TOSHIBA

Carrier

Air Conditioner

Installation Manual

“1:1 Model” Connection Interface

Model name:

TCB-PCNT31TLUL

[For Installation Professionals]

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

Contents

1 Precautions for Safety

⚠ WARNING

- **Only a qualified installer or qualified service person is allowed to do installation work.**
  Inappropriate installation may result in fire, electric shock or water leak.
- **Ask a qualified installer or qualified service person to do any repairs or to move the product.**
  Inappropriate installation may result in fire or electric shock.
- **Electrical work must be performed by a qualified installer or qualified service person in accordance with this installation manual.**
  The work must satisfy all local, national and international regulations.
  Make sure to use an exclusive power supply circuit for this unit at the rated voltage.
  Capacity shortage of the power supply or inappropriate work may result in electric shock or fire.

⚠ CAUTION

- Use predefined wire and connect them certainly. Keep the connecting terminal free from external force. Improper wire connection or clamping may result in exothermic, fire or malfunction.
- Perform wiring correctly in accordance with specified the current capacity. Failure to do so may result in short-circuiting, overheating or fire.
- Do not apply an excessive force on the board body, otherwise bending, separation, or disconnection generates resulted in heating or fire.

- After completion of installation, perform test run to check for any problems.
  Ask customer to keep this Manual at accessible place for future reference.

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2 Components

	Name	Q'ty	Application
1	P.C. board	1	1:1 Model interface P.C. board
2	U3,U4 relay terminal block	1	2P terminal block for relay (U3, U4)
3	Relay wire (A)	1	For connection of the 1:1 Model interface P.C. board and the U3,U4 relay terminal block (Blue connector)
4	Relay wire (B)	1	For connection of the 1:1 Model interface P.C. board and the indoor control P.C. board (Red connector)
5	Installation Manual	1	This manual
6	Spacer (A)	1	For fixing the 1:1 Model interface P.C. board (Used to install the P.C. board on to the sheet metal of the electric parts box of the indoor unit)
7	Spacer (B)	1	For fixing the 1:1 Model interface P.C. board (Required according to the shape of indoor unit)
8	Screws to fix the terminal block	3	For fixing the relay terminal block (0.2" (4mm)×0.6" (14mm))
9	Bundling band	1	For bundling wires
10	Terminal nameplate	2	For attaching near the relay terminal block
11	Interface P.C. board box	3	Only for the 4-way air discharge cassette type
12	Interface P.C. board cover	1	Only for the 4-way air discharge cassette type
13	Wire clamp	1	For fixing wires
14	Screws to fix the interface P.C. board box	1	For fixing the interface P.C. board box on to the bell-mouth (0.2" (4mm)×0.4" (10mm))
15	Screws to fix the interface P.C. board cover	2	For fixing the interface P.C. board cover (0.2" (4mm)×0.3" (8mm))

3 Wiring Connection

■ Wiring Connection

Remark

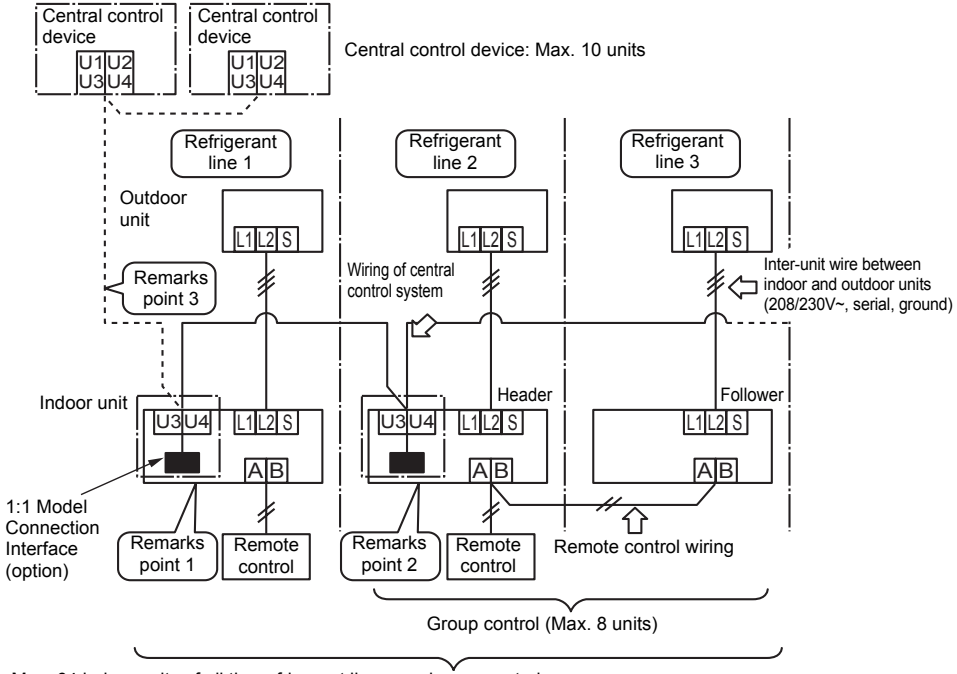
Point 1) When controlling the super digital inverter collectively, “1:1 Model” Connection Interface
(This option) is required.

Point 2) In group control, this Interface must be connected to header indoor unit.
(Connection to follower unit is unavailable.)

Point 3) Connect the central control devices to wires of the central control system.

Point 4) When controlling the super digital inverter collectively, turn on Bit 1 of SW01 in the line with the least line address No. (OFF as factory default.)

For the super digital inverter, re-setup of the address from the wired remote control is required after automatic addressing.



Max. 64 indoor units of all the refrigerant lines can be connected.
[When mixed with VRF type (Link wiring), No. of indoor units of VRF type is also included.]
* However, group, follower units of the super digital inverter are not included in No. of units.

VRF: SMMS series

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■ Wire Specification

No. of wires	Size	Specifications
2	Up to 3280’10” (1000m), shielded wire AWG16	2-core shielded wire
	Up to 6561’8” (2000m), shielded wire AWG14	

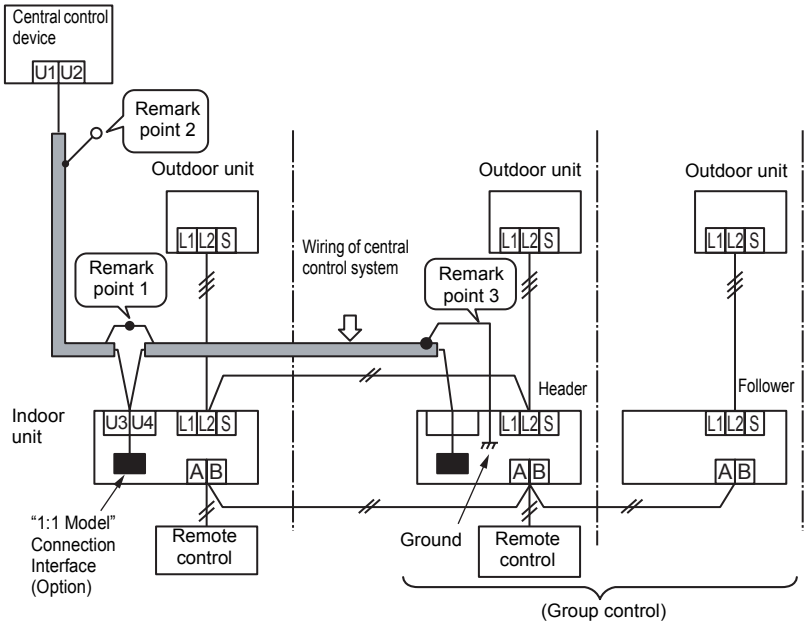
- Wire is 2-core and non-polarity.
- The length is same to wire length of the central control system.
  In case of system mixed with VRF type, the length includes all length of control wiring between indoor unit and outdoor units at VRF side.
- To prevent noise defect, use 2-core shield wire.
- Connect shield wires with closed-terminal connection and apply open process (insulation process) to the last termination. For grounding, perform grounding with one point at indoor unit side. (During central control for super digital inverter only)

Remark

Point 1) Closed terminal connection of shield wire (Connection of connecting parts of each indoor unit)

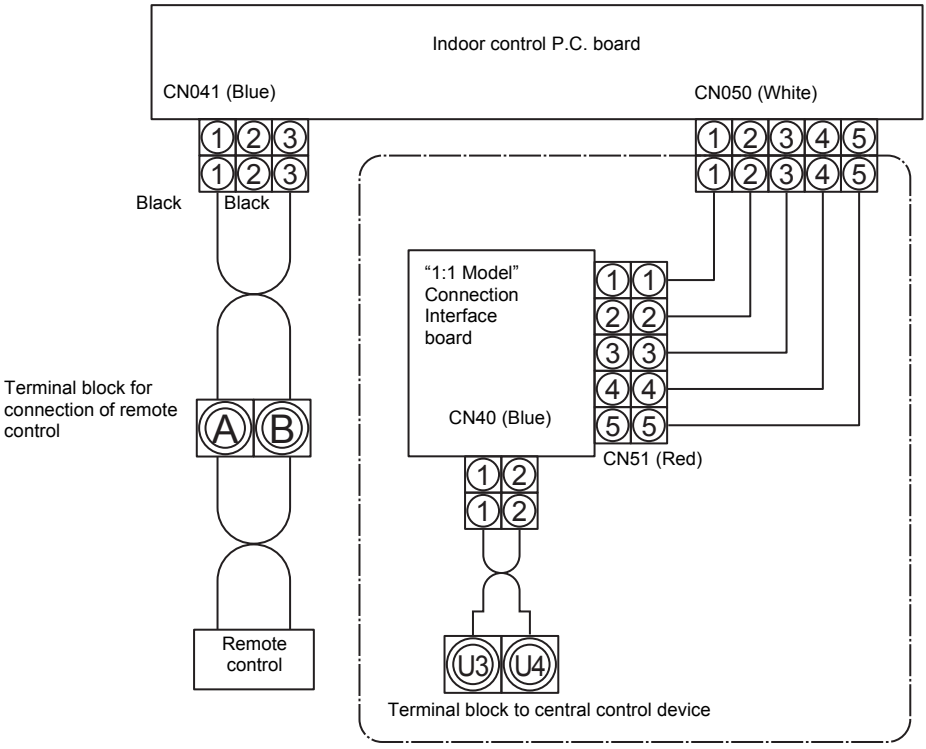
Point 2) Apply open process (insulation process) to the last termination.

Point 3) For grounding, perform grounding with one point at indoor unit side.



■ Wiring Diagram with Indoor Control P.C. Board

For details, refer to installation procedure for each model.



- Parts encircled with chain line are accessories attached to this product.
- ▭ indicates control P.C. board, ◎ and indicates terminal block (Characters inside of ◎ mark indicate terminal number.)
- There is no polarity for wire connection to terminal blocks U3 and U4.

NOTE

Do not apply voltage to terminals U3 and U4.
If applying voltage (208/230V) to U3 or U4 terminal by mistake, fusing occurs to protect terminals.
After checking wires, exchange connection of connecting connector on "1:1 Model" Connection Interface board from CN40 (Blue) to the spare CN44 (Brown).

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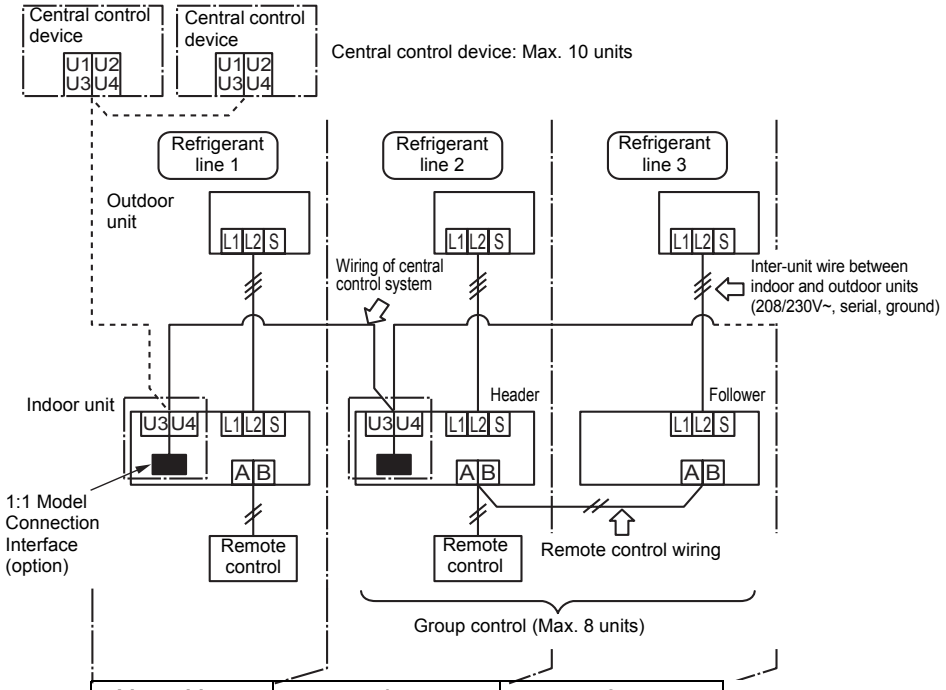
4 Setup of P.C. Board Switch

When the units controlled collectively are all super digital inverter, it is required to set up the terminator resistor. (Collective control for units without VRF type air conditioner)

- Using SW01, set up the terminator resistor.
- **Set up the terminator resistor to only adapter connected to the indoor unit in the line with the least line address No.**



Line address	1	2	
SW01 bit 1	ON	OFF	(OFF as factory default.)
SW01 bit 2	OFF	OFF	(OFF as factory default.)
Remarks	Turn on SW01 bit 1.	Factory default	

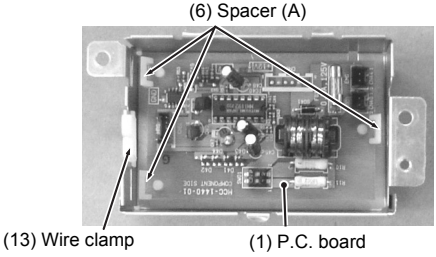
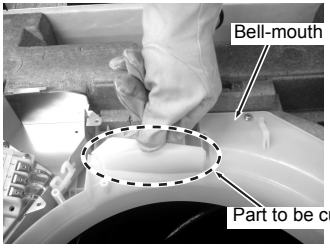
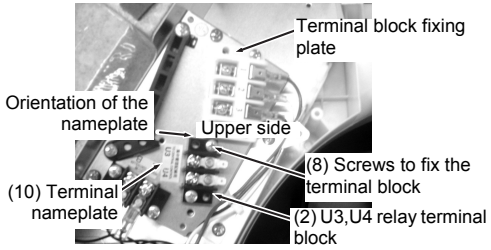
(Reference) Contents of switch setup

SW01		Terminator resistor	Remarks
Bit 1	Bit 2		
OFF	OFF	None	Mixed with VRF as factory default (Link wiring)
ON	OFF	100Ω	Central control by Super digital inverter
OFF	ON	75Ω	Spare
ON	ON	43Ω	Spare

5 Installation

For installation of “1:1 Model” Connection Interface board and removal of relay wire, wait for a while (approx. 1 minute) after turning off the power supplies of the air conditioner and the collective control devices. If not doing so, “1:1 Model” Connection Interface board may be damaged.

■ 4-way discharged type (RAV-SP**UT-UL)

No.	Procedure	Details
1	Install the P.C. board (1) and wire clamp (13) on to the interface P.C. board box (11) using the spacer (A) (6). (See the figure on the right.)	
2	Cut off the part of the bell-mouth indicated in the figure on the right.	
3	Install the U3, U4 relay terminal block (2) using the terminal block fixing screws (8) (0.2” (4mm)×0.6” (14mm)) on to the terminal block fixing plate in the electrical control box. (See the figure on the right.) Attach the terminal nameplate (10) near the U3, U4 relay terminal block according to the figure on the right.	

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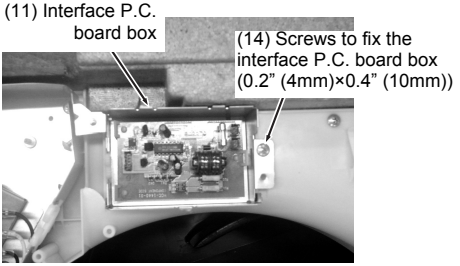
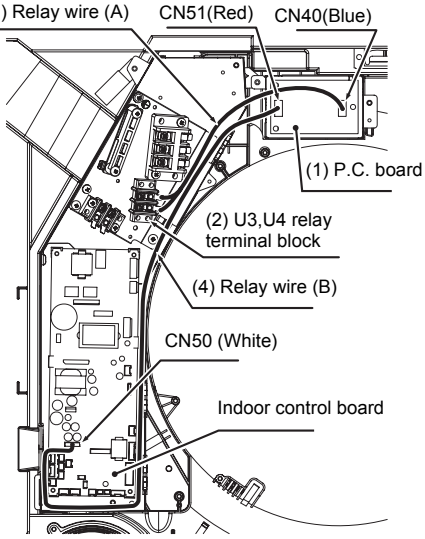
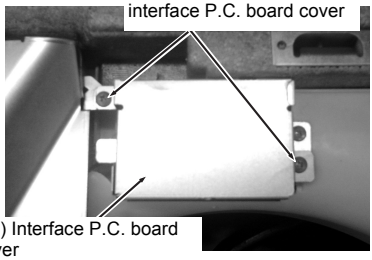
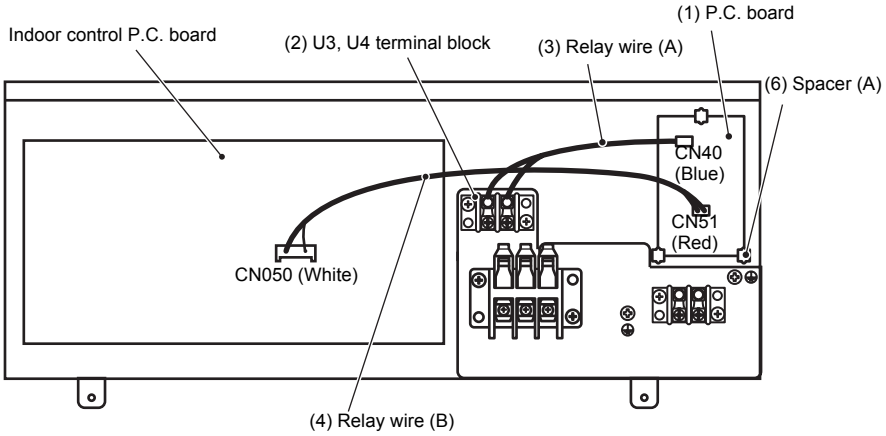
No.	Procedure	Details
4	Install the interface P.C. board box (11) (the P.C. board and wire clamp have been installed in step 1) on to the bell-mouth using the interface P.C. board box fixing screw (14) (0.2” (4mm)×0.4” (10mm)).	
5	Connect the relay wire (A) (3) from the crimping terminal of the U3,U4 relay terminal block to CN40 (blue) on the P.C. board (1). * There is no polarity for the connection of the relay wire (A) (3). Connect the relay wire (B) (4) from CN50 (white) on the indoor P.C. board to CN51 (red) on the P.C. board (1).	 * After connecting the relay wires (A) (3) and (B) (4), bundle the relay wires together with others nearby using the bundling band (9) to prevent the wires from being caught.
6	Fix the interface P.C. board cover (12) on to the interface P.C. board box using the two interface P.C. board cover fixing screws (15) (0.2” (4mm)×0.3” (8mm)).	

■ Under Ceiling type (RAV-SP***CT-UL)

No.	Procedure
1	Using board installing spacer (A) (6), install P.C. board (1) to the position of electrical control box of the indoor unit. (See the figure below.)
2	Using screw to fix the terminal box (8), install U3, U4 terminal block (2) to the position of electrical control box of the indoor unit. (See the figure below.) • When tightening the screws, be sure not to damage wires. • Adhere the attached terminal nameplate (10) near the relay terminal block.
3	Connect the relay wire (A) (3) from U3, U4 terminal block to CN40 (Blue) of P.C. board (1). Connect the relay wire (B) (4) from CN50 (White) on the indoor P.C. board to CN51 (Red) on P.C. board (1).

Details



- **(3) Relay wire (A)**
  Connect U3, U4 terminal block with P.C. board (1) CN40 (Blue). There is no polarity for wire connection.
- **(4) Relay wire (B)**
  Connect CN50 (White) on indoor control P.C. board with CN51 (Red) on P.C. board (1).
- When installing P.C. board (1) to electrical control box, insert three board installing spacers (A) (6) into holes of P.C. board.

⚠ CAUTION

After connection of the relay wires (A) (3) and (B) (4), bind them with bundling band (9) so that wires are not caught in. In this time, do not bundle the relay wires (A) and (B) together with the power supply lines such as power cable, ground wire. If not doing so, a trouble may be caused.

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6 Usage

Refer to Owner's Manual for the central control devices.

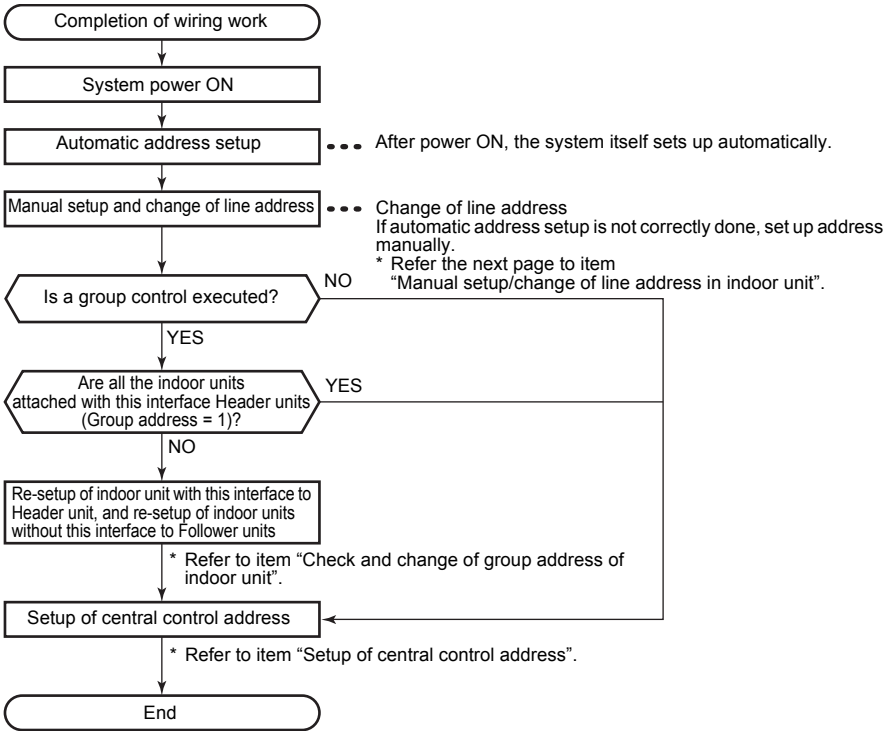
7 Other Cautions

In a group operation, be sure to turn on power supplies of all the indoor units in group control. (Within 3 minutes)
When power supply of the Header unit is not turned on, there is a possibility that the Header unit exchanges with Follower unit. (If Header unit is exchanged, the central control devices is unavailable.)

8 Address No. Setup

■ Outline

To connect the Super digital inverter to 1:1 Model central control system using this interface, it is required to set up address of each connected indoor unit for central control in the following procedure.



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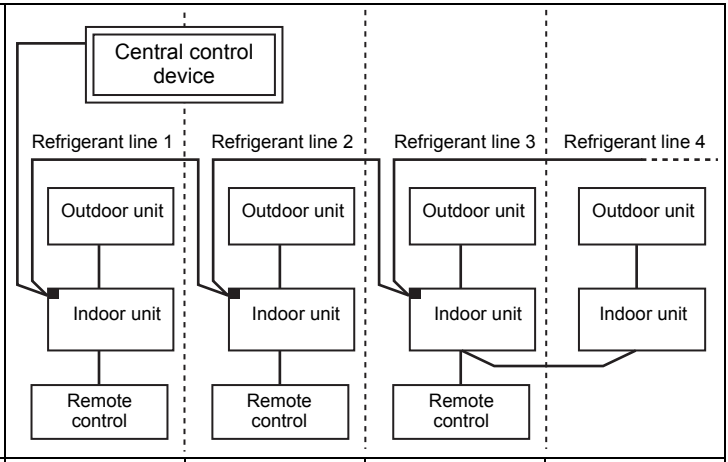
■ Manual Setup/Change of Line Address in Indoor Unit [In case of 29 refrigerant lines or less (Includes No. of refrigerant lines at VRF side if mixed)]

After the system power supply has been turned on, all the line addresses are allocated to “1” by automatic address setup except group control. Therefore change setup of the line address using the wired remote control for each refrigerant line.

Change line address for each refrigerant line.



Line address	1	1 → 2	1 → 3	2 → 4
Indoor unit address	1	1	1	1
Group address	0	0	1	2

After the line addresses and indoor unit addresses are changed manually

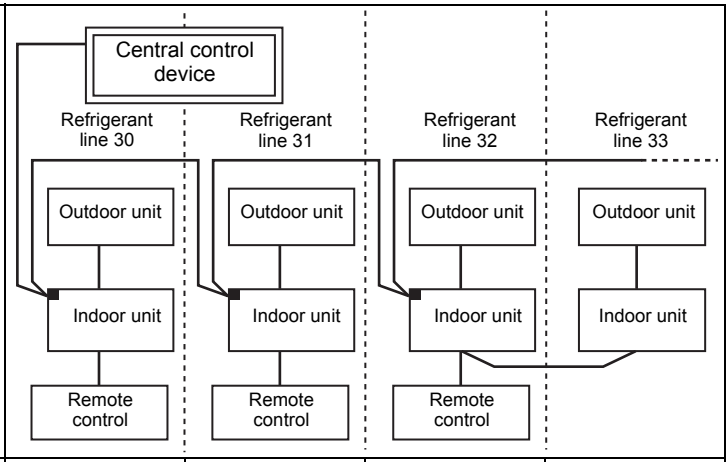
Line address (1)	1	2	3	4
Indoor unit address	1	1	1	1
Group address	0	0	1	2

[■ “1:1 Model” connection interface]

* For change/setup method by wired remote control, refer to “Change method of address setup”.
* Allocating different numeral value for each refrigerant line, set up the line address so that it does not overlap with other address No. (When controlling collectively VRF type units mixed with super digital inverter, set up numeral value which also differs from line address at VRF type side.)

■ Manual Setup/Change of Line Address in Indoor Unit [In case of 30 refrigerant lines or more (Includes No. of refrigerant lines at Multi side if mixed)]

After the system power supply has been turned on, all the line addresses are allocated to “1” by automatic address setup except group control. Therefore change setup of the line address using the wired remote control for each refrigerant line.



Line address	1 → 30	1 → 30	1 → 30	2
Indoor unit address	1	1 → 2	1 → 3	1
Group address	0	0	1	2

Point (1) Set “30” to all the line addresses of indoor units attached with these interface

Point (2) Change the indoor address so that the indoor unit numbers do not overlap.

After the line addresses and indoor unit addresses are changed manually

Line address (1)	30	30	30	2
Indoor unit address	1	2	3	1
Group address	0	0	1	2

[■ “1:1 Model” connection interface]

* For change/setup method by wired remote control, refer to “Change method of address setup”.
* Allocating different numeral value for each refrigerant line, set up the line address so that it does not overlap with other address No. (When controlling collectively VRF type units mixed with super digital inverter, set up numeral value which also differs from line address at VRF type side.)

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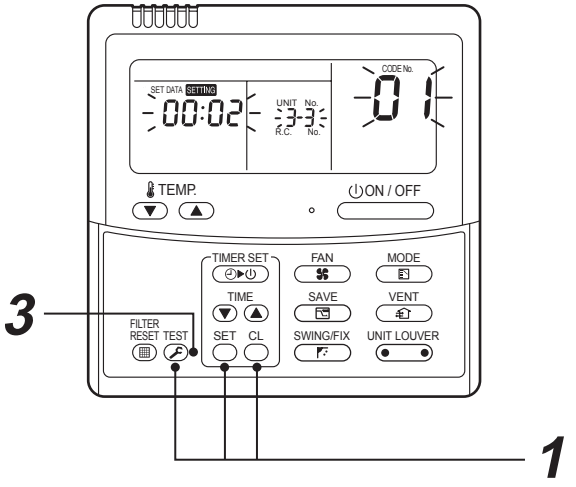
■ Check and Change of Group Address of Indoor Unit

In group control operation, the group address is allocated to indoor unit by automatic address setup after the system power supply has been turned on. From these addresses, “Header unit”: “1” and “Follower unit”: “2” can be recognized. As the central control device communicates with “Header unit” only, set up the group address from wired remote control so that the indoor unit attached with the interface becomes “Header unit”.

- **Check method for Header unit**

Beforehand check the indoor unit attached with this interface.
Stop the equipment.

<Procedure>



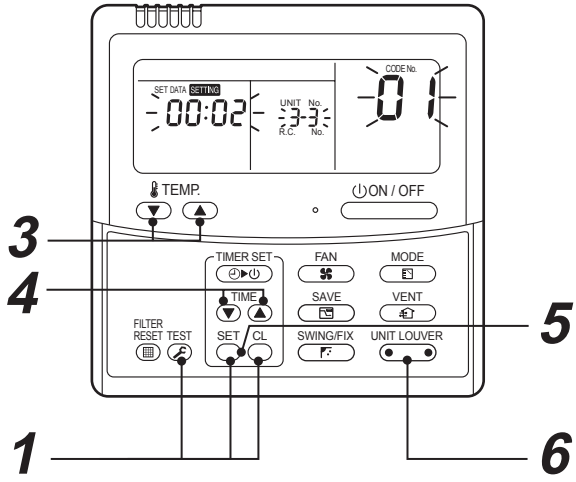
1 **Push SET, CL and TEST buttons simultaneously for 4 seconds or more.**
(The firstly displayed unit No. is the header indoor unit No. in the group control.)

2 **The indoor unit of which fan was turned on is the header indoor unit.**
If the header unit is not one with this interface, change it according to “How to set up Header unit”.

3 **Push TEST button returns the mode to normal mode.**

- **How to set up Header unit**
  (In case when the indoor unit of which fan was turned on is not one attached with interface)
  Change address in the following procedure.

<Procedure>



1 **Push SET, CL and TEST buttons simultaneously for 4 seconds or more.**
(The firstly displayed unit No. is the header indoor unit No. in the group control.)

2 **The indoor unit of which fan was turned on is the header indoor unit.**
If the header unit is not one with this interface, change it according to “How to set up Header unit”.

3 **Using the setup temperature ▼ and ▲ buttons, select CODE No. “14”.**

4 **Check that the SET DATA is 0001, and then change the SET DATA to 0002 using the timer time ▲ and ▼ buttons.**

5 **Push SET button. In this time, the setup ends if display changes from flashing to lighting.**

6 **Push UNIT LOUVER button, and then turn on fan of the indoor unit which is attached with adapter.**

7 **Leave the CODE No. as it is. (Select CODE No. 14.)**

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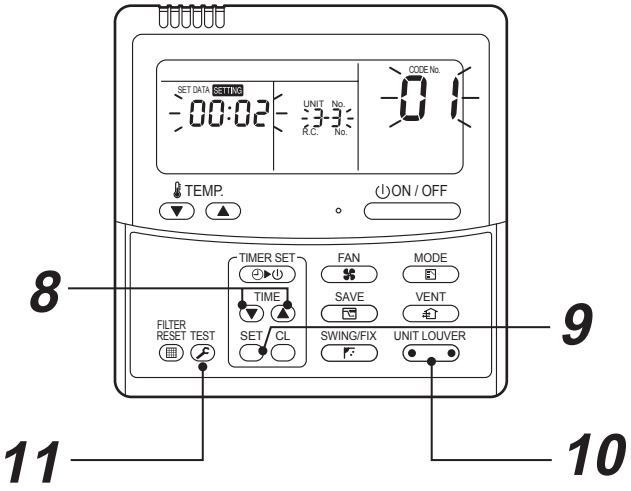

8 **Check that the SET DATA is 0002, and then change the SET DATA to 0001 using the timer time ▲ and ▼ buttons.**

9 **Push SET button. In this time, the setup ends if display changes from flashing to lighting.**

10 **When the above setup completed, push UNIT LOUVER button to select indoor unit of which setup was changed and then check the changed contents. (CODE No. 14 as it is)**

* When pushing CL button, the setup contents can be cleared.

NOTE

Cancellation is unavailable if the CODE No. is changed.

11 **Push TEST button. (Setup is determined.)**

When pushing TEST button, the display disappears and the status becomes the normal stop status. (The remote control operation is not accepted for approx. 1 minute after pushing TEST button.)

* If the remote control operation is not accepted for 1 minute or more after pushing TEST button, it is considered that the address setup is incorrect and the automatic address setup is being performed again. Change setup again after approx. 5 minutes.

TOSHIBA CARRIER CORPORATION

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