TOSHIBA
Leading Innovation >>>

APPLICATION CONTROL MANUAL

**3 Compressors & 3 Inverters
Super Modular Multi System-i**

Super Modular Multi System

Super Heat Recovery Multi System

Mini-SMMS

Super Digital Inverter

Digital Inverter

Preface

This manual covers all functions concerning application control of TCC products for SMMS-i, SMMS, SHRM, Mini-SMMS, DI and SDI. Part 1 contains a summary of the product specifications and technical data frequently referred to, and all installation manuals and detailed documents of related products are included in Part 2. This manual is made as a collection of technical data to provide customers with precise solutions and service, and its main use is a reference to check functions of a product, make a sales proposal, choose an air conditioning method and device, design an air conditioning system, or install a product. This manual is intended to be useful for sale persons, planners, system designers, architects, and constructors.

We provide various methods for application control to satisfy the requirements of each customer, from simple methods to extended methods. It is important to choose an appropriate control method quickly to fulfill the requirements of a customer. To assist with the choice, we have added a lot of information and reflect answers from FAQs in the contents of this new version. However, for function details and operation after the test run, refer to the Installation Manual and Owner's manual of each product and other technical documents.

We hope this manual contributes to appropriate use of our air conditioning control products and fulfillment of our customers' various needs.

Toshiba Carrier Corp.
Global Sales Division
Sales Engineering Department
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Part 1

1

OUTLINE OF SYSTEM AND APPLICATION CONTROL

Sensors/switch/key/actuator

Daiseikai

TCB-PCOS1E2

Super Digital Inverter
Digital Inverter

Cable for connector
CN32(TCB-KBCN32VEE)
CN60(TCB-KBCN60OPE)
CN61(TCB-KBCN61HAE)
CN70(TCB-KBCN70OAE)
CN73(TCB-KBCN73DEE)
CN80(TCB-KBCN80EXE)

Remote Sensor
TCB-TC21LE2

Wireless remote controller

Simple remote controller
RBC-AS21E2

Wired remote controller
RBC-AMT32(31)E

Wired remote controller
with Weekly timer
RBC-AMS41E

General Purpose I/F
TCB-IFCG1TLE

TCB-KBOS1E
for SDI4 only

External sw

"1:1 model" connection
TCC-Link Interface
TCB-PCNT30TLE2

GSM Modem

GSM REMOTE CONTROL
TCB-IFGSM1E

TCC-LINK

SMMS
SMMS-i

Mini-SMMS

Remote ON/OFF
TCB IFCB-4E2

Central remote controller
TCB-SC642TLE2

Compliant Manager
BMS-CM1280TLE

Schedule timer
TCB-EXS21TLE

ON-OFF controller
TCB-CC163TLE2

Master remote
Side remote

Alarm Status output
ON/OFF Command

Batch drive, error output
Master ON/OFF signal

1.LonWorks® : Registered trademark by Echelon corporation.
2.BACnet® : ANSI/ASHRAE 135-1995 A data Communication Protocol for Building Automation and Control Network
3.Modbus® : Registered trademark by Schneider E.

Open System

TCB-IFCB640TLE

Analog I/F (DC voltage)

DC line

TCB-IFLN642TLE/TCB-IFLN642UL

LonWorks®

TP

TCB-IFMB640TLE

RS485

Modbus® (Master)

BACnet®

TCC-LINK

TCS-Net Relay Interface

RS485

BMS-LSV4E
BMS-IFLSV4UL(U.S.)

Power peak-out control board
TCB-PCDM2E/4E

Snowfall /External master ON/OFF /Night
operation/Operation mode selection board
TCB-PCMO2E/4E

Error output control board
TCB-PCIN2E

Error output control board Compressor
operation /system operation ratio(SMMS-only)
TCB-PCIN4E

BMS-LSV6E BACnet Server
BMS-STBN08E BACnet Server Software
Energy monitoring

BMS-IFWH5E
BMS-IFWH5UL(U.S.)

Energy monitoring Relay I/F

Digital I/O Relay I/F
BMS-IFDD03E
BMS-IFDD03UL(U.S.)

Power Meter

Relay I/F

Digital I/O Relay I/F

I/O Device

I/O Device

TCC-LINK

RS485

Touch-screen Controller
BMS-TP0641ACE
BMS-TP5121ACE
BMS-TP0641PWE
BMS-TP5121PWE

Compliant Manager
BMS-CM1280FTLE

RS485

TCC-LINK

Intranet

Webserver
BMS-WB2561PWE

BMS-WB2561PWE Gateway

BMS-WB2561PWE Gateway

RS485

RS485

TCC-LINK

TCC-LINK

TCC-LINK

TCC-LINK

Energy monitoring Relay I/F
Digital I/O Relay I/F

Energy monitoring Relay I/F
Digital I/O Relay I/F

Power peak-out control signal
Master ON/OFF signal
Error/operation output
Compressor operation /system
operation ratio (SMMS-i only)

Air-conditioning Management System

BMS-WB01GTE Master Server

RS485

*Monitoring
*Remote control
*Schedule operation
*Error code indication
*Alarm list indication
*Monthly report
*Energy monitoring data etc.

Notes:
Co-existence and interoperability of each
product shall be referred to other
documents. (1-10)

1-2 List of application control solution

1-2-1 Remote control/Schedule operation/Central control solution

No	Application		Solution	Explanation	Model Name	Category					Connecting device or setting method	Reference No.
						SMMS-i	SMMS SHRM	Mini-SMMS	DI	SDI		
1	Remote control	Wired	Normal control with Individual, Group control	Full function control	RBC-AMT32(31)E	yes	yes	yes	yes	yes	indoor unit AB	
		Simple wired	Normal control with Individual, Group control	Start/stop, temperature setting, air flow setting, check code display only	RBC-AS21E2	yes	yes	yes	yes	yes	indoor unit AB	
		Wireless	Normal control with Individual, Group control	For 4-way air discharge cassette type	RBC-AX31U(W)-E RBC-AX31U(WS)-E	yes	yes	yes	yes	yes	indoor unit AB	
				For Under Ceiling, 1-way air discharge cassette	RBC-AX22CE2		yes	yes	yes	yes		
				For all type except Concealed duct high static pressure, Fresh air indoor and Flexi (DI/SDI)	TCB-AX21E2		yes	yes	yes	yes		
		Weekly timer with normal control	Normal control with individual, group control, Weekly Schedule timer	7 day timer, 8 functions for each day of the week	RBC-AMS41E	yes	yes	yes	yes	yes	indoor unit AB	
				Weekly timer mode (7 types of weekly schedule and 3 cycles /day, can program off mode a minute unit)	TCB-EXS21TLE RBC-AMT32(31)E	yes	yes	yes	yes	yes	Wired remote controller 4p terminal connected with TCB-EXS21TLE	1-3 1-4
2	Schedule operation for small or middle sized building		Weekly schedule operation with normal operation Individual, Group/Zone control	Schedule timer mode (ON/OFF, Remote controller prohibited setting possible, 6 programs/day/group, max 8 groups, max 100 hours back up), for max 64 indoors	TCB-EXS21TLE	yes	yes	yes	yes	yes	Connected with FCU CN61 TCC-Link main bus	
				Schedule timer mode (ON/OFF, Remote controller prohibited setting possible, 6 programs/day/group, max 8 groups, max 100 hours back up) — Max 64 indoor units/groups	TCB-SC642TLE2 TCB-EXS21TLE	yes	yes	yes	yes	yes	TCB-SC642TLE2 connected with TCB-EXS21TLE TCC-Link main bus	
				Max 64 indoor units/groups x 2	BMS-CM1280TLE TCB-EXS21TLE/bus	yes	yes	yes	yes	yes	BMS-CM1280TLE connected with TCB-EXS21TLE 2 TCC-Link main bus	
				ON/OFF function only. Schedule timer mode (Remote controller prohibited setting possible, 6 programs/day/group, max 8 groups, max 100 hours back up) for max 16 indoors/groups	TCB-EXS21TLE with TCB-CC163TLE2	yes	yes	yes	yes	yes	TCB-CC163TLE2 connected with TCB-EXS21TLE TCC-Link main bus	
3	Central control for small or middle sized building without schedule		Normal central operation, monitoring, zone control	Max 64 indoor units, 4 zone,16 groups/zone, 4 types central setting	TCB-SC642TLE2	yes	yes	yes	yes	yes	TCC-Link main bus	1-3
				Max 128 indoor units, (4 Zone/16 groups, 64 zone/64 groups) x 2ch, 4 types central setting	BMS-CM1280TLE	yes	yes	yes	yes	yes	2 TCC-Link main bus	1-4
			ON/OFF central control of max 16 indoor units/groups	Individual ON/OFF control up to 16 indoors/groups, Main, sub controllers /zone possible, all ON, all OFF, Max 10 controllers, including other central controllers	TCB-CC163TLE2	yes	yes	yes	yes	yes	TCC-Link main bus	
			Control by DC input voltages (Analog I/F)	8 Analog Inputs (1-10VDC), 2 Digital outputs, 64 indoor units	TCB-IFCB640TLE	yes	yes	yes	yes	yes	TCC-Link main bus	1-9

1-2-2 For Indoor application solution

No	Application	Solution	Explanation	Model Name	SMMS -i	SMMS SHRM	Mini- SMMS	DI	SDI	Connecting device or setting method	Reference No.
4	DN code	Function change	Setting functions necessary to perform applied control at the local site	-	yes	yes	yes	yes	yes	Item code (DN) setting from wired remote controller	4-4-1
	Connector	Ventilation fan control from Remote controller	CN32 output is interlocked with VENT ON/OFF signal on Remote controller	TCB-KBCN32VEE (cable)	yes	yes	yes	yes not all	yes not all	CN32 on indoor unit	
		Operation status signal output	CN60 output is cooling, heating, fan, defrost, thermo-ON	TCB-KBCN600PE (cable)	yes	yes	yes	yes not all	yes not all	CN60 on indoor unit	
		Leaving-ON prevention control by key sw	Indoor ON/OFF is interlocked with key box signal on CN61 input	TCB-KBCN61HAE (cable)	yes	yes	yes	yes not all	yes not all	CN61 on indoor unit	1-5 4-4-2
		Operation Input / Output	CN61 is ON/OFF control, ON/OFF status, alarm status,12v output								
		Option error input	Alarm is displayed on the remote controller by CN70 input	TCB-KBCN700AE (cable)	yes not all	yes not all	yes not all	yes not all	yes not all	CN70 on indoor unit	
		Demand input	Forced thermo-off operation by CN73 input	TCB-KBCN73DEE (cable)	yes not all	yes not all	yes not all	yes not all	yes not all	CN73 on indoor unit	
		Outside error input	CN80 input generates Code "L30" (for 1 minutes continuously) to stop forcedly the operation.	TCB-KBCN80EXE (cable)	yes	yes	yes	yes not all	yes not all	CN80 on indoor unit	
	Remote Temperature sensor	Remote sensing of indoor air temperature	Air temperature sensing at a distance by switching from body sensor max 1 and max 1 wired remote controller on the A/B terminal	TCB-TC21LE2	yes	yes	yes	yes	yes	indoor unit A/B	4-4-3
	Remote control Central control	Remote ON/OFF control by DC input	indoor unit on/off is interlocked with TCB-IFCB-4E2 DC inputs	TCB-IFCB-4E2	yes	yes	yes	yes	yes	CN61 on indoor unit	1-8
		Central control for Daiseikai/IMS through TCC-LINK	TCB-IFCG1TLE has HA control terminal. HA terminal is controlled through TCC-LINK from Central Controller.	TCB-IFCG1TLE	-	-	-	-	-	HA terminal	1-8
	Interlocking	The signal from window sensors, card key switch, fire alarm, etc interlock with operation status of indoor units	8 inputs for sensors, 4 outputs for actuators and 64 indoor units/groups. HA terminal connectable. On site programming by 2 Analog, 5 Digital inputs, 12 patterns	TCB-IFCG1TLE	yes	yes	yes	yes	yes	TCC-Link main bus	1-8
			Input ports for all stop, all start Operation, fire alarm (no TCB-SC642TLE2). Output ports for operating, alarm status	TCB-SC642TLE2	yes	yes	yes	yes	yes	TCC-Link main bus	1-3
				BMS-CM1280TLE BMS-CM1280FTLE	yes	yes	yes	yes	yes	2 TCC-Link main bus	1-4 1-9
			8 Sensors connected to BMS-IFDD02E2 can interlock with indoor units. 3 fire alarm/key lock direct inputs	BMS-TP** With BMS-IFDD02E2	yes	yes	yes	yes	yes	TCC-Link main bus	
			8 Sensors connected to BMS-IFDD02E2 can interlock with indoor units. 3 fire alarm/key lock direct inputs	BMS-CM1280FTLE with BMS-IFDD02E2	yes	yes	yes	yes	yes	2 TCC-Link main bus	1-9
			8 Sensors connected to BMS-IFDD02E2 can interlock with indoor units.	BMS-WB2561PWE with BMS-IFDD02E2	yes	yes	yes	yes	yes	TCC-Link main bus	
	Mobile Phone Control	Control by GSM SMS –mail text	Control and monitor ON/OFF, alarm status by GSM SMS mail system	TCB-IFGSM1E	yes	yes	yes	yes	yes	CN61 on indoor unit/HA for Daiseikai	1-8
	Network adapter	Central control by Ai-Net	Connectable to Ai NET Controller. Not recommended. No Rohs.	TCB-PCNT20E	(yes)	(yes)	(yes)	(yes)	(yes)	indoor unit CN309, CN041(AB)	1-8
		Central control with "1:1 model"	Compact 4-way cassette series2 needs the metal case TCB-PX30MUE additionally.	TCB-PCNT30TLE2	no	no	no	yes	yes	indoor unit CN050	1-8
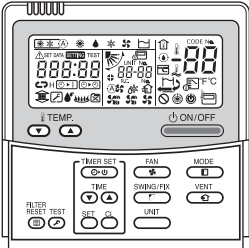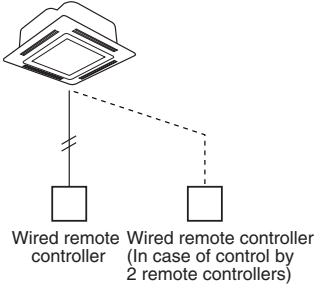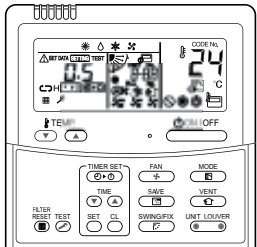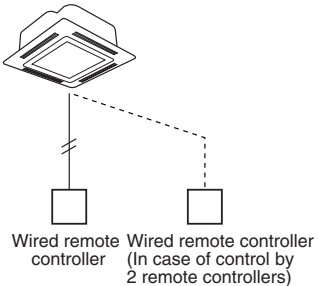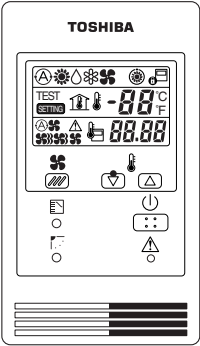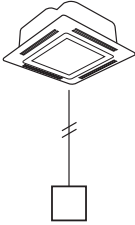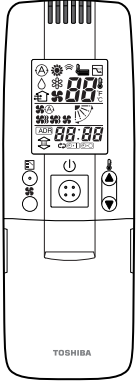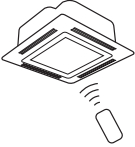
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No	Application	Solution	Explanation	Model Name	SMMS-i	SMMS SHRM	Mini-SMMS	DI	SDI	Connecting device or setting method	Reference No.
5	Dip Switch/JP Setting	Outdoor fan high static pressure shift	Control standard air volume of outdoor unit	-	yes	yes	no	no	no	SW10 on outdoor unit	
		Cooling priority, Heating priority setting	Cooling priority or heating priority can be selected	-	yes	yes	yes	no	no	SW11 on outdoor unit	1-6
		Specific indoor unit priority control	Only one indoor unit can be set as priority for changeover of operation mode	-	yes	yes	yes	no	no	SW11 on outdoor unit	
		PMV-Kit control	Set SW08 in this case, also when using the indoor unit under high humidity	-	no	no	yes	no	no	SW08 on outdoor unit	
		High static pressure shift	Control standard air volume of outdoor unit	-	no	no	no	no		SW802 on outdoor unit	
		Existing piping usage	19.1∅ is used for existing pipe. Follow the re-use existing pipe application procedure.	-	no	no	no	yes 3/4 series		SW802 or 801 sub PCB on outdoor unit	
		Power saving control	Power saving by reducing the compressor frequency 10%	-	no	no	no	yes 4 series only	yes some of 4 series	SW802 or 801 sub PCB on outdoor unit	1-13
		Snow-proof Fan control	When snow enters, the control to prevent generation of motor lock is validated.	-	no	no	no		yes series only	SW802 on outdoor unit	
		Defrost time change	The defrost interval is shortened than the standard status (Min 30 minutes)	-	no	no	no			J805, 806 on outdoor unit	
		Max frequency change	Max frequency of compressor at cooling/heating is lowered. But max capacity decreases.	-	no	no	no			J807 on outdoor unit	
		Cooling operation mode only	DN"0F" also can set.	-	no	no	no			J808 or SW801 sub PCB on outdoor unit	
	External board /Component	Power peak cut control	Restrict the upper limit capacity of the outdoor unit by setting.	TCB-PCDM2E	no	yes	yes	no	no	CN513 on outdoor unit Cable length is different (4E longer) 4E includes a ferrite noise filter.	
				TCB-PCDM4E	yes	yes	yes	no	no		
		Snowfall fan control	This input port can control ON/OFF of outdoor fan	TCB-PCMO2E	no	yes	no	no	no	CN509 on outdoor unit Cable length is different(4E longer) 4E includes a ferrite noise filter.	
				TCB-PCMO4E	yes	yes	no	no	no		
		External master ON/OFF control	Outdoor unit starts or stops by input control	TCB-PCMO2E	no	yes	yes	no	no	CN512 on outdoor unit Cable length is different(4E longer) 4E includes a ferrite noise filter.	
				TCB-PCMO4E	yes	yes	yes	no	no		
		Night operation (Sound reduction) control	Sound level can be reduced by compressor and fan speeds	TCB-PCMO2E	no	yes	yes	no	no	CN508 on outdoor unit Cable length is different(4E longer) 4E includes a ferrite noise filter.	
				TCB-PCMO4E	yes	yes	yes	no	no		
		Operation mode selection control	2 input ports restrict operation mode to cooling or heating mode.	TCB-PCMO2E	no	yes	yes	no	no	CN510 on outdoor unit Cable length is different(4E longer) 4E includes a ferrite noise filter.	
				TCB-PCMO4E	yes	yes	yes	no	no		
		Error/operation output control	Error status output and Operation status output when more than one indoor unit operation.	TCB-PCIN2E	no	yes	yes	no	no	CN511 on outdoor unit CN513 Mini-SMMS	1-7
				TCB-PCIN4E	yes	yes	yes	no	no		
		Compressor operation status	3 each compressor status real time outputs, countable operation time for energy monitoring, etc	TCB-PCIN4E	yes	no	no	no	no	CN514 on outdoor unit	
		Operation output ratio	Operation output ratio output (max output 100%), for real time monitoring, etc.	TCB-PCIN4E	yes	no	no	no	no	CN514 on outdoor unit	
		Peak-cut control/night operation /Compressor ON status output	Power saving 3 levels (stop/50%/75%) and reduce the capability for night operation (sound level 5db down at cooling). Compressor ON status output.	TCB-PCOS1E2	no	no	no	yes some of series 2/3 only	yes some of series 4 only	Transformer/Inverter outdoor UNIT	
		Peak-cut control/night operation/ Compressor ON status output	Power saving 3 levels (stop/50%/75%) and reduce the capability for night operation (sound level reduced to 45db heating/cooling). Compressor ON status output	TCB-KBOS1E (cable)	no	no	no	yes series 4 only	yes some of series 4 only	CN610 on outdoor unit CN704 on outdoor unit	

1-2-4 Open Network/Central control

No	Application	Solution	Explanation	Model Name	SMMS-i	SMMS SHRM	Mini-SMMS	DI	SDI	Connecting device or setting method	Reference No.
6	Open Network Solutions	DC voltage control (Analog I/F)	Central control by external variable DC voltage. Max 64 indoor units/groups	TCB-IFCB640TLE	yes	yes	yes	yes	yes	TCC-Link main bus	
		Compliant to Modbus protocol	Central control by Modbus. Max 64 indoor units/groups Compliant to RS485 Modbus RTU mode	TCB-IFMB640TLE							1-9
		Compliant to LON works protocol	Central control by Lonworks. Max 64 indoor units/groups Compliant to LonWorks EIA/ANSI 709.1 (FTX1 transceiver)	TCB-IFLN640TLE or TCB-IFLN642TLE TCB-IFLN642UL							
		Compliant to BACnet protocol	Central control by BACnet. Max 128 indoor units/ BACnet server Compliant to ANSI/ASHRAE Standard 135-2004 BACnet IP	BMS-LSV6E With BMS-LSV3E or BMS-LSV4E or BMS-IFLSV4UL (U.S.) BMS-STBN08E							
7	Central control for middle or large sized building with schedule	Full control/monitoring/Schedule without Energy monitoring, no PC web access	Max 64 or 512 indoor units	BMS-TP0641/521ACE With BMS-LSV3E or BMS-LSV4E or BMS-IFLSV4UL (U.S.)	yes	yes	yes	yes	yes	TCC-Link main bus Digital I/O Relay I/F (input 8 ports, output 4 ports/device) BMS-IFDD03E, BMS-IFDDO3UL (U.S.)	
		Full control/monitoring/Schedule with Energy monitoring, no PC web access	Max 64 or 512 indoor units	BMS-TP0641/ 5121PWE With BMS-LSV3E or BMS-LSV4E or BMS-IFLSV4UL (U.S.)	yes	yes	yes	yes	yes	TCC-Link main bus Energy monitoring with Energy monitoring Relay I/F BMS-IFWH5E or BMS-IFWH5UL (U.S.) (8 power meters/device)	1-9
			Max 128 indoor units	BMS-CM1280FTLE							
		Full control/monitoring/Schedule from PC Web with Energy monitoring	Max 256 indoor units	BMS-WB2561PWE With BMS-LSV3E or BMS-LSV4E or BMS-IFLSV4UL (U.S.)						Digital I/O Relay I/F (input 8 ports, output 4 ports/device) BMS-IFDD03E, BMS-IFDDO3UL (U.S.)	
			Max 2048 indoor units (1 BMS-WB01GTE (Master server) and max 8 BMS-WB2561PWE (gateway))	BMS-WB2561PWE BMS-WB01GTE With BMS-LSV3E or BMS-LSV4E or BMS-IFLSV4UL (U.S.)							
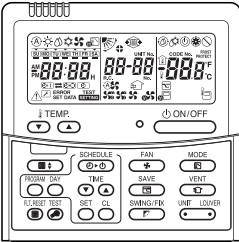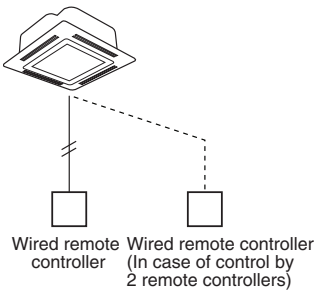
1-3 Remote controller

Name	Model name	Appearance	Application	Function	Reference No.
Wired remote controller	RBC-AMT21E RBC-AMT31E		**Connected to indoor unit** Wired remote controller / Wired remote controller (In case of control by 2 remote controllers)	• Start / Stop • Changing mode • Temperature setting • Air flow changing • Timer function 　① Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated. 　② Combined with the weekly timer, weekly schedule operation can be operated. • Filter sign 　Displays automatically maintenance time of indoor filter. 　Filter sign flashes. • Self-diagnosis function 　Pressing "CHECK" button displays the cause of the fault/error based on the check code. • Control by 2 remote controllers is available. 　Two remote controllers can be connected to one indoor unit. The indoor unit can then be operated separately from the two different places.	**1-4** **1-12-1** **4-1-1** **4-1-2**
	RBC-AMT32E		**Connected to indoor unit** Wired remote controller / Wired remote controller (In case of control by 2 remote controllers)	• Start / Stop • Changing mode • Temperature setting • Air flow changing • Power Save mode • Individual louver setting • Frost protection setting • Self cleaning mode • Timer function 　① Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated. 　② Combined with the weekly timer, weekly schedule operation can be operated. • Filter sign 　Displays automatically maintenance time of indoor filter. • Filter sign flashes. 　Self-diagnosis function 　Pressing "CHECK" button displays the cause of the fault/error based on the check code. • Control by 2 remote controllers is available. 　Two remote controllers can be connected to one indoor unit. The indoor unit can then be operated separately from the two different places.	**1-4** **1-12-1** **4-1-1**

Name	Model name	Appearance	Application	Function	Reference No.
Simple wired remote controller	RBC-AS21E RBC-AS21E2		**Connected to indoor unit** Simple remote controller	• Start / Stop • Temperature setting • Air flow changing • Check code display	**1-4** **1-12-1** **4-1-3**
Wireless remote controller kit	RBC-AX31U (W)-E RBC-AX31U (WS)-E RBC-AX22CE2 TCB-AX21E2		**Connected to indoor unit** 	• Start / Stop • Changing mode • Temperature setting • Air flow changing • Timer function Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated. • Control by 2 remote controllers is available. Two wireless remote controllers can operate one indoor unit. The indoor unit can then be operated separately from the two different places. • Check code display **RBC-AX31U(W)-E/RBC-AX31U(WS)-E** (For 4-way Air Discharge Cassette) **RBC-AX22CE2** (For Under Ceiling, 1-way Air Discharge Cassette) **TCB-AX21E2** For all types except Concealed duct high static pressure, Fresh air indoor and Flexi (DI/SDI)	**next page** **1-4** **1-12-1** **4-1-4** **4-1-5** **4-1-6**
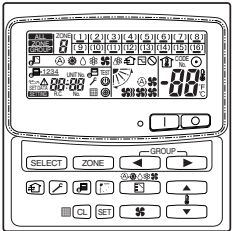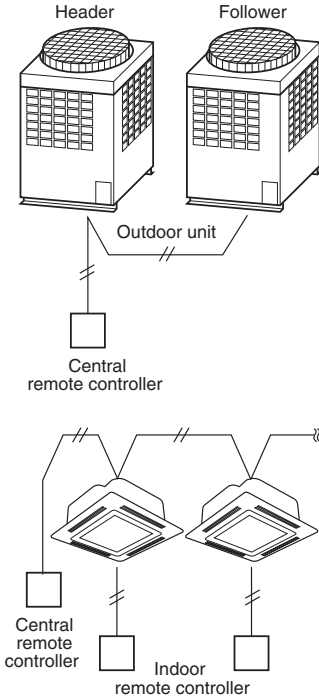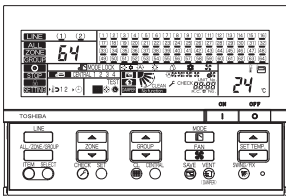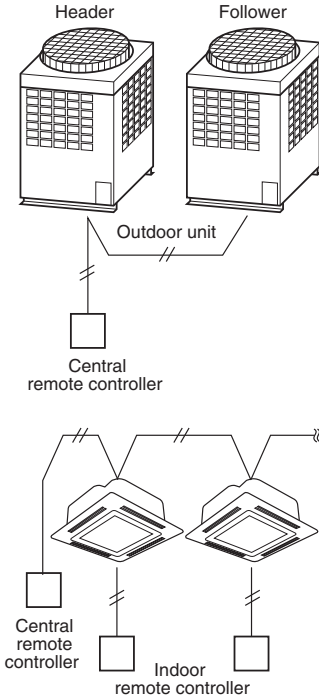
Wireless remote controller kit
(Kit includes Hand set and receiver unit)
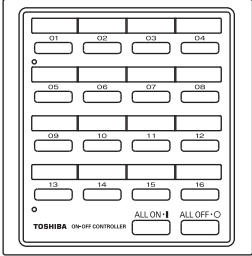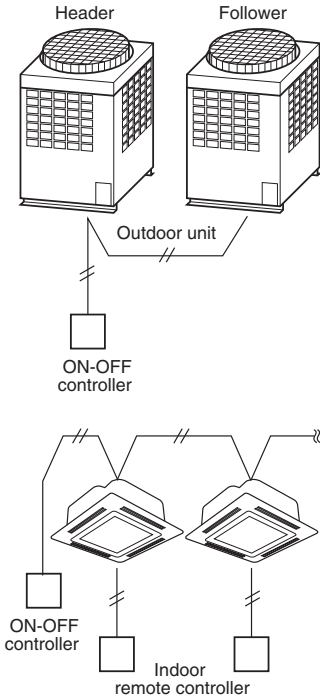
	Outlook and function		Reference No.
Wireless remote controller	**Wireless remote controller** (Common for all indoor unit types)		
Sensor unit (receiver unit)	**RBC-AX31U(W)-E** **RBC-AX31U(WS)-E** (for 4-way Air Discharge Cassette type) 162.6(W) x 162.6(D) (Mounted to the corner of ceiling panel)	• **Check code display** (sensor block display on the receiving unit) • **Test operation** (Switch setting on the receiver unit) • **Emergency operation** (Push "emergency operation" button on the receiver unit)	**1-4** **1-12-1** **4-1-4** **4-1-5** **4-1-6**
	RBC-AX22CE2 (For Under Ceiling, 1-way Air Discharge Cassette) 130W x 65H (Mounted to the display position behind the front cover)		
	TCB-AX21E2 For all types except Concealed duct high static pressure, Fresh air indoor and Flexi (DI/ SDI) 70W x 120H (Placed on the wall,etc)		

Name	Model name	Appearance	Application	Performance	Reference No.
Wired remote controller with weekly timer	RBC-AMS41E		**Connected to indoor unit** Wired remote controller / Wired remote controller (In case of control by 2 remote controllers)	• Start / Stop • Changing mode • Temperature setting • Air flow changing • Power Save mode • Individual louver setting • Frost protection setting • Self cleaning mode • Grill up/down • Timer function • Clock display • Schedule timer possible to program schedule timer (7 day timer) funtion possible to program 7 functions for each day of the week * The following items can be set in program; operation time, operation start/stop, operation mode, temperature setting, restriction on button opeartion ① Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated. ② Combined with the weekly timer, weekly schedule operation can be operated. • Filter sign Displays automatically maintenance time of indoor filter. Filter sign flashes. • Self-diagnosis function Pressing "CHECK" button displays the cause of the fault/error based on the check code. • Control by 2 remote controllers is available. Two remote controllers can be connected to one indoor unit. The indoor unit can then be operated separately from the two different places.	**1-4** **1-12-1** **4-1-7**

Name	Model name	Appearance	Application	Performance	Reference No.

Schedule timer	TCB-EXS21TLE		**Connected to central remote controller and wired remote controller**
			
			Weekly Timer mode
			
			Wired remote controller Schedule Timer
			
			Outdoor unit
			
			Schedule Timer mode
			
			Power
			Central remote controller Schedule Timer
			Indoor unit, TCB-SC642TLE, BMS-CM1280TLE or TCB-CC163TLE
				■ ON/OFF control
				• Schedule timer mode
				  – 6 programs per day for each group
				  – able to program up to 8 groups
				  – able to control up to 64 indoor units
				  – Power supply for program backup of up to 100 hours
				  – Program backup of up to 100 hours
				• Weekly timer mode
				  – able to control 1 indoor unit/ group with the wired remote controller (RBC-AM32(31)E)
				  – able to control up to 64 indoor units with the central controller or ON-OFF controller
				  – 7 types of weekly schedule and 3 running cycles per day are available.
				  – Off mode is programmable in minutes. mode
				■ Setting to cancel timer operation during holidays
				■ Timer operation can be temporarily cancelled.
				■ Remote controller use can be prohibited/permitted.
				* For wireless remote controllers, the ON/OFF status can only be controlled.
				■ Schedule timer mode and Weekly timer mode are switched by changing the setting of the bit 1 of S41.
					1-4 4-1-8

Name	Model name	Appearance	Application	Performance	Reference No.
Central remote controller	TCB-SC642TLE TCB-SC642TLE2		**Connected to outdoor unit, indoor unit** Header Follower Outdoor unit Central remote controller Central remote controller Indoor remote controller	• Individual control of up to 64 indoor units. • Individual control for max. 64 indoor units divided 1 to 4 zone. (Up to 16 indoor units for each zone) • Up to 16 outdoor header units are connectable. • 4 types of central control settings to inhibit individual operation by remote controller can be selected. • Setting for one of 1 to 4 zones is available. • Usable with other central control devices (Up to 10 central control devices and BMS I/F in one TCC-LINK bus) • Two control mode selectivity (Central controller mode Remote controller mode) • Operating with Schedule Timer TCB-EX21TLE (Schedule Timer mode)	1-4-4 4-2
	BMS-CM1280TLE		**Connected to outdoor unit, indoor unit** Header Follower Outdoor unit Central remote controller Central remote controller Indoor remote controller	• Individual control of up to (64 indoor units) x 2 TCC-LINK buses • Individual control of up to (64 indoor units divided 1 to 64 zone) x 2 TCC-LINK buses (up to 64 indoor units for each zone) • up to 16 outdoor header units are connectable per 1 TCC-LINK bus • 4 types of central control settings to inhibit individual operation by remote controller can be selected • Setting for (one of 1 to 64 zones)*2ch is available • Setting for (one of 1 to 64 groups) x 2ch is available • Usable with other central control devices (up to 10 central control devices and BMS I/F in one TCC-LINK bus.) • Two control mode selectively (central controller mode) (remote controller mode) by SW01 bit6 • Operating with Schedule Timer TCB-EX21TLE (Schedule Timer mode) • Return- back setting	1-4-4 4-8-5

Name	Model name	Appearance	Application	Performance	Reference No.
ON-OFF controller	TCB-SC163TLE TCB-SC163TLE2		**Connected to outdoor unit, indoor unit** 	• Individual control of up to 16 indoor units (groups)/one ON-OFF controller. • Operating with Schedule Timer TBC-EX21TLE (Schedule Timer mode) • MAX 2 ON-OFF Controllers (Main/Sub) per one zone. • MAX 4 ZONES, 8 ON-OFF controllers • All OFF, all ON control	1-4-4 4-3
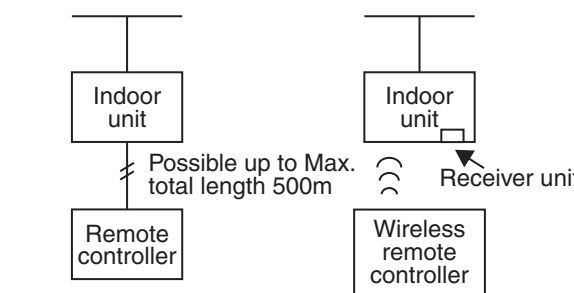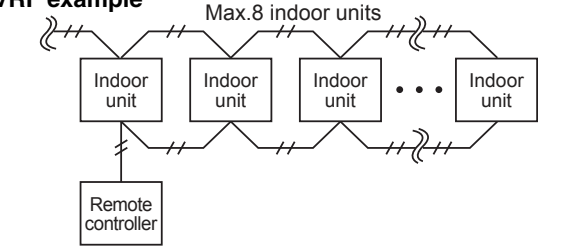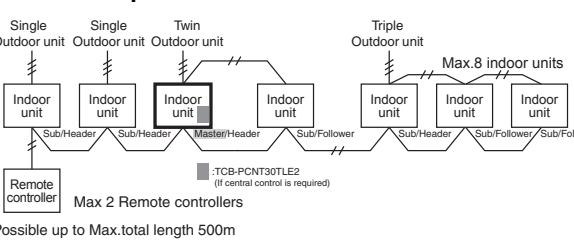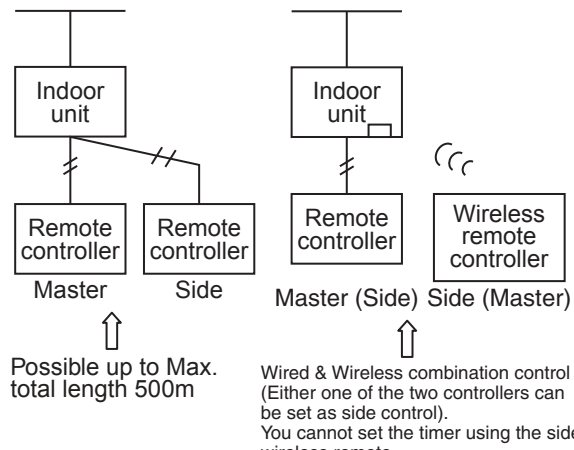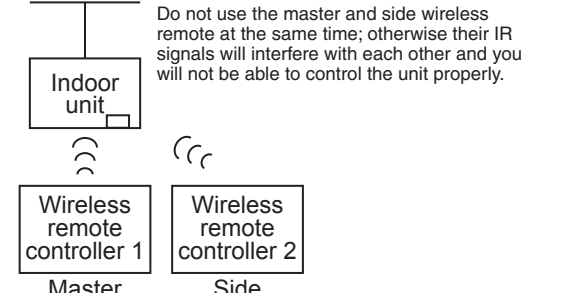
Remote Controller Comparison Table

Overall Function	Model Name	Normal — RBC-AMT32(31)E	With weekly — RBC-AMS41E	Simple — RBC-AS21E2	Ceiling/Cassettes kit (Common Controller WH-H1JE2; For 4-way cassette RBC-AX31U(W)-E RBC-AX31U(WS)-E / For Under Ceiling, 1-way RBC-AX22CE2)	Others kit / For other TCB-AX21E2 (WH-H1JE2)	WH-H2UE — For Hi-wall/Flexi Packed in
		Wired remote controller			**Wireless remote controller Note11**		
Dimension		120 x 120 x 16mm	120 x120 x 16mm	120 x 70 x 16mm	61 x 177 x 19.5mm (handset); RBC-AX31U(W)-E 162.6 x 162.6 x 24.1mm; RBC-AX22CE2 130 x 65mm	61 x 177 x 19.5mm (handset); 83.5 x 70 x 13mm	56 x 150 x 19mm; Receiver included
Installation place		Wall	Wall	Wall	Inside Indoor (receiver)	Wall (receiver)	-
Max wired length (indoor-receiver) Note13		300m	300m	300m	200m	200m	-
ON/OFF		yes	yes	yes	yes	yes	yes
MODE	Auto Note4	yes	yes	yes	yes	yes	yes
	cool	yes	yes	yes	yes	yes	yes
	heat	yes	yes	yes	yes	yes	yes
	dry Note1	yes	yes	yes	yes	yes	yes
	fan	yes	yes	yes	yes	yes	yes
Temperature setting range	Auto Note4	18~29 °C	18~29 °C	18~29 °C	17~27 °C	17~27 °C	17~30 °C
	cool	18~29 °C	18~29 °C	18~29 °C	18~30 °C	18~30 °C	17~30 °C
	heat	18~29 °C	18~29 °C	18~29 °C	16~30 °C	16~30 °C	17~30 °C
	dry	18~29 °C	18~29 °C	18~29 °C	18~30 °C	18~30 °C	17~30 °C
FAN Note2	auto/low/med/high	yes	yes	yes	yes	yes	yes
Flap position Note3		yes	yes	yes	yes	yes	yes
Ventilation control		yes	yes	no	no	no	no
Filter sign/reset		yes	yes	no	yes/no	yes/no	no/yes
Return back		yes	yes	no	no	no	no
Power Save Note10 / Individual louver Note10 / Frost protection (heating at 8 °C) Note10 / Self cleaning mode Note10		yes (31 no)	yes	no	no	no	no
CLOCK		no	yes	no	no	no	yes
ECO/HI-POWER/MEMO/AUTO		no	no	no	no	no	yes
Grille up/down Note10		no	yes	no	no	no	no
Central mode (function setting)		no	yes	no	no	no	no
Temperature sensor Note5		yes	yes	yes Note6	yes Note7	yes Note7	no
Header/follower (set by switch)	header	yes	yes	yes	yes Note9	yes Note9	yes
	follower	yes	yes	yes	yes Note9	yes Note9	yes/no Note12
Multiple control Note8		Max2 /1 indoor or 1group	Max 2 /1 indoor or 1group	Max 2 /1 indoor or 1group	Max6.Possible Address setting All,1,2,3,4,5,6	Max6.Possible Address setting All,1,2,3,4,5,6	no (one wireless only)
Timer		Off/repeat off/on	Off/repeat off/on	no	Off/repeat off/on	Off/repeat off/on	Off/on/on-off/daily
Weekly schedule		no	yes 7 day timer, 8 functions for each day of the week	no	no	no	no
Connectivity to Schedule Timer (TCB-EXS21TLE)		yes	no	no	no	no	no
Error output		yes	yes	yes	yes LED on receiver	yes LED on receiver	no
Error history		yes 4 history	yes 4 history	no	no	no	no

[NOTE.1] Not provided on the concealed duct high static pressure type
[NOTE.2] On the concealed duct high static pressure type, high only displayed and no selection
[NOTE.3] No function for concealed duct standard type, high static pressure type, floor standing cabinet type, floor standing concealed type, and slim duct type
[NOTE.4] S-HRM only except DI/SDI
[NOTE.5]
- DN code 32 setting is necessary for remote controller sensor.
- Be careful that the surrounding air flow of the remote temperature sensor is not poor.
- When using 2 remote controllers, the master controller is recognized as remote sensor through the temperature can be set from either master or side remote controller.
- Do not use remote sensor in case of group control except DI/SDI.

[NOTE.6] Select the remote sensor switch on the controller.
[NOTE.7] If wireless remote controller sensor is selected, temperature data from the sensor is used as Room temperature only during the operation of the remote controller by user (Start/Stop button).If the operation is stopped, it is automatically changed to the body sensor after about 12 minutes.
[NOTE.8] Wireless type max 6 address setting. the address switch position on both receiver and controller shall be selected.
[NOTE.9] At least one shall be wired type. In case of Fresh air indoor intake, wired remote controller shall be the master.
[NOTE.10] The actual functions depend on the air-conditioner.
[NOTE.11] Can't be connected to concealed duct high static pressure type or fresh air intake indoor unit as the master.
[NOTE.12] Flexi does not accept the sub controller.
[NOTE.13] Another 200 m for Indoor to Indoor wiring.

1-4 Application controls for remote controller

1-4-1 Applications for indoor remote controller

	Basic function	System diagram	Model
1	**Individual control** Air conditioner is individually operated at a distance.	Main remote controller / Wireless remote controller Indoor unit — Possible up to Max. total length 500m — Remote controller Indoor unit — Receiver unit — Wireless remote controller	• Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2** • Wireless remote controller kit **RBC-AX31U(W)-E** **RBC-AX31U(WS)-E** **RBC-AX22CE2** **TCB-AX21E2**
2	**GROUP control** One remote controller can control a group of up to a maximum of 8 indoor units. Operating on the same setting	**VRF example** Max.8 indoor units Indoor unit — Indoor unit — Indoor unit — ... — Indoor unit Remote controller **DI/SDI example** Single Outdoor unit / Single Outdoor unit / Twin Outdoor unit / Triple Outdoor unit Max.8 indoor units Indoor unit / Indoor unit / Indoor unit / Indoor unit / Indoor unit / Indoor unit / Indoor unit Sub/Header / Sub/Header / Master/Header / Sub/Follower / Sub/Header / Sub/Follower / Sub/Follower Remote controller :TCB-PCNT30TLE2 (If central control is required) Max 2 Remote controllers Possible up to Max.total length 500m	• Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2** • Wireless remote controller kit **RBC-AX31U(W)-E** **RBC-AX31U(WS)-E** **RBC-AX22CE2** **TCB-AX21E2**
3	**Two remote control** Air conditioner is controlled by two remote controllers in two locations.	Wired system Indoor unit — Remote controller (Master) / Remote controller (Side) Possible up to Max. total length 500m Indoor unit — Remote controller / Wireless remote controller Master (Side) / Side (Master) Wired & Wireless combination control (Either one of the two controllers can be set as side control). You cannot set the timer using the side wireless remote. Wireless system Do not use the master and side wireless remote at the same time; otherwise their IR signals will interfere with each other and you will not be able to control the unit properly. Indoor unit Wireless remote controller 1 (Master) / Wireless remote controller 2 (Side)	• Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2** • Wireless remote controller kit **RBC-AX31U(W)-E** **RBC-AX31U(WS)-E** **RBC-AX22CE2** **TCB-AX21E2**

	Basic function	System diagram	Model
4	**Control by weekly timer** (Weekly schedule operation)	Indoor unit — Remote controller — Schedule timer **or** Indoor unit — Remote controller with Weekly Timer TCB-EXS21TLE • 7 type of weekly schedule and 3 cycles per day • Program off mode RBC-AMS41E • 7 day timer • 8 functions/day	• Wired remote controller **RBC-AMT21E RBC-AMT32(31)E** + • Schedule timer **TCB-EXS21TLE** or **RBC-AMS41E**

1-4-2 Two remote controllers

This control is for one or more indoor units that are controlled by two separate remote controllers.
(Max. two remote controllers can be connected.)

③One indoor unit operated by two remote controllers
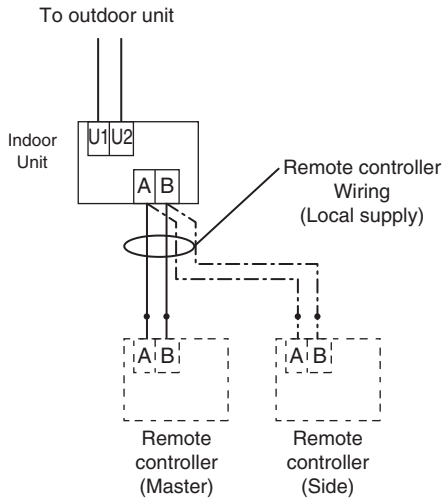
③Group control operated by two remote controllers
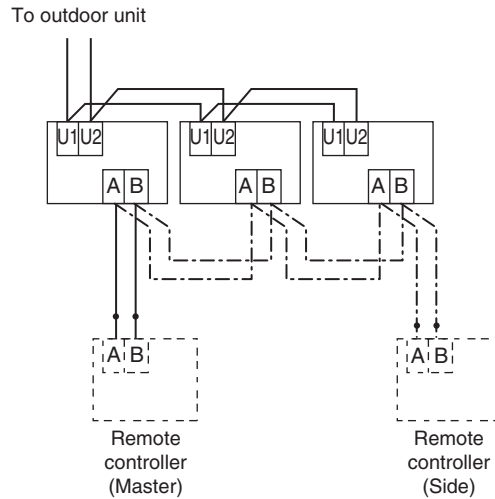
(Setting method for side remote controller)

In case of wired remote controller
Change the remote controller address connector on the side of the remote controller on the P.C. board.

(In case of remote controller [RBC-AS21E2], refer to **"4-1-3 Simple wired remote controller"**)

Remote controller (inside, rear)

Header remote controller
Follower remote controller

Follower remote controller
Header remote controller

DIP switch   DIP switch

Be sure to set switch 2 to the lower position.
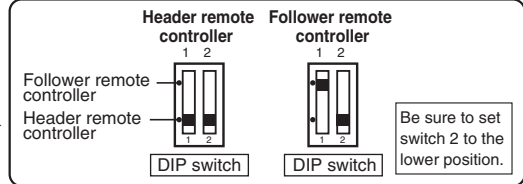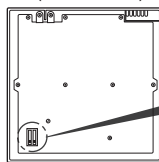
In case of wireless remote controller (RBC-AX31U, RBC-AX22)
Turn No.3 on DIP switch [S003] on sensor P.C. board from OFF to ON.

In case of TCB-AX21E2
RCU : MAIN
RCU : SUB
Switch on the Receiver Unit
For details, refer to "4-1-6 Wireless remote controller kit")

S 003
Bit 3 : OFF to ON
ON

Sensor P.C. board

Corner cap

Cover
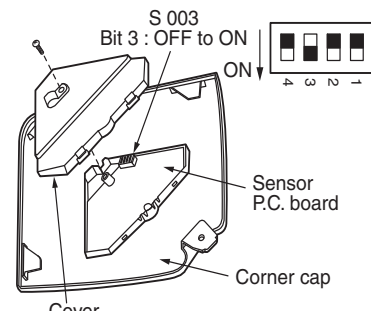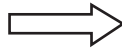
(Operation)
1) Operation items can be changed by "last push priority".
2) In case of using a timer, connect the timer to either remote controller.

1-4-3 Group control

Maximum of 8 indoor units can be controlled by one remote controller within a group control.
Twin change or triple control of a 1 by 1 model (Toshiba Digital inverter, Super digital inverter) corresponds to one group control.
The Header indoor unit controls the indoor air temperature based on the setting temperature of the remote controller.

VRF example

System sample
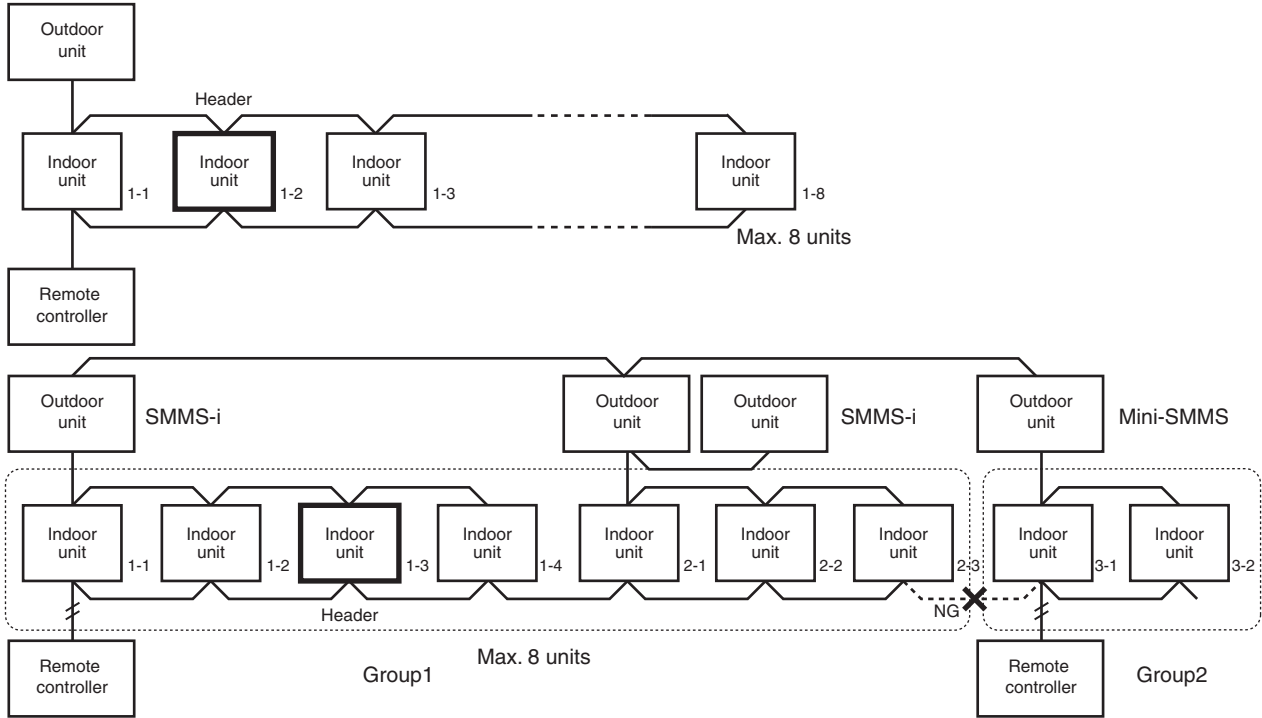
Refer to 3-2-6 for related information.

In case of DI/SDI, each Header indoor unit connected with outdoor unit controls room temperature according to setting on the remote controller. The Master indoor unit in the group is the representative of multiple indoor units and sends/receives signals to/from the remote controller and other indoor units in the group.

DI/SDI example
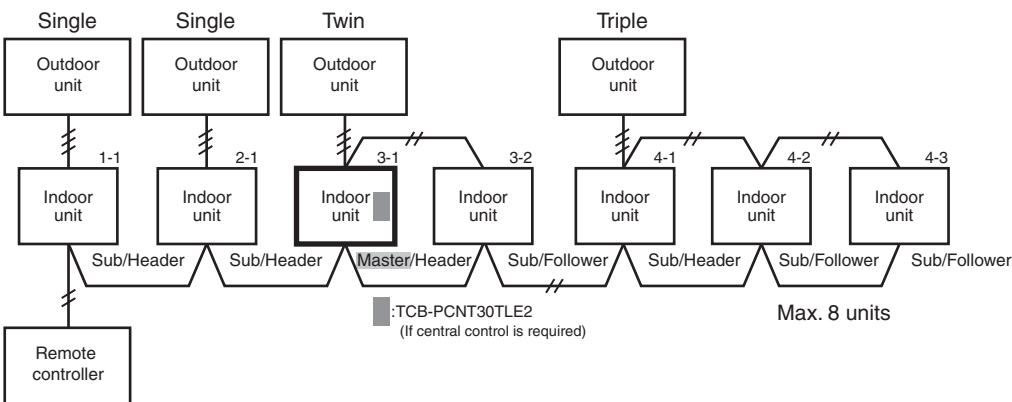
[NOTE]	**Be sure to supply the power to all indoor units within the group control.** "Do not make any groups containing two or more types of units (any two or more from SMMS-i, SMMS, Mini-SMMS and DI/SDI)."

[1] The number of indoor units and remote controls

    1. Maximum amount of devices in a group:

    Indoor unit: up to 8 units, remote control: up to 2 units (1 master and 1 sub unit), special remote sensor (TCB-TC21LE): 1 unit (Remote control must be one when the sensor is used.)
    Refer to 2-3 for the wiring distance limit.

2. The number of indoor units recognized by the upper central management device when they are grouped:
You cannot regard the group number as that of the recognized indoor units even if they are controlled on a group basis. The number varies depending on type of the system:
- In a VRF system: total number of indoor units
- In a DI/SDI system: number of indoor units equipped with TCC-LINK adaptors. Normally one master unit in a group
- In a system managed using central control addresses only*: number of indoor units which have a central control address regardless of whether the unit type is VRF or DI/SDI. Normally one master unit in a group

[NOTE] Systems managed using 64/128 Central Control, ON/OFF Control, Modbus, Lonworks, etc.

[2] Display range of remote controller
Remote controller reflects the setting range of header indoor unit.
Setting range : Operation mode, Air Volume setting, Setting temperature

[NOTE] Do not set the concealed duct high pressure type (AID-P***H, MMD-P***1H) as the header indoor unit.
⟹ Set another type of indoor unit as the header indoor unit.

- In the case that the concealed duct high static pressure type is the header indoor unit, the remote controller display will be as follows.
Operation mode   : [AUTO] [HEAT] [COOL] [FAN], no [DRY] mode
Air volume selection : [HIGH]
- In case of [DRY] mode, duct type keeps [FAN] mode.

[NOTE] Do not set the cooling only model as the header indoor unit.
⟹ Set heat pump model as header indoor unit.
- [AUTO] [HEAT] mode can't be operated.

[3] Remote location control (HA)
Both header and follower indoor units can respond by remote location control (HA) signals.
Master ON/OFF control can be conducted for all indoor units within the same group.

[NOTE] Don't input two or more HA signals to one group.

[4] Room temperature data
For collecting room temperature data for control purposes, you can choose the body TA sensor or a remote sensor. You can use the special sensor TCB-TC21LE or the sensor built in to the remote control. When you use group control, the sensor option varies as shown on the following table, depending on the system you use (VRF (SMMS-i, SMMS, S-HRM, MINI-SMMS) or DI/SDI).

Category	Group Control	Room temperature for control		
		Body TA sensor	**TCB-TC21LE**	**Sensor in Remote controller**
VRF	**Group**	yes(each)	prohibited	prohibited
	Individual	yes(each)	yes(each)	yes(each)
DI/SDI	**Group/Twin/Triple**	yes(Master)	yes(Master)	yes(Master)
	Single	yes(each)	yes(each)	yes(each)
DN code=32 TA sensor selection setting		Body TA sensor	Body TA sensor Note 1	Remote controller sensor. Note 2

[Note 1] Switched automatically upon the detection of communication between an indoor unit and the remote sensor. Body TA sensor is used if the remote sensor is detached. Remote control must be one. Able to use with another sensor at the same time if set to do so in the master settings.

[Note 2] If two remote controllers are used, the sensor in the master remote controller is selected by making the switch setting "Master" on the master remote. However, if the sensor in the wireless remote controller is set as master, cancelling the selection of the sensor in the remote controller on the wireless remote with its remote controller sensor switch changes the sensor to be used into the body TA sensor.
The sensor in the wireless remote controller is only used when the wireless remote controller operation has been activated with the Start/Stop button operation.

[Note 3] In group control, the remote controller does not work if the group address is not set to the indoor unit of the master unit.

[Note 4] Do not install the remote sensor where air flow is poor.
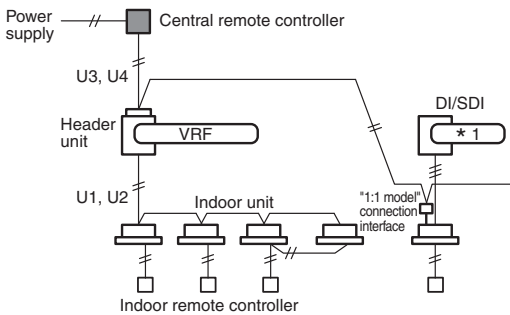
[5] Address setting
When performing automatic addressing of DI/SDI units, turn on all the indoor units of the group to be addressed. Addresses are not distributed to units which have not been turned on within 3 minutes from starting the automatic addressing.
After setting addresses, check the addresses of lines, indoor units and groups, and the central control addresses one by one regardless of the system type (VRF or DI/SDI). In particular, for groups on different refrigerant lines in a VRF system and groups in a DI/SDI system, confirm that each master unit has a unique address and specify which indoor units are master ones.
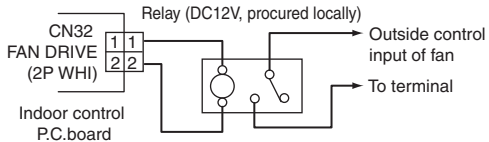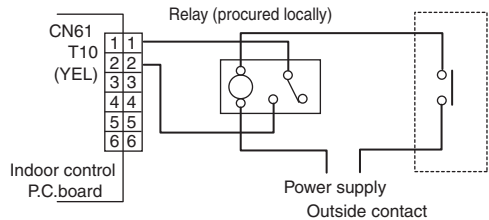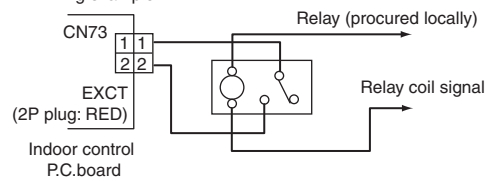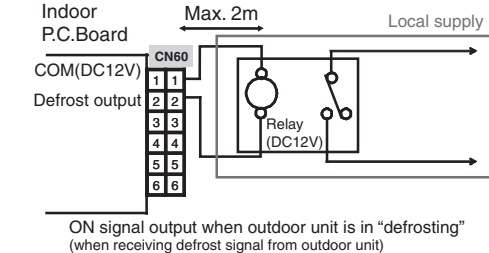
1-4-4 Application controls for central remote controller
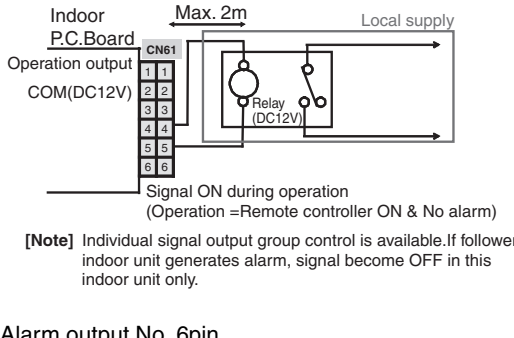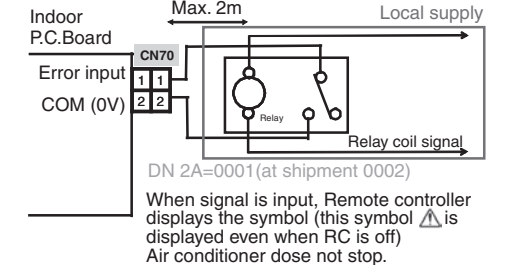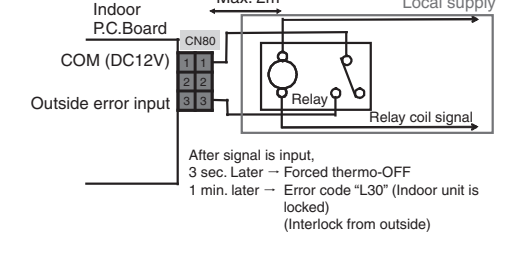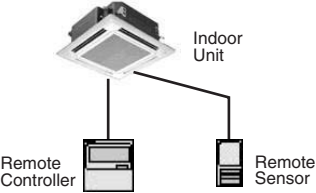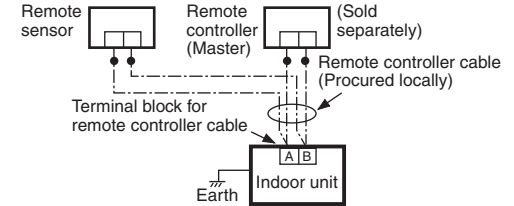
	Basic function	System diagram	Model	Reference No.
1	Central management controller for 64 units 128 units	 **Function of central remote controller** ■ TCB-SC642TLE2 • Individual control up to 64 indoor units. • Individual control for a max of 64 indoor units divided in to 4 zones. (Up to 16 indoor units for each zone.) • Up to 16 outdoor header units are connectable. • Setting for one of 1 to 4 zones is available. ■ RMS-CM1280TLE • Individual control of up to (64 indoor units) x 2 TCC-LINK buses • Individual control of up to (64 indoor units divided 1 to 64 zones) x 2 TCC-LINK buses (up to 64 indoor units for each zone) • Up to 16 outdoor header units are connectable per 1 TCC-LINK bus • Setting for (one of 1 to 64 zones) x 2ch is available • Setting for (one of 1 to 64 groups) x 2ch is available • Return-back setting ■ Can be used with other central control devices (Up to 10 central control devices with in one control circuit) ■ Two selectable modes Central controller mode/Remote controller mode ■ Master/Sub setting possible ■ Central control 4 mode • 4 selectable settings to restrict individual operation of remote controller.	• Central remote controller **TCB-SC642TLE2** or **BMS-CM1280TLE** • ON-OFF controller **TCB-CC163TLE2** **Indoor remote controller** • Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** • Wired remote controller with Weekly Timer **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2** • Wireless remote controller	**4-2** **4-8-5**

	Basic function	System diagram	Model	Reference No.
2	Central remote controller + Schedule Timer		• Central remote controller **TCB-SC642TLE2** or **BMS-CM1280TLE** • ON-OFF controller **TCB-CC163TLE2** + • Schedule timer **TCB-EXS21TLE** **Indoor remote controller** • Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** • Wired remote controller with Weekly Timer **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2**	**4-2** **4-8-5**
3	Central remote control without indoor remote controller		• Central remote controller **TCB-SC642TLE2** or **BMS-CM1280TLE** • ON-OFF controller **TCB-CC163TLE2** **Indoor remote controller** • Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** • Wired remote controller with Weekly Timer **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2**	**4-2** **4-8-5**

	Basic function	System diagram	Model	Reference No.
4	Central management control with "1 : 1 model"	Power supply — Central remote controller U3, U4 Header unit — VRF DI/SDI *1 U1, U2 Indoor unit "1:1 model" connection interface Indoor remote controller * TOSHIBA Digital Inverter System and Super Digital Inverter System	• Central remote controller **TCB-SC642TLE2** or **BMS-CM1280TLE** • ON-OFF controller **TCB-CC163TLE2** • "1 : 1 model" connection interface **TCB-PCNT30TLE2** (Some Hi-wall models are not compatible) **Indoor remote controller** • Wired remote controller **RBC-AMT21E** **RBC-AMT32(31)E** • Wired remote controller with Weekly Timer **RBC-AMS41E** • Simple wired remote controller **RBC-AS21E2**	**4-2** **4-8-5**

1-5 Application controls of indoor unit

No	Control name	Function	Setting method	Reference No.
1	**Function change**	Required functions to enable the applied control of the system. 　(Ex. Setup of TA sensor, body TA sensor / remote controller sensor)	Item code (DN) setting from wired remote controller	**4-4-1**
2	**Ventilation fan control from remote controller**	ON/OFF control can be operated from the wired remote controller when the Heat Exchange Ventilator or ventilation fan is installed in the system. CN32 FAN DRIVE (2P WHI) — Relay (DC12V, procured locally) — Outside control input of fan — To terminal Indoor control P.C.board	Setting from wired remote controller + TCB-KBCN32VEE (cable) Relay (local supply)	**4-4-2**
3	**Leaving-ON prevention control**	Using a door switch or card entry system etc, the leaving-ON of the indoor unit can be prevented, this is done by the setting of the remote controller and relay wiring. CN61 T10 (YEL) — Relay (procured locally) — Power supply — Outside contact Indoor control P.C.board DN 2E / J01 / Action: 0000 (At shipment) — Connect: Pulse input (Pulse width 200 to 300ms, Pulse interval 200ms or more) — Cut: Static input 0001 — Connect: Leaving ON prevention control (Prohibit Mode / Reset / Permit Mode / ON/OFF / OFF / ON/OFF Prohibit Mode) — Cut: No action (Heating = Lowest set point, Cool/Dry = Highest set point, Auto/Fan = neglect)	Setting from wired remote controller + TCB-KBCN61HAE (cable) Relay (local supply)	**4-4-2**
4	**Demand control**	Thermostat-OFF operation by relay signal. • Wiring example CN73 — Relay (procured locally) — Relay coil signal EXCT (2P plug: RED) Indoor control P.C.board	TCB-KBCN73DEE (cable) Relay (local supply)	**4-4-2**
5	**Operation status signal output**	Indoor P.C.Board — Max. 2m — Local supply CN60 COM(DC12V) — Defrost output — Relay (DC12V) ON signal output when outdoor unit is in "defrosting" (when receiving defrost signal from outdoor unit) 12v output 1pin Defrosting 2pin, Thermo-on 3pin, Cooling 4pin, Heating 5pin, Indoor fan output 6pin output	TCB-KBCN60OPE (cable) Relay (local supply)	**4-4-2**

No	Control name	Function	Setting method	Reference No.
6	**Operation output Alarm out put**	Indoor P.C.Board — CN61 Operation output 1 1 COM(DC12V) 2 2 / 3 3 / 4 4 / 5 5 / 6 6 Max. 2m Local supply Relay (DC12V) Signal ON during operation (Operation =Remote controller ON & No alarm) [Note] Individual signal output group control is available.If follower indoor unit generates alarm, signal become OFF in this indoor unit only. Alarm output No. 6pin	TCB-KBCN61HAE (cable) Relay (local supply)	**4-4-2**
7	**Option error input**	Indoor P.C.Board — CN70 Error input 1 1 COM (0V) 2 2 Max. 2m Local supply Relay Relay coil signal DN 2A=0001(at shipment 0002) When signal is input, Remote controller displays the symbol (this symbol ⚠ is displayed even when RC is off) Air conditioner dose not stop.	TCB-KBCN70OAE (cable) Relay (local supply)	**4-4-2**
8	**Outside error input**	Indoor P.C.Board — CN80 COM (DC12V) 1 1 2 2 Outside error input 3 3 Max. 2m Local supply Relay Relay coil signal After signal is input, 3 sec. Later → Forced thermo-OFF 1 min. later → Error code "L30" (Indoor unit is locked) (Interlock from outside)	TCB-KBCN80EXE (cable) Relay (local supply)	**4-4-2**
9	**Remote sensor (TCB-TC21LE2)** Indoor Unit Remote Controller / Remote Sensor	Air temperature sensing at a distance. Remote sensor — Remote controller (Master) — (Sold separately) Remote controller cable (Procured locally) Terminal block for remote controller cable A B Indoor unit Earth **[Note]** • Do not change the TA sensor on the remote controller sensor by using item code (DN) setting. • 2 remote controllers are prohibited.	Remote sensor (TCB-TC21LE2)	**4-4-3**

1-5-1 Indoor Connector port existing table

			Indoor Connector port					
			CN32	CN60	CN61	CN70	CN73	CN80
SMMS SMMS-i **S-HRM Mini-SMMS**	4-way cassette	1 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	yes	yes	yes
	Compact 4-way cassette	1 series	yes	yes	yes	yes	yes	yes
	2-way cassette	1 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	yes	yes	yes
	1-way cassette	1YH series	yes	yes	yes	yes	yes	yes
		2SH series	yes	yes	yes	yes	yes	yes
	Concealed duct	1 series	yes	yes	yes	yes	yes	yes
	Slim duct	1 series	yes	yes	yes	yes	yes	yes
	Concealed duct High static pressure	1 series	yes	yes	yes	yes	yes	yes
	Under Ceiling	1 series	yes	yes	yes	yes	yes	yes
	High wall	1 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	no	no	yes
		3 series	yes	yes	yes	no	no	yes
	Floor standing cabinet	1 series	yes	yes	yes	yes	yes	yes
	Floor standing concealed	1 series	yes	yes	yes	yes	yes	yes
	Floor standing	1 series	yes	yes	yes	yes	yes	yes
SMMS SMMS-i	Fresh air indoor intake	-	yes	yes	yes	yes	yes	yes
DI SDI	4-way cassette	all series	yes	yes	yes	yes	yes	yes
	Compact 4-way cassette	2 series	yes	yes	yes	yes	yes	yes
	Under Ceiling cassette	all series	yes	yes	yes	yes	yes	yes
	Duct	2 series	yes	yes	yes	yes	yes	yes
	Concealed duct High static pressure	3 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	yes	yes	yes
	High wall	2 series	no	yes	yes	no	no	yes
		1 series	no	yes	yes	no	no	yes
		0 series	no	no	no	no	no	no
	Flexi	all series	no	no	no	no	no	no
	Slim duct	Series 4	yes	yes	yes	yes	yes	yes
Daiseikai Inverter Multi	HA terminal							
	Daiseikai Hi wall	RAS-B**GKVP-E, RAS-B**GKCVP-E RAS-B*SKVP-E, RAS-*SKVP-ND RAS-*SKVR-E, RAS-*SKV-E RAS-*PKVP-E, RAS-*PKVP-ND RAS-M*PKVP-E, RAS-M*PKVP-ND						
	INVERTER Hi wall	RAS-*GKV-E2						
	INVERTER Multi Hi wall	RAS-M*GKV-E2 RAS-M*GKCV-E2						
	INVERTER Multi DUCT	RAS-M*GDV-E RAS-M*GDCV-E						

1-5-2 Signal specification

Function	Connector	Pin No	Cable Model Name	Outline
Fan output	CN32	1,2	TCB-KBCN32VEE	External Ventilation fan control from Remote controller
Option output	CN60	1,2,3,4,5,6	TCB-KBCN60OPE	Operation status signal output (cooling, heating, fan, defrost, thermo-ON)
Operation Input / Output	CN61	1,2,3,4,5,6	TCB-KBCN61HAE	External ON/OFF control, operation ON/OFF status output, alarm status output
Option error input	CN70	1,2	TCB-KBCN70OAE	Alarm display on Remote controller by this input
Demand input	CN73	1,2	TCB-KBCN73DEE	Forced thermo-off control by this input
Outside error input	CN80	1,3	TCB-KBCN80EXE	Generate check code "L30" (for 1 minutes continuously) to stop forcedly the operation
CHK Operation check	CN71	1,2	-	check indoor, fan "H", Louver horizontal and drain pump ON
DISP Exhibition mode	CN72	1,2	-	Operation with indoor & remote controller, without outdoor unit

1-6 Application controls of outdoor unit
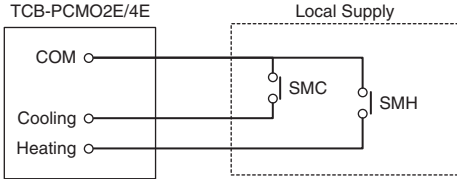
No	Control name	Function	Setting method	Reference No.
1	**Outdoor fan high static pressure shift**	Increases outdoor fan speed so that a duct with the maximum outside static pressure of 35Pa can be installed.	Switch setting on outdoor interface P.C. board	**4-5-1**
2	**Cooling priority, heating priority control**	Cooling priority or heating priority can be selected. (Setup at shipment : heating priority)		**4-5-2** **4-5-4**
3	**Specific indoor unit priority control**	Only one indoor unit can be set as priority for changeover of operation mode.	Switch setting on outdoor interface P.C. board + Item code (DN) setting from wired remote controller	**4-5-3** **4-5-4**
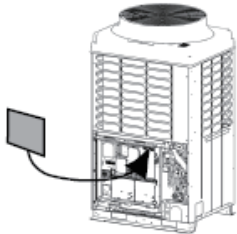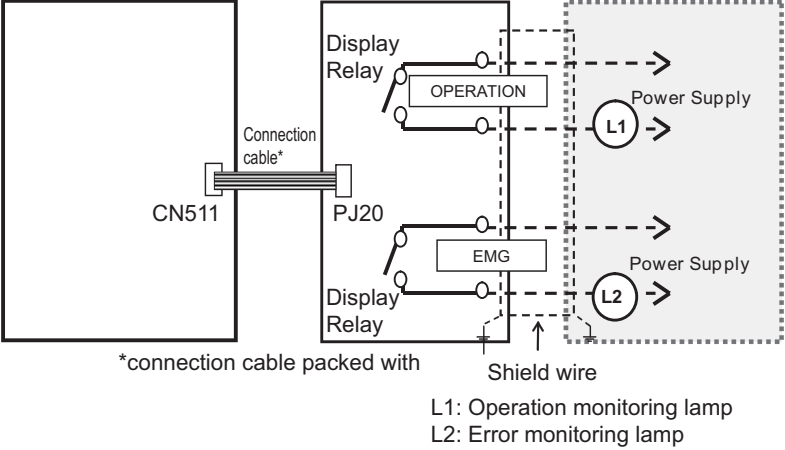
1-7 Application controls by the optional P.C. board of outdoor unit

Model name	Appearance	Function	Reference No.
TCB-PCDM2E/TCB-PCDM4E	Size : 71 x 85 (mm) **Application** * Install the optional P.C. board in the inverter assembly of the outdoor header unit. VRF including Mini-SMMS	**[1] Power peak-cut Control** ● **Purpose: Limiting air conditioning performance with external signals and decreasing the peak power consumption.** ● **Feature** The upper limit capacity of the outdoor unit is restricted based on the outdoor power peak selected setting. ● **Function** Two control settings are selectable by setting SW07 on the interface P.C. board on the header outdoor unit.	4-6-1

TCB-PCDM2E/4E   Local Supply

ON ○────────○ SW1
COM ○
OFF ○────────○ SW2
COM ○

[Standard function]
SW07-2 OFF

Input		SW07-1	
SW01	SW02	OFF	ON
ON	OFF	0% (stop)	Up to 60%
OFF	ON	100% (Normal)	100% (Normal)

<SMMS-i only>
By cutting J16 on the I/F B.C. board, the operation above becomes possible only with the signal from SW1.

[Additional function]
SW07-2 ON

Input		SW07-1	
SW01	SW02	OFF	ON
OFF	OFF	100% (Normal)	100% (Normal)
ON	OFF	Up to 80%	Up to 85%
OFF	ON	Up to 60%	Up to 75%
ON	ON	0% (stop)	Up to 60%

• Ensure that terminal contacts are fixed and secure.
• Do not turn on SW1 and SW2 terminals simultaneously.

• The differences between TCB-PCDM2E and TCB-PCDM4E are shown below:

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCDM2E	Same	Short	No	VRF other than SMMS- i types
TCB-PCDM4E		Long	Yes	All types of VRF
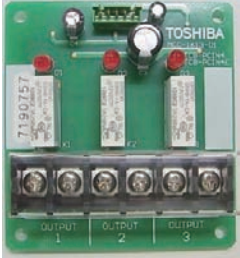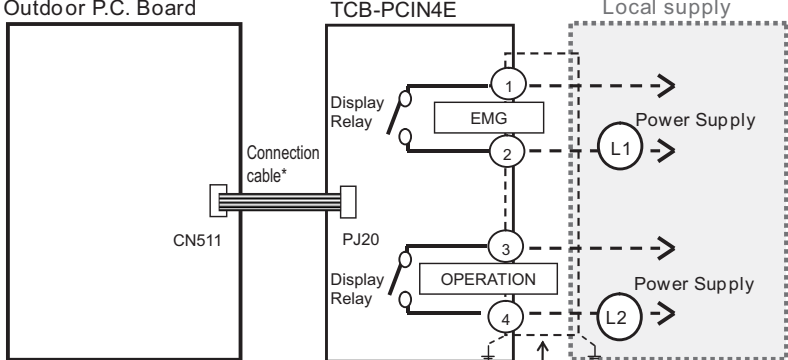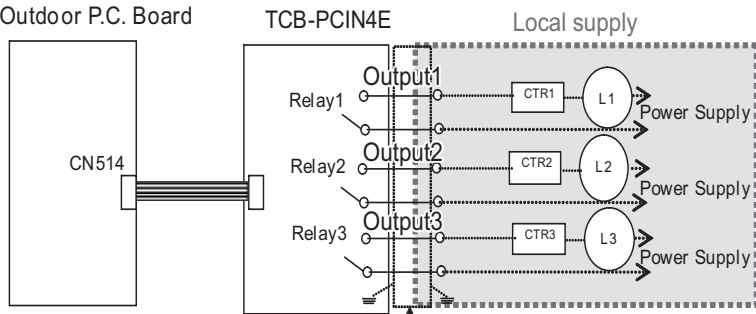
Model name	Appearance	Function	Reference No.
TCB-PCMO2E/TCB-PCMO4E	Size : 55.5 x 60 (mm) **Application** * Install the optional P.C. board in the inverter assembly of the outdoor header unit. VRF	**[2] Snowfall fan control (VRF excluding Mini-SMMS)** ● **Purpose: rotating the fan to prevent snow accumulation** ● **Feature** Outdoor fan is operated from the snowfall signal received from the outside. ● **Function** TCB-PCMO2E/4E Local Supply COM SMC Cooling | Terminal	Input signal	Operation
---	---	---
SMC	ON / OFF	Snowfall fan control (Operates outdoor fan.)
	ON / OFF	Normal operation (Releases control) | This control is activated when a input signal increases or decreases. (The increasing or decreasing signal needs to be held for a minimum of 100 msec in order to activate the control).	**4-6-2**
		[3] External master ON/OFF control (VRF including Mini-SMMS) ● **External master ON/OFF control (VRF including Mini-SMMS)** ● **Feature** The outdoor unit starts or stops the system. ● **Function** TCB-PCMO2E/4E Local Supply COM SMC SMH Cooling Heating SMC : Input signal for start SMH : Input signal for stop | Terminal	Input signal	Operation
---	---	---
SMC	ON / OFF	Starts all indoor units.
SMH	ON / OFF	Stops all indoor units. | • Ensure that terminal contacts are fixed and secure. This control is activated when a input signal increases or decreases. (The increasing or decreasing signal needs to be held for a minimum of 100 msec in order to activate the control).	**4-6-3**

Model name	Appearance	Function	Reference No.
TCB-PCMO2E/TCB-PCMO4E	Size : 55.5 x 60 (mm) **Application** * Install the optional P.C. board in the inverter assembly of the outdoor header unit. VFR including Mini-SMMS	*(see content below)*	**4-6-4**
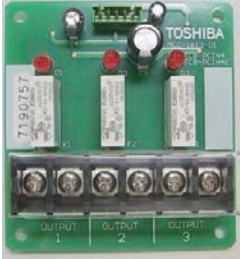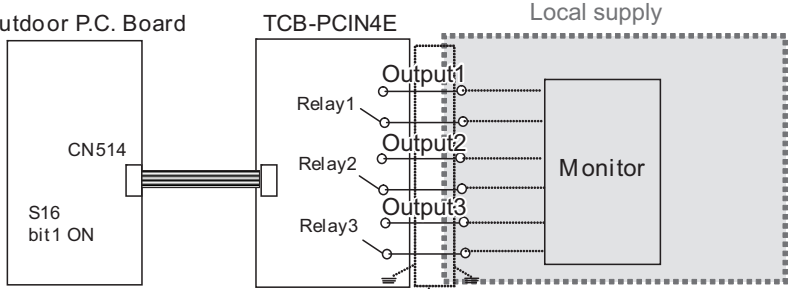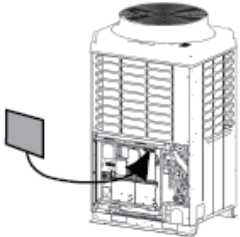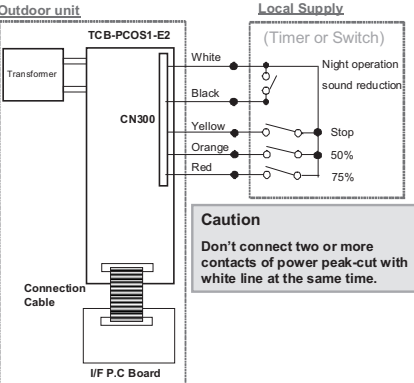
[4] Night operation (Sound reduction) control

- **Purpose: Reducing noise from an outdoor unit**
- **Feature**
  Sound level can be reduced by restricting the compressor and fan speeds.

- **Function**

TCB-PCMO2E/4E   Local Supply

COM   SMC   Cooling

Terminal	Input signal	Operation
SMC	ON / OFF (increasing)	Night operation (sound reduction) control
	ON / OFF (decreasing)	Normal Operation

This control is activated when a input signal increases or decreases.
(The increasing or decreasing signal needs to be held for a minimum of 100 msec in order to activate the control).

SMMS, SHRM

	Night operation sound reduction dB(A)	Capacity	
		COOL	HEAT
1201 type	50	Approx. 55%	Approx. 45%
1001 type	50	Approx. 65%	Approx. 55%
0801 type	50	Approx. 80%	Approx. 70%
0601 type	50	Approx. 75%	Approx. 70%
0501 type	50	Approx. 85%	Approx. 80%

SMMS-i

	Night operation sound reduction dB(A)	Capacity	
		COOL	HEAT
1604 type	53	Approx. 70%	Approx. 70%
1404 type	53	Approx. 80%	Approx. 80%
1204 type	50	Approx. 60%	Approx. 55%
1004 type	50	Approx. 70%	Approx. 65%
0804 type	50	Approx. 85%	Approx. 80%
0601 type	50	Approx. 75%	Approx. 70%
0501 type	50	Approx. 85%	Approx. 80%

Mini-SMMS

Outdoor unit capacity type	0401 type	0501 type	0601 type
Sound reduction (dB(A)) (Cooling/Heating)	46/48	46/48	47/49
Approximation capacity (Cooling/Heating)	90%/95%	85%/75%	85%/70%

Condition
Cooling : (Indoor 27deg DB, 19deg WB)
    (Outdoor temperature 25deg DB)
Heating : (Indoor 20 deg DB)
    (Outdoor temperature 7deg DB, 6 deg WB)

Model name	Appearance	Function	Reference No.
TCB-PCMO2E/TCB-PCMO4E	Size : 55.5 x 60 (mm) **Application** * Install the optional P.C. board in the inverter assembly of the outdoor header unit. VRF including Mini-SMMS	(see content below)	**4-6-5**

[5] Operation mode selection control

● **Purpose: Limiting operation modes to cooling and heating only**
● **Feature**
 This control can restrict the selectable operation mode.

● **Function**

TCB-PCMO2E/4E — Local Supply

COM
Cooling
Heating

SMC
SMH

SMC : Cooling mode designated input switch
SMH : Heating mode designated input switch

SMC	SMH	Selected operation mode
ON	OFF	Only cooling mode permitted
OFF	ON	Only heating mode permitted

Ensure terminal contacts are securely fixed.

JP line (I/F P.C. board of the center outdoor unit)	Function
SMMS-i J01 connected (factory setting) Mini-SMMS	When the operation mode is changed from that selected, the thermostats in the indoor units are turned off and the air conditioners run as shown in the table below: (see table below)

Selected mode	Operation after the mode is changed	Remote controller indication
Cooling/ Dry	Air blow operation at the air volume set on the remote controller	⏻ "Stand by"
Heating	Air blow operation at "Ultra low" air volume	⏻ "Stand by" ✳
Fan	Air blow operation at the air volume set on the remote controller	

JP line	Function
SMMS-i J01 cut SMMS, SHRM	Indoor units which are running in any operation mode other than that selected also forcibly shift their modes to that assigned in SMC/SMH. (see table below)

Operation mode assigned on the P.C. board	Assignable operation modes	Remote controller indication
Cooling	Cooling, Dry, Fan	No indication. However, "Mode select contro" is displayed for a few seconds when you choose an unselectable mode.
Heating	Heating, Fan	

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCMO2E	Same	Short	No	VRF other than SMMS- i types
TCB-PCMO4E		Long	Yes	All types of VRF

Model name	Appearance	Function	Reference No.
TCB-PCIN2E	**Application** VRF excluding S-MMS-i	Error output control ● **Feature** 　Operation and error monitoring is possible ● **Function** 　Operating monitoring : Display relay is ON when more than one indoor unit operation. 　Error monitoring : Display relay is ON when the system in error status. Outdoor P.C. Board　　　　　　　TCB-PCIN2E　　　　Local supply Display Relay OPERATION Power Supply　L1 Connection cable* CN511　　　PJ20 EMG Power Supply　L2 Display Relay *connection cable packed with Shield wire L1: Operation monitoring lamp L2: Error monitoring lamp Be sure to connect TCB-PCIN2E on header outdoor unit In case of MINI-SMMS, C513 ON I/F P.C. Board instead of CN511.	**4-6-6**

Model name	Appearance	Function	Reference No.
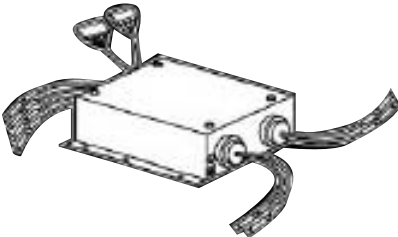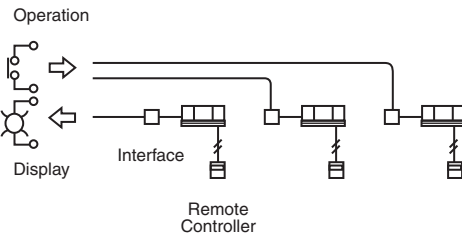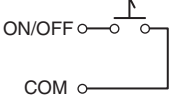
TCB-PCIN4E	(image of P.C. Board) **Application** **SMMS-i only (except for Error output control)** (image of outdoor unit)	Error output control[1]
		● **Feature**
		  Operation and error monitoring is possible
		● **Function**
		  Error monitoring : Display relay is ON when the system in error status.
		  Operating monitoring : Display relay is ON when more than one indoor unit operation.
		
		Outdoor P.C. Board — TCB-PCIN4E — Local supply
		Display Relay — EMG — 1 — Power Supply
		2 — L1
		Connection cable* — CN511 — PJ20 — 3
		Display Relay — OPERATION — Power Supply
		4 — L2
		*connection cable packed with — Shield wire — ⑤,⑥:open
		
		This board can also be used for SMMS, SHRM, MINI-SMMS
		
		L1:Error monitoring lamp
		L2:Operation monitoring lamp
		
		Be sure to connect TCB-PCIN4E on header outdoor unit
		In case of MINI-SMMS, C513 ON I/F P.C. Board instead of CN511.
			4-6-7

		Be sure to connect TCB-PCIN4E on header outdoor unit
		Compressor operation status [2]
		● **Feature**
		  Outputs the operation status of the compressors in each outdoor unit.
		● **Function**
		  While a compressor is running, the corresponding relay is ON.
		
		Outdoor P.C. Board — TCB-PCIN4E — Local supply
		Relay1 — Output1 — CTR1 — L1 — Power Supply
		CN514 — Relay2 — Output2 — CTR2 — L2 — Power Supply
		Relay3 — Output3 — CTR3 — L3 — Power Supply
		*connection cable packed with — Shielded wire
		Connectable to each outdoor unit
		
		L1,L2,L3: Operation monitoring lamp
		CTR1, CTR2, CTR3: Elapsed time measurement equipment
			4-6-8

Model name	Appearance	Function	Reference No.
TCB-PCIN4E	**Application** **SMMS-i only (except for Error output control)**	Operation ratio control [3] ● **Feature** Relays turn ON/OFF depending on the running rate of the system. ● **Function** The current output rate is output in the form 0, 20, 35, 50, 65, 80, 95 and 100 (%) (maximum system output is 100). *connection cable packed with Be sure to connect TCB-PCIN4E on header outdoor unit (see table below)	**4-6-9**

	Out1	Out2	Out3	Operation ratio %
System operation output	OFF	OFF	OFF	0
	ON	OFF	OFF	0~20
	OFF	ON	OFF	20~35
	ON	ON	OFF	35~50
	OFF	OFF	ON	50~65
	ON	OFF	ON	65~80
	OFF	ON	ON	80~95
	ON	ON	ON	95~100

Model name	Appearance	Function	Reference No.
TCB-PCOS1E2	**Application** **DI: some of series 2/3 only** **SDI :some of series4 only** **Connect to outdoor I/F unit**	● **Function** *connection cable and Transformer packed with **Night operation** **(Sound reduction by 5dB at cooling mode)** **Demand control has 3 steps** **75%, 50%, 0%(Operation stop)** **Compressor output** **Relay ON/OFF**	**4-6-10**
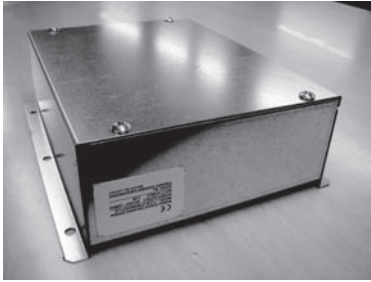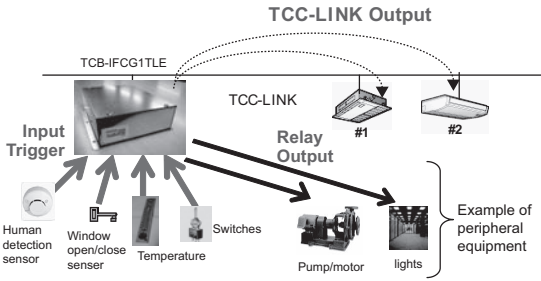
Model name	Appearance	Function	Reference No.
TCB-KBOS1E	**Cable for night operation or peak-cut control (5-core cable with yellow connector)** **Cable for Compressor output (2 core cable with blue connector)** **Application** **DI series4/SDI series4 (except 1.5-1.7HP) only** **Connect to outdoor unit cycle P.C. board**	● **Peak-cut control** Saves the power of the outdoor unit by the external peak-cut signal to suppress temporary peak power dissipation. The power saving can be switched to three levels; 75%, 50%, and operation stop. Sound pressure level : reduced to 45dB(A) (SDI series4 2HP to 5HP, Heating/Cooling) ● **Night operation** Reduce the capacity of the air conditioner by the input signal from a commercially available timer(procured locally)regardless of the outside air temperature or load to reduce operating noise. Sound pressure level : reduced to 45dB(A) (SDI series4 2HP to 5HP, Heating/Cooling) ● **Compressor output** Turns on the no-voltage contact output while the compressor is operating. ● **Function** 	**4-6-11**

1-8　Application control of optional devices connectable to indoor units

[1] Remote location ON/OFF control box

Model name	Appearance	Features	Reference No.
TCB-IFCB-4E2		• Start and stop of the air conditioner is possible by a external signal and indication of operation/alarm externally.	**4-7-1**
	Application	**Function**	
	Operation　Display　Interface　Remote Controller	• Monitoring 　ON/OFF status (for indoor unit) 　Alarm status (system & indoor unit stop) • ON/OFF command 　Air conditioner can be turned ON/OFF by the external signals. 　The external ON/OFF signals will initiate the signals shown below. ON/OFF　　COM　Non-voltage ON /OFF continuous signal	

[2] General purpose Interface

Model name	Appearance	Features	Reference No.
TCB-IFCG1TLE		Provide various applied controls that enable connection between the indoor unit and external equipments. • Equipped with 4 Relay contact outputs, 2 Analogue Outputs through which a central controller can send commands, and 4 Analogue Inputs/6 Digital Inputs through which the Central controller can read data. • Equipment with the HA terminal (*DAISEIKAI, IMS, etc.*) can be connected to the TCC-LINK central control network (DI/SDI,S-MMS,Mini-SMMS,S-HRM) for ON/OFF Control & Monitoring via this device. • Full Central Control by Modbus System TCB-IFMB641TLE and ON/OFF Control by Central Control by TCB-SC642TLE2 and Compliant Manager (Multi languagge). Programmable Control by Special Tool • Operation of specified indoor units can be programmed on site with input ports level change.	4-7-2

Application	Function
Central control via TCC-LINK Connectable with HA terminal (4pin input/output), alarm input Interlocking Operation (below)	Connection to TCC-LINK Interlocking operation with indoors and input ports • 2 Analog/5 Digital inputs can interlock with 64 indoors and 4 Relays • 12 programs possible

Port specification

Input/output ports	Channel number	Main spec	Connected Device/ Apparatus example
Analog Input	2	Temperature measurement: -10~90°C±0.4°C	Thermistor
	2	Analog Input: 0~10V 10bits resolution	Sensor, etc
Analog Output	2	Output: 0-10V 8bits resolution	Actuator, Motors, Pumps, etc
Digital Input	6	Photo coupler type: ON level 2mA, max 30mA	HA in (Daiseikai, IMS), Fan Sensor, etc
Digital Output	4	Relay contacts: Max 1A 42VAC/ 30VDC	Actuator, Motors, Pumps HA out (Daiseikai, IMS), Fan, light, etc

TCC-LINK Output

TCB-IFCG1TLE

TCC-LINK

#1 #2

Input Trigger

Relay Output

Human detection sensor | Window open/close senser | Temperature | Switches

Pump/motor | lights

Example of peripheral equipment

Use-Case for Application control of optional devices connectable to indoor units

A usage example of TCB-IFCB-4E2 and TCB-IFCG1TLE is shown below.

TCB IFCB-4E is able to output ON/OFF, Static/Pulse, or non-voltage commands corresponding to ON/OFF input from a sensor or sequencer output sensor. It can be connected to a CN61 indoor unit to control its starting and stopping.
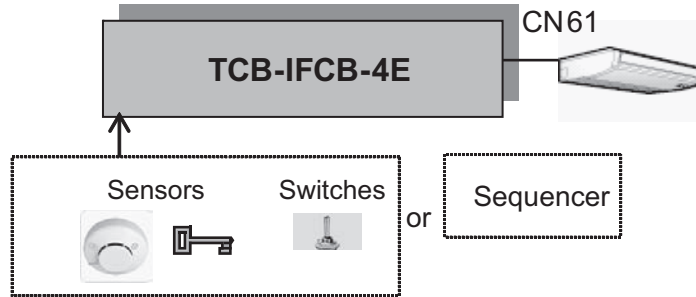
By using TCB-IFCG1TLE, you can program actions of indoor units and relay output corresponding to changes of status at input ports on site as well as the controller can access devices connected to I/O ports through the TCC-Link.

Start/stop HA air conditioners from the controller through TCC-LINK

All I/O ports are accessible through the Modbus master.

Central Control

Full Central Control
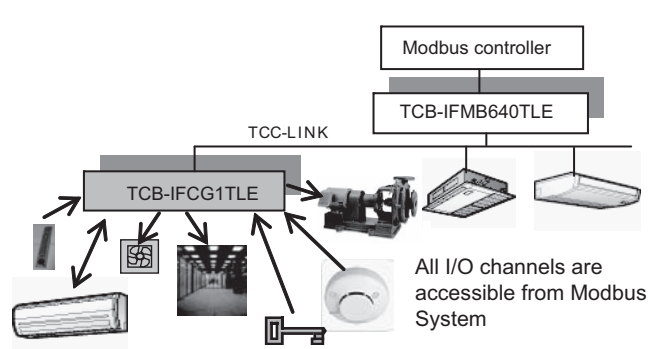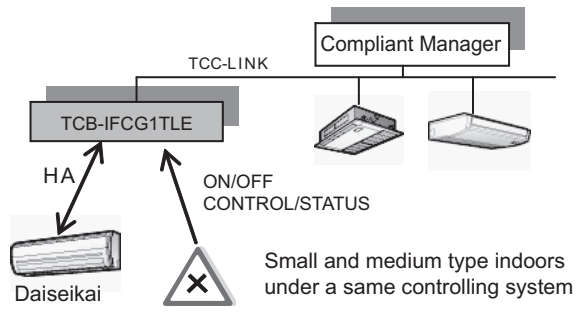
The actions of air conditioners and relay output control corresponding to changes of status at input ports are programmable on site. Relay outputs can form logic circuits. (Control Pattern Programming: combination of 2 analog and 5 digital inputs in 12 patterns)

Control Pattern Programming (1)
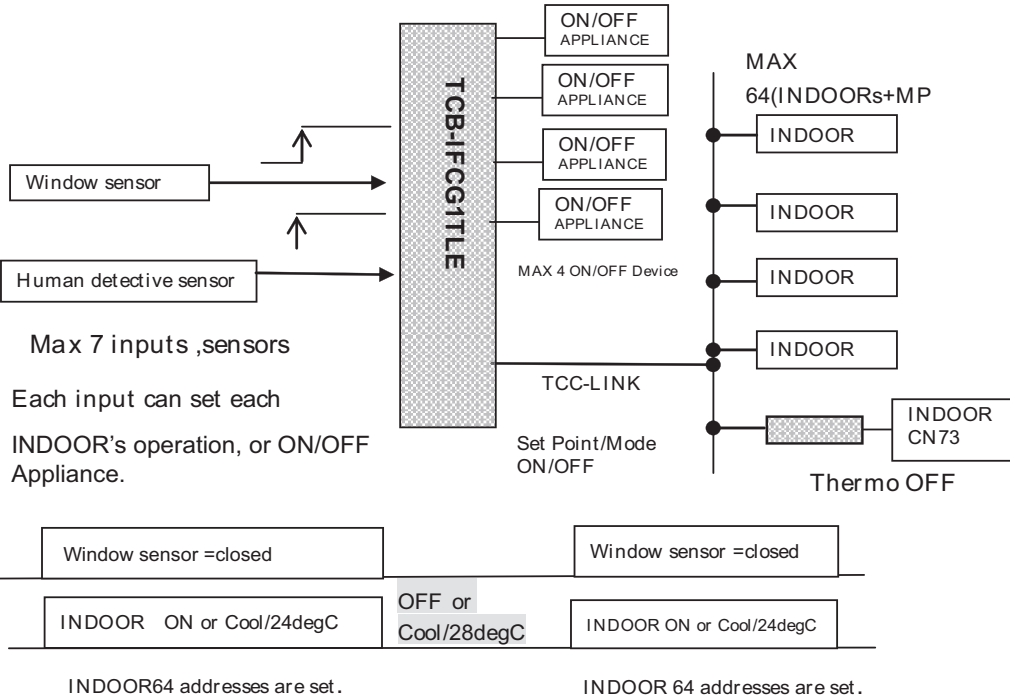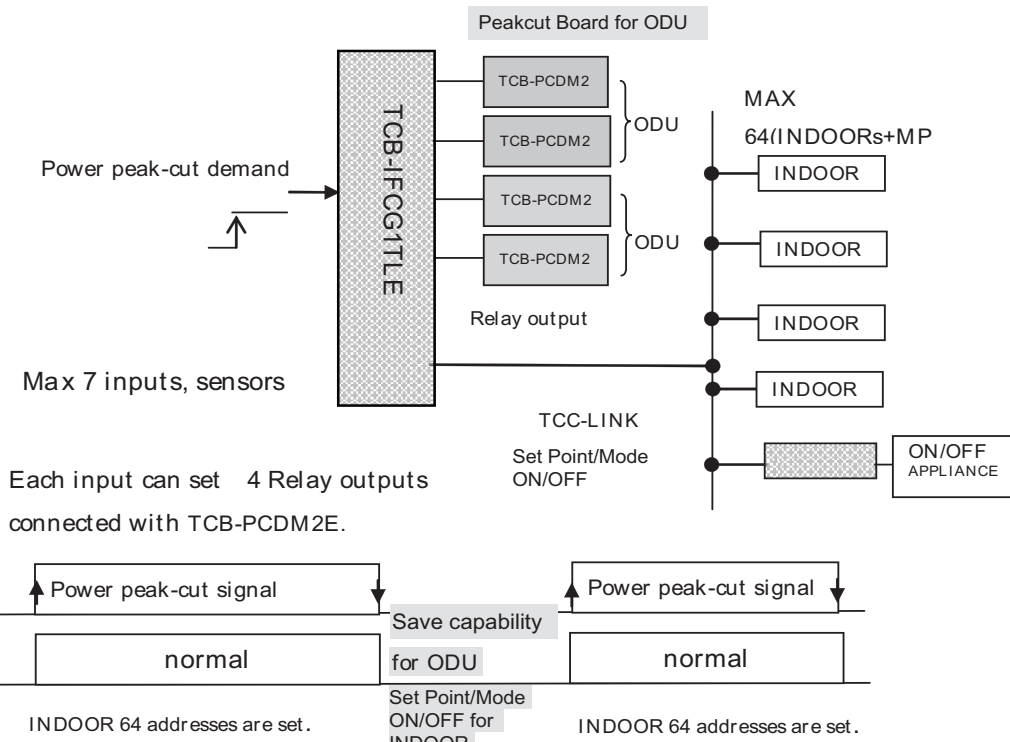
Control Pattern Programming (2)

Application	How
	Control Pattern Programming (1) If all four indoor units stop, the indoor unit taking in fresh air is stopped. If one or more of the four are running, the indoor unit taking in fresh air is kept running. The indoor unit taking in fresh air is controlled by the signals from the input port through TCC-Link, which are derived from the indoor units' operation signals through the OR gate formed by three built-in relays.
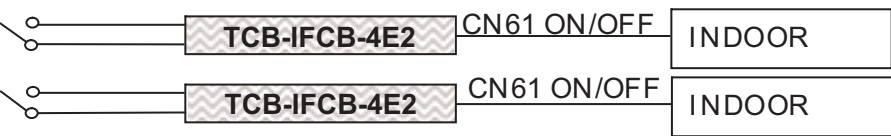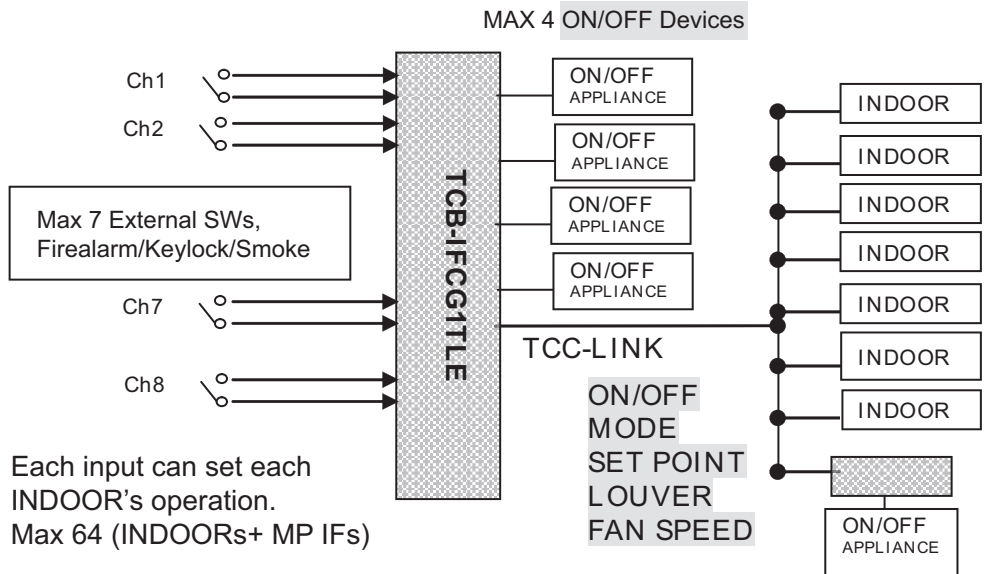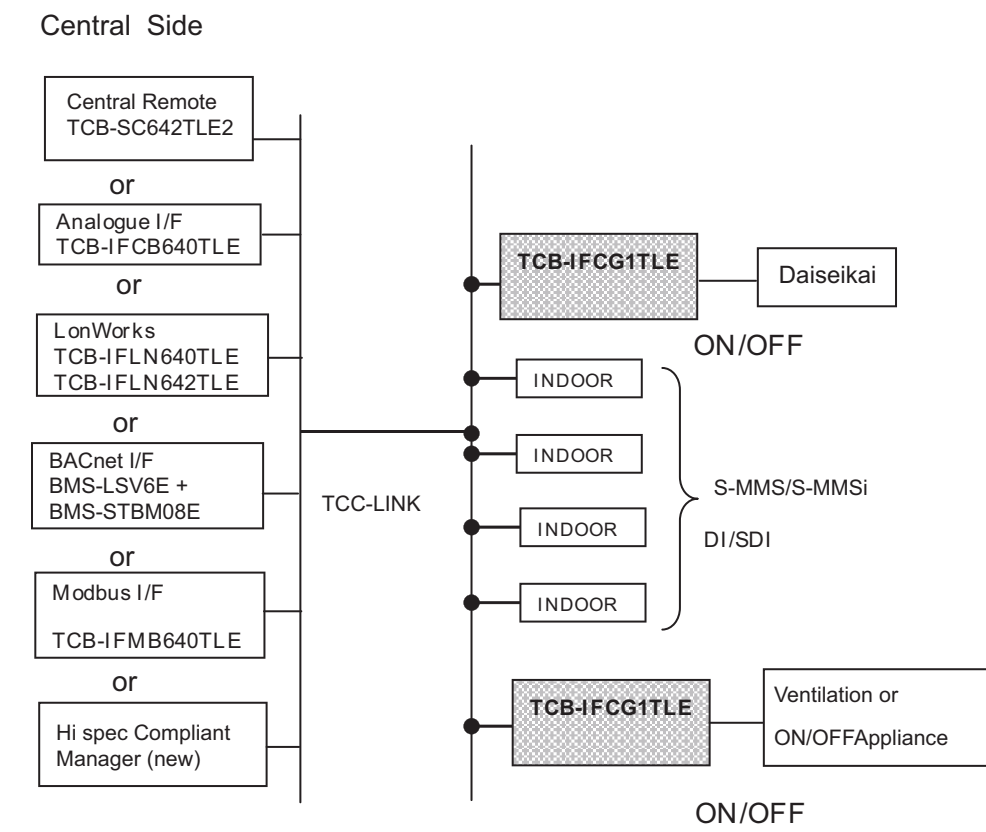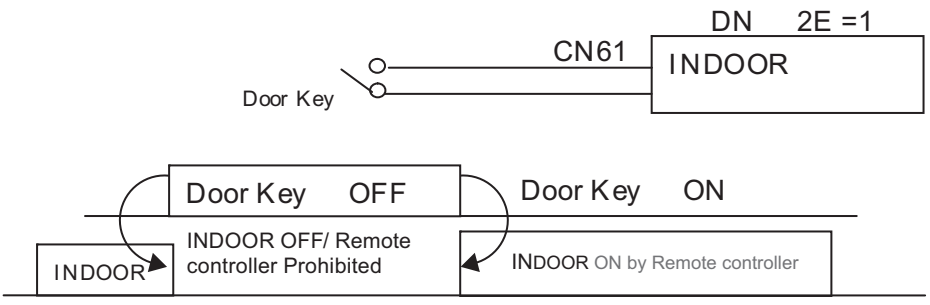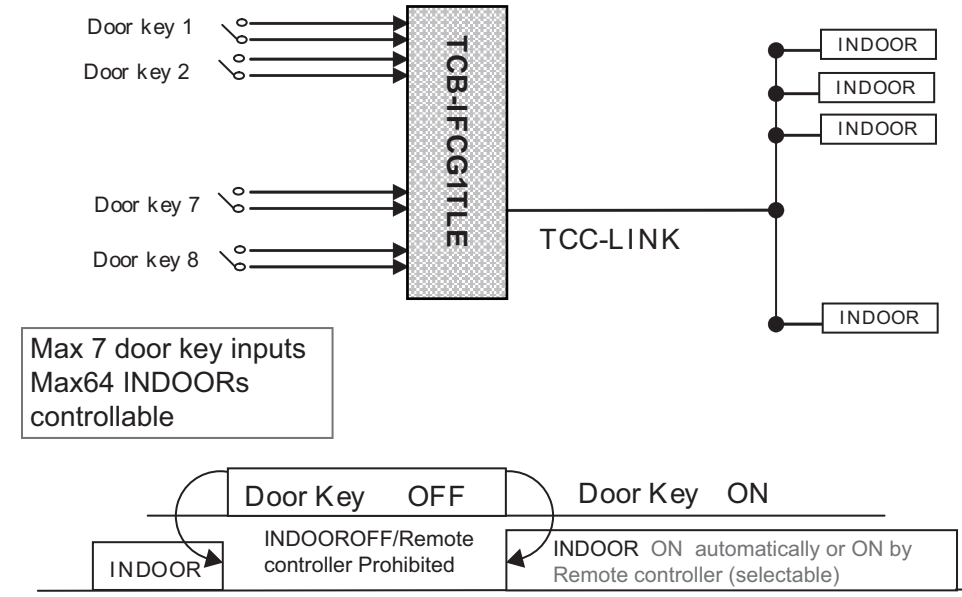
Interlocking

4 indoors and fresh air intake indoor

Through TCC-Link

(left column, row number **1**)

Application	How
2 **Interlocking** 3 indoors and a duct fan	**Control Pattern Programming (2)**

Control Pattern Programming (2)

If all three indoor units stop, the duct fan is stopped. If one or more is running, the duct fan is kept running.

The duct fan is started or stopped by the relay output signals coming into the input port, which are triggered by the signals derived from the indoor units' operation signals through the OR gate formed by three built-in relays.
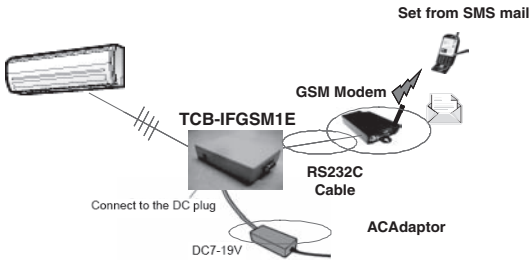
	Application	How
3	**Energy saving (1)** Control max 64 (INDOORs + TCB-IFCG1TLE) Plus 4 ON/OFF devices via Relay	**Control Pattern Programming (1)** Signals from the window sensor or human detective sensor can trigger the output signals from the four relays on TCB-IFCG1TLE and control temperature settings, operation modes and the starting/stoping of up to 64 indoor units through TCC-Link. TCB-IFCG1TLE ON/OFF APPLIANCE ON/OFF APPLIANCE ON/OFF APPLIANCE ON/OFF APPLIANCE Window sensor Human detective sensor MAX 4 ON/OFF Device Max 7 inputs ,sensors MAX 64(INDOORs+MP INDOOR INDOOR INDOOR INDOOR INDOOR CN73 TCC-LINK Each input can set each INDOOR's operation, or ON/OFF Appliance. Set Point/Mode ON/OFF Thermo OFF Window sensor =closed / Window sensor =closed INDOOR ON or Cool/24degC / OFF or Cool/28degC / INDOOR ON or Cool/24degC INDOOR64 addresses are set. / INDOOR 64 addresses are set.
4	**Energy saving (2)** ODU Peakcut saving Control max 64 (INDOORs + TCB-IFCG1TLE) Plus 2 TCB-PCDM2E for 2 ODUs	**Control Pattern Programming (1)** TCB-IFCG1TLE can receive the signal demanding power peak-cut and output four signals from its relays for outdoor units, and can control 64 indoor units through TCC-Link. Peakcut Board for ODU TCB-IFCG1TLE TCB-PCDM2 } ODU TCB-PCDM2 TCB-PCDM2 } ODU TCB-PCDM2 Power peak-cut demand Relay output Max 7 inputs, sensors MAX 64(INDOORs+MP INDOOR INDOOR INDOOR INDOOR ON/OFF APPLIANCE TCC-LINK Set Point/Mode ON/OFF Each input can set 4 Relay outputs connected with TCB-PCDM2E. Power peak-cut signal / Power peak-cut signal normal / Save capability for ODU / normal INDOOR 64 addresses are set. / Set Point/Mode ON/OFF for INDOOR / INDOOR 64 addresses are set.
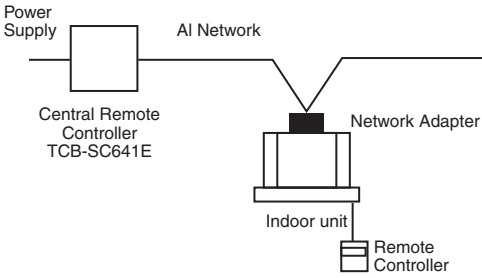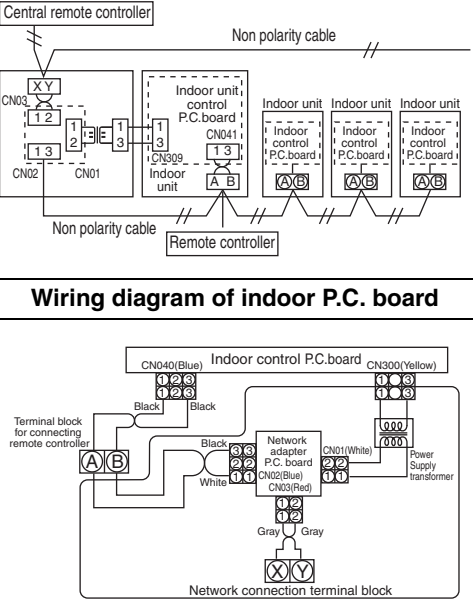
Application	How

5 **Remote CONTROL**

Interlocking with other system Security Control.

Control max 64 (INDOORs + TCB-IFCG1TLE) Plus 4 ON/OFF devices via Relay

TCB-IFCB-4E2 control one indoor via CN61.

```
o—o    ┌──────────────────┐  CN61 ON/OFF  ┌──────────┐
o—o    │  TCB-IFCB-4E2    │               │  INDOOR  │
       └──────────────────┘               └──────────┘

o—o    ┌──────────────────┐  CN61 ON/OFF  ┌──────────┐
o—o    │  TCB-IFCB-4E2    │               │  INDOOR  │
       └──────────────────┘               └──────────┘
```

Control Pattern Programming (1)
TCB-IFCG1TLE can receive the Sw input and output four signals from its relays, and can control the operation mode, temperature settings and starting/stoping of 64 indoor units.

MAX 4 ON/OFF Devices

Ch1, Ch2 ... Ch7, Ch8

Max 7 External SWs, Firealarm/Keylock/Smoke

TCB-IFCG1TLE

ON/OFF APPLIANCE (×4)

TCC-LINK

INDOOR (×7)

ON/OFF MODE SET POINT LOUVER FAN SPEED

ON/OFF APPLIANCE

Each input can set each INDOOR's operation.
Max 64 (INDOORs+ MP IFs)

6 **Central Control**

with S-MMS/DI SDI and Daiseikai or other device

The central control can start/stop various devices.

Central Side

Central Remote TCB-SC642TLE2

or

Analogue I/F TCB-IFCB640TLE

or

LonWorks TCB-IFLN640TLE TCB-IFLN642TLE

or

BACnet I/F BMS-LSV6E + BMS-STBM08E

or

Modbus I/F TCB-IFMB640TLE

or

Hi spec Compliant Manager (new)

TCC-LINK

TCB-IFCG1TLE — Daiseikai ON/OFF

INDOOR
INDOOR
INDOOR
INDOOR

S-MMS/S-MMSi
DI/SDI

TCB-IFCG1TLE — Ventilation or ON/OFFAppliance ON/OFF

Application	How
7 **Leaving-ON prevention control**	**Current method** DN 2E =1 CN61 — INDOOR Door Key Door Key OFF / Door Key ON INDOOR → INDOOR OFF/ Remote controller Prohibited / INDOOR ON by Remote controller **Control Pattern Programming(1)** TCB-IFCG1TLE can receive up to eight door key inputs and start/stop corresponding indoor units. In addition, unlike the CN61 control method above, the action of each indoor unit corresponding to the status of the door keys can be assigned separately. Door key 1 Door key 2 Door key 7 Door key 8 TCB-IFCG1TLE TCC-LINK INDOOR INDOOR INDOOR INDOOR Max 7 door key inputs Max64 INDOORs controllable Door Key OFF / Door Key ON INDOOR → INDOOROFF/Remote controller Prohibited / INDOOR ON automatically or ON by Remote controller (selectable)
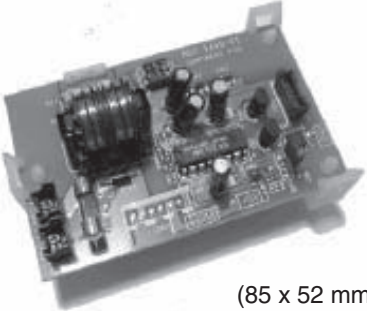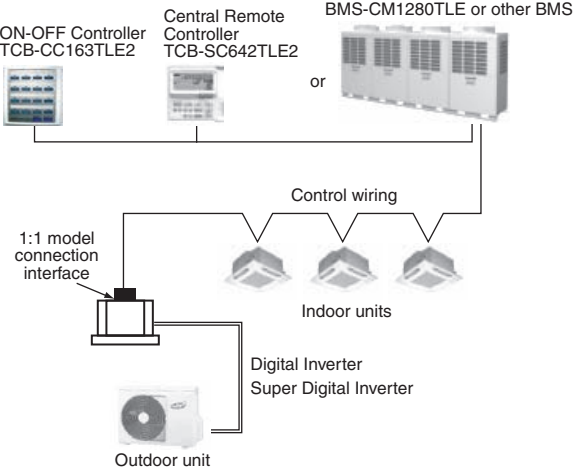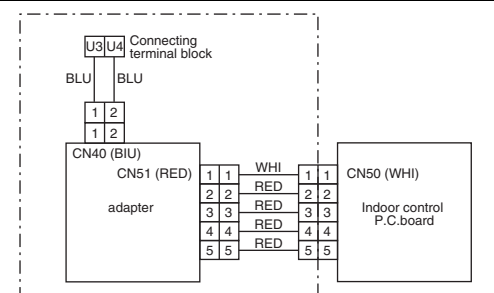
[3] GSM Phone control Interface

Model name	Appearance	Features	Reference No.
TCB-IFGSM1E		Controlling and Monitoring Toshiba air conditioning from registered mobile phone. • Stand alone, simple, cheap system without LAN • Possible on/off control and status monitoring of the air conditioner by the SMS mail system of GSM mobile phone • Auto alarm transfer function for S-MMS,SDI,DI • Triple "Security" is assured by SMS system, secret telephone numbers and PIN on TCB-IFGSM1E • Can register 5 Phone numbers which can control an air conditioner and 5 Phone numbers which can receive response from an air conditioner • Can register the name of air conditioner (max 19 characters) • Not necessary for Power Supply in case of CN61	**4-7-3**
	Application	**Function**	
		Non LAN / Internet area Secured Remote control or monitoring of air-conditioner ON/OFF control/monitoring • Control : write ON or OFF, then send mail • Status : write STATUS, then send mail • "Alarm" is automatically sent from the site (CN61)	

[4] Network adapter
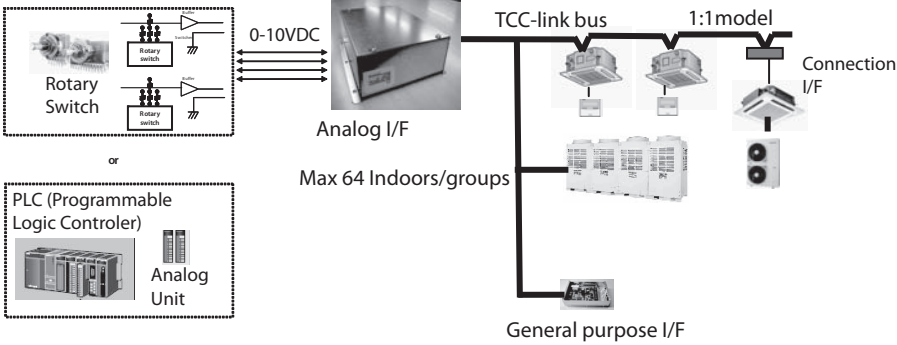
Model name	Appearance	Features	Reference No.
TCB-PCNT20E	 Install optional P.C. board in E-parts of indoor unit.	● Indoor units of VRF system are controlled by AI-NETWORK central remote controller. Connectable indoor units per group.	**4-7-4**
	Application	**Connection of cables**	
		 Wiring diagram of indoor P.C. board 	

[5] "1:1 model" connection interface

Model name	Appearance	Features	Reference No.
TCB-PCNT30TLE2	(85 x 52 mm) Install optional P.C. board in E-parts of the indoor unit. **Application** ON-OFF Controller TCB-CC163TLE2 · Central Remote Controller TCB-SC642TLE2 · or · BMS-CM1280TLE or other BMS Control wiring 1:1 model connection interface Indoor units Digital Inverter / Super Digital Inverter Outdoor unit	● Link adapter for "1:1 model" to enable connection to VRF system network 1:1 model :Super digital inverter Digital inverter ● High-wall type does not need this interface. ● Some types of indoor units (2 series compact, 4-way discharge cassette, etc.) need the metal case TCB-PX30MUE to use this interface. Refer to the Installation manual of each unit for details. **Connection of cables** ON-OFF control · Central control devices · Indoor unit · Indoor unit · Indoor unit · U3 U4 · Adaptor · Indoor control P.C.board · A B · A B · A B · Remote controller **Wiring diagram of indoor P.C. board** U3 U4 Connecting terminal block · BLU · BLU · 1 2 · 1 2 · CN40 (BIU) · CN51 (RED) · adapter · WHI · RED · RED · RED · RED · CN50 (WHI) · Indoor control P.C.board	**1-12-1 1-12-2 4-7-5 4-7-6**

1-9 Application control for network

1-9-1 Analog Interface

System diagram	Model	Reference No.

Rotary Switch
0-10VDC
or
PLC (Programmable Logic Controler)
Analog Unit
Analog I/F
TCC-link bus
1:1model
Connection I/F
Max 64 Indoors/groups
General purpose I/F
 	
For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"
	• Analog Interface
	  TCB-IFCB640TLE
	• 1:1model connection
	  TCC-Link Interface
	  TCB-PCNT30TLE2
	• General purpose I/F
	  TCB-IFCG1TLE
	• Wired Remote controller
	  RBC-AMT32(31)E
	  RBC-AS21E2
	• Wireless Remote controller
	  RBC-AX31U(W)-E
	  RBC-AX31U(WS)-E
	  RBC-AX22CE2
	  TCB-AX21E2
	• Wired Remote controller with weekly timer
	  RBC-AMS41E
		4-8-1

1-9-2　Modbus

System diagram	Model	Reference No.
Modbus Master — RS-485 — Modbus I/F — Max 64 Indoors/groups/IF TCC-link bus — 1:1model — Connection I/F. Modbus I/F — TCC link bus. Max number of Modbus I/F is decided by network traffic. Absolute max number is 15. Other system (security, etc)	• Modbus I/F **TCB-IFMB640TLE** • "1:1model" connection • TCC-Link Interface **TCB-PCNT30TLE2** • Wired Remote controller **RBC-AMT32(31)E** **RBC-AS21E2** • Wireless Remote controller **RBC-AX31U(W)-E** **RBC-AX31U(WS)-E** **RBC-AX22CE2** **TCB-AX21E2** • Wired Remote controller with weekly timer **RBC-AMS41E** **[Note]** • Pc master dummy program: Commissioning for Modbus I/F	**4-8-2**
For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"		

1-9-3 LONWORKS

System diagram	Model	Reference No.

Max 64 Indoors/groups/IF — TCC-link bus — 1:1model — Connection I/F — LON I/F — Twisted pair line Free/Bus topology — LONWORKS Controller — TCC-link bus — LON I/F — Max number of LON I/F is decided by network traffic or points number. Absolute max number is 127. — Other system (security, etc)	• LON Interface
	  TCB-IFLN640TLE
	  TCB-IFLN642TLE
	  TCB-IFLN642UL
	• "1:1model" connection
	  TCC-Link Interface
	  TCB-PCNT30TLE2
	• Wired Remote controller
	  RBC-AMT32(31)E
	  RBC-AS21E2
	• Wireless Remote controller
	  RBC-AX31U(W)-E
	  RBC-AX31U(WS)-E
	  RBC-AX22CE2
	  TCB-AX21E2
	• Wired Remote controller with weekly timer
	  RBC-AMS41E
	
	[Note] Xif file:
	• controller commissioning without LON Interface
		4-8-3

For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"		

1-9-4 BACnet

System diagram	Model	Reference No.

Max 128Indoors
BACnet server
RS-485
Relay I/F
TCC-link bus
1:1model
Connection I/F
Ethernet
BACnet Server software
BACnet Server Software
Max number of BACnet server depends on IP netowok and upper system.
Max8
Relay I/F
TCC-link bus
In case of 10BASE-T: Category 3 or Category 5
In case of 100BASE-TX: Category 5
(*)BACnet IP, (Annex J)
Ethernet
Other system
Central management controller
 	
For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"
	• BACnet server
	  BMS-LSV6E
	• BACnet Server Software
	  BMS-STBN08E
	• Setting file creation software
	• "1:1model" connection TCC-Link Interface
	  TCB-PCNT30TLE2
	• Relay Interface
	  BMS-LSV4E
	  BMS-IFLSV4UL (U.S.)
	  BMS-LSV3E
	• Wired Remote controller
	  RBC-AMT32(31)E
	  RBC-AS21E2
	• Wireless Remote controller
	  RBC-AX31U(W)-E
	  RBC-AX31U(WS)-E
	  RBC-AX22CE2
	  TCB-AX21E2
	• Wired Remote controller with weekly timer
	  RBC-AMS41E
	
	[Note] Pc BACnet explorer:
	• Commissioning for BACnet server (local supply)
		4-8-4

1-9-5 Compliant manager

System diagram	Model	Reference No.
For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"	• Compliant manager **BMS-CM1280FTLE** • Setting file creation software • Monthly report creation software • "1:1model" connection • TCC-Link Interface **TCB-PCNT30TLE2** • Energy monitoring Relay I/F **BMS-IFWH5E** **BMS-IFWH5UL (U.S.)** **BMS-IFWH4E2** • Digital I/O Relay I/F **BMS-IFDD03E** **BMS-IFDDO3UL (U.S.)** **BMS-IFDD02E2** • Wired Remote controller **RBC-AMT32(31)E** **RBC-AS21E2** • Wireless Remote controller **RBC-AX31U(W)-E,** **RBC-AX31U(WS)-E,** **RBC-AX22CE2** **TCB-AX21E2** • Wired Remote controller with weekly timer **RBC-AMS41E**	**4-8-5**

1-9-6 Touch screen controller system

System diagram	Model	Reference No.

Max 64/512 Indoors Touch Screen Controller
 	
RS-485
 	
Relay I/F
TCC-link bus
1:1model
Connection I/F
 	
Digital Input 3ch
Digital output 3ch
Fire alarm Key lock
Ethernet
 	
Max12
Relay I/F
TCC-link bus
 	
Monthly report creation software
 	
Energy monitoring Relay I/F
Power Meter
Max8
Pulse signal
Max8
 	
Digital I/O Relay I/F
Digital I/O signal
Fire alarm Door key Error
Max8
Max In 8 /Out 4
 	
Power meter:
Pulse width:50-1000ms
Pulse generator constants (kWh/pulse) 0.1-99.9
 	
For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"
	• Touch Screen Controller
	  BMS-TP0641ACE
	  BMS-TP5121ACE
	  BMS-TP0641PWE
	  BMS-TP5121PWE
	• Setting file creation software
	• Monthly report creation software
	• "1:1model" connection TCC-Link Interface
	  TCB-PCNT30TLE2
	• Relay Interface
	  BMS-LSV4E
	  BMS-IFLSV4UL(U.S.)
	  BMS-LSV3E
	• Energy monitoring Relay I/F
	  BMS-IFWH5E
	  BMS-IFWH5UL(U.S.)
	  BMS-IFWH4E2
	• Digital I/O Relay I/F
	  BMS-IFDD03E
	  BMS-IFDDO3UL(U.S.)
	  BMS-IFDD02E2
	• Wired Remote controller
	  RBC-AMT32(31)E
	  RBC-AS21E2
	• Wireless Remote controller
	  RBC-AX31U(W)-E
	  RBC-AX31U(WS)-E
	  RBC-AX22CE2
	  TCB-AX21E2
	• Wired Remote controller with weekly timer
	  RBC-AMS41E
		4-8-6

1-9-7 WEB BASED Controller

System diagram	Model	Reference No.

Max 256 Indoors or less
 	
BMS-WB2561PWE (Web Server)
Ethernet
TCS-Net Relay I/F
TCC-LINK
BMS-IFLSV3E
SMMS SMMS
RS-485
HUB
TCS-Net Relay I/F
TCC-LINK
BMS-IFLSV3E MiNi-SMMS
SMMS
PC (WINDOWS) *Local supply
I/F for Power Meter (BMS-IFWH4E2)
Network, Intranet, connection through LAN port
I/F for I/O signal (BMS-IFDD02E2)
 	
System product configuration table
 	
<table><tr><td>Product name</td><td colspan="2">Web Server System</td></tr><tr><td></td><td>Model name</td><td>Max. connectable units</td></tr><tr><td>Web Server</td><td>BMS-WB2561PWE</td><td>1</td></tr><tr><td>Indoor Unit</td><td>(TCC-LINK integrated model)</td><td>Max. 256</td></tr><tr><td>TCS-NET Relay Interface</td><td>BMS-IFLSV3E</td><td>Max. 8</td></tr><tr><td>Energy Monitoring Relay Interface</td><td>BMS-IFWH4E2</td><td>Max. 4</td></tr><tr><td>Digital Input/Output Relay Interface</td><td>BMS-IFDD02E2</td><td>Max. 4</td></tr></table>
<table><tr><td rowspan="3">Client PC specification</td><td>OS</td><td>Windows XP,Vista</td></tr><tr><td>Browser</td><td>Internet Explorer 6.0 or 7.0</td></tr><tr><td>Display</td><td>1,024 X 768 more</td></tr></table>
 	
Max 257 Indoors or more
 	
BMS-WB01GTE (Master Server)
Ethernet
TCS-Net Relay I/F
TCC-LINK
BMS-WB2561PWE (Gateway)
SMMS
RS-485
TCS-Net Relay I/F
TCC-LINK MiNi-SMMS
SMMS
HUB
TCS-Net Relay I/F
TCC-LINK
BMS-WB2561PWE (Gateway) SMMS
RS-485
TCS-Net Relay I/F
TCC-LINK MiNi-SMMS
PC (WINDOWS) *Local supply
I/F for Power Meter (BMS-IFWH4E2)
I/F for I/O signal (BMS-IFDD02E2)
Network, Intranet, connection through LAN port
Enable to connector up to 2,048 FCUs
 	
System product configuration table
 	
<table><tr><td>Product name</td><td colspan="3">Master Server System</td></tr><tr><td></td><td>Model name</td><td>Max. connectable units</td><td>Notes</td></tr><tr><td>Master Server</td><td>BMS- WB01GTE</td><td>1</td><td></td></tr><tr><td>Gateway</td><td>BMS- WB2561PWE</td><td>Max. 8</td><td></td></tr><tr><td>Indoor Unit</td><td>(TCC-LINK integrated model)</td><td>Max. 2048</td><td>Max. 256 units per Gateway</td></tr><tr><td>TCS-NET Relay Interface</td><td>BMS-IFLSV3E</td><td>Max. 64</td><td>Max. 8 units per Gateway</td></tr><tr><td>Energy Monitoring Relay Interface</td><td>BMS-IFWH4E2</td><td>Max. 32</td><td>Max. 4 units per Gateway</td></tr><tr><td>Digital Input/Output Relay Interface</td><td>BMS-IFDD02E2</td><td>Max. 32</td><td>Max. 4 units per Gateway</td></tr><tr><td>Central Remote Controller</td><td>TCB-SC642TLE
BMS-CM1280TLE</td><td>Max. 80</td><td>Max. 10 units per Gateway</td></tr></table>
<table><tr><td rowspan="3">Client PC specification</td><td>OS</td><td>Windows XP,Vista</td></tr><tr><td>Browser</td><td>Internet Explorer 6.0 or 7.0</td></tr><tr><td>Display</td><td>1,024 X 768 more</td></tr></table>
 	
Power meter:
Pulse width:50-1000ms
Pulse generator constants (kWh/pulse) 0.1-99.9
	BMS-WB2561PWE
	BMS-WB2561PWE
	BMS-WB01GTE
	
	• Setting file creation software
	• Monthly report creation software
	• "1:1mode" connection TCC-Link Interface
	  TCB-PCNT30TLE2
	• Relay Interface
	  BMS-LSV4E
	  BMS-IFLSV4UL(U.S.)
	  BMS-LSV3E
	
	• Energy monitoring Relay I/F
	  BMS-IFWH5E
	  BMS-IFWH5UL(U.S.)
	  BMS-IFWH4E2
	
	• Digital I/O Relay I/F
	  BMS-IFDD03E
	  BMS-IFDDO3UL(U.S.)
	  BMS-IFDD02E2
	• Wired Remote controller
	  RBC-AMT32(31)E
	  RBC-AS21E2
	• Wireless Remote controller
	  RBC-AX31U(W)-E
	  RBC-AX31U(WS)-E
	  RBC-AX22CE2
	  TCB-AX21E2
	• Wired Remote controller with weekly timer
	  RBC-AMS41E
		4-8-7

For detail, refer to 1-9-8 "Overall Central Controller System Specification Table"

1-9-8 Overall Central Controller System Specification Table

Category		Open protocol				64 central controller	Compliant Manager 128 central controller	WEB Type 128 central controller	Vender protocol			
		Analog I/F	Modbus	LonWorks	BACnet				Touch screen controller		WEB BASED controller	
Model name		TCB-IFCB640TLE	TCB-IFMB640TLE	TCB-IFLN640TLE TCB-IFLN642TLE TCB-IFLN642UL	BMS-LSV6E	TCB-SC642TLE2	BMS-CM1280TLE	BMS-CM1280FTLE	BMS-TP0641ACE BMS-TP5121ACE	BMS-TP0641PWE BMS-TP5121PWE	BMS-WB2561PWE	BMS-WB2561PWE BMS-WB01GTE
Power consumption		3.2 W	2.4 W	3 W	0.2 A	4 W	3 W	5 W	50 VA	50 VA	0.2 A	0.2 A
Power supply		15 VDC ±5%	220 - 240 VAC, 50/60 Hz	220 - 240 VAC, 50/60 Hz	220-240 VAC 50/60 Hz	AC220/230/240V	220 - 240 VAC 50/60Hz	220 - 240 VAC 50/60Hz	100 - 240 VAC, 50/60Hz	100 - 240 VAC, 50/60Hz	220 - 240 VAC 50/60 Hz	220 - 240 VAC 50/60 Hz
Size		66 (H) x 170 (W) x 200 (D) mm	66 (H) x 170 (W) x 200 (D) mm	66 (H)x246 (W)x193 (D) mm	250 (W) x 70,(H) x 145 (D) mm (292 (W) including the fixing metal plate)	160 (H) x 160 (W) x 90 (D) mm	120 (H) x 180 (W) x 88 (D) mm	256 (H) x 316 (W) x 54 (D) mm	256 (H) x 316 (W) x 54 (D) mm	256 (H) x 316 (W) x 54 (D) mm	250 (W) x 71.6 (H) x 210 (D) mm (292 (W) including the fixing metal plate)	250 (W) x 71.6 (H) x 210 (D) mm (292 (W) including the fixing metal plate)
Display		no	no	no	no	yes	yes B/W 157*42mm	yes B/W 157*742mm	yes COLOUR LCD 12.1inch 800*600	yes COLOUR LCD 12.1inch 800*600	no	no
Weight		820 g	1 kg	1.2 kg	1.5 kg	840 g	1.1 kg	1.2 kg	3.5 kg	3.5 kg	2.2 kg	2.2 kg
Max number per one controller [Note1] [Note2]	Indoor unit	64 units/groups (central control address)	64 units/groups (central control address) (Max15 Modbus I/F/ bus line)	64 units/groups (central control address) (Max127 LON I/F / bus line)	128 units (Max127 server/subnet)	64 units/groups (central control address)	128 units /groups (central control address)	128 units	64/512 units	64/512 units	256 units	2048 units
	TCC-link main bus	1	1	1	8	1	2	2	12	12	8	8
Energy monitoring function		-	-	-	-	no	yes	yes	no	yes	yes	yes
Web browser access via PC		-	-	-	-	no	4 users simultaneously	4 users simultaneously	no	no	8 users simultaneously 24 PCs connectable	-
1.) I/O port		Analog in 8ch, out 5ch (DC 0-10v variable) Digital in 2ch, out 5ch	-	-	-	2ch in on/off 2ch out on/off	3ch in on/off 2ch out on/off	3ch in on/off 2ch out on/off	3ch in on/off 3ch out on/off	3ch in on/off 3ch out on/off	-	-
2.) Communication port for TCC-link		yes 1ch	yes 1ch	yes 1ch	no (RS485 via Relay I/F max8)	yes 1ch	yes 2 ch	yes 2 ch	no (RS485 via Relay I/F)	no (RS485 via Relay I/F)	no (RS485 via Relay I/F)	-
3.) Communication port for RS485							1ch					
TCC-Link access through Relay I/F BMS-LSV3E/ BMS-LSV4E/BMS-IFLSV4UL(U.S.)		-	-	-	yes max 8 I/F	-	-	-	yes max 12 I/F	yes max 12 I/F	yes max 8 I/F	-
Energy monitoring Relay I/F connectable (8 power meters/device) BMS-IFWH5E, BMS-IFWH5UL(U.S.)		-	-	-	-	no	no	no	no	yes max4	yes max4	yes max4
Digital I/O Relay I/F connectable (input 8ports, output 4ports/device) BMS-IFDD03E, BMS-IFDDO3UL		-	-	-	-	no	no	no	yes max8	yes max8	yes max4	yes max4
Upper system		-	Modbus RTU mode 9.6/19.2/38.4kbps	-	-	-	-	-	-	-	-	-
4.) Communication port for Ethernet 10BASE-T/100BASE-TX		no	no	no	yes for upper system	no	yes Web access/Monthly report PC	yes Web access/Monthly report PC	yes Monthly report PC	yes Monthly report PC	yes Web access/ Monthly report PC	yes Web access/ Monthly report PC
5.) Communication port for others		-	-	twisted pair FT-X1 transceiver 78kbps with system	-	-	-	-	-	-	-	-
Network specification		-	MODBUS Application PROTOCOL Specification V1.1b	LonWorks EIA/AnSI 709.1 support	AnSI/ASHRAE Standard 135-2004 BACnet Advanced Application Controller (B-AAC) (except SCHED-B DM-DCC-B of BIBBs, AnnEX K)	-	-	-	-	-	-	-
Indoor view classification		-	-	-	-	4 zone,16groups/zone	Floor/Tenant/area/group unit (4zone, 16groups/zone)*2 (64zone, 64groups/zone)*2	(4zone, 16groups/zone)*2 (64zone, 64groups/zone)*2	Floor/Tenant/area/group unit	Floor/Tenant/area/group unit	Floor/Tenant/area/group unit	Floor/Tenant/area/group unit

Category		Open protocol				64 central controller	Compliant Manager 128 central controller	WEB Type	Vender protocol — Touch screen controller	Vender protocol — Touch screen controller	Vender protocol — WEB BASED controller	Vender protocol — WEB BASED controller
		Analog I/F	Modbus	LonWorks	BACnet				direct input 3/output 3 *through Digital I/O Relay interface	direct input 3/output 3 *through Digital I/O Relay interface	through Digital I/O Relay interface	through Digital I/O Relay interface
Interlocking with I/O port (fireAlarm-> all stop, etc)		-	-	-	-	All stop/start Alarm, operation status	All stop/start in Alarm, operation status	All stop/start, alarm in Alarm, operation status *through Digital I/O Relay interface	direct input 3/output 3 *through Digital I/O Relay interface	direct input 3/output 3 *through Digital I/O Relay interface	through Digital I/O Relay interface	through Digital I/O Relay interface
Command [Note3]	On / OFF	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Operation mode	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Fan speed	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Louver	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Set temperature	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Permit / Prohibit of Local Operation	no	no	no	no	yes	yes	yes	yes	yes	yes	yes
	Alarm all reset	no	no	no	no	yes	yes	yes	yes	yes	yes	yes
	Filter sign reset	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
	Ventilation with indoor	no	no	no	no	yes	yes	yes	no	no	no	no
Monitoring [Note3]	On / OFF	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Operation mode	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Fan speed	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Louver	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Set temperature	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Permit / Prohibit of Local Operation	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Room temperature	no	yes	yes	yes	no	no	yes	yes	yes	yes	yes
	Filter sign	no	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
	Error status	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Error code	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Model name	-	yes	-	-	-	-	-	-	-	-	-
	Accumulated operation time	-	yes	-	-	-	-	-	-	-	-	-
Return- back	to set back to pre-set value after preset time	-	-	-	-	no	yes	yes	no	no	yes	yes
Schedule	Master	-	-	-	-	no	no	yes 32 pattern	yes 20 pattern	yes 20 pattern	yes 256types	yes 256types
	Operation Execute	-	-	-	-	no	no	yes	yes	yes	yes	yes
	Special day	-	-	-	-	* possible with TCB-EXS21TLE	* possible with TCB-EXS21TLE	yes	yes	yes	yes	yes
	Daily	-	-	-	-	* possible with TCB-EXS21TLE	* possible with TCB-EXS21TLE	yes On/off 10 times	yes On/off 20 times	yes On/off 20 times	yes 10 operations	yes 10 operations
	Weekly	-	-	-	-	* possible with TCB-EXS21TLE	* possible with TCB-EXS21TLE	yes 32 pattern	yes 20 pattern	yes 20 pattern	yes	yes
	monthly	-	-	-	-	no	no	yes	yes	yes	yes	yes
	Billing	-	-	-	-	no	no	yes	no	yes	yes	yes
Error/Alarm history		-	-	-	-	no	no	yes	yes	no	yes	yes
Alarm e-mail		-	-	-	-	no	no	no	no	no	yes	yes
System management		-	-	-	-	no	no	3 levels	3 levels	3 levels	3 levels	3 levels

Note1: Restriction by TCC-Link specification:
1. Max 64indoors, max16*1 header outdoor with max 3 followers per 1 TCC-Link main bus, Max 48 indoors per 1VRF refrigerant system.
2. Number of indoor followers shall be counted for VRF, however in case of DI/SDI, number of TCC-link adaptor shall be counted.
3. Confirm that max 16 refrigerant systems per 1 main bus for VRF, max 64 total refrigerant systems per 1 main bus for only DI/SDI, max 64 total refrigerant systems for mixed VRF / DI/SDI.

Note2: Restriction by TCS-NET Relay Interface specification:
1. Only 1 Relay I/F is connected to 1 TCC-Link main bus.
2. One TCS-NET Relay Interface covers, Max 64indoors under the condition of Note1 no2, max 16 refrigerant systems for VRF, max 64 refrigerant systems for only DI/SDI, max 28 total refrigerant systems for mixed VRF / DI/SDI.

Note3: Actual functions depend on each air conditioner.

Depend on Upper System

1-9-9 Model selection flow for central control system

* 14 cases for Central Remote/ Touch screen/Compliant /WEB BASED
Key items for model selection are function of "Energy monitoring", "Web access from PC" and "number of indoor units".

Note for Estimation of max indoor number.
Note1: Restriction by TCC-Link specification:
1. Max 64indoors, max16*1 header outdoor with max 3 followers per 1 TCC-Link main bus, Max 48 indoors per 1VRF refrigerant system.
2. Number of indoor followers shall be counted for VRF, however in case of DI/SDI, number of TCC-link adaptor shall be counted.
3. Confirm that max 16 refrigerant systems per 1 main bus for VRF, max 64 refrigerant systems per 1 main bus for only DI/SDI, max 64 total refrigerant systems and max 16 VRF refrigerant systems per 1 main bus for mixed VRF / DI/SDI.
Note2: Restriction by TCS-NET Relay Interface specification:
1. Only 1 Relay I/F is connected to 1 TCC-Link main bus.
2. One TCS-NET Relay Interface covers, Max 64indoors under the condition of Note1 no2, max 16 refrigerant systems for VRF, max 64 refrigerant systems for only DI/SDI, max 28 total refrigerant systems for mixed VRF / DI/SDI.

start

Open system?

Select Lonworks/Modbus/BACnet/other

finished

Require Energy monitoring?

Web browser access

Web browser access

Require External I/O devices through BMS-IFDD02E2?

Require External I/O devices through BMS-IFDD02E2?

Require External I/O devices through BMS-IFDD02E2?

Require External I/O devices through BMS-IFDD02E2?

more than 64 indoors/1bus?

more than 128 indoors/2bus?

BMS-CM1280TLE
Max 128 indoors

TCB-SC642TLE2
Max 64 indoors

with Direct digital I/O

More than 64 indoors/1 bus?

more than 512 indoors?

BMS-TP0641ACE
Max 64 indoors

BMS-TP5121ACE

Estimate number of Relay I/F   Max 12

Estimate number of BMS-IFDD02E Max 8

Estimate number of BMS-IFDD02E   Max 1

with Direct digital I/O

with Direct digital I/O

finished

more than 64 indoors/1bus?

more than 512 indoors?

BMS-TP5121PWE
Max 512 indoors

BMS-TP0641PWE
Max 64 indoors

Estimate number of Relay I/F Max 12

Estimate number of BMS-IFWH4E2 Max 8

Estimate number of BMS-IFWH4E2 Max 1

with Direct digital I/O

more than 64 indoors/1bus?

more than 512 indoors?

BMS-TP5121PWE

BMS-TP0641PWE
Max 64 indoors

Estimate number of Relay I/F Max 12

Estimate number of BMS-IFDD02E BMS-IFWH4E2 Each Max 8

Estimate number of BMS-IFDD02E BMS-IFWH4E2 Each Max 1

with Direct digital I/O

BMS-CM1280FTLE
Max 128 indoors

Estimate number of BMS-IFWH4E2 max 4

with Direct digital I/O

more than 128 indoors/2bus?

more than 256 indoors?

BMS-WB2561PWE
Max 256indoors

Estimate number of Relay I/F   Max 8

Estimate number of BMS-IFWH4E2 max 4

BMS-WB01GTE-1
BMS-WB2561PWE
Max 2048 indoors

Estimate number of BMS-WB2561PWE Max 8

Estimate number of Relay I/F Max 8 for each BMS-WB2561PWE

Estimate number of BMS-IFWH4E2 max 4 for each BMS-WB2561PWE

more than 128 indoors/2bus?

more than 256 indoors?

BMS-CM1280FTLE
Max 128 indoors

Estimate number of BMS-IFDD02E&B MS-IFWH4E2 Each max4

with Direct digital I/O

BMS-WB2561PWE
Max 256 indoors

Estimate number of Relay I/F   Max 8

Estimate number of BMS-IFDD02E&BM S-IFWH4E2 Each max4

BMS-WB01GTE-1
BMS-WB2561PWE
Max 2048 indoors

Estimate number of BMS-WB2561PWE Max 8

Estimate number of Relay I/F Max 8 for each BMS-WB2561PWE

Estimate number of BMS-IFDD02E &BMS-IFWH4E2 Each max 4 for each BMS-WB2561PWE

finished

60

1-9-10 BMS work flow (1)

The BMS work flow (Touch screen/Compliant Manager/WEB BASED) is shown below. Documents to be referred to are prepared for each series or product.

Work Flow

System Designing (confirm required specification)

System Designing (System wiring diagram draft level)

Equipment selection/Device selection

Setup file data preparation
(System wiring diagram (note1)/power meter wiring diagram/System Address list/Schedule list (note2))

Setup file creation Using Setting file creation software

On site installation (construction work)

On site installation (address set up)

Trial operation and adjustment

Commissioning

If Energy monitoring

Preparation for monthly report creation software

Air-conditioner Installation

Controller Installation

Energy Monitoring I/F Installation And Power Meter if system requires

Relay I/F installation if system required

Digital I/O Relay I/F Installation if system requires

External signal Device Installation for Controller and Digital I/O Relay I/F if system requires

Address / Function Setting Data setting for WEB system if system requires

Related document

Training PPT material

Design manual

Installation manual

Setting file creation owner's manual

Installation manual

Service manual

Owner's manual

Monthly Report Creation Software Owner's Manual

Note1)
System wiring diagram
* All air-conditioners (FCU/CDU/controller) layout
* All TCS-Net system devices layout (include local equipment)
* Control Wiring diagram
* Refrigerant system piping information diagram

Note2)
System address list (see below table)
* All air-conditioners address information (line address,indoor unit address,group address, central control address)
* All TCS-Net system devices address information
* Control *classification for connection
* Model name

Building Name	Toshiba Building		IP Address	192.168.2.100

No	Air Conditioner List			Address Information					Display Name			R.C. Unit/Group	Energy I/F Data	Digital I/F Data	
	Outdoor Refrigerant System	Outdoor unit Model Name	Indoor Unit Model Name	TCC-LINK Line No	Line Address	Indoor Unit Address	Group Address	Group Relation	Central Control Address	Floor Name	Tenant Name	Area Name		Power Meter Address - Channel	Key Input Address - Channel	Fire Alarm Address - Channel
1			MMU-AP0181H			1	0	0	1				RC-1	1-1		2-8
2			MMU-AP0091H			2	1	0	2		TenantA	ShopA		1-1	1-2	2-8
3			MMU-AP0181H			3	2	2	2				RC-2	1-1		2-8
4	SYS-1	MMY-AP1401HT8	MMU-AP0091H		1	4	2	2	2	1F		ShopB		1-1		2-8
5			MMK-AP0091H			5	0	0	3			ShopC	RC-3	1-1	1-3	2-8
6			MMK-AP0181H			6	0	0	4		TenantB		RC-4	1-1	1-4	2-8
7			MMK-AP0181H		1	7	0	0	5			ShopD	RC-5	1-1	1-5	2-8
8			MMK-AP0181H			8	0	0	6				RC-6	1-1	1-6	2-8
9			MMU-AP0181H			1	1	0	7			ShopE	RC-7	1-2	1-7	2-8
10	SYS-2	MMYAP0801HT8	MMU-AP0181H		2	2	2	9	7	2F	TenantC			1-2		2-8
11			MMK-AP0181H			3	1	0	8				RC-8	1-2	1-8	2-8
12			MMK-AP0181H			4	2	11	8			ShopF		1-2		2-8
13			MMU-AP0181H			1	0	0	9			CEO	RC-9	1-3	2-1	2-8
14			MMU-AP0181H			2	0	0	10				RC-10	1-3	2-2	2-8
15			MMK-AP0181H			3	0	0	11				RC-11	1-3	2-3	2-8
16	SYS-3	MMYAP1001HT8	MMK-AP0181H	2	1	4	1	0	12	3F	Office		RC-12	1-3	2-4	2-8
17			MMK-AP0181H			5	2	16	12					1-3	2-4	2-8
18			MMU-AP0181H			6	2	16	12			Development		1-3	2-4	2-8
19			MMU-AP0181H			7	0	0	13					1-3	2-5	2-8
20			MMU-AP0181H			8	0	0	14				RC-13	1-3	2-6	2-8

Air conditioner list   Air conditioner address list   Display name Management category   Remote control   I/F Address Information

1-9-11 BMS work flow (2)

The BMS work flow (Open system Analog I/F, LonWorks®, Modbus®, BACnet®) is shown below. Documents to be referred to are prepared for each series or product. Analog I/F, LonWorks and Modbus use the central control addresses to identify indoor units.
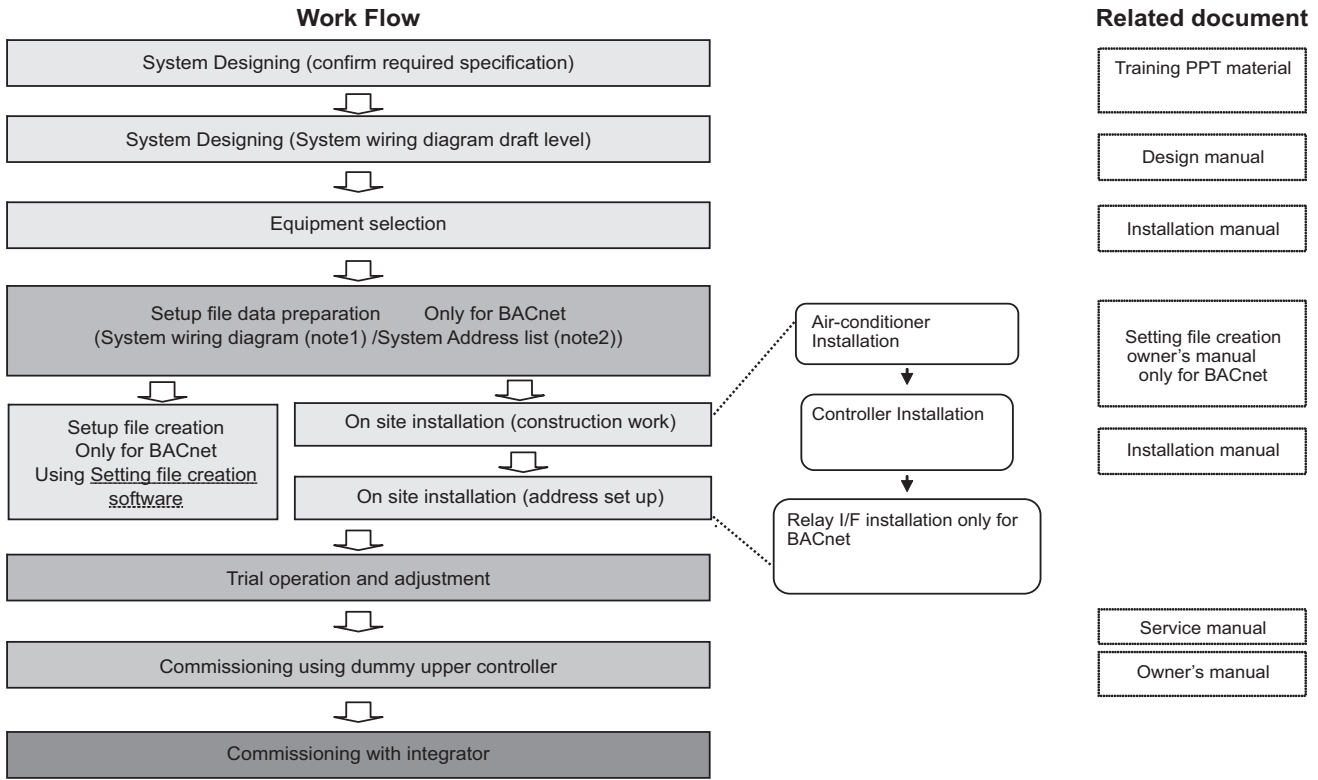
Work Flow   **Related document**

Note1)
System wiring diagram
* All air-conditioners (FCU/CDU/controller) layout
* All TCS-Net system devices layout (include local equipment)
* Control Wiring diagram
* Refrigerant system piping information diagram

Note2)
System address list
* All air-conditioners address information (line address,indoor unit address,group address for Only BACnet see below table, other system needs central control address)
* All TCS-Net system devices address information
* Model name

Airconditioner list								
Outdoor refrigerant system	Outdoor unit model name	Indoor unit model name	Header unit	Intelligent server address	TCS-Net relay I/F address	Line address	Indoor unit address	Group address
1		MMD-AP0721H	0				1	0
2		MMD-AP0721H	0				2	0
3		MMD-AP0961H	0				3	0
4		MMK-AP0241H	0				4	0
5		MMK-AP0241H	0				5	0
6	CDU-1	MMK-AP0241H	0		1	1	6	0
7		MMK-AP0181H	0				7	0
8		MMK-AP0181H	0				8	0
9	MMY-AP3611HT8	MMU-AP0481H	0				9	0
10		MMK-AP0151H	0				10	1
11		MMK-AP0151H	10				11	2
12		MMK-AP0121H	0				12	0
13		MMK-AP0121H	0				13	0
14		MMK-AP0091H	0				1	0
15		MMD-AP0721H	0				2	0
16		MMD-AP0721H	0	192.168.xxx.xxx			3	0
17		MMD-AP0361BH	0				4	0
18		MMD-AP0361BH	0				5	0
19	CDU-2	MMD-AP0361BH	0			2	6	0
20	MMY-AP3611HT8	MMD-AP0361BH	0				7	0
21		MMD-AP0361BH	0				8	0
22		MMD-AP0361BH	0				9	0
23		MMD-AP0271BH	0		2		10	0
24		MMK-AP0181H	0				11	0
25		MMD-AP0961H	0				1	0
26		MMD-AP0961H	0				2	0

Air conditioner list   BACnet Server/ TCS-Net I/F /Line/Indoor/Group address information

1-9-12 Outline of Energy monitoring and billing system
[1] Calculation concept

The following indicates how the energy monitoring system counts for each indoor unit's consumption.

1. A power meter measures total outdoor power consumption of the corresponding refrigerant systems. Integrated value of pulse signal from power meter is stored in the controller.
For example, 40HP system, a power meter measures power supply line consumption for 40HP outdoor units.

2. The controller with energy monitoring function can collect information of how much each indoor unit requests the cooling/heating capacity to the system (demand data) and each unit rating (HP). For example, 40HP system has 10units of 4HP indoor units, each indoor unit has its own capacity request to the system according to the room temp and setting temp history, this demand data are sent to the controller. And all necessary data (demand data, unit rating, power consumption) is stored in the controller.

3. The following calculation is performed in Monthly report creation software by using stored data in the controller. Demand ratio is the percent figure and calculated by demand data divided by full demand data.

4. Calculation

$$\Psi_A = P_{IN} \left[\frac{R_A \times S_A}{\sum_{n=1}^{n} {}^{i}R_n \times S_n} \right]$$

Where: P_{IN} = Total Power Consumption from power meter (kW) during a period of time

R_n = Unit rating (HP)

S_n = Demand ratio (%)

$_n$ = Number of unit

Ψ_A = Energy consumption (kW) for a period of time

[2] Power meter Selection and Setting concept

For electricity meters, select an appropriate product which has a non-voltage oscillator output terminal (see note below), considering the required accuracy, phase and wiring of the system and the maximum capacity. Refer to the figure below for installation of electricity meters. Normally, each refrigerant line requires one electricity meter in a SMMS-i/SMMS/ SHRM system. Please note that if one refrigerant line consists of plural outdoor units, electricity meter can't be installed on each outdoor unit because of the setting file limitation. In an SMMS-i/SMMS system, using one meter for two or more refrigerant lines is acceptable if power consumption is expected to be within the range of the measurement accuracy of the meter. In a DI/SDI/Mini-SMMS system, normally one electricity meter is used for two or more outdoor units. The pulse generator constants of the electricity meters must be registered on the setting file of the controller. The constants are separated by the channels of the relay I/F connected to the meters.

[NOTE] The pulse width must be 50-1000ms and the pulse generator constant (kWh/pulse) must be 0.1-99.9.

One refrigerant system

Controller

Energy Monitoring Relay I/F

BMS-IFWH5E(UL)

RS-485

Compliant Manager
or Touch screen

TCC-LINK bus

Monthly
report
creation
software

PC for energy monitoring

Note:
:Main switch (Fuse) and circuit
Breaker

Power Source

Power Meter

Total 8 ch

SMMS-i/SMMS

SHRM

Header   Follower   Follower   Follower

Outdoor unit

Pull box

Pull box

Indoor unit

Power Source

One refrigerant system

Header   Follower   Follower   Follower

Power Meter

Outdoor unit

Pull box

Pull box

Indoor unit

Power Source

Header

One refrigerant system

Power Meter

Outdoor unit

Pull box

Pull box

Indoor unit

Power Source

Power Meter

Mini-SMMS

Pull box

Outdoor unit

Indoor unit

Power Source

Power Meter

DI/SDI

Pull box

Outdoor unit

Indoor unit

64

1-9-13 Network Specification
1-9-13-1 Modbus

System Overview

This manual describes Modbus* protocol implementation specifications of TCB-IFMB640TLE. TCB-IFMB640TLE is equipped with the Modbus Slave functi on. Specifications that are not detailed in this manual conform to the following MODBUS specifications.

• MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b

• MODBUS over Serial Line Specification and Implementation Guide V1.01
  http://www.modbus-ida.org/

This implementation specification specifies the operation of Modbus that works on the RS485 serial line, where a slave device sends a response to a request from the master device. Multiple slave devices are connected to the RS485 bus. Modbus uses the Modbus RTU mode with the frame format shown below.

START	SLAVE ADDRESS	FUNCTION	DATA	CRC	END
>=3.5 characters	8 bits	8 bits	N*8 bits (N = 252 max.)	16 bits	>= 3.5 characters

Each slave device is connected to the TCC-LINK main bus. The internal da ta and operation of indoor units and TCB-IFCG1TLE units (general purpose interface) to which central control addresses 1 to 64 are assigned are controlled by the master device. Up to 15 slave devices may be connected to the master device.

A broadcast message will be sent when the slave address 0x00 is specified in a request, and all slave devices will receive the request but send no response including exception response. The figure below shows an example of the connection of the master device, slave devices, and air conditioners.
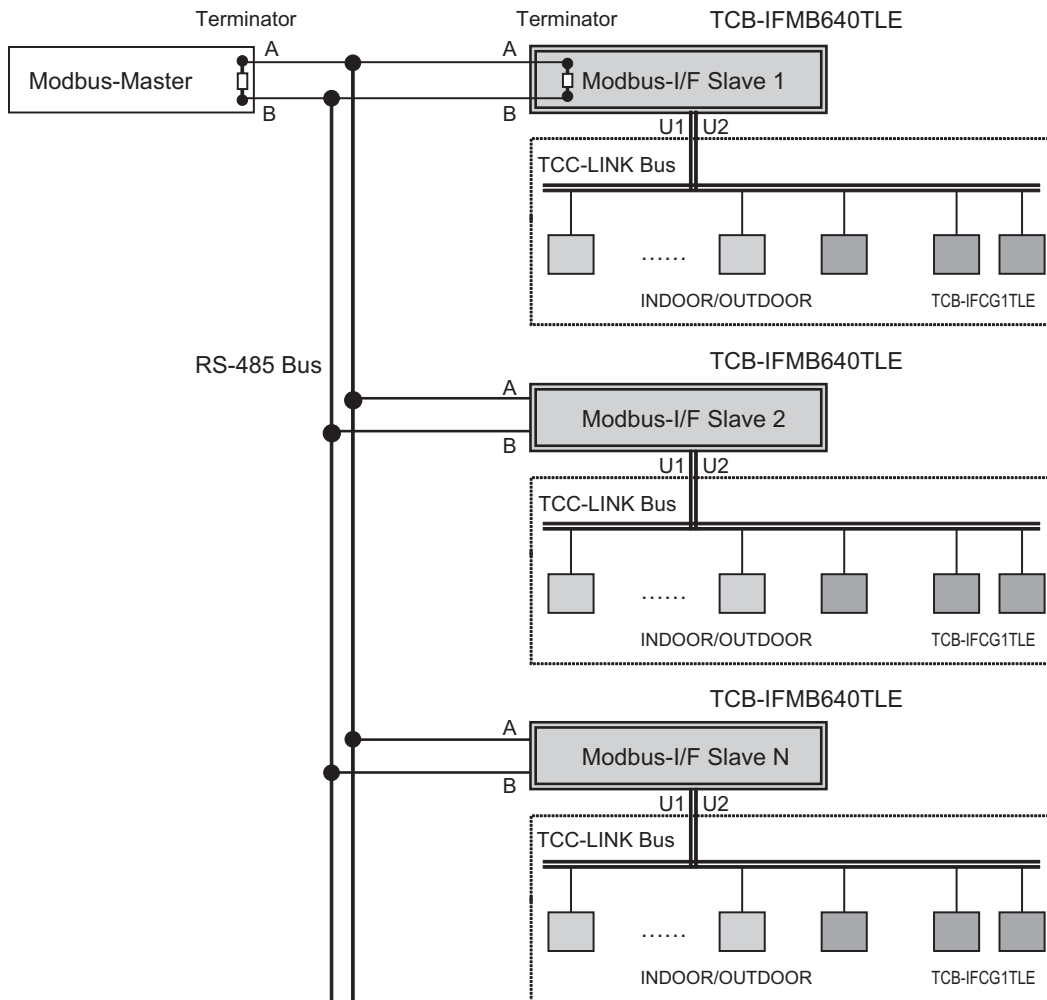
N = Max. 15

* "Modbus" is a registered trademark of Schneider Electric SA.

RS 485 Communication Parameters

RS 485 communication parameters are shown below.
- Character length = 11 bits, Data = 8 bits, Parity Check = even, Start bit =1 bit low, Stop bit = 1bit high
- Communication: 9600/19200/38400 bps (default: 19200 bps) Selected manually.
- Bit transmission order: LSB first (b0, b1….). Bit data is transmitted sequentially from the LSB.
- Byte transmission order: Big Endian. 0x1234 -> 0x12 then 0x34. Byte data is transmitted in the big endian order.
- Half duplex, 2 wires. 120 Ω termination. A: Non-inverted input, B: Inverted input
- After receiving a packet, a response is permitted after at least 3.5 characters.
- Connecter: 2 terminals

Applied Function Codes

The following function codes are implemented.

Function code	Sub function code	Function name
0x01	None	Read coils
0x02	None	Read Discrete input
0x03	None	Read holding register
0x04	None	Read Input register
0x05	None	Write single coil
0x06	None	Write single holding register
0x08	0x00, 01, 02, 04, 0A, 0B, 0C, 0D, 0E, 0F, 11, 12, 14	Diagnostics
0x0B	None	Get Comm Event Counter
0x0C	None	Get Comm Event Log
0x0F	None	Write multiple coils
0x10	None	Write multiple holding registers
		Exception

The relationship between the start address specified in a request from the master device and the value shown by "Modbus-address for registers" in the address assignment table is as follows:

- For Coil
  Start address = (Value of Modbus-address for registers) - 1
- For Discrete input
  Start address = (Value of Modbus-address for registers) - 10001
- For Input register
  Start address = (Value of Modbus-address for registers) - 30001
- For Holding register
  Start address = (Value of Modbus-address for registers) - 40001

Exception Response

Except for Broadcast, the master device issues a request expecting a normal response from a slave device. Slave units return a normal response when no error is detected, but return no response when an error occurs during the parity check or CRC check. Slave units must return an exception response when they receive a request which has been sent correctly but contains an error that applies to any of the following exception codes.

Exception code	Name
0x01	Illegal function A request of illegal function that is not supported by this specification is received
0x02	Illegal data address An illegal address that does not exist in section 7 of this manual. Address Assignment table or a data request size larger than 249 octets is specified.
0x03	Illegal data value Illegal data in any of the following cases: 1) When data other than that defined in section 7 of this manual Address Assignment table is specified. 2) When Broadcast (slave address = 0) is specified with a function code other than 0x05, 0x06, 0x0F, 0x10 3) When an address is specified for two or more devices
0x04	Slave device failure Slave device internal processing is not correct (When any error occurs during booting or reading the RAM).
0x05	ACK A slave device returns response ACK when it received a request while it is acquiring response data during the slave device initial data acquisition process.
0x06	Slave device busy When a slave device is busy and cannot return response data, this code is returned.
0x07	When a master's request is about an indoor unit which does not respond to the request. (However, the master's request is sent to the indoor unit.)

Counters and Registers

TCB-IFMB640TLE is equipped with the following counters and registers that are cleared by a power-on reset, restart process, or a counter reset command.

Register/Counter	Description
Coils (R/W)	For air-conditioner database
Discrete input (R)	For air-conditioner database
Input register (R)	For air-conditioner database
Holding register (R/W)	For air-conditioner database
Event counter	Counted when a slave device has processed a received message correctly. This counter is not incremented when the exception command or 0B command is received.
Message counter	Retains the number of messages sent by the slave device.
Diagnostics register	A 16-bit register that retains the content of diagnosis. 0x0000: Normal 0x0001: CRC error 0x0002: EEPROM checksum error Other: Reserved
Bus Communication Error Count	Total number of CRC errors detected by slave devices
Exception Error Count	Total number of exception errors detected by slave devices
Slave Message Count	Total number of messages received by the corresponding slave device
No Response Count	Total number of messages received by the corresponding slave device, which are not accompanied by response
Busy Count	Total of Busy Count (exception error) detected by the corresponding slave device
Bus Character Overrun Count	Number of character overrun errors (failure in receiving part of the data) detected in messages to the corresponding slave device

Sequence

The master device sends a request sequentially to each slave device, and gets response data from each slave device. A slave device returns a response to a request from the master device within one second (see the diagram below). When a slave device receives a data read request, the slave device returns the data stored in the register.

It is recommended that the master device collects specific information such as air conditioner models, addresses, unique numbers, and operation setting range when the master device accesses the air conditioning system for the first time.

When writing to air conditioners, the master device must read the operation range for, operation mode, fan speed and setting temperature from each air conditioner and write values within the operation range. Pay attention to the sequence of simultaneous setting for writing to air conditioners because it requires time for processing on the slave device side. Furthermore, because no response or exception response with respect to the writing for broadcast message is sent from slave devices, it is recommended that data written to slave devices be checked on the master device side as required. It is recommended to confirm whether a master's request is reflected by reading the read register after appropriate time once a communication is completed, because indoor units may not be able to receive a normal request from the master due to TCC-LINK communication condition.

In case master device sets Louver within a few seconds after setting the Operation mode "auto", the following sequence is required.

1. Write 0x05 as the Operation mode "auto" on the Coils.
2. Read the Operation mode status on Discrete input(R).
3. After confirming Operation mode status is changed to 0x05 or 0x06, write new Louver setting data on the Coils.

In addition, it is also recommended that data be requested at appropriate intervals so that the alarm data that is output from air conditioners is properly reflected in the discrete input register.
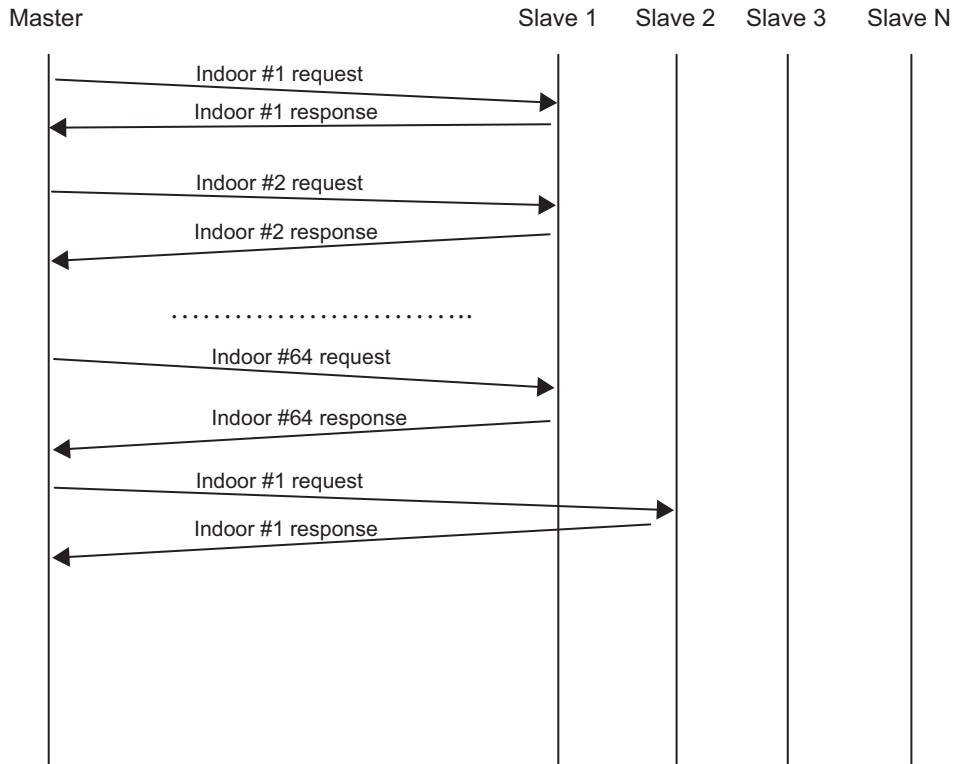
Address Assignment Table

Total 42368 octets (9728*2/8 + 9984*2*2). The data of the address assignment table is cleared during initialization.

Indoor number corresponds to central control address.

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Octet Order	Explanation
Coils (R/W)	1	1-8	On/Off setting	1 octet	1	1= On,0 =Off (address=1)
			Filter sign reset setting			1= reset, others = no action (address=2)
			Reserved			
		9-16	Operation mode setting	1 octet	2	0x00=unfix,0x 01= heat,0x 02= cool,0x 03= dry 0x 04= fan,0x05 auto (address=9LSB,address= 16MSB)
		17-24	Fan speed setting	1 octet	3	0x00=Invalid,0x01=Fan Stop,0x02=Auto,0x03=High,0x04=Medium,0x05=Low,0x06=Ultra Low,0x07=unfix (address=17 LSB,address=24MSB)
		25-32	Louver setting	1 octet	4	0x00= invalid, 0x 1 =swing, 0x 2= f1,0x 3 =f2,0x 4= f3, 0x 5= f4, 0x 6 =f5, 0x7=stop (address=25 LSB, address=32MSB)
		33-40	Remote controller on/off prohibit setting	1 octet	5	Remote controller on/off prohibit setting (address=33) Remote controller mode prohibit setting (address=34) Remote controller setpoint prohibit setting (address=35) Remote controller louver prohibit setting (address=36) Remote controller fan speed prohibit setting (address=37) 1=prohibit 0=permit
		41-48	Relay 1ch output for TCB-IFCG1TLE	1 octet	6	TCB-IFCG1TLE bit output see manual of TCB-IFCG1TLE
			Relay 2ch output for TCB-IFCG1TLE			
			Relay 3ch output for TCB-IFCG1TLE			
			Relay 4ch output for TCB-IFCG1TLE			
			Local operation prohibit for TCB-IFCG1TLE			1=prohibit 0=permit
			Reserved			
		49-152	Reserved	104bit	7-19	
	2	153-160	On/Off setting	1 octet	20	1= On,0 =Off (address=153)
			Filter sign reset setting			1= reset, others = no action (address=154)
			Reserved			
		161-168	Operation mode setting	1 octet	21	0x00= unfix,0x 01= heat,0x 02= cool,0x 03= dry 0x 04= fan, 0x 05 auto (address=161 LSB, address= 168MSB)
		169-176	Fan speed setting	1 octet	22	0x00=Invalid,0x01=Fan Sop,0x02=Auto,0x03=High,0x04=Medium,0x05=Low, 0x06=Ultra Low, 0x07=unfix (address=169 LSB, address=176MSB)
		177-184	Louver setting	1 octet	23	0x00= invalid,0x 1 =swing, 0x 2= f1,0x 3 =f2,0x 4= f3, 0x 5= f4,0x 6 =f5,0x7=stop (address=177 lsb,address=184MSB)
		185-192	Remote controller on/off prohibit setting	1 octet	24	Remote controller on/off prohibit setting (address=185)
		193-200	Relay output for TCB-IFCG1TLE	1 octet	25	TCB-IFCG1TLE bit output (See manual of TCB-IFCG1TLE)
		201-304	Reserved	104bit	26-38	

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Octet Order	Explanation
	n	(152*n -151)-(152*n -144)	On/Off setting	1 octet	19*n –18	
			Filter sign reset setting			
			Reserved			
		(152*n –143)-(152*n –136)	Operation mode setting	1 octet	19*n –17	
		(152*n –135)-(152*n –128)	Fan speed setting	1 octet	19*n –16	
		(152*n –127)-(152*n –120)	Louver setting	1 octet	19*n –15	
		(152*n –119)-(152*n –112)	Remote controller on/off prohibit setting	1 octet	19*n –14	
		(152*n –111)-(152*n –104)	Relay output for TCB-IFCG1TLE	1 octet	19*n –13	TCB-IFCG1TLE bit output See manual of TCB-IFCG1TLE
		(152*n –103)-152*n	Reserved	104 bits	19*n –12—19*n	
	64	9577-9584	On/Off setting	1 octet	1198	1= On,0 =Off1 (address=9577)
			Filter sign reset setting			1= reset, others = no action (address=9578)
			Reserved			
		9585-9592	Operation mode setting	1 octet	1199	0x00=unfix,0x 01= heat,0x 02= cool,0x 03= dry 0x 04= fan,0x05 auto (address=9585 LSB, address= 9592MSB)
		9593-9600	Fan speed setting	1 octet	1200	0x00=Invalid,0x01=Fan Sop,0x02=Auto,0x03=High,0x04=Medium,0x05= Low,0x06=Ultra Low,0x07=unfix (address=9593 LSB,address=9600MSB)
		9601-9608	Louver setting	1 octet	1201	0x00= invalid, 0x 1 =swing, 0x 2= f1,0x 3 =f2,0x 4= f3, 0x 5= f4, 0x 6 =f5,0x7=stop (address=9601 LSB,address=9608MSB)
		9609-9616	Remote controller on/off prohibit setting	1 octet	1202	Remote controller on/off prohibit setting (address=9609) Remote controller mode prohibit setting (address=9610) Remote controller setpoint prohibit setting (address=9611) Remote controller louver prohibit setting (address=9612) Remote controller fan speed prohibit setting (address=9613) 1=prohibit 0=permit
		9617-9624	Relay output for TCB-IFCG1TLE	1 octet	1203	TCB-IFCG1TLE bit output (See manual of TCB-IFCG1TLE)
		9625-9728	Reserved	104 bits	1204-1216	

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Octet Order	Explanation
Discrete input (R)	1	10001-10004	On/Off setting status	1 octet	1	1= On,0 =Off (address=10001)
			Filter sign status			1= abnormal, 0 =normal) (address =10002)
			Alarm Status			1= abnormal, 0 =normal) (address =10003)
			Reserved			
		10005-10008	Reserved			
		10009-10016	Operation mode status	1 octet	2	0x00= invalid,0x 01= heat,0x 02= cool,0x 03= dry 0x 04= fan,0x05 auto heat, 0x06=auto cool,0x07=unfix (address=9 LSB, address 16=MSB)
		10017-10024	Fan speed set status	1 octet	3	0x00=Invalid,0x01=Fan Sop,0x02=Auto,0x03=High,0x04=Medium,0x05= Low,0x06=Ultra Low,0x07=unfix (address=10017 LSB,address=10024MSB)
		10025-10032	Louver setting status	1 octet	4	0x00= invalid, 0x 1 =swing, 0x 2=f1,0x 3 =f2,0x 4= f3, 0x 5= f4, 0x 6 =f5,0x7=stop (address=10025 LSB,address=10032MSB)
		10033-10040	Remote controller on/off prohibit setting status	1 octet	5	Remote controller on/off prohibit setting (address=10033) Remote controller mode prohibit setting (address=10034) Remote controller setpoint prohibit setting (address=10035) Remote controller louver prohibit setting (address=10036) Remote controller fan speed prohibit setting (address=10037) 1=prohibit 0=permit
		10041-10048	Reserved	1 octet	6	
		10049-10056	Reserved	1 octet	7	
		10057-10064	On/Off input for TCB-IFCG1TLE	1 octet	8	TCB-IFCG1TLE bit input See manual of TCB-IFCG1TLE
			Alarm input for TCB-IFCG1TLE			
			Din2 input for TCB-IFCG1TLE			
			Din3 input for TCB-IFCG1TLE			
			Din4 input for TCB-IFCG1TLE			
			Din1 input for TCB-IFCG1TLE			
			Reserved			
		10065-10152	Reserved	88 bits	9-19	

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Octet Order	Explanation
	2	10153-10156	On/Off setting status	1 octet	20	1= On,0 =Off (address=10153)
			Filter sign status			1= abnormal, 0 =normal) (address =10154)
			Alarm Status			1= abnormal, 0 =normal) (address =10155)
			Reserved			
		10157-10160	Reserved			
		10161-10168	Operation mode status	1 octet	21	0x00= invalid,0x 01= heat,0x 02= cool,0x 03= dry 0x 04= fan,0x05 auto heat, 0x06=auto cool,0x07=unfix (address=10161 LSB, address=10168MSB)
		10169-10176	Fan speed set status	1 octet	22	0x00=Invalid,0x01=Fan Sop,0x02=Auto,0x03=High,0x04=Medium,0x05= Low,0x06=Ultra Low,0x07=unfix (address=10169 LSB,address=10176MSB)
		10177-10184	Louver setting status	1 octet	23	0x00= invalid, 0x 1 =swing, 0x 2= f1,0x 3 =f2,0x 4= f3, 0x 5= f4, 0x 6 =f5,0x7=stop (address=10177LSB,address=10184MSB)
		10185-10192	Remote controller on/ off prohibit setting status	1 octet	24	Remote controller on/off prohibit setting (address=10185) Remote controller mode prohibit setting (address=10186) Remote controller setpoint prohibit setting (address=10187) Remote controller louver prohibit setting (address=10188) Remote controller fan speed prohibit setting (address=10189) 1=prohibit 0=permit
		10193-10200	Reserved	1 octet	25	
		10201-10208	Reserved	1 octet	26	
		10209-10216	On/Off input for TCB-IFCG1TLE	1 octet	27	TCB-IFCG1TLE bit input See manual of TCB-IFCG1TLE
		10217-10304	Reserved	88 bits	28-38	
	n	152*n+9849 -152*n+9856	On/Off setting status/ etc.	1 octet	19*n −18	
		152*n+9857 -152*n+9864	Operation mode status	1 octet	19*n −17	
		152*n+9865 -152*n+9872	Fan speed set status	1 octet	19*n −16	
		152*n+9873 -152*n+9880	Louver setting status	1 octet	19*n −15	
		152*n+9881 -152*n+9888	Remote controller on/ off prohibit setting status	1 octet	19*n −14	
		152*n+9889 -152*n+9896	Reserved	1 octet	19*n −13	
		152*n+9897 -152*n+9904	Reserved	1 octet	19*n −12	
		152*n+9905 -152*n+9912	On/Off input for TCB-IFCG1TLE/ETC	1 octet	19*n −11	TCB-IFCG1TLE bit input See manual of TCB-IFCG1TLE
		152*n+9913 - 152*n+10000	Reserved	88 bits	19*n − 10-19*n	

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Octet Order	Explanation
	64	19577-19580	On/Off setting status	1 octet	1198	1= On,0 =Off (address=19577)
			Filter sign status			1= abnormal, 0 =normal) (address =19578)
			Alarm Status			1= abnormal, 0 =normal) (address =19579)
			Reserved			
		19581-19584	Reserved			
		19585-19592	Operation mode status	1 octet	1199	0x00= invalid,0x 01= heat,0x 02= cool,0x 03= dry 0x 04= fan,0x05 auto heat,0x06=auto cool,0x07=unfix (address=19585 LSB,address=19592MSB)
		19593-19600	Fan speed set status	1 octet	1200	0x00=Invalid,0x01=Fan Sop,0x02=Auto,0x03=High,0x04=Medium,0x05= Low,0x06=Ultra Low,0x07=unfix (address=19593 LSB,address=19600MSB)
		19601-19608	Louver setting status	1 octet	1201	0x00= invalid,0x 1 =swing, 0x 2= f1,0x 3 =f2,0x 4= f3, 0x 5= f4,0x 6 =f5,0x7=stop (address=19601LSB,address=19608MSB)
		19609-19616	Remote controller on/ off prohibit setting status	1 octet	1202	Remote controller on/off prohibit setting (address=19609)
						Remote controller mode prohibit setting (address=19610)
						Remote controller setpoint prohibit setting (address=19611)
						Remote controller louver prohibit setting (address=19612)
						Remote controller fan speed prohibit setting (address=19613)
						1=prohibit 0=permit
		19617-19624	Reserved	1 octet	1203	
		19625-19632	S-code Status	1 octet	1204	
		19633-19640	On/Off input for TCB-IFCG1TLE/ETC	1 octet	1205	TCB-IFCG1TLE bit input (See manual of TCB-IFCG1TLE)
		19641-19728	Reserved	88 bits	1206-1216	

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Explanation
Input register (R)	1	30001	Room temperature	2 octets	unit: °C SEEEEMMM MMMMMMMM Temperature = $(-1)^S \times (0.01 \times M) \times 2^{(E)}$ s: sign (s = 1: -, s = 0: +), M: -2048 to +2047 Range:-671088.64-----670760.96 unit: °C
		30002	Setting temperature status	2 octets	Same as Room temperature
		30003-30006	Alarm code	8 octets	30003 upper header indoor unit: 00 when no alarm occurs 30003 lower follower indoor unit 1: 00 when no alarm occurs ……………………………… 30006 upper follower indoor unit 6: 00 when no alarm occurs 30006 lower follower indoor unit 7: 00 when no alarm occurs
		30007-30014	Model name	16 octets	16 characters in 16 ASCII codes
		30015-30022	Peculiar number	16 octets	16 characters in 16 ASCII codes
		30023	Ability	2 octets	Unit ability Octet expression
		30024	Indoor Type	2 octets	Octet expression 0x00**
		30025-30030	Analog input for TCB-IFCG1TLE	2 octets*6CH	6-channel analog input for TCB-IFCG1TLE (See manual of TCB-IFCG1TLE) address=30025 CH1, address=30026 CH2 etc. see Note
		30031	Operation Mode/ Fan	2 octets	RS FM Operation mode and air volume can be set
		30032	Cool temp range	2 octets	CT CB Temperature setting upper and lower limits in cool mode
		30033	Heat temp range	2 octets	HT HB Temperature setting upper and lower limits in heat mode
		30034	Dry temp range	2 octets	DT DB Temperature setting upper and lower limits in dry mode
		30035	Auto temp range	2 octets	FT FB Temperature setting upper and lower limits in auto mode
		30036-30156	Reserved	126*2 octets	
	n	29845+156*n	Room temperature	2 octets	
		29846+156*n	Setting temperature status	2 octets	
		29847+156*n -29850+156*n	Alarm code	8 octets	
		29851+156*n -29858+156*n	Model name	16 octets	
		29859+156*n -29864+156*n	Peculiar number	16 octets	
		29865+156*n	Ability	2 octets	
		29868+156*n	Indoor Type	2 octets	
		29869+156*n- 29874+156*n	Analog input for TCB-IFCG1TLE	2 octets*6CH	6-channel analog input for TCB-IFCG1TLE (See manual of TCB-IFCG1TLE)
		29875+156*n	Operation Mode/ Fan	2 octets	RS FM Operation mode and air volume can be set
		29876+156*n	Cool temp range	2 octets	CT CB Temperature setting upper and lower limits in cool mode
		29877+156*n	Heat temp range	2 octets	HT HB Temperature setting upper and lower limits in heat mode
		29878+156*n	Dry temp range	2 octets	DT DB Temperature setting upper and lower limits in dry mode
		29879+156*n	Auto temp range	2 octets	FT FB Temperature setting upper and lower limits in auto mode
		29880+156*n- 30000+156*n	Reserved	126*2 octets	

Modbus-description	Indoor-number	Modbus-address for registers	Data name	Length	Explanation
	64	39829	Room temperature	2 octets	See Modbus address 30001-30024
		39830	Setting temperature status	2 octets	See Modbus address 30001-30024
		39831-39834	Alarm code	8 octets	See Modbus address 30001-30024
		39835-39842	Model name	16 octets	See Modbus address 30001-30024
		39843-39850	Peculiar number	16 octets	See Modbus address 30001-30024
		39851	Ability	2 octets	See Modbus address 30001-30024
		39852	Indoor Type	2 octets	See Modbus address 30001-30024
		39853-39858	Analog input for TCB-IFCG1TLE	2 octets*6CH	6-channel analog input for TCB-IFCG1TLE. See manual of TCB-IFCG1TLE
		39859	Operation Mode/Fan	2 octets	RS FM Operation mode and air volume can be set
		39860	Cool temp range	2 octets	CT CB Temperature setting upper and lower limits in cool mode
		39861	Heat temp range	2 octets	HT HB Temperature setting upper and lower limits in heat mode
		39862	Dry temp range	2 octets	DT DB Temperature setting upper and lower limits in dry mode
		39863	Auto temp range	2 octets	FT FB Temperature setting upper and lower limits in auto mode
		39864-39984	Reserved	126*2 octets	
		39985-39992	Software version	16 octets	TCB-IFMB640TLE is expressed in ASCII codes followed by the version number.
Holding register (R/W)	1	40001	Temperature setting value	2 octets	Same as Room temperature Valid range: 0 to 92, unit: 1, fractions rounded off
		40002	Accumulated operation time	2 octets	Octet expression unit: hour ex) 255hours=0xFF Unit: hour. Monitor on/off of the discrete input register to check the on/off state of all air conditioners every 15 minutes. When the register state is on, add 15 minutes. The register data is retained even during power-off.
		40003-40006	Analog output for TCB-IFCG1TLE	2 octets*4CH	4-channel analog output for TCB-IFCG1TLE (See manual of TCB-IFCG1TLE) see Note 2
		40007-40156	Reserved	150*2 octets	See Modbus address 40001-40156
	2	40157	Temperature setting value	2 octets	See Modbus address 40001-40156
		40158	Accumulated operation time	2 octets	See Modbus address 40001-40156
		40159-40162	Analog output for TCB-IFCG1TLE	2 octets*4CH	See Modbus address 40001-40156
		40163-40312	Reserved	150*2 octets	See Modbus address 40001-40156
	n	39845+156*n	Temperature setting value	2 octets	See Modbus address 40001-40156
		39846+156*n	Accumulated operation time	2 octets	See Modbus address 40001-40156
		39847+156*n-39850+156*n	Analog output for TCB-IFCG1TLE	2 octets*4CH	See Modbus address 40001-40156
		39851+156*n-40000+156*n	Reserved	150*2 octets	See Modbus address 40001-40156
	64	49829	Temperature setting value	2 octets	See Modbus address 40001-40156
		49830	Accumulated operation time	2 octets	See Modbus address 40001-40156
		49831-49834	Analog output for TCB-IFCG1TLE	2 octets*4CH	See Modbus address 40001-40156
		49835-49984	Reserved	150*2 octets	See Modbus address 40001-40156

Note 1

- Analog In (2 channels, thermistor) reading
  Received TCC-LINK value is retained in this register with two bytes.
  The received 2-byte data is a two's complement and is converted to as an absolute measurement temperature by dividing it by 100.
- Example) Received value 0xFE97 -> x0169 (converted to two's complement) -> 361 -> converted to 3.61 (K) (divided by 100) The Celsius temperature is obtained by subtracting 273.15 from 3.61.
- Analog In (4CH 0-10VDC)
  Received TCC-LINK value is retained in this register with two bytes. The true value is a two's complement, and the value obtained by dividing the true value by 1000 becomes the board input value.
  Example) Received value 0xD8F1 -> converted to 0x270F (two's complement) -> 9999 -> converted to 9.999V (divided by 1000)

Note 2

- TCB-IFCG1TLE Analog Out 4-channel writing
  The master device writes a 2-byte two's complement that is 1000 times of the transmit value.
  The TCB-IFCG1TLE board value is obtained by dividing a two's complement of 2-byte received value by 3000. A level in accordance with the value is output from the MPU treating 3.333 as 256 levels. The MPU output value is multiplied by 3 in the external circuit, and the TCB-IFCG1TLE board output value equals the transmit value.

Example 1) A value 9.999V calculated by the master device is sent -> -> 9999 (1000 times) -> 0x270F---> 0x D8F1 (two's complement) This value is written.

Calculation at the receiver (TCB-IFCG1TLE board) 0xD8F1- -> 0x270F (two's complement) -> 9999 -> 3.333V (divided by 3000)- -> 256 levels = 0xFF (3.333V) is DA output. A value 3.333*3 = 9.999V is output from "Analog Out" on the TCB-IFCG1TLE board.

Example 2) A value 3.000V calculated by the master device is sent -> 3000 (1000 times) -> 0x0BB8-- -> 0xF448 (two's complement) This value is written to the register.

Calculation at the receiver (TCB-IFCG1TLE board) 0xF448 -> 0x0BB8 (two's complement) -> 3000 -> 1V (divided by 3000) - -> 77 levels = 0x4D (1.00V) is DA output. A value 1.00*3 = 3.00V is output from "Analog Out" on the TCB-IFCG1TLE board.

Note 3

- Unused bits can be read and written. No data can be written to reserved areas. If a reserved area is read, 00 is always returned.

Note 4

- The meaning of RS/FM (operation mode, fan speed), CT/CB (temperature setting upper and lower limits in cool mode), HT/HB (temperature setting upper and lower limits in heat mode), DT/DB (temperature setting upper and lower limits in dry mode), and FT/FB (temperature setting upper and lower limits in auto mode) in the Input register (R) is shown below. The master device must read the following values from each air conditioner in advance, and must set values within this range when specifying operation data.

Bits of RS	Meaning
b7, b6	00 All operation modes enabled 01 Cooling/drying disabled 10 Heating disabled 11 Fan only enabled
b5	1: Auto mode enabled, 0: Auto mode disabled
b4	1: Ventilation enabled, 0: Ventilation disabled
b3	1: Heating mode enabled, 0: Heating mode disabled
b2	1: Drying mode enabled, 0: Drying mode disabled
b1	1: Cooling mode enabled, 0: Cooling mode disabled
LSB	1: Fan mode enabled, 0: Fan mode disabled

Bits of FM	Meaning (fan speed)
b3	1: High fan speed enabled, 0: disabled
b2	1: Medium fan speed enabled, 0: disabled
b1	1: Low fan speed enabled, 0: disabled
b0	1: Ultra-low fan speed enabled, 0: disabled

Upper-limit / lower-limit temperature	Meaning
CT CB	Temperature setting upper-limit value in cool mode Temperature setting lower-limit value in cool mode
HT HB	Temperature setting upper-limit value in heat mode Temperature setting lower-limit value in heat mode
DT DB	Temperature setting upper-limit value in dry mode Temperature setting lower-limit value in dry mode
FT FB	Temperature setting upper-limit value in auto mode Temperature setting lower-limit value in auto mode

The upper-limit and lower-limit values in the table above are converted to Celsius temperatures using the following formula.
Celsius temperature (°C) = -35 + (decimal read value / 2)

Note 5

• Temperature is transformed below.

Case 1) 28 °C   S=0, E=1, M=1400 → 0X0D78
Case 2) 24 °C   S=0, E=1, M=1200 → 0X0CB0
Case 3) 23 °C   S=0, E=1, M=1150 → 0X0C7E
Case 4) 18 °C   S=0, E=1, M=900 → 0X384

Note 6

• Operation mode setting example.

Case 1) heat (0X01)
         register address 9 → 1
         register address 10 to 16 → 0
Case 2) cool (0X02)
         register address 10 → 1
         register address 9, 11 to 16 → 0
Case 3) dry (0X03)
         register address 9, 10 → 1
         register address 11 to 16 → 0

Note 7

• Fan speed setting.

Case 1) Fan stop (0X01)
         register address 17 → 1
         register address 18 to 24 → 0
Case 2) Ultra low (0X06)
         register address 18, 19 → 1
         register address 17, 20 to 24 → 0

Note 8

• The following is the modbus telegram examples between master device and slave.
The case is for Indoor central control address "1", "slave address 1"
The numbers below are HEX code.

Case 1) Monitoring of Room temperature
          Request from master: Use function 04
          01 04 00 00 00 01 crc
          Reply from slave: 23 degree centigrade
          01 04 02 0c 7e crc

Case 2) Controlling of temperature set point
          Request from master: Use function 06 set 23 degree centigrade
          01 06 00 00 0c 7e crc
          Reply from slave:
          01 06 00 00 0c 7e crc

Case 3) Monitoring of temperature set point
          Request from master: Use function 03
          01 03 00 00 00 01 crc
          Reply from slave: 23 degree centigrade
          01 03 02 0c 7e crc

Case 4) Monitoring of fan speed status
          Request from master: Use function 02
          01 02 00 10 00 08 crc
          Reply from slave: fan stop
          01 02 01 01 crc

Case 5) Controlling of fan speed status
          Request from master: Use function 0f set fan auto
          01 0f 00 10 00 08 01 02 crc
          Reply from slave:
          01 0f 00 10 00 08 crc

Case 6) Monitoring of filters status
          Request from master: Use function 02
          01 02 00 01 00 01 crc
          Reply from slave: filter abnormal
          01 02 01 01 crc

Appendix

Alarm Codes

Code	Description	Main RMC or Outdoor 7-seg display	Note
0x25	TCC-LINK central control device transmit error	C05	
0x26	TCC-LINK central control device receiving error	C06	
0x41	Indoor-remote controller communication error	E01	Detected by remote controller
0x42	Remote controller transmit error	E02	
0x43	Indoor-remote controller communication error	E03	Detected by indoor unit
0x44	Indoor-outdoor communication error	E04	Detected by indoor unit
0x46	Decrease in the number of indoor units	E06	
0x47	Indoor-outdoor communication circuit error	E07	Detected by outdoor unit
0x48	Indoor address duplication	E08	
0x49	Master remote controller duplication	E09	
0x4a	Communication error in indoor PCB	E10	
0x4c	Automatic address start error	E12	
0x4f	No indoor unit during automatic addressing	E15	
0x50	Too many indoor units connected or over capacity	E16	
0x52	Header-follower indoor units communication error	E18	
0x53	Error in the number of header outdoor units	E19	
0x54	Connection to other system refrigerant line during automatic addressing	E20	
0x57	Outdoor-outdoor communication error	E23	
0x59	Follower outdoor setup address duplication	E25	
0x5a	Decrease in the number of outdoor units	E26	
0x5c	Follower outdoor error	E28	
0x5f	IPDU communication error	E31	
0x61	Indoor coil TCJ sensor error	F01	
0x62	Indoor coil TC2 sensor error	F02	
0x63	Indoor coil TC1 sensor error	F03	
0x64	TD1 sensor error	F04	
0x65	TD2 sensor error	F05	
0x66	TE1 sensor error	F06	
0x67	TL sensor error	F07	
0x68	TO sensor error	F08	
0x6a	Indoor suction temperature TA sensor error	F10	
0x6c	TS1 sensor error	F12	
0x6d	TH sensor error	F13	
0x6F	Outdoor temperature sensor incorrect wiring (TE, TL)	F15	
0x70	Outdoor pressure sensor incorrect wiring (Pd, Ps)	F16	
0x77	Ps sensor error	F23	
0x78	Pd sensor error	F24	
0x7d	Other indoor errors	F29	
0x7f	Outdoor EEPROM error	F31	
0x81	Compressor breakdown	H01	
0x82	Compressor error (lock)	H02	
0x83	Current detector circuit error	H03	
0x84	Compressor 1 case thermostat operation	H04	
0x86	Low-pressure protective operation	H06	
0x87	Low oil level detection protection	H07	
0x88	Oil level detection temperature sensor error	H08	
0x8e	Compressor 2 case thermostat operation	H14	

Code	Description	Main RMC or Outdoor 7-seg display	Note
0x90	Oil level detection circuit error	H16	
0xc3	Indoor header address duplication	L03	
0xc4	Outdoor line address duplication	L04	
0xc5	Priority indoor unit duplication (displayed on unit with priority)	L05	
0xc6	Priority indoor unit duplication (displayed on unit with priority)	L06	
0xc7	Group wire on individual indoor	L07	
0xc8	No address setting of indoor group	L08	
0xc9	No setting of indoor capacity	L09	
0xca	No setting of outdoor capacity	L10	
0xd2	FS unit error	L18	
0xd4	Central control address duplication	L20	
0xdc	Too many outdoor units connected	L28	
0xdd	IPDU error	L29	
0xde	External interlock error in indoor unit	L30	
0xdf	IC error	L31	
0xe1	Indoor fan motor error	P01	
0xe3	Discharge temperature TD1 error	P03	
0xe4	High-pressure switch operation error	P04	
0xe5	Missing phase detected, phase sequence error	P05	
0xe7	Heat sink TH overheat error	P07	
0xea	Indoor water overflow error	P10	
0xec	Indoor DC fan motor error	P12	
0xed	Outdoor liquid back detection error	P13	
0xef	Gas leak detected	P15	
0xf1	Discharge temperature TD2 error	P17	
0xf3	4-way valve error	P19	
0xf4	High-pressure protective operation	P20	
0xf6	Outdoor fan IPDU error	P22	
0xfa	G-TR short-circuit protection error	P26	
0xfd	Compressor position detector circuit error	P29	
0xfe	Group control follower unit is defective	P30	
0xff	Other indoor unit errors	P31	

Converted Capacity Values

Hexadecimal converted capacity values corresponding to TCC-LINK return values are used as response data.

Example) A value acquired as 0x03 (decimal 3) is converted to 28 as capacity.

Return value (decimal)	Converted capacity value (decimal)	Return value (decimal)	Converted capacity value (decimal)
0	Invalid	21	224
1	22	22	250
2	25	23	280
3	28	24	340
4	32	25	355
5	36	26	450
6	40	27	500
7	45	28	560
8	50	29	600
9	56	30	630
10	63	31	670
11	71	32	710
12	80	33	800
13	90	34	840
14	100		
15	112		
16	125		
17	140		
18	160		
19	180		
20	200		

1-9-13-2 LonWorks

Input Network Variables

n: air conditioner number (0 to 63)　　　*This number is subtracted "1" from central control address.

No.	Item	Network variable names	Network variable types	Data definition	Description
1	START/STOP instructions (Command)	nviOnOff[n]	SNVT_switch	STOP state=0 and value=0 START Other than above 　　(state=1 or value>0)	Switches START/STOP.
2	Operation mode setting (Command)	nviHvacMode[n]	SNVT_hvac_mode	AUTO 0 HEAT 1 COOL 3 DRY 5 FAN 9 (*) If data other than 0, 1, 3, 5, and 9 is received, it is ignored without processing.	Switches operation mode (AUTO/HEAT/COOL/DRY/FAN).
3	Temperature setting (Command)	nviSetPoint[n]	SNVT_temp_p	Temperature setting range 　　Between 0 and 92 Unit of increment 　　1 (0.7 or less=0, 　　　　0.8 or more=1) (*) A value below 0 is set to 92, and a value over 92 is set to 92.	Changes set temperature.
4	Fan speed setting (Command)	nviFanSpeed[n]	SNVT_switch	AUTO state=0 (value: not used) LOW state=1 and value=<50 MID state=1 and 51=<value=<75 HIGH state=1 and 76=<value (*) Value is not used in the AUTO mode.	Switches fan speed setting (AUTO/HIGH/MID/LOW).
5	Flap setting (Command)	nviLouver[n]	SNVT_switch	SWING state=0 (value: not used) f1 state=1 and value=<20 f2 state=1 and 21=<value=<40 f3 state=1 and 41=<value=<60 f4 state=1 and 61=<value=<80 f5 state=1 and 81=<value (*) Value is not used in the SWING mode.	Switches flap setting (SWING/f1/f2/f3/f4/f5).
6	Filter sign clear (Command)	nviFilterSign[n]	SNVT_switch	Clear state=1 or value>0 (*) If data other than above (state=0 and value=0) is received, it is ignored without processing.	Clears filter sign indication.
7	Disabling operation START/STOP by R/C (remote control) (Command)	nviOnOffLimit[n]	SNVT_switch	Operation enabled 　　state=0 or value=0 Operation disabled 　　Other than above 　　(state=1 and value>0)	Disables or enables operation START/STOP using R/C.
8	Disabling operation mode switching by R/C (Command)	nviModeLimit[n]	SNVT_switch	Operation enabled 　　state=0 or value=0 Operation disabled 　　Other than above 　　(state=1 and value>0)	Disables or enables operation mode switching using R/C.
9	Disabling temperature setting change by R/C (Command)	nviSetPointLimit[n]	SNVT_switch	Operation enabled 　　state=0 or value=0 Operation disabled 　　Other than above 　　(state=1 and value>0)	Disables or enables temperature setting change using R/C.

Input Network Variables

n: air conditioner number (0 to 63)　　　*This number is subtracted "1" from central control address.

No.	Item	Network variable names	Network variable types	Data definition	Description
10	Disabling fan speed switching by R/C (Command)	nviFanLimit[n]	SNVT_switch	Operation enabled　　state=0 or value=0　Operation disabled　　Other than above　　(state=1 and value>0)	Disables or enables fan speed switching using R/C.
11	Disabling flap switching by R/C (Command)	nviLouverLimit[n]	SNVT_switch	Operation enabled　　state=0 or value=0　Operation disabled　　Other than above　　(state=1 and value>0)	Disables or enables flap switching using R/C.
12	Forcible STOP (Command)	nviAllOff	SNVT_switch	All OFF　state=1 or value>0　(*) If data other than above　　(state=0 and value=0) is　　received, it is ignored without　　processing.	Turns OFF all air conditioners.

Output Network Variables

n: air conditioner number (0 to 63)　　　*This number is subtracted "1" from central control address.

No.	Item	Network variable names	Network variable types	Data definition	Description
13	START/STOP (Monitor)	nvoOnOff[n]	SNVT_switch	STOP　state=0 and value=0　START state=1 and value=100	Outputs START/STOP status.
14	Operation mode setting (Monitor)	nvoHvacMode[n]	SNVT_hvac_mode	AUTO　0　HEAT　1　COOL　3　DRY　5　FAN　9	Outputs operation mode status (AUTO/HEAT/COOL/DRY/FAN).
15	Temperature setting (Monitor)	nvoSetPoint[n]	SNVT_temp_p	-273.17 to 327.66	Outputs temperature setting.
16	Fan speed setting (Monitor)	nvoFanSpeed[n]	SNVT_switch	AUTO　state=0 and value=0　STOP　state=1 and value=0　ULTRA LOW　　state=1 and value=25　LOW　state=1 and value=50　MID　state=1 and value=75　HIGH　state=1 and value=100	Outputs fan speed status (AUTO/HIGH/MID/LOW/ULTRA LOW/STOP).
17	Flap setting (Monitor)	nvoLouver[n]	SNVT_switch	SWING state=0 and value=0　STOP　state=1 and value=0　f1　state=1 and value=20　f2　state=1 and value=40　f3　state=1 and value=60　f4　state=1 and value=80　f5　state=1 and value=100	Outputs flap status (SWING/f1/f2/f3/f4/f5).
18	Room temperature (Monitor)	nvoSpaceTemp[n]	SNVT_temp_p	-273.17 to 327.66	Outputs room temperature.

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Output Network Variables

No.	Item	Network variable names	Network variable types	Data definition	Description
19	Filter sign (Monitor)	nvoFilterSign[n]	SNVT_switch	No Alarm state=0 and value=0 Alarm state=1 and value=100	Outputs filter sign status.

20	Disabling operation START/STOP by R/C (Monitor)	nvoOnOffLimit[n]	SNVT_switch	Operation enabled
				     state=0 and value=0
				Operation disabled
				     state=1 and value=100
					Outputs setting of disabling/enabling operation START/STOP by R/C.

21	Disabling operation mode switching by R/C (Monitor)	nvoModeLimit[n]	SNVT_switch	Operation enabled
				     state=0 and value=0
				Operation disabled
				     state=1 and value=100
					Outputs setting of disabling/enabling operation mode switching by R/C.

22	Disabling temperature setting change by R/C (Monitor)	nvoSetPointLimit[n]	SNVT_switch	Operation enabled
				     state=0 and value=0
				Operation disabled
				     state=1 and value=100
					Outputs setting of disabling/enabling temperature setting change by R/C.

23	Disabling fan speed switching by R/C (Monitor)	nvoFanLimit[n]	SNVT_switch	Operation enabled
				     state=0 and value=0
				Operation disabled
				     state=1 and value=100
					Outputs setting of disabling/enabling fan speed switching by R/C.

24	Disabling flap switching by R/C (Monitor)	nvoLouverLimit[n]	SNVT_switch	Operation enabled
				     state=0 and value=0
				Operation disabled
				     state=1 and value=100
					Outputs setting of disabling/enabling flap switching by R/C.

25	Error (Monitor)	nvoAlarm[n]	SNVT_switch	No error state=0 and value=0 Error state=1 and value=100	Outputs whether an error has occurred or not.
26	Error code (Monitor)	nvoCheckCode[n]	SNVT_count	Error code 0x00 to 0xFF	Outputs an error code (0x00 to 0xFF).

27	FCU request command output (Monitor)	nvoCapaRequest[n]	SNVT_switch	Thermostat OFF
				     state=0 and value=0
				Thermostat ON
				     state=1 and value=1 to 15
					Outputs request command (an S-code (1 to 15))

28	Thermostat status (Monitor)	nvoThermo[n]	SNVT_switch	Thermostat OFF
				     state=0 and value=0
				Thermostat ON
				     state=1 and value=100
					Outputs thermostat ON/OFF status

29	Indoor unit status	nvoExist[n]	SNVT_switch	No unit
				     state=1 and value=0
				No error
				     state=1 and value=1
				Communication error
				     state=1 and value=2
					Outputs indoor unit status (No error/Communication error/No unit).

Configuration Properties

No.	Item	Network variable names	Network variable types	Data definition	Description
30	Setting of minimum transmission interval	nciMinSendT	SNVT_time_sec	0.1 to 6553.4 sec	Sets minimum transmission interval in case of room temperature change. No data is transmitted until the set time passes after the last transmission.
31	Setting of maximum transmission interval	nciMaxSendT	SNVT_time_sec	0.1 to 6553.4 sec Transmits data when status changes or the set interval time passes. 0 Transmits data only when status changes.	Transmits data when the set time passes after the last transmission even without status change.

Notes for use

(1) The setting range of control items using the LN interface is broader than that of air conditioner, which enables fine setting.
For this reason, the air conditioner setting does not comply with some LN interface control items.
When using the LN interface, check the air conditioner specifications and set appropriate values.

(Example) Temperature setting
The LN interface allows temperature setting ranging from 0 to +92 °C, but the temperature setting range of air conditioner is +18 to +29 °C.

(2) Air conditioner does not allow temperature setting in the FAN only operation mode.

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1-9-13-3 BACnet Protocol Implementation Conformance Statement BMS-STBNO8E

ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

BACnet Protocol Implementation Conformance Statement

Date	April 1, 2008
Vender Name	Toshiba Carrier Corporation
Product Name	BACnet Software
Product Model Number	BMS-STBN08E
Application Software Version	-
Firmware Revision	-
BACnet Protocol Revision	ANSI/ASHRAE Standard 135-2004

Product Description:

1. Applicable air conditioner
   1) VRF System
      - Super Modular Multi System
      - Super Heat Recovery System
      - Mini-SMMS system

   2) Light Commercial model
      - Digital InverterSeries (*)
      - Super Digital Inverter Series (*)

   (*) - 'Flexi model', 'High wall 0 series' cannot be applicable.
      - TCB-PCNT30TLE2 is necessary except High wall 2Series.

2. System Configuration
2.1 Sample Control Wiring diagram
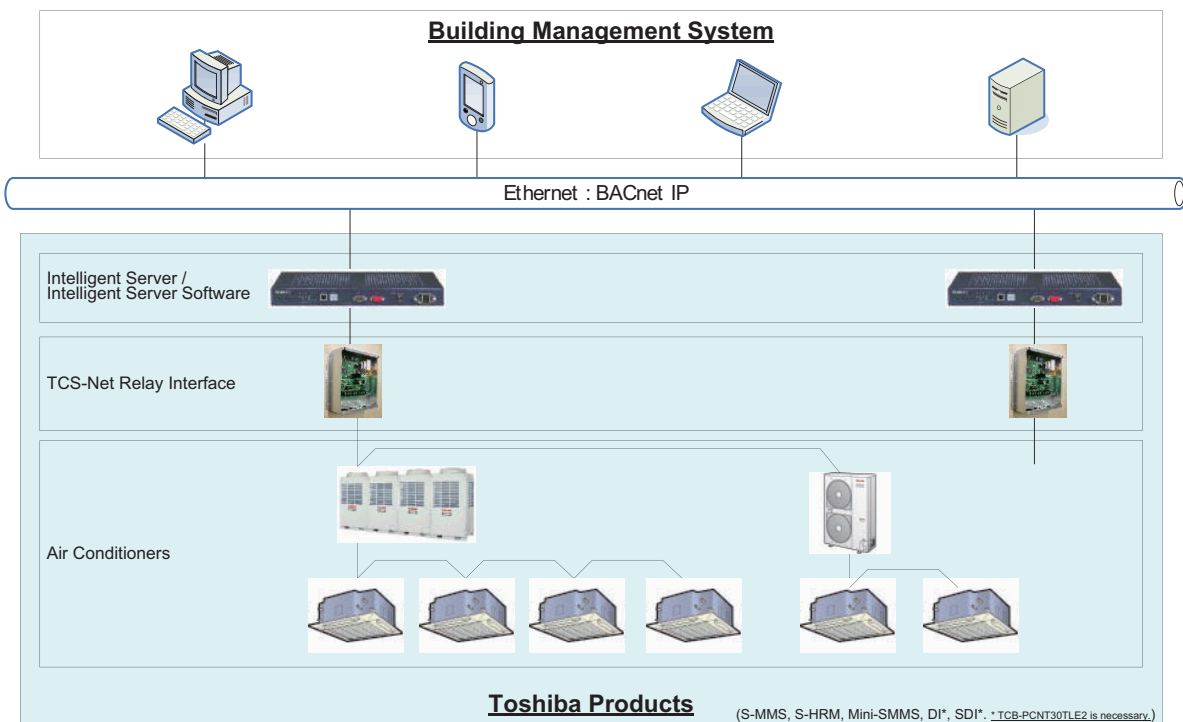
2.2 System Configuration and Limits

Item	Model Name	Specification	Connectable Q'ty
Intelligent Server	BMS-LSV6E	Hardware for BACnet Software	-
Intelligent Server Software	BMS-STBN08E	Protocol transformation RS-485 to BACnet IP	One Intelligent Server software per one BACnet Server
TCS-Net Relay Interface	BMS-IFLSV3E	Protocol transformation TCC-LINK to RS-485	Max. 8 units per one BACnet Server Max. 64 indoor units per one Relay I/F
Indoor unit			Max. 128 units per one BACnet Server

BACnet Standardized Device Profile (Annex L):

☐ **BACnet Operator Workstation (B‑OWS)**
☐ **BACnet Building Controller (B‑BC)**
☑ **BACnet Advanced Application Controller (B‑AAC)**
　(except SCHED-B DM-DCC-B of BIBBs, ANNEX K)
☐ **BACnet Application Specific Controller (B-ASC)**
☐ **BACnet Smart Sensor (B-SS)**
☐ **BACnet Smart Actuator (B-SA)**

List all BACnet Interoperability Building Blocks Supported (Annex K):

Data Sharing	Event & Alarm Management	Scheduling	Trending	Device & Network Management
DS-RP-B **DS-RPM‑B** **DS-WP-B** **DS-WPM‑B** **DS-COVU-B**	**AE-N-B** **AE-ACK‑B** **AE-INFO‑B**			**DM‑DDB-B** **DM‑DOB-B** **DM‑TS-B** **DM‑RD-B**

Segmentation Capability:

☐ Segmented requests supported　　Window Size _____
☐ Segmented responses supported　Window Size _____

Standard Object Types Supported:

Object-Type	Supported	Dynamically Creatable	Dynamically Deletable
Analog Input	☑	☐	☐
Analog Output	☑	☐	☐
Analog Value	☐	☐	☐
Binary Input	☑	☐	☐
Binary Output	☑	☐	☐
Binary Value	☐	☐	☐
Calendar	☐	☐	☐
Command	☐	☐	☐
Device	Yes	N/A	N/A
Event Enrollment	☐	☐	☐
File	☐	☐	☐
Group	☐	☐	☐
Loop	☐	☐	☐
Multi-state Input	☑	☐	☐
Multi-state Output	☑	☐	☐
Notification Class	☑	☐	☐
Program	☐	☐	☐
Schedule	☐	☐	☐

1-9-13-4 BACnet Server Software Specifications Protocol Implementation Conformance Statement BMS-STBN08E

1. General Outline

This document is applied to the communication specifications of BACnet Server Software (Model Name: BMS-STBN08E).

1.1 Applicable air conditioner

1) VRFSystem
   - Super Modular Multi System
   - Super Heat Recovery System
   - Mini-SMMS system

2) Light Commercial model
   - Digital InverterSeries(*)
   - Super Digital InverterSeries(*)

(*) - 'Flexi model', 'High wall 0 series' cannot applicable.
   - TCB-PCNT30TLE2 is necessary except High wall 2Series.

1.2 System Configuration
1.2.1 Sample Control Wiring diagram

Building Management System

Ethernet : BACnetIP

Toshiba Products (S-MMS, S-HRM, Mini-SMMS, DI*, SDI*, *TCB-PCNT30TLE2 is necessary)

Intelligent Server / Intelligent Server Software

TCS-Net Relay Interface

Air Conditioners
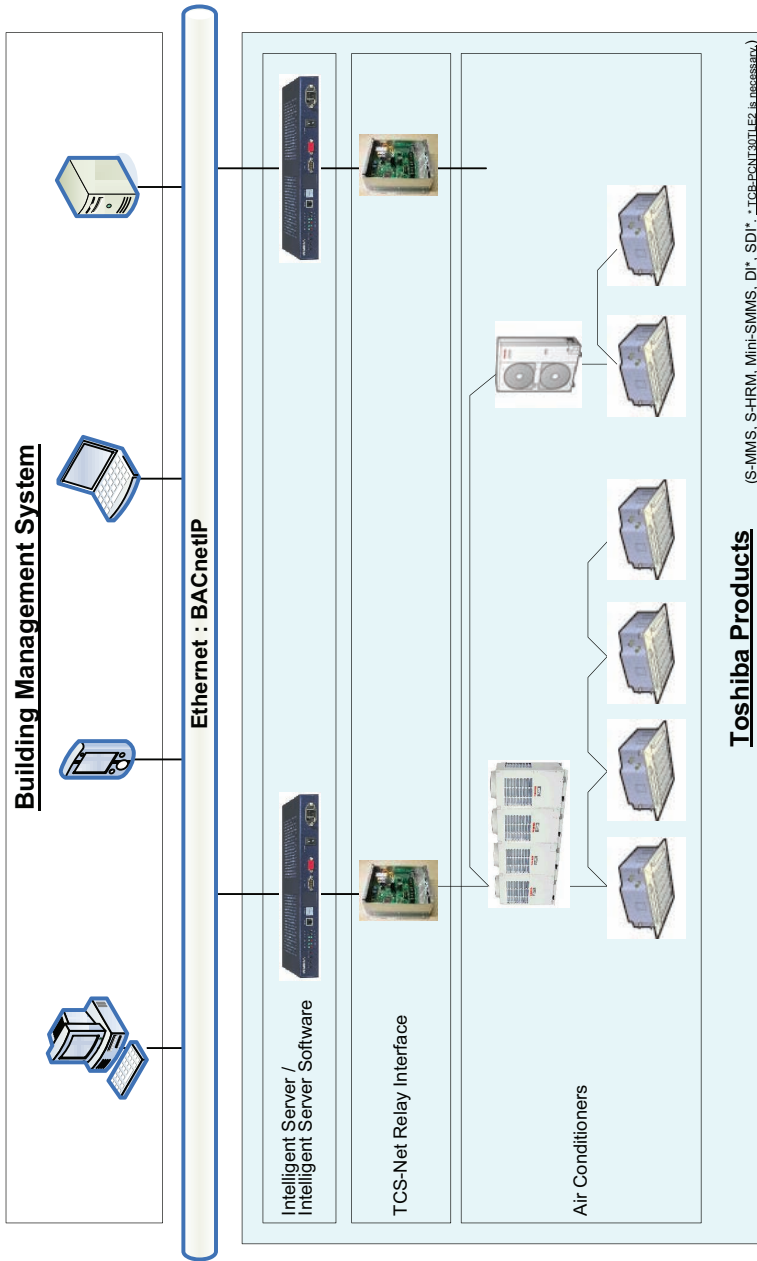
1.2.2 System Configuration and Limits

Item	Model Name	Specification	Connectable Q'ty	Note
Intelligent Server	BMS-LSV6E	Hardware for BACnet Software	-	
Intelligent Server Software	BMS-STBN08E	Protocol transformation RS-485 to BACnet IP	One Intelligent Server software per one BACnet Server	
TCS-Net Relay Interface	BMS-IFLSV3E	Protocol transformation TCC-LINK to RS-485	Max. 8 units per one BACnet Server Max. 64 indoor units per one Relay I/F	
Indoor unit			Max. 128 units per one BACnet Server	

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2. Communication Protocol Specification

2.1 Protocol Outline
- BACnet/IP
- ANSI/ASHRAE 135-2004
- UDP/IP

2.2 Ethernet Header
- 10BASE-T / 100BASE-T

2.3 IP Header
- Private Address of Class C (except between 192,168,0,0 and 192.168.0.255)
- Subnet Mask 255.255.255.0

2.4 UDP Header
- Unicast / Broadcast
- Port 47808 (0xBAC0)

2.5 BVLL Header
- BVLL Type (One Octet)   0x81 (BVLC to BACnet/IP)
- BVLC Function(One Octet)   0x0A (Unicast)
    0x0B (Broadcast)

2.6 NPCI
- Version   0x01
- Control   0x04 (With a response message)
    0x00 (Without a response message)

2.7 APDU
- Based on ANSI/ASHRAE 135-2004

2.8 UDP Header
- The instance number of a Device object   This number depend on LSB 1Byte of IP Address
- Segmentation   Transmission and reception are not supported.
- MaxAPDU Length   1024 octet (Receiveand Transmit)
- Vender ID   129 (Toshiba Carrier Corporation)

2.9 Network Options
- BACnet/IP Broadcast Management Device (BBMD) Function Not supported
- Registration by Foreign Devices   Not supported

3. Object List

Object Name	Object Type	Object Type (10bit)	Equipment category (4Bit)	Header/Follower ID Number (1Bit)	Equipment Number (1Byte)	Instance Number (1Byte)	Object ID (4Byte)	Value
Gateway Device	Device Object(8)	8	0000	0	0	IP address	0x020000**	
ON/OFF Status	Binary Output Object(4)	4	0000	0/1	FCU(n) 1-128	0x82	0x0100xx82/ 0x0101xx82	Start/Stop
Operation Mode	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x83	0x0040xx83/ 0x0041xx83	Heat/Cool/Fan/Dry/Auto
Fan Speed	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x85	0x0040xx85/ 0x0041xx85	Stop / Auto / HH / H / L / LL
Louver	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x87	0x0040xx87/ 0x0041xx87	Stop /Swing / F1 / F2 / F3 / F4 / F5
Set Temperature	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x84	0x0040xx84/ 0x0041xx84	From 18.0 to 29.0
Room Temperature	Analog Input Object(0)	0	0000	0/1	FCU(n) 1-128	0x08	0x0000xx08	From -39.0 To 150.0
Permit / Prohibit of Local Control	Multi-state Output Object(14)	14	0000	0/1	FCU(n) 1-128	0x89	0x0380xx89	- Start/Stop - Operation Mode - Temperature Setting
Error status	Binary Input Object(3)	3	0000	0/1	FCU(n) 1-128	0x40	0x00C0xx40/ 0x00C1xx40	Error / No Error
Error Code	Analog Input Object(0)	0	0000	0/1	FCU(n) 1-128	0x01	0x0000xx01/ 0x0001xx01	From 0x00 to 0xFF

4. Object Information

4.1 Gateway Device

Name	Data
Object Type	8
Equipment Category	0000
Equipment Number	0
Instance Number	IP Address
Object Type	Device Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value	Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				Application Tag	object identifire (0xc4)		'**' : Instance Number
						Device object	0x020000**		
Object Name(77)	Character string	R				Application Tag	character string (0x7507)		
						String	"AC_CONTROLLER"		
Object Type(79)	BACnet Object Type	R				Application Tag	enumerated (0x91)		Device(8)
						Device object	0x08		
System Status(112)	BACnet Device Status	R	*			Application Tag	enumerated (0x91)	Intrinsic reporting	
						value	OPERATIONAL 0x00 / NON_ OPERATIONAL 0x04		
Vender Name(121)	Character string	R				Application Tag	character string (0x750F)		
						value	Toshiba Carrier Corp.		
Vender Identifier(120)	Unsigned	R				Application Tag	Unsigned (0x21)		
						value	0x07D0		
Model Name(70)	Character string	R				Application Tag	character string		
						value	BMS-STBN08E		
Firmware Revision(44)	Character string	R				Application Tag	character string		
						value	AAC		
Application Software Version(12)	Character string	R				Application Tag	character string		
						value	*.**.**		
Protocol Version(98)	Unsigned	R				Application Tag	Bit string 4Byte		
						value	0x00000001		
Protocol Revision(139)	Unsigned	R				Application Tag	Bit string 4Byte		
						value	0x00000004		

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value			Notice of Status Change	Remarks
Protocol Service Supported(97)	BACnet Service Supported	R					Application Tag	Bit string 6Byte			
								First Byte	0x00		
								After the second Byte	0x20CBC83CE0		
							value	Service Name			
								AcknowledgementAlarm		N/A	
								confirmedCOVNotification		N/A	
								confirmedEventNotification		✓	
								getAlarmSummary		N/A	
								getEnrollmentSummary		N/A	
								subscriveCOV		N/A	
								atmicReadFile		N/A	
								atmicWriteFile		N/A	
								addListElement		✓	
								removeLlistElement		✓	
								createObject		N/A	
								deleteObject		N/A	
								readProperty		✓	
								readPropertyConditional		N/A	
								readPropertyMultiple		✓	
								writeProperty		✓	
								writePropertyMultiple		✓	
								deviceCommunucationControl		✓	
								confirmedPrivateTransfer		N/A	
								confirmedTextMessage		N/A	
								reinitializeDevice		✓	
								vtOpen		N/A	
								vtClose		N/A	
								vtData		N/A	
								Aithrnticate		N/A	
								requestKey		N/A	
								i-Am		✓	
								i-Have		✓	
								unconfirmedCOVnotification		✓	
								unconfirmedEventNotification		✓	
								unconfirmedPrivateTransfer		N/A	
								unconfirmedTextMessage		N/A	
								timeSyncronization		✓	
								Who-Has		✓	
								Who-Is		✓	
								ReadRange		N/A	
								utcTimeSyncronization		N/A	
								lifeSaftyOperation		N/A	
								subscribeCOVProperty		N/A	
								getEventInformation		✓	

Property Identifire	Property Data Type	Read/Write	Variable	Array	List	Tag	Value	Notice of Status Change	Remarks
Protocol Object Types Supported(96)	Protocol Object Types Supported	R					Application Tag — Bit string 5Byte		
							First Byte — 0x07		
							After the second Byte — 0xD8870000		
							Object Type		
							value — Analog-input	✓	
							Analog-output	✓	
							Analog-value	N/A	
							Binary-input	✓	
							Binary-output	✓	
							Binary-value	N/A	
							Calendar	N/A	
							Command	N/A	
							Device	✓	
							Event-enrollment	N/A	
							file	N/A	
							Group	N/A	
							Loop	N/A	
							Multi-state-input	✓	
							Multi-state-output	✓	
							Notification-class	✓	
							Program	N/A	
							Schedule	N/A	
							Average	N/A	
							Multi-state-value	N/A	
							Trend-log	N/A	
							Life-safety-point	N/A	
							Life-safety-zone	N/A	
							Accumulator	N/A	
							Pulse-converter	N/A	
MAX_APDU length Supported(62)	Unsigned	R					Application Tag — Unsigned(0x22)		
							value — 1024Byte(0x0400)		
Segmentation Supported(107)	BACnet Segmentation	R					Application Tag — Enumerated(0x91)		
							value — No-segmentation(0x03)		
Local Time(57)	Time	R	*				Application Tag — Time(0xB4)		
							value — Hour, Minute, Second, a hundredth of a second is "0"		
Local Date(56)	Date	R	*				Application Tag — Date(0xA4)		
							value — Year, Month, Day, a day of the week		
APDU Timeout(11)	Unsigned2	R					Application Tag — Unsigned1(0x22)		
							value — 60000msec(0xEA60)		
Number of APDU Retries(73)	Unsigned	R					Application Tag — Unsigned1(0x21)		
							value — 0x00		

4.2 ON / OFF status

Name	Data
Object Type	4
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x82
Object Type	Binary Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag binary input object	object identifire (0xc4) 0x0100**82		'**' : air conditioning number 0x01 – 0x80
Object Name(77)	character string	R					Application Tag String	character string (0x7513) " "		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag analog input object	enumerated (0x91) 0x04		Binary Output(4)
Present value(85)	BACnetBinaryPV	W	*			0x91	Application Tag Value	enumerated (0x91) INACTIVE 0x00 ACTIVE 0x01	COV	

4.3 Operation mode

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x83
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag binary input object	object identifire (0xc4) 0x0040**83		'**' : air conditioning number 0x01 – 0x80
Object Name(77)	character string	R					Application Tag String	character string (0x7511) " "		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag analog output object	enumerated (0x91) 0x01		
Present value(85)	Real	W	*			0x44	Application Tag Value	Real (0x44) Heating 1.0 Cooling 2.0 Fan 3.0 Dry 4.0 Auto 5.0	COV	

4.4 Fan Speed

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x85
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value	Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag: object identifire (0xc4); binary input object: 0x0040**85		'**'¹' : air conditioning number 0x01 – 0x80
Object Name(77)	character string	R					Application Tag: character string (0x7506); String: "_"		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag: enumerated (0x91); analog output object: 0x01		
Present value(85)	Real	W	*			0x44	Application Tag: Real (0x44); Value: Stop 1.0, Auto 2.0, HH 3.0, H 4.0, L 5.0, LL 6.0	COV	

4.5 Louver

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x87
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value	Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag: object identifire (0xc4); binary input object: 0x0040**87		'**'¹' : air conditioning number 0x01 – 0x80
Object Name(77)	character string	R					Application Tag: character string (0x7507); String: "_"		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag: enumerated (0x91); analog output object: 0x01		
Present value(85)	BACnetBinaryPV	W	*			0x44	Application Tag: Real (0x44); Value: SWING 1.0, F1 2.0, F2 3.0, F3 4.0, F4 5.0, F5 6.0, Stop 7.0	COV	

4.6 Set temperature

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x84
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read/Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		'**' : air conditioning number 0x01 – 0x80
							binary input object	0x0040**84		
Object Name(77)	character string	R					Application Tag	character string (0x750E)		
							String	" "		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		
							analog output object	0x01		
Present value(85)	BACnetBinaryPV	W	*			0x44	Application Tag	Real (0x44)	COV	
							Value	From 18.0 to 29.0		

4.7 Room temperature

Name	Data
Object Type	0
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x08
Object Type	Analog Input Object

Property Identifire	Property Data Type	Read/Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		'**' : air conditioning number 0x01 – 0x80
							binary input object	0x0000**08		
Object Name(77)	character string	R					Application Tag	character string (0x7513)		ANALOG_INPUT(0)
							String	" "		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		
							analog input object	0x00		
Present value(85)	BACnetBinaryPV	R	*			0x44	Application Tag	Real (0x44)		When is normal, the value is '0.0'.
							Value	From -39.0 to 150.0		

4.8 Permit / Prohibit of Local Operation

Name	Data
Object Type	3
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x89
Object Type	Multi-state Output Object(14)

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		'**' : air conditioning number 0x01 – 0x80
							binary input object	0x0380**89		
Object Name(77)	character string	R					Application Tag String	character string (0x750f)		
								"-"		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Binary Input(3)
							binary input object	0x03		
							Application Tag	enumerated (0x91)		
Present value(85)	BACnetBinaryPV	W	*			0x21	Value	Prohibition		intrinsic reporting	

Prohibition value table:

Mode	Temp	ON/OFF	Data
-	-	-	0x01
✓	-	-	0x02
-	✓	-	0x03
-	-	✓	0x04
✓	✓	-	0x05
✓	-	✓	0x06
-	✓	✓	0x07
✓	✓	✓	0x08

4.9 Error status

Name	Data
Object Type	3
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x40
Object Type	Binary Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag		Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)			'**' : air conditioning number 0x01 – 0x80
							binary input object	0x00C0**40			
Object Name(77)	character string	R					Application Tag	character string (0x750f)			
							String	"-"			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			Binary Input(3)
							binary input object	0x03			
Present value(85)	BACnetBinaryPV	R	*			0x91	Application Tag	enumerated (0x91)		intrinsic reporting	Error Code : please refer to '2.9 Indoor unit Error Code'.
							Value	No Error	0x00		
								Error	0x01		

4.10 Error Code

Name	Data
Object Type	4
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x01
Object Type	Analog Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag		Value	Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		'**' : air conditioning number 0x01 – 0x80
							binary input object	0x0000**01		
Object Name(77)	character string	R					Application Tag	character string (0x7514)		
							String	"-"		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Analog Input(0)
							binary input object	0x00		
Present value(85)	BACnetBinaryPV	R	*			0x44	Application Tag	Real (0x44)		When is No Error, the value is '0x00'.
							Value	From 0x00 to 0xFF		

1-9-14 Indoor/outdoor, Central control Communication Specification

Category	Portion	Specification	
DI/SDI	Indoor/outdoor		
		Communication method	Power-supply synchronous full duplex communication
		Communication speed	50/60bps (Power-supply frequency 50/60Hz)
		Power-supply frequency	50/60Hz
	Central control	Max Indoor/outdoor number	See 2.1
		Communication speed	9600bps
		Physical specification	2 wires HBS
	Remote controller	Max Remote controller number	2
		Communication speed	2400bps
		Physical specification	2wires +18v signal on power
VRF	Indoor/outdoor Central control	See 2.1 Same as DI/SDI's Central control	
	Indoor-sub bus remote controller	Max Indoor/outdoor Remote controller number	Remote controller: 2, indoor: 8, others, total max10
		Other :Same as DI/SDI remote controller bus	

1-9-15 HA Terminal Specification

Compliant to JEM 1427 STANDARD (Partial)

1. General outline of operation input / output terminal

Applicable Housing XHP-4 (vender:JST 2.5mm pitch)

HA Terminal Standard JEM1427 (Japan Electrical Manufacturer's Association)					
Pin No	Mark	Specification	Notes		
1	C1	**Input signal**	Pulse duration	200 to 300ms	The terminal can input a pulse signal. When indoor unit receives a pulse signal, Indoor unit turns over status of operation or stop. -If the operation of indoor unit is running, then indoor unit terns off. -If the operation of indoor unit is stopped, then indoor unit turns on.
2	C2		Pulse interval	200ms or more	
3	M1	**Output signal**	The terminal can output the status signal of operation or stop. When indoor unit is running, a signal is ON. When indoor unit is stopped, a signal is OFF.		
4	M2				

2. Structure of operation input / output terminal

2-1. Input signal terminal of operation status

Indoor P.C. Board

Max. 2m

Ic
Vc
R
D

Local Supply

R=100 ohm
D:I$_f$=100mA or more

2-2. Output signal terminal of operation status

Indoor P.C. Board

Max. 2m

Local Supply

Im
Vm
R
D

R=100 ohm
D:I$_f$=100mA or more

3. The connection condition and specifications of operation input / output terminal

3-1. Input signal terminal of operation status

1. Input pulse signal specifications

Item	Mark	Specification
Pulse duration	Tp	200ms - 300ms
Pulse interval	Ti	200ms or more

2. Input pulse pattern

Tp   Ti   Tp

200-300ms   200ms   200-300ms
             or more

The terminal can input a pulse signal.
When indoor unit receives a pulse signal, Indoor unit turns over status of operation or stop.
- If the operation of indoor unit is running, then indoor unit turns off.
- If the operation of indoor unit is stopped, then indoor unit turns on.

3-2. Output signal terminal of operation status

1. Output signal specification

Item	Specification
Output signal	While indoor unit runs, the signal ON. While indoor unit stop, the signal is OFF.

2. Output signal pattern
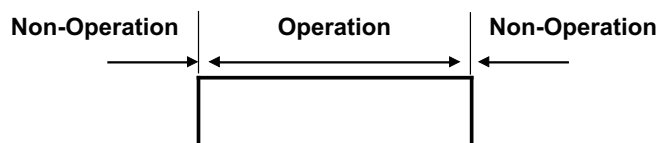
Non-Operation | Operation | Non-Operation

The terminal can output the status signal of operation or stop.
When indoor unit is running, a signal is ON. When indoor unit is stopped, a signal is OFF.

3-3. Input and output specification for external circuitry

Terminal	External Photo Coupler Status		Specification		Note
1,2 PIN C1 C2	Ic	ON	Output current	More than 2mA	
			Max tolerance current	5mA	
		OFF	Leak current	Less than 50µA at Vc=30v	
	Vc	ON	Operating voltage	Less than 0.6v at Ic=2mA	
		OFF	Surge tolerance voltage	More than 30V	
3,4 PIN M1 M2	Im	ON	Max ON detection current	2mA	
			Max tolerance current	20mA	
			Max peak current	50mA	Average is max 20mA.
		OFF	Leak current	Less than 10µA	
	Vm	ON	Operating voltage	Less than 1.6v at Im=2mA	
		OFF	Max voltage	0.3v	Typical value

1-10-1 Specification for Co-existence of each system on the same TCC-Link Bus line

	TCB-SC642TLE2 64 Central Remote Controller	TCB-CC163TLE2 ON/OFF Remote Controller	TCB-EXS21TLE Schedule timer	BMS-TP0641ACE / BMS-TP5121ACE / BMS-TP0641PWE / BMS-TP5121APWE with Relay I/F (BMS-IFLSV3E, 4E, 4UL) Touch Screen Controller	BMS-CM1280TLE Compliant Manager	BMS-CM1280FTLE Compliant Manager	BMS-WB2561PWE / BMS-WB01GTE with Relay I/F (BMS-IFLSV3E, 4E, 4UL) Web-Based Controller	BMS-LSV6E with Relay I/F (BMS-IFLSV3E, 4E, 4UL) BAC net	TCB-IFLN640TLE LonWorks	TCB-IFMB640TLE Modbus	TCB-IFCG1TLE General-purpose I/F	TCB-IFCB640TLE Analog I/F
TCB-SC642TLE2 64 Central Remote Controller	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
TCB-CC163TLE2 ON/OFF Remote Controller	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
TCB-EXS21TLE Schedule timer	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
BMS-TP0641ACE / BMS-TP5121ACE / BMS-TP0641PWE / BMS-TP5121APWE with Relay I/F (BMS-IFLSV3E, 4E, 4UL) Touch Screen Controller	OK	OK	OK	NG	OK	NG	NG	NG	OK	OK	OK	OK
BMS-CM1280TLE Compliant Manager	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
BMS-CM1280FTLE Compliant Manager	OK	OK	OK	NG	OK	NG	NG	NG	OK	OK	OK	OK
BMS-WB2561PWE / BMS-WB01GTE with Relay I/F (BMS-IFLSV3E, 4E, 4UL) Web-Based Controller	OK	OK	OK	NG	OK	NG	NG	NG	OK	OK	OK	OK
BMS-LSV6E with Relay I/F (BMS-IFLSV3E, 4E, 4UL) BAC net	OK	OK	OK	NG	OK	NG	NG	NG	OK	OK	OK	OK
TCB-IFLN640TLE LonWorks	OK	OK	OK	OK	OK	OK	OK	OK	NG	NG	OK	NG
TCB-IFMB640TLE Modbus	OK	OK	OK	OK	OK	OK	OK	OK	NG	NG	OK	NG
TCB-IFCG1TLE General-purpose I/F	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
TCB-IFCB640TLE Analog I/F	OK	OK	OK	OK	OK	OK	OK	OK	NG	NG	OK	NG
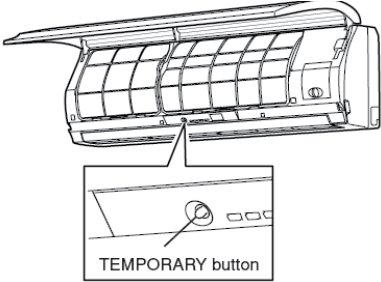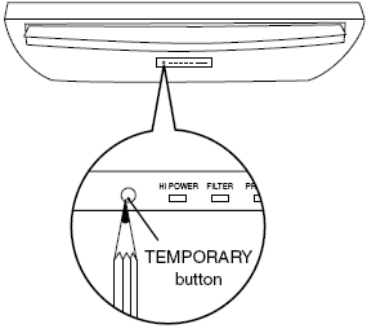
1-10-2 Interoperability List

	TCB-SC642 TLE2 — 64 Central Remote Controller	TCB-CC163TLE2 — ON/OFF Remote Controller	TCB-EXS21TLE — Schedule timer Note	BMS-TP0641ACE / BMS-TP5121ACE / BMS-TP0641PWE / BMS-TP5121APWE — Touch Screen Controller	BMS-CM1280TLE — 128 Central Compliant Manager	BMS-CM1280FTLE — Compliant Manager	BMS-WB2561PWE / BMS-WB01GTE — Web-Based Controller	BMS-LSV6E — BAC net	TCB-IFLN640TLE — LonWorks	TCB-IFMB640TLE — Modbus	TCB-IFCB-4E2 — Remote ON/OFF	TCB-IFCG1TLE — General-purpose I/F	TCB-IFCB640TLE — Analog I/F	BMS-IFLSV3E / BMS-IFLSV4E / BMS-IFLSV4UL — Relay I/F	BMS-IFWH4E2 / BMS-IFWH5E / BMS-IFWH5UL — Energy Monitoring	BMS-IFDD02E2 / BMS-IFDD03E / BMS-IFDD03UL — Digital I/O
TCB-SC642 TLE2 — 64 Central Remote Controller	-	-	OK	-	-	-	-	-	-	-	-	OK	-	-	-	-
TCB-CC163TLE2 — ON/OFF Remote Controller	-	-	OK	-	-	-	-	-	-	-	-	OK	-	-	-	-
TCB-EXS21TLE — Schedule timer Note	OK	OK	-	-	OK	OK	-	-	-	-	-	-	-	-	-	-
MS-TP0641ACE / BMS-TP5121ACE / BMS-TP0641PWE / BMS-TP5121APWE — Touch Screen Controller	-	-	-	-	-	-	-	-	-	-	-	-	-	OK	OK Only *PWE	OK
BMS-CM1280TLE — 128 Central Compliant Manager	-	-	OK	-	-	-	-	-	-	-	-	OK	-	-	-	-
BMS-CM1280FTLE — Compliant Manager	-	-	OK	-	-	-	-	-	-	-	-	-	-	-	OK	OK
BMS-WB2561PWE / BMS-WB01GTE — Web-Based Controller	-	-	-	-	-	-	-	-	-	-	-	-	-	OK	OK	OK
BMS-LSV6E — BAC net	-	-	-	-	-	-	-	-	-	-	-	OK	-	OK	-	-
TCB-IFLN640TLE — LonWorks	-	-	-	-	-	-	-	-	-	-	OK	-	-	-	-	-
TCB-IFMB640TLE — Modbus	-	-	-	-	-	-	-	-	-	-	OK	OK Full access	-	-	-	-
TCB-IFCB-4E2 — Remote ON/OFF	-	-	-	-	-	-	-	-	OK	OK	-	-	-	-	-	-
TCB-IFCG1TLE — General-purpose I/F	OK	OK	-	-	OK	-	-	OK	-	-	-	-	OK	-	-	-
TCB-IFCB640TLE — Analog I/F	-	-	-	-	-	-	-	-	-	-	-	OK	-	-	-	-
BMS-IFLSV3E / BMS-IFLSV4E / BMS-IFLSV4UL — Relay I/F	-	-	-	OK	-	-	OK	OK	-	-	-	-	-	-	-	-
BMS-IFWH4E2 / BMS-IFWH5E / BMS-IFWH5UL — Energy Monitoring	-	-	-	Only *PWE	-	OK	OK	-	-	-	-	-	-	-	-	-
BMS-IFDD02E2 / BMS-IFDD03E / BMS-IFDD03UL — Digital I/O	-	-	-	OK	-	OK	OK	-	-	-	-	-	-	-	-	-

Note: '-' means 'no interoperability'
    Weekly mode : Connectable with wired remote controller RBC-AMT32(31)E
    Only power supply cable connectivity is shown in the above table.

1-11 Auto restart function setting

Auto restart function allows the air conditioner to resume the set operating conditions in the event of a supply power shutdown without the use of the remote controller. The operation will resume without warning three minutes after the power is restored.

| Category	Indoor type	Setting Procedure for auto restart	
		User interface	How
SMMS SMMS-i S-HRM Mini-SMMS	All	Wired RMT RBC-AMT32(31)E RBC-AMS41E	Set DN code by wired remote controller. Code: automatic restart of power failure DN=28 Setting value: 0001: Restart 0000: none (default)
DI SDI	Excluding Flexi, Hi wall	ditto	ditto
	Hi wall	ditto	ditto
		Body button Indicator: operation lamp TEMPORARY button	No automatic restart setting at shipment HOW TO SET Power on. Push the "TEMPORARY" button on the front body continuously for more than 3seconds, less than 10 seconds. The air conditioner will acknowledge the setting and beep 2 times (first long, second short sound) and operation lamp flashing 5 seconds (5 Hz). The system will now restart automatically. HOW TO CANCEL Repeat the above setting procedure. The air conditioner will acknowledge the setting and beep 2 times (first long, second short sound). The air conditioner will now require to be manually restarted with the RMT after main power is turned off.
	Flexi	Body button Indicator: operation lamp HI POWER FILTER TEMPORARY button	No automatic restart setting at shipment HOW TO SET <u>In case of stand-by (not running)</u>: Push the "TEMPORARY" button on the front body continuously for more than 3seconds, less than 10 seconds. Air conditioner starts operating. The green lamp is indicated. About 3 seconds after, the air conditioner beeps 3 times. The lamp will change from green to orange. If it is not required to run at this time, push the "TEMPORARY" button again, or use remote controller to stop. <u>In case of running</u>: Push the "TEMPORARY" button on the front body continuously for more than 3 seconds, less than 10 seconds. About 3 seconds after, the air conditioner beeps 3 times. Air conditioner stops operating. The green lamp goes off. If it is not required to stop at this time, use remote controller to restart. During the subsequent operation, orange lamp is indicated. HOW TO CANCEL <u>In case of stand-by (not running)</u>: Push the "TEMPORARY" button on the front body continuously for more than 3 seconds, less than 10 seconds. Air conditioner starts operating. The orange lamp is indicated. About 3 seconds after, the air conditioner beeps 3 times. The lamp will change from orange to green. If it is not required to run at this time, push the "TEMPORARY" button once more, or use remote controller to stop. <u>In case of running</u>: Push the "TEMPORARY" button on the front body continuously for more than 3 seconds, less than 10 seconds. About 3 seconds after, the air conditioner beeps 3 times. Air conditioner stops operating. The orange lamp is turned off. If it is not required to stop at this time, use remote controller to restart. During the subsequent operation, green lamp is indicated.

1-12 Indoor Model Compatibility for remote controller, central controller and remote sensor

1-12-1 Indoor Model Compatibility list for remote controller, central controller and remote sensor

Group	Indoor Category	Option Category	Wired RMT RBC-AMS41E or RBC-AMT32(31)E or RBC-AS21E	Wired RMT RBC-AX31U(W)-E or RBC-AX31U(WS)-E	Wireless RMT TCB-AX21U(W)-E2	Wireless RMT RBC-AX22CE2	Wireless RMT TCB-AX21E2	WH-H2UE (handset) with embedded receiver unit	TCC-LINK ADAPTOR (for central control) TCB-PCNT30TLE2	Central control TCB-SC642TLE2 BMS-CM1280TLE or other BMS Weekly timer TCB-EXS21TLE	Remote sensor TCB-TC21LE
	4-way cassette	1 series	yes	yes	yes		yes				yes
	4-way cassette	2 series	yes	yes			yes				yes
	Compact 4-way cassette	1 series	yes								yes
	2-way cassette	1 series	yes				yes				yes
	2-way cassette	2 series	yes				yes				yes
	1-way cassette	1 YH series	yes				yes				yes
SMMS SMMS-i	1-way cassette	2 SH series	yes			yes	yes				yes
	Concealed duct Standard	1 series	yes				yes				yes
S-HRM	Slim duct	1 series	yes				yes				yes
Mini-SMMS	Concealed duct High static pressure	1 series	yes				no			yes	yes
	Under Ceiling	1 series	yes			yes	yes				yes
	High wall	1 series	yes				yes				yes
	High wall	2 series	yes				yes	yes packed			yes
	High wall	3 series	yes				yes				yes
	Floor standing cabinet	1 series	yes				yes				yes
	Floor standing concealed	1 series	yes				yes				yes
	Floor standing	1 series	yes				yes				yes
SMMS SMMS-i	Fresh air indoor intake	-	yes				yes Set as Sub		yes	yes	no
	4-way cassette	4 series	yes	yes			yes		yes	yes (with adaptor)	yes
	4-way cassette	3 series	yes		yes		yes		yes	yes (with adaptor)	yes
	4-way cassette	2 series	yes		yes		yes		yes	yes (with adaptor)	yes
	Compact 4-way cassette	2 series	yes			yes	yes		yes Need metal case TCB-PX30MUE	yes (with adaptor)	yes
DI SDI	Under Ceiling cassette	2 series	yes				yes		yes	yes (with adaptor)	yes
	Duct	2 series	yes				yes		yes	yes (with adaptor)	yes
	Concealed duct High static pressure	3 series	yes				no		yes	yes (with adaptor)	yes
	Concealed duct High static pressure	2 series	yes				no		yes	yes (with adaptor)	yes
	High wall	2 series	yes				yes	yes packed		yes (without adaptor)	yes
	Flexi	2 series	no				no	ditto	no	no	no
	Slim duct	4 series	yes				yes		yes	yes (with adaptor)	yes

1-12-2 TCC-LINK Adaptor (TCB-PCNT30TLE2) fixing place for DI/SDI indoor unit

4-way cassette 4series

Cable B
Cable A
CN51(red)
CN40(blue)
TCC-LINK Adaptor
CN50(white)
Indoor unit
U3/U4 Terminal
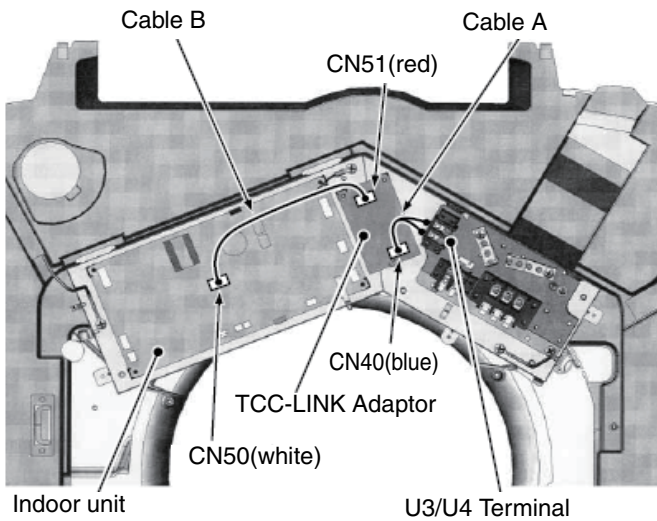
Compact 4-way cassette 2series

Cut off the slit of bell mouth. Refer to Installation manual of TCB-PX30MUE.

Indoor unit
(U3), (U4) terminals (For central control)
CN50 (WHITE)
CN51
CN41 (BLUE)
Connecting cable B
Connecting cable A
TCC-LINK Adaptor

Under ceiling 2series

Cable A
TCC-LINK Adaptor
CN40
CN50
CN51
Indoor unit
U3/U4 Terminal
RMT A/B Terminal
Cable B

Duct 2/1series

Relay wire (A)
Indoor P.C. board
Relay wire (B)
Spacer (A)
CN51 (Red)
1:1 model connection interface P.C. board
CN02 (Blue)
Spacer (A)
U3/U4 Terminal block
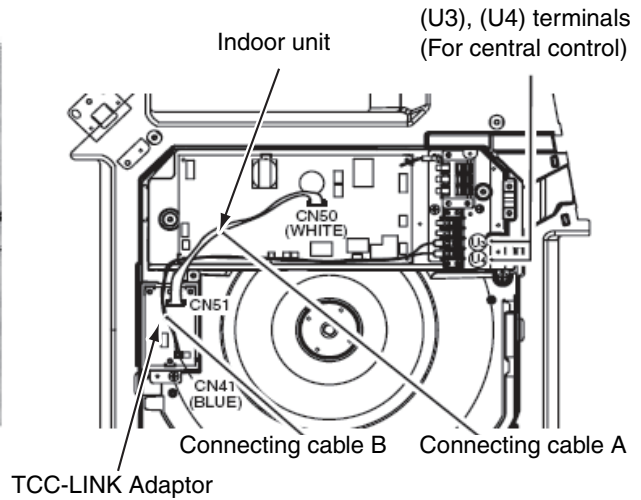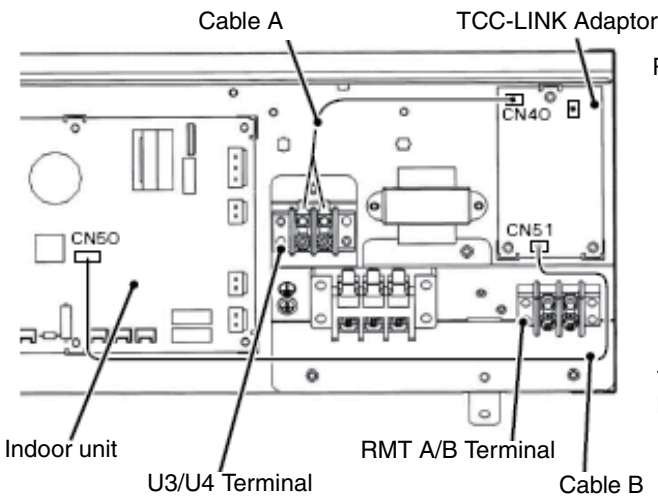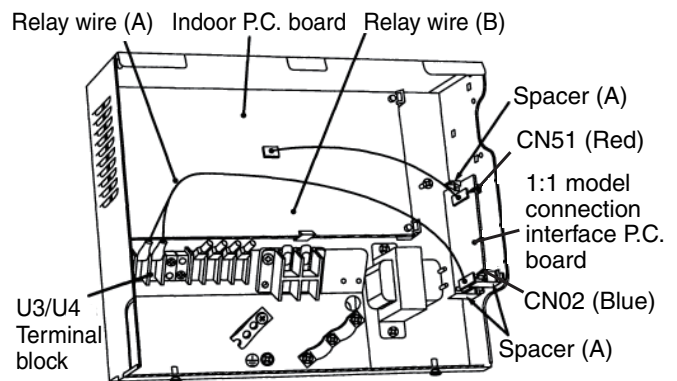
Concealed duct High static pressure 2/3series

TCC-LINK Adaptor
Indoor unit
U3/U4 Terminal

Slim duct 4series

TCC-LINK Adaptor
Indoor unit
U3/U4 Terminal
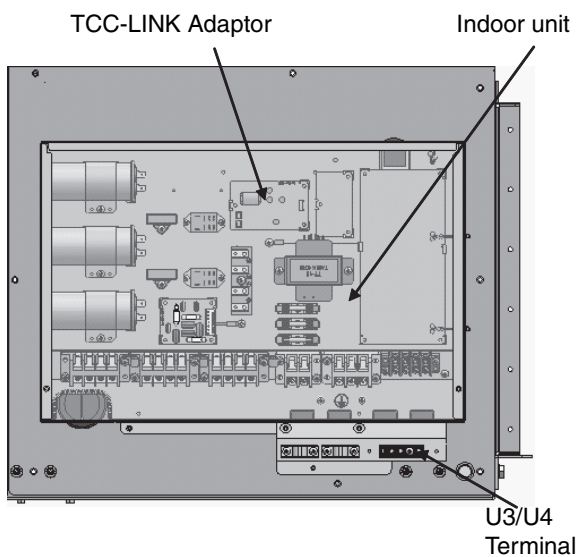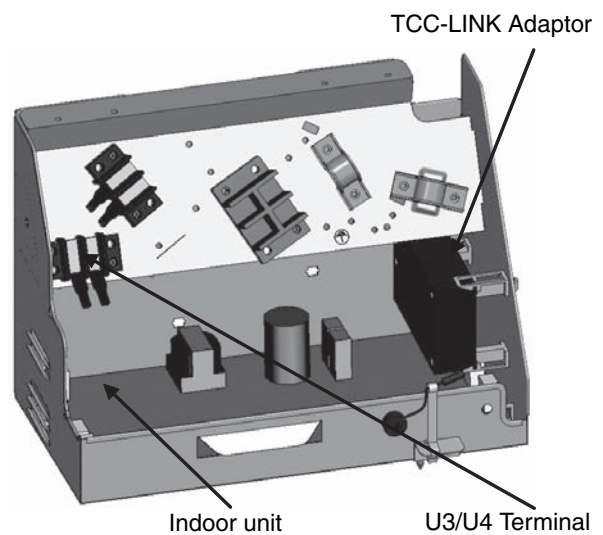
1-13 Category Compatibility list for DI/SDI Optional Control for Outdoor unit

Outdoor \ Function	TCB-KBOS1E (cable) Peak cut/night operation/ Compressor on status	TCB-PCOS1E2 (Board) Peak cut/night operation/ Compressor on status	Applicable model	High static pressure	Existing piping	Power saving	Snow-proof Fan control	Defrost Time change	Max frequency change	Cooling only
DI 4series	yes	no	**All**	-	Sw802 no3	Sw802 no2	Sw802 no1	J805, 806	J807	J808
				-	Note1	Note2	Note3	Note4	Note5	Note6
DI 3series	no	yes only following model RAV-SM563AT-E, SM803AT-E, SM1103AT-E, SM1403AT-E	**SM80 SM11/14/16**	-	Sw801 no3 bit (80) no5 bit (11/14/160) Note1	-	-	-	-	Only DN "0F"
DI 2series	no	yes only following model RAV-SM562AT-E, SM802AT-E, SM1102AT-E, SM1402AT-E	**-**	-	-	-	-	-	-	ditto
SDI 4series	yes excluding 1.5-1.7HP	yes only following model RAV-SP404AT-E/ATZ-E/ ATZG-E, SP454AT-E/ATZ-E/ ATZG-E, SP564AT-E/ATZ-E/ ATZG-E	**SP56**	-	Sw801 no3 on sub PCB	Sw801 no2 on sub PCB	-	-	-	Sw801 no1 on sub PCB Turn ON when Cooling only DN "0F" also can set.
				-	Turn off. 19.1 φ can not be used.	Note2	-	-	-	
			SP80	Sw802 no4	Sw802 no3	Sw802 no2	Sw802 no1	J805, 806	J807	J808
				Note8	Note1	Note2	Note3	Note4	Note5	Note6
			SP110 SP140 SP160	Sw802 no4	Sw802 no3	Sw802 no2	Sw802 no1	J805, 806	J807	J808
				Note8	Note1	Note2	Note3	Note4	Note5	Note6
SDI 2series	no	no	**-**	-	-	-	-	-	-	-

Max frequency change tables

RAV-SM224 / RAV-SM280

	RAV-SM224 COOL	RAV-SM224 HEAT	RAV-SM280 COOL	RAV-SM280 HEAT
No cut	78.0	74.4	91.2	96.0
cut	66.6	66.6	76.8	76.8

RAV-SP80

	COOL	HEAT
No cut	72.0	99.6
cut	72.0	79.2

RAV-SP1104 / RAV-SP1404 / RAV-SP1604

	SP1104 COOL	SP1104 HEAT	SP1404 COOL	SP1404 HEAT	SP1604 COOL	SP1604 HEAT
No cut	53.4	71.4	64.2	96.0	74.4	100.2
cut	53.4	64.2	64.2	72.0	74.4	79.8

Note1: Turn on when 19.1 φ is used for existing pipe. In this case, the heating capacity may be lower according to outside temp and indoor temp in heating operation.
Note2: Turn on for power saving. The control to lower the com freq 10 % is performed by indoor Heat exchanger temp in heating operation.
Note3: Turn on for snow-proof. When snow enters, the control to prevent generation of motor lock is validated. When outside temp is below 0°C though the comp stops, the outdoor fan operates with W5 (5th out of total 15 fan tap levels).
Note4: The defrost interval is cut to shorten it than the standard status. The contents of control and cutting method, refer to the section "Defrost control" in service manual.
Note5: When it is needed to lower the maximum value of the comp frequency, cut the JP wire. DN "0F" also can set.
Note6: When fixing the operation mode as cooling only, cut the JP wire. DN "0F" also can set.
Note7: When fixing the operation mode as cooling only, turn on no1 position. DN "0F" also can set.
Note8: Turn the sw to ON when mounting a duct to the discharge port of the outdoor unit. Add 3 taps to the upper limit values of the outdoor fan tap. The operation is performed with max upper fan: 890 rpm/lower fan; 910 rpm (WF). In this case, max capacity decreases. In this case, the operation is performed with max upper fan tap. The operation is performed with max upper fan: 890 rpm/lower fan; 910 rpm (WF). In this case, max capacity decreases.
the upper limit value of static pressure for duct is 5Pa or less on 25°C and please use straight duct. In this case, the outdoor noise level may increase.

1-14 Combination Pattern for DI/SDI models

July 2010 updated

Indoor Unit / Single System

Outdoor Unit

			Digital Inverter series 4	RAV-SM2244AT8-E, AT8Z-E, AT8ZG-E
				RAV-SM2244AT7, AT7Z-E, AT7ZG-E
				RAV-SM2804AT8-E, AT8Z-E, AT8ZG-E
				RAV-SM2804AT7-E, AT7Z-E, AT7ZG-E
			Digital Inverter series 3	RAV-SM563AT-E
				RAV-SM803AT-E
				RAV-SM1103AT-E
				RAV-SM1403AT-E, ATZ-E, ATZG-E
				RAV-SM1603AT-E, ATZ-E, ATZG-E
			Digital Inverter series 2	RAV-SM562AT-E
				RAV-SM802AT-E
				RAV-SM1102AT-E
				RAV-SM1402AT-E
			Super Digital Inverter series 4	RAV-SP404AT-E, ATZ-E, ATZG-E
				RAV-SP454AT-E, ATZ-E, ATZG-E
				RAV-SP564AT-E, ATZ-E, ATZG-E
				RAV-SP804AT-E, ATZ-E, ATZG-E
				RAV-SP1104AT-E, ATZ-E, ATZG-E (Z, ZG)
				RAV-SP1104AT8 (Z, ZG)-E/TR
				RAV-SP1104AT7 (Z, ZG)
				RAV-SP1404AT-E, ATZ-E, ATZG-E
				RAV-SP1404AT8 (Z, ZG)-E/TR
				RAV-SP1404AT7 (Z, ZG)
				RAV-SP1604AT8 (Z, ZG)-E/TR
				RAV-SP1604AT7 (Z, ZG)
			Super Digital Inverter series 2	RAV-SP562AT-E, ATZ-E, ATZG-E
				RAV-SP802AT-E, ATZ-E, ATZG-E
				RAV-SP1102AT-E, ATZ-E, ATZG-E
				RAV-SP1402AT-E, ATZ-E, ATZG-E

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			Indoor Unit																																																	
			Twin System																				Triple System														Double twin System													
			4way Cassette								Compact 4way		Slim duct		Duct				Ceiling				Hi wall		4way Cassette						Compact 4way	Slim duct	Duct		Ceiling		Hi wall		4way Cassette						Compact 4way	Slim duct	Duct		Ceiling		Hi wall	
			series 4				series 3		series 2		series 2		series 4		series 2				series 2				series 2		series 4		series 3		series 2		series 2	series 4	series 2		series 2		series 2		series 4		series 3		series 2		series 2	series 4	series 2		series 2		series 2	
			RAV-SM564UT-E x 2	RAV-SM804UT-E x 2	RAV-SM1104UT-E x 2	RAV-SM1404UT-E x 2	RAV-SM563UT-E x 2	RAV-SM803UT-E x 2	RAV-SM562UT-E x 2	RAV-SM802UT-E x 2	RAV-SM402MUT-E x 2	RAV-SM562MUT-E x 2	RAV-SM404SDT-E x 2	RAV-SM564SDT-E x 2	RAV-SM562BT-E x 2	RAV-SM802BT-E x 2	RAV-SM1102BT-E x 2	RAV-SM1402BT-E x 2	RAV-SM562CT-E x 2	RAV-SM802CT-E x 2	RAV-SM1102CT-E x 2	RAV-SM1402CT-E×2	RAV-SM562KRT-E x 2	RAV-SM802KRT-E x 2	RAV-SM564UT-E x 3	RAV-SM804UT-E x 3	RAV-SM563UT-E x 3	RAV-SM803UT-E x 3	RAV-SM562UT-E x 3	RAV-SM802UT-E x 3	RAV-SM562MUT-E x 3	RAV-SM564SDT-E x 3	RAV-SM562BT-E x 3	RAV-SM802BT-E x 3	RAV-SM562CT-E x 3	RAV-SM802CT-E x 3	RAV-SM562KRT-E×3	RAV-SM802KRT-E x 3	RAV-SM564UT-E x 4	RAV-SM804UT-E x 4	RAV-SM563UT-E x 4	RAV-SM803UT-E x 4	RAV-SM562UT-E x 4	RAV-SM802UT-E x 4	RAV-SM562MUT-E x 4	RAV-SM564SDT-E x 4	RAV-SM562BT-E x 4	RAV-SM802BT-E x 4	RAV-SM562CT-E x 4	RAV-SM802CT-E x 4	RAV-SM562KRT-E×4	RAV-SM802KRT-E x 4
Outdoor Unit	Digital Inverter series 4	RAV-SM2244AT8-E, AT8Z-E, AT8ZG-E			OK												OK				OK					OK		NG		NG				OK		OK		OK	OK		NG		NG		OK	OK	OK		OK		OK	
		RAV-SM2244AT7, AT7Z-E, AT7ZG-E			OK												OK				OK					OK		NG		NG				OK		OK		OK	OK		NG		NG		OK	OK	OK		OK		OK	
		RAV-SM2804AT8-E, AT8Z-E, AT8ZG-E				OK												OK				OK				OK		NG		NG				OK		OK		OK		OK		NG		NG				OK		OK		OK
		RAV-SM2804AT7, AT7Z, AT7ZG				OK												OK				OK				OK		NG		NG				OK		OK		OK		OK		NG		NG				OK		OK		OK
	Digital Inverter series 3	RAV-SM563AT-E																																																
		RAV-SM803AT-E																																																
		RAV-SM1103AT-E	OK				OK		NG			OK		OK	OK				OK				OK																											
		RAV-SM1403AT-E		OK				OK		NG						OK				OK				OK																										
		RAV-SM1603AT-E, ATZ-E, ATZG-E		OK				OK								OK				OK				OK	OK		OK		NG		OK	OK	OK		OK		OK															
	Digital Inverter series 2	RAV-SM562AT-E																																																
		RAV-SM802AT-E																																																
		RAV-SM1102AT-E	NG				NG		OK			OK		NG	OK				OK				OK																											
		RAV-SM1402AT-E		NG				NG		OK						OK				OK				OK																										
	Super Digital Inverter series 4	RAV-SP404AT-E, ATZ-E, ATZG-E																																																
		RAV-SP454AT-E, ATZ-E, ATZG-E																																																
		RAV-SP564AT-E, ATZ-E, ATZG-E																																																
		RAV-SP804AT-E, ATZ-E, ATZG-E									OK		OK																																					
		RAV-SP1104AT-E, ATZ-E, ATZG-E	OK				NG		NG			OK		OK	OK				OK				OK																											
		RAV-SP1104AT8 (Z, ZG)-E/TR	OK									OK		OK	OK				OK				OK																											
		RAV-SP1104AT7 (Z, ZG)	OK																																															
		RAV-SP1404AT-E, ATZ-E, ATZG-E		OK				NG		NG						OK				OK				OK																										
		RAV-SP1404AT8 (Z, ZG)-E/TR		OK												OK				OK				OK																										
		RAV-SP1404AT7 (Z, ZG)		OK																																														
		RAV-SP1604AT8 (Z, ZG)-E/TR		OK												OK				OK				OK	OK						OK	OK	OK		OK		OK															
		RAV-SP1604AT7 (Z, ZG)		OK																					OK																									
	Super Digital Inverter series 2	RAV-SP562AT-E, ATZ-E, ATZG-E																																																
		RAV-SP802AT-E, ATZ-E, ATZG-E																																																
		RAV-SP1102AT-E, ATZ-E, ATZG-E	OK				OK		OK			OK		OK	OK				OK				OK																											
		RAV-SP1402AT-E, ATZ-E, ATZG-E		OK				OK		OK						OK				OK				OK																										

1-15 Cable characteristics and length specification

1-15-1 Control wiring (TCC-Link)

Main bus

Connection devices	Type	Q'ty	Size total length			Polarity	Others
			Up to 100m	Up to 1000m	Up to 2000m		
Control wiring (Outdoor to Indoor / Indoor to Indoor / Central Control wiring)	Shield wire	2 cores	-	1.25 mm^2	2.0 mm^2	Non Polarity	Procured locally
Control wiring (Outdoor to Outdoor)		2 cores	1.25 to 2.0mm^2	-			

Sub bus (remote controller)

Connection devices	Type	Q'ty	Indoor A/B Terminal - Remote controller Terminal		Polarity	Others
			Up to 200m	Up to 300m		
Remote controller wiring (Indoor to Remote Controller wiring)	Shield wire	2 cores	IN CASE OF INCLUDING WIRELESS	IN CASE OF ONLY WIRED	Non Polarity	Procured locally
			Up to 200 m total length of control wiring between indoor units			
			0.5 to 2.0 mm^2			

1-15-2 BMS-related wiring

For details, refer to the Installation Manual of each BMS device.

Connection devices	Type	Q'ty	Size	Length	Polarity	Others
Power line for BMS	H07 RN-F or 245IEC66 AC220 V-240 V 50 Hz/60 Hz	2 cores	0.75 mm^2	Max 50 m	Non Polarity	Procured locally
RS485 for BMS	Shield wire	2 cores	1.25 mm^2	Max total 500 m	With Polarity	Procured locally
Digital Input / Output signal Line for Compliant Manager / Touch screen	227IEC75	2 cores	0.5 mm^2	Max 100 m	Non Polarity	Procured locally
Power meter for Energy monitoring Relay I/F	227IEC75	2 cores	0.3 mm^2	Max 100 m	Non Polarity	Procured locally
Digital I/O for Relay I/F to Input / Output signal	227IEC75	2 cores	0.3 mm^2	Max 100 m	With Polarity For output	Procured locally
Controller to Schedule Timer	-	4 cores	-	-	-	Attached with Schedule Timer
Ethernet line for Compliant Manager / Touch screen / Web based	Category 5 or 6 UTP straight-cable or Cross cable	8 cores	-	Max 100 m	-	Procured locally

Ethernet is a registered trademark of Xerox Corporation.

Part 1

2

SYSTEM WIRING DIAGRAM AND CONTROL WIRING METHOD

2-1 Applicable model and connectable units

1) Applicable model
- VRF system ....Super modular multi system (SMMS-i)
  - Super modular multi system (SMMS)
  - Super heat recovery multi system (SHRM)
  - Mini-SMMS
- 1:1 model...................Super digital inverter, Digital inverter

2) The number of connectable units

[1] For only VRF system

	Connected unit	No. of units	Note
1	Outdoor unit (Header unit)	Up to 16 units	
2	Outdoor unit (Follower unit)	Up to 3 units	In the same refrigerant system
3	Indoor unit	Up to 64 units	• Max. 64 units in case of group control* • Max. 48 units for one refrigerant system
4	Group control for indoor units	Up to 8 units	
5	Central control device	Up to 10 units	• Central remote controller • BMS I/F included

* A Follower indoor unit in a group control must be counted as one indoor unit.

[2] For combined system with Digital Inverter / Super Digital Inverter

	Connected unit	No. of units	Note
1	Outdoor unit (Header unit for VRF system)	Up to 16 units	
2	Outdoor unit (Follower unit for VRF system)	Up to 3 units	In the same refrigerant system
3	Indoor unit	Up to 64 units	• Max. 64 indoor units for both systems. * For 1:1 model, follower indoor units of twin control and group control must not be counted. • For VRF system, Max. 48 indoor units in one refrigerant system.
4	Group control for indoor units	Up to 8 units	
5	Central control device	Up to 10 units	• Central remote controller • BMS I/F included

* Max. 64 refrigerant system can be controlled in total. (VRF and 1:1 model combination). (However, for VRF system, up to 16 refrigerant system are connectable.)
* "1:1 model" interface connection is connected to the indoor units.

2-2 System wiring diagram
2-2-1 For VRF system only

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Central Control Device

Central Control Device

U1 U2
U3 U4

U1 U2
U3 U4

Max. 10 central control devices

Outdoor Unit

Central Control Device

U1 U2
U3 U4

Indoor Unit

Remote controller Wiring

Note [5]

Refrigerant System 1

Note [4]

U3 U4 U5 U6
U1 U2

Header Unit

U1 U2
A B

Remote Controller

Refrigerant System 2

Central control wiring
(Max.16 units can be connectable)

Header Unit

U3 U4 U5 U6
U1 U2

Follower Unit

U3 U4 U5 U6
U1 U2

Follower Unit

U3 U4 U5 U6
U1 U2

Follower Unit

U3 U4 U5 U6
U1 U2

Control wiring between outdoor units
(Max. 4 units can be connected.)

Note [1]

U1 U2
A B

U1 U2
A B

U1 U2
A B

U1 U2
A B

Remote controller

Max. 48 indoor units can be connected in one refrigerant system

Refrigerant System 3

Note [3]

Header Unit

U3 U4 U5 U6
U1 U2

Control wiring Between indoor and outdoor units

Note [2]

Note [2]

U1 U2
A B

U1 U2
A B

U1 U2
A B

Remote controller

Group control operation
(Max. 8 units)

Refrigerant System 4

U3 U4 U5 U6
U1 U2

Header Unit

U1 U2
A B

Remote Controller

Max. 64 indoor units for all refrigerant circuits

Note)
[1] Do not connect indoor/outdoor control wiring to more than one outdoor unit.
(The connection of the indoor/outdoor control wiring will automatically set the outdoor unit as the header unit.)
[2] Do not connect the control wiring between indoor and outdoor units to other refrigerant systems.
[3] Connect central the control wiring to the outdoor header unit.
[4] Connect central control devices to central control wiring.
[5] Central control the devices can be connected to control wiring of indoor and outdoor units.

2-2-2 For combined system with "1:1 model"

"1:1 model" (Super digital Inverter, Digital Inverter)

VRF system

Refrigerant System 1
Refrigerant System 2
Refrigerant System 3
Refrigerant System 4
Refrigerant System 5

Central Control Device
Central Control Device
U1 U2 U3 U4

Max. 10 Central control devices

Central control wiring : Max 64 refrigerant system for both VRF system and 1:1 model.
Max 16 refrigerant system for VRF system.

Header Unit
U3 U4
U1 U2 U5 U6

Note [6]

Note [2]

U3 U4
U1 U2 U5 U6

Follower unit
U3 U4
U1 U2 U5 U6

Follower unit
U3 U4
U1 U2 U5 U6

Note [3]

Note [1]

Control wiring between outdoor units (Max. 4 units can be connected.)

Header unit
U3 U4
U1 U2 U5 U6

"1:1 model" connection interface (TCB-PCNT30TLE)

Control wiring between indoor and outdoor units

Master unit
1 2 3
1 2 3
A B

U3 U4

Note [4] [5]

Sub unit
1 2 3
1 2 3
A B

Remote controller

Outdoor Unit

Central Control Device
U1 U2
U3 U4

Indoor Unit

Remote controller Wiring

U1 U2
A B

Remote Controller

Note [7]

Note [2]

U1 U2
A B

U1 U2
A B

U1 U2
A B

Remote controller

Max 48 indoor units can be connected.

U1 U2
A B

U1 U2
A B

U1 U2
A B

U1 U2
A B

Remote controller

Group control operation (Max. 8 units)

Max. 64 indoor units for all refrigerant systems (Don't count follower indoor units of group control and twin control of 1:1 model.)

Note) [1] Do not connect indoor/outdoor control wiring to more than one outdoor unit.
(The connection of the indoor/outdoor control wiring will automatically set the outdoor unit as the header unit.)
[2] Do not connect control wiring between indoor and outdoor units to other refrigerant systems.
[3] Connect the central control wiring to the outdoor header unit.
[4] When "1:1 model" is controlled by a central control device, "1:1 model" a connection interface will be necessary.
[5] In case of twin control on a 1:1 model, connect "1:1 model" Interface connection to the indoor Master unit.
[6] Connect central control devices to the central control wiring.
[7] Central control devices can also be connected to the control wiring between the indoor and outdoor units.

* In case of 1:1 model, Re-address setup is necessary for wired controllers. (For details, refer to "3-3").

2-3 Design of control wiring

1. All control wiring is 2-core and non-polarity wire.
2. Ensure use of shielded wire for the following wiring to prevent noise issues.
   - Outdoor-outdoor / indoor / outdoor-indoor control wiring, Central control wiring.

Control wiring between indoor and outdoor units (L1,L2,L3),
Central control wiring (L4)

Wiring	2-core, non-polarity
Type	Shield wire
Size	1.25mm² : Up to 1000m
Length	2.0mm² : Up to 2000m (*1)

Note (1) : Total of control wiring length for all refrigerant systems
(L1 + L2 + L3 + L4)

Control wiring between outdoor units (L5)

Wiring	2-core, non-polarity
Type	Shield wire
Size	1.25mm² ~ 2.0mm²
Length	Up to 100m (L5)

"1:1 model"
(Super digital Inverter, Digital Inverter)

1:1 model connection interface
(TCB-PCNT30TLE)

Remote controller wiring (L6,L7)

Wire	2-core, non-polarity
Size	0.5mm²~ 2.0mm²
Length	Up to 500m (L6 + L7)
	Up to 400m when wireless remote controller exists in a group control.
	Up to 200m total length of control wiring between indoor units (L6)

VRF system

Header unit

Follower unit

Remote controller

Outdoor unit

Indoor unit

Central Control Device

2-4 Earth method of shield wiring

2-4-1 For VRF system only
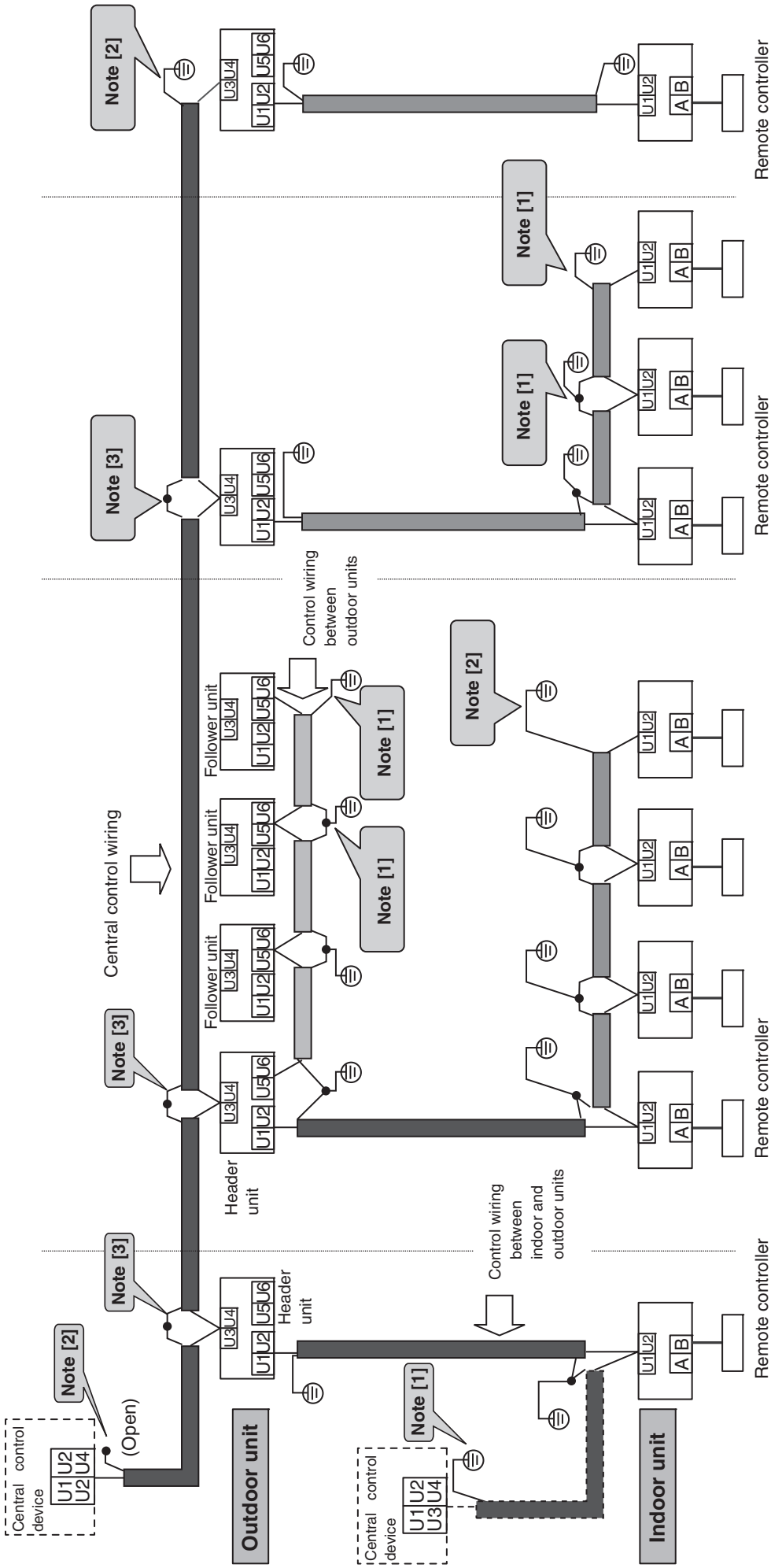
Note) [1] Be sure to close (connect) the end of the shielded wires, and perform the functional grounding for the end of wires which are connected to both indoor and outdoor units.
[2] For the shield wires which are connected between the central remote controller and the outdoor units, perform the functional grounding at only one end of central control wiring. Leave the other end of the wire at its final termination as an open wire.
[3] For the shield wires which are connected only between header outdoor units.

2-4-2 For combined system with "1:1 model"

Note) [1] Be sure to close (connect) the end of the shielded wires, and perform the functional grounding for the end of wires which are connected to both indoor and outdoor units.

[2] For the shield wires which are connected between the central remote controller and the outdoor units, perform the functional grounding at only one end of the wire of central control wiring. Leave the other end of the wire at its final termination as an open wire.

[3] For the shield wires which are connected only between header outdoor units.

2-5 General requirements for control wiring

1) Separate the control wiring and the power supply line to prevent malfunction.
2) Power supply line of the air conditioner must be a minimum of 50mm.
3) 300mm or more must be needed from other power source.
4) Ensure the shielded wires on both the indoor and outdoor units are grounded.
5) Control wiring and power supply line should not be wired in the same multiple core cable.

NG

Multiple core cable } Power supply
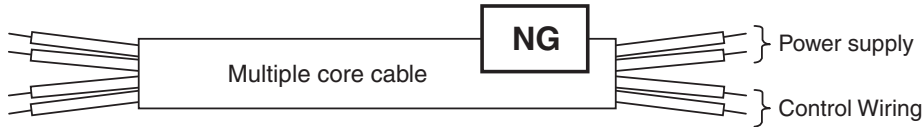
} Control Wiring

6) Do not wire two or more control wires in the same multiple core cable.

NG

Multiple core cable } Control wiring between indoor and outdoor units.

} Central control Wiring
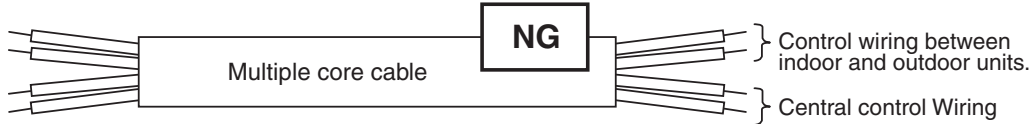
7) When high harmonic devices are located near to the air conditioner, the air conditioner must be re-located to a minimum of 3m from these devices.

NOTE Connection of four or more control wires to one terminal is prohibited.

Outdoor Unit
(Header unit)

| U3 | U4 |
| U1 | U2 | U5 | U6 |

Indoor unit

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

NOT GOOD

Remote controller

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

| U1 | U2 |
| A | B |

120
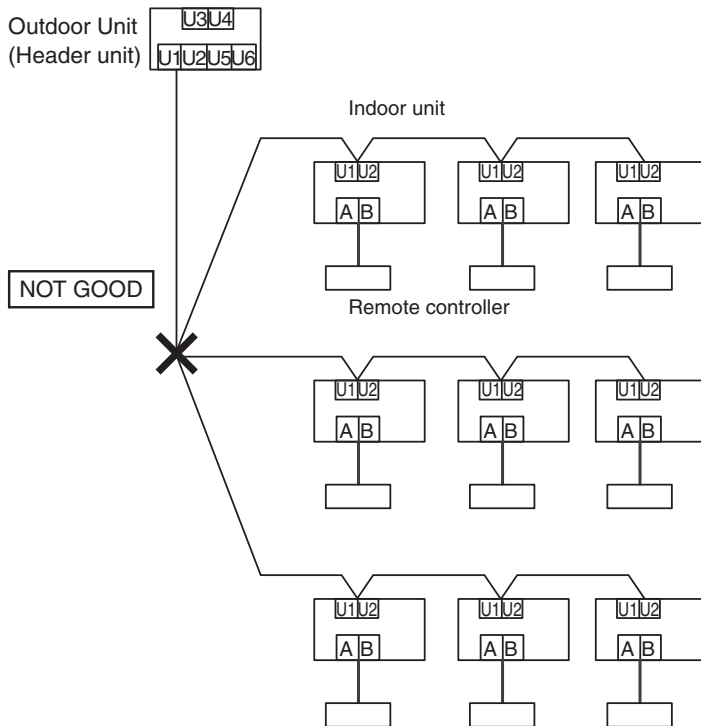
Looped wiring of control wires is prohibited.

Outdoor Unit
(Header unit)

U3 U4
U1 U2 U5 U6

Indoor unit

U1 U2
A B

U1 U2
A B

U1 U2
A B

Remote controller

Wiring of the communication line in a loop as shown is prohibited.

NOT GOOD

U1 U2
A B

U1 U2
A B

U1 U2
A B

U1 U2
A B

U1 U2
A B

U1 U2
A B
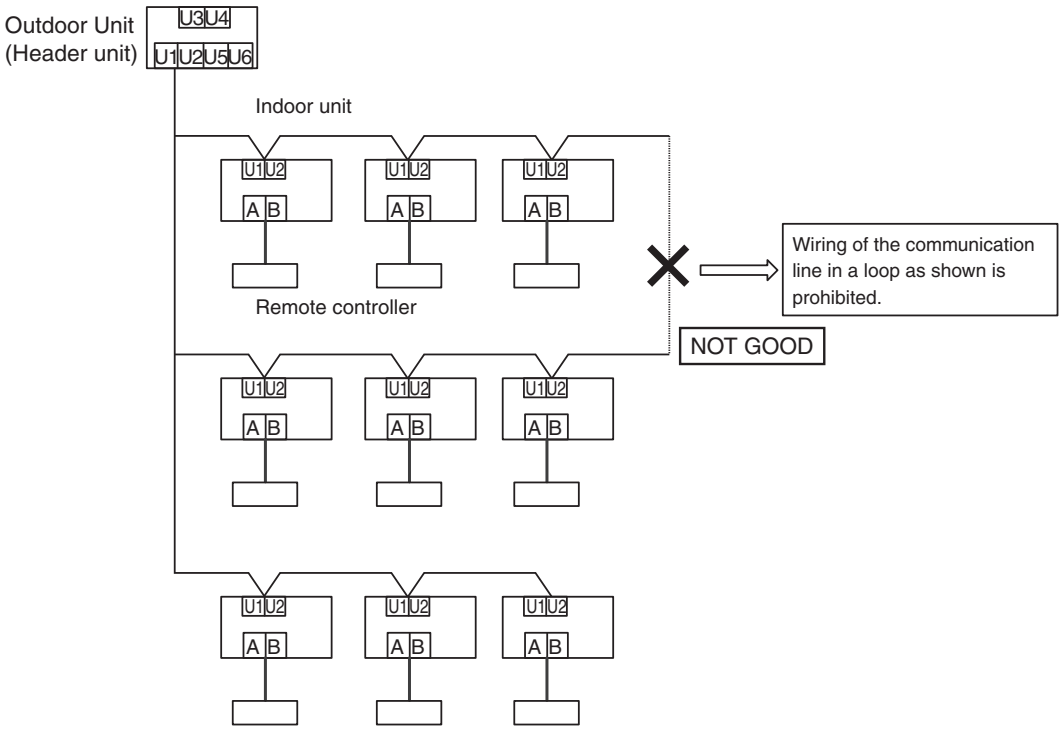
NOTE Do not mix two or more of the following types of indoor units in a group: SMMS-I, SMMS, Mini-SMMS, SHRM and DI/SDI.

| Outdoor unit | SMMS-i | | | | Outdoor unit | Outdoor unit | SMMS-i | | Outdoor unit | MINI-SMMS |

Indoor unit | Indoor unit | Indoor unit | | | Indoor unit | Indoor unit | Indoor unit | Indoor unit | Indoor unit

Remote controller

Group1   Max.8 units

Remote controller   Group2
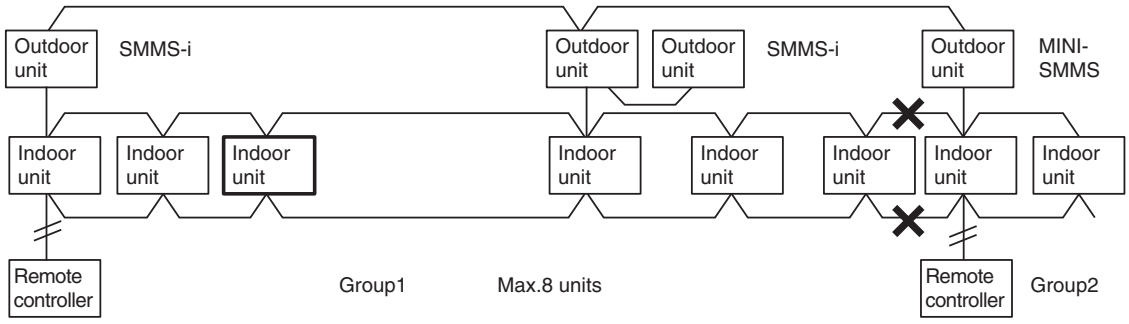
NOTE Relay I/Fs do not relay communication between separated TCC-Link buses. (The central controller in the figure below cannot control the indoor units under Relay I/F2.)

BMS System

Relay I/F1 - - - ▶ Central controller

Relay I/F2

Outdoor unit

Outdoor unit | Outdoor unit

Outdoor unit

Indoor unit | Indoor unit | Indoor unit

Indoor unit | Indoor unit | Indoor unit

Indoor unit | Indoor unit

Remote controller

Remote controller

Remote controller

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Part 1

3

ADDRESS SETUP

3-1 Definition of address

Indoor unit address

- "Indoor unit address" This enables the outdoor unit to recognize each individual indoor unit.
  An unique address is allocated to every indoor unit within a refrigeration system.
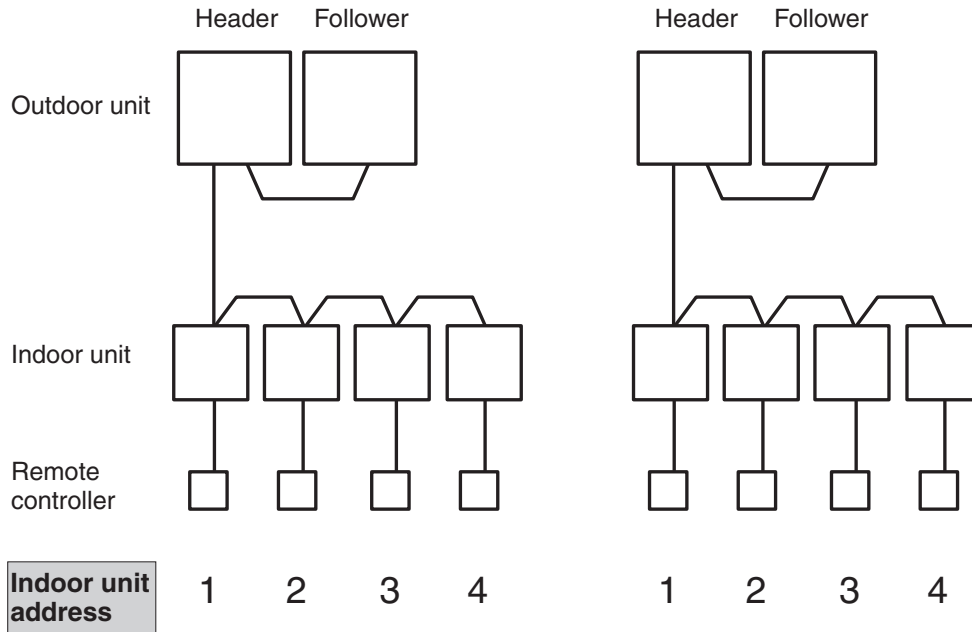
Group address (VRF) in case of DI/SDI, please refer to 3-3.

- "Group address" This is the address that recognizes the group control and determines the header indoor unit and follower indoor unit.
  Group address and the header indoor unit is decided automatically when the automatic address setting is performed.
  (Which indoor unit becomes the header unit is indefinite when automatic address setting is performed.)

  Indoor unit of individual control   : Group address = 0
  Header indoor unit of group control   : Group address = 1
  Follower indoor unit of group control : Group address = 2
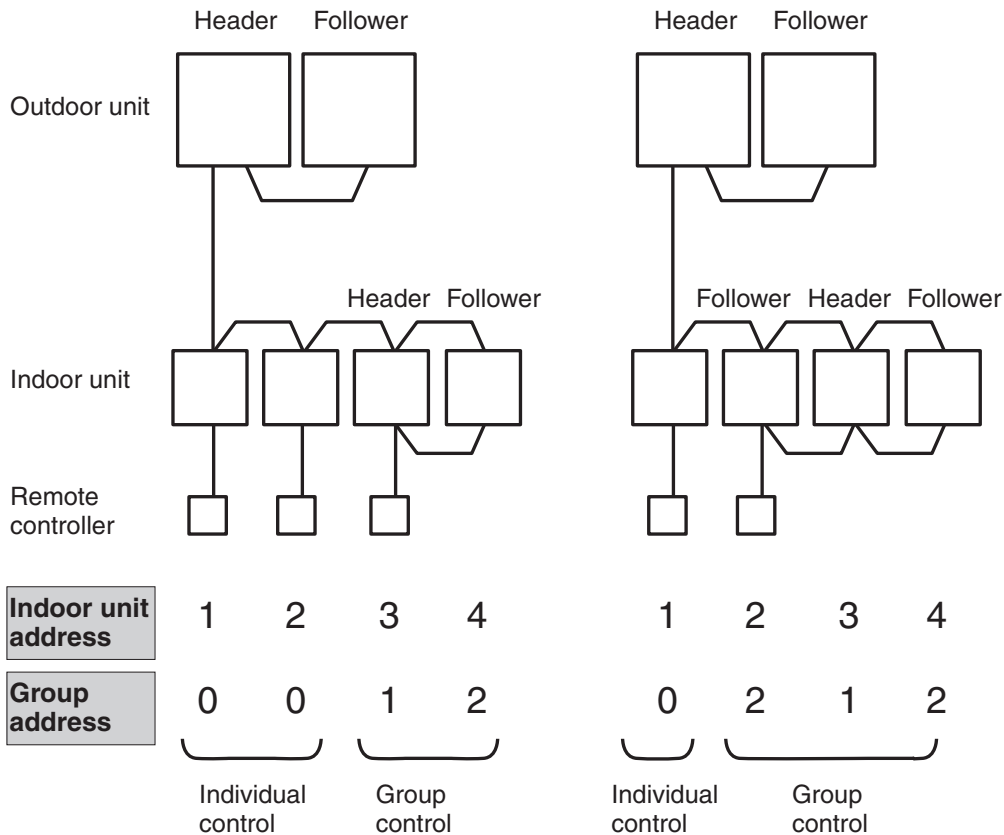
Line address (System address)

- "Line address" is the address in which the line (refrigerant system) indoor units are connected.
  This line address is set by a switch setting on the interface P.C. board on the header outdoor unit Factory setting : Line address is '1'.
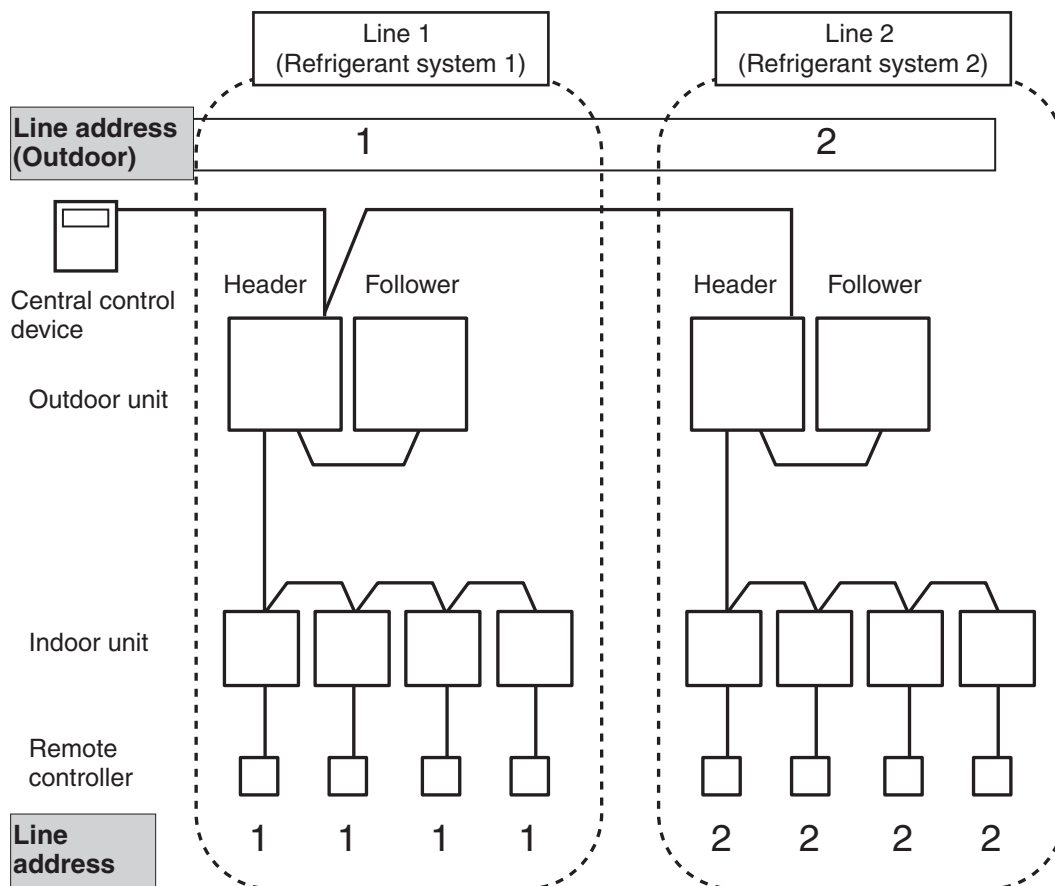
Central control address

• "Central control address" is used to make the central control devices recognize each indoor unit.
This address can be set from the central control devices either automatically or manually, or from wired remote controller devices manually.
In the case of group control in the VRF systems, one central control address is allocated to each indoor unit in a group control.
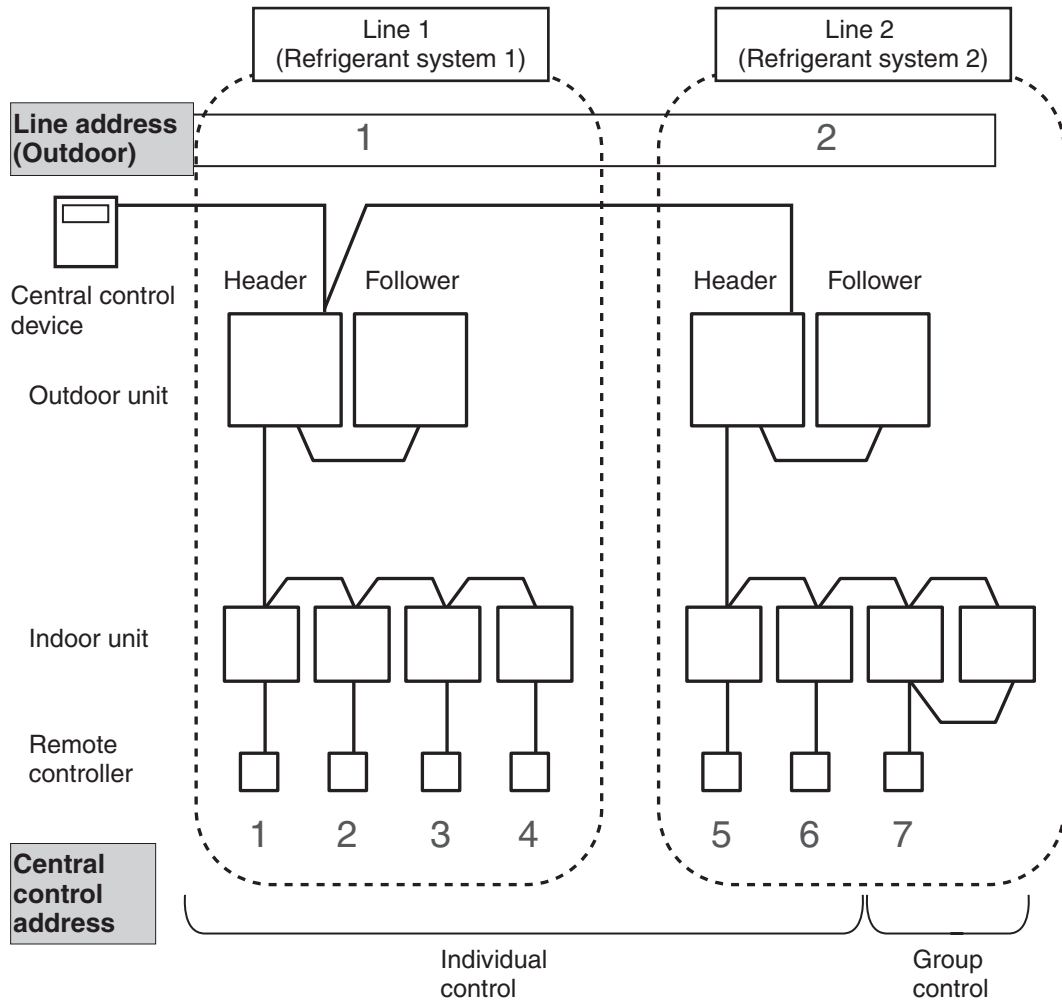
Zone address (Zone No.)

• "Zone address" is to be set when the central remote controller is used for each zone.
  Zone address is set by a switch setting on the central remote controller.

Central remote controller can divide all indoor units into a max. 4 zones.
The zone to which the indoor unit belongs is decided by its central control address.

Central control address	Zone No.
1 to 16	Zone 1
17 to 32	Zone 2
33 to 48	Zone 3
49 to 64	Zone 4

* RC: Remote controller
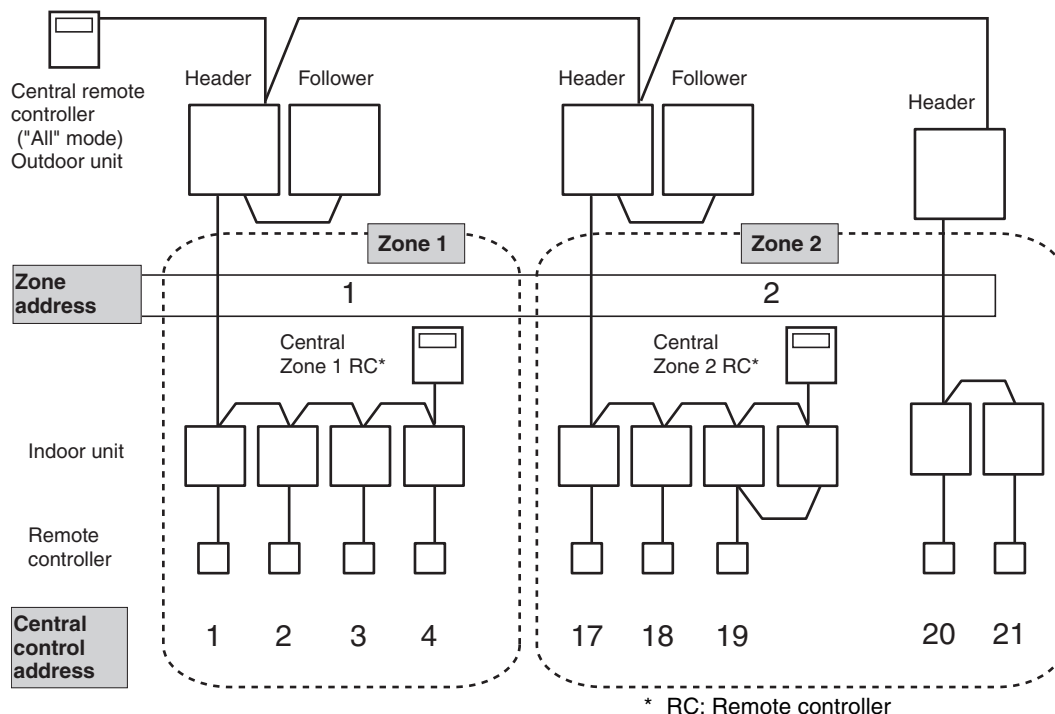
When using BMS-CM1280TLE or BMS-CM1280FTL, you can allocate a zone to each of the 64 central control addresses.

3-2 Address setup procedure (For VRF)

**In this air conditioner, it is required to set up address the indoor unit before starting the unit.
Set up the units address according to the following setup procedure.**

CAUTIONS

1. Set up the address after the wiring work has been completed.
2. Be sure to turn on the power in order of the indoor unit → outdoor unit. If turning on the power in the reverse order, a check code [E19-00] (Error of No. of header units) is displayed. When a check code is displayed, turn on the power again, butt in the correct order.
3. It requires a maximum of 10 minutes (Usually, approx. 5 minutes) to set up automatically an address to 1 line.
4. To set up an address automatically, the setup of the outdoor side is necessary.
   (Address setup cannot be performed by power-ON only.)
5. To set up an address, it is unnecessary to operate the air conditioner.
6. Manual address setup is also available besides automatic setup.
   Automatic address : Setup from SW15 on the interface P.C. board on the header unit
   Manual address   : Setup from the wired remote controller (RBC-ATM21E, RBC-AMT32(31)E, RBC-AMS41E)
   * It is temporarily necessary to set the indoor unit 1 by 1.
7. When turning on the power after automatic address setting, it takes up to about 10 minutes (usually about 3 minutes) before indoor units start running.

Address setting flow

The setting procedure differs as shown in 3-2-2 depending on the following elements: setting automatically/manually, controlled centrally or not, single/multiple refrigerant lines. Setting confirmation is required for all procedures, so prepare a wired remote controller RBC-AMT32(31)E or RBC-AMS41E. Refer to 3-2-8 when adding or replacing indoor units. Configure settings manually when connecting DI/SDI units.

Auto Setting Flow   **Manual Setting Flow**

[A] **Completion of wiring work** (Refer to chapter2)
Check all wiring, also confirm the relay connector between [U1-U2] and [U3-U4] terminal in every header outdoor is open (at shipment)

[B] **Line address setting** Refer to 3-2-2 Procedure 2 No.1
If just single refrigerant, just confirm the address is set to "1" (at shipment),not setting

[C] **Check at Power ON** Refer to 3-2-1
Power off' Power on (in order of indoor to outdoor, be sure all indoors and outdoors for address setting.)

[D] **Automatic address setting** Refer to 3-2-2 Procedure1 (single line) No.1-4 or Procedure2 (multiple line) No. 2-7
Manual address setting Refer to 3-2-3
Line address /Indoor Unit address /Group address setting for all Indoor units

Power ON reset All Indoor & Outdoor

[E] **Indoor address check** Refer to 3-2-4

[F] **Manual Address setting Change** Refer to 3-2-5
Arbitrate between automatic assigned address and registered address in BMS setting file. (Especially, group address in group operation)

[G] **Trial operation** Refer to the manual of air conditioner
For each refrigerant system

[H] **Setup of SW30-2** Refer to 3-2-9 (or 3-2-2 Procedure2 No.8)
On the interface P.C. board of outdoor unit. If single, keep same as at shipment (SW30-2 ON)

[I] **Setup of relay connector** Refer to 3-2-9 (or 3-2-2 Procedure2 No.9)
Connect only on all the header outdoor units

[J] **Central control address setting** Refer to 3-2-9 Flow Chart
Only when Central Control System requires "Central control address" (64/128 Central Remote Controller/ON/OFF Controller/Weekly Timer/Lonworks/Modbus/Analog I/F, etc.)

[K] **Trial operation** Refer to the manual of central controller

Only when connected to Central Control System

3-2-1 Check at main power-ON

After turning on the main power to the indoor units and the outdoor unit in which the refrigerant system is to be tested, firstly check the following items in each outdoor and indoor unit.
(After turning on the main power, be sure to check in order of indoor unit → outdoor unit.)

Check on outdoor unit
1. Check that all the rotary switches, SW01, SW02, and SW03 on the interface P.C. board on the header outdoor unit are set to "1".
2. If a error code is displayed on the 7-segment [B] display, investigate and remove the cause of the fault code.
3. **Check that [L08] is displayed on the 7-segment display [B]** on the interface P.C. board on the header outdoor unit. (L08: Indoor address unset up)
    (If the address setup operation has already been completed during service time, etc, the above check code will not be displayed and only [U1 ---] is displayed on the 7-segment display [A] and [B].)

7-segment display [A]   7-segment display [B]

Interface P.C. board

SW01   SW02   SW03
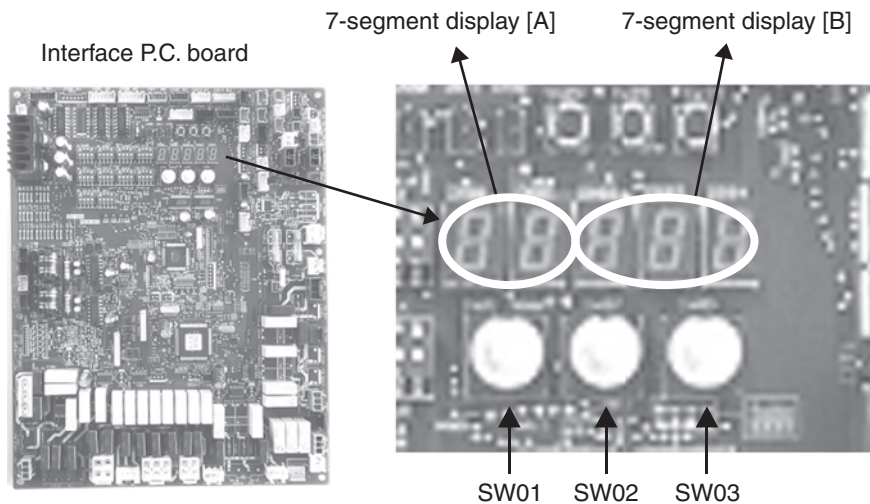
Check on indoor unit
1. Display check on the remote controller (In case of the wired remote controller)
    Check that a frame as shown in the following left figure is displayed on the LC display section of the remote controller.

Normal status
(Power and operation stop)

Abnormal status
(Power is not normally turned on.)
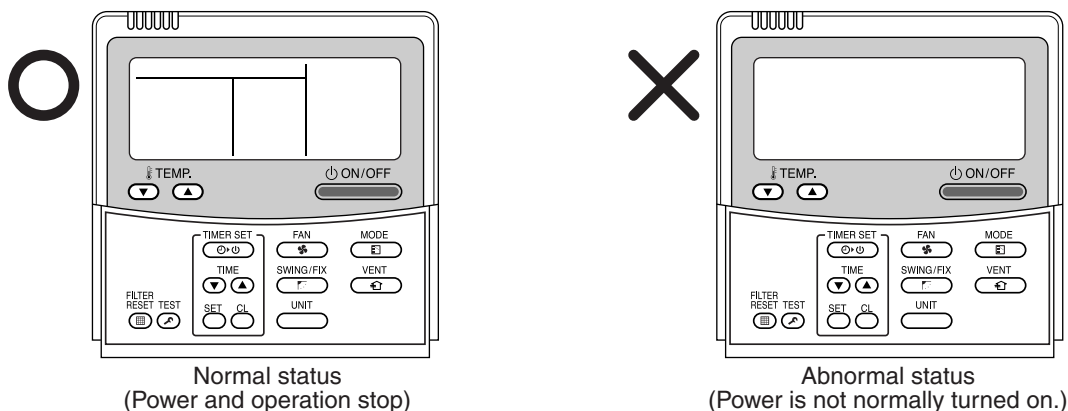
If a frame is not displayed as shown in the above right figure, the power to the remote controller is not normally turned on. Therefore check the following items.
* Check power supply to the indoor unit.
* Check wiring between the indoor unit and the remote controller.
* Check that the wiring connections to the indoor control P.C. board are correct and that there are no stray wire ends that may be causing a short circuit.
* Check that the transformer for the indoor microcomputer is functioning correctly.
* Check indoor control P.C. board failure.

3-2-2 Automatic address setup

The connection setting process of the terminal resister and relay connector differs in Procedure 1 and 2 below depending on the following elements: controlled centrally or not; single/multiple refrigerant systems.
The items to set are the line address (outdoor unit), indoor address (of lines/indoor units/groups), terminator resistor (outdoor unit), connection of relay connectors (outdoor unit) and central control address (indoor unit).
The table below shows whether setting is required.

Case		1	2	3	4
Central control		**no**		**yes**	
Refrigerant system		Single	Multiple	Single	Multiple
Cable systematic diagram (example)					
Set up Procedure for indoor address	**Auto**	Procedure1 No.1-4	Procedure2 No.1-7	Procedure1 No.1-5	Procedure2 No.1-10
	Manual*	Refer to 3-2-3, 3-2-4			
Setting items except indoor address					
	Line Address setting SW13/14	no ("1" at shipment)	yes Procedure2 No.1	no ("1" at shipment)	yes Procedure2 No.1
	Terminator resister SW30-2	ON (at shipment)	ON (at shipment)	ON (at shipment)	OFF Header outdoor except address "1" Procedure2 No.8
	The relay connector**	Open (at shipment)		Close (just before Central control address setting)	
	Central control address setting	no		yes 3-2-9	

* Required for confirmation and re-setting of indoor address
** Between [U1-U2] and [U3-U4] terminals in every header outdoor unit

Address setup procedure 1

1. Turn on the power to the indoor/outdoor units.
   (In order of indoor → Outdoor)
2. After approx. 1 minute, check that U. 1. L08 (U. 1. flash) is displayed in the 7-segment display section on the interface P.C. board of the header outdoor unit.
3. Push SW15 and start the automatic set up of the address. (Max. 10 minutes for 1 refrigerant system (Usually, approx. 5 minutes))
4. When the count Auto 1 → Auto 2 → Auto 3 is displayed in the 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light) , the setup has been completed.
5. **When using a central control, connect a relay connector between U1, U2 and U3, U4 terminals in the header unit.**

Header unit interface P.C. board

SW04 SW05 SW15 ← **3**

D600 D601 D602 D603 D604 ← **2, 4**

SW01 SW02 SW03

5

U1 U2	U3 U4	U5 U6
For internal wiring between indoor and outdoor	For wiring of central control system	For internal wiring between outdoor units

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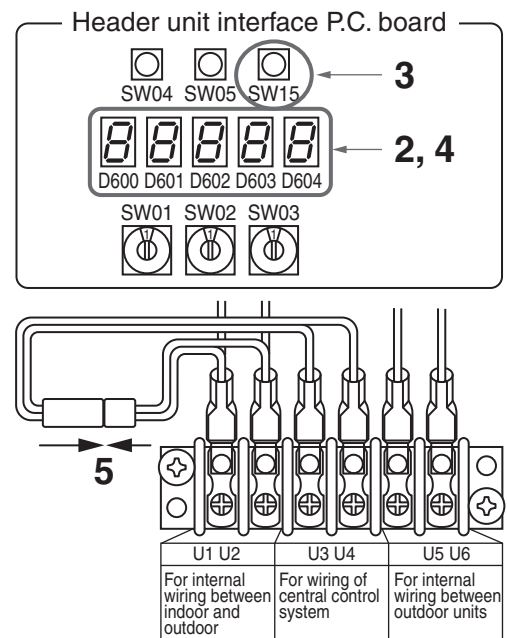
REQUIREMENT

- When a group control is performed over the multiple refrigerant systems, be sure to turn on the power supplies to all of the indoor units connected, so that the address set-up can be completed correctly.
- If turning on the power for each refrigerant system to set up address, a header group address must be set for each line. Therefore, an alarm code "L03" (Duplicated indoor header units) will be displayed during in operation after the address setup has been completed. In this case, change the group address using the wired remote controller so that only one header indoor unit is set up.

(Example)	Group control over multiple refrigerant systems

Wiring systematic diagram	Outdoor Outdoor
	
	Header Follower
	Indoor Indoor Indoor Indoor
	              Header Follower
	                ↓
	              Follower
	Remote controller
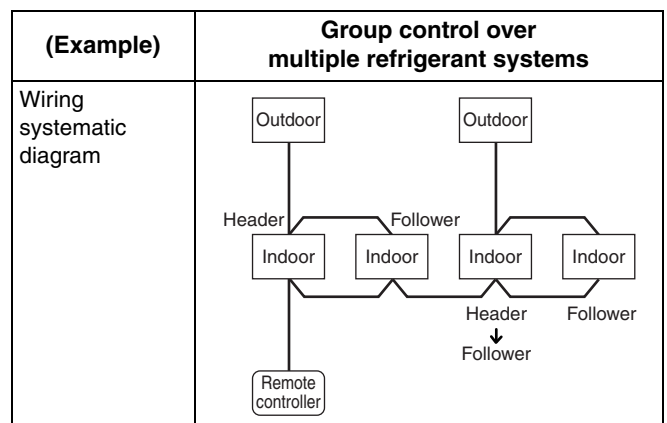
Address setup procedure 2

1. Using SW13 Bit4 and SW14 Bit1-4 on the interface P.C. board on the header outdoor unit in each system, set up the line (system) address for each system.
   (At shipment the address is set to 1 from the factory)

Note) Be careful not to duplicate with any other refrigerant systems.

SMMS/SHRM

Header outdoor unit interface P.C. board

SMMS-i

Header outdoor unit interface P.C. board
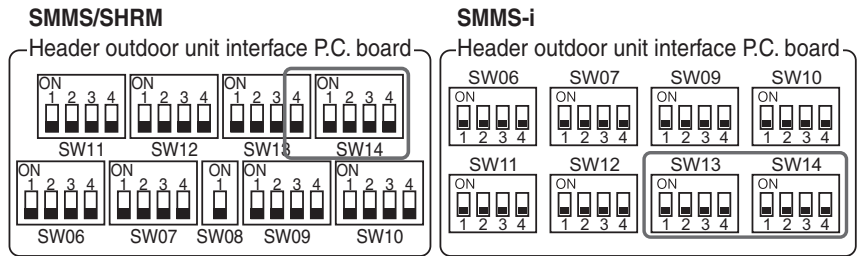
Line (system) address switch on outdoor interface P.C. board

(○: Switch ON, × : Switch OFF)

Line address	SW13				SW14				Line address	SW13				SW14			
	1	2	3	4	1	2	3	4		1	2	3	4	1	2	3	4
1				×	×	×	×	×	15				×	×	○	○	○
2				×	○	×	×	×	16				×	○	○	○	○
3				×	×	○	×	×	17				○	×	×	×	×
4				×	○	○	×	×	18				○	○	×	×	×
5				×	×	×	○	×	19				○	×	○	×	×
6				×	○	×	○	×	20				○	○	○	×	×
7				×	×	○	○	×	21				○	×	×	○	×
8				×	○	○	○	×	22				○	○	×	○	×
9				×	×	×	×	○	23				○	×	○	○	×
10				×	○	×	×	○	24				○	○	○	○	×
11				×	×	○	×	○	25				○	×	×	×	○
12				×	○	○	×	○	26				○	○	×	×	○
13				×	×	×	○	○	27				○	×	○	×	○
14				×	○	×	○	○	28				○	○	○	×	○

▨ : Is not used for setup of line address. (Do not change setup.)

2. Check that the relay connectors between U1U2 and U3U4 terminals are disconnected in all the header outdoor units to which the central control is connected. (At shipment from factory: No connection exists.)
3. Turn on the power to the indoor/outdoor units.
   (In order of indoor → outdoor)
4. After approx. 1 minute, check that 7-segment display is
   U. 1. L08 (U. 1. flash) on the interface P.C. board of the header outdoor unit.
5. **Push SW15 and start the setup of the automatic address.**
   (Max. 10 minutes for 1 refrigerant system (Usually, approx. 5 minutes))
6. When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light), the setup has finished.
7. Procedure 4. to 6. are to be repeated in all other refrigerant systems.
8. How to set up terminator resistor (SW30)
   When the address set-up has finished for each refrigerant line, place the "terminator" resistor (SW30) into the control line. Then turn off SW30-2 on the interface P.C. boards for all the header outdoor units of a system that are connected to the central control. However DO NOT include the system with the least amount of address numbers.
9. Connect the relay connector between U1U2 and U3U4 on the header outdoor unit for each refrigerant system.

2

U1 U2	U3 U4	U5 U6
For internal wiring between indoor and outdoor	For wiring of central control system	For internal wiring between outdoor units

Header outdoor unit interface P.C. board
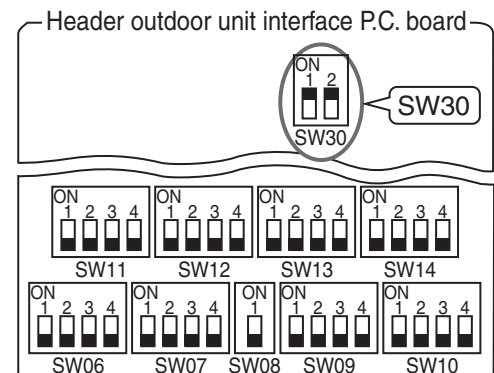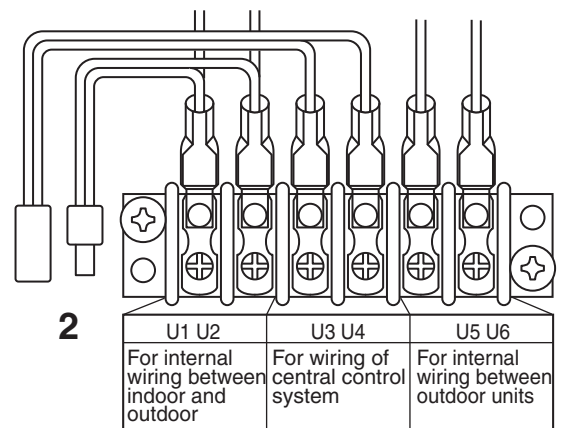
10. Then set up the central control address.
    (For the central control address setup, refer to the installation manual of the central control devices.)

Outdoor interface P.C. board	Header unit	Follower unit	Header unit	Follower unit	Header unit	Setup at shipment from factory
	1		**2**		**3**	
SW13, 14 (Line address)	1	(Setup is unnecessary.)	**2**	(Setup is unnecessary.)	**3**	1
SW30-2 Terminator resistor of indoor/outdoor communication line/central control communication line	ON	(Setup is unnecessary.)	**OFF after address setup**	(Setup is unnecessary.)	**OFF after address setup**	ON
Relay connector	**Connect short after address setup**	Open	**Connect short after address setup**	Open	**Connect short after address setup**	Open

Indoor side (Automatic setup)

Line address	1	1	2	2	3
Indoor unit address	1	2	1	2	1
Group address	0	0	1	2	0

Point

Relay connector   — **NOTE** —
Never connect a relay connector until the address setup for all the refrigerant lines have been completed, otherwise the unit addresses cannot be set-up correctly.

3-2-3 Manual address setup from the remote controller

In cases where you have a requirement to address a unit prior to completing the electrical installation and where the outdoor unit has yet to be commissioned. (manual set-up from wired remote controller)

Arrange one indoor unit and one remote controller set to 1 by 1.

Turn on the power.

(Wiring example in 2 systems)

System #1

outdoor

System #2

outdoor

Indoor   Indoor   Indoor   Indoor   Indoor

Line address → 1
Indoor address → 1
Group address → 1

Remote controller

Header indoor unit

1 1 2 2
2 3 1 2
2 2 2 2

Follower indoor unit
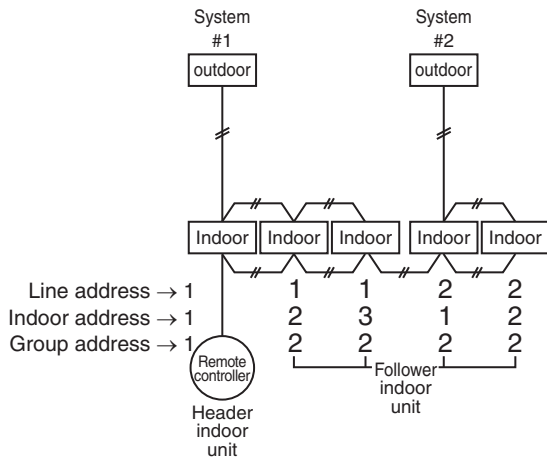
In the above example, of no inter-unit wire the address after you have individually connected the wired remote controller.

Group address

Individual   : 0000
Header unit   : 0001 } In case of group control
Follower unit : 0002

Operation procedure

1 → 2 → 3 → 4 → 5 → 6 →
7 → 8 → 9 → 10 → 11 End

Data

Item code

2, 5, 8

11

1

4, 7, 10

3, 6, 9
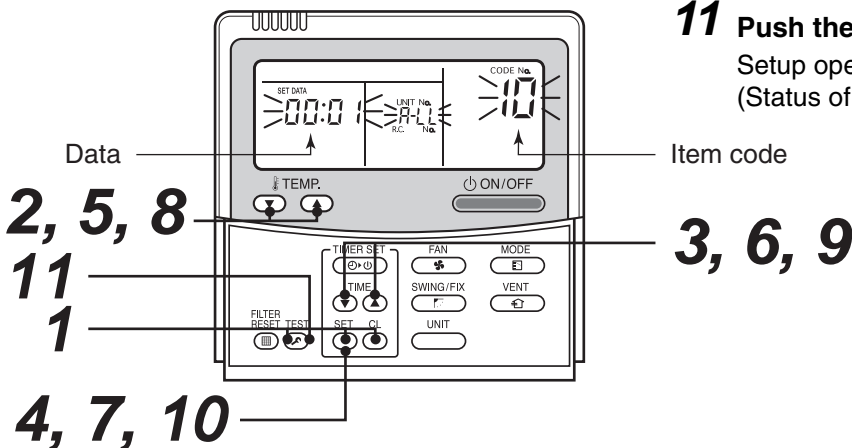
1 Push simultaneously the $\overset{SET}{\bigcirc}$ + $\overset{CL}{\bigcirc}$ + $\overset{TEST}{\bigcirc}$ buttons for 4 seconds or more.
LCD changes to flashing.

(Line address)

2 Using the $\overset{\text{TEMP.}}{\blacktriangledown \; \blacktriangle}$ buttons, set *l2* to the item code.

3 Using the $\overset{TIME}{\blacktriangledown \blacktriangle}$ buttons, set up the line address.
(Match it with the line address on the interface P.C. board of the header unit in the identical refrigerant system.)

4 Push the $\overset{SET}{\bigcirc}$ button.
(OK when display goes on.)

(Indoor address)

5 Using the $\overset{\text{TEMP.}}{\blacktriangledown \; \blacktriangle}$ buttons, set *l3* to the item code.

6 Using the timer time $\overset{TIME}{\blacktriangledown \blacktriangle}$ buttons, set up the indoor address.

7 Push the $\overset{SET}{\bigcirc}$ button.
(OK when display goes on.)

(Group address)

8 Using the $\overset{\text{TEMP.}}{\blacktriangledown \; \blacktriangle}$ buttons, set *l4* to the item code.

9 Using the $\overset{TIME}{\blacktriangledown \blacktriangle}$ buttons, set Individual = *0000*, Header unit = *0001*, Follower unit = *0002*.

10 Push the $\overset{SET}{\bigcirc}$ button.
(OK when display goes on.)

11 Push the $\overset{TEST}{\bigcirc}$ button.
Setup operation has finished.
(Status of unit will return to normal stop status.)

Note 1)
When setting the line address from the remote controller, do not use addresses 29 and 30.
The address 29 and 30 cannot be set up in the outdoor unit. Therefore if they are incorrectly set up, a check code [E04] (Indoor/outdoor communication circuit error) will be displayed.

3-2-4 Confirmation of indoor unit address and position by using the remote controller

Confirmation of indoor unit address and the position
1. **When you wish to know the indoor address and position of a unit within a system.**
   Procedure (while the air conditioner is in operation)

1 **If the unit stops, push the** ⏻ON/OFF **button.**

2 **Push the** UNIT **button.**
The unit NO *1-1* is displayed on the LCD.
(Disappears after several seconds) The displayed unit No indicates the line address and the indoor address. (If there are other indoor units connected to the same remote controller (Group control unit), unit unit No is displayed every time you push the UNIT button.)
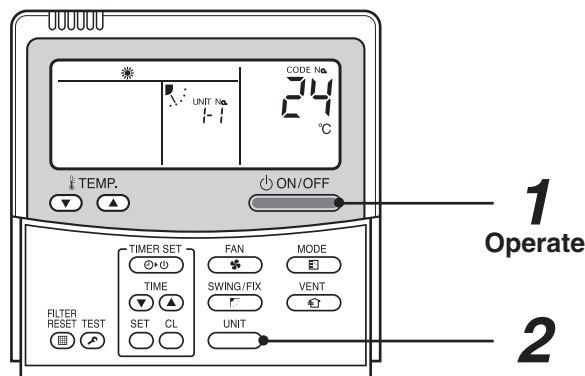
Operate

Operation procedure

1→2

2. **When you want to know the position of the indoor unit using its address**
   • **To confirm the unit numbers in a group control;**
   Procedure (while the air conditioner is in operation)
   The indoor unit numbers in a group control will be successively displayed and the corresponding indoor fan is turned on. (The air conditioner must not be in operation for this procedure to work.)

1 **Push the** VENT + TEST **buttons simultaneously for 4 seconds or more.**
   • Unit No *ALL* is displayed.
   • The fans of all the indoor units within the group control are turned on.

2 **For every push of the** UNIT **button, the indoor unit numbers in the group control are successively displayed.**
   • The first unit No. displayed will be the address of the header unit.
   • Only the fan of the selected indoor unit will operate.

3 **Push the** TEST **button to complete the procedure.**
All of the indoor units within the group control will stop.

End
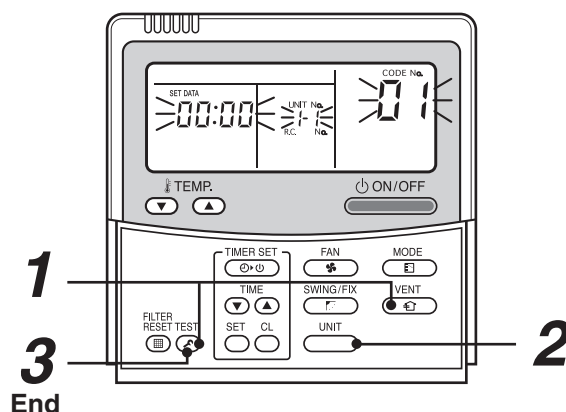
Operation procedure

1→2→3 **End**

• **To confirm all the unit numbers from an arbitrary wired remote controller;**
Procedure (while the air conditioner is not in operation)
All indoor units within the same refrigerant system can be confirmed, once an outdoor unit is selected. The indoor unit numbers are then successively displayed. With each unit display its fan will be turned on.

1 **Push the ▼ + ⌒ (TEST) buttons simultaneously for 4 seconds or more.**
Line 1, **item code** *AC* (Address Change) is displayed. (Select the outdoor unit.)

2 **Using the ⌒ (UNIT) + ⌒ (SWING/FIX) buttons, select the line address.**

3 **Using the ⌒ (SET) button, confirm the selected line address.**
  • The indoor unit address, which is connected to the refrigerant pipe of the selected outdoor unit is displayed and the fan is turned on.

4 **For every push of the ⌒ (UNIT) button, the indoor unit numbers in the identical pipe are successively displayed.**
  • Only the fan of the selected indoor unit will operate.

[To select another line address]

5 **Push the ⌒ (CL) button to return to procedure 2.**
  • The indoor address of another line can then be successively confirmed.

6 **Push the ⌒ (TEST) button to complete the procedure.**
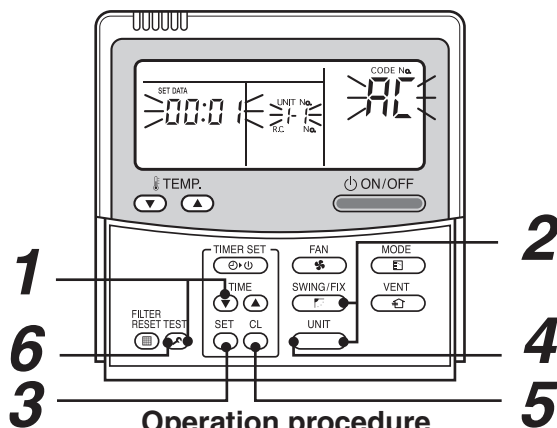
Operation procedure

1 → 2 → 3 →
4 → 5 → 6 End

3-2-5 Change of indoor address from wired remote controller

Change of indoor address from wired remote controller
• **To change the indoor address in an individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control** (When the setup operation with automatic address has finished, this change is available.)
Procedure (while the air conditioner is not in operation)

1 **Push simultaneously the ⌒ (SET) + ⌒ (CL) + ⌒ (TEST) buttons for 4 seconds or more.**
(Firstly the unit No. that indicates the header indoor unit within the group control will be displayed)

2 **In group control, select an indoor unit No to be changed by pushing the ⌒ (UNIT) button.**
(The fan of the selected indoor unit will turn on.)

3 **Using the ▼ ▲ (TEMP.) buttons, set *13* to the item code.**

4 **Using the ▼ ▲ (TIME) buttons, change the displayed setup data to your requirements.**

5 **Push the ⌒ (SET) button.**

6 **Using the ⌒ (UNIT) button, select the next unit No. that is to be changed. Repeat the procedure 4 to 6 and change the indoor address so that they will not be duplicated.**

7 **After the above change, push the ⌒ (UNIT) button to confirm the changed contents.**

8 **If it is acceptable, push the ⌒ (TEST) button to complete.**
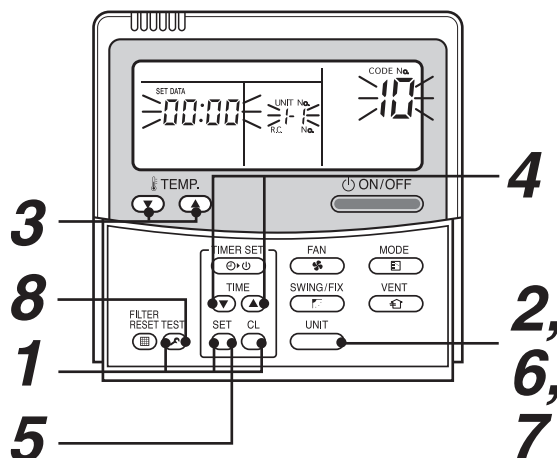
Operation procedure

1 → 2 → 3 → 4 →
5 → 6 → 7 → 8 End

• **To change all the indoor addresses from an arbitrary wired remote controller.**
  (When the setup operation for the automatic address has finished, this change is available.)
Contents : Using an arbitrary wired remote controller, the indoor unit address can be changed for each same refrigerant system.

∗ **Change the address in the address check/change mode.**
Procedure (while the air conditioner is not in operation)

1 **Push the ▽ + ⟨TEST⟩ buttons simultaneously for 4 seconds or more.**
(Line 1, item code 𝐴𝐶 (Address Change) will be displayed).

2 **Using the ⟨UNIT⟩ + ⟨SWING/FIX⟩ buttons, select the line address.**

3 **Push the ⟨SET⟩ button.**
• The indoor unit address, which is connected to the refrigerant system of the selected outdoor unit is displayed and the fan is turned on.
The current indoor address will be displayed on the setup data. (Line address is not displayed.)

4 **The indoor address of the setup data moves up/down by the ⟨TIME ▼▲⟩ buttons.**
Change the setup data to a new address.

5 **Push the ⟨SET⟩ button to determine the setup data.**

6 **For every push of the ⟨UNIT⟩ button, the indoor unit numbers in the identical pipe are successively displayed. Note Only the fan on the selected indoor unit operates.**
Repeat the procedure **4** to **6** and ensure that there are no duplications of indoor addresses.

7 **Push the ⟨SET⟩ button.**
(all of the displays on the LCD will go on)

8 **Push the ⟨TEST⟩ button to complete the procedure.**

1 **3** Cancel of line selection **2**

4 **8** **5, 7** **6**
To finish the setup
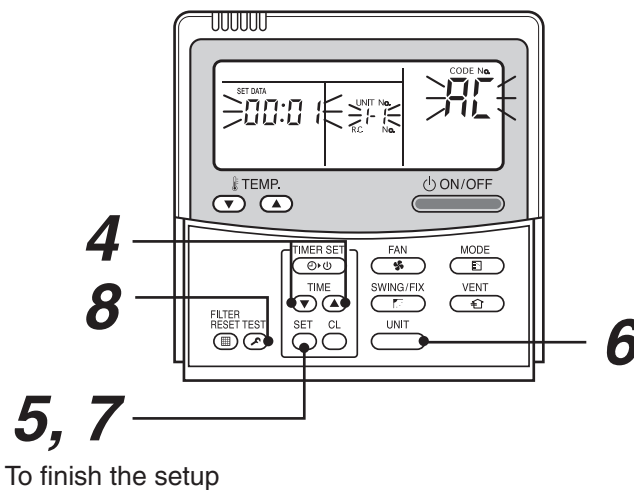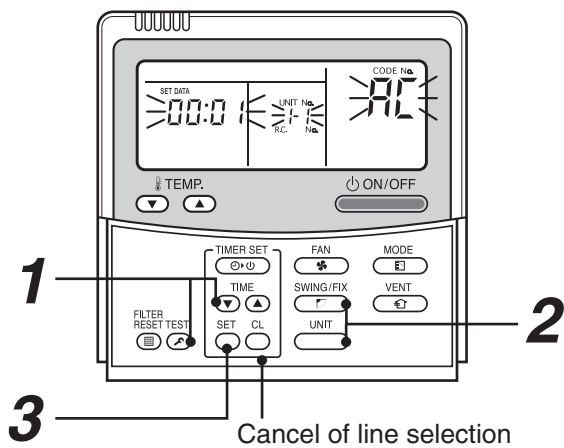
Note. If a unit No. cannot be called up, no outdoor unit exists within the system.
Push the [CL] button, and then select a line according to procedure **2**.

Operation procedure
1 → 2 → 3 → 4 →
5 → 6 → 7 → 8 **End**

3-2-6 Address setup example (VRF system)

[Automatic address / Manual address setup example]

Individual control

Automatic address setting		Available		Available	
Outdoor	Line address	1		1	
Configuration					
Indoor	Line address	1	1	1	1
	Indoor unit address	1	2	1	2
	Group address	0	0	0	0

* RC: Remote controller

Automatic address setting		Available		Available		Available	
Outdoor	Line address	1		1		1	
Configuration							
Indoor	Line address	1	1	1	1	1	1
	Indoor unit address	1	2	1	2	1	2
	Group address	0	0	0	0	0	0

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Group control

Automatic address setting		Available		Available		Available	
Outdoor	Line address	1		1		1	
Configuration							
Indoor	Line address	1	1	1	1	1	1
	Indoor unit address	1	2	1	2	1	2
	Group address	1	2	1	2	1	2

Central control (Multiple refrigerant systems)

Automatic address setting		Available				Available			
Outdoor	Line address	1		2		1		2	
Configuration									
Indoor	Line address	1	1	2	2	1	1	2	2
	Indoor unit address	1	2	1	2	1	2	1	2
	Group address	0	0	0	0	1	2	1	2

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Group control over other refrigerant systems

Automatic address setting		Available (*1)						
Outdoor	Line address	1		2			3	
Configuration								
Indoor	Line address	1	1	2	2	2	3	3
	Indoor unit address	1	2	1	2	3	1	2
	Group address	1	2	2	2	2	2	2

	Group address	1	2	1 → 2*	2	2	1 → 2*	2

→ It is necessary to change the group address as marked with * when an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system in which the address is to be set up.

*1
For group control within a refrigeration system automatic address setting is available only when all indoor units connected to a group control are turned on during address setting.

If an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system, it may cause the error code "L03" (Duplicated indoor header units) to be displayed. This is because the system believes there is more than one header unit within the group. In this case, change the group address by a wired remote controller so that only one indoor unit becomes the header unit within one group control.

Automatic address setting		Available (*1)						
Outdoor	Line address	1		2			3	
Configuration								
Indoor	Line address	1	1	2	2	2	3	3
	Indoor unit address	1	2	1	2	3	1	2
	Group address	1	2	2	2	2	2	2

	Group address	1	2	1 → 2*	2	2	1 → 2*	2

→ It is necessary to change the group address as marked with * when an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system in which the address is to be set up.

*1
For group control within a refrigeration system automatic address setting is available only when all indoor units connected to a group control are turned on during address setting.

If an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system, it may cause the error code "L03" (Duplicated indoor header units) to be displayed. This is because the system believes there is more than one header unit within the group. In this case, change the group address by a wired remote controller so that only one indoor unit becomes the header unit within one group control.

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3-2-7 Clearance of address (return unit address status to default factory shipment position)

Method 1

An address can be individually cleared from a wired remote controller.

"0099" is set up to line address, indoor address, and group address data from the remote controller.

(For the setup procedure, refer to the abovementioned address setup from the remote controller.)

Method 2

Clear the indoor addresses in the same refrigerant line from the outdoor unit.

1. Turn off the power to the complete refrigerant line that is to be returned to its original factory default address. Then change the header unit to the following status -
   1) Remove the relay connector between [U1U2] and [U3U4].
      (If it has been already removed, then leave it as it is.)
   2) Turn ON SW30-2 on the interface P.C. board on the header outdoor unit if it is OFF.
      (If it is already ON, leave it as it is.)
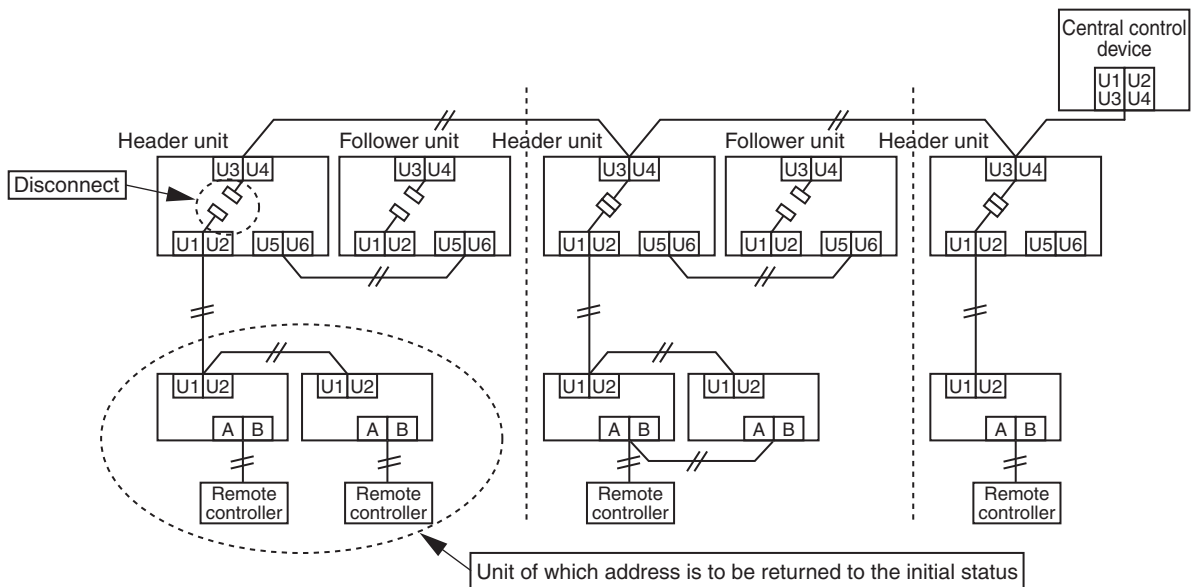
2. Turn on the indoor/outdoor power for the refrigeration line whose addresses has just been cleared. After approx. 1 minute, check that "U.1. - - -" is displayed. Then execute the following operation on the interface P.C. board for the header outdoor unit of which address is to be cleared in the refrigerant system.

SW01	SW02	SW03	SW04	Address which can be cleared
2	1	2	After checking that "A.d.buS" is displayed on 7-segment display, push SW04 for 5 seconds or more.	Line + Indoor + Group address
2	2	2	After checking that "A.d.nEt" is displayed on 7-segment display, push SW04 for 5 seconds or more.	Central control address

3. After "A.d. c.L." has been displayed on 7-segment display, return SW01/SW02/SW03 to 1/1/1.
4. When the address clearing has been completed correctly "U.1.L08" will be displayed on 7-segment display. If "A.d. n.G." is displayed on 7-segment display, there is a possibility that the refrigeration line is connected with another. Check the relay connector between [U1U2] and [U3U4] terminals again.
   NOTE) Warning, Failure to carry out these instructions correctly could result in the erasure of other refrigerant line addresses.
5. After the completion of the above steps, set-up the address/addresses again.

3-2-8 Additional and address-undefined units (System extension etc)

In the event that an indoor unit is setup with either an undefined address or additional units are added due to system extension, follow the methods below. Note this method can also be used for replacement P.C. board's etc.

Method 1
Set up an address individually from a wired remote controller.
(Line address, Indoor address, Group address and Central control address)
For the setup method, refer to the above "Manual address setup from the remote controller".

Method 2
Set up an address from the outdoor unit.
∗ Do not proceed to change the address of units that are already identified. Set-up only those units whose address is yet undefined. The allocation of the addresses will begin at the lowest available number and then continue upwards.

Setup procedure
Arrange the outdoor header units in the refrigerant line to the indoor units that are to be added. (Figure below)
1. Remove the relay connector between [U1U2] and [U3U4].
2. Turn ON SW30-2 on the interface P.C. board on the outdoor header unit side if it is OFF.
    * Turn off the power, and then execute the operation.

Central control device
U1 U2
U3 U4

Header unit   Follower unit   Header unit   Follower unit   Header unit
U3 U4   U3 U4   U3 U4   U3 U4   U3 U4
Disconnect
U1 U2 U5 U6   U1 U2 U5 U6   U1 U2 U5 U6   U1 U2 U5 U6   U1 U2 U5 U6

U1 U2   U1 U2   U1 U2   U1 U2   U1 U2
A B   A B   A B   A B   A B
Remote   Remote   Remote   Remote   Remote
controller controller   controller controller   controller

Added indoor unit
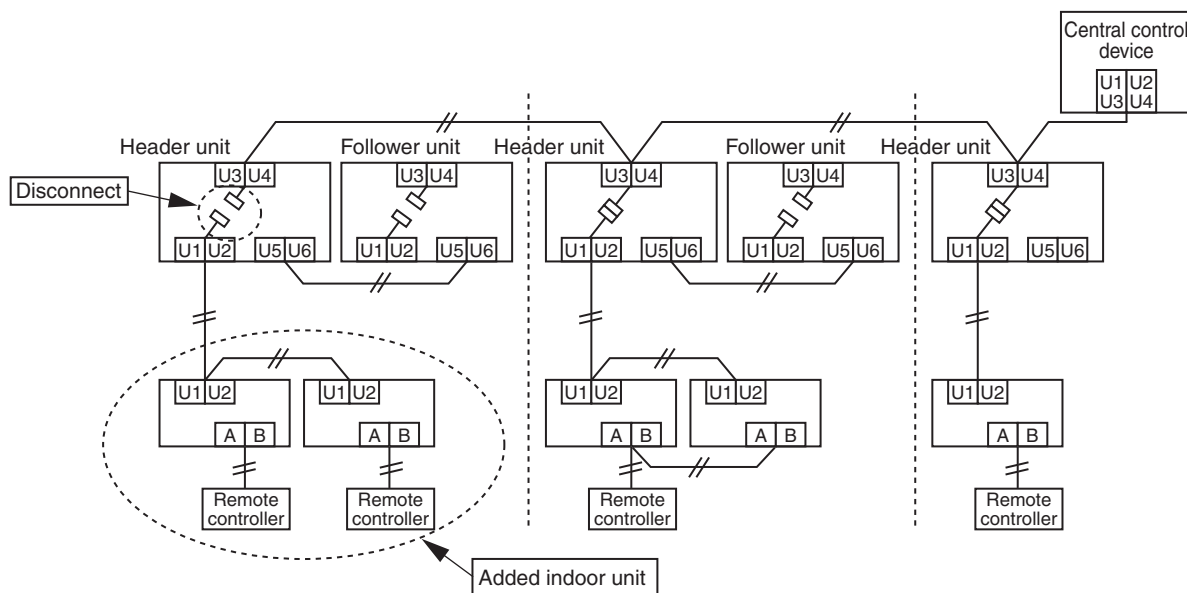
3. Turn on the indoor/outdoor power for all additional units, who's address set-up has yet to be completed. After approx. 1 minute, check that "U.1.---" is displayed on 7-segment display.
4. Execute the following operation on the interface P.C. board on the header outdoor unit.

SW01	SW02	SW03	SW04
2	14	2	After checking that "In. At" is displayed on 7-segment display, and then push SW04 for 5 seconds or more.

"AUTO1" → "AUTO2" → "AUTO3" … is counted and displayed on 7-degment display.
5. When "U.1. - - -" is displayed on the 7-segment display, the setup operation has finished.
    Turn off the indoor/outdoor power.
6. Return the following setup as before.
    • Relay connector
    • SW30-2
    • SW01, 02, 03

3-2-9 How to set the central control address

(Note)

1) Perform only after the setting of the indoor and outdoor unit addresses (Indoor/group/line address).
2) Three setting address methods can be selected.
   ① **Manual setting from the wired main remote controller (RBC-AMT21E, RBC-AMT32(31)E, RBC-AMS41E)**
   ② **Manual setting from the central control remote controller (TCB-SC642TLE2, BMS-CM1280TLE/FTLE)**
   ③ **Automatic setting from the central remote controller (TCB-SC642TLE2, BMS-CM1280TLE/FTLE)**

REQUIREMENT

- **Be sure to reconfirm the following status for all header outdoor units before the central control address setting.**
  [1] Check that the relay connectors between [U1,U2] and [U3,U4] terminals are disconnected in all header outdoor units to which the central control is connected.
  (At the shipment from factory : No connection of connector)
  [2] SW30-2 should be OFF in all header UNITS except the header unit with the least line address number. (At the shipment from factory : Set to ON)
- **Correct address setting can't be conducted without the setting status shown above.**
- **The procedure shown above should be conducted after the address setting of all the indoor and outdoor units.**

Interface P.C. board on the outdoor unit.

Flow chart of setting central control address

Completion of indoor unit addresses

Automatic setting? → Yes → Automatic setting

No ↓ Manual setting

Set from wired remote controller? → No → Setting from central remote controller

Yes ↓ Setting from wired remote controller

Method③

Automatic setting from central remote controller (TCB-SC642TLE2, BMS-1280TLE/FTLE)
(1) Press the ✐ and ZONE buttons at the same time for more than 4 sec.
(2) Select CODE No. C2 by pressing the setup temp. ▲ ▼ buttons.
(3) Press the SET button.
 ("C2" changes from flashing to ON state and automatic setting will start.)
(4) Finishing automatic setting, SETTING changes from flashing to OFF.
(5) Press the ✐ button.
(6) SETTING flashes for a few minutes, then OFF.

Method②

Manual setting from central remote controller (TCB-SC642TLE2, BMS-1280TLE/FTLE)
(1) Press the ✐ and ZONE buttons at the same time for more than 4 sec.
(2) Set CODE No. to C1 using setup temp. ▲ ▼ buttons.
(3) Press the SET button.
(4) Select the zone and group No. with ZONE and ◄ ► (Group) buttons.
(5) Set the Unit No. (Indoor and line address) with the ✐ and ☐ buttons.
(6) Press the SET button.
(7) Register the other Unit No. in the same way following the steps (4) to (6).
(8) Press the ✐ button.
(9) SETTING flashes for a few minutes, then OFF.
(10) End

Method①

Manual setting from wired remote controller (RBC-AMT21E, RBC-AMT32(31)E, RBC-AMS41E)
(1) Press the ✐ and ✑ buttons at the same time for more than 4 sec.
 (Don't press the UNIT button.)
(2) Set CODE No. to 03 using setup temp. ▲ ▼ buttons.
(3) Set the central control address using timer ▲ ▼ buttons.
(4) Press the SET button to register the address.
 (SETTING indications changes from flashing to ON state.)
(5) Press the ✐ button.
(6) SETTING indications changes from ON state to flashing.
 (approx. 1 minute.)
(7) End

1 by 1 model
{ Digital Inverter
Super Digital Inverter } → No ← VRF system?

Yes ↓

Checking duplication of central control address.
(1) Press the ⟨ ⏻ ⟩ button three times.
 If any duplication is discovered, error code "L20" is displayed.
 { Wired remote controller : Displayed promptly.
 Central remote controller : Max. 4 min. later.

Checking from central remote controller for duplication of the central control address
(1) Press the ✐ and ZONE buttons at the same time for more than 4 sec.
(2) Select CODE No. C3 using setup temp. ▲ ▼ buttons.
(3) Press the SET button.
(4) SETTING indication flashes and the central control address duplicated error check starts.
(5) The check is completed when CODE No. C3 flashes and the SETTING goes off.
(6) If any duplication is discovered, the GROUP No. will flash.
 The central control address is cleared by selecting the data where GROUP No. is flashing and by pressing the CL button.
 Set the correct central control address.

Duplication? → Yes (Duplication is discovered.)

No (No duplication) ↓

End

▲ Central remote controller (TCB-SC642TLE2)

3-3 Address setup procedure (when using DI/SDI only, or using DI/SDI and VRF)

When an outdoor unit and an indoor unit are connected, or when an outdoor unit is connected to each indoor unit respectively in the group operation even if multiple refrigerant lines are provided, the automatic address setup completes with power -ON of the outdoor unit after group construction check (refer to the note below). The operation of the remote controller is not accepted while automatic address works. (Approx.4 to 5 minutes)

CAUTIONS

1. Set up the address after the wiring has been completed.
2. "1:1Model" Connection Interface TCB-PCNT30TLE2 is necessary for DI/SDI for central control.
   Some of Hi-wall Type does not need "1:1Model" Connection Interface. Please refer to the installation manual of each model.
   Connect the central control devices to U3/U4 wires of the central control system.
3. When "1:1Model" Connection Interface is used for the group control or twin system or triple system, the interface must be connected to the Master unit of the indoor unit. (Connection to Sub unit is unavailable).
   One "1:1Model" Connection Interface per one group.
4. In group operation, be sure to turn on power supplies of all the indoor units in group control within 3 minutes. When power supply of the Master unit is not turned on, there is a possibility that the Master unit exchanges with Sub unit. (If Master unit is exchanged, the central control is unavailable.)

Note)
If group construction is abnormal, the automatic address sequence starts automatically.
Normal condition is below.
1. There is no duplicated indoor unit address.
2. There is no invalid indoor unit address.
3. Individual unit and master/sub units are not intermingled.
4. Only a unit for Individual.
5. A master indoor unit and 1 or more sub indoor units for group.

Address setting flow

Install "1:1Model" Connection Interface in the Master/Individual indoor unit

↓

Completion of wiring work
(Refer to 3-3-1, 2-4-2)

↓

Power – ON

↓

Group Construction check

— normal →

abnormal ↓

3 minutes elapse* —— No** →

yes ↓

Automatic address setting (1 minutes) —— finish →

Normal Group Construction

1. No duplicated indoor unit address.
2. No invalid indoor unit address.
3. Not intermingled (Individual unit and master/sub)
4. Only a unit for Individual
5. A master indoor unit and 1 or more sub indoor units for group.

* In group operation, be sure to turn on power supplies of all the indoor units in group control within 3 minutes.

** If judged as some abnormal conditions, it does not move to address setting.

VRF Address set up
Refer to 3-2

Initial communication → Remote controller communication → Regular communication (Note)

↓

Indoor address check   Refer to 3-2-4

↓

Manual address change of line address
(Refer to 3-2-5, 3-3-2, 3-3-3)

In case of mixed VRF, set non-duplicated line address in the whole system (up to 30).

↓

Manual address change of group address
(Refer to 3-2-5, 3-3-2, 3-3-3)

In case of group control, twin, triple, one Master shall be set in a group. Also, the indoor unit with "1:1Model" Connection Interface shall be the Master.

↓

Set up the terminator resister on "1:1Model" Connection Interface SW01
(Refer to 3-3-3)

In case that "1:1Model" Connection Interface is used only in DI/SDI system, set up the terminator to only adapter connected to the indoor unit in the line with the least line address No. by SW01-1 ON, SW01-2 OFF.

In case that mixed with VRF, SW01-1/-2 are OFF (no terminator) (Because VRF side has a terminator).

If setting for VRF is finished, the manual setting for DI/SDI is recommended.

↓

Central control address setting
(refer to 3-2-9) only in case central controller requires this address

If new Central control address setting is required for both VRF and DI/SDI, be carefull of the requirement at 3-2-9 and set up.

▨ Only when group controlling in DI/SDI with more than two refrigerant systems

☐ Only when central controlling

Note) In a group operation, if the indoor unit which was fed power after judgment of automatic address can not receive regular communication within 120 sec after power on, it reboots.

3-3-1　Basic configuration

The basic DI/SDI connection configuration of each type of model is shown below.

Single　Twin　　　　Triple　　　　　　Double Twin

<Terminology >
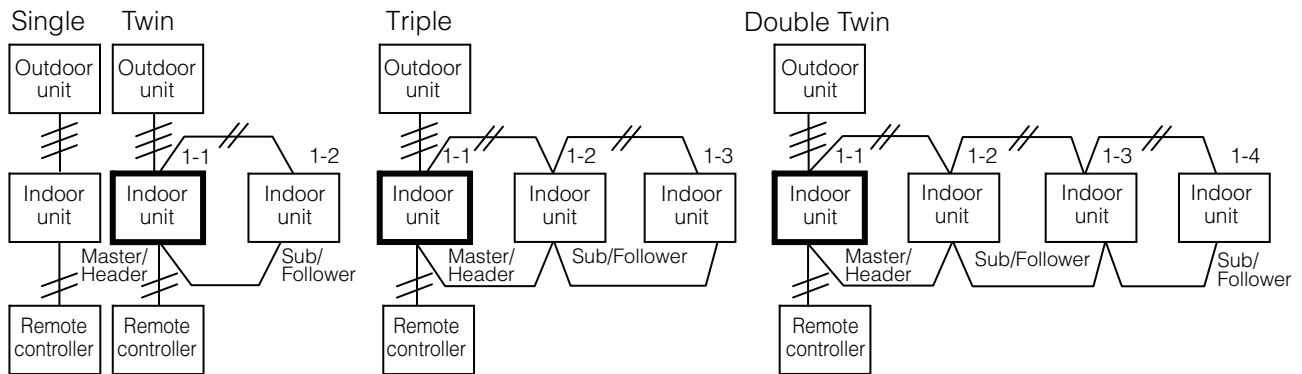
For 3-3-1, the terms for explaining DI/SDI used in this chapter are redefined here.

Indoor Unit No.　N-n =outdoor unit line address N (Max30) –indoor unit address n (max64)
Group address　　0=single (not group control)
　　　　　　　　　1=Master unit in group control
　　　　　　　　　2=sub unit in group control

Master unit:
The representative of multiple indoor units in group operation sends/receives signal to/from the remote controllers and sub indoor units. It has no relation with an indoor unit which communicates serially with the outdoor units. Also this unit communicates with the central controller. The operation mode and setup temperature range are reflected on the remote controller LCD. (Except air direction adjustment of louver)

Sub unit:
Indoor units other than master unit in group operation. Basically, sub units do not send/receive signals to/from the remote controller.

Header unit (Representative unit) (Master twin):
This unit communicates with the indoor unit (follower) which serial-communicates with the outdoor units and sends/receives signal (command from compressor) to/from the outdoor units as the representative of the cycle control in the outdoor units of the identical line address within the minimum unit which confugures one of the refrigerating cycles of twin.

Follower unit (Subordinate unit) (Sub twin):
Indoor units excluding the header unit in Twin. This unit communicates with Header indoor unit in the identical line address and performs control synchronized with Header unit. This unit does not perform the signal send /receive operation with the outdoor units. No judgement for serial signal error.

Connection examples are shown below. Refer to 3-3-3 when the central controller is connected.

(Example of 2-lines cabling)
(Solid line: Cabling, Broken line: Refrigerant pipe)

Line address → 1
Indoor unit address → 1
Group address → 1
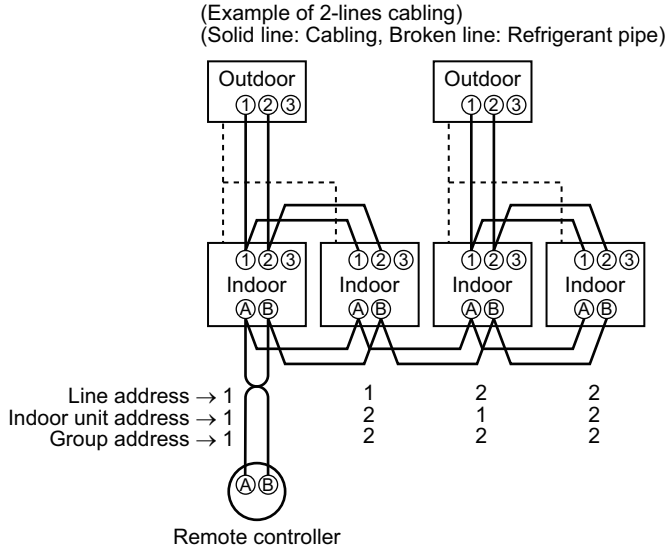
Remote controller

For the above example, perform setting by connecting singly the wired remote controller without remote controller inter-unit cable.

Group address
  Individual   : 0000
  Master unit : 0001 } In case of group control
  Sub unit   : 0002

3-3-2 Address re-setup for group control

After turning on the power and finishing automatic address setting, check the Indoor Unit No using the wired remote controller (refer to 3-2-4). If the line address is not unified in the devices in a refrigerant line, unify the line address using the wired remote controller. If group control is used, assign the group address "1" to any one of the indoor units and "2" to the rest of the units (refer to 3-2-3 and 3-2-5). Confirm that each indoor unit in a group has a unique Indoor Unit No (E08 error is not indicated on the wired remote controller).

1. Standard configuration (One outdoor unit)

In this case, address setting can be made by using auto addressing.
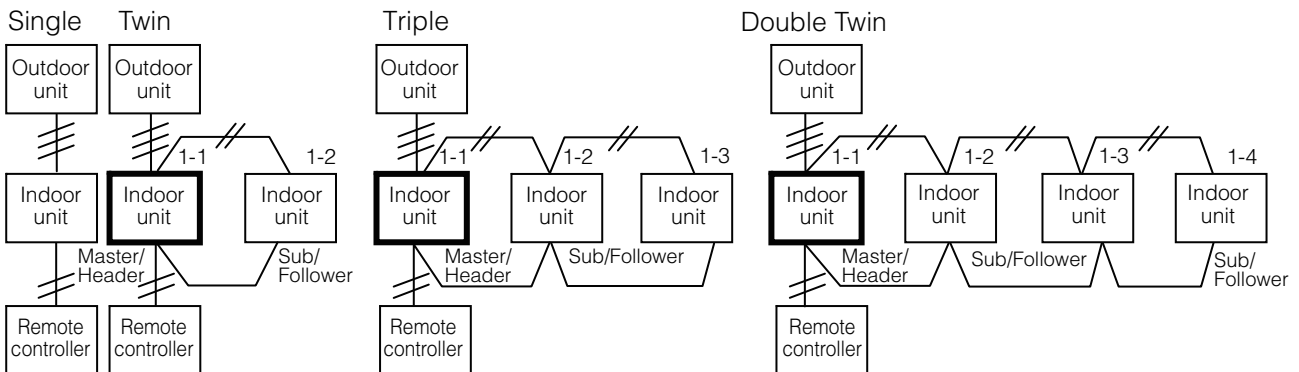
2. Group configuration (single only)

In this case, address setting can be made by using auto addressing.
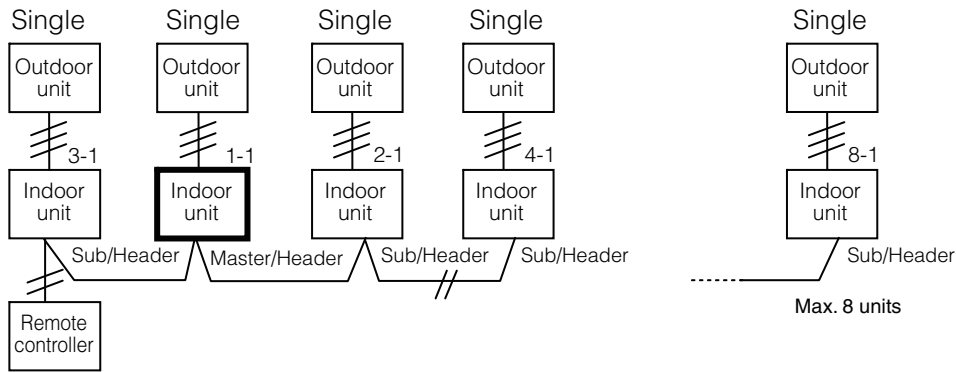
3. Multiple Group configuration (combination of single/twin/triple)

In this case, manual re-addressing is required.

Example of after Automatic address setting
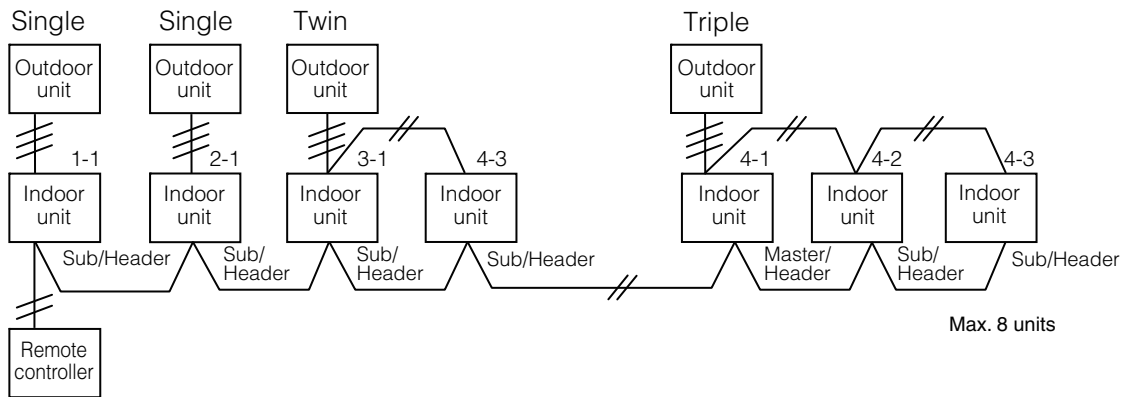
Change the setting manually for correct operation
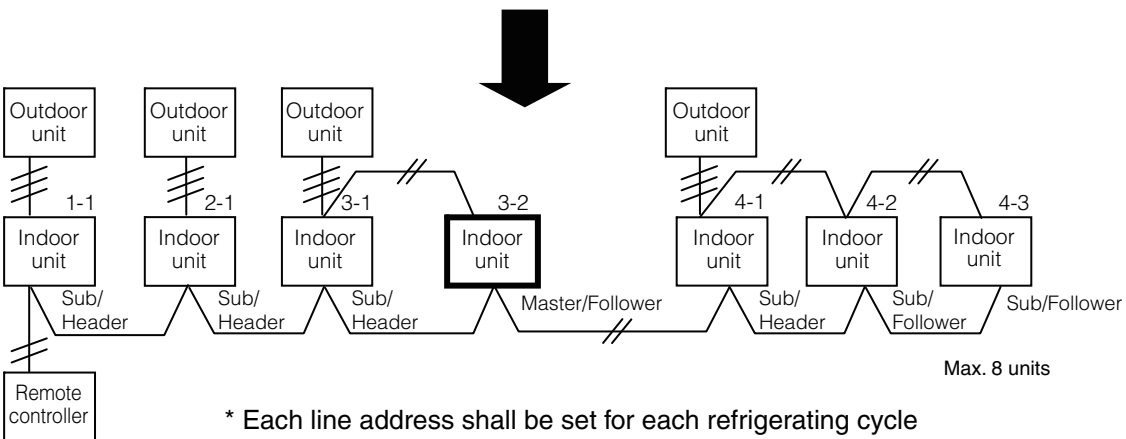
* Each line address shall be set for each refrigerating cycle
* Mater address shall be set to one indoor unit in a group.
* Max. 8 indoor units in a group.

3-3-3　Connection and Address re-setup example for central control

POINT 1
When controlling the super-digital inverter and the digital inverter, the adaptor named "1:1 model" connection interface (TCB-PCNT30TLE2) is necessary.

"1:1Model" Connection Interface TCB-PCNT30TLE2
SDI series 4 4-way discharge cassette type, etc. need metal case TCB-PX30MUE additionally for fixing. Some of Hi-wall Type does not need "1:1Model" Connection Interface. Please refer to the installation manual of each model.
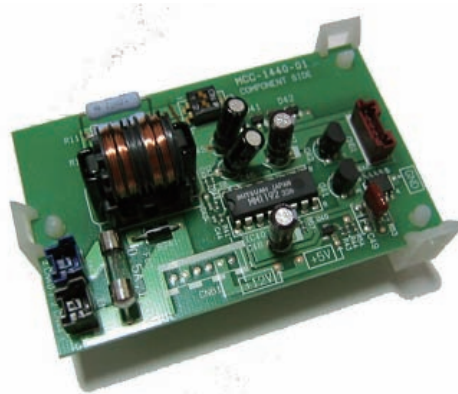
85 x 52mm

1.　Cabling connection of control wiring

Attach an adaptor per 1 group in the group control operation (including individual control).
Connect the adaptor to the Master indoor unit in the group control. (For details, see *POINT 3*.)
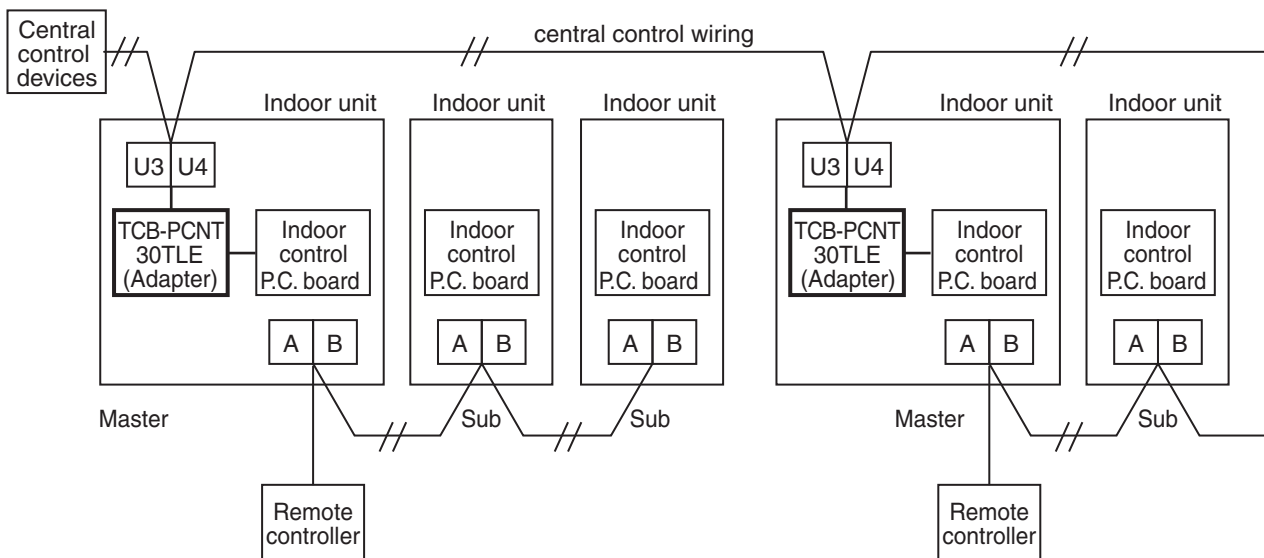
A central control connection example of a system where both VRF and DI/SDI are used is shown below. The VRF and DI/SDI subsystems are connected through the central control wiring and to the central control devices.
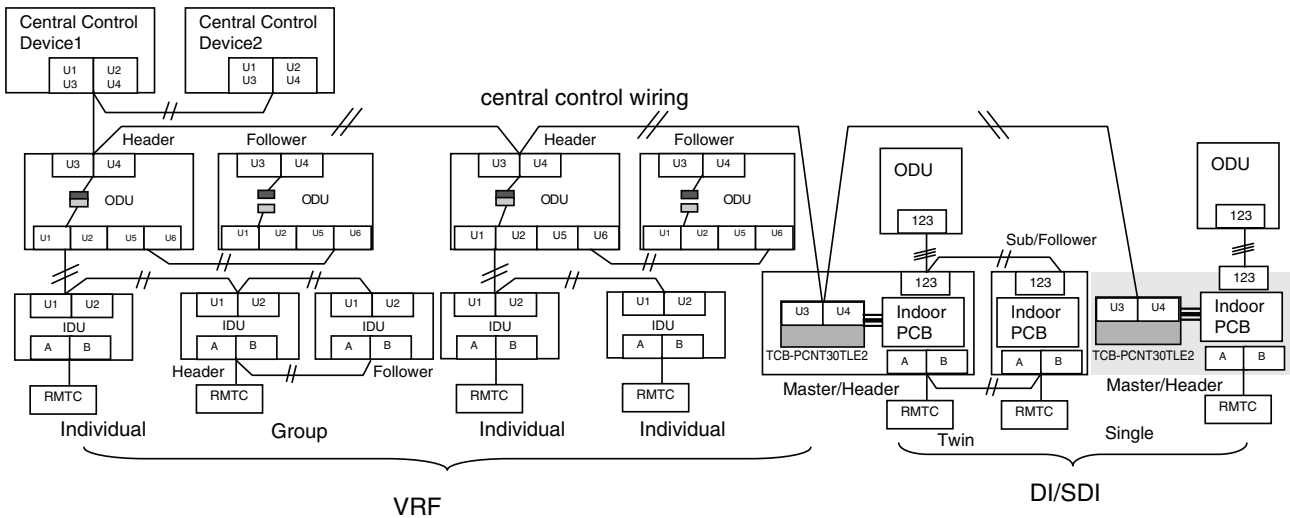
2. Cabling connection diagram with indoor control P.C. board

• For details, refer to Installation Manual.

Activate the terminator by setting SW01 on TCB-PCNT30TLE.
Termination is required only when a system consists of DI/SDI types of units only. Activate the terminator on the unit which has the smallest line address only.
In a system in which both VRF units and DI/SDI units are used, termination is not required.
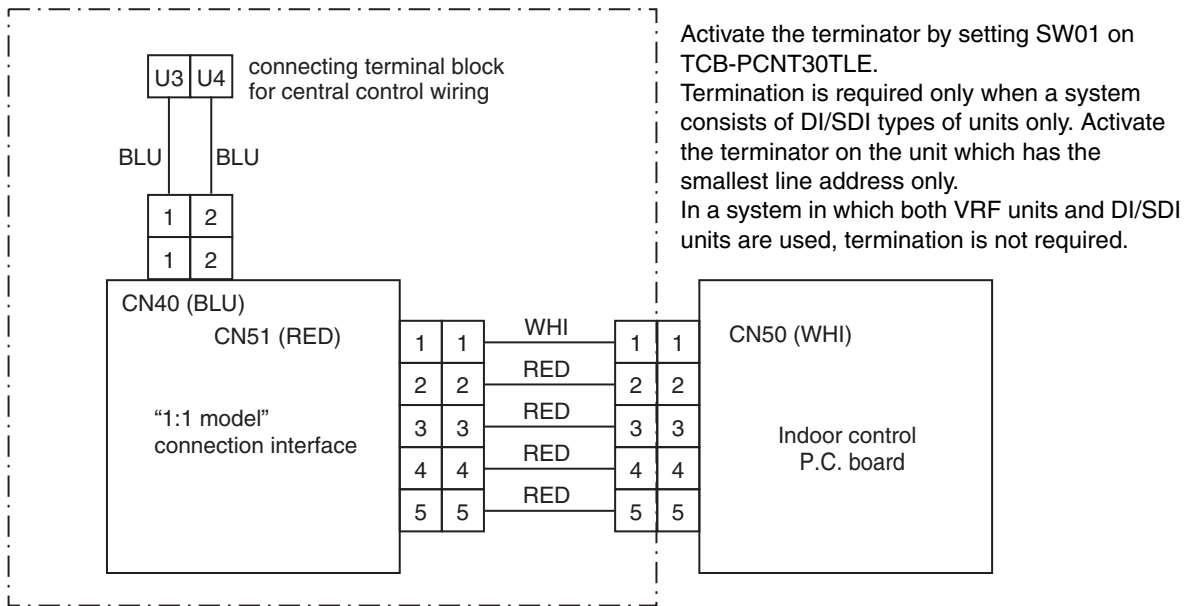
• Parts included in the single-point chain line are optional accessories.
• There is no polarity on the cables connected to U3 and U4 terminals.

POINT 2

After automatic address setup, it is necessary to change the line address from the wired remote controller for each system. (Manual re-setup)

Reason : After automatic address setup, all of the line addresses will become "1" except in a group control and then a duplicated address error "E08" will be outputted.

System A		
After automatic address		
Line address	1	2
Indoor unit address	1	1
Group address	1	2

System B		
1	2	3
1	1	1
1	2	2

System C
1
1
0

After change of manual address

Line address	1	2
Indoor unit address	1	1
Group address	1	2

No change

3	**4**	**5**
1	1	1
1	2	2

Need to change line address

6
1
0

Need to change line address

* A wired remote controller (RBC-AMT21E or RBC-AMT32(31)E, RBC-AMS41E) is required for address change.

* Set up a line address for each refrigerant system.
* Set up a line address so that it is not duplicated with other systems.
  (If the central control is conducted with VRF systems, set up a line address so that it is not also duplicated with line address of the VRF systems.)
* When performing a central control of over 30 systems, the address setup method needs to be changed.
  (including a VRF system)

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POINT 3

When the central control is performed for indoor units using twin control in a group operation, it may be required to change the group address. (Adapter is attached to the Master indoor unit.)

Reason : The central control device communicates with each individual indoor unit, the Master indoor unit of the group control and the Master indoor unit of the twin control. However, as the address is automatically set up, which unit will become the Master unit is indefinite. Therefore if the unit attached with adapter does not become the Master indoor unit, the central control function will become unavailable.
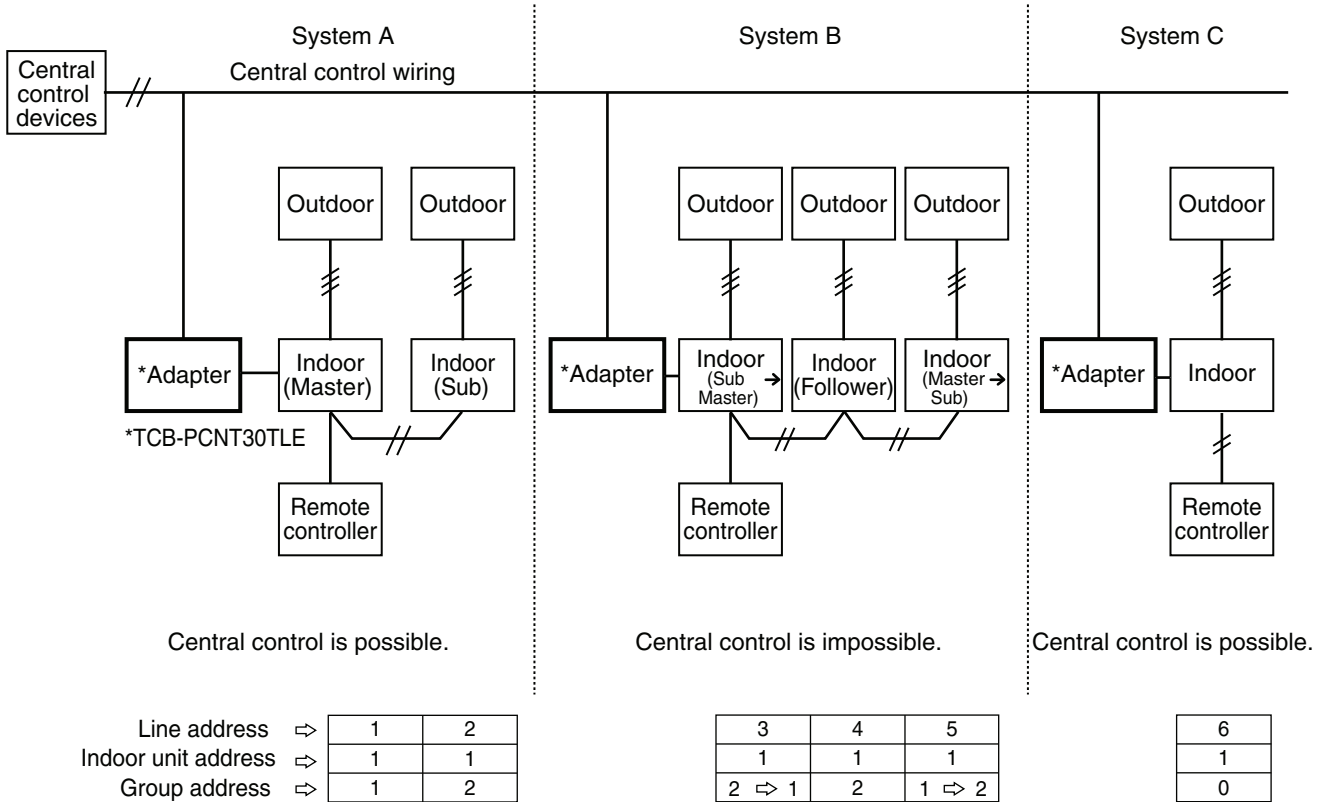
		System A			System B		System C
Line address	⇨	1	2	3	4	5	6
Indoor unit address	⇨	1	1	1	1	1	1
Group address	⇨	1	2	2 ⇨ 1	2	1 ⇨ 2	0

System A: Central control is possible.
System B: Central control is impossible.
System C: Central control is possible.

*TCB-PCNT30TLE

> *** A wired remote controller (RBC-AMT21E, RBC-AMT32(31)E, RBC-AMS41E) is required for address change.**

How to check the group address (Master/Sub indoor unit setup)
* Check the group address after confirming which unit is attached with the adapter.

Procedure When the air conditioner is not in operation

1 Push the ◯(SET) + ◯(CL) + ⦿(TEST) buttons simultaneously for 4 seconds or more.

2 The indoor unit in which the fan is turned on is the header indoor unit.

⬇

> Indoor unit in which the fan is turned on = Indoor unit with the adapter : To **Case 1**
> Indoor unit in which the fan is turned on ≠ Indoor unit with the adapter : To **Case 2**

Case 1

(In the case that the indoor unit in which the fan is turned on and the unit with the adapter are the same)

3 **As the central control is available, push** ^{TEST}⌖ **button. (Setup is determined.)**

When pushing the ^{TEST}⌖ button, the display disappears and the status returns to the normal stop status.

(The operation on the remote controller is not accepted for approx. 1 minute after the ^{TEST}⌖ button has been pushed.)

If the operation on the remote controller is not accepted for 1 minute or more after the ^{TEST}⌖ button has been pushed, an incorrect address setup is considered.

In this case, automatic address is performed again after approx. 5 minutes or more. Set up the group address again starting from procedure 1.

Case 2

(In the case that the indoor unit in which the fan is turned on and the unit from procedure 1 with the adapter is different)

The central control is unavailable, therefore change the address using the following procedure.

Indoor unit without the adapter : Header indoor unit → Follower indoor unit.

3 **Using the** ^{TEMP.}(▼)(▲) **buttons, select Item code 14.**

4 **Check the setup data is** 0001 **and change the setup data from** 0001 **to** 0002 **using the** ^{TIME}(▼)(▲) **buttons.**

5 **Push the** ^{SET}◯ **button. In this time, the setup has finished if the display changes from flashing to lighting.**

Indoor unit with the adapter : Follower indoor unit → Header indoor unit.

6 **Push the** ^{UNIT}⬭ **button to turn on the fan of the indoor unit attached with the adaptor.**

7 **Using the** ^{TEMP.}(▼)(▲) **buttons, select Item code 14.**

8 **Check the setup data is** 0002 **and change the setup data from** 0002 **to** 0001 **using the** ^{TIME}(▼)(▲) **buttons.**

9 **Push the** ^{SET}◯ **button.**

Confirmation of re-set up

In this time, the setup has finished if the display changes from flashing to lighting.

10 **When the above setup operation has finished, push the** ^{UNIT}⬭ **button to select the indoor unit of which the setup has been changed. Using the** ^{TEMP.}(▼)(▲) **buttons, specify the Item code 14 and check the changed contents.**

Pushing the ^{CL}◯ button enables you to clear the setup contents up to this point.

(In this case, repeat the procedure from **1**.)

11 **Push the** ^{TEST}⌖ **button. (Setup is determined.)**

When pushing the ^{TEST}⌖ button, the display disappears and the status returns to the normal stop status.

(The operation on the remote controller is not accepted for approx. 1 minute after the ^{TEST}⌖ button has been pushed.)

If the operation on the remote controller is not accepted for 1 minute or more after the ^{TEST}⌖ button has been pushed, an incorrect address setup is considered.

In this case, automatic address is performed again after approx. 5 minutes or more. Set up the group address again starting from procedure **1**.

3-3-4 Address change example of mixed with VRF

1 In case of central control of up to 29 refrigerant systems (including No. of VRF systems)
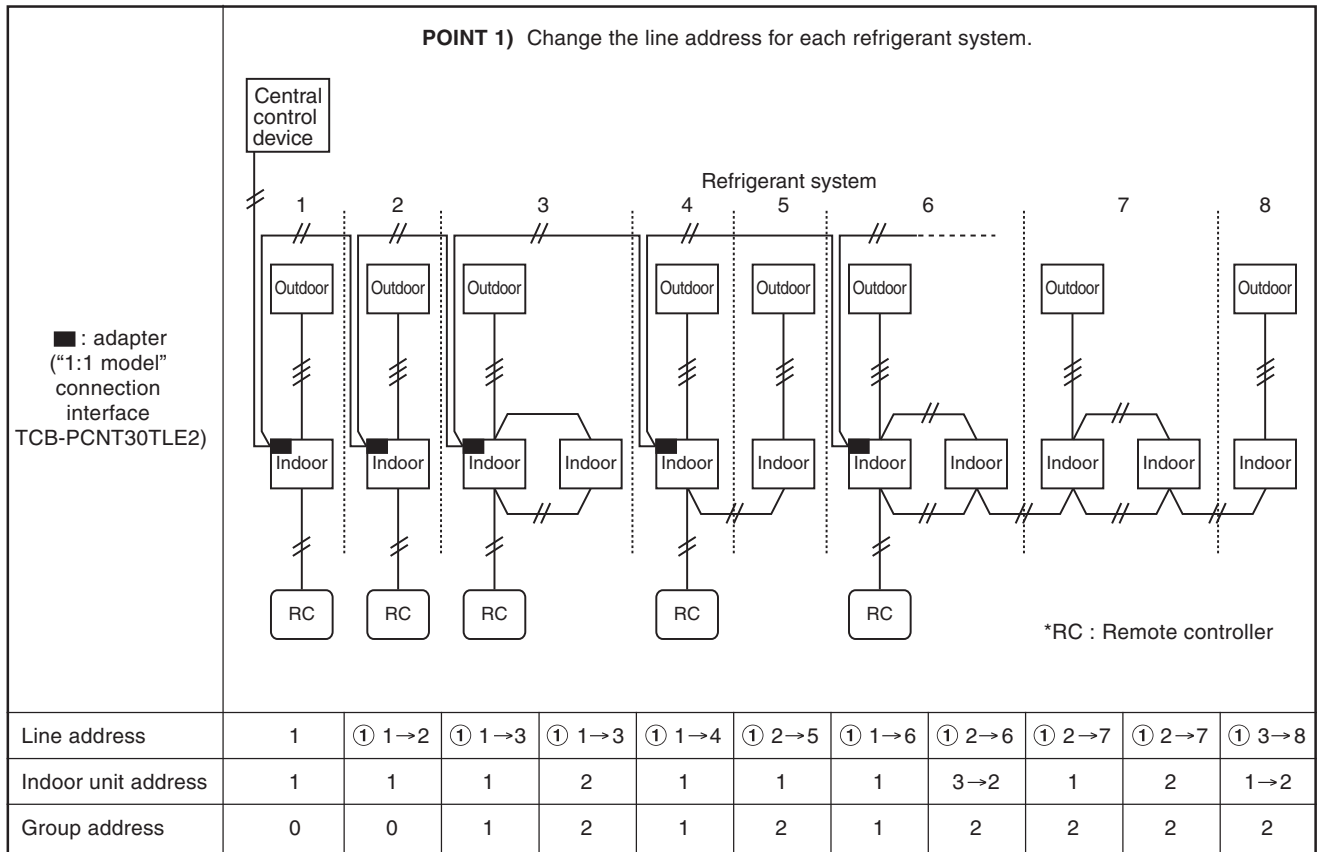
POINT 1) Change the line address for each refrigerant system.

■ : adapter ("1:1 model" connection interface TCB-PCNT30TLE2)

*RC : Remote controller

	1	2	3		4	5	6		7		8
Line address	1	① 1→2	① 1→3	① 1→3	① 1→4	① 2→5	① 1→6	① 2→6	① 2→7	① 2→7	① 3→8
Indoor unit address	1	1	1	2	1	1	1	3→2	1	2	1→2
Group address	0	0	1	2	1	2	1	2	2	2	2

Change the line address on the wired remote controller after automatic address setting.

Automatic address is impossible·
Set up again the address manually on the wired remote controller.

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2. In case of central control over 30 refrigerant systems (including No. of VRF systems if any)

 * Change operation is same to the above 1 up to 29th refrigerant system.
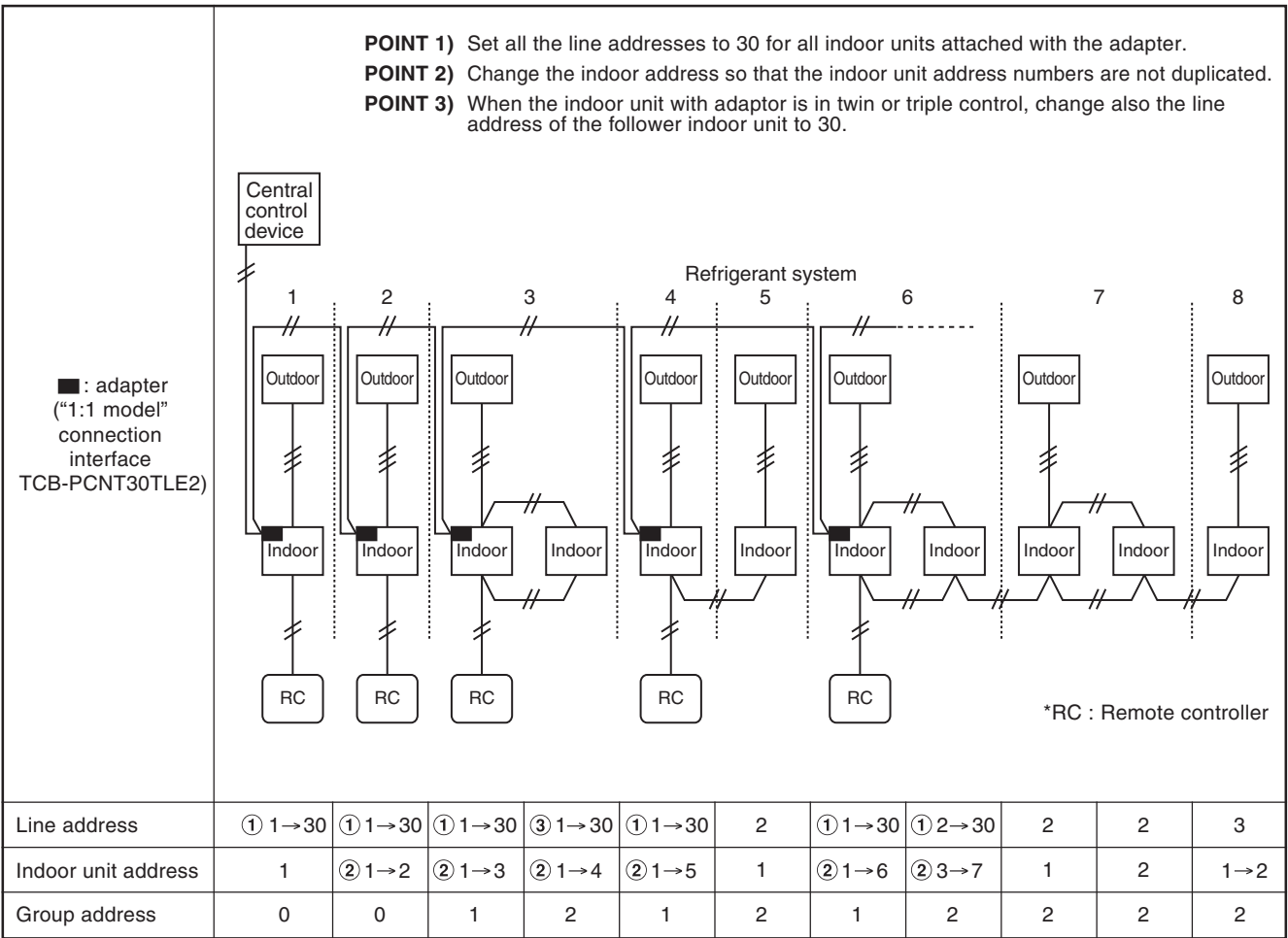
POINT 1) Set all the line addresses to 30 for all indoor units attached with the adapter.

POINT 2) Change the indoor address so that the indoor unit address numbers are not duplicated.

POINT 3) When the indoor unit with adaptor is in twin or triple control, change also the line address of the follower indoor unit to 30.

■ : adapter ("1:1 model" connection interface TCB-PCNT30TLE2)

*RC : Remote controller

	1	2	3		4	5	6		7		8
Line address	① 1→30	① 1→30	① 1→30	③ 1→30	① 1→30	2	① 1→30	① 2→30	2	2	3
Indoor unit address	1	② 1→2	② 1→3	② 1→4	② 1→5	1	② 1→6	② 3→7	1	2	1→2
Group address	0	0	1	2	1	2	1	2	2	2	2

Change the line address on the wired remote controller after automatic address setting.

Automatic address is impossible. Set up again the address manually on the wired remote controller.

Part 2

4

DETAILS OF APPLICATION CONTROL AND DEVICES

4 DETAILS OF APPLICATION CONTROL AND DEVICES

4-1 Remote controller

4-1-1 Wired remote controller (RBC-AMT32(31)E)

Installation Manual

Accessory parts

No.	Part Name	Q'ty
1	Remote controller	1
2	Screw M4 x 20	2

No.	Part Name	Q'ty
3	Wood screw	2
4	Installation Manual	1

Remote controller installation requirements

Installation place

Install the remote controller 1 - 1.5m above floor level (average room temperature area).
Do not install the remote controller in a place exposed to direct sunlight or outside air (such as a window, etc.).
Do not install the remote controller where ventilation is poor.
Do not install the remote controller in a freezing or refrigerated area - the remote controller is not water or splash-proof.
Install the remote controller in a vertical position.

How to select the room temperature sensor

Two room temperature sensors are installed: one in the indoor unit; the other in the remote controller. Only one sensor (usually the indoor unit's) can be active at any one time.

To select the sensor in the remote controller, perform the following steps.

1. Push (✎) + temperature setup button [▼] for 4 seconds or more.

   NOTE: The unit number displayed the first time is the indoor unit address of the master unit in the group control.
   NOTE: Do not press the [UNIT] button.

2. Using the temperature setup buttons [▼]/[▲] , specify the item code 32 .

3. Using the timer buttons [▼]/[▲] , change the setting from 0000 to 0001 .

4. Push the [SET] button. (The display should stop flashing and become constantly lit.)

5. Push the (✎) button.
   The status returns to the operation stop status and ⬜ is displayed in the LCD.

NOTE 1: When using two remote controllers, the room temperature sensor selection can be set either from the header/follower remote controller. Only the header remote controller can act as a remote control sensor. When using two remote controllers, the temperature can be set from either the header or follower remote controller.
NOTE 2: In group control, the remote control sensor does not work if the group address is not set to the indoor unit of the master unit.
NOTE 3: When using the remote sensor and the remote controller together, do not use the remote control sensor of the remote controller.

How to install the remote controller

NOTE 1: The remote controller wire should not be bundled with other wires (mains, etc.), or installed with other wires in the same conduit, as malfunction may result.
NOTE 2: Install the remote controller away from sources of electrical interference and electromagnetic fields.
NOTE 3: If electrical interference is unavoidable, countermeasures such as appropriate filtering should be employed.

Wiring slot
Wood screws
Remote controller Cover
Lower case (Rear case)
<Remote controller (Rear)>

1. For removal of the remote controller's lower case (rear case), insert the tip of a flat head screw driver, etc., into the two openings at the bottom of the remote controller to open the lower case.
2. Fix the remote controller's rear case by wood screws (2 pcs.). Do not over tighten, as it may damage the rear case.
3. Connect the wires from the indoor unit to the remote controller terminal block (Refer to "How to wire the remote controller")
   Connect the wires of the remote controller following the terminal numbering convention of the indoor unit to prevent miswiring. (Do not apply 230V AC mains voltage to the remote controller as it will be damaged).

How to wire the remote controller

Connection diagram

Terminal block for remote controller wiring in indoor unit

Remote controller wiring (procured on site)

A ⊕
B ⊕

* Use 0.5 to 2mm² wire.
* Can not use the closed end wire joint.

A
B

Remote controller
Remote controller terminal block

* Terminals A and B are non-polar.

Multiple remote controller installation requirements

In a dual remote controller system, one or more units are operated by multiple remote controllers. (A maximum of two remote controllers can be set.)

Remote controller (inside, rear)

Follower remote controller
Header remote controller

Header remote controller
1 2
DIP switch

Follower remote controller
1 2
DIP switch

Be sure to set switch 2 to the lower position.
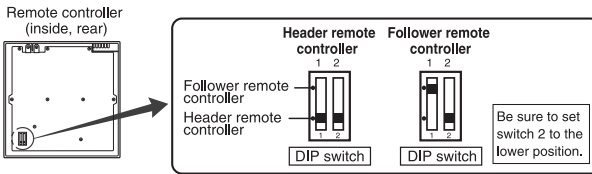
How to install

For a dual remote controller system, install the remote controllers in the following way.

1. Set one of remote controllers as the header remote controller. (The default setting is 'Header.')
2. Set the DIP switch on all other remote controller P.C. boards to Sub (to enable them as follower remote controllers).

Basic wiring diagram
NOTE: Terminals A and B are non-polar

Operating one indoor unit from remote controllers installed in two different locations.
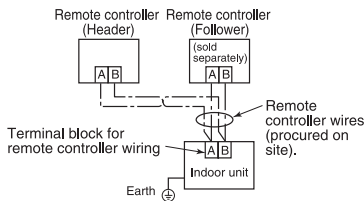
Remote controller (Header)
A B

Remote controller (Follower)
(sold separately)
A B

Terminal block for remote controller wiring

A B
Indoor unit

Remote controller wires (procured on site).

Earth ⊕

Operating a group control of multiple indoor units from remote controllers installed in two different locations.
* Header and Follower remote controllers are operable even if they are connected to any indoor unit.

Remote controller (Header)
A B

Remote controller inter-unit wires for group control
(procured on site)

Remote controller (Follower)
(sold separately)
A B

Terminal block for remote controller wire

A B
Indoor unit No.1
Earth

A B
Indoor unit No.2
Earth

A B
Indoor unit No.3
Earth

A B
Indoor unit No.8
Earth
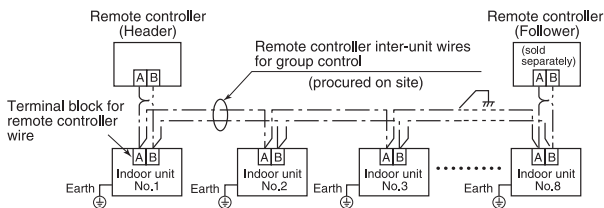
Remote controller test run setup

1. Push and hold the (🔧) button for 4 seconds or more until "TEST" appears in the LCD display, then press the [⏻ON/OFF] button.
   "TEST" appears in LCD display during the test run.
   Temperature adjustment is not possible while "TEST" is displayed. The test run applies considerable load on the machine; therefore, it is recommended not to use the test mode beyond necessity.

2. The test mode should be used in either HEAT or COOL mode.
   NOTE: The outdoor unit will not operate for approx. 3 minutes after power up, or the operation will stop.

3. Be sure the "TEST" indication in the LCD display has disappeared by pushing the (🔧) button again after exiting the test mode. (The remote controller has a 60-minute off timer function to prevent continuous test run).

Requirement

When a remote controller is used for the first time, initial operation after power on will take a few moments. This is not a malfunction.

<Initial power on period>
Allow **approx. 5 minutes** for the remote controller to operate.

| Power on | → | "SETTING" flashing | Approx. 5 minutes → | "SETTING" off | → | Complete |
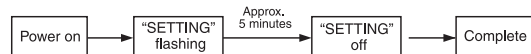
<Usual power on period after the second time>
Allow **approx. 1 minute** for the remote controller to operate.

| Power on | → | "SETTING" flashing | Approx. 1 minute → | "SETTING" off | → | Complete |

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Wired remote controller (RBC-AMT31E)

Operation manual

Parts Name of Remote Controller

Display section

In the display example, all indicators are displayed for purpose of explanation. In reality only, only the selected contents are indicated.

• When turning on the breaker for the first time, [**SET DATA**] flashes on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. After the [**SET DATA**] display has disappeared, you may use the remote controller.

Display section

Operation section

1 SET DATA display
Displayed during setup of the timer.

2 Operation mode select display
The selected operation mode is displayed.
Ⓐ [AUTO] mode is displayed on heat recovery type only.

3 CHECK display
Displayed while the protective device operates or a fault occurs.

4 Timer time display
Time of the timer is displayed. (When a trouble occurs, the check code is displayed.)

5 Timer SETIN setup display
When pushing the Timer SETIN button, the display on the timer is selected in order of [OFF] → [OFF] repeat OFF timer →[ON] → No display.

6 Filter display
If "FILTER" is displayed, clean the air filter.

7 TEST run display
Displayed during a test run.

8 Flap position display
(for 4-Way Air Discharge Cassette Type and Under Ceiling Type model only)
Displays flap position.

9 SWING display
Displayed during up/down movement of the flap.

10 Set up temperature display
The selected set up temp. is displayed.

11 Remote controller sensor display
Displayed When the sensor on the remote controller is used.

12 PRE-HEAT display
Displayed when the heating operation starts or defrost operation is carried out.

While this indication is displayed, the indoor fan stops or the mode enters into LOW.

13 Operation ready display
Displayed when cooling operation is unavailable because heating operation is performed.

14 No function display
Displayed if there is no function even if the button is pushed.

15 Air volume select display
The selected air volume mode is displayed.

(AUTO)　　(HIGH)
(MED.)　　(LOW)

In the Concealed Duct High Static Pressure type models, [HIGH] only is displayed for the air speed.

16 Mode select control display
Displayed when pushing "Operation mode select" button while the operation mode is fixed to heating or cooling by the system manager for the air conditioner.

17 Central control display
Displayed when using the remote controller together with the central remote controller, etc.

If Remote controller is prohibited at the central control side, flashes when operating ON/OFF, MODE, TEMP. buttons and the change is not accepted.

(The contents available to be set up on the remote controller differ according to the central control mode. For details, refer to Owner's Manual of the central control remote controller.)

Operation section

Push each button to select a desired operation.

This remote controller can operate a maximum of 8 indoor units.

- The details of the operation will need to be set up once, afterwards, the air conditioner can be used by pushing the ⏻ ON/OFF button only.

1 Air volume select button

Selects the desired air volume mode.
The Concealed Duct High Static Pressure type models do not have this function.

2 Timer set button

TIMER SET button is used when the timer is set up.

3 Check button

The CHECK button is used for the check operation. During normal operation, do not use this button.

4 Fan button

FAN button is used when a fan which is sold on the market or etc. is connected.

- If ⊘ is displayed on the remote controller when pushing the FAN button, a fan is not connected.

5 Filter reset button

Resets (Erases) "FILTER RESET" display.

6 UNIT and AUTO flap button

UNIT :
If multiple indoor units are operated by only one remote controller, select the units when the air direction is adjusted.
SWING/FIX :
Set up the auto swing and angle of the flap.
- This function is not provided on the Concealed Duct Standard Type, High Static Pressure Type, Floor standing Cabinet Type, of Floor Standing Concealed Type units.

7 Operation lamp

Lamp is lit during the operation. Lamp is off when stopped.

The operation lamp will flash if there a protection device has been operated or a fault has occurred.

8 ⏻ ON/OFF button

When this button is pushed the operation will either start ot stop depending on its operating status at the time the button was pushed.

When the operation has stopped, the operation lamp and all the displays will disappear.

9 Operation select button

Selects the desired operation mode.

10 Set up temperature button

Adjusts the room temperature.
Set the desired set temperature by pushing TEMP. ▼ ▲.

OPTION :

Remote controller sensor

Usually the TEMP. sensor on the indoor unit senses the temperature. The temperature surrounding the remote controller can also be sensed.
For details, contact the dealer from who you have purchased the air conditioner from.

- In the case that one remote controller controls the multiple indoor units, the setup operation is unavailable in group control.

Correct Usage

When you use the air conditioner for the first time or when you change the SET DATA value, follow the procedure below. From the next time, the operation displayed on the remote controller will start by pushing the
⏻ ON/OFF button only.

Preparation

Turn on the main power switch and/or the leakage breaker.

• When the power supply is turned on, a partition line is displayed on the display part of the remote controller.

* After the power supply is turned on, the remote controller will not not accept an operation for approx. 1 minute, this is not a failure.

REQUIREMENT

• While using the air conditioner, operate it only with the ⏻ ON/OFF button without turning off the main power supply or the breaker.

• Do not turn off the breaker while the air conditioner is in use.

• Turn on the breaker 12 hours or more before the air conditioner is due to be operated, if it has not been in use for an extended period of time.

1 Push the ⏻ ON/OFF button.

The operation lamp goes on and the operation starts.

2 Select an operation mode with the "MODE" button.

One push of the button, and the display changes in the order shown on the right.
• This function is not provided on the Concealed Duct High Static Pressure Type.

Cooling only model

DRY → COOL → FAN

Heat-pump model

HEAT → DRY → COOL → FAN
(Dehumidify)

3 Select air volume with "FAN" button.

One push of the button and the display changes in the order shown on the right.

AUTO → HIGH → MED. → LOW

• When air volume is "AUTO", the air volume differs according to the room temperature.

• In DRY mode, "AUTO" is displayed and the air volume is set to LOW.

• In heating operation, if the room temperature is not heated sufficiently with the VOLUME "LOW" operation, select "MED." or "HIGH" operation.

• As the room temperature is measured by the sensor found near the intake port of the indoor unit, the measured temperature value may be different to the actual room temperature, therefore consider this difference when setting the discharge temperature on the air conditioner. (Automatic air speed cannot be selected in FAN mode.)

• Air volume function is not provided to "Concealed Duct High Static Pressure Type" but the air speed "HIGH" symbol will be displayed.

4 Determine the set up temperature by pushing the TEMP. button.

Stop

Push the ⏻ ON/OFF button.

The operation lamp goes off, and the operation stops.

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Wired remote controller (RBC-AMT32E)
Operation manual
Parts Name of Remote Controller

■ Display section

In the display example, all indicators are displayed for the explanation. In reality only, the selected contents are indicated.

- When turning on the main power switch and leak breaker at the first time, **SETTING** flashes on the display part of the remote controller.
- While this display is flashing, the model is being automatically confirmed.
  Accordingly, wait for a while after **SETTING** display has disappeared, and then use the remote controller.

Display section

Operation section
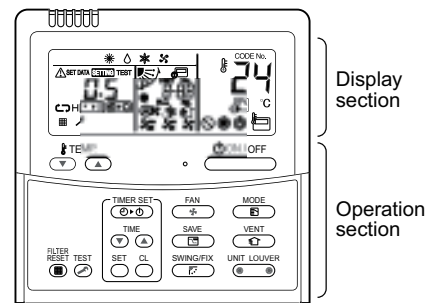
This remote controller can control the operation of Max. 8 indoor units.
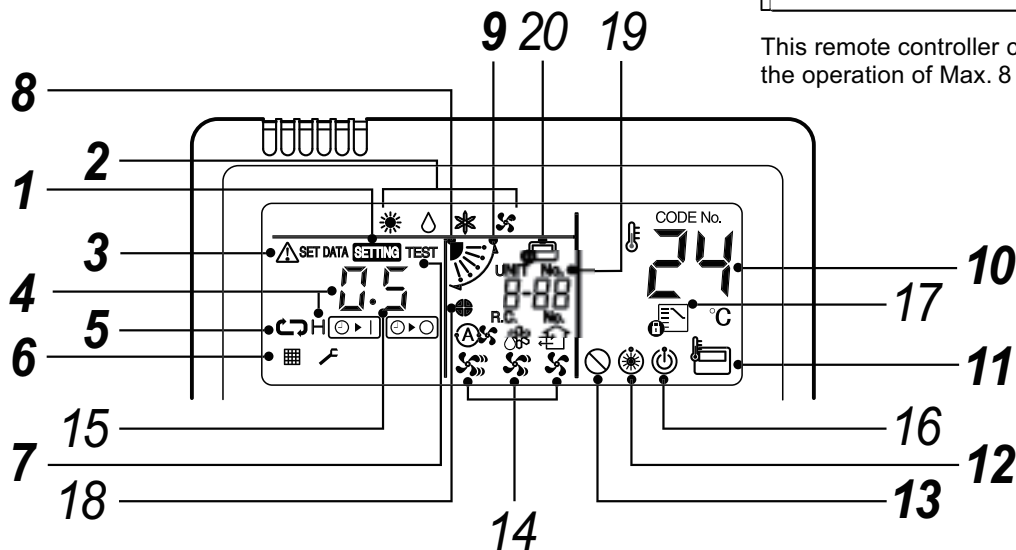
1 SETTING display
Displayed during setup of the timer etc.

2 Operation mode select display
The selected operation mode is displayed.

3 CHECK display
Displayed while the protective device works or a trouble occurs.

4 Timer time display
Time of the timer with H mark is displayed. (When a trouble occurs, the check code is displayed.)

5 Timer SET IN setup display
When pushing the Timer SET IN button, the display of the timer is selected in order of [OFF] ⊙▸○ → ↻ [OFF] repeat OFF timer → [ON] ⊙▸| → No display.

6 Filter display
If "FILTER ▦ " is displayed, clean the air filter.

7 TEST run display
Displayed during a test run.

8 Louver position display
(4-way Air Discharge Cassette, 2-way Air Discharge Cassette, 1-way Air Discharge Cassette, Under Ceiling and High Wall Type only (2H. 3H))
Displays louver position.

9 SWING display
Displayed during up/down movement of the louver.

10 Set up temperature display
The selected set up temp. is displayed.

11 Remote controller sensor display
Displayed while the sensor of the remote controller is used.

12 PRE-HEAT display (Heat-pump model only)
Displayed when the heating operation starts or defrost operation is carried out.

While this indication is displayed, the indoor fan stops or the mode enters in LOW.

13 No function display
Displayed if there is no function even if the button is pushed.
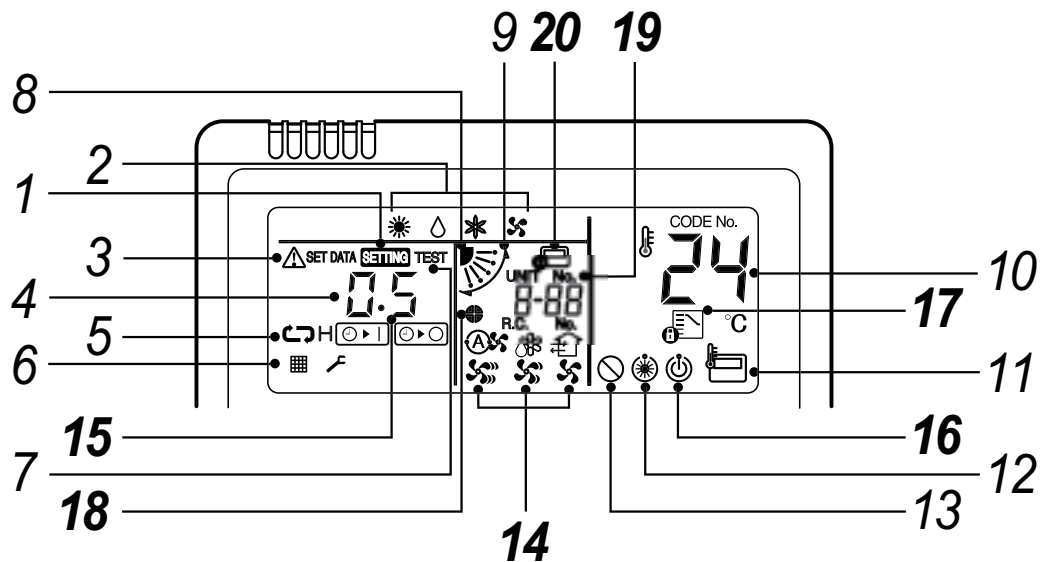
14 Air volume select display

The selected air volume mode is displayed.

(AUTO) (HIGH)

(MED.) (LOW)

15 Louver Number display
(exapmle:01, 02, 03, 04)

16 Operation ready display

Displayed when cooling or heating operation is impossible because the outdoor temperature goes out of the operable range.

17 Mode select control display

Displayed when pushing "Operation mode select button" while the operation mode is fixed to heating or cooling by the system manager of the air conditioner.

18 Louver lock display
(4-way Air Discharge Cassette Type 2H series only)

Displayed when there is a louver-locked unit in the group (including 1 indoor unit by 1 outdoor unit).

19 Unit Number display

Unit number of the indoor unit selected with the unit select button or abnormal indication of the indoor/outdoor unit.

20 Central control display

Displayed when the air conditioner is used under the central control in combination with a central control remote controller.

In case the remote controller is disabled by the central control system, flashes.

The button operation is not accepted.
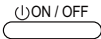
Even when you push ON/OFF, MODE, or TEMP. button, the button operation is not accepted.
(Settings made by the remote controller vary with the central control mode. For details, refer to the Owner's Manual of the central control remote controller.)

■ Operation section

Push each button to select a desired operation.

• The details of the operation needs to be set up once, afterward, the air conditioner can be used by pushing ⏻ ON / OFF button only.
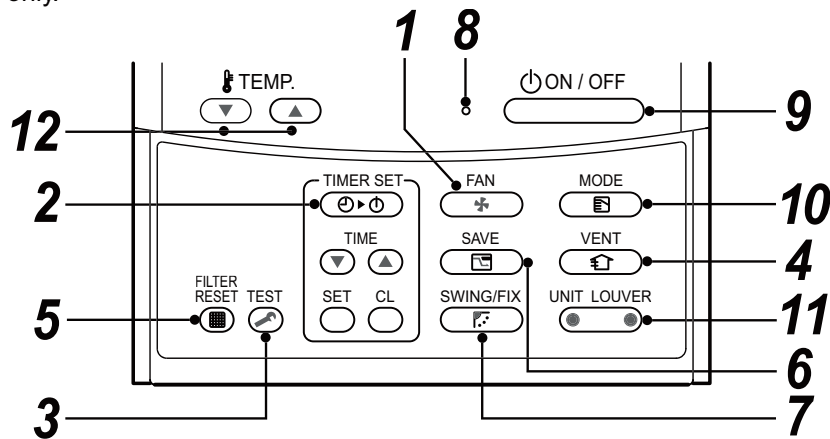
1 ❄ FAN **button (Air volume select button)**

Selects the desired air volume mode.

2 ⏲ TIMER SET **button (Timer set button)**

TIMER SET button is used when the timer is set up.

3 🔧 TEST **button (Check button)**

The CHECK button is used for the check operation.

During normal operation, do not use this button.

4 ⬆ VENT **button (Ventilation button)**

Ventilation button is used when a fan which is sold on the market is connected.

• If "No function ⃠ " is displayed on the remote controller when pushing the Ventilation button, a fan is not connected.

5 ▦ FILTER RESET **button (Filter reset button)**

Resets (Erases) " ▦ FILTER" display.

6 🗐 SAVE **button (Power save operation)**

7 ⬚ SWING/FIX **button (Swing/Wind direction button)**

Selects automatic swing or setting the louver direction.

• This function is not provided to Concealed Duct Standard Type, High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, or Slim Duct Type.

8 Operation lamp

Lamp is lit during the operation.

Lamp is off when stopped.

Also it flashes when operating the protection device or abnormal time.

9 ⏻ ON / OFF **button**

When the button is pushed, the operation starts, and it stops by pushing the button again.

When the operation has stopped, the operation lamp and all the displays disappear.

10 🗐 MODE **button (Operation mode select button)**

Selects desired operation mode.

11 ● ● UNIT LOUVER **button (Unit/Louver select button)**

Selects a unit number (left) and louver number (right).

UNIT:

Selects an indoor unit when adjusting wind direction when multiple indoor units are controlled with one remote controller.

LOUVER (4-way Air Discharge Cassette Type 2H series only):

Selects a louver when setting louver lock or wind direction adjustment independently.

12 🌡TEMP. ▼▲ **button (Set up temperature button)**

Adjusts the room temperature.

Set the desired set temperature by pushing 🌡 TEMP. ▼ or 🌡 TEMP. ▲.

OPTION :

Remote controller sensor

Usually the TEMP. sensor of the indoor unit senses the temperature. The temperature on the surrounding of the remote controller can also be sensed.
For details, contact the dealer from which you have purchased the air conditioner.

• In case that one remote controller controls the multiple indoor units, the setup operation is unavailable in group control.

Correct Usage

• When you use the air conditioner for the first time or when you change the SET DATA value, follow the procedure below. From the next time, the operation displayed on the remote controller will start by pushing the ⏻ON / OFF button only.

■ Preparation

Turn on the main power switch and/or the leakage breaker.

• When the power supply is turned on, a partition line is displayed on the display part of the remote controller.

∗ After the power supply is turned on, the remote controller does not accept an operation for approx. 1 minute, but it is not a failure.

REQUIREMENT

• While using the air conditioner, operate it only with ⏻ON / OFF button without turning off the main power switch and the breaker.

• When you use the air conditioner after it has not been used for a long period, turn on the power switch at least 12 hours before starting operation.
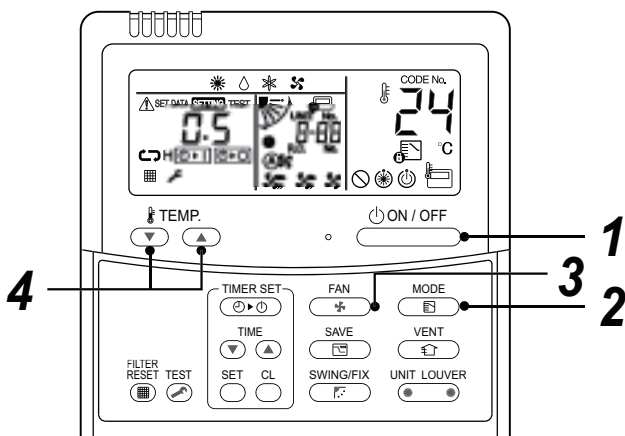
Start

1 Push ⏻ON / OFF button.

The operation lamp goes on, and the operation starts.

2 Select an operation mode with the "MODE ▣" button.

One push of the button, and the display changes in the order shown as follows.

• "◊ DRY mode" function is not provided to Concealed Duct High Static Pressure Type.

Cooling only model

DRY → COOL → FAN

Heat-pump model

HEAT → DRY → COOL → FAN
(Dehumidify)

3 Select air volume with " FAN ❈ " button.

One push of the button, and the display changes in the order shown as follows.

AUTO → HIGH → MED. → LOW

• When air volume is " AUTO", air volume differs according to the room temperature.

• In ◊ DRY mode, " AUTO" is displayed and the air volume is LOW.

• In heating operation, if the room temperature is not heated sufficiently with VOLUME " LOW" operation, select " MED." or " HIGH" operation.

• The temperature sensor senses temperature near the air inlet of the indoor unit, which differs from the room temperature depending on the installation condition.

A value of setting temperature is the measure of room temperature.
(" AUTO" is not selectable in the FAN mode.)

• Air volume of function is not provided to "Concealed Duct High Static Pressure Type" but air speed " HIGH" only is displayed.

4 Determine the set up temperature by pushing the "TEMP. ▽ " or "TEMP. △ " button.

Stop

Push ⏻ON / OFF button.

The operation lamp goes off, and the operation stops.

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[In case of cooling]

• Start the cooling operation after approx. 1 minute.

[In case of heating (For Heat-pump model only)]

• The heating operation mode is selected in accordance with the room temperature and operation starts after approximately 3 to 5 minutes.
• After the heating operation has stopped, FAN operation may continue for approx. 30 seconds.
• When the room temperature reaches the set temperature, the super low wind is discharged and the air volume decreases excessively.
• During defrost operation, the fan stops so that cool air is not discharged. (" ❄ PRE-HEAT" is displayed.)

NOTE

When restarting the operation after stop

• When restarting the operation immediately after stop, the air conditioner does not operate for approx. 3 minutes to protect the machine.

Adjustment of Wind Direction

For best cooling and heating performance, adjust the louvers (adjustment of up/down wind direction) appropriately.

⚠ CAUTION

• If cooling operation is performed with downward air outlet, dew may fall on surface of the cabinet or the horizontal louver resulted in dripping.
• If heating operation is performed with horizontal air outlet, unevenness of temperature may increase in the room.
• Do not move the horizontal louver directly with hands; otherwise a trouble is caused.
  Select direction of the horizontal louver using $\overset{\text{SWING/FIX}}{\boxed{\mathbb{P}}}$ switch on the remote controller.
  The horizontal louver does not stop immediately even if the switch is pushed.
  Adjusting the stop position, push the switch.

◆ For all models

[In Cooling operation]

Use the louvers with horizontal set point.

[In Heating operation (For Heat-pump model only)]

Use the louvers with downward set point.

◆ For Under Ceiling, 1-way Air Discharge Cassette, High Wall Type

[Right / Left air direction adjustment]

To change the air outlet direction to right or left side, set the vertical louver inside of the horizontal louver to the desired direction.

◆ 4-way Air Discharge Cassette Type (1H series), Compact 4-way Type

- When the air conditioner is not operating, the louvers automatically direct downward.
- While the air conditioner is in ready status for heating, the louvers direct upward.

  The swinging operation starts after heating ready status has been cleared, but "SWING ╱ " is displayed on the remote controller even if the status is ready to heating.

◆ 4-way Air Discharge Cassette Type (2H series)

- When the air conditioner is not operating, the louvers automatically close.
- The louvers direct horizontally when heating begins, during defrost operation, or during the minimum operation after reaching the set temperature.

  When you make a swing or air direction setting at this time, the remote controller display varies with the setting, but the louvers stay pointed straight out horizontally.

  When the air conditioner starts heating, the louvers direct to the set direction.
- As the refrigerant recovery control for the outdoor units in the Modular Multi system works even if the outdoor units stop, in some cases, the louver of the stopped indoor unit may open for several minutes.

[In Cooling operation]	**[In Heating operation (For Heat-pump model only)]**
Use the louvers with horizontal set point.	Use the louvers with downward set point.
For Cooling (Cool)	**For Heating (Heat)**
Direct the louvers horizontally.	Direct the louvers downward.
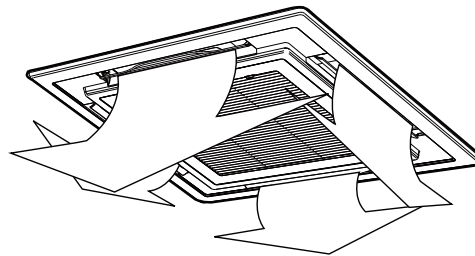
According to the shape or arrangement of the room, the cold air and hot air can be discharged for two directions or three directions. For details, contact the dealer.

◆ **4-way Air Discharge Cassette, 1-way Air Discharge Cassette (2SH series), Under CeilingType**

1 ← (pointing to SWING/FIX and UNIT LOUVER buttons)

Unit select button
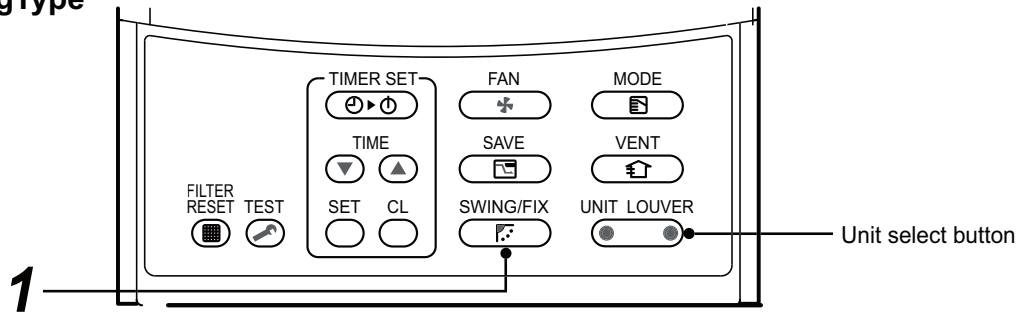
■ **How to set up the wind direction**

1 **Push $\overset{\text{SWING/FIX}}{\boxed{}}$ during operation.**

The wind direction changes for every push of the button.

[In HEAT operation (For Heat-pump model only)]

Direct the louver (adjustment plate of up/down wind direction) downward.

If directing horizontally, hot air may not come to the foot.

Initial setup
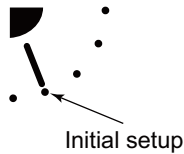
[In COOL/DRY operation]

Direct the louver (adjustment plate of up/down wind direction) horizontally.

If directing it downward, the dew may form on the surface of the air discharge port and may drop down.

Initial setup
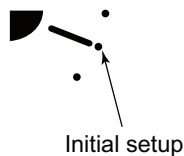
[In FAN operation]

Select a desired wind direction.

Initial setup
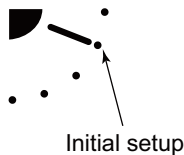
■ **How to start swinging**

1 **Push $\overset{\text{SWING/FIX}}{\boxed{}}$, set the louver (adjustment plate of up/down wind direction) direction to the lowest position, and then push $\overset{\text{SWING/FIX}}{\boxed{}}$ again.**

SWING $\diagup$ is displayed and the up/down wind direction is automatically selected.

Display during swinging

Repeat
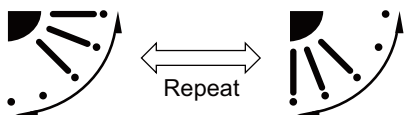
■ **How to stop swinging**

1 **Push $\overset{\text{SWING/FIX}}{\boxed{}}$ at a desired position while the louver is swinging.**

• **When $\overset{\text{SWING/FIX}}{\boxed{}}$ is pushed after that, wind direction can be set again from the highest position.**

∗ However, even if $\overset{\text{SWING/FIX}}{\boxed{}}$ is pushed while the louver is swinging, the louver position is displayed as follows and highest position of the louver may not be selected.

Display when swinging is stopped

FAN/HEAT operation   COOL/DRY operation

In this case, push $\overset{\text{SWING/FIX}}{\boxed{}}$ again two seconds later.

• In COOL/DRY operation, the louver does not stop as it directs downward. If stopping the louver as it directs downward during swing operation, it stops after moving to the third position from the highest position.

Display when stopping the swing

FAN/HEAT operation   COOL/DRY operation

Unit select button

• When multiple indoor units are controlled with one remote controller, wind direction can be set for each indoor unit by selecting individually.

• To set wind direction individually, push $\overset{\text{UNIT LOUVER}}{\boxed{\bullet\quad\bullet}}$ button to display an indoor unit number in the control group. Then set the wind direction of the displayed indoor unit.

• When no indoor unit number is displayed, all indoor units in the control group can be controlled simultaneously.

• Each time you push $\overset{\text{UNIT LOUVER}}{\boxed{\bullet\quad\bullet}}$ button, the display changes as follows:

Unit No. 1-1 ➡ Unit No. 1-2 ➡ Unit No. 1-3

No display ⬅ Unit No. 1-4

◆ 4-way Air Discharge Cassette Type (2H series only)

TEMP. ▼ ▲ ON / OFF

3

Unit select button

TIMER SET ⊕▸⊕ FAN ✤ MODE 🔲

TIME ▼ ▲ SAVE 🔲 VENT ⬆

FILTER RESET ■ TEST ⊘ SET CL SWING/FIX 🖵 UNIT LOUVER ● ●

1 ———————— *2*

■ How to set louver wind direction individually

1 Select an indoor unit to be set by pushing UNIT LOUVER ● (left side of the button) during operation.

- The indoor unit number changes each time you push the button.

  → Unit No. 1-1 ➡ Unit No. 1-2 ➡ Unit No. 1-3 ┐

  └ No display ⬅ Unit No. 1-4 ◄

  ∗ When no unit number is displayed, all indoor units are selected.

2 Select a louver you want to adjust change by pushing UNIT LOUVER ● (right side of the button).

- Each time you push the button, the display on the left of the remote controller changes as follows:

  → *01* → *02* → *03* → *04* → No display ┘

  ∗ When no louver number is displayed, all four louvers are selected.

Louver No.

02 UNIT No. 1-2 R.C. No.

03

Refrigerant pipe

04   *02*

Drain pipe

01

---

3 Determine wind direction of the selected louver by pushing SWING/FIX 🖵 .

- Each time you push the button, the display changes as follows:

  (1) (2) (3) (4)
  (7) (6) (5)
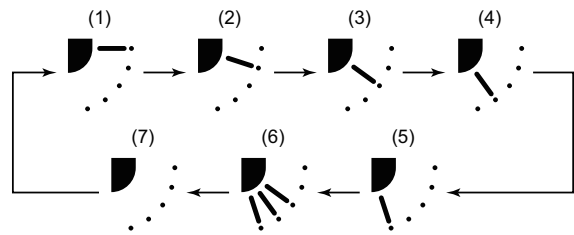
  ∗ During COOL (DRY) mode, (4) and (5) are not displayed.
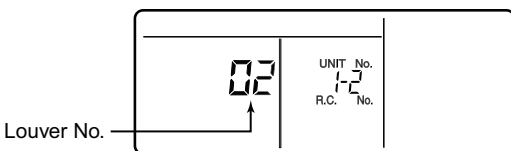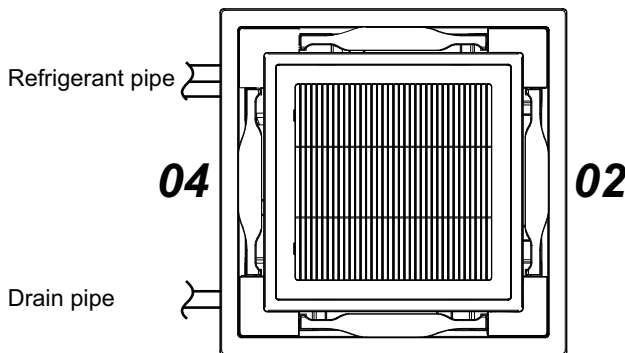
◆ 2-way Air Discharge Cassette, 1-way Air Discharge Cassette Type (1YH series)

TEMP. ▼ ▲ ON / OFF

TIMER SET ⊕▸⊕ FAN ✤ MODE 🔲

TIME ▼ ▲ SAVE 🔲 VENT ⬆

FILTER RESET ■ TEST ⊘ SET CL SWING/FIX 🖵 UNIT LOUVER ● ●

1, 2   *3*

→ Unit No. 1-1 ➡ Unit No. 1-2 ➡ Unit No. 1-3 ┐

└ No display ⬅ Unit No. 1-4 ◄
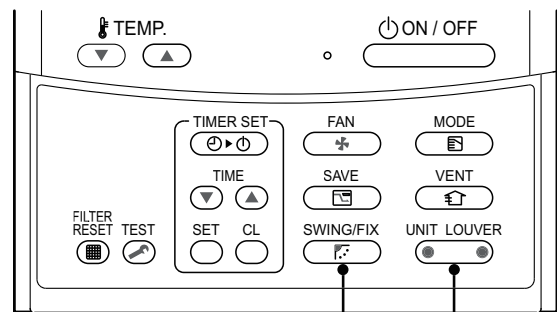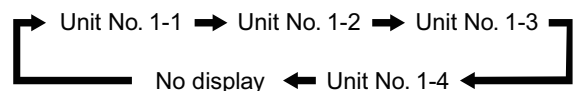
Setup of air direction and swinging

1 Push SWING/FIX 🖵 button during operation.

- [SWING ⤴] is displayed and the air direction automatically changes upward/downward.

  In case when one remote controller controls the multiple indoor units, each indoor unit can be selected and its air direction can be set up.

2 Push SWING/FIX 🖵 button again during swinging of the louver.

- The air outlet louver can be stopped at the desired position.

3 UNIT LOUVER ● ●

- To set up the air direction individually, push UNIT LOUVER ● ● button to display each indoor unit No. in a group control. Then set up the air direction to a displayed indoor unit.

- If there is no display, all the indoor units can be operated collectively.

- Every pushing UNIT LOUVER ● ● button, the display exchanges as shown in the figure.

4-1-2 Wired remote controller (RBC-AMT21E)

Installation Manual

Accessory parts

Part Name	Q'ty	Part Name	Q'ty
Remote controller (200mm-cable attached)	1	Spacer	2
Screw M4 x 25	2	Wire joint	2
Wood screw	2	Installation Manual	1

Requirement to install the remote controller

Installation place

Install the remote controller at a position with height 1 to 1.5m from the floor, where the average temperature in the room can be felt.
Do not install the remote controller at a place exposed to direct sunlight or direct outside air, such as a side of window, etc.
Do not install the remote controller at a place behind something or rear side of something where air flow is poor in the room.
Do not install the remote controller in the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
Be sure to set the remote controller vertically on the wall surface, etc.

How to select the room temperature sensor

The room temperature sensors are equipped in the indoor unit and remote controller.
One of two sensors works. Usually, the room temperature sensor in the indoor unit is set to work. To select the sensor in the remote controller side, refer to the following procedure.
1. Keep [⚙], [SET], and [CL] buttons pushed for 4 seconds or more.
   NOTE) The UNIT No. displayed at the first time is the indoor unit address of the master unit in the group control.
   NOTE) Do not push [UNIT] (select) button.
2. Using the temperature setup buttons [▲]/[▼], specify the item code (0032).
3. Using the timer buttons [▲]/[▼], change the set data from (0000) to (0001).
4. Push [SET] button.
   (OK if the display changes from flashing to lighting)
5. Push [⚙] button.
   The status returns to the normal status. In this time, 🖆 is displayed in LCD.

NOTE 1 :
When using two remote controllers, the master remote controller is recognized as 🖆 sensor though the temperature can be set from either master or sub remote controller.
NOTE 2 :
In a group control, the 🖆 sensor does not work if the group address is not set to the indoor unit of the master unit.
NOTE 3 :
When using the remote sensor together with the remote controller, do not use the 🖆 sensor of the remote controller.

How to install remote controller

NOTE 1 : Avoid twisting the remote controller wiring with the power supply cable or routing the cabling in the same metal conduit, as this may cause electrical interference and may cause the unit to malfunction.
NOTE 2 : Install the remote controller away from any electrical device that may be a source of electrical noise.
NOTE 3 : When electrical noise is present in the power supply, counter measures such as mounting a noise filter may be necessary.

• **When installing the remote controller directly to the wall surface, ensure the wall can sufficiently support the weight of the controller.**
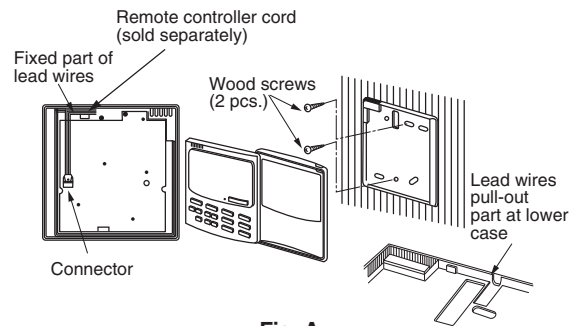
Fig. A

1. For removal and mounting of the remote controller body and the rear case, refer to the item, "Using as concealed type".
2. Connect the remote controller cable to the connectors on the controller body, ensuring that the cabling is routed securely in the groove provided. Notching the lower case (thin part of the upper center part) with a suitable tool, pull out the remote controller cables. (Fig. A) (Refer to the item, "How to perform cabling of the remote controller".)
   Before connecting the cables to the remote controller, confirm the terminal number. (Do not apply AC 200/230/ 240V to the remote controller.)
3. Fix the remote controller body using the two wood screws.
4. Using the cable clips (Accessory of remote controller cable sold separately), fix the remote controller cable to the wall surface.

How to perform cabling of the remote controller
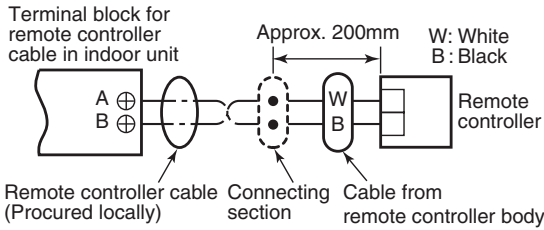
Connection diagram

Terminal block for remote controller cable in indoor unit

Approx. 200mm

W: White
B: Black

A ⊕
B ⊕

W
B

Remote controller

Remote controller cable (Procured locally)
Connecting section
Cable from remote controller body

Non polarity, 2 core cable is used.
Use 0.5mm² to 2mm² cable.
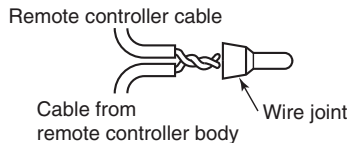
Attached wire joint (White, 2 pcs.)	Remote controller cable Cable from remote controller body — Wire joint 1) Peel the sheath of the cable by approx. 14mm. 2) Twist two cables and pressure-connect them using a wire joint. 3) When an exclusive pressure-connecting tool is not used or soldering connection is used, apply insulation process with insulation tape.

For cabling of the remote controller, use the remote controller cable (sold separately).

1. Connect the remote controller cable to the connectors on the controller body, ensuring that the cabling is routed securely in the groove provided.

2. When using the remote controller cable (sold separately), refer to the Installation Manual supplied with the remote controller cable.

Fixed part of lead wires
Connector
Remote controller cable (sold separately)
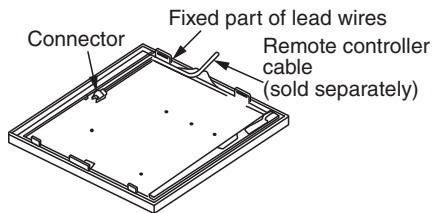
Requirement for installation of multiple remote controllers

"2 remote controllers" means that one or multiple units are operated by multiple remote controllers.

(Max. 2 remote controllers can be set.)

Remote controller

Remote controller address connector
Master remote controller
Remote controller check
Secondary remote controller

Remote controller address
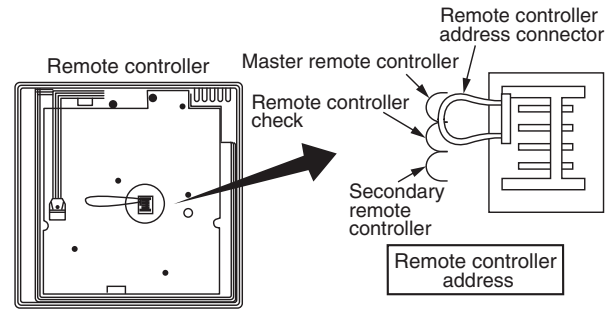
How to install

For 2 remote controllers, install the remote controllers in the following procedure.

1. Set one of two remote controllers as the master remote controller. (At shipment from factory)

2. For the other remote controller, exchange the remote controller address connector from the master to secondary remote controller on the P.C. board. Under this condition, the other remote controller functions as a secondary controller.

Basic wiring diagram

NOTE :

Connect cables without miswiring.
(Miswiring will cause the unit to malfunction.)

In the case of operating an indoor unit from the remote controllers at two positions

Remote controller (Master)
Remote controller (secondary)
(Sold separately)

Remote controller cable (Procured locally)

Terminal block for remote controller cable

1 2
Indoor unit
Earth

In the case of operating a group control of multiple indoor units from the remote controllers at two positions

*Master and secondary remote controllers are operable even if they are installed to any indoor unit.

Remote controller (Master)
Remote controller inter-unit cables for group control (Procured locally)
(Sold separately)
Remote controller (secondary)

Terminal block for remote controller cable

A B
Indoor unit No.1
A B
Indoor unit No.2
A B
Indoor unit No.3
A B
Indoor unit No.N

Earth   Earth   Earth   Earth
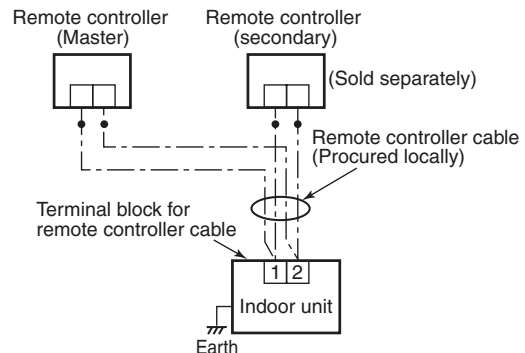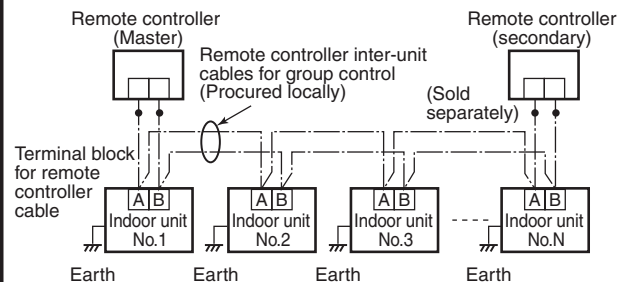
Remote controller test run setup

1. When the remote controller is used for the first time, it will not accept an operation until approximately 5 minutes after the power supply has been turned on.

   This is not a fault, as this time is used to check the setup of the remote controller.

2. Push the [⌁ ⏻] key after [TEST] has been displayed on the LCD by keeping the [🔧] button on the remote controller pressed for 4 seconds or more

   During the test run, [TEST] is displayed on the LCD

   The temperature cannot be controlled if [TEST] is displayed.

   Do not use [TEST] in a case other than a test run, otherwise an excessive load is applied to the air conditioner.

3. Use [TEST] in either HEAT, COOL, or FAN operation modes.

   NOTE : The outdoor unit will not operate for approx. 3 minutes after the power supply has been turned on or theoperation has been stopped.

4. After the test run has finished, push the [🔧] button again to check the [TEST] symbol on the LCD has gone off.

   (For this remote controller, a release function of 60 minutes is provided to prevent continuous test runs.)

Wired remote controller (RBC-AMT21E)

Operation manual

Parts Name of Remote Controller

Display section

In the display example, all indicators are displayed for purpose of explanation. In reality only, only the selected contents are indicated.

- When turning on the leak breaker for the first time, [**SET DATA**] flashes on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. After the [**SET DATA**] display has disappeared, you may use the remote controller.

Display section

Operation section

1 **SET DATA display**

Displayed during setup of the timer.

2 **Operation mode select display**

The selected operation mode is displayed. Ⓐ [AUTO] mode is displayed on heat recovery type only.

3 **CHECK display**

Displayed while the protective device operates or a fault occurs.

4 **Timer time display**

Time of the timer is displayed. (When a trouble occurs, the check code is displayed.)

5 **Timer SETIN setup display**

When pushing the Timer SETIN button, the display on the timer is selected in order of [OFF] ⊕⟩┃ → ⟳ [OFF] repeat OFF timer → [ON] ⊕⟩◯ → No display.

6 **Filter display**

If "FILTER ⬙" is displayed, clean the air filter.

7 **TEST run display**

Displayed during a test run.

8 **Flap position display (for 4-Way Air Discharge Cassette Type and Under Ceiling Type model only)**

Displays flap position.

9 **SWING display**

Displayed during up/down movement of the flap.

10 **Set up temperature display**

The selected set up temp. is displayed.

11 **Remote controller sensor display**

Displayed When the sensor on the remote controller is used.

12 **PRE-HEAT display**

Displayed when the heating operation starts or defrost operation is carried out.

While this indication is displayed, the indoor fan stops or the mode enters into LOW.

13 **Operation ready display**

Displayed when cooling operation is unavailable because heating operation is performed.

14 **No function display**

Displayed if there is no function even if the button is pushed.

15 **Air volume select display**

The selected air volume mode is displayed.

(AUTO)	Ⓐ✿
(HIGH)	✿
(MED.)	✿
(LOW)	✿

In the Concealed Duct High Static Pressure type models, [HIGH] only is displayed for the air speed.

Operation section

Push each button to select a desired operation.

This remote controller can operate a maximum of 8 indoor units.

- The details of the operation will need to be set up once, afterwards, the air conditioner can be used by pushing the ⌜ :: ⏻ ⌝ button only.

1 Air volume select button

Selects the desired air volume mode.
The Concealed Duct High Static Pressure type models do not have this function.

2 Timer set button

TIMER SET button is used when the timer is set up.

3 Check button

The CHECK button is used for the check operation. During normal operation, do not use this button.

4 Fan button

FAN button is used when a fan which is sold on the market or etc. is connected.

- If ⊘ is displayed on the remote controller when pushing the FAN button, a fan is not connected.

5 Filter reset button

Resets (Erases) "FILTER ▦" display.

6 UNIT and AUTO flap button

⌜UNIT⌝ :
If multiple indoor units are operated by only one remote controller, select the units when the air direction is adjusted.

⌜ ⌝ :
Set up the auto swing and angle of the flap.
- This function is not provided on the Concealed Duct Standard Type, High Static Pressure Type, Floor standing Cabinet Type, of Floor Standing Concealed Type units.

7 Operation lamp

Lamp is lit during the operation. Lamp is off when stopped.

The operation lamp will flash if there a protection device has been operated or a fault has occurred.

8 ⌜ :: ⏻ ⌝ button

When this button is pushed the operation will either start ot stop depending on its operating status at the time the button was pushed.

When the operation has stopped, the operation lamp and all the displays will disappear.

9 Operation select button

Selects the desired operation mode.

10 Set up temperature button

Adjusts the room temperature.
Set the desired set temperature by pushing ⌜ ▲ ⌝ or ⌜ ▼ ⌝ .

OPTION :

Remote controller sensor
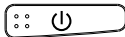
Usually the TEMP. sensor on the indoor unit senses the temperature. The temperature surrounding the remote controller can also be sensed.
For details, contact the dealer from who you have purchased the air conditioner from.

- In the case that one remote controller controls the multiple indoor units, the setup operation is unavailable in group control.

Correct Usage

When you use the air conditioner for the first time or when you change the SET DATA value, follow the procedure below. From the next time, the operation displayed on the remote controller will start by pushing the [:: ⏻] button only.

Preparation

Turn on the main power switch and/or the leakage breaker.

• When the power supply is turned on, a partition line is displayed on the display part of the remote controller.

* After the power supply is turned on, the remote controller will not not accept an operation for approx. 1 minute, this is not a failure.

REQUIREMENT

• While using the air conditioner, operate it only with the [:: ⏻] button without turning off the main power supply or the leak breaker.

• Do not turn off the leak breaker while the air conditioner is in use.

• Turn on the leak breaker 12 hours or more before the air conditioner is due to be operated, if it has not been in use for an extended period of time.

Cooling only model

DRY — COOL — FAN

Heat-pump model

HEAT → DRY → COOL → FAN
(Dehumidity)

AUTO → HIGH → MED. → LOW
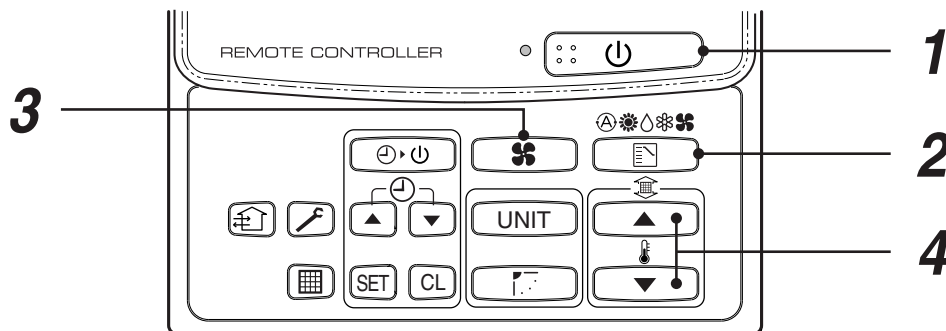
1 Push the [:: ⏻] button.

The operation lamp goes on and the operation starts.

2 Select an operation mode with the "[🗈]" button.

One push of the button, and the display changes in the order shown on the right.
• This function is not provided on the Concealed Duct High Static Pressure Type.

3 Select air volume with "FAN" button.

One push of the button and the display changes in the order shown on the right.
• When air volume is "AUTO", the air volume differs according to the room temperature.
• In DRY mode, "AUTO" is displayed and the air volume is set to LOW.
• In heating operation, if the room temperature is not heated sufficiently with the VOLUME "LOW" operation, select "MED." or "HIGH" operation.
• As the room temperature is measured by the sensor found near the intake port of the indoor unit, the measured temperature value may be different to the actual room temperature, therefore consider this difference when setting the discharge temperature on the air conditioner. (Automatic air speed cannot be selected in FAN mode.)
• Air volume function is not provided to "Concealed Duct High Static Pressure Type" but the air speed "HIGH" symbol will be displayed.

4 Determine the set up temperature by pushing the "TEMP. [▲]" or "TEMP. [▼]" button.

Stop

Push the [:: ⏻] button.

The operation lamp goes off, and the operation stops.

4-1-3 Simple wired remote controller (RBC-AS21E2)

Installation Manual

Accessory parts

Part Name	Q'ty	Part Name	Q'ty
Remote controller	1	Spacer	2
(200mm-cable attached)		Wire joint	2
Screw M4 x 25	2	Clamper	1
Wood screw	2	Installation Manual	1

Requirement to install the remote controller

Installation place

Install the remote controller in a position within 1 to 1.5m from the floor, where the average temperature in the room can be felt.

Do not install the remote controller in a place exposed to direct sunlight or direct outside air, such as the side of a window, etc.

Do not install the remote controller in a place behind something or to the rear side of an object, where air flow is poor.

Do not install the remote controller in a freezing box or refrigerator, as the remote controller is not waterproof.

Be sure to position the remote controller vertically on the wall surface, etc.

How to select the room temp. sensor

The room temperature sensors are equipped in the indoor unit and the remote controller.

Only one of the two sensors can be used at any one time. Usually, the room temperature sensor in the indoor unit is set to work.

To select the sensor in the remote controller, turn the remote controller sensor from OFF to ON.

NOTE 1 :

Selecting the sensor in the secondary remote controller is impossible.

NOTE 2 :

Do not select the sensor in the remote controller when another remote controller sensor is used.
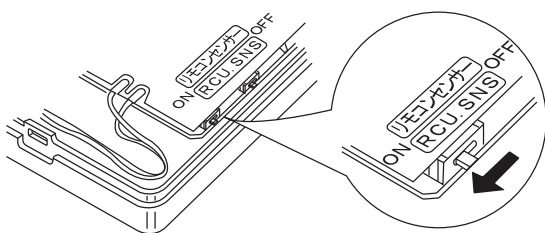
How to install the remote controller switch

NOTE 1 :

Avoid twisting the remote controller cable with the power supply cable, etc. and do not store them in the same metal pipe conduit, otherwise it may cause a malfunction.

NOTE 2 :

Install the remote controller away from any device that may cause electrical interference.

NOTE 3 :

When noise is contained in the power supply of the indoor unit, counter measures such as mounting a noise filter may be necessary.

In case of using the remote controller as a concealed type
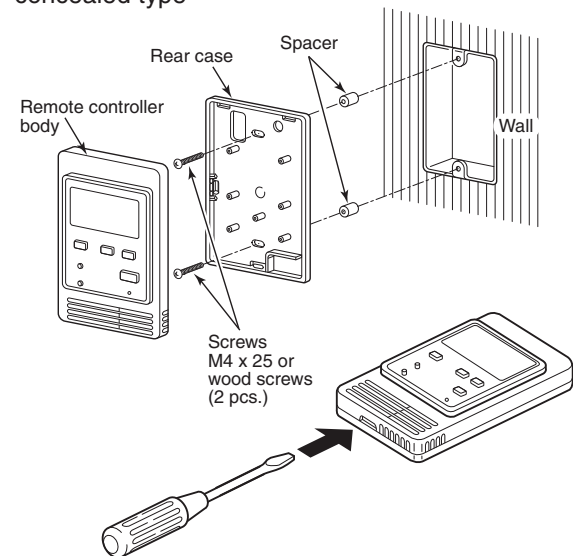
1. Inserting a flat bladed screwdriver, etc. into the groove on the lower side of the remote controller body, force open the rear case to remove it.
2. Using the attached M4 screws (2 pcs.), fix the rear case of the remote controller.
   Before installation, open the screw holes with a screwdriver, etc.
   Fix it with the spacer, but do not apply excessive force. If the remote controller does not fit closely to the wall, adjust it by cutting off the spacer.
3. Connect the remote controller cable (2 cores) to the cable from the remote controller body.
   Connect the remote controller cable (without miswiring) upon confirmation of the terminal numbers on the indoor unit. (If applied AC 220/230/240V, the unit may be damaged.)
4. Install the remote controller body to the rear case by inserting the tabs on the controller body into the rear case.

How to perform the cabling of the remote controller
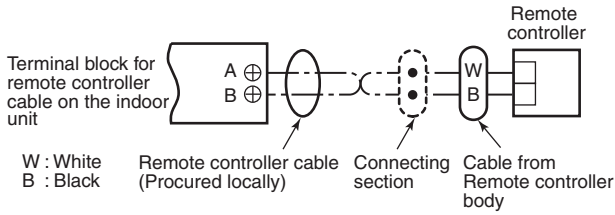
Connection diagram

Terminal block for remote controller cable on the indoor unit

Remote controller

A ⊕
B ⊕

W : White
B : Black

Remote controller cable (Procured locally)

Connecting section

Cable from Remote controller body

W
B

- Non polarity, 2 core cable is used.
  Use 0.5mm² to 2 mm² cable.
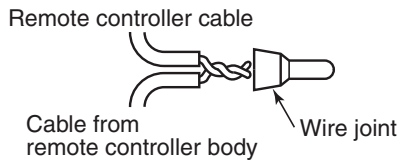
Attached wire joint (White, 2 pcs.)	Remote controller cable Cable from remote controller body Wire joint
	1) Peel the sheath of cable to be connected by approx. 14mm.
	2) Twist the two cables and pressure-connect them using a wire joint.
	3) When an exclusive pressure-connecting tool is not used or soldering connection is used, apply insulation process with an insulation tape.

Requirement for installation of multiple remote controllers

"2 remote controller control" means that one or multiple units are operated by multiple remote controllers.
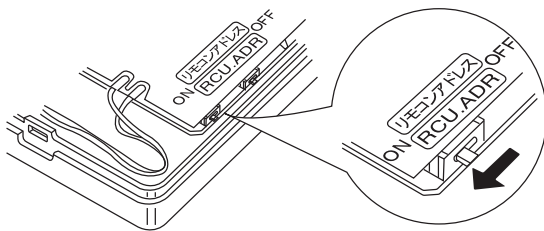
How to install

For 2 remote controller control, install the remote controllers in the following procedure.
1. Set one of the set multiple remote controllers to the master remote controller.
   (At shipment from factory)
2. For other remote controllers, turn the remote controller address switch on the remote controller P.C. board from OFF to ON. They will function as secon-dary remote controllers under the above condition.

• Basic cabling diagram
NOTE :

Connect the cables without miswiring.
(Miswiring will cause the unit to malfunction.)

In the case of operating an indoor unit from the remote controllers at two positions

Remote controller (Master)

Remote controller (Side)

(Sold separately)

Remote controller cable (Procured locally)

Terminal block for remote controller cable

A B

Indoor unit

Earth

In the case of operating a group control of multiple indoor units from the remote controllers at two positions
* Master and secondary remote controllers are operable even if they are installed to any indoor unit.

Remote controller (Master)

Remote controller inter-unit cable for group control (Procured locally)

Remote controller (secondary)

(Sold separately)

(Sold separately)

Terminal block for remote controller cable

| A B | A B | A B | A B |
| Indoor unit No.1 | Indoor unit No.2 | Indoor unit No.3 | Indoor unit No.N |

Earth   Earth   Earth   Earth
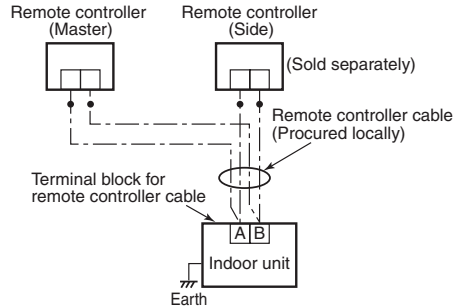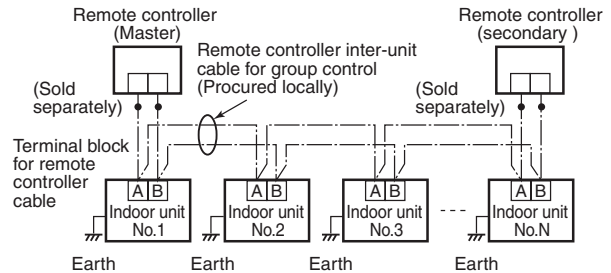
Remote controller test run setup

1. Push the ⏻ key after keeping the [CHECK] button pushed on the remote controller for 4 seconds or more.

   During the test run, "TEST" is displayed on the LCD.

   The temperature cannot be controlled if [TEST] is displayed. Do not use [TEST] in a case other than a test run, otherwise an excessive load is applied on the air conditioner.

2. **Use [TEST] in one of HEAT, COOL, and FAN operation modes.**

NOTE :

The outdoor unit will not operate for approx. 3 minutes after the power supply has been turned on or the operation has been stopped.

3. After the test run has finished, push the [CHECK] button again and check "TEST" on the LCD has gone off. (For this remote controller, a release function of 60 minutes is provided to prevent consecutive test runs.)

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Operation Manual (RBC-AS21E2)

NAME AND OPERATION

- For Cooling Only type, ⒶＡ, ☀ and 🌡 are not displayed on LCD.
- Max. 8 indoor units can be operated by a remote controller.
- Once the operational items have been set, you can operate the previous condition by pushing the ⬚ button only.

The following display is for explanation only and differs from the real display.
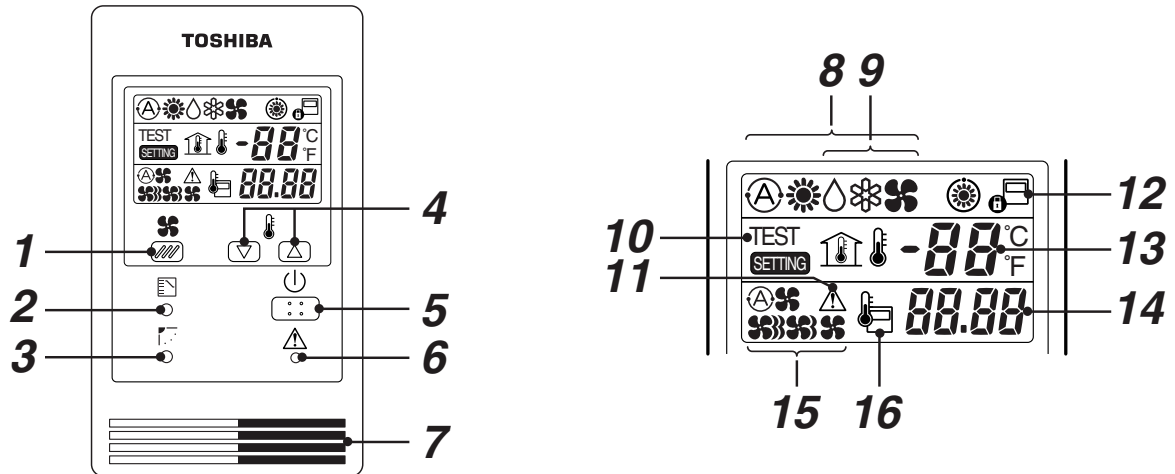
1 **Fan Speed button**

2 **Operation mode button**

3 **Swing/Air direction button**

The flap angle is changed.

4 **Temperature Setup button**

For every push of the △ button, the temperature increases by 1°C.

For every push of the ▽ button, the temperature decrease by 1°C.

5 ⏻ **[Start/Stop] button**

6 **Check button (Used in servicing)**

- Do not use this button in normal operation.

7 **Remote control temperature sensor**

Usually controlled by the indoor unit sensor, it can be changed to the remote controller. For details, contact the dealer who you purchased the air conditioner from. (When using a group control method, do not use the remote controller sensor.)

8 **Selected mode displays (Heat pump type)**

Any one of Ⓐ, ☀, ◊, ❄ or ❅ can be displayed.

While 🌡 is displayed, the indoor fan stops or the mode is set to Low speed setting.

Ⓐ [AUTO] mode is displayed on heat recovery type only.

9 **Selected mode displays (Cooling only type)**

Any one of ◊, ❄ or ❅ can be displayed.

10 **TEST is displayed during the Test Run.**

11 ⚠ **(CHECK) is displayed when the protective device has operated, or a fault has occurred.**

12 ⬚ **is displayed during the operation.**

If the remote controller setting is prohibited by the central remote controller, ⬚ will flash when the [Start/Stop], [Operation Select] or [Temp. Setup] button has been pushed and the change has not been accepted.

13 **The setup temperature is displayed.**

14 **Warning code is displayed when a fault has occurred.**

15 **Selected fan speed, Ⓐ❅, ❅, ❅ or ❅ displays.**

16 🌡 **is displayed when the remote controller sensor is used.**

- When turning on the power switch to the remote controller for the first time, the 🌡 flashes. While 🌡 is displayed, the automatic model check is operating. Operate the remote controller after 🌡 symbol has disappeared.

HOW TO OPERATE THE AIR CONDITIONER

COOL/HEAT AUTO, HEAT, DRY, COOL, FAN

1 **Power supply**

Turn on the power supply to the air conditioner 12 hours before starting the operation.

2 **Push the ⏻ button.**
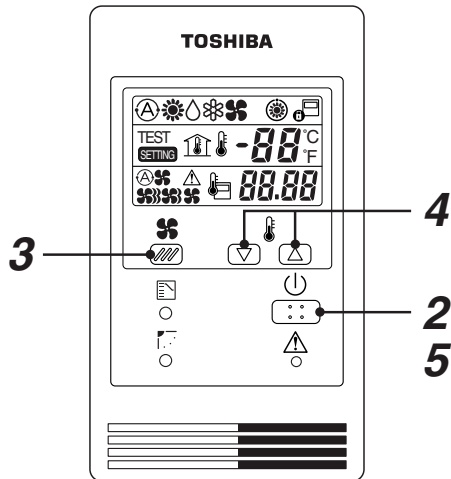
3 **Push ✻ button (▨) to select the fan speed.**

When selecting AUTO, the fan speed is automatically changed.
(During FAN mode, the air speed cannot be adjusted.)

4 **Push either ▽ or △ set to Auto.**
Recommended temperature

• During FAN mode, the temperature cannot be set up.

5 **Stop**

Push the ⏻ button.

When stopping the unit by the remote controller, the fan on the outdoor unit may keep operating for a while even if the compressor on the outdoor unit has stopped.

• When the unit cannot be stopped by the remote controller.

Turn off the main power supply or the leakage breaker and then contact the dealer who you purchased the air conditioner from.

• In heating, if the room is not heated enough with the FAN ✻, select FAN ✺ or ✻.

• As the room temperature is measured by the sensor found near the intake port of the indoor unit, the measured temperature value may be different to the actual room temperature, therefore consider this difference when setting the discharge temperature on the air conditioner.

Automatic Cool/Heat

When all indoor units in the identical refrigerant system are controlled as a group and when all indoor units are installed in the same room, the cooling or heating operation is automatically performed by the difference between the setup temperature and the room temperature.

4-1-4 Wireless remote controller kit (1) RBC-AX31U (W)-E/ RBC-AX31U (WS)-E

Installation Manual

Accessories

Part Name		Q'ty		Part Name		Q'ty
Signal receiving part		1		Owner's Manual		1
Remote controller		1		Installation Manual (this manual)		1
Remote controller holder		1		Tapping screw Ø4×16 mm		2
				Clamper		1
Battery		2		Clamper screw Ø4×12 mm		1

Settings for the signal receiving part before installation

Before installing the signal receiving part, make the following settings referring to each description.
• When installing wireless remote controller together with wired remote controller → Perform "Settings when installing the wireless remote controller kit together with wired remote controller"
• When ceiling height exceeds the standard height (factory setting) → Perform "Settings for high ceiling"
• When installing multiple signal receiving parts in a room → Perform "Remote controller address setting"

How to attach the signal receiving part

Since the signal receiving part can be attached at only one corner shown in (Fig. 1), be careful of the orientation of the signal receiving part after the ceiling panel is attached to the indoor unit.
1. Detach the air inlet grille.
2. Detach the adjust corner cap at the corner where the signal receiving part is to be installed. (Fig. 2)
Pull the knob of the adjust corner cap in the arrow *1* direction, and detach the adjust corner cap.
*The knob is provided only on one side of the cap. Be sure to detach the cap from the knob side.

(Fig. 1)

(Fig. 2)
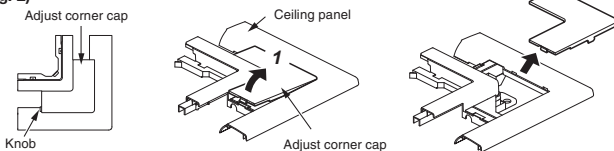
3. A pad is packed in the two rectangular holes (indoor unit side and signal receiving part side) for ceiling panel wires. Remove the pads temporarily, and pass the wires from the wireless signal receiving part through the rectangular holes. (Fig. 3)
4. After the wiring is completed following "How to wire the signal receiving part" below without slack of the wires, pull the black pad that covers the wire by approx. 20 mm out of the rectangular hole on the indoor unit side, and then clamp the wires with the supplied clamper tightened with the screw. Then return the packing removed from the rectangular hole on the signal receiving part to the original position. (Fig. 3)
* Securely position the black pad and fix the packing. Failure to do so may cause water leakage or dew drop on the unit and wires.

(Fig. 3)

Remove the pad from the rectangular hole on the signal receiving part side, clamp the wires with the clamper, secure the clamper with the Ø4×12 screw, and then return the pad to the original position.
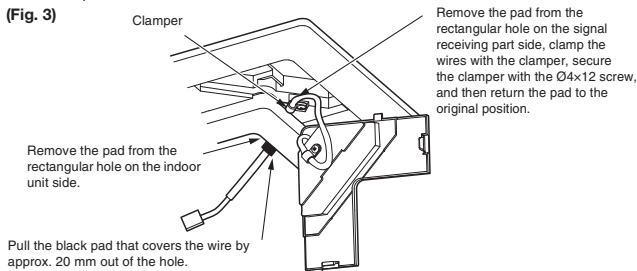
5. Attach the signal receiving part to the ceiling panel, while taking care not to catch the wires. (Fig. 4)

(Fig. 4) Insert the two claws on the adjust corner cap (with signal receiving part) into the rectangular holes of the ceiling panel in the arrow direction.

Push the adjust corner cap in the arrow directions so that the three claws are fitted.
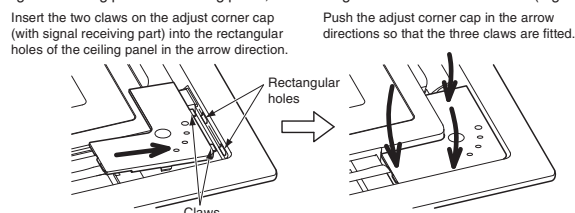
• Push the three claws of the adjust corner cap firmly as far as they will go. Failure to do so may result in water leakage.
* For details of the wiring and test run, refer to " How to wire the signal receiving part" and "Test run " below.
Note: Do not bundle these control signal wires with the power wire to avoid malfunction.

How to wire the signal receiving part
<Connection diagram>
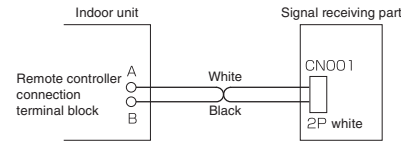
<Connection>
Connect the wires from the signal receiving part to the remote controller connection terminal block of the indoor unit. (The terminals are nonpolar.)
• Clamp the redundant portion of the wires with the clampers in the electric parts box.
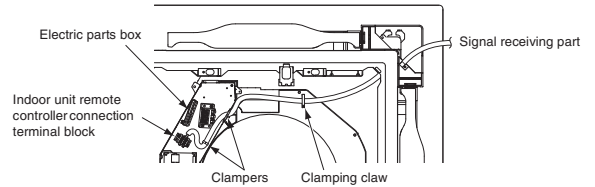
Test run

Perform usual operations using the remote controller to check for normal operation. A test run can be executed forcibly by using the following procedure if the room temperature is too high to turn off the thermostat.
1. Turn off the power of the air conditioner, and remove the screws to detach the signal receiving part cover.
2. Set bit 1 of DIP switch S003 on the signal receiving part P.C. board to ON.
3. Attach the signal receiving part to the ceiling panel by reversing the procedure of removal, and then turn on the power of the air conditioner.
4. Push [START/STOP] on the wireless remote controller, and select COOL or HEAT with [Mode select]. (Temperature cannot be controlled during a test run.)
5. All LEDs on the signal receiving part flash during a test run.
6. After the test run has been completed, be sure to set bit 1 of DIP switch S003 to OFF and confirm that the LEDs do not flash.
7. Clamp the wires properly with the clamper secured together with the signal receiving part cover.
Note 1: Use the forced test run only for test run because it overloads the air conditioner.
Note 2: The remote controller is disabled for approx. 1 minute after power-on, but this is normal. The signal from the remote controller is received, but the receive data is discarded.
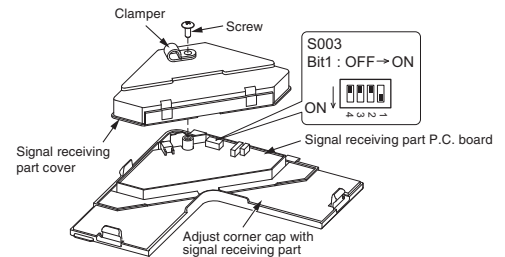
Settings when installing the wireless remote controller kit together with wired remote controller

A dual remote controller system is available by in stalling the wireless remote controller kit together with the wired remote controller. (Up to two wireless and wired remote controllers can be installed.) The dual remote controller system controls one or more indoor units with two remote controllers.
Note: Connect wires correctly to the signal receiving part, checking terminal numbers on the indoor unit. If 220/240 VAC is applied, the circuit will be broken.
Note: Multiple wireless remote controller kit s cannot be attached to one indoor unit.
Note: To use the wireless remote controller kit together with the wired remote controller, set either remote controller to a follower remote controller.
• To use the wired remote controller as a follower, change the setting of the DIP switch on the back of the wired remote controller P.C. board from Header to Follower. For changing DIP switch setting, refer to the installation manual of the wired remote controller.
• To use the wireless remote controller as a follower, set bit 3 of DIP switch S003 on the signal receiving part P.C. board to ON.

Controlling one indoor unit by two remote controllers
• The indoor unit is operable regardless of the settings (Header or Follower) of the remote controllers.
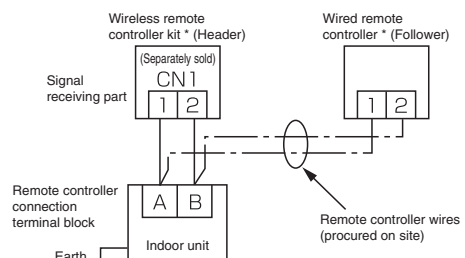
* Use 0.5 to 2 mm² wires for on-site wiring.
* The total length of wires should be 400m or less.

Performing group control of multiple indoor units by two remote controllers

- Header and follower indoor units are operable even if they are attached to any indoor unit.
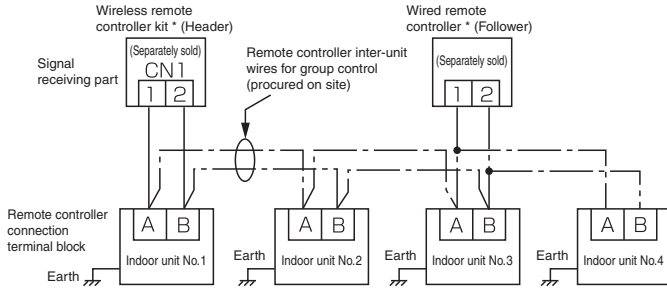
* Use 0.5 to 2 mm² wires for on-site wiring.
* The total length of inter-unit wires should be 200m or less.

Settings for high ceiling

- When an indoor unit is installed on a ceiling higher than the standard height (factory setting shown in the table below) or when changing the number of air discharge ports by using the windshield kit (separately sold), the DC fan tap is required. Bit 2 (tap 1) and bit 4 (tap 2) of DIP switch S003 on the signal receiving part P.C. board are used for the DC fan tap setting. Change the setting with DIP switch S003 on the signal receiving part P.C. board of this product (RBC-AX31U).
  The setting change is shown below.
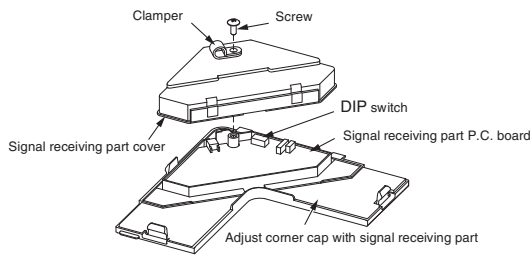
DIP switch [S003]

1	For test run
2	Tap 1
3	For switching header/follower
4	Tap 2
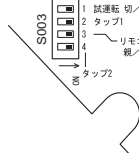
The following table shows tap settings.

Ceiling Height

Tap 1	Tap 2	Unit installable ceiling height (unit: m)								
		SM56 types			SM80 types			SM110, 140 types		
		4 directions	3 directions	2 directions	4 directions	3 directions	2 directions	4 directions	3 directions	2 directions
OFF Factory setting	OFF	2.8	3.2	3.5	3.0	3.3	3.6	3.9	4.2	4.5
OFF	ON	3.2	3.5	3.8	3.3	3.5	3.8	4.2	4.4	4.6
ON	OFF	3.5	3.8	-	3.6	3.8	-	4.5	4.6	-

Note: The windshield kit is necessary to set the air discharge direction to 3 or 2 directions. In addition to the setting change mentioned above, change the setting using the wired remote controller according to the installation manual of the windshield kit. Failure to change the setting may cause condensation. After the setting change has been completed, reassemble the parts as they were. Clamp the wires properly with the clamper secured together with the signal receiving part cover.

Remote controller address setting

- When two or more signal receiving parts are installed in a room, a unique address can be set for each signal receiving part to prevent interference.
- When you push the reset button after replacing batteries, the address displayed on the remote controller shows "ALL". While "ALL" is displayed, signals from the remote controller can be received regardless of the setting of the address switches in the signal receiving part.
- For how to change remote controller addresses, refer to the Owner's Manual.
- Detach the signal receiving part cover of the signal receiving part when changing the signal receiving part address. After the setting change has been completed, clamp the wires properly with the clamper secured together with the signal receiving part cover.

How to handle the remote controller

- **To set the remote controller on the wall**
  Push [START/STOP] at the installation position on the wall to check that the signal from the remote controller is received correctly.

To take the remote controller out of the holder, pull it toward you.
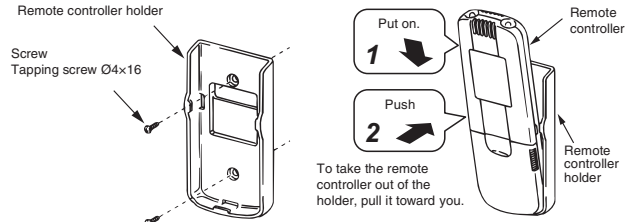
- **Replacing batteries**
1. Slide and remove the cover downward while holding both sides of the cover.
2. Insert two AAA alkaline batteries correctly matching the (+) and (-) polarities with the indication.
3. Push the reset button with a fine-tipped pen and attach the cover.
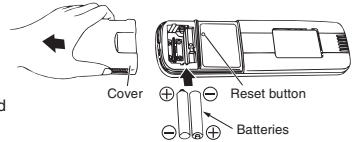
Setting the room temperature sensor

- The room temperature sensor is provided in the indoor unit and the remote controller. The room temperature sensor functions in either indoor unit or remote controller.
- The sensor setting was made to the indoor unit side when the product was shipped. To change the setting to the remote controller side, push the sensor button (right figure) inside the remote controller wait for " 🖐 " mark to appear on the LCD.
- **Note:** Even if the sensor is set to the remote controller side, when the room temperature data from the remote controller does not arrive at the indoor unit for 10 minutes, the sensor setting automatically changes to the indoor unit side. Install the remote controller pointing it at the indoor unit as much as possible.
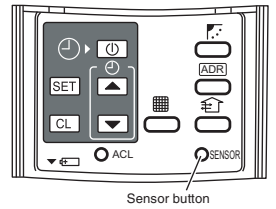
How to set slide switches

- Set the slide switches in the battery compartment of the remote controller depending on indoor unit types that use the signal receiving part.
- **Note:** The slide switches are set to "S" and "A" by default.
- **Note:** After the switch setting has been changed, push the reset button.
* For details, refer to the Owner's Manual.
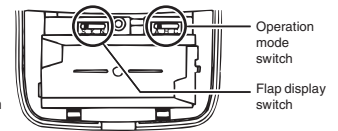
Heat pump (With automatic cooling/heating)	Heat pump (Without automatic cooling/heating)	Cool-only	Flap display switching

* Do not change the flap display setting.

Self-diagnosis function and measures

- The following table shows a few examples. For details of indoor unit errors, refer to the Installation Manual of the indoor unit.

LED	Possible cause	Measures
These LEDs do not light or flash even if the remote controller is operated.	- Power is not turned on. - Incorrect connection between signal receiving part and indoor unit	
Flashing	Loose connection between signal receiving part and indoor unit	Check connections and reconnect wires correctly, if necessary.
Flashing	Incorrect or loose connection between indoor unit and outdoor unit	
Flashing alternately	The protective device of the outdoor unit is activated.	Check the outdoor unit.
Flashing alternately	The protective device of the indoor unit is activated.	Check the indoor unit.

LEDs on the signal receiving part ● : OFF   ☼ : Flashing (at intervals of 0.5 seconds)
LED color ⏻ : Green   🕒 : Green   ☀ : Orange

Notes on installing remote controller

- When using a wireless remote controller in the remote controller holder on a wall, turn on a fluorescent light and operate the remote controller at the installation position. Make sure that the air conditioner operates normally and then secure the remote controller holder on the wall.
- When installing a remote controller that senses room temperature with the sensor, avoid the following places.
  - A place exposed to direct cool air, warm air or direct sunlight
  - A place subject to thermal effects

Explanation to the customer

- After the installation work has been completed, execute a test run to check for normal operation and then hand the customer the Owner's Manual and Installation Manual of the wireless remote controller kit.
- Explain how to use and maintain the wireless remote controller kit to the customer according to the Owner's Manual of the wireless remote controller kit.

4-1-5　Wireless remote controller kit (2) (RBC-AX22CE2)

Installation Manual

Accessory parts

No.	Accessory		Q'ty	No.	Accessory		Q'ty
1	Sensor unit		1	4	Battery		2
2	Remote controller		1	5	Owner's Manual		1
3	Remote controller holder		1	6	Truss tapping screw, 4 ×16		2

Installation of sensor unit

1. Open the suction grille, remove the screw, move the side panel towards you (direction of arrow) and then remove the side panel. (Fig. A)

2. Cover the end of the flat head screw driver with vinyl tape and forcedly insert it into the groove at the side under the circle mark on the cover. (Be careful not to damage the panel.) (Fig. B)

3. Pass the lead wire through the panel and install the sensor unit to the panel hole.
   (Projection of the sensor unit is fixed by the panel hole.)

4. Fix the lead wire of the sensor to the cord clamp which fixes the cables to the louver motor. (Fig. C)

5. Install the side panels.

6. Route the lead wire from the sensor unit along with the cables from the louver motor and then fix it with the cord clamp. (Fig. D)

   ＊ Route the cable in using a hole in the upper side of the electric box.

Fig. A

Panel

Side panel

Suction grille

Fig. B

Flat head screw driver
(Lap it with vinyl tape.)

Vinyl tape

Insert it into groove at the side under circle mark on the cover.

Cover

Fig. C

Cord clamp

Sensor

Fig. D

Cord clamp

Terminal block for remote controller cabling
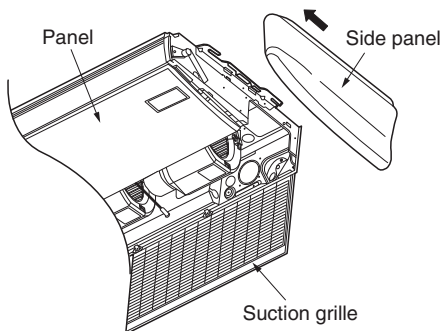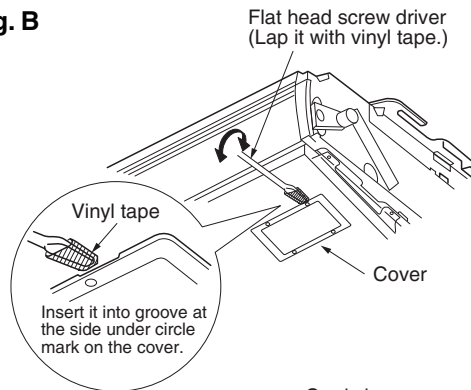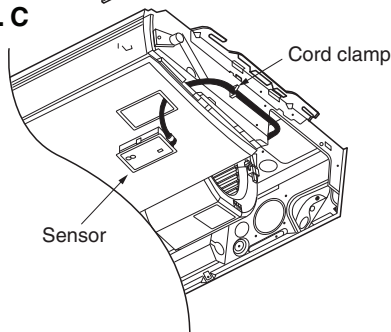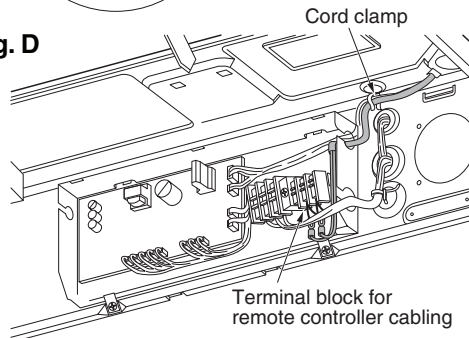
[NOTE 1]
Avoid twisting the cables of the sensor with the power cables, otherwise a malfunction is caused.
＊For cabling and test run, refer to "Cabling of sensor unit" and "Test run" that can be found in the Installation Manual supplied with the indoor unit.

How to perform cabling of sensor units

Connection diagram

Connection
- Connect the cables out of the sensor unit to the terminal block of the remote controller cabling. (There is no polarity.)
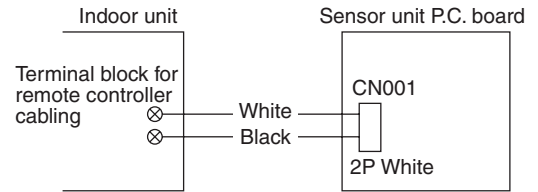
Indoor unit

Terminal block for remote controller cabling

White
Black

Sensor unit P.C. board

CN001

2P White

Requirement

The control by two remote controllers is enabled by installing the wireless remote controller with the wired remote controller from an indoor unit.
(Max. 2 remote controllers of wireless or wired are installable.)

"2-remote controllers" controlling means that one or multiple units are operated by multiple remote controllers.

NOTES :

1. Upon confirmation of the terminal numbers the indoor unit, connect the remote controller cables without miscabling. (If applied AC 220–240 Volt, the unit will be damaged.)
2. Multiple wireless remote controller kits cannot concurrently be used for an indoor unit.
3. When installing simultaneously the wireless remote controller with the wired remote controller, set one of them as the secondary remote controller.
   - When setting the wired remote controller as the sub, exchange the address connector at the rear of P.C. board of the wired remote controller from master to secondary remote controller.
   - When setting the wireless remote controller as the secondary unit, turn No.3 DIP switch [S003] on the P.C. board of wireless remote controller sensor unit from OFF to ON.

To operate an indoor unit by 2 remote controllers

* The indoor unit is operated if either wireless or wired remote controller is set as master or secondary remote controller.
  (Total cable length: Within 400m)

Wireless remote controller kit (Master)

Wired remote controller (secondary)

Sensor unit CN1 (Sold separately)

(Sold separately)

Remote controller cable (Procured locally) (0.5 to 2mm²)

Terminal block for remote controller cable

Indoor unit

Earth
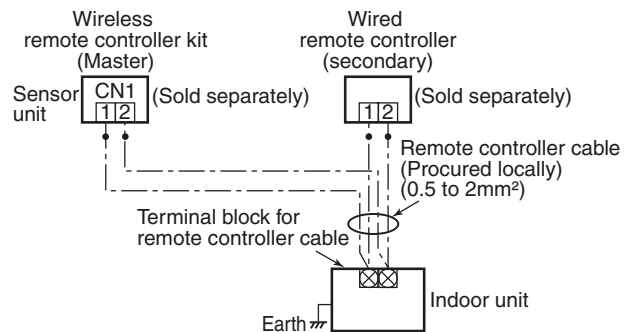
To operate a group control of multiple indoor units by 2 remote controllers

* Master and secondary remote controllers are operable even if they are installed to any indoor unit.
  (Total cable length: Within 200m)
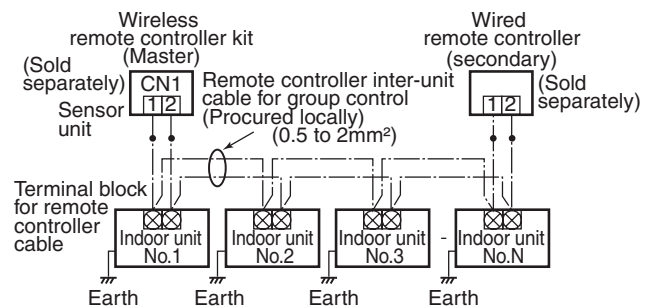
Wireless remote controller kit (Master)

Wired remote controller (secondary)

(Sold separately) Sensor unit CN1

Remote controller inter-unit cable for group control (Procured locally) (0.5 to 2mm²)

(Sold separately)

Terminal block for remote controller cable

Indoor unit No.1   Indoor unit No.2   Indoor unit No.3   Indoor unit No.N

Earth   Earth   Earth   Earth

How to set the room temperature sensor

- The room temperature sensors are equipped in the indoor unit and the wireless remote controller. Only one of the two sensor's can be used at any one time.
- The room temperature sensor is set to the indoor unit side as standard from the factory.
  To select the sensor on the remote controller, push the SENSOR button (Right figure) inside of the remote controller cover and wait for " 🌡 " mark to appear on the LCD.

NOTE :

If the room temperature data from the remote controller is not transmitted to the unit for 10 minutes or more, the sensor on indoor unit side is automatically selected even if the sensor on the remote controller side is selected.
Position the remote controller towards the unit as much as possible.
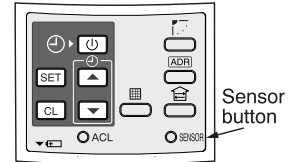
Sensor button

How to set the address switch

- When the multiple sensors are installed in the same room, an address can be set to prevent cross communication.
- When replacing the battery and pushing the SET button, the address of the remote controller becomes [ALL] and the sensor is enabled to receive signals regardless of the setting of the address switch in the operation section.
- For selecting the remote controllers address, refer to the Owner's Manual.
- Change the address of the sensor by removing the screws on the P.C. board cover on the sensor unit. You can then adjust the address, using the table shown as a reference. Once complete, re-attach the cover, using the screws you previously removed.

Display of remote controller address	Address **ALL**	Address **1**	Address **2**	.....	Address **6**
Address switch position of sensor	* Address switch of sensor unit can be set any position.	S001 / S002 (4–6 1–3 Address select / Address)	S001 / S002 (4–6 1–3 Address select / Address)	.....	S001 / S002 (4–6 1–3 Address select / Address)

Slide switch

- Check that the slide switch in the battery box of the remote controller is set to [S] / [A] at shipment from the factory.
  Do not change the setting.

Select of operation mode set to A.
Select of flap indication set to S.

A H C

S K N

TOSHIBA
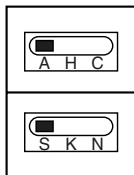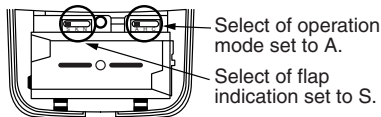
Lamp indication of sensor
● : Goes off
☼ : Flash
    (0.5-sec. interval)

Lamp indication	Cause	Measures
⏻ ● 🕙 ● ✳ ● No indication even if the remote controller is operated.	Power supply is not turned on. Miscabling between sensor unit and indoor unit	Check cable connection and correct it.
⏻ ☼ 🕙 ● ✳ ●	Defective connection between sensor unit and indoor unit	
⏻ ● 🕙 ● ✳ ☼	Miscabling or defective connection between indoor and outdoor units	
⏻ ☼ 🕙 ● ✳ ☼ Flashes alternatively	Protective device of outdoor unit works.	Check outdoor unit.
⏻ ● 🕙 ☼ ✳ ☼ Flashes alternatively	Protective device of indoor unit works.	Check indoor unit.

How to set up the filter (sold separately) of the high ceiling

- When the height of the installation exceeds 3.5m or when installing a filter, the fan speed needs to be changed. In order to do this the DC fan Tap's need to be set at No.2 (Tap 1) and No.4 (Tap 2) on DIP switch [S003] on the wireless sensor P.C. board. The wireless sensor P.C. board can be accessed by removing the screws at the rear side of the wireless sensor unit and the rear cover.

[S003] No.2 (Tap 1) and [S003] No.4 (Tap 2) are
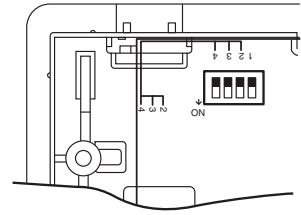
Setup for high ceiling

	[S003] No.2 (Tap 1)	[S003] No.4 (Tap 2)	Installable height of ceiling
Standard (At shipment)	OFF	OFF	3.5m
Type 1	OFF	ON	4.0m

	[S003] No.2 (Tap 1)	[S003] No.4 (Tap 2)	Filter sold separately
Standard (At shipment)	OFF	OFF	Standard filter
Type 1	OFF	ON	Optical regeneration deodorant filter
Type 3	ON	OFF	High-performance filter
Type 6	ON	ON	Deodorant filter / Ammonia deodorant filter

[NOTE]

If the setup has been performed once, the set contents of Type 1, 3, and 6 can be arbitrarily changed. However, it is required that you turn off [S003] No.2 (Tap 1) and No.4 (Tap 2) on the DIP switch and you are also required to rewrite the wired remote controller (sold separately) to return the set content to the standard one (at shipment). (For rewriting by a wired remote controller, refer to the Installation Manual supplied with the indoor unit.)

Never set ON to DIP switch [S003] No.1 (Test run). (A test run is carried out on the remote controller.) (For the test run, refer to the Installation Manual supplied with the indoor unit.)

Cautions for installation of the remote controller

- Before fixing the remote controller holder to the wall, place the remote controller in its proposed position and turn on all fluorescent lights and then check that the air conditioner can receive the signals from the remote controller. If the unit operates correctly you can fix the remote control holder to the wall.
- When the room temperature is sensed by the remote controller, mount the remote controller paying attention to the following items.
  - Place not exposed directly to cold or hot wind.
  - Place not exposed directly to the sunlight.
  - Other places where the remote controller is not influenced.

Explanation to customers

- Hand over the "Owner's Manual" and "Installation Manuals" to the customer after installation has been completed.
- Explain the functions and maintenance of the remote controller according to the "Owner's Manual".

How to handle the remote controller

- **In the case of using a remote controller mounted to the wall, etc.**
  Firstly check a signal is received correctly by pushing the (I) button at the position where the remote controller is to be mounted.

- **Replacement of battery**
1. Holding both ends of the cover and remove it by sliding the cover downwards.
2. Correctly insert 2 AAA alkali batteries matching + and - polarities.
3. Push the SET button with something tipped and attach the cover.

Mounting screw
Truss tapping
4 x 16

Put on.
1

Push.
2

- To take off the remote controller, pull it towards you.

Cover

RESET button

4-1-6 Wireless remote controller kit (3) (TCB-AX21E2)

Accessory parts

No.	Parts		Quantity	No.	Parts		Quantity
1	Separate receiver unit (provided 200mm power cable)		1	**6**	Spacer		4
2	Plate mounting		1	**7**	Wire joints		2
3	Screws M4 x 25		2	**8**	Clamp		1
4	Screws M4 x 40		2	**9**	Pattern template 95 x 51		1
5	Wood screws		2				

Switch location of receiver unit

ALL·○
RCU : SUB
PCB CHK.
TEST RUN

RCU : MAIN
NORMAL

1 2 3
ADR
4 5 6
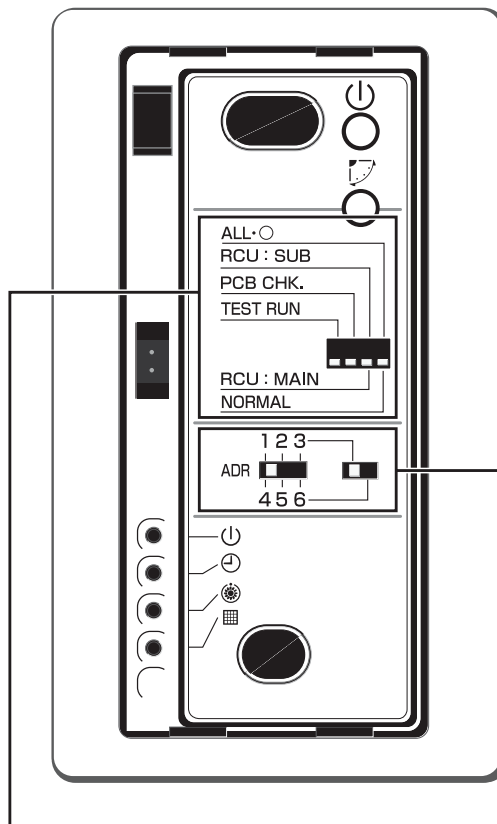
Address selector switch
This switch is used to address one of a maximum of six air conditioners that can be controlled by the remote controller.

All·○/NORMAL selector switch
Set this switch to the "NORMAL" position for the normal operation of the air conditioner. When this switch is set to the "ALL·○" position, the indoor unit of the air conditioner is turned off.

RCU:SUB/RCU:MAIN selector switch
Set this switch to the "RCU:MAIN" position for normal operation. Refer to page 7 for setting the "RCU:SUB" position.

PCB CHK switch
This switch is not used and should be set in the position shown in the figure.

TEST RUN switch
This switch is used for test running.

Installation location of receiver unit

• Do not install in a location where the air contains oil mist, such as in a kitchen or factory.

• Do not install next to a window, or in any other location directly exposed to sunlight and outside air.

• Do not install nearby devices which can be expected to produce electrical noise, such as elevators, automatic doors and industrial sewing machines.

• If the receiver unit is installed near a rapid-start type or inverter-type fluorescent lamp (a lamp which does not include a glow lamp), it may not be possible to receive the wireless remote controller signal. In order to prevent interference from fluorescent lamps, leave a minimum of 2 meters between the receiver unit and the fluorescent lamps and install the receiver unit in a location where it can receive the wireless remote controller signal even when the fluorescent lamps are lit.

How to install the receiver unit

NOTES :

• To avoid malfunction of the remote controller, do not assemble or run remote control wiring together with the power cables and do not enclose them in the same metal conduit.

• When the power unit induces electrical noise, it is recommended that a noise filter or the like be installed.

For flush mounting into a wall, install the separate receiver unit into the metal switch box (field supply) that has been recessed into the wall previously.

1. Insert a flathead screwdriver or similar tool into the notch and remove the face plate.

2. Fix the receiver unit with 2 M4 screws provided. Do not overly tighten and use the provided spacers. If the receiver unit does not fit change into the wall, cut the spacers to adjust the clear-ance.

3. Connect the receiver unit wiring (2-core cable) with the cables extended from the indoor unit. (Refer to the section on receiver unit wiring.) Be sure to determine the correct terminal numbers on the indoor unit when wiring the receiver unit. The remote controller will be damaged if high voltage (such as 200 VAC) is applied.

4. Reinstall the face plate.

Receiver unit

Screw M4 x 25 (2)

Spacer

Remove

Face plate
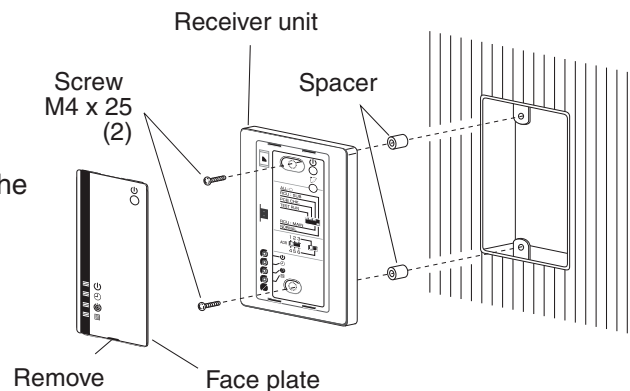
Ensure that the wall where the receiver unit is to be installed can support the controller sufficiently.

1. Insert a flathead screwdriver or similar tool into the groove on the bottom of the receiver unit. Pry open with the screwdriver and remove the lower case. (Fig. A).

Face plate
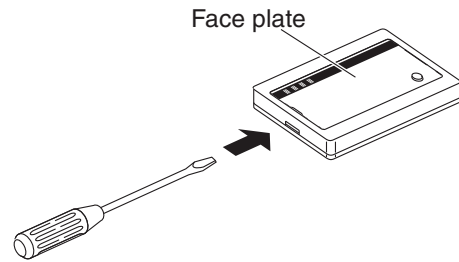
Fig.A

2. In order to later pass the receiver wiring out through the upper case (thin part at the top center), use nippers or a similar tool to cut a notch in the same size as the remote controller cord (optional). (Fig. B)

Notch where remote controller cord passes through top case

Clamp

2–3mm

Connector

Remote controller cord (optional)
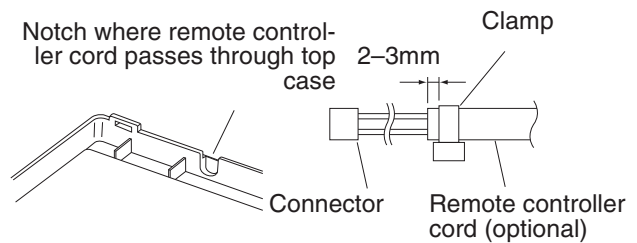
Fig.B

3. Disconnect the wires that were connected to the connector at the time of shipment.

4. Fasten the remote controller cord (optional) at the position shown in Fig. C, using the provided cord clamp. Then connect the cord to the receiver connector.

Remote controller cord (optional)

Wood screws (2)

Receiver unit
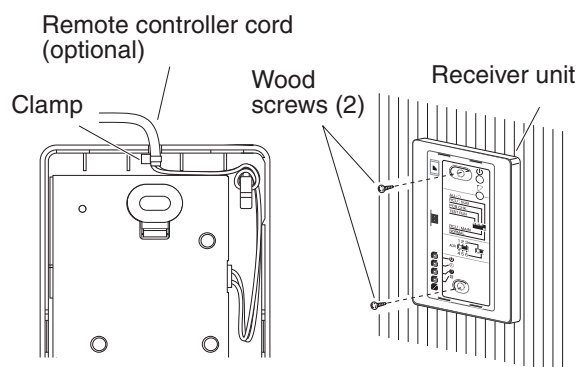
Clamp

Fig.C

5. Shape the remote controller cord as shown in Fig. C so that it fits inside the top of the receiver unit, above the P.C. board. Then attach the lower case. At this time, bend the head of the clamp so that it faces sideways.

6. Remove the nameplate and use 2 wood screws to attach the receiver unit.

7. Use the provided cord clips to fasten the remote controller cord to the wall.

8. Reattach the nameplate.

If the separate receiver unit is installed on the ceiling, use the provided ceiling mounting bracket for installation.

1. Insert a screwdriver or similar tool into the notch at the bottom to remove the receiver nameplate.

2. Cut a section out of the ceiling along the provided paper pattern (95 x 51 mm).

3. Pass the wire through the provided mounting bracket and insert the bracket into the installation hole. (Fig. D)
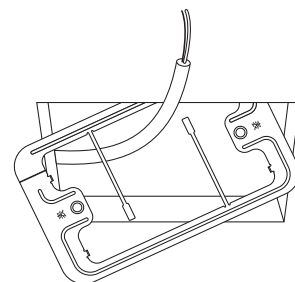
Fig.D

4. Use bracket parts (A) and (B) to securely grip the ceiling material. (Fig. E)

5. Connect the receiver wire (2-core) to the wire from the indoor unit. (Refer to "Wiring the Receiver Unit.") Check the terminal number on the indoor unit before wiring the receiver unit and be sure not to wire incorrectly. (The unit will be damaged if high voltage, such as 200 VAC, is applied.)

6. Adjust the provided spacers so that they are several millimeters larger than the thickness of the ceiling material. Pass the 2 supplied screws (M4 x 40) through the spacers and tighten them enough to hold the receiver unit in place.

Part (A)

Part (B)
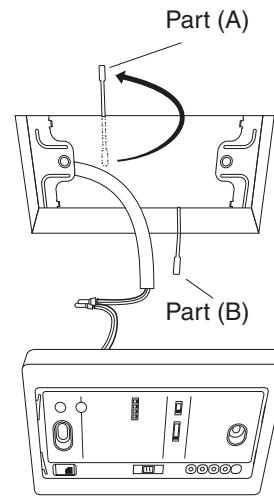
Fig.E

7. Return parts (A) and (B) through the gap between the ceiling and receiver unit so that they are contained in the openings. Then tighten the screws. Do not tighten the screws excessively. This may result in damage or deformation of the case. Tighten to the point where the receiver unit can be moved slightly by hand. (Fig. F)
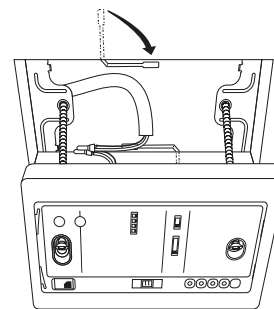
Fig.F

8. Reattach the nameplate.

How to perform cabling of sensor unit

Flush Mounting

• Connection diagram

Indoor unit remote controller terminal board

1
2

WHT
BLK

1
2

Separate receiver unit

Wire of receiver unit (field supply)

Power wire from receiver unit
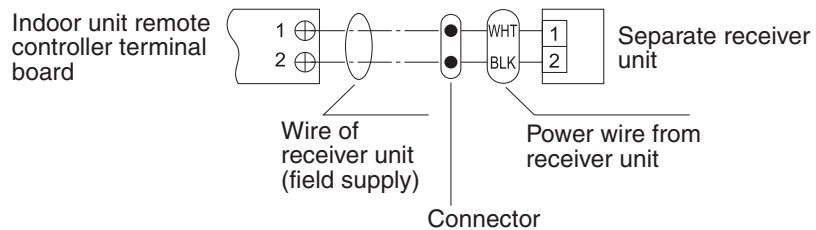
Connector

• Provided wire joint (WHT 2)

1. Strip the insulation to approximately 14 mm from the ends of the wires to be connected.

2. Twist together the 2 wires and create a crimp connection at the wire joint.

3. If a special crimping tool is not used, or if the connection is soldered, insulate the wires using insulation tape.

Wire of receiver unit (field supply)

Power wire from receiver unit

Wire joint CE-1 (provided)
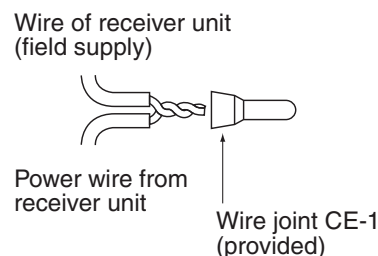
Exposed Mounting

Connection diagram
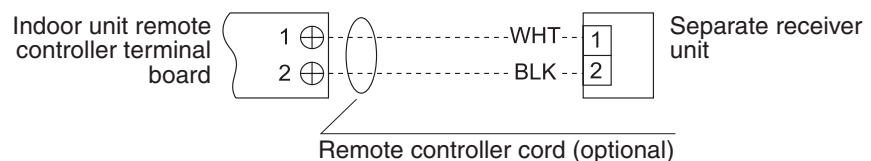
Indoor unit remote controller terminal board

1
2

WHT
BLK

1
2

Separate receiver unit

Remote controller cord (optional)

Requirement

The control by two remote controllers is enabled by installing the wireless remote controller with the wired remote controller for an indoor unit.
(Max. 2 remote controllers (wireless or wired) are allowed.)
"2-remote controllers" controlling means that one or multiple units are operated by the multiple remote controllers.

NOTES :

1. Upon confirmation of the terminal numbers of the indoor unit, connect the remote controller cables without miscabling. (If applied AC 220–240 Volt, damage the unit.)
2. The multiple wireless remote controller kits cannot concurrently be used for an indoor unit.
3. When installing simultaneously the wireless remote controller with the wired remote controller, set one of them as the secondary remote controller.
   - When setting the wired remote controller as the side, exchange the address connector at the rear of P.C. board of wired remote controller from master to side remote controller.
   - When setting the wireless remote controller as the secondary controller, turn the switch on the wireless remote controller receiver unit from RCU: MAIN to RCU:SUB.

To operate an indoor unit by 2 remote controllers

The indoor unit is operated if either wireless or wired remote controller is set as master or secondary remote controller
(Total cable length: Within 400m)
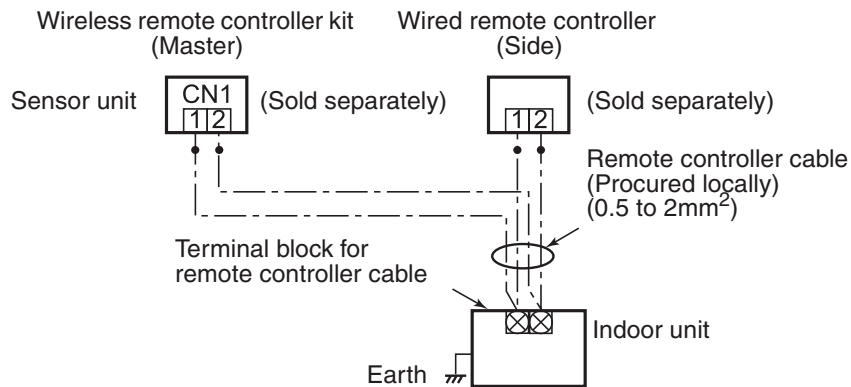
To operate a group control of multiple indoor units using 2 remote controllers

Both Master and Secondary remote controllers are able to be used, even if they are installed to other indoor units.
(Total cable length: Within 200m)
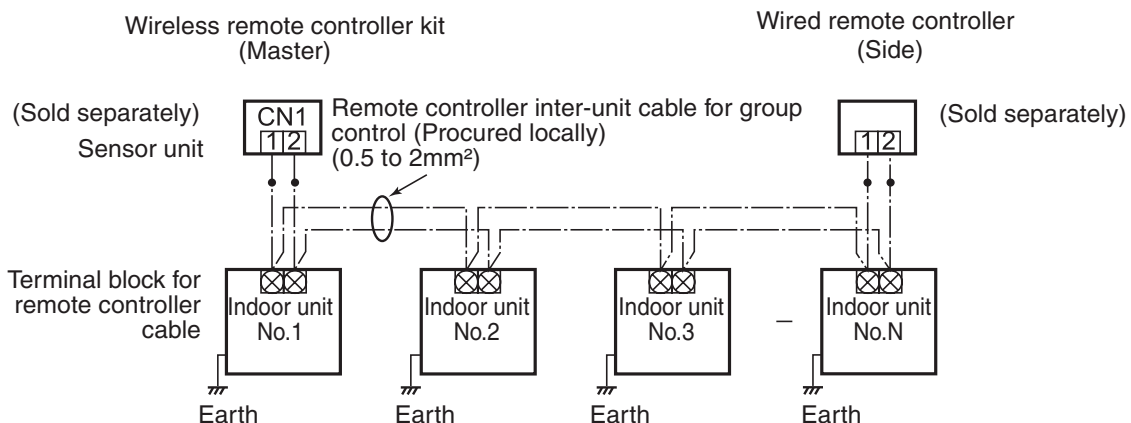
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How to set the room temperature sensor

- The room temperature sensors are equipped in the indoor unit and the wireless remote controller. Only one of the two sensors will be used.
- The factory setting for the room temperature sensor is set to use the indoor unit side.
  To select the sensor in the remote controller, push the SENSORb utton (Right figure) inside of the remote controller cover and wait for " " mark to appear on the LCD.
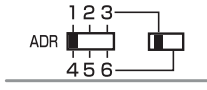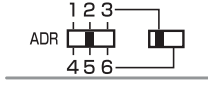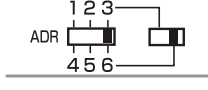
NOTE :
If the room temperature data from the remote controller is not transmitted to the unit for 10 minutes or more, the sensor at indoor unit side is automatically selected even if the sensor at the remote controller side is selected.
Position the remote controller, so that it is pointing towards the indoor unit as much as possible.
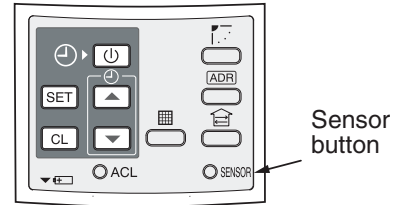
Sensor button

How to set the address switch

- When the multiple sensors are installed in the same room, an address can be set to prevent cross communication.
- When replacing the battery and pushing the SET button, the address of the remote controller becomes [ALL] and the sensor is enabled to receive signals regardless of the setting of the address switch of the operation section.
- For selecting the remote controller address, refer to Owner's Manual.
- Change the address of the sensor by removing the screws on the P.C. board cover of the sensor unit. After this, fix the cover with the screws.

Display of remote controller address	Address ALL	Address 1	Address 2		Address 6
Address switch position of sensor	Address switch of sensor unit can be set at any position.				

Wireless remote controller

Operation Manual

Display Section

In reference to the explanation of the remote controller display, refer to the two figures shown on this page.

Only selected contents are display during actual operation.

• When turning on the power supply for the first time, it will take up to 3 minutes before the **[SET DATA]** symbol will flash. This flashing display will last for around 1 minute. While this display is flashing, the model is being automatically confirmed.
After the minute has passed and the [**SET DATA**] display has disappeared, you can then use the remote controller.
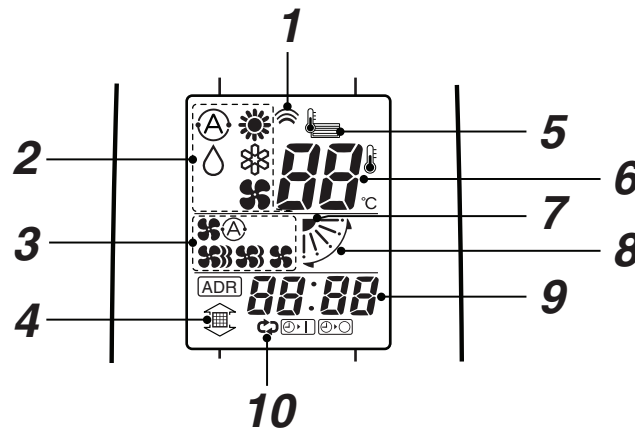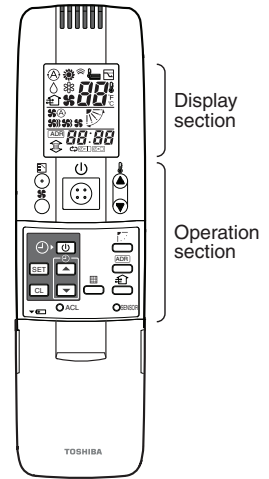
1 Transmitting indication

Displayed while operating the switches on the remote controller.

2 Mode display

The selected operation mode is displayed.

Ⓐ [AUTO] mode is displayed on heat recovery type only.

3 Fan mode select display

The selected fan mode is displayed.

(AUTO) 🌀Ⓐ
(HIGH) 🌀
(MED.) 🌀
(LOW) 🌀

4 Filter display

If "FILTER 🔲" is displayed, clean the air filter.

5 Remote temperature sensor display

Displayed when remote temperature sensor is selected.

6 Set up temperature display

The selected set up temp. is displayed.

7 Flap position display

8 SWING display

Displayed during up/down movement of the flap.

9 Timer time display

Time of the timer is displayed.
(When a fault has occurred the check code is displayed.)

10 Timer SETIN setup display

When pushing the Timer SET button, the display of the timer is selected in order of [OFF] 🕐 → [OFF] repeat OFF timer 🔁 → [ON] 🕐 → No display.

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Push each button to select a desired operation.

- The details of the operation firstly need to be set up. After this the air conditioner can be used simply by pushing the ⏻ button only.
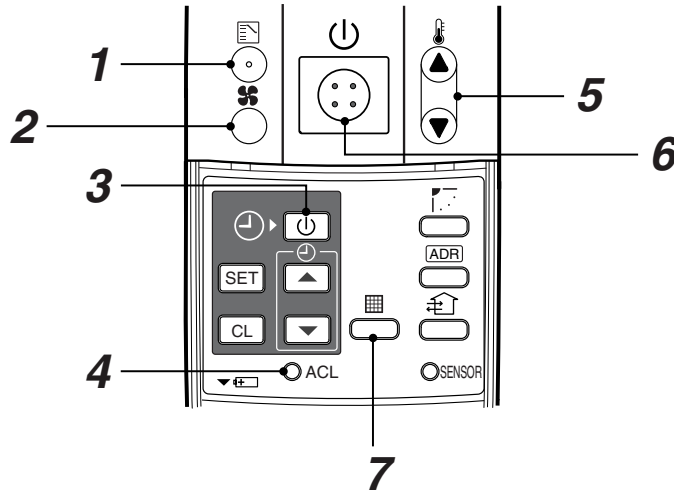
1 Operation select button

Selects the desired operation mode.

2 Fan mode select button

Selects a fan mode.

3 Timer set button

TIMER SET button is used when the timer is set up.

4 Check button

CHECK button is used for check operation. During normal operation, do not use this button.

5 Temperature set button

Adjusts the required room temperature.

Set required set temperature by pushing ▲ or ▼ .

6 Start/Stop button

When this button is pushed the operation starts. Push the button again and the operation will stop.

When the operation stops, the operation lamp and all the displays will disappear.

7 Filter reset button

Resets (Erases) "FILTER ▩" display.

OPTION :

Remote controller sensor

Usually the TEMP. sensor of the indoor unit is used to monitor the room's temperature. However it is possible to use the remote controller as a means of measuring the room temperature. For further details please contact the dealer who you purchased the air conditioner from.

For details, contact the dealer from which you have purchased the air conditioner.

NOTE :
When a mode prohibited by the central control is selected in the local settings on an indoor unit and you want to change another setting of the indoor unit, select the prohibited mode on the remote controller before configuring the setting you want to change.

(Ex. 1)Changing the temperature settings under the central control mode 4
Select the mode of the indoor unit using button 1, and adjust the temperature setting on the remote controller.
(Ex. 2) Changing the fan settings under the central control mode 3
Select the mode of the indoor unit using buttons 1 and 5, and adjust the fan settings on the remote controller.

Signal Receiving Part (RBC-AX31U(W)-E/RBC-AX31U(WS)-E)

Signal Receiving Part

- The signal receiving part is attached to the indoor unit.
- Hereinafter, all remote controller button names are indicated with respective symbols displayed on the remote controller.

Example: Start/Stop button → (\|)
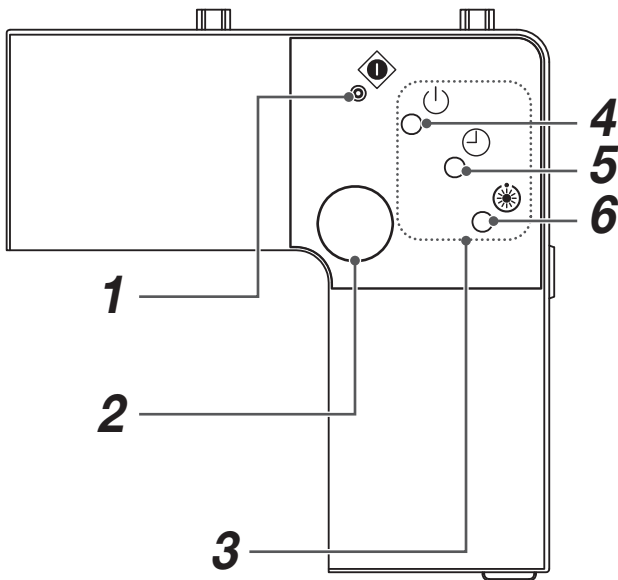
1 Emergency operation button

2 Signal receiver
Receives signals from the remote controller.

3 LEDs
Any of these LEDs flashes during an error state.

4 Run LED (green)
Lights while the air conditioner is working.

5 Timer LED (green)
Lights while the timer is reserved.

6 Not Ready LED (orange)
- Lights in the heating mode at the beginning of operation or during defrosting or when the temperature controller is activated.
- Flashes during an error state.

The rear of signal receiving part
The following switches are provided on the rear of the signal receiving part. For their settings, contact the dealer from whom you purchased the air conditioner.

- **Header/follower switch**
  Normally, set this switch to "HEADER" to use the remote controller as a header. The remote controller can be used together with the wired remote controller (sold separately).
- **Test run switch**
  Do not use this switch in normal operation, but use for service.
- **Address switches**
  Distinguish transmit signals and receive signals.

⚠ CAUTION

- If "pi, pi" sound is heard with the Run LED lighting and the Timer and Not Ready LEDs flashing alternately while the heat-pump type air conditioner is used, desired operation mode is disabled. The same is true if the AUTO mode is selected in a model that is not provided with the cool/heat auto function.
- Even if you push (\|), 🗎 or 🌡 when remote controller operation is disabled by the central control or other means, "pi" is heard 5 times and the button operation is not accepted.

Signal Receiving Part (RBC-AX22CE2)

• The signal receiving part is mounted in the ceiling panel.
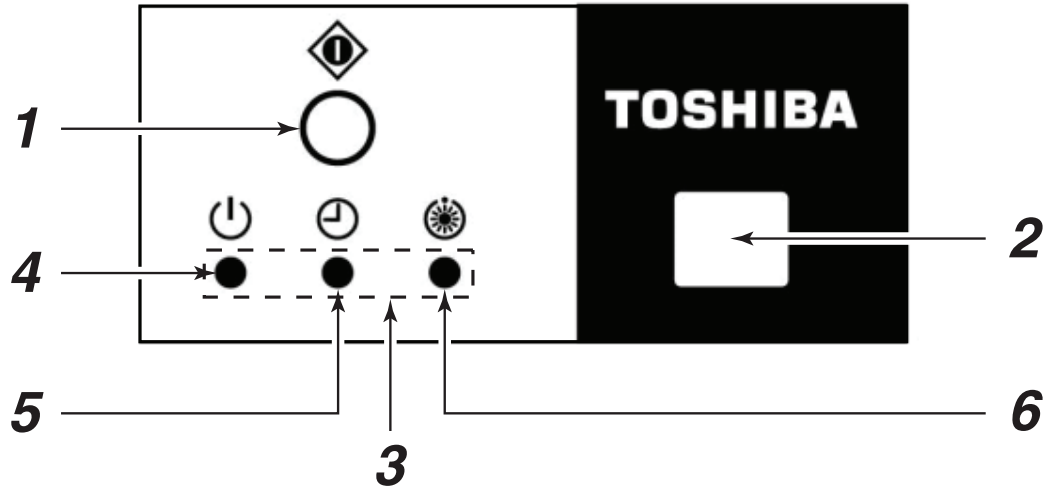
Signal Receiving Part

1 **Temporary operation button**

2 **Signal receiving part**

The signal sent from the remote controller is received.

3 **Display lamp**

One of the displays will flash if a fault has occurred.

4 ⏻ **lamp**

This lamp goes on during operation.

5 🕐 **lamp**

This lamp goes on when the timer is set.

6 ❋ **lamp**

• In heating operation this lamp will come on in the following cases;

The operation has started.
The temp. controller has worked.
The unit is under defrost operation.

• This lamp will flash when a fault has occurred.

• If a "beep, beep" sound is heard, the MODE lamp on the display lamp goes on and the 🕐 lamp and ❋ lamp flash alternately, the operation to perform the desired mode has been unsuccessful.

Signal Receiving Part (TCB-AX21E2)

• The signal receiving part is mounted in the ceiling panel.
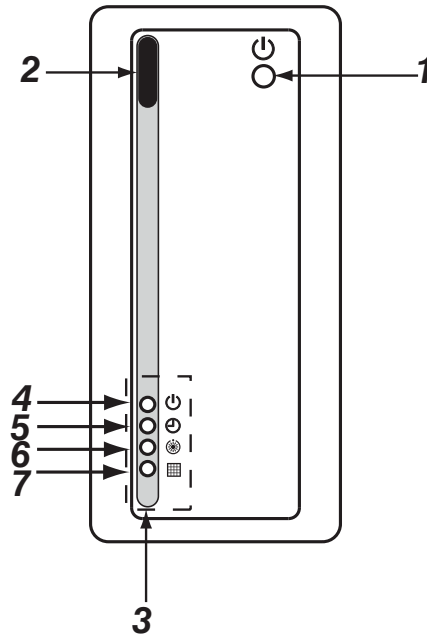
Signal Receiving Part

1 **Temporary operation button**

2 **Signal receiving part**

The signal sent from the remote controller is received.

3 **Display lamp**

One of the displays will flash if a fault has occurred.

4 ⏻ **lamp**

This lamp goes on during operation.

5 ⏱ **lamp**

This lamp goes on when the timer is set.

6 ✳ **lamp**

• In heating operation this lamp will come on in the following cases;

The operation has started.
The temp. controller has worked.
The unit is under defrost operation.

• This lamp will flash when a fault has occurred.

7 ▦ **lamp**

This displays lights to indicate that it is time to clean the filter.

• If a "beep, beep" sound is heard, the MODE lamp on the display lamp goes on and the ⏱ lamp and ✳ lamp will flash alternately, the operation to perform the desired mode has been unsuccessful.

HOW TO OPERATE THE UNIT

Cool/Heat AUTO, Heat, Dry, Cool, Fan

Power supply

Turn on the power supply to the wireless remote controller 12 hours before starting the operation.

- After the power supply has been turned on, the operation of the remote controller is not accepted for approx. 1 minute. This is not a failure.
  (The sensor receives the signal, but the received contents are cleared.)
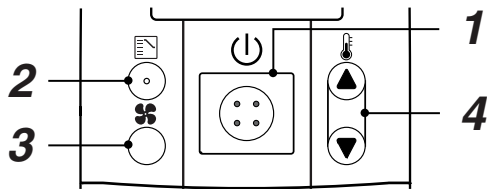
1 Push the Start/Stop button.

2 Push the 📄 (Operation Select button) operation to select one of Ⓐ, ☀, ◇, ❄, and 🐾.

3 Push the 🐾 (Fan Mode Select button) to select one of the fan speed modes.

When selecting Ⓐ, the fan speed is automatically changed.
(During FAN mode, the air speed is not automatically changed.)

4 Push either the Ⓐ or ▼ to select the desired temperature.

- During FAN mode, the temperature cannot be set up.

5 **Stop**

Push the Start/Stop button.

When using the remote controller to stop the unit, the outdoor unit fan may keep operating for a while even if the compressor on the outdoor unit has stopped.

- **In heating operation, if the room is not comfortably heated with the FAN 🐾, select FAN 🐾⟩ or 🐾.**

  Although they are displayed, the function may not be provided according to the indoor unit. (i.e. Fan speed is constant.)

- **When the unit cannot be stopped by normal operation**

  Turn off the power switch or leakage breaker and then contact the shop who you purchased the air conditioner from.

Automatic cool/heat

When all indoor units in the identical refrigerant system are controlled as a group, the cooling/heating operation is automatically performed by the difference between the setup temperature and the room temperature.

Dry operation

- Dry function is only available on certain models and although the remote controller may indicate this setting, no operation is taking place. (Same to Cooling operation)
- When the room temperature approaches the setup temperature, running/stop operations are automatically repeated.
- In order to keep the humidity levels as low as possible the indoor fan will go into low mode when the dry operation has finished.
- The fan speed cannot be adjusted according to the indoor unit model or the status of the room temperature.
- The DRY mode cannot be used according to the indoor unit model or when the outdoor temperature is below 15°C .

HOW TO OPERATE THE TIMER

- After setting the timer, set the remote controller at a position where the signal can reach the sensors (indoor unit body) .
  (The signal for the timer operation is sent from the remote controller.)

Use in the following cases	During display
To stop the air conditioner after the previously set time has passed	⏱▸ǀ
To stop the air conditioner every time after the previously set time has passed	↻ ⏱▸ǀ
To operate the air conditioner after the previously set time has passed	⏱▸○

Timer time

For every push of the ▲, the setup time increases by 0.5 hour (30 minutes). The maximum time to be set is 72.0 hours.

For every push of the ▼, the setup time decreases by 0.5 hour (30 minutes). The minimum time to be set is 0.5 hours.

Timer display

For every push of the SET button, the display changes as follows;

No display

⏱▸ǀ → ↻⏱▸ǀ → ⏱▸○

Use example

How to use the OFF timer

(Ex.)To stop the unit after 30 minutes

1. **When pushing the timer SET button once, ⏱▸ǀ and the time will flash on the remote controller.**

2. **Push TIME ▲ or ▼ to set the time to 0.5.**

3. **Push the SET button and the ⏱▸ǀ timer will be displayed.**

How to use the repeat timer

(Ex.)To stop the air conditioner every time after 2.5 hours has passed

1. **When pushing the timer SET twice, ↻, ⏱▸ǀ and the time will flash on the remote controller.**

2. **Push TIME ▲ or ▼ to set the time to 2.5.**

3. **Push the SET and the ↻, ⏱▸ǀ timer will be displayed.**
   If the ⏱▸ǀ works, the operation will stop after 2.5 hours. When pushing the ⏻ (Start/Stop) button again to operate the unit, the operation will again stop after 2.5 hours.

How to use ON timer

(Ex.)To operate the unit for 8 hours

1. **When pushing the timer SET button three times, the ⏱▸ǀ and the timer will flash on the remote controller.**

2. **Push TIME ▲ or ▼ to set the time to 8.0.**

3. **Push the SET button**
   The operation mode display disappears and the time and the ⏱▸ǀ will go on.

To stop the timer operation

To stop the timer operation
Push the CL button. Then the timer display will disappear.

HOW TO ADJUST AIR DIRECTION

- Never move the flap (Air direction up/down adjusting plate) which is operated on the remote controller with your hands except in a case of cleaning the flap.
- While the unit is not in operation, the flap (air direction up/down adjusting plate) will be directed downwards automatically.
- During the preparation for heating, the flap (air direction up/down adjusting plate) will be directed upwards. The swinging operation will start after the heating preparation status has been cleared. However, swinging is displayed on the auto flap display on the remote controller even if the heating operation is being prepared.

How to set up the air direction

For every push of the button during operation, the air direction will change.

How to adjust the the air flow direction, using the swinging function
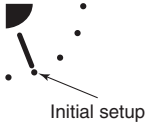
When pushing the button, set the direction of the flap (air direction up/down adjusting plate) to the lowest position, and then push the button again, the swinging is displayed and the air direction automatically change either upwards/downwards.

How to stop the louver from swinging

Pushing the button once again during swinging of the flap will stop the flap at the desired position.
Then, when pushing the button, the air direction can be set to the position from the uppermost position.

- In cooling or dry operation, the flap will not swing if it is already at a downwards position.

  If doing so, the flap will stop at the 3rd position from the uppermost position.

In heating operation

Direct the flap (air direction up/down adjusting plate) downwards, otherwise the hot air may not be able to reach the floor.

Initial setup

In cooling/dry operation

Direct the flap (air direction up/down adjusting plate) upwards, otherwise dewdrops may form and drip down near the discharge grille.

Initial setup

In air blowing operation

Initial setup

In all operation modes

Series of operation

Display when swinging has stopped

Fan/Heat operation   Cool/Dry operation
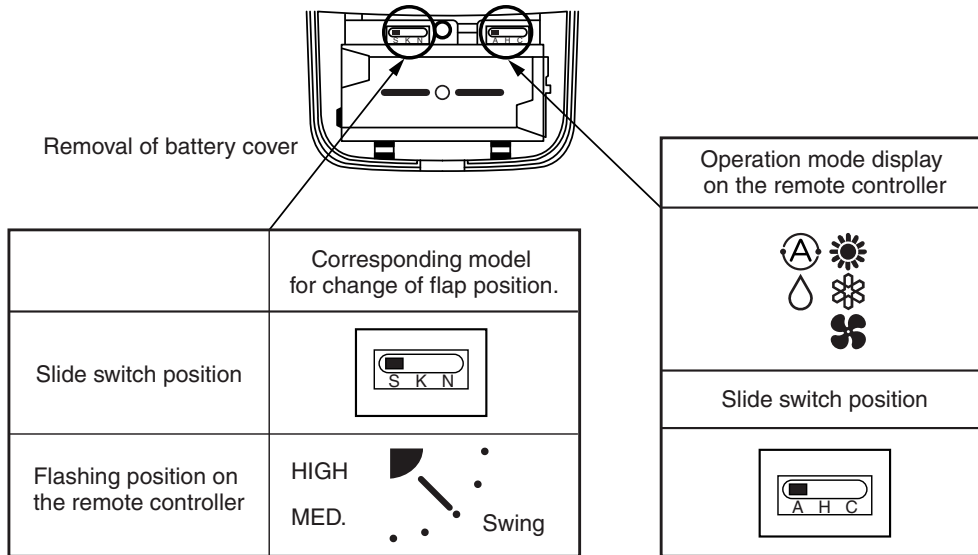
SLIDE SWITCH

- Do not change the setting of the slide switch because a malfunction will occur when using other settings.
- Before usage, check the slide switch is set to the position as follows;

Removal of battery cover

	Corresponding model for change of flap position.
Slide switch position	S K N
Flashing position on the remote controller	HIGH MED. Swing

Operation mode display on the remote controller
(A) ☀ ◊ ❄ ❀
Slide switch position
A H C

HOW TO INSERT THE BATTERIES

1. Holding both sides of the cover remove it by sliding it downwards.
2. Correctly insert 2 AAA alkali batteries matching + and - polarities.
3. Push the RESET button with something tipped and re-attach the cover.

- Replace the batteries when the display section of the remote controller is difficult to read, or when the signal cannot be sent if you are not close to the sensor.
  (The standard replacement time of the alkali batteries is approx. one year.)
- Always use the same type and make of new batteries.
- If you will not be using the remote controller for an extended period of time, remove the batteries from the case.

RESET button

Cover
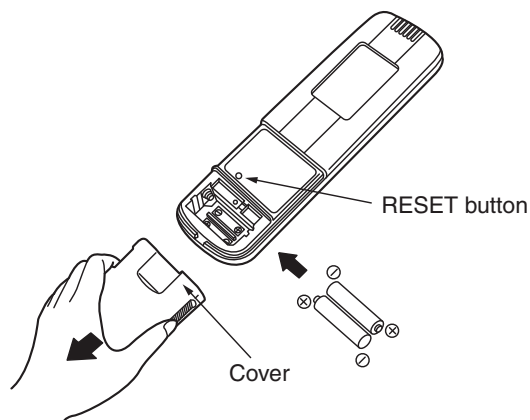
ADDRESS

When the multiple indoor units corresponding to the wireless remote controller are installed in the same room, an address can be set up to prevent interference.

A maximum of 6 indoor units can be controlled individually by one remote controller.

The address code for receiving the signal is found inside the sensor (inside of panel or indoor unit) and the address switch for sending the signal is found inside the remote controller. For details, contact the dealer who you purchased the air conditioner from.

How to Check the Address

When pushing the ADR button on the remote controller, the present address is displayed on the display section of the remote controller. If this address matches with the address of the sensor (inside of panel or indoor unit), a buzzer sounds.
(When ALL is displayed, the buzzer sound is heard.)

When ALL is displayed, the air conditioner can be operated regardless of any address on the sensor (inside of the indoor unit). Send the signal by directing the remote controller towards the sensor (panel or indoor unit body) of the unit to be operated.

How to Match the Address

Setup to remote controller address

1. When keeping the ADR pushed for 4 seconds or more, the ADR lamp comes on in the display section of the remote controller and the present address is displayed (flashing).

2. For every push of the ADR, the address is exchanged as ALL → 1 → 2 → 3 … → 6 → ALL. Match one of them with the address switch on the indoor unit sensor.

3. When pushing the CL, the address display goes on and is displayed for 5 seconds.
   If the address matches with the address switch on the operation part, the buzzer sounds.

| Display of remote controller address	Address **ALL**	Address **1**	Address **2**	……	Address **6**
Address switch position on sensor	* Address switch on sensor unit can be set to any position.	S001 4–6 / 1–3 Address select S002 3 2 1 / 6 5 4 Address	S001 4–6 / 1–3 Address select S002 3 2 1 / 6 5 4 Address	……	S001 4–6 / 1–3 Address select S002 3 2 1 / 6 5 4 Address

Turn the knob to the right side for 1 to 3 and turn the knob to the left side for 4 to 6 on the Address select switch S001.

Emergency Operation (RBC-AX31U(W)-E/RBC-AX31U(WS)-E)

HOW TO PERFORM EMERGENCY OPERATION

In the event of an emergency shown below, push emergency operationeon the signal receiving part (inside the ceiling panel or indoor unit) for emergency operation.

- The batteries of the remote controller have been exhausted.
- The remote controller is out of order.
- The remote controller has been lost.
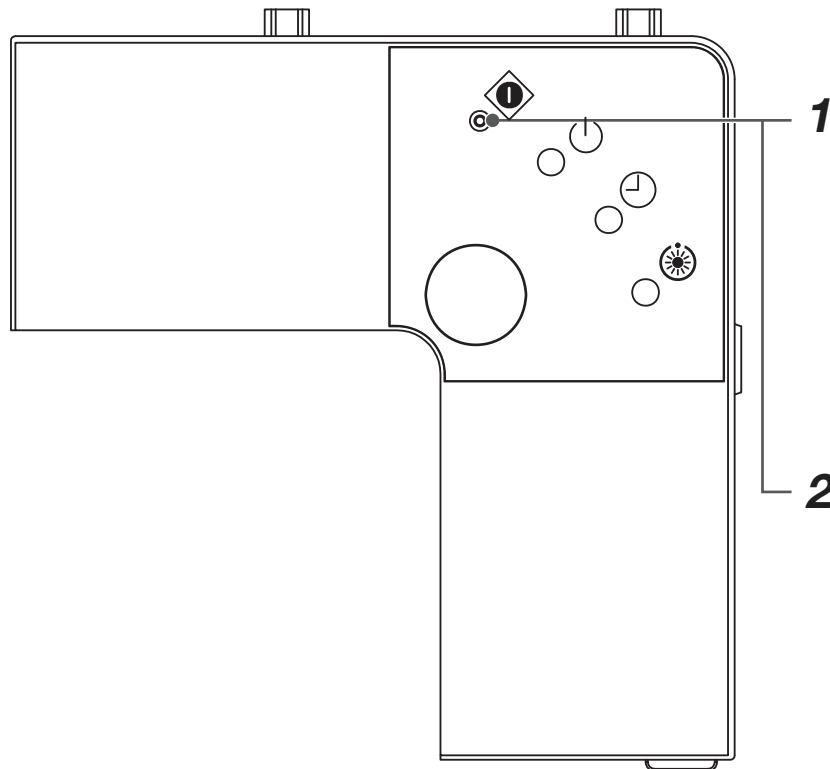
1 Start

Push emergency operation.
(When the emergency operation is started at a room temperature of 24°C or more, the air conditioner enters the cooling mode. When t he emergency operation is started at a room temperature below 24°C, the air conditioner enters the heating mode.)

2 Stop

Push emergency operation once again.

REQUIREMENT

The test run switch in the signal receiving part is used for a test run during the installation work. Do not use it for other purposes.

Emergency Operation (RBC-AX22CE2)

HOW TO PERFORM A TEMPORARY OPERATION

In the following cases, you can operate the air conditioner temporarily by using the operation panel found on the inside of the unit.

- The battery in the remote controller has expired.
- A fault has occurred in the remote controller.
- The remote controller has disappeared.
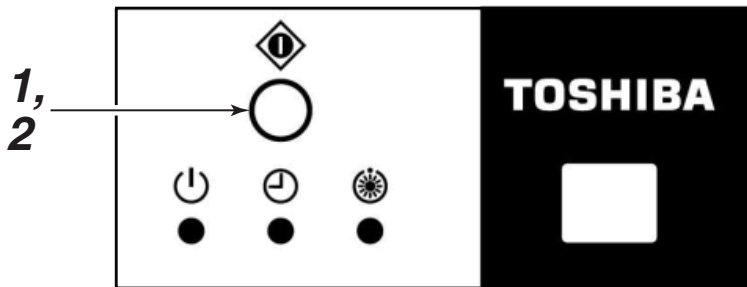
1 Start

Push the temporary operation button.

(If starting the operation when the room temperature is 24°C or higher, the mode enters COOL mode. If starting the operation when the room temperature is 24°C or lower, the mode enters HEAT mode.)

2 Stop

Push the temporary button once more.

CAUTION

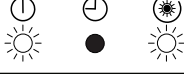- The ON switch for the test run is used during the installation of the unit. Do not use them in the normal operation.
- If the "all stop" is selected a signal from the remote controller will not be accepted.

Emergency Operation (TCB-AX21E2)

HOW TO PERFORM EMERGENCY OPERATION

In the following cases, you can operate the air conditioner temporarily by using the operation panel found on the inside of the unit.

- The battery in the remote controller has expired.
- A fault has occurred with the remote controller.
- The remote controller has disappeared.

1,2
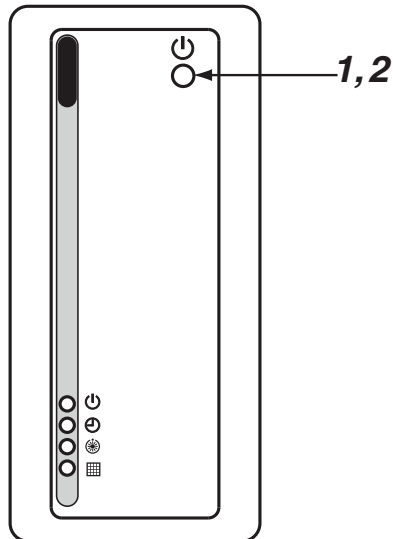
1 Start

Push the temporary operation.

(If starting the operation when the room temperature is 24°C or higher, the mode enters COOL mode. If starting the operation when the room temperature is 24°C or lower, the mode enters HEAT mode.)

2 Stop

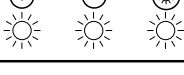Push the temporary operation once more.

CAUTION

- The ON switch for the test run is used for the test run mode during the installation of the unit. Do not use them in the normal operation.
- If the "all stop" is selected a signal from the remote controller will not be accepted.

BEFORE ASKING FOR A SERVICE ENGINEER

**Before requesting a service engineer, check the following items.**

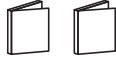| Phenomenon		Cause	Measures
Check again	Operation does not start even if the switch is turned on.	Stopped? or after power failure?	Push Start/Stop on the remote controller.
		Is there power supply to the power switch?	Turn on the power supply switch.
		Fuse?	Contact the dealer who you purchased the air conditioner from.
		Has the unit been set on a timer mode?	Delete the timer operation.
		Is not [ALL OFF] of [Signal Receiving Part] selected?	Set the switch to [Normal position] and stop the operation.
		Has the battery of the remote controller expired?	Replace the battery.
		Is the operation mode correct i.e. ❅ (cool) and ☀ (heat)" or "No Ⓐ"?	Change the operation mode.

Phenomenon		Cause
Contact the dealer who you purchased the air conditioner from.	Display lamp flashes. ⏻ (flashing) ⏲ (on) ☀ (on)	• A communication error between the sensor and the indoor unit, or a setup error of the units address when the wired remote controller is used.
	⏻ (on) ⏲ (on) ☀ (flashing)	• A communication error between the indoor unit and the outdoor unit has occurred.
	⏻ (on) ⏲ (flashing) ☀ (flashing)	• A protective device of the indoor unit has operated.
	⏻ (flashing) ⏲ (on) ☀ (flashing)	• A protective device on the outdoor unit has operated.
	⏻ (flashing) ⏲ (flashing) ☀ (on)	• A fault has occurred on the temperature sensor.
	⏻ (on) ⏲ (flashing) ☀ (on)	• The compressor of the outdoor unit is protected.
	⏻ (flashing) ⏲ (flashing) ☀ (flashing)	• The test run is performed. Turn off the Trial ON switch.

Please check the above items. If the fault remains, stop the unit operation and turn off the power supply. Then contact the dealer from who you purchased the air conditioner from, stating the unit model and the fault code or problem. Never attempt to repair any part of the air conditioner yourself as it can be very dangerous.

4-1-7 Remote controller with weekly timer (RBC-AMS41E) Installation Manual

Accessory parts

| No.	Part Name		Q'ty
1	Remote controller		1
2	Screw M4 x 20 mm		2
3	Wood screws		2
4	Installation Manual		2
5	Owner's Manual		2

Requirements to install the remote controller

Installation place

• Install the remote controller 1 m - 1.5 m above floor level (average room temperature area).
• Do not install the remote controller in a place exposed to direct sunlight or outside air (such as a window, etc.).
• Do not install the remote controller where ventilation is poor.
• Do not install the remote controller in a freezing or refrigerated area - the remote controller is not water or splash-proof.
• Install the remote controller in a vertical position.

Remote controller installation dimension

Be sure to follow the installation dimension as shown in the figure 1 when you install the remote controller on the wall.
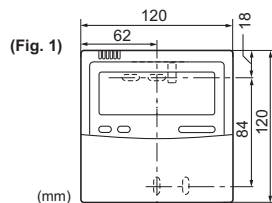
(Fig. 1)

120
62
18
84
120
(mm)

How to install the remote controller

NOTE 1: The remote controller wire should not be bundled with other wires (mains, etc.), or installed with other wires in the same conduit, as malfunction may result.
NOTE 2: Install the remote controller away from sources of electrical interference and electromagnetic fields.
NOTE 3: If electrical interference is unavoidable, countermeasures such as appropriate filtering should be employed.

Wiring slot
Wood screws
Lower case (Rear case)
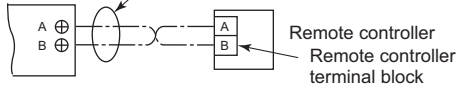Remote controller Cover
<Remote controller (Rear)>
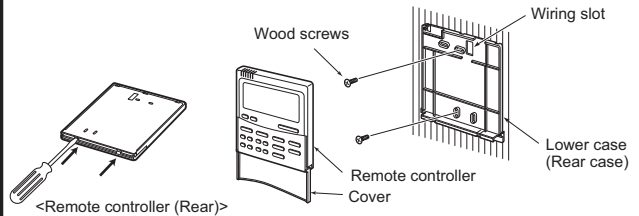
1. For removal of the remote controller's lower case (rear case), insert the tip of a straight blade screwdriver, etc., into the two openings at the bottom of the remote controller to open the lower case.
2. Fix the remote controller's rear case by wood screws (2 pcs.). Do not over tighten, as it may damage the rear case.
3. Connect the wires from the indoor unit to the remote controller terminal block. (Refer to "How to wire the remote controller".) **Connect the wires of the remote controller following the terminal numbering convention of the indoor unit to prevent miswiring. (Do not apply AC 230V mains voltage to the remote controller as it will be damaged).**

How to wire the remote controller

• Connection diagram

Terminal block for remote controller wiring in indoor unit

Remote controller wiring (Field procurement)

* AWG20 (Use 0.5 mm^2 wire)
* Can not use the closed end wire joint.
* Use UL wires rated 300 V.

A ⊕
B ⊕

A
B

Remote controller
Remote controller terminal block

* Terminals A and B are non-polar.

Multiple remote controller installation requirements

In a dual remote controller system, one or more units are operated by multiple remote controllers. (A maximum of two remote controllers can be set.)

Remote controller (inside, rear)

DIP switch 1 2	DIP switch 1 2	DIP switch 1 2	DIP switch 1 2
Header remote control/scheduled timer operation	Header remote control/timer operation	Follower remote control/scheduled timer operation	Follower remote control/no timer function

• How to install

For a dual remote controller system, install the remote controllers in the following way.
1. Set one of remote controllers as the header remote controller. (The default setting is 'Header.')
2. Set the DIP switch on all other remote controller P.C. boards to Sub (to enable them as follower remote controllers).

• Operating one indoor unit from remote controllers installed in two different locations.

Remote controller (Header)
Remote controller (Follower) (sold separately)

A B
A B

Remote controller wires (Field procurement).

Terminal block for remote controller wiring

A B
Indoor unit

Earth ⏚

• Operating a group control of multiple indoor units from remote controllers installed in two different locations.
* Header and Follower remote controllers are operable even if they are connected to any indoor unit.

Remote controller (Header)
Remote controller (Follower) (Sold separately)

A B
A B

Remote controller inter-unit wires for group control
(Field procurement)

Terminal block for remote controller wire

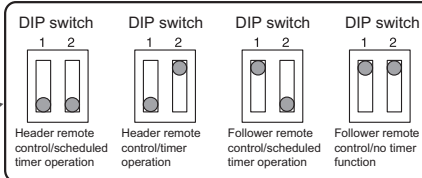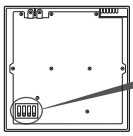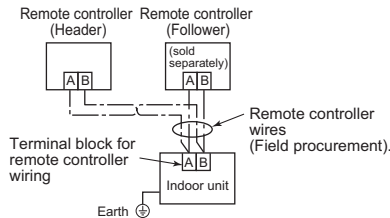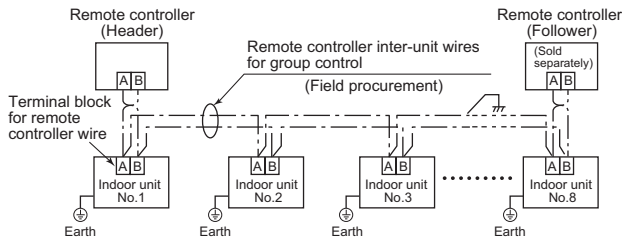| A B Indoor unit No.1	A B Indoor unit No.2	A B Indoor unit No.3	....	A B Indoor unit No.8
⏚ Earth	⏚ Earth	⏚ Earth		⏚ Earth

Remote controller test run setup

1. Push and hold the 🔧 button for 4 seconds or more until "TEST" appears in the LCD, then press the ⏻ON/OFF button.
   • "TEST" appears in LCD during the test run.
   • Temperature adjustment is not possible while "TEST" is displayed. The test run applies considerable load on the machine; therefore, it is recommended not to use the test mode beyond necessity.
2. The test mode should be used in either HEAT or COOL mode.
   NOTE: The outdoor unit will not operate for approx. 3 minutes after power up, or the operation will stop.
3. Be sure the "TEST" indication in the LCD has disappeared by pushing the 🔧 button again after exiting the test mode. (The remote controller has a 60-minute off timer function to prevent continuous test run).

How to select the room temperature sensor

Two room temperature sensors are installed: one in the indoor unit; the other in the remote controller. Only one sensor (usually the indoor unit's) can be active at any one time.

To select the sensor in the remote controller, perform the following steps.
1. Push 🔧 + temperature setup button ▼ for 4 seconds or more.
   NOTE: The unit number displayed the first time is the indoor unit address of the master unit in the group control.
   NOTE: Do not press the UNIT button.
2. Using the temperature setup buttons ▼ / ▲ , specify the item code 𝟥𝟤 .
3. Using the timer buttons ▼ / ▲ , change the setting from 𝟢𝟢 𝟢𝟢 to 𝟢𝟢 𝟢𝟣 .
4. Push the SET button. (The display should stop flashing and become constantly lit.)
5. Push the 🔧 button.
   The status returns to the operation stop status and is displayed in the LCD.

NOTE 1: When using two remote controllers, the room temperature sensor selection can be set either from the header/follower remote controller. Only the header remote controller can act as a remote control sensor. When using two remote controllers, the temperature can be set from either the header or follower remote controller.
NOTE 2: In group control, the remote control sensor does not work if the group address is not set to the indoor unit of the master unit.
NOTE 3: When using the remote sensor and the remote controller together, do not use the remote control sensor of the remote controller.

Selecting the operation when the power is restored after a power outage

Follow the steps below to select and set the operation status of the air conditioner when power is restored after a power outage has occurred during a scheduled operation.
1. Hold down the 🔧 + ⊙▸⏻ buttons for at least 4 seconds. (This step can be performed whether the air conditioner is running or shut down.)
2. Press the TEMP. ▼ / ▲ buttons, and set code No.14.
3. Press the TIME ▼ / ▲ buttons, and set the setting data to 𝟢𝟢 𝟢𝟢 (factory setting) or 𝟢𝟢 𝟢𝟣 .
4. Press the SET button. The setting data is entered successfully if the display stops blinking and lights up.
5. Press the 🔧 button.
* 𝟢𝟢 𝟢𝟢 (factory setting):
   No settings are sent when the power is restored, and the scheduled operation is resumed as soon as the program time is reached after the power has been restored.
* 𝟢𝟢 𝟢𝟣 : If there was a program which was to have run during the power outage, it is resumed in accordance with what was programmed. If there is no program, operation resumes in accordance with what was being performed prior to the power outage.
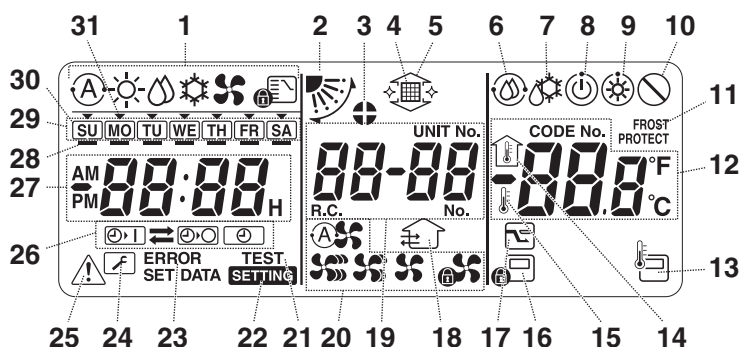
Remote controller with weekly timer (RBC-AMS41E)
Operation Manual
Parts and their functions

LCD area

All displays are shown lighted only for the purposes of description.

1 Operation mode display
This indicates the mode of operation which is currently selected.

2 Air direction
This indicates the air direction which has been selected.

3 Fixed louvers
This appears when the louvers are fixed.
* It also appears when the remote controller function has been selected.

4 Filter
This appears when it is time to inspect the filter.

5 Grille up/down
This appears when the grille is goes up or goes down.

6 Self-cleaning operation
This appears while self-cleaning is underway.

7 Defrosting
This appears while defrosting is underway during a heating operation.

8 Ready
This display appears on some models.

9 Heating ready (indoor fan stops while this is displayed)
This appears before a heating operation starts or while defrosting.

10 No function
This appears when a button is pushed but there is no corresponding function.

11 FROST PROTECT operation
This appears during a frost protection operation.

12 Numeric display
This displays the numeric value of the temperature, the numerical order of the trouble history events or the code numbers when the functions are set.

13 Remote control sensor
This appears when the remote control sensor is used.

14 Indoor temperature
This appears when the intake temperature is displayed on the numeric display.

15 Set temperature
This appears when the set temperature is displayed on the numeric display.

16 Central control
This appears when key operation limits are being enforced by the central controller or other unit or when key operation limits have been set in the program for the scheduled operation currently being executed.

17 Save operation
This appears while a save operation is being set or executed.

18 Ventilation operation
This appears while the ventilation fan is operating.

19 Numeric display
The numbers of the indoor units or numbers of the scheduled operation programs are displayed here.

20 Air speed display
This indicates the selected air speed.

21 TEST
This appears while a test run operation is being performed.

22 SETTING
This appears when the clock time, a program or the timer is being set.

23 ERROR
This appears when there is an error in the program setting input.

24 Servicing
This appears during servicing.

25 Inspect
This appears when trouble has occurred.

26 Timer function display
This indicates the function whose operation has been scheduled when a scheduled operation or timer operation has been set.

27 Numeric display
This indicates the present clock time, program operation time or timer execution time.

28 Operation reservation ▬
    This appears for the days of the week on which programs have been set.
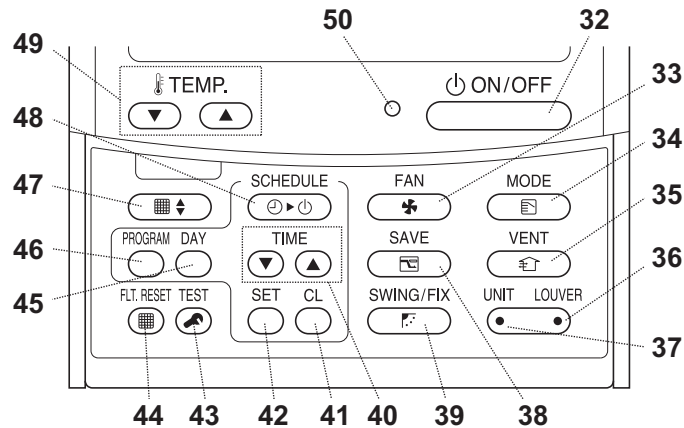
29 Days of the week display

30 Special holiday ▯
    This appears for a day of the week which has been set as a special holiday.

31 Day arrow ▼
    This indicates the current day of the week or day on which a program is set.

Button operation area

32 ON/OFF button
    Shortly after this button is pushed, operation starts, and operation stops shortly after the button is pushed again.

33 FAN button
    Use this to select the desired air speed mode.

34 MODE button
    Use this to select the desired operation mode.

35 VENT button
    Use this when a ventilation fan or other unit, purchased on the market, has been connected.

36 LOUVER button
    Use this to select the louvers when setting the air direction for each louver or when fixing the louvers in place.

37 UNIT button
    Use this to select the indoor unit to be operated when operating a multiple number of indoor units using one remote controller.

38 SAVE button
    Use this when performing save operations.

39 SWING/FIX button
    Use this to select the desired air direction or swing operation.

40 TIME buttons
    Use this to set the clock or adjust the time when the operating time is set.

41 CL button
    Use this when clearing the setting of the program (for a scheduled operation or timer operation) which is being set.

42 SET button
    Use this when entering the settings of the program (for a scheduled operation or timer operation) which is being set.

43 TEST button
    Use this for servicing.
    * This button is not normally used.

44 FLT.R ESET button
    Use this to reset (extinguish) the filter display.

45 DAY button
    Use this to select the targeted day of the week when setting the clock or setting a program.

46 PROGRAM button
    Use this when starting and ending the program settings for scheduled operations.

47 Grille button
    Use this to raise or lower the grille.

48 SCHEDULE button
    Use this when executing or releasing scheduled operations or when selecting ON or OFF for timer operations.

49 TEMP buttons
    Push ▽ and △ to set the temperature to the desired value.
    * These buttons are also used to raise or lower the grille when the grille function is used.

50 ON lamp
    This lights during operation. It blinks when trouble has occurred or when a protection operation is performed.

Setting the current day of the week and clock time

- Set the current clock time and day of the week.
- The day of the week and clock settings can be performed whether the air conditioner is running or shut down.
  - * The air conditioner continues to operate (run) while the day of the week and clock settings are being performed.
- The normal operation of the air conditioner or a program for a scheduled operation can be input even without performing the day of the week and clock settings, but the scheduled operation cannot be executed. In order to execute scheduled operations, the day of the week and clock must be set without fail.
- Before this remote controller is shipped from the factory, the initial setting (default) of the 24-hour display is established for the clock time display, but this can be changed to the 12-hour (AM/PM) display.
  - * If you want to use the 12-hour time display, refer to the "Selecting the remote controller functions" section.
  - * In these instructions, the 24-hour display is used in the figure and descriptions.

Preparations

Turn on the ground fault interrupter.
- When the power is turned on, a dividing line appears on the remote controller display.
  - * For about a minute after the power has been turned on, **SETTING** on the LCD screen blinks, and there will be no response to the keys of the remote controller even when they are pushed.

1 Hold down the ^{SCHEDULE} ⏻ button (48) for at least 4 seconds.
  - The display transfers to the day of the week/clock setting screen.
  - The whole LCD display blinks.

<Blinks>

2 Repeatedly push the ^{DAY} ◯ button (45), and select the current day of the week.
  - Move the day arrow ▼ to the position above the current day of the week.
 - The LCD display continues to blink.

SU MO TU WE TH FR SA

3 Push the TIME ▼ and ▲ buttons (40), and select the current clock time.
  - Each time the ▲ button (40) is pushed, the clock is moved forward by one minute.
  - Each time the ▼ button (40) is pushed, the clock is moved back by one minute.
  - When the ▲ or ▼ button is held down, the clock is moved forward or back in 10-minute increments.
  - The LCD display continues to blink.

4 Push the ^{SET} ◯ button (42) to return to the original screen.
  - As soon as the button is pushed, the clock starts running. (Do this in synchronization with a time signal.)
  - **SETTING** on the LCD screen goes off.
  - After the clock has been set, the entire LCD screen lights, but the colon (":") continues to blink.

Correct operating procedures

Procedure for normal operation

The functions will differ depending on the model and system.

- Follow the steps below before using the remote control system for the very first time or when changing any of the settings.
- After the steps have been followed, operation will commence using the settings established simply by pushing the ⏻ON/OFF button (32).

### Preparations

Turn on the ground fault interrupter.
- When the power is turned on, a dividing line appears on the remote controller display.
  * For about a minute after the power has been turned on, SETTING on the LCD screen blinks, and there will be no response to the keys of the remote controller even when they are pushed.

  Notes
- Do not turn off the ground fault interrupter during the operating season of the remote control system.
- After the remote control system has been shut down for a prolonged period, turn on the ground fault interrupter back on at least 12 hours before its operation is to be started.

Starting operation

1 **Push the ⏻ON/OFF button (32) to start operation.**
- The ON lamp lights, and the operation details are displayed on the LCD screen.

2 **Push the MODE button (34), and select the mode of operation.**
- Each time this button is pushed, the operation mode display changes in the sequence shown below.
- Stop pushing the button when the symbol corresponding to the desired mode of operation lights.

Auto — Heating — Dry — Cooling — Fan
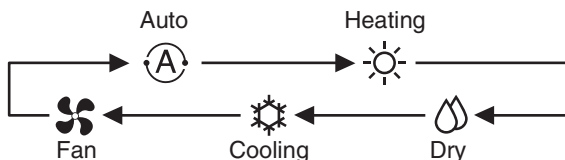
3 **Push the ⏻ON/OFF button (32) to shut down operation.**
- The ON lamp goes off, and the operation details are cleared from the LCD screen. (The frame lines remain displayed.)
- Before operation shuts down, the self-cleaning operation is commenced if the air conditioner was run in the Auto (during cooling), cooling or dry mode for 10 or more minutes.
  * For details on the self-cleaning operation, refer to the "Self-cleaning operations" section.

Changing the air speed

**1** **Push the FAN button (33), and select the desired air speed.**
- Each time the button is pushed, the air speed display changes in the sequence shown below.
- Stop pushing the button when the symbol corresponding to the desired air speed lights.

Auto air speed — High air speed — Medium air speed — Low air speed
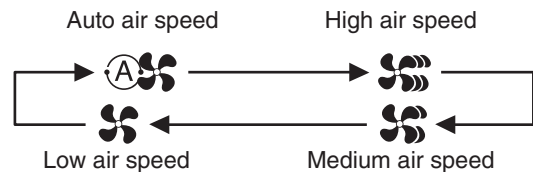
  * If, during heating, the rooms do not heat up quickly at the low air speed setting, change the setting to high or medium.
  * The auto air speed cannot be selected during fan operations.

Changing the temperature

1 **Push the TEMP ▽ and △ buttons (49), and select the desired temperature setting.**
- When the ▽ button (49) is pushed, the temperature on the numeric display goes down; conversely, when the △ button (49) is pushed, the temperature displayed goes up.
- The temperature cannot be set during fan operations.

Adjusting the air direction

The functions will differ depending on the model and system.

- To increase the cooling or heating effect, be sure to change the louver direction between cooling and heating operations.
- The nature of air is to fall toward the floor where it collects when it is cold and to rise toward the ceiling where it collects when it is warm.

⚠ CAUTION

- **For cooling operations, set the louvers to the horizontal blow-out position.**
  Performing cooling operations with the louvers at the downward blow-out position may cause condensation to form around the air outlets and louver surfaces and water may drip.
 * For further details, refer to the operating instructions of the air conditioner.

Changing the air direction

1 **During operation, push the SWING/FIX button (39), and select the desired air direction.**

- Each time the button is pushed, the air direction display changes in the sequence shown below.
- Stop pushing the button when the symbol corresponding to the desired air direction lights.
  * Air directions 4 and 5 are not displayed during cooling or dry operations.
  * It may not be possible to set air direction 1 after the air direction has been at the random setting. If this is the case, wait 2 seconds, and then push the SWING/FIX button (39) again.
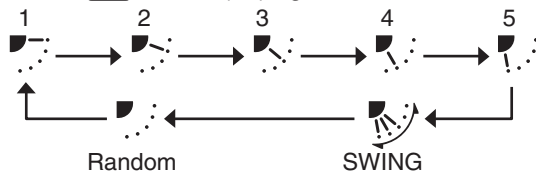

Starting the louver swing motion

1 **During operation, push the SWING/FIX button (39), and select the symbol shown on the right.**

- If the button is then pushed from the downward blow-out position, the symbol shown on the right lights for the air direction display.

Stopping the louver swing motion

1 **While the louvers are swinging, push the SWING/FIX button (39) when the louvers reach the desired position.**

- The symbol shown on the right lights for the air direction display.
  * The louvers will not stop at the downward blow-out position during a cooling or dry operation. Even when the button is pushed at the downward blow-out position, the louvers will stop swinging only after moving to the third position from the top.

* Concerning the UNIT button (37)

- When a multiple number of indoor units are being run using a single remote controller, this button can be used to select one indoor unit and set the air direction of that unit.
- When the air direction is to be set for each of the units, push the UNIT button (37), and display the number of one of the indoor units controlled as the group on the numeric display. Change the air direction for the indoor unit now displayed.
- If no indoor unit number is indicated on the numeric display, the same air direction setting will apply to all the indoor units.

Frost protection operation
(heating at 8°C)

The functions will differ depending on the model and system.

- This is a heating operation function which is specially designed for use in cold regions where it will keep the indoor temperature constant while you are out.
- To enable this function, an application control setting is required. Consult your dealer or a contractor with specialized experience.
  * For further details, refer to the operating instructions of the air conditioner.

Setting the frost protection operation

1 Push the TEMP ⌄ button (49) during a heating operation.

- Repeatedly push the button or hold it down until "*18*" appears on the numeric display.

2 Now hold down the TEMP ⌄ button (49) for at least 4 seconds.

- When this button is pushed, what appears on the numeric display changes from "*18*" to "*8*", and the FROST PROTECT display lights.
- The frost protection operation now starts.

Releasing the frost protection operation

1 Push the TEMP ⌃ button (49) during the frost protection operation.

- When this button is pushed, the FROST PROTECT display goes off, and what appears on the numeric display changes from "*8*" to "*18*".
- A normal heating operation now starts. The temperature setting is 18°C so push the TEMP ⌃ button (49), and select the desired temperature setting.

Save operations

The functions will differ depending on the model and system.

- During this operation, the maximum current is restricted.
  * For further details, refer to the operating instructions of the air conditioner.

Initiating a save operation

1 During operation, push the SAVE button (38).

- The save operation where the maximum current is restricted starts, and the save operation display lights.

2 To release the save operation, push the SAVE button (38) again.

- The save operation display goes off, and normal operation starts.

Self-cleaning operations

The functions will differ depending on the model and system.

- When the air conditioner has stopped operating after an auto (cooling), dry or cooling operation, this function moves into action to dry out the insides of the indoor units using the fan operation so as to keep the indoor units clean.
  * For further details, refer to the operating instructions of the air conditioner.

1 The self-cleaning operation starts automatically when the air conditioner was in the auto (cooling), dry or cooling mode for at least 10 minutes before its operation is shut down.

- The ON lamp goes off, the operation stop display appears on the LCD screen, and the self-cleaning operation display lights.
- The duration of the self-cleaning operation differs depending on the operation time prior to shutdown.

Operation time prior to shutdown	Duration of self-cleaning operation
Under 10 minutes	No self-cleaning operation
10 or more minutes but under an hour	1 hour
1 hour or more	2 hours

2 To stop the self-cleaning operation, push the ON/OFF button (32) twice in succession.

- The self-cleaning operation display goes off, and the self-cleaning operation ends.

Grille operation procedure

The functions will differ depending on the model and system.

> * For further details, refer to the operating instructions of the air conditioner.

Operation

1 Hold down the grille button ⬛⁺ (47) for at least 4 seconds.

- The display transfers to the grille up/down screen, and the indoor units stop operating.
- The filter ▦, grille up/down ⌇ and numeric display blink.
  > * The "no function" display ⊘ appears when the grille is not connected or the control settings have not been established correctly.

2 Push the ⬛ᵁᴺᴵᵀ button (37), and select the indoor unit for which the grille is to be set.

- Each time the button is pushed, the unit number on the numeric display changes.
  > * The fan of the selected indoor unit starts running, and the louver swings.

3 Push the TEMP ▽ or △ button (49) to move the up/down grille.

- When the ▽ button (49) is pushed, the up/down grille goes down slowly; conversely, when the △ button (49) is pushed, the up/down grille goes up.
- If the up/down grille makes contact with an obstacle while it is going down, it stops.
- Several seconds after the up/down grille rises and is neatly stowed in the air intake, the motor stops.
  > * The louver swings while the grille is going up or down.
  > * When the grille is stowed in the panel, this stowing operation is repeated 3 times to ensure that the grille is safely stowed away.

4 Push the ⏻ ON/OFF button (32) to stop the up/down grille.

- The up or down movement of the up/down grille now stops.
- If the ⏻ ON/OFF button (32) is not pushed and the grille continues to move down, the grille will automatically stop when it has moved down to the distance set.
  > * To change the movement from up to down or vice versa, stop the up/down grille movement first, and then make the change.

5 Push the grille button ⬛⁺ (47).

- The grille operation mode is exited.
- The filter ▦, grille up/down ⌇ and numeric display goes off, and **SETTING** blinks.
  > * While **SETTING** is blinking, there is no response to the keys of the remote controller even when they are pushed.

Detailed settings

The functions will differ depending on the model and system.

- For descriptions of the following settings, refer to the operating instructions of the air conditioner.
  - Changing the swing type
  - Fixing or releasing the louvers
  - Changing the save operation settings

Scheduled operations

- Scheduled operations for a 1-week period can be performed using this remote controller.
- Eight (01 to 08) operations for each day of the week can be set in a scheduled operation program (item settings).
  – The following items can be set in a program:
    a. Operation time
    b. Operation start/stop
    c. Operation mode
    d. Temperature setting (frost protection)
    e. Restriction on button operations
    f. Save operation
- With a scheduled operation, the air conditioner is operated at the set operation time according to the program which has been set.
- The operation time can be set in 1-minute increments.
  * Restriction on button operations
    This function cancels the button operations while a scheduled operation is being executed. To use this function, refer to the "Selecting the remote controller functions" section and change the settings before proceeding with the program settings described below. The initial (factory) setting calls for no restriction on the button operations.
  * Save operation
    The save operation function is not provided for some models and systems. To find out whether the function is provided, consult your dealer or a contractor with specialized experience.
  * Concerning the "Continue xx" setting
    The "Continue" setting can be established for the operation start/stop, operation mode and temperature setting items. This setting causes the current operation modes of the indoor units to be continued.
  * "Continue" is set on the initial screen for each item of each program number so in the example of the operation given above there is no need to input anything for the operation start/stop and operation mode items.
  * This function does not work if the "timer operation function" or "no timer function" has been selected by following the steps set forth in the "Selecting the remote controller functions" section.

How to set up the operation programs

- Perform the steps below to set up a scheduled operation program (item settings).
  * Programs can be set up whether the air conditioner is running or shut down.
  * While these steps are being taken, an air conditioner which is operating continues to operate.

1 Push the ⊙ PROGRAM button (46).
  - The display transfers to the program input screen.
  - The entire LCD screen starts blinking.

2 Push the ⊙ DAY button (45).
  - Repeatedly push the button to move the day arrow ▼ to the position above the day of the week when the scheduled operation is to be executed.

        ▼
   SU MO TU WE TH FR SA
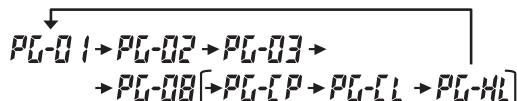
3 Push the ⊙ SET button (42).
  - Set the day of the week when the scheduled operation is to be executed.
  - The days of the week display and the day arrow ▼ stop blinking and light up.

4 Push the ⊙ UNIT button (37).
  - Each time the button is pushed, the number on the numeric display changes in the following sequence.
  - Stop pushing the button when the number to be programmed blinks on the display.

$$PG\text{-}01 \rightarrow PG\text{-}02 \rightarrow PG\text{-}03 \rightarrow$$
$$\rightarrow PG\text{-}08 [\rightarrow PG\text{-}CP \rightarrow PG\text{-}CL \rightarrow PG\text{-}HL]$$

  * For the items inside the square parentheses, refer to the "Editing the operation programs" section.

5 Push the ⊙ SET button (42).
  - The program number on the numeric display stops blinking and lights up.

6 Push the TIME ▼ and ▲ buttons (40).
  - Set the operation time. This time must be input.
  - The steps taken are the same as for setting the clock.
    * After setting the time, there is no need to push the ⊙ SET button (42). All the items will be entered together in step **8**.

7 **Set what is to be operated at the time which was set in step *6*.**

   * The settings can be established in any sequence.

The functions will differ depending on the model and system.

I. Selecting and setting operation/stop
    Each time the ⟨SCHEDULE⟩ button (48) is pushed, what appears on the timer function display changes in the following sequence. Stop pushing the button when the desired operation blinks on the display.

(No display)	→	⊙▸○	→	⊙▸|
Operation continue		Operation stop		Operation start
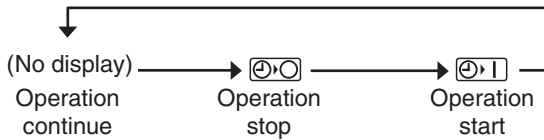
II. Selecting and setting the operation mode
    Each time the ⟨MODE⟩ button (34) is pushed, what appears on the operation mode display (1) changes in the following sequence. Stop pushing the button when the operation mode blinks on the display.

Operation mode   Fan   Cooling
(No display)   Auto   Heating   Dry

III. Setting the temperature
    Each time the TEMP ▽ and △ buttons (49) are pushed, what appears on the numeric display changes in the following sequence. Stop pushing the buttons when the target temperature to be set blinks on the display.
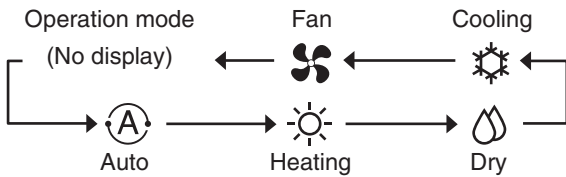

▽ or △

- - ⟶ *29*
Push △ 4 seconds or more   △ ↑↓ ▽

…

Frost protection operation   △ ↑↓ ▽
8 ⟶ *18*
Push ▽ 4 seconds or more
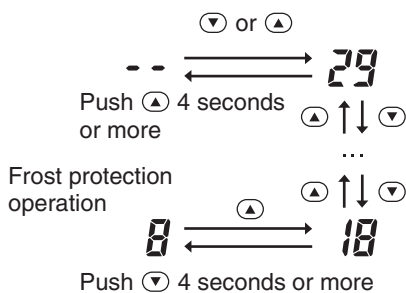
IV. Setting the restriction on the button operations
- Each time the ⟨MODE⟩ button (34) is pushed while the ⟨TEST⟩ button (43) is held down, the central control display changes from off to blinking or vice versa. To place the restriction on the button operations, ensure that the display is blinking.
  * The ⟨ON/OFF⟩ button (32), ⟨MODE⟩ button (34) and TEMP ▽ and △ buttons (49) are the buttons whose operation will be restricted by this setting. For further details, refer to the "Selecting the remote controller functions" section.

V. Setting the save operation
    Each time the ⟨SAVE⟩ button (38) is pushed, the numeric display and save operation display ⏚ change in the following sequence. Stop pushing the button when the desired save operation mode (mode 0 to 3) blinks on the display.

0 → *1* → *2* → *3*
Mode 0   Mode 1   Mode 2   Mode 3
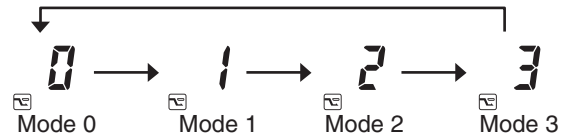
Save operation mode	Description
Mode 0	No save operation
Mode 1	Save operation with 75% upper limit
Mode 2	Save operation with 50% upper limit
Mode 3	Compressor shutdown

8 **Push the ⟨SET⟩ button (42), and enter all the items in steps I to V above and the operation time together.**
- The display of all the setting items changes from blinking to lighted.

9 **In addition:**
  I. To input the settings into the different program number for the same day of the week, repeat the operations from step *4*.
  II. To move to a different day of the week and input the program, repeat the operations from step *2*.

10 **Finally, push the ⟨PROGRAM⟩ button (46) to return to the original screen.**
- An underbar is displayed under the selected day of the week.

Example of setting up an operation program

Example of program input
For program 01 for Wednesday, "7:00", "ON", "heating", "25°C", "restriction on key operation enabled", "save operation" and "mode 1" will be set.

• Initial screen (clock setting/operation stop)

0

• Push the PROGRAM button (46), and transfer the display to the input screen.
• On the input screen, the entire display blinks.

1
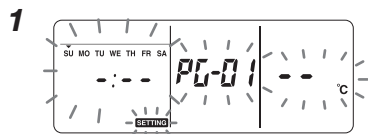
• Push the DAY button (45), and move the day arrow ▼ to the position above "WE".

2
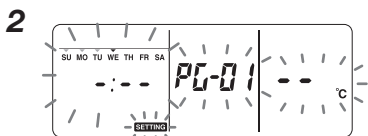
• Push the SET button (42), and enter the day of the week.
• The days of the week display and the day arrow ▼ stop blinking and light up.

3
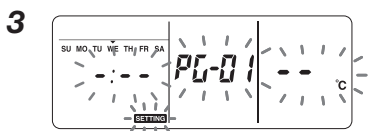
• Repeatedly push the UNIT button (37), and display the number of the program which is to contain the settings on the numeric display.

4
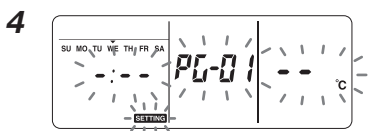
• Push the SET button (42), and enter the program number.
• The numeric display stops blinking and lights up.

5
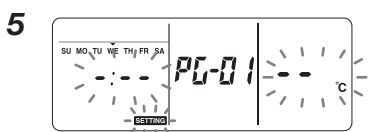
• Push the TIME ▼ and ▲ buttons (40), and set the operation time.
• If the buttons are held down for four or more seconds, the time can be moved forward or back in 10-minute increments.

6
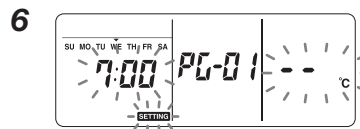
I. Selecting and setting operation/stop
Push the SCHEDULE button (48) until blinks on the display.
II. Selecting and setting the operation mode
Push the MODE button (34) until ☼ blinks on the display.
III. Setting the temperature
Push the TEMP ▼ and ▲ buttons (49) until "25" blinks on the numeric display.
IV. Setting the restriction on the button operations
Push the MODE button (34) while holding down the TEST button (43) until blinks on the display.
V. Setting the save operation
Push the SAVE button (38) until blinks on the display.

7
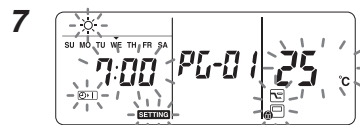
• Push the SET button (42) to enter the operation settings.
• With the exception of **SETTING**, all the displays stop blinking and light up.

8
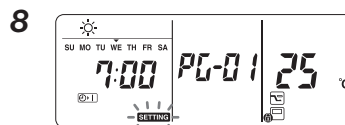
• Finally, when the PROGRAM button (46) is pushed, **SETTING** goes off, and the original screen is restored.

9
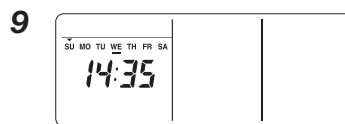
• An underbar is displayed under the selected day of the week.

Scheduled operation setup

How to execute scheduled operations

- On the screen of the remote controller whose power has been turned on, check that the current day of the week and clock time are set accurately.
  Scheduled operations cannot be executed while the days of the week display, the day arrow ▼ and numeric display are still blinking.
- Set at least one operation program.
  Check that at least one operation reservation display ▬ is indicated below the days of the week on the remote controller screen.

1 Push the SCHEDULE button (48).

- Although first extinguished on the timer function display, the symbol shown on the right now starts blinking.

2 Push the SET button (42) within 5 seconds of completing step **1**.

- The symbol on the timer function display stops blinking and lights.

How to release a scheduled operation

1 Push the SCHEDULE button (48).

- The symbol on the timer function display changes from the lighted status to blinking.

2 Push the CL button (41) within 5 seconds of completing step **1**.

- The symbol on the timer function display stops blinking and goes off.

Error displays

- Trouble may be to blame if the ERROR display **ERROR** remains lighted for 3 seconds while a scheduled operation is being executed or while a scheduled operation program is being input. Check for trouble, and remedy it.

1 When the SET button (42) was pushed while a scheduled operation was being executed:

- The current day of the week and/or current clock time have not been set. Proceed with the clock setting operation.
- No programs have been set. Input the operation program.

2 When the SET button (42) was pushed while a program was being input:

- One setting time overlaps another setting time. Change one of the setting times.

Program check operation

- Programs are checked using the program input screen.

1 Push the PROGRAM button (46).

- The display transfers to the program input screen.
- The entire LCD screen blinks.

2 Push the DAY button (45).

- Repeatedly push the button until the day arrow ▼ moves to the position above the day of the week whose program is to be checked.

3 Push the SET button (42).

- Enter the day of the week whose program is to be checked.
- The days of the week display and day arrow ▼ stop blinking and light up.

4 Push the UNIT button (37).

- Each time this button is pushed, the program number and editing type are scrolled forward in sequence on the numeric display.
- Display the number of the program to be checked, and check the program's settings.
  * Unless the SET button (42) is pushed, the key operations are canceled, in which case the program settings will remain unchanged.

5 After completing the check, push the PROGRAM button (46) to return to the original screen.

Editing the operation programs (instructions for copying)

• When setting the operation programs, the already programmed settings for another days of the week can be copied for an specially designated day of the week.
  * The program settings can be copied whether the air conditioner is running or shut down.

Copying the program settings

1 **Push the ⭕ᴾᴿᴼᴳᴿᴬᴹ button (46).**
  • The display transfers to the program input screen.
  • The entire LCD screen blinks.

2 **Push the ⭕ᴰᴬʸ button (45).**
  • Repeatedly push the button until the day arrow ▼ moves to the copy source day of the week.

3 **Push the ⭕ˢᴱᵀ button (42).**
  • Enter the copy source day of the week.
  • The days of the week display and day arrow ▼ stop blinking and light up.

4 **Push the ⭕ᵁᴺᴵᵀ button (37).**
  • Repeatedly push this button until "PG-CP" (shown right) appears on the numeric display.   **PG-CP**
    * PG-CP ..... PROGRAM-COPY

5 **Push the ⭕ˢᴱᵀ button (42).**
  • The "PG-CP" display stops blinking and lights up.
  • The day of the week where the day arrow ▼ is lighted serves as the copy source.

6 **Again push the ⭕ᴰᴬʸ button (45).**
  • Repeatedly push the button until the day arrow ▼ moves to the copy destination day of the week.
  • The day arrow ▼ blinks while the copy destination is being selected.

7 **Push the ⭕ˢᴱᵀ button (42).**
  • The settings of the copy source day of the week are copied into the copy destination day of the week.
  • The blinking of the day arrow ▼ displayed for the copy destination day of the week changes to the lighted operation reservation display.
    * Copying involves overwriting any existing settings.
      Bear in mind that the original setting of the copy destination will be deleted when the ⭕ˢᴱᵀ button (42) is pushed.

8 **To continue copying, repeat steps 4 to 7.**

9 **Finally, push the ⭕ᴾᴿᴼᴳᴿᴬᴹ button (46) to return to the original screen.**

Editing the operation programs (instructions for clearing)

• Operation programs which have been set can be cleared (deleted) in two ways.
  1. All the programs for a specific day of the week can be cleared.
  2. A specific program on a specific day of the week can be cleared.
  * The program settings can be cleared whether the air conditioner is running or shut down.

How to clear the program settings

■ How to clear the programs for a specific day of the week

1 **Push the ⭕ᴾᴿᴼᴳᴿᴬᴹ button (46).**
  • The display transfers to the program input screen.
  • The entire LCD screen blinks.

2 **Push the ⭕ᴰᴬʸ button (45).**
  • Repeatedly push the button until the day arrow ▼ moves to the day of the week whose programs are to be cleared.

3 **Push the ⭕ˢᴱᵀ button (42).**
  • Enter the day of the week whose programs are to be cleared.
  • The days of the week display and day arrow ▼ stop blinking and light up.

4 **Push the ⭕ᵁᴺᴵᵀ button (37).**
  • Repeatedly push this button until "PG-CL" (shown right) appears on the numeric display.   **PG-CL**
    * PG-CL ...... PROGRAM-CLEAR

5 **Push the ⭕ˢᴱᵀ button (42).**
  • The settings of all the programs which have been set and displayed for the day of the week are cleared (deleted), and the no program set status blinks on the screen.
    * Bear in mind that cleared settings cannot be restored.

6 **To continue clearing, repeat steps 2 to 5.**

7 **Finally, push the ⭕ᴾᴿᴼᴳᴿᴬᴹ button (46) to return to the original screen.**

■ **How to clear individual programs on the same day of the week**

1 Push the ⊙ button (46).
 • The display transfers to the program input screen.
 • The entire LCD screen blinks.

2 Push the ⊙ button (45).
 • Repeatedly push the button until the day arrow ▼ moves to the day of the week for which a program to be cleared has been set.

3 Push the ⊙ button (42).
 • Enter the day of the week for which the program to be cleared has been set.
 • The days of the week display and day arrow ▼ stop blinking and light up.

4 Push the ⊙ button (37).
 • Repeatedly push this button until the number of the program to be cleared appears on the numeric display.
 • The program number displayed blinks.

5 Push the ⊙ button (42).
 • Enter the number of the program to be cleared.
 • The program number on the numeric display blinks.

6 Push the ⊙ button (41).
 • The settings for the program number on the numeric display are cleared (deleted), and the no program set status blinks on the screen.
  * Bear in mind that cleared settings cannot be restored.

7 To continue clearing, repeat steps *2* to *6*.

8 Finally, push the ⊙ button (46) to return to the original screen.

Editing the operation programs (instructions for special holidays)

• A "special holiday" is a day of the week on which the scheduled operations set for that day of the week can be temporarily canceled. (The program remains stored in the memory.)
• When the day of the week set as a special holiday has passed, the special holiday setting is released, and the air conditioner operates as per the original program starting from the following week.
• Special holiday settings can be established for any day up to a week ahead starting from the current day of the week. When a special holiday has been set for the current day of the week, the setting starting from the next program time after the set time will be canceled.
• The special holiday setting cannot be established for any day of the week which has no program settings.
  * The special holiday setting can be established whether the air conditioner is running or shut down.

How to establish the special holiday setting

1 Push the ⊙ button (46).
 • The display transfers to the program input screen.
 • The entire LCD screen blinks.

2 Push the ⊙ button (45).
 • Repeatedly push the button until the day arrow ▼ moves to the day of the week which is to be set as a special holiday.

3 Push the ⊙ button (42).
 • Enter the day of the week which is to be set as a special holiday.
 • The days of the week display and day arrow ▼ stop blinking and light up.

4 Push the ⊙ button (37).
 • Repeatedly push this button until "PG-HL" (shown right) appears on the numeric display.
  * PG-HL ...... PROGRAM-HOLIDAY

PG-HL

5 Push the ⊙ button (42).
 • The special holiday display ⬚ blinks at the day of the week which has now been set as a special holiday.

6 To continue with another setting, repeat steps *2* to *5*.

7 Finally, push the ⊙ button (46) to return to the original screen.
 • The special holiday display ⬚ above the day of the week set stops blinking and lights up.

How to cancel the special holiday setting

1 **Perform steps *1* to *4* in "How to establish the special holiday setting" for the day of the week whose special holiday setting is to be canceled.**

2 **Push the $\overset{\text{SET}}{\bigcirc}$ button (42).**
  • The special holiday display ▢ over the day of the week set changes from lighted to blinking.

3 **Finally, push the $\overset{\text{PROGRAM}}{\bigcirc}$ button (46) to return to the original screen.**
  • The special holiday display ▢ above the day of the week set stops blinking and goes off.

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Timer operations

- Before this remote controller is shipped from the factory, the schedule timer operation function is set as an initial setting (default), but the count-down timer operation function can be selected instead.
  - * Users who want the timer operation function should refer to the "Selecting the remote controller functions" section.
  - * Bear in mind that if the timer operation function has been selected, the scheduled operation function cannot be used.
- The three following functions can be selected by the timer operation function:
  OFF timer:
  Operation is shut down when the set time is reached.
  Repeated OFF timer:
  Every time operation is started, it is shut down after the set duration.
  ON timer:
  Operation is started when the set time is reached.
  - * The maximum time which can be set is 168 hours (7 days).

Timer operations

How to execute timer operations

1 During operation, push the $\overset{\text{SCHEDULE}}{\odot\cdot\odot}$ button (48), and select the timer operation which is to be set.

- The **SETTING** display and numeric display blink, and the timer function display lights.
- Each time the button is pushed, what appears on the timer function display changes in the following sequence.
- Stop pushing the button when the desired operation lights up on the display.

No timer
(No display)

| OFF timer | Repeated OFF timer | ON timer |
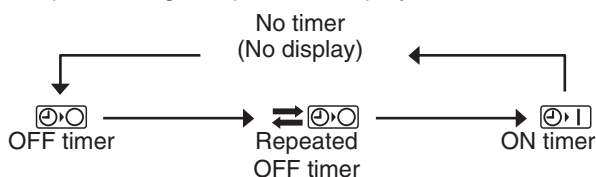
2 Push the TIME ▽ and △ buttons (40), and select the set time.

- Each time the △ button (40) is pushed, the set time is moved forward in half-hour (30-minute) increments. If the set time is more than one day (24 hours) ahead, it is moved forward in 1-hour increments. The upper limit is 7 days (168 hours) ahead.
  The numbers representing any set time from 0.5 hour to 23.5 hours appear on the numeric display. For a set time more than 24 hours ahead, the number of days and time are indicated.
- Each time the ▽ button (40) is pushed, the set time is moved back in half-hour (30-minute) increments (from 0.5 hour to 23.5 hours) or in 1-hour increments (from 24 hours to 168 hours).

Example of remote controller display
- When the set time is 23.5 hours ahead

23.5 H

- When the set time is 34 hours ahead

1d 10H

"1d" = 1 day = 24 hours
"10H" = 10 hours
Total = 34 hours

3 Push the $\overset{\text{SET}}{\bigcirc}$ button (42).

- The numeric display stops blinking and lights up, and the timer function display changes to blinking from its lighted status.
- The **SETTING** display goes off.
  - * When the ON timer function is set, the operation of the air conditioner is shut down. This means that apart from the lighted numeric display and blinking timer function display, all other displays go off.

How to cancel a timer operation

1 Push the $\overset{\text{CL}}{\bigcirc}$ button (41) during the timer operation.

- The timer function display and numeric display go off.
  - * A timer operation can be canceled while the timer operation is being set or executed.

Troubleshooting

Before requesting repair work

Check out the following points before requesting repair work.

The scheduled operation is not performed even though the set time is reached.
- The scheduled operation has not been set.
- A special holiday has been set.

The current clock time setting is blinking.
- There has been a prolonged power outage. Re-set the current clock time and current day of the week.

There is no response when the keys are operated.
- The restriction has been set for the key operations. Check the program.

The clock is not displayed when the power is turned on.
- The timer operation function or follower remote controller has been set.
- The setting for not displaying the clock has been established.

<Caution> If the problem persists even after checking out the above points, stop operating the air conditioner, set the ground fault interrupter to off, and give the model number and details of the symptoms to your dealer. **Do NOT attempt to remedy the problem yourself due to the dangers involved**.

Trouble diagnosis

<<Checks and inspections>>
- When trouble has occurred in the air conditioner, an inspection code and the number of the indoor unit concerned blink on the numeric display.

Inspection code   Address of indoor unit where the trouble has occurred
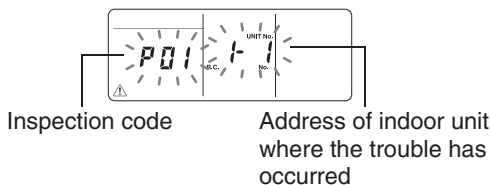
- Inspection codes are displayed only during operation.
- If the display has gone off, check the trouble by following the steps in "Checking the trouble history" below.

<<Checking the trouble history>>
- When trouble has occurred in the air conditioner, the trouble history can be checked by following the steps below. (Up to four events are stored in the trouble history.)
- The trouble history can be checked whether the air conditioner is running or shut down.

1 Push the SET button (42) and TEST button (43) together for at least 4 seconds.
- The numeric displays blink, and the servicing display and inspect display light.

Inspection code   Numerical order of trouble history events

Address of indoor unit where the trouble has occurred
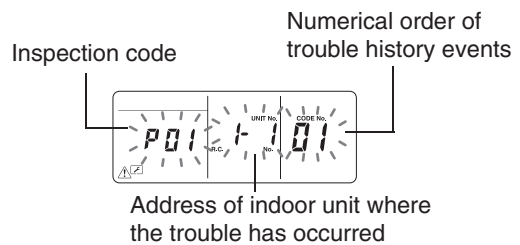
2 Push the TEMP ▽ or △ button (49).
- Each time one of these buttons is pushed, the trouble history events are displayed in numerical order.
- The "01" code on the numeric display indicates the latest event, and "04" the earliest event.
  * Do not push the CL button (41) since all the trouble history events of the indoor units will be deleted.

3 After checking the events, push the TEST button (43) to return to the original screen.

Concerning trouble occurring in the remote controller

" ⚠ ", " 🕐 " and " ✧ ✧ " **blink** at the same time.
- This means that trouble has occurred on the remote controller's circuit board. Contact your dealer.
- Normal air conditioner operations are still possible, but no scheduled operations can be performed.

Selecting the remote controller functions

- Change the settings of the remote controller functions as required by taking the steps below.

How to change the remote controller functions

1 **While operation is shut down, push the** $\overset{\text{TEST}}{\circledS}$ **button (43) and** $\overset{\text{SCHEDULE}}{\circledcirc\blacktriangleright\circlearrowleft}$ **button (48) together for at least 4 seconds.**
- The numeric displays and **SETTING** display blink, and the fixed louvers display lights.

2 **Push the TEMP** $\triangledown$ **and** $\blacktriangle$ **buttons (49).**
- Repeatedly push the buttons until the setting to be changed blinks on the display.

3 **Push the TIME** $\triangledown$ **and** $\blacktriangle$ **buttons (40).**
- Repeatedly push the buttons until the setting to be changed blinks on the display.

4 **Push the** $\overset{\text{SET}}{\bigcirc}$ **button (42). Then push the** $\overset{\text{TEST}}{\circledS}$ **button (43) to return to the original screen.**
- When the $\overset{\text{SET}}{\bigcirc}$ button (42) is pushed, the numeric displays and **SETTING** display stop blinking and light up, and when the $\overset{\text{TEST}}{\circledS}$ button (43) is pushed again, they go off.

Items to be set

- 24-hour/12-hour display setting <code No.10>
  – The 24-hour display or 12-hour (AM/PM) display can be selected for the clock which is displayed on the remote controller.
  – This item's selection is also reflected on the clock displayed on the clock setting screen and program input screen.

  Setting   Description

  0000:   24-hour display (factory setting)
  0001:   12-hour (AM/PM) display

- Restriction on button operations <code No.12>
  This item sets the range of the restriction placed on the button operations which can be applied while scheduled operations are being performed.
  Setting: 0000 (factory setting)

Code No.12
O: Can be operated.
X: Cannot be operated.

Setting	[ON/OFF]	[MODE]	[TEMP.]
0000	O	O	O
0001	X	O	X
0002	X	X	X
0003	O	X	X
0004	O	X	O

- Display/non-display of clock <code no.13>
  This item selects and sets whether the day of the week and clock time are to be displayed.
  Setting: 0000 (factory setting)

Code No.13
O: Display   X: No display

Setting	Scheduled operation underway		Scheduled operation in standby	
	Air conditioner now operating	Air conditioner now shut down	Air conditioner now operating	Air conditioner now shut down
0000	O	O	O	O
0001	X	X	X	X
0002	O	O	X	X
0003	O	X	X	X
0004	O	O	O	X
0005	O	X	O	X

- Selection of operation when power is restored after a power outage <code No.14>
  This item selects the operation to be performed when power is restored after a power outage occurred during a scheduled operation.
  0000: No operations are performed when the power is restored, and the scheduled operation is resumed as soon as the program time is reached after the power has been restored. (When the power is restored, the scheduled operation is based on the operation of the indoor units.)
  0001: If there was a programmed operation during the power outage, that operation is performed when the program is resumed. If there is no programmed operation or if the "Continue xx" setting is in place, the operation prior to the power outage is resumed.

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Selecting the functions using the DIP switches of the remote controller

• The following functions can be selected using the DIP switches on the remote controller's circuit board.

Setting procedure

• Open the back cover of the remote controller, and select the functions using the DIP switches located at the bottom left of the circuit board.
• After establishing the settings, turn the ground fault interrupter off and then back on.

Setting items

• Remote controller header/follower setting: Bit 1
  When operating the air conditioner using two remote controllers, set one of the controls to be the follower.
  * Set the remote controller used as the schedule timer to be the header.
• Operation function setting: Bit 2
  One of the following three operation functions can be selected and set.
  1. Scheduled operation function
  2. Timer operation function
  3. No scheduled or timer operation function

[DIP switches] (factory settings)

Bit
ON

OFF

| 1 | 2 | 3 | 4 |

Bit 1	Bit 2	Bit 3	Bit 4
ON: Follower	ON: Timer operation	—	—
	OFF: No function		
OFF: Header	ON: Timer operation	—	—
	OFF: Scheduled operation		

4-1-8 Weekly timer (TCB-EXS21TLE)

Installation Manual

Accessories for Schedule Timer

No.	Supplied parts	Q'ty
1	CN61 (T10) power wire (with current fuse) *1	1
2	1.2m length of connecting wire *2	1
3	Screws M4 × 25	2
4	Spacers	2
5	Wire joints	6
6	Operation manual	2
7	Installation manual	1

*1 If the fuse blows as a result of a wiring short-circuit, miswiring, or overcurrent, replace it with a 125V, 0.1A fuse (Fig.1).
*2 Use this connecting wire when using with weekly timer mode. Connect the provided connecting wire (4 cores) to the power terminal (4P connector) of the schedule timer unit. (Fig.5)

Fig.1

Indoor unit control PCB CN61 (T10) connector (6P orange)

1. Power wire

Fuse
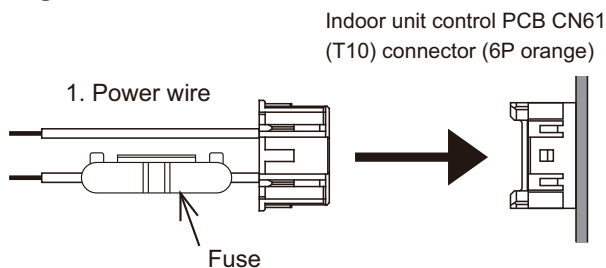
Installing the Schedule Timer

<Note1> Avoid twisting the inter-unit control wiring or the input/output wiring together with power or other wiring, and avoid running them in the same metal conduit. Doing so can cause malfunction.
<Note2> Install the schedule timer at a location away from any sources of electrical noise.
<Note3> Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

Fig.2

Switch box for 1 switch (no cover) or switch box for 2 switches (no cover)

M4 x 25 small flat-head screws (2)

Spacer

Schedule timer unit

Decorative cover (panel)

Under-case (back case)
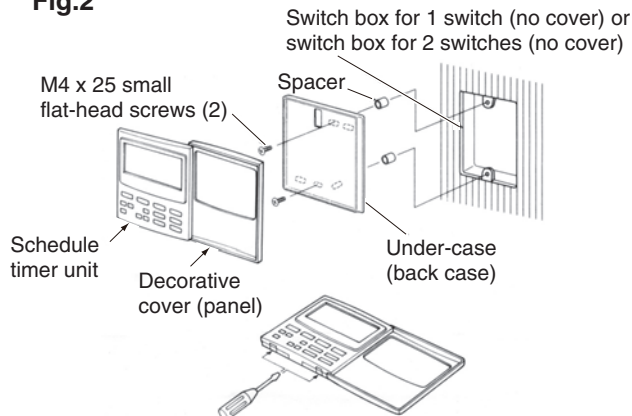
(1) Open the panel on the schedule timer unit. Insert a standard (flathead) screwdriver or similar tool into the notches on the bottom of the schedule timer unit to open and remove the back case.
(2) Use the 2 supplied M4 small screws and install the schedule timer back case onto the switch box. Before installing, use a screwdriver or similar tool to press on and open the screw holes that correspond to the JIS box that is used.
When fastening the case, use spacers and do not tighten the screws too much. If the schedule timer does not fit tightly against the wall, cut the spacers as required to make adjustments.
(3) Connect the supplied power wire (2-core) and inter-unit control wire (3-core) to the schedule timer unit.
("Wiring for Weekly Timer mode")
(4) Align the schedule timer unit with the tabs on the back case and press to install it.

Installation of connected schedule timers

● When installing schedule timers (remote controller switches, system controllers, etc.) onto the wall, use the method shown in Figs. 3 and 4.

Fig.3

More than 95 mm (From wall)

More than 125 mm (For connected installation)

Remote controller wiring outlet

Switch box for 1 switch (no cover)

Fig.4

More than 95 mm (From wall)

More than 125 mm (For connected installation)

Remote controller wiring outlet

Switch box for 2 switches (no cover)
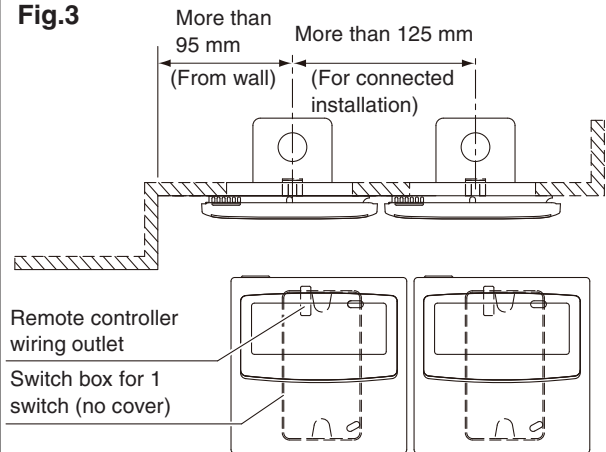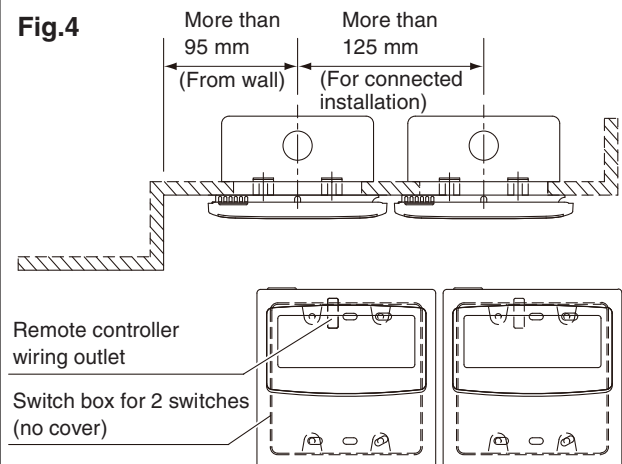
* For maintenance reasons, leave a gap of 25 mm or more between the remote controller switch and schedule timer if they are arranged in parallel above/below each other.

This remote controller has two methods of usage with the weekly timer and the schedule timer.
The wiring method and switch setting are different in each case.

Wiring for the Schedule Timer mode

● Wiring Diagram (Be sure to use the provided wires for the connection wiring.)

Fig.5

Power terminal · Timer terminal · Schedule timer · Clamp filter · Connecting wire (accessory) · Wired remote controller
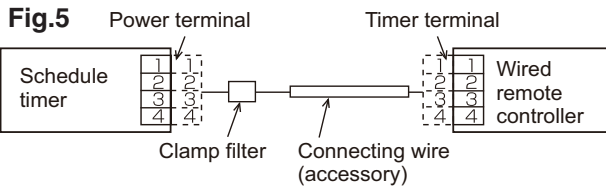
● Location   The schedule timer and wired remote controller can be located on either the right and left.

● System Diagram

Fig.6
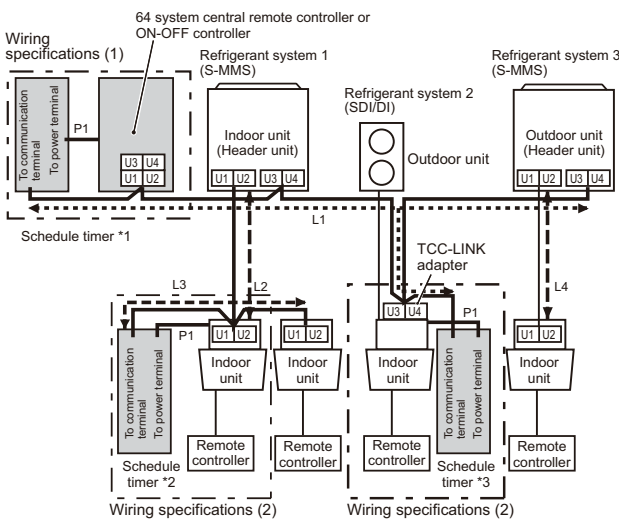
⧈ : Terminal board   ▯ : Connector

Schedule timer — DC12V 4 wires — Wired remote controller — Indoor unit — Outdoor unit

<Basic Wiring Diagram>

Fig.7

*1 In the case the schedule timer is connected to the 64 system central remote controller or ON-OFF controller

*2 In the case the schedule timer is connected to the indoor unit for S-MMS

*3 In the case the schedule timer is connected to the TCC-LINK adapter

Wiring	Max. Length		Electric cable specifications
P1:Power wire for schedule timer	100m		0.5mm^2
L1: Central control system wiring L2,L3,L4: Indoor/Outdoor communication line	L1+L2+ L3+L4	Less than 1000m	MVVS 1.25mm^2
		Less than 2000m	MVVS 2.0 mm^2

P1, L1, L2, L3 and L4 have no polarity.

<Note>
● This schedule timer is device connected to TCC-LINK.
● The maximum number of schedule timer units that can be connected is 8. (A maximum of 10 schedule timer units and other central control devices can be connected.)
● In the case of SDI/DI, an extra TCC-LINK adapter may be required.

● **Wiring**
● The schedule timer wiring can be connected by the following two methods. Select one of these connection methods according to the actual installation location. When wiring, extend the lengths of the wires using wire joints (accessory) and extension wires (field supply).

<Note>
● **When installing multiple schedule timers, avoid the use of communication line.**
● **Connection diagram (Be sure to use the provided wires as the power wiring.)**

Wiring specifications (1)

If a 64 system central remote controller (or ON-OFF controller) is installed (power is supplied from the 64 system central remote controller):

Fig. 8
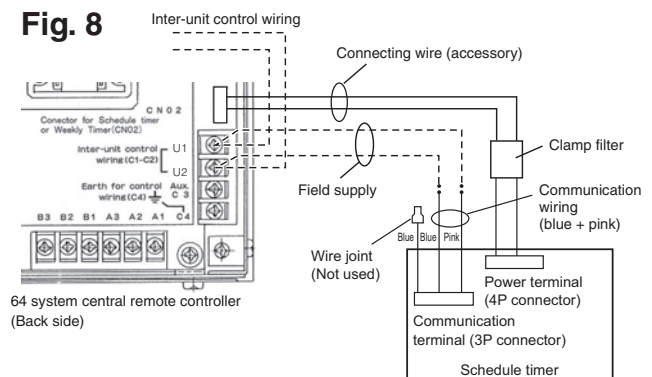
● Wiring procedures   Connect the provided connecting wire to the power terminal (4P connector) of the schedule timer. The terminal attached to the clamp filter must be connected to the schedule timer.

● The power wiring and communication wiring has no polarity.

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Wiring specifications (2)

If a 64 system central remote controller (or ON-OFF controller) is not installed (power is supplied from the indoor unit):

<Note> (1) The only functions of the schedule timer are indoor unit ON/OFF and remote controller enable/disable operations.

(2) It is required that during installation, a 64 system central remote controller or wired remote controller be installed next to the schedule timer so that operation mode and other information can be checked.

(3) If the 64 system central remote controller or other central control device is not present, the schedule timer cannot be used in combination with a system that does not utilize remote controllers including high wall (KRT series) systems.

Fig. 9
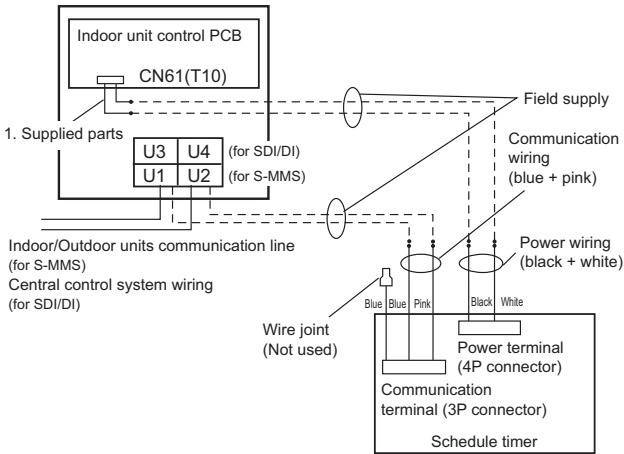
● The power wiring and communication wiring has no polarity.

● **The length of the power wiring must be no more than 100 m.**

The ground method of a shield wire (when using with the Schedule Timer)

Fig. 10
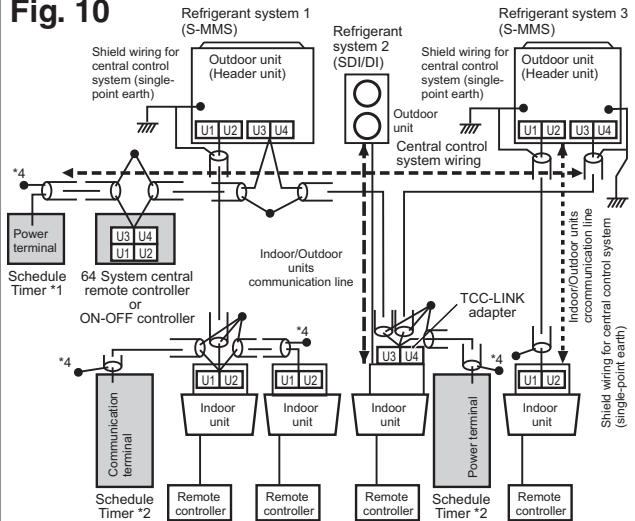
*1 In the case the schedule timer is connected to the 64 system central remote controller or ON-OFF controller

*2 In the case the schedule timer is connected to the indoor unit for S-MMS

*3 In the case the schedule timer is connected to the TCC-LINK adapter

<Grounding of the shield wires>

● The shield wires of the central control wiring should be connected at closed end, and these should be single-point ground.

● The terminal end (*4) of the shield wires should be open and insulated.

Explanation to Customers

● After work is completed, present the Operation Manual and Information for the Person in Charge of Installation (Electrical) Work to the customer.

● Explain to the customer the methods for use of the system, as described in the Operation Manual.

Memory Backup Switch

After installation is completed, check that the backup switch on the reverse side of the schedule timer PCB is turned to ON.
(The backup battery will retain the current time for up to 100 hours.)

Fig. 11
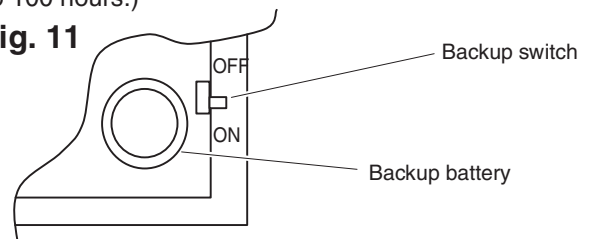
When using with the Weekly Timer, all switch settings should be OFF except S41-1.

About the Setting Switches

● Complete the switch settings before turning ON the schedule timer power.

S41

OFF ◄──► ON

* These switches are all OFF at the time of delivery.

Function selector switch (1) settings
• **In the case of using the schedule timer: Set to OFF**
• **In the case of using the weekly timer: Set to ON ***

Timer Group Settings (2, 3)

Function	2	3
1 timer group – fixed	OFF	OFF
4 timer group – fixed	OFF	ON
8 timer group – fixed	ON	OFF
Manual group setting	ON	ON

For details of the timer groups, refer to the Creating Timer Groups when using the Schedule Timer as described in below.

Central Control Main/Sub Switching (4)   Sub: OFF   Main: ON

(Central Control Devices center/ Terminal switching)
(1) Set to "sub" (OFF) when using together with the 64 system central remote controller. (Factory setting: Sub)
(2) Set to **"main" (ON)** when using together with an ON-OFF controller, wired remote controller or wireless remote controller.

   * When using with multiple schedule timer units, set only 1 unit to **"main" (ON)** and set the remainder to "sub" (OFF).

Schedule Timer Address Settings (5, 6, 7)
A maximum of 8 schedule timer units can be connected to the inter-unit control wiring (central control wiring). If multiple units are connected, use the setting switches and allocate the addresses, taking care to avoid duplication.

Address	5	6	7
Address 1	OFF	OFF	OFF
Address 2	OFF	OFF	ON
Address 3	OFF	ON	OFF
Address 4	OFF	ON	ON
Address 5	ON	OFF	OFF
Address 6	ON	OFF	ON
Address 7	ON	ON	OFF
Address 8	ON	ON	ON

Holiday and Operation Disable Settings for Each Group (8).
When this switch is set to OFF, units are all controlled together. When this switch is ON, the units are controlled by the settings for each timer group.
(For details of the timer groups, refer to the Creating Timer Groups when using the Schedule Timer as described in below.)

S42

■□	1
■□	2
■□	3
■□	4
■□	5
■□	6
■□	7
■□	8

OFF ◄──► ON

* These switches are all OFF at the time of delivery.

Simultaneous time communications (5)	Disabled: OFF Enabled: ON
When multiple schedule timers are installed, set this switch to **ON** to perform time settings for multiple units simultaneously. One minute after the time is set, the time at the other schedule timers will change to match the set time. (Ordinarily this switch is set to OFF.)	

Spare (6, 7, 8)
Be sure that these switches are OFF when the system is used.
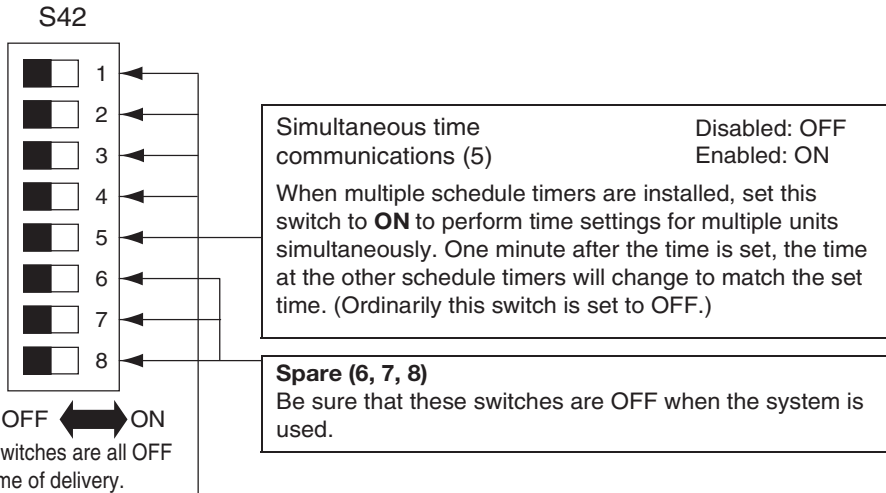
● The following switch setting is required when selecting remote controller enable/disable button to enable with the schedule timer.

Remote controller disabled item Switch (2, 3, 4)

When remote controller enable/disable is used with the schedule timer, set the remote controller item switches 2, 3 and 4 to the specific item according to the following items.

OFF: No setting
ON: Setting

2: Temperature setting
3: Operation mode
4: Start/stop
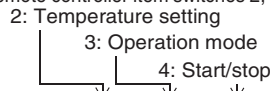
	Remote controller disabled items	64 system central remote controller indication	2	3	4
Mode 0	Remote controller enable/disable not used	No indication	OFF	OFF	OFF
Mode 1	Start/stop	Central 1	OFF	OFF	ON
Mode 2	Operation mode	Central 4	OFF	ON	OFF
Mode 3	Operation mode + Start/stop	Central	OFF	ON	ON
Mode 4	Temperature setting	Central	ON	OFF	OFF
Mode 5	Temperature setting + Start/stop	Central	ON	OFF	ON
Mode 6	Temperature setting + Start/stop	Central 3	ON	ON	OFF
Mode 7	Temperature setting + Operation mode + Start/stop	Central	ON	ON	ON

• All switch settings should be set to **OFF** when enable/disable is not used.
• Central 1 – 4 are the designations for the remote-controller disable modes for the 64 system central remote controller.
• After the above setting is completed, perform the enable/disable setting using the remote controller [🔓 / 🔒] button with schedule timer. For more information, refer to [Setting Up Programmed Operations] in the Operation Manual of the Schedule Timer.

Remote Controller Enable Items Switch (1) (Substitute/Addition Selector)

OFF: (Substitute mode)
All setting contents will be substituted to setting contents using the remote controller disabled item switches 2, 3 and 4 as opposed to the remote controller enable/disable items in setting presently.

Example: In the case of setting to [Mode 5] during remote controller disabled item (Temperature setting+ Start/stop mode)

Use to remote controller
○: Setting changeable   ✕ : Setting cannot be changed

Set to central 4 with the 64 system central controller	Set to remote controller disabled item via the timer	Set to remote controller enabled item via the timer
Temperature setting ○ Operation mode ✕ Start/Stop ○	Temperature setting ✕ Operation mode ○ Start/Stop ○	Temperature setting ○ Operation mode ○ Start/Stop ○

Change to all of the setting items with switches → Enable all items independently of determined by setting switches
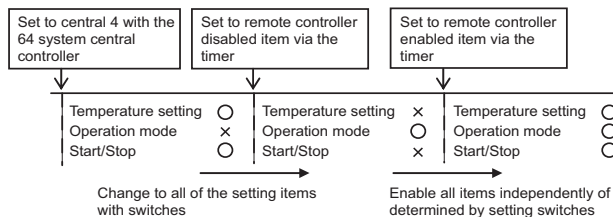
ON: (Addition mode)
Items set to ON using the remote controller disabled item switches 2, 3 and 4 will be added to the remote controller enable/disable items in the current setting.

Example: In the case of setting to [Mode 5] during remote controller disabled item (Temperature setting+ Start/stop mode)

Use to remote controller
○: Setting changeable   ✕ : Setting cannot be changed

Set to central 4 with the 64 system central controller	Set to remote controller disabled item via the timer	Set to remote controller enabled item via the timer
Temperature setting ○ Operation mode ✕ Start/Stop ○	Temperature setting ✕ Operation mode ○ Start/Stop ✕	Temperature setting ○ Operation mode ✕ Start/Stop ○

Disabled addition with switch setting items only (Temperature setting + Start/stop) → Enabled addition with switch setting items only (Temperature setting + Start/stop)
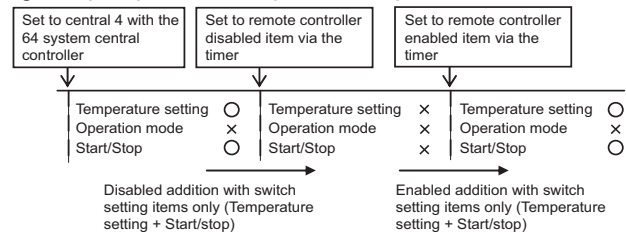
Setting Central Control Addresses when using with the Schedule Timer

● **When using the schedule timer, central control addresses setting of the indoor unit is required.**

(If central control address of the indoor unit has not been set, the schedule timer cannot be used to start and stop these units normally. Therefore, be sure to set the central control addresses of the indoor unit before turning on the power of the schedule timer.)

(1) Turn on the power of all the indoor units.

(2) Confirm the setting for the system addresses, indoor addresses and group addresses of all indoor units. If a wrong setting is found, reset the system addresses, indoor addresses and group addresses correctly.

(3) Perform the address settings that turn off the power of the indoor units.
  • Central control address setting using the wired remote controller

<Perform the following procedures, 1 to 5, to all the indoor units>

1. Press and hold the wired remote controller TEST button and VENT button for at least 4 seconds.

2. Assign the item code (DN) to $\boxed{03}$ using the temperature setting button ▲/▼.

3. Set the desired control address (1 to 64) using the timer button ▲/▼.

4. Press the ET button.
  (Confirm the remote controller indication changes from flashing to fully lit.)

5. After setting is completed, press the TEST button and then return the unit to general off status.
  (In this case, it will take about 1 minute for normal remote controller operation to resume.)

<Central control address setting using the 64 system central remote controller>

Refer to the [Address switch setting] in the [Installation manual of 64 system central remote controller] that is supplied to the 64 system central remote controller.

Creating Timer Groups when using the Schedule Timer

● The schedule timer can be used to create up to 8 timer groups (8 zones).

<Setting fixed timer groups (zones)>

Fig. 12
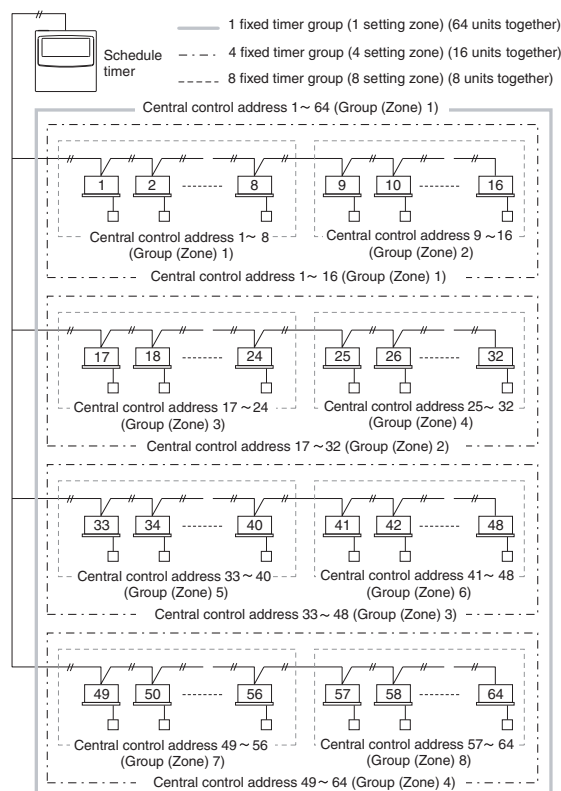
● **Procedure for making fixed timer group settings (zone)**

(1) First, use a 64 system central remote controller or the wired remote controllers to set the central control addresses, as assigned in the figure above, to the indoor units that will be subject to group timer control.

(2) Next, use S41 switches 2 and 3 to set the number of timer groups (zones) you wish to create.
  (For setting of switches 2 and 3, refer to the [About the Setting Switches] item above.

(3) Finally, turn on the schedule timer power. Initial communications are performed. (SC An flashes in the display.) The normal display appears after several minutes, and the timer group settings are confirmed.

<Procedure for making manual timer group settings (zone)>

Manual timer group settings allow central control addresses to be assigned freely within the timer groups such as the setting example below.

Fig. 13
Setting example

Schedule timer

(Group (Zone) 1)

| 1 | 2 | -------- | 8 | 9 | 10 | -------- | 16 |

(Group (Zone) 3)

| 17 | 18 | -------- | 24 | 25 | 26 | -------- | 32 |

(Group (Zone))

| 33 | 34 | -------- | 40 | 41 | 42 | -------- | 48 |

(Group (Zone) 4)   (Group (Zone) 5)   (Group (Zone) 6)

| 49 | 50 | -------- | 56 | 57 | 58 | -------- | 64 |

(Group (Zone) 7)   (Group (Zone) 8)
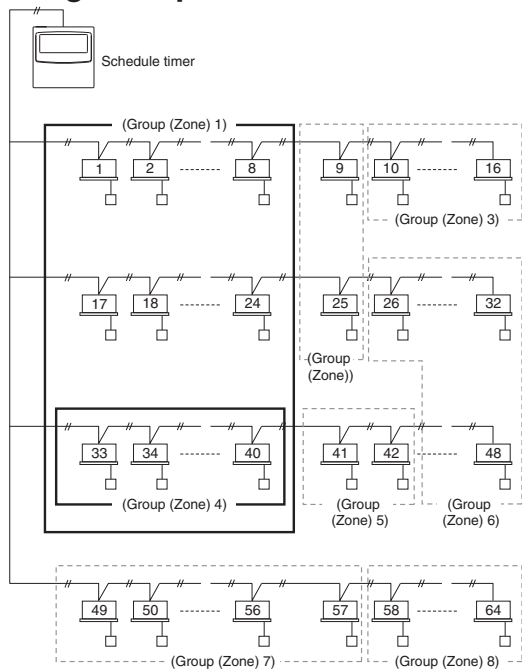
● **Procedure for making manual timer group settings (zone)**

(1) Turn on (manual settings) S41 setting switches 2 and 3, then turn on the power.Restart and initial communications are performed. (𝟝𝖢 𝖱𝗇 flashes in the display.) The normal display appears after several minutes.

(2) When the normal display appears, press and hold the schedule timer [CLEAR] button, the ⏰▸[I/O] button, and the [🔓/🔒] button **1** for 4 seconds or longer. "𝖱𝖽-𝟢𝟣" appears, flashing, in the present time display. (𝖱𝖽 indicates "address" and 𝟢𝟣 is the central address number.)

(3) Use the [GROUP] button **2** in the Setting buttons area to select the timer group for programmed operation. Then use the [DAY] button **3** in the Setting buttons area to select the central control address to assign and register for that timer group. Press the [SET] button **4** to register the selected central control address. (Registered central control address appears on the [Timer program] display area of the schedule timer.)

(4) To continue registering addresses, repeat step (3). Central control address numbers will be added to the right side on the [Timer program] display area of the schedule timer. To cancel a registered central control address, use the [GROUP] button **2** in the Setting buttons area to select the timer group, then use the [DAY] button **3** in the Setting buttons area to select the central control address and press the [CLEAR] button **5**.

(5) When registration is completed, press the [I/O] button **6** . The schedule timer restarts automatically and performs initial communications. (𝟝𝖢 𝖱𝗇 flashes in the display.) The normal display appears after several minutes, and the manually assigned timer group settings are confirmed.

Fig. 14

Timer program display area
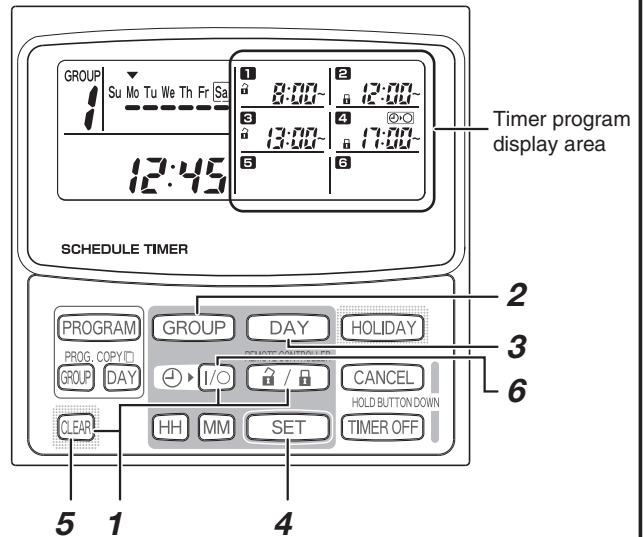
• During manual timer group settings, the schedule timer can be used to create up to 8 groups (8 zones), and the central control addresses can be registered up to 64 units in 1 group (1 zone).In addition, one of the central control addresses can be set in multiple timer groups.

(Indoor units of the central control address 33-40 are performed to start/stop and enable/disable operation according to the programmed operation for both timer group (zone) 1 and 4 to illustrate with reference to the thick frame marking as shown in above setting example of Fig. 13)

Checking the Central Control Addresses and Operating the Units that are Controlled by the Schedule Timer

● The schedule timer communicates with the indoor units to check which central control addresses can be controlled with the current timer control.

The schedule timer can then be used to start and stop these units.

(1) Press and hold the schedule timer [🔓/🔒] button, [TIMER OFF] button, and [CLEAR] button for 4 seconds or longer. "𝖱𝖽- (central control address)" appears in sequence, blinking.

(2) Use the [GROUP] button in the ▮ area to display the blinking central control addresses in sequential order. In this way, it is possible to check which central control addresses in the displayed timer group can be operated by the timer.

(3) With the selected timer group displayed, press the timer ⏰▸[I/O] button. Each time the button is pressed the indoor units in the displayed timer group start or stop. Pressing the [🔓/🔒] button in this mode permits all items (operation start/stop, operation mode, temperature setting items) at the indoor units in the displayed timer group where remote controller prohibit is in effect.

(4) After checking the addresses and operating the units, press and hold the [CANCEL] button for 2 seconds or longer. The schedule timer display returns to the normal display and all controllable indoor units stop.

Installation Work Plan

● Use the wired remote controller to check the unit No. of the indoor units. (Start the A/C unit with the wired remote controller, then press the remote controller UNIT SELECT button once to display the unit No. of the master unit.)

Schedule timer — Fixed timer group			Central control addresses	Indoor unit Unit No. System - Indoor	Room name
1	4	8			
1 At the time of shipment	1	1	1	– , –	
			2	– , –	
			3	– , –	
			4	– , –	
			5	– , –	
			6	– , –	
			7	– , –	
			8	– , –	
		2	9	– , –	
			10	– , –	
			11	– , –	
			12	– , –	
			13	– , –	
			14	– , –	
			15	– , –	
			16	– , –	
	2	3	17	– , –	
			18	– , –	
			19	– , –	
			20	– , –	
			21	– , –	
			22	– , –	
			23	– , –	
			24	– , –	
		4	25	– , –	
			26	– , –	
			27	– , –	
			28	– , –	
			29	– , –	
			30	– , –	
			31	– , –	
			32	– , –	
	3	5	33	– , –	
			34	– , –	
			35	– , –	
			36	– , –	
			37	– , –	
			38	– , –	
			39	– , –	
			40	– , –	
		6	41	– , –	
			42	– , –	
			43	– , –	
			44	– , –	
			45	– , –	
			46	– , –	
			47	– , –	
			48	– , –	
	4	7	49	– , –	
			50	– , –	
			51	– , –	
			52	– , –	
			53	– , –	
			54	– , –	
			55	– , –	
			56	– , –	
		8	57	– , –	
			58	– , –	
			59	– , –	
			60	– , –	
			61	– , –	
			62	– , –	
			63	– , –	
			64	– , –	

Weekly timer (TCB-EXS21TLE)

Operation Manual

Names and Functions of Parts

■ Operating Buttons

A: PROGRAM button
B: PROG. COPY buttons
C: CLEAR button
D: Setting buttons

E: HOLIDAY button
F: CANCEL button
G: TIMER OFF button

A: PROGRAM button	Use to start setting programs and to enter program settings.
B: PROG. COPY buttons	Use to copy programs to specific days in a schedule. The GROUP button is not used.
C: CLEAR button	Press to clear the settings of the currently displayed program. • The current program is not cleared unless the PROGRAM button is pressed after pressing the CLEAR button.
D: Setting buttons GROUP DAY HH MM ⏱▸I/○ REMOTE CONTROLLER 🔓/🔒 SET	Use to make program settings and to set the present time. Press to set groups for programmed operation. Press to set today's day and days of programmed operation. Press to set the present time and times used in programmed operation. Use to start/stop indoor units via the timer. Not used. Use to set programmed operation trigger time. • Program settings are not entered unless the PROGRAM button is pressed at the end of setting operations.
E: HOLIDAY button	Press to set and cancel holidays during a scheduled week of operation.
F: CANCEL button	Press to cancel the current program setting operation, copying operation or holiday setting operation. When the CANCEL button is held down for 2 seconds, the current setting operation or copying operation is canceled and the normal display returns.
G: TIMER OFF button	Press to turn the timer OFF when timer operation will not be used for a long period of time. When this button is held down for 2 seconds, TIMER OFF appears on the display. Programs cannot be run until the button is again held down for 2 seconds.

• Some of these buttons are disabled when SDI/DI is used with the schedule timer in the conventional weekly timer mode. If any of the disabled buttons is pressed, ⊘ appears on the display. For more information, contact your dealer.

■ Display
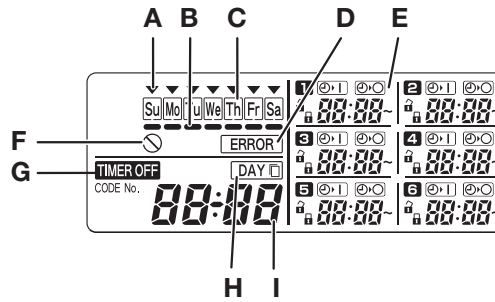
A:	Today's day of the week (▼)	Indicates today's day of the week.
B:	Program schedule indication (▬)	Appears under days that are scheduled for program operation.
C:	Holiday schedule indication (☐)	Appears around scheduled holidays.
D:	ERROR indication	Displayed when a mistake is made during timer setting.
E:	Timer program	Displays set timer programs.
F:	⊘ (Disabled Feature) indication	Displayed if the selected feature was disabled during installation.
G:	TIMER OFF indication	Displayed when the timer has been turned OFF.
H:	Copy mode indication	Displayed when copying a program into a day of the schedule.
I:	Present time	Displays the present time on a 24-hour clock. Also, displays settings in the various setting modes.

Using the Schedule Timer

To use the schedule timer, follow the steps below.

STEP 1   Turn ON power to the air conditioner.
- Turn ON power to the air conditioner connected to the schedule timer.

  NOTE
  Do not turn off the power mains in heating and cooling seasons. (This keeps the crankcase heater electricity turned on, which protects the compressor at startup.) If the air conditioner has been OFF for a long period of time, turn on power 12 hours before starting operation.

STEP 2   Make the initial settings of the schedule timer.
- Set the present time and today's day of the week.

STEP 3   Set up programs of the schedule timer.
- Make settings for programmed operation.

■ Setting the Present Time

Set the present time. (Example: When the present time is 12:45)

STEP 1   **Hold down the SET button and press the HH button to set the hour.**
- The hour increases one hour at a time with each single press of the HH button while the SET button is held down.
- The hour scrolls rapidly when both the SET button and HH button are held down. (Example: To set 12:00, release the HH button when "12" is displayed.)
- When the SET button is released, the hour is set and the indication changes from blinking to lighting.
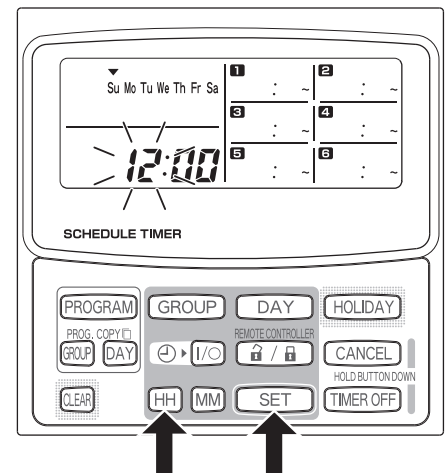
STEP 2   **Hold down the SET button and press the MM button to set the minutes.**
- The minutes increase one minute at a time with each single press of the MM button while the SET button is held down.
- The minutes scroll rapidly when both the SET button and MM button are held down. (Example: To set 00:45, release the MM button when "45" is displayed.)
- When the SET button is released, the minutes are set and the indication changes from blinking to lighting.
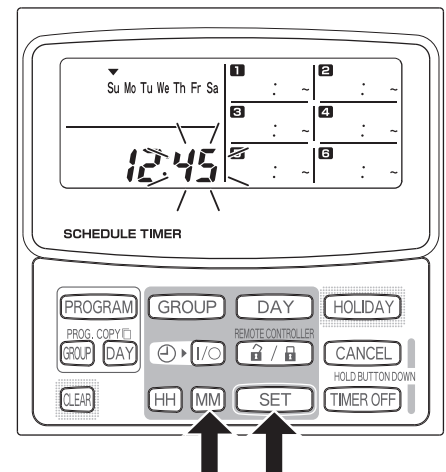
| NOTE |
- **Pressing just the HH or MM button does not change the time.**

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■ Setting Today's Day of the Week

Set today's day of the week. (Example: When today is Wednesday)

STEP 1 **Hold down the SET button and press the DAY button to set today's day of the week.**

- ▼ blinks and moves one day at a time across the days of the week with each single press of the DAY button while the SET button is held down.
- When the SET button is released, the day of the week is set and the ▼ changes from blinking to lighting.

▽ → ▽ → ▽ → ▼ → ▽ → ▽ → ▽

Su   Mo   Tu   We   Th   Fr   Sa
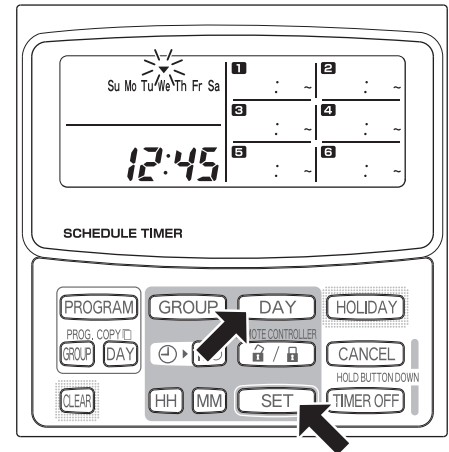
| NOTE |

- **Pressing just the DAY button does not change the day of the week.**

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■ Setting Up Programmed Operations

Correctly set the present time and today's day of the week.
Unless both are correctly set, the programs will not run as expected.
- Up to 3 programmed operations can be set per day for day of the week.
- To change the settings of an existing program, use the same below procedure used to set up a new program.

Example settings

1 ⏱▸I	**2** ⏱▸○
8:00~	12:00~
3 ⏱▸I	**4** ⏱▸○
13:00~	17:00~
5 ⏱▸I	**6** ⏱▸○
19:00~	21:00~

STEP 1   **Press the PROGRAM button**
- When the PROGRAM button is pressed, today's day of the week start blinking and the present time indication changes to a blinking "PG-1".
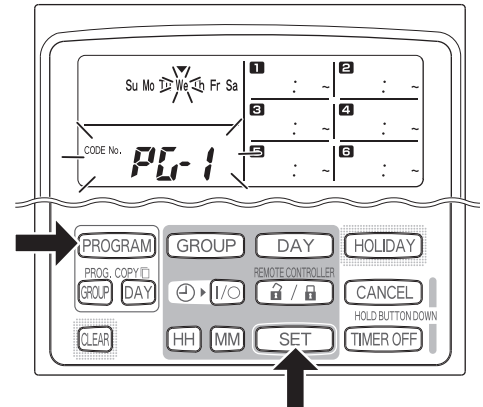
STEP 2   **Press the DAY button and select a day of the week for programmed operation.**
- When the SET button is pressed, the program schedule marker (━) changes from blinking to lighting and, at the same time, the time set in program **1** starts blinking. Also, the present time indication changes to a blinking "PG-2".

NOTE
- The currently selected day of the week blinks slowly at this time.
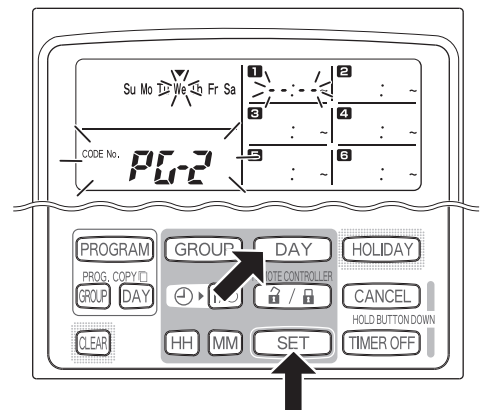
STEP 3   **Set the ON time and OFF time, and press the SET button.**
- Set the trigger time with the HH and MM buttons, and press the SET button.
- When the SET button is pressed, the ON time changes from blinking to lighting and, at the same time, the OFF time starts blinking.
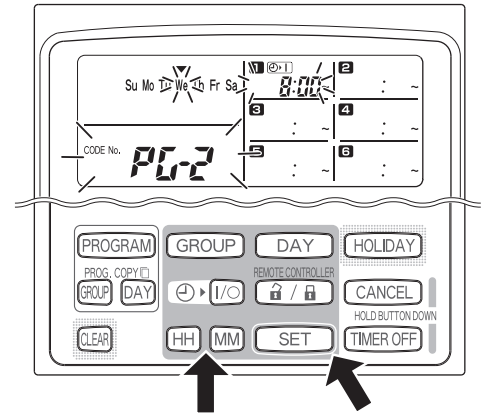
STEP 4   **Set up programs in the same way.**
- When the SET button is pressed, settings are automatically arranged in the order of earliest time first.
- If the SET button is pressed without any new settings being made in the program, program **1** starts blinking again and settings can be changed.
- Similarly, if the SET button is pressed with the third program set up, the first program starts blinking.
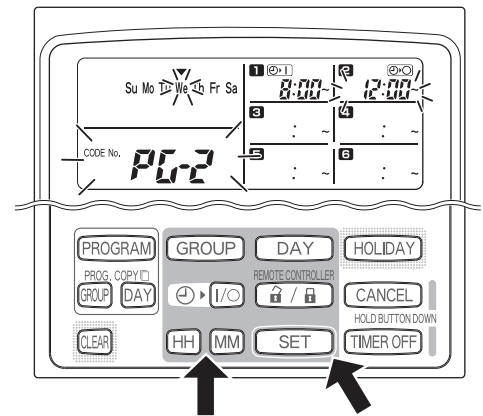
STEP 5   **Press the PROGRAM button.**
- Program settings are entered and the normal display returns.
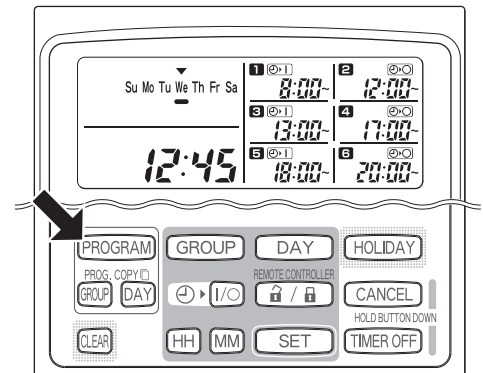
STEP 6   **Set up programmed operation for other days of the week in the same way.**
Programs that have already been set up can be copied into other days of the week.

> **NOTE**
> - **A "0:00" time setting is interpreted to mean 12:00 midnight.**
> - **To cancel program settings during program setup (while "PG-1" or "PG-2"is blinking on the display), hold down the CANCEL button for more than 2 seconds. The normal display returns.**
> - If settings are canceled without pressing the PROGRAM button, settings are not entered.

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■ Setting Errors

If "ERROR" is displayed (the [ERROR] indication blinks) while the programmed operation is set up, correct the set time using the following steps.

If Program Times Are the Same
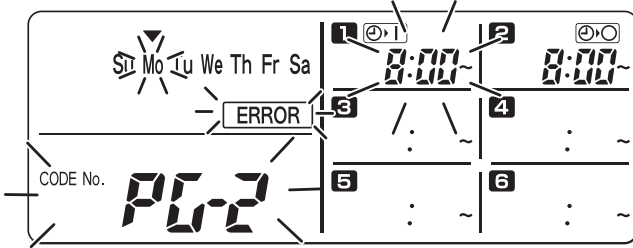
STEP 1 Every time the SET button is pressed, ON time and OFF time of the error program switch alternately. Select the program to be corrected.

STEP 2 Change the time setting with the HH and MM buttons.

STEP 3 Press the SET button and check "ERROR" is not displayed.

STEP 4 Press the PROGRAM button to end the setting mode.

The following ON time/OFF time settings generate an error.

1) When operating times overlap

Example:
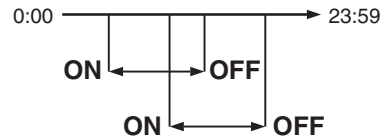
2) When OFF time is earlier than ON time

Example:
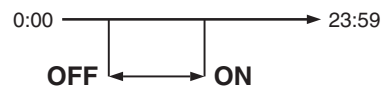
3) When ON time and OFF time are equal

Example:

4) When only ON time or OFF time is set

Example:
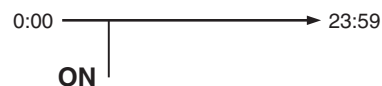
Example Time Settings That Do Not Cause Errors

The time settings below generate no error.

1) When OFF time of the preceding cycle equals ON time of the following cycle

Example:

1 ⏱▸❙	**2** ⏱▸○
8:00~	*12:00~*
3 ⏱▸❙	**4** ⏱▸○
12:00~	*19:00~*

```
0:00 ──────────────────────────► 23:59
        ON └──► OFF
           ON └────────► OFF
```
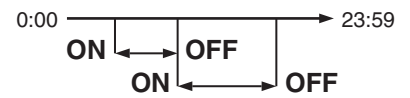
2) The operating time zone of the latter cycle is earlier than OFF time of the former cycle

Example:

1 ⏱▸❙	**2** ⏱▸○
12:40~	*16:50~*
3 ⏱▸❙	**4** ⏱▸○
8:00~	*12:00~*

➡

1 ⏱▸❙	**2** ⏱▸○
8:00~	*12:00~*
3 ⏱▸❙	**4** ⏱▸○
12:40~	*16:50~*

```
0:00 ──────────────────────────► 23:59
                  ON └──► OFF
   ON └────► OFF
```
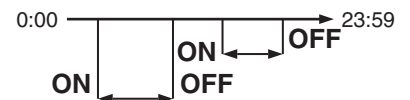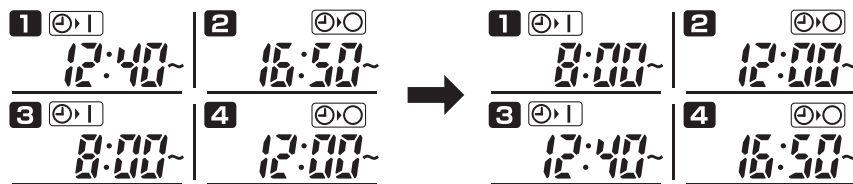
When the PROGRAM button is pressed, time settings are
arranged in order of operating time zones.

3) When ON time and OFF time are *0:00*

Example:

1 ⏱▸❙	**2** ⏱▸○
0:00~	*0:00~*

➡

1 ⏱▸❙	**2** ⏱▸○
0:00~	*24:00~*

When the SET button is pressed, *24:00* appears allowing the 24-hour
operation.

■ How to Check Program Times

You can check the programmed times fo day of the week.

STEP 1   **Press the DAY button.**
- When the DAY button is pressed the first time, tomorrow's day of the week starts blinking and the program settings for tomorrow are displayed.
- Every time the DAY button is pressed, the program settings change in order of the days of the week.
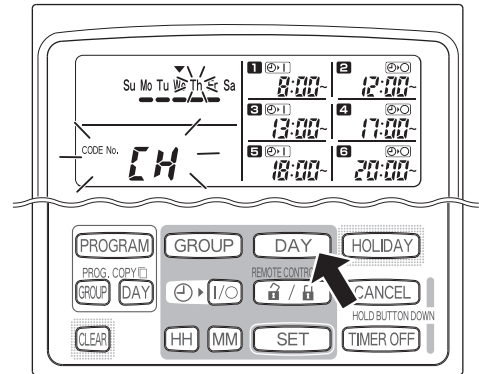
STEP 2   **End checking.**
- Press the CLEAR button. The normal display returns.

  NOTE
- Holding down the CANCEL button for more than 2 seconds also returns the normal display.

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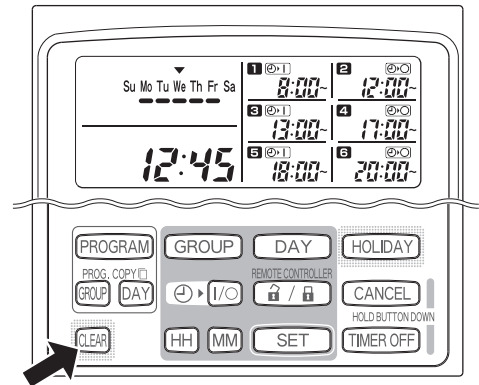
■ How to Copy Program Times

You can copy the already set program of one day into another day (Day Program Copying).

Example of Day Program Copying
(Copying Monday's program into Tuesday)
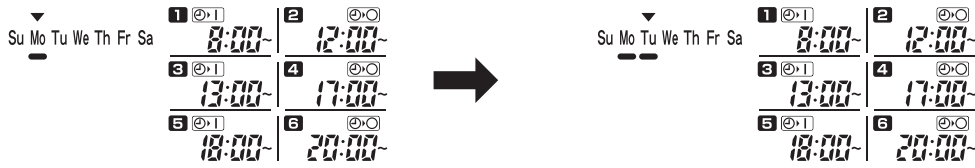
How to Copy Day Programs

STEP 1 **Press the PROG. COPY DAY button.**
- The present day of the week indication ▼ starts blinking and the present time indication changes to a blinking "CP-1".
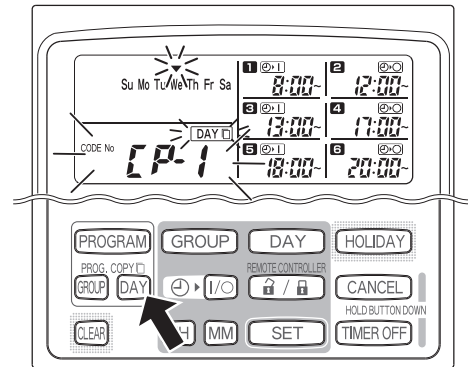
STEP 2 **Select a source day program to copy.**
- Every time the DAY button is pressed, the ▼ moves across the days of the week display, therefore select a day of the week that will serve as the copy source.
- Once having selected the copy source day, press the SET button to set it. The display changes to key you to select a copy destination day.
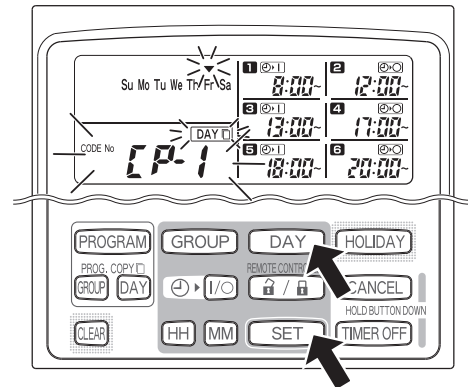
STEP 3 **Select a copy destination day.**
- When the schedule timer is ready for you to select a copy destination day, "CP-2" starts blinking in the present time display area, while the selected copy source day blinks in the days of the week. Therefore, select a day of the week as the copy destination, using the DAY button.

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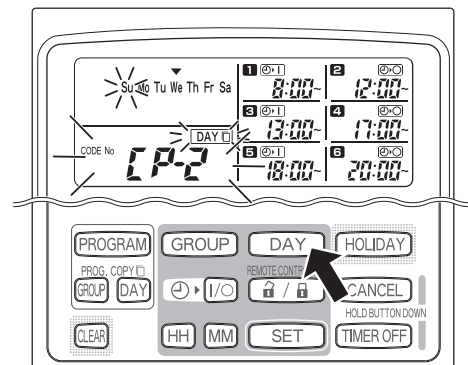
STEP 4   **Press the SET button to copy.**
- Press the SET button and the program schedule marker (➖) will be displayed.
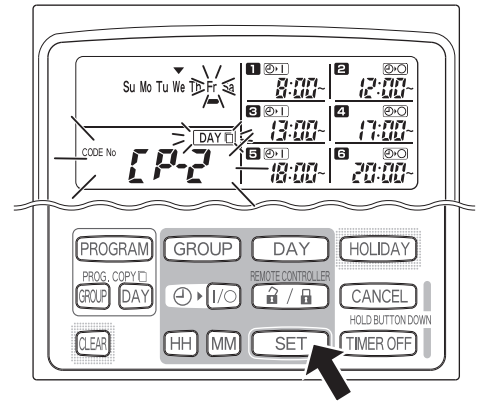
STEP 5   **Select other copy destination days if desired.**
- You can copy the selected source day program into other days by repeatedly pressing the DAY button to select a day of the week followed by the SET button to set it.

> **NOTE**
> - Pressing the CLEAR button extinguishes the program schedule marker (➖) and cancels the copy operation.
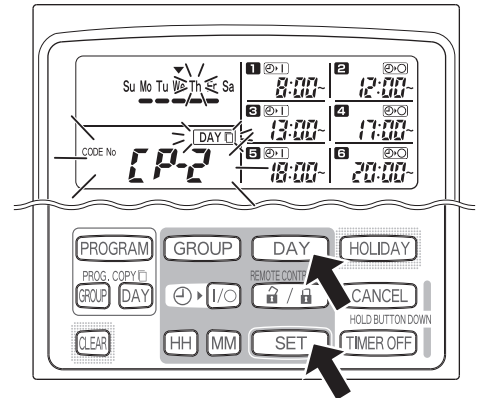
STEP 6   **Press the PROG. COPY DAY button to enter the copied program in the selected days.**
- The normal display returns.
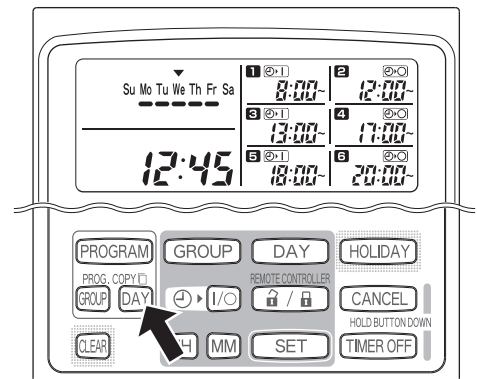
NOTE
- If a program already exists in the copy destination day, the newly copied program overwrites the existing program.
- If you accidentally copy over a program in the day program copy mode, holding down the CANCEL button for more than 2 seconds returns the program to the point prior to pressing the PROG. COPY DAY button in STEP 1. (All changes and copy operations made up until that point are cleared.)

■ How to Set Holidays in a Scheduled Week of Operation

Operations programmed for a specific day during the week can be temporarily disabled by setting that day as a holiday.

- When the set holiday passes, the holiday setting is canceled and operation is resumed as programmed the following week.
- Holidays can be selected for the week starting from today's day. If today is selected as a holiday, the holiday setting is canceled from the next programmed operation. (Depending on the program, if the program is currently running, the program may not stop.)

Example Setting

Su Mo Tu We Th |Fr| Sa

Today is Thursday and Friday is set as a holiday.

➡

Su Mo Tu We Th |Fr| Sa

When Friday comes, the program set for that day does not run.

➡

Su Mo Tu We Th Fr Sa

When Saturday comes, Friday's holiday setting is canceled.

STEP 1   **Press the HOLIDAY button.**
- "HL" starts blinking in the present time display area and today's day of the week starts blinking.
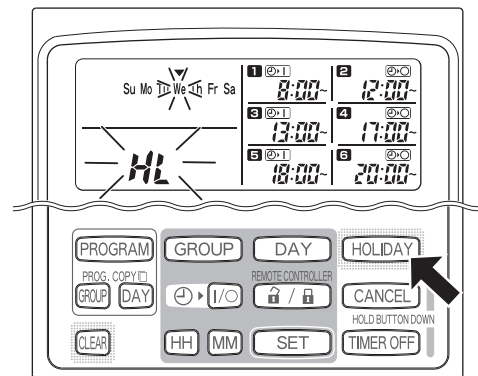
STEP 2   **Select a day as the holiday using the DAY button, and press the SET button.**
- A "☐" appears over the selected holiday.
- To select other holidays, select a day using the DAY button and set it with the SET button.
- If you made a mistake or want to cancel a holiday, press the CLEAR button.
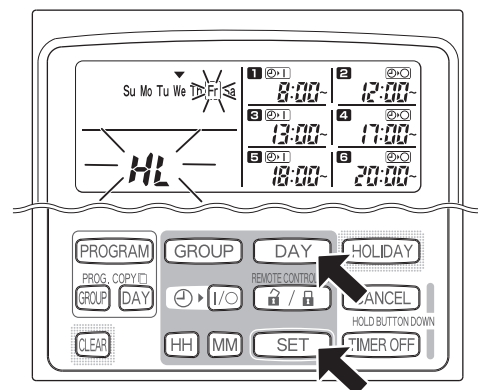
STEP 3   **Press the HOLIDAY button to enter the holiday.**
- The normal display returns.

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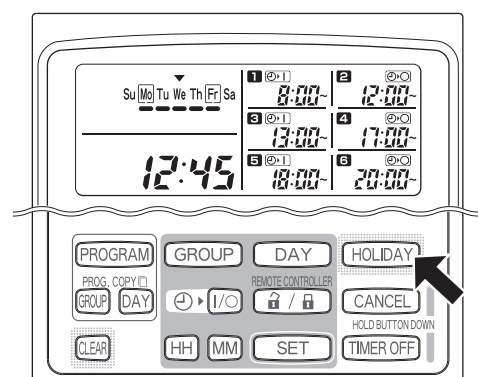
■ How to Disable the Timer Operation

To halt programmed operation for one week or more, you can disable all timer programs.
• Once the timer has been disabled, programmed operations are not run until the below procedure is performed.
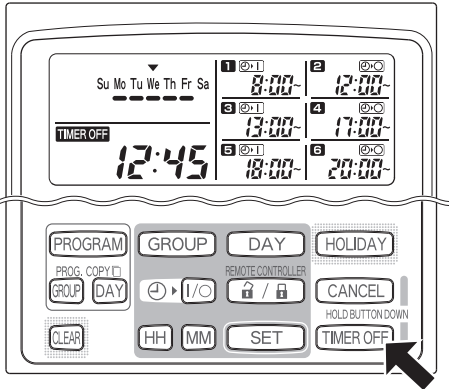
<table>
<tr>
<td>Hold down the TIMER OFF button for more than 2 seconds</td>
<td>To turn the timer back ON, hold down the TIMER OFF button for more than 2 seconds</td>
</tr>
<tr>
<td>

Su Mo Tu We Th Fr Sa
TIMER OFF
12:45

1 8:00~ **2** 12:00~
3 13:00~ **4** 17:00~
5 18:00~ **6** 20:00~

PROGRAM GROUP DAY HOLIDAY
PROG. COPY
GROUP DAY
CLEAR HH MM SET TIMER OFF

</td>
<td>

Su Mo Tu We Th Fr Sa
12:45

1 8:00~ **2** 12:00~
3 13:00~ **4** 17:00~
5 18:00~ **6** 20:00~

PROGRAM GROUP DAY HOLIDAY
PROG. COPY
GROUP DAY
CLEAR HH MM SET TIMER OFF

</td>
</tr>
<tr>
<td>• **TIMER OFF** appears on the display. The timer is disabled from the next scheduled program.</td>
<td>• **TIMER OFF** goes out and the timer is enabled from the next scheduled program.</td>
</tr>
</table>
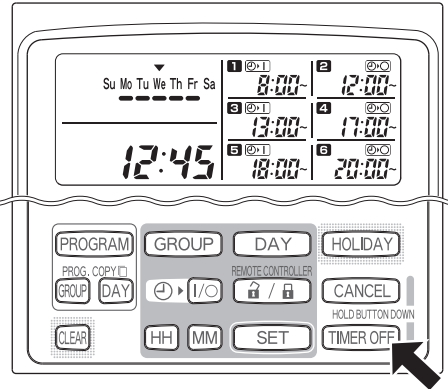
■ How to Clear Programs

Press the PROGRAM button.
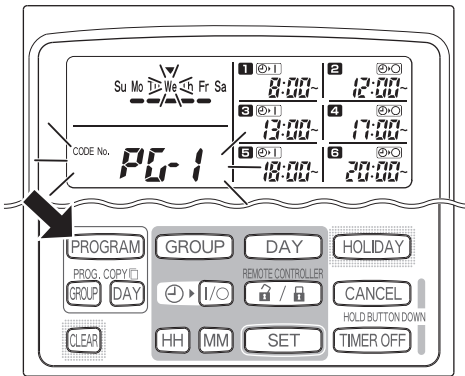
- When the PROGRAM button is pressed, the present day of the week starts blinking and the present time indication changes to a blinking "PG-1".

NOTE
- Holding down the CANCEL button for more than 2 seconds returns the program to the point prior to pressing the PROGRAM button. (All operations made up until that point are cleared.)

To cancel specific days
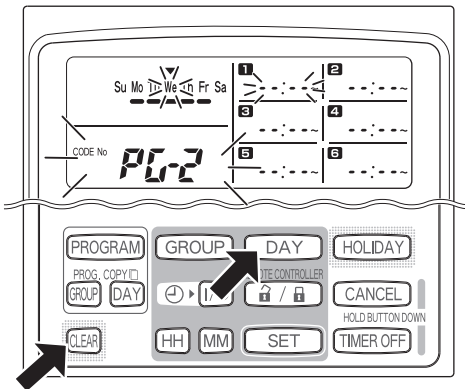
- Select a day to be deleted using the DAY button and press the CLEAR button. The program contents are completely cleared. The display appears as shown above.
- Press the PROGRAM button to enter the clear operation. The normal display returns without the program schedule marker (●) underneath the days of the week.

To cancel individual programs on specific days
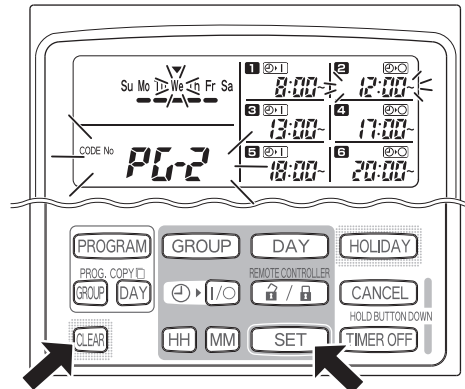
- Select a day and press the SET button. Programmed operations start blinking in rotation from the first one. Press the CLEAR button when the programmed operation to be cleared starts blinking. (The remaining programmed operations are automatically arranged in chronological order.)
- Press the PROGRAM button to enter the clear operation. The normal display returns.

Example:
Display after the second program was cleared from the display content above

Important Information to Remember

1. Power Outages

If the battery incorporated in the schedule timer ran out and the power of the air conditioner was lost and then the power has been restored, the following display appears with the colon ":" of the present time blinking. Pressing the PROGRAM button restores the normal display screen. If the present time is within the programmed operation time zone, the air conditioner starts running.
• Program settings are retained in the non-volatile memory of the schedule timer, therefore they are not cleared in the event of a power outage. Also, the present time and today's day of the week are retained for a maximum of 100 hours by the internal battery.

Schedule timer settings (Example)
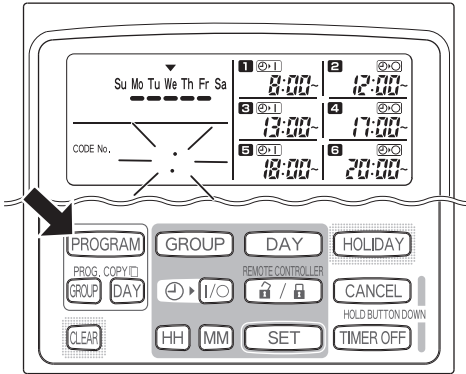
2. Schedule Timer and Air Conditioner Operation

Air conditioners provided with a schedule timer operate according to either the control of a connected remote controller or programmed operations using the schedule timer.

Schedule timer settings (Example)

| | 8:00 | 12:00 | 13:00 | 17:00 | 18:00 | 20:00 |

Air conditioner operation without control from the remote controller

Stopped | Running | Stopped | Running | Stopped | Running | Stopped

Air conditioner operation when controlled by the remote controller

Running | Stopped | Stopped | Running | Stopped | Running | Stopped

Run/stop control from the remote controller

Run/stop control from the remote controller

Run/stop control from the remote controller

Troubleshooting

Before requesting servicing, check the following.

Trouble		Cause/Remedy
Check before requesting servicing	Air conditioners do not operate as scheduled when the set time comes.	The timer has been disabled. A holiday has been scheduled.
	The present time indication is a blinking " : ".	There was a power outage. Press the PROGRAM button.
	88:88 blinks in the present time display area.	Power to the air conditioner was lost for a long period of time. Set the present time and today's day of the week again.

If trouble persists despite taking the above action, stop the schedule timer, turn off the unit and report the serial number and problem to your dealer. Never service the unit yourself as this is dangerous.

4-2 Central remote controller (TCB-SC642TLE2)
4-2-1 Outline

1. Feature

■ **Connectable units**
 • Max.64 indoor units or groups can be connected and controlled by one central remote controller
 • All indoor units can be divided to 1,2,3, or 4 zones.
 • ALL / ZONE / GROUP (individual) control mode is selectable.

 (Up to 16 indoor units or groups for each zone.)

■ **Mode setting**
 (1) Central control / Remote control mode
   ● Central control mode
    Central controller is used as a central control device.
    Individual setting by remote controller can be inhibited by central remote controller.
   ● Remote control mode
    Central controller is used as a remote controller.
    Settings by the central controller are inhibited by other central control devices.

 (2) ALL / ZONE mode
   ● ALL mode
    All indoor units can be controlled by the central controller.
   ● ZONE mode
    Indoor units in one of ZONE 1,2,3,or 4 can be controlled by the central remote controller.
   ● GROUP mode
    indoor unites of each group can be controlled individually.

 (3) Function of central controller can be 10 different types according to combination of central control / remote control
    mode and ALL / ZONE mode setting as shown in the table below.

	Central control	Remote control
ALL	ALL / Central	ALL / Remote
ZONE 1	ZONE1 / Central	ZONE1 / Remote
ZONE 2	ZONE2 / Central	ZONE2 / Remote
ZONE 3	ZONE3 / Central	ZONE3 / Remote
ZONE 4	ZONE4 / Central	ZONE4 / Remote

■ **Operation function**
 Start / stop, Operation Mode select, Setting temperature, Air volume setting, Frap position select, Central 1,2,3,4 /
 individual select, Ventilation, etc.

■ **Maximum number of connected central controller**
 Up to 10 units in one control wiring circuit.(including other central control devices.)

■ **Display**
 LCD

■ **Timer**
 Weekly timer (TCB-EXS21TLE) ... Sold separately

2. System configuration

• "ALL"   : All indoor units can be controlled by central remote controller.
• "ZONE"   : Indoor units in one of ZONE 1, 2, 3 or 4 can be controlled by central remote controller.
• "GROUP" : Indoor units of each group can be controlled individually.
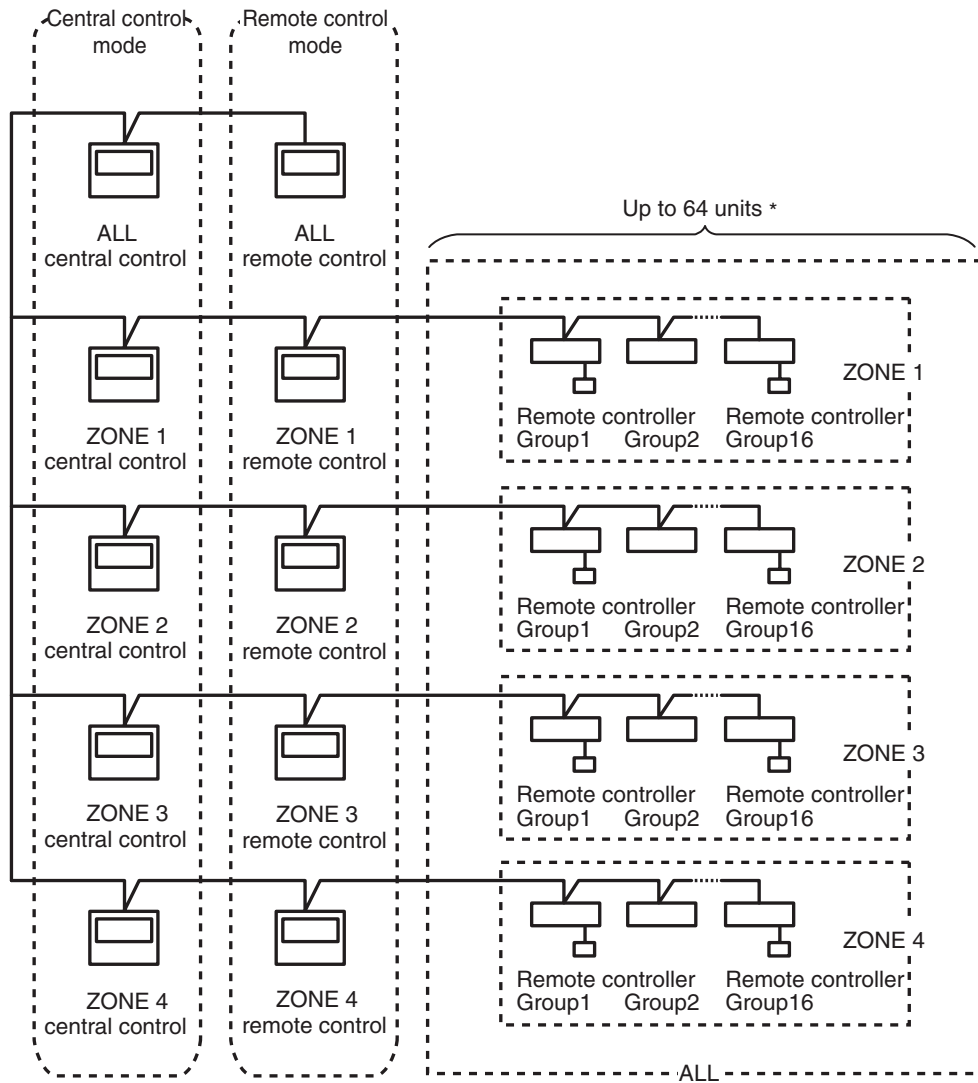
* In case of "1:1 model", follower indoor units in a group control and twin control must not be counted as "one unit". In the case of a VRF system, follower indoor units in a group control must be counted as "one unit".

3. Function matrix of central remote controller

	Central control mode					Remote control mode				
	ALL Central control	ZONE 1 Central control	ZONE 2 Central control	ZONE 3 Central control	ZONE 4 Central control	ALL Remote control	ZONE 1 Remote control	ZONE 2 Remote control	ZONE 3 Remote control	ZONE 4 Remote control
Controllable units	64 group (zone 1 to 4)	16 group (zone 1)	16 group (zone 2)	16 group (zone 3)	16 group (zone 4)	64 group (zone 1 to 4)	16 group (zone 1)	16 group (zone 2)	16 group (zone 3)	16 group (zone 4)
Operation units	ALL ZONE GROUP	ZONE GROUP	ZONE GROUP	ZONE GROUP	ZONE GROUP	ALL ZONE GROUP	ZONE GROUP	ZONE GROUP	ZONE GROUP	ZONE GROUP
ON	OK	OK	OK	OK	OK	OK *1	OK *1	OK *1	OK *1	OK *1
OFF	OK	OK	OK	OK	OK	OK *1	OK *1	OK *1	OK *1	OK *1
Operation mode change	OK	OK	OK	OK	OK	OK *1	OK *1	OK *1	OK *1	OK *1
Setting temperature	OK	OK	OK	OK	OK	OK *1	OK *1	OK *1	OK *1	OK *1
Setting air volume	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Setting frap position	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Central / Remote	OK *2	OK *2	OK *2	OK *2	OK *2	X	X	X	X	X
Ventilation ON/OFF	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Weekly timer connection	OK *3	OK *4	OK *4	OK *4	OK *4	OK *5	OK *6	OK *6	OK *6	OK *6
Batch operation display (LCD)	OK *7	OK *8	OK *8	OK *8	OK *8	OK *7	OK *8	OK *8	OK *8	OK *8
Batch alarm display (LCD)	OK *7	OK *8	OK *8	OK *8	OK *8	OK *7	OK *8	OK *8	OK *8	OK *8

x...Disable

*1 Individual ON/OFF operation with the remote controller is inhibited under the "central 1" mode.
   Individual ON/OFF operation, MODE, and Temp. setting operations with the remote controller are inhibited under the "central 2" mode.
   Individual MODE and Temp. setting operations with the remote controller are inhibited under the "central 3" mode.
   Individual MODE operation with the remote controller is inhibited under the "central 4" mode.
*2 "central 1" "central 2" "central 3" "central 4" "individual" can be set.
*3 ON, OFF, remote control permitted / inhibited per ALL can be selected. (6 type)
*4 ON, OFF, remote control permitted / inhibited per ZONE can be selected. (6 type)
*5 ON, OFF per ALL can be selected. (2 type)
*6 ON, OFF per ZONE can be selected. (2 type)
*7 Per ALL
*8 Per ZONE

4. Function items of central remote controller (TCB-SC642TLE2)

No	Items		Function	Remarks
1	Power Supply		AC220/230/240V	
2	Connectable indoor units		Max. 64 units	
3	Max. zone control units		Max. 4 zones	
4	Controllable indoor units per zone		Max.16 units	
5	Zone setting		Zone.1 : Central control address 1 to 16 Zone.2 : Central control address 17 to 32 Zone.3 : Central control address 33 to 48 Zone.4 : Central control address 49 to 64	
6	Monitoring	ON/OFF	Available	
		Operation mode	Available	
		Set up temperature	Available	
		Air volume select	Available	
		Flap position	Available *	* Remote controller less system only
		Error contents	Available	
		Filter sign	Available	
7	Setting	ON/OFF	Available	
		Operation select	Available	
		Setting temperature	Available	
		Setting air volume	Available	
		Setting flap position	Available *	* Remote controller less system only
		Reset filter sign	Available	
		Individual operation	Available	
		Master zone control	Available	
		Individual control in the zone	Available	
		Master operation	Available	
		Control with ventilation fan	Available	
8	Restriction of local remote controller		Available 1) Operation disable 2) ON/OFF, mode select and setting temp. disable 3) Mode select and setting temp. disable 4) Mode select disable	
9	Weekly schedule		Available (by connecting weekly timer)	
10	Forced stop command (Fire alarm)		Available	
11	Master ON/OFF command		Available	
12	Stop command		Available	
13	External operation output		Available	
14	Error output		Available	
15	Connectable central control devices		Up to 2 devices (Master / Sub)	In case of "zone fix mode", Up to 5 units (Master, zone 1,2,3,4)
16	Display		Operation status display for each zone	

5. Zone control

Central remote controller (TCB-SC642TLE2)

Max, 16 units per one zone

Up to 4 zone

| @1 | @2 | @3 | --------- | @15 | @16 | Zone 1 (Central control address 1~16 only) |

| @17 | @18 | @19 | --------- | @31 | @32 | Zone 2 (Central control address 17~32 only) |

| @33 | @34 | @35 | --------- | @47 | @48 | Zone 3 (Central control address 33~48 only) |

| @49 | @50 | @51 | --------- | @63 | @64 | Zone 4 (Central control address 49~64 only) |
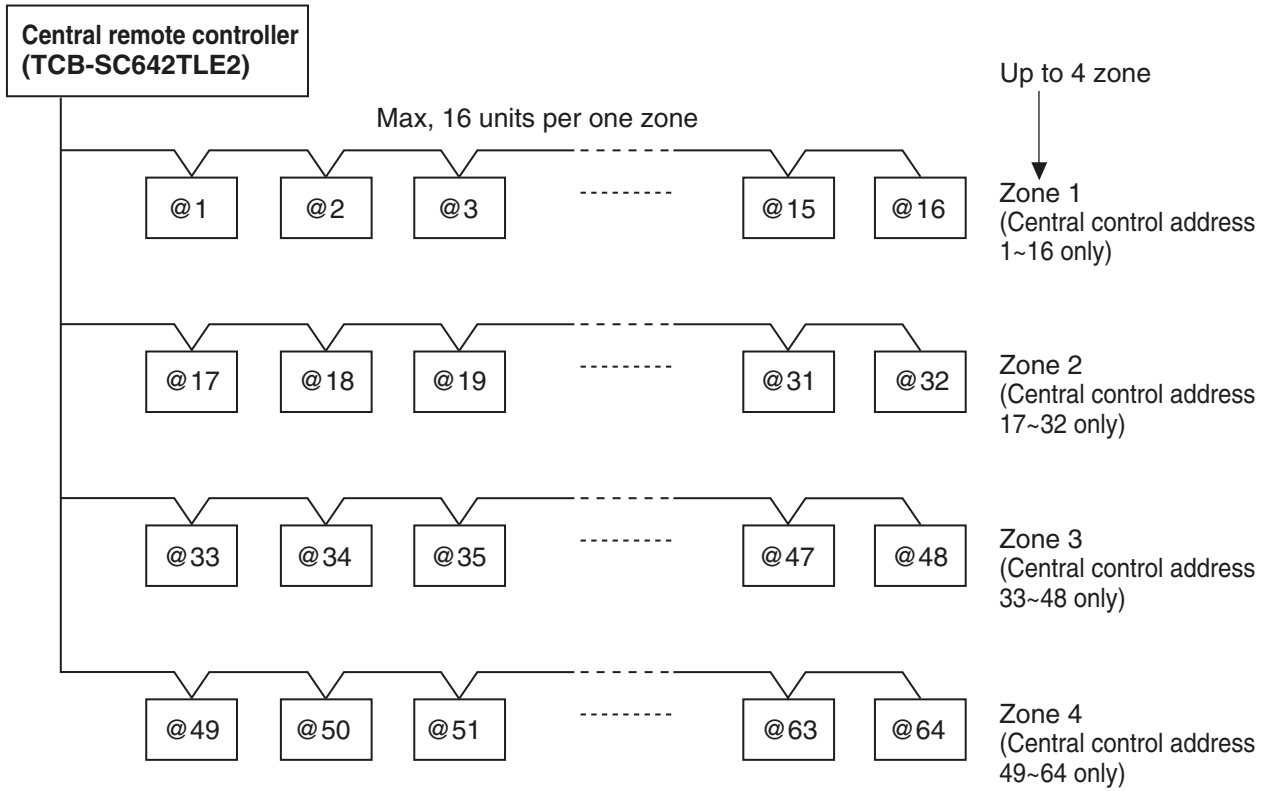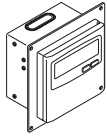
4-2-2 Installation procedure

1. General

This booklet briefly outlines where and how to install the central controller. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the controller before beginning.

NOTE Give these instructions to the customer after finishing the installation.

Part Name	Figure	Q'ty	Remarks
Central controller		1	
Tapping screw	Truss-head Phillips 4 x 16 mm	4	For securing the central controller
Rawl plug		4	For securing the central controller
Manual		1	For installation
		1	For operation

2. Installation site selection

Install the central controller at a height of between 1 and 1.5 meters above the floor.
Do not install the central controller in a place where it will be exposed to direct sunlight or near a window or other place where it will be exposed to the outside air.
Be sure to install the central controller vertically, such as on a wall.

3. How to install the central controller

CAUTION

Do not twist the control wiring together with the power supply wiring or run it through the same metal conduit, because this may cause a malfunction.
Install the central controller away from sources of electrical noise. Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

WARNING

Do not supply power to the unit or try to operate it until the tubing and wiring to the outdoor unit is completed.

■ **Overview of the central controller**

116
47
15
13

Electrical component box

Hole for electrical wiring

Hole for electrical wiring

Control unit   **Unit: mm**

160
148
(6)
6
6
160
148
121
(6)
121

21   69

115   ⇦ **Z**

Mounting plate (for flush mounting)

4-Ø 5 diameter holes (for mounting)

128
80
36
80
128
13
47

Hole for electrical wiring

Rear plate

4-Ø 5.5 diameter holes (for mounting)
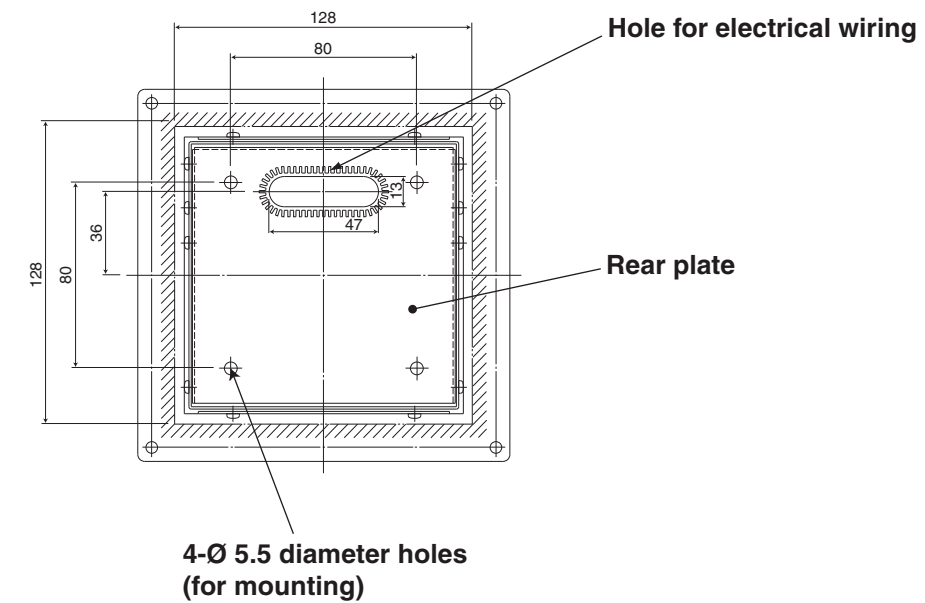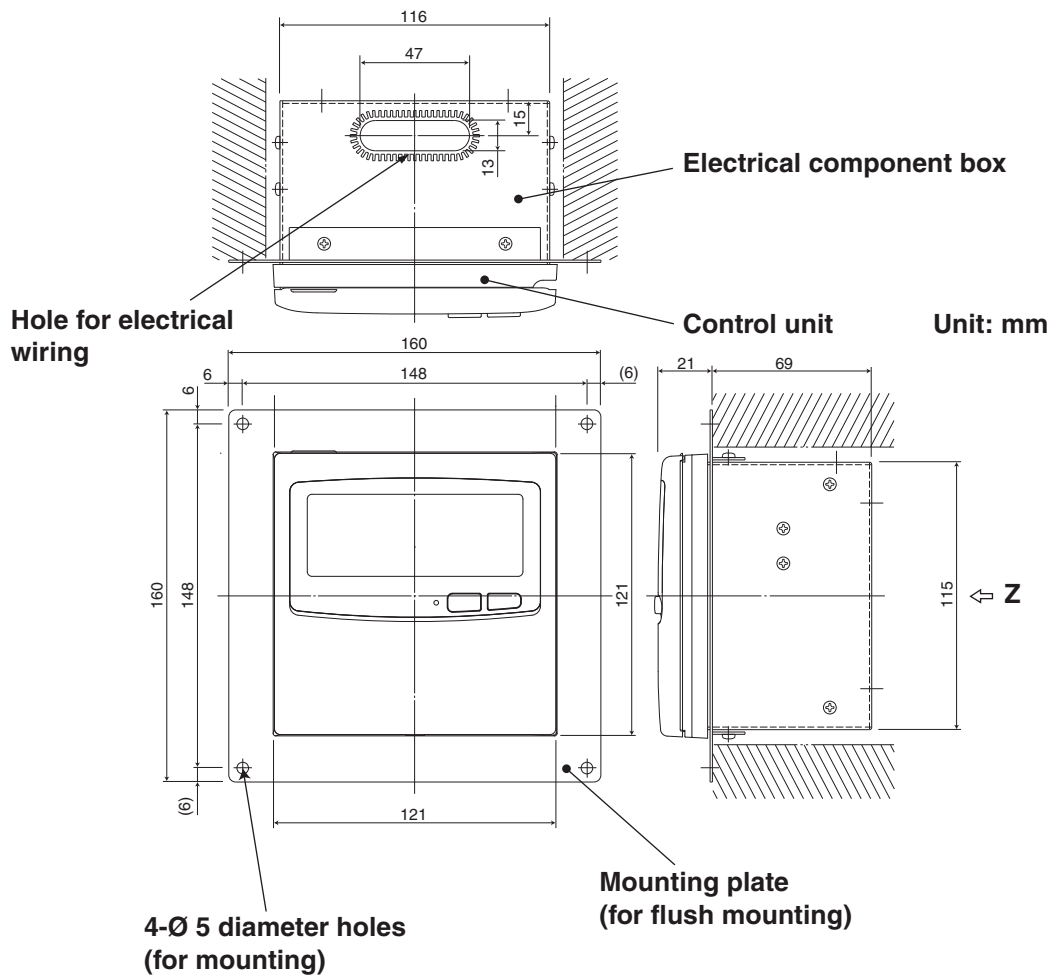
Fig. 1

Z-view (back side)

* In order to mount the central controller flush with the wall, an opening measuring 128 mm x 128 mm is necessary.

■ Installation procedure

a): Normal mounting

b): Flush mounting

Mounting plate

Electrical component box

Hole for electrical wiring

Rear plate

Fig. 2
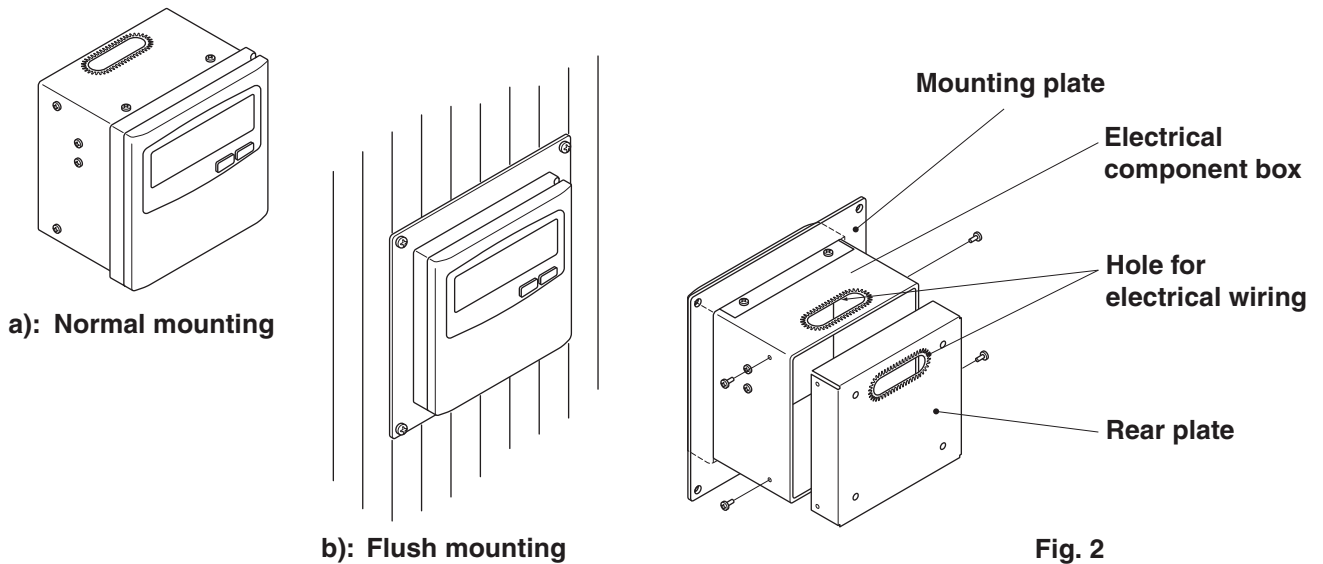
1. Decide how the central controller will be mounted: in the normal manner or flush with the wall.
   a) To mount the central controller in the normal manner, remove the mounting plate. Then reattach the four screws to the electrical component box.
   b) To mount the central controller flush with the wall, make an opening in the wall measuring 128 mm x 128 mm. The opening must be at least 85 mm deep as measured from the outside surface of the wall.

2. Remove the rear plate and connect the electrical wiring.
   1) Remove the four screws located on both sides of the rear plate.
   2) Either the hole in the top of the electrical component box or the hole in the rear plate may be used to feed in the electrical wiring.
   3) If the hole on the top is used, the rear plate should be turned upside down.

3. Secure the central controller in place.
   a) If the central controller is being mounted in the normal manner, first attach the rear plate to the wall using the screws and Rawl plugs provided. Next, place the body of the central controller over the rear plate and secure it in place using the four screws.
   b) If the central controller is being mounted flush to the wall, fit it through the mounting plate on the wall and secure it in place using the screws and Rawl plugs provided.

4.8 mm dia. holes
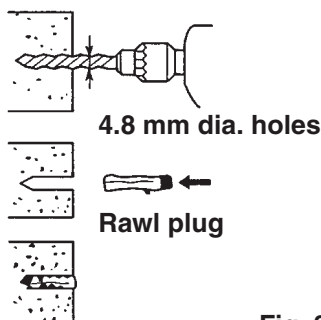
Rawl plug

Fig. 3

| NOTE | To mount the central controller on a wall made of cinder block, brick, concrete, or a similar material, drill 4.8 mm diameter holes into the wall and insert Rawl plugs to anchor the mounting screws. |

■ **Layout of electrical terminals**

Clamp for electrical wiring

Connector (CN02) for weekly timer (TCB-EXS21TLE, Sold separately)

P.C. board

CN02

Earth for the power supply wiring

N
L

U1/U3
U2/U4
C3
C4

B3 B2 B1 A3 A2 A1
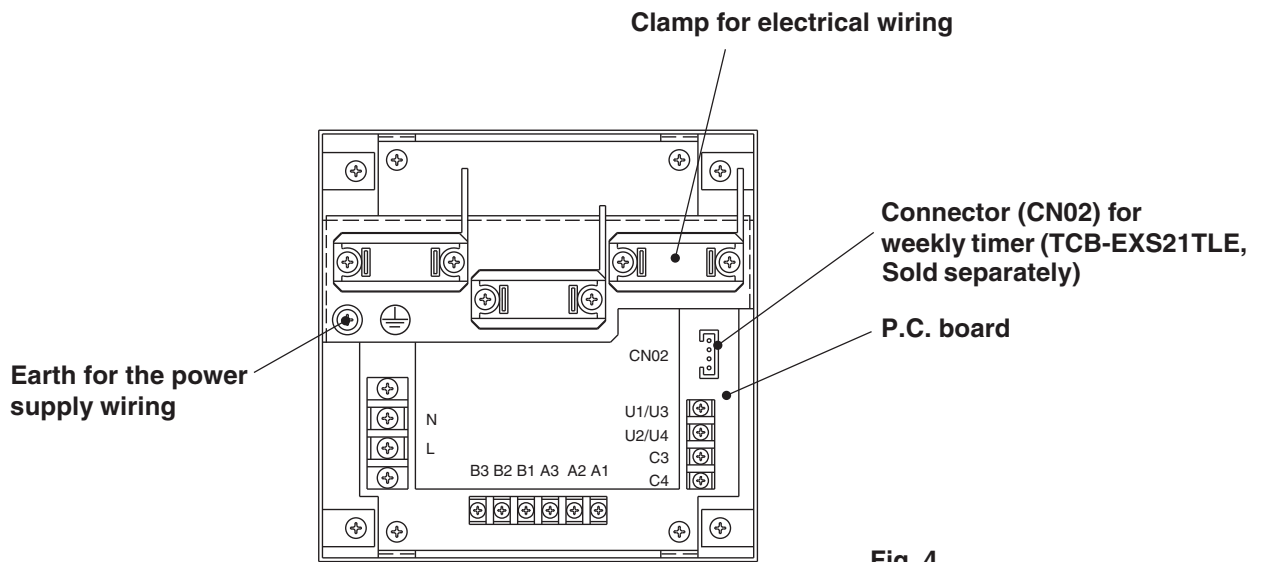
Fig. 4

How to connect electrical wiring

1) Basic wiring

L:
N:
Power supply ($\sim$ 50 Hz/60 Hz, 220–240 V)

U1/U3:
U2/U4:
Indoor unit control wiring. (Low voltage)

C3:   Auxiliary

C4:   Earth for inter-unit control wiring

⏚:   Earth for the power supply wiring

2) Terminals for remote monitoring

A1:   Input for turning on air conditioners concurrently.

A2:   Input for turning off air conditioners concurrently.

A3:   Common input for turning air conditioners on or off.

B1:   On operation state indicator output.

B2:   Alarm indicator output.

B3:   Common indicator output.

■ **How to wiring**

⚠ CAUTION **Ensure that wiring connections are correct. (Incorrect wiring will damage the equipment.)**

How to wire the central controller

In order to ensure safety, turn off the air conditioner power before mounting or removing the central controller.

Connect the communication wires to the indoor/outdoor unit connecting wires or central control system wires.

Use the following as the communication wires.

Total wire length of less than 1,000 meters: MVVS1.25mm^2

Total wire length of less than 2,000 meters: MVVS2.0mm^2

The total wire length is obtained by adding the lengths of the indoor/outdoor unit connecting wires to the lengths of the central control system wires.

Do not run the communication wires inside the same electrical wire conduits as the power cables.

For the communication wires, use signal wires that visually identify them as being different from either the remote controller wires or the power cables.

Connect the power cable of the central controller to the AC220–240V power source. (Incorrect wiring will damage the equipment.)

Connect the wires in such a way that none of the wires will be connected incorrectly. (Incorrect wiring will damage the equipment.)

Basic wiring diagram

When using a central control connect the communication wiring to the air conditioners as shown below.

The maximum number of air conditioners which can be connected in one central control system is 64 indoor units and 16 outdoor units (header outdoor units). (With VRF system)

Up to ten central controllers including other central control units can be connected.

MM○: Indoor Unit model name of VRF system.
(MMU, MMD, MMC, MML, MMK, MMF, etc.)
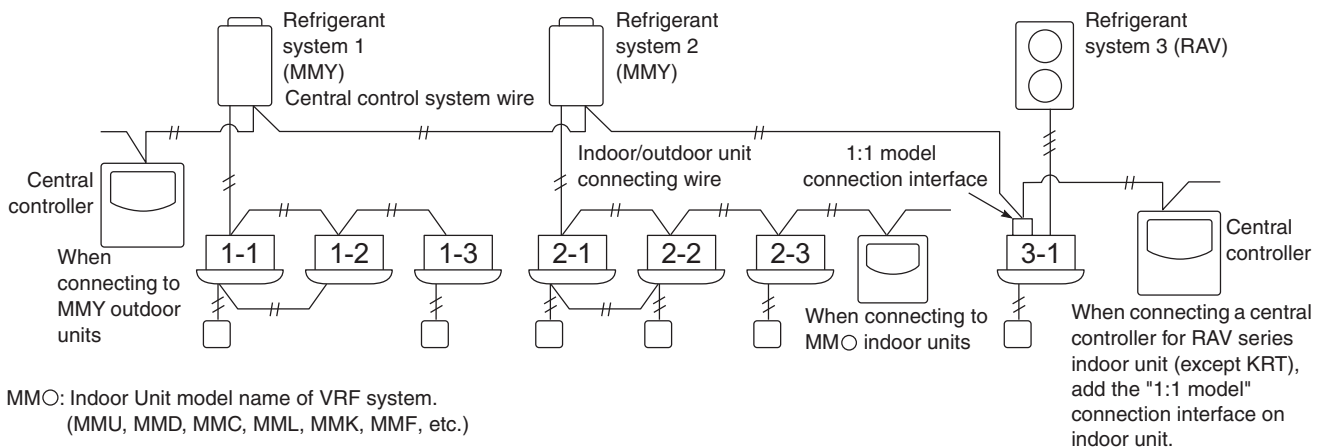
Fig. 5

NOTE When connecting to MMY outdoor units, make the connection to the central control system wires (U3 and U4 terminals).

When connecting to MM○ indoor units, make the connection to the indoor/outdoor unit connecting wire (U1 and U2 terminals).

When connecting to a RAV air conditioner, make the connection to the U3 and U4 terminals.

The 1:1 model connection interface is required for the RAV air conditioner. (except KRT series.)

Wiring connection procedure

As shown in the figure below, connect the terminal block (U1/U3, U2/U4) of the central controller with the terminals (U3, U4) of the outdoor unit (central unit).
It is also possible to connect to the indoor/outdoor unit the connecting wire of other indoor or outdoor units (no matter which refrigerant system is used).
Since the terminals do not have polarities, U1/U2 or U3/U4 can be reversed.
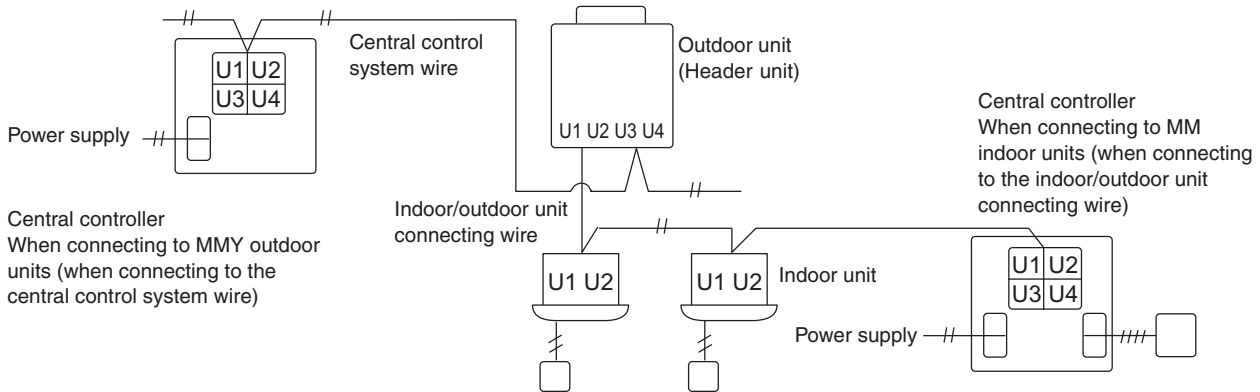
Fig. 6

| NOTE | The fuse will blow to protect the equipment if an AC voltage of 220–240V is applied by mistake to U1/U3 or U2/U4. If this should happen, first re-connect the terminals correctly. |

Check the fuse on the indoor/outdoor control board since this fuse may have blown as well.

Grounding the shielded wires

Terminate the connection of the shielded wires for all of the central control wires and ensure single-point earthing.
Even when connecting the centrally controlled unit to the indoor/outdoor unit connecting wires, terminate the connection of the shielded wires and ensure single-point earthing for all the indoor/outdoor unit connecting wires.
Leave the final termination open (insulate it).
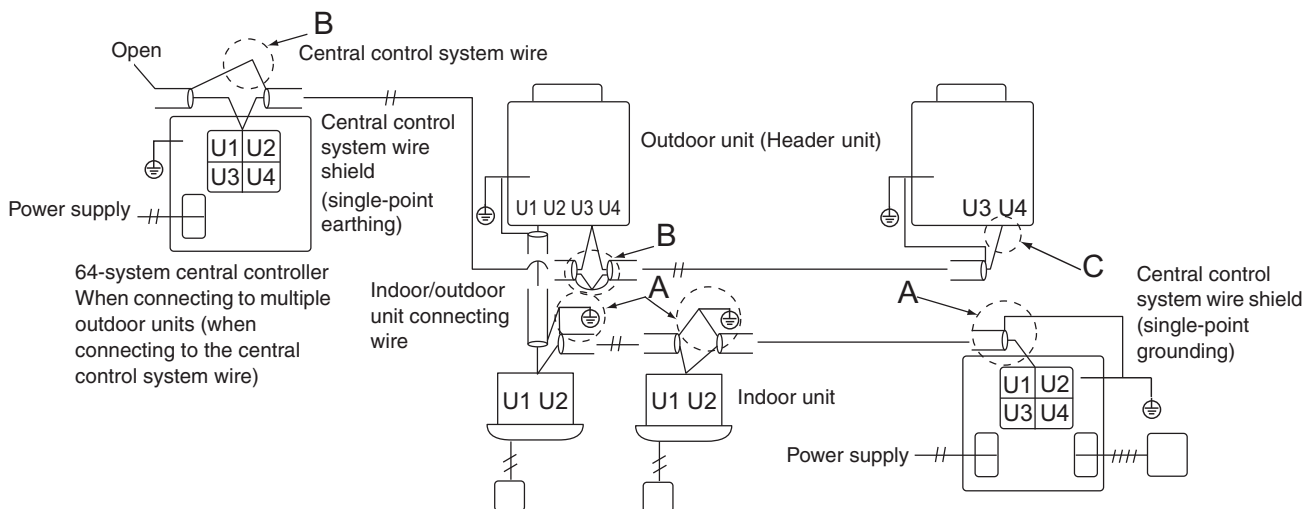
Area A: Earth both ends of the shielded cable used for the indoor/outdoor unit connections.
Area B: Use a shielded cable for the central control wiring system.
Area C: Earth only one end of the central control system wiring at its final termination. (Leave the other end of the wire as an open wire (i.e. insulate it).)

Fig. 7

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4. Address switch setting
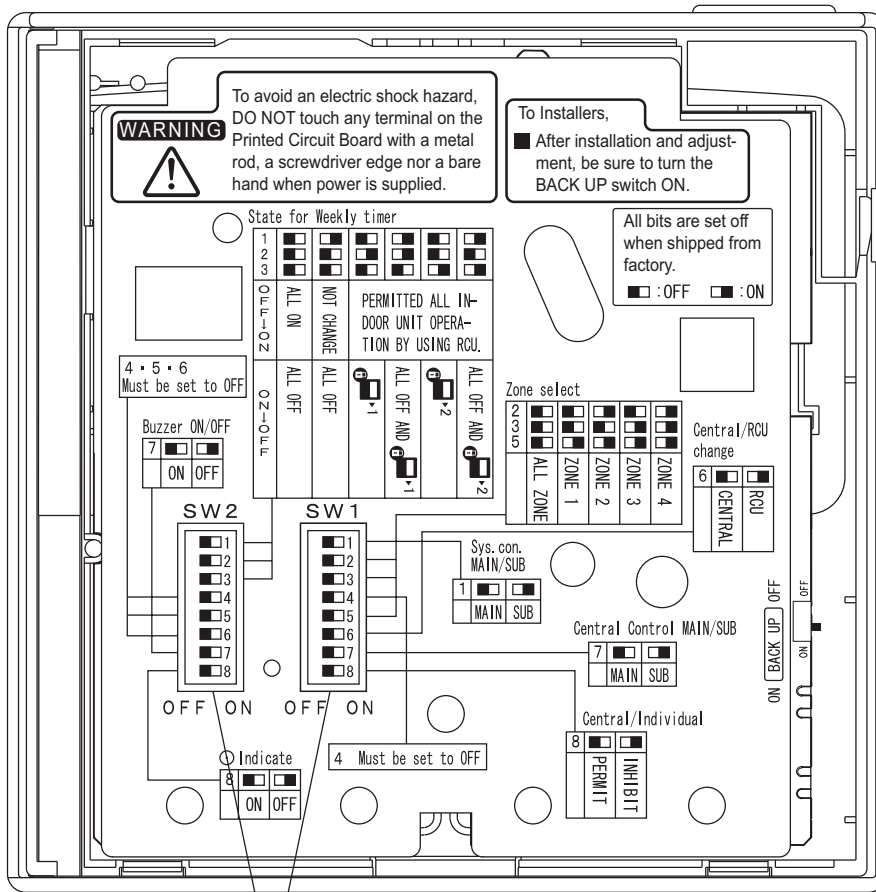
Dip switch

P.C. board in the control unit

Fig. 8

Gap
Gap
Coin
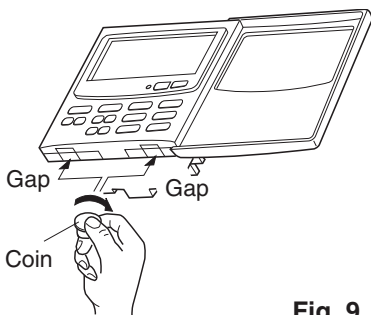
Fig. 9

How to reach the P.C. board
Remove the flat-top screw on the bottom of the back side of the case. When you open up the decorative cover, you will see two notches under the control unit. Inset a coin or other flat object into these notches and pry off the back case. The P.C. board on the back of the control unit is now visible.

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SW1

Main/sub selection switch
> OFF: Central controller operates as main controller.
> ON: Central controller operates as sub-controller.

ON ↕ OFF

SW1

1 2 3 4 5 6 7 8

ALL/ZONE mode selection switch
> ALL mode:
> All indoor units can be controlled by the central controller.
> ZONE 1, 2, 3, 4 mode:
> Indoor units in one of zone's 1, 2, 3, or 4 can be controlled by the central controller. All indoor units cannot be set.

	2	3	4	5
ALL mode	OFF	OFF		OFF
ZONE 1 mode	OFF	OFF		ON
ZONE 2 mode	ON	OFF	OFF	ON
ZONE 3 mode	OFF	ON		ON
ZONE 4 mode	ON	ON		ON

Central control/Remote control mode selection switch
> OFF: Central control mode.
> Individual setting by remote controller can be inhibited by the central controller.
>
> ON: Remote control mode.
> Setting by central controller is inhibited by other central control devices.

Central control Main/Sub selection switch
> (OFF: Main, ON: Sub)
> ① When only one central controller is used, set the switch to OFF position.
> ② When multiple central controllers are used, set only one central controller to the OFF position and the others to the ON position.
>   ALL mode central controller to be set at the OFF position. (recommended)

⊡ (Central control) button operation switch
> OFF: ⊡ (Central control) button operation is permitted.
> ON : ⊡ button operation is inhibited.

*All switches are set at the OFF position at the factory.

Fig. 10

SW2

ON ↕ **OFF**

SW2
1 2 3 4 5 6 7 8

Weekly timer input switches

Central controller operation can be set when the weekly timer activates (ON/OFF).

Central controller operation	Switch No.		1	2	3
	Timer OFF → ON	Timer ON → OFF			
①	All ON	All OFF	OFF	OFF	OFF
②	No change	All OFF	ON	OFF	OFF
③	Individual control of all indoor units to be permitted	All indoor units to be 🔲 1*1	OFF	ON	OFF
④	Ditto	All OFF and all indoor units to be 🔲 1*1	ON	ON	OFF
⑤	Ditto	All indoor units to be 🔲 2*2	OFF	OFF	ON
⑥	Ditto	All OFF and all indoor units to be 🔲 2*2	ON	OFF	ON

In case of Remote control mode, use ① or ②.

In case of ZONE 1, 2, 3, 4 mode, ALL, means all indoor units are of ZONE's 1, 2, 3, 4.

*1: 🔲 1 (Central control 1) means ON/OFF operation cannot execute by the remote controller.

*2: 🔲 2 (Central control 2) means ON/OFF, MODE change. Temp. setting cannot be executed by the remote controller.

Auxiliary switch

Must be set to OFF position.

Beep tone switch

OFF: Beep tone when each button is pushed.
ON: No tone when each button is pushed.

⊙ Indication switch

Normally set to the OFF position.
When set to the ON position, ☞ indication is not displayed on the LCD of the central controller.
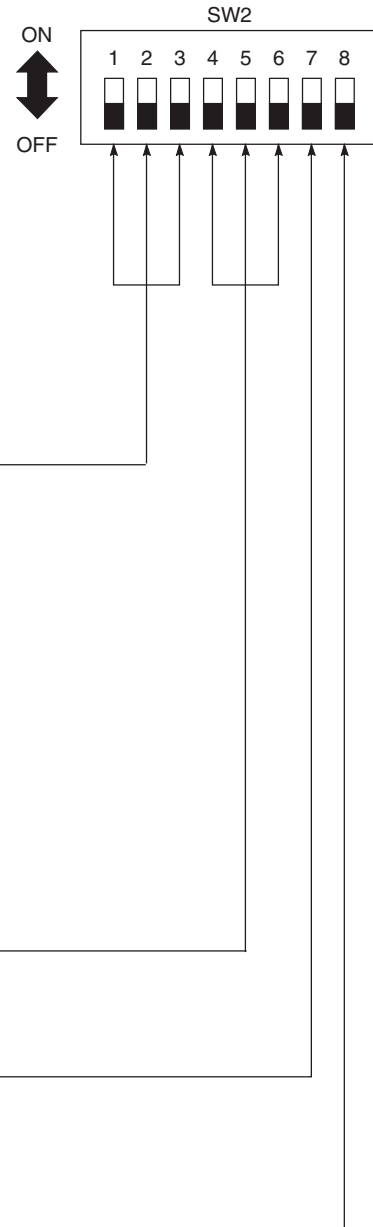
*All switches are set at the OFF position at the factory.

Fig. 11

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5. Mode setting

According to function of each central controller, set SW1 as shown in Fig. 12.

(1) Central control/Remote control mode

Central control mode

Central controller is used as the main central control device.
Individual setting by remote controller can be inhibited by central controller.

Remote control mode

Central controller is used as a remote controller.
Setting by central controller is inhibited by other central control devices.

(2) ALL/ZONE mode

ALL mode

All indoor units can be controlled by the central controller.

ZONE mode

Indoor units in one of the following ZONE'S 1, 2, 3 or 4 can be controlled by the central controller.

(3) Function of central controller can be used in 10 different ways, according to the combination of the central control/remote control mode and the ALL/ZONE mode setting as shown in table 1.

(4) Stick the central controller unit label in a easy to read position.
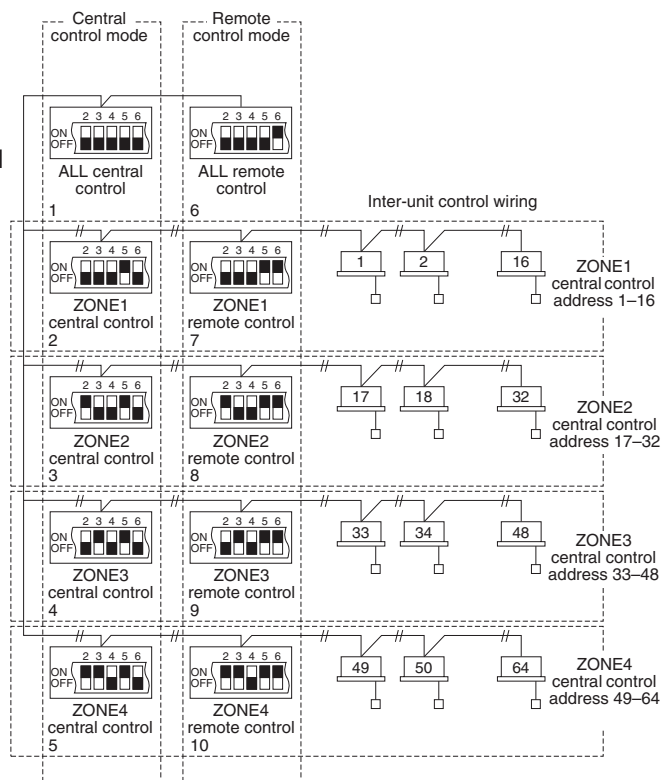
Fig. 12

Table 1

		Central control		Remote control
ALL	1.	ALL/Central	6.	ALL/Remote
ZONE1	2.	ZONE1/Central	7.	ZONE1/Remote
ZONE2	3.	ZONE2/Central	8.	ZONE2/Remote
ZONE3	4.	ZONE3/Central	9.	ZONE3/Remote
ZONE4	5.	ZONE4/Central	10.	ZONE4/Remote

6. How to perform zone registration

To operate the central controller properly, zone registration is required after finishing the test run (and after setting all indoor unit addresses) by using one of the following methods.

Procedures common to all units

1. Connect the U1/U2 terminals to the relay connectors on the U3/U4 terminals found inside the outdoor unit (Header unit).

2. Leave the SW30-2 switch (termination resistor) on the outdoor unit (Header unit) interface board at the ON position for one system only and set all the other switches to the OFF position.
(For details on the SW-30 position, refer to the wiring diagram provided with the outdoor unit.)

   (a)Zone registration using the remote controller (RBC-AMT21E, RBC-AMT32E, RBC-AMS41E)

   (b) Zone registration using the central controller (TCB-SC642TLE2)

   (c) Automatic zone registration using the central controller (TCB-SC642TLE2)

For methods (a) and (b), you should make a zone registration table manually before performing the registration as shown on page 262.

For method (c), zone registration is executed automatically, proceeding from small indoor unit address and small central addresses to larger numbers in numerical order. For example:

For methods (b) and (c)
These methods are not supported by the RAV models.
For RAV models, initiate the zone registration described in (a).
Wait at least 10 minutes after the power has been turned on before starting to set the addresses.
It may take up to 10 minutes to establish initial communication between the indoor and outdoor units. If the addresses are set before this communication is completed, the central address may fail to be set in some of the indoor units.

Central adress	1	2	3	4	5	6	
ZONE-group	1-1	1-2	1-3	1-4	1-5	1-6	
Indoor unit address	1-1	1-2	2-1	2-2	2-3	3-1	

NOTE

1. An indoor unit address is assigned to each indoor unit during automatic address operation. Each indoor unit address combines an Line address and indoor unit number as follows:

$$1 - 1$$: Indoor unit address (UNIT No.)
    Indoor unit No.
    Refrigerant circuit No. (Line address)
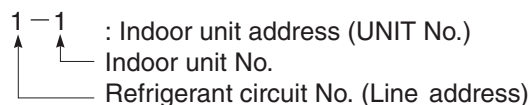
This address (UNIT No.) is displayed on the remote controller when the UNIT button is pressed.

2. The central address represents the zone and group number. These addressed are assigned in ascending numerical order.

3. For details on how to set the addresses when the "1:1 model" connection interface is connected to the central control, refer to these instructions and to the installation instructions of the "1:1 model" connection interface.

■ ZONE registration table

ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location	ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location
1	1	1			3	1	33		
	2	2				2	34		
	3	3				3	35		
	4	4				4	36		
	5	5				5	37		
	6	6				6	38		
	7	7				7	39		
	8	8				8	40		
	9	9				9	41		
	10	10				10	42		
	11	11				11	43		
	12	12				12	44		
	13	13				13	45		
	14	14				14	46		
	15	15				15	47		
	16	16				16	48		
2	1	17			4	1	49		
	2	18				2	50		
	3	19				3	51		
	4	20				4	52		
	5	21				5	53		
	6	22				6	54		
	7	23				7	55		
	8	24				8	56		
	9	25				9	57		
	10	26				10	58		
	11	27				11	59		
	12	28				12	60		
	13	29				13	61		
	14	30				14	62		
	15	31				15	63		
	16	32				16	64		

NOTE

1. Assign indoor unit addresses to the desired positions (central addresses) manually.

2. For group control, only the main indoor unit should be assigned. Sub indoor units cannot be assigned.

(a) Zone registration using the remote controller (RBC-AMT21E, RBC-AMT32(31)E, RBC-AMS41E)

(Determination of central address)
This method is not supported by the RAV models. For RAV models, initiate the zone registration described in (a).

In this case, after confirming which indoor unit is connected to the remote controller ensure that the air conditioner is in the OFF state. You can then set the central addresses one at a time.

If the system has no remote controller, connect a remote controller to the system temporarily. Then follow this procedure.

| NOTE |

The indoor unit address must already have been set before performing zone registration. If necessary, refer to the Installation Manual supplied with the outdoor unit.

(1) Press the TEST and VENT buttons at the same time on the remote controller for a period of more than 4 seconds.

(2) Do not press the UNIT button.

(3) Once in this mode, the UNIT No., Item CODE No., No. of SET DATA and SETTING indications will flash on the display as shown Fig. 13.

| NOTE |

In case of group control "ALL" instead of "UNIT No." will flash on the display. Select the main indoor unit address by pressing the UNIT button once.

(4) Set Item CODE No. to 03 using the TEMP. (🌡) buttons.

| NOTE |

The Item CODE No. 03 must be selected to perform zone registration using the remote controller.

(5) Set the Central address which you want to assign to the indoor unit address using the TIME (🕐) buttons according to the zone registration table.

(6) Press the SET button. The Item CODE No. and Central address changes from flashing to ON state. If you make a mistake, then press the CL button and reset the central address.

(7) Press the TEST button to finish zone registration.
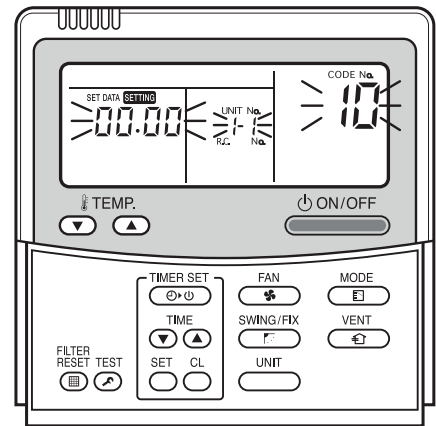
Fig. 13
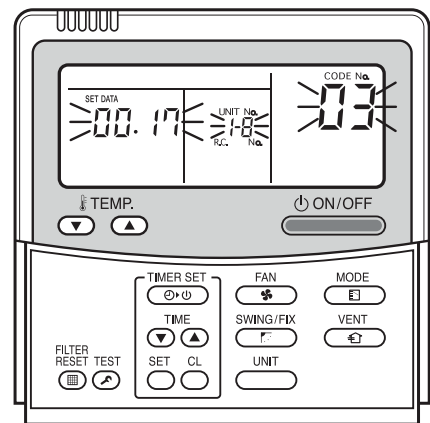
Fig. 14

For example, in this case
Indoor unit address: 1-8
Central address: 17 (ZONE 2, GROUP 1)

(b) Zone registration using the central controller (TCB-SC642TLE2)
This method is not supported by the RAV models.
For RAV models, initiate the zone registration
described in (a).

In this case, you can manually set all the Central addresses
by the central controller at once.

(1) Press the [🔧] and [ZONE] buttons at the same time
for a period of more than 4 seconds.
[SETTING] and Item CODE No. C1 will flash.

(2) After confirming that Item CODE No. C1 is displayed,
press the [SET] button. Once in this mode, a change
takes place as shown in Fig. 15.

(3) Select the zone and group No. which you want to set
with the [ZONE] and [◄] [►] (GROUP) buttons.
If already set, press the [CL] buttons.

(4) Set the unit No. (Indoor unit address) with the [🔲] and
[🔲] buttons, according to the zone registration table.

    R.C. No. .... [🔲] button

    Indoor unit No................. [🔲] button

(5) Press the [SET] button.
GROUP No. turns ON and UNIT No. (Indoor unit
address) changes from flashing to ON state. UNIT
No. is registered to the selected ZONE No. and GROUP
No.
If you make a mistake, then press the [CL] button and
reselect the ZONE, GROUP and UNIT No.

(6) Register the other UNIT No.s in the same way by
following the steps (3) to (5).

(7) Finally, complete the registration by pressing the [🔧]
button.
[SETTING] will flash for a few minutes and then turn OFF.

If data is registered the unit No. is displayed.

If no data is registered no number is displayed.

Selected group No. if no data is registered.
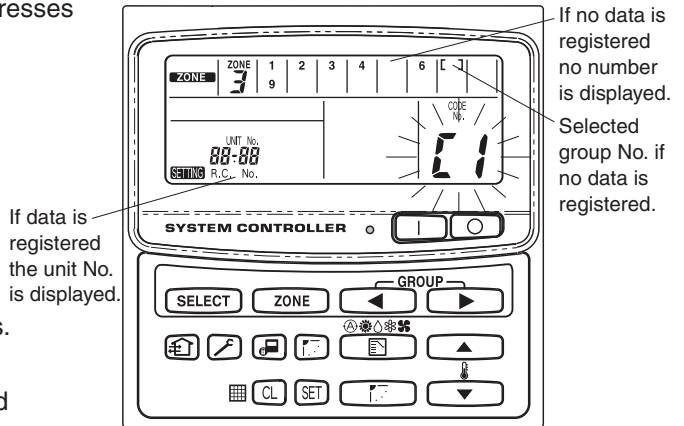
Fig. 15
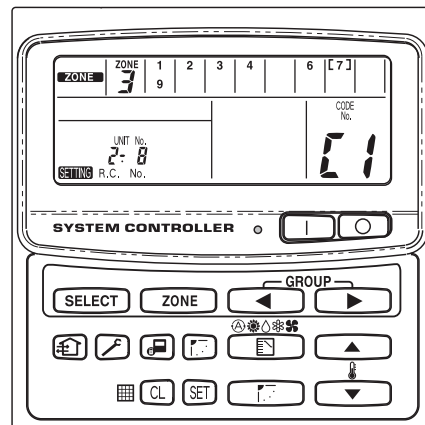
For example, in the case at left
Zone 3, group No. 7
Unit No. (indoor unit address) Line Address : 2
                                        Indoor Unit Address :8
Unit No. 2-8 is registered to zone 3-group 7.

Fig. 16

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(c) Automatic zone registration using the central controller (TCB-SC642TLE2)

(1) Press the ⊡ and ⌷ZONE⌷ buttons at the same time for more than 4 seconds.
   𝗦𝗘𝗧𝗧𝗜𝗡𝗚 and Item CODE No. C1 will flash.

(2) Select Item CODE. No. C2 by pressing the ⌷▲⌷ and ⌷▼⌷ (🌡) buttons and then press the ⌷SET⌷ button.
   C2 changes from flashing to an ON state and the automatic zone registration will start.

(3) Registered GROUP No. will be removed for all units within the group.

(4) Central address will be assigned from the small indoor unit address to a singular group one in numerical order automatically.
   Finishing automatic zone registration, 𝗦𝗘𝗧𝗧𝗜𝗡𝗚 changes from flashing to OFF.

(5) If an error has occured, the "CHECK" starts flashing and the zone registration will finish at this time. Press the ⌷CL⌷ button.

(6) Finally, complete the automatic zone registration mode by pressing the ⊡ button.
   𝗦𝗘𝗧𝗧𝗜𝗡𝗚 symbol will flash for a few minutes and will then turn OFF.

Fig. 17

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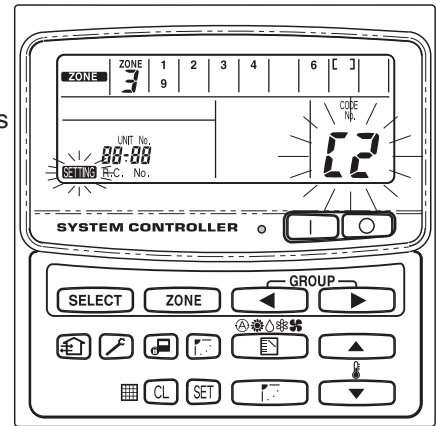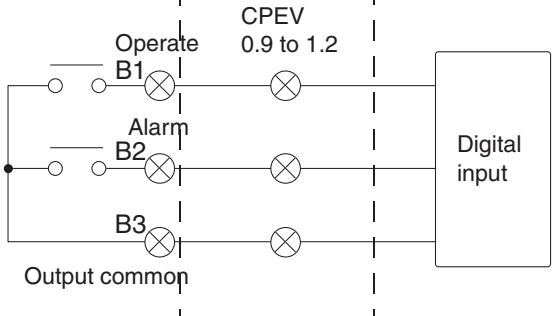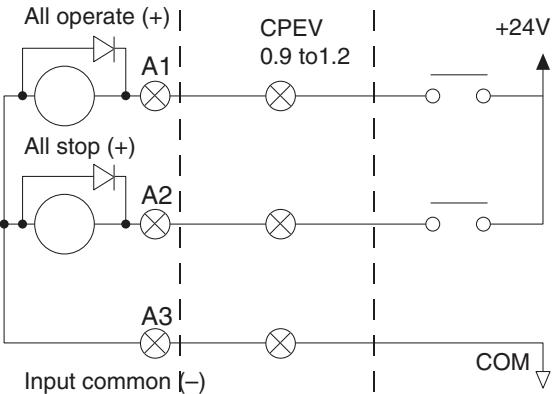
7. Checking from the central controller for duplication of the central address

Central address duplication error check: C3

* This cannot be used with RAV air conditioners. For further details, refer to the instructions of the TCC-LINK adapter.

(1) Hold down the ⟨✍⟩ and ⟨ZONE⟩ buttons together for at least four seconds. (Item CODE No. C1 starts flashing.)

(2) Press the ⟨▲⟩ or ⟨▼⟩ (🌡) button to select CODE No. C3.

(3) When the ⟨SET⟩ button is now pressed, Item CODE No. C3 lights and the **SETTING** symbol flashes. The central address duplicated error check now starts.

(4) The addresses of all the indoor units is checked in sequence starting with outdoor unit system 1. The check is completed when Item CODE No. C3 flashes and the **SETTING** symbol goes off.

(5) If any duplication is discovered among the central addresses, the GROUP No. will flash.
Press the ⟨▲⟩ or ⟨▼⟩ (🌡) button to select Item CODE No. C1, and press the ⟨SET⟩ button.
The central address is cleared by selecting the area where the GROUP No. is flashing and then by pressing the ⟨CL⟩ button, set the correct central address using the wired remote controller or the central controller.

(6) Press the ⟨✍⟩ button to complete the procedure.
SETTING flashes for several minutes, the initial setting is automatically established and the procedure is completed.

8. Connections with external equipment

Designation	Input/output item	Central controller side		Equipment side (Procure locally as per system design)		
		Input/output conditions	Terminal name	Demarcation terminals	Circuitry example	Input/output conditions
Digital input/output terminals	Status output	Operate output Alarm output "A" (normally open) contact without voltage Static (relay output) Allowable contact voltage, current: DC 30 V, 0.5 A	Operate B1 Alarm B2 B3 Output common	CPEV 0.9 to 1.2	Digital input	Wiring length: Max. 100 meters
	Control input	All operation inputs All stop inputs "A" (normally open) contact with voltage Pulse (photocoupler input) Allowable contact voltage, current: DC 24 V, 10 mA	All operate (+) A1 All stop (+) A2 A3 Input common (−)	CPEV 0.9 to1.2	+24V COM	Pulse width: 300 ms or more Wiring length: Less than 100 meters

9. Memory back up switch

Check the back up switch on the back side of the central remote controller P.C. board is ON.
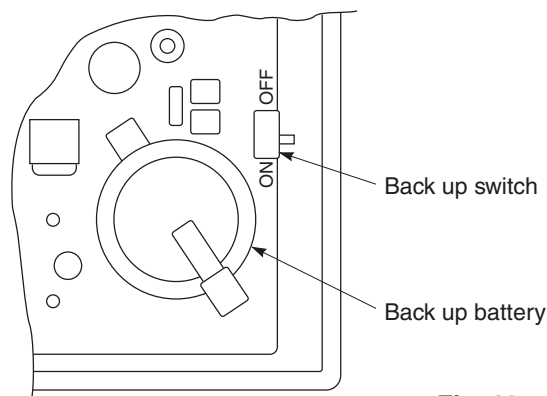
Fig. 18

10. Test run of the central controller

(1) Power on all indoor units. Next, power on the central controller.

$\boxed{\text{SETTING}}$ will flash and will check the indoor unit address automatically.

(2) If the group No. displayed on the central controller is not same as the indoor unit No.* which is connected, see Fig. 7 and set again.

*In case of group control, main unit No. only.

11. How to perform an air conditioner test run

(1) Hold down the ⌸ button of the central controller for at least four seconds.

During the test run, "TEST" appears on the LCD display.

(2) Press the ⬭ and ⬭ buttons.

The temperature cannot be adjusted at the "TEST" position.
Do not use this procedure except when performing a test run since it will strain the equipment.

(3) Upon completion of the operation, press the ⌸ button, and check that "TEST" on the LCD display has gone off.

4-2-3 Operation procedure

How to Use the Central Controller

■ Functions of buttons

A: ALL/ZONE/GR SELECT button	Use this button to select one of the following:
NOTE A maximum of four zones and 16 groups (units) in a zone can be set.	**ALL:** Used for turning all the air conditioners on and off. **ZONE:** Used for turning all the air conditioners of each zone on and off. **GROUP:** Used for turning all the air conditioners of each group on and off.
B: ZONE select button	Use this button to select a zone (1 to 4) to operate individually.
C: GROUP select buttons	Use these buttons to select a group (1 to 16) to operate individually.

■ Functions of buttons (Continued)

D: ON button	⊏I⊐	This button is for turning the selected air conditioner on.
E: OFF button	⊏○⊐	This button is for turning the selected air conditioner off.
F: Operation lamp		This lamp lights when the unit is turned on.
G: MODE button		Use this button to select one of the following five operations:
(AUTO)	Ⓐ	Ⓐ : Used to automatically set cooling or heating operation. **Some models are not provided with a mode for automatically setting the cooling or heating operation.** (temperature range: 18 to 29 ˚C)
(HEAT)		☀ : Used for normal heating operation. **For heat pump type, heat recovery type** (temperature range: 18 to 29 ˚C)
(DRY)		◊ : Used for dehumidifying without changing the room temperature. (temperature range: 18 to 29 ˚C)
(COOL)		❋ : Used for normal cooling operation. (temperature range: 18 to 29 ˚C)
(FAN)		✿ : Used to run the fan only, without heating or cooling operation.
NOTE		When the indication is displayed, you cannot change the mode from ❋ and ◊ or ☀ to ☀ or ❋ and ◊ . To change the mode, turn off all units once then select the mode again.
H: Temperature setting buttons	⊏▲⊐ ⊏▼⊐	⊏▲⊐ : Press this button to increase the temperature setting. ⊏▼⊐ : Press this button to decrease the temperature setting.
I: FAN SPEED button	⊏✿⊐	
(AUTO)		Ⓐ✿: The air conditioner automatically decides the fan speed.
(HI.)		✿》 : High fan speed.
(MED.)		✿ : Medium fan speed.
(LO.)		✿ : Low fan speed.
J: FLAP button	(↖)	1. Use this button to set the airflow direction to a specific angle. The airflow direction is displayed on the remote control unit. Operation mode	Number of airflow direction settings ❋ (COOL) or ◊ (DRY)	3 ☀ (HEAT) or ✿ (FAN)	5 Ⓐ (AUTO) Cooling mode:	3 Heating mode:	5 • **In the cool mode and dry mode, when the flaps are set in a downward position, condensation may form and drip around the vent. Do not move the flap with your hands.**
	⚠ CAUTION	
	NOTE	This function is available only for 4-Way air discharge cassette type and Under ceiling type.
	(⌣)	2. Use this button to make the airflow direction sweep up and down automatically. Press this button several times until the (⌣) symbol appears on the display.
	NOTE	1) The flap setting can be performed only for units that have no remote controllers. 2) In the ALL or ZONE modes, no flap settings can be performed. If necessary, you should select the GR mode and use the FLAP button.

■ Functions of buttons (Continued)

K: CHECK button ⚒ ⚠ CAUTION	This button is used only when servicing the air conditioner. **Do not use the CHECK button for normal operation.**	
L: CENTRAL CTRL button ⊡	Use this button to inhibit the individual operation by a remote controller as follows: ⊡·1234 1: Individual ON/OFF operation is inhibited. 2: Individual ON/OFF, MODE and Temperature setting operation is inhibited. 3: Individual MODE and Temperature setting operation is inhibited. 4: Individual MODE operation is inhibited. No indication: Central control is cleared. (Individual operation)	
M: SET button [SET] NOTE	This button is used for setting the indoor unit's address when installing the air conditioner. **Do not use the SET button for normal operation.**	
N: CL button [CL]	Use this button to reset the filter sign ▦. The air conditioner has a timer for the filter change and informs you when the filter needs cleaning.	
O: VENTILATION button ⊡	Use this button when you installed a fan available in the market. Pressing this button turns the fan on and off. When turning off the air conditioner, the fan will also turn off. While the fan is operating, ⇗ will appear in the display. If ⊘ is displayed when pressing the ventilation button, no fans are installed.	

■ **Display**
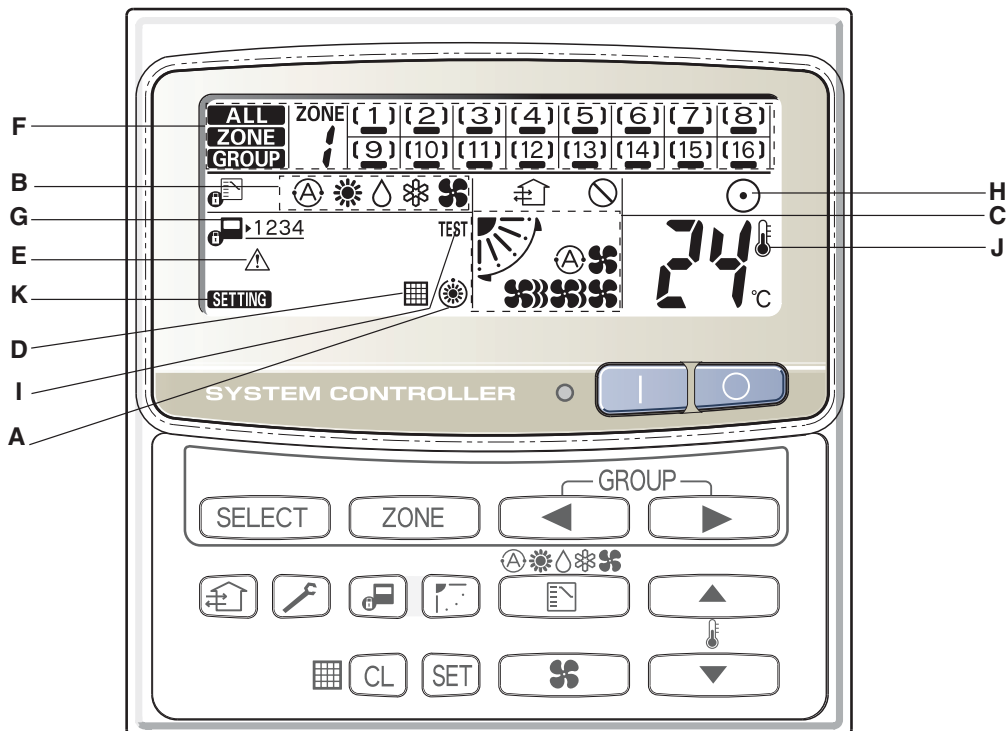
Description

A: When the unit is in the heating standby mode, the ❋ indicator appears.

B: The currently selected operation mode is displayed.

C: The currently selected FAN SPEED, Airflow Direction and SWEEP settings are displayed.

D: This indication appears when the filter needs cleaning.

E: This indication appears only when an abnormality occurs within a unit.

F: The currently selected mode (ALL, ZONE or GROUP), ZONE number and GROUP number are displayed.

GROUP number display (no figure: no number registered)

GROUP state display ([ ] : registered group, ❋ : currently selected group)

Operation state display (— : on, no sign: off, ❋ : alarm)

G: The currently selected central control mode (1, 2, 3 or 4) is displayed.

H: Lights when any of the air conditioners under the central control is operating; turns off when none of the air conditioners under the central control are operating. Blinks when any conditioner is operating under abnormal conditions and its protection functionality is working.

I: This indication appears while a test run is underway.

J: This indication appears when the temperature is set.

K: When turning on the power switch of the central controller, **SETTING** sign blinks for a few minutes. While blinking, any controls using the central controller are stopped. This is because the central controller is verifying the connected groups.

■ How to start group operation

To start group operation

Power		Turn the power supply switch on more than 12 hours before starting operation.
1	SELECT	Press the SELECT button and select GROUP.
2	ZONE	Select the ZONE No. including the group to be operated by pressing ZONE button.
3	◄ ►	Select the GROUP No. to be operated by pressing GROUP select buttons ◄ ►.
4	▤	Set the operation mode by pressing the MODE button.
5	I	Press the ON button.
6	▲ ▼	Set the desired temperature by pressing one of the temperature setting buttons ▲ ▼.
7	❄	Set the desired fan speed by pressing the FAN SPEED button.
8	⌂	Set the airflow direction to a specific angle or sweep mode.
9	▣	By pressing ▣, select your desired setting. Individual: Controls with the remote controller are possible. Central 1: Individual ON/OFF operation with the remote controller is inhibited. Central 2: Individual ON/OFF, MODE, and Temp. setting operations with the remote controller are inhibited. Central 3: Individual MODE and Temp. setting operations with the remote controller are inhibited. Central 4: Individual MODE operation with the remote controller is inhibited. Under Central/Individual settings other than listed above, "CENTRAL" is displayed.
AUTO Operation		Depending on the difference between the temperature setting and the room temperature, heating and cooling alternate automatically so that a uniform room temperature is maintained. Some models are not provided with a mode for automatically setting the cooling or heating operation.
Stop	○	Confirming the GROUP No. to be selected, press the OFF button.

NOTE   The flap setting can be performed only for units that have no remote controllers.

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■ How to start collective operation

To start collective operation (ALL or ZONE)
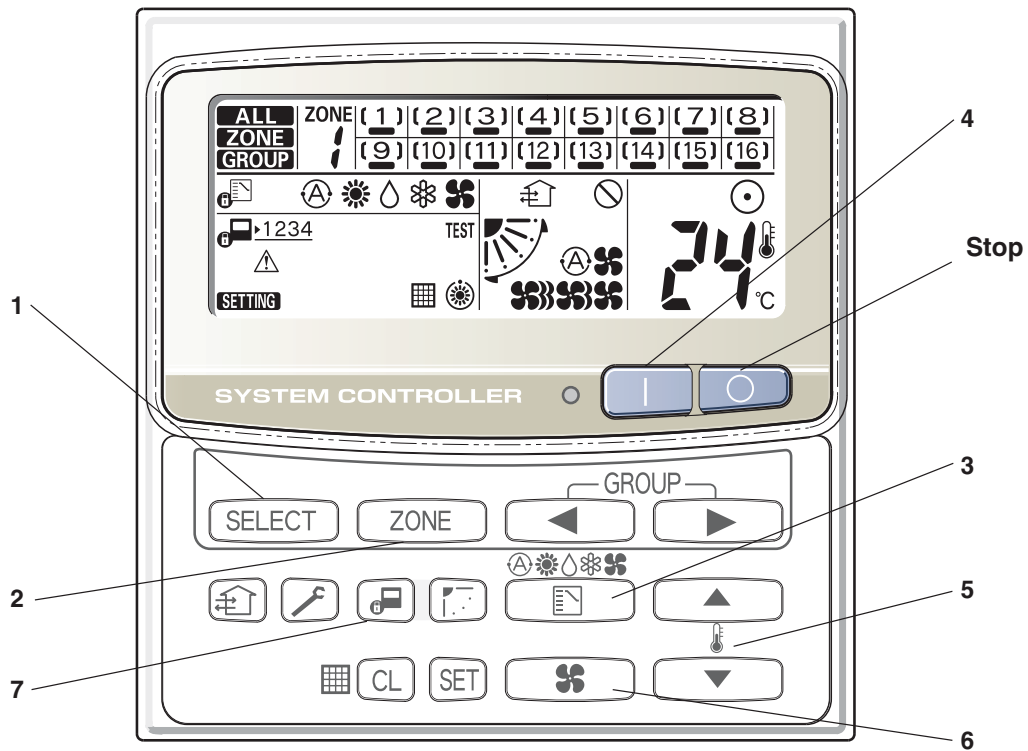
Power		Turn the power supply switch on 12 hours or more before starting operation.
1	SELECT	Press the SELECT button and select ALL or ZONE. In case of ZONE collective operation.
2	ZONE	Select the ZONE No. to be operated by pressing ZONE button.
3		Set the operation mode by pressing the MODE button.
4		Press the ON button.
5	▲ ▼	Set the desired temperature by pressing one of the temperature setting buttons ▲ ▼.
6		Set the desired fan speed by pressing the FAN SPEED button.
7		Select the control mode.
Stop		Confirming the ZONE No. to be selected or ALL indication, press the OFF button.

NOTE In the ALL or ZONE mode, no flap settings can be performed. If necessary, you should select the GR mode and use the FLAP button.

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4-3 ON-OFF controller (TCB-CC163TLE2)

4-3-1 Outline

1. Feature

■ **Connectable units**
- Max.16 header or individual units can be connected and controlled in one ON-OFF controller.
- ON-OFF controller can be allocated to one of Zone 1, 2, 3 or 4.

■ **Operation function**
- Indoor unit Start / Stop (individual or ALL)
- Group inhibited / ALL indoor unit control permitted selection
- Weekly schedule (by connecting weekly timer : sold separately)
- External Input / Output (Fire alarm input, fault output etc.)

■ **Maximum number of connected central controller**
Up to 10 central control devices in one control wiring circuit. (including other central control devices.)

■ **Timer**
Weekly timer (TCB-EXS21TLE), sold separately, can be applicable.

2. System configuration
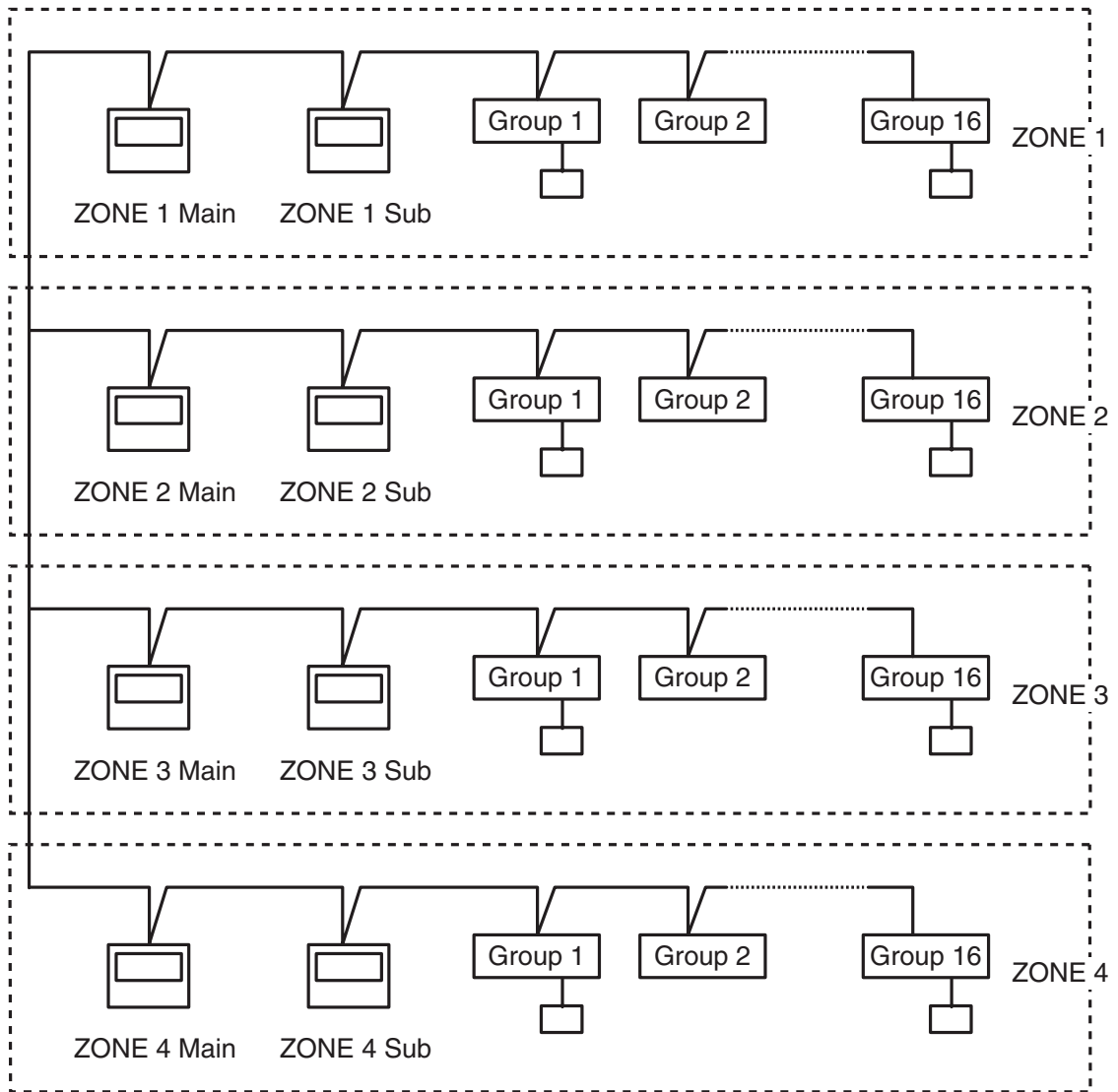
* In case of "1:1 model" (Super digital inverter / digital inverter), follower indoor units in a group control and twin control must not be counted as "one unit". In the case of VRF system, follower indoor units in a group control must be counted as "one unit".

3. Function items of ON-OFF controller (TCB-CC163TLE2)
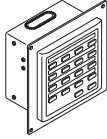
No	Items		Function		Remarks
1	Power Supply		50Hz/60Hz 220 - 240V		
2	Connectable indoor units		Max. 16 units or groups		
3	Max. selectable zone		Max. 1 zones		
4	Controllable indoor units per zone		Max.16 header or individual units		
5	Zone setting		Zone	Central Control Address	
			1	1 to 16	
			2	17 to 32	
			3	33 to 48	
			4	49 to 64	
6	Monitoring	ON/OFF	Available		
		Fault indication	Available		
7	Setting	ON/OFF	Available		Individual or ALL
8	Weekly schedule		Available (by connecting weekly timer)		RBC-EXW21E2
9	Forced stop command (Fire alarm)		Available		
10	External operation output		Available		
11	Fault output		Available		
12	Connectable ON-OFF control devices		Up tp 2 devices (Master / Sub)		Max. 10 devices

4-3-2 Installation procedure

1. General

This booklet briefly outlines where and how to install the ON-OFF controller. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the controller before beginning.

NOTE | Give these instructions to the customer after finishing the installation.

Part Name	Figure	Qty	Remarks
ON-OFF controller		1	
Tapping screw	Truss-head Phillips 4 × 16 mm	4	For securing the ON-OFF controller
Rawl plug		4	For securing the ON-OFF controller
Manual		1	For installation
		1	For operation
Switch name Label		1	

2. Installation site selection

- Install the ON-OFF controller at a height of between 1 and 1.5 meters above the floor.
- Do not install the ON-OFF controller in a place where it will be exposed to direct sunlight or a place where it will be exposed to the outside air.
- Be sure to install the ON-OFF controller vertically, such as on a wall.

3. How to install the ON-OFF controller

⚠ **CAUTION**

- **Do not twist the control wiring together with the power wiring or run it through the same metal conduit, as this may cause a malfunction.**
- **Install the ON-OFF controller away from sources of electrical noise.**
- **Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.**

⚠ **WARNING**

Do not supply power to the unit or try to operate it until the piping and wiring to the outdoor unit is completed.

■ Overview of the ON-OFF controller
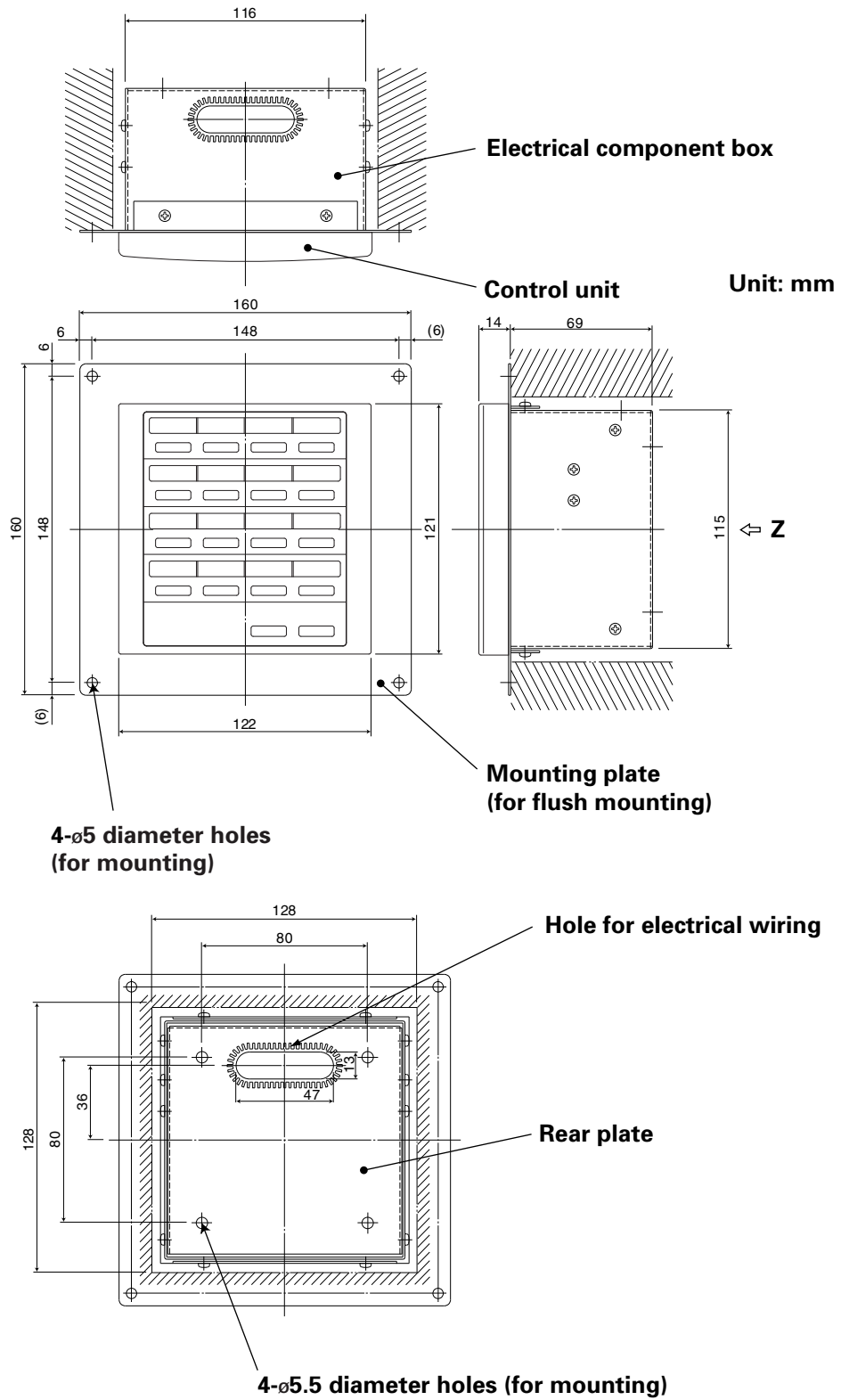
116

Electrical component box

Control unit

Unit: mm

160
148
6
(6)

160
148

121

14 69

115 ⇦ **Z**

122

(6)

**Mounting plate
(for flush mounting)**

**4-⌀5 diameter holes
(for mounting)**

128
80

Hole for electrical wiring

36
80
128

13
47

Rear plate

4-⌀5.5 diameter holes (for mounting)

Z-view (back side)

Fig. 1

*   In order to mount the ON-OFF controller flush with the wall, an opening
    measuring 128 mm × 128 mm is necessary.

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■ **Installation procedure**

a): Normal mounting

b): Flush mounting

Mounting plate
Electrical component box
Hole for electrical wiring
Rear plate
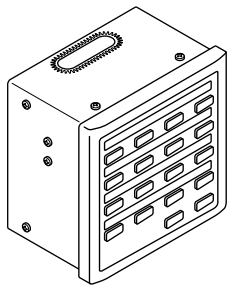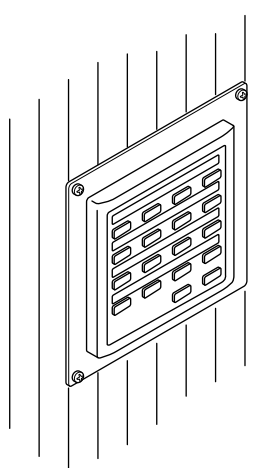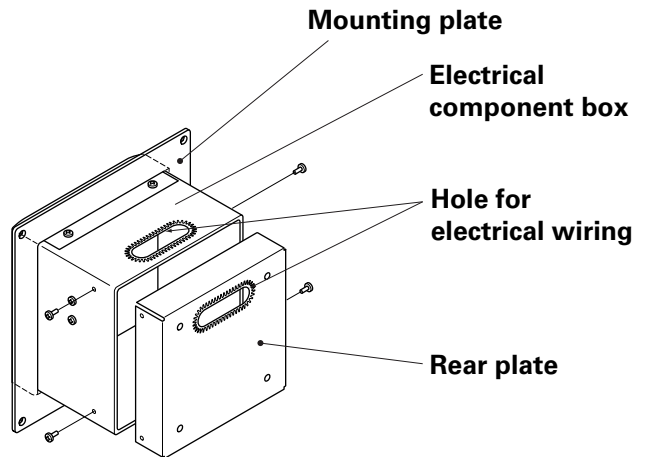
Fig. 2

1. Decide how the ON-OFF controller will be mounted: in the normal method or flush with the wall.
    a) To mount the ON-OFF controller in the normal method, remove the mounting plate. Then reattach the four screws to the electrical component box.
    b) To mount the ON-OFF controller flush with the wall, make an opening in the wall measuring 128 mm × 128 mm. The opening must be at least 85 mm deep measured from the outside surface of the wall.

2. Remove the rear plate and connect the electrical wiring.
    1) Remove the four screws located on both sides of the rear plate.
    2) Either the hole in the top of the electrical component box or the hole in the rear plate may be used to feed the electrical wiring through.
    3) If the hole on top is used, the rear plate should be turned upside down.

3. Secure the ON-OFF controller in place.
    a) If the ON-OFF controller is being mounted in the normal method, first attach the rear plate to the wall using the screws and Rawl plugs provided. Next, place the body of the ON-OFF controller over the rear plate and secure it in place using four screws.
    b) If the ON-OFF controller is being mounted flush with the wall, fit it through the mounting plate on the wall and secure it in place using the screws and Rawl plugs provided.
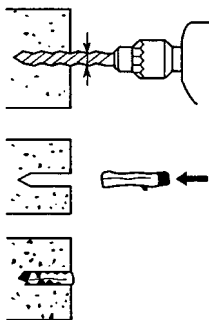
NOTE   To mount the ON-OFF controller on a wall made of cinder block, brick, concrete, or a similar material, drill 4.8 mm diameter holes in the wall and insert Rawl plugs to anchor the mounting screws.

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■ **Layout of electrical terminals**

Clamp for electrical wiring

Connector (CN02) for weekly timer (optional)

Earth for power wiring

PCB

Fig. 3

Rear plate
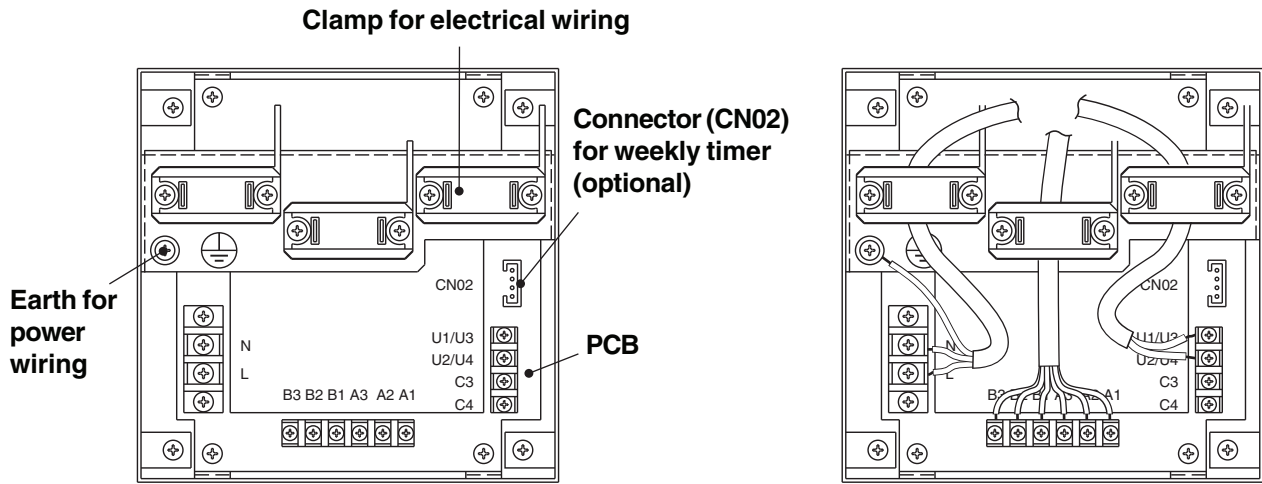
How to connect electrical wiring

1) Basic wiring

N:
L:
Power supply ($\sim$ 50 Hz/60 Hz, 220 – 240 V)

- Power supply wire specification: Cable 3-core, in conformance with Design 60245 IEC 57.
- Fix the wires with cord clamp.

Earth line

Power supply wire
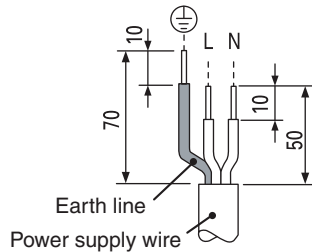
U1/U3:
U2/U4:
Central control wiring. (Low voltage)

C3:   Auxiliary

C4:   Ground for Central control wiring

2) Terminals for remote monitoring

A1:   Input for turning on air conditioners concurrently.

A2:   Input for turning off air conditioners concurrently.

A3:   Common input for turning air conditioners on or off.

B1:   On operation state indicator output.

B2:   Alarm indicator output.

B3:   Common indicator output.

Wire connection

- Power supply wire specification: Cable 3-core 1 mm^2, in conformance with Design 60245 IEC 57.

286
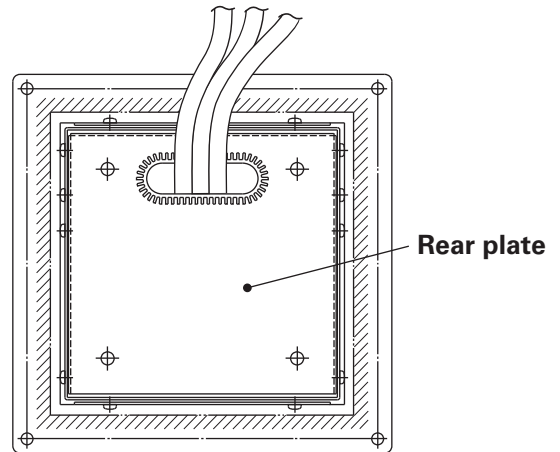
■ How to wire

⚠️ **CAUTION**   **Ensure that wiring connections are correct. (Incorrect wiring will damage the equipment.)**

How to wire the ON-OFF controller

In order to ensure safety, turn off the air conditioner power before mounting or removing the ON-OFF controller.

1) Connect the communication wires to the indoor/outdoor unit connecting wires or central control wiring.
2) Use the following as the control wiring.
   Total wire length of less than 1000 meters: Shield wire 1.25mm²
   Total wire length of less than 2000 meters: Shield wire 2.0mm²
   The total wire length is obtained by adding the lengths of the indoor/outdoor unit control wiring to the lengths of the central control wiring.
3) Do not run the control wiring inside the same electrical wire conduits as the power cables.
4) For the communication wires, use control wires that visually identify them as being different from either the remote controller wires or the power cables.
5) Connect the power cable of the ON-OFF controller to the AC220–240V power source. (Incorrect wiring will damage the equipment.)
6) Connect the wires in such a way that none of the wires will be connected incorrectly. (Incorrect wiring will damage the equipment.)

Basic wiring diagram

Connect the control wiring of the air conditioners shown which is the wiring method when central control is used.

- The maximum number of air conditioners which can be connected in one central control system is 64 indoor units and 16 outdoor units (Header units). (With VRF system)
- The ON-OFF controller can connect two units (main and sub) to each zone.
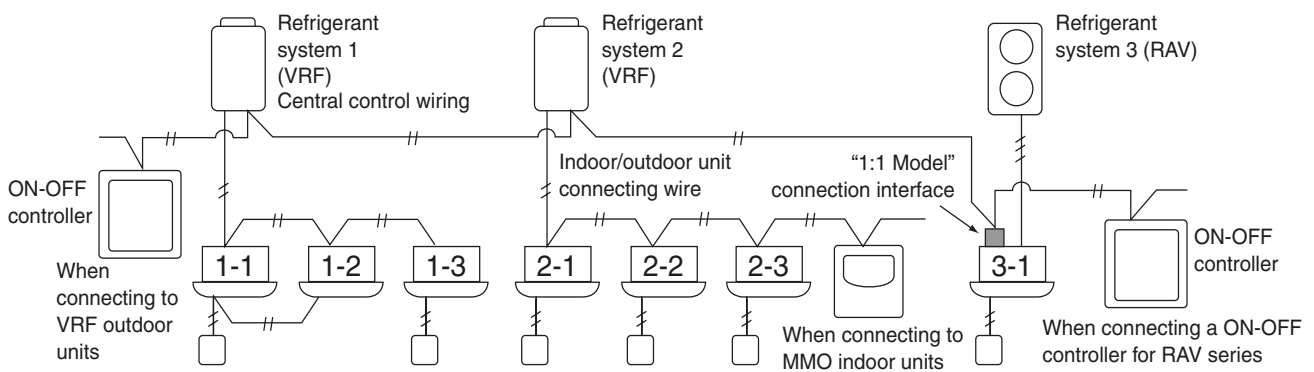
MMO : Super Modular Multi Indoor Unit model name.
      (MMU, MMD, MMC, MML, MMK and MMF)
"VRF" shows S-MMS and S-HRM.
"RAV" shows DI and SDI.
"1:1 Model" connection interface : TCB-PCNT30TLE2.

Fig. 4

NOTE
- When connecting to VRF outdoor units, make the connection to the central control wiring (U3 and U4 terminals).
- When connecting to MMO indoor units, make the connection to the indoor/outdoor unit connecting wire (U1 and U2 terminals).
- When connecting to a RAV air conditioner, make the connection to the U3 and U4 terminals.
- The "1:1 Model" connection interface is required for the RAV air conditioner. (except KRT series.)
- A general-purpose unit control interface is required with some air conditioner models.

Wiring connection procedure

As shown in the figure below, connect the terminal block (U1/U3, U2/U4) of the ON-OFF controller with the terminals (U3, U4) to the outdoor unit (Header unit).

- It is also possible to connect to the indoor/outdoor unit connecting wire terminals (U1, U2) on the indoor or outdoor unit (no matter which refrigerant system is used).
- Since the terminals do not have polarities, U1/U2 or U3/U4 can be reversed.
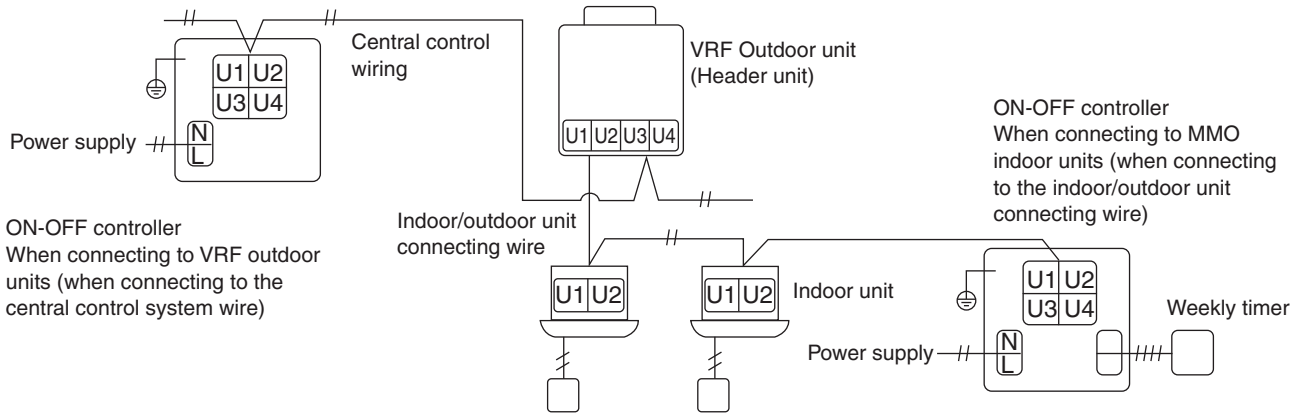
Fig. 5

| NOTE | The fuse will blow to protect the equipment if an AC voltage of 220–240V is applied by mistake to U1/U3 or U2/U4. If this should happen, first re-connect the terminals correctly, and then connect the communication wire to the U1/U3 and spare terminals. Check the fuse on the indoor/outdoor control board as this fuse may have blown as well. |

Grounding the shielded wires

- Terminate the connection of the shielded wires for all the central control wires, and provide single-point grounding.
- Even when connecting the centrally controlled unit to the indoor/outdoor unit connecting wires, terminate the connection of the shielded wires, and provide single-point grounding for all the indoor/outdoor unit connecting wires.
- Leave the final termination open and insulate.
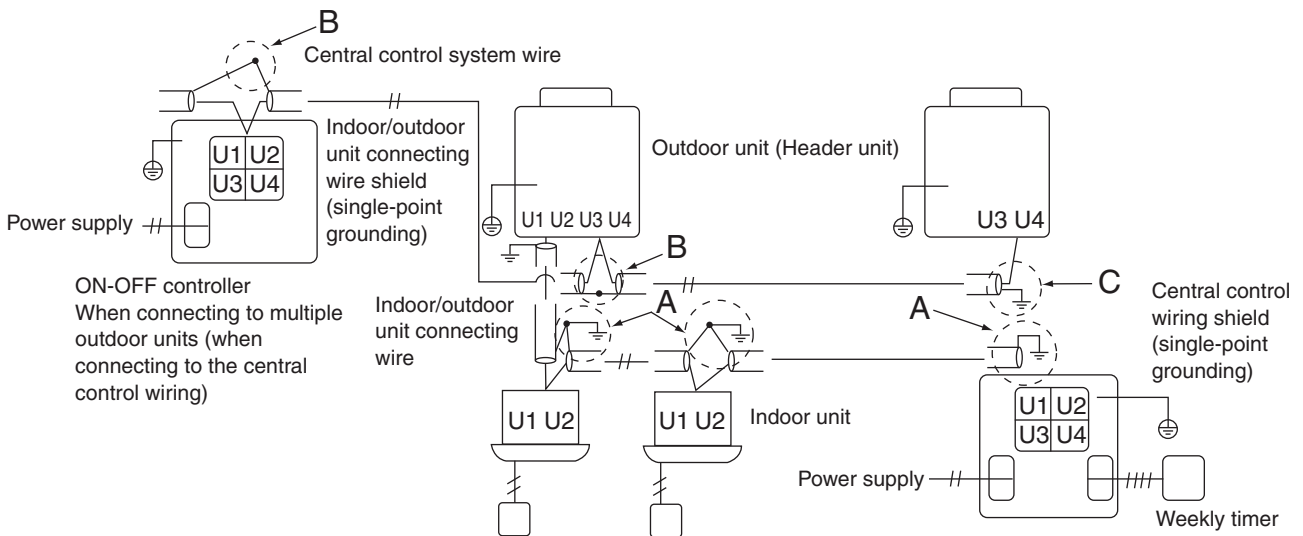
Area A: Ground both ends of the shielded cable used for the indoor/outdoor unit connection.
Area B: Connect a shielded cable for the central control system wiring.
Area C: Ground only one end of the central control system wiring at its final termination. (Leave the other end of the wire at its final termination as an open wire and insulate.
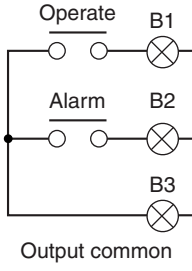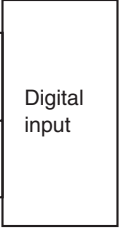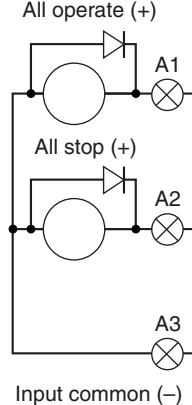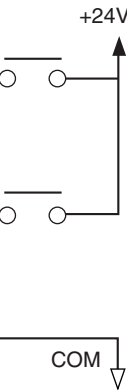
Fig. 6

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■ Connections with external equipment

Designation	Input/output item	ON-OFF controller side		Equipment side		
		Input/output conditions	Terminal name	Demarcation terminals	Circuitry example	Input/output conditions
Digital input/output terminals	Output status	Operate output Alarm output "A" (normally open) contact without voltage Static (relay output) Allowable contact voltage, current: DC 30 V, 0.5 A	Operate ⊗ B1 / Alarm ⊗ B2 / ⊗ B3 / Output common	CPEV 0.9 to 1.2 φ ⊗ ⊗ ⊗	Digital input	Wiring length: Max. 100 meters
	Control input	All operate input All stop input "A" (normally open) contact with voltage Pulse (photocoupler input) Allowable contact voltage, current: DC 24 V, 10 mA	All operate (+) ⊗ A1 / All stop (+) ⊗ A2 / ⊗ A3 / Input common (−)	CPEV 0.9 to 1.2 φ ⊗ ⊗ ⊗	+24V / COM	Pulse width: 300 ms or more Wiring length: Max. 100 meters

4. Dip switch setting

WARNING To avoid an electric shock hazard, DO NOT touch any terminal on the Printed Circuit Board with a metal rod, a screwdriver edge nor a bare hand when power is supplied.

Zone Address setting

All bits are set off when shipped from factory.

∎◻ :OFF
◻∎ :ON

1 (Central Address 1 ~ 1 6)
2 (Central Address 1 7 ~ 3 2)
3 (Central Address 3 3 ~ 4 8)
4 (Central Address 4 9 ~ 6 4)

RCU permit/inhibit setting

Multi Conntroller MAIN/SUB

| 3 | MAIN | SUB |

Central Control MAIN/SUB

| 4 | MAIN | SUB |

OFF   ON

All Indoor unit ON·| / OFF·○

| 8 | All indoor unit | inhibited Indoor unit |

All indoor contro permitted
1 ~ 1 6 Group inhibited
5 ~ 1 6 Group inhibited
9 ~ 1 6 Group inhibited
1 3 ~ 1 6 Group inhibited

P.C. board of the control unit

Dip switch
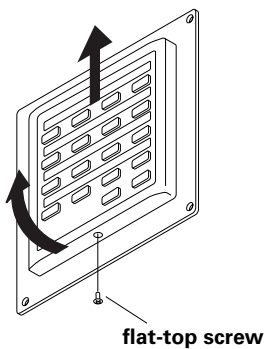
How to locate the P.C board
Remove the flat-top screw on the bottom of the back case.
Raise the bottom of the control unit and remove the unit by sliding it upwards.
The P.C. board on the back of the control unit is now visible.

NOTE   Do not force the bottom of the control unit open. Doing so may damage the notch at the top and make it impossible to install the control unit.

flat-top screw

DIPSW1

Fig. 7

Zone address switches

Use to set the zone addresses.

	1	2
1(Central control Adress 1-16)	OFF	OFF
2(Central control Adress 17-32)	ON	OFF
3(Central control Adress 33-48)	OFF	ON
4(Central control Adress 49-64)	ON	ON

ON-OFF controller main/sub selection switch

This is normally used in the main (OFF) setting.

When the ON-OFF controller is to be used by a main unit and a sub unit (2 units) in one zone, set one unit to main (OFF) and the other unit to sub (ON).

OFF: ON-OFF controller operates as main controller.

ON: ON-OFF controller operates as sub-controller.

NOTE
- Set the zone address switch of the sub ON-OFF controller to the same address as the main ON-OFF controller.
- One ON-OFF controller must always be set as the main ON-OFF controller.

Central control main/sub selection switch

(OFF: main, ON: sub)

This is normally used in the main (OFF) setting.

Set it to sub (ON) when a communication adapter, ON-OFF controller is to be used concurrently.

Group inhibited/all indoor unit control permitted selection switch

Use these to switch between the group inhibited and all indoor unit control permitted statuses for each of the four groups.

	5	6	7
All indoor unit control permitted	OFF	OFF	OFF
1-16 Group inhibited	ON	OFF	OFF
5-16 Group inhibited	OFF	ON	OFF
9-16 Group inhibited	ON	ON	OFF
13-16 Group inhibited	OFF	OFF	ON

All indoor run/stop selection switch

Use this to select the units to be operated or stopped when the ALL ON. or ALL OFF button has been pressed.

OFF : All indoor unit

ON: inhibited indoor unit

*All switches are in the OFF position at shipment.

5. Zone address setting

The zone addresses must be set (using #1 and #2 of DIPSW1) when the ON-OFF controllers are to be controlled in a multiple number of zones.
- Set to zone 1 when the ON-OFF controller is to be used in one zone only.
- When the ON-OFF controllers are to be used in a multiple number of zones, one of them must be set to zone 1 without fail.
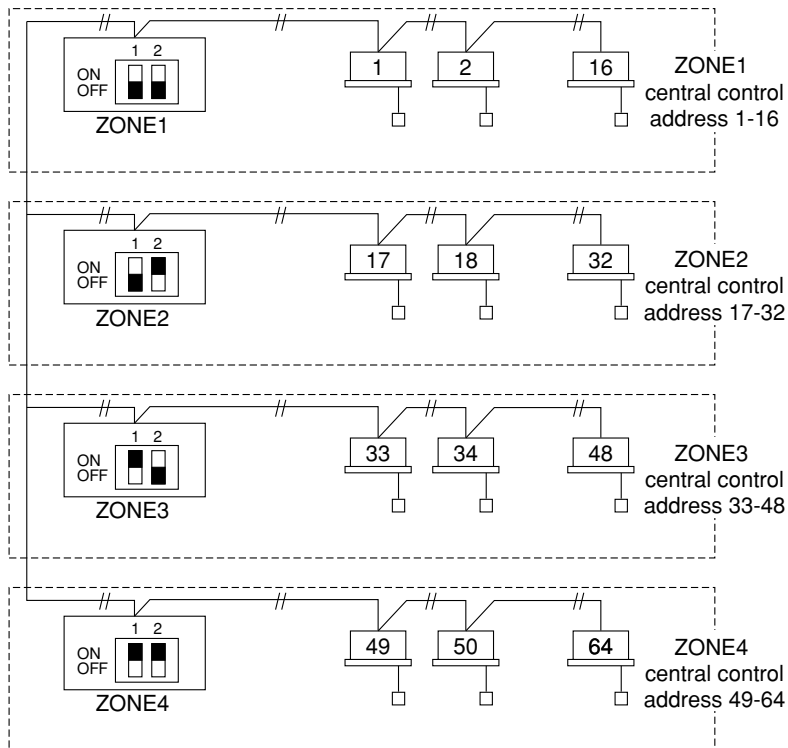
Fig. 8

6. How to perform zone registration

To operate the ON-OFF controller correctly, zone registration is necessary after finishing the test run (and after setting all indoor unit addresses) using one of the following methods.

  (a) Zone registration using the remote controller (RBC-AMT31E)
      Refer to page 295

  (b) Zone registration using the ON-OFF controller (TCB-SC642TLE2)
      Refer to page 296

  (c) Automatic zone registration using the ON-OFF controller (TCB-SC642TLE2)
      Refer to page 297

For methods (a) and (b), you should make a zone registration table manually before performing the registration as shown on page 294.

For method (c), zone registration is executed automatically, proceeding from low indoor unit address and low central addresses to higher numbers in numerical order. For example:

Central control address	1	2	3	4	5	6	
ZONE-group	1-1	1-2	1-3	1-4	1-5	1-6	
Indoor unit address	1-1	1-2	2-1	2-2	2-3	3-1	

NOTE

1. An indoor unit address is assigned to each indoor unit during automatic address operation. Each indoor unit address combines a Refrigerant circuit address and indoor unit number as follows:

$1-1$: Indoor unit address (UNIT No.)
          Indoor unit No.
          Line address (Refrigerant circuit No.: R.C. address)
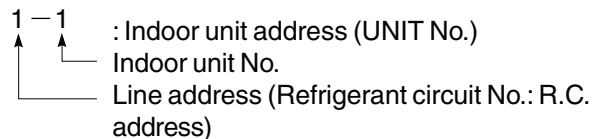
This address is displayed on the remote controller under UNIT No. when the UNIT button is pressed.

2. The central address represents the zone and group number. These addresses are assigned in ascending numerical order.

3. For details on how to set the addresses when the "1:1 model" connection interface (TCB-PCNT30TLE2) is connected for central control, refer to these instructions and to the installation instructions of the "1:1 model" connection interface.

■ ZONE registration table

ZONE	GROUP	Central control address	Indoor unit address (UNIT No.)	Unit location	ZONE	GROUP	Central control address	Indoor unit address (UNIT No.)	Unit location
1	1	1			3	1	33		
	2	2				2	34		
	3	3				3	35		
	4	4				4	36		
	5	5				5	37		
	6	6				6	38		
	7	7				7	39		
	8	8				8	40		
	9	9				9	41		
	10	10				10	42		
	11	11				11	43		
	12	12				12	44		
	13	13				13	45		
	14	14				14	46		
	15	15				15	47		
	16	16				16	48		
2	1	17			4	1	49		
	2	18				2	50		
	3	19				3	51		
	4	20				4	52		
	5	21				5	53		
	6	22				6	54		
	7	23				7	55		
	8	24				8	56		
	9	25				9	57		
	10	26				10	58		
	11	27				11	59		
	12	28				12	60		
	13	29				13	61		
	14	30				14	62		
	15	31				15	63		
	16	32				16	64		

NOTE
1. Assign indoor unit addresses to the required positions (central control addresses) manually.

2. For group control, only the main indoor unit should be assigned. Sub indoor units cannot be assigned.

(a)Zone registration using the wired remote controller (RBC-AMT31E)
(Determination of central address)

● This method is not supported by the RAV models. For RAV models, initiate the zone registration described in (a).

● In this case, after confirming which indoor unit is connected to the remote controller and that the air conditioner in the OFF state, set the central control addresses one at a time.

● If the system has no remote controller, connect a remote controller to the system temporarily. Then follow this procedure.

| NOTE |

The indoor unit address must already have been set before performing zone registration. If necessary, refer to the Installation Manual supplied with the outdoor unit.

(1) Press the $\overset{\text{TEST}}{\oslash}$ and $\overset{\text{VENT}}{\ominus}$ buttons at the same time on the remote controller for more than 4 seconds.

(2) Do not press $\overset{\text{UNIT}}{\ominus}$ button.

(3) Once in this mode, the UNIT No., CODE No., No. of SET DATA and SETTING indications will flash on the display as shown in Fig. 9.

| NOTE |

In case of group control "ALL" instead of "UNIT No." will flash on the display. Select the main indoor unit address by pressing the $\overset{\text{UNIT}}{\ominus}$ button once.

(4)Set CODE No. to 03 using the $\overset{\text{TEMP.}}{\underset{\blacktriangledown}{}}$ $\overset{}{\underset{\blacktriangle}{}}$ (🌡) buttons.

| NOTE |

The CODE No. 03 must be selected to perform zone registration using the remote controller.

(5) Set the Central control address which you want to assign to the indoor unit address using the $\overset{\text{TIME}}{\underset{\blacktriangledown}{}}\overset{}{\underset{\blacktriangle}{}}$ (🕐) buttons according to the zone registration table.

(6) Press the $\overset{\text{SET}}{\ominus}$ button. The CODE No. and Central control address changes from flashing to ON state. If you make mistake, then press the $\overset{\text{CL}}{\ominus}$ button and reset the central control address.

(7) Press the $\overset{\text{TEST}}{\oslash}$ button to finish zone registration.
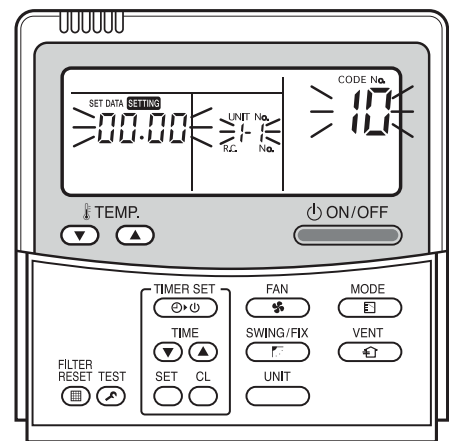
Fig. 9
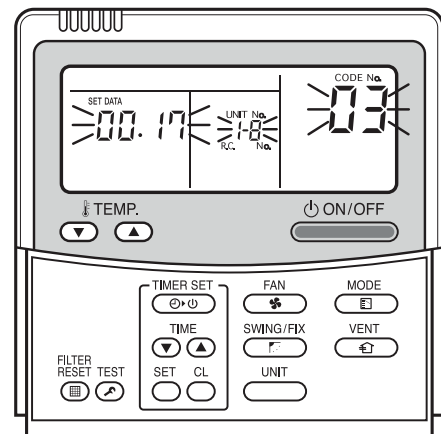
For example, in this case
  Indoor unit address: 1-8
  Central control address :
                17 (ZONE 2, GROUP 1)

Fig. 10

(b) Zone registration using the central remote controller (TCB-SC642TLE2)

● This method is not supported by the RAV models. For RAV models, initiate the zone registration described in (a).

● In this case, you set all Central addresses by ON-OFF controller at once manually.

(1) Press the 🔧 and ZONE buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) After confirming that CODE No. C1 is displayed, press the SET button. Once in this mode, a change takes place as in Fig. 11.

(3) Select the zone and group No. which you want to set with ZONE and ◄ ► (GROUP) buttons.
If already set, press the CL buttons.

(4) Set the unit No. (Indoor unit address) with 🔲 and 🔲 buttons, according to the zone registration table.

    R.C. No. .... 🔲 button

    Indoor unit No. .... 🔲 button

(5) Press the SET button.

GROUP No. turns ON and UNIT No. (Indoor unit address) changes from flashing to ON state. UNIT No. is registered to selected ZONE No. and GROUP No.

If you make mistake, then press the CL button and reselect the ZONE, GROUP and UNIT No.

(6) Register the other UNIT No. in the same way by following the steps (3) to (5).

(7) Finally, complete the registration by pressing the 🔧 button.
SETTING flashes for a few minutes, then OFF.
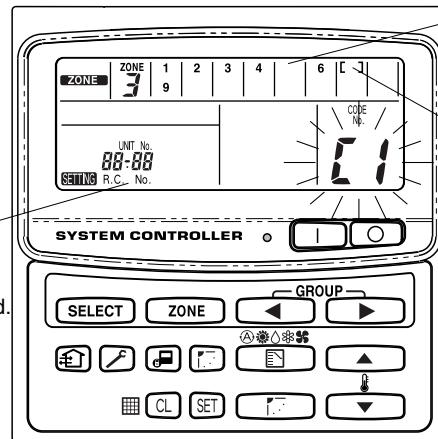
If no data is registered no number is displayed.

Selected group No. if no data is registered.

If data is registered the unit No. is displayed.

Fig. 11
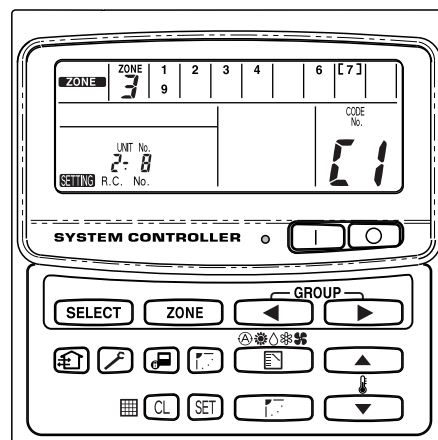
For example, in the case above
   Zone 3, group No. 7
   Unit No. (indoor unit address) 2-8

   Unit No. 2-8 is registered to zone 3-group 7.

Fig. 12

(c) Automatic zone registration using the Central remote controller (TCB-SC642TLE2)

(1) Press the ⌀ and ⌞ZONE⌟ buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) Select CODE. No. C2 by pressing ⌞▲⌟ and ⌞▼⌟ (🌡) button and press the ⌞SET⌟ button.
C2 changes from flashing to ON state and automatic zone registration will start.

(3) Registered GROUP No. will disappear.

(4) Central address will be assigned from low indoor unit address to higher one's in numerical order automatically.
Finishing automatic zone registration, **SETTING** changes from flashing to OFF.

(5) If an error occurs, the "CHECK" starts flashing and zone registration finishes at this time. Press the ⌞CL⌟ button.

(6) Finally, complete automatic zone registration mode by pressing the ⌀ button.
SETTING flashes for a few minutes, then OFF.

Fig. 13

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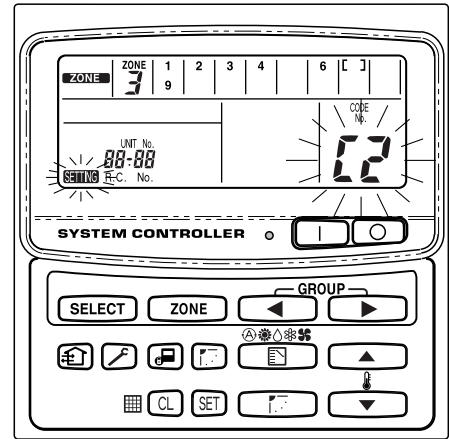
7. Checking from the central controller for duplication of the central address

This cannot be used with RAV air conditioners. For further details, refer to the instructions of the "1:1 model" connection interface (TCB-PCNT30TLE2).

(1) Press the ⌷ and ⌷ZONE⌷ buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) Select CODE. No. C3 by pressing ⌷▲⌷, ⌷▼⌷ (🌡) button and press the ⌷SET⌷ button.
C3 changes from flashing to ON state and SETTING will flash. Then auto. Duplicated error checking will start.

(3) If C3 changes from ON to flashing and SETTING stops flashing and disappears, there is no duplicate.
Then finally, complete the auto duplicate error checking mode by pressing the ⌷ button.

(4) If either the GROUP No., ZONE No. and UNIT No. flashes, you should retry the zone registration.
① Select CODE No. C1 by pressing ⌷▲⌷, ⌷▼⌷ (🌡) button and then press the ⌷SET⌷ button.
② Select the flashing GROUP No. with ZONE and GROUP button. Then press the ⌷CL⌷ button and reselect the ZONE, GROUP and UNIT No.
③ Then finally, complete the auto. Duplicate error checking mode by pressing the ⌷ button.
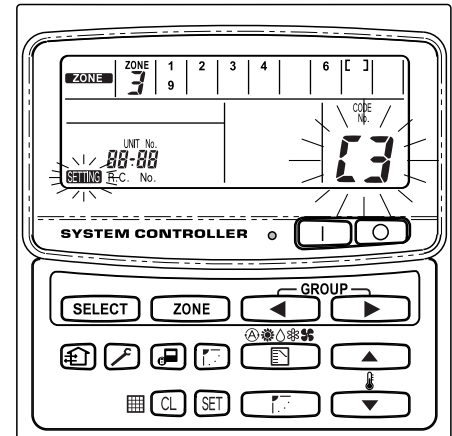
Fig. 14

8. Test run of the ON-OFF controller

(1) Turn on all the air conditioners.

(2) Turn on the ON-OFF Controller.

(3) Verify that the ON/OFF button is lit.

If the ON/OFF button flashes, verify the flash sequence as below, and inspect the air conditioner.
① **If the button flashes quickly for a few seconds-**
- Check that the central control address is set correctly.
- Check that the power is on.
- Check that the wiring is not shorted or cut.
② **If the button flashes slowly and continuously-**
- Check that the air conditioner is operating correctly.
- Check that the protection mechanism is functioning.
③ **If the numbers 15 or 16 flash quickly on the display-**
- The ON-OFF controller is initializing. Wait a few moments.
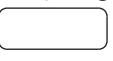
4-3-3 Operation procedure

How to Use the ON-OFF Controller

■ Functions of buttons

A : ON/OFF button

C : ALL OFF button

B : ALL ON button

A: ON/OFF button 01 ~ 16	Press this to start up or stop an individual air conditioner.
B: All ON button ALL ON・I NOTE	Press this to start up all the air conditioners at the same time. **The indoor units which can be operated by the ON-OFF controller now start operating in sequence at intervals of 1 to 2 seconds.**
C: All OFF button ALL OFF・O	Press this to stop all the air conditioners at the same time.

■ **How to use the nameplate**

The nameplate shows the rooms where the air conditioners are to be operated, and it enables the operating statuses of the air conditioners in those rooms to be checked by the operation indicator lamps.

Steps
1. Insert an implement such as a ballpoint pen into the hole on the left of the transparent cover, and remove the cover.
2. Use a writing instrument such as an oil-based pen to write the names of the rooms on the switch name labels provided, and adhere the labels to the name display.
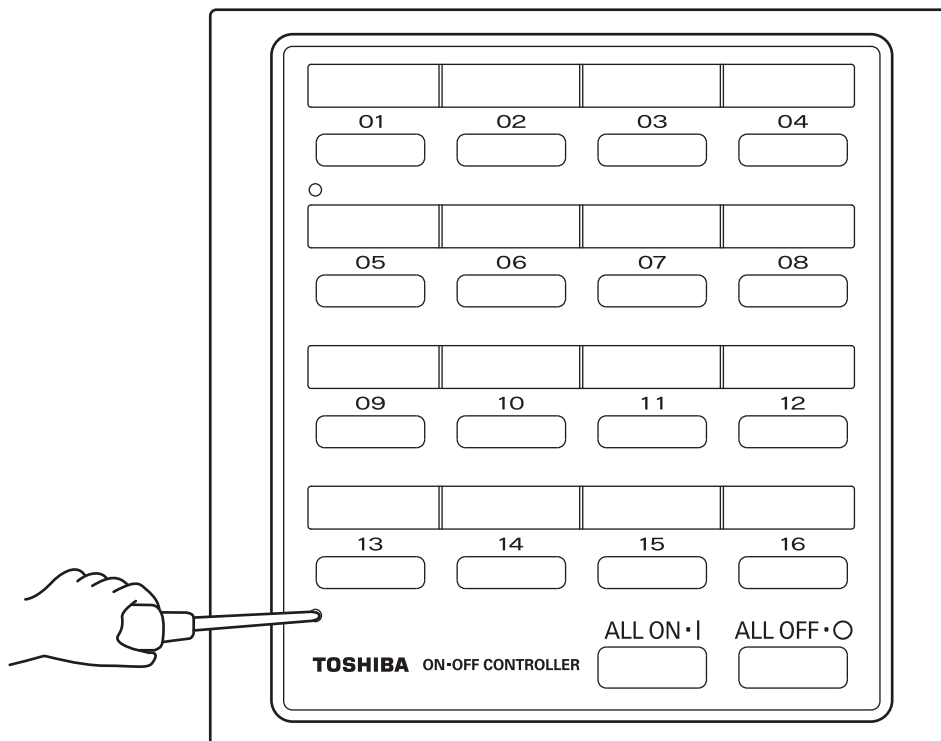
4-4 Application controls of indoor unit

4-4-1 Setup of the selection function in the indoor unit (Be sure to Execute Setup by a Wired Remote Controller RBC-AMT32(31)E, RBC-AMS41E)

Procedure Execute the setup operation while the unit operation is stopped.
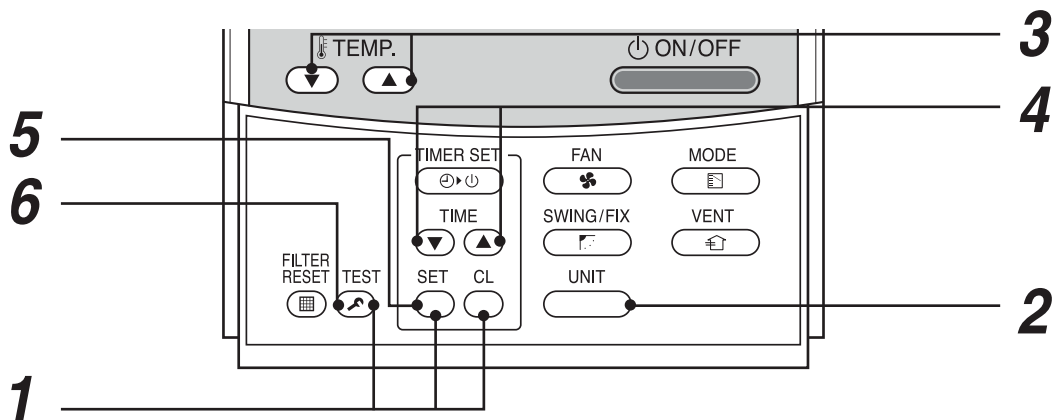
(RBC-AMT31E)

1 Push the SET, CL, and TEST buttons simultaneously for 4 seconds or more.

The display number shown first indicates the header indoor unit address in the group control.

At this time, the fan of the selected indoor unit is turned on.

2 For every push of the UNIT button, the indoor unit numbers in the group control are successively displayed. In this time, the fan of the selected indoor unit is turned on.

3 Specify the item code (DN) using the TEMP. buttons.

4 Select the setup data using the TIME buttons.

(When changing the DN code to "33", change the temperature indication on the unit from "°C" to "°F" on the remote controller.)

5 Push the SET button. (OK if display goes on.)

• To change the selected indoor unit, return to procedure **2**.
• To change the item to be set up, return to procedure **3**.

6 Pushing the TEST button returns the status to normal stop status.

CAUTION

Be sure to perform the item code (DN) set up as "Cooling Only" for the cooling only indoor unit in case of a heat recovery type (Super HRM). If this setting is not performed, error code [L18] may occur.

Table: Function selecting item numbers (DN) for SMMS
(Items necessary to perform the applied control at the local site are described.)

DN	Item	Description	At shipment
01	Filter sign lighting time	0000 : None 0001 : 150H 0002 : 2500H 0003 : 5000H 0004 : 10000H	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
04	Specific indoor unit priority	0000 : No priority 0001 : Priority	0000 : No priority
06	Heating temp shift	0000 : No shift 0001 : +1°C 0002 : +2°C to 0010 : +10°C (Up to +6 recommended)	0002 : +2°C (Floor type 0000 : 0°C)

0d	Existence of automatic cool/heat mode	0000 : Provided 0001 : Not provided
		                                                           (Automatic selection from
		                                                           connected outdoor unit)
			0001 : Not provided

0F	Cooling only	0000 : Heat pump 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Heat pump
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual 0001 : Header unit of group 0002 : Follower unit of group	0099 : Unfixed
19	Flap type (Adjustment of air direction)	0000 : Not provided 0001 : Swing only 0004 : [4-way Air Discharge Cassette type] and [Under Ceiling type]	According to type
1E	Temp difference of automatic cooling/ heating mode selection COOL → HEAT, HEAT → COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None 0001 : Restart	0000 : None
2A	Selection of option/ error input (CN70)	0000 : Filter input 0001 : Alarm input (Air washer, etc.) 0002 : Humidifier input	0002 : Humidifier
2E	HA terminal (CN61) select	0000 : Usual 0001 : Leaving-ON prevention control	0000 : Usual (HA terminal)

30	Automatic elevating grille	0000 : Unavailable 0001 : Available
		            (Standard, (Auto grille, Oil guard,
		            Oil guard panel) Auto grille panel)
			0000 : Unavailable

31	Ventilating fan control	0000 : Unavailable 0001 : Available	0000 : Unavailable
32	TA sensor selection	0000 : Body TA sensor 0001 : Remote controller sensor	0000 : Body TA sensor
33	Temperature unit select	0000 : °C (at factory shipment) 0001 : °F	0000 : °C

40	Control for humidifier (+ drain pump control)	0000 : None 0001 : Humidifier + Vaporizing system
		                                                           (Pump ON)
		0002 : Humidifier + Ultrasonic system
		            (Pump ON after specified time passed) (Unused)
		0003 : Humidifier + Natural drain system (Pump OFF)
			0003 : Humidifier ON,
			Pump OFF

5d	High ceiling selection (Air volume selection)	[4-way Air Discharge Cassette type] and [Under Ceiling type]
		0000 : Standard filter
		0001 : Super-long life
		[Concealed Duct Standard type]
		0000 : Standard static pressure 0001 : High static pressure 1
		            (40Pa) (70Pa)
		0003 : High static pressure 2 0005 : Correspond to quiet sound
		            (100Pa) 0006 : Low static pressure (20Pa)
			0000 : Standard

60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
62	Smudging-proof control clear	0000 : Clear	4-way Air Discharge Cassette type only
92	Outside interlock release condition	0000 : Operation stop 0001 : Release communication signal receive	0000 : Operation stop

Table: Function selecting item numbers (DN) for MINI-SMMS (example)

Table: Function selecting item code (DN)
(Items necessary to perform the applied control at the local site are described.)

DN	Item	Description	At shipment
01	Filter display delay timer	0000 : None 0001 : 150H 0002 : 2500H 0003 : 5000H 0004 : 10000H	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
04	Specific indoor unit priority	0000 : No priority 0001 : Priority	0000 : No priority
06	Heating temp shift	0000 : No shift 0001 : +1°C 0002 : +2°C to 0010 : +10°C (Up to +6 recommended)	0002 : +2°C (Floor type 0000 : 0°C)
0d	Existence of [AUTO] mode	0000 : Provided 0001 : Not provided (Automatic selection from connected outdoor unit)	0001 : Not provided
0E	Follows operation mode of the header unit	0000 : Does not follow 0001 : Follows	0000 : Not provided
0F	Cooling only	0000 : Heat pump 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Heat pump
10	Type	0000 : (1-way air discharge cassette) 0001 : (4-way air discharge cassette) to 0037	According to model type
11	Indoor unit capacity	0000 : Unfixed 0001 to 0034	According to capacity type
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual 0001 : Header unit of group 0002 : Follower unit of group	0099 : Unfixed
19	Louver type (Adjustment of air direction)	0000 : Not provided 0001 : Swing only 0004 : [4-way Air Discharge Cassette type] and [Under Ceiling type]	According to type
1E	Temp difference of [AUTO] mode selection COOL → HEAT, HEAT→ COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None 0001 : Restart	0000 : None
2A	Selection of option/ error input (CN70)	0000 : Filter input 0001 : Alarm input (Air washer, etc.) 0002 : None	0002 : None
2E	HA terminal (CN61) select	0000 : Usual 0001 : Leaving-ON prevention control	0000 : Usual (HA terminal)
30	Automatic elevating grille	0000 : Unavailable 0001 : Available	0000 : Unavailable
31	Ventilating fan control	0000 : Unavailable 0001 : Available	0000 : Unavailable
32	TA sensor selection	0000 : Body TA sensor 0001 : Remote controller sensor	0000 : Body TA sensor
33	Temperature unit select	0000 : °C (at factory shipment) 0001 : °F	0000 : °C
40	Drain pump control	0000 : None 0001 : Pump ON 0002 : None 0003 : Pump OFF	0003 : Pump OFF
5d	High ceiling selection (Air volume selection)	*(see sub-table below)*	0000 : Standard
60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
62	Anti-ceiling smudging control	0000 : Clear	4-way Air Discharge Cassette type only

DN 5d sub-table:

Indoor unit type		Item	Set up data 0	1	2	3	6
4-way Air Discharge Cassette	MMU-AP* * * 1H	High ceiling	Standard	High ceiling (1)	—	High ceiling (3)	—
		Filter	Standard	Super long life filter	—	High efficiency filter	—
Compact 4-way Air Discharge Cassette	MMU-AP* * * 1MH	High ceiling	Standard	—	High ceiling (2)	High ceiling (3)	—
1-way Air Discharge Cassette	MMU-AP* * * 2SH	High ceiling	Standard	High ceiling (1)	—	High ceiling (3)	—
Concealed Duct Standard	MMU-AP* * * 1BH	External static pressure	40Pa	70Pa	—	100Pa	20Pa
Slim Duct	MMU-AP* * * 1SPH	External static pressure	10Pa	20Pa	—	35Pa	50Pa

Table: Function selecting item numbers (DN) for DI (example)

Table 1. Setting data (CODE No. table (example))

DN	Item	Setting data	Factory-set value
01	Filter sign lighting time		Depending on Type
02	Filter pollution level		0000: standard
03	Central control address		0099: Not determined
06	Heating suction temperature shift		0002: +2°C (flooring installation type: 0)
OF	Cooling only		0000: Heat pump
10	Type		Depending on model type
11	Indoor unit capacity		Depending on capacity type
12	System address		0099: Not determined
13	Indoor unit address		0099: Not determined
14	Group address		0099: Not determined
19	Louver type (wind direction adjustment)		Depending on Type.
1E	Temperature range of cooling/heating automatic SW control point		0003: 3 deg (Ts ± 1.5)
28	Power failure automatic recovery		0000: None
2A	Option/Abnormal input (CN70) SW		0002: Humidifier
2b	Thermo output SW (T10 ③)		0000: Thermo ON
31	Ventilation fan (standalone)		0000: Not available
32	Sensor SW (Selection of static pressure)		0000: Body sensor
40	Humidifier control (+ drain pump control)		0003: Humidifier ON + Pump OFF
5d	High ceiling SW		0000: Standard
60	Timer setting (wired remote controller)		0000: Available
C2	Demand setting (outdoor unit current demand)		0075: 75 %
d0	Remote controller operation save function		0001: Enable
d3	Rotation number of the self-clean operation		0001: 210ypm(at self-clean operation)
d1	Frost protection function		0000: None
F0	Swing mode		0001: Standard
F1	Louver fixing position (Flap No. 1)		0000: Not fixed
F2	Louver fixing position (Flap No. 2)		0000: Not fixed
F3	Louver fixing position (Flap No. 3)		0000: Not fixed
F4	Louver fixing position (Flap No. 4)		0000: Not fixed

Table: Function selecting item numbers (DN) for SDI (4series example)

Function selection item No. (DN) list

DN	Item	Contents	At shipment from factory
01	Filter sign lighting time	0000: None 0001: 150H 0002: 2500H 0003: 5000H 0004: 10000H 0005: Clogging sensor used	According to type
02	Filter stain level	0000: Standard 0001: Heavy stain (Half of standard time)	0000: Standard
03	Central control address	0001: No.1 unit to 0064: No.64 unit 0099: Undecided	0099: Undecided
06	Heating suction temp. shift	0000: No shift 0001: +1°C 0002: +2°C to 0010: +10°C (Up to +6 is recommended.)	0002: +2°C (Floor type 0000: 0°C)
0F	Cooling-only	0000: Heat pump 0001: Cooling only (No display for [AUTO] [HEAT])	0000: Heat pump
10	Type	0000: (1-way air discharge cassette) 0001: (4-way air discharge cassette) to 0037	According to model type
11	Indoor unit capacity	0000: Undecided 0001 to 0034	According to capacity type
12	Line address	0001: No.1 unit to 0030: No.30 unit	0099: Undecided
13	Indoor unit address	0001: No.1 unit to 0064: No.64 unit	0099: Undecided
14	Group address	0000: Individual 0001: Master unit in group 0002: Follower unit in group	0099: Undecided
1E	In automatic cooling/heating, temp. width of cool → heat, heat → cool mode selection control point	0000: 0 deg to 0010: 10 deg (Cool/heat are reversed with ± (Data value) / 2 against the set temperature)	0003: 3 deg (Ts ±1.5)
28	Automatic reset of power failure	0000: None 0001: Provided	0000: None
2A	Selection of option / error input (CN70)	0000: Filter input 0001: Alarm input (Air cleaner, etc.) 0002: Humidifier input	0002: Humidifier
2b	Selection of thermostat output (T10 ③)	0000: Indoor thermostat ON 0001: ON receiving output of outdoor compressor	0000: Thermostat ON
2E	Selection of HA (T10) terminal	0000: Normal (JEMA) 0001: Card input (Forgotten to be off) 0002: Fire alarm input	0000: Normal (HA terminal)
31	Fan (Single operation)	0000: Impossible 0001: Possible	0000: Impossible
32	Sensor selection	0000: Body TA sensor 0001: Remote controller sensor	0000: Body sensor
40	Humidifier control (+Drain pump control) (This function is not provided.)	0000: No control 0001: Humidifier + Vaporizing type (Pump ON) 0002: Humidifier + Supersonic type (Pump ON when specified time elapsed) 0003: Humidifier + Natural drain type (Pump OFF)	0003: Humidifier ON Pump OFF
5d	External static pressure	0000: Standard (At shipment) (10 Pa) 0001: High static pressure 1 (20 Pa) 0003: High static pressure 2 (35 Pa) 0006: High static pressure 3 (50 Pa)	0000: Standard
60	Timer setting (Wired remote controller)	0000: Operable 0001: Operation prohibited	0000: Operable
C2	Current demand X% to outdoor unit	0050: 50% to 0100: 100%	0075: 75%
D0	Existence of remote controller save function	0000: Invalid (Impossible) 0001: Valid (Possible)	0001: Valid (Possible)
D1	Existence of 8°C heating operation function	0000: Invalid (Impossible) 0001: Valid (Possible)	0001: Invalid (Impossible)

■ Monitoring function of remote controller switch

When using the remote controller (Model Name: RBC-AMT32(31)E, RBC-AMS41E), the following monitoring function can be utilized.

Calling of display

<Contents>

The temperature of each sensor of the remote controller, indoor unit and outdoor unit and the operating status can be checked by calling the service monitor mode from the remote controller.

<Procedure>

1 Push ⌀TEST + ⌀CL buttons simultaneously for 4 seconds or more to call up the service monitor mode.
The service monitor goes on and firstly the temperature of the CODE No. *00* is displayed.

⇩

2 Push ⌀TEMP. button to change CODE No. (CODE No.) to the CODE No. to be monitored.
For display code, refer to the following table.

⇩

3 Push ⌀UNIT LOUVER button to change to item to be monitored.
The sensor temperature of indoor unit or outdoor unit in its refrigerant line and the operating status are monitored.

⇩

4 Push ⌀TEST button to return the status to the normal display.

Returns to normal display

<Operation procedure>
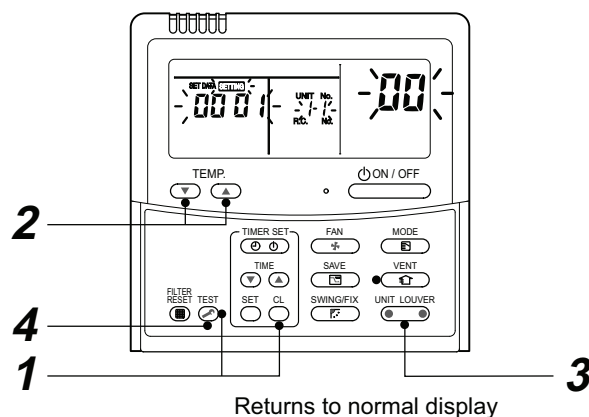
1 → 2 → 3 → 4

Code example for SMMS, refer to other document for target model.

	CODE No.	Data name	Unit	Display form		CODE No.	Data name	Unit	Display form
Indoor unit data	00	Room temp. (Under control) (Note 1)	°C	× 1	Individual outdoor unit data (Note 3, 4)	10	Compressor 1 discharge temp. (Td1)	°C	× 1
	01	Room temp. (Remote controller)	°C	× 1		11	Compressor 2 discharge temp. (Td2)	°C	× 1
	02	Indoor suction temp. (TA)	°C	× 1		12	High pressure sensor detection pressure (Pd)	MPa	× 100
	03	Indoor coil temp. (TCJ)	°C	× 1		13	Low pressure sensor detection pressure (Ps)	MPa	× 100
	04	Indoor coil temp. (TC2)	°C	× 1		14	Suction temp. (TS)	°C	× 1
	05	Indoor coil temp. (TC1)	°C	× 1		15	Outdoor coil temp. (TE)	°C	× 1
	08	Indoor PMV opening degree	pls	× 1/10		16	Liquid side temp. (TL)	°C	× 1
	F2	Indoor fan accumulated operation time	h	× 100		17	Outside temp. (TO)	°C	× 1
	F3	Filter sign time	h	× 1		18	Low pressure saturation temp. (TU)	°C	× 1
						19	Compressor 1 current (I1)	A	× 10
System data	0A	No. of connected indoor units	unit			1A	Compressor 2 current (I2)	A	× 10
	0B	Total HP of connected indoor units	HP	× 10		1B	PMV1 + 2 opening degree	pls	× 1/10
	0C	No. of connected outdoor units	unit			1D	Compressor 1, 2 ON/OFF	—	(Note 2)
	0D	Total HP of connected outdoor units	HP	× 10		1E	Outdoor fan mode	—	0 to 31
						1F	Outdoor unit HP	HP	× 1

(Note 1) In the group connection, only data of the header indoor unit is displayed.

(Note 2) 01: Only compressor 1 is ON.
10: Only compressor 2 is ON.
11: Both compressor 1 and 2 are ON.

(Note 3) For the CODE No., an example of header unit is described.

(Note 4) Upper girder of CODE No. indicates the outdoor unit No.
1: Header unit (A)
2: Follower unit (B)
3: Follower unit (C)
4: Follower unit (D)
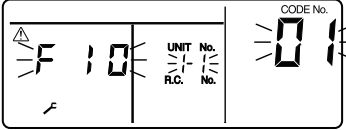
Confirmation of error history (RBC-AMT32(31)E, RBC-AMS41E)

When a trouble occurred on the air conditioner, the trouble history can be confirmed with the following procedure. (The trouble history is stored in memory up to 4 troubles.)

The history can be confirmed from both operating status and stop status.

Procedure	Description
1	When pushing ⊖ (SET) and ⊘ (TEST) buttons at the same time for 4 seconds or more, the following display appears. If [🔧 Service check] is displayed, the mode enters in the trouble history mode. • [01: Order of trouble history] is displayed in CODE No. window. • [Check code] is displayed. • [Indoor unit address in which an error occurred] is displayed in UNIT No.
2	Every pushing of [▼ / ▲] button used to set temperature, the trouble history stored in memory is displayed in order. The numbers in CODE No. indicate CODE No. [01] (latest) → [04] (oldest). **CAUTION** Do not push ⊖ (CL) button because all the trouble history of the indoor unit will be deleted.
3	After confirmation, push ⊘ (TEST) button to return to the usual display.

■ Selection of indoor air temperature sensor

(How to select "body TA sensor" or "remote controller sensor")

Remote controller (RBC-AMT32(31)E, RBC-AMT41E, RBC-AS21E2, or wireless) has the sensor to detect the air temperature.

Either the body TA sensor or remote controller sensor can be selected by item code (DN) setting from the wired remote controller.

DN	32	0000	Body TA sensor	At shipment
		0001	Remote controller sensor	
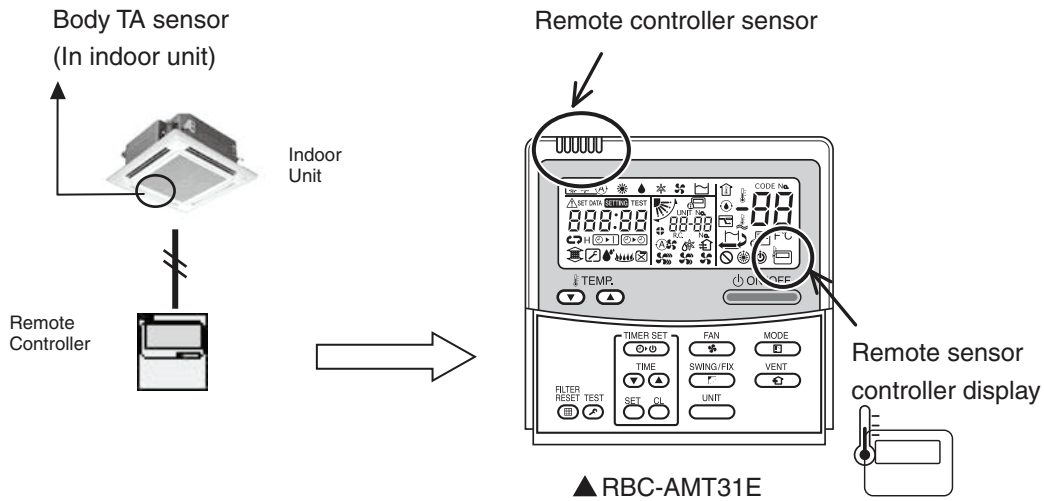
▲ RBC-AMT31E

[Note]

In case of using the remote sensor "TCB-TC21LE",

don't select "remote controller sensor" by item code (DN) setting.

You can use only one remote controller sensor (set as the master remote) together with the remote sensor.
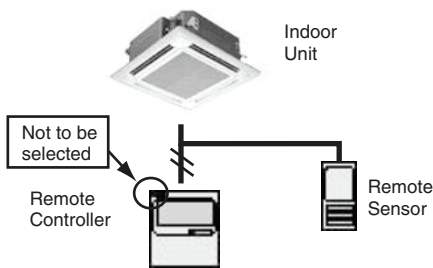
4-4-2 Connector

List of Connector, cable and outline of application

Function	Connector	Pin No	Cable Model Name	Outline
Fan output	CN32	1, 2	TCB-KBCN32VEE	External Ventilation fan control from Remote controller
Option output	CN60	1, 2, 3, 4, 5, 6	TCB-KBCN60OPE	Operation status signal output (cooling, heating, fan, defrost, thermo-ON)
Operation Input / Output	CN61	1, 2, 3, 4, 5, 6	TCB-KBCN61HAE	External ON/OFF control, operation ON/OFF status output, alarm status output
Option error input	CN70	1, 2	TCB-KBCN70OAE	Alarm display on Remote controller by this input
Demand input	CN73	1, 2	TCB-KBCN73DEE	Forced thermo-off control by this input
Outside error input	CN80	1, 3	TCB-KBCN80EXE	Generate check code "L30" (for 1 minutes continuously) to stop forcedly the operation
CHK Operation check	CN71	1, 2	–	check indoor, fan "H", Louver horizontal and drain pump ON
DISP Exhibition mode	CN72	1, 2	–	Operation with indoor & remote controller, without outdoor unit

Indoor Connector port existing table

			Indoor Connector port					
			CN32	CN60	CN61	CN70	CN73	CN80
SMMS SMMS-i S-HRM Mini-SMMS	4-way cassette	1 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	yes	yes	yes
	Compact 4-way cassette	1 series	yes	yes	yes	yes	yes	yes
	2-way cassette	1 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	yes	yes	yes
	1-way cassette	1YH series	yes	yes	yes	yes	yes	yes
		2SH series	yes	yes	yes	yes	yes	yes
	Concealed duct	1 series	yes	yes	yes	yes	yes	yes
	Slim duct	1 series	yes	yes	yes	yes	yes	yes
	Concealed duct High static pressure	1 series	yes	yes	yes	yes	yes	yes
	Under Ceiling	1 series	yes	yes	yes	yes	yes	yes
	High wall	1 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	no	no	yes
		3 series	yes	yes	yes	no	no	yes
	Floor standing cabinet	1 series	yes	yes	yes	yes	yes	yes
	Floor standing concealed	1 series	yes	yes	yes	yes	yes	yes
	Floor standing	1 series	yes	yes	yes	yes	yes	yes
SMMS SMMS-i	Fresh air indoor intake	-	yes	yes	yes	yes	yes	yes
DI SDI	4-way cassette	all series	yes	yes	yes	yes	yes	yes
	Compact 4-way cassette	2 series	yes	yes	yes	yes	yes	yes
	Under Ceiling cassette	all series	yes	yes	yes	yes	yes	yes
	Duct	2 series	yes	yes	yes	yes	yes	yes
	Concealed duct High static pressure	3 series	yes	yes	yes	yes	yes	yes
		2 series	yes	yes	yes	yes	yes	yes
	High wall	2 series	no	yes	yes	no	no	yes
		1 series	no	yes	yes	no	no	yes
		0 series	no	no	no	no	no	no
	Flexi	all series	no	no	no	no	no	no
	Slim duct	Series 4	yes	yes	yes	yes	yes	yes
Daiseikai Inverter Multi	HA terminal							
	Daiseikai Hi wall	RAS-B**GKVP-E, RAS-B**GKCVP-E RAS-B*SKVP-E, RAS-*SKVP-ND RAS-*SKVR-E, RAS-*SKV-E RAS-*PKVP-E, RAS-*PKVP-ND RAS-M*PKVP-E, RAS-M*PKVP-ND						
	INVERTER Hi wall	RAS-*GKV-E2						
	INVERTER Multi Hi wall	RAS-M*GKV-E2 RAS-M*GKCV-E2						
	INVERTER Multi DUCT	RAS-M*GDV-E RAS-M*GDCV-E						

Fan output (CN32)		
1	DC12V (Common)	
2	Fan output (Open collector)	-Shipment setup (DN31=0000) ON with indoor unit ON, OFF with indoor unit OFF are linked -Ventilation control (DN31=0001) Individual ON/OFF control from ventilation button of remote controller

Option output (CN60)		
1	DC12V (COM)	Common for Pin. 2 to 6
2	Defrost output (Open collector)	ON signal when outdoor unit is in defrosting (when receiving defrost signal from outdoor unit)
3	Thermo ON output (Open collector)	ON signal when indoor unit is "thermo-ON"
4	Cooling output (Open collector)	ON when operation mode is cooling (Cooling, Dry, Cooling in Auto mode)
5	Heating output (Open collector)	ON when operation mode is heating (Heating, Heating in Auto mode)
6	Fan output (Open collector)	ON when indoor fan is ON (ex. Interlock cabling)

Operation terminal (CN61)		
1	ON/OFF input	External ON/OFF control (DN code 2E, J01)
2	0V (Common for Pin. 1, 3)	
3	ON/OFF prohibition input	Remote controller ON/OFF prohibition is permitted/ prohibited input signal
4	Operation output (Open collector)	On signal during "remote controller ON"
5	DC12V (Common for Pin. 4, 6)	
6	Alarm output (Open collector)	On signal during alarm output (non recovery fatal error)

Option error input (CN70)		
1	Error input	Default : DN2A=0002 (at shipment) DN2A=0001 (External error input) When signal is input, error symbol is displayed on RC. (Indoor unit dose not stop)
2	0V (COM)	

Check operation check (CN71)		
1		
2	0V (COM)	This is used to check indoor operation. Performs operation of indoor fan "H", Louver horizontal and drain pump ON without communication with outdoor and remote controller

Display exhibition Mode (CN72)		
1	input	Connect with 2pin, operation without outdoor
2	0V (COM)	

Demand input (CN73)		
1	Demand input	Indoor unit forced thermo-OFF
2	0V (COM)	

Outside error input (CN80)		
1	DC12V (COM)	Common for Pin.3
2	–	
3	Outside error input	After signal is input, 3 sec. Forced thermo-off 1 min. Error code "L30" (Interlock from outside) and stop the operation (this unit only)

HA Terminal Only Daiseikai, Inverter Multi Standard JEM1427 (Japan Electrical Manufacturer's Association)					
Pin No	Mark	Specification	Notes		
1	C1	Input signal	Pulse duration	200 to 300ms	The terminal can input a pulse signal. When indoor unit receives a pulse signal, Indoor unit turns over status of operation or stop. -If the operation of indoor unit is running, then indoor unit turns off. -If the operation of indoor unit is stopped, then indoor unit turns on.
2	C2		Pulse interval	200ms or more	
3	M1	Output signal	The terminal can output the status signal of operation or stop. When indoor unit is running, a signal is ON. When indoor unit is stopped, a signal is OFF.		
4	M2				

4-4-2-1 Fan output (CN32)

1	DC12V (Common)	
2	Fan output (Open collector)	-Shipment setup (DN31=0000) ON with indoor unit ON, OFF with indoor unit OFF are linked -Ventilation control (DN31=0001) Individual ON/OFF control from ventilation button of remote controller VENT Remote controller ON ◇ <u>Ventilation ON</u> (IF already ON, ON remains) Remote controller OFF ◇ <u>Ventilation OFF</u> (IF already OFF, OFF remains)

1 **Red** **Housing: XAP-02V-1 (White)**   **UL1007**
2 **Blue** **Contact: SXA-001T-P0.6**   **AWG22**

50 cm

Indoor P.C.

Board

Max. 2m

Local supply

CN32

COM(DC12V) 1 1

Fan Output 2 2

Relay (DC12V)
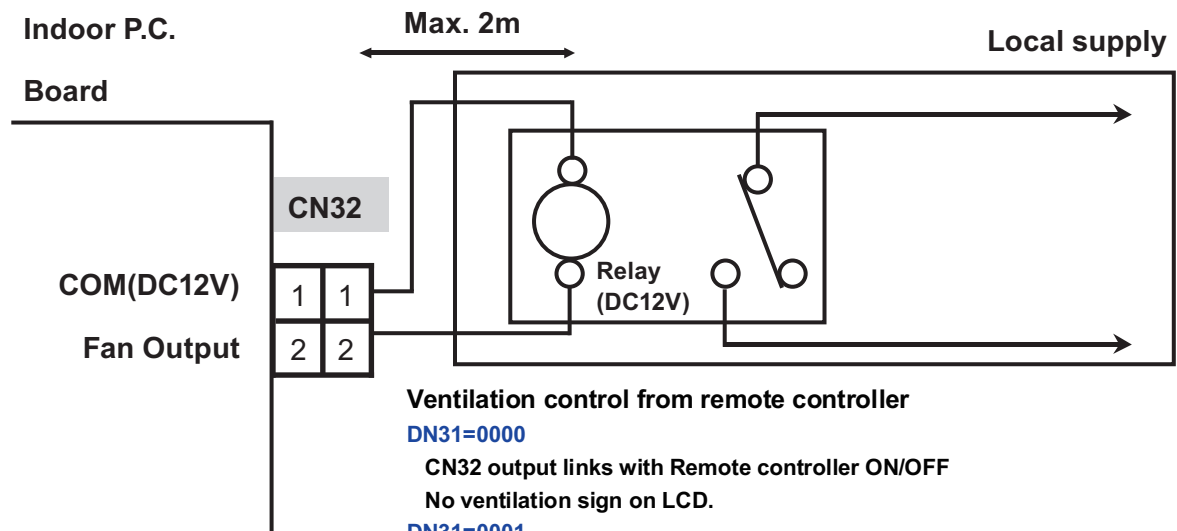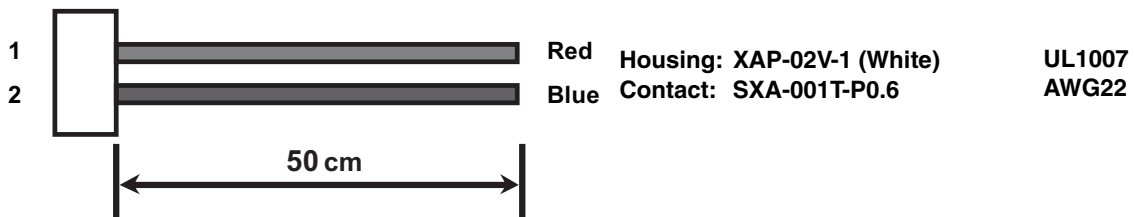
Ventilation control from remote controller
DN31=0000
  CN32 output links with Remote controller ON/OFF
  No ventilation sign on LCD.
DN31=0001
  CN32 output links with Remote controller ON/OFF
  Individual ON/OFF by "VENT" button
  Ventilation sign on LCD

DN31=0000

Indoor unit ON (=remote controller ON)

Operation

Ventilation ON

Operation

Indoor unit OFF (=remote controller OFF)

No Operation

Ventilation OFF

No Operation

DN31=0001

Indoor unit operation chart (=remote controller ON/OFF chart)

Operation
Indoor unit ON (=remote controller ON)

No Operation
Indoor unit OFF (=remote controller OFF)

Ventilation operation chart

| Operation | No Operation | Operation | No Operation | Operation | No Operation |

Ventilation button of remote controller

Push | Push | Push | Push

Ventilation fan control from remote controller

[Function]

- The start/stop operation can be operated from the wired remote controller when air to air heat exchanger or ventilating fan is installed in the system.
- The fan can be operated even if the indoor unit is not in operation.
- Use a fan which can receive the no-voltage A contact as an outside input signal.
- In a group control, the units are collectively operated and as such cannot be individually operated.

(1) Operation

Handle a wired remote controller in the following procedure.

* Set up the wired remote controller only when the system is not in operation.
* Be sure to set up the wired remote controller to the header indoor unit. (Same in group control)
* In a group control, if the wired remote controller is set up to the header indoor unit, both header and follower units are simultaneously operable.

1 **Push concurrently the** $\overset{\text{SET}}{\bigcirc}$ **+** $\overset{\text{CL}}{\bigcirc}$ **+** $\overset{\text{TEST}}{\bigcirc}$ **buttons for 4 seconds or more.**

The unit No. displayed firstly indicates the header indoor unit address in the group control.

In this time, the fan of the selected indoor unit will turn on.

2 **For every push of the** $\overset{\text{UNIT}}{\bigcirc}$ **button, the indoor unit numbers in the group control are displayed successively.**

In this time, the fan of the selected indoor unit only will turn on.

3 **Use the** $\overset{\text{TEMP.}}{\underset{\blacktriangledown \ \blacktriangle}{}}$ **buttons to specify the item code** $\mathit{31}$.

4 **Using the** $\overset{\text{TIME}}{\underset{\blacktriangledown \ \blacktriangle}{}}$ **button, select the setup data. (At shipment:** $\mathit{0000}$**)**

The setup data is as follows:

Setup data	Handling of operation of air to air heat exchanger or ventilating fan
$\mathit{0000}$	Unavailable (At shipment)
$\mathit{0001}$	Available

5 **Push the** $\overset{\text{SET}}{\bigcirc}$ **button. (OK if display goes on.)**

- To change the selected indoor unit, go to procedure **2**).
- To change the item that is to be set up, go to procedure **3**).

6 **Pushing the** $\overset{\text{TEST}}{\bigcirc}$ **returns the status to the usual stop status.**

4-4-2-2 Option output CN60

1	DC12V (COM)	Common for Pin. 2 to 6
2	Defrost output (Open collector)	ON signal when outdoor unit is in defrosting (when receiving defrost signal from outdoor unit)
3	Thermo ON output (Open collector)	ON signal when indoor unit is "thermo-ON"
4	Cooling output (Open collector)	ON when operation mode is cooling (Cooling, Dry, Cooling in Auto mode)
5	Heating output (Open collector)	ON when operation mode is heating (Heating, Heating in Auto mode)
6	Fan output (Open collector)	ON when indoor fan is ON (ex. Interlock cabling)

White

1	Red
2	Blue
3	Orange
4	Yellow
5	Brown
6	Black

50 cm

Housing: XAP-06V-1-Y(Yellow) UL1007
contact: SXA-001T-P0.6 AWG24

Indoor P.C. Board

CN60

COM(DC12V)

Defrost output

Max. 2m

Local supply

Relay (DC12V)

ON signal output when outdoor unit is in "defrosting"
(when receiving defrost signal from outdoor unit)

Indoor P.C. Board

CN60

COM(DC12V)

Thermo-ON output

Max. 2m

Local supply

Relay (DC12V)

ON signal when indoor unit Thermo-ON

Indoor P.C. Board

CN60

COM(DC12V)

Cooling output

Max. 2m

Local supply

Relay (DC12V)
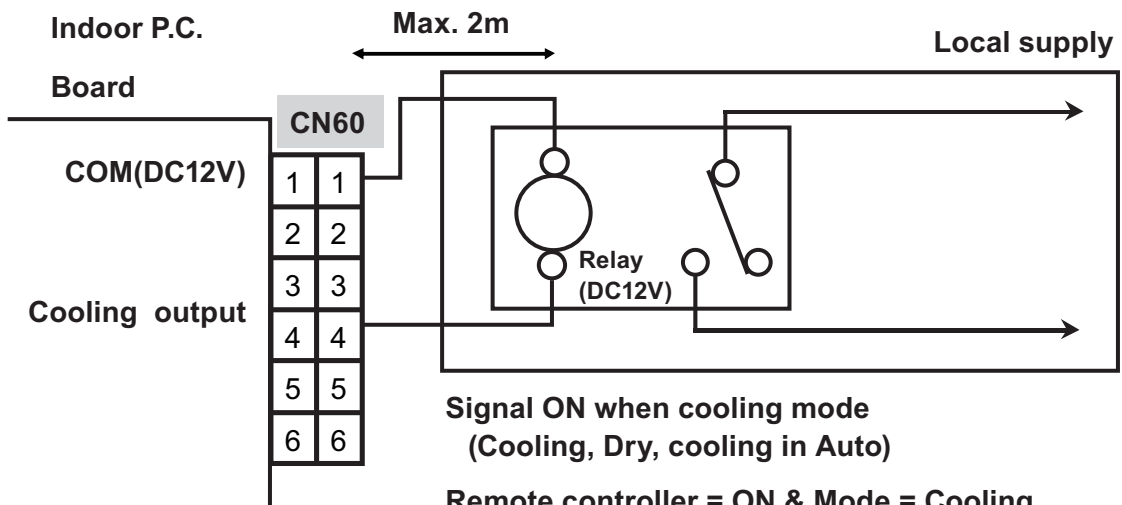
Signal ON when cooling mode
(Cooling, Dry, cooling in Auto)

Remote controller = ON & Mode = Cooling
-Signal is still ON during thermo-off
-Signal is OFF during alarm status

Indoor P.C. Board

Max. 2m

Local supply

CN60

COM(DC12V)

1	1
2	2
3	3
4	4
5	5
6	6

Relay (DC12V)

Heating output

**Signal ON when heating mode
(Heating, Heating in Auto)**

**Remote controller = ON & Mode = Heating
-Signal is still ON during thermo-off**
-Signal is OFF during alarm status

Indoor P.C. Board

Max. 2m

Local supply

CN60

COM(DC12V)

1	1
2	2
3	3
4	4
5	5
6	6

Relay (DC12V)

Fan output

Signal ON when indoor fan is running
**(Signal ON has 2 pattern; 1. Fan is operated /
2. Fan and indoor unit are operated)**
Ex. Interlock cabling (for booster fan, etc.)

(Note) Signal is OFF when 4-way cassette type performs intermittent operation after oil recovery control.

4-4-2-3 Operation terminal (CN61)
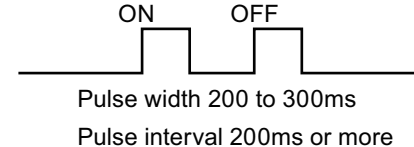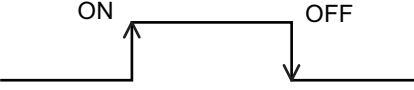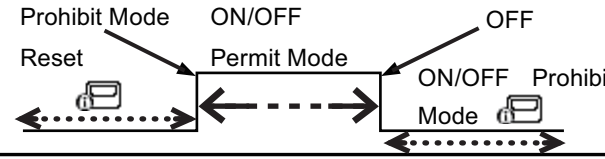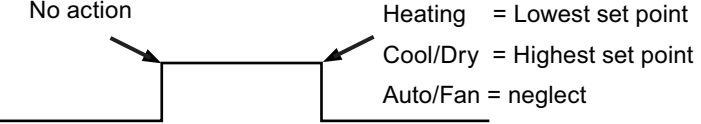
1	ON/OFF input	External ON/OFF control (DN code 2E, J01)
2	0V (Common for Pin. 1,3)	
3	ON/OFF prohibition input	Input signal makes switching of permission/prohibition of individual remote controller ON/OFF (During prohibition, "Central controlling mark" is shown on the LCD.)
4	Operation output (Open collector)	On signal during "remote controller ON"
5	DC12V (Common for Pin. 4,6)	
6	Alarm output (Open collector)	On signal during alarm output

1,4: specification is same as HA terminal. (refer to 1-9-15)

Yellow

1		Blue
2		white
3		Orange
4		Yellow
5		Red
6		Brown

Housing: XAP-06V-1-Y (Yellow)   UL1007
Contact: SXA-001T-P0.6   AWG22

50 cm

Indoor P.C.

Board

Local supply

CN61

ON/OFF input

COM (0V)

1	1
2	2
3	3
4	4
5	5
6	6

Relay

(DC12V)

Power supply

Max. 2m

J01

DN 2E	J01	Action
0000 (At shipment)	⬤ Connect	**Pulse input** ON ⎍ OFF ⎍ Pulse width 200 to 300ms Pulse interval 200ms or more
	✖ Cut	**Static input** ON ⎍‾‾‾‾‾‾ OFF ⎍
0001	⬤ Connect	Leaving ON prevention control Prohibit Mode Reset ← ON/OFF Permit Mode → OFF ON/OFF Prohibit Mode
	✖ Cut	No action Heating = Lowest set point Cool/Dry = Highest set point Auto/Fan = neglect

Indoor P.C. Board

CN61

1	1
COM(0V) 2	2
Prohibition input 3	3
4	4
5	5
6	6

Local supply

Relay

Relay (DC12V)

Power supply

When signal ON, Remote controller ON/ OFF is prohibited. Central controller becomes Central 1 (ON/OFF Prohibited) mode.
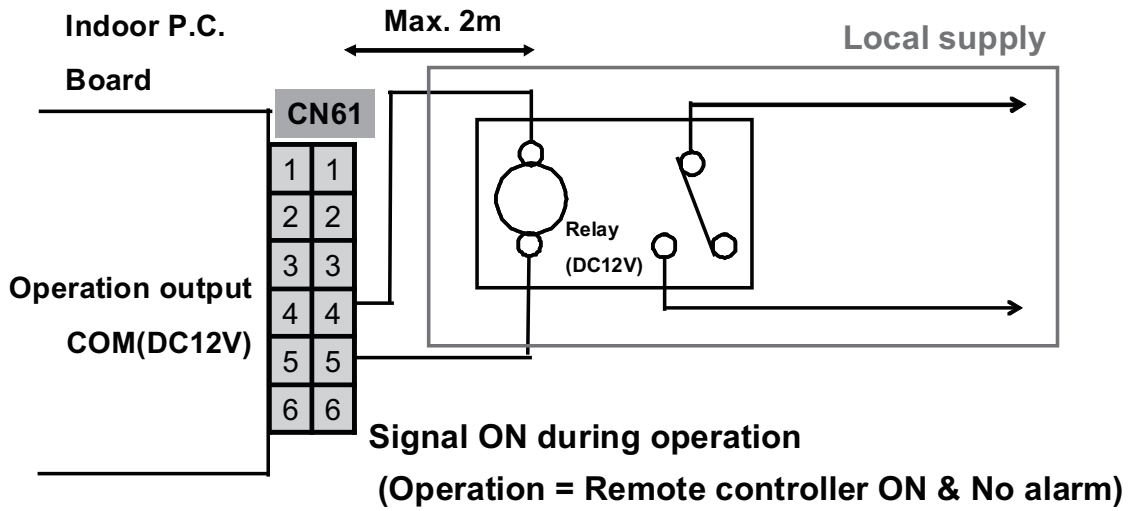
Indoor P.C. Board

CN61

1	1
2	2
3	3
4	4
5	5
6	6

Operation output

COM(DC12V)

Max. 2m

Local supply

Relay (DC12V)

Signal ON during operation

(Operation = Remote controller ON & No alarm)

(Note) Individual signal output group control is available.

If follower indoor unit generates alarm, signal becomes OFF in this indoor unit only.

Indoor P.C. Board

CN61

1	1
2	2
3	3
4	4
5	5
6	6

COM(DC12V)

Alarm output

Max. 2m

Local supply

Relay (DC12V)

Alarm : both indoor/Outdoor alarm
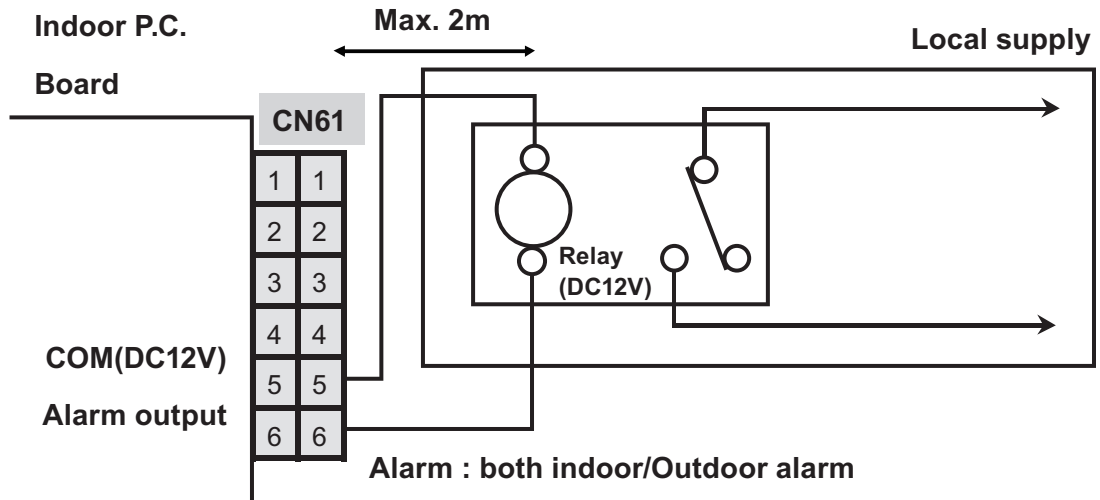
Leaving-ON prevention control

[Function]

- This function controls the indoor units individually. It is connected to the control P.C. board of the indoor unit.
- In a group control, it is connected by cable to the indoor unit (Control P.C. board), and the item code $\mathcal{C}\mathcal{E}$ is set to the connected indoor unit.
- It is used when the start operation from the outside is unnecessary but the stop operation is required.
- Using a card switch box, card lock, etc, the leaving-ON of the indoor unit can be protected.
  - When inserting a card, the start/stop operation from the remote controller is allowed.
  - When taking out a card, the system stops if the indoor unit is operating and the start/stop operation from the remote controller is forbidden.

(1) Control items

 1) Outside contact ON : The start/stop operation from the remote controller is allowed.
          (The card is inserted into the card switch box)

 2) Outside contact OFF : If the indoor unit is operating, it is stopped forcedly.
          (Start/Stop function is prohibited by the remote controller)
          (The card is taken out from the card switch box)

 ∗ This function has priority even if Remote control ON/OFF is prohibited.
 ∗ When the outside contact is off, Remote control ON/OFF will be prohibited and the center side will recognize the status. When the outside contact is on, Remote control ON/OFF will not be prohibited and the center side will recognize the status.
 ∗ When the card switch box does not perform the above contact operation, convert it using a relay with normally-closed contact.

(2) Operation

Handle the wired remote controller switch in the following procedure.

 ∗ Set the wired remote controller switch only when the unit is not in operation.

1 Push concurrently $\overset{SET}{\bigcirc}$ + $\overset{CL}{\bigcirc}$ + $\overset{TEST}{\bigcirc}$ buttons for 4 seconds or more.

2 Using the $\overset{TEMP.}{\underset{\blacktriangledown\ \blacktriangle}{}}$ button, specify the item code $\mathcal{C}\mathcal{E}$.

3 Using the timer time $\overset{TIME}{\underset{\blacktriangledown\ \blacktriangle}{}}$ button, set $\mathit{0001}$ to the setup data.

4 Push the $\overset{SET}{\bigcirc}$ button.

5 Push the $\overset{TEST}{\bigcirc}$ button. (The status returns to the usual stop status.)

(3) Wiring

* In the figure, the contact indicates a status that the card is taken out.

CN61 T10 (YEL)

Indoor control PCB

Relay (procured locally)

Power supply

Outside contact (Card switch box, etc: Procured locally)
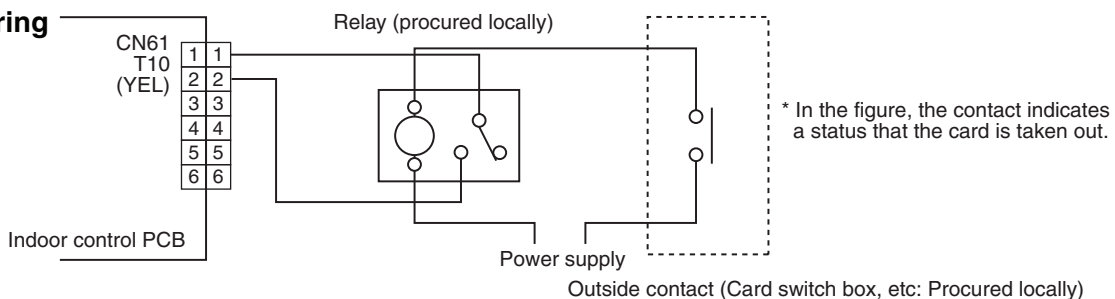
Note) Determine the cable length between the indoor control PCB and the relay so that they are within 2m.

4-4-2-4 Option error input (CN70)

1	Error input	Default : DN2A=0002 (at shipment) DN2A = 0001 (External error input) When signal is input, error symbol is displayed on RC. (Indoor unit dose not stop)
2	0V (COM)	

White

1 — Blue
2 — White

Housing: HER-2 (White)
Contact: SEH-001T-P0.6

UL1007
AWG22

50 cm

Max. 2m

Indoor P.C. Board

Local supply

CN70

Error input 1 | 1
COM(0V) 2 | 2

Relay

Relay coil signal

DN 2A=0001(at shipment 0002)

When signal is input,
Remote controller displays the symbol ⚠
(this symbol is displayed even when RC is off)
Air conditioner dose not stop.

4-4-2-5 Demand input (CN73)

1	Demand input	Indoor unit is forced to turn thermo OFF
2	0V(COM)	

Red

1   **Blue**

2   **White**

50 cm

Housing: HER-2-R (Red)   **UL1007**
Contact: SHE-001T-P0.6   **AWG22**

Indoor P.C.
Board

Local supply

CN73

Demand input

COM(0V)

1   1

2   2

Relay
(DC12V)

Relay coil signal

$1.5k\Omega$

$5v$
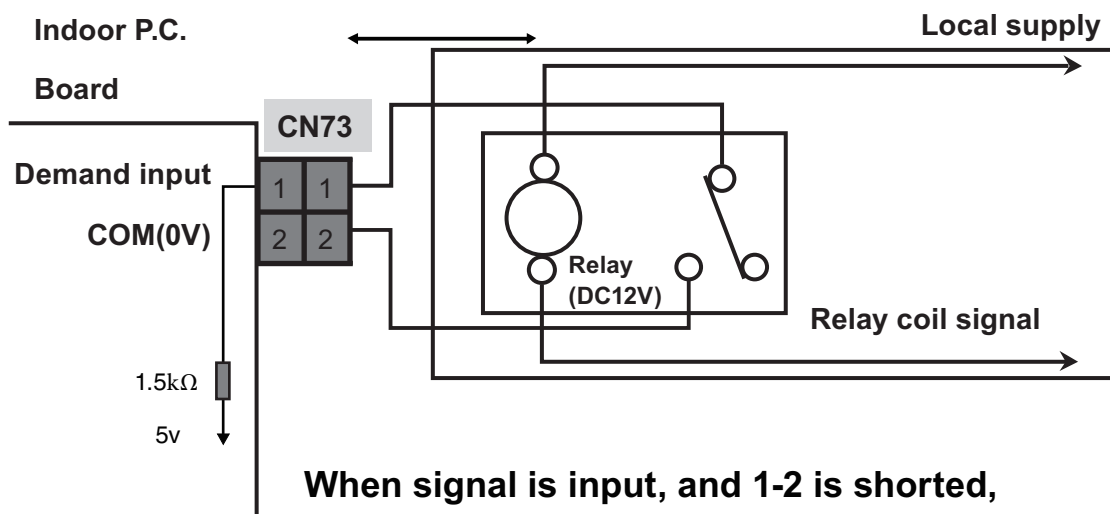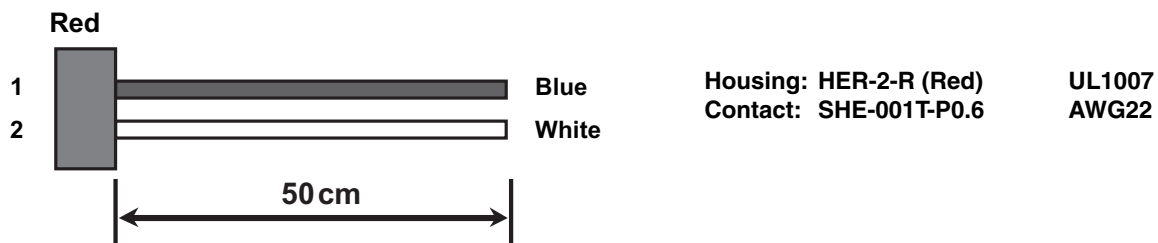
When signal is input, and 1-2 is shorted,
Indoor unit is in "Thermo-off" status forcibly.

4-4-2-6 Outside error input (CN80)

1	DC12V (COM)	Common for Pin.3
2	–	
3	Outside error input	After signal is input: 3 sec.: Thermo-off forcedly 1 min.: Generates Error code "L30" (Interlock from outside) to stop the operation forcedly.
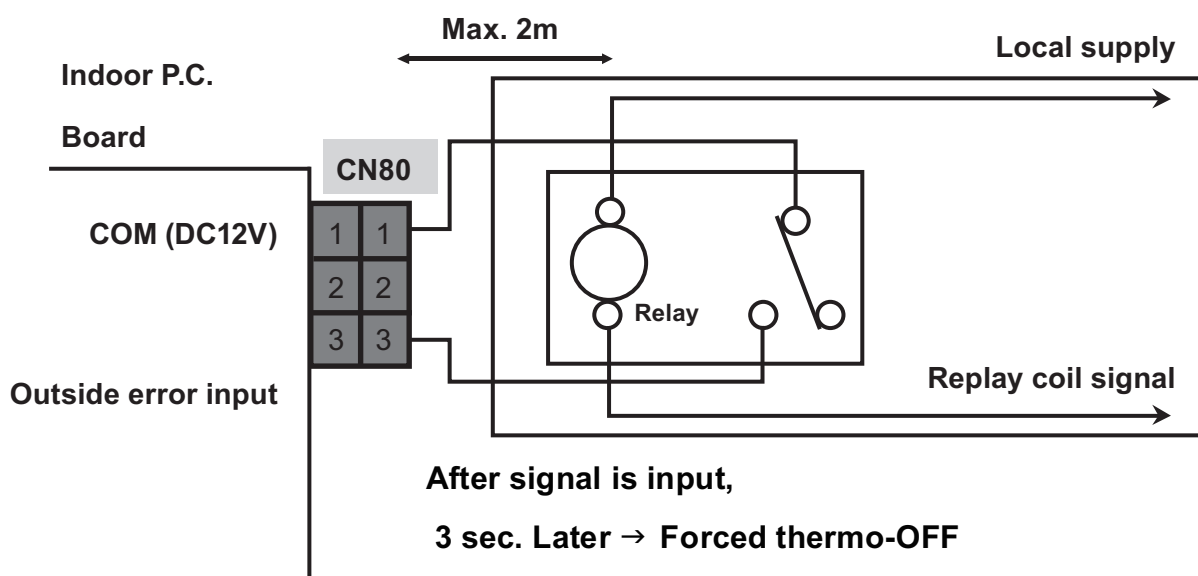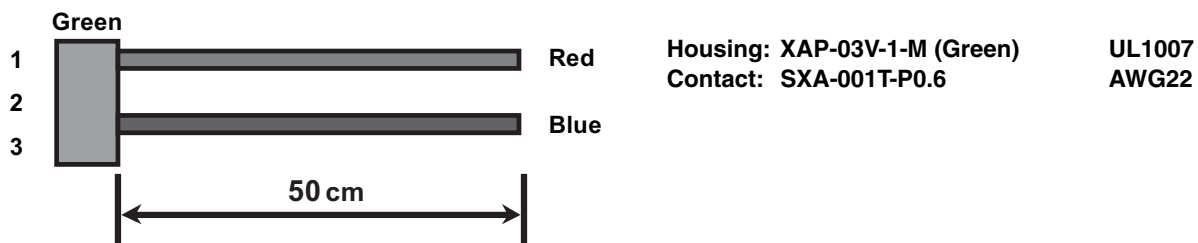
Green

1   **Red**

2

3   **Blue**

50 cm

Housing:	XAP-03V-1-M (Green)	**UL1007**
Contact:	SXA-001T-P0.6	**AWG22**

Max. 2m

Local supply

Indoor P.C.

Board

CN80

COM (DC12V)

1	1
2	2
3	3

Relay

Replay coil signal

Outside error input

After signal is input,

3 sec. Later → Forced thermo-OFF

1 min. later →Error code "L30" (Indoor unit is locked)

(Interlock from outside)

4-4-2-7 Specification of relay

Indoor unit		Specification of Relay
DC motor type	MMU-AP***1H MMU-AP***1MH MMU-AP***2SH MMD-AP***1BH MMD-AP***1SPH MMK-AP***2H MMC-AP***1H	Rated coil current : 75mA (approx.)

Indoor unit		Specification of Relay
AC motor type	MMU-AP***1WH MMU-AP***1YH MMU-AP***1SH MMD-AP***1H MMK-AP***1H MML-AP***1H MML-AP***1BH MMF-AP***1H	Rated coil current :16mA (approx.)

4-4-2-8 HA Terminal

- Daiseikai, Inverter Multi only

■Compliant to JEM 1427 STANDARD (Partial)

1. General outline of operation input / output terminal

Applicable Housing XHP-4 (vender:JST 2.5mm pitch)

HA Terminal Standard JEM1427 (Japan Electrical Manufacturer's Association)					
Pin No	Mark	Specification	Notes		
1	C1	Input signal	Pulse duration	200 to 300ms	The terminal can input a pulse signal. When indoor unit receives a pulse signal, Indoor unit turns over status of operation or stop. -If the operation of indoor unit is running, then indoor unit turns off. -If the operation of indoor unit is stopped, then indoor unit turns on.
2	C2		Pulse interval	200ms or more	
3	M1	Output signal	The terminal can output the status signal of operation or stop. When indoor unit is running, the signal output is ON. When indoor unit is stopped, the signal output is OFF.		
4	M2				

2. Structure of operation input / output terminal

2-1. Input signal terminal of operation status

R=100 ohm

$D:I_f$=100mA or more

2-2. Output signal terminal of operation status

R=100 ohm

$D:I_f$=100mA or more

3. The connection condition and specifications of operation input / output terminal

3-1. Input signal terminal of operation status

1. Input pulse signal specifications

Item	Mark	Specification
Pulse duration	Tp	200ms – 300ms
Pulse interval	Ti	200ms or more

2. Input Pulse pattern

200-300ms 200ms or more 200-300ms

The terminal can input a pulse signal.

When indoor unit receives a pulse signal, Indoor unit turns over status of operation or stop.

- If the operation of indoor unit is running, then indoor unit turns off.

- If the operation of indoor unit is stopped, then indoor unit turns on.

3-2. Output signal terminal of operation status

1. Output signal specification

Item	Specification
Output	While indoor unit runs, the signal is ON.
signal	While indoor unit stops, the signal is OFF.

2. Output signal pattern
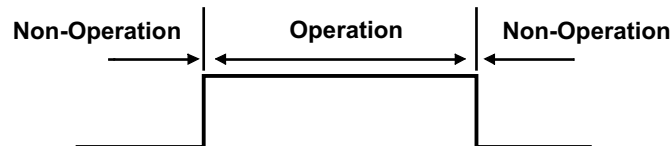
The terminal can output the status signal of operation or stop.

When indoor unit is running, the signal output is ON. When indoor unit isstopped, the signal output is OFF.

3-3. Input and output specification for external circuitry

Terminal	External Photo Coupler Status		Specification		Note
1,2 PIN C1 C2	Ic	ON	Output current	More than 2mA	
			Max tolerance current	5mA	
		OFF	Leak current	Less than 50µA at Vc=30v	
	Vc	ON	Operating voltage	Less than 0.6v at Ic=2mA	
		OFF	Surge tolerance voltage	More than 30V	
3,4 PIN M1 M2	Im	ON	Max ON detection current	2mA	
			Max tolerance current	20mA	
			Max peak current	50mA	Average is max 20mA
		OFF	Leak current	Less than 10µA	
	Vm	ON	Operating voltage	Less than 1.6v at Im=2mA	
		OFF	Max voltage	0.3v	Typical value

4-4-3 Remote sensor (TCB-TC21LE2)

[Installation work and service]

Accessory parts

Part Name	Q'ty	Part Name	Q'ty
Remote sensor (200mm-cable attached)	1	Spacer	2
Small screw M4 x 25	2	Wire joint	2
Wood screw	2	Cable clamper	1
		Installation Manual	1

Requirement to install the remote sensor

Installation place

• Install the remote sensor at a position with height of 1 to 1.5m from the floor, where the average temperature in the room can be felt.
• Do not install the remote sensor at a place exposed to the direct sunlight or direct outside air, such as on the side of window, etc.
• Do not install the remote sensor in a place that is behind something or to the rear side of something, where air flow is poor.
• Do not install the remote controller in a place where it may be subjected to high levels of moisture or water intake, as the unit is not water proof.
• Be sure to set the remote sensor so that it is positioned vertically on the wall surface, etc.

How to install the remote sensor

NOTE 1 : Do not twist or route (in the same conduit) the remote sensor cable with the main power supply, as a malfunction may occur.
NOTE 2 : Install the remote sensor away from any source of electrical noise.
NOTE 3 : When noise is induced into the power source of the indoor unit, some measures such as mounting a noise filter is necessary.
• In case of using the remote sensor as a concealed type
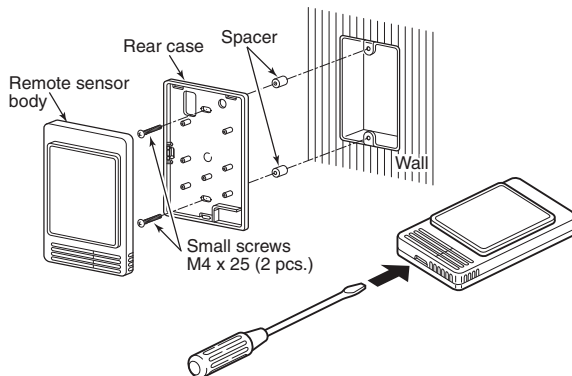
1. To remove the cover from the rear case gently place a flat blade screwdriver into the gap at the bottom and rotate. This will prise open the case.
2. Using the attached M4 screws (2 pcs.), fix the rear case of the remote sensor. Before installation, open up the screw holes with a screw driver or another suitable tool.

The sensor comes with spacers attached to the rear section, if the remote sensor does not fit closely to the wall, adjust the distance by cutting off the spacer. Do not apply excessive force when fixing the sensor to the wall surface.
3. Connect the remote sensor cable (2 cores) to the terminal numbers on the indoor unit. (Applying AC 220/230/240V breaks the unit.)
4. Install the remote sensor body by matching the tabs on the rear case.

How to perform the cabling of the remote sensor

In case of using the remote sensor as a concealed type

• **Connection diagram**

• Non polarity, 2 core cable is used..
• Use 0.5mm² to 2 mm² cable.
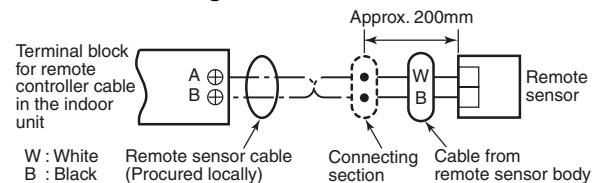
Attached wire joint (White, 2 pcs.)	1) Peel the sheath on the cable that is to be connected by approx. 14mm. 2) Twist two cables and pressure-connect them using a wire joint. 3) When an exclusive pressure-connecting tool is not used or a soldering connection is used, apply some insulation tape.
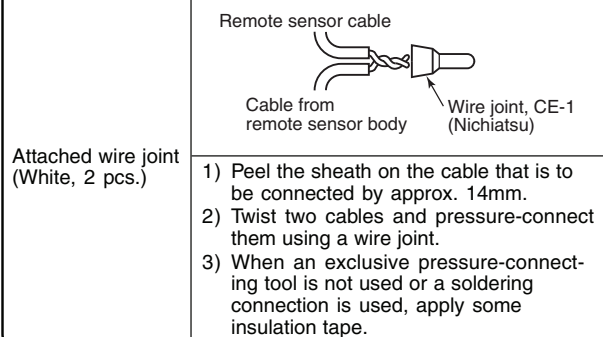
Requirement for using the remote sensor together with the remote controller

• **How to install**
For the above control, install the remote sensor in the following procedure.
1. Set the remote controller as the master remote controller.
2. For correct temperature control by remote sensor, do not change the remote sensor switch in the master remote controller. (In case of using RBC-AS21E2)

• **Basic cabling diagram**
1. Connect cables without miswiring. (Miswiring may cause the unit to fail.)
2. In a situation where you need to operate an indoor unit from the remote sensors and the remote controller.
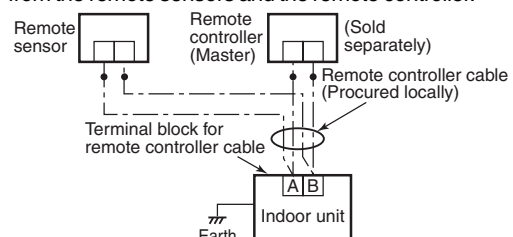
[Note]

In case of using the remote sensor "TCB-TC21LE",

don't select "remote controller sensor" by item code (DN) setting.

You can use only one remote controller sensor (set as the master remote) together with the remote sensor.

Room temperature data

For collecting room temperature data for control purposes, you can choose the body TA sensor or a remote sensor.

You can use the special sensor TCB-TC21LE or the sensor built in to the remote control. When you use group control, the sensor option varies as shown on the following table, depending on the system you use (VRF (SMMS-i, SMMS, S-HRM, MINI-SMMS) or DI/SDI).

Category	Group Control	Room temperature for control		
		Body TA sensor	**TCB-TC21LE**	**Sensor in Remote controller**
VRF	**Group**	yes(each)	prohibited	prohibited
	Individual	yes(each)	yes(each)	yes(each)
DI/SDI	**Group/Twin/Triple**	yes(Master)	yes(Master)	yes(Master)
	Single	yes(each)	yes(each)	yes(each)
DN code=32 TA sensor selection setting		Body TA sensor	Body TA sensor Note 1	Remote controller sensor. Note 2

[Note 1] Switched automatically upon the detection of communication between an indoor unit and the remote sensor. Body TA sensor is used if the remote sensor is detached. Remote control must be one. Able to use with another sensor at the same time if set to do so in the master settings.

[Note 2] If two remote controllers are used, the sensor in the master remote controller is selected by making the switch setting "Master" on the master remote. However, if the sensor in the wireless remote controller is set as master, cancelling the selection of the sensor in the remote controller on the wireless remote with its remote controller sensor switch changes the sensor to be used into the body TA sensor.

The sensor in the wireless remote controller is only used when the wireless remote controller operation has been activated with the Start/Stop button operation.

[Note 3] In group control, the remote controller does not work if the group address is not set to the indoor unit of the master unit.

[Note 4] Do not install the remote sensor where air flow is poor.

4-5 Application controls of outdoor unit

■ **SMMS-i, SMMS, SHRM**

The following functions become available by setting the switches on the outdoor interface P.C. board.

No.	Function	Switch No.	Bit
1	Outdoor fan high static pressure shift	SW10	2
2	Cooling priority, Heating priority control	SW11	1, 2

Interface P.C. board of outdoor unit

<SMMS-i>

<SMMS>

Switch position magnified drawing

SW06 SW07 SW09 SW10
2

SW11 SW12 SW13 SW14

SW11
1,2

SW16 SW17

Switch position magnified drawing

SW11
1,2

SW10
2

331
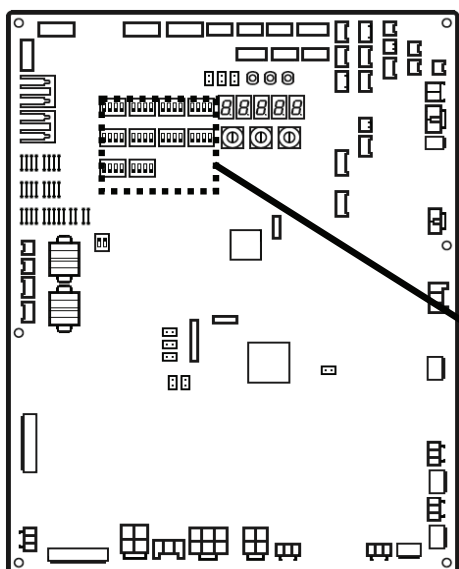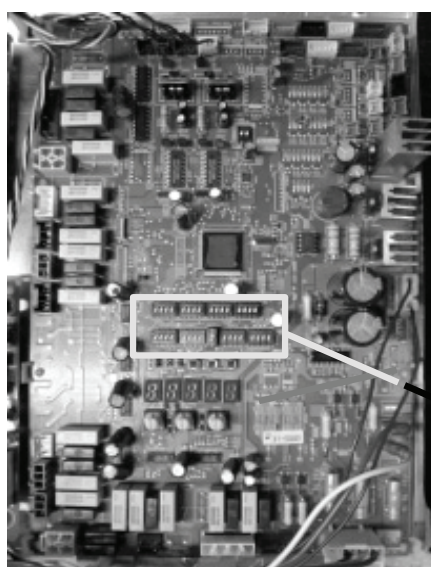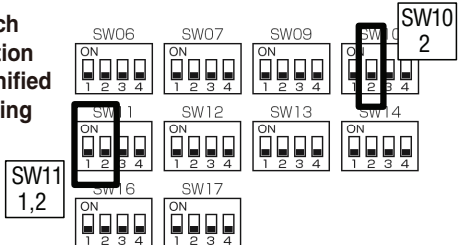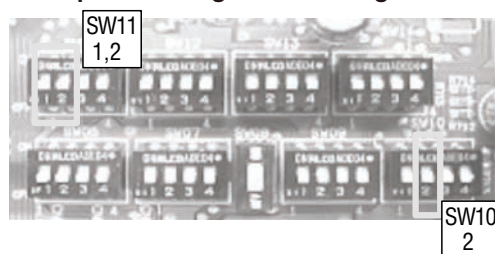
4-5-1 Outdoor fan high static pressure shift

■ Usage/Features

This function is set when connecting a duct to the discharge port of the outdoor unit.

■ Setup

Turn "Bit 2" on the Dip switch [SW10] on the interface P.C. board on the outdoor unit to the ON side. For the outdoor units which are connected with the ducts, set this function regardless of the header unit or follower unit.

■ Specifications for SMMS

Increase No. of rotations on the propeller fan of the outdoor fan so that a duct with the maximum outside static pressure 35Pa (3.5mmAq) can be installed. If installing a discharge duct (Below 35Pa (3.5mmAq)) but exceeding the duct resistance 15Pa (1.5mmAq), execute this setup.

Discharge air volume in each outdoor unit is described in the following table.

Capacity rank (MMY-MAP)	0501, 0601 type	0801 type	1001, 1201 type
Standard air volume of outdoor unit (m³/min.)	150	165	175

■ Specifications for SMMS-i

This function increases the revolution speed of the fan of the outdoor unit to make it possible to install a duct which requires the maximum outside static pressure shown in the list below. Turn this setting on if you install an air-outlet duct whose resistance is more than 15Pa (1.5mmAq). The maximum outside static pressure values of basic units are shown below.

Capacity rank (MMY-MAP) Inverter unit	0804 type	1004 type	1204 type	1404 type	1604 type
Max outdoor static pressure(Pa)	60	60	50	40	40
Air volume of outdoor unit (m³/min)	165	175	193	200	216

(Note) The outdoor unit's air volume when the outside static pressure is 0Pa and the fan's speed has been increased.
To find the actual air volume, calculate the duct resistance from the air volume of the outdoor unit.

4-5-2 Cooling priority, heating priority control

■ Usage/Features

Cooling priority or heating priority can be selected.

There are the following four patterns in selecting setup of the priority mode. Select a priority mode based upon the demand of the destination to be installed.

*For Super HRM system, don't set SW11 (Leave as it is at shipment.)

■ Setup

(Note) In "Specific indoor unit priority" mode only, it is necessary to set up one indoor unit, which you wish to give priority to. (Refer to "4-4-1".)
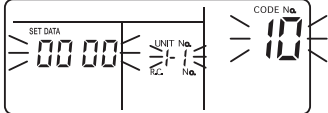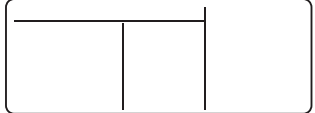
Outdoor unit (Header unit only) setup

SW11		Operation
Bit 1	Bit 2	
OFF	OFF	Heating priority (Setup at shipment)
ON	OFF	Cooling priority
OFF	ON	No. of operating units (Priority is given to operation mode that has the most demand)
ON	ON	Specific indoor unit priority (Priority is given to operation mode of the indoor unit to which the operation mode priority has been set to)

4-5-3　Indoor unit setup in "Specific indoor unit priority" mode

① Setup switch (sw11) on interface P.C. board of header outdoor unit. (SW11 bit1=ON, bit2=ON)
② The setup can be changed when the system is not in operation. (Be sure to stop the system.)

Procedure	Operation contents
1	When pushing the SET + CL + TEST buttons at the same time for 4 seconds or more, as shown in the figure, the display section flashes and after a short period of time the following confirmation code should be displayed [*10*]. • When the item code is one other than [*10*], push the TEST button to eliminate the display and then repeat the procedure from the first step. (The remote controller operation is not accepted for approx. 1 minute after pushing the TEST button.) (In a group control, the indoor unit with its number displayed first is set to the header unit.)
2	For every push of the UNIT, the indoor unit numbers in the group control are successively displayed. Select the indoor unit of which setup is to be changed. In this time, the fan and louver of the selected indoor unit will operate allowing you to identify the position of the indoor unit of which the setup is to be changed.
3	Using the TEMP. ▼ ▲ buttons, specify the item code [*04*].
4	Using the TIME ▼ ▲ buttons, select the setup data [*0001*]. Priority: *0001*, No priority: *0000*
5	Push the SET button. In this time, the setup operation finishes when the display changes from flashing to lighting.
6	After setup operation has finished, push the TEST button. (Setup is determined.) When pushing the TEST button, the display disappears and the status returns to the usual stop status. (The remote controller operation is not accepted for approx. 1 minute.)

(NOTE)

Only one indoor unit can be set to "Priority". If the multiple indoor units are accidentally set to "Priority", an error code (L05 or L06: Duplicated indoor unit priority) is displayed.

If a unit is displaying "L05", [0001 (Priority)] setup. Identify the unit which you will give priority to from the other indoor units and return the setup data for all other indoor units to [0000 (No priority)].

Error code	Error contents
L05	Indoor unit priority duplication ([*0001*] is set up.)
L06	Indoor unit priority duplication ([*0000*] is set up.)

■ Mini SMMS

When using the outdoor unit under the following conditions,it is necessary to set up DIP switch on the outdoor unit interface P.C. board.

Setup

Set up DIP switch

1. When using PMV Kit in the Mini-SMMS system
2. When using the indoor unit under high humidity condition
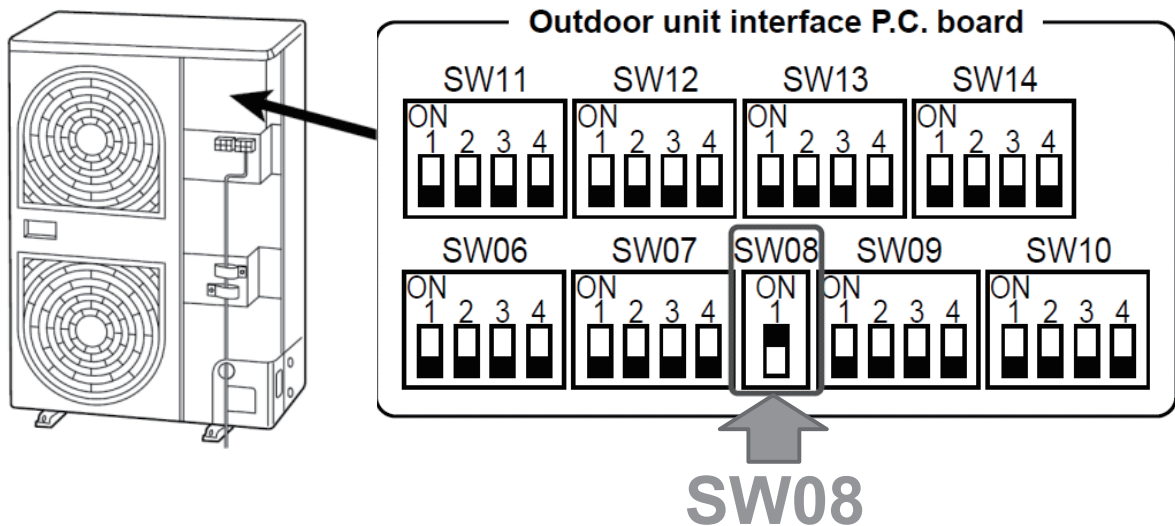
[Reference]
Indoor side: 27 °C dry bulb temperature
24 °C wet bulb temperature
Operation time 4 hours or more

4-5-4 Cooling Priority, Heating Priority, Specific indoor unit Priority control

■ **Usage/Features**

Cooling priority or heating priority can be selected.

There are the following four patterns in selecting setup of the priority mode. Select a priority mode based upon the demand of the destination to be installed.

■ **Setup**

(Note) In "Specific indoor unit priority" mode only, it is necessary to set up an indoor unit only which you desire to give priority.
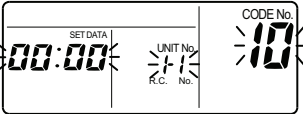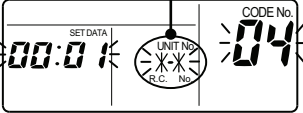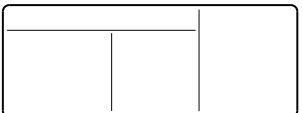
1. Outdoor unit (Header unit only) setup

SW11		Operation
Bit 1	**Bit 2**	
OFF	OFF	Heating priority (Setup at shipment)
ON	OFF	Cooling priority
OFF	ON	No. of operating units (Priority is given to operation mode with which much more units operate.)
ON	ON	Specific indoor unit priority (Priority is given to operation mode of the indoor unit to which the operation mode priority has been set up.)

2. Indoor unit setup in "Specific indoor unit priority" mode

The setup can be changed during stop of operation. (Be sure to stop the system.)

Procedure	Operation contents
1	When pushing [SET] + [CL] + [🔧] buttons at the same time for 4 seconds or more, as shown in the figure, the display section flashes after a while confirm the displayed item code is [*10*]. • When the item code is one other than [*10*], push [🔧] button to eliminate the display and then repeat the procedure from the first step. (The remote controller operation is not accepted approx. 1 minute after pushing [🔧] button.) (In a group control, the indoor unit with number displayed firstly is set to the header unit.)
2	Every pushing [UNIT], the indoor unit numbers in the group control are successively displayed. Select the indoor unit of which setup is to be changed. In this time, as the fan and louver of the selected indoor unit operate, the position of the indoor unit of which setup is to be changed can be confirmed.
3	Using the setup temperature [▲] and [▼] buttons, specify the item code [*04*].
4	Using the timer time [▲] and [▼] buttons, select the setup data [*0001*]. Priority: *0001* , No priority: *0000*
5	Push [SET] button. In this time, the setup operation finishes when the display changes from flashing to lighting.
6	After setup operation has finished, push [🔧] button. (Setup is determined.) When pushing [🔧] button, the display disappears and the status returns to the usual stop status. (The remote controller operation is not accepted for approx. 1 minute.)

(NOTE)

Only one indoor unit can be set to "Priority". If the multiple indoor units are accidentally set to "Priority", an error code (L05 or L06: Duplicated indoor unit priority) is displayed.

To the unit displaying "L05", [0001 (Priority)] is setup. Separate a unit which you will give priority from the other indoor units, and return the setup data of the other indoor units to [0000 (No priority)].

Error code	Error contents
L05	Indoor unit priority duplication ([*0001*] is set up.)
L06	Indoor unit priority duplication ([*0000*] is set up.)

4-6 Application controls by optional P.C. board of outdoor unit

The following functions become available by using a control P.C. board sold separately.

Set up the switches on the header outdoor unit (U1).

■ SMMS, SHRM, Mini-SMMS

No.	Function	Switch No.	Bit	Connector No.	Used control P.C. board
1	Power peak-cut control (Standard)	SW07	1	CN513	TCB-PCDM2E
2	Power peak-cut control (Expansion)	SW07	1,2	CN513	TCB-PCDM2E
3*	Snowfall fan control	—	—	CN509	TCB-PCMO2E
4	External master ON/OFF control	—	—	CN512	TCB-PCMO2E
5	Night operation control	—	—	CN508	TCB-PCMO2E
6	Operation mode selection control	—	—	CN510	TCB-PCMO2E
7	Error output control	—	—	CN511 / C513**	TCB-PCIN2E

* Not applicable for Mini-SMMS.   ** Use C513 for Mini-SMMS.

Outdoor unit interface P.C. board

Connector position magnified drawing

CN508 Red | CN509 Black | CN510 White | CN513 Blue

CN511 Green
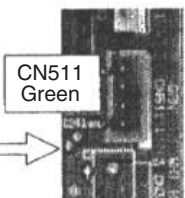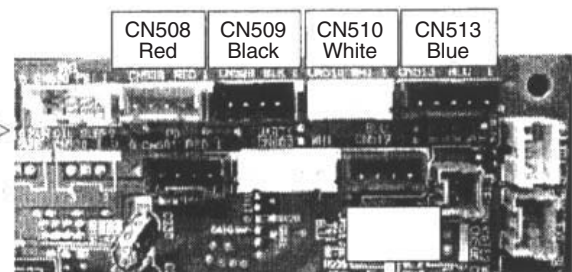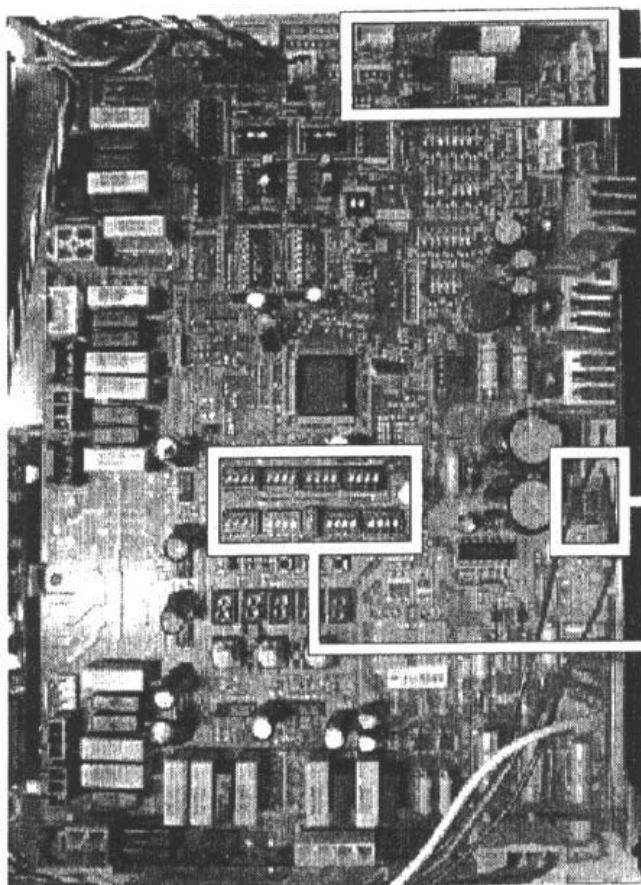
Switch position magnified drawing
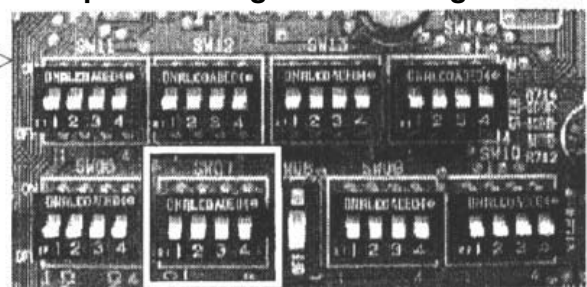
SW07

Bit 1	For power peak-cut control selection
Bit 2	For power peak-cut control (expansion) selection

■ Dimension

TCB-PCDM2E
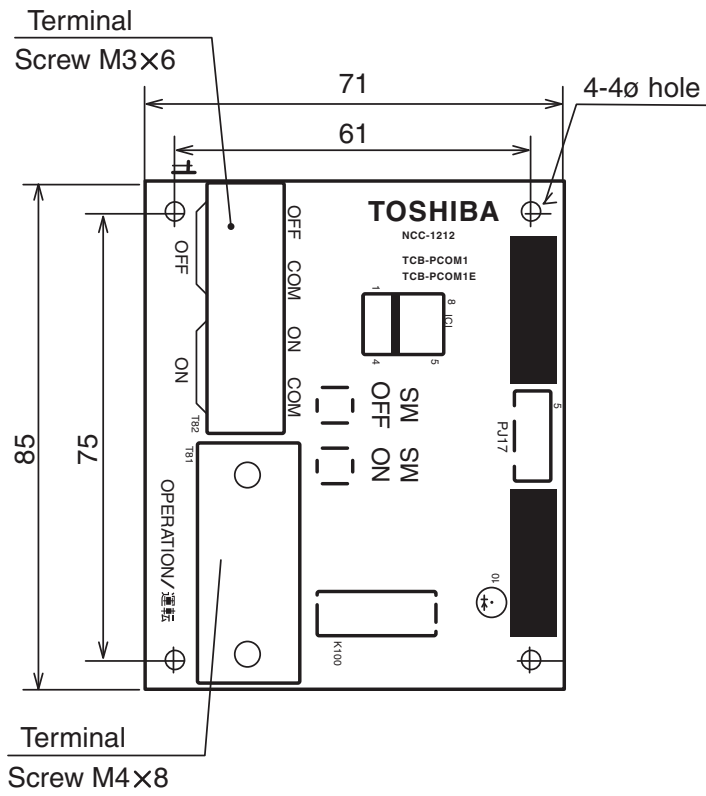
TCB-PCMO2E
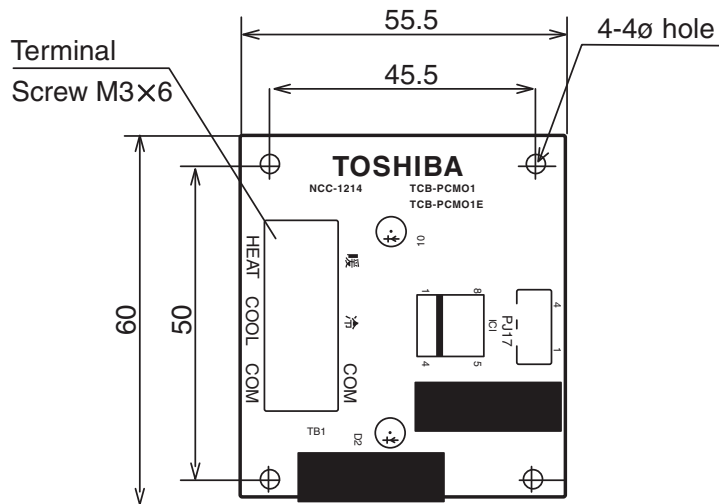
TCB-PCIN2E
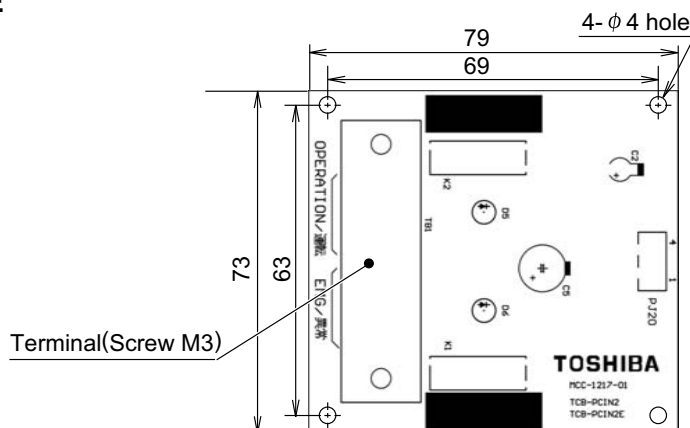
Installation procedure of power peak cut control board (TCB-PCDM2E)

1. Accessory parts

No	Parts name	Q'ty	No	Parts name	Q'ty
1	Power peak-cut control board	1	5	Installation manual	1
2	Connection cable	1	6	Cable-clamp	1
3	Support to fix the board	4	7	Screw for cable-clamp	1
4	Installation manual	1	8	Binding band	2

2. Placing Position

Install this P.C. board on the upper side of the inverter assembly on the outdoor unit.

See TCB-PCDM4E for Mini-SMMS.

Power peak-cut control board

Interface PCB

TCB-PCDM2E

85   35

I/F board
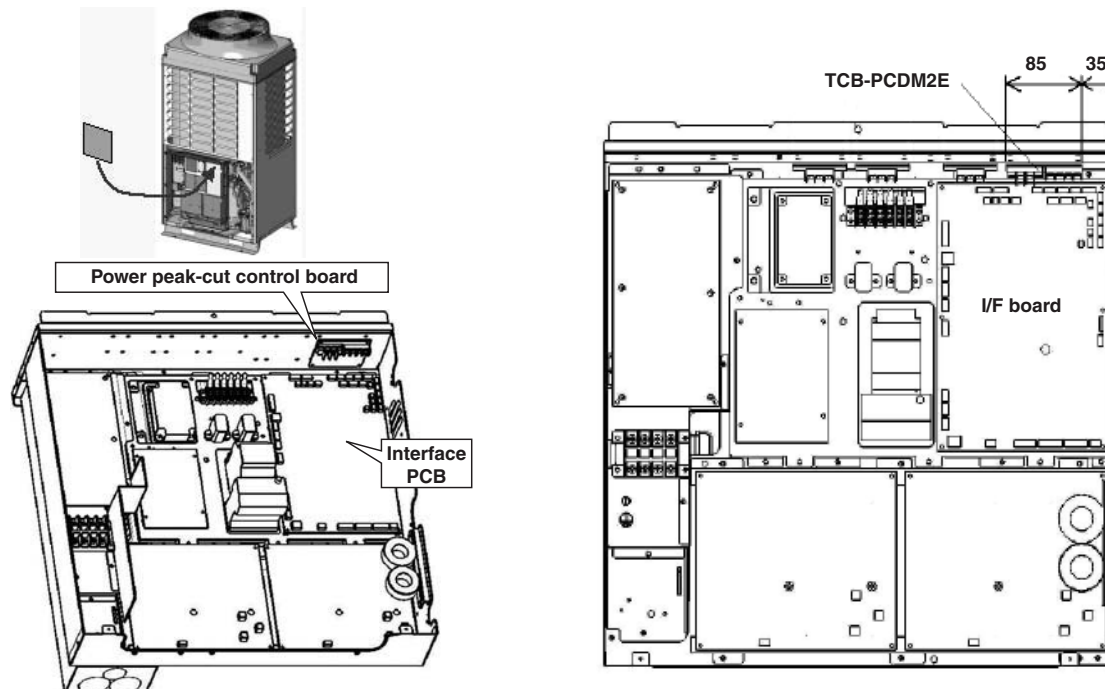
3. How to install

(1) Be sure to turn off the power supply when installing.

(2) Install this P.C. board by using the support to fix the board.

There are four installation holes to place the support, they can be found on the upper side of the inverter assembly.

(3) Connect the P.C. board (TCB-PCDM2E) PJ17 and outdoor unit interface CN513 with the connection cable.

(4) Bind the remaining cable with the attached banding band.

Interface P.C. board

CN513
Blue
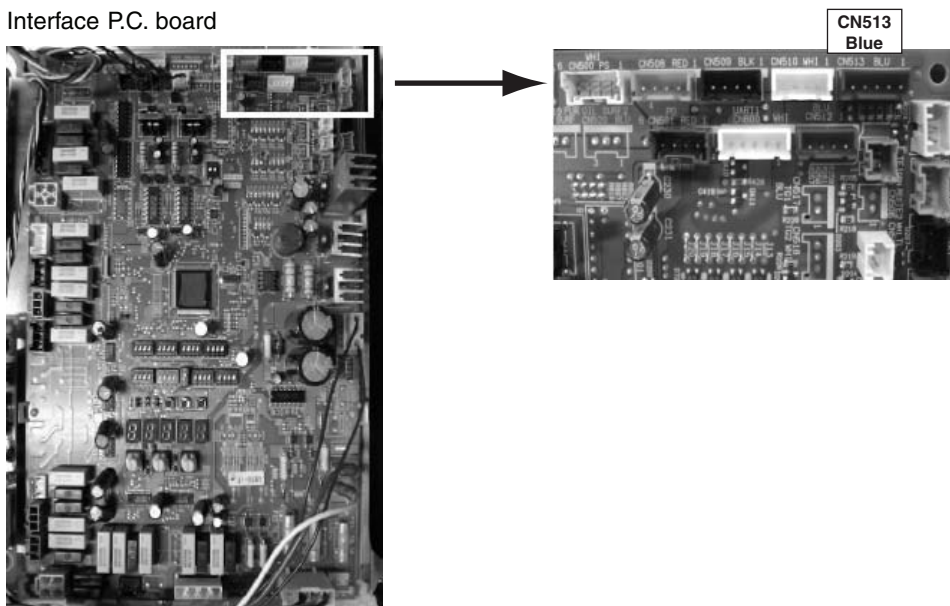
4. wiring

	Length	Size	Type
Input wiring	Up to 500m	2-core or 3-core, 0.75mm^2	Shield wire
Output wiring	Up to 200m	2-core, 0.75mm^2*	Shield wire
	Up to 400m	2-core, : 1.5mm^2*	

* In conformity with design 60245 IEC 57

(1) Refer to the "Electric wiring diagram" when wiring.
(2) Be sure to use shielded wire to prevent electrical noise interference, and earth both sides of shielded wires.
(3) Fix the output wiring with the cord clamp and banding band.
Place the output wiring into the banding band and band it together with the other wiring.
Fix the cord clamp using the screw hole on the "B" position.

[Inverter assembly box]

A

B

Binding band

Cable-clamp

Output wiring
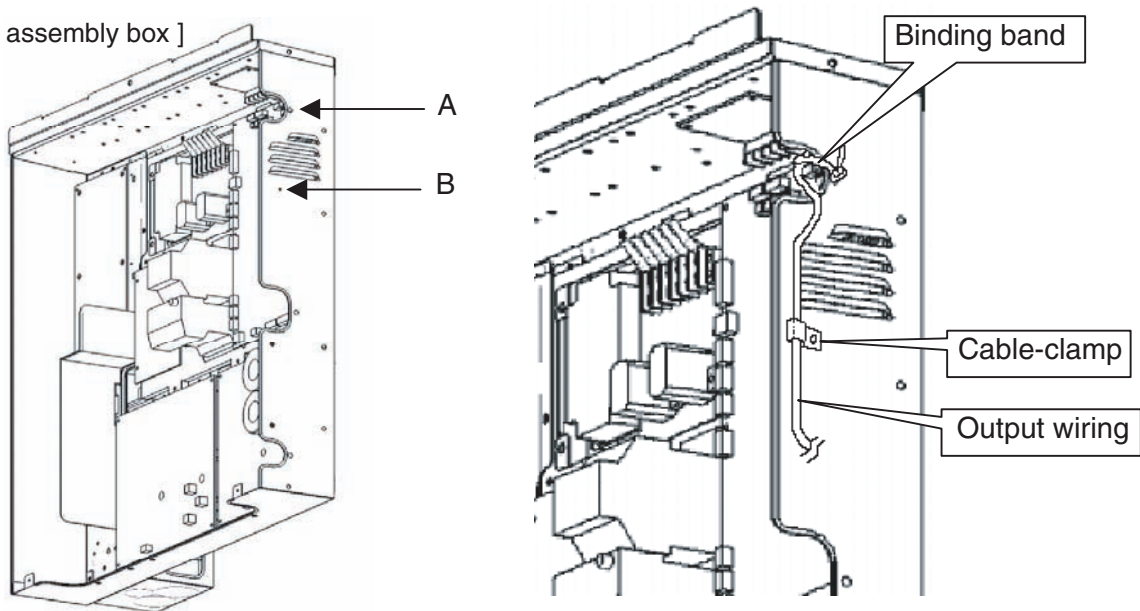
Installation procedure of external master ON/OFF control board (TCB-PCMO2E)

1. Accessory Parts

No	Parts name	Q'ty	No	Parts name	Q'ty
1	External master ON/OFF control board	1	5	Installation manual	1
2	Connection cable	1	6	Binding band	1
3	Support to fix the board	4	7	Screw for cable clamp	1
4	Instruction Manual	1			

2. Placing position

See TCB-PCMO4E for Mini-SMMS.

Install this P.C. board to the upper position on the inverter assmembly on the outdoor unit.

Up to 4 TCB-PCMO2E can be installed simultaneously in one inverter assembly.
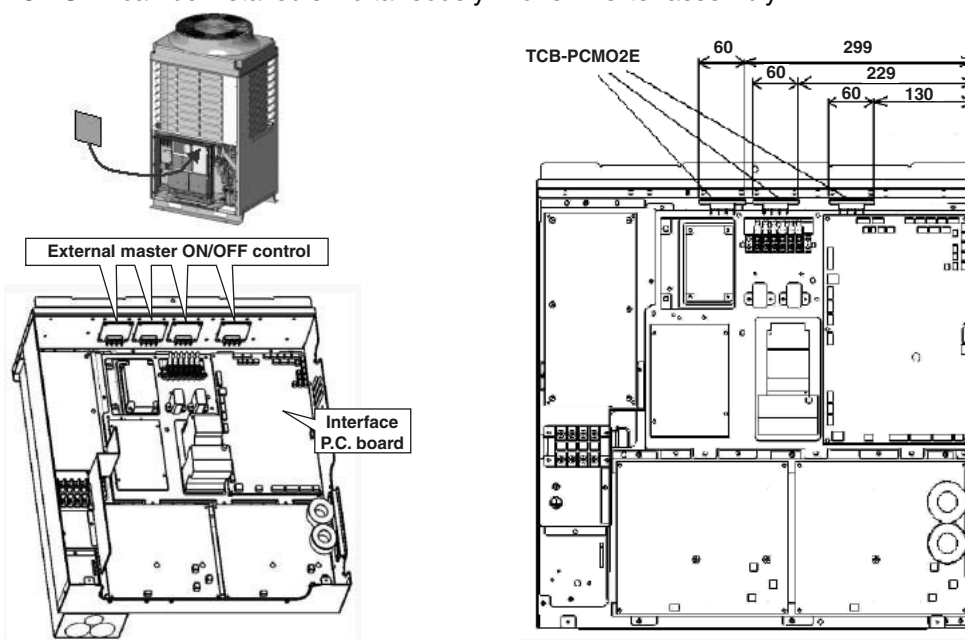
3. How to install

(1) Be sure to turn off the power supply when installing.

(2) Place this P.C. board by using the support to fix the board.
There are four installation holes to place the support, they can be found on the upper side of the inverter assembly.

(3) Connect the P.C. board (TCB-PCMO2E) PJ17 and outdoor unit interface CN508 to CN512 with the connection cable.
Connecter on interface P.C. board is different according to its purpose.

(4) Install the P.C. board so that the terminal block faces the inside of the inverter box assembly.

Interface P.C. board
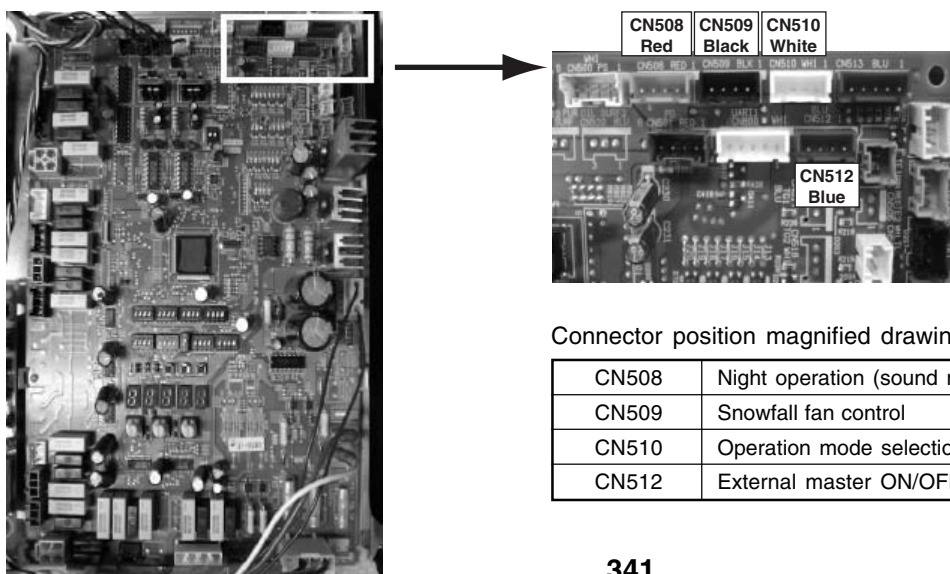
Connector position magnified drawing

CN508	Night operation (sound reduction) control
CN509	Snowfall fan control
CN510	Operation mode selection control
CN512	External master ON/OFF control

Installation procedure of Error/operation output control board (TCB-PCIN2E)

1. Accessory parts

No.	Parts name	Q'ty
1	Connection cable	1
2	Support to fix the board	4
3	Earth screw	2
4	Wire-clamp	1
5	Screw for cable-clamp	1
6	Binding band	2

See TCB-PCIN2E for Mini-SMMS installation/wiring.

2. Installation

Install this P.C. board to the upper side of the electric component box on outdoor unit.

[Outdoor unit]   **[Electric component box]**

TCB-PCIN2E

Outdoor unit interface PC board
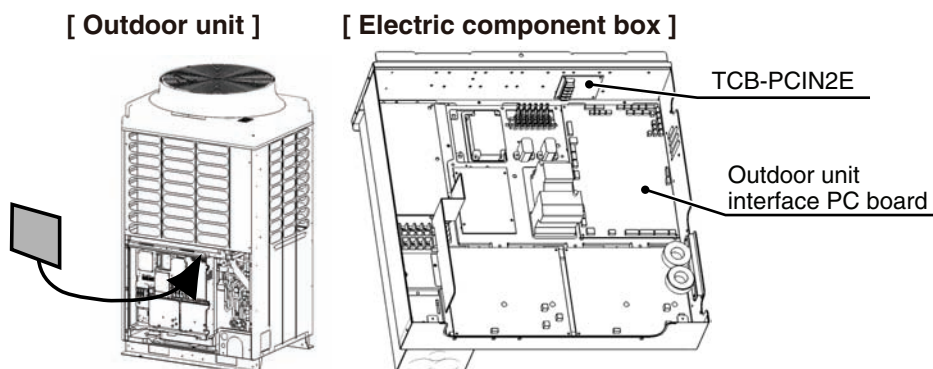
(1) Be sure to turn off the power switch before installing.

(2) Place this P.C. board by using the support on the upper side of the electric component box. There are four installation holes to place the support on the upper side of the electric component box.

(3) Connect the P.C.board (TCB-PCIN2E)PJ20 and outdoor unit interface CN511 withconnection cable.

(4) Bind the remaining connection cable with the attached banding band.

[Outdoor unit interface PC board]

CN511 GREEN
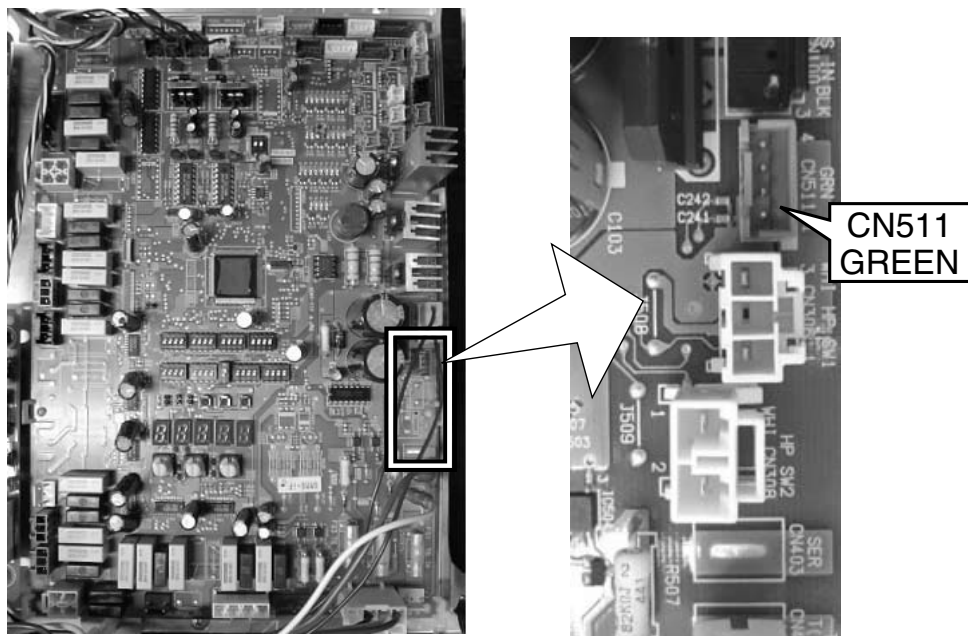
3. Wiring

	Length	Size	Type
Output wiring	Up to 200m	4-core, 0.75mm^2 $\star$	Shield wire
	Up to 400m	4-core, 1.5mm^2 $\star$	

$\star$ In conformity with design 60245 IEC 57

(1) Refer to the "Electric wiring diagram" when wiring.

(2) Be sure to use the shield wire to prevent noise trouble, and perform the grounding at both sides of shield wires.

(3) Fix the output wiring with the cable-clamp and banding band.

    (3)-1. Let the output wiring into the banding band and band it together with the other wiring.

    (3)-2. Fix the wire-clamp using the screw hole on the "B" position.

[Electric component box]

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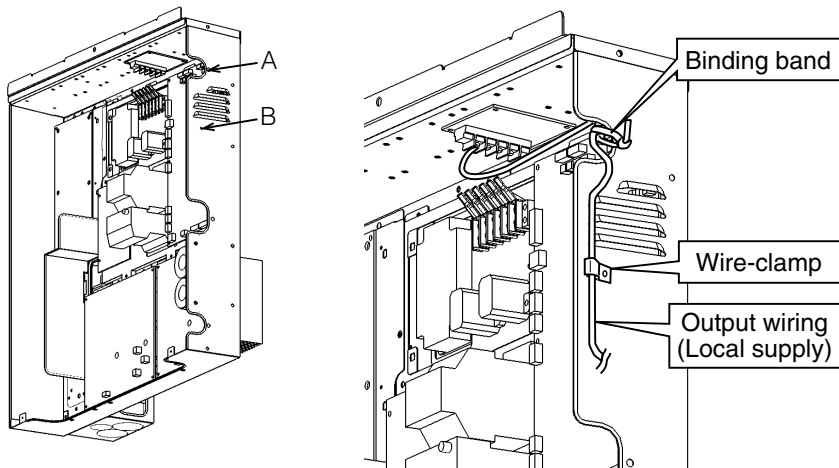
■ SMMS-i, SMMS, SHRM, Mini-SMMS

The following functions become available by using a control P.C. board sold separately.

NO.	Function	Connected Outdoor unit	Switch No.	Bit On/off	JP for SMMS-i	Connector No.	Used control P.C.Board	Note
1	Power peak cut control (standard)	header	SW07	1 on/off 2 off	JP16	CN513	TCB-PCDM4E	In case of SMMS-i JP16 cut, one input switch is possible.
2	Power peak cut control (extension)	header	SW07	1 on/off 2 on		CN513	TCB-PCDM4E	
3	Snowfall fan control	header				CN509	TCB-PCMO4E	Not applicable for Mini-SMMS
4	External master ON/OFF control	header				CN512	TCB-PCMO4E	
5	Night operation (Sound reduction) control	header				CN508	TCB-PCMO4E	
6	Operation mode selection control	header			JP01	CN510	TCB-PCMO4E	In case of SMMS-i JP01 cut, forcible operation mode is possible.
7	Error/operation output control	header				CN511 C513	TCB-PCIN4E	C513 for Mini-SMMS
8	Compressor operation status	each				CN514	TCB-PCIN4E	Can not be used simultaneously.
9	Operation output ratio	header	SW16	1 on		CN514	TCB-PCIN4E	Applicable for only SMMS-i

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■ Dimension

TCB-PCDM4E

Terminal block (M3)

4-4 mm dia. mounting holes

TOSHIBA

NCC-1212

TCB-PCDM2
TCB-PCDM2E

71

61

85

75

OFF

COM

ON

COM

OFF

ON

SW
OFF

SW
ON

PJ17

OPERATION/運転

Terminal block (M4)

TCB-PCMO4E

55.5

45.5

TOSHIBA

NCC-1214

TCB-PCMO1
TCB-PCMO1E

Terminal block (M3)

60

50

HEAT 暖

COOL 冷

COM COM

PJ17

4-4 mm dia. mounting holes

TCB-PCIN4E

73

63

79

69

PJ20

MCC-1613-02

Terminal block (M3)

4-4 mm dia. mounting holes

OUTPUT1 OUTPUT2 OUTPUT3
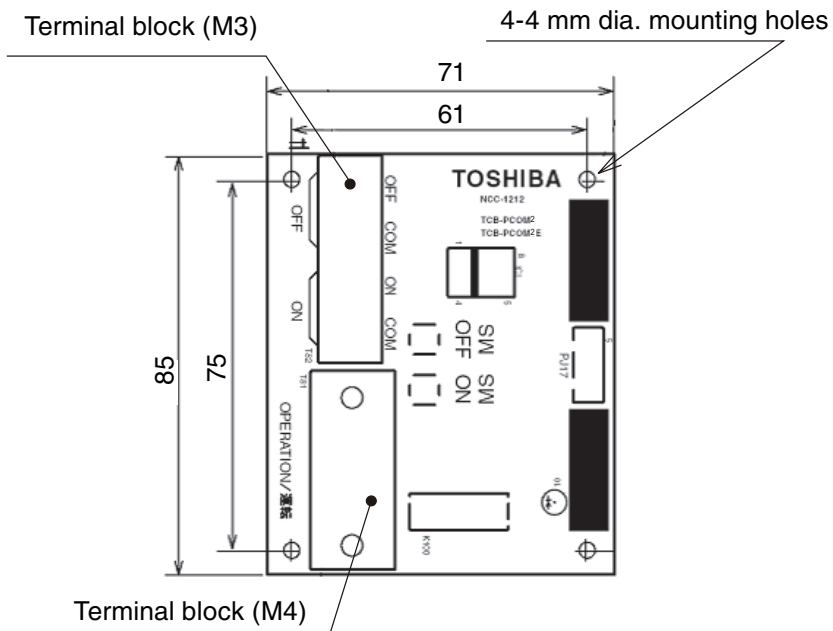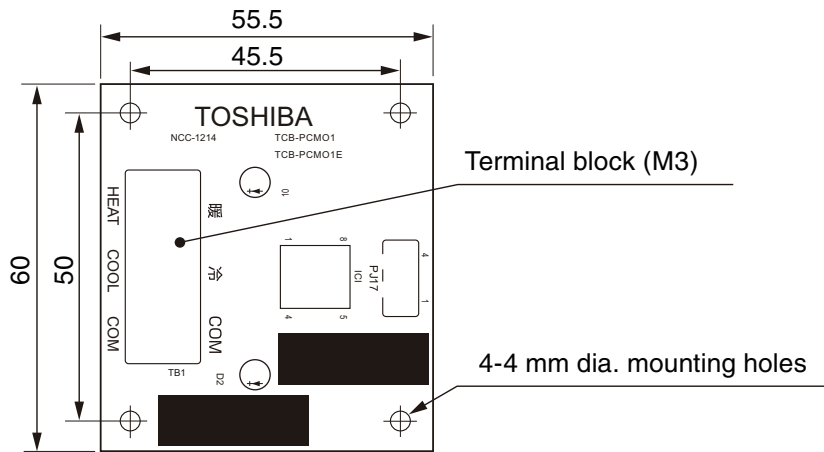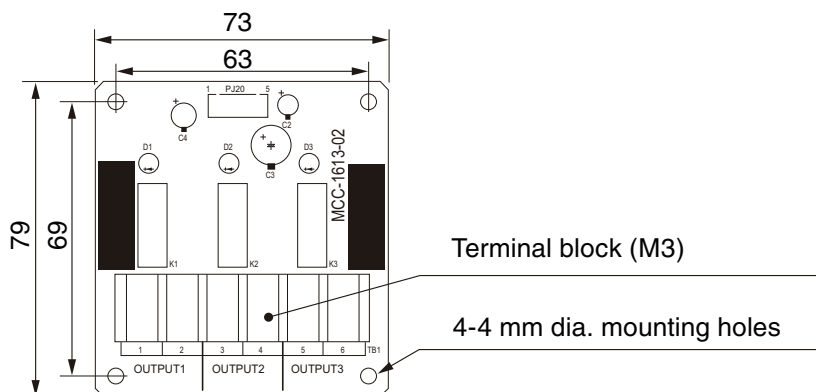
Installation procedure of Power peak cut control board (TCB-PCDM4E)
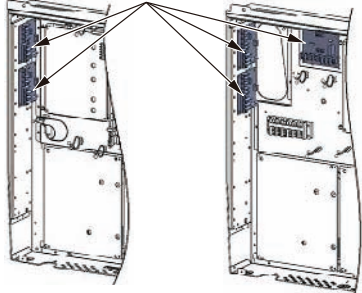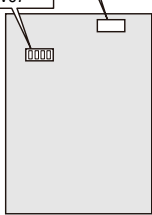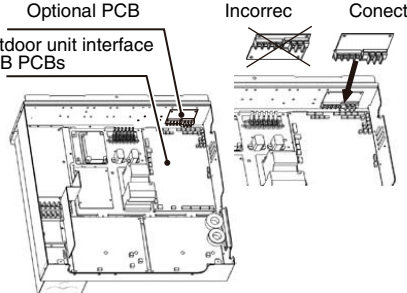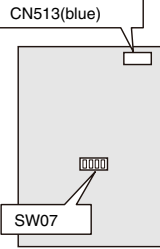
1. Accessory parts

No.	Part Name		Q'ty
1	Connection cable		1
2	Support to fix the board		4
3	Wire clamp		1
4	Wire clamp fixing screw		1
5	Earth screw		2
6	Bindling band A		4
7	Clamp filter		3
8	Bindling band B		3

2. Installation

1. Before starting installation work, be sure to turn the power supply OFF.

2. Install the "optional PCB" at the position on the electrical components box shown in the figure below.

3. Install the "optional PCB" at the specified location inside the electrical components box using the support (2).

4. There are four mounting holes for the fixing support at specified locations inside the electrical components box.

5. Connect the connector (PJ17) on the "optional PCB" to the connector (CN513) on the "interface PCB" using the connection cable.

6. The connection cable is long. Tie it using the binding band (6).

[PCB Installation Position]

SMMS-i

MMY-MAP080 to 120   MMY-MAP140 to 160
Optional PCB

(max. number installed: 1 pc)

SMMS-i
Connector Positions

CN513(blue)
SW07

SMMS

Optional PCB   Incorrec   Conect
Outdoor unit interface
PCB PCBs

(max. number installed: 1 pc)

SMMS
Connector Positions

CN513(blue)
SW07

MiNi-SMMS

Screw

Screw

Screw

Hook part

Interface
P.C. board

Optional P.C. board
•Optional PCB (left side)

(max. number installed: 1 pc)

Install this optional P.C. board to the back side of the Interface P.C. board on outdoor unit.

1. If the screw fo the position shown in the figure is removed and an upper right hook is slipped, an interface board will open.

2. Place this P.C. board by using the support of the electric component box. There are four installation holes to place the support of the electric component box.

MiNi-SMMS
Connector Positions

CN513(blue)

SW07

3. Wiring

	length	size	type
Input wiring	Up to 500 m	0.75 mm^2*	Shield wire

* In conformity with design 60245 IEC57

(1) Refer to the "electric wiring diagram" when wiring.
(2) Be sure to use shielded wire to prevent electrical noise interface, and earth both sides of shielded wire.

SMMS-i

6 -a   6 -b   7   8   1   6 -b

8

7

Optional
PCB

Input
wiring

Output
wiring

3   4

[A]

1. Tie the output wiring using the binding band A (6) at the position in the figure on the left.
(6 -a):Tie the output/input wiring togerther with other leads.
(6 -b):Tie the output/input wiring after passing the upper fixation hole on of the bandling band.
2. Attach the clamp filter (7) to the output wiring, input wiring and connection cable as shown in the figure. Use binding band B (8) to fix the clamp filter (7) to the wirings.
 * When more than one optional PC boards are installed, band all the connection cables and attach one clamp filter.
3. Fix the wire clamp (3) using the screw (4) holes at location [A] in the figure on the left.

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SMMS, SHRM Optional PCB 6 [B] 3 4 [A] Output wiring	**1.** Pass the binding band A (6) through securing hole [B] shown in the figure on the left and tie the output wiring together with other wiring. **2.** Fix the wire clamp (3) using the screw (4) holes at location [A] in the figure on the left.
MiNi-SMMS Electric component box 3 4 Output wiring (max. number installed: 1 pc)	1. Tie the output wiring with the wire clamp (3).

4. Details of Operation

By switching SW07 (bit 2) on the outdoor unit interface PCB, super module multi (MMY-) supports both standard specifications (2-stage switching) and enhanced functions (4-stage switching).

⚠ **CAUTION**

Specifications of display relay contact
• The terminal for display output ([Operation] terminal) must satisfy the following electrical rating.

<Electrical Rating>
220 to 240 VAC, 10 mA or more, 1 A or less
24 VAC, 10 mA or more, 1 A or less (non-conductive load)

When connecting a conductive load (e.g. relay coil) to the display relay load, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit.

Installation procedure of Snowfall fan control/External master ON/OFF control/Night operation (Sound reduction) control/Operation mode selection control board (TCB-PCMO4E)

1. Accessory parts

No.	Part Name		Q'ty
1	Connection cable		1
2	Support to fix the board		4
3	Earth screw		2
4	Binding band A		4
5	Clamp filter		2
6	Binding band B		2

2. installation and wiring

1. Before starting installation work, be sure to turn the power supply OFF.
2. Install the "optional PCB" at the position on the electrical components box shown in the figure below.
3. Install the "optional PCB" at the specified location inside the electrical components box using the fixing support.
4. There are four mounting holes for the fixing support (2) at specified locations inside the electrical components box.
5. Connect the connector (PJ17) on the "optional PCB" to the connector (CN513) on the "interface PCB" using the connection cable (1) . (See figure on right.)
6. The cable (provided) is long. Tie it using the binding band A (4).

	length	size	type
Input wiring	Up to 500 m	0.75 mm^{2}*	Shield wire

* In conformity with design 60245 IEC57

(1) Refer to the "electric wiring diagram" when wiring.
(2) Be sure to use shielded wire to prevent electrical noise interface, and earth both sides of shielded wire.

[PCB Installation Position]

SMMS-i	**SMMS-i** **Connector Positions**

SMMS-i

MMY-MAP080 to 120   MMY-MAP140, 160

Optional PCB

(max. number installed: 4 pcs)

1   4 -b   5   6   4 -b

4 -a

Optional
PCB

6

5

Input
wiring

SMMS-i Connector Positions

CN508 (red)   CN510 (white)

CN509 (black)   CN512 (blue)

Outdoor unit
interface PCB

1. Tie the input wiring using the binding band A (4) at the position in the figure on the left. (4 -a):Tie the input wiring together with other leads. (4 -b):Tie the input wiring after passing the upper fixation hole on of the binding band.
2. Attach the clamp filter (5) to the input wiring and connection cable (1) as shown in the figure. Use binding band B (6) to fix the clamp filter (5) to the wirings.
   * When more than one optional PC boards are installed, band all the connection cables and attach one clamp filter.

SMMS, SHRM

Optional PCB

Interface PCB
(outdoor unit control PCB)

Incorrect   Correct

(max. number installed: 4 pcs)

SMMS Connector Positions

CN510 (white)

CN508 (red)

CN509 (black)

CN512 (blue)

Outdoor unit
interface PCB

MiNi-SMMS

Screw

Screw

Hook part

Interface P.C. board

Optional P.C. board
• Optional PCB (both side)

(max. number installed: 2 pcs)

Install this optional P.C. board to the back side of the Interface P.C. board on outdoor unit.

1. If the screw of the position shown in the figure is removed and an upper right hook is slipped, an interface board will open.

2. Place this P.C. board by using the support of the electric component box. There are four installation holes to place the support of the electric component box.

Mini-SMMS
Connector Positions

CN510 (white)

CN508 (red)

CN509 (black)

CN512 (blue)

Outdoor unit interface PCB
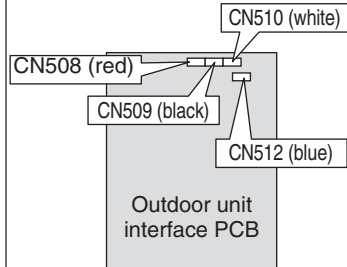
Installation procedure of Error/operation output control/Compressor operation status/Operation output ratio board (TCB-PCIN4E)

1. Accessory parts

No.	Part Name		Q'ty
1	Connection cable 1 (for CN511)	(4 wires)	1
2	Connection cable 2 (for CN514)	(5 wires)	1
3	Support to fix the board		4
4	Wire clamp		1
5	Wire clamp fixing screw		1
6	Earth screws		2
7	Binding band A		4
8	Clamp filter		2
9	Binding band B		2

2. Installation

1. Before starting installation work, be sure to turn the power supply OFF.
2. Install the "Optional PCB" at the position on the electrical components box shown in the figure on the right.
3. Install the "Optional PCB" at the specified location inside the electrical components box using the fixing support.
4. There are four mounting holes for the fixing support at specified locations inside the electrical components box.
5. Connect the connector (PJ20 (green)) on the "Optional PCB" to the connector (CN511 (green) or CN514 (green)) on the "interface PCB" using the connector cable (provided). (See figure on right.)
6. The cable (provided) is long. Tie it using the binding band.

[PCB Installation Position]

SMMS-i

MMY-MAP080 to 120   MMY-MAP140, 160

Optional PCB

(max. number installed: 2 pcs)

SMMS-i
Connector Positions

CN514 (green)
CN511 (green)

Outdoor unit interface PCB

SMMS, SHRM	SMMS **Connector Positions**
Optional PCB Outdoor unit interface PCB (max. number installed: 1 pcs)	CN511 (green) Outdoor unit interface PCB

MiNi-SMMS
 	
Screw
Screw
Hook part
Interface P.C. board
 	
Optional P.C. board
• Up to total of two boards
  Optional PCB (right side)
 	
(max. number installed: 1 pc)
	Install this optional P.C. board to the back side of the Interface P.C. board on outdoor unit.
	
	1. If the screw of the position shown in the figure is removed and an upper right hook is slipped, an interface board will open.
	
	2. Place this P.C. board by using the support of the electric component box. There are four installation holes to place the support of the electric component box.
	
	Mini-SMMS
	      Connector Positions
	
	CN511 (green)
	
	Outdoor unit interface PCB

3. Wiring

	length	size	type
Input wiring	Up to 500 m	0.75 mm^2*	Shield wire

* In conformity with design 60245 IEC57

(1) Refer to the "electric wiring diagram" when wiring.
(2) Be sure to use shielded wire to prevent electrical noise interface, and earth both sides of shielded wire.

SMMS-i 	**1.** Tie the output wiring using the binding band A (7) at the position in the figure on the left. (7 -a):Tie the output wiring togerther with other leads. (7 -b):Tie the output wiring after passing the upper fixation hole on of the bandling band. **2.** Attach the clamp filter (8) to the output wiring and connection cable (1 or 2) as shown in the figure. Use binding band B (9) to fix the clamp filter (5) to the wirings. * When more than one optional PC boards are installed, band all the connection cables and attach one clamp filter. **3.** Fix the wire clamp (4) using the screw holes at location [A] in the figure on the left.
SMMS, SHRM 	**1.** Pass the binding band A (7) through securing hole [B] shown in the figure on the left and tie the output wiring together with other wiring. **2.** Fix the wire clamp (4) using the screw holes at location [A] in the figure on the left.
MiNi-SMMS 	**1.** Tie the output wiring with the wire clamp (4).

4. Details of Operation, Electrical Wiring Diagram

⚠ CAUTION

Output Relay (K1, K2, K3) Contact Specifications
- Output terminals (OUTPUT1, 2, 3) must satisfy the following electrical rating.
- When connecting a conductive load (e.g. relay coil) to loads K1, K2 and K3, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit.

<Electrical Rating>
220-240 VAC, 10 mA or more, 1A or less
24 VAC, 10 mA or more, 1 A or less (non-conductive load)

4-6-1 Power peak-cut control (standard) (SMMS-i/SMMS/SHRM/Mini-SMMS)

Purpose: Limiting air conditioning performance with external signals and decreasing the peak power consumption.

Function / Electric wiring diagram

Two types of control can be selected by setting SW07 on the interface P.C. board on the header unit. For the differences between TCB-PCDM2E and TCB-PCDM4E, refer to the table on the next page.

[Standard function]
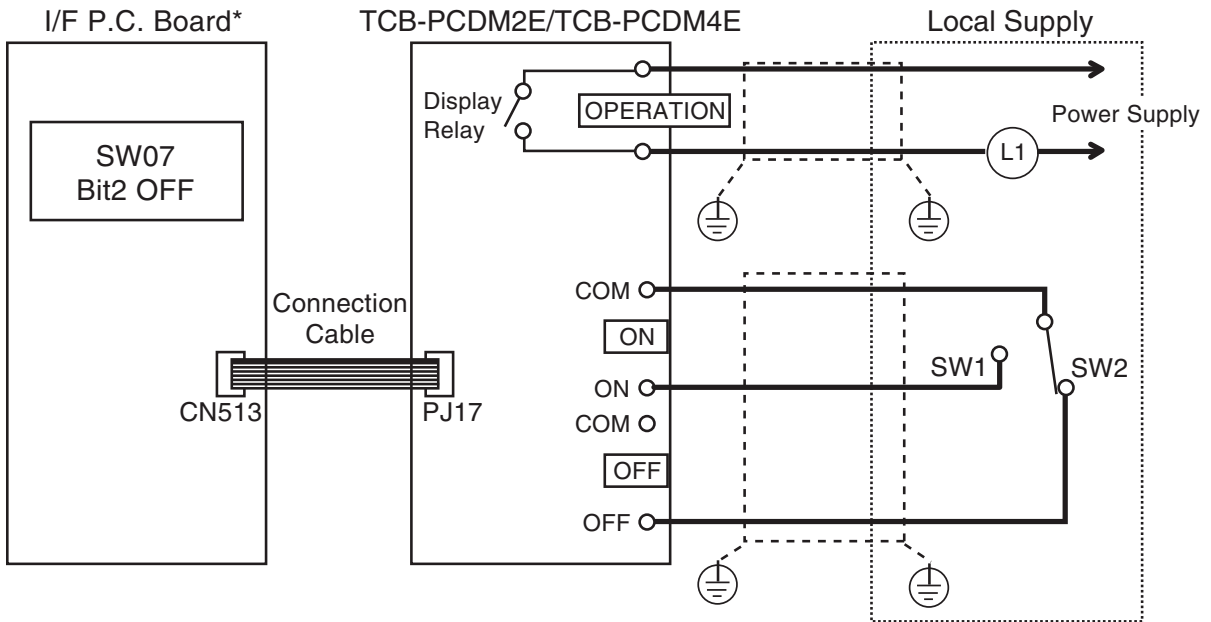
*Place this optional P.C. board on the header outdoor unit.

In case of pulse signal
Be sure to prepare the point of contact for each terminal.
The time of the pulse signal is more than 100 msec.
Don't switch on SW1 and SW2 terminals simultaneously.
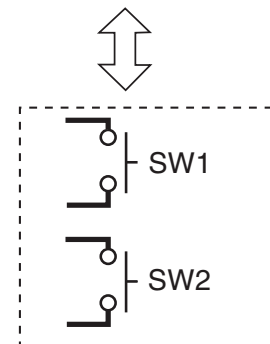
SW07-Bit2 OFF

Input		SW07-Bit1		Display Relay
SW1	SW2	Bit1 OFF	Bit1 ON	(L1)
OFF	ON	100% (Normal)	100% (Normal)	OFF
ON	OFF	0% (Stop)	Up to 60%	ON

SMMS-i

By cutting J16 on the I/F B.C. board, the operation above becomes possible only with the signal from SW1.

⚠ CAUTION

Display Relay capacity of "OPERATION"
Below AC240V 0.5A (COS ∅=100%)
When connecting load such as relay coil to "L1" load, insert the noise surge absorber.
Below DC24V 1A (Non-inductive load)
When connecting load such as relay coil to "L1" load, insert the bypass circuit.

Power peak-cut control (expansion) (SMMS-i/SMMS/SHRM/Mini-SMMS)

[Expansion function]

I/F P.C. Board*   TCB-PCDM2E/TCB-PCDM4E   Local Supply
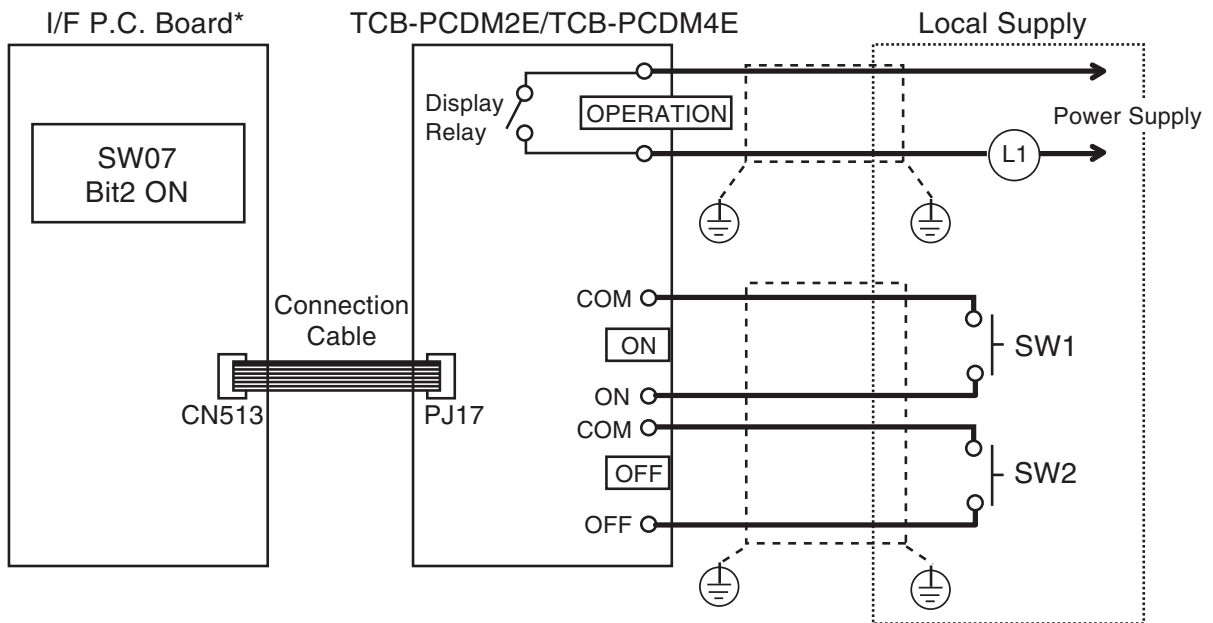
*Place this optional P.C. board on the header outdoor unit.

SW07-Bit2 ON

Input		SW07-Bit1		Display Relay
SW1	SW2	Bit1 OFF	Bit1 ON	(L1)
OFF	OFF	100% (Normal)	100% (Normal)	OFF
ON	OFF	Up to 80%	Up to 85%	ON
OFF	ON	Up to 60%	Up to 75%	ON
ON	ON	0% (stop)	Up to 60%	ON

⚠ CAUTION

Display Relay capacity of "OPERATION"
Below AC240V 0.5A (COS ∅=100%)
When connecting load such as relay coil to "L1" load, insert the noise surge absorber.
Below DC24V 1A (Non-inductive load)
When connecting load such as relay coil to "L1" load, insert the bypass circuit.

• The differences between TCB-PCDM2E and 4E are shown below:

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCDM2E	Same	short	No	VRF other than SMMS- i types
TCB-PCDM4E		long	Yes	All types of VRF

4-6-2 Snowfall fan control (SMMS-i/SMMS/SHRM)

Purpose: rotating the fan of the outdoor unit to prevent snow accumulating on it

Feature

Outdoor fan is operated by the snowfall signal from the outside.

Function

I/P.C. board*   Connection Cable   TCB-PCMO2E/TCB-PCMO4E   Local Supply

CN509   PJ17   COM   COOL   HEAT   SMC
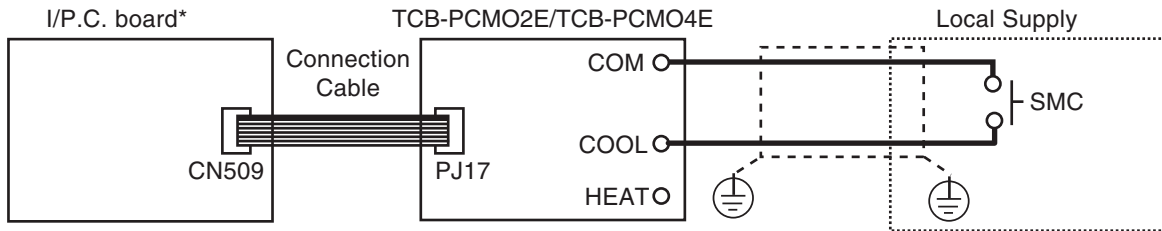
*Place this optional P.C. board on the header outdoor unit.

SMC : Snowfall detection switch

Terminal	Input signal	Operation
COOL (SMC)	ON / OFF	Snowfall fan control (Operates outdoor fan)
	ON / OFF	Normal operation

⚠ CAUTION

Be sure to prepare a non-voltage continuation point of contact for each terminal.

• The differences between TCB-PCMO2E and 4E are shown below:

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCMO2E	Same	short	No	VRF other than SMMS- i types
TCB-PCMO4E		long	Yes	All types of VRF

4-6-3 External master ON/OFF control (SMMS-i/SMMS/SHRM/Mini-SMMS)

Purpose: Starting/stopping all indoor units connected to an outdoor unit with external signals

Feature

The outdoor unit starts or stops the system.
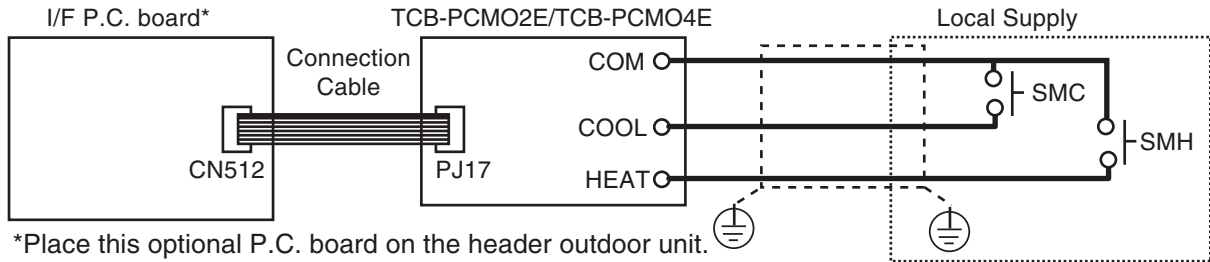
Function

*Place this optional P.C. board on the header outdoor unit.

SMC : Input signal for start
SMH : Input signal for stop

Terminal	Input signal	Operation
COOL (SMC)	ON / OFF	Starts all indoor units.
HEAT (SMH)	ON / OFF	Stops all indoor units.

⚠ CAUTION

Be sure to prepare a non voltage pulse point contact for each terminal.

This control is conducted when input signal goes up or falls down.
(Standing and falling status should be held for 100 msec or more.)

• The differences between TCB-PCMO2E and 4E are shown below:

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCMO2E	Same	short	No	VRF other than SMMS- i types
TCB-PCMO4E		long	Yes	All types of VRF

4-6-4 Night operation (Sound reduction) control (SMMS-i/SMMS/SHRM/ Mini-SMMS)

Purpose: Reducing noise from an outdoor unit

Feature
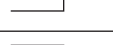
Sound level can be reduced by restricting compressor and fan speed.

Function

I/F P.C. Board*   TCB-PCMO2E/TCB-PCMO4E   Local Supply

Connection Cable

CN508   PJ17

COM
COOL
HEAT

SMC
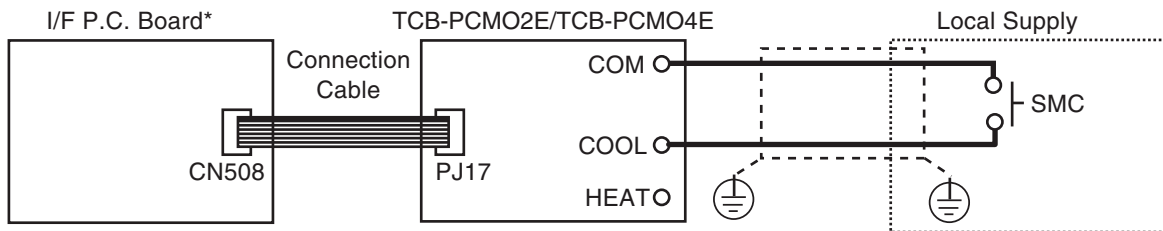
*Place this optional P.C. board on the header outdoor unit.

SMC : Input signal for night operation

Terminal	Input signal	Operation
COOL (SMC)	ON / OFF (rising)	Night operation control
	ON / OFF (falling)	Normal Operation

SMMS, SHRM

	Night operation sound reduction dB(A)	Capacity	
		COOL	HEAT
1201 type	50	Approx. 55%	Approx. 45%
1001 type	50	Approx. 65%	Approx. 55%
0801 type	50	Approx. 80%	Approx. 70%
0601 type	50	Approx. 75%	Approx. 70%
0501 type	50	Approx. 85%	Approx. 80%

SMMS-i

	Night operation sound reduction dB(A)	Capacity	
		COOL	HEAT
1604 type	53	Approx. 70%	Approx. 70%
1404 type	53	Approx. 80%	Approx. 80%
1204 type	50	Approx. 60%	Approx. 55%
1004 type	50	Approx. 70%	Approx. 65%
0804 type	50	Approx. 85%	Approx. 80%
0601 type	50	Approx. 75%	Approx. 70%
0501 type	50	Approx. 85%	Approx. 80%

MINI-SMMS

Outdoor unit capacity type	0401 type	0501 type	0601 type
Sound reduction (dB(A)) (Cooling/Heating)	46/48	46/48	47/49
Approximation capacity (Cooling/Heating)	90%/95%	85%/75%	85%/70%

Condition

Cooling : (Indoor 27deg DB, 19deg WB)
 (Outdoor temperature 25deg DB)

Heating : (Indoor 20 deg DB)
 (Outdoor temperature 7deg DB,
  6 deg WB)

⚠ CAUTION

Be sure to prepare a non-voltage continuation point of contact for each terminal.

• The differences between TCB-PCMO2E and 4E are shown below:

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCMO2E	Same	short	No	VRF other than SMMS- i types
TCB-PCMO4E		long	Yes	All types of VRF

4-6-5 Operation mode selection control (SMMS-i/SMMS/SHRM/Mini-SMMS)

Purpose: Limiting operation modes to cooling and heating only

Feature

This control can be operated by the operation mode which is permitted by SMC or SMH.

Function
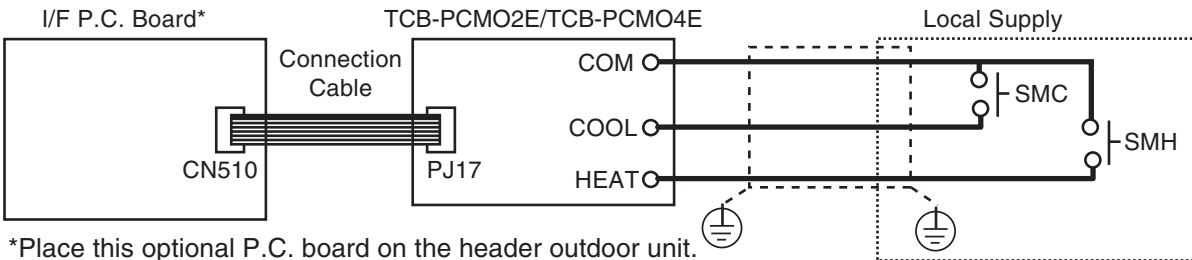
*Place this optional P.C. board on the header outdoor unit.

SMC : Cooling mode designated input switch
SMH : Heating mode designated input switch

Terminal		Selected operation mode
COOL (SMC)	HEAT (SMH)	
ON	OFF	Only cooling mode permitted
OFF	ON	Only heating mode permitted
OFF	OFF	Normal Operation

JP line (I/F P.C. board of the center outdoor unit)	Function
SMMS-i J01 connected (factory setting) Mini-SMMS	When the operation mode is changed from that selected, the thermostats in the indoor units are turned off and the air conditioners run as shown in the table below: <table><tr><td>Selected mode</td><td>Operation after the mode is changed</td><td>Remote controller indication</td></tr><tr><td>Cooling/Dry</td><td>Air blow operation at the air volume set on the remote controller</td><td>"Stand by"</td></tr><tr><td>Heating</td><td>Air blow operation at "Ultra low" air volume</td><td>"Stand by"</td></tr><tr><td>Fan</td><td>Air blow operation at the air volume set on the remote controller</td><td></td></tr></table>
SMMS-i J01 cut SMMS, SHRM	Indoor units which are running in any operation mode other than that selected also forcibly shift their modes to that assigned in SMC/SMH. <table><tr><td>Operation mode assigned on the P.C. board</td><td>Assignable operation modes</td><td>Remote controller indication</td></tr><tr><td>Cooling</td><td>Cooling, Dry, Fan</td><td rowspan="2">No indication. However, "Mode select contro" is displayed for a few seconds when you choose an unselectable mode.</td></tr><tr><td>Heating</td><td>Heating, Fan</td></tr></table>

⚠ CAUTION

Be sure to prepare a non voltage continuous point of contact for each terminal.

• The differences between TCB-PCMO2E and 4E are shown below:

	PCB	Supplied cable	Noise filter	Compatible models
TCB-PCMO2E	Same	short	No	VRF other than SMMS- i types
TCB-PCMO4E		long	Yes	All types of VRF

Operation mode change by SMH/SMC change =>2 types (Forcibly change or Stand by)

● SMMS, SHRM, SMMS-i (J01 cut)

When Selected Operation Mode is COOL:

Prohibit: heat
Permit: cool/dry/fan

When Selected Operation Mode is HEAT:

Prohibit: cool/dry
Permit: heat/fan

Display On RMT

"mode select control"

"Stand-by"

"Stand-by2"

SMH SMC — Normal — COOL — HEAT — time

Forcedly change

Forcedly change

Indoor Mode Setting/status — heat — cool — heat — dry — **dry** — heat — fan cool — **fan** — heat — heat

"mode select control" a few sec. ON

"mode select control" a few sec. ON

Note: "mode select controll" is not displayed

● SMMS-i (J01 no-cut at shipment)/Mini-SMMS

SMH SMC — Normal — COOL — HEAT — time — Normal — COOL

Stand by

Stand by

Indoor Mode Setting/status — heat — **fan → ultra low** — cool heat — cool — **fan → ultra low** — dry — **dry** — **fan → normal** — fan — heat — heat — cool — **fan → normal** — cool — cool

Stand-by display — ON — ON — ON — ON
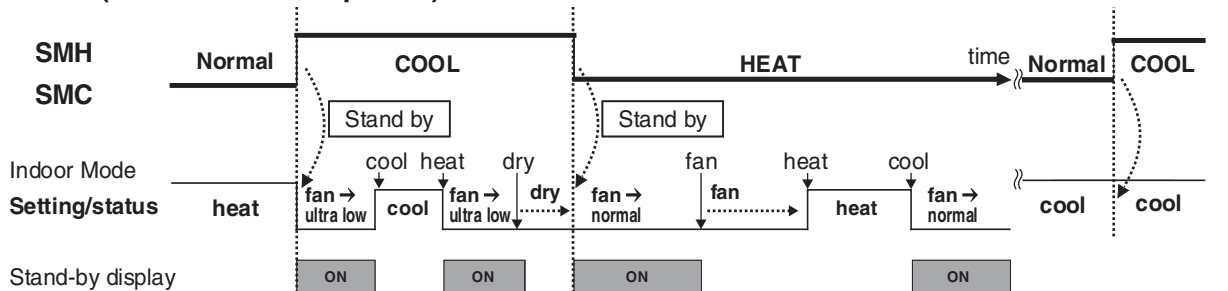
4-6-6 Error/Operation output control (SMMS, SHRM, Mini-SMMS)

Purpose: Monitoring the operation status using external devices

Feature

Operation and error monitoring is possible.
Operation monitoring: Display relay is ON when more than one indoor unit is operating.
Error monitoring: Display relay is ON when the system is in error status.

Function

Outdoor P.C. Board — TCB-PCIN2E — Local supply

Display Relay — OPERATION — Power Supply — L1

Connection Cable*

CN511 — PJ20

Display Relay — EMG — Power Supply — L2

*connection cable packed with

Shield wire
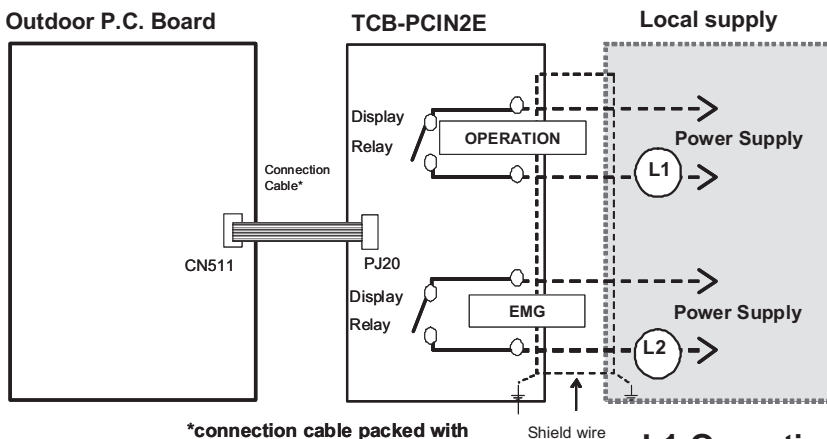
L1:Operation monitoring lamp

L2:Error monitoring lamp

Note) be sure to connect TCB-PCIN2E on header outdoor unit

In case of Mini-SMMS, use CN513 on I/F p.c. Board.

4-6-7 Error/Operation output control (SMMS-i, SMMS, Mini-SMMS)

Purpose: Monitoring the operation status using external devices

Feature

Operation and error monitoring is possible.
Operation monitoring: Display relay is ON when more than one in door unit is operating.
Error monitoring: Display relay is ON when the system is in error status.

Function

<SMMS-I system diagram> SW16=all 0
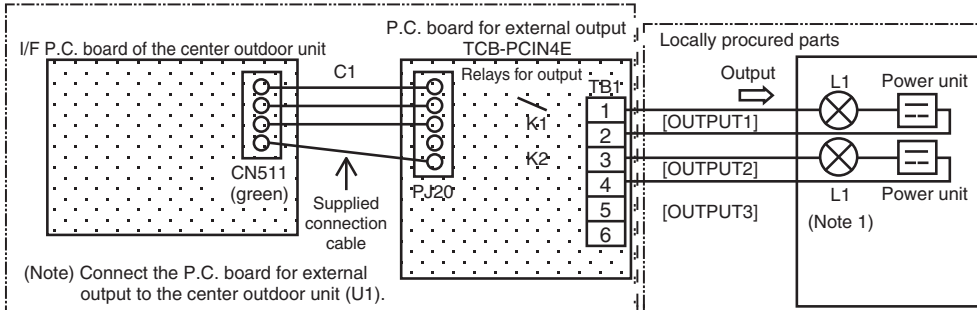
C1	Connection cable 1 (for CN511)
CN511	Connectors of the I/F side (green)
K1, K2	Relays for output
L1	Error indication lamp
L2	Operation indication lamp
OUTPUT1	xxx
OUTPUT2	xxx
PJ20	Connectors of the optional P.C. board
TB1	Terminal block

(Note) Connect the P.C. board for external output to the center outdoor unit (U1).

⚠ Note 1) specifications for the contacts of the output relays (K1, K2, K3)

① Be sure to connect a load which has the same rating as that shown below to the output terminals [OUTPUT1], [OUTPUT2] and [OUTPUT3].
AC200V 10mA or more and 1A or less, or DC24V 10mA or more and 1A or less (non-inductive load)

② When you connect an inductive load such as a relay coil to the load for the relays for output K1, K2, K3, connect a surge absorber CR (AC) or a diode for counter inductive voltage to the bypass circuit.

4-6-8 Compressor operation status output (SMMS-i only)

Purpose: Monitoring whether a compressor is running or not using external devices

Feature

Relays turn on/off corresponding to the status (running/stopping) of compressors.
Signals corresponding 3 compressors' status are output.

Function

<SMMS-i system diagram> *Connectable to each outdoor unit SW16=all 0

<Action>
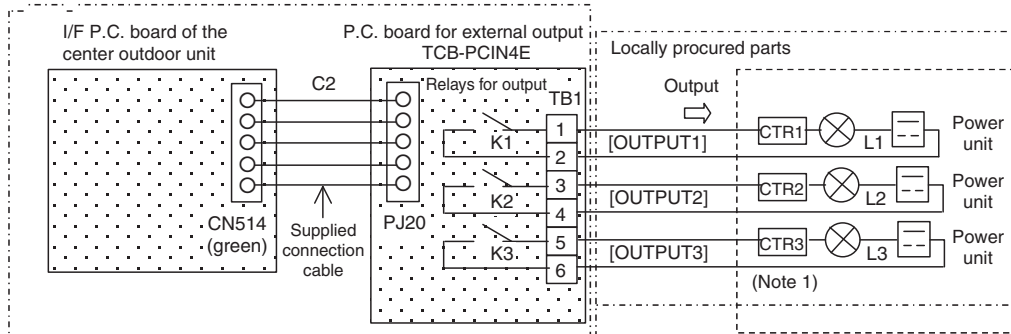
When a compressor is running, the relay of the output terminal corresponding to the compressor is closed (ON). When the compressor is stopped, the relay is opened (OFF).
As shown in the diagram, the output terminals [OUTPUT1], [OUTPUT2] and [OUTPUT3] correspond to the compressors 1, 2 and 3, located from the observer's left, respectively.

⚠ Note 1) specifications for the contacts of the output relays (K1, K2, K3)

① Be sure to connect a load which has the same rating as that shown below to the output terminals [OUTPUT1], [OUTPUT2] and [OUTPUT3].
AC200V 10mA or more and 1A or less, or DC24V 10mA or more and 1A or less (non-inductive load)

② When you connect an inductive load such as a relay coil to the load for the relays for output K1, K2, K3, connect a surge absorber CR (AC) or a diode for counter inductive voltage to the bypass circuit.

<Three compressor models>
14/16HP

<Two compressor models>
8-12HP
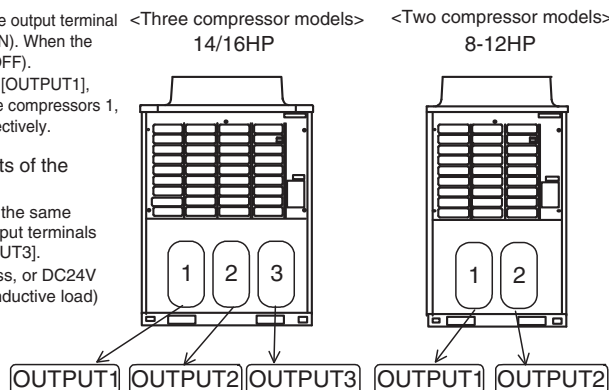
C2	Connection cable 2 (for CN514)
CN514	Connectors of the I/F side (green)
CTR1	Elapsed operation time meter 1
CTR2	Elapsed operation time meter 2
CTR3	Elapsed operation time meter 3
K1, K2, K	Relays
L1, L2, L3	Operation indication lamp
OUTPUT1	Output terminal for compressor 1
OUTPUT2	Output terminal for compressor 2
OUTPUT3	Output terminal for compressor 3
PJ20	Connectors of the optional P.C. board
TB1	Terminal block

4-6-9 Operation rate indication (SMMS-i only)

Purpose: Monitoring the operation ratio using external devices

Feature

Indicates the output ratio in 8 steps from 0 % to 100 % (maximum output of the system=100%) as the operation ratio.
The 8 steps are indicated through the combination of the output from the three relays.

Function

<SMMS-i system diagram> Slide the first bit of SW16 on the I/F P.C. board on the center outdoor unit to ON.

C2	Connection cable 2 (for CN514)
CN514	Connectors of the I/F side (green)
MONITOR	Monitoring device
KI, K2, K3	Relays
L1, L2, L3	Operation indication lamp
OUTPUT1	Output terminal for each function
OUTPUT2	Output terminal for each function
OUTPUT3	Output terminal for each function
PJ20	Connectors of the optional P.C. board
TB1	Terminal block

<Action>
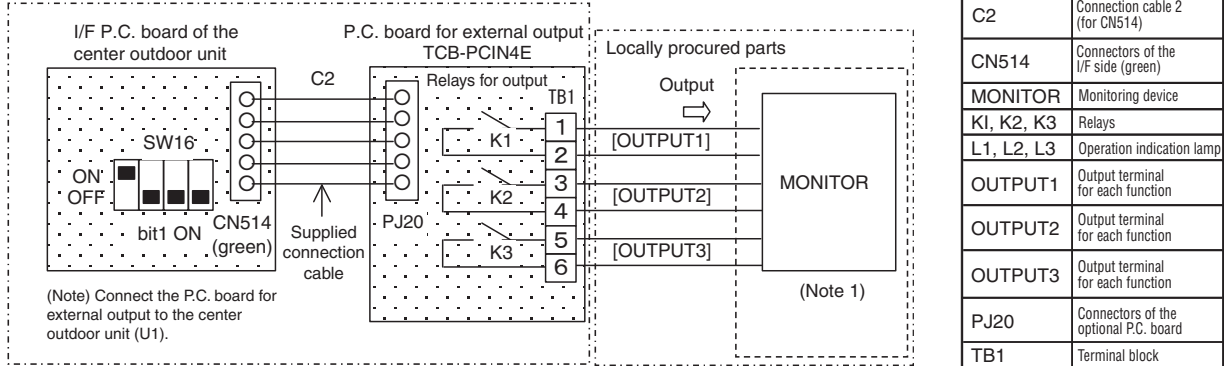
As shown in the table, each output terminal outputs ON/OFF (relay is closed/opened) according to the operation rate of the system.

(Operation rate FA: current output rate when the maximum system output is 100%)

	P.C. board for external output			I/F P.C. board of the center outdoor unit
	Signal output			The first bit of SW16: ON
	OUTPUT1	OUTPUT2	OUTPUT3	Operation rate FA (0-100%)
System operation output	OFF	OFF	OFF	FA=0%
	ON	OFF	OFF	0%<FA<20%
	OFF	ON	OFF	20%≦FA<35%
	ON	ON	OFF	35%≦FA<50%
	OFF	OFF	ON	50%≦FA<65%
	ON	OFF	ON	65%≦FA<80%
	OFF	ON	ON	80%≦FA<95%
	ON	ON	ON	95%≦FA

⚠ Note 1) specifications for the contacts of the output relays (K1, K2, K3)

① Be sure to connect a load which has the same rating as that shown below to the output terminals [OUTPUT1], [OUTPUT2] and [OUTPUT3].
AC200V 10mA or more and 1A or less, or DC24V 10mA or more and 1A or less (non-inductive load)

② When you connect an inductive load such as a relay coil to the load for the relays for output K1, K2, K3, connect a surge absorber CR (AC) or a diode for counter inductive voltage to the bypass circuit.

4-6-10 Night operation and demand control (DI/SDI only)

Purpose: Reducing power consumption and noise

Applicable model:

\<SDI\>
SDI4 : RAV-SP404AT-E/ATZ-E/ATZG-E、SP454AT-E/ATZ-E/ATZG-E、SP564AT-E/ATZ-E/ATZG-E
\<DI\>
DI2 : RAV-SM562AT-E、SM802AT-E、SM1102AT-E、SM1402AT-E
DI3 : RAV-SM563AT-E、SM803AT-E、SM1103AT-E、SM1403AT-E

Feature

Sound level can be reduced with connecting outdoor P.C. board.

Demand control has 3 steps. For Night operation, combine with ready made Timer device.

Function
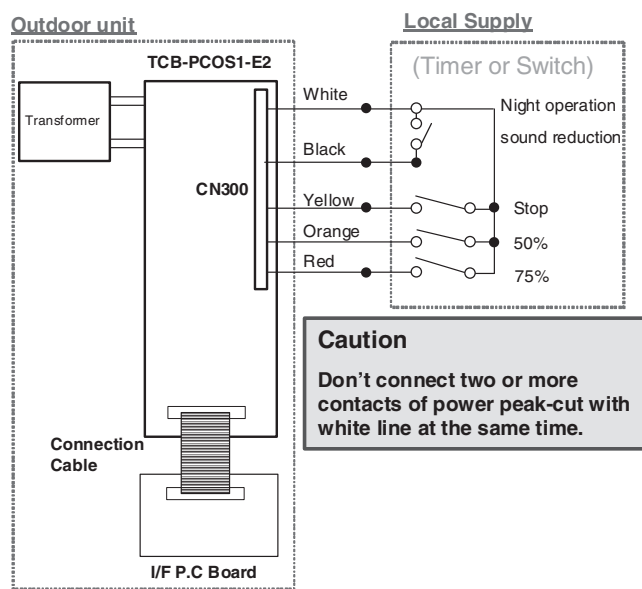
Outdoor unit

TCB-PCOS1-E2

Transformer

CN300

White — Night operation — sound reduction
Black
Yellow — Stop
Orange — 50%
Red — 75%

Local Supply

(Timer or Switch)

Caution

Don't connect two or more contacts of power peak-cut with white line at the same time.

Connection Cable

I/F P.C Board

*connection cable and Transformer packed with

Night operation
(Sound reduction by 5dB at cooling mode)

Demand control has 3 steps
75%,50%,0% (Operation stops)

Compressor output
Relay ON/OFF

Digital Inverter Air Conditioner Application Control Kit
TCB-PCOS1E2

Installation Manual

1. Object model

RAV-SM56*AT-E,   SM80*AT-E
RAV-SM110*AT-E, SM140*AT-E

2. Accessories

Name	Q'ty	Application
Wire(A) (Yellow connector : 5-core)	1	Connecting wire for Night operation(Sound reduction) control or Power peak-cut control
Wire(B) (Blue connector : 2-core)	1	Connecting wire for Compressor operation output
PCB	1	Application control PCB
Wire(C) (Red connector : 2-core)	1	Connecting wire for Power supply
Wire(D) (Blue connector : 5-core)	1	Connecting wire for Communication line
Transformer	1	———
Fixing plate(A)	1	Fixing plate(SM56,80)
Cover	1	For fixing plate(A)
Fixing plate(B)	1	Fixing plate(SM110,140)
Spacer	4	For fixing Application Control PCB
Clamp	2	For fixing plate(B)
Screws(A) (M3 x 6)	2	For fixing Transformer
Screws(B) (M4 x 8)	4	Fixing screws for mounting fixing plate and cover
Binding band	3	Used to process wires for binding the wires
Holder	2	———
Installation Manual	1	This Manual

Use	• Power peak-cut control ············· Correspond to the temporary power peak-cut control by controlling the capacity of the outdoor unit using an external signal. ······ Capacity control is made in 3 steps of 75%, 50% and Operation stop. • Night operation ······················ The capacity is controlled using a timer procured on site (to be purchased locally) (Sound reduction) regardless of the outdoor temperature and load to reduce the sound level of the operation. • Compressor operation output ······ Outputs a dry contact ON signal when the compressor is in operation.

3. How to install

No.	Name	Q'ty	Q'ty to be used		Work items
			RAV-SM56,80	RAV-SM110,140	
1	Wire(A)	1	1	1	Connect a timer (local procurement) to the CN300 of PCB
2	Wire(B)	1	1	1	Connect a timer (local procurement) to the CN201 of PCB
3	PCB	1	1	1	———
4	Wire(C)	1	1	1	Connect between the CN100 of the PCB and faston receptacle of terminal block for power supply of the outdoor unit.
5	Wire(D)	1	1	1	Connect between the CN400 of the PCB and the PCB of the outdoor unit. (SM56,SM80 : CN806 SM110,SM140 : CN804)
6	Transformer	1	1	1	Connect to the CN101 and CN102 of PCB
7	Fixing plate(A)	1	1	———	———
8	Cover	1	1	———	———
9	Fixing plate(B)	1	———	1	———
10	Spacer	4	4	4	For attaching PCB
11	Clamp	2	———	2	For fixing Wire clamp
12	Screws(A)	2	2	2	For fixing Transformer
13	Screws(B)	4	4	2	For fixing plate(A), Cover, and fixing plate(B)
14	Binding band	3	3	3	Used suitably
15	Holder	2	———	2	———
16	Installation manual	1	1	1	———

<RAV-SM56, SM80>

13 2

10 4

3

6

(Transformer wire)

6

(Wire(D) only)

5

2

4

12 2

1

5

5

7

6

(Transformer wire)

13 2

8

<RAV-SM110, SM140>

(Transformer wire)

6

5

1

2

(Transformer wire)

6

(Wire(D) only)

5

4

3

9

13 2

10

6

11 2

12 2

4. Wiring diagram

An Outdoor unit is controlled as follows
by connecting between a white and each line
using Timer or Switch purchased locally.

White	Common
Black	Night operation (Sound reduction by 5dB at cooling mode)
Yellow	Power peak-cut 0% operation (stop)
Orange	Power peak-cut 50% operation
Red	Power peak-cut 75% operation

Caution
Don't connect two or more
contacts of power peak-cut with
white line at the same time.

Compressor operation output
(Non-voltage ON/OFF
output signal (Dry contact))

(to be purchased locally)

DC250V, 10mA to 1A
DC24V, 10mA to 1A
DC12V, 10mA to 1A

Inverter assembly PCB of the outdoor unit
• SM56,80 : CN806   • SM110,140 : CN804

Faston receptacle of
terminal block for power
supply of the outdoor unit

Transformer

PCB
CN101
CN102
CN300
CN100
CN201
CN400
Wire(C)
Wire(D)

Local Supply
White
Black
Yellow
Orange
Red

5. Parts installation method and assembly to the outdoor unit (SM56, SM80)

Installation method for the PCB of the outdoor unit

(1) Mount a Transformer to the rear side of the Fixing plate(A) using Screws(A) (2 pieces).

(2) Install Spacers (4 pieces) and PCB to the front side of the Fixing plate(A).

(3) Connect the Lead wires (2 types) of the Transformer to the CN101 and CN102 of the
PCB. In addition, connect the Wire(C) (2-core) to CN100 and the Wire(D) (5-core) to
CN400.

> To connect the Wire(A) and the Wire(B), refer to the Wiring diagram of installation
> method to connect the wires.

Fixing plate(A)

Lead wires of the Transformer
(connected to the CN101)

Wire(C)
(connected to the CN100)

Wire(A)
(connected to the CN300)

Wire(B)
(connected to the CN201)

Wire(D)
(connected to the CN400)

Lead wires of the Transformer
(connected to the CN102)

PCB   Spacer
(4 pieces)
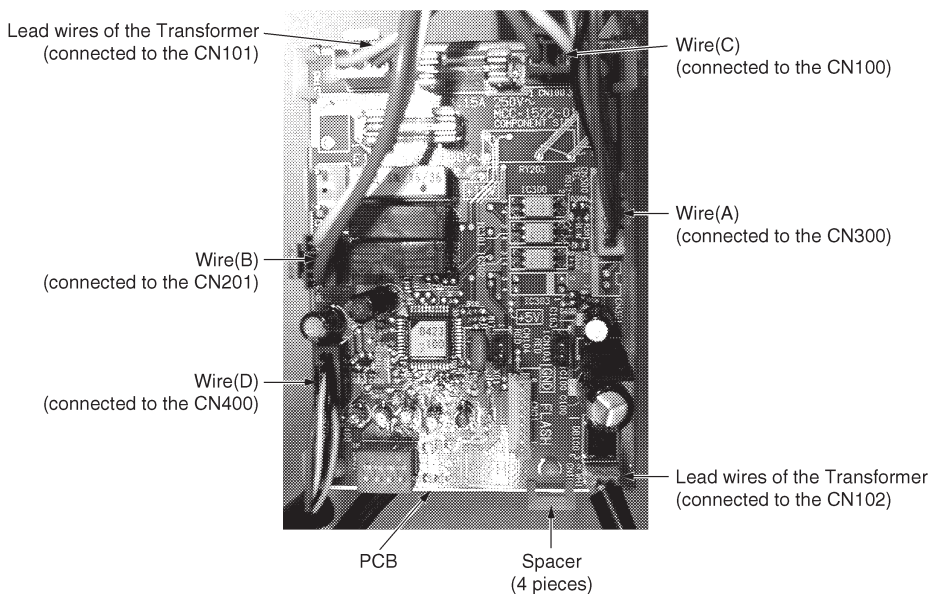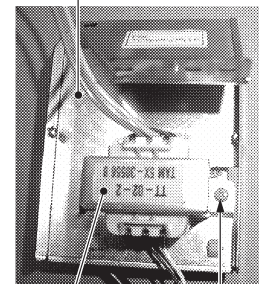
Transformer   Screws(A)
(2 pieces)

Extract the wires other
than the wire(D) from
this cut-away section
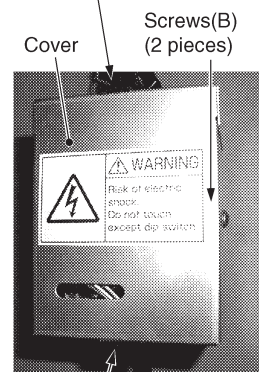
Cover   Screws(B)
(2 pieces)

⚠ WARNING
Risk of electric
shock.
Do not touch
except dip switch

Extract the wire(D) from
this cut-away section

⚠ CAUTION	**Don't allow the wires to come into pinching with cover parts.** Otherwise, the wires may be broken or heated or fire may occur.

(4) Close the cover to the Fixing plate(A) with Screws(B) (2 pieces). Pass the wires through
the cut-away section of the cover and do not allow the wires to come into pinching.

Assembly to the Outdoor Unit

(1) Remove the Top plate.
(2) Remove the Front cabinet.
(3) Remove the Cover of packed valve and wiring lid.
(4) Fix the PCB assembly to the Inverter assembly with Screws(B) (2 pieces).
(5) Remove the power supply terminal block cover of the outdoor unit and connect the Wire(C) (2-core) to the faston receptacle of terminal block for power supply.
(6) Connect the Wire(D) (5-core) to the Inverter assembly.

• Connect the wire to CN806.

Screws(B) (2 pieces)

Cover
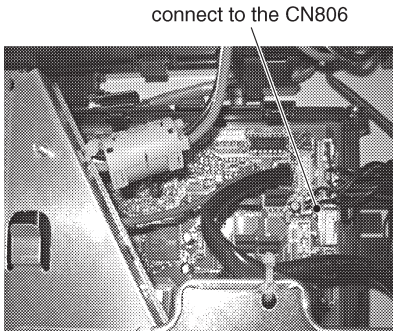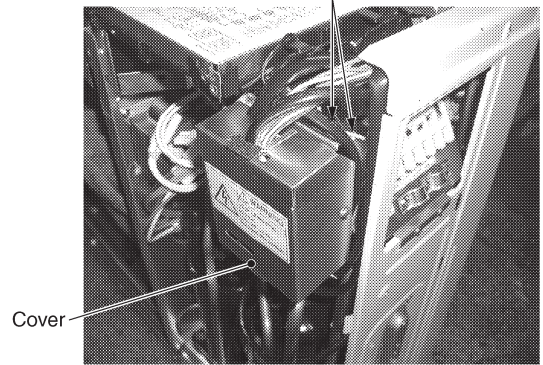
connect to the CN806

Application Control Kit
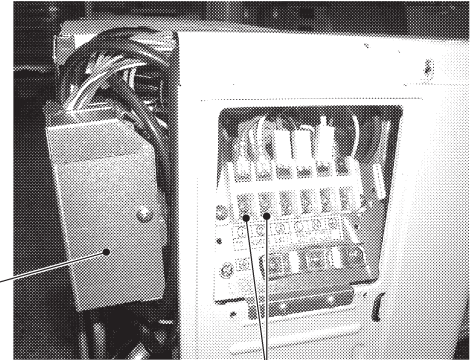
Connect the Wire(C) (2-core) to the faston receptacle of the terminal block for power supply.

(7) Tie the wire with binding band, if necessary.
(8) Re-assemble the Front cabinet.

6. Parts installation method and assembly to the outdoor unit (SM110, SM140)

Installation method for the PCB of the outdoor unit

(1) Fix the clamp to the Fixing plate(B).
(2) Fix the Spacers(4 pieces) and PCB to the front side of the Fixing plate(B).
(3) Mount the Transformer to the Fixing plate(B).
(4) Connect the Wire(D) (5-core) to CN400.
    Pass the wires through the Clamp section of the Fixing plate(B) and do not allow the wires to come into pinching.

⚠ CAUTION	Don't allow the wires to come into pinching with cover parts. Otherwise, the wires may be broken or heated or fire may occur.

Lead wires of the Transformer (connected to the CN101)

Wire(B) (connected to the CN201)

Wire(D) (connected to the CN400)

Clamp (Extract the wire(D) from this clamp section)

Spacer (4 pieces)

Wire(C) (connected to the CN100)

Wire(A) (connected to the CN300)

Clamp (Extract the wires other than the wire(D) from this clamp section)

Fixing plate(B)

PCB

Lead wires of the Transformer (connected to the CN102)

To connect the Wire(A) and the Wire(B), refer to the Wiring diagram of installation method to connect the wires.

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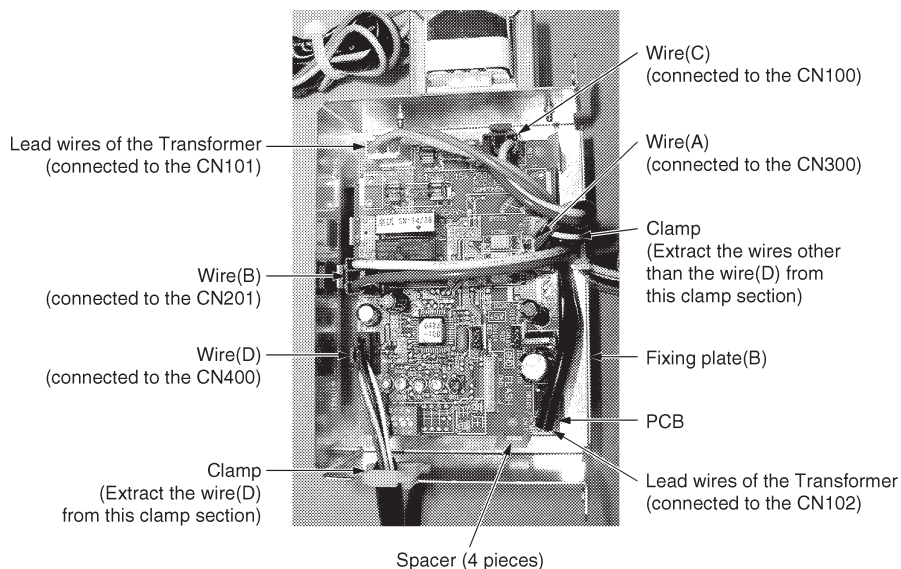
Assembly to the Outdoor Unit

(1) Remove the Front cabinet.

(2) Fix the Application Control Kit to the Inverter assembly with Screws(B) (2 pieces).

Install the Application Control Kit in the back of Inverter assembly.
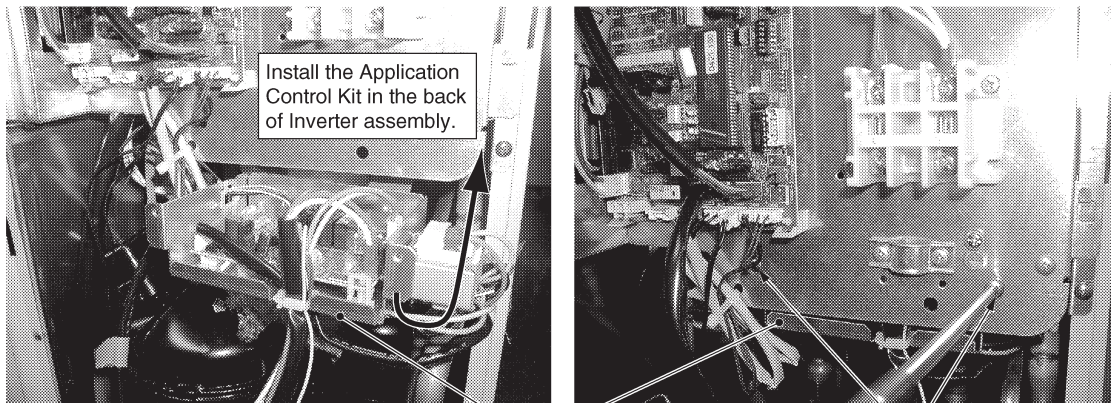
Application Control Kit   Screws(B) (2 pieces)

(3) Connect the Wire (D) (5-core) to CN804 of the SUB PCB.
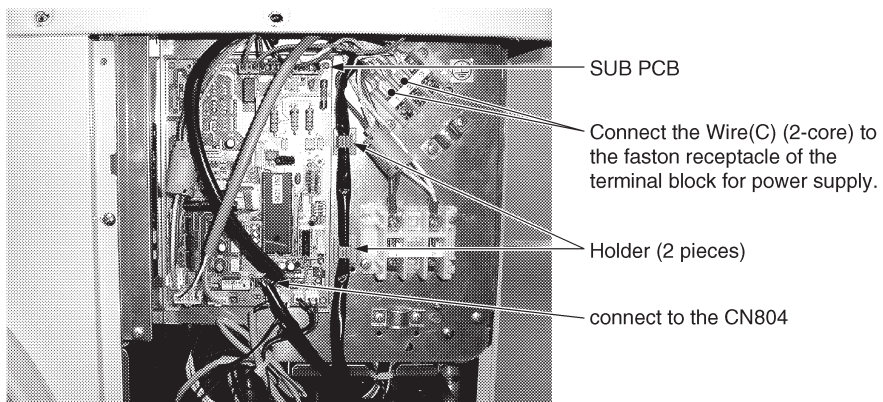
SUB PCB

Connect the Wire(C) (2-core) to the faston receptacle of the terminal block for power supply.

Holder (2 pieces)

connect to the CN804

(4) Tie the wire with binding band, if necessary.

(5) Re-assemble the Front cabinet.

4-6-11 TCB-KBOS1E
Peak-cut control/night operation/Compressor ON status output (DI/SDI only)

Purpose: Reducing power consumption and noise
Monitoring whether a compressor is running or not using external devices

Feature

Peak-cut control:3 power saving levels by external switch for outdoor unit (stop/50%/75%)
Night operation: Reducing the capacity of air conditioner by external switch
Sound pressure level : reduced to 45dB(A) (SDI series4 2HP to 5HP, Heating/Cooling)
Compressor output : Relay output is ON while the Compressor is operating

For Night operation, combine with ready made Timer device

Applicable model

DI series4, SDI series4 except 1.5-1.7HP

Function

1. Components of TCB-KBOS1E

Component	Q'ty	Remarks
Cable for night operation or peak-cut control (5-core cable with yellow connector)	1	Use these cables as required.
Compressor output cable (2-core cable with blue connector)	1	
Installation Manual (this manual)	1	

Application	• Peak-cut control ....Saves the power of the outdoor unit by the external peak-cut signal to suppress temporary peak power dissipation. ....The power saving can be switched to three levels: 75%, 50%, and operation stop. • Night operation ....Reduces the capacity of the air conditioner by the input signal from a commercially available timer (procured locally) regardless of the outside air temperature or load to reduce operating noise. • Compressor output......................Turns on the no-voltage contact output while the compressor is operating.

2. Connecting the Cables

<u>\<System diagram\></u>
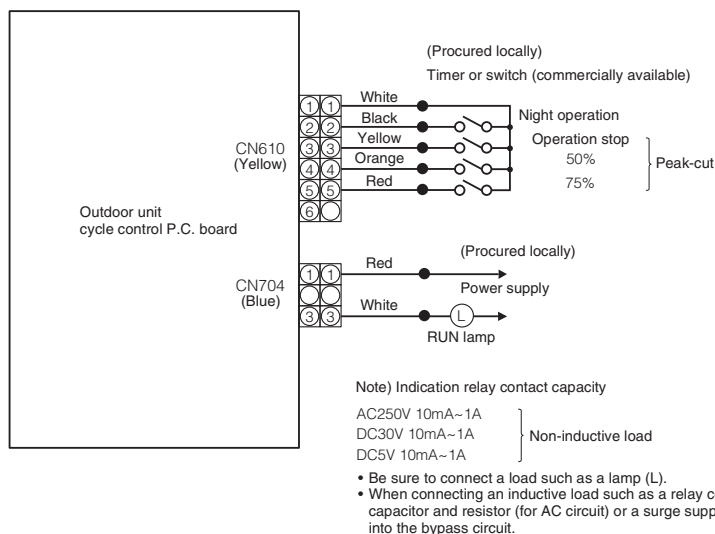
Connect the cables firmly to the cycle control P.C. board of the outdoor unit so that they will not be disconnected from respective connectors.

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4-7 Application controls by optional devices connected to indoor unit

4-7-1 Remote control by "remote location ON/OFF control box"

■ Remote location ON/OFF control box (TCB-IFCB-4E2)

[Wiring and setup]

- Use an exclusive connector for connection with the indoor control P.C. board.
- In a group control, the system can operate when connecting with any indoor unit (Control P.C. board) in the group. However when taking out the operation/error signal from one unit, it is necessary to take it from all other units within the group individually.

(1) Control items

1) Start/Stop input signal : Operation start/stop in unit
2) Operation signal : Output during normal operation
3) Error signal : Output during alarm
(Serial communication error or indoor/outdoor protective device) operation

(2) Wiring diagram using remote control interface (TCB-IFCB-4E2)

Input   IFCB-4E : No voltage ON/OFF serial signal

Output   No voltage contact for operation, error display

                 Contact capacity: Below Max. AC240V 0.5A

Indoor control PCB

Start/Stop input	1
COM (GND)	2
Remote controller prohibition/clear input	3
Operation signal output	4
COM (+12V)	5
Error signal output	6

CN61
T10
(YEL)

CN06: 1, 2, 3, 4

CN13: 1, 2, 3, 4, 5, 6

ON side Start signal input
OFF side Stop signal input
COM
Operation signal output
Error signal output

Power supply
220-240V, 50Hz
220V, 60Hz

TCB-IFCB-4E

372
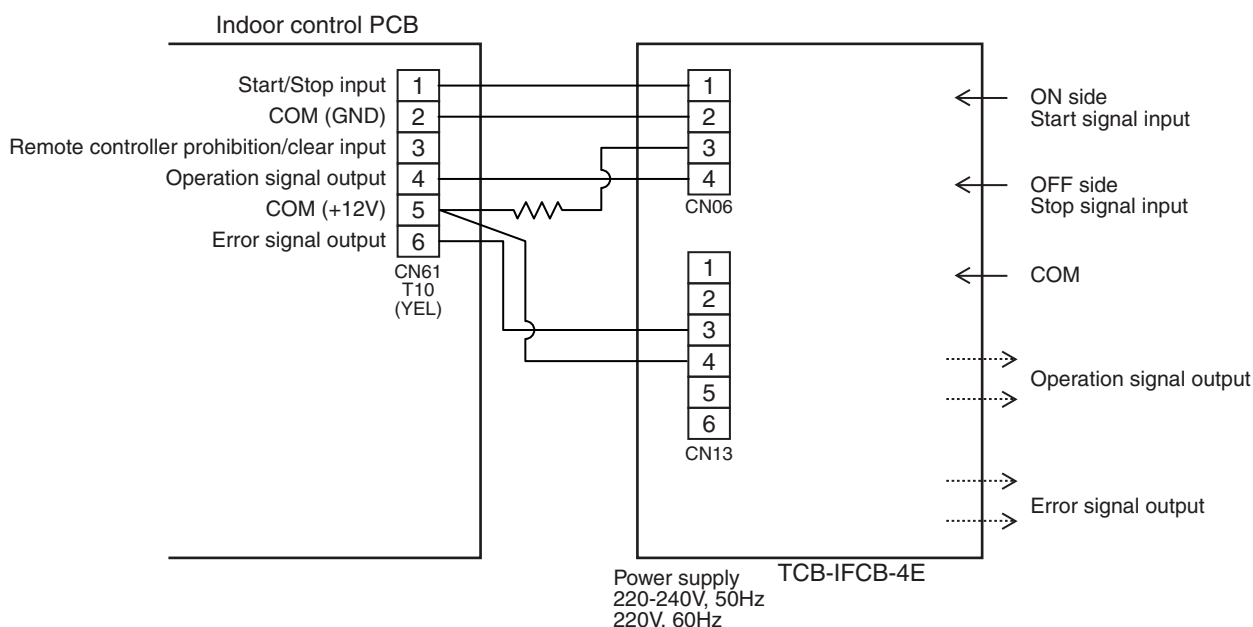
Installation Manual
NAME :Remote location ON/OFF Control box

■ Model Name : TCB-IFCB-4E2

■ Usage/Function/Characteristics

Start and Stop of the air conditioner is possible by the external signal as well as the indication of operation/alarm to

• Monitoring

The following functions are outputted by non-voltage contact.
1) ON/OFF status (for indoor unit)
2) Alarm status (System & indoor unit stop)

• ON/OFF command

The air conditioner can be turned ON/OFF by the external signals. The external ON/OFF signals are the outputs for the signals on the right.

ON/OFF

COM

TCB-IFCB-4E
Non-voltage
ON/OFF continuous signal
(Dry contact)
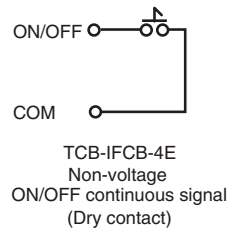
• Central priority mode and Last-push priority modes

A select switch to select central priority mode (CEN-TRAL) or last-push priority mode (LAST-PUSH) is provided on this interface. Select the one most appropriate to the users requirement.

Central priority mode :

• The air conditioner will start operation when the external signal is ON. The ON/OFF control of the air conditioner can then be controlled by remote controller.
• The air conditioner will stop operation when the external signal is OFF. The ON/OFF control of the air conditioner cannot then be controlled by remote controller.

Last-push priority mode :

• ON/OFF of the air conditioner is possible by the external signals or the latest command from the local remote controller. (The mode enables you to turn on/off the air conditioner by the local remote controller even if the external signal is OFF)

■ Specifications

Name	Remote location ON/OFF control box	Status output signal	Non-voltage contact (For indication of ON/OFF status, and alarm) Contact capacity : Max. AC 240V 0.5A or less
Model name	TCB-IFCB-4E2	Cabinet material	Galvanized steel
Power supply	Single phase, 220-240V, 50 Hz 220V, 60Hz	Size/Weight	66 (height) x 170 (width) x 200 (depth) (mm)/1050g
No. of connected indoor units	1 to 16 units for 1 interface (Group connection for 2 or more connected units)	Installation method	Exposed installation on specified position of indoor unit, appropriate position on wall surface or ceiling
Ambient temperature/humidity	0°C to 40°C DB, 30% to 90% RH		
Receive signal type of central ON/OFF command	Non-voltage ON/OFF continuous signal	Accessory	Shield wire cable with both-end connectors for CN06 and CN13 connector : 1.5m x 2

■ Outside view

• Fix this control box to the place besides the indoor unit.

■ Inside view

200

6-φ5.5 mounting hole

Approx. 300

22   78   78   22

Approx. 1500

22   78   78   22

66
63.6

146.9

156   170
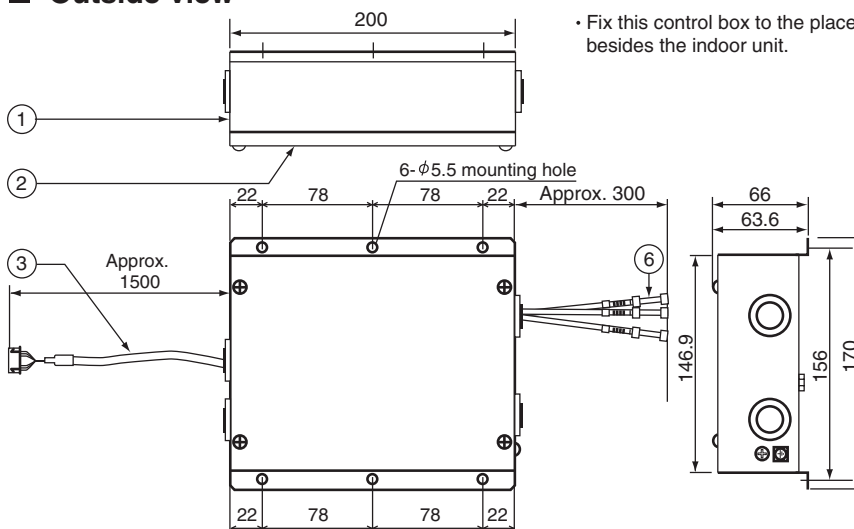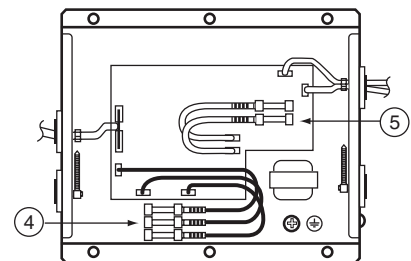
(NOTE) Do not install the accessory parts at the following locations.
1. Location where combustible gas may leak
2. Location where direct sunlight shines
3. Location with high humidity such as bathroom, kitchen, etc.
4. Location with high levels of dust
5. Location where rain or dew drops such as outdoors
6. Location in 1m-range of a TV or radio

No.	Name	Specification
1	Case unit	Galvanized steel 0.8t
2	Case cover	Galvanized steel 0.8t
3	Harness to connect indoor unit P.C. board	CN61 connector
4	Harness for indication cable	UL1015 AWG18 tip-insulation type butt connector
5	Harness for power supply	3-core, 0.75mm²
6	Harness for ON/OFF command	UL1015 AWG18 tip-insulation type butt connector

■ Accessory parts

・ Accessory No.1 connecting cables are already built in.

No.	Name	Q'ty	Remarks
1	Cable (For CN61 connector, with 6P connectors to both ends, L=1.5m)	1 pcs.	Connected to connector CN61 on P.C. board of indoor unit
2	M4 tapping screw	4 pcs.	For installation of this control box

■ Performance/Electric cabling diagram

Remote location for ON/OFF control box

P.C. board

CN13
CN06

COM OPERATION COMP. ALARM COM ON OFF Power input AC220-240V
TP7 TP8 TP9 TP10 TP3 TP1 TP2 TP4 TP5

White Yellow Pink Red Black Earth Screw

Transformer

Gray Blue

Power supply 220-240V, 50Hz 220V, 60Hz

* ⬭ : Tab terminal
* ▯ : Butt terminal

L1 L2

Power supply MAX. 240V 0.5A

Non-voltage ON/OFF continuous signal

L1 ON operation lamp
L2 Alarm indication lamp

Central panel (Required at the site)

Electric parts box of indoor unit

P.C. board for Indoor unit
CN61

A B

Wired Remote controller

(Note)
* For connecting, be sure to use the attached cables.
* Cables other than connecting cables will be required at the site.
* Fix the cables securely by using the holes provided for fixation.

Cable specifications (Local supply)

Power supply cable *1	Up to 80m : 3-core, 0.75mm²
ON/OFF command signal cable	Up to 500m : 2-core or 3-core, 0.75mm²
Indication signal cable *1	Up to 200m : 3-core, 0.75mm² Up to 400m : 3-core, 1.5mm²

*1) In conformity with design 60245 IEC 57

• Selecting of Central priority/Last-push priority

The select switch has been previously set to LAST-PUSH side on shipment from the factory.

When using the air conditioner with central priority, remove the cover on the interface adapter and select "CENTRAL" side on the select switch (SW 1) found near the center of P.C. board.

(CAUTION)
Be sure to turn off the power supply to the interface adapter before selecting one side on the select switch.

• Wiring method

(1) Power supply cable, earth and indication signal cable must be connected in this control box.
Detach the lid of the control box and connect the cables with the terminal according to the purpose.
(2) Be sure to secure the cables with the cable clamp.

Indication signal cable

Power supply cable

Cable clamp   Earth terminal   Cable clamp
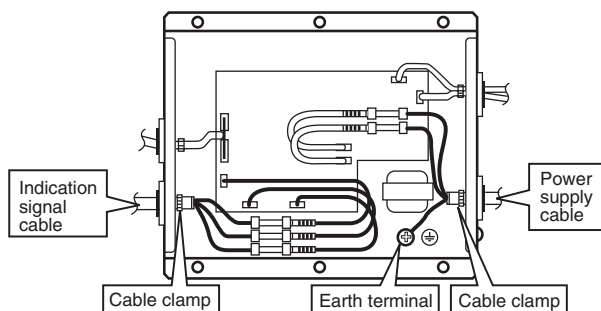
• Notes on connecting relays

(Relays are used for central indication in order to prevent malfunction by the surge absorber.)

a. To drive induction load with DC power

Diode

OPERATION

Diode

ALARM

Interface side   COM   Central side
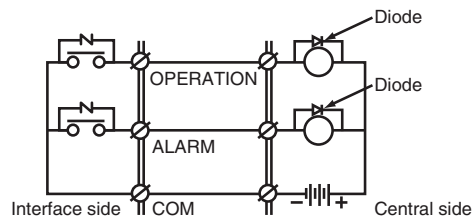
(Note)
Mount diodes to the both ends of the relay coil.
Select a diode that has a reverse flow range 10 times or more of the voltage used and the forward current is more than the load current.

b. To drive induction load with AC power

Surge absorber

OPERATION

Surge absorber

ALARM

Interface side   COM   Central side
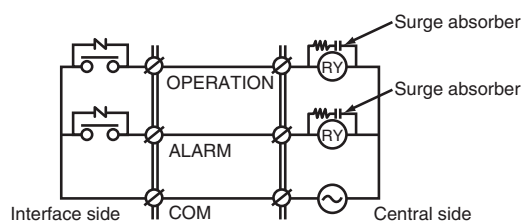
(Note)
Mount surge absorbers to both ends of the relay coil.
Use a surge absorber of which voltage range is 350V AC/500V DC or more.

4-7-2 Gereral Purpose Interface (TCB-IFCG1TLE)
4-7-2-1 TCB-IFCG1TLE
TCB-IFCG1TLE Installation Manual

Introduction

■ Applications/Functions/Specifications

Applications

- The TCB-IFCG1TLE is provided with the following input/output ports through which the central controller* can control the output ports and read data from the input ports. The TCB-IFCG1TLE enables reading of ON/OFF information and sensor data of relay-connected indoor units and general devices, as well as various applied controls including voltage control of actuators, motors, etc.
- The TCB-IFCG1TLE also enables sensor-based control of air conditioners such as air conditioner ON/OFF control with the change in digital input values of this board.
- * Full access can be made through the Modbus (TCB-IFMB640TLE) interface. However, RO1, RO2, DI3, and DI6 can be accessed or read from the TOSHIBA BMS central controller such as the 64-way central control remote controller (TCB-SC642TLE2).

- Inputs and outputs are connected to an appropriate device in the external circuit. Digital inputs and outputs can handle binary values and analog inputs, outputs can handle linear values.
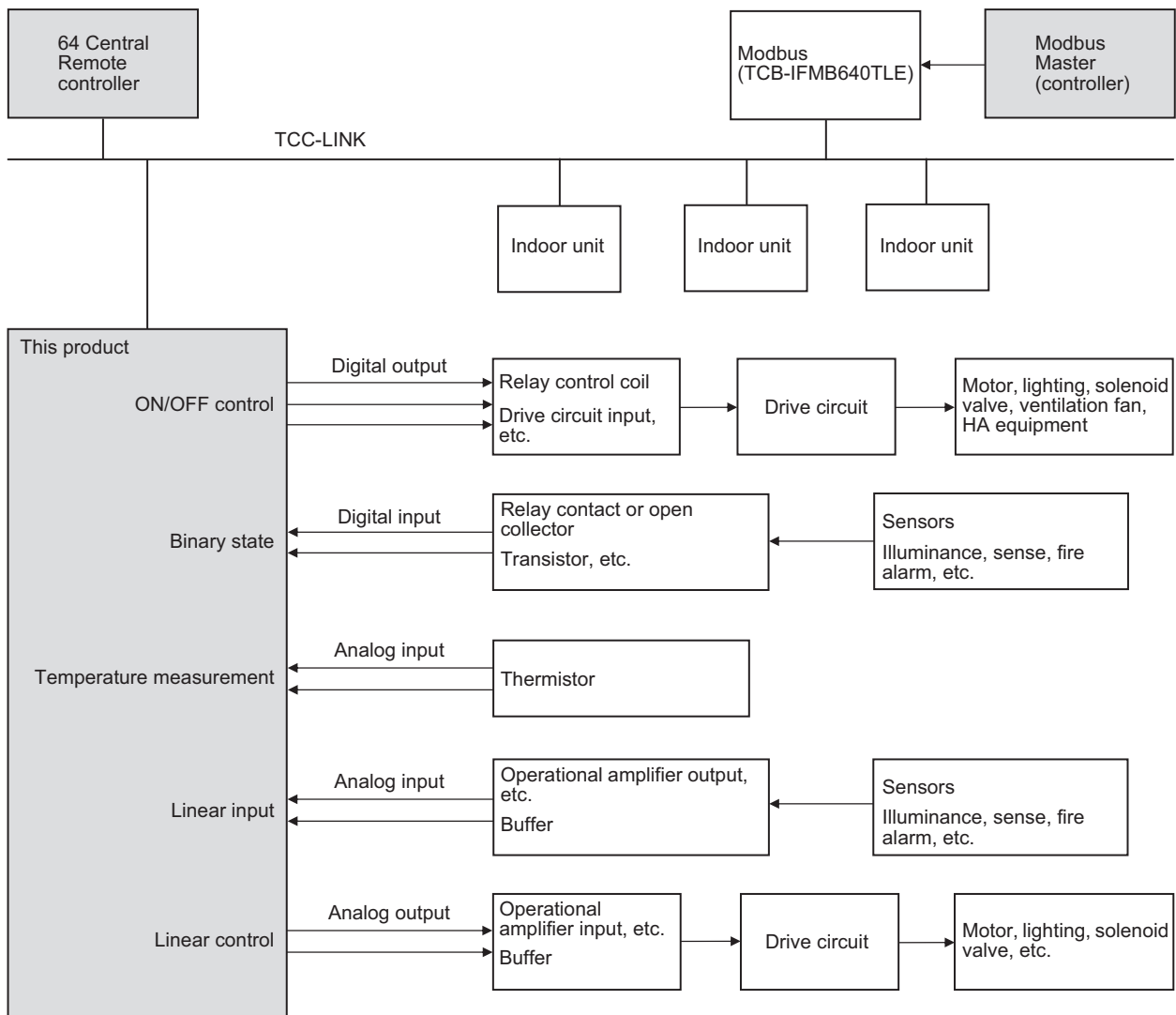
- Compatible Air Conditioners
  S-MMS, S-HRM, Mini-SMMS, DI, SDI

Specifications

Power supply	15 VDC ±5%
Power consumption	4 W
Operating temperature/humidity	0 to 40 °C, 20 to 85% RH
Storage temperature	-20 to 60 °C
Chassis material	Galvanized sheet metal 0.8t (no coating)
Dimensions	66 (H) × 170 (W) × 200 (D) mm
Mass	820 g

■ External View

	Parts name	Specifications		Parts name	Specifications
1	Case	Galvanized sheet metal	5	Grommet	C30-SG20A
2	Case lid	Galvanized sheet metal	6	Grommet	C30-SG20A
3	Grommet	C30-SG20A	7	Grommet for power supply	C30-SG20A
4	Grommet	C30-SG20A	8	DC Jack	MJ-40

Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	TCB-IFCG1TLE (TCB-IFCG2TLE)	1	
2	Installation Manual	1	
3	Screw	4	M4 x 12mm tapping screws

Use the following wiring materials to connect the signal lines and power lines. (Procured on site)

No.	Line	Description	
1	TCC-LINK	Type	2-core shield wires
		Wire size	1.25 mm², 1000m max.
		Length	2.00 mm², 2000m max. (Total Length of TCC-LINK Network, includes indoor/outdoor connection.)
2	Signal	Type	Multi-core wire
		Wire size	Stranded wire, single wire *1
		Length	0.08097 mm² to 3.309 mm² (AWG28 to AWG12) Max. 20 m *2
3	Power	Specified by AC adaptor	

*1 Use shielded wire according to the installation environment.
   Normally PVC cable is recommended. The conductor diameter should be approximately 0.7 mm and its resistance should be 60Ω/km. For 2-core cable, the outer diameter should be approximately 5 mm.
*2 Varies with use environment and conditions.

An AC adaptor unit for this product must meet the following requirements and be procured locally.

REQUIREMENT

- Output: 15 V ±5%
- Current: 0.5 A or more
- Shall conform to applicable safety standards (including EN60950-1 or IEC 60950-1, etc), EMI standards (EN550022 and EN61000-3), and EMS standards (including EN50024, (EN61204-3), and EN61000-4).
- Shall meet environmental conditions and required lifetime.
- DC Plug 2.1mmØ (inner diameter)
             5.5mmØ (outer diameter)
             10mm   (length)

Recommended product is

Model name: UI312-1508 produced by UNIFIVE TECHNOLOGY CO., LTD

Homepage addresses of UNIFIVE TECHNOLOGY CO., LTD are

http://www.unifive-us.com/, http://www.unifive.com.tw/, http://www.unifive.co.kr/, http://www.unifive.com/ or http://www.unifive.cn/.

Installation

■ TCB-IFCG1TLE (TCB-IFCG2TLE) Installation Method and Orientation

There are five orientations of Surface/Wall Mount that the TCB-IFCG1TLE (TCB-IFCG2TLE) can be installed, these are shown below.

NOTE

Use screws supplied for installation of device.

No good

REQUIREMENT

Do not install the unit in any of the following places.
- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

■ Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100mm
100mm
100mm

Connection of Power cables/Earth wires/Signal wires

⚠ CAUTION

- Power lines have polarity.
- The TCC-LINK signal lines have no polarity.

REQUIREMENT

Disconnect the AC adaptor for this appliance from the main power supply.

- The AC adaptor for this appliance must be connected to the main supply by a circuit breaker or switch with a contact separation of at least 3 mm.

■ Power cables/Earth wires/Signal wires

Connect power cables, earth wires, and signal wires to the specified terminals on the terminal block as shown below.

DC power input 15V ±5%

TCC-LINK communication line

Connect the shield of the TCC-LINK communication line to earth on the air conditioner side.
Do not connect the shield wire to this board. It should be open and insulated.
U1 and U2 have no polarity.

⚠ CAUTION
Polarity

+ −   U2 U1

SWART
CN5

SW7

Secure each cable with a cable clamp.

LED TCC-LINK ERROR (RED)
LED TCC-LINK (YELLOW)

SW6

SW5

LED POWER

SW1

SW2

AI3+- AI3- AI5+ AI5- AO2+-AO2-   RO1+RO1-RO3+RO3-   DI1+ DI1- DI3+ DI3- DI5+DI5-
AI4+- AI4- AI6+AI6-AO3+-AO3--   RO2+RO2-RO4+RO4-   DI2+ DI2- DI4+ DI4- DI6+ DI6-

Secure each cable with a cable clamp.

Analog input   Relay output   Digital input

Analog input/output
Digital output
RO output

20　5
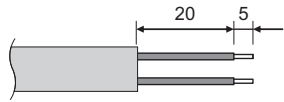
Length of stripped signal wires

U1, U2

10　5
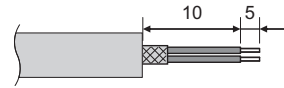
Length of stripped TCC-LINK wires

⚠ CAUTION

To connect a wire to a wiring terminal on the signal terminal block, insert a screwdriver or the like into a wiring terminal opening hole at an angle of 45 degrees and raise the screwdriver end to open the wiring terminal as shown below. Insert a wire into the open wiring terminal in this state, and then lower the screwdriver end and remove from the terminal opening hole.

Wiring terminal opening holes

Wiring terminals

Wiring terminal opening holes

Wiring terminals

Appearance of signal terminal block

Screwdriver or the like

Open the wiring terminal

Wiring terminal opening holes

Wiring terminals

Wiring terminal opening holes
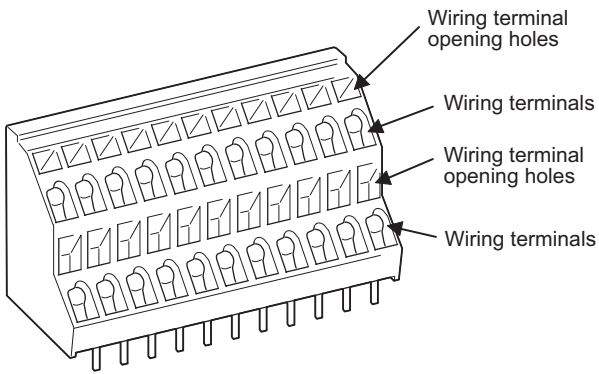
Wiring terminals

Side view of signal terminal block

■ Wiring Connection

The following displays an example of the TCB-IFCG1TLE connection to the TCC-LINK Network.

The TCC-LINK communication lines are connected to the U1 and U2 terminal blocks on the TCB-IFCG1TLE board as shown below.

Communication lines are connectable for both wires between indoor units and between outdoor unit and indoor units and for central control wires.

> **NOTE**
>
> The TCB-IFCG1TLE device can be connected to the TCC-LINK network on the indoor side using the U1 & U2 connections, OR on the outdoor side via the U3 & U4 connections.

For connection to external devices through digital inputs/outputs and analog inputs/outputs, refer to "Connection to External Devices" in "Input/Output Specifications"

Shield earthing

The shield of the TCC-LINK Network wire should be connected on the air conditioner side and left open and insulated at the TCB-IFCG1TLE side.

• U1 and U2 have no polarity.
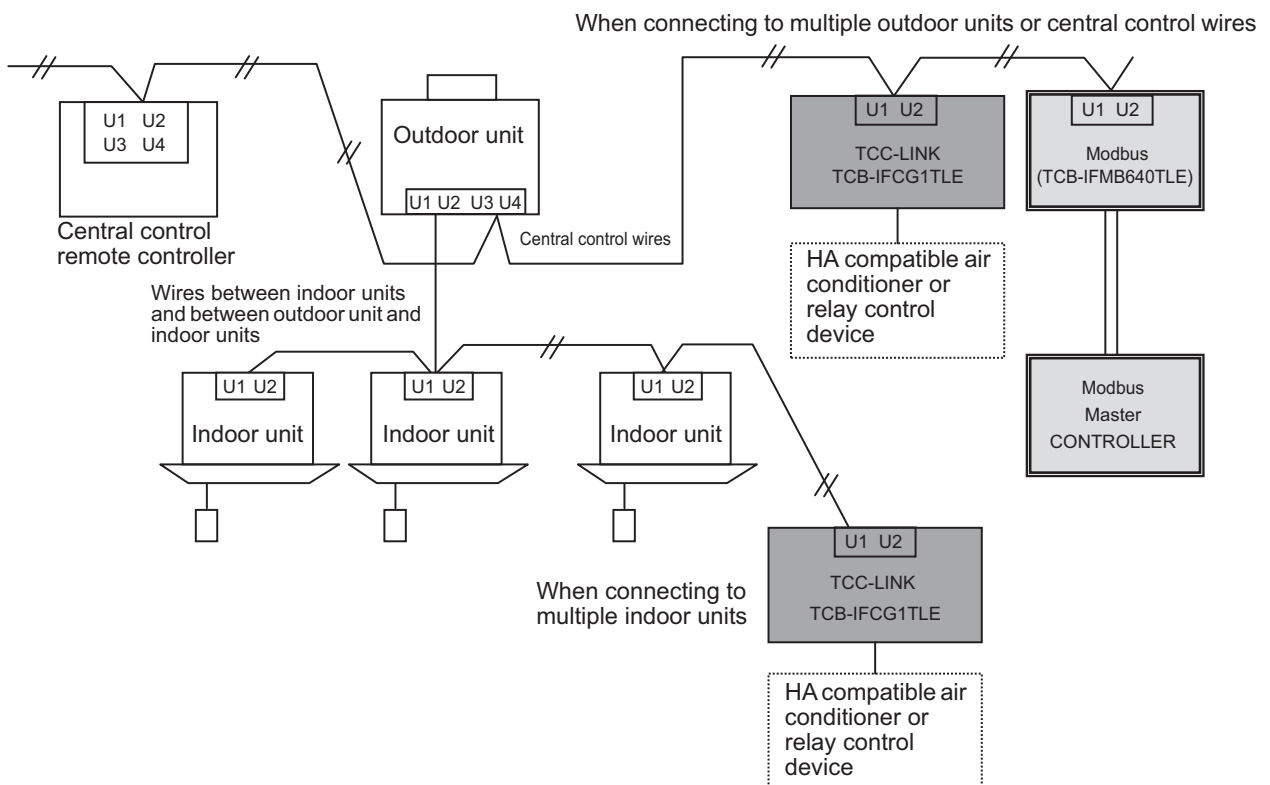
Connecting HA Compatible Air Conditioner (When connecting to an air conditioner with JEMA-compliant HA terminals)

(1) Set SW5-2 = OFF, SW5-3 = ON and SW5-4 = OFF on this board.

(2) Detach the panel of the indoor unit to be connected. Connect the 4 Pin plug with four wires (length must be 1.9 m or less, insulator thickness must be 1 mm or more, procured locally) to the 4 Pin HA connector on the control board of the indoor unit. Consult the manufacturer of the air conditioner about the location of the HA terminals and the installation method.

(3) Connect 1, 2, 3, and 4 of the four wires to RO1+, RO1-, DI3+, and DI3-, respectively.
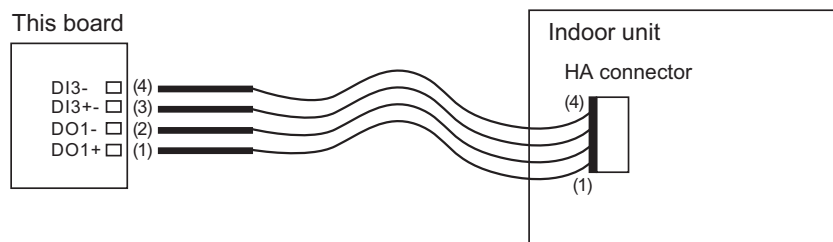
Setting
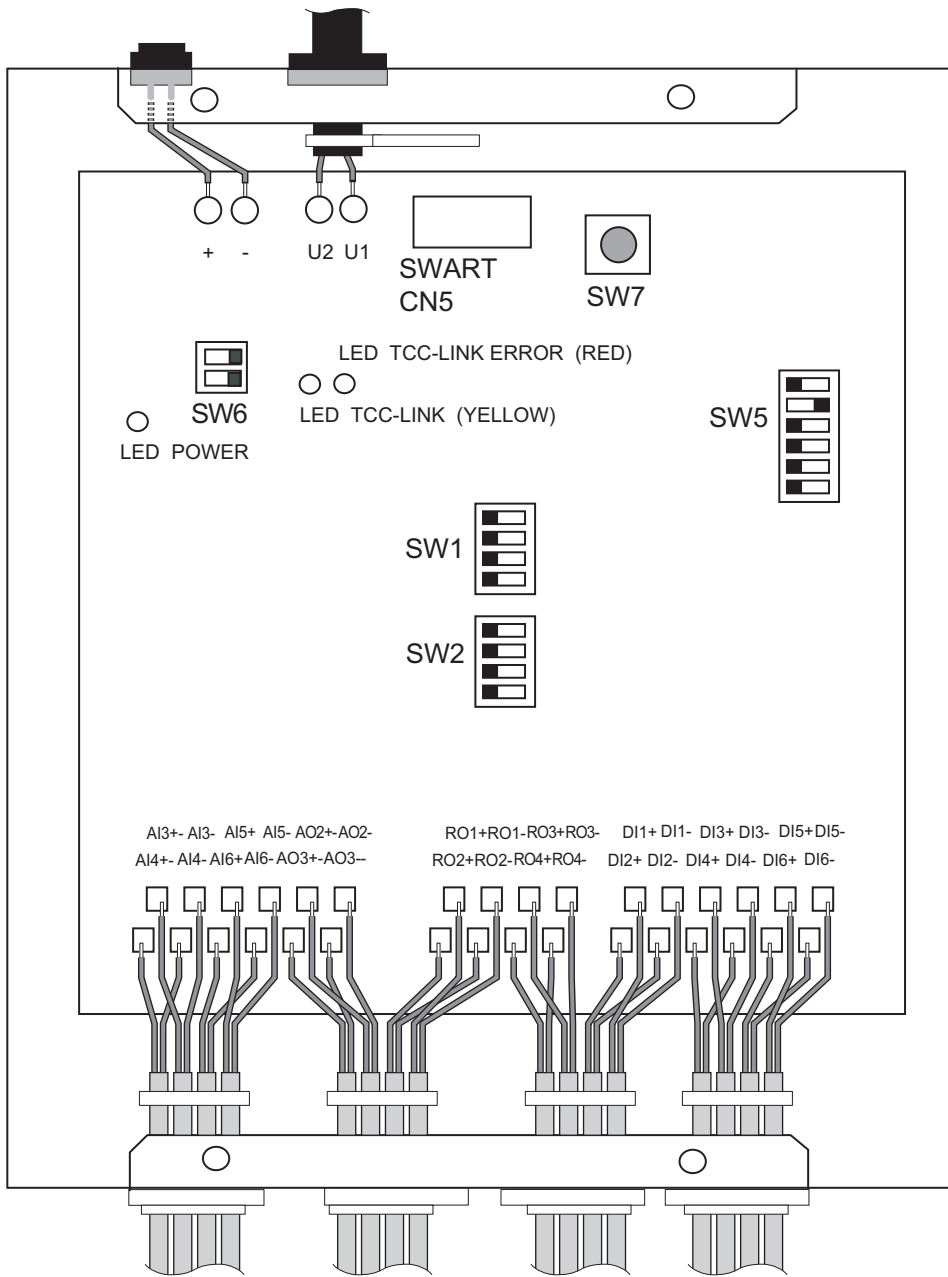
1. Setting Terminator Resistor for the TCC-LINK Communication Line

The TCC-LINK consists of TCB-IFCG1TLE units only. When no multiple air conditioners or custom air conditioners are connected, set SW6-1 of only one TCB-IFCG1TLE unit to ON and insert a 100-ohm terminator resistor into the TCC-LINK bus. SW6-2 is not used.
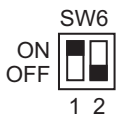
⚠ CAUTION

Switch settings are ONLY registered at power ON and when the reset switch has been pressed. When changing DIP Switch settings, be sure to either power down, or press reset switch SW7 to enable changes to be registered.

2. Setting SW5

SW5 is used for address mode, relay output type, and link operation settings.

SW5

ON
OFF

1 2 3 4 5 6
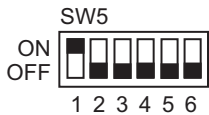
SW5-1: Address setting selection

      OFF: Address is set with SW1 and SW2 ON: Address is set by the central controller

  * For details, see (1) and (2) in "3. Setting Addresses Using SW1 and SW2".

SW5-2: RO1/RO2 discrete output selection

      OFF: Pulse type ON: Static type

SW5-3: RO1/RO2 discrete output pulse type selection

      OFF: 2 pulse outputs selection, ON: HA selection (ON/OFF alternatively)

SW5-4: RO2 discrete output polarity selection

  * For details, see the table in "1. Functions" in "Digital Inputs and Outputs".

SW5-5: OFF or ON

SW5-6: OFF or ON

  * For details, see the table in "3. Functions of DI4 and DI1 (TCB-IFCG1TLE only)" in "Digital Inputs and Outputs".

3. Setting Addresses Using SW1 and SW2

SW1   SW2

ON
OFF

1 2 3 4   1 2 3 4

An address set with SW1 and SW2 corresponds to the unit number of an indoor unit. When two or more general purpose interface units are used, do not set duplicated addresses. Always set SW2-3 and SW2-4 to OFF.

(1) When setting central control addresses from the central controller

Set SW5-1 to ON.

This setting is available when setting or changing central control addresses from the central controller for a system containing VRF, DI/SDI indoor units, and the general purpose interface. Set a desired unit number with SW1 and SW2 according to the switch settings in the table below. The line address is registered as 31. At this time, the central control address of the general purpose interface is set by the central controller.

Example) When central control address is set to 1 with SW1 and SW2, the unit number of the general purpose interface is 31-1.

(2) When setting central control addresses using SW1 and SW2

Set SW5-1 to OFF.

An address set with SW1 and SW2 is the central control address of the general purpose interface. Set central control addresses according to the requirement of the customer. The line address is registered as 31.

Example) When central control address is set to 5 with SW1 and SW2, the unit number of the general purpose interface is 31-5 and the central control address is 5.

When SW5-1 is set to OFF, the central controller cannot set any central control addresses. Set central control addresses different from those of indoor units.

▼ Setting central control addresses

Address	SW1 1	2	3	4	SW2 1	2	Address	SW1 1	2	3	4	SW2 1	2	Address	SW1 1	2	3	4	SW2 1	2	Address	SW1 1	2	3	4	SW2 1	2
1							17					●		33						●	49					●	●
2	●						18	●				●		34	●					●	50	●				●	●
3		●					19		●			●		35		●				●	51		●			●	●
4	●	●					20	●	●			●		36	●	●				●	52	●	●			●	●
5			●				21			●		●		37			●			●	53			●		●	●
6	●		●				22	●		●		●		38	●		●			●	54	●		●		●	●
7		●	●				23		●	●		●		39		●	●			●	55		●	●		●	●
8	●	●	●				24	●	●	●		●		40	●	●	●			●	56	●	●	●		●	●
9				●			25				●	●		41				●		●	57				●	●	●
10	●			●			26	●			●	●		42	●			●		●	58	●			●	●	●
11		●		●			27		●		●	●		43		●		●		●	59		●		●	●	●
12	●	●		●			28	●	●		●	●		44	●	●		●		●	60	●	●		●	●	●
13			●	●			29			●	●	●		45			●	●		●	61			●	●	●	●
14	●		●	●			30	●		●	●	●		46	●		●	●		●	62	●		●	●	●	●
15		●	●	●			31		●	●	●	●		47		●	●	●		●	63		●	●	●	●	●
16	●	●	●	●			32	●	●	●	●	●		48	●	●	●	●		●	64	●	●	●	●	●	●

* ● shows that the corresponding switch of SW1 and SW2 is set to ON.

Trial Operation Check

■ Before starting trial operation

Check before starting trial operation

Set all Indoor unit and TCB-IFCG1TLE central control addresses (DN03).

NOTE

These central control address MUST be different for ALL indoor units in a central control network.

- Connect one central controller or one Modbus System (TCB-IFMB640TLE+one Master) to TCC-LINK BUS.

■ Trial operation

Operate the central controller and check the communication status between TCB-IFCG1TLE and central controller. Check that LED23 lights up when Relay 1 is turned on and goes out when Relay 1 is turned off. When controlling from Modbus System, check that the DI, RO, AI and AO values of TCB-IFCG1TLE are correct. For details, refer to the specifications of TCB-IFMB640TLE.

Input/Output Specifications

■ Digital Inputs and Outputs

1. Functions

The following signals can be set and their states can read through the Modbus (TCB-IFMB640TLE) interface. However, RO1, RO2 (*1), DI3, and DI6 can be accessed from a central controller such as the 64-way central control remote controller (TCB-SC642TLE2).

DI6, DI5, DI4, DI1, DI2 and DI3 are photocoupler input signals. Transmit these input signals through contacts, a switch, or a sink device.

For details of these signals, see the "Connection to External Devices".

Signal classification		Port name	Data item	TCB-IFCG1TLE	TCB-IFCG2TLE
Digital output	Relay contact output	DO1 DO2 DO3 DO4	Output type	"a" or "b" contact selectable	"a" or "b" contact selectable
			Output point	4	2
			Maximum contact current	1 A	1 A
			Maximum contact voltage	250 VAC 30 VDC	250 VAC 30 VDC
Digital input	Type 1	DI1 DI2 DI3 DI4 DI5 DI6	Input type	Photocoupler insulation	Photocoupler insulation
			Number of input points	6	1
			Input resistance	100 Ω	100 Ω
			Minimum input ON current	2 mA	2 mA
			Maximum allowable input ON current	30 mA	30 mA
			Maximum input OFF current	0.05 mA	0.05 mA

Connector	Signal name	SW5 -2	SW5 -3	SW5 -4	Operation	In/ Out
RO1+ RO1-	Relay 1 ch output for general purpose interface				Relay contact output	Out
		OFF	OFF	*	Normally open. Closed for 250 ms when Relay 1 setup request is turned ON. (*1)	
		OFF	ON	*	Normally open. Closed for 250 ms each time Relay 1 setup request is turned ON or OFF. HA output type (*1)	
		ON	*	*	Normally open. Continuously closed when Relay 1 setup request is ON, and opened when Relay 1 setup request is OFF. (*2)	
RO2;+ RO2-	Relay 2 ch output for general purpose interface				Relay contact output	Out
		OFF	OFF	ON	Normally closed. Opened for 250 ms when Relay 1 setup request is turned OFF. (*1)	
		OFF	OFF	OFF	Normally open. Closed for 250 ms when Relay 1 setup request is turned OFF. (*1)	
		OFF	ON	*	Normally open. Closed when Relay 2 setup request is ON, and opened when Relay 2 setup request is OFF.	
		ON	*	*	Normally open. Closed when Relay 2 setup request is ON, and opened when Relay 2 setup request is OFF.	
RO3+ RO3- (TCB-IFCG1TLE only)	Relay 3 ch output for general purpose interface	*	*	*	Relay contact output. Normally open. Closed when Relay 3 setup request is ON, and opened when Relay 3 setup request is OFF.	Out
RO4+ RO4- (TCB-IFCG1TLE only)	Relay 4 ch output for general purpose interface	*	*	*	Relay contact output. Normally open. Closed when Relay 4 setup request is ON, and opened when Relay 4 setup request is OFF.	Out

Connector	Signal name	SW5-2	SW5-3	SW5-4	Operation	In/Out
DI5 (TCB-IFCG1TLE only)	On/off input for general purpose interface				Used for Relay 1 ON/OFF input setting at hand. This signal switches on and off of Relay 1 when DI5 is opened for more than 100 ms and then closed for 100 ms. The output mode depends on SW5-1, -2 and -3. However, when the on-hand setting is disabled through TCC-LINK, this port setting is not available.	IN
DI6 (TCB-IFCG1TLE only)	Alarm input for general purpose interface				Alarm input Closed signal indicates an alarm	IN
DI4 (TCB-IFCG1TLE only)	Din2 input for general purpose interface				Din2 input	IN
DI1 (TCB-IFCG1TLE only)	Din3 input for general purpose interface				Din3 input	IN
DI2 (TCB-IFCG1TLE only)	Din4 input for General Purpose I/F				Din4 input	IN
DI3	Din1 input for general purpose interface HA input				HA monitor input. Closed signal shows operation and open signal shows operation stop.	IN

(*1) Can be controlled by the central control remote controller, BMS central controller (such as the 64-way central control remote controller, or Modbus (TCB-IFMB640TLE). When DI3 contact input is ON, no transfer pulse is output even if ON instruction is issued. When DI3 contact input is OFF, no transfer pulse is output even if OFF instruction is issued. At this time, Relay 2 control through Modbus (TCB-IFMB640TLE) is disabled.

(*2) Status request response indicates the contact state, but does not indicate the DI3 state.

2. Connecting Relay-Controlled Devices

With respect to relay contacts of TCB-IFCG1TLE, there are four output types of the ON set signal and OFF reset signal sent to a device to be controlled, as described in "1. Functions." Choose the most suitable type. For details, see the examples of relay circuit and the description of functions.

The figure below shows the states of relay contacts of RO1, RO2, RO3, and RO4.

	SW5-2	SW5-3	SW5-4
	OFF	ON	Don't care

	SW5-2	SW5-3	SW5-4
	OFF	OFF	OFF

	SW5-2	SW5-3	SW5-4
	OFF	ON	Don't care

	SW5-2	SW5-3	SW5-4
	ON	Don't care	Don't care
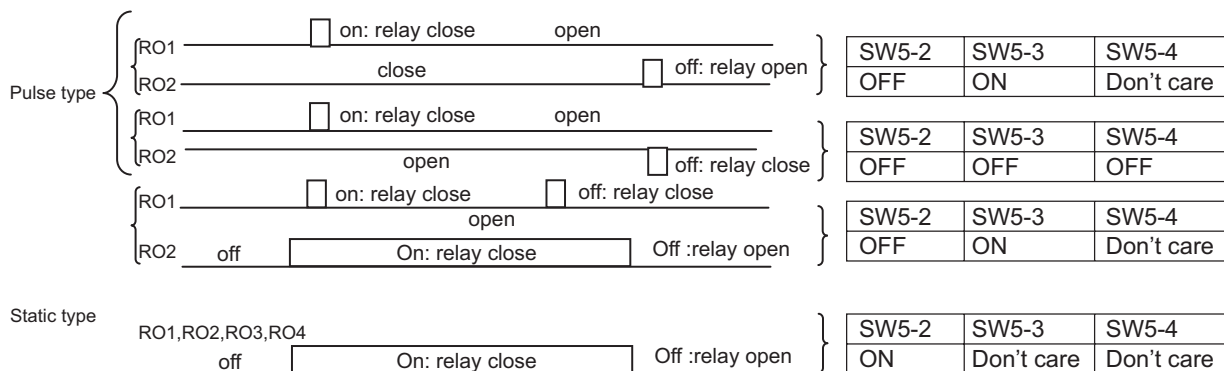
3. Functions of DI4 and DI1 (TCB-IFCG1TLE only)

The input states of the DI4 and DI1 ports can be acquired through the Modbus (TCB-IFMB640TLE) interface. Indoor units can be controlled (for operation stop, etc.) according to the DI4 and DI1 input states by the setting for Case 2 in the following table.

Case	SW5- -5	SW5- -6	Functions of DI4 and DI6	Local linkage
1	OFF	OFF	DI4 and DI1 input states can be acquired through the Modbus (TCB-IFMB640TLE) interface.	Not provided
2	ON	OFF	DI4 and DI1 input states can be acquired through the Modbus (TCB-IFMB640TLE) interface. When the DI4 input state has changed from "current ON" to "current OFF" it is notified simultaneously through the TCC-LINK line to turn off all indoor units. When the DI1 input state has changed from "current ON" to "current OFF", all indoor units of group address 1 are turned off through the TCC-LINK line.	Provided
3	OFF	ON	SWART entry setup mode	Provided
4	ON	ON	Reserved	

■ Analog Inputs and Outputs

1. Functions

The following table lists available analog inputs and outputs. Input states of 4-channel analog input signals can be acquired, and 2-channel analog output signals can be output through the Modbus (TCB-IFMB640TLE) interface.

Signal classification		Port name	Data item	TCB-IFCG1TLE	TCB-IFCG2TLE
Analog input	Type 1 Temperature measurement (thermistor input)	AI3 AI4	Input type	A/D converter input	
			Number of input points	2	0
			Thermistor	5 KΩ, YSI's product Each series of 44000, 45000, 46000, 48000, 55000 and 44900.	
			Measurement error	±0.4°C (excluding thermistor measurement error)	
			Measurement range	-10 to 90°C	
	Type 2 0-10V range	AI5 AI6	Input type	Resistor-divided A/D converter input	Resistor-divided A/D converter input
			Number of input points	2	2
			Resolution	10 bits	10 bits
			Allowable input voltage range	0.0 V to 10.0 V	0.0 V to 10.0 V
			Input resistance	3 KΩ	3 KΩ
			Input connectable output resistance	50 Ω or less	50 Ω or less
			Conversion time	160 mS	160 mS
			Conversion error	± (Input voltage x 0.008 + 0.05) V	± (Input voltage x 0.008 + 0.05) V
Analog output	0-10V range	AO2 AO3	Output type	Class-C push-pull	
			Number of output points	2	0
			Resolution	8 bits	
			Output voltage range	0.0 V to 10.0 V	
			Maximum output source current	10 mA	
			Output connectable load resistance	1 KΩ or more	
			Conversion time	10 µS	
			Conversion error	± (Input voltage x 0.008 + 0.12) V	

Terminal name	Input/output name		Use and devices to be connected	Remarks
AI3+	CH1 thermistor input (TCB-IFCG1TLE only)	Analog Input CH1	Thermistor: Use the YSI's product (5 Kohms) or equivalent	Values converted to Celsius temperature can be read to one decimal place through the Modbus (TCB-IFMB640TLE) interface.
AI3-	AI3 GND			
AI4+	CH2 thermistor input (TCB-IFCG1TLE only)	Analog Input CH2	Thermistor: Use the YSI's product (5 Kohms) or equivalent	Values converted to Celsius temperature can be read to one decimal place through the Modbus (TCB-IFMB640TLE) interface.
AI4-	AI4 GND			
AI5+	0-10 V DC input	Analog Input CH3	0 to 10 V. For general sensors The buffer output is connected.	Allocation of the Modbus (TCB-IFMB640TLE) input register (R) Values up to the third decimal place can be transmitted.
AI5-	AI5 GND			
AI6+	0-10 V DC input	Analog Input CH4	0 to 10 V. For general sensors The buffer output is connected.	Allocation of the Modbus (TCB-IFMB640TLE) input register (R) Values up to the third decimal place can be transmitted.
AI6-	AI6 GND			
AO2+	0-10 V DC output (TCB-IFCG1TLE only)	Analog Output CH1	0 to 10 V. For general actuators and input buffers Connected to the buffer input, resistance load, etc.	Allocation of the Modbus (TCB-IFMB640TLE) holding register (R/W) Values up to the third decimal place can be transmitted.
AO2-	AO2 GND			
AO3+	0-10 V DC output (TCB-IFCG1TLE only)	Analog Output CH2	0 to 10 V. For general actuators and input buffers Connected to the buffer input, resistance load, etc.	Allocation of the Modbus (TCB-IFMB640TLE) holding register (R/W) Values up to the third decimal place can be transmitted.
AO3-	AO3 GND			

■ Connection to External Devices

This product supports versatile applications including air conditioning through connections to various external devices such as sensors, key switches, drive circuit control input/output signals, and home automation equipment. Observe the following precautions when connecting this product to external devices.

General safety precautions to be observed in the circuit design process

- Be sure to install a safety circuit in the external control circuit so that the system will operate safely in the event of a malfunction or abnormality occurring in this product or a abnormality as a result of external factors.
- Output signals of this product may be kept ON or OFF due to fusing or burnout of the output relay or damage of the output transistor. To protect against this problem, be sure to provide a safety circuit in the external control circuit so that the entire system operates safely.
- Take fail-safe measures at the user side in case of a signal line disconnection or an abnormal signal due to power interruption.
- The life of output relays depends greatly on the contact open/close conditions. When using them, be sure to verify the performance with actual relays under actual use conditions and then use them within the number of open/close times that will not affect the relay performance. Continuous use of a deteriorated relay may result in an insufficient insulation between circuits or a burnout of the relay.

General precautions on system start-up

- For systems that have a load that could be dangerous to humans and/or has equipment connected to the output circuit, be sure to disconnect the output wiring temporarily and then perform the operation test.
- Before turning on the power supply, make sure that electrical specifications and wiring are all correct.

REQUIREMENT

- The electrical circuit to be connected to this product must be provided on the power supply secondary side and operate at a voltage of 42 V or less.
- To protect the signals from noise interference use the correct shielded cable for wiring.
- Connection to external relay
  To control the power supply primary side of an external circuit by the relay outputs RO1, RO2, RO3, and RO4 of this product, connect the control coil of the IEC-approved relay to RO1 to RO4 to achieve reinforced insulation from the power supply primary side including the external circuit and control the power supply primary side by the IEC-approved relay contacts.
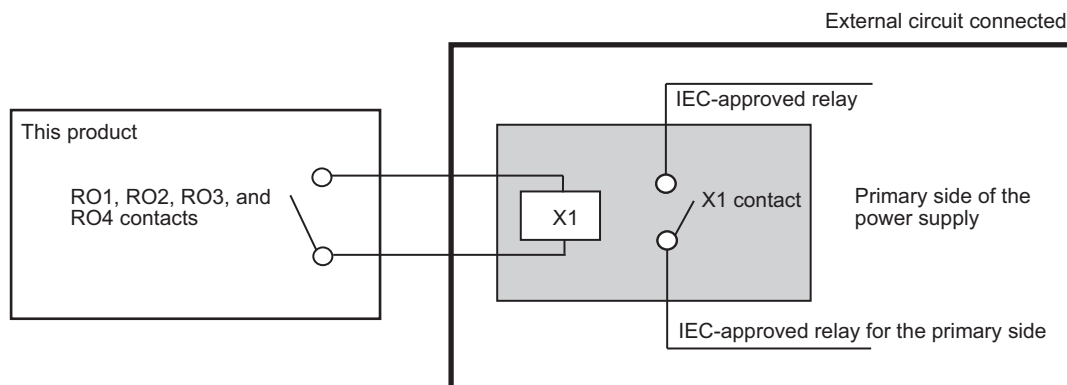
Reinforced insulation between X1 control coil side circuit and primary side circuit of the power supply including X1 contact.

Relay connection

▼ Noise reduction for relay output

When opening/closing a circuit of inductive load, connect a surge killer, diode or varistor in parallel with the load as shown below.

Circuit examples		Application		Characteristics
		AC	DC	
Capacitor-resistor system		Y	Y	When the load is a relay or solenoid, its operate time is delayed.
Diode system		N	Y	The operate time is more delayed than the capacitor-resistor system.
Varistor system		Y	Y	Some operate time is needed.
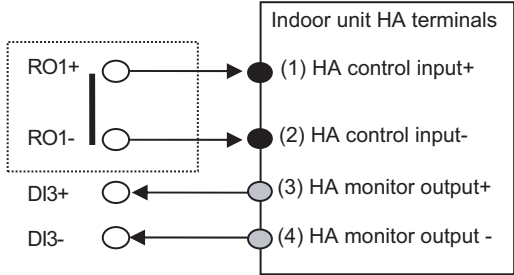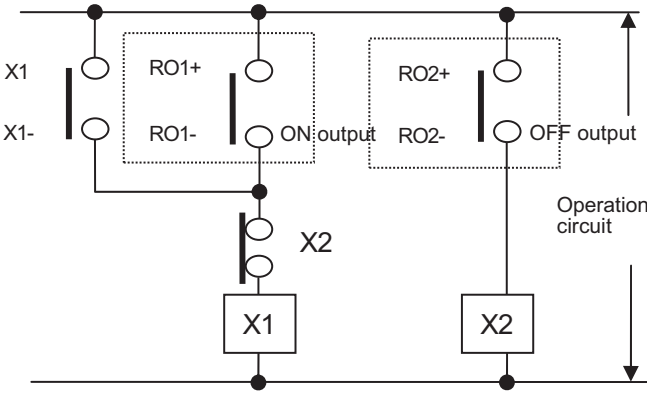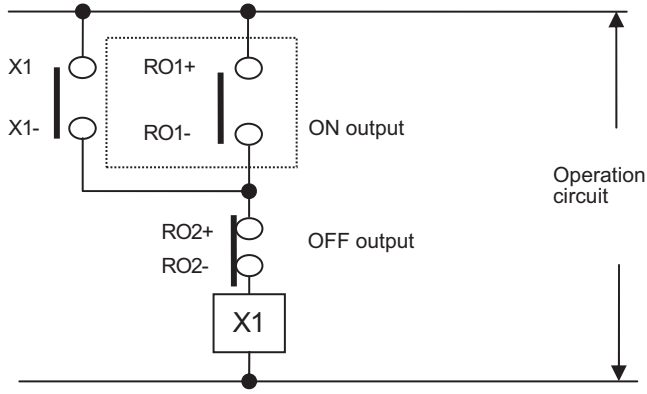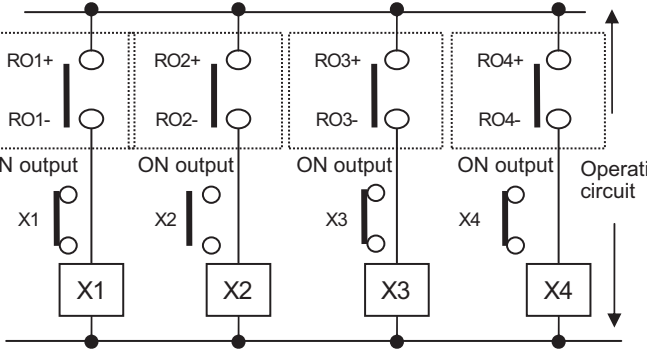
▼ RO1, RO2, RO3, and RO4 contacts

Contacts are directly output.

This product

Relay G5NB 12 V (Omron)

X1

RO1+, RO2+, RO3+, RO4+

RO1-, RO2-, RO3-, RO4-
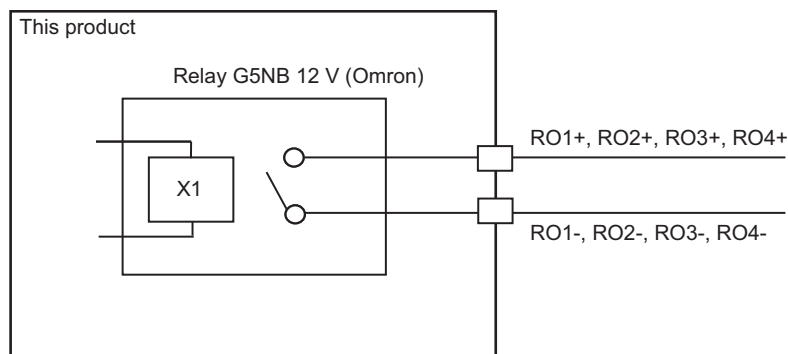
Examples of relay contact connection

Refer to "2. Connecting Relay-Controlled Devices"

Type	Connection	Remarks
Pulse contact output RO1 ON/OFF: "a" contact output Home automation (HA) equipment operation	Indoor unit HA terminals RO1+ — (1) HA control input+ RO1- — (2) HA control input- DI3+ — (3) HA monitor output+ DI3- — (4) HA monitor output -	SW5-2 = OFF SW5-3 = ON SW5-4 = OFF DI3+ -> DI3- Shows indoor unit is operating when current is ON, and indoor unit stops when current is OFF. Relay contacts are turned ON when operation is started and stopped.
Pulse contact output Both RO1 and RO2 ON/OFF: "a" contact output		SW5-2 = OFF SW5-3 = OFF SW5-4 = OFF X1 ("a" contact) and X2 ("b" contact) are auxiliary relays. X1 contacts are closed during a time period from RO1 ON output to RO2 OFF output. Connect a device to be controlled to the contacts of X1.
Pulse contact output RO1 ON: "a" contact output RO2 OFF: "b" contact output		SW5-2 = OFF SW5-3 = ON SW5-4 = ON X1 (a contact) is auxiliary relay. X1 contacts are closed during a time period from RO1 ON output to RO2 OFF output. Connect a device to be controlled to the contacts of X1.
Continuous contact output RO1, RO2, RO3, RO4 ON: "a" contact output		SW5-2 = ON SW5-3 = OFF X1 to X4 are auxiliary relays. Each contact is used. These contacts can be used directly for power line ON and OFF without auxiliary relays within the allowable range of current and voltage. When relays X1, X2, X3, and X4 are used, connect a device to be controlled or power line to each contact.

* $\boxed{Xn}$ shows the control coil of an auxiliary relay, and Xn ◯ shows the contact of auxiliary relay Xn.

▼ Examples of digital input connection

100Ω DI1,DI2,DI3,DI4,DI5,DI6 5V 360Ω Contact

HA terminal monitor output 5V 100Ω DI1,DI2,DI3,DI4,DI5,DI6 (3) (4) 360Ω Current sink

100Ω DI1,DI2,DI3,DI4,DI5,DI6 5V Contact 360Ω

100Ω DI1,DI2,DI3,DI4,DI5,DI6 5V Current sink 360Ω
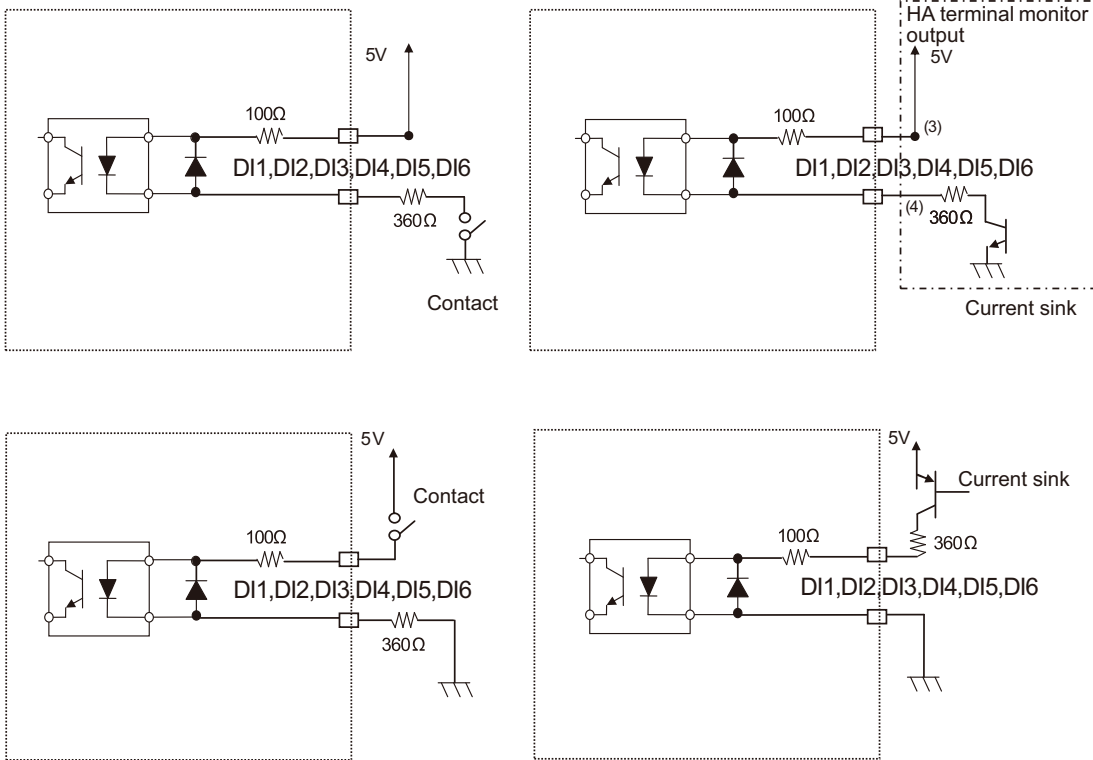
▼ Examples of analog input connection

AD Converter 2KΩ + AI5,AI6 0-10V
1KΩ − AI5-,AI6
AD Converter + AI3,AI4 Thermistor YSI 5KΩ −
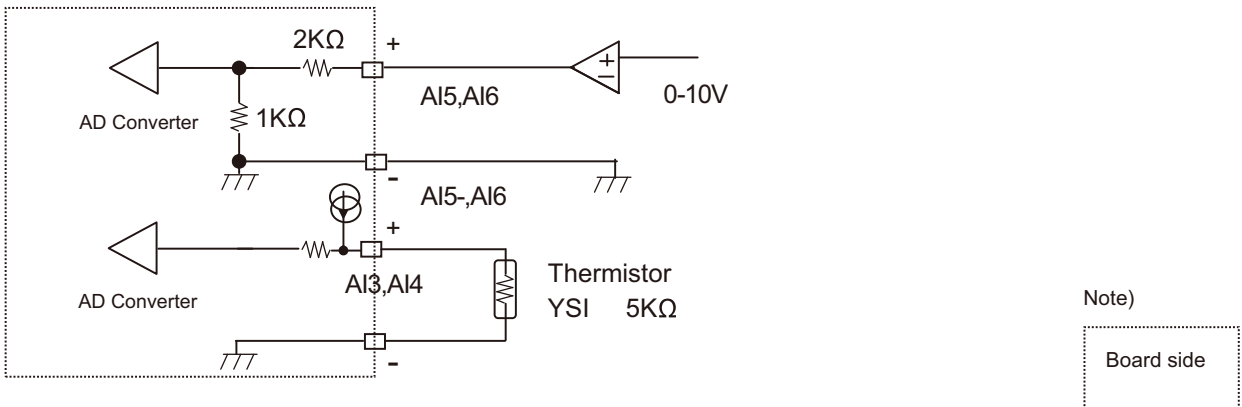
Note)
Board side

REQUIREMENT

Connect external connecting point groups AI5-/AI6-/AI7-/AI8- and AO2-/AO3-/AO4-/AO5- to the same earth point in each power supply system.

▼ Examples of analog output
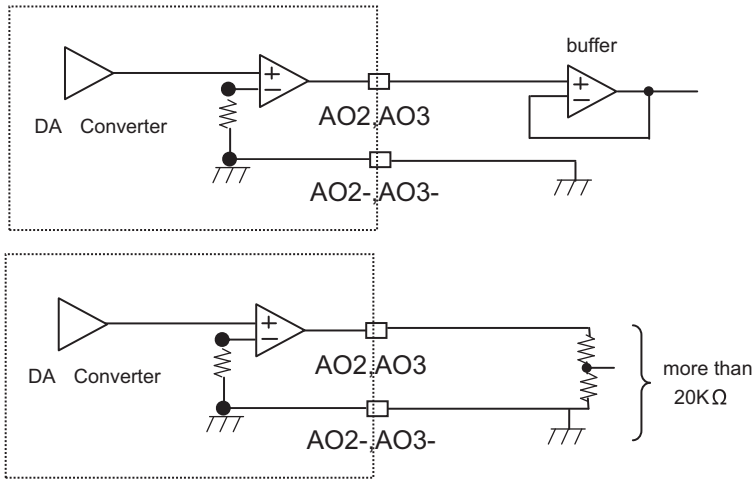
Note)

Board side

■ Advanced conjunction function

Set SW5-5 to OFF and SW5-6 to ON.

Connect the SWART connector CN5 on this board to the RS232C connector of the PC, and download several setting files to this product from the dedicated PC tool software. Then collaborative operation among various input ports, air conditioners, and relay contacts RO1 to RO4 can be set in detail.

For how to download the setting files and their contents, see the manual specified separately.

For the detail data, contact your dealer.

■ Indication of LEDs

The following LEDs light as follows:

LED No.	LED color	Lighting condition
D10	Red	Lights while power is supplied to this board.
D11	Yellow	Lights for 0.5 seconds during TCC-LINK transmission.
D12	Red	Lights while TCC-LINK transmission is halted.

4-7-2-2 Programming Tool for TCB-IFCG1TLE

TCB-IFCG1TLE is equipped with function to configure the actions of indoor units and the ON/OFF status of its relays according to the change of signals coming into its input ports and control air conditioning together with sensors and other air conditioning devices.

Using this software, you can configure the air conditioning control settings and ON/OFF action settings of the 4 channel relays of TCB-IFCG1TLE according to the change of signals coming into its input ports and save the settings on TCB-IFCG1TLE.

TCB-IFCG1TLE has 7 programmable input ports (2 analog and 5 digital) and you can configure the air conditioning control settings of up to 64 indoor units (through TCC-Link) and the control settings of the four relays according to the change of voltage level (4 levels on the analog ports and 2 levels on the digital ports).

You can program up to 12 sets of assigned signals and corresponding actions of air conditioning control and relays.

For air conditioning control, you can configure the settings of the items below:
• Start/stop
• Operation mode
• Temperature setting
• Air flow
• Local control prohibition (except start and stop)

Assignable central control addresses for indoor units are 1-64 and "All", which assigns all the addresses (1-64) at once.

1. Introduction

This manual describes how to use the setting tool software for the advanced conjunction function for the general purpose interface. The setting tool allows writing, reading, and erasing air conditioning control data to respond to input port changes for the general purpose I/F board (TCB-IFCG1TLE, referred to as GP hereinafter).

2. Overview of the System

This manual is intended for the setting tool for operations in conjunction with the GP.

Set the switches on the GP to SW5-5: OFF and SW5-6: ON, connect the connector CN5 on the GP to the RS232C connector on the PC with the DYNA KIT cable, connect the power line of the GP, and then press the RESET button (SW7) on the GP.

General Purpose I/F board (GP)

RS232C
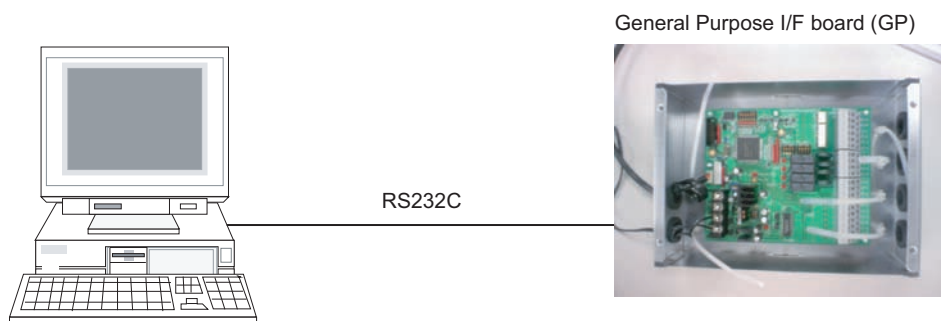
3. Necessary equipment and software

Product	Product name	Obtain from
DYNA KIT cable	Adapter CNV2-3.3V	Carrier sales company
.NET Framework	Microsoft .NET Framework 2.0 or later	Download from Microsoft web site.
Writing tool software	Setting tool software for advanced conjunction function for the General Purpose Interface	Carrier sales company
PC	Windows XP or 2000 with RS232C port	—

4. Operating Environment and Installation

4-1. Operating Environment

Supported OS: Windows XP / 2000
Microsoft .NET Framework 2.0 or higher and a serial port are necessary to operate this system.

4-2. Required Files and Installation

- Microsoft .NET Framework 2.0 or higher can be downloaded from the Microsoft website.
- Copy the following files to an appropriate directory.
  - serialPort.txt
  - GPSettingTool.pdb
  - GPSettingTool.exe

4-3. Serial Port Setting

Set the serial port as follows:

- Baud Rate = 38400 bps
- Data bit = 8
- Parity check = no parity   } Fixed
- Stop bit = 1
- No flow control
- COM port = COM1 (default)
- Timeout = 2 seconds (default)

5. Serial Port Setup File Format

The COM port and timeout period settings can be changed with the setup file "serialPort.txt". However, even if the settings are changed after startup, the setting change is not reflected because these settings are made during system startup. If there is an error in the setup file, an error message appears and the GP setting tool is not activated. The COM port and timeout period cannot be changed independently. Therefore, when changing either COM port or timeout period, both COM port or timeout period must be set together. If the setup file does not exist in the same directory, the default settings of the COM port and timeout period are used.
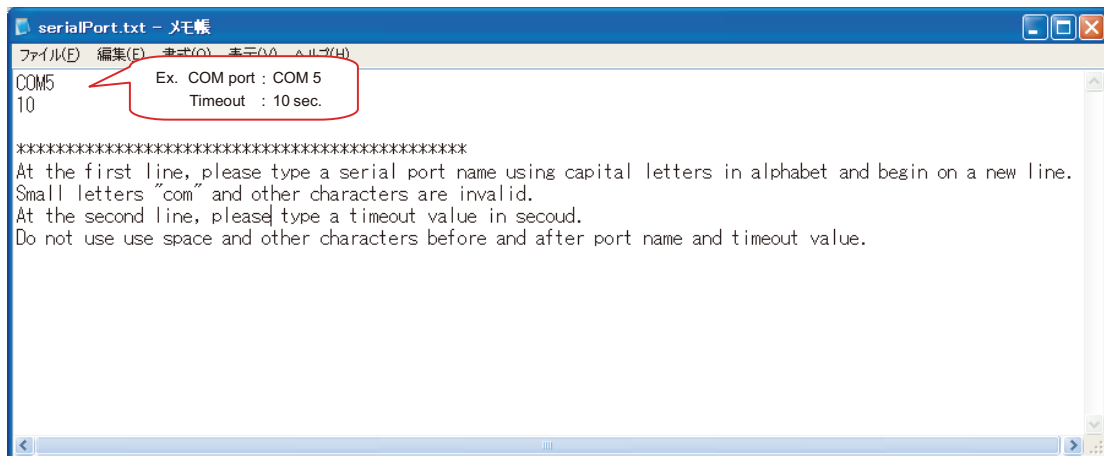
- Type a COM port name using capital alphabets on the first line.
  If small letters (e.g. com) are entered, an error occurs.
- Type a timeout value in second on the second line.
  A value from 1 to 300 (seconds) can be set. If a value outside this range (e.g. –1, 0, or 400) or a fractional value (e.g. 1.5) is entered, an error occurs.

If these settings are entered on other lines or space or other characters are used before or after the port name and timeout value, an error occurs.

6. How to Use the GP Setting Tool

6-1. Startup

Start the GPSettingTool.exe.

6-2. Write Operation

The set data of the selected patterns can be written to the GP.
The set data of other patterns in the GP remains unchanged when the set data of the selected patterns is written.
When the set data of the selected patterns already exists, it is overwritten to the new data by the write operation.
The write operation takes time in some cases.

6-2-1. Selecting Patterns

Click the checkboxes of patterns you want to select.
Two or more patterns are selectable.
Click the Toggle All button to select all patterns or cancel selection of all patterns.
If no pattern is selected, an error occurs.

6-2-2. Setting Trigger Port and Condition

Select the tab of the selected pattern to set Trigger Port and Condition.

If no Trigger Port is selected, an error occurs.
When selecting values for Condition, if the same value is selected for before and after (e.g. before = H, after = H), an error occurs.

When digital input (DI1 to DI6) is selected for Trigger Port, if values except for the combinations shown below are selected, an error occurs. <u>"H" corresponds to the state where input current does not flow to the relevant DI port, and "L" corresponds to the state where the input current flows to the relevant DI port.</u>

Before	After
H	L
L	H
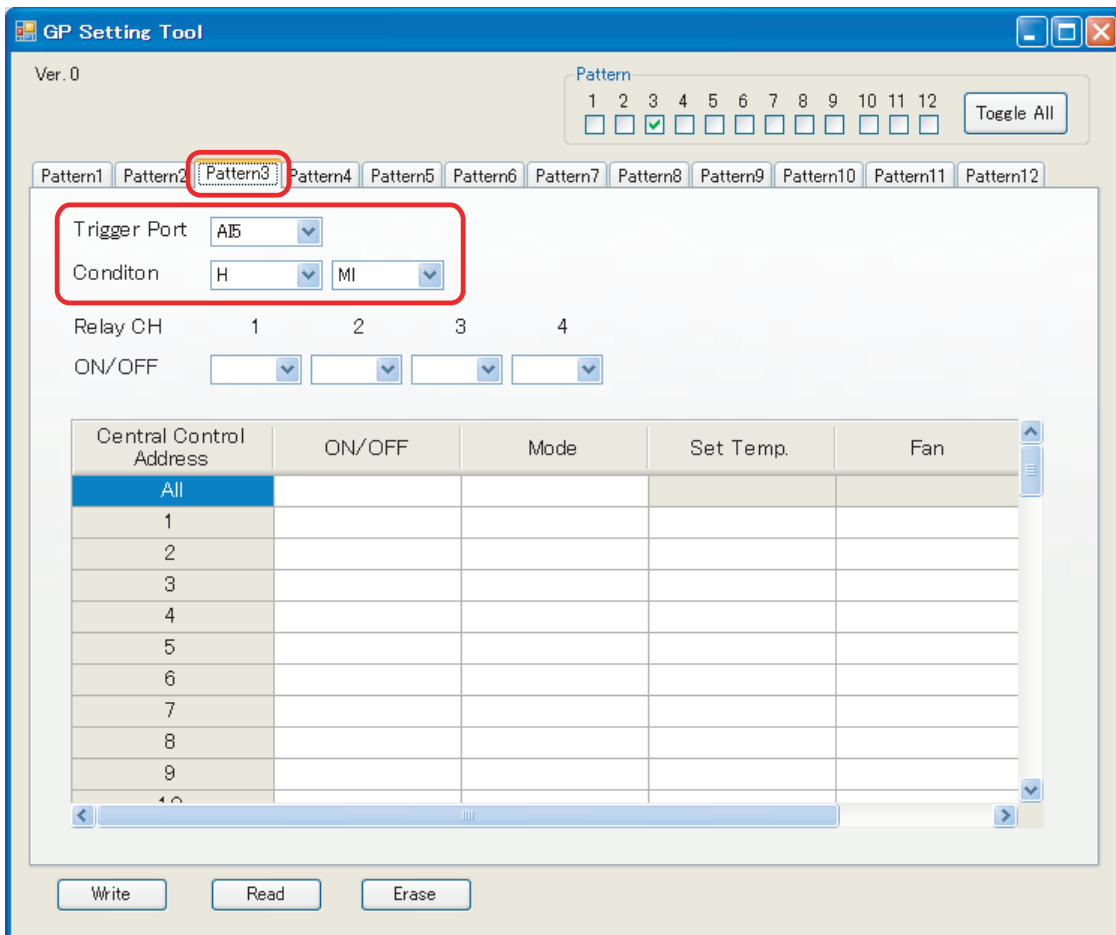
6-2-3. Setting Relay CH and Air Conditioning Control Data

The following items can be set for air conditioning control data.
- On/OFF
- Operating mode
- Set temperature
- Fan speed
- Disabling of remote control (ON/OFF only)

Each central control address (1 to 64) can be set individually, and all addresses (1 to 64) can also be set collectively with the All button. However, the All button cannot be used for setting set temperature and fan speed. While setting of an item (e.g. operating mode HEAT) is made for all addresses, if the setting of the same item is made for an address (e.g. address 10), an error occurs.

If no data is set for both Relay CH and air conditioning control data, an error occurs.
Up to 30 settings can be made for air conditioning control data. If excess settings are made, an error occurs.
For each central control address, set temperature and fan speed are treated as one air conditioning control data.

Example) In the case of the following window, there are six settings as ⬭ is one air conditioning control data.
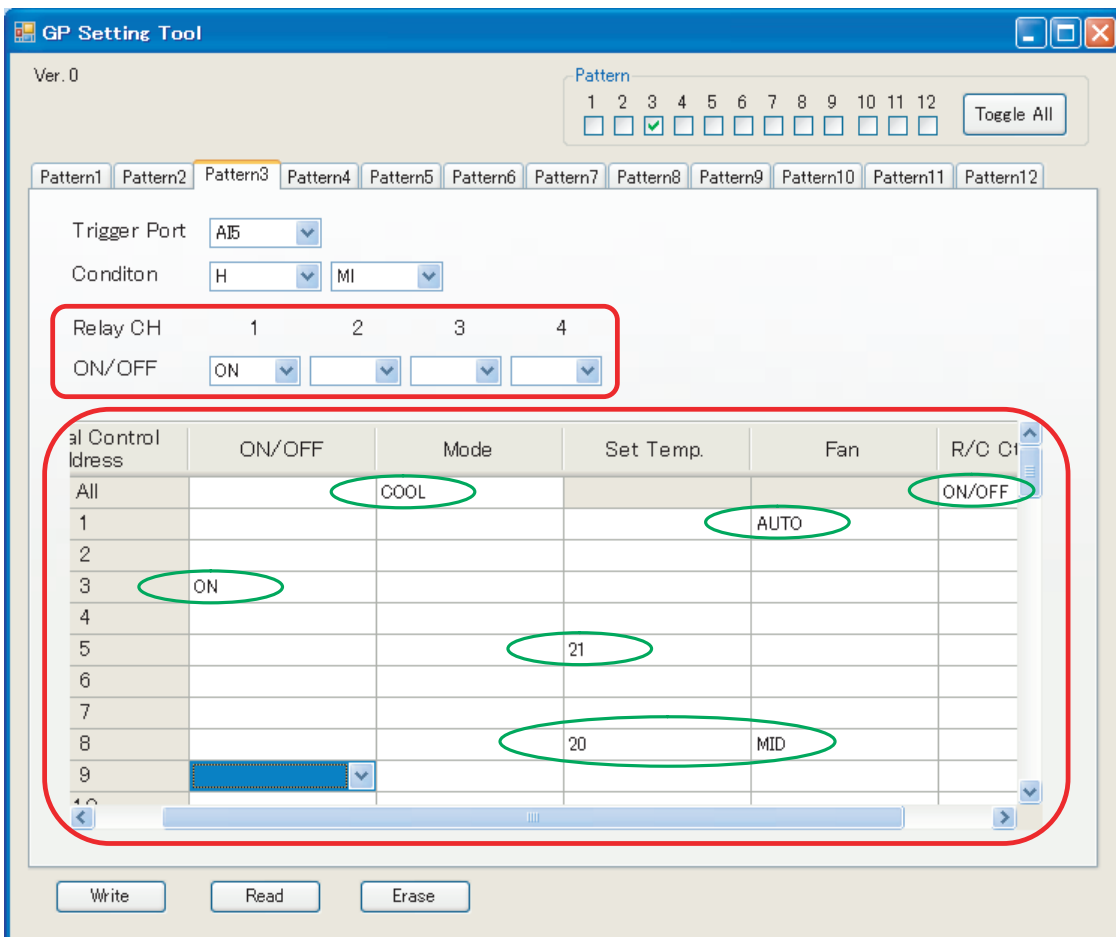
6-2-4. Writing Set Data

After all data have been set, click the Write button.
A confirmation message appears. Confirm the message and click the OK button to send the set data.
To cancel the write operation, click the Cancel button.
After the writing is completed, a completion message appears.
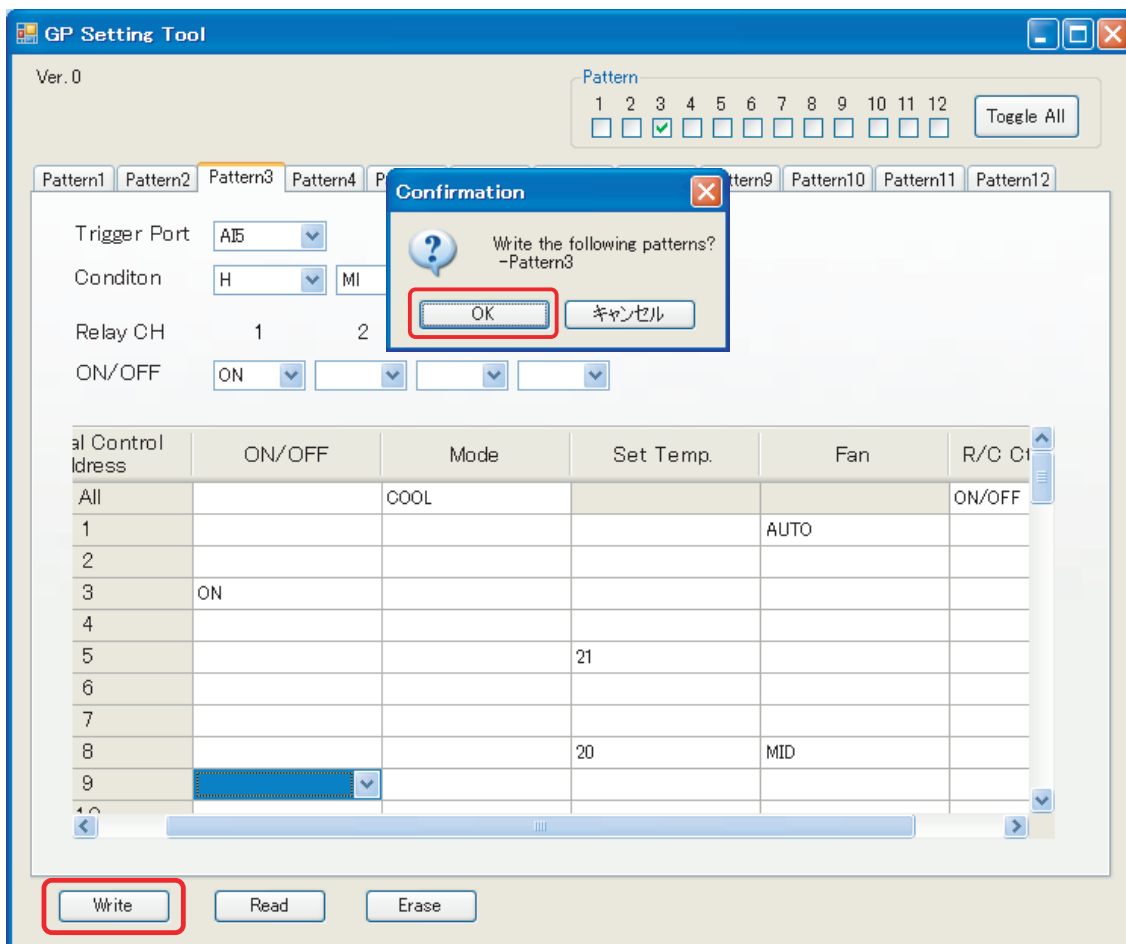
6-3. Read Operation

When the set data of the selected pattern is stored in the GP, the data can be read and displayed on the window.
During this read operation, only the data of the selected pattern is displayed and the display contents of other patterns on the window are completely cleared.
The read operation takes time in some cases.

6-3-1. Selecting Patterns

Click the checkboxes of patterns you want to select.
Two or more patterns are selectable.
Click the Toggle All button to select all patterns or cancel selection of all patterns.
If no pattern is selected, an error occurs.

6-3-2. Reading Set Data

Click the Read button after patterns are selected.
A confirmation message appears. Confirm the message and click the OK button to read the set data.
To cancel the read operation, click the Cancel button.
After the reading is completed, a completion message appears and the read data is displayed on the window of the selected pattern.
If there is no set data, a confirmation message appears indicating "no data."
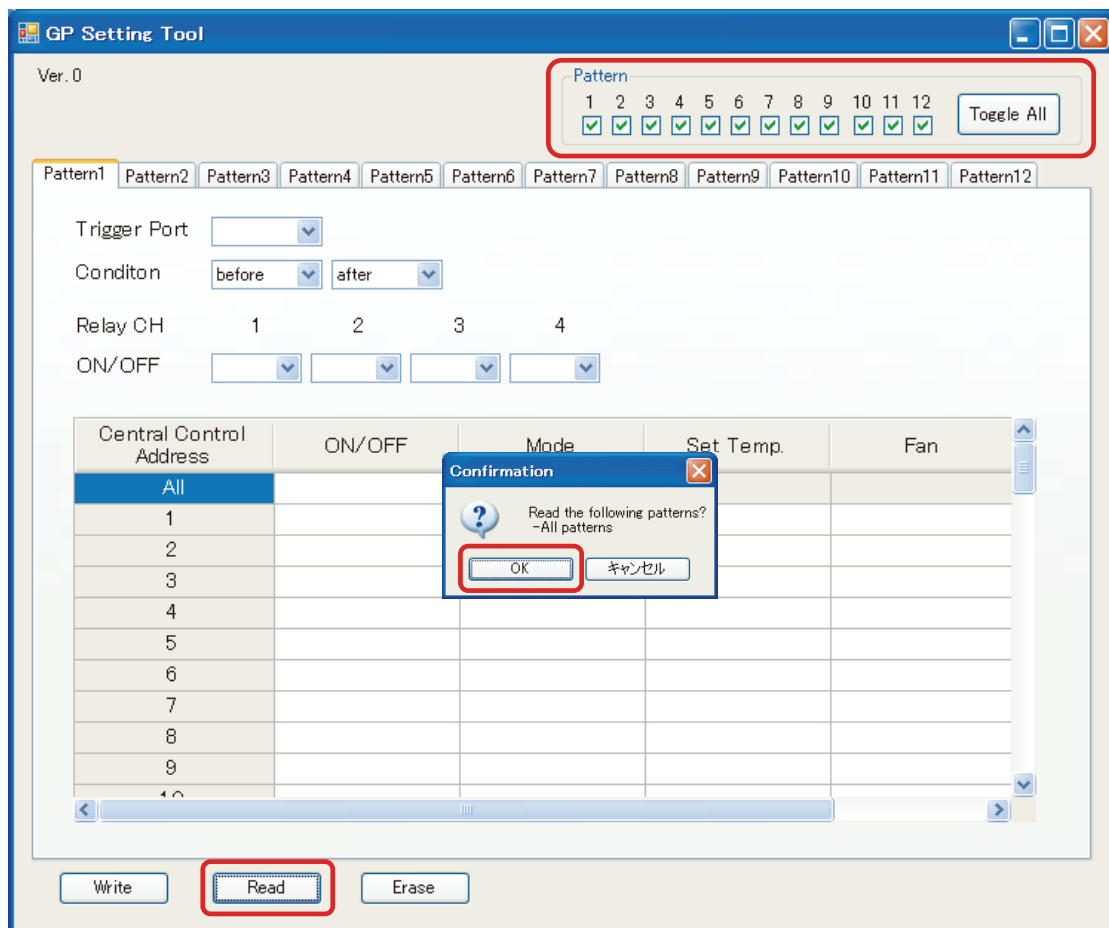
6-4. Erase Operation

The set data of the selected patterns, which is stored in the GP can be erased with the Erase button.
The set data of other patterns in the GP is not erased when the set data of the selected patterns is erased.
The erase operation takes time in some cases.

6-4-1. Selecting Patterns

Click the checkboxes of patterns you want to select.
Two or more patterns are selectable.
Click the Toggle All button to select all patterns or cancel selection of all patterns.
If no pattern is selected, an error occurs.

6-4-2. Erasing Set Data

Click the Erase button after patterns are selected.
A confirmation message appears. Confirm the message and click the OK button to erase the set data.
To cancel the erase operation, click the Cancel button.
After the erasure is completed, a completion message appears and the windows of the selected patterns are cleared.
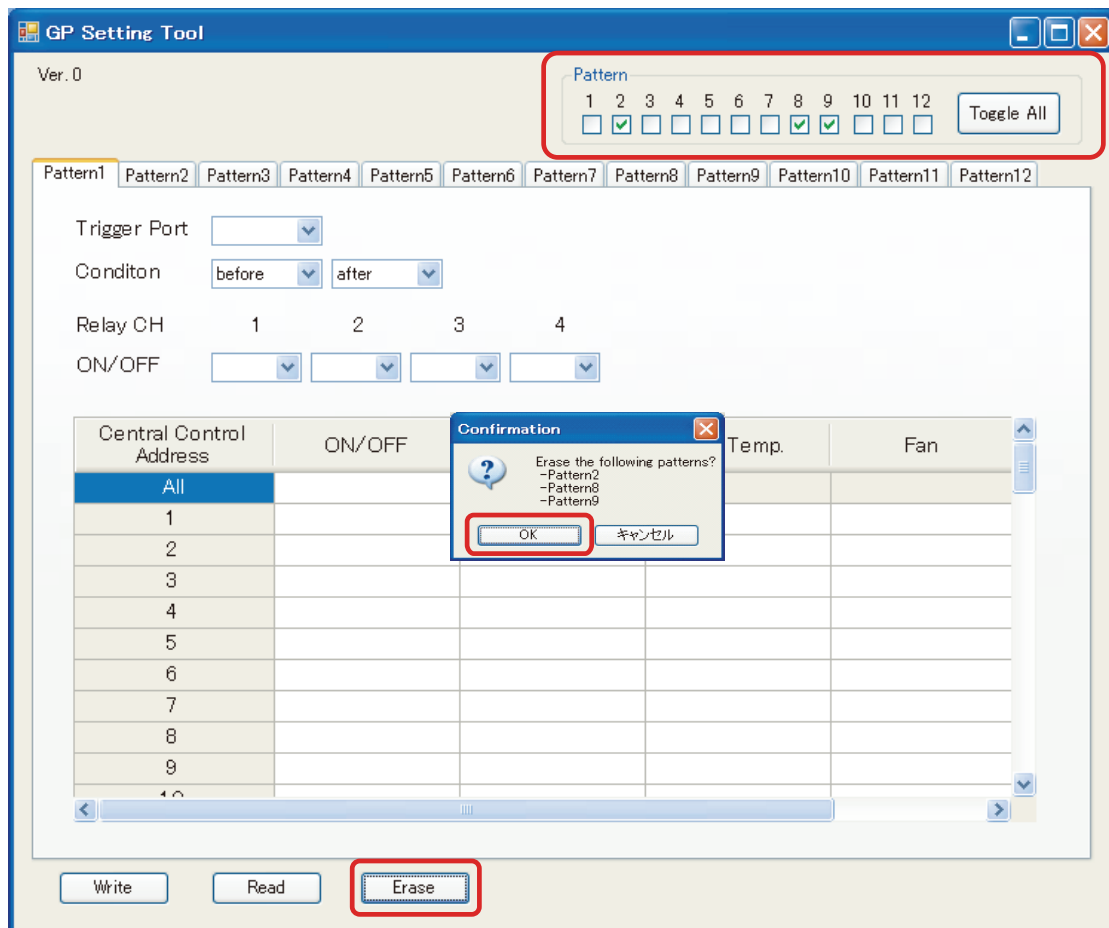
7. Errors

7-1. Communication Error

Error Message	Action
Time Out	Check the following: • Power supply to the GP • Connection between PC and GP • Connection of the serial cable • COM port setting • Timeout period setting If this error still occurs after these connections and settings are checked, contact Global Sales Division /Engineering Consultant Group of Toshiba Carrier Corporation.

7-2. System Errors

If normal operation is prevented due to the following errors, contact Global Sales Division /Engineering Consultant Group of Toshiba Carrier Corporation.

Error Message	Description
Format Error(GP)	Receive data from GP is incorrect
FCC error	GP's FCC error
PN error	Pattern number error
PN error(Erase)	Erase pattern number error
STX code error	GP's STX code error
ACK: FCC error	FCC error
ACK: DL error	DL error
ACK: Format error	Format error
ACK: Memory full	Outside the EEPROM area
ACK: PN error	Pattern number error
ACK: Pattern Exist	Specified pattern exists during write operation
ACK: Command error	Command (STX) error

4-7-3 GSM Phone Control Interface (TCB-IFGSM1E)
TCB-IFGSM1E Installation Manual

Introduction

■ Applicable Air Conditioner Models

The following models equipped with home automation (HA) connector CN08/CN09/CN22,

DAISEIKAI		RAS-B**GKVP-E
		RAS-B**GKCVP-E
		RAS-B10SKVP-E
		RAS-B13SKVP-E
		RAS-B16SKVP-E
		RAS-10SKVP-ND
		RAS-13SKVP-ND
		RAS-16SKVP-ND
		RAS-10SKVR-E
		RAS-13SKVR-E
		RAS-16SKVR-E
		RAS-18SKVR-E
		RAS-22SKVR-E
		RAS-10SKV-E
		RAS-13SKV-E
		RAS-16SKV-E
		RAS-18SKV-E
		RAS-22SKV-E
		RAS-**PKVP-E
		RAS-**PKVP-ND
		RAS-M**PKVP-E
		RAS-M**PKVP-ND
Inverter	High wall	RAS-**GKV-E2
Inverter Multi	High wall	RAS-M**GKV-E2
		RAS-M**GKCV-E2
	Duct	RAS-M**GDV-E
		RAS-M**GDCV-E

The following models equipped with connector CN61:

S-MMS, S-HRM, Mini-SMMS, DI, SDI

■ Applicable Areas

Global System for Mobile Communications (2G digital mobile phone communication system) service areas.

■ Applications, Functions and Features

Applications: The GSM Phone Control Interface TCB-IFGSM1E allows ON/OFF control of air conditioners, operation status monitoring, and alarm monitoring from a GSM mobile phone. This interface is suitable for remote air conditioning control of empty homes and unmanned facilities.

Functions: Equipped with an RS-232C connector for connection to a GSM modem and a connector for connection to an indoor unit of air conditioner, the TCB-IFGSM1E receives air conditioner ON/OFF setting SMS message sent from a GSM mobile phone via the GSM modem, analyses SMS message characters, and then performs air conditioner settings through the indoor unit connector according to the analysis result. When the TCB-IFGSM1E receives a status acquisition request SMS message, it sends a response air conditioner ON/OFF status SMS message. Furthermore, for custom and S-MMS indoor units equipped with connector CN61, the TCB-IFGSM1E automatically notifies the destination of the registered telephone number in case of an alarm.

Features: The TCB-IFGSM1E provides the simplest operation for commands to air conditioners with a text message using the short message service (SMS).
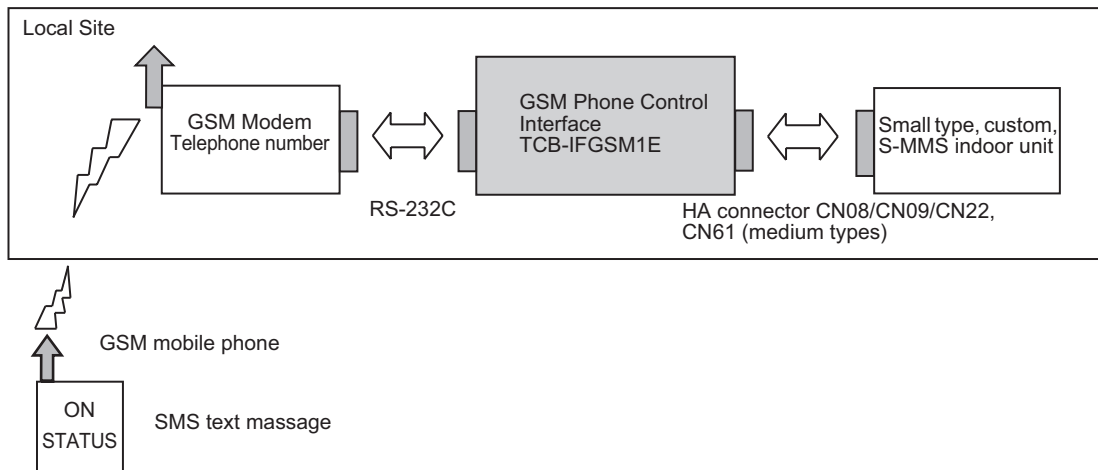
■ External View
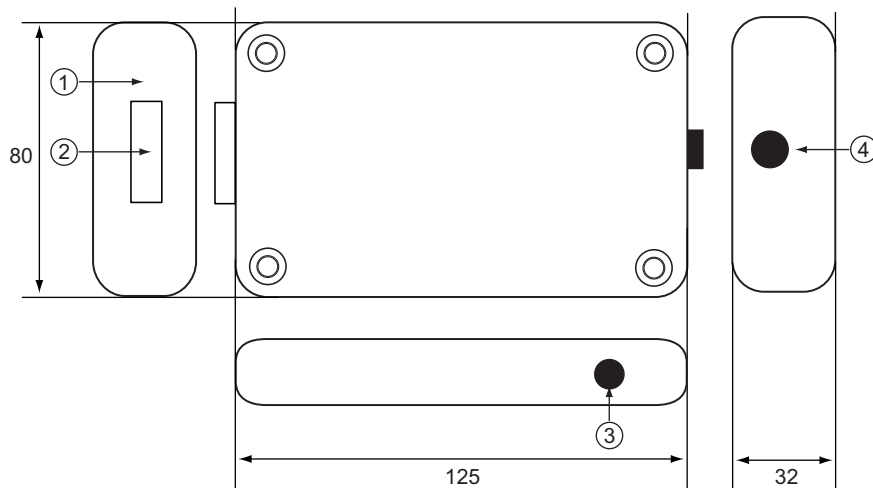
	Parts name	Specification
①	Case	Plastic (nonflammable ABS resin)
②	RS-232C connector	D-sub 9-pin male connector
③	DC plug jack	6.3 Ø
④	Grommet	9 Ø

Before Installation

Specifications

Media used		Global System for Mobile Communications (2G digital mobile phone communication system)
Operation	Air conditioner control items	Air conditioner ON/OFF control is designated by mobile phone SMS message.
	Air conditioner status acquisition items	Air conditioner ON, OFF, and alarm status is notified by mobile phone SMS message. (Auto-notification is provided only when CN61 is used.)
	Operation/notification target telephone number	Up to 5 numbers can be registered initially.
	Accessible telephone number	Up to 5 numbers can be registered initially.
TCB-IFGSM1E hardware	Power supply	Specified by AC adapter No external power supply is required when CN61 is used.
	Power consumption	1.1 W
	RS-232C connector	Supports communication specifications (9600bps, non-parity, 8 bits, 1 stop bit, flow control provided/none) D-sub 9-pin male connector Protocol: Supports ETSI GSM 07.05, GSM 07.07, GSM 03.40, GSM 03.38 standard compliant SMS-related AT commands.
	Connector for the air conditioner	Photocoupler HA connector specification, 12 VDC power input, alarm input
		CN3: HA connector (For CN08/CN09/CN22)
		CN4: For CN61
	Operating temperature/ humidity	0 to 40°C, 20 to 85% RH
	Storage temperature	-10 to 60°C
	Chassis material	Plastic (nonflammable ABS resin UL-94V0)
	Dimensions	32 (H) × 80 (W) × 125 (D) mm
	Mass	150 g

No.	Line	Description	
1	RS-232C cable	Type	Straight-type cable with D-sub 9-pin male-female connectors
		Wire size	Conforming to RS-232C
		Length	Max. 15 m
2	Indoor unit cable	Type	Multi-core wire
		Wire size	Stranded wire (*1) 0.08097 to 3.309 mm² (AWG28 to AWG12)
		Length	Max. 2 m (*2)
3	Power	Specified by AC Adapter Not required when CN61 is used	

(*1) Thickness of insulator must be at least 1 mm. When the insulator is thinner than 1 mm, put the wire into a vinyl tube with insulator thicker than 1 mm.

(*2) Varies with use environment and conditions.

An AC adaptor unit required when connecting to the HA connector CN08/CN09/CN22 must be procured locally. The AC adaptor must meet the following requirements.

- Output voltage: 7-19 V ± 5 %
- Output current: Min. 0.1 A
- Shall conform to IEC safety standards (including EN60950-1 or IEC 60950-1, etc), and shall have been certified as required for EMI standards (EN550022 and EN61000-3) and EMS standards (including EN50024, (EN61204-3), and EN61000-4).
- Shall meet environmental conditions and required lifetime.
- DC Plug 2.1mmØ (inner diameter)
         5.5mmØ (outer diameter)
         10mm   (length)

Recommended product is

Model name: UI312-1508 produced by UNIFIVE TECHNOLOGY CO., LTD

Homepage addresses of UNIFIVE TECHNOLOGY CO., LTD are

http://www.unifive-us.com/, http://www.unifive.com.tw/, http://www.unifive.co.kr/, http://www.unifive.com/ or http://www.unifive.cn/.

Parts Supplied with the Product and Required Materials

Part name	Description / Specification	Quantity	Procurement
GSM Phone Control Interface TCB-IFGSM1E	This product	1	Supplied
GSM modem	Provided with an RS-232C connector and the SMS-related AT command function. Conforming to ETSI GSM 07.05, GSM 07.07, GSM 03.40, and GSM 03.38 standards.	1	Procured locally (including power supply)
Power supply	Not required when CN61 is used.	1	Procured locally
RS-232C cable	Used for connection to between GSM modem and TCB-IFGSM1E. A straight cable with male-female connectors (max.15 m)	1	Procured locally
Indoor unit cable	Use a commercially available 6-pin cable for connection to CN61. (Model name: TCB-KBCN61HAE)	1	Procured locally Ask your dealer.
	Use a 1.9 m 4-pin cable for connection to HA terminal.	1	Supplied
Insulating tube for cable protection	Use this tube (Thickness: at least 1 mm) to protect the indoor unit cable if the user may touch the cable.	1	Procured locally
Screw	For 4 feet to be attached to the wall (M3 x 16 tapping screw)	4	Supplied
Foot	4 feet (including screws MT-34K) to be attached to the TCB-IFGSM1E.	4	Supplied
Cable clamp	For clamping indoor unit cable.	1	Supplied
Installation Manual	Used by installation staff	1	Supplied
Owner's Manual	Used by the user	1	Supplied

Parts Required for Tests

GSM modem simulator software (CD-ROM)	Used for checking air conditioner communication and RS-232C communication.	1	Supplied
PC for tests	Equipped with RS-232C communication function. Used for the GSM modem simulator software.	1	Procured locally
RS-232C cable for tests	A cross cable with female-female connectors used for connection to a PC	1	Procured locally

Write down the GSM modem telephone number, PIN, and PUK number.

GSM modem telephone number:

PIN:

PUK number:

Installation

■ TCB-IFGSM1E Installation Method and Orientation

There are five orientations of Surface/Wall Mount that the TCB-IFGSM1E can be installed, these are shown below.

NOTE

Please use screws supplied for installation of device.

Remove the screws at the four corners, fix the supplied plastic external mounting feet, and then tighten the supplied MT-34K screws to secure the case, feet, and case lid together. Then secure the TCB-IFGSM1E to a wall with screws using the holes B.
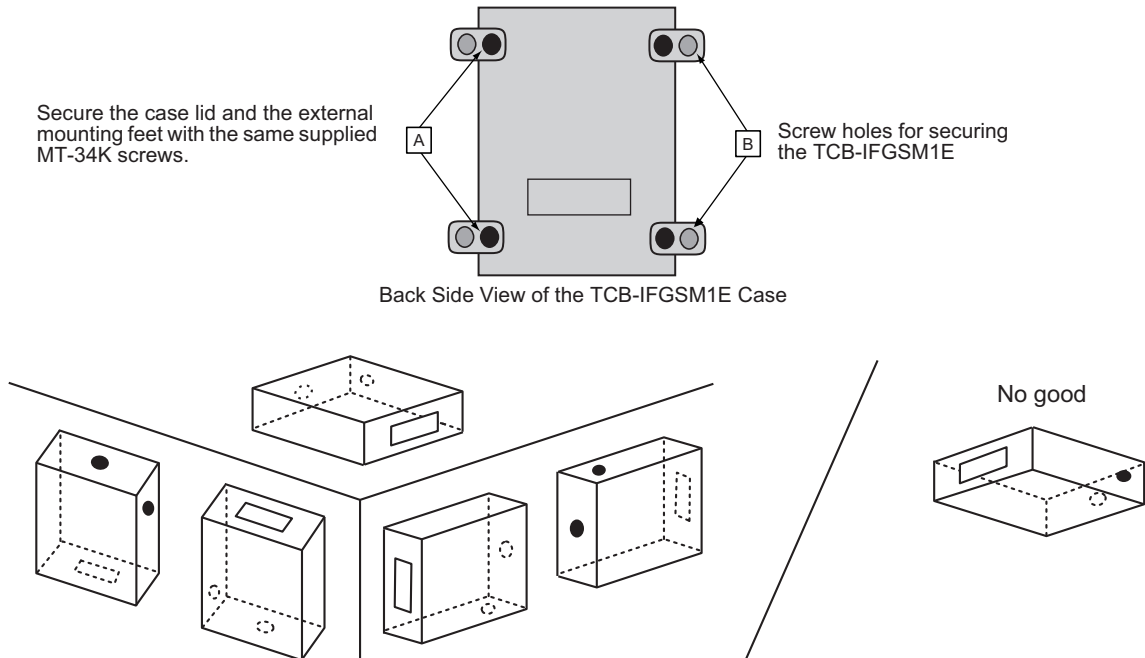
Secure the case lid and the external mounting feet with the same supplied MT-34K screws.

A

B Screw holes for securing the TCB-IFGSM1E

Back Side View of the TCB-IFGSM1E Case

No good

REQUIREMENT

Do not install the unit in any of the following places.
- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

■ Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100mm   100mm

100mm
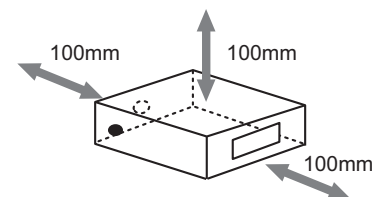
Connection of Power cable and Signal wires

⚠ CAUTION

Power lines have polarity.

REQUIREMENT

Disconnect the AC adaptor for this appliance from the main power supply.
- The AC adaptor for this appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3 mm.

■ Power cable and Signal wires

Use a commercially available cable between the TCB-IFGSM1E and an air conditioner that has a connector CN61. For models that have connector CN08/CN09/CN22, use the supplied HA cable. Connect cables referring to the installation manual of each indoor unit for cable connection and location of connectors.

⚠ CAUTION

Use a commercially available RS-232C straight cable with female-male connectors between GSM modem and TCB-IFGSM1E. Since the maximum length of this cable is 15 m, install the GSM modem and the power supply unit within this range where GSM radio wave can be well received.

REQUIREMENT

- If the TCB-IFGSM1E is installed at a place where the TCB-IFGSM1E and the indoor unit cable may be touched by the user, pass the cable through a insulating tube with more than 1750V voltage resistant (IEC approved item, outer diameter must be less than 10Ø) to completely insulate the cable. Insert the tube up to the connector and push it firmly as far as it will go.

Connect this cable following the installation manual of each indoor unit

GSM modem

TCB-IFGSM1E

Connector CN08/CN09/CN22 or CN61

Indoor unit cable
Max. 2 m
Use the insulating tube if the user may touch this cable

RS-232C cable

Connect to the D-sub connector

Connect to the DC plug

DC7-19V

AC adaptor
Not required when CN61 is used
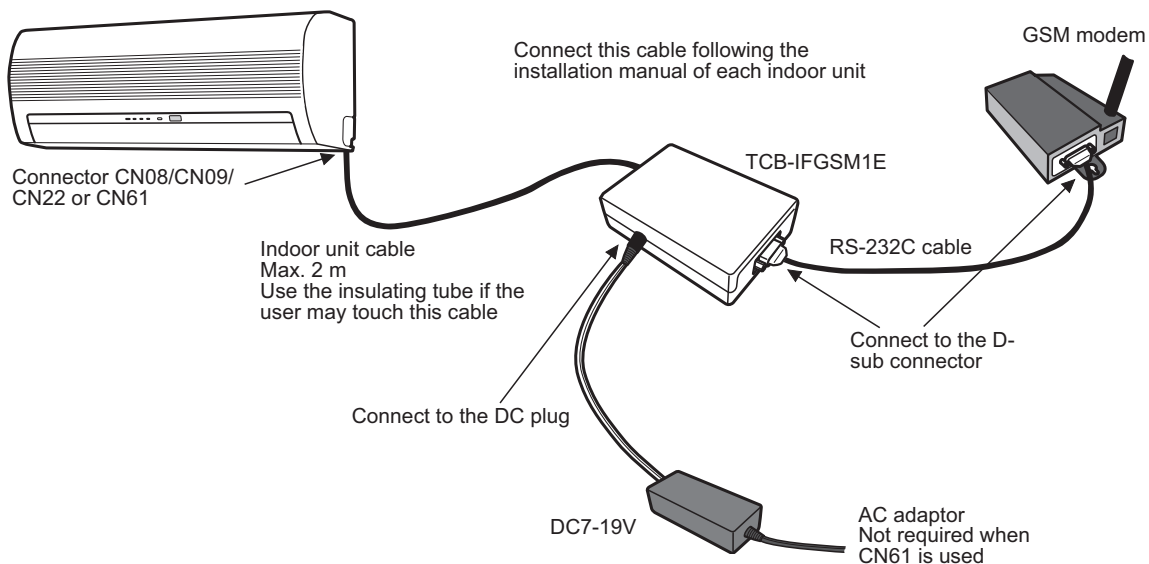
The cable connected to the CN61 and CN4 should be the optional connector cable TCB-KBCN61HAE.

Connecting CN3 and CN4 of TCB-IFGSM1E to Indoor Unit

⚠ CAUTION

Turn off the power of the air conditioner and check that no voltage is applied to the indoor unit cable. Do not connect the power cable to the TCB-IFGSM1E.

Open the case of the TCB-IFGSM1E, draw the indoor unit cable through the grommet hole, and then connect the cable's connector to CN3 or CN4.

The cable connector differs depending on the connector used in the indoor unit. For the CN08/CN09/CN22, HA connector, use the 4-pin CN3 connector; for the CN61 connector, the 6-pin CN4 connector.

Connect the indoor unit cable according to the table below, and then clamp it with a cable clamp.

TCB-IFGSM1E CN3 pin No.	Indoor unit	TCB-IFGSM1E CN4 pin No.	Indoor unit
	CN08/CN09/CN22 (HA connector) pin No. DAISEIKAI, Inverter/Inverter Multi		CN61 pin No. S-MMS, S-HRM, Mini-SMMS, DI, SDI
1	1 (C1)	1	1 (Operation input)
2	2 (C2)	2	2 (Ground)
3	3 (M1)	3	3 (Insulate this pin as it is not used for this function.)
4	4 (M2)	4	4 (Operation status output)
		5	5 (12V output)
		6	6 (Alarm output)
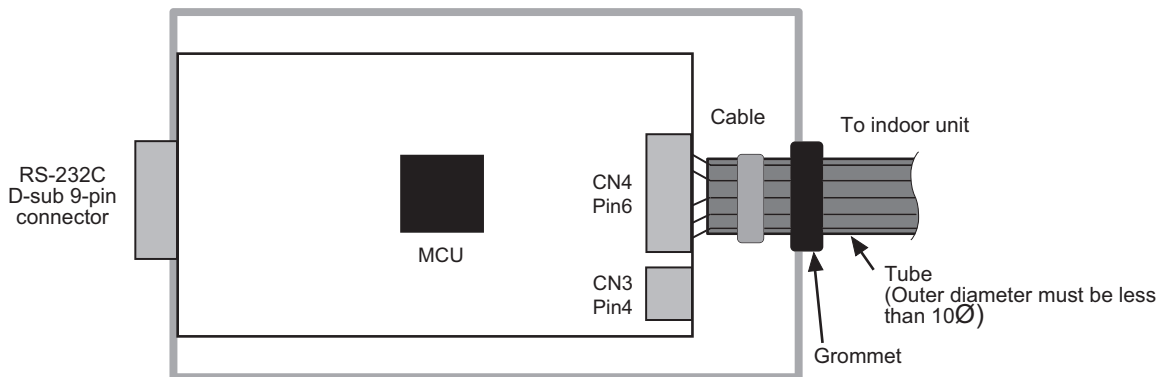
P.C. Board Top View (with the TCB-IFGSM1E Case Lid Open)

Side view

Fix the end of tube to the wire with a cable tie at 22mm from the connector side wire end. Provide extra length to the wire.
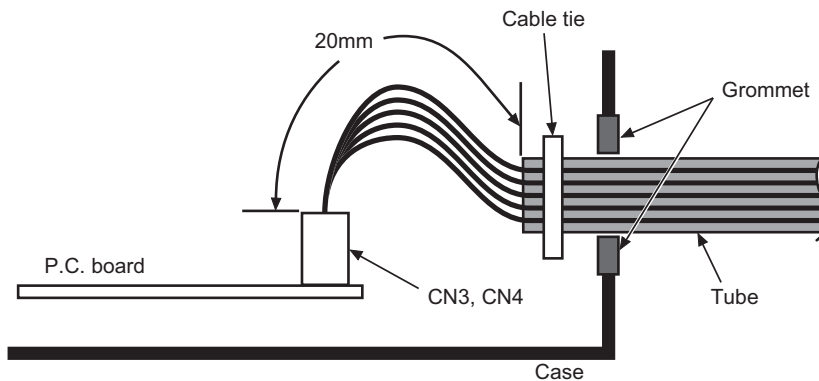
Connection to GSM Modem

Insert a valid SIM card into the slot of the GSM modem following the Owner's Manual.

Screw the D-sub connector connected to the RS-232C cable to secure it.

Setting

Set JP1, JP2, JP3, JP4, and SW1 to the positions shown in the table below:

Part No.	Function	Setting
JP1	Selection of HA or BT	HA
JP2	Selection of 5V or 12V	12V
JP3	Selection of 5V or 12V	12V
JP4	Selection of GND or OPEN	OPEN (in case of CN3), GND (in case of CN4)
JP5	Selection of HA or BT	HA
SW1	Selection of CPU mode	SW1-1, SW1-2, SW1-3 = OFF, SW1-4 = ON
SW2	PIN code setting	Refer to the description on the next page.
SW3	Setting	Refer to the description on the next page.
SW4	Resetting	–

⚠ CAUTION

The TCB-IFGSM1E does not function correctly unless JP1, JP2, JP3, JP4, JP5, and SW1 are set to the positions shown below. Be sure to set them correctly.
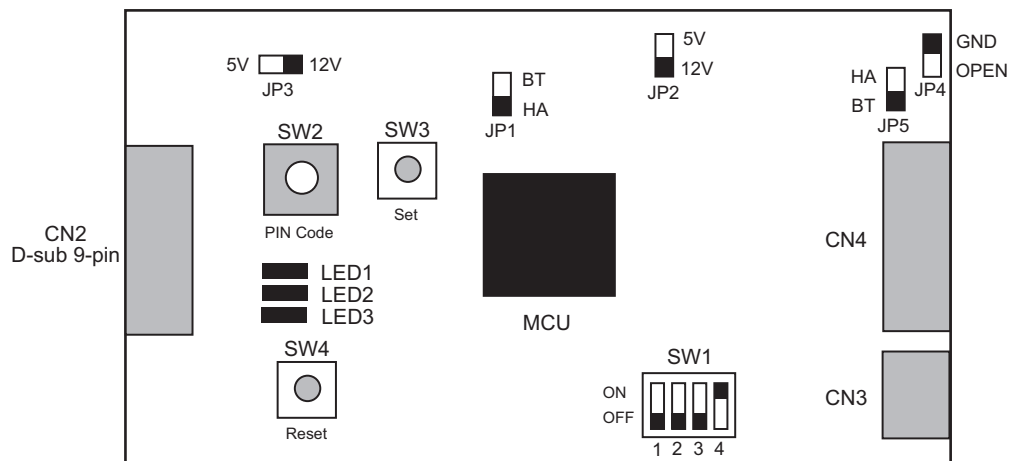
P.C. Board Top View (with the TCB-IFGSM1E Case Lid Open)

Trial Operation Check

⚠ CAUTION

Insert the plug of the AC adapter firmly into a power outlet as far as it will go. Improper connection may cause electric shock or fire due to accumulated dust.

When the TCB-IFGSM1E is connected to an air conditioner that uses CN61, turn on the air conditioner. When the TCB-IFGSM1E is connected to an air conditioner that uses an HA connector, connect an external power supply unit to the DC jack and supply power to the TCB-IFGSM1E. When PIN code and PUK code for the modem are given from the telephone service company and they must be set, set them using the following procedure.

■ PIN Code / PUK Code Setting Procedures

Setting PIN code

Press and release the reset switch SW4 while pressing the set switch SW3, wait for at least 10 seconds, and then release SW3. Then the TCB-IFGSM1E enters the PIN code read mode. Specify the lowest digit of PIN with the PIN code set switch SW2, and then press SW3 for less than 10 seconds. Then set the second lowest digit of PIN and press SW2 for less than 10 seconds. Repeat this operation to enter the specified PIN code. After all the digits have been set, press SW3 for at least 10 seconds to complete the PIN setting procedure.
Example) If the PIN is 45678, specify 8, 7, 6, 5, and 4 in this order.

Setting PUK code

To set a PUK code following the PIN code setting, press SW3 for less than 10 seconds within 10 seconds upon completion of the PIN setting. The TCB-IFGSM1E enters the PUK code setting mode. Specify the lowest digit of PUK code with SW2, and then press SW3 for less than 10 seconds to enter the lowest digit. Repeat this operation until the 8-digit PUK code is completely read.
Example) If the PUK is 34724569, specify 9, 6, 5, 4, 2, 7, 4, and 3 in this order.

PIN code is a 4-digit to 8-digit number, and PUK code is an 8-digit number. Therefore, the TCB-IFGSM1E automatically returns from the PUK code setting mode after eight numbers have been given in the PUK code setting, but remains in the waiting state until 8 digits of the PUK code have been completely read.

■ Modem Emulator Setting and Operation Check

Setting the modem emulator

Install the modem emulator software for this system to the PC (with RS-232C communication function) beforehand. For computers which do not have serial port, PC Card or USB to RS-232C converter can be used to arrange an RS-232C port. Connect the RS-232C D-sub connector of the PC to the D-sub connector of the TCB-IFGSM1E with an RS-232C cross cable.
Set the communication configuration of the PC to 9600bps, non parity, 8 bits, 1 stop bit with an appropriate communication port number.
Start the modem emulator software. The following screen appears.
- Set the serial port number to the number set on the PC.
- From the READY, SIM PIN, and PUK radio buttons, choose READY when no PIN is set.
- From the READY, SIM PIN, and PUK radio buttons, choose SIM PIN when a PIN is set.
- Enter the mobile phone number to be used for the test in the TEL textbox.

The number set here is the number the modem will recognise and the GSM phone number used for this test. The number must be set as <GSM phone number> or <"+" + "Country code" + "GSM phone number">. For the details, ask your mobile network operator.

Click the OPEN button. When communication between the TCB-IFGSM1E and the PC starts successfully, the communication log appears in the textbox as shown below. If it does not appear, improper connection to the TCB-IFGSM1E, incorrect communication configuration, incorrect TCB-IFGSM1E settings, or power-off is considered as the cause. Examine the cause and solve the problem.

The figure shows a normal communication log between the PC and the TCB-IFGSM1E when a PIN is set. AT+CPIN=45678 means that the PIN is set to 45678.
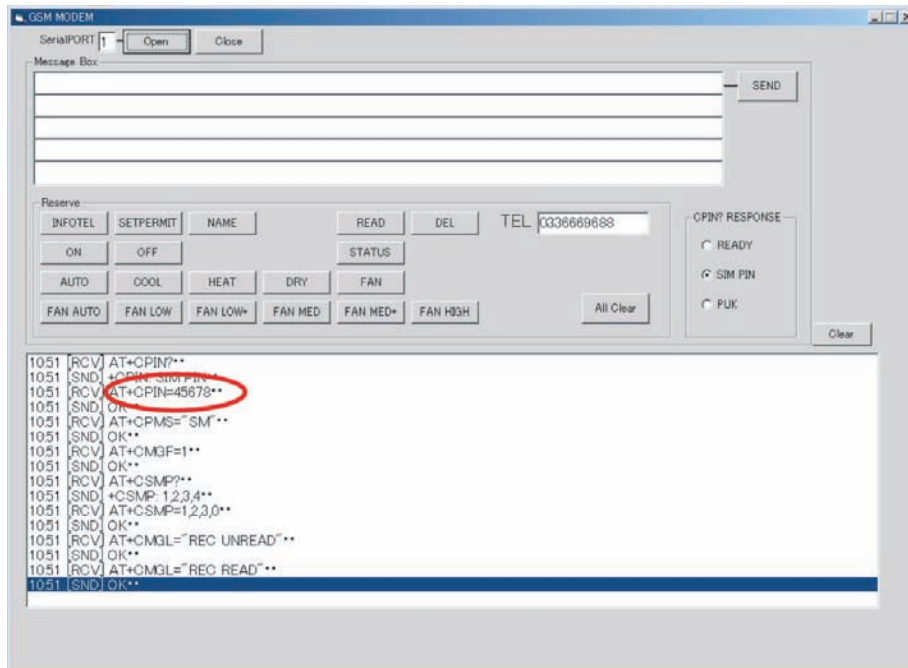
Setting destination telephone number, setting permitted telephone number, and specified air conditioner name

Settings of destination telephone number, setting permitted telephone number, and the name of specified air conditioner for test are available on this screen.

To set the destination telephone number for notification, click the **INFOTEL** button, enter the telephone number for test in the Message Box following INFOTEL, and then click the SEND button.

This telephone number must be the same as the number in TEL textbox <GSM phone number> or <"+" + "Country code" + "GSM phone number">.

When the number appears in the following message in the textbox, the setting has been successfully completed. When a PIN is set, enter the PIN and the telephone number for test with a space separator after INFOTEL, and then click the SEND button. **** indicates the PIN.

[SND] INFOTEL ++++ (or INFOTEL***** ++++)
[SND]OK
(+++: Telephone number for test)

To set the setting permitted telephone number, click the SETPERMIT button, enter a telephone number for test in the Message Box following SETPERMIT, and then click the SEND button. This telephone number must be the same as the number in TEL textbox.

When the number appears in the following message in the textbox, the setting has been successfully completed. When a PIN is set, enter the PIN and the telephone number for test with a space separator after SETPERMIT, and then click the SEND button. **** indicates the PIN.

[SND] SETPERMIT ++++ (or SETPERMIT***** ++++)
[SND]OK
(+++: Telephone number for test)

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To set the name of specified air conditioner, click the NAME button, enter alphanumeric characters for test in the Message Box following **NAME**, and then click the SEND button. NAME can be up to 19 characters of English alphabets and Arabic numerals (spaces cannot be included).

When the entered alphanumeric characters appear in the following message in the textbox, the setting has been successfully completed. When a PIN is set, enter the PIN and the alphanumeric characters for test with a space separator after NAME, and then click the SEND button. **** indicates the PIN.

[SND] NAME +++ (or NAME***** ++++)
[SND]OK
(+++: Entered alphanumeric characters) **** indicates the PIN.

If an error is returned, an invalid PIN or characters may have been set.
The following figure shows the screen when the initial setting succeeded.
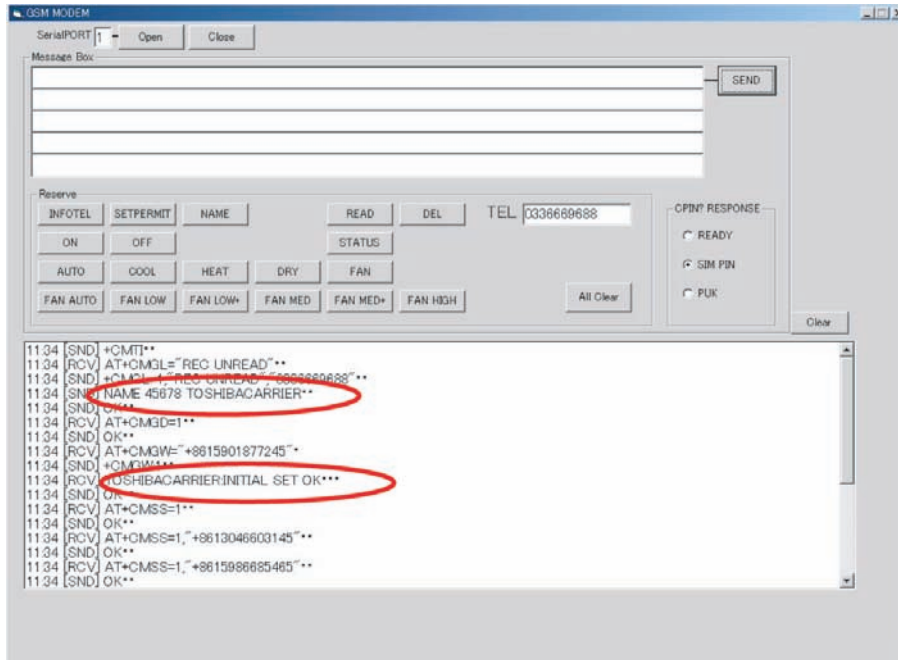
■ Checking Communication with Air Conditioner

Check the communication with the air conditioner.

Setting air conditioner ON/OFF

While the air conditioner is OFF, click the ON button in the screen above. When **ON** appears in the Message Box, click the SEND button. At this time, when the following message appears in the textbox at the centre of the screen and the air conditioner is turned on as specified, the communication with the air conditioner is successful.

[RCV] ++++++++ SETTING OK
(++++++++: indicates the characters of the registered NAME)

While the air conditioner is ON, click the **OFF** button in the screen above. When OFF appears in the Message Box, click the SEND button. At this time, when the following message appears in the textbox at the centre of the screen and the air conditioner is turned off as specified, the communication with the air conditioner is successful.

[RCV] ++++++++ SETTING OK
(++++++++: indicates the characters of the registered NAME)

The following figure shows the screen when the ON/OFF setting succeeded.
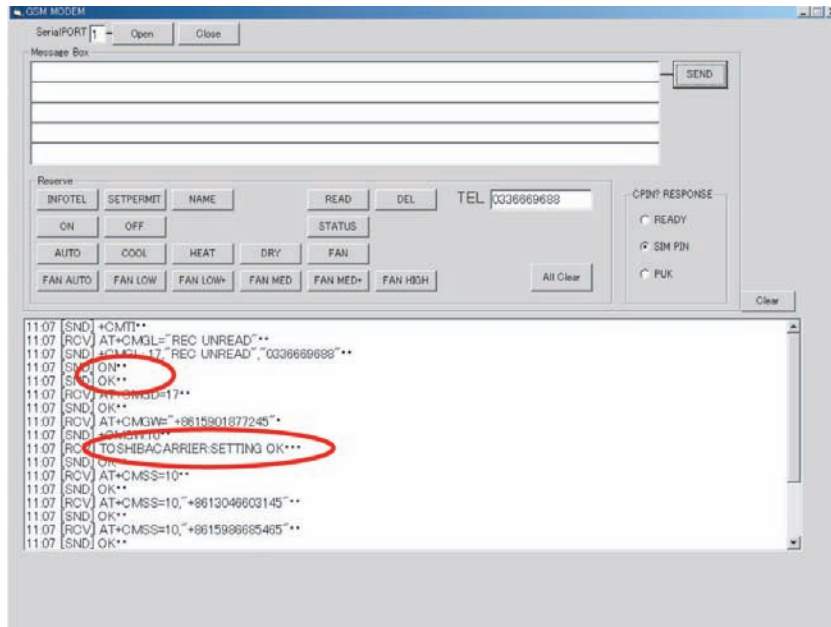
Monitoring air conditioner ON/OFF status

Click the STATUS button. When **STATUS** appears in the Message Box, click the SEND button. At this time, when the air conditioner ON/OFF status is displayed as shown in the following message in the textbox at the centre of the screen and the displayed content matches the actual ON/OFF status of the air conditioner, the air conditioner is operating correctly.

[RCV] ++++++++ STATUS OFF
or
[RCV] ++++++++ STATUS ON
(++++++++: indicates the characters of the registered NAME)

The test run in connection with the air conditioner performed by the modem emulator software on the PC is completed.

■ Checking Communication Using Actual Telephone Network

Connect a GSM modem to the TCB-IFGSM1E and perform a test run using the actual telephone network.

Connecting to GSM modem and temporarily fixing GSM modem location and orientation

Connect the TCB-IFGSM1E to the GSM modem with an RS-232C straight cable, and secure the D-sub connectors on both ends of the cable to each unit with screws. Also fix the installation position and orientation of the GSM modem temporarily.

Turn on the power of the GSM modem. Then open the SMS message creation screen on the specified mobile phone. When the target air conditioner is OFF, create an SMS message by selecting **ON** and send the SMS message to the GSM modem telephone number.

After a while, an SMS message with text "SETTING OK" is returned. Check that the indoor unit is turned on.

Then create an SMS message by selecting **STATUS** and send the SMS message to the GSM modem telephone number.

When the air conditioner status can be acquired with "NAME:STATUS ON" or "NAME:STATUS OFF," the test run is successful.

If the setting for the air conditioner is not reflected or the air conditioner status cannot be acquired, SMS message transmission or reception may have failed due to incorrect destination telephone number, bad wave condition or a problem of the telephone network. Examine the cause and solve the problem.

If the current GSM modem location or orientation worsens the communication status, find the best location or orientation and fix the GSM modem temporarily at the point.

■ Deleting the Telephone Numbers for Test

Before delivering the product to the customer, delete the destination telephone number and the setting permitted telephone number that were registered for the test run.

Restarting the modem emulator software

Connect the TCB-IFGSM1E to the PC again and restart the modem emulator software.

Deleting the destination telephone number

Enter "**DEL INFOTEL** ++" (++: mobile phone number for test) in the Message Box, and click the SEND button.
Check that the following message appears in the textbox at the centre of the screen.

[SND] DEL INFOTEL ++++
[SND]OK

Enter "**READ INFOTEL** [ENTER]" in the Message Box, and click the SEND button.
Check that the following message appears again in the textbox at the centre of the screen.

[RCV] ++++++++ **READ INFOTEL** NONE
(++++++++: indicates the characters of the registered NAME)

Deleting the setting permitted telephone number

Enter "**DEL SETPERMIT** ++**" (++: mobile phone number for test) in the Message Box, and click the SEND button.
Check that the following message appears in the textbox at the centre of the screen.

[SND] DEL SETPERMIT ++++
[SND]OK

Enter "**READ   SETPERMIT** [ENTER]" in the Message Box, and click the SEND button.
Check that the following message appears again in the textbox at the centre of the screen.

[RCV] ++++++++ READ SETPERMIT NONE
(++++++++: indicates the characters of the registered NAME)

If you have set a PIN for testing and it is not used actually, follow the procedure below to delete it.

Deleting a PIN number

Enter "**DEL PIN** **" (**: registered PIN number) in the Message Box, and click the SEND button.
Check that the following message appears in the Text box.

[SND] DEL PIN ***
[SND]OK

■ Fixing the GSM Modem Location and Final Connection

Secure the GSM modem at the temporary location that was determined for the test run.
Connect the GSM modem to the TCB-IFGSM1E with the RS-232C cable, and secure the D-sub connectors of the cable with screws.
Turn on the power unit supplied with the GSM modem.

Now the test run is completed.

Trouble Shooting

If the operation on the mobile phone is disabled or an error response is received, find the cause using the following procedure.

After an operation SMS message is sent, a response "AIRCON NO RESPONSE" is returned.

↓

• The indoor unit is not powered on. • The cable between indoor unit and TCB-IFGSM1E is not connected properly.

When an initial registration SMS message is sent, a response "INITIAL SET NG" is returned.

↓

INFOTEL, SETPERMIT, or NAME is missing in the initial registration SMS message. Or, a PIN has been set, but it has not been entered.

After an operation SMS message is sent, a response "INITIAL UNCOMPLETED" is returned.

↓

The initial setting has not been made by the initial registration SMS message.

After an operation SMS message is sent, a response "CHARACTER SETTING ERROR" is returned.

↓

Unregistered characters are used.

When an operation SMS message is sent, a response "SETTING NG" is returned.

↓

Control other than ON/OFF control (COOL, HEAT, etc.) is requested even when HA control is specified.

No response SMS message is received after an operation SMS message is sent.

↓

• The operation SMS message was not sent to the telephone number of the GSM modem. • The destination telephone number is not set correctly. Pay attention on whether there is "+" or "+" + "Country code" at the beginning of the phone number. • The setting permitted telephone number is not set correctly. Pay attention on whether there is "International access code" or "+" + "Country code" at the beginning of the phone number. • The GSM modem is not powered on. • The radio wave condition of the GSM modem is bad. • There is a problem with the GSM telephone network. • The TCB-IFGSM1E is not powered on.

↓

If the problem still remains after taking proper actions for these possible causes, check the communication between GSM modem and TCB-IFGSM1E using the following procedure.

↓

Set the communication parameters of the PC, connect the PC to the TCB-IFGSM1E with the RS-232C cross cable, and then start the GSM modem simulator software. • Is a response returned when operated from the PC? • If no response is returned, check the JP1, JP2, JP3, JP4, and SW1 settings of the TCB-IFGSM1E. • Press SW4 to reset the MCU.

↓

If the problem still remains after taking these actions, replace the TCB-IFGSM1E.

↓

Communication between the GSM modem simulator and the TCB-IFGSM1E is successful.

↓

No response SMS message is yet received.

↓

Check the GSM modem operation following the Owner's Manual of the GSM modem.

LED	LED status	TCB-IFGSM1E status
LED1	OFF	Note) LED1 lights as follows during BT operation: During normal operation: ON During initial processing: Blink (long interval) During an error: Blink (short interval) During stop: OFF * Long interval: Repeat of ON for approx. 2 seconds and OFF for approx. 0.5 second * Short interval: Repeat of ON for approx. 0.5 second and OFF for approx. 0.5 second
LED2	ON	LED2 lights after power-on and reset. It goes out when the PIN processing is completed on the modem side.
	Blink ON: Approx. 2 seconds OFF: Approx. 0.5 seconds	LED2 blinks at this interval when a PIN or PUK number is requested by the modem after power-on or reset. It goes out when the TCB-IFGSM1E state has changed.
	Blink ON: Approx. 0.5 seconds OFF: Approx. 0.5 seconds	LED2 blinks at this interval when modem is not connected or an modem communication error has occurred It goes out when the TCB-IFGSM1E state has changed.
	Blink ON: Approx. 6 seconds OFF: Approx. 0.5 seconds	LED2 blinks at this interval while the TCB-IFGSM1E is reading a PIN or PUK number. It goes out when the PIN or PUK number has been read.
LED3	ON	Power-on

TCB-IFGSM1E
Owner's Manual

Features

The following remote control is enabled by sending a short message service (SMS) from your GSM (global system for mobile communications) mobile phone.

- Air conditioner ON/OFF control
- Air conditioner ON/OFF status monitoring
- Auto-sending of an SMS notification message in the event of an air conditioner alarm and alarm monitoring
  (S-MMS and DI, SDI models only)

This system is equipped with the following security function.

- The air conditioner receives commands only from the registered GSM phone number and sends air conditioner information SMS messages only to the registered GSM phone number.

Messages consisting of alphanumeric characters and symbols are sent and received by SMS message.

The overall system configuration is shown below.
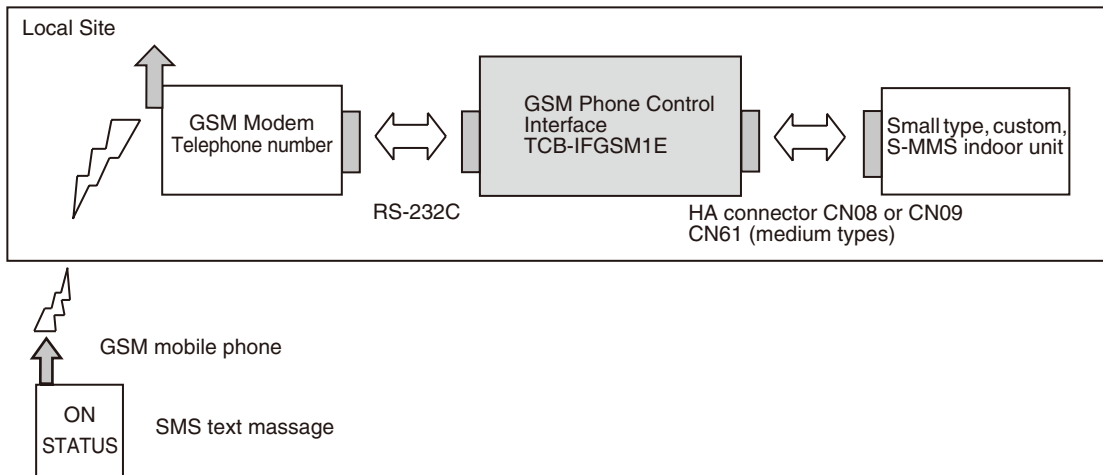
Before use

- To use this GSM remote monitoring system, you must subscribe to the GSM mobile phone equipped with the SMS message function for operation and to the GSM telephone service of GSM modem. The cost for communication with the GSM modem will be charged separately. Write down the subscribed GSM modem telephone number, PIN, and PUK number as follows and keep it at hand.

GSM modem telephone number:

PIN:

PUK number:

⚠ WARNING

Keep these numbers in secret. If the GSM modem telephone number and/or PIN are known to the third party, he/she may maliciously operate the air conditioner with impersonation.

- The following air conditioner models are available in this system.

DAISEIKAI		RAS-B**GKVP-E
		RAS-B**GKCVP-E
		RAS-B10SKVP-E
		RAS-B13SKVP-E
		RAS-B16SKVP-E
		RAS-10SKVP-ND
		RAS-13SKVP-ND
		RAS-16SKVP-ND
		RAS-10SKVR-E
		RAS-13SKVR-E
		RAS-16SKVR-E
		RAS-18SKVR-E
		RAS-22SKVR-E
		RAS-**SKV-E
		RAS-**PKVP-E
		RAS-**PKVP-ND
		RAS-M**PKVP-E
		RAS-M**PKVP-ND
Inverter	High wall	RAS-**GKV-E2
Inverter Multi	High wall	RAS-M**GKV-E2
		RAS-M**GKCV-E2
	Duct	RAS-M**GDV-E
		RAS-M**GDCV-E
S-MMS, S-HRM, Mini-SMMS, DI, SDI		

- Ask the dealer or the installer about whether the GSM modem, GSM Phone Control Interface TCB-IFGSM1E, and the target air conditioner are supplied with power and their connections and initial settings are completed.
- Be familiar with how to create, send, and receive an SMS message using your GSM mobile phone in advance.

Initial settings

- Make the following settings on your GSM mobile phone.
- In the following example, you do not need to enter the < and > symbols. You just enter the value enclosed in < and >.
- The phone number specified at SETPERMIT is the phone number to control an air conditioner which is connected to the GSM Modem. Enter the telephone number as <GSM phone number> or <"+" + "Country code" + "GSM phone number" (omit the first zero of the GSM phone number, if it starts from zero)> for domestic transmission, or <"International access code" + "Country code" + "GSM phone number" (omit the first zero of the GSM phone number, if it starts from zero)> for international transmission. For the details, ask your mobile network operator.
- It replies to the SETPERMIT, INFOTEL commands and the operations to the air conditioner from mobile by sending SMS messages to the phone number specified at INFOTEL. Enter the telephone number as <GSM phone number> or <"+" + "Country code" + "GSM phone number" (omit the first zero of the GSM phone number, if it starts from zero)>. "+" + Country code may not be necessary for local transmission. For the details, ask your mobile network operator.
- NAME can be up to 19 characters of English alphabets and Arabic numerals (spaces cannot be included).

NOTE

Maximum length of SMS is 160 characters. Pay attention on it when you set SETPERMIT, INFOTEL or NAME at first time.

When your message becomes more than 160 characters long, divide it into plural SMS to send.

(a) Create an SMS message for setting the setting permitted GSM phone number of the target air conditioner.

```
SETPERMIT< >
```

Enter the GSM phone number in <   > as a string of numbers. Space character can be included.

Up to five GSM phone numbers can be entered by inserting a new line at the end of the message above.

```
SETPERMIT< >
SETPERMIT<    >
SETPERMIT<    >
```

When a PIN is provided, be sure to enter it in <***> before <GSM phone number>. PIN is a 4-digit to 8-digit code. Space character can be included. Be sure to enter PIN for all GSM phone numbers.

```
SETPERMIT<***><  >
SETPERMIT<***><  >
SETPERMIT<***><  >
```

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(b) Create an SMS message for setting the destination GSM phone number for notification. Create the following INFOTEL message that includes the mobile phone number to control the air conditioner following (a).

```
 SETPERMIT<    >

 SETPERMIT< >

  INFOTEL   <    >
```

Enter the GSM phone number in INFOTEL < > as a string of numbers. Space character can be included.
Up to five GSM phone numbers can be entered by inserting a new line at the end of the message above.

```
  INFOTEL   <    >

  INFOTEL   <    >

  INFOTEL   <    >

  INFOTEL   <    >
```

When a PIN is provided, be sure to enter it in <***> before <GSM phone number>. PIN is a 4-digit to 8-digit code. Space character can be included. Be sure to enter PIN for all GSM phone numbers.

```
  INFOTEL    <***><  >

  INFOTEL    <***><  >

  INFOTEL    <***><  >
```

(c) Enter the name of the specified air conditioner in < > following (b). Use alphanumeric characters for the name. This setting is necessary to identify air conditioners when two or more GSM remote monitoring systems. Make this setting even when one system is used.

```
  NAME       <    >
```

When a PIN is provided, be sure to enter it in <***> before <name>. PIN is a 4-digit to 8-digit code. Space character can be included.

```
  NAME        <***>< >
```

(d) After you have created these SMS message, send them to the GSM modem telephone number used in this system.

After a while, the following SMS message is sent to the GSM phone number that was set in the SMS message for setting the destination GSM phone number.

- Response SMS message to indicate successful initial settings
  Name of specified air conditioner:
  INITIAL SET OK
- Response SMS message to indicate unsuccessful initial settings
  Name of specified air conditioner:
  INITIAL SET NG

When an SMS message that includes "INITIAL SET OK" is received, the initial settings are completed.

REQUIREMENT

If an SMS message that includes "INITIAL SET NG" is received, an invalid message that includes unspecified characters was sent. Check the sent messages, and try to send messages until "OK" response SMS message is received. When a PIN is provided, check whether the correct PIN code was entered.

If no response SMS message is received, the transmit SMS message may not have arrived at the GSM modem telephone number or the destination GSM phone number setting may be incorrect or there may be a problem with the local site including the GSM modem. Refer to Chapter 6 Troubleshooting.
Nevertheless, if an SMS message including "INITIAL SET OK" is not received yet, contact the installer.

Usual operation

(a) To operate the air conditioner, send the following SMS message to the GSM modem telephone number used in this system.

> ON

(b) To stop the air conditioner, send the following SMS message to the GSM modem telephone number used in this system.

> OFF

After the (a) or (b) SMS message is sent, the following SMS message is returned.

- When this SMS message was sent before initial settings
  INITIAL UNCOMPLETED
- When the characters in the sent SMS message are different from those above
  Name of specified air conditioner:
  CHARACTER SETTING ERROR
- When the SMS message was received successfully
  Name of specified air conditioner:
  SETTING OK
- When the SMS message was not received due to a problem of the local site
  Name of specified air conditioner:
  SETTING NG

(c) To monitor the air conditioner ON/OFF status, send the following SMS message to the GSM modem telephone number used in this system.

> STATUS

The following SMS message is returned.

- When there is no alarm
  (During operation)
  Name of specified air conditioner:
  STATUS ON
  (During operation stop)
  Name of specified air conditioner:
  STATUS OFF
- When there is an alarm (S-MMS/DI/SDI)
  Name of specified air conditioner:
  STATUS ON ALARM
  Name of specified air conditioner:
  STATUS OFF ALARM

(d) When an alarm has occurred in S-MMS or DI or SDI, the following SMS message is sent.

Name of specified air conditioner: ALARM

(e) Deleting registered GSM phone number
To delete the registered setting permitted GSM phone number, send the following message to the GSM modem telephone number used in this system.
Any operations from the GSM phone number deleted here is invalid.

> DEL SETPERMIT<++++>

++++: GSM phone number to be deleted

To delete the registered destination GSM phone number, send the following SMS message to the GSM modem telephone number used in this system.

> DEL INFOTEL   <++++>

++++: GSM phone number to be deleted

- When the GSM phone number is deleted correctly, the following SMS message is returned.
  Name of specified air conditioner:
  INITIAL SET OK

- If incorrect characters are used or specified GSM phone number does not exist, the following SMS message is returned.
  Name of specified air conditioner: INITIAL SET NG
  Send a correct SMS message.

(f) Requesting registered GSM phone numbers

To request the registered setting permitted GSM phone numbers, send the following SMS message to the GSM modem telephone number used in this system.

```
READ INFOTEL
```

The following SMS message is returned from the GSM modem.
Name of specified air conditioner: READ INFOTEL
++++++,******,<<<<<<<<,>>>>>>>>,++++++ +++++
("++++++," "******," "<<<<<<<<," ">>>>>>>>," and "+++++++++++" are registered destination GSM phone numbers separated by commas and sent from the local site.)

If no GSM phone number is registered, the following SMS message is returned.
Name of specified air conditioner: READ INFOTEL NONE

To request the registered destination GSM phone numbers, send the following SMS message to the GSM modem telephone number used in this system.

```
READ SETPERMIT
```

The following SMS message is returned from the GSM modem.
Name of specified air conditioner: READ SETPERMIT
++++++,******,<<<<<<<<,>>>>>>>>,++++++ +++++
("++++++," "******," "<<<<<<<<," ">>>>>>>>," and "+++++++++++" are registered setting permitted GSM phone numbers separated by commas and sent from the local site.)

(g) Deleting a PIN number

When a registered PIN number is no longer required because the registered contents of the SIM card have been changed, send the following SMS message to the GSM modem telephone number used in this system.
*** is the PIN to be deleted.

```
DEL PIN      < *** >
```

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Troubleshooting

⚠ WARNING

- Unplug the AC adapter if there is a burnt odor or any other abnormality. Using the TCB-IFGSM1E continuously with an abnormality may cause fire, electric shock or breakdown. Contact the dealer or installer.

Refer to the following for sending and receiving SMS messages.
- When an SMS message including "INITIAL SET NG" (after the initial setting SMS message is sent) or "CHARACTER SETTING ERROR" (during usual operation) is received, a message with unspecified characters was sent. Check the message content again and try to send a message until "OK" response SMS message is received.
  <For example>
  - When INFOTEL, SETPERMIT, NAME, ON, OFF, DEL or READ are misspelled or typed in lower case letters.
  - When the registered NAME exceeds 19 characters, or contains any spaces or characters other than English alphabets and arabic numerals.
  - When the registered GSM phone number contains any characters other than "+" and arabic numerals.
- When no response SMS message is returned, check the destination GSM modem telephone number, the set destination GSM phone number, and the set setting permitted GSM phone number of the sent SMS message.
  <For example>
  Followings are the examples of causes when the GSM phone number is "XXXXXXXXXX".
  Number registering patterns:
  Pattern1: XXXXXXXXXX
  Pattern2: "+" + "Country code" + "XXXXXXXXXX", or
  Pattern3: "International access code" + "Country code" + "XXXXXXXXXX".
  (In Pattern2 and 3, omit the first zero of the GSM phone number, if it starts from zero).
  - Cause1) When the registered PIN and the sent number do not match.
    When the registered PIN is "1111" and the sent number is "1112<XXXXXXXXXX>", TCB-IFGSM1E will not reply to the GSM phone.
  - Cause2) When TCB-IFGSM1E is in Australia and SMS is sent from a GSM phone within Australia, if the SETPERMIT number is not registered as Pattern1: XXXXXXXXXX or Pattern2: +61XXXXXXXXXX (61 is the Australian country code), TCB-IFGSM1E will not reply to the GSM phone.
  - Cause3) When SMS is sent from a GSM phone within New Zealand, if the SETPERMIT number is not registered as Pattern3: 0064XXXXXXXXXX ("00" is the international access code of New Zealand and "64" is the country code of New Zealand), TCB-IFGSM1E will not reply to the GSM phone.
  - Cause4) The registered GSM phone numbers set by INFOTEL are neither Pattern1 nor 2.

If the problem still remains, the following possible causes are considered. Contact the dealer or installer.
- When no SMS message is returned in response to the initial setting SMS message or status SMS message, the transmit SMS message may not have arrived at the GSM modem telephone number or there may be a problem with the local site including power interruption.
- When an SMS message including "SETTING NG" is received, a problem has occurred in the local site.

Specification

| Media used		Global System for Mobile Communications (2G digital mobile phone communication system)
Operation	Air conditioner control items	Air conditioner ON/OFF control is designated by mobile phone SMS message.
	Air conditioner status acquisition items	Air conditioner ON, OFF, and alarm status is notified by mobile phone SMS message. (Auto-notification is provided only when CN61 is used.)
	Operation/notification target GSM phone number	Up to 5 numbers can be registered initially.
	Accessible GSM phone number	Up to 5 numbers can be registered initially.
TCB-IFGSM1E hardware	Power supply	7-19 VDC No external power supply is required when S-MMS, DI or SDI is used.
	Power consumption	1.1 W at 19V input
	RS-232C connector	Supports communication specifications (9600bps, non-parity, 8 bits, 1 stop bit, flow control provided/none) D-sub 9-pin male connector Protocol: Supports ETSI GSM 07.05, GSM 07.07, GSM 03.40, GSM 03.38 standard compliant SMS-related AT commands.
	CN3/CN4 connector (connection to air conditioner)	Photocoupler HA connector specification, 12 VDC power input, alarm input 4-pin/6-pin connector
	Operating temperature/ humidity	0 to 40°C, 20 to 85% RH
	Storage temperature	-10 to 60°C
	Chassis material	Plastic (nonflammable ABS resin UL-94V0)
	Dimensions	32 (H) × 80 (W) × 125 (D) mm
	Mass	150 g

4-7-4 Central control by AI-NETWORK (Network adapter)

MODEL : TCB-PCNT20E

[Installation Manual]

1. Components

Part name	Q'ty	Description
P.C. board	1	P.C. board corresponded to the network
Relay terminal block	1	2P (X, Y) terminal block for relay
Relay cable (A)	1	For connection of adapter board with X, Y relay terminal block (Red connector)
Relay cable (B)	1	For connection of adapter board with remote controller terminal block (Blue connector)
Installation Manual	1	This manual
Spacer (A)	2	For fixing the adapter P.C. board (Used for other types than 4-way cassette type)
Spacer (B)	1	For fixing the adapter P.C. board (Used for other types than 4-way cassette type)
Spacer (C)	3	For fixing the adapter P.C. board (Used for 4-way cassette type)
Screws to fix terminal block	2	For fixing the relay terminal block (M4 x 14)
Transformer cover	1	Used to store transformer (For 4-way cassette type)
Transformer base	1	Used to store transformer (For 4-way cassette type)
Transformer	1	For supplying power to adapter
Screws to fix transformer	2	For fixing transformer (M3 x 6)
Screws to assemble transformer cover	2	For assembling transformer cover (M4 x 6 for 4-way)
Screws to fix transformer base	2	For fixing transformer base (M4 x 10 for 4-way)
Bundling band	3	Used to process cables so that they are not caught in.
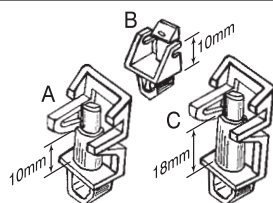
2. Combination List of Adapter Parts

	Parts	For 4-way air discharge cassette type	For Concealed duct standard type
1	Adapter P.C. board	3 spacers (C) for installing P.C. board	2 spacers (A) for installing P.C. board 1 spacer (B) for installing P.C. board
2	Transformer	M3 x 6 B tight screw (2 pcs.)	M3 x 6 B tight screw (2 pcs.)
3	For assembling transformer cover	M4 x 6 tapping screws (2 pcs.)	———
4	For fixing transformer base	M4 x 10 plus tight screws (2 pcs.)	———
5	XY terminal block	M4 x 14 tapping tight screws (2 pcs.)	M4 x 14 tapping tight screws (2 pcs.)
6	Adapter P.C. board to XY terminal block	Connector, red color, lead length : 600L	Connector, red color, lead length : 600L
7	Adapter P.C. board to AB terminal block	Connector, blue color, lead length : 600L	Connector, blue color, lead length : 600L

* Spacer (A) for installing P.C. board : Spacer to be mounted by using the hole on the P.C. board.
(For other types than 4-way cassette type)
Spacer (B) for installing P.C. board : Spacer to be mounted by pinching it in the P.C. board.
(For other types than 4-way cassette type)
Spacer (C) for installing P.C. board : Spacer to be mounted by using the hole on the P.C. board for 4-way cassette type.

* For other indoor unit types, refer to the installation manual supplied with this adapter.

3. Connection of Cables

[1] Connection of network cables

・Attach one network adapter per group (including one unit).
  Connect the network adapter to any one of the indoor units in a group control.
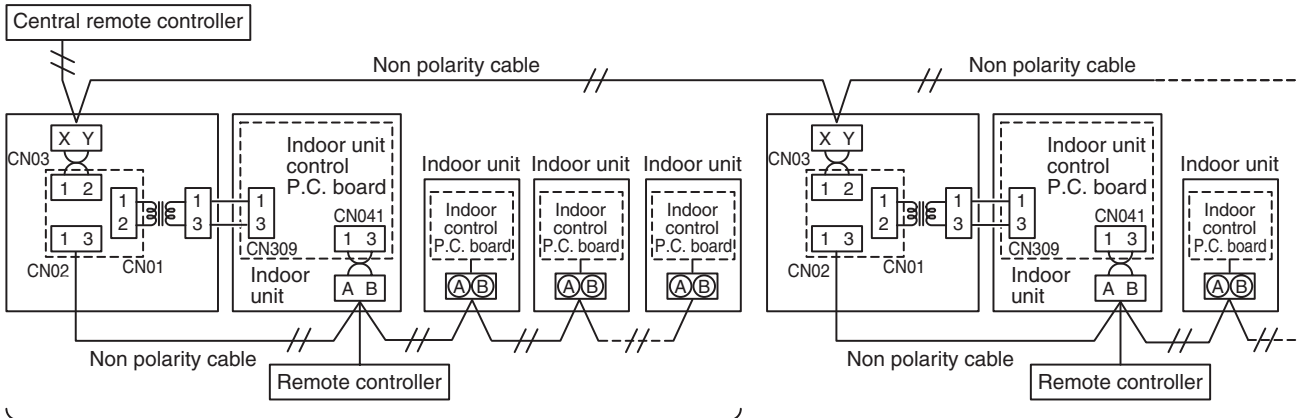
Connectable indoor units per group : Up to 8 units (In case of 1-remote controller system*)
* In case of 2-remote controllers system, up to 7 indoor units are allowed to be connected.

[2] Cabling diagram of indoor control P.C. board

For details, see the installation procedure for the individual model.
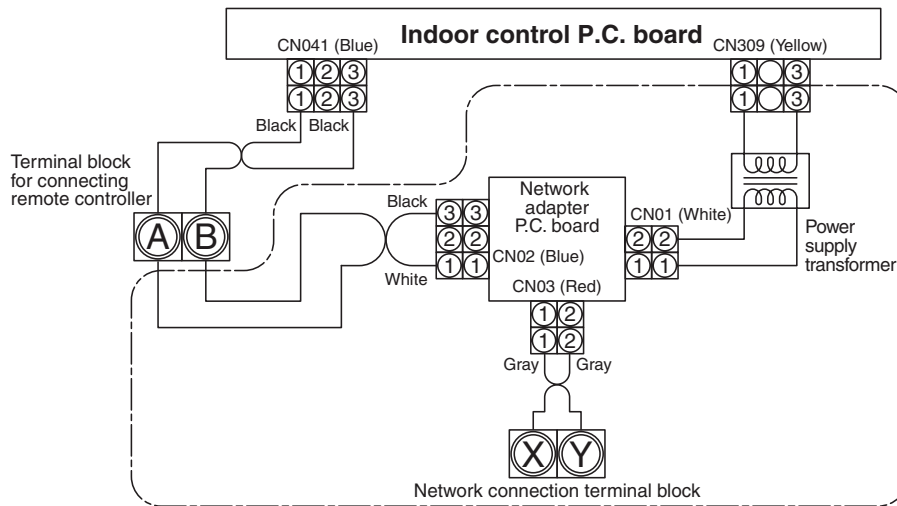
・The enclosed section shown above includes the attached parts.
・There is no polarity on the cabling between the terminal blocks, A, B and X,Y.
・Arrange the total cable length of the remote controller cable and the inter-unit cable of the remote controller within 400m.

4. Installation Procedure

・For installation of the adapter P.C. board and the removal of the relay cable, be sure to wait for approx. 1 minute after turning off the power supply to the air conditioner and the collective control remote controller. If not the adapter P.C. board may be damaged.

■ In case of 4-way Air Discharge Cassette type*

No.	Procedure
1	Using the spacer (C), install the adapter P.C. board to the position on the electric parts box of the indoor unit.
2	Using the 2 pcs. Ø4 x 14 tapping tight screws, install X, Y relay terminal block to the position on the electric parts box. ・ When tightening the screws, be sure not to damage the cable.
3	Using 2 pcs. Ø4 x 6 tapping screws, install the transformer box storing the transformer to a position at the side of the bell mouth.
4	Using the relay cable (A), connect the X, Y relay terminal block with CN03 (Red) on the adapter P.C. board and remote controller terminal block (A, B) with CN02 (Blue) on the adapter P.C. board using the relay cable (B). Perform cabling between the yellow connector on the transformer and CN309 on the adapter P.C. board, and between the white connector change and the CN01 change socket on the adapter P.C. board respectively.

Details

Adapter TCB-PCNT20E sold separately

Transformer cover

CAUTION :
Be careful that the lead wire of the transformer is not caught in between the transformer cover and the transformer base.

Relay cable (A)

Spacer (C)

Transformer base

Network adapter P.C. board

X, Y relay terminal block

CN02 (Blue)

CN03 (Red)

CN309 (Yellow)

CN01 (White)

Spacer (C)

Spacer (C)

Relay cable (B)

Indoor P.C. board

A, B terminal blocks for remote controller

Transformer box

* To install the adapter P.C. board on the electric parts box, put 3 pcs. spacer (C) into the holes on the P.C. board

> * After the connection of the relay cables (A) and (B), fix them along with the neighboring cables with bundling band so that cables cannot be caught.

* For other indoor unit types, refer to installation manual supplied with this adapter.
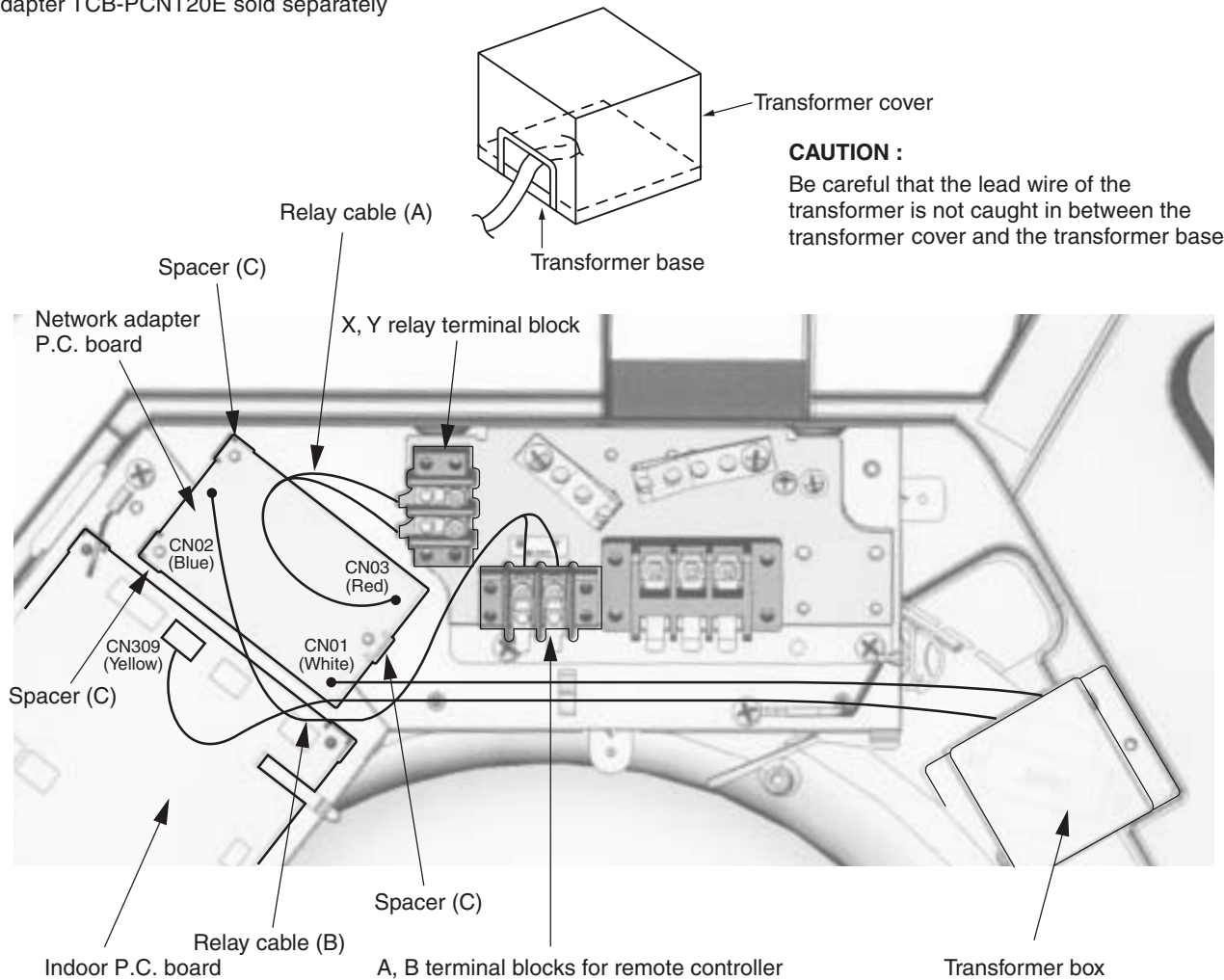
5. Setup of Address No.

To connect the indoor unit to the central remote controller using the adapter, it is necessary to set up the network address No.
· It is required to agree the network address No. with the central remote controller system No.
· The network address No. is set to 1 at the shipment from the factory.
The following two methods are used for setup.

1. Setup from the remote controller at the indoor unit side (RBC-AMT21E, RBC-AMT32(31)E, RBC-AMS41E)
· This method is available only when [7] on the setup switch SW01 on the adapter P.C. board is OFF.

Procedure Set up the address No. while the air conditioner is not in operation.

1 Push the ⌂ (VENT) and ⟳ (TEST) buttons for 4 seconds or more.

In the case of group control, the unit No. ALL is displayed and all of the indoor units in the group control are selected. (Fig. 1)

At this time, the fans on all of the selected indoor units will start and the swing operation will begin in the models with louvers.

(Keep the display status of ALL without pushing the UNIT button.)

In case of individual remote controller with no group control, the system address and the indoor unit address are displayed.

2 Using the ▼ ▲ (TEMP.) buttons, specify the item code 03.

3 Using the ▼ ▲ (TIME) buttons, select the setup data.
The following table shows the setup data. (Table 1)

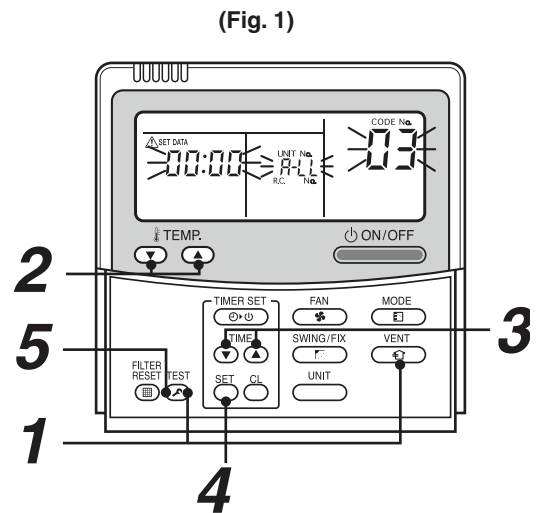**4** Push the ◯ (SET) button.
(When the display goes on, the setup data is accepted.)
To change the setup item, return to the step **2**.

5 Push the ⟳ (TEST) button. The status returns to the normal stop status.

(Fig. 1)

(Table 1)

Setup data	Network address No.
0001	1
0002	2
0003	3
·	·
·	·
·	·
0064	64
0099	No setting (Shipment from the factory.)

2. Setup by the switch on the adapter P.C. board

When the remote controller is not found, or when you do not want to change the setup of network address No. on the remote controller, set up the address No. by using the setup switch SW01 (Network address No. setup switch) on the adapter P.C. board.

Procedure

1 Turn off the power supply.

**2** Set [7] on the address No. setup switch to the ON side.
Accordingly, the setup of the address No. from the remote controller is invalidated. (Fig. 2)

3 The network address No. is set up by combining ON/OFF settings for the address No. setup switch, from SW01 [6] to [1].
For the relationship between ON/OFF combination and the address number see (Table 2).
A case when the address No. is set to 16 is shown in (Fig. 3).

Address No. setup on the remote controller is invalid.

SW01

ON side
OFF side (Numeral side)
1 2 3 4 5 6 7
Address No. setup
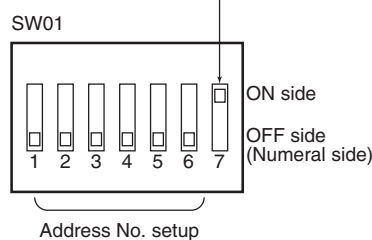
Setup example (Address No. 16)

ON side
OFF side (Numeral side)
1 2 3 4 5 6 7
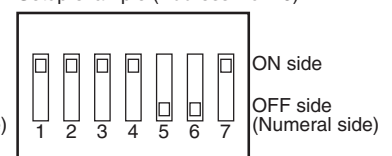
(Fig. 2)   **(Fig. 3)**

When the network address No. has been changed, turn on the power to the central remote controller again or reset the central remote controller from the reset hole on the control panel.

■ **Address No. setup table (SW01)**

(Table 2)

○ : ON side, × : OFF side

Address No.	①	②	③	④	⑤	⑥	Address No.	①	②	③	④	⑤	⑥
01	×	×	×	×	×	×	33	×	×	×	×	×	○
02	○	×	×	×	×	×	34	○	×	×	×	×	○
03	×	○	×	×	×	×	35	×	○	×	×	×	○
04	○	○	×	×	×	×	36	○	○	×	×	×	○
05	×	×	○	×	×	×	37	×	×	○	×	×	○
06	○	×	○	×	×	×	38	○	×	○	×	×	○
07	×	○	○	×	×	×	39	×	○	○	×	×	○
08	○	○	○	×	×	×	40	○	○	○	×	×	○
09	×	×	×	○	×	×	41	×	×	×	○	×	○
10	○	×	×	○	×	×	42	○	×	×	○	×	○
11	×	○	×	○	×	×	43	×	○	×	○	×	○
12	○	○	×	○	×	×	44	○	○	×	○	×	○
13	×	×	○	○	×	×	45	×	×	○	○	×	○
14	○	×	○	○	×	×	46	○	×	○	○	×	○
15	×	○	○	○	×	×	47	×	○	○	○	×	○
16	○	○	○	○	×	×	48	○	○	○	○	×	○
17	×	×	×	×	○	×	49	×	×	×	×	○	○
18	○	×	×	×	○	×	50	○	×	×	×	○	○
19	×	○	×	×	○	×	51	×	○	×	×	○	○
20	○	○	×	×	○	×	52	○	○	×	×	○	○
21	×	×	○	×	○	×	53	×	×	○	×	○	○
22	○	×	○	×	○	×	54	○	×	○	×	○	○
23	×	○	○	×	○	×	55	×	○	○	×	○	○
24	○	○	○	×	○	×	56	○	○	○	×	○	○
25	×	×	×	○	○	×	57	×	×	×	○	○	○
26	○	×	×	○	○	×	58	○	×	×	○	○	○
27	×	○	×	○	○	×	59	×	○	×	○	○	○
28	○	○	×	○	○	×	60	○	○	×	○	○	○
29	×	×	○	○	○	×	61	×	×	○	○	○	○
30	○	×	○	○	○	×	62	○	×	○	○	○	○
31	×	○	○	○	○	×	63	×	○	○	○	○	○
32	○	○	○	○	○	×	64	○	○	○	○	○	○

Requirement in Service Time

When using this product as a service part for the adapter P.C. board be sure to set the setup switch SW01 (Network address No. setup switch) on the adapter P.C. board so that it is same as one before the change.

6. To Customers

◆◆ Cautions in using the remote controller ◆◆

1. After the power supply to all of the air conditioning units has been turned on, turn on the power supply to the central remote controller. (16-systems : RBC-CR1-PE, 64-systems : RBC-CR64-PE)
   If the power supplies of the air conditioner and the remote controller are turned on at the same time, or if they are turned on in reverse order, the check code [97] may be temporarily displayed on the central remote controller. When the connection cabling and setup on the central address are correct, the connected air conditioner is displayed on the central remote controller.

2. As described below, there are differences on the display of the LCD and the individual restrictions for the operation in the main wired remote controller (RBC-AMT32(31)E, RBC-AMS41E) and the central remote controller.

	Item	Contents		Cautions
		Main remote controller	**Central remote controller**	
1	Fan speed select	Ⓐ❀ ❀❀ ❀❀ ❀	Ⓐ❀ ❀❀ ❀❀ ❀	Display of air speed selection differs.
2	Fan speed select in FAN mode	❀❀ ❀❀ ❀	Ⓐ❀ ❀❀ ❀❀ ❀	When operating the main remote controller, Ⓐ❀ is not displayed. If selecting Ⓐ❀ at the central side, Ⓐ❀ is then displayed on the main remote controller. At this time, the air speed is displayed as ❀❀.
3	Fan speed select in DRY mode	Ⓐ❀ ❀❀ ❀❀ ❀	Ⓐ❀	Ⓐ❀ is only displayed on the central remote controller. Ⓐ❀ is displayed on the main remote controller even when changes of the setup temperature/louver and air speed changes are done automatically.
4	Air direction adjustment	and air direction adjustment	[LOUVER]	[LOUVER] only is displayed on the central remote controller. [LOUVER] is displayed when the flap is swinging and when the operation status is changed i.e. ON to OFF
		(No display)	[LOUVER] Manual	Set the air direction on the main remote controller.
5	Check button	Test run (4 seconds)	Display of check code and Check reset (3 seconds)	In the case of a unit without the function of air direction adjustment The function differs when the 🗹 button is pushed for a long time. If the central remote controller-ON is reset during the operation of the air conditioner, the operation will stop temporarily. (fault/error of the air conditioner is cleared.)
6	Check code	Display with 3 digits (Alphabet + 2 digits numerals)	Display with 2 digits (Alphabet or numerals)	The display of the check code differs. **Ex.)** Float switch operation Main side : [P10], Collective side : [0b]

3. When using the remote controller with the former remote controller (RBC-AM1E, AT1E), if Last-push priority/Center/Locked is selected on the central remote controller, the display will differ on the main remote controller.

	Item	Contents		Remarks
		New remote controller (RBC-AMT32(31)E, RBC-AMS41E)	**Former remote controller (RBC-AM1E, AT1E)**	
1	Last-push priority	(No display)	(No display)	All of the setups and Start/Stop operations will be available.
2	Center	CENTER goes on.	CENTER goes on.	The setup contents on the central remote controller are fixed. The Start/Stop operation and timer operation will be available on the main remote controller.
3	Locked		CENTER flashes.	The setup contents on the central remote controller are fixed and the air conditioner will stop. The operation on the main remote controller will be unavailable.

* Before using the remote controller, read the Owner's Manual thoroughly.

4-7-5 Central control with "1:1 model" ("1:1 model" connection interface)

MODEL: TCB-PCNT30TLE2

Before Installation

This adapter corresponds to the digital inverter air conditioner.

Do not use or connect this adapter for other type of air conditioner than the above because the indoor P.C. boards of other air conditioners differ from one of the digital inverter air conditioner.
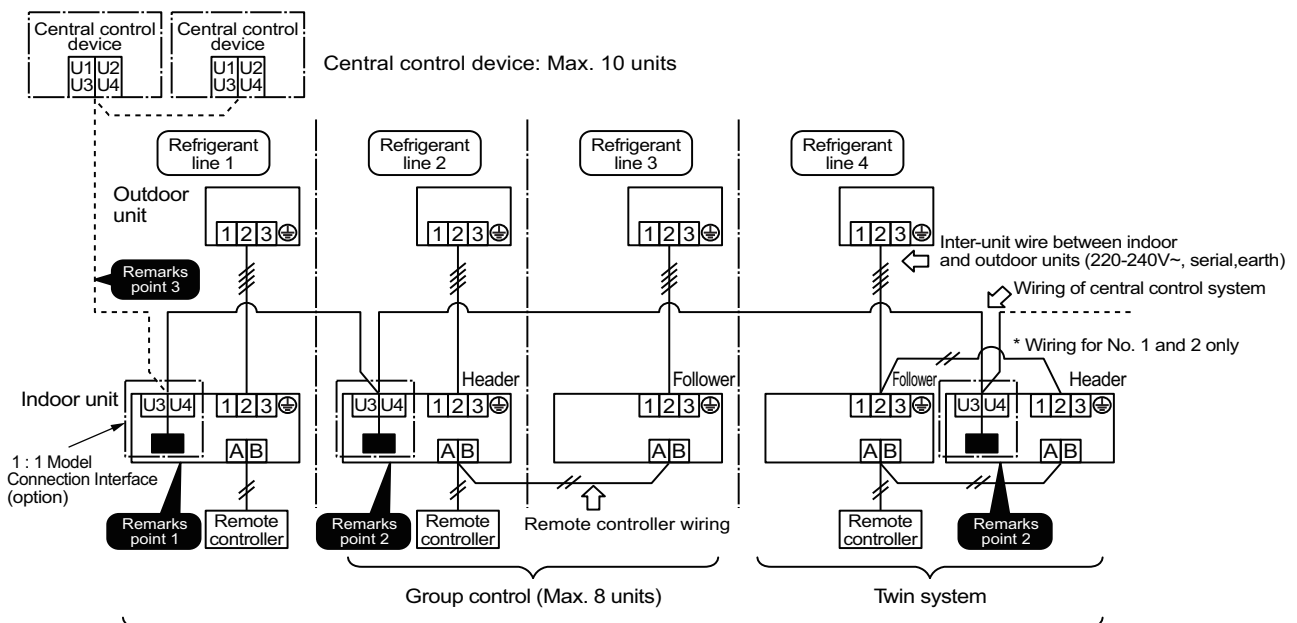
Wiring Connection

1. Wiring connection

Remarks
Point 1) When controlling the digital inverter air conditioner collectively, "1 : 1 Model" Connection Interface (This option) is required.
Point 2) In group control or twin system, this adapter must be connected to Header unit of the indoor unit. (Connection to follower unit is unavailable.)
Point 3) Connect the central control devices to wires of the central control system.
Point 4) When controlling the digital inverter air conditioner collectively, turn on Bit 1 of SW01 in the line with the least line address No. (OFF has been set up at shipment from the factory.)

For the digital inverter air conditioner, re-setup of the address from the wired remote controller is required after automatic addressing.

Central control device: Max. 10 units

Max. 64 indoor units of all the refrigerant lines can be connected.
[When mixed with VRF type (Link wiring), No. of indoor units of VRF type is also included.]
* However, group, twin follower units of the digital inverter air conditioner are not included in No. of units.

VRF : Variable Refrigerant Flow

2. Wire Specifications

No. of wires	Size	Specifications
2	Up to 1000m, braided wire 1.25mm^2	2-core shield wire
	Up to 2000m, braided wire 2.0mm^2	

- Wire is 2-core and non-polarity.
- The length is same to wire length of the central control system.

  In case of system mixed with VRF type, the length includes all length of control wiring between indoor unit and outdoor units at VRFside.
- To prevent noise defect, use 2-core shield wire.
- Connect shield wires with closed-terminal connection and apply open process (insulation process) to the last termination. For grounding (earth), perform grounding with one point at indoor unit side. (During central control for digital inverter air conditioner only)

Remarks

Point 1) Closed terminal connection of shield wire (Connection of connecting parts of each indoor unit)

Point 2) Apply open process (insulation process) to the last termination.

Point 3) For grounding (earth), perform grounding with one point at indoor unit side.

(Group control)   (Twin system)
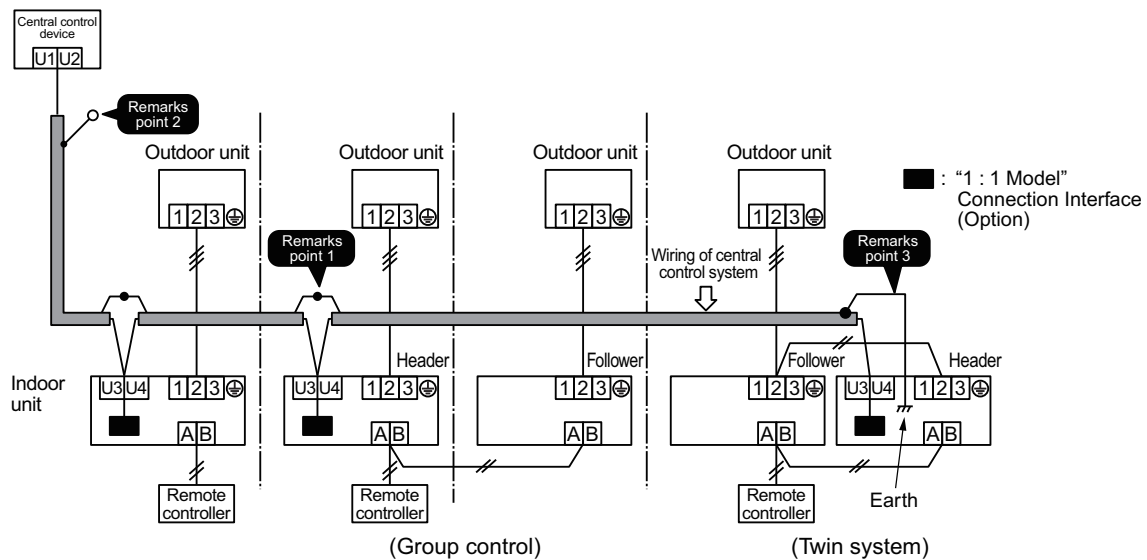
3. Wiring Diagram with Indoor Control P.C. Board

For details, refer to installation procedure for each model.
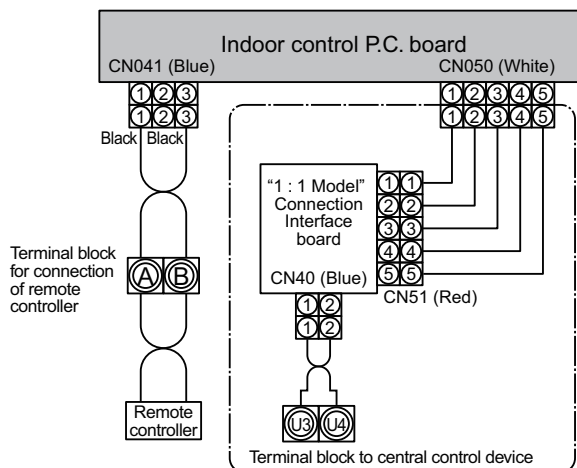
- Parts encircled with chain line are accessories attached to this product.
- ▨ indicates control P.C. board, and ◎ indicates terminal block (Characters inside of ◎ mark indicate terminal number.)
- There is no polarity for wire connection to terminal blocks U3 and U4.

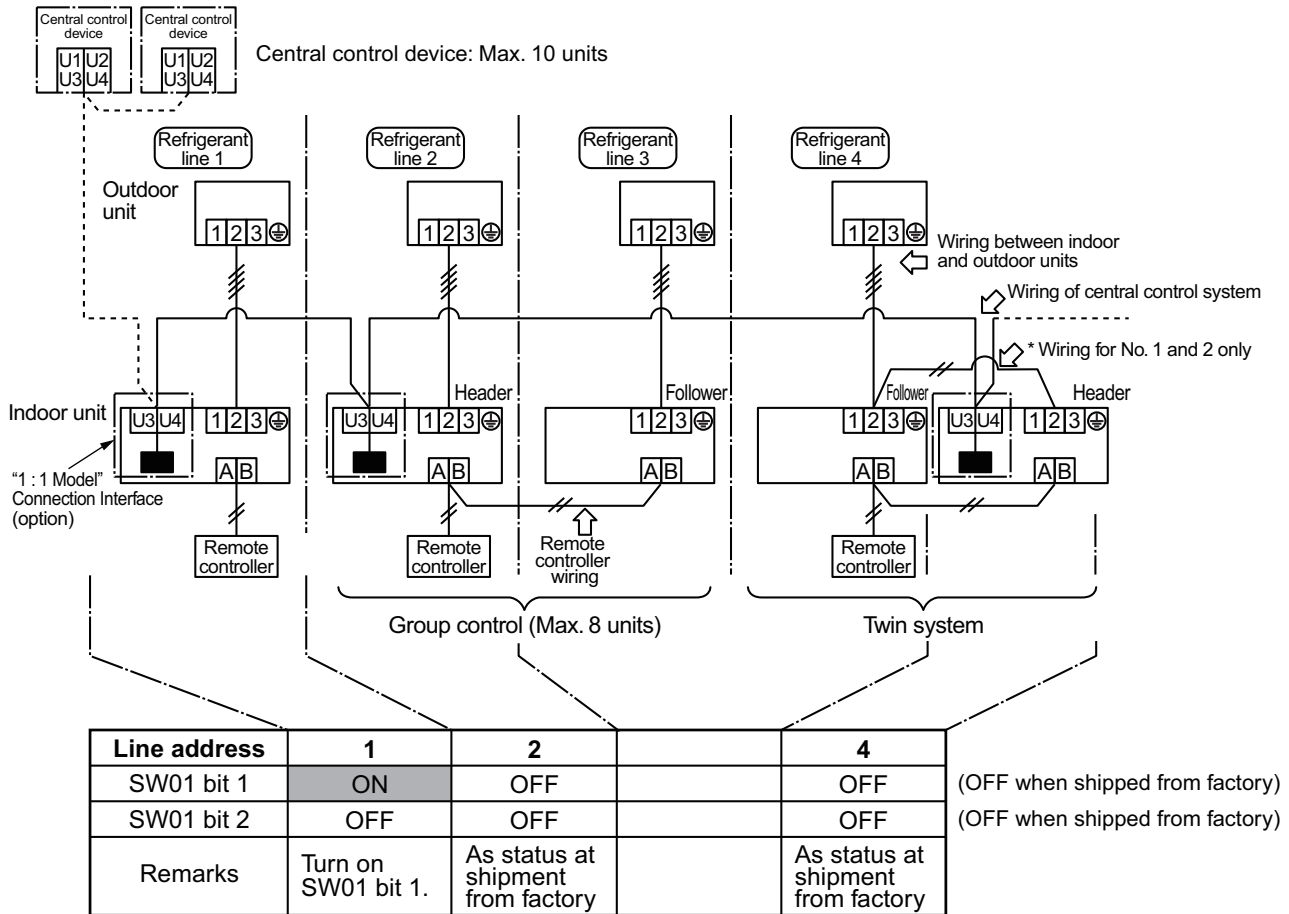### (NOTE)

Do not apply voltage to terminals U3 and U4.

If applying voltage to U3 or U4 terminal by mistake, fusing occurs to protect terminals.

After checking wires, exchange connection of connecting connector on "1 : 1 Model" Connection Interface board from CN40 (Blue) to the spare CN44 (Brown).

Setup of P.C. Board Switch

When the units controlled collectively are all digital inverter air conditioners, it is required to set up the terminator resistor. (Collective control for units without VRF type air conditioner)

• Using SW01, set up the terminator resistor.

• **Set up the terminator resistor to only adapter connected to the indoor unit in the line with the least line address No.**

Line address	1	2		4	
SW01 bit 1	ON	OFF		OFF	(OFF when shipped from factory)
SW01 bit 2	OFF	OFF		OFF	(OFF when shipped from factory)
Remarks	Turn on SW01 bit 1.	As status at shipment from factory		As status at shipment from factory	

(Reference) Contents of switch setup

SW01		Terminator resistor	Remarks
Bit 1	Bit 2		
OFF	OFF	None	Mixed with VRF at shipment from factory (Link wiring)
ON	OFF	100Ω	Central control by digital inverter air conditioners
OFF	ON	75Ω	Spare
ON	ON	43Ω	Spare

Installation Procedure

- For installation of "1 : 1 Model" Connection Interface board and removal of relay wire, be sure to wait for a while (approx. 1 minute) after turning off the power supplies of the air conditioner and the collective control devices. If not doing so, "1 : 1 Model" Connection Interface board may be damaged.

■ In case of 4-way Air Discharge Cassette type
(RAV-SM∗∗∗UT-E, RAV-SP∗∗∗UT-E, RAV-SM∗∗∗UT-K, RAV-SM∗∗∗UT-4C)

No.	Procedure
1	Using board installing spacer (A), install "1 : 1 Model" Connection Interface board to the position of electric parts box of the indoor unit. (See the figure below.)
2	Using terminal block fixing screws, install U3, U4 terminal block to the position of electric parts box of the indoor unit. (See the figure below.) • When tightening the screws, be sure not to damage wires. • Adhere the attached nameplate near the relay terminal block.
3	Connect the relay wire (A) from U3, U4 terminal block to CN40 (Blue) of "1 : 1 Model" Connection Interface board. Connect the relay wire (B) from CN50 (White) on the indoor P.C. board to CN51 (Red) on "1 : 1 Model" Connection Interface board.

Details

- * Relay wire (A)

  Connect U3, U4 terminal block with "1 : 1 Model" Connection Interface CN40 (Blue). There is no polarity for wire connection.

- Relay wire (B)

  Connect CN50 (White) on indoor control P.C. board with CN51 (Red) on "1 : 1 Model" Connection Interface board.
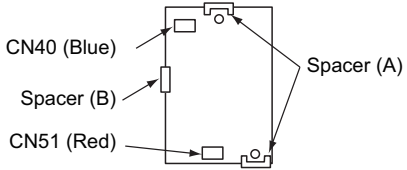
- When installing "1 : 1 Model" Connection Interface board to electric parts box, insert three board installing spacers (A) into holes of P.C. board.
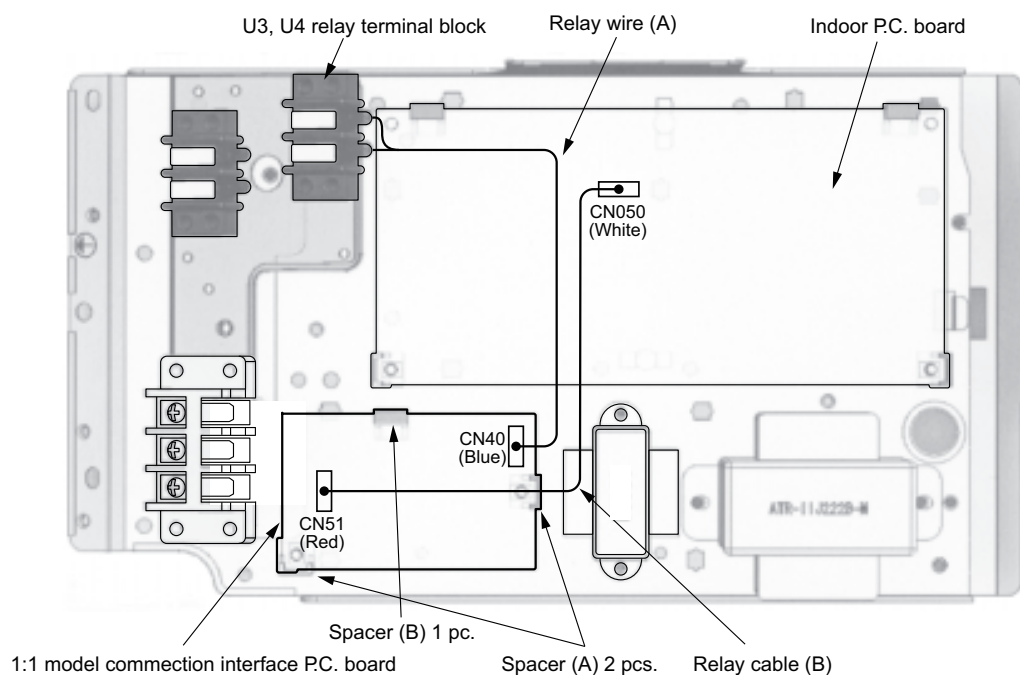
CAUTION

After connection of the relay wires (A) and (B), bind them with banding band so that wires are not caught in. In this time, be sure not to bind the relay wires (A) and (B) together with the power supply lines such as power cable, earth wire, etc.; otherwise a trouble may be caused.

■ In case of Concealed Duct type (RAV-SM**0BT-E, RAV-SM**0BT-4C)

No.	Procedure
1	Using board installing spacer (A), (B) install "1 : 1 Model" Connection Interface board to the position of electric parts box of the indoor unit. (See the figure below.) **\<Installation position of spacers for fixing P.C. board\>** CN40 (Blue) Spacer (A) Spacer (B) CN51 (Red)
2	Using terminal block fixing screws, install U3, U4 terminal block to the position of electric parts box of the indoor unit. (See the figure below.) • When tightening the screws, be sure not to damage wires. • Adhere the attached nameplate near the relay terminal block.
3	Connect the relay wire (A) from U3, U4 relay terminal block to CN40 (Blue) of "1 : 1 Model" Connection Interface board. Connect the relay wire (B) from CN050 (White) on the indoor P.C. board to CN51 (Red) on "1 : 1 Model" Connection Interface board.

Details

U3, U4 relay terminal block — Relay wire (A) — Indoor P.C. board
CN050 (White)
CN40 (Blue)
CN51 (Red)
ATR-11J2229-N
Spacer (B) 1 pc.
1:1 model commection interface P.C. board
Spacer (A) 2 pcs.   Relay cable (B)

* Relay wire (A)

   Connect U3, U4 terminal block with "1 : 1 Model" Connection Interface CN40 (Blue). There is no polarity for wire connection.

• Relay wire (B)

   Connect CN050 (White) on indoor control P.C. board with CN51 (Red) on "1 : 1 Model" Connection Interface board.

* When installing "1 : 1 Model" Connection Interface board to electric parts box of Concealed type air conditioner, insert two board installing spacers (A) into holes of P.C. board (at upper side and lower right of P.C. board) and install one of them to the electric parts box (at lower left of P.C. board) using the board installing spacer (B) of a type which pinches the P.C. board.
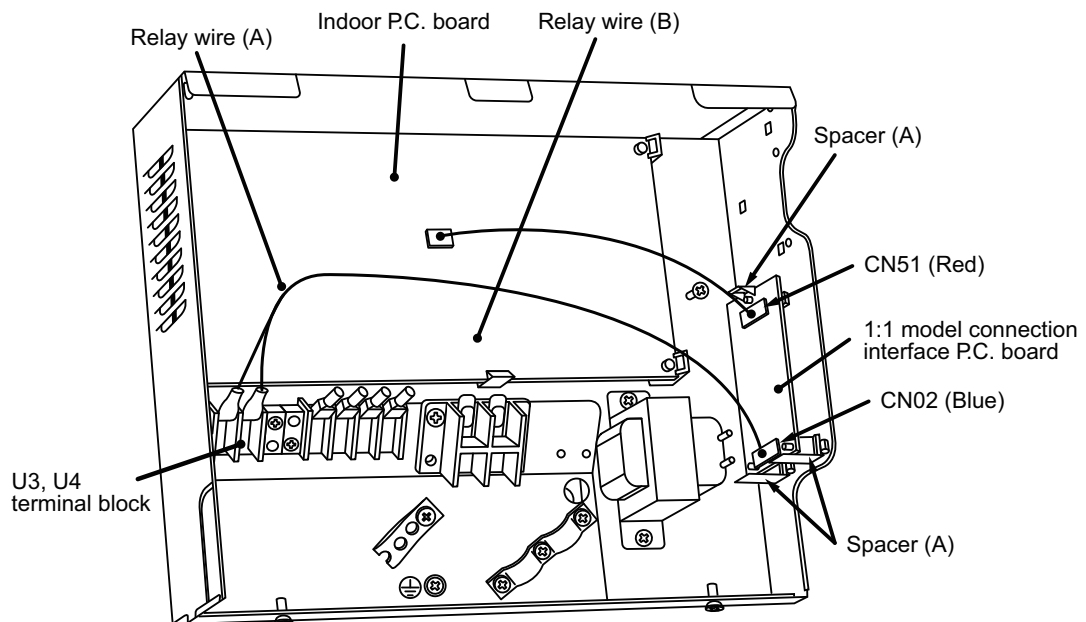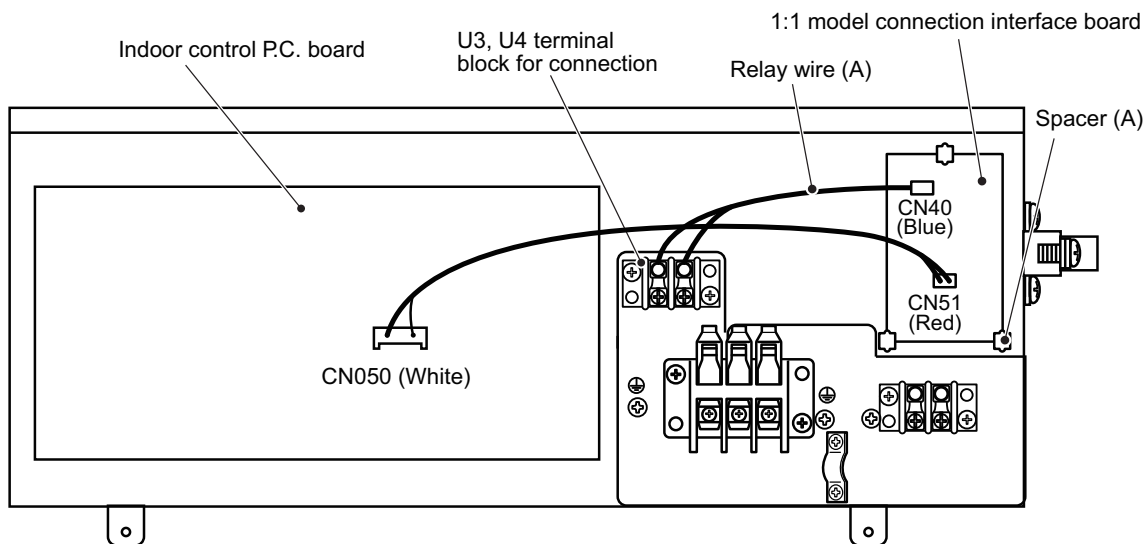
◤ CAUTION ◢

After connection of the relay wires (A) and (B), bind them with banding band so that wires are not caught in. In this time, be sure not to bind the relay wires (A) and (B) together with the power supply lines such as power cable, earth wire, etc.; otherwise a trouble may be caused.

■ In case of Concealed Duct Standard type (RAV-SM**2BT-E, RAV-SM**1BT-E, RAV-SM**1BT-4C)

No.	Procedure
1	Using board installing spacer (A), install "1 : 1 Model" Connection Interface board to the position of electric parts box of the indoor unit. (See the figure below.)
2	Using terminal block fixing screws, install U3, U4 terminal block to the position of electric parts box of the indoor unit. (See the figure below.) • When tightening the screws, be sure not to damage wires. • Adhere the attached nameplate near the relay terminal block.
3	Connect the relay wire (A) from U3, U4 terminal block to CN40 (Blue) of "1 : 1 Model" Connection Interface board. Connect the relay wire (B) from CN50 (White) on the indoor P.C. board to CN51 (Red) on "1 : 1 Model" Connection Interface board.

Details

* Relay wire (A)

  Connect U3, U4 terminal block with "1 : 1 Model" Connection Interface CN40 (Blue). There is no polarity for wire connection.

• Relay wire (B)

  Connect CN50 (White) on indoor control P.C. board with CN51 (Red) on "1 : 1 Model" Connection Interface board.

• When installing "1 : 1 Model" Connection Interface board to electric parts box, insert three board installing spacers (A) into holes of P.C. board.

CAUTION

After connection of the relay wires (A) and (B), bind them with banding band so that wires are not caught in. In this time, be sure not to bind the relay wires (A) and (B) together with the power supply lines such as power cable, earth wire, etc.; otherwise a trouble may be caused.

■ In case of Under Ceiling type (RAV-SM✳✳✳CT-E, RAV-SM✳✳✳CT-4C)

No.	Procedure
1	Using board installing spacer (A), install "1 : 1 Model" Connection Interface board to the position of electric parts box of the indoor unit. (See the figure below.)
2	Using terminal block fixing screws, install U3, U4 terminal block to the position of electric parts box of the indoor unit. (See the figure below.) • When tightening the screws, be sure not to damage wires. • Adhere the attached nameplate near the relay terminal block.
3	Connect the relay wire (A) from U3, U4 terminal block to CN40 (Blue) of "1 : 1 Model" Connection Interface board. Connect the relay wire (B) from CN50 (White) on the indoor P.C. board to CN51 (Red) on "1 : 1 Model" Connection Interface board.

Details

Indoor control P.C. board

U3, U4 terminal block for connection

1:1 model connection interface board

Relay wire (A)

Spacer (A)

CN40 (Blue)

CN51 (Red)

CN050 (White)

• Relay wire (A)

Connect U3, U4 terminal block with "1 : 1 Model" Connection Interface CN40 (Blue). There is no polarity for wire connection.

• Relay wire (B)

Connect CN50 (White) on indoor control P.C. board with CN51 (Red) on "1 : 1 Model" Connection Interface board.

• When installing "1 : 1 Model" Connection Interface board to electric parts box, insert three board installing spacers (A) into holes of P.C. board.

CAUTION

After connection of the relay wires (A) and (B), bind them with banding band so that wires are not caught in. In this time, be sure not to bind the relay wires (A) and (B) together with the power supply lines such as power cable, earth wire, etc.; otherwise a trouble may be caused.

Usage

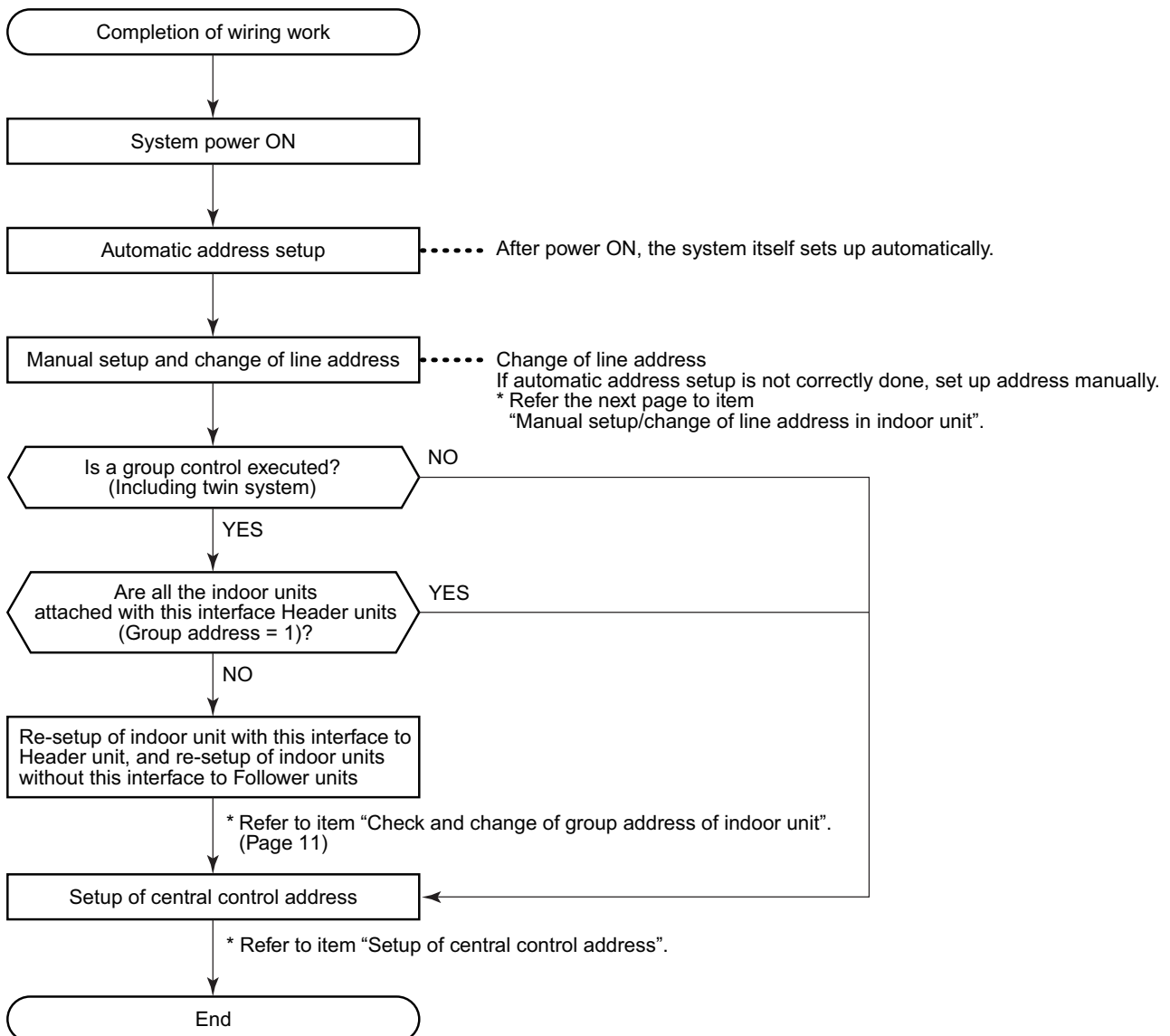• Refer to Owner's Manual for the central control devices (TCB-SC642TLE2, TCB-CC163TLE2)

Other Cautions

• In a group operation, be sure to turn on power supplies of all the indoor units in group control. (Within 3 minutes)
  When power supply of the Header unit is not turned on, there is a possibility that the Header unit exchanges with Follower unit. (If Header unit is exchanged, the central control is unavailable.)

Address No. Setup

■ Outline

To connect the digital inverter air conditioner to TCC-LINK central control system using this interface, it is required to set up address of each connected indoor unit for central control in the following procedure.

```
        ┌──────────────────────────────┐
        │   Completion of wiring work   │
        └──────────────────────────────┘
                      │
        ┌──────────────────────────────┐
        │        System power ON        │
        └──────────────────────────────┘
                      │
        ┌──────────────────────────────┐
        │    Automatic address setup    │ ······  After power ON, the system itself sets up automatically.
        └──────────────────────────────┘
                      │
        ┌──────────────────────────────┐
        │ Manual setup and change of    │ ······  Change of line address
        │       line address            │         If automatic address setup is not correctly done, set up address manually.
        └──────────────────────────────┘         * Refer the next page to item
                      │                             "Manual setup/change of line address in indoor unit".
             ╱─────────────────╲          NO
            ⟨  Is a group control  ⟩ ─────────────┐
            ⟨  executed?           ⟩              │
             ╲ (Including twin system)╱            │
                      │ YES                        │
             ╱─────────────────╲          YES      │
            ⟨ Are all the indoor units⟩ ───────────┤
            ⟨ attached with this      ⟩            │
            ⟨ interface Header units   ⟩           │
            ⟨ (Group address = 1)?    ⟩            │
             ╲─────────────────╱                   │
                      │ NO                          │
        ┌──────────────────────────────┐           │
        │ Re-setup of indoor unit with  │          │
        │ this interface to Header unit, │         │
        │ and re-setup of indoor units   │         │
        │ without this interface to      │         │
        │ Follower units                 │         │
        └──────────────────────────────┘           │
                      │  * Refer to item "Check and change of group address of indoor unit".
                      │    (Page 11)
        ┌──────────────────────────────┐           │
        │ Setup of central control      │ ◄─────────┘
        │ address                        │
        └──────────────────────────────┘
                      │  * Refer to item "Setup of central control address".
        ┌──────────────────────────────┐
        │            End                 │
        └──────────────────────────────┘
```

After the system power supply has been turned on, all the line addresses are allocated to "1" by automatic address setup except group control. Therefore change setup of the line address using the wired remote controller for each refrigerant line.

Change line address for each refrigerant line.
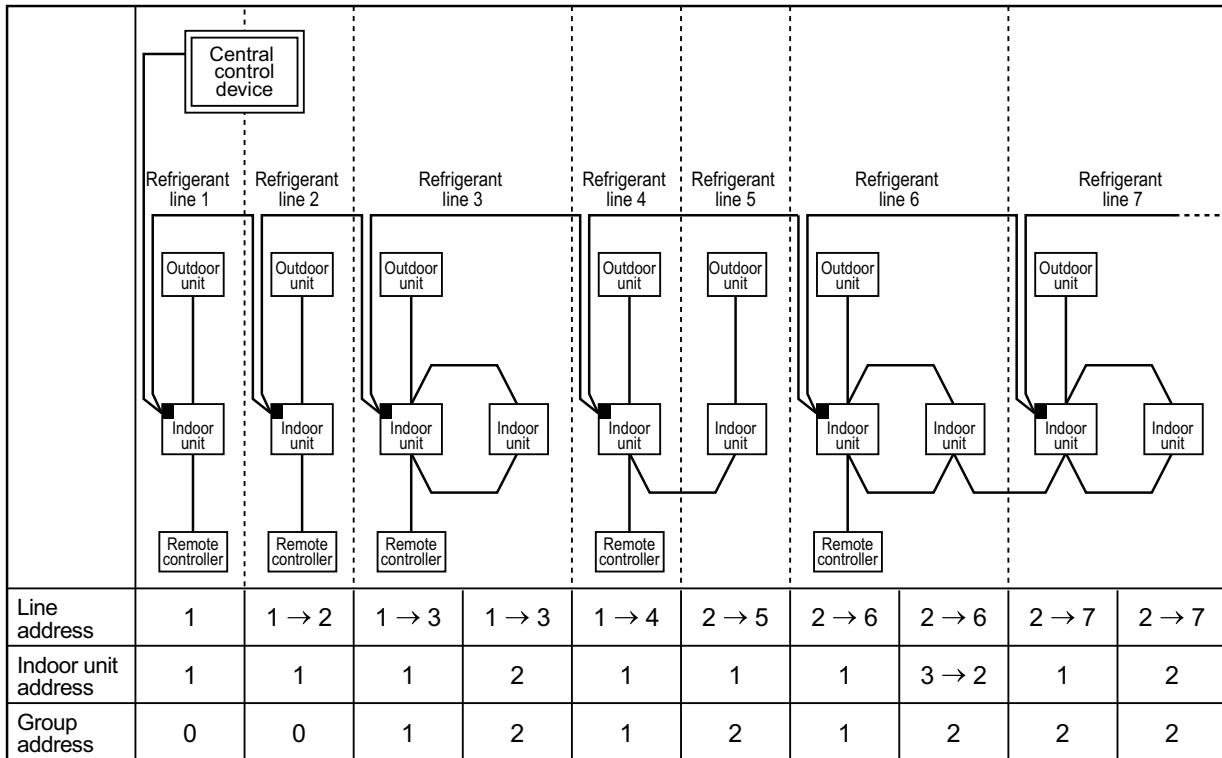
	Refrigerant line 1	Refrigerant line 2	Refrigerant line 3		Refrigerant line 4	Refrigerant line 5	Refrigerant line 6		Refrigerant line 7	
Line address	1	1 → 2	1 → 3	1 → 3	1 → 4	2 → 5	2 → 6	2 → 6	2 → 7	2 → 7
Indoor unit address	1	1	1	2	1	1	1	3 → 2	1	2
Group address	0	0	1	2	1	2	1	2	2	2

In case of group control including twin system, the automatic address does not normally work. Set the automatic address again from the wireless remote controller manually.

Line address (1)	1	2	3	3	4	5	6	6	7	7
Indoor unit address	1	1	1	2	1	1	1	2	1	2
Group address	0	0	1	2	1	2	1	2	2	2

[■ → "1 : 1 Model" connection interface]

* For change/setup method by wired remote controller, refer to "Change method of address setup". (Page 15)

* Allocating different numeral value for each refrigerant line, set up the line address so that it does not overlap with other address No. (When controlling collectively VRF type units mixed with digital inverter air conditioner unit, set up numeral value which also differs from line address at VRF type air conditioner side.)

■ Manual Setup/Change of Line Address in Indoor Unit
[In case of 30 refrigerant lines or more (Includes No. of refrigerant lines at Multi side if mixed)]

After the system power supply has been turned on, all the line addresses are allocated to "1" by automatic address setup except group control. Therefore change setup of the line address using the wired remote controller for each refrigerant line.

	Refrigerant line 30	Refrigerant line 31	Refrigerant line 32		Refrigerant line 33	Refrigerant line 34	Refrigerant line 35		Refrigerant line 36	
Line address	1 → 30	1 → 30	1 → 30	1 → 30	1 → 30	2	1 → 30	2 → 30	2	2
Indoor unit address	1	1 → 2	1 → 3	1 → 4	1 → 5	1	1 → 6	1 → 7	1	2
Group address	0	0	1	2	1	2	1	2	2	2
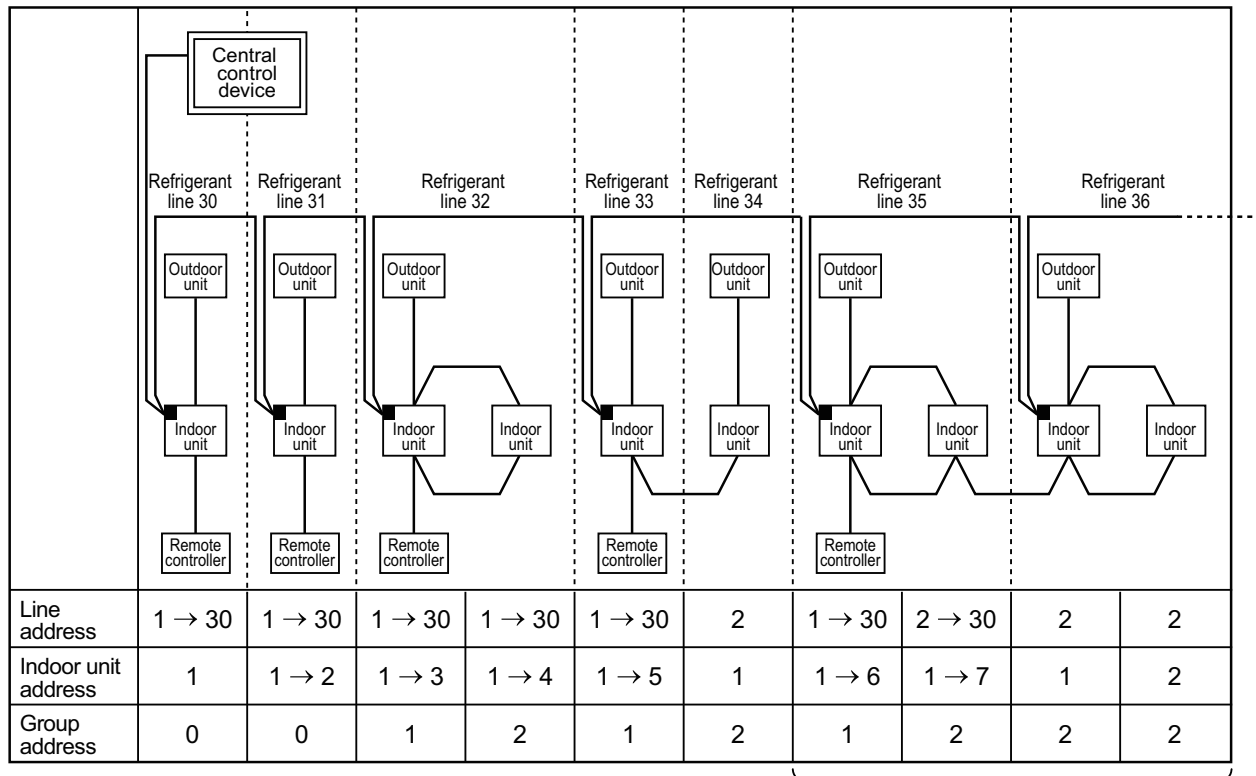
Point (1) Set "30" to all the line addresses of indoor units attached with these interface

Point (2) Change the indoor address so that the indoor unit numbers do not overlap.

Point (3) When the indoor unit attached with this interface is controlled with twin or system, change also line address of the follower unit to "30".

In case of group control including twin system, the automatic address does not normally work. Set the automatic address again from the wireless remote controller manually.

Line address (1)	30	30	30	30	30	2	30	30	2	2
Indoor unit address	1	2	3	4	5	1	6	7	1	2
Group address	0	0	1	2	1	2	1	2	2	2

[■ → "1 : 1 Model" connection interface]

* For change/setup method by wired remote controller, refer to "Change method of address setup". (Page 15)

* Allocating different numeral value for each refrigerant line, set up the line address so that it does not overlap with other address No. (When controlling collectively VRF type units mixed with digital inverter air conditioner unit, set up numeral value which also differs from line address at VRF type air conditioner side.)

■ Check and Change of Group Address of Indoor Unit

In group control or twin operation, the group address is allocated to indoor unit by automatic address setup after the system power supply has been turned on. From these addresses, "Header unit": "1" and "Follower unit": "2" can be recognized. As the central control device (remote controller) communicates with "Header unit" only, set up the group address from wired remote controller so that the indoor unit attached with the adapter becomes "Header unit".

• Check method for Header unit

Beforehand check the indoor unit attached with this interface.

During stop of the equipment.

<Procedure>

1 Push $\overset{SET}{\bigcirc}$, $\overset{CL}{\bigcirc}$ and $\overset{TEST}{\bigcirc}$ buttons simultaneously for 4 seconds or more.

(The firstly displayed unit No. is the header indoor unit No. in the group control.)

2 The indoor unit of which fan was turned on is the header indoor unit.

If the header unit is not one with this interface, change it according to "How to set up Header unit".

3 Pushing $\overset{TEST}{\bigcirc}$ button returns the mode to normal mode.
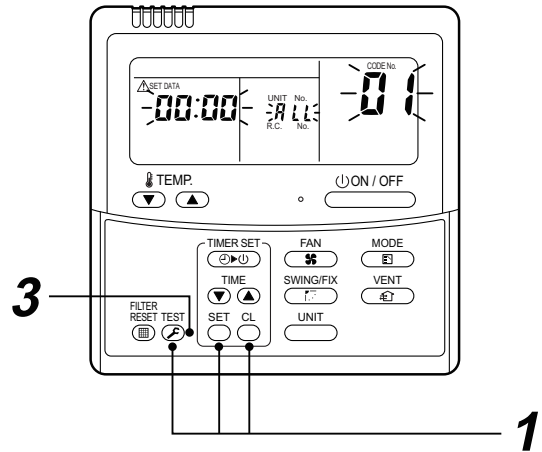
• How to set up Header unit
(In case when the indoor unit of which fan was turned on is not one attached with adapter)

Change address in the following procedure.

<Procedure>

1 Push $\overset{SET}{\bigcirc}$, $\overset{CL}{\bigcirc}$ and $\overset{TEST}{\bigcirc}$ buttons simultaneously for 4 seconds or more.

(The firstly displayed unit No. is the header indoor unit No. in the group control.)

2 The indoor unit of which fan was turned on is the header indoor unit.

3 Using the setup temperature (▼) and (▲) buttons, select item code "14".

4 Check that the setup data is 0001, and then change the setup data to 0002 using the timer time (▼) and (▲) buttons.

5 Push $\overset{SET}{\bigcirc}$ button. In this time, the setup ends if display changes from flashing to lighting.

⇩

(To be continued)

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⇩
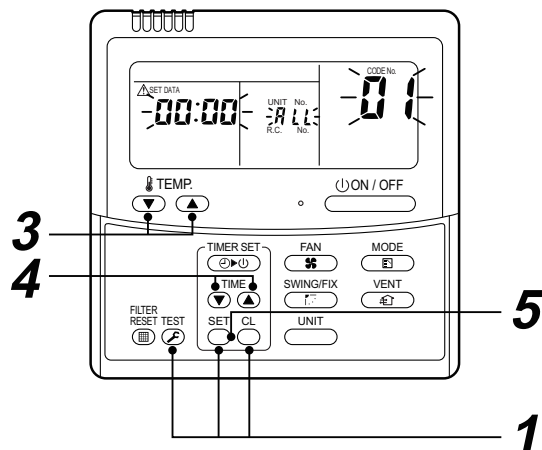
6 Push `UNIT` button, and then turn on fan of the indoor unit which is attached with adapter.

7 Leave the item code as it is. (Select item code 14.)

8 Check that the setup data is 0002, and then change the setup data to 0001 using the timer time ▼ and ▲ buttons.

9 Push `SET` button. In this time, the setup ends if display changes from flashing to lighting.

10 When the above setup completed, push `UNIT` button to select indoor unit of which setup was changed and then check the changed contents. (Item code 14 as it is)

   * When pushing `CL` button, the setup contents can be cleared.
   (In this case, repeat procedure from **1** .)

   Note) Cancellation is unavailable if the item code is changed.

11 Push `TEST` button. (Setup is determined.)
   When pushing `TEST` button, the display disappears and the status becomes the normal stop status.
   (The remote controller operation is not accepted for approx. 1 minute after pushing `TEST` button.)

   * If the remote controller operation is not accepted for 1 minute or more after pushing `TEST` button, it is considered that the address setup is incorrect and the automatic address setup is being performed again. Change setup again after approx. 5 minutes.
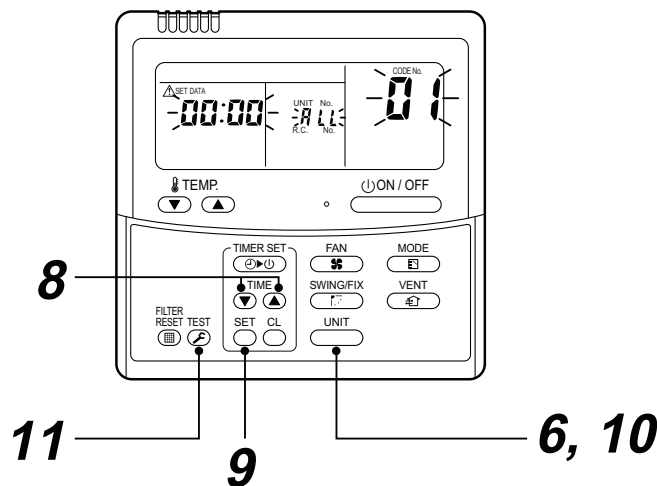
■ Setup of Central Control Address

* For details, refer to Installation Manual for central remote controller.

1. Address setup method is classified into the following three methods.
   1) Manual setup from wired remote controller
   2) Manual setup from central remote controller
   3) Automatic setup from central remote controller
2. In group control, set up the central control address to the Header unit of the group.

```
Determination of indoor address
        │
        ▼
Is automatic address set up? ─── Automatic setup ──────────────┐
        │ Manual setup                                          │
        ▼                                                        │
Setup from wired remote controller ── Setup from central remote controller ──┐ │
        │                                                      │ │
        ▼                                                      ▼ ▼
```

Manual address setup from wired remote controller

1 Push $\overset{\text{TEST}}{\mathcal{F}}$ and $\overset{\text{VENT}}{\boxed{\text{⬆}}}$ buttons simultaneously for 4 seconds or more.
Do not push $\overset{\text{UNIT}}{\boxed{}}$ button.

2 Set "03" to item code with temperature setup $\boxed{\blacktriangledown}$ and $\boxed{\blacktriangle}$ buttons.

3 Using timer setup/time $\boxed{\blacktriangledown}$ and $\boxed{\blacktriangle}$ buttons, set up the central control address.

4 Registration completes with $\overset{\text{SET}}{\bigcirc}$ button. (**SETTING** changes from flashing to lighting.)

5 Push $\overset{\text{TEST}}{\mathcal{F}}$ button.

6 Initial setup starts.
(For approx. 1 minute)

7 End

Manual address setup with item code "C1" of central remote controller

1 Push $\boxed{\mathcal{F}}$ and $\boxed{\text{ZONE}}$ buttons simultaneously for 4 seconds or more.

2 Set "C1" to item code with temperature setup $\boxed{\blacktriangledown}$ and $\boxed{\blacktriangle}$ buttons.

3 Push $\boxed{\text{SET}}$ button.

4 Select $\boxed{\text{ZONE}}$ or $\boxed{\blacktriangleleft}$ $\boxed{\blacktriangleright}$ buttons to select zone and group to be registered.

5 Using $\boxed{\text{⊟}}$ and $\boxed{\text{⬚}}$, perform registration. (Select the indoor unit.)

6 Registration completes with $\boxed{\text{SET}}$ button.

7 Repeat procedure **4** to **6**.

8 Push $\boxed{\mathcal{F}}$ button.

9 **SETTING** flashes and the initial setup starts.

10 End

Automatic address setup with item code "C2" of central remote controller

1 Push $\boxed{\mathcal{F}}$ and $\boxed{\text{ZONE}}$ buttons simultaneously for 4 seconds or more.

2 Set "C2" to item code with temperature setup $\boxed{\blacktriangledown}$ and $\boxed{\blacktriangle}$ buttons.

3 Push $\boxed{\text{SET}}$ button and the address setup starts. "C2" goes on and **SETTING** flashes.

4 When **SETTING** goes off and "C2" flashes, setup ends.

5 Push $\boxed{\mathcal{F}}$ button.

6 **SETTING** flashes and the initial setup starts.
(For approx. 1 minute)

7 End

Check method

Check overlap of central control addresses

Make operation status by pushing $\boxed{\text{I}}\boxed{\text{O}}$ buttons of central remote controller three times each.

When there is overlapped units

An alarm code "L20" is displayed on the remote controller and alarm code "L20" or "P30" on central remote controller, respectively.

⌈ Wired remote controller:
  Displayed immediately
  central remote controller:
⌊ After 4 minutes at maximum

Overlapped
YES ───→ Overlapped?
              │ No overlap
              ▼
            End

(Example)

```
┌──────────────┐
│   Central    │
│control device│
└──────┬───────┘
   ┌───┴────────────┬─────────────┐
┌──┴─────────┐  ┌───┴────────┐
│Outdoor unit│  │Outdoor unit│
└──┬─────────┘  └───┬────────┘
┌──┴─────────┐  ┌───┴────────┐
│ Indoor unit│  │ Indoor unit│
└──┬─────────┘  └───┬────────┘
   ○ 1-1-0          ○ 1-2-0
```
(Line - Indoor - Group)
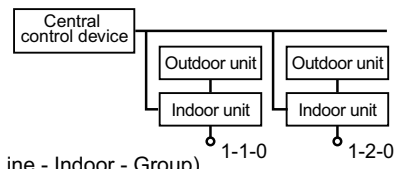
*1
In case of digital inverter air conditioner, if the same line address is set up to the multiple indoor units which are controlled collectively, the central control address setup is impossible by this method.

<Central control address/zone/group correspondence table>

Central control Address	Zone	Group	Central control Address	Zone	Group	Central control Address	Zone	Group	Central control Address	Zone	Group
1	1	1	17	2	1	33	3	1	49	4	1
2		2	18		2	34		2	50		2
3		3	19		3	35		3	51		3
4		4	20		4	36		4	52		4
5		5	21		5	37		5	53		5
6		6	22		6	38		6	54		6
7		7	23		7	39		7	55		7
8		8	24		8	40		8	56		8
9		9	25		9	41		9	57		9
10		10	26		10	42		10	58		10
11		11	27		11	43		11	59		11
12		12	28		12	44		12	60		12
13		13	29		13	45		13	61		13
14		14	30		14	46		14	62		14
15		15	31		15	47		15	63		15
16		16	32		16	48		16	64		16
									99	Not set up	

■ **Address Setup/Change Method**

<Procedure>
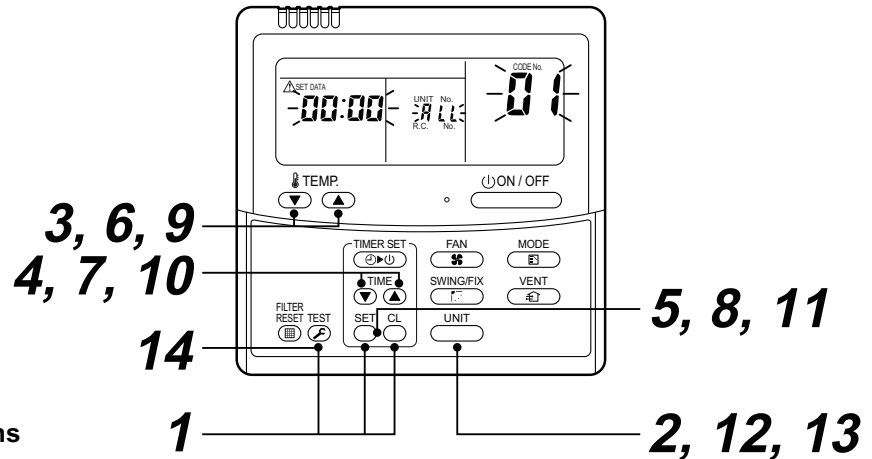
1 **Push ⬡(SET), ⬡(CL) and ⊘(TEST) buttons simultaneously for 4 seconds or more.**

LCD changes to flashing.
(The firstly displayed unit No. is the header indoor unit No. in the group control.)

2 **In group control, use ⬡(UNIT) button for change.**

Select the indoor unit No. (The fan of the selected indoor unit is turned on.)

<Line address>

3 **Using the setup temperature (▼) and (▲) buttons, select item code "12".**

4 **Using timer time (▼) and (▲) buttons, set up the line address.**

5 **Push ⬡(SET) button.** (OK when display goes on.)

<Indoor unit address>

6 **Using the setup temperature (▼) and (▲) buttons, select item code "13".**

7 **Using timer time (▼) and (▲) buttons, set up the indoor unit address.**

8 **Push ⬡(SET) button.** (OK when display goes on.)

<Group address>

9 **Using the setup temperature (▼) and (▲) buttons, select item code "14".**

10 **Using timer time (▼) and (▲) buttons, set up Individual = 0000, Header unit = 0001, and Follower unit = 0002.**

11 **Push ⬡(SET) button. (OK when display goes on.)**

12 **Using ⬡(UNIT) button, select an indoor unit No. to be changed at the next time.**
Repeat procedure from **3** to **12** and change setup so that addresses are not overlapped.

13 **After the above change, push ⬡(UNIT) button to check the changed contents.**

14 **If all is right, push ⊘(TEST) button. Setup ends.**

<Wiring example of 2 lines>

	#1			#2	
	Outdoor			Outdoor	
	Indoor	Indoor	Indoor	Indoor	Indoor

Remote controller

Line address	→ 1	1	1	2	2
Indoor unit address	→ 1	2	3	1	2
Group address	→ 1	2	2	2	2

Header unit   Follower unit
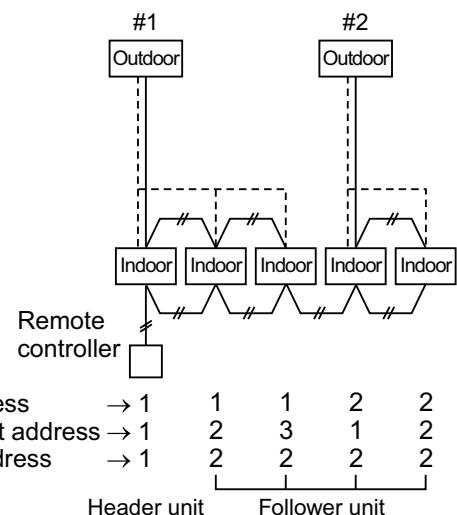
Group address

Individual : 0000
Header unit : 0001
Follower unit : 0002 } In case of group control

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Alarm code when addresses are overlapped

	Procedure	Alarm code
Case 1	When line addresses are overlapped **Central control device** ⫽ Line 1 ··· Line 2 Line 1: Outdoor → Indoor, Remote controller Line address : 1 Indoor address : 1 Group address : 0 Central control address : 1 Line 2: Outdoor → Indoor, Remote controller Line address : 1 Indoor address : 1 Group address : 0 Central control address : 2	**Wired remote controller side** Line 1: E08 Line 2: E08 **Central remote controller side** E08 to Line 1 or Line 2
Case 2	When line addresses are overlapped (Both Line 1 and 2 operate) **Central control device** ⫽ Line 1 ··· Line 2 Line 1: Outdoor → Indoor, Remote controller Line address : 1 Indoor address : 1 Group address : 0 Central control address : 1 Line 2: Outdoor → Indoor, Remote controller Line address : 2 Indoor address : 1 Group address : 0 Central control address : 1	**Wired remote controller side** Line 1: L20 Line 2: L20 **Central remote controller side** L20 to Line 1 or Line 2
Case 3	When only one-side Line 2 operates from remote controller, and overlap of the central control address is detected in Case 2 • Line 1: During stop • Line 2: Under operation (Overlap of central control address is detected.) Line 1: Alarm code is output even if it stops. Line 2: Alarm code is not output to the central side. (Alarm is displayed on the wired remote controller.)	**Wired remote controller side** Line 1: No alarm Line 2: L20 **Central remote controller side** Line 1: No alarm Line 2: L20 or Line 1: P30 Line 2: No alarm

4-7-6 Connection Interface Kit

MODEL : TCB-PX30MUE

1. Installation Procedure

1. Cut off the slit of bell mouth on the Air Conditioner unit (RAV-SM***MUT-E) with a nipper or a cutter for attaching the Connection Interface Kit.

Cutting off portion (Shaded area)

After cutting off the slit of bell mouth on the unit, clear up the surface of the slit that there is no burr on the cutting edge.
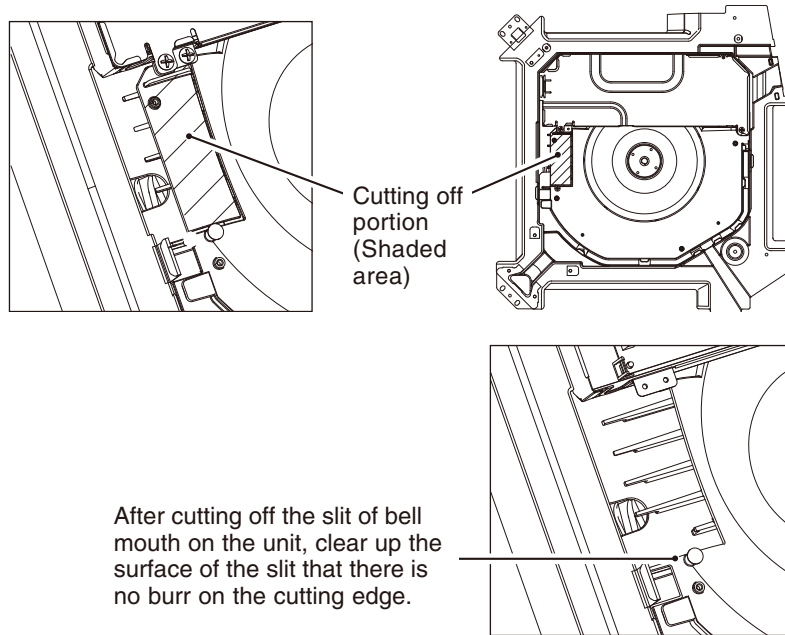
2. Attach the Connection Interface Kit (TCB-PX30MUE) on the Air Conditioner unit (RAV-SM***MUT-E). After insert the hook of the unit to the Connection Interface Kit hole, and then tighten a Cross slot screw (4x14).

Connection Interface Kit

Cross slot screw
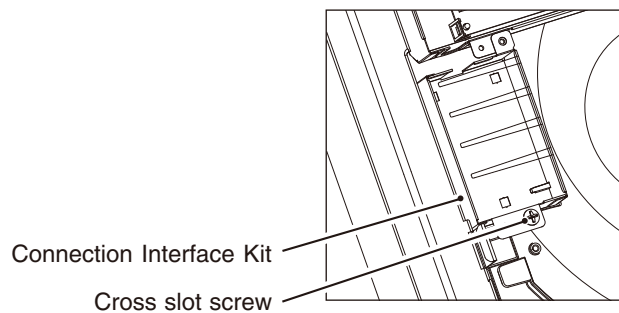
3. Install the spacers and P.C. board that are attached to the TCB-PCNT30TLE2, on the Connection Interface Kit.

Spacers (Attached to the TCB-PCNT30TLE2)

P.C. board (Attached to the TCB-PCNT30TLE2)
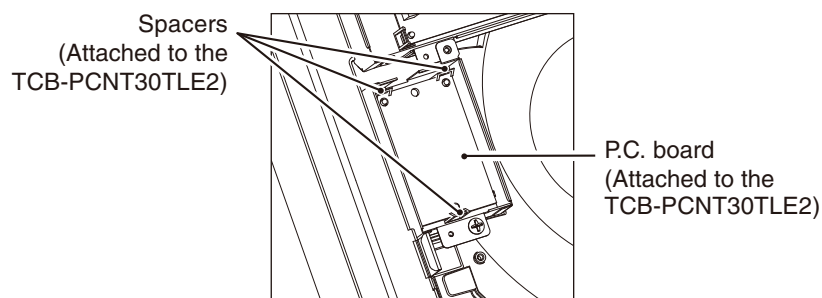
4. Remove the 2P terminal block for the communication cable of the electric parts box on the unit, and then replace with the attached 4P terminal block for the communication cable.

4-1. Disconnect the lead wires on the 2P terminal block of the electric parts box from the Faston connector on the unit.

4-2. Replace the 2P connector with 4P connector on the terminal block.

4-3. Connect the lead wires that are disconnected as shown above steps 4-1, to the 4P terminal block.

CN41
(BLUE)
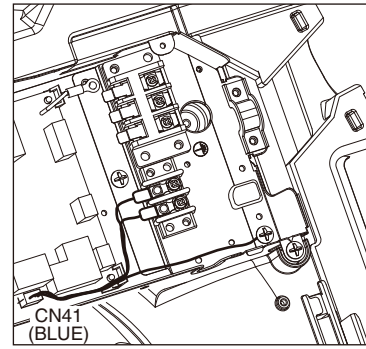
(A), (B) terminals (Connecting for the Remote Controller)

CN41
(BLUE)
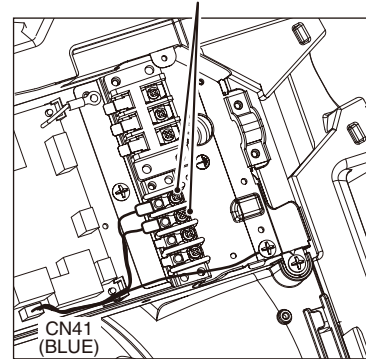
5. Connect the connection cables attached to the electric parts block.

(U3), (U4) terminals
(For central control)

TERMINAL

Connecting cable B   Connecting cable A

WIRING DIAGRAM
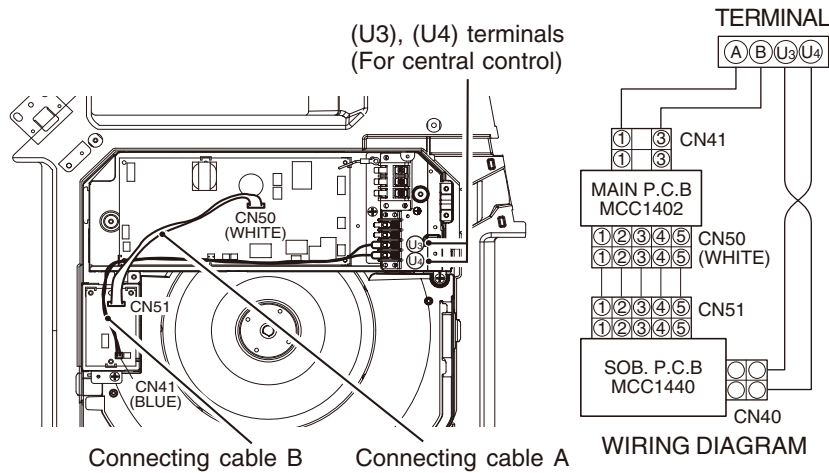
6. Setting for Central Control
For Central Control setting, refer to the Installation Manual of the TCB-PCNT30TLE2.

7. After the installation work has been completed, install the Connection Interface Kit cover to the Connection Interface Kit tightened with the two screws (4x10).

Connection Interface Kit cover

Screw (4x10)

Hook of Connection Interface Kit

Screw (4x10)

450
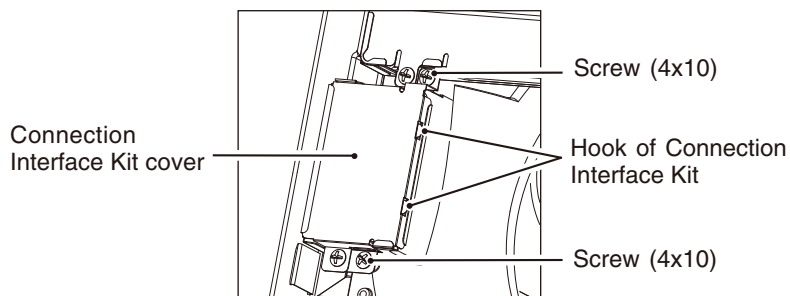
4-8 Application control for network

4-8-1 TCB-IFCB640TLE Installation Manual

Introduction

■ Applications/Functions/Specifications

Applications

The TCB-IFCB640TLE can provide instructions to and acquire status information from the general purpose interface TCB-IFCG1TLE and up to 64 indoor units on the TCC-LINK by applying variable voltage 0 to 10 V to the 8-channel analog input without using special communication protocol. In other words, the TCB-IFCB640TLE can access indoor units and the general purpose interface by varying voltage at a proper timing with connection to a rotary encoder and a multi channel variable-voltage processing circuit.

- By applying voltage of each level corresponding to central control address and setting value between terminal inputs AI*+ and AI*- and specifying Set or Get, indoor units or TCB-IFCG1TLE can be controlled and their status information can be acquired.

| Indoor unit | Indoor unit | Indoor unit | Indoor unit | General Purpose I/F TCB-IFCG1TLE |

TCC-LINK command conversion

AN example of a user-prepared controller circuit is shown separately.

TCC-LINK main bus

Analog I/F TCB-IFCB640TLE

Set/Get setting

AD input 8 channels
Input level determination → TCC-LINK

- Air conditioner address setting (2 ports)
- Temperature setting
- Operation mode setting
- Fan speed setting
- ON/OFF setting
- Louver position setting

Specify voltage

DA output 5 channels
TCC-LINK → Level output

- Temperature setting status
- Actual operation mode
- Fan speed setting status
- ON/OFF status
- Louver position setting status

Determine voltage level

D input 2channels
Input level determination → TCC-LINK

- General purpose interface Relay 1 static operation
- General purpose interface Relay 2 static operation

Specify H/L

D output 5 channels
TCC-LINK → Level output

- General purpose interface Relay 1 setting status
- General purpose interface Relay 2 setting status
- Alarm/no alarm status of specified indoor unit
- Alarm/no alarm status of all indoor units
- Alarm/no alarm status of general purpose interface

Determine H/L

- Compatible Air Conditioners
  S-MMS, S-HRM, Mini-SMMS, DI, SDI

Specifications

Power supply	15 VDC ±5%
Power consumption	3.2 W
Operating temperature/humidity	0 to 40 °C, 20 to 85% RH
Storage temperature	-20 to 60 °C
Chassis material	Galvanized sheet metal 0.8t (no coating)
Dimensions	66 (H) × 170 (W) × 200 (D) mm
Mass	820 g

■ External View

	Parts name	Specifications		Parts name	Specifications
1	Case	Galvanized sheet metal	5	Grommet	C30-SG20A
2	Case lid	Galvanized sheet metal	6	Grommet	C30-SG20A
3	Grommet	C30-SG20A	7	Grommet for power supply	C30-SG20A
4	Grommet	C30-SG20A	8	DC Jack	MJ-40

Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	TCB-IFCB640TLE	1	
2	Installation Manual	1	
3	Screw	4	M4 x 12 mm tapping screws

Use the following wiring materials to connect the signal lines and power lines. (Procured on site)

No.	Line		Description
1	TCC-LINK	Type	2-core shield wires
		Wire size	1.25 mm², 1000m max.
		Length	2.00 mm², 2000m max. (Total Length of TCC-LINK Network, includes indoor/outdoor connection.)
2	Signal	Type	Multi-core wire
		Wire size	Stranded wire, single wire *1 0.08097 mm² to 3.309 mm²
		Length	(AWG28 to AWG12) Max. 20 m *2
3	Power		Specified by AC adaptor

*1 Use shielded wire according to the environment.
   Normally PVC cable is recommended. The conductor diameter should be approximately 0.75 mm and its resistance should be 25 Ω/km. For 16-core cable, the outer diameter should be approximately 13 mm.
*2 Varies with use environment and conditions.

An AC adaptor unit for this product must meet the following requirements and be procured locally.

REQUIREMENT

- Output: 15 V ±5%
- Current: 0.5 A or more
- Shall conform to applicable safety standards (including EN60950-1 or IEC 60950-1, etc), EMI standards (EN550022 and EN61000-3), and EMS standards (including EN50024, (EN61204-3), and EN61000-4).
- Shall meet environmental conditions and required lifetime.
- DC Plug 2.1 mmØ (inner diameter)
              5.5 mmØ (outer diameter)
              10 mm   (length)

Recommended product is
Model name: UI312-1508 produced by UNIFIVE TECHNOLOGY CO., LTD
Homepage addresses of UNIFIVE TECHNOLOGY CO., LTD are
http://www.unifive-us.com/, http://www.unifive.com.tw/, http://www.unifive.co.kr/, http://www.unifive.com/ or http://www.unifive.cn/.

Installation

■ TCB-IFCG1TLE (TCB-IFCG2TLE) Installation Method and Orientation

There are five orientations of Surface/Wall Mount that the TCB-IFCG1TLE (TCB-IFCG2TLE) can be installed, these are shown below.

NOTE

Use screws supplied for installation of device.

REQUIREMENT

Do not install the unit in any of the following places.
- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

■ Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

Connection of Power cables/Earth wires/Signal wires

⚠ CAUTION

- Power lines have polarity.
- The TCC-LINK signal lines have no polarity.

REQUIREMENT

Disconnect the AC adaptor for this appliance from the main power supply.

- The AC adaptor for this appliance must be connected to the main supply by a circuit breaker or switch with a contact separation of at least 3 mm.

■ Power cables/Earth wires/Signal wires

Connect power cables, earth wires, and signal wires to the specified terminals on the terminal block as shown below.

DC power input 15V±5%

TCC-LINK communication line

Connect the shield of the TCC-LINK communication line to earth on the air conditioner side.
Do not connect the shield wire to this board. It should be open and insulated.
U1 and U2 have no polarity.

⚠ CAUTION Polarity

+ -   U2 U1

SW7

○ LED TCC-LINK ERROR (RED)
○ LED TCC-LINK (YELLOW)
○ LED AC TEST
○ LED POWER

SW6   SW1   SW3   SW4

SW2

Secure each cable with a cable clamp.

AI1+ AI1- AI3+ AI3- AI5+ AI5- AI7+ AI7-
AI2+ AI2- AI4+ AI4- AI6+ AI6- AI8+ AI8-

AO1+ AO1- AO3+ AO3- AO5+
AO2+ AO2- AO4+ AO4- AO5-

DI5+ DI5- DO1+ DO2+ DO3+
DI6+ DI6- DO4+ DO5+ COM

Secure each cable with a cable clamp.

▼ Length of stripped signal wires

AI1+ AI1- AI3+ AI3- AI5+ AI5- AI7+ AI7-
AO1+ AO1- AO3+ AO3- AO5+

|← 50 →|← 5 →|

AI2+ AI2- AI4+ AI4- AI6+ AI6- AI8+ AI8-
AO2+ AO2- AO4+ AO4- AO5-

|← 30 →|← 5 →|

DI5+ DI5- DO1+ DO2+ DO3+
DI6+ DI6- DO4+ DO5+ COM

|← 15 →|← 5 →|

▼ U1 U2

|← 10 →|← 5 →|

⚠ CAUTION

To connect a wire to a wiring terminal on the signal terminal block, insert a screwdriver or the like into a wiring terminal opening hole at an angle of 45 degrees and raise the screwdriver end to open the wiring terminal as shown below. Insert a wire into the open wiring terminal in this state, and then lower the screwdriver end and remove from the terminal opening hole.

Wiring terminal opening holes

Wiring terminals

Wiring terminal opening holes

Wiring terminals

Appearance of signal terminal block

Open the wiring terminal

Screwdriver or the like

Wiring terminal opening holes

Wiring terminals

Wiring terminal opening holes

Wiring terminals

Side view of signal terminal block

■ Wiring Connection

The following displays an example of the TCB-IFCG1TLE connection to the TCC-LINK Network.
The TCC-LINK communication lines are connected to the U1 and U2 terminal blocks on the TCB-IFCG1TLE board as shown below.

> **NOTE**
>
> The TCB-IFCG1TLE device can be connected to the TCC-LINK network on the Indoor side using the U1 & U2 connections, OR on the Outdoor Side via the U3 & U4 connections.

Shield earthing

The shield of the TCC-LINK Network wire should be connected on the air conditioner side and left open and insulated at the TCB-IFCG1TLE side.

• U1 and U2 have no polarity.

When connecting to multiple outdoor units or central control wires

| U1 U2 |
| U3 U4 |

Central control
remote controller

Outdoor unit

U1 U2 U3 U4

Central control wires

Wires between indoor units
and between outdoor unit and
indoor units

| U1 U2 |
Indoor unit

| U1 U2 |
Indoor unit

| U1 U2 |
Indoor unit

| U1 U2 |
TCC-LINK
TCB-IFCG1TLE

HA compatible air
conditioner or
relay control
device

| U1 U2 |
TCB-IFCB640TLE

Controller
prepared by
user
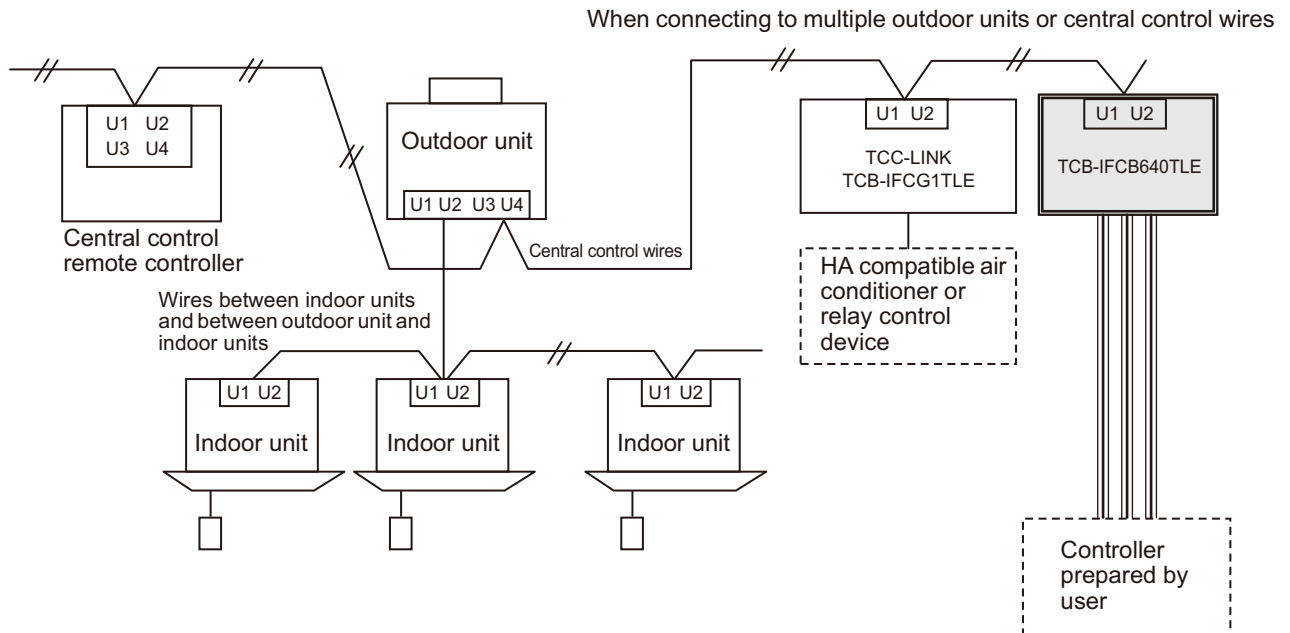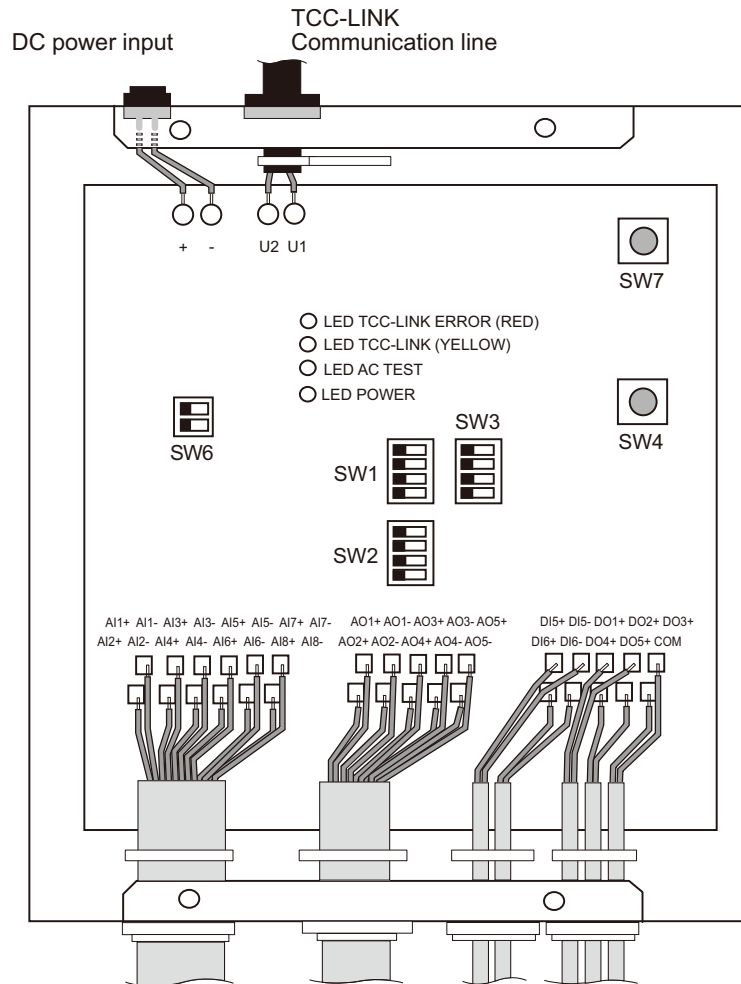
Setting

1. Setting Terminator Resistor for the TCC-LINK Communication Line

Set SW6-1 to OFF and do not insert 100-ohm terminator resistor into the TCC-LINK bus. SW6-2 is not used.

2. Setting SW1, SW2, and SW3

SW1, SW2, and SW3 are used for the trial operation check. For details, refer to "7 Trial Operation Check".
SW1, SW2, and SW3 are usually set to all OFF.

> **NOTE**
>
> Switch settings are ONLY registered at power ON and when the reset switch has been pressed. When changing DIP Switch settings please be sure to either power down, or press reset switch SW7 to enable changes to be registered.

Trial Operation Check

■ Before starting trial operation

Set all Indoor unit and TCB-IFCG1TLE central control addresses (DN03).

> **NOTE**
>
> These central control address MUST be different for ALL indoor units in a central control network.

- Once the Indoor Unit Central Control addresses have been set, be sure to press the reset Switch (SW7) on the TCB-IFCB640TLE to enable the device to update itself.

■ Trial operation

(1) Check the communication status between TCB-IFCB640TLE and indoor unit or TCB-IFCG1TLE using LED D13. To check the communication between the TCB-IFCB640TLE and each Indoor Unit or TCB-IFCG1TLE connected, select the Central Control Address (DN03) using SW1 to SW3 and monitor the response of LED D13 referring to the table below.

Confirming procedure:
- Set bit1 of SW3 to "ON" during normal operation.
- Set the central control address of the target indoor unit with SW1 and SW2 according to the "Indoor unit or TCB-IFCG1TLE central control address and SW1/SW2 setting" table shown below.
- Communication status is displayed by LED D13.

Communication status with indoor unit	D13	Remarks
Normal	Lighting	
Error	Blinking	Communication with the indoor unit was established previously, but is disabled currently.
Invalid indoor unit	Light off	Communication with the indoor unit has never been established.

(Example) Check the communication status of indoor unit with a central control address of 41.
Set bit1 of SW3 to "ON", SW2 to "2" and SW1 to "8".

Indoor unit or TCB-IFCG1TLE central control address and SW1/SW2 setting

Indoor unit central control address	SW2	SW1	Indoor unit central control address	SW2	SW1	Indoor unit central control address	SW2	SW1	Indoor unit central control address	SW2	SW1
1	0	0	17	1	0	33	2	0	49	3	0
2	0	1	18	1	1	34	2	1	50	3	1
3	0	2	19	1	2	35	2	2	51	3	2
4	0	3	20	1	3	36	2	3	52	3	3
5	0	4	21	1	4	37	2	4	53	3	4
6	0	5	22	1	5	38	2	5	54	3	5
7	0	6	23	1	6	39	2	6	55	3	6
8	0	7	24	1	7	40	2	7	56	3	7
9	0	8	25	1	8	41	2	8	57	3	8
10	0	9	26	1	9	42	2	9	58	3	9
11	0	A	27	1	A	43	2	A	59	3	A
12	0	B	28	1	B	44	2	B	60	3	B
13	0	C	29	1	C	45	2	C	61	3	C
14	0	D	30	1	D	46	2	D	62	3	D
15	0	E	31	1	E	47	2	E	63	3	E
16	0	F	32	1	F	48	2	F	64	3	F

The relationship between the notation for SW1 and SW2 in the table above and the bits of SW1 and SW2 are shown in the following table.
The ●s indicate that the bit is turned on.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
SW Bit1		●		●		●		●		●		●		●		●
SW Bit2			●	●			●	●			●	●			●	●
SW Bit3					●	●	●	●					●	●	●	●
SW Bit4									●	●	●	●	●	●	●	●

After the communication status check is completed, set all bits of SW2 and bit1 of SW3 to "OFF".

■ LED indication during normal operation

	LED	Description
D10	Power indicator	Lights while the power is on.
D11	TCC-LINK communication status indicator	Blinks during TCC-LINK communication.
D12	TCC-LINK communication error indicator	Lights temporarily when TCC-LINK is busy.
D13	TEST indicator	Used in the test mode.

Input/Output Specifications

■ Setting input timing chart

The AI1 Input Mode will always have an "Idle mode" inserted between and Set (Setting) of Get (Status acquisition) operation when they are transmitted.

During a "Set" operation, the Indoor unit Central Control address specified by AI2 and AI3 immediately after the transition to the "Set" mode is read, and the value to be set is applied to the indoor unit. The setting value is read and set ONLY during the transition to the Set mode.

During a Get operation, the indoor unit central control address specified by AI2 and AI3 immediately after transition to the Get mode is read, and the address status is output to AO1, AO2, AO3, AO4, and AO5. This output value is retained until the next Get operation is performed. General purpose equipment addresses are retained as DO1, DO2, DO3, DO4, and DO5 outputs separately from indoor unit addresses until the next general purpose equipment Get operation is performed. The process moves to Set or Get mode from the specified idle voltage.

Retain AI4, AI5, AI6, AI7, AI8, I0, and I1 address setting data for 200 ms after transition to the Set mode as input condition. For AI1 Set or Get, retain the value for 200 ms after transition from the idle mode.
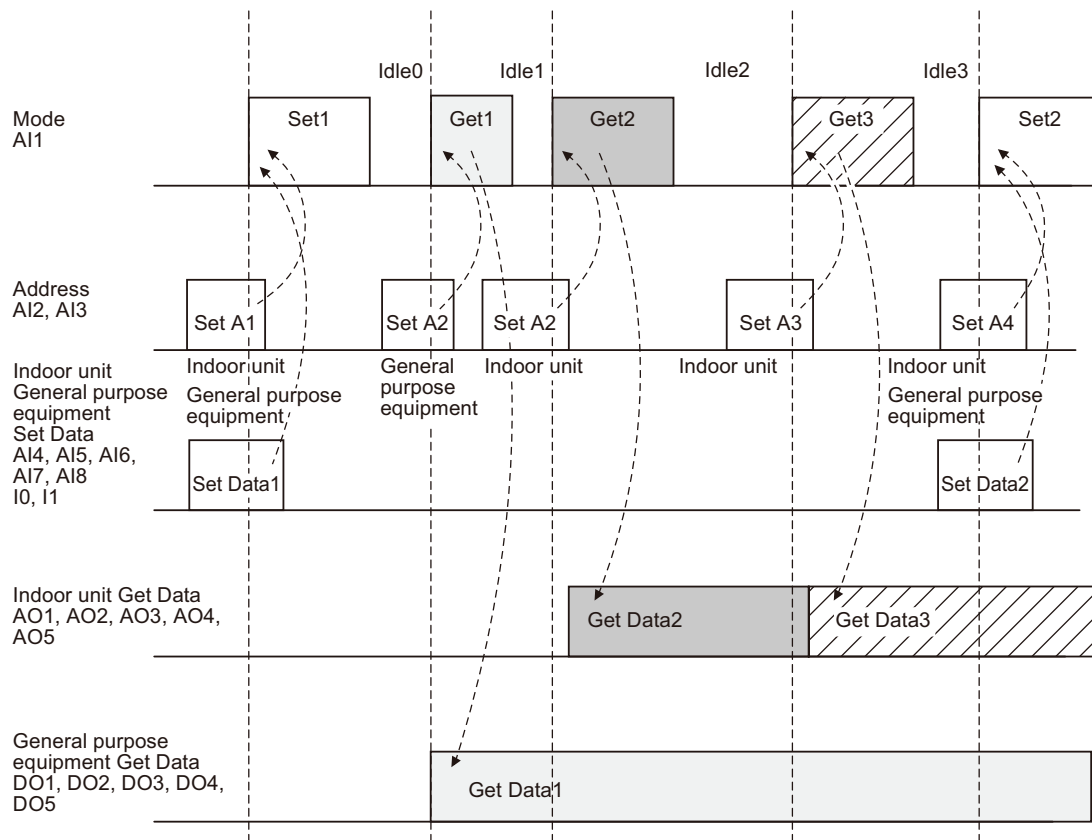
■ Input/output level

■ Analog input/output specifications

Analog input/output voltage levels are shown in the following table.

Signal classification		Port name	Data item	Specification
Analog input	0 to 10V range	AI1 AI2 AI3 AI4 AI5 AI6 AI7 AI8	Input type	Resistor-divided A/D converter input
			Number of input points	2
			Resolution	10 bits, 0 to 1023 levels
			Allowable input voltage range	0.0 V to 10.0 V
			Input resistance	3 KΩ
			Connection circuit output resistance	50 Ω or less
			Conversion time	160 ms
Analog output	0 to 10V range	AO1 AO2 AO3 AO4 AO5	Output type	Class-C push-pull
			Output point	5
			Resolution	8 bits, 0 to 255 levels
			Output voltage range	0.0 V to 10.0 V
			Maximum output source current	10 mA
			Connection circuit load resistance	10 KΩ or more
			Conversion time	10 µS

A/D converter input specifications

Apply voltages specified in the table below to each set of terminals AI + and AI- on the terminal block.
If a value outside of those outlined in the table below is sent to the device, then no setting will be applied to the air conditioner.

No.	Name	Description	In/Out	Connector
S0	Set/Get/Idle	Sets mode.	Analog In	AI1
S1	Address set	Sets the lower 3 bits of central control address.	Analog In	AI2
S2	Address set	Set the upper 3 bits of central control address.	Analog In	AI3
S3	Set Point Temperature set	Room temperature setting value 16 to 29°C (in units of 1°C)	Analog In	AI4
S4	Operation Mode set	Sets operation mode.	Analog In	AI5
S5	Fan Speed set	Sets fan speed.	Analog In	AI6
S6	Indoor on/off set	Sets on/off.	Analog In	AI7
S7	Louver set	Sets louver position.	Analog In	AI8
SO1	Set Point Temperature set value	Temperature set value status 18 (16) to 29 (27)°C (in units of 1°C)	Analog Out	AO1
SO2	Operation Mode status	Actual operation mode	Analog Out	AO2
SO3	Fan Speed set status	Fan speed set status	Analog Out	AO3
SO4	Indoor on/off status	On/off status, communication failure status, and internal error status	Analog Out	AO4
SO5	Louver set status	Louver position set status	Analog Out	AO5

S1, S2	S7	S5	10V circuit input value (volt)
0	Invalid	Invalid	1.52 ± 0.20
1	Swing	Fan Stop	2.66 ± 0.20
2	F1	Auto	3.80 ± 0.20
3	F2	Quick	4.94 ± 0.20
4	F3	High	6.09 ± 0.20
5	F4	Low	7.22 ± 0.20
6	F5	Ultra Low	8.39 ± 0.20
7	Stop	–	9.57 ± 0.20
Default			0.645 >

The following table shows the relationship between S1/S2 settings and central control addresses. Apply voltages corresponding to values of S1 and S2.

Central control address	Setting S1	S2	Central control address	Setting S1	S2	Central control address	Setting S1	S2	Central control address	Setting S1	S2	Central control address	Setting S1	S2	Central control address	Setting S1	S2	Central control address	Setting S1	S2	Central control address	Setting S1	S2
1	0	0	9	0	1	17	0	2	25	0	3	33	0	4	41	0	5	49	0	6	57	0	7
2	1	0	10	1	1	18	1	2	26	1	3	34	1	4	42	1	5	50	1	6	58	1	7
3	2	0	11	2	1	19	2	2	27	2	3	35	2	4	43	2	5	51	2	6	59	2	7
4	3	0	12	3	1	20	3	2	28	3	3	36	3	4	44	3	5	52	3	6	60	3	7
5	4	0	13	4	1	21	4	2	29	4	3	37	4	4	45	4	5	53	4	6	61	4	7
6	5	0	14	5	1	22	5	2	30	5	3	38	5	4	46	5	5	54	5	6	62	5	7
7	6	0	15	6	1	23	6	2	31	6	3	39	6	4	47	6	5	55	6	6	63	6	7
8	7	0	16	7	1	24	7	2	32	7	3	40	7	4	48	7	5	56	7	6	64	7	7

S3	10V circuit input value (volt)
18 (16)	1.04 ± 0.15
19 (17)	1.82 ± 0.15
20 (18)	2.60 ± 0.15
21 (19)	3.38 ± 0.15
22 (20)	4.16 ± 0.15
23 (21)	4.94 ± 0.15
24 (22)	5.72 ± 0.15
25 (23)	6.51 ± 0.15
26 (24)	7.28 ± 0.15
27 (25)	8.06 ± 0.15
28 (26)	8.85 ± 0.15
29 (27)	9.70 ± 0.15
Default	0.469 >

> **NOTE**
>
> The relationship between temperature and 10V input shifts depending on the indoor unit temperature setting range specification.

S4	10V circuit input value (volt)
Heat	2.70 ± 0.30
Cool	4.21 ± 0.20
Fan	5.76 ± 0.20
Dry	7.31 ± 0.20
Auto	8.94 ± 0.20
Default	1.15 >

S6	S0	10V circuit input value (volt)
OFF	SET	3.50 >
ON	GET	5.06 ± 1
Idle	Idle	6.67 <

D/A converter output

Each AO output during a Get operation of a unit that was judged to be non-existent due to power-off or disconnection immediately after start-up will be treated as default.

SO5	SO3	SO2	Circuit output value (volt)
Invalid	Invalid	Invalid	1.77 ± 0.2
Swing	Fan Stop	Heat	2.75 ± 0.2
F1	Auto	Cool	3.77 ± 0.2
F2	Quick	Fan	4.75 ± 0.2
F3	High	Dry	5.77 ± 0.2
F4	Low	Auto Heat	6.79 ± 0.2
F5	Ultra Low	Auto Cool	7.77 ± 0.25
Stop	–		8.24 ± 0.25
Default			0

SO1	Circuit output value (volt)
18 (16)	1.26 ± 0.2
19 (17)	2.00 ± 0.2
20 (18)	2.71 ± 0.2
21 (19)	3.41 ± 0.2
22 (20)	4.16 ± 0.2
23 (21)	4.86 ± 0.2
24 (22)	5.61 ± 0.2
25 (23)	6.31 ± 0.2
26 (24)	7.02 ± 0.25
27 (25)	7.77 ± 0.25
28 (26)	8.47 ± 0.25
29 (27)	9.18 ± 0.25
Default	0

NOTE

The relationship between temperature and 10 V input shifts depending on the indoor unit temperature setting range specification.

SO4	Circuit output value (volt)
OFF	2.67 ± 0.2
ON	4.20 ± 0.2
No response	5.73 ± 0.2
For future reserved	7.22 ± 0.25
For future reserved	8.86 ± 0.25
default	0
Internal error	10.00 ± 0.25

"ON" and "OFF" indicates the status of a unit of the specified address. However, this indicates the Relay1 status for the TCB-IFCG1TLE.

"No response" is output when a unit that was judged as existent during the initialization process disappeared after that and was judged to send no response.

"Internal error" is output when an analog interface error occurs independently of other units. If Get operation is performed in the case that there is no unit from the beginning, the default value is output.

■ Digital input/output specifications

The following table lists digital input/output specifications.

Signal classification	Port name	Data item	Specification
Digital output	DO1 DO2 DO3 DO4 DO5	Output type	Insulated by photocoupler
		Output point	5
		Maximum output current	10 mA
		Maximum voltage (between DO and Com)	DC 55 V
		Maximum voltage (between Com and DO)	DC 7 V
Digital input	DI5 DI6	Input type	Insulated by photocoupler
		Input point	2
		Input resistance	100 Ω
		Minimum input ON current	2 mA
		Maximum allowable input ON current	30 mA
		Maximum input OFF current	0.05 mA

The DO4 alarm outputs "1" when any one of the indoor units outputs an alarm in the free existent address setting mode. For specifications of the general purpose interface TCB-IFCG1TLE, refer to the TCB-IFCG1TLE manual.

Name	Description	In/Out	Connector
Relay 1 set for General Purpose I/F	Relay setting for general purpose interface TCB-IFCG1TLE (1: on, 0: off)	In	DI5
Relay 2 set for General Purpose I/F	Relay setting for general purpose interface TCB-IFCG1TLE (1: on, 0: off)	In	DI6
Alarm status output for General Purpose I/F	General purpose interface TCB-IFCG1TLE alarm input status (1: alarm, 0: no alarm)	Out	DO3
Alarm status	Specified indoor unit (1: alarm, 0: no alarm)	Out	DO5
Alarm status	All indoor units (1: alarm, 0: no alarm)	Out	DO4
Relay 1 set status for General Purpose I/F	Relay set value for general purpose interface TCB-IFCG1TLE (1: on, 0: off)	Out	DO1
Relay 2 set status for General Purpose I/F	Relay set value for general purpose interface TCB-IFCG1TLE (1: on, 0: off)	Out	DO2

■ Connection to External Devices

Observe the following precautions when connecting this product to external devices.

General safety precautions to be observed in the circuit design process

- Be sure to install a safety circuit in the external control circuit so that the system will operate safely in the event of a malfunction or abnormality occurring in this product or a abnormality as a result of external factors.
- Take fail-safe measures at the user side in case of a signal line disconnection or an abnormal signal due to power interruption.

General precautions on system start-up

- For systems that have a load that could be dangerous to humans and/or has equipment connected to the output circuit, be sure to disconnect the output wiring temporarily and then perform the operation test.
- Before turning on the power supply, make sure that electrical specifications and wiring are all correct.

REQUIREMENT

- The electrical circuit to be connected to this product must be provided on the power supply secondary side and operate at a voltage of 50 V or less.
- To protect the signals from noise interference use the correct shielded cable for wiring.

▼ Example of digital input connection
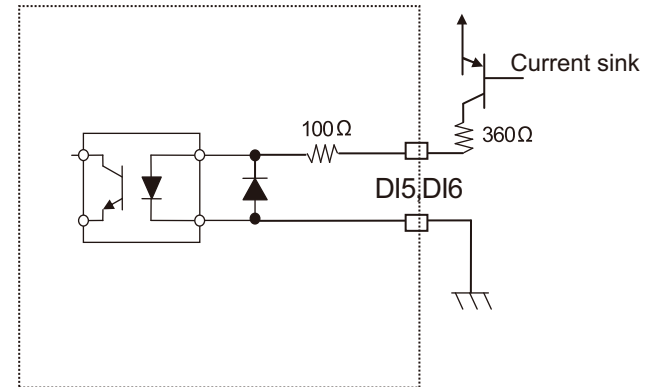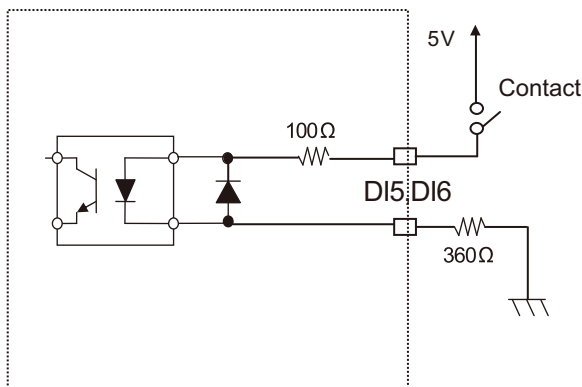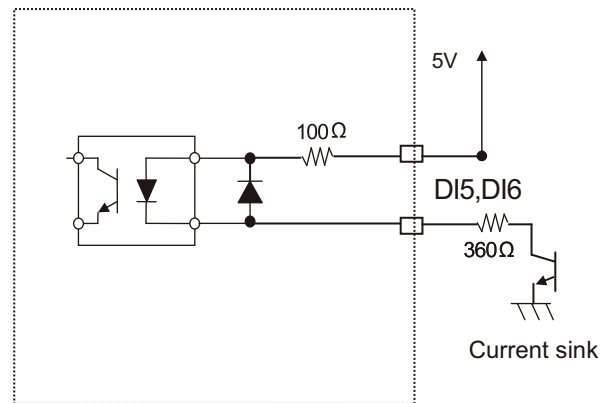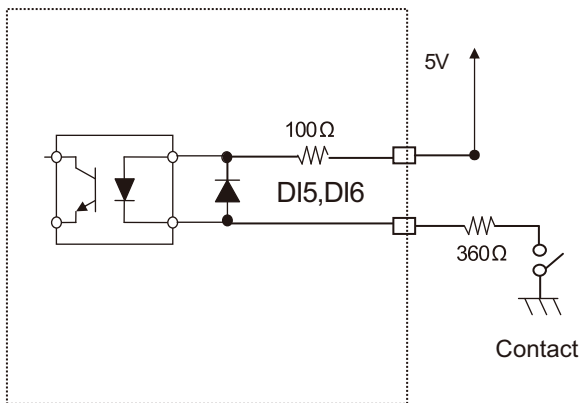
REQUIREMENT

Connect an external connecting point group DI5- and DI6- to the same earth point in each power supply system.

466

▼ Example of digital output connection

DO1,DO2,DO3,DO4,DO5

5V   External board A
10KΩ
100Ω
100Ω
100Ω
100Ω
100Ω
COM

DO1,DO2,DO3,DO4,DO5

5V   External board A
10KΩ
100Ω
100Ω
100Ω
5V
10KΩ   External board B
100Ω
100Ω
COM
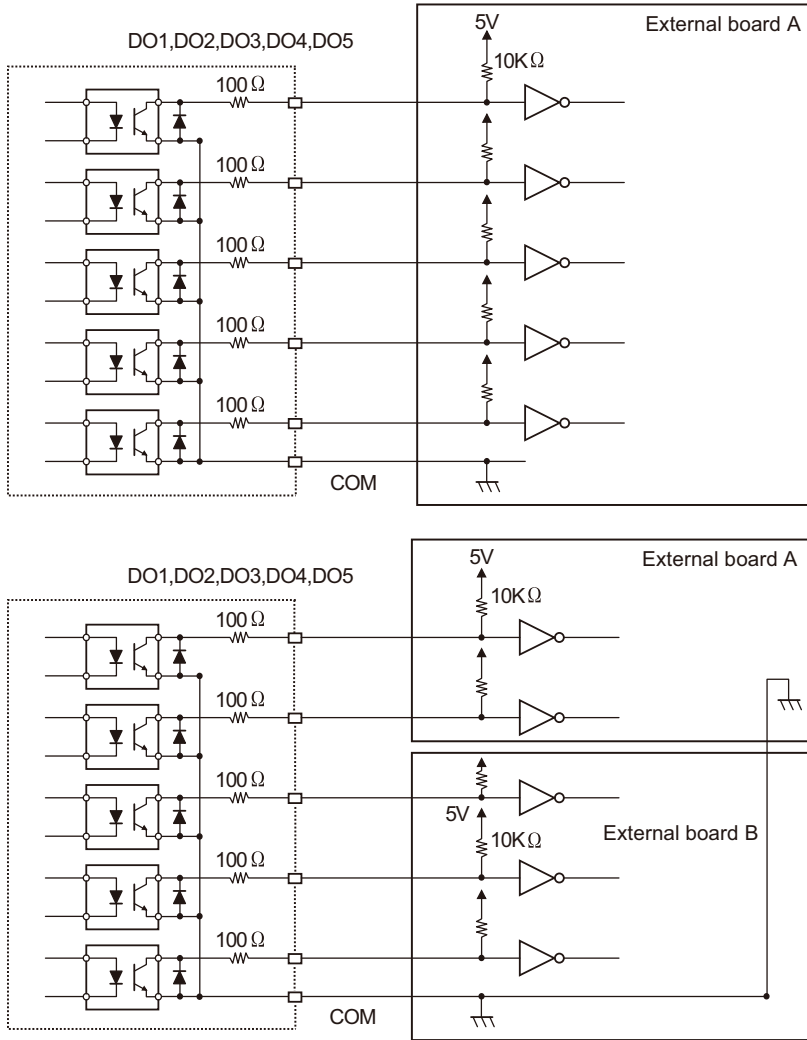
▼ Example of analog input connection

2KΩ   AI1+,AI2+,AI3+,AI4+,AI5+,AI6+,AI7+,AI8+
+
AD Converter   1KΩ   0-10V

AI1-,AI2-,AI3-,AI4-,AI5-,AI6-,AI7-,AI8-
-
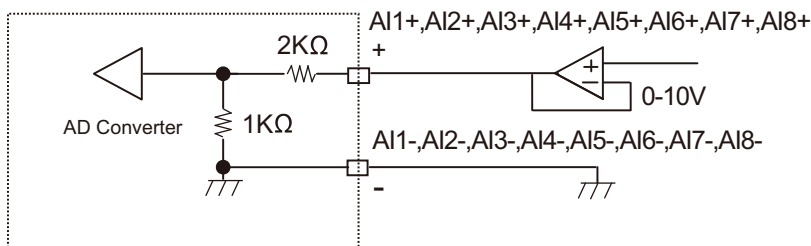
Note)

Board side

REQUIREMENT

Connect external connecting point groups AI1-/AI2-/AI3-/AI4/AI5-/AI6-/AI7-/AI8- and AO1-/AO2-/AO3-/AO4-/AO5- to the same earth point in each power supply system.

467

▼ Example of analog output connection

AO1+,AO2+,AO3+,AO4+,AO5+

+

DA Converter

0-10V

-

AO1-,AO2-,AO3-,AO4-,AO5-

AO1+,AO2+,AO3+,AO4+,AO5+

+

DA Converter

more than 10KΩ

-

AO1-,AO2-,AO3-,AO4-,AO5-
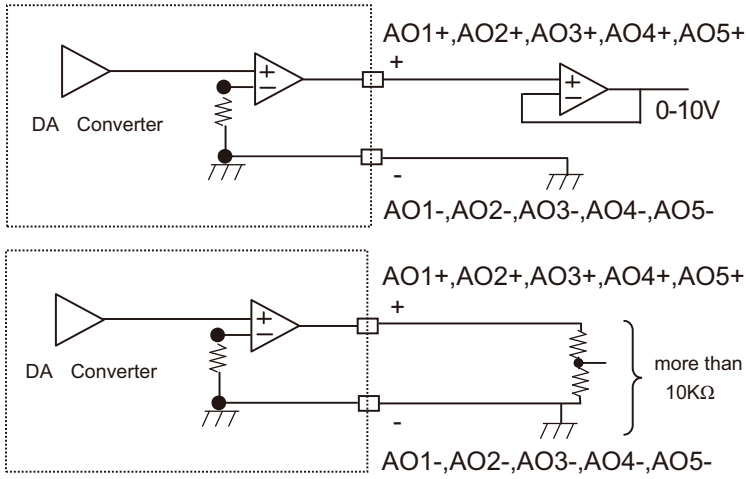
Note)

Board side

■ Indication of LEDs

The following LEDs light as follows:

LED No.	LED color	Lighting condition
D10	Red	Lights while power is supplied to this board.
D11	Yellow	Lights for 0.5 seconds during TCC-LINK transmission.
D12	Red	Lights while TCC-LINK transmission is halted.
D13	Green	Indoor communication test

Annex

■ Example of controller interface

▼ Example of AD/DA connection circuit
Example of controller internal configuration 1
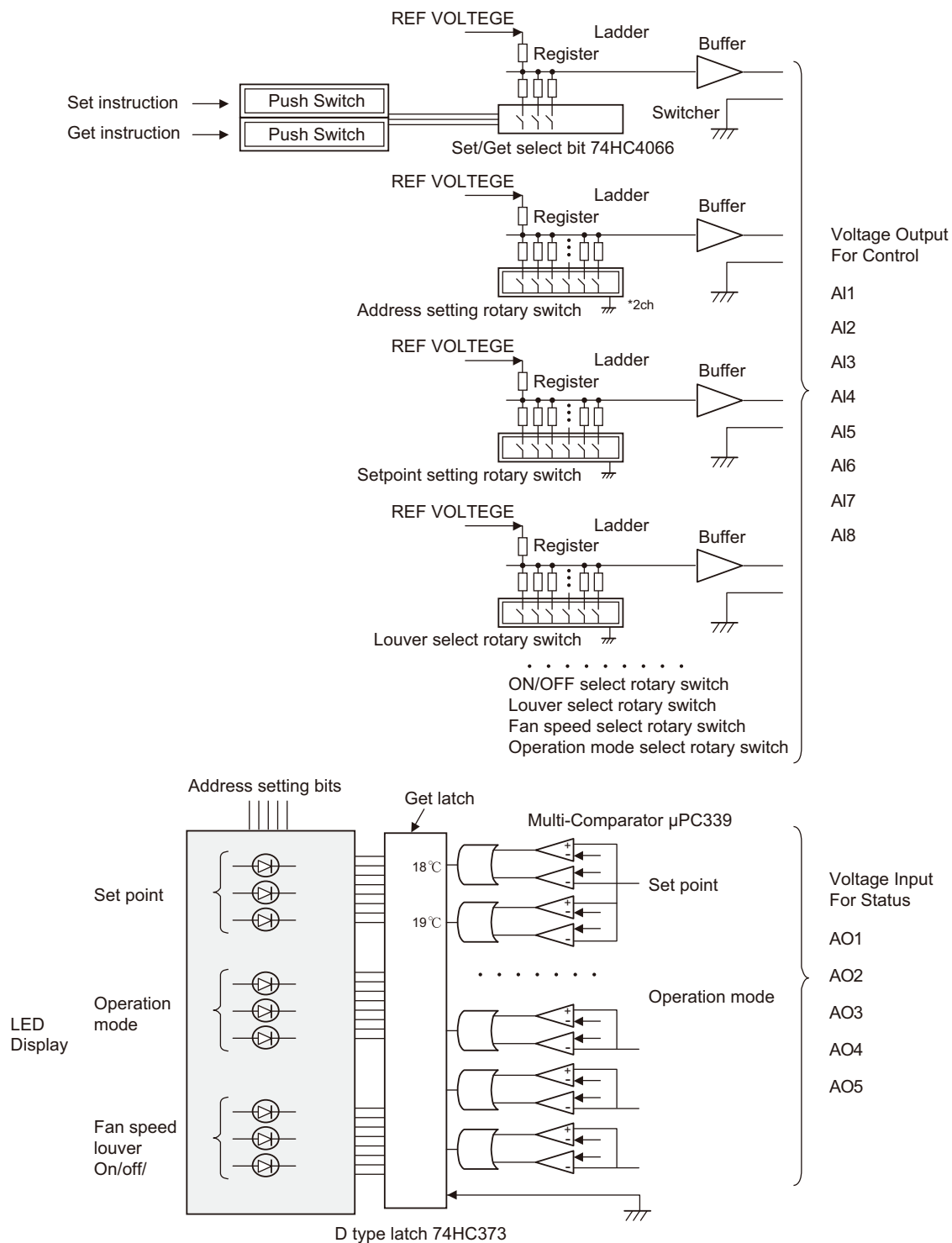
This circuit can be realized by hardware.
Design this circuit to maintain the accuracy of voltage output and input detection.

Example of controller internal configuration 2

External Board

Windows/Linux PC BASED Controller/Display

- Set instruction
- Specify address
- Specify setpoint
- Specify ON/OFF
- Specify operation mode
- Specify fan speed
- Specify louver
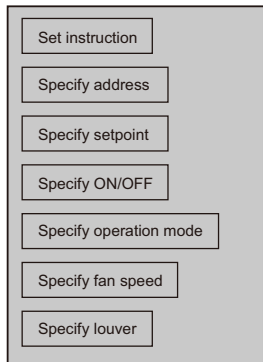
Get instruction: Auto-polling processing

This example of configuration requires I/O control programming. Design the external board so that the output voltage accuracy is maintained within the specified range including temperature change and secular change. Use a commercially available general digital I/O board that meets the specification for the number of I/O ports.

General DIGITAL I/O BOARD

PCI Bus etc.

Output Port 27p

Input Port 16p

Set/get S0
Address S1
Address S2

Set point Operation mode Fan speed louver on/off

REF VOLTEGE
Register
Buffer
Decoder 2 to 4 74HC139
Switch 74HC4066

REF VOLTEGE
Register
Buffer
Decoder 3 to 8 74HC138
Switch 74HC4051

REF VOLTEGE
Register
Buffer
Decoder 3 to 8 74HC138
Switch 74HC4051

REF VOLTEGE
Register
Buffer
Switch 74HC4066
Decoder 74HC138
Decoder 74HC138
Decoder 74HC138
Decoder 74HC138
Switch 74HC4051
Decoder 74HC138

Decoder 2 to 4 74HC139

For General Purpose I/F

Operation mode Fan speed louver

Multi-Comparator μPC339
Encoder 8 to 3 74HC148
Switch 74HC4066

Set point
Multi-Comparator μPC339
Encoder 74HC148

Multi-Comparator μPC339
Encoder 74HC148

on/off/error
Multi-Comparator μPC339
Encoder 74HC148

For General Purpose I/F

Voltage Output
AI1
AI2
AI3
AI4
AI5
AI6
AI7
AI8

Voltage Input For Status
AO1
AO2
AO3
AO4
AO5

4-8-2 TCB-IFMB640TLE Installation Manual

Introduction

■ Applications/Functions/Specifications

Applications
• TCB-IFMB640TLE controls Toshiba air conditioners and TCB-IFCG1TLE.

Functions
• The TCB-IFMB640TLE performs the signal conversion between TCC-LINK and Modbus* Master.

Specifications

Power supply	220 - 240 VAC, 50/60 Hz
Current	18 mA
Power consumption	2.4 W
Operating temperature/humidity	0 to 40 °C, 10 to 90% RH (no condensation)
Storage temperature	-20 to +60 °C
Chassis material	Galvanized sheet metal 0.8t (no coating)
Dimensions	66 (H) x 170 (W) x 200 (D) mm
Mass	1 kg

* Note) "Modbus" is a registered trade mark of Schneider Electric SA.

■ External View
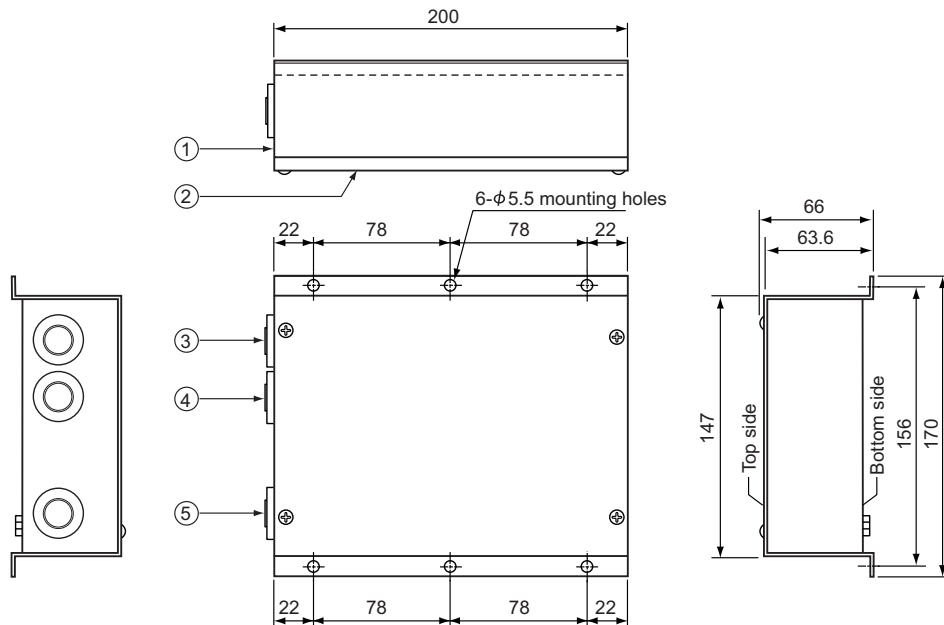
	Parts name	Specifications
1	Case	Galvanized sheet metal
2	Case lid	Galvanized sheet metal
3	Grommet	C30-SG20A
4	Grommet	C30-SG20A
5	Grommet for power supply	C30-SG20A

Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	TCB-IFMB640TLE	1	
2	Installation Manual	1	
3	Modbus Implementation Specification Manual	1	
4	Screw	4	M4 x 12mm tapping screws

Use the following wiring materials to connect the signal lines and power lines. (Procured on site)

No.	Line	Description	
1	For TCC-LINK	Type	2-core shield wires
		Wire size	1.25 mm^2, 1000m max.
		Length	2.00 mm^2, 2000m max. (total length including air conditioner area)
2	For RS-485	Type	2-core shield wires
		Wire size	1.25 mm^2, 500m max.
		Length	(total length)
3	For power	Type	H07 RN-F or 245IEC66
		Wire size	0.75mm^2, 50 m max.

Installation

■ TCB-IFMB640TLE Installation Method and Orientation

There are five installation methods for this TCB-IFMB640TLE as shown below: surface mount and wall mounts. Use the attached screws.

No good

REQUIREMENT

Do not install the unit in any of the following places.
• Humid or wet place
• Dusty place
• Place exposed to direct sunlight
• Place where there is a TV set or radio within one meter
• Place exposed to rain (outdoors, under eaves, etc.)

■ Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100 mm

100 mm

Connection of Power cables/Earth wires/Signal wires

⚠ CAUTION

- The RS-485 signal lines have polarity. Connect A to A, and B to B. If connected with incorrect polarity, the unit will not work.
- The TCC-LINK signal lines have no polarity.

■ Power cables/Earth wires/Signal wires

Connect power cables, earth wires, and signal wires to the specified terminals on the terminal block.

Connect the shield wire of the TCC-LINK communication wire to the earth on the air conditioner side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Connect the shield wire of the RS-485 communication wire to the earth on the host system side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Secure each cable with a cable clamp.

Air conditioner

Modbus Master

Connect the earth wire to the earth terminal on the chassis.

Power supply 220 - 240 VAC, 50/60 Hz

FG
U1 U2 TCC-LINK
A B RS-485
L N
SW6
SW5
LED5 LED4 LED3 LED2 LED1
SW4 SW3 SW2 SW1 SW7

Length of stripped power cable

35 10
L
N
55 10

Length of stripped RS-485 communication wire

35 10

■ Wiring Connection

The following describes a connection example when using two or more TCB-IFMB640TLE units.

Terminator resistor setting (See "SETTING" for the setting method.)

- Set the RS-485 terminator resistor to "120 ohm" for No.1 (relay interface address SW1=1) TCB-IFMB640TLE unit, and set to "open" for other units.
- Set the TCC-LINK terminator resistor to "open" as it is set on the air conditioner side.

Shield earthing

- The shield of RS-485 signal wires should be connected at closed end, and the terminal end should be open and insulated. The shield earth of the RS-485 signal wires should be single-point earth at the Modbus master. The shield earth of the RS-485 signal wires should be single-point earth.
- The shield of TCC-LINK signal lines should be connected at the closed end, and the TCB-IFMB640TLE terminal end should be open and insulated. Earth is connected on the air conditioner side.
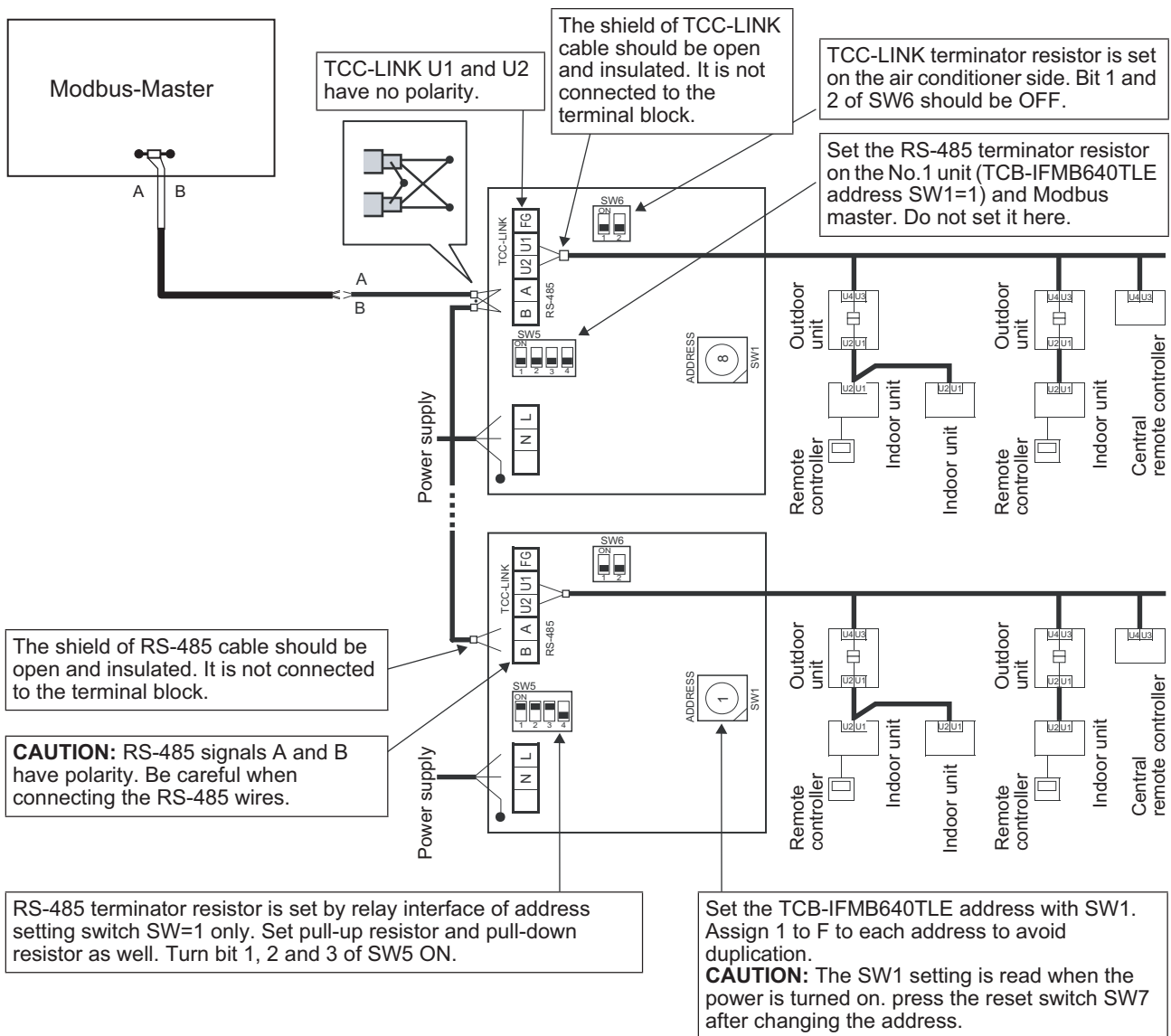
Setting

The following settings are necessary to use TCB-IFMB640TLE.

- SW1   TCB-IFMB640TLE address set switch
  When two or more TCB-IFMB640TLE are used, set a different address for SW1 to avoid address duplication.
  Assign addresses in an ascending order.

⚠ CAUTION

- **For the TCB-IFMB640TLE whose address SW1=1, perform terminator resistor setting.**
- **When the SW1 setting has been changed, press the reset switch SW7. The new address setting is read.**
- **To clear all accumulated operating values to 0, set SW2 to 3 and press the reset switch SW7, and then set SW2 to 0 and press the reset switch SW7 again.**
- **To set the delayed response mode, set SW2 to 4 and press the reset switch SW7. With this mode, a slave delays responding to the requests from the master for 250ms.**
  Leave SW2 set to 4 to keep the response mode set as delayed response mode.
- **When the setting of bit3 and bit4 of SW3 has been changed, press the reset switch SW7. The new set value is read.**

- SW2   Test switch, accumalated operating value setting, delayed response mode.
- SW3   Test switch, RS-485 baud rate setting (9600/19200/38400) bps.
- SW4   Test switch
  Not used during operation.
  Set these switches to zero (0) or "all OFF".
- SW5   RS-485 terminator resistor select switch
  Set "120 ohm" only when the relay interface address SW=1, and set "open" for TCB-IFMB640TLE.

- SW6   TCC-LINK terminator resistor select switch
  The TCC-LINK terminator resistor is set on the air conditioner side. Set SW6 to "open".
- SW7   Reset switch
  When performing an address setting with SW1, press this reset switch after the address setting to read the set value.

SW1	TCB-IFMB640TLE address set switch	
	1-F	TCB-IFMB640TLE address
	0	Not used
SW2	Test switch (0 usually), accumalated operating value setting, delayed response mode	
SW3	Test switch (1, 2 OFF usually) 3, 4 OFF 9600/ 3 ON, 4 OFF 19200/3 OFF, 4 ON 38400/3 ON, 4 ON 19200	
SW4	Test switch	
SW5	RS-485 terminator resistor select switch	
	Resistor Set | Open	Bit1: pull-up resistor select. Bit2: pull-down resistor select. Bit3: terminator resistor select. Bit4: terminator resistor select.
SW6	TCC-LINK terminator resistor select switch	
	100 ohm | Open	Note:Bit 1 is not used.
SW7	Reset switch	
LED1	Power indicator	
LED2	RS-485 communication status indicator	
LED3	TCC-LINK Communication status indicator	
LED4	TCC-LINK Communication error indicator	
LED5	Test indicator	

REQUIREMENT

- **RS-485 terminator resistor select switch SW5.**
  Set "120 ohm" (bit1,2,3 ON) only when the TCB-IFMB640TLE address SW=1, and set "open" for other TCB-IFMB640TLE.
- **The TCC-LINK terminator resistor is set on the air conditioner side. Set SW6 to "open".**

Trial Operation Check

■ Before starting trial operation

- Set the indoor unit central control address so that it does not match any other indoor unit addresses.
- Be sure to press the reset switch SW7 on the TCB-IFMB640TLE when the indoor unit central control address setting has been changed or added.

■ Trial operation

(1) Check the communication status between TCB-IFMB640TLE and indoor unit or TCB-IFCG1TLE with LED5. Check that the communication between TCB-IFMB640TLE and each indoor unit or TCB-IFCG1TLE connected is normally performed by selecting an indoor unit or TCB-IFCG1TLE using SW1 to SW3.

Confirming procedure:
- Set bit1 of SW3 to "ON" during normal operation.
- Set the central control address of the target indoor unit with SW1 and SW2. Set SW1 and SW2 according to the "Indoor unit central control address and SW1/SW2 setting" table below.
- Communication status is displayed by LED5.

Communication status with indoor unit	LED5	Remarks
Normal	Lighting	
Error	Blinking	Communication with the indoor unit was established previously, but is disabled currently.
Invalid indoor unit	Light off	Communication with the indoor unit has never been established.

(Example) Check the communication status of indoor unit with a central control address of 41.
Set bit1 of SW3 to "ON", SW2 to "2" and SW1 to "8".

Indoor unit or TCB-IFCG1TLE central control address and SW1/SW2 setting

Indoor unit central control address	SW2	SW1	Indoor unit central control address	SW2	SW1	Indoor unit central control address	SW2	SW1	Indoor unit central control address	SW2	SW1
1	0	0	17	1	0	33	2	0	49	3	0
2	0	1	18	1	1	34	2	1	50	3	1
3	0	2	19	1	2	35	2	2	51	3	2
4	0	3	20	1	3	36	2	3	52	3	3
5	0	4	21	1	4	37	2	4	53	3	4
6	0	5	22	1	5	38	2	5	54	3	5
7	0	6	23	1	6	39	2	6	55	3	6
8	0	7	24	1	7	40	2	7	56	3	7
9	0	8	25	1	8	41	2	8	57	3	8
10	0	9	26	1	9	42	2	9	58	3	9
11	0	A	27	1	A	43	2	A	59	3	A
12	0	B	28	1	B	44	2	B	60	3	B
13	0	C	29	1	C	45	2	C	61	3	C
14	0	D	30	1	D	46	2	D	62	3	D
15	0	E	31	1	E	47	2	E	63	3	E
16	0	F	32	1	F	48	2	F	64	3	F

(2) Perform the communication status checking between TCB-IFMB640TLE and Modbus Master.

Check that the communication with Modbus Master is normally performed.

When bit2 of SW3 is set to "ON", the communication status with the Modbus Master is displayed by LED5.

Communication status with Modbus Master	LED5	Remarks
Normal reception	Lighting	Lights for one second
Error	Light off	A communication error occurred or no data has been received.

When both bit1 and bit2 of SW3 are set to "ON", the communication status display of the indoor unit corresponding to bit1 takes precedence.

After the communication status check is completed, set bit1 and bit2 of SW3 to "OFF" again.

■ LED indication during normal operation

LED		Description
LED1	Power indicator	Lights while the power is on.
LED2	RS-485 communication status indicator	Blinks during RS-485 communication.
LED3	TCC-LINK communication status indicator	Blinks during TCC-LINK communication.
LED4	TCC-LINK communication error indicator	Lights temporarily when TCC-LINK is busy.
LED5	TEST indicator	Used in the test mode.

4-8-3 TCB-IFLN642TLE Installation Manual

Introduction

Applicable air conditioners

TCC-LINK compatible air conditioners

Applications/Functions/Features

• **Applications**
The LN interface is connected to the LONWORKS network, and is used to control TCC-LINK compatible Toshiba air conditioners by the building control system using LON (Local Operating Network).

• **Functions**
The LN interface converts signals between TCC-LINK signals for air conditioners and LONWORKS signals.

• **Features**
The LN interface enables various settings such as air conditioner operation stop, temperature, operation mode switching by the building control system, as well as monitoring of operating status, room temperature, various settings, etc.
One LN interface has a capacity to control indoor units of up to 64 units. (*1)
A free topology FT-X1 transceiver is used as the LONWORKS transceiver (also communicatable with FTT-10A).

Specifications

Name	LN interface
Model	TCB-IFLN642TLE
Power supply	220 - 240 VAC, 50/60 Hz
Power consumption	3 W
Number of connectable indoor units	64 units (*1)
Operating temperature/humidity	0 to 40 °C, 20 to 90% RH
Storage temperature	-20 to +60 °C (no condensation)
Dimensions	66 (H)×246 (W)×193 (D) mm
Mass	1.2 kg

(*1) 64 indoor groups are available in case of single split system like Digital Inverter or Super Digital Inverter.

External View
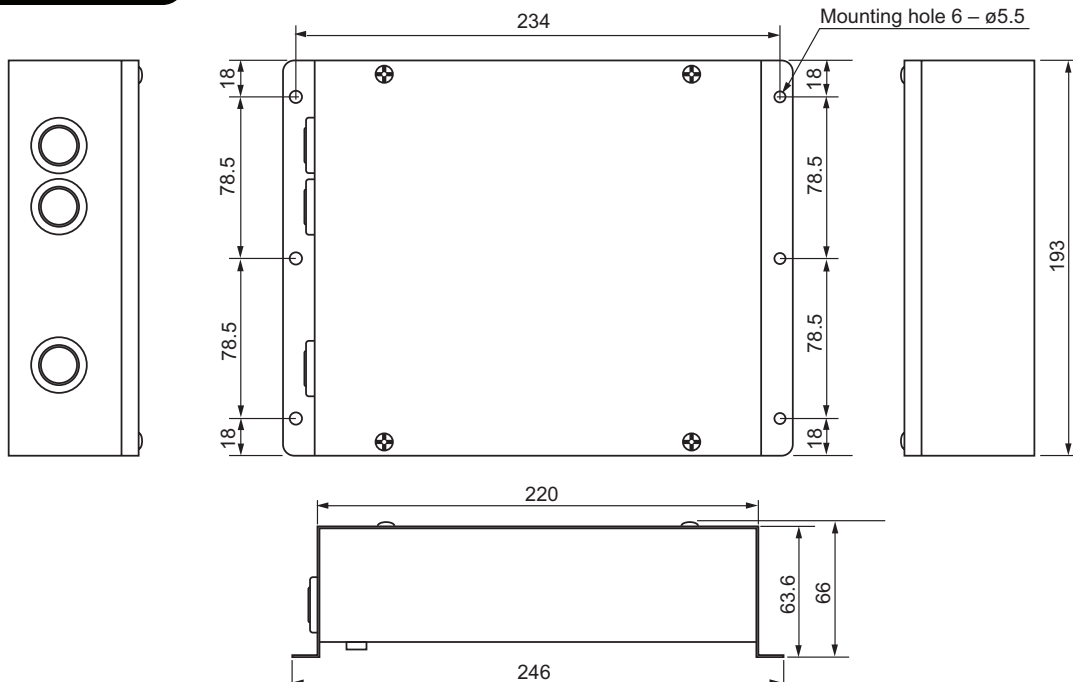
Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	LN interface	1	
2	Installation Manual	1	
3	Screw	4	M4 × 12 mm tapping screws

Use the following wiring materials to connect signal lines and power lines. (Procured on site)

No.	Line	Descrption	
1	For TCC-LINK	Type	2-core shield wire
		Wire size	1.25 mm², 1000 m max. (total length including
		Length	2.00 mm², 2000 m max. air conditioner area)
2	For LONWORKS	Type	Twisted pair shield cable (dedicated cable or equivalent)
		Wire size	0.65 mm × 1P
		Length	Free topology : 500 m max. (total length) Bus topology : 1000 m max.
3	For power	Type	H07 RN-F or 245IEC66
		Wire size	0.75 mm², 50 m max.

Installation

Installation Method and Orientation

There are five installation methods as shown in the figure: surface mount and wall mount.
Do not install the unit in any other orientation.
Use the attached screws.
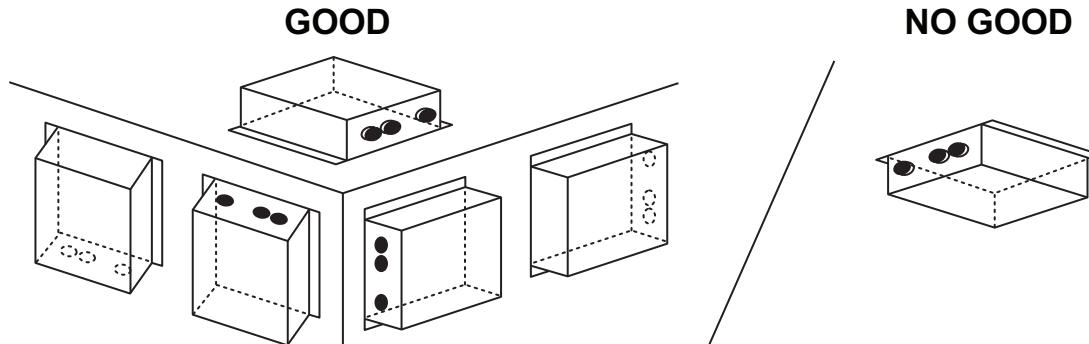
GOOD   **NO GOOD**

REQUIREMENT

Do not install the unit in any of the following places.

• Humid or wet place
• Dusty place
• Place exposed to direct sunlight or at a high temperature
• Place within one meter from a TV set or radio
• Place exposed to rain (outdoors, under eaves, etc)

Installation Space and Maintenance Space

A side space for connection through cable inlets and an upper space
for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100mm

100mm

Connection of Power Cables/Signal Wires/Earth Wires

Connect power cables, signal wires, and earth wires to the specified terminals on the terminal block.

Clamp each cable firmly with a cable clamp.

Connect the shield wire of the TCC-LINK communication cable to the earth on the air conditioner side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Air conditioner

LONWORKS system

Connect the shield wire of the LONWORKS communication cable to the earth on the upper LONWORKS system side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Connect the earth wire to the earth terminal of the chassis.

Power supply 220 - 240 VAC

U1
U2
TCC-LINK
LON
FG
L
N

LED6 LED5 LED4 LED3 LED2 LED1
LED7
SW1
SW7
ON 1 2 3 4
ON 1 2
SW5
SW2
SW4
ON 1 2 3 4
SW3
SW6
LED8
SW8

Length of stripped power cable

35 10
55 10

Length of stripped signal wire

35 10
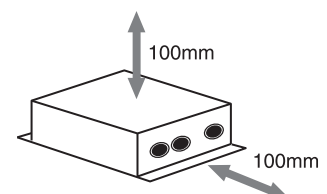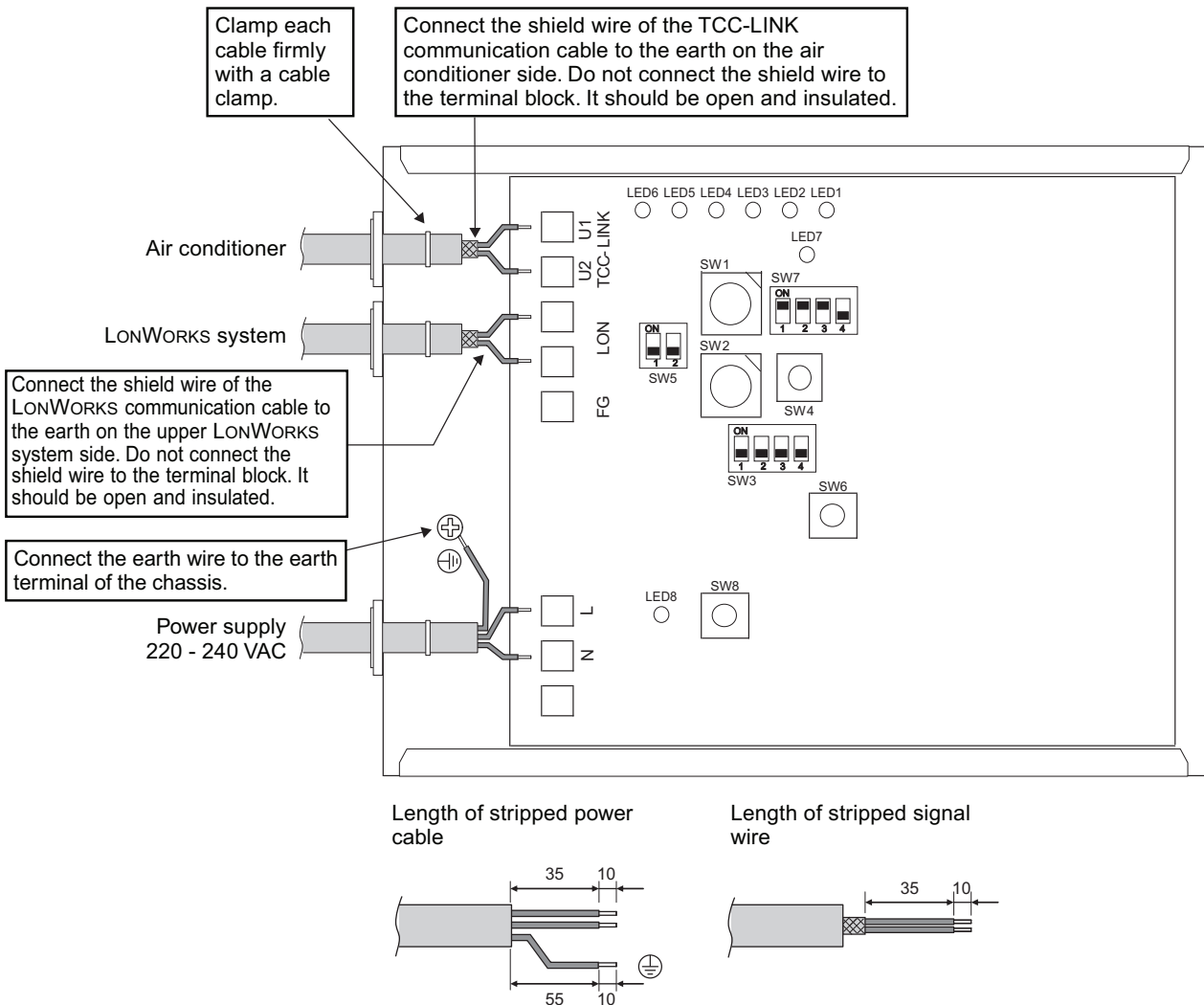
REQUIREMENT

- **Disconnect the appliance from the main power supply.**
  This appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3mm.
- The TCC-LINK communication cable and the LONWORKS communication cable have no polarity.

The following describes a connection example on the system.

Terminator resistor setting

• TCC-LINK terminator resistor
The TCC-LINK terminator resistor is set on the air conditioner side.
(See "Setting" for setting.)

• LON terminator resistor
The LON terminator resistor is set on the upper LONWORKS system side.

Shield grounding of communication cables

• TCC-LINK communication cable
The shield earth of the TCC-LINK communication cable should be single-point earth on the air conditioner side. The shield wire should be open and insulated.

• LONWORKS communication cable
The shield earth of the LONWORKS communication cable should be single-point earth on the upper LONWORKS system side. The shield wire should be open and insulated.
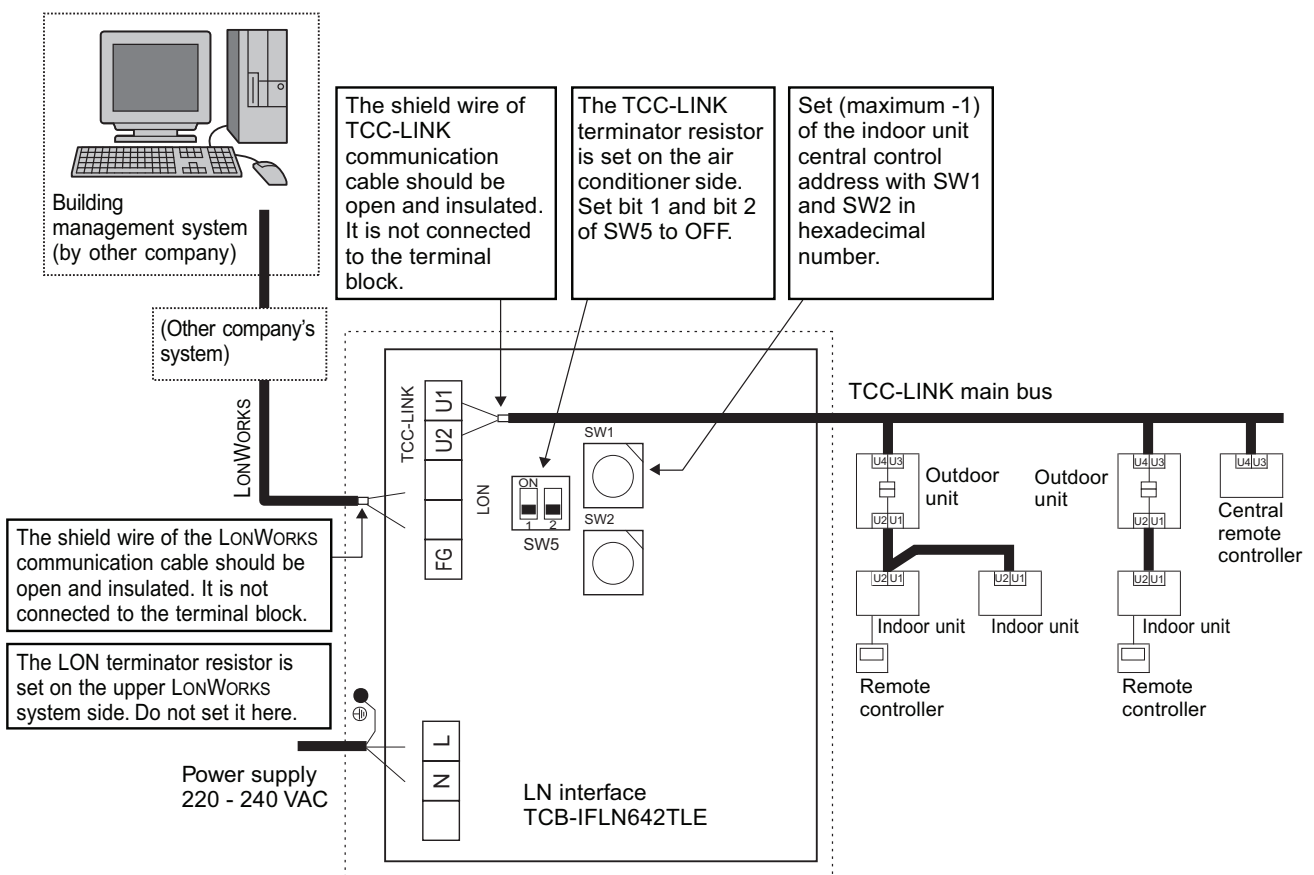
The following settings are necessary to use the LN interface.

TCC-LINK

- SW1/SW2 Set the number of indoor units to be connected.
  The number is sent to the LN interface.
  Set the maximum of the indoor unit central control address according to the table below.
  The factory setting is "3F" (64 units connected).

> **REQUIREMENT**
>
> The set data is read only when the power is turned on.
> When changing the SW1/SW2 setting, push the reset switch SW6 after setting.

(*) Set the indoor unit central control address from 1 to 64 consecutively.
This means that the maximum of the central control address equals the number of connected indoor units.
However, if an address is omitted, the maximum of the central control address differs from the number of connected indoor units. In this case, set the maximum of the central control address according to the table below.

Note: The system works normally when the set value is larger than the maximum.
However, it will result in communication loss.

Indoor unit central control address and SW1/SW2 setting

Indoor unit central control address	SW1	SW2	Indoor unit central control address	SW1	SW2	Indoor unit central control address	SW1	SW2	Indoor unit central control address	SW1	SW2
1	0	0	17	1	0	33	2	0	49	3	0
2	0	1	18	1	1	34	2	1	50	3	1
3	0	2	19	1	2	35	2	2	51	3	2
4	0	3	20	1	3	36	2	3	52	3	3
5	0	4	21	1	4	37	2	4	53	3	4
6	0	5	22	1	5	38	2	5	54	3	5
7	0	6	23	1	6	39	2	6	55	3	6
8	0	7	24	1	7	40	2	7	56	3	7
9	0	8	25	1	8	41	2	8	57	3	8
10	0	9	26	1	9	42	2	9	58	3	9
11	0	A	27	1	A	43	2	A	59	3	A
12	0	B	28	1	B	44	2	B	60	3	B
13	0	C	29	1	C	45	2	C	61	3	C
14	0	D	30	1	D	46	2	D	62	3	D
15	0	E	31	1	E	47	2	E	63	3	E
16	0	F	32	1	F	48	2	F	64	3	F

- SW3 Test switch (not used for normal operation, all OFF)
- SW4 Test switch (not used for normal operation)
- SW5 Used to set TCC-LINK terminator resistor.
  The TCC-LINK terminator resistor is set on the air conditioner side, and is not set here. Set SW5 to "Open".

SW5 TCC-LINK terminator resistor select switch	
ON 1 2	ON 1 2
100 ohm	Open
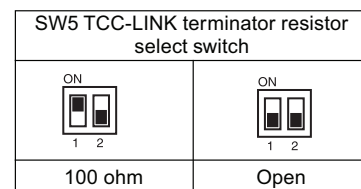
- SW6 Reset switch
  When changing the setting of the number of connected indoor units with SW1 and SW2, push this reset switch after setting to read the set value.
- SW7 Mode set switch
  Used to set MCU operation mode.
  Do not change the setting.

SW7 Mode set switch
ON 1 2 3 4
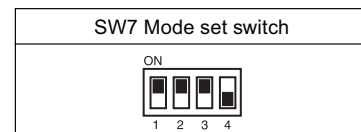
LONWORKS System

LONWORKS specific setting called "binding" is required.
A specific tool is used for the setting. Ask a professional engineer for this process.
- SW8 Service pin for LONWORKS system
  Used for binding with the upper LONWORKS system.

Trial Operation Check

> **REQUIREMENT**
> - Be sure to specify each unique central control address of the indoor unit.
> - Be sure to push the reset switch, SW6 on the LN interface before changing or adding the central control address of the indoor unit.

Check the communication status between LN interface and indoor units. It can be checked even when the LONWORKS system is not running.
By using SW1, SW2, and SW3, check the communication status of each connected indoor unit with LED4 and LED5.

Checking TCC-LINK communication status

Set bit 2 of SW3 to "ON" during normal operation.
Set the central control address of the target indoor unit with SW1 and SW2 according to the table above.

Example: When checking communication status of indoor unit of central control address 25:
        Set bit 2 of SW3 to "ON", SW1 to "1", and SW2 to "8".

Indication of TCC-LINK communication status

LED4 and LED 5 show communication status of the indoor unit selected by SW1 and SW2.

TCC-LINK communication status	LED5	LED4	Remarks
Normal	ON	OFF	
Error	ON	ON	Communication with the indoor unit was established previously, but is disabled currently.
No indoor unit	OFF	ON	Communication with the indoor unit has never been established.
Invalid indoor unit	OFF	OFF	More indoor units are connected than the LN interface can control.

End of TCC-LINK communication status check

Re-set SW1 and SW2 to the number of connected indoor units, and set bit2 of SW3 to "OFF".

> **REQUIREMENT**
> Be sure to re-set SW1 and SW2 correctly.
> Wrong setting may result in a malfunction when the unit is reset.

LED indication during normal operation

LED			Description
LED1	POWER	Power indicator	Lights while the power is on.
LED2	TCC-LINK	TCC-LINK communication status indicator	Blinks during TCC-LINK communication.
LED3	USB	–	Not used
LED4	BUSY	TCC-LINK busy indicator	Lights temporarily when TCC-LINK is busy (during auto address setting of an air conditioner, etc.). Communication restarts soon.
LED5	TEST	Test indicator	Used in the test mode.
LED6	UP-LINK	LONWORKS communication status indicator	Blinks during LONWORKS communication.
LED7	RESET	Reset indicator	Lights when reset operation is performed.
LED8	SERVICE	LONWORKS indicator	

(*) Ask the manufacturer of the upper system for trial operation check of the LONWORKS system.

4-8-4 BMS-LSV6E Installation Manual

Before Installation

> **NOTE**
>
> Prepare the following software (sold separately) before using the server.
>
> **Available software**
>
> Intelligent Server Software   BMS-STCC☐☐E (☐☐ is 06 or higher)
>
> BACnet Software   BMS-STBN☐☐E (☐☐ is 06 or higher)

Check the following package contents.

No.	Item	Quantity	Remarks
1	INTELLIGENT SERVER	1	
2	Installation Manual	1	
3	Cable	1	RS-485 cable for Intelligent Server
4	Closed end wire joint	2	

Use the following wiring materials to connect signal lines. (Procured on site)

No.	Signal line		Description
1	For RS-485	Type	2-core shield wire
		Wire size	1.25 mm^2, 500 m max. (total length)
		Length	
2	For ethernet	Type	LAN cable (higher than Category 5, UTP) The appropriate use of straight cable/cross cable should be done depending on your system used.)
		Length	100 m max

Intelligent Server Specifications

Names of each parts

- POWER switch
- L1 LED
- L2 LED
- S1 switch
- L3 LED
- RUN LED
- Shut down switch
- AC inlet (AC IN)
- Ethernet port2 (LAN2)
- Ethernet port1 (LAN1)
- CF CARD slot
- Serial port1 (COM1)

Specifications

Power Supply	220-240 VAC 50/60 Hz
Current	0.2 A
Operating temperature/humidity	0 to 40 °C, 10 to 90 %RH (no condensation)
Storage temperature	-20 to 60 °C
Dimension	250 (W) × 70 (H) × 145 (D) mm (292 (W) including the fixing metal plate)
Mass	1.5 kg
COM port	RS-485 (9-pin, D-SUB)
LAN	10BASE-T/100BASE-TX

External view
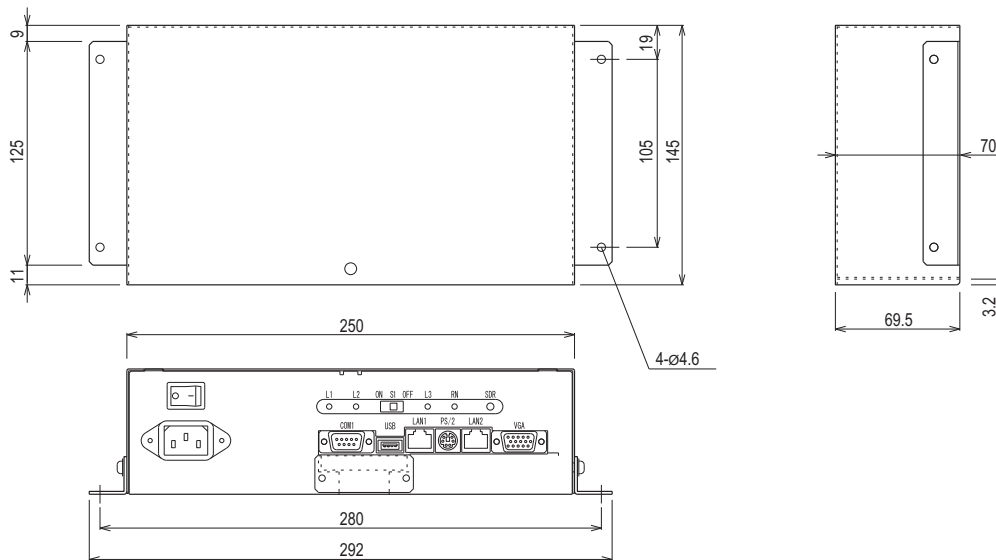
CF (Compact Flash) card Installation

> **REQUIREMENT**
> - Do not insert or remove the CF (Compact Flash) card during power on of the Intelligent Server.
>   Doing so may cause a failure.
> - If the CF (Compact Flash) card is not inserted properly, the Intelligent Server will not work.

Insert the CF card (with the software sold separately)
Push the CF card fully into the slot.

Rating label
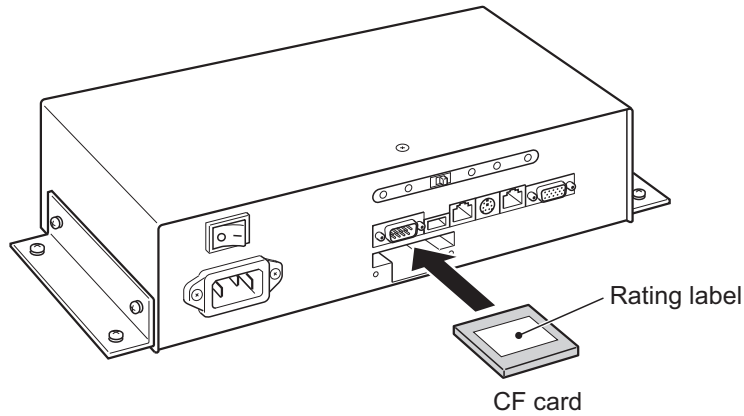
CF card

(1) Remove two screws and the cover plate and the CF card slot appears.
(2) Insert the CF card with its rating label attached surface upward.
    Confirm the CF card is surely pushed into the slot.

Setting

The setting is not required.
S1 is set to "OFF".

Intelligent Server Installation Method and Orientation

There are 2 types of setting methods and directions available for the server. Use the fixing metal plates attached when installing the server.

(1) Surface mount

(2) Wall mount
Mount the server with the front face upward.

Fixing screw hole positions

(Unit : mm)
6   280   6
19
105   145
21
AC inlet side   4 x ø4.6

REQUIREMENT

Do not install the unit in any of the following places.
• Humid or wet place
• Dusty place
• Place exposed to direct sunlight
• Place where there is a TV set or radio within one meter
• Place exposed to rain (outdoors, under eaves, etc.)

Installation Space and Maintenance Space

The installation space and the maintenance space must be determined before installation.
These spaces depend on installation method.

Installation Space

The values in the following table are required for installation space in each direction. Select an installation place that allows good air ventilation.

(unit: mm)

Item	Direction	Surface mount	Wall mount – type A	Wall mount – type B
Installation space	Top	100	50	100
	Bottom	0	0	0
	Front	100	100	100
	Rear	Location adjacent to wall permitted (*1)		
	Right side	50	100	100
	Left side	50	100	100

(*1) "Location adjacent to wall permitted" means that the unit can be installed close to the wall on that side.

Maintenance Space

Maintenance space is required for installation and maintenance of the unit.
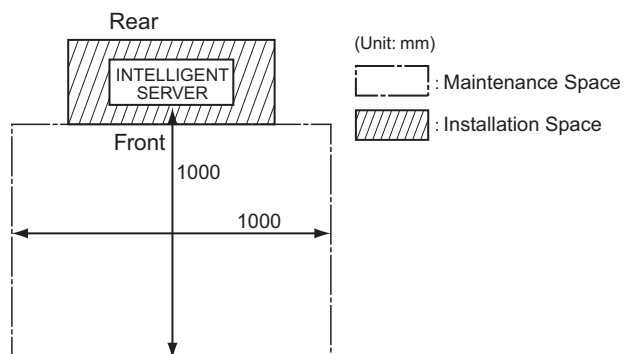
AC Power Cable Connection

REQUIREMENT

Power cable is not supplied for the Intelligent Server. Insert a three core power cord applicable to the standard of the country you use. Be sure to connect the earth line of the power cable securely.

• Insert an AC power cable into the AC inlet of the unit.
• Connect the power cord plug to an outlet (220 V - 240 V, AC).

REQUIREMENT

• Disconnect the appliance from the main power supply. Connect this appliance to the main power supply by a circuit breaker or a switch with a contact separation of at least 3mm.
• Make sure that the outlet is earthed.

Ethernet wire Connection

• Insert the Ethernet wire into the Ethernet port1 (LAN1).

Serial Port (RS-485) Connection

• Confirm that the power supply for the intelligent server is shut off.
• Connect RS-485 cable (packaged with the intelligent server) to Serial port 1 (COM1).
  Fix the cable to the Intelligent Server by the fixing screws (two locations on both sides) attached to the connector on RS-485 cable.

Connection to the TCS-NET Relay Interface

• TxRx(+) Connection
  Connect three of the four wires of RS-485 wire (red wire/orange wire/wire from the terminal board RS-485 A of the TCS-NET Relay Interface) together with the closed end wire joint. The red and orange wires can be connected directly to the terminal board RS-485 A of the Relay Interface.
• TxRx(-) Connection
  Connect three of the four wires of RS-485 wire (brown wire/yellow wire/wire from the terminal board RS-485 B of the TCS-NET Relay Interface) together with the closed end wire joint. The brown and yellow wires can be connected directly to the terminal board RS-485 B of the Relay Interface.
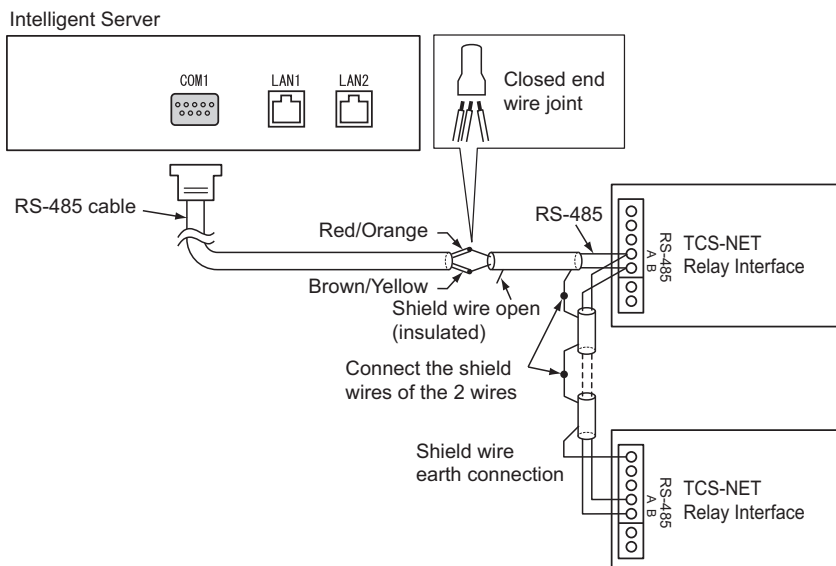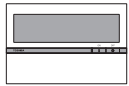
Intelligent Server

COM1   LAN1   LAN2   Closed end wire joint

RS-485 cable

Red/Orange
Brown/Yellow
Shield wire open (insulated)
Connect the shield wires of the 2 wires
Shield wire earth connection

RS-485   RS-485 A B   TCS-NET Relay Interface

RS-485 A B   TCS-NET Relay Interface

NOTE

The RS-485 signal wire has polarity. If connected with incorrect polarity, the unit will not work.

Do not connect or disconnect the wire during control operation. Doing so may cause a malfunction.

4-8-5 BMS-CM1280TLE/BMS-CM1280FTLE Installation Manual

PACKAGED ITEMS OF COMPLIANT MANAGER

Part name	Image	Quantity	Remarks
Compliant Manager		1	
Manual		1	Owner's Manual
		1	Installation Manual
		1	Network Setting Manual * Packaged for BMS-CM1280FTLE only
CD-R		1	* Packaged for BMS-CM1280FTLE only
Clamp filter		2	BMS-CM1280TLE
		4	BMS-CM1280FTLE
Tie-wraps		2	BMS-CM1280TLE
		4	BMS-CM1280FTLE

■ External Dimensions
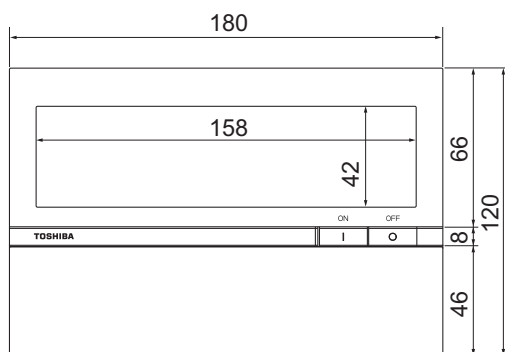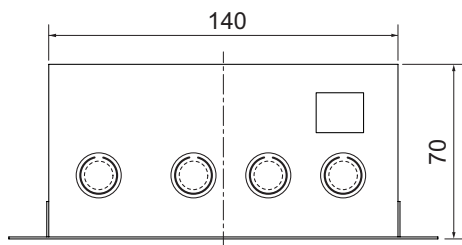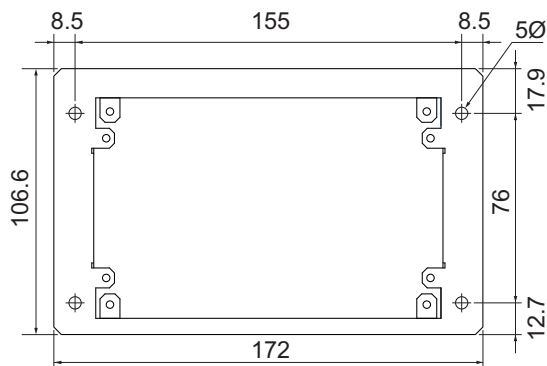
Dimensions of unit fixing holes in the wall, etc.
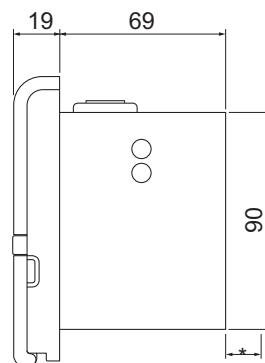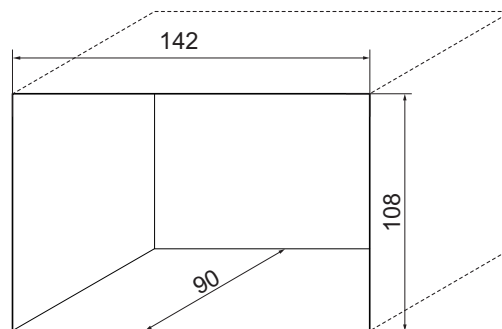
* Reserve space of 10mm or more when installing the unit.

INSTALLATION OF THE COMPLIANT MANAGER

⚠ CAUTION

- Do not twist communication wires (used between indoor unit and outdoor unit and used for central control) and input/output wires with power wires or bundle them together with power wires in a metal tube. Doing so may cause malfunction.
- Install the Compliant Manager away from a noise source.
- When noise is induced into the power supply of the Compliant Manager, take proper measures such as attaching of a noise filter.
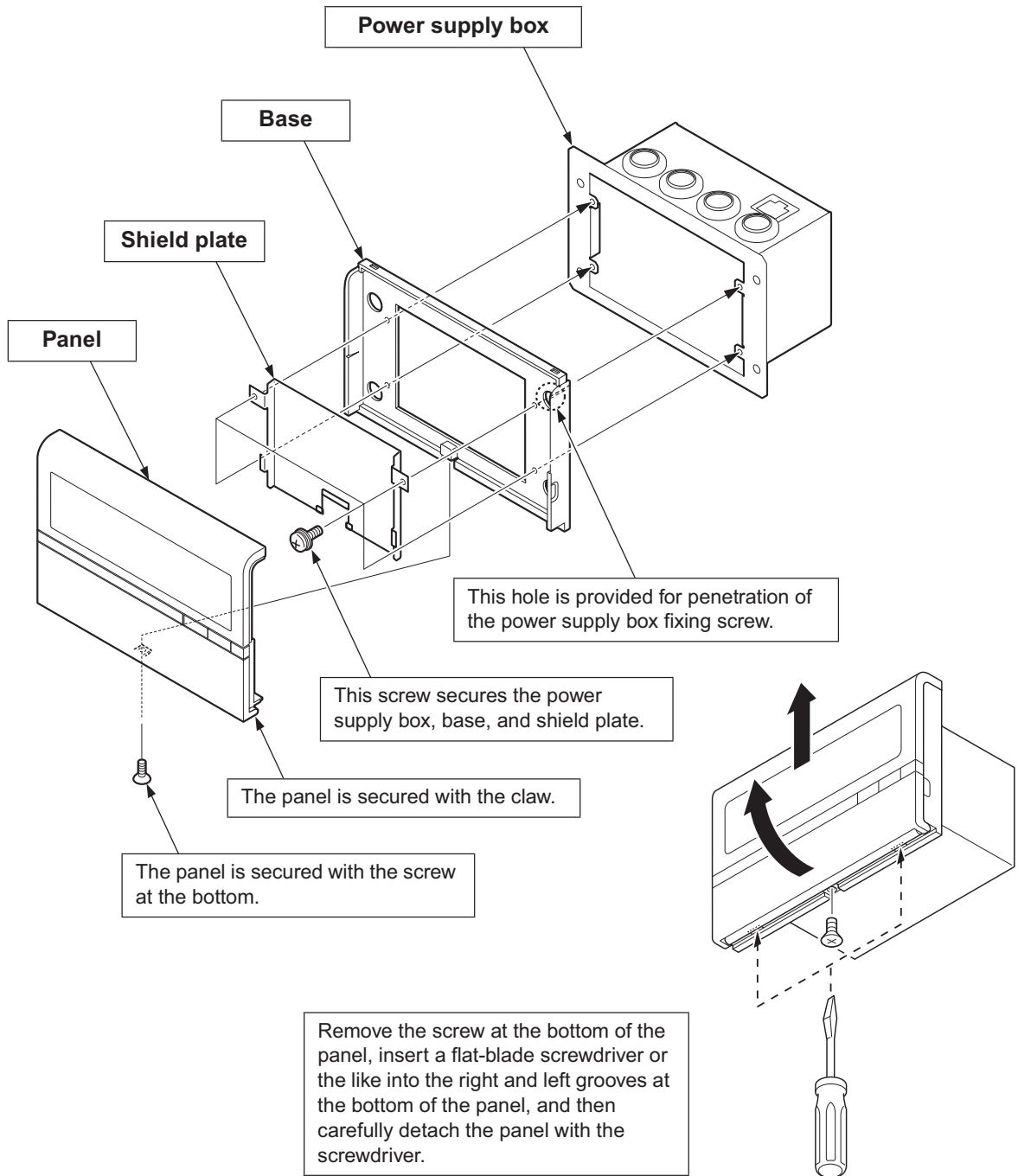
Power supply box

Base

Shield plate

Panel

This hole is provided for penetration of the power supply box fixing screw.

This screw secures the power supply box, base, and shield plate.

The panel is secured with the claw.

The panel is secured with the screw at the bottom.

Remove the screw at the bottom of the panel, insert a flat-blade screwdriver or the like into the right and left grooves at the bottom of the panel, and then carefully detach the panel with the screwdriver.

CONNECTION OF POWER CABLES/SIGNAL WIRES/EARTH WIRES

Connect power cables, signal wires, and earth wires to the specified terminals on the terminal block.

*1 Secure the power cable with the clamp in the case.
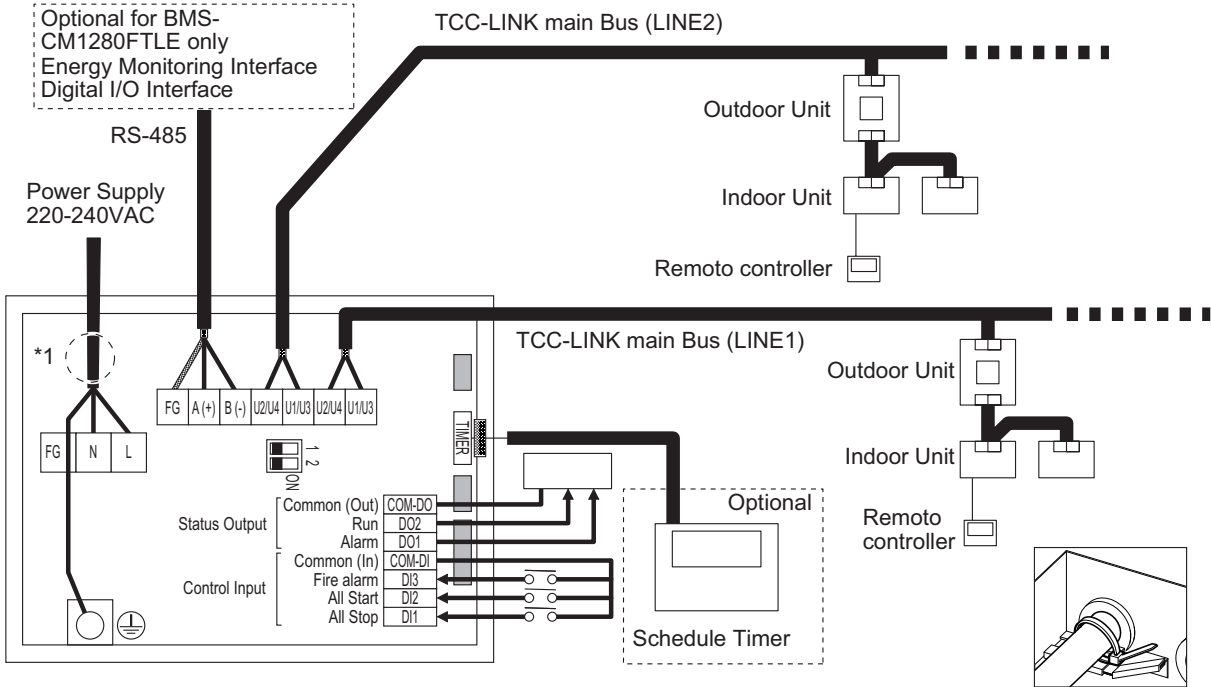
NOTE

- TCC-LINK does not have polarity.
- RS-485 has a polarity. Connect A(+) to A(+) and connect B(-) to B(-).
- For TCC-LINK, connect the shield wire to the ground on the air conditioner side (single-point grounding).
- For RS-485, connect the shield wire to the ground on the Compliant Manager side (single-point grounding).

Length of stripped power cable
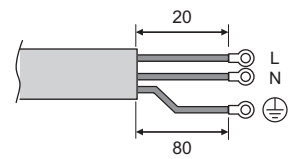
Attach a round pressure terminal to the end of each wire of the power cable.

Round pressure terminal

Power wire
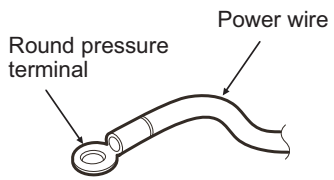
Length of stripped TCC-LINK and RS-485 communication wire
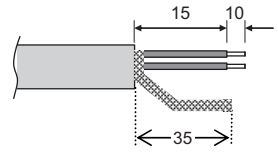
Be sure to attach the supplied clamp filter to the communication wire.
* When attaching the clamp filter, be sure to pass the communication wire twice through the clamp filter as shown below. Then fasten the communication wire with the supplied cable tie-wrap.

TCC-LINK wire RS-485 wire

LAN cable
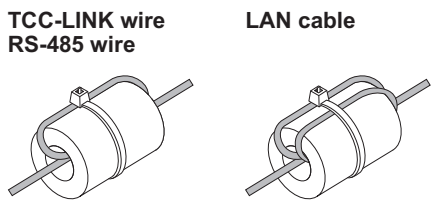
Length of stripped digital Input/Output communication wire
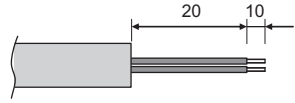
Remove and insert the wire while pressing the upper button with a screwdriver.

<Connections to External Equipment>
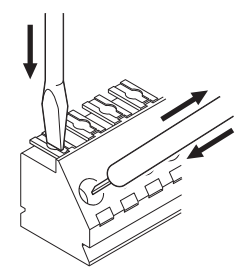
Designation	Input/Output item	Compliant Manager side		External equipment side		
		Input/output conditions	Terminal name	Demarcation terminal	Example of circuit	Input/output conditions
Digital input/output terminals	Status output	Alarm output Run output Non-voltage "A" contacts Static (Relay output) Allowable contact voltage/current 30 VDC, 0.3 A	0.4 to 1.2 Ø Alarm Run Output common		Digital input	Wiring length: 100 m or less
	Control input	All stop input All start input Fire alarm input Voltage-applied "A" contacts All stop: Pulse or static All start: Pulse or static Fire alarm: Static (Photocoupler input) * Select non-voltage contacts that allow minute current (12V, 1mA)	+12V 0.4 to 1.2 Ø All stop (+) All start (+) Fire alarm (+) Input common (−) COM		(Pulse or static) (Pulse or static) (Static)	Pulse width: 300 ms or more Wiring length: 100 m or less

*Wire the cable so that the user should not touch the electricity port directly.

<Specifications for Wiring>

Use the following materials to connect signal lines and power lines (procured on site)

No	Line		Description
1	For TCC-LINK	Type	2-core shield wire
		Wire size	1.25mm², 1000m max. (total length including
		Length	2.00mm², 2000m max. air conditioner area)
2	For RS-485	Type	2-core shield wire
		Wire size	1.25mm², 500m max. (total length)
		Length	
3	For Power	Type	H07 RN-F or 245IEC66
		Wire size	0.75mm², 50m max.
		Length	
4	For Digital Input/Output connection	Type	227IEC75 (2-wire)
		Wire size	0.5mm², 100m max.
		Length	

MODE SETTING FOR THE CONTROLLER

■ Operation mode

Use SW1-<6> for the operation mode setting.

OFF side: Central control mode
    This Compliant Manager is used as a central control unit.
    Settings with the remote controller are inhibited by the setting of the Compliant Manager.

ON side: Remote control mode
    This Compliant Manager is used as a remote controller.
    Settings with the Compliant Manager are inhibited by the setting of another central control unit.

■ Control group selection

Either simultaneous mode or an arbitrary range of a line and 16 groups (1 to 16, 17 to 32, 33 to 48, and 49 to 64) can be selectively set.

		DIP-SW1				DIP-SW2	
		<2>	<3>	<4>	<5>	<5>	<6>
All groups		OFF	OFF	OFF	OFF	OFF	OFF
LINE 1	Group 1 to 16	ON	OFF	OFF	OFF	OFF	ON
	Group 17 to 32	OFF	ON	OFF	OFF	OFF	ON
	Group 33 to 48	OFF	OFF	ON	OFF	OFF	ON
	Group 49 to 64	OFF	OFF	OFF	ON	OFF	ON
LINE 2	Group 1 to 16	ON	OFF	OFF	OFF	ON	ON
	Group 17 to 32	OFF	ON	OFF	OFF	ON	ON
	Group 33 to 48	OFF	OFF	ON	OFF	ON	ON
	Group 49 to 64	OFF	OFF	OFF	ON	ON	ON
Example: When setting LINE 1 (group 1 to 32) in the control group selection		ON	ON	OFF	OFF	OFF	ON

* When the control group selection is used, only the set group range is displayed.

* The control group selection is available only for one line.

- Each line consists of up to 64 zones and 64 groups (up to 128 zones and 128 groups in total).
- Each group number is a central control address. (Effective values 1 to 64 and 99 are unset values.)
- Default setting when shipped: One group is assigned to one zone (zone number = group number)
- Groups that can be registered in each zone must meet the following conditions.
1. Groups are connected to the same line.
2. Groups are in the same group number range when the control group selection is used.

Gr = Group

ALL: The Compliant Manger operates as follows in combination with LINE selection.
LINE 1 ALL (All groups on LINE 1 are selected.)
LINE 2 ALL (All groups on LINE 2 are selected.)
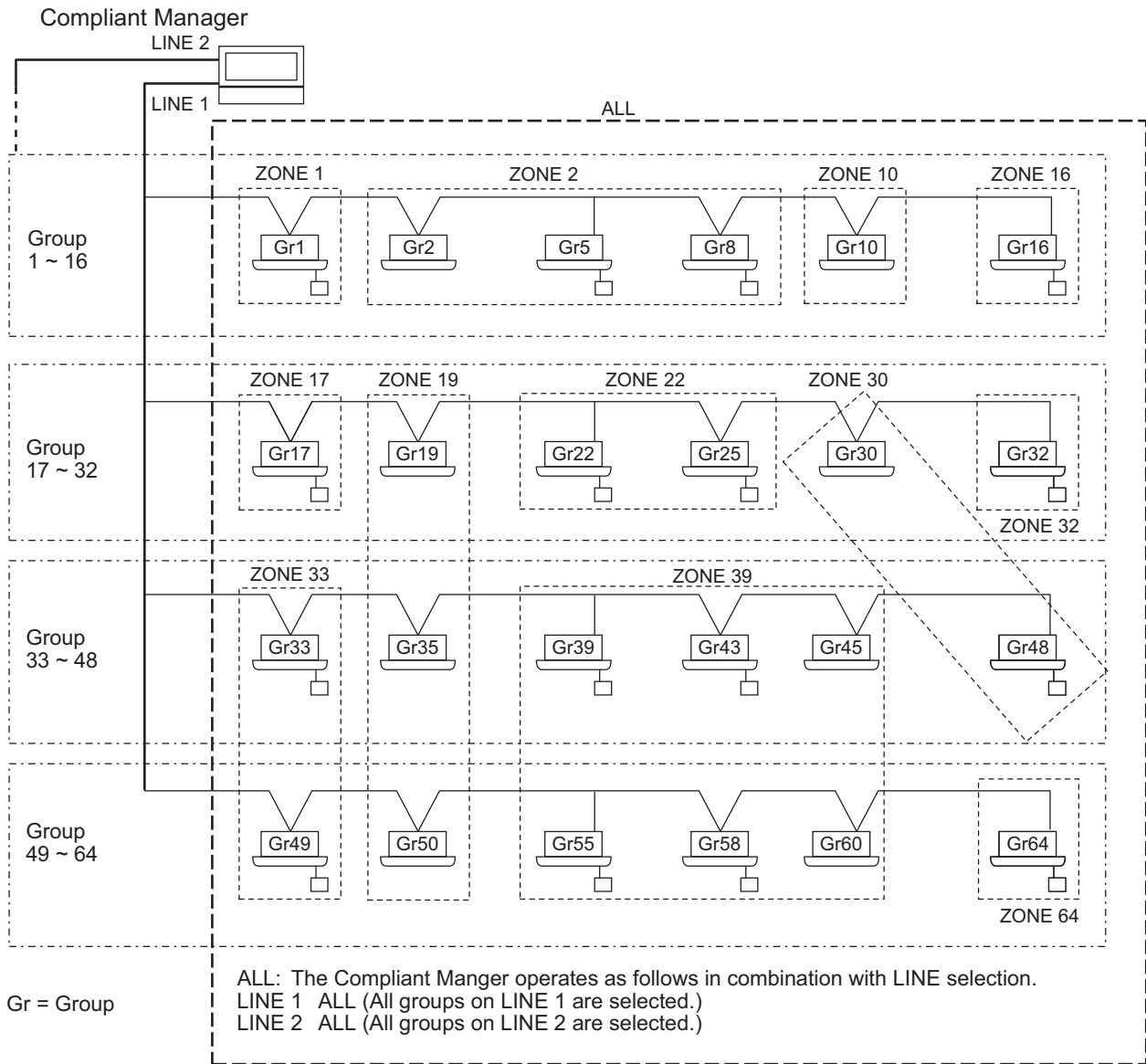
- * When the control group selection is not used ("ALL group"), all groups and zones on LINE 1 and LINE 2 can be controlled.
- * When the control group selection is used, only groups and zones in the set group range can be controlled.
  - When the control group selection is used, groups and zones outside this range are not displayed and cannot be operated.
  - **ALL** means the entire set group range.
  - Zones can be registered and operated only within the set group range. (No groups outside the range can be registered or operated.)
  - The group control mode is available only for one line.
- * Multiple group ranges can be specified by the control group setting.

(Example) When groups 33 to 48 and groups 49 to 64 are specified at the same time, a group range (groups 33 to 64) is set by the control group setting.

SWITCHES FOR SETTING

The settings switch is installed on the rear of the Compliant Manager.

<DIP-SW1>

DIP-SW1

ON
OFF
1 2 3 4 5 6 7 8
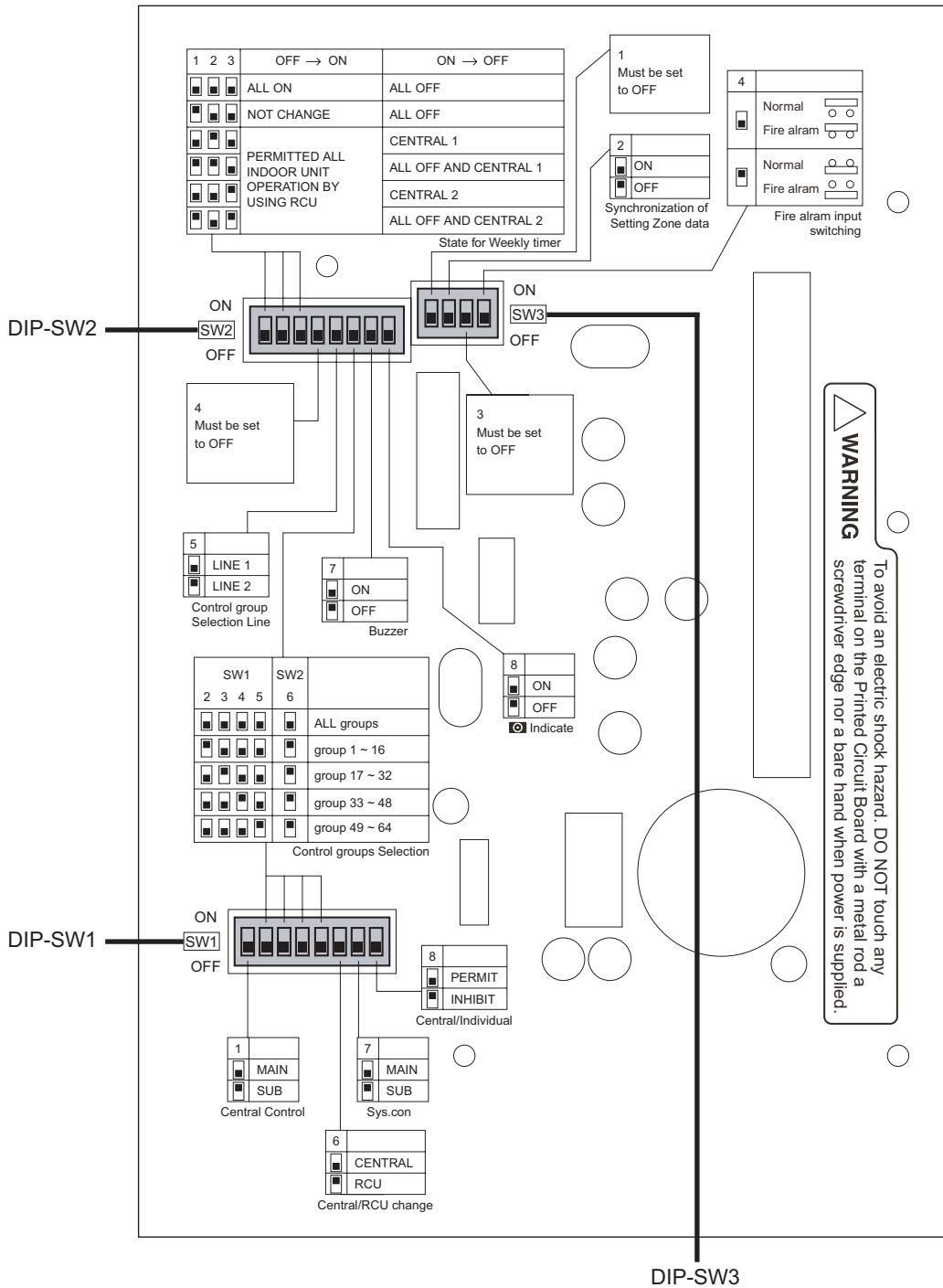
<1> Compliant Manager main/sub selection

OFF: Main
ON: Sub

Normally, this bit is set to OFF.

When two Compliant Manager units are used as a main unit and a sub unit with the same mode setting, set this bit to OFF (Main) for one unit and to ON (Sub) for the other unit.
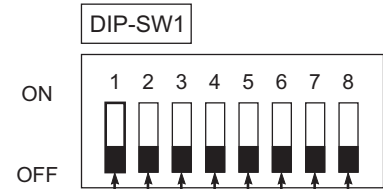
<2> to <5> Control group selection

Control group selection	SW2-<6>	SW1
All groups	OFF	-
Group 1 ~ 16	ON	<2> ON
Group 17 ~ 32	ON	<3> ON
Group 33 ~ 48	ON	<4> ON
Group 49 ~ 64	ON	<5> ON

These bits specify a group range used in the control group selection. The Compliant Manager for which control group selection is set controls only groups within the set group range.

* To use the control group selection, set SW1-<2> to <5> and SW2-<5> to <6>.

<6> Central control/remote controller mode selection

OFF: Central control mode
ON: Remote controller mode

Central control mode: Individual setting by remote controller can be inhibited by Compliant Manager.
Remote controller mode: Setting by Compliant Manager is inhibited by other centra control equipments.

<7> Central control Main/Sub selection

OFF: Main
ON: Sub

This setting is required when multiple Compliant Manager units are used or another central control unit is used.

(1) Set this bit to OFF when one Compliant Manager unit is used.
(2) When multiple central control units are used as a main unit and sub units, set to OFF (Main) for one unit and set to ON (Sub) for other units.
* It is recommended that the "All groups" (control group selection setting) be set for the central control main unit.

<8> Central button enable/ disable

OFF: $\overset{\text{CENTRAL}}{\bigcirc}$ button operation is permitted
ON: $\overset{\text{CENTRAL}}{\bigcirc}$ button operation is inhibited

* The $\overset{\text{CENTRAL}}{\bigcirc}$ button is disabled in the remote controller mode regardless of this setting.

\<DIP-SW2\>

DIP-SW2

ON 1 2 3 4 5 6 7 8
OFF

\<1\> to \<3\> Timer input switching

These bits switch operation when the schedule timer has changed.
- Use (1) and (2) only in the remote control mode.
- When the control group selection is used, "All ON," "All OFF" and "all indoor units" mean those within the set group range.

Central controller operation		Switch No. \<1\>	\<2\>	\<3\>
Timer OFF → ON	**Timer ON → OFF**			
(1) All ON	All OFF	**OFF**	**OFF**	**OFF**
(2) No change	All OFF	**ON**	**OFF**	**OFF**
(3) Individual control of all indoor units to be permitted	All indoor units CENTRAL 1	**OFF**	**ON**	**OFF**
(4) Ditto	All OFF and all indoor units to be CENTRAL 1	**ON**	**ON**	**OFF**
(5) Ditto	All indoor units CENTRAL 2	**OFF**	**OFF**	**ON**
(6) Ditto	All OFF and all indoor units to be CENTRAL 2	**ON**	**OFF**	**ON**

\<4\> **Always** OFF

Always set this bit to OFF.

\<5\> **Control group Selection line**

OFF: LINE 1
ON: LINE 2

* Set a line number for which the control group selection is used.

\<6\> **Control group selection enable**

OFF: Normal mode
ON: Control group selection

Set this bit to ON when the control group selection is used.
* To use the control group selection, set SW1-\<2\> to \<5\> and SW2-\<5\> to \<6\>. For details, see the table on the previous page.

\<7\> **Buzzer**

OFF: With buzzer sound
ON: Without buzzer sound

\<8\> ⊙ **indication**

OFF: Displayed
ON: Not displayed

498

<DIP-SW3>

Factory setting: All OFF

DIP-SW3

<1> Always OFF
• Always set this bit to OFF.
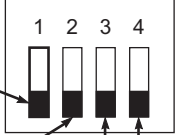
<2> Synchronization of Setting Zone data

OFF: With transfer
ON:　Without transfer
This bit specifies whether to perform synchronous communication of Setting Zone data between Compliant Managers.
* When this bit is set to ON (without transfer), synchronous communication is not performed, and when zone setting is made, the data is not reflected in other Compliant Managers.

<3> Always OFF
• Always set this bit to OFF.

<4> Fire alarm input switching
• OFF: CLOSE: Fire alarm (OPEN: Normal)

COM-DI
DI3
(Normal)

COM-DI
DI3
(Fire alarm)
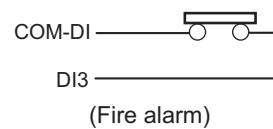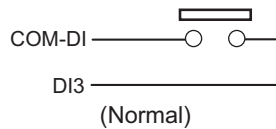
• ON: OPEN: Fire alarm (CLOSE: Normal)

COM-DI
DI3
(Normal)

COM-DI
DI3
(Fire alarm)
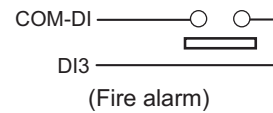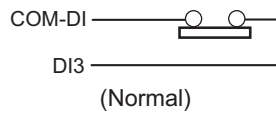
CENTRAL CONTROL ADDRESS (GROUP NUMBER) SETTING

- Central control addresses must be assigned to all air conditioners to be controlled.
- Under the control of the Compliant Manager, central control address equals group number.

> **For address setting when connecting a TCC-LINK adapter to the central control system, refer to this manual and the TCC-LINK adapter installation manual.**

<Preparations for central control address (group number) setting>

- Turn on the power of all air conditioners.
- This Compliant Manager or a standard wired remote controller is necessary for setting central control addresses.
- Terminate the operation of air conditioners, and then set central control addresses.
- * To set central control addresses with the Compliant Manager, initial communication with all connected indoor and outdoor units must have been completed. Therefore, wait at least 10 minutes after power-on, and then start central control address setting.

NOTE

If the address setting is made before the initial communication is completed, an address is not assigned to some units.
- Connect terminals U1 and U2 in the outdoor unit (Header unit) to the relay connector of terminals U3 and U4.
- Set SW30-2 on the interface P.C. board of the outdoor unit (Header unit) to ON only for one system, and to OFF for others.
- * The location of SW30 is shown in the wiring diagram supplied with the outdoor unit.

<Setting central control addresses (group numbers)>

Use "manual setting from wired remote controller," "manual setting," or "automatic setting" to set central control addresses.

A Manual setting from wired remote controller
Set central control addresses (group numbers) from a standard wired remote controller.
- * The following setting procedure is described based on button operations of the <u>wired remote controller RBC-AMT32E or RBC-AMT31E</u>.
- (1) Press the TEST button and VENT button simultaneously for at least 4 seconds.
  (Note: Do not press the UNIT LOUVER button during setting.)
- (2) Press the TEMP. button to change the CODE No. 03.
- (3) Set central control addresses (group numbers) with the TIME buttons.
  - Group numbers used for the Compliant Manager are central control addresses (DN item 03).
  - The effective address range is 1 to 64. However, there must be no duplicate address on the same line.
  - An address value of 99 is used as an unset address.
- (4) Press the SET button to fix the setting.
- (5) Press the TEST button to exit the address setting mode.
  - * This setting procedure may vary depending on the wired remote controller model.
  - * Perform these steps while air conditioners are not working.

B Manual setting

Set central control addresses (group numbers) manually from the Compliant Manager.

(1) Press the $\overset{\text{CHECK}}{\oslash}$ button and ZONE ▭▼ button simultaneously for at least 4 seconds.
    (CODE No. C1 flashes.)

(2) Check CODE No. C1, and then press the $\overset{\text{SET}}{\circ}$ button.

(3) Select the line on which the unit exists and the zone and group in which addresses are to be registered with the LINE button, ZONE ▭▲ and ▭▼ buttons, and GROUP ▭▲ and ▭▼ buttons.

   • When a zone is selected, group numbers registered in the zone are displayed.
   • Groups whose numbers are displayed are already registered.
   • Even when addresses have been registered, the registration can be cancelled with the $\overset{\text{CL}}{\circleddash}$ button.

(4) Select the unit to be registered in the group selected in step (3).

   • Switch refrigeration system No.1 to 31 with the $\overset{\text{CENTRAL}}{\circ}$ button, and then switch indoor unit No.1 to 64 with the $\overset{\text{SWING/FIX}}{\circledS}$ button.
   • When no system exists, indoor unit number is displayed as "- -".
   • System number 31 is for a local adapter and heat exchange ventilators. An indoor unit number is always displayed regardless of whether the unit exists or not.

(5) Press the $\overset{\text{SET}}{\circ}$ button to register the setting or press the $\overset{\text{CL}}{\circleddash}$ button to cancel the setting.

(6) To continue registration, repeat steps (3) to (5).

(7) Press the $\overset{\text{CHECK}}{\oslash}$ button to terminate the address setting.

C Automatic setting

Set central control addresses automatically from the Compliant Manager.
(Central control addresses are set automatically in ascending order of unit number.)

(1) Press the $\overset{\text{CHECK}}{\oslash}$ button and ZONE ▭▼ button simultaneously for at least 4 seconds.
    (CODE No. C1 flashes.)

(2) Press the SET TEMP. ▭▲ or ▭▼ button to change the CODE No. to C2.

(3) Press the $\overset{\text{SET}}{\circ}$ button. (Central control addresses are automatically registered. This registration requires several minutes. **SETTING** lights during this address setting.)

(4) **SETTING** goes out and the indication of C2 flashes, which shows completion of the automatic address registration.

(5) Press the $\overset{\text{CHECK}}{\oslash}$ button to exit the address setting mode.

<Checking duplicate central control address>

NOTE

This function is not available for light commarcial air conditioners.
For details, refer to the manual of the TCC-LINK adapter.

(1) Press the $\overset{\text{CHECK}}{\oslash}$ button and ZONE ▭▼ button simultaneously for at least 4 seconds.
    (CODE No. C1 flashes.)

(2) Press the SET TEMP. ▭▲ or ▭▼ button to change the CODE No. C3.

(3) Press the $\overset{\text{SET}}{\circ}$ button to start checking a duplicate central control address error. (**SETTING** lights during this check.)

(4) When **SETTING** goes out, the check has been completed.

   * When nothing appears in the group number display area at the end of checking, no duplicate address error has been detected.
   * When a group number in the group number display area flashes at the end of checking, a duplicate address error has been detected.
     (Correct the duplicate address.)

<Correcting duplicate address>

Correct the duplicate address detected through the check using the following procedure.

(1) When the duplicate address check has been completed, select CODE No. C1 with the SET TEMP. ▲ or ▼ button.

(2) Press the ○ (SET) button.

(3) The number of group in which the error has been detected flashes.
Select the flashing group number to be corrected with the GROUP ▲ or ▼ button.

(4) Press the (CL) button to clear the set incorrect central control address.
After that, set a correct central control address.

(5) Press the (CHECK) button to terminate the duplicate address correction.

ZONE SETTING

Register groups in a zone or cancel them.

(1) Change the mode to the zone setting mode.
- Press the $\overset{CHECK}{\oslash}$ button, $\overset{SET}{\bigcirc}$ button, and ZONE ⬛▲ button simultaneously for at least 4 seconds.
  (The displayed zone number flashes and the Compliant Manager enters the zone setting mode. Indicates CODE No. "E1".)

(2) Select the zone to be set.
- Select the zone number to be set with the ZONE ⬛▲ or ⬛▼ button, and then press the $\overset{SET}{\bigcirc}$ button to fix the selection.
  (When the selection has been fixed, the selected zone number flashes.)
- When selection of zone has been fixed, the 〔 〕 marks of the group numbers registered in the zone light up.

(3) Change registration of groups in a zone.
  Register groups in a zone.
  1. Select the group number to be set with the GROUP ⬛▲ or ⬛▼ button. Pressing the SET TEMP. ⬛▲ or ⬛▼ button skips the group number by +16 or by -16.
  2. Press the $\overset{SET}{\bigcirc}$ button.
     The 〔 〕 marks of the registered group numbers light up. (〔 〕 → 〔 ﹅ 〕)
  3. Pressing the $\overset{CL}{\boxplus}$ button restores the state before the $\overset{SET}{\bigcirc}$ button is pressed.
  4. To continue registration of groups, repeat this procedure from the beginning.

NOTE

No zone data has been stored at this time. If the ZONE ⬛▲ or ⬛▼ button is pressed before the registration change is fixed, the set content for registration change is discarded.

---

(4) Fix the registration change.
  Press the $\overset{CHECK}{\oslash}$ button. The set content for registration change is stored in the memory.
  * After the memory write operation has been completed, the Compliant Manager exits the zone setting mode.

CHANGING RETURN-BACK TIME/TEMPERATURE SETTINGS

Return-back time and return-back temperature (CODE No. settings) can be changed using the following procedure.

NOTE

Do not change the data of CODE No. 0A and the following item codes to prevent the remote controller from malfunctioning.

CODE No.	Item	Data	
		Factory setting	Setting range
01	Return-back Enable/Disable	001 (Enabled)	000 (Disabled), 001 (Enabled)
02	Return-back 1 Time, Heating	030 (30 minutes)	1 to 60 minutes (in units of 1 minute)
03	Return-back 1 Time, Cooling	030 (30 minutes)	1 to 60 minutes (in units of 1 minute)
04	Return-back 1 Temp., Heating	018 (18°C)	18 to 29°C (in units of 1°C)
05	Return-back 1 Temp., Cooling	028 (28°C)	18 to 29°C (in units of 1°C)
06	Return-back 2 Time, Heating	030 (30 minutes)	1 to 60 minutes (in units of 1 minute)
07	Return-back 2 Time, Cooling	030 (30 minutes)	1 to 60 minutes (in units of 1 minute)
08	Return-back 2 Temp., Heating	018 (18°C)	18 to 29°C (in units of 1°C)
09	Return-back 2 Temp., Cooling	028 (28°C)	18 to 29°C (in units of 1°C)

Changing settings

The following shows an example of changing the time (factory setting) in the case of return-back 1 heating from 30 minutes to 45 minutes.

(1) Change the mode to the CODE No. setting change mode.
Press the $\overset{CHECK}{\oslash}$, $\overset{CL}{\boxdot}$, and ZONE ▽ buttons simultaneously for at least 4 seconds.
(**SETTING** and CODE No. flash.)

(2) Set the data of the CODE No..
1. Change the CODE No. to "02" with the SET TEMP. △ or ▽ button.
2. Change the set data to "045" with the GROUP △ or ▽ button.
(**SETTING** and CODE No. are still flashing.)
3. Press the $\overset{SET}{\bigcirc}$ button to determine the data. **SETTING** and CODE No. change to lighting.
4. To continuously change other settings, repeat steps 1 to 3 above.

NOTE

At this time, the entered data of the selected CODE No. has not been saved yet.

(3) Determine the change.
Press the $\overset{CHECK}{\oslash}$ button to write the updated data in the memory of the remote controller.
* When the data has completely been written in the memory, the CODE No. setting change mode is exited.

LINE 1

ZONE	GROUP	Indoor unit No.	Installation place	ZONE	GROUP	Indoor unit No.	Installation place
	1				33		
	2				34		
	3				35		
	4				36		
	5				37		
	6				38		
	7				39		
	8				40		
	9				41		
	10				42		
	11				43		
	12				44		
	13				45		
	14				46		
	15				47		
	16				48		
	17				49		
	18				50		
	19				51		
	20				52		
	21				53		
	22				54		
	23				55		
	24				56		
	25				57		
	26				58		
	27				59		
	28				60		
	29				61		
	30				62		
	31				63		
	32				64		

LINE 2

ZONE	GROUP	Indoor unit No.	Installation place	ZONE	GROUP	Indoor unit No.	Installation place
	1				33		
	2				34		
	3				35		
	4				36		
	5				37		
	6				38		
	7				39		
	8				40		
	9				41		
	10				42		
	11				43		
	12				44		
	13				45		
	14				46		
	15				47		
	16				48		
	17				49		
	18				50		
	19				51		
	20				52		
	21				53		
	22				54		
	23				55		
	24				56		
	25				57		
	26				58		
	27				59		
	28				60		
	29				61		
	30				62		
	31				63		
	32				64		

TEST RUN

<Conducting a Test Run for the Compliant Manager>

• A test run is necessary to confirm that the Compliant Manager has recognized air conditioner units after the central control address setting.

(1) Turn on the power of all connected air conditioners.

(2) Turn on the power of the Compliant Manager.

(3) Make sure that the number of air conditioners connected to each line (only main units when group control is performed) equals the group number count displayed on the Compliant Manager.

(4) When these numbers are identical, there is no problem.
If they differ, set central control addresses again according to "Central Control Address (Group Number) Setting." Also make sure that there is no incorrect wiring.

<Conducting a Test Run for Air Conditioners>

(1) Press the $\overset{\text{CHECK}}{\oslash}$ button for at least 4 seconds. (The "TEST" indication lights in the test run mode.)

(2) Press the $\boxed{\overset{\text{ON}}{I}}$ button and $\boxed{\overset{\text{OFF}}{O}}$ button. (Temperature cannot be set during a test run.)

(3) When the test run is completed, press the $\overset{\text{CHECK}}{\oslash}$ button to exit the test run mode.

SPECIFICATIONS

Model	BMS-CM1280TLE	BMS-CM1280FTLE
Power supply	220-240 VAC 50/60Hz	
Power consumption	3W	5W
Number of connectable indoor units (TCC-LINK)	128 Units (LINE1 64 Units, LINE2 64 Units)	
Energy Monitoring Relay Interface (RS-485)	4 Units (max.)	
Digital Input/Output Relay Interface (RS-485)	4 Units (max.)	
Operating temperature	0 to 40°C to 90%RH	
Storage Temparature	-20 to +60°C (no condensation)	
Dimensions	120 (H) × 180 (W) × 88 (D)	
Weight	1.1Kg	1.2Kg

BMS-CM1280FTLE
Network Configuration Guide

🚫 Prohibited	**Never connect the Compliant Manager to the Internet.** We assume no responsibility for any problems resulting from connection to the Internet. Only local area connection is allowed for the Compliant Manager.

This guide describes the setting procedure for connecting the Compliant Manager to your personal computer (abbreviated to "PC" hereinafter) via the network.
PC operation to monitor and control air conditioners is detailed in the Owner's Manual (Web Version).

1. System Configuration of PC

The PC to be connected must meet the following system configuration conditions so that the Compliant Manager operates normally.

<Operating system>
- Microsoft Windows XP
- Microsoft Windows Vista

<Hardware>
- Screen resolution 1024 × 768 pixels or more

<Browser>
- Firefox 2.0
- Internet Explorer version 6.0 or version 7.0

2. Connecting LAN Cable

Connect the LAN cable to the connector on the top of the Compliant Manager.

3. Client PC Settings

3-1. Setting IP Address
<Windows XP>

1) Log on to the system with the PC administrator's account.
2) Click [Start] -> [Control Panel]. (Fig.1)
   Fig.1

3) Click [Network Connections]. (Fig.2)
   Fig.2

4) Right-click [Local Area Connection] and choose "Properties" from the contextual menu. (Fig.3)
   Fig.3

5) Select the "Internet Protocol (TCP/IP)" checkbox, and click [Properties]. (Fig.4)
   Fig.4

6) Select the "Use the following IP address:" radio button, and set as follows:
   IP address: 192.168.2.*** (***: Excluding 30)
   Subnet mask: 255.255.255.0
   Then click [OK]. (Fig.5)
   Fig.5

7) Close all the windows.

<Windows Vista>

1) Log on to the system with the PC administrator's account.

2) Click [Start] -> [Control Panel]. (Fig.1)

Fig.1

3) Click [Network and Sharing Center]. (Fig.2)

Fig.2

4) Click "View status" of Local Area Connection. (Fig.3)

Fig.3

5) Click [Properties] in the Local Area Connection Status window. (Fig.4)

Fig.4

6) Select the "Internet Protocol Version 4 (TCP/IPv4)" checkbox, and click [Properties]. (Fig.5)

Fig.5

7) Select the "Use the following IP address:" radio button, and set as follows:
IP address: 192.168.2.*** (***: Excluding 30)
Subnet mask: 255.255.255.0.
Then click [OK]. (Fig.6)

Fig.6

8) Close all the windows.

3-2. Setting Browser
<Internet Explorer>
1) Start Internet Explorer.
2) Click [Tools] on the toolbar. (Fig.1)
   Fig.1

3) Choose "Internet Options" from the pull-down menu. (Fig.2)
   Fig.2

4) Click the "Connections" tab. (Fig.3)
   Fig.3

5) Click [LAN settings]. (Fig.4)
   Fig.4

6) Clear the "Use a proxy server for your LAN" checkbox (Fig.5) or select the "Bypass proxy server for local addresses" checkbox (Fig.6), and then click [Advanced].
   Fig.5
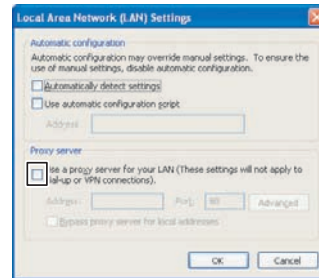
   Fig.6
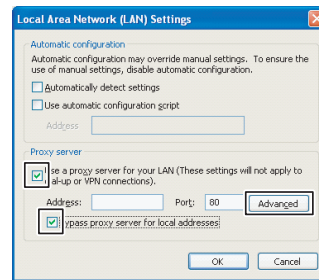
Add "192.168.2.30" to the "Do not use proxy server for addresses beginning with:" field. (Fig.7)
   Fig.7
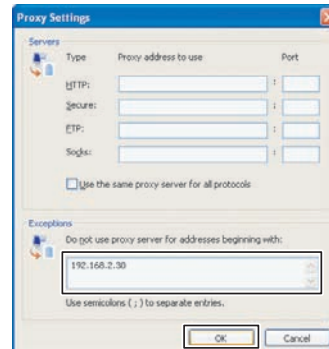
7) Type "http://192.168.2.30/index.html" in the address bar to connect the PC to the air conditioning control system for Compliant Manager.

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\<Firefox>

1) Start Firefox.
2) Click [Tools] and choose "Options" from the pull-down menu. (Fig.1)

   Fig.1
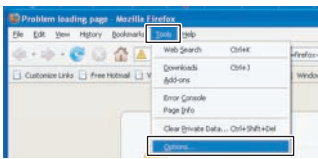
3) Click [Advanced]. (Fig.2)

   Fig.2
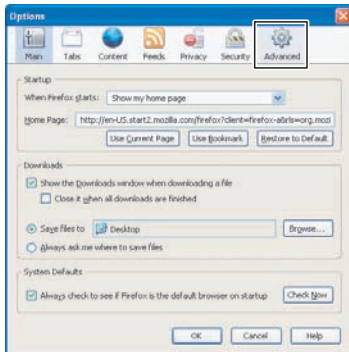
4) Click the "Network" tab. (Fig.3)

   Fig.3
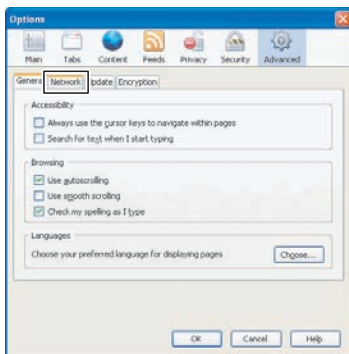
5) Click [Settings]. (Fig.4)

   Fig.4
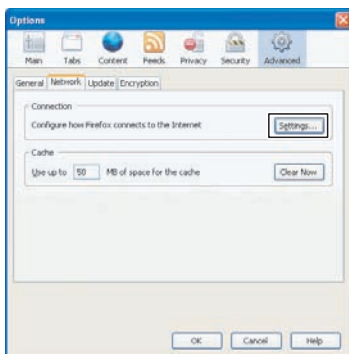
6) Select the "Direct connection to the Internet" checkbox (Fig.5) or the "Manual proxy configuration:" checkbox, and then add "192.168.2.30" to the "No Proxy for:" field in the Connection Settings window. (Fig.6)

   Fig.5
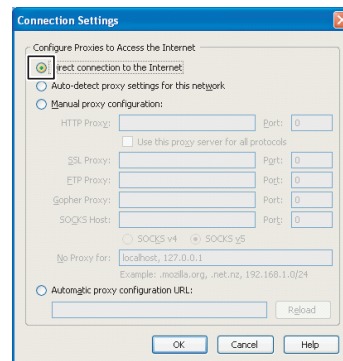
   Fig.6
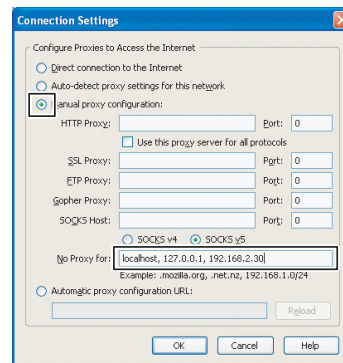
7) Type "http://192.168.2.30/index.html" in the address bar to connect the PC to the air conditioning control system for Compliant Manager.

4. Displaying and Changing IP address of the Compliant Manager

IP address, subnet mask, default gateway, and address setting of the Compliant Manager can be displayed and changed using the following procedures (CODE No. settings).

CODE No.	Item	Data	
		Factory setting	**Setting range**
10	IP address (MSB)	192	0 to 255
11	IP address	168	0 to 255
12	IP address	2	0 to 255
13	IP address (LSB)	30	0 to 255
14	Subnet mask (MSB)	255	0 to 255
15	Subnet mask	255	0 to 255
16	Subnet mask	255	0 to 255
17	Subnet mask (LSB)	0	0 to 255
18	Default gateway (MSB)	0	0 to 255
19	Default gateway	0	0 to 255
1A	Default gateway	0	0 to 255
1B	Default gateway (LSB)	0	0 to 255
1C	Address setting	0	0: Display only 1: Manual setting 2: Auto acquisition (by DHCP)

4-1. Displaying IP address

1) Change the mode to the CODE No. setting change mode.
   Press the (CHECK), (CL), and ZONE buttons simultaneously for at least 4 seconds.
   (SETTING and CODE No. flash.)
2) Select the CODE No. for IP address.
   1. Change the CODE No. to "10" to "1B" with the SET TEMP. or button.
   2. The address of each item is displayed as setup data.
3) Press the (CHECK) button to finish the IP address display.

4-2. Changing IP address

The following procedure describes how to change an IP address using an example of changing IP address to 192.168.2.38.

1) Change the mode to the CODE No. setting change mode.
   Press the (CHECK), (CL), and ZONE buttons simultaneously for at least 4 seconds.
   (SETTING and CODE No. flash.)
2) Set the data of the CODE No..
   1. Change the CODE No. to "1C" with the SET TEMP. or button.
   2. Change the set data to "1" with the GROUP or button.
      (SETTING and CODE No. are still flashing.)
   3. Press the (SET) button to determine the data. (SETTING and CODE No. change to lighting.)
   4. Change the CODE No. to "13" with the SET TEMP. or button.
   5. Change the set data to "38" with the GROUP or button.

NOTE)
At this time, the entered data of the selected CODE No. has not been saved yet.

3) Exit the CODE No. setting change mode.
   Press the (CHECK) button to write the updated data in the memory of the Compliant Manager.
   * When the data has completely been written in the memory, the CODE No. setting change mode is exited.
4) Press the Reset button to restart the Compliant Manager.
   * IP address is set during the restart process.

When the IP address of the Compliant Manager has been changed, be sure to change the IP address of the client PC to the address in the same segment. Also change the setting of the browser to the IP address of the Compliant Manager.

BMS-CM1280TLE/BMS-CM1280FTLE
Owner's Manual

SYSTEM CONFIGURATION OF THE COMPLIANT MANAGER
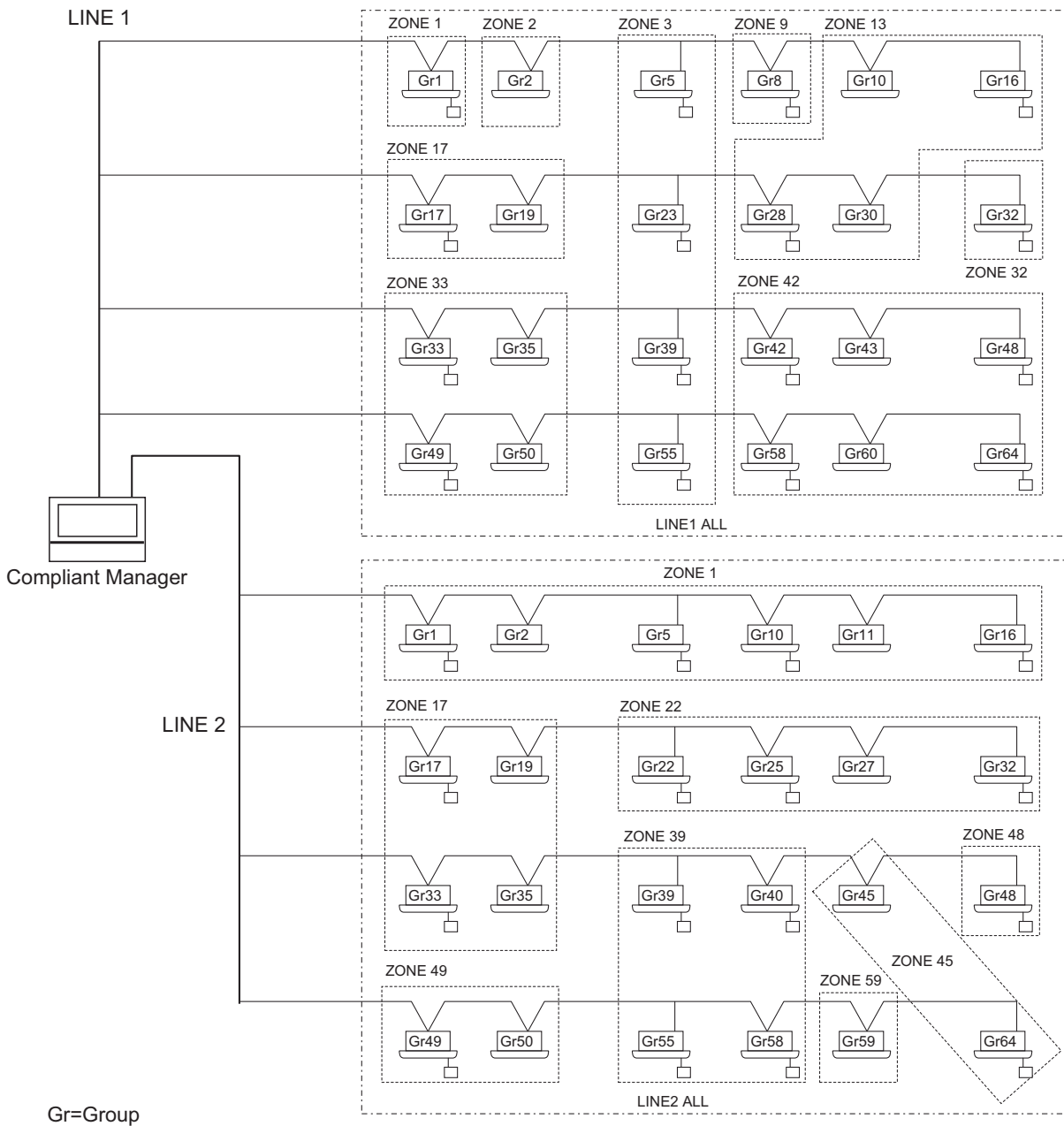
* Up to 64 zones and 64 groups per line can be managed.
  (This Compliant Manager controls 2 lines, 128 zones, and 128 groups in total.)

* Groups that can be registered in each zone must meet the following conditions.
  1. Groups are connected to the same line.
  2. Groups are in the same group number range when the control group selection is used.
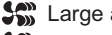
* In the control group selection, the Compliant Manager displays only for air conditioners in the set group number range. (For details, refer to the Installation Manual.)

HOW TO USE THE COMPLIANT MANAGER
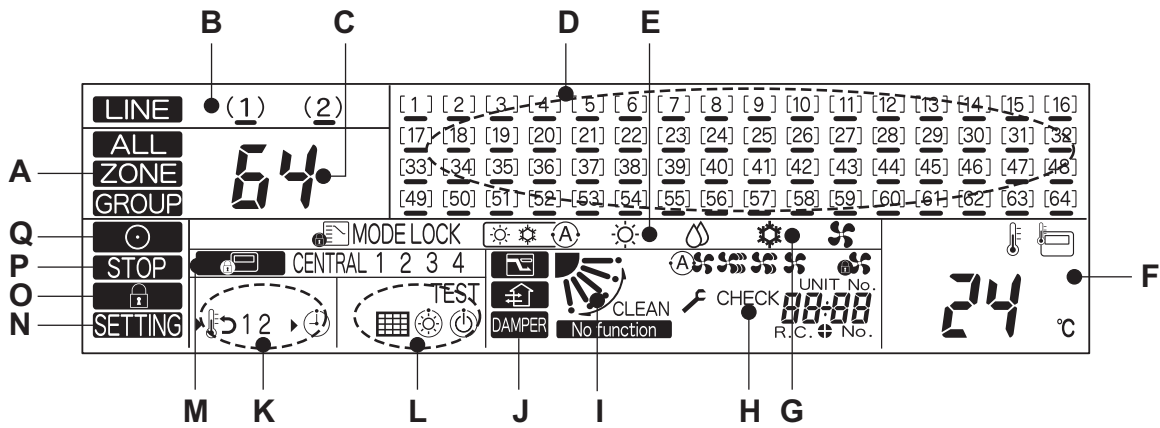
■ Button operation

A: LINE button	LINE	Switches line 1 (display 1), line 2 (display 2)
B: ALL/ZONE/ GROUP button	ALL/ZONE/GROUP	Switches ALL, ZONE, and GROUP. **ALL** : Selects all groups on the selected line simultaneously. **ZONE** : Selects all groups in the specified zone. **GROUP** : Selects a group. • Group 1 to 64 connected to the same line can configure zones. • Groups connected to different lines cannot be specified for the same zone. • This remote controller can control up to 2 lines, 128 zones, and 128 groups.
C: ZONE button	▲ ZONE ▼	**▲** : Increments the zone number. **▼** : Decrements the zone number. * There are 64 zones per line (128 zones in total).
D: GROUP button	▲ GROUP ▼	**▲** : Increments the group number. **▼** : Decrements the group number. * There are 64 groups per line (128 groups in total).

E: MODE **button**	MODE 🖿	Switches operation mode. (* Selectable operation modes vary depending on models.) AUTO: ☼ ✿ Ⓐ Automatically switches heating operation and cooling operation alternately. HEAT: ☼ Performs heating operation. DRY : ◊ Performs dehumidifying operation. COOL: ✿ Performs cooling operation. FAN : ✹ Performs FAN operation. * When 🔒 MODE LOCK lights, operation mode is fixed to COOL or HEAT by the remote control system.
F: FAN **button**	FAN ✹	Switches air volume. (* Selectable air volume levels vary depending on models.) AUTO: Ⓐ✹ Air volume is automatically switched by the indoor unit. HEAT: ✹ Large air volume (Fan speed: High) MED.: ✹ Medium air volume (Fan speed: Medium) LOW : ✹ Small air volume (Fan speed: Low) * While 🔒✹ is displayed, air volume is fixed and cannot be selected.
G: Run lamp		Indicates the operating status of the selected group. OFF: The selected group is not operating. ON: The selected group is operating. Flashing: When an error occurs or the protective device is activated
H: ON **button**	ON I	Starts operation.
I: OFF **button**	OFF O	Stops operation.
J: SET TEMP. **button**	▲ SET TEMP. ▼	▲ Increases the set temperature. ▼ Decreases the set temperature.
K: RESET **button**		Used to reset settings. (Do not usually use this button.)
L: SWING/FIX **button**	SWING/FIX	Switches the auto-swing mode and louver direction when no remote controller is used. * This button is disabled in the ALL or ZONE mode.
M: VENT **button**	VENT	Used when a commercially available ventilation fan is connected. Pressing this button runs or stops the connected ventilation fan. When operation of air conditioners is started or stopped, the ventilation fan is also started or stopped at the same time. (While the ventilation fan is running, 🔲 is displayed on the display.) * When No function appears on the display when the VENT button is pressed, no ventilation fan is connected. * This button is used to operate and stop the damper when a heat exchange ventilaters is connected.
N: SAVE **button**	SAVE	Drives the air conditioner into the power saving mode. * When No function appears on the display, the power saving mode is not available for the air conditioner.
O: CENTRAL **button**	CENTRAL ○	Switches CENTRAL 1 to CENTRAL 4 in the central control mode. No indication: Central control is cleared (individual operation) * This button is disabled in the remote controller mode.
P: CL **button**	CL	Erases the filter mark on the display. This button is also used for the initial settings.
Q: SET **button**	SET ○	Used for service or special operations. (Do not usually use these buttons.)
R: CHECK **button**	CHECK ⊘	
S: ITEM **button**	ITEM SELECT ○ ○	Used for enable/disable settings for return-back operation* and timer operation. ITEM ○ : Selects an item to be set sequentially. (The selected item and the ▶ mark light.)
T: SELECT **button**	ITEM SELECT ○ ○	SELECT ○ : Enables or disables the selected item. * Selectable items may vary depending on models.

* **[Return-back operation]**
The return-back operation is a function to return the temperature automatically to the set temperature in a predetermined time period if a temperature lower than the specified temperature (for cooling) or higher than the specified temperature (for heating) is set on the remote controller.

A:	ALL/ZONE/GROUP	**ALL** , **ZONE** , or **GROUP** is displayed.
B:	**Line number**	**LINE** (1) ← When a line is selected, the ( ) mark of the selected line number flashes. The number lights when a device is controlling the line collectively. **LINE** (1) (2) ← When both line 1 and line 2 are selected, the line of the flashing ( ) mark is displayed. The underline lights when there is at least one operating air conditioner on the line. The underline flashes when an alarm occurs.
C:	**Zone number**	The selected line number, zone number or group number is displayed. **ALL** 1.2 **ZONE** 1~64 **GROUP** 1~64
D:	**Group number**	Connected groups are automatically recognized and displayed. When a group is specified with the GROUP ▲ ▼ button, it is displayed like [ ]. [ ] Flashing: Shows a group that is being set among selected groups. [ ] Lighting: Shows selected groups. 3 Underline: Shows that the group is operating. 3 The underline flashes when an alarm occurs.
E:	**Operation mode**	The current operation mode is displayed. AUTO: ☼ ✿ Ⓐ HEAT: ☼ DRY: 💧 COOL: ✿ FAN: ❊ * When 🔒 MODE LOCK lights when the MODE button is pressed, switching of HEAT and COOL operation mode is disabled.
F:	**Temperature**	The set temperature is displayed.
G:	**Air volume**	One of AUTO Ⓐ❊ , HEAT ❊, MED. ❊, LOW ❊, or FIXED 🔒❊ is displayed.

H: Check code	When the selected air conditioner is abnormal, its unit number and the check code are displayed.
I: Louver position/swing	Louver position or louver swinging is displayed. (When no remote controller is used.)
J: Functions (1)	▭ : Lights when the power saving mode is activated. ⬚ : Lights when a ventilation fan is running. DAMPER : Lights when the damper is operating with a total heat exchanger connected. No function : Lights when the VENT or SAVE button is pressed though the function is not provided.
K: Functions (2)	⌁↻1 : Displayed when functions of schedule and return-back operation enabled activated. ⌁↻ 2 * (A separately sold schedule timer is required.) 🕓
L: Functions (3)	▦ : Indicates that filters should be replaced. TEST : Indicates that a test run is being executed. ⏻ : Displayed when the air conditioner cannot operate with the selected operation mode (when heating and cooling modes are mixed in the multi- indoor unit control system). ❁ : Displayed at the beginning of heating operation or during defrosting operation. While this mark is displayed, the indoor fan stops.
M: Central control	CENTRAL 1 2 3 4 : The selected operation prohibited setting (CENTRAL 1, 2, 3, or 4) is displayed in the central control mode. 🔒 : Displayed when the central control system is controlling. When the ON I , OFF O , MODE , or SET TEMP. ▲ ▼ button is pressed with remote controller operation disabled by the central control system, 🔒 flashes and no setting change is accepted.
N: **SETTING**	Flashes for several minutes when the power switch is turned on. While this mark is flashing, no setting is enabled because the Compliant Manager is recognizing connected groups.
O: 🔒 ("Controller Prohibition" mark)	Lights while the controller prohibition function is activated. (While this mark is lighting, no operation is enabled.) * Pressing the CHECK, SET, and LINE buttons simultaneously switches controller prohibition ON/OFF.
P: **STOP**	Lights in the emergency stop state due to an alarm signal input. (Ex. fire alarm)
Q: ⊙ ("Operating" mark)	Lights when at least one controlled air conditioner is operating. Flashes when at least one air conditioner is abnormal or the protective device is activated.

HOW TO PERFORM GROUP OPERATION
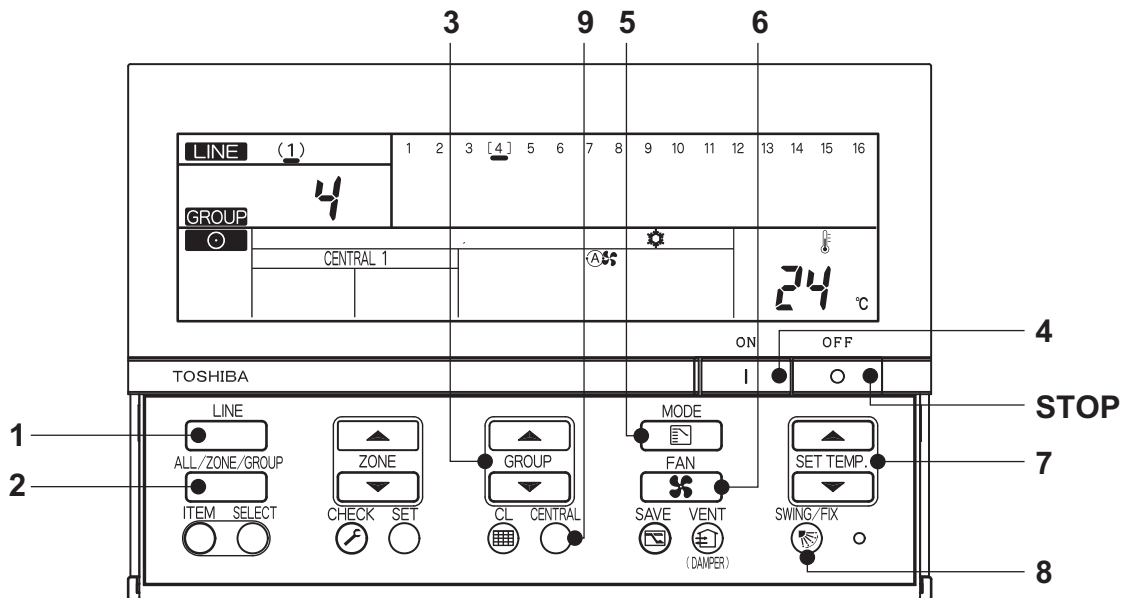
(Example) Operating LINE 1, GROUP 4 (Cooling at 24°C, air volume: AUTO)

Power on	Turn on the power of the remote controller. (Buttons on the remote controller are disabled while **SETTING** is displayed, but this is not a fault.)
1 Line switching	Select line 1 with the LINE button.
2 ALL/ZONE/GROUP	**GROUP** Select **GROUP** with the ALL/ZONE/GROUP button.
3 Group switching	Select group number 4 with the GROUP ▲ and ▼ buttons. (Group number 4 blinks like [4].)
4 ON	Press the ON button to start operation.
5 Operation mode switching	☼ Select COOL mode with the MODE button.
6 Air volume switching	Ⓐ Select AUTO air volume with the FAN button.
7 Temperature setting	24°C Set temperature to 24°C with the SET TEMP. ▲ and ▼ buttons.
8 Swing/wind direction setting (When no remote controller is used)	Select a louver position or up/down swinging with the SWING/FIX button.
9 Central/individual (Only in the central control mode)	Change the setting with the CENTRAL button. Individual: Controls with the remote controller are possible. CENTRAL 1:Disables operation start/stop using the remote controller. CENTRAL 2:Disables operation start/stop, operation mode switching, and temperature setting using the remote controller. CENTRAL 3:Disables operation mode switching and temperature setting using the remote controller. CENTRAL 4:Disables operation mode switching using the remote controller. "CENTRAL" is displayed for central or individual control other than above.
STOP	Press the OFF button to stop operation.

* Indications on the LCD of the Compliant Manager remain unchanged even when operation is stopped.

HOW TO PERFORM ZONE OPERATION AND SIMULTANEOUS OPERATION
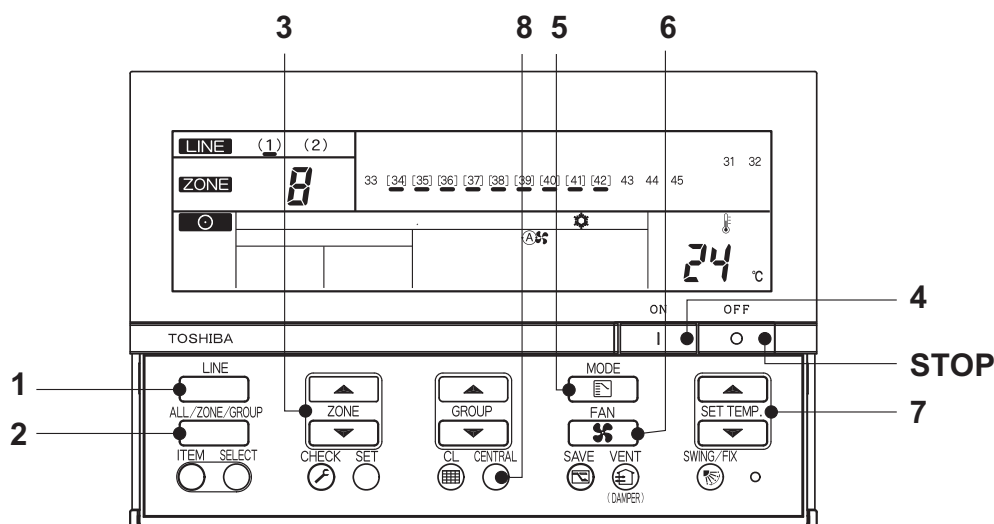
(Example) Performing zone operation (LINE 1, ZONE 8, GROUP 34~42 cooling at 24°C, air volume: AUTO) and simultaneous operation (LINE 1, cooling at 24°C, air volume: AUTO)

	Zone operation (LINE 1, ZONE 8, cooling at 24°C, air volume: AUTO)	Simultaneous operation (LINE 1, cooling at 24°C, air volume: AUTO)
Power on	Turn on the power of the remote controller (Buttons on the remote controller are disabled while **SETTING** is displayed, but this is not a fault.)	
1 Line switching	(1) Select line 1 with the LINE button.	
2 ALL/ZONE/GROUP	Select **ZONE** with the ALL/ZONE/GROUP button.	Check that **ALL** is displayed. If it is not displayed, select **ALL** with the ALL/ZONE/GROUP button.
3 Zone switching	Select 8 ZONE with the ZONE ▲ and ▼ buttons. ("8" is displayed.)	(Not necessary) ("1" is displayed.)
4 ON	Press the ON button to start operation. (Operation starts sequentially at intervals of about one second.)	
5 Operation mode switching	☼ Select COOL mode with the MODE button.	
6 Air volume switching	Ⓐ Select AUTO air volume with the FAN button.	
7 Temperature setting	24°C Set temperature to 24°C with the SET TEMP. ▲ and ▼ buttons.	
8 Central/individual (Only in the central control mode)	Change the setting with the CENTRAL button. Individual: Controls with the remote controller are possible. CENTRAL 1:Disables operation start/stop using the remote controller. CENTRAL 2:Disables operation start/stop, operation mode switching, and temperature setting using the remote controller. CENTRAL 3:Disables operation mode switching and temperature setting using the remote controller. CENTRAL 4:Disables operation mode switching using the remote controller. "CENTRAL" is displayed for central or individual control other than above.	
STOP	Press the OFF button to stop operation.	

* When **ALL** or **ZONE** is displayed, the SWING/FIX button is disabled.
* Settings when ALL or ZONE is selected: Only the contents that are set in the ALL or ZONE mode are set in each air conditioner.
  (Example) When the MODE button is pressed in the ALL or ZONE mode, only the operation mode is set in each air conditioner.
* Indications on the LCD of the Compliant Manager remain unchanged even when operation is stopped.

SPECIFICATIONS

Model	BMS-CM1280TLE	BMS-CM1280FTLE
Power supply	220-240 VAC 50/60Hz	
Power consumption	3W	5W
Number of connectable indoor units (TCC-LINK)	128 Units (LINE1 64 Units, LINE2 64 Units)	
Energy Monitoring Relay Interface (RS-485)	4 Units (max.)	
Digital Input/Output Relay Interface (RS-485)	4 Units (max.)	
Operating temperature	0 to 40°C to 90%RH	
Dimensions	-20 to +60°C (no condensation)	
Mass	120 (H) × 180 (W) × 88 (D)	
Weight	1.1Kg	1.2Kg

4-8-6 BMS-TP0641/5121ACE Installation Manual

Introduction

● **Applications/Functions**

The Touch Screen Controller is equipped with the LCD display and the touch panel and has various functions such as operation control, operation status monitoring, scheduled operation, and error code display of up to 64 or 512 indoor units.

● **Specifications**

Power supply	100 - 240 VAC, 50/60Hz
Power consumption	50VA
Operating temperature/humidity	0°C to 50°C, 20% to 85% RH (no condensation)
Storage temperature	-10°C to +60°C
Dimensions	256 (H) × 316 (W) × 54 (D) mm
Mass	3.5kg

	BMS-TP0641ACE	BMS-TP0641PWE	BMS-TP5121ACE	BMS-TP5121PWE	
Air conditioning control	◯	◯	◯	◯	◯ : available
Power distribution	✕	◯	✕	◯	✕ : Not available
Indoor units connected	Max. 64 units	Max. 64 units	Max. 512 units	Max. 512 units	

External View

CF (Compact Flash) card slot (CF card for data files)

Input/Output port

USB

Ethernet

COM1(RS-232C)

COM2(RS-485)

Power input terminal block

PCI expansion unit connector cover

POWER LED

Function switch (F1, F2, F3)

M4 Tap (×4 pcs.) (depth: 10 mm max.)
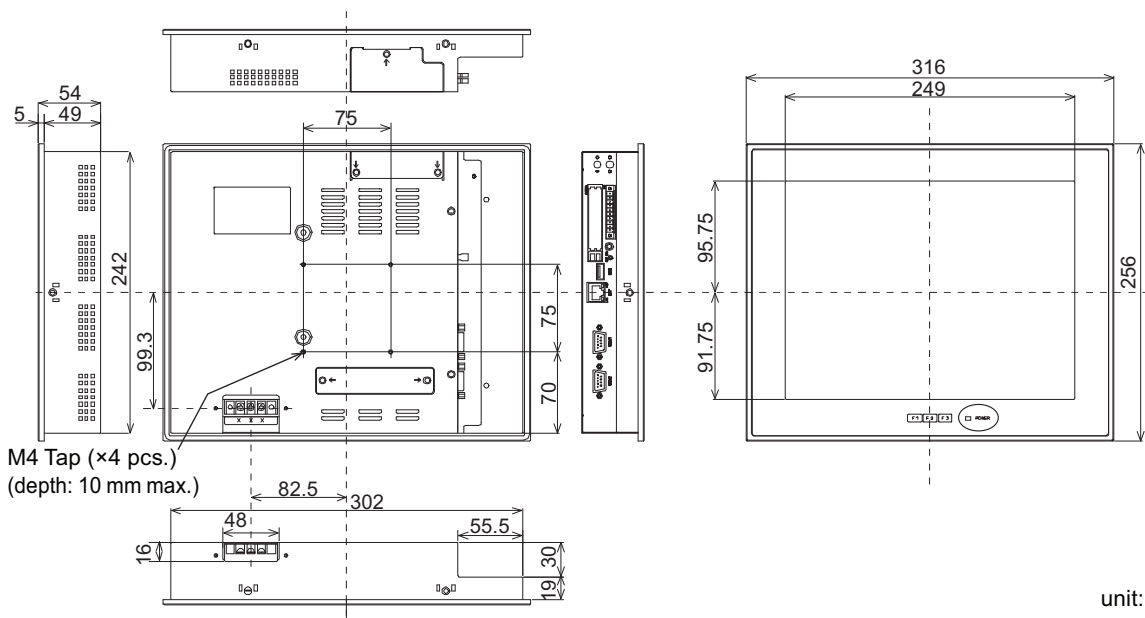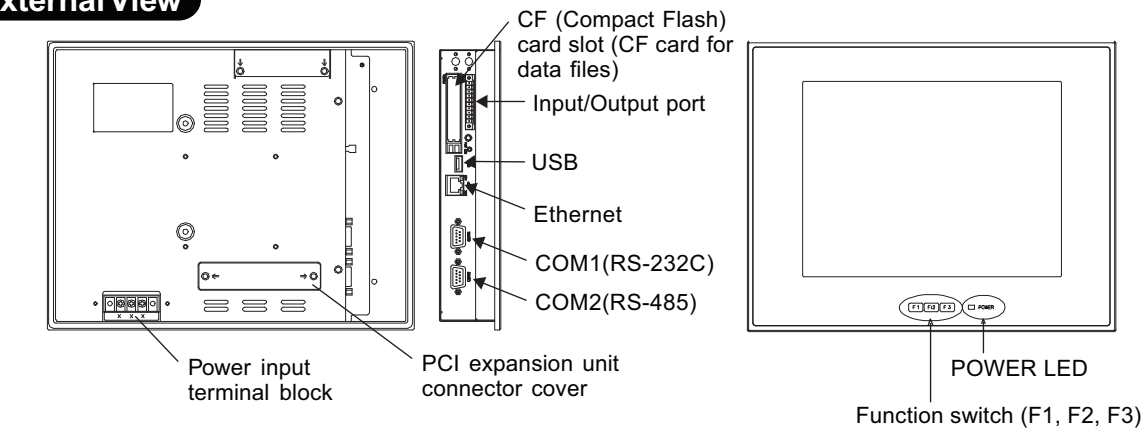
unit: mm

Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	Touch Screen Controller	1	
2	Fixture	6	For fixing the unit at pannel mount
3	CF(compact flash) for data file	1	It is inserted in the CF card slot of controller at shipment. (For data file)
4	CF adapter	1	It is inserted in the CF card slot of controller at shipment.
5	Simple stand	1	
6	Triangle thread screw (M4 × 8, Ni)	1	For simple stand
7	Card cover	1	For preventing CF(compact flash) from coming out
8	Triangle thread screw (M3 × 6, Ni)	1	For card cover
9	RS-485 cable	1	For connecting controller and TCS-NET Relay Interface
10	Installation Manual	1	This manual

Use the following materials to connect the signal lines and power lines. (procured on site)

No.	Line		Description
1	For RS-485	Type	2-core shield wire
		Wire size	$1.25mm^2$, 500m max. (total length)
		Length	
2	For digital Input/Output connection	Type	2-core wire, $0.3mm^2$, 100m max
		Wire size	
		Length	
3	For Power	Type	H07 RN-F or 245IEC66
		Wire size	$0.75mm^2$, 50 m max.

Installation

Installation Space and Maintenance Space

Space 30mm or more in between the controller and surrounding objects.

Make space for service.

Side view

Bottom view
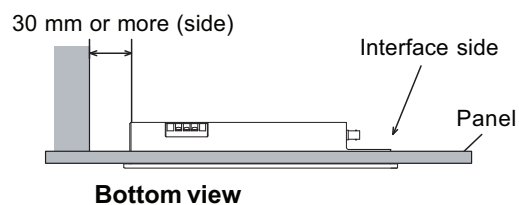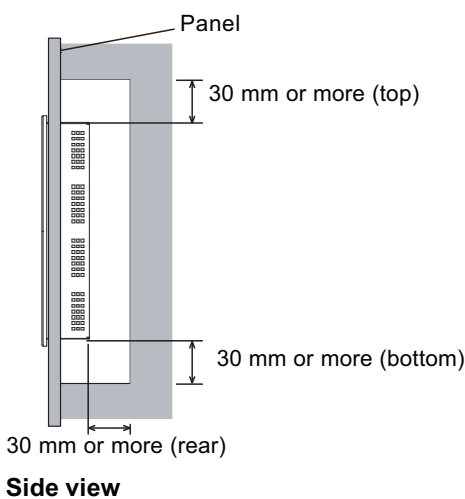
Installation Method

Two installation methods are provided. One is the panel mount with the fixture. The other is the desk top installation using the CONTEC stand (procured on site).

(1) Panel Mount

How to install the fixture

1. Insert the controller from outside of the panel.
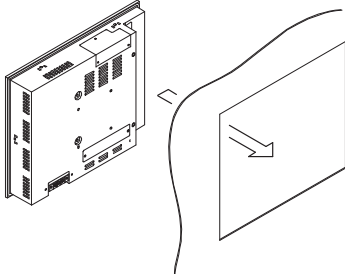
2. Insert the fixtures from inside of the panel.

Touch Screen Controller

Panel

Fixture

Tightening screws excessively may cause the screws to break. Optimum tightening torque for good waterproofing effect is 0.6N/m.

Panel cut size

303^{+1}_{-0}

R1 or less

243^{+1}_{-0}
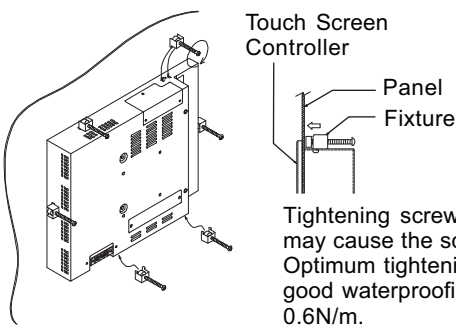
Panel thickness: 1.6 - 7 mm   [mm]
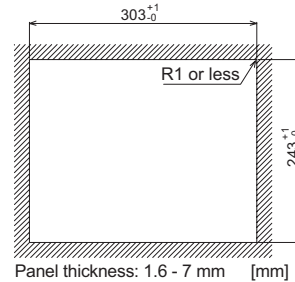
REQUIREMENT

Use a panel (procured on site) of thickness 1.6-7 mm.

(2) Desk Top Installation using the CONTEC stand (procured on site)

75 mm

75mm
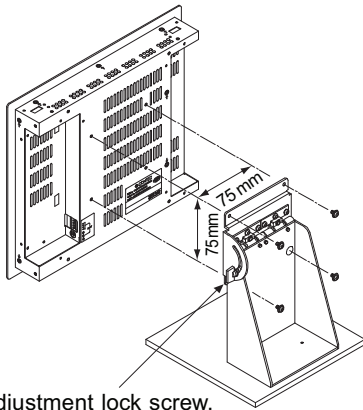
The angle adjustment lock screw. (Loosen the screw and adjust angle.)

For reference

Display stand (not supplied with the controller)

Use the CONTEC stand (model: IPC-SND-03).
For details of the stand, visit the CONTEC web site.
  Global site: http://www.contec.com/
  China: http://www.contec.com.cn/

REQUIREMENT

Do not install the unit in any of the following places.

• Humid or wet place

• Dusty place

• Place exposed to direct sunlight

• Place where there is a TV set or radio within one meter

• Place exposed to rain (outdoors, under eaves, etc.)

Connection of Power cables/Earth wires/Signal wires

Connect cables to the connectors and terminals specified.

REQUIREMENT

Power cable is not supplied for the Touch Screen Controller. Prepare a 3-pin power cable conforming to applicable safety standards. Be sure to connect the earth line earth of the power cable securely.

Power input terminal

Digital Input

Digital Output

For details of the connection, refer to I/O port connection on next page.

Ethernet
(To customer's PC)

Connect firmly the power cable to the power input terminal.

Connect the attached RS-485 cable to COM2.

Power supply

COM2 (RS-485)
(TCS-NET relay interface)

Length of stripped power cable

35 10

45 10

Length of stripped digital Input/Output connector wire

35 10

CAUTION

• Ensure to connect the breaker to the primary side of power.

I/O Port Connection

The I/O Port is used to control air conditioners by interlocking them with electric lock signals and fire alarm signals, and to transmit air conditioner failures to other devices.

I/O Port

10	1

↓ Front (LCD side)

Pin No.	Signal name	Remarks
1	PI_PCOM	Input plus common
2	PI(0)	Input 0
3	PI(1)	Input 1
4	PI(2)	Input 2
5	P_PO(0)	Output 0+
6	N_PO(0)	Output 0-
7	P_PO(1)	Output 1+
8	N_PO(1)	Output 1-
9	P_PO(2)	Output 2+
10	N_PO(2)	Output 2-

Input/Output specifications

Input	Input type	Photo-coupler insulation
	Number of input	3
	Input resistance	3k ohm
Output	Output type	Open collector
	Number of output	3
	Output current	Max. 100mA (per 1 output)
	Output voltage	Less than 30V DC

(1) The example of input circuit is shown below. It is electrically insulated by the photo-coupler.
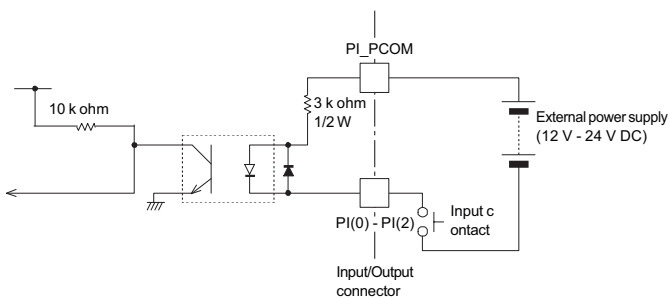
(2) The example of output circuit is shown below. It is electrically insulated by the photo-coupler.
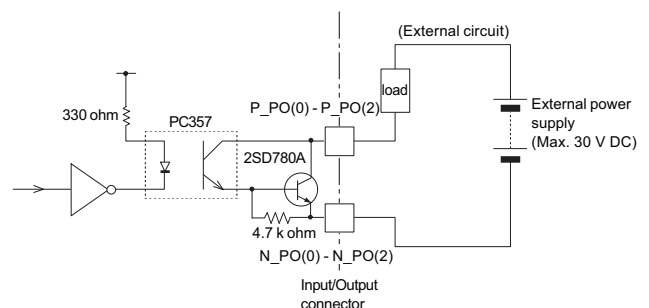
The example of the system wiring connection is shown below.

Terminator Resistor Setting

● RS-485 terminator resistor

The terminator resistors of RS-485 are set at both ends of communication cable. The RS-485 terminator resistor (at one end) of the Touch Screen Controller is set at shipment. No setting is needed.
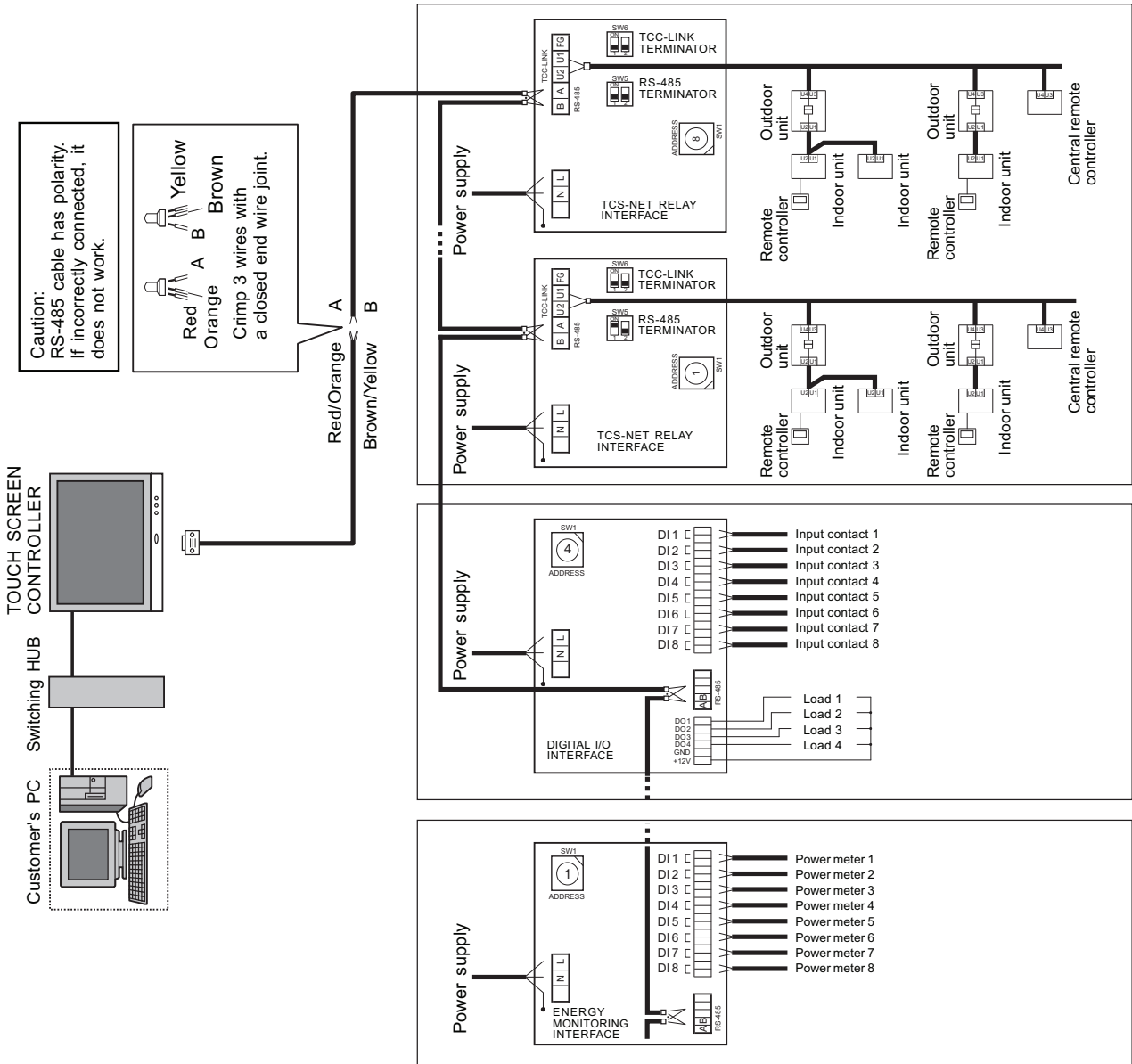
The setting of the Touch Screen Controller is done at shipment. No setting is required.

Before Trial operation

● **Setting File Creation**

The setting file is necessary to use the Touch Screen Controller.
Please inquire of your local sales office about it.
The setting file will be copied to the Compact Flash card inserted in the CF slot of the Touch Screen Controller.

● **Trial Operations of Air Conditioner and Each Interface**

Confirm the trial operations of the air conditioner and the each interface. And turn on the power of each device.

Trial operation

● **Start-up of the Touch Screen Controller**

Connect the power cable, earth wire and signal wire of the Touch Screen Controller.
Insert the compact flash containing the setting file in the CF slot and turn on the power.
The initial screen appears.

● **Initialization**

It is necessary to initialize the system to make the setting file effective.
Operational Procedure
(1) Press the [MENU] button. The menu screen appears.
(2) Press the [SYSTEM RESET] button on the menu screen.
　　The message to confirm the operation appears. Press [Yes] to execute.
　　Then, the system re-starts up.

● **Confirmation of Communication with Each Interface**

When the communication with the interface listed on the setting file is disconnected, the communication error is displayed on the Touch Screen Controller. Press the [Alarm List] button to confirm whether the communication error occurs or not. (Communication error judging time: Approx. 15 minutes)

The suspected causes of the communication error will be as follows.
 • The interface is not powered.
 • The address setting of the interface is incorrect.
 • The communication between the Touch Screen Controller and the interface is disconnected.
 • The setting file is incorrect.

● **Confirmation of Communication with Air Conditioner**

When the communication with the air conditioner is disconnected, the communication error is displayed on the Touch Screen Controller. The frame of air conditioner button on the screen is displayed orange.

The suspected causes of the communication error will be as follows.
 • The air conditioner is not powered.
 • The address setting of the air conditioner is incorrect.
 • The communication between the TCS-NET relay interface and the air conditioner is disconnected.
 • The communication between the Touch Screen Controller and the TCS-NET relay interface is disconnected.
 • The setting file is incorrect.

4-8-7 BMS-WB2561PWE/BMS-WB01GTE Installation Manual

BEFORE INSTALLATION

NOTE

- To use the Web Based Controller, TCS-NET Relay Interface (separately sold) and client PC are required other than this server. To use power distribution function, Energy Monitoring Relay Interface (separately sold) is required. To use interlock control funtion between air conditioner and fire alarm signal or electronic lock signal, Digital Input/Output Relay Interface (separately sold) is required.

- Client PC system requirements
  The PC to be connected must meet the following system requirements to operate the Server normally.
  <Operating system>
    Microsoft Windows XP
    Microsoft Windows Vista
  <Hardware>
    Screen resolution 1024 × 768 pixels or more
  <Browser>
    Internet Explorer version 6.0 or version 7.0

- Use normal open type contact for Power Meter Input or Digital Input when Energy Monitoring Relay Interface or Digital Input/Output Relay Interface is used in the system. Normal close type contact cannot be used.

- The software programs of this product were installed as factory default.

Check the following package contents.

No.	Item	Web Server/Gateway	Master Server
		Quantity	Quantity
1	Web Server/Gateway	1	
2	Master Server		1
3	Installation Manual	1	1
4	CD-R	1	1
5	Cable (RS-485 cable for Server)	1 (Installed)	
6	Closed end wire joint	2	2

Use the following wiring materials to connect signal lines. (Procured on site)

No.	Signal line		Description
1	For RS-485	Type	2-core shield wire
		Wire size	1.25 mm^2, 500 m max. (total length)
		Length	
2	For Ethernet	Type	LAN cable (higher than Category 5, UTP) The appropriate use of straight cable/cross cable should be done depending on your system used.
		Length	100 m max

MASTER SERVER/WEB SERVER/GATEWAY SPECIFICATIONS

■ Names of each parts

REQUIRMENT
Set S1 [OFF] for normal operation.

■ Specifications

Power Supply	220-240 VAC 50/60 Hz
Current	0.2 A
Operating temperature/humidity	0 to 40 °C, 10 to 90 %RH (no condensation)
Storage temperature	-20 to 60 °C
Dimension	250 (W) × 71.6 (H) × 210 (D) mm (292 (W) including the fixing metal plate)
Mass	2.2 kg
COM port	RS-485 (9-pin, D-SUB)
LAN	10BASE-T/100BASE-TX

■ External view
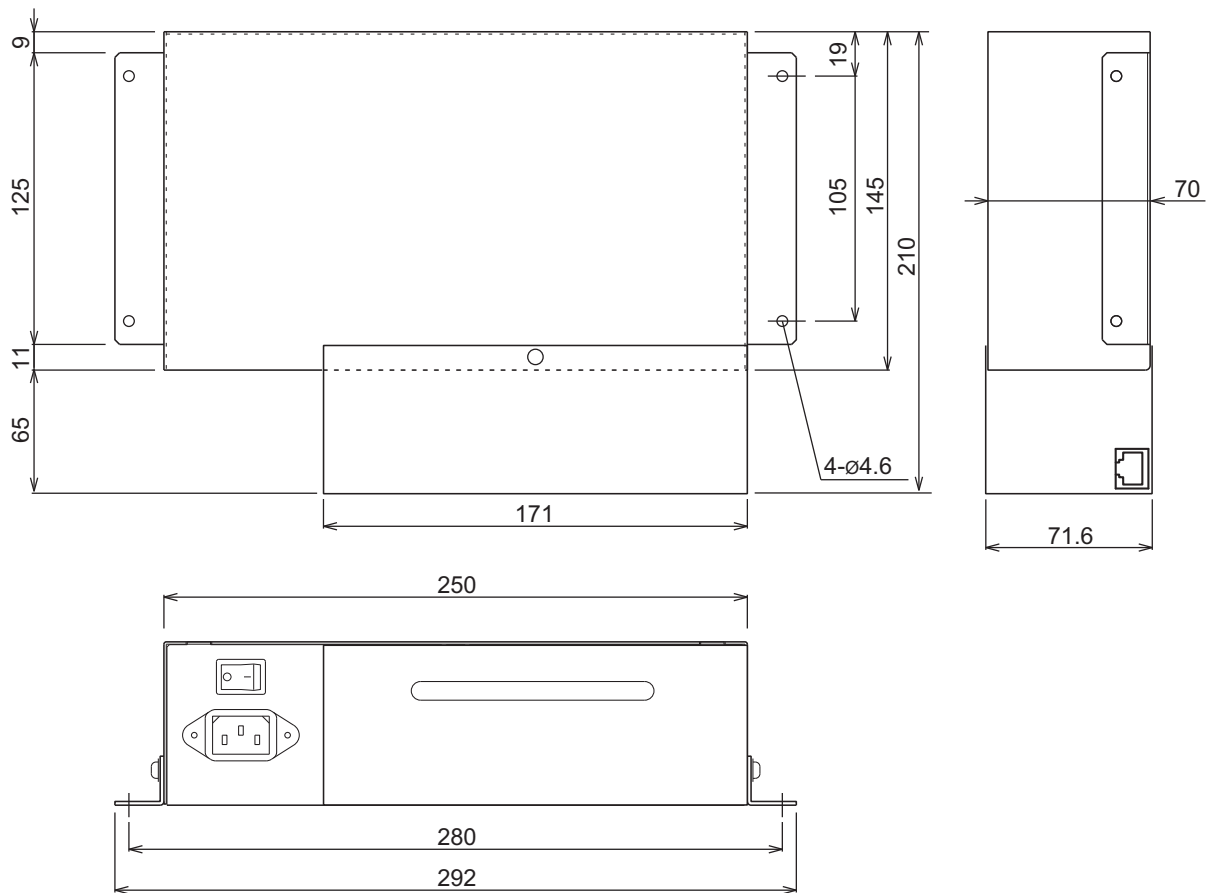
SYSTEM OVERVIEW

The Web Based Controller has two systems: Web Server System and Master Server System. Select either one according to the number of air conditioners to be connected.
Web Server System: Allows management of up to 256 air conditioners with a single web server.
Master Server System: Allows management of up to 2048 air conditioners with one Master Server and up to eight Gateways.

INSTALLATION

■ Master Server/Web Server/Gateway Installation Method and Orientation

There are 2 types of setting methods and directions available for the server. Use the fixing metal plates attached when installing the server.

(1) Surface mount

(2) Wall mount

Mount the server with the front face upward.

▼ **Fixing screw hole positions**

(Unit : mm)

6   280   6

9   125   11   65

19   105   145   21

4 x ø4.6

171

⇩
AC inlet side

REQUIREMENT

Do not install the unit in any of the following places.
- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

■ Installation Space and Maintenance Space

The installation space and the maintenance space must be determined before installation.
These spaces depend on installation method.

Installation Space

The values in the following table are required for installation space in each direction. Select an installation place that allows good air ventilation.

(unit: mm)

Item	Direction	Surface mount	Wall mount
Installation space	Top	100	100
	Bottom	0	0
	Front	100	100
	Rear	Location adjacent to wall permitted (*1)	
	Right side	100	100
	Left side	100	100

(*1) "Location adjacent to wall permitted" means that the unit can be installed close to the wall on that side.

Maintenance Space

Maintenance space is required for installation and maintenance.
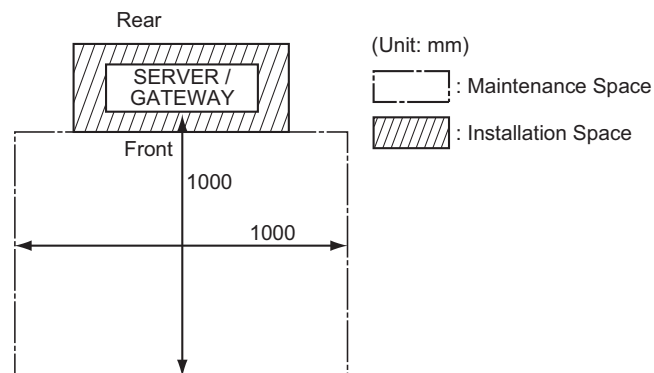
CABLE CONNECTION

Master Server
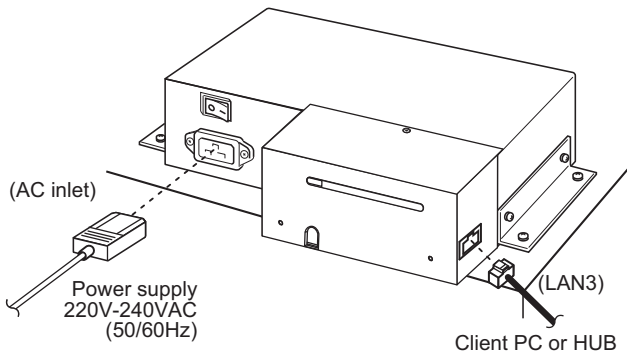
(AC inlet)

Power supply
220V-240VAC
(50/60Hz)

(LAN3)

Client PC or HUB

Web Server/Gateway

(AC inlet)

Power supply
220V-240VAC
(50/60Hz)

(COM1)

TCS-NET Relay Interface,
Energy Monitoring Relay
Interface,
Digital Input/Output Relay
Interface

(LAN3)

Master Server
or Client PC
or HUB
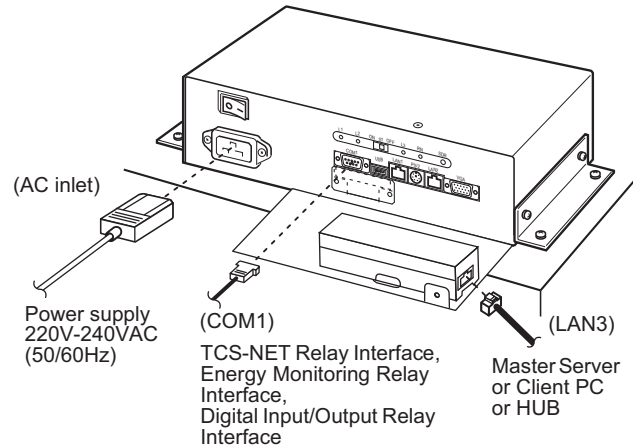
■ AC Power Cable Connection

REQUIREMENT

Power cable is not supplied for the Server. Insert a three core power cord applicable to the standard of the country you use. Be sure to connect the earth line of the power cable securely.

- Insert an AC power cable into the AC inlet.
- Connect the power cord plug to an outlet (220 V - 240 V, AC).

REQUIREMENT

- Disconnect the appliance from the main power supply. Connect this appliance to the main power supply by a circuit breaker or a switch with a contact separation of at least 3mm.
- Make sure that the outlet is earthed.

■ Ethernet Cable Connection

- Insert the Ethernet cable into the Ethernet port3 (LAN3).

NOTE

Disconnecting the Ethernet cable.
- Remove the metal plate cover.
- Insert a pin into the cable separation hole of the Hyper Isolation Transformer HIT-100.
- Remove the cable slowly.

Insert a pin into the hole and push the latch.

Pull out the cable.
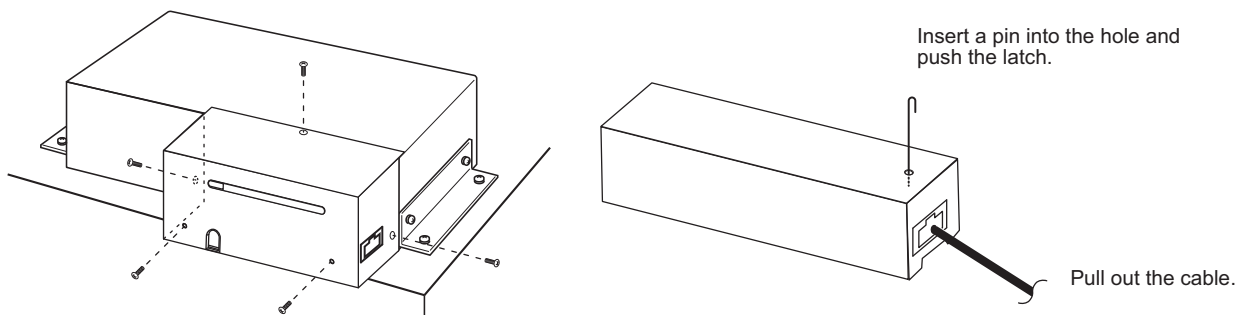
■ Serial Port (RS-485) Connection

- Confirm that the power supply for the server is shut off.
- RS-485 cable is connected to Serial port 1 (COM1) of the Web Server/Gateway as factory default.
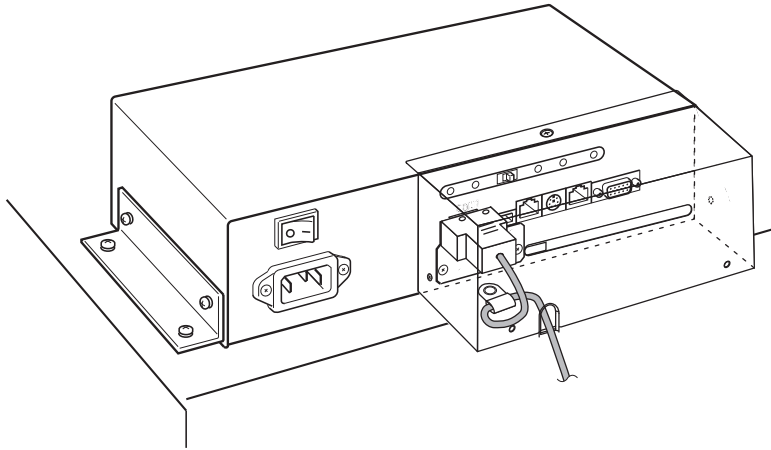
Connection to the TCS-NET Relay Interface

- TxRx(+) Connection
  Connect three wires of RS-485 wire (red wire/white wire/wire from the terminal board RS-485 A of the TCS-NET Relay Interface) together with the closed end wire joint.
- TxRx(-) Connection
  Connect three wires of RS-485 wire (black wire/green wire/wire from the terminal board RS-485 B of the TCS-NET Relay Interface) together with the closed end wire joint.

REQUIREMENT

- Put the closed end wire joint into the piping or the wall. Do not expose the closed end wire joint.

Web Server/Gateway (BMS-WB2561PWE)

NOTE

The RS-485 signal wire has polarity.
If connected with incorrect polarity, the unit will not work.
Do not connect or disconnect the wire during control operation.
Doing so may cause a malfunction.

▼ Example of Cable Connection for Web Server System (In case of connecting 256 FCUs or less)

Client P.C.

HUB

Insert the Ethernet cable into the Ethernet port3 (LAN3).

Web Server
(BMS-WB2561PWE)

COM1   LAN1   LAN2

LAN3

Connect the supplied RS-485 cable to the serial port (COM1)

Power supply

Connect each shield wire of the 2 cables.

Red/White   A

Black/Green   B

Caulk the 3 cables using a closed-end wire joint.

A   B

Red/White   Black/Green

TCC-LINK   U2 U1 FG

B A   RS-485

TCS-NET Relay Interface

Power supply

N L

Power supply

Connect the shield wire of RS-485 cable to the terminal block only when the TCS-NET relay interface address SW=1.

CAUTION: The RS-485 cable (A/B) has polarity. If it is connected with incorrect polarity, the unit will not work.

TCC-LINK   U2 U1 FG

B A   RS-485

TCS-NET Relay Interface

Power supply

N L

U4 U3   Outdoor unit   Outdoor unit   U4 U3   U4 U3

U2 U1   U2 U1   Central remote controller

U2 U1   U2 U1   U2 U1

Indoor unit   Indoor unit   Indoor unit

Remote controller   Remote controller

U4 U3   Outdoor unit   Outdoor unit   U4 U3   U4 U3

U2 U1   U2 U1   Central remote controller

U2 U1   U2 U1   U2 U1

Indoor unit   Indoor unit   Indoor unit

Remote controller   Remote controller

▼ Example of Cable Connection for Master Server System (In case of connecting 257 FCUs or more)

Master Server (BMS-WB01GTE)

COM1 LAN1 LAN2

LAN3

Power supply

Client P.C.

Insert the Ethernet cable into the Ethernet port3 (LAN3).

HUB

Gateway (BMS-WB2561PWE)

COM1 LAN1 LAN2

LAN3

Gateway (BMS-WB2561PWE)

COM1 LAN1 LAN2

LAN3

Gateway (BMS-WB2561PWE)

COM1 LAN1 LAN2

LAN3

Power supply

Power supply

Power supply

Connect the supplied RS-485 cable to the serial port (COM1)

Connect each shield wire of the 2 cables.

Red/White   A

Black/Green   B

Caulk the 3 cables using a closed-end wire joint.

A   B

Red/White   Black/Green

Power supply

TCC-LINK U2 U1 FG
B A   RS-485

TCS-NET Relay Interface

N L

Connect the shield wire of RS-485 cable to the terminal block only when the TCS-NET relay interface address SW=1.

CAUTION: The RS-485 cable (A/B) has polarity. If it is connected with incorrect polarity, the unit will not work.

Power supply

TCC-LINK U2 U1 FG
B A   RS-485

TCS-NET Relay Interface

N L

Power supply

Outdoor unit Outdoor unit

U4 U3
U2 U1

U4 U3
U2 U1

Central remote controller

U4 U3

U2 U1

U2 U1

U2 U1

Indoor unit Indoor unit

Indoor unit

Remote controller

Remote controller

Outdoor unit Outdoor unit

U4 U3
U2 U1

U4 U3
U2 U1

Central remote controller

U4 U3

U2 U1

U2 U1

U2 U1

Indoor unit Indoor unit

Indoor unit

Remote controller

Remote controller

▼ Example of Cable Connection for Interfaces

Web Server / Gateway
(BMS-WB2561PWE)

TCC-LINK U1 and U2 have no polarity.

The shield of TCC-LINK cable should be open and insulated. It is not connected to the terminal block.

TCC-LINK terminator resistor is set on the air conditioner side. Bit 1 and 2 of SW6 should be OFF.

Set the RS-485 terminator resistor on the No.1 unit (relay interface address SW1=1) and host system. Do not set it here.

Connect the shield wires of the two wires.

Red/White — A
Black/Green — B

Red/White A   Black/Green B

Caulk the 3 cables using a closed-end wire joint.

Connect the shield wire of RS-485 cable to the terminal block only when the TCS-NET relay interface address SW=1.

CAUTION: RS-485 signals A and B have polarity. Be careful when connecting the RS-485 wires.

RS-485 terminator resistor is set by relay interface of address setting switch SW1=1 only. Set pull-up resistor and pull-down resistor as well. Turn bit 1, 2 and 3 of SW5 ON.

Set the Energy Monitoring Relay Interface address with SW1. Assign 1 to 4 to each address to avoid duplication. You can set the Energy Monitoring Relay Interface address independently from the TCS-NET Relay Interface address or the Digital Input/Output Relay Interface address.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch (SW7) after changing the address.

Set the Digital Input/Output Relay Interface address with SW1. Assign 1 to 4 to each address to avoid duplication. You can set the Digital Input/Output Relay Interface address independently from the TCS-NET Relay Interface address or the Energy Monitoring Relay Interface address.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch (SW7) after changing the address.

Set the TCS-NET Relay Interface address with SW1. Assign 1 to 8 to each address to avoid duplication.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch SW7 after changing the address.

RS-485 terminator resistor is set on TCS-NET Relay Interface side. Bit 1 and 2 of SW8 should be OFF.

CAUTION: Use normal open type contact for Power Meter Input or Digital Input. Normal close type contact cannot be used.

TCC-LINK / U2 U1 FG / SW6 / B A / RS-485 / SW5 / ADDRESS 8 SW1 / N L / Power supply

Outdoor unit / Outdoor unit / U4 U3 / U2 U1 / Indoor unit / Remote controller / Central remote controller

ENERGY MONITORING INTERFACE / SW1 / ADDRESS / N L / Power supply / SW8 / A B / RS-485

DI 1 — Power meter 1
DI 2 — Power meter 2
DI 3 — Power meter 3
DI 4 — Power meter 4
DI 5 — Power meter 5
DI 6 — Power meter 6
DI 7 — Power meter 7
DI 8 — Power meter 8

DIGITAL I/O INTERFACE / SW1 / ADDRESS / N L / Power supply / SW8 / A B / RS-485

DI 1 — Input contact 1
DI 2 — Input contact 2
DI 3 — Input contact 3
DI 4 — Input contact 4
DI 5 — Input contact 5
DI 6 — Input contact 6
DI 7 — Input contact 7
DI 8 — Input contact 8

DO1
DO2
DO3
DO4
GND
+12V

TRIAL OPERATION CHECK

■ Before the test run

Setting file creation

Setting file creation is necessary to use the Master Server or the Web Server.
Selection of whether the Web Server/Gateway (BMS-WB2561PWE) is used as Web Server or Gateway is established by setting file.
Inquiry your dealer for the details of the setting file creation.
Setting file will be write on the Master Server or the Web Server by using its uploader.
IP addresses of the Master Server, the Web Server and the Gateway need to be changed at this point.

In a Web Server System: Upload a setting file to the Web Server
In a Master Server System: Upload a setting file to the Master Server

Test run confirmation for the air conditioner

Complete a test run confirmation for the air conditioner.

■ Test run

Turn on the power of the Web Server, the Master Server and the Gateway.

Operation	Summary of operation		Note
Operation confirmation	1) Operation confirmation for the Master Server, the Web Server and the Gateway.		
	Master Server	L1 and L2 (red) light RN (green) light	
	Web Server, Gateway.	L1 and L2 (red) blink RN (green) light	
	2) Operation confirmation for the interfaces.		
	TCS-NET Relay IF	LED2 (green) LED3 (orange) blink	
	Energy Monitoring Relay IF	LED2 (green) blink Confirmation for input pulse from the power meter.	
	Digital I/O Relay IF	LED2 (green) blink Confirmation for fire alarm input and electronic lock input.	
	3) Set up client PC's network connection. (Refer to "NETWORK CONFIGURATION GUIDE".) Once the setup is done, access to the Master Server or the Web Server by web browser on the client PC, and display the logon screen. *Cannot access to the Server right after booting. Wait 5 minutes and access to the Server.		

	4) Enter user name and password on the logon screen to log on.
	Factory default: User name (TCC), Password (TCCTCC)
	  * It cannot be logged on immediately after booting.
	      Wait approximately 20 minutes and enter user name and password.
			Refer to the Owner's Manual of the Web Based Controller for the details.

	5) Air conditioner setting change confirmation Start and stop the air conditioner with a client PC and confirm that the air conditioner will start and stop.		
	6) Air conditioner status display confirmation Change the operation status or the setting status of the air conditioner with its remote controller and confirm that its status will be displayed correctly on the client PC monitor.		

■ Data backup setting

Data of the Master Server or the Web Server can be backup by using a BackUp Software for Web Based Controller.
Refer to the Owner's Manual of the BackUp Software for the details.

NETWORK CONFIGURATION GUIDE

<table>
<tr><td>🚫
Prohibited</td><td>**Never connect the Server to the Internet.**
We assume no responsibility for any problems resulting from connection to the Internet.
Only local area connection is allowed for the Server.</td></tr>
</table>

This guide describes the setting procedure for connecting the *Master (Web) Server to your personal computer (abbreviated to "PC" hereinafter) via the network.

PC operation to monitor and control air conditioners is detailed in the Owner's Manual.

*: Read as "Master Server" for Master Server System and "Web Server" for Web Server System

1. System Configuration of PC

The PC to be connected must meet the following system configuration conditions so that the *Master (Web) Server operates normally.

<Operating system>
- Microsoft Windows XP
- Microsoft Windows Vista

<Hardware>
- Screen resolution 1024 × 768 pixels or more

<Browser>
- Internet Explorer version 6.0 or version 7.0

2. Connecting LAN Cable

Connect the LAN cable to the connector LAN3 of the *Master (Web) Server.

LAN3
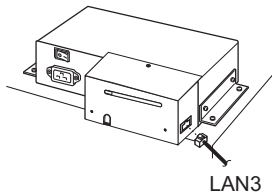
NOTE

Inquiry the network administrator when it is used in a company LAN.

The followings are the setting procedure when it is used in local network.

3. Client PC Settings

3-1. Setting IP Address
<Windows XP>

1) Log on to the system with the PC administrator's account.
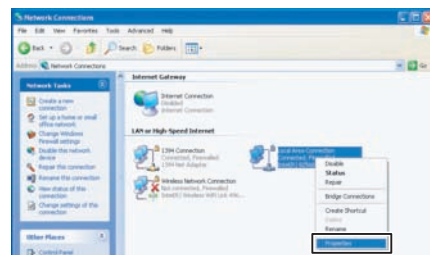
2) Click [Start] -> [Control Panel]. (Fig.1)

   Fig.1

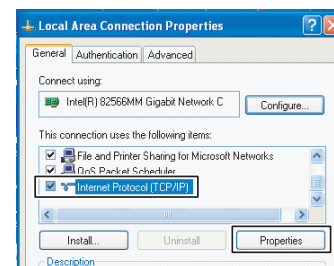(3) Click [Network Connections]. (Fig.2)

   Fig.2

4) Right-click [Local Area Connection] and choose "Properties" from the contextual menu. (Fig.3)
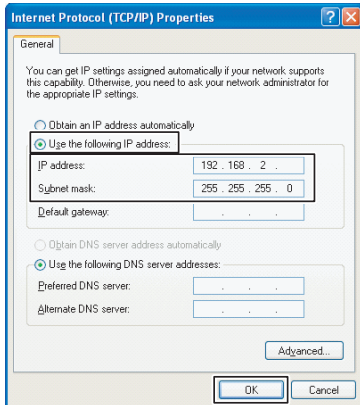
   Fig.3

5) Select the "Internet Protocol (TCP/IP)" checkbox, and click [Properties]. (Fig.4)

   Fig.4

6) Select the "Use the following IP address:" radio button, and set as follows:
IP address: 192.168.2.*** (***: must be other than 99.)
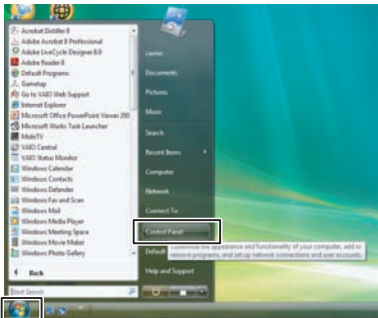Subnet mask: 255.255.255.0
Then click [OK]. (Fig.5)
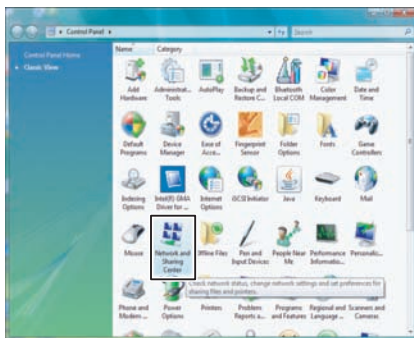**Fig.5**

7) Close all the windows.

<Windows Vista>

1) Log on to the system with the PC administrator's account.
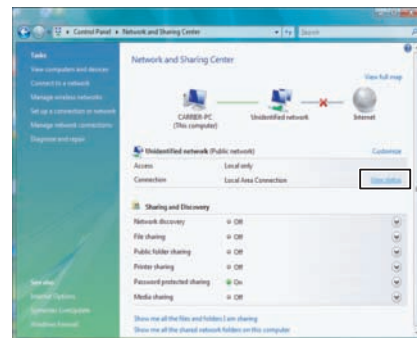2) Click [Start] -> [Control Panel]. (Fig.1)
Fig.1

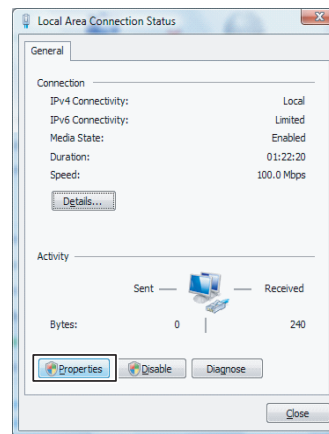
3) Click [Network and Sharing Center]. (Fig.2)
Fig.2

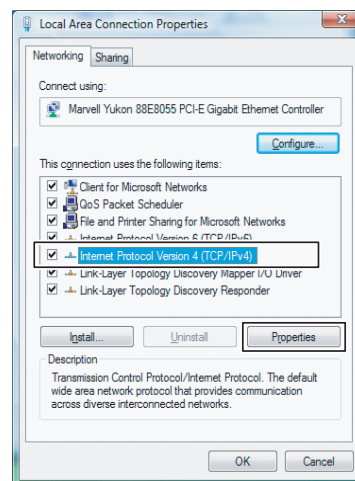4) Click "View status" of Local Area Connection. (Fig.3)
Fig.3

5) Click [Properties] in the Local Area Connection Status window. (Fig.4)
Fig.4

6) Select the "Internet Protocol Version 4 (TCP/IPv4)" checkbox, and click [Properties]. (Fig.5)
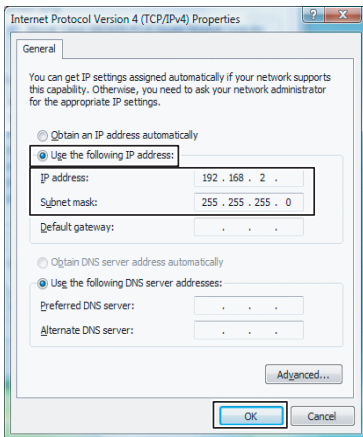**Fig.5**

7) Select the "Use the following IP address:" radio button, and set as follows:
IP address: 192.168.2.*** (***: must be other than 99.)
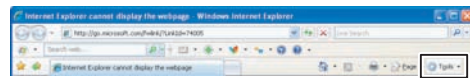Subnet mask: 255.255.255.0.
Then click [OK]. (Fig.6)

Fig.6

8) Close all the windows.
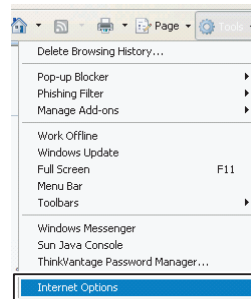
3-2. Setting Browser

<Internet Explorer>

1) Start Internet Explorer.
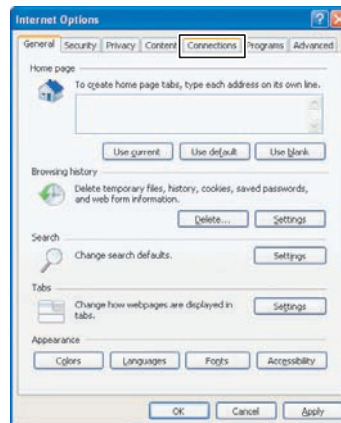2) Click [Tools] on the toolbar. (Fig.1)

Fig.1

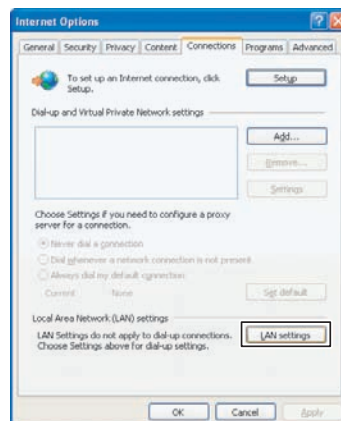3) Choose "Internet Options" from the pull-down menu. (Fig.2)

Fig.2

4) Click the "Connections" tab. (Fig.3)
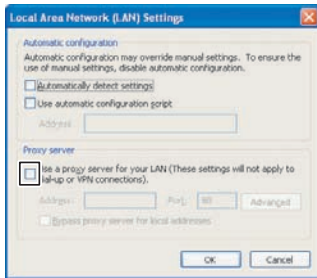
Fig.3

5) Click [LAN settings]. (Fig.4)

Fig.4

541

6) Clear the "Use a proxy server for your LAN" checkbox (Fig.5) or select the "Bypass proxy server for local addresses" checkbox (Fig.6), and then click [Advanced].

Fig.5

Fig.6

Add "192.168.2.99:8080" to the "Do not use proxy server for addresses beginning with:" field.

Fig.7

7) Type "http://192.168.2.99:8080/AirCon5/jsp/login.jsp" in the address bar to connect the PC to the air conditioning control system for Web Based Controller.

Fig.8

http://192.168.2.99:8080/AirCon5/jsp/login.jsp

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4-8-8 BMS-LSV4E Installation Manual

Introduction

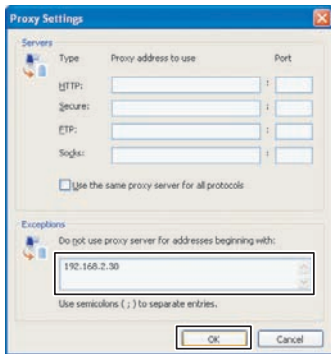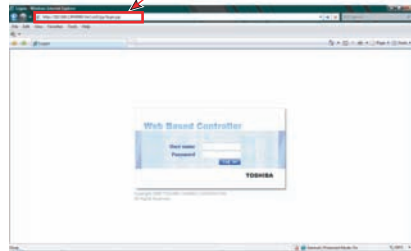## ■ Applications/Functions/Specifications

Applications
- The TCS-NET Relay Interface is used to connect air conditioners (with TCC-LINK installed) to the air conditioner control system or BACnet system.

Functions
- The TCS-NET Relay Interface converts signals between TCC-LINK and RS-485.

Specifications

Power supply	220 - 240 VAC, 50/60 Hz
Current	18 mA
Power consumption	2.4 W
Operating temperature/humidity	0 to 40 °C, 10 to 90% RH (no condensation)
Storage temperature	-20 to +60 °C
Chassis material	Galvanized sheet metal 0.8t (no coating)
Dimensions	66 (H) x 170 (W) x 200 (D) mm
Mass	1 kg

■ External View
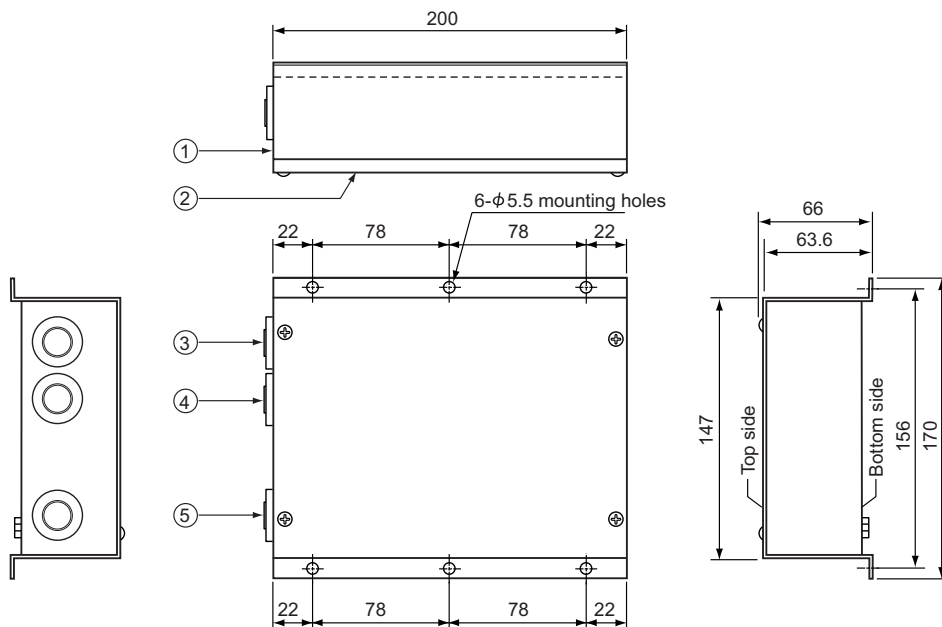
	Parts name	Specifications
1	Case	Galvanized sheet metal
2	Case lid	Galvanized sheet metal
3	Grommet	C30-SG20A
4	Grommet	C30-SG20A
5	Grommet for power supply	C30-SG20A

Before Installation

Check the following package contents.

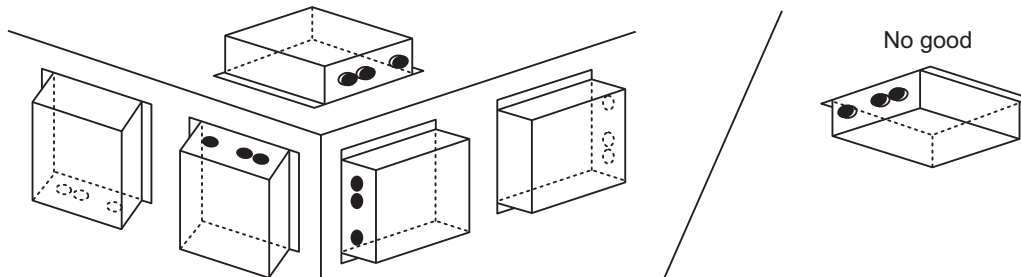| No.	Item	Quantity	Remarks
1	TCS-NET Relay Interface	1	
2	Installation Manual	1	
3	Screw	4	M4 x 12mm tapping screws
4	Leaflet (Caution for exchanging product)	1	

Use the following wiring materials to connect the signal lines and power lines. (Procured on site)

No.	Line	Description	
1	For TCC-LINK	Type	2-core shield wires
		Wire size	1.25 mm^2, 1000m max.
		Length	2.00 mm^2, 2000m max. (total length including air conditioner area)
2	For RS-485	Type	2-core shield wires
		Wire size	1.25 mm^2, 500m max. (total length)
		Length	
3	For power	Type	H07 RN-F or 245IEC66
		Wire size	0.75mm^2, 50 m max.

Installation

■ TCS-NET Relay Interface Installation Method and Orientation

There are five installation methods for this relay interface as shown below: surface mount and wall mounts. Use the attached screws.

No good

REQUIREMENT

Do not install the unit in any of the following places.
- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

■ Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100mm

100mm

Connection of Power cables/Earth wires/Signal wires

⚠ CAUTION

- The RS-485 signal lines have polarity. Connect A to A, and B to B. If connected with incorrect polarity, the unit will not work.
- The TCC-LINK signal lines have no polarity.

■ Power cables/Earth wires/Signal wires

Connect power cables, earth wires, and signal wires to the specified terminals on the terminal block.
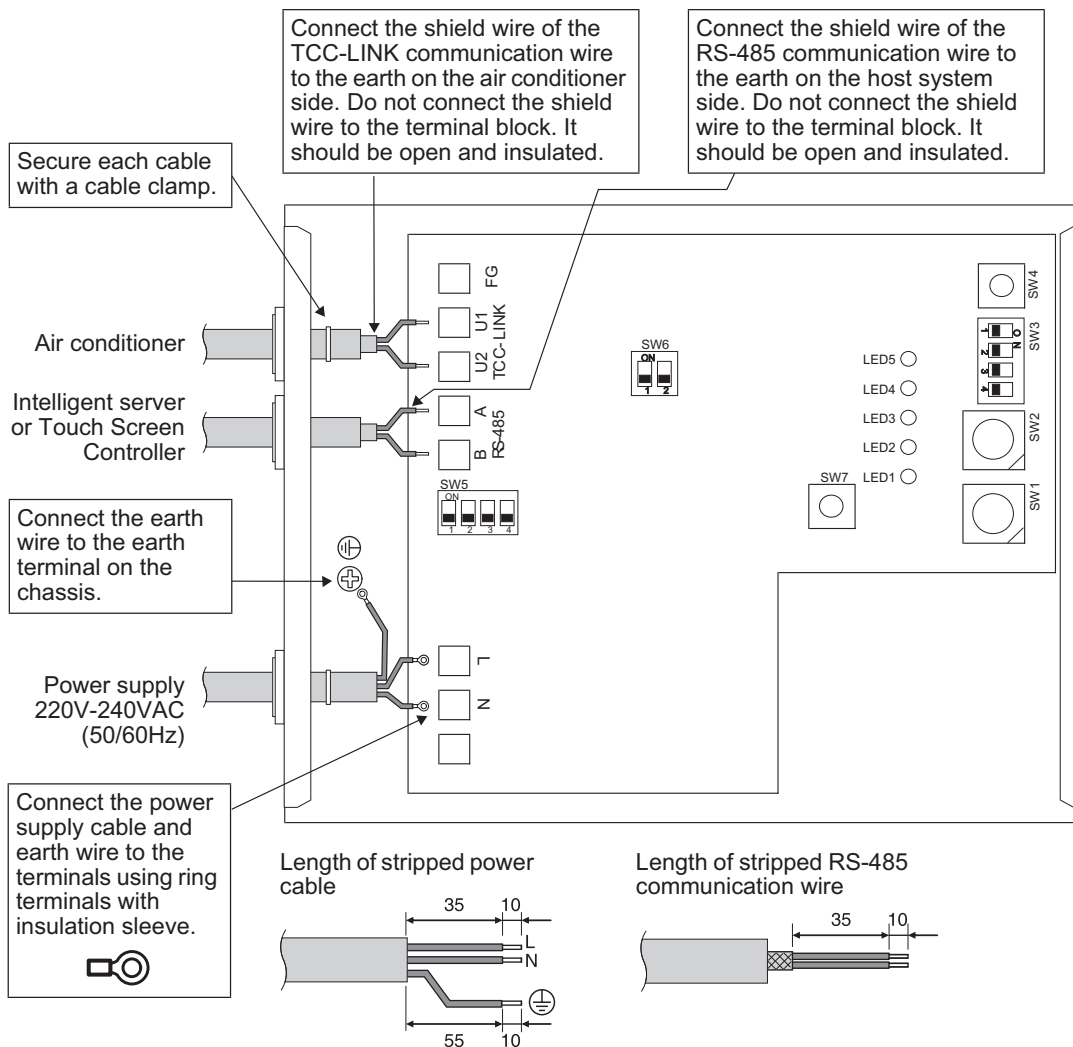
Connect the shield wire of the TCC-LINK communication wire to the earth on the air conditioner side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Connect the shield wire of the RS-485 communication wire to the earth on the host system side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Secure each cable with a cable clamp.

Air conditioner

Intelligent server or Touch Screen Controller

Connect the earth wire to the earth terminal on the chassis.

Power supply 220V-240VAC (50/60Hz)

Connect the power supply cable and earth wire to the terminals using ring terminals with insulation sleeve.

Length of stripped power cable
35 10
L
N
55 10

Length of stripped RS-485 communication wire
35 10

REQUIREMENT

Disconnect the appliance from the main power supply.

This appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3mm.

Fasten the screws to the terminal with torque of 0.5Nm.

■Wiring Connection

The following describes a connection example when using two or more TCS-NET Relay Interface units.
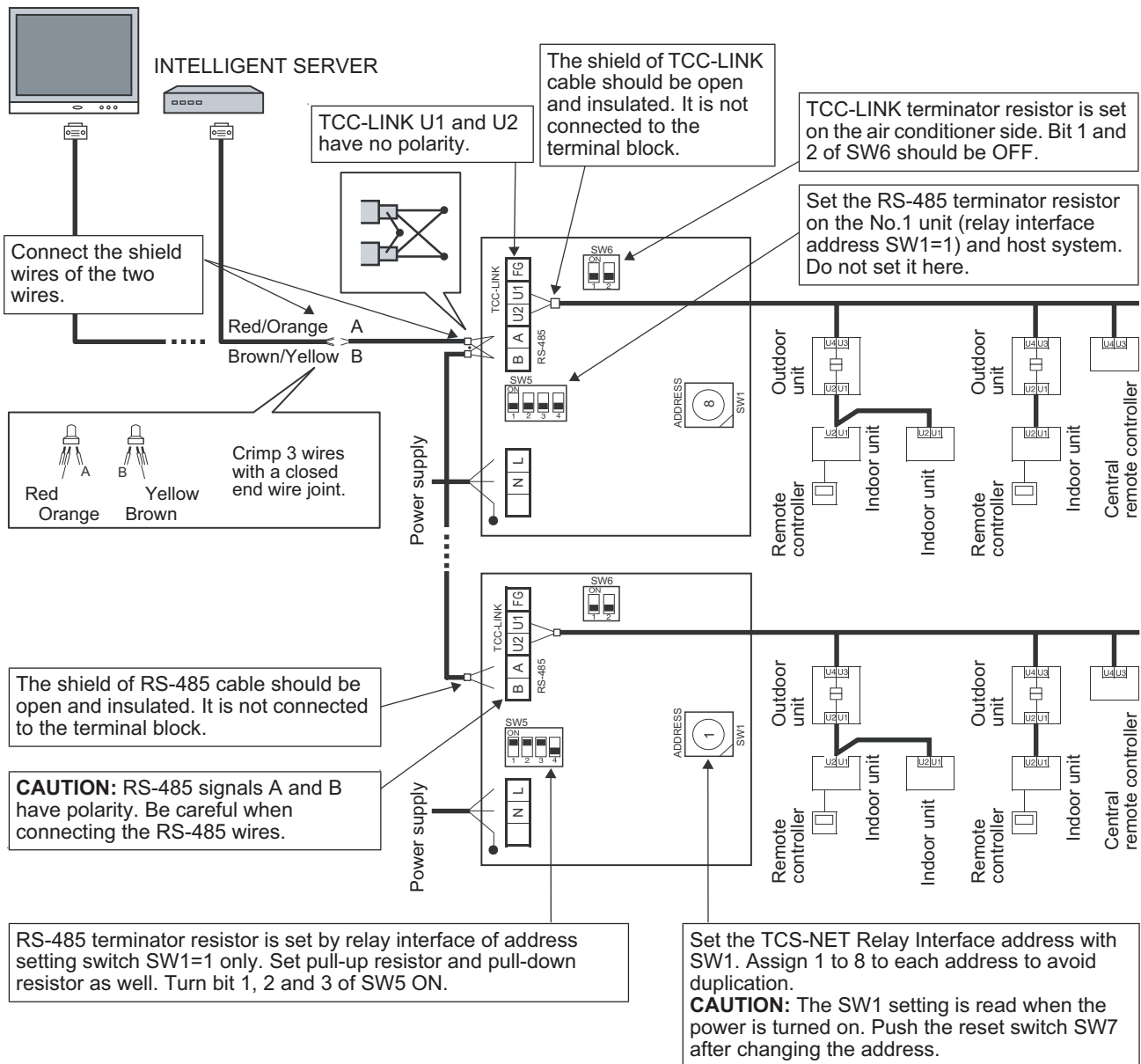
Terminator resistor setting (See "Setting" for the setting method.)
- Set the RS-485 terminator resistor to "Resistor set (120 ohm)" for No.1 (relay interface address SW1=1) TCS-NET Relay Interface unit, and set to "open" for other units.
- Set the TCC-LINK terminator resistor to "open" as it is set on the air conditioner side.

Shield earthing
- The shield of RS-485 signal wires should be connected at closed end, and the terminal end should be open and insulated. The shield earth of the RS-485 signal wires should be single-point earth at the host system.
  The shield earth of the RS-485 signal wires should be single-point earth.
- The shield of TCC-LINK signal lines should be connected at the closed end, and the TCS-NET Relay Interface terminal end should be open and insulated. Earth is connected on the air conditioner side.

TOUCH SCREEN CONTROLLER

INTELLIGENT SERVER

The shield of TCC-LINK cable should be open and insulated. It is not connected to the terminal block.

TCC-LINK U1 and U2 have no polarity.

TCC-LINK terminator resistor is set on the air conditioner side. Bit 1 and 2 of SW6 should be OFF.

Set the RS-485 terminator resistor on the No.1 unit (relay interface address SW1=1) and host system. Do not set it here.

Connect the shield wires of the two wires.

Red/Orange A
Brown/Yellow B

Red Yellow
Orange Brown

Crimp 3 wires with a closed end wire joint.

Power supply

The shield of RS-485 cable should be open and insulated. It is not connected to the terminal block.

CAUTION: RS-485 signals A and B have polarity. Be careful when connecting the RS-485 wires.

RS-485 terminator resistor is set by relay interface of address setting switch SW1=1 only. Set pull-up resistor and pull-down resistor as well. Turn bit 1, 2 and 3 of SW5 ON.

Set the TCS-NET Relay Interface address with SW1. Assign 1 to 8 to each address to avoid duplication.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch SW7 after changing the address.
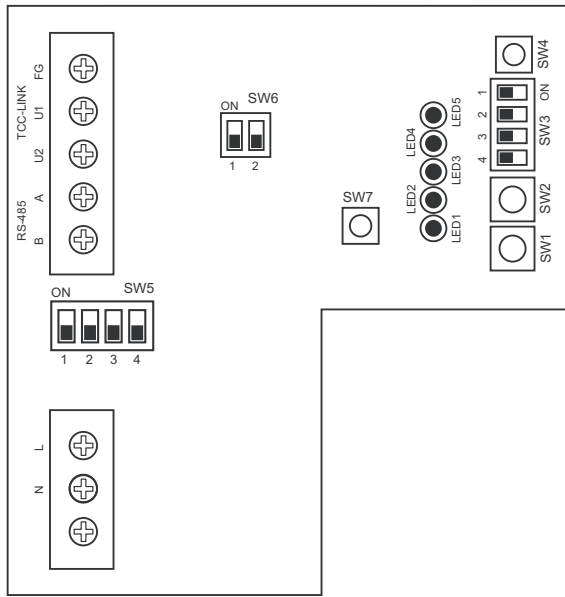
Setting

The following settings are necessary to use TCS-NET Relay Interface.
- SW1 TCS-NET Relay Interface address set switch
  When two or more TCS-NET Relay Interface are used, set a different address for SW1 to avoid address duplication.
  Assign addresses in an ascending order.

⚠ CAUTION

- **Set relay interface addresses according to the air conditioner address table.**
  For the relay interface whose address SW1=1, perform terminator resistor setting.
- **When the SW1 setting has been changed, push the reset switch SW7. The new address setting is read.**

- SW2 Test switch
- SW3 Test switch
- SW4 Test switch
  Not used during operation.
  Set these switches to zero (0) or "all OFF".
- SW5 RS-485 terminator resistor select switch
  Set "Resistor set (120 ohm)" only when the relay interface address SW=1, and set "open" for other relay interfaces.

- SW6 TCC-LINK terminator resistor select switch
  The TCC-LINK terminator resistor is set on the air conditioner side. Set SW6 to "open".
- SW7 Reset switch
  When performing an address setting with SW1, push this reset switch after the address setting to read the set value.

SW1	Relay interface address set switch		
	1-8	Relay interface address	
	0, 9-F	Not used	
SW2	Test switch (0 usually)		
SW3	Test switch (all OFF usually)		
SW4	Test switch		
SW5	RS-485 terminator resistor select switch		
	Resistor Set	Open	Bit1: pull-up resistor select. Bit2: pull-down resistor select. Bit3: terminator resistor select. Bit4: terminator resistor select.
SW6	TCC-LINK terminator resistor select switch		
	100 ohm	Open	Note:Bit 2 is not used.
SW7	Reset switch		
LED1	Power indicator		
LED2	RS-485 communication status indicator		
LED3	TCC-LINK Communication status indicator		
LED4	TCC-LINK Communication error indicator		
LED5	Test indicator		

REQUIREMENT

- **RS-485 terminator resistor select switch SW5.**
  Set "Resistor set (120 ohm)" (bit1, 2, 3 ON) only when the TCS-NET Relay Interface address SW=1, and set "open" for other relay interfaces.
- **The TCC-LINK terminator resistor is set on the air conditioner side. Set SW6 to "open".**

Trial Operation Check

■ Before starting trial operation

Complete the air conditioner trial operation.
Turn on the power of the TCS-NET Relay Interface after all cable connections and settings are completed.
Then turn on power of the Touch Screen Controller or intelligent Server.

■ Trial operation

Check the TCC-LINK and RS-485 communication status of the TCS-NET Relay Interface by checking the blinking of the LEDs.

⚠ CAUTION

For the operation check of the Touch Screen Controller, refer to the Touch Screen Controller Installation Manual.

LED		Normal operation	Abnormal operation
LED1	Power indicator	ON	OFF
LED2	RS-485 communication status indicator	Blinking	OFF
LED3	TCC-LINK communication status indicator	Blinking	OFF
LED4	TCC-LINK communication error indicator	OFF	ON
LED5	TEST indicator	OFF	ON

LED1 Power indicator
    ON: While power is on
    OFF: When power is not turned on
LED2 RS-485 communication status indicator
    Blinking: When RS-485 communication with the host system is normal
    OFF: When RS-485 communication with the host system is disabled
LED3 TCC-LINK communication status indicator
    Blinking: When TCC-LINK communication with any of the air conditioners is normal
    OFF: When TCC0-LINK communication with all air conditioners is disabled
LED4 TCC-LINK communication error indicator
    ON: While TCS-NET Relay Interface cannot send signals due to busy communication on the air conditioner side. This status is temporary. This LED turns OFF after a while and communication will restart.
    OFF: When communication of the air conditioner side is not busy
LED5 Test indicator
    Not used in normal operation
    Displayed only in the test mode

Trademarks

• BACnet is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.).

4-8-9 BMS-IFDD03E Installation Manual

Introduction

Applications/Functions/Specifications

• Applications

The Digital Input/Output Relay Interface is used to control air conditioners by interlocking them with electric lock signals and fire alarm signals, and to transmit air conditioner failures to other devices.

• Functions

The Digital Input/Output Relay Interface connects non-voltage contact signals, transmits their input status to the Touch Screen Controller, and outputs signals from the contacts (open collector) according to the command from the Touch Screen Controller.

• Specifications

Power supply	220 - 240 V, AC 50/60 Hz
Power consumption	6.5 W
Operating temperature/ humidity	0 to 40 °C, 10 to 90% RH
Storage temperature	-20 to +60 °C
Chassis material	Galvanized sheet metal 0.8t (no coating)
Dimensions	66(H) x 193(W) x 246(D) mm
Mass	1.65 kg

Digital input	Input type	Photo-coupler insulation
	Input points	8 points
	Input registance	9 k ohm
	Input "ON" current	1 mA
Digital output	Output type	Open collector
	Output points	4 points
	Output current	Max. 35 mA (per point)
	Output voltage	Less than DC 24V
External power supply for Input/Output		DC 12 V, 120 mA

External View
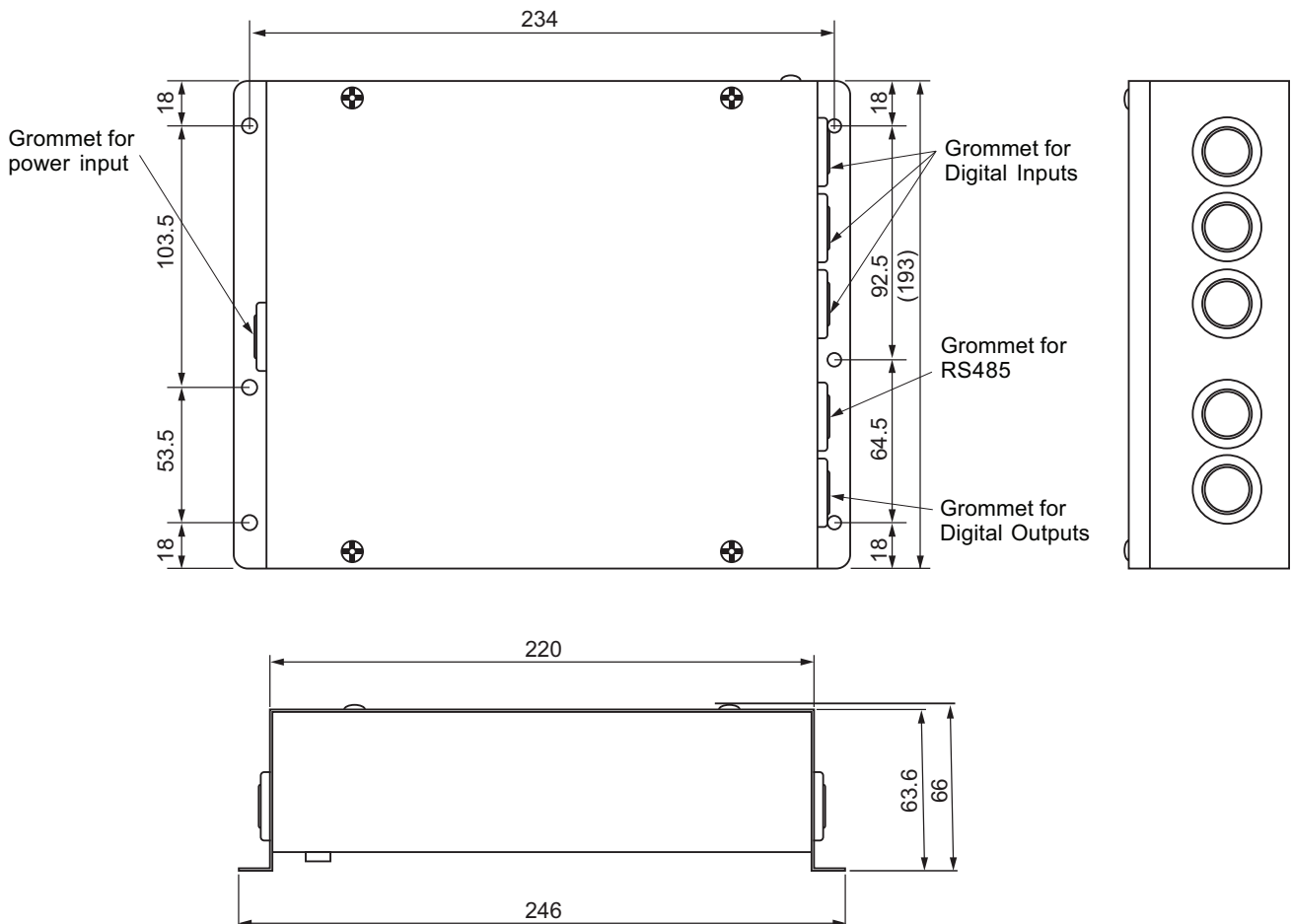
Before Installation

Check the following package contents.

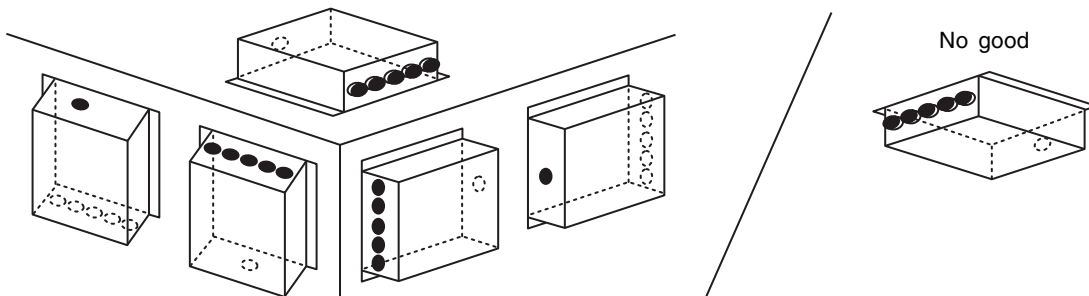| No.	Item	Quantity	Remarks
1	DIGITAL INPUT/OUTPUT RELAY INTERFACE	1	
2	Installation Manual	1	
3	Screw	4	M4 x 12mm tapping screws
4	Pin terminal	2	

Use the following wiring materials to connect signal lines and power lines. (Procured on site.)

No.	Line	Description	
1	For RS-485	Type	2-core shield wire
		Wire size	1.25mm^2, 500m max. (total length)
		Length	
2	For digital Input/Output connection	Type	2-core wire, 0.3mm^2, 100m max.
		Wire size	
		Length	
3	For power	Type	H07 RN-F or 245IEC66
		Wire size	0.75mm^2, 50 m max.

Installation

Digital Input/Output Relay Interface Installation Method and Orientation

There are five installation methods for this relay interface as shown below, surface mount or wall mount. Use the attached screws.
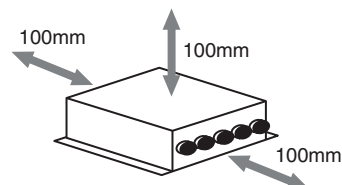

No good

REQUIREMENT

Do not install the unit in any of the following places.
- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100mm
100mm
100mm

⚠ **CAUTION**

The RS-485 signal wire has polarity. Connect A to A, and B to B. If connected with incorrect polarity, the unit will not work.
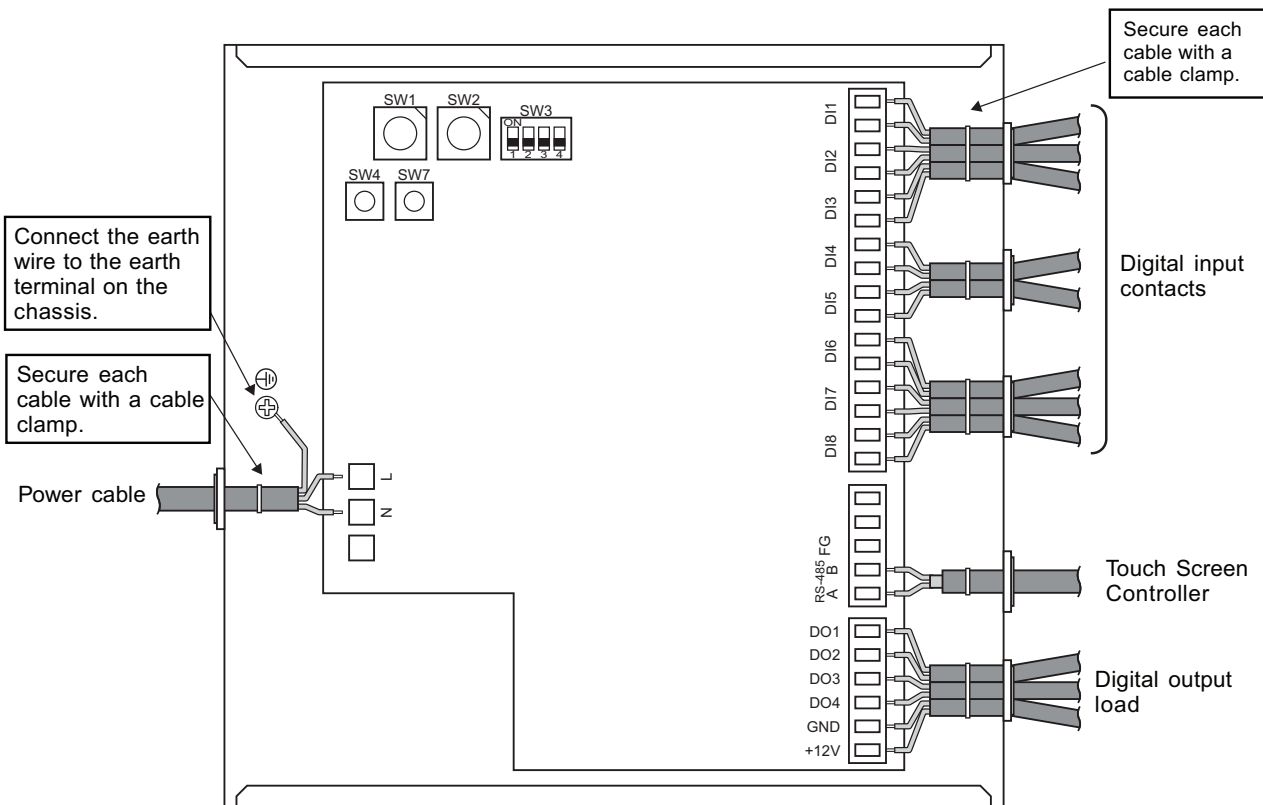
REQUIREMENT
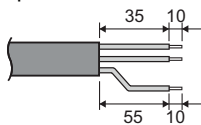
Disconnect the appliance from the main power supply.
This appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3mm.
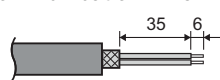
Power cables/Earth wires/Signal wires

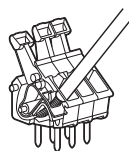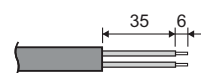Connect power cables, earth wires, and signal wires to the specified terminals on the terminal block.

Secure each cable with a cable clamp.

Connect the earth wire to the earth terminal on the chassis.

Secure each cable with a cable clamp.

Power cable

Digital input contacts

Touch Screen Controller

Digital output load

Length of stripped power cable

35 10
55 10

Length of stripped communication wire

35 6

Length of stripped digital Input/Output connector wire

35 6

Insert the wire by pushing the lever with a screwdriver. Check that the wire is inserted securely.

When inserting two RS-485 communication cables into a single terminal for connection to another interface, crimp them using the attached pin terminal.

⚠ CAUTION

If an inductive load (relay coil) or a bulb is connected, a surge voltage or rush current will be generated. Take adequate measures against surge voltage or rush current.

The following describes wiring connections of the Digital Input/Output Relay Interface when it is used in the air conditioner control system.

• Terminator resistor setting

Set the RS-485 terminator resistor by the TCS-NET Relay Interface.
Do not set it by the Digital Input/Output Relay Interface.

• Shield earthing

The shield earth of the RS-485 signal wires should be single-point earth. Earth the wires on the Touch Screen Controller.
Other shield lines should be closed, and the terminal end should be open and insulated.
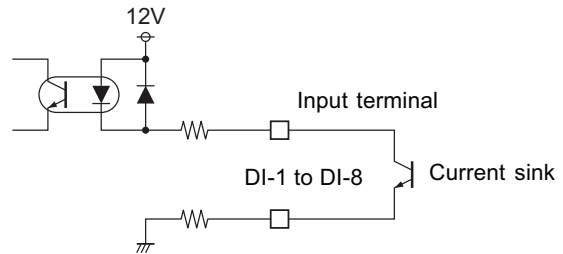
• Connection of external digital inputs

Input circuit examples are shown below (electrically isolated using a photo-coupler).
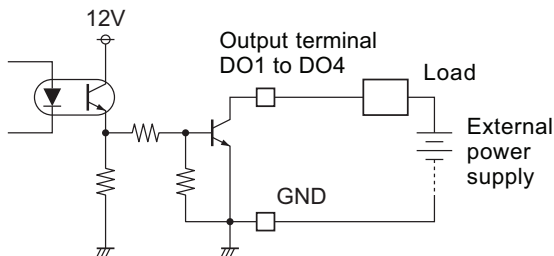
(1) Example of contact input connection
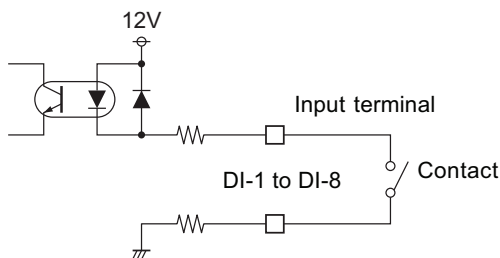
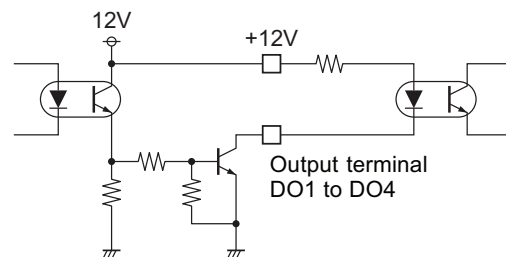(2) Example of current sink connection

• Connection of external digital outputs

Output circuit examples are shown below (open collector output electrically isolated using a photo-coupler).
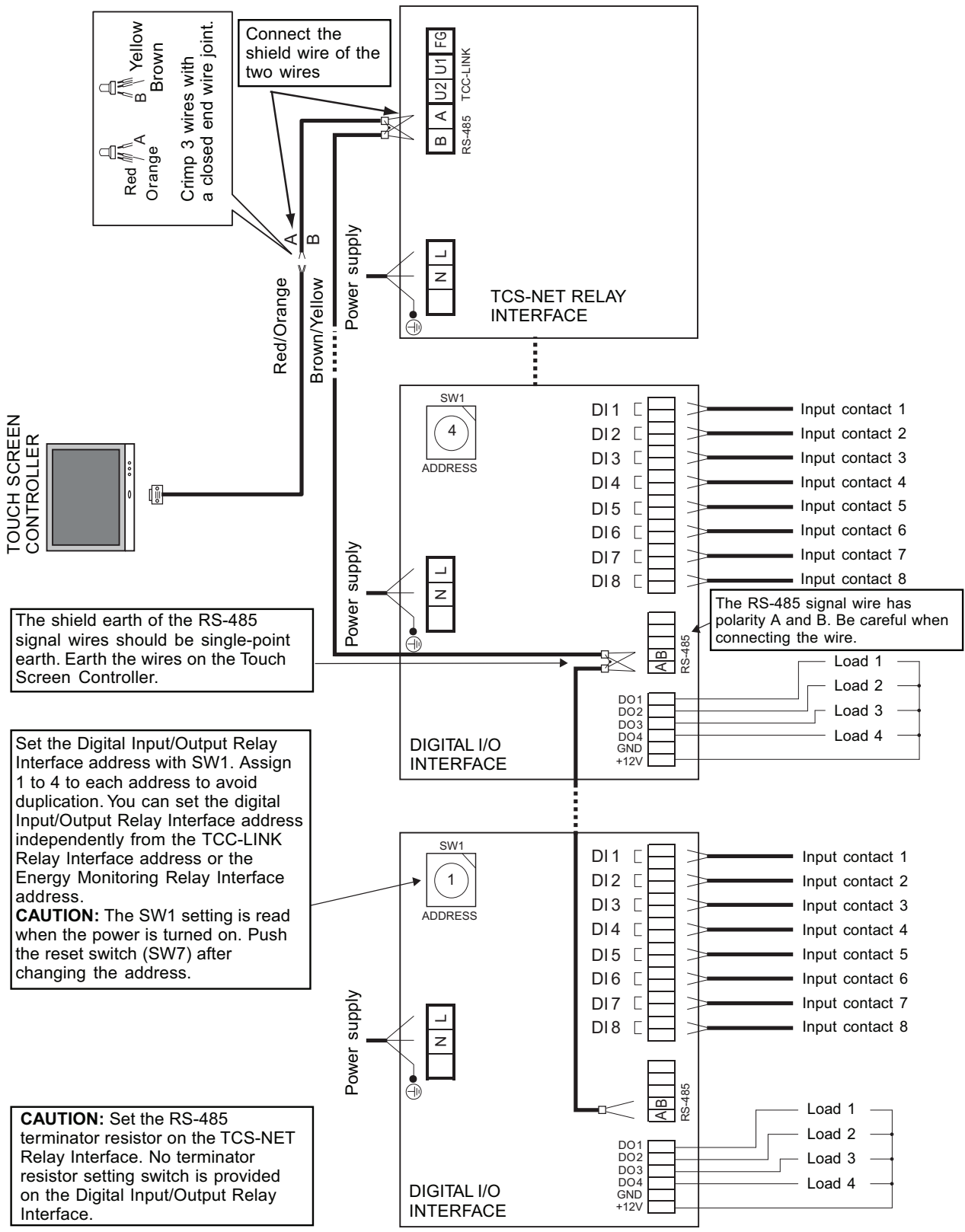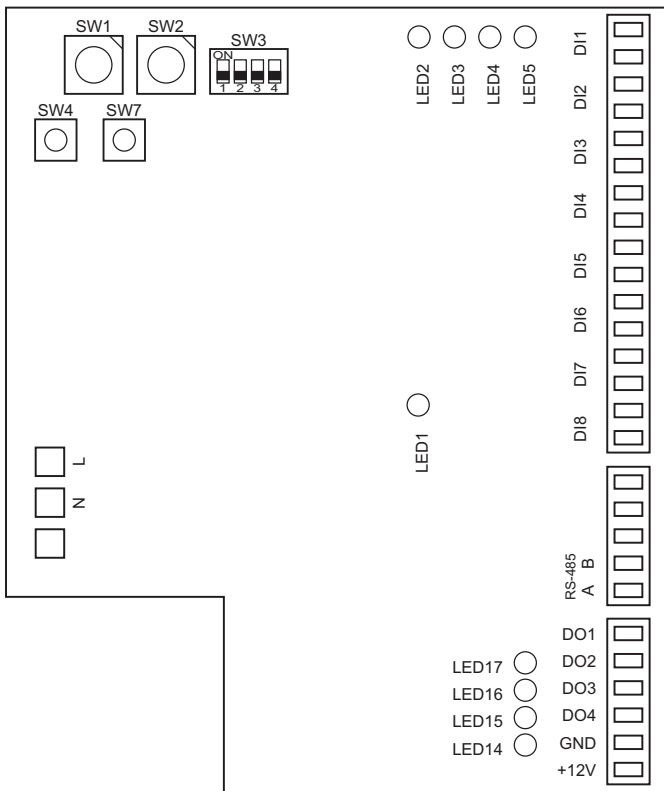
(1) Example of load connection

(2) Example of load connection

Connection diagram

Red
Orange
A
B
Yellow
Brown

Crimp 3 wires with
a closed end wire joint.

Connect the
shield wire of the
two wires

TCC-LINK

B | A | U2 | U1 | FG

RS-485

A
B

Red/Orange

Brown/Yellow

Power supply

N | L

TCS-NET RELAY
INTERFACE

TOUCH SCREEN
CONTROLLER

SW1

4

ADDRESS

Power supply

N | L

DI 1 — Input contact 1
DI 2 — Input contact 2
DI 3 — Input contact 3
DI 4 — Input contact 4
DI 5 — Input contact 5
DI 6 — Input contact 6
DI 7 — Input contact 7
DI 8 — Input contact 8

The shield earth of the RS-485
signal wires should be single-point
earth. Earth the wires on the Touch
Screen Controller.

The RS-485 signal wire has
polarity A and B. Be careful when
connecting the wire.

A | B

RS-485

Load 1
Load 2
Load 3
Load 4

DO1
DO2
DO3
DO4
GND
+12V

DIGITAL I/O
INTERFACE

Set the Digital Input/Output Relay
Interface address with SW1. Assign
1 to 4 to each address to avoid
duplication. You can set the digital
Input/Output Relay Interface address
independently from the TCC-LINK
Relay Interface address or the
Energy Monitoring Relay Interface
address.
CAUTION: The SW1 setting is read
when the power is turned on. Push
the reset switch (SW7) after
changing the address.

SW1

1

ADDRESS

Power supply

N | L

DI 1 — Input contact 1
DI 2 — Input contact 2
DI 3 — Input contact 3
DI 4 — Input contact 4
DI 5 — Input contact 5
DI 6 — Input contact 6
DI 7 — Input contact 7
DI 8 — Input contact 8

A | B

RS-485

CAUTION: Set the RS-485
terminator resistor on the TCS-NET
Relay Interface. No terminator
resistor setting switch is provided
on the Digital Input/Output Relay
Interface.

Load 1
Load 2
Load 3
Load 4

DO1
DO2
DO3
DO4
GND
+12V

DIGITAL I/O
INTERFACE

SW1	Address set switch	
	1 - 4	Address
	0,5 - F	Not used
SW2	Operating mode set switch (0 usually)	
SW3	Test switch (all OFF usually)	
SW4	Test switch	
SW7	Reset switch	
LED1	Power indicator	
LED2	RS-485 communication status indicator	
LED3	Not used	
LED4	Test indicator	
LED5	Test indicator	
LED14 - LED17	Digital output indicator	

The following settings are necessary to use Digital Input/Output Relay Interfaces.

- SW1   Address set switch
  When two or more Digital Input/Output Relay Interfaces are used, set a different address for each unit to avoid address duplication.
  Assign addresses in ascending order.

⚠ CAUTION

- Set relay interface addresses according to the air conditioner address table.
- When the SW1 setting has been changed, push the reset switch SW7. The new address setting is read.

- SW2   Operation mode set switch
- SW3   Test switch   These switches are not used during normal
- SW4   Test switch   operation. Set zero (0) or "all OFF".
- SW7   Reset switch
  When performing address setting with SW1, push this reset switch after address setting to read the set value.

554

Trial Operation Check

Before starting trial operation

Turn on the power of the Digital Input/Output Relay Interface after all cable connections and settings are completed. Turn on power of the air conditioning control system.

Trial operation

• Confirming external input connection

In the test mode, when the external inputs connected to the input terminals DI-1 to DI-8 are ON, the respective LEDs will goes on so you can confirm the connection.

Confirming procedure:

Set the operation mode switch SW2 to "3", and push the reset switch SW7 to enter the test mode.
Unless SW4 is pushed, the respective input status of DI-1 to DI-4 is indicated by LED2 to LED5.
When SW4 is pushed, the respective input status of DI-5 to DI-8 is indicated by LED2 to LED5.
(*) To return to the normal operation, reset SW2 to "zero (0)" and push SW7.

	LED2	LED3	LED4	LED5
SW4 OFF	Displays DI-1 input status.	Displays DI-2 input status.	Displays DI-3 input status.	Displays DI-4 input status.
SW4 ON	Displays DI-5 input status.	Displays DI-6 input status.	Displays DI-7 input status.	Displays DI-8 input status.

Input ON: LED lights
Input OFF: LED turns off

• Checking external output connection

In the test mode, you can set output terminals DO1 to DO4 to ON or OFF with the test switch. Their output status is indicated by each LED.

Checking procedure:

Set the operation mode switch SW2 to "3" in the same way as the external input check, and then push the reset switch SW7 to enter the test mode.
When the bit of the test switch SW3 is set to ON, the external output turns ON; when set to OFF, the external output turns OFF.
Bits 1 to 4 of SW3 correspond to output terminals DO1 to DO4.
The respective output status of output terminals DO1 to DO4 is indicated by LED14 to LED17.
The LEDs light with the output ON, and goes off with the output OFF.
(*)To return to normal operation, reset SW2 to "zero (0)" and push SW7.

LED14	LED15	LED16	LED17
Displays DO1 output status.	Displays DO2 output status.	Displays DO3 output status.	Displays DO4 output status.

Output ON: LED lights
Output OFF: LED turns off

• Checking the RS-485 communication status

Use LED2 for checking the RS-485 communication status.
When RS-485 communication with Touch Screen Controller is normal, LED2 will blink.

		Normal	**Abnormal**
LED1	Power indicator	ON	OFF
LED2	RS-485 communication status indicator	Blinking	OFF
LED3	Not used	OFF	—
LED4	Test indicator	OFF	—
LED5	Test indicator	OFF	—

4-8-10 BMS-IFWH5E Installation Manual

Introduction

Applications/Functions/Specifications

• Applications

The Energy Monitoring Relay Interface is used to measure and distribute the power of the air conditioner.

• Functions

The interface calculates output power pulses with connected power meters, and then sends the calculation result to the Touch Screen Controller.

• Specifications

Power supply	220 - 240 V, AC 50/60 Hz
Power consumption	2.8 W
Operating temperature/ humidity	0 to 40°C, 10 to 90% RH
Storage temperature	-20 to +60°C
Chassis material	Galvanized sheet metal 0.8t
Dimensions	66(H) x 193(W) x 246(D) mm
Mass	1.65 kg

Power meter input	Input type	photo-coupler insulation
	Input point	8 points
	Input regstance	9 k ohm
	Input "ON" current	1 mA
	Input pulse condition	50 m - 1000 m sec

External View
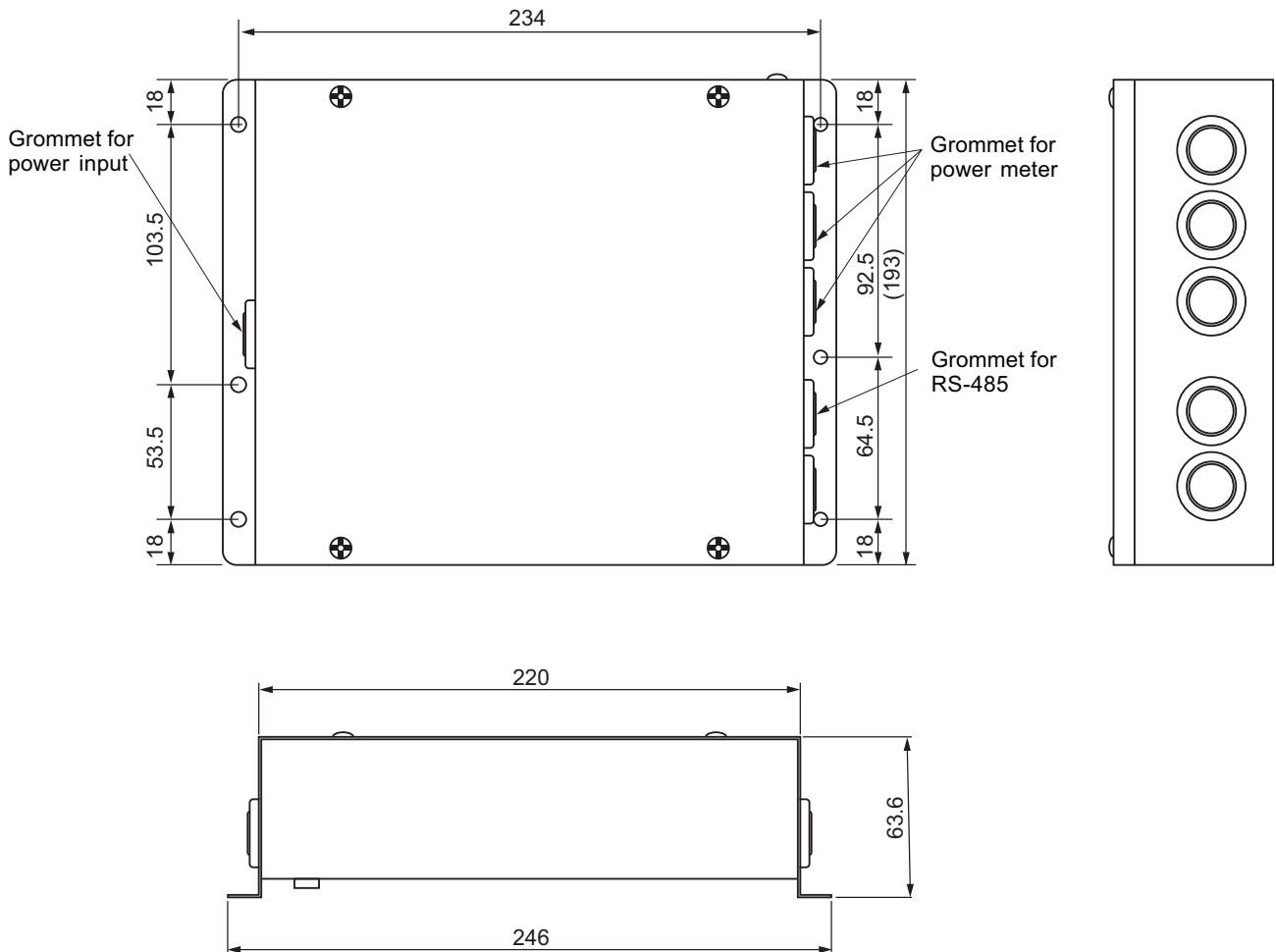
Before Installation

Check the following package contents.

No.	Item	Quantity	Remarks
1	ENERGY MONITORING RELAY INTERFACE	1	
2	Installation Manual	1	
3	Screw	4	M4 x 12mm tapping screws
4	Pin terminal	2	

Use the following wiring materials to connect signal lines and power lines. (Procured on site)

No.	Line	Description	
1	For RS-485	Type	2-core shield wire
		Wire size	1.25 mm^2, 500m max. (total length)
		Length	
2	For connection to power meter	Type	2-core wire
		Wire size	0.3mm^2, 100m max.
		Length	
3	For power	Type	H07 RN-F or 245IEC66
		Wire size	0.75mm^2, 50 m max.

Installation

Energy Monitoring Relay Interface Installation Method and Orientation

There are five installation methods for this relay interface as shown below: surface mount and wall mounts.
Use the attached screws.

No good

REQUIREMENT

Do not install the unit in any of the following places.
• Humid or wet place
• Dusty place
• Place exposed to direct sunlight
• Place where there is a TV set or radio within one meter
• Place exposed to rain (outdoors, under eaves, etc.)

Installation Space and Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects.

100mm

100mm

100mm

557

⚠ CAUTION

The RS-485 signal wire has polarity. Connect A to A, and B to B. If connected with incorrect polarity, the unit will not work.
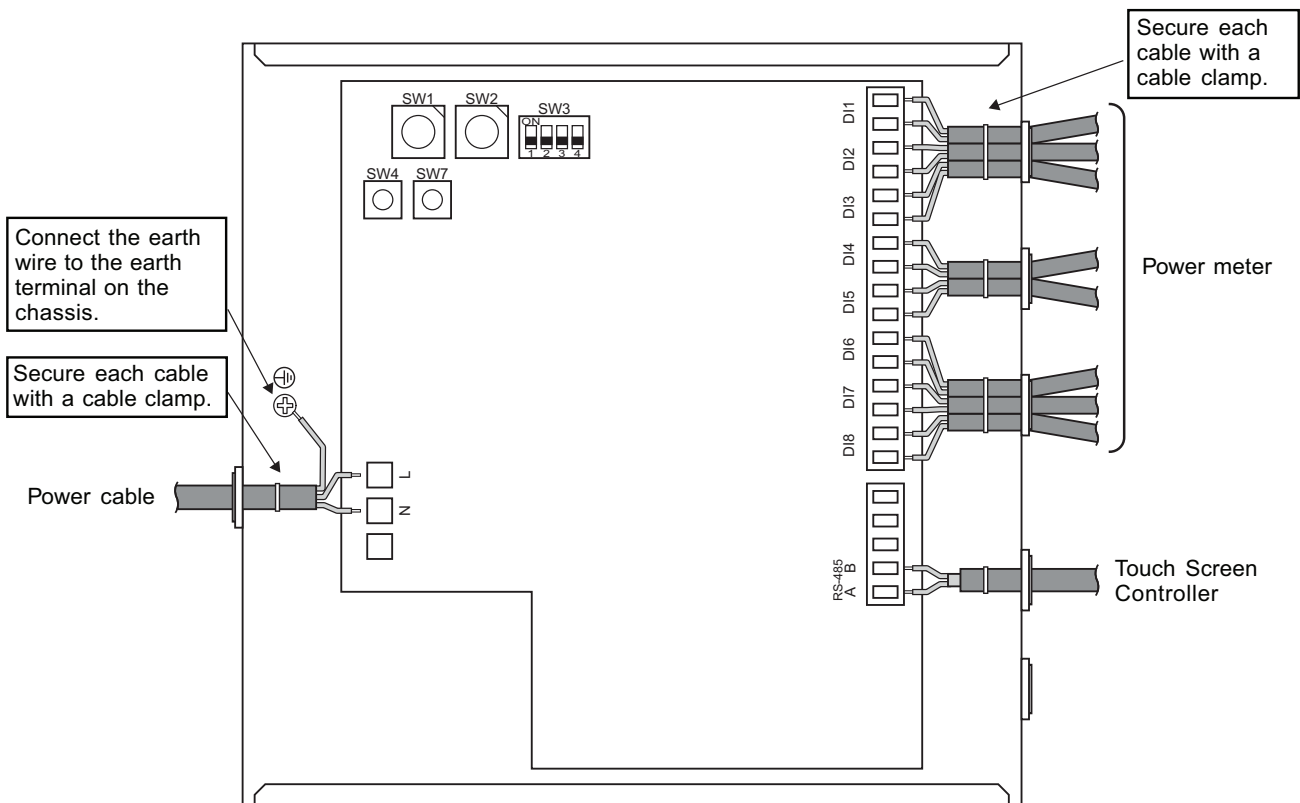

REQUIREMENT

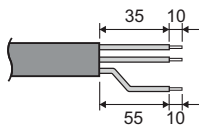**Disconnect the appliance from the main power supply.**
This appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3mm.

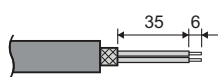## Power cables/Earth wires/Signal wires

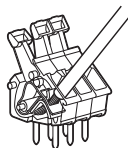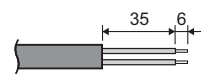Connect power cables, earth wires, and signal wires to the specified terminals on the terminal block.

Secure each cable with a cable clamp.

Power meter

Connect the earth wire to the earth terminal on the chassis.

Secure each cable with a cable clamp.

Power cable

Touch Screen Controller

Length of stripped power cable

35　10
55　10

Length of stripped communication wire

35　6

Length of stripped power meter wire

35　6

Insert the wire by pushing the lever with a screwdriver. Check that the wire is inserted securely.

When inserting two RS-485 communication wires into a single terminal for connection to another interface, crimp them using the attached pin terminal.

Wiring Connection

The following describes wiring connections of the Energy Monitoring Relay Interface when it is used in the air conditioner control system.

• Terminator resistor setting

Set the RS-485 terminator resistor by the TCS-NET Relay Interface.
Do not set it by the Energy Monitoring Relay Interface.

• Shield earthing

The shield earth of the RS-485 signal wires should be single-point earth. Earth the wires on the Touch Screen Controller side.
Other shield lines should be closed, and the terminal end should be open and insulated.

• Connection of power meter

Use a power meter with a pulse generator.
Connect the non-voltage contact output of the power meter to the Energy Monitoring Relay Interface.
An external input circuit is shown below.
Input signal is electrically isolated by photo-coupler.
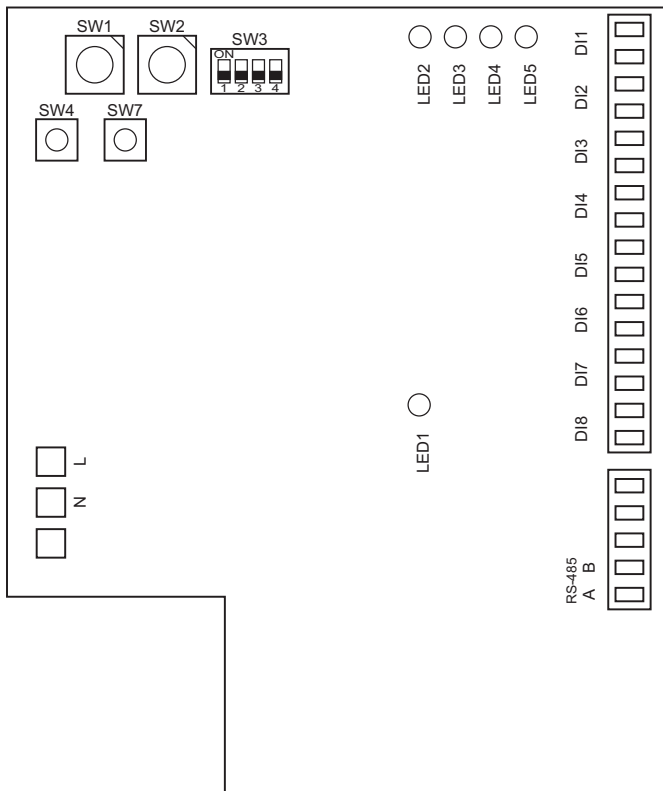
(1) Example of contact input connection

Energy Monitoring Relay Interface

(2) Example of current sink connection

Energy Monitoring Relay Interface

Connection diagram

Red / A Orange
B Yellow Brown

Crimp 3 wires with a close end wire joint.

TOUCH SCREEN CONTROLLER

A
B

Red/Orange
Brown/Yellow

TCS-NET RELAY INTERFACE

B A U2 U1 FG
RS-485 TCC-LINK

Power supply
N L

Connect the respective shield wires of two cables.

Power supply

SW1
4
ADDRESS

Power supply
N L

DI 1 — Power meter 1
DI 2 — Power meter 2
DI 3 — Power meter 3
DI 4 — Power meter 4
DI 5 — Power meter 5
DI 6 — Power meter 6
DI 7 — Power meter 7
DI 8 — Power meter 8

A B
RS-485

ENERGY MONITORING INTERFACE

CAUTION: RS-485 signals A and B have polarity. Be careful when connecting the RS-485 wire.

The shield earth of the RS-485 signal wires should be single-point earth. Earth the wires on the Touch Screen Controller side. Do not earth here.

Set the Energy Monitoring Relay Interface address with SW1. Assign 1 to 4 to each address to avoid duplication. Each interface has its own address and can be set independently.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch after changing the address.

SW1
1
ADDRESS

Power supply
N L

DI 1 — Power meter 1
DI 2 — Power meter 2
DI 3 — Power meter 3
DI 4 — Power meter 4
DI 5 — Power meter 5
DI 6 — Power meter 6
DI 7 — Power meter 7
DI 8 — Power meter 8

A B
RS-485

ENERGY MONITORING INTERFACE

CAUTION: RS-485 signals A and B have polarity. Be careful when connecting the RS-485 wire.

CAUTION: No terminator resistor setting switch is provided on the Energy Monitoring Relay Interface. Set the RS-485 terminator resistor on the TCS-NET Relay Interface.

SW1	Address set switch	
	1 - 4	Address
	0,5 - F	Not used
SW2	Operating mode set switch (0 usually)	
SW3	Test switch (all OFF usually)	
SW4	Test switch	
SW7	Reset switch	
LED1	Power indicator	
LED2	RS-485 communication status indicator	
LED3	Not used	
LED4	Test indicator	
LED5	Test indicator	

The following settings are necessary to use Energy Monitoring Relay Interfaces.

• SW1 Address set switch
  When two or more Energy Monitoring Relay Interfaces are used, set a different address for each unit to avoid address duplication.
  Assign addresses in an ascending order.

⚠CAUTION

• Set relay interface addresses according to the air conditioner address table.
• When the SW1 setting has been changed, push reset switch SW7. The new address setting is read.
• You can set the Energy Monitoring Relay Interface address independently from the TCS-NET Relay Interface address or the Digital Input/Output Relay Interface address.

• SW2 Operation mode set switch
• SW3 Test switch   These switches are not used during normal operation. Set zero (0) or "all OFF".
• SW4 Test switch

• SW7 Reset switch
  When performing a address setting with SW1, push this reset switch after the address setting to read the set value.

Before starting trial operation

Turn on the power of the Energy Monitoring Relay Interface after all wire connections and settings are completed. Turn on power of the air conditioning control system.

Trial operation

• Confirming connection to power meters

In the test mode, when the external inputs connected to the input terminals DI-1 to DI-8 are ON, the respective LEDs will goes on so you can confirm the connection.

Confirming procedure:

Set the operation mode switch SW2 to "3", and push the reset switch SW7 to enter the test mode.

Unless SW4 is pushed, respective input status of DI-1 to DI-4 is indicated by LED2 to LED5.

When SW4 is pushed, respective input status of DI-5 to DI-8 is indicated by LED2 to LED5.

(*) To return to the normal operation, reset SW2 to "zero (0)" and push SW7.

	LED2	LED3	LED4	LED5
SW4 OFF	Displays DI-1 input status.	Displays DI-2 input status.	Displays DI-3 input status.	Displays DI-4 input status.
SW4 ON	Displays DI-5 input status.	Displays DI-6 input status.	Displays DI-7 input status.	Displays DI-8 input status.

Input ON: LED lights
Input OFF: LED turns off

• Checking the RS-485 communication status

Use LED2 for checking the RS-485 communication status.

When RS-485 communication with Touch Screen Controller is normal, LED-2 will blink.

		Normal	Abnormal
LED1	Power indicator	ON	OFF
LED2	RS-485 communication status indicator.	Blinking	OFF
LED3	Not used	OFF	—
LED4	Test indicator	OFF	—
LED5	Test indicator	OFF	—

Part 2

5

DIMENSIONAL DRAWING

Wired remote controller

RBC-AMT32(31)E

120

120

16

Wired remote controller

RBC-AMT21E

4

2.7

120

120

16
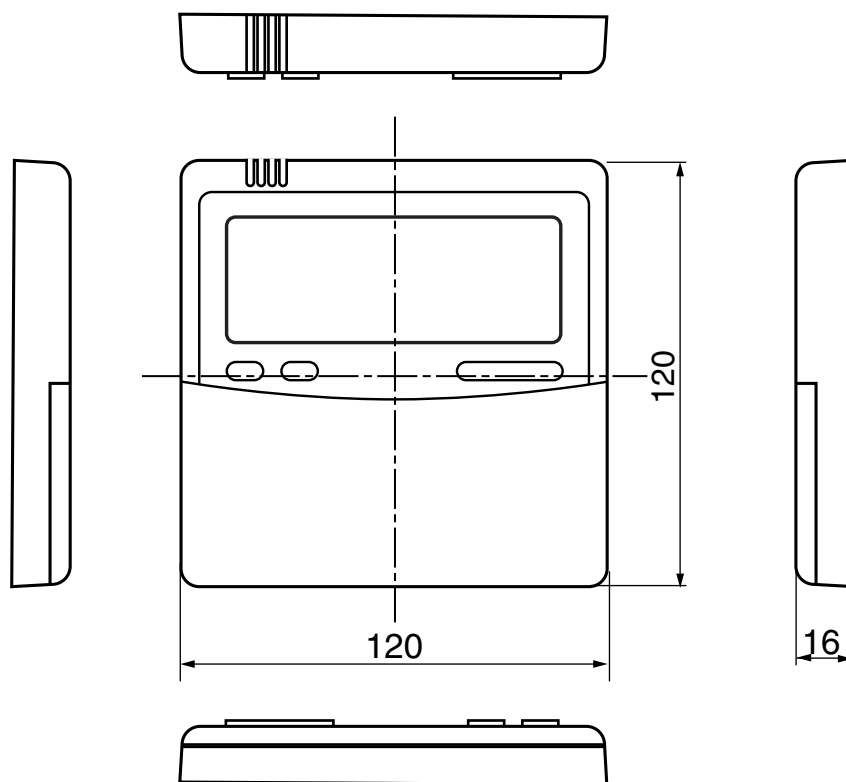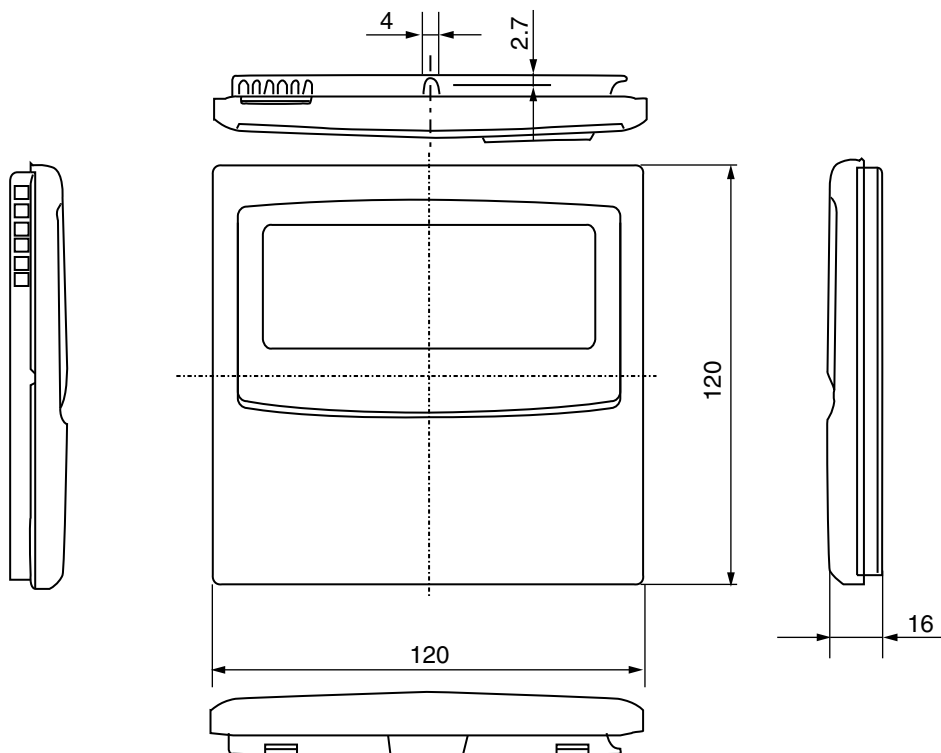
Simple wired remote controller

RBC-AS21E/RBC-AS21E2
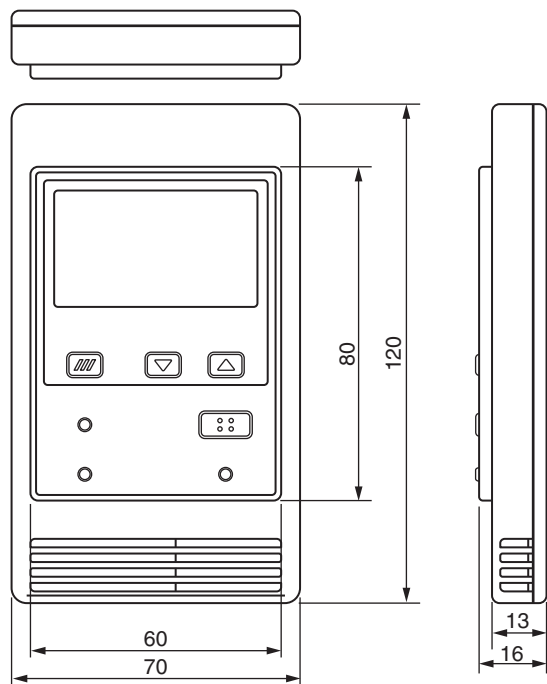
Wireless remote controller kit
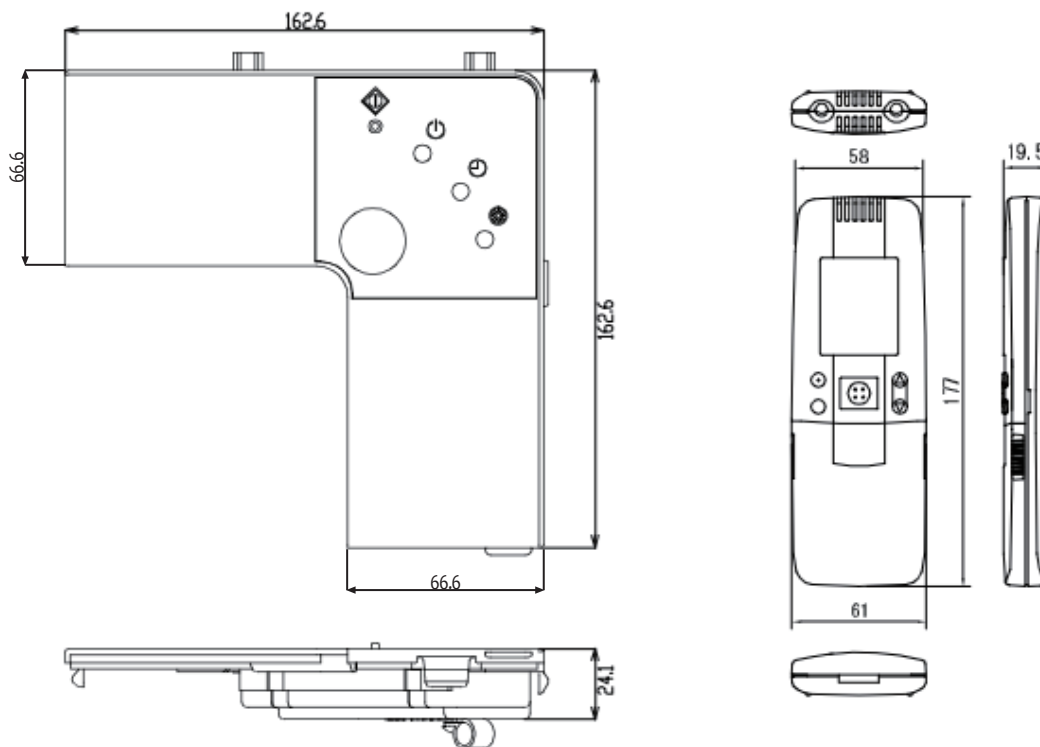
RBC-AX31U(W)-E/RBC-AX31U(WS)-E

Wireless remote controller kit
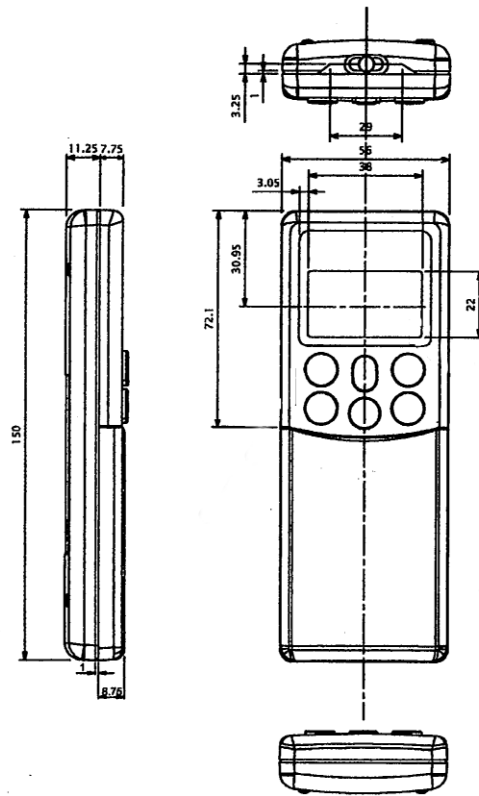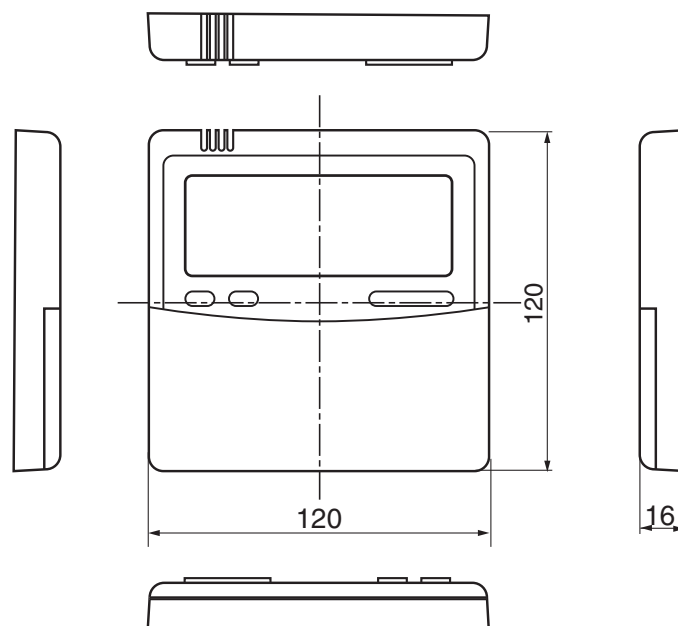
RBC-AX22CE2

Wireless remote controller kit

TCB-AX21E/TCB-AX21E2

4.4 x 9.4 long hole

4.4 x 5.4 long hole
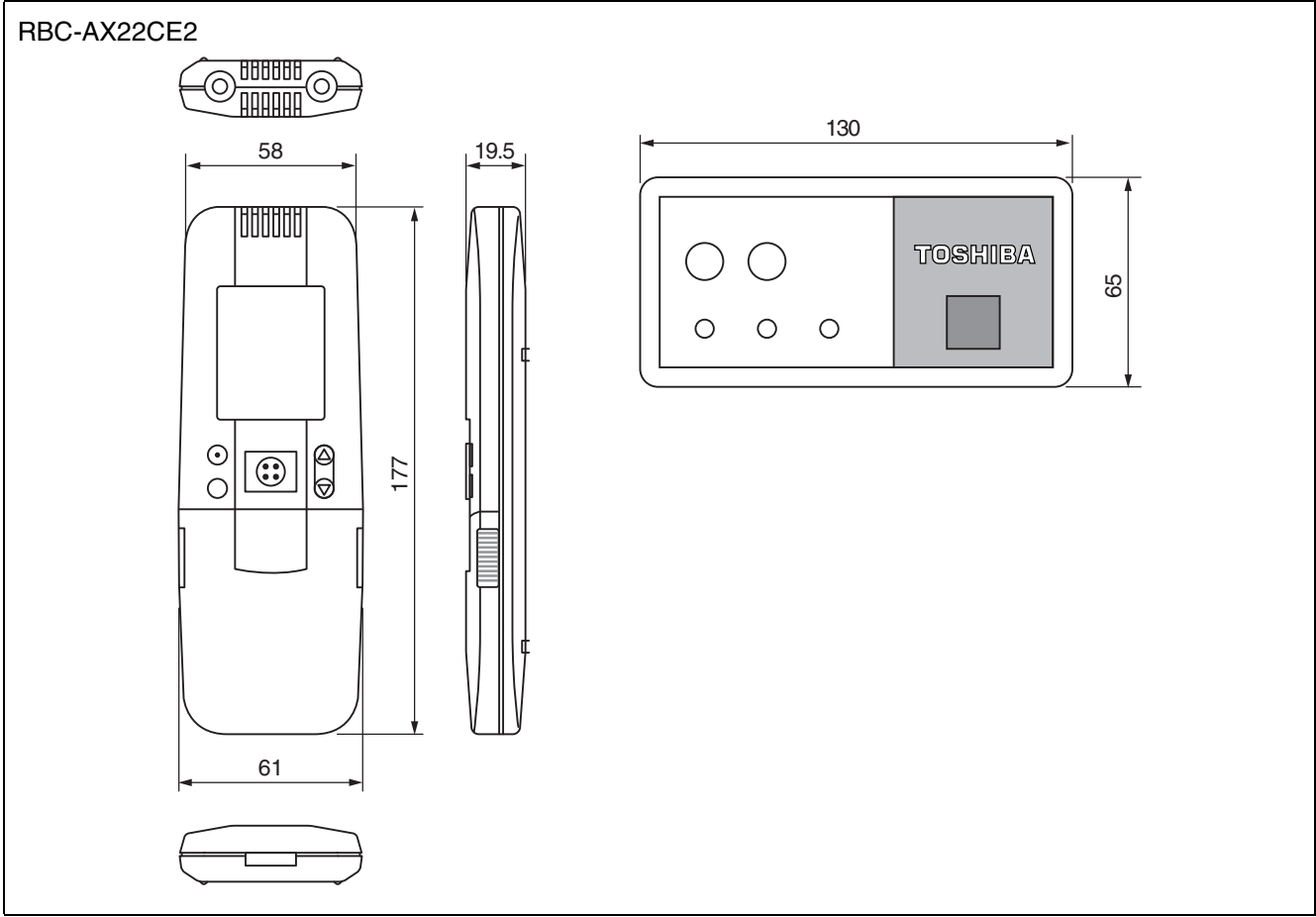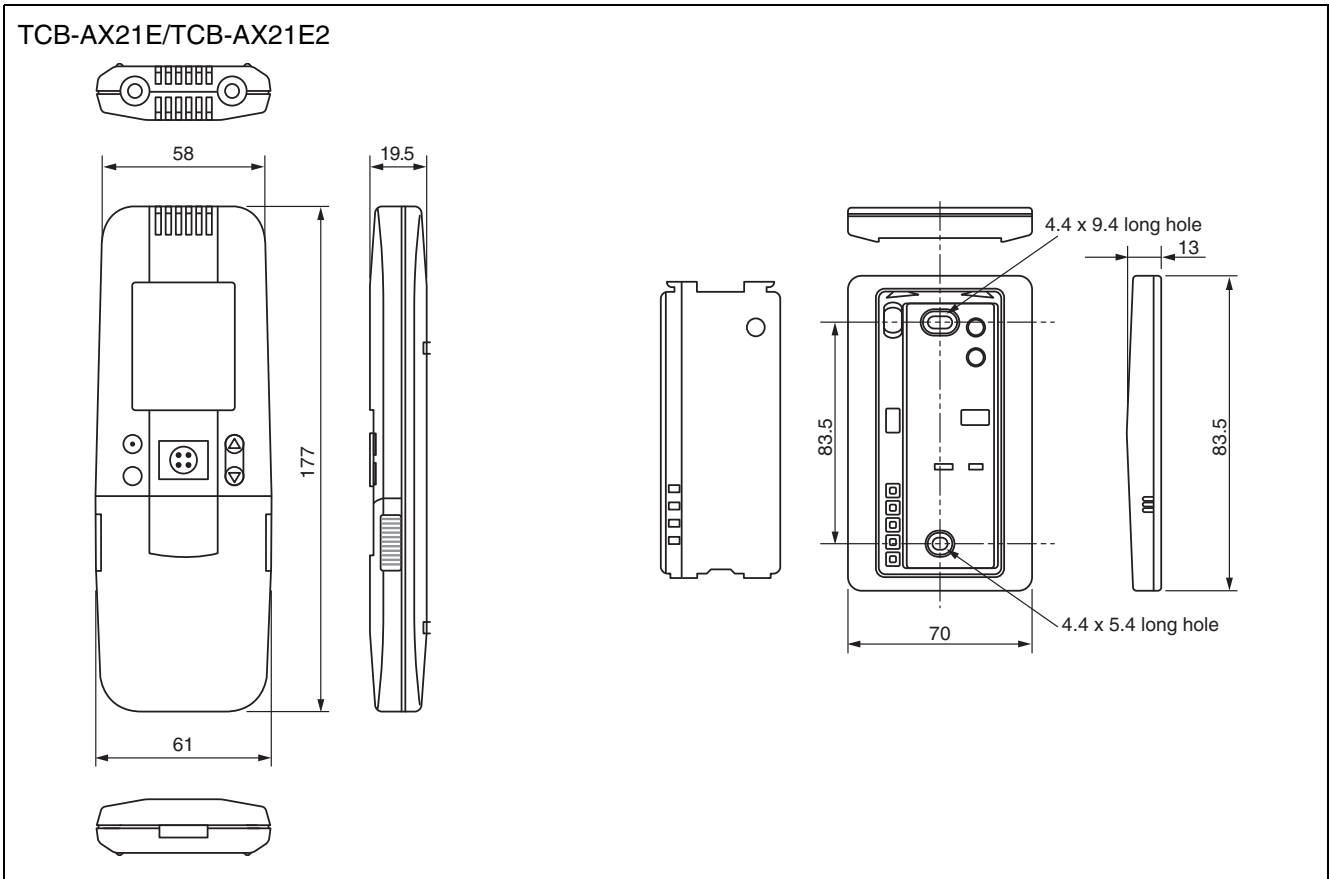
Wireless remote controller (Hi wall/Flexi packed)

WH-H2UE

Wired remote controller with weekly timer

RBC-AMS41E

Weekly timer

TCB-EXS21TLE

Central remote controller

TCB-SC642TLE/TCB-SC642TLE2

Z-view

ON-OFF controller

TCB-CC163TLE2
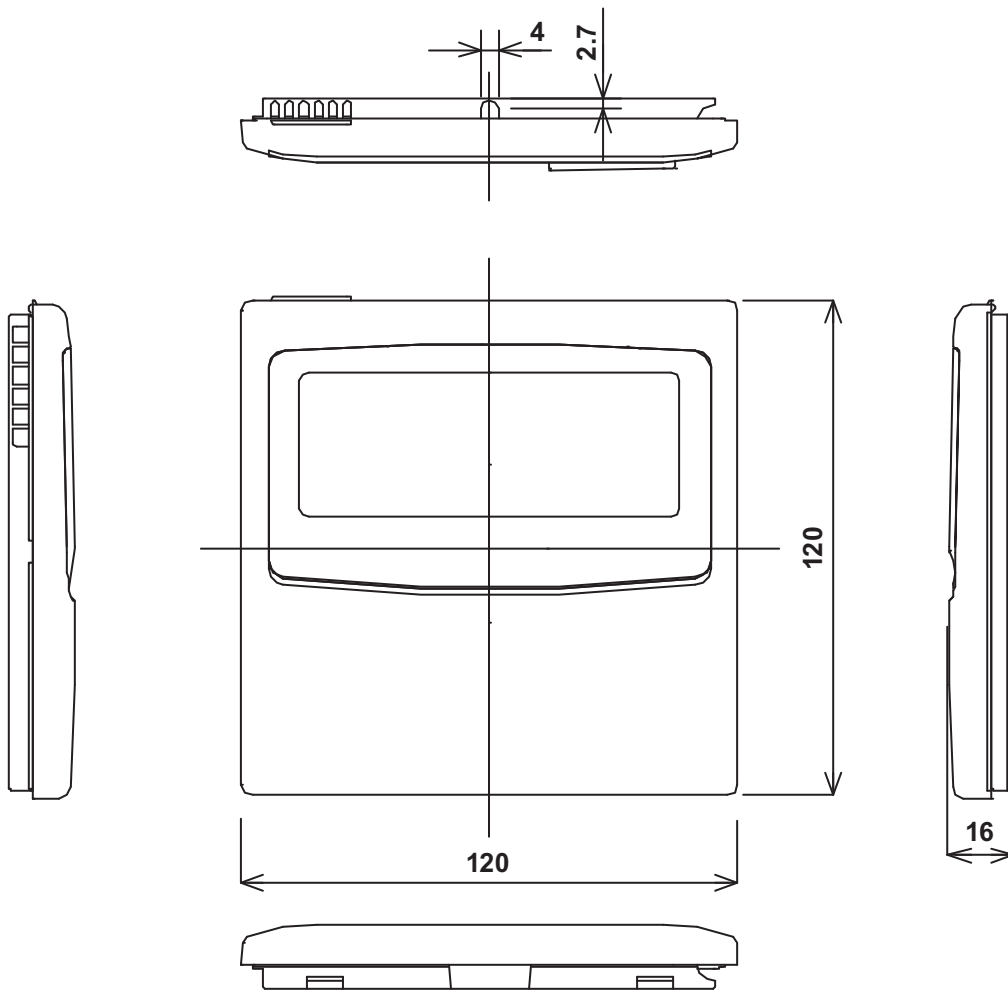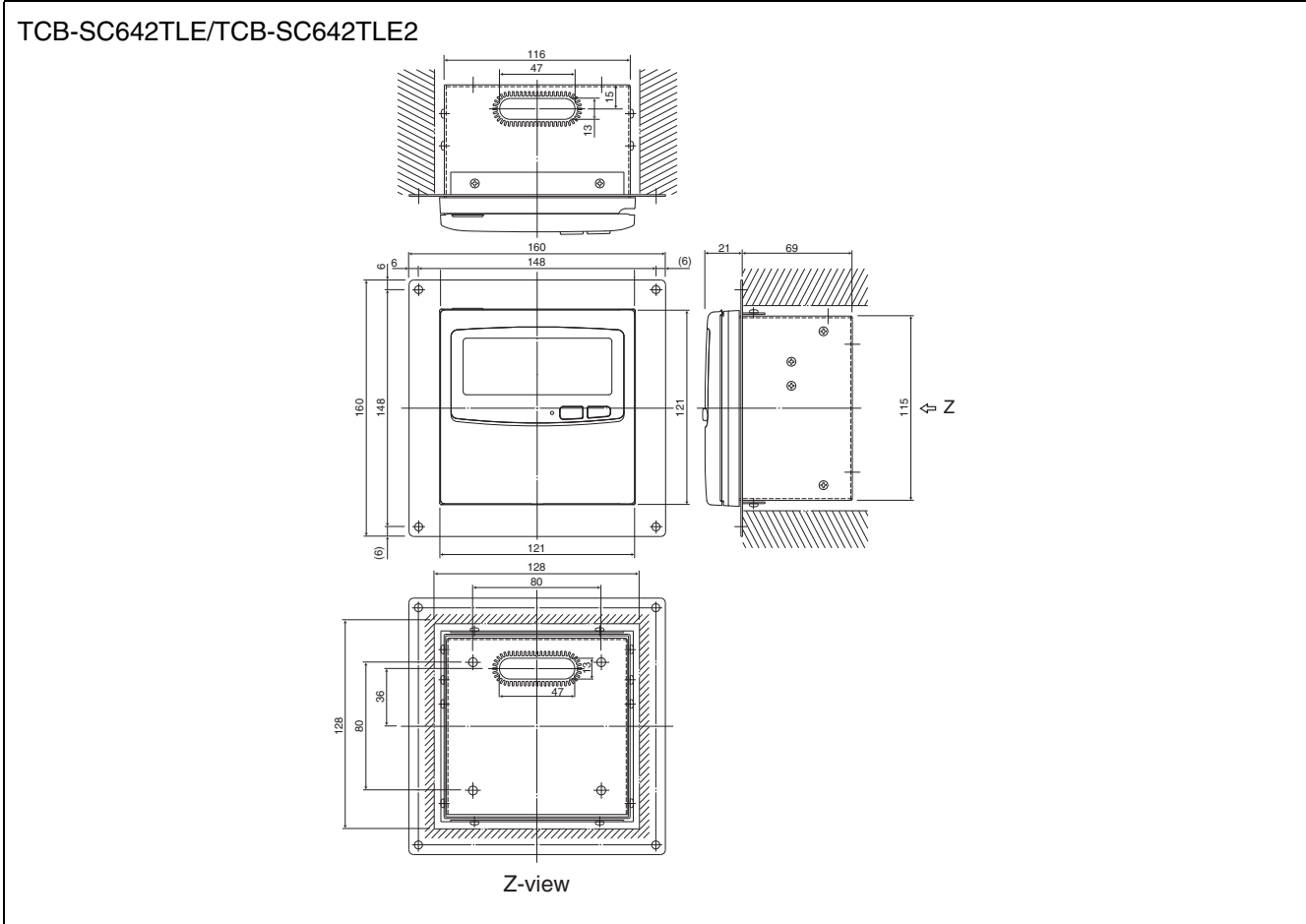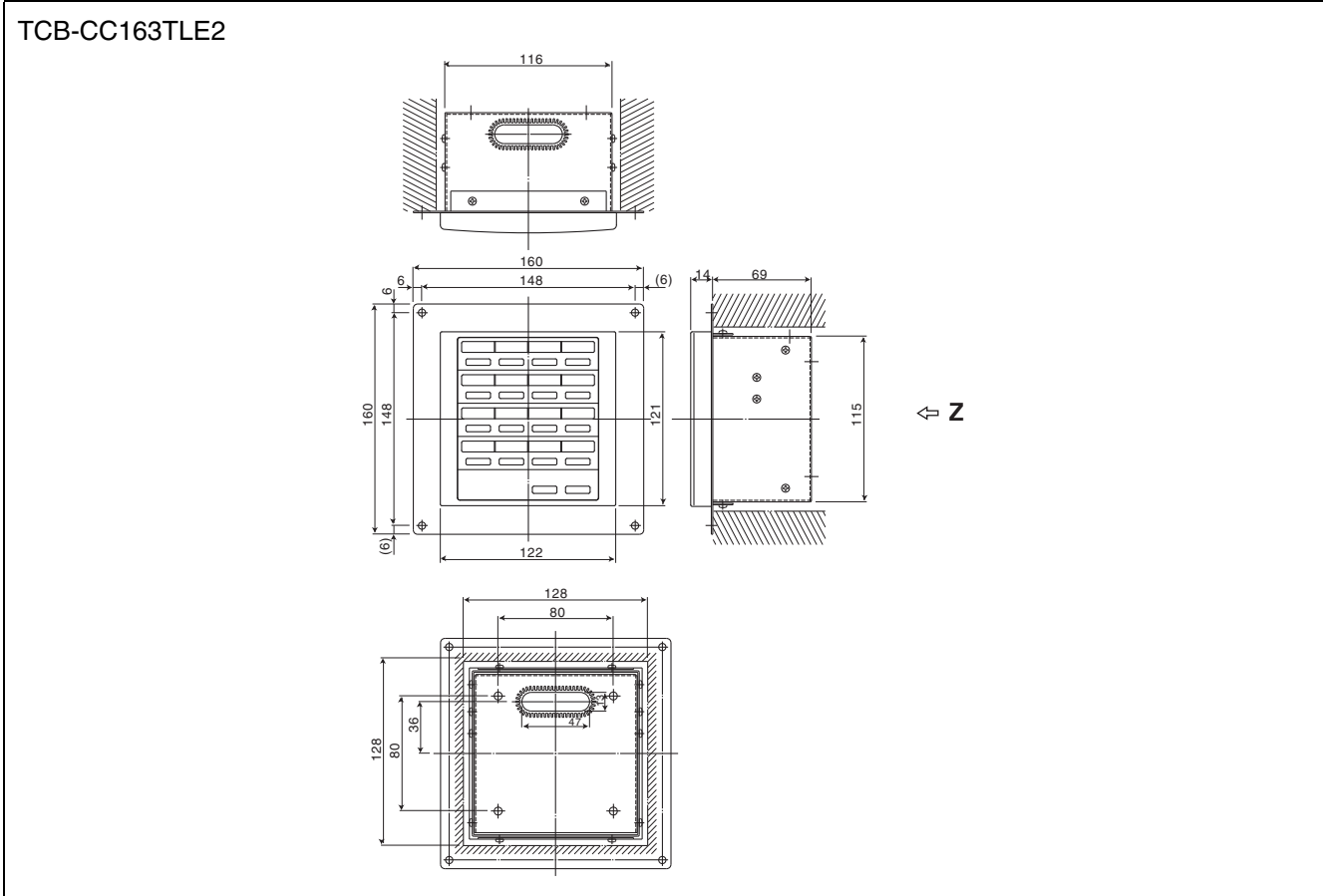
Remote sensor

TCB-TC21LE/TCB-TC21LE2
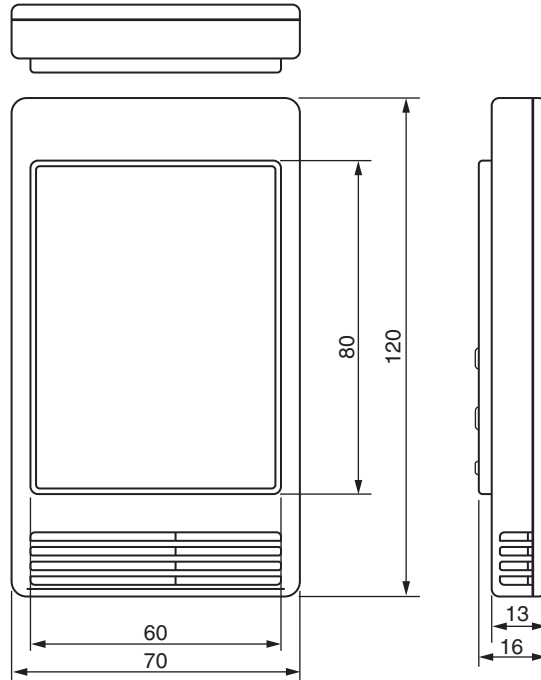
Remote location ON/OFF control box
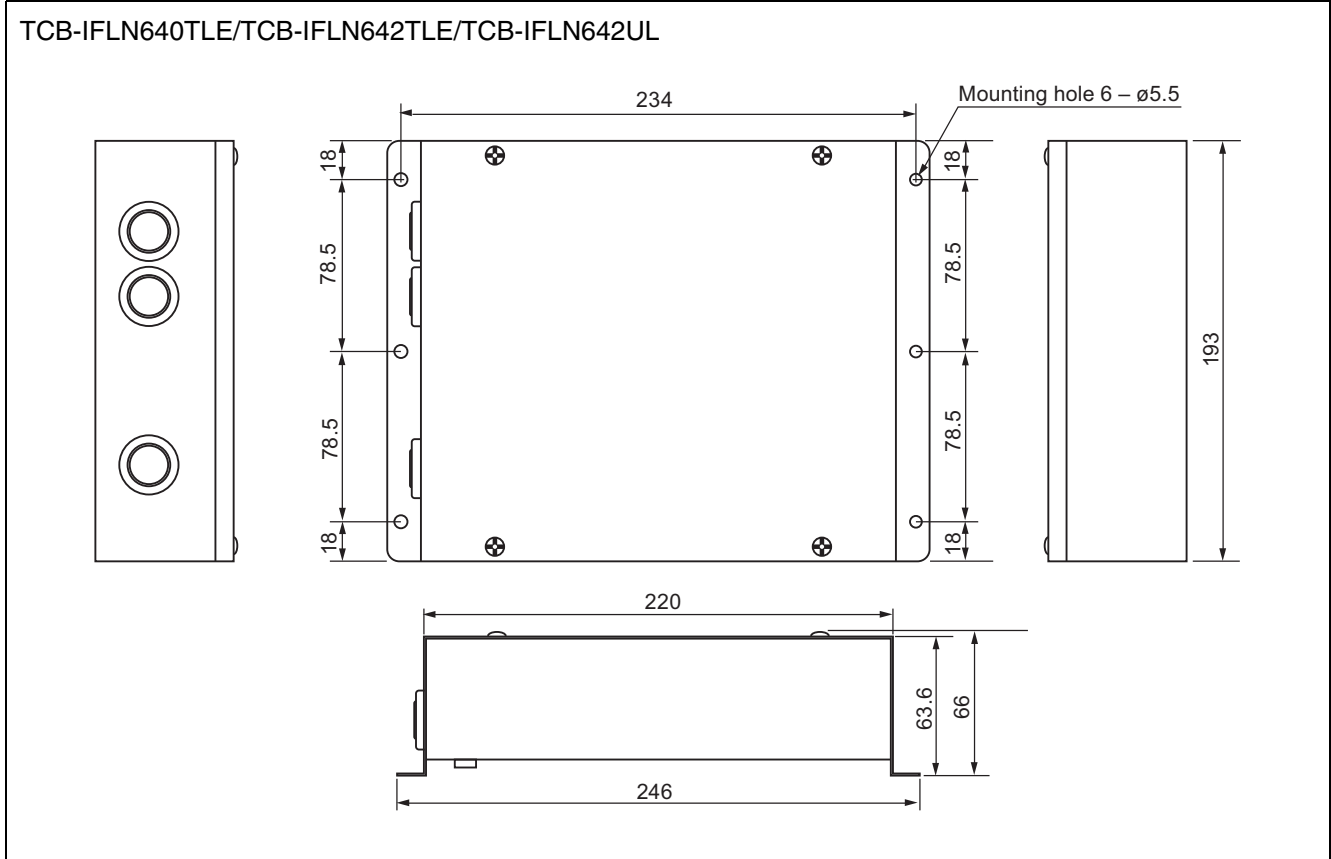
TCB-IFCB-4E2
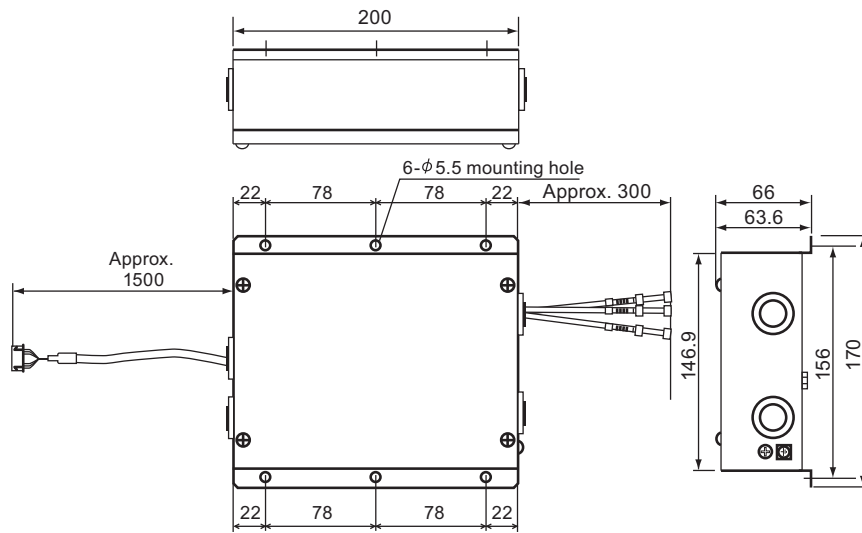
General Purpose Interface/Analog Interface

TCB-IFCG1TLE/TCB-IFCB640TLE
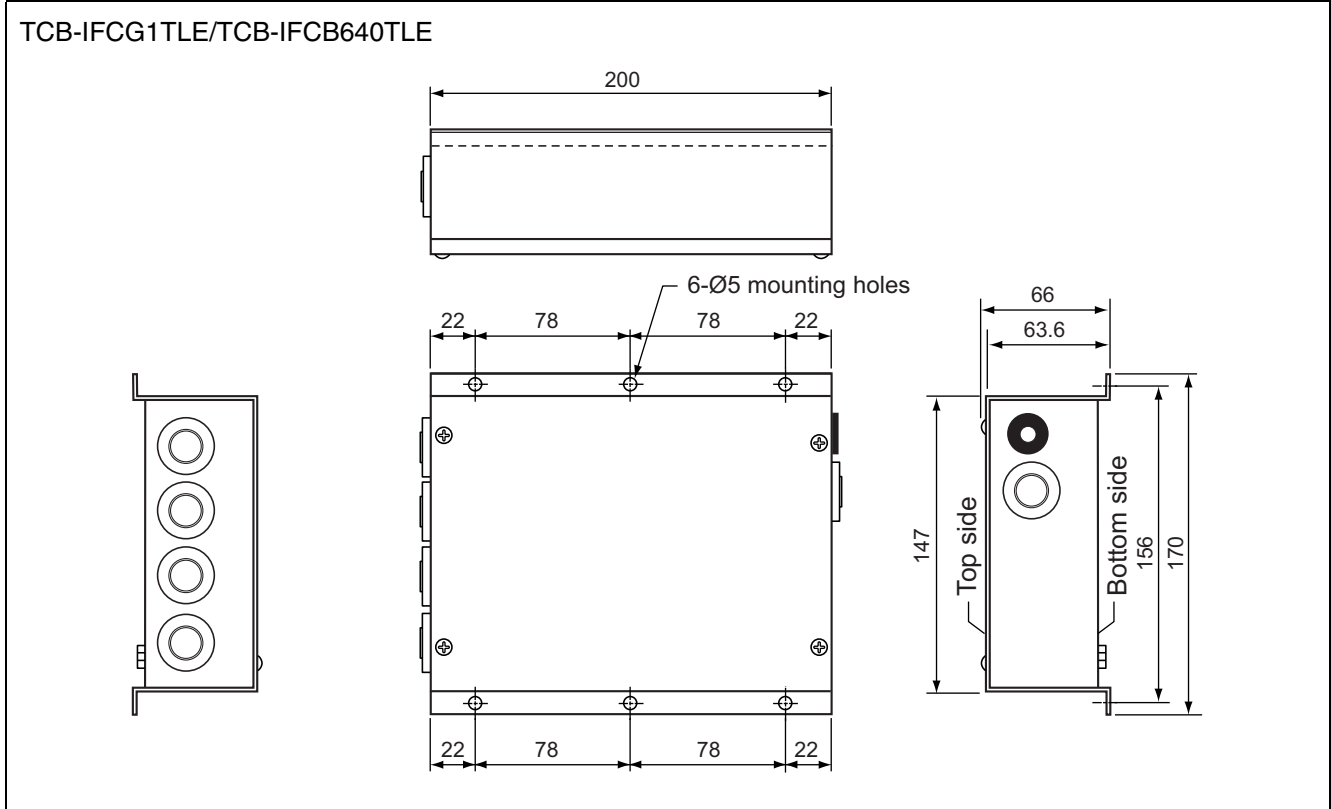
GSM Mobile Phone control interface
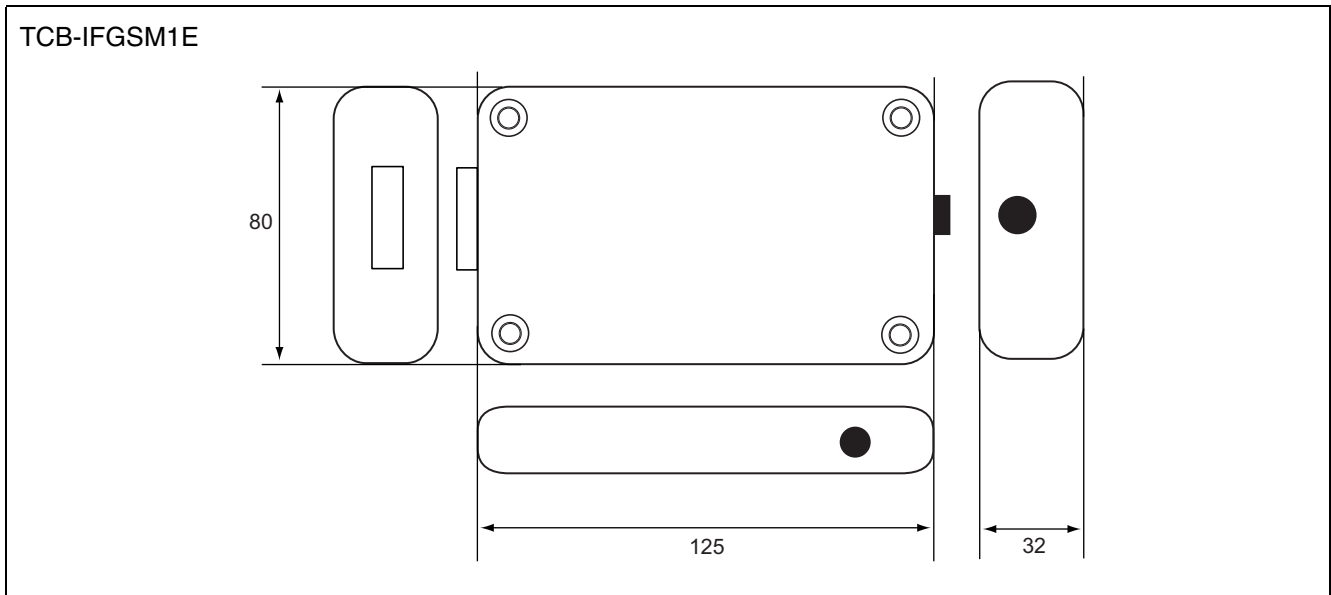
TCB-IFGSM1E

Modbus Interface
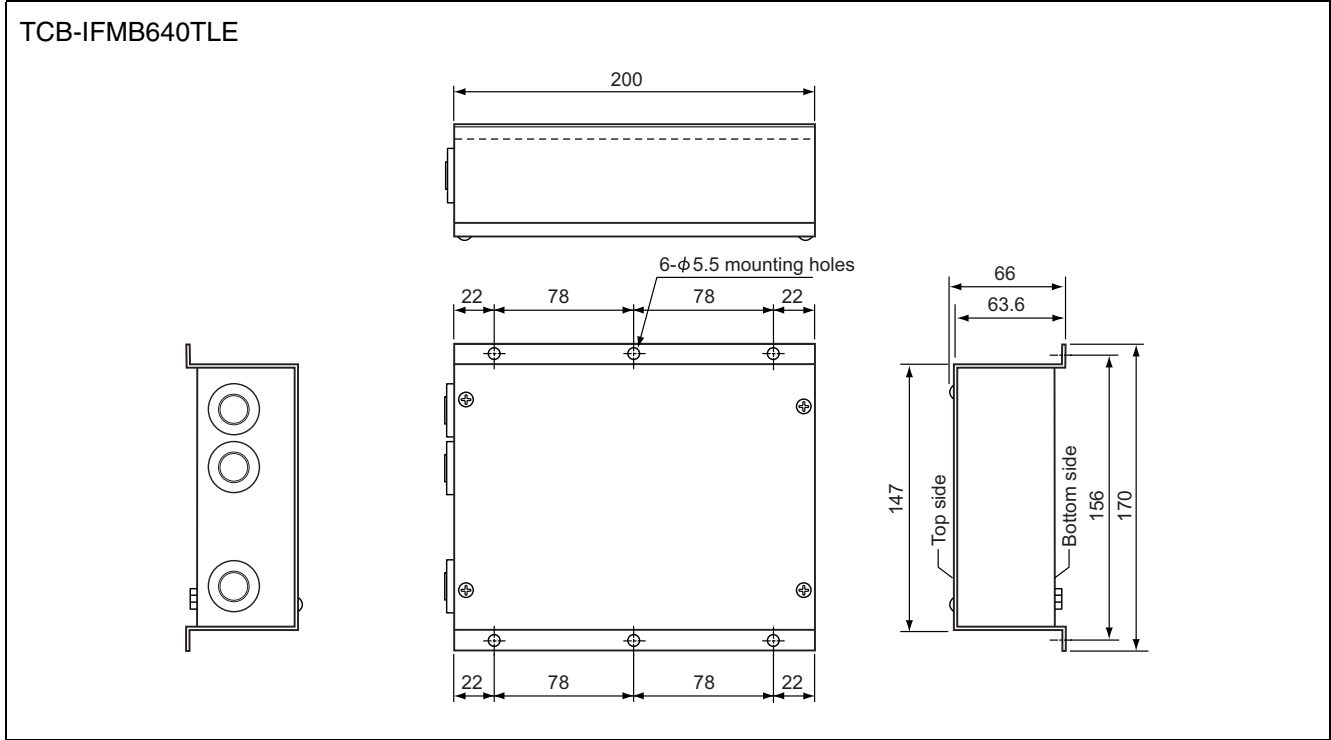
TCB-IFMB640TLE

LON Gateway

TCB-IFLN640TLE/TCB-IFLN642TLE/TCB-IFLN642UL

BACnet server

BMS-LSV6E

125
9
11
19
145
105
250
280
292
70
69.5
3.2
4-Ø4.6

L1 L2 ON SI OFF L3 RN SDR
COM1 USB LAN1 PS/2 LAN2 VGA

Compliant manager

BMS-CM1280TLE/BMS-CM1280FTLE

8.5   155   8.5   5Ø
17.9
76
12.7
106.6
172
140
70
180
158
42
66
120
8
46

Dimensions of unit fixing holes in the wall, etc.

142
108
90

19   69
90
*

* Reserve space of 10mm or more when installing the unit.

TOSHIBA

ON   OFF

Touch Screen Controller

BMS-TP0641ACE
BMS-TP5121ACE
BMS-TP0641PWE
BMS-TP5121PWE
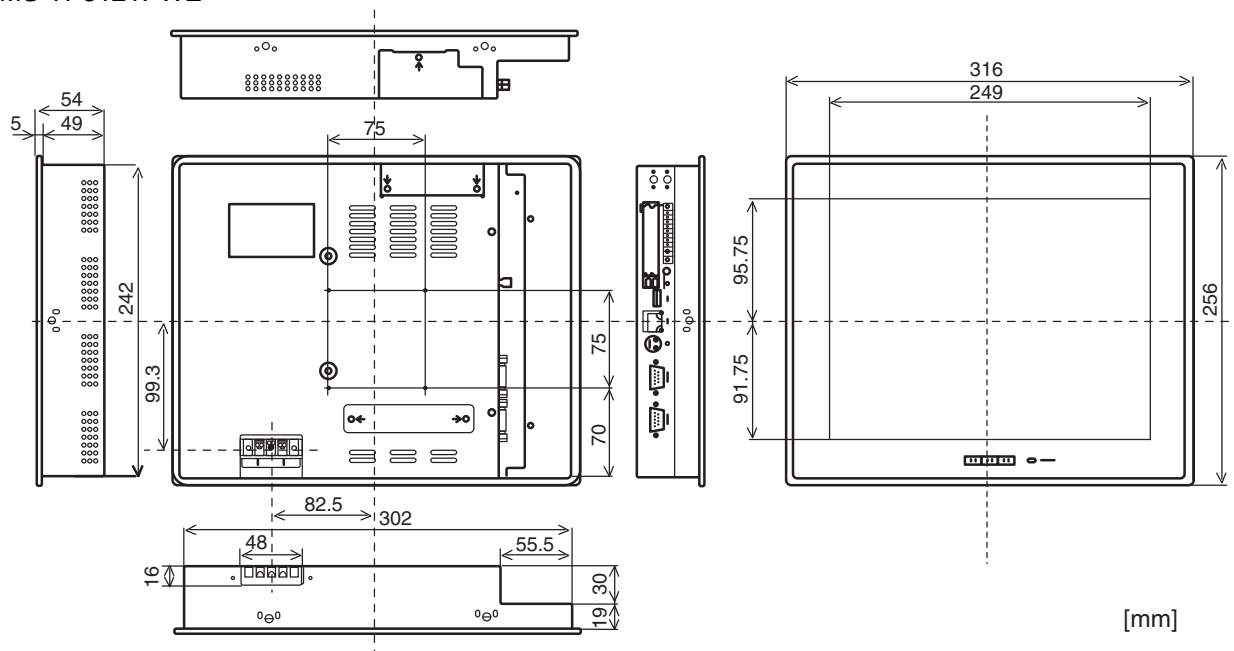
[mm]

Web Based Controller

BMS-WB2561PWE/BMS-WB01GTE
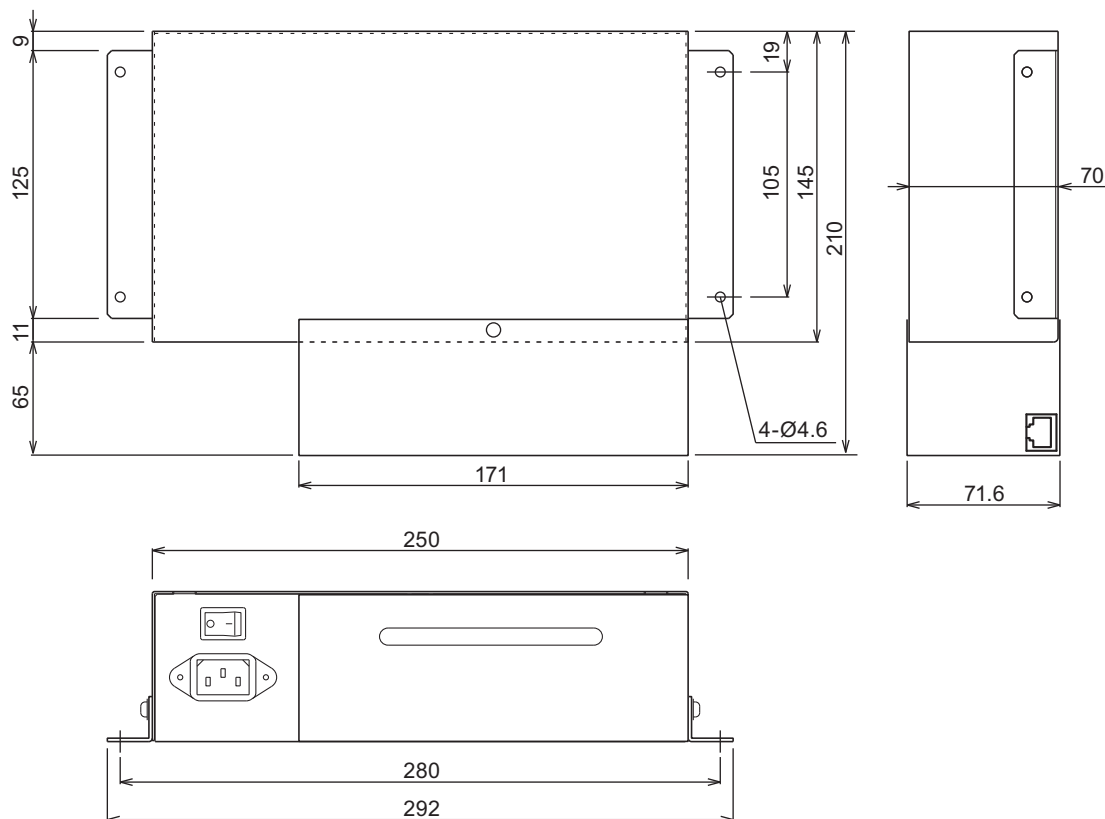
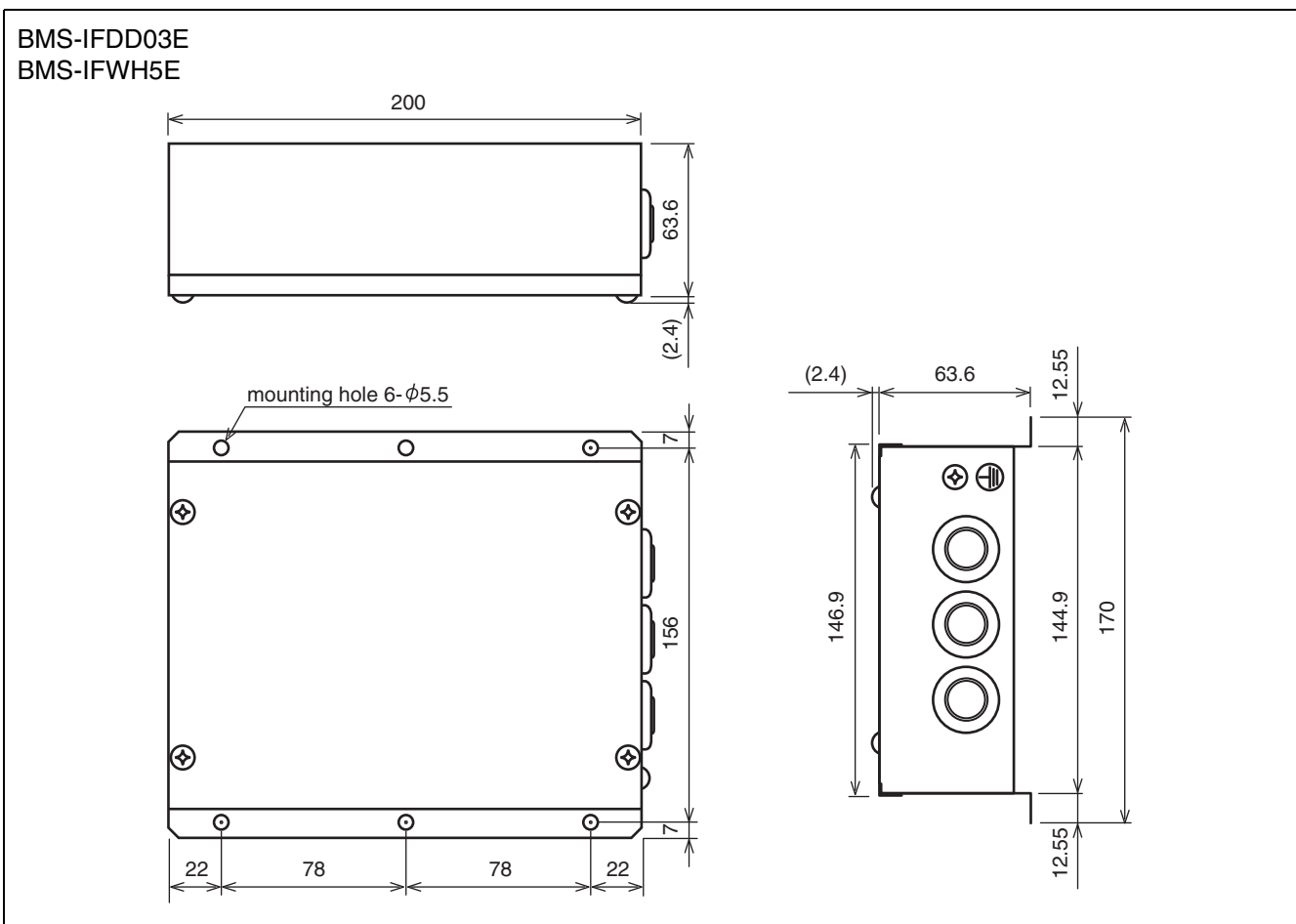## TCS-Net Relay Interface
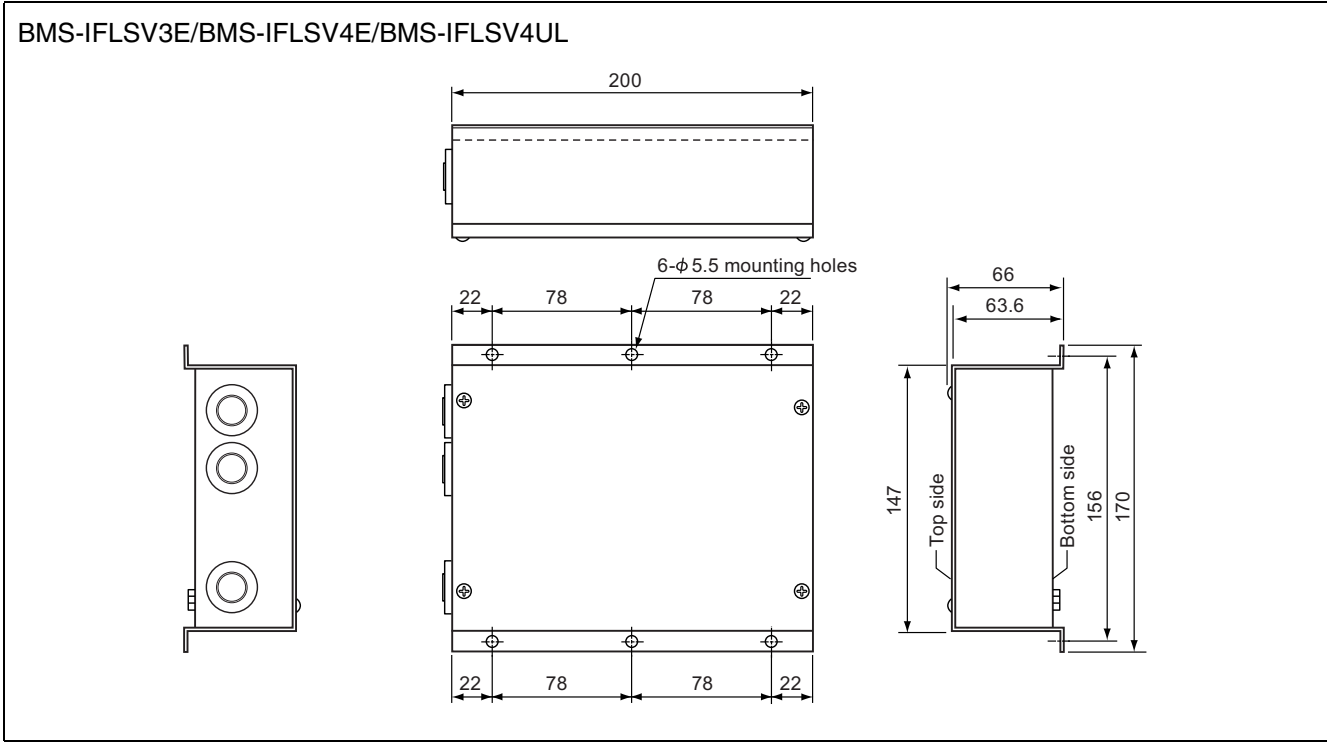
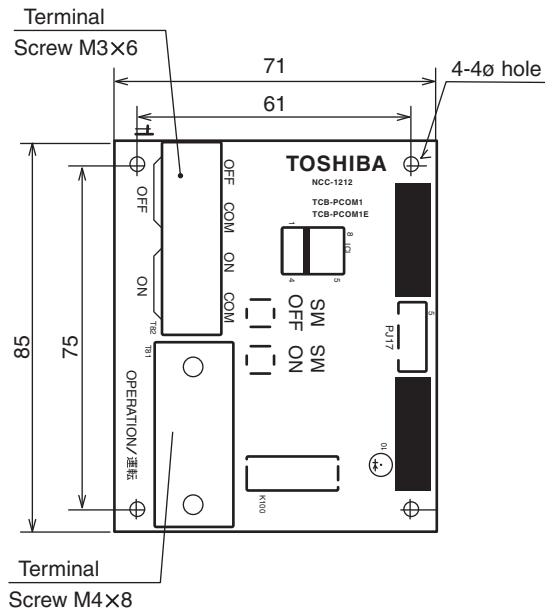BMS-IFLSV3E/BMS-IFLSV4E/BMS-IFLSV4UL

Digital I/O Relay Interface/Energy Monitoring Relay Interface

BMS-IFDD03E
BMS-IFWH5E

Dimension

TCB-PCDM2E
TCB-PCDM4E

Terminal
Screw M3×6

71
61

4-4ø hole

TOSHIBA
NCC-1212
TCB-PCOM1
TCB-PCOM1E

85
75

Terminal
Screw M4×8

TCB-PCMO2E
TCB-PCMO4E

Terminal
Screw M3×6

55.5
45.5

4-4ø hole

TOSHIBA
NCC-1214
TCB-PCMO1
TCB-PCMO1E

60
50

TCB-PCIN2E

4-4Ø hole

79
69

Terminal (Screw M3)

73
63

TOSHIBA
MCC-1217-01
TCB-PCIN2
TCB-PCIN2E

TCB-PCIN4E

73
63
79
69

PJ20

MCC-1613-02

Terminal block (M3)

4-4 mm dia. mounting holes

OUTPUT1　OUTPUT2　OUTPUT3

TCB-PCNT30TLE2

R11
R10
SW01
MCC-1440
L41
CN40
CN44
CN61
CN51
IC40
52
85

577
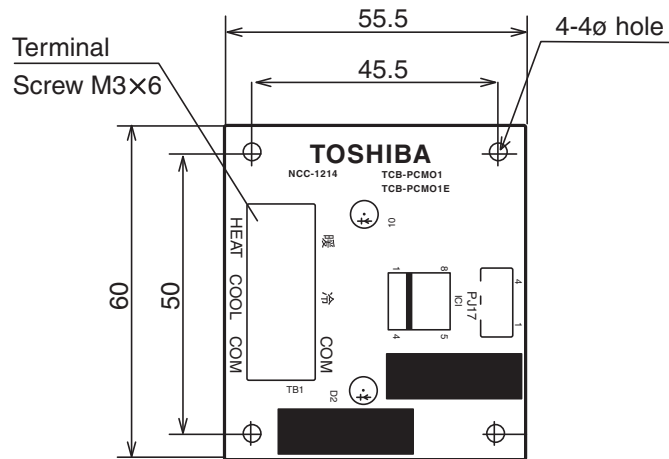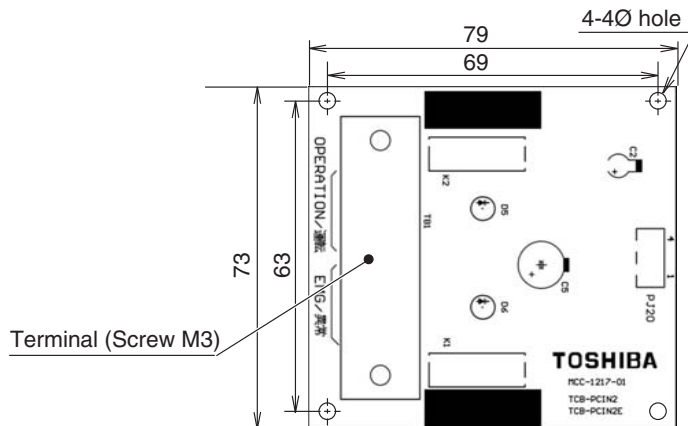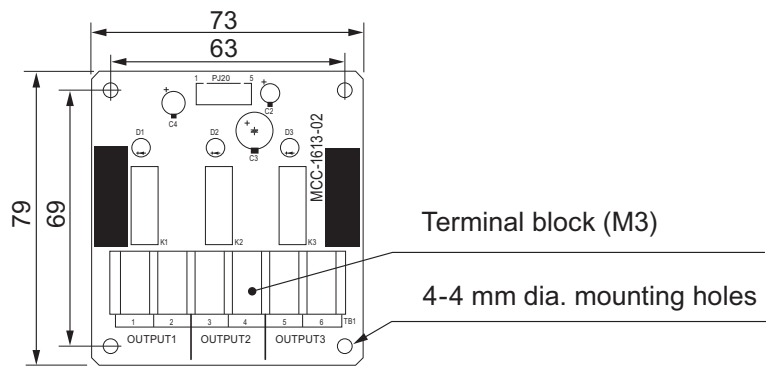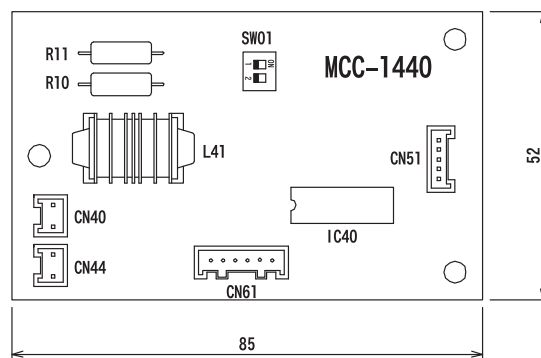
TOSHIBA CARRIER CORPORATION

2 CHOME 12-32, KONAN, MINATOKU, TOKYO, 108-0075, JAPAN