TOSHIBA

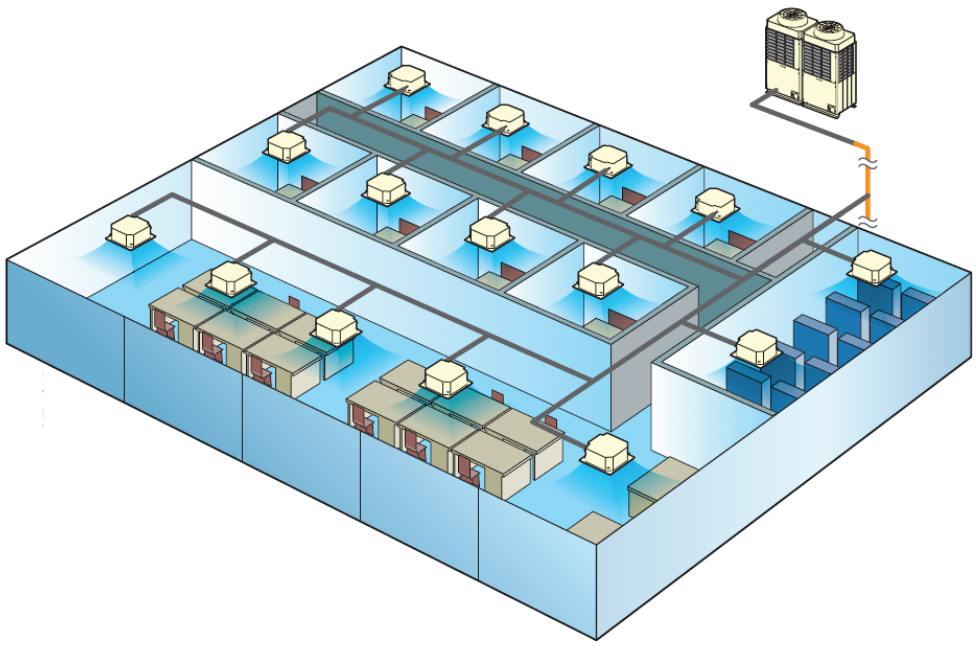
Leading Innovation

E15-3R1

APPLICATION CONTROL MANUAL

Model name:

Super Modular Multi System-e (SMMS-e)
Super Heat Recovery Multi System-e (SHRM-e)
MiNi-SMMS-e
Super Digital Inverter (SDI)
Digital Inverter (DI)



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Outline of system

1-1 List of models and outline
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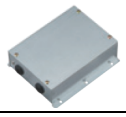
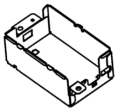
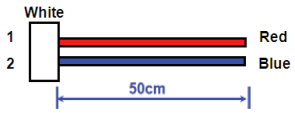
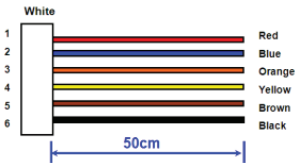
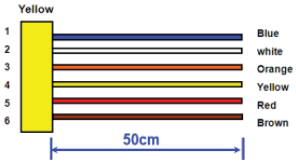
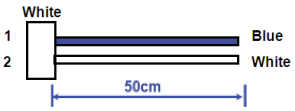
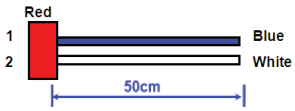
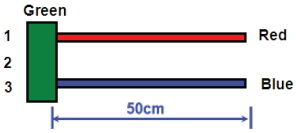
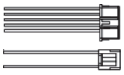
1-1 List of models and outline

Appliance name	Model Name and appearance	Explanation	Connecting device or setting method	
Remote controller				
Wired remote controller	RBC-AMT32E 	Standard type.	Indoor unit	Individual control Group control Two remote control
	RBC-AMS41E 	With schedule timer.		
	RBC-AMS54E-ES/EN 	With LCD display and backlight.		
	NRC-01HE 	For Air to Air Heat Exchanger with DX coil unit.		
	RBC-AS41E 	With simplified control. Start/stop, temperature setting, air flow setting, check code display only.		
Wireless remote controller kit	RBC-AX32U(W/WS)-E 	For 4-way Air Discharge Cassette.		Individual control Two remote control (wired & wireless)
	RBC-AX33CE 	For Under Ceiling, Under Ceiling and 1-way Air Discharge Cassette SH		
	TCB-AX32E2 	For Compact 4-way Cassette, 1-way Air Discharge Cassette YH, Concealed Duct Standard, Slim Duct, Floor Standing Cabinet, Floor Standing.		
	RBC-AX32UW(W)-E 	For 2-way Air Discharge Cassette.		

Appliance name	Model Name and appearance	Explanation	Connecting device or setting method
Schedule timer and central remote controller			
Schedule timer	TCB-EXS21TLE 	Weekly timer mode. 7 types of weekly schedule and 3 cycles/day, can program off mode a minute unit.	Wired remote controller 4 p terminal connected with TCB-EXS21TLE
ON-OFF controller	TCB-CC163TLE2 	Max. 16 indoor units. ON/OFF function only. Schedule timer mode. (+Schedule timer)	Central control wiring
Compliant manager	BMS-CM1280TLE 	Max. 128 indoor units. (2 TCC-LINK) (4 Zone/16 groups, 64 zone/64 groups) × 2ch, 4 types central setting. Schedule timer mode. (+Schedule timer)	Central control wiring
Advanced central control			
Smart BMS Manager	BMS-SM1280HTLE 	Max. 128 indoor units. (2 TCC-LINK) Full control/monitoring/Schedule from PC Web with Energy monitoring.	Central control wiring Energy Monitoring Relay Interface Digital I/O Relay Interface
Smart BMS Manager with data analyzer	BMS-SM1280ETLE 	Max. 128 indoor units. (2 TCC-LINK) Full control/monitoring/Schedule from PC Web with Energy monitoring, Data analysis.	Central control wiring Energy Monitoring Relay Interface Digital I/O Relay Interface
Touch Screen Controller	BMS-CT5120E 	Max. 512 indoor units. Full control/monitoring/Schedule with Energy monitoring.	Central control wiring Relay Interface Energy Monitoring Relay Interface Digital I/O Relay Interface
	BMS-CT5121E 	Max. 512 indoor units. Full control/monitoring/Schedule with Energy monitoring, PC web access, Data analysis.	Central control wiring Relay Interface Energy Monitoring Relay Interface Digital I/O Relay Interface
Open network and analog interface			
Lon Interface	TCB-IFLN642TLE 	Central control by LonWorks. Max 64 indoor units/groups. Compliant to LonWorks EIA/ANSI 709.1 (FT-X1 transceiver).	Central control wiring
Modbus Interface	TCB-IFMB641TLE 	Central control by Modbus. Max 64 indoor units/groups. Compliant to RS485 Modbus RTU mode.	Central control wiring
BACnet Server	BMS-LSV9E+BMS-STBN10E 	Central control by BACnet. Max 128 indoor units. BACnet server Compliant to ANSI / ASHRAE Standard 135-2008 BACnet IP.	Central control wiring Relay Interface
BN Interface	BMS-IFBN640TLE 	Central control by BACnet. Max 64 indoor units. BACnet server Compliant to ANSI / ASHRAE Standard 135-2008 BACnet IP.	Central control wiring
Analog Interface	TCB-IFCB640TLE 	Max. 64 indoor units. Control by DC input voltages.	Central control wiring

Appliance name	Model Name and appearance	Explanation	Connecting device or setting method	
Indoor unit optional devices				
Remote location ON/OFF Control box	TCB-IFCB-4E2 	Monitoring from outside. ON/OFF command from external signals.	Indoor unit	
General Purpose Interface	TCB-IFCG1TLE 	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.	Central control wiring	
GSM Phone Control Interface	TCB-IFGSM1E 	Control and monitor ON/OFF, alarm status by GSM SMS mail system.	Indoor unit	
Remote sensor	TCB-TC41LE 	Remote sensing of indoor air temperature.	Indoor unit	
Central control with “1:1 model”	TCB-PCNT30TLE2 	Central control with “1:1 model”.	DI SDI	Indoor unit
Connection Interface Kit	TCB-PX30MUE 	For 4-way cassette 4series, Compact 4-way cassette 2 series.		
Optional connecting kit	TCB-PCUC1E 	For Under Ceiling 7series, High static duct 6series (8-10HP), Floor standing 6series. (VRF) For High static duct 4seires (LC)	Indoor unit For external I/O without local relay preparation	

Appliance name		Model Name and appearance	Explanation	Connecting device or setting method	
Indoor unit optional devices					
	Connectors	TCB-KBCN32VEE 	Ventilation fan control from Remote controller.	CN32 on indoor unit	
		TCB-KBCN60OPE 	Operation status signal output.	CN60 on indoor unit	
		TCB-KBCN61HAE 	Leaving-ON prevention control by key sw Operation Input / Output.	CN61 on indoor unit	
		TCB-KBCN70OAE 	Option error input.	CN70 on indoor unit	
		TCB-KBCN73DEE 	Demand input.	CN73 on indoor unit	
		TCB-KBCN80EX 	Outside error input.	CN80 on indoor unit	
Indoor unit controls					
	Function change of indoor unit	-	Setting functions necessary to perform applied control at the local site.	Item code (DN) setting from wired remote controller	
	Ventilation fan control from remote controller	-	Ventilation fan start/stop operation from wired remote controller.	Setting from wired remote controller and relay wiring (local supply)	
	Leaving-ON prevention control	-	Control to prevent Leaving-ON of indoor unit.		
	Demand control from indoor unit	-	Thermo-OFF operation by relay signal.	Relay wiring (local supply)	
Outdoor unit optional devices for VRF					
	Power peak-cut control board	TCB-PCDM4E 	Power peak-cut. (Standard function)	Header outdoor unit	CN513 on outdoor unit
			Power peak-cut. (Expansion function)		
	External master ON/OFF control board	TCB-PCMO4E 	Snowfall fan control.		CN509 on outdoor unit
			External master ON/OFF control.		CN512 on outdoor unit
			Night operation (Sound reduction) control.		CN508 on outdoor unit
			Operation mode selection control board.		CN510 on outdoor unit
	Output control board	TCB-PCIN4E 	Error/operation output control.		CN511 on outdoor unit (CN513 Mini-SMMS)
			Compressor operation status.		CN514 on outdoor unit
			Operation output ratio board.		

Appliance name		Model Name and appearance	Explanation	Connecting device or setting method	
Outdoor unit optional devices for DI/SDI					
	Digital Inverter Air Conditioner Application Control Kit	TCB-PCOS1E2 	Peak-cut control / night operation / Compressor ON status output.	DI(3), SDI(4) *1	Transformer/Inverter outdoor unit
	Optional Connector Cable	TCB-KBOS1E 	Peak-cut control / night operation / Compressor ON status output.	DI(4), SDI(4) *1	CN610 on outdoor unit CN704 on outdoor unit
Outdoor unit controls for VRF					
	Outdoor fan high static pressure shift	-	Control standard air volume of outdoor unit.	SW10 on outdoor unit	
	Cooling priority, heating priority control	-	Cooling priority or heating priority can be selected. (Setup at shipment: heating priority)	SW11 on outdoor unit	
	Specific indoor unit priority control	-	Only one indoor unit can be set as priority for changeover of operation mode.	SW11 on outdoor unit + Item code (DN) setting from wired remote controller	
	PMV-Kit control (Mini-SMMS-e only)	-	Set SW08 in this case, also when using the indoor unit under high humidity.	SW08 on outdoor unit	
Outdoor unit controls for DI/SDI					
	High static pressure shift	-	Control standard air volume of outdoor unit.	SDI(4) *2	SW802 on outdoor unit
	Existing piping usage	-	19.1 Ø is used for existing pipe. Follow the re-use existing pipe application procedure.	DI(3,4), SDI(4) *2	SW802 or 801 sub PCB on outdoor unit
	Power saving control	-	Power saving by reducing the compressor frequency 10%.	DI(4), SDI(4) *2	
	Snow-proof Fan control	-	When snow enters, the control to prevent generation of motor lock is validated.		SW802 on outdoor unit
	Defrost time change	-	The defrost interval is shortened than the standard status. (Min 30 minutes)		J805, 806 on outdoor unit
	Max frequency change	-	Max frequency of compressor at cooling/heating is lowered. But max capacity decreases.		J807 on outdoor unit
	Cooling operation mode only	-	DN “0F” also can set.		J808 or SW801 sub PCB on outdoor unit

Note

*1 Outdoor unit optional devices for DI/SDI

LC CDU

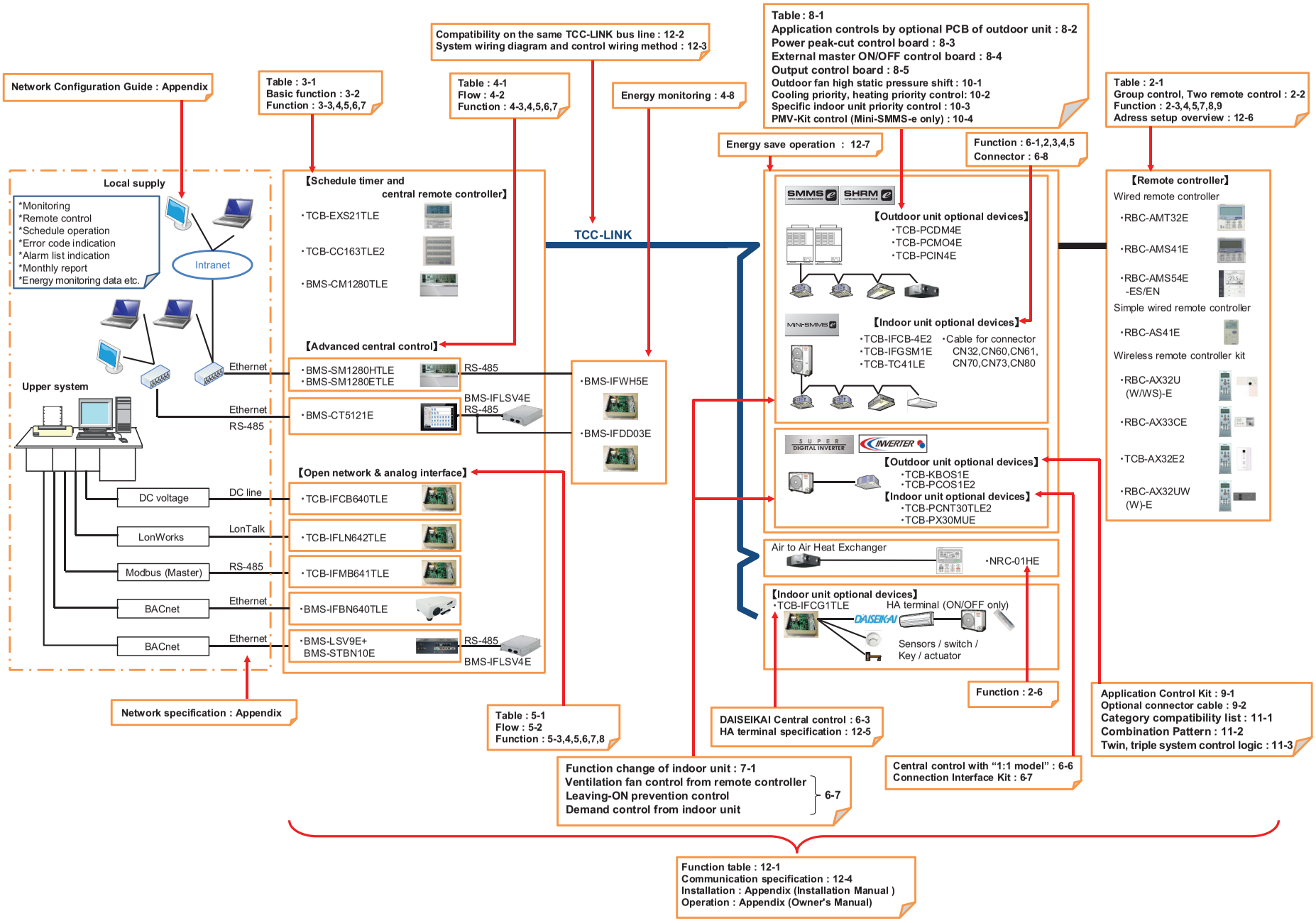
	A: TCB-PCOS1E2 B: TCB-KBOS1E2 ×: None - : No models								
	VRF	DI (1ph)	DI (3ph)	SDI (1ph)	SDI (3ph)	SPI (1ph)	SPI (3ph)	FS(1ph)	FS(3ph)
1.00		×	-	-	-	-	-	-	-
1.50		×	-	A	-	-	-	×	-
1.70		-	-	A	-	-	-	-	-
2.00		A	-	A	-	×	-	×	-
2.50		-	-	-	-	-	-	-	-
3.00		A	-	B	-	×	-	×	-
3.2 / 3.3			-	-	-	-	-	×	-
4.00		A	×	B	B	×	×	×	×
5.00		A	×	B	B	×	×	×	×
6.00		-	-	×	B	-	-	-	×
7.00		-	-	-	-	-	-	-	×
8.00		-	B	-	-	-	-	-	-
10.00		-	B	-	-	-	-	-	-

*2 Outdoor unit control for DI/SDI

SW-setting	Type	1P-DI			3P-DI		1P-SDI			3P-SDI	1P-SPI		3P-SPI
	Capacity	30,40	56,80	110,140	110,140	224,280	40,45,56	80	110,140	110,140,160	40,56,80	100,125	100,125
Control standard air volume of outdoor unit.	SW802 on outdoor unit	N/A	N/A	N/A	N/A	N/A	N/A	N/A	P	P	N/A	N/A	N/A
19.1Ø is used for existing pipe. Follow the re-use existing pipe application procedure.	SW802 or 801 sub PCB on outdoor unit	N/A	P(*1)	P(*1)	P(*2)	P	P	P	P	P	N/A	N/A	N/A
Power saving by reducing the compressor frequency 10%.		N/A	N/A	N/A	N/A	P	P	P	P	P	N/A	N/A	N/A
When snow enters, the control to prevent generation of motor lock is validated.	SW802 on outdoor unit	N/A	P(*1)	P(*1)	N/A	P	N/A	P	P	P	-	-	-
The defrost interval is shortened than the standard status. (Min 30 minutes)	J805, 806 on outdoor unit	N/A	N/A	N/A	N/A	P	N/A	P	P	P	-	-	-
Max frequency of compressor at cooling/ heating is lowered. But max capacity decreases.	J807 on outdoor unit	N/A	P(*1)	P(*1)	P(*3)	P	N/A	P	P	P	N/A	N/A	N/A
DN"0F" also can set.	J808 or SW801 sub PCB on outdoor unit	N/A	P(*1)	P(*1)	N/A	P	P	P	P	P	-	-	-

*1: SW01 & SW02 sub PCB on outdoor unit
*2: J805 cut on CDB PCB (MCC-1626)
*3: J806 cut on CDB PCB (MCC-1626)

1-2 System overview



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Remote controller

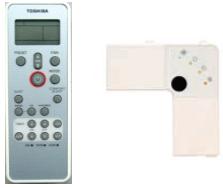
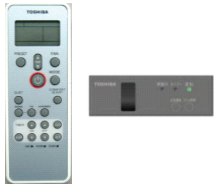
2-1 Line Up & Function – Remote controller
2-2 Application controls for remote controller
2-3 Wired remote controller RBC-AMT32E
2-4 Remote controller with weekly timer RBC-AMS41E
2-5 Wired remote controller RBC-AMS54E-ES/EN
2-6 Wired remote controller for Air to Air Heat Exchanger with DX coil unit NRC-01HE
2-7 Simple wired remote controller RBC-AS41E
2-8 Wireless remote controller kit
2-9 Remote Controller Comparison Table

2-1 Line Up & Function – Remote controller

Wired Remote Controller

Model Name	RBC-AMT32E	RBC-AMS41E	RBC-AMS54E-ES/EN	NRC-01HE	RBC-AS41E
Appearance					
ON/OFF	✓	✓	✓	✓	✓
Mode	✓	✓	✓	✓	-
Setting Temperature	✓	✓	✓	✓	✓
Fan Speed	✓	✓	✓	✓	✓
Timer Function	✓	✓	✓	✓	-
Schedule Function	-	✓	✓	-	-
Multi language	-	-	✓	-	-
Energy Save Function	✓	✓	✓	✓	-
Permit/Prohibit function	-	-	-	-	-
Filter dirty indicator	✓	✓	✓	✓	✓
Error Display	✓	✓	✓	✓	✓
Dual automatic mode	-	-	✓	-	-
Soft cooling	-	-	✓	-	-

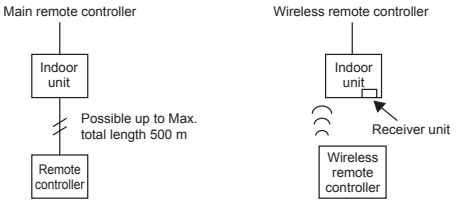
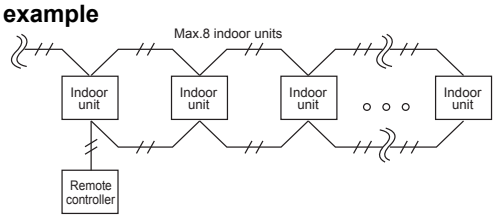
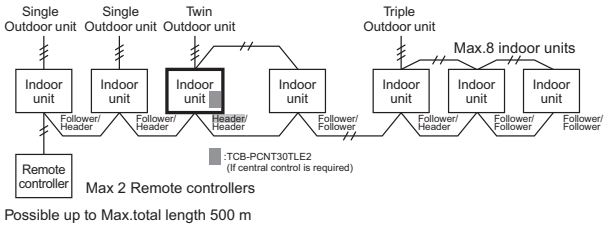
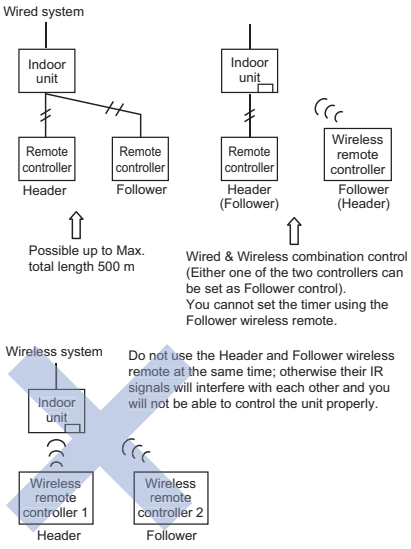
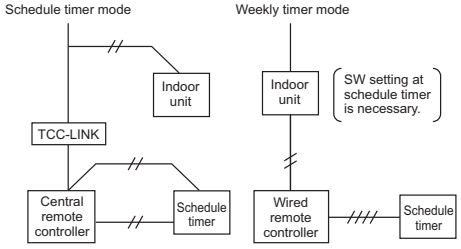
Wireless Remote Controller

Model Name	RBC-AX32U(W/WS)-E	RBC-AX33CE	TCB-AX32E2	RBC-AX32UW(W)-E
Appearance				
ON/OFF	✓	✓	✓	✓
Mode	✓	✓	✓	✓
Setting Temperature	✓	✓	✓	✓
Fan Speed	✓	✓	✓	✓
Timer Function	✓	✓	✓	✓
Schedule Function	-	-	-	-
Multi language	-	-	-	-
Energy Save Function	-	-	-	-
Permit/Prohibit function	-	-	-	-
Filter dirty indicator	-	-	-	-
Error Display	✓ (*)	✓ (*)	✓ (*)	✓ (*)
Dual automatic mode	-	-	-	-
Soft cooling	-	-	-	-

(*) : The error indication is displayed with LED of the receiver unit.

2-2 Application controls for remote controller

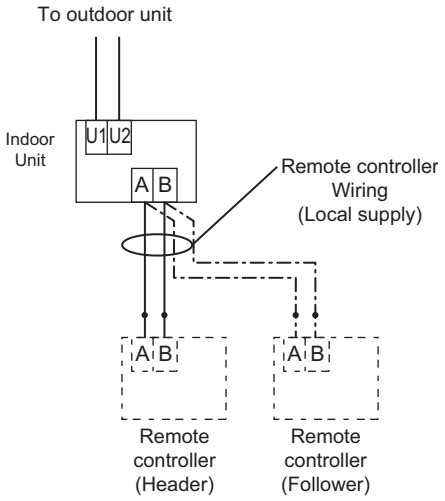
2-2-1 Applications for indoor remote controller

	Basic function	System diagram
1	**Individual control** Air conditioner is individually operated at a distance.	
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**  **DI/SDI example** 
3	**Two remote controller** Air conditioner is controlled by two remote controllers in two locations.	
4	**Control by schedule timer** Schedule timer mode and Weekly timer mode	

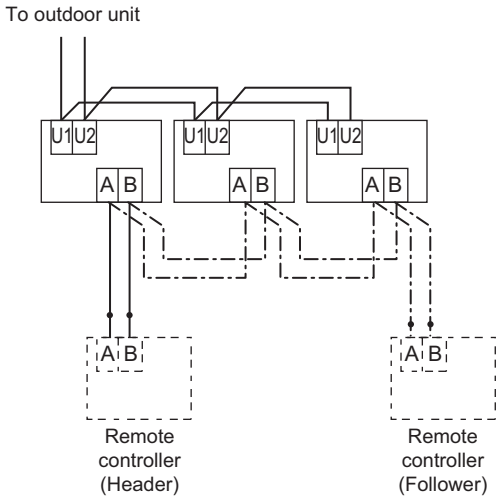
2-2-2 Two remote controllers

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

One indoor unit operated by two remote controllers



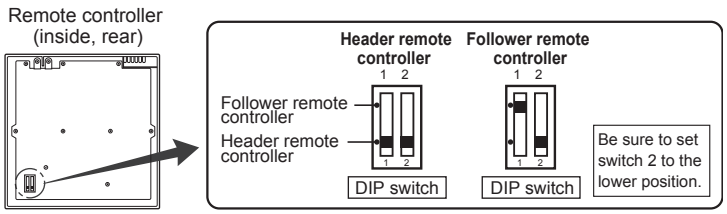
Group control operated by two remote controllers



(Setting method for Follower remote controller)

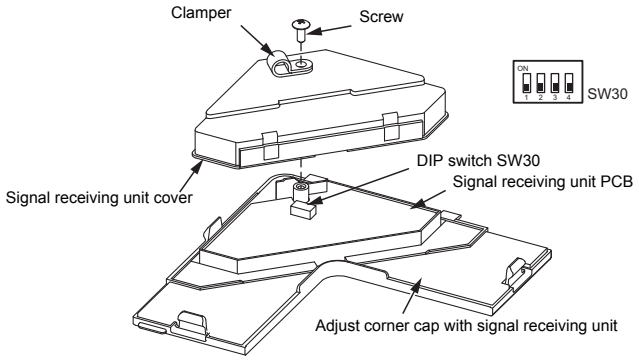
In case of wired remote controller (RBC-AMT32E, NRC-01HE)

Change the remote controller address connector on the side of the remote controller on the PCB.



In case of wireless remote controller (RBC-AX32U(W)-E, RBC-AX32U(WS)-E)

To use the wireless remote controller as a follower, set bit 4 (Follower side) of DIP switch SW30 on the signal receiving unit PCB to ON.



For details, refer to the installation manual of each controller.

(Operation)

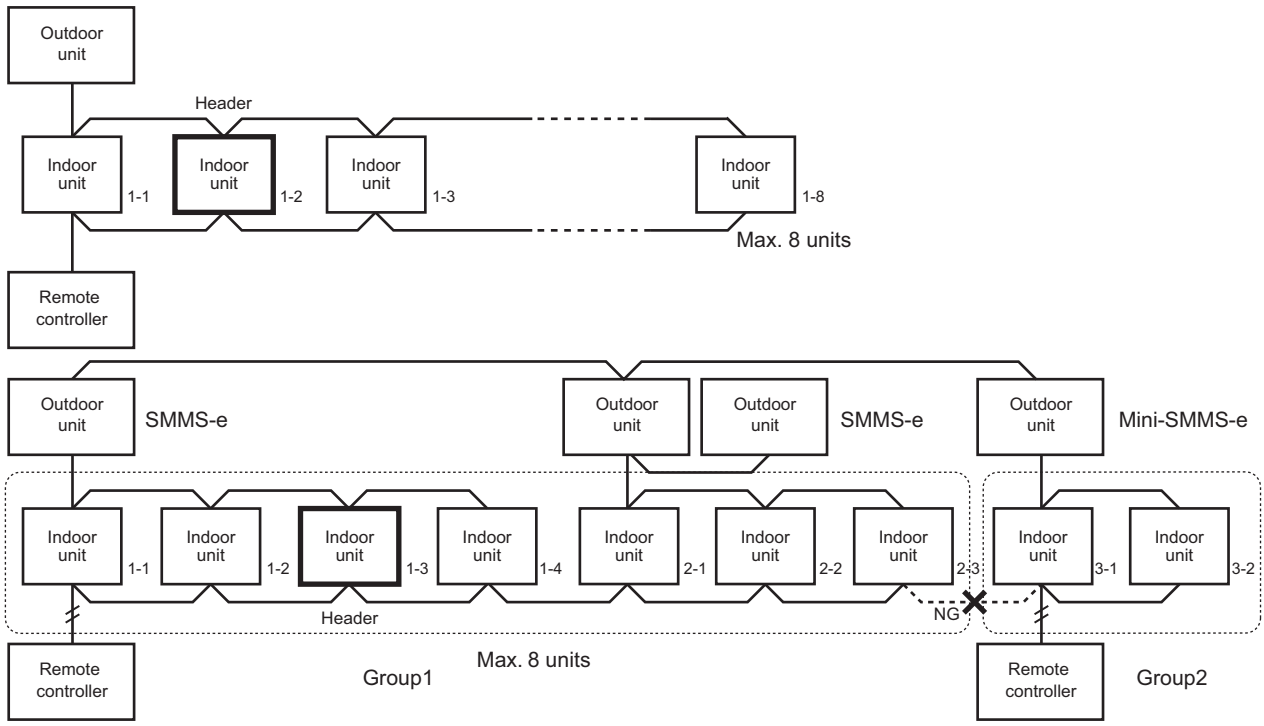
1) Operation items can be changed by “last push priority”.
2) In case of using a timer, connect the timer to either remote controller.

2-2-3 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.

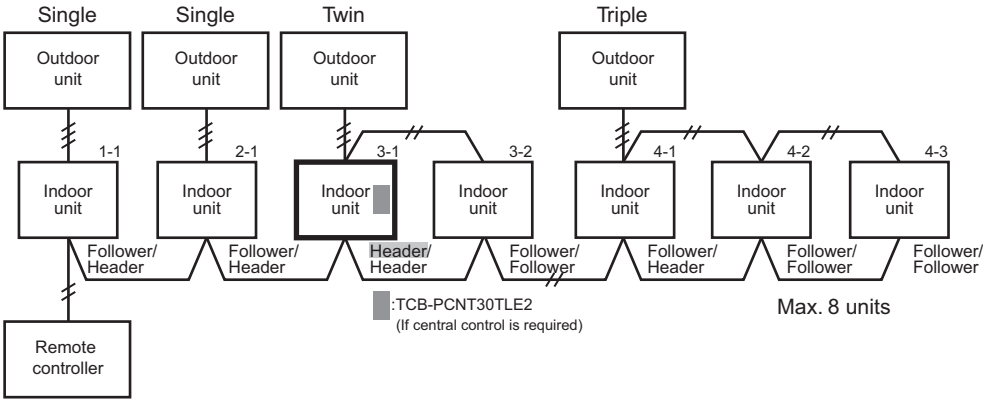
VRF example

System sample



In case of DI/SDI, each Header indoor unit connected with outdoor unit controls room temperature according to setting on the remote controller. The Header 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 under the group control.** If the power isn't supplied to the header indoor unit, communication between indoor units and remote controller can't be performed. "Do not make any groups containing two or more types of units (any two or more from VRF 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 Header and 1 Follower unit), special remote sensor (TCB-TC41LE):
1 unit (Remote controller must be one when the sensor is used.)

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 Header 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 Header 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 (MMD-AP****H) 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-TC41LE or the sensor built in to the remote controller. When you use group control, the sensor option varies as shown on the following table, depending on the system you use (VRF or DI/SDI).

Category	Group Control	Room temperature for control		
		Body TA sensor	TCB-TC41LE	Sensor in Remote controller
VRF	Group	yes(each)	prohibited	prohibited
	Individual	yes(each)	yes(each)	yes(each)
DI/SDI	Group/Twin/Triple	yes(Header)	yes(Header)	yes(Header)
	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 controller must be one. Able to use with another sensor at the same time if set to do so in the Header settings.

[Note 2] If two remote controllers are used, the sensor in the Header remote controller is selected by making the switch setting “Header” on the Header remote. However, if the sensor in the wireless remote controller is set as Header, 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 Header unit.

[Note 4] Do not install the remote sensor where air flow is poor.

[5]Address setting

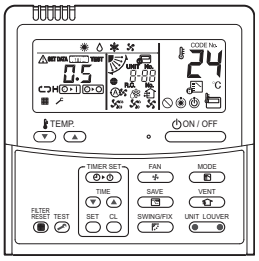
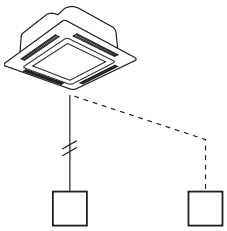
When performing automatic addressing of DI/SDI units, turn on all the indoor units of the group to be addressed. Addresses are not distributed to units which have not been turned on within 3 minutes from starting the automatic addressing.

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 Header unit has a unique address and specify which indoor units are Header ones.

2-3 Wired remote controller RBC-AMT32E

The standard remote controller can control an individual indoor unit or a group of 8 indoor units.
The remote control allows the operating parameters to be set for the indoor unit.
It also allows faults to be displayed and unit configurations to be set up.
The weekly timer can be fitted to this remote control.

Outline

Appearance	Application	Function
	**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 schedule 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.

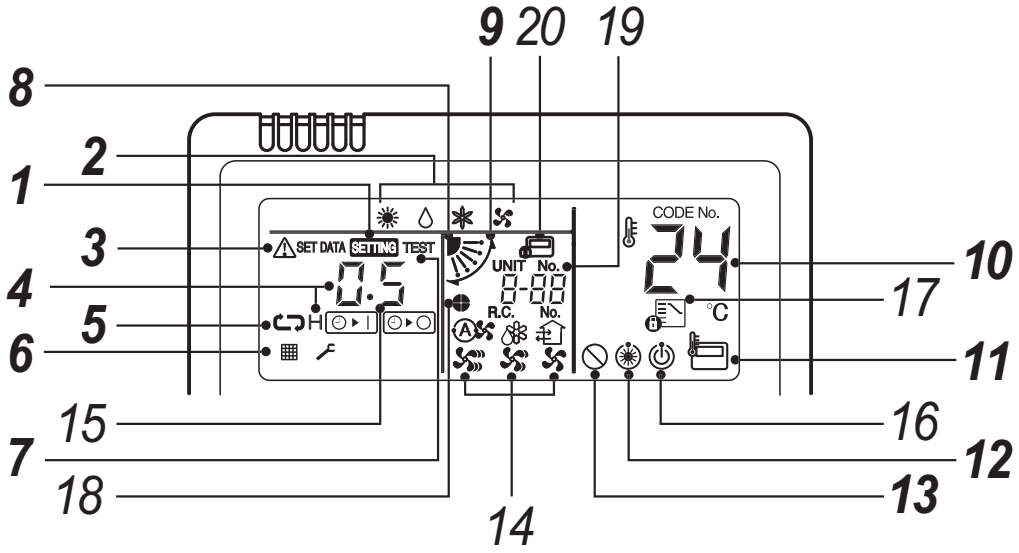
Specifications

Part name	Wired remote controller
Model Name	RBC-AMT32E
Power supply	No external power supply is required
Dimension	120 × 120 × 16 mm

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter dirty indicator	Reset	✓
Error Display	Reset	Hexadecimal fault code
Schedule Function	Scheduled timer required	-

Parts Name of Remote Controller (Display section)



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
Displays louver position.

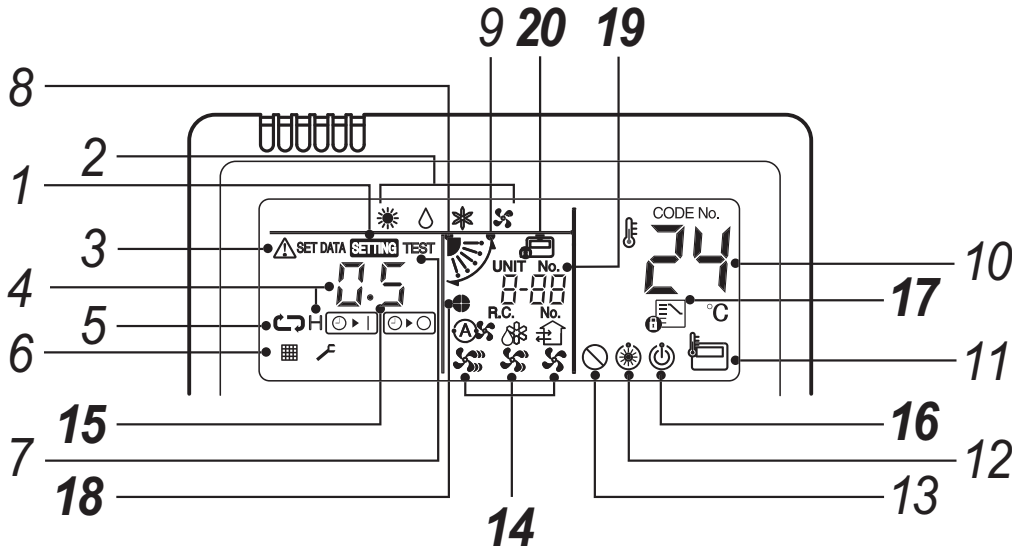
9 SWING display
Displayed during up/down movement of the louver.

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

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.)

Installation

➔ Please refer to the Installation Manual

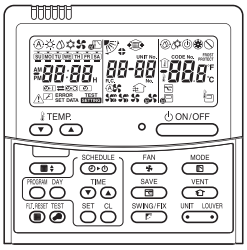
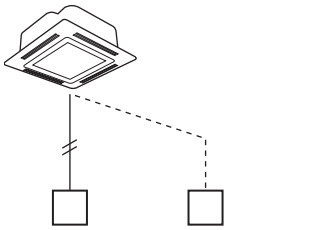
Operation

➔ Please refer to the Owner’s Manual

2-4 Remote controller with weekly timer RBC-AMS41E

This controller is based on the standard wired controller but has the additional control provided by a built-in 7-day timer function making it an ideal solution for any light commercial or VRF application that requires schedule timer operations or Night set-back control.
The 7-Day timer function can set multiple Indoor Unit parameters and can control:
Operation ON/OFF, Operation Mode, Set Temperature, Energy Saving Function*, Frost Protection Function*, button restrictions.
Restriction on button operation.
* Specific Unit Combinations only.

Outline

Appearance	Application	Function
	**Connected to indoor unit** 	• 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) function 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 operation 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 schedule 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.

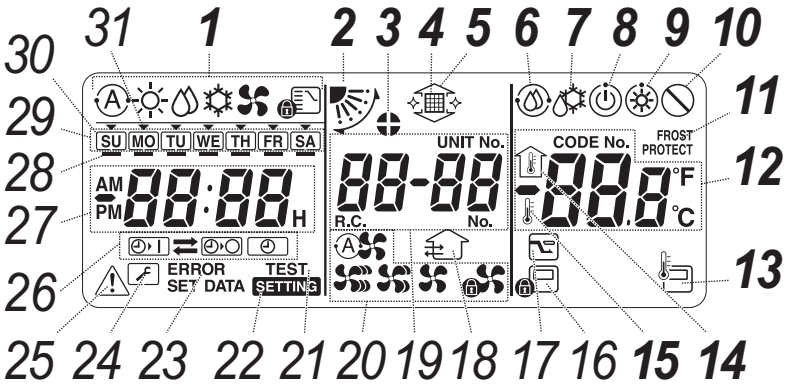
Specifications

Part name	Remote controller with weekly timer
Model Name	RBC-AMS41E
Power supply	No external power supply is required
Dimension	120 × 120 × 16 mm

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter dirty indicator	Reset	✓
Error Display	Reset	Hexadecimal fault code
Schedule Function	7 day timer, 8 functions for each day of the week	-

Parts Name of Remote Controller (Display section)



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.

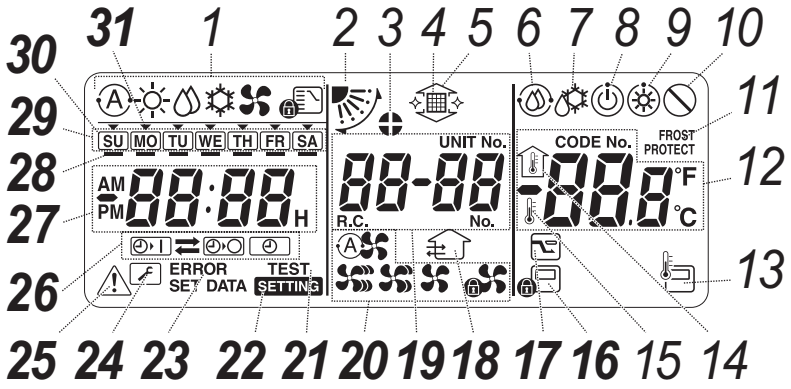
11 FROST PROTECT operation
This appears during a frost protection operation.

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 controller sensor
This appears when the remote controller 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.

Installation

➔ Please refer to the Installation Manual

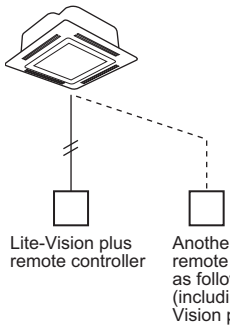
Operation

➔ Please refer to the Owner's Manual

2-5 Wired remote controller RBC-AMS54E-ES/EN

This is the local remote controller with a built in 7-Day Timer-featuring a multi-language LCD display with backlight, Energy Saving Options and a Return back function.
Possibility to set and display the room name to easily set-up and monitor the working parameters.
Modern and desirable controller design with menu driven display.
Save mode by schedule timer to optimize energy consumption.
Room temperature display always available.
Two “Hot Keys” (F1, F2) for easy operation of air conditioner functions.
Easy to read layout including display of Indoor Unit Model Name and serial number.
New temperature display that can show the Indoor Unit settings in increments of 0.5 °C.
Built-in backup power. Settings are kept in memories up to 48 hours in case of power failure.
Remote TA sensor available in controller.
Can be connected to a single Indoor Unit or a group of up to 8 Indoor Units.

Outline

Appearance	Application	Function
	**Connected to indoor unit** 	**Display** • Full dot display with back light • Multilingual language (11 languages) -EN : English, Italian, Polish, Greece, Russian, Turkish -ES : English, Spanish, Portuguese, French, Dutch, German • Indoor unit & outdoor unit temperature • Filter remaining hour, Total operation running hour • Name of room **Energy Saving** • Schedule timer with Energy save operation 4 pattern per day • Save ratio : 3 steps of 0% (thermo off) / 50% / 75% • Return back : Setting range 10 to 120 min **Schedule timer** • 8 programs per day • Off reminder timer **Others** • Easy to use by simple button • Night operation mode • Key Lock • Dual automatic mode • Soft cooling • Saving operation(expand function for LC model.)

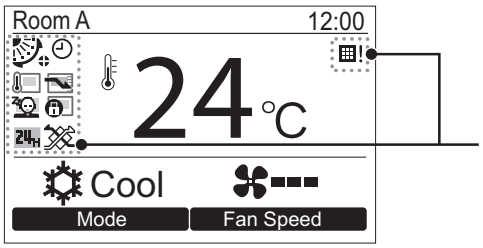
Specifications

Part name		Lite-Vision plus Remote Controller
Model Name		RBC-AMS54E-ES/EN
Power supply		No external power supply is required
Dimension		120 × 120 × 20 mm
Multilingual language	-EN	English, Italian, Polish, Greece, Russian, Turkish
	-ES	English, Spanish, Portuguese, French, Dutch, German

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter dirty indicator	Reset	✓
Error Display	Reset	Hexadecimal fault code
Schedule Function	8 programs per day, Holiday setting	-

Parts Name of Remote Controller (Display section)



Icons appear on the screen when the detailed display mode is selected.

▼Icon list

*1 Refer to the Installation / Operation Manual supplied with the remote controller.

	Shows the Energy saving operation is activated.		Shows a timer function is activated.
	Shows the remote controller sensor is activated. (*1)		Shows the Louver lock is activated.
	Shows the Night operation is activated.		Shows the setting of the louver.
	Shows the central control device prohibits the use of the remote controller (*1)		Shows the filter needs to be cleaned.
Auto	Operation mode : Auto	Heat	Operation mode : Heat
Cool	Operation mode : Cool	Dry	Operation mode : Dry
Fan	Operation mode : Fan		Fan mode : Auto
	Fan mode : High		Fan mode : Med
	Fan mode : Low		Shows soft cooling is activated.
			Shows the Energy saving operation is activated.

▼Ventilation icon list

- Ventilation icons appear on the display only when a ventilation unit is connected.
- Refer to the Owner's Manual supplied with the Air to Air Heat Exchanger for details about the ventilation icons.

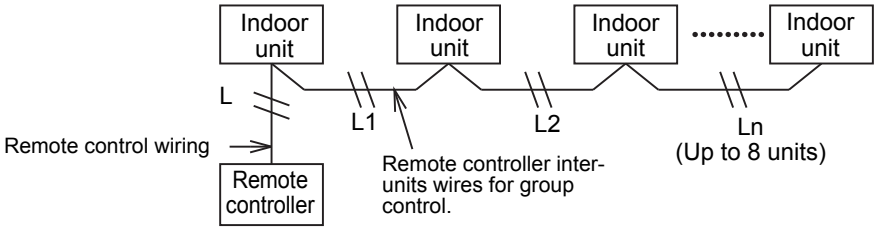
	Automatic mode	24H	24-hour ventilation mode
	Bypass mode		Nighttime heat purge mode
	Total heat exchange mode		

Requirement

◆ Remote control wiring and inter-unit wiring between remote controllers

Do not allow the wire for the remote controller (communication wire) and the wire for AC220-240 V to come into contact or put them together in one electrical conduit; otherwise, the control system may have trouble due to noise.
* Varies depending on the type of remote controller used.

Wiring type	VCTF: 0.5 mm² to 2.0 mm² × 2		
Total length of remote control wiring and inter-wiring between remote controllers (L+L1+L2+...Ln)	1 remote controller	2 remote controllers	2 remote controllers including a wireless remote controller
	Up to 500 m	Up to 300 m	Up to 400 m
Total length of inter-wiring between remote controllers (L1+L2+...Ln)	Up to 200 m		



■ Requirements for wiring of group control

- To make wiring of group control for indoor units of 4-way cassette type and other types, set the 4-way cassette type as the header unit; otherwise, some settings such as the individual louver setting are not available.
- To make wiring of group control for the indoor unit with the automatic grille-up / down function and the one without the function, set the indoor unit with the automatic grille-up / down function as the header unit; otherwise, the automatic grille-up / down function is not available.

■ Requirements for installing two remote controllers

In the dual remote controller system, one or more units are operated from two remote controllers. (Up to two remote controllers can be installed.)

Set the follower remote controller

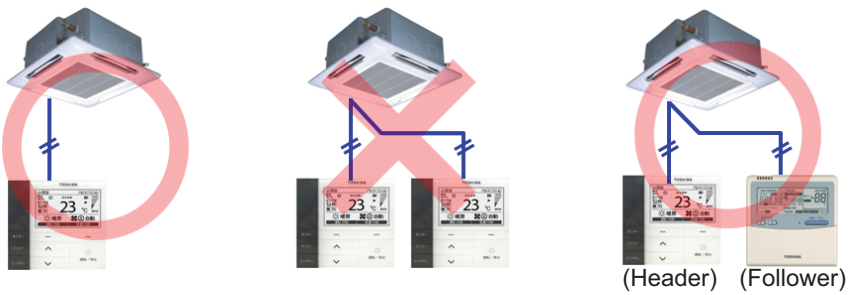
Set from “6. Header/Follower” in “Initial setting” on the MENU screen.

Install the remote controllers

For the dual remote controller system, install the remote controllers as follows:

1 **Set one remote controller as the header remote controller.**
(The remote controllers are set as “Header remote controller” as factory default.)

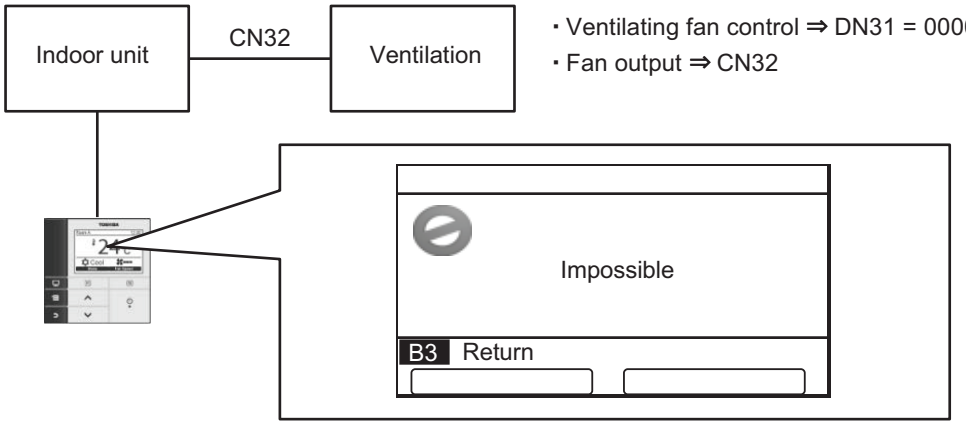
2 **When the dual remote controller system is installed by using this remote controller (RBC-AMS54E-ES, RBC-AMS54E-EN) with the other type of remote controller, set this remote controller as the Header remote controller.**



Ventilation pattern

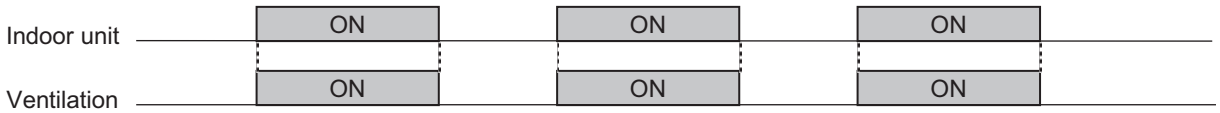
Item	Setting	Contents
Ventilating fan control	DN31	0000: Unavailable, 0001: Available
Fan output	CN32, Group	Connected to indoor unit

◆ Pattern 1

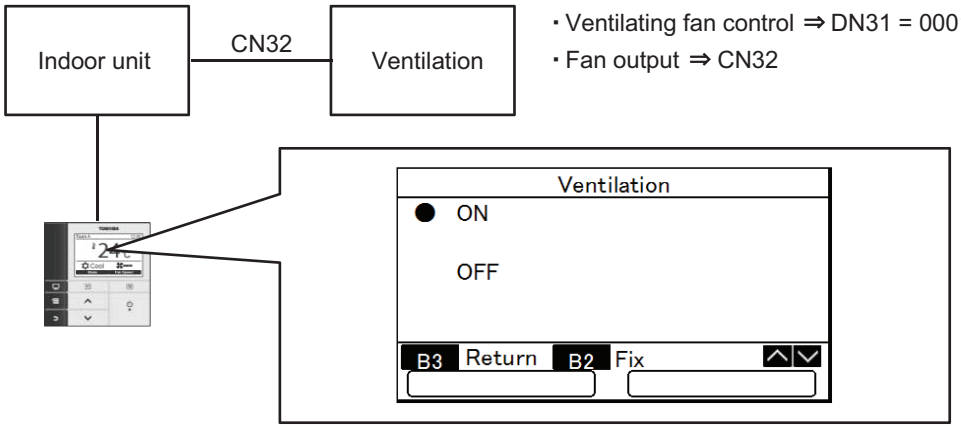


Menu item	Contents
1. ON/OFF	Unavailable
2. Fan speed	Unavailable
3. Mode	Unavailable
4. 24H ventilation off	Unavailable

Action

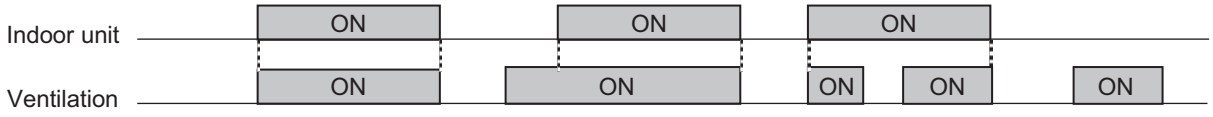


◆ Pattern 2

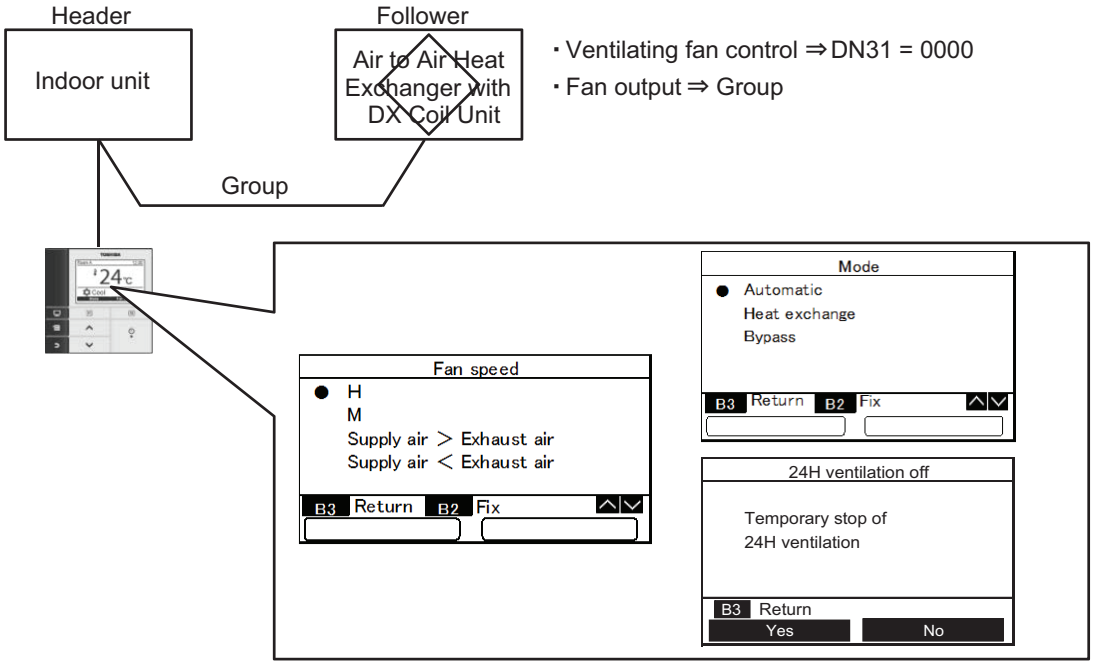


Menu item	Contents
1. ON/OFF	available
2. Fan speed	Unavailable
3. Mode	Unavailable
4. 24H ventilation off	Unavailable

Action

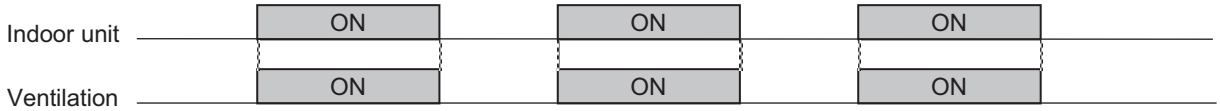


◆ Pattern 3

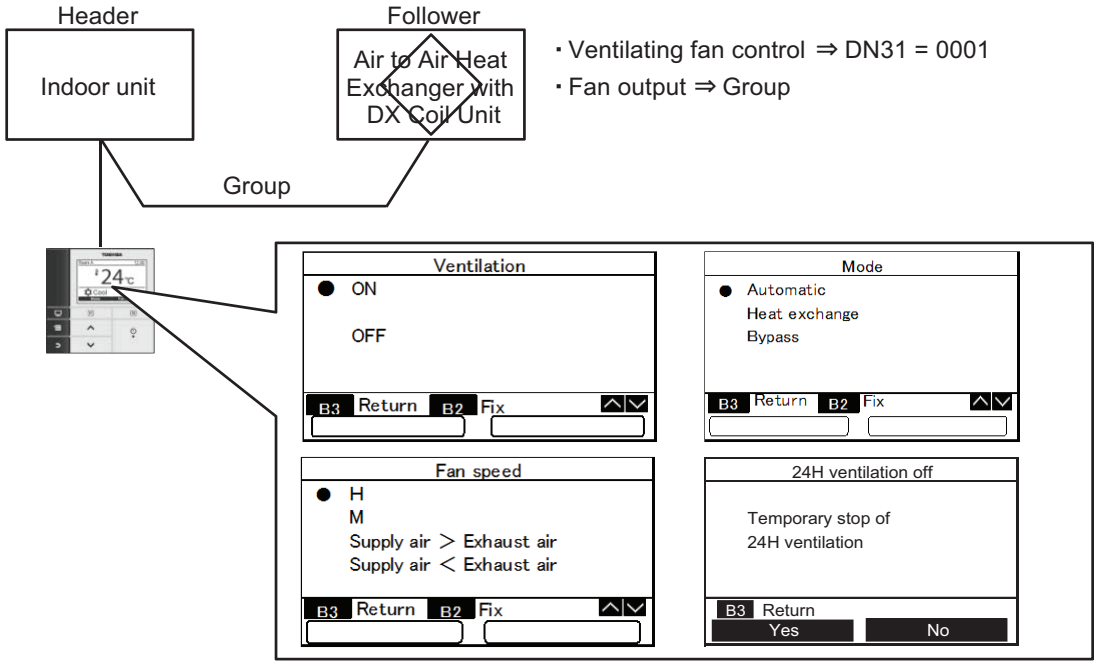


Menu item	Contents
1. ON/OFF	Unavailable
2. Fan speed	available
3. Mode	available
4. 24H ventilation off	available

Action

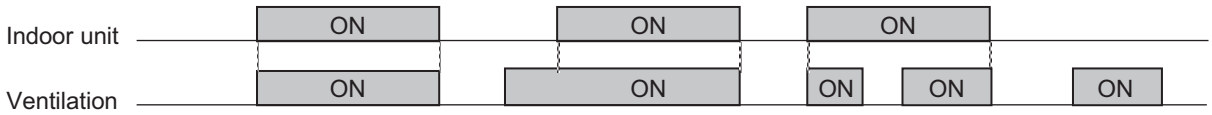


◆ Pattern 4

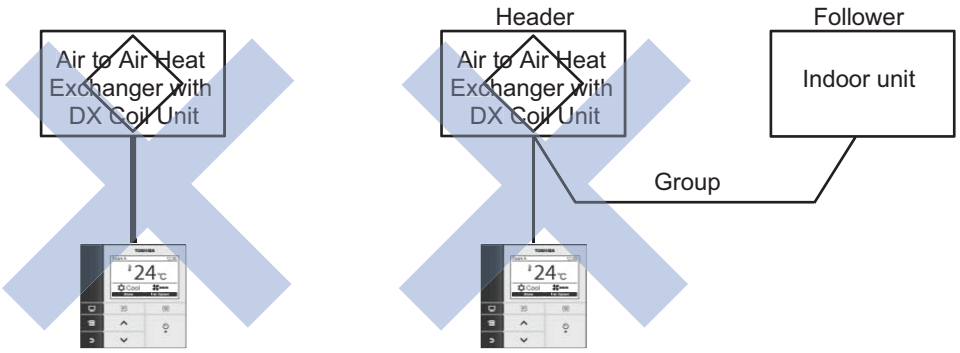


Menu item	Contents
1. ON/OFF	available
2. Fan speed	available
3. Mode	available
4. 24H ventilation off	available

Action



✻Prohibition pattern



▪1 by 1

・Ventilation unit is set to header of group operation

■ Dual Set Point / Soft Cooling / Refrigerant Leakage Detection Constant Fan / Secondary Heating

[1]Outline of these functions With RBC-AMS54E-EN/ES remote controller

Dual Set Point

This function enables the end user to operate cooling and heating automatically, via individual set temparatures.

Soft Cooling

This function allows the user to prevent cold air draft duaring indoor unit start-up and stable operation. During this mode, indoor capacity and lover position are restriced.

Refrigerant Leakage Detection (for SMMS-e, SHRM-e, Mini SMMS-e)

This function enables the system to detect a refrigerant leakage in the system.
This function is available for the following combinations: SMMS-e / SHRM-e / Mini SMMS-e.

•Any remote controller

Constant Fan

This function enables the end user to hold a setting air flow while thermo-off.

Secondary Heating

This function enables the end user to interlock operation of another heating device at heating mode.

[2]Applicable unit

Indoor unit : List below (each series or later)
Outdoor unit : VRF . . . . SMMS-e, SMMS-i, SHRM-e, SHRM-i, Mini SMMS-e, Mini SMMS, Side Blow VRF
: LC . . . . . DI, SDI

VRF

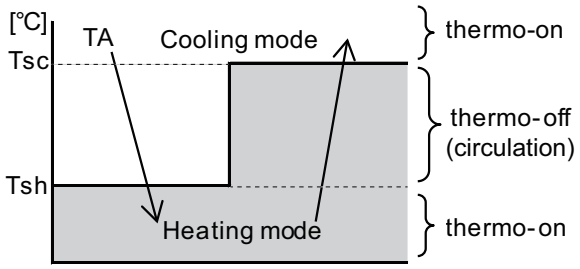
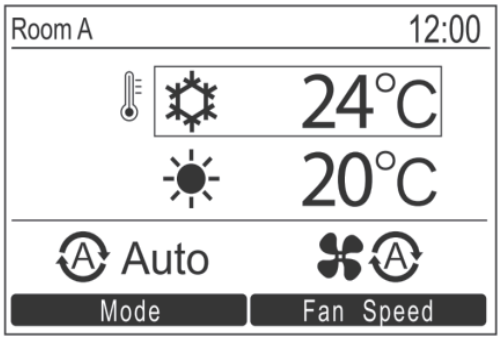
Type (including -TR, -IN models)	Model name	ser.
4-way	MMU-AP****HP1-E	4
Compact 4-way (0.6HP)	MMU-AP****MH1-E	6
Compact 4-way (0.8-2HP)	MMU-AP****MH1-E	4
2-way	MMU-AP****WH1-E	2
1-way (YH)	MMU-AP****YH1-E	4
1-way (SH)	MMU-AP****SH1-E	4
Slim Duct 0.6HP	MMD-AP****SPH1-E	6
Slim Duct	MMD-AP****SPH1-E	4
High Static Duct (2-6HP)	MMD-AP****HP1-E	6
High Static Duct (8-10HP)	MMD-AP****HP-E	6
Concealed duct	MMD-AP****BHP1-E	6
Ceiling	MMC-AP****HP1-E	7
Floor standing	MMF-AP****H1-E	6
Floor standing cabinet	MML-AP****H1-E	4
Floor standing concealed	MML-AP****BH1-E	4
Console	MML-AP****NH1-E	4*1
High wall	MMK-AP****H1	3
Compact High wall 0.6HP	MMK-AP****MHP1-E	4
Compact High wall	MMK-AP****MH1-E	4
Air to Air Heat Exchanger With DX-coil	MMD-VN***HEX1E	N/A
	MMD-VN***HEX1E2	N/A
Air to Air Heat Exchanger With DX-coil and Humidifier	MMD-VNK***HEX1E	N/A
	MMD-VNK***HEX1E2	N/A
Fresh Air Intake Unit	MMD-AP**HFE-E	N/A

LC

Type (including -TR, -IN models)	Model name	ser.
High Static Duct (8-10HP)	RAV-SM****DTP-E	4

*1: Secondary heating is not including.
N/A: Not Applicable to any series.

[3]Control specifications

Items	Outline of specifications	Remarks
Dual Set Point	If this function is enable, the indoor will be operated as Fig.1, at Auto Mode.  Fig1. Control outline **<Control Outline>** 1) If TA goes down along a down arrow in Fig.1, indoor unit operates as cooling thermo-off mode until Tsh. 2) If TA goes up along a up allow in Fig.1, indoor unit operates as heating thermo-off mode until Tsc. 3) If TA is between Tsc to Tsh, indoor unit operates as thermo-off (circulation). 4) When the indoor unit starts operating with [ON] button on RC, Operation mode will be decided according to the following conditions. •In case of TA ≥ (Tsc+Tsh) / 2 + 1°C, indoor unit operate in Cooling mode •In case of TA < (Tsc+Tsh) / 2 - 1°C, indoor unit operate in Heating mode •In case of (Tsc + Tsh) / 2 - 1°C < TA ≤ (Tsc+Tsh) / 2 + 1°C, indoor unit operates as cooling thermo-off mode. **<How to enable>** If you want to enable this function, please set DN[77] = 0002. Display on RC changes to dual set temperature.  Fig.2: Display example on RC **<Note>** If the indoor unit receives an additional set temperature command, for example Auto Mode from another RC, within the same group, the dual set point is not supported. Tsc and Tsh on RBC-AMS54E-EN/ES is automatically set as below. Tsc = < New set temperature from another RC > + 1.5°C Tsh = < New set temperature from another RC > - 1.5°C	TA: Temp. room sensor Tsc: Temp.set cooling Tsh: Temp.set heating RC: Remote Controller DN [77] : 0000 (factory set) 0002 (enable)

<table>
<tr><th>Items</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>Soft Cooling</td><td>
If this function is enable, indoor capacity is restricted by the save rate as Fig.1
Indoor capacity and loverangle arerestricted during soft cooling setting.

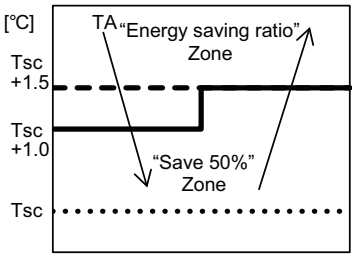


Fig.1 Save rate control at soft cooling mode

<Control Outline>
1) When TA goes down along a down arrow in Fig.1, indoor unit is controlled with "Energy saving ratio"*1 until Tsc+1.0[°C].
2) When TA goes up along a up arrow in Fig.1, indoor unit is controlled with "Save 50%" *2 until Tsc+1.5[°C].
3) On this mode, the range of louver angle is restricted as shown in Fig.2.

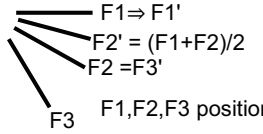


Fig.2 Louver angle restriction

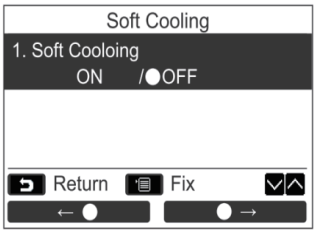


Fig.3 Soft Cooling configuration on RC

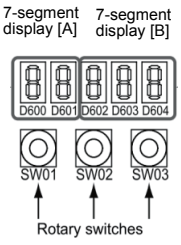
<How to enable>
This function will be enabled by using RBC-AMS54E-EN/ES remote controller as shown in Fig.3.
<Note>
•" " is displayed on the display screen during the Soft cooling operation.
•"No function" appears on RC for the unit which doesn't have the soft cooling function.
</td><td>
TA:
Temp. room sensor

Tsc:
Temp.set cooling

*1 "Energy saving ratio" can be set in "9. Energy saving" setting.

[MENU] button
→"12. Soft cooling"
→ON
→[MENU] button
</td></tr>
<tr><td>Refrigerant Leakage Detection</td><td>
The refrigerant leakage can be confirmed by using the switches on Interface PCB of the outdoor unit, or remote controller.

<Confirming the refrigerant leakage>
Indoor Unit: Call the Monitor function of remote controller
<table>
<tr><td>CODE No.</td><td>Display</td></tr>
<tr><td rowspan="3">[E0]</td><td>[- - - -] = Not available,</td></tr>
<tr><td>[0000] = Normal,</td></tr>
<tr><td>[0001] = Possibility of Leakage</td></tr>
</table>
Outdoor Unit: Set SW01 to 03 as shown in the following table
<table>
<tr><th>SW01</th><th>SW02</th><th>SW03</th><th colspan="3">Display detail</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">13</td><td rowspan="2">14</td><td rowspan="2">Refrigerant leakage detection</td><td>A</td><td>[L. d]</td></tr>
<tr><td>B</td><td>Normal: [... ...0]
Possibility of leakage: [... ...1]
Clear the data: [...C.L] (Only Display for 5 seconds)</td></tr>
</table>
You can confirm details more on Outdoor Unit manual.



</td><td>
Monitor function

<RBC-AMS54E-EN/ES>
1. push [MENU] button
2. push [MENU]+[V] buttons (4sec)
3. select "4.monitor function".
</td></tr>
</table>

Items	Outline of specifications	Remarks
Constant Fan	**<DN[05]: Setting of fan operation during heating thermo off.>** Table.1 Configuration fan control during thermo-off of heating.	*In case VRF model, there is a case of working compressor during a indoor unit thermo-off.
	<DN[9B]: Setting of "prevention of cold air discharge" control enable/disable> When heating operation, indoor unit inhibition the fan speed to prevention of cold air discharge. Control outline is bellow (Fig1 & Fig2). If this function disable, set DN[9B] according to Table.2.	*Indoor fan does not comply with remote controller setting during oil/ refrigerant recovery control.

DN [05]	compressor	
	ON	OFF
1	L	UL
12	in accordance with RC	

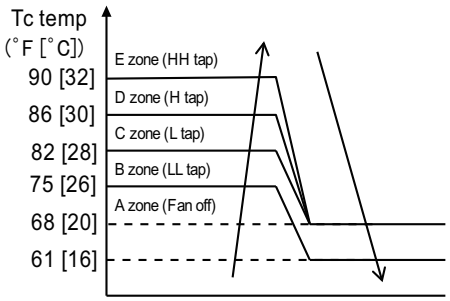


Fig.1 Fan speed at prevention of cold air discharge (VRF)

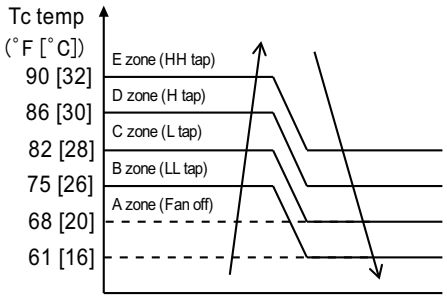


Fig.2 Fan speed at prevention of cold air discharge (SDI)

Table.2 Configuration fan control during thermo-on of heating.

DN [9B]	function detail
0000	Prevention control of cold air discharge "enable" (Factory setting)
0001	Prevention control of cold air discharge without A zone
0002	Work in RC setting Fan speed. (Prevention control of cold air discharge "disable")

<Combination Pattern of DN[05] & [9B]>

Setting	DN [9B]	0000	0000	0001	0001	0002	0002
	DN [05]	0001	0012	0001	0012	0001	0012
Indoor fan	Thermo ON	HH to OFF	HH to OFF	HH to LL	HH to LL	RC setting	RC setting
	Thermo OFF	L or LL	RC setting	L or LL	RC setting	L or LL	RC setting

*Factory setting

*RC = Remote controller

<Note>
During defrosting, indoor fan speed become RC setting when DN [05] is set as 0012 and DN [9B] is set as "0002". In case of DN [9B] is set as "0000" or "0001", indoor fan speed may change based on prevention control of cold air discharge.
Please select the setting carefully considering cold air throw during defrosting.

Items	Outline of specifications	Remarks
Secondary Heating	If this function is enable, the indoor unit will operate according to TA.temperature (Fig.1) **<Control Outline>** 1) If TA goes down along a down allow in Fig.1, Secondly Heating output is OFF until T_{SA_L} 2) If TA goes up along a up allow in Fig.1, Secondly Heating output is ON until T_{SA_H} 3) If the outdoor unit is defrost mode, Secondly Heating output is ON regardless of any conditions. 4) If you want to restrict Secondly Heating output depending on outdoor temperature, you can set threshold temperature as Fig.2.	TA: Temp. room sensor Ts: Temp.set on RC T_{SA_H}: Temp.set air high (= Ts - ΔA_{S-H}) T_{SA_L}: Temp.set air low (= T_{SA_H} - ΔA_{H-L}) T_{SO_H}: Temp.set out high T_{SO_L}: Temp.set out low (=T_{SO_H} - ΔO_{H-L})

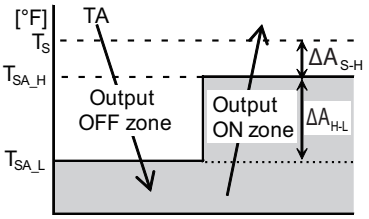


Fig.1 Control outline (TA)

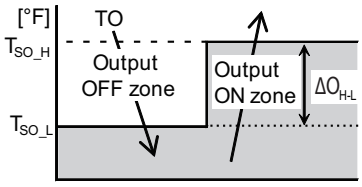


Fig.2 Control outline (TO)

<How to enable>

If you want to enable this function, please set combination of DN [C6] [C7] [DB] [DC] as Table.1

Table.1 Data set combination of SHE

DN Code	legends	set data		factory set
		set number	actual value	
[DB]	ΔA_{H-L}	0001 ~ 0010	0.9 ~ 9.0°F	0006 (5.4°F)
[DC]	ΔA_{S-H}	0001 ~ 0010	0.9 ~ 9.0°F	0000 (invalid)
[C6]	T_{SO-H}	-0015 ~ 0015	-5.0 ~ 59.0°F	0000
[C7]	Δ_{OH-L}	0001 ~ 0010	0.9 ~ 18.0°F	0000 (invalid)

<How to install>

There is a different installation between the model which has MCC-1643 (PCB) and doesn't have.

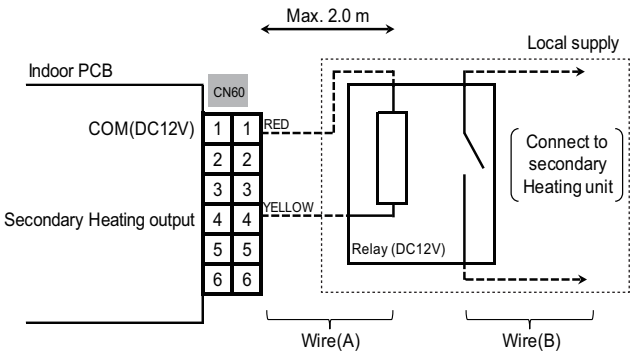
Table.2 Models which are installed MCC-1643.

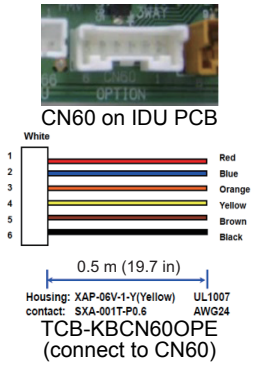
	Type	Model name	ser.
VRF	High Static Duct (8-10HP)	MMD-AP****HP-E	6
	Floor standing	MMF-AP****H1-E	6
LC	High Static Duct (8-10HP)	RAV-SM****DTP-E	4

1) In case of the indoor unit which MCC-1643 PCB is not installed.
The parts which need preparations.

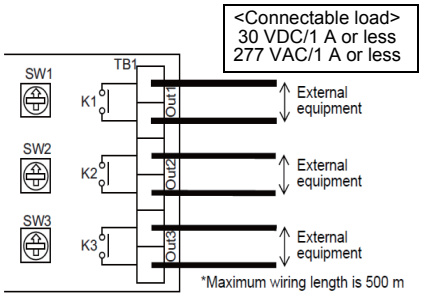
No.	Name	Q'ty	Work item
1	Wire (A)	1	TCB-KBCN60OPE (Connect to IDC PCB CN60 to relay)
2	Relay (DC12V)	1	Local procurement
3	Wire (B)	1	Local procurement (Connect to relay to secondary heating unit)

• Wiring diagram





2) In case of the indoor which MCC-1643 PCB is installed. You will need the option board (TCB-PCUC1E).
You can use any TB1 terminals “OUT1”, “OUT2”,“OUT3” as Secondly Heating output signal with setting “SW1”or “SW2”or“SW3” as position 1 (within set range 0 ~ F).



[For Secondary Heating Installation Professionals]

- Before installation work, please read this manual thoroughly and install the products correctly.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Perform installation work securely.**
  Incomplete installation may causes an electric shock or a fire.
- **Ask an authorized dealer or qualified installation professional to reinstall adapters.**
  Incomplete installation may causes an electric shock or a fire.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Use an exclusive power supply for the air conditioner at the rated voltage.**
  An insufficient power supply capacity or inappropriate installation may cause fire.

⚠ CAUTION

- Using specified wires, securely connect the wires so that an external force of wire is not applied to connecting part of terminals; otherwise disconnection, heating or fire may occur.
- For wiring work, use wires with correct current capacity; otherwise leakage, heating or fire will generate.
- This document covered only indoor unit output function.
  Refer to the manual of connecting device for specification and installation.

Installation

➔ Please refer to the Installation Manual

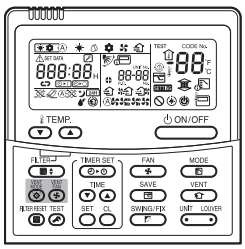
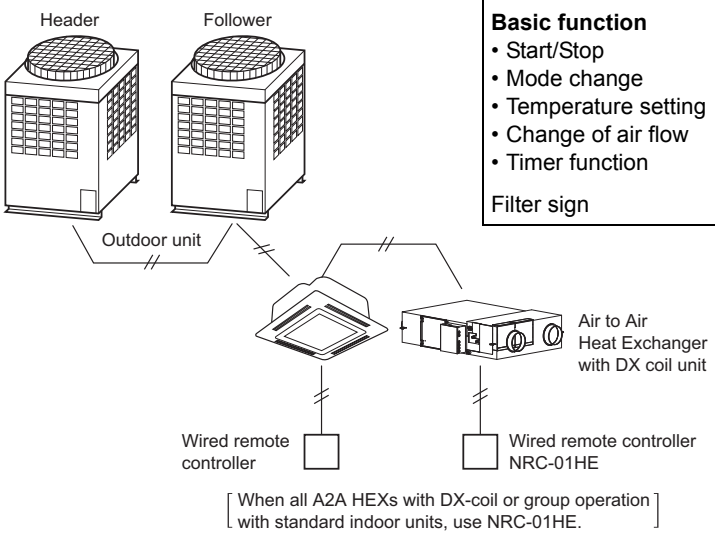
Operation

➔ Please refer to the Owner's Manual

2-6 Wired remote controller for Air to Air Heat Exchanger with DX coil unit NRC-01HE

One of these remote controllers can be used to control both indoor air conditioner units and Air to Air Heat Exchanger with DX Coil Units (up to 8 units in total).

Outline

Appearance	Application	Function
		**Ventilation** • Ventilation start/stop • Ventilation mode change • Change of ventilation fan speed **Basic function** • Start/Stop • Mode change • Temperature setting • Change of air flow • Timer function Filter sign

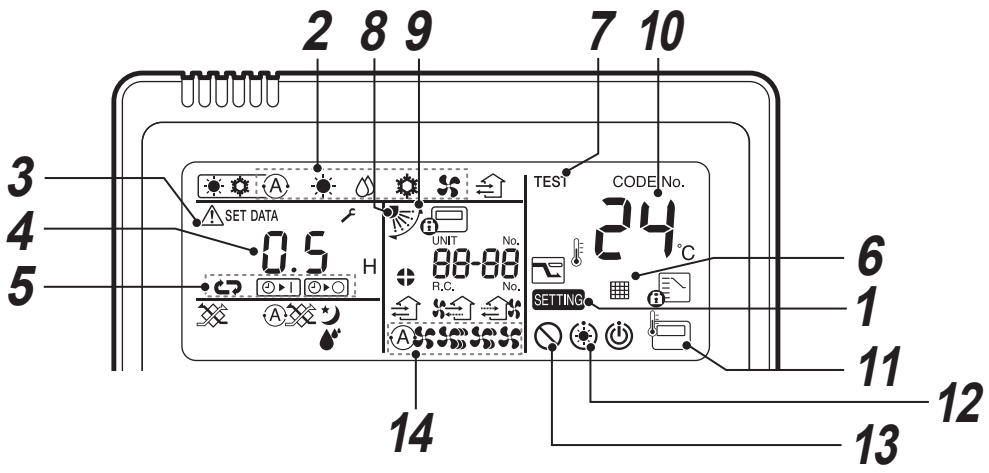
Specifications

Part name	Wired remote controller for Air to Air Heat Exchanger with DX coil unit
Model Name	NRC-01HE
Power supply	No external power supply is required
Dimension	120 × 120 × 16 mm

Main functions

Function		Operation	Monitoring
ON/OFF		✓	✓
Mode		Heat, Cool, Dry, Fan, Auto	✓
Setting temperature		18 - 29 °C	✓
Fan Speed		Auto, Low, Medium, High	✓
Louver position		Swing, Fix	✓
Filter dirty indicator		Reset	✓
Error Display		Reset	Hexadecimal fault code
Schedule Function		Scheduled timer required	-
Air to Air Heat Exchanger with DX coil unit	ON/OFF	✓	✓
	Mode	Automatic, Heat exchange	✓
	Fan Speed	High, Low, SA>EA (SA<EA)	✓

Parts Name of Remote Controller (Display section)



1 SETTING indicator
Displayed when setting the timer or other functions.

2 Operation mode indicator
Indicates the operation mode selected.

3 Error indicator
Displayed when the protective device activates or an error occurs.

4 Time indicator
Indicates time concerning the timer.
(Indicates a error code when an error occurs.)

5 Timer mode indicator
Each time you press the TIMER SET button, the indication changes as follows: , , , and no timer indication.

6 Filter indicator
Reminder to clean the air filter.

7 Test run indicator
Displayed during a test run.

8 Louver position display (*1)

9 Swing indicator (*1)

10 Set temperature display
The selected set temperature is displayed.

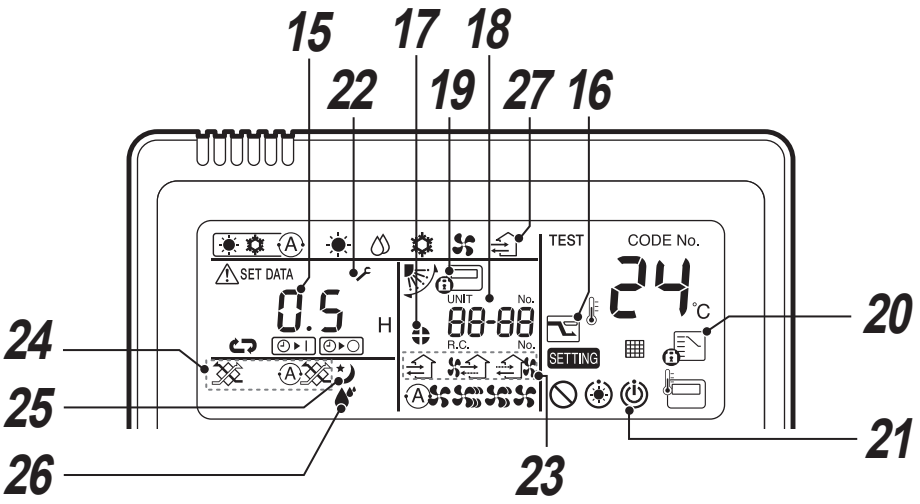
11 Remote controller sensor indicator
Displayed when the remote controller sensor is used.

12 Pre-heat indicator
Displayed when the heating mode is energized or defrost cycle is initiated.
While this indication is displayed, the indoor fan stops or operate in fan mode.

13 No function indicator
Displayed when the function requested is not available on that model.

14 Fan speed indicator (*1)
Indicates the selected fan speed:

(Auto)	
(High)	
(Medium)	
(Low)	



15 Louver Number display. (*1)

16 Power saving mode display
Displayed during capacity saving mode.

17 Louver lock indicator (*1)

18 UNIT No. indicator
The number of the Air to Air Heat Exchanger with DX Coil Unit selected using the UNIT button or that of the unit in which an error has occurred.

19 Central control indicator
Displayed when a central control device such as a central controller is also used. If the central control device prohibits the use of local remote controllers, blinks when any of the ON / OFF, MODE or TEMP. buttons are pressed and the operation is rejected. The items controllable with the remote differ depending on the mode of central control. Refer to the owner's manual of the central control device you are using for more information

20 Operation mode controlled indicator
Displayed when MODE button is pushed while operation mode is fixed to cool or heat by the air conditioner administrator.

21 Operation ready display (*1)
This display appears on some models.

22 Service display
Displayed while the protective device works or a trouble occurs.

23 Ventilation fan speed indicator
Indicates the ventilation fan's speed. , , or is indicated.
When the remote is used to control air conditioners together with the Air to Air Heat Exchanger with DX Coil Unit as a group, VENT FAN indicator appears (blinks) only when the button is pressed.

(High)		
(Low)		
(SA > EA)	(*2)	* Displayed when the setting is activated.
(SA < EA)	(*2)	

24 Ventilation mode indicator
Indicates the selected ventilation mode. or is indicated.

(Automatic mode)	
(Heat exchange mode)	

25 Nighttime heat purge indicator
Displayed during the nighttime heat purge operation. (*2)

26 Humidification indicator (VNK type only)
Displayed during humidifying.

27 Ventilation indicator
If the remote is used to control the Air to Air Heat Exchanger with DX Coil Unit in a system linked with air conditioners, and separate operation of the unit is set to available, the indicator is displayed while the unit is running.
* The indicator is not displayed when the unit is running in a system equipped with only the Air to Air Heat Exchanger with DX Coil Unit.

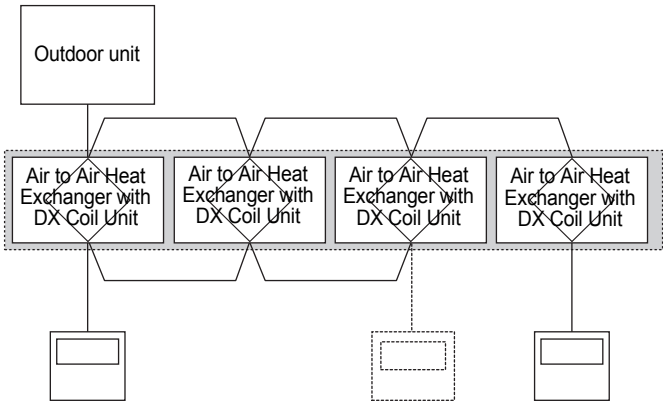
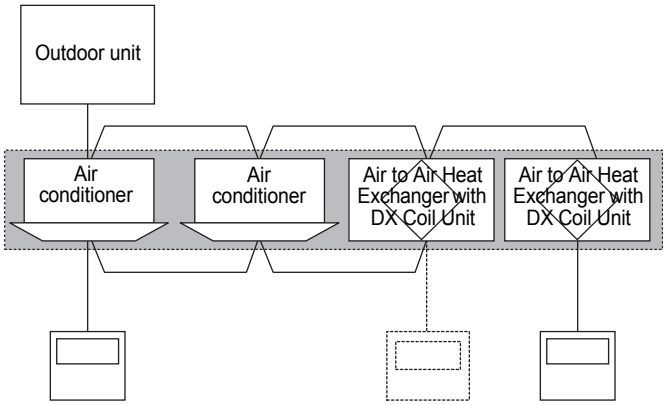
(*1):
Not displayed. These functions are not available for Air to Air Heat Exchanger with DX Coil Unit.

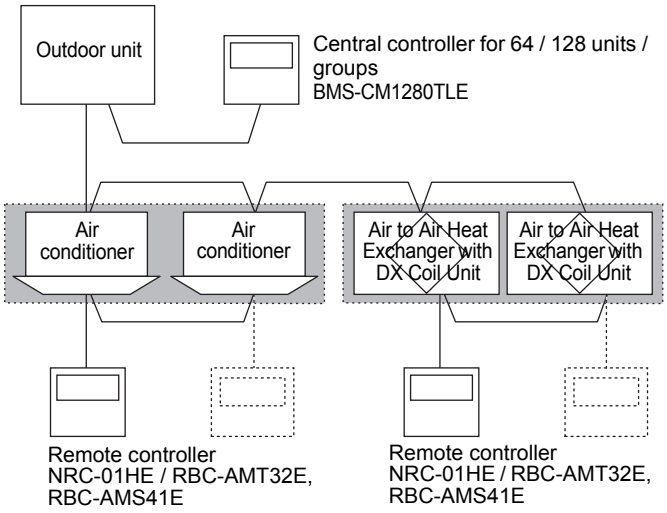
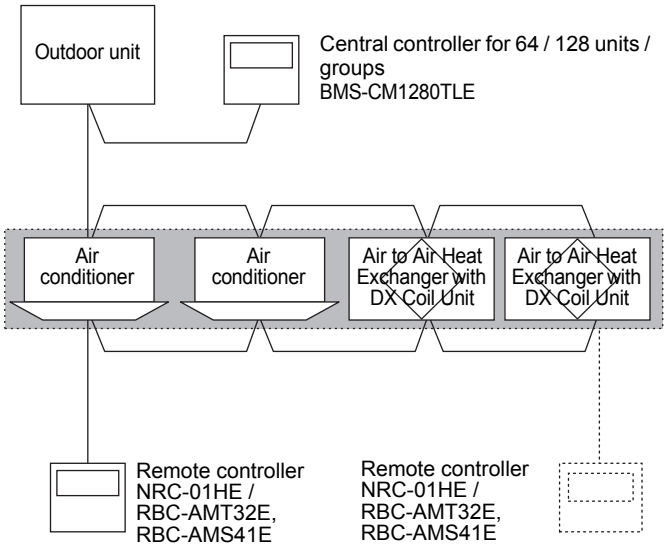
(*2):
Displayed when these operation modes are activated.

System configuration

The control method of this product differs depending on the system configuration. Operate it following the methods explained in the system configuration examples below.

- For the actual system configuration, ask your dealer or the installer of the product for information.
- Refer also to the installation manuals and owner's manuals of the remote controllers.
- If a central remote controller is used, refer also to its installation manual and owner's Manual.

System example	Operation	Note
A. Air to Air Heat Exchanger with DX Coil Unit system  Remote controller NRC-01HE / RBC-AMT32E, RBC-AMS41E	The remote controller can be used to ON/OFF running the Air to Air Heat Exchanger with DX Coil Unit. **Remote controller for the Air to Air Heat Exchanger with DX Coil Unit (NRC-01HE)** The remote controller can be used to select the operation mode, start and stop the unit, control the ventilation FAN speed, select the ventilation mode, and adjust the temperature. **Main remote controller (RBC-AMT32E, RBC-AMS41E)** • The remote controller can be used to select the operation mode, start and stop the unit, and adjust the temperature. • The remote controller cannot be used to change the ventilation FAN speed or select ventilation mode.	If two remote controllers are used, the latter operation overrides the former and their indications always reflect the result of the latter operation.
B. Air to Air Heat Exchanger with DX Coil Unit system linked with air conditioners  Remote controller NRC-01HE / RBC-AMT32E, RBC-AMS41E	The remote controller can be used to ON/OFF running the Air to Air Heat Exchanger with DX Coil Unit. **Remote controller for the Air to Air Heat Exchanger with DX Coil Unit (NRC-01HE)** The remote controller can be used to select the operation mode, start and stop the unit, control the ventilation FAN speed, select the ventilation mode, and adjust the temperature. **Main remote controller (RBC-AMT32E, RBC-AMS41E)** • The remote controller can be used to select the operation mode, start and stop the unit, and adjust the temperature. • The remote controller cannot be used to change the ventilation FAN speed or select the ventilation mode. * The remote controller (NRC-01HE) can be used to start and stop only the Air to Air Heat Exchanger with DX Coil Unit. For this operation, it is necessary to change the settings. Consult the dealer for details.	If two remote controllers are used, the latter operation overrides the former and their indications always reflect the result of the latter operation.

System example	Operation	Note
C. Central control system (When controlling the Air conditioner and the Air to Air Heat Exchanger with DX Coil Unit separately) 	The central controller can be used to ON/OFF the whole system and separately ON/OFF groups of Air conditioners and the Air to Air Heat Exchanger with DX Coil Units. The central controller cannot be used to control the ventilation FAN speed or select the ventilation mode of the Air to Air Heat Exchanger with DX Coil Unit. * Use NRC-01HE or RBC-AMT32E, RBC-AMS41E to control only the group of the Air to Air Heat Exchanger with DX Coil Unit. You cannot control the ventilation FAN speed or select the ventilation mode when using RBC-AMT32E, RBC-AMS41E.	If two control devices are used; the central controller and the remote controllers for the Air to Air Heat Exchanger with DX Coil Unit and Air conditioner, the latter operation overrides the former regardless of which device is used.
D. Central control system (When controlling the Air conditioner and the Air to Air Heat Exchanger with DX Coil Unit together) 	The central controller can be used to ON/OFF the whole system. The central controller cannot be used to control the ventilation FAN speed or select the ventilation mode of the Air to Air Heat Exchanger with DX Coil Unit. The remote controller (NRC-01HE) can be used to control the ventilation FAN speed and select the ventilation mode of the Air to Air Heat Exchanger with DX Coil Unit. The remote controller (RBC-AMT32E, RBC-AMS41E) cannot be used to control the ventilation FAN speed or select the ventilation mode of the Air to Air Heat Exchanger with DX Coil Unit. * The remote controller (NRC-01HE) can be used to start and stop only the Air to Air Heat Exchanger with DX Coil Unit. For this operation, it is necessary to change the settings. Consult the dealer for details.	

* When the Air to Air Heat Exchanger with DX Coil Unit system linked with indoor air conditioners is used, set the Air to Air Heat Exchanger with DX Coil Unit as “Follower”, referring to “Setting the address manually using the remote controller” in the Installation Manual of the outdoor unit.

Installation

➔ Please refer to the Installation Manual

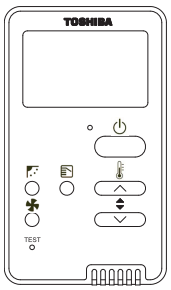
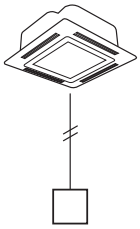
Operation

➔ Please refer to the Owner’s Manual

2-7 Simple wired remote controller RBC-AS41E

This is a simplified version of the standard wired remote controller and can be connected to a single Indoor Unit, or group of up to 8 Indoor Units.
The reduced function display and simplified button layout make this controller the ideal solution for hotel and office applications.

Outline

Appearance	Application	Function
	**Connected to indoor unit**  Simple remote controller	• Start / Stop • Temperature setting • Air flow changing • Check code display

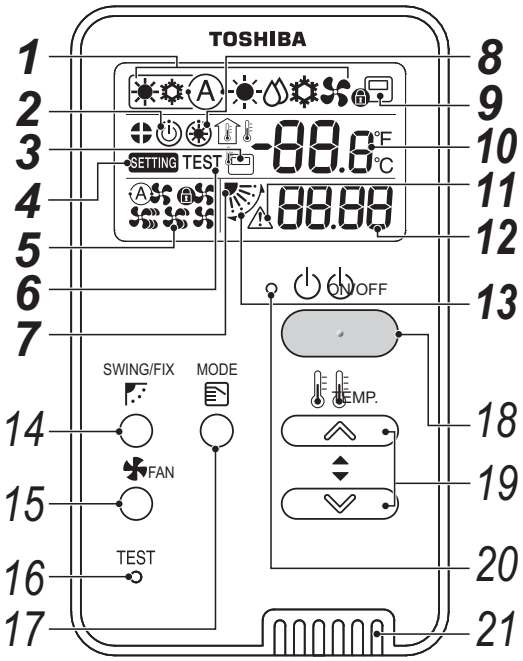
Specifications

Part name	Simple wired remote controller
Model Name	RBC-AS41E
Power supply	No external power supply is required
Dimension	120 × 70 × 16 mm

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter dirty indicator	-	-
Error Display	Reset	Hexadecimal fault code
Schedule Function	-	-

Parts Name of Remote Controller (Display section)



■ Indicators

All icons on the display are shown for this explanation. Icons related to heating do not appear for cooling only models.
Operations are not accepted when “SETTING” is flashing.

1 Operation mode indicator

Indicates the operation mode selected.

2 Operation standby indicator

Indicates that the Super Modular Multi System-e cannot cool if a different indoor unit is heating or cannot heat if one is cooling; and that the Super Heat Recovery Multi System-e cannot heat or cool because the outside temperature is outside the operating range.

3 Remote controller sensor indicator

Displayed when the remote controller sensor is used.

4 Setting indicator

Indicates that the model is being checked automatically after a breaker is thrown or some other occurrence.

5 Fan speed indicator

Indicates the selected fan speed:
“Ⓐ Auto”, “ High”, “ Medium”, “ Low” or “ Fix”.

6 Test run indicator

Displayed during test run.

7 Louver position indicator

Indicates the louver position.

8 Pre-heat indicator

Displayed when the heating mode is energized or defrost cycle is initiated.
While this indication is displayed, the indoor fan stops or operate in fan mode.

9 Central control indicator

Displayed when the air conditioner is controlled centrally and used with central control devices such as the central remote controller.
If the use of the remote controller is prohibited by the central control, blinks when the ON/OFF, MODE, or TEMP. button on the remote controller is pushed, and the buttons do not function.
(Settings that can be configured on the remote controller differ depending on the mode of the central control. For details, read the Owner’s Manual of the central remote controller.)

10 Temperature setting indicator

The selected set temperature is displayed.

11 Service display

Displayed while the protective device works or a check occurs.

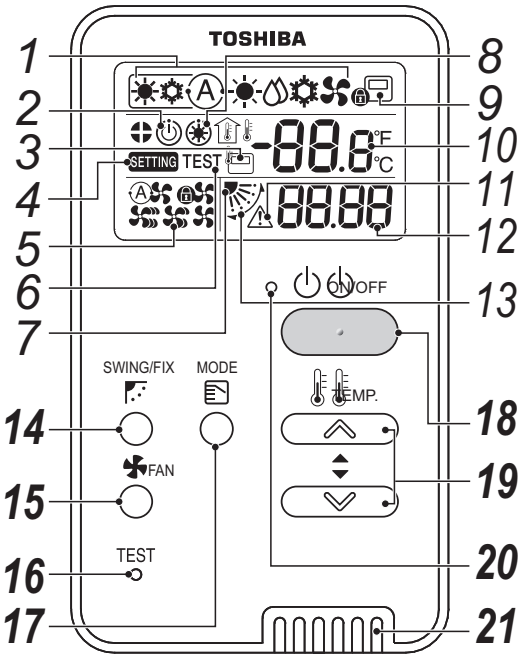
12 Check code indicator

When a check occurs, alternately indicates the indoor unit number and the check code.

13 Swing indicator

Displayed during up/down movement of the louver.

■ Operations



14 Set louver and swing button
Set automatic swing or the angle of the louvers.

15 Fan speed button
Selects the desired fan speed.

16 Test button
Used for test runs and for servicing.
* Not normally used.

17 Mode select button
Selects desired operation mode.

18 ON/OFF button
Turns on the unit when pushed, and turns off when pushed again.

19 Temperature setting button
Adjusts the set temperature.
Select the desired set point by pushing temperature button.

20 Operation lamp
Lights during operations. Blinks when a check occurs or the protective device activates.

21 Remote controller sensor
Normally, the indoor unit's temperature sensor detects the temperature, but it can also detect the temperature near the remote controller. For details, contact your dealer.
* Do not set during group control.

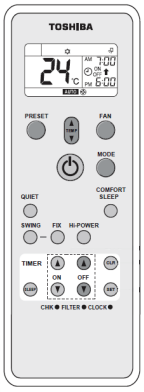
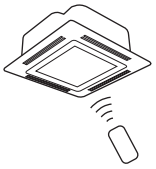
Installation
➔ Please refer to the Installation Manual

Operation
➔ Please refer to the Owner's Manual

2-8 Wireless remote controller kit

The wireless controller is available with a series of receiver unit designs.
These receivers are specially designed to fit into different Indoor Unit models to provide a high standard of finish.
The wireless controller features an easy to use and compact button layout, standard control buttons immediately available and display screen to show all the main operating parameters.

Outline

Appearance		Application	Function
RBC-AX32U(W)-E RBC-AX32U(WS)-E RBC-AX33CE TCB-AX32E2 RBC-AX32UW(W)-E		**Connected to indoor unit** 	• Start/Stop • Mode change • Temperature setting • Change of air flow • Timer function • Control by 2 remote controllers is available. • Check code display RBC-AX32U(W)-E RBC-AX32U(WS)-E (For 4-way Air Discharge Cassette)  RBC-AX33CE (For Under Ceiling, 1-way Air Discharge Cassette SH)  TCB-AX32E2 (For Compact 4-way Cassette, 1-way Air Discharge Cassette YH, Concealed Duct Standard, Slim Duct, Floor Standing Cabinet, Floor Standing)  RBC-AX32UW(W)-E (For 2-way Air Discharge Casette) 

Specifications

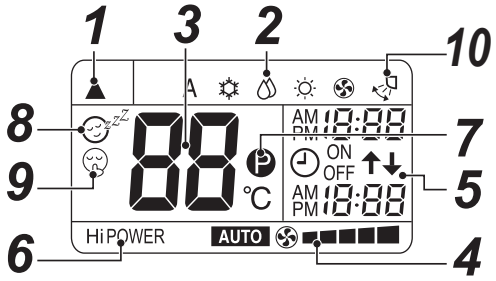
Part name			Wireless remote controller kit
Model Name			RBC-AX32U(W/WS)-E, TCB-AX32E2, RBC-AX33CE, RBC-AX32UW(W)-E
Power supply			No external power supply is required
Dimension	RBC-AX32U(W/WS)-E	Receiver	163 × 163 × 24 mm
	RBC-AX33CE	Receiver	130 × 65 mm
	TCB-AX32E2	Receiver	120 × 70 × 18.2 mm
	WH-L11SE	Handset	157 × 56 × 19 mm
	RBC-AX32UW(W)-E	Receiver	162 × 65 mm
	WH-H1JE2	Handset	177 × 61 × 19.5 mm

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	17 - 30 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter dirty indicator	Reset	-
Error Display	Reset	LED on receiver unit
Schedule Function	-	-

Parts Name of Remote Controller (Display section)

▼WH-L11SE (RBC-AX32U(W)-E, RBC-AX32U(WS)-E, RBC-AX33CE, TCB-AX32E2, RBC-AX32W(W)-E)



• In the illustration, all indications are indicated for explanation.
During operation, only the relevant indications will be indicated on the remote controller.

1 Transmission mark
This transmission mark (▲) indicates when the remote controller transmits signals to the indoor unit.

2 Mode display
Indicates the current operation mode.
(A : Auto changeover control, ☼ : Cool, 💧 : Dry, ☀ : Heat, ✿ : Fan only)

3 Temperature display
Indicates the temperature setting (17 °C to 30 °C).
When you set the operating mode to ✿ : Fan only, no temperature setting is indicated.

4 FAN speed display
Indicates the selected fan speed. AUTO or one of five fan speed levels (LOW ▪ , LOW$^+$ ▪▪ , MED ▪▪▪ , MED$^+$ ▪▪▪▪ , HIGH ▪▪▪▪▪) can be indicated.
Indicates AUTO when the operating mode is 💧 : Dry.
* Five patterns are displayed. but the actual fan speed varies depending on the indoor unit type.

5 TIMER and clock time display
The time set for timer operation or clock time is indicated.
The present time is always indicated except for TIMER operation.

6 Hi POWER display
Indicates when the high power operation starts.
Push the Hi-POWER button to start and push it again to stop the operation.

7 Ⓟ (PRESET) display
Indicated when memorizing the preferred operation mode or when it has been memorized.
Also, this icon is indicated when the memorized preferred operation is displayed.

8 (COMFORT SLEEP) display
Indicated during the OFF timer operation that automatically adjusts the room temperature and the fan speed. Each time you push the COMFORT SLEEP button, the display changes in the sequence of 1h, 3h, 5h, and 9h.

9 (QUIET) display
Indicated during the quiet operation.

10 Swing display
Indicated during the swinging operation where the horizontal louver automatically moves up and down.

NOTE

When both wired remote controller or central controller and wireless remote controller are used, display on the screen of wireless remote controller may differ from the actual operation in some cases.

Installation

➔ Please refer to the Installation Manual
(RBC-AX32U(W/WS)-E, RBC-AX33CE, TCB-AX32E2, RBC-AX32UW(W)-E)

Operation

➔ Please refer to the Owner's Manual
(RBC-AX32U(W/WS)-E, RBC-AX33CE, TCB-AX32E2, RBC-AX32UW(W)-E)

2-9 Remote Controller Comparison Table

Part name		Wired Remote Controller				
		Standard	With schedule timer	With LCD display and backlight	For Air to Air Heat Exchanger with DX coil unit	Simple wired remote controller
Model Name		RBC-AMT32E	RBC-AMS41E	RBC-AMS54E-ES/EN	NRC-01HE	RBC-AS41E
Dimension	Handset	120 × 120 × 16 mm	120 × 120 × 16 mm	120 × 120 × 20 mm	120 × 120 × 16 mm	120 × 70 × 16 mm
	Receiver					
Installation place		Wall	Wall	Wall	Wall	Wall
Max wired length [Note.9]		500 m	500 m	500 m	500 m	500 m
ON/OFF		✓	✓	✓	✓	✓
Mode	Auto [Note.4]	✓	✓	✓	✓	✓
	cool	✓	✓	✓	✓	✓
	heat	✓	✓	✓	✓	✓
	dry [Note.1]	✓	✓	✓	✓	✓
	fan	✓	✓	✓	✓	✓
Temperature setting range	Auto [Note.4]	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C
	cool	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C
	heat	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C
	dry [Note.1]	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C	18 - 29 °C
FAN [Note.2] auto/low/med/high		✓	✓	✓	✓	✓
Louver position [Note.3]		✓	✓	✓	✓	✓
Ventilation control		✓	✓	✓	✓	✓
Filter sign/reset		✓	✓	✓	✓	-
Return back		-	-	✓	✓	-
Power Save [Note.8] Individual louver [Note.8] Frost protection (heating at 8 °C) [Note.8] Self cleaning mode [Note.8]		✓	✓	✓	✓	-
CLOCK		-	✓	✓	-	-
ECO/HI-POWER/MEMO/AUTO		-	-	-	-	-
Grille up/down [Note.8]		-	✓	✓	-	-
Function setting (DN code)		✓	✓	✓	✓	-
Temperature sensor [Note.5]		✓	✓	✓	✓	✓ [Note.6]
Header/follower	Header	✓	✓	✓	✓	✓
	Follower	✓	✓	✓	✓	✓
Multiple control [Note.7]		Max 2 /1 indoor or 1 group	Max 2 /1 indoor or 1 group	Max 2 /1 indoor or 1 group	Max 2 /1 indoor or 1 group	Max 2 /1 indoor or 1 group
Timer		Off/repeat off/on	Off/repeat off/on	Off/repeat off/on	Off/repeat off/on	-
Weekly schedule		-	✓ 7 day timer, 8 functions for each day of the week	✓ 8 programs/day, Holiday setting, 3 patterns	-	-
Connectivity to Schedule Timer (TCB-EXS21TLE)		✓	-	-	✓	-
Error output		✓	✓	✓	✓	✓
Error history		✓ 4 history	✓ 4 history	✓ 10 history	✓ 4 history	-
Air to Air Heat Exchanger with DX coil unit	ON/OFF	✓	✓	✓ [Note.10]	✓	-
	Mode	-	-	✓ [Note.10]	✓	-
	Fan Speed	-	-	✓ [Note.10]	✓	-

Part name		Wireless Remote Controller					
		For 4-way Air Discharge Cassette	For Under Ceiling and 1-way Air Discharge Cassette SH	For Compact 4-way Cassette, 1-way Air Discharge Cassette YH, Concealed Duct Standard, Slim Duct, Floor Standing Cabinet, Floor Standing	For 2-way Air Discharge Cassette	For Hi-wall 3series (VRF), Hi-wall 6series (LC), Console	For High-wall 4series (VRF)
Model Name		RBC-AX32U(W/WS)-E (WH-L11SE)	RBC-AX33CE (WH-L11SE)	TCB-AX32E2 (WH-L11SE)	RBC-AX32UW(W)-E (WH-L11SE)	WH-L11SE	WH-H2UE
Dimension	Handset	157 × 56 × 19 mm			157 × 56 × 19 mm		56 × 150 × 19 mm
	Receiver	163 × 163 × 24 mm	130 × 65 mm	120 × 70 × 18.2 mm	162 × 65 mm	Receiver included	Receiver included
Installation place		Inside Indoor (receiver)	Inside Indoor (receiver)	Wall (receiver)	Inside Indoor (receiver)	-	-
Max wired length [Note.9]		400 m	400 m	400 m	400 m	-	-
ON/OFF		✓	✓	✓	✓	✓	✓
Mode	Auto [Note.4]	✓	✓	✓	✓	✓	✓
	cool	✓	✓	✓	✓	✓	✓
	heat	✓	✓	✓	✓	✓	✓
	dry [Note.1]	✓	✓	✓	✓	✓	✓
	fan	✓	✓	✓	✓	✓	✓
Temperature setting range	Auto [Note.4]	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C
	cool	17 - 30 °C	17 - 30 °C	17 - 30 °C	18 - 30 °C	17 - 30 °C	17 - 30 °C
	heat	17 - 30 °C	17 - 30 °C	17 - 30 °C	16 - 30 °C	17 - 30 °C	17 - 30 °C
	dry [Note.1]	17 - 30 °C	17 - 30 °C	17 - 30 °C	18 - 30 °C	17 - 30 °C	17 - 30 °C
FAN [Note.2] auto/low/med/high		✓	✓	✓	✓	✓	✓
Louver position [Note.3]		✓	✓	✓	✓	✓	✓
Ventilation control		-	-	-	-	-	-
Filter sign/reset		- /✓	- /✓	- /✓	- /✓	- / ✓	- /✓
Return back		-	-	-	-	-	-
Power Save [Note.8] Individual louver [Note.8] Frost protection (heating at 8 °C) [Note.8] Self cleaning mode [Note.8]		-	-	-	-	-	-
CLOCK		✓	✓	✓	✓	✓	✓
ECO/HI-POWER/MEMO/AUTO		✓	✓	✓	✓	✓	✓
Grille up/down [Note.8]		-	-	-	-	-	-
Function setting (DN code)		-	-	-	-	-	-
Temperature sensor [Note.5]		-	-	-	-	-	-
Header/follower	Header	✓	✓	✓	✓	✓	✓
	Follower	✓	✓	✓	✓	✓	✓
Multiple control [Note.7]		MAX 2/1 indoor or 1 group	MAX 2/1 indoor or 1 group	MAX 2/1 indoor or 1 group	MAX 2/1 indoor or 1 group	Max2/1 indoor or 1group	- (one wireless only)
Timer		Off/on/on-off/daily	Off/on/on-off/daily	Off/on/on-off/daily	Off/on/on-off/daily	Off/on/on-off/daily	Off/on/on-off/daily
Weekly schedule		-	-	-	-	-	-
Connectivity to Schedule Timer (TCB-EXS21TLE)		-	-	-	-	-	-
Error output		✓ LED on receiver	✓ LED on receiver	✓ LED on receiver	✓ LED on receiver	✓ LED on receiver	-
Error history		-	-	-	-	-	-
Air to Air Heat Exchanger with DX coil unit	ON/OFF	-	-	-	-	-	-
	Mode	-	-	-	-	-	-
	Fan Speed	-	-	-	-	-	-

[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] SHRM-e 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 Header controller is recognized as remote sensor through the temperature can be set from either Header or Follower 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] Wireless type max 6 address setting. the address switch position on both receiver and controller shall be selected.

[NOTE.8] The actual functions depend on the air-conditioner.

[NOTE.9] Another 200 m for Indoor to Indoor wiring.

[NOTE.10] For settings, refer to the installation manual of RBC-AMS54E-ES/EN.

3

Schedule timer and central remote controller

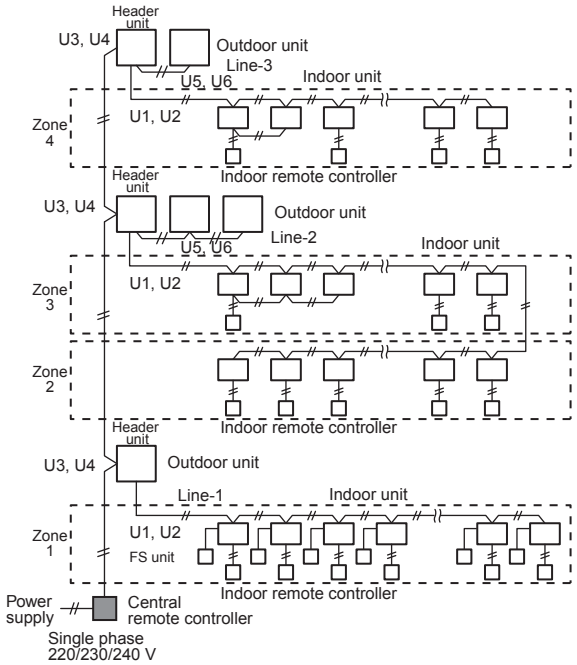
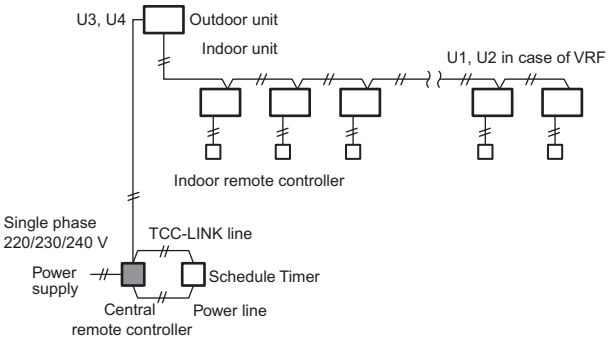
3-1 Line Up & Function - Schedule timer and central remote controller
3-2 Application controls for central remote controller
3-3 Schedule timer TCB-EXS21TLE
3-4 ON-OFF controller TCB-CC163TLE2
3-5 Compliant Manager BMS-CM1280TLE
3-6 Central remote controller Comparison Table

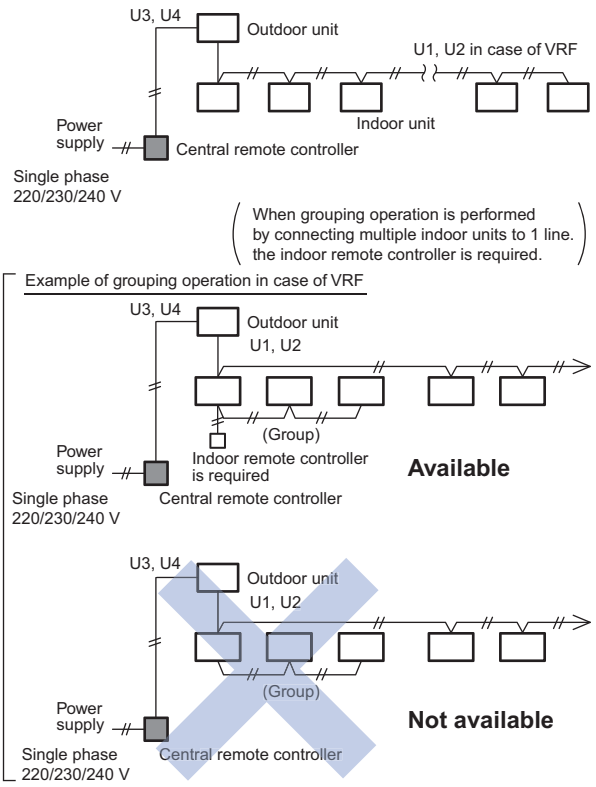
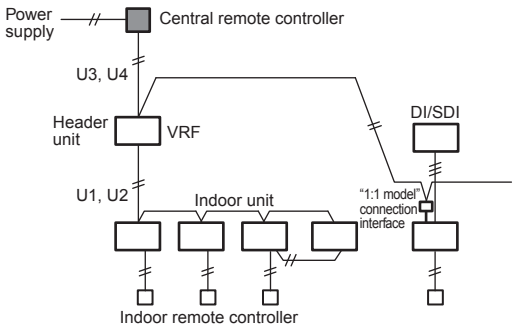
3-1 Line Up & Function - Schedule timer and central remote controller

Model Name	Schedule Timer	Central Remote Control	
	TCB-EXS21TLE	TCB-CC163TLE2	BMS-CM1280TLE
Appearance			
ON/OFF	✓	✓	✓
Mode	-	-	✓
Setting Temperature	-	-	✓
Fan Speed	-	-	✓
Timer Function	✓	✓ (*2)	✓ (*2)
Schedule Function	✓	✓ (*2)	✓ (*2)
Multi language	-	-	-
Energy Save Function	-	-	-
Permit/Prohibit function	✓	-	✓
Filter dirty indicator	-	-	✓
Error Display	-	✓ (*1)	✓

(*1) : Error can be recognized by blink of the button on the remote controller. However, error code is not displayed.
(*2) : Schedule timer (TCB-EXS21TLE) needed.

3-2 Application controls for central remote controller

	Basic function	System diagram
1	Central management controller for 64 units / 128 units	 **Function of central remote controller** ■ BMS-CM1280TLE • Individual control of up to (64 indoor units) × 2 TCC-LINK buses • Individual control of up to (64 indoor units divided 1 to 64 zones) × 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) × 2ch is available • Setting for (one of 1 to 64 groups) × 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 ■ Header/Follower setting possible ■ Central control 4 mode • 4 selectable settings to restrict individual operation of remote controller.
2	Central remote controller + Schedule Timer	

	Basic function	System diagram
3	Central remote controller without indoor remote controller (Please prepare a wired remote controller for operation confirming of indoor unit in advance.)	
4	Central management control with “1 : 1 model”	

3-3 Schedule timer TCB-EXS21TLE

The Schedule Timer is an advanced control device that can be used to control Indoor Unit parameters based on a timed schedule, and has two possible modes of operation to choose from, these are:

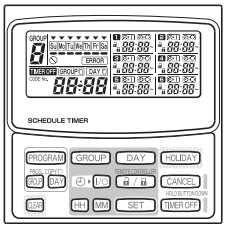
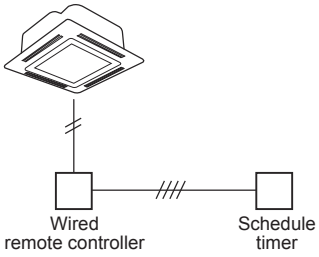
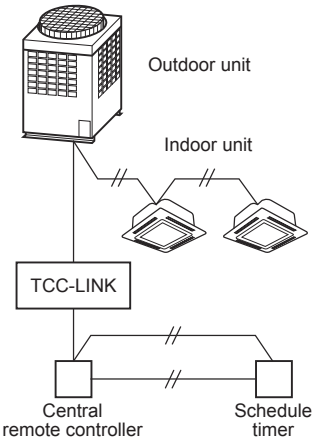
Weekly Timer Mode

The timer is connected to an Indoor Unit via a local or central remote controller.

Schedule Timer Mode

The timer is connected directly to the TCC Link Central Control network and can set timer functions for up to 64 Indoor Units in up to 8 programmable control groups.

Outline

Appearance	Application	Function
	**Weekly timer mode** Connected to central remote controller or wired remote controller  **Schedule timer mode**  	■ 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-AM32E) – 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.

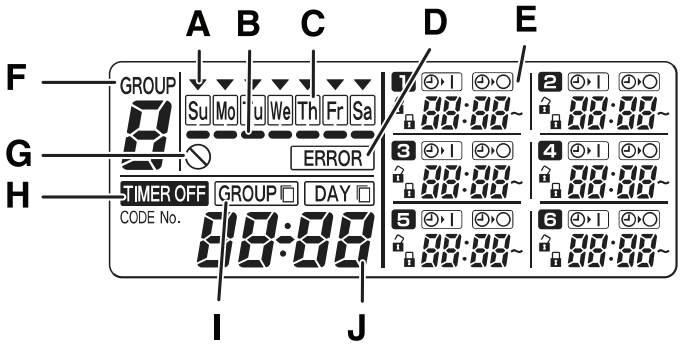
Specifications

Part name		Schedule Timer
Model Name		TCB-EXS21TLE
Power supply		No external power supply is required
Dimension		120 × 120 × 16 mm
Max number per one controller	Indoor unit	64
	TCC-link bus	1
Indoor view classification		• 1 fixed timer group (1 setting zone) (64 units together) • 4 fixed timer group (4 setting zone) (16 units together) • 8 fixed timer group (8 setting zone) (8 units together)

Main functions

Function		Operation	Monitoring
ON/OFF		✓	-
Timer Function		✓	✓
Central / Individual (Operation prohibited)		✓	-
Weekly Timer Mode	Number of registrations	Equivalent to the number of indoor units	-
	Settable period	7 days, Up to 1 week later including current date	-
	Number of set points per day	3 settings	-
	Interval of set point	1 minute	
	Settable parameters	ON/OFF	-
	Special day	Holiday setting : 1 pattern	-
Schedule Timer Mode	Number of registrations	Equivalent to the number of indoor units	-
	Settable period	7 days, Up to 1 week later including current date	-
	Number of set points per day	6 settings	-
	Interval of set point	1 minute	-
	Settable parameters	ON/OFF Permit/Prohibit	-
	Special day	Holiday setting : 1 pattern	-

Parts Name of Remote Controller (Display section)



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. Also, indicates the copy source/destination during group program copying.
F: Group No.	Up to 8 groups can be selected and displayed.
G: ⃠ (Disabled Feature) indication	Displayed if the selected feature was disabled during installation.
H: TIMER OFF indication	Displayed when the timer has been turned OFF.
I : Copy mode indication	Displayed when copying a program into a group or day of the schedule.
J: Present time	Displays the present time on a 24-hour clock. Also, displays settings in the various setting modes.

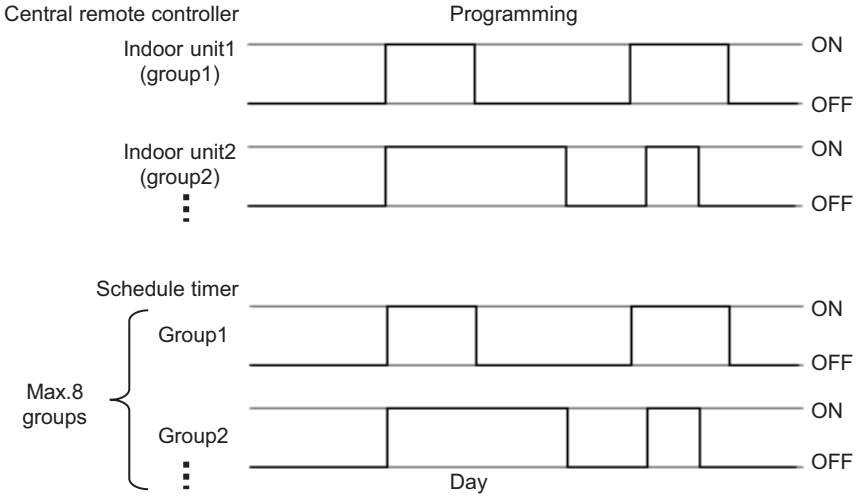
Permit/Prohibit operation selection

Mode	Remote controller disabled items	Central remote controller indication
0	Remote controller enable/disable not used	No indication
1	ON/OFF	Central 1
2	Operation mode	Central 4
3	Operation mode + ON/OFF	Central
4	Temperature setting	Central
5	Temperature setting + ON/OFF	Central
6	Temperature setting + ON/OFF	Central 3
7	Temperature setting + Operation mode + ON/OFF	Central

Mode select

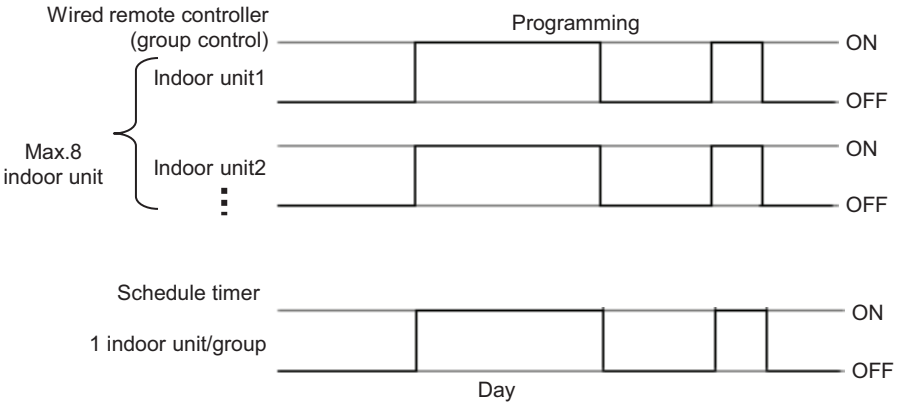
■ Schedule timer mode

- 6 programmings per day
- Enabling 8 groups to be programmed
- A maximum of 64 indoor units can be controlled
- A maximum of 100 hours back-up power supply



■ Weekly Timer Mode

- 7 types of weekly schedule and 3 programmings per day
- Can set ON/OFF by one-minute interval



Installation

➔ Please refer to the Installation Manual

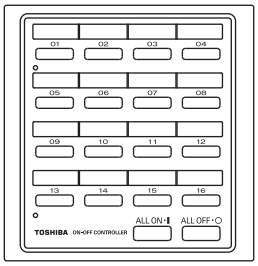
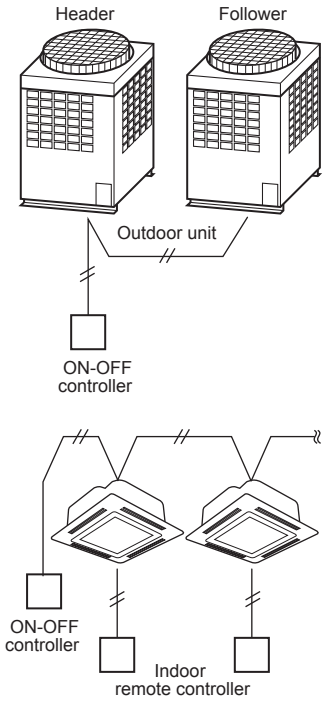
Operation

➔ Please refer to the Operation Owner's Manual

3-4 ON-OFF controller TCB-CC163TLE2

The TCB-CC163TLE2 is a 16-Way ON/OFF controller for use with VRF, DI and SDI equipment.
It is a simplified Central Control device that can be connected to up to 16 Indoor Units via the TCC-Link network to provide simple “1 touch” ON/OFF control and for all connected Indoor Units.

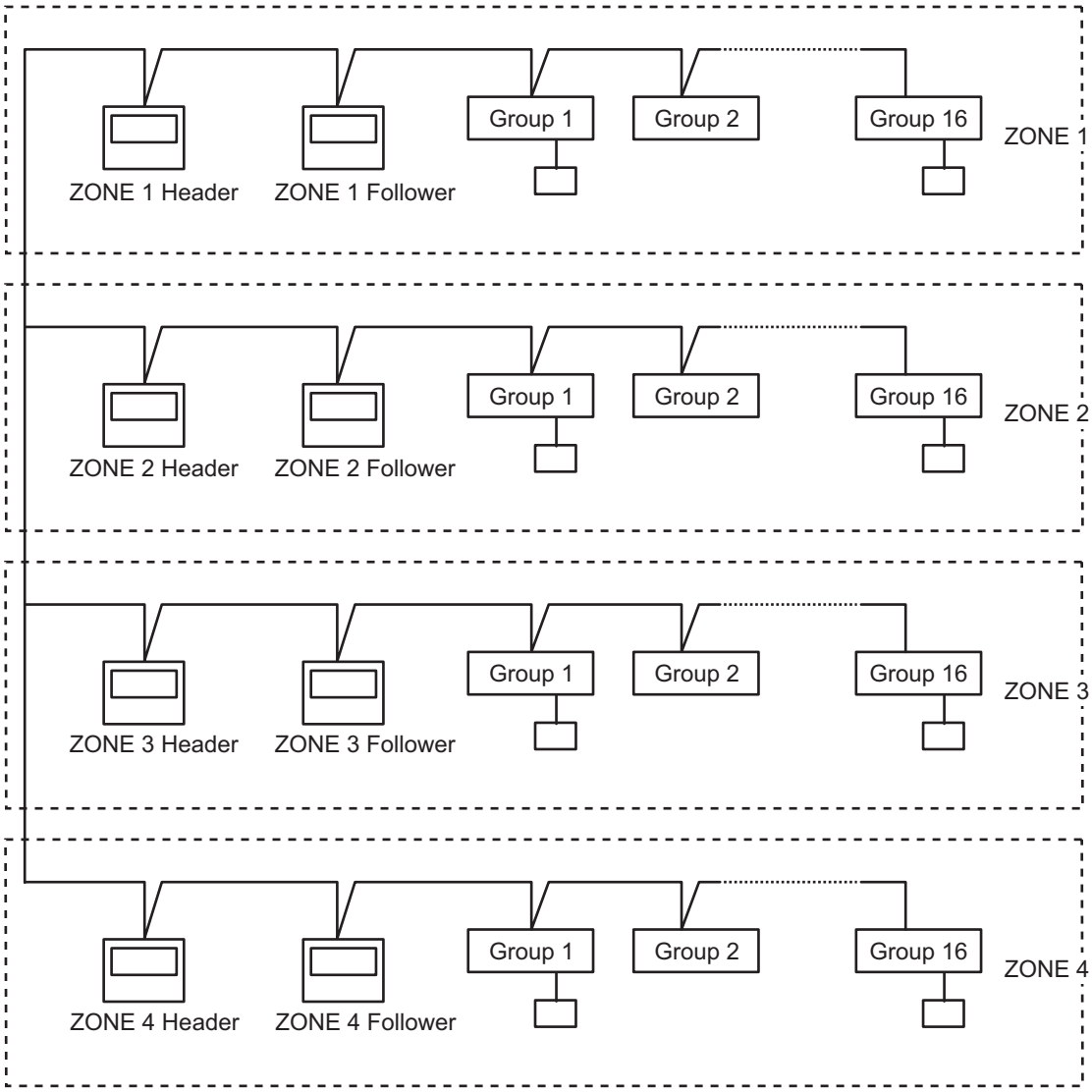
Outline

Appearance	Application	Function
	**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

Specifications

Part name		ON-OFF controller
Model Name		TCB-CC163TLE2
Power supply		220 - 240 VAC 50/60 Hz
Dimension		160 × 160 × 83 mm
Max number per one controller	Indoor unit	16
	TCC-link bus	1
Indoor view classification		4 zone, 16 groups/zone

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”.

Main functions

Function		**Operation**	**Monitoring**
ON/OFF		✓ (Individual or ALL)	✓
Error Display		-	✓ (*1)
Schedule Function		Scheduled timer required	-
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
Connectable ON-OFF control devices		Up to 2 devices (Header/Follower) Max.10 devices	

(*1) Error can be recognized by blink of the button on the remote controller. However, error code is not displayed.

Installation

➔ Please refer to the Installation Manual

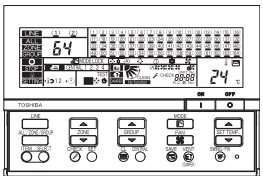
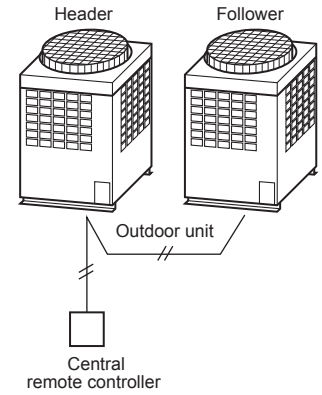
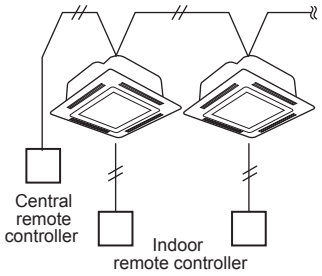
Operation

➔ Please refer to the Owner’s Manual

3-5 Compliant Manager BMS-CM1280TLE

This Controller is an advanced Central Control device that can be connected to up to 128 Indoor Units (2 × 64 IDU TCC-Link Connections).
The High-Spec model has the same hardware control function as the standard version, but also has the ability of control from a Local Area Network and, with the addition of an additional Interface, is capable of Energy Monitoring and report creation functions.
This controller is ideal where advanced control, Energy Monitoring, advanced scheduling or access to individual air Conditioners is required from networked computer systems.

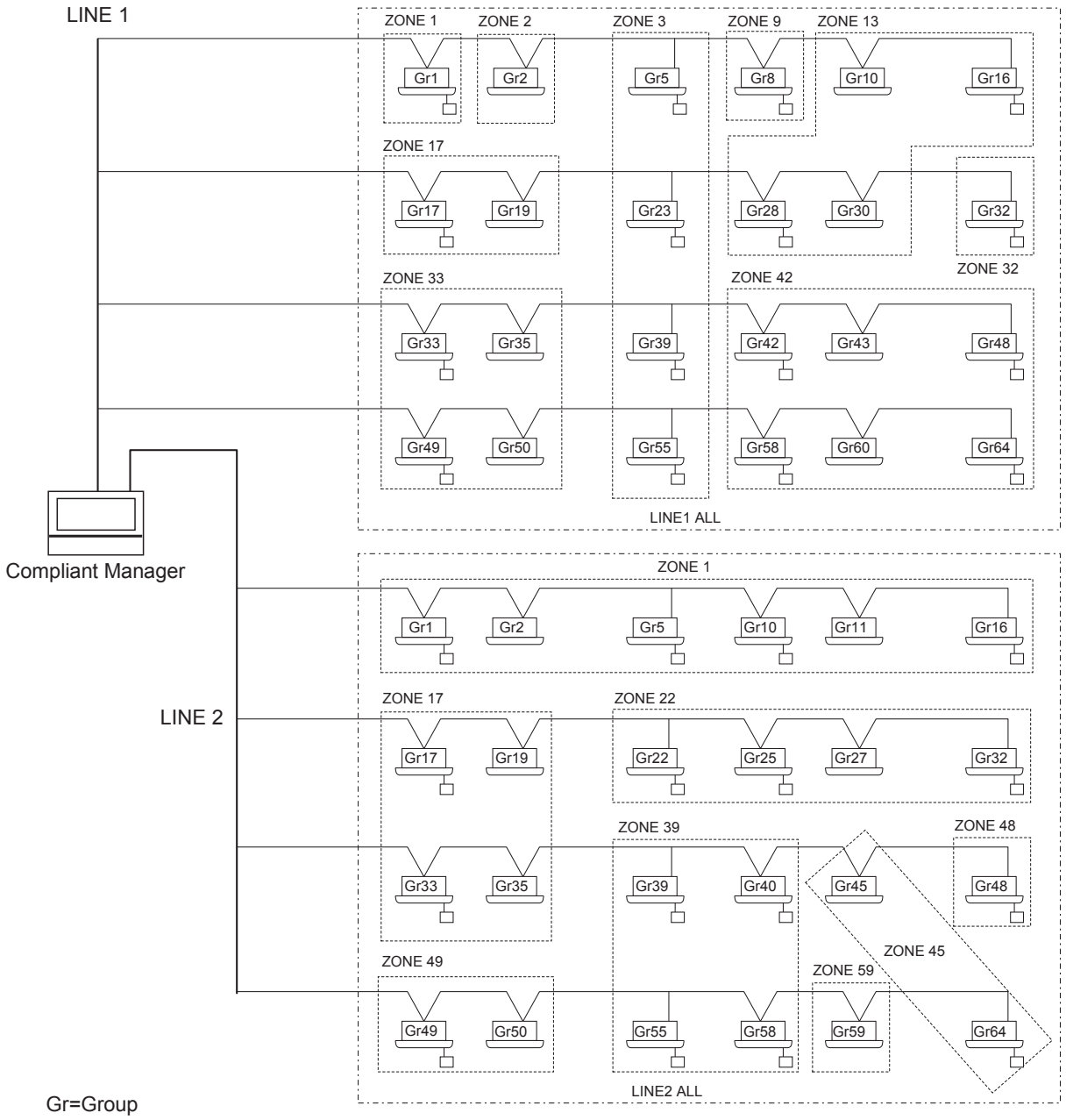
Outline

Appearance	Application	Function
	**Connected to outdoor unit, indoor unit**  	• Individual control of up to (64 indoor units) × 2 TCC-LINK buses • Individual control of up to (64 indoor units divided 1 to 64 zone) × 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) × 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 bit 6 • Operating with Schedule Timer TCB-EX21TLE (Schedule Timer mode) • Return- back setting

Specifications

Part name		Compliant Manager
Model Name		BMS-CM1280TLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension		120 × 180 × 88 mm
Max number per one controller	Indoor unit	128
	TCC-link bus	2
Indoor view classification		(4 zone, 16 groups / zone) (64 zone, 64 groups / zone)

System configuration

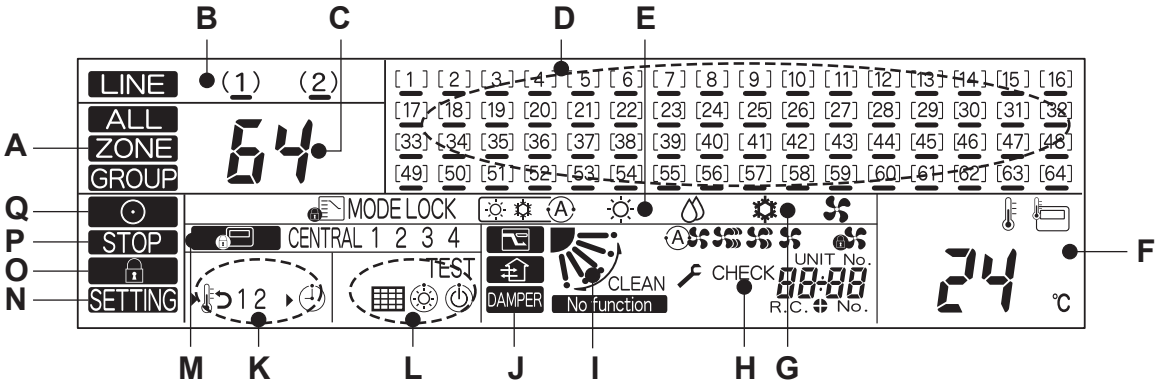


* Up to 64 zones and 64 groups per line can be managed.
  (This Compliant Manager controls 2 lines, 128 zones, and 128 groups in total.)
* Groups that can be registered in each zone must meet the following conditions.
  1. Groups are connected to the same line.
  2. Groups are in the same group number 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.)

Main functions

Function		Operation	Monitoring
ON/OFF		✓	✓
Operation mode		✓	✓
Set temperature		✓	✓
Air speed		✓	✓
Swing / Direction		✓	✓
Filter sign		✓	✓
Child lock (Unit operation prohibited)		✓	✓
Power saving mode		✓	✓
Return back		✓	✓
Central / Individual (Operation prohibited)		✓	✓
Ventilation		✓	✓
Error Display		Reset	Hexadecimal fault code
Schedule Function		Scheduled timer required	-
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
	Fire alarm input	✓	-

Parts Name of Remote Controller (Display section)



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 2 : Displayed when functions of schedule and return-back operation enabled activated. * (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, OFF, 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.

Installation

➔ Please refer to the Installation Manual

Operation

➔ Please refer to the Owner's Manual

3-6 Central remote controller Comparison Table

Part name			Schedule timer	Central remote controller	
				ON-OFF controller	Compliant Manager
Model Name			TCB-EXS21TLE	TCB-CC163TLE2	BMS-CM1280TLE
Power supply			No external power supply is required	220 - 240 VAC 50/60 Hz	220 - 240 VAC 50/60 Hz
Dimension			120 × 120 × 16 mm	160 × 160 × 83 mm	120 × 180 × 88 mm
Display			✓	-	✓ (B/W 157*42 mm)
Max number per one controller [Note1]		Indoor unit	64	16	128
		TCC-link bus	1	1	2
Indoor view classification			1 fixed timer group 4 fixed timer group 8 fixed timer group	4 zone, 16 groups / zone	(4 zone, 16 groups / zone) *2 (64 zone, 64 groups / zone) *2
Monitoring [Note2]	ON/OFF		-	✓	✓
	Operation mode		-	-	✓
	Set temperature		-	-	✓
	Air speed		-	-	✓
	Swing / Direction		-	-	✓
	Filter sign		-	-	✓
	Child lock (Unit operation prohibited)		-	-	✓
	Power saving mode		-	-	✓
	Return back		-	-	✓
	Central control		-	-	✓
	Operation switch control		-	-	✓
	Ventilation		-	-	✓
Operation [Note2]	ON/OFF		✓	✓	✓
	Operation mode setting		-	-	✓
	Temperature setting		-	-	✓
	Air speed setting		-	-	✓
	Swing / Direction		-	-	✓
	Filter sign reset		-	-	✓
	Child lock (Unit operation prohibited)		-	-	✓
	Power saving mode (Compatible models only)		-	-	✓
	Return back		-	-	✓
	Central / Individual (Operation prohibited)		✓	-	✓
	Ventilation		-	-	✓
Error Display		Unit No.	-	✓	✓
		Error code	-	-	✓
Schedule Function [Note3]		Special day	✓	✓ [Note3]	✓ [Note3]
		Daily	✓	✓ [Note3]	✓ [Note3]
		Weekly	✓	✓ [Note3]	✓ [Note3]
Digital input / output	Alarm output		-	✓	✓
	Run output		-	✓	✓
	All stop input		-	✓	✓
	All start input		-	✓	✓
	Fire alarm input		-	-	✓

[NOTE.1] Restriction by TCC-Link specification:

1. Max 64 indoors, max 16*1 header outdoor with max 3 followers per 1 TCC-Link main bus, Max 48 indoors per 1 VRF 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.

[NOTE.2] Actual functions depend on each air conditioner

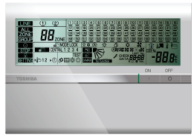
[NOTE.3] Schedule timer (TCB-EXS21TLE) needed.

4

Advanced central control

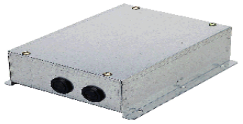
4-1 Line Up & Function – Advanced central control
4-2 Work flow
4-3 Smart BMS Manager BMS-SM1280HTLE
4-4 Smart BMS Manager with data analyzer BMS-SM1280ETLE
4-5 Touch screen controller system BMS-CT5121E
4-6 Central remote controller comparison table
4-7 Outline of Energy monitoring and billing system
4-8 Data flow overview

4-1 Line Up & Function – Advanced central control

Model Name	Smart BMS Manager	Smart BMS Manager with data analyzer	Touch Screen Controller	
	BMS-SM1280HTLE	BMS-SM1280ETLE	BMS-CT5120E	BMS-CT5121E
Appearance				
Start / Stop, Mode, Setting Temperature, Fan Speed	✓	✓	✓	✓
Filter dirty indicator, Error Display	✓	✓	✓	✓
Permit/Prohibit function	✓	✓	✓	✓
Schedule Timer Connection	✓	✓	-	-
Schedule function	✓	✓	✓	✓
WEB Connection	✓	✓	-	✓
Option interface connection	✓ (*1)	✓ (*1)	✓ (*1)	✓ (*1)
Energy Monitoring	✓ (*2)	✓ (*2)	✓ (*2)	✓ (*2)
Multi Language	✓	✓	✓	✓
Demand Function	✓	✓	✓	✓
Error information transfer function by E-mail	-	✓	-	✓

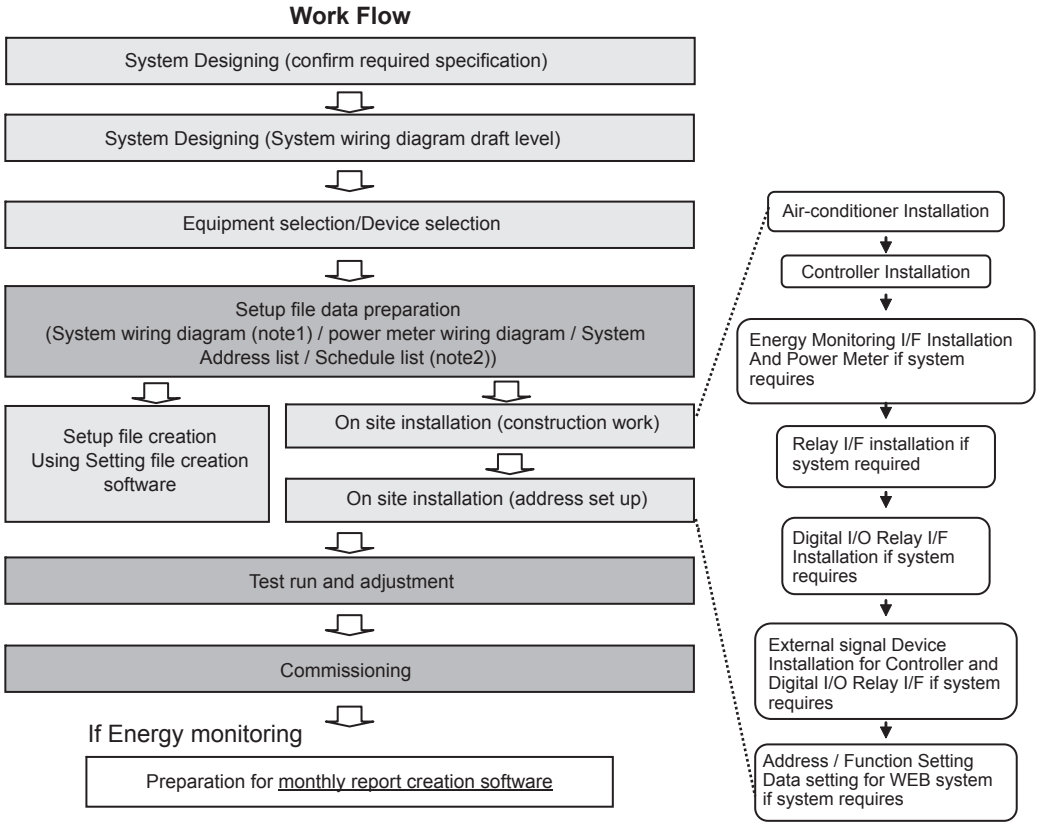
(*1) Digital I/O Relay interface only.
(*2) Energy Monitoring interface needed.

Additional devices

Model Name	Relay Interface	Digital Input / Output interface	Energy monitoring interface
	BMS-IFLSV4E	BMS-IFDD03E	BMS-IFWH5E
Appearance			
TCC-link line	✓ (1 Line)	-	-
Option interface connection	-	✓	-
Energy Monitoring	-	-	✓
Digital input/output	-	8 / 4	8 / -

4-2 Work flow

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



Note1)
System wiring diagram
* All air-conditioners (FCU/CDU/controller) layout
* All 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 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	SYS-1	MMY-AP1401HT8	MMU-AP0181H	1	1	1	0	0	1	1F	TenantA	ShopA	RC-1	1-1	1-1	2-8
2			MMU-AP0091H			2	1	0	2				RC-2	1-1	1-2	2-8
3			MMU-AP0181H			3	2	2	2					1-1		2-8
4			MMU-AP0091H			4	2	2	2					1-1		2-8
5			MMK-AP0091H			5	0	0	3		TenantB	ShopB	RC-3	1-1	1-3	2-8
6			MMK-AP0181H			6	0	0	4			ShopC	RC-4	1-1	1-4	2-8
7			MMK-AP0181H			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	SYS-2	MMYAP0801HT8	MMU-AP0181H		2	1	1	0	7	2F	TenantC	ShopE	RC-7	1-2	1-7	2-8
10			MMU-AP0181H			2	2	9	7					1-2		2-8
11			MMK-AP0181H			3	1	0	8			ShopF	RC-8	1-2	1-8	2-8
12			MMK-AP0181H			4	2	11	8					1-2		2-8
13	SYS-3	MMYAP1001HT8	MMU-AP0181H	2	1	1	0	0	9	3F	Office	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			Development	RC-11	1-3	2-3	2-8
16			MMK-AP0181H			4	1	0	12				RC-12	1-3	2-4	2-8
17			MMU-AP0181H			5	2	16	12					1-3	2-4	2-8
18			MMU-AP0181H			6	2	16	12					1-3	2-4	2-8
19			MMU-AP0181H			7	0	0	13				RC-13	1-3	2-5	2-8
20			MMU-AP0181H			8	0	0	14					1-3	2-6	2-8

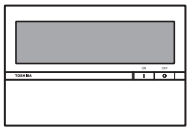
Air conditioner list | Air conditioner address list | Display name Management category | Remote control | I/F Address Information

4-3 Smart BMS Manager BMS-SM1280HTLE

The Smart BMS Manager has the same hardware Control Function as the BMS-CM1280TLE Controller, but also has the ability of control from a Local Area Network and, with the use of an additional Interface, is capable of Energy Monitoring and Report Creation Functions.
This controller is ideal where advanced control, Energy Monitoring, advanced scheduling or access to individual Air Conditioners is required from networked computer systems.
Same Hardware control features as the BMS-CM1280TLE Controller.
Can be connected to a single PC or LAN to allow advanced control functions from a Multi-Language Web Browser Display Screen.*
Energy Monitoring and report creation functions available.
Advanced operation & master schedules can be set on a calendar.
Additional Digital I/O Device Available.
Thin profile controller and separate power supply unit enables easy installation.

Outline

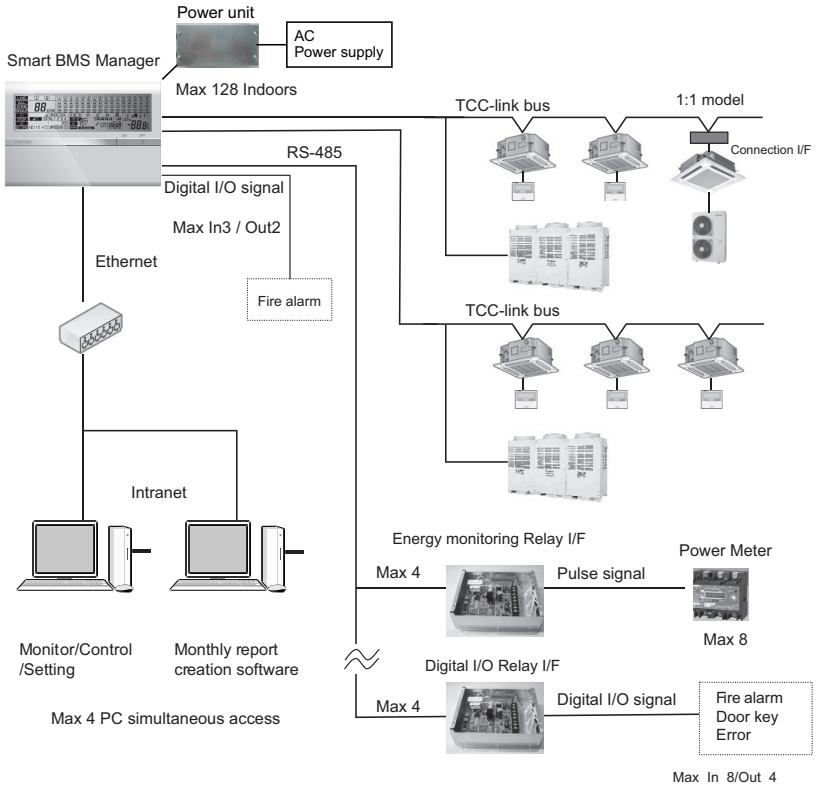
Appearance



Features

- Advanced Zone Configuration available (up to 64 Programmable Zones)
- External Input for Simultaneous Indoor Unit ON/OFF Control and external Alarm Input
- External Output for Operation status and Alarm Status
- 4-Pattern Permit/Prohibit Functions
- Schedule Timer can be connected for 7-Day Timer Functions.
- Return Back Function Available
- Can be connected to a single PC or LAN to allow advanced control functions from a Multi-Language Web Browser Display Screen *
- Energy Monitoring and report creation functions available
- Advanced operation & master schedules can be set on a calendar
- Additional Digital I/O Device Available
- Thin profile controller and separate power supply unit enables easy installation.

Application



*Compatible with Windows XP, Windows Vista, and Windows 7 Operating Systems.

Compatible web browsers include:
Windows Internet Explorer versions 7 & 8, and Mozilla Firefox version 2 & 3.

Power meter:
Pulse width: 50-1000 ms
Pulse generator constants (kWh/pulse) 0.1-99.9

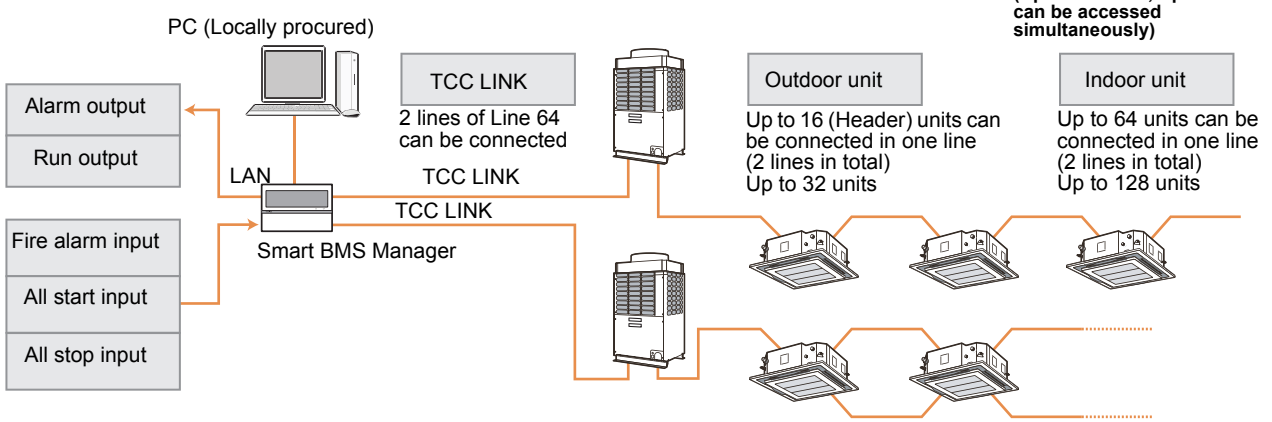
Specifications

Part name		Smart BMS Manager
Model Name		BMS-SM1280HTLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension	Central Controller	120 × 180 × 64 mm
	Power Unit	114 × 177 × 50 mm
Max number per one controller	Indoor unit	128
	TCC-link bus	2
	Energy monitoring interface	4
	Digital Input / Output interface	4
Indoor view classification		(4 zone,16 groups/zone) (64 zone, 64 groups/zone)

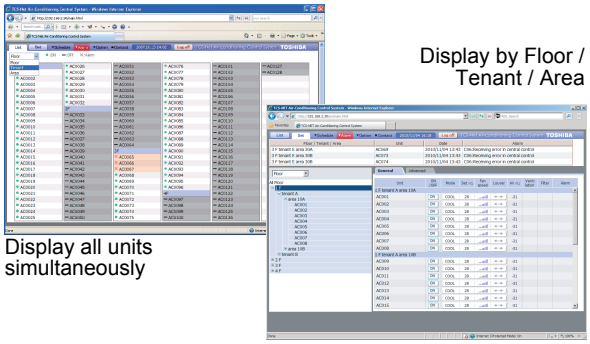
System configuration (No option)

Can be controlled or monitored from your computer.
English, German, French, Italian, Spanish, and Chinese are supported.
Detailed scheduling is also possible.

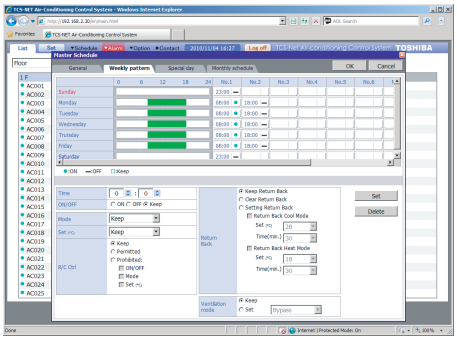
Can set any zone of 1 to 128 units!
(Up to 32 users, Up to 4 units can be accessed simultaneously)



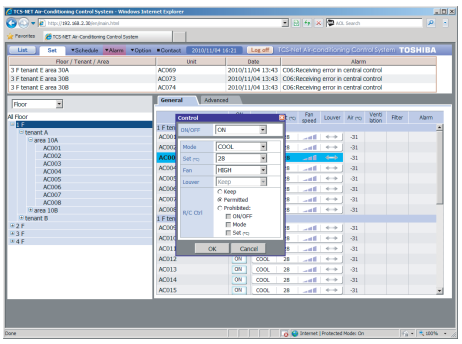
WAN
Wide Area Network: Network that connects remote Local Area Networks (LAN) using a telephone line or ISDN
- Cannot be connected via the above network for security reasons



- **Select a display according to the usage**
  Can change between Display all units simultaneously and Display by Floor / Tenant / Area according to the usage.

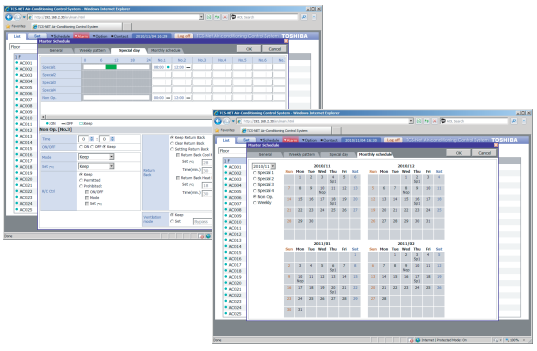


- **Schedule timer not necessary**
  Can set a week pattern or special day. Equipped with return back function effective for energy saving.
  - **Return back**
    If the set temperature has been changed, the temperature forcedly returns to the temperature you set. (1 – 255 minutes can be set)



- **Settings can be easily changed by floor / tenant / area in a batch or by each air-conditioner**

  Off, Operation mode, Temperature setup, Fan, Louver, Operation of remote control prohibited

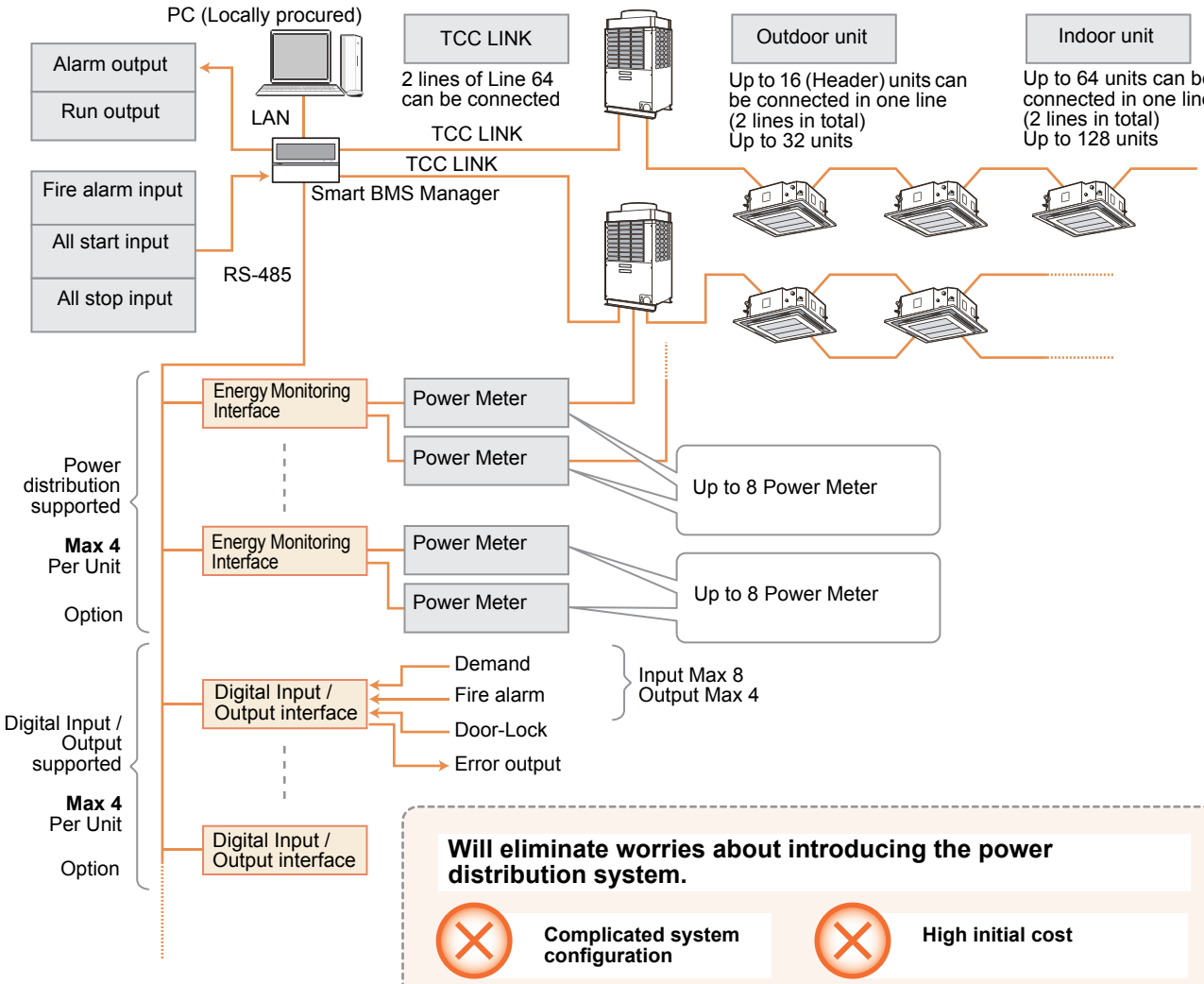


- **Malfunctioning unit can be easily checked.**
- **The check code, error content, and its occurrence time are displayed in addition to the information on the floor, tenant, area, and unit.**

System configuration (Optional)

Power can be distributed for each indoor unit (*).
Indoor unit can be controlled by external signals.

System image



Will eliminate worries about introducing the power distribution system.

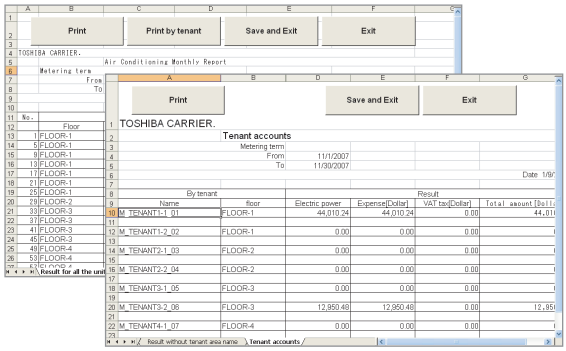
- ✕ **Complicated system configuration**
- ✕ **High initial cost**

Managing from inspection to aggregation simultaneously will reduce management and costs!

Can set any zone of 1 to 128 units!
(Up to 32 users, Up to 4 units can be accessed simultaneously)

- **WAN**

Wide Area Network: Network that connects remote Local Area Networks (LAN) using a telephone line or ISDN
·Cannot be connected via the above network for security reasons



- **Daily / Monthly Report creation function**
  Can distribute electric power to each indoor unit using Energy Monitoring Relay Interface. (*)
- **Linkage to external signals**
  Can stop the indoor unit (can stop all units simultaneously) by lock linkage or fire alarm signal using Digital Input / Output Relay Interface.

* In the case of group operation of the VRF indoor units, power is distributed by group.
Power cannot be distributed to the indoor follower unit in the DI/SDI indoor unit group.

Main functions

Function		Unit operation	Browser operation	
Monitoring	ON/OFF	✓	✓	
	Operation mode	✓	✓	Cool / Heat / Dry / Fan
	Set temperature	✓	✓	
	Air speed	✓	✓	Rapid / High / Low / Fixed (*1)
	Swing / Direction	✓ (*2)	✓ (*3)	
	Filter sign	✓	✓	
	Child lock (Unit operation prohibited)	✓	-	
	Power saving mode	✓	-	
	Return back (*4)	✓	✓	
	Central / Individual (Operation prohibited)	✓	-	
	Operation switch control	✓	-	
	Ventilation	✓	-	
Operation	ON/OFF	✓	✓	
	Operation mode	✓	✓	
	Set temperature	✓	✓	
	Air speed	✓	✓	
	Swing / Direction	✓ (*2)	✓	
	Filter sign	✓	✓	
	Child lock (Unit operation prohibited)	✓	-	
	Power saving mode	✓	-	
	Return back (*4)	✓	✓	
	Central / Individual (Operation prohibited)	✓	✓	
	Ventilation	✓	-	
Schedule	Master schedule setting (Yearly, Weekly)	-	✓ Number of schedules : 32 patterns (Weekly schedule setting)	
	ON/OFF	-	✓	Up to 10 per day Can be set in units of one minute
	Operation mode	-	✓	
	Set temperature	-	✓	
	Remote controller valid / invalid	-	✓	
Schedule control	Master schedule	-	✓	
	Charging schedule	-	✓	
Alarm display	Unit No.	✓	✓ (*5)	
	Occurrence time	-	✓	
	Alarm code	✓	✓	
	Alarm content	-	✓	
	Alarm history	-	✓	Number of history records : 1,024
Electric charge calculation (*6)	Create daily report file	-	✓	Daily report file saving period : 45 days Monthly report file saving period : 3 months
	Create monthly report file	-	✓	
	Automatic inspection	-	✓	
	Charging schedule	-	✓	
PC user limitation	Access authority	-	✓	3 levels
	Number of registered users	-	✓	32
Web control	WebAccess	-	✓	Internet Explorer 7, 8 Firefox 2.0, 3.0, 3.5, 3.6
	Languages	-	✓	English, French, German, Italian, Spanish, Chinese
Separately sold products	Energy Monitoring Relay interface (*7)	-	✓	Maximum number of connected units : 4
	Digital Input/Output Relay interface (*8)	-	✓	Maximum number of connected units : 4
Digital input / output	Alarm output	✓	-	
	Run output	✓	-	
	All stop input	✓	-	
	All start input	✓	-	
	Fire alarm input	✓	-	

*1: Displayed when a model with the air speed setting fixed is connected
*2: In case that there is no local remote controller. Not compatible with an independent louver of a new 4-way cassette type. Only on or off setting for swinging.
*3: Only the on or off swinging setting can be configured on a browser.
*4: The temperature automatically returns to the set one after the set time (remaining time) has elapsed.
* Up to 60 minutes can be set for the remaining time.
*5: The unit name or error description can also be displayed.
*6: Need to set the locally procured products or the unit of electric charges.
*7: A power meter with pulse transmitter locally needs to be connected to the power meter interface in order to measure power of the connected air conditioner.
*8: In digital I/O interface, each air conditioner can be stopped (thermo off by demand alarm) by receiving 1. Lock No., 2. Fire alarm signal, or 3. Demand alarm signal.
* The group control of the central controller does not automatically apply on the browser (web), and needs to be set.

Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”
Data Download Software	This software downloads the monthly report data and backup data.
Monthly Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
Power Meter Pulse Generator Constants software	The power meter pulse generator constants are a software program used to check whether power meter pulses are calculated. This software is used when performing test run check of the air conditioning control system.

Installation

➔ Please refer to the Installation Manual

Operation

➔ Please refer to the Owner’s Manual

Network Configuration

➔ Please refer to the Network Configuration Guide

Operation for Web

➔ Please refer to the Owner’s Manual (Web type)

Installation for Relay Interface (BMS-IFLSV4E)

➔ Please refer to the Installation Manual

Installation for Energy monitoring Relay Interface (BMS-IFWH5E)

➔ Please refer to the Installation Manual

Installation for Digital I/O Relay Interface (BMS-IFDD03E)

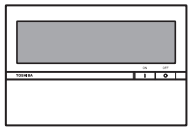
➔ Please refer to the Installation Manual

4-4 Smart BMS Manager with data analyzer BMS-SM1280ETLE

Data analyzer
On a connected local supplied personal computer is possible to view data analysis and energy monitoring.
Advanced operations and settings can be managed with this tool:
Set temperature restrictions, save operation modes, peak cut controls on condensing unit.
A set of graphs and detailed reports will help to easily monitor the performance of the system.

Outline

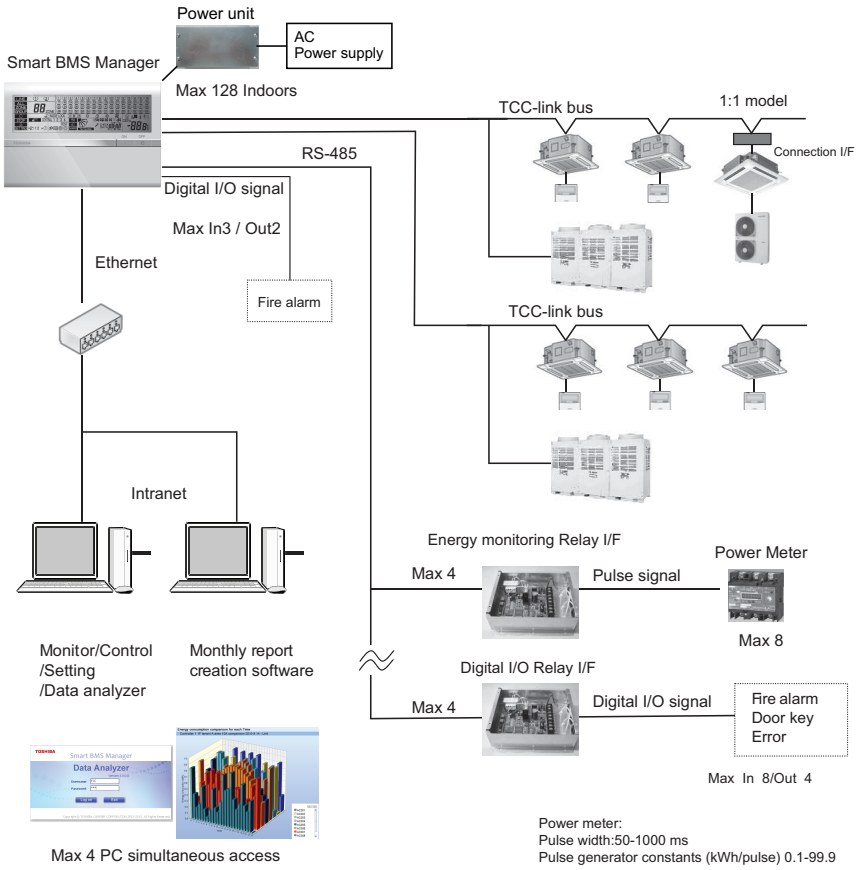
Appearance



Features

- Advanced Zone Configuration available (up to 64 Programmable Zones)
- External Input for Simultaneous Indoor Unit ON/OFF Control and external Alarm Input
- External Output for Operation status and Alarm Status
- 4-Pattern Permit/Prohibit Functions
- Schedule Timer can be connected for 7-Day Timer Functions.
- Return Back Function Available
- Can be connected to a single PC or LAN to allow advanced control functions from a Multi-Language Web Browser Display Screen *
- Energy Monitoring and report creation functions available
- Advanced operation & master schedules can be set on a calendar
- Additional Digital I/O Device Available
- Thin profile controller and separate power supply unit enables easy installation.

Application



*Compatible with Windows XP, Windows Vista, and Windows 7 Operating Systems.

Compatible web browsers include:
Windows Internet Explorer versions 7 & 8, and Mozilla Firefox version 2 & 3.

This version of the Smart BMS Manager offers further functions like:
• Data analysis
• Saving data on a storage medium
• Software for graphic exposure
• Error forwarding via email

Specifications

Part name		Smart BMS Manager with data analyzer
Model Name		BMS-SM1280ETLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension	Central Controller	120 × 180 × 64 mm
	Power Unit	114 × 177 × 50 mm
Max number per one controller	Indoor unit	128
	TCC-link bus	2
	Energy monitoring interface	4
	Digital Input / Output interface	4
Indoor view classification		(4 zone,16 groups/zone) *2 (64 zone, 64 groups/zone) *2

System configuration

➔ Please refer to the Smart BMS Manager BMS-SM1280HTLE

Data Analyzer function

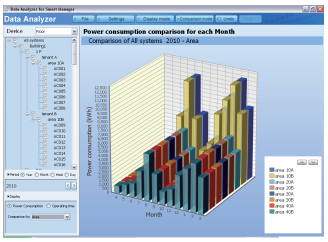
Air conditioner operating status (understanding current status)	• Graphic display of status of power consumption in entire building (for each floor or tenant is also possible). • Graphic display on one screen of outdoor temperature, room side suction temperature, and indoor set temperature which affect power consumption. • Easy to understand graphic display of peak consumption times in time line by month, date, or time. • Quickly spot wasteful air conditioners by displaying ranking of power consumption (all connected air conditioners).
Energy savings control (improving operations)	• Save energy and shift to energy saving temperatures easily. • Matching energy savings to needs of each tenant. ...Settings to control range of set temperature and settings to return to set temperature. • Save energy by pinpointing peak periods. ...Manage schedules for saving energy (suppressing capacity) used by indoor / outdoor units. • Handle power peaks with Peak Cut Controller. (Separate Peak Cut Controller required) • Set up schedules to avoid forgetting to turn off power and more.
Check results of energy savings (evaluating)	• Possible to do comparisons like outside temperature and power consumption from one year to the next. • Easy to understand the times when consumption is not reduced by understanding time line and reduction rates at the bottom of graphs. • More than just comparing entire buildings, comparisons can be done by floor, tenant, or air conditioner making it possible to understand reduction rates for each floor or tenant.

1. **Models that can be connected:**
2. **The indoor savings and outdoor demand settings are functions that can only be set when the Super Module Multi System-e (heat pump model) is connected.**
3. **With the Super Module Multi System-e, it is possible to measure the estimates of power consumption even if a power meter is not attached.**
   1) Just a reference, cannot be used for power distribution.
   2) Does not include power consumption for options that are not provided power from indoor unit power consumption or outdoor unit power.
   3) Cannot measure the estimates of power consumption with the Super Module Multi System-e, Digital Inverter, Super Digital Inverter for facilities. It is necessary to install a separate electricity meter.

Easy to understand operating status of air conditioners

Graphs for at a glance understanding

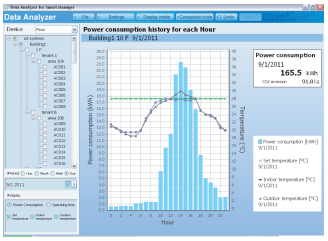
▼Power consumption by floor (simultaneous display)



Power consumption of up to 4 floors displayed simultaneously in 3D graph.
Easy to understand which floor consumes the most power.

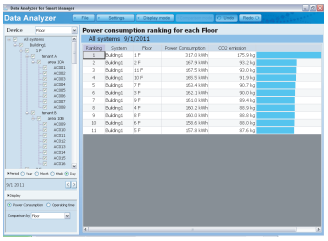
* Also possible to display for each tenant or for each air conditioner.

▼History of power consumption by air conditioners in a time line (month, date, time) and more



More than just power consumption, simultaneously display outdoor temperature, room side suction temperature, and indoor set temperature which affect power consumption. Plus it is possible to analyze operating status by month, date, and time.

▼Ranking of power consumption per air conditioner



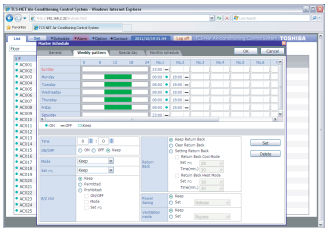
Quickly spot high consumption air conditioners by displaying power consumption ranking.

* Display ranking of all connected air conditioners.

Quickly improve control of energy savings

Easy online settings via the web

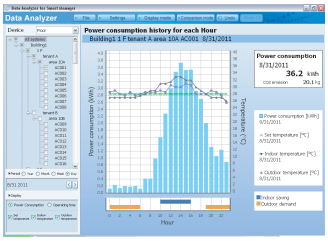
▼Easy to set up management of energy saving operations for air conditioners



1. Targeted air conditions are shifted to energy saving temperatures (while cooling +2ºC, while heating -2ºC) with easy settings.
2. Set temperature range limitation
   Limit temperature setting range with settings defined by building manager.
3. Manage schedules for indoor savings and outdoor demand (suppressing capacity)
   Suppressing capacity for each air conditioner
   (0 / 50 / any % setting with remote control)
   Set upper limit for capacity of outdoor unit systems
   (0 / 60 / 70 / 80 / 90 %)

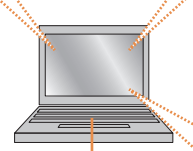
Easy to evaluate results of energy savings with comparative graphs

▼Check results of energy savings by air conditioners in a time line (month, date, time)



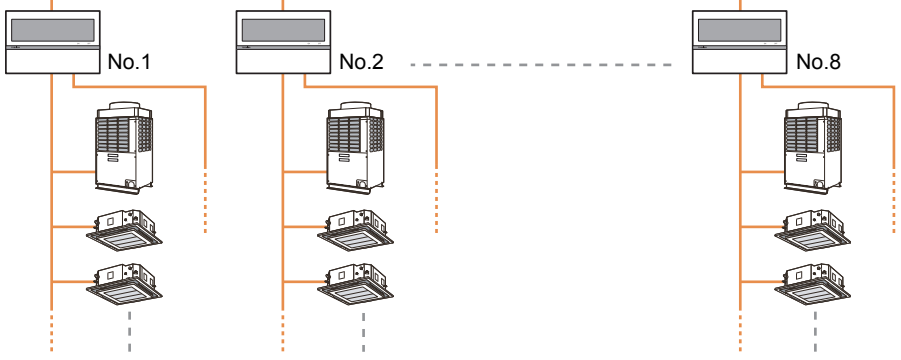
Possible to compare months, dates, and times. Plus, it is possible to check reduction results per time period so it is easy to understand the time periods with the lowest energy saving results. Linked to even more operational improvements.

PC
(Locally procured)



HUB

Smart BMS Manager
with data analyzer



1. **Models that can be connected:**
2. **The indoor savings and outdoor demand settings are functions that can only be set when the Super Module Multi System-e (heat pump model) is connected.**
3. **With the Super Module Multi System-e, it is possible to measure the estimates of power consumption even if a power meter is not attached.**
   1) Just a reference, cannot be used for power distribution.
   2) Does not include power consumption for options that are not provided power from indoor unit power consumption or outdoor unit power.
   3) Cannot measure the estimates of power consumption with the Super Module Multi System-e, Digital Inverter, Super Digital Inverter for facilities. It is necessary to install a separate electricity meter.

Main functions

Function		Unit operation	Browser operation	
Monitoring	ON/OFF	✓	✓	
	Operation mode	✓	✓	Cool / Heat / Dry / Fan
	Set temperature	✓	✓	
	Air speed	✓	✓	Rapid / High / Low / Fixed (*1)
	Swing / Direction	✓ (*2)	✓ (*3)	
	Filter sign	✓	✓	
	Child lock (Unit operation prohibited)	✓	-	
	Power saving mode	✓	-	
	Return back (*4)	✓	✓	
	Central / Individual (Operation prohibited)	✓	-	
	Operation switch control	✓	-	
	Ventilation	✓	-	
Operation	ON/OFF	✓	✓	
	Operation mode	✓	✓	
	Set temperature	✓	✓	
	Air speed	✓	✓	
	Swing / Direction	✓ (*2)	✓	
	Filter sign	✓	✓	
	Child lock (Unit operation prohibited)	✓	-	
	Power saving mode	✓	-	
	Return back (*4)	✓	✓	
	Central / Individual (Operation prohibited)	✓	✓	
	Ventilation	✓	-	
Schedule	Master schedule setting (Yearly, Weekly)	-	✓ Number of schedules : 32 patterns (Weekly schedule setting)	
	ON/OFF	-	✓	Up to 10 per day Can be set in units of one minute
	Operation mode	-	✓	
	Set temperature	-	✓	
	Remote controller valid / invalid	-	✓	
Schedule control	Master schedule	-	✓	
	Charging schedule	-	✓	
Alarm display	Unit No.	✓	✓ (*5)	
	Occurrence time	-	✓	
	Alarm code	✓	✓	
	Alarm content	-	✓	
	Alarm history	-	✓	Number of history records : 1,024
Electric charge calculation (*6)	Create daily report file	-	✓	Daily report file saving period : 45 days Monthly report file saving period : 3 months
	Create monthly report file	-	✓	
	Automatic inspection	-	✓	
	Charging schedule	-	✓	
PC user limitation	Access authority	-	✓	3 levels
	Number of registered users	-	✓	32
Web control	WebAccess	-	✓	Internet Explorer 8.0, 9.0 Firefox 7.0, 8.0
	Languages	-	✓	English, German, Italian, French, Spanish, Chinese, Portuguese, Turkish, Russian, Greek, Dutch, Czech, Croatian
Separately sold products	Energy Monitoring Relay interface (*7)	-	✓	Maximum number of connected units : 4
	Digital Input/Output Relay interface (*8)	-	✓	Maximum number of connected units : 4
Alarm E-mail (*9)	Number of registered mail address	-	✓	5
Digital input / output	Alarm output	✓	-	
	Run output	✓	-	
	All stop input	✓	-	
	All start input	✓	-	
	Fire alarm input	✓	-	

*1: Displayed when a model with the air speed setting fixed is connected
*2: In case that there is no local remote controller. Not compatible with an independent louver of a new 4-way cassette type. Only on or off setting for swinging.
*3: Only the on or off swinging setting can be configured on a browser.
*4: The temperature automatically returns to the set one after the set time (remaining time) has elapsed.
* Up to 60 minutes can be set for the remaining time.
*5: The unit name or error description can also be displayed.
*6: Need to set the locally procured products or the unit of electric charges.
*7: A power meter with pulse transmitter locally needs to be connected to the power meter interface in order to measure power of the connected air conditioner.
*8: In digital I/O interface, each air conditioner can be stopped (thermo off by demand alarm) by receiving 1. Lock No., 2. Fire alarm signal, or 3. Demand alarm signal.
* The group control of the central controller does not automatically apply on the browser (web), and needs to be set.
*9: SMTP E-mail server can use “SMTP” server or “POP before SMTP” server only.

Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”
Data Download Software	This software downloads the monthly report data and backup data.
Monthly Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
Power Meter Pulse Generator Constants software	The power meter pulse generator constants are a software program used to check whether power meter pulses are calculated. This software is used when performing test run check of the air conditioning control system.
Data Analyzer for Smart BMS Manager	This software displays a history graph of operating power consumption or time of air conditioners managed with Smart BMS Manager.

Installation
➔ Please refer to the Installation Manual

Operation
➔ Please refer to the Owner’s Manual

Network Configuration
➔ Please refer to the Network Configuration Guide

Operation for Web
➔ Please refer to the Owner’s Manual (Web type)

Operation for Data Analyzer
➔ Please refer to the Operating Instructions

Installation for Relay Interface (BMS-IFLSV4E)
➔ Please refer to the Installation Manual

Installation for Energy monitoring Relay Interface (BMS-IFWH5E)
➔ Please refer to the Installation Manual

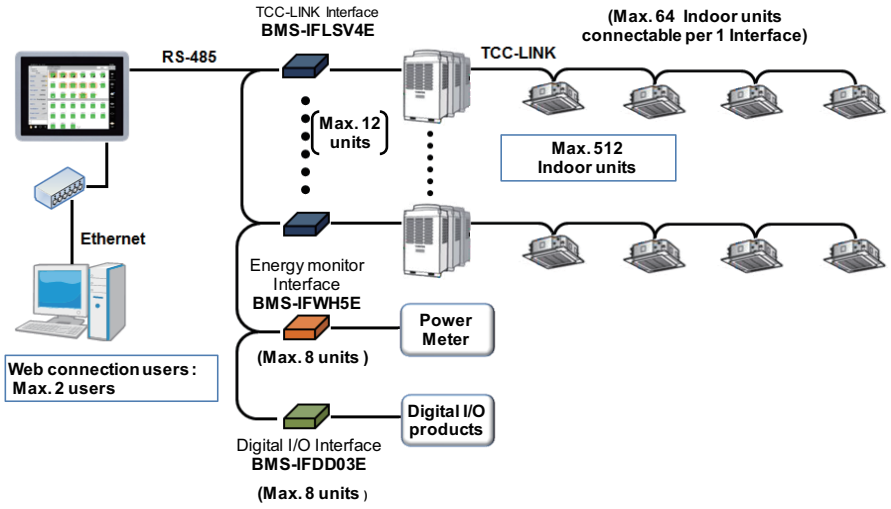
Installation for Digital I/O Relay Interface (BMS-IFDD03E)
➔ Please refer to the Installation Manual

4-5 Touch screen controller system BMS-CT5121E

The Touch Screen Controller can be connected to 64 or 512 Indoor Units depending on model and offers Energy Monitoring* and schedule program functions.
This controller is ideally suited to any small or large installation where Energy monitoring functions are required, or where a professional and highly presentable finish is required.
It can control each of the individual indoor units and is capable of providing information from the indoor unit settings and malfunction check codes.
The Touch Screen is connected to the air conditioner control network directly by relay interfaces.

TOUCH SCREEN CONTROLLER for Air Conditioning Control System (hereafter TOUCH SCREEN CONTROLLER) consists of an operation section and a display section. It is equipped with an LCD display and touch panel, enabling functions such as monitoring of the status of air conditioners, setting changes, scheduled operation, error displays, and output of data for monthly reports.

Outline

Appearance	Application
	
Features	
■ Simple Layout for easy control and monitoring of Indoor Units ■ Area, Tenant and Indoor Unit names can be assigned based on building layout ■ Intelligent alarm code shows fault description	

Specifications

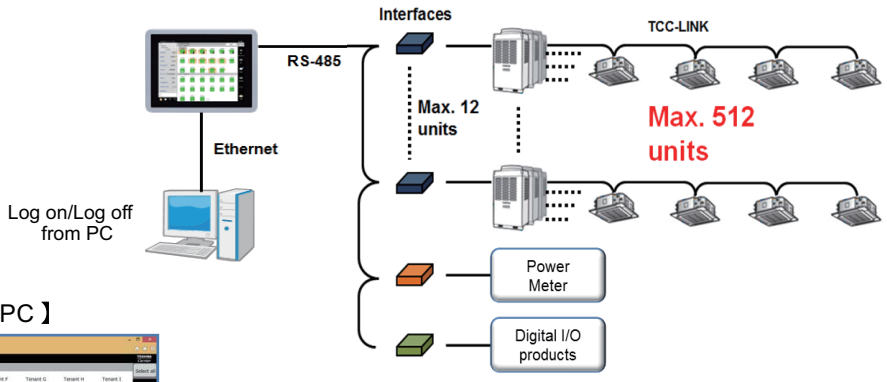
Part name		Touch screen controller system	
Model Name		BMS-CT5121E	BMS-CT5120E
Power Supply (for AC-adopter*1)		220~240 V 50/60 Hz (Main unit supply from AC-adopter: 12V-DC)	
Dimension		323 × 256 × 49 mm	
Max number per one controller	Indoor unit	512	
	TCC-link bus	12	
	Relay interface	12	
	Energy monitoring interface	8	
	Digital Input / Output interface	8	
Indoor view classification		Floor/Tenant/area/group unit	

*1: The power cable is field arrangement.

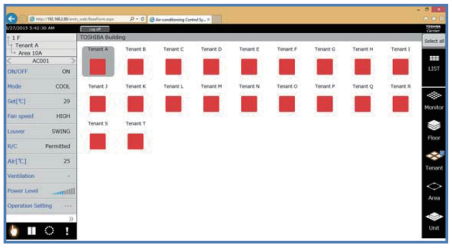
System configuration

1) Monitoring / Controlling using a computer (Web connection function)

You can use your computer to monitor and control air conditioners via the Touch Screen Controller.



【 Web browser screen on PC 】



- Monitoring and controlling (include scheduling) operation
- Similar user interface by mouse operation and the screen.
- Up to 2 users can be logged on concurrently.

Note > O/S : Windows8.1 (R) or Windows10(R).
Web browser : Internet Explorer 11 (R).

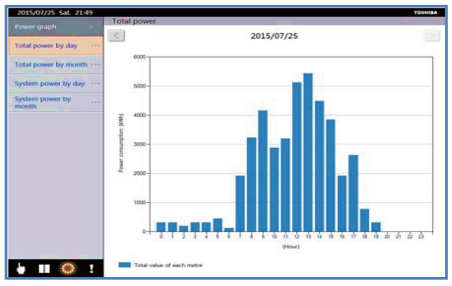
2) Graph function

You can display the indoor temperature, the set temperature, the outdoor temperature, and the power of electricity meter in a graph. (*Cannot use web browser)

【 Indoor unit graph by a day 】

- Indoor unit graph screen mode :
- The value can be selected from indoor temperature ,set temperature of indoor unit and outdoor temperature of connected outdoor unit.
- When multiple indoor unit are selected, the temperature is shown as average value.

【 Power graph by a day 】



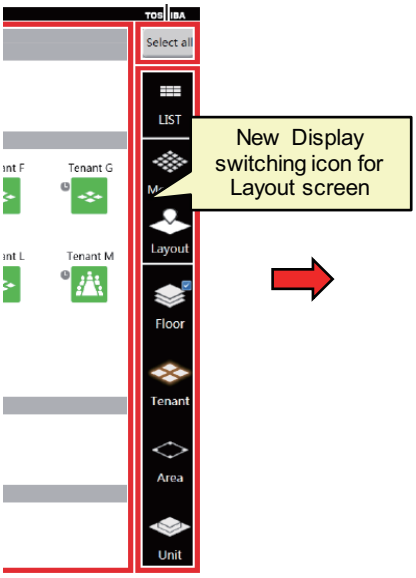
- Power graph screen mode :
- The value can be displayed the power of selected electricity meter or total power.

- This graph function cannot use comparing or analyzing these data.
  In those purpose, please use **"Data analyzer*"** of PC software which is in this package.
  This is also a new feature of BMS-CT5121E.

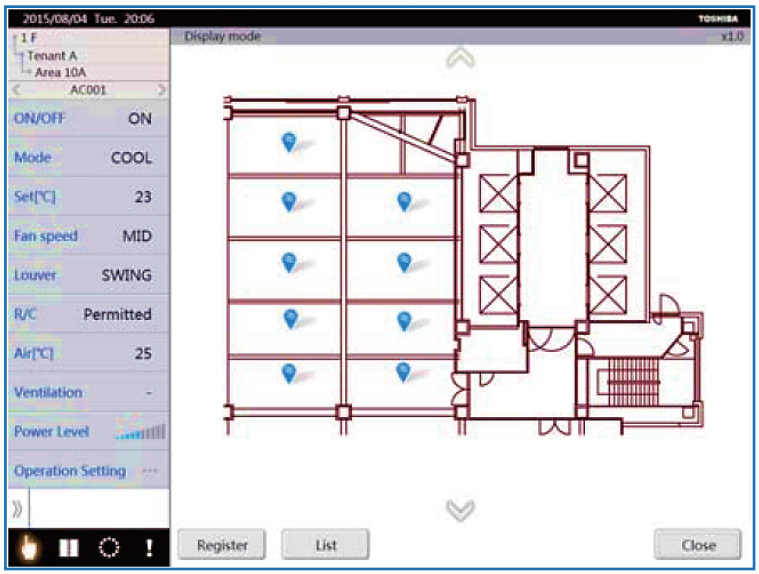
***** This tool is the same as "Smart BMS managers with Data Analyzer".

3) Layout diagram function

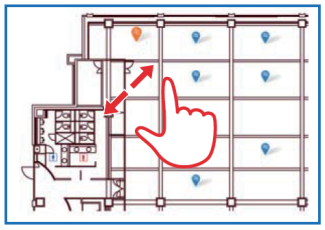
You can display unit icons on the layout diagram[*1,*2] so that you know the potion of the air conditioners.
(*Cannot use web browser)



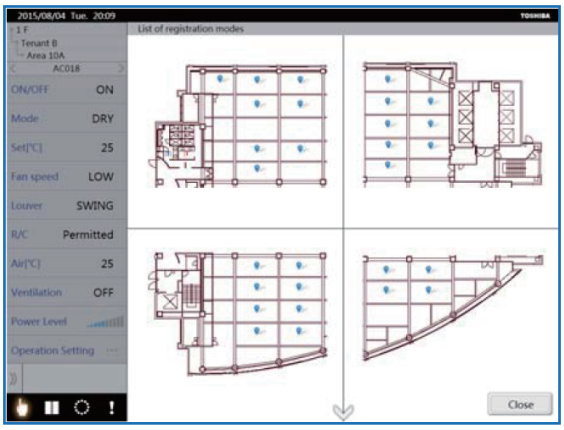
【 Layout diagram 】



- Checking the location of indoor unit on the layout diagram from the control screen.
- Monitoring and controlling operation on the layout diagram.
- 4 layout diagram can display at the same time.
- Smart operation to zoom in and out



【 Multiple display 】



*1 This function need to install “Layout image file”.
When customer/user want to use this function, TCC request the original layout data to customer/user.
After received customer data, TCC make and draw Layout image file.
The Drawing fee require separately.
*2 “Layout image file” can have max. 32 files.

4) Alarm e-mail function

When abnormalities occur in monitoring indoor units, the information about the abnormalities are sent to the e-mail address set as recipients. (*Cannot use web browser)

Main functions

Function			BMS-CT5121E	BMS-CT5120E
Monitoring	LED ON/OFF		-	-
	Operation Status of each group		✓	✓
	Filter Sign		✓	✓
	Prohibit		✓	✓
	Measurement List		temp	temp
	Malfunction List		✓	✓
	Malfunction Log		✓	✓
	External output	ON/OFF	-	-
		Error	✓	-
	Energy use status	Energy Consumption	✓	-
		Energy Comparison	✓	-
	Ranking	Energy Consumption	✓	-
		Fan operating time	✓ (operation time)	-
	Target Value Setting		-	-
	Peak cut Control Status check		-	-
Operation	ON/OFF		✓	✓
	Operation mode		✓	✓
	Vent mode (Ventilation fan unit)		✓	✓
	Fan speed		✓	✓
	Fan speed (Ventilation fan unit)		-	-
	Set temp		✓	✓
	Air detection		✓ (Swing)	✓ (Swing)
	Inter Lock Lossnay unit		-	-
	Schedule (Available/Not Available)		✓	✓
	Hold		✓	✓
	Prohibit Local Remote		✓	✓
	Filter sign reset		✓	✓
	Schedule Setting	Weekly, annual, today	✓	✓
	Malfunction reset		✓	✓
	Clear malfunction log		✓	✓
	External input	Demand level	-	-
		Emergency stop	-	-
		ON/OFF operation (OFF only)	✓	✓
		Prohibit/Permit mode	-	-
System	Web based		✓	-
	Energy consumption		✓	✓

Installation

➔ Please refer to the Installation Manual

Installation for Relay Interface (BMS-IFLSV4E)

➔ Please refer to the Installation Manual

Installation for Energy monitoring Relay Interface (BMS-IFWH5E)

➔ Please refer to the Installation Manual

Installation for Digital I/O Relay Interface (BMS-IFDD03E)

➔ Please refer to the Installation Manual

4-6 Central remote controller comparison table

Part name		Advanced central control			
		Smart BMS manager		Smart BMS manager with data analyzer	
Model Name		BMS-SM1280HTLE		BMS-SM1280ETLE	
Power supply		220 - 240 VAC 50/60 Hz		220 - 240 VAC 50/60 Hz	
Dimension	Central Controller	120 × 180 × 64 mm		120 × 180 × 64 mm	
	Power Unit	114 × 177 × 50 mm		114 × 177 × 50 mm	
Display		✓ (B/W 157*42 mm)		✓ (B/W 157*42 mm)	
Max number per one controller [Note1] [Note2]	Indoor unit	128		128	
	TCC-link bus	2		2	
	Relay I/F	-		-	
	Energy monitoring I/F	4		4	
	Digital Input / Output I/F	4		4	
Communication port	TCC-link	2		2	
	RS485	Energy monitoring I/F : 4 Digital Input / Output I/F : 4		Energy monitoring I/F : 4 Digital Input / Output I/F : 4	
	Ethernet	✓ (Web access / Monthly report PC)		✓ (Web access / Monthly report PC / Data analyzer)	
Indoor view classification		(4 zone, 16 groups / zone)*2 (64 zone, 64 groups / zone)*2		(4 zone, 16groups / zone)*2 (64 zone, 64 groups / zone)*2	
Unit / Browser operation		Unit	Browser	Unit	Browser
Monitoring [Note3]	ON/OFF	✓	✓	✓	✓
	Operation mode	✓	✓	✓	✓
	Set temperature	✓	✓	✓	✓
	Air speed	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓
	Filter sign	✓	✓	✓	✓
	Child lock (Unit operation prohibited)	✓	-	✓	-
	Power saving mode	✓	-	✓	-
	Return back	✓	✓	✓	✓
	Central control	✓	-	✓	-
	Room temperature	-	✓	-	✓
	Ventilation	✓	-	✓	-
Operation [Note3]	ON/OFF	✓	✓	✓	✓
	Operation mode setting	✓	✓	✓	✓
	Temperature setting	✓	✓	✓	✓
	Air speed setting	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓
	Filter sign reset	✓	✓	✓	✓
	Child lock (Unit operation prohibited)	✓	-	✓	-
	Power saving mode (Compatible models only)	✓	-	✓	-
	Return back	✓	✓	✓	✓
	Central / Individual (Operation prohibited)	✓	✓	✓	✓
	Ventilation	✓	-	✓	-
Alarm display	Unit No.	✓	✓	✓	✓
	Occurrence time	-	✓	-	✓
	Alarm code	✓	✓	✓	✓
	Alarm content	-	✓	-	✓
	Alarm history	-	✓	-	✓
Schedule Function	Master	-	✓ (32 patterns)	-	✓ (32 patterns)
	Operation execute	-	✓	-	✓
	Special day	-	✓	-	✓
	Daily	-	✓ (10 operations)	-	✓ (10 operations)
	Weekly	-	✓ (32 patterns)	-	✓ (32 patterns)
	Monthly	-	✓	-	✓
	Billing	-	✓	-	✓
Alarm e-mail		-	-	-	✓
Multilingual language		-	✓ (6 languages)	-	✓ (13 languages)
Data analyzer		-	-	-	✓
Digital input / output	Alarm output	✓	-	✓	-
	Run output	✓	-	✓	-
	All stop input	✓	-	✓	-
	All start input	✓	-	✓	-
	Fire alarm input	✓	-	✓	-

Part name		Advanced central control		
		Touch screen controller system		
Model Name		BMS-CT5121E		BMS-CT5120E
Power supply		220 - 240 VAC 50/60 Hz		
Dimension	Central Controller	323 × 256 × 49 mm		
	Power Unit			
Display		✓ (12.1 inch / Capacitance touch panel method)		
Max number per one controller [Note1] [Note2]	Indoor unit	512		512
	TCC-link bus	12		12
	Relay I/F	12		12
	Energy monitoring I/F	8		8
	Digital Input / Output I/F	8		8
Communication port	TCC-link	- (RS485 via Relay I/F)		
	RS485	Relay I/F : 12 Energy monitoring I/F : 8 Digital Input / Output I/F : 8		Relay I/F : 12 Energy monitoring I/F : 8 Digital Input / Output I/F : 8
	Ethernet	✓ (Web access / Monthly report PC / Data analyzer)		✓ (Monthly report PC)
Indoor view classification		Floor/Tenant/area/group unit		
Unit / Browser operation		Unit	Browser	Unit
Monitoring [Note3]	ON/OFF	✓	✓	✓
	Operation mode	✓	✓	✓
	Set temperature	✓	✓	✓
	Air speed	✓	✓	✓
	Swing / Direction	✓	✓	✓
	Filter sign	✓	✓	✓
	Child lock (Unit operation prohibited)	-	-	-
	Power saving mode	✓	✓	✓
	Return back	✓	✓	✓
	Central control	✓	✓	✓
	Room temperature	✓	✓	✓
	Ventilation	✓	✓	-
Operation [Note3]	ON/OFF	✓	✓	✓
	Operation mode setting	✓	✓	✓
	Temperature setting	✓	✓	✓
	Air speed setting	✓	✓	✓
	Swing / Direction	✓	✓	✓
	Filter sign reset	✓	✓	✓
	Child lock (Unit operation prohibited)	✓	-	✓
	Power saving mode (Compatible models only)	✓	✓	✓
	Return back	✓	✓	✓
	Central / Individual (Operation prohibited)	✓	✓	✓
	Ventilation	✓	✓	✓
Alarm display	Unit No.	✓	✓	✓
	Occurrence time	✓	✓	✓
	Alarm code	✓	✓	✓
	Alarm content	✓	✓	✓
	Alarm history	✓	✓	✓
Schedule Function	Master	✓ (32 patterns)	✓ (32 patterns)	✓ (32 patterns)
	Operation execute	✓	✓	✓
	Special day	✓	✓	✓
	Daily	✓ (10 operations)	✓ (10 operations)	✓ (10 operations)
	Weekly	✓ (32 patterns)	✓ (32 patterns)	✓ (32 patterns)
	Monthly	✓	✓	✓
	Billing	✓	✓	✓
Alarm e-mail		✓	-	-
Multilingual language		✓ (14 languages)	✓ (14 languages)	✓ (13 languages)
Data analyzer		-	✓	-
Digital input / output	Alarm output	✓	-	✓
	Run output	-	-	-
	All stop input	-	-	-
	All start input	-	-	-
	Fire alarm input	✓	-	✓

[NOTE.1] Restriction by TCC-Link specification:

1. Max 64 indoors, max 16*1 header outdoor with max 3 followers per 1 TCC-Link main bus, Max 48 indoors per 1 VRF 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.

[NOTE.2] Restriction by Relay Interface specification:

1. Only 1 Relay I/F is connected to 1 TCC-Link main bus.
2. One Relay Interface covers, Max 64 indoors under the condition of Note1 no2, max 16 refrigerant systems for VRF, max 64 refrigerant systems for only DI/SDI.

[NOTE.3] Actual functions depend on each air conditioner

4-7 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, 40 HP system, a power meter measures power supply line consumption for 40 HP 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, 40 HP system has 10 units of 4 HP 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

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

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

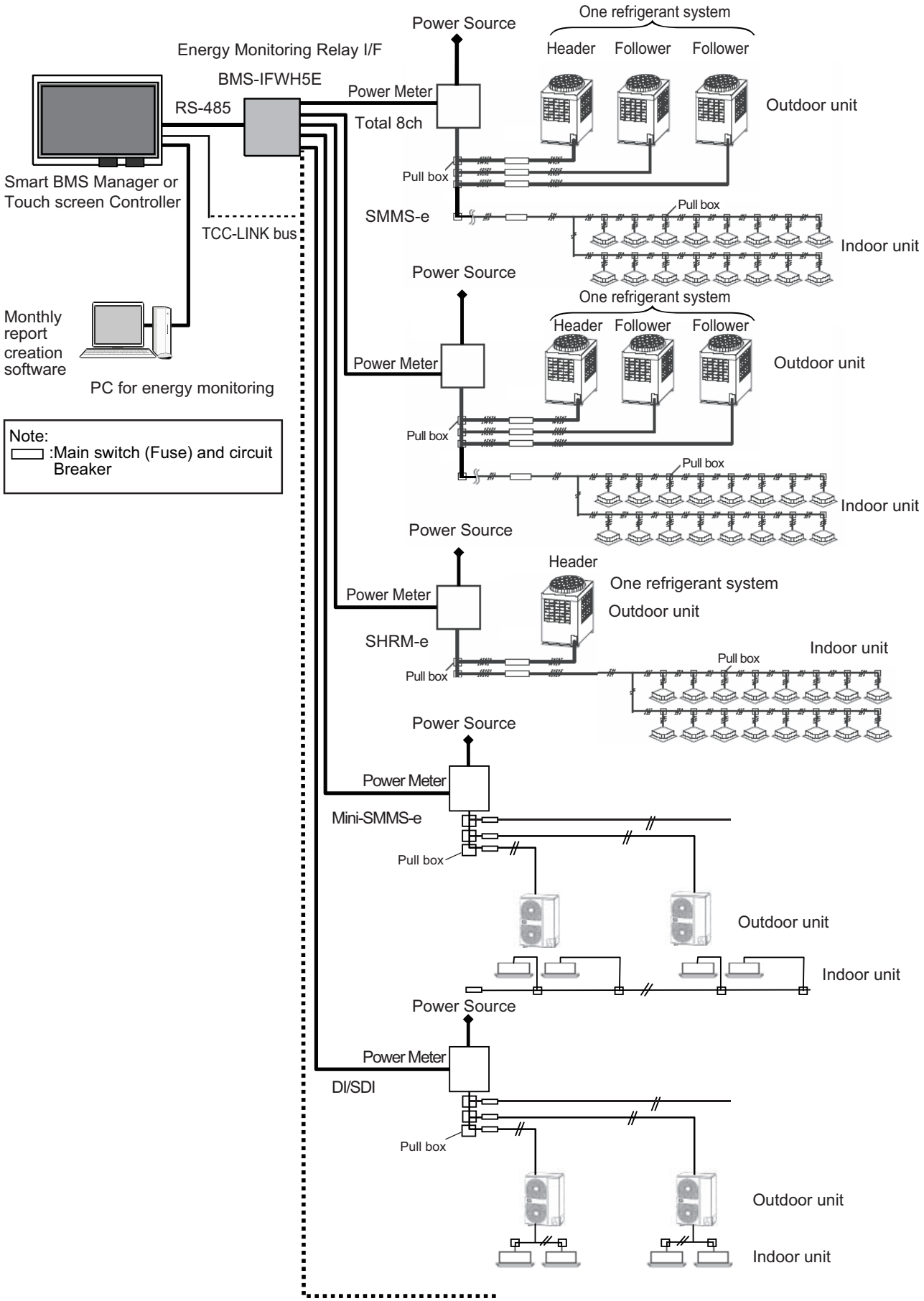
$Ø_A$ = Energy consumption (kW) for a period of time

[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-e/SHRM-e 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-e 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-e 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 50-1000 ms and the pulse generator constant (kWh/pulse) must be 0.1-99.9.

[Layout]


Power Source
One refrigerant system
Header
Follower
Follower
Energy Monitoring Relay I/F
BMS-IFWH5E
Power Meter
RS-485
Total 8ch
Outdoor unit
Pull box
Smart BMS Manager or
Touch screen Controller
SMMS-e
Pull box
TCC-LINK bus
Indoor unit
Power Source
One refrigerant system
Header
Follower
Follower
Monthly
report
creation
software
Power Meter
Outdoor unit
Pull box
Pull box
Indoor unit
PC for energy monitoring
Power Source
Header
Note:
:Main switch (Fuse) and circuit
Breaker
Power Meter
One refrigerant system
Outdoor unit
SHRM-e
Indoor unit
Pull box
Pull box
Power Source
Power Meter
Mini-SMMS-e
Pull box
Outdoor unit
Indoor unit
Power Source
Power Meter
DI/SDI
Pull box
Outdoor unit
Indoor unit

4-8 Data flow overview

System address list should contains following information.

- All air-conditioners address information
- All system devices address information
- Control classification
- Model name

[NOTE]
This information is essential to prevent troubles.
Be sure to complete before on site installation.

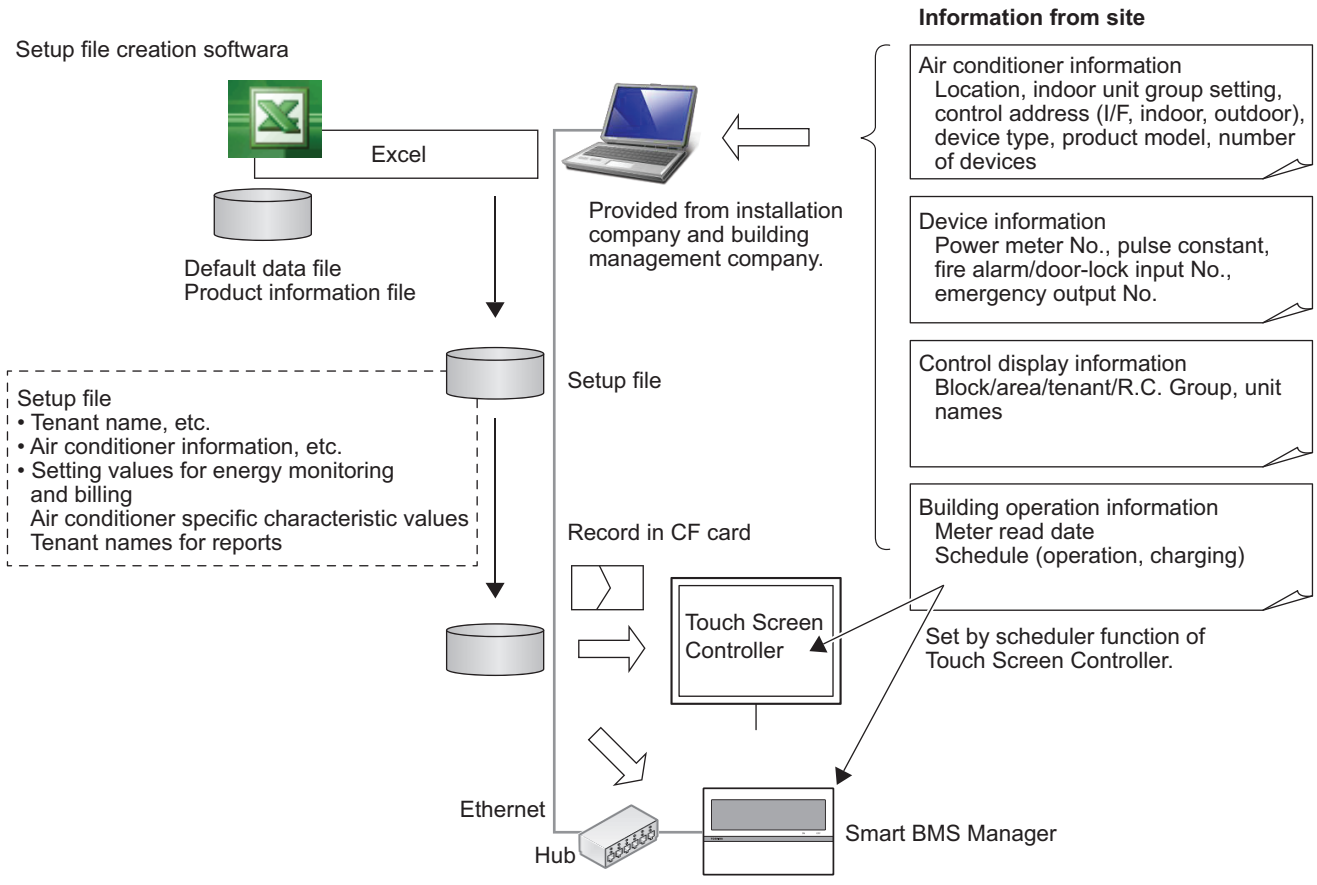
System address list

Building Name	Toshiba Building	IP Address	192.168.2.100

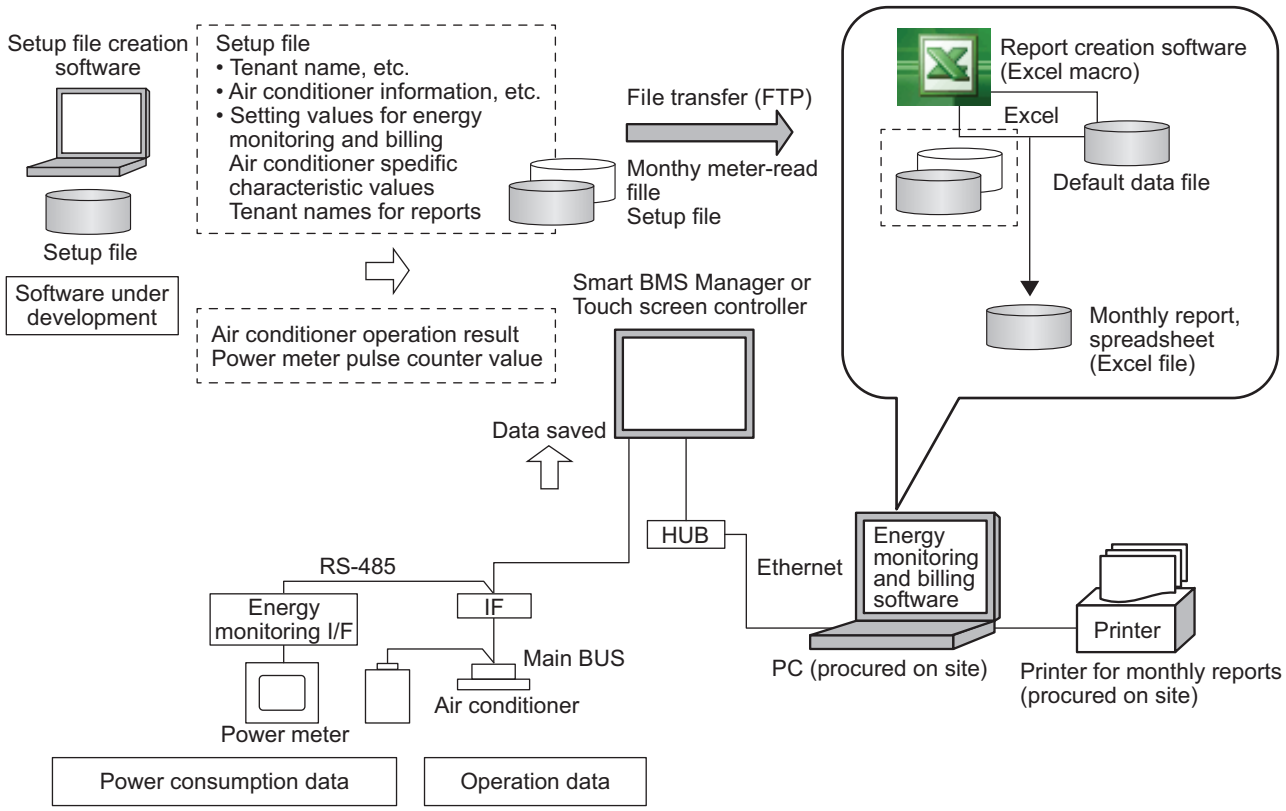
No	Air Conditioner List			Address Information						Display Name			R.C. Unit/Group	Energy I/F Data	Digital I/F Data	
	Outdoor Refrigerant System	Outdoor unit Model Name	Indoor Unit Model Name	TCC-LINK Line No	Line Address	Indoor Unit Address	Group Address	Group Relation	Central Control Address	Floor Name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

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

Setup file data flow



Energy Monitoring Data Flow



5

Open network and analog interface

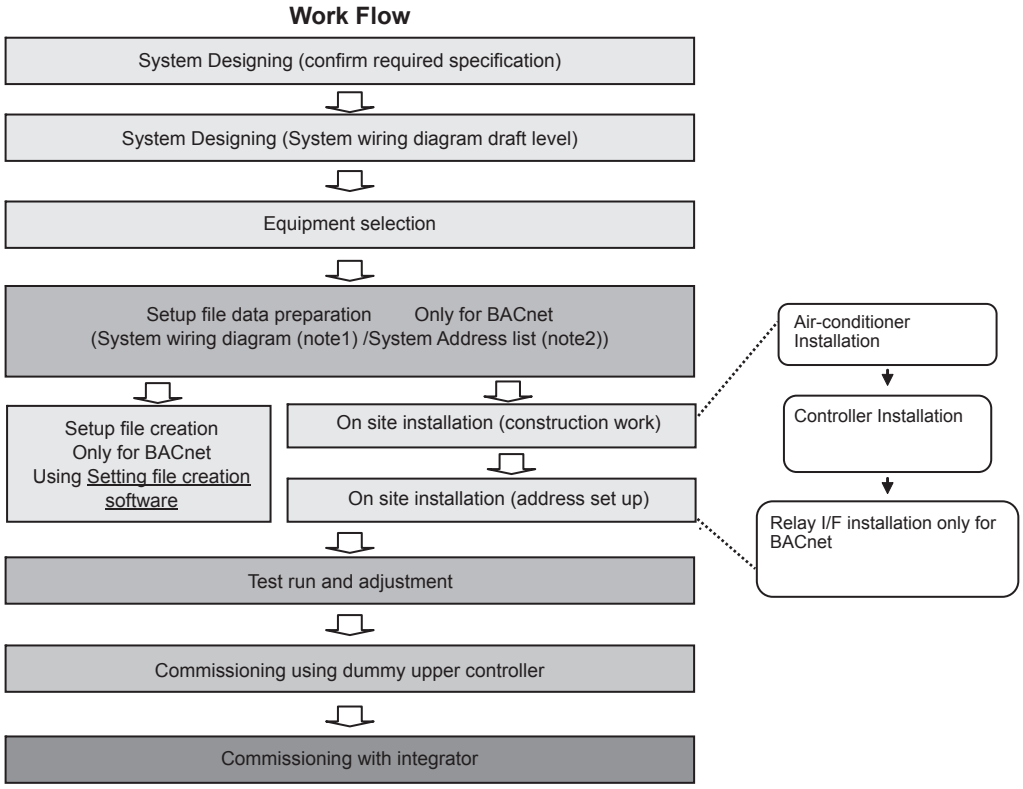
5-1 Line Up & Open network and analog interface
5-2 Work flow
5-3 Lon Interface TCB-IFLN642TLE
5-4 Modbus Interface TCB-IFMB641TLE
5-5 BACnet Server BMS-LSV9E (BMS-STBN10E)
5-6 BN Interface BMS-IFBN640TLE
5-7 Analog Interface TCB-IFCB640TLE
5-8 Open network and analog interface comparison table

5-1 Line Up & Open network and analog interface

Model Name	LN Interface		Modbus Interface		BACnet Server		BN Interface		Analog Interface	
	TCB-IFLN642TLE		TCB-IFMB641TLE		BMS-LSV9E		BMS-IFBN640TLE		TCB-IFCB640TLE	
Appearance										
Object	Command	Monitoring	Command	Monitoring	Command	Monitoring	Command	Monitoring	Command	Monitoring
ON/OFF status	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operation mode	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fan speed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Louver	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Set temperature	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Filter dirty indicator	✓	✓	✓	✓	-	✓	-	✓	-	-
Room temperature	-	✓	-	✓	-	✓	-	✓	-	-
Permit / Prohibit of Local Operation	✓	✓	✓	✓	✓	✓	✓	✓	-	-
Error status	-	✓	-	✓	-	✓	-	✓	-	✓
Error code	-	✓	-	✓	-	✓	-	✓	-	-

5-2 Work flow

The BMS work flow (LonWorks®, Modbus®, BACnet®, Analog I/F) 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.



Note1)
System wiring diagram
* All air-conditioners (FCU/CDU/controller) layout
* All 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 system devices address information
* Model name

Airconditioner list

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

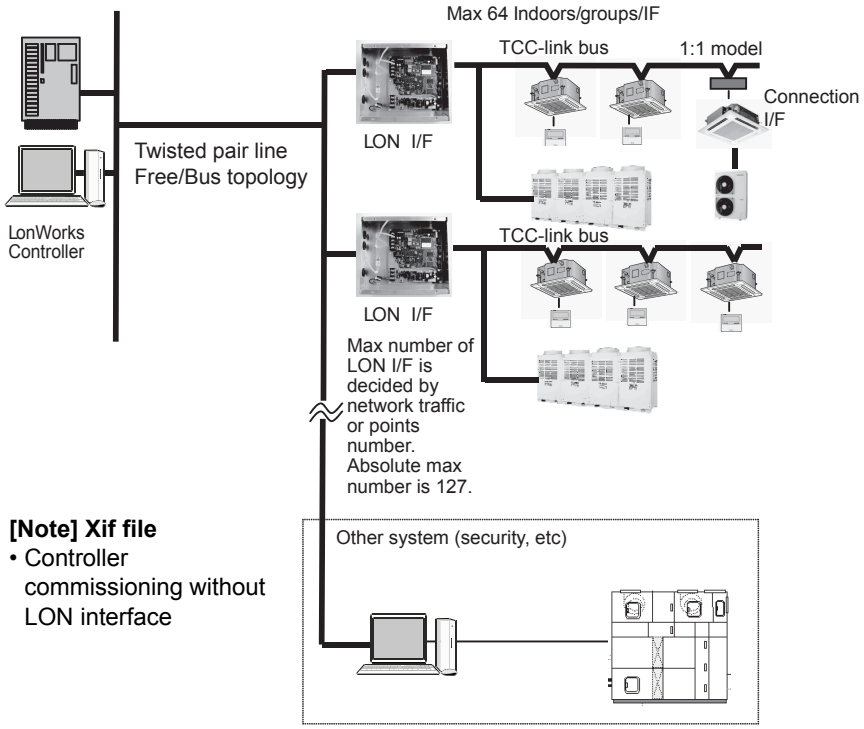
Air conditioner list

BACnet Server/
I/F /Line/Indoor/Group address information

5-3 Lon Interface TCB-IFLN642TLE

The Toshiba LonWorks interface 100% LonMark Compliant and is designed to connect the Toshiba Air Conditioning system to a LonWorks Building Management Control System.
This Interface connects directly to the Toshiba TCC-Link Central Control Network on the Air Conditioner side and can be wired on the Indoor or outdoor side depending on preference.
The Interface is then connected to the LonWorks Building Management Control system where it provides 28 Network variables for the sending of Control Commands and receiving unit information.
Multiple Toshiba LonWorks Interfaces can be connected to a single TCC-Link Network and addressed using simple switches provided on the device.
This is to enable ease of installation, especially in buildings with separate areas where 1 Interface may be used for each area/ floor.

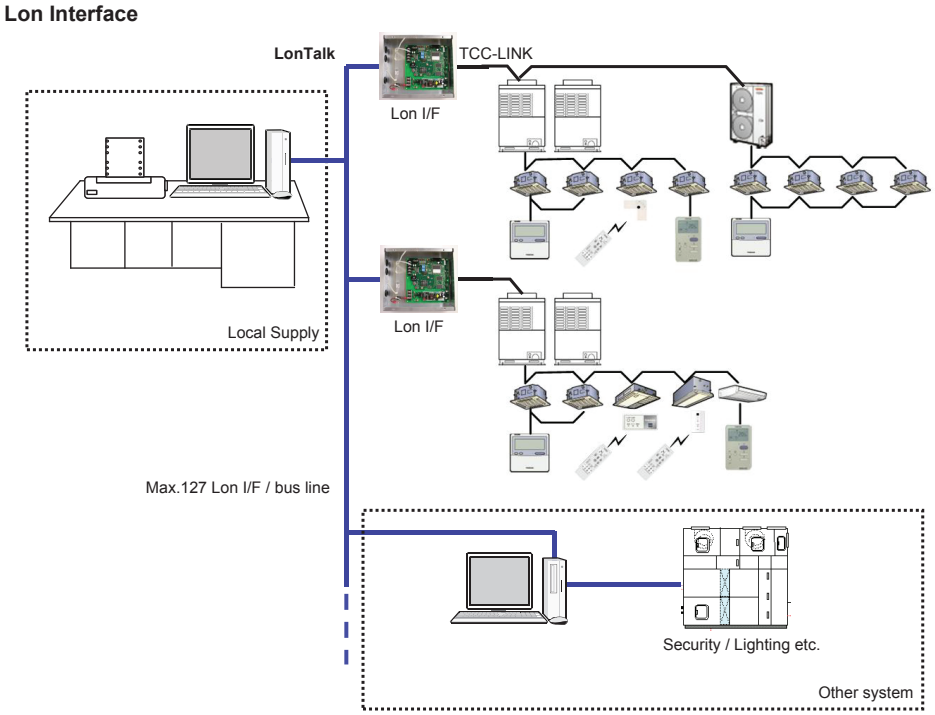
Outline

Appearance	Application
	
Features ■ Maximum 64 Indoor Units/ Groups and 16 Outdoor Systems can be connected to a single LonWorks Interface ■ Network adaptor TCB-PCNT30TLE2 required (1 per Master Indoor unit) for connection of DI/SDI Indoor Units ■ Up to 9 Central Remote Controller can be connected to one TCC-Link bus line.	**[Note] Xif file** • Controller commissioning without LON interface

Specifications

Part name		Lon Interface
Model Name		TCB-IFLN642TLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension		66 × 246 × 193 mm
Max number per one controller	Indoor unit	64
	TCC-link bus	1
Lon I/F / bus line		127
Communication port		Twisted pair FT-X1 transceiver 78 kbps with system
Network specification		LonWorks EIA/ANSI 709.1 support

System configuration



Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter sign	Reset	✓
Room temperature	-	✓
Permit / Prohibit of Local Operation	ON/OFF, Mode, Set temp., Fan Speed, Louver	✓
Error status	-	✓
Error code	-	✓

Installation

➔ Please refer to the Installation Manual

Network specifications

➔ Please refer to the Network Variables Specifications

5-4 Modbus Interface TCB-IFMB641TLE

The Toshiba ModbusR interface is designed to connect the Toshiba Air Conditioning system to a Modbus Building Management System.
The Toshiba Interface connects directly to the Toshiba TCC-Link Central Control Network on the Air Conditioner and can be wired on the Indoor or outdoor side depending on preference.
The Interface then uses the Modbus RTU protocol based on the RS-485 type serial communications protocol to connect to a suitable Modbus Master device.
Finally, this Modbus Master device is connected to the BMS control system and allows control of all connected Toshiba Air Conditioner equipment from that BMS control system.
Multiple Toshiba Modbus Interfaces can be connected to a single TCC-Link Network and addressed using simple switches provided on the device.
This is to enable ease of installation, especially in buildings with separate areas where 1 Interface may be used for each area/ floor.

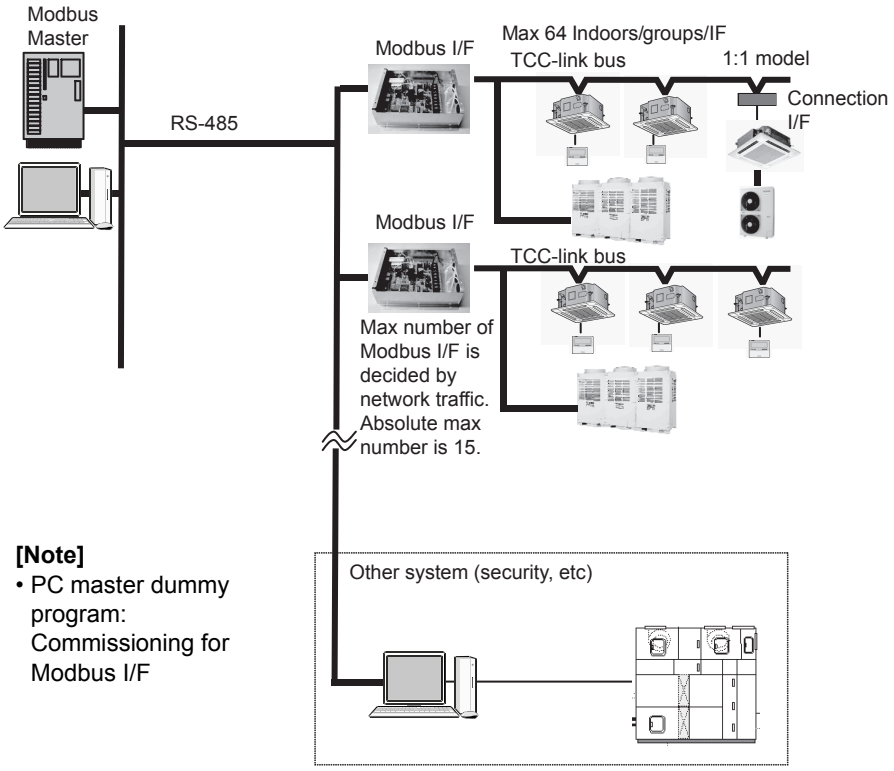
Outline

Appearance

Features

- Maximum 64 Indoor Units/ Groups and 16 Outdoor Systems can be connected to a single Modbus Interface
- Network adaptor TCB-PCNT30TLE2 required (1 per Master Indoor unit) for connection of DI/SDI Indoor Units
- Maximum 15 Modbus I/F can be connected per Modbus Master Device
- Up to 9 Central Remote Controller can be connected to one TCC-Link bus line.

Application

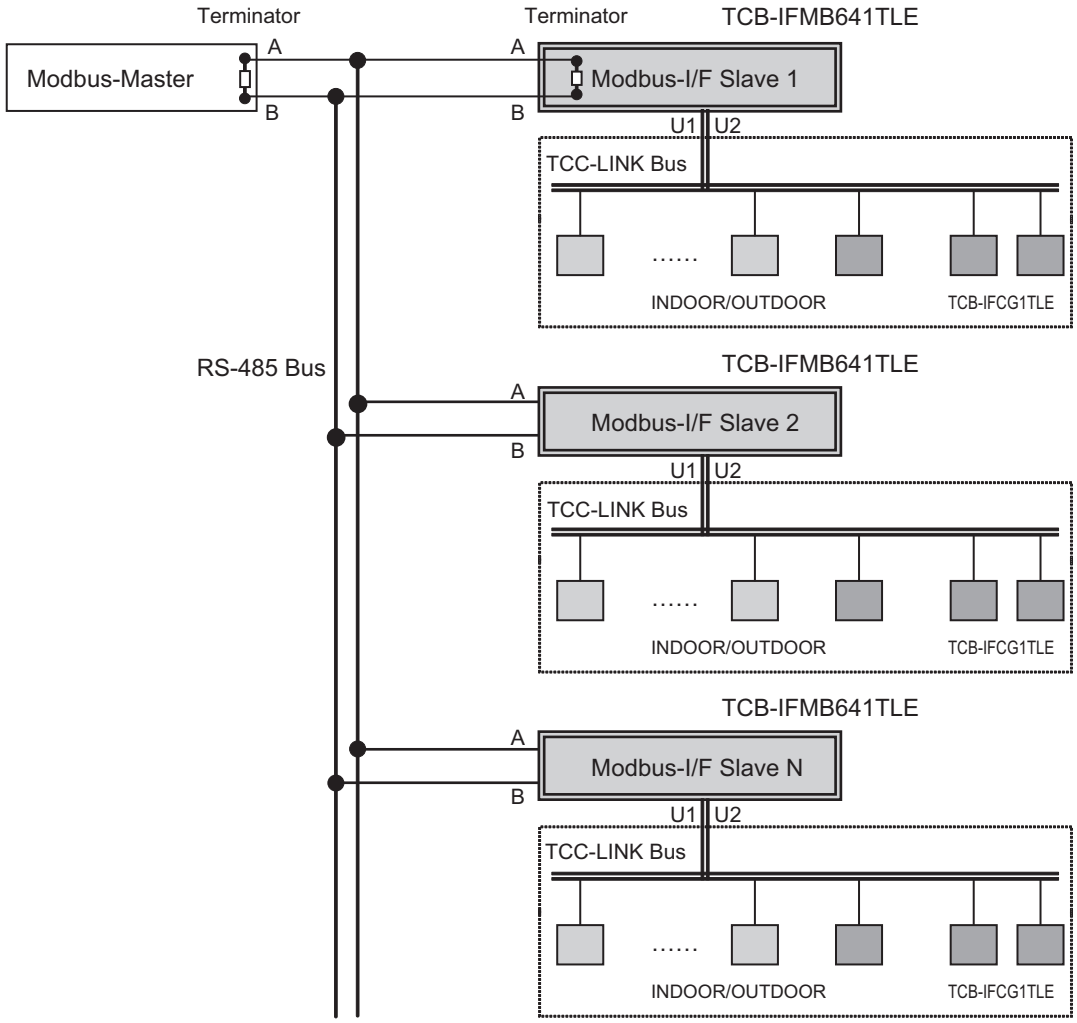


[Note]
• PC master dummy program: Commissioning for Modbus I/F

Specifications

Part name		Modbus Interface
Model Name		TCB-IFMB641TLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension		66 × 170 × 200 mm
Max number per one controller	Indoor unit	64
	TCC-link bus	1
Modbus I/F / bus line		15
Communication port for RS485		Modbus RTU mode 9.6/19.2/38.4 kbps
Network specification		Modbus APPLICATION PROTOCOL SPECIFICATION V1.1b

System configuration



N = Max. 15

Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter sign	Reset	✓
Room temperature	-	✓
Permit / Prohibit of Local Operation	ON/OFF, Mode, Set temp., Fan Speed, Louver	✓
Error status	-	✓
Error code	-	✓

Installation

➔ Please refer to the Installation Manual

Network specifications

➔ Please refer to the Specifications Manual

5-5 BACnet Server BMS-LSV9E (BMS-STBN10E)

A Building Management System (BMS) is a computer based control system that is installed in buildings to control and monitor mechanical and electrical equipment, such as Ventilation, lighting, power systems, fire systems and security for that building. The core function of most BMS systems is to manage the environment within the building and can be used to control heating and cooling equipment and manage the systems that distribute the treated air throughout the building.
The Toshiba BACnet® control system consists the BMS-LSV9E Intelligent server and the BMS-STBN10E BACnet server software, and can be connected to the TCC-Link Central Control Network via a Relay Interface to enable control of up to 128 Indoor Units from a BACnet® building management system.

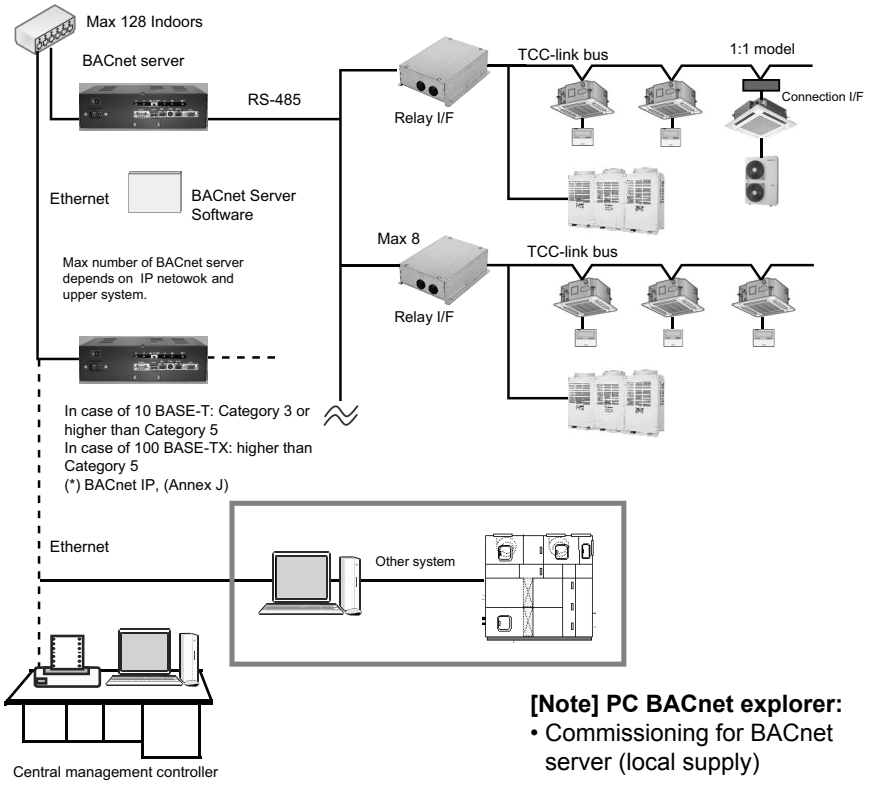
Outline

Appearance

Features

- Maximum 64 Indoor Units/Groups and 16 Outdoor Systems can be connected to a single Relay Interface
- Maximum 8 Relay Interfaces can be connected to a BACnet Intelligent Server
- Total Maximum 128 Indoor Units per BACnet Intelligent Server
- TCB-PCNT30TLE2 Network adaptor required for connection of DI/SDI to BACnet System

Application

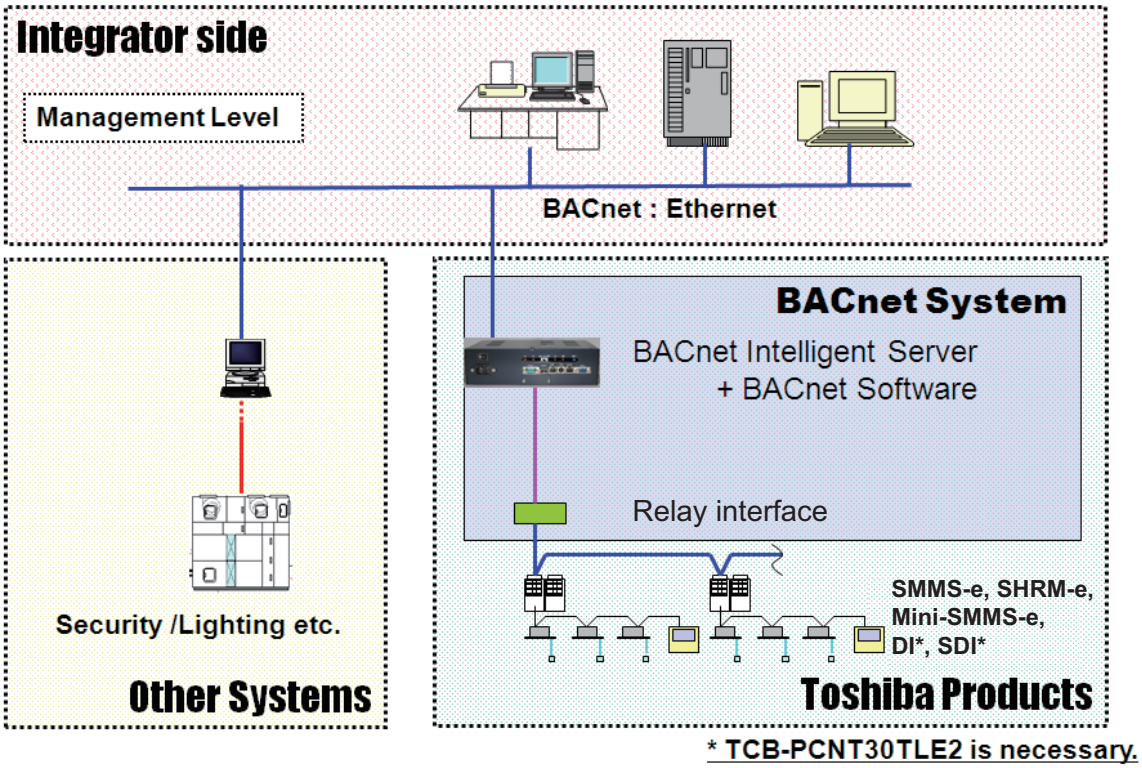


[Note] PC BACnet explorer:
• Commissioning for BACnet server (local supply)

Specifications

Part name		BACnet Server
Model Name		BMS-LSV9E (Intelligent Server) BMS-STBN10E (BACnet Server Software)
Power supply		220 - 240 VAC 50/60 Hz
Dimension		250 × 70 × 145 mm
Max number per one controller	Indoor unit	128
	TCC-link bus	-
	Relay interface	8
Communication port for Ethernet		10 BASE-T/100 BASE-TX for upper system
Network specification		ANSI/ASHRAE Standard 135-2008 BACnet Application Specific Controller (B-ASC)

System configuration



Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter sign	✓	✓
Room temperature	-	✓
Permit / Prohibit of Local Operation	ON/OFF, Mode, Set temp.	✓
Error status	-	✓
Error code	-	✓

Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”

Installation

➔ Please refer to the Installation Manual

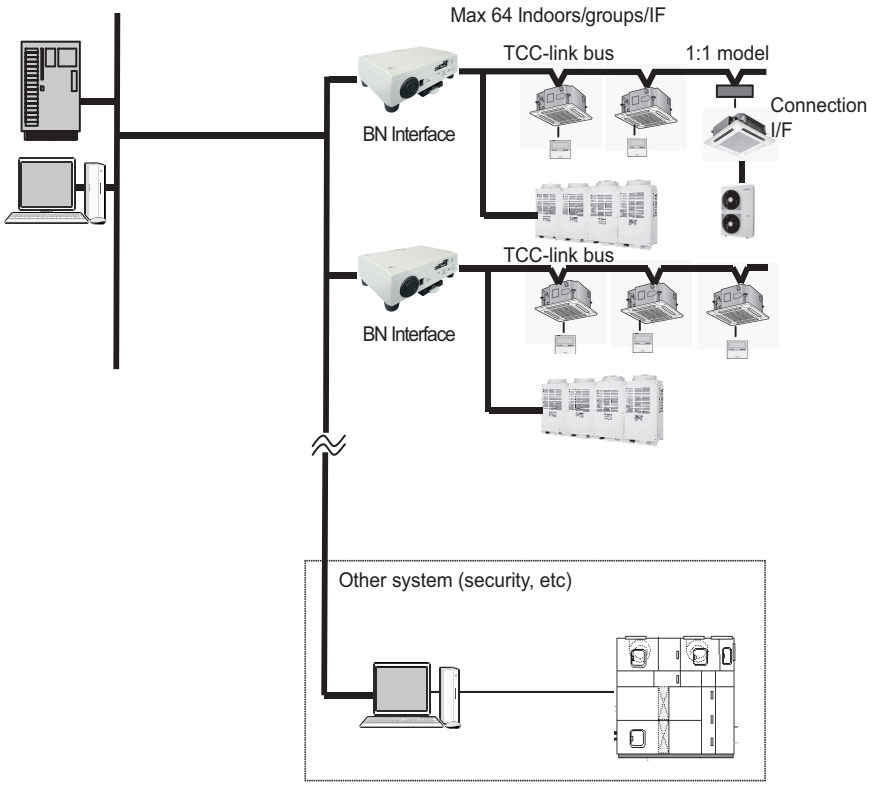
Network specifications

➔ Please refer to the BACnet Protocol Implementation Conformance Statement,
BACnet Server Software Specifications (Network Object and Variable Specifications)

5-6 BN Interface BMS-IFBN640TLE

The BN interface refers to equipment used for controlling Building Management Systems (Procured locally) and air conditioners
(TCC-LINK compatible models) through communications via a network to enable centralized control.

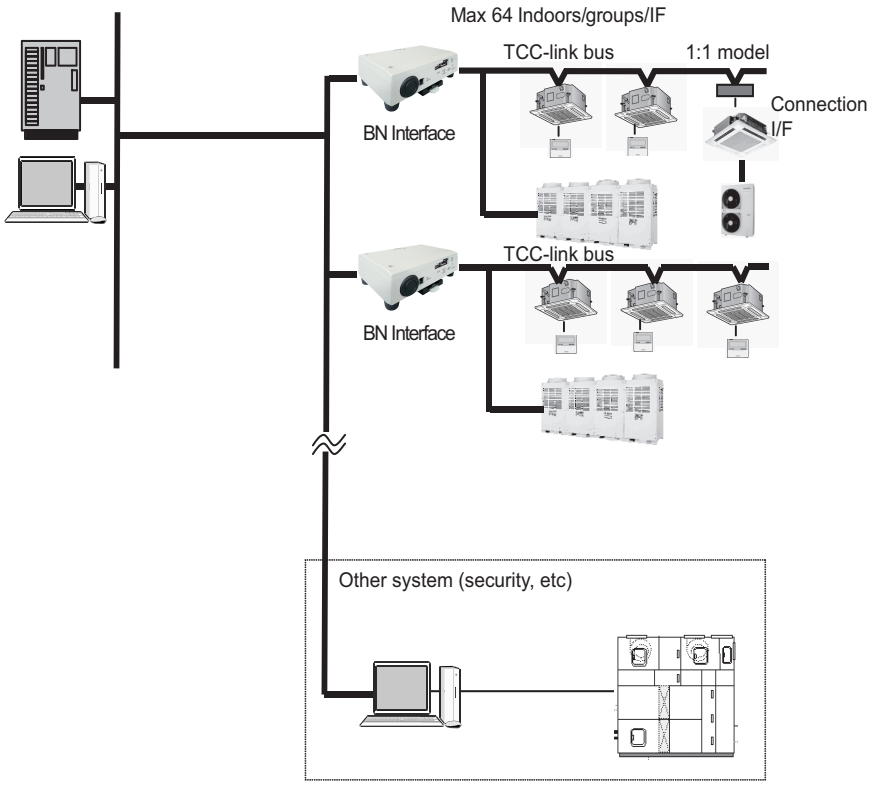
Outline

Appearance	Application
	
Features	
Relay I/F is unnecessary. Up to 64 indoor units connection DIN-rail installation (Attachment) BTL certification	

Specifications

Part name		BN Interface
Model Name		BMS-IFBN640TLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension		140 × 90 × 45 mm
Max number per one controller	Indoor unit	64
	TCC-link bus	1
	Relay interface	-
Communication port for Ethernet		10BASE-T/100BASE-TX for upper system
Network specification		ANSI/ASHRAE Standard 135-2008 BACnet Application Specific Controller (B-ASC)

System configuration



Main functions

Function	Command	Monitoring
On / Off	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter sign	-	✓
Room temperature	-	✓
Permit / Prohibit of Local Operation	On/Off, Mode, Set temp.	✓
Error status	-	✓
Error code	-	✓

Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”

Installation

➔ Please refer to the Installation Manual

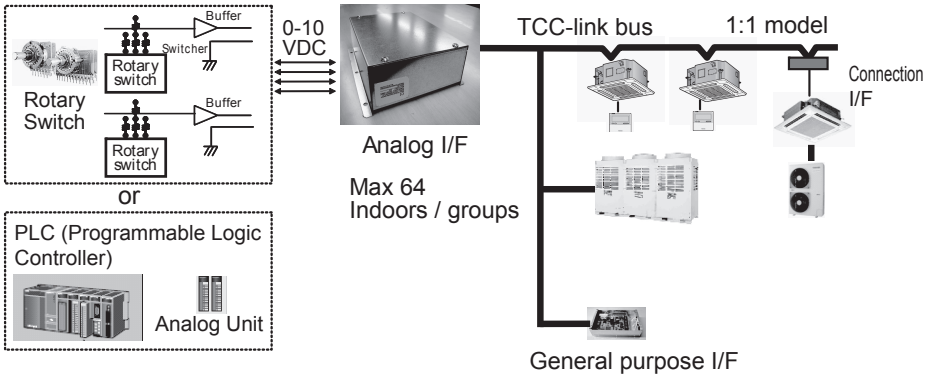
Network specifications

➔ Please refer to the BACnet Protocol Implementation Conformance Statement, BN Interface Specifications (Network Object and Variable Specifications)

5-7 Analog Interface TCB-IFCB640TLE

That Analogue Relay Interface is a device that can be connected directly to the TCC-Link Central Control network to provide Analogue & Digital Inputs & Outputs for control over Toshiba Air Conditioner products from non-Toshiba Control systems. This Interface is ideal for Integrating the Toshiba Air Conditioner product into basic or PLC BMS control systems, such as may be found in older controls systems.

Outline

Appearance	Application
	

Features

- Maximum 64 Indoor Units/Groups and 16 Outdoor Systems can be connected to a single Analogue Interface
- Network adaptor TCB-PCNT30TLE2 required (1 per Master Indoor unit) for connection of DI/SDI Indoor Units
- Digital & Analogue Inputs and Outputs available for control of Indoor Units and the General Purpose Relay Interface from TOSHIBA

Specifications

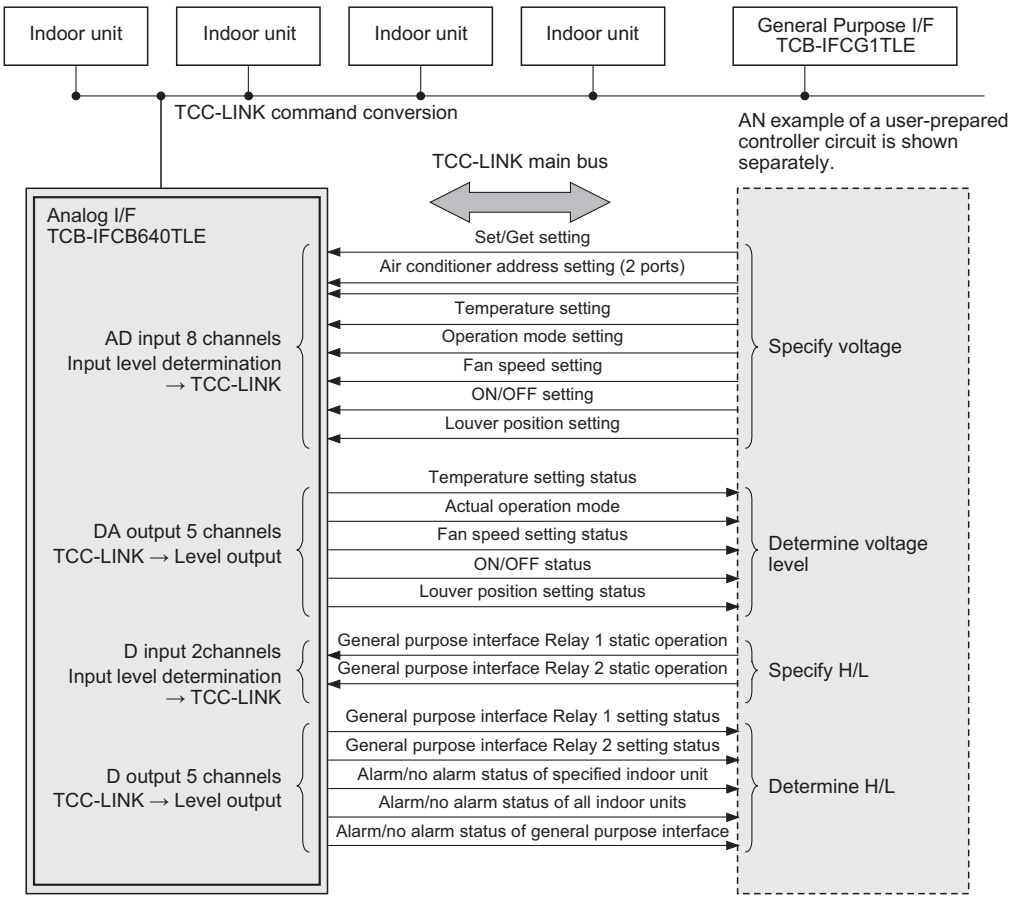
Part name		Analog Interface
Model Name		TCB-IFCB640TLE
Power supply		15 VDC ±5%
Dimension		66 × 170 × 200 mm
Max number per one controller	Indoor unit	64
	TCC-link bus	1
Input / Output	Analog input	8
	Analog output	5
	Digital input	2 (*1)
	Digital output	5 (*1)

(*1) General Purpose Interface (TCB-IFCG1TLE) needed in part.

Input/Output specifications

Signal classification		Port name	Data item	Specification
Analog input	0 to 10 V 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 k ohm
			Connection circuit output resistance	50 ohm or less
			Conversion time	160 ms
Analog output	0 to 10 V 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 k ohm or more
			Conversion time	10 µS
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 ohm
			Minimum input ON current	2 mA
			Maximum allowable input ON current	30 mA
			Maximum input OFF current	0.05 mA

System configuration



Main functions

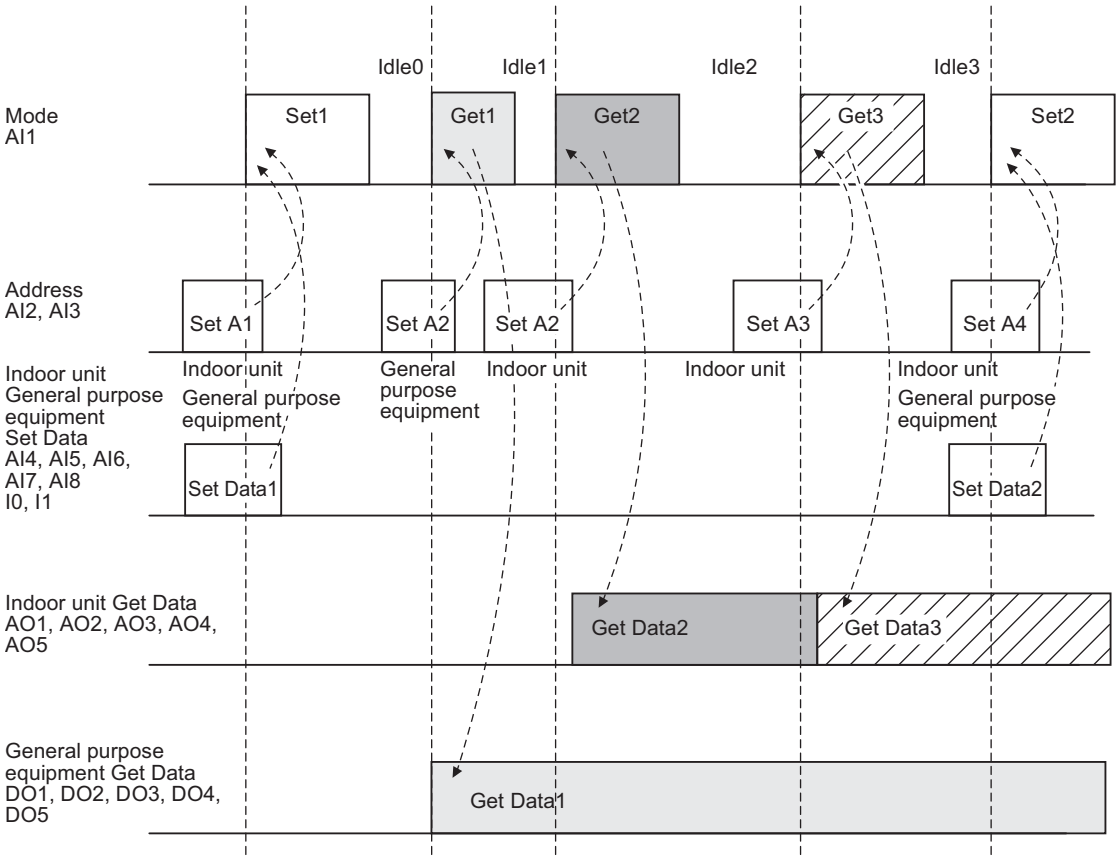
Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Filter sign	-	-
Room temperature	-	-
Permit / Prohibit of Local Operation	-	-
Error status	-	✓
Error code	-	-

Analog/Digital specifications

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	Sets 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
	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

■ 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.



Installation

➔ Please refer to the Installation Manual

5-8 Open network and analog interface comparison table

Part name		Open network and analog interface				
		Lon Interface	Modbus Interface	BACnet Server	BN Interface	Analog Interface
Model Name		TCB-IFLN642TLE	TCB-IFMB641TLE	BMS-LSV9E BMS-STBN10E	BMS-IFBN640TLE	TCB-IFCB640TLE
Power supply		220 - 240 VAC 50/60 Hz	220 - 240 VAC 50/60 Hz	220 - 240 VAC 50/60 Hz	220 - 240 VAC 50/60 Hz	15 VDC ±5%
Dimension		66 × 246 × 193 mm	66 × 170 × 200 mm	250 × 70 × 145 mm	140 × 45 × 90 mm	66 × 170 × 200 mm
Display		-	-	-	-	-
Max number per one controller [Note1] [Note2]	Indoor unit	64	64	128	64	64
	TCC-link bus	1	1	8	1	1
	Relay I/F	-	-	8	-	-
Communication port	TCC-link	1	1	- (RS485 via Relay I/F)	1	1
	RS485	-	Modbus RTU mode 9.6/19.2/38.4 kbps for upper system	Relay I/F : 8	-	-
	Ethernet	-	-	10 BASE-T / 100 BASE-TX for upper system	10BASE-T/ 100BASE-TX for upper system	-
	Others	Twisted pair FT-X1 transceiver 78 kbps with system	-	-	-	Analog in 8, out 5 (DC 0-10 v variable) Digital in 2, out 5
Indoor view classification		-	-	-	-	-
Network specification		LonWorks EIA/ANSI 709.1 support	Modbus APPLICATION PROTOCOL SPECIFICATION V1.1b	ANSI/ASHRAE Standard 135-2008 BACnet Application Specific Controller (B-ASC)	ANSI/ASHRAE Standard 135-2008 BACnet Application Specific Controller (B-ASC)	-
Monitoring [Note3]	ON/OFF	✓	✓	✓	✓	✓
	Operation mode	✓	✓	✓	✓	✓
	Set temperature	✓	✓	✓	✓	✓
	Air speed	✓	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓	✓
	Filter sign	✓	✓	✓	✓	-
	Child lock (Unit operation prohibited)	-	-	-	-	-
	Power saving mode	-	-	-	-	-
	Return back	-	-	-	-	-
	Central control	✓	✓	✓	✓	-
	Room temperature	✓	✓	✓	✓	-
	Ventilation	-	-	-	✓	-
Operation [Note3]	ON/OFF	✓	✓	✓	✓	✓
	Operation mode setting	✓	✓	✓	✓	✓
	Temperature setting	✓	✓	✓	✓	✓
	Air speed setting	✓	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓	✓
	Filter sign reset	✓	✓	✓	✓	-
	Child lock (Unit operation prohibited)	-	-	-	-	-
	Power saving mode (Compatible models only)	-	-	-	-	-
	Return back	-	-	-	-	-
	Central / Individual (Operation prohibited)	✓	✓	✓	✓	-
	Ventilation	-	-	-	✓	-
Alarm display	Unit No.	✓	✓	✓	✓	✓
	Occurrence time	-	-	-	-	-
	Alarm code	✓	✓	✓	✓	-
	Alarm content	-	-	-	-	-
	Alarm history	-	-	-	-	-
Schedule Function		Depend on upper system				
Alarm e-mail						

[NOTE.1] Restriction by TCC-Link specification:

1. Max 64 indoors, max 16*1 header outdoor with max 3 followers per 1 TCC-Link main bus, Max 64 indoors per 1 VRF 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.

[NOTE.2] Restriction by Relay Interface specification:

1. Only 1 Relay I/F is connected to 1 TCC-Link main bus.
2. One Relay Interface covers, Max 64 indoors under the condition of Note1 no2, max 16 refrigerant systems for VRF, max 64 refrigerant systems for only DI/SDI.

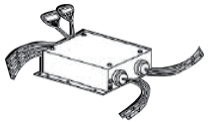
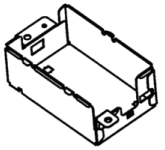
[NOTE.3] Actual functions depend on each air conditioner

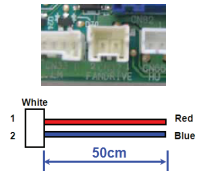
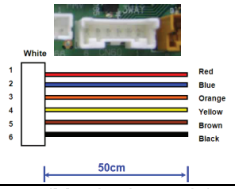
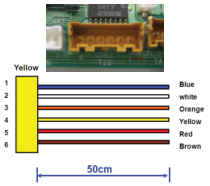
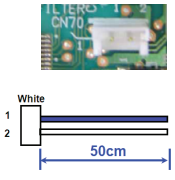
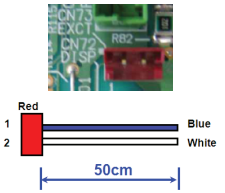
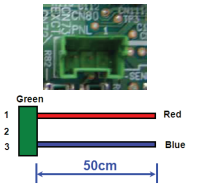
6

Indoor unit optional devices

6-1 Line Up & Function – Indoor unit optional devices
6-2 Remote location ON/OFF Control box TCB-IFCB-4E2
6-3 General Purpose Interface TCB-IFCG1TLE
6-4 GSM Phone Control Interface TCB-IFGSM1E
6-5 Remote sensor TCB-TC41LE
6-6 Digital Inverter Air Conditioner “1:1 Model” Connection Interface TCB-PCNT30TLE2
6-7 Connection Interface Kit TCB-PX30MUE
6-8 Application control kit TCB-PCUC1E
6-9 Connectors

6-1 Line Up & Function – Indoor unit optional devices

Model Name	Remote location ON/ OFF control box	General Purpose Interface	GSM Phone Control Interface	Remote sensor	Digital Inverter Air Conditioner "1:1 Model" Connection Interface	Connection Interface Kit	Application control kit
	TCB-IFCB-4E2	TCB-IFCG1TLE	TCB-IFGSM1E	TCB-TC41LE	TCB-PCNT30TLE2	TCB-PX30MUE	TCB-PCUC1E
Appearance							
ON/OFF	✓	✓ (Operation only) (*1)	✓	Remote sensing of indoor air temperature	-	Some types of indoor units (2 series compact, 4-way discharge cassette, etc.) need the metal case TCB-PX30MUE to use TCB-PCNT30TLE2.	-
Mode	-	✓ (Operation only) (*1)	-		-		✓
Setting Temperature	-	✓ (Operation only) (*1)	-		-		✓
Fan Speed	-	✓ (Operation only) (*1)	-		-		✓
Permit / Prohibit function	-	✓ (Operation only) (*1)	-		-		-
Filter dirty indicator	-	-	-		-		-
Error Display	✓	✓	✓		-		-
Ventilation	-	-	-		-		-
TCC-link line	-	-	-		✓ (For DI/SDI)		-
Digital input / output	1 / 2	6 / 4	-		-		-
Analog input / output	-	4 / 2 (*2)	-		-		-

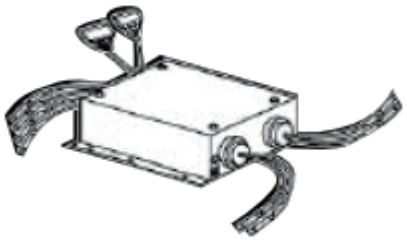
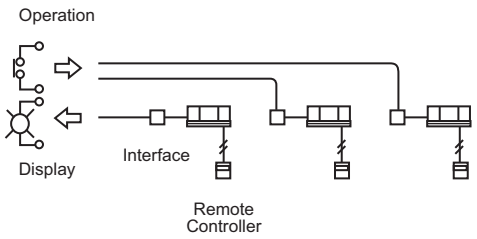
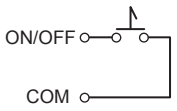
Model Name	Fan output (CN32)	Option output (CN60)	Operation terminal (CN61)	Option error input (CN70)	Demand input (CN73)	Outside error input (CN80)
	TCB-KBCN32VEE	TCB-KBCN60OPE	TCB-KBCN61HAE	TCB-KBCN70OAE	TCB-KBCN73DEE	TCB-KBCN80EXE
Appearance						
ON/OFF	-	✓ (Monitoring only)	✓	-	-	-
Mode	-	✓ (Monitoring only)	-	-	-	-
Setting Temperature	-	-	-	-	-	-
Fan Speed	-	-	-	-	-	-
Permit / Prohibit function	-	-	✓ (Operation only)	-	-	-
Filter dirty indicator	-	-	-	✓ (Operation only)	-	-
Error Display	-	-	✓	✓ (Operation only)	-	✓ (Operation only)
Ventilation	✓ (Operation only)	-	-	-	-	-
Demand function	-	-	-	-	✓ (Operation only)	-
Digital input / output	1 / -	5 / -	2 / 2	- / 1	- / 1	- / 1
Analog input / output	-	-	-	-	-	-

(*1) : Operation of specified indoor units can be controlled with input ports. Setting parameters by programming tool.
(*2) : Modbus system (TCB-IFMB641TLE) needed.

6-2 Remote location ON/OFF Control box TCB-IFCB-4E2

Start and Stop of the air conditioner is possible by the external signal as well as the indication of operation/alarm to outside is possible.
This application control P.C. board connects to the CN61 connector of the Indoor Unit Interface P.C. board.
It can be connected to the Master unit of a group to provide ON/OFF Control of up to 8 Indoor Units.

Outline

Appearance	Features
	• Start and stop of the air conditioner is possible by a external signal and indication of operation/alarm externally.
Application	**Function**
	• 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.  Non-voltage ON/OFF continuous signal

Specifications

Part name	Remote location ON/OFF control box
Model Name	TCB-IFCB-4E2
Power supply	220 - 240 VAC 50/60 Hz
Dimension	66 × 170 × 200 mm
No. of connected indoor units	1 to 8 units for 1 interface (Group connection for 2 or more connected units)
Receive signal type of central ON/OFF command	Non-voltage ON/OFF continuous signal
Status output signal	Non-voltage contact (For indication of ON/OFF status, and alarm) Contact capacity : Max. AC 240 V, 0.5 A or less

System configuration

[Wiring and setup]

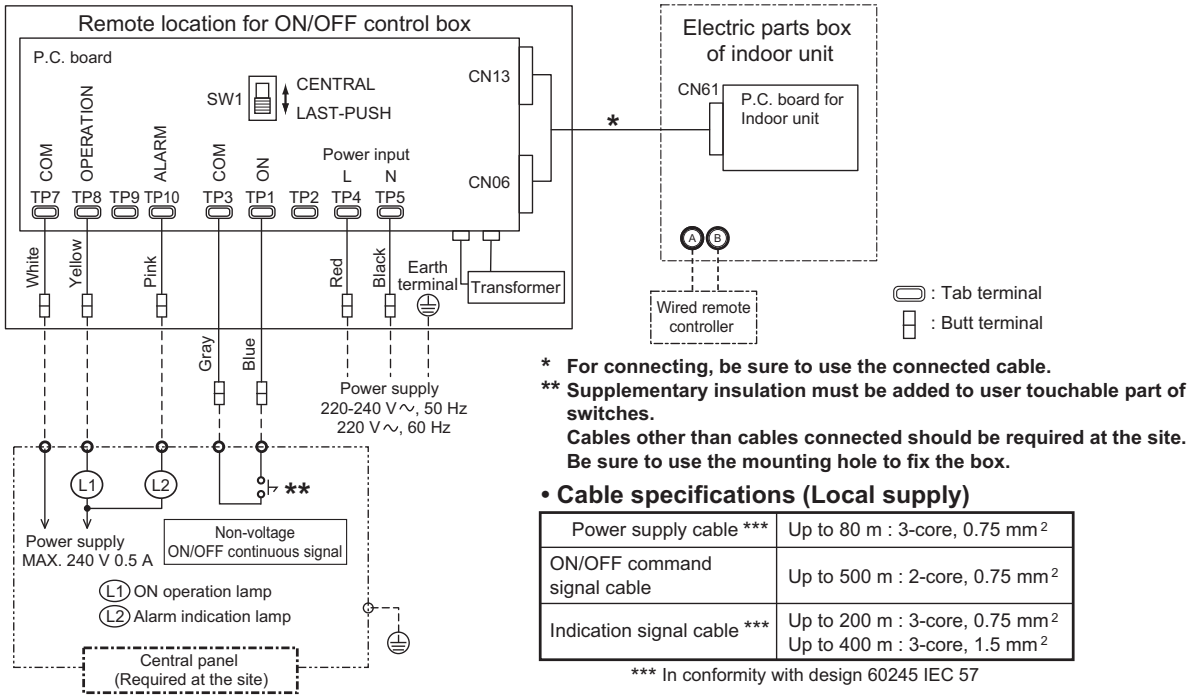
- Use an exclusive connector for connection with the indoor control PCB.
- In a group control, the system can operate when connecting with any indoor unit (Control PCB) in the group. However when taking out the operation/error signal from one unit, it is necessary to take it from all other units within 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 No voltage ON/OFF serial signal
Output No voltage contact for operation, error display
Contact capacity : Below Max. AC240 V 0.5 A



*** For connecting, be sure to use the connected cable.**
**** Supplementary insulation must be added to user touchable part of switches.**
Cables other than cables connected should be required at the site.
Be sure to use the mounting hole to fix the box.

• Cable specifications (Local supply)

Power supply cable ***	Up to 80 m : 3-core, 0.75 mm^2
ON/OFF command signal cable	Up to 500 m : 2-core, 0.75 mm^2
Indication signal cable ***	Up to 200 m : 3-core, 0.75 mm^2 Up to 400 m : 3-core, 1.5 mm^2

*** In conformity with design 60245 IEC 57

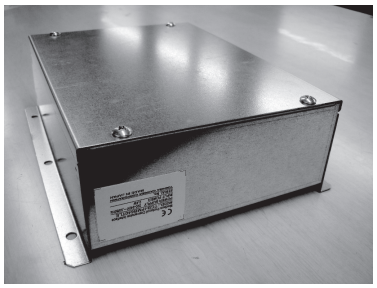
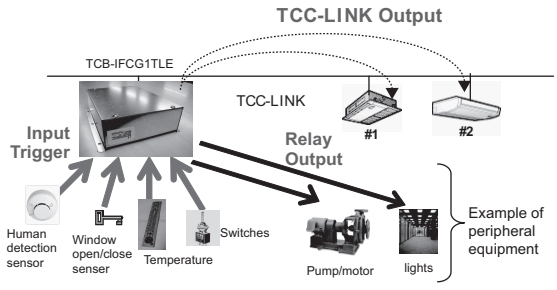
Installation

➔ Please refer to the Installation Manual

6-3 General Purpose Interface TCB-IFCG1TLE

The General Purpose Relay Interface is a device that can be connected directly to the TCC-Link Central Control Network and addressed on the TCC-Link Network in order to provide control of non-Toshiba equipment from a Toshiba control system, and control of the Toshiba Air Conditioner from digital & Analogue Inputs.
TCB-IFCG1TLE is given a Central Control address (similar to an Indoor Unit) and can then be controlled from a central control device.
Only ON/OFF Input/Output available from Central Controllers.
Full Control Available From Modbus Interface Only.
Can be used to allow ON/OFF control and monitoring of Residential Indoor Units from TCC-Link Central Control devices (selected models only).

Outline

Appearance	Features
	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 (*IMS, etc.*) can be connected to the TCC-LINK central control network (SMMS-e, SHRM-e, Mini-SMMS-e, DI, SDI) for ON/OFF Control & Monitoring via this device. • Full Central Control by Modbus System TCB-IFMB641TLE and ON/OFF Control by Compliant Manager (Multi language). Programmable Control by Special Tool • Operation of specified indoor units can be programmed on site with input ports level change.
Application	**Function**
Central control via TCC-LINK Connectable with HA terminal (4 pin 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

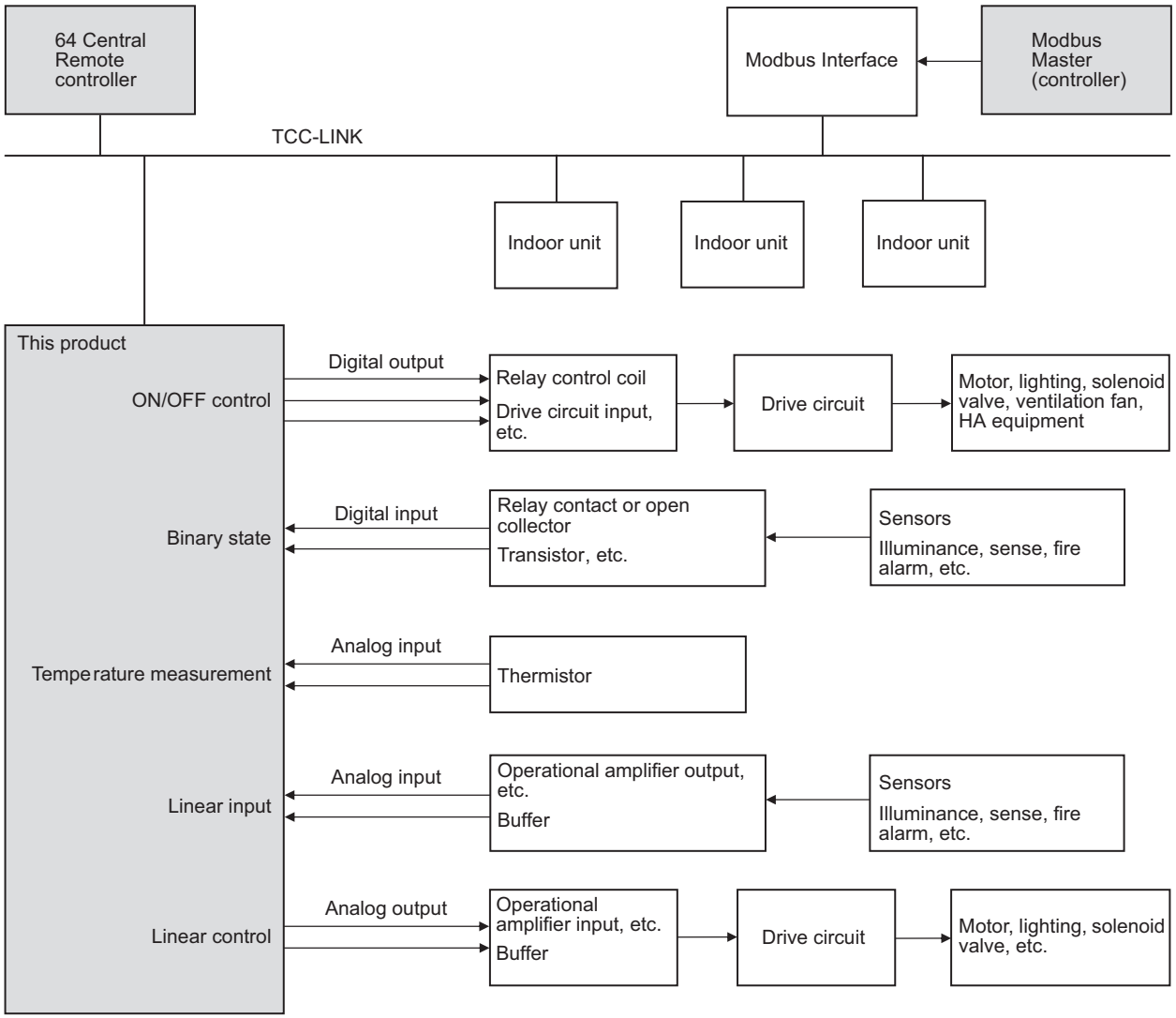
Input/ output ports	Channel number	Main spec	Connected Device/ Apparatus example
Analog Input	2	Temperature measurement: -10~90 °C±0.4 °C	Thermistor
	2	Analog Input: 0~10 V 10 bits resolution	Sensor, etc
Analog Output	2	Output: 0-10 V 8 bits resolution	Actuator, Motors, Pumps, etc
Digital Input	6	Photo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

Specifications

Part name		General Purpose Interface
Model Name		TCB-IFCG1TLE
Power supply		DC 15 V ± 5%
Dimension		66 × 170 × 200 mm
Max number per one interface	Indoor unit	63
	TCC-link bus	1
Input / Output	Analog input	4 (*1) Thermistor / 0 to 10 V
	Analog output	2 (*1) 0 to 10 V
	Digital input	6
	Digital output	4

(*1) Modbus system (TCB-IFMB641TLE) needed.

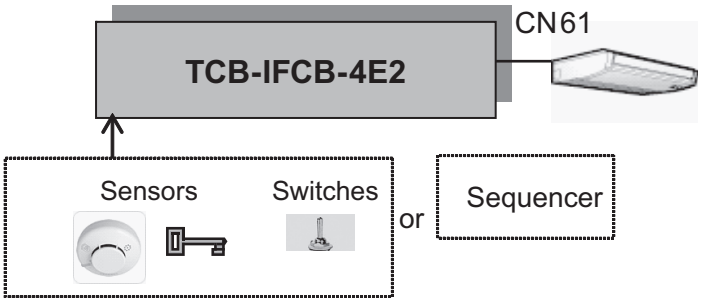
System configuration



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.

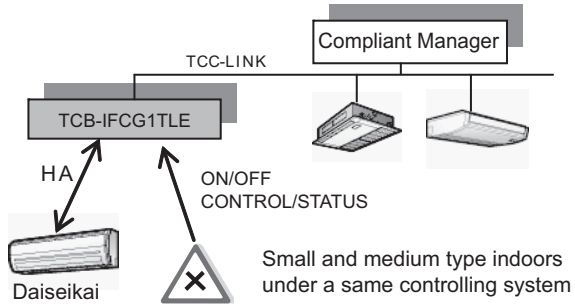
TCB IFCB-4E2 is able to output ON/OFF, Static/Pulse, or non-voltage commands corresponding to ON/OFF input from a sensor or sequencer output sensor. It can be connected to a CN61 indoor unit to control its starting and stopping.



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.

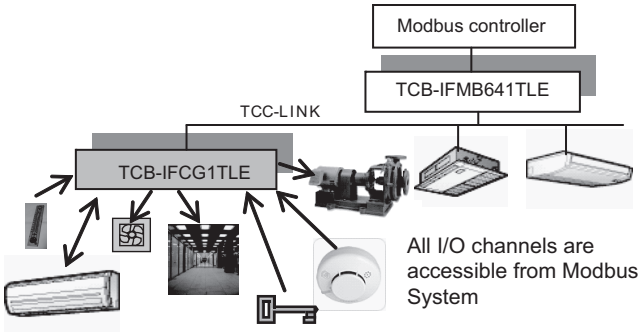
Start/stop HA air conditioners from the controller through TCC-LINK

Central Control



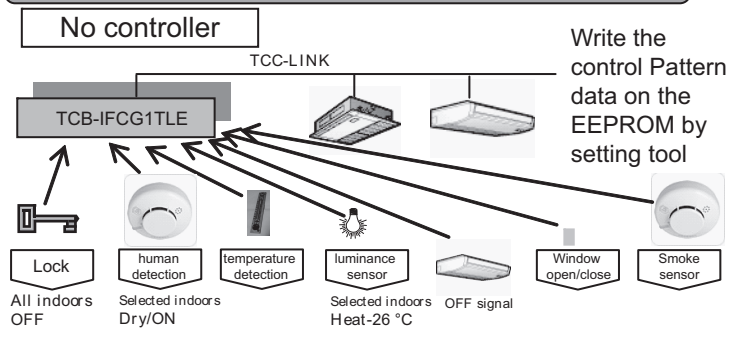
All I/O ports are accessible through the Modbus master.

Full Central Control

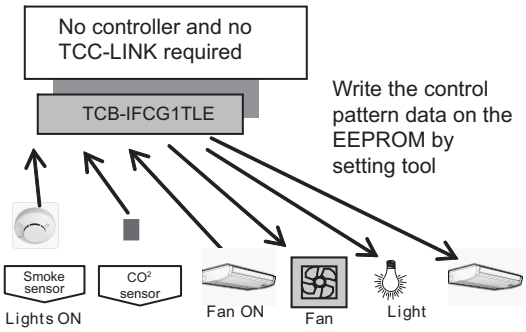


The actions of air conditioners and relay output control corresponding to changes of status at input ports are programmable on site. Relay outputs can form logic circuits. (Control Pattern Programming: combination of 2 analog and 5 digital inputs in 12 patterns)

Control Pattern Programming (1)



Control Pattern Programming (2)



Installation

➔ Please refer to the Installation Manual

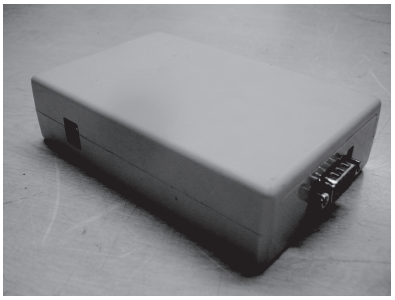
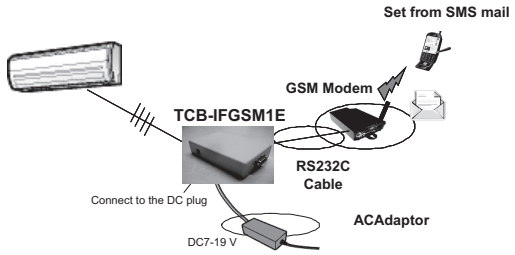
Setting Tool

➔ Please refer to the Setting Tool Manual

6-4 GSM Phone Control Interface TCB-IFGSM1E

The TCB-IFGSM1E Interface is a device that allows control of the Toshiba Air Conditioner Equipment from a remote location using standard GSM (Global system for Mobile communications) Mobile phone SMS text messages.
Device connects to CN61 on DI/SDI & VRF Indoor Units.
Daiseikai Residential & DI Flexi units can be connected via HA connector on Indoor Unit.
Control Functions vary depending on HA/CN61 Connection used.

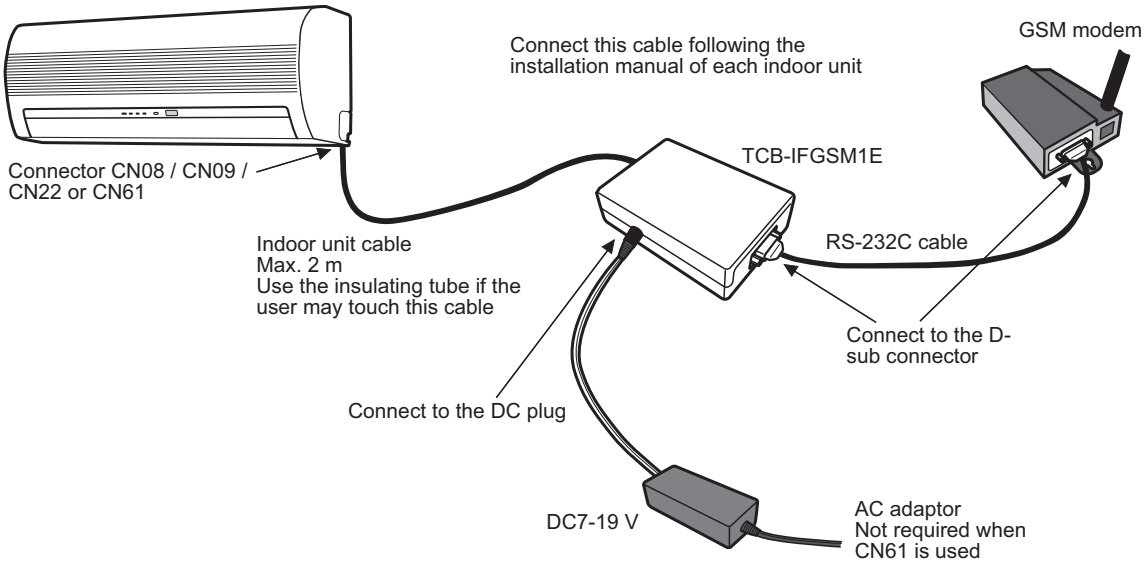
Outline

Appearance	Features
	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 SMMS-e, SHRM-e, Mini-SMMS-e, DI, SDI • 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
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)

Specifications

Part name		GSM Phone Control Interface
Model Name		TCB-IFGSM1E
Power supply		DC 7-19 V ± 5% No external power supply is required when CN61 is used.
Dimension		32 × 80 × 125 mm
No. of connected indoor units		1 to 8 units for 1 interface (Group connection for 2 or more connected units)
RS-232C connector		Supports communication specifications (9600 bps, 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
		CN4: For CN61
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.

System configuration



The cable connected to the CN61 and CN4 should be the optional connector cable TCB-KBCN61HAE.

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	Locally procured (including power supply)
Power supply	Not required when CN61 is used.	1	Locally procured
RS-232C cable	Used for connection to between GSM modem and TCB-IFGSM1E. A straight cable with male-female connectors (max.15 m)	1	Locally procured
Indoor unit cable	Use a commercially available 6-pin cable for connection to CN61. (Model name: TCB-KBCN61HAE)	1	Locally procured 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	Locally procured
Screw	For 4 feet to be attached to the wall (M3 × 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	Locally procured
RS-232C cable for tests	A cross cable with female-female connectors used for connection to a PC	1	Locally procured

Write down the GSM modem telephone number, PIN, and PUK number.

GSM modem telephone number:

PIN:

PUK number:

Main functions

Function	HA	CN61
ON/OFF	✓	✓
ON/OFF Status output	✓	✓
Alarm output	-	✓

Installation

➔ Please refer to the Installation Manual

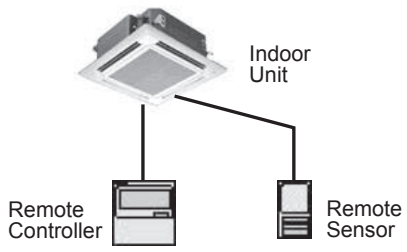
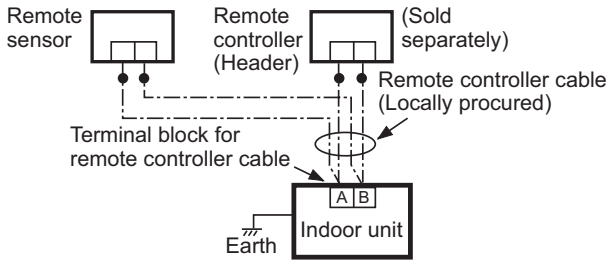
Operation

➔ Please refer to the Owner's Manual

6-5 Remote sensor TCB-TC41LE

Air temperature sensing at a distance by switching from body sensor max 1 and max 1 wired remote controller on the A/B terminal.

Outline

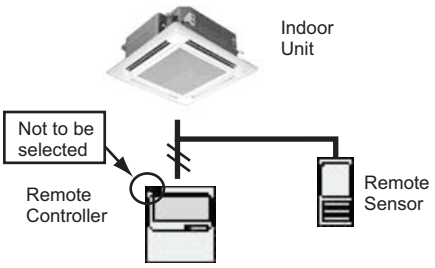
Control name	Function
Remote sensor (TCB-TC41LE) 	Air temperature sensing at a distance.  **[Note]** • Do not change the TA sensor on the remote controller sensor by using item code (DN) setting. • 2 remote controllers are prohibited.

Specifications

Part name	Remote sensor
Model Name	TCB-TC41LE
Power supply	No external power supply is required
Dimension	120 × 70 × 16 mm
No. of connected indoor units	1

Note

In case of using the remote sensor “TCB-TC41LE”,
don’t select “remote controller sensor” by item code (DN) setting.
You can use only one remote controller sensor (set as the Header 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-TC41LE or the sensor built in to the remote controller. When you use group control, the sensor option varies as shown on the following table, depending on the system you use (VRF or DI/SDI)

Category	Group Control	Room temperature for control		
		Body TA sensor	**TCB-TC41LE**	**Sensor in Remote controller**
VRF	**Group**	yes (each)	prohibited	prohibited
	Individual	yes (each)	yes (each)	yes (each)
DI/SDI	**Group/Twin/Triple**	yes (Header)	yes (Header)	yes (Header)
	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 controller must be one. Able to use with another sensor at the same time if set to do so in the header settings.

[Note 2] If two remote controllers are used, the sensor in the header remote controller is selected by making the switch setting “Header” on the header remote. However, if the sensor in the wireless remote controller is set as header, 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 header unit.

[Note 4] Do not install the remote sensor where air flow is poor.

Installation

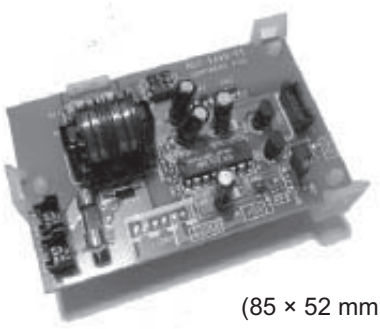
➔ Please refer to the Installation Manual

6-6 Digital Inverter Air Conditioner “1:1 Model” Connection Interface TCB-PCNT30TLE2

This interface corresponds to the digital inverter air conditioner.
Do not use or connect this interface 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.

Outline

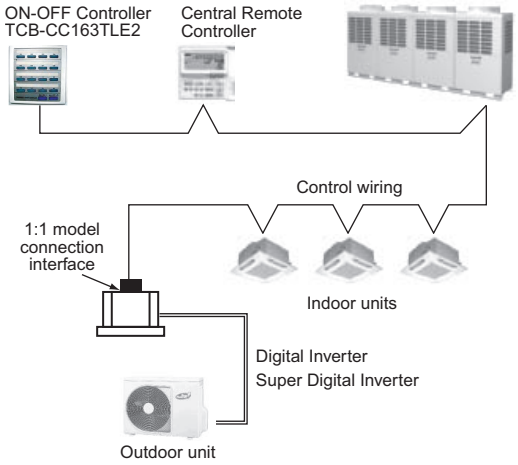
Appearance



(85 × 52 mm)

Install optional P.C. board in E-parts of the indoor unit.

Application

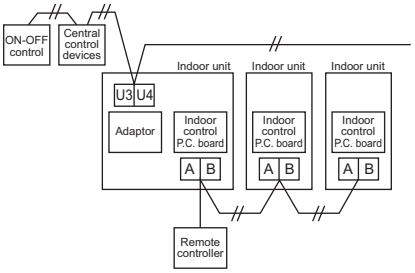


Features

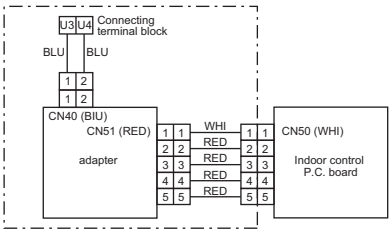
- Link adapter for “1:1 model” to enable connection to VRF system network

  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



Wiring diagram of indoor P.C. board



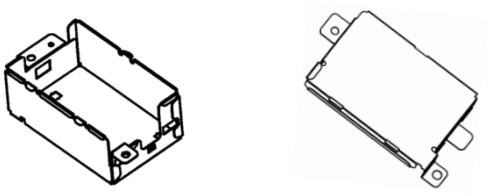
Specifications

Part name		Digital Inverter Air Conditioner “1:1 Model” Connection Interface
Model Name		TCB-PCNT30TLE2
Power supply		No external power supply is required
Dimension		85 × 52 mm
Max number per one interface	Indoor unit	1 (DI/SDI)
	TCC-link bus	1

6-7 Connection Interface Kit TCB-PX30MUE

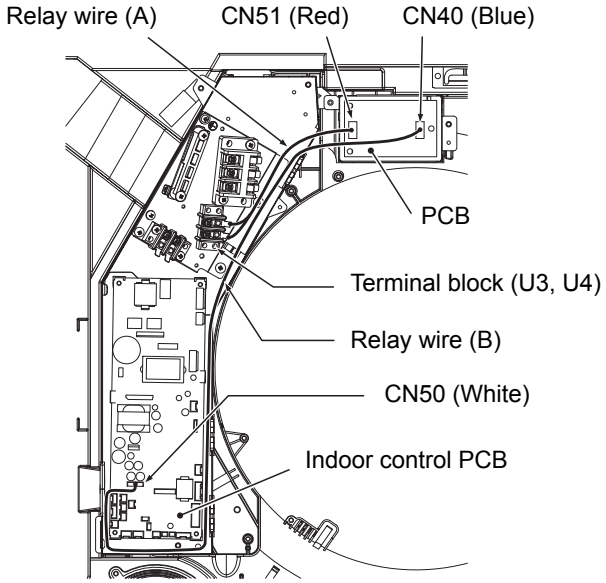
For 4-way cassette 4 series, Compact 4-way cassette 2 series.

Outline drawing

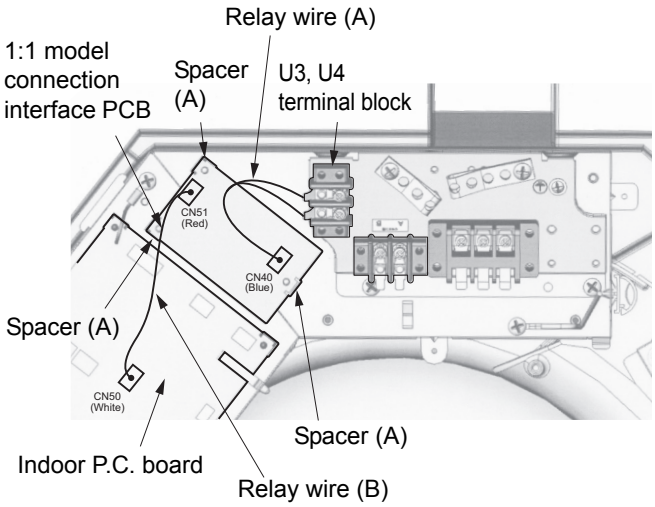


TCC-LINK Adaptor (TCB-PCNT30TLE2) fixing place for DI/SDI indoor unit

4-way Air Discharge Cassette type (4 series)

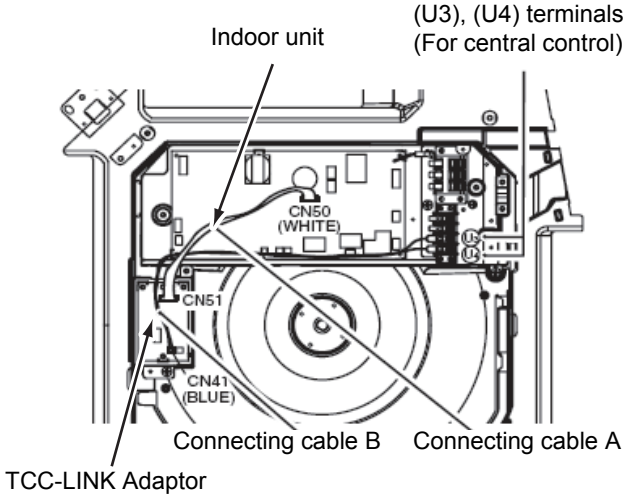


4-way Air Discharge Cassette type

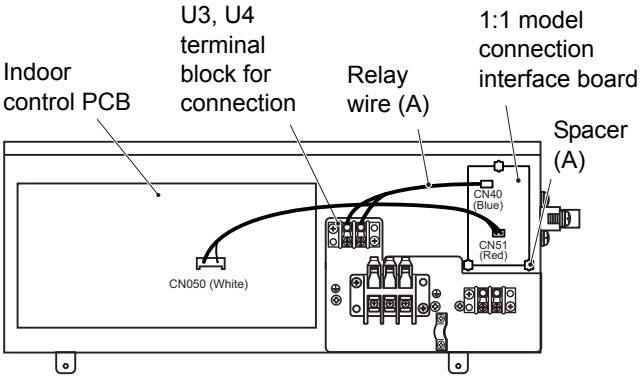


Compact 4-way cassette 2 series

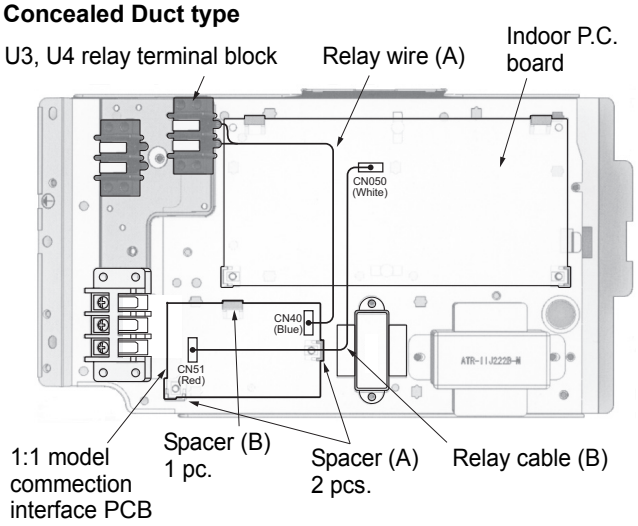
Cut off the slit of bell mouth. Refer to Installation manual of TCB-PX30MUE.



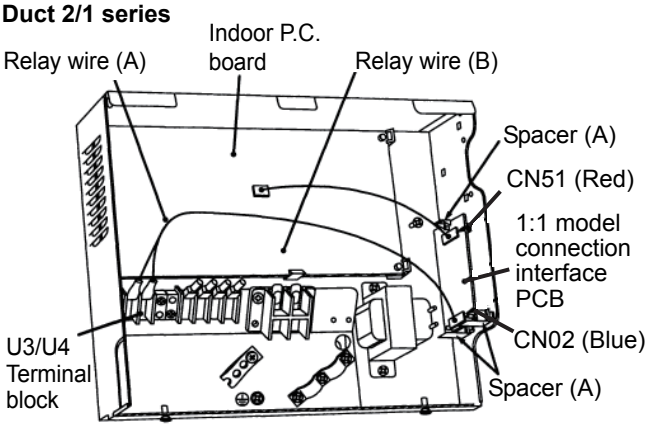
Under Ceiling type



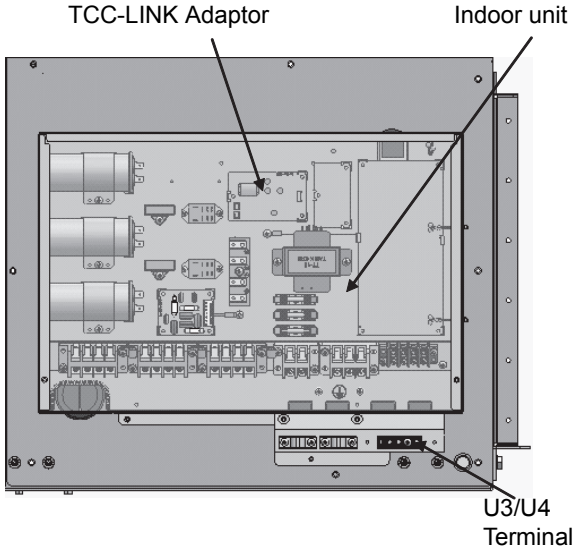
Concealed Duct type



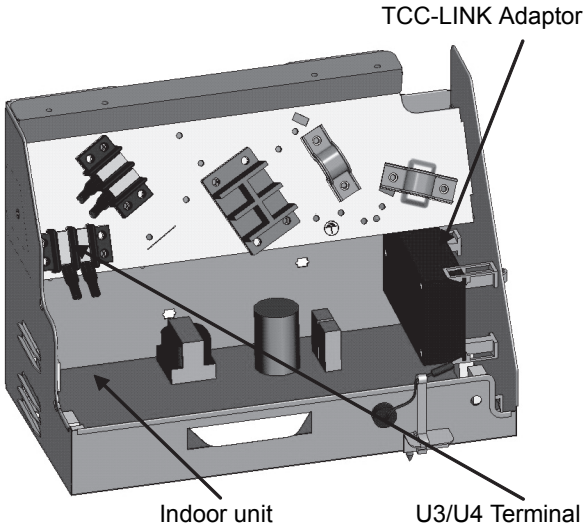
Duct 2/1 series



Concealed duct High static pressure 2/3 series



Slim duct 4 series



Installation

➔ Please refer to the Installation Manual

Operation

➔ Please refer to the Owner's Manual

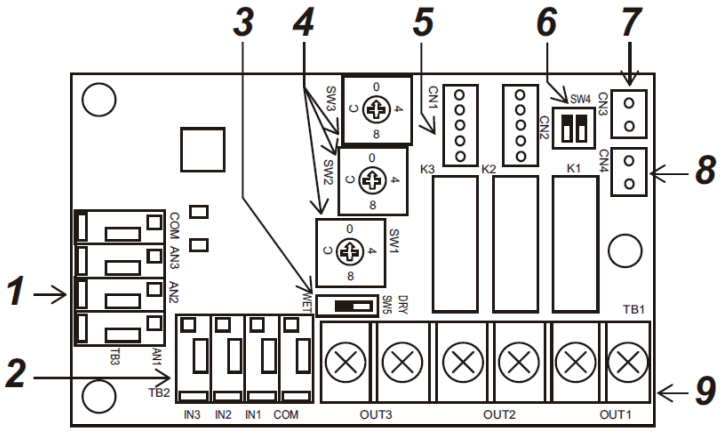
6-8 Application control kit TCB-PCUC1E

Specifications

Part name	Application control kit
Model Name	TCB-PCUC1E
Power supply	No external power supply is required
Dimension	85 × 52 mm
No. of connected indoor units	1 (For Ceiling only)

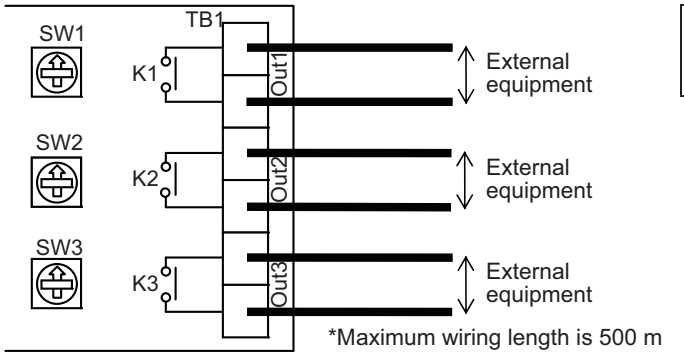
Outline

Terminal	
1	External analog input terminal (TB3)
2	External digital input terminal (TB2)
3	External digital input
4	Switch for setting signal output (Factory default: 0)
5	Connector for connecting to indoor circuit board (CN1)
6	Switch for function select (SW4) (Factory default: OFF)
7	FILTER connector (CN3)
8	EXCT connector (CN4)
9	Signal output terminal block (TB1)



Signal output terminal (TB1)

The following signal outputs are extracted from “OUT1”, “OUT2”, and “OUT3”.
It is possible to change the signal outputs with SW1, SW2, and SW3.
* Always turn off the power to the indoor unit before setting the signal outputs.
Note that even if you set the signal outputs, the settings do not change if the power to the indoor unit is ON.



<Connectable load>
30 VDC/1 A or less
277 VAC/1 A or less

SW1, 2, and 3 settings Signal output	
0 : No output (default)	A : Heater output
1 : Cool dry output	B : Actual compressor on output
2 : Heat output	C : Actual fan status output
3 : Defrost output	D : Filter sign output
4 : Fan output (indoor unit fan ON)	E : Demand response output
5 : Thermo. ON output	F : Not used
6 : Ventilation output	
7 : Operation output	
8 : Alarm output	
9 : Humidify output *1	

*1 Attach the short plug provided to CN3 if using humidify output.

External digital input terminal (TB2)

▼ IN1: External error input

The air conditioner system stops and check code “L30: Indoor unit external interlock error” is displayed on the wired remote controller when an external error is input.

▼ IN2: Prohibition of local input

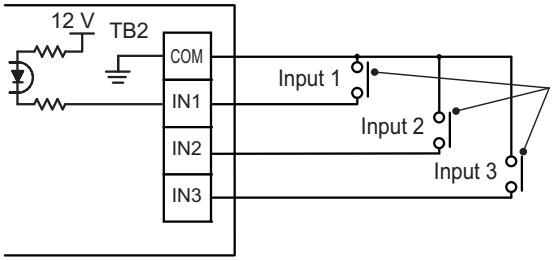
is displayed on the wired remote controller and operations cannot be started or stopped from the wired remote controller during prohibition of local input.
It is also possible to release local prohibition from the central remote controller.
(Most recent input is given priority.)

▼ IN3: Not used

* Do the wiring as shown to the right for input of either “Voltage ON: WET” or “Voltage OFF: DRY”.

“Voltage OFF” input

Set the input switch (SW5) to the “Voltage OFF: DRY” side.
(Factory default: Voltage OFF (DRY) side)

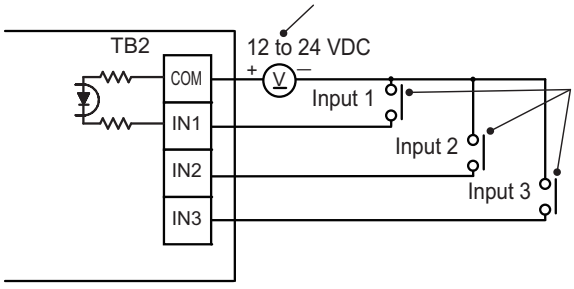


Use contacts for micro-currents.
(Use ones that have minimum application loads of 12 VDC and 1 mA or less.)

“Voltage ON” input

Set the input switch (SW5) to the “Voltage ON: WET” side.
(Factory default: Voltage OFF (DRY) side)

Use 12 to 24 VDC for external power source.
Approximately 10 mA input current is required for each contact.
Be careful of the capacity of the power source.
(Do not apply 220-240 VAC)
Connect COM terminal to + side of the power supply.

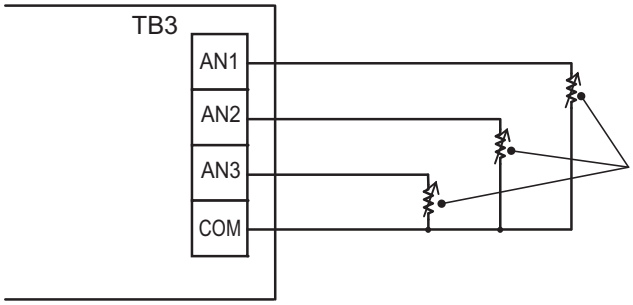


Use contacts for micro-currents.
(Use ones that have minimum application loads of 12 VDC and 1 mA or less.)

External analog input terminal (TB3)

It is possible to change the indoor unit's operation mode (AN1), set temperature (AN2), and blower setting (AN3) by connecting a variable resistor to the analog input terminal.

* When both the wired remote controller and the central controller are used, the most recent setting has priority.



Variable resistance
Refer to the following table for the various resistance settings.

Do not apply voltage or current to AN1, AN2, AN3, or COM.

<Operation mode: AN1>

Operation switching	External resistance (Ω)
Stop	30
Blower	60
Cool	90
Warm	120

<Set temperature: AN2>

Set temperature (°C)	External resistance (Ω)
17	10
18	20
19	30
20	40
21	50
22	60
23	70
24	80
25	90
26	100
27	110
28	120
29	130
30	140

<Blower setting: AN3>

Blower setting	External resistance (Ω)
Auto	30
Fast	60
High	90
Low	120

▼ FILTER (CN3)

Install the short plug provided to CN3 if connecting a humidifier.

▼ EXCT (CN4)

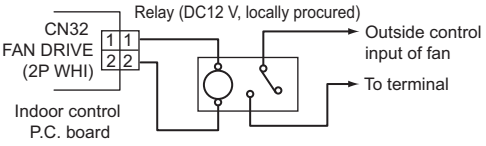
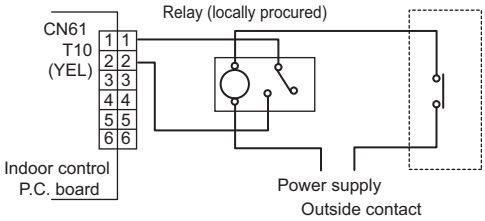
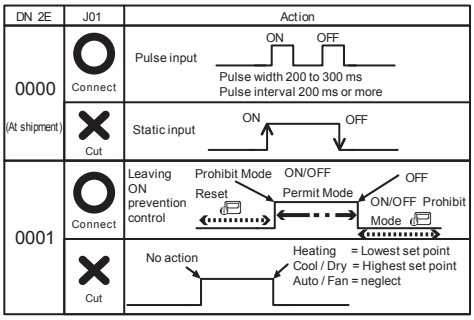
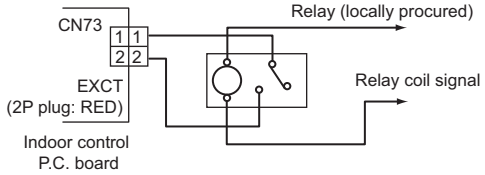
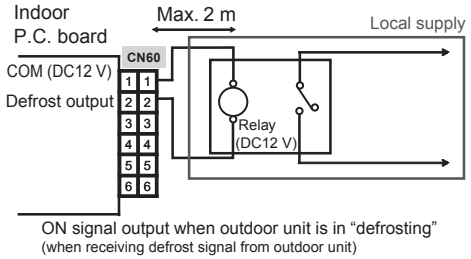
Can thermo. OFF by shorting this connector.
Use contacts for micro-currents when using external contacts.
(Use ones that have minimum application loads of 12 VDC and 1 mA or less.)
LED display

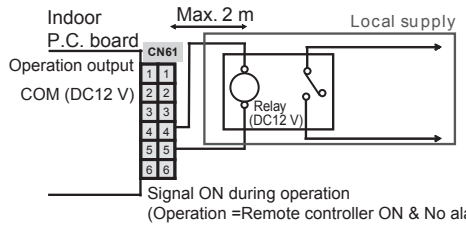
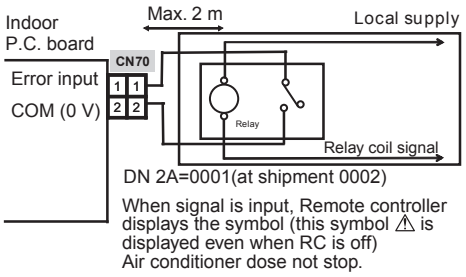
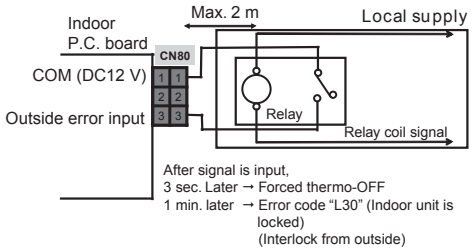
<Wiring specifications> Wire type: Sheathed vinyl cord, single strand Wire thickness: 1.25 to 2.00 mm^2 (prep 9 to 10 mm of the tips of wires) Total wire length: Max 70 m * If you use twisted strand wires, connect a pin terminator.

6-9 Connectors

Indoor Units have a number of Connectors built in to allow for connection and control of external equipment and control/ monitoring of the Air Conditioner.

Outline

Control name	Function	Setting method
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. 	Setting from wired remote controller + TCB-KBCN32VEE (cable) Relay (local supply)
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.  	Setting from wired remote controller + TCB-KBCN61HAE (cable) Relay (local supply)
Demand control	Thermostat-OFF operation by relay signal. • Wiring example 	TCB-KBCN73DEE (cable) Relay (local supply)
Operation status signal output	 12 V output 1 pin Defrosting 2 pin, Thermo-on 3 pin, Cooling 4 pin, Heating 5 pin, Indoor fan output 6 pin output	TCB-KBCN60OPE (cable) Relay (local supply)

Control name	Function	Setting method
Operation output **Alarm out put**	 **[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. 6 pin	TCB-KBCN61HAE (cable) Relay (local supply)
Option error input		TCB-KBCN70OAE (cable) Relay (local supply)
Outside error input		TCB-KBCN80EXE (cable) Relay (local supply)

Specifications

Fan output (CN32)		
1	DC12 V (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	DC12 V (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)

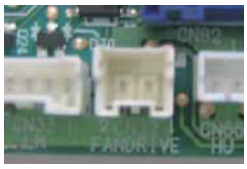
Operation terminal (CN61)		
1	ON/OFF input	External ON/OFF control (DN code 2E, J01)
2	0 V (Common for Pin. 1, 3)	
3	ON/OFF prohibition input	Remote controller ON/OFF prohibition is permitted / prohibited input signal
4	Operation output (Open collector)	On signal during “remote controller ON”
5	DC12 V (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	0 V (COM)	

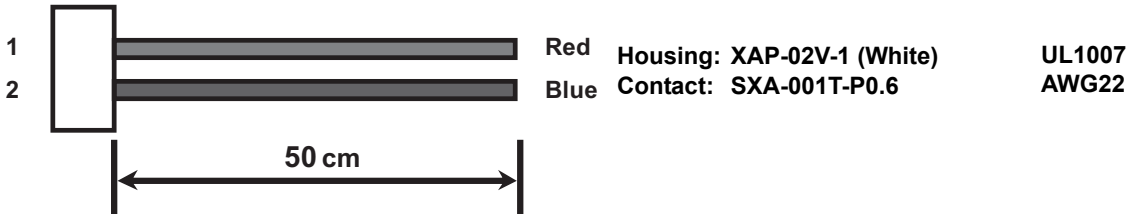
Check operation check (CN71)		
1		
2	0 V (COM)	This is used to check indoor operation. Performs operation of indoor fan “H”, Louver horizontal and drain pump ON without communication with outdoor and remote controller

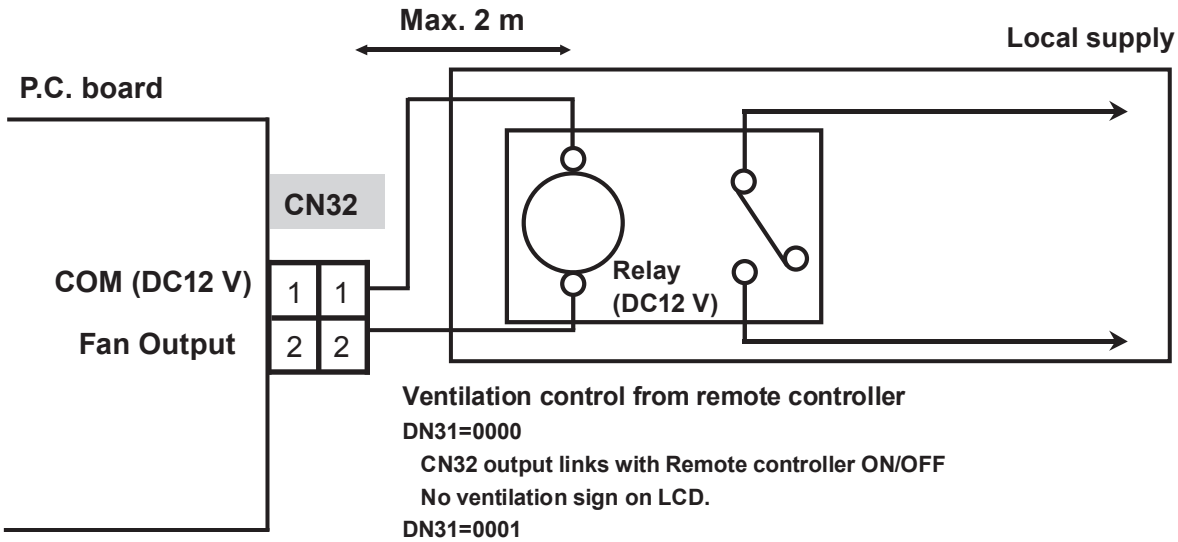
Display exhibition Mode (CN72)		
1	input	Connect with 2 pin, operation without outdoor
2	0 V (COM)	

Fan output (CN32)



1	DC12 V (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  Remote controller ON ◇ Ventilation ON (IF already ON, ON remains) Remote controller OFF ◇ Ventilation OFF (IF already OFF, OFF remains)





Ventilation control from remote controller

DN31=0000

CN32 output links with Remote controller ON/OFF

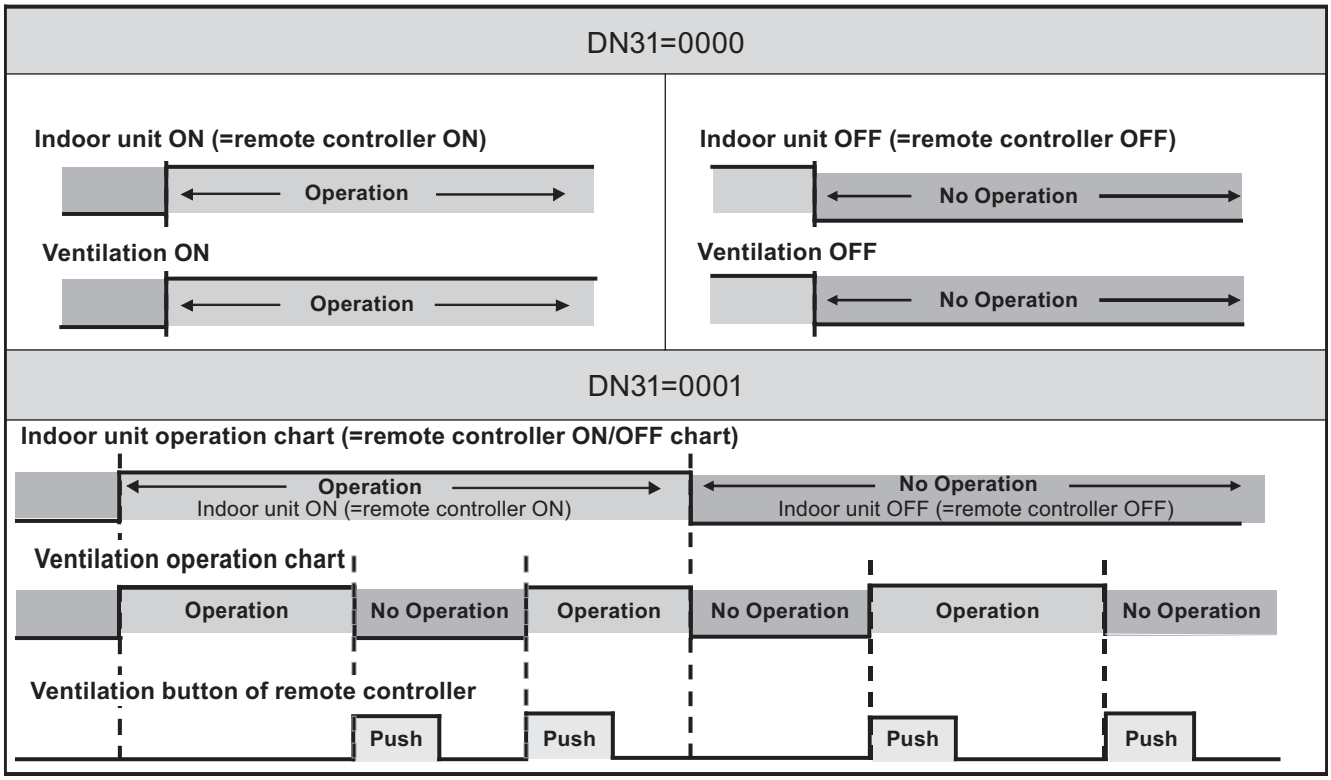
No ventilation sign on LCD.

DN31=0001

CN32 output links with Remote controller ON/OFF

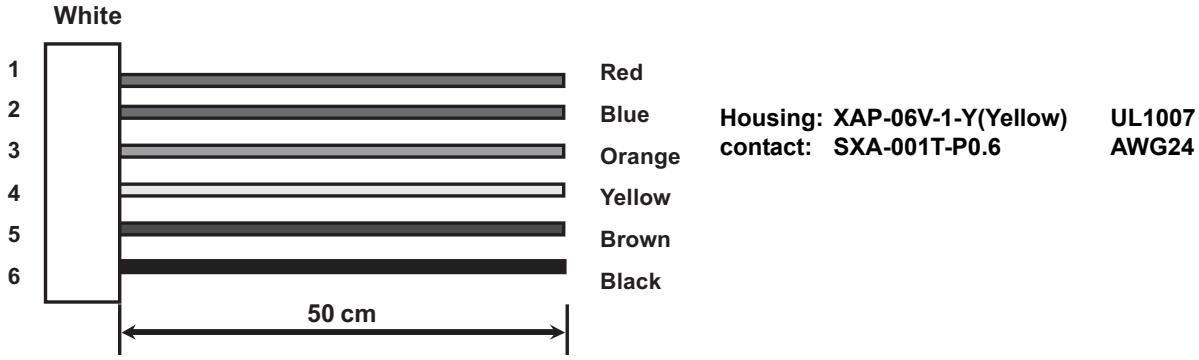
Individual ON/OFF by "VENT" button

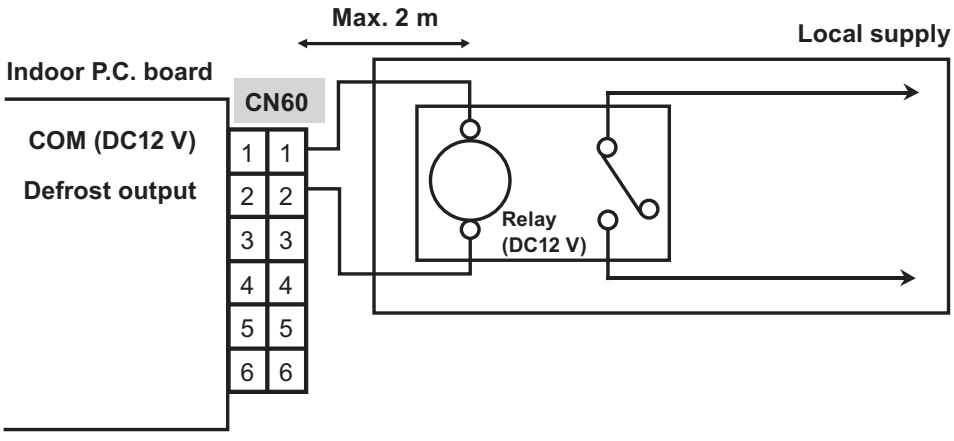
Ventilation sign on LCD


DN31=0000
Indoor unit ON (=remote controller ON)
Operation
Indoor unit OFF (=remote controller OFF)
No Operation
Ventilation ON
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

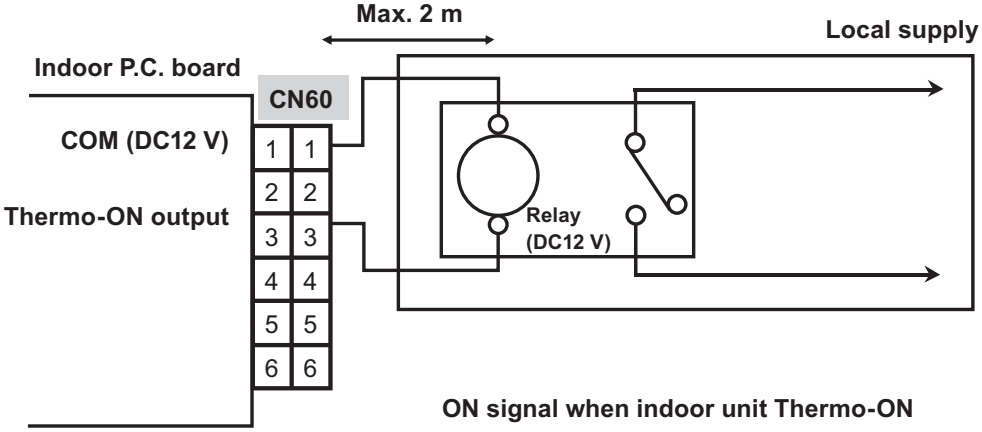
Option output CN60

1	DC12 V (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)

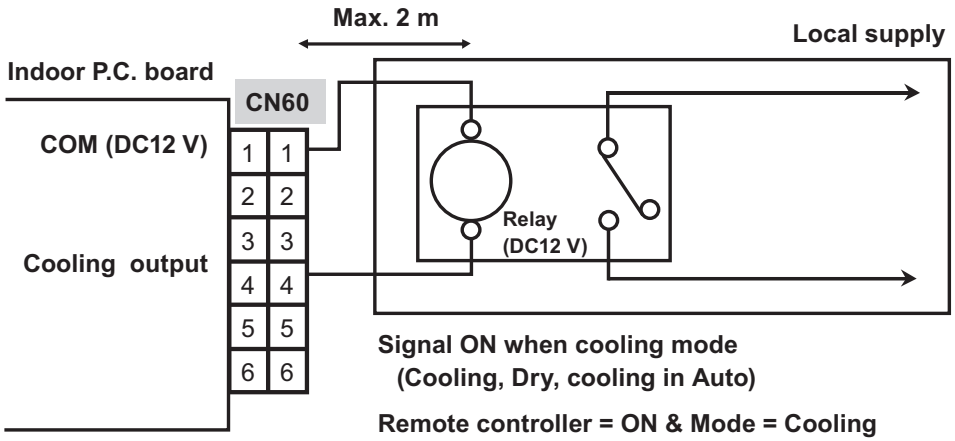




ON signal output when outdoor unit is in “defrosting”
(when receiving defrost signal from outdoor unit)

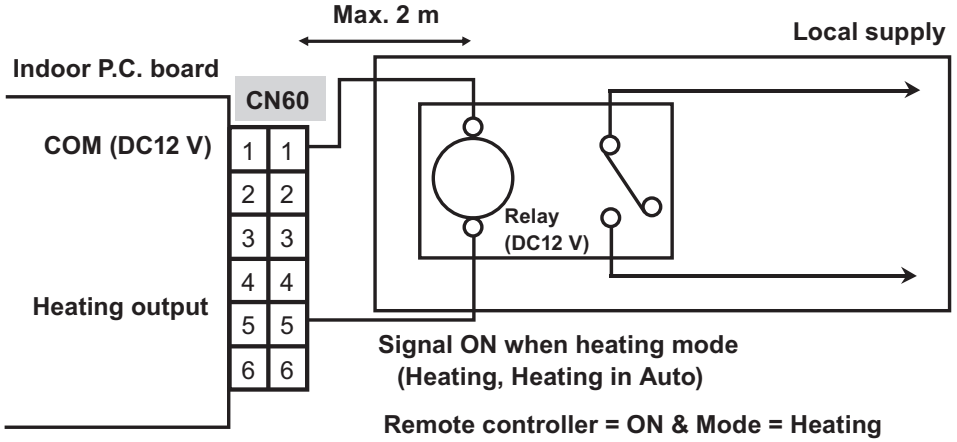


ON signal when indoor unit Thermo-ON



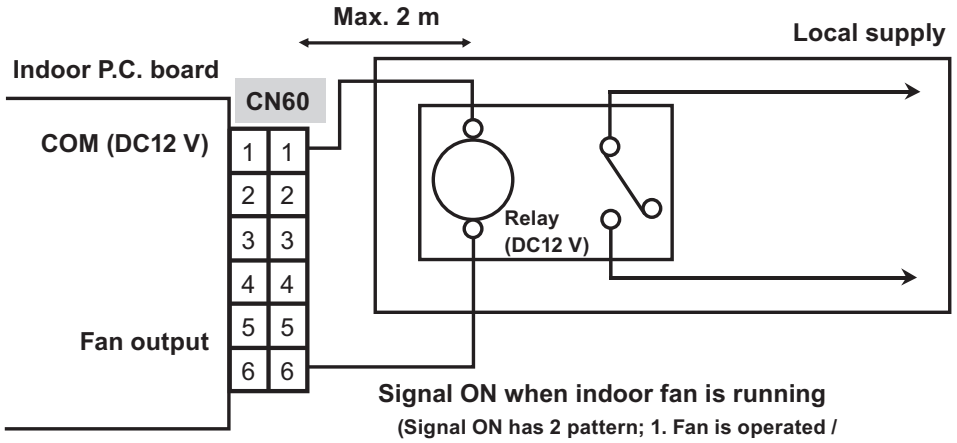
Signal ON when cooling mode
(Cooling, Dry, cooling in Auto)

Remote controller = ON & Mode = Cooling
-Signal is still ON during thermo-off
-Signal is OFF during alarm status



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



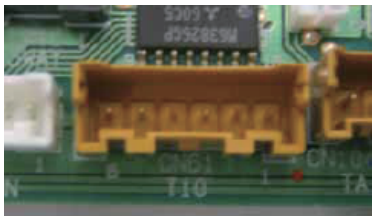
Signal ON when indoor fan is running

(Signal ON has 2 pattern; 1. Fan is operated /
2. Fan and indoor unit are operated)

Ex. Interlock cabling (for booster fan, etc.)

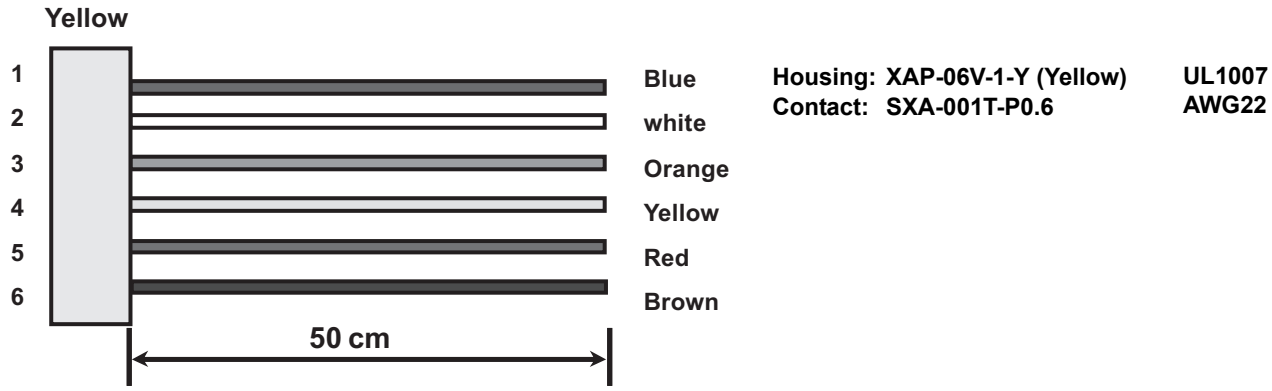
(Note) Signal is OFF when 4-way cassette type performs intermittent operation after oil recovery control.

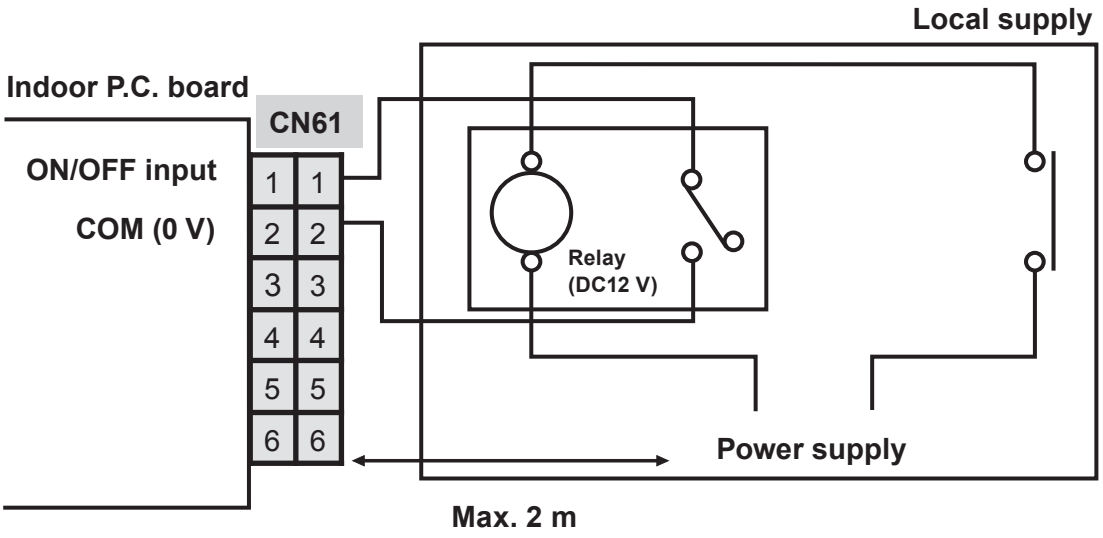
Operation terminal (CN61)



1	ON/OFF input	External ON/OFF control (DN code 2E, J01)
2	0 V (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	DC12 V (Common for Pin. 4,6)	
6	Alarm output (Open collector)	On signal during alarm output

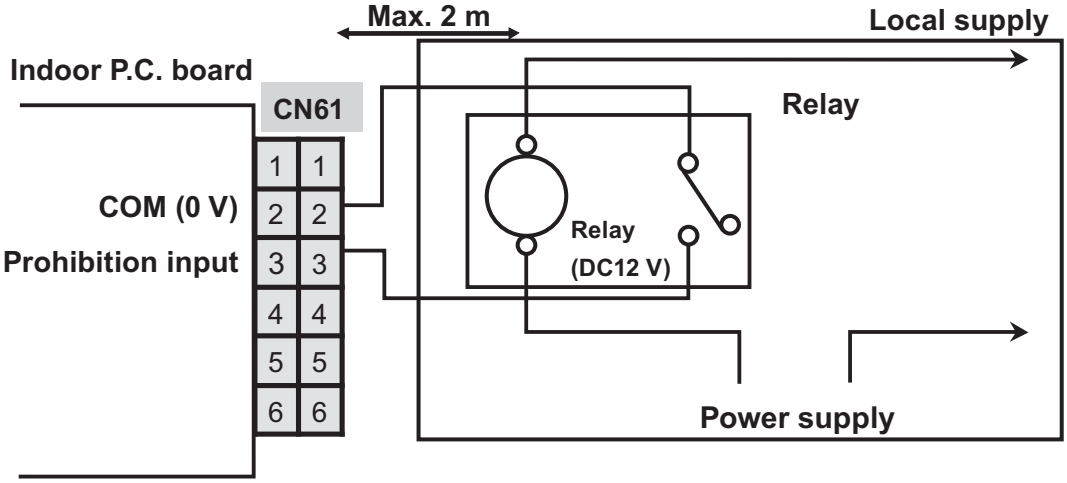
1,4: specification is same as HA terminal. (refer to 12-5)



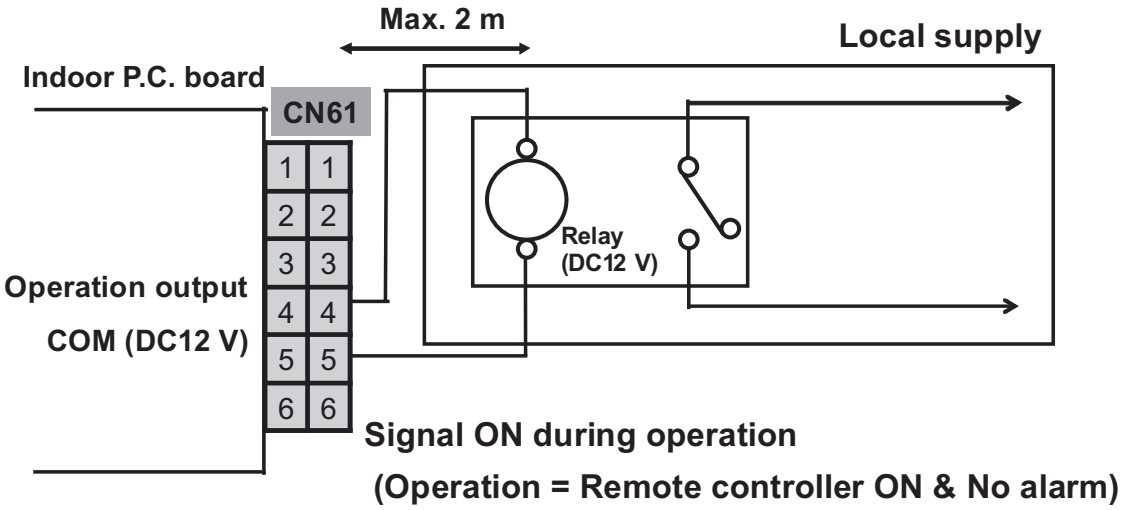


J01

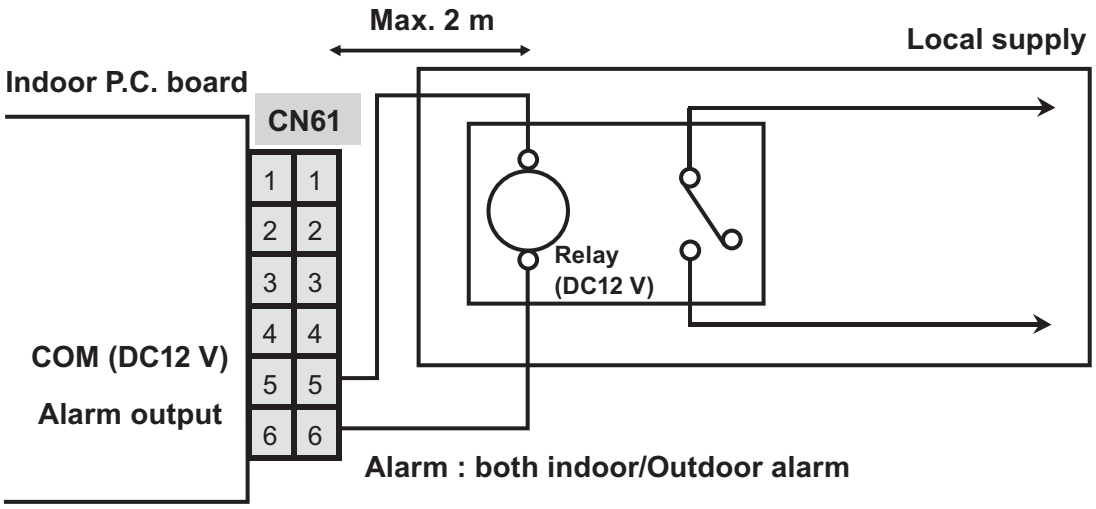
DN 2E	J01	Action
0000 (At shipment)	○ Connect	Pulse input ON OFF Pulse width 200 to 300 ms Pulse interval 200 ms or more
	× Cut	Static input ON OFF
0001	○ Connect	Leaving ON prevention control Prohibit Mode Reset ON/OFF Permit Mode OFF ON/OFF Prohibit Mode
	× Cut	No action Heating = Lowest set point Cool/Dry = Highest set point Auto/Fan = neglect



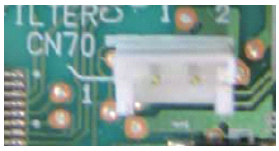
When signal ON, Remote controller ON/ OFF is prohibited. Central controller becomes Central 1 (ON/OFF Prohibited) mode.



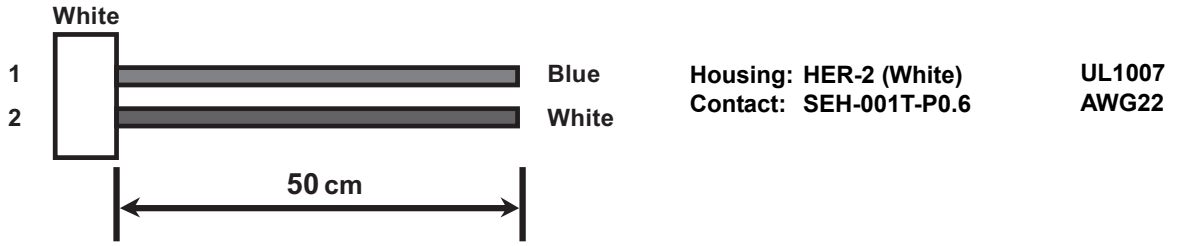
(Note) Individual signal output group control is available.
If follower indoor unit generates alarm, signal becomes OFF in this indoor unit only.

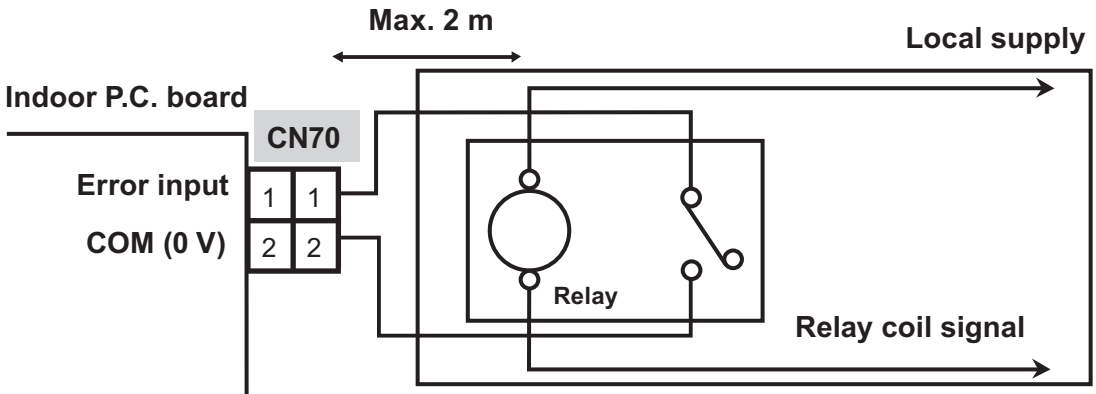


Option error input (CN70)



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 does not stop)
2	0 V (COM)	



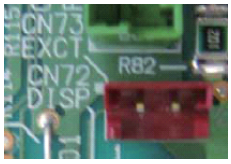


DN 2A=0001 (at shipment 0002)

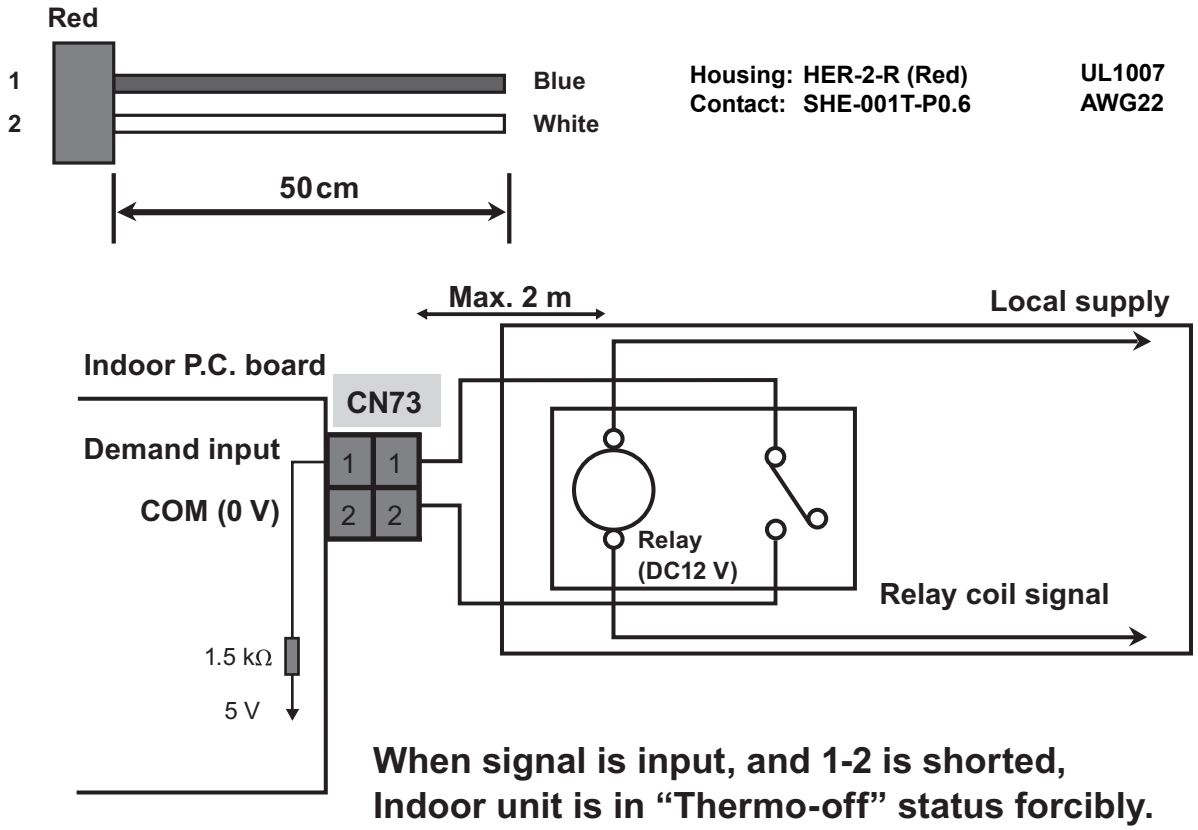
When signal is input,
Remote controller displays the symbol ⚠
(this symbol is displayed even when RC is off)

Air conditioner dose not stop.

Demand input (CN73)



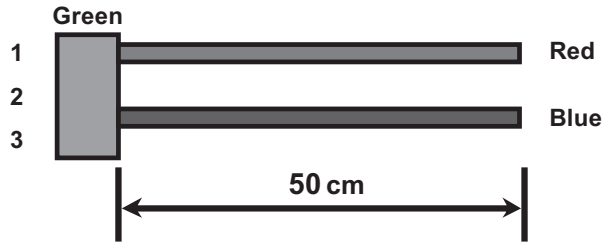
1	Demand input	Indoor unit is forced to turn thermo OFF
2	0 V (COM)	



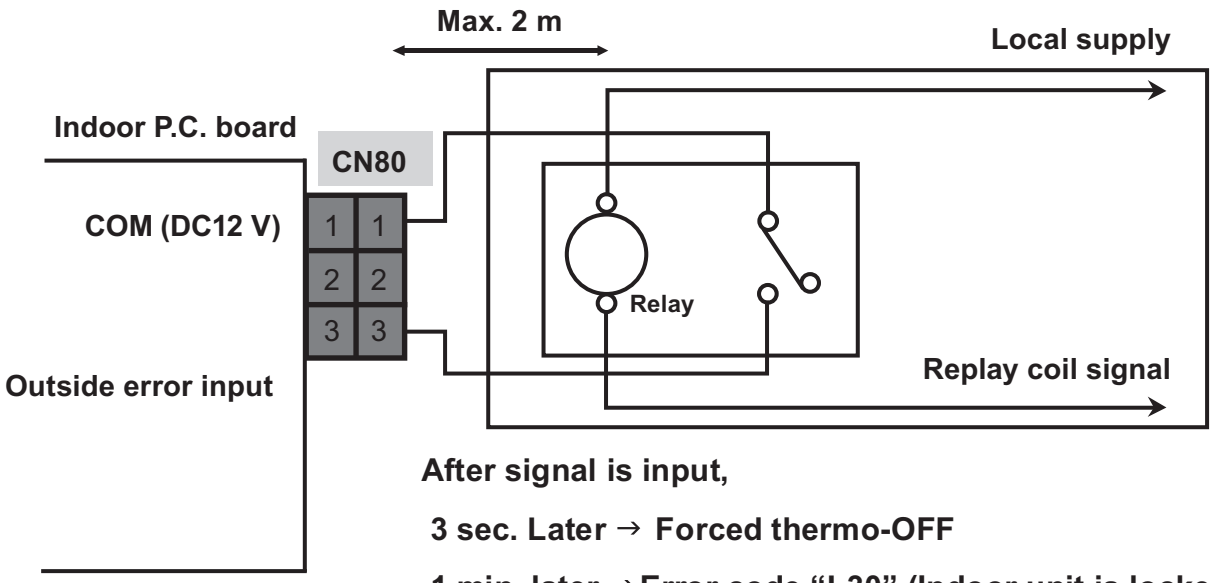
When signal is input, and 1-2 is shorted,
Indoor unit is in “Thermo-off” status forcibly.

Outside error input (CN80)

1	DC12 V (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.



Housing: XAP-03V-1-M (Green) **UL1007**
Contact: SXA-001T-P0.6 **AWG22**



After signal is input,

3 sec. Later → Forced thermo-OFF

1 min. later → Error code “L30” (Indoor unit is locked)

(Interlock from outside)

Specification of relay

Indoor unit		Specification of Relay
DC motor type	MMU-AP***4H* MMU-AP***4MH* MMU-AP***6MH* MMU-AP***2WH* MMU-AP***4SH* MMD-AP***6BH* MMD-AP***4SPH* MMD-AP***6HP* MMC-AP***7H* MMK-AP***3H* MMK-AP***4MH* MML-AP***4NH*	Rated coil current : 75 mA (approx.)

Indoor unit		Specification of Relay
AC motor type	MMU-AP***4YH* MML-AP***4H* MML-AP***4BH* MMF-AP***4H* MMD-AP***1HFE	Rated coil current : 16 mA (approx.)

Indoor Connector port existing table

Indoor Category			Indoor Connector port					
			CN32	CN60	CN61	CN70	CN73	CN80
SMMS-e / SHRM-e / Mini-SMMS-e	4-way Air Discharge Cassette Type	4 series	✓	✓	✓	✓	✓	✓
	Compact 4-way Cassette Type	4 series	✓	✓	✓	✓	✓	✓
		6 series	✓	✓	✓	✓	✓	✓
	2-way Air Discharge Cassette Type	2 series	✓	✓	✓	✓	✓	✓
	1-way Air Discharge Cassette Type	4YH series	✓	✓	✓	✓	✓	✓
		4SH series	✓	✓	✓	✓	✓	✓
	Concealed Duct Type	6 series	✓	✓	✓	✓	✓	✓
	Concealed Duct High Static Pressure Type	4 series	✓	✓	✓	✓	✓	✓
		6 series	✓	✓	✓	✓	✓	✓
	Slim Duct Type	4 series	✓	✓	✓	✓	✓	✓
	Ceiling Type	7 series	✓	-	✓	-	-	-
	High-wall Type	3 series	✓	✓	✓	-	-	✓
		4 series	✓	✓	✓	-	-	✓
	Floor Standing Concealed Type	4 series	✓	✓	✓	✓	✓	✓
	Floor Standing Cabinet Type	4 series	✓	✓	✓	✓	✓	✓
	Floor Standing Type	6 series	✓	-	✓	-	-	-
	Console Type	4 series	✓	✓	✓	-	-	✓
	Fresh Air Intake Indoor Unit Type	-	✓	✓	✓	✓	-	-
	Air to Air Heat exchanger with DX-coil Type	-	-	-	✓	✓	✓	✓
SMMS-e	Large Capacity Floor standing Type	4 series	✓	✓	✓	✓	✓	-
DI/SDI	4-way Air Discharge Cassette Type	4 series	✓	✓	✓	✓	✓	✓
	Compact 4-way Cassette Type	4 series	✓	✓	✓	✓	✓	✓
	Concealed Duct Type	6 series	✓	✓	✓	✓	✓	-
	Concealed Duct High Static Pressure Type	4 series	✓	✓	✓	✓	✓	✓
	Slim Duct Type	4 series	✓	✓	✓	✓	✓	✓
	Ceiling Type	7 series	✓	✓	✓	✓	✓	✓
	High-wall Type	6 series	✓	✓	✓	-	-	✓

Indoor Category		HA terminal			
		CN08	CN61	CN22	CN212
DAISEIKAI	Super Daiseikai PKVP/PAVP Inverter high-wall	-	-	-	✓
	Super Daiseikai SKVP2 Inverter high-wall	-	-	✓	-
	Suzumi+ SKV2 Inverter high-wall	-	-	✓	-
	AvAnt 7SKV Inverter high-wall	-	-	✓	-
	UFV Inverter console	-	-	-	✓
Inverter Multi	Inverter 4-way cassette	✓	-	-	-
	GDV Inverter ducted	-	✓	-	-
	Super Daiseikai PKVP/PAVP Inverter high-wall	-	-	-	✓
	Suzumi SKV Inverter high-wall	-	-	✓	-
	UFV Inverter console	-	-	-	✓

7

Indoor unit controls

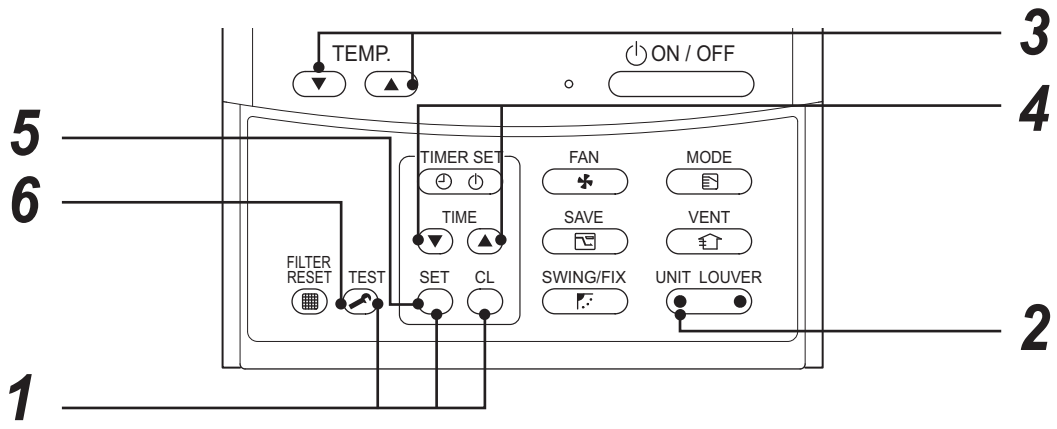
7-1 Setup of the selection function in the indoor unit

7-2 Indoor Model Compatibility for remote controller, central controller and remote sensor

7-1 Setup of the selection function in the indoor unit

(Be sure to Execute Setup by a Wired Remote Controller RBC-AMT32E, RBC-AMS41E, NRC-01HE)

Procedure Execute the setup operation while the unit operation is stopped.



(RBC-AMT32E)

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***.

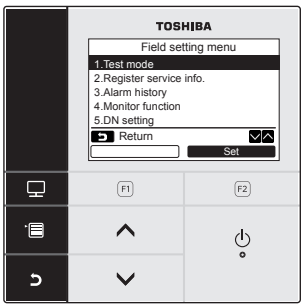
6 **Pushing the TEST button returns the status to normal stop status.**

⚠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. If this setting is not performed, error code [L18] may occur.

For operation of RBC-AMS54E

1. Field setting menu



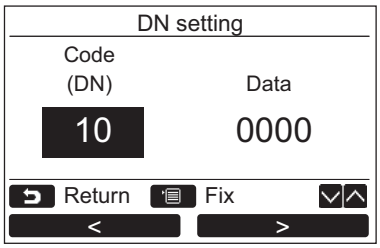
1 **Push the [MENU] button to display the menu screen.**

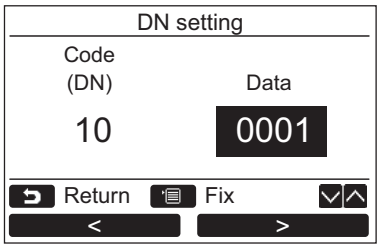
2 **Push and hold the [MENU] button and the [∨] button at the same time to display the "Field setting menu".**
→Push and hold the buttons for more than 4 seconds.

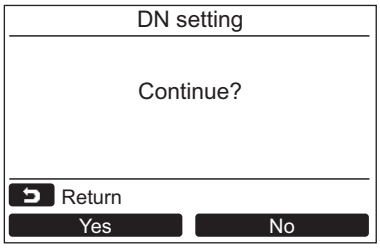
3 **Push the [CANCEL] button to return.**

2. DN setting

Perform the advanced settings for the air conditioner.
Carry out the setting operation while the indoor unit is stopped. (Turn off the air conditioning unit before starting the setting operation.)







1 **Push the [∧] / [∨] button to select "5. DN setting" on the "Field setting menu" screen, then push the "Set" [F2] button.**
→The fan and louver of the indoor unit operate. When the group control is used, the fan and louver of the selected indoor unit operate.
→Move the cursor to select "DN code" with the "<" [F1] button, then set "DN code" with the [∧] / [∨] button.
→Move the cursor to select "data" with the ">" [F2] button, then set "data" with the [∧] / [∨] button.

2 **Refer to the Installation Manual supplied with the indoor unit or service manual for details about the DN code and data.**

3 **Push the [MENU] button to set the other DN codes. After "Continue?" is displayed on the screen, push the "Yes" [F1] button.**

4 **Push the "No" [F2] button to finish the setting operation. " ⧖ " appears on the screen for a while, then the screen returns to the "Field setting menu" screen.**
→Pushing the "No" [F2] button displays the unit selection screen when the group control is used. Push the [CANCEL] button on the unit selection screen to finish the setting operation. " ⧖ " appears on the screen for a while, then the screen returns to the "Field setting menu" screen.

Table: Function selecting item numbers (DN) for SMMS-e

Function CODE No. (DN code) Table (Includes All Functions Needed to Perform Applied Control on Site)

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
0F	Cooling only	0000: Heat pump 0001: Cooling only (No display of [AUTO] [HEAT])	0000: Heat pump
10	Type	0001: 4-way Air Discharge Cassette	Depending on 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 (Air direction adjustment)	0000: No louver 0001: Swing only 0002: (1-way Air Discharge Cassette type, Under Ceiling type) 0003: (2-way Air Discharge Cassette type) 0004: (4-way Air Discharge Cassette 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 0002: None (Air washer, etc.)	0002: None
2E	HA terminal (CN61) select	0000: Usual 0001: Leaving-ON prevention control 0002: Fire alarm input	0000: Usual (HA terminal)
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
92	External interlock release condition	0000: Operation stopped 0001: Release signal received	0000: Operation stopped
d0	Whether the power saving mode can be set by the remote control	0000: Invalid 0001: Valid	0001: Valid
F0	Swing mode	0001: Standard 0002: Dual swing 0003: Cycle swing	0001: Standard
F1	Louver fixed position (Louver No.1)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F2	Louver fixed position (Louver No.2)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F3	Louver fixed position (Louver No.3)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F4	Louver fixed position (Louver No.4)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed

<table>
<tr><th>DN</th><th>Item</th><th>Description</th><th>At shipment</th></tr>
<tr><td rowspan="3">5d</td><td>High-ceiling adjustment
(Air flow selection)</td><td>1-way air discharge cassette (SH)
<table><tr><td>Value</td><td>Type</td><td>AP015, AP018</td><td>AP024</td></tr><tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td><td>3.8 m or less</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>4.0 m or less</td><td>4.0 m or less</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>4.2 m or less</td><td>4.2 m or less</td></tr></table>2-way air discharge cassette
<table><tr><td>Value</td><td>Type</td><td>AP007~AP030</td><td>AP036~AP056</td></tr><tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m or less</td><td>2.7 m or less</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>3.2 m or less (*)</td><td>3.0 m or less</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>3.8 m or less (*)</td><td>3.5 m or less</td></tr></table>* The high-ceiling installation of model AP007 to AP012 can only be undertaken when the combined capacity of the indoor units connected is 100% or less than the capacity of the outdoor unit. Do not proceed with high-ceiling installation if this limit is exceeded.
4-way air discharge cassette
<table><tr><td rowspan="2">Value</td><td>Type</td><td colspan="3">AP009~AP012</td><td colspan="3">AP015~AP018</td></tr><tr><td>Air flow at outlet</td><td>4 directions</td><td>3 directions</td><td>2 directions</td><td>4 directions</td><td>3 directions</td><td>2 directions</td></tr><tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m</td><td>2.8 m</td><td>3.0 m</td><td>2.8 m</td><td>3.2 m</td><td>3.5 m</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>-</td><td>-</td><td>-</td><td>3.2 m</td><td>3.5 m</td><td>3.8 m</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>-</td><td>-</td><td>-</td><td>3.5 m</td><td>3.8 m</td><td>-</td></tr><tr><td rowspan="2">Value</td><td>Type</td><td colspan="3">AP024~AP030</td><td colspan="3">AP036~AP056</td></tr><tr><td>Air flow at outlet</td><td>4 directions</td><td>3 directions</td><td>2 directions</td><td>4 directions</td><td>3 directions</td><td>2 directions</td></tr><tr><td>0000</td><td>Standard (factory default)</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>3.6 m</td><td>3.8 m</td><td>-</td><td>3.6 m</td><td>3.8 m</td><td>-</td></tr></table>Under ceiling
<table><tr><td>Value</td><td>Type</td><td>AP015~AP056</td></tr><tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>4.0 m or less</td></tr></table></td><td rowspan="2">0000: Standard</td></tr>
<tr><td>Built-in filter</td><td colspan="2">2-way air discharge cassette
0000: Standard filter (factory default)
0001: Super long-life filter
4-way air discharge cassette
0000: Standard filter (factory default)
Under ceiling
0000: Standard filter (factory default)
Concealed duct standard
0000: Standard filter (factory default)
0001: High-efficiency filter (65%, 90%)</td></tr>
<tr><td>Static pressure selection</td><td>Concealed duct standard
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: Low static pressure</td><td>Slim Duct
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: High static pressure 3</td></tr>
<tr><td>60</td><td>Timer setting
(wired remote controller)</td><td>0000: Available (can be performed)</td><td>0001: Unavailable (cannot be performed)</td><td>0000: Available</td></tr>
</table>

Type
DN code “10”

Value	Type	Model
0000	1-way Air Discharge Cassette	MMU-AP***SH
0001*1	4-way Air Discharge Cassette	MMU-AP***H
0002	2-way Air Discharge Cassette	MMU-AP***WH
0003	1-way Air Discharge Cassette (Compact)	MMU-AP***YH
0004	Concealed Duct Standard	MMD-AP***BH
0005	Slim Duct	MMD-AP***SPH (SH)
0006	Concealed Duct High Static Pressure	MMD-AP***H
0007	Under Ceiling	MMC-AP***H
0008	High Wall	MMK-AP***H
0010	Floor Standing Cabinet	MML-AP***H
0011	Floor Standing Concealed	MML-AP***BH
0013	Floor Standing	MMF-AP***H
0014	Compact 4-way Air Discharge Cassette	MMU-AP***MH
0015	Super Slim Duct	MMD-AP****M(P)HY
0016	Fresh Air Intake indoor unit (Duct type)	MMD-AP***HFE
0018	Console	MML-AP****NH

*1 Default value stored in EEPROM mounted on service P.C. board

Indoor Unit Capacity
DN code “11”

Setup data	Model	
0000*	*Invalid	
0040	005 type	MMU-AP0054MH
		MMD-AP0054SPH
0041	005 type	MMU-AP0056MH
		MMD-AP0056SPH
0001	007 type	
0002	008 type	
0003	009 type	
0004	010 type	
0005	012 type	
0006	014 type	
0007	015 type	
0008	017 type	
0009	018 type	
0010	020 type	
0011	024 type	
0012	027 type	
0013	030 type	

Setup data	Model
0014	-
0015	036 type
0016	-
0017	048 type
0018	056 type
0019	-
0020	-
0021	072 type
0022	-
0023	096 type
0024	-
0025	-
0026	-
0027	-
0028	-
～	-
0034	-

*1 Default value stored in EEPROM mounted on service P.C. board

Table: Function selecting item numbers (DN) for SHRM-e

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	FS unit Connection set of multiple indoor units	0000: Standard (1 FS unit: 1 indoor unit) 0001: Multiple units connected (1 FS unit: Multiple indoor units)	0000: Standard
0F	Cooling only	0000: Heat pump 0001: Cooling only (No display of [AUTO] [HEAT])	0000: Heat pump
10	Type	0001: 4-way Cassette	Depending on model type
11	Indoor unit capacity	0000: Unfixed 0001 to 0050	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 0048: No.48 unit	0099: Unfixed
14	Group address	0000: Individual 0001: Header unit of group 0002: Follower unit of group	0099: Unfixed
19	Group address	0000: No louver 0001: Swing only 0002: (1-way Cassette type, Ceiling type) 0003: (2-way Cassette type) 0004: (4-way Cassette 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 0002: None (Air washer, etc.)	0002: None
2E	HA terminal (CN61) select	0000: Usual 0001: Leaving-ON prevention control 0002: Fire alarm input	0000: Usual (HA terminal)
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
F0	Swing mode	0001: Standard 0002: Dual swing 0003: Cycle swing	0001: Standard
F1	Louver fixed position (Louver No.1)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F2	Louver fixed position (Louver No.2)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F3	Louver fixed position (Louver No.3)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F4	Louver fixed position (Louver No.4)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
92	External interlock release condition	0000: Operation stopped 0001: Release signal received	0000: Operation stopped
d0	Whether the power saving mode can be set by the remote control	0000: Invalid 0001: Valid	0001: Valid
77	Dusl set point	0000: Unavailable 0002: Available	0000: Unavailable
Fd	Priority operation mode (Flow Selector unit)	0000: Heating 0001: Cooling	0000: Heating
FE	Flow Selector unit address	0001: No.1 unit to 0064: No.64 unit 0099: Unfixed	0099: Unfixed

<table>
<tr><th>DN</th><th>Item</th><th>Description</th><th>At shipment</th></tr>
<tr><td rowspan="3">5d</td><td>High-ceiling adjustment
(Air flow selection)</td><td>1-way cassette (SH)
<table><tr><th>Value</th><th>Type</th><th>AP015, AP018</th><th>AP024</th></tr><tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td><td>3.8 m or less</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>4.0 m or less</td><td>4.0 m or less</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>4.2 m or less</td><td>4.2 m or less</td></tr></table>2-way cassette
<table><tr><th>Value</th><th>Type</th><th>AP007~AP030</th><th>AP036~AP056</th></tr><tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m or less</td><td>2.7 m or less</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>3.2 m or less (*)</td><td>3.0 m or less</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>3.8 m or less (*)</td><td>3.5 m or less</td></tr></table>* The high-ceiling installation of model AP007 to AP012 can only be undertaken when the combined capacity of the indoor units connected is 100% or less than the capacity of the outdoor unit. Do not proceed with high-ceiling installation if this limit is exceeded.
4-way cassette
<table><tr><th rowspan="2">Value</th><th>Type</th><th colspan="3">AP009~AP012</th><th colspan="3">AP015~AP018</th></tr><tr><th>Air flow at outlet</th><th>4 directions</th><th>3 directions</th><th>2 directions</th><th>4 directions</th><th>3 directions</th><th>2 directions</th></tr><tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m</td><td>2.8 m</td><td>3.0 m</td><td>2.8 m</td><td>3.2 m</td><td>3.5 m</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>-</td><td>-</td><td>-</td><td>3.2 m</td><td>3.5 m</td><td>3.8 m</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>-</td><td>-</td><td>-</td><td>3.5 m</td><td>3.8 m</td><td>-</td></tr><tr><th rowspan="2">Value</th><th>Type</th><th colspan="3">AP024~AP030</th><th colspan="3">AP036~AP056</th></tr><tr><th>Air flow at outlet</th><th>4 directions</th><th>3 directions</th><th>2 directions</th><th>4 directions</th><th>3 directions</th><th>2 directions</th></tr><tr><td>0000</td><td>Standard (factory default)</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td></tr><tr><td>0003</td><td>High-ceiling (3)</td><td>3.6 m</td><td>3.8 m</td><td>-</td><td>3.6 m</td><td>3.8 m</td><td>-</td></tr></table>Ceiling
<table><tr><th>Value</th><th>Type</th><th>AP015~AP056</th></tr><tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td></tr><tr><td>0001</td><td>High-ceiling (1)</td><td>4.0 m or less</td></tr></table></td><td rowspan="3">0000: Standard</td></tr>
<tr><td>Built-in filter</td><td>2-way cassette
0000: Standard filter (factory default)
0001: Super long-life filter
4-way cassette
0000: Standard filter (factory default)
Ceiling
0000: Standard filter (factory default)
Concealed duct standard
0000: Standard filter (factory default)</td></tr>
<tr><td>Static pressure selection</td><td>Concealed duct standard
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: Low static pressure</td><td>Slim Duct (AP007~AP018)
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: High static pressure 3</td></tr>
<tr><td>60</td><td>Timer setting
(wired remote controller)</td><td>0000: Available (can be performed)</td><td>0001: Unavailable (cannot be performed)</td><td>0000: Available</td></tr>
</table>

Codes (DN codes) for changing settings (Necessary for local advanced control)

DN	Item	Description	At shipment
40	Humidifier type setting	0000: No humidifier 0001: Humidifier	Depends on the type
47	Ventilation fan speed during nighttime heat purge operation	0000: Always LOW 0001: Operate at ventilation fan speed set last time the operation was stopped	0000: Always LOW
48	Unbalanced fan speed ventilation	0000: Invalid 0001: SA > EA 0002: SA < EA	0000: Invalid
4C	Nighttime heat purge setting	0000: Invalid 0001: Start in 1 hour to 0048: Start in 48 hours	0000: Invalid
4E	Linkage with external devices	0000: ON/OFF linked 0001: ON linked 0002: OFF linked	0000: ON/OFF linked
5C	Damper output	0000: Normal 0001: Nighttime heat purge compatible	0000: Normal
60	Timer setting (Wired remote controller)	0000: Possible 0001: Not possible	0000: Possible
BB	Humidity judgment by outdoor temperature	0000: Not judged 0001: Judged	0000: Not judged
BD	Continuous humidifying time	0001: 1 hour to 0020: 20 hours	0006: 6 hours
BE	Delay after drainage	0015: 15 minutes to 0030: 30 minutes	0015: 15 minutes
C9	Air to Air intake temperature correction (Cool)	0000: No shift 0001: –0.5°C 0002: –1.0°C to 0007: –3.5°C	0004: –2.0°C
CA	Air to Air intake temperature correction (Heat)	0000: No shift 0001: 0.5°C 0002: 1.0°C to 0007: 3.5°C	0005: 2.5°C
D0	Power saving mode	0000: Invalid 0001: Valid	0001: Valid
EA	Current ventilation mode	0002: Heat exchange mode 0003: Automatic mode	0002: Heat exchange mode
EB	Current ventilation fan speed	0002: High 0003: Low 0004: Unbalanced	0002: High
ED	Operation output	0000: Normal operation only 0001: Normal + Nighttime heat purge 0002: Nighttime heat purge only 0003: Supplying fan linked 0004: Exhausting fan linked	0000: Normal operation only
EE	Abnormal signal / Bypass mode signal switch	0000: Abnormal signal output 0001: Bypass signal output	0000: Abnormal signal output

Type
DN code "10"

Value	Type	Model
0000	1-way Cassette MMU-AP	MMU-AP✻✻✻SH
0001*1	4-way Cassette MMU-AP	MMU-AP✻✻✻H
0002	2-way Cassette MMU-AP	MMU-AP✻✻✻WH
0003	1-way Cassette (Compact)	MMU-AP✻✻✻YH
0004	Concealed Duct Standard MMD-AP	MMD-AP✻✻✻BH
0005	Slim Duct MMD-AP	MMD-AP✻✻✻SPH (SH)
0006	Concealed Duct High Static Pressure	MMD-AP✻✻✻H
0007	Ceiling	MMC-AP✻✻✻H
0008	High Wall MMK-AP	MMK-AP✻✻✻H
0010	Floor Standing Cabinet MML-AP	MML-AP✻✻✻H
0011	Floor Standing Concealed MML-AP	MML-AP✻✻✻BH
0013	Floor Standing MMF-AP	MMF-AP✻✻✻H
0014	Compact 4-way Cassette	MMU-AP✻✻✻MH
0050	Air to Air Heat Excanger with DX coil Unit	MMD-VN✻✻✻HEX✻

*1 Default value stored in EEPROM mounted on service P.C. board

Indoor Unit Capacity
DN code "11"

Value	Capacity
0000*1	Invalid
0001	007 type
0003	009 type
0005	012 type
0007	015 type
0009	018 type
0011	024 type
0012	027 type
0013	030 type
0015	036 type
0017	048 type
0018	056 type
0021	072 type
0023	096 type
~	-

*1 Default value stored in EEPROM mounted on service P.C. board

Table: Function selecting item numbers (DN) for Mini-SMMS-e (MCY-MAP0604HT*, MCY-MAP0804HT*)

(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
0F	Cooling only	0000: Heat pump 0001: Cooling only (No display of [AUTO] [HEAT])	0000: Heat pump
10	Type	0001: 4-way Air Cassette	Depending on 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: Outdoor unit of group 0002: Follower unit of group	0099: Unfixed
19	Louver type (Air direction adjustment)	0000: No louver 0001: Swing only 0002: (1-way Air Cassette type, Ceiling type) 0003: (2-way Air Cassette type) 0004: (4-way Air Cassette 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 0002: None (Air washer, etc.)	0002: None
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 (factory default) 0001: °F	0000: °C
F0	Swing mode	0001: Standard 0002: Dual swing 0003: Cycle swing	0001: Standard
F1	Louver fixed position (Louver No.1)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F2	Louver fixed position (Louver No.2)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F3	Louver fixed position (Louver No.3)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed
F4	Louver fixed position (Louver No.4)	0000: Release 0001: Horizontal discharge position 0005: Downward discharge position	0000: Not fixed

<table>
<tr><th>DN</th><th>Item</th><th>Description</th><th>At shipment</th></tr>
<tr><td rowspan="3">5d</td><td>High-ceiling adjustment
(Air flow selection)</td><td>1-way air cassette (SH)
<table>
<tr><th>Value</th><th>Type</th><th>AP015, AP018</th><th>AP024</th></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td><td>3.8 m or less</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>4.0 m or less</td><td>4.0 m or less</td></tr>
<tr><td>0003</td><td>High-ceiling (3)</td><td>4.2 m or less</td><td>4.2 m or less</td></tr>
</table>
2-way air cassette
<table>
<tr><th>Value</th><th>Type</th><th>AP007~AP030</th><th>AP036~AP056</th></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m or less</td><td>2.7 m or less</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>3.2 m or less (*)</td><td>3.0 m or less</td></tr>
<tr><td>0003</td><td>High-ceiling (3)</td><td>3.8 m or less (*)</td><td>3.5 m or less</td></tr>
</table>
* The high-ceiling installation of model AP007 to AP012 can only be undertaken when the combined capacity of the indoor units connected is 100% or less than the capacity of the outdoor unit. Do not proceed with high-ceiling installation if this limit is exceeded.
4-way air cassette
<table>
<tr><th rowspan="2">Value</th><th>Type</th><th colspan="3">AP009~AP012</th><th colspan="3">AP015~AP018</th></tr>
<tr><th>Air flow at outlet</th><th>4 directions</th><th>3 directions</th><th>2 directions</th><th>4 directions</th><th>3 directions</th><th>2 directions</th></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m</td><td>2.8 m</td><td>3.0 m</td><td>2.8 m</td><td>3.2 m</td><td>3.5 m</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>-</td><td>-</td><td>-</td><td>3.2 m</td><td>3.5 m</td><td>3.8 m</td></tr>
<tr><td>0003</td><td>High-ceiling (3)</td><td>-</td><td>-</td><td>-</td><td>3.5 m</td><td>3.8 m</td><td>-</td></tr>
<tr><th rowspan="2">Value</th><th>Type</th><th colspan="3">AP024~AP030</th><th colspan="3">AP036~AP056</th></tr>
<tr><th>Air flow at outlet</th><th>4 directions</th><th>3 directions</th><th>2 directions</th><th>4 directions</th><th>3 directions</th><th>2 directions</th></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td></tr>
<tr><td>0003</td><td>High-ceiling (3)</td><td>3.6 m</td><td>3.8 m</td><td>-</td><td>3.6 m</td><td>3.8 m</td><td>-</td></tr>
</table>
Ceiling
<table>
<tr><th>Value</th><th>Type</th><th>AP015~AP056</th></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>4.0 m or less</td></tr>
</table></td><td rowspan="3">0000: Standard</td></tr>
<tr><td>Built-in filter</td><td colspan="2">2-way air cassette
0000: Standard filter (factory default)
0001: Super long-life filter
4-way air cassette
0000: Standard filter (factory default)
Ceiling
0000: Standard filter (factory default)
Concealed duct standard
0000: Standard filter (factory default)</td></tr>
<tr><td>Static pressure selection</td><td>Concealed duct standard
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: Low static pressure</td><td>Slim Duct
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: High static pressure 3</td></tr>
<tr><td>60</td><td>Timer setting
(wired remote controller)</td><td>0000: Available (can be performed)</td><td>0001: Unavailable (cannot be performed)</td><td>0000: Available</td></tr>
<tr><td>92</td><td>External interlock release condition</td><td>0000: Operation stopped</td><td>0001: Release signal received</td><td>0000: Operation stopped</td></tr>
<tr><td>D0</td><td>Whether the power saving mode can be set by the remote controller</td><td>0000: Invalid</td><td>0001: Valid</td><td>0000: Valid</td></tr>
</table>

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)
0F	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: 210 ypm (at self-clean operation)
d1	Frost protection function		0000: None
F0	Swing mode		0001: Standard
F1	Louver fixing position (Louver No. 1)		0000: Not fixed
F2	Louver fixing position (Louver No. 2)		0000: Not fixed
F3	Louver fixing position (Louver No. 3)		0000: Not fixed
F4	Louver fixing position (Louver No. 4)		0000: Not fixed

Table: Function selecting item numbers (DN) for SDI (4 series example)

Function selection item No. (DN) list

DN	Item	Contents	Factory default
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 recommended)	0002: +2°C (Floor type 0000: 0°C)
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: 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: Header unit in group 0002: Follower unit in group	0099: Undecided
19	Louver type (Air direction adjustment) *None for concealed duct	0000: No louver 0001: Swing only 0002: 1-way 0003: 2-way 0004: 4-way	According to model type
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
42	Self clean time	0000: None 0001: 0.5 h to 0.012: 6.0 h The case that compressor-ON time is 10 to 60 minutes is set up. When ON time is over 60 minutes, the operating time becomes two times of it.	0002: 60 minutes

<table>
<tr><th>DN</th><th>Item</th><th>Contents</th><th>Factory default</th></tr>
<tr><td>5d</td><td>High-ceiling adjustment
(Air flow selection)</td><td>4-way cassette
<table>
<tr><td rowspan="2">Value</td><td>Type</td><td colspan="3">AP009-AP012</td><td colspan="3">AP015-AP018</td></tr>
<tr><td>Air flow at outlet</td><td>4 directions</td><td>3 directions</td><td>2 directions</td><td>4 directions</td><td>3 directions</td><td>2 directions</td></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>2.7 m</td><td>2.8 m</td><td>3.0 m</td><td>2.8 m</td><td>3.2 m</td><td>3.5 m</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>–</td><td>–</td><td>–</td><td>3.2 m</td><td>3.5 m</td><td>3.8 m</td></tr>
<tr><td>0003</td><td>High-ceiling (3)</td><td>–</td><td>–</td><td>–</td><td>3.5 m</td><td>3.8 m</td><td>–</td></tr>
<tr><td rowspan="2">Value</td><td>Type</td><td colspan="3">AP024-AP030</td><td colspan="3">AP036-AP056</td></tr>
<tr><td>Air flow at outlet</td><td>4 directions</td><td>3 directions</td><td>2 directions</td><td>4 directions</td><td>3 directions</td><td>2 directions</td></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td><td>3.0 m</td><td>3.3 m</td><td>3.6 m</td></tr>
<tr><td>0001</td><td>High-ceiling (1)</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td><td>3.3 m</td><td>3.5 m</td><td>3.8 m</td></tr>
<tr><td>0003</td><td>High-ceiling (3)</td><td>3.6 m</td><td>3.8 m</td><td>–</td><td>3.6 m</td><td>3.8 m</td><td>–</td></tr>
</table>
Ceiling
<table>
<tr><td>Value</td><td>Type</td><td>AP015-AP018</td></tr>
<tr><td>0000</td><td>Standard (factory default)</td><td>3.5 m or less</td></tr>
<tr><td>0001</td><td>Hight-ceiling (1)</td><td>4.0 m or less</td></tr>
</table></td><td>0000: Standard</td></tr>
<tr><td></td><td>Built-in filter</td><td>4-way cassette
0000: Standard filter (factory default)
Ceiling
0000: Standard filter (factory default)
Duct
0000: Standard filter (factory default)
0001: High-performance filter (65%, 90%)</td><td></td></tr>
<tr><td></td><td>Static pressure selection</td><td>Duct
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: Low static pressure

Slim Duct (AP007-AP018)
0000: Standard (factory default)
0001: High static pressure 1
0003: High static pressure 2
0006: High static pressure 3</td><td></td></tr>
<tr><td>60</td><td>Timer setting
(Wired remote controller)</td><td>0000: Operable
0001: Operation prohibited</td><td>0000: Operable</td></tr>
<tr><td>C2</td><td>Current demand X% to outdoor unit</td><td>0050: 50% to 0100: 100%</td><td>0075: 75%</td></tr>
<tr><td>D0</td><td>Existence of remote controller save function</td><td>0000: Invalid (Impossible)
0001: Valid (Possible)</td><td>0001: Valid (Possible)</td></tr>
<tr><td>D1</td><td>Existence of 8°C heating operation function</td><td>0000: Invalid (Impossible)
0001: Valid (Possible)</td><td>0001: Invalid (Impossible)</td></tr>
<tr><td>92</td><td>External interlock release condition</td><td>0000: Operation stopped 0001: Release signal received</td><td>0000: Operation stopped</td></tr>
<tr><td>d0</td><td>Whether the power saving mode can be set by the remote control</td><td>0000: Invalid 0001: Valid</td><td>0001: Valid</td></tr>
<tr><td>77</td><td>Dual set point</td><td>0000: Unavailable 0002: Available</td><td>0000: Unavailable</td></tr>
<tr><td>B3</td><td>Soft cooling</td><td>0000: Unavailable
0001: Available</td><td>0001: Available</td></tr>
<tr><td>d3</td><td>Revolution count of self clean</td><td>0000: Invalid (Self cleaning is not performed.)
0011: Valid (Self cleaning is performed at 310 rpm.)</td><td>0000: Invalid</td></tr>
<tr><td>d4</td><td>Display/No display of [SELF CLEANING] during self clean operation</td><td>0000: Displayed, 0001: Not displayed</td><td>0000: Displayed</td></tr>
<tr><td>F6</td><td>Presence of Application control kit</td><td>0000: None
0001: Exist</td><td>0000: None</td></tr>
</table>

◆ Monitoring function of remote controller switch

When using the remote controller (Model Name: RBC-AMT32E, RBC-AMS41E, NRC-01HE), the following monitoring function can be utilized.

Wired remote controller: Refer to the installation manual of RBC-AMS54E

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.

⇩

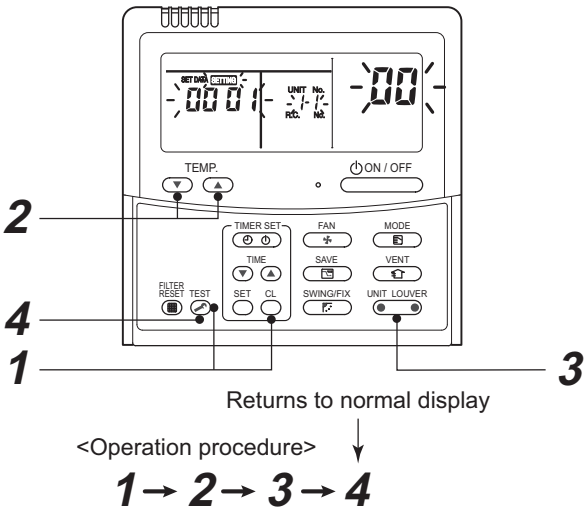
2 **Push TEMP. button to change CODE No. (CODE No.) to the CODE No. to be monitored.**
For display code, refer to the following table.

⇩

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.**



Code example for SHRM-e, refer to other document for target model.

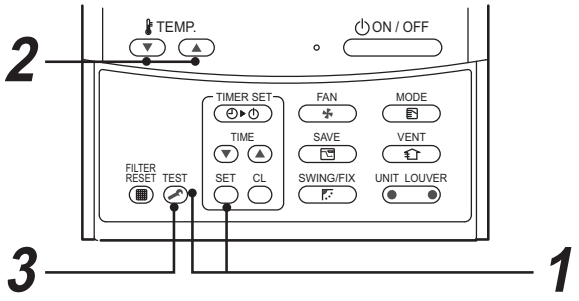
	CODE No.	Data name	Unit	Display form
Indoor unit data	00	Room temp. (Under control) (Note 1)	°C	× 1
	01	Room temp. (Remote controller)	°C	× 1
	02	Indoor suction temp. (TA)	°C	× 1
	03	Indoor coil temp. (TCJ)	°C	× 1
	04	Indoor coil temp. (TC2)	°C	× 1
	05	Indoor coil temp. (TC1)	°C	× 1
	08	Indoor PMV opening degree	pls	× 1 / 10
	F2	Indoor fan accumulated operation time	h	× 100
	F3	Filter sign time	h	× 1
System data	0A	No. of connected indoor units	unit	
	0B	Total HP of connected indoor units	HP	× 10
	0C	No. of connected outdoor units	unit	
	0D	Total HP of connected outdoor units	HP	× 10

	CODE No.	Data name	Unit	Display form
Individual outdoor unit data (Note 3, 4)	10	Compressor 1 discharge temp. (Td1)	°C	× 1
	11	Compressor 2 discharge temp. (Td2)	°C	× 1
	12	High pressure sensor detection pressure (Pd)	Mpa	× 100
	13	Low pressure sensor detection pressure (Ps)	Mpa	× 100
	14	Suction temp. (TS)	°C	× 1
	15	Outdoor coil temp. (TE)	°C	× 1
	16	Liquid side temp. (TL)	°C	× 1
	17	Outside temp. (TO)	°C	× 1
	18	Low pressure saturation temp. (TU)	°C	× 1
	19	Compressor 1 current (I1)	A	× 10
	1A	Compressor 2 current (I2)	A	× 10
	1B	PMV1 + 2 opening degree	pls	× 1 / 10
	1D	Compressor 1, 2 ON/OFF	–	(Note 2)
	1E	Outdoor fan mode	–	0 to 31
	1F	Outdoor unit HP	HP	× 1

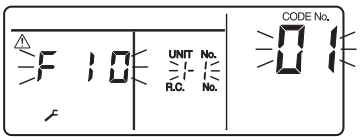
(Note 1) In the group connection, only data of the header indoor unit is displayed.
(Note 2) 01: Only compressor 1 is ON.
10: Only compressor 2 is ON.
11: Both compressor 1 and 2 are ON.
(Note 3) For the CODE No., an example of header unit is described.
(Note 4) Upper girder of CODE No. indicates the outdoor unit No..
1: Header unit (A)
2: Follower unit (B)
3: Follower unit (C)
4: Follower unit (D)

Confirmation of error history (RBC-AMT32E, RBC-AMS41E, NRC-01HE)

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.



Wired remote controller: Refer to the installation manual of RBC-AMS54E

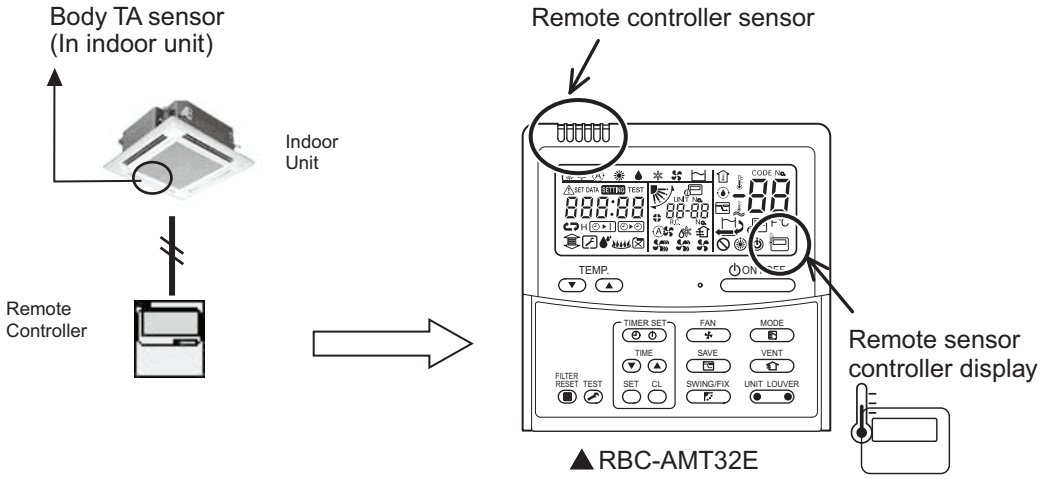
Procedure	Description
1	When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears. If [Service check] is displayed, the mode enters in the trouble history mode. • [01: Order of trouble history] is displayed in CODE No. window. • [Check code] is displayed. • [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”)

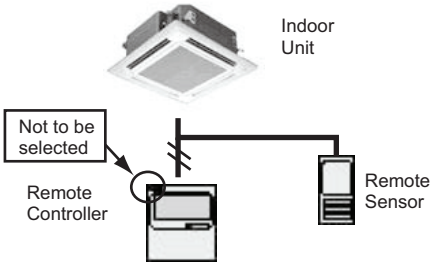
Remote controller (wired or wireless) has the sensor to detect the air temperature.
Either the body TA sensor or remote controller sensor can be selected by item code (DN) setting from the wired remote controller.

DN	32	0000	Body TA sensor	At shipment
		0001	Remote controller sensor	



Note

In case of using the remote sensor “TCB-TC41LE”,
don’t select “remote controller sensor” by item code (DN) setting.
You can use only one remote controller sensor (set as the Header remote) together with the remote sensor.



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 SET + CL + TEST 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 UNIT 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 TEMP. buttons to specify the item code 31.**

4 **Using the TIME button, select the setup data. (At shipment: 0000)**

The setup data is as follows:

Setup data	Handling of operation of air to air heat exchanger or ventilating fan
0000	Unavailable (At shipment)
0001	Available

5 **Push the SET 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 TEST returns the status to the usual stop status.**

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 2E 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)

∗ When the card switch box does not perform the above contact operation, convert it using a relay with 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 SET + CL + TEST buttons for 4 seconds or more.

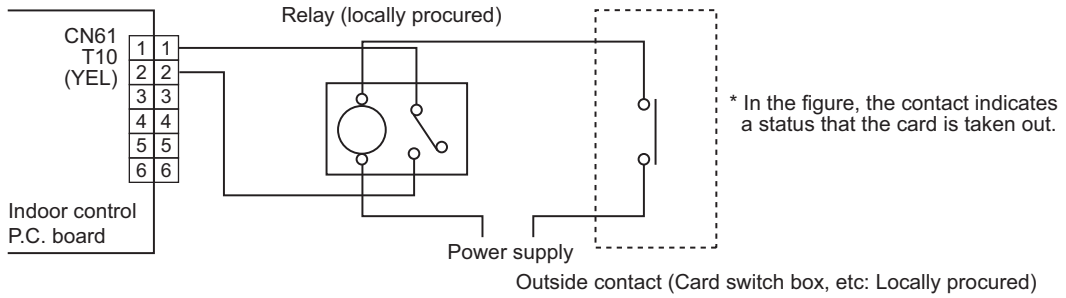
2 Using the TEMP. button, specify the item code 2E.

3 Using the timer time TIME button, set 0001 to the setup data.

4 Push the SET button.

5 Push the TEST button. (The status returns to the usual stop status.)

(3) Wiring

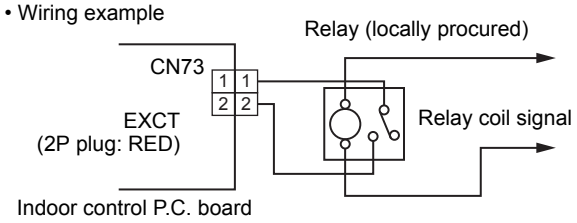


Note) Determine the cable length between the indoor control P.C. board and the relay so that they are within 2 m.

Power peak-cut from indoor unit

When the relay is turned on, a forced thermostat-OFF operation will begin.

• Wiring example

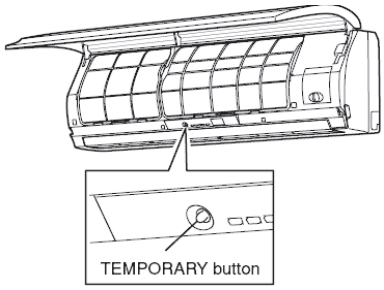


Note) Determine the cable length between the indoor, outdoor control P.C. board and the relay so that they are within 2 m.

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.

<table>
<tr><th rowspan="2">Category</th><th rowspan="2">Indoor type</th><th colspan="2">Setting Procedure for auto restart</th></tr>
<tr><th>User interface</th><th>How</th></tr>
<tr><td>VRF</td><td>All</td><td>Wired remote controller</td><td>Set DN code by wired remote controller.
Code: automatic restart of power failure DN=28
Setting value: 0001: Restart
0000: none (default)</td></tr>
<tr><td rowspan="3">DI
SDI</td><td>Excluding Hi wall</td><td>ditto</td><td>ditto</td></tr>
<tr><td rowspan="2">Hi wall</td><td>ditto</td><td>ditto</td></tr>
<tr><td>Body button

Indicator: operation lamp
 
</td><td>No automatic restart setting at shipment

HOW TO SET
Power on.
Push the “TEMPORARY” button on the front body continuously for more than 3 seconds, 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.</td></tr>
</table>

7-2 Indoor Model Compatibility for remote controller, central controller and remote sensor

Indoor Category \ Option Category			Wired Remote Controller	Wireless Remote Controller						TCC-LINK ADAPTOR (for central control) TCB-PCNT30TLE2	Remote sensor TCB-TC41LE	Central control
			RBC-AMT32E, RBC-AMS41E, RBC-AMS54E-ES/EN, NRC-01HE, RBC-AS41E	RBC-AX32U(W/WS)-E	RBC-AX33CE	TCB-AX32E2	RBC-AX32UW(W)-E	WH-L11SE	WH-H2UE			
SMMS-e/ SHRM-e/ Mini-SMMS-e	4-way Air Discharge Cassette Type	4 series	✓	✓	-	✓	-	-	-	-	✓	✓
	Compact 4-way Cassette Type	4 series	✓	-	-	✓	-	-	-	-	✓	✓
		6 series	✓	-	-	✓	-	-	-	-	✓	✓
	2-way Air Discharge Cassette Type	2 series	✓	-	-	✓	✓	-	-	-	✓	✓
	1-way Air Discharge Cassette Type	4 YH series	✓	-	-	✓	-	-	-	-	✓	✓
		4 SH series	✓	-	✓	✓	-	-	-	-	✓	✓
	Concealed Duct Type	6 series	✓	-	-	✓	-	-	-	-	✓	✓
	Concealed Duct High Static Pressure Type	6 series	✓	-	-	-	-	-	-	-	✓	✓
	Slim Duct Type	4 series	✓	-	-	✓	-	-	-	-	✓	✓
	Ceiling Type	7 series	✓	-	✓	✓	-	-	-	-	✓	✓
	High-wall Type	3 series	✓	-	-	✓	-	✓ (Packed)	-	-	✓	✓
		4 series	✓	-	-	✓	-	-	✓ (Packed)	-	✓	✓
	Floor Standing Concealed Type	4 series	✓	-	-	✓	-	-	-	-	✓	✓
	Floor Standing Cabinet Type	4 series	✓	-	-	✓	-	-	-	-	✓	✓
	Floor Standing Type	4 series	✓	-	-	✓	-	-	-	-	✓	✓
	Console Type	4 series	✓	-	-	✓	-	✓ (Packed)	-	-	✓	✓
	Fresh Air Intake Indoor Unit Type	-	✓	-	-	✓ (Set as follower)	-	-	-	-	-	✓
	Air to Air Heat exchanger with DX-coil Type	-	✓	-	-	✓ (Set as follower)	-	-	-	-	-	✓
SMMS-e	Large Capacity Floor Standing Type	4 series	✓	-	-	✓	-	-	-	-	✓	✓
DI / SDI	4-way Air Discharge Cassette Type	4 series	✓	✓	-	✓	-	-	-	✓ (Need TCB-PX30MUE)	✓	✓ (With adaptor)
	Compact 4-way Cassette Type	4 series	✓	-	-	✓	-	-	-	✓ (Need TCB-PX30MUE)	✓	✓ (With adaptor)
	Concealed Duct Type	6 series	✓	-	-	✓	-	-	-	✓	✓	✓ (With adaptor)
	Concealed Duct High Static Pressure Type	4 series	✓	-	-	-	-	-	-	✓	✓	✓ (With adaptor)
	Slim Duct Type	4 series	✓	-	-	✓	-	-	-	✓	✓	✓ (With adaptor)
	Ceiling Type	7 series	✓	-	✓	✓	-	-	-	✓	✓	✓ (With adaptor)
	High-wall Type	6 series	✓	-	-	✓	-	✓ (Packed)	-	-	✓	✓ (Without adaptor)

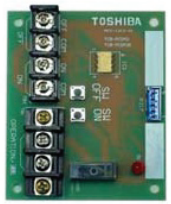
Indoor Category \ Option Category			Wired Remote Controller	Wireless Remote Controller				TCC-LINK ADAPTOR (for central control) TCB-PCNT30TLE2	Remote sensor TCB-TC41LE	Central control
			RBC-AMT32E, RBC-AMS41E, RBC-AMS54E-ES/EN, NRC-01HE, RBC-AS41E	RBC-ACX33CE	RBC-ACX33CE1	TCB-ACX32E2	Attached (not option)			
SPI	4-way Air Discharge Cassette Type	UP	✓	-	-	-	✓ (Attached)	N/A	✓	N/A
		UP-1	✓	-	-	-	✓(Attached)	△XXXXXX	✓	△XXXXXX
	Concealed Duct Type	DP	✓	-	-	✓	-	✓	✓	✓ (With adaptor)
	Ceiling Type	CP	✓	✓	-	-	-	✓	✓	✓ (With adaptor)
	High-wall Type	KRP	✓	-	-	-	✓ (Attached)	✓	✓	✓ (With adaptor)
LC-FS	4-way Air Discharge Cassette Type	USP	✓	-	-	-	✓ (Attached)	△XXXXXX	✓	△XXXXXX
	Concealed Duct Type	BSP	✓	-	-	✓	-	✓	✓	△XXXXXX
	Ceiling Type	CSP	✓	-	✓	-	-	✓	✓	△XXXXXX

8

Outdoor unit optional devices for VRF

8-1 Line Up & Function – Outdoor unit optional devices for VRF
8-2 Power peak-cut control board TCB-PCDM4E
8-3 External master ON/OFF control board TCB-PCMO4E
8-4 Output control board TCB-PCIN4E

8-1 Line Up & Function – Outdoor unit optional devices for VRF

Model Name	Power peak-cut control board			External master ON/OFF control board			Output control board		
	TCB-PCDM4E			TCB-PCMO4E			TCB-PCIN4E		
Appearance									
System	SMMS-e	SHRM-e	Mini-SMMS-e	SMMS-e	SHRM-e	Mini-SMMS-e	SMMS-e	SHRM-e	Mini-SMMS-e
Power peak-cut control (Standard)	✓	✓	✓	-	-	-	-	-	-
Power peak-cut control (Expand)	✓	✓	✓	-	-	-	-	-	-
Snowfall fan control	-	-	-	✓	✓	-	-	-	-
External master ON/OFF control	-	-	-	✓	✓	✓	-	-	-
Night operation (Sound reduction) control	-	-	-	✓	✓	✓	-	-	-
Operation mode selection control	-	-	-	✓	✓	✓	-	-	-
Error/Operation output control	-	-	-	-	-	-	✓	✓	✓
Compressor operation output	-	-	-	-	-	-	✓	✓	-
Operation rate display	-	-	-	-	-	-	✓	✓	-
Max. number installed (*)	1	1	1	4	4	2	2	2	1
Kind of digital input / output	2 / 1			6 / -			- / 8		

(*) : Mini-SMMS is up to a total of 2 boards.

8-2 Power peak-cut control board TCB-PCDM4E

The Power Peak Cut accessory PCB connects to connector CN513 of the Header Outdoor Unit PCB.
- The upper limit capacity of the Outdoor Unit is restricted based on the demand request signal from the external input.
- There are two functions that can be selected depending on requirements, the standard function and the advanced function.

Outline

Appearance

Application

* Install the optional PCB in the inverter assembly of the outdoor header unit.

VRF

Function

Power peak-cut Control

- **Purpose: Limiting air conditioning performance with external signals and decreasing the peak power consumption.**

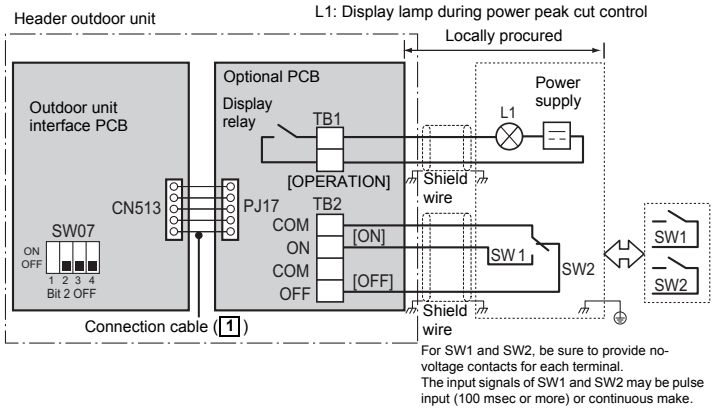
- **Feature**
  The upper limit capacity of the outdoor unit is restricted based on the outdoor power peak selected setting.

- **Function**
  Two control settings are selectable by setting SW07 on the interface PCB on the header outdoor unit.

- **Electrical Wiring Diagram**

Standard Specifications

(Wiring example)



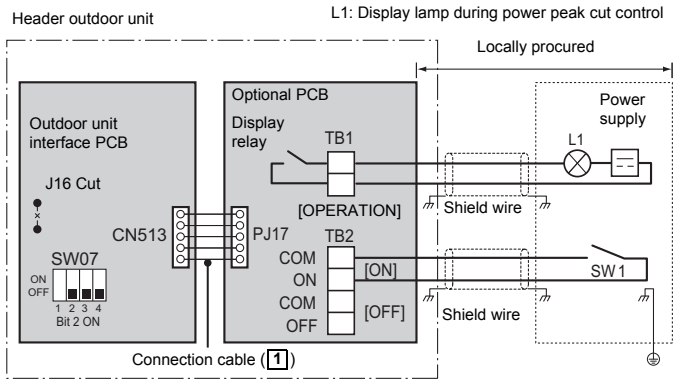
<SW07 (bit 2) OFF [2-stage switching]>

Input		SW07 (bit 1)		Display relay (L1)
SW1	SW2	Bit 1 OFF	Bit 1 ON	
OFF	ON	100% (normal operation)	100% (normal operation)	OFF
ON	OFF	0% (forced stop)	Approx. 60% (upper limit regulated)	ON

Two-core cable support

It allows ON/OFF power peak-cut control to be implemented using a power peak-cut control ON input (SW1) alone, provided that the J16 (J20) jumper wire on the interface PCB of the outdoor unit has been removed.

(Wiring example)

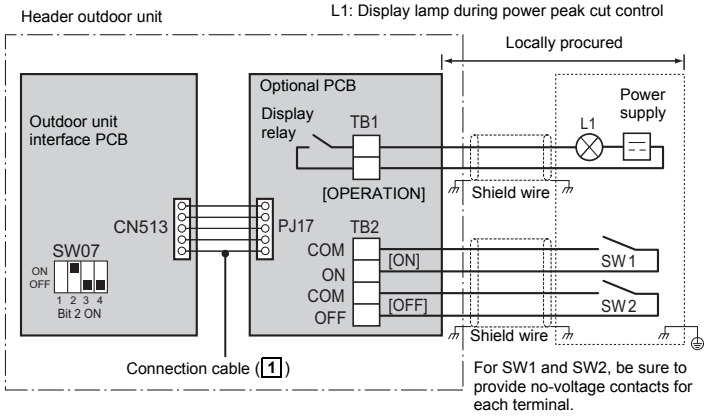


Appearance	Function
	<SW07 (bit 2) OFF [2-stage switching]> Power peak-cut control turns ON when SW1 in the wiring example is ON (continuous make).

Jumper lead J16	Input SW1	SW07 (bit 1)		Display relay (L1)
		Bit 1 OFF	Bit 1 ON	
Cut	OFF	100% (normal operation)	100% (normal operation)	OFF
	ON	0% (forced stop)	Approx. 60% (upper limit regulated)	ON

Enhanced Functions

(Wiring example)



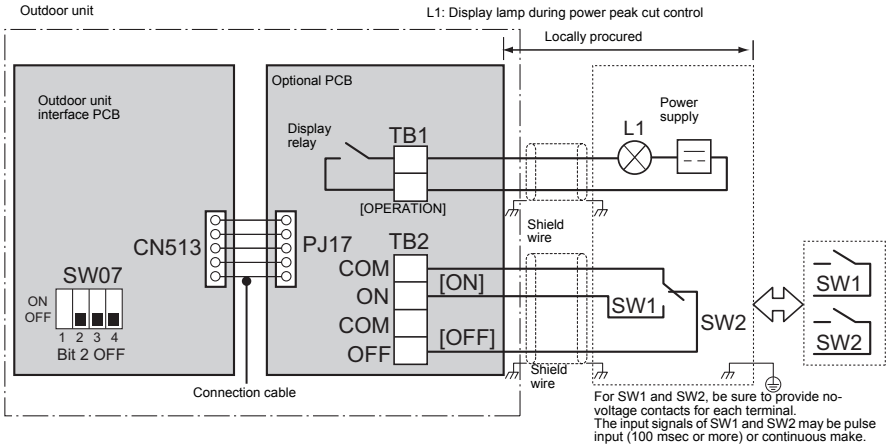
<SW07 (bit 2) ON [4-stage switching]>

Input		SW07 (bit 1)		Display relay (L1)
SW1	SW2	Bit 1 OFF	Bit 1 ON	
OFF	OFF	100% (normal operation)	100% (normal operation)	OFF
ON	OFF	Approx. 80% (upper limit regulated)	Approx. 85% (upper limit regulated)	ON
OFF	ON	Approx. 60% (upper limit regulated)	Approx. 75% (upper limit regulated)	ON
ON	ON	0% (forced stop)	Approx. 60% (upper limit regulated)	ON

Specifications

Part name		Power peak-cut control board
Model Name		TCB-PCDM4E
Power supply		No external power supply is required
Dimension		71 × 85 mm
Max.number installed	SMMS-e	1
	SHRM-e	1
	Mini-SMMS-e	1
Digital input / output	Power peak-cut control (Standard)	2 / 1
	Power peak-cut control (Two-core cable support)	1 / 1
	Power peak-cut control (Expand)	2 / 1

Power peak-cut control (standard)



Operation

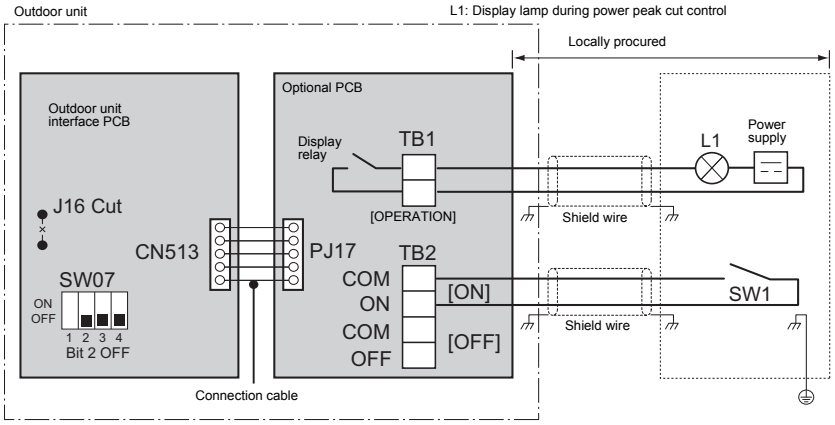
An external power peak-cut control signal limits the peak capacity of the outdoor unit.
L1: Power peak-cut control indication lamp
SW1: Power peak-cut control ON switch (ON as long as target power peak-cut control has been reached or exceeded, normally OFF)*1
SW2: Power peak-cut control OFF switch (OFF as long as target power peak-cut control has not been reached or exceeded, normally ON)*1
*1 The inputs of SW1 and SW2 can be either pulse (100 msec or wider) or step signals.
Do not turn on SW1 and SW2 simultaneously.
* Be sure to provide a contact for each terminal.

Power peak-cut control settings

Power peak-cut control PCB	SW1	SW2	L1	Interface PCB of outdoor unit	
				SW07 Bit 1 OFF	SW07 Bit 1 ON
Power peak-cut control ON signal received	ON	OFF	ON	0% (forced stop)	60% capacity (upper limit regulated)
Power peak-cut control OFF signal received	OFF	ON	OFF	100% (normal operation)	100% (normal operation)

Two-core cable support

It allows ON/OFF power peak-cut control to be implemented using a power peak-cut control ON input (SW1) alone, provided that the J16 jumper wire on the interface PCB of the outdoor unit has been removed.



<SW07 Bit 2 OFF (two-step control)>
Power peak-cut control is enabled as long as SW1, as shown on the wiring diagram, is ON (continuously).

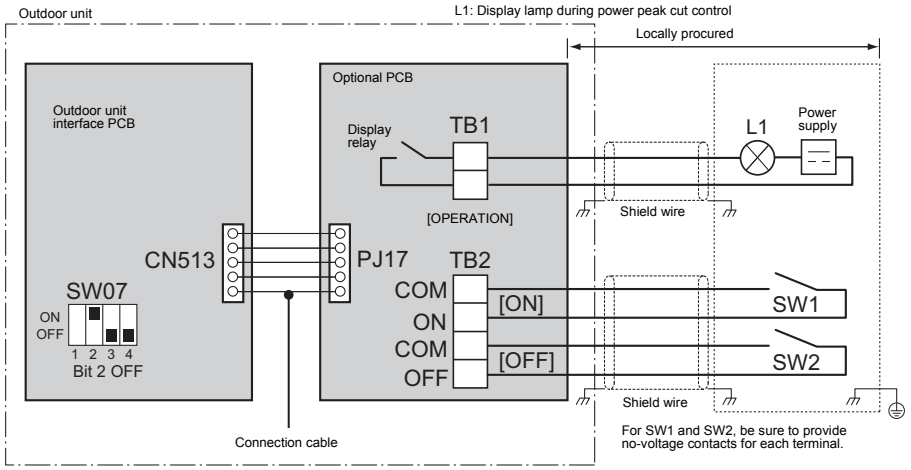
Jumper wire J16	Input SW1	SW07 Bit 1		Indicator relay
		Bit 1 OFF	Bit 1 ON	(L1)
Cut	OFF	0% (forced stop)	60% capacity (upper limit regulated)	OFF
	ON	100% (normal operation)	100% (normal operation)	ON

Note 1: 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 VDC, 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.

Power peak-cut control (extended)



Operation

An external power peak-cut control signal limits the peak capacity of the outdoor unit.
L1: Power peak-cut control indication lamp
SW1: Power peak-cut control ON switch*1
SW2: Power peak-cut control OFF switch*1
*1 The inputs of SW1 and SW2 can be either pulse (100 msec or wider) or step signals.
* Be sure to provide a contact for each terminal.

Extended power peak-cut control settings

Specifications of display relay contact

Indication lamp	External power peak-cut control signals		Peak capacity	
			I/F SW07 Bit 1	
L1	SW1	SW2	OFF	ON
OFF	OFF	OFF	100% (normal operation)	100% (normal operation)
ON	ON	OFF	80% (upper limit regulated)	85% (upper limit regulated)
ON	OFF	ON	60% (upper limit regulated)	75% (upper limit regulated)
ON	ON	ON	0% (forced stop)	60% (upper limit regulated)

Note 1: 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

➔ Please refer to the Installation Manual

8-3 External master ON/OFF control board TCB-PCMO4E

This is an application control PCB that can be connected to a VRF Outdoor Unit in order to provide one of up to four available functions, these are:

- Snowfall Fan Control
- External Master ON/OFF Control
- Night Operation Control
- Operation Mode Selection Control

Outline

Appearance

Application

* Install the optional PCB in the inverter assembly of the outdoor header unit.

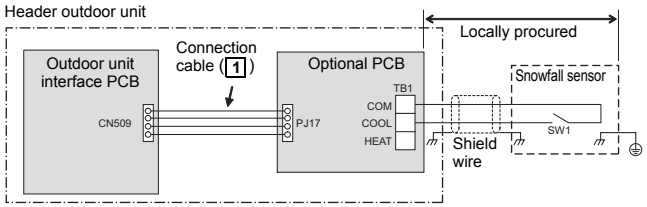
VRF

Function

[1] Snowfall fan control (SMMS-e, SHRM-e)

- **Purpose: rotating the fan to prevent snow accumulation**
- **Functions**

  The outdoor unit fan operates at snowfall by connecting to the outdoor unit interface PCB.
- **Operation**



SW1: Snowfall detection switch (snowfall sensor)

Terminal	Input Signal	Operation
Cooling (SW1)	ON OFF	Snowfall fan control (Fan in outdoor unit operates.)
	ON OFF	Normal operation

⚠CAUTION

Be sure to provide no-voltage continuous contacts for each terminal.

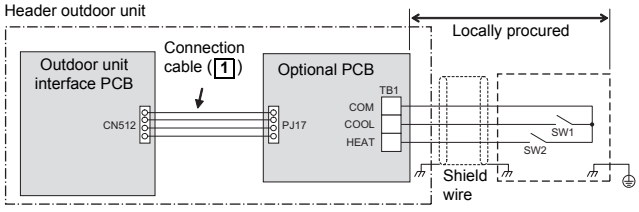
This control is activated when a input signal increases or decreases.
(The increasing or decreasing signal needs to be held for a minimum of 100 msec in order to activate the control).

[2] External master ON/OFF control

- **External master ON/OFF control**
- **Functions**

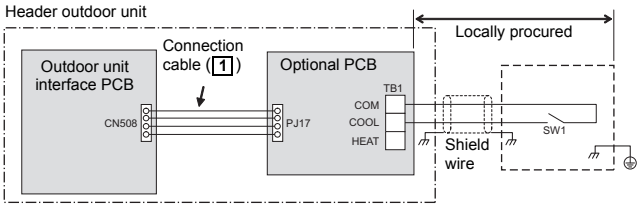
  Indoor units connected to the outdoor unit can be batch-operated or batch-stopped by connecting to the interface PCB of those outdoor units. Batch operation is performed in the previously active mode.
- **Operation**

  The outdoor unit connection is for the header unit (U1).



SW1: Operation input switch
SW2: Stop input switch

Terminal	Input Signal	Operation
COOL (SW1)	ON OFF	Batch-operates indoor units.
HEAT (SW2)	ON OFF	Batch-stops indoor units.

Appearance	Function
	**⚠CAUTION** Be sure to provide no-voltage pulse contacts for each terminal. Hold the ON state for at least 100 msec. Do not turn SW1 and SW2 ON simultaneously • 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).
Application	**[3] Night operation (Sound reduction) control** ● **Purpose: Reducing noise from an outdoor unit** ● **Functions** The rotation speed of the compressor and fan can be restricted during input of the night time signal to reduce noise by connecting to the interface PCB of outdoor units. ● **Operation** The outdoor unit connection is for the header unit (U1).
 * Install the optional PCB in the inverter assembly of the outdoor header unit. VRF	 SW1 : Night time signal switch

Terminal	Input Signal	Operation
COOL (SW1)	ON OFF	Night time control
	ON OFF	Normal operation

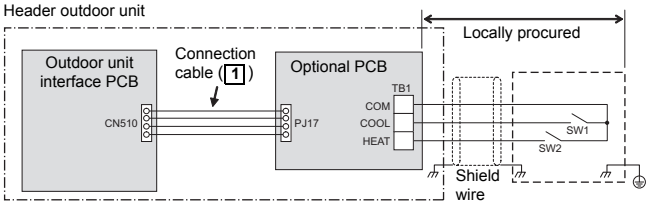
⚠CAUTION

Be sure to provide no-voltage continuous contacts for each terminal.

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] Operation mode selection control

● **Purpose: Limiting operation modes to cooling and heating only**
● **Functions**
The heating/cooling mode of the system can be selected by connecting to the interface PCB of outdoor units.
● **Operation**
The outdoor unit connection is for the header unit (U1).



SW1: Cooling mode specified input switch
SW2: Heating mode specified input switch

Input Signal		Operation: Selected operation mode
Cooling (SW1)	Heating (SW2)	
ON	OFF	Cooling operation only allowed
OFF	ON	Heating operation only allowed
OFF	OFF	Normal operation

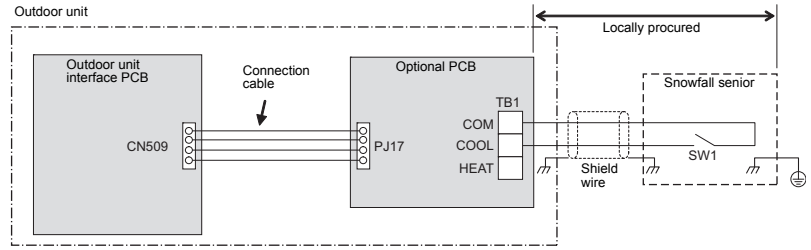
⚠CAUTION

Be sure to provide no-voltage continuous contacts for each terminal.

Specifications

Part name		External master ON/OFF control board
Model Name		TCB-PCMO4E
Power supply		No external power supply is required
Dimension		55.5 × 60 mm
Max.number installed	SMMS-e	4
	SHRM-e	4
	Mini-SMMS-e	2
Digital input / output	Snowfall fan control	1 / -
	External master ON/OFF control	2 / -
	Night operation (Sound reduction) control	1 / -
	Operation mode selection control	2 / -

Snowfall fan control



SW1: Snowfall detection switch (snowfall sensor)

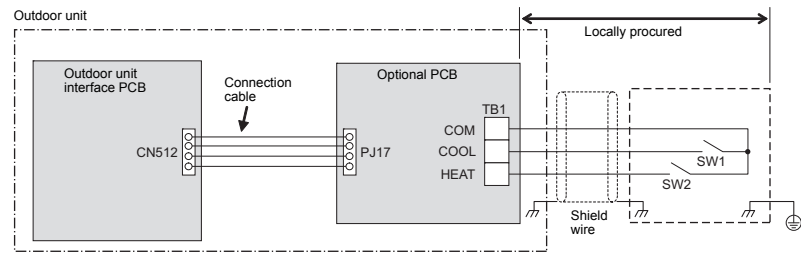
Operation

An external snowfall signal turns on the outdoor unit fan.

Terminal	Input signal	Operation
COOL (SW1)	ON / OFF	Snowfall fan control (Turns on outdoor unit fan)
	ON / OFF	Normal operation (Cancels control)

The input signal is recognized during its rising / falling phase.
(After reaching the top / bottom of the rising / falling edge, the signal must remain there for at least 100 ms.)

External master ON/OFF control



SW1: Operation input switch
SW2: Stop input switch)

Operation

The system is started / stopped from the outdoor unit.

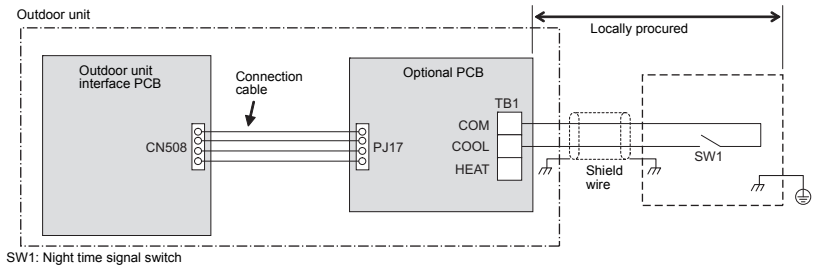
Terminal	Input signal	Operation
COOL (SW1)	ON / OFF	Turns on all indoor units
HEAT (SW2)	ON / OFF	Turns off all indoor units

The input signal is recognized during its falling phase. (After reaching the bottom of the falling edge, the signal must remain there for at least 100 ms.)

⚠CAUTION

(1) Do not turn on the COOL (SW1) and HEAT (SW2) terminals simultaneously.
(2) Be sure to provide a contact for each terminal.
External signal: No-voltage pulse contact

Night operation (sound reduction) control



SW1: Night time signal switch

Operation

This function decreases noise at night or other times as necessary.

Terminal	Input signal	Operation
COOL (SW1)	ON / OFF	Night time control
	ON / OFF	Normal operation

The input signal is recognized during its rising / falling phase.
(After reaching the top / bottom of the rising / falling edge, the signal must remain there for at least 100 ms.)

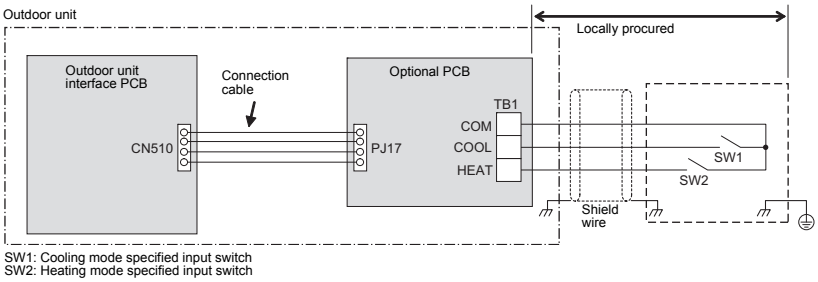
The system's capacity is reduced during low-noise operation.
The table below provides a rough guide to this capacity reduction.

The optional PCB should be connected to the header outdoor unit (U1).

Sound reduction and approximation capacity (reference)

➔ Please refer to the databook

Operation mode selection control



NOTE

SW1: COOL mode selection switch
SW2: HEAT mode selection switch

Input signal		Operation	Remarks
COOL (SW1)	HEAT (SW2)		
ON	OFF	Only cooling operation allowed	*
OFF	ON	Only heating operation allowed	*
OFF	OFF	Normal operation	

* The display " (Operation mode selection control in progress)" appears on the remote controller

Indoor unit operation intervention function [only supported by SHRM-e and SMMS-e
The statuses of indoor units operating in a mode different from the selected operation mode can be changed by changing the status of a jumper wire (J01) provided on the interface PCB of the header outdoor unit.

<table>
<tr><th>Jumper wire</th><th>Description of intervention</th></tr>
<tr><td>J01 connected (factory default)</td><td>All indoor units operating in a mode different from the selected operation mode (prohibited-mode indoor units) become non-priority units (thermostat OFF).
Prohibited-mode indoor units
<table>
<tr><th>Operation mode</th><th>Operation status</th><th>Remote controller display</th></tr>
<tr><td>COOL</td><td>Fan operation at air flow rate set via remote controller</td><td rowspan="3">" " operation ready</td></tr>
<tr><td>HEAT</td><td>Fan operation at extremely low air flow rate</td></tr>
<tr><td>FAN</td><td>Fan operation at air flow rate set via remote controller as normal</td></tr>
</table></td></tr>
<tr><td>J01 cut</td><td>The selected operation mode is imposed on all indoor units operating in a different mode.
<table>
<tr><th>Mode selected at PCB</th><th colspan="2">Remote controller operation / display</th></tr>
<tr><td>Normal</td><td>All modes (COOL, DRY, HEAT and FAN) available</td><td></td></tr>
<tr><td>COOL</td><td>Only COOL, DRY and FAN available</td><td rowspan="2">" operation mode control" (turned on during remote control operation)</td></tr>
<tr><td>HEAT</td><td>Only HEAT and FAN available</td></tr>
</table></td></tr>
</table>

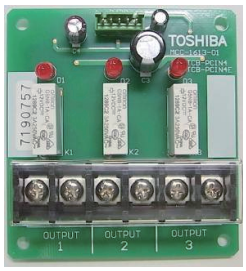
The optional PCB should be connected to the header outdoor unit (U1).

8-4 Output control board TCB-PCIN4E

The Operation Output Control accessory PCB connects to connector CN511 of the Header Outdoor Unit PCB.
This PCB provides an output signal based on the ON/OFF status of the connected units and an error output signal based on detected faults on the system.
The operation ON/OFF output provides the ideal control external ventilation fans.
When connected to the SMMS-e, SHRM-e product, the TCB-PCIN4E can be used to output the ON/OFF operation status of the compressors and to output system operating rate.

Outline

Appearance



Application

* Install the optional PCB in the inverter assembly of the outdoor header unit. (except for compressor operation output)

VRF

Function

[1] Error output control

● **Functions**

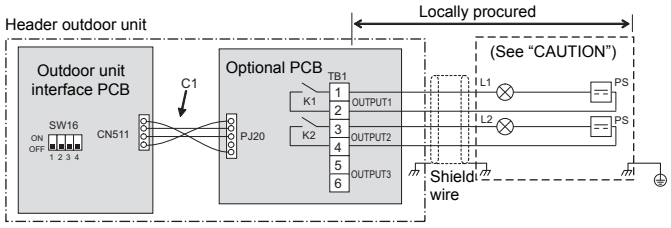
The operation error indication PCB can output operation and error states by connecting to the interface PCB of outdoor units.

● **Operation**

Operation output: The operation indication is output when even one of the indoor units in the system is operating.

Error output: The error indication is output when an error has occurred on even one of the indoor units or outdoor units in the system.

(Wiring example)



C1	Connector cable 1 (1)
CN511	Connector on interface side (green)
K1, K2	Relays
L1	Error indication Lamp
L2	Operation indication Lamp
OUTPUT1	Error output
OUTPUT2	Operation output
PJ20	Connector on optional PCB side
PS	Power supply unit
TB1	Terminal block

* Connect optional boards to the center outdoor unit.
* [OUTPUT3] is normally output when power is turned on.

[2] Compressor operation status

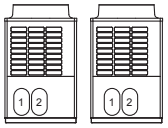
● **Functions**

This function can be applied, for example, to the elapsed operation time count of each compressor mounted on an outdoor unit since the compressor in operation signal can be output externally.

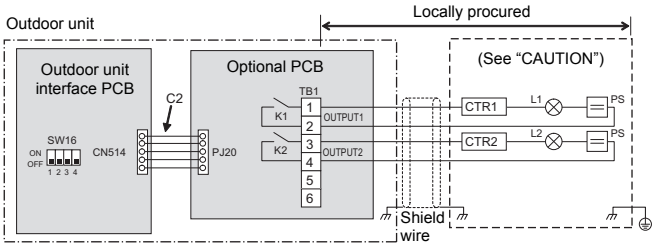
● **Operation**

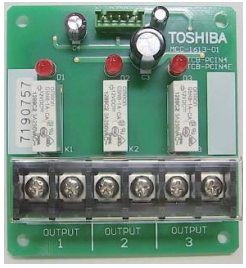
During compressor operation, the relay of the output terminal corresponding to that compressor turns ON (closes) and turns OFF (opens) when compressor operation stops.

As shown in the figure, the output terminals are "OUTPUT1" and "OUTPUT2" from the left compressor facing the front of the outdoor unit.



(Wiring example)



Appearance	Function
	

C2	Connector cable 2 (2)
CN514	Connector on interface side (green)
CTR1	Elapsed operation counter 1
CTR2	Elapsed operation counter 2
CTR3	Elapsed operation counter 3
K1, K2, K3	Relays
L1, L2, L3	Operation indication LEDs
OUTPUT1	Compressor 1 operation output terminal
OUTPUT2	Compressor 2 operation output terminal
OUTPUT3	Compressor 3 operation output terminal
PJ20	Connector on optional PCB side
PS	Power supply unit
TB1	Terminal block

Application

* Install the optional PCB in the inverter assembly of the outdoor header unit.

VRF

[3] Operation ratio control

● **Functions**

The operation state can be remotely checked since the system operating rate signal can be output externally.

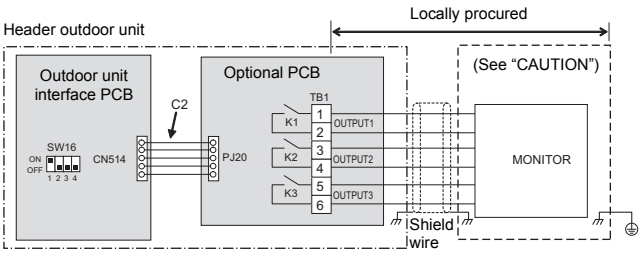
● **Operation**

As shown in the table, each of the output terminals turns ON (relay closes) and OFF (relay opens) according to the system operating rate.

Functions	SW16	OUTPUT1	OUTPUT2	OUTPUT3	Operating rate FA
System operating rate output	 bit 1 : ON bit 2 : OFF	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

OFF=relay open ON=relay closed

(Wiring example)



C2	Connector cable 2 (2)
CN514	Connector on interface side (green)
K1, K2, K3	Relays
MONITOR	Monitoring device
OUTPUT1	Output terminal for each function
OUTPUT2	Output terminal for each function
OUTPUT3	Output terminal for each function
PJ20	Connector on optional PCB side
TB1	Terminal block

* Connect optional boards to the center outdoor unit.

9

Outdoor unit optional devices for DI/SDI

9-1 Digital Inverter Air Conditioner Application Control Kit TCB-PCOS1E2
9-2 Optional Connector Cable TCB-KBOS1E

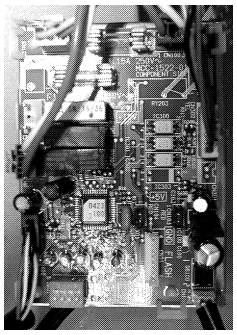
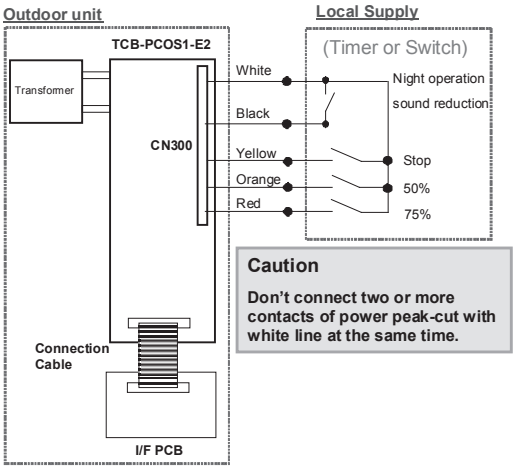
9-1 Digital Inverter Air Conditioner Application Control Kit TCB-PCOS1E2

This application control PCB connects to the CN510 connector of the Outdoor Unit Interface PCB (DI Only). When connected the Sound Reduction & Demand control has 4 possible settings based on input connections (Volt Free Contact):

• Night Operation Control
  - Sound reduction of 5 dB in cooling mode.

• Control of the max. capacity
  - 75% Demand Setting.
  - 50% Demand Setting.
  - 0% Demand Setting.

Outline

Appearance	Function
	● **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**
Application	
DI: some of series 4 only **SDI :some of series 4 only** **Connect to outdoor I/F unit**	

Specifications

Part name			Digital Inverter Air Conditioner Application Control Kit
Model Name			TCB-PCOS1E2
Power supply			No external power supply is required
Dimension			70 × 100 mm
Object model		DI 4 RAV-	SM56*AT-E, SM80*AT-E, SM110*AT-E, SM140*AT-E
		SDI 4 series RAV-	SP404AT-E/ATZ-E/ATZG-E, SP454AT-E/ATZ-E/ATZG-E, SP564AT-E/ATZ-E/ATZG-E
Digital input / output	Night operation		1 / -
	Demand control has 3 steps		3 / -
	Compressor output		- / 1

Installation

➔ Please refer to the Installation Manual

9-2 Optional Connector Cable TCB-KBOS1E

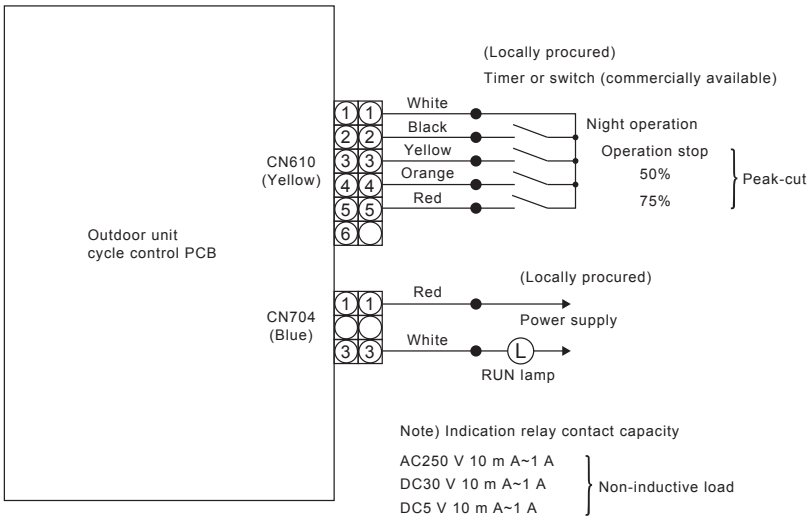
This accessory is compatible with Series 4 DI and SDI equipment (excludes SDI 1.5-1.7 RS Units) and can be used to provide three possible functions, these are:

• Power Peak-Cut Control
This function provides 3 levels of power saving levels by use of an external input.
Settings are Stop, 50% and 75% total capacity.

• Night Operation
This function reduces the noise of the outdoor unit by restricting the fan and compressor operation.

• Compressor Output
Provides a non-voltage contact that is On whilst the compressor is operating.

Outline

Appearance	Function
Cable for night operation or peak-cut control (5-core cable with yellow connector) **Cable for Compressor output (2 core cable with blue connector)**	● **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 45 dB(A) (SDI series 4 2 HP to 5 HP, Heating / Cooling) ● **Night operation** Reduce the capacity of the air conditioner by the input signal from a commercially available timer(locally procured)regardless of the outside air temperature or load to reduce operating noise. Sound pressure level : reduced to 45 dB(A) (SDI series 4 2 HP to 5 HP, Heating / Cooling) ● **Compressor output** Turns on the no-voltage contact output while the compressor is operating.
Application	● **Function**
DI series4 / SDI series 4 (except 1.5-1.7 HP) only **Connect to outdoor unit cycle PCB**	

Specifications

Part name			Optional Connector Cable
Model Name			TCB-KBOS1E
Length			300 mm
Object model		DI	series 4
		SDI	series 4 except 1.5-1.7 HP
Digital input / output	Night operation		1 / -
	Demand control has 3 steps		3 / -
	Compressor output		- / 1

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 45 dB(A) (SDI series 4 2 HP to 5 HP, 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 series 4, SDI series 4 except 1.5-1.7 HP

Function

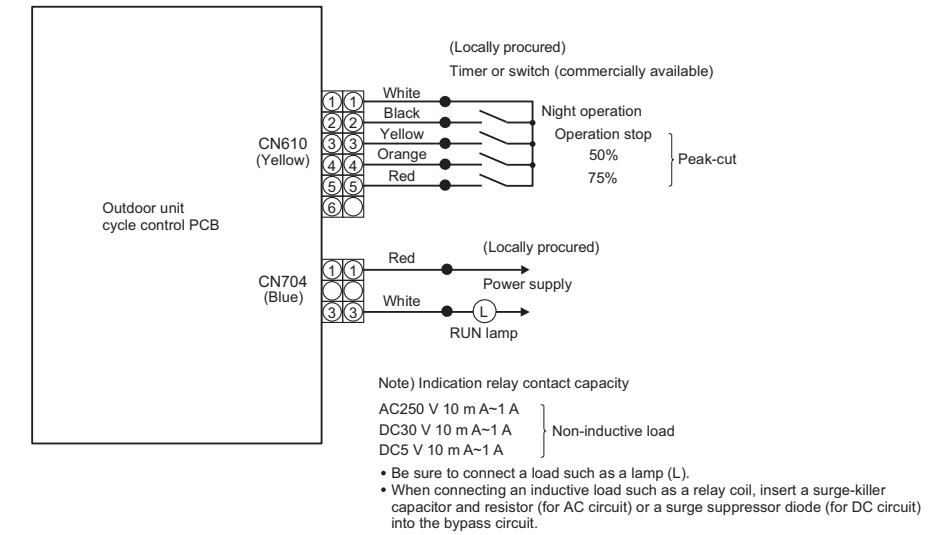
1. Components of TCB-KBOS1E

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 (locally procured) 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

<System diagram>



Connect the cables firmly to the cycle control PCB of the outdoor unit so that they will not be disconnected from respective connectors.

Installation

➔ Please refer to the Installation Manual

10

Outdoor unit controls for VRF

10-1 Applied control for outdoor unit
10-2 Outdoor fan high static pressure shift
10-3 Priority operation mode setting
10-4 Indoor unit setup in “Specific indoor unit priority” mode (Except SHRM-e)
10-5 SMMS wave tool (SMMS-e, SHRM-e only)

10-1 Applied control for outdoor unit

■ SMMS-e

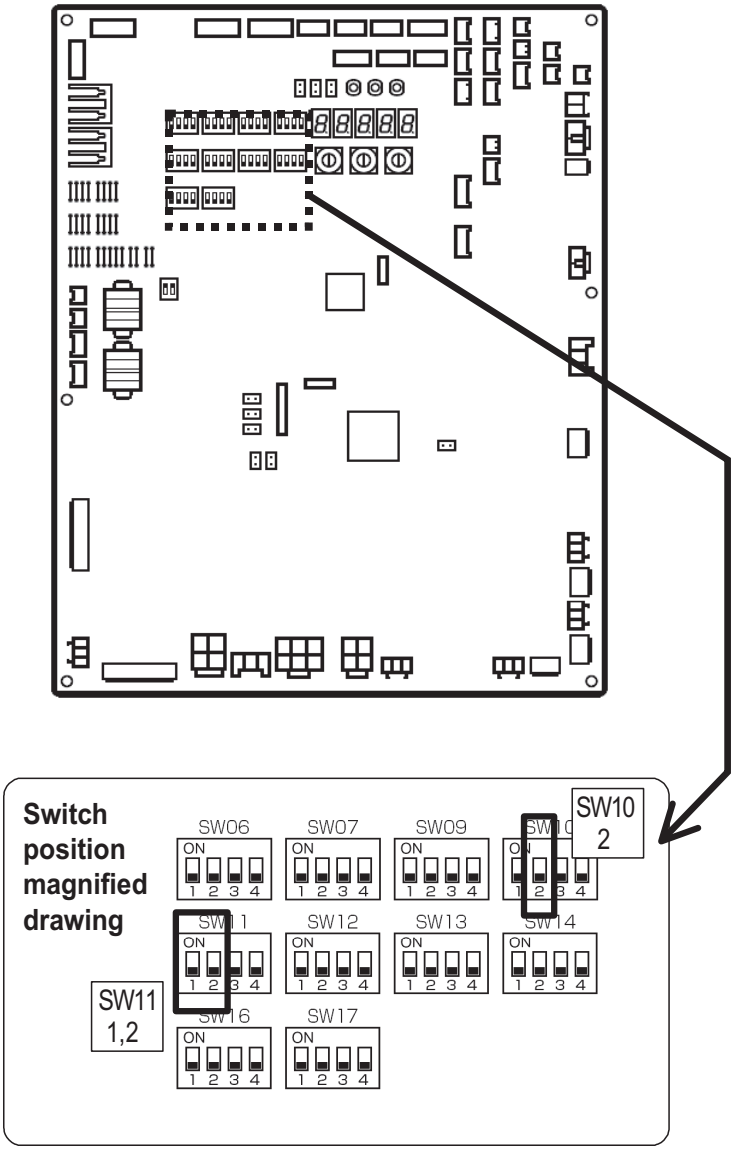
The outdoor fan high static pressure support and priority operation mode setting (cooling / heating / number of units / or priority indoor unit) functions are made available by setting relevant switches provided on the interface PCB of the outdoor unit.

The following functions become available by setting the switches on the outdoor interface PCB.

No.	Function	Switch No.	Bit
1	Outdoor fan high static pressure shift	SW10	2
2	Cooling priority, Heating priority control	SW11	1, 2

Interface PCB of outdoor unit

<SMMS-e, SHRM-e>

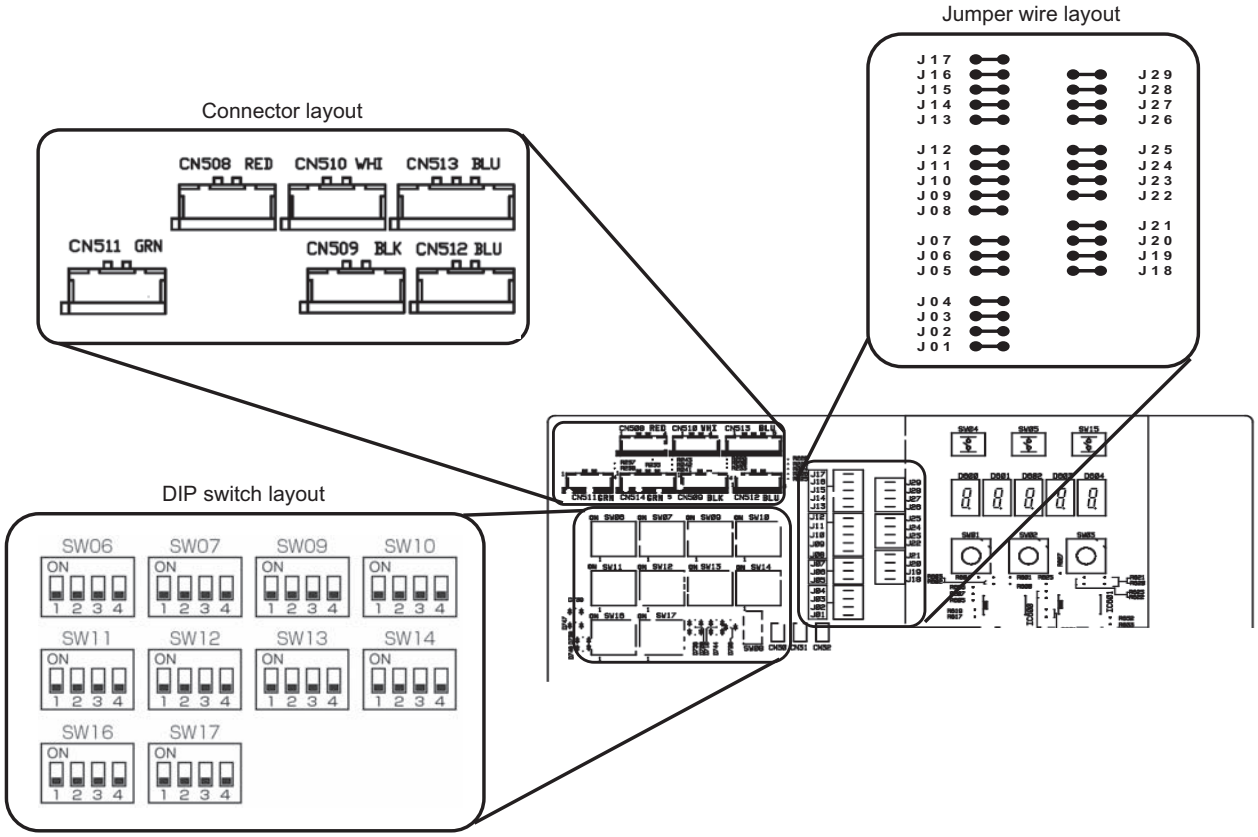


■ Mini-SMMS-e

The outdoor fan high static pressure support and priority operation mode setting (cooling / heating / number of units / or priority indoor unit) functions are made available by setting relevant switches provided on the interface PCB of the outdoor unit.

The following functions become available by setting the switches on the outdoor interface PCB.

No.	Function	Switch No.	Bit
1	Outdoor fan high static pressure shift	SW10	2
2	Cooling priority, Heating priority control	SW11	1, 2



10-2 Outdoor fan high static pressure shift

Purpose / characteristics

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 PCB 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.

Specification

Increase the speed of the propeller fan units on the outdoor fan to allow the installation of a duct with a maximum external static pressure not greater than specified in the table below. If a discharge duct with a resistance greater than 15 Pa (1.5 mmAq) is to be used, enable this function. The maximum external static pressures of base units are shown Data book. In the case of combined use of multiple outdoor units, set all the units to the same maximum external static pressure as the one with the lowest maximum external static pressure.

Databook

➔Please refer the databook

10-3 Priority operation mode setting

■ SMMS-e, Mini-SMMS-e

Purpose/characteristics

This function allows switching between priority cooling and priority heating.
Four patterns of priority operation mode setting are available as shown in the table below. Select a suitable priority mode according to the needs of the customer.

Setup

⚠CAUTION

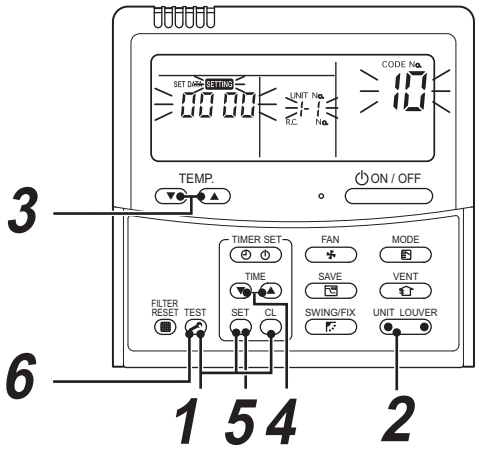
In the case of the priority indoor unit mode, it is necessary to set up the specific indoor unit chosen for priority operation (a single unit only).

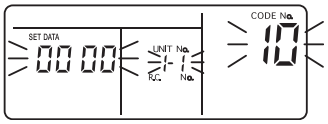
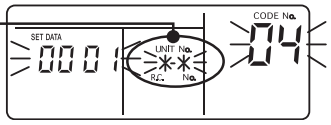
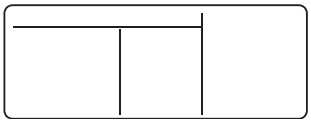
(1) Outdoor unit setup method (header unit)

SW11		Operation
Bit 1	Bit 2	
OFF	OFF	Priority heating (factory default)
ON	OFF	Priority cooling
OFF	ON	Priority operation based on No. of units in operation (priority given to the operation mode with the largest share of units in operation)
ON	ON	Priority indoor unit (priority given to the operation mode of the specific indoor unit set up for priority operation)

10-4 Indoor unit setup in “Specific indoor unit priority” mode (Except SHRM-e)

(1) Setup switch (sw11) on interface PCB 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.)

10-5 SMMS wave tool (SMMS-e, SHRM-e only)

SMMS wave tool

"SMMS wave tool" is an application software ("Application") for the Android OS smartphone and for those who install and do maintenance to the compatible air conditioning equipment.
The Application enables checks of some of the system and data and test operations of compatible air conditioning equipment.
Please check the information about compatible air conditioning equipment and smartphone from the below URL.
Be sure to read the Operating Manual before the use of this Application, "SMMS wave tool".
You can download the Application and the Operating Manual from the below URL or QR code.
QR code is a trademark or registered trademark of DENSO WAVE Inc.
Android is a trademark or registered trademark of Google Inc.

URL: http://www.toshiba-carrier.co.jp/global/appli/smms_wave_tool/

QR code

NOTICE

- This Application enables the auto-address setup and the test operation of the outdoor unit by smartphone in 48 hours from the power input to the outdoor unit.
- You should decide whether to make use of this auto-address setup and test operation function at its own responsibility and also be sure to confirm notices in the Operating Manual before performing the test operation.
- If you want to disable the function of the auto-address setup and the test operation, perform the following operations.
- Refer to the service manual for setting change of the auto-address setup and the test operation function to be effective.

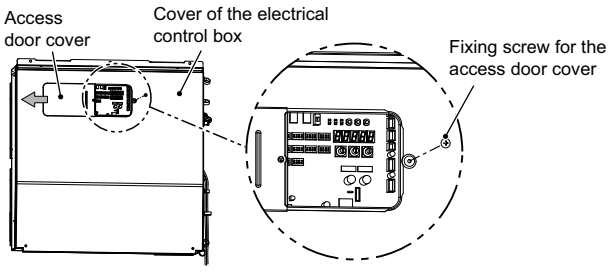
■Switch setting of some functions prohibition

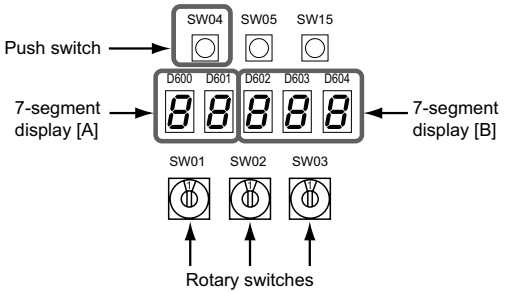
Step	Rotary switch			Push switch	7-segment display	Condition
	SW01	SW02	SW03	SW04	[A] [B]	
(1)	2	1	14	–	[nf] [c.00]	Setting preparation
(2)	2	1	14	Press for more than 5 secs	[nf] [c.01]	Setting completion
(3)	1	1	1	–	[U.1.] [- - -]	Return the switch

* Do it again if the 7-segment display is different from the above.
* The functions other than the auto-address setup and test operation of this Application can work normally even if the auto-address set up and test operation function are disabled.

⚠ CAUTION

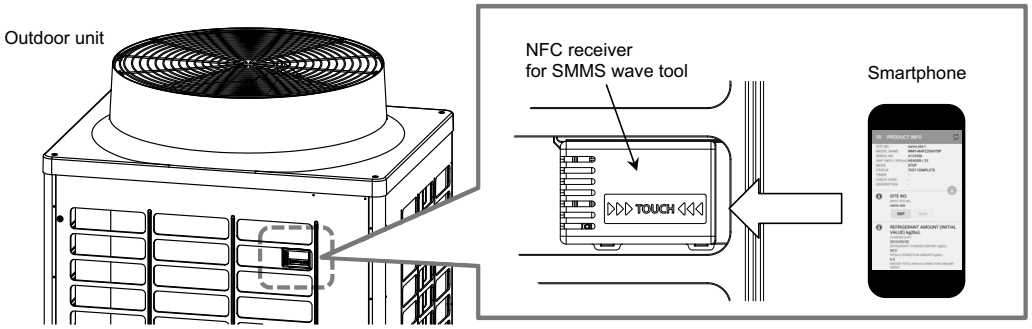
- High voltage parts exist in the electrical control box.
  If you set Switch setting, set it from the access door cover of the electrical control box cover to avoid electric shock.
- After finishing operations, slide the access door cover to the position before and fix it with the screw.





HOW TO USE

- This Application uses the NFC (Near Field Communication) function of smartphone.
- For the use, hold your smartphone to the "TOUCH" mark of the outdoor unit.
- Refer to the Operating Manual of the "SMMS wave tool" for the details.



11

Outdoor unit controls for DI/SDI

11-1 Category Compatibility list for DI/SDI Optional Control for Outdoor unit

11-2 DI/SDI Twin, Triple system control logic

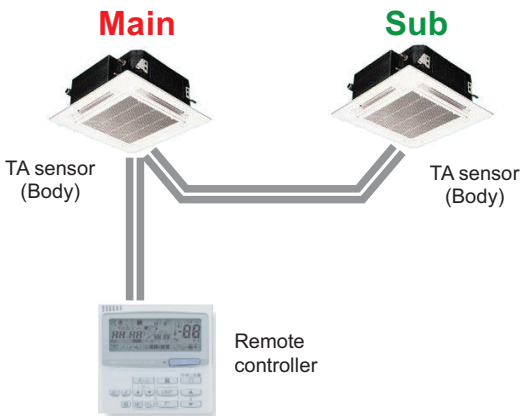
11-1 Category Compatibility list for DI/SDI Optional Control for Outdoor unit

<table>
<tr><th rowspan="2">Function
Outdoor</th><th>TCB-KBOS1E (cable)</th><th>TCB-PCOS1E2 (Board)</th><th colspan="8">Setting</th></tr>
<tr><td>Peak cut/night operation/ Compressor on status</td><td>Peak cut/night operation/ Compressor on status</td><td>Applicable model</td><td>High static pressure</td><td>Existing piping</td><td>Power saving</td><td>Snow-proof Fan control</td><td>Defrost Time change</td><td>Max frequency change</td><td>Cooling only</td></tr>
<tr><td rowspan="2">DI 4 series</td><td rowspan="2">yes</td><td rowspan="2">no</td><td>All</td><td>-</td><td>Sw802 no3</td><td>Sw802 no2</td><td>Sw802 no1</td><td>J805, 806</td><td>J807</td><td>J808</td></tr>
<tr><td>-</td><td>Note1</td><td>Note2</td><td>Note3</td><td>Note4</td><td>Note5
<table><tr><td></td><td colspan="2">RAV-SM224</td><td colspan="2">RAV-SM280</td></tr><tr><td></td><td>COOL</td><td>HEAT</td><td>COOL</td><td>HEAT</td></tr><tr><td>No cut</td><td>78.0</td><td>74.4</td><td>91.2</td><td>96.0</td></tr><tr><td>cut</td><td>66.6</td><td>66.6</td><td>76.8</td><td>76.8</td></tr></table></td><td>Note6</td></tr>
<tr><td rowspan="6">SDI 4 series</td><td rowspan="6">yes
excluding 1.5-1.7 HP</td><td rowspan="6">yes
only following model
RAV-SP404AT-E/ATZ-E/ ATZG-E, SP454AT-E/ATZ-E/ ATZG-E, SP564AT-E/ATZ-E/ ATZG-E</td><td rowspan="2">SP56</td><td>-</td><td>Sw801 no3 on sub PCB</td><td>Sw801 no2 on sub PCB</td><td>-</td><td>-</td><td>-</td><td>Sw801 no1 on sub PCB</td></tr>
<tr><td>-</td><td>Turn off. 19.1 Ø can not be used.</td><td>Note2</td><td>-</td><td>-</td><td>-</td><td>Turn ON when Cooling only DN “0F” also can set.</td></tr>
<tr><td rowspan="2">SP80</td><td>Sw802 no4</td><td>Sw802 no3</td><td>Sw802 no2</td><td>Sw802 no1</td><td>J805, 806</td><td>J807</td><td>J808</td></tr>
<tr><td>Note8</td><td>Note1</td><td>Note2</td><td>Note3</td><td>Note4</td><td>Note5
<table><tr><td></td><td colspan="2">RAV-SP80</td></tr><tr><td></td><td>COOL</td><td>HEAT</td></tr><tr><td>No cut</td><td>72.0</td><td>99.6</td></tr><tr><td>cut</td><td>72.0</td><td>79.2</td></tr></table></td><td>Note6</td></tr>
<tr><td rowspan="2">SP110
SP140
SP160</td><td>Sw802 no4</td><td>Sw802 no3</td><td>Sw802 no2</td><td>Sw802 no1</td><td>J805, 806</td><td>J807</td><td>J808</td></tr>
<tr><td>Note8</td><td>Note1</td><td>Note2</td><td>Note3</td><td>Note4</td><td>Note5
<table><tr><td></td><td colspan="2">RAV-SP1104</td><td colspan="2">RAV-SP1404</td><td colspan="2">RAV-SP1604</td></tr><tr><td></td><td>COOL</td><td>HEAT</td><td>COOL</td><td>HEAT</td><td>COOL</td><td>HEAT</td></tr><tr><td>No cut</td><td>53.4</td><td>71.4</td><td>64.2</td><td>96.0</td><td>74.4</td><td>100.2</td></tr><tr><td>cut</td><td>53.4</td><td>64.2</td><td>64.2</td><td>72.0</td><td>74.4</td><td>79.8</td></tr></table></td><td>Note6</td></tr>
</table>

Note1: Turn on when 19.1 Ø is used for existing pipe. In this case, the heating capacity may be lower according to outside temp and indoor temperature in heating operation.
Note2: Turn on for power saving. The control to lower the compressor frequency 10% is performed by indoor Heat exchanger temperature in heating operation.
Note3: Turn on for snow-proof. When snow enters, the control to prevent generation of motor lock is validated. When outside temperature is below 0°C though the compressor 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 compressor frequency, cut the JP wire. Max frequency at cooling/heating is lowered. In this case max capacity decreases.
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, the upper limit value of static pressure for duct is 5 Pa or less on 25°C and please use straight duct. In this case, the outdoor noise level may increase.

11-2 DI/SDI Twin, Triple system control logic

Control logic



	Main	Sub
Line address	1	1
Indoor address	1	2

Main indoor unit
= Communicate with outdoor unit
(Serial communication)
= Communicate with salve indoor

Sub indoor unit
= No Communication with outdoor unit
(No error judgment of serial signal)
= Communication with master indoor
= No error detection of serial communication

Thermo control

Thermo-off = "Off priority"
Header / Follower = ON/OFF → Thermo-OFF
Header / Follower = OFF / ON → Thermo-OFF

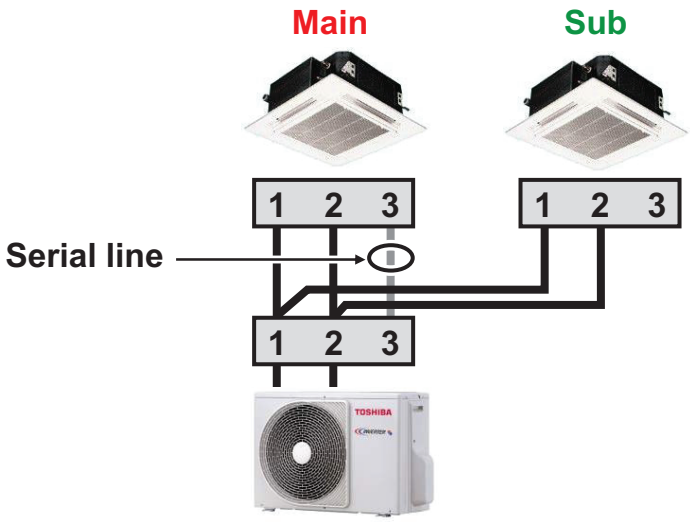
Thermo ON control
Header / Follower = ON/ON → Thermo-ON
Header / Follower = OFF/ON → Thermo-OFF
Header / Follower = ON/OFF → Thermo-OFF

(Note) When remote controller sensor is selected, both indoor units use remote controller sensor as "TA sensor".

< Auto mode >
Main indoor unit decides operation mode.

< Auto fan speed >
Fan speed control is performed individually among main/sub indoor units.

< Sub indoor unit >
- Indoor unit without serial communication become Sub indoor unit.
- The data of sub indoor unit is not memorized in EEPROM.
  When turned on the power, judgment of main/sub indoor unit is performed every time.



12

Common function and specification

12-1 List of application control function
12-2 Specification for Co-existence of each system on the same TCC-link bus line
12-3 System wiring diagram and control wiring method
12-4 Indoor / outdoor, Central control Communication Specification
12-5 HA Terminal Specification
12-6 Address Setup
12-7 The difference between VRF & DI/SDI in Energy Save operation
12-8 Outline of Energy monitoring and billing system
12-9 Software Combination for BMS

12-1 List of application control function

✓: Command / Monitoring
△: Operation only
◇: Monitoring only

No	Type	Model Name		System	Function																																			AtoA			I/O port				Outdoor unit									Remarks
					TCS-NET Relay Interface BMS-IFLSV4E	Schedule timer TCB-EXS21TLE	TCC-link line	Indoor unit	On / Off	Mode	Setting Temperature	Dual set point	Fan Speed	Timer Function	Schedule Function	Multi language	Energy Save Function	Permit/Prohibit function	Filter dirty indicator	Error Display	Error history	Return back	Room temperature monitoring	Ventilation with Indoor	DN code	WEB connection	Option interface connection with BMS-IFDD03E	Digital I/O Relay Interface BMS-IFDD03E	Energy monitoring with BMS-IFWH5E	Energy monitoring Relay Interface BMS-IFWH5E	Demand function	Data analyzer	Error information transfer function by E-mail	On / Off	Mode	Fan Speed	DI	DO	AI	AO	Power peak cut	Snowfall fan	External master ON/OFF	Night operation	Operation mode selection	Error/Operation output	Compressor operation status	Operation output ratio	
1	1:1	Wired remote controller	RBC-AMT32E	VRF,DI, SDI	-	✓	-	1	✓	✓	✓	-	✓	✓	-	-	✓	-	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2		Remote controller with weekly timer	RBC-AMS41E		-	-	-	1	✓	✓	✓	-	✓	✓	✓	-	✓	-	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3		Wired remote controller	RBC-AMS54E-ES/ EN		-	-	-	1	✓	✓	✓	✓ (*7)	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	
4		Wired remote controller for Air to Air Heat Exchanger with DX coil unit	NRC-01HE		-	-	-	1	✓	✓	✓	-	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	
5		Simple wired remote controller	RBC-AS41E		-	-	-	1	✓	-	✓	-	✓	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6		Wireless remote controller kit	RBC-AX32U(W/ WS)-E		-	-	-	1	✓	✓	✓	-	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7			RBC-AX33CE		-	-	-	1	✓	✓	✓	-	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8			TCB-AX32E2		-	-	-	1	✓	✓	✓	-	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9			RBC-AX32UW(W)-E		-	-	-	1	✓	✓	✓	-	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	CRC (*6)	Schedule timer	TCB-EXS21TLE		-	-	1	64	✓	-	-	-	-	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11		ON-OFF controller	TCB-CC163TLE2		-	✓	1	16	✓	-	-	-	-	✓ (*3)	✓ (*3)	-	-	-	-	✓ (*2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12		Compliant manager	BMS-CM1280TLE		-	✓	2	128	✓	✓	✓	-	✓	✓ (*3)	✓ (*3)	-	-	✓	✓	✓	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-	-	-	-	-	
13		Smart manager	BMS-SM1280HTLE		-	✓	2	128	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	4	✓	4	✓	-	-	✓	✓	✓	3	2	-	-	-	-	-	-	-	-	-	-	-	
14		Smart manager with data analyzer	BMS-SM1280ETLE		-	✓	2	128	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	4	✓	4	✓	✓	✓	✓	✓	✓	3	2	-	-	✓	-	-	-	-	-	-	-	-	
15		Touch Screen Controller	BMS-CT5120E		✓	-	12	512	✓	✓	✓	-	✓	✓	✓	-	-	✓	✓	✓	✓	-	✓	-	-	-	✓	8	✓	8	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	
16		Touch Screen Controller	BMS-CT5021E		✓	-	12	512	✓	✓	✓	-	✓	✓	✓	-	-	✓	✓	✓	✓	-	✓	-	-	✓	✓	8	✓	8	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	
17	BMS (*6)	LonWorks LN Interface	TCB-IFLN642TLE		-	-	1	64	✓	✓	✓	-	✓	-	-	-	-	✓	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18		BACnet Server	BMS-LSV6E		✓	-	8	128	✓	✓	✓	-	✓	✓	✓	-	-	✓	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19		BN Interface	BMS-IFBN640TLE		-	-	1	64	✓	✓	✓	-	✓	✓	✓	-	-	✓	✓	✓	✓	-	✓	-	-	-	✓	8	✓	8	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	
20		Modbus Interface	TCB-IFMB641TLE		-	-	1	64	✓	✓	✓	-	✓	-	-	-	-	✓	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21		Analog Interface	TCB-IFCB640TLE		-	-	1	64	✓	✓	✓	-	✓	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	8	5	-	-	-	-	-	-	-	-	-	
22	Indoor unit	Remote location ON/OFF Control box	TCB-IFCB-4E2		-	-	-	1	✓	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	
23		General Purpose Interface	TCB-IFCG1TLE		-	-	1	63	✓ (*4)	✓ (*4)	✓ (*4)	-	✓ (*4)	-	-	-	✓ (*4)	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	4	4 (*5)	2 (*5)	-	-	-	-	-	-	-	-	-	
24		GSM Phone Control Interface	TCB-IFGSM1E		-	-	-	1	✓	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GSM SMS
25		Remote sensor	TCB-TC21LE2		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Remote sensing of indoor air temperature
26		Central control with "1:1 model"	TCB-PCNT30TLE2	DI,SDI	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
27		Connection Interface Kit	TCB-PX30MUE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	For 4-way cassette 4series, Compact 4-way cassette 2series
28		Optional connecting cable	TCB-PCUC1E	VRF,DI, SDI (Not all)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29		Connectors	TCB-KBCN32VEE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	△	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	CN32 on indoor unit
30			TCB-KBCN60OPE		-	-	-	1	◇	◇	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	CN60 on indoor unit
31			TCB-KBCN61HAE		-	-	-	1	✓	-	-	-	-	-	-	-	-	△	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	CN61 on indoor unit
32			TCB-KBCN70OAE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	△	△	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	CN70 on indoor unit
33			TCB-KBCN73DEE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	CN73 on indoor unit
34			TCB-KBCN80EXE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	△	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	CN80 on indoor unit

No	Type	Model Name		System	Function																																			AtoA			I/O port				Outdoor unit									Remarks
					TCS-NET Relay Interface BMS-IFLSV4E	Schedule timer TCB-EXS21TLE	TCC-link line	Indoor unit	On / Off	Mode	Setting Temperature	Dual set point	Fan Speed	Timer Function	Schedule Function	Multi language	Energy Save Function	Permit/Prohibit function	Filter dirty indicator	Error Display	Error history	Return back	Room temperature monitoring	Ventilation with Indoor	DN code	WEB connection	Option interface connection with BMS-IFDD03E	Digital I/O Relay Interface BMS-IFDD03E	Energy monitoring with BMS-IFWH5E	Energy monitoring Relay Interface BMS-IFWH5E	Demand function	Data analyzer	Error information transfer function by E-mail	On / Off	Mode	Fan Speed	DI	DO	AI	AO	Power peak cut	Snowfall fan	External master ON/OFF	Night operation	Operation mode selection	Error/Operation output	Compressor operation status	Operation output ratio	
35	Outdoor unit	Power peak-cut control board	TCB-PCDM4E	VRF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	✓	-	-	-	-	-	-	-	CN513 on Outdoor unit
36		External master ON/OFF control board	TCB-PCMO4E		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	△	△	△	△	-	-	-	CN509, CN512, CN508, CN510 on Outdoor unit
37		Output control board	TCB-PCIN4E		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	◇	◇	◇	CN511, CN514 on Outdoor unit
38		Digital Inverter Air Conditioner Application Control Kit	TCB-PCOS1E2	DI (Series2,3), SDI (Series4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	1	-	-	△	-	-	△	-	-	◇	-	
39		Optional Connector Cable	TCB-KBOS1E	DI (Series4), SDI (Series4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	1	-	-	△	-	-	△	-	-	◇	-	

(*1) : The error indication is displayed with LED of the receiver unit.
(*2) : Error can be recognized by blink of the button on the remote controller. However, error code is not displayed.
(*3) : Schedule timer (TCB-EXS21TLE) needed.
(*4) : Operation of specified indoor units can be controlled with input ports. Setting parameters by programming tool.
(*5) : Accessible to all I/Os from Modbus System TCB-IFMB641TLE.
(*6) : Central control device : Up to 10 units can be connected in one line (TCC-link)
(*7) : Dual set point function can operate only SMRM-e combination

12-2 Specification for Co-existence of each system on the same TCC-link bus line

✓ : Compatibility on the same TCC-Link bus line

Model Name	Schedule timer TCB-EXS21TLE	ON-OFF controller TCB-CC163TLE2	Central remote controller TCB-SC642TLE2	Compliant manager BMS-CM1280TLE	Compliant manager (Web) BMS-CM1280FTLE	Smart BMS Manager BMS-SM1280HTLE	Smart BMS Manager with data analyzer BMS-SM1280ETLE	Touch Screen Controller BMS-TP0641/5121ACE BMS-TP0641/5121PWE	Touch Screen Controller BMS-CT5120E BMS-CT5121E	WEB Based Controller BMS-WB2561PWE BMS-WB01GTE	LonWorks LN Interface TCB-IFLN642TLE	BACnet Server BMS-LSV9E+BMS-STBN10E	BN interface BMS-IFBN640TLE	Modbus Interface TCB-IFMB641TLE	Analog Interface TCB-IFCB640TLE	General Purpose Interface TCB-IFCG1TLE
Schedule timer TCB-EXS21TLE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ON-OFF controller TCB-CC163TLE2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Central remote controller TCB-SC642TLE2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Compliant manager BMS-CM1280TLE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Compliant manager(Web) BMS-CM1280FTLE	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	✓	-	-	✓
Smart BMS Manager BMS-SM1280HTLE	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	✓	-	-	✓
Smart BMS Manager with data analyzer BMS-SM1280ETLE	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	✓	-	-	✓
Touch Screen Controller BMS-TP0641/5121ACE BMS-TP0641/5121PWE	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	✓	-	-	✓
Touch Screen Controller BMS-CT5120E BMS-CT5121E	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	✓	-	-	✓
WEB Based Controller BMS-WB2561PWE BMS-WB01GTE	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-
LonWorks LN Interface TCB-IFLN642TLE	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-
BACnet Server BMS-LSV9E+BMS-STBN10E	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	✓
BN interface BMS-IFBN640TLE	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	✓
Modbus Interface TCB-IFMB641TLE	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	✓
Analog Interface TCB-IFCB640TLE	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	✓
General Purpose Interface TCB-IFCG1TLE	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓

12-3 System wiring diagram and control wiring method

12-3-1 Applicable model and connectable units

1) Applicable model

- VRF system.....Super modular multi system-e (SMMS-e)
  Super heat recovery multi system-e (SHRM-e)
  Mini-SMMS-e
- 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.

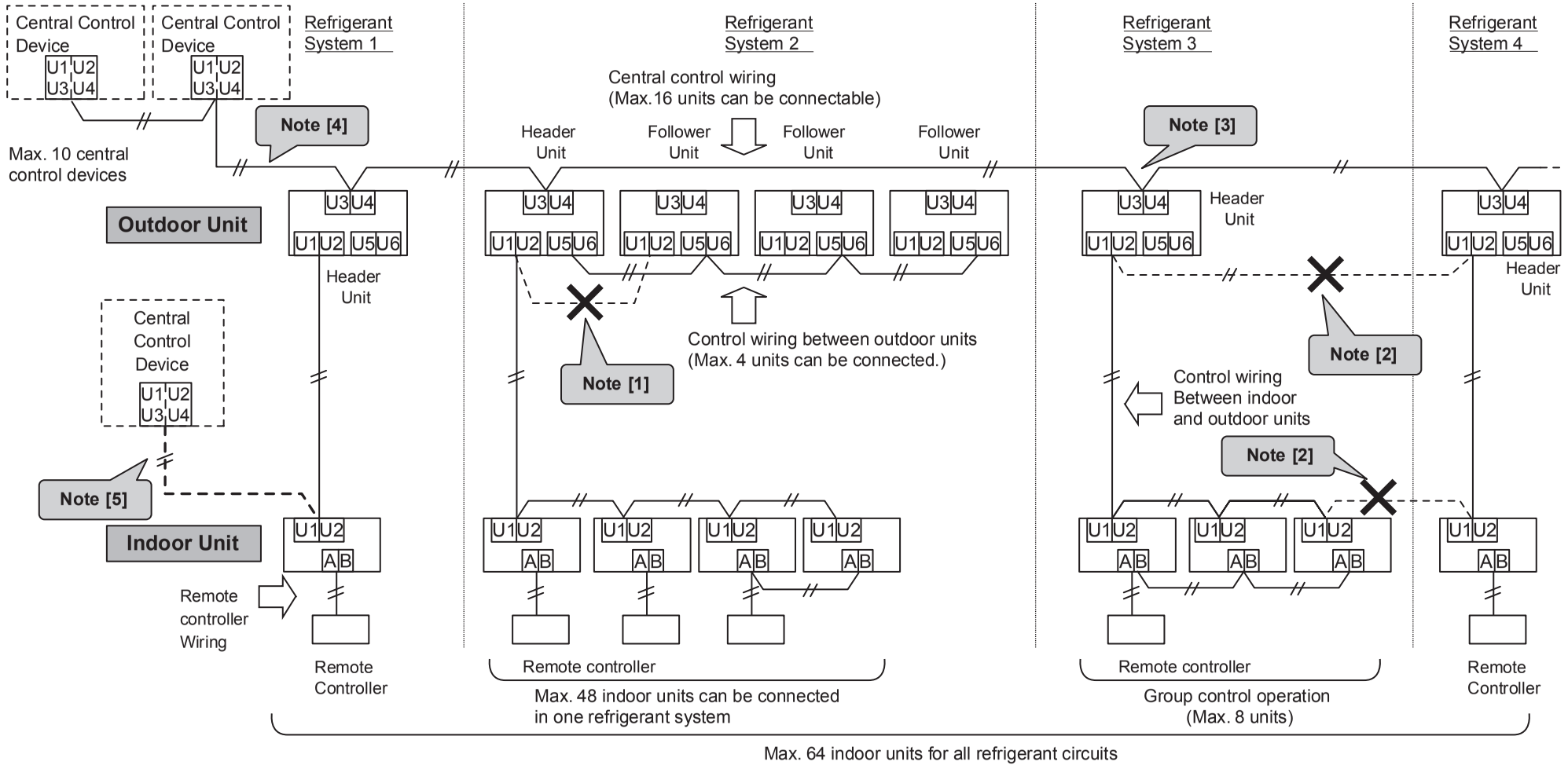
[2] For combined system with Digital Inverter / Super Digital Inverter

	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.

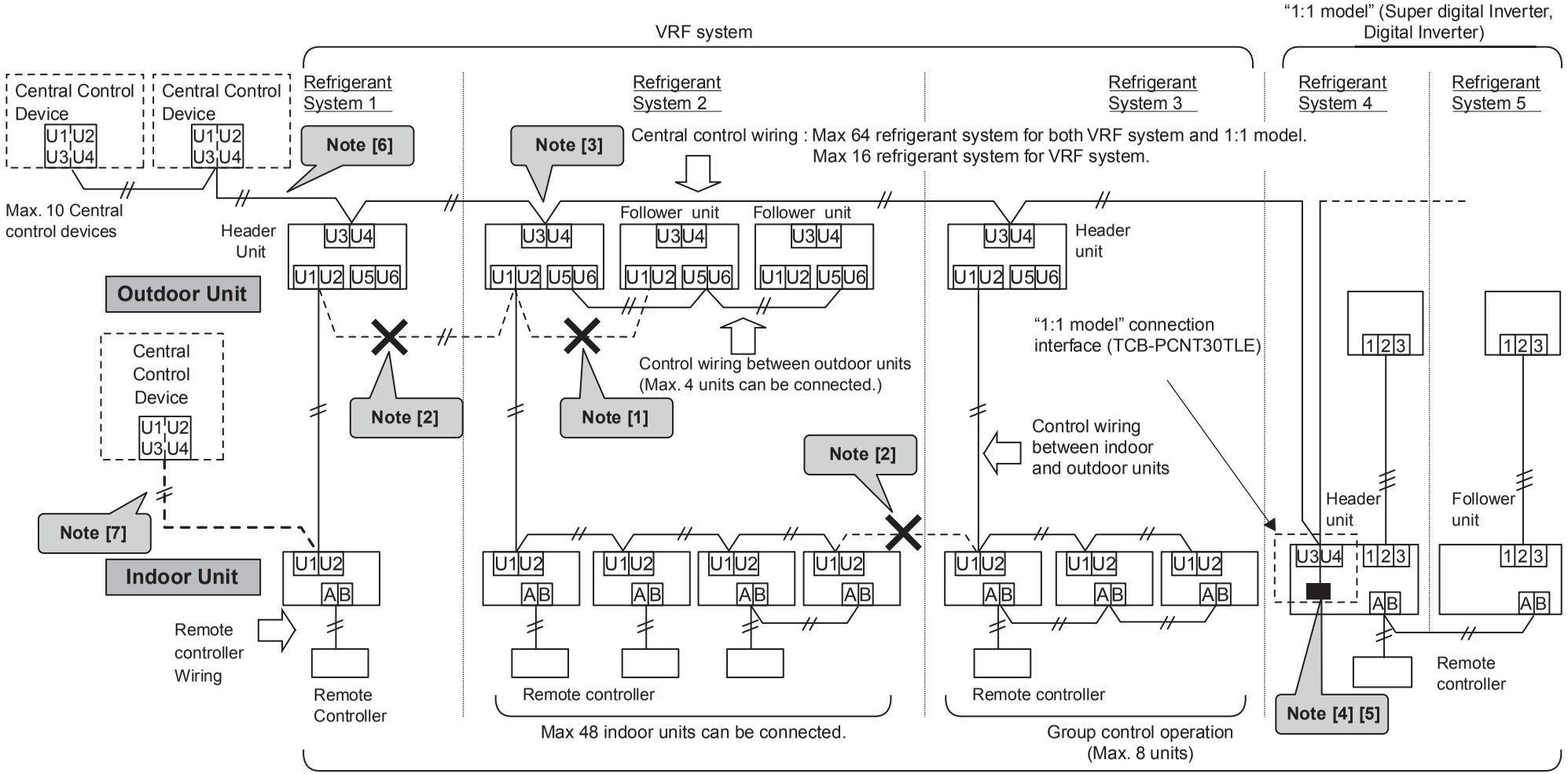
12-3-2 System wiring diagram

For VRF system only



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.

For combined system with “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 Header 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.**

12-3-3 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-indoor / outdoor-indoor control wiring, Central control wiring.

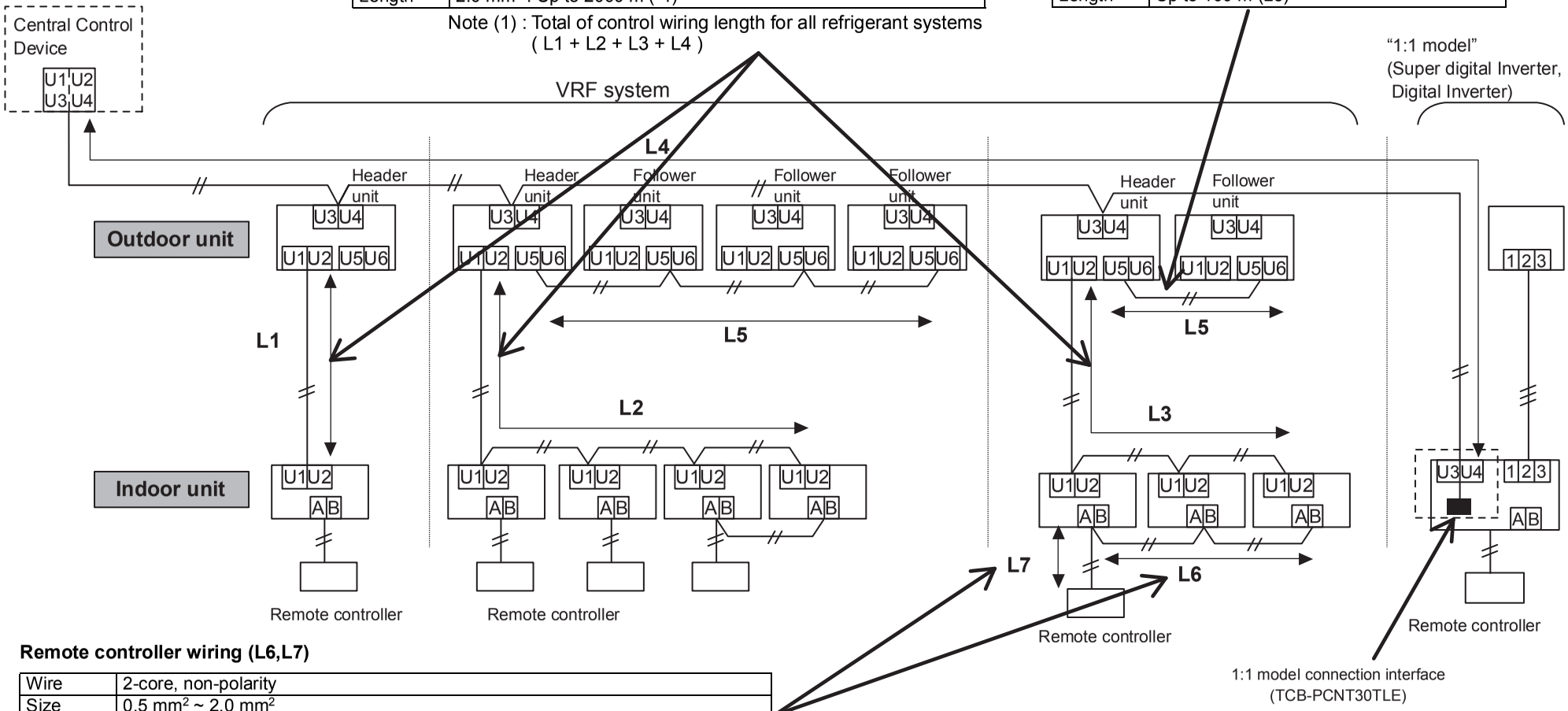
Control wiring between indoor and outdoor units (L1,L2,L3), Central control wiring (L4)

Wiring	2-core, non-polarity
Type	Shield wire
Size Length	1.25 mm² : Up to 1000 m 2.0 mm² : Up to 2000 m (*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 Length	1.25 mm² ~ 2.0 mm² Up to 100 m (L5)

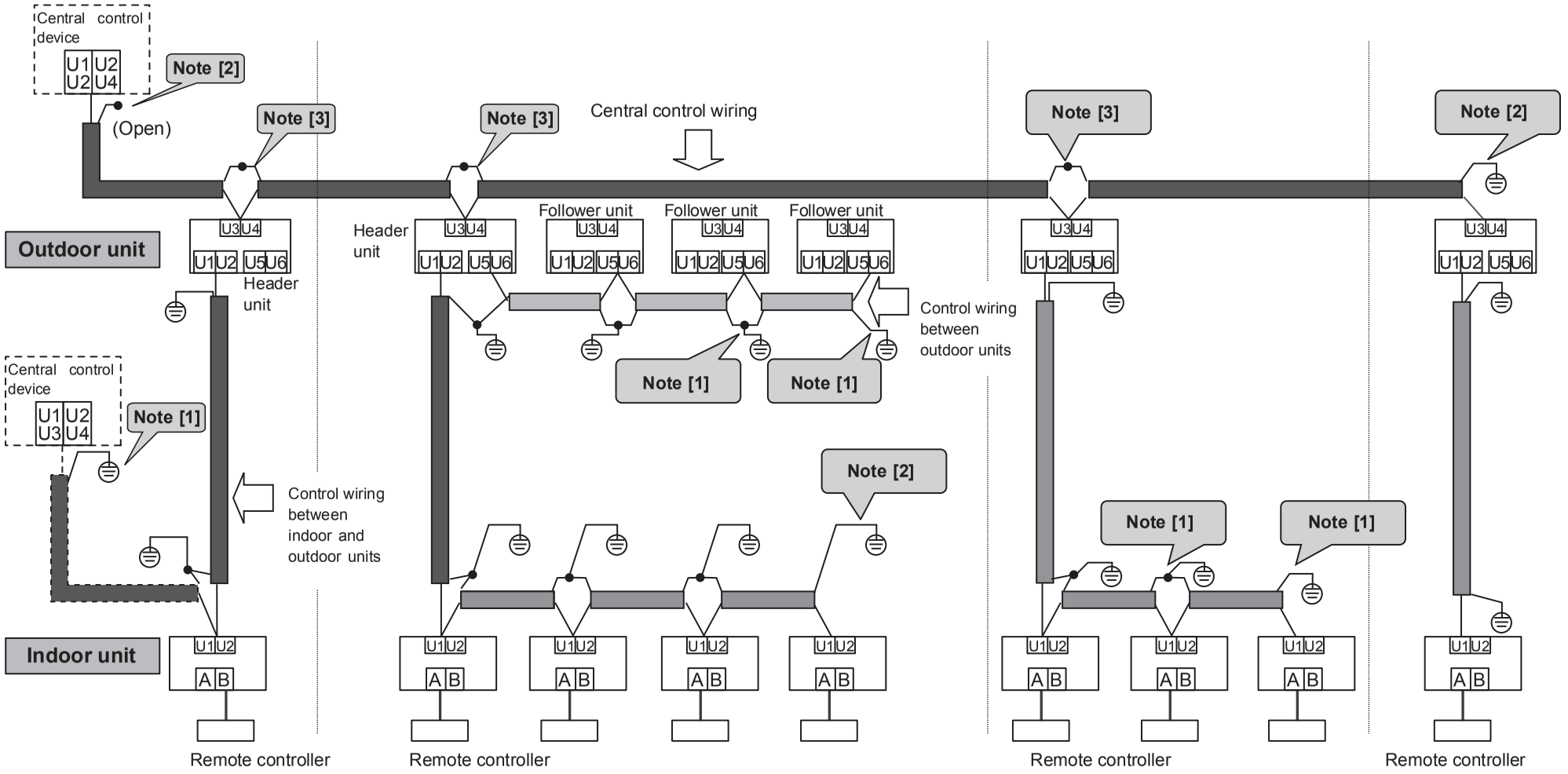


Remote controller wiring (L6,L7)

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

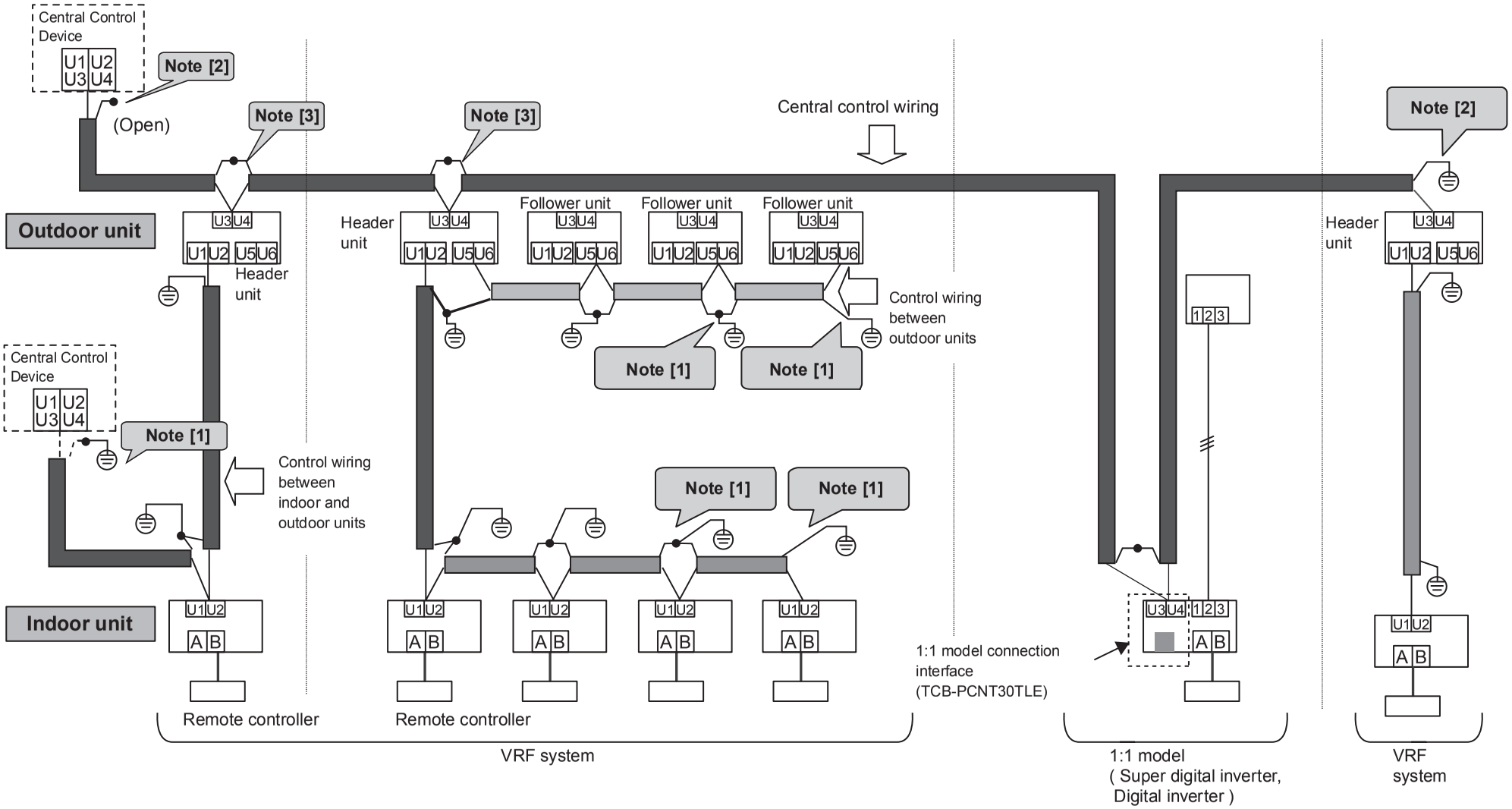
12-3-4 Earth method of shield wiring

For VRF system only



Note) [1] Be sure to close (connect) the end of the shielded wires, and perform the functional earthing 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 earthing 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.

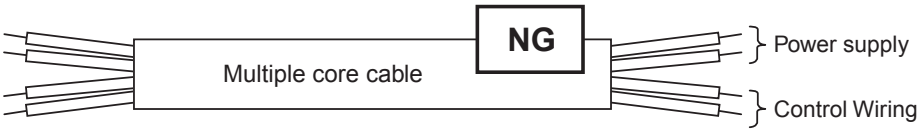
For combined system with “1:1 model”



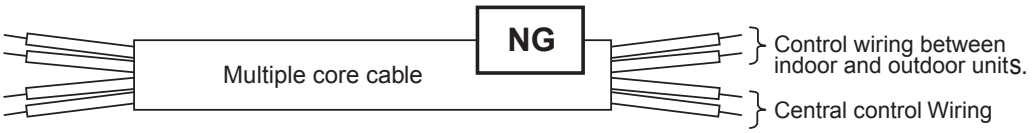
Note) [1] Be sure to close (connect) the end of the shielded wires, and perform the functional earthing for the end of wires which are connected to both indoor and outdoor units.
[2] For the shield wires which are connected between the central remote controller and the outdoor units, perform the functional earthing 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.

12-3-5 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 50 mm.
3) 300 mm or more must be needed from other power source.
4) Ensure the shielded wires on both the indoor and outdoor units are earthed.
5) Control wiring and power supply line should not be wired in the same multiple core cable.



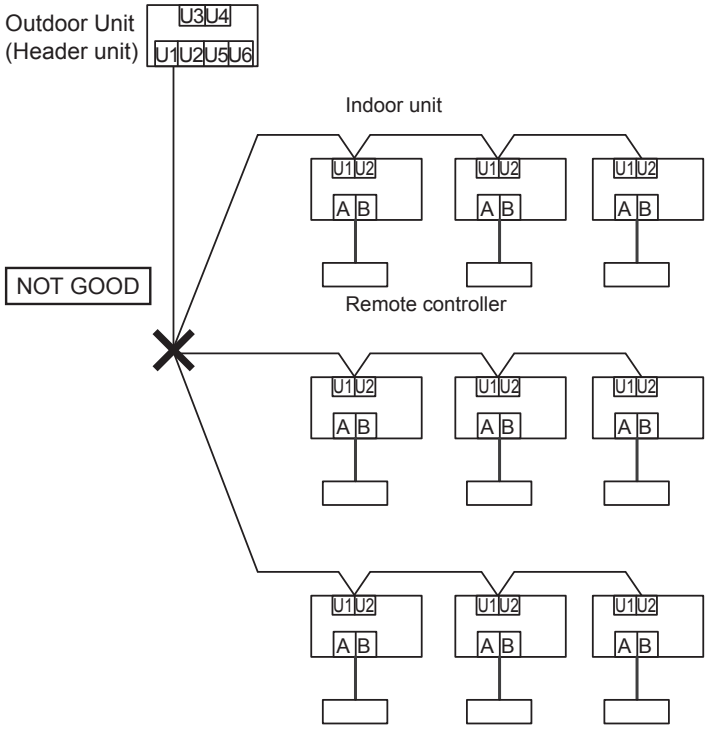
6) Do not wire two or more control wires in the same multiple core cable.



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

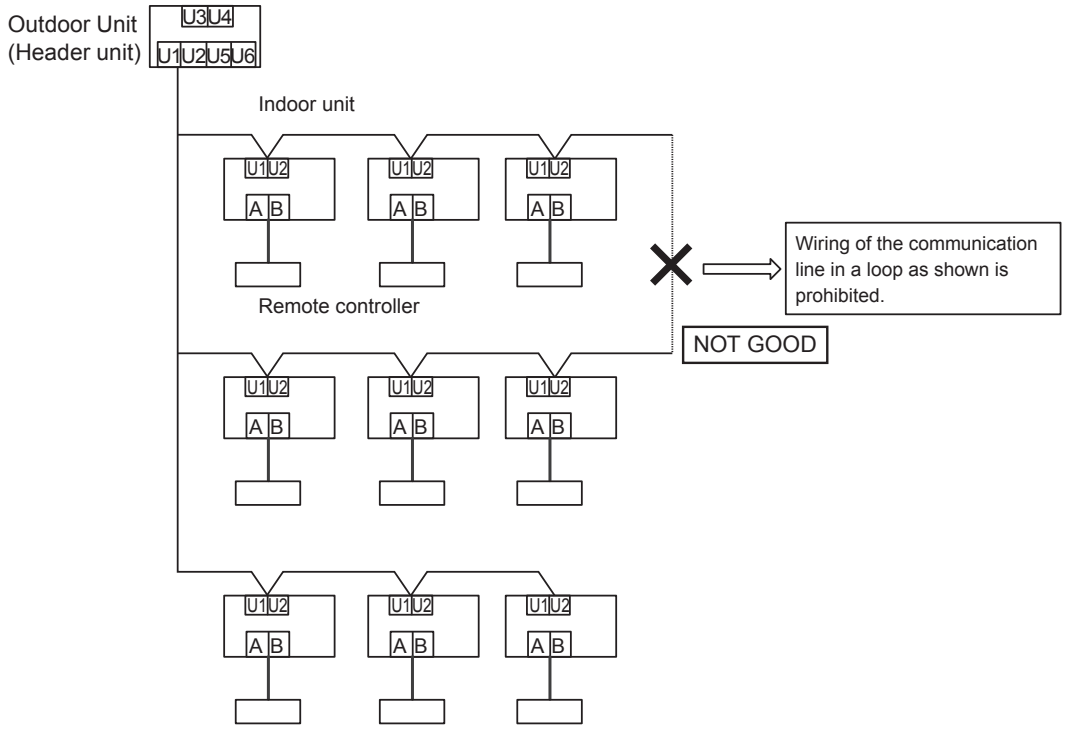
NOTE

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



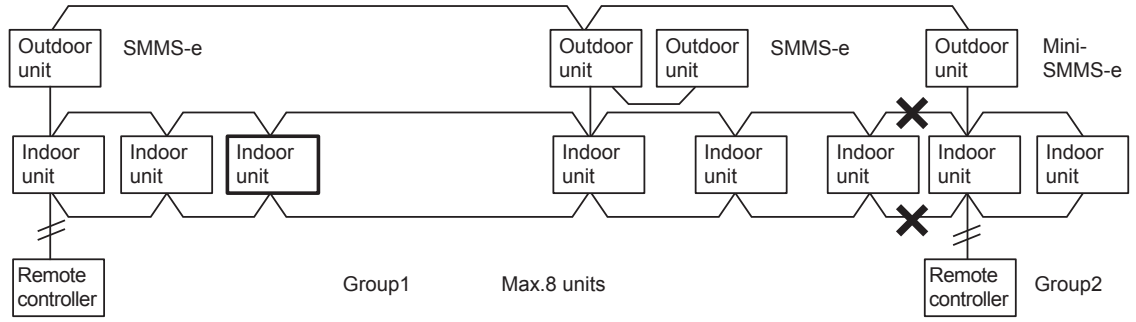
NOTE

Looped wiring of control wires is prohibited.



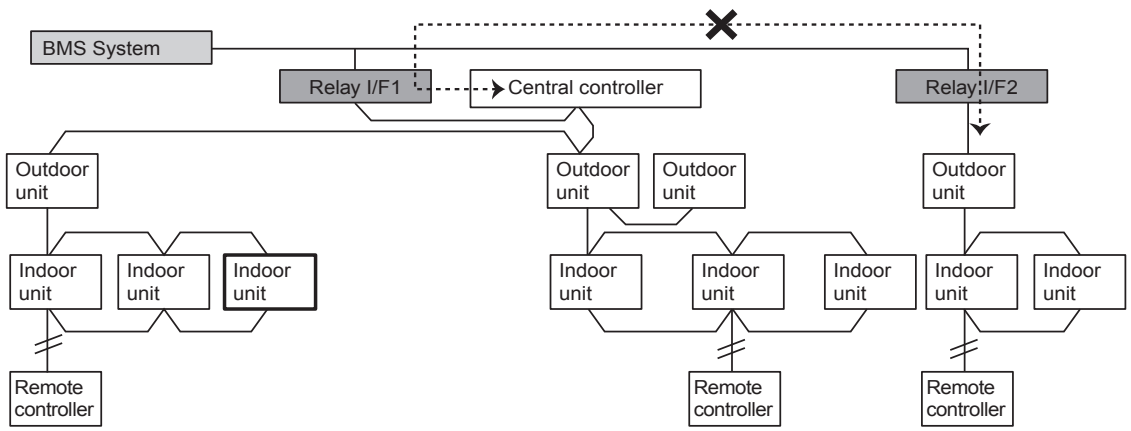
NOTE

Do not mix two or more of the following types of indoor units in a group: SMMS-e, Mini-SMMS-e, SHRM-e and DI/SDI.

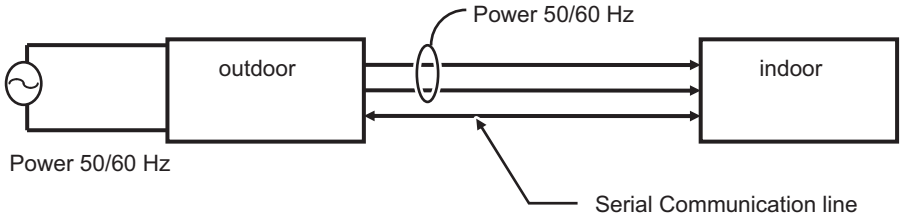


NOTE

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.)



12-4 Indoor / outdoor, Central control Communication Specification

<table>
<tr><th>Category</th><th>Portion</th><th colspan="3">Specification</th></tr>
<tr><td rowspan="8">DI/SDI</td><td>Indoor/outdoor</td><td colspan="3"> 

<table>
<tr><td>Communication method</td><td>Power-supply synchronous full duplex communication</td></tr>
<tr><td>Communication speed</td><td>50/60 bps (Power-supply frequency 50/60 Hz)</td></tr>
<tr><td>Power-supply frequency</td><td>50/60 Hz</td></tr>
</table></td></tr>
<tr><td rowspan="3">Central control</td><td colspan="2">Max Indoor/outdoor number</td><td>See 2.1</td></tr>
<tr><td colspan="2">Communication speed</td><td>9600 bps</td></tr>
<tr><td colspan="2">Physical specification</td><td>2 wires HBS</td></tr>
<tr><td rowspan="3">Remote controller</td><td colspan="2">Max Remote controller number</td><td>2</td></tr>
<tr><td colspan="2">Communication speed</td><td>2400 bps</td></tr>
<tr><td colspan="2">Physical specification</td><td>2 wires +18 v signal on power</td></tr>
<tr><td rowspan="2">VRF</td><td>Indoor/outdoor Central control</td><td colspan="3">See 2.1
Same as DI/SDI’s Central control</td></tr>
<tr><td>Indoor-sub bus remote controller</td><td colspan="2">Max Indoor/outdoor Remote controller number</td><td>Remote controller: 2, indoor: 8, others, total max 10</td></tr>
<tr><td colspan="3">Other :Same as DI/SDI remote controller bus</td></tr>
</table>

Control wiring (TCC-Link)

Main bus

Connection devices	Type	Q’ty	Size total length			Polarity	Others
			Up to 100 m	Up to 1000 m	Up to 2000 m		
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	Locally procured
Control wiring (Outdoor to Outdoor)		2 cores	1.25 to 2.0 mm^2	-			

Sub bus (remote controller)

Connection devices	Type	Q’ty	Size total length		Polarity	Others
			Indoor A/B Terminal - Remote controller Terminal			
			Up to 200 m	Up to 300 m		
Remote controller wiring (Indoor to Remote Controller wiring)	Shield wire	2 cores	IN CASE OF INCLUDING WIRELESS	IN CASE OF ONLY WIRED	Non Polarity	Locally procured
			Up to 200 m total length of control wiring between indoor units			
			0.5 to 2.0 mm^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	Locally procured
RS485 for BMS	Shield wire	2 cores	1.25 mm^2	Max total 500 m	With Polarity	Locally procured
Digital Input / Output signal Line for Compliant Manager / Touch screen	227IEC75	2 cores	0.5 mm^2	Max 100 m	Non Polarity	Locally procured
Power meter for Energy monitoring Relay I/F	227IEC75	2 cores	0.3 mm^2	Max 100 m	Non Polarity	Locally procured
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	Locally procured
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	-	Locally procured

12-5 HA Terminal Specification

Compliant to JEM 1427 STANDARD (Partial)

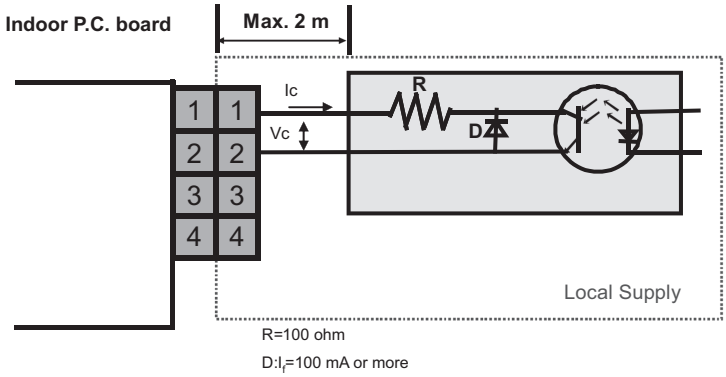
1. General outline of operation input / output terminal

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

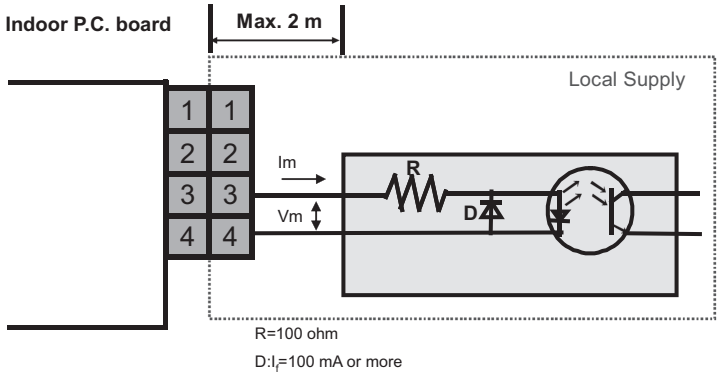
HA Terminal Standard JEM1427 (Japan Electrical Manufacturer's Association)					
Pin No.	**Mark**	**Specification**	**Notes**		
1	**C1**	**Input signal**	Pulse duration	200 to 300 ms	The terminal can input a pulse signal. When indoor unit receives a pulse signal, Indoor unit turns over status of operation 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	200 ms 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



2-2. Output signal terminal of operation status



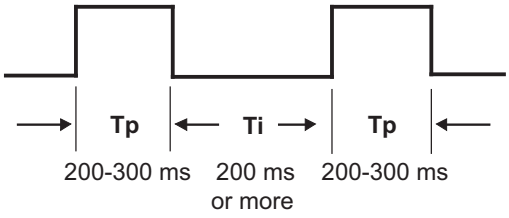
3. The connection condition and specifications of operation input / output terminal

3-1. Input signal terminal of operation status

1. Input pulse signal specifications

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

2. Input pulse pattern



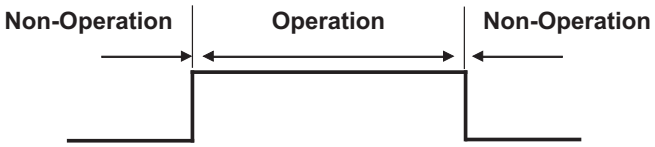
The terminal can input a pulse signal.
When indoor unit receives a pulse signal, Indoor unit turns over status of operation or stop.
- If the operation of indoor unit is running, then indoor unit turns off.
- If the operation of indoor unit is stopped, then indoor unit turns on.

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



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

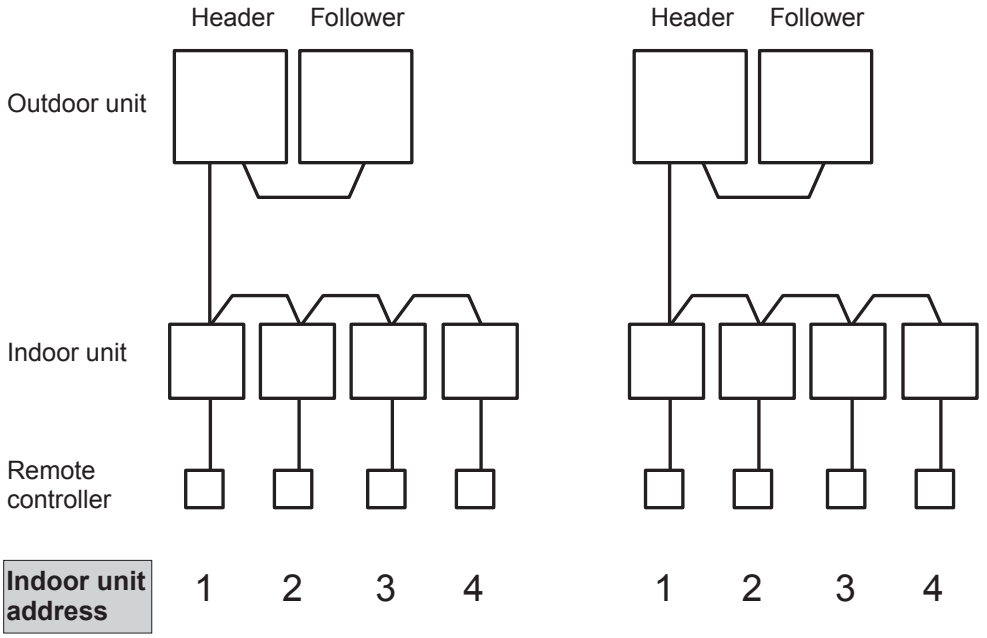
Terminal	External Photo Coupler Status		Specification		Note
1,2 PIN C1 C2	Ic	ON	Output current	More than 2 mA	
			Max tolerance current	5 mA	
		OFF	Leak current	Less than 50 ìA at Vc=30 v	
	Vc	ON	Operating voltage	Less than 0.6 v at Ic=2 mA	
		OFF	Surge tolerance voltage	More than 30 V	
3,4 PIN M1 M2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

12-6 Address Setup

12-6-1 Definition of address

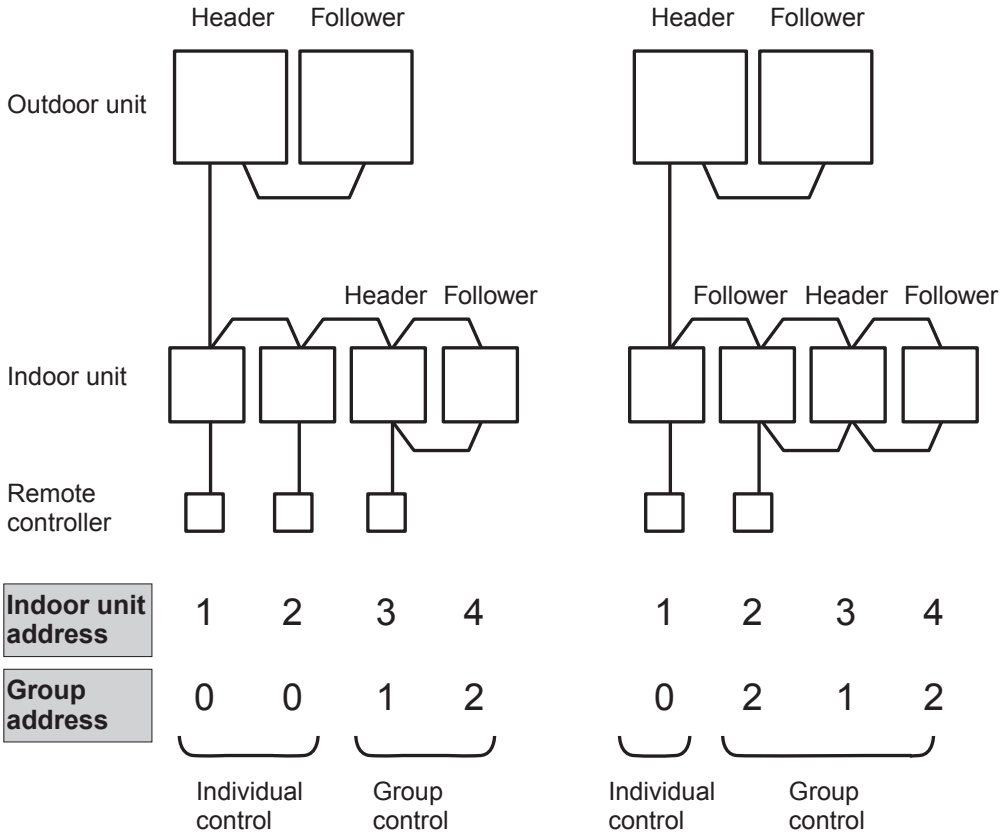
Indoor unit address

- "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.



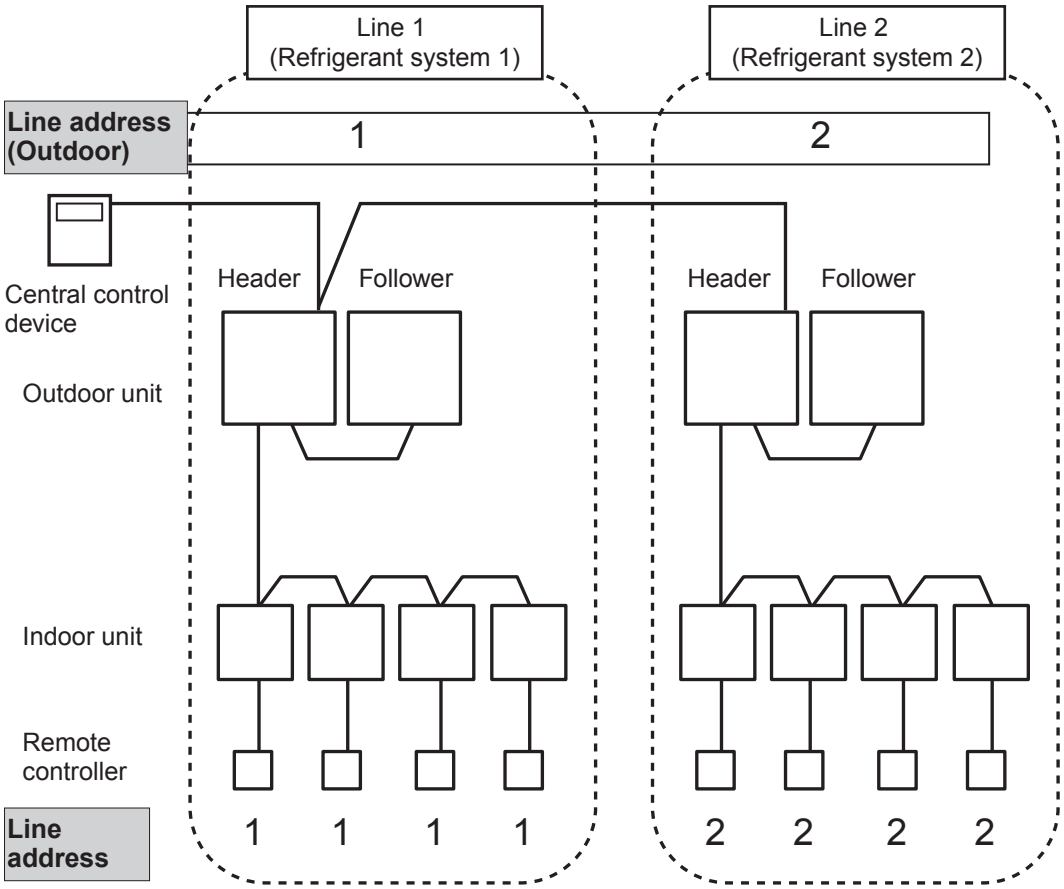
Group address

- "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



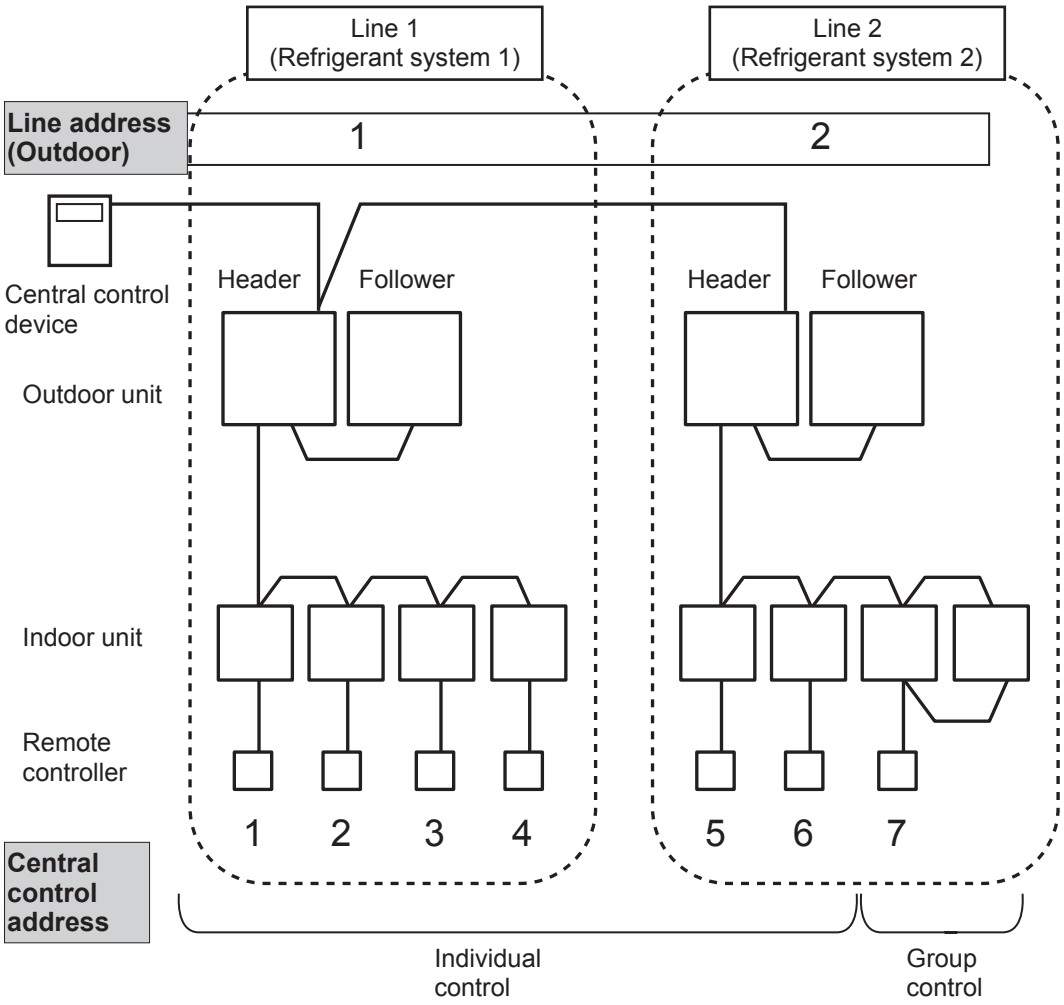
Line address (System address)

- "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 default : 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.

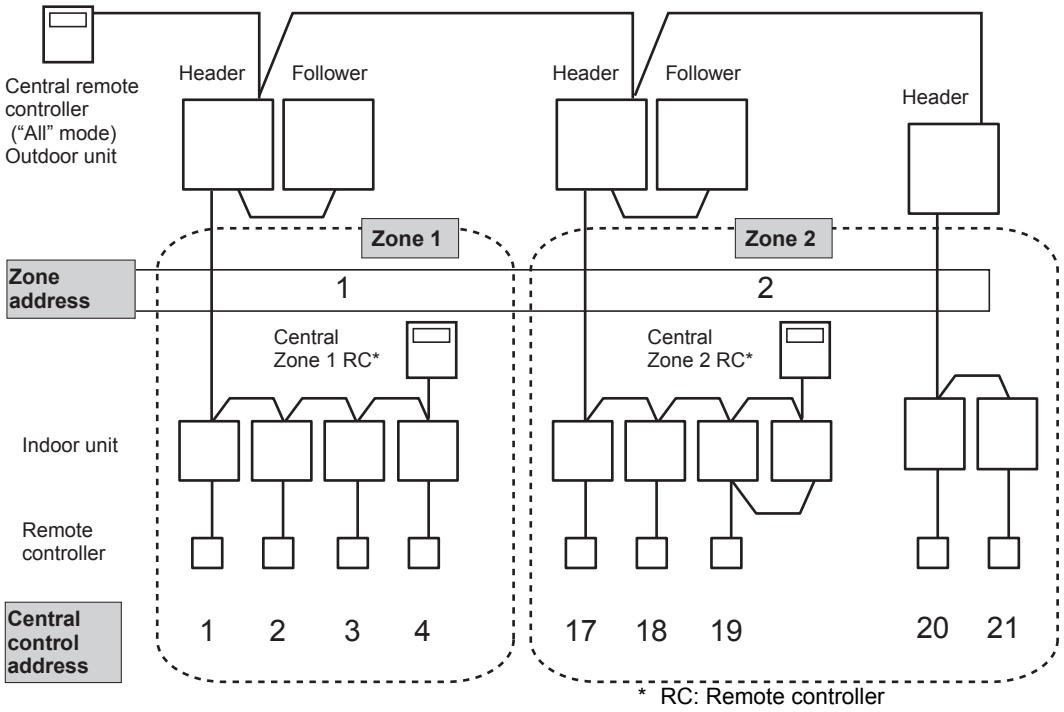


Zone address (Zone No.)

- "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



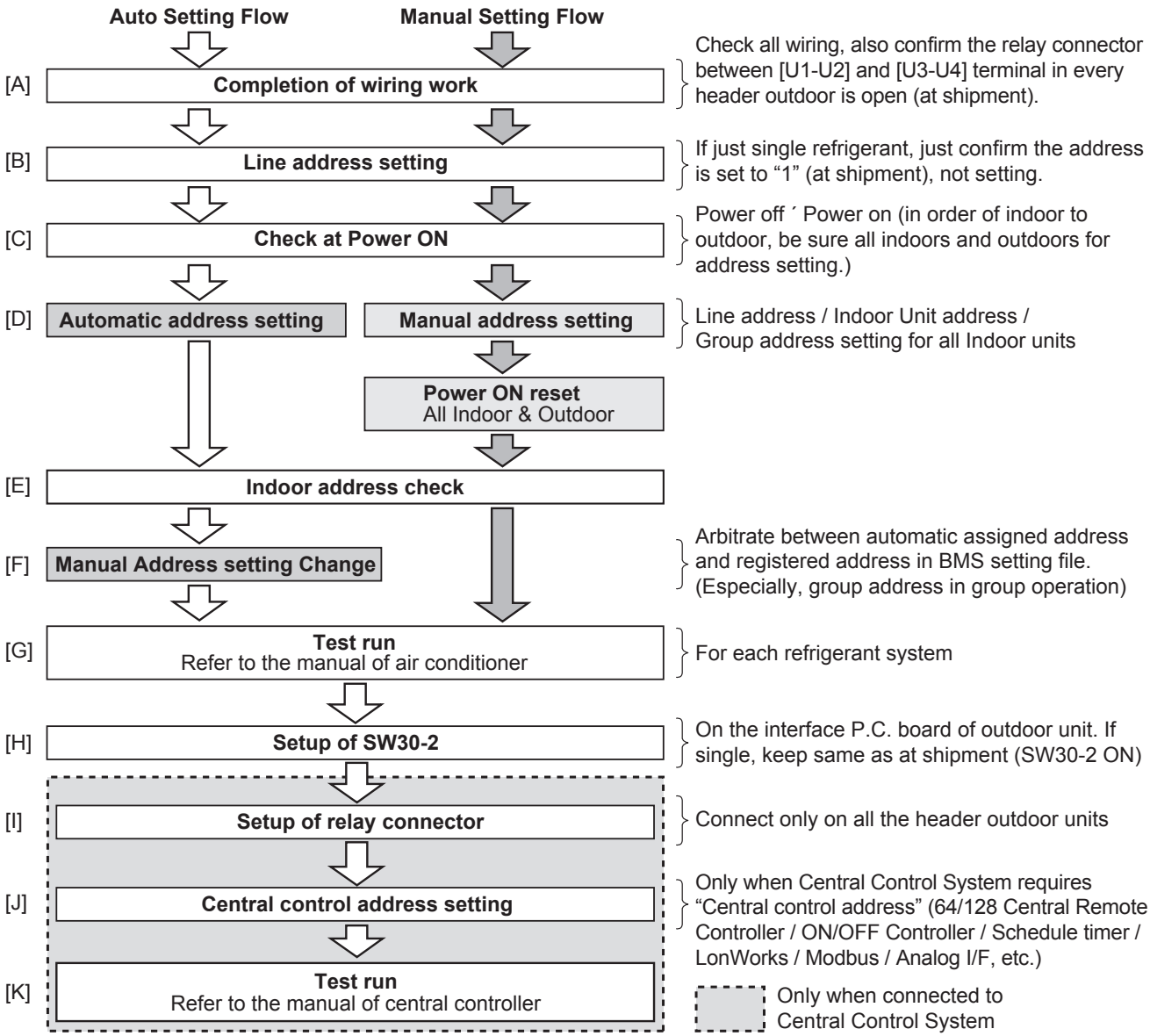
12-6-2 Address setup procedure (For VRF)

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
   * 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



12-6-3 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

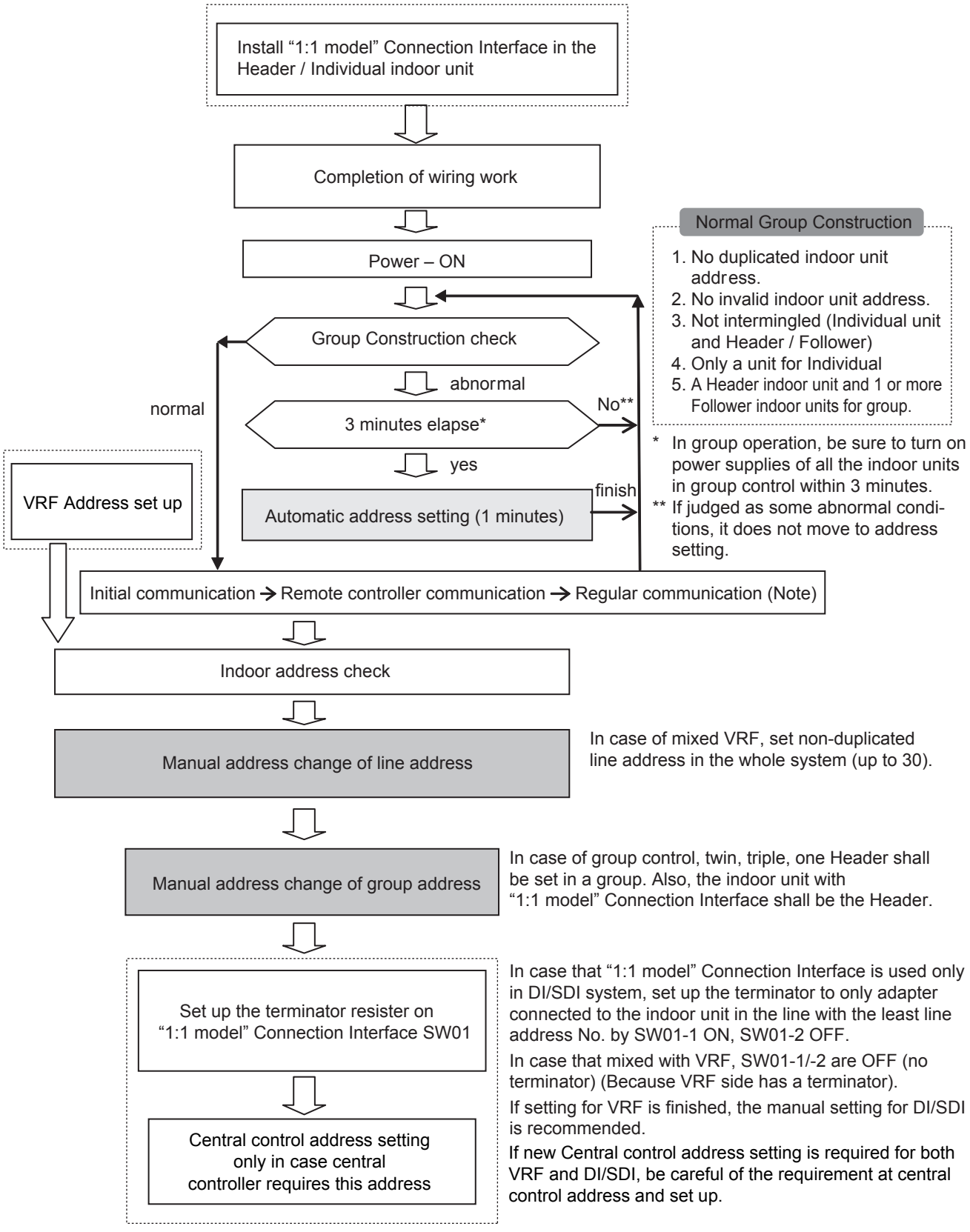
1. Set up the address after the wiring has been completed.
2. "1:1 model" Connection Interface TCB-PCNT30TLE2 is necessary for DI/SDI for central control.
   Some of Hi-wall Type does not need "1:1 model" Connection Interface. Please refer to the installation manual of each model.
   Connect the central control devices to U3/U4 wires of the central control system.
3. When "1:1 model" Connection Interface is used for the group control or twin system or triple system, the interface must be connected to the Header unit of the indoor unit. (Connection to Follower unit is unavailable). One "1:1 model" 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 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.)

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 Header/Follower units are not intermingled.
4. Only a unit for Individual.
5. A Header indoor unit and 1 or more Follower indoor units for group.

Address setting flow



12-7 The difference between VRF & DI/SDI in Energy Save operation

[1] The difference between VRF & DI/SDI in Energy Save operation

Please note that the control method in Energy saving operation is different between VRF & DI/SDI.
However the purpose of this function, Energy saving, is same and this function is operated by Remote controller.

<DI/SDI> The method to control power consumption by limiting the peak of the compressor's electric current.
= To control peak current by limiting **% of the current release

<VRF> The style to control FCU capacity
= To control FCU Capacity by limiting **% of the Max capacity

[2] The list of FCU function

-E: For EMEA sales area, Asia (except for Korea, China), and South America.
-TR: For Turkey only -A: For Australia and New Zealand only

<DI/SDI>

→ New FCU model

Energy Save Operation	RBC-AMS54E-ES/EN	RBC-AMT32E/RBC-AMS41E
O	0%, 50%, Option 50-100% per 1%	Option 50-100% per 1%
#	0%, 50%, Option (Only 75% *4)	Option (only 75% *4)
×	NA	NA

Before FCU's Model change

			FCU only function	Combination function with CDU					
				SDI ser4 / DI BIG	DI ser3	SDI ser4 / DI BIG	DI ser3	SDI ser4 / DI BIG	DI ser3
		Series	Linked with A2A HEX by TCC link *1	Energy save operation (Limit the peak of electric current)		Night Operation by only New Controller *2		Frost Protection (8 °C set temp. in heating mode)	
4way	RAV-SM**UT-E	4	×	O	#	O	×	O *3	×
Slim duct	RAV-SM**SDT-E	4							
High static duct	RAV-SM**DT-E	2							
	RAV-SM**DT-A	3							
Others	–	–	×	×	×	×	×	×	×

After FCU's Model change

4way	RAV-SM**UT-E	4	×	O	#	O	×	O *3	×
Slim duct	RAV-SM**SDT-E	4							
High static duct	RAV-SM**DT-E	2							
	RAV-SM**DT-A	3							
Compact 4way	RAV-SM**MUT-E	4	O	O	#	O	×	O *3	×
Std Duct	RAV-SM**BT-E	4							
Ceiling	RAV-SM**CT-E	4							
High Wall	RAV-SM**KRT-E	4	×						

*1) A2A HEX: VN-M**HE
*2) New Controller: RBC-AMS54E-ES, RBC-AMS54E-EN. This function is only DI/SDI combination SDI, DI BIG.
*3) Initial setting OFF. If you would like to set up 8°C, please set up according to Installation Manual of indoor units.
*4) Only 75%: Even if save ratio is set over 50%, the save operation will be 75% automatically.

<VRF>

→ New FCU model

Energy Save Operation		RBC-AMS54E-ES/EN	RBC-AMT32E/RBC-AMS41E
	O	0%, 50%, Option (Only 75%) *2	Option (Only75%) *2
	×	NA	NA

Before FCU's Model change

			FCU only function	Combination function with CDU	
				SMMS-e	Mini-SMMS-e
		Series	Linked with A2A HEX by TCC link *1	Energy save operation (Limit the FCU capacity)	
4way	MMU-AP***H	2	×	O	×
2way	MMU-AP***WH	2			
Console	MML-AP***NH-E	4			
High Wall ser3	MMK-AP***H	3			
Others	–	–	×	×	×

After FCU's Model change

4way	MMU-AP***H	2	×	O	×
2way	MMU-AP***WH	2			
Console	MML-AP***NH-E	4			
High Wall ser3	MMK-AP***H	3			
Compact 4way	MMU-AP**MH-E	4	O	O	×
Slim duct	MMD-AP**SPH-E	4			
Std duct	MMD-AP**BH-E	4			
High static duct	MMD-AP***H-E	4			
Ceiling	MMC-AP***H-E	4			
Floor standing	MMF-AP***H-E	4			
Floor standing concealed type	MML-AP***H-E	4			
Floor standing cabinet type	MML-AP***BH-E	4			
1way YH/SH	MMU-AP***YH-E	4			
High Wall ser2	MMK-AP***MH-E	4	×		

*1) A2A HEX: VN-M**HE
*2) Only 75%: Even if save ratio is set over 50%, the save operation will be 75% automatically.

12-8 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, 40 HP system, a power meter measures power supply line consumption for 40 HP 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, 40 HP system has 10 units of 4 HP 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

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

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

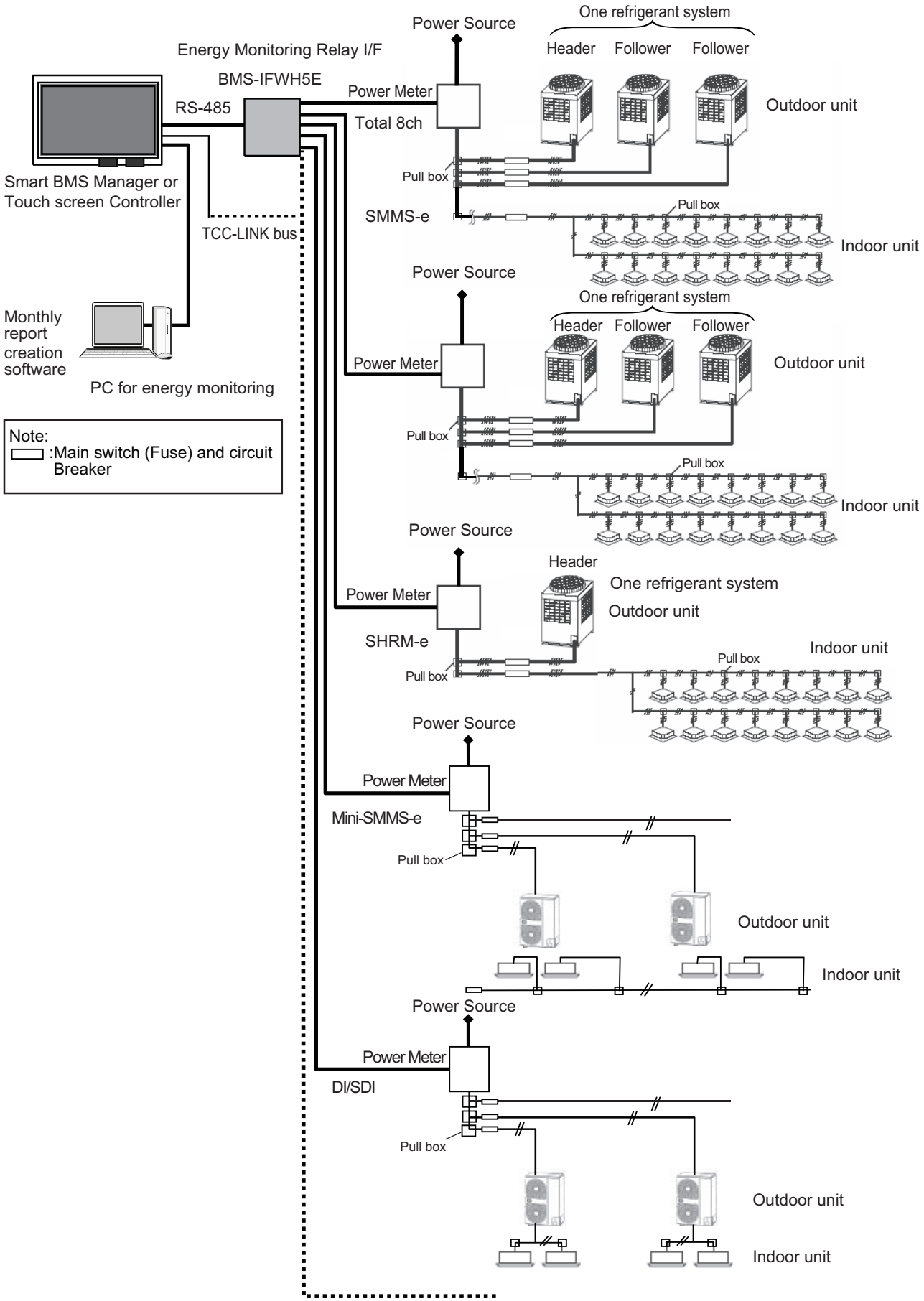
$Ø_A$ = Energy consumption (kW) for a period of time

[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-e/SHRM-e 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-e 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 50-1000 ms and the pulse generator constant (kWh/pulse) must be 0.1-99.9.

[Layout]


Power Source
One refrigerant system
Header
Follower
Follower
Energy Monitoring Relay I/F
BMS-IFWH5E
Power Meter
RS-485
Total 8ch
Outdoor unit
Pull box
Smart BMS Manager or
Touch screen Controller
SMMS-e
Pull box
TCC-LINK bus
Indoor unit
Power Source
One refrigerant system
Header
Follower
Follower
Monthly
report
creation
software
Power Meter
Outdoor unit
Pull box
Pull box
Indoor unit
PC for energy monitoring
Power Source
Header
Note:
:Main switch (Fuse) and circuit
Breaker
Power Meter
One refrigerant system
Outdoor unit
SHRM-e
Indoor unit
Pull box
Pull box
Power Source
Power Meter
Mini-SMMS-e
Pull box
Outdoor unit
Indoor unit
Power Source
Power Meter
DI/SDI
Pull box
Outdoor unit
Indoor unit

12-9 Software Combination for BMS

Software name		Explanation
Smart BMS manager		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
	Data Download Software	This software downloads the monthly report data and backup data.
	Monthly report creation	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
	Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
	Power Meter Pulse Generator Constants software	The power meter pulse generator constants are a software program used to check whether power meter pulses are calculated. This software is used when performing test run check of the air conditioning control system.
Smart BMS manager with data analyzer		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
	Data Download Software	This software downloads the monthly report data and backup data.
	Monthly report creation	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
	Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
	Power Meter Pulse Generator Constants software	The power meter pulse generator constants are a software program used to check whether power meter pulses are calculated.This software is used when performing test run check of the air conditioning control system.
	Data Analyzer for Smart Manager	This software displays a history graph of operating power consumption or time of air conditioners managed with Smart BMS Manager.
Touch screen controller system		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
	Data Download Software	This software downloads the monthly report data and backup data.
	Monthly report creation	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Touch screen controller in a report format. This software will also allow you to print these reports.
WEB Based Controller		
	Setting File Creation Software	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
BACnet Server		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.

APPLICATION CONTROL MANUAL

December, 2016

TOSHIBA CARRIER CORPORATION