updated August 06,2013



STANDARD INVERTER PACKAGED AIR-CONDITIONERS

(Split system, air to air heat pump type)

CEILINING CASSETTE-4WAY TYPE

FDT71VNPVF1 FDT90VNPVF1

DUCT CONNECTED-HIGH STATIC PRESSURE TYPE

FDU71VNPVF1 FDU90VNPVF1

FLOOR STANDING TYPE

FDF71VNPVD1 FDF90VNPVD1

CEILING SUSPENDED TYPE

FDEN71VNPVF1 FDEN90VNPVF1

DUCT CONNECTED-LOW/MIDDLE STATIC PRESSURE TYPE

FDUM71VNPVF1 FDUM90VNPVF1



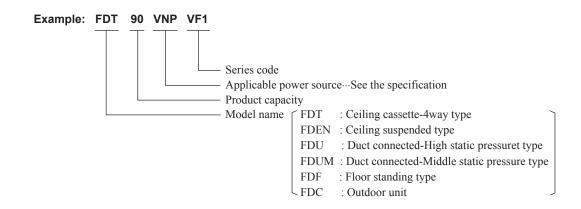
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■ How to read the model name



1. OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

1.1 Remote control

(1) Wired remote control Model RC-E5

This button is used at servicing.

This button is used during test operation.

TEST button -

The figure below shows the remote control with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation Characters displayed with dots in the liquid crystal display area are abbreviated.

The figure below shows the remote control with the cover opened. Ventilaion display Weekly timer display Displayed during ventilation operation Displays the settings of the weekly timer. Centeal control display Operation setting display area Displayed when the air conditioning system is Displays setting temperature, airflow controlled by centralized remote control. volume, operation mode and oparation message. Timer operation display Displays the timer operation setting. Operation/check indicator light During oparation: Lit in green CENTER: SUN (MON) (TUE) (MED) (THU) (FR) (SAT) In case of error: Flashing in red ⊕AM/*B:BB* ●AM/*B:BB* Fhour 3 Temperature setting buttons Operation/stop button These buttons are used to set the 7.5°C 🍀 📶 This button is used to operate and stop temperature of the room. the air conditioning system. **↓**TEMP ① ON/OFF Press the button once to operate the system and press it once again to stop Timer button -This button is used to set the system. the timer mode. MODE button This button is used to change the operation mode. Timer setting buttons -**FAN SPEED button** These buttons are used to set // 5 4 This button is used to set the airflow the timer mode and the time. LOU volume. **VENT** button ESP button This button is used to operate external This button is used to select the auto static ventilator. pressure adjustment mode. LOUVER button This button is used to operate/stop the Cover swing louver. AIR CON No. button Display the indoor unit number connected to this **SET** button remote control. •This button is used to fix the setting. •This button is used to set the silent mode. CHECK button

RESET button

previous operation.

(Press it after cleaning the air filter)

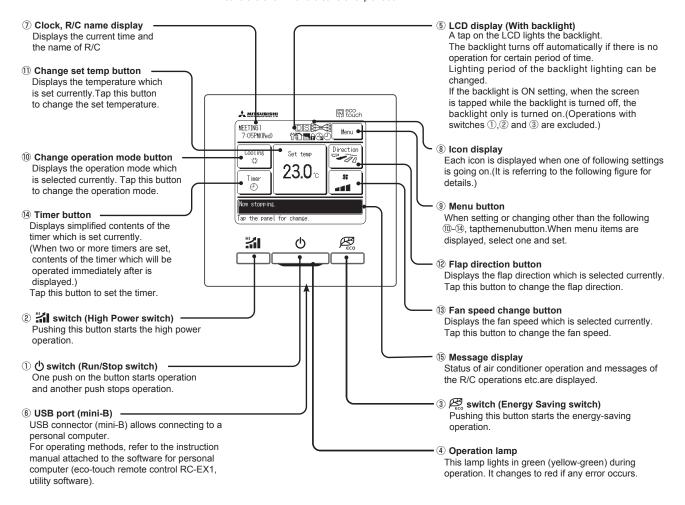
Press this button while making settings to go back to the

•This button is also used to reset the "FILTER CLEANING" display.

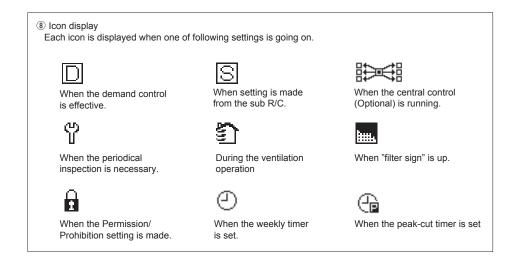
^{*} All displays are described in the liguid crystal display for explanation.

Model RC-EX1A

All icons are shown for the sake of explanation.

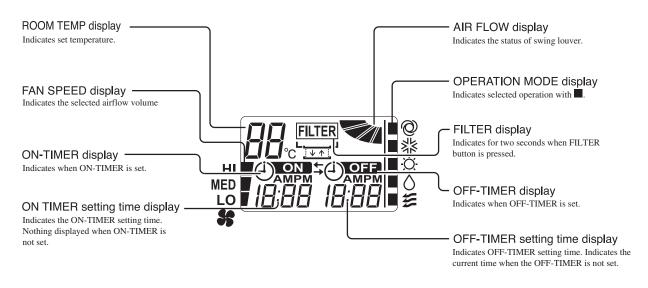


Touch panel system, which is operated by tapping the LCD screen with a finger, is employed for any operations other than the 1 Run/Stop, 2 High power and 3 Energy-saving switches.

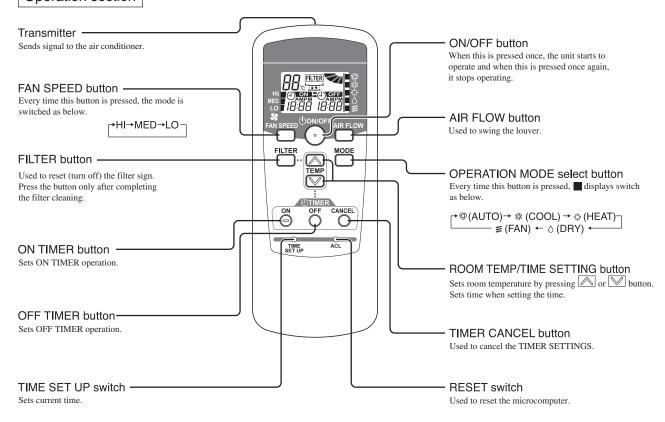


(2) Wireless remote control

Indication section



Operation section

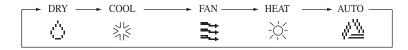


 $[\]ensuremath{^{*}}$ All displays are described in the liquid crystal display for explanation

1.2 Operation control function by the wired remote control

Model RC-E5

(1) Switching sequence of the operation mode switches of remote control



(2) CPU reset

This functions when "CHECK" and "ESP" buttons on the remote control are pressed simultaneously. Operation is same as that of the power supply reset.

(3) Power failure compensation function (Electric power supply failure)

- This becomes effective if "Power failure compensation effective" is selected with the setting of remote control function.
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.

After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.

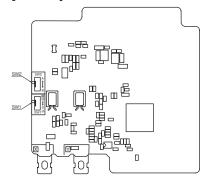
· Content memorized with the power failure compensation are as follows.

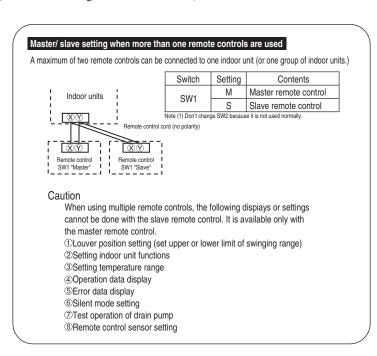
Note (1) Items (f), (g) and (h) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

- (a) At power failure Operating/stopped

 If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)
- (b) Operation mode
- (c) Airflow volume mode
- (d) Room temperature setting
- (e) Louver auto swing/stop
 - However, the stop position (4-position) is cancelled so that it returns to Position (1).
- (f) "Remote control function items" which have been set with the remote control function setting ("Indoor function items" are saved in the memory of indoor unit.)
- (g) Upper limit value and lower limit value which have been set with the temperature setting control
- (h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

[Parts layout on remote control PCB]



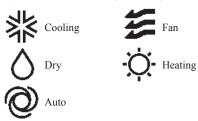


Back

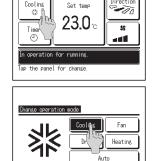
Model RC-EX1A

(1) Switching sequence of the operation mode switches of remote control

- (a) Tap the change operation mode button on the TOP screen.
- (b) When the change operation mode screen is displayed, tap the button of desired mode.
- (c) When the operation mode is selected, the display returns to the TOP screen. Icons displayed have the following meanings.

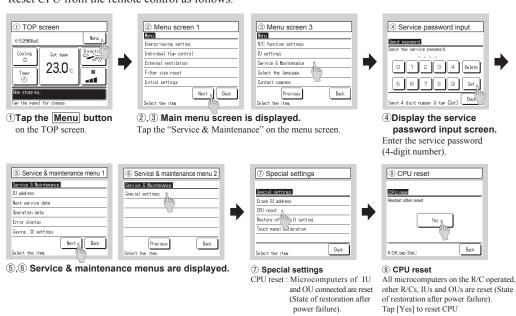


- Notes(1) Operation modes which cannot be selected depending on combinations of IU and OU are not displayed.
 - (2) When the Auto is selected, the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.



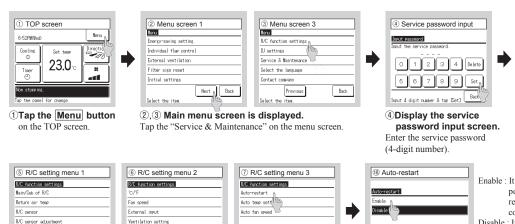
(2) CPU reset

Reset CPU from the remote control as follows.



(3) Power failure compensation function (Electric power supply failure)

Enable the Auto-restart function from the remote control as follows.



(5),(6),(7) Display the R/C setting menu screens.

Next Back

Enable: It returns to the state be fore the supply power failure as soon as the power is restored (After the end of the primary control at the power on).

Disable: It stops after the restoration of power

Supply, regardless the state of operation before the power failure.

® Auto-restart

Set the state of operation to be started when the power supply is restored after a power failure.

Back

Back

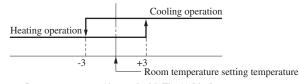
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.
 - After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.
- Content memorized with the power failure compensation are as follows.
 - Note (1) Items (f), (g) and (h) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.
 - (a) At power failure Operating/stopped

 If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)
 - (b) Operation mode
 - (c) Airflow volume mode
 - (d) Room temperature setting
 - (e) Louver auto swing/stop
 - However, the stop position (4-position) is cancelled so that it returns to Position (1).
 - (f) "Remote control function items" which have been set with the remote control function setting ("Indoor function items" are saved in the memory of indoor unit.)
 - (g) Upper limit value and lower limit value which have been set with the temperature setting control
 - (h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

1.3 Operation control function by the indoor control

(1) Auto operation

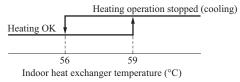
(a) If "Auto" mode is selected by the remote control, the heating and the cooling are automatically switched according to the difference between outdoor air temperature and setting temperature and the difference between setting temperature and return air temperature. (When the switching of cooling mode ↔ heating mode takes place within 3 minutes, the compressor does not operate for 3 minutes by the control of 3-minute timer.) This will facilitate the cooling/heating switching operation in intermediate seasons and the adaptation to unmanned operation at stores, etc (ATM corner of bank).



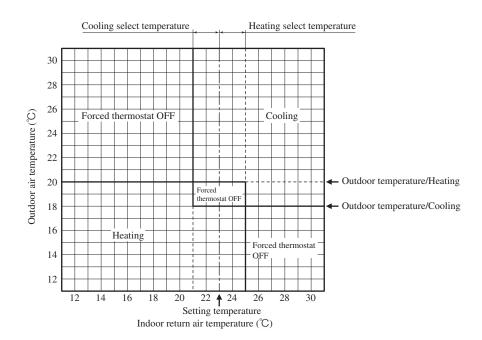
Room temperature (detected with Thi-A) [deg]

Notes (1) Temperature range of switching cooling/heating mode can be changed by RC-EX1A from $\pm 1.0 \sim \pm 4.0$.

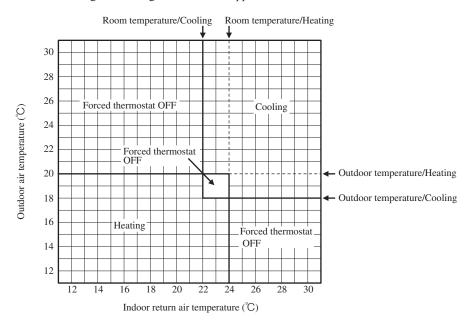
- (2) Room temperature control during auto cooling/auto heating is performed according to the room temperature setting temperature. (DIFF: ±1 deg)
- (3) If the indoor heat exchanger temperature rises to 59°C or higher during heating operation, it is switched automatically to cooling operation. In addition, for 1 hour after this switching, the heating operation is not performed, regardless of the temperature shown at right.



- (b) The following automatic controls are performed other than (a) above. (FDT, FDU, FDUM series only)
 - (i) Cooling or heating operation mode is judged according to the conditions of the "Judgment based on Setting temperature + Cooling select temperature and Indoor return air temperature" and the "Judgment based on Outdoor temperature".
 - 1) In "Setting temperature Cooling select temperature < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor return air temperature" \Rightarrow Operation mode: Cooling
 - 2) "Setting temperature + Heating select temperature > Indoor return air temperature" and "Outdoor temperature/Heating > Outdoor air temperature" \Rightarrow Operation mode: Heating
 - 3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.
 - 4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



- (ii) Regardless of the setting temperature, the cooling or heating operation mode is judged according to the "Judgment based on Room temperature/Cooling or Heating and Outdoor temperature/Cooling or Heating".
- 1) In case of "Room temperature/Cooling < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor air temperature" \Rightarrow Operation mode: Cooling
- 2) In case of "Room temperature/Heating > Indoor return air temperature" and "Outdoor temperature /Heating > Outdoor air temperature" \Rightarrow Operation mode: Heating
- 3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.
- 4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



(2) Operations of functional items during cooling/heating

Operation	Cod	ling		Heating			
Functional item	Thermostat ON	Thermostat OFF	Fan	Thermostat ON	Thermostat OFF	Hot start (Defrost)	Dehumidify
Compressor	0	×	×	0	×	0	O/×
4-way valve	×	×	×	0	0	○(×)	×
Outdoor unit fan	0	×	×	0	×	○(×)	O/×
Indoor unit fan	0	0	0	O/×	O/×	O/×	O/×
Drain pump ⁽³⁾	0	X ⁽²⁾	× ⁽²⁾		O/× ⁽²⁾		Thermostat ON: O Thermostat OFF: X ⁽²⁾

Note (1) ○: Operation ×: Stop ○/×: Turned ON/OFF by the control other than the room temperature control.

- (2) ON during the drain motor delay control.
- (3) Drain pump ON setting may be selected with the indoor unit function setting of the wired remote control.

(3) Dehumidifying operation

Return air temperature thermistor [ThI-A (by the remote control when the remote control thermistor is enabled)] controls the indoor temperature environment simultaneously.

- (a) Operation is started in the cooling mode. When the difference between the return air temperature and the setting temperature is 2°C or less, the indoor unit fan tap is brought down by one tap. That tap is retained for 3 minutes after changing the indoor unit fan tap.
- (b) If the return air temperature exceeds the setting temperature by 3°C during dehumidifying operation, the indoor unit fan tap is raised. That tap is retained for 3 minutes after changing the indoor unit fan tap.
- (c) If the thermostat OFF is established during the above control, the indoor unit fan tap at the thermostat ON is retained so far as the thermostat is turned OFF.

(4) Timer operation

(a) RC-E5

(i) Sleep timer

Set the duration of time from the present to the time to turn off the air-conditioner.

It can be selected from 10 steps in the range from "OFF 1 hour later" to "OFF 10 hours later". After the sleep timer setting, the remaining time is displayed with progress of time in the unit of hour.

(ii) OFF timer

Time to turn OFF the air-conditioner can be set in the unit of 10 minutes.

(iii) ON timer

Time to turn ON the air-conditioner can be set. Indoor temperature can be set simultaneously.

(iv) Weekly timer

Timer operation (ON timer, OFF timer) can be set up to 4 times a day for each weekday.

(v) Timer operations which can be set in combination

Item	Timer	OFF timer	ON timer	Weekly timer
Timer		×	0	×
OFF timer	OFF timer ×		0	×
ON timer	0	0		×
Weekly timer	×	×	×	

Note (1) ○: Allowed ×: Not

(2) Since the ON timer, sleep timer and OFF timer are set in parallel, when the times to turn ON and OFF the airconditioner are duplicated, the setting of the OFF timer has priority.

(b) RC-EX1A

(i) Sleep timer

Set the time from the start to stop of operation. The time can be selected in the range from 30 to 240 minutes (in the unit of 10-minute).

Note (1) Enable the "Sleep timer" setting from the remote control. If the setting is enabled, the timer operates at every time.

(ii) Set OFF timer by hour

Set the time to stop the unit after operation, in the range from 1 to 12 hours (in the unit of hour).

(iii) Set ON timer by hour

Set the time to start the unit after the stop of operation, in the range from 1 to 12 hours (in the unit of hour). It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

(iv) Set ON timer by clock

Set the time to start operation. The time can be set in the unit of 5-minute. This setting can be activated only once or at every time. It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

Note (1) It is necessary to set the clock to use this timer.

(v) Set OFF timer by clock

Set the time to stop operation. The time can be set in the unit of 5-minute. This setting can be activated only once or at every time.

Note (1) It is necessary to set the clock to use this timer.

(vi) Weekly timer

Set the ON or OFF timer for a week. Up to 8 patterns can be set for a day. The day-off setting is provided for holidays and non-business days.

Note (1) It is necessary to set the clock to use the weekly timer.

(vii) Combination of patterns which can be set for the timer operations

	Sleep time	Set OFF timer by hour	Set ON timer by hour	Set OFF timer by clock	Set ON timer by clock	Weekly timer
Sleep time		×	×	0	0	0
Set OFF timer by hour	×		×	×	×	×
Set ON timer by hour	×	×		×	×	×
Set OFF timer by clock	0	×	×		0	×
Set ON timer by clock	0	×	×	0		×
Weekly timer	0	×	×	×	×	

Note (1) ○: Allowed ×: Not

(5) Remote control display during the operation stop

When the operation is stopped (the power supply is turned ON), it displays preferentially the "Room temperature", "Center/Remote", "Filter sign", "Inspection" and "Timer operation".

(6) Hot start (Cold draft prevention at heating)

(a) Operating conditions

When either one of following conditions is met, the hot start control is performed.

- (i) From stop to heating operation
- (ii) From cooling to heating operation
- (iii) Form heating thermostat OFF to ON
- (iv) After completing the defrost control (only on units with thermostat ON)

(b) Contents of operation

- (i) Indoor fan motor control at hot start
 - Within 7 minutes after starting heating operation, the fan mode is determined depending on the condition of thermostat (fan control with heating thermostat OFF).
 - a) Thermostat OFF
 - i) Operates according to the fan control setting at heating thermostat OFF.
 - ii) Even if it changes from thermostat OFF to ON, the fan continues to operate with the fan control at thermostat OFF till the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher.
 - iii) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set airflow volume.
 - b) Thermostat ON
 - i) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 25°C or lower, the fan is turned OFF and does not operate.
 - ii) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 25°C or higher, the fan operates with the fan control at heating thermostat OFF.
 - iii) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set airflow volume.
 - c) If the fan control at heating thermostat OFF is set at the "Set airflow volume" (from the remote control), the fan operates with the set airflow volume regardless of the thermostat ON/OFF.
 - 2) Once the fan motor is changed from OFF to ON during the thermostat ON, the indoor fan motor is not turned OFF even if the heat exchanger thermistor detects lower than 25°C.
 - Note (1) When the defrost control signal is received, it complies with the fan control during defrosting.
 - 3) Once the hot start is completed, it will not restart even if the temperature on the heat exchanger thermistor drops.
- (ii) During the hot start, the louver is kept at the horizontal position.
- (iii) When the fan motor is turned OFF for 7 minutes continuously after defrosting, the fan motor is turned ON regardless of the temperatures detected with the indoor heat exchanger thermistors (ThI-R1, R2).

(c) Ending condition

- (i) If one of following conditions is met during the hot start control, this control is terminated, and the fan is operated with the set airflow volume.
 - 1) Heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher.
 - 2) It has elapsed 7 minutes after starting the hot start control.

(7) Hot keep

Hot keep control is performed at the start of the defrost control.

- (a) Control
 - (i) When the indoor heat exchanger temperature (detected with ThI-R1 or R2) drops to 35°C or lower, the speed of indoor fan is changed to the lower tap at each setting.
 - (ii) During the hot keep, the louver is kept at the horizontal position.
- (b) Ending condition

When the indoor fan is at the lower tap at each setting, it returns to the set airflow volume as the indoor heat exchanger temperature rises to 45°C or higher.

(8) Auto swing control (FDTC, FDT and FDEN only)

(a) RC-E5

- (i) Louver control
 - 1) Press the "LOUVER" button to operate the swing louver when the air conditioner is operating.
 - "SWING ="" is displayed for 3 seconds and then the swing louver moves up and down continuously.
 - 2) To fix the swing louver at a position, press one time the "LOUVER" button while the swing louver is moving so that four stop positions are displayed one after another per second.
 - When a desired stop position is displayed, press the "LOUVER" button again. The display stops, changes to show the "STOP 1—" for 5 seconds and then the swing louver stops.
 - 3) Louver operation at the power on with a unit having the louver 4-position control function
 - The louver swings one time automatically (without operating the remote controller) at the power on.
 - This allows inputting the louver motor (LM) position, which is necessary for the microcomputer to recognize the louver position.
 - Note (1) If you press the "LOUVER" button, the swing motion is displayed on the louver position LCD for 10 second. The display changes to the "SWING -" display 3 seconds later.
- (ii) Automatic louver level setting during heating

At the hot start with the heating thermostat OFF, regardless whether the auto swing switch is operated or not (auto swing or louver stop), the louver takes the level position (In order to prevent the cold start). The louver position display LCD continues to show the display which has been shown before entering this control.

(iii) Louver-free stop control

When the louver-free stop has been selected with the indoor function of wired remote controll " \Rightarrow_{n} POSITION", the louver motor stops when it receives the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position where it was before the stop.

(b) RC-EX1A

- (i) Louver control
 - 1) To operate the swing louver when the air conditioner is operating, press the "Direction" button on the TOP screen of remote control. The wind direction select screen will be displayed.
 - 2) To swing the louver, touch the "Auto swing" button. The lover will move up and down. To fix the swing louver at a position, touch one of [1] [4] buttons. The swing lover will stop at the selected position.
 - 3) Louver operation at the power on with a unit having the louver 4-position control function
 - The louver swings one time automatically (without operating the remote controller) at the power on.
 - This allows the microcomputer recognizing and inputting the louver motor (LM) position.
- (ii) Automatic louver level setting during heating

At the hot start and the heating thermostat OFF, regardless whether the auto swing switch is operated or not (auto swing or louver stop), the louver takes the level position (in order to prevent blowing of cool wind). The louver position display LCD continues to show the display which has been shown before entering this control.

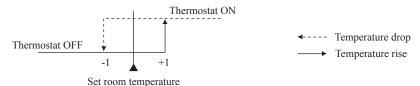
(iii) Louver free stop control

If you touch the "Menu" \rightarrow "Next" \rightarrow "R/C settings" buttons one after another on the TOP screen of remote control, the "Flap control" screen is displayed. If the free stop is selected on this screen, the louver motor stops upon receipt of the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position before the stop.

(9) Thermostat operation

(a) Cooling

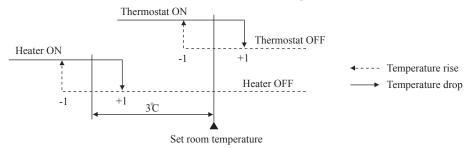
- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set temperature < +1 at the start of cooling operation (including from heating to cooling).

(b) Heating

- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set point < +1 at the start of cooling operation (including from cooling to heating).

(c) Fan control during heating thermostat OFF

- (i) Following fan controls during the heating thermostat OFF can be selected with the indoor function setting of the wired remote control.
 - ① Low fan speed (Factory default), ② Set fan speed, ③ Intermittence, ④ Fan OFF
- (ii) When the "Low fan speed (Factory default)" is selected, the following taps are used for the indoor fans.
 - · For AC motor: Lo tap
 - · For DC motor: ULo tap
- (iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.
- (iv) If the "Intermittence" is selected, following controls are performed:
 - 1) If the thermostat is turned OFF during the heating operation, the indoor unit moves to the hot control and turns OFF the indoor fan if the heat exchanger thermistors (both ThI-R1 and R2) detect 25°C or lower.
 - Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at Lo or ULo for 2 minutes.
 In the meantime the louver is controlled at level.
 - 3) After operating at Lo or ULo for 2 minutes, the indoor fan moves to the state of 1) above.
 - 4) If the thermostat is turned ON, it moves to the hot start control.
 - 5) When the heating thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from Lo or ULo to stop.
 - The remote control uses the operation data display function to display temperatures and updates values of temperature even when the indoor fan is turned OFF.
 - 6) When the defrosting starts while the heating thermostat is turned OFF or the thermostat is turned OFF during defrosting, the indoor fan is turned OFF. (Hot keep or hot start control takes priority.) However, the suction temperature is updated at every 7-minute.
 - 7) When the heating thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.
- (v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

(d) Fan control during cooling thermostat OFF (FDT, FDU, FDUM series only)

- (i) Following fan controls during the cooling thermostat OFF can be selected with the indoor function setting of the wired remote control.
 - ① Low fan speed, ② Set fan speed (Factory default), ③ Intermittence, ④ Fan OFF
- (ii) When the "Low fan speed" is selected, the following taps are used for the indoor fans.
 - · For DC motor: ULo tap
- (iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.
- (iv) If the "Intermittence" is selected, following controls are performed:
 - 1) If the thermostat is turned OFF during the cooling operation, the indoor unit fan motor stope.
 - 2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.
 - 3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.
 - 4) If the thermostat is turned ON, the fan starts operation at set fan speed.
 - 5) When the cooling thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
 - By using operation data display function at wireless remote control, the tempenature as displayad and the value is updated including the fan stops.
 - 6) When the cooling thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.
- (v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

(10) Filter sign

As the operation time (Total ON time of ON/OFF switch) accumulates to 180 hours (1), "FILTER CLEANING" is displayed on the remote control. (This is displayed when the unit is in trouble and under the centralized control, regardless of ON/OFF)

Note (1) Time setting for the filter sign can be made as shown below using the indoor function of wired remote control "FILTER SIGN SET". (It is set at TYPE 1 at the shipping from factory.)

Filter sign setting	Function		
TYPE 1	Setting time: 180 hrs (Factory default)		
TYPE 2	Setting time: 600 hrs		
TYPE 3	Setting time: 1,000 hrs		
TYPE 4	Setting time: 1,000 hrs (Unit stop) (2)		

⁽²⁾ After the setting time has elapsed, the "FILTER CLEANING" is displayed and, after operating for 24 hours further (counted also during the stop), the unit stops

(11) Compressor inching prevention control

(a) 3-minute timer

When the compressor has been stopped by the thermostat, remote control operation switch or anomalous condition, its restart will be inhibited for 3 minutes. However, the 3-minute timer is invalidated at the power on the electric power source for the unit.

- (b) 3-minute forced operation timer
 - (i) Compressor will not stop for 3 minutes after the compressor ON. However, it stops immediately when the unit is stopped by means of the ON/OFF switch or by when the thermister turned OFF the change of operation mode.
 - (ii) If the thermostat is turned OFF during the forced operation control of heating compressor, the louver position (with the auto swing) is returned to the level position.
 - Note (1) The compressor stops when it has entered the protective control.

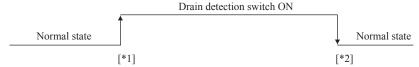
(12) Drain pump control

- (a) This control is operated when the inverter frequency is other than 0 Hz during the cooling operation and automatic cooling and dehumidifying operations.
- (b) Drain pump ON condition continues for 5 minutes even when it enters the OFF range according to (i) above after turning the drain pump ON, and then stops. The 5-minute delay continues also in the event of anomalous stop.
- (c) The drain pump is operated with the 5-minute delay operation when the compressor is changed from ON to OFF.
- (d) Even in conditions other than the above (such as heating, fan, stop, cooling thermostat OFF), the drain pump control is performed by the drain detection.
- (e) Following settings can be made using the indoor function setting of the wired remote control.
 - (i) 🗱 (Standard (in cooling & dry)): Drain pump is run during cooling and dry.
 - (ii) 器合制0黨 [Operate in standard & heating]: Drain pump is run during cooling, dry and heating.
 - (iii) 攀合副原副[Operate in heating & fan]: Drain pump is run during cooling, dry, heating and fan.
 - (iv) 禁冷器[Operate in standard & fan]: Drain pump is run during cooling, dry and fan.

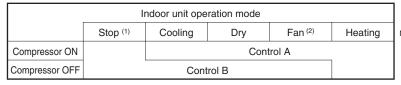
 Note (1) Values in [] are for the RC-EX1A model.

(13) Drain motor (DM) control

(a) Drain detection switch is turned ON or OFF with the float switch (FS) and the timer.



- [*1] Drain detection switch is turned "ON" when the float switch "Open" is detected for 3 seconds continuously in the drain detectable space.
- [*2] Drain detection switch is turned "OFF" when the float switch "Close" is detected for 10 seconds continuously.
- (i) It detects always from 30 seconds after turning the power ON.
 - 1) There is no detection of anomalous draining for 10 seconds after turning the drain pump OFF.
 - 2) Turning the drain detection switch "ON" causes to turn ON the drain pump forcibly.
 - 3) Turning the drain detection switch "OFF" releases the forced drain pump ON condition.
- (b) Indoor unit performs the control A or B depending on each operating condition.



Note (1) Including the stop from the cooling, dehumidifying, fan and heating, and the anomalous stop (2) Including the "Fan" operation according to the mismatch of operation modes

(i) Control A

- 1) If the float switch detects any anomalous draining condition, the unit stops with the anomalous stop (displays E9) and the drain pump starts. After detecting the anomalous condition, the drain motor continues to be ON.
- 2) It keeps operating while the float switch is detecting the anomalous condition.

(ii) Control B

If the float switch detects any anomalous drain condition, the drain motor is turned ON for 5 minutes, and at 10 seconds after the drain motor OFF it checks the float switch. If it is normal, the unit is stopped under the normal mode or, if there is any anomalous condition, E9 is displayed and the drain motor is turned ON. (The ON condition is maintained during the drain detection.)

(14) Operation check/drain pump test run operation mode

- (a) If the power is turned on by the dip switch (SW7-1) on the indoor PCB when electric power source is supplied, it enters the mode of operation check/drain pump test run. It is ineffective (prohibited) to change the switch after turning power on.
- (b) When the communication with the remote control has been established within 60 seconds after turning power on by the dip switch (SW7-1) ON, it enters the operation check mode. Unless the remote control communication is established, it enters the drain pump test run mode.
 - Note (1) To select the drain pump test run mode, disconnect the remote control connector (CNB) on the indoor PCB to shut down the remote control communication.

(c) Operation check mode

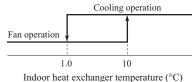
There is no communication with the outdoor unit but it allows performing operation in respective modes by operating the remote control.

(d) Drain pump test run mode

As the drain pump test run is established, the drain pump only operates and during the operation protective functions by the microcomputer of indoor unit become ineffective.

(15) Cooling, dehumidifying frost protection

(a) To prevent frosting during cooling mode or dehumidifying mode operation, the of compressor speed is reduced if the indoor heat exchanger temperature (detected with ThI-R) drops to 1.0 °C or lower at 4 minutes after the start of compressor operation. If the indoor unit heat exchanger temperature is 1.0 °C or lower after 1 minutes, the compressor speed is reduced further. If it becomes 2.5 °C or higher, the control terminates. When the indoor heat exchanger temperature has become as show below after reducing the compressor speed, it is switched to the fan operation. For the selection of indoor fan speed, refer to item 2).



(b) Selection of indoor fan speed

If it enters the frost prevention control during cooling operation (excluding dehumidifying), the indoor unit fan speed is switched

- (i) In cases of FDEN
 - 1) When the indoor unit return air temperature (detected with ThI-A) is 23°C or lower, this control is invalidated and, as 2 hours elapse after starting the frost prevention control, it is terminated.
 - 2) If it is detected again within 15 minutes from the start of frost prevention control, the indoor fan speed is raised by 1 tap to increase the indoor unit fan speed. If it is detected within further 15 minutes, the indoor unit fan speed is raised by 1 tap more.

Note (1) Indoor unit fan speed can be increased by up to 2 taps.

- 3) "#FAN SPEED SW VALID/INVALID" of this control is selectable with the function setting of remote control.
- (ii) In the case of FDT, FDU, FDUM, FDF
 - When the indoor return air detection temperature (detected with ThI-A) is 23°C or higher and the indoor heat exchanger temperature (detected with ThI-R) detects the compressor frequency drop start temperature A°C+1°C, of indoor unit fan speed is increased by 20rpm.
 - 2) If the phenomenon of 1) above is detected again after the acceleration of indoor unit fan, indoor unit fan speed is increased further by 20rpm.

Note (1) Indoor unit fan speed can be increased by up to 2 taps.

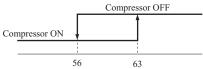
• Compressor frequency drop start temperature

Symbol Item Symbol	A
Temperature - Low (Factory default)	1.0
Temperature - High	2.5

Note (1) Frost prevention temperature setting can be selected with the indoor unit function setting of the wired remote control.

(16) Heating overload protection

(a) If the indoor heat exchanger temperature (detected with ThI-R) at 63°C or higher is detected for 2 seconds continuously, the compressor stops. When the compressor is restarted after a 3-minute delay, if a temperature at 63°C or higher is detected for 2 seconds continuously within 60 minutes after initial detection and if this is detected 5 times consecutively, the compressor stops with the anomalous stop (E8). Anomalous stop occurs also when the indoor heat exchanger temperature at 63°C or higher is detected for 6 minutes continuously.



Indoor heat exchanger temperature (°C)

(b) Indoor unit fan speed selection

If, after second detection of heating overload protection up to fourth, the indoor fan is set at Me and Lo taps when the compressor is turned ON, the indoor fan speed is increased by 1 tap.

(17) Anomalous fan motor

- (a) After starting the fan motor, if the fan motor speed is 200rpm or less is detected for 30 seconds continuously and 4 times within 60 minutes, then fan motor stops with the anomalous stop (E16).
- (b) If the fan motor fails to reach at -50(FDU: -500) rpm less than the required speed, it stops with the anomalous stop (E20).

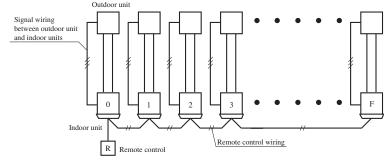
(18) Plural unit control - Control of 16 units group by one remote control

(a) Function

One remote control switch can control a group of multiple number of unit (Max. 16 indoor units). "Operation mode" which is set by the remote control switch can operate or stop all units in the group one after another in the order of unit No.⁽¹⁾. Thermostat and protective function of each unit function independently.

Notes (1) Unit No. is set by SW2 on the indoor unit control PCB. Unit No. setting by SW2 is necessary for the indoor unit only.

SW2: For setting of 0 - 9, A - F



(2) Unit No. may be set at random unless duplicated, it should be better to set orderly like 0, 1, 2..., F to avoid mistake.

(b) Display to the remote control

- (i) Center or each remote control basis, heating preparation: the youngest unit No. among the operating units in the remote mode (or the center mode unless the remote mode is available) is displayed.
- (ii) Inspection display, filter sign: Any of unit that starts initially is displayed.
- (iii) Confirmation of connected units
 - 1) In case of RC-E5 remote control

Pressing "AIR CON No." button on the remote control displays the indoor unit address. If "▲" "▼" button is pressed at the next, it is displayed orderly starting from the unit of youngest No.

2) In case of RC-EX1A remote control

If you touch the buttons in the order of "Menu" \rightarrow "Next" \rightarrow "Service & Maintenance" \rightarrow "IU address" on the TOP screen of remote control, the indoor units which are connected are displayed.

(iv) In case of anomaly

- 1) If any anomaly occurs on a unit in a group (a protective function operates), that unit stops with the anomalous stop but any other normal units continue to run as they are.
- Signal wiring procedure Signal wiring between indoor and outdoor units should be made on each unit same as the normal wiring. For the group control, lay connect with sires wiring between rooms using terminal blocks (X, Y) of remote control. Connect the remote control communication wire separately from the power supply wire or wires of other electric devices (AC220V or higher).

(19) High ceiling control

When sufficient air flow rate cannot be obtained from the indoor unit which is installed at a room with high ceiling, the air flow rate can be increased by changing the fan tap. To change the fan tap, use the indoor unit function "FAN SPEED SET" on the wired remote control.

Fan tap		Indoor unit airflow setting					
		Sall - Sal - Sal - Sal	8a11 - 8a10 - 8a00	%ad - %ad)	8a11 - 8a10		
FAN SPEED SET	STANDARD	PHi - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me		
	HIGH SPEED1, 2	PHi - PHi - Hi - Me	PHi - Hi - Me	PHi - Me	PHi - Hi		

Notes (1) Factory default is STANDARD.

- (2) At the hot-start and heating thermostat OFF, or other, the indoor unit fan is operated at the low speed tap of each setting
- (3) This function is not able to be set with wireless remote controls or simple remote control (RCH-E3)

(20) Abnormal temperature thermistor (return air/indoor heat exchanger) wire/short-circuit detection

(a) Broken wire detection

When the return air temperature thermistor detects -50°C or lower or the heat exchanger temperature thermistor detect -50°C or lower for 5 seconds continuously, the compressor stops. After a 3-minute delay, the compressor restarts but, if it is detected again within 60 minutes after the initial detection for 6 minutes continuously, stops again (the return air temperature thermistor: E7, the heat exchanger temperature thermistor: E6).

(b) Short-circuit detection

If the heat exchanger temperature thermistor detects 70°C or higher for 5 seconds continuously at 2 minutes and 20 seconds after the compressor ON during cooling operation, the compressor stops (E6).

(21) External input/output control (CnT or CnTA)

Be sure to connect the wired remote control to the indoor unit. Without wired remote control remote operation by CnT is not possible to perform.

■ Priority order for combinations of CnT and CnTA input.

				Cn	TA		
		① Operation stop level	② Operation stop pulse	③ Operation permission/prohibition	4 Operation permission/prohibition pulse	⑤ Cooling/heating selection level	6 Cooling/heating selection pulse
	① Operation stop level	CnT ①	CnT ①	CnT ① +CnTA ②	CnT ①	CnT ① /CnTA ⑤	CnT ① /CnTA ⑥
	② Operation stop pulse	CnT ②	CnT ②	CnT ② +CnTA ③	CnT ②	CnT ② /CnTA ⑤	CnT ② /CnTA ⑥
C-T	③ Operation permission/prohibition level	CnT ③ >CnTA ①	CnT ③ >CnTA ②	CnT ③ +CnTA ③	CnT ③	CnT ③ /CnTA ⑤	CnT ③ /CnTA ⑥
CnT	Operation permission/prohibition pulse	CnT 4	CnT 4	CnT 4 +CnTA 3 **	CnT 4	CnT 4 /CnTA 5	CnT 4 /CnTA 6
	(5) Cooling/heating selection level	CnT ⑤ /CnTA ①	CnT 5 /CnTA 2	CnT 5 /CnTA 3 **	CnT 5 /CnTA 4	CnT ⑤	CnT ⑤
	Cooling/heating selection pulse	CnT 6 /CnTA 1	CnT 6 /CnTA 2	CnT 6 /CnTA 3	CnT 6 /CnTA 4	CnT 6	CnT 6

Note (1) Following operation commands are accepted when the operation prohibition is set with CnTA as indicated with *.

Individual operation command from remote control, test run command from outdoor unit and operation command from optional device, CNT input.

Reference: Explanation on the codes and the combinations of codes in the table above

- 1. In case of CnT "Number", the CnT "Number" is adopted and CnTA is invalidated.
- 2. In case of CnTA "Number", the CnTA "Number" is adopted and CnT is invalidated.
- 3. In case of CnT "Number"/CnTA "Number", the CnT "Number" and the CnTA "Number" become independent functions each other.
- 4. In case of CnT "Number" + CnTA "Number", the CnT "Number" and the CnTA "Number" become competing functions each other.
- 5. In case of CnT "Number" > CnTA "Number", the function of CnT "Number" supersedes that of CnTA "Number".
- 6. In case of CnT "Number" < CnTA "Number", the function of CnTA "Number" supersedes that of CnT "Number". (The "Number" above means ① ⑥ in the table.)

(a) Output for external control (remote display)

Following output connectors (CnT) are provided on the indoor control PCB for monitoring operation status.

- ① **Operation output:** Outputs DC12V signal for driving relay during operation
- **2 Heating output:** Outputs DC12V signal for driving relay during heating operation
- 3 Thermostat ON output: Outputs DC12V signal for driving relay when compressor is operating.
- (4) **Error output:** Outputs DC12V signal for driving relay when anomalous condition occurs.

(b) Remote operation input

Remote operation input connector (CnT-6 or CnTA) is provided on the indoor control PCB.

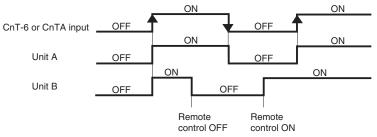
However remote operation by CnT-6 or CnTA is not effective, when "Center mode" is selected by center controller.

In case of plural unit (twin, triple, double twin), remote operation input to CnT-6 or CnTA on the slave indoor unit is invalid.

Only the "LEVEL INPUT" is acceptable for external input, however when the indoor function setting of "Level input (Factory default)" or "Pulse input" is selected by the function for "External input" of the wired remote control, operation status will be changed as follows.

(i) In case of "Level input" setting (Factory default)

Input signal to CnT-6 or CnTA is OFF→ON unit ON Input signal to CnT-6 or CnTA is ON→OFF unit OFF Operation is not inverted.

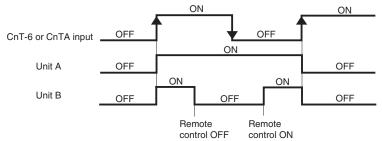


Note: The latest operation has priority

It is available to operate/stop by remote control or center control

(ii) In case of "Pulse input" setting (Local setting)

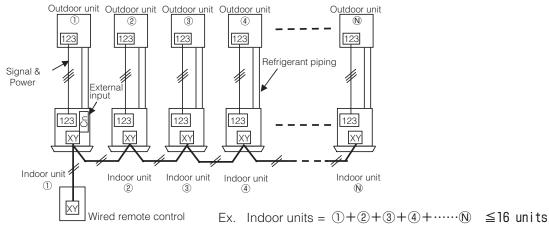
It is effective only when the input signal to CnT-6 or CnTA is changed OFF→ON, and at that time unit operation [ON/ OFF] is inverted.



(c) Remote operation

(i) In case of multiple units (Max. 16 indoor units group) are connected to one wired remote control

When the indoor function setting of wired remote control for "External control set" is changed from "Individual (Factory default)" to "For all units", all units connected in one wired remote control system can be controlled by external operation input.



	Individual operation	on (Factory default)	All units operation	on (Local setting)
	ON		ON	OFF
CnT-6 or CnTA	Only the unit directly connected to the remote control can be operated.	Only the unit directly connected to the remote control can be stopped opeartion.	All units in one remote control system can be operated.	All units in one remote control system can be stopped operation.
	Unit ① only	Unit ① only	Units ① – 🕅	Units ① – 🕦

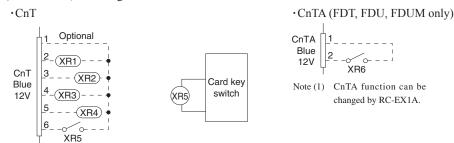
When more than one indoor unit (Max. 16 indoor units) are connected in one wired remote control system:

- (1) With the factory default, external input to CnT-6 or CnTA is effective for only the unit ①.
- (2) When setting "For all unit" (Local setting), all units in one remote control system can be controlled by external input to CnT-6 or CnTA on the indoor unit ①.
- (3) External input to CnT-6 or CnTA on the other indoor unit than the unit ① is not effective.

(22) Operation permission/prohibition

(In case of adopting card key switches or commercially available timers)

When the indoor function setting of wired remote control for "Operation permission/prohibition" is changed from "Invalid (Factory default)" to "Valid", following control becomes effective.



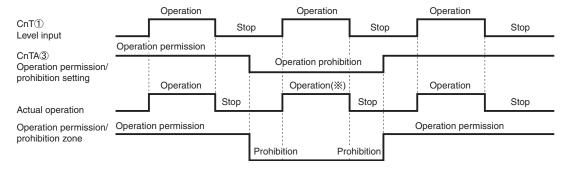
		operation default)		on/prohibition mode ocal setting)
CnT-6 or CnTA	ON	OFF	ON	OFF
	Operation	Stop	Operation permission*1	Operation prohibition (Unit stops)

*1 Only the "LEVEL INPUT" is acceptable for external input, however when the indoor function setting of "Level input (Factory default)" or "Pulse input" is selected by the function for "External input" of the wired remote control, operation status will be changed as follows.

In case of "Level input" setting	In case of "Pulse input" setting
Unit operation from the wired remote control becomes available*(1)	Unit starts operation *(2)

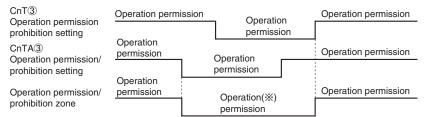
- *(1) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Level input (Factory default)";
 - ① When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
 - ② When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.
- *(2) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Pulse input (Local setting)";
 - ① When card key switch is ON (Operation permission), the unit starts operation in conjunction with ON signal. and also start/stop operation of the unit from the wired remote control becomes available.
 - ② When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.
- (3) This function is invalid only at "Center mode" setting done by central control.

(a) In case of CnT ① Operation stop level > CnTA ③ Operation permission/prohibition level



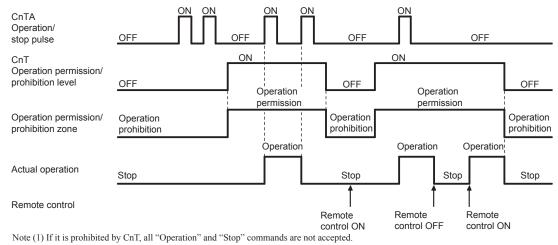
(*X) CnT level input supersedes CnTA operation prohibition.

(b) In case of CnT ③ Operation permission/prohibition level + CnTA ③ Operation permission/prohibition level

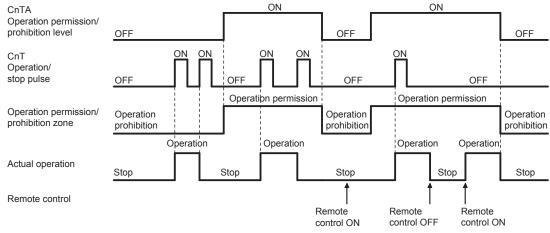


(*) Operation prohibition zone is determined by the OR judgment between CnT Operation prohibition zone and CnTA Operation prohibition zone.

(c) In case of CnT ③ Operation permission/prohibition level > CnTA ② Operation/stop pulse



(d) In case of CnT ② Operation/stop pulse + CnTA ③ Operation permission/prohibition level



(23) Selection of cooling/heating external input function

- (a) When "External input 1 setting: Cooling/heating" is set for the indoor unit function from remote control, the cooling or heating is selected with CnT-6 or CnTA.
- (b) When the External input 1 method selection: Level input is set for the indoor unit function:
 - CnT-6 or CnTA: OPEN → Cooling operation mode
 - · CnT-6 or CnTA: CLOSE → Heating operation mode
- (c) When the External input 1 method selection: Pulse input is set for the indoor unit function:

 If the external input is changed OPEN → CLOSE, operation modes are inverted (Cooling → Heating or Heating → Cooling).

- (d) If the cooling/heating selection signal is given by the external input, the operation mode is transmitted to the remote control.
 - Selection of cooling/heating external input function

External input selection	External input method		Operation
		External terminal input (CnT or CnTA)	OFF ON OFF ON OFF Cooling zone Heating zone, Cooling zone Heating zone, Cooling zone Heating zone
	(5) Level	Cooling/heating	Cooling Heating Cooling
External input salastion		Cooling/heating (Competitive)	Cooling Cooling Heating Cooling Auto, cooling, dry mode command † † Heating, auto, heating mode command from remote control
External input selection Cooling/heating selection	⑥ Pulse	External terminal input (CnT or CnTA)	OFF Heating zone The setting "Cooling heating selection", the cooling/heating is selected by the current operation mode. During heating: Set at the heating zone (cooling prohibition zone). During cooling, day, and and fan mode: Set at cooling zone (theating prohibition zone).
		Cooling/heating	Auto Cooling Cooling
		Cooling/heating (Competitive)	Auto Cooling Cooling 1 Set "Cooling 1 Auto, cooling, dry mode command 1 Auto, heating mode command by remote control command by remote control

Notes (1) Regarding the priority order for combinations of CnT and CnTA, refer to Page 20.

(24) Fan control at heating startup

(a) Start conditions

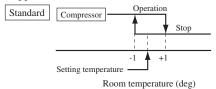
At the start of heating operation, if the difference of setting temperature and return air temperature is 5°C or higher after the end of hot start control, this control is performed.

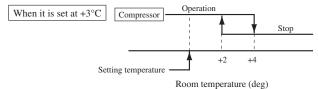
- (b) Contents of control
 - (i) Sampling is made at each minute and, when the indoor unit heat exchanger temperature (detected with ThI-R) is 37°C or higher, present number of revolutions of indoor unit fan speed is increased by 10min⁻¹.
 - (ii) If the indoor unit heat exchanger temperature drops below 37°C at next sampling, present number of revolutions of indoor unit fan speed is reduced by 10min⁻¹.
- (c) End conditions

Indoor fan speed is reduced to the setting airflow volume when the compressor OFF is established and at 30 minutes after the start of heating operation.

(25) Room temperature detection temperature compensation during heating

With the standard specification, the compressor is turned ON/OFF with the thermostat setting temperature. When the thermostat is likely to turn OFF earlier because the unit is installed at the ceiling where warm air tends to accumulate, the setting can be changed with the wired remote control indoor unit function "** \$P OFFSET". The compressor and the heater are turned ON/OFF at one of the setting temperature +3, +2 or +1°C in order to improve the feeling of heating. The setting temperature, however, has the upper limit of 30°C.





(26) Return air temperature compensation

This is the function to compensate the deviation between the detection temperature by the return air temperature thermistor and the measured temperature after installing the unit.

- (a) It is adjustable in the unit of 0.5°C with the wired remote control indoor unit function "RETURN AIR TEMP".
 - +1.0°C, +1.5°C, +2.0°C
- -1.0°C, -1.5°C, -2.0°C
- (b) Compensated temperature is transmitted to the remote control and the compressor to control them. Note (1) The detection temperature compensation is effective on the indoor unit thermistor only.

(27) High power operation (RC-EX1A only)

It operates at with the set temp. fixed at 16°C for cooling, 30°C for heating and maximum indoor fan speed for 15 minutes maximum.

(28) Energy-saving operation (RC-EX1A only)

It operates with the setting temperature fixed at 28°C for cooling, 22°C for heating or 25°C for auto. (Maximum capacity is restricted at 80%.)

(29) Warm-up control (RC-EX1A only)

Operation will be started 5 to 60 minutes before use according to the forecast made by the microcomputer which calculates when the operation should be started in order to warm up the indoor temperature near the setting temperature at the setting time of operation start.

(30) Home leave mode (RC-EX1A only)

When the unit is not used for a long period of time, the room temperature is maintained at a moderate leval, avoiding extremely hot or cool temperature.

- (a) Cooling or heating is operated according to the outdoor temperature (factory setting 35°C for cooling, 0°C for heating) and the set temp. (factory setting 33°C for cooling, 10°C for heating)
- (b) Set temp and indoor fan speed can be set by RC-EX1A.

(31) Auto temp. setting (RC-EX1A only)

Setting temperature is adjusted automatically at the adequate temperature the center set temp. is 24°C by correcting the outdoor air temperature.

(32) Fan circulator operation (RC-EX1A only)

When the fan is used for circulation, the unit is operated as follows depending on the setting with the remote control.

- (a) If the invalid is selected with the remote control, the fan is operated continuously during the fan operation. (mormal fan mode)
- (b) If the valid is selected with the remote control, the fan is operated or stopped when on the difference of the remote control temperature sensor and the indoor unit return air temperature sensor becomes bigger than 3°C.

(33) The operation judgment is executed every 5 minutes (RC-EX1A only)

Setting temperature Ts is changed according to outdoor temperature

This control is valid with cooling and heating mode. (NOT auto mode)

- (a) Operate 5 minutes forcedly.
- (b) Setting temperature is adjusted every 10 minutes.
 - (i) Cooling mode.
 - Ts = outdoor temperature offset value
 - (ii) Heating mode.
 - Ts = outdoor temperature offset value
- (c) If the return air temperature lower than 18°C or return air temperature becomes lower than 25°C, unit goes thermo OFF.

(34) Auto fan speed control (RC-EX1A only)

In order to reach the room temperature to the set temperature as quickly as possible, the airflow rate is increased when the set temperature of thermostat differs largely from the return air temperature. According to temperature difference be tureen set temperature and return air temperature, indoor fan tap are controlled automalically.

- Auto 1: Changes the indoor unit fan tap within the range of $Hi \leftrightarrow Me \leftrightarrow Lo$.
- Auto 2: Changes the indoor unit fan tap within the range of PHi \leftrightarrow Hi \leftrightarrow Me \leftrightarrow Lo.

(35) IU overload alarm (RC-EX1A only)

When the indoor air temperature becomes higher or lower than the temperature set with the remote control by more than 5 to 10° C at 30 minutes after starting operation, the signal is transmitted to the external output (CNT). Receipt of the signal by the external output is indicated by lighting an LED or other prepared onsite.

1.4 Operation control function by the outdoor control

(1) Compressor command speed

Unit: rps

Model	Coo	ling	Heating		
Item	FDC71	FDC90	FDC71	FDC90	
Upper limit	12	20	120		
Lower limit	1	2	1	2	

(2) Compressor protection start

(a) Compressor protection start I

- (i) Operating conditions: When the compressor is turned ON from the state of OFF.
- (ii) **Detail of operation**: During the protection start I control, the upper limit of compressor speed is restricted to the speeds as shown in the following table.

Unit: rps

			Time after esta	Time after establishment of operating conditions (Including acceleration time)						
			Less than 3 min	Less than 5 min	Less than 7 min	Less than 9 min	9 min or more			
	Cooling		120	120	120	120				
FDC71	Heating ⁽¹⁾	TH2≧10°C	120	120	120	120				
		TH2<10°C	48	56	56	75	End of control			
	Cooling		120	120	120	120	End of control			
FDC90	Heating ⁽¹⁾	TH2≧10°C	55	55	75	95				
		TH2<10°C	55	55	75	95				

Note (1) Judgment by the outdoor air temperature sensor (TH2) is made only at the start of control during heating operation.

(b) Compressor protection start II

- (i) Operating conditions: When the outdoor air temperature sensor (TH2) has detected lower than 10°C after starting the compressor during heating operation.
- (ii) **Detail of operation**: During the protection start II control, the upper limit of compressor speed is restricted to the speeds as shown in the following table.

Unit: rps

		Time after compressor ON (Including acceleration time)							
		Less than 1 min	Less than 5 min	Less than 7 min	Less than 9 min	9 min or more			
FDC71		40	32	90	110				
FDC90	TH2≧-5°C	40	32	90	110	End of control			
LDC90	TH2<-5°C	40	45	90	110				

(3) Outdoor unit fan control

(a) Outdoor unit fan speed and fan motor speed

Unit: min⁻¹

Fan speed	1st speed	2nd speed	3rd speed	4th speed	5th speed	6th speed	7th speed	8th speed
FDC71	150	225	485	520	570	685	800	850
FDC90	150	300	500	650	740	835	890	950

(b) Outdoor unit fan control at start (Cooling operation only)

When the outdoor air temperature (TH2) is lower than 22°C at the start of compressor, the outdoor unit fan is operated at a fixed speed.

- (i) When the outdoor air temperature is higher than 11°C, the compressor runs at 2nd speed for 30 seconds after the compressor ON.
- (ii) When the outdoor air temperature is lower than 11°C, the compressor runs at 1st speed for 30 seconds after the compressor ON.

(c) Relationship between compressor speed and outdoor unit fan speed
 Outdoor unit fan speed is controlled according to the operation mode (Heating/cooling) and the compressor speed.

Unit: rps

									omii ips
Fan speed		1st speed	2nd speed	3rd speed	4th speed	5th speed	6th speed	7th speed	8th speed
FDC71	Cooling	-	-	-	0-22	22-30	30-58	58-80	80-
	Heating	-	-	-	0-30	30-38	38-78	78-90	90-
EDC00	Cooling	-	-	0-30	30-46	46-64	64-70	70-75	75-
FDC90	Heating	-	-	0-30	30-46	46-70	70-90	90-	-

(d) Outdoor fan control at low outdoor temperature

(i) Cooling

- 1) **Operating conditions:** When the outdoor air temperature (TH2) is 22°C or lower continues for 30 seconds while the compressor command speed is other than 0 rps.
- **2) Detail of operation:** After the outdoor fan operates at A speed for 60 seconds; the corresponding outdoor heat exchanger temperature shall implement the following controls.

• Value of A

	Outdoor fan
Outdoor temperature > 10°C	12th speed
Outdoor temperature ≤ 10°C	9th speed

a) Outdoor heat exchanger temperature ≤ 21°C

After the outdoor fan speed drops (down) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is lower than 21°C, gradually reduce the outdoor fan speed by 1 speed. (Lower limit 9th speed)

b) 21° C < Outdoor heat exchanger temperature $\leq 38^{\circ}$ C

After the outdoor fan speed maintains for 20 seconds; if the outdoor heat exchanger temperature is 21°C~38°C, maintain outdoor fan speed again.

c) Outdoor heat exchanger tempeature > 38°C

After the outdoor fan speed rises (up) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is higher than 38°C, gradually increase outdoor fan speed by 1 speed. (Upper limit 15th speed)

- 3) Reset conditions: When either of the following conditions is satisfied
 - a) The outdoor air temperature (TH2) is 25°C or higher and fan speed is 15th speed.
 - b) The compressor command speed is 0 rps.
- 4) Outdoor unit fan speed and fan motor speed

Unit: min⁻¹

Fan speed	9th speed	10th speed	11th speed	12th speed	13th speed	14th speed	15th speed
FDC71	150	175	200	225	305	385	485
FDC90	200	225	250	275	300	400	500

(ii) Heating

- 1) Operating conditions: When the outdoor air temperature (TH2) is 4°C or lower continues for 30 seconds while the compressor command speed is other than 0 rps.
- 2) Detail of operation: The outdoor fan is stepped up by 2 speed step at each 20 seconds. (Upper limit 8th speed)
- 3) Reset conditions: When either of the following conditions is satisfied
 - a) The outdoor air temperature (TH2) is 6°C or higher.
 - b) The compressor command speed is 0 rps.

(e) Outdoor fan control at overload

(i) Cooling

- 1) Operating conditions: When the outdoor air temperature (TH2) is 41°C or higher continues for 30 seconds while the compressor command speed is other than 0 rps.
- 2) Detail of operation: The outdoor fan is stepped up by 3 speed. (Upper limit 8th speed)
- 3) Reset conditions: When either of the following conditions is satisfied
 - a) The outdoor air temperature (TH2) is 40°C or lower.
 - b) The compressor command speed is 0 rps.

(ii) Heating

- 1) Operating conditions: When the outdoor air temperature (TH2) is 13°C or higher continues for 30 seconds while the compressor command speed is other than 0 rps.
- **2) Detail of operation:** After the outdoor fan operates at -3 speed for 60 seconds; the corresponding outdoor heat exchanger temperature shall implement the following controls.
 - a) Outdoor heat exchanger temperature ≤ 10°C

After the outdoor fan speed rises (up) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is lower than 10°C, gradually increase the outdoor fan speed by 1 speed.

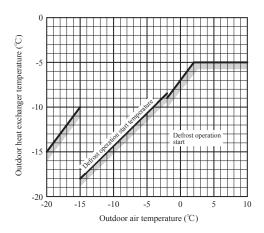
- b) 10°C < Outdoor heat exchanger temperature ≤ 13°C
 - After the outdoor fan speed maintains for 20 seconds; if the outdoor heat exchanger temperature is 10°C~13°C, maintain outdoor fan speed again.
- c) Outdoor heat exchanger tempeature > 13°C
 - After the outdoor fan speed drops (down) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is higher than 38°C, gradually reduce outdoor fan speed by 1 speed. (Lower limit 2nd speed)
- 3) Reset conditions: When either of the following conditions is satisfied
 - a) The outdoor air temperature (TH2) is 11°C or lower.
 - b) The compressor command speed is 0 rps.

(f) Outdoor fan motor protection

If the outdoor fan motor has operated at 75 rpm or lower for more than 30 seconds, the compressor and fan motor are stopped.

(4) Defrosting operation

- (a) Starting conditions (Defrosting operation can be started only when all of the following conditions are met.)
 - (i) After start of heating operation
 - When it elapsed 35 minutes. (Accumulated compressor operation time)
 - (ii) After end of defrosting operation
 - When it elapsed 35 minutes. (Accumulated compressor operation time)
 - (iii) Outdoor heat exchanger sensor (TH1) temperature
 - When the temperature has been below -5°C for 3 minutes continuously.
 - (iv) The difference between the outdoor air sensor temperature and the outdoor heat exchanger sensor temperature (TH2-TH1)
 - The outdoor air temperature $\geq -2^{\circ}\text{C}$: 7°C or higher
 - -15°C < The outdoor air temperature < -2°C : $4/15 \times$ The outdoor air temperature + 7°C or higher
 - The outdoor air temperature \leq -15°C : -5°C or higher



(v) During continuous compressor operation

In addition, when the speed command from the indoor controller of the indoor unit during heating operation has counted 0 rps 10 times or more and all conditions of (i), (ii) above and the outdoor air temperature is 3°C or less and the temperature for outdoor heat exchanger sensor (TH1) is -5°C or less: 62 rps or more, -4°C or less: less than 62 rps are satisfied, defrost operation is started.

- **(b)** Ending conditions (Operation returns to the heating cycle when either one of the following is met.)
 - (i) Outdoor heat exchanger sensor (TH1) temperature: 20°C or higher
 - (ii) Continued operation time of defrosting → For more than 18 minutes.

Defrost operation



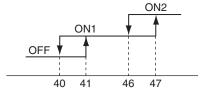
*Depends on an operation condition, the time can be longer than 7 minutes.

(5) Cooling overload protective control

(a) Operating conditions: When the outdoor air temperature (TH2) has become continuously for 30 seconds at 41°C or more, or 47°C or more with the compressor running, the lower limit speed of compressor is

Model	FDC71, 90VNP				
Outdoor air temperature	41°C or more	47°C or more			
Lower limit speed	30 rps	40 rps			

brought up.



Outdoor air temperature (°C)

(b) Detail of operation

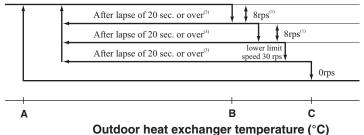
The lower limit of compressor command speed is set to 30 or 40 rps and even if the calculated result becomes lower than that after fuzzy calculation, the speed is kept to 30 or 40 rps. However, when the thermo OFF, the speed is reduced to 0 rps.

- **(c) Reset conditions:** When either of the following condition is satisfied.
 - 1) The outdoor air temperature is lower than 40°C.
 - 2) The compressor command speed is 0 rps.

(6) Cooling high pressure control

- (a) Purpose: Prevents anomalous high pressure operation during cooling.
- **(b) Detector:** Outdoor heat exchanger sensor (TH1)
- (c) Detail of operation:

(Example) Fuzzy



Outdoor air temperature(TH2)	Α	В	С
TH2 ≧ 32°C	53	58	63
TH2 < 32°C	51	53	56

Outdoor neat exchanger temperature (C)

- Notes (1) When the outdoor heat exchanger temperature is in the range of B ~ C °C, the compressor command speed is reduced by 8 rps at each 20 seconds.
 - (2) When the temperature is C °C or higher, the compressor is stopped.
 - (3) When the outdoor heat exchanger temperature is in the range of A ~ B °C, if the compressor command speed is been maintained and the operation has continued for more than 20 seconds at the same speed, it returns to the normal cooling operation.

(7) Cooling low outdoor temperature protective control

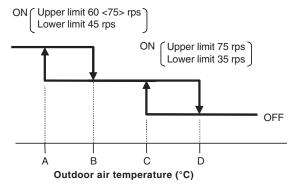
(a) Operating conditions: When the outdoor air temperature (TH2) is C°C or lower continues for 20 seconds while the compressor command speed is other than 0 rps.

(b) Detail of operation:

- (i) The lower limit of the compressor command speed is set to 45 (35) rps and even if the speed becomes lower than 45 (35) rps, the speed is kept to 45 (35) rps. However, when the thermo OFF, the speed is reduced to 0 rps.
- (ii) The upper limit of the compressor command speed is set to 60 < 75 > (75) rps and even if the calculated result becomes higher than that after fuzzy calculation, the speed is kept to 60 < 75 > (75) rps.

Notes $\ \ (1)$ Values in ($\ \)$ are for outdoor air temperature is C or D

(2) Values in < > are for the model FDC90



 Values of A, B, C, D Model FDC71VNP

	Outdoor air temp. (°C)					
	Α	В	С	D		
First time	9	11	22	25		
After the second time	16	19	25	28		

Model FDC90VNP

Outdoor air temp. (°C)						
A B C D						
9	11	22	25			

- (iii) Reset conditions: When either of the following condition is satisfied
 - 1) The outdoor air temperature (TH2) is D °C or higher.
 - 2) The compressor command speed is 0 rps.

(8) Heating high pressure control

- (a) Start condition: When the indoor heat exchanger temperature (ThI-R1, R2) has risen to a specified temperature while the compressor is turned on.
- (b) Compressor command speed is controlled according to the zones of indoor heat exchanger temperature as shown by the following table.

	Th I -R < P1	P1 ≦ ThI-R < P2	P2 ≦ ThI-R < P3	P3 ≦ ThI-R
Protection control speed (NP)	Normal	Retention	NP-4rps	NP-8rps
Sampling time (s)	Normal	10	10	10

Model FDC71VNP	•		Unit: °C
NP ThI-R	P1	P2	P3
10 ≦ NP < 50	45	52	54.5
50 ≦ NP < 115	45	52	57
115 ≦ NP < 120	45 ~ 43	52 ~ 50	57 ~ 55
120 ≦ NP	43	50	55

Model FDC90VNP Uni								
NP ThI-R	P1	P2	Р3					
10 ≦ NP < 90	45	52	57					
90 ≦ NP < 120	45 ~ 43	52 ~ 45	57 ~ 48					
120 ≦ NP	43	45	48					

(9) Heating overload protective control

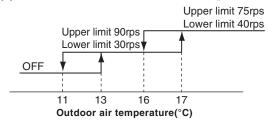
(a) **Operating conditions**: When the outdoor air temperature (TH2) is 13 °C or higher continues for 30 seconds while the compressor command speed is other than 0 rps.

(b) Detail of operation

- (i) Taking the upper limit of compressor command speed range at 90(75)rps, if the output speed obtained with the fuzzy calculation exceeds the upper limit, the upper limit value is maintained.
- (ii) The lower limit of compressor command speed is set to 30(40)rps and even if the calculated result becomes lower than that after fuzzy calculation, the speed is kept to 30(40)rps. However, when the thermo OFF, the speed is reduced to 0 prs

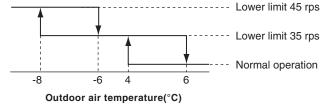
Note (1) Values in ($\,$) are for outdoor air temperature at 17°C.

(c) Reset conditions: The outdoor air temperature (TH2) is lower than 11°C



(10) Heating low outdoor temperature protective control

- (a) Operating conditions: When the outdoor air temperature (TH2) is 4°C or lower continues for 30 seconds while the compressor command speed is other than 0 rps.
- **(b) Detail of operation:** The lower limit compressor command speed is change as shown in the figure below.



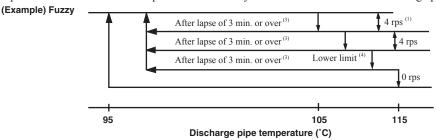
- (c) Reset conditions: When either of the following condition is satisfied.
 - (i) The outdoor air temperature (TH2) is higher than 6°C
 - (ii) The compressor command speed is 0 rps.
 - (iii) Compressor protection start II is activate.

(11) Compressor overheat protection

(a) **Purpose:** It is designed to prevent deterioration of oil, burnout of motor coil and other trouble resulting from the compressor overheat.

(b) Detail of operation

(i) Speeds are controlled with temperature detected by the sensor mounted on the discharge pipe.



- Notes (1) When the discharge pipe temperature is in the range of 105~115°C, the speed is reduced by 4 rps.
 - (2) When the discharge pipe temperature is raised and continues operation for 20 seconds without changing, then the speed is reduced again by 4 rps.
 - (3) If the discharge pipe temperature is in the range of 95~105°C even when the compressor command speed is maintained for 3 minutes when the temperature is in the range of 95~105°C, the speed is raised by 1 rps and kept at that speed for 3 minutes. This process is repeated until the command speed is reached.
 - (4) Lower limit speed

	Cooling	Heating
Lower limit speed	25 rps	32 rps

(ii) If the temperature of 115°C is detected by the sensor on the discharge pipe, then the compressor will stop immediately. When the discharge pipe temperature drops and the time delay of 3 minutes is over, the unit starts again within 1 hour but there is no start at the third time.

(12) Current safe

- (a) Purpose: Current is controlled not to exceed the upper limit of the setting operation current.
- **(b) Detail of operation:** Input current to the converter is monitored with the current sensor fixed on the printed circuit board of the outdoor unit and, if the operation current value reaches the limiting current value, the compressor command speed is reduced.

If the mechanism is actuated when the compressor command speed is less than 30 rps, the compressor is stopped immediately. Operation starts again after a delay time of 3 minutes.

(13) Current cut

- (a) Purpose: Inverter is protected from overcurrent.
- **(b) Detail of operation:** Output current from the inverter is monitored with a shunt resistor and, if the current exceeds the setting value, the compressor is stopped immediately. Operation starts again after a delay time of 3 minutes.

(14) Outdoor unit failure

This is a function for determining when there is trouble with the outdoor unit during air conditioning.

The compressor is stopped if any one of the following in item (a), (b) is satisfied. Once the unit is stopped by this function, it is not restarted.

- (a) When the input current is measured at 1 A or less for 3 continuous minutes or more.
- (b) If the outdoor unit sends a 0 rps signal to the indoor unit 3 times or more within 20 minutes of the power being turned on.

(15) Serial signal transmission error protection

- (a) **Purpose:** Prevents malfunction resulting from error on the indoor \leftrightarrow outdoor signals.
- **(b) Detail of operation:** If the compressor is operating and a serial signal cannot be received from the indoor control with outdoor control having serial signals continues for 7 minute and 35 seconds, the compressor is stopped.

After the compressor has been stopped, it will be restarted after the compressor start delay if a serial signal can be received again from the indoor control.

(16) Rotor lock

If the motor for the compressor does not turn after it has been started, it is determined that a compressor lock has occurred and the compressor is stopped.

(17) Refrigeration cycle system protection

(a) Starting conditions

- (i) When 5 (Heating: 9) minutes have elapsed after the compressor ON or the completion of the defrost control
- (ii) Other than the defrost control
- (iii) When, after meeting the conditions of (i) and (ii) above, the compressor speed, indoor air temperature (ThI-A) and indoor heat exchanger temperature (ThI-R) have met the conditions in the following table for 5 minutes:

Operation mode	Compressor speed (N)	Indoor air temperature (ThI-A)	Indoor air temperature (ThI-A)/ Indoor heat exchanger temperature (ThI-R)
Cooling	40≦ N	10≦ThI-A≦40	ThI-A-4 <thi-r< td=""></thi-r<>
Heating	40≦N	0 ≦ThI-A ≦ 40	ThI-R <thi-a+4< td=""></thi-a+4<>

(b) Contents of control

- (i) When the conditions of (a) above are met, the compressor stops.
- (ii) Error stop occurs when the compressor has stopped 3 times within 60 minutes.

(c) Resetting condition

When the compressor has been turned OFF

(18) Silent mode

As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor fan tap.

Model Item	Outdoor fan tap (Upper limit)
FDC71VNP	Cooling: 7th speed, Heating: 7th speed
FDC90VNP	Cooling: 7th speed, Heating: 5th speed

(19) Broken wire detection on temperature sensor

1) Outdoor unit heat exchanger sersor, outdoor air sensor

If the following is detected for 5 second continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop. Or with in 20 seconds after power ON. Note (1) During defrosting and for 3 minutes after the end of defrosting, it is not detected.

- Outdoor unit heat exchanger sensor: -55°C or lower
- Outdoor air temperature sensor: -55 or lower
- 2) Discharge pipe temperature sensor

If the following is detected for 5 second continuously within 10 minutes to 10 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrosting and for 3 minutes after the end of defrosting, it is not detected.

• Discharge pipe temperature sensor: -25°C or lower

2. MAINTENANCE DATA

2.1 Diagnosing of microcomputer circuit

(1) Selfdiagnosis function

(a) Check indicator table

Whether a failure exists or not on the indoor unit can be know by the contents of remote control error code, indoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

(i) Indoor unit

In case of these indoor unit errors, the outdoor control PCB Red LED stays OFF.

Addition

R	emote	control	Indoor co	ntrol PCB				Defenses	
Error	code	Red LED	Red LED	Green LED (1)	Location of trouble	Description of trouble	Repair method	Reference page	
			Stays OFF	Keeps flashing	_	Normal operation	_	_	
No-ind	No-indication Stays OFF		Stays OFF	Stays OFF	Indoor unit power supply	Power OFF, broken wire/blown fuse, broken transformer wire	Repair	62	
			*	Keeps	Remote control wires	Poor connection, breakage of remote control wire * For wire breaking at power ON, the LED is OFF.	Repair		
			3-time flash	flashing	Remote control	Defective remote control PCB	Replacement of remote control		
		Γ © or CT I/U	Stays OFF	Keeps flashing	Indoor-outdoor units connection wire	Poor connection, breakage of indoor-outdoor units connection wire	Repair	64 ~ 68	
					Remote control	• Improper setting of master and slave by remote control			
Ε	1		Stays OFF	* Keeps flashing	Remote control wires (Noise)	Poor connection of remote control signal wire (White) * For wire breaking at power ON, the LED is OFF Intrusion of noise in remote control wire	Repair Replacement of	69	
				0	Remote control indoor control PCB	*• Defective remote control or indoor control PCB (defective communication circuit)?	remote control or PCB		
			2-time flash	Keeps flashing	Indoor-outdoor units connection wire	Poor connection of wire between indoor-outdoor units during operation (disconnection, loose connection) Anomalous communication between indoor-outdoor units by noise, etc.	Repair		
F	5		2-time	Keeps	(Noise)	CPU-runaway on outdoor sub PCB	Power reset or Repair	=0	
_	_		flash	flashing	Outdoor sub PCB	*• Occurrence of defective outdoor sub PCB on the way of power supply (defective communication circuit)?	Replacement of PCB	70	
			2-time flash	Keeps flashing	Outdoor sub PCB	Defective outdoor sub PCB on the way of power supply	Replacement		
			110311	Hashing	Fuse				
E	5		1-time	Keeps	Indoor heat exchanger tempera- ture thermistor	Defective indoor heat exchanger temperature thermistor(defective element, broken wire, short-circuit) Poor contact of temperature thermistor connector	Replacement, repair of temperature thermistor	71	
		flash		flashing	Indoor control PCB	*• Defective indoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB		
E	7		1-time flash	Keeps flashing	Indoor return air temperature thermistor	Defective indoor return air temperature thermistor (defective element, broken wire, short-circuit) Poor contact of temperature thermistor connector	Replacement, repair of temperature thermistor	72	
			THUS!		Indoor control PCB	*• Defective indoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB		
_		Keeps flashing			Installation or operating condi- tion	Heating over-load (Anomalously high indoor heat exchanger temperature)	Repair		
E	B		1-time flash	Keeps flashing	Indoor heat exchanger tempera- ture thermistor	Defective indoor heat exchanger temperature thermistor (short-circuit)	Replacement of temperature therm- istor	73	
					Indoor control PCB	*• Defective indoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB		
_					Drain trouble	Defective drain pump (DM), broken drain pump wire, disconnected connector	Replacement, repair of DM		
E	岁		1-time	Keeps	Float switch	Anomalous float switch operation (malfunction)	Repair	74	
_	_		flash	flashing	Indoor control PCB	*• Defective indoor control PCB (Defective float switch input circuit) *• Defective indoor control PCB (Defective DM drive output circuit)?	Replacement of PCB	,.	
					Option	Defective optional parts (At optional anomalous input setting)	Repair		
<u> </u>	<u> </u>		Stays OFF	Keeps flashing	Number of connected indoor units	When multi-unit control by remote control is performed, the number of units is over	Repair	75	
E	11.		Keeps flashing	Keeps flashing	Address setting error	Address setting error of indoor units	Repaie	76	
E	18		3-time	Keeps	Indoor unit No. setting	No master is assigned to slaves.	Repair	77	
	17		flash	flashing	Remote control wires	Anomalous remote control wire connection, broken wire between master and slave units	·	.,	
F	15		1(2)-time flash	Keeps flashing	Fan motor	• Defective fan motor	Replacement, repair	78	
_			1-time	Keeps	Indoor power PCB	Defective indoor power PCB	Replacement		
<u>E</u> E	<u>18</u>		flash 1-time	flashing Keeps	Address setting error	Address setting error of master and slave indoor units	Repair	79	
E	19		flash	flashing	Indoor control PCB	Improper operation mode setting	Repair	80	

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Remote	control	Indoor co	ntrol PCB			Repair method	Reference page
Error code	Red LED	Red LED	Green LED (1)	Location of trouble	Description of trouble		
	1(2)-time Keeps		Fan motor	Defective by rotation speed of fan motor	Replacement, repair	81	
LCU		flash	flashing	Indoor power PCB	Defective indoor power PCB	Replacement	81
E2 I	Keeps flashing	1-time flash	Keeps flashing	Panel switch detection	Defective panel switch operation (FDT only)	Repair	82
E28		Stays OFF	Keeps flashing	Remote control temperature thermistor	Broken wire of remote control temperature thermistor	Repair	83

Notes (1) Normal indicator lamp (Indoor unit: Green) extinguishes (or lights continuously) only when CPU is anomalous. It keeps flashing in any trouble other than anomalous CPU.

(2) * mark in the description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

(ii) Outdoor unit

Remote	control	Indoor co	ntrol PCB	Outdoor control PCB				Reference																	
Error code	Red LED	Red LED	Green LED	Red LED	Location of trouble	Description of trouble	Repair method	page																	
					Installation, operation status	Higher outdoor heat exchanger temperature	Repair																		
E35		Stays OFF	Keeps flashing	2-time flash	Outdoor heat exchanger temperature sensor	Defective outdoor heat exchanger temperature sensor	Replacement, repair of temperature sensor	84																	
					Outdoor main PCB	*• Defective outdoor main PCB (Defective temperature sensor input circuit)?	Replacement of PCB																		
					Installation, operation status	Higher discharge temperature	Repair																		
E 36		Stays OFF	Keeps flashing	5-time flash	Discharge pipe temperature sensor	Defective discharge pipe temperature sensor	Replacement, repair of temperature sensor	85																	
					Outdoor main PCB	*• Defective outdoor main PCB (Defective temperature sensor input circuit)?	Replacement of PCB																		
E37		Stays OFF	Keeps	8-time flash	Outdoor heat exchanger temperature sensor	Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	86																	
			nasning		Outdoor main PCB	*• Defective outdoor main PCB (Defective temperature sensor input circuit)?	Replacement of PCB																		
E 38		Stays OFF	Keeps	8-time flash	Outdoor air temperature sensor	Defective outdoor air temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	87																	
			nasning	nushing	manning	nasining	nasining	nasinig	nasining	nasinig	.iusiiiig	nasimig	nasimig	nasinilg	nuoning	- naoning		-iuoiiiig	-iuoiiiig			Outdoor main PCB	*• Defective outdoor main PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39	Keeps flashing	Stays OFF	Keeps	8-time flash	Discharge pipe temperature sensor	Defective discharge pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	88																	
			- Tabiling	T.u.o.m.g		Outdoor main PCB	*• Defective outdoor main PCB (Defective temperature sensor input circuit)?	Replacement of PCB																	
E40		Stays OFF	Keeps flashing	4-time flash	Installation, operation status	Service valve (gas side) closing operation	Replacement	89																	
E42		Stays OFF	Keeps	1-time flash	Outdoor main PCB, compressor	Current cut (Anomalous compressor over-current)	Replacement of PCB	90 • 91																	
			nasning		Installation, operation status	Service valve closing operation	Repair																		
EYT		Stays OFF	Keeps	1-time flash	Outdoor main PCB	• Over voltage	Repair	92																	
			flashing	2-time flash	Fan motor	Defective active filter Defective fan motor	PCB replacement																		
E48		Stays OFF	Keeps flashing	ON	Outdoor main PCB	Defective outdoor main PCB	Replacement	93																	
E5 1		Stays OFF	Keeps flashing	1-time flash	Power transistor error (outdoor main PCB)	Power transistor error	Replacement of PCB	94																	
			W		Operation status	Shortage in refrigerant quantity	Repair																		
E57		Stays OFF	Keeps flashing	2-time flash	Installation status	Service valve closing operation	Service valve opening check	95																	
ES8		Stays OFF	Keeps flashing	3-time flash	Overload operation Overcharge Compressor locking	Current safe stop	Replacement	96																	
E 59		Stays OFF	Keeps flashing	2-time flash	Compressor, outdoor main PCB	Anomalous compressor startup Voltage drop	Replacement	97																	
E 50		Stays OFF	Keeps flashing	7-time flash	Compressor	Anomalous compressor rotor lock	Replacement	98																	
⊕WAIT INSPEC		Stays OFF	Keeps flashing	6-time flash	Indoor - outdoor connection wire	Poor connection, breakage of indoor - outdoor units connection wire	Repair	_																	

Note (1) * mark in the description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

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#

(iv) Display sequence of error codes or inspection indicator lamps

■ Occurrence of one kind of error

Displays are shown respectively according to errors.

■ Occurrence of plural kinds of error

Section	Category of display
Error code on remote control	• Displays the error of higher priority (When plural errors are persisting)
Red LED on indoor control PCB	E I E5 ······E 10>E35>·····E60
Red LED on outdoor main PCB	• Displays the present errors. (When a new error has occurred after the former error was reset.)

■ Error detecting timing

Castian	Eman description	Error code	Eman datastina timina	
Section	Error description	Error code	Error detecting timing	
	Drain trouble (Float switch activated)	E9	Whenever float switch is activated after 30 second had past since power ON.	
	Communication error at initial operation	"''WAIT''	No communication between indoor and outdoor units is established at initial operation.	
	Remote control communication circuit error	ΕI	Communication between indoor unit and remote control is interrupted for mote than 2 minutes continuously after initial communication was established.	
Indoor	Communication error during operation	E5	Communication between indoor and outdoor units is interrupted for mote than 2 minutes continuously after initial communication was established.	
	Excessive number of connected indoor units by controlling with one remote control	E 10	Whenever excessively connected indoor units is detected after power ON.	
	Return air temperature thermistor anomaly	EΠ	-50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature.	
	Indoor heat exchanger temperature thermistor anomaly	E6	-50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature. Or 70°C or higher is detected for 5 seconds continuously.	
	Outdoor air temperature sensor anomaly	E 38	-55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor. Or -55°C or higher is detected for 5 seconds continuously within 20 seconds after power ON.	
	Outdoor heat exchanger temperature sensor anomaly	E37	-55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor. Or -55°C or lower is detected for 5 seconds continuously within 20 seconds after power ON.	
	Discharge pipe temperature sensor anomaly	E39	-25°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor.	

■ Error log and reset

Error indicator	Memorized error log	Reset
Remote control display	Higher priority error is memorized.	Stop the unit by pressing the ON/OFF
Red LED on indoor control PCB • Not memorized.		switch of remote control. • If the unit has recovered from anomaly, it
Red LED on outdoor main PCB	Memorizes a mode of higher priority.	can be operated.

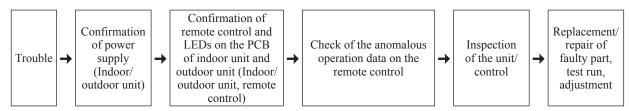
Resetting the error log

- Resetting the memorized error log in the remote control Holding down "CHECK" button, press "TIMER" button to reset the error log memorized in the remote control.
- · Resetting the memorized error log in the indoor unit The remote control transmits error log erase command to the indoor unit when "VENTI" button is pressed while holding down "CHECK" button.

Receiving the command, the indoor unit erase the log and answer the status of no error.

Troubleshooting procedure

When any trouble has occurred, inspect as follows. Details of respective inspection method will be described on later pages.



Troubleshooting at the indoor unit

With the troubleshooting, find out any defective part by checking the voltage (AC, DC), resistance, etc. at respective connectors at around the indoor PCB, according to the inspection display or operation status of unit (the compressor does not run, fan does not run, the 4-way valve does not switch, etc.), and replace or repair in the unit of following part.

(a) Replacement part related to indoor PCB's

Control PCB, power supply PCB, temperature thermistor (return air, indoor heat exchanger), remote control switch and fuse

Note (1) With regard to parts of high voltage circuits and refrigeration cycle, judge it according to ordinary inspection methods.

(b) Instruction of how to replace indoor control PCB

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the replacement in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, WARNING and CAUTION.

Both mentions the important items to protect your health and safety so strictly follow them by any means.

⚠ WARNING
 ⚠ CAUTION
 Wrong installation would cause serious consequences such as injuries or death.
 Wrong installation might cause serious consequences depending on circumstances.

After completing the replacement, do commissioning to confirm there are no anomaly

WARNING

- Replacement should be performed by the specialist.
- If you replace the PCB by yourself, it may lead to serious trouble such as electric shock or fire.
- Replace the PCB correctly according to these instructions.
- Improper replacement may cause electric shock or fire.
- Shut off the power before electrical wiring work.

Replacement during the applying the current would cause the electric shock, unit failure or improper running.

It would cause the damage of connected equipment such as fan motor,etc.

- Fasten the wiring to the terminal securely, and hold the cable securely so as not to apply unexpected stress on the terminal.
- Loose connections or hold could result in abnormal heat generation or fire.
- Check the connection of wiring to PCB correctly before turning on the power, after replacement.

Defectiveness of replacement may cause electric shock or fire

CAUTION

- In connecting connector onto the PCB, connect not to deform the PCB. It may cause breakage or malfunction.
- Insert connecter securely, and hook stopper. It may cause fire or improper running
- Bundle the cables together so as not to be pinched or be tensioned. It may cause malfunction or electric shock for disconnection or deformation.

(i) Model FDT, FDU, FDUM series

1) Control PCB

Replace and set up the PCB according to this instruction.

 $\ensuremath{\textcircled{1}}$ Set to an appropriate address and function using switch on PCB.

Select the same setting with the removed PCB.

item	switch	Content of control				
Address	SW2	Plural indoor units control by 1 remote controller				
Test run	SW7-1	_	Normal			
16211011	3007-1	0	Operation check/drain motor test run			

O:ON -:OFF

② Set to an appropriate capacity using the model selector switch(SW6).

Select the same capacity with the PCB removed from the unit.

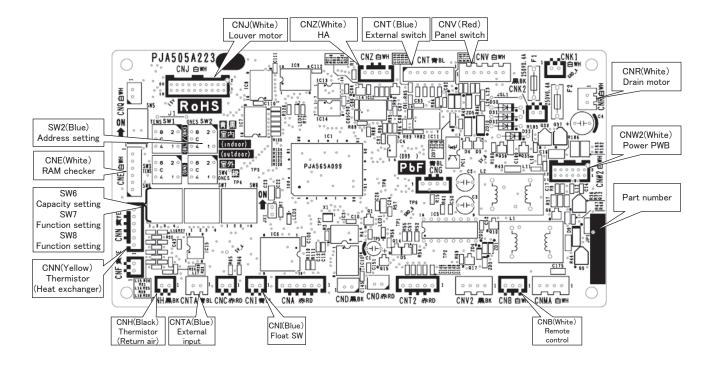
SW6	-1	-2	-3	-4
71V	0		_	0
100V	0	0		0



Example setting for 71V

- 3 Replace the PCB
 - 1. Exchange PCB after detaching all connectors connected with the PCB.
 - 2. Fix the PCB so as not to pitch the wiring.
 - 3. Connect connectors to the PCB. Match the wiring connector to the connector color on the PCB and connect it.

Control PCB



2) Power PCB

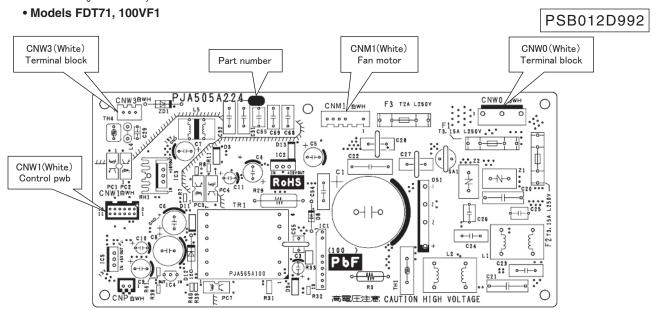
Model FDT, FDUM series

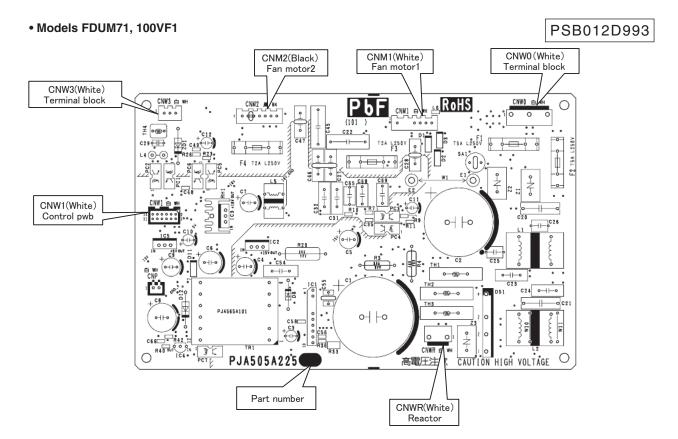
This PCB is a general PCB. Replace the PCB according to this instruction.

① Replace the PCB

- 1. Unscrew terminal of the wiring(yellow/green) connected to Terminal block (CNWO) from the box.
- 2. Replace the PCB only after all the wirings connected to the connector are removed.
- 3. Fix the board such that it will not pinch any of the wires.
- 4. Reconnect the wirings to the PCB. Wiring connector color should match with the color of connector of the PCB.
- 5. Screw back the terminal of wiring, that was removed in 1.

② Power PCB





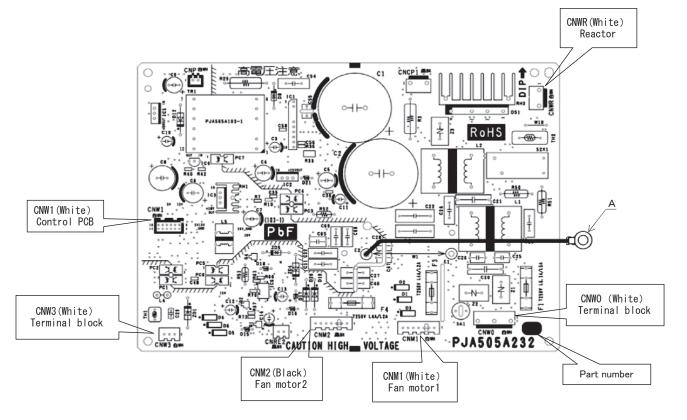
Model FDU series PSC012D021

This PCB is a general PCB. Replace the PCB according to this instruction.

1) Replace the PCB

- a) Unscrew terminal(Arrow A) of the "E2" wiring(yellow/green) that is connected to PCB.
- b) Replace the PCB only after all the wirings connected to the connector are removed.
- c) Fix the board such that it will not pinch any of the wires.
 d) Reconnect the wirings to the PCB. Wiring connector color should match with the color of connector of the PCB.
 e) Screw back the terminal(Arrow A) of the "E2" wiring, that was removed in 1.

2) Power PCB



(ii) Model FDEN series

Replace and set up the PCB according to this instruction.

PSB01ZD974C

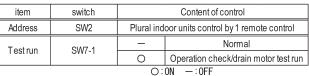
- ① Set to an appropriate address and function using switch on PCB.
- 1. There is a unit having plural applicable PCB depending on a model.
- 2. Set the function setting corresponding the spare PCB and the applicable model.
- 3. Do "Setting according to the model *1" refer to " $\fill \fill \fill$ control" after turning on the power source when using wired remote control
- ② Set to an appropriate capacity using the model selector switch(SW6). Select the same capacity with the PCB removed from the unit.

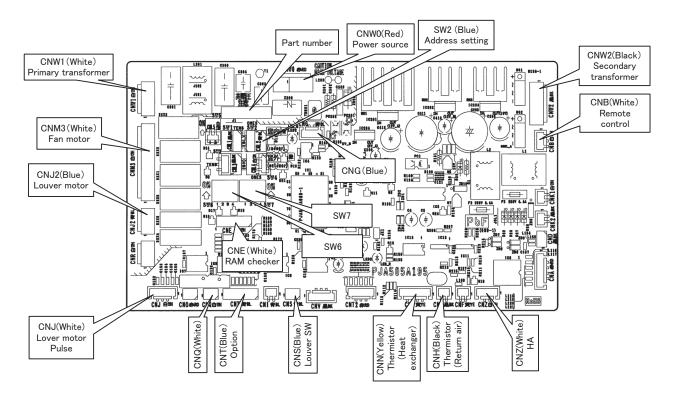
SW6	-1	-2	-3	-4
71V	0	_	_	0
100V	0	0	_	0



Example setting for 71V

- 3 Replace the PCB
- 1. Fix the PCB so as not to pitch the cords.
- 2. Connect connectors to the PCB. Connect a cable connector with the PCB connector of the same color.
- 3.Do not pass CPU surrounding about wirings.
- 4 Control PCB





PSB012D976C

(iii) Model FDF series

1) Control PCB

Replace and set up the PCB according to this instruction.

① Set to an appropriate address and function using switch on PCB. Select the same setting with the removed PCB.

item	switch	Content of control		
Address	SW2	Plural indoor units control by 1 remote control		
Test run	run SW7-1	_	Normal	
restruit		0	Operation check/drain motor test run	

② Set to an appropriate capacity using the model selector switch(SW6).

Select the same capacity with the PCB removed from the unit.

SW6	-1	-2	-3	-4
71V	0	_	_	0
100V	0	0	_	0

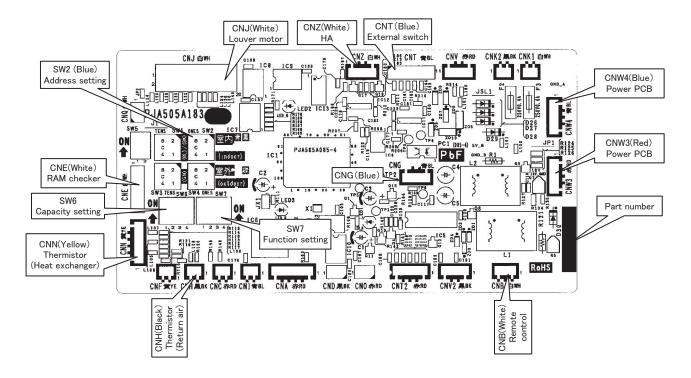


Example setting for 71V

3 Replace the PCB

- 1. Fix the PCB so as not to pitch the cords.
- 2. Connect connectors to the PCB. Connect a cable connector with the PCB connector of the same color.
- 3.Do not pass CPU surrounding about wirings.

Control PCB



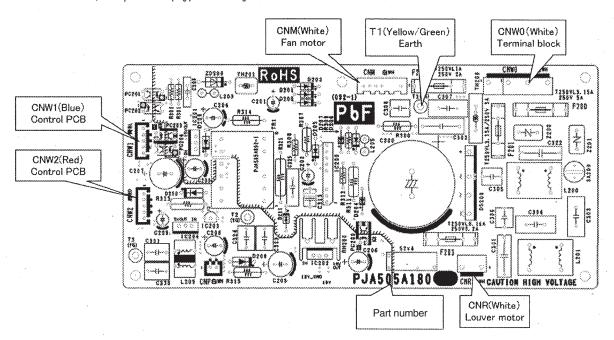
2) Power PCB

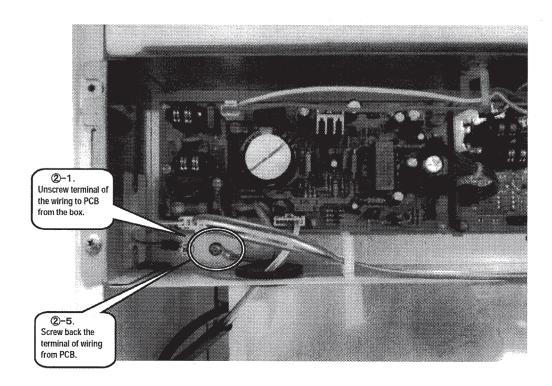
PSB012D953C

This PCB is a general PCB. Replace the PCB according to this instruction.

Replace the PCE

- 1. Unscrew terminal of the wiring(yellow/green) soldered to PCB from the box.
- 2. Replace the PCB only after all the wirings connected to the connector are removed.
- 3. Fix the board such that it will not pinch any of the wires.
- 4. Reconnect the wirings to the PCB. Wiring connector color should match with the color of connector of the PCB.
- Screw back the terminal of wiring (yellow/green) from PCB(T1), that was removed in 1. In that case, do not place the crimping part of the wiring under the PCB.





●DIP switch setting list

Switches	Description	D	efault setting	Remarks	
SW2	Address No. setting at plural indoor u	units control by 1 R/C	0		0-F
SW5-1	Reserved		OFF		keep OFF
SW5-2	Reserved		OFF		keep OFF
SW6-1				•	
SW6-2	Model selection		As par n	nadal	See table 1
SW6-3	Woder selection		As per model		See table 1
SW6-4					
SW7-1	Test run, Drain motor	Normal*/Test run	OFF	Normal	
SW7-2	Reserved		OFF		keep OFF
SW7-3	Powerful mode	Valid*/Invalid	ON	Valid	
SW7-4	Reserved		OFF		keep OFF
SW8-1	Reserved				keep OFF
SW8-2	Reserved				keep OFF
SW8-3	Reserved				keep OFF
SW8-4	Reserved				keep OFF
JSL1	Superlink terminal spare	Normal*/switch to spare	With		

Note (1): SW8: FDT, FDU, FDUM only. * Default setting

Table 1: Indoor unit model selection with SW6-1-SW6-4

	0: OFF	1:ON
	71V	100V
SW6-1	1	1
SW6-2	0	1
SW6-3	0	0
SW6-4	1	1

(4) Troubleshooting at the outdoor unit

When troubleshooting the outdoor unit, firstly assess the overview of malfunction and try to presume the cause and the faulty part by checking the error code dispalyed on the remote control and flashing pattern of indicator lamps (Red LED), and then proceed further inspection and remedy it.

Self-diagnosis system by microcomputor on indoor and outdoor PCB can assist to find the cause of malfunction smoothly by making a diagnosis of not only the anomaly of microcomutor, but also the anomaly in power supply system, installation space, overload resulting from improper charging amount of refrigerant and etc.

Unless the power is reset, the error log is saved in memory and the inspection indicator lamps on outdoor PCB keep flashing after automatical recovering from malfunction.

After automatical recovering from malfunction, if any another error mode which has a higher priority than the previous error saved in memory occurs, it is overwritten in memory and is displayed.

[Reset of power supply]

Be sure to avoid electrical shock, when replacing or checking the outdoor PCB, because some voltage is still retained in the electrolytic capacitor on the PCB even after shutting down the power supply to the outdoor unit.

Be sure to start repairing work, after confirming that the Red LED on the PCB has been extiguished for more than 10 seconds after more than 3 minutes had been passed since power shut down, and reconfirming that voltage has been discharged sufficiently by measuring the voltage (DC) between both terminals of electrolytic capacitor (C58) (Measurment of voltage may be disturbed by the moisture-proof coating. In such case, remove the coating and measure it by taking care of avoiding electrical shock)

(a) Module of part to be replaced for outdoor unit control

Outdoor main PCB, Outdoor sub PCB, Temperature sensor (of outdoor heat exchanger, discharge pipe, outdoor air), Fuses (for power supply and main PCB)

(b) Replacement procedure of outdoor control PCB

Precautions for Safety

Since the following precaution is the important contents for safety, be sure to observe them.
 WARNING and CAUTION are described as follows:

∴WARNING

Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.

CAUTION

Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

/!\ WARNING

- Securely replace the PCB according to this procedure.
 If the PCB is incorrectly replaced, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before replacing the PCB. The PCB replacement under current-carrying will cause an electric shock or fire.
- After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire.

CAUTION

Band the wiring so as not to tense because it will cause an electric shock.

Exchange the PCB(Main) according to the following procedures.

PSC012D029

- 1. Exchange the PCB (Main) after checking that the red LED (LED1) on the PCB (Main) goes out for 10 seconds or more after elapsing 3 minutes or more from power OFF. (Refer to Fig.1)
- 2. Open the lid, and measure DC voltage on both edges of electrolytic capacitor C58 and check that the voltage is discharged sufficiently. (Refer to Fig.2) (Since the capacitor is coated with prevention-of-moisture coating, the voltage may be hard to be measured. Remove the coating before measuring if required, taking care of an electric shock.)
- 3. Remove the PCB (Main) (Refer to Step.1 and Step.2), and disconnect the harness connected to the reactor, terminal block, etc., and disconnect the connectors connected to the PCB (Main) before exchanging the PCB. (Refer to Step.3) (Harness to be able to band together after PCB exchange with tie wrap bands.)
- 4. Connect the harness and connectors with the PCB (Main) and the PCB (Sub). (Confirm the **connectors are not half inserted**.)

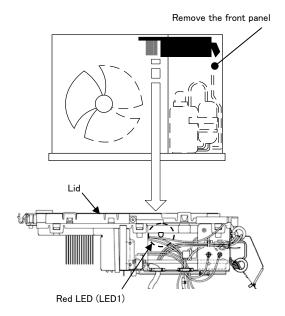


Fig.1 Location of LED

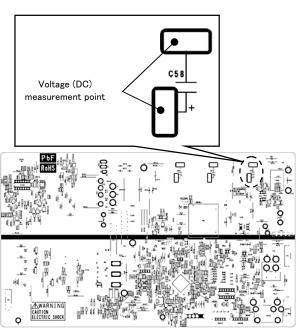


Fig.2 Voltage measurement point (Solder face of PCB (Main))

Step.1 After removing the screws, raises the PCB (Main) as shown in the Fig.3.

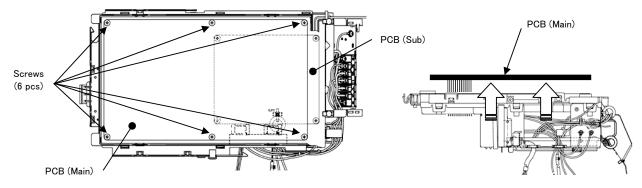


Fig.3 Upside view and removal method of PCB(Main)

Step.2 Disconnect the connectors and remove the band (when there is a band) as shown in the Fig.4-1 and Fig.4-2.

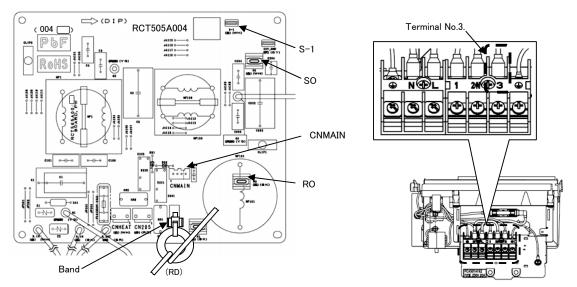


Fig.4-1 Parts arrangement view (PCB (Sub))

Fig.4-2 Terminal block side view

Step.3 Disconnect the connectors from PCB (Main).

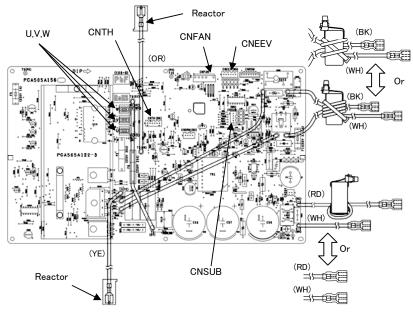


Fig.5 Parts arrangement view (Parts face of PCB (Main))

Data Item (Operation Mode)

(Set Temperature)

(Return Air Temperature)

(Indoor Unit Fan Speed)

(Response Frequency)

(Frequency Requirements)

(Outdoor Air Temperature)

(Compressor Frequency)

(Comp Bottom Temperature)

(Target Super Heat)

(Discharge Pipe Temperature)

(Discharge Pipe Super Heat)

(Outdoor Unit Fan Speed)

(Protection State No. of The Compressor)

The Compressor

nsion Valve EEVC

nsion Valve EEVH)

(High Pressure)

(Low Pressure)

(Current)

(Super Heat)

(63H1 On/Off) (Defrost Control On/Off)

(Remote Control Thermistor Tempeature)

(Indoor Heat Exchanger Thermistor / U Bend)

(Indoor Heat Exchanger Thermistor /Capillary

(Indoor Heat Exchanger Thermistor /Gas Header

(Pulse of Indoor Unit Expansion Value)

H (Total Running Hours of The Indoor Unit)

(Outdoor Heat Exchanger Thermistor)

(Outdoor Heat Exchanger Thermistor)

Check of anomalous operation data with the remote control (a) In case of RC-E5 remote control

Operation data can be checked with remote control unit operation.

- ① Press the CHECK button. The display change "OPER DATA
- ② Press the O (SET) button while "OPER DATA T" is displayed.
- 3 When only one indoor unit is connected to remote control, "DATA LOADING" is displayed (blinking indication during data loading).
 - Next, operation data of the indoor unit will be displayed. Skip to step ②.
- 4 When plural indoor units is connected, the smallest address number of indoor unit among all connected indoor unit is displayed. [Example]:
 - " (blinking 1 seconds) → " [/[]000 inking.
- ⑤ Select the indoor unit number you would like to have data displayed with the | \ | \ | button.
- 6 Determine the indoor unit number with the (SET) button.

(The indoor unit number changes from blinking indication to continuous indication)

"[/[]000" (The address of selected indoor unit is blinking for 2 seconds.)

"DATA LOADING" (A blinking indication appears while data loaded.)

Next, the operation data of the indoor unit is indicated.

 \bigcirc Upon operation of the $|\triangle|$ $|\nabla|$ button, the current operation data is displayed in order from data number 01.

The items displayed are in the above table.

- *Depending on models, the items that do not have corresponding data
- ® To display the data of a different indoor unit, press the AIR CON NO. indoor unit selection screen.
- Pressing the OON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation go back to the previous screen.

⊙If two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)

Details of Compressor protection status No. 33

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P31, (11). (b). (i)
"2"	Discharge pipe temperature anomaly	P31, (11). (b). (ii)
"3"	Current safe control of inverter primary current	P31, (12)
"4"	High pressure protection control	P29, (6). (c)
"5"	High pressure anomaly	P31, (11)
"8"	Anti-frost prevention control	
"9"	Current cut	P32, (13)
"11"	Power transistor anomaly (Overheat)	
"12"	Compression ratio control	
"13"	Spare	
"14"	Dewing prevention control	
"15"	Current safe control of inverter secondary current	
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	

	37	TOTAL C	:OMP RUN_	H (Total Running Hours of
	38	O/U EE\	/1P	(Pulse of The Outdoor Unit Expar
	39	0/U EE\	/2P	(Pulse of The Outdoor Unit Expar
are				
butto	on, whi	ch allo	ws you	to go back to the i
:11	1.	1		1 . 11
WIII	unao y	our iast	operation	on and allow you to

Note(1) Operation data display on the remote control.

•Data is dispalyed until canceling the protection control. *In case of multiple protections controlled, only the younger No. is displayed

Note(2) Common item.

① In heating mode

Number

01 쌄

02

03

04

05

06

07

08

09

10

11

12

21

22

23

24

25 HP

26 LP

27

28

30

31

32

33

34

35

36

SET TEMP

RETURN AIR.

■SENSOR

THI-R1_

THI-R2.

THI-R3.

DEMAND

ANSWER

I/U EEV

OUTDOOR

THO-R1

TH0-R2

COMP

Τd

CT

SH.

TDSH.

63H1

DEFROST

I/U FANSPEED

TOTAL I/U RUN

<u>Hz</u>

.MPa

.MPa

Ĉ

AMP

COMP BOTTOM

TARGET SH

_ి

PROTECTION No.

0/U FANSPEED

ڻ_

ှင်_

Ĉ

Hz

Ηz

During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.

② In cooling and dehumidifying mode. During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

(b) In case of RC-EX1A remote control

[Operating procedure]

- ① On the TOP screen, touch the buttons in the order of "Menu" → "Next" → "Service & Maintenance" → "Service password" → "Set" → "Error display" → "Error history".
- ② When only one indoor unit is connected to the remote control, followings will be displayed.
 - 1. When there is any anomaly: "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly. Contents of display
 - · Error code
 - · Number and data item
 - 2. When there is no anomaly: "No anomaly" is displayed, and this mode is terminated.
- When two or more indoor units are connected to the remote control, followings will be displayed.
 - 1. When there is any anomaly: If the unit having anomaly is selected on the "Select IU" screen, "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly.

Contents of display

- · Indoor unit No.
- · Error code
- · Number and data item
- 2. When there is no anomaly: "No anomaly" is displayed, ant this mode is terminated.

Note (1) When the number of connected units cannot be shown in a page, select "Next".

- ④ If you press [RUN/STOP] button, the display returns to the TOP screen.
 - O If you touch "Back" button on the way of setting, the display returns to the last precious screen.

Note (1) When two remote controls are used to control indoor units, the check of anomaly operation data can be made on the master remote control only. (It cannot be operated from the slave remote control.)

■ Anomaly operation data (Corresponding data may not be provided depending on models. Such items will not be displayed.)

Number		Data Item
01	*	(Operation Mode)
02	SET TEMPc	(Set Temperature)
03	RETURN AIR た	(Return Air Temperature)
04	esensorc	(Remote Control Thermistor Tempeature)
05	THI-R1c	(Indoor Heat Exchanger Thermistor / U Bend)
06	THI-R2c	(Indoor Heat Exchanger Thermistor /Capillary)
07	THI-R3c	(Indoor Heat Exchanger Thermistor /Gas Header)
08	I/U FANSPEED	(Indoor Unit Fan Speed)
09	DEMANDHz	(Frequency Requirements)
10	ANSWERHz	(Response Frequency)
11	I/U EEVP	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN	_H (Total Running Hours of The Indoor Unit)
21	OUTDOORზ	(Outdoor Air Temperature)
22	THO-R1t	(Outdoor Heat Exchanger Thermistor)
23	THO-R2c	(Outdoor Heat Exchanger Thermistor)
24	COMPHz	(Compressor Frequency)
25	HPMPa	(High Pressure)
26	LPMPa	(Low Pressure)
27	ڻbT	(Discharge Pipe Temperature)
28	COMP BOTTOMc	(Comp Bottom Temperature)
29	CTAMP	(Current)
30	TARGET SH	(Target Super Heat)
31	orH2	(Super Heat)
32	TDSHt	(Discharge Pipe Super Heat)
33	PROTECTION No	(Protection State No. of The Compressor)
34	O/U FANSPEED	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN_	
38	0/U E EV1P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	0/U	(Pulse of The Outdoor Unit Expansion Valve EEVH)

Details of Compressor protection status No. 33

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P31, (11). (b). (i)
"2"	Discharge pipe temperature anomaly	P31, (11). (b). (ii)
"3"	Current safe control of inverter primary current	P31, (12)
"4"	High pressure protection control	P29, (6). (c)
"5"	High pressure anomaly	P31, (11)
"8"	Anti-frost prevention control	
"9"	Current cut	P32, (13)
"11"	Power transistor anomaly (Overheat)	
"12"	Compression ratio control	
"13"	Spare	
"14"	Dewing prevention control	
"15"	Current safe control of inverter secondary current	
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	

Note(1) Operation data display on the remote control.

Data is dispalyed until canceling the protection control.

In case of multiple protections controlled, only the younger No. is displayed.

Note(2) Common item ① In heating mode.

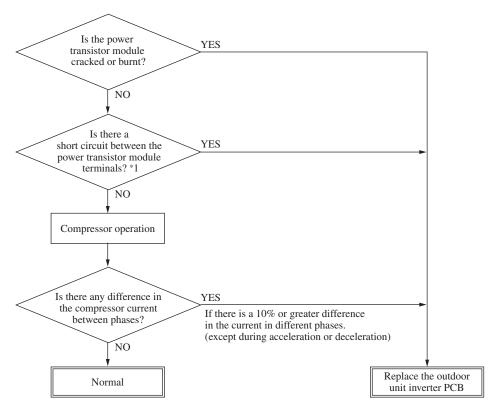
During protection control by the command signal for reducing compressor

frequency from indoor unit, No. "4" is displayed.

② In cooling and dehumidifying mode.

During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

(6) Power transistor module (including the driver PCB) inspection procedure



*1 Power transistor module terminal short circuit check procedure

Disconnect the compressor wiring, then conduct a short circuit check.

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P-N terminals.

Bring the tester probes in contact with the following places on each te rminal.

P: Power transistor P terminal,

N: Power transistor N terminal,

U: End of red harness to compressor

V: End of white harness to compressor

W: End of black or blue harness to compressor

Check for a power transistor short circuit.

- When you do not have a diagnostic checker for judging if the inverter is defective, measure between the terminals of the power transistor parts, judge whether the power transistor is defective or not.
- Disconnect the compressor, then measure with the control incorporated.

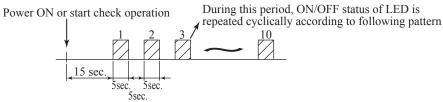
Tester			
	Terminal	Normal values (Ω)	Diode mode (V)
(+)	(-)		
P	N		
N	P		
P	U		_
P	V		
P	W		
N	U		
N	V	A few of M Ω	
N	W	(Not short)	Approx 0 AV
U	P		Approx. 0.4V
V	P		
W	P		
U	N		
V	N		_
W	N		

If the measured values range from $0\sim several\ k\Omega$, there is a possibility that the elements are damaged, so replace the power transistor parts.

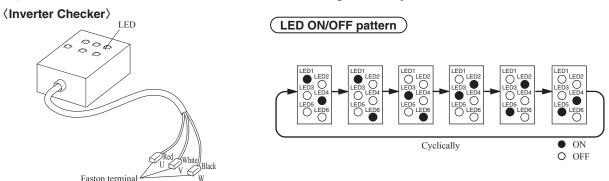
(7) Inverter checker for diagnosis of inverter output

- Checking method
- (a) Setup procedure of checker.
 - (i) Power OFF (Turn off the breaker).
 - (ii) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
 - (iii) Connect the wires U (Red), V (White) and W (Black) of checker to the terminal of disconnected wires (U, V, W) from compressor respectively.
 - (iv) Connect the short connector to CNROM on the main PCB.
- (b) Operation for judgment.
 - (i) Power ON.
 - (ii) After 15 seconds since power has turned ON. LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
 - (iii) Check ON/OFF status of 6 LED's on the checker.
 - (iv) Judge the PCB by ON/OFF status of 6 LED's on the checker.

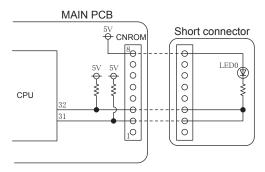
ON/OFF status of LED	If all of LED are ON/OFF according to following pattern	If all of LED stay OFF or some of LED are ON/OFF
Inverter PCB	Normal	Anomalous



e) Be sure to disconnect the connector from CNROM, after finishing the check operation.



Connect to the terminal of the wires which are disconnected from compressor.



F3 250V 1A

See page 93.

CNFAN

♦Inspection of outdoor fan motor

♦Check point of outdoor unit **⚠CAUTION- HIGH VOLTAGE** High voltage is produced in the control box. Don't touch electrical parts in the control box for 5 minutes after the unitisstopped. ♦Inspection power transistor Remove the fasten terminal and test output voltage Color symbol Black Power source Brown AC220/230/240V 50Hz Orange AC220V 60Hz PWB ASSY (MAIN) PWB ASSY (SUB) Red POWER TRANSISTOR White 250V 20A 250V 20A (BK) Yellow ACTIVE FILTER ***** (WH) Yellow Green (YG) (WH) (YG) CNMAIN CNSUB

CNTH

SWITCHING POWER CIRCUIT

CNEEV

EEV

CN20S G3

20S

_____(YG)

(RD) C-2

♦Power source and serial signal inspection

① to **N**: AC 220/230/240V

BK

BR

OR

RD

WH

Y

YG

- ① to ②/N: AC220/230/240V
- 2/N to 3: Normal if the voltage oscillates between DC 0 and approx. 20V

3 _____(YG)

♦Inspection power transistor

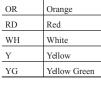
'13 • PAC-SM-190

♦Check point of outdoor unit

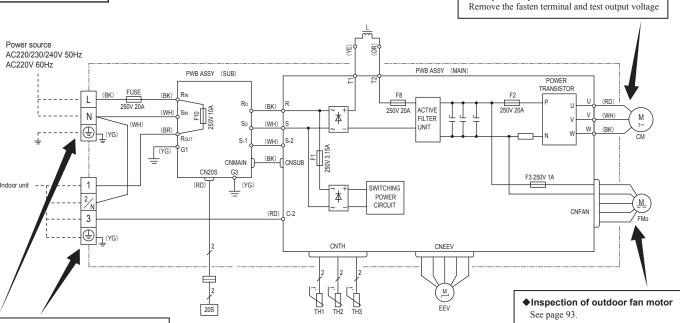


High voltage is produced in the control box. Don't touch electrical parts in the control box for 5 minutes after the unitisstopped.

Color symbol BK Black BR Brown OR Orange RD Red



Y



♦Power source and serial signal inspection

- ① to **N**: AC 220/230/240V
- ① to ②/N:AC220/230/240V
- (2/N) to (3): Normal if the voltage oscillates between DC 0 and approx. 20V

2.2 Troubleshooting flow (1) List of troubles

Remote control display	Description of trouble	Reference page
None	Operates but does not cool.	55
None	Operates but does not heat.	56
None	Earth leakage breaker activated	57
None	Excessive noise/vibration (1/3)	58
None	Excessive noise/vibration (2/3)	59
None	Excessive noise/vibration (3/3)	60
None	Louver motor failure (FDT, FDEN, FDF series)	61
None	Power supply system error (Power supply to indoor control PCB)	62
None	Power supply system error (Power supply to remote control)	63
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	64
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	65
⊕WAIT⊕	Communication error at initial operation	66~68
E1	Remote control communication circuit error	69
E5	Communication error during operation	70
E6	Indoor heat exchanger temperature thermistor anomaly	71
E7	Return air temperature thermistor anomaly	72
E8	Heating overload operation	73
E9	Drain trouble (FDT, FDU, FDUM series)	74
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	75
E11	Address setting error of indoor units	76
E14	Communication error between master and slave indoor units	77
E16	Indoor fan motor anomaly (FDT, FDU, FDUM, FDF series)	78
E18	Address setting error of moster and slave indoor unit	79
E19	Indoor unit operation check	80
E20	Indoor fan motor rotation speed anomaly (FDT, FDU, FDUM, FDF series)	81
E21	Defective panel switch operation (FDT only)	82
E28	Remote control temperature thermistor anomaly	83
E35	Cooling overload operation	84
E36	Discharge pipe temperature error	85
E37	Outdoor heat exchanger temperature sensor anomaly	86
E38	Outdoor air temperature sensor anomaly	87
E39	Discharge pipe temperature sensor anomaly	88
E40	Service valve (gas side) closing operation	89
E42	Current cut	90,91
E47	Active filter voltage error	92
E48	Outdoor fan motor anomaly	93
E51	Power transistor anomaly	94
E57	Insufficient refrigerant amount or detection of service valve closure	95
E58	Current safe stop	96
E59	Compressor startup failure	97
E60	Compressor rotor lock error	98

Troubleshooting (2)

					<u> </u>
(Error code	LED	Green	Red	Content
	Remote control: None	Indoor	Keeps flashing	Stays OFF	Operates but does not cool

1. Applicable model

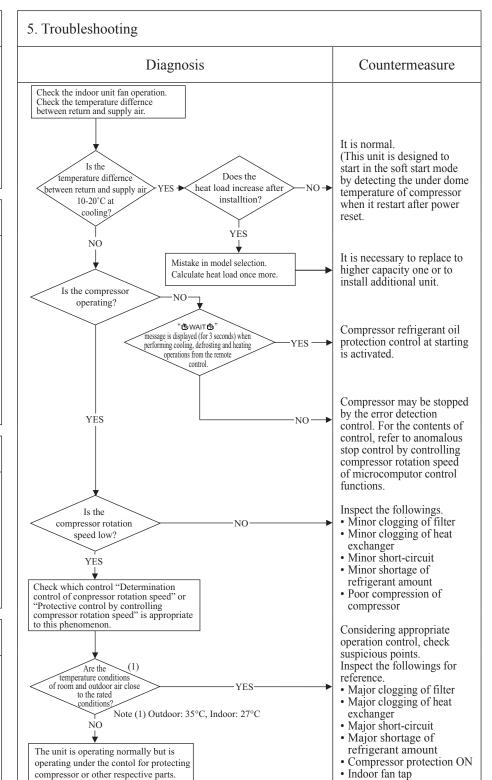
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- · Poor compression of compressor
- · Faulty expansion valve operation



Note:

compressor or other respective parts.

					<u> </u>
9[Error code	LED	Green	Red	Content
	Remote control: None	Indoor	Keeps flashing	Stays OFF	Operates but does not heat

5. Troubleshooting 1. Applicable model All models Diagnosis Countermeasure Check the indoor unit fan operation. Check the temperature differnce between return and supply air. Does the temperature differnce between return and supply ai 10-30°C at heat load increase after installtion? heating's 2. Error detection method YES NO Mistake in model selection. Calculate heat load once again. Is the compressor operating? "®WAIT®' message is displayed (for 3 seconds) when performing cooling, defrosting and heating operations from the remote control. YES NO

compressor rotation

speed low?

YES

appropriate to this phenomenon.

Are the

temperature conditions of room and outdoor air close

Check which control "Determination control of conpressor rotation speed" or "Protective control

by controlling compressor rotation speed" is

It is normal. (This unit is designed to start in the soft start mode by detecting the under dome temperature of compressor when it restart after power reset.

It is necessary to replace to higher capacity one or to install additional unit.

Compressor refrigerant oil protection control at starting is activated.

Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputor control functions.

Inspect the followings.

- Minor clogging of filter
- Minor clogging of heat exchanger
- Minor short-circuit Minor shortage of
- refrigerant amount
- Poor compression of compressor

Considering appropriate operation control, check suspicious points. Inspect the followings for reference.

- Major clogging of filter
- Major clogging of heat exchanger
- Major short-circuit
- Major shortage of refrigerant amount
- Compressor protection ON
- Indoor fan tap

3. Condition of Error displayed

4. Presumable cause

- Faulty 4-way valve operation
- · Poor compression of compressor
- · Faulty expansion valve operation

	conditions? Note (1) Outdoor: 7°	°C, Indoor: 20°C
(The unit is operating normally but is operating under the contol for protecting compressor or other respective parts.	

				<u></u>
Error code	LED	Green	Red	Content
Remote control: None	Indoor	Stays OFF	Stays OFF	Earth leakage breaker activated

1. Applicable model 5. Troubleshooting All models Diagnosis Countermeasure Are OK the insulation resistance and Replace compressor.* NO coil resistance of compressor? YĖS 2. Error detection method Is insulation of respective harnesses OK? Secure insulation NO Is any harness bitten between resistance. pannel and casing YĖS Check the outdoor unit grounding wire/earth leakage breaker. Check of the outdoor unit grounding wire/earth leakage breaker 3. Condition of Error displayed ① Run an independent grounding wire from the grounding screw of outdoor unit to the grounding terminal on the distribution panel. (Do not connect to another grounding wire.) 2 In order to prevent malfunction of the earth leakage breaker itself, confirm that it is conformed to higher harmonic regulation. * Insulation resistance of compressor • Immediately after installation or when the unit has been left for long time without power supply, the insulation resistance may drop to a few $M\Omega$ because of refrigerant migrated in the compressor. When the earth breaker is activated at lower insulation resistance, check the following points. ① Check if the earth leakage breaker is conformed to higher 4. Presumable cause harmonic regulation or not. Since the unit is equipped with inverter, it is necessary to use components conformed to higher harmonic regulation in order · Defective compressor to prevent malfunction of earth leakage breaker. • Noise

Note:		

				(A)
Error code	LED	Green	Red	Content
Remote control: None	Indoor	1	-	Excessive noise/vibration (1/3)

5. Troubleshooting

1.Applicable model

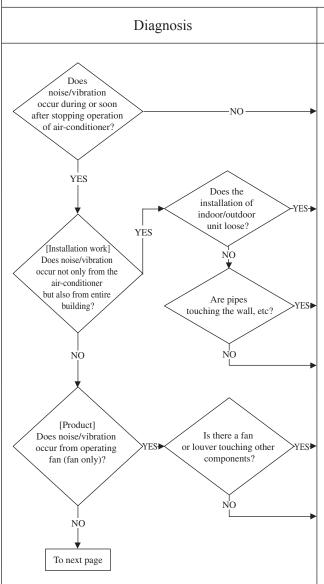
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- ① Improper installation work
- Improper anti-vibration work at instllation
- Insufficient strength of mounting face
- 2 Defective product
 - Before/after shipping from factory
- ③ Improper adjustment during commissioning
 - Excess/shortage of refrigerant, etc.



Countermeasure

If excessive noise/vibration persists when sufficient time has elapsed after stopping the unit, it is considered that the air-conditioner is not the source.

Check the installed condition carefully, and correct the position or insert rubber cushions or others into the gap, if necessary.

Prevent the vibration from transmitting to wall and etc by fixing pipes on the wall or wrapping rubber cushion around the pipe which goes through the hole in the wall or applying other appropriate means.

Strength of ceiling wall, floor, etc. may be insufficient. Review the installing position or reinforce it.

Check for leaning of installed unit or anomalous mounting of fan, louver or motor and specify the contacting point and correct it

When the heat exchanger or filter is clogged, clean them. In case that the unit is installed at the site where background noise is very low, small noise from indoor unit can be heard, but it is normal. Before installation, check for background noise if backgound nois is very low, convince client prior to installation.

3 7	r .	
	Oto	
1.	OLC	ı

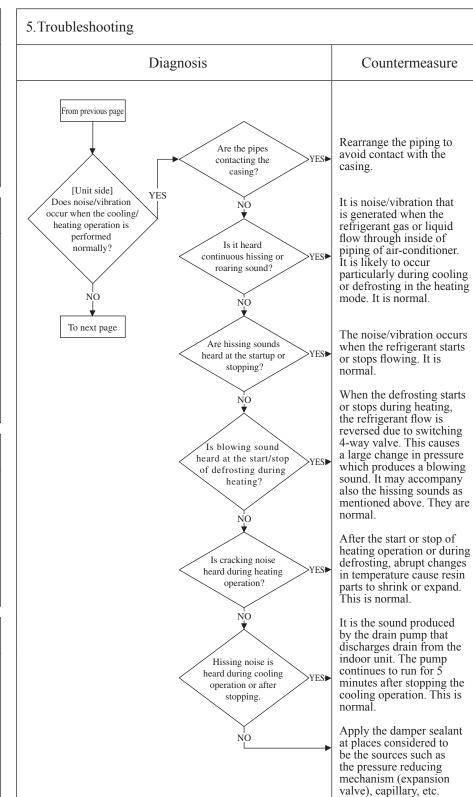
_					<u></u>
(1	Error code	LED	Green	Red	Content
	Remote control: None	Indoor	_	-	Excessive noise/vibration (2/3)

1.Applicable model All models

2.Error detection method

3. Condition of Error displayed

4. Presumable cause



_						1)
(1	Error code	LED	Green	Red	Content	
	Remote control: None	Indoor	Ī	Ī	Excessive noise/vibration (3/3)	

\bigcup 1. Applicable model 5. Troubleshooting All models Diagnosis Countermeasure From previous page If insufficient cooling/ Adjustment heating problem happens due to anomalous operating conditions at cooling/ heating, followings are during commissioning Does noise/vibration occur when the cooling/heating operation is in 2. Error detection method anomalous condition? suspicious. Overcharge of refrigerantInsufficient charge of YES refrigerant • Intrusion of air, nitrogen, etc. In such occasion, it is necessary to recover refrigerant, vacuum-dry and recharge refrigerant. * Since there could be many causes of noise/ vibration, the above do not cover all. In such case, check the conditions when, where, 3. Condition of Error displayed how the noise/vibration occurs according to following check point. • Indoor/outdoor unit • Cooling/heating/fan mode • Startup/stop/during operation • Operating condition (Indoor/outdoor temperatures, pressure) • Time it occurred • Operation data retained by the remote control 4. Presumable cause such as compressor rotation speed, heat exchanger temperature, EEV opening degree, etc. • Tone (If available, record the noise) • Any other anomalies

Note:			

				(4)
Error code	LED	Green	Red	Content
Remote control: None			a. 0.000	Louver motor failure
	Indoor	Keeps flashing	Stays OFF	(FDT, FDEN, FDF series)

1.Applicable model

FDT, FDEN, FDF series only

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Defective LMLM wire breakageFaulty indoor control PCB

5. Troubleshooting	
Diagnosis	Countermeasure
Does the louver operate at the power on? NO Is LM wiring broken? NO YES	Repair wiring.
YES Is LM locked? NO	Defective indoor control PCB → Replace.
Is the louver operable with the remote control?	Replace LM. Normal Adjust LM lever and then check again.
LM: louver motor	

					<u> </u>
(Error code	LED	Green	Red	Content Power supply system error
	Remote control: None	Indoor	Stays OFF		(Power supply to indoor control PCB)

1.Applicable model

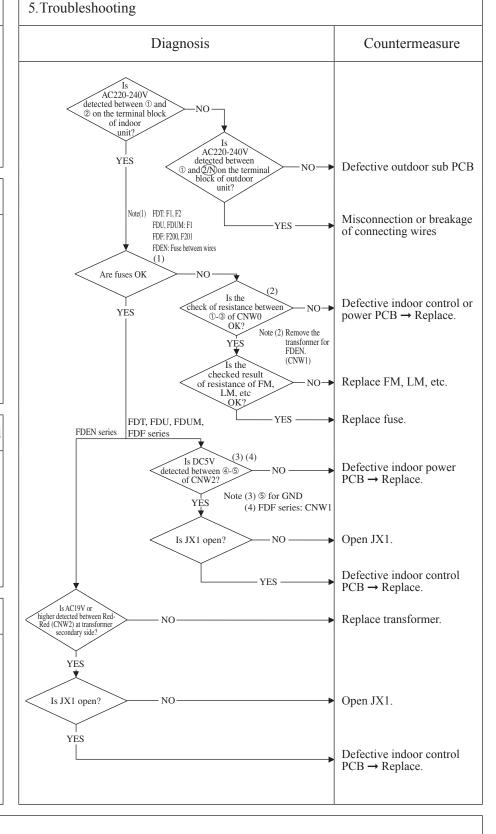
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Misconnection or breakage of connecting wires
- · Blown fuse
- Faulty transformer
- Faulty indoor control or power PCB
- Broken harness
- Faulty outdoor sub PCB



Error code LED Gree	en Red	
Entor code		Content Downer gumply gygtom arror
Remote control: None Indoor Keeps fla	shing Stays OFF	Power supply system error (Power supply to remote control)

1. Applicable model 5. Troubleshooting All models Diagnosis Countermeasure Isn't there any Correct. loose connection of remote YES control wires? NO 2. Error detection method Isn't remote control wire broken or Replace wires. YES short-circuited? NO Disconnect remote control wires. Is DC15V or higher detected between X-Y Replace remote control. YES of indoor unit terminal block? 3. Condition of Error displayed NO FDT, FDU, FDUM, FDF FDEN series series Is DC180V between ①-② of CNW2? Defective indoor power PCB→Replace. Defective indoor control PCB→Replace. Note (1) FDF series: CNW1 4. Presumable cause Is 24V or higher between (Brown-Brown) of Replace transformer. transformer secondary • Remote control wire side? breakage/short-circuit • Defective remote control Malfunction by noiseFaulty indoor power PCB Defective indoor control YES PCB→Replace. Broken harness • Faulty indoor control PCB

				<u>9</u>
Error code	LED	Green	Red	Content
Remote control: INSPECT I/U	Indoor	Keeps flashing	Stays OFF	INSPECT I/U (When 1 or 2 remote controls are connected)

1. Applicable model

All models

2. Error detection method

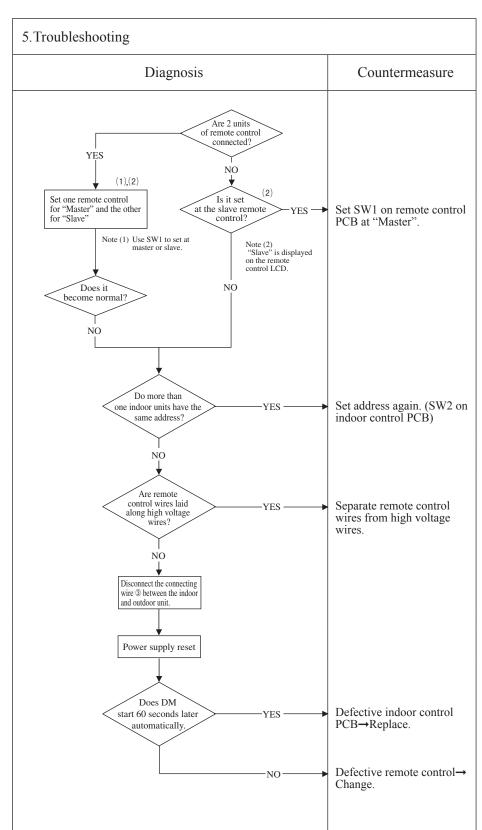
Communication between indoor unit and remote control is disabled for more than 30 minutes after the power on.

3. Condition of Error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor control PCB



Note: If any error is detected 30 minutes after displaying "WAIT "on the remote control, the display changes to "INSPECT I/U".

				<u> </u>
Error code	LED	Green	Red	Content
Remote control: INSPECT I/U	Indoor	Keeps flashing	Stays OFF	INSPECT I/U (Connection of 3 units or more remote control)

1.Applicable model

All models

2. Error detection method

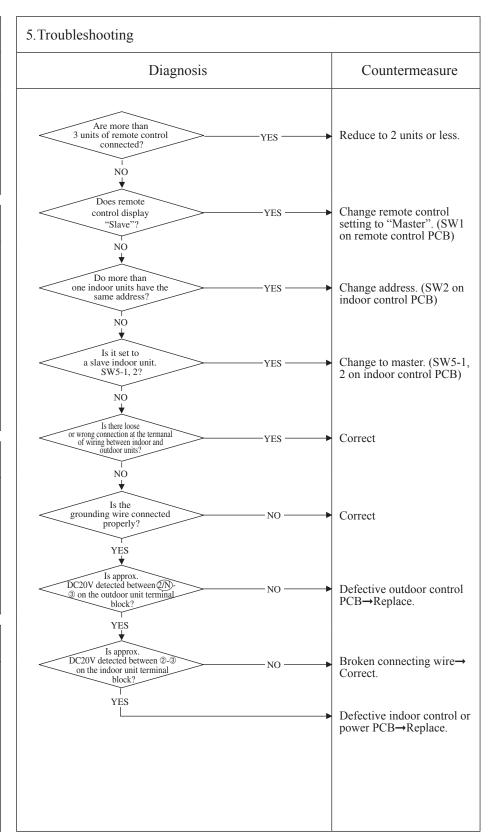
Indoor unit cannot communicate for more than 30 minutes after the power on with remote control.

3. Condition of Error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor control or power PCB
- Faulty outdoor control PCB



Note: If any error is detected 30 minutes after displaying "WAIT "on the remote control, the display changes to "INSPECT I/U".

(PError code)	LED	Green	Red	Content
Remote control: @WAIT @	Indoor	Keeps flashing	Stays OFF	Communication error at initial operation (1/3)

1. Applicable model

All models

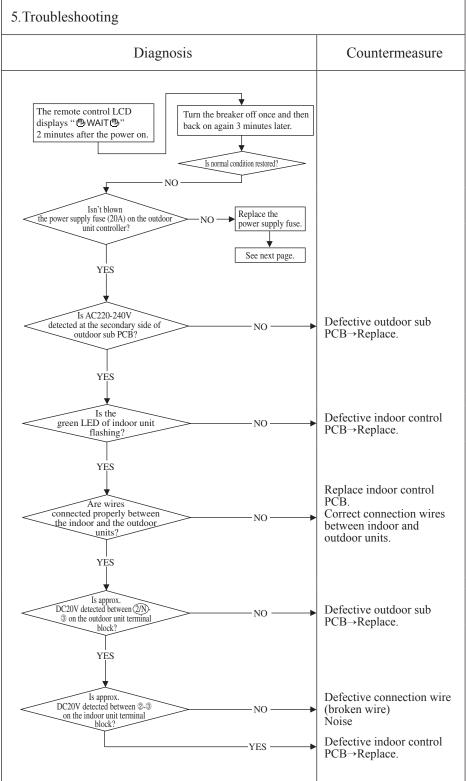
When the remote control LCD displays " WAIT " 2 minutes after the power on.

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Blown fuse
- Faulty outdoor sub PCB
- Connection between PCB's
- Faulty indoor control PCB
- Defective remote control
- · Broken remote control wire



Note: If any anomaly is detected during communication, the error code E5 is displayed. Inspection procedure is same as above. (Excluding matters related to connection) When the power supply is reset after the occurrence of E5, the LED will display "@WAIT®" if the anomaly continues. If the breaker ON/OFF is repeated in a short period of time (within 1 minute), "@WAIT®" may be displayed. In such occasion, turn the breaker off and wait for 3 minutes.

					9
(1	Error code	LED	Green	Red	Content
	Remote control: WAIT	Indoor	Keeps flashing	Stays OFF	Communication error at initial operation (2/3)

1.Applicable model

All models

When the fuse is blown, the method to inspect outdoor PCB before replacing the power supply fuse

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Blown fuse
- Faulty outdoor sub or main PCB
- Faulty reactor

Prom previous page Isn't there a short-circuit between phases of outdoor sub PCB? YES Replace the outdoor sub PCB and PCB Replace the reactor. Replace the reactor the anomalous? Replace the reactor.
Isn't there a short-circuit between phases of outdoor sub PCB? Replace the outdoor sub PCB Replace the outdoor sub PCB Replace the outdoor main PCB Replace the outdoor main PCB Replace the reactor.

Note:			

(Error code	LED	Green	Red	Content
	Remote control: WAIT	Indoor	Keeps flashing	Stays OFF	Communication error at initial operation (3/3)

1. Applicable model

All models

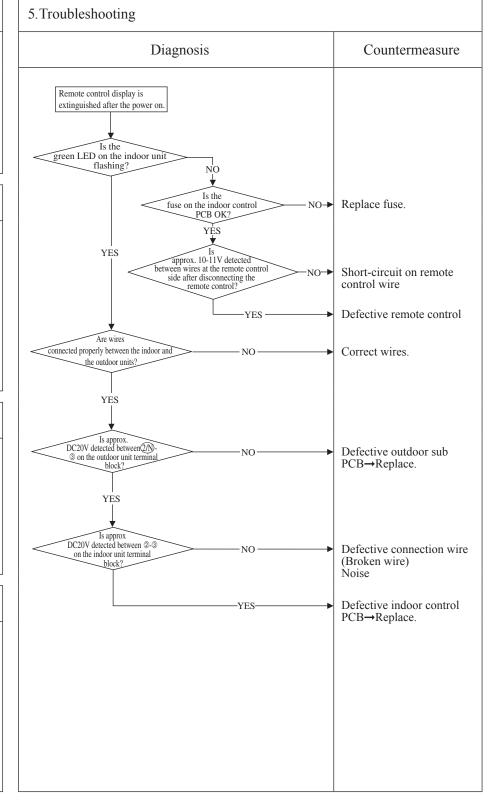
When the remote control display is extinguished after the power on.

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Blown fuse
- Connection between PCB's
- Blown fuse
- Faulty indoor control PCB
- Defective remote control
- Wire breakage on remote control
- Faulty outdoor sub PCB



					Θ
(Error code	LED	Green	Red	Content
	Remote control: E1		V 0 . 1	Ct. OFF	Remote control
		Indoor	Keeps nasning	Stays OFF	communication circuit error
			•		

1. Applicable model

All models

2. Error detection method

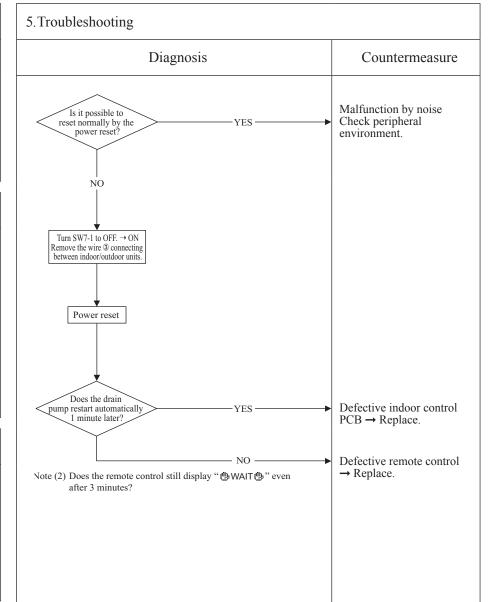
When normal communication between the remote control and the indoor unit is interrupted for more than 2 minutes. (Detectable only with the remote control)

3. Condition of Error displayed

Same as above

4. Presumable cause

- Defective communication circuit between remote control-indoor unit
- Noise
- Defective remote controlFaulty indoor control PCB



Note: If the indoor unit cannot communicate normally with the remote control for 180 seconds, the indoor unit PCB starts to reset automatically.

				(4)
Error code	LED	Green	Red	Content
Remote control: E5	Indoor	Keeps flashing	2-time flash	Communication error during operation

1.Applicable model

All models

2. Error detection method

When normal communication between indoor and outdoor unit is interrupted for more than 2 minutes.

3. Condition of Error displayed

Same as above is detected during operation.

4. Presumable cause

- Unit No. setting error
- Broken remote control wire
 Faulty remote control wire connection
 Faulty outdoor sub PCB

5. Troubleshooting							
Diagnosis	Countermeasure						
Note (1) Inspect faulty connections (disconnection, looseness) on the outdoor unit terminal block. connection of signal wires at the outdoor unit side OK? YES Note (2) Check for faulty connection or breakage of	Repair signal wires.						
Note (2) Check for faulty connection or breakage of signal wires between indoor-outdoor units. NO NO NO YES	Repair signal wires.						
Power reset Has the remote control LCD returned to normal state?	Defective outdoor sub PCB (Defective network communication circuit) → Replace.						
YES —	Unit is normal. (Malfunction by temporary noise, etc.)						

					Θ	
(1	Error code	LED	Green	Red	Content	
	Remote control: E6				Indoor heat exchanger	
		Indoor	Keeps flashing	1-time flash	temperature thermistor anomaly	

1. Applicable model

All models

2. Error detection method

Anomalously low temperature or high temperature (resistance) is detected on the indoor heat exchanger thermistor (ThI-R1, R2 or R3).

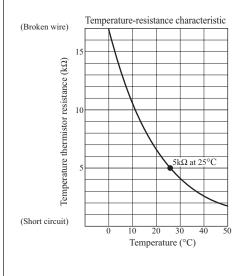
3. Condition of Error displayed

- When the temperature thermistor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection
- detection.
 Or if 70°C or higher is detected for 5 seconds continuously.

4. Presumable cause

- Defective indoor heat exchanger thermistor connector
- Indoor heat exchanger temperature thermistor anomaly
- Faulty indoor control PCB

5. Troubleshooting Diagnosis Countermeasure Is the connection of indoor heat exchanger temperature thermistor Correct. → Insert connector securely. connector OK? YES Are characteristics of indoor Defective indoor heat heat exchanger temperature thermistor OK? exchanger temperature thermistor \rightarrow Replace. YES Defective indoor control PCB → Replace. (Defective indoor unit heat exchanger temperature thermistor input circuit)



							Ø
(1	Error code	LED	Green	Red	Content	D 4	
	Remote control: E7					Return air temperature	
	Remote control. E/	Indoor	Keeps flashing	1-time flash		thermistor anomaly	

All models

2. Error detection method

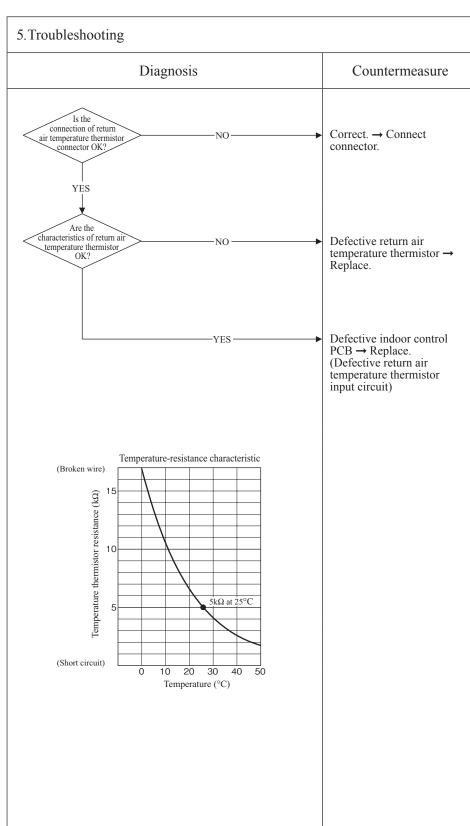
Anomalously low temperature or high temperature (resistance) is detected by indoor return air temperature thermistor (ThI-A)

3. Condition of Error displayed

- When the temperature thermistor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.
- Or if 48°C or higher is detected for 5 seconds continuously.

4. Presumable cause

- Defective return air temperature thermistor connector
- Defective return air temperature thermistor
- Faulty indoor control PCB



					Ω
Error code	LED	Green	Red	Content	
Remote control: E8	Indoor	Keeps flashing	1-time flash	Heating overload operation	

All models

2. Error detection method

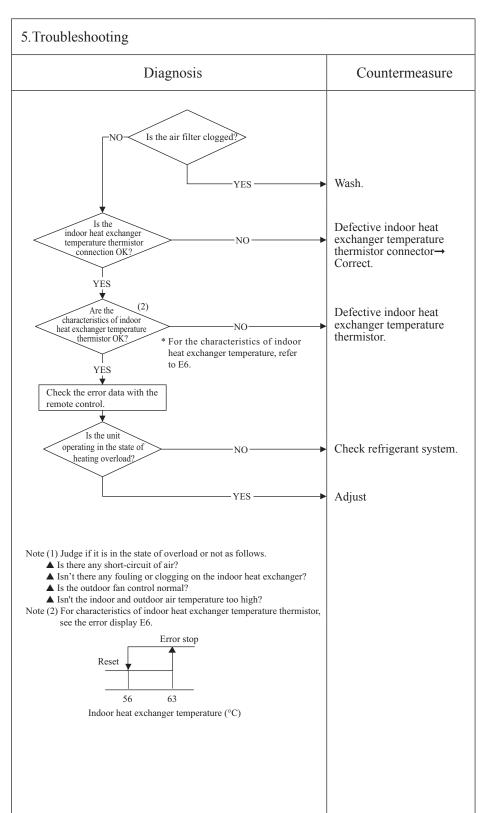
Indoor heat exchanger temperature thermistor (ThI-R1, R2, R3)

3. Condition of Error displayed

When it is detected 5 times within 60 minutes from initial detection or when the overload condition is detected for 6 minutes continuously.

4. Presumable cause

- · Clogged air filter
- Defective indoor heat exchanger temperature thermistor connector
- Defective indoor heat exchanger temperature thermistor
- · Anomalous refrigerant system



Note: During heating operation; After starting compressor, compressor rotation speed is decreased by detecting indoor heat exchanger temperature (ThI-R) in order to control high pressure.

					<u> </u>
	Error code	LED	Green	Red	Content
_	Remote control: E9				Drain trouble
1	Kemote control. E9	Indoor	Keeps flashing	1-time flash	(FDT, FDU, FDUM series)

FDT, FDU, FDUM series only

2. Error detection method

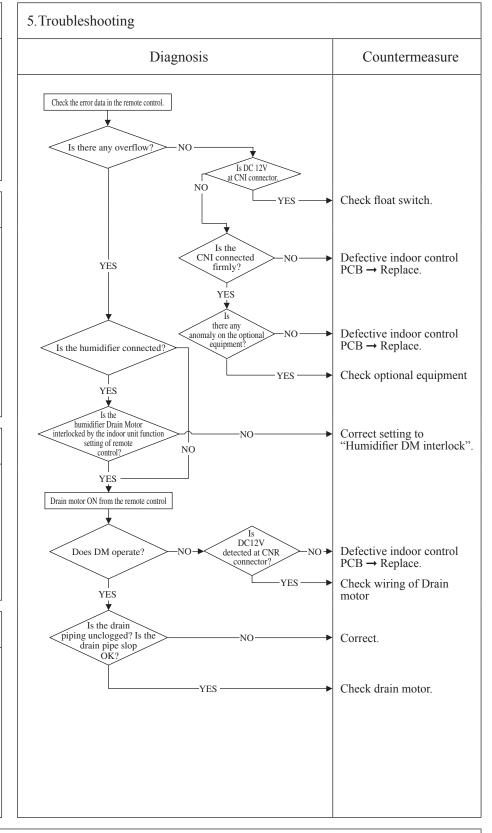
Float switch is activated

3. Condition of Error displayed

If the float switch OPEN is detected for 3 seconds continuously or if float switch connector or wire is disconnected.

4. Presumable cause

- Defective indoor control or power PCB
- Float switch setting error
- Humidifier DM interlock setting error
- Optional equipment setting error
- Drain piping error
- Defective drain motor
- Disconnection of drain motor wiring



Note: When this error occurred at power ON, disconnection of wire or connector of the float switch is suspected. Check and correct it (or replace it, if necessary).

				, G
Error code Remote control: E10	LED	Green Keeps flashing	Red Stays OFF	Content Excessive number of connected indoor units (more than 17 units) by controlling with one remoto control
1.Applicable model	5.Tro	ublesho	oting	
All models				D
an mouse				Diagnosis Countermeasure
		indoor units o	ore than 17 connected to o e control?	Defective remote control → Replace.
2.Error detection method				YES Reduce to 16 or less units.
When it detects more than 17 of indoor units connected to one remote contorl				
3. Condition of Error displayed				
Same as above				
4. Presumable cause				
Excessive number of indoor units connected Defective remote control				

Note:			

Countermeasure

Remote control: E11 Address setting error of		d Conte	Red	Green	LED	Error code
Indoor Keeps flashing Keeps flashing indoor units	_	ashing	Keeps flashing	Keeps flashing	Indoor	Remote control: E11

1. Applicable model

All models

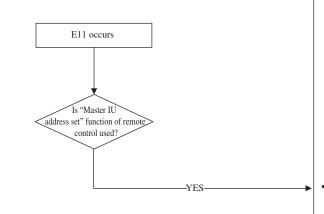
2. Error detection method

IU address has been set using the "Master IU address set" function of remote control.

3. Condition of Error displayed

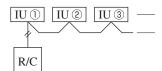
Same as above

5. Troubleshooting		



Diagnosis

In case the wiring is below and "Mastar IU address set" is used, E11 is appeared.



• In cases of RC-E5

• In cases of RC-ES

Return address No. to

"IU ..." using [▲] or

[▲] button.
• In cases of RC-EX1A

Menu → Next

→ IU settings → Select IU

4. Presumable cause

Same as above

Note:		

				<u> </u>
Error code	LED	Green	Red	Content
Remote control: E14	Indoor	Keeps flashing	3-time flash	Communication error between master and slave indoor units
				between master and stave indoor units

All models

2. Error detection method

When communication error between master and slave indoor units occurs

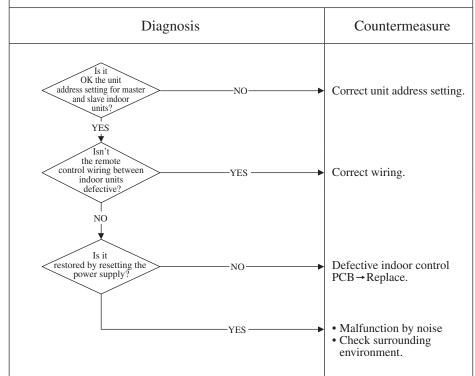
3. Condition of Error displayed

Same as above

4. Presumable cause

- Unit address setting error
- Broken remote control wire
- Defective remote control wire connection
- Defective indoor control PCB

5. Troubleshooting



Note (1) Set dip switches SW5-1 and SW5-2 as shown in the following table. (Factory default setting – "Master")

			Indoor unit	
		Master	Slave-a	Slave-b
Dip	SW5-1	OFF	OFF	ON
switch	SW5-2	OFF	ON	OFF

Note:			

					<u></u>
U	Error code	LED	Green	Red	Content
	Remote control: E16				Indoor fan motor anomaly
	Remote control. E10	Indoor	Keeps flashing	1(2)-time flash	(FDT, FDU, FDUM, FDF series)
					(,,,,

Note(1) Value in () is for the FDU, FDUM series FMI2 only.

1. Applicable model

FDT, FDU, FDUM, FDF series only

2. Error detection method

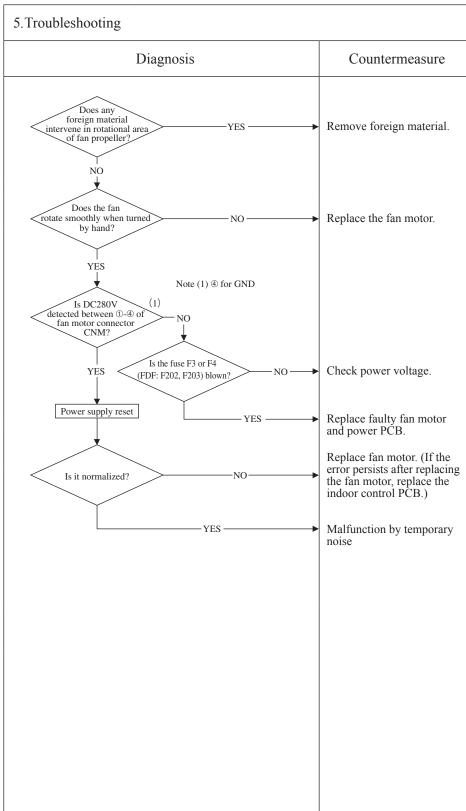
Detected by rotation speed of indoor fan motor

3. Condition of Error displayed

When actual rotation speed of indoor fan motor drops to lower than 200rpm for 30 seconds continuously, the compressor and the indoor fan motor stop. After 2-seconds, it starts again automatically, but if this error occurs 4 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective indoor power PCB
- Foreign material at rotational area of fan propeller
 • Defective fan motor
- Dust on control PCB
- · Blown fuse
- External noise, surge



Error code L	LED	Green	Red	Content
Remote control: E18	door	Keeps flashing	1-time flash	Address setting error of master and slave indoor units

1.Applicable model 5. Troubleshooting All models Diagnosis Countermeasure E18 occurs Is "Master IU address set" function of remote control used? 2. Error detection method IU address has been set using the "Master IU address set" function of remote control. • In cases of RC-E5 Return address No. to "IU ..." using [▲] or [▲] button. • In cases of RC-EX1A Menu → Next → IU settings → Select IU -YES-3. Condition of Error displayed Same as above 4. Presumable cause Same as above

Note:			

Error code	LED	Green	Red	Content	
Remote control: E19	Indoor	Keeps flashing	1-time flash	Indoor	unit operation check

All models

2. Error detection method

After indoor operation check, when the communication between indoor and outdoor unit is established and SW7-1 is still kept ON.

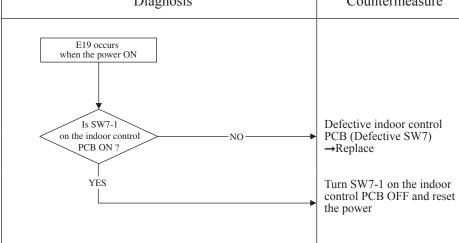
3. Condition of Error displayed

Same as above

4. Presumable cause

Mistake in SW7-1 setting (Due to forgetting to turn OFF SW7-1 after indoor operation check)

5. Troubleshooting	
Diagnosis	Countermeasure



Note:			

						9
	9	Error code	LED	Green	Red	Content
		Remote control: E20			flashing 1(2)-time flash	Indoor fan motor rotation speed
			Indoor	Keeps flashing		anomaly (FDT, FDU, FDUM, FDF series)
П						

Note(1) Value in () is for the FDU, FDUM series FMI2 only.

1. Applicable model

FDT, FDU, FDUM, FDF series only

2. Error detection method

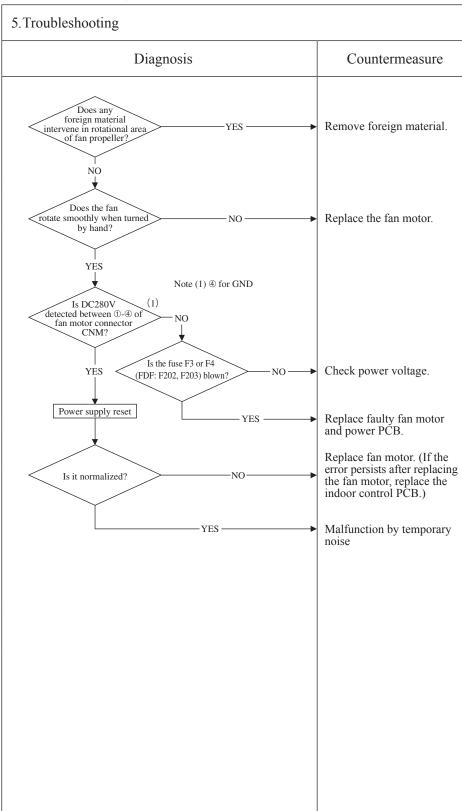
Detected by rotation speed of indoor fan motor

3. Condition of Error displayed

When the actual fan rotation speed does not reach to the speed of [required speed -50 (FDU:-500) min⁻¹] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly.

4. Presumable cause

- Defective indoor power PCB
- Foreign material at rotational area of fan propeller
 • Defective fan motor
- Dust on control PCB
- · Blown fuse
- External noise, surge



						<u> </u>
(1	Error code	LED	Green	Red	Content	Nafaatiyya nanal gyyitah
	Remote control: E21	Indoor	Keeps flashing	1-time flash		Defective panel switch peration (FDT series)

FDT series only

2. Error detection method

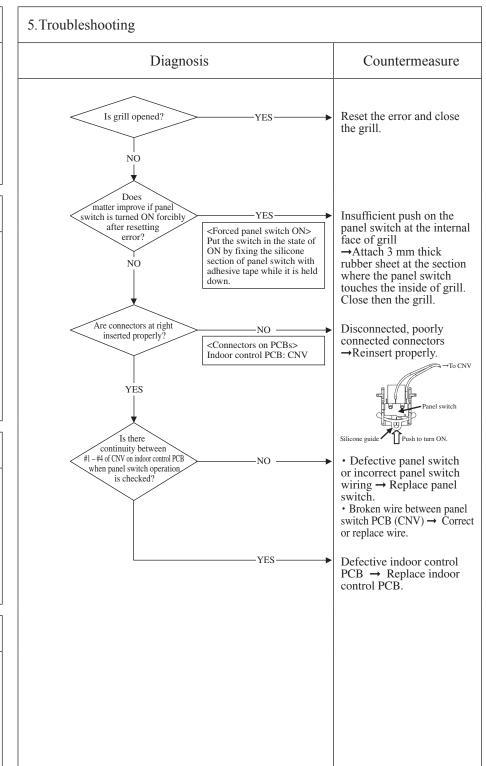
Panel switch (PS) has detected Open for more than 1 second.

3. Condition of Error displayed

Same as above

4. Presumable cause

- Defective panel switch
- Disconnection of wiring
- Defective indoor control PCB



					9
P	Error code	LED	Green	Red	Content
	Remote control: E28	Indoor	Keeps flashing	Stays OFF	Remote control temperature thermistor anomaly

All models

2. Error detection method

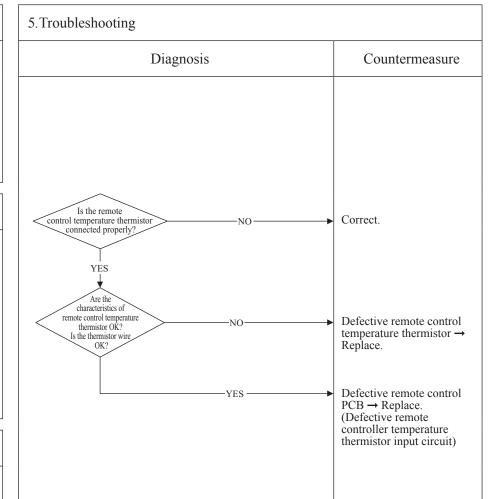
Detection of anomalously low temperature (resistance) of remote control temperature thermistor (Thc)

3. Condition of Error displayed

When the temperature thermistor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Faulty connection of remote control temperature thermistor
- Defective remote control temperature thermistor
- Defective remote control PCB



Resistance-temperature characteristics of remote control temperature thermistor (Thc)

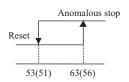
		1			
Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	Resistance value (kΩ)		
0	65	30	16		
1	62	32	15		
2	59	34	14		
4	53	36	13		
6	48	38	12		
8	44	40	11		
10	40	42	9.9		
12	36	44	9.2		
14	33	46	8.5		
16	30	48	7.8		
18	27	50	7.3		
20	25	52	6.7		
22	23	54	6.3		
24	21	56	5.8		
26	19	58	5.4		
28	18	60	5.0		

Note: After 10 seconds has passed since remote control thermistor was switched from valid to invalid, E28 will not be displayed even if the thermistor harness is disconnected. At same time the thermistor, which is effective, is switched from remote control thermistor to indoor return air temperature thermistor. Even though the remote control thermistor is set to be Effective, the return air temperature displayed on remote control for checking still shows the value detected by indoor return air temperature thermistor, not by remote control temperature thermistor.

					<u> </u>
(1	Error code	LED	Green	Red	Content
	Remote control: E35	Indoor	Keeps flashing	Stays OFF	Cooling overload operation
		Outdoor	-	2-time flash	

All models

2. Error detection method



Outdoor heat exchanger temperature (°C)

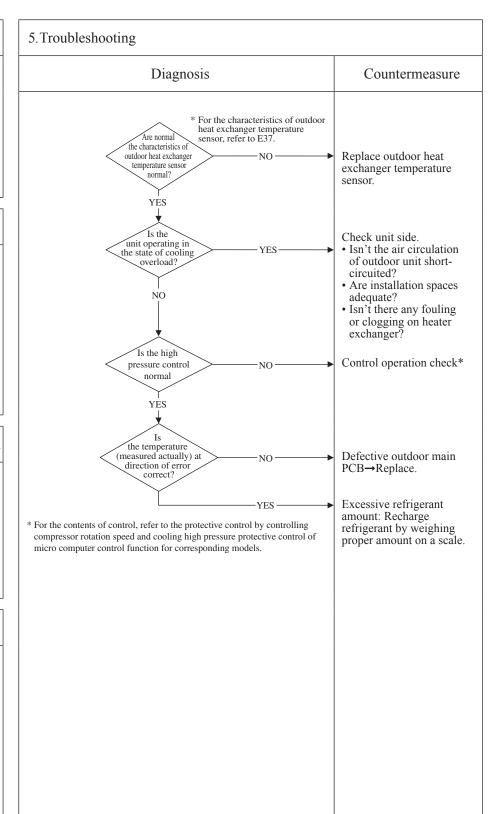
Note (1) Values in () are applicable when outdoor temperature (TH2) is lower than 32 °C

3. Condition of Error displayed

When anomalous outdoor heat exchanger temperature occurs 5 times within 60 minutes or 63(56)°C or higher continues for 10 minutes, including the compressor stop.

4. Presumable cause

- Defective outdoor heat exchanger temperature sensor
- Defective outdoor main PCB
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger
- Excessive refrigerant quantity



(1	Error code	LED	Green	Red	Content
	Remote control: E36	Indoor	Keeps flashing	Stays OFF	Discharge pipe temperature error
		Outdoor	_	5-time flash	

All models

2. Error detection method

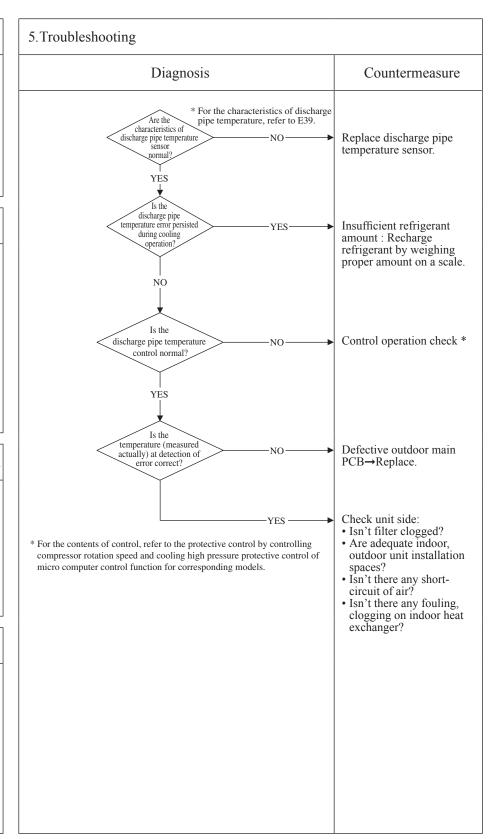
For the error detection method, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of micro computer control function for corresponding models.

3. Condition of Error displayed

When discharge pipe temperature anomaly is detected 2 times within 60 minutes is compressor stop.

4. Presumable cause

- Defective outdoor main PCB
- Defective discharge pipe temperature sensor
- Clogged filter
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger



				<u> </u>
Error code	LED	Green	Red	Content
Remote control: E37	Indoor	Keeps flashing	Stays OFF	
	Outdoor	ı	8-time flash	temperature sensor anomaly

All models

2. Error detection method

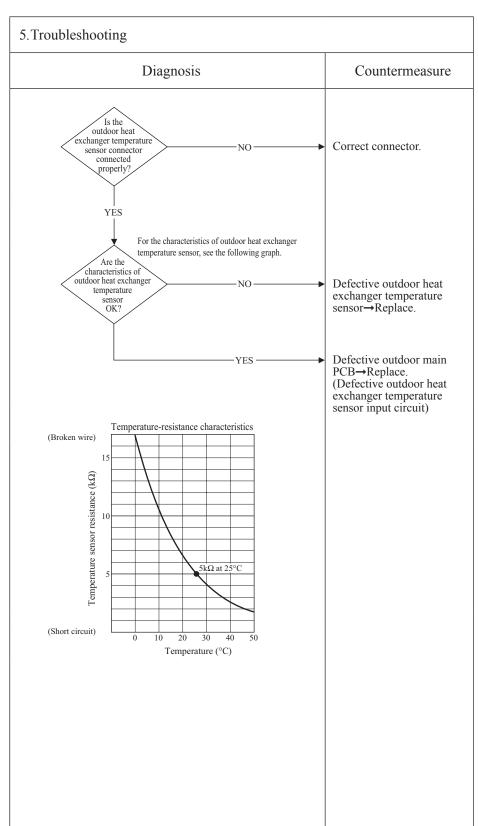
Detection of anomalously low temperature (resistance) on the outdoor heat exchanger temperature sensor

3. Condition of Error displayed

- When the temperature sensor detects -55 °C or lower for 20 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- minutes.
 When -55 °C or lower is detected for within 20 second after power ON.

4. Presumable cause

- Defective outdoor main PCB
- Broken sensor harness or temperature sensing section
- Disconnected wire connection (connector)



(Error code	LED	Green	Red	Content
	Remote control: E38	Indoor	Keeps flashing	Stays OFF	
		Outdoor	_	8-time flash	sensor anomaly

All models

2. Error detection method

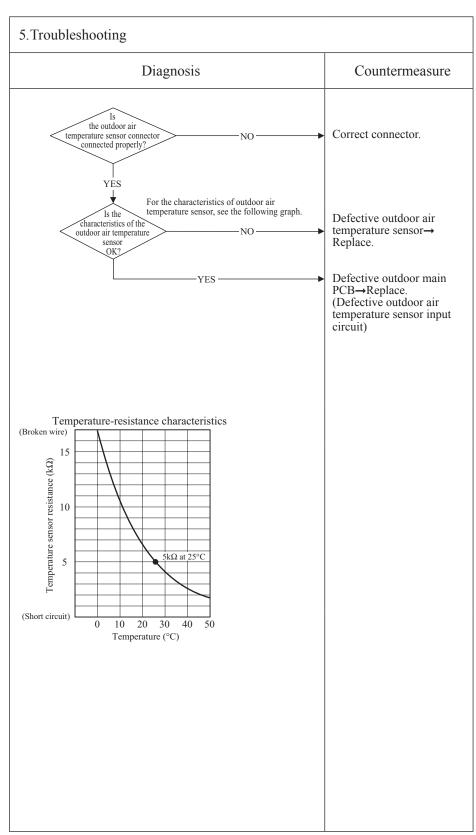
Detection of anomalously low temperature (resistance) on outdoor air temperature sensor

3. Condition of Error displayed

- When the temperature sensor detects -55 °C or lower for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes
- minutes.
 When -55 °C or lower is detected for within 20 second after power ON.

4. Presumable cause

- Defective outdoor main PCB
- Broken sensor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)



					9
Error code	LED	Green	Red	Content D: 1 ·	
Remote control: E39	Indoor	Keeps flashing	Stays OFF		
	Outdoor	_	8-time flash	temperature sensor anomaly	

All models

2. Error detection method

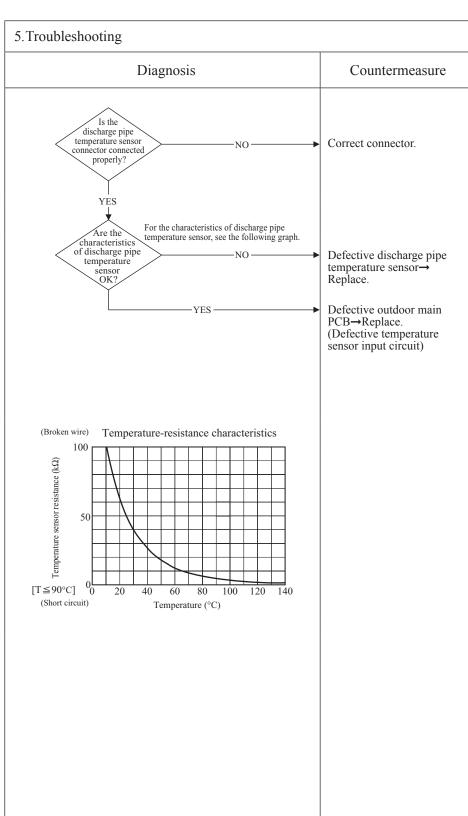
Detection of anomalously low temperature (resistance) on the discharge pipe temperature sensor

3. Condition of Error displayed

When the temperature sensor detects -25 °C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.

4. Presumable cause

- Defective outdoor main PCB
- Broken sensor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)



_					<u> </u>
(Error code	LED	Green	Red	Content
	Remote control: E40	Indoor	Keeps flashing	Stays OFF	Service valve (gas side) closing operation
		Outdoor	_	1-time flash	

All models

2. Error detection method

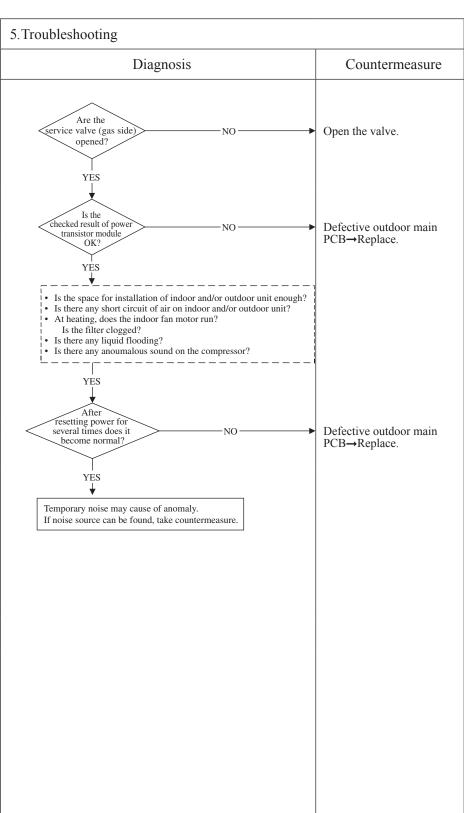
If the inverter output current value exceeds the setting value within 80 seconds after the compressor ON in the heating mode, the compressor stops.

3. Condition of Error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping. (In heating mode)
- After 3-minute delay, the compressor restarts, but if this anomaly occurs 2 times within 20 minute after the intial detection.

4. Presumable cause

- Service valve (gas side) closing
- Defective outdoor main PCB



_					<u> </u>
(1	Error code	LED	Green	Red	Content
	Remote control: E42	Indoor	Keeps flashing	Stays OFF	Current cut (1/2)
		Outdoor	_	1-time flash	

All models

2. Error detection method

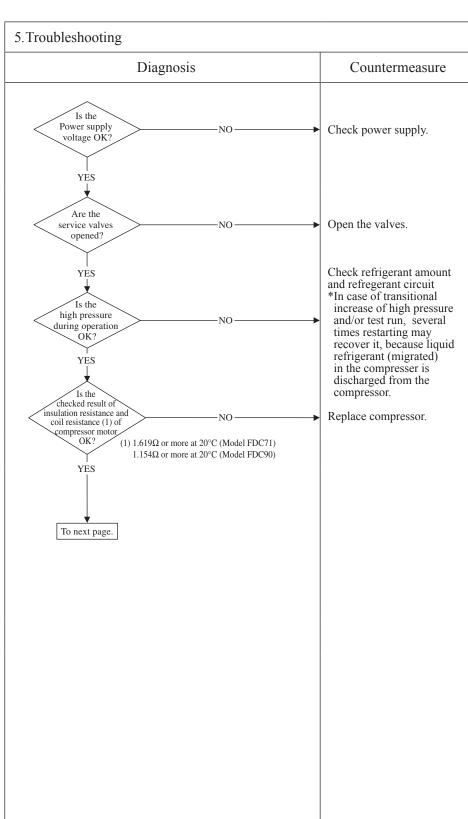
In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.

3. Condition of Error displayed

• If the output current of inveter exceeds the specifications, it makes the compressor stopping.

4. Presumable cause

- The valves closed
- Faulty power supply
- Insufficient refrigerant amount
- Faulty compressorFaulty power transistor module



						9
ρ	Error code	LED	Green	Red	Content	
	Remote control: E42	Indoor	Keeps flashing	Stays OFF	Current cut (2/2)	
		Outdoor	-	1-time flash	= = = = = = = = = = = = = = = = = = = =	

All models

2. Error detection method

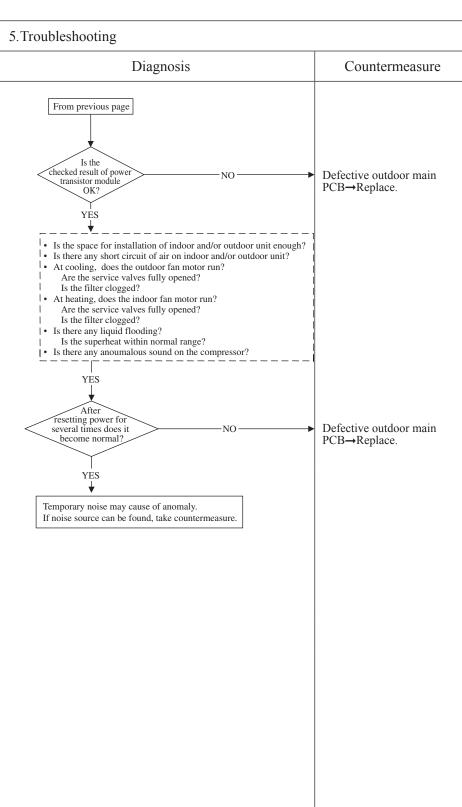
In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.

3. Condition of Error displayed

• If the output current of inveter exceeds the specifications, it makes the compressor stopping.

4. Presumable cause

- Defective outdoor main PCB
- · Faulty power supply
- Insufficient refrigerant amount
- Faulty compressorFaulty power transistor module



				(
Error code	LED	Green	Red	Content
Remote control: E47	Indoor	Keeps flashing	Stays OFF	Active filter voltage error
	Outdoor	-	2-time flash	

All models

2. Error detection method

Error is displayed if the converter voltage exceeds target voltage (3 times within 20 minutes). Remote control may be set after 3 minutes delay. Error is displayed if the converter voltage is lower than 210V (1-time within 5 seconds after power ON)

3. Condition of Error displayed

Same as above

4. Presumable cause

- Defective outdoor main PCB
- Dust on outdoor main PCBAnomalous power supply

5. Troubleshooting	
Diagnosis	Countermeasure
Is the power supply normal?	Restore normal condition.
Is voltage within the specified range? NO	Restore normal condition.
Check Soldered surfaces on the outdoor main PCB for foreign matter like dust, fouling, etc.	Remove foreign matter like dust, fouling, etc.
• If the overvoltage (DC voltage is higher than 400V) occurs, Red LED flashes 1-time.	Defective outdoor main PCB→Replace.

Note:			

					<u> </u>
(1	Error code	LED	Green	Red	Content
	Remote control: E48	Indoor	Keeps flashing	Stays OFF	Outdoor fan motor anomaly
		Outdoor	_	ON	

All models

2. Error detection method

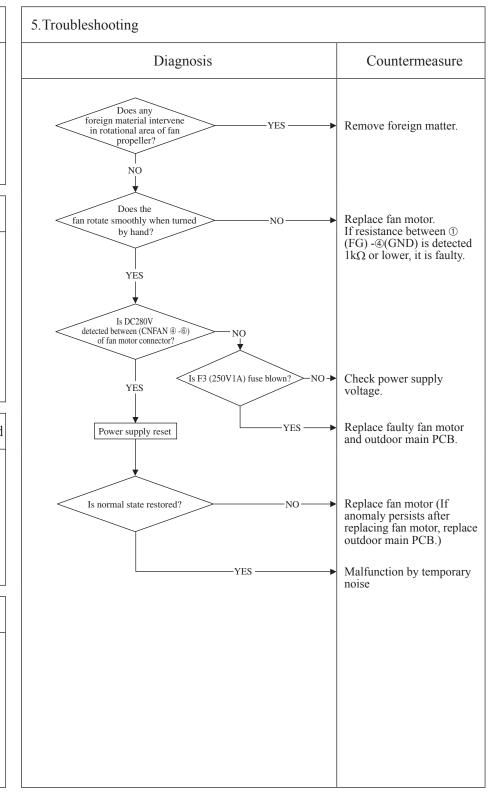
Detected by rotation speed of outdoor fan motor

3. Condition of Error displayed

When actual rotation speed of outdoor fan motor drops to 75min⁻¹ or lower for 30 minutes continuously, the compressor and the outdoor fan motor stop. After 3-minutes delay, it starts again automatically, but if this anomaly occurs 3 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor main PCB
- · Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor main PCB
- Blown F3 fuse



Note: When E48 error occurs, in almost cases F3 fuse (1A) on the outdoor main PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor main PCB (or fuse) is replaced,, another trouble could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.

After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)

_						(1)
9	Error code	LED	Green	Red	Content		
	Remote control: E51	Indoor	Keeps flashing	Stays OFF		Power transistor anomaly	
		Outdoor	_	1-time flash			

1. Applicable model All models

2. Error detection method

Power transistor primary current

3. Condition of Error displayed

If the power transistor primary current exceeds the setting value for 3 seconds, the compressor stops.

4. Presumable cause

- Faulty outdoor main PCB
 Dust on outdoor main PCB
 Blown F2 fuse

Outdoor	_	1-time flash			•
5. Trou	ablesho	oting			
		Ι	Diagnosis		Countermeasure
		Chec Surfaces on the conforeign m four	k soldered utdoor main PCB for atter like dust, ling,etc. YES F2 fuse 20A)blown?		Remove foreign matter like dust, fouling, etc.
				NO NO	Defective outdoor main PCB→Replace.

Note:	

From code LED Green Red Content	
End code Content	
Remote control: E57 Indoor Keeps flashing Stays OFF or detection of service valve closs	
Outdoor – 2-time flash Of detection of Service varve clos	ure

All models

2. Error detection method

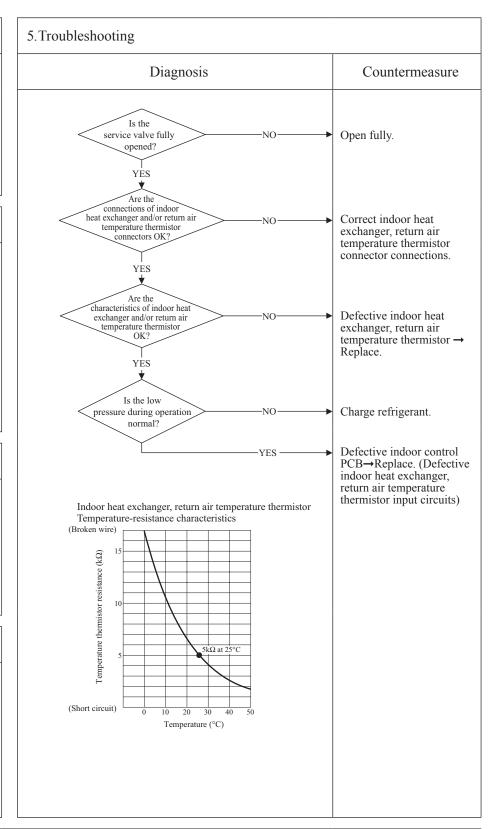
• Judge insufficient refrigerant amount by detecting the temperature differnce between indoor heat exchanger (ThI-R) and indoor return air (ThI-A).

3. Condition of Error displayed

When the insufficient refrigerant amount is detected 3 times within 60 minutes.

4. Presumable cause

- · Defective indoor heat exchanger temperature thermistor
- Defective indoor return air temperature thermistor
- Defective indoor control PCB
- · Insufficient refregerant amount



Note: When the compressor speed is 40 rps or under at 5 minutes after the start of compressor or the completion of defrosting, the low refrigerant protection control judges, by detecting the difference between the indoor heat exchanger temperature (ThI-R) and the indoor return air temperature (ThI-A), that it is in the state of gas low, and stops the compressor.

Cooling: Indoor return air temperature (ThI-A) – Indoor heat exchanger temperature (ThI-R) ≥ 4 deg

Heating: Indoor heat exchanger temperature (ThI-R) – Indoor return air temperature (ThI-A) $\leq 4 \deg$

_					<u> </u>
9	Error code	LED	Green	Red	Content
	Remote control: E58	Indoor	Keeps flashing	Stays OFF	Current safe stop
		Outdoor	_	3-time flash	

All models

2. Error detection method

When the current safe control has operated at the compressor speed of 30 rps or under.

3. Condition of Error displayed

Same as above

4. Presumable cause

- Excessive refrigerant amount
 Indoor,outdoor unit installation spaces
 Faulty compressor
 Defective outdor air temp.

- Defective outdoor main PCB

5. Troubleshooting	
Diagnosis	Countermeasure
Is the refrigerant amount nomal?	Adjust the refrigerant amount properly.
Is outdoor ventilation condition good ?	Secure space for inlet and outlet.
YES NO NO	Replace compressor.
YES	replace compressor.
Inspect outdor air temp. sensor	Replace sensor.
YES	Defective outdoor main PCB→Replace. (Defective outdor air temp. sensor input circuit)

						Ø
ρ	Error code	LED	Green	Red	Content	
	Remote control: E59	Indoor	Keeps flashing	Stays OFF	Compressor startup failure	
		Outdoor	-	2-time flash		

All models

2. Error detection method

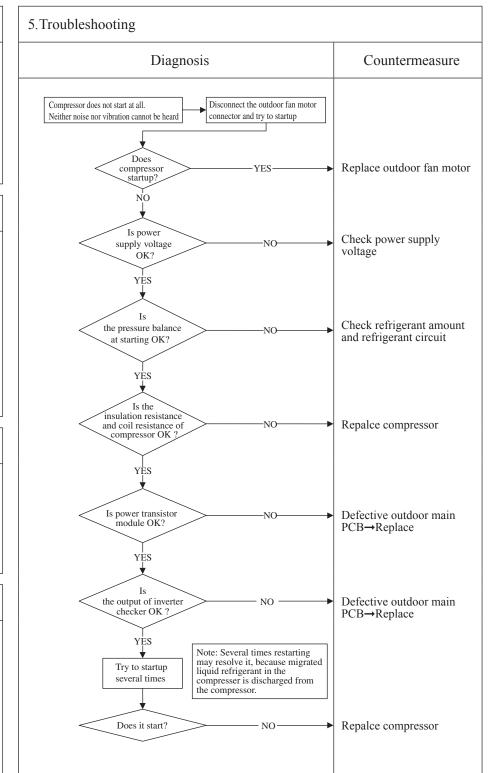
- If it fails to change over to the rotor detection operation of compressor motor
- Power supply voltage is less than 120V

3. Condition of Error displayed

If compressor fails to startup for 42 times

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor main PCB
- Anomalous power supply voltage
- Improper refrigerant amount and refrigerant circuit
- Faulty compressor (Motor bearing)



Note: Insulation resistance

- Institution resistance. The unit is left for long period without power supply or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several $M\Omega$ or lower. If the electric leakage breaker is activated due to low insulation resistance,
- © Check whehter the insulation resistance can recover or not, ater 6 hours has passed since power ON.

 (By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated)

 © Check whether the electric leakage breake conforms to high-hermonic specifications

 (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

						_
9	Error code	LED	Green	Red	Content	
	Remote control: E60	Indoor	Keeps flashing	Stays OFF	Compressor rotor lock error	
		Outdoor	1	7-time flash	r in r	

All models

2. Error detection method

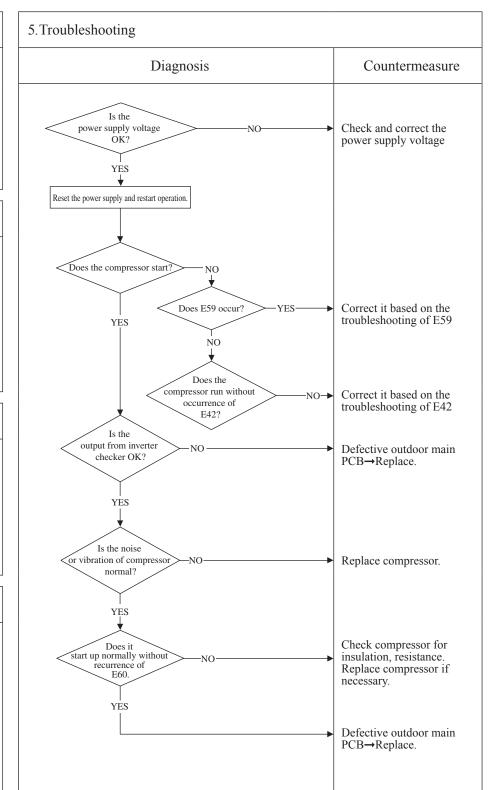
Compressor rotor position

3. Condition of Error displayed

If it fails again to detect the rotor position after shifting to the compressor rotor position detection operation, the compressor stops.

4. Presumable cause

- Defective outdoor fan motor
- Defective outdoor main PCB · Anomalous power supply
- voltage
- Improper refrigerant amount and refrigerant circuit
- Defective compressor (motor, bearing)



- Note: Insulation resistance

 The unit is left for long period without power supply or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several $M\Omega$ or lower. If the electric leakage breaker is activated due to low insulation resistance, check followings.

 ① Check whether the insulation resistance can recover or not, ater 6 hours has passed since power ON.

 (By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated)

 ② Check whether the electric leakage breake conforms to high-hermonic specifications

 (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

PJF000Z286

3. Use twin core cord (0.3mm²) at remote control line.

4. Do not put remote control line alongside power source line.

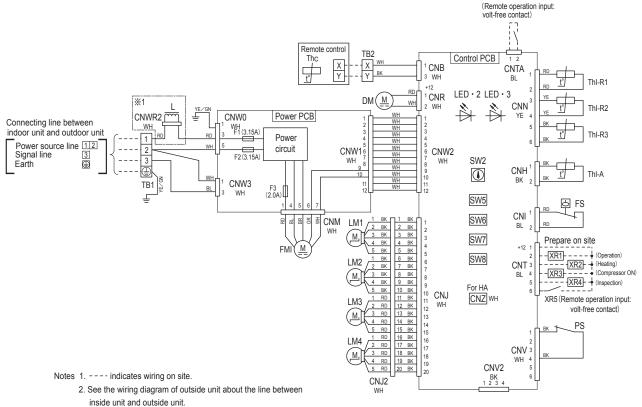
5. Section 1 (X1) is provided on the model FDT100 only.

ယ Ш Ш TRICAL WIRING

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(a) Indoor units

Ceiling cassette-4way type (FDT) Models FDT7VF1, 100VF1



DM Drain motor F1~3 Fuse FMI Fan motor FS Float switch L Reactor LED ⋅ 2 Indication lamp (Green-Normal operation) LED ⋅ 3 Indication lamp (Red-Inspection) LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ✓ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)		
F1~3 Fuse FMI Fan motor FS Float switch L Reactor LED · 2 Indication lamp (Green-Normal operation) LED · 3 Indication lamp (Red-Inspection) LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ✓ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	CNB~Z	Connector
FMI Fan motor FS Float switch L Reactor LED · 2 Indication lamp (Green-Normal operation) LED · 3 Indication lamp (Red-Inspection) LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ✓ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)		Drain motor
FS Float switch L Reactor LED • 2 Indication lamp (Green-Normal operation) LED • 3 Indication lamp (Red-Inspection) LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ✓ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	F1~3	Fuse
L Reactor LED · 2 Indication lamp (Green-Normal operation) LED · 3 Indication lamp (Red-Inspection) LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ∕ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ∕ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	FMI	Fan motor
LED • 2 Indication lamp (Green-Normal operation) LED • 3 Indication lamp (Red-Inspection) LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ✓ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	FS	Float switch
(Green-Normal operation) LED · 3	L	Reactor
LM1~4 Louver motor PS Panel switch SW2 Remote control communication address SW5 Plural units Master ✓ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	LED • 2	
PS Panel switch SW2 Remote control communication address SW5 Plural units Master ∕ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ∕ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	LED · 3	Indication lamp (Red-Inspection)
SW2 Remote control communication address SW5 Plural units Master ∕ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ∕ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	LM1~4	Louver motor
address SW5 Plural units Master ∕ Slave setting SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ∕ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	PS	Panel switch
SW6 Model capacity setting SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	SW2	
SW7-1 Operation check, Drain motor test run SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	SW5	Plural units Master / Slave setting
SW7-3 Powerful mode Valid ✓ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	SW6	Model capacity setting
Valid ∕ Invalid TB1 Terminal block (Power source) (□mark) TB2 Terminal block (Signal line) (□mark) Thc Thermistor (Remote control)	SW7-1	Operation check, Drain motor test run
((mark) TB2 Terminal block (Signal line) (mark) Thc Thermistor (Remote control)	SW7-3	1 01101101111000
Thc Thermistor (Remote control)	TB1	
Thc Thermistor (Remote control)	TB2	Terminal block (Signal line) (□mark)
TLIA	Thc	_
I I I I I I I I I I I I I I I I I I I	ThI-A	Thermistor (Return air)
ThI-R1,2,3 Thermistor (Heat exchanger)	ThI-R1,2,3	Thermistor (Heat exchanger)

^	lor	Ma	rlea

COIOT IVIATKS							
Mark	Color	Mark	Color				
BK	Black	RD	Red				
BL	Blue	WH	White				
BR	Brown	YE	Yellow				
OR	Orange	YE/GN	Yellow / Green				

Color Marks							
Mark	Color	Mark	Color				
BK	Black	RD	Red				
BL	Blue	WH	White				
BR	Brown	YE	Yellow				
OR	Orange	YE/GN	Yellow/Green				

Ceiling suspended type (FDEN) Models FDEN71VF1, 100VF1 Capacitor for FMI Connector Fuse Fan motor (with thermistor) Indication lamp (Green-Normal operation) Indication lamp (Red-Inspection) Louver motor Remote control communication address Plural units Master/Slave setting Model capacity setting Operation check, Drain motor test run Terminal block (Power source) (□mark)

Terminal block (Signal line) (□mark)

Thermistor (Remote control)

Thermistor (Heat exchanger)

Thermistor (Return air)

Closed-end connector

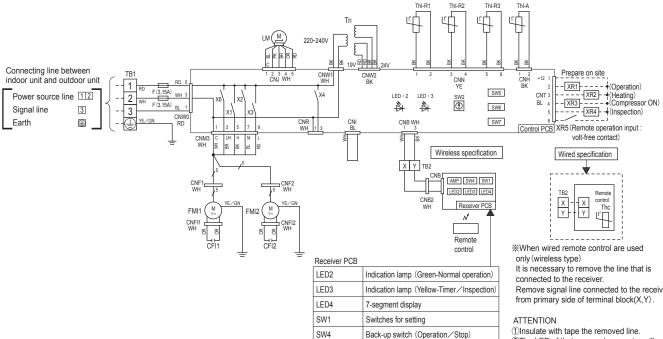
Transformer

Relay for FMI

Relay for DM

<u></u>

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*When wired remote control are used

It is necessary to remove the line that is connected to the receiver.

Remove signal line connected to the receiver ■mark from primary side of terminal block(X,Y).

- ①Insulate with tape the removed line. 2The LED of that removed connector will
- not be able to make any indication.

Color Marks

CFI1,2

CNB~Z

FMI1,2

LED · 2

LED · 3

LM

SW2

SW5

SW6

SW7-1

TB1

TB2

Thc

ThI-A

Trl

ThI-R1,2,3

X1~3,6

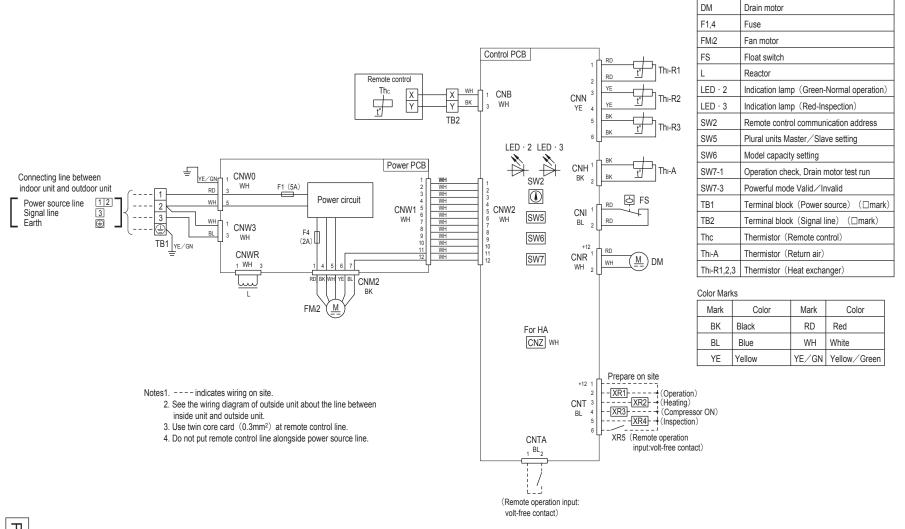
Mark	Color	Mark	Color
BK	Black	RD	Red
BL	Blue	WH	White
BR	Brown	YE	Yellow
OR	Orange	YE/GN	Yellow/Green
PK	Pink		

See the wiring diagram	n of outside	unit about	the line	betwe
indoor unit and outdo	or unit.			

3. Use twin core cord (0.3mm²X2) at remote control line.

Notes 1. ---- indicates wiring on site

4. Do not put remote control line alongside power source line.

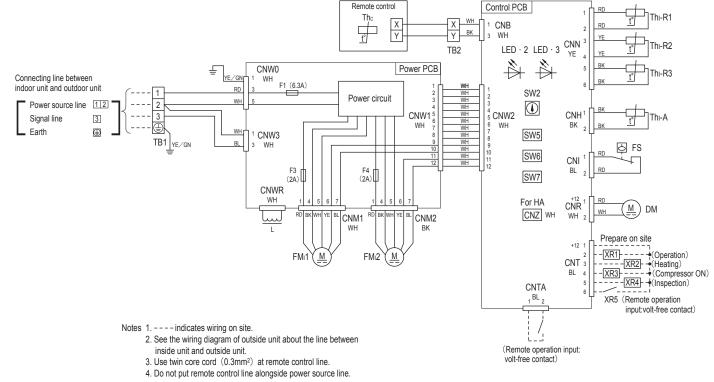


(c) Duct connected-High static pressure type (FDU) Model FDU71VF1

CNB~Z

Connector

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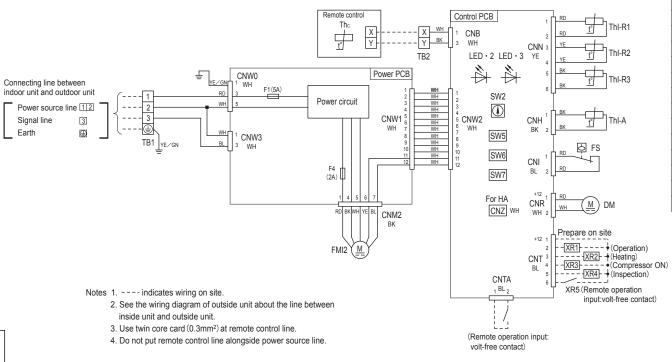


Connector
Drain motor
Fuse
Fan motor (with thermostat)
Float switch
Reactor
Indication lamp (Green-Normal operation)
Indication lamp (Red-Inspection)
Remote control communication address
Plural units Master / Slave setting
Model capacity setting
Operation check, Drain motor test run
Powerful mode Valid / Invalid
Terminal block (Power source) (□mark)
Terminal block (Signal line) (□mark)
Thermistor (Remote control)
Thermistor (Return air)
Thermistor (Heat exchanger)

Mark	Color	Mark	Color
BK	Black	RD	Red
BL	Blue	WH	White
YE	Yellow	YE/GN	Yellow/Green

(d) Duct connected-Low/Middle static pressure type (FDUM) Model FDUM71VF1

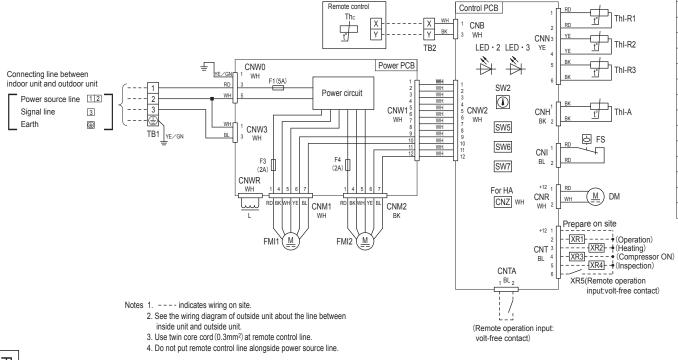
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CNB~Z	Connector
DM	Drain motor
F1,4	Fuse
FMI2	Fan motor (with thermostat)
FS	Float switch
LED · 2	Indication lamp (Green-Normal operation)
LED · 3	Indication lamp (Red-Inspection)
SW2	Remote control communication address
SW5	Plural units Master / Slave setting
SW6	Model capacity setting
SW7-1	Operation check, Drain motor test run
SW7-3	Powerful mode Valid / Invalid
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote control)
ThI-A	Thermistor (Return air)
Thl-R1,2,3	Thermistor (Heat exchanger)
■mark	Closed-end connector

Mark	Color	Mark	Color			
BK	Black	RD	Red			
BL	Blue	WH	White			
BR	Brown	YE	Yellow			
OR	Orange	YE/GN	Yellow/Green			





CNB~Z	Connector
DM	Drain motor
F1,3,4	Fuse
FMI1,2	Fan motor (with thermostat)
FS	Float switch
L	Reactor
LED · 2	Indication lamp (Green-Normal operation)
LED · 3	Indication lamp (Red-Inspection)
SW2	Remote control communication address
SW5	Plural units Master / Slave setting
SW6	Model capacity setting
SW7-1	Operation check, Drain motor test run
SW7-3	Powerful mode Valid / Invalid
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote control)
ThI-A	Thermistor (Return air)
Thl-R1,2,3	Thermistor (Heat exchanger)
■mark	Closed-end connector

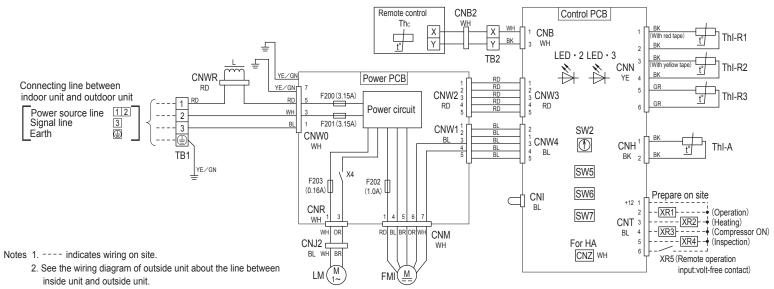
Mark	Mark Color		Color
BK	Black	RD	Red
BL	Blue	WH	White
BR	Brown	YE	Yellow
OR	Orange	YE/GN	Yellow/Green

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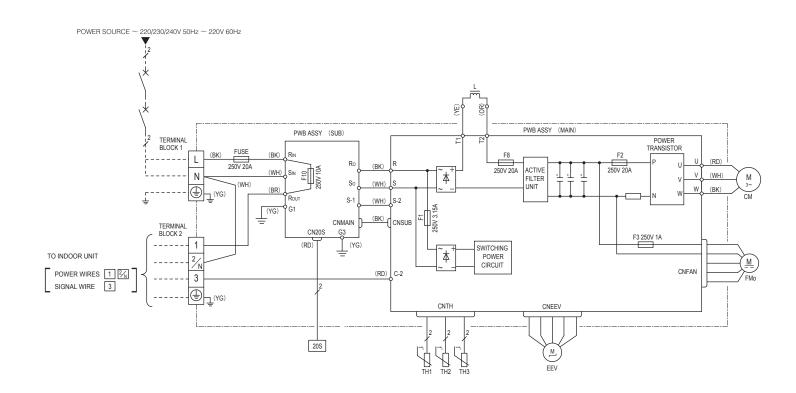
Mark	Color	Mark	Mark Color		Color
BK	Black	GR Gray		WH	White
BL	Blue	OR Ora		YE	Yellow
BR	Brown	RD	Red	YE/GN	Yellow/Green

Connector	
COMMICCION	
Fuse	
Fan motor	
Reactor	
Indication lamp	
(Green-Normal operation)	
Indication lamp (Red-Inspection)	
Louver motor	
Remote control communication	
address	

SW5	Plural units Master / Slave setting
SW6	Model capacity setting
SW7- 1	Operation check, Drain motor test run
TB1	Terminal block (Power source)
	(□ mark)
TB2	Terminal block (Signal line) (口mark)
Thc	Thermistor (Remote control)
ThI-A	Thermistor (Return air)
ThI-R1,2,3	Thermistor (Heat exchanger)
X4	Relay for DM



- 3. Use twin core cord (0.3mm²X2) at remote control line.
- 4. Do not put remote control line alongside power source line.



Power cable, indoor-outdoor connecting wires

Fower Cable, indoor-outdoor connecting wires					
Model	MAX running current (A)	Power cable size (mm²)	Power cable length (m)	indoor-outdoor wire size x number	Earth wire size (mm²)
71	14.5	2.0	15	1.5mm² x 4	1.5

- The specifications shown in the above table are for units without heaters. For units with heaters, refer
 to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

Item	Description	
СМ	Compressor motor	
CN20S CNTH CNEEV CNFAN	Connector	
EEV	Electric expansion valve (coil)	
FMo	Fan motor	
L	Reactor	
TH1	Heat exchanger sensor (outdoor unit)	
TH2	Outdoor air temp.sensor	
TH3	Discharge pipe temp.sensor	
20S	Solenoid coil for 4 way valve	

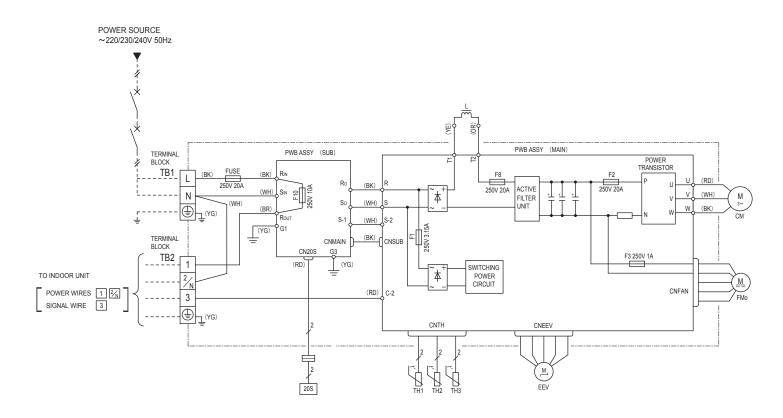
Mark	Color
ВК	Black
BR	Brown
OR	Orange
RD	Red
WH	White
YE	Yellow
YG	Yellow/Green

2

Outdoor units Model FDC71VNP

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Power cable, indoor-outdoor connecting wires

	Model	MAX running current (A)	Power cable size (mm²)	Power cable length (m)	indoor-outdoor wire size x number	Earth wire size (mm²)
	90	18	2.5	15	1.5mm² x 4	1.5

- The specifications shown in the above table are for units without heaters. For units with heaters, refer
 to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX, over current should be chosen along the regulations in each country.
- along the regulations in each country.

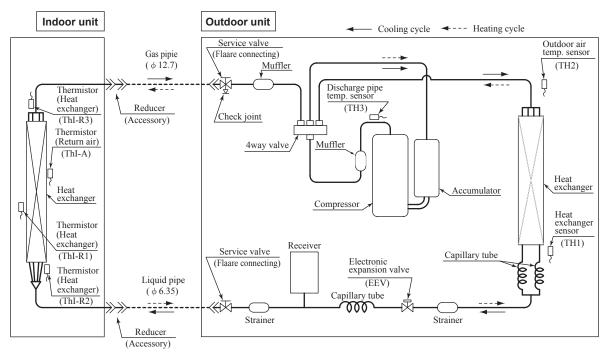
 The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

	Item	Description
	СМ	Compressor motor
	CN20S CNTH CNEEV CNFAN	Connector
	EEV	Electric expansion valve (coil)
	FMo	Fan motor
	L	Reactor
	TH1	Heat exchanger sensor (outdoor unit)
	TH2	Outdoor air temp.sensor
	TH3	Discharge pipe temp.sensor
	20S	Solenoid coil for 4 way valve

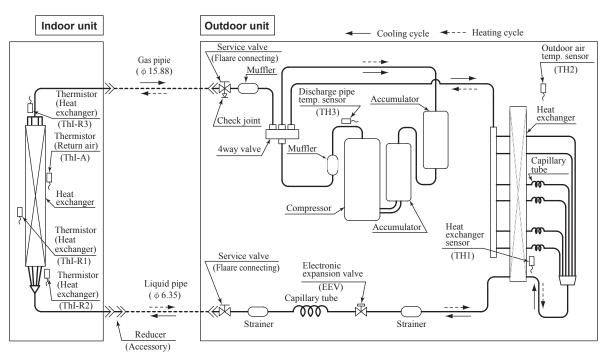
Mark	Color	
вк	Black	
BR	Brown	
OR	Orange	
RD	Red	
WH	White	
YE	Yellow	
YG	Yellow/Green	

4. PIPING SYSTEM

Model 71



Model 90



Preset point of the protective devices

Parts name	Mark	Equipped unit	FDT, FDEN, FDU, FDUM, FDF series
Thermistor (for protection overloading in heating)	ThI-R	Indoor unit	OFF 63℃ , ON 56℃
Thermistor (for frost prevention)	IIII-K	indoor unit	OFF 1.0° C , ON 10° C
Thermistor (for protection high pressure in cooling.)	TH1	0.41	OFF 63℃ , ON 53℃
Thermistor (for detecting discharge pipe temp.)	TH3	Outdoor unit	OFF 115℃, ON 95℃

5. APPLICATION DATA

5.1 Installation of indoor unit

(1) Ceiling cassette-4way type (FDT)

This manual is for the installation of an indoor unit. For electrical wiring work (Indoor), refer to page 136. For remote control installation, refer to page 148. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to page 162.

This unit always be used with the panel

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels [AWARNING] and [ACAUTION] <u>AWARNING</u>: Wrong installation would cause serious consequences such as injuries or death. ACAUTION: Wrong installation might cause serious consequences depending on circumstances. Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown on the right:
- Never do it under any circumstances. After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit.

Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

MARNING

Installation should be performed by the specialist.

If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit



Install the system correctly according to these installation manuals.

Improper installation may cause explosion, injury, water leakage, electric shock, and fire



● Check the density refered by the foumula (accordance with ISO5149). If the density exceeds the limit density, please consult the dealer and installate the ventilation system

Use the genuine accessories and the specified parts for installation. If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the



Ventilate the working area well in case the refrigerant leaks during installation. If the refrigerant contacts the fire, toxic gas is produced

●Install the unit in a location that can hold heavy weight. Improper installation may cause the unit to fall leading to acciden



• Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes

Improper installation may cause the unit to fall leading to accident Do not mix air in to the cooling cycle on installation or removal of the air conditioner.



If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injur Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.

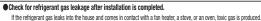
Power source with insufficient capacity and improper work can cause electric shock and fire.



• Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal. Loose connections or hold could result in abnormal heat generation or fire



● Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services Improper fitting may cause abnormal heat and fire





Use the specified pipe, flare nut, and tools for R410A.

Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle



Tighten the flare nut according to the specified method by with torque wrench.

If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period



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• Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also

cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak. ■Connect the nines for refrigeration circuit securely in installation work before compressor is operated.

If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system.

• Stop the compressor before removing the pipe after shutting the service valve on pump down work. If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circ

and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle. Only use prescribed optional parts. The installation must be carried out by the qualified installer.

If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire

● Do not repair by yourself. And consult with the dealer about repair.

Improper repair may cause water leakage, electric shock or fire Consult the dealer or a specialist about removal of the air conditioner. Improper installation may cause water leakage, electric shock or fir

Turn off the power source during servicing or inspection work.

If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan • Do not run the unit when the panel or protection guard are taken off. Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper running

PJF012D016C / A



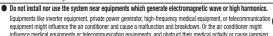
 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.

Do not install the indoor unit near the location where there is possibility of flammable gas leakages

Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such

It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire.

It could cause the damage of the items.



- Do not install the indoor unit in the locations listed below (Re sure to install the indoor unit)
- It could cause the unit falling down and injury.

- Install the drain pipe to drain the water surely according to the installation manual.
- user's health and safety.
- If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents
- and not to make air-bleeding.
- Incomplete insulation could cause condensation and it would wet ceiling, floor, and any other valuables.
- Do not install the outdoor unit where is likely to be a nest for insects and small animals
- Pav extra attention, carrying the unit by hand.
- Make sure to dispose of the packaging material.

Do not control the operation with the circuit breaker

It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury

Perform earth wiring surely. Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could se unit failure and electric shock due to a short circ If the earth leakage breaker is not installed, it can cause electric shocks . Using the incorrect one could cause the system failure and fire Do not use any materials other than a fuse of correct capacity where a fuse should be used Connecting the circuit by wire or copper wire could cause unit failure and fire If the gas leaks and gathers around the unit, it could cause fire. as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handled. Secure a space for installation, inspection and maintenance specified in the manual. 0 Insufficient space can result in accident such as personal injury due to falling from the installation place Do not use the indoor unit at the place where water splashes such as laundry. Indoor unit is not waterproof. It could cause electric shock and fire. Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art. influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause iamming, Do not install the remote control at the direct sunlight. It could cause breakdown or deformation of the remote contro Do not install the indoor unit at the place listed below Places where flammable gas could leak. Places where carbon fiber, metal powder or any powder is floated. Place where the substances which affect the air conditioner are generated such as suffide gas, chloride gas, acid, alkali or ammonic atmospheres. Places where cosmetics or special sprays are frequently used. Highly salted area such as beach. Heavy snow area Places where the system is affected by Places exposed to oil mist or steam directly. On vehicles and ships smoke from a chimney Places where machinery which generates high harmonics is used. Altitude over 1000m out not instant the induor unit in the evaluations inset unew does are in instant the induor unit. Locations with any obstacles which can prevent inlet and outlet air of the unit. Locations where vibration can be amplified due to insufficient strength of structure. Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the infrared specification unit) initiate specification unity. Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m) Locations where drainage cannot run off safely. It can affect performance or function and etc... Do not put any valuables which will break down by getting wet under the air conditioner ion could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's be Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use. Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit. 0 If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. To avoid damaging, keep the indoor unit packed or cover the indoor unit. Improper connection of the drain pipe may cause dropping water into room and damaging user's belongings Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit. Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen) Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping wor 0 • For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps Check if the drainage is correctly done during commissioning and ensure the space for inspection and mai Ensure the insulation on the pipes for refrigeration circuit so as not to condense water Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the user to keep the surroundings clean. Carry the unit with 2 people if it is heavier than 20kg, Do not use the plastic straps but the grabbing place, moving the unit by hand. Use protective gloves in order to avoid injury by the aluminum fin. etals like nail and woods are used in the package Do not operate the system without the air filter. It may cause the breakdown of the system due to clogging of the heat exchanger. Do not touch any button with wet hands. Do not touch the refrigerant piping with bare hands when in operation. The pipe during operation would become e very hot or cold according to the operating condition, and it could cause a burn or Do not clean up the air conditioner with water. It could cause electric shock. Do not turn off the power source immediately after stopping the operation.

1Before installation

- Install correctly according to the installation manual.
- Confirm the following points:

OUnit type/Power supply specification OPipes/Wires/Small parts OAccessory items

Accessory item

For un	it hanging		For refrigerant pipe			For drain pipe			
Flat washer (M10)	Level gauge	Pipe cover(big)	Pipe cover (small)	Strap	Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp	
0			5 III		0	0	\$	()	
8	1	1	1	4	1	1	1	1	
For unit hanging	For unit hanging and adjustment	For heat insulation of gas pipe	For heat insulation of liquid tube	For pipe cover fixing	For heat insulation of drain socket	For heat insulation of drain socket	For drain pipe connecting	For drain hose mounting	

2 Selection of installation location for the indoor unit

- ① Select the suitable areas to install the unit under approval of the user
- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on
- · Areas where there is enough space to install and service.
- · Areas where it can be drained properly. Areas where drain pipe descending slope can be
- Areas where there is no obstruction of airflow on both air return grille and air supply port.
- · Areas where fire alarm will not be accidentally activated by the air conditioner.
- Areas where the supply air does not short-circuit.Areas where it is not influenced by draft air.
- · Areas not exposed to direct sunlight.
- Areas where dew point is lower than around 28°C and relative humidity is lower than 80%. This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the air conditioner is operated under the severer condition than mentioned

If there is a possibility to use it under such a condition, attach additional insulation of 10 to 20mm thick for entire surface of indoor unit, refrigeration pipe and drain pipe.

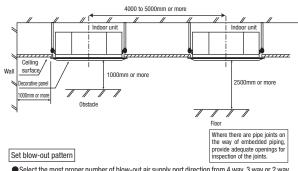
- Areas where TV and radio stays away more than 1m. (It could cause jamming and noise.)
- · Areas where any items which will be damaged by getting wet are not placed such as food, table wares, server, or medical equipment under the unit.
- Areas where there is no influence by the heat which cookware generates.
- · Areas where not exposed to oil mist, powder and/or steam directly such as above fryer.
- Areas where lighting device such as fluorescent light or incandescent light doesn't affect the operation.

(A beam from lighting device sometimes affects the infrared receiver for the wireless remote control and the air conditioner might not work properly.)

- 2)Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.
- 3 If there are 2 units of wireless type, keep them away for more than 6m to avoid malfunction due to cross communication.
- 4When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service

- When it is not possible to keep enough space between indoor unit and wall or between indoor units, close the air supply port where it is not possible to keep space and confirm there is no short circuit of airflow
- Install the indoor unit at a height of more than 2.5m above the floor.



- Select the most proper number of blow-out air supply port direction from 4 way, 3 way or 2 way according to the shape of the room and installation position. (1 way is not available.)
- If it is necessary to change the number of air supply port, prepare the covering materials.
- Instruct the user not to use low fan speed when 2way or 3way air supply is used.
- Do not use 2way air supply port under high temperature and humidity environment. (Otherwise it could cause condensation and leakage of water.)
- It is possible to set the airflow direction port by port independently. Refer to the user's manual

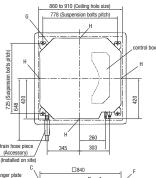
3 Preparation before installation

- If suspension bolt becomes longer, do reinforcement of earthquake resistant

When suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

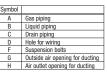
- OIn case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength
- When suspension bolt length is over 1000mm, apply the earthquake resistant brace to the bolt. Prepare four (4) sets of suspension bolt, nut and spring washer (M10 or M8) on site.

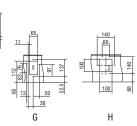
Ceiling opening, Suspension bolts pitch, Pipe position



		(mm)
Series	Туре	a
Single Split (PAC)	40 to 71 type	246
series	100 to 140 type	298
VRF (KX)	28 to 71 type	246
series	90 to 160 type	298

Drain hose piece (Accessory)	345	303		
(Installed on site)				
Hanger plate for suspention bolt	□84	40 B A	F	
150 207			123	es es
Air filter	Air return grill	control box	0	32

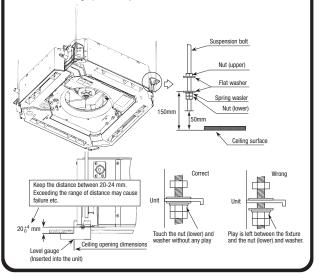




(4) Installation of indoor unit

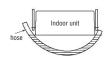
Work procedure

- Prepare a ceiling hole with the size of from 860mm × 860mm to 910mm × 910mm referring to the template attached in the package.
- Arrange the suspension bolt at the right position (725mm×778mm).
- Make sure to use four suspension bolts and fix them so as to be able to hold 500N load.
- Ensure that the lower end of the suspension bolt should be 50mm above the ceiling plane. Temporarily put the four lower nuts 150mm above the ceiling plane and the upper nuts on distant place from the lower nuts in order not to obstruct hanging the indoor unit or adjust the indoor unit position, and then hang the indoor unit
- Adjust the indoor unit position after hanging it by inserting the level gauge attached on the package into the air supply port and checking if the gap between the ceiling plane and the indoor unit is appropriate. In order to adjust the indoor unit position, adjust the lower nuts while the upper nuts are put on distant place. Confirm there is no backlash between the hanger plate for suspension bolt and the lower nut and washer



(4) Installation of indoor unit (continued)

- Make sure to install the indoor unit horizontally. Confirm the levelness of the indoor unit with a level gauge or transparent hose filled with water. Keep the height difference at both ends of the indoor unit within 3mm.
- 7. Tighten four upper nuts and fix the unit after height and levelness adjustment.



Caution

- Do not adjust the height by adjusting upper nuts. It will cause unexpected stress on the indoor unit and it will lead to deformation of the unit, failure of attaching a panel, and generating noise from the fan.
- Make sure to install the indoor unit horizontally and set the gap between the unit underside and the ceiling plane properly. Improper installation may cause air leakage, dew condensation, water leakage and noise.
- Even after decorative panel attached, still the unit height can be adjusted finely. Refer to the installation manual for decorative panel for details.
- Make sure there is no gap between decoration panel and ceiling surface, and between decoration panel and the indoor unit. The gap may cause air leakage, dew condensation and water leakage
- In case decorative panel is not installed at the same time, or ceiling material is installed after the unit installed, put the cardboard template for installation attached on the package (packing material of cardboard box) on the bottom of the unit in order to avoid dust coming into the indoor

5Refrigerant pipe

Caution

- Be sure to use new pipes for the refrigerant pipes. Use the flare nut attached to the product or a nut compatible with JIS B 8607, Class 2 Regarding whether existing pipes can be reused or not, and the washing method, refer to the instruction manual of the
- outdoor unit, catalogue or technical data.

 1) In case of reuse: Do not use old flare nut, but use the one attached to the unit or compatible with JIS B 8607, Class 2.

 2) In case of reuse: Flare the end of pipe replaced partially for R410A.





Pipe dia.	Min. pipe	Protruding dimer	sion for flare, mm	Flare O.D.	Flare nut	
d d	wall thickness	Rigid (Clutch type)		D	tightening torque	
mm	mm	For R410A	For R410A Conventional tool		N-m	
6.35	8.0	0 ~ 0.5	0.7 ~ 1.3	8.9 ~ 9.1	14 ~ 18	
9.52	0.8			$12.8 \sim 13.2$	32 ~ 42	
12.7	8.0			16.2 ~ 16.6	49 ~ 61	
15.88	1			$19.3 \sim 19.7$	68 ~ 72	
19.05	1.2			23.6 ~ 24.0	100 ~ 120	

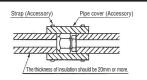
- •Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation.
 - In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
- Do not use any refrigerant other than R410A.
- Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting,
- Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
- Use special tools for R410 refrigerant

Work procedure

- 1. Remove the flare nut and blind flanges on the pipe of the indoor unit.
- * Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then
 - (Gas may come out at this time, but it is not abnormal.)
- Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
- 2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit. *Bend radius of pipe must be 4D or larger. Once a pipe is bent, do not readjust the bending. Do not twist a pipe or collapse to 2/3D or smaller.
 - *Do a flare connection as follows:
 - Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the coppe pipe, and then remove them.
 - When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table below. Make sure to hold the pipe on the indoor unit securely by a spanner when tightening the nut in order to avoid unexpected stress on the copper pipe.
- 3. Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
 - Make sure to insulate both gas pipes and liquid pipes completely
- XIncomplete insulation may cause dew condensation or water dropping. Refrigerant is charged in the outdoor unit.
- - As for the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.

(5) Refrigerant pipe (continued)

Refrigerating machine oil should not be applied to the threads of union or external surface of flare. It is because, even if the same tightening torque is applied, the oil is likely to decrease the slide friction force on the threads and increase, in turn, the axial component force so that it could crack the flare by the stress corrosion. Refrigerating machine oil may be applied to the internal surface of flare only.



6 Drain pipe

Caution

- Install the drain pipe according to the installation manual in order to drain properly. Imperfection in draining may cause flood indoors and wetting the household goods, etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell.
- Connect the pipe securely to avoid water leakage from the joint.
- Insulate the pipe properly to avoid condensation drop.
- Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

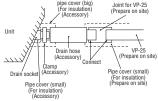
Work procedure

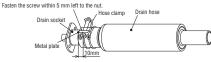
1. Make sure to insert the drain hose (the end mode of soft PVC) to the end of the step part of drain socket.

Attach the hose clamp to the drain hose around 10mm from the end, and fasten the screw within 5mm left to the nut

The step part Drain hose

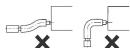
Do not apply adhesives on this end



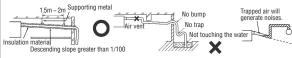


- 2. Prepare a joint for connecting VP-25 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-25 pipe (prepare on site). **As for drain pipe, apply VP-25 made of rigid PVC which is on the market.
 - Make sure that the adhesive will not get into the supplied drain hose.
 - It may cause the flexible part broken after the adhesive is dried up and gets rigid.

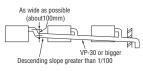
 The flexible drain hose is intended to absorb a small difference at installation of the unit or drain pipes. Intentional bending, expanding may cause the flexible hose broken and water leakage.



- 3. Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.
- Pay attention not to give stress on the pipe on the indoor unit side, and support and fix the pipe as close place to the unit as possible when connecting the drain pipe
- Do nt set up air vent.



 When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for

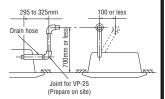


- 4. Insulate the drain pipe.
- Be sure to insulate the drain socket and rigid PVC pipe installed indoors otherwise it may cause dew condensation and water leakage.
 - *After drainage test implementation, cover the drain socket part with pipe cover (small size), then use the pipe cover (big size) to cover the pipe cover (small size), clamps and part of the drain hose, and fix and wrap it with tapes to wrap and make joint part gapless

6 Drain pipe (continued)

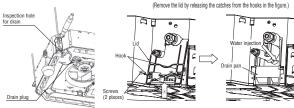
Drain up

 The position for drain pipe outlet can be raised up to 700mm above the ceiling. Use elbows for installation to avoid obstacles inside ceiling. If the horizontal drain pipe is too long before vertical pipe, the backflow of water will increase when the unit is stopped, and it may cause overflow of water from the drain pan on the indoor unit. In order to avoid overflow, keep the horizontal pipe length and offset of the pipe within the limit shown in the figure below.



Drain test

- After installation of drain pipe, make sure that drain system work in good condition and no water leakage from joint and drain pan. Check if the motor sound of drain pump is normal or not.
- Do drain test even if installation of heating season.
 For new building cases, make sure to complete the test before hanging the ceiling.
- 1 Fill water of approx 1,000 cc in the drain pan of the main unit. Take care not to wet electrical equipment such as the drain pump, etc Inject water through the blow outlet using a feed water pump, or the like, or through the refrigerant pipe joint.
 - When injecting water through the blow outlet
- ●When removing the lid to inject water through the refrigerant joint (1) Remove screws at 2 places. (2) While pressing the lid in the direction ①, pull and remove the lid in the direction ②.



- 2. Make sure that water is drained out properly and there is no water leakage from any joints of the drain pipe at the test. Confirm that the water is properly drained out while the drain motor is operating. At the
- drain socket (transparent), it is possible to check if the water is drained out properly. Unplug the drain plug on the indoor unit to remove remaining water on the drain pan after the test, and re-plug it. And insulate the drain pipe properly finally.

Drain pump operation

- OIn case electrical wiring work finished
- Drain pump can be operated by remote control (wired).

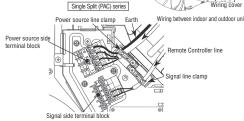
 For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

 Oln case electrical wiring work not finished
- Drain numn will run continuously when the din switch "SW7-1" on the indoor unit PCB is turned ON, the Connect The CNB is disconnected, and then the power supply (230VAC on the terminal block ① and ②) is turned ON. Make sure to turn OFF "SW7-1" and reconnect the Connector CNB after the test.

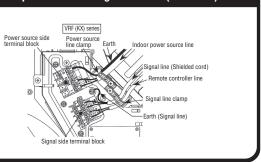
7Wiring-out position and wiring connection

- Electrical installation work must be performed according to the installation manual by an
 electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country.
 - Be sure to use an exclusive circuit.
- Use specified cord, fasten the wiring to the terminal securely, and hold the cord securely in order not to apply unexpected stress on the terminal.
- Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
- Be sure to do D type earth work
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work
- Remove a lid of the control box (3 screws) and the wiring cover (2 screws).
- Hold each wiring inside the unit and fasten them to terminal block securely.
- Fix the wiring with clamps. 4. Install the removed parts back to original place.





Wiring-out position and wiring connection (continued)



®Panel installation

- Attach the panel on the indoor unit after electrical wiring work.
- Refer to attached manual for panel installation for details

9Check list after installation

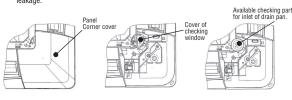
Check the following items after all installation work completed.

Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Supply voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks airflow on air inlet and outlet?	Insufficient capacity	

(10) How to check the dirt of drain pan (Maintenance)

The method of checking the dirt of drain pan

- It is possible to check the dirt for inlet of drain pan without detaching the panel. (Inspection is not possible when the high efficient filter and option spacer is installed.)
- Open the air return grille and remove the panel corner cover on drain pan side.
- Remove the cover of inspection window. (1screw)
- Check the drain pan from the inspection window.
 - If the drain pan is very dirty, remove the drain pan and clean it.
- After checking of the dirty of drain pan, restore the cover of the inspection window securely. Improper restoration of the cover may cause dew condensation and water



Attention for removing drain pan

• The fixing components have been attached the with drain pan. Pay attention to these components during installation and removing. Take off the hanging hook after removing four screws. During the installation of drain pan, fix the drain pan firmly by using four screws after hanging it up with the fixing hook.



PANEL INSTALLATION MANUAL

PJF012D003C ∕€\

Read this manual together with the indoor unit's installation manual

★ WARNING

Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal.

Loose connection or hold will cause abnormal heat generation or fire.



Make sure the power supply is turned off when electric wiring work.

Otherwise, electric shock, malfunction and improper running may occur



Before installation

- Follow installation manual carefully, and install the panel properly
 Check the following items.

O Acc	essories			
Access	ories			
Bolt	6)-	4 pieces	For panel installation	900000000000000000000000000000000000000
Strap		4 pieces	For avoiding the corner panel from falling	
Screw	\$	4 pieces	For fixing the corner panel	
Note: Ac	ccessories are laid in the	position	removing the corner panel.	T-1
				Accessories holding position

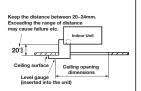
② Checking the indoor unit installation position

- · Read this manual together with the air conditioner installation manual carefully.
- Check if the opening size for the indoor unit is correct with the level gauge supplied in the indoor unit
- Check if the gap between the ceiling plane and the indoor unit is correct by inserting the level gauge into the air outlet port of the indoor unit. (See below drawing)
- Adjust the installation elevation if necessary.

If there is a height difference beyond the design limit between the installation level of the indoor unit and the ceiling plane, the panel may be subject to excessive stress during installation, it may cause distortion and damage.

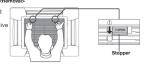
The installation level of the indoor unit can be adjusted finely from the opening provided on the corner, even after panel is attached.
(Refer to

Attaching the panel for details.)



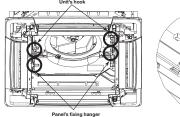
③ Removing the air return grille

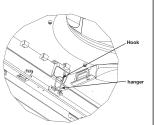
Hold the stoppers on the air return grille (2 places) toward OPEN direction, open the air return grille.
 Remove the hooks of the air return grille from the decorativ panel while it is in the open position.



6 Attaching the panel

- Lift up the hanger (2 places) on the panel for temporary support.
 Hang the panel on the hook on the indoor unit.



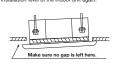


2. Fix the panel on the indoor unit

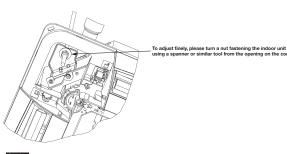
· Fasten the panel on the indoor unit with the four bolts supplied with the panel

Improperly tightened hanging bolts can cause the problems listed below, so make sure that you have tightened them securely. Air leakage Air leakage along the ceiling

If there is a gap remaining between the ceiling and the decorative panel even after the hanging bolts are tightened, adjust the installation level of the indoor unit again.



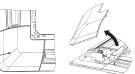
It is possible to adjust the installation height of the indoor unit with the panel attached as long as there is no influence on the drain pipe inclination and/or the indoor unit levelness.



re there is no stress given on the panel when adjusting the height of the indoor void unexpected distortion. It may cause the distortion of panel or failing to

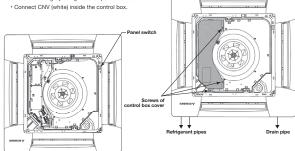
Removing a corner panel

Pull the corner panel toward the direction indicated by the arrow and remove it. (Same way for all four corner panels)



② Electrical wiring

- 1. After removing three screws of control box, detach the cover of control box (the hatched part).
- 2. Connect the connector for louver motor (white 20P). · Hold the wiring by using the clamps of the indoor unit.
- · Hold the connector inside the control box
- 3. Connect the connector for panel switch.
- · Hold the wiring by using the clamps of the indoor unit.

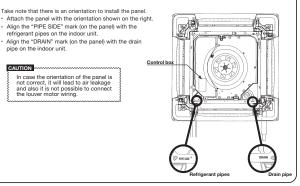


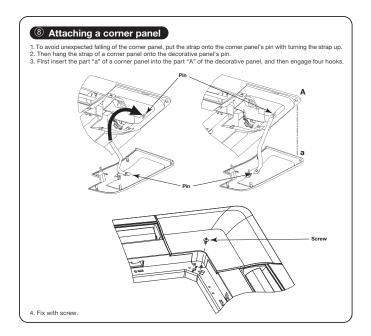
motor (white) Clamps of unit main body

CAUTION more. To start the air conditioner, close the air return grill.

In case the orientation of the panel is not correct, it will lead to air leakage and also it is not possible to connect the louver motor wiring.

⑤ Orientation of the panel installation





9 How to set the airflow direction

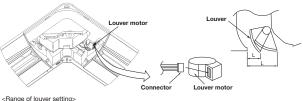
It is possible to change the movable range of the louver on the air outlet from the wired remote control. Once the top and bottom position is set, the louver will swing within the range between the top and the bottom when swing operation is chosen. It is also possible to apply different setting to each louver.

For the setting method of the louver's operating range, refer to the instruction manual of the wired remote

- If it is necessary to fix the louver position manually, follow the procedure mentioned below.

 1. Shut off the main power switch.

 2. Unplug the connector of the louver motor which you want to fix the position. Make sure to insulate unplugged connectors electrically with a viny! tape.
- 3. Adjust the louver position slowly by hand so as to be within the applicable range mentioned below table.



<Range of louver setting>

Vertical airflow direction Dimension L (mm) Horizontal 0° Downwards 45° 43 26

- Any automatic control or operation from the remote control will be disabled on the louver whose po-sition is fixed in the above way.
- Do not set a louver beyond the specified range. Failure to observe this instruction may result in dripping, dew condensation, the fouling of the ceiling and the malfunctioning of the unit.

Mattaching the air return grille To attach the air return grille, follow the procedure described in <a>Beamoving the air return grille in the reverse order. 1. Hang the hooks of the air return grille in the hole of the panel. (The hooks of the grille can be hanged in three side of the panel as following.) 2. After the grille is hanged, close the grille while the stoppers on the grille (2 places) are kept pressed to "OPEN" direction. When the grille comes to the original position, release the stoppers to hold the grille. Make sure to hear the sound of "CLICK" in both stoppers. The grill may be installed at one of these three sides. The grill cannot be installed at this side Attaching the air return grille from the hinge side. Be careful in air return grille attaching, unstable attaching may cause grille falling. Repair or replace the distorted, broken stopper at once, or the grille falling may occur.

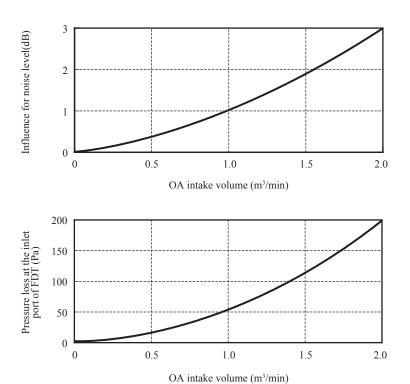
OUTDOOR AIR (OA) INTAKE FOR FDT

If it is required to intake OA through FDT unit, make sure to check following points carefully in order to conform to the requirement of customer.

If the OA intake volume through FDT unit is not satisfied with the required ventilation air volume, consider to install an independent ventilation system.

- 1) Be sure to calculate cooling/heating load considering the ventilation heat load and to decide the air-conditioning system.
- 2) Be sure the OA intake volume to FDT unit should not exceed 20% of the Supply Air (SA) volume of FDT unit and it should be less than 2m³/min.
- Be sure to decide the OA intake volume considering the mixed air temperature will be within the usage temperature range of FDT unit.
 - Especially in following case, please consider to intake OA after processing OA or reducing the OA intake volume.
- 4) Be sure to equip a suitable filter for OA intaken in order to protect the dust. (Because OA does not pass through the filter equipped on FDT unit)
- 5) Be sure to insulate OA duct.
 (If not, it may have dew condensation.)
- 6) Be sure to interlock the booster fan for OA with the fan of FDT unit by using CNT connector.

 (If not, the dust trapped on the filter of FDT unit may be blown out to the room by the OA being intaken during the fan of FDT unit stopping)
- 7) Be sure to select a suitable booster fan for OA considering the pressure loss in the OA duct and the pressure loss at the inlet port of FDT with following diagram.
 - (Please take into consideration the noise level as well)



<Selection of booster fan>

Booster fan should have a static pressure calculated with following formula

Static pressure of booster fan

= the pressure loss at the inlet port of FDT (from above diagram)

+ Pressure loss in the OA duct (In case of ϕ 100 duct, 5Pa/m is required)

Select the booster fan from the fan characteristic diagram

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PFA012D621B ∕Ы

(2) Ceiling suspended type (FDEN)

This manual is for the installation of an indoor unit

For electrical wiring work (Indoor), refer to page 136. For remote control installation, refer to page 148. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to the page 162.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, [AWARNING] and [ACAUTION]. WARNING: Wrong installation would cause serious consequences such as injuries or death. ACAUTION: Wrong installation might cause serious consequences depending on circumstances Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown as follows:
- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit. Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

⚠ WARNING

Installation should be performed by the specialist.

If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit.

Install the system correctly according to these installation manuals.

Improper installation may cause explosion, injury, water leakage, electric shock, and fire

•When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage, referred by the formula (accordance with ISO5149).

If the density of refrigerant exceeds the limit, please consult the dealer and install the ventilation system, otherwise lack of oxygen can occur, which can cause serious accidents.

Ouse the genuine accessories and the specified parts for installation.

If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit

Ventilate the working area well in case the refrigerant leaks during installation.

If the refrigerant contacts the fire, toxic gas is produce

●Install the unit in a location that can hold heavy weight

●Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes.

n may cause the unit to fall leading to acciden

Do not mix air in to the cooling cycle on installation or removal of the air conditioner

If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and inj

Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.

Power source with insufficient capacity and improper work can cause electric shock and fire

Ouse specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.

ons or hold could result in abnormal heat generation or fire

●Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services

roper fitting may cause abnormal heat and fire.

Check for refrigerant gas leakage after installation is completed.

If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced.

Ouse the specified pipe, flare nut, and tools for R410A.

ting parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle

Tighten the flare nut according to the specified method by with torque wrench.

If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period

• Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can occur Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak.

 $\blacksquare \textbf{Connect the pipes for refrigeration circuit securely in installation work before compressor is operated. }$ sor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system

Stop the compressor before removing the pipe after shutting the service valve on pump down work If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.

Only use prescribed optional parts. The installation must be carried out by the qualified installer.

If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire

Do not repair by yourself. And consult with the dealer about repair. r repair may cause water leakage, electric shock or fire.

Consult the dealer or a specialist about removal of the air conditioner.

per installation may cause water leakage, electric shock or fir

●Turn off the power source during servicing or inspection work If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan

●Do not run the unit when the panel or protection guard are taken off.

Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and in

⚠ CAUTION

Perform earth wiring surely.

Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth co cause unit failure, electric shock and fire due to a short circuit

Earth leakage breaker must be installed.

 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.

Jsing the incorrect one could cause the system failure and fire

 Do not use any materials other than a fuse of correct capacity where a fuse should be used. Connecting the circuit by wire or copper wire could cause unit failure and fire

 Do not install the indoor unit near the location where there is possibility of flammable gas leakage. If the gas leaks and gathers around the unit, it could cause fire

Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (su as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handle

It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire Secure a space for installation, inspection and maintenance specified in the manual.

Insufficient space can result in accident such as personal injury due to falling from the installation place

 Do not use the indoor unit at the place where water splashes such as laundry. Indoor unit is not waterproof. It could cause electric shock and fire.

 Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art,

It could cause the damage of the items. Do not install nor use the system near equipments which generate electromagnetic wave or high harmonic

Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunicati equipment might influence the air conditioner and cause a malfunction and breakdown. Or the air conditioner might influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause iam

 Do not install the remote control at the direct sunlight. It could cause breakdown or deformation of the remote control.

Do not install the indoor unit at the place listed below.

Places where flammable gas could leak.

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Places where carbon fiber, metal powder or any powder is floated. Place where the substances which affect the air conditioner are generated

such as sulfide gas, chloride gas, acid, alkali or ammonic atmospheres. Places exposed to oil mist or steam directly.

Places exposed to our most of common of the common of the

Places where cosmetics or special sprays

frequently used. Highly salted area such as beach

Heavy snow area Places where the system is affected by

smoke from a chimney. - Altitude over 1000m

 Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit.) secording to the installation manual for each model because each indoor unit has each limitation)
Locations with any obstacles which can prevent inlet and outlet air of the unit
Locations with any obstacles which can prevent inlet and outlet air of the unit
Locations where without one an emplified due to installient strength of structure
Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the

infrared specification unit) Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)

Locations where drainage cannot run off safely.
 It can affect performance or function and etc..

Do not put any valuables which will break down by getting wet under the air conditioner.

n could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it dama Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use. It could cause the unit falling down and injury.

 Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit. If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. To avoid damaging, keep the indoor unit packed or cover the indoor unit.

Install the drain pipe to drain the water surely according to the installation manual.

 Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen

user's health and safety. Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of ox occur, which can cause serious accidents. 0

For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps,

Check if the drainage is correctly done during commissioning and ensure the space for inspection and mainti

 Ensure the insulation on the pipes for refrigeration circuit so as not to condense water. Incomplete insulation could cause condensation and it would wet ceiling, floor, and any other valuables

Do not install the outdoor unit where is likely to be a nest for insects and small animals

Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the us Pay extra attention, carrying the unit by hand.

Carry the unit with 2 people if it is heavier than 20kg. Do not use the plastic straps but the grabbing place, moving the ur by hand. Use protective gloves in order to avoid injury by the aluminum fin.

 Make sure to dispose of the packaging material. Leaving the materials may cause injury as metals like nail and woods are used in the package

Do not operate the system without the air filter.

It may cause the breakdown of the system due to clogging of the heat exchanger Do not touch any button with wet hands.

It could cause electric shock

• Do not touch the refrigerant piping with bare hands when in operation. The pipe during operation would become very hot or cold according to the operating condition, and it could cause a burn

Do not clean up the air conditioner with wate

It could cause electric shock.

 Do not turn off the power source immediately after stopping the operation Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or br

Do not control the operation with the circuit breaker.
It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury

①Before installation

- •Install correctly according to the installation manual.
- Confirm the following points:

OUnit type/Power supply specification OPipes/Wires/Small parts OAccessory items

Accessory item

For un	it hanging	For refrigerant pipe			For drain pipe					For air return grille
Flat washer (M10)	Paper pattern	Pipe cover (large)	Pipe cover (small)	Strap	Drain hose (with clamp)	Hose clamp	Fixing bracket	Screw	Heay insulation	Screw
0		6	6	Ш	@DIIII)	()		P		
8	1	1	1	4	1	1	1	2	1	4
	For unit hanging and adjustment	For heat insulation of gas pipe			For drain pipe connection	For drain hose mounting		For installing of fixing bracket		For fixing air return grille



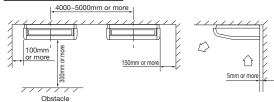
②Selection of installation location for the indoor unit

- 1 Select the suitable areas to install the unit under approval of the user.
 - Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
 - Areas where there is enough space to install and service.
- · Areas where it can be drained properly. Areas where drain pipe descending slope can be taken.
- Areas where there is no obstruction of airflow on both air return grille and air supply port.
- · Areas where fire alarm will not be accidentally activated by the air conditioner.
- · Areas where the supply air does not short-circuit.
- · Areas where it is not influenced by draft air.
- · Areas not exposed to direct sunlight.
- Areas where dew point is lower than around 23°C and relative humidity is lower than 80% This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the air conditioner is operated under the severer condition than mentioned above.
- Areas where TV and radio stavs away more than 1m. (It could cause jamming and noise.)
- · Areas where any items which will be damaged by getting wet are not placed such as food, table wares, server, or medical equipment under the unit.
- Areas where there is no influence by the heat which cookware generates.
- · Areas where not exposed to oil mist, powder and/or steam directly such as above fryer.
- · Areas where lighting device such as fluorescent light or incandescent light doesn't affect the operation.

(A beam from lighting device sometimes affects the infrared receiver for the wireless remote control and the air conditioner might not work properly.)

- ② Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.
- $\ensuremath{\mathfrak{I}}$ If there are 2 units of wireless type, keep them away for more than 6m to avoid malfunction due to cross communication.
- When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service



③Preparation before installation

- •If suspension bolt becomes longer, do reinforcement of earthquake resistant. O For arid ceiling
 - When suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.
- O In case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength.
- When suspension bolt length is over 1000mm, apply the earthquake resistant brace to the bolt.
- Prepare four (4) sets of suspension bolt, nut and spring washer (M10) on site.

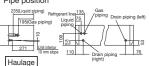
③Preparation before installation (continued)

Pitch of suspension bolts and pipe position

Pitch of suspension bolts

			(mm)
Series	type	Α	В
Single Split (PAC)	40 to 50 type	1070	1022
series	60 to 71 type	1320	1272
	60 to 71type 1320 100 to 140type 1620	1572	
	36 to 56type	1070	1022
VRF (KX) series	71type	1320	1272
	112 to 140type	1620	1572

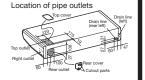
Pipe position



•Move the box as close to the installation area as possible packed.

•If it must be unpacked, wrap the unit with a nylon sling, and be careful not to damage the unit.

olf you need to lay the unit on a floor after unpacking, always



%The outlet through which the pipings are taken out is available in three directions.
%Pipes can be taken out in 3 directions (rear, right or

- Cut out holes using nippers, etc.
 Cut out holes to take out pipes along the cutoff line
- Cut out the top face cover aligning to the piping
- position. When taking pipe out to right-hand side, cut out a
- hole along the groove at the inside of side panel. After installing pipes and wires, seal clearances around pipes and wires with putty, etc. to shut off dust.

Make sure to install the covers at rear and top in order t protect the inside of unit from intrusion of dust of protect wires from damages by sharp edges. Wher taking them out to the right-hand side, remove burrs of sharp edges from the cutout.



put it with the intake grille facing upward. Preparation before instalation

 Remove the air return grille. Slide stoppers (4 places) of the catches then pull out the pins (4 or 6 places).

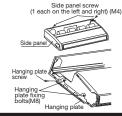


Remove the screw, and then loosen the fixing bolts.

Hanging plate

2. Remove the side panel.

Remove the screw and detach the side panel by sliding it toward the direction indicated by the arrow mark.



Remote control

Installation of remote control

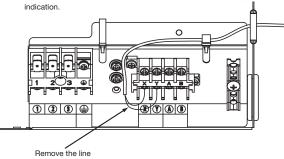
Up to two receiver or wired remote control can be installed in one indoor unit

- When both wired and wireless remote control are used It is necessary to set wired or wireless remote control as slave. (For the method of changing the setting, refer to the installtion manual attached to remote control or wireless kit.)
- When wired remote control are used only (wireless type) It is necessary to remove the line that is connected to the receiver. Remove signal line connected to the receiver from primary side of terminal block (X, Y).

ATTENTION

①Insulate with tape the removed line.

2The LED of that removed connector will not be able to make any



5Installation of indoor unit

Work procedure

- Select the suspension bolt locations and the pipe hole location (1) Use enclosed paper pattern as a reference, and drill the holes for the suspension bolts and pipe. *Decide the locations based on direct measurements
 - (2) Once the locations are properly placed, the paper pattern can be removed.
- 2. Install the suspension bolts in place.
- 3. Fix with 4 suspension bolts, which can endure load of 500N.
- 4. Check the measurements given at the right figure for the length of the suspension bolt:
- 5. Fasten the hanging plate onto the suspension bolts.



Hanging plate

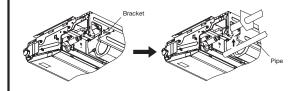
(For left-side drain connection, give the

- 6. Install the unit to the hanging plate
- (1) Slide the unit in from front side to get it hanged on the hanging plate with the bolts.
 (2) Fasten the four fixing bolts (M8: 2
- each on the left and right sides) firmly (3) Fasten the two screws (M4: 1 each on
- the left and right sides). **⚠WARNINIG**: Hang a side panel on from the panel side to the rear side and then fasten it securely onto
- the indoor unit with screws. *To ensure smooth drain flow, install the unit with
- a descending slope toward the drain outlet
- ⚠ CAUTION: Do not give the reversed slope, which may cause water leaks

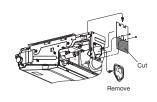
6Refrigerant pipe (continued)

The pipe can be connected from three different directions. (back, reight, top)

 When the pipe is routed through the back.
 If the bracket is removed, piping work will become easy. *After piping, reinstall the removed bracket.



When the pipe is routed through the back Cut the removed top cover, and install to the rear panel instead of rear cover.



6Refrigerant pipe

Caution

- When re-using the existing pipe system for R22 or R407C, pay attention to the following items.

 Change the flare nuts with the attached ones (JIS category 2), and reprocess the flare parts · Do not use thin-walled pipes.
- Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation.
 In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes
- Do not use any refrigerant other than R410A. Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And air getting
- into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.

 Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc. •Use special tools for R410 refrigerant.

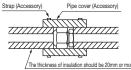
Work procedure

- Remove the flare nut and blind flanges on the pipe of the indoor unit.
- **Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them (Gas may come out at this time, but it is not abnormal.)
- Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.) 2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit.
- When taking out the pipe to rear or top, install it together with the electric wire[®], passing them through the attached cover.
- Seal clearances with putty, etc. to shut off dust.
- *Bend the pipe with as big radius as possible and do not bend the pipe repe In addition, do not twist and crush the pipes.
- *Do a flare connection as follows:
- ●Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected
- stress to the copper pipe, and then remove them.

 •When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table below. Make sure to hold the pipe on the indoor unit securely by a spanner when tightening the nut in order to avoid unexpected stress on the copper pipe.
- Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
 - Make sure to insulate both gas pipes and liquid pipes completely.
- %Incomplete insulation may cause dew condensation or water dropping 4. Refrigerant is charged in the outdoor unit.

As for the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.

Pipe diameter Tightening torque N·m ø 6.35 ø 9.52 34 to 42 49 to 61 ø 12.7 ø 15.88 68 to 82 100 to 12



⑦Drain pipe

The drain pipes may face out towards the back to the left, or to the right side.

Hanging plate

- Install the drain pipe according to the installation manual in order to drain properly. Imperfection in draining may cause flood indoors and wetting the household goods, etc
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful andinflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency
- of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell. Connect the pipe securely to avoid water leakage from the joint.
- Insulate the pipe properly to avoid condensation drop.

 Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

Work procedure

- 1. Insert drain hose completely to the base, and tighten the drain hose clamp securely. (adhesive must not be used.) * When plumbing on the left side, move the rubber plug and the cylindrical insulating materials by the pipe connecting hole on
- the left side of the unit to the right side.

 Beware of a possible outflow of water that me occur upon removal of a drain plug.
- 2. Fix the drain hose at the lowest point with a hose clamp supplied as an accessory. as illustrated in the right drawing by laying it without leaving a slack.
 - Take head of electrical cables so that they may not run beneath the drain hose
- ⚠ A drain hose must be clamped down with a hose clamp
- There is a possibility that drain water overflows.

 3. Connect VP-20(prepare on site) to drain hose. (adhesive must not be used.)
- W Use commercially available rigid PVC general pipe VP-20 for drain pipe. Do not to make the up-down bending and trap in the mid-way while assuming that the drain pipes is downhill. (more than 1/100)
- Never set up air vent.
 Insulate the drain pipe.
- Insulate the drain hose clamp with the heat insulation supplied as accessories.
- When the unit is installed in a humid place, consider precautions against dew condensation such as heat insulation for the drain pipe.

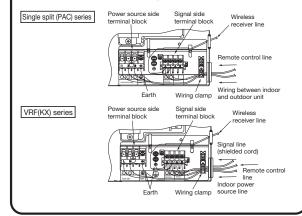
Drain test

- After installation of drain pipe, make sure that drain system work in good condition and no water leakage from joint and drain pan.
- Do drain test even if installation of heating season

®Wiring-out position and wiring connection

- Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a powe provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the
- Be sure to use an exclusive circuit.
- Use specified cord, fasten the wiring to the terminal securely, and hold the
- cord securely in order not to apply unexpected stress on the terminal.

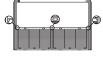
 Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
- Be sure to do D type earth work.
 For the details of electrical wiring work, see attached instruction manual for electrical wiring work.
- Remove a lid of the electrical box (2 screws).
- Hold each wiring inside the unit and connect to a terminal block surely. Fix the wiring by clamps.
- 4. Install the removed parts back to original place.



Attaching the air return grille

- The air return grille must be attached when electrical cabling work is completed.
- 1. Fix the chains tied to the air return 2. Close the air return grille. grille onto the indoor unit with screws supplied as accessories (4 pieces).
 - This completes the unit installtion work.





®Check list after installation

Check the following items after all installation work completed.

Check if	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Supply voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks airflow on air inlet and outlet?	Insufficient capacity	

11 How to set the airflow direction

It is possible to change the movable range of the louver on the air outlet from the wired remote control. Once the top and bottom position is set, the louver will swing within the range between the top and the bottom when swing operation is chosen. It is also possible to apply different setting to each louver. Note:This function is not able to be set with wireless remote control or simple remote control

- Stop the air conditioner and press SET button and LOUVER button simultaneously for three seconds or
- The following is displayed if the number of the indoor units connected to the remote control is one. Go to step 4.
- "≒¬No. 1 ≜"

 The following is displayed if the number of the indoor units connected to the remote control are more than one. - 60 SELECT I./U -



2. Press ▲or ▼ button.(selection of indoor unit) ● Select the indoor unit of which the louver is set.

3. Press SET button.(determination of indoor unit) •Selected indoor unit is fixed.

[EXAMPLE]
"I/U001" (displayed for two

"≶⊃i‰1 #."

4. Press₄ory button.(selection of louver No.)

◆Select the louver No. to be set according to the right figure.

- 5. Press O SET button.(Determination of louver No.)
- The louver No. to be set is confirmed and the display shows the upper limit of the movable range.

 [EXAMPLE] If No.1 louver is selected,

 "No.1 UFFE? 0" — current upper limit position

- 6. Press ▲ or ▼ button.(selection of upper limit position)

 Select the upper limit of louver movable range.

 "position 1" is the most horizontal, and "position 6" is the most downward.

 "position --" is to return to the factory setting.

 If you need to change the setting to the default

systems, use "position --".

"In LIFFER T" (the most horizotal)

"In LIFFER T" (the most horizotal)

"In LIFFER 0:

"In LIFFER



- 7. Press SET button. (Fixing of the upper limit position)
 The upper limit position is fixed and the setting position is displayed for two seconds. Then proceed to lower limit position selection display.

[EXAMPLE]
No.1 LIPPER2 (displayed for two seconds)

- Press ▲or ▼button.(Selection of lower limit position)
 Select the lower limit position of louver.
 "position 1" is the most horizontal, and "position 6 "is the most downwards.
 "position ---" is to return to the factory setting. If you need to change the setting to the default setting, use "position --".

No.1 LONGRS \$
No.1 LONGRS \$ (the most downwards)
No.1 LONGRS \$ (return to the default setting)

- 9. Press SET button.(Fixing of the lower limit position)
- Upper limit position and lower limit position are fixed, and the set positions are displayed for two seconds, then setting is completed.

 After the setting is completed, the louver which was set moves from the original position to the lower limit position, and goes back to the original position again. (This operation is not performed if the indoor unit and/or indoor unit fan is in operation.)

[Example] No.1 U2 L6



10.Press ⊕oNOFF button.

•Louver adjusting mode ends and returns to the original display.

If the upper limit position number and the lower limit position number are set to the same position, the louver is fixed at that position auto swing does not funtion.

If you press RESET button during settings, the display will return to previous display. If you press ONOFF button during settings, the mode will be ended and return to original display, and the settings that have not been completed will become invalid.

When plural remote controls are connected, louver setting operation cannot

(3) Duct connected-High static pressure type (FDU) (a) Indoor unit

This manual is for the installation of an indoor unit.

For electrical wiring work (Indoor), refer to page 140. For remote control installation, refer to page 148. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to page 162.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself
- The precautionary items mentioned below are distinguished into two levels, [AWARNING] and [ACAUTION]. AWARNING: Wrong installation would cause serious consequences such as injuries or death. <u>ACAUTION</u>: Wrong installation might cause serious consequences depending on circumstances. Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown on the right: Never do it under any circumstances. Always do it according to the instruction.
- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit.

 Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

△ WARNING

Installation should be performed by the specialist.

If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn

•Install the system correctly according to these installation manuals.

Improper installation may cause explosion, injury, water leakage, electric shock, and fire

Check the density refered by the foumula (accordance with ISO5149).

If the density exceeds the limit density, please consult the dealer and installate the ventilation system.

Use the genuine accessories and the specified parts for installation. If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit

• Ventilate the working area well in case the refrigerant leaks during installation.

If the refrigerant contacts the fire, toxic gas is produced

Install the unit in a location that can hold heavy weight.

Improper installation may cause the unit to fall leading to accide

• Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes. Improper installation may cause the unit to fall leading to accident

Do not mix air in to the cooling cycle on installation or removal of the air conditioner.

If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injur

Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit. Power source with insufficient capacity and improper work can cause electric shock and fire

• Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in

order not to apply unexpected stress on the terminal. Loose connections or hold could result in abnormal heat generation or fire.

●Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services

Improper fitting may cause abnormal heat and fire

Check for refrigerant gas leakage after installation is completed.

If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced

Use the specified pipe, flare nut, and tools for R410A.

Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle

● Tighten the flare nut according to the specified method by with torque wrench. If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period

Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can

Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak. • Connect the pipes for refrigeration circuit securely in installation work before compressor is operated.

If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system.

• Stop the compressor before removing the pipe after shutting the service valve on pump down work. If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit

and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle. Only use prescribed optional parts. The installation must be carried out by the qualified installer.

If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire

Do not repair by yourself. And consult with the dealer about repair. Improper repair may cause water leakage, electric shock or fire

Consult the dealer or a specialist about removal of the air conditioner.

Improper installation may cause water leakage, electric shock or fire.

 $\ensuremath{\bullet}$ Turn off the power source during servicing or inspection work. If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan

● Do not run the unit when the panel or protection guard are taken off.

Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper running

PJG012D004

⚠ CAUTION

Perform earth wiring surely.

Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth co

Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handled

It could cause the damage of the items.

• Do not install nor use the system near equipments which generate electromagnetic wave or high harmonics Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunication equipment might influence the air conditioner and cause a malfunction and breakdown. Or the air conditioner might

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Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit

Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use.

Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit

• Install the drain pipe to drain the water surely according to the installation manual.

• Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit.

Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen) to user's health and safety.

If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.

and not to make air-bleeding.

incomplete insulation could cause condensation and it would wet ceiling, floor, and any other valuables

Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the use keep the surroundings clean.

The pipe during operation would become very hot or cold according to the operating condition, and it could cause a burn of

Do not control the operation with the circuit breaker.

It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury

cause unit failure and electric shock or fire due to a short circuit. Earth leakage breaker must be installed. 0 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all O Using the incorrect one could cause the system failure and fire. Do not use any materials other than a fuse of correct canacity where a fuse should be used. Connecting the circuit by wire or copper wire could cause unit failure and fire. Do not install the indoor unit near the location where there is possibility of flammable gas leakages If the gas leaks and gathers around the unit, it could cause fire. It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire Secure a space for installation, inspection and maintenance specified in the manual Ø ufficient space can result in accident such as personal injury due to falling from the installation place Do not use the indoor unit at the place where water splashes such as laundry ndoor unit is not waterproof. It could cause electric shock and fire Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art. influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause jamming. Do not install the remote control at the direct sunlight. It could cause breakdown or deformation of the remote control Places where cosmetics or special sprays are Do not install the indoor unit at the place listed below Places where flammable gas could leak Places where carbon fiber, metal powder or any powder is floated.
Place where the substances which affect the air conditioner are generated such as sulfide gas, chloride gas, acid, alkali or ammonic atmospheres.
Places exposed to oil mist or steam directly. Highly salted area such as beach Heavy snow area
Places where the system is affected by smoke from a chimney. On vehicles and ships Places where machinery which generates high harmonics is used. according to the installation manual for each model because each indoor unit has each limitation) Locations with any obstacles which can prevent filet and outlet air of the unit Locations where vibration can be amplified due to insufficient strength of structure. Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the infrared specification unit) \bigcirc Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m) Locations where drainage cannot run off safely. It can affect performance or function and etc. Do not put any valuables which will break down by getting wet under the air conditioner. uld drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's It could cause the unit falling down and injury. If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. To avoid damaging, keep the indoor unit packed or cover the indoor unit. Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work 0 • For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps, 0 Check if the drainage is correctly done during commissioning and ensure the space for inspection and m Ensure the insulation on the pipes for refrigeration circuit so as not to condense water ø Do not install the outdoor unit where is likely to be a nest for insects and small animals. Pay extra attention, carrying the unit by hand. Carry the unit with 2 people if it is heavier than 20kg, Do not use the plastic straps but the grabbing place, moving the unit by hand. Use protective gloves in order to avoid injury by the aluminum fin. Make sure to dispose of the packaging material. a Leaving the materials may cause injury as metals like nail and woods are used in the package Do not operate the system without the air filter. \bigcirc It may cause the breakdown of the system due to clogging of the heat exchanger. Do not touch any button with wet hands. It could cause electric shock Do not touch the refrigerant piping with bare hands when in operation. Do not clean up the air conditioner with water. It could cause electric shock Do not turn off the power source immediately after stopping the operation. Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown

OThis model is middle static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit

1) Before installation Install correctly according to the installation manual. Confirm the following points:

OUnit type/Power supply specification OPipes/Wires/Small parts OAccessory items Accessory item

For hanging	F	or refrigerant pip	е	For drain pipe			
Flat washer (M10)	Pipe cover (big)	Pipe cover (small)	Strap	Pipe cover (big)	Pipe cover (small)	Drain hose	Hose clamp
0	5	5	<u> </u>	5	5		()
8	1	1	4	- 1	1	1	1
	For heat insulation of gas pipe	For heat insulation of liquid tube	For pipe cover fixing	For heat insulation of drain socket	For heat insulation of drain socket	For drain pipe connecting	For drain hose mounting

2 Selection of installation location for the indoor unit

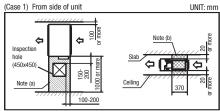
- ① Select the suitable areas to install the unit under approval of the user.
 - Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- · Areas where there is enough space to install and service.
- · Areas where it can be drained properly. Areas where drain pipe descending slope can be
- · Areas where there is no obstruction of airflow on both air return grille and air supply port.
- · Areas where fire alarm will not be accidentally activated by the air conditioner.
- · Areas where the supply air does not short-circuit.
- · Areas where it is not influenced by draft air.
- · Areas not exposed to direct sunlight.
- · Areas where dew point is lower than around 28°C and relative humidity is lower than 80%. This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the air conditioner is operated under the severer condition than mentioned above. If there is a possibility to use it under such a condition, attach additional insulation of 10 to 20mm thick for entire surface of indoor unit, refrigeration pipe and drain pipe.
- · Areas where TV and radio stays away more than 1m. (It could cause jamming and noise.)
- Areas where any items which will be damaged by getting wet are not placed such as food. table wares, server, or medical equipment under the unit.
- · Areas where there is no influence by the heat which cookware generates
- · Areas where not exposed to oil mist, powder and/or steam directly such as above fryer. · Areas where lighting device such as fluorescent light or incandescent light doesn't affect
- the operation. (A beam from lighting device sometimes affects the infrared receiver for the wireless remote control and the air conditioner might not work properly.)
- 2 Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the

Space for installation and service

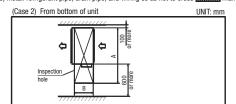
• Make installation altitude over 2.5m.

Select either of two cases to keep space for installation and services

strength is not enough, it could cause injury due to unit falling.



Notes (a) There must not be obstacle to draw out fan motor. (marked area) (b) Install refrigerant pipe, drain pipe, and wiring so as not to cross marked area.



(Size of inspe	UNIT: mm		
Single type	-	71	100-140
Multi type	45, 56	71, 90	112-160
A	1100	1300	1720
В	62	725	

3Preparation before installation

If suspension bolt becomes longer, do reinforcement of earthquake resistant.

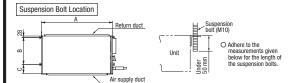
OFor grid ceiling

When the suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

Oln case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength

When suspension bolt length is over 1000mm, apply the earthquake resistant brace to the bolt.

Prepare four (4) sets of suspension bolt, nut and spring washer (M10) on site.

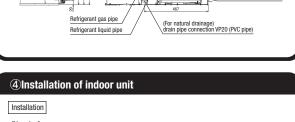


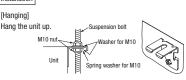
			UNIT: mm
Single type	_	71	100-140
Multi type	45, 56	71, 90	112-160
A	786	986	1404
В	472	472	530
C	135	135	180

Pipe locations UNIT: mm

Single type Multi type	71 45-90	
	Refrigerant Iqui	pipe (For natural drainage)

Single type	100-140	
Multi type	112-160	
		t gas pipe (For natural drainage) frain pipe connection VP20 (FVC pipe) frain pipe connection VP20 (FVC pipe)





If the measurements between the unit and the ceiling hole do not match upon installation, it may be adjusted with the long holed installation tool.

Adjustment for horizontality

OEither use a level vial, or adjust the level according to the method below.

Adjust so the bottom side of the unit will be leveled with the water surface as illustrated below Pour water Water surface Let the pipe side be slightly sloped

Olf the unit is not leveled, it may cause malfunctions or inoperation of the float switch.

⑤Duct Work

- ① A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.
 - An air filter can be provided on the main body of the air conditioner (on the inlet port). Remove it when connecting the duct on the inlet port.

② Blowout duct

- Use rectangular duct to connect with unit.
- Duct size for each unit is as shown below.

				Olvill. Illilli
ſ	Single type	_	71	100-140
	Multi type	45, 56	71, 90	112-140
	Α	682	882	1202
	В	172	172	172
	В	• -		

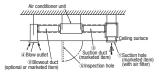
- Duct should be at their minimum length.
- •We recommend to use sound and heat insulated duct to prevent it from condensation.
- Connect duct to unit before ceiling attachment.

3 Inlet port

- When connecting the duct to the inlet port, remove the air filter if it is fitted to the inlet port.
- Inlet port size for each unit is as shown below.

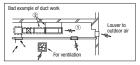
Single	ty	pe		-	П		71		1	00-1	40
Multi	Ту	ре	4	5, 56	\neg	7	71, 90)	1	12-1	60
A				582			742			1282	2
В				202	П		202			237	
				<u> </u>			A	_	_	_	<u>L</u>
		•	<u> </u>								

- Make sure to insulate the duct to prevent dewing on it.
- (4) Install the specific blowout duct in a location where the air will circulate to the entire room.
 - Conduct the installation of the specific blowout hole and the connection of the duct before attaching them to the ceiling.
- Insulate the area where the duct is secured by a band for dew condensation prevention.
- (5)Make sure provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.



Bad example of duct work

- ①If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.
 - a)Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling. Unit should be operated under the conditions as listed in the above table and within the limitation of wind volume. When the building is a concrete structure, especially immediately after the construction, humidity tends to rise even if the space over the ceiling is not substituted in place of a duct. In such occasion, it is necessary to insulate the entire unit with glass wool (25mm). (Use a wire net or equivalent to hold the glass wool in place.)
- b)It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35°C DB, suction air temperature is 27°C WB) and it could result in such troubles as compressor overload, etc..
- c)There is a possibility that the blow air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from be heat exchanger may fall to reach the drain pan but leak outside (Example: drip on to the ceiling) with consequential water leakage in the room.
- ②If vibration damping is not conducted between the unit and the duct, and between the unit and the slab, vibration will be transmitted to the duct and vibration noise may occur. Also, vibration may be transmitted from the unit to the slab. Vibration damping must be performed.



⑤Duct Work (continued)

Connecting the air intake/vent ducts

①Fresh Air Intake

[for air intake duct only]

OUse the side fresh air intake hole, or supply through a part of the suction duct.

[for simultaneous air intake/vent]
OIntake air through the suction duct.
(the side cannot be used)

Side fresh air intake hole Side fresh air intake through the suction duct Fresh air intake through the suction duct Fresh air intake through the suction duct Air vent hole Air vent hole

2)Air Vent

OUse the side air vent hole.
(always use together with the air intake)

Olnsulate the duct to protect it from dew condensation.

6Refrigerant pipe

Caution

Secure with a band, etc.

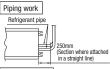
Use the new refrigerant pipe.

When re-using the existing pipe system for R22 or R407C, pay attention to the following items.

- Change the flare nuts with the attached ones (JIS category 2), and reprocess the flare parts.
- · Do not use thin-walled pipes.
- Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation. In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
- Do not use any refrigerant other than R410A.

Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.

- Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
- Use special tools for R410A refrigerant.



When conducting piping work, make sure to allow the pipes to be aligned in a straight line for at least 250 mm, as shown in the left illustration. (This is necessary for the drain pump to function)

Work procedure

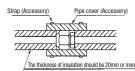
- Remove the flare nut and blind flanges on the pipe of the indoor unit.
 - Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them. (Gas may come out at this time, but it is not abnormal.)
- Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
- Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit. XBend the pipe with as big radius as possible and do not bend the pipe repeatedly. In addition, do not twist and crush the pipes.

※Do a flare connection as follows:

- Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them.
- When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table below. Make sure to hold the pipe on the indoor unit securely by a spanner when tightening the nut in order to avoid unexpected stress on the copper pipe.
- Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
- Make sure to insulate both gas pipes and liquid pipes completely.
- 4. Refrigerant is charged in the outdoor unit.

Name of the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.

Pipe diameter	Tightening torque N·m
φ 6.35	14 to 18
φ 9.52	34 to 42
φ 12.7	49 to 61
φ 15.88	68 to 82



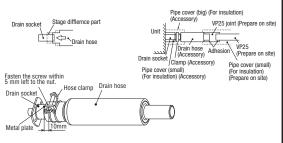
7 Drain pipe

Caution

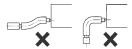
- Install the drain pipe according to the installation manual in order to drain properly.
 Imperfection in draining may cause flood indoors and wetting the household goods, etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell.
- Connect the pipe securely to avoid water leakage from the joint.
- Insulate the pipe properly to avoid condensation drop.
- Check if the water can flow out properly from both the drain outlet on the indoor unit and the end
 of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

Work procedure

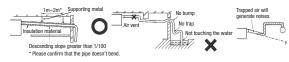
- Make sure to insert the drain hose (the end mode of soft PVC) to the end of the step part
 of drain socket.
 - Attach the hose clamp to the drain hose around 10mm from the end, and fasten the screw within 5mm left to the nut.
 - Do not apply adhesives on this end.
 - Do not use acetone-based adhesives to connect to the drain socket.



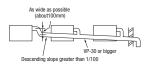
- Prepare a joint for connecting VP-25 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-25 pipe (prepare on site).
 XAs for drain pipe, apply VP-25 made of rigid PVC which is on the market.
 - Make sure that the adhesive will not get into the supplied drain hose.
 It may cause the flexible part broken after the adhesive is dried up and gets rigid.
 - The flexible drain hose is intended to absorb a small difference at installation of the unit or drain pipes. Intentional bending, expanding may cause the flexible hose broken and water leakage.



- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.
 - Pay attention not to give stress on the pipe on the indoor unit side, and support and fix the pipe as close place to the unit as possible when connecting the drain pipe.
 - Do not set up air vent.



●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.

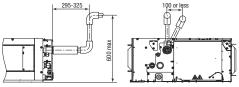


- 4. Insulate the drain pipe.
 - Be sure to insulate the drain socket and rigid PVC pipe installed indoors otherwise it may cause dew condensation and water leakage.
 - After drainage test implementation, cover the drain socket part with pipe cover (small size), then use the pipe cover (big size) to cover the pipe cover (small size), clamps and part of the drain hose, and fix and wrap it with tapes to wrap and make joint part gapless.

7 Drain pipe (continued)

Drain up

• The position for drain pipe outlet can be raised up to 600mm above the ceiling. Use elbows for installation to avoid obstacles inside ceiling. If the horizontal drain pipe is too long before vertical pipe, the backflow of water will increase when the unit is stopped, and it may cause overflow of water from the drain pan on the indoor unit. In order to avoid overflow, keep the horizontal pipe length and offset of the pipe within the limit shown in the figure below.



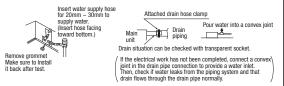
Otherwise, the construction point makes it same as drain pipe construction.

Drain test

- 1. Conduct a drain test after completion of the electrical work.
- During the trail, make sure that drain flows properly through the piping and that no water leaks from connections.
- 3. In case of a new building, conduct the test before it is furnished with the ceiling.
- 4. Be sure to conduct this test even when the unit is installed in the heating season.

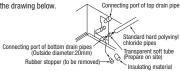
Procedures

- 1. Supply about 1000 cc of water to the unit through the air outlet by using a feed water pump.
- 2. Check the drain while cooling operation.



Outline of bottom drain piping work

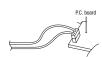
 If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.



Uncoupling the drain motor connector

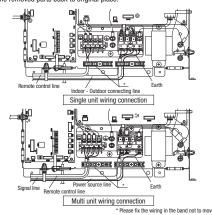
 Uncouple the connector CNR for the drain motor as illustrated in the drawing on the right.

Note: If the unit is run with the connector coupled, drain water will be discharged from the upper drain pipe joint, causing a water leak.



®Wiring-out position and wiring connection

- Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country.
 - Be sure to use an exclusive circuit.
- Use specified cord, fasten the wiring to the terminal securely, and hold the cord securely in order not to apply unexpected stress on the terminal.
- Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work.
- 1. Remove a lid of the control box (2 screws).
- 2. Hold each wiring inside the unit and fasten them to terminal block securely.
- 3. Fix the wiring with clamps.
- 4. Install the removed parts back to original place



9 External static pressure setting

You can set External Static Pressure (E.S.P.) by method of MANUAL SETTING on remote control. Indoor unit will control fan-speed to keep rated air flow volume at each fan speed setting (Lo-Uhi) You can set required E.S.P by wired remote control that calculated with the set air flow rate and pressure loss of the duct connected. 111111

- How to set E.S.P. by wired remote control
- Push "◆" marked button(E.S.P. button).
 Select indoor unit No. by using ◆ button.
- $\ensuremath{\mathfrak{G}}$ Select setting No. by using $\ensuremath{\clubsuit}$ button and set E.S.P. by O button.

See detailed procedure in technical manual.

Notice

You can NOT set E.S.P. by wireless remote control.



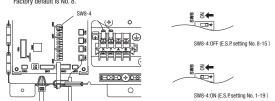
When E.S.P. setting is higher than actual E.S.P., the airflow rate becomes excessively higher. This will cause water leakage if water splashes.

When E.S.P. setting is lower than actual \dot{E} .S.P., the airflow rate becomes excessively lower and the cooling or heating may become ineffective.

In order to reduce the risk above the factory E.S.P. setting is set within the range of $80 - 150 \, \text{Pa}$ (E.S.P. setting No. 8 - 15). Be sure to use within the range of $80 - 150 \, \text{Pa}$ in actual operations. If actual E.S.P. is lower than 80 Pa, it may cause water leakage.

Setting No.								
E.S.P (Pa)	80	90	100	110	120	130	140	150

If 1 – 7 is selected for the setting No. on the remote control, the setting No. shows No. 8.
 If 16 – 20 is selected for the setting No. on the remote control, the setting No. shows No. 15.
 Factory default is No. 8.



If SW8-4 is turned to "ON", E.S.P. setting range can be changed to 10 - 200 Pa (E.S.P. setting No. 1 - 19). This should not be used when actual E.S.P. cannot be confirmed, because the risk above becomes higher

Setting No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
E.S.P. (Pa)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	200

X If 20 is selected for the setting No. on the remote control, the setting No. shows No. 19.

10 Check list after installation

Check the following items after all installation work completed.

Check if	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Supply voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
No mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks airflow on air inlet and outlet?	Insufficient capacity	
Is setting of E.S.P finished?	Excessive air flow, water drop blow out	

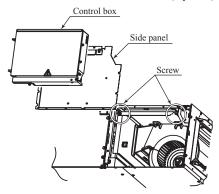
(b) Replacement procedure of the fan unit

Notes(1) The unit is a heavy item. It must be supported securely and handled with care not to drop when it is necessary to replace.

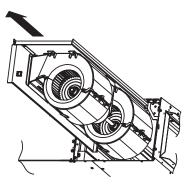
(2) For the maintenance space, refer to page 121.

(i) Model FDU71VF1

1) Remove the control box and the side panel, and remove the screws marked in the circles (2 places) in the figure.

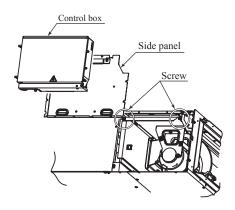


2) Take out the fan unit in the arrow direction.

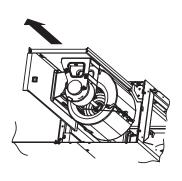


(ii) Model FDU100VF1

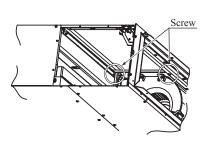
1) Remove the control box and the side panel, and remove the screws marked in the circles (2 places) from the unit located at the near side.

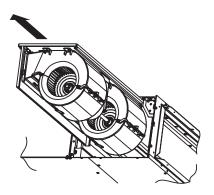


Take out the fan unit located at the near side in the arrow direction.



- 3) Remove the screws marked in the circles (2 places) from the fan unit located at the far side.
- 4) Take out the fan unit in the arrow direction.





(4) Duct connected-Low / Middle static pressure type (FDUM)

(a) Indoor unit

PJG012D008

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This manual is for the installation of an indoor unit.

For electrical wiring work (Indoor), refer to page 136. For remote control installation, refer to page 148. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, [AWARNING] and [ACAUTION]. [AWARNING]: Wrong installation would cause serious consequences such as injuries or death △CAUTION: Wrong installation might cause serious consequences depending on circumstances. Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown on the right: Never do it under any circumstances. cording to the instruction.
- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit. Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

⚠ WARNING

Installation should be performed by the specialist.

0 If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit.

Install the system correctly according to these installation manuals.

on may cause explosion, injury, water leakage, electric shock, and fire

●Check the density refered by the foumula (accordance with ISO5149).

If the density exceeds the limit density, please consult the dealer and installate the ventilation system

•Use the genuine accessories and the specified parts for installation.

If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit

• Ventilate the working area well in case the refrigerant leaks during installation.

If the refrigerant contacts the fire, toxic gas is produced

Install the unit in a location that can hold heavy weight. tallation may cause the unit to fall leading to accid

Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes.

Improper installation may cause the unit to fall leading to accidents

Do not mix air in to the cooling cycle on installation or removal of the air conditioner.

If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injurie

Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit. Power source with insufficient capacity and improper work can cause electric shock and fire

•Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in

order not to apply unexpected stress on the terminal.

Loose connections or hold could result in abnormal heat generation or fire

■ Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services

Improper fitting may cause abnormal heat and fire.

Check for refrigerant gas leakage after installation is completed.

If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced

•Use the specified pipe, flare nut, and tools for R410A.

Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle

Tighten the flare nut according to the specified method by with torque wrench.

f the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period

● Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can

Poisonous gases will flow into the room through drainage pine and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant lea

Connect the pipes for refrigeration circuit securely in installation work before compressor is operated. If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due

to abnormal high pressure in the system • Stop the compressor before removing the pipe after shutting the service valve on pump down work.

If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit

and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle

•Only use prescribed optional parts. The installation must be carried out by the qualified installer. you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire

Do not repair by yourself. And consult with the dealer about repair.

Improper repair may cause water leakage, electric shock or fire Consult the dealer or a specialist about removal of the air conditioner.

Improper installation may cause water leakage, electric shock or fire

Turn off the power source during servicing or inspection work.

If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.

lacktriangle Do not run the unit when the panel or protection guard are taken off.

Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper running

⚠ CAUTION

Perform earth wiring surely.

ect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock or fire due to a short circuit.

Earth leakage breaker must be installed.

If the earth leakage breaker is not installed, it could cause electric shocks or fire.

 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.

Connecting the circuit by wire or copper wire could cause unit failure and fire

If the gas leaks and gathers around the unit, it could cause fire.

 Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handled.

Do not use the indoor unit at the place where water splashes such as laundry.

Indoor unit is not waterproof. It could cause electric shock and fire.

It could cause the damage of the items.

Do not install nor use the system near equipments which generate electromagnetic wave or high harmonics.

Do not install the indoor unit at the place listed below.

Places where flammable gas could leak.

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Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit

according to the installation manual for each model because each indoor unit has each limitation)

Locations with any obstacles which can prevent inlet and outlet air of the unit Locations where vibration can be amplified due to insufficient strength of structure

Locations where drainage cannot run off safely.
 It can affect performance or function and etc..

Do not put any valuables which will break down by getting wet under the air conditioner.

Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use.

It could cause the unit falling down and injury. Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit.

If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. o avoid damaging, keep the indoor unit packed or cover the indoor unit

 $Improper \ connection \ of \ the \ drain \ pipe \ may \ cause \ dropping \ water \ into \ room \ and \ damaging \ user's \ belongings$

• Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit. Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen) to user's health and safety.

 Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can

• For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps, and not to make air-bleeding.

Ensure the insulation on the pipes for refrigeration circuit so as not to condense water.

Incomplete insulation could cause condensation and it would wet ceiling, floor, and any other val

Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the use

Pav extra attention, carrying the unit by hand.

It may cause the breakdown of the system due to clogging of the heat exchange

Do not touch any button with wet hands.

The pipe during operation would become very hot or cold according to the operating condition, and it could ca

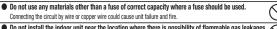
Do not clean up the air conditioner with water.

Do not turn off the nower source immediately after stonning the operation.

Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown

It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury

Using the incorrect one could cause the system failure and fire



Do not install the indoor unit near the location where there is possibility of flammable gas leakages

It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire

 Secure a space for installation, inspection and maintenance specified in the manual. a Insufficient space can result in accident such as personal injury due to falling from the installation place.

Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art.

Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunication equipment might influence the air conditioner and cause a malfunction and breakdown. Or the air conditioner might

influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause jamming. Do not install the remote control at the direct sunlight.

It could cause breakdown or deformation of the remote control.

Places where carbon fiber, metal powder or any powder is floated. Place where the substances which affect the air conditioner are generated such as suffide gas, chloride gas, acid, alkali or ammonic atmospheres. Places exposed to oil mist or steam directly.

On vehicles and ships

Places where machinery which generates high harmonics is used.

smoke from a chimney. Altitude over 1000m

frequently used. Highly salted area such as beach.

Places where cosmetics or special sprays are

Heavy snow area
Places where the system is affected by

Locations where two around an oral amplined use or insurincent seeigh of succeeds.

Locations where the infraedr eceiver is exposed to the direct sunlight or the strong light beam. (in case of the infraed specification unit)

Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)

d drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's belo

Install the drain pipe to drain the water surely according to the installation manual.

Check if the drainage is correctly done during commissioning and ensure the space for inspection and mainti-

 Do not install the outdoor unit where is likely to be a nest for insects and small animals. eep the surroundings clean

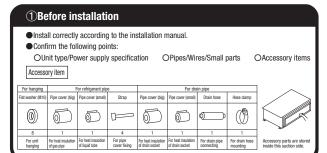
Leaving the materials may cause injury as metals like nail and woods are used in the package Do not operate the system without the air filter.

Do not touch the refrigerant piping with bare hands when in operation.

It could cause electric shock.

Do not control the operation with the circuit breaker.

OThis model is middle static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit.



2) Selection of installation location for the indoor unit

- ① Select the suitable areas to install the unit under approval of the user.
- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- · Areas where there is enough space to install and service.
- Areas where it can be drained properly. Areas where drain pipe descending slope can be taken.
- · Areas where there is no obstruction of airflow on both air return grille and air supply port.
- · Areas where fire alarm will not be accidentally activated by the air conditioner.
- · Areas where the supply air does not short-circuit.
- Areas where it is not influenced by draft air.
- · Areas not exposed to direct sunlight.
- Areas where dew point is lower than around 28°C and relative humidity is lower than 80%.
 This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the air conditioner is operated under the severer condition than mentioned above. If there is a possibility to use it under such a condition, attach additional insulation of 10 to 20mm thick for entire surface of indoor unit, refrigeration pipe and drain pipe.
- · Areas where TV and radio stays away more than 1 m. (It could cause jamming and noise.)
- Areas where any items which will be damaged by getting wet are not placed such as food, table wares, server, or medical equipment under the unit.
- · Areas where there is no influence by the heat which cookware generates.
- Areas where not exposed to oil mist, powder and/or steam directly such as above fryer.
- Areas where lighting device such as fluorescent light or incandescent light doesn't affect
 the operation.
 (A beam from lighting device sometimes affects the infrared receiver for the wireless remote

control and the air conditioner might not work properly.)

② Check if the place where the air conditioner is installed can hold the weight of the unit. If it is

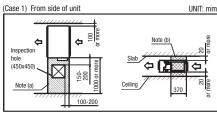
(2) Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.

Space for installation and service

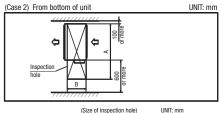
Make installation altitude over 2.5m.

(Indoor Unit)

Select either of two cases to keep space for installation and services.



Notes (a) There must not be obstacle to draw out fan motor. (________ marked area)
(b) Install refrigerant pipe, drain pipe, and wiring so as not to cross ______ marked area



(Size of inspection hole) UNIT:								
Single type	50	50 60-71						
Multi type	22-56	71-90	112-160					
A	1100	1300	1720					
В	62	725						

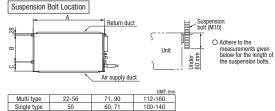
3Preparation before installation

If suspension bolt becomes longer, do reinforcement of earthquake resistant.
 OFor grid ceiling

When the suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

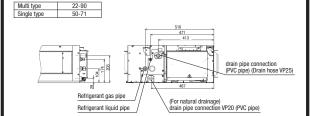
- Oln case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength.
- When suspension bolt length is over 1000mm, apply the earthquake resistant brace to the bolt.

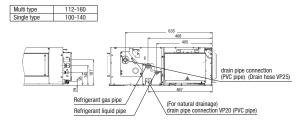
• Prepare four (4) sets of suspension bolt, nut and spring washer (M10) on site.

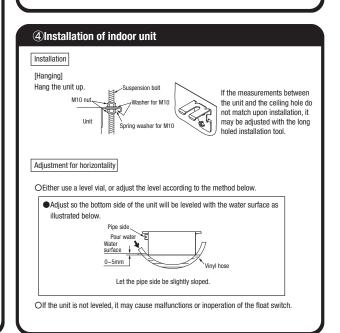


			UNIT: mm
Multi type	22-56	71, 90	112-160
Single type	50	60, 71	100-140
Α	786	986	1404
В	472	472	530
С	135	135	180

Pipe locations UNIT: mm







(5) Duct Work

- ① A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.
- An air filter can be provided on the main body of the air conditioner (on the inlet port). Remove it when connecting the duct on the inlet port.

2 Blowout duct

Use rectangular duct to connect with unit.
 Duct size for each unit is as shown below.

			UNIT: mm
Single type	50	60-71	100-140
Multi type	22-56	71-90	112-140
A	682	882	1202
В	172	172	172
В	•	•	100

- Duct should be at their minimum length.
- We recommend to use sound and heat insulated duct to prevent it from condensation.
- Connect duct to unit before ceiling attachment.

3 Inlet port

- When shipped the inlet port lies on the back.
- When connecting the duct to the inlet port, remove the air filter if it is fitted to the inlet port.
- •When placing the inlet port to carry out suction from the bottom side, use the following procedure to replace the suction duct joint and the bottom plate.







 Replace the removed bottom plat and duct joint.



- Fit the duct join with a screw; fit the bottom plate.
- Make sure to insulate the duct to prevent dewing on it.

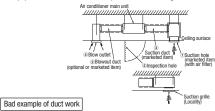
 Install the specific blowout duct in a location where the air will
- circulate to the entire room.

 Conduct the installation of the specific blowout hole and the connection of the duct before attaching them to the ceiling.

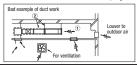
 Insulate the area where the duct is secured by a band for dew condensation prevention.



⑤Make sure provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.



- ①If a duct is not provided at the suction side but it is substituted with the space over the ceiling humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.
 - a)Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling. Unit should be operated under the conditions as listed in the above table and within the limitation of wind volume. When the building is a concrete structure, especially immediately after the construction, humidity tends to rise even if the space over the ceiling is not substituted in place of a duct. In such occasion, it is necessary to insulate the entire unit with glass wool (25mm). (Use a wire net or equivalent to hold the glass wool in place.)
 - b)It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35°C DB, suction air temperature is 27°C WB) and it could result in such troubles as compressor overload, etc..
 - c)There is a possibility that the blow air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from be heat exchanger may fall to reach the drain pan but leak outside (Example: drip on to the ceiling) with consequential water leakage in the room.
- ②If vibration damping is not conducted between the unit and the duct, and between the unit and the slab, vibration will be transmitted to the duct and vibration noise may occur. Also, vibration may be transmitted from the unit to the slab. Vibration damping must be performed.



(5) Duct Work (continued)

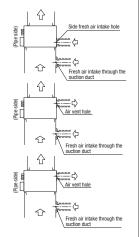
Connecting the air intake/vent ducts

①Fresh Air Intake

[for air intake duct only]

OUse the side fresh air intake hole, or supply through a part of the suction duct.

[for simultaneous air intake/vent]
OIntake air through the suction duct.
(the side cannot be used)



(always use together with the air intake)

Olnsulate the duct to protect it from dew condensation.

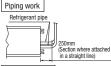
6Refrigerant pipe

OUse the side air vent hole.

Caution

2)Air Vent

- ●Use the new refrigerant pipe.
- When re-using the existing pipe system for R22 or R407C, pay attention to the following items.
- · Change the flare nuts with the attached ones (JIS category 2), and reprocess the flare parts.
- · Do not use thin-walled pipes.
- Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation. In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
- Do not use any refrigerant other than R410A.
 - Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.
- Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
- Use special tools for R410A refrigerant.



When conducting piping work, make sure to allow the pipes to be aligned in a straight line for at least 250 mm, as shown in the left illustration. (This is necessary for the drain pump to function)

Work procedure

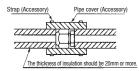
- 1. Remove the flare nut and blind flanges on the pipe of the indoor unit.
- Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the
 nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them.
 (Gas may come out at this time, but it is not abnormal.)
- Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
- Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit. XBend the pipe with as big radius as possible and do not bend the pipe repeatedly. In addition, do not twist and crush the pipes.

※Do a flare connection as follows:

- Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them.
- When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table below. Make sure to hold the pipe on the indoor unit securely by a spanner when tightening the nut in order to avoid unexpected stress on the copper pipe.
- Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
 - Make sure to insulate both gas pipes and liquid pipes completely
 - *Incomplete insulation may cause dew condensation or water dropping.
- Refrigerant is charged in the outdoor unit.

As for the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.

Ì	Pipe diameter	Tightening torque N⋅m
	φ 6.35	14 to 18
	φ 9.52	34 to 42
	φ 12.7	49 to 61
	ф 15.88	68 to 82



7Drain pipe

Caution

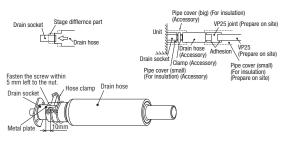
- Install the drain pipe according to the installation manual in order to drain properly.
 Imperfection in draining may cause flood indoors and wetting the household goods, etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen).
 In addition, it may cause corrosion of heat exchanger and bad smell.
- Connect the pipe securely to avoid water leakage from the joint.
- Insulate the pipe properly to avoid condensation drop.
- Check if the water can flow out properly from both the drain outlet on the indoor unit and the end
 of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

Work procedure

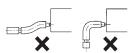
Make sure to insert the drain hose (the end mode of soft PVC) to the end of the step part
of drain socket.

Attach the hose clamp to the drain hose around 10mm from the end, and fasten the screw within 5mm left to the nut.

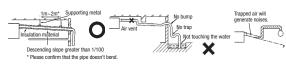
- Do not apply adhesives on this end.
- Do not use acetone-based adhesives to connect to the drain socket.



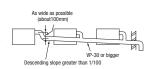
- Prepare a joint for connecting VP-25 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-25 pipe (prepare on site).
 XAs for drain pipe, apply VP-25 made of rigid PVC which is on the market.
 - Make sure that the adhesive will not get into the supplied drain hose.
 It may cause the flexible part broken after the adhesive is dried up and gets rigid.
 - The flexible drain hose is intended to absorb a small difference at installation of the unit or drain pipes. Intentional bending, expanding may cause the flexible hose broken and water leakage.



- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.
 - Pay attention not to give stress on the pipe on the indoor unit side, and support and fix the pipe as close place to the unit as possible when connecting the drain pipe.
 - ●Do not set up air vent.



•When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.

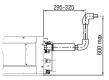


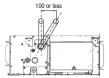
- 4. Insulate the drain pipe.
 - Be sure to insulate the drain socket and rigid PVC pipe installed indoors otherwise it may cause dew condensation and water leakage.
 - After drainage test implementation, cover the drain socket part with pipe cover (small size), then use the pipe cover (big size) to cover the pipe cover (small size), clamps and part of the drain hose, and fix and wrap it with tapes to wrap and make joint part gapless.

7 Drain pipe (continued)

Drain up

• The position for drain pipe outlet can be raised up to 600mm above the ceiling. Use elbows for installation to avoid obstacles inside ceiling. If the horizontal drain pipe is too long before vertical pipe, the backflow of water will increase when the unit is stopped, and it may cause overflow of water from the drain pan on the indoor unit. In order to avoid overflow, keep the horizontal pipe length and offset of the pipe within the limit shown in the figure below.





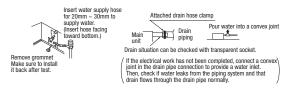
Otherwise, the construction point makes it same as drain pipe construction.

Drain test

- 1. Conduct a drain test after completion of the electrical work.
- 2. During the trail, make sure that drain flows properly through the piping and that no water leaks from connections.
- 3. In case of a new building, conduct the test before it is furnished with the ceiling.
- 4. Be sure to conduct this test even when the unit is installed in the heating season.

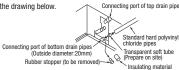
Procedures

- 1. Supply about 1000 cc of water to the unit through the air outlet by using a feed water pump.
- 2. Check the drain while cooling operation.



Outline of bottom drain piping work

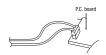
 If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.



Uncoupling the drain motor connector

 Uncouple the connector CNR for the drain motor as illustrated in the drawing on the right.

Note: If the unit is run with the connector coupled, or drain water will be discharged from the upper drain pipe joint, causing a water leak.

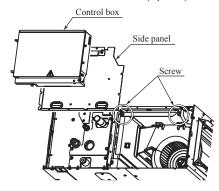


(b) Replacement procedure of the fan unit

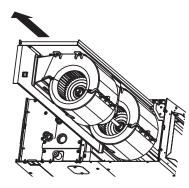
Notes(1) The unit is a heavy item. It must be supported securely and handled with care not to drop when it is necessary to replace. (2) For the maintenance space, refer to page 127.

(i) Model FDUM71VF1

1) Remove the control box and the side panel, and remove the screws marked in the circles (2 places) in the figure.

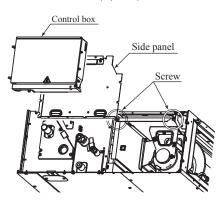


2) Take out the fan unit in the arrow direction.

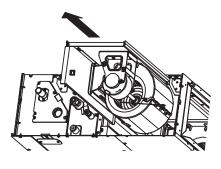


(ii) Model FDUM100VF1

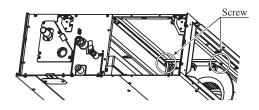
 Remove the control box and the side panel, and remove the screws marked in the circles (2 places) from the unit located at the near side.



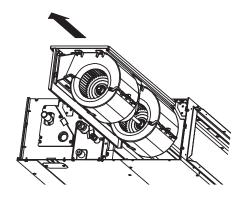
2) Take out the fan unit located at the near side in the arrow direction.



3) Remove the screws marked in the circles (2 places) from the fan unit located at the far side.



4) Take out the fan unit in the arrow direction.



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(5) Floor standing type (FDF)

This manual is for the installation of an indoor unit.

For electrical wiring work (Indoor), refer to page 144. For remote control installation, refer to page 148. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to Page 162.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, [AWARNING] and [ACAUTION] MARNING: Wrong installation would cause serious consequences such as injuries or death. ACAUTION: Wrong installation might cause serious consequences depending on circumstances.
- Both mentions the important items to protect your health and safety so strictly follow them by any means. ● The meanings of "Marks" used here are as shown on the right:
- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit. Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

↑ WARNING

Installation should be performed by the specialist.

If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit

Install the system correctly according to these installation manuals

Improper installation may cause explosion, injury, water leakage, electric shock, and fire

Check the density refered by the foumula (accordance with ISO5149).

If the density exceeds the limit density, please consult the dealer and installate the ventilation system

•Use the genuine accessories and the specified parts for installation.

specified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit.

Ventilate the working area well in case the refrigerant leaks during installation.

If the refrigerant contacts the fire, toxic gas is produced

Install the unit in a location that can hold heavy weight.

Improper installation may cause the unit to fall leading to accidents • Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes

tion may cause the unit to fall leading to accidents

Do not mix air in to the cooling cycle on installation or removal of the air conditioner. If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and iniu

Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.

Power source with insufficient capacity and improper work can cause electric shock and fire

• Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in

ler not to apply unexpected stress on the terminal. Loose connections or hold could result in abnormal heat generation or fire

● Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services

Improper fitting may cause abnormal heat and fire.

● Check for refrigerant gas leakage after installation is completed.

If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced

Use the specified pipe, flare nut, and tools for R410A.

Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle ● Tighten the flare nut according to the specified method by with torque wrench

If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long perio

• Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can

Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak

• Connect the pipes for refrigeration circuit securely in installation work before compressor is operated.

If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system.

Stop the compressor before removing the pipe after shutting the service valve on pump down work. If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit

ould cause explosion and injuries due to abnormal high pressure in the cooling cycle Only use prescribed optional parts. The installation must be carried out by the qualified installer.

If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire

● Do not repair by yourself. And consult with the dealer about repair

mproper repair may cause water leakage, electric shock or fire

 Consult the dealer or a specialist about removal of the air conditioner. Improper installation may cause water leakage, electric shock or fire

• Turn off the power source during servicing or inspection work. If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating far

● Do not run the unit when the panel or protection guard are taken off.

Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get burned, or electric shock.

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper runn

↑ CAUTION

Perform earth wiring surely.

Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Imperfect earth work (grounding) could cause an electric shock or fire if some trouble or earth leakage occurs

Earth leakage breaker must be installed.

Unless the earth leakage circuit breaker is provided, if could cause a fire or electric shock

 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.

Using the incorrect one could cause the system failure and fire

 Do not use any materials other than a fuse of correct canacity where a fuse should be used. Connecting the circuit by wire or copper wire could cause unit failure and fire.

 Do not install the indoor unit near the location where there is possibility of flammable gas leakages. If the gas leaks and gathers around the unit, it could cause fire.

 Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handled. It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire.

Secure a space for installation, inspection and maintenance specified in the manual.

Insufficient space can result in accident such as personal injury due to falling from the installation place.

Do not use the indoor unit at the place where water splashes such as laundry.

Indoor unit is not waterproof. It could cause electric shock and fire.

 Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art. It could cause the damage of the items.

Do not install nor use the system near equipments which generate electromagnetic wave or high harmonics.

Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunication equipment might influence the air conditioner and cause a malfunction and breakdown. Or the air conditioner might influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause iam

 Do not install the remote control at the direct sunlight. It could cause breakdown or deformation of the remote control.

Do not install the indoor unit at the place listed below.

Places where flammable gas could leak

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- Places where carbon fiber, metal powder or any powder is floated.
- Place where the substances which affect the air condit
- such as sulfide gas, chloride gas, acid, alkali or ammonic atmospheres.

 Places exposed to oil mist or steam directly.

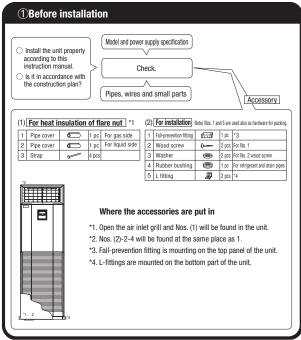
- On vehicles and ships Places where machinery which generates high harmonics is used.
- Places where cosmetics or special sprays at frequently used. Highly salted area such as beach.
- Heavy snow area Places where the system is affected by
- - Altitude over 1000m

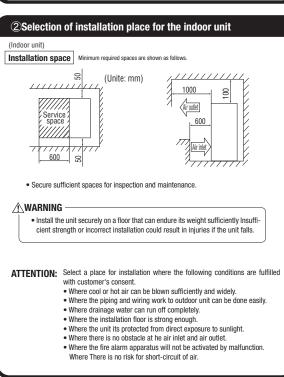
Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit.) to not missan the industry with the rocations insect before the state to instant the industry and incording to the installation manual for each model because each indoor unit has each limitation) Locations with any obstacles which can prevent inlet and outlet air of the unit Locations where vibration can be amplified due to insufficient strength of structure.

- Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the infrared specification unit)

 Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed with
- Locations where drainage cannot run off safely. It can affect performance or function and etc.
- Do not put any valuables which will break down by getting wet under the air conditioner.
- Condensation could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's belongings. Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use. It could cause the unit falling down and injury.
- Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit
- If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and lea To avoid damaging, keep the indoor unit packed or cover the indoor unit.

Install the drain pipe to drain the water surely according to the installation manual. a Improper connection of the drain pipe may cause dropping water into room and damaging user's belongings Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit. Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen) to Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen occur, which can cause serious accidents For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps, and not to make air-bleeding. Check if the drainage is correctly done during commissioning and ensure the space for inspection and mainte Ensure the insulation on the pipes for refrigeration circuit so as not to condense water. 0 densation and it would wet ceiling, floor, and any other valuable Incomplete insulation could cause of Do not install the outdoor unit where is likely to be a nest for insects and small animals Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the user to Pav extra attention, carrying the unit by hand 0 Carry the unit with 2 people if it is heavier than 20kg. Do not use the plastic straps but the grabbing place, moving the unit by hand. Use protective gloves in order to avoid injury by the aluminum fin. Make sure to dispose of the packaging material. O Leaving the materials may cause injury as metals like nail and woods are used in the package Do not operate the system without the air filter. It may cause the breakdown of the system due to cloqqing of the heat exchanger Do not touch any button with wet hands. It could cause electric shock Do not touch the refrigerant piping with bare hands when in operation. The pipe during operation would become very hot or cold according to the operating condition, and it could cause a burn or Do not clean up the air conditioner with water. It could cause electric shock. Do not turn off the power source immediately after stopping the operation Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdow Do not control the operation with the circuit breaker It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury

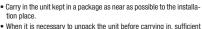




3 Carrying-in and installation of the unit

Carrying-in

ATTENTION:

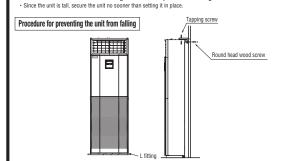


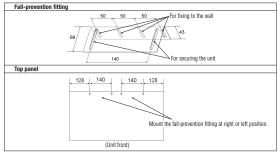


When placing the unit on the floor after unpacking, be sure to have its front face at the top.

3 Carrying-in and installation of the unit (Continued)

• Be sure to fix the unit with L-fittings and the fall-prevention fitting.

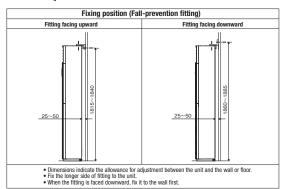




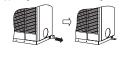
(1) Fixing the unit with the fall-prevention fitting



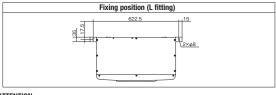
- (1)Loosen screws (2 pcs) and remove the fallprevention fitting.
- 2)Select a position to fix the fall-prevention fitting as illustrated and fix it to the top of unit and the
 - · The fixing positon of the fall-prevention fitting is as illastrated below



(2) Fixing the unit with the L-fittings



- ①Remove the L-fittings mounted on the unit with
- 2)Turn over the L-fitting and fix it to the unit and either the floor or the wall as illustrated.
- · Fixing position of the L-fittings are as illustrated



ATTENTION:

Install the unit on the level.
Inclination must be less than 1°in fore-aft and right-left directions.

4 Refrigerant piping

Caution

Use the new refrigerant pipe.

When re-using the existing pipe system for R22 or R407C, pay attention to the following items

- Change the flare nuts with the attached ones (JIS category 2), and reprocess the flare parts.
- · Do not use thin-walled pipes.
- •Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation.

In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.

Do not use any refrigerant other than R410A.

Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And if air getting into refrigerant circuit, it may cause anomaously high pres and may result in burst, etc.

- Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
- •Use special tools for R410 refrigerant.

Work procedure

- 1. Remove the flare nuts and flare caps from the pipes of the indoor unit.
 - ** Make sure to loosen the flare nut by holding the flared male fitting with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them.

(Gas may come out a little at this time, but it is no anomaly.)

Pay attention that the flare nut may pop out.

(Because it is sometimes pressurized in the indoor unit)

2. Make a flare on liquid pipe and gas pipe, and connect the refrigrant pipes to the indoor unit.

**Bend the pipe with as big radius as possible and do not bend the pipe repeatedly. In addition, do not twist and crush the pipes.

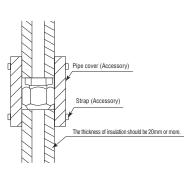
*Do a flare connection as follows:

- Make sure to loosen the flare nut by holding the flared male fitting with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the cooper pipe, and then remove them.
- When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it with a spanner within the specified torque mentioned in the table below.

Make sure to hold the flared male fitting on the indoor unit side with another spanner when tightening the nut in order to avoid unexpected stress on the copper pipe.

- 3. Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
 - Make sure to insulate both gas pipes and liquid pipes completely.
 - ★Incomplete insulation may cause dew condensation and dew dropping.
- 4. Refrigerant is pre-charged in the outdoor unit.

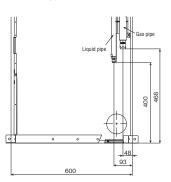
As for the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.



Pipe diameter	Tightening torque N⋅m
φ 6.35	14 to 18
φ 9.52	34 to 42
φ 12.7	49 to 61
ф 15.88	68 to 82
ф 19.05	100 to 120

4Refrigerant piping (Continued)

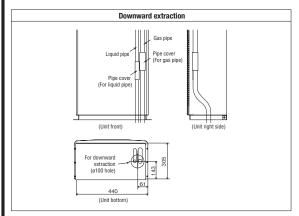
Pipe and wire extracting position

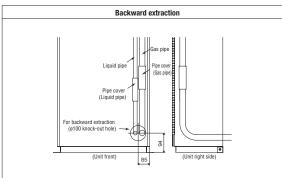


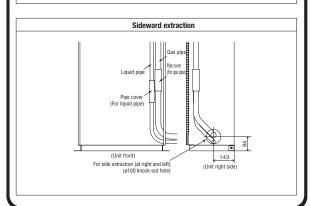
ATTENTION:

 Do not cut off the flange at the hole on the base plate for the downward extraction.









⑤Drain pipe

! WARNING

• Do not insert the drain pipe directly in the drain ditch where toxic gases such as sulffuric gas are produced.
Toxic gas may flow into the room.

ACAUTION

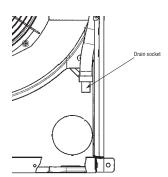
• Install the drain pipe properly according to the installation manu And insulate it to prevent from dew condensation.

Improper installation of drain pipe may cause damage of furniture drainage water leaked or dew condensation.

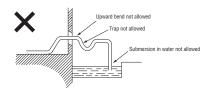
Procedure

- 1. Connect the drain socket to the drain pipe (PV-20) provided at site and fix the joint with
- adhesive tape, or the like.

 When the pipe provided at site runs through a room, insulate the pipe with a commercial insulator (Polyethylene foam: Specific gravity 0.03, thickness 15 mm or more) to prevent dewing.







- Insulate the drain pipe to prevent dewing. (Especially in room and unit)
- Incline the drain pipe downward to the outlet (1/50 1/100). Upward bend or trap is not allowed on the way.
- Use a commercial hard polyvinyl chloride pipe, PV-20, for the drain pipe. <Use of adhesive agent is prohibited.>

6Wire extracting position and wire connecton

Control box position and power cable connection

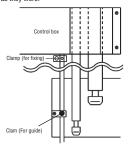
- Electric work must be made by qualified electricians according to the "Engineering standards concerning electric equipment", "Extension wiring regulations" and the electric wiring work manual. Be sure to use dedicated electric circuits.
- Make sure to use specified wires for wiring, and connect them securely. Clamp the wires to protect the terminal connection from external force.

 • Make sure to protect the unit with the D-type grounding work.
- For details of wiring work, refer to the attached electric wiring work manual.

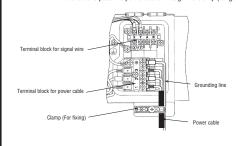


Procedure

- (1) Remove the control box cover (fixed with a screw).
- 2Introduce wires in the unit and connect securely on the terminals.
- ③Fix each wire with a clamp (for fixing).
- (4) Install removed parts as they were.



Make sure to pass the power cable through the clamp (for guide).



7Check list after installation

Check the following items after all installation work completed.

Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for gas leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Supply voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks airflow on air inlet and outlet?	Insufficient capacity	

(6) Effective range of cool/hot wind (Reference)

(a) FDT series

Guideline for ceiling height

Ean Smood Sotting	Model		
Fan Speed Setting	FDT71VF1	FDT100VF1	
Hi	3.0m	3.2m	
PHi	3.8m	4.3m	

Notes (1) If the ceiling height is over 3m, please consider to add circulators.

This table shows reference values in case of four outlet.

If you shut some outlets, they are different.

Fan speed setting can be changed by using a wired remote control.

(b) FDEN series

Model	Effective range	
FDEN71VF1	8.0m	
FDEN100VF1	9.0m	

[Conditions] 1. Height of unit: 2.4 - 3.0 (m) above floor level

2. Fan speed: Hi

3. Location: Free space without obstacles

4. The effective range means the horizontal distance for wind to reach the floor.

5. Wind speed at the effective range: 0.5 m/s

(c) FDF series

Model	Effective range
FDF71VD1	5m
FDF100VD1	8m

[Conditions] 1. Fan speed: Hi

2. Location: Free space without obstacles

3. The effective range means the horizontal distance for the wind to reach the floor.

4. Wind speed at the effective range: 0.5 m/s

5.2 Electric wiring work installation

(1) FDT, FDEN, FDUM, series

PSB012D999

Electrical wiring work must be performed by an electrician qualified by a local power provider according to the electrical installation technical standards and interior wiring regulations applicable to the installation site.

Security instructions

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.

[AWARNING]: Wrong installation would cause serious consequences such as injuries or death. ACAUTION : Wrong installation might cause serious consequences depending on circumstances. Both mentions the important items to protect your health and safety so strictly follow them by any means.

- The meanings of "Marks" used here are as shown on the right: Never do it under any circumstances.
- Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short circuit.

↑WARNING

●Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.

Power source with insufficient capacity and improper work can cause electric shock and fin

- Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal. Loose connections or hold could result in abnormal heat generation or fire.
- Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property. Improper fitting may cause abnormal heat and fire.
- Ouse the genuine optional parts. And installation should be performed by a specialist.

 If you install the unit by yourself, it could cause water leakage, electric shock and fire

- Do not repair by yourself. And consult with the dealer about repair. Improper repair may cause water leakage, electric shock or fire.
- Consult the dealer or a specialist about removal of the air conditioner. Improper installation may cause water leakage, electric shock or fire
- Turn off the power source during servicing or inspection work. If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper running.

△CAUTION

Perform earth wiring surely.

Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short circuit.

Earth leakage breaker must be installed.

Use power source line of correct capacity.

SW7-1

0FF

- If the earth leakage breaker is not installed, it can cause electric shocks
- Make sure to install earth leakage breaker on power source line. (countermeasure thing to high harmonics.) Absence of breaker could cause electric shock
- Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.
 Using the incorrect one could cause the system failure and fire
- Do not use any materials other than a fuse of correct capacity where a fuse
- Connecting the circuit by wire or copper wire could cause unit failure and fire.
- Using incorrect capacity one could cause electric leak, abnormal heat generation and fire.
- Do not mingle solid cord and stranded cord on power source and signal side
- In addition, do not mingle difference capacity solid or stranded cord. Inappropriate cord setting could cause loosing screw on terminal block, bad electrical contact, smoke and fire.
- Do not turn off the power source immediately after stopping the operation. Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or
- Do not control the operation with the circuit breaker.

 It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.

Control mode switching The control content of indoor units can be switched in following way. (is the default setting) Switch No Control Content SW2 Indoor unit address (0-Fh) SW5-1 Master/Slave Switching (plural /Slave unit Setting) SW5-2 Model capacity setting SW6-1~4 ON Operation check, Drain motor test run

Normal operation

①Electrical Wiring Connection

- Electrical wiring work must be performed by an electlician an qualified by a local power provider. These wiring specifications are determined on the assumption that the following instructions are observed:
- 10 Don clus cords other than copper ones.
 Do not use any supply line lighter than one specified in parentheses for each type below.
 -braided cord (code designation God24 Elec 5.1), if allowed in the relevant part 2;
 -ordinary tough rubber sheathed cord (code designation 60245 Elec 5.3);
 -flat twin tinsel cord (code designation 60247 Elec 4.1);
 -ordinary polyinyl chloride sheathed cord (code designation 60247 Elec 5.3);
 (2) Connect the power supply to the outdoor unit.
 2) Parve arta afterion so as not to confuse signal line and power source line connection, because an error in their connection can be burn all the boards at once.
- Screw the line to terminal block without any looseness, certainly.
- Do not turn on the switch of power source, before all of line work is done.
- Provide a dedicated branching circuit and never share a branching circuit with other equipment. If shared, disconnection at the circuit breaker may occur, which can cause secondary damage.
- Use three-core cable as wiring between indoor and outdoor unit. As for detail, refer to "INSTALLATION MANUAL" of outdoor Unit
- Set earth of D-type.

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 Do not add cord in the middle of line (of indoor power source, remote control and signal) route on outside of unit. If connecting point is flooded, it could cause problem as for electric or communication.

(In the case that it is necessary to set connecting point on the signal line way, perform thorough waterproof measurement.)

- Run the lines (power source, remote control and "between indoor and outdoor unit") upper ceiling through iron pipe or other tube protection to avoid the damage by mouse and so on.
- Keep "remote control line" and "power source line" away from each other on constructing
- Do not connect the power source line [220V/240V/380V/415V] to signal side terminal block.
- Otherwise, it could cause failure. Connection of the line ("Between indoor and outdoor unit", Earth and Remote control)
- Connection of the line ("Between indoor and outdoor unit", Earth and Hemote control)

 Of Renowe lid of control box before connect the above lines, and connect the lines to terminal block according to number pointed on label of terminal block.
 In addition, pay enough attention to confirm the number to lines, because there is electrical polarity except earth line.
 Furthermore, connect earth line to earth position of terminal block of power source.

 Of lintal earth leakage breaker on power source line. In addition, select the type of breaker for inverter circuit as earth leakage breaker.

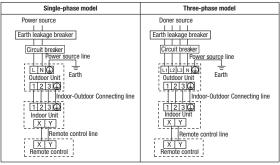
 Of lith the function of selected earth leakage breaker is only for earth-fault protection, hand switch (switch listed and type "B" fuse) or circuit breaker is required in series with the earth leakage breaker.

 Of listal isolator of disconnect switch on the power supply wining in accordance with the local codes and regulations.

 The isolator should be set in the box with key to prevent touching by another person when servicing.

Cable connection for single unit installation

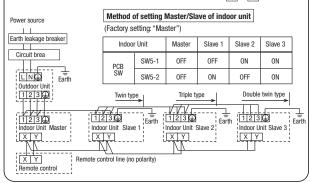
- ①As for connecting method of power source, select from following connecting patterns. In principle, do not directly connect power souce line to inside unit.
- country with referring to technical documents, and follow its instruction.
- 2) For cable size and circuit breaker selection, refer to the outdoor unit installation manual



Cable connection for a V multi configuration installation

- ①Connect the same pairs number of terminal block "①, ②, and ③"and " X and Y" between master and slave indoor units.
- 2Do the same address setting of all inside units belong to same refrigerant system by rotary switch SW2 on indoor unit's PCB (Printed circuit board).

 ③Set slave indoor unit as "slave 1" through "slave 3" by address switch SW5-1, 5-2 on PCB.
- When the AIR CON NO. button on the remote control unit is pressed after turning on the power, an indoor unit's address number will be displayed. Do not fail to confirm that the connected indoor unit's numbers are displayed on the remote control unit by pressing the 🔳 or 🔻 button.



②Remote Control, Wiring and functions

- DO NOT install it on the following places
- 1)Places exposed to direct sunlight
- ②Places near heat devices
- (3)High humidity places
- 4 Hot surface or cold surface enough to generate condensation
- ⑤Places exposed to oil mist or steam directly.
- 6 Uneven surface

Installation and wiring of remote control

- ①Install remote control referring to the attached installation manual.
- ②Wiring of remote control should use 0.3mm² ×2 core wires or cables.

The insulation thickness is 1mm or more. (on-site configuration)

3 Maximum prolongation of remote control wiring is 600 m.

If the prolongation is over 100m, change to the size below.

But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

100 - 200m	0.5mm ² × 2 cores
Under 300m	0.75mm ² × 2 cores
Under 400m	1.25mm ² × 2 cores
Under 600m	$2.0 \text{mm}^2 \times 2 \text{ cores}$

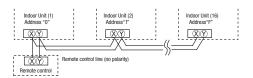
- Avoid using multi-core cables to prevent malfunction.
- ⑤Keep remote control line away from earth (frame or any metal of building).
- ⑥Make sure to connect remote control line to the remote control and terminal block of indoor unit. (No polarity)

Control plural indoor units by a single remote control.

①A remote control can control plural indoor units (Up to 16).

In above setting, all plural indoor units will operate under same mode and temperature setting. ②Connect all indoor units with 2 core remote control line.

③Set unique remote control communication address from "0" to "F" to each inside unit by the rotary switch SW2 on the indoor unit's PCB.



Master/ slave setting when more than one remote control unit are used

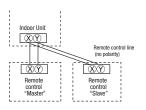
A maximum of two remote control units can be connected to one indoor unit (or one group of indoor units.)

The air conditioner operation follows the last operation of the remote control regardless of the master/slave setting of it.

Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and one (1) wireless kit" or "two (2) wireless kits".

Set one to "Master" and the other to "Slave".

Note:The setting "Remote control unit sensor enabled" is only selectable with the master remote control unit in the position where you want to check room temperature.



③ Operation and confirmation from remote control

Operation from RC-EX1A

Operation from RC-E5

Check the number of units connected in the remote control system.
 It checks sub units of twin, triple or W-twin connection.

"Menu" \Rightarrow "Next" \Rightarrow "Service & Maintenance" \Rightarrow "Input password" \Rightarrow "IU address"

Press AIR CON NO button to display the IU address. Press the ♥ or ♠ button and check addresses of connected indoor units one by one.

2 Check if each unit is connected properly in the remote control system. It cannot check main and sub units of twin, triple or W-twin connection.

When the operation is stopped, "Menu"⇒
"Next"⇒"Service & Maintenance"⇒
"Input password"⇒"IU address"⇒"check run mode"

If AIR CON NO. button is pressed when the operation is stopped, the indoor unit address is displayed. If you select one of addresses for connected indoor units by pressing the 🔻 or 🔊 button and press the 🖜 (MODE) button, the unit starts to blow a

3 Setting main/slave remote controls

"Menu"⇒"Next"⇒"R/C function settings"⇒
"Input password"⇒"Main/Sub of R/C"

Set SW1 to "Slave" for the slave remote control

4 Checking operation data

"Menu"⇒"Next"⇒"Service & Maintenance"⇒
"Input password"⇒"Operation data"

Press the (EHECK) button. ⇒ "(MRKNA)\(\hat{n}\) is displayed. ⇒ Press the the two (SET) button. ⇒ "(MRKNA)\(\hat{n}\) is displayed. ⇒ Press the "\(\hat{n}\) SEBITI III button. ⇒ Select one of addresses for connected indoor units by pressing the \(\hat{n}\) or \(\hat{v}\) button. ⇒ Press the two (SET) button. ⇒ "(MINI (MINI)\(\hat{n}\) is displayed. ⇒ Select data by pressing the \(\hat{n}\) or \(\hat{v}\) button. \(\hat{v}\) in the (MINI)\(\hat{n}\) is displayed.

5 Checking inspection display

"Menu"⇒"Next"⇒"Service & Maintenance"⇒
"Input password"⇒"Inspection display"

 $\begin{array}{|c|c|c|c|}\hline Press the \underline{CHECK} button. \Rightarrow & \hline \bullet button. \Rightarrow \\ ERR DATA. \Rightarrow Press the & \hline \bullet (SET) button. \Rightarrow \\ \text{"DATA LOADING" is displayed.} \Rightarrow Data. \end{array}$

6 Cooling test run from remote control

"Menu" ⇒ "Next" ⇒ "Installation settings" ⇒
"Input password" ⇒ "Test run" ⇒
"Cooling test run" ⇒ "Start"

(1) Start the system by pressing the [CONDEF] button.

2 Select * (2) (Cool)* with the (1) (MODE) button.

3 Press the [EST] button for 3 seconds or longer.

The scene display will suit the TEST RIM * **

4 When the (10) EST) button is pressed while * ** TEST RIM * **

is indicated, a cooling test now will start.

The screen display will switch **

This screen display will switch **

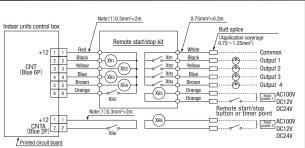
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7 Trial operation of drain pump from remote control

"Menu"⇒"Next"⇒"Installation settings"⇒
"Input password"⇒"Test run"⇒
"Drain pump test run"⇒"Run"

(") Press the TEST button for three seconds or longer.
The display will change " \$ TEST IRM ▼"
(2 Press the Test to the displayed.
(3 When the (18) SET) button is pressed, a drain pump operation will start. Display: " 6 (2) TIO STIP "

4 Function of CNT connector of indoor printed circuit board



Note (1): Do not use the length over 2 meter

● CNT connector (local) vendor model Connector : Made by molex 5264-06 Terminals : Made by molex 5263 T

Function

Output 1	Air conditioner operation output (When the air conditioner ON: XR1 = ON)		
Output 2	Heating output		
Output 3	Thermostat ON output (When the thermostat ON: XR3 = ON)		
Output 4	Air conditioner check ON (When checking air conditioner: XR4 = ON)		
	At shipping	XR5 OFF ⇒ ON: Air conditioner operates.	
Input		XR5 ON ⇒ OFF: Air conditioner stops.	
	*Function	ns and controls may vary depending on the switching at site.	
	At shipping	X_{R6} OFF \Rightarrow ON: Air conditioner operates.	
Input 2 (FDT etc.)		XR6 ON ⇒ OFF: Air conditioner stops.	
(1 D 1 Ctc.)	*Function	ns and controls may vary depending on the switching at site.	

* Refer to I/U settings.

CNTA connector is installed on FDT, etc. Refer to the spec. drawings

CNTA connector (local) vendor model Connector : Made by JST XAP02V-1-E Terminals : Made by JST SXA-01T-P0.6

⑥ Operation and setting from remote control

- A: Refer to the instruction manual for RC-EX series.
 B: Refer to the installation manual for RC-EX series.
 C: Loading a utility software vie Internet

 O: Nearly same function setting and operations are possible.

	Setting & display item	Description	RC-EX series	
Re	mote Control network			Т
	Control plural indoor units by a single remote control	A remote control can control plural indoor units up to 16 (in one group of remote control network). An address is set to each indoor unit.	0	(
2	Master/slave setting of remote controls	A maximum of two remote controls (include option wireless) can be connected to one indoor unit. Set one to "Master" and the other to "Slave".	В	(
0	P screen, Switch manipulation		Α	T
1 [Menu	"Control", "Settings", or "Details" can be selected. (319.)	Α	Т
2	Operation mode	"Cooling", "Heating", "Fan", "Dry" or "Auto" can be set.	Α	
ł	Set temp.	"Set temperature" can be set by 0.5°C interval.	Α	
	Air flow direction	"Air flow direction". [Individual flap control setting] can be set.	Α	
ŀ	Fan speed	"Fan speed" can be set.	A	
ı	Timer setting	"Timer operation" can be set.	A	Н
- H				+
. 1	ON/OFF	"On/Off operation of the system" can be done.	A	L
	High power SW	"High power operation" or "Normal operation" can be selected.	Α	┺
9	Energy-saving SW	"Energy-saving operation" or "Normal operation" can be selected.	Α	
En	nergy-saving settin		Α	
	Auto OFF timer [Administrator password]	For preventing the timer from keeping ON, set hours to stop operation automatically with this timer. -The selectable range of setting time is from 30 to 240 minutes (10minutes interval) -When setting is "Valid", this timer will activate whenever the ON timer is set.	Α	-
	Peak-cut timer [Administrator password]	Power consumption can be reduced by restricting the maximum capacity. Set the [Start time], the [End time] and the capacity limit % (Peak-cut %). -4-operation patterns per day can be set at maximum. -The setting time can be changed by 5-minutes interval. -The selectable range of capacity limit % (Peak-cut %) is from 0% to 40-80% (20% interval). -Holiday setting is available.	А	
	Automatic temp. set back [Administrator password]	After the elapse of the set time period, the current set temp. will be set back to the [Set back temp.] 'The setting can be done in cooling and heating mode respectively. 'The selectable range of the set time is from 20 min. to 120 min. (10 min. interval). 'Set the [Set back temp.] by 1°C interval.	Α	
nc	dividual flap control setting		Α	Т
- 1	Individual flap control setting	The moving range (the positions of upper limit and lower limit) of the flap for individual air outlet port can be set.	Α	1
	ntilation	The moving range (and positions or appear infinit and nowles infinity of the hap for individual air outlet port dail so oct.	-/-	+
1	External ventilation (In combination with ventilator)	On/Off operation of the external ventilator can be done. -The settings of [Interlock] with AC (air-conditioner); [Single operation] of ventilator or operation [invalid] of ventilation can be done through [Ventilation settings] in the [Remote controller] menu.	Α	
ilte	er sign reset		Α	
	Filter sign reset	The filter sign can be reset.	В	+
ŀ	Setting next cleaning date	The next cleaning date can be set.	A	+
_		The flext cleaning date can be set.	Α	╁
	ial settings		_	╀
ŀ	Clock setting	The current date and time can be set or revised.	Α	1
ŀ	Date and time display	[Display] or [Hide] the date and/or time can be set, and the [12H] or [24H] display can be set.	Α	\perp
3	Summer time	When select [Valid], the +1hour adjustment of current time can be set.When select [Invalid], the [Summer time] adjustment can be reset.	Α	\perp
1	Contrast	The contrast of LCD can be adjusted higher or lower.	Α	
5	Backlight	Switching on/off a light can be set and the period of the lighting time can be set within the range of 5sec-90sec (5sec interval).	Α	Г
3	Controller sound	It can set with or without [Controller sound (beep sound)] at touching panel.	Α	П
im	ner settings		Α	\top
	Set On timer by hour	The period of time to start operation after stopping can be set. 'The period of set time can be set within the range of 1hour-12hours (1hr interval). 'The operation mode, set temp and fan speed at starting operation can be set.	Α	
	Set Off timer by hour	The period of time to stop operation after starting can be set. -The period of set time can be set within the range of 1hour-12hours (1hr interval).	Α	
3	Set On timer by clock	The clock time to start operation can be set. -The set clock time can be set by 5 minutes interval. -[Once (one time only)] or [Everyday] operation can be switched. -The operation mode, set temp and fan speed at starting operation can be set.	Α	
1	Set Off timer by clock	The clock time to stop operation can be set. -The set clock time can be set by 5 minutes interval. -[Once (one time only)] or [Everyday] operation can be switched.	Α	
5	Confirmation of timer settings	Status of timer settings can be seen.	Α	Γ
/ee	ekly timer			Г
	Weekly timer [Administrator password]	On timer and Off timer on weekly basis can be set. -8-operation patterns per day can be set at a maximum. -The setting clock time can be set by 5 minutes interval. +Noliday setting is available. -The operation mode, set temp and fan speed at starting operation can be set.	Α	
μ.	omo logvo mode			+
- 1	ome leave mode Home leave mode [Administrator password]	When leaving home for a long period like a vacation leave, the unit can be operated to maintain the room temperature not to be hotter in summer or not to be colder in winter. The judgment to switch the operation mode (Cooling⇔Heating) is done by the both factors of the set temp, and outdoor air temp.	Α	

	Setting & display item	Description	RC-EX	
	Iministrator settings	·	series A	1
-	Enable/Disable setting	[Administrator password] *Enable/Disable setting of operation can be set. [On/Off] [Change set temp.] [Change operation mode] [Change air flow direction]	A	╀
' '	inable/ bisable setting	[Individual flap control setting][Fan speed] [High power operation] [Energy-saving operation] [Timer settings] [Weekly timer settings]	Α	1,
		Request for administrator password can be set. [Individual flap control setting][Weekly timer][Energy-saving setting][Home leave mode][Administrator settings]	'`	
2	Silent mode timer	The period of time to operate the outdoor unit by prioritizing the quietness can be set.		
		•The [Start time] and the [End time] for operating outdoor unit in silent mode can be set. •The period of the operation time can be set once a day by 5 minutes interval.	Α	4
3	Setting temp. range	The upper/lower limit of indoor temp. setting range can be set.	A	1 2
.		•The limitation of indoor temp. setting range can be set for each operation mode in cooling and heating.		
-	Temp. increment setting RC display setting	The temp increment setting can be changed by 0.5°C or 1.0°C. Register [Room name] [Name of I/U]	Α	+
ال	no display setting	Display [indoor temp.] or not.		-
		Display [inspection code] or not.	Α	H
		Display [Heating stand-by] [Defrost operation] [Auto cooling/heating] or not		
6	Change administrator password	The administrator password can be changed. (Default setting is "0000")	Α	
		The administrator password can be reset.	В	
.Ins	taller settings	[Service password]	В	
1	nstallation date	The [Installation date] can be registered.	В	
.		When registering the [Installation date], the [Next service date] is displayed automatically. (For changing the [Next service date], please refer the item of [Service & Maintenance].)		_
2	Service contact	The [Service contact] can be registered and can be displayed on the RC.	В	
,	Fest run	•The [Contact company] can be registered within 10 characters. •The [Contact phone] can be registered within 13 digits.		-
١	Cooling test run	On/Off operation of the test run can be done. The [Cooling test run] can be done at 5°C of set temp, for 30 minutes.		-
	Drain pump test run	Only the drain pump can be operated.	В	
		The [Test run] operation can be done with fixed compressor Hz set by installer.	1	
4		In case of combination with only the ducted indoor unit which has a function of static pressure adjustment, the static pressure is adjustable.	В	Ι
5 [Change auto-address	The set address of each indoor unit decided by auto-address setting method can be changed to any other address. (For multiple KX units only)	В	
6	Address setting of Main IU	Main indoor unit address can be set.	_	
		 Only the Main indoor unit can change operation mode and the Sub indoor units dominated by the Main indoor unit shall follow. The Main indoor unit can domain 10 indoor units at a maximum. 	В	4
BC	function settings	*The wain indoor unit can domain to indoor units at a maximum. [Service password]	В	╁
	Main/Sub RC setting	The setting of [Main/Sub RC] can be changed.	В	
	RC sensor	The offset value of [RC sensor] sensing temp. can be set respectively in heating and cooling.	В	
ŀ	9 RC sensor adjustment	The offset value of [RC sensor] sensing temp. can be set respectively in heating and cooling.		+
3	- · · · · · · · · · · · · · · · · · · ·	-The setting range of offset value is ±3°C both in cooling and heating.	В	4
4	12 Operation mode	The [Valid/Invalid] setting of [Auto][Cooling][Heating] and [Dry] can be done respectively.	В	(
5	13 Fan speed	The setting of [Fan speed] can be done from following patterns. 1-speed, 2-speeds (Hi-Me), 2-speeds (Hi-Lo), 3-speeds, 4-speeds.	В	(
_	14 External input	The applicable range ([Individual] or [All units]) of CnT input to the multiple indoor units connected in one control system.	В	
6	F VPI-PI-PI-	•[Individual]: Only the unit received CnT input signal. •[All units]: All the units connected to one control system received CnT input signal.		1
7	15 Ventilation setting	The setting of [Invalid] operation of ventilator, [Interlock] with AC or [Independent] of ventilator can be selected. When setting [Interlock], the operation of external ventilator is interlocked with the operation of AC •When setting [Independent], only the operation of external ventilator is available.	В	
8 -	16 Flap control	The [Flap control] method can be switched to[Stop at fixed position] or [Stop at any position] • [Stop at fixed position] : Stop the flap at a certain position		+
		among the designated 4 positions. [Stop at any position] : Stop the flap at any arbitrary position just after the stopping command from RC was sent.	В	
9	17 Auto-restart	The operation control method after recovery of power blackout happened during operation can be set.	В	(
0	18 Auto temp. setting	[Valid] or [Invalid] of [Auto temp. setting] can be selected.	В	
_	19 Auto fan speed setting	[Valid] or [Invalid] of [Auto fan speed setting] can be selected.	В	_
-	J settings	[Service password]	В	Ь.
-	High ceiling	The fan tap of indoor fan can be changed. •[Standard] [High ceiling 1] [High ceiling 2] can be selected.	В	
-	Filter sign	The setting of filter sign display timer can be done from following patterns.	В	(
~ -	external input 1	The content of control by external input can be changed. The selectable contents of control are [On/Off] [Permission/Prohibition] [Cooling/heating] [Emergency stop]	В	1
· F	External input 1 signal	The type of external input signal ([Level input]/[Pulse input]) can be changed.	В	1
-	External input 2	*The selectable contents of control are [0n/0ff] [Permission/Prohibition] [Cooling/heating] [Emergency stop] The tree of external input signal (II and input) (II) and input) ear he changed	B	+
· -	External input 2 signal	The type of external input signal ([Level input]/[Pulse input]) can be changed. The judgment term of heating thermo-off can be adjusted within the range from 0 to +3°C (1°C integral).	В	_
-	Return air sensor adjust.	The judgment temp. of heating thermo-off can be adjusted within the range from 0 to $+3^{\circ}$ C (1 $^{\circ}$ C interval) The sensing temp. of return air temp. sensor built in the indoor unit can be adjusted within the range of $\pm 2^{\circ}$ C.	В	2
-	an control in heating thermo OFF	The fan control method at heating thermo-off can be changed. The selectable fan control methods are [Low] [Set fan speed] [Intermittent] [Stop].	В	(
. н	Anti-frost temp.	The judgment temp. of anti-frost control for the indoor unit in cooling can be changed to [Temp. High] or [Temp. Low].	В	
Ľ	Anti-frost control	When the anti-frost control of indoor unit in cooling is activated, the fan speed can be changed.	В	
F	Drain pump operation	In any operation mode in addition to cooling and dry mode, the setting of drain pump operation can be done.	В	
-		The time period of residual fan operation after stopping or thermo-off in cooling mode can be set.	В	
-		The time period of residual fan operation after stopping or thermo-off in heating mode can be set.	В	
- 1-		The fan operation rule following the residual fan operation after stopping or thermo-off in heating mode can be set.	В	
-	an circulator operation	In case that the fan is operated as the circulator, the fan control rule can be set.	В	Ι
7	Control pressure adjust. (For OA processing unit only)	When only the OA processing units are operated, control pressure value can be changed.	В	(
	Auto operation mode	The [Auto rule selection] for switching the operation mode automatically can be selected from 3 patterns.	В	L
-	Thermo. rule setting	When selecting [Outdoor air temp. control], the judgment temp can be offset by outdoor temp	В	L
_	Auto fan speed control	Under the [Auto fan speed control] mode, the switching range of fan speed can be selected from following 2 patterns [Auto 1] [Auto 2]. •[Auto 1] : Hi ⇔Me⇔Lo•[Auto 2] : P-hi⇔Hi⇔Me⇔Lo•	В	1
	rvice & Maintenance	[Service password]	В	\vdash
1	U address No.	Max. 16 indoor units can be connected to one remote control, and all address No. of the connected indoor units can be displayed. -The indoor unit conforming to the address No. can be identified by selecting the address No. and tapping [Check] to operate the indoor fan.	В	
ا ,	Next service date	• The Indoor unit conforming to the address No. can be identified by selecting the address No. and tapping [check] to operate the indoor fain. The [Next service date] can be registered. • The [Next service date] and [Service contact] is displayed on the [Periodical check] message screen.	AB	+
- 1-	Deration data	The [Next service date] can be registered.*The [Next service date] and [Service contact] is displayed on the [Periodical check] message screen. Total 39 items of [Operation data] for indoor unit and outdoor unit can be displayed.	В	
-	Error history	[Date and time of error occurred] [I/U address] [Error code] for Max. 16 latest cases of error history can be displayed.	В	
	Display anomaly data	The operation data just before the latest error stop can be displayed.	В	ť
-	Reset periodical check	The timer for the periodical check can be reset.	В	
-	Saving I/U settings	The I/U settings memorized in the indoor PCB connected to the remote control can be saved in the memory of the remote control.	В	Ť
-	Special settings	[Erase I/U address] [CPU reset] [Initializing] [Touch panel calibration]	В	_
_	spection	terms of account for a room fundamental frager barrer animation.		- 4
	•		Α	\vdash
-	Confirmation of Inspection	The address No, of anomalous indoor/outdoor unit and error code are displayed.	l	

PSB012D994

(2) FDU series

Electrical wiring work must be performed by an electrician qualified by a local power provider according to the electrical installation technical standards and interior wiring regulations applicable to the installation site.

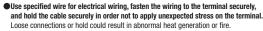
Security instructions

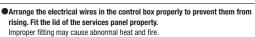
- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, △WARNING and △CAUTION .

- The meanings of "Marks" used here are as shown on the right:
- Never do it under any circumstances.
- Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short circuit.

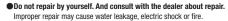
△WARNING

- Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.
- Power source with insufficient capacity and improper work can cause electric shock and fire.





- •Use the genuine optional parts. And installation should be performed by a specialist.
- If you install the unit by yourself, it could cause water leakage, electric shock and fire.



- Consult the dealer or a specialist about removal of the air conditioner.
 Improper installation may cause water leakage, electric shock or fire.
- Turn off the power source during servicing or inspection work.
 If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- Shut off the power before electrical wiring work.

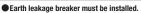
 It could course electric shock, unit failure and impressor running.

It could cause electric shock, unit failure and improper running

∧CAUTION

Perform earth wiring surely.

Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock or fire due to a short circuit.



If the earth leakage breaker is not installed, it could cause electric shocks or fire.

 Make sure to install earth leakage breaker on power source line. (countermeasure thing to high harmonics.)

Absence of breaker could cause electric shock

 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.
 Using the incorrect one could cause the system failure and fire.

 Do not use any materials other than a fuse of correct capacity where a fuse should be used.

Connecting the circuit by wire or copper wire could cause unit failure and fire.

Use power source line of correct capacity.
 Using incorrect capacity one could cause electric leak, abnormal heat generation and fire.

Do not mingle solid cord and stranded cord on power source and signal side terminal block.

In addition, do not mingle difference capacity solid or stranded cord.

Inappropriate cord setting could cause loosing screw on terminal block, bad electrical

Do not turn off the power source immediately after stopping the operation.
Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown

Do not control the operation with the circuit breaker.

It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.

(1) Electrical Wiring Connection

- Use three-core cable as wiring between indoor and outdoor unit. As for detail, refer to "INSTAL-LATION MANUAL" of outdoor Unit.
- Set earth of D-type

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- Keep "remote control line" and "power source line" away from each other on constructing of unit outside.
- Run the lines (power source, remote control and "between indoor and outdoor unit") upper ceiling through iron pipe or other tube protection to avoid the damage by mouse and so on.
- Do not add cord in the middle of line route (of power source, remote control and "between indoor and outdoor unit") on outside of unit. If connecting point is flooded, it could cause problem as for electric or communication. (In the case that it is necessary to set connecting point on the way, perform thorough waterproof measurement.)
- Do not connect the power source line [220V/240V/380V/415V] to signal side terminal block.
 Otherwise, it could cause failure.
- Screw the line to terminal block without any looseness, certainly.
- Do not turn on the switch of power source, before all of line work is done.
- Connection of the line ("Between indoor and outdoor unit", Earth and Remote control)
- ①Remove lid of control box before connect the above lines, and connect the lines to terminal block according to number pointed on label of terminal block.

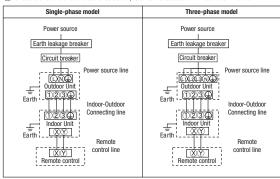
In addition, pay enough attention to confirm the number to lines, because there is electrical polarity except earth line. Furthermore, connect earth line to earth position of terminal block of power source.

- ②Install earth leakage breaker on power source line. In addition, select the type of breaker for inverter circuit as earth leakage breaker.
- (Switch itself and type "B" fuse) or circuit breaker is only for earth-fault protection, hand switch (switch itself and type "B" fuse) or circuit breaker is required in series with the earth leakage breaker.
- ⑤Install isolator or disconnect switch on the power supply wiring in accordance with the local codes and regulations.

The isolator should be set in the box with key to prevent touching by another person when servicing.

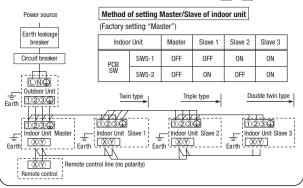
Cable connection for single unit installation

- ①As for connecting method of power source, select from following connecting patterns. In principle, do not directly connect power souce line to inside unit.
- As for exceptional connecting method of power souce, discuss with the power provider of the country with referring to technical documents, and follow its instruction.
- 2) For cable size and circuit breaker selection, refer to the outdoor unit installation manual.



Cable connection for a V multi configuration installation

- ①Connect the same pairs number of terminal block "①, ②, and ③"and "② and ①" between master and slave indoor units.
- ②Do the same address setting of all inside units belong to same refrigerant system by rotary switch SW2 on indoor unit's PCB (Printed circuit board).
- ③Set slave indoor unit as "slave 1" through "slave 3" by address switch SW5-1, 5-2 on PCB.



2 Remote Control, Wiring and functions

- ●D0 N0T install it on the following places
 - 1) Places exposed to direct sunlight
- 2 Places near heat devices
- (3)High humidity places
- 4)Hot surface or cold surface enough to generate condensation
- (5)Places exposed to oil mist or steam directly.
- 6 Uneven surface

Installation and wiring of remote control

- ①Install remote control referring to the attached installation manual.
- ②Wiring of remote control should use 0.3mm² ×2 core wires or cables.

The insulation thickness is 1mm or more, (on-site configuration)

3 Maximum prolongation of remote control wiring is 600 m.

If the prolongation is over 100m, change to the size below.

But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

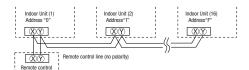
100 - 200m	0.5mm ² × 2 cores
Under 300m	0.75mm ² × 2 cores
Under 400m	1.25mm ² × 2 cores
Under 600m	2.0mm ² × 2 cores

- Avoid using multi-core cables to prevent malfunction.
- ⑤Keep remote control line away from earth (frame or any metal of building).
- 6 Make sure to connect remote control line to the remote control and terminal block of indoor unit. (No polarity)

Control plural indoor units by a single remote control

- 1) A remote control can control plural indoor units (Up to 16)
- In above setting, all plural indoor units will operate under same mode and temperature setting (2)Connect all indoor units with 2 core remote control line.
- ③Set unique remote control communication address from "0" to "F" to each inside unit by the rotary switch SW2 on the indoor unit's PCB

After a unit is energized, it is possible to display an indoor unit address by pressing AIR CON NO.] button on the remote control unit. Press the a or button to make sure that all indoor units connected are displayed in order.



Confirming method of indoor units

When indoor unit address number is displayed on remote control, pushing the (MODE) button to make the indoor unit with that number blow air (Display example: I/U001 Push the (MODE) button again to stop the operation.

However, this operation is invalid on the air-conditioning running.

Master/ slave setting when more than one remote control unit are used

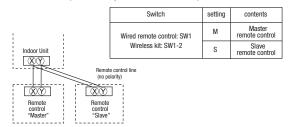
A maximum of two remote control units can be connected to one indoor unit (or one group of indoor units.)

The air conditioner operation follows the last operation of the remote control regardless of the master/slave setting of it. Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and

one (1) wireless kit" or "two (2) wireless kits".

Set SW1 (wired remote control) or SW1-2 (wireless kit) to "Slave" for the slave remote control unit. It was factory set to "Master" for shipment.

Note:The setting "Remote control unit sensor enabled" is only selectable with the master remote control unit in the position where you want to check room temperature.



3Trial operation

The method of trial cooling operation

Operate the remote control unit as follows.

- 1. Starting a cooling test run.
- ①Start the system by pressing the ①ON/OFF button.
- ②Select " \$ (Cool)" with the (MODE) button.
- ③Press the TEST button for 3 seconds or longer.

The screen display will switch to: "

 TEST RUN ▼ "

run will start.

The screen display will switch to " # TEST RIN ".

2. Ending a cooling test run

Pressing the MODE button, the MODE button will end a cooling test run. (Cooling test run will end after 30 minutes pass.)

* TEST RUN " shown on the screen will go off.

Checking operation data

Operation data can be checked with remote control unit operation

- 1. Press the CHECK button.
- The display change " ∩PFR ∩ATA ▼ " 2. Press the (SET) button while
- ' NPER NATA ▼ " is displayed.
- 3. When only one indoor unit is connected to remote control, " DATA I NADING " is displayed (blinking indication during data loading).

Next, operation data of the indoor unit will be displayed. Skip to step 7.

4. When plural indoor units is connected, the smallest address number of indoor unit among all connected indoor unit is displayed.

[Example]:

- '&\$ SELECT I/U" (blinking 1 seconds)→ "I/U000 ▲ " blinking.
- 5. Select the indoor unit number you would like to have data displayed with the ▲ **v** button.
- 6. Determine the indoor unit number with the (SET) button.

(The indoor unit number changes from (The indoor unit number of stage - blinking indication to continuous indication)

39 D/U EEV2 Y PURSE IN TRANSPORTED - Continuous Proposition (Continuous Indication)

**Depending on outdoor unit model, there are data not shown. indoor unit is blinking for 2 seconds.)

Number		Data Item
01	*	(Ope ration Mode)
02	SET TEMP°C	(Set Temperature)
03	RETURN AIR	(Return Air Temperature)
04	☐SENSOR°	(Remote Control ThermistorTemperature)
05	THI-R1c	(Indoor Unit Heat Exchanger Thermistor / U Bend
06	THI-R2c	(Indoor Unit Heat Exchanger Thermistor /Capillary
07	THI-R3c	(Indoor Unit Heat Exchanger Thermistor /Gas Header)
08	I/U FANSPEED	(Indoor Unit Fan Speed)
09	DEMANDHz	(Frequency Requirements)
10	ANSWERHz	(Response Frequency)
11	I/U EEVP	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN	_H (Total Running Hours of The Indoor Unit
21	OUTDOORc	(Outdoor Air Temperature)
22	THO-R1°c	(Outdoor Unit Heat Exchanger Thermistor
23	THO-R2c	(Outdoor Unit Heat Exchanger Thermistor
24	COMPHz	(Compressor Frequency)
25	HPMPa	(High Pressure)
26	LPMPa	(Low Pressure)
27	Tdc	(Discharge Pipe Temperature)
28	COMP BOTTOM	(Comp Bottom Temperature)
29	CTAMP	(Current)
30	TARGET SHc	(Target Super Heat)
31	SHb	(Super Heat)
32	TDSHt	(Discharge Pipe Super Heat)
33	PROTECTION No	(Protection State No. of The Compressor)
34	O/U FANSPEED	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN_	
38	0/U EEV 1P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	0/U EEV2P	(Pulse of The Outdoor Unit Expansion Valve EEVH)

" DATA LOADING" (A blinking indication appears while data loaded.) Next, the operation data of the indoor unit is indicated.

7. Upon operation of the $\boxed{lacktriangle}$ button, the current operation data is displayed in order from data number 01.

The items displayed are in the above table.

*Depending on models, the items that do not have corresponding data are not displayed.

- 8. To display the data of a different indoor unit, press the AIR CON NO. button, which allows you to go back to the indoor unit selection screen.
- 9. Pressing the ON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

Olf two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)

Trail operation of drain pump

Drain pump operation from remote control unit is possible. Operate a remote control unit by following the steps described below.

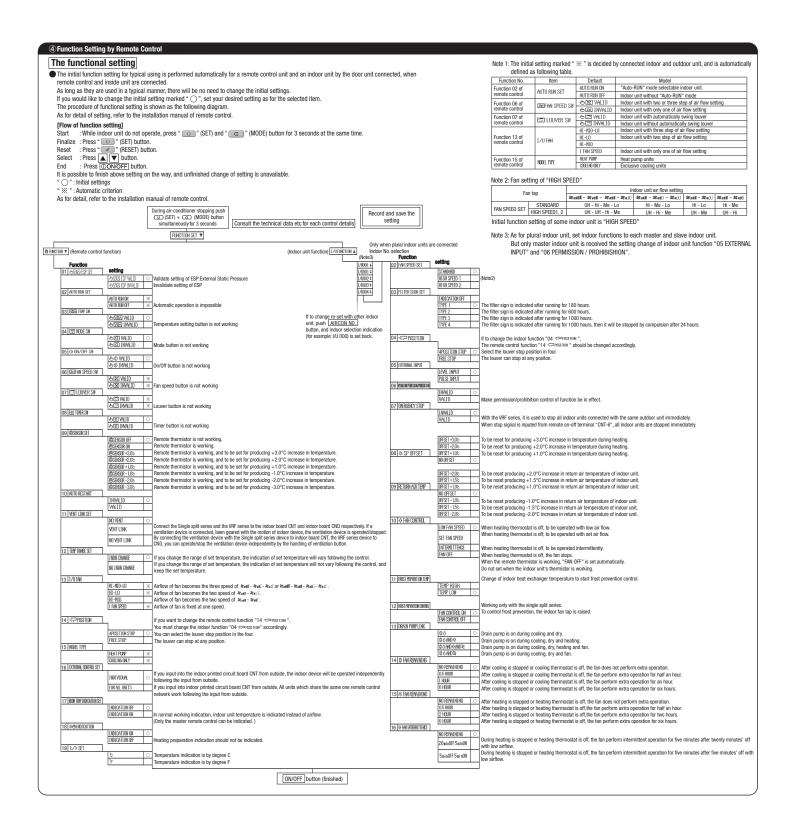
- 1. To start a forced drain pump operation.
- 1) Press the TEST button for three seconds or longer.

The display will change " \$ TEST RUN ▼

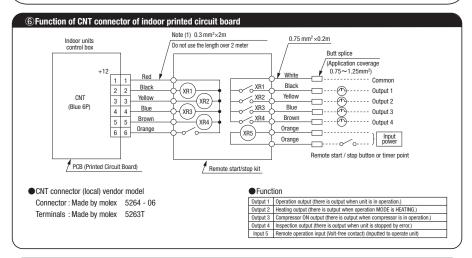
(SET) button is pressed, a drain pump operation will start. Display: " 라이 TN STNP

- 2. To cancel a drain pump operation.
- 1) If either (SET) or (ON/OFF) button is pressed, a forced drain pump operation will stop. The air conditioning system will become OFF.

Olf two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data, (The slave remote control is not available.)



⑤Control mode switching ● The control content of indoor units can be switched in following way. (______ is the default setting) Switch No. Control Content SW₂ Indoor unit address (0-Fh) SW5-1 Master/Slave Switching (plural /Slave unit Setting) SW5-2 SW6-1~4 Model capacity setting ON Operation check, Drain motor test run SW7 - 1 OFF Normal operation



Error Code of indoor unit

LED on indoor

green (normal)

Continuous blinking

Continuous blinking

Not sure Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking

red (checking)

Off

Off

Blinking once

Blinking once

Blinking once

Blinking once Blinking twice

Off

nking for three tim

Blinking once

Blinking twice

Blinking once

Blinking once Blinking twice

F1

E6

E7

E9

E14

F16

F19

E20

E28

Over E30

Content

Pault on the transmission between indoor circuit board and remote control

Indoor air inhaling sensor broken or short-circuit

The temperature of heat exchange abnormal

Float SW actions (only with FS)

Drain pump over current excess number of remote control

Fan motor (1) abnormal
Fan motor (2) abnormal
Configuration fault on running checking

an motor (1) abnormal rotation

Fan motor (2) abnormal rotation
Remote control sensor interrupte
Outdoor unit checking (outdoor cir

short-circuit

(7)Troubleshooting

The operation data is saved when the situation of abnormal operation happen, and the data can be confirmed by remote control. [Operating procedure]

- 1. Press the CHECK button. The display change " NPFR DATA
- 2. Once, press the button, and the display change " ERROR DATA 🚡
- 3. Press the \bigcirc (SET) button and abnormal operation data mode is started.
- 4. When only one indoor unit is connected to remote control, following is displayed.
- $\ensuremath{\textcircled{1}}\xspace The case that there is history of abnormal operation.$
- → Error code and " DATA LOADING " is displayed.
- [Example]: [E8] (ERROR CODE)
- "DATA LOADING" is displayed (blinking indication during data loading). Next, the abnormal operation data of the indoor unit will be displayed. Skip to step 8.
- 2)The case that there is not history of abnormal operation.
- \rightarrow " NO ERROR " is displayed for 3 seconds and this mode is closed.
- 5. When plural indoor units is connected, following is displayed. 1)The case that there is history of abnormal operation.
 - → Error code and the smallest address number of indoor unit among all connected indoor unit is displayed.
 - [Example]: [E8] (ERROR CODE) ▲ " blinking 1711000
- ②The case that there is not history of abnormal operation.
- Only address number is displayed. 6. Select the indoor unit number you would like to have data displayed with the ▲ ▼ button.
- 7. Determine the indoor unit number with the (SET) button.

[Example]: [E8] (ERROR CODE)

 $\underline{\blacktriangle}$ " (The address of selected indoor unit is blinking for 2 seconds.) " I/U000

[E8] "DATA LOADING" (A blinking indication appears while data loaded.)

Next, the abnormal operation data is indicated.

If the indoor unit doing normal operation is selected, NO ERROR $\,$ " is displayed for 3 seconds and address of indoor unit is displayed.

8. By the 🛕 🔻 button, the abnormal operation data is displayed.

Displayed data item is based on (3) Trial operation

*Depending on models, the items that do not have corresponding data are not displayed.

9. To display the data of a different indoor unit, press the AIR CON No. button, which allows you to go back to the indoor unit slection screen.

10.Pressing the OON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

Olf two (2) remote controls are connected to one (1) indoor unit, only the master control is available for trial operation and confirmation of operation data.

PGA012D405

(3) FDF series

Electrical wiring work must be performed by an electrician qualified by a local power provider according to the electrical installation technical standards and interior wiring regulations applicable to the installation site.

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels. AWARNING and ACAUTION .

<u>AWARNING</u>: Wrong installation would cause serious consequences such as injuries or death. $\underline{\hspace{-0.5cm} \triangle \hspace{-0.5cm} \text{CAUTION}} \hspace{0.2cm} \textbf{: Wrong installation might cause serious consequences depending on circumstances}.$ Both mentions the important items to protect your health and safety so strictly follow them by any means.

- The meanings of "Marks" used here are as shown on the right:

 Never do it under any circumstances. Always do it according to the instruction.
- Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short circuit.

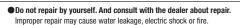
∆WARNING

Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.

Power source with insufficient capacity and improper work can cause electric shock and fire.

- Use specified wire for electrical wiring, fasten the wiring to the terminal securely. and hold the cable securely in order not to apply unexpected stress on the terminal. Loose connections or hold could result in abnormal heat generation or fire.
- Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property. Improper fitting may cause abnormal heat and fire
- Use the genuine optional parts. And installation should be performed by a

specialist. If you install the unit by yourself, it could cause water leakage, electric shock and fire.



Consult the dealer or a specialist about removal of the air conditioner.

Improper installation may cause water leakage, electric shock or fire.

Turn off the power source during servicing or inspection work. If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper running.

^CAUTION

Perform earth wiring surely.

Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short circuit.

Earth leakage breaker must be installed.

If the earth leakage breaker is not installed, it can cause electric shocks.

Make sure to install earth leakage breaker on power source line. (countermeasure thing to high harmonics.)

Absence of breaker could cause electric shock

 Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.

Using the incorrect one could cause the system failure and fire.

Do not use any materials other than a fuse of correct capacity where a fuse should be used.

Connecting the circuit by wire or copper wire could cause unit failure and fire

Use power source line of correct capacity.

Using incorrect capacity one could cause electric leak, abnormal heat generation and fire.

Do not mingle solid cord and stranded cord on power source and signal side

In addition, do not mingle difference capacity solid or stranded cord. Inappropriate cord setting could cause loosing screw on terminal block, bad electrical contact smoke and fire

Do not turn off the power source immediately after stopping the operation. Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or

• Do not control the operation with the circuit breaker.

It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury

(1) Electrical Wiring Connection

Use three-core cable as wiring between indoor and outdoor unit. As for detail, refer to "INSTALLATION MANUAL" of outdoor Unit.
 Set earth of D-type.

- Keep "remote control line" and "power source line" away from each other on constructing of unit outside.
 Run the lines (power source, remote control and "between indoor and outdoor unit") upper ceiling through iron
- Prair the lines (power source, remote control and or eleveen indoor and outdoor unit.) upper ceiming intrody into pipe or other tube protection to avoid the damage by mouse and so on.

 Do not add cord in the middle of line route (of power source, remote control and "between indoor and outdoor unit") on outside of unit. If connecting point is flooded, it could cause problem as for electric or communication. (In the case that it is necessary to set connecting point on the way, perform thorough waterproof measurement.)

 Do not connect the power source line [2201/2401/3801/415V] to signal side terminal block. Otherwise, it could

- cause railure.

 Screw the line to terminal block without any looseness, certainly.

 Do not turn on the switch of power source, before all of line work is done.

 Connection of the line ("Between indoor and outdoor unit", Earth and Remote control)

 Remove lid of control box before connect the above lines, and connect the lines to terminal block according to number pointed on label of terminal block. In addition, pay enough attention to confirm the number to lines, because there is electrical polarity except earth

line. Furthermore, connect earth line to earth position of terminal block of power source. 2Install earth leakage breaker on power source line. In addition, select the type of breaker for inverter circuit as

earm leakage breaker.

3ff the function of selected earth leakage breaker is only for earth-fault protection, hand switch (switch itself and type "B" fuse) or circuit breaker is required in series with the earth leakage breaker.

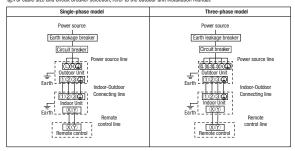
4Install the local switch near the unit.

Cable connection for single unit installation

①As for connecting method of power source, select from following connecting patterns. In principle, do not directly connect power souce line to inside unit.

** As for exceptional connecting method of power souce, discuss with the power provider of the country with referring to technical documents, and follow its instruction

②For cable size and circuit breaker selection, refer to the outdoor unit installation manual



Cable connection for a V multi configuration installation

- Connect the same pairs number of terminal block "), @, and @"and " and " between master and slaveindoor units.
- ②Do the same address setting of all inside units belong to same refrigerant system by rotary switch SW2 on indoor unit's PCB (Printed circuit board).
- (3)Set slave indoor unit as "slave 1" through "slave 3" by address switch SW5-1, 5-2 on PCB.
- When the AIR CON NO. button on the remote control unit is pressed after turning on the power, an indoor unit's address number will be displayed. Do not fail to confirm that the connected indoor unit's numbers are displayed on the remote control unit by pressing the 🛕 or 🔻 buttor

Method of setting Master/Slave of indo

(Factory setting: "Master") Power source

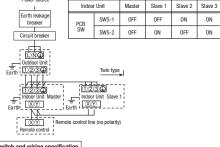
 \emptyset

0

0

0

 \mathcal{O}

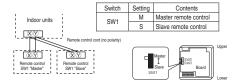


Switch and wiring specification

Refer to the installation manual attached to the outdoor unit

2 Wiring for the remote control

For each indoor unit, one more remote control can be connected in addition to the one which is built in the main unit.

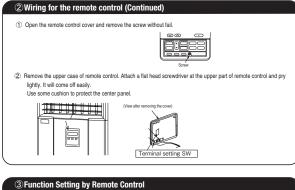


Set SW1 to "Slave" for the slave remote control. It was factory set to "Master" for shipment.

Note: The setting "Remote control thermistor enabled" is only selectable with the master remote control in the position where you want

to check room temperature ner operation follows the last operation of the remote control regardless of the master/ slave setting of it.

Remove the cover and change the setting of switch as follows



Installation and wiring of remote control ①Wiring of remote control should use 0.3mm² × 2 core wires or cables. (on-site configuration) 2)Maximum prolongation of remote control wiring is 600 m If the prolongation is over 100m, change to the size below But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact 100 - 200m The indication when power source is supplied When power source is turned on, the following is displayed on the remote control until the communication between the remote control and indoor unit settled. Master remote control : "@WAIT@ "M Slave remote control : "@WAIT@ "S At the same time, a mark or a number will be displayed for two seconds first. This is the software's administration number of the remote control, not an error cord. □ RL □WAIT® M **The left mark is only an example. Other marks may appear. When remote control cannot communicate with the indoor unit for half an hour, the below indication willappear. Check wiring of the indoor unit and the outdoor unit etc. INSPECT I/U How to set function Stop air-conditioner and press ○ (SET) ↔ (MODE) buttons at the same time for over three seconds, and the "FUNCTION SET ▼ " will be displayed. Fixing button 7 Finishing button FUNCTION SET ▼ 2. Press (SET) button 3. Make sure which do you want to set, "☐ FUNCTION ▼" (remote control function) or "I/U FUNCTION "≼indoor unit function). ☐ FUNCTION ▼ 5. Press (SET) button. I ∕U FUNCTION ▲ 6. [On the occasion of remote control function selection] "DATA LOADING" (Indication with blinking) → Display is changed to "01 GRILLE ↑↓SET". ② Press ▲ or ▼ button. *No. and function*are indicated by turns on the remote control function to BZ ← Function No. AUTO RUN SET ← Function ③ Press ◯ (SET) button. The current setting of selected function is indicated. (for example) "AUTO RUN ON" ← If "02 AUTO RUN SET" is selected. AUTO RUN ON ← Setting Press or button. Select the setting. AUTO RUN ON UTO RUN OFF A (6) Press ○ (SET) button. SET COMPLETE* will be detailed, and the setting will be completed. Then after "No. and function" indication returns, Set as the same procedure if you want to set continuously, and if to finish, go to 7. SET COMPLETE ion of indoor unit function selection] ① "DATA LOADING" (Blinking for 2 to 23 seconds to read the data) Indication is changed to "02 FAN SPEED SET". Go to ② [Note] (1) If plural indoor units are connected to a remote control, the indication is "I/U 000" (clinking). — The lowest number of the indoor unit connected is indicated.

I/U000 A (2) Press ▲ or ▼ button.

Select the number of the indoor unit you are to set

If you select "ALL UNIT ▼", you can set the same setting with all unites.

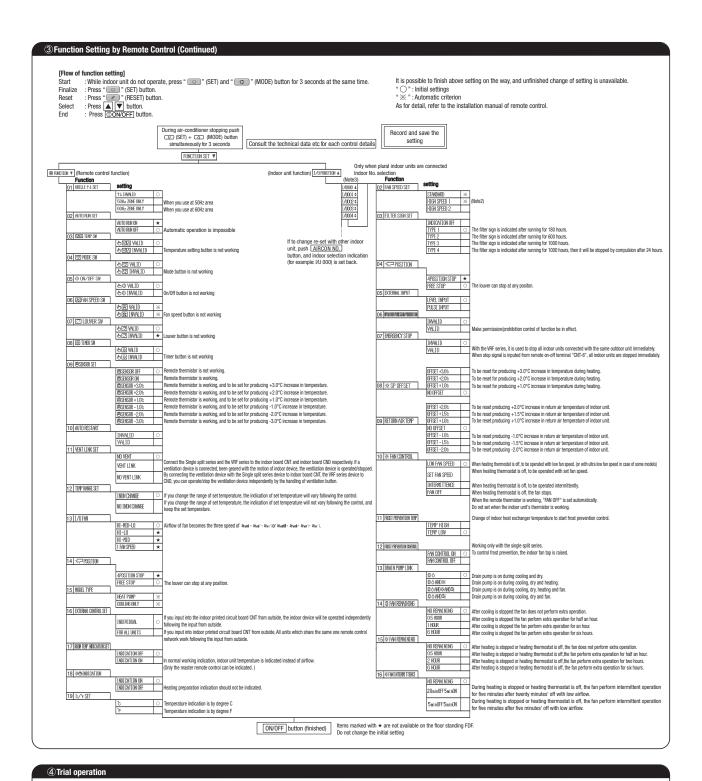
Function No.

FAN SPEED SET ← Function

(3) Press (3) (SET) button.

inction is indicated. If "02 FAN SPEED SET" is selecte STANDARD Setting ④ Press or button. (S) Press ① (SET) button. "SET COMPLETE" will be indicated, and the setting will be completed. "The water "No and function" indication returns, set as the same procedure if you want to set continuously, and if to finish, go to 7. SET COMPLETE ** When plural indoor units are connected to a remote control, press the AIRCON NO. button, which allows you to go back to the indoor unit selection screen. (example "I/U 000") 7. Press ON/OFF button. It is possible to finish by pressing ONOFF button on the way, but unfinished change of setting is unavailable. During setting, if you press | It is possible to finish by pressing ONOFF button, you return to the previous screen. Setting is memorized in the controller and it is saved independently of power failure. setting. (But. if you select "ALL UNIT ▼", the setting of the lowest number indoor unit is displayed.) The functional setting ●The initial function setting for typical using is performed automatically by the indoor unit connected, when remote control and indoor unit are connected. As long as they are used in a typical manner, there will be no need to change the initial settings. If you would like to change the initial setting marked "○", set your desired setting as for the selected item. The procedure of functional setting is shown as the following diagram. Sequence of the function setting is as follows. The range of temperature setting When shipped, the range of set temperature differs depending on the operation mode as below. Heating: 16~300C (55~860F) Except heating (cooling, fan, dry, automatic) : 18~30ûC (62~86ûF) Oupper limit and lower limit of set temperature can be changed with remote control. Upper limit setting: valid during heating operation. Possible to set in the range of 20 to 300C (68 to 860F). Lower limit setting: valid except heating (automatic, cooling, fan, dry) Possible to set in the range of 18 to 260C (62 to When you set upper and lower limit by this function, control as below. 1. When ②TEMP RANGE SET, remote control function of function setting mode is "INDN CHANGE" (factory setting), [If upper limit value is set] During heating, you cannot set the value exceeding the upper limit. [If lower limit value is set] During operation mode except heating, you cannot set the value below the lower limit. 2. When @ TEMP RANGE SET, remote control function of function setting mode is "NO INDN CHANGE" [If upper limit value is set] During healing, even if the value exceeding the upper limit is set, upper limit value will be sent to the indoor unit. But, the indication is the same as the temperature set. [If lower limit value is set] During except heating, even if the value lower than the lower limit is set, lower limit value will be sent to the indoor unit. But, the indication is the same as the temperature set. ●How to set upper and lower limit value 1. Stop the air-conditioner, and press ○ (SET) and ○ (MODE) button at the same time for over three seconds. The indication changes to "FUNCTION SET ▼ Press ♥ button once, and change to the "TEMP RANGE ▲ " indication. Press ♥ USET) button, and enter the temperature range setting mode. Select "UPPER LIMIT ▼" or "LOWER LIMIT ▲" by using ▲ ▼ button. Press (SET) button to fix. Press ☐ (SET) button to fix. When "UPPER LIMIT ▼" is selected (valid during heating) ① Indication: "5 √ ^ SET UP" → "UPPER 500C V" ② Select the upper limit value with temperature setting button ☑ ☑. Indication example: "UPPER 260C V ^* (blinking) ③ Press ☐ (SET) button to fix. Indication example: "UPPER 260C (Displayed for two seconds) After the fixed upper limit value displayed for two seconds, the indication will return to "UPPER LIMIT ▼". 7. When 1'CBNE LIMIT ★ 1'S selected (valid during cooling, dry, tan, automatic) ① Indication: *⑤ ∨ ∧ SET UP' → "LOWER 180C ∧ " ② Select the lower limit value with temperature setting button □ □. Indication example: "LOWER 240C ∨ ∧ " (blinking) (uninsing) ③ Press □ ((SET) button to fix. Indication for example: "LOWER 240C" (Displayed for two seconds) After the fixed lower limit value displayed for two seconds, the indication will return to "LOWER LIMIT ▼". 8. Press ○NOFF] button to finish. It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable. TEMP RANGE N. O. - 3·5 During setting, if you press (RESET) button, you return to the previous screen. Note 1: Fan setting of "HIGH SPEED" Fan tap Initial function setting of some indoor unit is "HIGH SPEED" Note 2: As for plural indoor unit, set indoor functions to each master and slave indoor unit. But only master indoor unit is received the setting change of indoor unit function "05 EXTERNAL INPUT" and "06 PERMISSION / PROHIBISHION".

③Function Setting by Remote Control (Continued)



The method of trial cooling operation

Operate the remote control unit as follows.

1. Starting a cooling test run.

①Start the system by pressing the $\boxed{\bigcirc \text{ON/OFF}}$ button.

②Select " $\mbox{\em \sharp}\mbox{\em (Cool)}\mbox{\em with the}$ $\mbox{\em \circlearrowleft}\mbox{\em (MODE)}$ button.

③Press the TEST button for 3 seconds or longer.

The screen display will switch to♯ TEST RUN ▼

⊕When the
□ (SET) button is pressed while " \$ TEST RUN ▼ " is indicated, a cooling test run will start.

The screen display will switch to TEST RUN ".

2. Ending a cooling test run.

Pressing the OONOFF button, the (TEMP) button or (MODE) button will end a cooling test run. (Cooling test run will end after 30 minutes pass.)

" 恭 TEST RUN " shown on the screen will go off.

4 Trial operation (Continued)

Checking operation data

Operation data can be checked with remote control unit operation.

- 1. Press the CHECK button.
- The display change " <code>OPER DATA</code> $\quad \pmb{\triangledown}$ "
- 2. Press the \bigcirc (SET) button while OPER DATA \blacktriangledown " is displayed.
- When only one indoor unit is connected to remote control, " DATA LOADING" is displayed (blinking indication during data loading)

Next, operation data of the indoor unit will be displayed. Skip to step 7.

4. When plural indoor units is connected, the smallest address number of indoor unit among all connected indoor unit is displayed [Example]:

- Select the indoor unit number you would like to have data displayed with the
 button.
- 6. Determine the indoor unit number with the O (SET) button.

01	蕊	(Ope ration Mode)
02	SET TEMP	(Set Temperature)
03	RETURN AIRc	(Return Air Temperature)
04	■SENSOR°c	(Remote Control Thermistor Tempe rature)
05	THI-R1c	(Indoor Unit Heat Exchanger Thermistor / U Bend)
06	THI-R2c	(Indoor Unit Heat Exchanger Thermistor /Capillary)
07	THI-R3c	(Indoor Unit Heat Exchanger Thermistor /Gas Header)
08	I/U FANSPEED	(Indoor Unit Fan Speed)
09	DEMANDHz	(Frequency Requirements)
10	ANSWER Hz	(Response Frequency)
11	I/U EEVP	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN	H (Total Running Hours of The Indoor Unit)
21	OUTDOORc	(Outdoor Air Temperature)
22	THO-R16	(Outdoor Unit Heat Exchanger Thermistor
23	THO-R2c	(Outdoor Unit Heat Exchanger Thermistor
24	COMPHz	(Compressor Frequency)
25	HPMPa (High Pressure)	
26	LPMPa	(Low Pressure)
27	Tdb	(Discharge Pipe Temperature)
28	COMP BOTTOM_6	(Comp Bottom Temperature)
29	CTAMP	(Current)
30	TARGET SH°	(Target Super Heat)
31	SHc	(Super Heat)
32	TDSHc	(Discharge Pipe Super Heat)
33	PROTECTION No	(Protection State No. of The Compressor)
34	O/U FANSPEED	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN_	H (Total Running Hours of The Compressor)
38	0/U EEV 1P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	D/HFFV2 P	(Pulse of The Outdoor Unit Expansion Valve EEVH)

Depending on outdoor unit model, there are data not shown

(The indoor unit number changes from blinking indication to continuous indication)

 $I \not= U000 \qquad \text{`` (The address of selected indoor unit is blinking for 2 seconds.)}$

" $\mbox{DATA\,LOADING}\,$ " (A blinking indication appears while data loaded.)

Next, the operation data of the indoor unit is indicated.

7. Upon operation of the button, the current operation data is displayed in order from data number 01

The items displayed are in the above table.

*Depending on models, the items that do not have corresponding data are not displayed.

- 8. To display the data of a different indoor unit, press the AIR CON NO. button, which allows you to go back to the indoor unit selection screen.
- 9. Pressing the ON/OFF button will stop displaying data.

Pressing the ((RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

5Control mode switching

● The control content of indoor units can be switched in following way.

(is the default setting)

	Switch No.	Control Content	
	SW2	Indoor unit address (0-Fh)	
	SW5-1	Master/Slave Switching (plural /Slave unit Setting)	
	SW5-2	waster/olave owitering (plurar/olave unit oething)	
	SW6-1~4	Model capacity setting	
	SW7 —1	ON	Operation check, Drain motor test run
L		0FF	Normal operation

| Second control to co

7Troubleshooting

The operation data is saved when the situation of abnormal operation happen, and the data can be confirmed by remote control.

Error Code of indoor unit

Display on remote	LED on indoor circuit board		Content	
control	red (checking)	green (normal)	Content	
	Off	Continuous blinking	Normal	
Off	Off	Off	Fault on power, indoor power off or lack phase	
E1	Off	Continuous blinking	Fault on the transmission between indoor circuit board and remote control	
	Not sure	Not sure	Indoor computer abnormal	
E5	Blinking twice	Continuous blinking	Fault on outdoor-indoor transmission	
E6	Blinking once	Continuous blinking	Indoor heat exchange sensor interrupted or short-circuit	
E7	Blinking once	Continuous blinking	Indoor air inhaling sensor broken or short-circuit	
E8	Blinking once	Continuous blinking	The temperature of heat exchange abnormal	
E9	Blinking once	Continuous blinking	Float SW actions (only with FS)	
E10	Off	Continuous blinking	Excess number of remote control connections	
E14	Blinking for three times	Continuous blinking	The communication fault for master/slave indoor units	
E16	Blinking once	Continuous blinking	Fan motor abnormal	
E19	Blinking once	Continuous blinking	Configuration fault on running checking model	
E28	Off	Continuous blinking	Remote control sensor interrupted	
Over E30	Off	Continuous blinking	Outdoor unit checking (outdoor circuit board LED checking)	

[Operating procedure]

- 1. Press the CHECK button.
- The display change " OPER DATA ▼ "
- 2. Once, press the button, and the display change ERROR DATA ".
- 3. Press the O (SET) button and abnormal operation data mode is started.
- 4. When only one indoor unit is connected to remote control, following is displayed.

→ Error code and " DATA LOADING" is displayed.

[Example]: [E8] (ERROR CODE)

"DATA LOADING" is displayed (blinking indication during data loading).

Next, the abnormal operation data of the indoor unit will be displayed. Skip to step 8.

②The case that there is not history of abnormal operation.

- → " NO ERROR " is displayed for 3 seconds and this mode is closed.
- 5. When plural indoor units is connected, following is displayed.

 $\label{eq:theorems} \ensuremath{ \textcircled{1}} \text{The case that there is history of abnormal operation.}$

→ Error code and the smallest address number of indoor unit among all connected indoor unit is displayed.

[Example]: [E8] (ERROR CODE)

- 2)The case that there is not history of abnormal operation.
- → Only address number is displayed.
- Select the indoor unit number you would like to have data displayed with the button.
- 7. Determine the indoor unit number with the (SET) button.

[Example]: [E8] (ERROR CODE)

[E8] " $\mbox{DATA LOADING}$ " (A blinking indication appears while data loaded.)

Next, the abnormal operation data is indicated.

If the indoor unit doing normal operation is selected, " NO ERROR " is displayed for 3 seconds and address of indoor unit is displayed.

8. By the 🛕 🔻 button, the abnormal operation data is displayed.

Displayed data item is based on 3 Trial operation

*Depending on models, the items that do not have corresponding data are not displayed.

- 9. To display the data of a different indoor unit, press the AIR CON No.] button, which allows you to go back to the indoor unit slection screen.
- 10.Pressing the OON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

Off two (2) remote controls are connected to one (1) indoor unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)

5.3 Installation of wired remote control (option)

(1) Model RC-E5

PJA012D730

Read together with indoor unit's installation manual.

MARNING

- Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal.
 - Loose connection or hold will cause abnormal heat generation or fire.
- Make sure the power supply is turned off when electric wiring work.
 Otherwise, electric shock, malfunction and improper running may occur.



ACAUTION

- DO NOT install the remote control at the following places in order to avoid malfunction.
 - (1) Places exposed to direct sunlight
- (4) Hot surface or cold surface enough to generate condensation
- (2) Places near heat devices
- (5) Places exposed to oil mist or steam directly
- (3) High humidity places
- (6) Uneven surface



DO NOT leave the remote control without the upper case.

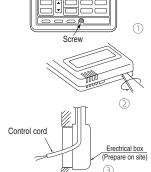
In case the upper cace needs to be detached, protect the remote control with a packaging box or bag in order to keep it away from water and dust.



Accessories	Remote control, wood screw (ø3.5×16) 2 pieces
Prepare on site Remote control cord (2 cores) the insulation thickness in 1mm or more.	
	[In case of embedding cord] Erectrical box, M4 screw (2 pieces)
	[In case of exposing cord] Cord clamp (if needed)

Installation procedure

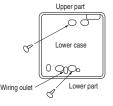
- Open the cover of remote control, and remove the screw under the buttons without fail.
- ② Remove the upper case of remote control. Insert a flat-blade screwdriver into the dented part of the upper part of the remote control, and wrench slightly.

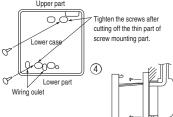


[In case of embedding cord]

3 Embed the erectrical box and remote control cord beforehand.

Prepare two M4 screws (recommended length is 12-16mm) on site, and install the lower case to erectrical box. Choose either of the following two positions in fixing it with screws.

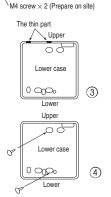




- Sonnect the remote control cord to the terminal block. Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y). (X and Y are no polarity)
- Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.

[In case of exposing cord]

- 3 You can pull out the remote control cord from left upper part or center upper part. Cut off the upper thin part of remote control lower case with a nipper or knife, and grind burrs with a file etc.
- ④ Install the lower case to the flat wall with attached two wooden screws.

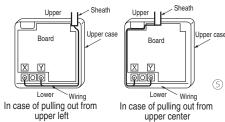


(4)

S Connect the remote control cord to the terminal block.

Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y). (X and Y are no polarity)

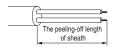
Wiring route is as shown in the right diagram depending on the pulling out direction.



The wiring inside the remote control case should be within 0.3mm² (recommended) to 0.5mm². The sheath should be peeled off inside the remote control case.

The peeling-off length of each wire is as below.

Pulling out from upper left	Pulling out from upper center
X wiring : 215mm	X wiring : 170mm
Y wiring : 195mm	Y wiring : 190mm



- Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.
- In case of exposing cord, fix the cord on the wall with cord clamp so as not to slack.

Installation and wiring of remote control

- ① Wiring of remote control should use 0.3mm² × 2 core wires or cables. (on-site configuration)
- ② Maximum prolongation of remote control wiring is 600 m.

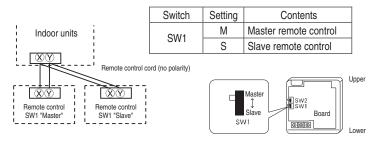
If the prolongation is over 100m, change to the size below.

But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

100 - 200m	$\cdots 0.5$ mm ² \times 2 cores
Under 300m	······0.75mm ² × 2 cores
Under 400m	······1.25mm ² × 2 cores
Under 600m	·····2.0mm ² × 2 cores

Master/ slave setting when more than one remote controls are used

A maximum of two remote controls can be connected to one indoor unit (or one group of indoor units.)



Set SW1 to "Slave" for the slave remote control. It was factory set to "Master" for shipment.

Note: The setting "Remote control thermistor enabled" is only selectable with the master remote control in the position where you want to check room temperature.

The air conditioner operation follows the last operation of the remote control regardless of the master/ slave setting of it.

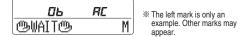
The indication when power source is supplied

When power source is turned on, the following is displayed on the remote control until the communication between the remote control and indoor unit settled.

Master remote control : "@WAIT@ M"
Slave remote control : "@WAIT@ S"

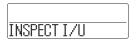
At the same time, a mark or a number will be displayed for two seconds first.

This is the software's administration number of the remote control, not an error cord.



When remote control cannot communicate with the indoor unit for half an hour, the below indication will appear.

Check wiring of the indoor unit and the outdoor unit etc.



The range of temperature setting

When shipped, the range of set temperature differs depending on the operation mode as below.

Heating: 16~30°C (55~86°F)

Except heating (cooling, fan, dry, automatic): 18~30°C (62~86°F)

Upper limit and lower limit of set temperature can be changed with remote control.

Upper limit setting: valid during heating operation. Possible to set in the range of 20 to 30°C (68 to 86°F). Lower limit setting: valid except heating (automatic, cooling, fan, dry) Possible to set in the range of 18 to 26°C (60°C).

Lower limit setting: valid except heating (automatic, cooling, fan, dry) Possible to set in the range of 18 to 26°C (62 to 79°F).

When you set upper and lower limit by this function, control as below.

1. When ②TEMP RANGE SET, remote control function of function setting mode is "INDN CHANGE" (factory setting), [If upper limit value is set]

During heating, you cannot set the value exceeding the upper limit.

[If lower limit value is set]

During operation mode except heating, you cannot set the value below the lower limit.

When @TEMP RANGE SET, remote control function of function setting mode is "NO INDN CHANGE" [If upper limit value is set]

During heating, even if the value exceeding the upper limit is set, upper limit value will be sent to the indoor unit. But, the indication is the same as the temperature set.

[If lower limit value is set]

During except heating, even if the value lower than the lower limit is set, lower limit value will be sent to the indoor unit. But, the indication is the same as the temperature set.

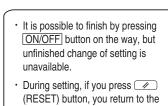
How to set upper and lower limit value

1. Stop the air-conditioner, and press (SET) and (MODE) button at the same time for over three seconds.

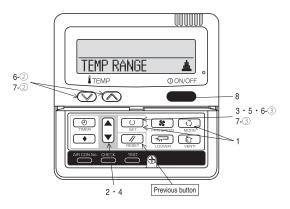
The indication changes to "FUNCTION SET ▼".

- 2. Press ▼ button once, and change to the "TEMP RANGE ▲ " indication.
- 3. Press (SET) button, and enter the temperature range setting mode.
- 4. Select "UPPER LIMIT ▼" or "LOWER LIMIT ▲" by using ▲ ▼ button.
- 5. Press (SET) button to fix.
- 6. When "UPPER LIMIT ▼" is selected (valid during heating)
 - ① Indication: " \bigcirc \lor \land SET UP" \rightarrow "UPPER 30°C \lor "
 - ② Select the upper limit value with temperature setting button ☑ △. Indication example: "UPPER 26°C ∨ ∧" (blinking)
 - ③ Press ◯ (SET) button to fix. Indication example: "UPPER 26°C" (Displayed for two seconds)

 After the fixed upper limit value displayed for two seconds, the indication will return to "UPPER LIMIT ▼".
- 7. When "LOWER LIMIT **\(\Lambda \)**" is selected (valid during cooling, dry, fan, automatic)
 - ① Indication: " $\textcircled{b} \lor \land \mathsf{SET} \mathsf{UP}" \to "\mathsf{LOWER} \mathsf{18}^\circ\mathsf{C} \land "$
 - ② Select the lower limit value with temperature setting button $\boxed{\ }$ $\boxed{\ }$. Indication example: "LOWER 24°C $\lor \land$ " (blinking)
 - ③ Press (SET) button to fix. Indication for example: "LOWER 24°C" (Displayed for two seconds) After the fixed lower limit value displayed for two seconds, the indication will return to "LOWER LIMIT ▼".
- 8. Press ON/OFF button to finish.



previous screen.



The functional setting

The initial function setting for typical using is performed automatically by the indoor unit connected, when remote control and indoor unit are connected.

As long as they are used in a typical manner, there wiil be no need to change the initial settings.

If you would like to change the initial setting marked " O ", set your desired setting as for the selected item. The procedure of functional setting is shown as the following diagram.

Flow	of	function	settingl
1 10 11	٠.	IUIICUOII	Sching

Start : Stop air-conditioner and press " " (SET) and " " (MODE) buttons at the same time for over three seconds.

Finalize : Press " (SET) button.

Reset : Press " (RESET) button.

Select : Press | To button.

End : Press | NOFF| button.

Record and keep the setting

Consult the technical data etc. for each control details

It is possible to finish above setting on the way. and unfinished change of setting is unavailable.

": Initial settings

Stop air-conditioner and press ○ (SET) + ○ (MODE) buttons at the same time for over three seconds

FUNCTION SET ▼

To next page

☐ FUNCTION ▼ (Remote control function) Function setting 01 6MAEF 3E ○ Validate setting of ESP:External Static Pressure SP INVALID Invalidate setting of ESP 02 AUTO RUN SE Automatical operation is impossible 03 I ☑ ☑ TEMP SW ⊹D⊠ VALID S⊠⊠ INVALII Temperature setting button is not working 04 🖾 MODE SW (SEE VALID (SEE INVALI Mode button is not working 05 O ON/OFF SW On/Off button is not working 06 FAN SPEED SW 용절 INVALID Fan speed button is not working 07 🖾 LOUVER SW ⊕⊠ VALID ⊕⊠ INVALID Louver button is not working 08 @ TIMER SW ७७ VALID ७७ INVALID Timer button is not working 09 ■ SENSOR SE ESENSOR OF Remote thermistor is not working. Remote thermistor is working.

Remote thermistor is working.

Remote thermistor is working, and to be set for producing +3.0°C increase in temperature.

Remote thermistor is working, and to be set for producing +2.0°C increase in temperature.

Remote thermistor is working, and to be set for producing +1.0°C increase in temperature. © SENSOR +2.0° © SENSOR +1.0° Remote thermistor is working, and to be set for producing -1.0°C increase in temperature. Remote thermistor is working, and to be set for producing -2.0 °C increase in temperature. Remote thermistor is working, and to be set for producing -3.0 °C increase in temperature. 10 AUTO RESTART 11 | VENT LINK SET NO VENT In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), the operation of ventilation device is linked with the operation of indoor unit. VENT LINK operation of indoor unit.

In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), you can operate /stop the ventilation device independently by

(VENT) button. NO VENT LINK 12 TEMP RANGE SET If you change the range of set temperature, the indication of set temperature INDN CHANGE will vary following the control.

If you change the range of set temperature, the indication of set temperature will not vary following the control, and keep the set temperature. NO INDN CHANG 13 I/U FAN Airflow of fan becomes of %adl- %adl- %adl or the four speed of %adll- %adl- %adl- %adl Airflow of fan becomes of & all - & all] Airflow of fan becomes of *****
Airflow of fan is fixed at one speed. If you change the remote control function "14 %¬POSITION", you must change the indoor function "04 %¬POSITION" accordingly. 14 ⇒¬POSITION You can select the louver stop position in the four. The louver can stop at any position. 4POSITION STOR 15 MODEL TYPE COOLENG ONLY 16 EXTERNAL CONTROL SET If you input signal into CNT of the indoor printed circuit board from external, the indoor unit will be operated independently according to the input from external. If you input into CNT of the indoor printed circuit board from external, all units which connect to the same remote control are operated according to the input from external. INDIVIDUAL FOR ALL UNITS 17 ROOM TEMP INDICATION SET INDICATION OFF In normal working indication, indoor unit temperature is indicated instead of airflow (Only the master remote control can be indicated.) 18 * INDICATION Heating preparation indication should not be indicated. 19 %/°E SET Temperature indication is by degree C Temperature indication is by degree F To next page

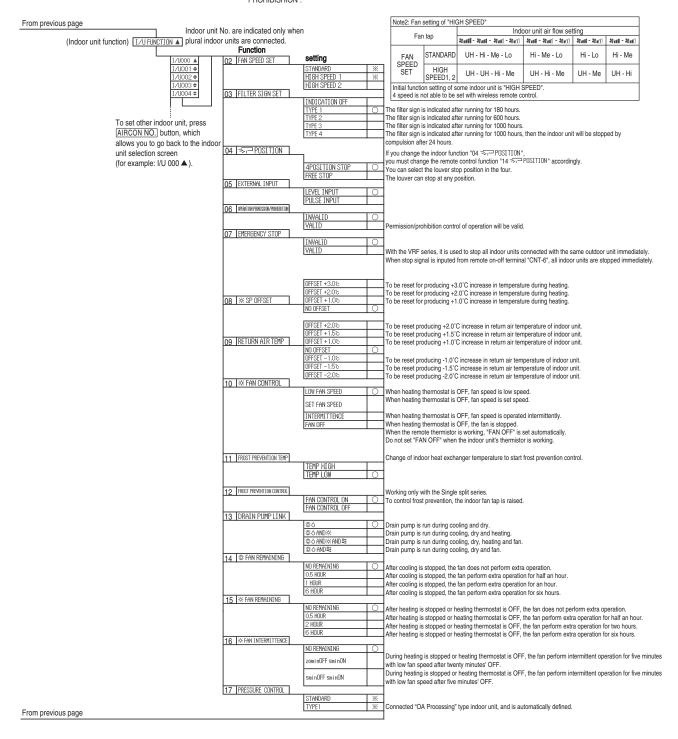
> ON/OFF button (finished)

Note 1: The initial setting marked "%" is decided by connected indoor and outdoor unit, and is automatically defined as following table.

Function No.	Item	Default	Model	
Remote control	AUTO RUN SET	AUTO RUN ON	"Auto-RUN" mode selectable indoor unit.	
function02		AUTO RUN OFF	Indoor unit without "Auto-RUN" mode	
Remote control	☑SIFAN SPEED SW	용조 VALID	Indoor unit with two or three step of air flow setting	
function06		6國 INVALID	Indoor unit with only one of air flow setting	
Remote control function07	EZ LOUVER SW	&⊡ VALID	Indoor unit with automatically swing louver	
		& ☑ INVALID	Indoor unit without automatically swing louver	
Remote control function13	I/U FAN	HI-MID-LO	Indoor unit with three step of air flow setting	
		HI-LO	Indoor unit with two step of air flow setting	
		HI-MID		
		1 FAN SPEED	Indoor unit with only one of air flow setting	
Remote control	MODEL TYPE	HEAT PUMP	Heat pump unit	
function15		COOLING ONLY	Exclusive cooling unit	

Note 3: As for plural indoor unit, set indoor functions to each master and slave indoor unit.

But only master indoor unit is received the setting change of indoor unit function "05 EXTERNAL INPUT" and "06 PERMISSION / PROHIBISHION".



How to set function

Stop air-conditioner and press ○ (SET) (MODE) buttons at the same time for over three seconds, and the "FUNCTION SET ▼" will be displayed.



- 2. Press (SET) button.
- Make sure which do you want to set, "
 [□] FUNCTION ▼ "
 (remote control function) or "I/U FUNCTION ▲ " (indoor unit function).
- 4. Press ▲ or ▼ button.

 Selecct "■ FUNCTION ▼" (rem

Selecct "■ FUNCTION ▼" (remote control function) or "I/U FUNCTION ▲" (indoor unit function).



5. Press (SET) button.

6. [On the occasion of remote control function selection]

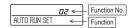
① "DATA LOADING" (Indication with blinking)

Usplay is changed to "01 ⑤☑A ESP SET".

② Press ▲ or ▼ button.

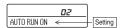
"No. and function" are indicated by turns on the remote control function table, then you can select from them.

(For example)



3 Press (SET) button.

The current setting of selected function is indicated. (for example) "AUTO RUN ON" ← If "02 AUTO RUN SET" is selected



Press or button. Select the setting.



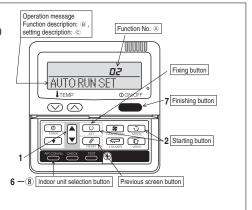
S Press (SET)

"SET COMPLETE" will be indicated, and the setting will be completed.

Then after "No. and function" indication returns, Set as the same procedure if you want to set continuously ,and if to finish, go to 7.



Press ON/OFF button. Setting is finished.



[On the occasion of indoor unit function selection]

① "DATA LOADING" (Blinking for 2 to 23 seconds to read the data)

Indication is changed to "02 FAN SPEED SET".

[Note]

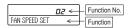
 If plural indoor units are connected to a remote control, the indication is "I/U 000" (blinking) ← The lowest number of the indoor unit connected is indicated.



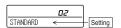
- (2) Press ▲ or ▼ button. Select the number of the indoor unit you are to set If you select "ALL UNIT ▼", you can set the same setting with all unites.
- (3) Press (SET) button.
- ② Press ▲ or ▼ button.

"No. and function" are indicated by turns on the indoor unit function table, then you can select from them.

(For example)



③ Press ○ (SET) button. The current setting of selected function is indicated. (For example) "STANDARD" ← If "02 FAN SPEED SET" is selected.



- ④ Press ▲ or ▼ button. Select the setting.
- S Press () (SET) button. "SET COMPLETE" will be indicated, and the setting will be completed.

Then after "No. and function" indication returns, set as the same procedure if you want to set continuously, and if to finish, go to 7.



When plural indoor units are connected to a remote control, press the AIRCON NO. button, which allows you to go back to the indoor unit selection screen. (example "I/U 000 A")

- It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable.
- During setting, if you press $\begin{tabular}{c} \end{tabular}$ (RESET) button, you return to the previous screen.
- Setting is memorized in the control and it is saved independently of power failure.

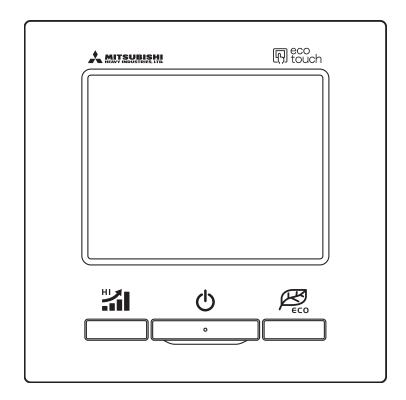
[How to check the current setting]

When you select from "No. and funcion" and press set button by the previous operation, the "Setting" displayed first is the current setting.

(But, if you select "ALL UNIT ▼ ", the setting of the lowest number indoor unit is displayed.)

(2) Model RC-EX1A PJZ012D077

eco touch REMOTE CONTROL RC-EX1A INSTALLATION MANUAL



1) Safety Precautions

This installation manual describes the installation methods and precautions related to the remote control. Use this manual together with the user's manuals for the indoor unit, outdoor unit and other optional equipment. Please read this manual carefully before starting the installation work to install the unit properly.

Safety precautions

Please read this manual carefully before starting installation work to install the unit properly. Every one of the followings is important information to be observed strictly.

<u></u>∴WARNING	Failure to follow these instructions properly may result in serious consequences such as death, severe injury, etc	
∴CAUTION	Failure to follow these instructions properly may cause injury or property damage.	

It could have serious consequences depending on the circumstances.

The following pictograms are used in the text.



•Keep this manual at a safe place where you can consult with whenever necessary. Show this manual to installers when moving or repairing the unit. When the ownership of the unit is transferred, the "Installation Manual" should be given to a new owner.

MARNING

Ask a professional contractor to carry out installation work according to the installation manual. Improper installation work may result in electric shocks, fire or break-down.



Shut OFF the main power supply before starting electrical work.

Otherwise, it could result in electric shocks, break-down or malfunction.



Do not install the unit in appropriate environment or where inflammable gas could generate, flow in, accumulate or leak.

If the unit is used at places where air contains dense oil mist, steam, organic solvent vapor, corrosive gas (ammonium, sulfuric compound, acid, etc) or where acidic or alkaline solution, special spray, etc. are used, it could cause electric shocks, break-down, smoke or fire as a result of significant deterioration of its performance or corrosion.



Do not install the unit where water vapor is generated excessively or condensation occurs.

It could cause electric shocks, fire or break-down.



Use the specified cables for wiring, and connect them securely with care to protect electronic parts from external forces.



Improper connections or fixing could cause heat generation, fire, etc.

Seal the inlet hole for remote control cable with putty.

If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.



When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.

It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.



The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.

A CAUTION

Do not install the remote control at following places.

It could cause break-down or deformation of remote control.

- (i) Where it is exposed to direct sunlight
- (ii) Near the equipment to generate heat
- (iii) Where the surface is not flat



When the upper case is removed, put it in a packing box or packing bag to protect internal PCBs or other parts from dust, moisture, etc.



2) Accessories & Prepare on site

Accessories

R/C main unit, wood screw (ø3.5 x 16) 2 pcs User's Manual, Installation Manual

Parts procured at site

Item name	Q'ty	Remark	
Switch box For 1 piece or 2 pieces (JIS C8340 or equivalent)	1	These are not required when installing	
Thin wall steel pipe for electric appliance (JIS C8305 or equivalent)	As required	directly on a wall.	
Lock nut, bushing (JIS C8330 or equivalent)	As required		
Lacing (JIS C8425 or equivalent)	As required	Necessary to run R/C cable on the wall.	
Putty	Suitably	For sealing gaps	
Molly anchor	As required		
R/C cable (0.3 mm² x 2 pcs)	As required	See right table when longer than 100 m	

When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm^2 . Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

< 200 m	0.5 mm ² x 2-core
< 300 m	0.75 mm ² x 2-core
< 400 m	1.25 mm ² x 2-core
< 600 m	2.0 mm ² x 2-core

3) Remote control installation procedure

Determine where to install the remote control

Installation "Using a switch box"

"Installed directly on a wall"

Wiring direction "Backward"

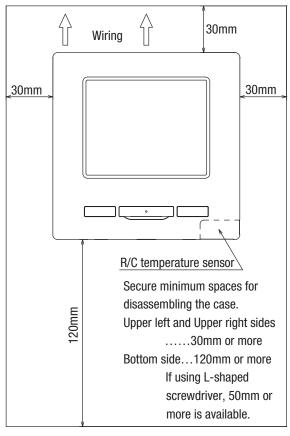
"Upper center", "Upper left"

Cautions for selecting installation place

- (i) Installation surface must be flat and sufficiently strong. R/C case must not be deformed.
- (ii) Where the R/C can detect room temperatures accurately. This is a must when detecting room temperatures with the temperature sensor of R/C.
 - · Install the R/C where it can detect the average temperature in the room.
 - · Install the R/C separated from a heat source sufficiently.
 - · Install the R/C where it will not be influenced by the turbulence of air when the door is opened or closed.

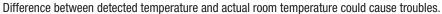
Select a place where the R/C is not exposed to direct sunlight or blown by winds from the air conditioner or temperatures on the wall surface will not deviate largely from actual room temperature.

Installation space



Request

Be sure not to install R/C at a place where temperatures around the installation surface of R/C may differ largely from actual room temperature.



The correction for detected temperature by the R/C cannot offset such temperature difference because it corrects the detected temperatures itself.



Request

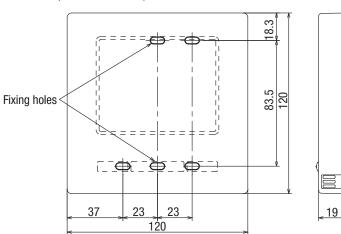
Do not install the R/C at a place where it is exposed to direct sunlight or where surrounding air temperature exceeds 40°C or drops below 0°C.



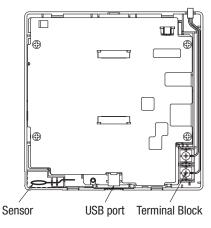
It could cause discoloration, deformation, malfunction or breakdown.

Installation procedure

Dimensions (Viewed from front)







- ① To remove the upper case from the bottom cases of R/C
 - · Insert the tip of flat head screwdriver or the like in the recess at the lower part of R/C and twist it lightly to remove.

Take care to protect the removed upper case from moisture or dust.



② Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit.

R/C wires (X, Y) have no polarity.

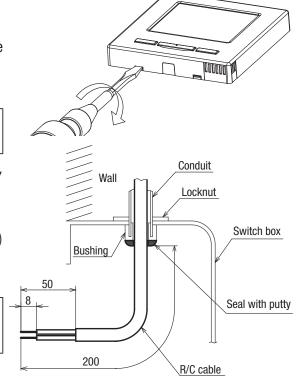
In case of embedding wiring (When the wiring is retrieved "Backward")

③ Embed the switch box and the R/C wires beforehand.

Seal the inlet hole for the R/C wiring with putty.

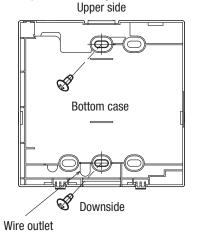
 If dust or insect enters, it could cause electric shocks, fire or breakdown.



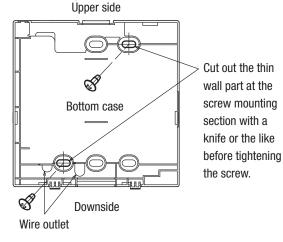


4 When wires are passed through the bottom case, fix the bottom case at 2 places on the switch box.

Switch box for 1 pc



Switch box for 2 pcs

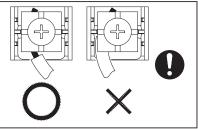


- ⑤ When fixing the bottom case diagonally at 2 places, cut out the thin wall section on the case.
- ⑥ Fix wires such that the wires will run around the terminal screws on the top case of R/C.

Cautions for wire connection

Use wires of no larger than 0.5 mm² for wiring running through the remote control case, Take care not to pinch the sheath.

Tighten by hand (0.7 N·m or less) the wire connection. If the wire is connected using an electric driver, it may cause failure or deformation.

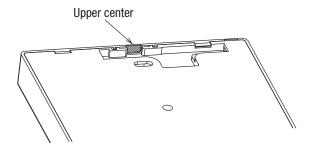


Wiring hole on bottom case

Install the upper case with care not to pinch wires of R/C.

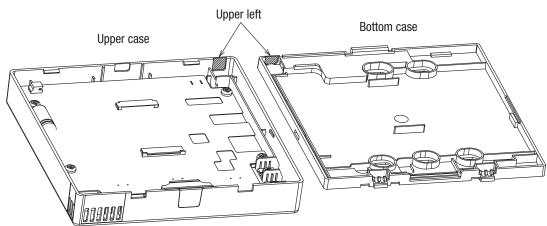
In case of exposing wiring (When the wiring is taken out from the "upper center" or "upper left" of R/C)

③ Cut out the thin wall sections on the cases for the size of wire.



When taking the wiring out from the upper center, open a hole before separating the upper and bottom cases. This will reduce risk of damaging the PCB and facilitate subsequent work.

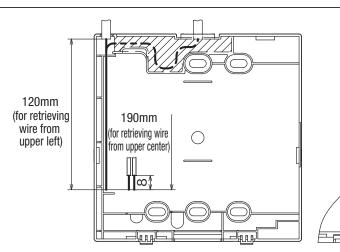
When taking the wiring out from the upper left, take care not to damage the PCB and not to leave any chips of cut thin wall inside.



If the hole is cut too large, moisture, dust or insects may enter. Seal gaps with putty or the like.



- ④ Fix the bottom R/C case on a flat surface with wood screws.
- (5) In case of the upper center, pass the wiring behind the bottom case. (Hatched section)
- ⑥ Fix wires such that the wires will run around the terminal screw of the top case of R/C.
- Install the top case with care not to pinch wires of R/C.

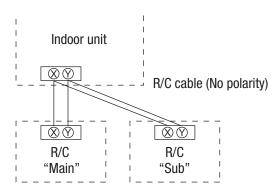




Main-Sub setting for use of two or more R/Cs

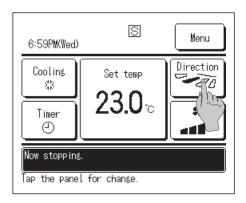
Up to two units of R/C can be used at the maximum for 1 indoor unit or 1 group. One is main R/C and the other is sub R/C.

Operating range is different depending on the main or sub R/C.



Set the "Main" and "Sub" as described at Section 7 of installtion manual attached to the remote control.

R/C function	Main	Sub
Run/Stop, setting temperature, fan speed and flap		
direction operations		
High power and energy-saving operations	\circ	\circ
Energy-saving setting	0	_
R/C sensor	0	_
Test run menu operation	0	_
Room temperature range setting	0	_
Indoor unit settings	0	_
Individual flap control	0	_
Operation data display		_
Error history display	0	0



Note: Connection to personal computer

It can be set from a personal computer via the USB port (mini-B). Connect after removing the cover for USB port of upper case.

Replace the cover after use.

If dust, insect, etc. enters, it could cause electric shocks or breakdown.



Special software is necessary for the connection.

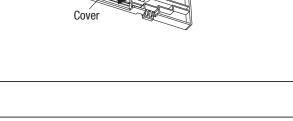
For details, view the web site or refer to the engineering data.

Do not connect to a personal computer without using the special software.

Do not connect the personal computer to the USB simultaneously with other USB devices.



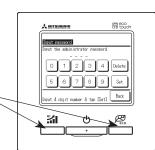
It could cause malfunction or breakdown of R/C or personal computer.



Note: Initializing of password

Administrator password (for daily setting items) and service password (for installation, test run and maintenance) are used.

- The administrator password at factory default is "0000". This setting can be changed (Refer to User's Manual). When the administrator password is forgotten, it can be initialized, if the [Highpower] and the [Energy-saving] buttons are pushed simultaneously for 5 seconds on the administrator password input screen.
- Service password is "9999", which cannot be changed.
 When the administrator password is input, the service password is also accepted.



USB port

Note: Combination of R/C and indoor unit

- (1) It can be used as the combination of Main and Sub with RC-E3 to -E5 type of wireless R/C (option part).
- (2) It can be combined with FD-V or FD-KX E6 type and later types of indoor units
- (3) In cases of combination with FD-V or FD-KX E6 type unit, there are some controlling items which cannot be used. If operating such items, the message "Invalid request" is displayed.

For details, refer to the installation manual attached to the remote control.

5.4 Installation of outdoor unit

Model FDC71VNP

PCA012D057A

R410A REFRIGERANT USED

- This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 109.
- . When install the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply voltage and etc.) and installation spaces.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and strictly follow it during the installation work in order
- The precautionary items mentioned below are distinguished into two levels, **AWARNING** and **ACAUTION**. WARNING: Wrong installation would cause serious consequences such as injuries or death. CAUTION: Wrong installation might cause serious consequences depending on circumstances.

Both mentions the important items to protect your health and safety so strictly follow them by any means.

- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.
- For installing qualified personnel, take precautions in respect to themselves by using suitable protective clothing, groves, etc., and then perform the installation works.
- Please pay attention not to fall down the tools, etc. when installing the unit at the high position.
- If unusual noise can be heard during operation, consult the dealer.
- The meanings of "Marks" used here are shown as follows:



Always do it according to the instruction.

. Installation must be carried out by the qualified installer.

If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction. Do not carry out the installation and maintenance work except by the qualified installer.

- Install the system in full accordance with the installation manual. Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- Be sure to use only for household and residence.

If this appliance is installed in inferior environment such as machine shop and etc... it can cause malfunction.

 When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage, referred by the formula (accordance with ISO5149).

If the density of refrigerant exceeds the limit, please consult the dealer and install the ventilation system, otherwise lack of oxygen can occur, which can cause serious

Use the original accessories and the specified components for

If parts other than those prescribed by us are used, It may cause water leaks, electric shocks, fire and personal injury.

Install the unit in a location with good support.

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

. Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

 Ventilate the working area well in the event of refrigerant leakage during installation.

• Ensure that no air enters in the refrigerant circuit when the unit is

If air enters in the refrigerant circuit, the pressure in the refrigerant circuit

If the refrigerant comes into contact with naked flames, poisonous gas is produced.

- Use the prescribed pipes, flare nuts and tools for R410A. Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- Tighten the flare nut by torque wrench with specified method. If the flare nut were tightened with excess torque, this may cause burst and refrigerant leakage after a long period.
- . Do not open the operation valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation. If the compressor is operated in state of opening operation valves before completed connection of refrigerant piping work, air can be sucked into refrigerant circuit, which can cause bust or personal injury due to anomalously high pressure in the refrigerant
- The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit. Power supply with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- Be sure to shut off the power before starting electrical work. Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- . Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.
- Unconformable cables can cause electric leak, anomalous heat production or fire. • This appliance must be connected to main power supply by means of a circuit breaker or switch (fuse:20A) with a contact separation of at least
- Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.

. Do not bundling, winding or processing for the power cord. Or, do not deforming the power plug due to tread it. This may cause fire or heating

. Do not run the unit with removed panels or protections.

Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.

Incorrect installation may result in overheating and fire.

- Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.
- Loose connections or cable mountings can cause anomalous heat production or fire.
- . Be sure to fix up the service panels.

Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.

. Be sure to switch off the power supply in the event of installation, inspection or servicing.

If the power supply is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.

Stop the compressor before removing the pipe after shutting the service valve on pump down work.

If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.

• Only use prescribed optional parts. The installation must be carried out by the qualified installer.

If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire,

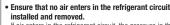
- . Be sure to wear protective goggles and gloves while at work.
- · Earth leakage breaker must be installed.

If the earth leakage breaker is not installed, it can cause electric shocks.

 Appliance is not to be used by children or persons with reduced physical. sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children being supervised not to play with appliance.

. Do not perform any change of protective device itself or its setup condition. The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.





becomes too high, which can cause burst and personal injury.

 Do not processing, splice the power cord, or share a socket with other power plugs. This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.

↑ CAUTION



. Carry out the electrical work for ground lead with care.

Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.



- Use the circuit breaker for all pole correct capacity. Circuit breaker should be the one that disconnect all poles under over current. Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- Install isolator or disconnect switch on the power supply wiring in accordance with the local codes and regulations. The isolator should be locked in OFF state in accordance with FN60204-1.
- After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.
- Secure a space for installation, inspection and maintenance specified in the manual.

Insufficient space can result in accident such as personal injury due to falling from the installation place.

. Do not install the unit in the locations listed below.

- Locations where carbon fiber, metal powder or any powder is floating.
- Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur
- Vehicles and ships.
- Locations where cosmetic or special sprays are often used.
- . Locations with direct exposure of oil mist and steam such as kitchen and machine nlant
- Locations where any machines which generate high frequency harmonics are
- Locations with salty atmospheres such as coastlines.
- . Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
- . Locations where the unit is exposed to chimney smoke
- . Locations at high altitude (more than 1000m high).
- · Locations with ammonic atmospheres.
- Locations where heat radiation from other heat source can affect the unit.
- · Locations without good air circulation.
- Locations with any obstacles which can prevent inlet and outlet air of the unit.
- · Locations where short circuit of air can occur (in case of multiple units
- inetallation) Locations where strong air blows against the air outlet of outdoor unit.
- . Locations where something located above the unit could fall. It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire

. Take care when carrying the unit by hand.

If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.

. Dispose of any packing materials correctly.

Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.

 Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.

Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.

 When perform the air conditioner operation (cooling or drying operation) in which ventilator is installed in the room. In this case, using the air conditioner in parallel with the ventilator, there is the possibility that drain water may backflow in accordance with the room lapse into the negative pressure status. Therefore, set up the opening port such as incorporate the air into the room that may appropriate to ventilation (For example; Open the door a little). In addition, just as above, so set up the opening port if the room lapse into negative pressure status due to register of the wind for the high rise apartment etc.

. Do not install the outdoor unit in the locations listed below.

- Locations where discharged hot air or operating sound of the outdoor unit can hother neighborhood
- . Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
- · Locations where vibration can be amplified and transmitted due to insufficient
- · Locations where vibration and operation sound generated by the outdoor unit can affect seriously (on the wall or at the place near bed room).
- Locations where an equipment affected by high harmonics is placed (TV set or radio receiver is placed within 5m).
- · Locations where drainage cannot run off safely.
- It can affect surrounding environment and cause a claim.
- . Do not install the unit near the location where leakage of combustible uacec can occur

If leaked gases accumulate around the unit, it can cause fire.

. Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.

Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire

 Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics.

Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.

. Do not install the outdoor unit in a location where insects and small animals can inhahit

Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.

 Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.

Using an old and damage base flame can cause the unit falling down and cause personal injury.

 Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used. Connecting the circuit with copper wire or other metal thread can cause unit

failure and fire

• Do not touch any buttons with wet hands.

It can cause electric shocks.

Do not touch any refrigerant pipes with your hands when the system is in

During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury. Do not touch the suction or aluminum fin on the outdoor unit.

- This may cause injury.
- Do not put anything on the outdoor unit and operating unit. This may cause damage the objects or injury due to falling to the object.
- . Do not use the unit for special purposes such as storing foods, cooling
- precision instruments and preservation of animals, plants or art.
- . Do not clean up the unit with water.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit operation valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the left before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

Check before installation work

- Model name and power source
- · Refrigerant piping length
- · Piping, wiring and miscellaneous small parts Indoor unit installation manual
- Q'ty Accessories for outdoor unit Grommet (Heat pump type only) Drain elbow (Heat pump type only) Reducer set ø9.52 →ø6.35 A) Reducer set ø15.88 → ø12.7

	Option parts	Q'ty
(a)	Sealing plate	1
6	Sleeve	1
0	Inclination plate	1
a	Putty	1
@	Drain hose (extension hose)	1
Ð	Piping cover	1
	(for insulation of connection piping)	'

Necessary tools for the installation work	Wrench key (Hexagon) [4m/m]	
Necessary tools for the installation work	Vacuum pump	
1 Plus headed driver	Vacuum pump adapter (Anti-re	everse flow type)
2 Knife	(Designed specifically for R410	DA)
3 Saw	Gauge manifold (Designed spe	ecifically for R410A)
4 Tape measure	Charge hose (Designed specif	ically for R410A)
5 Hammer	Flaring tool set (Designed spec	cifically for R410A)
6 Spanner wrench	Gas leak detector (Designed s	pecifically for R410A)
7 Torque wrench [14.0~82.0N·m (1.4~8.2kgf·m)]	Gauge for projection adjustme	ent
8 Hole core drill (65mm in diameter)	(Used when flare is made by u	sing conventional flare too

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(1) HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity CAUTION When a unit is holsted with shirts for hadrage, and his solution and fall center position. If not properly balanced, the unit can be thrown off-balance and fall.

1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When you have to unpack the unit for a compelling reason before you haul it to the installation point, hoist the unit with nylon slings or ropes and protection pads so that you may not damage the unit.

2) Portage

• The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- O A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance
- O A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit. O A place where the unit is not exposed to oil splashes.
- O A place where it can be free from danger of flammable gas leakage.
- O A place where drain water can be disposed without any trouble.
- O A place where the unit will not be affected by heat radiation from other heat source.
- O A place where snow will not accumulate.
- A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- O A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment
- O A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- O If a operation is conducted when the outdoor air temperature is -5°C lower, the outdoor unit should be installed at a place where it is not influenced by natural wind.
- O A place where strong wind will not blow against the outlet air blow of the unit.

4) Caution about selection of installation location

- (1) If the unit is installed in the area where the snow will accumulate, following measures are required. The bottom plate of unit and intake, outlet may be blocked by snow.
- 1 Install the unit on the base so that the bottom is higher than snow cover surface, and draining water is secured.



- 2 Provide a snow hood to the outdoor unit on site.
- 3 Install the unit under eaves or provide the roof on site.





- Since drain water generated by defrost control may freeze, following measures are required. • Don't execute drain piping work by using a drain elbow and drain grommets (accessories). [Refer to Drain piping work.]
- Attached heater on a base plate on site, if there is possibility to freeze drain water. In case that the product has a corrective drainage system, the drainage paths should have suitable threatment against freezing but be sure not to melt the material of drainage paths with heat.

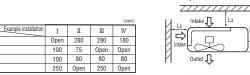
- (2) If the unit can be affected by strong wind, following measures are required. Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.
- 1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.
- 2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.
- 3. The unit should be installed on the stable and level foundation. If the foundation is not level the down the unit with wires.





5) Installation space

- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In order to facilitate servicing of controllers, please provide a sufficient space between units so that their top plates can be removed easily.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.



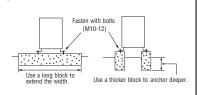
(2) Notabilia for installation

L2 13

6) Installation

1 Anchor bolt fixed position

288.7 ___Outlet



The height of a wall is 1200mm or less

- In installing the unit, fix the unit's legs with bolts specified on the above.
- The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the above illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5 mm or less.) Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation. when the outdoor temperature is -5°C or lower.

● When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly.

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(2) REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

• Check the following points in light of the indoor unit specifications and the installation site.

Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Restrictions			Dimensional restrictions	Marks appearing in the drawing on the right
lada a sa sa isa	FDT, FDEN, FDU, FDUM	Main pipe length	30m or less	L
Indoor unit	FDF	waiii pipe ieiigiii	23m or less	L
Elevation difference between	When the outdoor unit is positioned higher		20m or less	Н
indoor and outdoor units	When the outdoor unit is positioned lower		20m or less	Н

△CAUTION

indoor unit specifications.

• The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see " 5. LITILIZATION OF EXISTING PIPING."

When pipe is brazing.

2) Determination of pipe size • Determine refrigerant pipe size pursuant to the following guidelines based on the

	Gas pipe	Liquid pipe
Outdoor unit connected	ø12.7 Flare	ø6.35 Flare
Refrigerant piping (branch pipeL)	ø12.7	ø6.35
Indoor unit connected	ø15.88	ø9.52

About brazing Brazing must be performed under a nitrogen gas flow. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging. If the refrigerant is existing in the pipe at brazing, poisonous gas is produced Plug the end of the pipe with tape, or othe material, and fill the pipe with nitrogen gas, <N>>

Only use nitrogen gas (N2) Pipe diameter [mm]

Minimum pipe wall thickness [mm]



0.8

O-type pipe

8.0

O-type pipe

Outdoor unit

Indoor unit

*Phosphorus deoxidized seamless copper pipe ICS 23.040.15, ICS 77.150.30

3) Refrigerant pipe wall thickness and material

• Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.

NOTE Select pipes having a wall thickness larger than the specified minimum pipe thickness.

4) On-site piping work

♠ CAUTION

Take care so that installed pipes may not touch components within a unit. IMPORTANT IAKE care so that installed pipes may not cool components main a difficulties.

If touching with an internal component, it will generate abnormal sounds and/or vibrations.

Regarding the change in the size of liquid/gas pipe;

Use the reducer at indoor unit side. Reducer set is available in the outdoor unit as accessory

How to remove the side cover | Please remove the screw of a side cover and remove to the front.

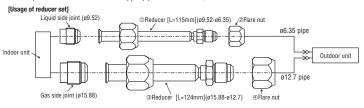
- · Carry out the on site piping work with the operation valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.

 Bend a pipe to a radius as large as practical.(R100-R150) Do not bend a pipe repeatedly to correct
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion
- The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.

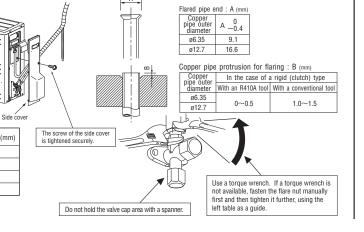
Do not apply force beyond proper fastening torque in tightening the flare nut.

Fix both liquid and gas operation valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

Operation valve size (mm)	Tightening torque (N·m)	Tightening angle (°)	Recommended length of a tool handle (mm)
ø6.35	14~18	45~60	150
ø9.52	34~42	30~45	200
ø12.7	49~61	30~45	250
ø15.88	68~82	15~20	300



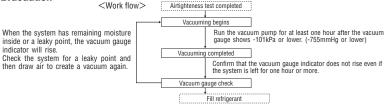
Reducer set (0~@) is included in the outdoor unit as accessory



5) Air tightness test

- ① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation valve shut all the time.
- a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
- b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
- c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
- d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient Temperature fall 1°C, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
- e) If a pressure drop is observed in checking e) and a) d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.
- ② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.

6) Evacuation



Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- Ouse a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

Indoor unit	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe ø6.35)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
FDT, FDEN FDU, FDUM	0.02	1.6	15
FDF	0.02	1.6	8

- ●This unit contains factory charged refrigerant covering 15m/8m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 15m/8m refrigerant piping. When refrigerant piping exceeds 15m/8m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 15m/8m.
- •If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, please see "5. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

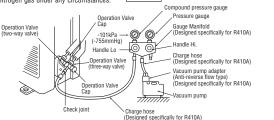
Additional charge volume (kg) = { Main length (m) - Factory charged volume} x 0.02 (kg/m)

*When an additional charge volume calculation result is negative,

- it is not necessary to charge refrigerant additionally.
- For an installation measuring 15m/8m or shorter in pipe length, please charge the refrigerant volume charged for shipment at the factory, when you recharge refrigerant after servicing etc.

8) Heating and condensation prevention

- (1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
- · Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- (2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
 - · All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
 - · Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
 - Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
 - · Both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.



Outdoor unit

Gas side operation valve

(

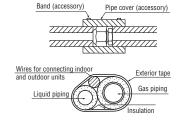
Securely tighten the operation valve cap and the check joint blind nut after adjustment.

Operation valve size (mm)	Operation valve cap tightening torque (N·m)	Check joint blind nut tightening torque (N·m)	
ø6.35 (1/4")	20~30	10 10	
ø12.7 (1/2")	25~35	10~12	

(2) Charging refrigerant

- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- ◆Charge refrigerant always from the liquid side service port with the operation valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- •In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes.
 Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

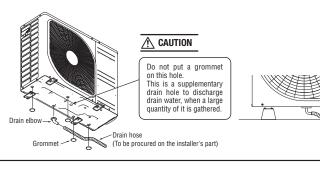
NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.



PAC-SM-190

(3) DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as accessories, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of operation valve or connected nines
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)



 When condensed water needs to be led to a drain, etc., install the unit on a flat base or concrete blocks (prepared on site) Then, please secure space for the

drain elbow and the drain hose

(4) **ELECTRICAL WIRING WORK** For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.

Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- •Do not use any supply cord lighter than one specified in parentheses for each type below.
- braided cord (code designation 60245 IEC 51).
- · ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
- · flat twin tinsel cord (code designation 60227 IEC 41);
- Use polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire.
- If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.
- Do not turn on the power until the electrical work is completeted.
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- · For power supply cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- •When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.

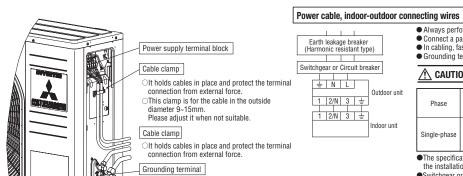
↑ CAUTION

In case of faulty wiring connection, the indoor unit stops, and then the run lamp turns on and the timer lamp blinks.

Use cables for interconnection wiring to avoid loosening of the wires. CENELEC code for cables Required field cables.

H05RNR4G1.5 (Example) or 245IEC57

- Harmonized cable type
- 300/500 volts
- Natural-and/or synth, rubber wire insulation
- Polychloroprene rubber conductors insulation
- R Stranded core
- 4or5 Number of conductors
- One conductor of the cable is the earth conductor (vellow/areen)
- 1.5 Section of copper wire (mm²)



OPlease be sure to carry out D-type (type III)

grounding work.

- Always perform grounding system installation work with the power cord unplugged.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

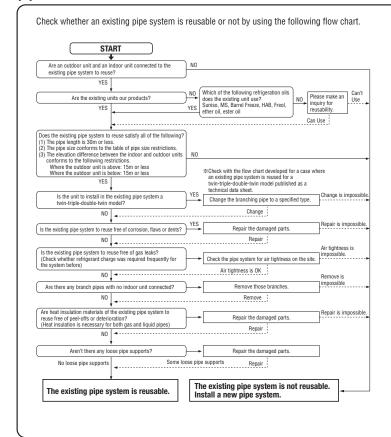
CAUTION

Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.

		Switchgea	r or Circuit Breaker	Power souce	Interconnecting and grounding wires (minimum)	
Phase	Earth leakage breaker	Switch breaker	Over current protector rated capacity	(minimum)		
Single-phase	20A,30mA, 0.1sec or less	30A	20A	2.0 mm ²	1.5mm×4	

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or Circuit breaker capacity which is calculated from MAX, over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

(5) UTILIZATION OF EXISTING PIPING



<Table of pipe size restrictions>

©:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits

Additional charge volume per meter of pipe 0.02kg/m 0.025kg/m			0.06	cg/m		
Indoor unit	Pipe size Liquid pipe		ø6.35	ø6.35	ø9.52	ø9.52
illuoor ullit	Gas pipe	ø12.7	ø15.88	ø12.7	ø15.88	
		Usability	0	0	Δ	\triangle
FDT, FDEN FDU. FDUM	Maximum one-way pipe length		30	24	10	10
FDU, FDUIVI	Length	covered without additional charge	15	12	5	5
		Usability	0	0	Δ	\triangle
FDF	1	Maximum one-way pipe length	23	18	8	8
	Length	covered without additional charge	8	6	3	3

• Please consult with our distributor in the area, if you need to recover refrigerant and charge it again.

• Any combinations of pipe sizes not listed in the table are not usable.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) - Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m)

* If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.

Example) When FDT is installed in a 10m long existing pipe system (liquid ø9.52, gas ø12.7), the quantity of refrigerant to charge additionally should be $(10m-5m) \times 0.06$ kg/m = 0.3 kg.

↑ WARNING

<Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

- (1) Run the unit for 30 minutes for a cooling operation.
- (2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
- (3) Close the liquid side operation valve of the outdoor unit and pump down (refrigerant recovery)
- (4) Blow with nitrogen gas. * If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
 - For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R410A.

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.

• If you choose to wash the pipe system, please contact our distributor in the area.

INSTALLATION TEST CHECK POINTS

No gas leaks from the joints of the operation valve and joint.

Check the following points again after completion of the installation, and before turning on the power. Conduct a test run again and ensure that the unit operates properly. Explain to the customer how to use the unit and how to take care of the unit following the instruction manual.

After installation

Operation valve is fully open.

Power cables and connecting wires are securely fixed to the terminal block.	The pipe joints for indoor and outdoor pipes have been insulated
The power supply voltage is correct as the rating.	The reverse flow check cap is attached.
The drain hose is fixed securely.	The cover of the pipe cover (A) faces downward to prevent rain to

The cover of the pipe cover (A) faces downward to prevent rain from entering. Gaps are properly sealed between the pipe covers (A) (B) and the wall surface / pipes

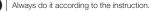
The screw of the side cover is tightened securely.

. When install the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply voltage and etc.) and installation spaces.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and strictly follow it during the installation work in order Keep the installation manual together with owner's manual at a place where any user can read at any time.
- The precautionary items mentioned below are distinguished into two levels. WARNING and CAUTION. WARNING: Wrong installation would cause serious consequences such as injuries or death. ACAUTION: Wrong installation might cause serious consequences depending on circumstances. Both mentions the important items to protect your health and safety so strictly follow them by any means.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual
- Moreover if necessary, ask to hand them to a new user.
- For installing qualified personnel, take precautions in respect to themselves by using suitable protective clothing, groves, etc., and then perform the installation works.
- Please pay attention not to fall down the tools, etc. when installing the unit at the high position.
- If unusual noise can be heard during operation, consult the dealer.
- The meanings of "Marks" used here are shown as follows:





Installation must be carried out by the qualified installer.

If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction. Do not carry out the installation and maintenance work except by the qualified installer.

- Install the system in full accordance with the installation manual. Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire
- · Be sure to use only for household and residence.

If this appliance is installed in inferior environment such as machine shop and etc. it can cause malfunction.

 When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage, referred by the formula (accordance with ISO5149).

If the density of refrigerant exceeds the limit, please consult the dealer and install the ventilation system, otherwise lack of oxygen can occur, which can cause serious accident

 Use the original accessories and the specified components for installation.

If parts other than those prescribed by us are used, It may cause water leaks, electric shocks, fire and personal injury.

 Install the unit in a location with good support. Unsuitable installation locations can cause the unit to fall and cause material

damage and personal injury. . Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury

 Ventilate the working area well in the event of refrigerant leakage during installation.

↑ WARNING If the refrigerant comes into contact with naked flames, poisonous gas is produced.

- Use the prescribed pipes, flare nuts and tools for R410A. Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- Tighten the flare nut by torque wrench with specified method. If the flare nut were tightened with excess torque, this may cause burst and refrigerant leakage after a long period.
- . Do not open the operation valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation. If the compressor is operated in state of opening operation valves before completed connection of refrigerant piping work, air can be sucked into refrigerant circuit, which can cause bust or personal injury due to anomalously high pressure
- . The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit. Power supply with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- . Be sure to shut off the power before starting electrical work. Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- . Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.
- Unconformable cables can cause electric leak, anomalous heat production or fire.
- This appliance must be connected to main power supply by means of a circuit breaker or switch (fuse:20A) with a contact separation of at least
- . Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.

Incorrect installation may result in overheating and fire.

- Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.
- Loose connections or cable mountings can cause anomalous heat production or fire.
- . Be sure to fix up the service panels.
- Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- . Be sure to switch off the power supply in the event of installation, inspection or servicing.
- If the power supply is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- . Stop the compressor before removing the pipe after shutting the service valve on pump down work.

If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.

- . Only use prescribed optional parts. The installation must be carried out by the qualified installer. If you install the system by yourself, it can cause serious trouble such as water
- leaks, electric shocks. fire.
- . Be sure to wear protective goggles and gloves while at work.
- . Earth leakage breaker must be installed.
- If the earth leakage breaker is not installed, it can cause electric shocks.
- Appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children being supervised not to play with appliance.



• Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.

If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.

 Do not processing, splice the power cord, or share a socket with other power plugs. This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.

- . Do not bundling, winding or processing for the power cord. Or, do not deforming the power plug due to tread it. This may cause fire or heating.
- . Do not run the unit with removed panels or protections.

Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.

. Do not perform any change of protective device itself or its setup condition. The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.

↑ CAUTION



• Carry out the electrical work for ground lead with care.

Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.



- Use the circuit breaker for all pole correct capacity. Circuit breaker should be the one that disconnect all poles under over current.

 Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- Install isolator or disconnect switch on the power supply wiring in accordance with the local codes and regulations.

 The isolator should be locked in OFF state in accordance with FN60204-1.
- After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.
- Secure a space for installation, inspection and maintenance specified in the manual.

Insufficient space can result in accident such as personal injury due to falling from the installation place.

. Do not install the unit in the locations listed below.

- Locations where carbon fiber, metal powder or any powder is floating.
- Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
- Vehicles and ships.
- · Locations where cosmetic or special sprays are often used.
- Locations with direct exposure of oil mist and steam such as kitchen and machine plant
- Locations where any machines which generate high frequency harmonics are used.
- Locations with salty atmospheres such as coastlines.
- Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
- Locations where the unit is exposed to chimney smoke.
- . Locations at high altitude (more than 1000m high).
- · Locations with ammonic atmospheres.
- Locations where heat radiation from other heat source can affect the unit.
- Locations without good air circulation.
- Locations with any obstacles which can prevent inlet and outlet air of the unit.
- Locations where short circuit of air can occur (in case of multiple units installation)
- Locations where strong air blows against the air outlet of outdoor unit.
 Locations where something located above the unit could fall.

It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.

. Take care when carrying the unit by hand.

If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.

. Dispose of any packing materials correctly.

Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.

 Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.

Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.

• When perform the air conditioner operation (cooling or drying operation) in which ventilator is installed in the room. In this case, using the air conditioner in parallel with the ventilator, there is the possibility that drain water may backflow in accordance with the room lapse into the negative pressure status. Therefore, set up the opening port such as incorporate the air into the room that may appropriate to ventilation (For example; Open the door a little). In addition, just as above, so set up the opening port if the room lapse into negative pressure status due to register of the wind for the high rise apartment etc.

. Do not install the outdoor unit in the locations listed below.

- Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
- Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
- Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
- Locations where vibration and operation sound generated by the outdoor unit can affect seriously (on the wall or at the place near bed room).
- Locations where an equipment affected by high harmonics is placed (TV set or radio receiver is placed within 5m).
- · Locations where drainage cannot run off safely.
- It can affect surrounding environment and cause a claim.
- Do not install the unit near the location where leakage of combustible gases can occur.

If leaked gases accumulate around the unit, it can cause fire.

 Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.

Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.

Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics.

Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.

Do not install the outdoor unit in a location where insects and small animals can inhabit.

Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.

- Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.
- Using an old and damage base flame can cause the unit falling down and cause personal injury.
- Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.

 Connecting the circuit with cooper wire or other metal thread can cause unit.

failure and fire.

• Do not touch any buttons with wet hands.

It can cause electric shocks

 Do not touch any refrigerant pipes with your hands when the system is in operation.

During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.

- Do not touch the suction or aluminum fin on the outdoor unit.
 This may cause injury.
- . Do not put anything on the outdoor unit and operating unit.
- This may cause damage the objects or injury due to falling to the object.
- Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.
- . Do not clean up the unit with water.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit operation valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure.

 Accordingly, you are required to arrange dedicated R410A tools listed in the table on the left before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

(Check before installation work)

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

4	Accessories for outdoor unit					
1	Grommet (Heat pump type only)	2				
2	Drain elbow (Heat pump type only)	1				
	Reducer set ø9.52 → ø6.35	1				

	Option parts	Q'ty
(a)	Sealing plate	1
6	Sleeve	1
0	Inclination plate	1
a	Putty	1
e	Drain hose (extension hose)	1
(f)	Piping cover	1
\Box	(for insulation of connection piping)	'

Nananamutaa	Necessary tools for the installation work	9 Wrench key (Hexagon) [4m/m]	
	Necessary tools for the installation work		Vacuum pump
1	Plus headed driver	11	Vacuum pump adapter (Anti-reverse flow type)
2	Knife	11	(Designed specifically for R410A)
3	Saw	12	Gauge manifold (Designed specifically for R410A)
4	Tape measure	13	Charge hose (Designed specifically for R410A)
5	Hammer	14	Flaring tool set (Designed specifically for R410A)
6	Spanner wrench	15	Gas leak detector (Designed specifically for R410A)
7	Torque wrench [14.0~82.0N·m (1.4~8.2kgf·m)]	16	Gauge for projection adjustment
8	Hole core drill (65mm in diameter)	10	(Used when flare is made by using conventional flare tool)

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(1) HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

△CAUTION

When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position. If not properly balanced, the unit can be thrown off-balance and fall.

1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from
- When you have to unpack the unit for a compelling reason before you haul it to the installation point, hoist the unit with nylon slings or ropes and protection pads so that you may not damage the unit.



2) Portage

• The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- O A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance
- O A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit.
- O A place where the unit is not exposed to oil splashes.
- A place where it can be free from danger of flammable gas leakage.
- O A place where drain water can be disposed without any trouble
- O A place where the unit will not be affected by heat radiation from other heat source.
- O A place where snow will not accumulate.
- O A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any
- O A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- O A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment
- O A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- O If a operation is conducted when the outdoor air temperature is -5°C lower, the outdoor unit should be installed at a place where it is not influenced by natural wind.
- O A place where strong wind will not blow against the outlet air blow of the unit.

4) Caution about selection of installation location

- (1) If the unit is installed in the area where the snow will accumulate, following measures are required. The bottom plate of unit and intake, outlet may be blocked by snow,
 - 1 Install the unit on the base so that the bottom is higher than snow cover surface, and draining water is secured



2 Provide a snow hood to the outdoor unit on site

3 Install the unit under eaves or provide the roof on site.

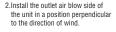




Since drain water generated by defrost control may freeze, following measures are required. Don't execute drain piping work by using a drain elbow and drain grommets (accessories). [Refer to Drain piping work.]

 Attached heater on a base plate on site, if there is possibility to freeze drain water. In case that the product has a corrective drainage system, the drainage paths should have suitable threatment against freezing but be sure not to melt the material of drainage paths with heat.

- (2) If the unit can be affected by strong wind, following measures are required. Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.
- 1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



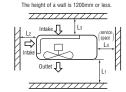


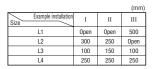
3.The unit should be installed on the stable and level foundation If the foundation is not level the down the unit with wires.



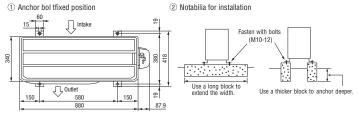
5) Installation space

- Walls surrounding the unit in the four sides are not acceptable
- There must be a 1-meter or larger space in the above.
- When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In order to facilitate servicing of controllers, please provide a sufficient space between units so that their ton plates can be removed easily
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.





6) Installation



- In installing the unit, fix the unit's legs with bolts specified on the above.
- The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the above illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5 mm or less.) Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is -5°C or lower.

• When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly.

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(2) REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

• Check the following points in light of the indoor unit specifications and the installation site.

Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Restrictions			Dimensional restrictions	Marks appearing in the drawing on the right
Indoor unit	FDT, FDEN, FDU, FDUM	Main pipe length	30m or less	L
	FDF		23m or less	L
Elevation difference between	When the outdoor unit is pos	sitioned higher	20m or less	Н
indoor and outdoor units	When the outdoor unit is pos	sitioned lower	20m or less	Н



 The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below.
 Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see "5, UTILIZATION OF EXISTING PIPING."

2) Determination of pipe size

• Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

	Gas pipe	Liquid pipe
Outdoor unit connected	ø15.88 Flare	ø6.35 Flare
Refrigerant piping (branch pipeL)	ø15.88	ø6.35
Indoor unit connected	ø15.88	ø9.52

When pipe is brazing.

About brazing Brazing must be performed under a nitrogen gas flow. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging. If the refrigerant is existing in the pipe at brazing, poisonous gas is produced. Primary side Plug the end of the pipe with tape, or othe material, and fill the pipe with nitrogen gas <N₂> Relief valve Only use nitrogen gas (N2)

3) Refrigerant pipe wall thickness and material

• Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.

NOTE Select pipes having a wall thickness larger than the specified minimum pipe thickness.

Pipe diameter [mm] ø6.35 ø15.88 Minimum pipe wall thickness [mm] 0.8 1.0 O-type pipe O-type pipe

*Phosphorus deoxidized seamless copper pipe ICS 23.040.15, ICS 77.150.30

Side cover

4) On-site piping work

Take care so that installed pipes may not touch components within a unit. IMPORTANT IAKE care so that installed pipes may not could component a family a limit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

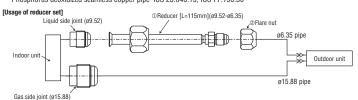
 Regarding the change in the size of liquid pipe; Use the reducer at indoor unit side. Reducer set is available in the outdoor unit as accessory.

How to remove the side cover | Please remove the screw of a side cover and remove to the front.

- Carry out the on site piping work with the operation valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.

 Bend a pipe to a radius as large as practical (R100-R150) Do not bend a pipe repeatedly to correct
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion
- The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.

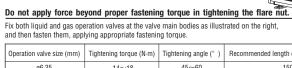
♠ CAUTION



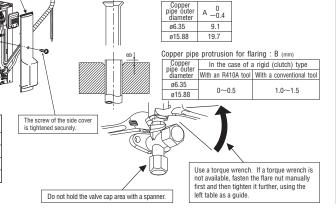
Outdoor unit L

Indoor unit





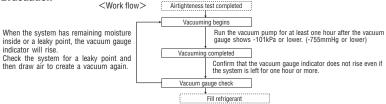
Operation valve size (mm)	Tightening torque (N·m)	Tightening angle (°)	Recommended length of a tool handle (mm)	
ø6.35	14~18	45~60	150	
ø9.52	34~42	30~45	200	
ø12.7	49~61	30~45	250	
ø15.88	68~82	15~20	300	



5) Air tightness test

- ① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation valve shut all the time.
- a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
- b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
 c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
- of life in pressure drop is observed with an installation pressured to the specified level and left for about one day, it is acceptable. When the ambient Temperature fall 1°C, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
- e) If a pressure drop is observed in checking e) and a) d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.
- ② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances

6) Evacuation



Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- Ouse a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

Indoor unit	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe ø6.35)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
FDT, FDEN FDU, FDUM	0.025	2.1	15
FDF	0.025	2.1	8

- ●This unit contains factory charged refrigerant covering 15m/8m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 15m/8m refrigerant piping. When refrigerant piping exceeds 15m/8m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 15m/8m.
- •If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, please see "5. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main length (m) – Factory charged volume} x 0.025 (kg/m)

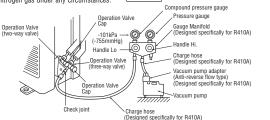
*When an additional charge volume calculation result is negative,

it is not necessary to charge refrigerant additionally.

• For an installation measuring 15m/8m or shorter in pipe length, please charge the refrigerant volume charged for shipment at the factory, when you recharge refrigerant after servicing etc.

8) Heating and condensation prevention

- (1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
- · Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- (2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
 - · All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
 - · Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
 - · Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
 - · Both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.



Outdoor unit

operation valve

Check joint

Indoor unit

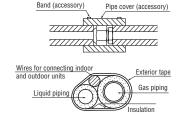
Securely tighten the operation valve cap and the check joint blind nut after adjustment.

Operation valve size (mm)	Operation valve cap tightening torque (N·m)	Check joint blind nut tightening torque (N·m)
ø6.35 (1/4")	20~30	10- 10
ø15.88 (5/8")	30~40	10~12

(2) Charging refrigerant

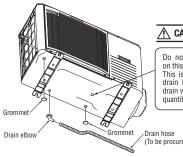
- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the operation valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- •In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes.
 Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.



 Execute drain piping by using a drain elbow and drain grommets supplied separately as accessories, where water drained from the outdoor unit is a problem.

 Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)



♠ CAUTION Do not put a grommet on this hole. This is a supplementary drain hole to discharge drain water, when a large quantity of it is gathered. (To be procured on the installer's part)

led to a drain, etc., install the unit on a flat base or concrete blocks. (prepared on site) Then, please secure space for the drain elbow and the drain hose.

When condensed water needs to be

(4) ELECTRICAL WIRING WORK

For details of electrical cabling, refer to the indoor unit installation manual

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country. Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- •Do not use any supply cord lighter than one specified in parentheses for each type below.
- · braided cord (code designation 60245 IEC 51),
- · ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
- · flat twin tinsel cord (code designation 60227 IEC 41);
- Use polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- . Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- •The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.
- . Do not turn on the power until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- ·For power supply cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- •When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.

∴ CAUTION

In case of faulty wiring connection, the indoor unit stops, and then the run lamp turns on and the timer lamp blinks.

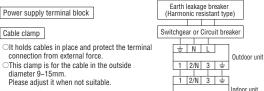
Use cables for interconnection wiring to avoid loosening of the wires. CENELEC code for cables Required field cables.

H05RNR4G1.5 (Example) or 245IEC57

- Harmonized cable type
- 300/500 volts
- Natural-and/or synth. rubber wire insulation
- Polychloroprene rubber conductors insulation
- Stranded core
- 4or5 Number of conductors
- G One conductor of the cable is the earth conductor (vellow/green)
- Section of copper wire (mm2)

Power cable, indoor-outdoor connecting wires

Cable clamp Olt holds cables in place and protect the terminal connection from external force. Grounding terminal OPlease be sure to carry out D-type (type III)



- Always perform grounding system installation work with the power cord unplugged. Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

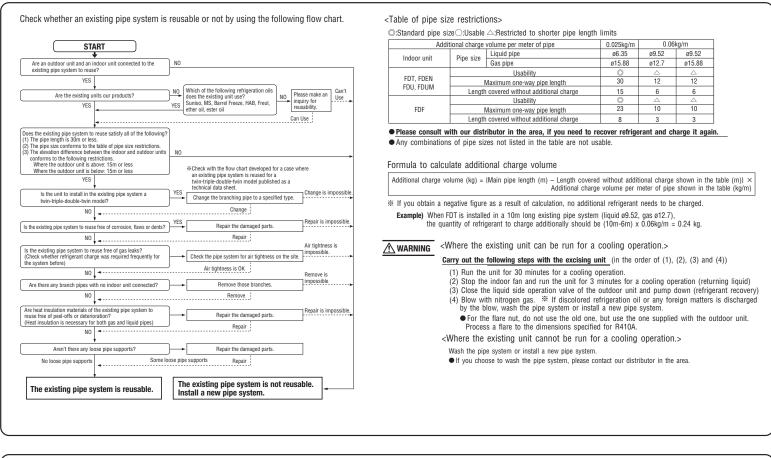
♠ CAUTION

Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation

Phase	Earth leakage breaker	Switchgea	r or Circuit Breaker	Power souce (minimum)	Interconnecting and grounding wires (minimum)
		Switch breaker	Over current protector rated capacity		
Single-phase	20A,30mA, 0.1sec or less	30A	20A	2.5 mm ²	1.5mm×4

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- •Switchgear or Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

(5) UTILIZATION OF EXISTING PIPING



INSTALLATION TEST CHECK POINTS				
Check the following points again after completion of the installation, and before turning on the power. Conduct a test run again and ensure that the unit operates properly. Explain to the customer how to use the unit and how to take care of the unit following the instruction manual.				
After installation				
Power cables and connecting wires are securely fixed to the terminal block.	The pipe joints for indoor and outdoor pipes have been insulated.	1		
The power supply voltage is correct as the rating.	The reverse flow check cap is attached.	1		
The drain hose is fixed securely.	The cover of the pipe cover (A) faces downward to prevent rain from entering.	1		
Operation valve is fully open.	Gaps are properly sealed between the pipe covers (A) (B) and the wall surface / pipes.	1		
No gas leaks from the joints of the operation valve and joint.	The screw of the side cover is tightened securely.	J		

STANDARD INVERTER PACKAGED **AIR-CONDITIONERS**



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