MITSUBISHI ELECTRIC

CITY MULTI Control System
and Mitsubishi Mr. SLIM Air Conditioners

MA Remote Controller — PAR-20MAA

Installation Manual

This instruction manual describes how to install the MA Remote Controller for Mitsubishi Building Air Conditioning Systems, direct expansion type CITY MULTI air conditioner indoor units (-A Type and later), and Mitsubishi Mr. SLIM air conditioners. Please read this manual thoroughly and install the remote control as accordingly. For information on how to wire and install the air conditioning units, refer to the installation manual for them.

1 Safety Precautions

- Read these Safety Precautions and perform installation work accordingly.
- The following two symbols are used to flag dangers that may be caused by incorrect use and their degree:

⚠ WARNING	This symbol denotes what could lead to serious injury or death if you misuse the PAR-20MAA.
⚠ CAUTION	This symbol denotes what could lead to a personal injury or damage to your property if you misuse the PAR-20MAA.

- After reading this installation manual, give it and the Indoor unit Installation manual to the end user.
- The end user should keep this manual and the Indoor unit Installation manual in a place where he or she can see it at anytime. When someone moves or repairs the PAR-20MAA, make sure that this manual is forwarded to the end user.

⚠ WARNING

Ask your dealer or technical representative to install the unit. Any deficiency caused by your own installation may result in an electric shock or fire.	Ensure that installation work is done correctly following this Installation manual. Any deficiency caused by installation may result in an electric shock or fire.
Install in a place which is strong enough to withstand the weight of the PAR-20MAA. Any lack of strength may cause the PAR-20MAA to fall down, resulting in personal injury.	All electrical work must be performed by a licensed technician according to local regulations and the instructions given in this manual. Any lack of electric circuit capacity or any defect caused by installation may result in an electric shock or fire.
Firmly connect the wiring using the specified cables. Carefully check that the cables do not come any force on the terminals. Improper wiring connections may produce heat and possibly a fire.	Do not move and re-install the PAR-20MAA yourself. Any deficiency caused by incorrect re-installation may result in an electric shock or fire. Ask your dealer or a specialized worker for moving and installation.
Never modify or repair the PAR20MAA by yourself. Any deficiency caused by your modification or repair may result in an electric shock or fire. Consult with your dealer about repairs.	To dispose of this product, consult your dealer.

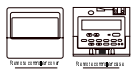
⚠ CAUTION

Do not install in any place exposed to flammable gas leakage. The flammable gases accumulated around the body of PAR-20MAA may cause an explosion.	Use a standard wire in compliance with the current capacity. A failure to this may result in an electric shock, heating or fire.
Do not use in any special environment. Using in any place exposed to oil (including machine oil), steam and sulfuric gas may deteriorate the performance significantly or give damage to the components parts.	Do not touch any PCB (Printed Circuit Board) with your hands or with tools. Do not allow dust to collect on the PCB. Doing so may cause fire or an electric shock.
Wire so that it does not receive any tension. Tension may cause wire breakage, heating or fire.	Do not remove the insulation sheet on the PCB. Doing so may cause an electric shock.
Completely seal the wire lead-in part with putty etc. Any dew, moisture, insects entering this unit may cause an electric shock or a malfunction.	Do not touch any control button using a sharp object. Doing so may cause an electric shock or a malfunction.
Do not use it with water. Doing so may cause an electric shock or a malfunction.	Never contact the power supply with the control wiring terminals. Doing so will certainly cause the controller to catch fire.
Do not install in any place at a temperature of more than 40°C or less than 0°C or exposed to direct sunlight.	When installing the remote controller in a hospital or communication facility, take ample countermeasures against noise. Inverter, emergency power supply generators, high frequency medical equipment, and wireless communication equipment can cause the remote controller to malfunction or to fail. Radiation from the remote controller may affect communication equipment and prevent medical operations or the human body or machines with image transmission and cause noise.
Do not install in any place where acidic or alkaline solution or special spray are often used. Doing so may cause an electric shock or malfunction.	

2 Confirming the Supplied Parts

Confirm that the box includes the following parts. In addition to this installation manual:

1. Remote controller (cover, body) 1
2. Remote control cord (10 m) 1
3. Cross recessed pan head screw (M4 × 30) 2
4. Wood screw (4.1 × 16, used for directly hooking to the wall) 2
5. Caution label (in 10 languages) 1



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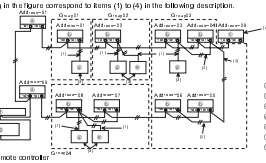
3 How To Wire Transmission Line

The wiring is different when the remote controller is connected to a CITY MULTI control system (–A' type and later) and when it is connected to a Mr. SLIM air conditioner (A control type). The wiring also differs with the system configuration. Check the system used.

1. Connecting to CITY MULTI control system

The numbers (1) to (4) in the figure correspond to items (1) to (4) in the following description.



(1) Wiring from the remote controller
- Connect to the MA remote controller terminal block (TB15) on the indoor unit.
- The terminal block has no polarity. Connect to the symbols "A" and "B" on the terminal block.

(2) Operating in a group (Groups 03, and 04 above)
- In a room set the MA remote controller terminal block (TB15) of the indoor units you want to operate as a group, and connect the MA remote controller to that point.
- When also linking with a CITY MULTI control system as shown in the figure above, group setting at the system controller (central controller in the figure above) is necessary.

(3) Number of connectable remote controllers (groups 02 and 04)
- A master remote controller and one sub-ordinate remote controller, a total of two, can be connected to a group made up of indoor units.

(4) To interlock a LOSSNAY, make the following settings using the remote controller. (For a description of how to set an interlock, see section (7 Ventilation Setting).)
Set the LOSSNAY address and the address of all the indoor units you want to interlock.

(5) Total length of remote controller wiring
- The remote controller can be wired up to 200 m. Procure 0.3 to 1.25 mm², 2-core cable at the installation site.

⚠ CAUTION Remote controllers cannot be wired together. Only one wire can be connected to the remote controller terminal block.

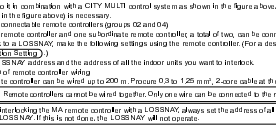
NOTE: When interlocking the MA remote controller with a LOSSNAY, always set the address of all the indoor units in the group and the address of the LOSSNAY. If this is not done, the LOSSNAY will not operate.

2. Connecting to Mr. SLIM air conditioner

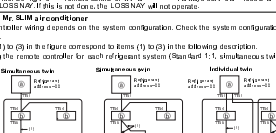
The remote controller wiring depends on the system configuration. Check the system configuration. Wire the remote controller as shown in the example below.

The numbers (1) to (3) in the figure correspond to items (1) to (3) in the following description.

[1] Connecting the remote controller for each refrigerant system (Standard 1:1, simultaneous twin, simultaneous triple, simultaneous four (individual twin))



[2] When grouping by different refrigerant systems



* Set the refrigerant address using the outdoor unit dip switches. (For more information, refer to the outdoor unit installation manual.)

* All the indoor units enclosed in ____ are controlled as one group.

(1) Wiring from remote controller
- Connect to indoor unit TB5 (remote controller terminal block). (The terminal block has no polarity.)
- For simultaneous multi type, when mixing various types of indoor units, always connect the remote controller to the indoor unit with the most functions (wind velocity, vane, louver, etc.).

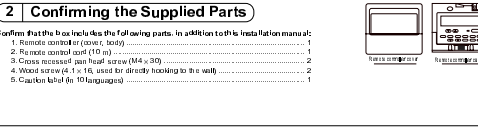
(2) When grouping with different refrigerant systems
- Group using the remote controller wiring. Connect the remote controller to an arbitrary indoor unit of each refrigerant system you want to group.
- When mixing different types of indoor units in the same group, always make the outdoor unit connecting the indoor unit with the most functions (wind velocity, vane, louver, etc.) the master unit (refrigerant address = 00). Also, when the master unit is the simultaneous multi type, always satisfy the conditions of (1) above.
- The MA remote controller can control up to 16 refrigerant systems as one group.

2

(3) Up to two remote controllers can be connected to one group
- When two remote controllers are connected to one group, always set the master remote controller and sub-ordinate remote controller.
- When only one remote controller is connected to one group, set it as the master remote controller. When two remote controllers are connected to one group, set the master remote controller and sub-ordinate remote controller. (For a description of how to set the master/sub-ordinate switch, see step ⑤ in section (4 How To Install).)

(4) Total length of remote controller wiring
- The remote controller can be wired up to 200 m. Procure 0.3 to 1.25 mm², 2-core cable at the installation site.

⚠ CAUTION
- The wiring cannot be connected to TB5 of the Indoor unit of the same refrigerant system. If so connected, the system will not operate normally.
- Remote controllers cannot be wired together. Only one wire can be connected to the remote controller terminal block.
- When connecting to TB5, connect up to two wires of the same size to one terminal block.



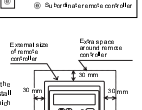
4 How To Install

1. Choose a place in which to install the remote controller (switch box).

Be sure to observe the following steps:

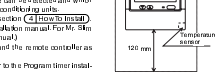
(1) Temperature sensors are provided with both the remote controller and the Indoor units. When using the remote controller temperature sensor, the master remote controller detects the room temperature. Install the master remote controller in a place where the average room temperature can be detected and which is not affected by any heat source from direct sunlight or air blown from air conditioning units.
(For how to set the master and sub-ordinate remote controller, see step ⑤ in section (4 How To Install).
For how to set the temperature sensor, refer to the Free Plan Indoor unit Installation manual. For Mr. Slim air conditioners, see section (8 Function Selection) of this Installation manual.)

(2) When installing on either the switch box or the wall, allow extra space around the remote controller as shown in the figure at the right.
(When using the remote controller in combination with a Program timer, refer to the Program timer installation manual.)



NOTE: Make sure that there is no air gap where near the remote controller sensor. If there is, the remote controller cannot detect the exact room temperature.

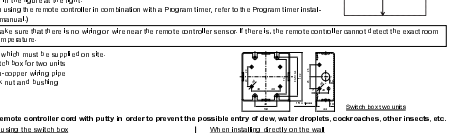
(3) Parts which must be supplied on site.
- Switch box for two units
- Thin-copper wiring pipe
- Lock nut and bushing



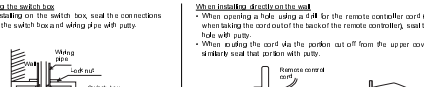
2. Seal the remote controller cord with putty in order to prevent the possible entry of dew, water droplets, cockroaches, other insects, etc.

When using the switch box
- When installing on the switch box, seal the connections between the switch box and wiring pipe with putty.

When installing directly on the wall
- When opening a hole using a drill for the remote controller cord (or when taking the cord out of the backof the remote controller), seal the hole with putty.
- When routing the cord via the portion cut off from the upper cover, similarly seal that portion with putty.



3. Remove the remote controller cover.
- Insert a minus screwdriver into one of the open slots and move the screwdriver in the arrow direction.



⚠ CAUTION Do not turn the screwdriver in the slot. Doing so may damage the slot.

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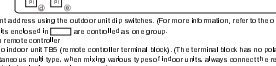
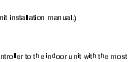
4. Install the lower case on the switch box or directly on the wall.

When using the switch box



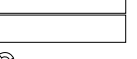
When installing directly on the wall



⚠ CAUTION Do not tighten the screws too tight. Doing so may deform or crack the lower cover.

NOTE: - Choose a flat plane for installation.
- Fasten the switch box at more than two places when installing directly on the wall.
- When reinstalling on the wall, fasten securely using anchors.

5. Connect the remote control cord to the remote controller terminal block.



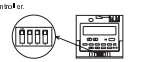
⚠ CAUTION Do not use crimp terminals to connect to remote controller terminal blocks. The terminals may contact the board and cause trouble or contact the cover and damage the cover.

6. When using two remote controllers in one group, set the dip switches.

When using two remote controllers in one group, specify the main and sub remote controllers using dip switch No. 1 shown below.
- When connecting only one remote controller to one group, it is always the main remote controller. When connecting two remote controllers to one group, set one remote controller as the main remote controller and the other as the sub remote controller.
- The factory setting is "Main".

Setting the dip switches

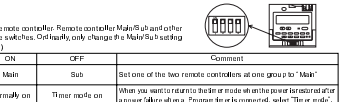
The dip switches are at the bottom of the remote controller. Remote controller Main/Sub and other function settings are performed using these switches. Ordinarily, only change the Main/Sub setting of SW1. (The factory settings are all "ON".)



SW No.	SW contents	ON	OFF	Comment
1	Remote controller Main/Sub setting	Main	Sub	Set one of the two remote controllers at one group to "Main"
2	When remote controller temperature sensor is used	Normally on	Timer mode on	When you want to return the timer mode with the power is restored after a power failure, set to "Program timer is connected".
3	Cooling/Heating display in AUTO mode	Yes	No	When you do not want to display "Cooling" and "Heating" in the Auto mode, set to "No".
4	Intake temperature display	Yes	No	When you do not want to display the intake temperature, set to "No".

7. Wiring note for installing directly on the wall (or open wiring)
- Cut off the shaded area from the upper cover using a knife, nippers, etc.
- Take out the remote control cord connected to the terminal block via this portion.

8. Install the cover to the remote controller.



To remove the cover, insert a minus screwdriver into one of the open slots, and move it in the direction of the arrow shown in the figure.

First, hook the cover to the two upper claws and then fit it to the remote controller.

⚠ CAUTION Press the cover until it snaps shut. If not, it may fall off. ⚠ CAUTION Do not touch the screwed portion with a screwdriver, etc. Doing so may damage the PCB.

NOTE: A protection sheet is stuck to the operation section. Peel off this protection sheet before use.

9. Affix a caution label.

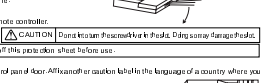
A caution label in English is supplied on the back surface of the control panel door. Affix another caution label in the language of a country where you use the remote controller the English one.

5 How To Connect Optional Parts

- The exterior design for PAC-SC32PTA (Program timer) is different from the one for PAR-20MAA.
- When connecting a Program timer, connect a 5-core cable to the connector on the remote controller. (A 5-core cable is supplied with the Program timer.)
- To route the cable, cut off the thin wall portion.
- For wiring path convenience, install the Program timer to the left-hand side of the remote controller. When expansion is expected, take into consideration remote controller space at the left-hand side.
For the operation method details, refer to the Program timer Installation manual.

6 Test Run

1. Before making a test run, refer to the "Test Run" section of the Indoor unit Installation manual.
2. Press the [TEST] button twice successively within three seconds. Test run starts.
3. Stop the test run by pressing the [ON/OFF] button.
4. If trouble occurred during the test run, refer to the "Test Run" section of the Indoor unit Installation manual.



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7 Ventilation Setting

Make this setting only when interlocked operation with LOSSNAY is necessary with CITY MULTI models.)
(*This setting cannot be made with Mr. SLIM air conditioners.)

Perform this operation when you want to register the LOSSNAY, confirm the registered units, or delete the registered units controlled by the remote controller.
The following uses Indoor unit address 05 and LOSSNAY address 30 as an example to describe the setting procedure.

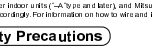
[Setting Procedure]

① Stop the air conditioner using the remote controller Ⓐ [ON/OFF] button.
If the OFF display shown below does not appear at this time, step ② cannot be performed.

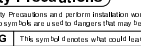
② Press and hold down the Ⓑ [FILTER] and Ⓒ [louver] buttons at the same time for two seconds. The display shown below appears. The remote controller confirms the registered LOSSNAY addresses of the currently connected Indoor units.

③ Registration confirmation result
- The Indoor unit address and registered LOSSNAY address are displayed alternately.

<Indoor unit address and Indoor unit display> <LOSSNAY address and LOSSNAY display>



- When LOSSNAY are not registered

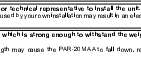


④ If registration is unnecessary, end registration by pressing and holding down the Ⓑ [FILTER] and Ⓒ [louver] buttons at the same time for two seconds.
If a new LOSSNAY must be registered, go to step ⑤. **1. Registration procedure**. If you want to confirm another LOSSNAY, go to step ⑦. **2. Confirmation procedure**. To delete a registered LOSSNAY, go to step ⑨. **3. Deletion procedure**.

< 1. Registration procedure >

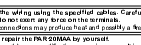
⑤ Set the address of the LOSSNAY and the Indoor unit connected by the remote controller you want to register using the Ⓓ [TEMP.] (▽) and (△)] buttons. (01 to 50)

⑥ Set the address of the LOSSNAY you want to register using the Ⓔ [TIMER SET (▽) and (△)] buttons. (01 to 50)

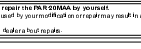


Indoor unit address LOSSNAY address

⑦ Press the Ⓔ [TEST] button, and register the set Indoor unit address and LOSSNAY address.
- Registration end display
The Indoor unit address and "IC" and LOSSNAY address and "LC" are alternately displayed.



- Registration error display
If the address was not correctly registered, the Indoor unit address and registered LOSSNAY address are alternately displayed.

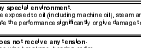


Cannot be registered because the registered Indoor unit or LOSSNAY does not exist.
Cannot be registered because another LOSSNAY was registered at the registered Indoor unit.

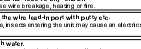
< 2. Confirmation procedure >

⑧ Set the address of the Indoor unit connected by the remote controller whose LOSSNAY you want to confirm using the Ⓓ [TEMP.] (▽) and (△) buttons. (01 to 50)

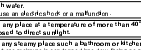
<Indoor unit address>



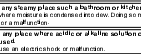
⑨ Press the Ⓔ [Timer selection] button and confirm the LOSSNAY address registered at the set Indoor unit address.
- Confirmation end display (When no LOSSNAY is connected.)
The Indoor unit address and "IC" and registered LOSSNAY address and "LC" are alternately displayed.



- Confirmation end display (When no LOSSNAY is not connected.)



Registered Indoor unit address does not exist.



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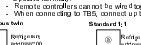
[Procedure] (Set only when change is necessary.)

① Check the set contents of each mode. When the set contents of a mode were changed by function selection, the function set that mode also change. Check the set contents and change them (step ② to ⑥) if change the setting based on the setting table Table 1 check No. Fix the factory setting, refer to the Indoor unit installation manual.

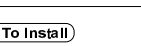
② Set the remote controller to OFF.
Press and hold down the Ⓐ [FILTER] and Ⓑ [TEST] buttons at the same time for two seconds or longer.
"FUNCTION" blinks for a while. Then the remote controller display changes to the display shown below.



* If the remote controller enters the OFF state after the "FUNCTION" and room temperature displays " 88 " have flashes for two seconds, communication is probably abnormal. Make sure there are no noise sources near the transmission line.

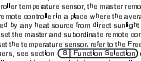
NOTE: If you make a mistake during operation, end function selection by step ⑥ and repeat selection from step ②.

③ Set the Indoor unit address No.
Press the Ⓔ [Timer selection] button. The unit address No. display "--" flashes.



* When setting mode 1 to 3, set the unit address No. to "00".
* When setting modes 7 to 11:
- When setting for each Indoor unit, set the unit address No. to "01-04".
- When batch setting for all Indoor units, set the unit address No. to "AL".

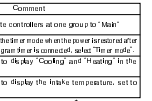
④ Refrigerant address and unit address No. registration
Press the Ⓓ [Mode selection] button. The refrigerant address and unit address No. are registered.
After a while, the mode No. display "--" flashes.



* When " 88 " flashes at the room temperature display, the selected refrigerant address is not in the system.
When "F" is displayed at the unit address No. display, and when it flashes together with the refrigerant address display, the selected unit address No. does not exist. Correctly set the refrigerant address and unit address No. by repeating steps ③ and ④.

When registered using the Ⓓ [Mode selection] button, the registered Indoor unit begins fan operation. When you want to know the location of the Indoor units of the unit address No. whose functions were selected, check here. When the unit address No. is 00 or AL, all the Indoor units of the selected refrigerant address perform the fan operation.

Ex) When refrigerant address 00, unit address No. = 02 registered



* When group play by different refrigerant systems and an indoor unit other than the specified refrigerant address performs the fan operation, the refrigerant address set here is probably duplicated.
Recheck the refrigerant address at the outdoor unit rotary switches.

⑤ Mode No. selection
Select the mode No. you want to set with the Ⓓ [TEMP.] (▽) and (△)] buttons. (Only the settable mode numbers can be selected.)

⑦ Select the setting contents of the selected mode.
When the Ⓔ [Timer selection] button is pressed, the current setting No. flashes. Use this to check the currently set contents.

Select the setting No. using the Ⓓ [TEMP.] (▽) and (△)] buttons.

⑧ The contents set at steps ③ to ⑦ are registered.
When the Ⓓ [Mode selection] button is pressed, the mode No. and setting No. flash and registration begins. The flashing mode No. and setting No. change to a steady light and setting ends.

* When "--" appears at the mode No. and setting No. displays and " 88 " flashes at the room temperature display, communication is probably abnormal. Make sure there are no noise sources near the transmission line.

⑨ To select more functions, repeat steps ③ to ⑧.

⑩ End function selection
Press and hold down the Ⓐ [FILTER] and Ⓑ [TEST] buttons at the same time for two seconds or longer.
After a while, the function selection display disappears and the remote controller returns to the air conditioner off display.

* Do not operate the air conditioner from the remote controller for 30 seconds after the end of function selection.

NOTE: When the functions of an Indoor unit were changed by function selection after the end of installation, always indicate the set contents by entering a ○ or other mark in the appropriate check field of Table 1.

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< 3. Deletion procedure >

Use this procedure when you want to delete registration of Indoor units connected by the remote controller and LOSSNAY.

① Confirm (see **2. Confirmation procedure**) the LOSSNAY you want to delete and display the Indoor units and LOSSNAY confirmation results.

② Press the Ⓔ [TIMER SET] button twice and delete registration of the LOSSNAY registered at the set Indoor unit.
- Deletion end display
Indoor unit address and "--" and registered LOSSNAY address and "--" are alternately displayed.

- Deletion error display
When deletion was not performed properly.

8 Function Selection

Perform only when change is necessary with Mr. SLIM air conditioner.
(Cannot be performed with CITY MULTI control system.)

Set the functions of each Indoor unit from the remote controller, as required. The functions of each Indoor unit can be selected only from the remote controller.
Set the functions by selecting the necessary items from Table 1.

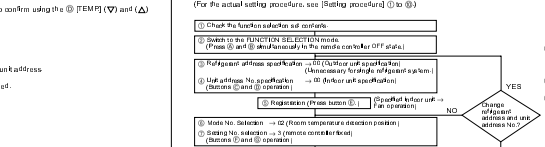
Table 1: Function selection contents (For a detailed description of the factory settings and mode of each function, refer to the Indoor unit Installation manual.)

Function	Settings	Mode No.	Setting No.	Check	Others
Power failure automatic recovery	Not available	01	1		Unit address No. 00
	Available (Approximate 4 minutes simple start in the same condition as before power failure)	01	2		
Indoor temperature detecting	Indoor unit operating average	02	1		These items are set for all Indoor units.
	Set by Indoor unit's remote controller	02	2		
	Remote controller's internal sensor	02	3		
LOSSNAY connectivity	Not Supported	03	1		
	Supported (Indoor unit is not equipped with automatic mode)	03	2		
	Supported (Indoor unit is equipped with automatic mode)	03	3		
Power voltage	240 V	04	1		
	220 V, 230 V	04	2		
Energy saving cycle	Energy saving cycle as necessary is not provided	05	1		
	Energy saving cycle automatically adjusted	05	2		
Filter sign	100 Hr	07	1		Unit address No. 01 to 04 or ALL
	2500 Hr	07	2		
	No filter sign indicator	07	3		
Fan speed	Set: 5 speed Standard: 4 + High ceiling ① (PCFH(A)P-KA type)	08	1		
	Set: 5 speed High ceiling: 4 + High ceiling ②	08	2		
No. of air outlets	4 directions	09	1		
	3 directions	09	2		
	2 directions	09	3		
Installed options (high-performance filter)	Not supported	10	1		
	Supported	10	2		
Up/down vane setting	No vanes	11	1		
	Equipped with vanes (No. 1 set)	11	2		
	Equipped with vanes (No. 2 sets)	11	3		
Energy saving air flow (Heating mode)	Disabled	12	1		
	Enabled	12	2		
Humidifier (Direct Add on type)	Not supported	13	1		
	Supported	13	2		

NOTE: When the Indoor unit functions were changed using the function selection after installation is complete, always indicate the set contents by entering ○ or other mark in the appropriate check field of Table 1.

[Function selection flow]

First grasp the function selection flow. The following describes setting of "Room temperature detection position" of Table 1 as an example.
(For the actual setting procedure, see [Setting procedure] ① to ⑥.)



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9 Self check

Retrieves the error history of each unit using the remote controller.

① Switch to the self check mode.
When the Ⓐ [CHECK] button is pressed twice in succession within three seconds, the display shown below appears.

Self check address and self check refrigerant address

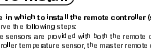
② Set the address or refrigerant address No. you want to self check.
When the Ⓔ [TEMP. (▽) and (△)] buttons are pressed, the address decreases and increases between 01 and 50 or 00 and 15. Set it to the address No. or refrigerant address No. you want to self check.

Approximately three seconds after the change operation, the self check refrigerant address changes from flashing to a steady light and self check begins.

③ Self check result display <Error history> (For the contents of the error code, refer to the Indoor unit Installation manual or service hand book.)

④ Error history reset
The error history is displayed in ③ Self check results display.

When the Ⓔ [Timer selection] button is pressed twice successively within three seconds, the self check address or refrigerant address flashes.



When the error history was reset, the display shown below appears.
When error history reset failed, the error contents are displayed again.

⑤ Self check reset
There are the following two ways of resetting self check.
Press the Ⓐ [CHECK] button two times in succession within three seconds → Resets self check and returns to the state before self check.
Press the Ⓑ [ON/OFF] button → Self check resets and operation stops.
(When no operation is prohibited, this operation is ineffective.)

10 Remote Controller Check

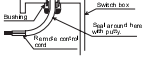
① First check the power mark.
When normal voltage (DC12V) is not applied to the remote controller, the power mark goes off.
When the power mark is off, check the remote controller wiring and the Indoor unit.

② Switch to the remote controller check mode.
When the Ⓐ [CHECK] button is held down for five seconds or longer, the display shown below appears.

When the Ⓑ [FILTER] button is pressed, remote controller check begins.

③ Remote controller check result
When remote controller is normal

When remote controller is faulty
(Error display 1) "NG" flashes → Remote controller send/receive circuit abnormal



Stop the unit supplying at the remote controller check for other causes.

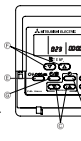
When the problem is other than the check of remote controller
(Error code 2) E3 E4 6833 6834 flash → Cannot send

Remote controller switching is necessary.

(Error display 3) "ERC" and data error count are displayed → Data error generation
Data error count (Max 66 errors)

There is noise on the transmission line, or the Indoor unit or another remote controller is faulty. Check the transmission line and the other remote controllers.

* Data error count "1" is the difference between the number of bits of remote controller sent data and the number of bits actually sent to the transmission line. In this case, the send data was disturbed by the noise, etc. Check the transmission line.



④ Remote controller check reset
When the Ⓐ [CHECK] button is held down for five seconds or longer, remote controller check resets and the "HO" and RUN lamp flash.
Approximately 30 seconds later, the remote controller returns to the state before remote controller check.

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