MHI

SERVICE MANUAL

Manual No. '09 • KX-SM-125
updated March 11, 2010

• Note:
Regarding the Duct Connected-High static Pressure-type Outdoor Air Processing Unit Series FDU500～1800FKXE6, refer to the DATA BOOK No.'08 • KX-DB-122

INVERTER DRIVEN MULTI-INDOOR UNIT CLIMATE CONTROL SYSTEM

Alternative refrigerant R410A use models

(OUTDOOR UNIT)

KX6 series **(Heat pump type)**

FDC224KXE6, 280KXE6, 335KXE6

(INDOOR UNIT) –KX6 series–

FDT28KXE6A 36KXE6A 45KXE6A 56KXE6A 71KXE6A 90KXE6A 112KXE6A 140KXE6A 160KXE6A	FDTC22KXE6A 28KXE6A 36KXE6A 45KXE6A 56KXE6A	FDTW28KXE6 45KXE6 56KXE6 71KXE6 90KXE6 112KXE6 140KXE6	FDTS45KXE6 71KXE6	FDTQ22KXE6 28KXE6 36KXE6	FDU71KXE6 90KXE6 112KXE6 140KXE6 224KXE6 280KXE6
FDUM22KXE6 28KXE6 36KXE6 45KXE6 56KXE6 71KXE6 90KXE6 112KXE6 140KXE6	FDQS22KXE6 28KXE6 36KXE6 45KXE6 56KXE6	FDK22KXE6 28KXE6 36KXE6 45KXE6 56KXE6 71KXE6	FDE36KXE6A 45KXE6A 56KXE6A 71KXE6A 112KXE6A 140KXE6A	FDFL28KXE6 45KXE6 71KXE6	FDFU28KXE6 45KXE6 56KXE6 71KXE6
FDUH22KXE6 28KXE6 36KXE6					

MITSUBISHI HEAVY INDUSTRIES, LTD.

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1. OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

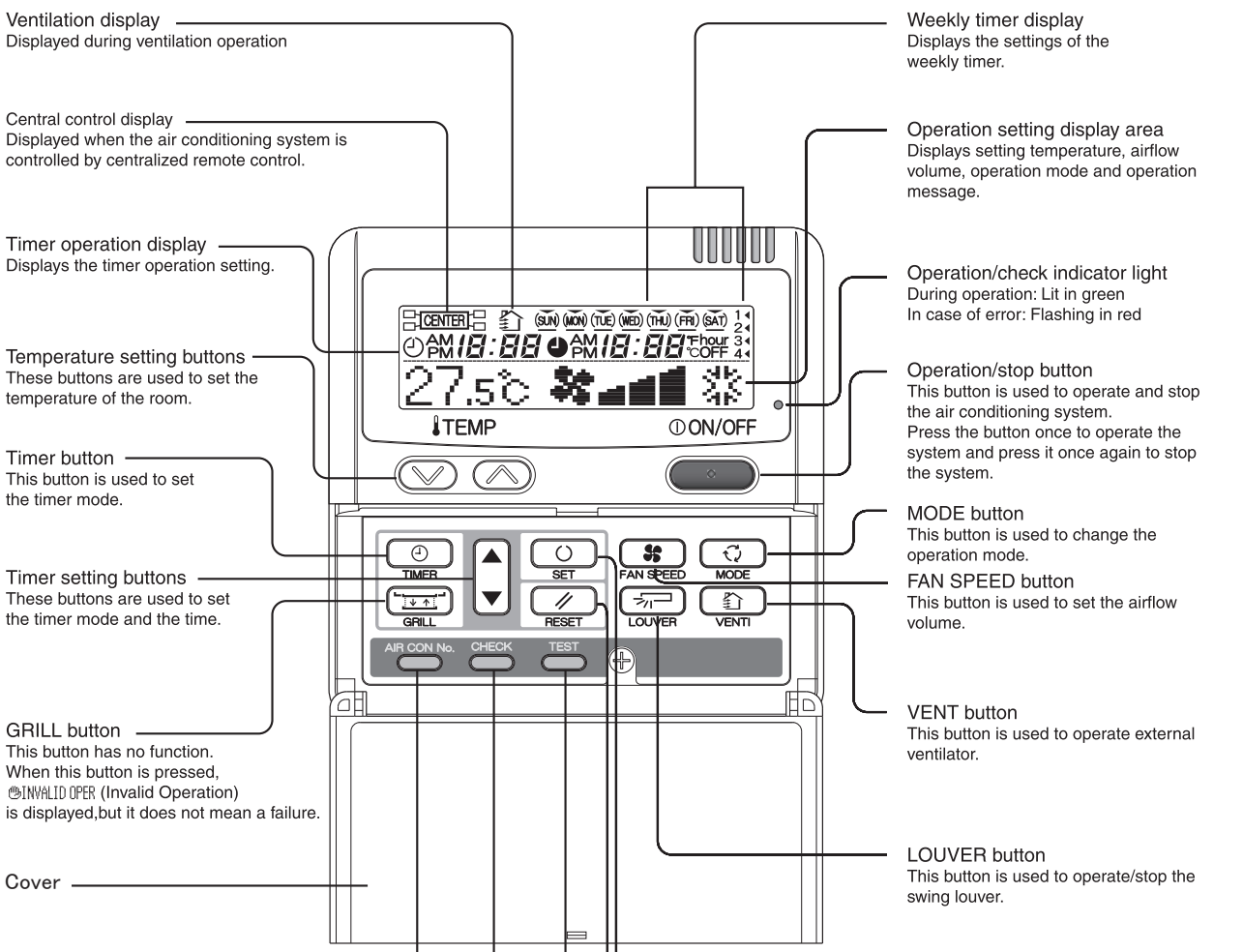
1.1 Wired remote controller (Option parts)

The figure below shows the remote controller 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.

Pull the cover downward to open it.

The figure below shows the remote control with the cover opened.



Ventilation display
Displayed during ventilation operation

Central control display
Displayed when the air conditioning system is controlled by centralized remote control.

Timer operation display
Displays the timer operation setting.

Temperature setting buttons
These buttons are used to set the temperature of the room.

Timer button
This button is used to set the timer mode.

Timer setting buttons
These buttons are used to set the timer mode and the time.

GRILL button
This button has no function.
When this button is pressed,
INVALID OPER (Invalid Operation)
is displayed,but it does not mean a failure.

Cover

AIR CON No. button
Display the indoor unit number connected to this remote control.

CHECK button
This button is used at servicing.

TEST button
This button is used during test operation.

Weekly timer display
Displays the settings of the weekly timer.

Operation setting display area
Displays setting temperature, airflow volume, operation mode and operation message.

Operation/check indicator light
During operation: Lit in green
In case of error: Flashing in red

Operation/stop button
This button is used to operate and stop the air conditioning system.
Press the button once to operate the system and press it once again to stop the system.

MODE button
This button is used to change the operation mode.

FAN SPEED button
This button is used to set the airflow volume.

VENT button
This button is used to operate external ventilator.

LOUVER button
This button is used to operate/stop the swing louver.

SET button
•This button is used to fix the setting.
•This button is used to set the silent mode.

RESET button
•Press this button while making settings to go back to the previous operation.
•This button is also used to reset the “FILTER CLEANING” display. (Press it after cleaning the air filter)

∗ All displays are described in the liguid crystal display for explanation.

Installation of remote control

DO NOT install it on the following places in order to avoid malfunction.

(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

1.2 Operation control function by the indoor controller

(1) Operations of functional items during cooling/heating

Operation / Functional item	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Hot start (Defrost)	
Compressor	○	×	×	○	×	○	○/×
4-way valve	×	×	×	○	○	○(×)	×
Outdoor fan	○	×	×	○	×	○(×)	○/×
Indoor fan	○	○	○	○/×	○/×	○/×	○/×
Louver motor	○/×			○/×	○/×	○/×	○/×
Drain pump (4)	○	×(2)	×(2)	○/×(2)			Thermostat ON: ○ Thermostat OFF: ×(3)

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 by the indoor unit function setting of the wired remote controller.

(2) Dehumidifying operation

(a) When the humidity sensor is not provided (Models other than FDT Series)
return air thermistor [Thı-A (by the remote controller when the remote control sensor is enabled)] controls the indoor temperature environment simultaneously.
1) Operation is started in the cooling mode. When the difference between the return air thermistor 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 fan tap.
2) If the suction air temperature exceeds the setting temperature 3°C or more during defrosting operation, the indoor fan tap is raised by one tap. That tap is retained for 3 minutes after changing the indoor fan tap.
3) If the thermostat OFF is established during the above control, the indoor fan tap at the thermostat ON is retained so far as the thermostat is turned OFF.
4) After stopping the cooling operation, the indoor unit continues to run at Lo for 15 seconds.

(b) When the humidity sensor is provided (FDT Series only) [Optional]
1) Operation starts in the cooling mode, and the target relative humidity is determined based on the setting temperature. If the humidity detected by the humidity sensor becomes lower than the target relative humidity, the indoor unit fan tap is retained.
2) Anything other than 1) above is same as the item (a) above.

(3) Timer operation

(a) 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 clock timer setting, the remaining time is displayed with progress of time in the unit of hour.

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

(c) ON timer
Time to turn ON the air-conditioner can be set. Indoor temperature can be set simultaneously.

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

(e) Timer operations which can be set in combination

	Timer	OFF timer	ON timer	Weekly timer
Timer		×	○	×
OFF timer	×		○	×
ON timer	○	○		×
Weekly timer	×	×	×	

Note (1) ○: Allowed ×: Not

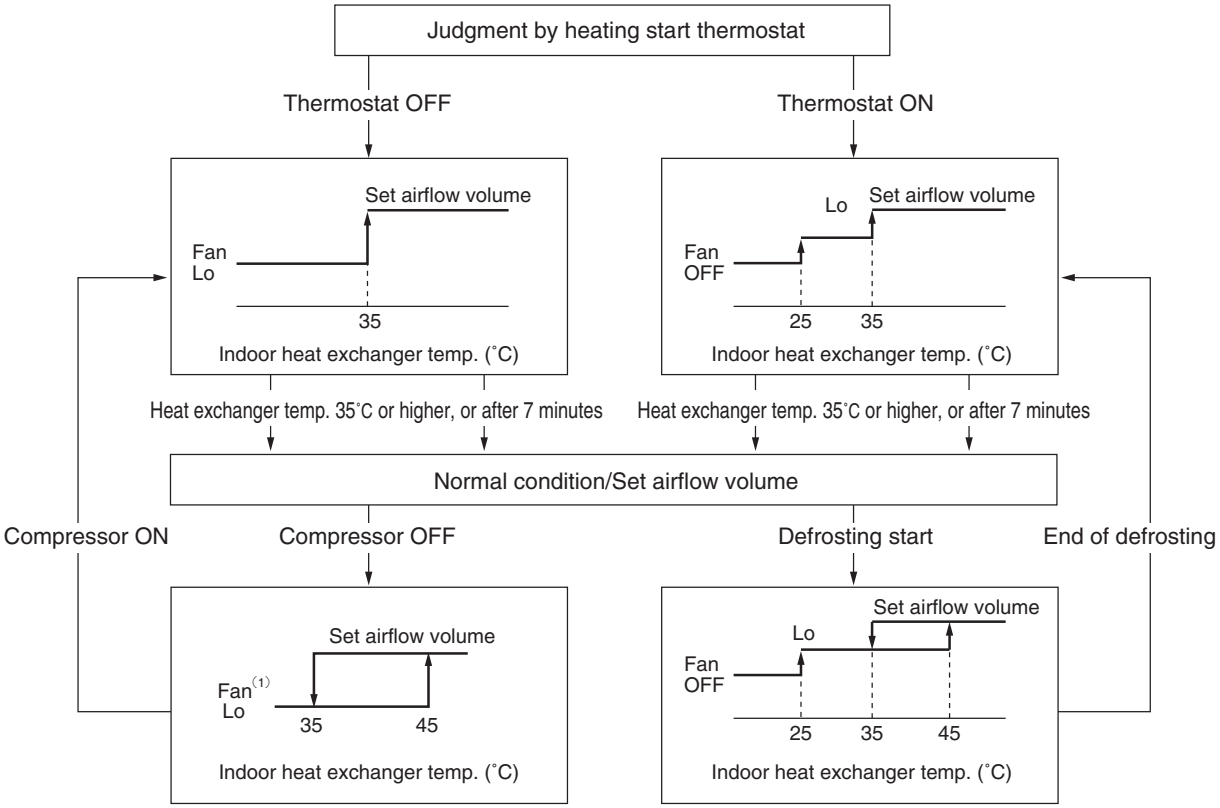
(4) Remote controller display during the operation stop

(a) "Centralized control ON" is displayed always on the LCD under the "Center/Remote" and "Center" modes during the operation stop (Power ON). This is not displayed under the "Remote" mode.

(b) If this display is not shown under the "Center/Remote" mode, check if the indoor unit power switch is turned on or not.

(5) Hot start (Prevention of cold draft during heating)

At the startup of heating operation, at resetting the thermostat, during defrosting operation and at returning to heating, the indoor fan is controlled by the indoor heat exchanger temperature (detected with Thı-R) to prevent the cold draft.



Note (1) Heating preparation is displayed during the hot start (when the compressor is operating and the indoor fan does not provide the set airflow volume).

(6) Hot keep

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

(a) Control

1) When the indoor heat exchanger temperature (detected with Thı-R1 or R2) drops to 35°C or lower, indoor fan is changed to the lower tap at each setting.

2) During the hot keep operation, the louver horizontal control signal is transmitted.

(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.

(7) Fan control during the heating thermostat OFF

When the heating thermostat is turned OFF, the setting of the fan control is selectable with using the indoor function of wired remote controller [Heating fan control].

(a) Low speed (Factory default)

If the indoor heat exchanger temperature drops 35°C or lower with the heating thermostat OFF, the indoor fan operate at the lower speed tap at each setting.

(b) Set airflow volume

Even if the indoor heat exchanger temperature drops 35°C or lower with the heating thermostat OFF, the indoor fan continues to run at the set airflow volume.

(c) Intermittent operation

If the indoor heat exchanger temperature drops 35°C or lower with the heating thermostat OFF, the indoor fan operates at the lower speed tap at each setting and, when the indoor heater exchanger temperature drops 25°C or lower, the indoor fan stops for 5 minutes. Then the fan runs at the slow speed tap for 2 minutes, and the judgment is made by the thermostat.

(d) Stop

If the indoor heat exchanger temperature drops 35°C or lower with the heating thermostat OFF, the indoor fan is turned OFF. The same applies also when the remote controller sensor is effective.

(8) Filter sign

As the operation time (when ON/OFF switch is at ON) accumulates to 180 hours (1), "Filter cleaning" is displayed on the remote controller. (This is also 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 controller "Filter sign setting". (It is set at 1 at the shipping from factory.)

Filter Sign Setting	Function
Setting 1	Setting time: 180 hrs (Factory default)
Setting 2	Setting time: 600 hrs
Setting 3	Setting time: 1,000 hrs
Setting 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.

(9) Auto swing control [Applicable model: FDT, FDTC, FDTW FDTS, FDTQ (Excepted duct panel model) and FDE]

(a) Louver control

(i) Press the [Louver] button to operate the swing louver when the air conditioner is operating.
"Auto wind direction" is displayed for 3 seconds and then the swing louver moves up and down continuously.

(ii) 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 "Louver stop" for 5 seconds and then the swing louver stops.

(iii) Louver operation at the power on
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 "Auto wind direction" display 3 seconds later.

(b) Automatic louver level setting during heating
While hot start operation and heating thermostat OFF operation, the louver keeps the level position (In order to prevent the cold draft) whether the auto swing switch is operated or not (auto swing or louver stop), The louver position display LCD continues to show the display which has been shown before entering this control.

(c) Louver-free stop control
When the louver-free stop has been selected with the indoor function of wired remote controller "Louver control setting", the louver motor stops when it receives the stop signal from the remote controller. If the auto swing signal is received from the remote controller, the auto swing will start from the position where it was before the stop.

Note (1) When the indoor function of wired remote controller "Louver control setting" has been switched, switch also the remote control function "Louver control setting" in the same way.

(10) Compressor inching prevention control

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

(b) 3-minutes forced operation timer

- Compressor will not stop for 3 minutes after the compressor ON. However, it stops immediately when the thermostat is turned OFF by the stop command by means of the ON/OFF switch or the change of operation mode.
- If the thermostat is turned OFF during the forced compressor operation in heating mode, 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.

(11) Drain motor (DM) control [Applicable type: FDT, FDTC, FDTW, FDTS, FDTQ, FDUM, FDQS and FDU90～140]

(a) Drain motor (DM) start operation at the same time when compressor ON at cooling and dehumidifying mode and keeps operating for 5 minutes after operation stop, the anomalous stop, thermostat OFF and switching from cooling or dehumidifying operation to fan or heating operation.

	Indoor unit operation mode				
	Stop (1)	Cooling	Dehumidifying	Fan (2)	Heating
Compressor ON		Control A			
Compressor OFF	Control B				

Note (1) Including the stop from cooling, dehumidifying, fan and heating operation 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.
2) The drain motor 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 condition 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.)

(b) Drain motor (DM) interlock control
(i) Start conditions
Depending on the function setting of the remote controller, the drain motor is turned ON under either one of the following conditions.
1) During heating operation (Both the thermostat ON/OFF)
2) During heating operation (Both the thermostat ON/OFF) + Fan operation
3) Fan operation

(ii) Stop conditions
The drain motor is turned OFF 5 minutes after the stop of operations 1) to 3) above.

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

(a) If the power is turned on when the dip switch (SW7-1) on the indoor PCB is ON state, 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 controller 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 controller 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 controller communication.

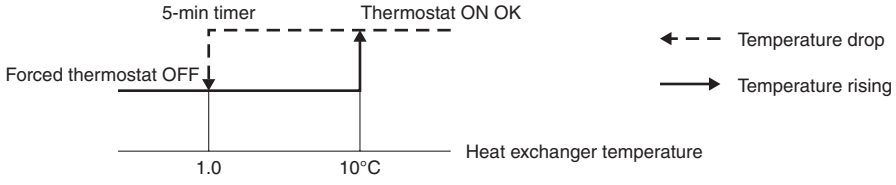
(c) Operation check mode
There is no communication with the outdoor unit but it allows performing operation in respective modes by operating the remote controller.

(d) Drain pump test run mode
When the drain pump test run is established, only the drain pump operates, and during operation the protective functions by the microcomputer of indoor unit become ineffective.

(13) Indoor heat exchanger anti-frost (anti-frost control)

Thermostat OFF control

1) Thermostat is turned OFF depending on the temperature detected with the heat exchanger sensor (Thı-R1, R2) during "Cooling" and "Dehumidifying" operations.



2) For 4 minutes after the thermostat ON, the forced thermostat OFF control for the anti-frost protection is not effective.
a) When temperatures detected by the heat exchanger sensors Thı-R1 and R2 are higher than the anti-frost protection temperature at 4 minutes after the thermostat ON, the detection starts from the state of thermostat ON.

3) If the temperature detected with the heat exchanger sensor Thı-R1 or R2 has stayed below the anti-frost protection temperature (-0.5°C) continuously for 5 minutes after 4 minutes of the thermostat ON operation, then the thermostat is turned OFF forcibly.
The thermostat will be turned ON if temperatures detected by Thı-Ra and R2 picked up in the thermostat ON range.

4) "Anti-frost" signal is sent to the outdoor unit.

(14) Anomalous fan motor (FDT and FDK only)

Fan motor will be stopped with displaying “E16”, if it has detected the revolutions of 200 rpm or less continuously for 30 seconds at a rate of 4 times within 60 minutes, after starting the motor.

(15) High ceiling control [Applicable type: FDT, FDTC, FDTW, FDTS and FDE]

When the indoor unit is installed at a high ceiling, the airflow volume mode control can be changed with the indoor function of wired remote controller “High ceiling setting”.

Setting	Standard (Shipping)	High Ceiling 1	High Ceiling 2
Remote controller setting	Hi Me Lo	Hi Me Lo	Hi Me Lo
Fan speed	Hi Me Lo	UHi1 Hi Me	UHi2 Hi Me

Note (1) It is set at Standard at the shipping from factory.

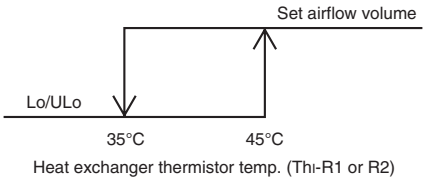
(2) At the hot start, heating thermostat OFF, or other, the indoor fan operate at the slow speed tap at each setting.

(16) Hot start

Indoor fan motor control is performed at the start of heating operation.

(a) When the temperature detected with the indoor heat exchanger thermistor (Thı-R1 or Thı-R2) drops 35°C or lower, it control the fan with AC motor: Lo and DC motor: ULo.

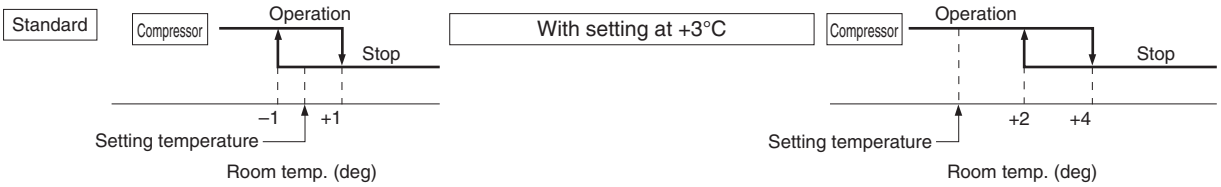
(b) When the heat exchanger thermistor detects 45°C or higher with the fan running at Lo/ULo, it returns to the set airflow volume.



(c) On the indoor unit of which the thermostat has been turned OFF during heating operation, the fan is turned OFF if the heat exchanger thermistor temperature (Thi-R1 or Thi-R2) drops 25°C or lower.

(17) Detection room temperature compensation during heating

With the standard specification, the compressor is turned ON/OFF based on the setting temperature of thermostat. However, when the thermostat OFF is likely to occur earlier because the unit is installed in a condition that warm air tends to accumulate near the ceiling, the setting can be changed by using the indoor function of wired remote controller “Heating room temperature compensation”. Since the compressor is turned ON/OF at one of the setting temperature at +3, +2 or +1°C, the feeling of heating can be improved. However, the upper limit of setting temperature is 30°C.



(18) Return air temperature compensation

This is the function to compensate a difference between the detected temperature of the Return air thermistor and the measured temperature after installation of unit.

(a) It is adjustable in the unit of 0.5°C by using the indoor function of wired remote controller “Return air thermistor compensation”.

- +1.0°C, +1.5°C and +2.0°C
- −1.0°C, −1.5°C and −2.0°C

(b) Since the compensated temperature is transmitted to the remote controller and the outdoor unit, it is controlled with the compensated temperature.

Note (1) Compensation of detection temperature is effective for the indoor unit sensor only.

(19) External control (Remote display)/Remote operation

Always connect the wired remote controller. Otherwise, you cannot perform the remote operation.

(a) Output for external control (remote display) (Optional remote RUN/STOP monitor kit can be utilized.)

Following output connectors (CNT) are provided on the indoor control PCB. Connect the remote RUN/STOP monitor kit and pick up respective dry contact signal.

- **Operation output**: Outputs DC12V relay drive signal during operation.

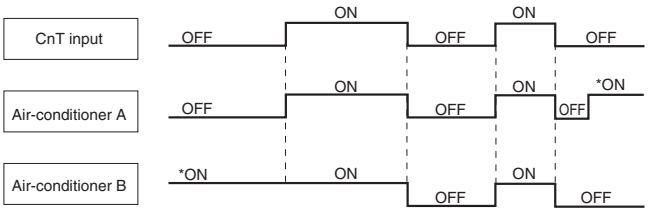
- **Heating output**: Outputs DC12V relay drive signal during heating operation.
- **Compressor ON output**: Outputs DC12V relay drive signal when the compressor is operating.
- **Error output**: When any anomalous condition occurs, it outputs DC12V relay drive signal.

(b) Remote operation input

Remote operation inputs (switch input, timer input) connectors (CnT) are provided on the indoor control PCB.
However, the remote operation by the CnT is not effective when "Center mode" is selected with the air-conditioner.

(i) At the shipping from factory [Indoor function of wired remote controller "External input selector" is set at the level input.]

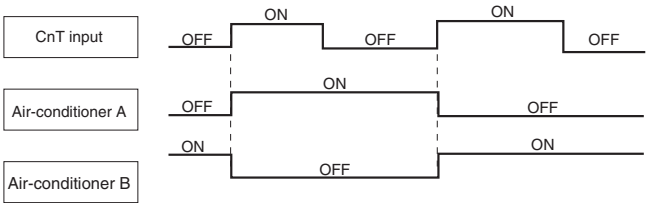
- Startup at the input signal to CnT OFF → ON [Edge input] … Air-conditioner ON
- Stop at the input signal to CnT ON → OFF [Edge input] … Air-conditioner OFF



Note (1) ON marked with * means ON by a remote controller switch or other.

(ii) When the setting is changed to the pulse input at site using the indoor unit function of wired remote controller "External input selector"

It becomes effective only when the input signal to CnT is changed OFF→ON and the air-conditioner operation [ON/OFF] is inverted.



(c) Processing of emergency stop signal

This emergency stop signal is used to stop all indoor unis connected to the same outdoor unit in emergency.

1) The emergency stop control becomes effective if the emergency stop control setting is changed to "Valid" from the wired controller.
2) If the emergency stop [E-63] signal is received from outdoor unit, it is transmitted to the remote controller and makes stop.

(d) Fresh air processing operation input

1) If indoor unit controller receive fresh air processing operation signal (*1) or fresh air processing stop signal from remote controller, it output ON signal or OFF signal from CnD connector respectively.
   *1. Operation switch ON at interlock setting and ventilation switch ON at non-interlock setting.
2) Output relay is DC12V option and maximum relay load is LY2F (OMRON).
3) In case of interlock setting, if either of indoor units connected to one remote controller is in the state of anomalous stop, the fresh air processing unit connected to that indoor unit cannot be operated. Other processing units connected to the indoor units operating normally can be operate.
   In case of non-interlock setting, processing unit can start ventilation even though the connected indoor unit is in anomalous stop.
4) In case of interlock setting if indoor unit stops, processing unit also stop.
5) In case of interlock setting if indoor unit stops with anomalous stop, processing unit also stop.
6) If indoor unit is started or stopped from center console, processing unit can start or stop in case of interlock setting, but it keep stopping in case of non-interlock setting.
7) Interlock or non-interlock can be set only on the remote controller.

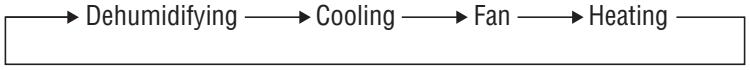
(20) Dip switch function

Model capacity selection with SW6 — 0 : OFF, 1 : ON

Model	P22	P28	P36	P45	P56	P71	P80	P90	P112	P140	P160	P224	P280
SW6-1	0	1	0	0	0	0	1	0	1	0	1	0	1
SW6-2	0	0	1	0	1	0	0	1	1	0	0	1	1
SW6-3	0	0	0	1	1	0	0	0	0	1	1	1	1
SW6-4	0	0	0	0	0	1	1	1	1	1	1	1	1

1.3 Operation control function by the remote controller

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



(2) [CPU reset]

When the “CHECK” and “GRILL” buttons on the remote controller are pressed at the same time, this function is activated. This function is same as power supply reset.

(3) [Power failure compensation function]

- This function becomes effective when “POWER FAILURE COMPENSATION SET” is valid by setting the remote controller functions.
- The remote controller's status is always stored in memory, and after recovery of power, operation is resumed according to the memory contents. However the auto swing stop position and timer mode are cancelled, but the weekly timer setting is restored with the holiday setting through all weekdays.
  By resetting the clock and cancelling the holiday setting for each weekday after recovery of power, weekly timer setting becomes effective.
- Contents stored in memory for power failure compenstion are as follows.

Note (1) Item ⑥⑦ and ⑧ are stored in memory regardless of whether the power failure compensation setting is valid or invalid, and silent mode setting is cancelled regardless of whether the power failure compensation setting is valid or invalid.

① Running or Stopping status just before power failure
If it had been operating under OFF timer mode or simple timer mode, memorzed status is as stopping (At the recovery of power, the timer mode is cancelled but weekly timer setting is changed to the holiday setting through all weekdays

② Operation mode

③ Fan speed mode

④ Room temperature setting

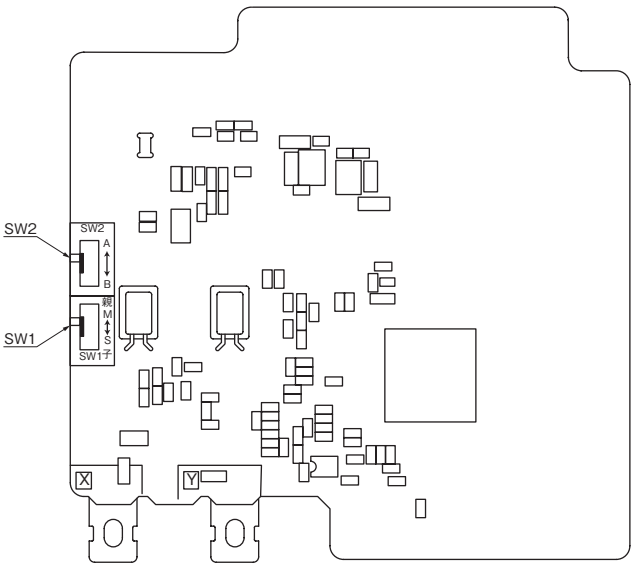
⑤ Louver auto swing/stop
However, the stop position (position 4) is cancelled and is becomes the level position (position 1).

⑥ “Remote control function items”, set with the remote controller function setting (“Indoor unit function items” are stored in the inoor unit's memory.)

⑦ Upper limit value and lower limit value set by temperature setting control.

⑧ Clock timer setting and weekly timer setting (Other timer settings are not sotred in memory).

[Parts layout on remote controller PCB]



■ **Control selector switch (SW1)**

Switch		Function
SW1	M	Master remote controller
	S	Slave remote controller

Note (1) SW2 is not normally used, so do not change the selection.

1.4 Operation control function by the outdoor controller

(A) Normal control

(1) Operation of major functional components under each operation mode

Operation mode / Fonctional item	Cooling/Dehumidifying		Fan	Heating		
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost
Compressor (CM)	○	×	×	○	×	○
Magnetic contactor CM1 (52X1, 52X2)	○	○	×/○	○	○	○
Outdoor unit fan mortor (FMo-1)	○	×/○	×/○	○/×	×/○	○→×
Outdoor unit fan mortor (FMo-2)	○/×	×/○	×/○	○/×	×/○	○→×
4 way valve (20S)	×	×	×	○	○	○→×
Heating electronic expansion valve (EEVH)	Fully open	Fully open	※1	Opening Angle Control	※2	Fully closed / Fully open
Super cooling coil electronic expansion valve (EEVSC)	Opening Angle Control	Fully closed	Fully closed	Fully closed	Fully closed	Fully closed
Solenoid valve (SV1) (oil return)	○/×	×	×	○/×	×	○/×
Solenoid valve (SV6) (fluid return)	○/×	○/×	×	○/×	○/×	○/×
Solenoid valve (SV11) (gas bypass)	×	×	×	○/×	×	×
Crankcase heater (CH)	○/×	○/×	○	○/×	○/×	○/×

Note (1) It means ○ : ON, × : OFF, ○/× : -, ×/○ : ON or OFF.

(2) This shows the state of output when all indoor units are under the same mode.

(3) ※1 : When stopped from cooling, it is fully open

When stopped from heating, it is fully closed unless another degree of opening is specified by the electronic expansion valve (EEV) control at the stop.

※2 : When stopped from heating, it is fully closed unless another degree of opening is specified by the electronic expansion valve (EEV) control at the stop.

(2) Compressor pre-start control

(a) Remote controller full stop → Operation

(i) Start conditions

- When it has changed to the compressor operation frequency command > 0 Hz from the state of compressor stopping.

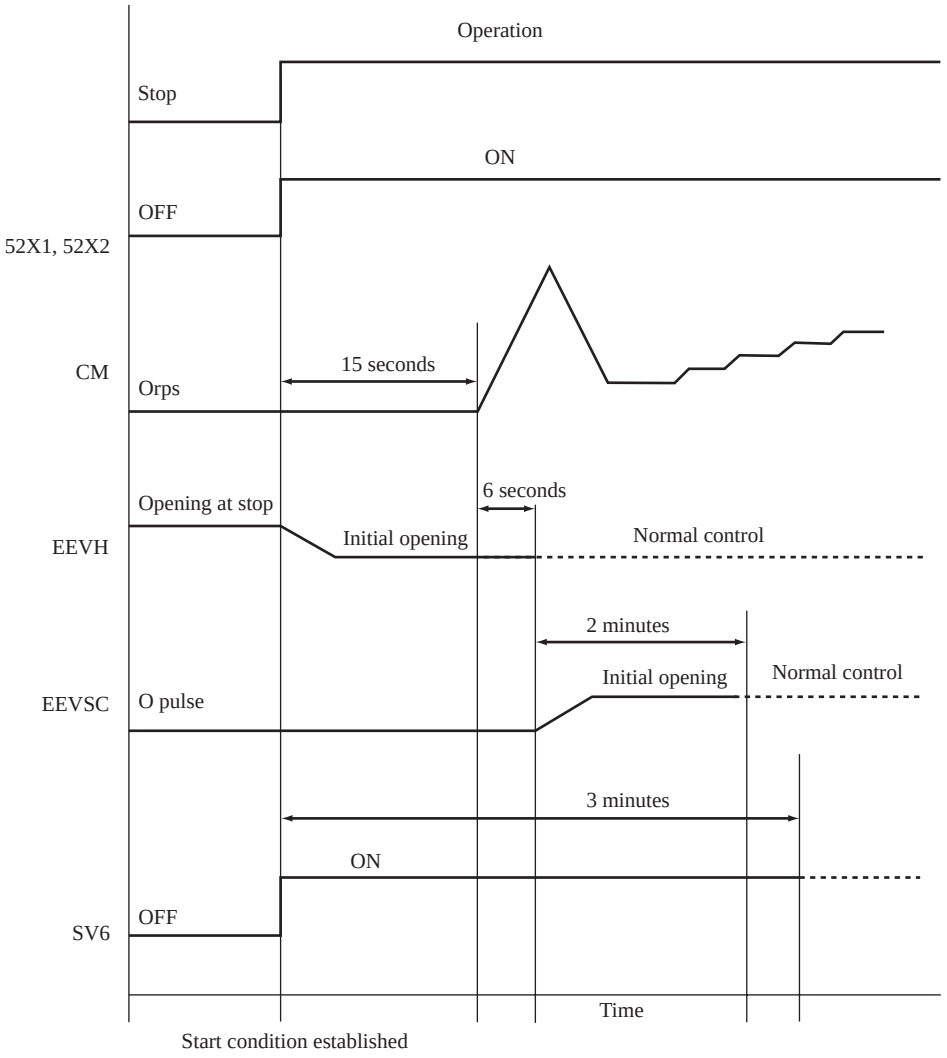
(ii) Control contents

- It sets the compressor operation frequency command = 0 Hz, and then after this control ends, It starts the compressor.

(iii) End conditions

When all of following conditions are satisf ied

① It has elapsed 15 seconds after the start of this control.



- Meaning of marks

52X1, 52X2	Solenoid for compressor	CM	Compressor
EEVH	Heating electronic expansion valve	EEVSC	Subcooling coil electronic expansion valve
SV6	Solenoid valve [Oil return]	—	———

(b) Cooling → Heating

(i) Start conditions

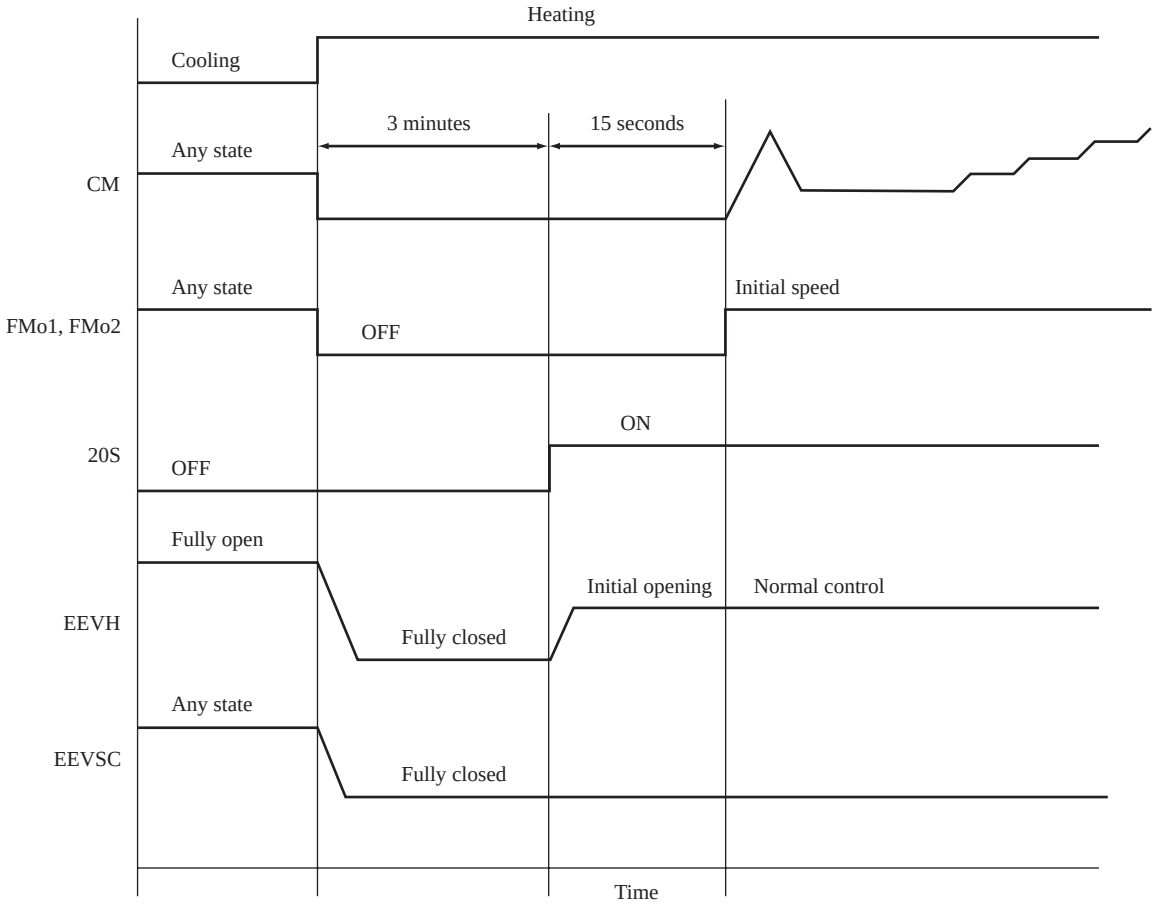
- When the outdoor unit operation mode is changed from the cooling operation to heating operation

(ii) Control contents

1) When the compressor is operating, it makes the compressor stopped.
2) Each functional component operates according to the sequence shown below.

(iii) End conditions

- End of sequence



- Meaning of marks

CM	Compressor	EEVH	Heating electronic expansion valve
FMo1, FMo2	Fan motor	EEVSC	Subcooling coil electronic expansion valve
20S	4-way solenoid valve	—	———

(c) Heating → Cooling

(i) Start conditions

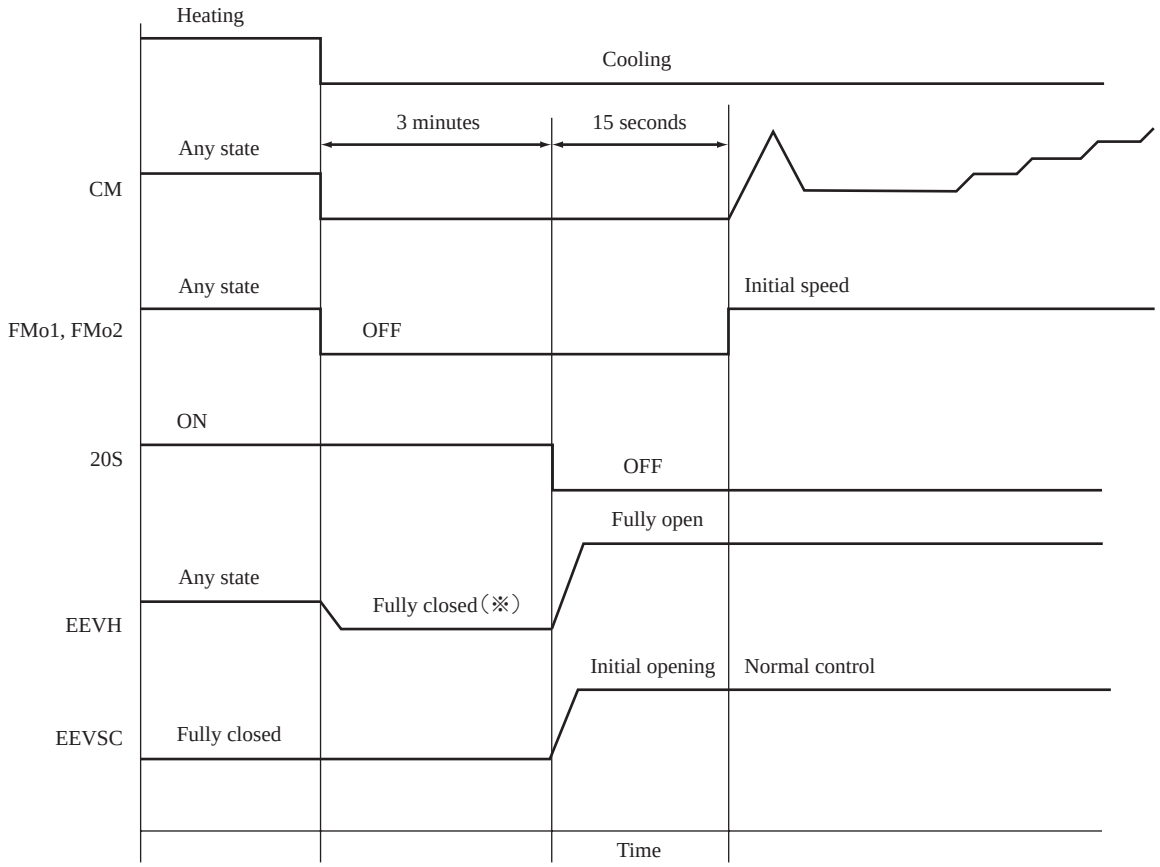
- When the outdoor unit operation mode is changed from the heating operation to cooling operation

(ii) Control contents

1) When the compressor is operating, it makes the compressor stopped.
2) Each functional component operates according to the sequence shown below.

(iii) End conditions

- End of sequence



Note (1) ※ : It is fully closed till the end of 3-minute delay after the automatic reset.

- Meaning of marks

CM	Compressor	EEVH	Heating electronic expansion valve
FMo1, FMo2	Fan motor	EEVSC	Subcooling coil electronic expansion valve
20S	4-way solenoid valve	—	———

(3) Compressor control

(a) 4-way valve switching safeguard

In order to switch 4-way valve completely, it makes the compressor speed increasing as follows.

(i) This control starts to increase the compressor speed from 10Hz after the compressor pre-start control ends.

(ii) The target compressor speed is shown in following table.

Item / Model	4-way valve switching safeguard/Target compressor speed	
	Frequency (Fk)	Speed (rps)
FDC224KXE6	70	50
FDC280KXE6		
FDC335KXE6	71	42

(b) Compressor protection start

After the 4-way valve switching safeguard, the compressor is controlled with the following compressor protection start.

① Compressor protection start, normal

② Compressor protection start A

③ Compressor protection start B

		Initial start remote controller ON error reset	Thermostat ON start	
			Operation mode is changed during thermostat OFF	Operation mode is not changed during thermostat OFF
Compressor ON Initial	Less than 45 min after power ON	Compressor protection start B	Compressor protection start B	Compressor protection start B
	45min. or more after power ON	Compressor protection start A	Compressor protection start A	Compressor protection start A
Compressor ON Second & later	Less than 45 min after stop	Compressor normal protection start	Compressor normal protection start	Compressor normal protection start
	45min. or more after stop	Compressor protection start A	Compressor protection start A	Compressor protection start A

(i) Compressor protection start, normal

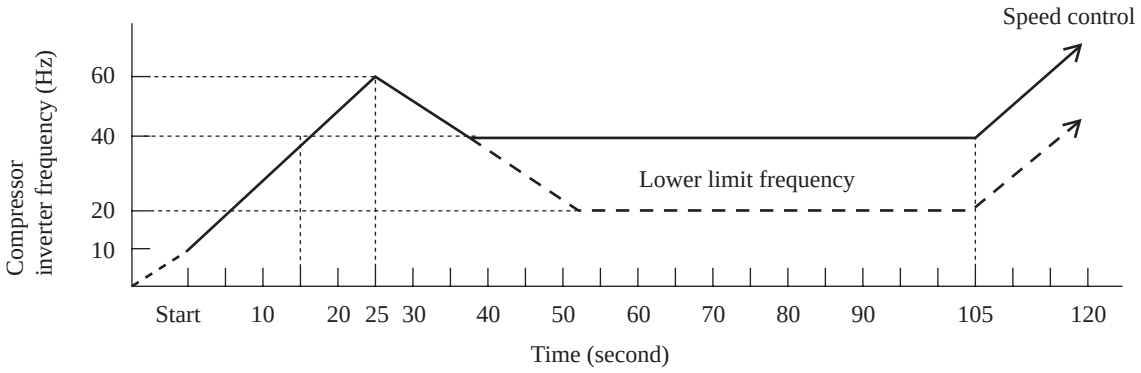
< Control contents >

Compressor maintains operation at lower limit frequency, after 4-way valve switching safeguard ends.
(During this control, compressor speed is prohibited to increase.)
After this control ends, comperssor speed is governed by the compressor speed control.

< End conditions >

When either one of the following conditions is established

a) When it has elapsed 1 minute and 45 seconds after the start



(ii) Compressor protection start A

< Control contents >

① Compressor maintains operation at lower limit frequency, after 4-way valve switching safeguard ends.
If the time from starting till reaching the lower limit frequency after 4-way valve switching safeguard operation has elapsed 1minute, the target frequency is changed to that of 1minute later from the lower limit frequency.

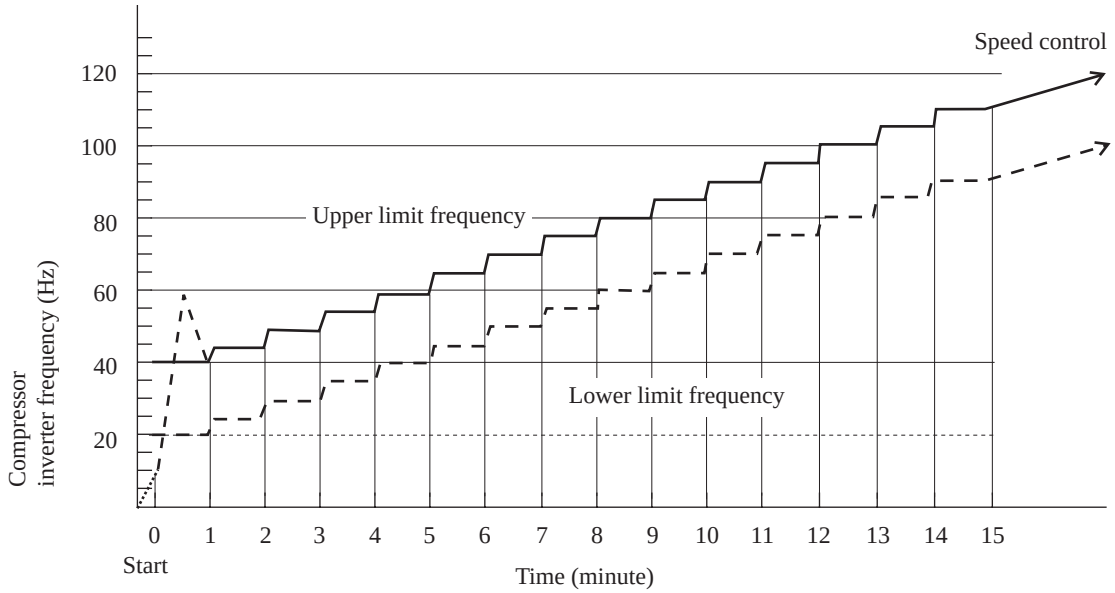
② During this control, the target frequency is increased at a rate of 5Hz/minute from the lower limit frequency.
(Note) The starting point of this control is the completion point of inverter start (10Hz).

< End conditions >

When either one of following conditions is established

a) When the frequency upper limit increase by this control continued for 15 minutes in total

When the inverter has stopped within 15 minutes after the start and is started again, it starts with the normal protection start and increases the frequency upper limit at a rate of 5 Hz/minute till the frequency increase continues for 15 minutes in total.



(iii) Compressor protection start B

< Control contents >

① Compressor maintains operation at lower limit frequency, after 4-way valve switching safeguard ends.

If the time from starting till reaching the lower limit frequency after 4-way valve switching safeguard operation has elapsed 2 minutes, the target frequency is changed to that of 2 minutes later from the lower limit frequency.

② For 18 minutes after starting, the target frequency is increased at a rate of 5Hz/2 minutes from the lower limit frequency.

③ For 18 minutes after starting, the starting point of this control is the completion point of inverter start (10 Hz).

④ From 18 minutes to 24 minutes, it is increased at a rate of 5 Hz/minute.

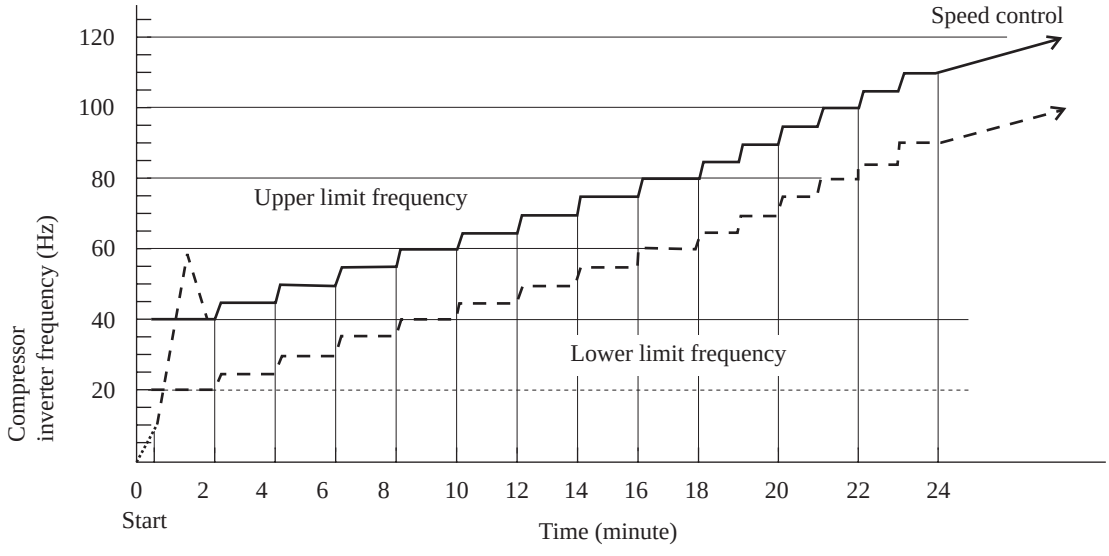
< End conditions >

When either one of the following conditions is established

(a) This frequency-up control will end when the cumulative operation time after starting becomes 24 minutes.

If the inverter stopped within 24 minutes after starting and starts again, it starts with "Compressor protection start, normal" and increases the frequency at a rate of 5Hz/minute till the cumulative operation time after starting becomes 24 minutes.

However, if 45 minutes have been elapsed since inverter stopped and starts again, it starts with "Compressor protection start A".



(4) Outdoor fan control

(a) Outdoor fan speed and fan motor rotation speed.

The 7th outdoor fan speed in the following table is specified as the rated speed. Under the normal control, the speeds up to 8th level (800 rpm) are used.

Outdoor fan tap	Cooling		Heating	
	FMo1 [rpm]	FMo2 [rpm]	FMo1 [rpm]	FMo2 [rpm]
0th speed	0	0	0	0
1st speed	200	0	200	0
2nd speed	200	200	200	200
3rd speed	300	300	300	300
4th speed	400	400	400	400
5th speed	500	500	500	500
6th speed	575	575	575	575
7th speed	700	700	700	700
8th speed	800	800	800 (780)	800 (780)

Note (1) Figures in the parentheses in the above table are applicable to FDC224KXE6.

(b) Fan control during cooling

During cooling and dehumidifying, fan speed is controlled in accordance with the high pressure (sensed by PSH) and the outdoor air temperature (sensed by Tho-A).

(i) Initial fan speeds are as follows.

Initial ourdoor fan speed at cooling

Model	Outdoor air temp ≤ 10ºC	10ºC < Outdoor air Temp. < 15ºC	15ºC ≤ Outdoor air Temp.
All models	2nd speed	4th speed	6th speed

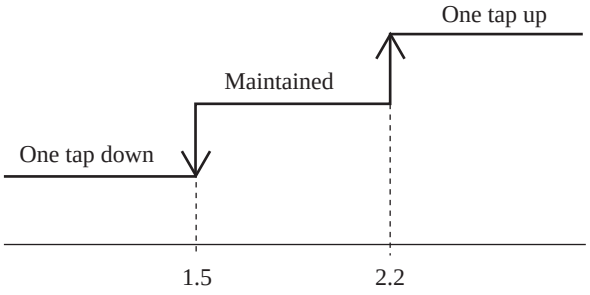
(ii) During normal operation, the speed is changed in accordance with the high pressure value.

① When it has detected HP ≧ 2.2 MPa for 1 minute continuously, the fan speed is raised by one tap.

② When it is 1.5 MPa < HP < 2.2 MPa, the present fan speed is maintained.

③ When it has detected HP ≦ 1.5 MPa for 1 minute continuously, the fan speed is dropped by one tap.

④ Control range of fan speed is 1th – 8th speeds.



(iii) When states under this control change from HP < 3.3 MPa to HP ≧ 3.3 MPa, the fan speed is changed preferentially to the followings. (After the change it returns to the normal control.)

① When the outdoor air temperature ≧ 30ºC, it changes to 7th or higher speed.

② When the outdoor air temperature < 30ºC, it changes to 3th or higher speed.

③ When the fan speed was higher than the above before the change of states, the fan speed is not changed.

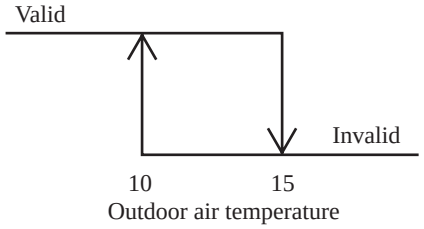
(c) Outdoor fan cooling control at low outdoor air temperature.

(i) Start conditions

This control is performed when all of following conditions is established.

① When the ordinary outdoor fan control is performed

② Outdoor air temperature ≦ 10ºC (It is reset with the hysteresis of the outdoor air temperature > 15ºC.)

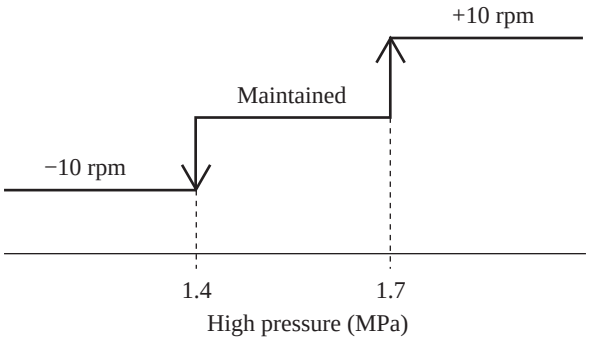


③ Outdoor fan speed = 1st speed (200 rpm)

(ii) Control contents

① Initial fan speed is 200 rpm

② If the following high pressure is detected for 20 seconds continuously, fan speed will be changed



③ Outdoor fan speed is in a range of 130 rpm – 300 rpm.

(iii) End conditions

When either one of following conditions is established

① When the ordinary outdoor unit fan cooling control ends

② Outdoor air temperature > 15ºC

③ Outdoor fan speed ≧ 2th speed

(Note) This control range is not more than 300 rpm × 1fan.

(d) Outdoor fan heating control

The fan speed control is performed based on the low pressure (detected with PSL) during heating operation.

(i) Initial fan speed is 6th speed.

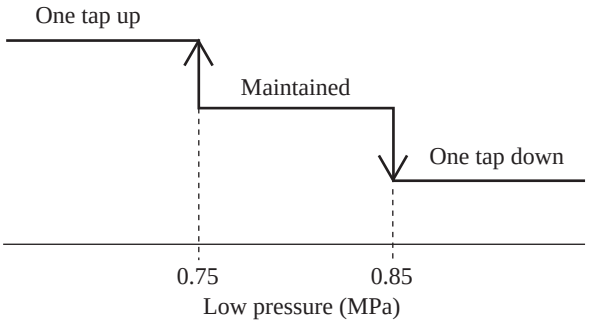
(ii) Speed is changed depending on the low pressure value.

① When it is detected LP ≦ 0.75 MPa for 30 seconds continuously, the fan speed is raised by 1 tap.

② When it is 0.75 MPa < LP < 0.85 MPa, the present fan speed is maintained.

③ When it is detected LP ≧ 0.85 MPa for 30 seconds continuously, the fan speed is dropped by 1 tap.

④ Control range of fan speed is 1st – 8th speeds.



(iii) When states change from LP < 1.0 MPa to HP ≧ 1.0 MPa during this control, the fan speed is changed preferentially to the following. (It returns to the normal control after the change.)

① It changes to 4th or lower speed.

② If the fan speed was lower than the above speed before the change of states, the fan speed does not change.

(5) Defrost control

(a) Temperature condition of defrosting

1) Start conditions (Standard specification or cold region specification can be selected by switching the jumper wire J15.)

Defrost operation will start, when outdoor unit whose compressor is operating under heating mode has satisfied all the following conditions.

(i) When 33 minutes of cumulative compressor operation time has passed since heating operation started.
(ii) When 33 minutes of cumulative compressor operation time has passed since the previous defrosting ended.
(iii) When 8 minutes has passed since the compressor turned ON from OFF status.
(iv) When 8minutes has passed since one outdoor fan turned ON from OFF status.
(v) After all above conditions have been met, when any of the following conditions is satisfied.
① When the outdoor heat exchanger temperature (sensed by Tho-R) and the outdoor air temperature (sensed by Tho-A) dropped below the defrosting start temperature in Fig. 1 for 30 seconds continuously
② When the suction pressure saturated temperature calculated by the low pressure (sensed by PSL) and the outdoor air temperature (sensed by Tho-A) dropped below the defrosting start temperature in Fig. 2 for 3 minutes continuously

Fig. 1

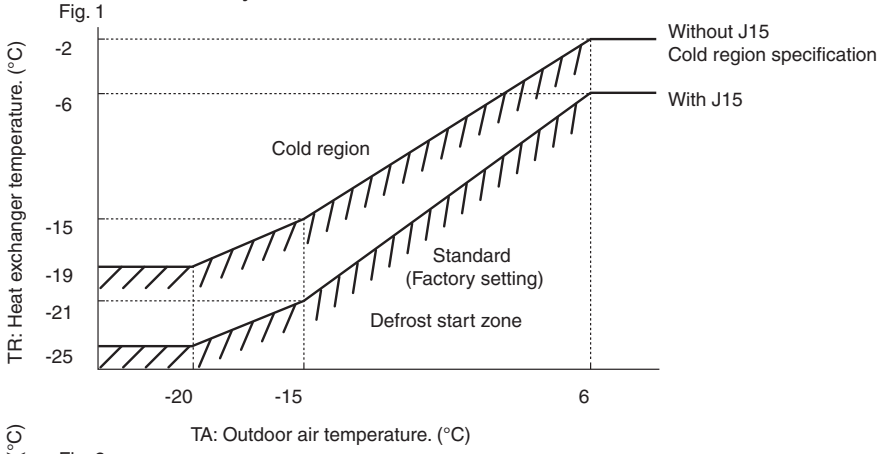
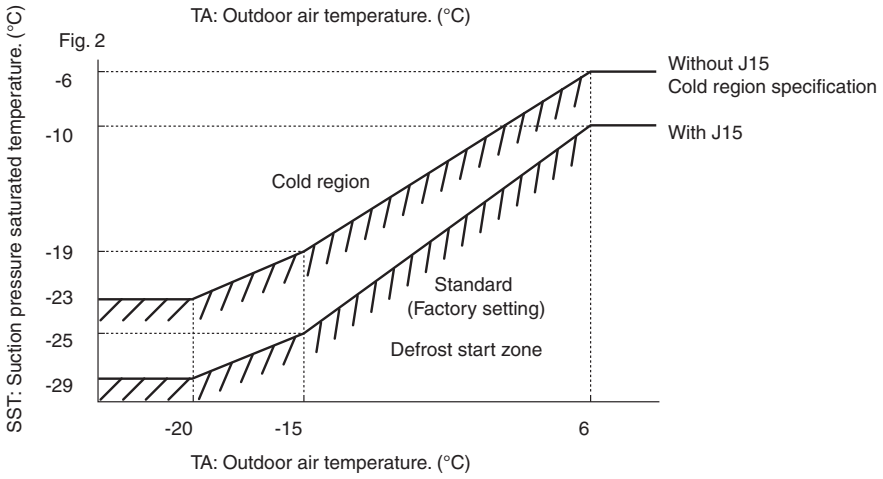


Fig. 2



2) End conditions

Defrosting operation stops when any of the following conditions is satisfied.

(i) When 12 minutes has passed since defrost started
(ii) When the outdoor heat exchanger temperature (sensed by Tho-R) is detected 10°C or higher continuously for 10 seconds
(iii) When it has detected the high pressure (HP) ≥ 3.0MPa

(b) Time condition of defrosting

1) Start conditions

Defrosting operation start when all of the following conditions are satisfied.

(i) When 33 minutes of cumulative compressor operation time has passed since heating operation started.
(ii) When 33 minutes of cumulative compressor operation time has passed since the previous defrosting ended.
(iii) When 105 seconds has passed since the compressor turned ON from OFF status in heating mode.
(iv) When the oil return condition has been established
(v) Following cases are excluded.
① When the upper limit frequency of the compressor protection start A or B is lower than the defrosting frequency
② During the normal compressor protection start

2) End conditions

Defrosting operation stops when any of the following conditions is satisfied.

(i) When 12 minutes has passed since defrost started
(ii) When the outdoor heat exchanger temperature (sensed by Tho-R) is detected 10°C or higher continuously for 10 seconds
(iii) When it has detected the high pressure (HP) ≥3.0MPa

(6) Protective control

(a) Discharge pipe temperature (Td) control

Discharge pipe temperature sensor (Tho-D1) monitors the discharge pipe temperature (Td) to avoid the rise of discharge pipe temperature.

1) Compressor capacity control

(i) Start conditions

When all of following conditions are satisfied

① When the compressor is ON state.

② When it detects the discharge pipe temperature (sensed by Tho-D1) is higher than 120ºC

(ii) Control contents

Whenever it detects the discharge pipe temperature is higher than 120ºC for 5 seconds, the capacity is decreased.

(iii) End conditions

When any of the following conditions is satisfied

① When the discharge pipe temperature (sensed by Tho-D1) drops below 110ºC

② When the compressor is OFF state.

③ During the defrosting control

2) Indoor EEV slightly open control at heating stop.

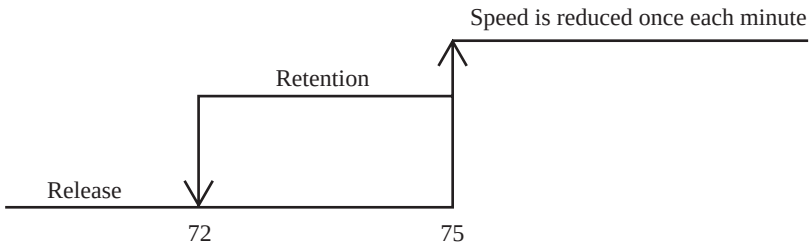
Rise of discharge pipe temperature (Td) is restarined by opening the indoor EEV during heating stop.

(b) Over-current protection control (Current safe)

1) If the input current value at the inverter inlet (converter inlet L3-phase) exceeds the setting value, the compressor speed is reduced. If the higher value persists even after the speed reduction, the speed is reduced further.
2) This control terminates when it is lower than the reset value for 3 minutes continuously or lower than the setting value for 6 minutes continuously.

(c) Power transistor temperature (PT) protective control

If the power transistor temperature exceeds 75°C, the compressor speed is controlled.



(7) Test run

(a) Start conditions

(i) Turn ON the test run switch (SW5-1). The switch is invalid if it is turned ON before the power ON.

(ii) Pump down switch (SW5-3) must be turned OFF.

(b) Contents of control

(i) Turning ON the dip switch (SW5-2) conducts cooling operation and turning OFF (SW5-2) conducts heating operation.

1) Cooling operation

Compressor operation frequency control is conducted by the cooling low pressure control.

2) Heating operation

Compressor operation frequency control is conducted by the heating high pressure control.

(ii) Test run start signal under corresponding operation mode is transmitted to all indoor units connected.

(c) End conditions

(i) When the test run switch (SW5-1) is turned OFF, it stops.

(ii) When it has stopped anomalously by the error control during test run, the error is displayed in the same way as the case of normal operation and the state of anomalous stop is kept ON even if the test run switch (SW5-1) is turned OFF.

(B) Optional controls

- **Functions of outdoor PCB connector CNS1 and CNZ1**

① CNS1 connector : By changing the allocation of external input functions [P07-"X"] on the 7-segment, following functions can be selected.

Function No."X"	CNS1 short circuited	CNS1 open
"0" : External operation input	Operation permission	Operation prohibition
"1" : Demand input	Invalid	Valid
"2" : Forced cooling/heating input	Heating	Cooling
"3" : Silent mode input 1	Valid	Invalid
"4" : Spare	—	—
"5" : Outdoor fan snow guard control input	Valid	Invalid
"6" : Test run external input 1	Test run start	Normail operation
"7" : Test run external input 2	Cooling test run	Heating test run
"8" : Silent mode input 2	Valid	Invalid
"9" : Spare	—	—

② CNZ1 connector: By changing the allocation of external output functions [P06-"X"] on the 7-segment, following functions can be selected.

"0" : Operation output
"1" : Error output
"2" : Compressor ON cutput
"3" : Fan ON output
"4 – 9" : Spare

(1) External input and demand input

(a) Operation permission and prohibition modes

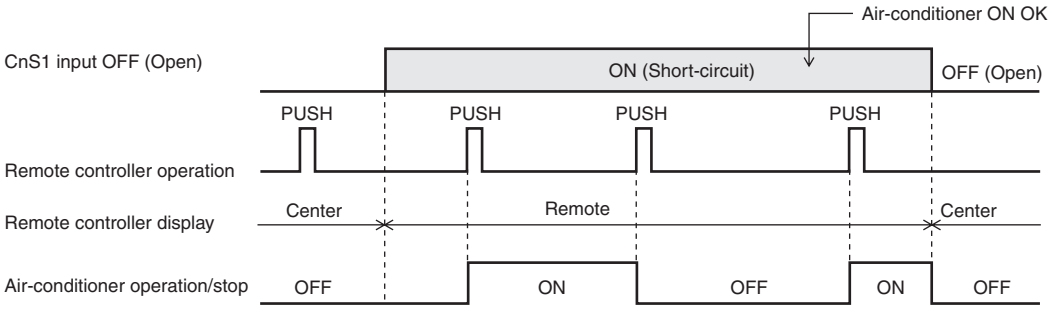
(Note) With 7-segment display [P07]-[0]

1) Operation permission or operation prohibition mode is switched with the connector (CnS1) and the jumper wire (J13) on the outdoor PCB.
   J13: Switching of CnS1 input method
   J13 short-circuited: CNS1 is for the level input.
   J13 open: CnS1 is for the pulse input.
2) Operation permission/prohibition control by the external input CnS1 of outdoor unit

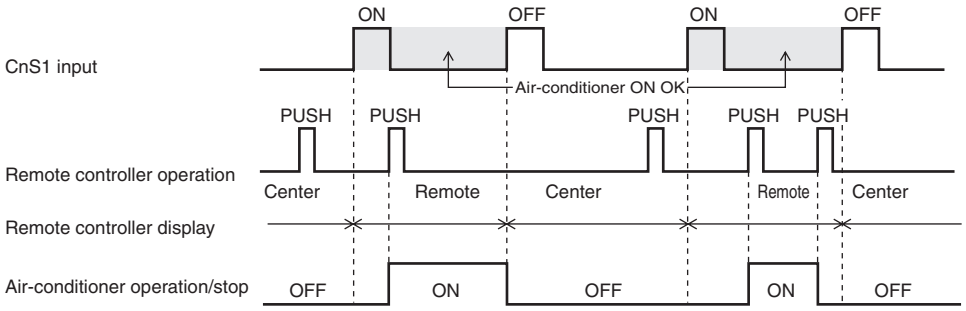
Input: CnS1	Switching with J13	CnS1: Switching of operation permission/ prohibition modes
Short-circuit / Open	Short-circuit (Level input)	Operation prohibition mode → Operation permission mode
	Open (Pulse input)	Switching of operation permission/ operation prohibition modes (Reversal)
Short-circuit / Open	Short-circuit (Level input)	Operation permission mode → Operation prohibition mode
	Open (Pulse input)	— (NOP)

Note (1) Factory setting – J13: Short-circuit, CnS1: Short-circuit (Short-circuit pin connected)

3) The operation condition is desplayed on the LCD of remote controller and is transferred to optional centralised controller.
4) When the control comand from remote controller is not accepted (Under the condition of the system all stop status by external input), “Center” is dispalyed. See Item 5) mentioned below.
5) CnS1 performs the following operations depending on the short-circuit or open of the jumper wire (J13). In case of pulse input, the pulse width is 500ms or larger.
   ① J13 – Short-circuit



   ② J13 - Open



(b) Demand control

(Note) With 7-segment [P07] = [1]

1) Demand control and normal operation are switched with the connector (CnS1) and the jumper wire (J13) on the outdoor PCB.
   J13: Switching of CnS1 input method
   J13 short-circuit: CnS1 is for the level input
   J13 open: CnS1 is for the pulse input

2) Operation/ stop control by the demand input CnS1 of outdoor unit

Input: CnS1	Switching with J13	CnS1: Switching of demand control/ normal operation
Short-circuit Open	Short-circuit (Level input)	Demand control → Normal operation
	Open (Pulse input)	Switching of normal operation/ demand control (Reversal)
Short-circuit Open	Short-circuit (Level input)	Normal operation → Demand control
	Open (Pulse input)	$\overline{\text{NOP}}$

Note (1) Factory setting – J13: Short-circuit, CnS1: Short-circuit (Short-circuit pin connected)

3) The operation condition is desplayed on the LCD of remote controller and is transferred to optional centralised controller.

4) Demand control

Demand ratio can be switched with the dip switches (SW4-5, 4-6) on the outdoor PCB.

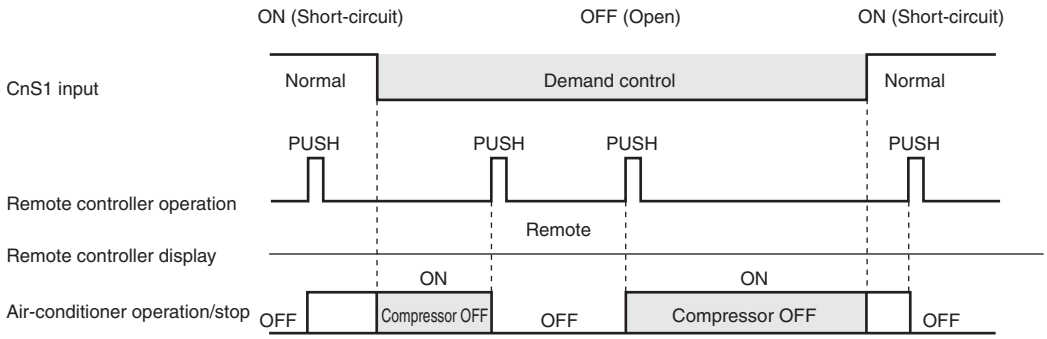
SW4-5, SW4-6 demand switching: 0 – Open, 1 – Short-circuit (Factory default is open)

SW4-5	SW4-6	Compressor Out put(%)
0	0	80
1	0	60
0	1	40
1	1	0

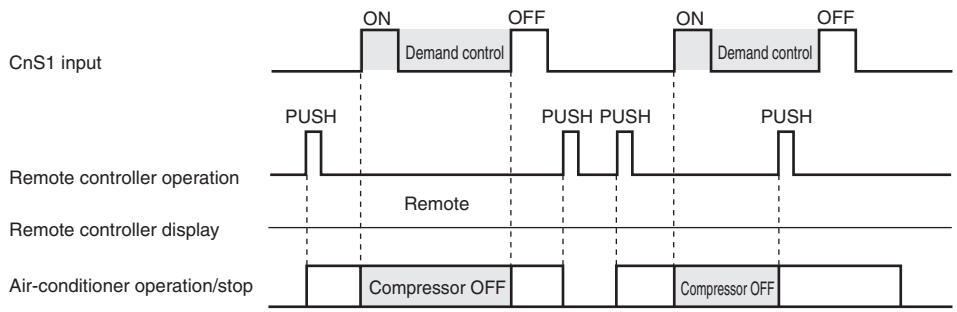
5) CnS1 performs the following operations depending on the short circuited or open of the jumper wire (J13).

In the case of pulse input, the pulse width is 500ms or larger.

① J13 – Short-circuit



② J13 - Open



(2) Silent mode control

(a) Start conditions

When all of the following conditions is established

(i) At the start of silent mode initiated by the indoor unit or when the silent mode input is made effective (short-circuited) at the external input terminal (Factory default: CnG2) on the outdoor unit

(ii) When the outdoor unit operation mode is cooling or heating

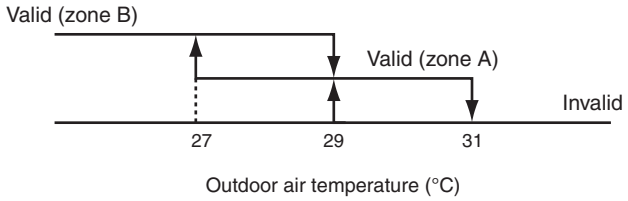
(iii) When the outdoor air temperature satisfies the following conditions

1) Silent setting 0, 1: Effective in zone A and B

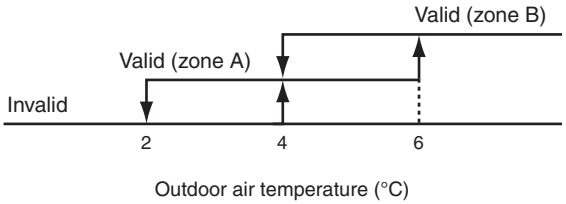
2) Silent setting 2, 3: Effective in zone B

(Note) Silent setting 0 to 3 can be swiched by [P05] of 7-segment display.

<Outdoor operation mode - Cooling>



<Outdoor operation mode - Heating>



(iv) It is excluded when the following invalid conditions are established

(For prevention of anomalous pressure rise at start)

- For 30 seconds after either compressor has been turned ON

(During a special operation)

- During the 4-way valve switching safeguard
- During the defrost control
- During the oil return control
- During the moved pump down control
- During the pump down control for removal of the unit

(Note) Any controls affected by the restriction of compressor and outdoor fan capcity during the silent mode are excluded.

(b) Control contents

Setting values can be changed with the silent setting as follows.

(i) Upper limit of compressor speed is restricted.

(ii) Upper limit of outdoor fan speed is restricted.

Item / Setting	Upper limit of compressor speed			Upper limit of outdoor fan speed		
	rps			rpm		
	P224	P280	P335	P224	P280	P335
Silent setting 0 (Factory default)	80	100		780	800	
Silent setting 1	74	88		700	700	
Silent setting 2	64	80		575	575	
Silent setting 3	50	60		540	540	

(c) End condition

- When the starting conditions are not established

(3) Outdoor fan snow protection control

(a) This control is enabled/disabled by entering data into 7-segment display.

(b) Setting method of outdoor fan control

[Starting conditions]

When following conditions are established for 10 minutes continuously.

(i) Snow protection control setting is valid ([P02]-1) and outdoor air temperature < 3°C or external input of outdoor fan snow protection control ON. ([P07]-5 and CnS1 is shorted)

① Set the Code No. to “P02”.

② “0” or “1” is displayed at the data display area.
“0”: Outdoor fan control disabled (Factory setting)
“1”: Outdoor fan control enabled

③ Press SW7 (Data write/delete) for 3 seconds continuously.

④ “0” or “1” blinks every 0.5 second at the data display area.

⑤ Press SW8 (one digit) to toggle the display back and forth between “0” and “1” (blinking).

⑥ If SW7 is pressed for 3 seconds or longer continuously while “0 “ and “1” is blinking, the blinking stops.
With this operation, the enabled/disabled setting of outdoor fan control is stored in memory of EEPROM, and henceforth the outdoor fan is controlled according to the contents of memory.

⑦ Contents of the outdoor fan control are retained even if the power is turned off and backed on again.

(c) Contents of outdoor fan snow protection control

① If the outdoor air temperature drops 3°C or lower when the unit is all stop or error stop, the outdoor fan runs at the rating speed (7th speed) once every 10 minutes.

② The outdoor fan runs for 30 seconds.*
*Operation time outdoor fan is changeable from 10 to 600 seconds by [P03]

③ During this snow protection control, the compressor’s magnetic contactor (52X1 52X2) is ON.

(d) End conditions of outdoor fan snow protection control

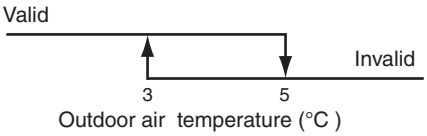
When folowing conditions are established.

(i) Snow protection control setting is invalid ([P02]-0) or outdoor air temperature > 5°C and external input of outdoor fan snow protection control OFF ([P07]-[5]and CnS1is opend).

(ii) Compressor ON

(iii) During all stop by anomaly

<Outdoor air temperature condition at snow protection control>



(4) External output

This function is used in order to operate the external optional devices in conjunction with relay outputs of the respective operation information from outdoor unit.

[External output function]

External output function of CnZ1 can be switched by changing of [P06] on 7-segment display as mentioned below.

0: Operation output

- When the outdoor unit operation mode is “Operation”, the external output relay is turned ON.

(Note) The “Operation” includes not only compressor ON mode but also Fan mode and thermostat OFF mode under the condition of remote controller ON. But the anomalous stop is excluded.

1: Error output

- It is turned ON at anomalous stop, and turned OFF when “CHECK” and “RESET” buttons on remote controller are pressed simutaneously after recovering from the anomaly. Even if “CHECK” and “RESET” buttons are pressed before recovering from the anomaly, it is not turned OFF, but when recovering from the anomaly later, it is automatically turned OFF.

2: Compressor ON output

- It is turned ON when the compressor is ON.

3: Fan ON output

- It is turned ON when the outdoor fan speed command > 0.

(5) Energy saving mode control

This control is effective, when [P04] of 7-segment display is set 000, 040, 060, 080 (except OFF)

(a) Control contents

(i) Compressor upper limit speed is changed according to the setting ratio.

(ii) Compressor upper limit speed is obtained by multiplying the rating speed (at cooling/heating) with the setting ratio as follows.

OFF: Normal (Factory setting)

80%: 80% of rating compressor upper limit speed

60%: 60% of rating compressor upper limit speed

40%: 40% of rating compressor upper limit speed

0%: 0% of rating compressor upper limit speed (stop)

(iii) Except 0% of energy saving ratio, the following controls take precedence over this control.

- 4-way valve switching safeguard
- Defrosting control
- Oil return control
- During the pump down control for removal of the unit
- Pump down control at start/stop

(6) Forced cooling/heating operation

(a) With this control, SW3-7 on the outdoor PCB is turned ON and CnG1 (equipped with short circuit pin) is shorted or opened so as to forcibly determined whether the indoor unit is operated for cooling or heating.

(b) If any operation mode other than the forcible mode is commanded from indoor unit, the mode unmatch message is displayed on the remote controller or others and operation enters in the FAN mode.

SW3-7	CnG1	Operation
ON	Open	Cooling only
	Close	Heating only

(7) Emergency stop control

When one of indoor units receives the emergency stop signal from optional device like as refrigerant leakage detector and the information is transmitted to the outdoor unit, the outdoor unit stops operation and an emergency stop error is transmitted to all indoor units running.

Make the emergency stop effective by remote controller indoor function setting.

(a) When it receives the "Emergency stop" command from the indoor unit, it makes all stop by error.

(b) It shows the Error display "E63" and transmits the "Emergency stop" command to all indoor units.

(c) If the "Emergency stop reset" command is received from the indoor unit, the "Emergency stop reset" command is transmitted to all indoor units.

(8) Pump down operation control for removal of the unit

When an outdoor unit is discarded or removed, the pump down control is performed at the outdoor unit side in order to recover the refrigerant quickly to the outdoor unit.

(a) Start conditions

This is implemented with the liquid service valve closed.

(i) Outdoor unit operation mode – Stop

(ii) Turn ON the test run cooling switch SW5-2 (cooling).

(iii) Turn ON the pump down switch SW5-3 (pump down).

(iv) Turn ON the test run switch SW5-1 when the above (i)-(iii) statuses are satisfied.

Note (1) Input before the power ON is invalid.

(b) Control contents

(i) Compressor starts under compressor start protection control and runs at target speed of pump down operation. However, when the operation start conditions have been established during the 3-minute delay control of compressor, the compressor starts after completing the 3-minute delay control.

Item / Model	Hp	Target compressor speed at pump down operation
FDC224KXE6	8	50HZ
FDC280KXE6	10	62HZ
FDC335KXE6	12	52HZ

(ii) As the start conditions are established, both red LED and green LED on the outdoor PCB flash continuously. 7-segment display shows “PdS” (Channel 0) at the code display area.

(iii) During the pump down operation control, the protective controls (excluing low pressure protective control, anomalous low pressure control and pressure ratio protection control) and the error detection control are effective.

(iv) The sub-cooling coil expansion valve (EEVSC) closes fully during the pump down control.

(c) End conditions

If any of the following conditions is satisfied, this control ends.

(i) If a low pressure (LP) ≤ 0.01MPa is detected for 5 seconds continuously, it ends normally and initiates the followings.

① Red LED: keeps lighting

② Green LED: keeps flashing

③ 7-segment display: PdE

④ Remote controller: Stop

(ii) Anomalous all stop by the error detection control

(iii) If the cumulative compressor operation time under the pump down control totals 15 minutes (ending by time count up), it stops and initiates the following.

① Red LED: stays OFF

② Green LED: keeps flashing

③ 7-segment display: No display

④ Remote controller: Stop

(iv) When any of setting switches (SW5-1, SW5-2 and SW5-3) has been turned OFF during pump down.

(Note) Even if only the pump down switch SW5-3 is turned OFF, it does not recognized as the cooling test run mode , but stops

(C) Data output

(1) 7-segment and operation data retention

(a) 7-segment display

Operation information is displayed for checking various operation data during test run and for helping malfunction diagnosis at servicing. Input data to microcomputer, contents of outdoor unit control, indoor unit registration information, or other, are mainly displayed on the 7-segment LED.

(i) Operation information display

① Displays each item at 7-segment of 3-digit × 2 on the outdoor unit PCB.

② Display is controlled with the following buttons.

SW9: Setting button for order of 10 of display code

SW8: Setting button for order of 1 of display code

SW7: Data erase/write button

③ Select the order of 10 for the code No. of each item with SW9 or SW8 for the order of 1.
Following identification alphabets are used at the code display.
"C": "C00" – "C99"
"P": "P00" – "Pxx" (up to a place where content is specified)

④ Code [C96]is operable item. It is possible to delete the retained operation data (data of 30 minutes preceding an anomalous stop) by following resetting procedure.
<Resetting operation>
- Select code [C96]. If any anomalous data is retained, the data display [dEL] is shown.
- Pressing SW7 for 3 seconds erases the memory data on RAM.
  (EEPROM data are not erased.)
- As the data are erased, the data display shows [- - -].
  When no anomalous data are retained, it displays [---] as well.
- Unless the reset operation is performed, data are retained. Therefore, if normal operation is resumed without the reset operation and an anomalous stop occurs again, no new anomalous data cannot be retained, but former anomalous data are still retained unchanged.

⑤ If you press SW8 (order of 1), the number changes 0 → 1 → 2 ... 9 → 0.

⑥ If you press SW9 (order of 10), the number jumps to the leading code of each order of 10.
Data display [Cxx] and setting value display [Pxx] are considered to be continuous.
Example: Pressing SW9 at [C07] it changes to [C10]
: Pressing SW9 at [C90], it changes to [P00]

⑦ Codes [C44] are operable items. With the following reset operation, the cumulative compressor operation time corresponding to the code No. can be erased (reset). (Reset of operation time after replacing the compressor)
<Resetting operation>
- Select codes [C44]. Cumulative compressor operation time up to present is displayed.
- Pressing SW7 for 3 seconds erases the memory data.
  However, the cumulative compressor operation time data in the 30 minutes log data preceding an anomalous stop (if this retained log data are not deleted) are not erased by this procedure.

⑧ Data display for spare items is left in blank.

(ii) When the temperature is below -10.0°C for the display of discharge pressure saturated temperature and suction pressure saturated temperature, the fraction after decimal point is rounded up. (Because the range of 7-segment display is 3-digit.)

(iii) Return the error No. display after an error to the normal display by turning ON the dipswitch SW3-1.

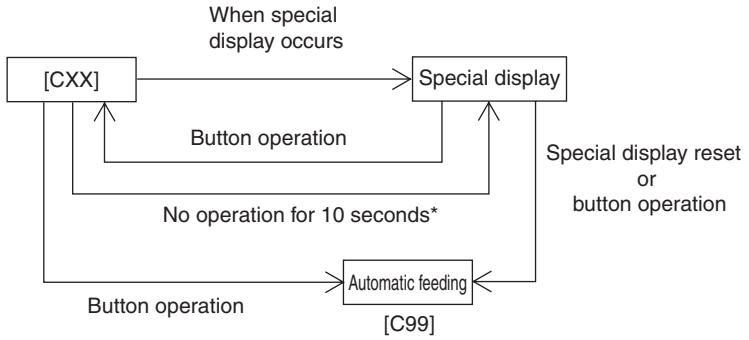
(iii) Precedence of display

① [Exx] > [Related to check operation ([CHJ] > [CHU])] > [PdE] > [PdS]> [oPx] > [Cxx]

② If resetting from the display of ①, it is switched to [C00].

③ If SW8 or SW9 is pressed during the display of ①, it changes to [C00].
However, unless no button input is done for 10 seconds after change to [C00], it changes to the display of ① automatically according to the precedence.

④ Display switching
Special display is the display other than [CXX].



* If the special display is reset in the meanwhile, it remains as [CXX].

(b) List of 7-segment displays

Code No.	Contents of display	Data display range	Minimum unit	Remarks
Error display	[Exx]			
Caution display	[oPx]			
Special display	[PdS][PdE]			
Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<Sensor value, actuator information>				
C00	CM1 operation frequency	0 ~ 130	1Hz	
C01	(Spare)			
C02	Tho-A Outdoor air temperature	L,-20 ~ 43	1°C	
C03	Tho-R1 Heat exchanger temperature 1	L,-25 ~ 73	1°C	
C04	Tho-R2 Heat exchanger temperature 2	L,-25 ~ 73	1°C	
C05	(Spare)			
C06	(Spare)			
C07	Tho-D1 Discharge pipe temperature (CM1)	L,31 ~ 136	1°C	
C08	(Spare)			
C09	(Spare)			
C10	Tho-C1 Under-dome temperature (CM1)	L,5 ~ 90	1°C	
C11	(Spare)			
C12	Tho-P1 Power transistor temperature (CM1)	L,5 ~ 136	1°C	
C13	(Spare)			
C14	Tho-SC Sub-cooling coil temperature 1	L,18 ~ 73	1°C	
C15	Tho-H Sub-cooling coil temperature 2	L,-25 ~ 73	1°C	
C16	Tho-S Suction pipe temperature	L,-25 ~ 73	1°C	
C17	Inverter secondary current	0 ~ 50	1A	
C18	CT1 (CM1) current	0 ~ 50	1A	
C19	(Spare)			
C20	EEVH1 Heating expansion valve opening angle	0 ~ 500	1 pulse	
C21	(Spare)			
C22	EEVSC Sub-cooling coil expansion valve opening angle	0 ~ 500	1 pulse	
C23	FMo1 Actual fan speed	0 ~ 999	10min-1	
C24	FMo2 Actual fan speed	0 ~ 999	10min-1	
C25	PSH High pressure sensor	0 ~ 4.15	0.01MPa	
C26	PSL Low pressure sensor	0 ~ 1.70	0.01MPa	
C27	(Spare)			
C28	(Spare)			
C29	(Spare)			
C30	Pressure switch	0,1 (0: Close, 1: Open)	–	Order of 100: 63H1-1 Order of 10: (Spare) Order of 1: (Spare)
C31	External input	0,1 (0: Close, 1: Open)	–	Order of 100: CNS1 Order of 10: CNS2 Order of 1: CNG1

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
C32	External input	0,1 (0: Close, 1: Open)	–	Order of 100: CNG2 Order of 10: (Spare) Order of 1: (Spare)
C33	Relay output	0,1 (0: Close, 1: Open)	–	Order of 100: 52C-1 Order of 10: 20S Order of 1: Crankcase heater 1
C34	Relay output	0,1 (0: Close, 1: Open)	–	Order of 100: SV6 Order of 10: (Spare) Order of 1: (Spare)
C35	Relay output	0,1 (0: Close, 1: Open)	–	Order of 100: SV1 Order of 10: SV11 Order of 1: SV12
C36	Relay output	0,1 (0: Close, 1: Open)	–	Order of 100: (Spare) Order of 10: (Spare) Order of 1: (Spare)
C37	External output	0,1 (0: Close, 1: Open)	–	Order of 100: External output (CNZ1) Order of 10: CnH Operation output Order of 1: CnY Anomalous output
C38	(Spare)	–	–	
C39	(Spare)	–	–	
<Outdoor unit information>				
C40	Number of connected indoor units	0 ~ 50	1	
C41	Capacity of connected indoor units	0 ~ 200	1	
C42	Number of indoor units with thermostat ON	0 ~ 50	1	
C43	Required Hz total	0 ~ 999	1Hz	
C44	Cumulative compressor operation time (CM1)	0 ~ 655	100h	
C45	(Spare)			
C46	Discharge pressure saturated temperature	-50 ~ 70	0.1°C	Range unable to display (-10°C or under) is in the unit of 1°C.
C47	Suction pressure saturated temperature	-50 ~ 30	0.1°C	Range unable to display (-10°C or under) is in the unit of 1°C.
C48	Sub-cooling coil temperature sensor 1 saturated pressure	-0.68 ~ 4.15	0.01 MPa	0 is omitted in negative range. -0.68 → [-.68]
C49	Cooling sub-cooling	0 ~ 50	0.1deg	
C50	Heating overheat	0 ~ 50	0.1deg	
C51	Sub-cooling coil overheat	0 ~ 50	0.1deg	
C52	Discharge pipe overheat 1	0 ~ 50	0.1deg	
C53	Under-dome overheat 1	0 ~ 50	0.1deg	
C54	Target cooling low pressure	0.00 ~ 2.00	0.01MPa	
C55	Target heating high pressure	1.60 ~ 4.15	0.01MPa	
C56	Target Fk	0 ~ 999	1Hz	
C57	Inverter 1 operation frequency command	0 ~ 130	1Hz	
C58	(Spare)	0 ~ 130	1Hz	
C59	FMo1 Fan Speed command	0 ~ 999	10min-1	
C60	FMo2 Fan Speed command	0 ~ 999	10min-1	

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<Anomalous counter information>				
C70	Counter · Sensor wire disconnected	0 ~ 3	1	
C71	Counter · High pressure protection	0 ~ 5	1	
C72	Counter · Anomalous low pressure ③ (During operation)	0 ~ 5	1	
C73	Counter · Anomalous low pressure ① (During stop)	0 ~ 5	1	
C74	Counter · Discharge pipe 1 anomalous temperature	0 ~ 5	1	
C75	Counter · Anomalous FMo1 stop	0 ~ 5	1	
C76	Counter · Anomalous FMo2 stop	0 ~ 5	1	
C77	Counter · Current cut (CM1)	0 ~ 4	1	
C78	Counter · Compressor 1 starting failure	0 ~ 20	1	
C79	Counter · Inverter 1 comunication error	0 ~ 4	1	
C80	(Spare) Counter · Power transistor 1 overheat	0 ~ 4	1	
C81	(Spare)			
C82	Counter · Inverter 1 desynchronism error	0 ~ 4	1	
C83	Counter · Inverter 1 comunication error cumulative	0 ~ 127	1	
C84	Counter · Indoor/outdoor comunication error	0 ~ 255	1	
C85	Counter · CPU reset	0 ~ 255	1	
C86	(Spare)			
C87	(Spare)			
C88	(Spare)			
C89	(Spare)			
C90	(Spare)			
C91	(Spare)			
C92	(Spare)			
C93	Counter – Liquid-back error	0 ~ 3	1	
C94	(Spare)			
<Others>				
C95	(Spare)			
C96	Data reset			
C97	Program · Sub version	0 ~ 991	–	
C98	Program · POL version	0.00 ~ 9.99	0.01	
C99	Auto feed display	–		

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<User setting>				
P00	(Spare)	– – – –	–	
P01	Operation priority selection	0,1	–	0: First push priority (at shipping) 1: Last push priorit
P02	Outdoor unit fan snow protection control	0,1	–	0: Control disabled (at shipping) 1: Control enabled
P03	Outdoor unit fan snow protection control ON time setting	30 : (Factory default) 10, 30 ~ 600 [Sec]	30	Changes like 10, 30, 60 90 … 600
P04	Energy saving mode *2	OFF,000,040, 060,080		0: OFF, 1: 0%, 2: 40%. 3: 60%, 4: 80% Factory default is 0: OFF.
P05	Silencing mode setting	0 : (Factory default) 0 ~ 9	1	
P06	Allocation of external output (CnZ1)	0 : (Factory default) 0 ~ 9	1	
P07	Allocation of external input (CnS1)	0 : (Factory default) 0 ~ 9	1	
P08	Allocation of external input (CnS2)	1 : (Factory default) 0 ~ 9	1	
P09	Allocation of external input (CnG1)	2 : (Factory default) 0 ~ 9	1	
P10	Allocation of external input (CnG2)	3 : (Factory default) 0 ~ 9	1	

Code No.	Data display contents	Data display range	Min. unit	Remarks
<Service engineer setting>				
P16	(Spare)	– – – –	– – –	
P17	(Spare)	– – – –	– – –	
P18	(Spare)	– – – –	– – –	
P19	Preferencial switch to ensure certain indoor outlet air temperature at heating	0 : (Factory default) 0.1	–	0: Control for ensuring certain indoor outlet air temperature at heating is valid 1: Control for ensuring certain indoor outlet air temperature at heating is invalid
P20	Allowable total capacity of thermostat ON indoor units to ensure certain indoor outlet temperature at heating	110 : (Factory default) 100, 090, 080	–	Changes to 110, 100, 090, 080, 110 …
P21	Allowable number of thermostat ON indoor units to ensure certain indoor outlet temperature at heating	0 : (Factory default) 0 ~ 9	1	
P22	(Spare)	– – – –	– – –	
P23	(Spare)	– – – –	– – –	
P24	(Spare)	– – – –	– – –	
P25	(Spare)	– – – –	– – –	
<Newsuper link setting>				
P30	Superlink communication status	0,1	–	0: Previous superlink 1: New superlink
P31	Automatic address setting start input	0 : (Factory default) 0,1	–	0: Automatic address setting standby 1: Automatic address setting start
P32	Input the starting indoor address for automatic address setting	1 : (Factory default) 1 ~ 127	1	Specify the starting indoor address connected in one refrigerant system for automatic address setting.
P33	Input the number of connected indoor units	1 : (Factory default) 1 ~ 24 (*)	1	Specify the number of indoor units connected in one refrigerant system for automatic address setting. (*) Maximum connectable number of indoor units for each outdoor unit
P34	Polarity difinition	0 : (Factory default) 0,1	–	0: Network polarity not defined 1: Network polarity defined
P36	(Spare)	–		
P37	(Spare)	–		
P38	(Spare)			
P39	(Spare)			

(c) Saving of Operation Data

Mainly for investigating the causes of market claims, operation data are always saved in memory. If any trouble occurs, the data writing is stopped and only the operation data prior to the time when the trouble occurs are recorded. These data can be loaded to a PC via RS232C connector of PCB and utilized for identifying causes.

(i) Operation data for a period of 30minutes prior to the present operation are saved and updated continuously.

(ii) If an anomalous stop occurs, the data are not updated any more.

(iii) Data are written in based on 1 minute sampling interval and following data is transmitted to PC upon demand.

Data	Data range	Example
Software version	Ascii 15 bytes	KD3C218######## (# : NULL)
PID (Program ID)	Ascii 2 bytes	5D
Outdoor unit capacity	Ascii 3 bytes	As listed blow
Power supply frequency	Ascii 2 bytes	60
Outdoor address	Ascii 2 bytes	00 ~ 3F
Indoor address × 16 units	Ascii 2 bytes × 16 units	40 ~ 7F
Indoor capacity × 16 units	Ascii 3 bytes × 16 units	022 ~ 280

Outdoor unit composition	Outdoor unit capacity data	Remarks
Single type	Example: 10HP - [S10]	S: Display with Horse Power of single type

(iv) Error retention and monitoring data

Code No.	Write contents	Record data				
		Data write range	Unit of write	Number of bytes	Contents	
00	Indoor 1 Thı-A	–14 ~ 50	A/D value	1	Return air	
01	Indoor 1 Thı-R1	0 ~ 72	A/D value	1	Heat exchanger 1	
02	Indoor 1 Thı-R2	0 ~ 72	A/D value	1	Heat exchanger 2	
03	Indoor 1 Thı-R3	0 ~ 72	A/D value	1	Heat exchanger 3	
04	Indoor 1 EEV	0 ~ 470	1 pulse	2		
05	Indoor 1 operation/stop	0,1	–	1	0	Stop
					1	Operation
06	Indoor 1 operation mode	0 ~ 4	–	1	0	Auto
					1	Dehumidifying
					2	Cooling
					3	Fan
					4	Heating
07	Indoor 1 request Hz	0 ~ 255	1Hz	1		
08	Indoor 1 answer Hz	0 ~ 255	1Hz	1		
09	Indoor 1 indoor local	–	–	1	Bit0	Anti-frost
					Bit1	EEV opening angle implementation
10	Indoor 1 Thi spare	–14 ~ 50	A/D value	1	Discharge	
11	Indoor 1 type	0 ~ 67	–	1	0	FDT
					1	FDK
					2	Others
					3	FDE
					4	FDTC
					5	
					6	
					7	
					60 ~	
12	Indoor 1PID	–	–	1		

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents	
0	Error code	00 ~ 99	–	1	00: No error on outdoor unit 01-99: All errors	
1	Error existing unit address	00 ~ FF	–	1	00 – 3F: Outdoor 40 – 6F: Indoor	
<Sensor value>						
2	Tho-A Outdoor air temperature	-20 ~ 70	A/D value	1		
3	Tho-R1 Heat exchanger temp. 1	-40 ~ 75	A/D value	2		
4	Tho-R2 Heat exchanger temp. 2	-40 ~ 75	A/D value	2		
5	Tho-D1 Discharge pipe temp. (CM1)	-20 ~ 140	A/D value	1		
6	Tho-S Suction pipe temperature	-40 ~ 75	A/D value	2		
7	Tho-SC Sub-cooling coil temp. 1	-40 ~ 75	A/D value	2		
8	Tho-H Sub-cooling coil temp. 2	-40 ~ 75	A/D value	2		
9	Tho-P1 Power transistor temp. (Radiator fin)	-20 ~ 140	A/D value	1		
10	Inverter secondary current	0 ~ 50	A/D value	1		
11	Tho-C1 Under-dome temp. (CM1)	-40 ~ 90	A/D value	1		
12	CT1 Current	0 ~ 50	A/D value	1		
13	High pressure sensor	0 ~ 4.15	A/D value	1		
14	Low pressure sensor	0 ~ 1.70	A/D value	1		
<Outdoor unit information>						
15	Number of connected indoor units	0 ~ 127	1 unit	1		
16	Capacity of connected indoor units	0 ~ 65535	–	2		
17	Number of indoor units with thermostat ON	0 ~ 255	1 unit	1		
18	Total capacity of indoor units with cooling thermostat ON	0 ~ 65535		2		
19	Total capacity of indoor units with heating thermostat ON	0 ~ 65535		2		
20	Operation mode	0 ~ 2	–	1	0 1 2	Stop Cooling Heating
21	Inverter CM1 actual operation frequency	0 ~ 255	1Hz	1		
22	FMo1 Actual fan speed	0 ~ 65535	10min-1	2		
23	FMo2 Actual fan speed	0 ~ 65535	10min-1	2		
24	Required Hz total	0 ~ 65535	1Hz	2		
25	Discharge pressure saturated temperature	-50 ~ 70	0.01°C	2		
26	Suction pressure saturated temperature	-50 ~ 30	0.01°C	2		
27	Sub-cooling coil temp. sensor 1 saturated pressure	-0.68 ~ 4.15	0.01MPa	2		
28	Pressure ratio	1.0 ~ 10.0	0.1	1		
29	Cooling sub-cooling	0 ~ 50	0.1deg	2		
30	Suction overheat	0 ~ 50	0.1deg	2		
31	Sub-cooling coil overheat	0 ~ 50	0.1deg	2		
32	Discharge pipe overheat	0 ~ 50	0.1deg	2		
33	Compressor 1 under-dome overheat	0 ~ 50	0.1deg	2		
34	Target Fk	0 ~ 65535	1Hz	2		
35	Answer Hz total	0 ~ 65535	1Hz	2		
36	Inverter 1 operation frequency command	0 ~ 120	1Hz	1		

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
37	FMo1 Fan speed command	0 ~ 65535	10min-1	2			
38	FMo2 Fan speed command	0 ~ 65535	10min-1	2			
39	EEVH1 opening degree	0 ~ 65535	1 pulse	2			
40	EEVSC opening degree	0 ~ 65535	1 pulse	2			
41	Compressor target cooling low pressure	0.00 ~ 2.00	0.01MPa	1			
42	Compressor target heating high pressure	0.00 ~ 4.15	0.01MPa	2			
43	Outdoor EEVH target superheat	0 ~ 25.5	0.1°C	1	Actual range: 5°C – 11°C		
44	Outdoor EEVH initial learning opeing position	0 ~ 255	1 pulse	1			
45	Outdoor EEVSC target superheat	0 ~ 25.5	0.1°C	1			
46	Cumulative amount of hold-up oil.	0 ~ 2550	10cc	1	Actual range: 0cc – 1100cc		
47	Oil return count down	0 ~ 255	3 min.	1	Actual range: 0 – 600min (10 hour)		
<PCB hardware input>							
48	External input	–	–	1	Bit0	63H1	0: Open, 1: Short-circuit
					Bit1	(Spare)	0: Open, 1: Short-circuit
					Bit2	CNS1	0: Open, 1: Short-circuit
					Bit3	CNS2	0: Open, 1: Short-circuit
					Bit4	CNG1	0: Open, 1: Short-circuit
					Bit5	CNG2	0: Open, 1: Short-circuit
					Bit6	(Spare)	0: Open, 1: Short-circuit
					Bit7	(Spare)	0: Open, 1: Short-circuit
49	Dip SW [SW3]	–	–	1	Bit0	SW3-1	0 : OFF, 1 : ON
					Bit1	SW3-2	0 : OFF, 1 : ON
					Bit2	SW3-3	0 : OFF, 1 : ON
					Bit3	SW3-4	0 : OFF, 1 : ON
					Bit4	SW3-5	0 : OFF, 1 : ON
					Bit5	SW3-6	0 : OFF, 1 : ON
					Bit6	SW3-7	0 : OFF, 1 : ON
					Bit7	SW3-8	0 : OFF, 1 : ON
50	Dip SW [SW4]	–	–	1	Bit0	SW4-1	0 : OFF, 1 : ON
					Bit1	SW4-2	0 : OFF, 1 : ON
					Bit2	SW4-3	0 : OFF, 1 : ON
					Bit3	SW4-4	0 : OFF, 1 : ON
					Bit4	SW4-5	0 : OFF, 1 : ON
					Bit5	SW4-6	0 : OFF, 1 : ON
					Bit6	SW4-7	0 : OFF, 1 : ON
					Bit7	SW4-8	0 : OFF, 1 : ON
51	Dip SW [SW5]	–	–	1	Bit0	SW5-1	0 : OFF, 1 : ON
					Bit1	SW5-2	0 : OFF, 1 : ON
					Bit2	SW5-3	0 : OFF, 1 : ON
					Bit3	SW5-4	0 : OFF, 1 : ON
					Bit4	SW5-5	0 : OFF, 1 : ON
					Bit5	SW5-6	0 : OFF, 1 : ON
					Bit6	SW5-7	0 : OFF, 1 : ON
					Bit7	SW5-8	0 : OFF, 1 : ON

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
52	Dip SW [SW6]	–	–	1	Bit0	SW6-1	0 : OFF, 1 : ON
					Bit1	SW6-2	0 : OFF, 1 : ON
					Bit2	SW6-3	0 : OFF, 1 : ON
					Bit3	SW6-4	0 : OFF, 1 : ON
					Bit4	SW6-5	0 : OFF, 1 : ON
					Bit5	SW6-6	0 : OFF, 1 : ON
					Bit6	SW6-7	0 : OFF, 1 : ON
					Bit7	SW6-8	0 : OFF, 1 : ON
53	Jumper SW	–	–	1	Bit0	J11	0: Open, 1: Short-circuit
					Bit1	J12	0: Open, 1: Short-circuit
					Bit2	J13	0: Open, 1: Short-circuit
					Bit3	J14	0: Open, 1: Short-circuit
					Bit4	J15	0: Open, 1: Short-circuit
					Bit5	J16	0: Open, 1: Short-circuit
					Bit6	(Spare)	
					Bit7	(Spare)	
<PCB hardware output>							
54	Relay output	–	–	1	Bit0	52X1, 52X2	0 : OFF, 1 : ON
					Bit1	20S	0 : OFF, 1 : ON
					Bit2	CH1	0 : OFF, 1 : ON
					Bit3	SV1	0 : OFF, 1 : ON
					Bit4	SV6	0 : OFF, 1 : ON
					Bit5	SV11	0 : OFF, 1 : ON
					Bit6	(Spare)	0 : OFF, 1 : ON
					Bit7	(Spare) FMC1,2	0 : OFF, 1 : ON
55	Relay output	–	–	1	Bit0	Operation output (CnH)	0 : OFF, 1 : ON
					Bit1	Error output (CnY)	0 : OFF, 1 : ON
					Bit2	External output (CnZ)	0 : OFF, 1 : ON
					Bit3	(Spare)	0 : OFF, 1 : ON
					Bit4	(Spare)	0 : OFF, 1 : ON
					Bit5	(Spare)	0 : OFF, 1 : ON
					Bit6	(Spare)	0 : OFF, 1 : ON
					Bit7	(Spare)	0 : OFF, 1 : ON
<Related to compressor>							
56	CM1 Cumulative operation hours (Approx.)	0 ~ 65535	1h	2			
57	CM1 Starting times	0 ~ 65535	× 20 times	2			
58	CM1 3-minute delay timer	0 ~ 180	1 sec	1			
59	Energizing time count down	0 ~ 255	1 min	1			
60	Control status CH Compressor protection timer	0 ~ 360	3 min	1			
61	Control status CH Compressor protection start	0 ~ 15	–	1	15	Protection start complete	
					0 ~ 14	Protection start ON	

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
<Error counter information>							
72	Control status HP (63H1) anomaly counter	0 ~ 5	1	1			
73	Control status LP anomaly counter while running	0 ~ 5	1	1			
74	Control status LP anomaly counter while stopping	0 ~ 5	1	1			
75	Control status Td1 error counter	0 ~ 5	1	1			
76	Control status DC fan motor 1 error counter	0 ~ 5	1	1			
77	Control status DC fan motor 2 error counter	0 ~ 5	1	1			
78	Control status sensor wire disconnected counter	0 ~ 3	1	1			
79	Control status INV1 current cut error counter	0 ~ 4	1	1			
80	Control status INV1 starting failure counter	0 ~ 20	1	1			
81	Control status INV1 communication error counter	0 ~ 4	1	1			
82	Control status INV1 desynchronism error counter	0 ~ 4	1	1			
83	Control status INV1 communication error counter cumulative	0 ~ 255	1	1			
84	(Spare) Control status INV1 power transistor overheat error counter	0 ~ 4	1	1			
85	Control status INV1 rotor lock error counter	0 ~ 127	1	1			
<Setting value display>							
86	Operation priority switching outsoor fan snow protection control	0,1	–	1	0	First push priority	
					1	Last push priority	
87	Outdoor fan snow protection control	0,1		1	0	Invalid	
					1	Valid	
88	Outdoor fan snow protection control ON time setting	30: (Factory default) 10, 30 – 600 [sec]	10 sec	1			
89	Demand ratio change value	OFF, 000, 040, 060, 080 Factory default 0: OFF	–	1			
90	Silent mode setting	0 ~ 9	–	1			
91	CNS1 function quota value	0 ~ 9	–	1			
92	CNS2 function quota value	0 ~ 9	–	1			
93	CNG1 function quota value	0 ~ 9	–	1			
94	CNG2 function quota value	0 ~ 9	–	1			
95	External output function quota	0 ~ 9	–	1			
96	Target cooling low pressure compensation	-0.20 ~ +0.20	0.01MPa	1			
97	Target cooling high pressure compensation	0.00 ~ 0.40	0.01MPa	1			
98	Heating setting 1 (Target outlet temperature)	40 ~ 50	1 [°C]	1			

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
99	Heating setting 2 (Target high pressure)	3.15 ~2.75	0.05 [MPa]	1			
100	Heating setting 3 (Judgment temperature)	30 ~ 38	1 [℃]	1			
<Other>							
104	Override number	0 ~	–	1			
	<Indoor unit information>						
106	Registered indoor 1 – 8 operation mode	0 ~ 4	–	8	0	Auto	
					1	Humidifying	
					2	Cooling	
					3	Fan	
					4	Heating	
107	Registered indoor 1 – 8 request Hz	0 ~ 255	1Hz	8			
108	Registered indoor 1 – 8 answer Hz	0 ~ 255	1Hz	8			

Compressor stop cause (Cord No. C68)

It shows the latest comprressor anomalous stop cause

Compressor stop cause		No
	At power on	0
Sensor disconnection and/or short-circuit	Outdoor air temperature	1
	Outdoor heat exchanger temperture 1	2
	Outdoor heat exchanger temperture 2	3
	Discharge pipe temperature sensor 1(CM1)	4
	Suction pipe temperature sensor	5
	Sub-cooling temperature sensor 1(liquid side)	6
	Sub-cooling temperature sensor 2(gas side)	7
	Under-dome temperature sensor 1	8
	Power transistor temperature sensor 1	9
	Active filter temperature sensor	10
	High pressure sensor	11
	Low pressure sensor	12
Anomaly detection	HP anomaly	20
	LP anomaly	21
	Td1 anomaly	22
	FMo1 anomaly	23
	FMo2 anomaly	24
	Inverter 1 current cut	25
	Inverter 1 startup failure	26
	Inverter 1 communication error	27
	Inverter 1 anomalous compressor induced voltage and torque	28
	Inverter 1 power tansistor overheat	29
	Inverter 1 rotor lock	30
	Liquid flooding anomaly	31
Stop by restriction	Outdoor operation mode heating/cooling switching	40
	Heating overload protection	41

*

(2) Outdoor PCB setting

Code	Input	Remarks
SW1	Outdoor address No. (Order of 10)	
SW2	Outdoor address No. (Order of 1)	
SW3-1	Inspection LED reset	Normal ★/Reseet
SW3-2	Automatic backup operation	None ★/With
SW3-7	Forced heating/cooling	Normal ★/Forced heating-cooling
SW3-8	Test mode	Normal ★/Test
SW5-1	Test run SW	Normal ★/Test run
SW5-2	Test run	Heating ★/Cooling
SW5-3	Pump down SW	Normal ★/Pump down
SW7	Data erase/Write	
SW8	7-segment display code No. increasing (order of 1)	
SW9	7-segment display code No. increasing (order of 10)	
SW4-1	Model selection	See following table.
SW4-2		
SW4-3		
SW4-4		
SW4-5	Demand ratio selection	See following table.
SW4-6	Demand ratio selection	See following table.
SW5-5	SL selection	New SL ★/Previous SL
J11	Power supply voltage selection	Open
J12	Power supply voltage selection	Open
J13	External input Level/Pulse	Level ★/Pulse
J14	Defrost reset temperature	Normal ★/Intensive
J15	Defrost start temperature Normal/Cold region	Normal ★/Cold weather region

Note (1) Jumper wires J13, J15 indicate short-circuit/open.
(2) Dip switch SW's indicate OFF/ON.
(3) ★ indicates the factory default setting (OFF).

■ **Model selection with SW4-1 – SW4-4**

Model / Switch	FDC224	FDC280	FDC335
SW4-1	0	1	0
SW4-2	0	0	1
SW4-3	0	0	0
SW4-4	0	0	1

Note (1) 0: OFF, 1: ON

■ **Demand ratio selection with SW4-5, SW4-6**

SW4-5	SW4-6	Compressor capacity (%)
0	0	80
1	0	60
0	1	40
1	1	0

Note (1) 0: OFF, 1: ON

2 SYSTEM TROUBLESHOOTING PROCEDURE

2.1 Basics of troubleshooting

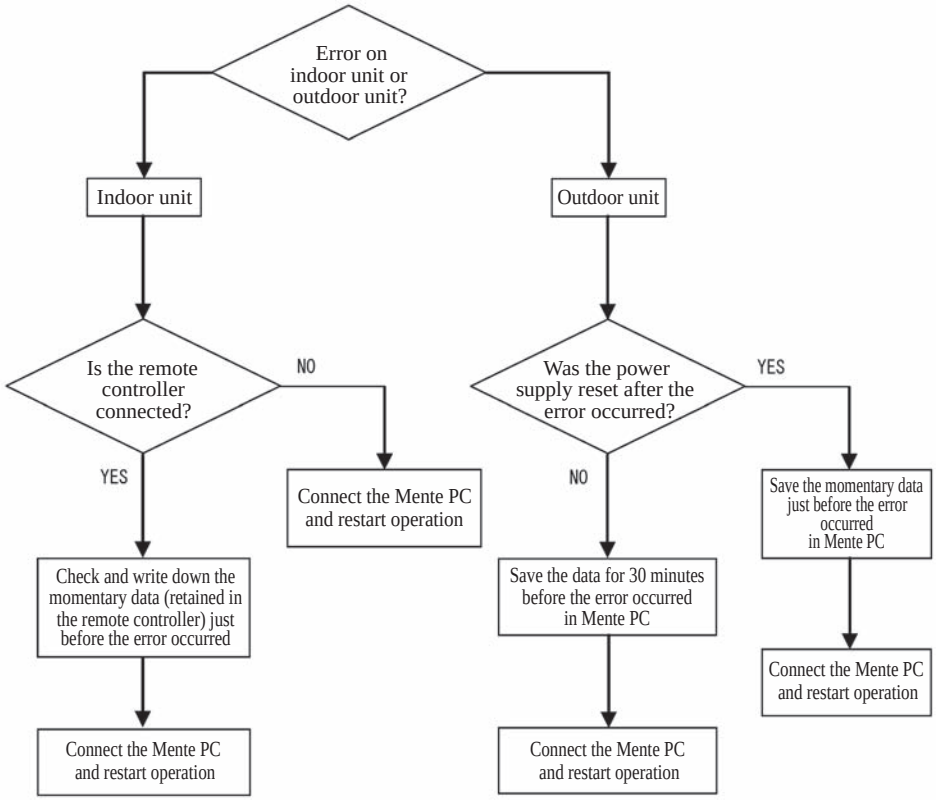
Basic troubleshooting is to check/analyze/save data by connecting the Mente PC.

Whenever arriving at the site, always connect the Mente PC before starting work.

Method of error data analysis (Basic procedure)

- Identify whether particular error occurred during operation or stopping.
- Is it caused by the installation conditions of outdoor/indoor unit? (Refrigerant quantity, pipe length, short-circuit, clogged filter, etc.)
- Isn't there any beginner's mistake at the installation? (Wrong address, mistake in piping or wiring, etc.)
- Is the failure related to any hardware (parts)? (SV main body, coil, capillary, check valve, sensor, etc.)
- Is it a major component.

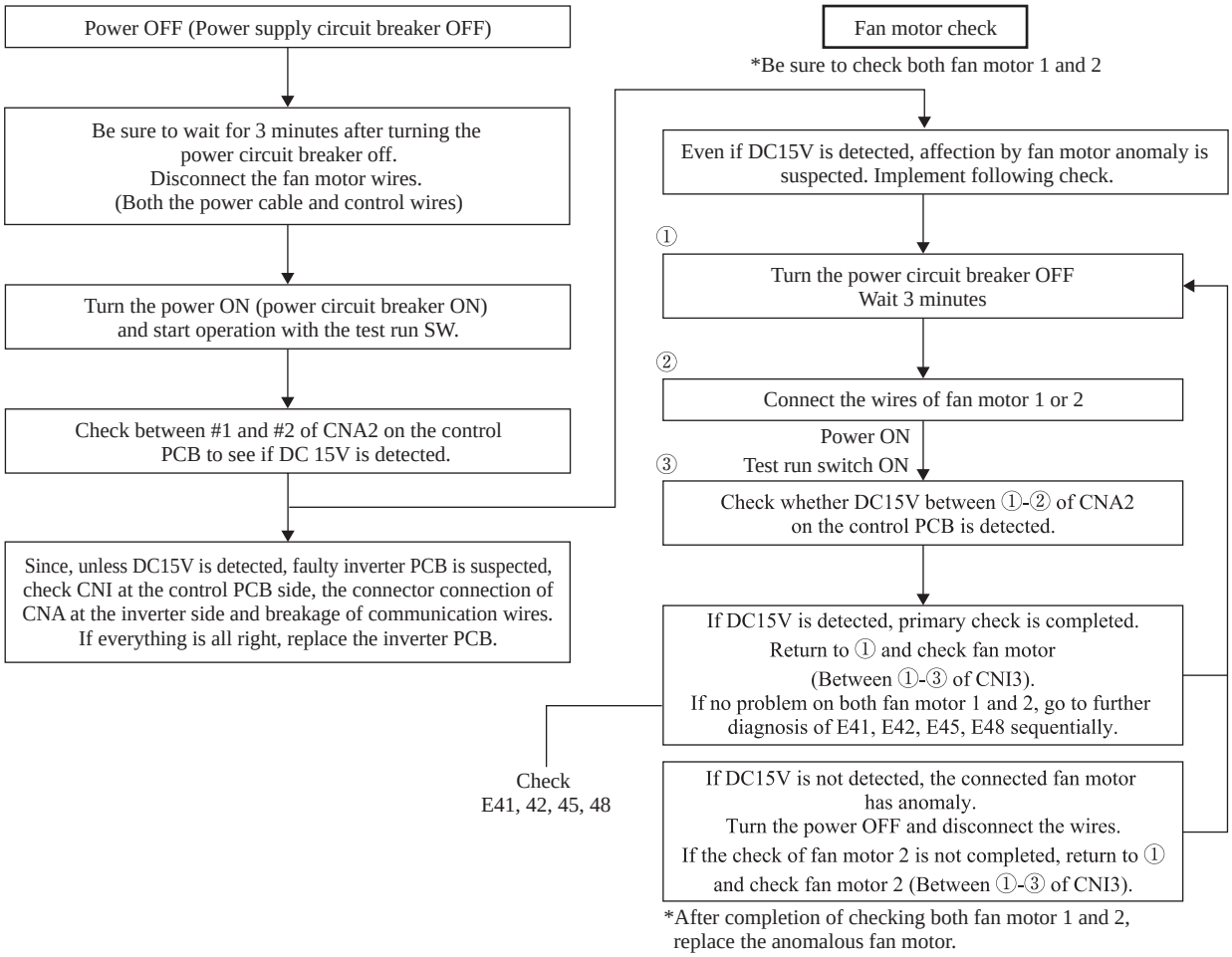
  Compressor, inverter PCB and outdoor DC fan motor.
- Is it a failure of electrical component?



2.2 Explanation of troubleshooting

(a) Checking 15V on the control PCB (Step to check if the inverter PCB fails or not)

Use this to diagnose E41, E42, E45 and E48.



(b) Inspection of short-circuit on the power transistor module terminals

Disconnect the wiring of compressor and check for short-circuit with a tester.

Inspect between terminals of: P-U, P-V, P-W, N-U, N-V, N-W and P-N

It will be easier to contact the tester at the following place at each terminal.

P: P terminal of power transistor

N: N terminal of power transistor

U: End of red harness to compressor

V: End of white harness to compressor

W: End of blue harness to compressor

Terminal (+)	Terminal (−)	Normal value (Ω)
P	N	Several 10 M
N	P	Several M
P	U	Several 10 M
P	V	
P	W	
N	U	Several 100K
N	V	
N	W	
U	P	Several 100K
V	P	
W	P	
U	N	Several 10 M
V	N	
W	N	

Note (1) When a measured value is 0 – a few kΩ, the element may be broken. Replace the power transistor part.

2.3 Contents of troubleshooting

(a) List of inspection displays

1) Indoor and outdoor units

Remote controller error code	7-segment display	Name of inspection	Classification	Page
E1	–	Remote controller communication error	Communication error	59
E2	–	Duplicated indoor unit address	Address setting error	60
E3	–	Outdoor unit signal line error	Address pairing setting error	61
E5	–	Communication error during operation	Communication error	62
E6	–	Indoor heat exchanger temperature thermistor anomaly (Thi-R)	Thermistor wire breakage	63
E7	–	Indoor return air temperature thermistor anomaly (Thi-A)	Thermistor wire breakage	64
E9	–	Drain trouble	System error	65
E10	–	Excessive number of indoor units (more than 17 units) by controlling one remote controller	Communication error	66
E12	–	Address setting error by mixed setting method	Address setting error	67
E16	–	Indoor fan motor anomaly (FDT series)	DC fan motor error	68
	–	Indoor fan motor anomaly (FDK series)	DC fan motor error	69
E19	–	Indoor unit operation check drain motor check mode anomaly	Setting error	70
E28	–	Remote controller temperature thermistor anomaly (Thc)	Thermistor wire breakage	71
E30	E30	Unmatch connection of indoor and outdoor unit	System error	72
E31	E31	Duplicated outdoor unit address No.	Address setting error	73
E32	E32	Open L3 Phase on power supply at primary side	Site setting error	74
E36	E36-1	Discharge pipe temperature error (Tho-D1)	System error	75
	E36-3	Liquid flooding anomaly	System error	76
E37	E37-1, 2 E37-5, 6	Outdoor heat exchanger temperature thermistor (Tho-R) and subcooling coil temperature thermistor (Tho-SC, -H) anomaly	Thermistor wire breakage	77
E38	E38	Outdoor air temperature thermistor anomaly (Tho-A)	Thermistor wire breakage	78
E39	E39-1	Discharge pipe temperature thermistor anomaly (Tho-D1)	Thermistor wire breakage	79
E40	E40	High pressure anomaly (63H1-1 activated)	System error	80
E41 (E51)	E41 (E51)-1	Power transister overheat	System error	81
E42	E42-1	Current cut (CM1)	System error	82
E43	E43-1 E43-2	Excessive number of indoor units connected, excessive total capacity of connection	Site setting error	83
E45	E45-1	Communication error between inverter PCB and outdoor control (PCB)	Communication error	84
E46	E46	Mixed address setting methods coexistent in same network	Address setting error	85
E48	E48-1 E48-2	Outdoor DC fan motor anomaly	DC fan motor error	86
E49	E49	Low pressure anomaly	System error	87
E53/E55	E53/E55-1	Suction pipe temperature thermistor anomaly (Tho-S), Under-dome temperature thermistor anomaly (Tho-C1)	Thermistor wire breakage	88
E54	E54-1 E54-2	High pressure sensor anomaly (PSH)/Low pressure sensor anomaly (PSL)	Thermistor wire breakage	89
E56	E56-1	Power transitor temperature thermistor anomaly (Tho-P1)	Thermistor wire breakage	90
E58	E58-1	Anomalous compressor by loss of synchronism	System error	91
E59	E59-1	Compressor startup failure (CM1)	System error	92
E60	E60-1	Rotor position detection failure (CM1)	System error	93
E63	E63	Emergency stop	Site setting error	94

2) Optional controller in-use

SL-1N-E SL-2N-E SL-3N-E		Indoor unit control PCB		Outdoor unit control PCB		Location of trouble	Description of trouble	Repair method
Error code	Red LED	Red LED	Green LED	Red LED	Green LED			
E75	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Keep flashing	SL-1N-E SL-2N-E SL-3N-E	・Communication enor (Deflective communication circuit on the main unit of SL1N-E, SL2N-Eor SL3N-E)	Replacoment

(b) Troubleshooting

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	Keeps flashing	Stays Off	Operates but does not cool
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

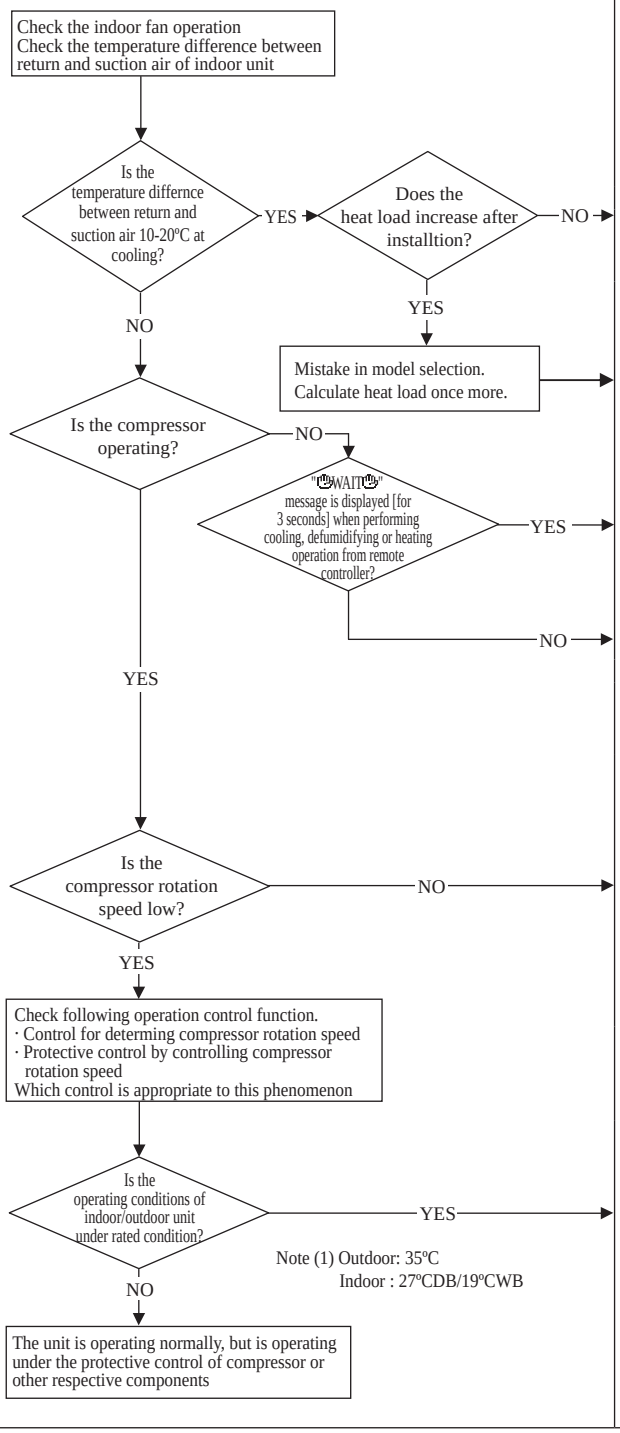
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Poor compression of compressor
- Expansion valve anomaly

5. Troubleshooting

Diagnosis	Countermeasure
	It is normal (This unit is designed to start in the soft start mode by detecting the compressor under-dome temperature when it restart after power reset) It is necessary to replace to higher capacity unit or to install additional unit Compressor refrigerant oil protective control at starting is activated. For the contents of control, refer to the compressor start control. 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 microcomputer control function Check the followings • Minor clogging of filter • Minor fouling of heat exchanger • Minor short-circuit of airflow • Slightly insufficient or excessive refrigerant amount • Poor compression of compressor Check suspicious points considering appropriate operation control Check the followings for reference • Severe clogging of filter • Severe clogging of heat exchanger • Severe short-circuit of airflow • Severely insufficient or excessive refrigerant amount • Under protective control of compressor • Indoor unit fan tap setting • Valid setting of silent mode

Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	Keeps flashing	Stays Off	Operates but does not heat
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

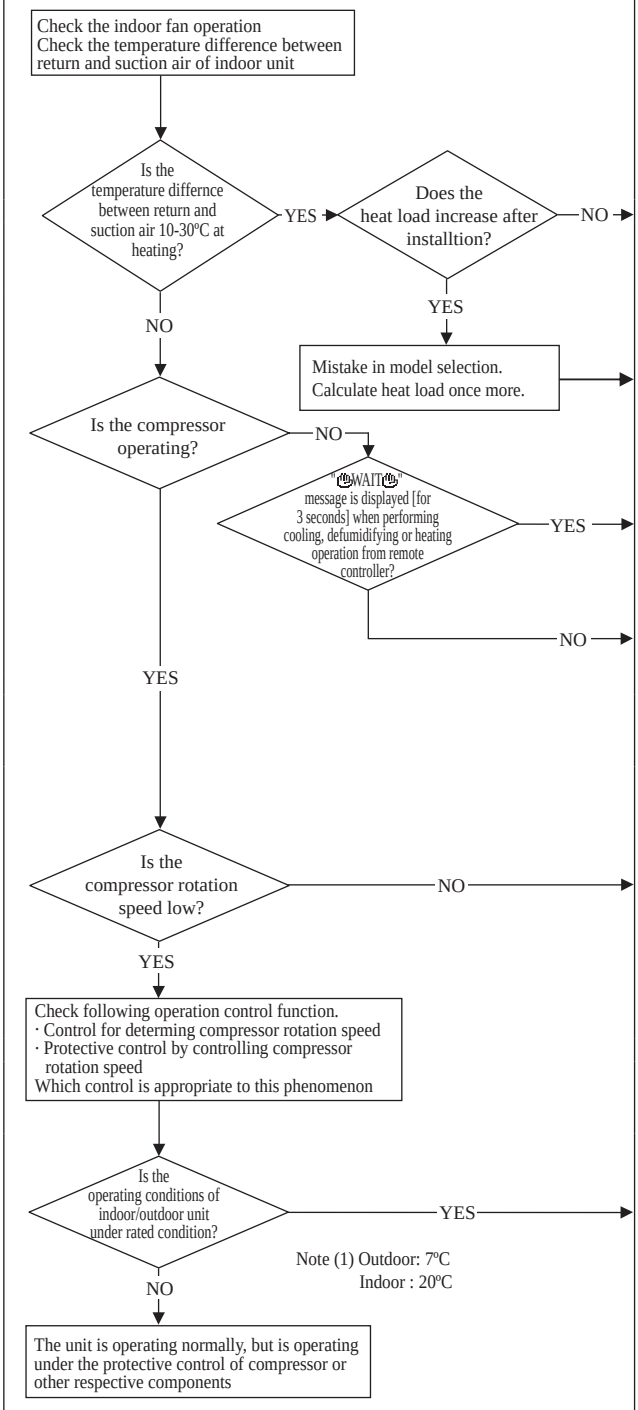
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- 4-way valve anomaly
- Poor compression of compressor
- Expansion valve anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	Stays Off	Stays Off	Earth leakage breaker activated
	Outdoor	Stays Off	Stays Off	

1. Applicable model

All models

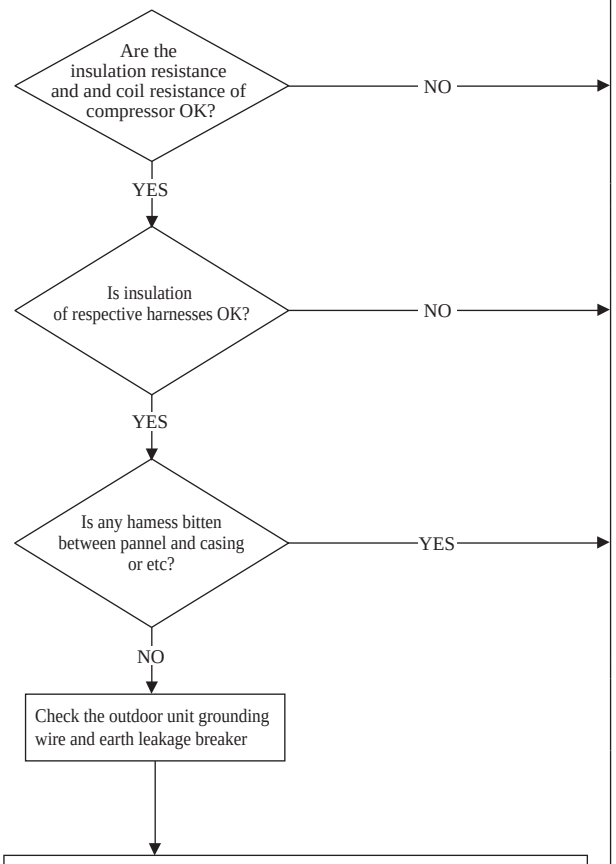
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Compressor anomaly
- Noise

5. Troubleshooting



Check of the outdoor unit grounding wire and earth leakage breaker

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 the conformity of high harmonic regulation.

* Insulation resistance of compressor
- Immediately after installation or when the unit has been left for long period without power supply, the insulation resistance may drop to a few M because of refrigerant migrated in the compressor.
  When the earth leakage breaker is activated at lower insulation resistance, check the following points.

① 6 hours after power ON, check if the insulation resistance recovers to normal.
When power ON, crankcase heater heat up compressor and evaporates the refrigerant migrated in the compressor.
② Check if the earth leakage breaker is conformed to higher harmonic regulation or not.
Since the unit has inverter, it is necessary to use components conformed to high harmonic regulation in order to prevent malfunction of earth leakage breaker.

Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	–	–	Excessive noise/vibration (1/3)
	Outdoor	–	–	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

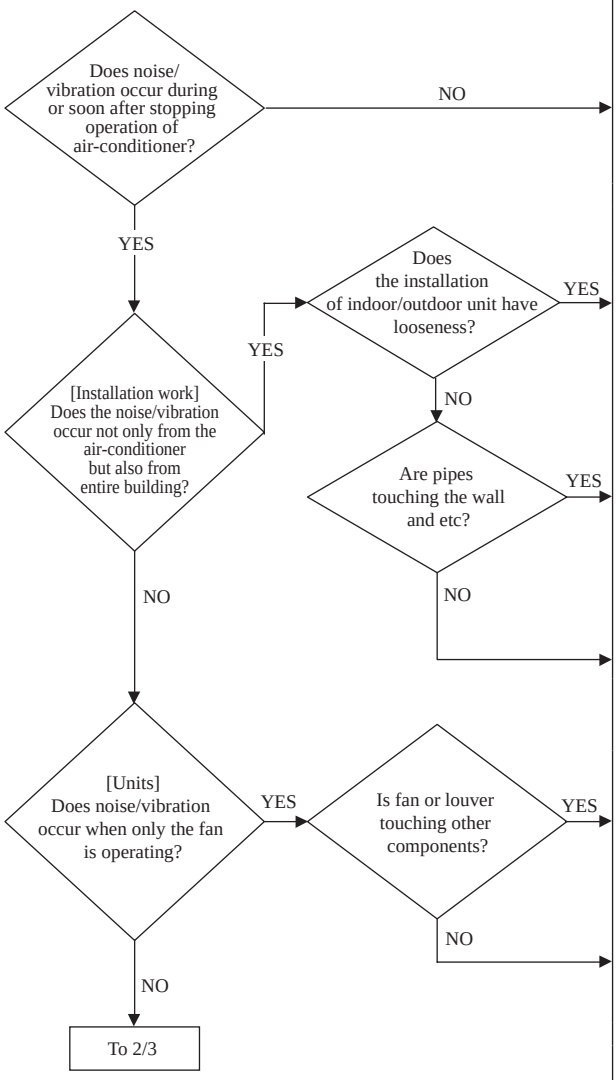
4. Presumable cause

① Improper installation work
- Improper vibration-proof work at instllation
- Insufficient strength of mounting surface

② Anomaly of product
- Before/after shipment from factory

③ Improper adjustment during commissioning
- Excessive/insufficient refrigerant.

5. Troubleshooting



Diagnosis	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 installed position or insert rubber cushions into the gap or take other measure in order to eliminate looseness. Prevent the vibration from transmitting to wall and etc by fixing pipes on the wall tightly 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 installation place or apply reinforcement to increase the strength. Check for leaning of installed unit or incorrect mounting of fan, louver or motor, and then specify the contacting point and correct it. When th eheat exchanger or filter is clogged, clean them. In case that the unit is installed at the site where background noise is very low, even the low level noise from indoor unit like as refrigerant flow noise can be heard, but it is normal. Before installation, check for background noise. If background noise is very low, convince client prior to installation.

Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	–	–	Excessive noise/vibration (2/3)
	Outdoor	–	–	

1. Applicable model

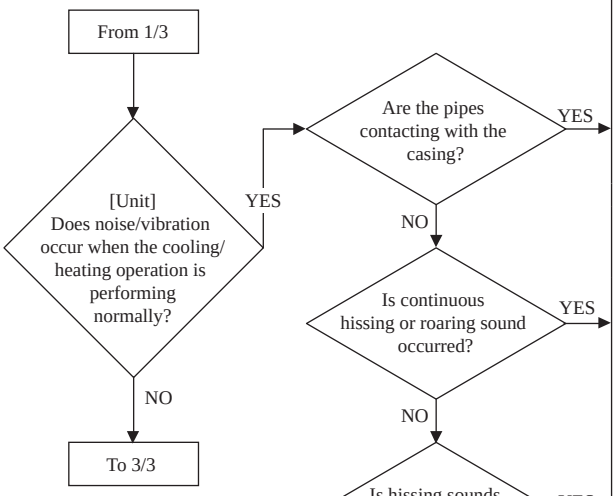
All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5. Troubleshooting



Diagnosis	Countermeasure
Are the pipes contacting with the casing? YES	Rearrange the piping to avoid contact with the casing.
Is continuous hissing or roaring sound occurred? YES	Noise/vibration is generated when the refrigerant gas or liquid flows through inside of piping of air-conditioner. It is likely to occur particularly during cooling or defrosting in the heating mode. It is normal.
Is hissing sounds occurred at the startup or stopping? YES	The noise/vibration occurs when the refrigerant starts or stops flowing. It is normal.
Is blowing sound occurred at the start/stop of defrost operation during heating mode? YES	When the defrosting starts or stops during heating mode, the refrigerant flow is reversed due to switching 4-way valve. This causes a large change in pressure wich produces a blowing sound. It may also accompany the hissing sound as mentioned above. This is normal.
Is cracking noise occurred during heating operation? YES	After the start or stop of heating operation or during defrosting, abrupt changes in temperature cause resin parts to shrink or expand. This is normal.
Is hissing noise occurred during cooling operation or after operation stopped? YES	It is the sound produced by the drain pump that discharges drain from indoor unit. The pump continues to run for 5 minutes after stopping the cooling operation. This is normal.
NO	Apply the damper sealant at the place considered to be the sources such as the pressure reducing mechanism (Expansion valve, capillary tube, etc.)

Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	–	–	Excessive noise/vibration (3/3)
	Outdoor	–	–	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5. Troubleshooting

Diagnosis	Countermeasure
From 2/3 [Adjustment during commissioning] Does noise/vibration occur when the cooling/heating operation is performed under anomalous condition? YES	If insufficient cooling/heating problem happens due to anomalous operating conditions at cooling /heating, followings are suspicious. • Excessive charged amount of refrigerant • Insufficient charge amount of refrigerant • Intrusion of air, nitrogen, etc. In such case, it is necessary to recover refrigerant, vacuum-dry and recharge refrigerant. * Since there could be many causes of noise/vibration, the above may not cover all. In such case, check the conditions when, where, how the noise/vibration occurs according to following check points and ask our consultation • Indoor/outdoor unit • Cooling/heating/fan mode • Startup/stop/during operation • Operating condition (Indoor/outdoor temperatures and pressures) • Time it occurred • Operation data retained by remote controller or Mente PC such as compressor rotation speed, heat exchanger temperature, EEV opening degree and etc. • Tone (If available, record the noise) • Any other anomalies

Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	Keeps flashing	Stays Off	Louver motor anomaly
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

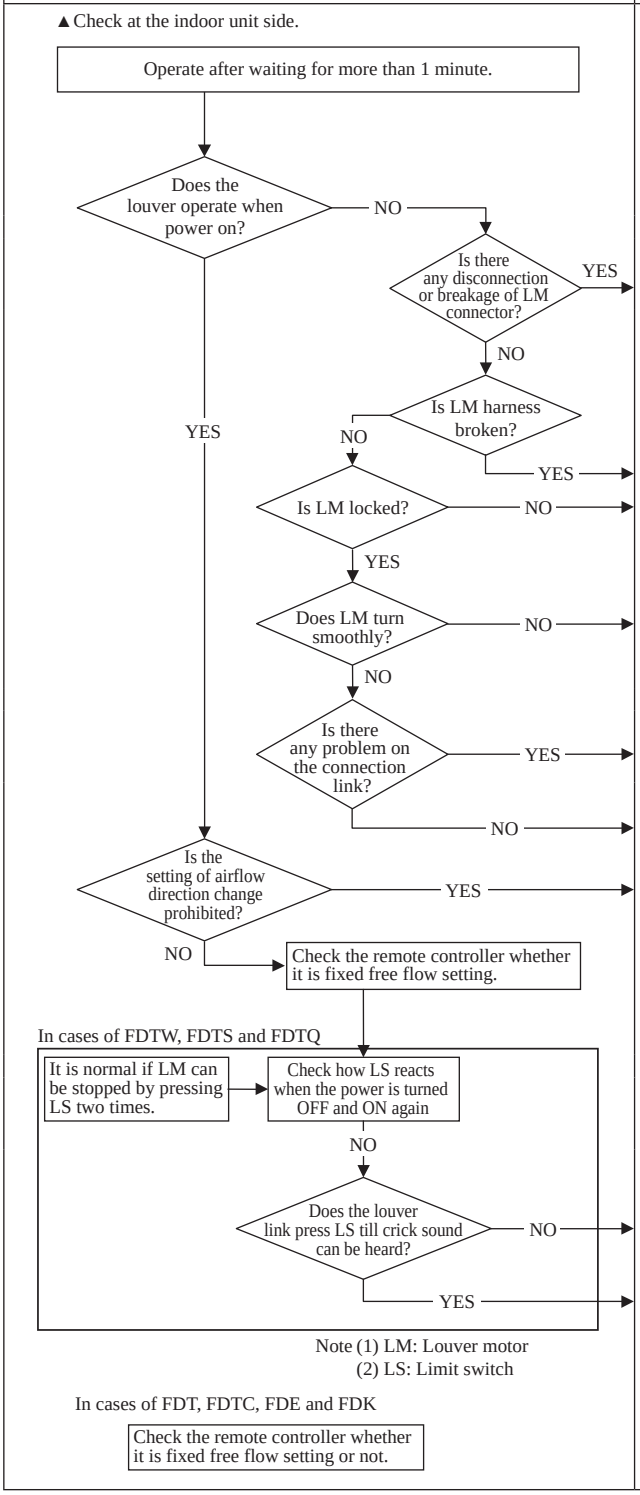
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Louver motor anomaly
- Disconnection/breakage of LM harness
- Limit switch anomaly

5. Troubleshooting



Note:

Error code

Remote controller: None
7-segment display:

LED	Green	Red
Indoor	Stays Off	Stays Off
Outdoor	Stays Off	2 times flash

Content

Power supply system anomaly (Power supply to indoor unit PCB)

1. Applicable model

All models

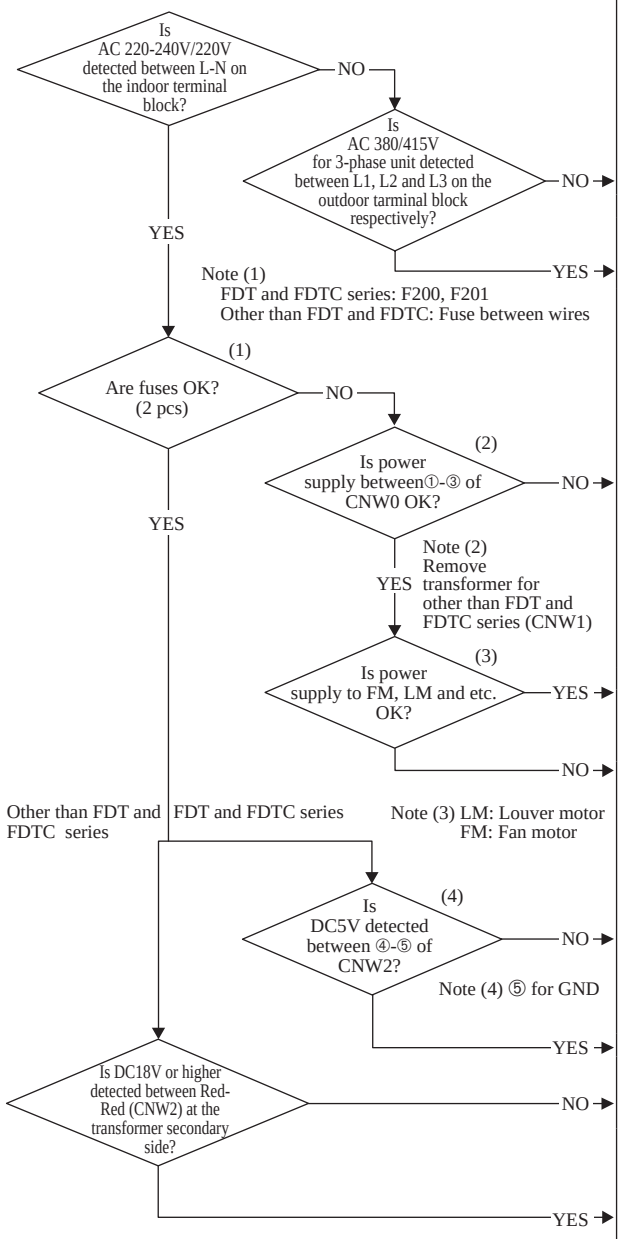
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Wrong connection or breakage of connecting wires
- Blown fuse
- Transformer anomaly
- Indoor power PCB anomaly
- Broken harness
- Indoor control PCB anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: None 7-segment display:	Indoor	Stays Off	Keeps lighting	Power supply system error (Power supply to remote controller)
	Outdoor	Stays Off	Keeps lighting	

1. Applicable model

All models

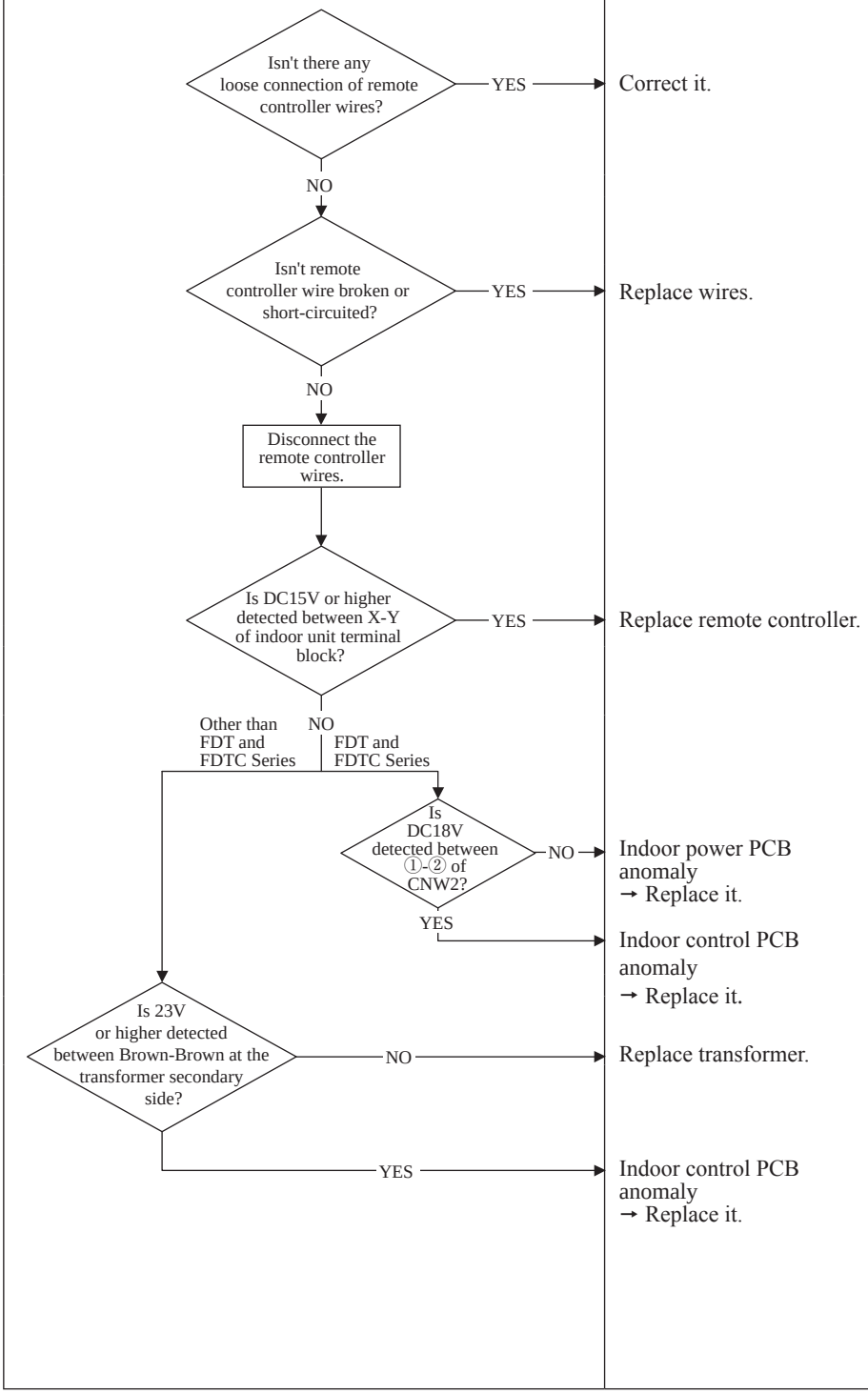
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Remote controller wire breakage/short-circuit
- Remote controller anomaly
- Malfunction by noise
- Indoor power PCB anomaly
- Broken harness
- Indoor control PCB anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: WAIT 7-segment display:	Indoor	Keeps flashing	Stays Off	WAIT (1)
	Outdoor	Keeps flashing	Keeps flashing	

1. Applicable model

All models

(In case that WAIT is kept on displaying on the remote controller for more than 2 minutes after power ON)

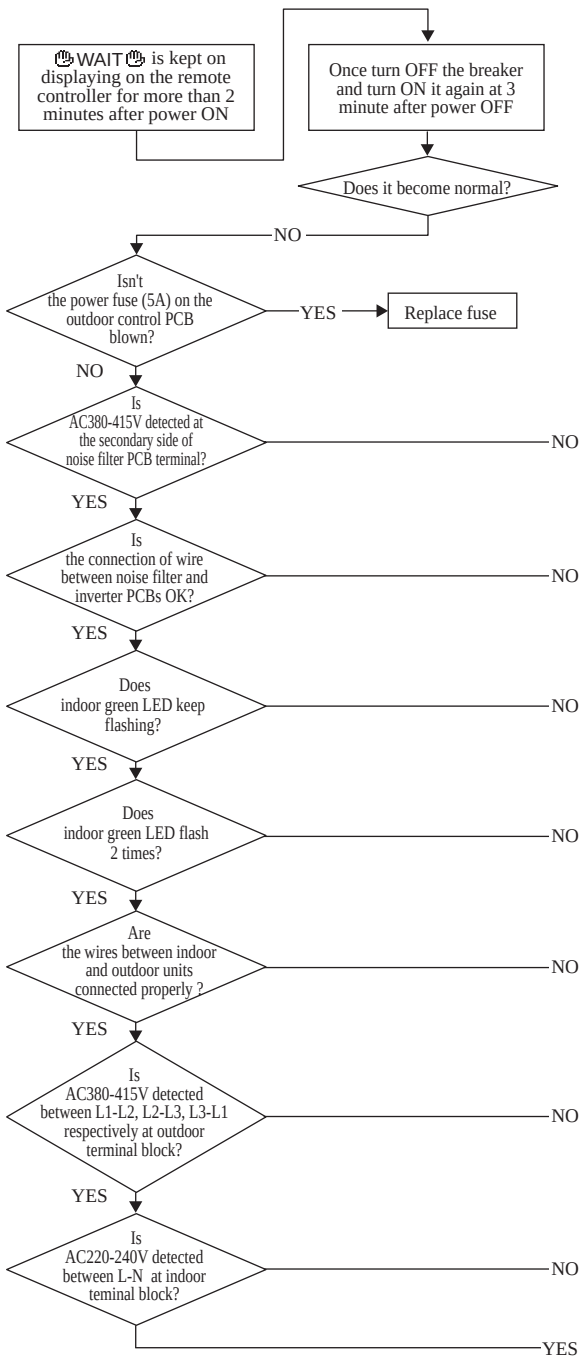
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5. Troubleshooting



Note: (1) When anomaly occurs during establishing communication betweeen indoor and outdoor unit, error code E5 is displayed (outdoor red LED flash 2-times)
In case of E5, the way of troubleshooting is same as above mentioned (except for checking of connecting wire)
When reset the power after E5 occurs, if this anomaly recurs, WAIT is displayed on remote controller. If power ON/OFF is repeated in a short period (within 1 minute), WAIT may be displayed. In such case, please wait for 3 minute after the power breaker OFF.
(2) If any error is detected 30 minutes after displaying "WAIT" on the remote controller, the display changes to "INSPECT I/U".

Error code	LED	Green	Red	Content
Remote controller: ✋WAIT✋ 7-segment display:	Indoor	Keeps flashing	Stays Off	✋WAIT✋ (2)
	Outdoor	Keeps flashing	Keeps flashing	

1. Applicable model

All models

(In case of fuse blown, how to check the unit before replacement of fuse)

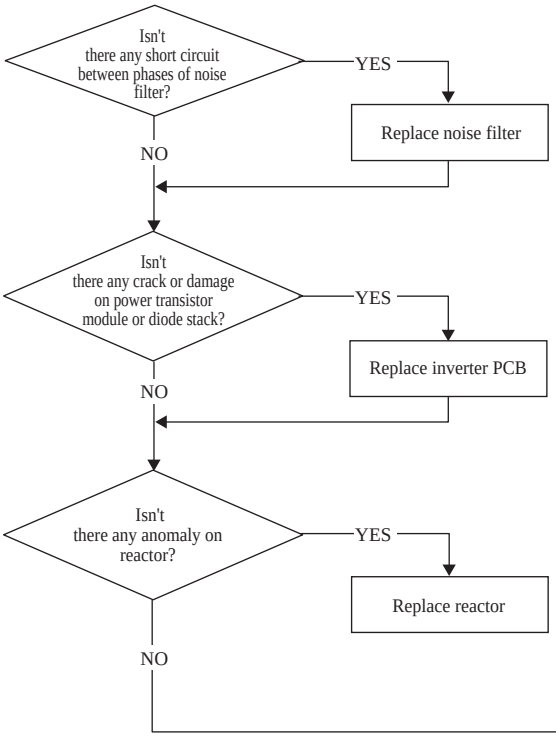
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
	Replace fuse

Note:

Error code	LED	Green	Red	Content
Remote controller: ✋WAIT✋ 7-segment display:	Indoor	Keeps flashing	Stays Off	✋WAIT✋ (3)
	Outdoor	Keeps flashing	Keeps flashing	

1.Applicable model

All models

(No display on the remote controller after power ON)

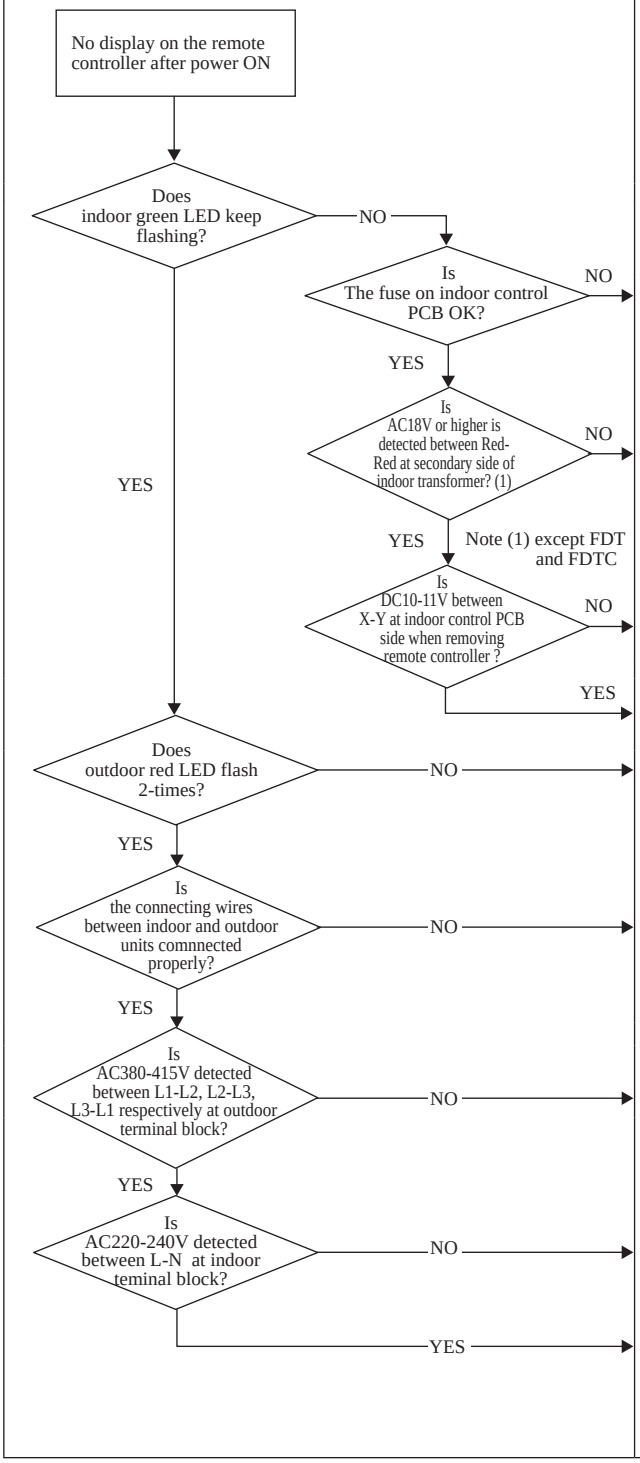
2.Error detection method

3. Condition of error displayed

4.Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5.Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: WAIT 7-segment display:	Indoor	Keeps flashing	Stays Off	WAIT (4)
	Outdoor	Keeps flashing	Keeps flashing	

1.Applicable model

All models

(In case that WAIT is kept on displaying on the remote controller for more than 2 minutes after power ON)

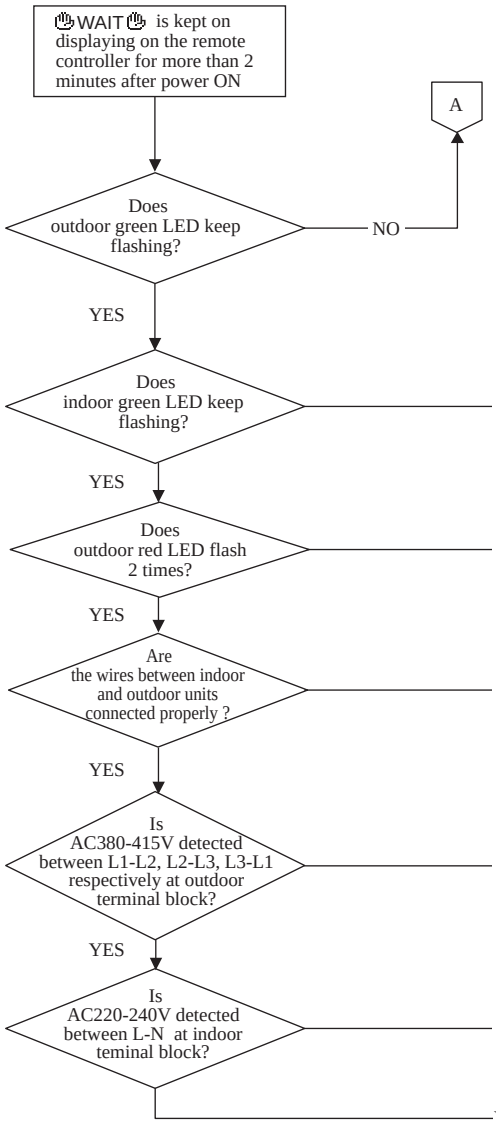
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: ✋WAIT✋ 7-segment display:	Indoor	Stays OFF	Stays Off	✋WAIT✋ (5)
	Outdoor	Stays OFF	Stays Off	

1.Applicable model

All models

(In case that LED on outdoor control PCB stays OFF)

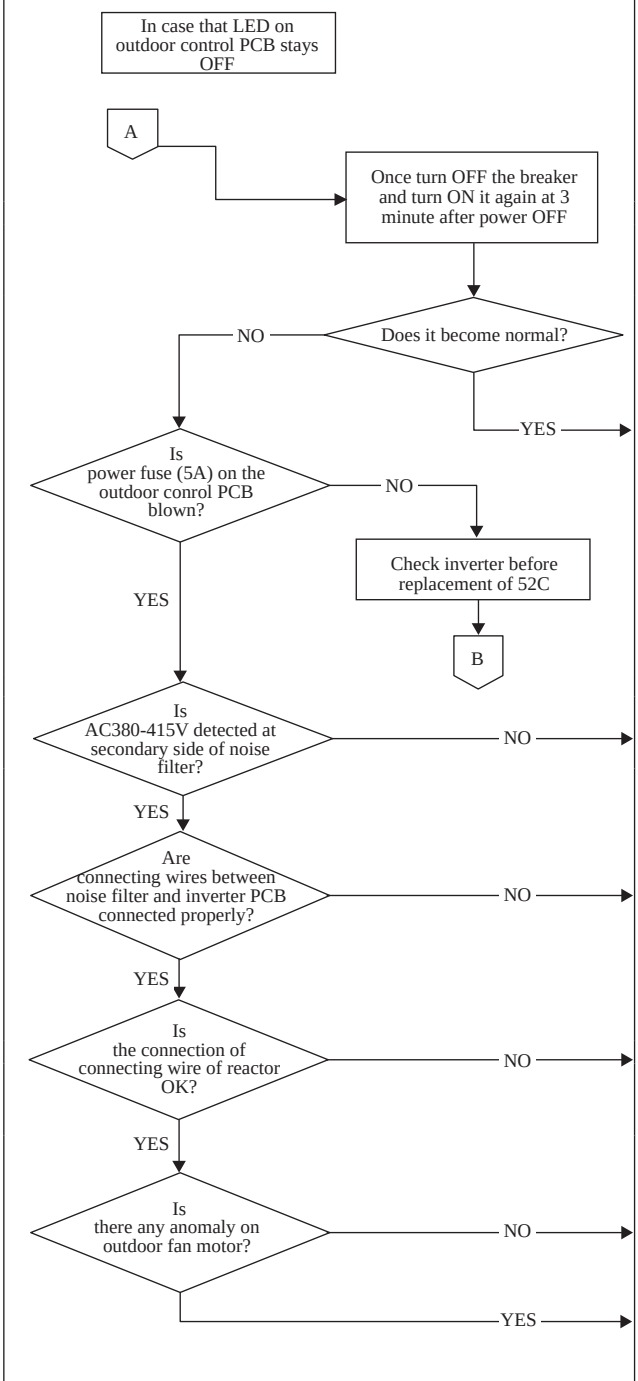
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: ✋WAIT✋ 7-segment display:	Indoor	Stays Off	Stays Off	✋WAIT✋ (6)
	Outdoor	Stays Off	Stays Off	

1.Applicable model

All models

(In case of fuse blown, how to check the unit before replacement of fuse)

2. Error detection method

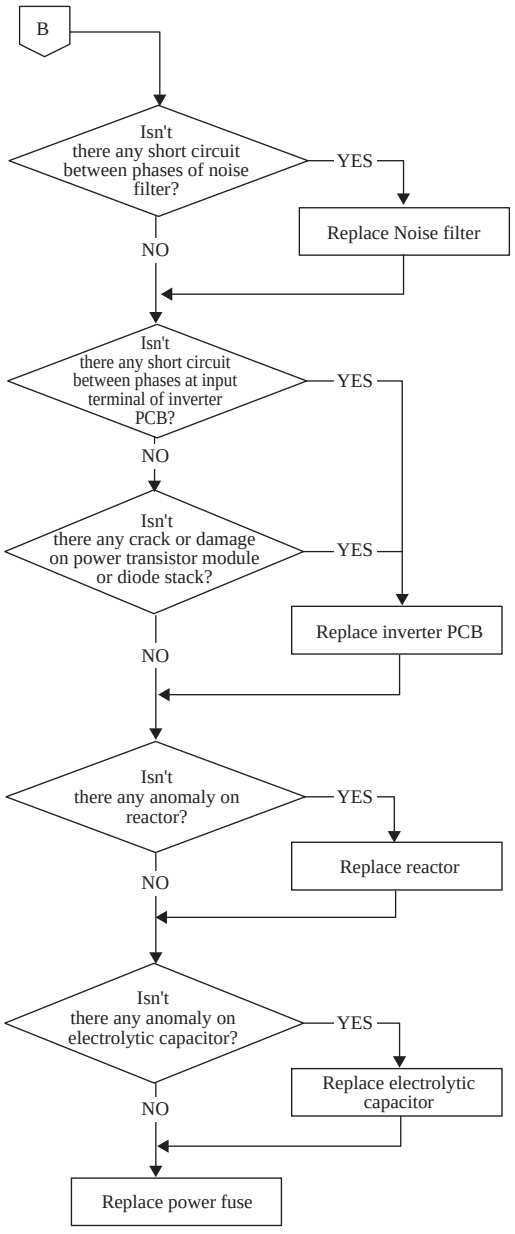
3. Condition of error displayed

4. Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure



Note:

Error code

Remote controller: 〔No display〕
7-segment display:

LED	Green	Red
Indoor	Stays OFF	Stays Off
Outdoor	Stays OFF	Stays Off

Content

[No display]

1.Applicable model

All models

(No display on the remote controller after power ON)

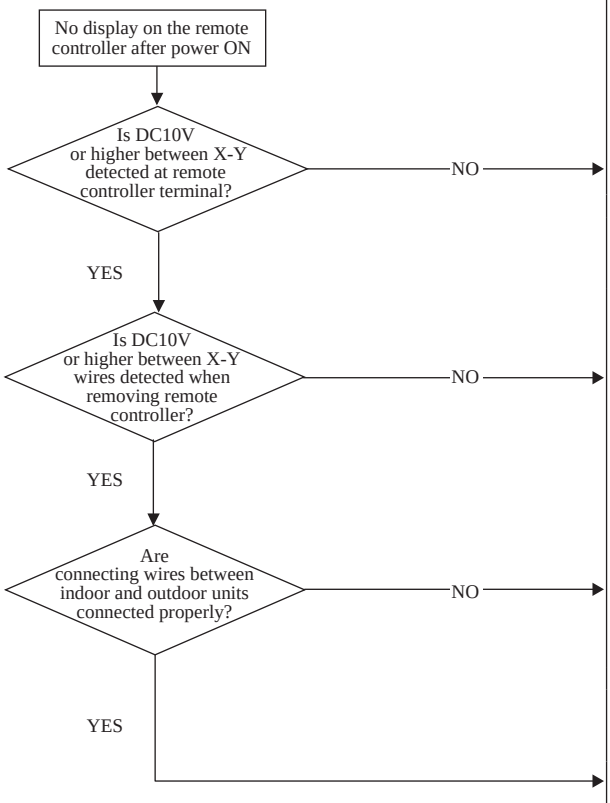
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Fuse blown
- Noise filter anomaly
- Anomalous connection of wire between PCBs
- Indoor control PCB anomaly
- Remote controller anomaly
- Breakage of connecting wires of remote controller
- Outdoor control PCB anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: E1 7-segment display: -	Indoor	Keeps flashing	Stays Off	Remote controller communication error
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

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

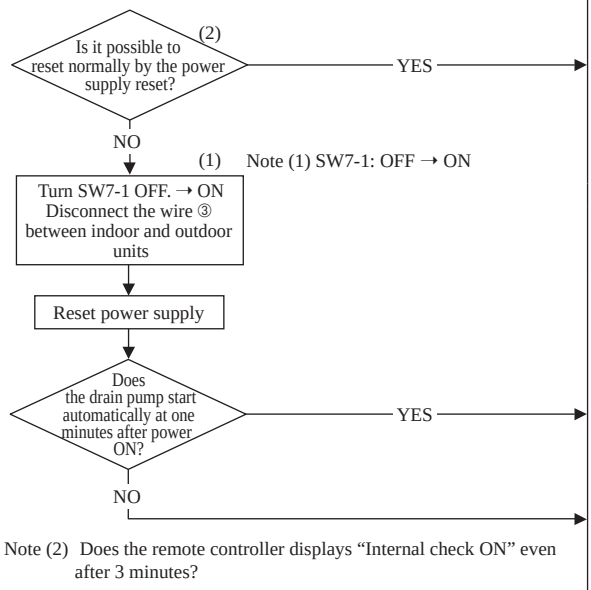
3. Condition of error displayed

Same as above

4. Presumable cause

- Anomalous communication circuit between remote controller and indoor unit
- Noise

5. Troubleshooting



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

Error code	LED	Green	Red	Content
Remote controller: E2 7-segment display: -	Indoor	Keeps flashing	Keeps flashing	Duplicated indoor unit address
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

More than 129 indoor units are connected in the same superlink system.
Duplicated indoor unit address

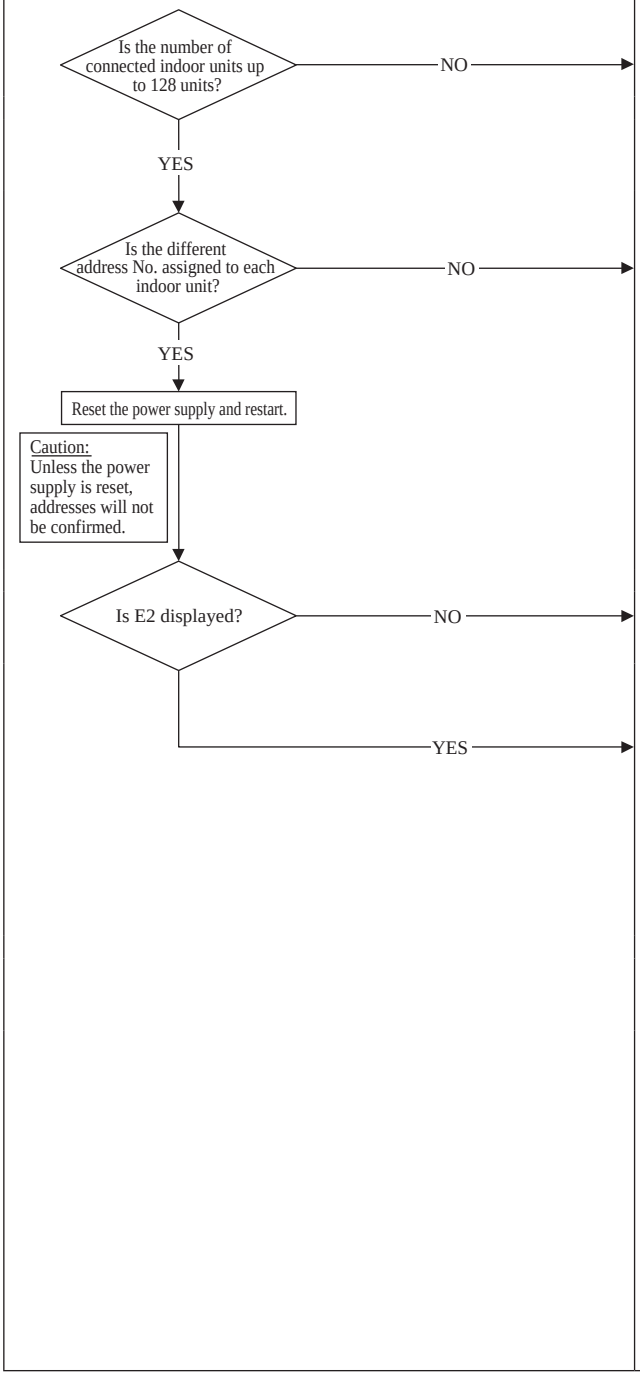
3. Condition of error displayed

Same as above

4. Presumable cause

- Number of connected indoor units exceeds the limitation.
- Duplicated indoor unit address
- Indoor control PCB anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: E3/5 7-segment display: -	Indoor	Keeps flashing	2 times flash	Outdoor unit signal line error
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

No outdoor unit exists in the same superlink system.

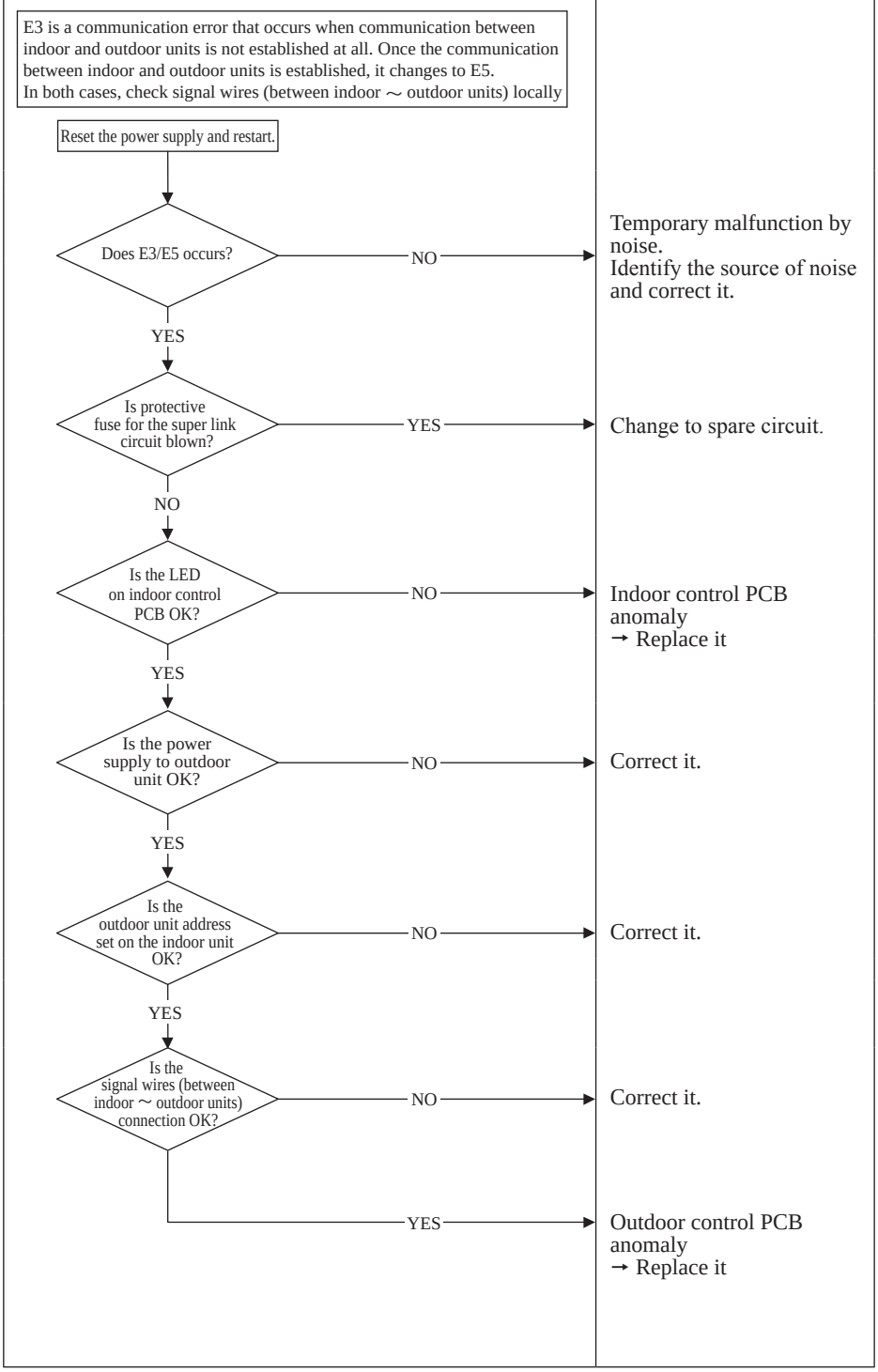
3. Condition of error displayed

Same as above

4. Presumable cause

- Power is not supplied to the outdoor unit
- Unmatch of pairing between indoor and outdoor units
- Indoor control PCB anomaly
- Outdoor control PCB anomaly
- Missing local wiring

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: E5 7-segment display: -	Indoor	Keeps flashing	*See below	Communication error during operation
	Outdoor	Keeps flashing	2 time flash	

1. Applicable model

All models

2. Error detection method

When the communication between indoor and outdoor units is interupted for more than 2 minutes

3. Condition of error displayed

When this anomaly is detected during operation.

4. Presumable cause

- Unit address No. setting error
- Remote controller wires broken
- Poor connection/disconnection of remote controller wires
- Indoor control PCB anomaly

5. Troubleshooting

Diagnosis

* In case that indoor red LED flashes 2 times

Note (1) Check the connection (disconnection, looseness) of signal wires at outdoor terminal block

Is the connection of signal wires at the outdoor unit side OK?

NO → Repair signal wires.

YES

Note (2) Check the connection (disconnection, looseness, brakage) of signal wires (between indoor and outdoor units)

Is the connection of signal wires (between indoor and outdoor units) OK?

NO → Repair signal wires.

YES

Reset the power supply and restart.

Does the remote controller LCD becomes normal?

NO → Go to the diagnosis of ✋WAIT✋ (1)

YES → Unit is normal. (Malfunction by temporary noise, etc.)

* In case that indoor red LED stays OFF

Reset the power supply and restart.

Does the remote controller LCD becomes normal?

NO → Outdoor control PCB anomaly (Network communicaion circuit anomaly) → Replace it

YES → Unit is normal. (Malfunction by temporary noise, etc.)

Note: When the pump down switch is turned on, communication between indoor and outdoor units is cancelled so that "Communication error E5" will be displayed on the remote controller and indoor control PCB, but this is normal.

Error code	LED	Green	Red	Content
Remote controller: E6 7-segment display: -	Indoor	Keeps flashing	1 time flash	Indoor heat exchanger temperature thermistor anomaly (Thi-R)
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) of Thi-R1, R2, R3

3. Condition of error displayed

- If -50ºC or lower is detected for 5 seconds continuously, compressor stops. After 3-minute delay, the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection.
- Or if 70ºC or higher is detected for 5 seconds continuously.

4. Presumable cause

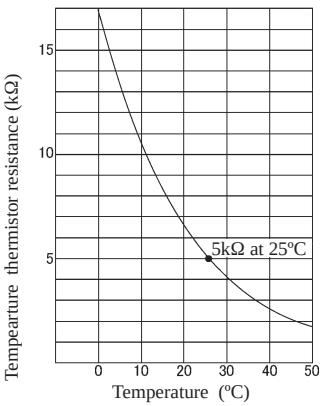
- Anomalous connecion of indoor heat exchanger temperature thermistor
- Indoor heat exchanger temperature thermistor anomaly
- Indoor control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Is the connector of thermistor connected properly ? — NO	Insert the connector securely
YES	
Regarding the characteristics of the thermistor, see the following chart	
Are the characteristics of thermistor OK? *1 — NO	Replace thermistor (Thi-R)
YES	Replace indoor control PCB

*1 Check several times to prove any poor connection

Temperature-resistance characreristics of indoor heat exchanger temperature thermistor (Thi-R1, R2, R3)



Note:

Error code	LED	Green	Red	Content
Remote controller: E7 7-segment display: -	Indoor	Keeps flashing	1 time flash	Indoor return air temperature thermistor anomaly (Thi-A)
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) of Thi-A

3. Condition of error displayed

- If -50°C or lower is detected for 5 seconds continuously, compressor stops. After 3-minutes delay the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection.
- Or if 48°C or higher is detected for 5 seconds continuously.

4. Presumable cause

- Anomalous connection of indoor return air temperature thermistor
- Indoor return air temperature thermistor anomaly
- Indoor control PCB anomaly

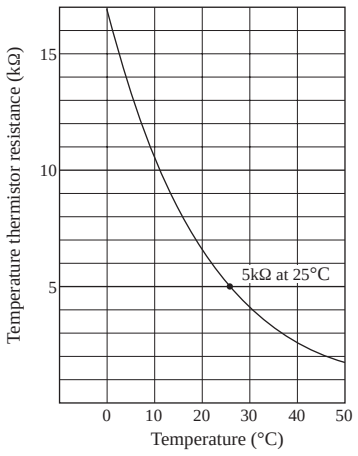
5. Troubleshooting

Diagnosis	Countermeasure
Is the connector of thermistor connected properly ? — NO	Insert the connector securely
YES → Are the characteristics of thermistor OK? *1 — NO	Replace thermistor (Thi-A)
YES	Replace indoor control PCB

Regarding the characteristics of the thermistor, see the following chart

*1 Check several times to prove any poor connection

Temperature-resistance characreristics of indoor return air temperature thermistor (Thi-A)



Note:

Error code	LED	Green	Red	Content
Remote controller: E9 7-segment display: -	Indoor	Keeps flashing	1 time flash	Drain trouble
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

FDT, FDTC, FDTW, FDTQ, FDTS, FDR, FDU, FDUM, and FDQS series

2. Error detection method

Float switch is activated

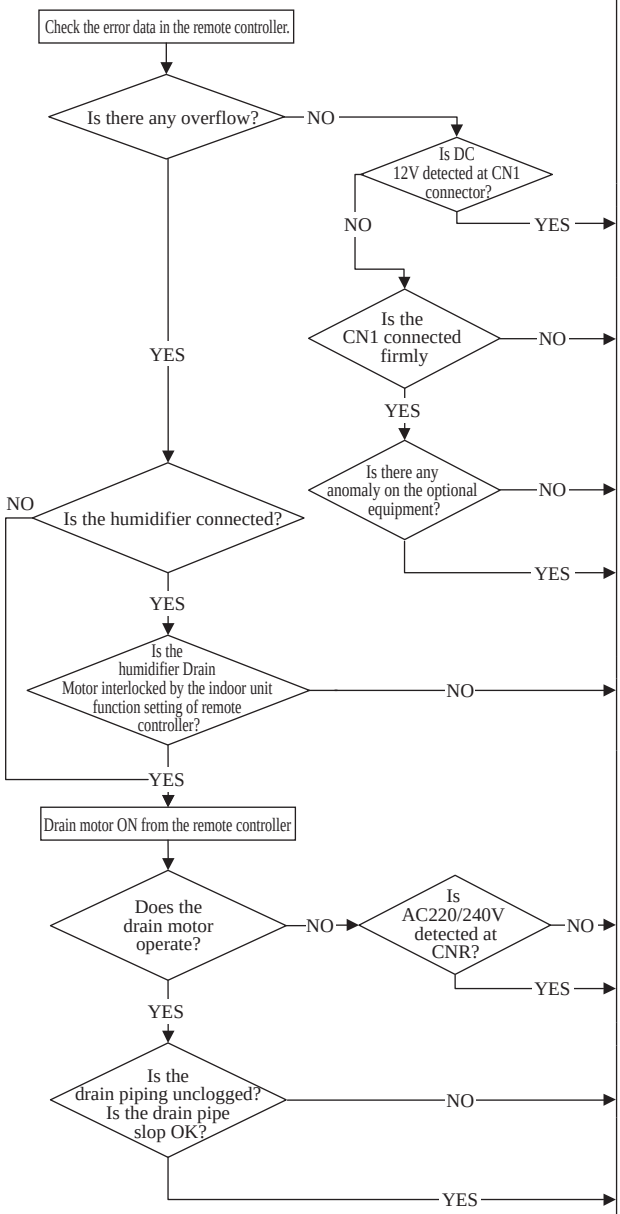
3. Condition of error displayed

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

4. Presumable cause

- Indoor control PCB anomaly
- Mistake in setting of float switch
- Mistake in setting of humidifier drain motor interlock
- Mistake in setting of optional equipment
- Mistake in drain piping
- Drain motor anomaly
- Disconnection/breakage of drain motor wires

5. Troubleshooting



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

Error code	LED	Green	Red	Content
Remote controller: E10 7-segment display: -	Indoor	Keeps flashing	Stays Off	Excessive number of indoor units (moe than 17 units) by controlling one remoto controller
	Outdoor	Keeps flashing	Stays Off	

1.Applicable model

All models

2. Error detection method

When it detects more than 17 of indoor units connected to one remote contorller

3. Condition of error displayed

Same as above

4.Presumable cause

- Excessive number of indoor units connected.
- Remote controller anomaly.

5.Troubleshooting

Diagnosis	Countermeasure
Aren't more than 17 indoor units connected to one remote controller? — NO	Remote controller anomaly → Replace it.
YES	Reduce to 16 or less units.

Note:

Error code	LED	Green	Red	Content
Remote controller: E12 7-segment display: -	Indoor	Keeps flashing	Keeps flashing	Address setting error by mixed setting method
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

Automatic address setting and manual adress setting are mixed when setting adress of indoor units

3. Condition of error displayed

Same as above

4. Presumable cause

Mistake in address setting for indoor unit

5. Troubleshooting

Diagnosis	Countermeasure
Isn't the automatic setting and manual setting mixed in the address setting method for indoor units? — YES	Review address setting.
NO	Replace indoor control PCB.

Address setting method list (Figures in [ ] are for Previous superlink models)

		Models for new superlink protocol			Models for Previous superlink protocol		
		Indoor unit address setting		Outdoor unit address setting	Indoor unit address setting		Outdoor unit address setting
		Indoor unit No. SW	Outdoor unit No. SW	Outdoor unit No. SW	Indoor unit No. SW	Outdoor unit No. SW	Outdoor unit No. SW
Manual address setting	(New SL)	000-127	00-31	00-31	00-47	00-47	00-47
	(Previous SL)	[00-47]	[00-47]	[00-47]			
Automatic address setting for single refrgerant system	(New SL)	000	49	49	49	49	49
	(Previous SL)						
Automatic address setting for multiple refrgerant systems	(New SL)	000	49	00-31	Not available		
	(Previous SL)	Not available					

Note:

Error code	LED	Green	Red	Content
Remote controller: E16 7-segment display: -	Indoor	Keeps flashing	1 time flash	Indoor fan motor anomaly (FDT series)
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

FDT series only

2. Error detection method

Detected by revolution speed of indoor fan motor

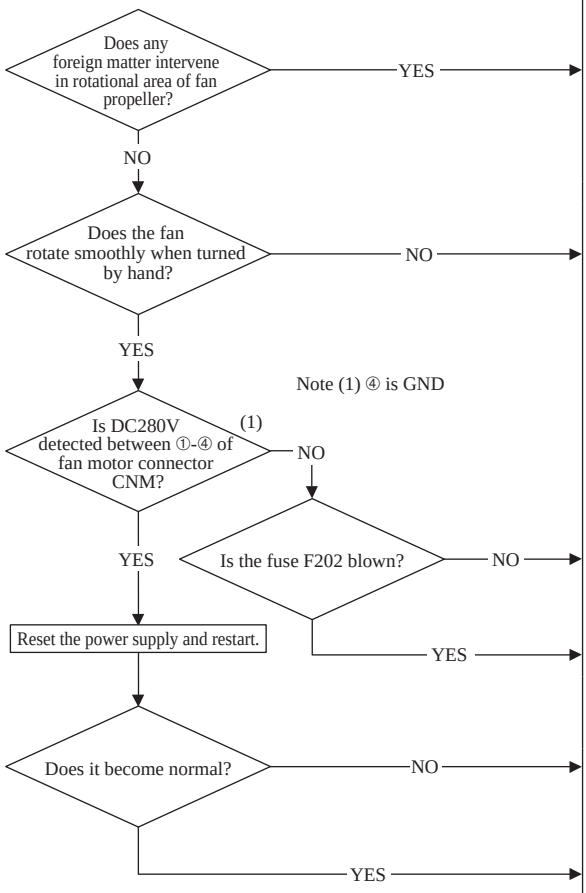
3. Condition of error displayed

When actual revolution speed of indoor fan motor drops to lower than 200min^{-1} for 30 seconds continuously, the compressor and the indoor fan motor stop. After 2-seconds delay, fan motor starts again automatically, but if this anomaly occurs 4 times within 60 minutes after the initial detection.

4. Presumable cause

- Indoor fan motor anomaly
- Foreign matter at rotational area of fan propeller
- Fan motor anomaly
- Dust on control PCB
- Blown fuse
- External noise, surge

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: E16 7-segment display: -	Indoor	Keeps flashing	1 time flash	Indoor fan motor anomaly (FDK series)
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

FDK series only

2. Error detection method

Detected by revolution speed of indoor fan motor

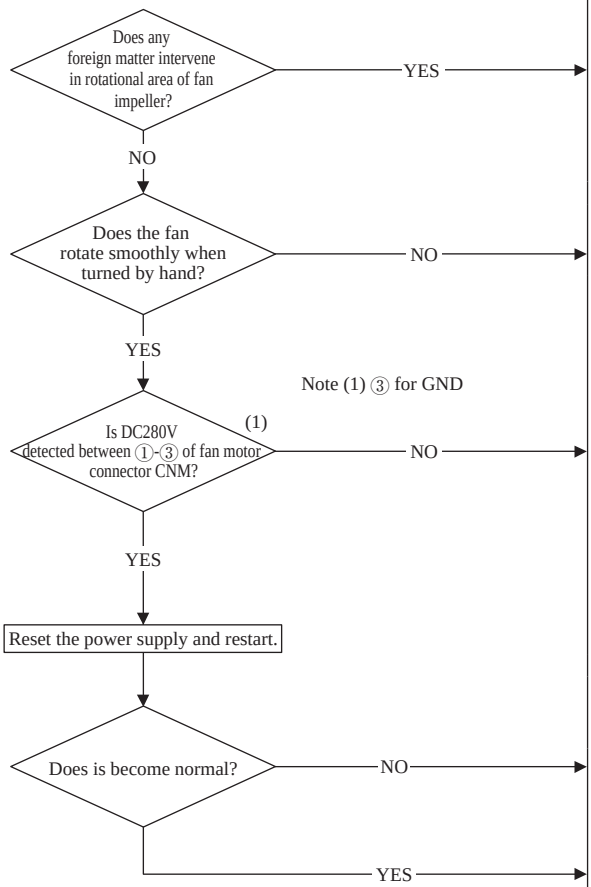
3. Condition of error displayed

When actual revolution speed of indoor fan motor drops to lower than 200min^{-1} for 30 seconds continuously, the compressor and the indoor fan motor stop. After 3-seconds delay, fan motor starts again automatically, but if this anomaly occurs 4 times within 60 minutes after the initial detection.

4. Presumable cause

- Indoor fan motor anomaly
- Foreign matter at rotational area of fan impeller
- Fan motor anomaly
- Dust on control PCB
- Blown fuse
- External noise, surge

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: E19 7-segment display: -	Indoor	Keeps flashing	1 time flash	Indoor unit operation check, drain motor check mode anomaly
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

E19 occurs

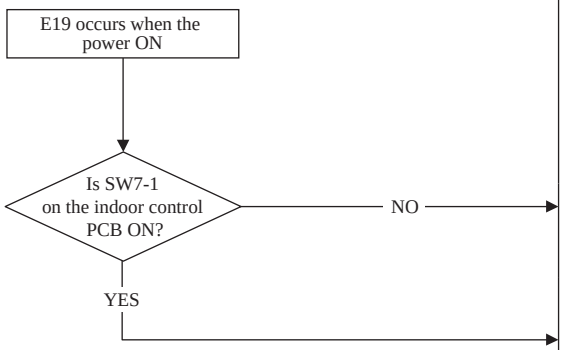
3. Condition of error displayed

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
Is SW7-1 on the indoor control PCB ON? NO	Indoor control PCB anomaly (Anomalous SW7) → Replace
Is SW7-1 on the indoor control PCB ON? YES	Turn SW7-1 on the indoor control PCB OFF and reset the power

Note: Indoor operation check/drain pump check mode
If the power is ON after SW7-1ON. indoor operation check/drain pump check mode can be established.
1) When the communication between remote controller and indoor PCB is established 15 seconds after power ON, it goes to indoor operation check.
2) When the communication between remote controller and indoor PCB is not established, it goes to drain pump check (CnB connector should be open before power ON)

Error code	LED	Green	Red	Content
Remote controller: E28 7-segment display: -	Indoor	Keeps flashing	Stays Off	Remote controller temperature thermistor anomaly (Thc)
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) of Thc

3. Condition of error displayed

- If -50ºC or lower is detected for 5 seconds continuously, compressor stops. After 3-minutes delay, the compressor is restarted automatically, biut if this anomaly occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Anomalous connection of remote controller temperature thermistor
- Remote controller temperature thermistor anomaly
- Remote controller PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Is the connector of thermistor connected properly ? — NO	Insert the connector securely
YES → Regarding the characteristics of the thermistor, see the following table → Are the characteristics of thermistor OK? Is the thermistor wire OK *1 — NO	Replace thermistor (Thc)
YES	Replace indoor control PCB

*1 Check several times to prove any poor connection

Temperature-resistance characreristics of remote controller temperature thermistor (Thc)

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

Note: After 10 seconds has elapsed since remote controller temperature thermistor was switched from invalid to valid, E28 will not be displayed even if the thermistor harness is disconnected or broken. However, in such case, the indoor return air temperature thermistor (Thi-A) will be valid instantly instead of the remote controller temperature thermistor (Thc).
Please note that even though the remote controller temperature thermistor (Thc) is valid, the displayed return air temperature on the remote controller LCD shows the value detected by the indoor return air temperature thermistor (Thi-A), not by the remote controller temperature thermistor (Thc).

Error code	LED	Green	Red	Content
Remote controller: E30 7-segment display: E30	Indoor	Keeps flashing	Stays Off	Unmatch connection of indoor and outdoor unit
	Outdoor	Keeps flashing	1 time flash	

1.Applicable model

Outdoor unit

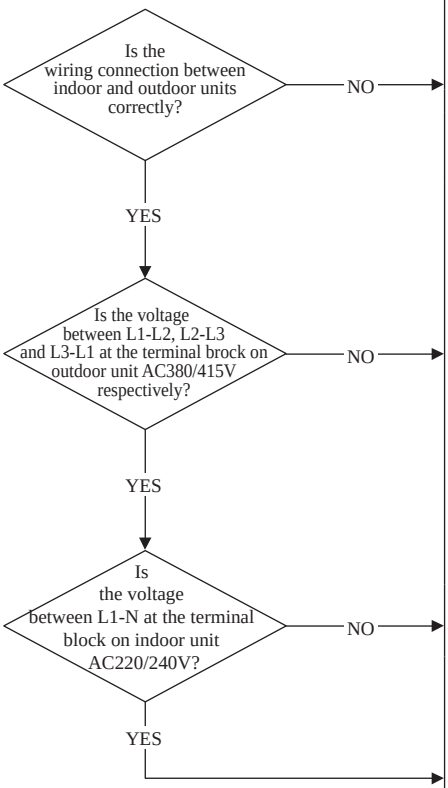
2.Error detection method

3. Condition of error displayed

4.Presumable cause

- Indoor control PCB anomaly
- Outdoor control PCB anomaly

5.Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote controller: E31 7-segment display: E31	Indoor	Keeps flashing	Stays Off	Duplicated outdoor unit address No.
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

When the microcomputer of outdoor control PCB recognizes the dupplicated address No. by scanning all adresses of outdoor units in the same superlink system.

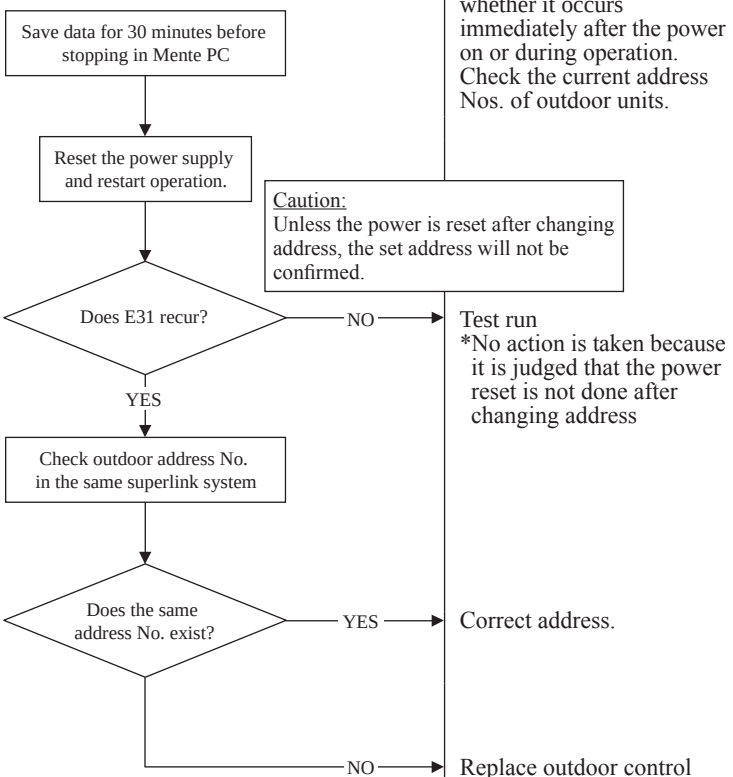
3. Condition of error displayed

When duplicated outdoor unit address No. exists in the same superlink system.

4. Presumable cause

- Mistake in the address setting of outdoor units
- More than 129 indoor units connected
  [Maximum number can be set by address switch is 128 units]
- No setting of Master/Slave setting switch for combination use

5. Troubleshooting



Note: After taken above measure, reset the power and confirm no error is displayed occurs.
Unless the power is reset after changing address, the set address will not be confirmed.
In case of combination use, set the same address to both master and slave units. Distinction of master or slave unit is done by setting SW4-7. (Refer the instruction manual and technical manual for details)

Error code	LED	Green	Red	Content
Remote controller: E32 7-segment display: E32	Indoor	Keeps flashing	Stays Off	Open L3 Phase on power supply at primary side
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

By Checking the power supply voltage at primary side of the outdoor control PCB
(Check only L3 phase)

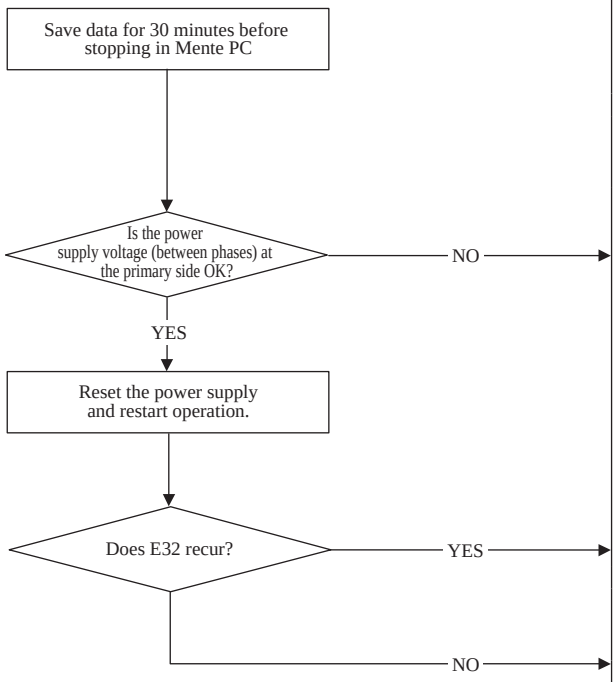
3. Condition of error displayed

When the power supply voltage between L1-L3 or L2-L3 becomes 0V and/or the current of L3 decrease to 0A

4. Presumable cause

- Anomalous power supply at primary side
- Outdoor control PCB anomaly.

5. Troubleshooting



Diagnosis	Countermeasure
	Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. (It will be useful to persuade the customer why an improvement of power supply is required by showing these data)
NO	Propose an improvement to the customer.
YES	Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.
YES	Replace outdoor control PCB.
NO	Wait and see without taking any action.

Note:

Error code	LED	Green	Red	Content
Remote controller: E36 7-segment display: E36-1	Indoor	Keeps flashing	Stays Off	Discharge pipe temperature error (Tho-D1)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

When anomalously high temperature is detected by the discharge pipe temperature thermistor (Tho-D1)

3. Condition of error displayed

When 130°C or higher is detected by the discharge temperature thermistor, the compressor stops. After 3 minutesdelay, the compressor starts again automatically, but if this anomaly occurs 2 times within 60 minutes after the initial detection, or 130°C or higher is detected continuously for 60 minutes.

4. Presumable cause

- Discharge pipe temperature anomaly
- SV1 (liquid refrigerant by-pass valve) anomaly
  - Beakage of coil
  - Faulty main body.
- Outdoor control PCB anomaly
- Insufficient amount of refrigerant
- Insufficient airflow volume
- Short-circuit of airflow

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition Check the ROM version Confirmation of SV1 operation
Is the unit installation environment within the range of limitation? — NO	Propose an improvement to the customer.
YES	
Are the refrigerant amount and piping length OK? — NO	Adjust the refrigerant amount poperly (Check whether the refrigerant amount is insufficient or not.) (Check the gas leakage)
YES	
Is the insertion of the thermistor connector into the connector on outdoor control PCB OK? — NO	Insert connector securely.
YES	
Is the discharge pipe temperature thermistor OK? — NO	Check if the characteristics are correct by referring the characteristics chart of E39. And if necessary, replace the discharge pipe temperature thermistor.
YES	
Reset the power supply and restart operation.	Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.
Is the error recur when restarting? — NO	Wait and see. Continue to obtain data, if possible. (Keep connecting the Mente PC)
YES	
Is there AC200V of output signal for SV1 from outdoor control PCB? — NO	Replace outdoor control PCB
YES	
Is the coil of SV1 energized? — NO	Replace the coil SV1
YES	
Does the refrigerant flow through SV1 main body ? — NO	Replace the SV1 main body (If there is no refrigerant in liquid line, charge refrigerant additionall)
YES	
	Check refrigerant amount again.

Note:

Error code	LED	Green	Red	Content
Remote controller: E36 7-segment display: E36-3	Indoor	Keeps flashing	Stays Off	Liqiud flooding anomaly
	Outdoor	Keeps flashing	3 times flash	

1. Applicable model

Outdoor units

2. Error detection method

When 5ºC or lower of the under-dome temperature superheat is detected for 15 minutes continuously or for 30 minutes continuously.

3. Condition of error displayed

When above anomaly is detected 3 times within 90 minutes.

4. Presumable cause

- Unmatching of refrigerant piping and/or signal wiring
- Overcharging of refrigerant
- Anomalous control of superheat
- Anomalous circuit of liquid refrigerant by-pass
- Anomalous refrigerant circuit of subcool coil
- Under-dome temperature (Tho-D1) anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition Check the ROM version Comfirmation of SV1 operation
Are there any wrong connection of refrigerant piping and/or signal wiring ? · Check the numbers of connected indoor units recognized by outdoor unit in comparison with those numbers in utility drawing YES	Correct the connection of refrigerant piping and/or signal wiring properly
NO Are there any excessive refrigerant charged at site? · Check the calculation result of additional refrigerant charging amount and the record of additional refrigerant charged amount YES	Adjust refrigerant amount properly
NO Are there any leakage of refrigerant through valve sheet of SV1? · Check the temperature difference between before and after SV1 YES	Replace SV1 Replace the coil of SV1
NO Are there any fault in subcooling coil circuit ? · Check whether the EEVSC is kept open · Check whether the thermistor of Tho-H is inserted in the thermistor holder properly (at cooling mode) · Check whether the characteristics of Tho-H and PSL is OK YES	• Replace EEVSC • Check the coil of EEVSC → Replace the coil of EEVSC • Replace Tho-H • Replace PSL
NO Is the superheat control of indoor unit OK at cooling mode? · Check whether the indoor EEV is kept open or not · Check whether Thi-R1, R2 are installed at proper position or the characteristics of them are OK · Check whether the air filter is clogged · Check whether the indoor fan rotates NO	• Replace indoor EEV • Check the coil of EEV → Replace the coil of EEV • Check the installed position of Thi-R1, R2, R3 → Replace Thi-R, if necessary • Check the air filter • Check the connection of indoor fan motor connector → Replace indoor fan motor * By checking Thi-R1, R2, R3 from indoor unit operation data of Mente PC, specify the indoor unit which tends to be liquid flooding (Thi-R3≒Thi-R2 shows the probability of liquid flooding)
YES Is the superheat control of outdoor unit OK at heating mode? · Check whether EEVH1 is kept open or not · Check whether Tho-R1, R2 are installed at proper position or the characteristics of them is OK · Check whether the characteristics of PSL are OK · Check whether the fin of outdoor heat exchanger is clogged with snow, ice or dust · Check whether the outdoor fan rotates NO	• Replace EEVH1 • Check the coil of EEVH1 → Replace the coil of EEVH1 • Check the installed position of Tho-R1, R2, R3 → Replace Tho-R, if necessary • Clean the fin of outdoor heat exchanger • Check the connection of outdoor fan motor connector → Replace outdoor fan motor
YES Is the characteristics of Tho-C1 OK ? NO	• Replace Tho-C1
YES	Correct the data with Mente PC and ask our consultation

Note:If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E37 7-segment display: E37-1, 2, 5, 6*1	Indoor	Keeps flashing	Stays Off	Outdoor heat exchanger temperature termistor (Tho-R) and subcooling coil temperature thermistor (Tho-SC,-H) anomaly
	Outdoor	Keeps flashing	*1	

*1 E37-1: one time flash (Tho-R1), E37-2: 2 time flash (Tho-R2), E37-5: 5 time flash (Tho-SC), E37-6: 6 time flash (Tho-H)

1.Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low temperature (resistance) of Tho-R or Tho-SC or Tho-H

3. Condition of error displayed

- If -50°C or lower is detected for 5 seconds continuously within 2-minutes to 2-minutes 20-seconds after the compressor ON, the compressor stops. And after 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection.
- If -50°C or lower is detected for 5 seconds continuously within 20 seconds after power ON

4.Presumable cause

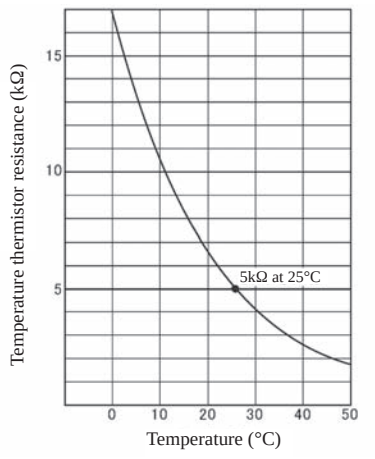
- Broken thermistor harness or the internal wire of sensing section (Check the molded section as well)
- Disconnection of thermistor harness connection (connector)
- Outdoor control PCB anomaly

5.Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value
Is the connector of thermistor connected properly? — NO	Insert the connector securely
YES → Are the characteristics of thermistor OK?*2 — NO	Replace Thermistor (Tho-SC, Tho-H, Tho-R)
YES	Replace outdoor control PCB

*2
Check several times to prove any poor connection

Outdoor heat exchanger temperature thermistor (Tho-R1, R2, R5, R6)
Sub-cooling coil thermistor (Tho-SC, Tho-H)
Temperature-resistance characteristics



Note:

Error code	LED	Green	Red	Content
Remote controller: E38 7-segment display: E38	Indoor	Keeps flashing	Stays Off	Outdoor air temperature thermistor anomaly (Tho-A)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low temperature (resistance) of Tho-A

3. Condition of error displayed

- If -30°C or lower is detected for 5 seconds continuously within 2-minutes to 2-minutes 20-seconds after the compressor ON, the compressor stops. And after 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection.
- If -30°C or lower is detected for 5 seconds continuously within 20 seconds after power ON.

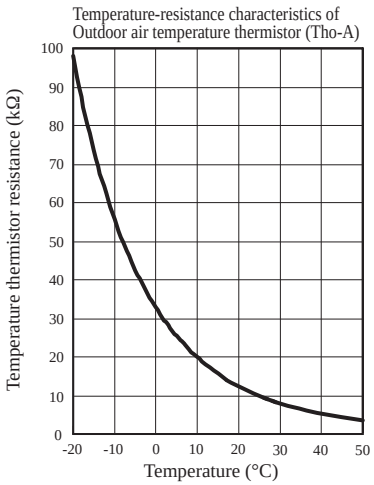
4. Presumable cause

- Broken thermistor harness or the internal wire of sensing section (Check the molded section as well)
- Disconnection of thermistor harness connection (connector)
- Outdoor control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.
Is the connector of thermistor connected properly? — NO	Insert the connector securely
YES → Are the characteristics of thermistor OK?*1 — NO	Replace thermistor (Tho-A).
YES	Replace outdoor control PCB.

*1
Check several times to prove any poor connection



Note:

Error code	LED	Green	Red	Content
Remote controller: E39 7-segment display: E39-1	Indoor	Keeps flashing	Stays Off	Discharge pipe temperature thermistor anomaly (Tho-D1)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low temperature (resistance) of Tho-D1

3. Condition of error displayed

- If 3°C or lower is detected for 5 seconds continuously within 10-minutes to 10-minutes 20-seconds after the compressor ON, the compressor stops. And after 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection.

4. Presumable cause

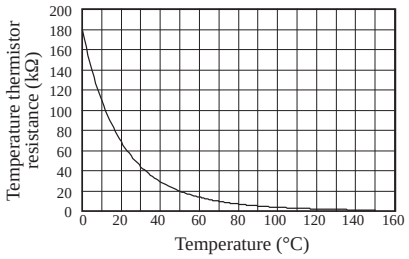
- Broken thermistor harness or the internal wire of sensing section (Check the molded section as well)
- Disconnection of thermistor harness connection (connector)
- Outdoor control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.
Is the connector of thermistor connected properly? — NO	Insert the connector securely
YES → Are the characteristics of thermistor OK? *3 — NO	Replace thermistor (Tho-D1).
YES	Replace outdoor control PCB.

*3
Check several times to prove any poor connection

Temperature-resistance characteristics of discharge pipe temperature thermistor (Tho-D1)



Note:

Error code	LED	Green	Red	Content
Remote controller: E40 7-segment display: E40	Indoor	Keeps flashing	Stays Off	High pressure anomaly (63H1-1activated)
	Outdoor	Keeps flashing	1 time flash	

1.Applicable model

Outdoor unit

2. Error detection method

When high pressure switch 63H1-1 is activated

3. Condition of error displayed

- If high pressure exceeds 4.15MPa
- If 63H1-1 is activated 5 times within 60 minutes
- If 63H1-1 is activated for 60 minutes continuously

4.Presumable cause

- Short-circuit of airflow at condenser side of heat exchanger/Disturbance of airflow/Clogging filter/Fan motor anomaly
- Disconnection of high pressure switch connector
- Breakage of high pressure switch harness
- Closed service valves
- High pressure sensor anomaly
- High pressure switch anomaly

5.Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition Check the sensed value of high pressure sensor when the 63H1-1 is activated Check whether the high pressure switch is activated at the sensed value of high pressure sensor.
Was 63H1 activated at 4.15MPa or higher? — NO → Does the sensed value of the high pressure sensor show 4.15MPa? (Normal?) — NO	High pressure sensor anomaly is suspicious. Check high pressure sensor itself according to the troubleshooting procedure of E54, after retarting operation. (If the high pressure sensor [PSH] fails, replace it)
YES → Are the 63H1-1 OK? Are the connector and/or harnesse OK? — NO	If the connector is disconnected or the harness is broken, correct it. Also check whether the high pressure switch is properly mounted or not
YES → Are the service valves fully open? — NO	Open operation valve.
YES → Connect a pressure gauge and restart operation.	Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.
Is it stop at 4.15MPa of gauge pressre ? — NO	Replace outdoor control PCB.
YES → Is there any clogging in the refrigerant circuit ? — YES	Remove clogs.
NO	Check items (condenser side): • Filter clogging • Airflow volume (Fan motor) • Short-circuit of airflow

Note:If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E41(E51) 7-segment display: E41(E51)-1	Indoor	Keeps flashing	Stays Off	Power transistor overheat
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

When anomalously high temperature is detected by power transistor temperature thermistor (Tho-P1)

3. Condition of error displayed

Anomalously high temperature of power transistor is detected 5 times within 60 minutes (E41). Or it is detected for 15 minutes continuously (E51)

4. Presumable cause

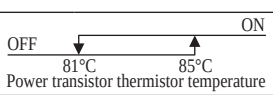
- Power transistor anomaly
- Power transistor temperature thermistor anomaly
- Improperly fixing of power transistor to radiator fin
- Inverter PCB anomaly
- Outdoor fan motor anomaly
- Anomalous cooling fan motor for inverter
- Inadequate installation space of outdoor unit

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions Check the temperature of power transistor Check the operation of outdoor fan and cooling fan
Does the outdoor fan run ? — NO	Repair it according to the troubleshooting procedure of E48
YES → Reset power supply and restart	Check it as much as possible under the operating conditions for 30 minutes before error occurred
Does the error recur when restarting? — NO	Wait and see. Continue to obain data, if possible (Keep connecting the Mente PC)
YES → Is the cooling fan for inverter running? — NO	If the cooling fan does not run in spite of the operation ON range, check the voltage at the connector of cooling fan. If the 220/240V is detected, repalce cooling fan motor. If 0V is detected, replace outdoor control PCB
YES → Is 15V of power for control PCB detected? — NO	After checking the loose connection of connetor or breakage of harness, replace inverter PCB
YES → After power OFF	
Is the connection of power transistor temperature thermistor OK? (Check short-circuit or breakage of harness) — NO	Connect the connector of thermistor securely. Or replace power transistor temperature thermistor
YES → Is the characteristics of power transitor temperature thermistor OK? * — NO	Replace power transistor temperature thermistor
YES → Is the fixing of power transistor OK? (Check tightening of screws or application of radiation silicon) — NO	Fix power transistor on to the radiation fin with proper application of radiation silicon
YES	Replace power transistor

* Refer the characterristics of power transistor temperature thermistor to E56 (page 90)

Note: The operating conditions of cooling fan for inverter is shown in the right figure.
If the error does not recur, connect the Mente PC and continue to collect data.



Error code	LED	Green	Red	Content
Remote controller: E42 7-segment display: E42-1	Indoor	Keeps flashing	Stays Off	Current cut (CM1)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

When anomalously high output current of inverter is detected by the current sensormounted in the power transistor

3. Condition of error displayed

When 88A or higher output current of inverter is detected 4 times within 15 minutes.

4. Presumable cause

- Compressor anomaly
- Leakage of refrigerant
- Power transistor module anomaly
- Anomalous power supply for inverter PCB
- Outdoor fan motor anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions Check pressure anomaly Check the operation of outdoor fan
Is the coil resistance and insulation (megger check) of compressor motor OK? — NO	Replace compressor. Check the capillary tube and stariner of oil separator. If necessary, replace the capillary tube and strainer as well.
YES → Does the outdoor fan run ? — NO	Repair it according to the troubleshooting of E48
YES → Is 15V of power for control PCB detected? Is the outdoor fan motor OK? (Refer the checking method of 15V in page41) — NO	Replace inverter PCB or outdoor fan motor
YES → Reset power supply and restart	Check it as much as possible under the operating conditions for 30 minutes before error occurred
Does E42 recur? — NO	Wait and see. Continue to obain data, if possible (Keep connecting the Mente PC)
YES → Do you have inverter checker for judging whether inverter PCB is OK or not? — YES → Is the checked result by inverter checker OK? — NO	Replace power transistor module Replace inverter PCB
NO / YES → After power OFF, Remove the 1-3 layers of control box	
Is the checked result by measuring the resistance beween each terminal of power transistor module OK? (Are there any short-circuit?) — NO	Replace power transistor module. Refer Page 41. (Remove the power cable from compressor and check the resistance between P-U, P-V, P-W, N-U, N-V, N-W respectively.
YES	Replace inverter PCB

Note: In case that there is no the insulation resistance anomaly, the compressor anomaly could be considered.
If this anomaly occurs after replacement of power transistor module and/or inverter PCB, try to replace compressor as well.
If the error does not recur, connect the Mente PC and continue to collect data

Error code	LED	Green	Red	Content
Remote controller: E43 7-segment display: E43-1, 2 *1	Indoor	Keeps flashing	Stays Off	Excessive number of indoor units connected, excessive total capacity of connection
	Outdoor	Keeps flashing	*1	

*1 E43-1:1 time flash (Excessive number of indoor units connected), E43-2:2 time flash (Excessive capacity of indoor units connection)

1. Applicable model

Outdoor unit

2. Error detection method

When the number of connected indoor units exceeds the limitation.
When the total capacity of connected indoor units exceeds the limitation.

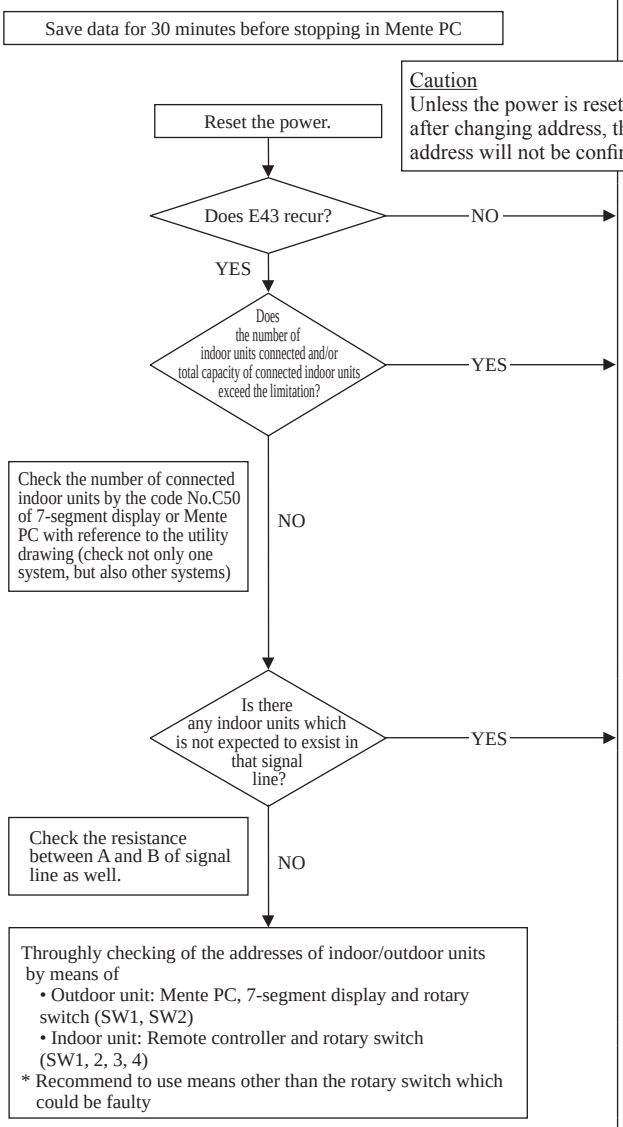
3. Condition of error displayed

- Excessive number of connected indoor units
- Excessive total capacity of connected indoor units
- The total capacity of connected indoor units exceeds the limitation

4. Presumable cause

- Mistake in setting of indoor/ outdoor unit addresses
- Mistake in signal wire connection

5. Troubleshooting



Note: After completing the above procedure, reset the power and confirm that the error display does not recur. Unless the power is reset for both indoor unit and outdoor unit, the set addresses will not be confirmed.

Error code	LED	Green	Red	Content
Remote controller: E45 7-segment display: E45-1	Indoor	Keeps flashing	Stays Off	Communication error between inverter PCB and outdoor control PCB
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

When the communication between inverter PCB and outdoor control PCB is not established.

3. Condition of error displayed

Same as above.

4. Presumable cause

- Signal wire anomaly
- Outdoor control PCB anomaly
- Inverter PCB (INV1) anomaly
- Rush current prevention resistor anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions
Is 15V of power for control PCB detected? Is the outdoor fan motor OK? (Refer the checking method of 15V in page 41) — NO	Replace inverter PCB or outdoor fan motor
YES → Reset power supply and restart	Check it as much as possible under the operating conditions for 30 minutes before error occurred
Does E45 recur? — NO	Wait and see. Continue to obain data, if possible (Keep connecting the Mente PC)
YES → Turn off the power. IS the harness and/or connector between inverter PCB and outdoor control PCB OK ? — NO	Check whether the harness is broken? Check whether the connector is loose? → If there is problem, correct it.
YES → Is the rush current prevention resistor broken? — YES	Disconnect the harness from the resistor and measure the resistance. If broken, replace the resistor. In such case check the harness between diode module and inverter PCB as well
NO → Is the harness and/or connector between inverter PCB and diode module OK? — NO	Check whether the harness is broken? Check whether the connector is loose? → If there is problem, correct it.
YES → Is the setting of switches on the inverter PCB OK? * — NO	Correct the setting of switches on the inverter PCB
YES	Replace outdoor control PCB

* Switch setting of inverter PCB

SW1-1	OFF
SW1-2	OFF
SW1-3	OFF
SW1-4	OFF
JSW1-1	ON
JSW1-2	OFF
JSW1-3	OFF
JSW1-4	OFF

Note: If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E46 7-segment display: E46	Indoor	Keeps flashing	Stays Off	Mixed address setting methods coexistent in same network.
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

Outdoor unit

2. Error detection method

If the signal line of a outdoor unit system applied automatic address setting is connected to other outdoor unit system (Detected at indoor unit side)

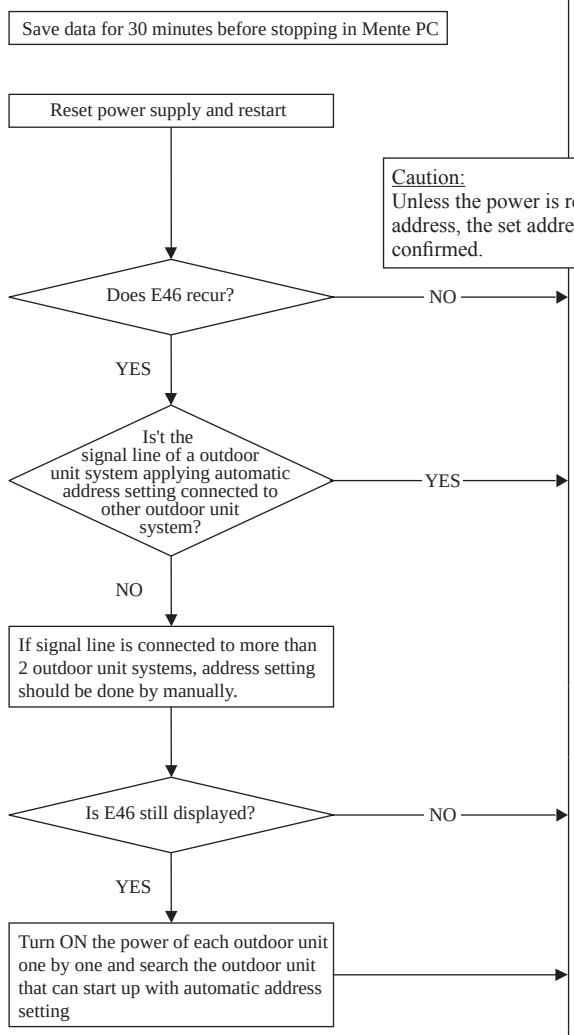
3. Condition of error displayed

Same as above.

4. Presumable cause

- Mistake in the address setting
- Mistake in the connection of signal wire

5. Troubleshooting



<Reference>
Error display at mixed address setting

	Auto	Manual
Auto address setting	E31	E46
Manual address setting	E46	Normal

Note: After completing the above procedure, reset the power and confirm that the error display does not recur. Unless the power is reset for both indoor unit and outdoor unit, the set addresses will not be confirmed.

Error code	LED	Green	Red	Content
Remote controller: E48 7-segment display: E48-1, 2 *1	Indoor	Keeps flashing	Stays Off	Outdoor DC fan motor anomaly
	Outdoor	Keeps flashing	*1	

*1 E48-1: 1 time flash (FMO1), E48-2 : 2 time flash (FMO2)

1. Applicable model

Outdoor unit

2. Error detection method

- If 400min^{-1} or lower of the fan rotation command and the state of overcurent are detected for 10 times continueously
- If 100min^{-1} of the actual fan rotation speed is detected for 30 seconds (Fan motor is locked)

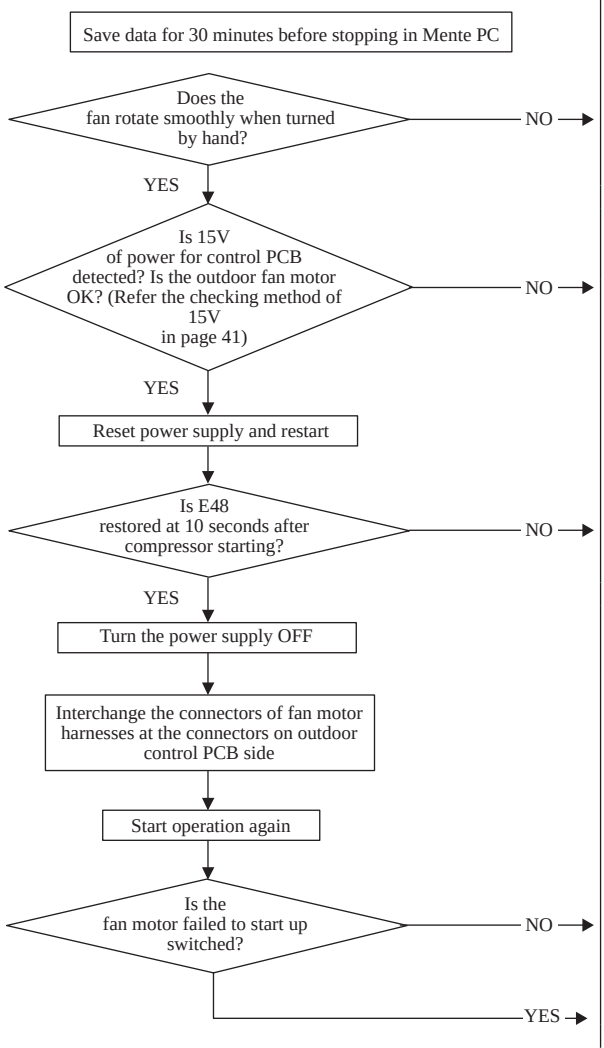
3. Condition of error displayed

Same as above.

4. Presumable cause

- Breakage of harness or loose conection of connector
- Outdoor fan motor anomaly
- Inverter PCB anomaly
- Outdoor control PCB anomaly

5. Troubleshooting (Inspect also the fan motor 2 even if it is E48-1. Inspect also the fan motor 1 even if it is E48-2.)



Note: If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E49 7-segment display: E49	Indoor	Keeps flashing	Stays Off	Low pressure anomaly
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low pressure

3. Condition of error displayed

- At start up after power on:
  When the low pressure sensor detects lower than 0.003MPa for 60 seconds continuously.
  And if this anomaly occurs 2 times.
- During operation:
  When the low pressure sensor detects 0.134MPa or lower for 30 seconds coninuously.
  And if this anomaly occurs 5 times within 60 minutes

4. Presumable cause

- Low pressure sensor (PSL) anomaly
- Service valves closed
- EEV anomaly (EEV closed)
- Insufficient refrigerant amount
- Clogging at EEV or strainer

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions Check error status. Is the refrigerant amount OK Check additional refrigerant amount charged at site according to the piping length instructed on the label pasted on the panel of the unit.
Reset power supply and restart.	
Does the error occur immediately after the startup? YES	Check whether the service valves are open.
NO: Does the low pressure fluctuate after the startup? NO: Is the connection of sensor connector OK? NO	Correct the connection of low pressure sensor connector
YES: Are the sensor characteristics OK?* NO	Replace low pressure sensor.
* The sensor characteristics is shown in Page 89	
YES: Is the opening degree of EEV for evaporator side fluctuating? NO: Is the connection of thermistor connector for heat exchanger OK? NO	Correct the connection of temperature thermistor connector of heat exchanger
YES: Is the checked result of harness and insulation of EEV coil OK?	
YES: Are the thermistor characteristics OK? NO	Replace temperature thermistor of heat exchanger at evaporator side.
YES	Replace control PCB at evaporator side.
NO	Replace EEV coil.
Does the EEV operate normally by judging from Mente PC data, etc? NO: Isn't EEV or strainer clogged? YES	Replace EEV main body or strainer.
YES / NO	Check for short circuit of airflow of heat exchanger at evaporator side and for fan motor anomaly

Note: Check whether the indoor unit is connected to other outdoor superlink network.
If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E53/E55 7-segment display: E53/E55-1	Indoor	Keeps flashing	Stays Off	Suction pipe temperature thermistor anomaly (Tho-S), Under-dome temperature thermistor anomaly (Tho-C1)
	Outdoor	Keeps flashing	1 time flash	

E53: Tho-S, E55-1: Tho-C1

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low temperature (resistance) of Tho-S or Tho-C

3. Condition of error displayed

- if -50°C or lower is detected for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after compressor ON, compressor stops. When the compressor is restarted automatically after 3-minutes delay, if this anomaly occurs 3 times within 40 minutes

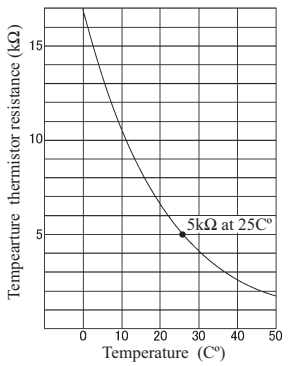
4. Presumable cause

- Broken thermistor harness or the internal wire of sensing section (Check the molded section as well)
- Disconnection of thermistor harness connection (connector)
- Outdoor control PCB anomaly

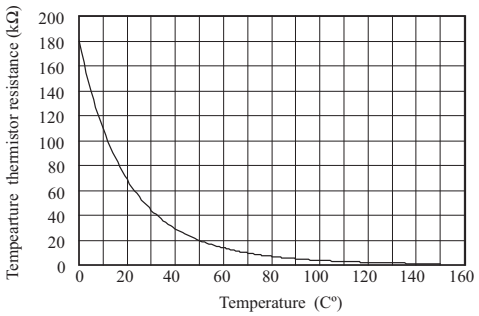
5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value
Is the connector of thermistor connected properly ? — NO	Insert the connector securely
YES	
Regarding the characteristics of the thermistor, see the following chart	
Are the characteristics of thermistor OK? *1 — NO	Replace thermistor (Tho-S or Tho-C1)
YES	Replace outdoor control PCB
*1 Check several times to prove any poor connection	

Temperature-resistance characreristics of suction pipe temperature thermistor (Tho-S)



Temperature-resistance characreristics of under-dome temperature thermistor (Tho-C1)



Note:

Error code	LED	Green	Red	Content
Remote controller: E54 7-segment display: E54-1, 2 *1	Indoor	Keeps flashing	Stays Off	High pressure sensor anomaly (PSH) Low pressure sensor anomaly (PSL)
	Outdoor	Keeps flashing	*1	

*1 E54-1: 1 time flash (PSL), E54-2 : 2 time flash (PSH)

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalous pressure (valtage) of PSH or PSL

[Operation range
High pressure : 0-4.15MPa
Low pressure : 0-1.7MPa]

3. Condition of error displayed

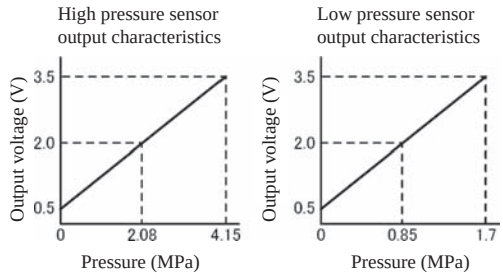
If anomalous sensor output voltage (0V or lower or 3.49V or higher) is detected for 5 seconds within 2 minutes to 2 minutes 20 seconds after the compressor ON

4. Presumable cause

- Broken sensor harness
- Disconnection of sensor harness connection (connector)
- Sensor (PSH, PSL) anomaly
- Outdoor control PCB anomaly
- Anomalous installation conditions
- Insufficient airflow volume
- Excessive or insufficient refrigerant amount

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC Check the data for 30 minutes before stopping	Check and save the data of operating conditions Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value.
Is anomalous pressure detected? YES → Is the connector of the sensor inserted properly to the connector on the outdoor control PCB? NO	Insert the connector securely and restart operation
NO / YES → Reset the power and restart operation.	
E54 Does it recur? NO	Temporary malfunction by noise. Correct if the source of noise is specified.
YES → Does the pressure converted from the sensor output voltage match the actual pressure measure by pressure gauge? NO	Replace sensor (PSH, PSL)
YES	Replace outdoor control PCB



Sensor output Black (GND) – White; Output voltage (Black – Red; DC5V)

Note:

Error code	LED	Green	Red	Content
Remote controller: E56 7-segment display: E56-1	Indoor	Keeps flashing	Stays Off	Power transitor temperature thermistor anomaly (Tho-P1)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low temperature (resistance) of Tho-P1

3. Condition of error displayed

When the outdoor air temperature is above 0ºC, if -10ºC or lower is detected for 20 seconds continuously within 10 minutes to 10 minutes 30 seconds after compressor ON, compressor stops. When the compressor is restarted automatically after 3-minutes delay, if this anomaly occurs 3 times within 40 minutes

4. Presumable cause

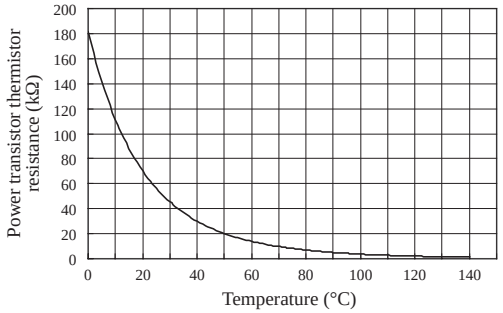
- Broken thermistor harness or the internal wire of sensing section (Check the molded section as well)
- Disconnection of thermistor harness connection (connector)
- Outdoor control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature of Mente PC data with actual measured value
Is the connector of thermistor connected properly OK ? — NO	Insert the connector securely
YES	
Are the characteristics of thermistor OK? *1 — NO	Replace power transistor temperature thermistor (Tho-P1).
YES	Replace outdoor control PCB.

*1 Check several times to prove any poor connection

Temperature-resistance characteristics of power transistor temperature thermistor (Tho-P1)



Note:

Error code	LED	Green	Red	Content
Remote controller: E58 7-segment display: E58-1	Indoor	Keeps flashing	Stays Off	Anomalous compressor by loss of synchronism
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

E58 is displayed on 7-segment LED

3. Condition of error displayed

This anomaly is established 4 times within 15 minutes.

4. Presumable cause

- Insufficient time elapsed after the power supplied, before compressor startup. (Startup the compressor wihtout crankcase heater ON)
- Compressor anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating condition
Check the data for 30 minutes before stopping	
Is this the first startup within one hour after power is supplied? — YES	Refrigerant might be migrated in the refrigerant oil in the compressor. Wait for about one hour under the condition of power ON and start again. (Turn the on crankcase heater ON and evaporate the liquid refrigerant migrated in the compressor.
NO	
Is there any replacement record of inverter PCB ? — YES	The model setting could be wrong. Check the dip switch for model setting on the outdoor control PCB.
NO	
Compressor could be locked → Replace the compressor	

Note: If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E59 7-segment display: E59-1	Indoor	Keeps flashing	Stays Off	Compressor startup failure (CM1)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor (If the compressor speed cannot increase 11Hz or higher)

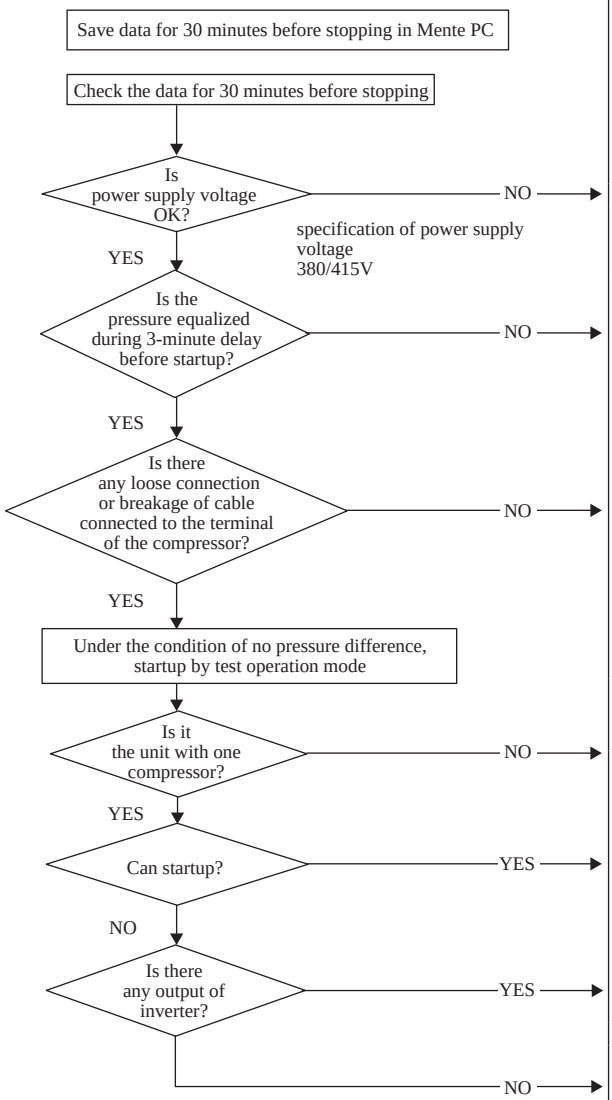
3. Condition of error displayed

If the compressor fails to startup for 20 times (10 patterns x 2 times) continuously.

4. Presumable cause

- Anomalous voltage of power supply
- Anomalous components for refrigerant circuit
- Inverter PCB anomaly
- Loose connection of connector or cable
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note: If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E60 7-segment display: E60-1	Indoor	Keeps flashing	Stays Off	Rotor position detection failure (CM1)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Outdoor unit

2. Error detection method

Detection of the compressor rotor position.

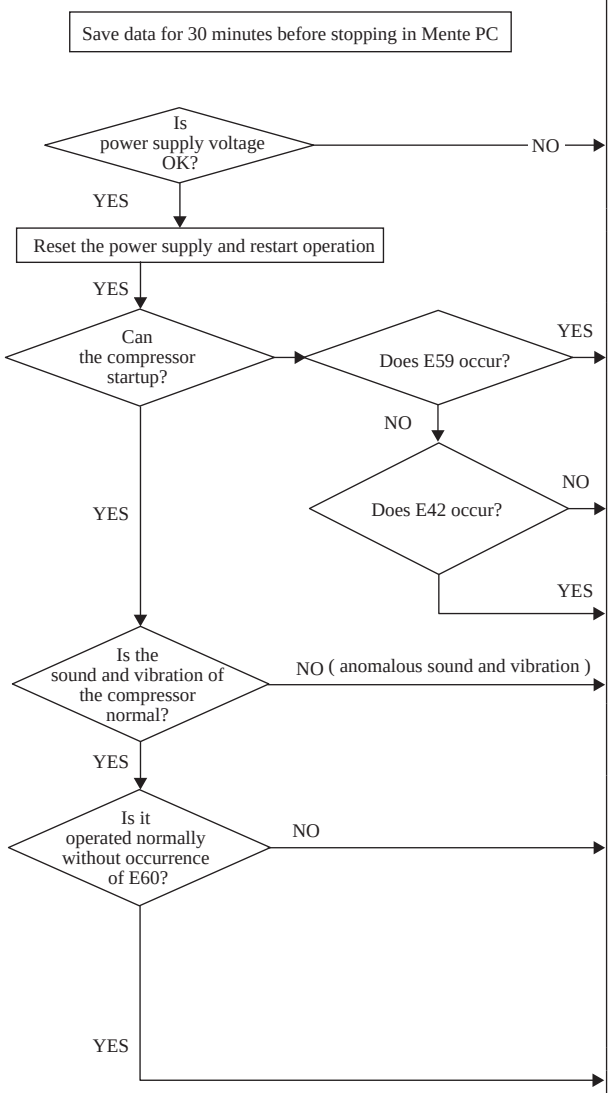
3. Condition of error displayed

If it fails to detect the rotor position of compressor, after changinging over to the operation of compressor rotor position detection, the compressor stops. When it is restart automatically after 3 minutes delay, this anomaly occurs 4 times within 15 minute after the initial detection

4. Presumable cause

- Compressor anomaly
- Inverter PCB anomaly
- Anomaly of power supply

5. Troubleshooting



Note: If the error does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote controller: E63 7-segment display: E63	Indoor	Keeps flashing	Stays Off	Emergency stop
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model

Indoor unit

2. Error detection method

When ON signal is inputted to the CnT terminal of indoor control PCB

3. Condition of error displayed

Same as above

4. Presumable cause

Factors for emergency stop

5. Troubleshooting

Diagnosis	Countermeasure
Save data for 30 minutes before stopping in Mente PC	Check and save the data of operating conditions Check the conditions whether it occurs immediately after the power on or during operation.
Is the remote controller setting of Emergency Stop "Valid"? — NO	Replace remote control PCB
YES → Is ON signal inputted to the CnT terminal of indoor control PCB? — NO	Replace indoor control PCB
YES	Check the cause of emergency stop. (It is better to have the data for 30 minutes before stopping, when instructing the installer)

Note: Indoor unit detected emergency stop signal gives command "all stop"

2.4 Outdoor unit control PCB replacement procedure

PCB012D017A Ⓒ

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

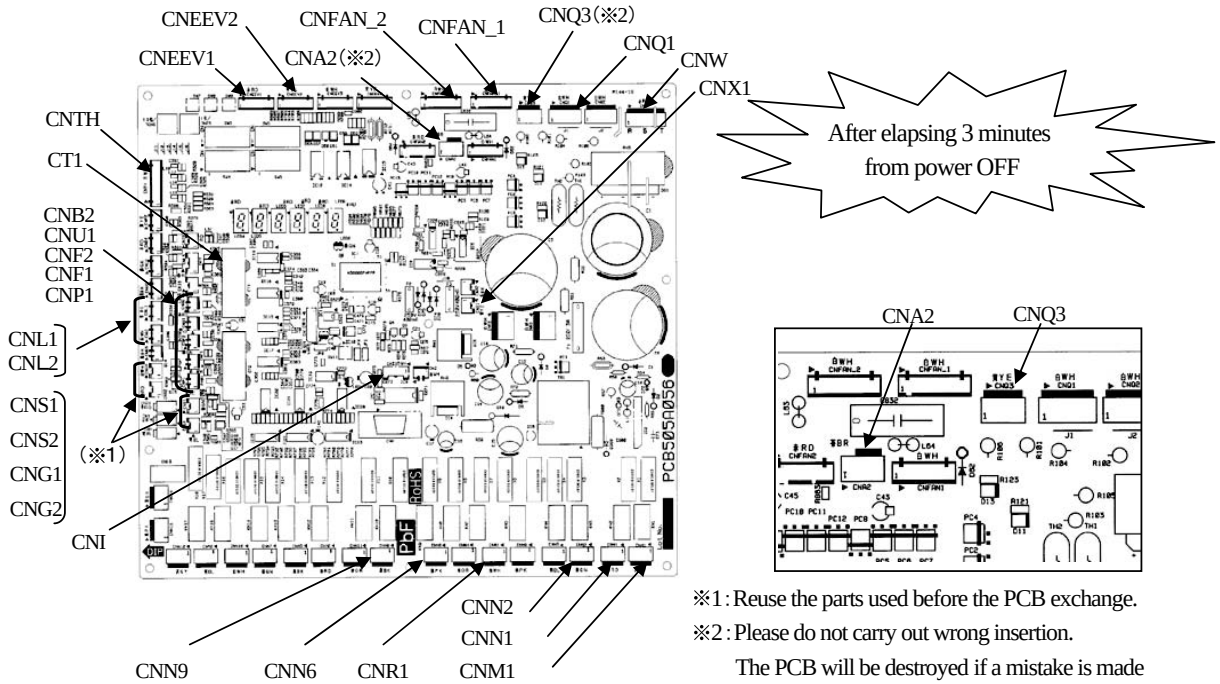
⚠ CAUTION

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

(Note) If cut the tie, the wiring cables should be bound with new tie again.

- Exchange the control PCB according to the following procedure.

1. Replace the control PCB after elapsing 3 minutes from power OFF. (Be sure to measure voltage (DC) at both capacitor terminals (1. Power supply for PCB 2. Power supply for fan motor) and check that the voltage is discharged completely. (Refer to Fig.1))
2. Disconnect the connectors from the PCB.
3. Disconnect the blue wiring passing through CT1 on the PCB before replace the coutrol PCB.
4. Set the setting switches (SW1-6) of new PCB same as previous PCB.
5. Tighten up a screw after passing blue wiring through CT1 of the changed.
6. Connect the connectors to the PCB. (Contirm the connectors are not half inserted.)



(only FDC335KXE6)

Parts arrangement view

※1 : Reuse the parts used before the PCB exchange.

※2 : Please do not carry out wrong insertion.
The PCB will be destroyed if a mistake is made in putting CNA2 (brown) and CNQ3 (yellow).

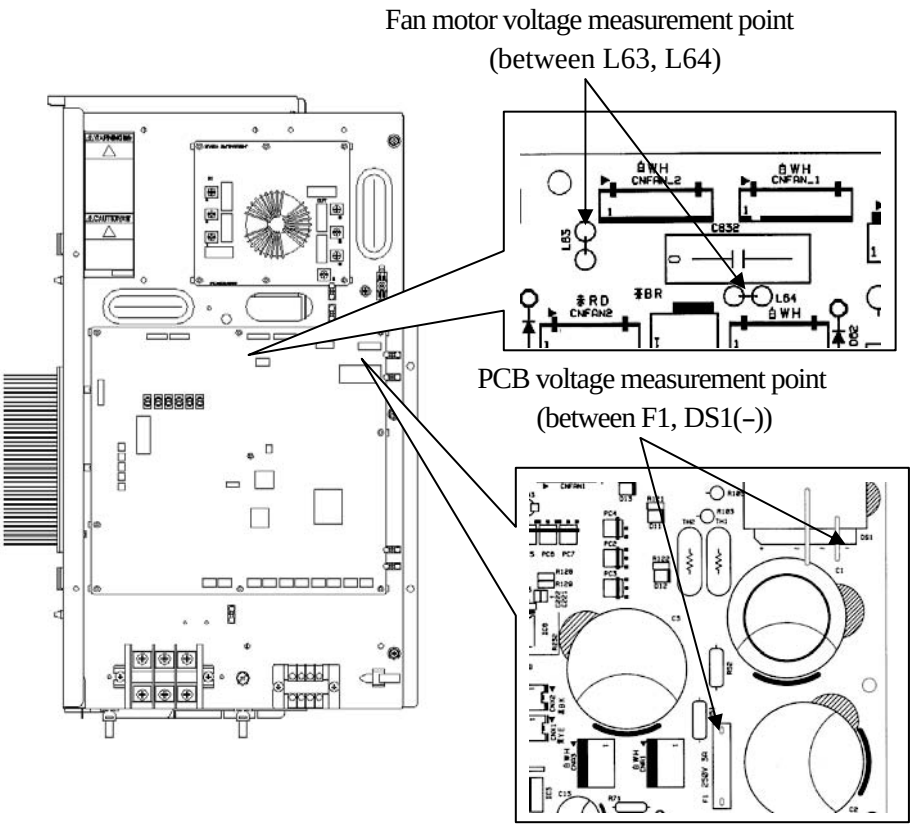
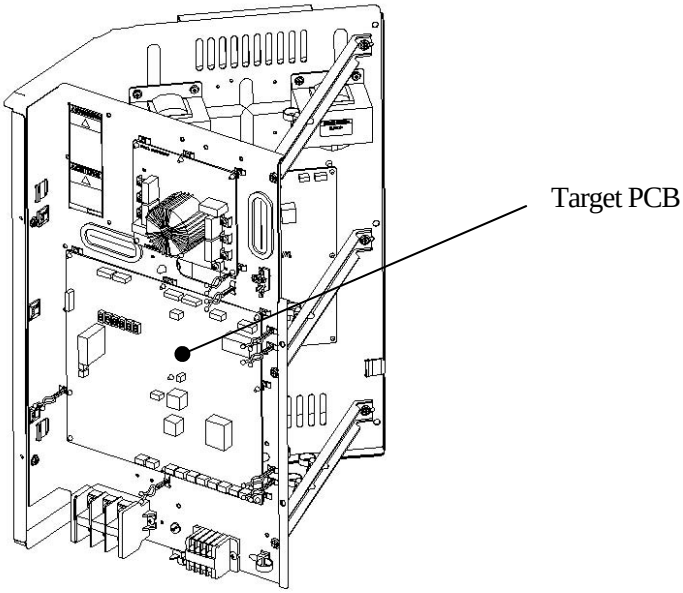


Fig.1 Voltage measurement points



Appearance of the controller

2.5 Inverter PCB replacement procedure

PCB012D018AB Ⓑ

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

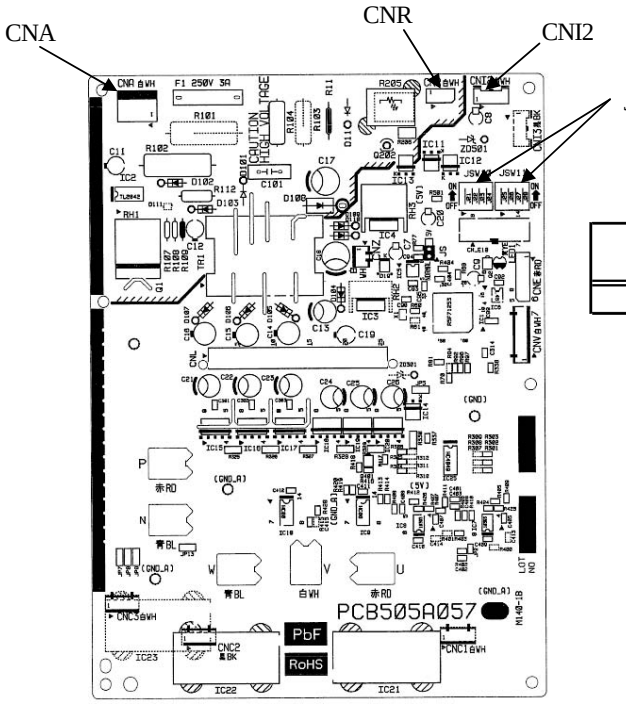
⚠ CAUTION

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

(Note) If cut the tie, the wiring cables should be bound with new tie again.

- Exchange the inverter PCB according to the following procedure.

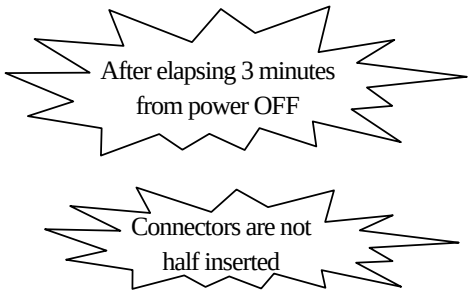
1. Replace the inverter PCB after elapsing 3 minutes from power OFF.
   (Be sure to measure voltage (DC) of two places (1. Power supply for PCB 2. Power supply for fan motor) and check that the voltage is discharged completely. (Refer to Fig.1))
2. Disconnect all of terminals and connectors from the inverter PCB before replace the invertor PCB.
3. Replace to the new PCB.
4. Set the setting switches (JSW 10, 11) of new PCB as shown in table 1.
5. Connect all of terminals and connectors to the new PCB securely.
   (Check the secure connection of terminals and connectors again)



Parts Arrangement View

Table.1 Switch Setting

Model	JSW10	JSW11			
		1	2	3	4
All models	all OFF	OFF	ON	OFF	OFF



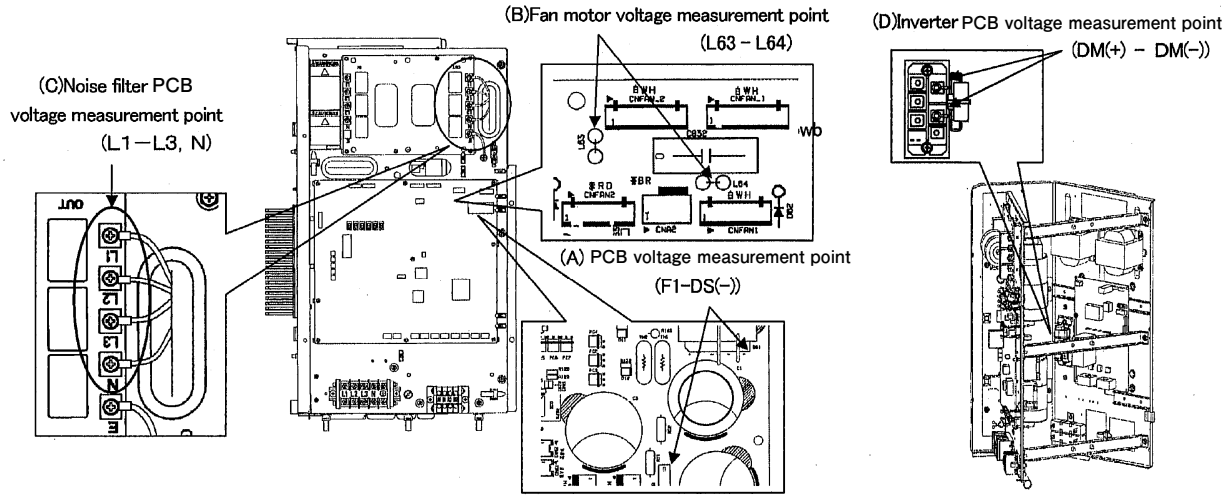
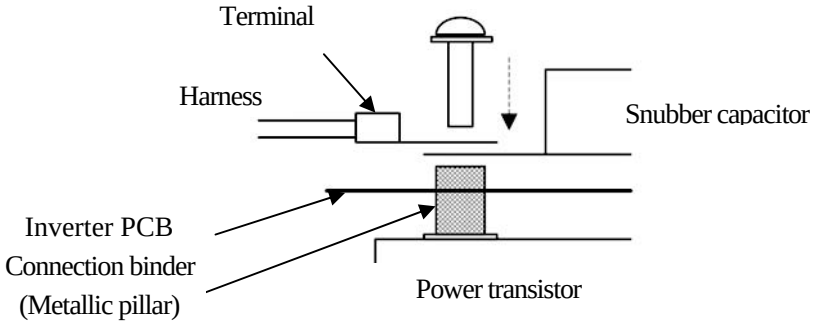


Fig.1 Voltage Measurement Points



Installation Method to Power transistor

• Procedure on tightening harness (snubber capacitor) and power transistor with screw.
A metallic connection binder is set in each hole of the inverter PCB of "P", "N", "U", "V", and "W" beforehand. Then tighten the harness (snubber capacitor) and the power transistor with the screw together. (Connect snubber capacitor with "P" and "N".)

■ Function of Dip switch for control (SW3, 4, 5)

•SW3 (Function setting)

Switch		Function
SW3-1	ON	Inspection LED reset
	OFF	Normal
SW3-7	ON	Forced cooling/heating
	OFF	Normal

•SW4 (Change demand ratio)

Switch				Function
SW4-5	ON	SW4-6	OFF	Compressor capacity 60%
			ON	Compressor capacity 0%
	OFF		OFF	Compressor capacity 80%
			ON	Compressor capacity 40%

■ Function of Jumper wire (J13, 15)
(With: Shorted / None: Opened)

Jumper		Function
J13	With	External input Level input
	None	External input Pulse input
J15	With	Defrost time Normal
	None	Defrost time Cold weather region

•SW5 (Function setting)

	ON/OFF	Function	
SW5-1	ON	Test run switch	Test run
	OFF	Test run switch	Normal
SW5-2	ON	Test run operation mode	Cooling
	OFF	Test run operation mode	Heating
SW5-3	ON	Pump down switch	Pump down
	OFF	Pump down switch	Normal
SW5-5	ON	Super link protocol: Previos SL	
	OFF	Super link protocol: New SL	

•SW4 (Model selection)

Switch / Model	SW4			
	1	2	3	4
FDC224	OFF	OFF	OFF	OFF
FDC280	ON	OFF	OFF	OFF
FDC335	OFF	ON	OFF	ON

•SW7, 8, 9 (Function setting)

Switch	Function	
SW7	Data erase/data write	
SW8	7-segment dispalay No.UP	order of 1
SW9	7-segment dispalay No.UP	order of 10

■ Function of Connector

Connector	Function	Color	Connector	Function	Color
CNEEV1	Heating EEV	Red	CNF2	Sub-cooling coil thermistor 1	Green
CNEEV2	Sub-cooling coil EEV	White	CNP1	Power transistor thermistor (CM)	Yellow
CNA2	Power fan motor	–	CNL1	High pressure sensor	Blue
CNFAN1	Fan motor 1	White	CNL2	Low pressure sensor	White
CNFAN2	Fan motor 2	Red	CNS1	External input	–
CNQ1	High pressure switch (CM1)	White	CNS2	Demand input	–
CNTH	Heat exchanger thermistor 1 (Exit/front)	White	CNN1	4-way switching solenoid valve	Red
	Discharge pipe thermistor		CNN2	Solenoid valve•oil return (CM1)	Green
	Suction pipe thermistor		CNN6	Solenoid valve (liquid bypass)	Pink
	External air thermistor		CNN9	Solenoid valve (gas bypass)	Black
CNB2	Heat exchanger thermistor 2	Red	CMM1	Solenoid valve for CM	Gray
CNU1	Under-dome thermistor (CM1)	Blue	CNR1	Crankcase heater	White
CNF1	Sub-cooling coil thermistor 1	White			

●DIP Switch setting list

(1) Outdoor unit

(a) Control PCB

Switches	Description		Default setting		Remarks
SW1	Outdoor address No. (Order of 10)		4		0–9
SW2	Outdoor address No. (Order of 1)		9		0–9
SW3-1	Inspection LED reset	Normal*/Reset	OFF	Normal	
SW3-2	Spare		OFF		keep OFF
SW3-3	Spare		OFF		keep OFF
SW3-4	Reserved		OFF		keep OFF
SW3-5	Check operation start	Normal*/Start	OFF	Normal	
SW3-6	Reserved		OFF		keep OFF
SW3-7	Forced heating/cooling	Normal*/Forced	OFF	Normal	
SW3-8	Reserved		OFF		keep OFF
SW4-1 SW4-2 SW4-3 SW4-4	Model selection		As per model		See table 1
SW4-5 SW4-6	Demand ratio selection		OFF OFF		See table 2
SW4-7	Reserved		OFF		Keep OFF
SW4-8	Spare		OFF		Keep OFF
SW5-1	Test run SW	Normal*/Test run	OFF	Normal	
SW5-2	Test run mode	Heating*/Cooling	OFF	Heating	
SW5-3	Pump down operation	Normal*/Pump down	OFF	Normal	
SW5-4	Reserved		OFF		Keep OFF
SW5-5	Superlink selection	New SL*/Previous SL	OFF	New SL(Auto)	
SW5-6	Reserved		OFF		Keep OFF
SW5-7	Reserved		OFF		Keep OFF
SW5-8	Reserved		OFF		Keep OFF
SW6-1	Reserved		OFF		Keep OFF
SW6-2	Reserved		OFF		Keep OFF
SW6-3	Spare		OFF		Keep OFF
SW6-4	Spare		OFF		Keep OFF
SW6-5	Spare		OFF		Keep OFF
SW6-6	Spare		OFF		Keep OFF
SW6-7	Spare		OFF		Keep OFF
SW6-8	Spare		OFF		Keep OFF
SW7	Data Erase/Write	Erase*/Write	OFF	Erase	
SW8	7-segment display code No. increase (Order of 1)		0		
SW9	7-segment display code No. increase (Order of 10)		0		
J10	Superlink terminal spare	Normal*/switch to spare	With	Normal	
J11 J12	Power voltage selection		As per voltage		See table 3
J13	External input	Level*/Pulse	With	Level	
J14	Spare		With		Keep With
J15	Defrost start temperature	Normal*/Cold region	With	Normal	
J16	Outdoor unit type selection	KXR/KX	With	KXR	See table 1

＊Default setting

Table 1: Model selection with SW4-1–SW4-4 and J16

0: OFF 1:ON

	224	280	335
SW4-1	0	1	0
SW4-2	0	0	1
SW4-3	0	0	0
SW4-4	0	0	1
J16	None	None	None

Table 2: Demand ratio selection with SW4-5, SW4-6

0: OFF 1:ON

SW4-5	SW4-6	Compressor capacity (%)
0	0	80
1	0	60
0	1	40
1	1	0

Table 3: Power voltage selection with J11, J12

0: None 1: With

Outdoor unit	J11	J12
380V 60Hz	0	1
380/415V 50Hz	0	0

(2) Indoor unit

Switches	Description		Default setting		Remarks
SW1	Indoor unit address No. (Order of 10)		0		0–9
SW2	Indoor unit address No. (Order of 1)		0		0–9
SW3	Outdoor unit address No. (Order of 10)		4		0–9
SW4	Outdoor unit address No. (Order of 1)		9		0–9
SW5-1	Superlink selection	Automatic*/Previous SL	OFF	Automatic	
SW5-2	Indoor unit address No. (Order of 100)		OFF	0	OFF: 0, ON: 1
SW6-1 SW6-2 SW6-3 SW6-4	Model selection		As per model		See table 1
SW7-1	Test run, Drain motor	Normal*/Test run	OFF	Normal	
SW7-2	Reserved		OFF		keep OFF
SW7-3	Spare		OFF		keep OFF
SW7-4	Reserved		OFF		keep OFF
JSL1	Superlink terminal spare	Normal*/switch to spare	With	Normal	

＊Default setting

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

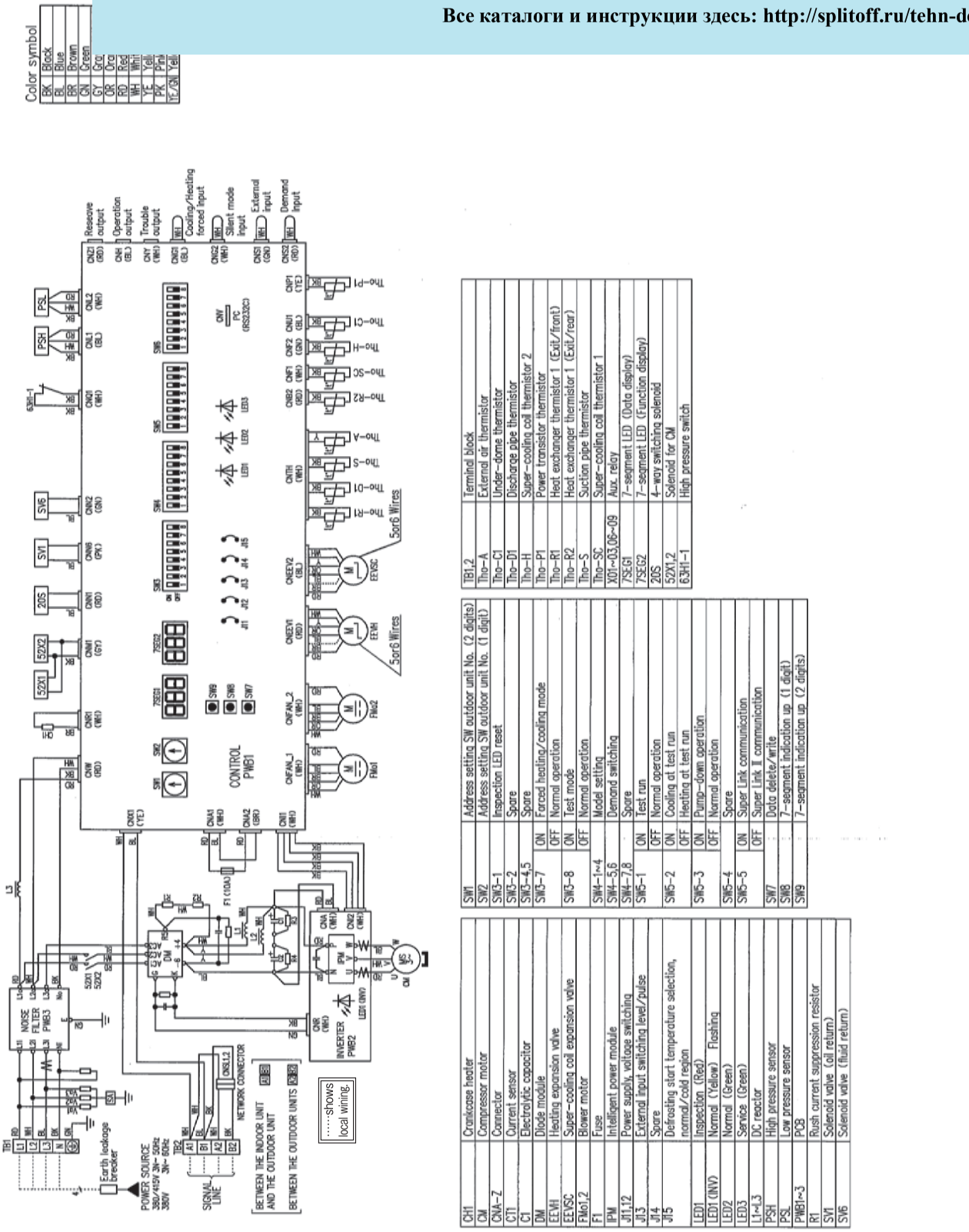
0: OFF 1:ON

	P22	P28	P36	P45	P56	P71	P80	P90	P112	P140	P160	P224	P280
SW6-1	0	1	0	0	0	0	1	0	1	0	1	0	1
SW6-2	0	0	1	0	1	0	0	1	1	0	0	1	1
SW6-3	0	0	0	1	1	0	0	0	0	1	1	1	1
SW6-4	0	0	0	0	0	1	1	1	1	1	1	1	1

3. ELECTRICAL WIRING

3.1 Outdoor unit

Models FDC224KXE6, 280KXE6



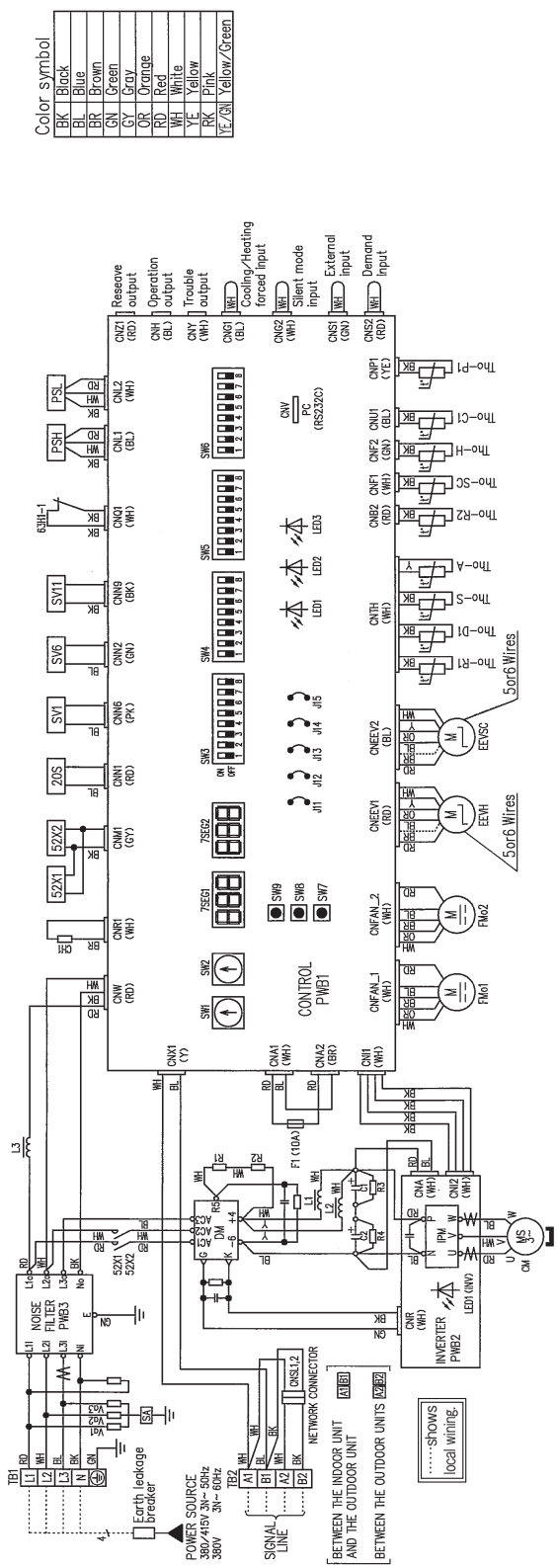
CH1	Crankcase heater
CM	Compressor motor
CNA-Z	Connector
CT1	Current sensor
C1	Electrolytic capacitor
DM	Diode module
EEVH	Heating expansion valve
EEVSC	Super-cooling coil expansion valve
FMo1,2	Blower motor
F1	Fuse
IPM	Intelligent power module
JI1,12	Power supply, voltage switching
JI3	External input switching level/pulse
JI4	Spare
JI5	Defrosting start temperature selection, normal/cold region
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) Flashing
LED2	Normal (Green)
LED3	Service (Green)
L1~L3	DC reactor
PSH	High pressure sensor
PSL	Low pressure sensor
PWB1~3	PCB
R1	Rush current suppression resistor
SV1	Solenoid valve (oil return)
SV6	Solenoid valve (fluid return)

SW1		Address setting SW outdoor unit No. (2 digits)
SW2		Address setting SW outdoor unit No. (1 digit)
SW3-1		Inspection LED reset
SW3-2		Spare
SW3-4,5		Spare
SW3-7	ON	Forced heating/cooling mode
	OFF	Normal operation
SW3-8	ON	Test mode
	OFF	Normal operation
SW4-1~4		Model setting
SW4-5,6		Demand switching
SW4-7,8		Spare
SW5-1	ON	Test run
	OFF	Normal operation
SW5-2	ON	Cooling at test run
	OFF	Heating at test run
SW5-3	ON	Pump-down operation
	OFF	Normal operation
SW5-4		Spare
SW5-5	ON	Super Link communication
	OFF	Super Link II communication
SW7		Data delete/write
SW8		7-segment indication up (1 digit)
SW9		7-segment indication up (2 digits)

TB1,2	Terminal block
Tho-A	External air thermistor
Tho-C1	Under-dome thermistor
Tho-D1	Discharge pipe thermistor
Tho-H	Super-cooling coil thermistor 2
Tho-P1	Power transistor thermistor
Tho-R1	Heat exchanger thermistor 1 (Exit/front)
Tho-R2	Heat exchanger thermistor 1 (Exit/rear)
Tho-S	Suction pipe thermistor
Tho-SC	Super-cooling coil thermistor 1
X01~03,06~09	Aux. relay
7SEG1	7-segment LED (Data display)
7SEG2	7-segment LED (Function display)
20S	4-way switching solenoid
52X1,2	Solenoid for CM
63H1~1	High pressure switch

PCB003Z033 A

Model FDC335KXE6



CH1	Crankcase heater
CM	Compressor motor
CNA-Z	Connector
CT1	Current sensor
C1	Electrolytic capacitor
DM	Diode module
EEVH	Heating expansion valve
EEVSC	Super-cooling coil expansion valve
FMo1,2	Blower motor
F1	Fuse
IPM	Intelligent power module
J11,12	Power supply, voltage switching
J13	External input switching level/pulse
J14	Spare
J15	Defrosting start temperature selection, normal/cold region
LED1	Inspection (Red)
LED1 (INV)	Normal (Yellow) Flashing
LED2	Normal (Green)
LED3	Service (Green)
L1~L3	DC reactor
PSH	High pressure sensor
PSL	Low pressure sensor
PWB1~3	PCB
R1	Rush current suppression resistor
SV1	Solenoid valve (oil return)
SV6	Solenoid valve (fluid return)
SV11	Solenoid valve (gas bypass)

SW1	Address setting SW outdoor unit No. (2 digits)	
SW2	Address setting SW outdoor unit No. (1 digit)	
SW3-1	Inspection LED reset	
SW3-2	Spare	
SW3-4,5	Spare	
SW3-7	ON	Forced heating/cooling mode
	OFF	Normal operation
SW3-8	ON	Test mode
	OFF	Normal operation
SW4-1~4	Model setting	
SW4-5,6	Demand switching	
SW4-7,8	Spare	
SW5-1	ON	Test run
	OFF	Normal operation
SW5-2	ON	Cooling at test run
	OFF	Heating at test run
SW5-3	ON	Pump-down operation
	OFF	Normal operation
SW5-4	Spare	
SW5-5	ON	Super Link communication
	OFF	Super Link II communication
SW7	Data delete/write	
SW8	7-segment indication up (1 digit)	
SW9	7-segment indication up (2 digits)	

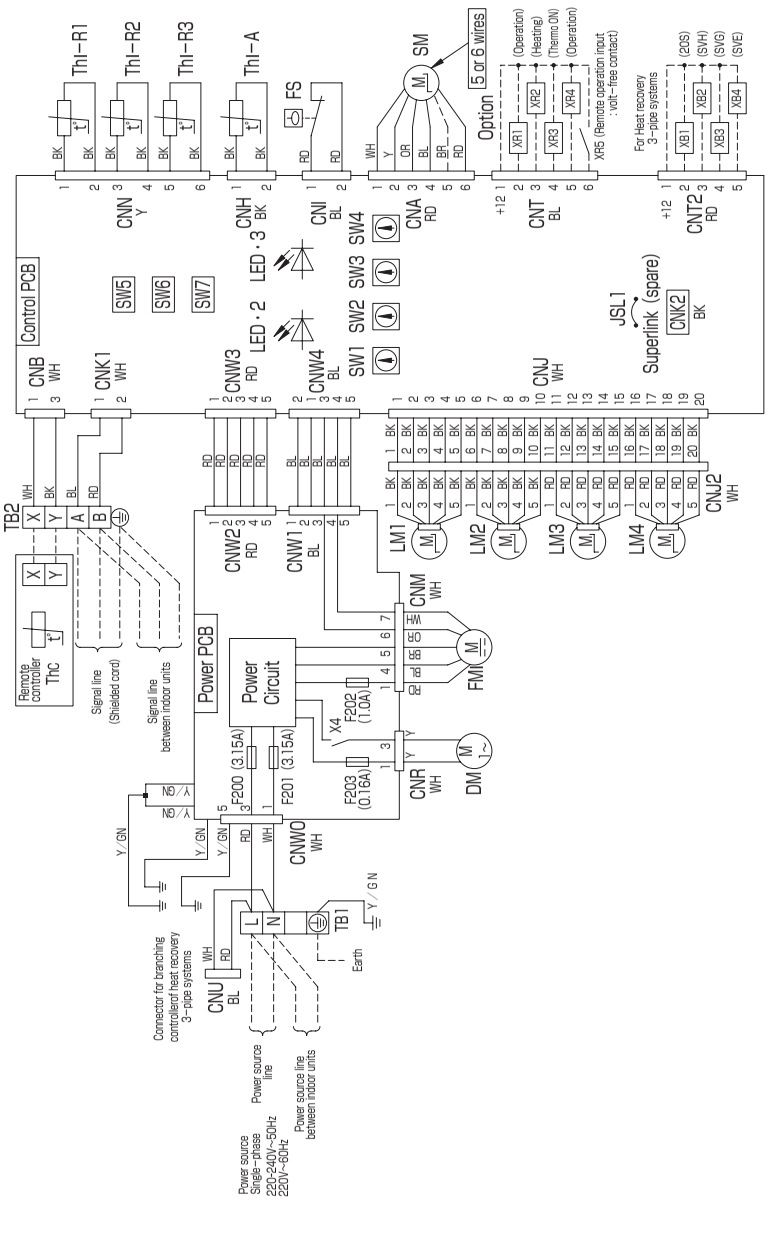
TB1,2	Terminal block
Tho-A	External air thermistor
Tho-C1	Under-dome thermistor
Tho-D1	Discharge pipe thermistor
Tho-H	Super-cooling coil thermistor 2
Tho-P1	Power transistor thermistor
Tho-R1	Heat exchanger thermistor 1 (Exit/front)
Tho-R2	Heat exchanger thermistor 1 (Exit/rear)
Tho-S	Suction pipe thermistor
Tho-SC	Super-cooling coil thermistor 1
X01~03,06~09	Aux. relay
7SEG1	7-segment LED (Data display)
7SEG2	7-segment LED (Function display)
20S	4-way switching solenoid
52X1,2	Solenoid for CM
63H1-1	High pressure switch

PCB003Z035 A

3.2 Indoor unit

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

Models All models



Color Marks

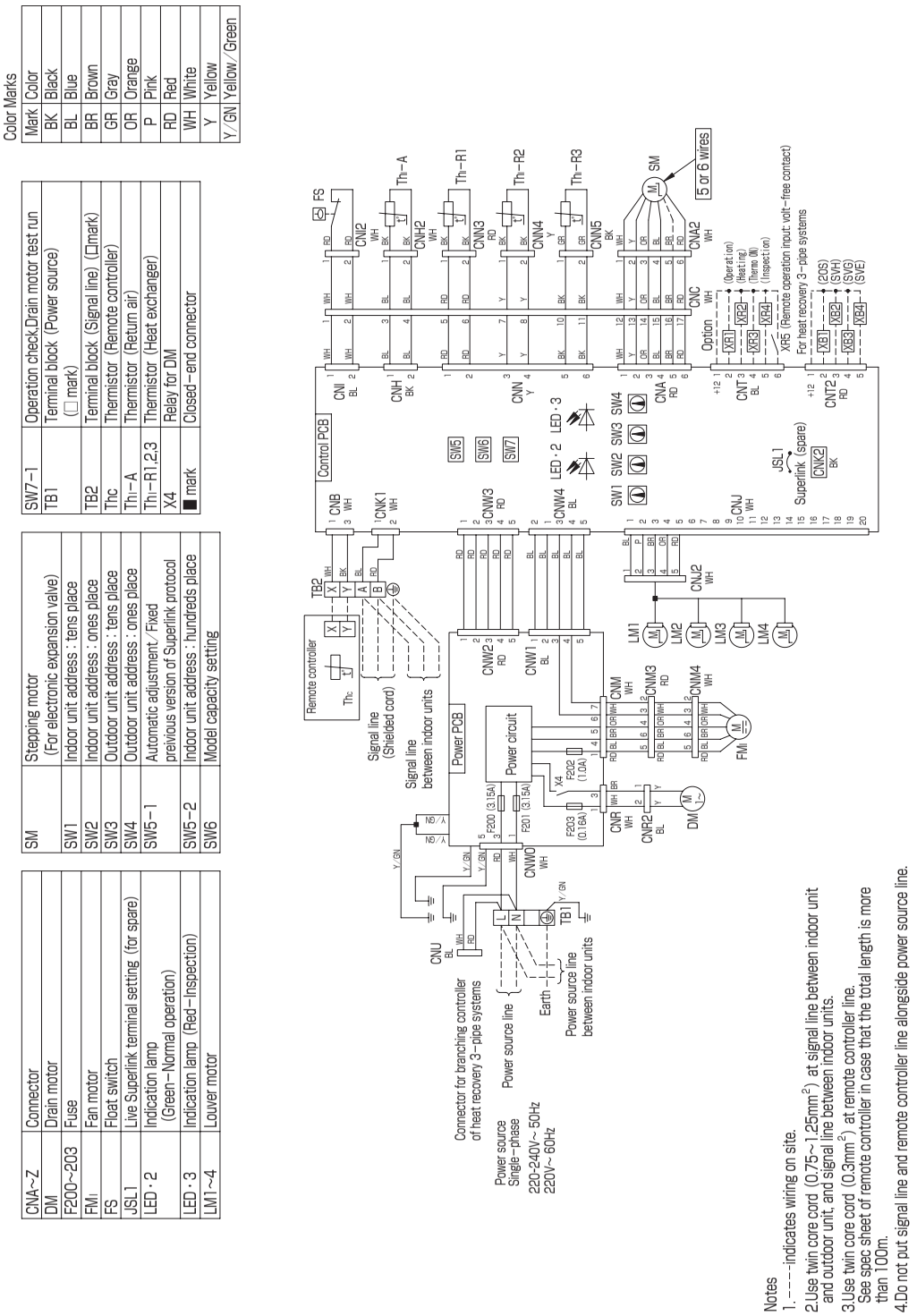
Mark	Color	Mark	Color
BK	Black	RD	Red
BL	Blue	WH	White
BR	Brown	Y	Yellow
OR	Orange	Y/GN	Yellow/Green

Notes
1. - - - indicates wiring on site.
2. Use twin core cord (0.75~1.25mm^2) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cord (0.3mm^2) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJF000Z053

(b) Ceiling cassette-4 way Compact type (FDTC)

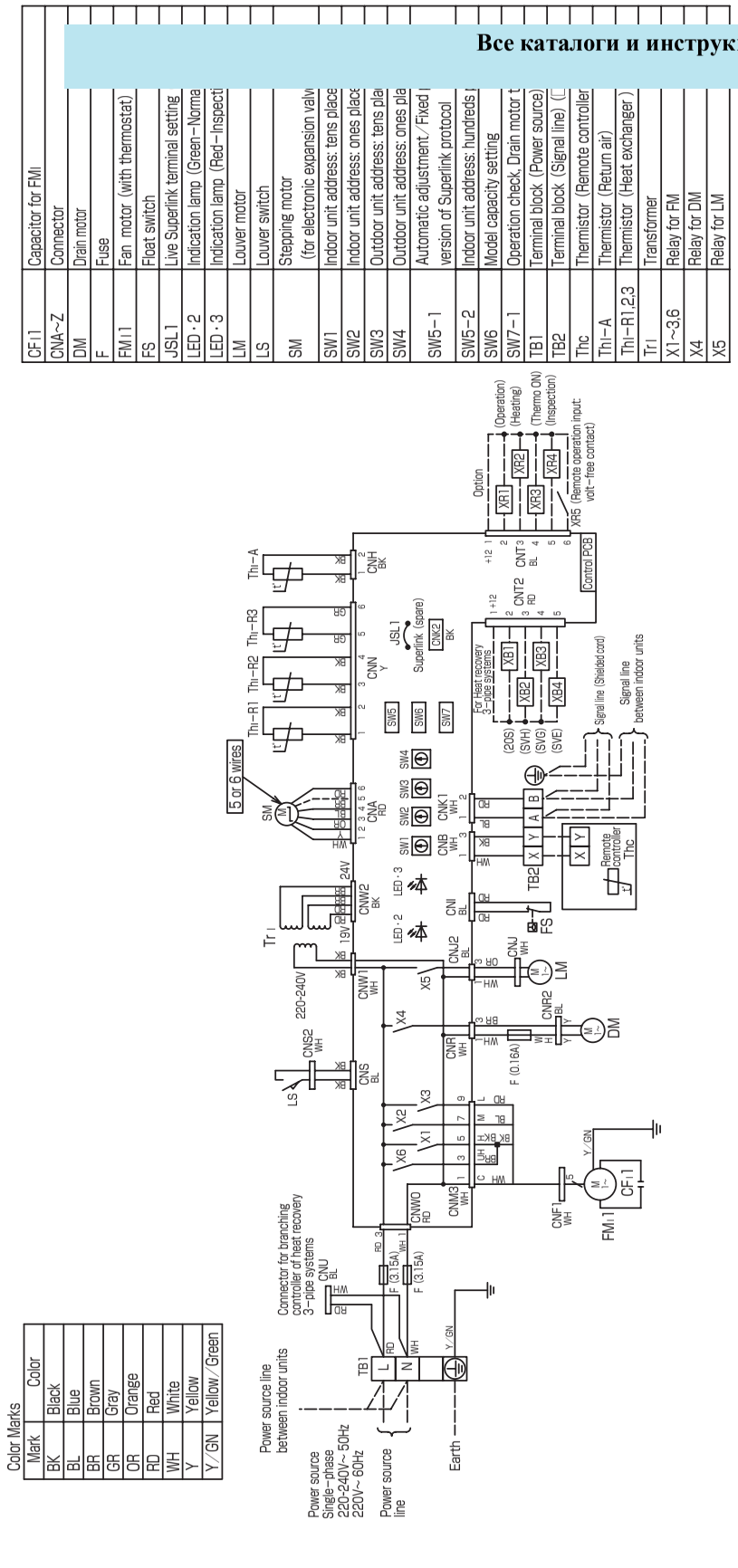
Models All moddels



PJA003Z331 B

(c) Ceiling cassette-2 way type (FDTW)

Models FDTW28KXE6, 45KXE6, 56KXE6

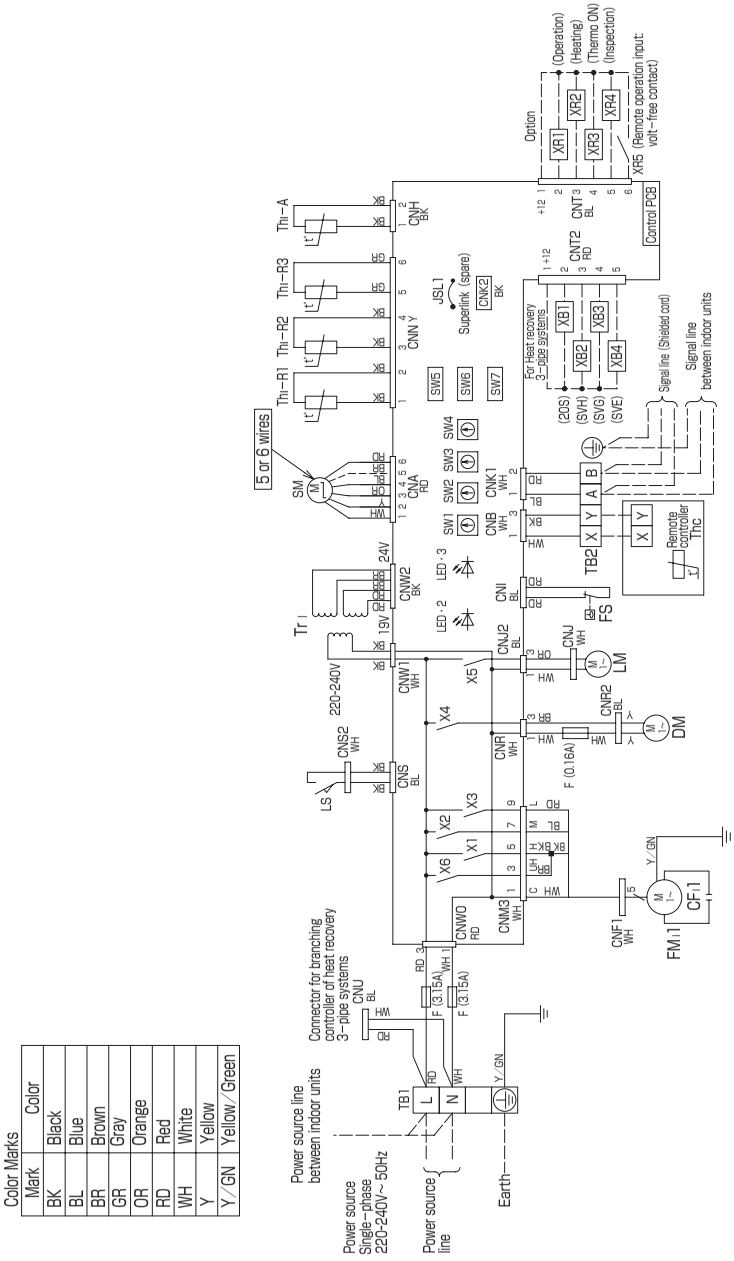


Notes 1. —— indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJB001Z560 B

Models FDTW71KXE6, 90KXE6

CF1 1	Capacitor for FM1
CNA~Z	Connector
DM	Drain motor
F	Fuse
FM1 1	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED·2	Indication lamp (Green-Normal operation)
LED·3	Indication lamp (Red-Inspection)
LM	Louver motor
LS	Louver switch
SM	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5-1	Automatic adjustment:/Fixed previous version of Superlink protocol
SW5-2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7-1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote controller)
Th1-A	Thermistor (Return air)
Th1-R1,2,3	Thermistor (Heat exchanger)
Tr1	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
X5	Relay for LM

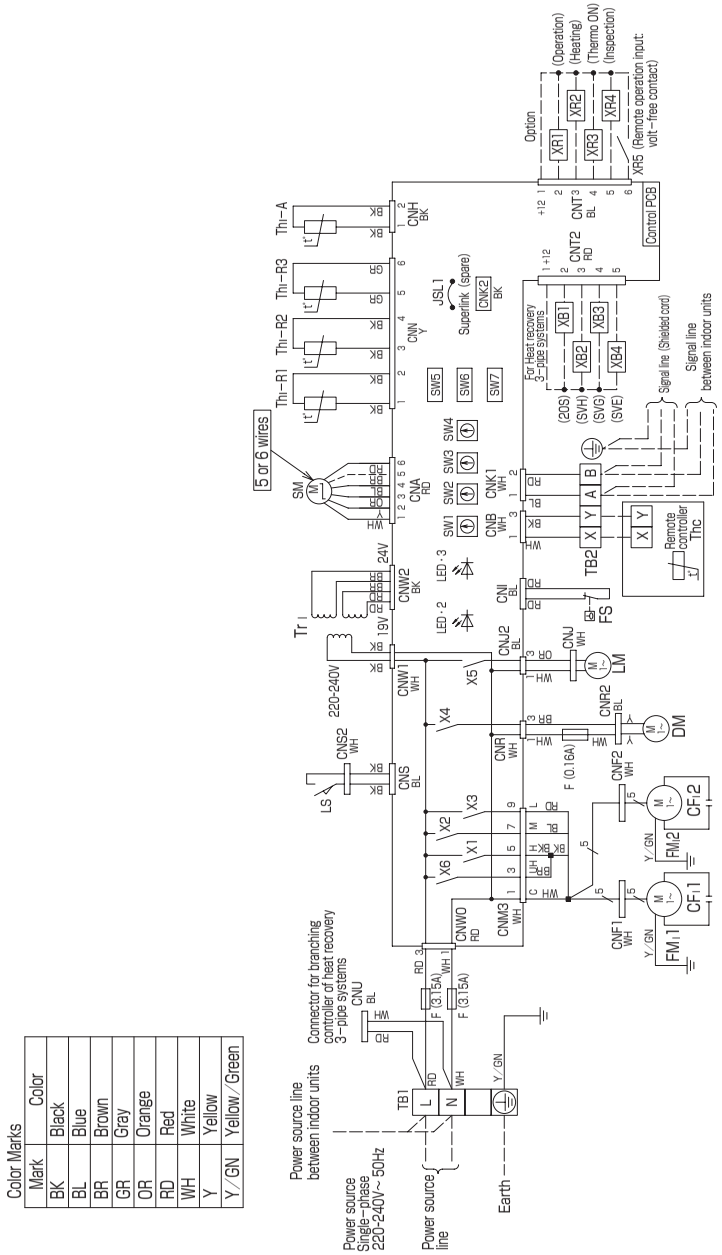


Notes 1. — indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJB001Z561 B

Models FDTW112KXE6, 140KXE6

CF1,2	Capacitor for FM
CNA~Z	Connector
DM	Drain motor
F	Fuse
FM1,2	Fan motor (with thermos
FS	Float switch
JSL1	Live Superlink terminal set
LED・2	Indication lamp (Green–N
LED・3	Indication lamp (Red–Ins
LM	Louver motor
LS	Louver switch
SM	Stepping motor (for electronic expansion
SW1	Indoor unit address: tens
SW2	Indoor unit address: ones
SW3	Outdoor unit address: ten
SW4	Outdoor unit address: one
SW5–1	Automatic adjustment / Fi version of Superlink protoc
SW5–2	Indoor unit address: hundr
SW6	Model capacity setting
SW7–1	Operation check, Drain mo
TB1	Terminal block (Power so
TB2	Terminal block (Signal line
Thc	Thermistor (Remote contr
Thl–A	Thermistor (Return air)
Thl–R1,2,3	Thermistor (Heat exchang
Tr1	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
X5	Relay for LM
■mark	Closed–end connector



Color Marks

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

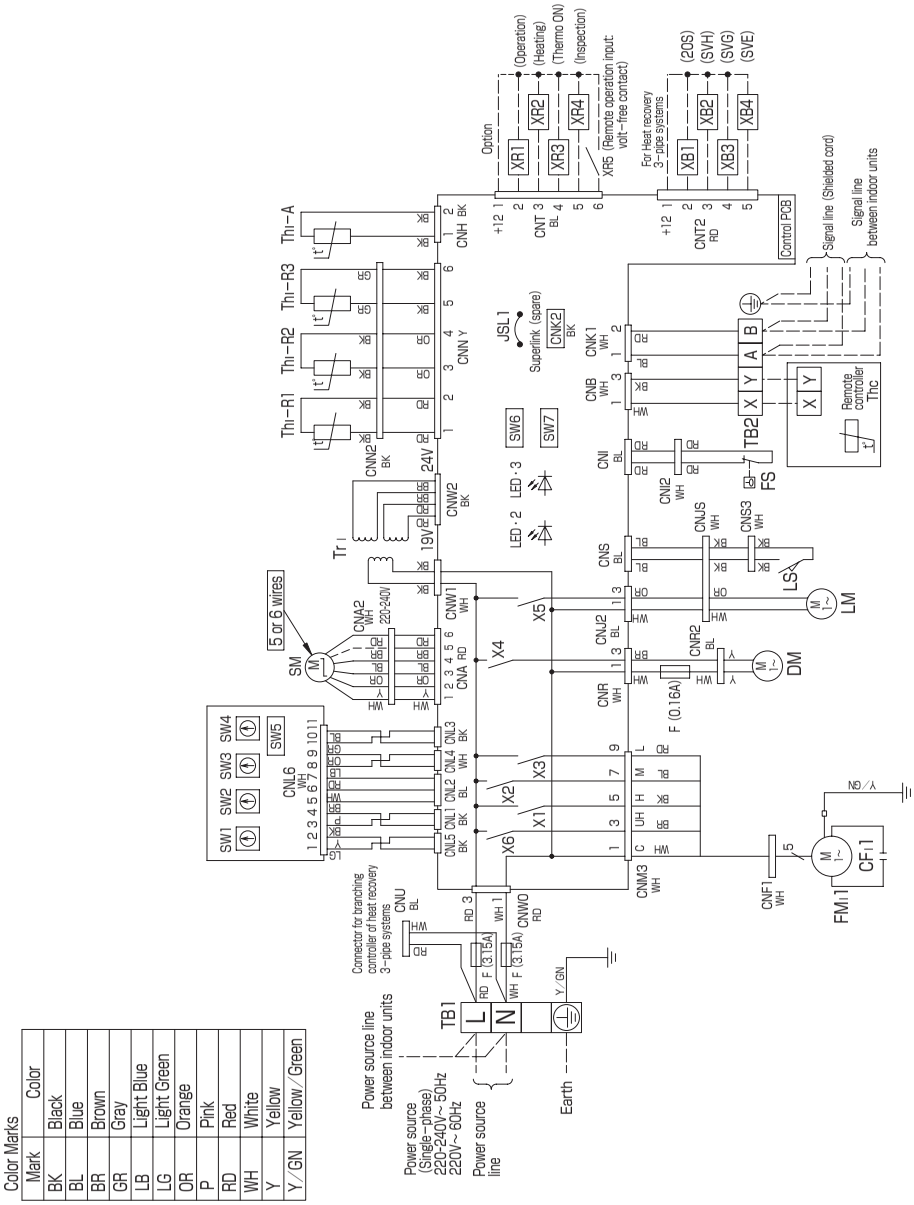
Notes 1. —–indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJB001Z562 B

(d) Ceiling cassette-1 way type (FDTS)

Model FDTS45KXE6

CFi1	Capacitor for FMi
CNA~Z	Connector
DM	Drain motor
F	Fuse
FMi1	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED · 2	Indication lamp (Green–Normal operation)
LED · 3	Indication lamp (Red–Inspection)
LM	Louver motor
LS	Louver switch
SM	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5–1	Automatic adjustment/Fixed previous version of Superlink protocol
SW5–2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7–1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote controller)
Thi–A	Thermistor (Return air)
Thi–R1,2,3	Thermistor (Heat exchanger)
Tr i	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
X5	Relay for LM
■mark	Closed–end connector



Color Marks

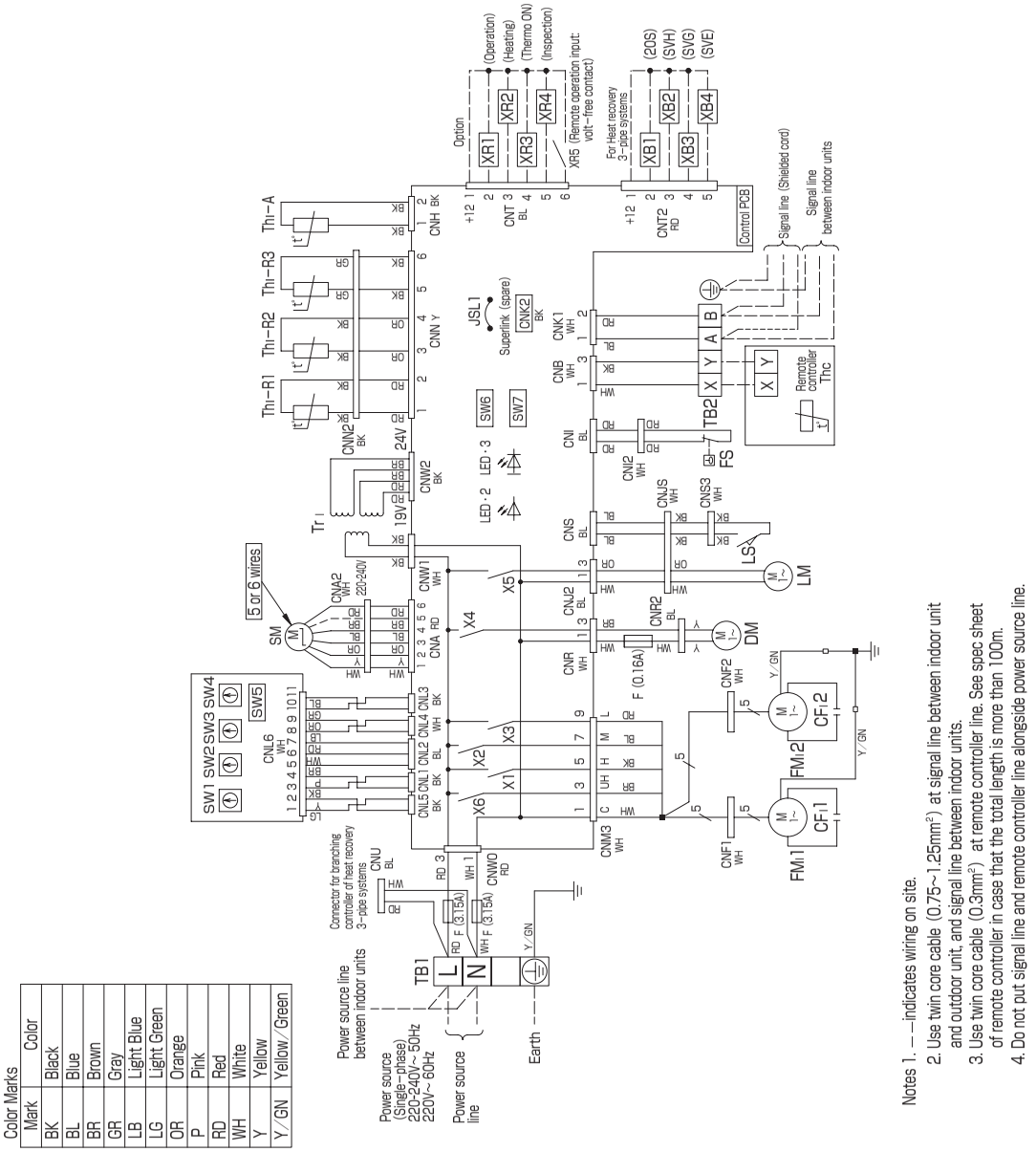
Mark	Color
BK	Black
BL	Blue
BR	Brown
GR	Gray
LB	Light Blue
LG	Light Green
OR	Orange
P	Pink
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green

Notes 1. —indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJC001Z195 A

Model FDTS71KXE6

CF1,2	Capacitor for FM1
CNA~Z	Connector
DM	Drain motor
F	Fuse
FM1,2	Fan motor (with thermos
FS	Float switch
JSL1	Live Superlink terminal se
LED : 2	Indication lamp (Green–M
LED : 3	Indication lamp (Red–Ins
LM	Louver motor
LS	Louver switch
SM	Stepping motor (for elec valve)
SW1	Indoor unit address: tens
SW2	Indoor unit address: ones
SW3	Outdoor unit address: ter
SW4	Outdoor unit address: on
SW5–1	Automatic adjustment / version of Superlink proto
SW5–2	Indoor unit address: hund
SW6	Model capacity setting
SW7–1	Operation check, Drain m
TB1	Terminal block (Power so
TB2	Terminal block (Signal lin
Thc	Thermistor (Remote con
Thi–A	Thermistor (Return air)
Thi–R1,2,3	Thermistor (Heat exchar
Tri	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
X5	Relay for LM
■mark	Closed–end connector



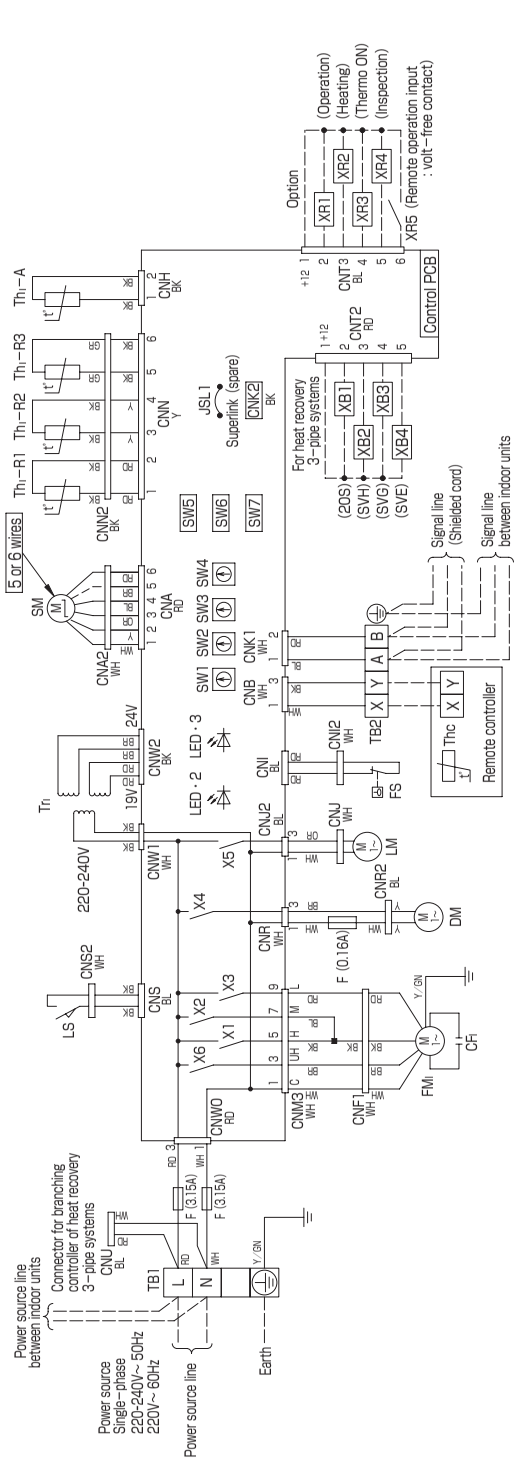
Notes 1. — indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJC001Z196 A

(e) Ceiling cassette-1 way compact type (FDTQ)

Models All models

• Direct blow panel



Notes
1. ——indicates wiring on site.
2. Use twin core cord (0.75~1.25mm^2) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cord (0.3mm^2) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

CFi	Capacitor for FMi
CNA~Z	Connector
DM	Drain motor
F	Fuse
FMi	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED · 2	Indication lamp (Green-Normal operation)
LED · 3	Indication lamp (Red-Inspection)
LM	Louver motor
LS	Louver switch

SM	Stepping motor (For electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5-1	Automatic adjustment / Fixed preivious version of Superlink protocol
SW5-2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7-1	Operation check, Drain motor test run

TB1	Terminal block (Power source) (□ mark)
TB2	Terminal block (Signal line) (□ mark)
Thc	Thermistor (Remote controller)
Thi-A	Thermistor (Return air)
Thi-R1,2,3	Thermistor (Heat exchanger)
Tr□	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
X5	Relay for LM
■mark	Closed-end connector

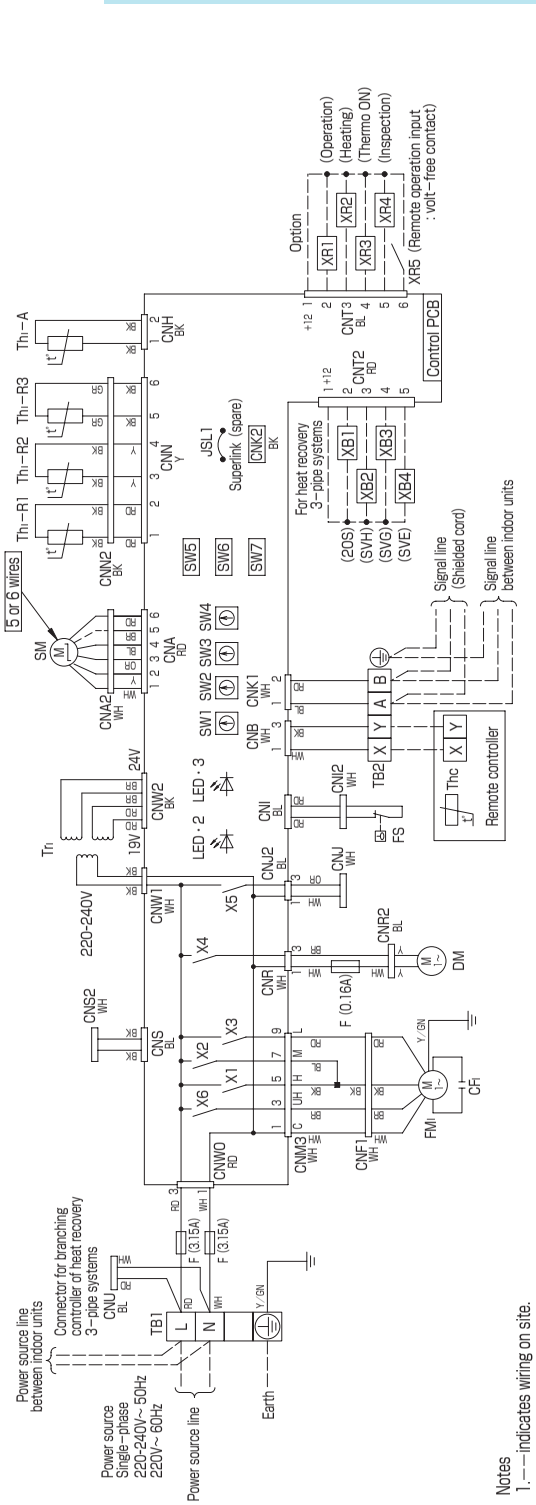
Color Marks

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

PJC001Z190 A

Models All models

- **Duct panel**



Notes
1. —— Indicates wiring on site.
2. Use twin core cord (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cord (0.3mm²) at remote controller line.
   See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

Color Marks

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

CFi	Capacitor for FMi
CNA~Z	Connector
DM	Drain motor
F	Fuse
FMi	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED · 2	Indication lamp (Green–Normal operation)
LED · 3	Indication lamp (Red–Inspection)

SM	Stepping motor (For electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5~1	Automatic adjustment/Fixed previous version of Superlink protocol
SW5~2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7~1	Operation check, Drain motor test run

TB1	Terminal block (Power source) (□ mark)
TB2	Terminal block (Signal line) (□ mark)
Thc	Thermistor (Remote controller)
Thi-A	Thermistor (Return air)
Thi-R1,2,3	Thermistor (Heat exchanger)
Tri	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
X5	Relay for LM
■ mark	Closed–end connector

Changing the fan tap

The factory setting of the fan tap is "Standard".
Change the fan tap to "High Speed 1" by using the function setting of the wired remote controller.

CATEGORY	NUMBER	FUNCTION	SETTING
1/U FUNCTION	02	FAN SPEED SET	HIGH SPEED 1

Invalidating the louver button

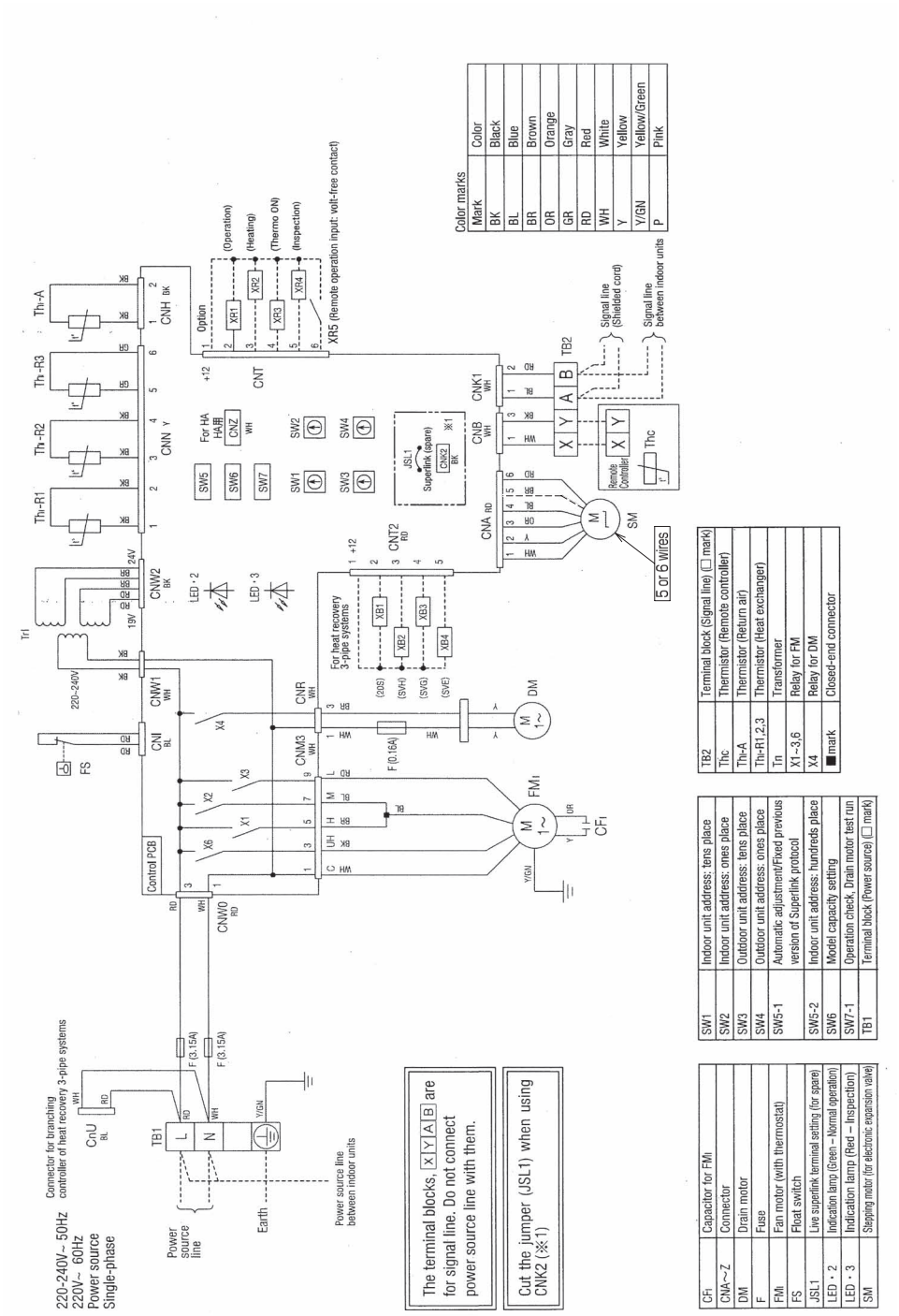
The factory setting of the louver button is "Valid".
Change the louver button to "Invalid" by using the function setting of the wired remote controller.

CATEGORY	NUMBER	FUNCTION	SETTI
FUNCTION (REMOTE CONTROLLER FUNCTION)	07	LOUVER SW	INVAI

PJC001Z240 A

(f) Duct connected-High static pressure type (FDU)

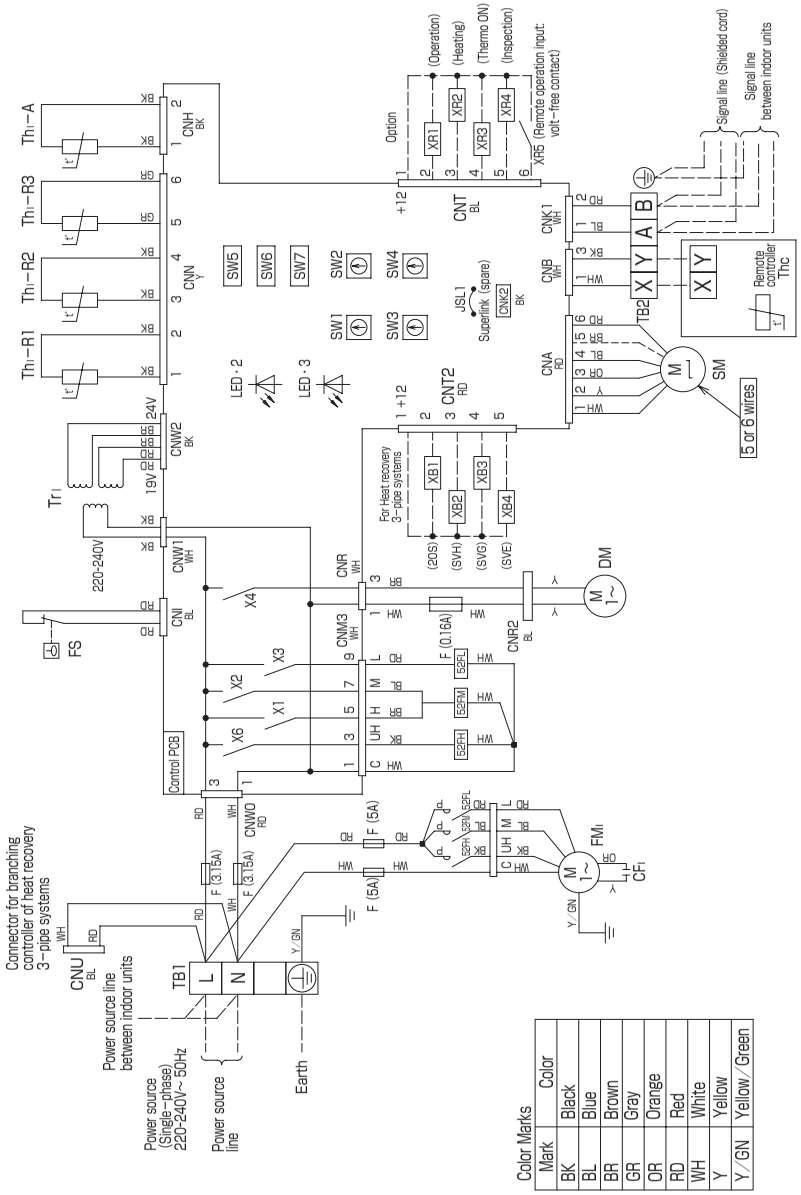
Models FDU71KXE6



Notes 1. — indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJD011G034

CFI	Capacitor for FMI
CNA~Z	Connector
DM	Drain motor
F	Fuse
FMI	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for
LED・2	Indication lamp (Green–Normal op
LED・3	Indication lamp (Red–Inspection)
SM	Stepping motor (for electronic exp valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5~1	Automatic adjustment / Fixed prev version of Superlink protocol
SW5~2	Indoor unit address: hundreds plac
SW6	Model capacity setting
SW7~1	Operation check, Drain motor test
TB1	Terminal block (Power source) (□
TB2	Terminal block (Signal line) (□ma
Thc	Thermistor (Remote controller)
Th I~A	Thermistor (Return air)
Th I~R1,2,3	Thermistor (Heat exchanger)
Tr I	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
■mark	Closed-end connector
52FL,FM,FH	Electromagnetic contactor for FM



Color Marks

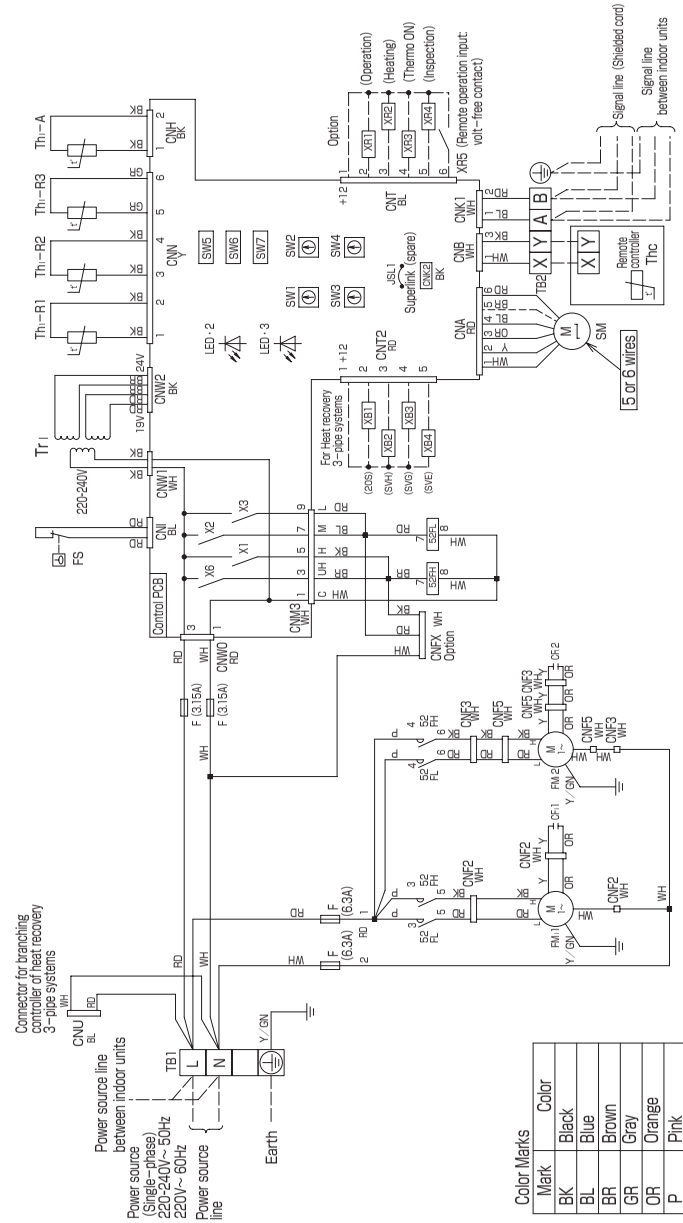
Mark	Color
BK	Black
BL	Blue
BR	Brown
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green

Notes 1. —indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJD001Z229 B

Models FDU224KXE6, 280KXE6

CF1,2	Capacitor for FM
CNA~Z	Connector
F	Fuse
FM1,2	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED・2	Indication lamp (Green-Normal operation)
LED・3	Indication lamp (Red-Inspection)
SM	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5-1	Automatic adjustment / Fixed previous version of Superlink protocol
SW5-2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7-1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote controller)
Th1-A	Thermistor (Return air)
Th1-R1,2,3	Thermistor (Heat exchanger)
Tr1	Transformer
X1-3,6	Relay for FM
■mark	Closed-end connector
52FL,FH	Electromagnetic contactor for FM



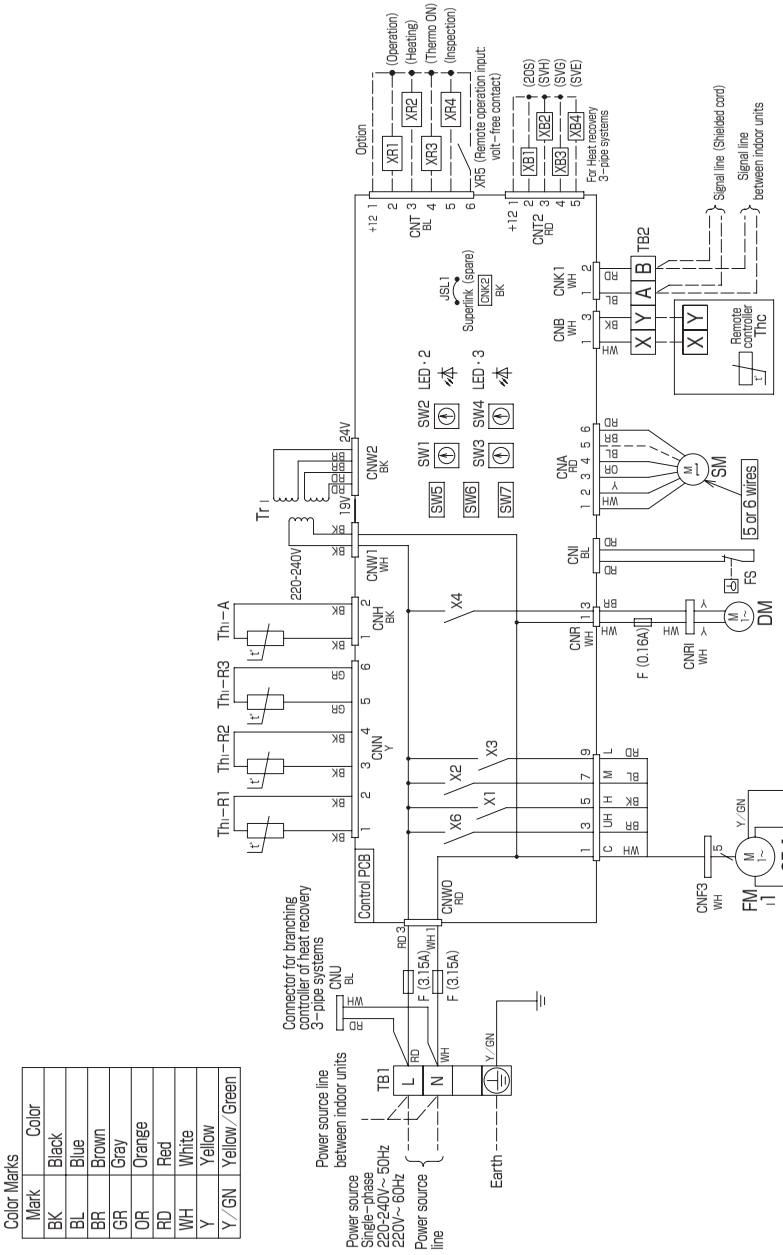
Notes 1. —indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJD001Z230 B

(g) Duct connected-Middle static pressure type (FDUM)

Models FDUM22KXE6, 28KXE6, 36KXE6, 45KXE6, 56KXE6, 71KXE6, 90KXE6

CF1	Capacitor for FM1
CNA~Z	Connector
DM	Drain motor
F	Fuse
FM1	Fan motor (with thermos
FS	Float switch
JSL1	Live Superlink terminal se (for spare)
LED・2	Indication lamp (Green−Normal operatio
LED・3	Indication lamp (Red−Ins
SM	Stepping motor (for electronic expansion
SW1	Indoor unit address: tens
SW2	Indoor unit address: ones
SW3	Outdoor unit address: ten
SW4	Outdoor unit address: one
SW5−1	Automatic adjustment./F previous version of Superlir
SW5−2	Indoor unit address: hundr
SW6	Model capacity setting
SW7−1	Operation check, Drain mo test run
TB1	Terminal block (Power so (□mark)
TB2	Terminal block (Signal line
Thc	Thermistor (Remote cont
Th1−A	Thermistor (Return air)
Th1−R1,2,3	Thermistor (Heat exchan
Tr1	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
■mark	Closed−end connector



Notes 1. — indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJR002Z258 B

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

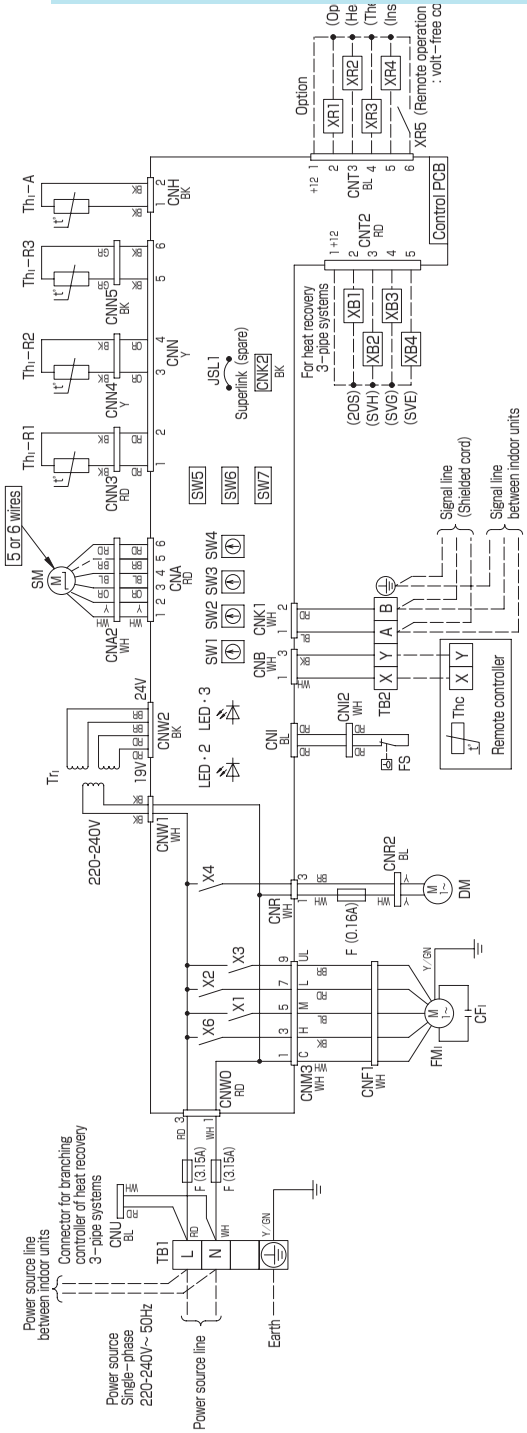
CF i1,2	Capacitor for FM i
CNA~Z	Connector
DM	Drain motor
F	Fuse
FM i1,2	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED・2	Indication lamp (Green-Normal operation)
LED・3	Indication lamp (Red-Inspection)
SM	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5-1	Automatic adjustment/Fixed previous version of Superlink protocol
SW5-2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7-1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote controller)
Thi-A	Thermistor (Return air)
Thi-R1,2,3	Thermistor (Heat exchanger)
Tri	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
■mark	Closed-end connector

Notes 1. — —indicates wiring on site.
2. Use twin core cable (0.75~1.25mm^2) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm^2) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PJR002Z259 B

(h) Duct connected (Ultra thin)-Low static pressure type (FDQS)

Models All models



Notes
1. —— indicates wiring on site.
2. Use twin core cord (0.75~1.25mm^2) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cord (0.3mm^2) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

CF1	Capacitor for FM1
CNA~Z	Connector
DM	Drain motor
F	Fuse
FM1	Fan motor (with thermostat)
FS	Float switch
JSL1	Live Superlink terminal setting (for spare)
LED · 2	Indication lamp (Green-Normal operation)
LED · 3	Indication lamp (Red-Inspection)

SM	Stepping motor (For electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5-1	Automatic adjustment / Fixed previous version of Superlink protocol
SW5-2	Indoor unit address: hundreds place
SW6	Model capacity setting

SW7-1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□ mark)
TB2	Terminal block (Signal line) (□ mark)
Thc	Thermistor (Remote controller)
Th1-A	Thermistor (Return air)
Th1-R1,2,3	Thermistor (Heat exchanger)
Tr1	Transformer
X1~3,6	Relay for FM
X4	Relay for DM

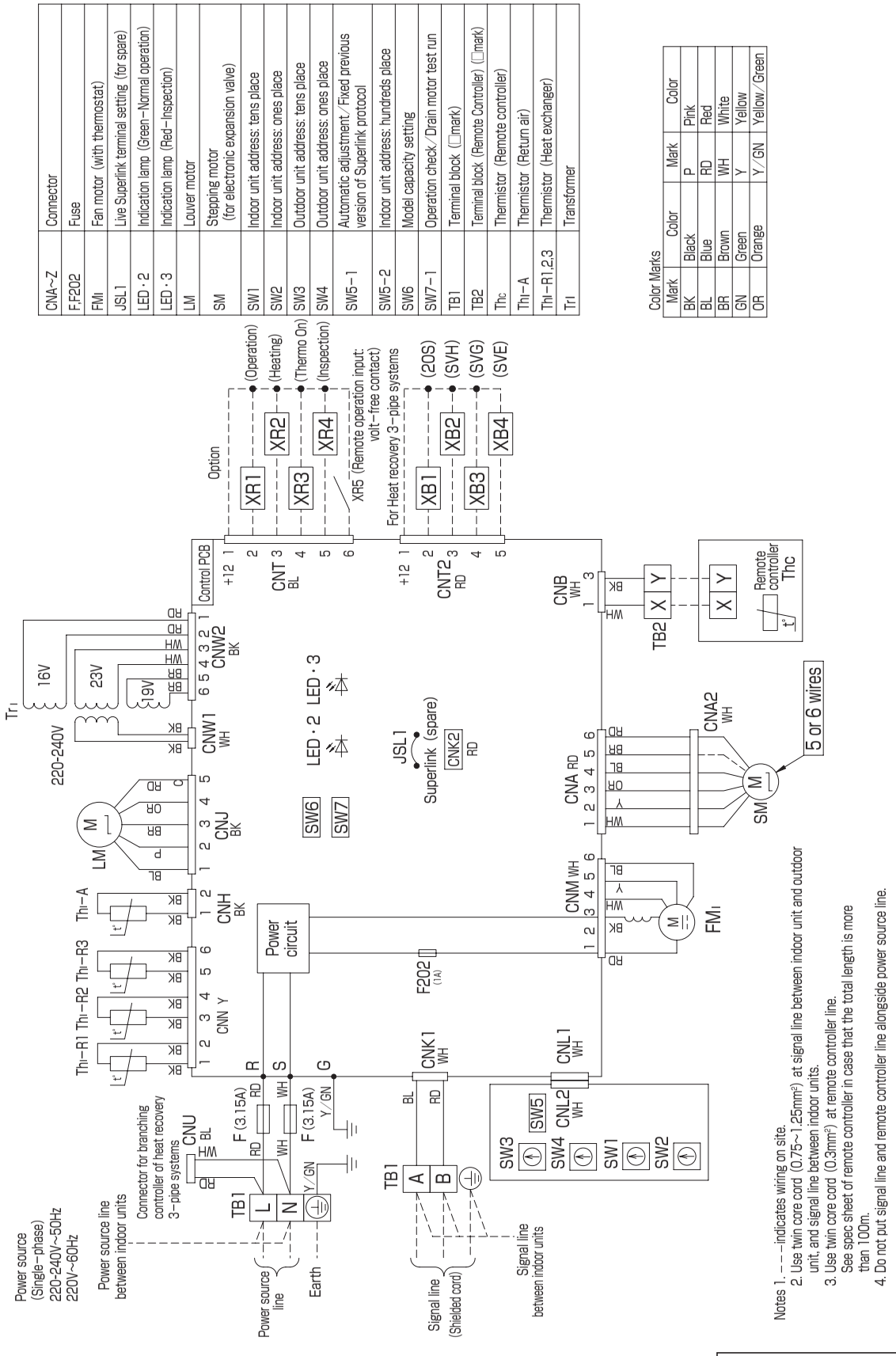
Color Marks

Mark	Color	Mark	Color
BK	Black	RD	Red
BL	Blue	WH	White
BR	Brown	Y	Yellow
GR	Gray	Y/GN	Yellow/Gre
OR	Orange		

PJC001Z200

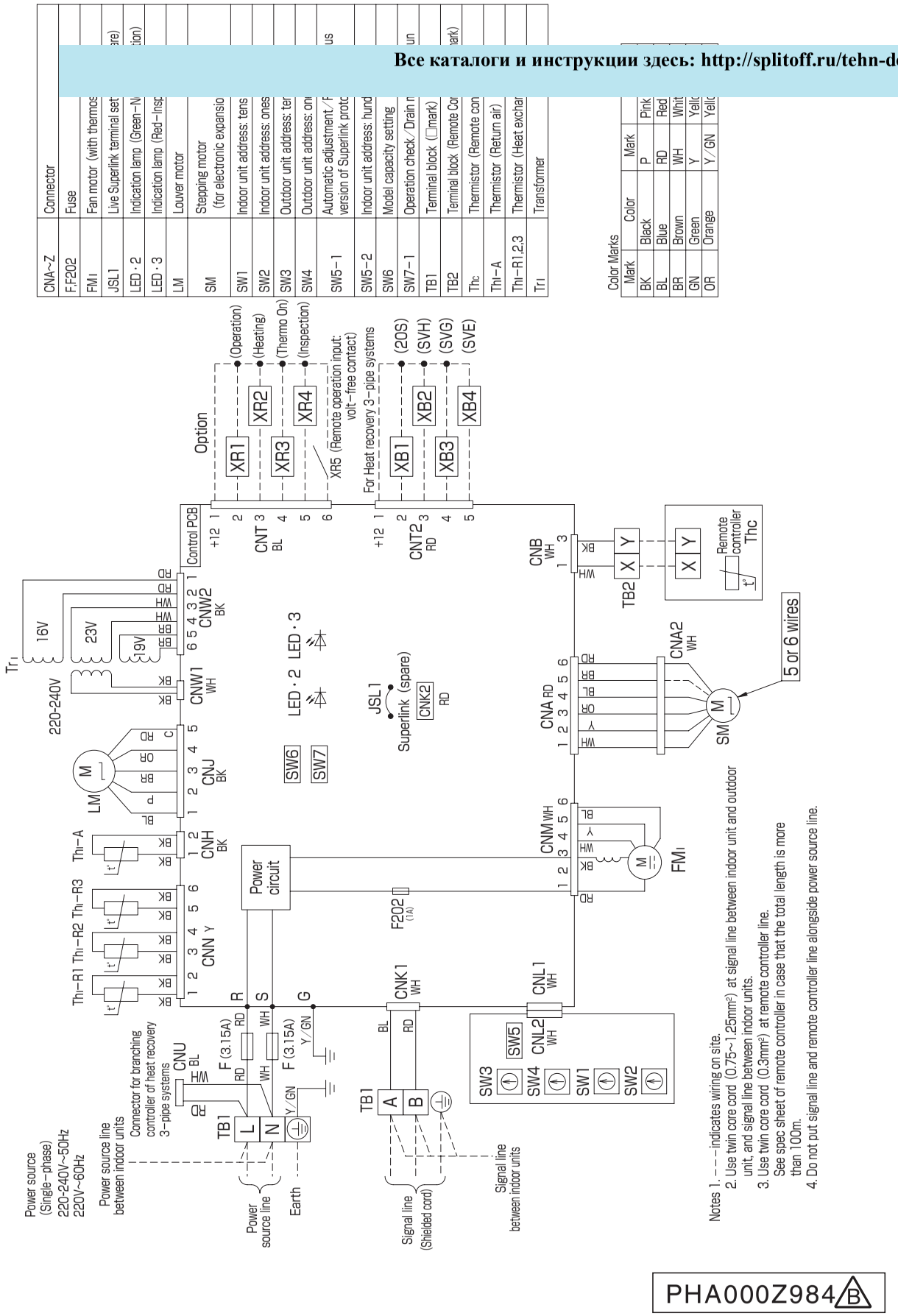
(i) Wall mounted type (FDK)

Models FDK22KXE6, 28KXE6, 36KXE6, 45KXE6, 56KXE6



PHA000Z983 B

Models FDK71KXE6

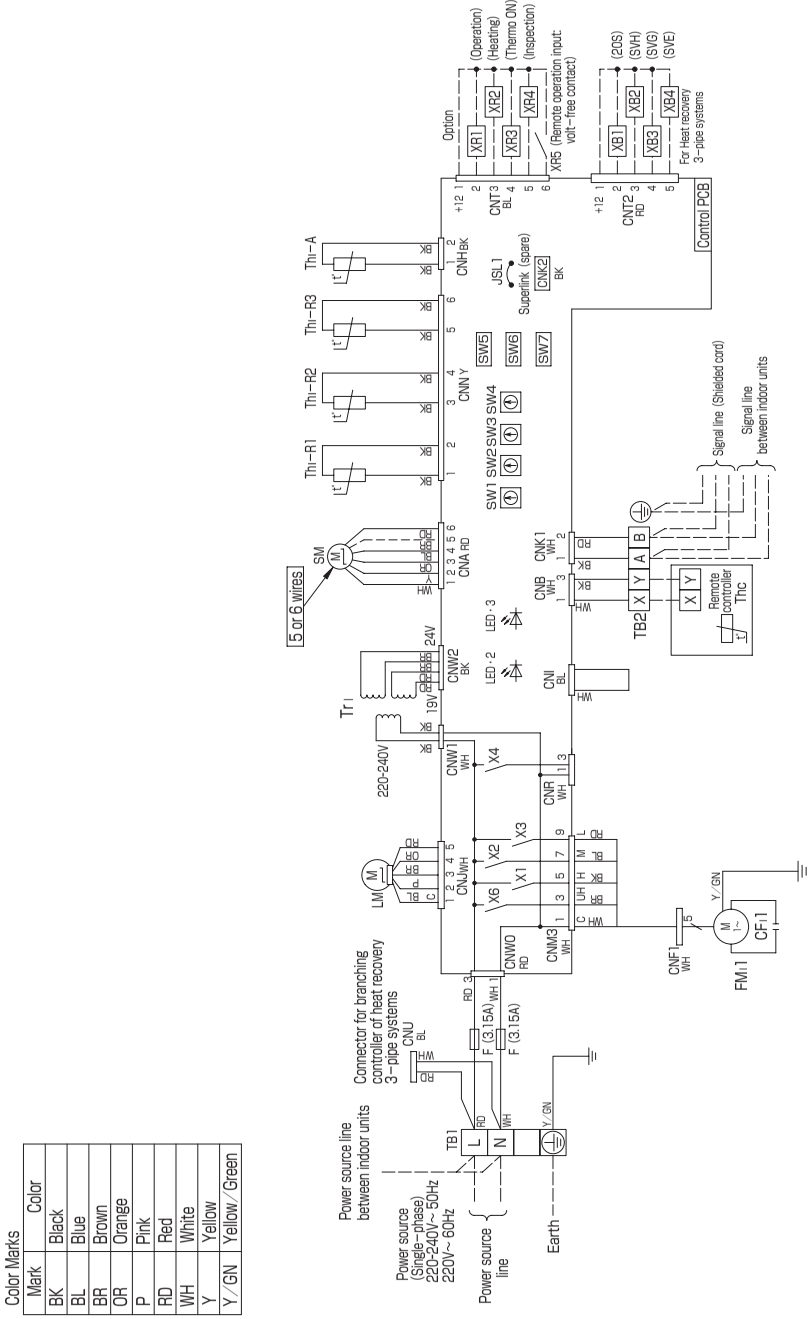


PHA000Z984 B

(j) Ceiling suspended type (FDE)

Models FDE36KXE6A, 45KXE6A, 56KXE6A

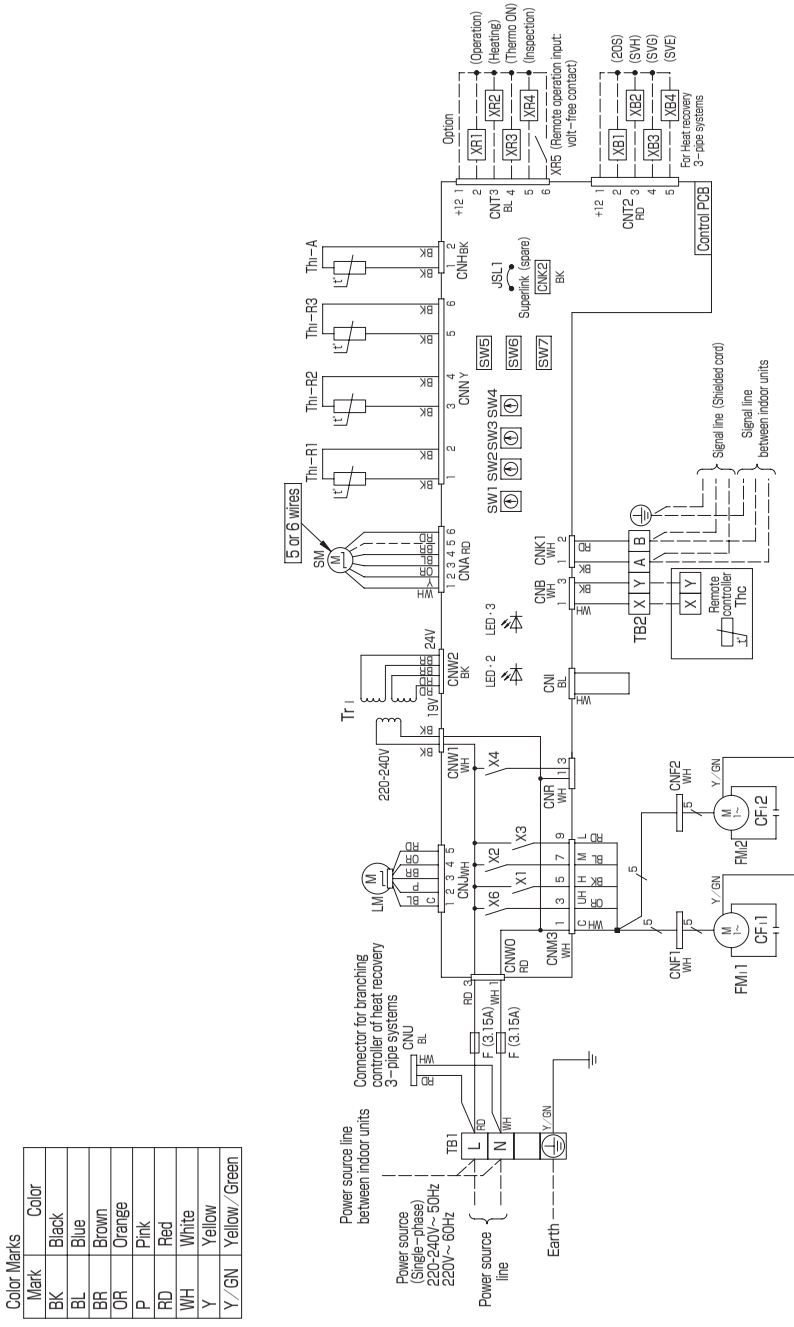
CF1,2	Capacitor for FM1
CNA~Z	Connector
F	Fuse
FM1,2	Fan motor (with thermostat)
JSL1	Live Superlink terminal setting (for spare)
LED・2	Indication lamp (Green–Normal operation)
LED・3	Indication lamp (Red–Inspection)
LM	Louver motor
SM	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5~1	Automatic adjustment / Fixed previous version of Superlink protocol
SW5~2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7~1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote controller)
Th1~A	Thermistor (Return air)
Th1~R1,2,3	Thermistor (Heat exchanger)
Tr1	Transformer
X1~3,6	Relay for FM
X4	Relay for DM



PFA003Z826 B

Models FDE71KXE6A, 112KXE6A, 140KXE6A

CF1,2	Capacitor for FM1
CNA~Z	Connector
F	Fuse
FM1,2	Fan motor (with t
JSL1	Live Superlink terr setting (for spare)
LED・2	Indication lamp (Green−Normal o
LED・3	Indication lamp (Red−Inspection)
LM	Louver motor
SM	Stepping motor (for electronic exp e)
SW1	Indoor unit address e
SW2	Indoor unit address e
SW3	Outdoor unit addre ce
SW4	Outdoor unit addre ce
SW5−1	Automatic adjustn previous version of S tocol
SW5−2	Indoor unit address hundreds place
SW6	Model capacity se
SW7−1	Operation check, L test run
TB1	Terminal block (Pc (mark))
TB2	Terminal block (Si (mark) r)
Thc	Thermistor (Remo
TH−A	Thermistor (Return
TH−R1,2,3	Thermistor (Heat)
Tr1	Transformer
X1~3,6	Relay for FM
X4	Relay for DM
■mark	Closed−end conne



Color Marks

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

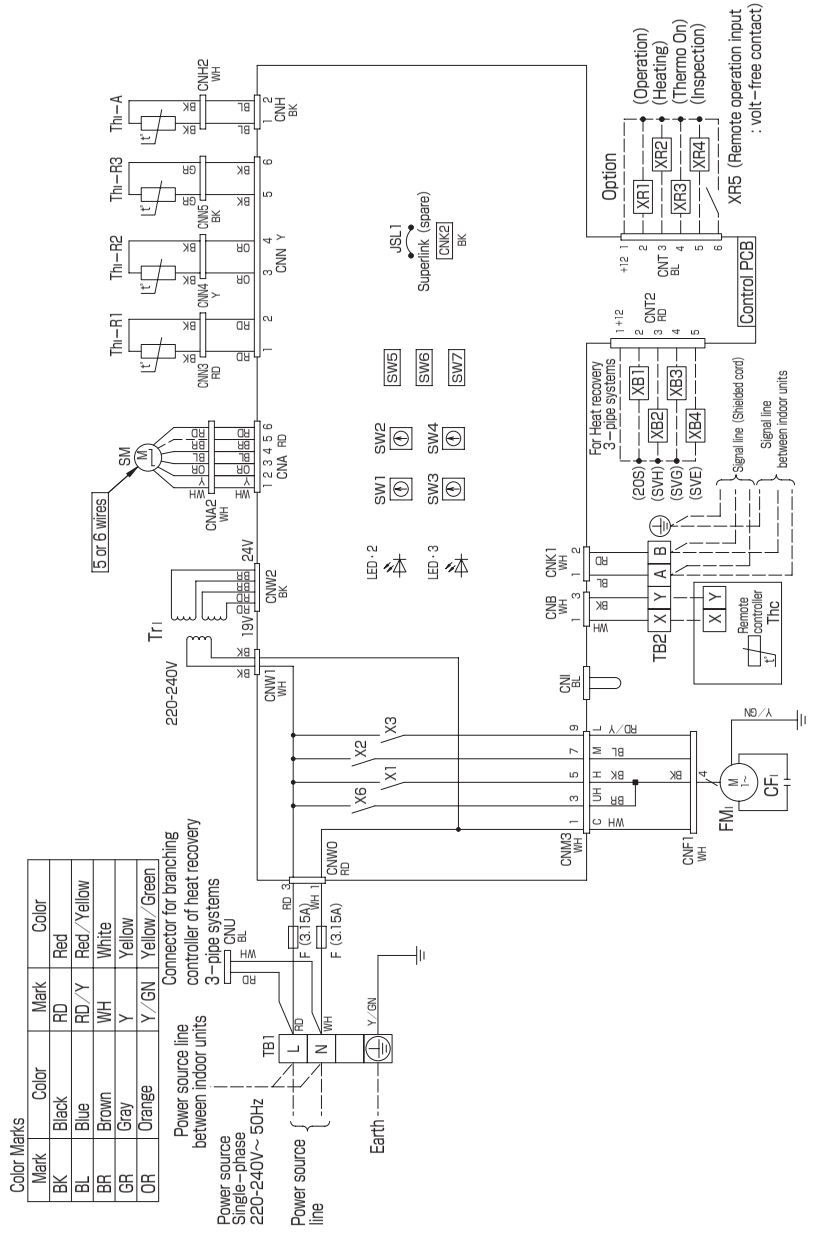
Notes 1. — — indicates wiring on site.
2. Use twin core cable (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cable (0.3mm²) at remote controller. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PFA003Z827 B

(k) Floor standing (with casing) type (FDFL)

Models All models

CF1	Capacitor for FM1
CNA~Z	Connector
F	Fuse
FM1	Fan motor (with thermostat)
JSL1	Live Superlink terminal setting (for spare)
LED · 2	Indication lamp (Green–Normal operation)
LED · 3	Indication lamp (Red–Inspection)
SM	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place
SW2	Indoor unit address: ones place
SW3	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place
SW5–1	Automatic adjustment/Fixed previous version of Superlink protocol
SW5–2	Indoor unit address: hundreds place
SW6	Model capacity setting
SW7–1	Operation check, Drain motor test run
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Thermistor (Remote controller)
Th1–A	Thermistor (Return air)
Th1–R1,2,3	Thermistor (Heat exchanger)
Tr1	Transformer
X1~3,6	Relay for FM
■mark	Closed–end connector

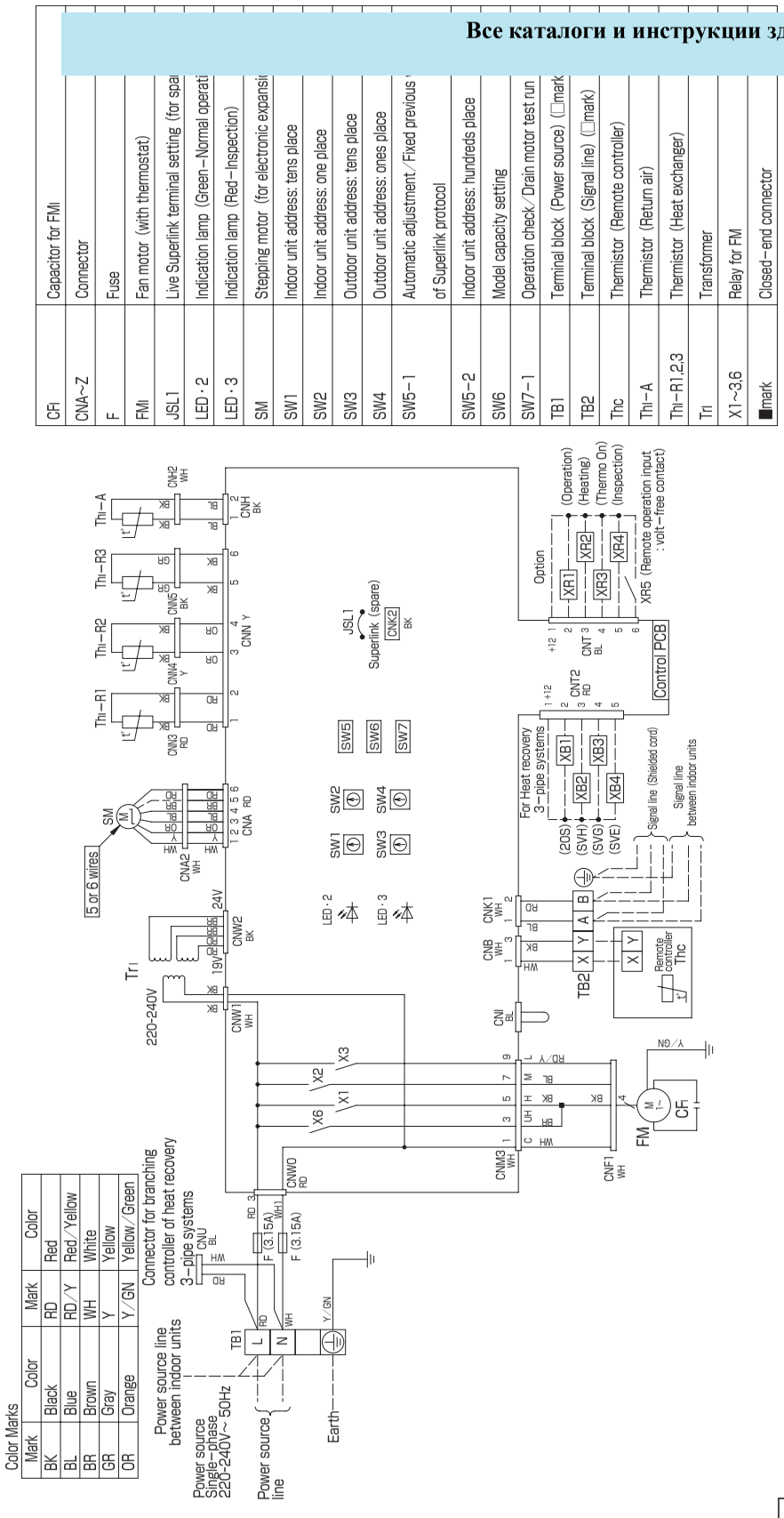


Notes 1. —— indicates wiring on site.
2. Use twin core cord (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cord (0.3mm²) at remote controller line. See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PGD000Z053B

(I) Floor standing (without casing) type (FDFU)

Models All models

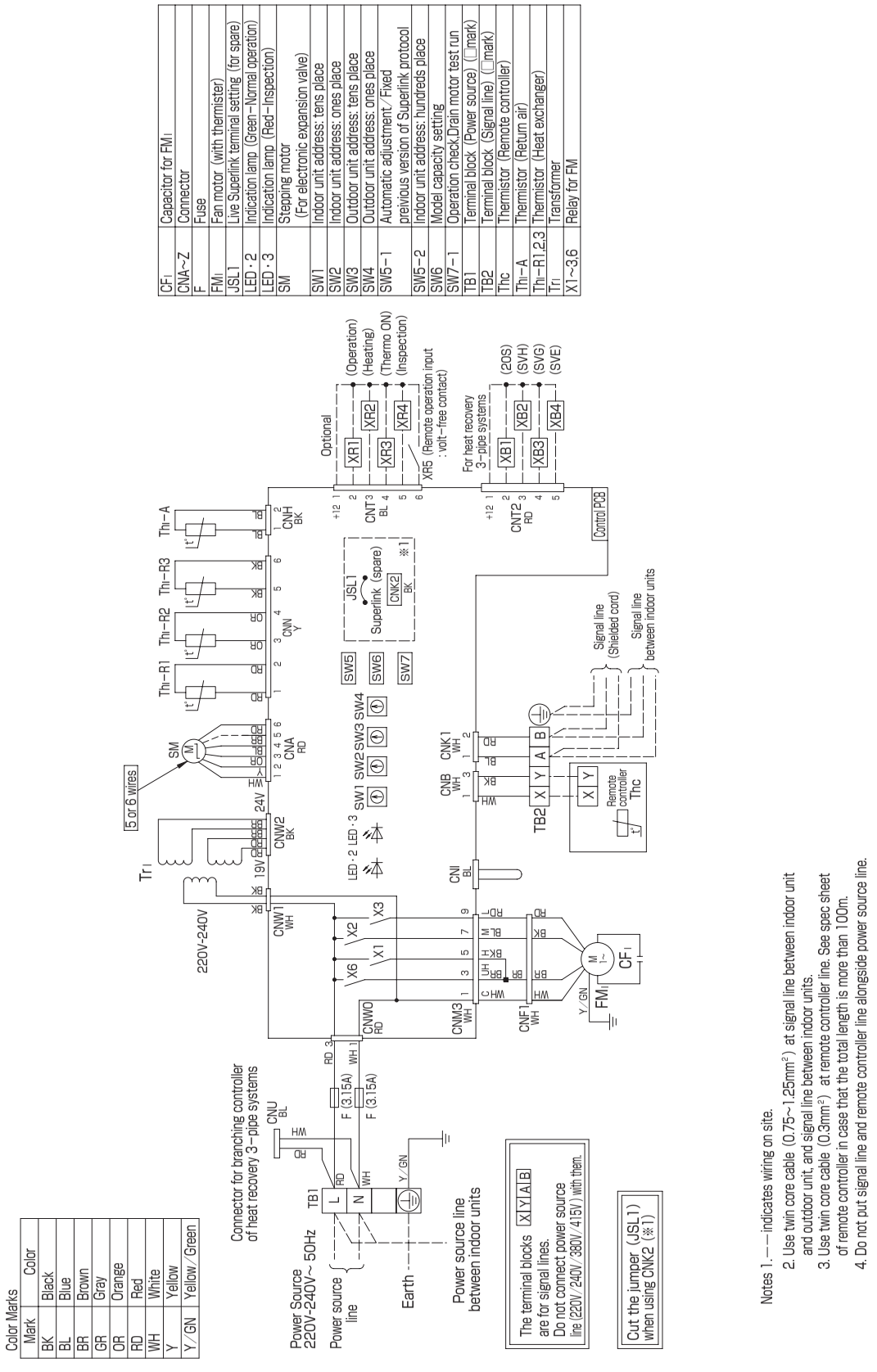


Notes 1. — indicates wiring on site
2. Use twin core cord (0.75~1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Use twin core cord (0.3mm²) at remote controller line.
See spec sheet of remote controller in case that the total length is more than 100m.
4. Do not put signal line and remote controller line alongside power source line.

PGD000Z058 A

(m) Duct Connected-Compact and Flexible type (FDUH)

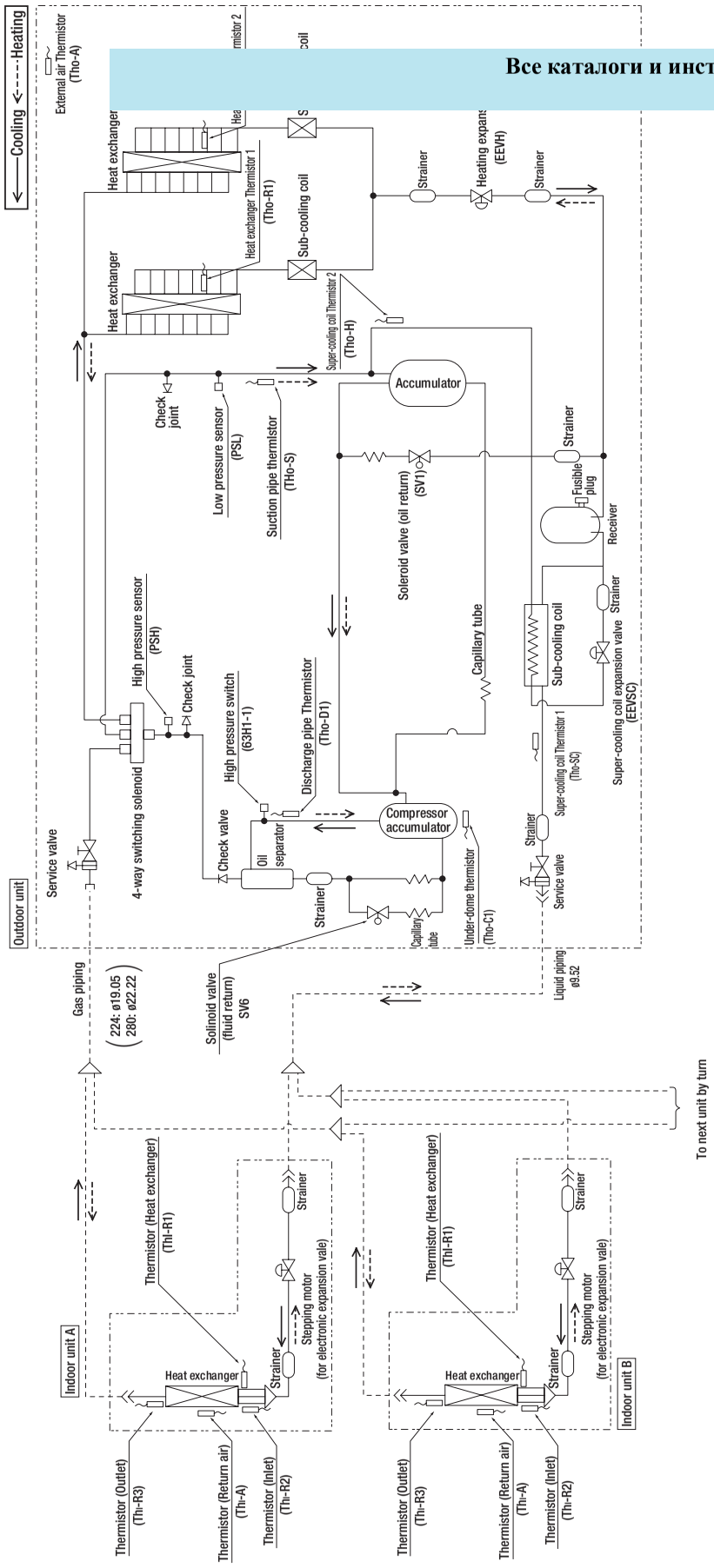
Models All models



PJC001Z255 A

4. PIPING SYSTEM

Models FDC224KXE6, 280KXE6



■Function of thermistor

Low pressure sensor (PSL)	Thermistor (Tho-D1)	: For control of discharge pipe temperature
	Thermistor (Tho-A)	: For heating and cooling to low outdoor temp., fo
	Thermistor (Tho-R1, R2)	: For control of defrosting
	Thermistor (Tho-S)	: For control of suction pipe temperature
High pressure sensor (PSH)	Thermistor (Tho-SC)	: Sub-cooling coil control during cooling
	Thermistor (Tho-H)	: Sub-cooling coil control during cooling
	Thermistor (Tho-C1)	: Under-dome temperature control

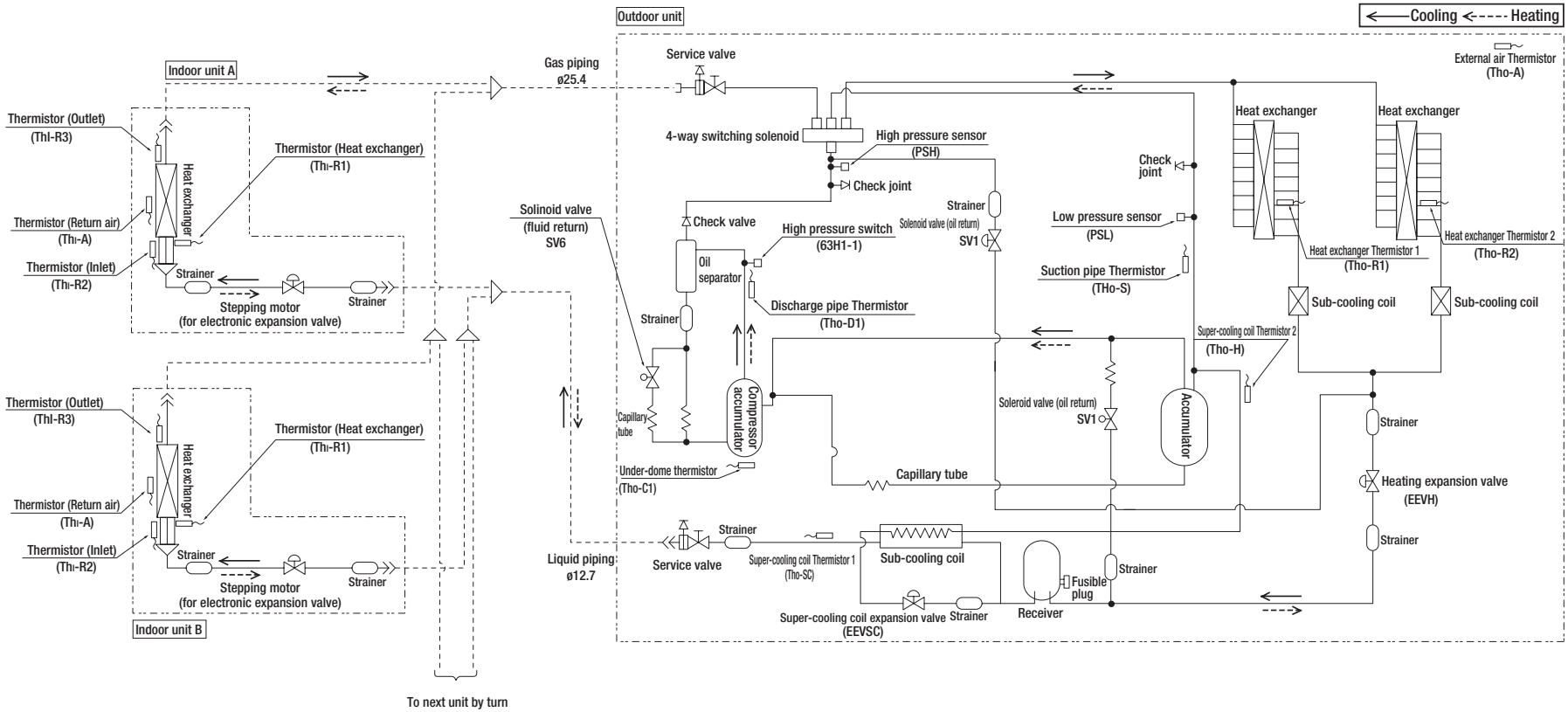
Compressor control	Protection	0.18 ON/0.236 OFF (MPa)
	Error	0.134 ON/0.18 OFF (MPa)
Compressor control	Protection	Cooling : 3.70 ON (MPa)
		Heating : 3.00 ON (MPa)
Thermistor (Thl-R1,R2)	: Heating operation : Indoor fan control	
	Cooling operation : Frost prevention	
		Superheat control
Thermistor (Thl-R3)	: Cooling superheat control	

■Pressure switch setting value

Name	Setting value
High pressure switch (63H1-1) [For protection]	4.15 open/3.15 close (MPa)

■Solenoid valve operation

Name	Control content	
SV6	At inverter accumulator start	: Open
	During under-dome temperature control	: Open
SV1	During discharge temperature control	: Open



■Pressure switch setting value

Name	Setting value
High pressure switch ($63H_{1-1}$) [For protection]	4.15 open/3.15 close (MPa)

■Solenoid valve operation

Name	Control content	
SV6	At inverter accumulator start	: Open
	During under-dome temperature control	: Open
SV1	During discharge temperature control	: Open

■Function of thermistor

Low pressure sensor (PSL) : Compressor control
Protection
0.18 ON/0.236 OFF (MPa)
Error
0.134 ON/0.18 OFF (MPa)

High pressure sensor (PSH) : Compressor control
Protection
Cooling : 3.70 ON (MPa)
Heating : 3.00 ON (MPa)

Thermistor (Thı-R1,R2) : Heating operation : Indoor fan control
Cooling operation : Frost prevention
Superheat control

Thermistor (Thı-R3) : Cooling superheat control

Thermistor (Tho-D1) : For control of discharge pipe temperature

Thermistor (Tho-A) : For heating and cooling to low outdoor temp., for control of defrosting

Thermistor (Tho-R1,R2) : For control of defrosting

Thermistor (Tho-S) : For control of suction pipe temperature

Thermistor (Tho-SC) : Sub-cooling coil control during cooling

Thermistor (Tho-H) : Sub-cooling coil control during cooling

Thermistor (Tho-C1) : Under-dome temperature control

5 APPLICACTION DATA

5.1 Installation of indoor unit

This manual is for the installation of an indoor unit.
For electrical wiring work (Indoor), refer to the electrical wiring work installation manual. For remote controller installation, refer to the installation manual attached to a remote controller. For wireless kit installation, refer to the installation manual attached to a wireless kit. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to the installation manual attached to an outdoor unit.
This unit must 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, ⚠WARNING and ⚠CAUTION .
  ⚠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.
- 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.
- **Consider measurement not to exceed the limit of the density of refrigerant in the event of leakage especially when it is installed in a small room.**
  Consult the specialist about the measure. If the density of refrigerant exceeds the limit in the event of the leakage, serious accidents may occur due to lack of oxygen.
- **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 accidents.
- **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 injuries.
- **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.
- **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.
- **Make sure there is no dust or clogging on both the plug and the socket nor loose connection of the socket before plugging, and plug in securely to the end of the blade.**
  Accumulation of dust, clogging on the socket or plug, or loose installation of the socket could cause electric shock and fire. Replace the socket if it is loose.
- **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 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.
- **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.
- **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.
- **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 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.
- **Use the circuit breaker of correct capacity.**
  Using the incorrect capacity 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 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.
- **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 jamming.
- **Do not install the remote controller at the direct sunlight.**
  It could cause breakdown or deformation of the remote controller.
- **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 or alkali.
  - 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 are 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 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 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.**
  Improper connection of the drain pipe may cause dropping water into room and damaging user's belongings.
- **Do not put the drain pipe directly into the ditch where toxic gas such as sulfide gas is generated.**
  Toxic gas would flow into the room and it would cause serious damage to user's health and safety.
- **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.
- **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 maintenance.
- **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 user to keep the surroundings clean.
- **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.**
  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 or frostbite.
- **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.
- **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.

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

PJA012D007 b

①Before installation

●Install correctly according to the installation manual.

●Confirm the following points:

○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For unit 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
								
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

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 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 controller and the air conditioner might not work properly.)

②Check 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.

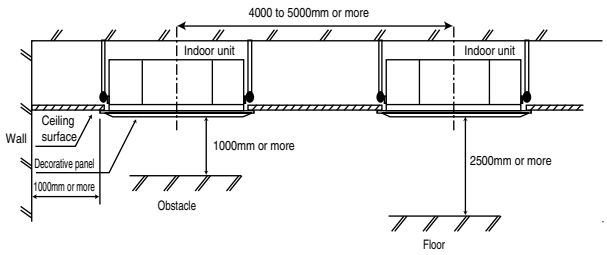
③If there are 2 units of wireless type, keep them away for more than 6m to avoid malfunction due to cross communication.

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.



Set blow-out pattern

●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. (sold as accessory)

●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 tne user's manual for details.

③Preparation before installation

●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

○For grid ceiling

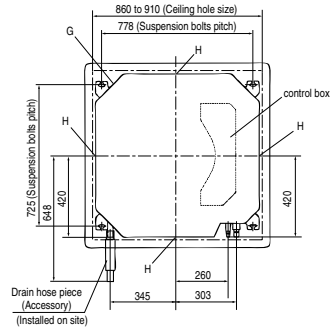
When suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

○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 or M8) on site.

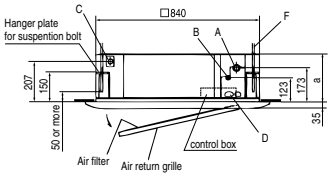
Ceiling opening, Suspension bolts pitch, Pipe position

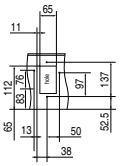


(mm)

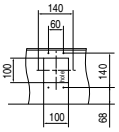
Series	Type	a
Single Split (PAC) series	40 to 71 type	246
	100 to 140 type	298
VRF (KX) series	28 to 71 type	246
	90 to 160 type	298

Symbol	
A	Gas piping
B	Liquid piping
C	Drain piping
D	Hole for wiring
F	Suspension bolts
G	Outside air opening for ducting
H	Air outlet opening for ducting





G

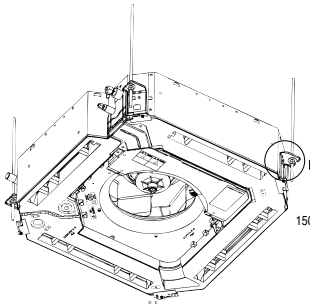


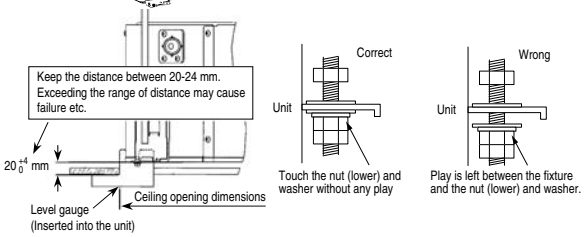
H

④Installation of indoor unit

Work procedure

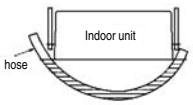
1. Prepare a ceiling hole with the size of from 860mm × 860mm to 910mm × 910mm referring to the template attached in the package.
2. Arrange the suspension bolt at the right position (725mm×778mm).
3. Make sure to use four suspension bolts and fix them so as to be able to hold 500N load.
4. Ensure that 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.
5. 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.





④Installation of indoor unit (continued)

6. 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 unit.

⑤Refrigerant pipe

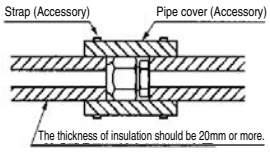
Caution

- ●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 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

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



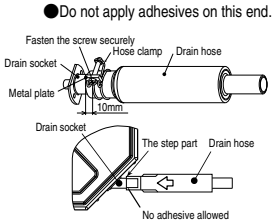
⑥Drain pipe

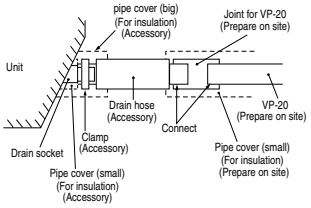
Caution

- ● 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.

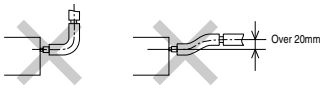
Work procedure

1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
   ●Do not apply adhesives on this end.

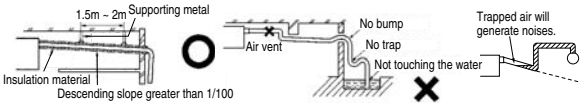




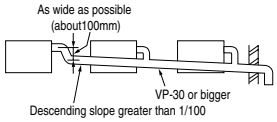
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   ● Make sure that the adhesive will not get into 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.
   Do not bend or make an excess offset on the drain hose as shown in the picture.
   Bend or excess offset will cause drain 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 not set up air vent.



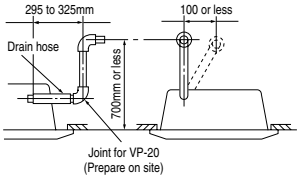
●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

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.

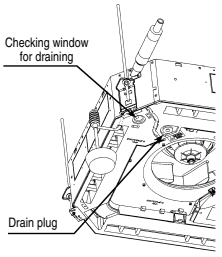


⑥Drain pipe (continued)

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. Pour water of about 1000cc into the drain pan in the indoor unit by pump so as not to get the electrical component wet.
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.
3. 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

○In case electrical wiring work finished

Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

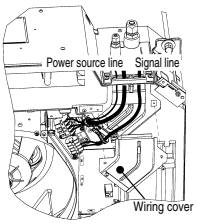
○In case electrical wiring work not finished

Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector 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.

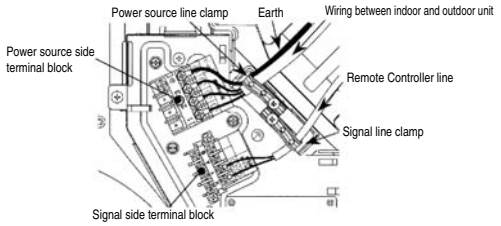
⑦Wiring-out position and wiring connection

- 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.

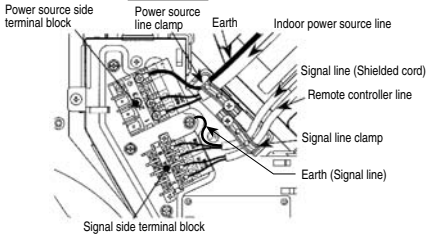
1. Remove a lid of the control box (3 screws) and the wiring cover (2 screws).
2. Hold each wiring inside the unit and fasten them to terminal block securely.
3. Fix the wiring with clamps.
4. Install the removed parts back to original place.



Single Split (PAC) series



VRF (KX) series



⑧Panel installation

- Attach the panel on the indoor unit after electrical wiring work.
- Refer to panel installation manual for details. (See next page)

⑨Check list after installation

- Check the following items after all installation work completed.

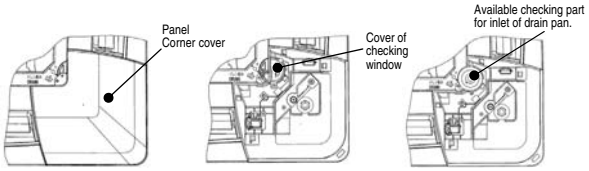
Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Supply voltage is same as mentioned in the model 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	

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

The method of checking the dirt of drain pan

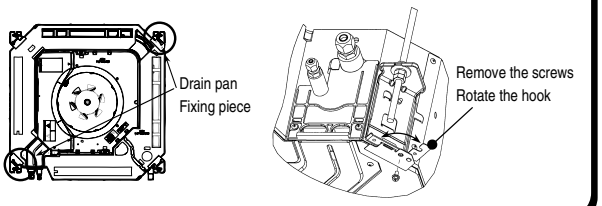
- It is possible to check the dirt for inlet of drain pan without detaching the panel.
  (Inspection is not possible when the high efficient filter and option spacer is installed.)

1. Open the air return grille and remove the panel corner cover on drain pan side.
2. Remove the cover of inspection window. (1screw)
3. Check the drain pan from the inspection window.
   If the drain pan is very dirty, remove the drain pan and clean it.
4. 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 leakage.



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

PJF012D003

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.**

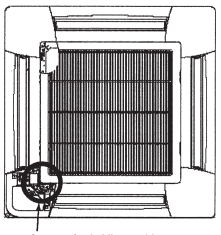
① Before installation

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

Accessories

Bolt	4 pieces	For panel installation
Strap	4 pieces	For avoiding the corner panel from falling

Note: Accessories are laid in the position removing the corner panel.



Accessories holding position

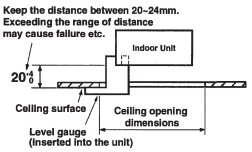
② Checking the indoor unit installation position

- 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.

Caution

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.

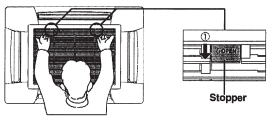
- The installation level of the indoor unit can be adjusted finely from the opening on the corner, even after panel is attached. (Refer to ⑥ Attaching the panel for details.)



③ Removing the air return grille

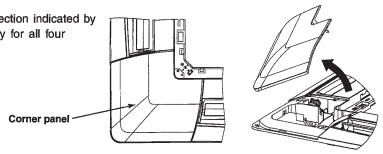
<Removal>

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



④ 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)



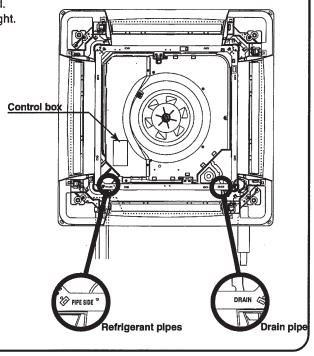
⑤ Orientation of the panel installation

Take note that there is an orientation to install the panel.

- Attach the panel with the orientation shown on the right.
- Align the "PIPE SIDE" mark (on the panel) with the refrigerant pipes on the indoor unit.
- Align the "DRAIN" mark (on the panel) with the drain pipe on the indoor unit.

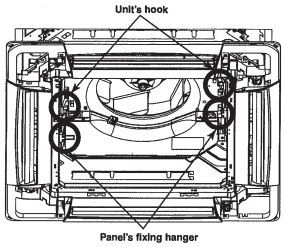
CAUTION

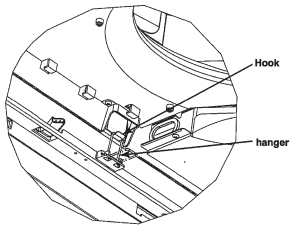
In case the orientation of the panel is not correct, it will lead to air leakage and also it is not possible to connect the louver motor wiring.



⑥ Attaching the panel

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

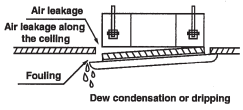


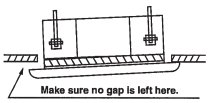


2. Fix the panel on the indoor unit
   - Fasten the panel on the indoor unit with the four bolts supplied with the panel.

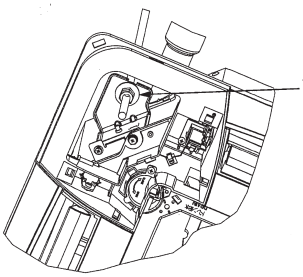
Caution

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

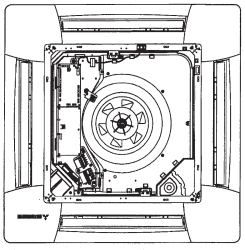


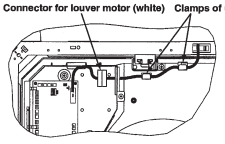
Caution

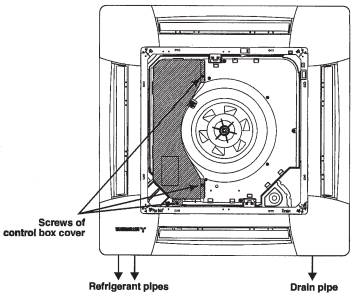
Make sure there is no stress given on the panel when adjusting the height of the indoor unit to avoid unexpected distortion. It may cause the distortion of panel or failing to close the air return grille.

⑦ 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.

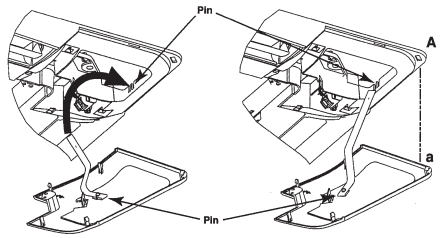






⑧ Attaching a corner panel

1. To avoid unexpected falling of the corner panel, put the strap onto the corner panel's pin with turning the strap up.
2. Then hang the strap of a corner panel onto the decorative panel's pin.
3. First insert the part "a" of a corner panel into the part "A" of the decorative panel, and then engage four hooks.



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 controller. 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.

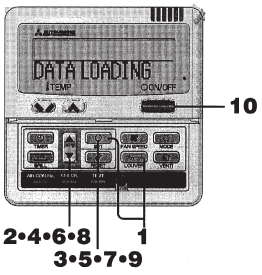
1 Stop the air conditioner and press SET button and LOUVER button simultaneously for three seconds or more.

The following is displayed if the number of the indoor units connected to the remote controller is enGo to step 4.

"DATA LOADING "
↓
"No.1 ▲"

The following is displayed if the number of the indoor units connected to the remote controller are more than one

"SELECT I/U "
↓
"I/U000 ▲"



2 Press ▲ or ▼ button.(selection of indoor unit)

Select the indoor unit of which the louver is set.

[EXAMPLE]
I/U000 ▲"⇔"I/U001 ⇕"⇔"I/U002 ⇕"⇔
"I/U003 ⇕"

3 Press SET button. (determination of indoor unit)

Selected indoor unit is fixed.

[EXAMPLE]
"I/U001 " (displayed for two seconds)
↓
"DATA LOADING "
↓
"No.1 ▲"

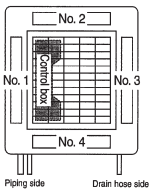
NOTICE

- For FDT type, in case the louver No to be set is uncertain, set any louver temporarily. The louver will swing once when the setting is completed and it is possible to confirm the louver No and the position. After that, choose the correct louver No and set the top and bottom position.

4 Press ▲ or ▼ button. (selection of louver No.)

Select the louver No. to be set according to the right figure.

[EXAMPLE]
"No.1 ▲" ⇔ "No.2 ⇕" ⇔ "No.3 ⇕" ⇔
"No.4 ▼"



Louver No.

5 Press SET button. (Determination of louver No.)

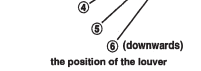
The louver No. to be set is confirmed and the display shows the upper limit of the movable range.

[EXAMPLE] If No.1 louver is selected,
"No.1 UPPER2 ⇕" ←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 setting, use "position --".

"No.1 UPPER1 ▼" (the most horizontal)
⇔ "No.1 UPPER2 ⇕"
⇔ "No.1 UPPER3 ⇕"
⇔ "No.1 UPPER4 ⇕"
⇔ "No.1 UPPER5 ⇕"
⇔ "No.1 UPPER6 ▲" (the most downwards)
⇔ "No.1 UPPER-- ▲" (return to the default setting)



the position of the louver

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 UPPER2 (displayed for two seconds)
↓
No.1 LOWER5 ⇕ (shows current setting)

8 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 --".

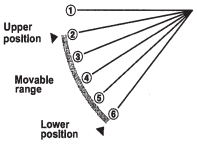
No.1 LOWER1 ▼ (the most horizontal)
No.1 LOWER2 ⇕
No.1 LOWER3 ⇕
No.1 LOWER4 ⇕
No.1 LOWER5 ⇕
No.1 LOWER6 ⇕ (the most downwards)
No.1 LOWER-- ▲ (return to the default setting)

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 (displayed for two seconds)
SET COMPLETE
No.1 ▲



10 Press ①ON/OFF button.

Louver adjusting mode ends and returns to the original display.

Caution

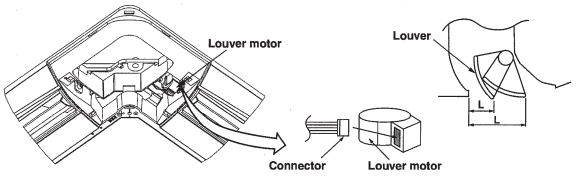
If the upper limit position number and the lower limit position number are set to the same position, the louver is fixed at that position auto swing does not funtion.

ATTENTION

If you press RESET button during settings, the display will return to previous display. If you press ①ON/OFF 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 controllers are connected, louver setting operation cannot be set by slave remote controller.

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 vinyl 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	Horizontal 0°	Downwards 45°
Dimension L (mm)	43	26

※It can be set between 26~43mm freely.

Caution

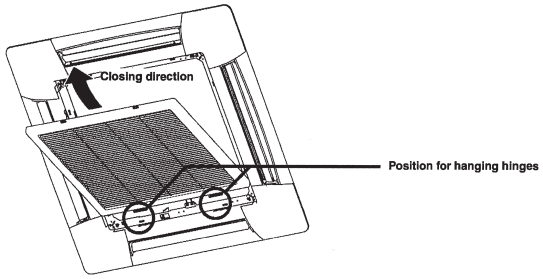
- Any automatic control or operation from the remote controller will be disabled on the louver whose position is fixed in the above way.
- Do not set a louver beyond the specified range. Failure to observe this instruction may result in dripping, dew condensation, the fouling of the ceiling and the malfunctioning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

⑩ Attaching the air return grille

There is no orientation on attaching the air return grille onto the panel.

To attach the air return grille, follow the procedure described in ③ Removing 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 any four side of the panel.)
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.

<Installation>



Caution

- 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.

(b) Ceiling cassette-4way compact type (FDTC)

① Before installation

- Install correctly according to the installation manual.
- Confirm the following points:
  ○ Unit type/Power supply specification ○ Pipes/Wires/Small parts ○ Accessory items

Accessory itme

For unit hanging		For refrigerant pipe			For draom pipe			
Flat washer (M10)	Level gauge (Insulation)	Pipe cover(big)	Pipe cover (small)	Strap	Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp
								
8	4	1	1	4	1	1	1	1
For unit hanging	For adjustment in hoisting in the unit's main body	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 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 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 controller and the air conditioner might not work properly.)

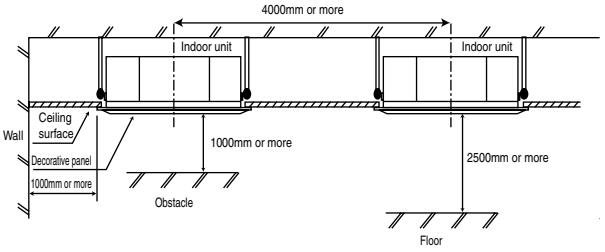
② Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.

③ If there are 2 units of wireless type, keep them away for more than 5m to avoid malfunction due to cross communication.

④ When plural indoor units are installed nearby, keep them away for more than 4m.

Space for installation and service

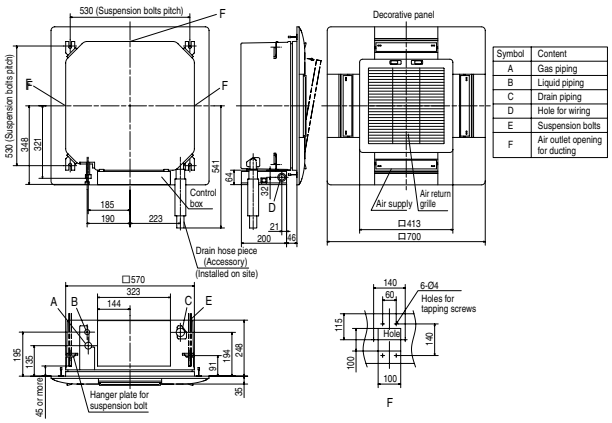
- When it is not possible to keep enough space between indoor unit and wall or between indoor units, close the air supply port where it is not possible to keep space and confirm there is no short circuit of airflow.
- Install the indoor unit at a height of more than 2.5m above the floor.



③ Preparation before installation

- If suspension bolt becomes longer, do reinforcement of earthquake resistant.
  ○ For grid 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.
  ○ 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 or M8) on site.

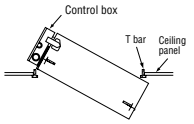
Ceiling opening, Suspension bolts pitch, Pipe position



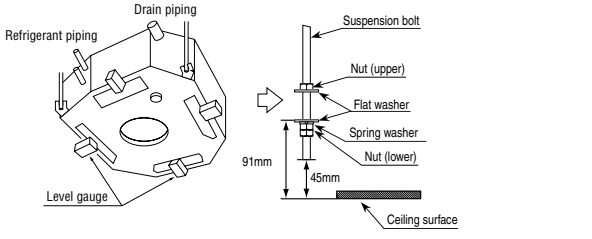
④ Installation of indoor unit

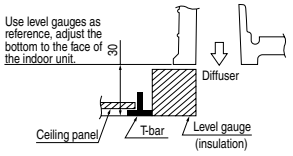
Work procedure

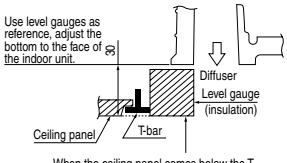
1. This units is designed for 2 x 2 grid ceiling.
   If necessary, please detach the T bar temporarily before you install it.
   If it is installed on a ceiling other than 2 x 2 grid ceiling, provide an inspection port on the control box side.
2. Arrange the suspension bolt at the right position (530mm×530mm).
3. Make sure to use four suspension bolts and fix them so as to be able to hold 500N load.
4. Ensure that the lower end of the suspension bolt should be 45mm above the ceiling plane.
   Temporarily put the four lower nuts 91mm 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.



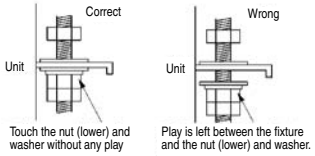
5. Adjust the indoor unit position after hanging it by inserting the level gauge attached on the package into the air supply port and checking if the gap between the ceiling plane and the indoor unit is appropriate. In order to adjust the indoor unit position, adjust the lower nuts while the upper nuts are put on distant place. Confirm there is no backlash between the hanger plate for suspension bolt and the lower nut and washer.





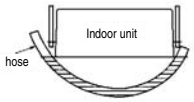


When the ceiling panel comes below the T bar, align the bottom of the level gauge to the lower face of the ceiling panel.



④ Installation of indoor unit (continued)

6. 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 unit.

⑤ Refrigerant pipe

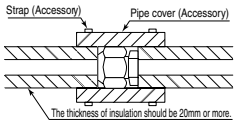
Caution

- 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 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

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



⑥ Drain pipe

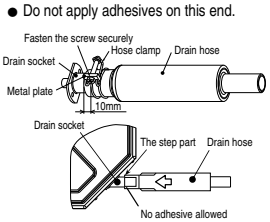
Caution

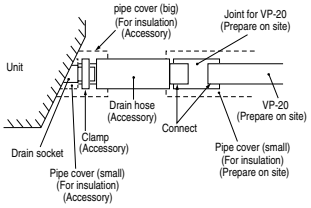
- Install the drain pipe according to the installation manual in order to drain properly.
  Imperfection in draining may cause flood indoors and wetting the household goods etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is 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.

⑥ Drain pipe (continued)

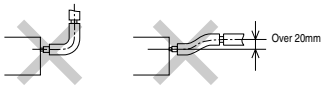
Work procedure

1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
   - Do not apply adhesives on this end.

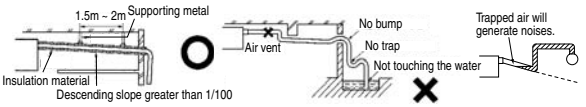




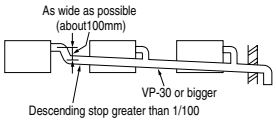
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   - Make sure that the adhesive will not get into 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.
     Do not bend or make an excess offset on the drain hose as shown in the picture.
     Bend or excess offset will cause drain 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 not set up air vent.



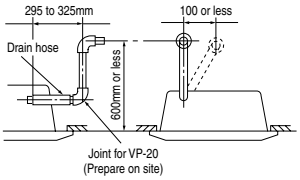
   - When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

Drain up

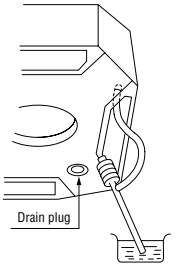
- The position for drain pipe outlet can be raised up to 600mm above the ceiling. Use elbows for installation to avoid obstacles inside ceiling. If the horizontal drain pipe is too long before vertical pipe, the backflow of water will increase when the unit is stopped, and it may cause overflow of water 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.



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. Pour water of about 1000cc into the drain pan in the indoor unit by pump so as not to get the electrical component wet.
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.
3. 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.



⑥ Drain pipe (continued)

Drain pump operation

○ In case electrical wiring work finished
Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

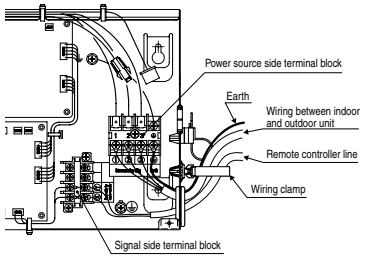
○ In case electrical wiring work not finished
Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector CNB is disconnected, and then the power supply (220-240VAC on the terminal block [① and ②] or [Ⓛ and Ⓝ]) is turned ON.
Make sure to turn OFF "SW7-1" and reconnect the Connector CNB after the test..

⑦ Wiring-out position and wiring connection

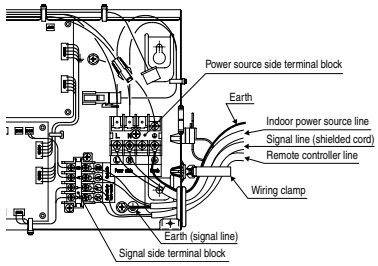
- Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country. 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.
- Be sure to do D type earth work.
- 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 clamp.
4. Install a lid of the control box back to original place.

Single split (PAC) series



VRF (KX) series



⑧ Panel installation

- After wiring work finished, install the panel on the indoor unit.
- Refer to panel installation manual for details.(Set next page)

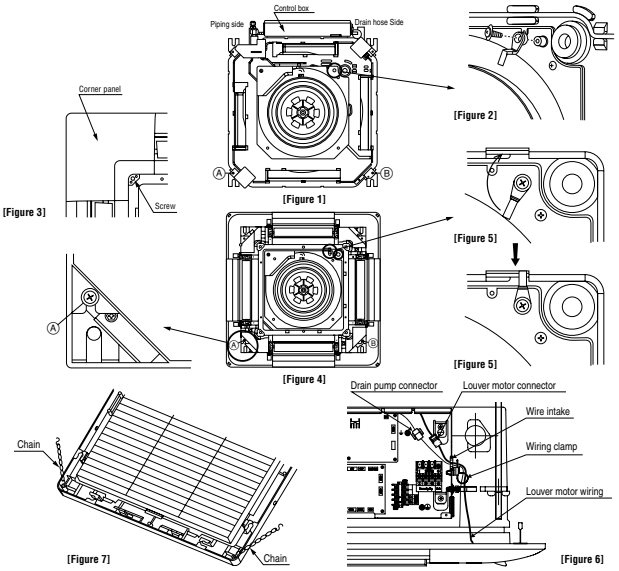
Accessory items

1	Hook		1 piece	For fixing temporarily
2	Chain		2 pieces	
3	Bolt		4 pieces	For installing the panel
4	Screw		1 piece	For attaching a hook
5	Screw		2 pieces	For attaching a chain

⑧ Panel installation (continued)

Work procedure

1. Make sure that the indoor unit is positioned at the correct height with the supplied level gauge. Remove the level gauge before you install the panel.
2. Screw the two bolts of the supplied four bolts by about 5mm. (● mark Ⓐ Ⓑ) [Figure 1]
3. Attach the supplied hook to the indoor unit with the screw (1 screw). [Figure 2]
4. Open the air return grille.
5. Remove the screw of a corner panel and remove a corner panel. (four places) [Figure 3]
6. Hang the panel on two bolts. (● mark Ⓐ Ⓑ) [Figure 4]
7. Rotate the hook and put it into the slot of the panel. And install the panel temporarily. [Figure 5]
8. Tighten the two bolts which were used to install the panel temporarily and the other two bolts.
9. Open a lid of the control box.
10. Fix the louver motor wiring and the drain pump wiring with clamp. And put louver motor wiring into the control box. [Figure 6]
11. Connect the connector of louver motor. [Figure 6]
12. Attach two chains to the air return grille with two screws. [Figure 7]
13. Install the corner panels back to original places. At that time attach the chains to the panel with screws together.
14. Close the air return grille.



⑨ 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	

PANEL INSTALLATION MANUAL

Please read this manual together with the air conditioning unit's installation manual.

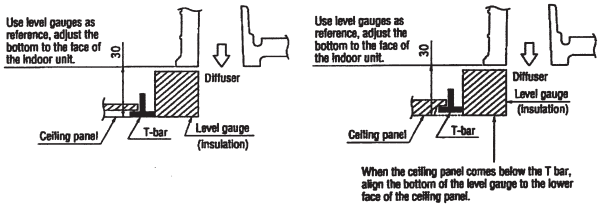
PJA012D751 b

1 Checking the unit main body for level installation

- Please read this manual together with the air conditioning unit's installation manual.
- Check the installation level of the air conditioning unit main body relatively to the ceiling material.
- By attaching the level gauge supplied as an accessory of the air conditioning unit main body, determine the installation level of the main body.
- Remove the level gauge before you attach the panel.
- The installation level of the main body can be adjusted to some extent from the opening provided on a corner, even after the panel is attached.
- As long as it does not affect the level of the indoor unit body or the drain piping, you may adjust the installation height of the unit body slightly with the cover panel on.

∗**Caution:** If there is a height difference beyond the design limit existing between the installation level of the air conditioning unit main body and the ceiling material, the panel may be subject to excessive stress during installation work and broken.

[For conventional ceiling]

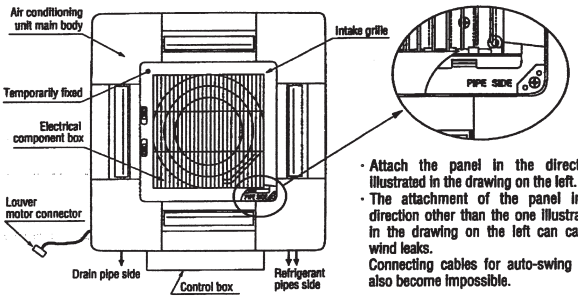


2 Removing the intake grille

① By sliding its hooks sideways, open the intake grille.
② Remove the intake grille's hinges from the cover panel while it is in the open position.

3 The direction of attachment of the main body, panel and intake grille

1. The main body and panel must be attached in a prescribed direction.
   - Bring the panel's intake opening area with the indication of "PIPE SIDE" over the main body's refrigerant pipes.
   - Check motor connectors for the direction of connection.
2. The intake grille can also be attached in a rotated position by 90 degrees.



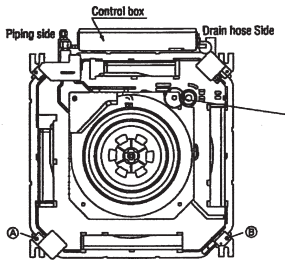
- Attach the panel in the direction illustrated in the drawing on the left.
- The attachment of the panel in a direction other than the one illustrated in the drawing on the left can cause wind leaks.
  Connecting cables for auto-swing will also become impossible.

4 Attaching the panel

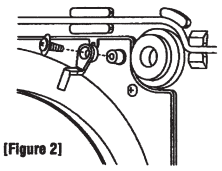
〈**Accessory items**〉
(It is attached to the panel.)

1	Hook		1 piece	For fixing temporarily
2	Chain		2 pieces	
3	Screw		4 pieces	For hoisting the panel
4	Screw		1 piece	For attaching a hook
5	Screw		2 pieces	For attaching a chain

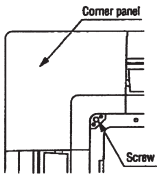
1. Make sure that the unit main body is positioned at the correct height and the opening on the ceiling is made to the correct dimensions with the level gauge supplied with the main body. Remove the level gauge before you attach the panel.
2. Screw in two bolts out of the four supplied with the panel by about slightly less than 5mm. (● mark ⒶⒷ) [Figure 1]
3. Attach the hook supplied with the panel to the main body with the hook fixing screw (1 screw). [Figure 2]
4. Open the intake grille.
5. Please remove the screw of a corner panel and remove a corner panel. (four places) [Figure 3]
6. A panel is hooked on two bolts (● mark ⒶⒷ). [Figure 4]
7. Please rotate a hook, put in the slot on the panel, and carry out fixing the panel temporarily. [Figure 5]
8. Tighten the two bolts used for fixing the panel temporarily and the other two.
9. Please open the lid of a control box.
10. Like drain pump wiring, please band together by the clamp and put in louver motor wiring into a control box. [Figure 6]
11. Please connect a louver motor connector. [Figure 6]
12. Attach two chains to the intake grille with two screws. [Figure 7]
13. Replace the corner panels. Please also close a chain with a screw together then.
14. Close the intake grille.



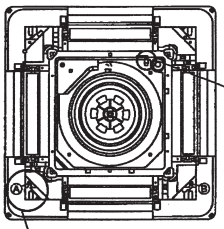
[Figure 1]



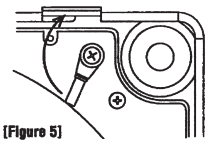
[Figure 2]



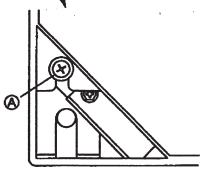
[Figure 3]

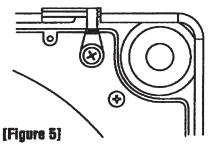


[Figure 4]

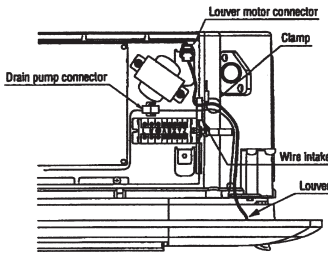


[Figure 5]

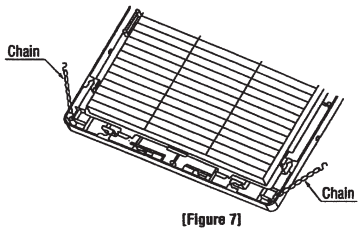




[Figure 5]



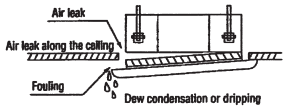
[Figure 6]



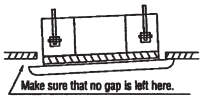
[Figure 7]

Caution:

- Improperly tightened hanging bolts can cause one or more of the problems listed below, so make sure that you have tightened them up securely.

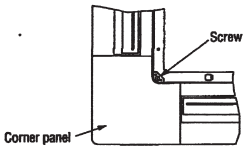


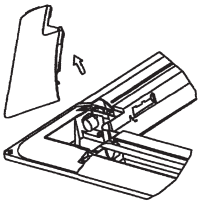
- If there is a gap remaining between the ceiling and the cover panel even after the hanging bolts are tightened up, adjust the installation level of the indoor unit main body again.



5 Removing a corner panel

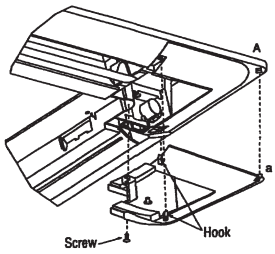
- Unscrew the screw from the corner area, pull the corner panel toward the direction indicated by the arrow mark.





6 Attaching a corner panel

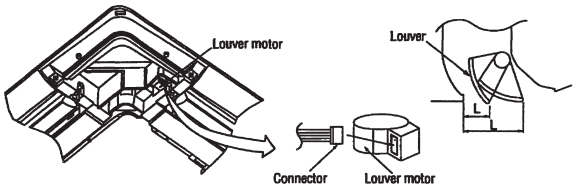
- First insert the part "a" of a corner panel into the part "A" of the cover panel, engage two hooks and tighten the screw.



7 Fixing vertical wind directions

●This cover panel allows the user to set the vertical direction of winds blown from each diffuser outlet independently to his preferred angle according to the setting of installation. Once a vertical wind direction is fixed, it will override and disable any remote control unit operations or automatic control attempting to change it.
Occasionally, a different wind direction may be indicated on the remote control unit's LCD display.

①Disconnect the main power switch (earth leakage breaker).
②Unplug the connector of the louver motor of the diffuser outlet you want to fix its wind direction. Please do not forget to insulate unplugged connectors electrically with a vinyl tape.
③By moving the wind direction-setting louver of the diffuser outlet you want to fix its wind direction slowly with your hand, set the wind direction within the range specified in the table below.



<Range of louver setting>

Yardstick for vertical wind direction setting	Horizontal 23°	Downward 50°
Measurement L (mm)	40	24

※You can set to any point between 24 mm and 40 mm.

✻**Caution:** Please do not set a louver beyond the specified range. A failure to observe this instruction may result in dripping, dew condensation, the fouling of the ceiling and the malfunctioning of the unit.

(C) Ceiling cassette-2way type (FDTW)

PJB012D227 a

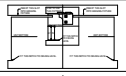
①Before installation

●Install correctly according to the installation manual.

●Confirm the following points:

○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For unit hanging		For refrigerant pipe		
Flat washer (M10)	Paper pattern	Pipe cover(big)	Pipe cover (small)	Strap
				
4	1	1	1	4
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 drain pipe				For wiring fixing		
Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp	Flat washer (M4)	Nut (M4)	Bolt (M4)
						
1	1	1	1	1	1	1
For heat insulation of drain socket	For heat insulation of drain socket	For drain pipe connecting	For drain hose mounting			

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 28°C and relative humidity is lower than 80%.

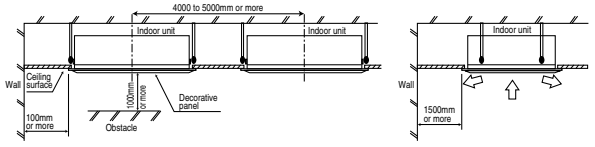
  This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the air conditioner is operated under the severer condition than mentioned above.
  If there is a possibility 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 controller and the air conditioner might not work properly.)

②Check 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.

③When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service

●Install the indoor unit at a height of more than 2.5m above the floor.



③Preparation before installation

●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

○For grid 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.

○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)

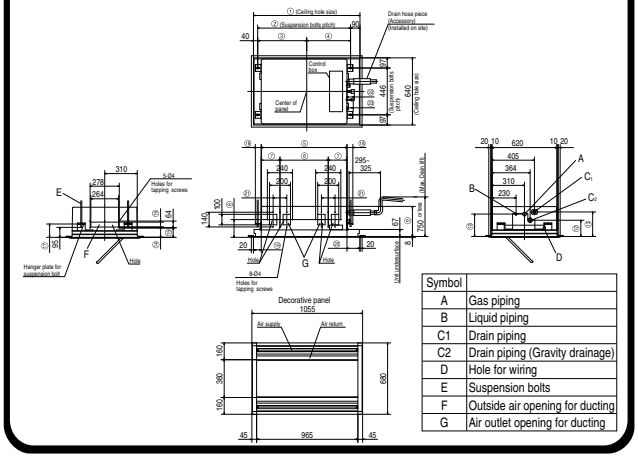
●If placing the unit with the top plate facing up (in the reversed orientation of packaging) is unavoidable, use care so that the area other than supporting member of the unit, will not be subjected to excessive loads. (A heavy load on the central part of this area could cause a damage to the filter).

Ceiling opening, Suspension bolts pitch, Pipe position

UNIT: mm

	Type		
	28 ~ 56	71, 90	112, 140
①	1015	1260	1730
②	885	1130	1600
③	468	590	825
④	417	540	775
⑤	817	1054	1524
⑥	460	460	240
⑦	178	382	672
⑧	161	240	255
⑨	287	342	357
⑩	214	226	241
⑪	405	410	410
⑫	155	155	170

	Type		
	28 ~ 56	71, 90	112, 140
⑬	234	284	299
⑭	98	95	110
⑮	91	88	103
⑯	47	50	50
⑰	127	127	137
⑱	56	66	66
⑲	74	78	78
⑳	124	128	128
㉑	130	-	-
㉒	70	82.5	80.5
㉓	60	65	70

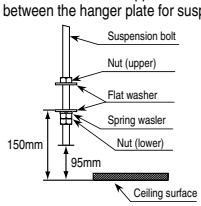


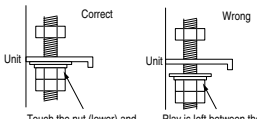
Symbol	
A	Gas piping
B	Liquid piping
C1	Drain piping
C2	Drain piping (Gravity drainage)
D	Hole for wiring
E	Suspension bolts
F	Outside air opening for ducting
G	Air outlet opening for ducting

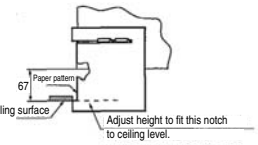
④Installation of indoor unit

Work procedure

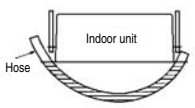
1. Cut an installation opening in the ceiling to the measurements specified for ceiling opening.
2. Set the suspension bolts in place.
   ※ The suspension bolts pitch center do not match the panel center.
3. Make sure to use four suspension bolts and fix them so as to be able to hold 500N load.
4. Ensure 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.
5. 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.







6. 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.

⑤Refrigerant pipe

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 air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.

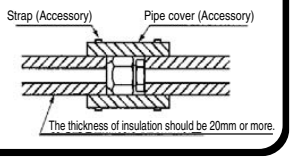
●Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.

●Use special tools for R410 refrigerant.

Work procedure

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
•6.35	14 to 18
•9.52	34 to 42
••12.7	49 to 61
••15.88	68 to 82
••19.05	100 to 120



⑥Drain 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.

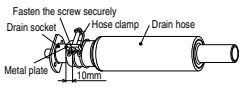
● Insulate the pipe properly to avoid condensation drop.

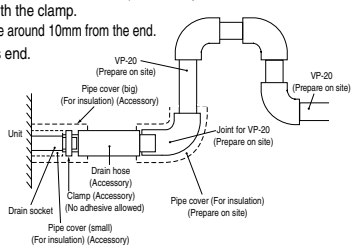
● Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.

● 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

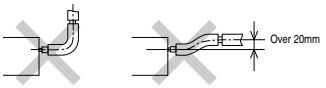
1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp.
Attach the hose clamp to the drain hose around 10mm from the end.
●Do not apply adhesives on this end.



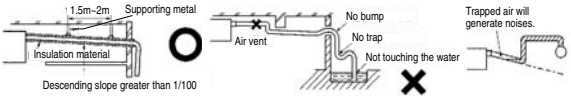


⑥Drain pipe (continued)

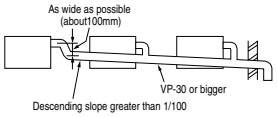
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
● Make sure that the adhesive will not get into the 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 not set up air vent.



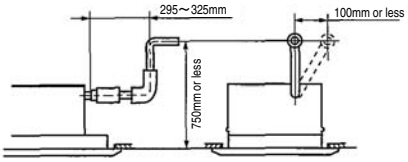
●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

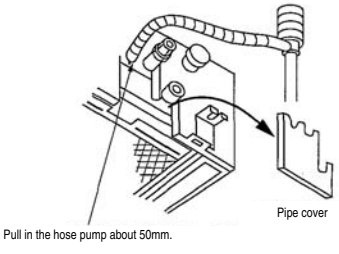
Drain up

● The position for drain pipe outlet can be raised up to 750mm 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. Pour water of about 1000cc into the drain pan in the indoor unit by pump so as not to get the electrical component wet.
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.
3. 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.



⑥Drain pipe (continued)

Drain pump operation

○In case electrical wiring work finished

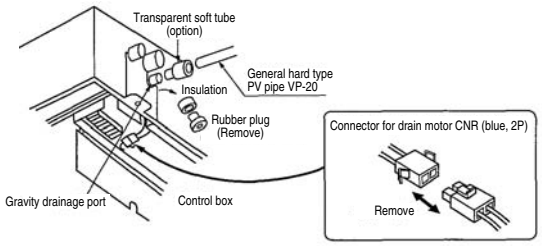
Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

○In case electrical wiring work not finished

Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector 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.

In case of gravity drainage

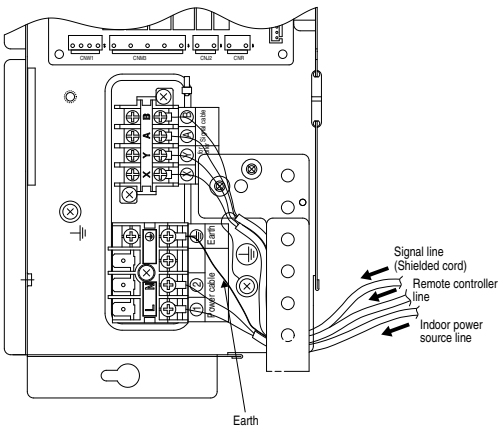
1. Remove the rubber plug and insulation from the gravity drainage port.
2. Connect the drain hose (VP-20) using the Gravity drainage connecting tube (option) and secure firmly with a clamp.
   (∗ If the drain tube is directly connected with the gravity drainage port, the drain pan could not be removed.)
3. Find CNR drain motor connector (blue, 2P) in the control box, and remove it.
   (∗ If the unit is used with this connector being connected, the drainage will go out through the standard drain connecting port, causing leaks.)



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.

1. Remove a lid of the control box (2 screws).
2. Hold each wiring inside the unit and fasten them to a terminal block securely.
3. Fix the wiring with supplied screw, nut and washer.
4. Install the removed parts back to original place.

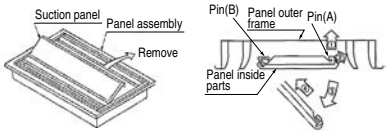


⑧Panel installation

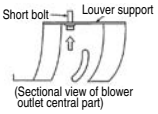
●Attach the panel on the indoor unit after electrical wiring work.

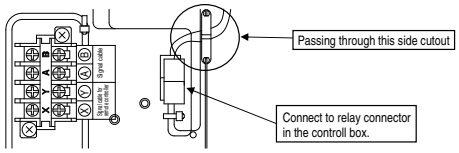
Work procedure

1. Using the paper pattern attached as an accessory, check to ensure the unit height and ceiling opening are finished true to the specified dimensions.
   Remove the suction panel from the panel assembly. (Ref. below diagram)



2. Among the bolts which are attached to the panel, 2 screw must be inserted 5mm at the diagonal positions.
3. Hang the panel on the 2 bolts and temporarily tighten them.
4. Tighten the temporarily tightened 2 bolts and the remaining 2 bolts.
5. Tighten the 2 short bolts (15mm) at the louver supporting section of blower outlet central part.
6. Connect the connecter of louver motor and limit switch through the side cutout of control box.





7. When the louver motor does not operate by the remote controller operation, check the connection of the connector, turn off the power for 10 seconds or longer, and reset.

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	

(d) Ceiling cassette-1way type (FDTS)

① Before installation

- Install correctly according to the installation manual.
- Confirm the following points:
  ○ Unit type/Power supply specification ○ Pipes/Wires/Small parts ○ Accessory items

Accessory item

For main unit suspension	For refrigerant			For panel	For drain pipe			
Paper pattern	Pipe cover (big)	Pipe cover (small)	Strap	Round machine screw (M5 x 35)	Pipe cover (big)	Pipe cover (small)	Drain hose	Hose clamp
2 pcs. (One for left and one for right)	1 pcs. For heat insulation of gas pipe	1 pcs. For heat insulation of liquid pipe	4 pcs. For pipe cover fixing	7 pcs. Fixing of direct air flow panel	1 pcs. For heat insulation of drain socket	1 pcs. For heat insulation of drain socket	1 pcs. For drain pipe connecting	1 pcs. For drain hose mounting

② Selection of installation location for the indoor unit

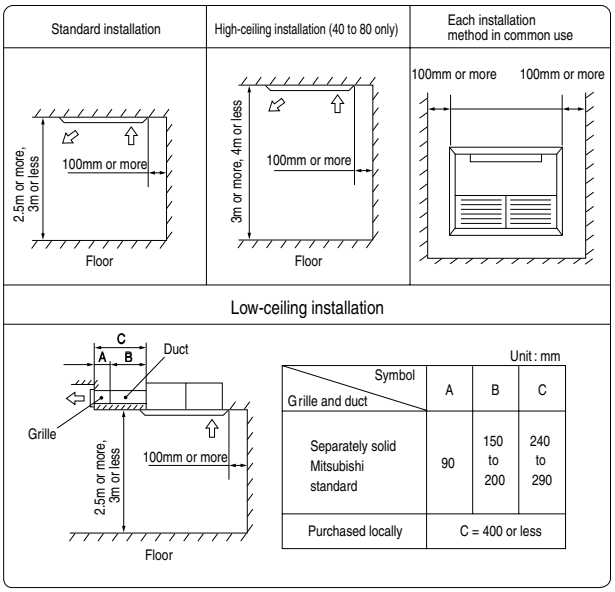
① Select the suitable areas to install the unit under approval of the user.
- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- Areas where there is enough space to install and service.
- Areas where it can be drained properly. Areas where drain pipe descending slope can be 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 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 controller 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.

④ When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service



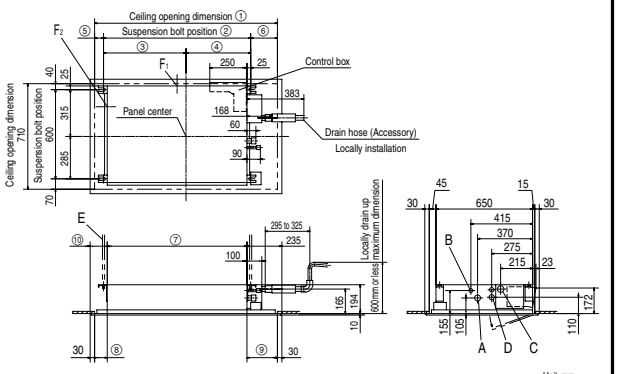
Unit : mm

Symbol / Grille and duct	A	B	C
Separately solid Mitsubishi standard	90	150 to 200	240 to 290
Purchased locally	C = 400 or less		

③ Preparation before installation

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

③ Preparation before installation (continued)



A	Refrigerant gas piping
B	Refrigerant liquid piping
C	Drain piping
D	Power supply inlet
E	Suspension bolt
F1,2	Outlet air hole

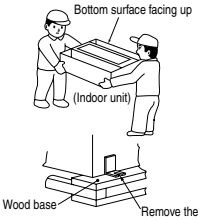
Unit: mm

Multi	Type 45	Type 71
①	1230	1440
②	990	1250
③	555	675
④	435	575
⑤	60	45
⑥	180	145
⑦	940	1200
⑧	85	70
⑨	205	170
⑩	115	100

④ Installation of indoor unit

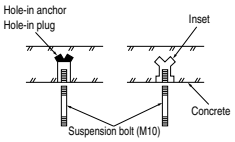
Delivery

○ Deliver the unit as close as possible to the installation location without unpacking it.
○ If unpacked and delivery can not be avoided, use a nylon sling or a rope with pads placed where the rope contacts the unit so it is not scratched.
○ To place the unit on the floor after unpacking, be sure that the unit bottom surface is facing up. (To avoid damage to the unit bottom surface as it is made of a styrene foam).
○ The unit and wood are fixed with two wood screws. When unpacking them, remove the two wood screws.



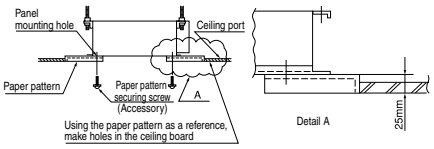
Securing suspension bolts

Tighten the bolts firmly according to the method shown in the drawing or other suitable methods.

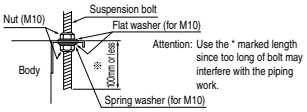


Installation

○ Ceiling hole drilling procefure



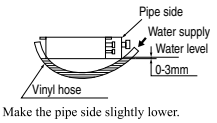
○ Unit mounting procedure



If the holes on the unit and the ceiling do not match, use a mounting bracket with oval hole to adjust the position.

<Horizontal adjustment>
Use a level or the following procedure to adjust horizontally.

○ Adjust so that the bottom surface of the unit and the water level is as shown in the below drawing.



⑤ Refrigerant pipe

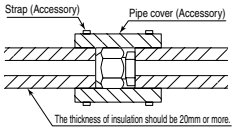
Caution

- 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 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 the 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 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.
   ※ 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 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.
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 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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



⑥ Drain pipe

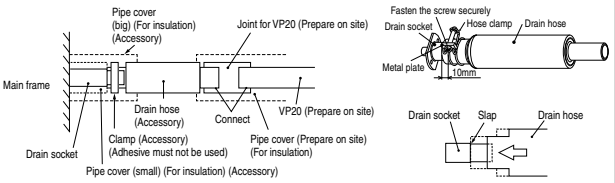
Caution

- 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.

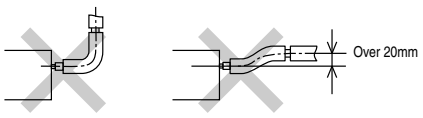
⑥ Drain pipe (continued)

Work procedure

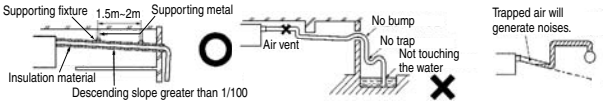
1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
   - Do not apply adhesives on this end.



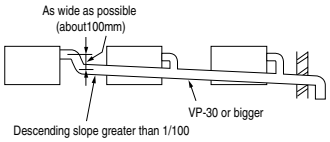
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※ As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   - Make sure that the adhesive will not get into 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 not set up air vent.



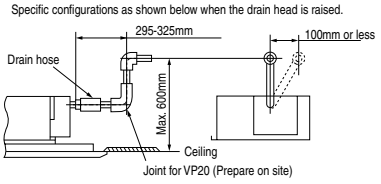
   - When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

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.



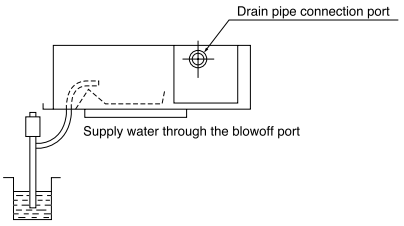
All piping work except above piping are performed in a similar normal drain piping.

⑥ Drain pipe (continued)

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. Pour water of about 1000cc into the drain pan in the indoor unit by pump so as not to get the electrical component wet.
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.
3. 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

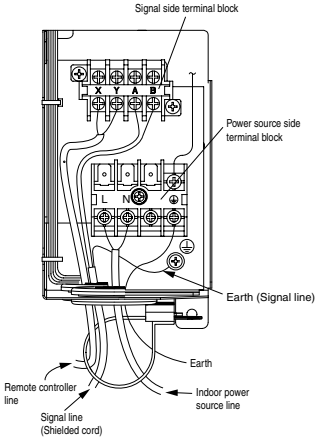
○ In case electrical wiring work finished
Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

○ In case electrical wiring work not finished
Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector 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.

⑦ 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.
- Be sure to do D type earth work.
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work.

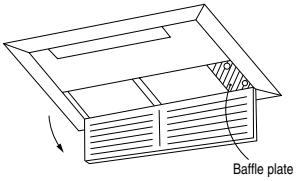
1. Remove a lid of the control box (2 screws).
2. Hold each wiring inside the unit and fasten them to terminal block securely.
3. Fix the wiring with clamps.
4. Install the removed parts back to original place.



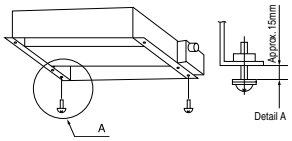
⑧ Panel installation

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

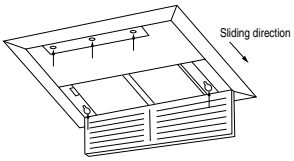
① Open the grille and remove the baffle plate. (Loosing the two screws.)



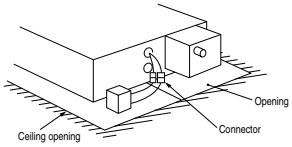
② Screw the two installation screws to the indoor unit.



③ Hook the panel the two screws (-②), and slide the panel approximately 10mm along the allow in following figure. Screw left five installation screw to the indoor unit.



④ Connect the connectors of louver motor and limit switch using "opening" space.



⑤ Return the baffle plate at its original position.

⑥ Close the grille.

Confirm the grille fixed with a hook securely.

* The grille may take the liberty to open if grille is not fixed securely.

⑨ 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	

(e) Ceiling cassette-1way compact type (FDTQ)

PJC012D116 C

①Before installation

●Install correctly according to the installation manual.
●Confirm the following points:
○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For refrigerant pipe			For drain pipe			
Pipe cover(big)	Pipe cover (small)	Strap	Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp
						
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

②Selection of installation location for the indoor unit

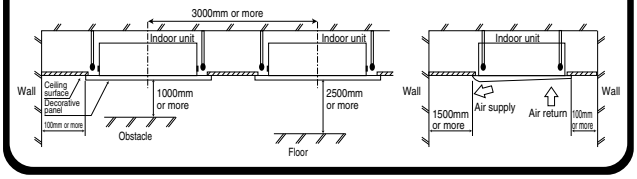
① Select the suitable areas to install the unit under approval of the user.
- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- Areas where there is enough 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 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.

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 When plural indoor units are installed nearby, keep them away for more than 3m.

Space for installation and service

●Install the indoor unit at a height of more than 2.5m above the floor.



③Preparation before installation

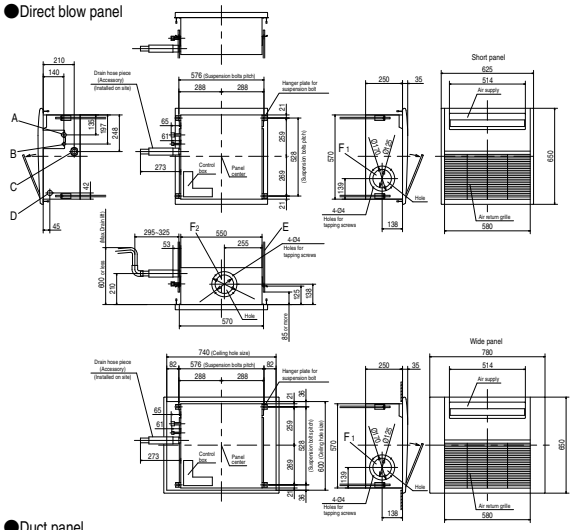
●If suspension bolt becomes longer, do reinforcement of earthquake resistant.
○For grid ceiling
When suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.
○In case the unit is hanged directly from the slab and is installed 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.

Ceiling opening, Suspension bolts pitch, Pipe position

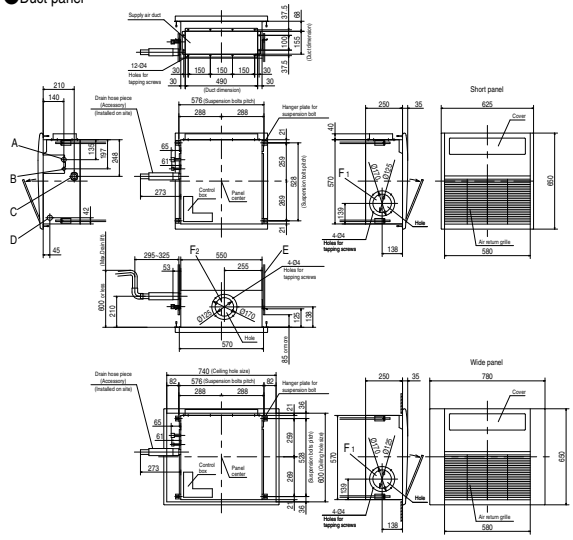
Symbol	Content
A	Gas piping
B	Liquid piping
C	Drain piping
D	Hole for wiring
E	Suspension bolts
F1,2	Outside air opening for ducting

③Preparation before installation (continued)

●Direct blow panel



●Duct panel



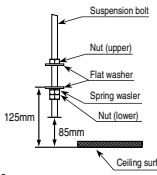
④Installation of indoor unit

Work procedure

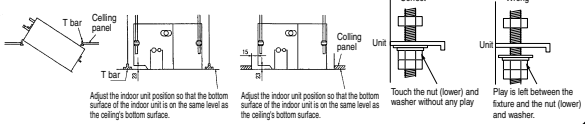
1. In case of installing on a ceiling other than 2 × 2 grid ceiling, prepare a ceiling hole with the size of 600mm × 740mm.
2. Arrange the suspension bolt at the right position (528mm × 576mm).
3. Make sure to use four suspension bolts and fix them so as to be able to hold 500N load.
4. Ensure that the lower end of the suspension bolt should be 85mm above the ceiling plane. Temporarily put the four lower nuts 125mm 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.
5. Adjust the indoor unit position after hanging it so that the bottom surface of the indoor unit is on the same level as the ceiling (bottom surface of the T bar).
   The allowable gap between the bottom surface of the ceiling and that of the indoor unit is when the bottom surface of the indoor unit is no higher than 5mm.
   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.

Caution

● Do not install the bottom surface of the inddor unit lower than the bottom surface of the ceiling.

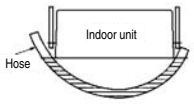


[For 2 x 2 grid ceiling] **[For ordinary ceiling]**



④Installation of indoor unit (continued)

6. 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

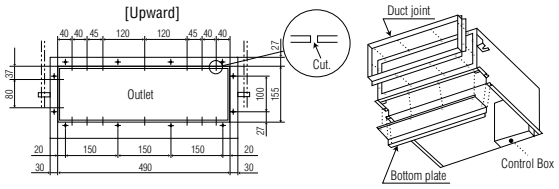
- ●Do not adjust the height by adjusting upper nuts. It will cause unexpected stress on the indoor unit and it will lead to deformation of the unit, failure of attaching a panel.
- ●Make sure to install the indoor unit horizontally and set the gap between the unit underside and the ceiling plane properly. Improper installation may cause air leakage, dew condensation, water leakage and noise.
- ●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, avoid dust coming into the indoor unit.

⑤The indoor unit change procedure for duct type

Prepare a duct panel.

(1) Drill hole for duct

① While referring to the dimensions, cut the insulation.
② Cut sheet metal for the hole, and drill hole.
③ Install the duct joint with screws attached to the panel.
④ Install the bottom plate with screws attached to the panel.



⑤ Set up as follows:

Changing the fan tap

Change the fan tap to the high speed by the remote controller.
[Method]
① Stop the operation of air conditioner. Press (SET) button and (MODE) button for 3 seconds at the same time.
② Select "I/U FUNCTION ▲ " (Indoor Unit Function) and press (SET) button.
③ Select "FAN SPEED SET " (Fan Speed Setting) of No."02" and press (SET) button.
④ Select "HIGH SPEED 1 " (High Fan Speed 1) and press (SET) button.
⑤ Press ON/OFF button to exit.
As for details, refer to the installation manual of remote controller.

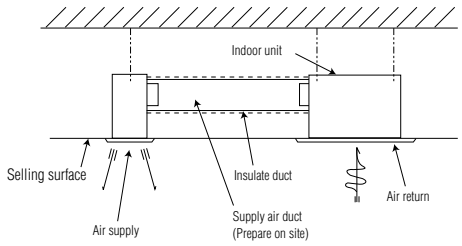
CATEGORY	NUMBER	FUNCTION	SETTING
I/U FUNCTION ▲	02	FAN SPEED SET	HIGH SPEED 1

Invalidating the louver switch

Invalidate the louver switch by the remote controller.
[Method]
① Stop the operation of air conditioner. Press (SET) button and (MODE) button for 3 seconds at the same time.
② Select " FUNCTION ▼" (Remote Controller Function) and press (SET) button.
③ Select " LOUVER S/W" (Louver Switch Setting) of No. "07" and press (SET) button.
④ Select " INVALID " (Louver Switch Invalid) and press (SET) button.
⑤ Press ON/OFF button to exit.
As for details, refer to the installation manual of remote controller.

CATEGORY	NUMBER	FUNCTION	SETTING
FUNCTION ▼	07	LOUVER S/W	INVALID

(2) Duct work



Request

- ●Calculate air flow and the static pressure to select the duct's length and shape.

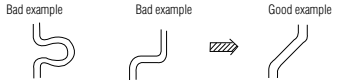
⑤The indoor unit change procedure for duct type (continued)

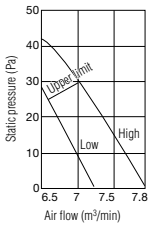
Caution

- ●Take care that the static pressure does not exceed 30 Pa.
  The indoor unit has condensation owing to the decrease of air flow, may cause wetting the ceiling and household goods.

Request

- ●The duct should be minimum bends. (Make the bend radius as large as possible.)
- ●Conduct the duct work before ceiling attachment.





(3) Connecting duct for outside air intake

① Outside air intake
- ●Use the intake, which is easier for work, either at the rear or the side.

② Duct connection
- ●Connect the 125 mm diameter duct, using the duct flange for 125mm diameter duct. (Clamp with band)
- ●Insulate the duct to prevent condensation.

⑥Refrigerant pipe

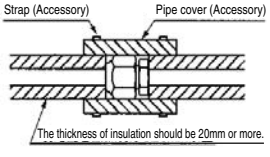
Caution

- ●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 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

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



⑦Drain pipe

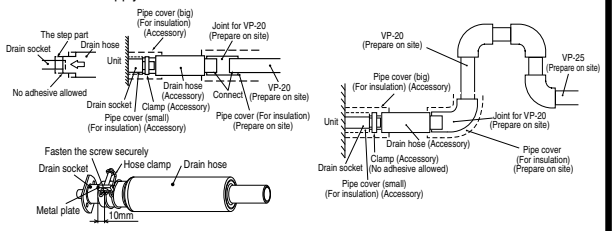
Caution

- ● 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.

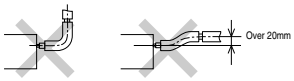
⑦Drain pipe (continued)

Work procedure

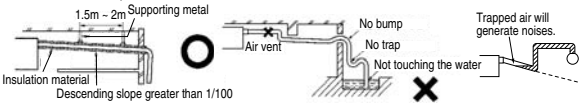
1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
   ●Do not apply adhesives on this end.



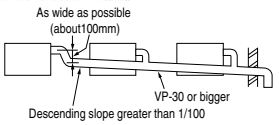
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   ●When drain pipe is set to rising in the nearest of the unit, use the VP-20 pipe.
   When drain pipe is set to after the horizontal pulling, use the VP-25 and above pipe.
   ●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 not set up air vent.



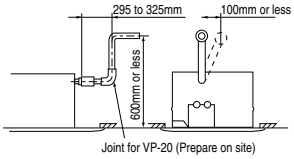
   ●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

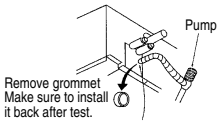
Drain up

● 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.



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. Remove the drain grommet, and pour water of about 1000cc into the drain pan in the indoor unit by pump so as not to get the electrical component wet.
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.
3. Unplug the drain plug on the indoor unit to remove remaining water on the drain pan after the test, and re-plug it.
4. Make sure to install the grommet back to original place.
5. Insulate the drain pipe properly finally.



⑦Drain pipe (continued)

Drain pump operation

○In case electrical wiring work finished
Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.
○In case electrical wiring work not finished
Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector CNB is disconnected, and then the power supply (220-240VAC on the terminal block Ⓛ and Ⓝ) is turned ON. Make sure to turn OFF "SW7-1" and reconnect the Connector CNB after the test.

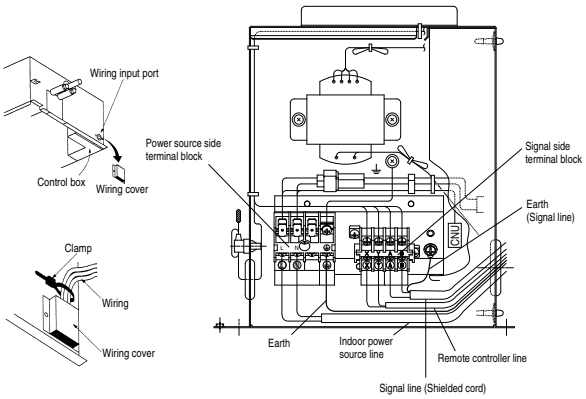
⑧Wiring-out position and wiring connection

● 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.

1. Remove a lid of the control box (2 screws) and the wiring cover (2 screws).
2. Hold each wiring inside the unit and fasten them to terminal block securely.
3. Take out the wiring to upper direction of wiring cover, and fix the wiring with clamp.
4. Install the removed parts back to original place.

Caution

Make sure to install the wiring cover. Otherwise it may cause dew condensation into the control box.



⑨Panel installation

●Attach the panel on the indoor unit after electrical wiring work.
●Refer to panel installation manual for details. (See next page)

⑩Check 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	

PANEL INSTALLATION MANUAL

PJC012D118

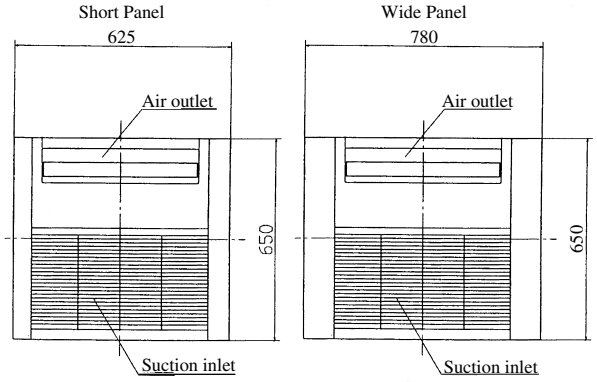
Please read this manual together with installation manual of indoor unit.

⚠ Warning

● **Please perform electrical work after cutting off main power.**
Otherwise, electrical shock or malfunction, etc. may occur.

Notice

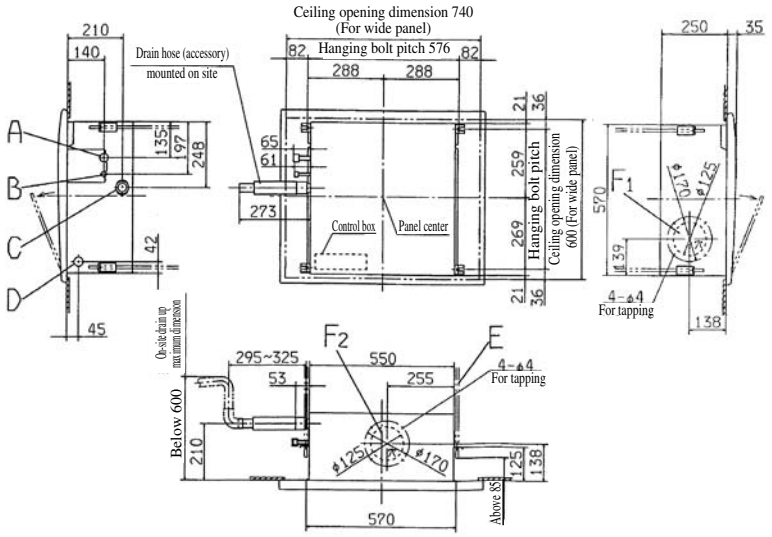
If the louver cannot be moved by remote control operation, cut off the main power for over 10 seconds after confirming the connection of connector, then turn on the power again.



1 Accessories

1	Air filter	1	
2	Hanging bolts	4	For mounting panel
3	Screws (M4 L=8mm)	2	For mounting chains

2 Confirm the mounting level of main unit



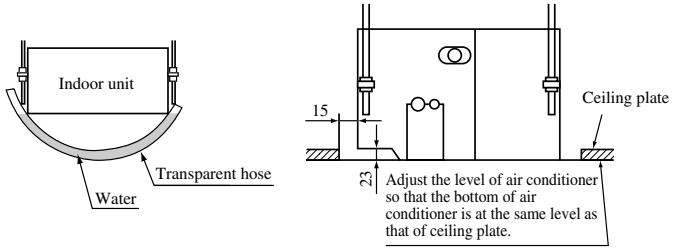
Marks	Description
A	Piping for refrigerant gas side
B	Piping for refrigerant liquid side
C	Drain piping
D	Power inlet
E	Hanging bolt
F1,2	OA inlet

● Confirm the mounting level of air conditioner and ceiling. Adjust the level of air conditioner so that the bottom of air conditioner is at the same level as that of ceiling plate (the T-bar).
The level differential tolerance between the bottom surface of ceiling and that of main unit is that air conditioner main unit cannot be higher than ceiling bottom surface for 5mm.

Caution

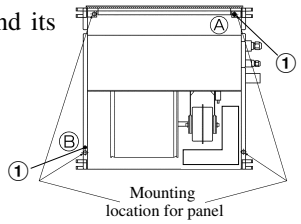
Do not set the main unit below the bottom surface of ceiling.

● Confirm the level of air conditioner.



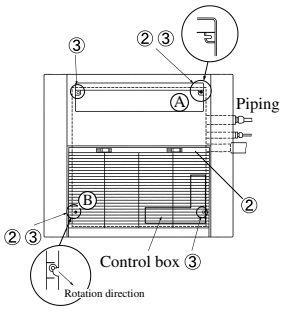
3 Mount the panel

① Attach 2 of 4 hanging bolts supplied with the panel on the indoor piping side and its diagonal position respectively, and tighten them gently for 5mm. (Ⓐ Ⓑ ● marks)

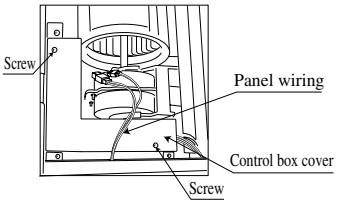


② Open the suction grille, hang the panel onto 2 bolts, and secure it temporarily.
When securing the panel temporarily, hang the panel onto Ⓐ side bolts as shown in the left figure, then hang onto Ⓑ side while turning it.

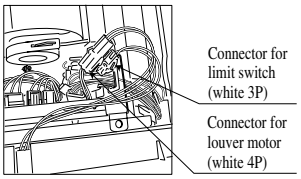
③ Tighten the temporarily secured hanging bolts and other 2 hanging bolts.



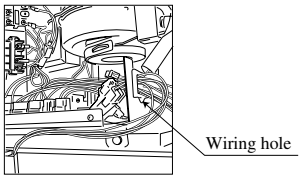
④ Remove 2 screws on the control box, and open the cover.



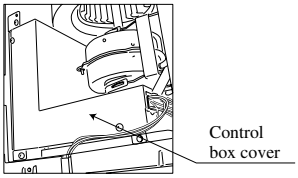
⑤ Connect the connector for louver motor (white 4P) and the connector for limit switch (white 3P).
The connector on the indoor unit side is in the control box.



⑥ After connecting the connectors, pass the wiring on the panel side through wiring hole. Hold the connector in the control box.



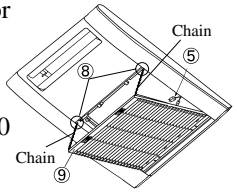
⑦ Close control box cover, and tighten 2 screws.



⑧ Mount the chain attached with suction grille on the panel using screw. The screws for mounting chain and hanging bolts are in the same bag.

⑨ Close suction grille, then work is completed.

⑩ If the louver cannot be moved by remote control operation, cut off the power for over 10 seconds after confirming the connection of connector, then turn on the power again.



(f) Duct connected High static pressure type (FDU)

(1) Models 71～140

○This model is middle static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit.

①Before installation

●Install correctly according to the installation manual.

●Confirm the following points:

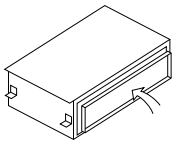
○Unit type/Power supply specification

○Pipes/Wires/Small parts

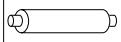
○Accessory items

Accessory item

For refrigerant pipe		
Pipe cover(big)	Pipe cover (small)	Strap
		
1	1	4
For heat insulation of gas pipe	For heat insulation of liquid tube	For pipe cover fixing



Accessory parts are stored inside this suction side.

For drain pipe			
Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp
			
1	1	1	1
For heat insulation of drain socket	For heat insulation of drain socket	For drain pipe connecting	For drain hose mounting

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 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 controller and the air conditioner might not work properly.)

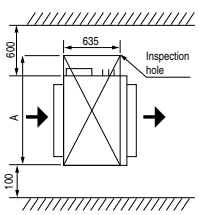
②Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.

Space for installation and service

●Make installation altitude over 2.5m.

(Indoor Unit)

Installation Space



UNIT: mm

Multi type	71	90, 112, 140
Single type	71	100, 125, 140
A	1200	1720

③Preparation before installation

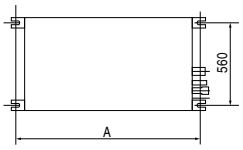
●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

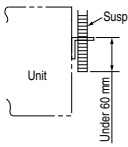
○For grid ceiling
When the suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

○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.

Suspension Bolt Location





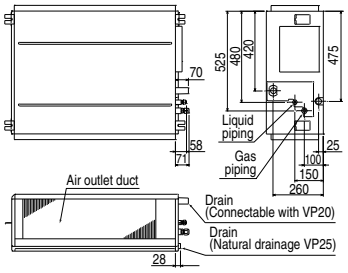
○ Adhere to the measurements given below for the length of the suspension bolts.

UNIT: mm

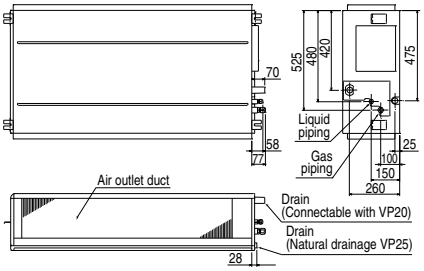
Multi type	71	90, 112, 140
Single type	71	100, 125, 140
A	986	1406

Pipe locations UNIT: mm

Multi type	71
Single type	71



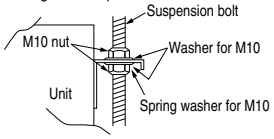
Multi type	90, 112, 140
Single type	100, 125, 140



④Installation of indoor unit

Installation

[Hanging]
Hang the unit up.

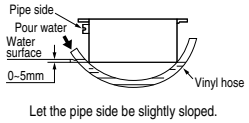


If the measurements between the unit and the ceiling hole do not match upon installation, it may be adjusted with the long holed installation tool.

Adjustment for horizontality

○Either 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.



Let the pipe side be slightly sloped.

○If the unit is not leveled, it may cause malfunctions or inoperation of the float switch.

⑤Duck Work

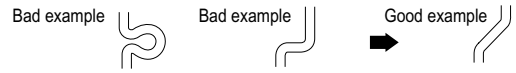
A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.

①●The air conditioner main unit does not have an air filter. Incorporate it into the easy-to-clean suction grille.

②Blowout duct

●The ducts should be at their minimum lengths.

●Keep the bends to a minimum. (The bending radius should be as large as possible.)



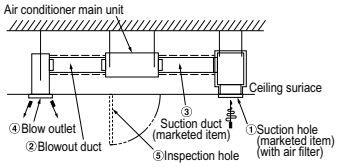
●Conduct the duct work before ceiling attachment.

③Suction duct

●Make sure to insulate the duct to prevent dewing on it.

④Location and form of blow outlet should be selected so that air from the outlet will be distributed all over the room, and equipped with a device to control air volume.

⑤Make sure provide an inspection hole on the ceiling. It is indispensable to service elecric equipment, motor, functional components and cleaning of heat exchanger.



Delete

Bad example of duct work

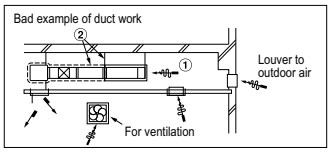
①If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.

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.



⑥Refrigerant pipe

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.

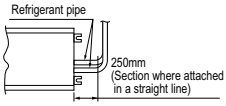
●Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation.
In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.

●Do not use any refrigerant other than R410A.
Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And 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.

Piping work

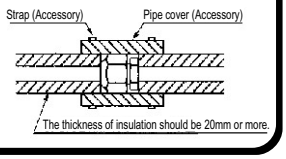


When conducting piping work, make sure to allow the pipes to be aligned in a straight line for at least 250 mm, as shown in the left illustration. (This is necessary for the drain pump to function)

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.)
2.Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
ϕ6.35	14 to 18
ϕ9.52	34 to 42
ϕ12.7	49 to 61
ϕ15.88	68 to 82
ϕ19.05	100 to 120



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.

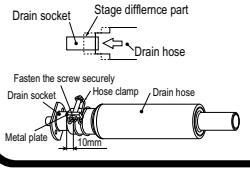
● Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.

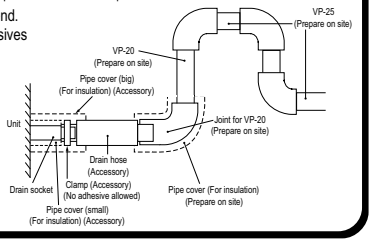
● Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

Work procedure

1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.

●Do not apply adhesives on this end.
●Do not use acetone-based adhesives to connect to the drain socket.

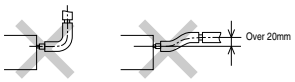




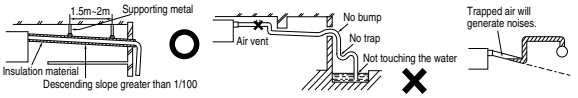
*

⑦Drain pipe (continued)

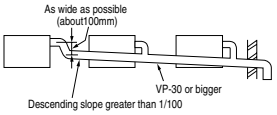
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   - When installing drain pipe, use VP-20 for the pipe goes up the closest to the unit, and VP-25 or higher number product for farther pipes.
   - 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 not set up air vent.



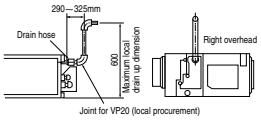
   - When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

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.



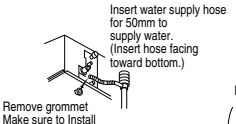
Otherwise, the construction point makes it same as drain pipe construction.

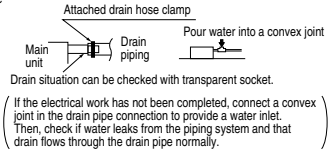
Drain test

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.

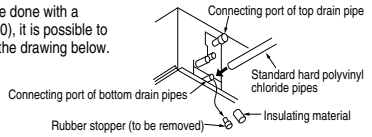




If the electrical work has not been completed, connect a convex joint in the drain pipe connection to provide a water inlet. Then, check if water leaks from the piping system and that drain flows through the drain pipe normally.

Outline of bottom drain piping work

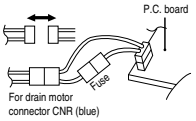
- If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.



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.



⑦Drain pipe (continued)

Drain pump operation

○In case electrical wiring work finished

Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

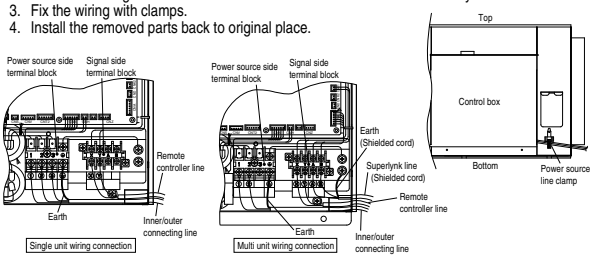
○In case electrical wiring work not finished

Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector 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.

⑧Wiring-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.

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.



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	

⑩Tap selection on blower unit (when the high peformance filter is used)

The fan tap's factory setting is "Standard." If you want to change it to the high static-pressure setting, you can avail yourself of the following two methods. Use one of the two methods to set the fan tap.
Make sure to perform the functional setting with remote controller.
Select [Indoor function] in the functional setting mode, and change the function number [01] [High wall setting].
For operation method, refer to the user's manual of the remote controller.

Function number A	Functional content B	Setting content C	Default setting
01	High wall setting	Standard	○
		High wall 1	

UNIT: Pa

Static Pressure	Standard Tap	50
	High Tap	130

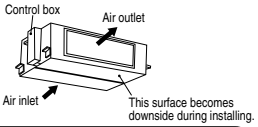
⚠ CAUTION

- Taps should not be used under static pressure outside the unit mentioned above. Dew condensation may occur with the unit and wet the ceiling or furniture.
- Do not use under static pressure outside the unit of 50Pa or less. Water drops may be blown from the diffuser outlet of the unit and wet the ceiling or furniture.

(2) Models 224, 280

PJD012D036 a

○This model is high static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit.



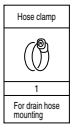
①Before installation

●Install correctly according to the installation manual.

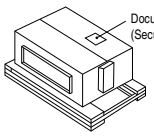
●Confirm the following points:

○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item



Accessories storage position (during packing)



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 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.

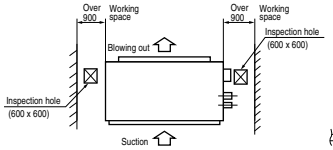
(A beam from lighting device sometimes affects the infrared receiver for the wireless remote controller and the air conditioner might not work properly.)

②Check 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.

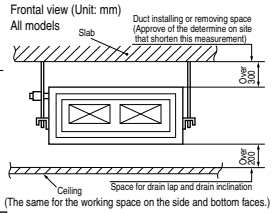
Space for installation and service

●Make installation altitude over 2.5m.

Top view (Unit: mm)
All models



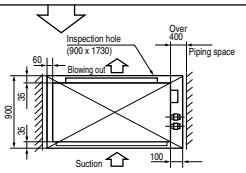
Frontal view (Unit: mm)
All models



(The same for the working space on the side and bottom faces.)

If the conditions shown in the left hand side cannot be met, the following method is also possible.

Top view (Unit: mm)
All models
The frontal view is as the left hand illustration.



Air Conditions and Airflow Limits

Single	Multi	Airflow m³/min			Temperature of the blow-in air of the indoor unit		Air temperature surrounding the indoor unit
		Rating	Lower limit	Upper limit	Cooler	Heater	
200	224	51	38	65	Upper limit 26°C WB When outdoor temperature is 35°C Lower limit 16°C WB When outdoor temperature is 15°C	Upper limit 27°C DB Outdoor temperature is below 20°C WB Lower limit 10°C DB Outdoor temperature is above 10°C WB	Dew point temperature below 28°C
250	280	68	51	87	Refer to the technical document published by our company for more details.		

③Preparation before installation

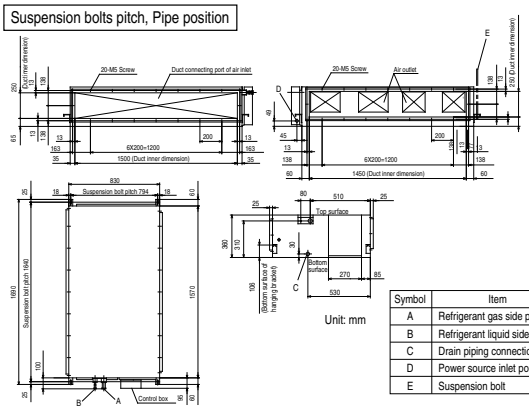
●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

○For 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.

○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.

Suspension bolts pitch, Pipe position



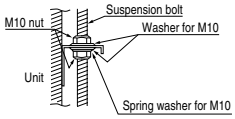
Symbol	Item
A	Refrigerant gas side piping
B	Refrigerant liquid side piping
C	Drain piping connection port
D	Power source inlet port
E	Suspension bolt

④Installation of indoor unit

Installation

[Hanging]

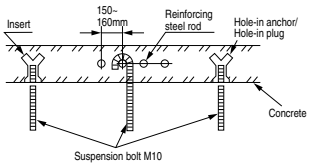
○Hang the unit up.



○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.

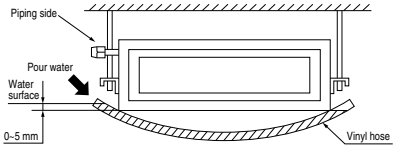
[Method for Fixing the Suspension Bolt]

○Secure the suspension bolt with one of the methods shown in the following illustration.



Horizontal Adjustment

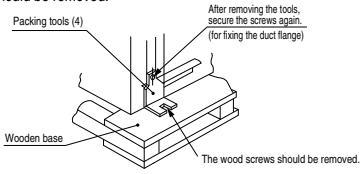
○Use a level vial or adjust the level as shown in the following illustration.



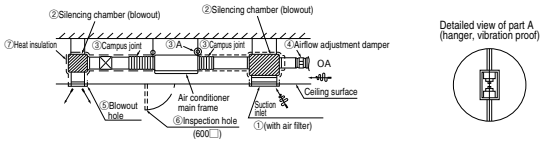
Set the pipe side slightly lower than the other side.

○If it is not horizontal, the float switch malfunctions or does not function.

(Packing Tools)
The packing tools (4) are not necessary.
Packing tools (4) should be removed.



⑤Duck work



①Air filters are not provided with the main frame of the air conditioner. Assemble on to the suction grill which can be cleaned easily.

②Fit the silencing chamber according to the noise level tolerance inside the installation room. If it is particularly necessary to keep the noise level low, further silencing devices is required (always install them in offices, and conference rooms).

③In order to keep the vibration from transferring to the ceiling and the slab, use a campus joint for the duct and a vibration proof rubber for the main frame.

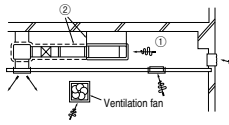
④Attach an airflow adjustment damper to the connection point of the OA duct so airflow adjustment may be possible after installation.

⑤For the blowing outlet, select a shape and location where air may circulate, and a structure where airflow may be controlled.

⑥An inspection hole must be made in the ceiling surface. This is necessary for the repair and maintenance of the electrical parts, motor and functional parts, as well as for cleaning the heat exchanger.

⑦Insulation must be performed for the duct to prevent water condensation on the duct. The thickness of the insulating material is 65 mm (JISA 9501).

A bad example of duct work



①If the suction duct is not used, and the attic is used as a suction duct, the attic will become extremely humid depending on the performance of the ventilation fan, the strength of wind blowing to the atmospheric gallery and the climate (e.g., rainy days).

a. Condensation occurs on the outer board of the unit and water may fall on the ceiling. Use the unit according to the air conditions in the above table and airflow limits. In concrete constructions, high humidity can occur in new constructions even when the attic is not used as a suction duct. In this case, insulate the entire unit with glass wool (25 mm) (use a metal net to hold the wool).

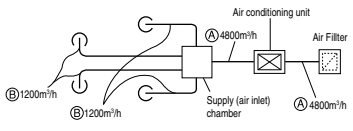
b. Operation of the unit may exceed its limits (for example, when the temperature of the suction air is 24 °C with the outdoor temperature of 35 °C DB). In such a cases, problems such as an overload of the compressor may occur.

c. The volume of the air blowing in may increase due to the performance of the ventilation fan and the wind strength blowing against the atmospheric gallery. The air usage limit may be exceeded, and the water from the heat exchanger will not be able to drain to the drain pan. Instead it will drain outside and cause a water leak (to the ceiling).

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.

Simple setting method for duct measurement

The following shows the method when duct is used at one side of 250mm as 1Pa/m by frictional resistance per the unit length of the duct, and in case of 250 type (single unit)/280 type (multi unit) , 60Hz rating airflow for a example.



	Airflow	Duct (mm x mm)
Ⓐ	4800m³/h (80m³/min)	250 x 950
Ⓑ	1200m³/h (20m³/min)	250 x 310

○Calculation of duct resistance
(Simplified calculate as following table)

Straight piping port	Calculate at 1Pa per 1m length to 1Pa/m
Bending port	Calculate at 3 to 4 m straight pipe per 1 piece of binding pipe
Air outlet port	Calculate at 25Pa
Chamber	Calculate at 50Pa per 1 piece
Air inlet grille (with filter)	Calculate at 40Pa per 1 piece

[Simplified duct dimension selection table] 1Pa/m

Airflow / Duct type	Quadrangle duct
Item	Dimensions
m³/h (m³/min)	(mm×mm)
100	250× 60
200	250× 90
300	250× 120
400	250× 140
450 (7.5)	250× 160
500	250× 170
600 (10)	250× 190
800	250× 230
1,000	250× 270
Ⓑ 1,200 (20)	250× 310
1,400	250× 350
1,600	250× 390
1,800 (30)	250× 430
2,000	250× 470
2,400 (40)	250× 560
3,000 (50)	250× 650
3,500	250× 740
4,000	250× 830
4,500	250× 920
Ⓐ 4,800 (80)	250× 950
5,000	250×1000
5,500	250×1090
6,000 (100)	250×1180

⑥Refrigerant pipe

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 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.

●The indoor unit pipes allow the maintenance panel to be removed. Therefore, regardless of the piping direction, there should be a straight section of 400 mm or more.

Work procedure

1. When brazing work, perform it while cool down around the brazing port with wet towels to prevent the overheating.
2. After check the gas leak test, install the heat insulation (prepare on site) to the brazing port of the indoor unit.
   ●Be sure to perform the heat insulation both of gas side piping with liquid side piping.
   ※If heat insulation does not install to the pipes, dew condensation may occurs and it may cause the water leakage.
   The thickness of the heat insulation should be more than 20mm.
3. 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.

Single unit			Multi unit			
Type 200	Liquid piping	•Φ9.52	Type 224	Liquid piping	•Φ9.52	Flaring
	Gas piping	•Φ25.4		Gas piping	••Φ19.05	Flaring
Type 250	Liquid piping	••Φ12.7	Type 280	Liquid piping	•Φ9.52	Flaring
	Gas piping	•Φ25.4		Gas piping	••Φ22.22	Flaring

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.

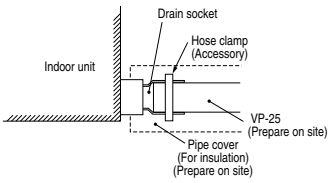
● Insulate the pipe properly to avoid condensation drop.

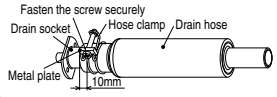
● Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.

● 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.

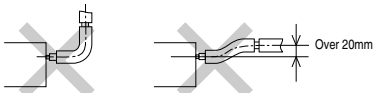
Work procedure

1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
   ●Do not apply adhesives on this end.



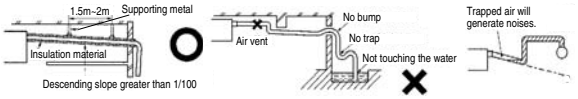


2. Prepare a joint for connecting VP-25 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-25 pipe (prepare on site).
   ※As for drain pipe, apply VP-25 made of rigid PVC which is on the market.
   ●Make sure that the adhesive will not get into 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.

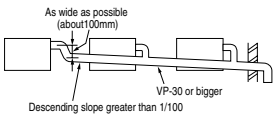


⑦Drain pipe (continued)

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 not set up air vent.



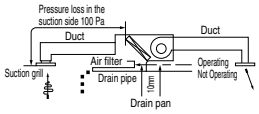
- ●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

Caution

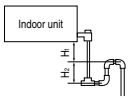
When the duct is connected and the blowing device is operated, the pressure inside the unit becomes negative to the atmospheric pressure.



Example: As shown in the above illustration, if the pressure loss of the suction grill, air filter, and the suction side of the duct is 100 Pa, the drain water level during operation is 10mm higher than when it is not operating.

Fixing Traps

The pressure loss varies depending on the clogging in the air filter. Therefore, make one trap (during the piping work) to prevent water from remaining in the drain pan. It is necessary to make a trap with a structure that allows cleaning. Use the T joint as demonstrated in the left illustration. Also, set the trap height as shown in the left illustration. Arrange the trap near to the unit.



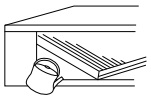
- ●Make one trap along the drain pipe as the left illustration.

H1 = 100 mm or the static pressure of the blowing device
H2 = 1/2 H1 or 50 ~ 100 mm

Drain test

Upon completion of drain piping, check by running water through it.

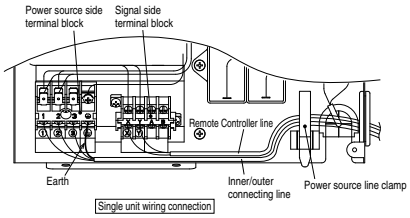
- ○Remove the side panel and gradually pour 1000 cc of water into the drain pan. Ensure that the water drains smoothly.
  Also, ensure that there are no water leaks from the connections and joints.



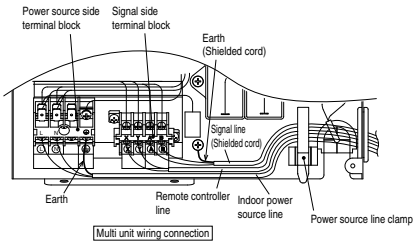
⑧Wiring-out position and wiring connection

- ● 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.

1. Remove a lid of the control box (2 screws) and a hook which is located on top of it.
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.



Single unit wiring connection



Multi unit wiring connection

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	

(g) Duct connected Middle static pressure type (FDUM)

PJR012D317 a

○This model is middle static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit.

①Before installation

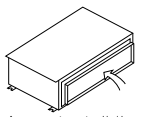
●Install correctly according to the installation manual.

●Confirm the following points:

○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For refrigerant pipe			For drain pipe			
Pipe cover(big)	Pipe cover (small)	Strap	Pipe cover(big)	Pipe cover(small)	Drain hose	Hose damp
						
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



Accessory parts are stored inside this suction side.

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 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 controller and the air conditioner might not work properly.)

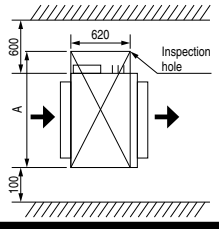
②Check if the place where the air conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.

Space for installation and service

●Make installation altitude over 2.5m.

(Indoor Unit)

Installation Space



UNIT: mm

Multi type	22~56	71, 90	112, 140
Single type	50	60, 71	100~140
A	1100	1300	1720

③Preparation before installation

●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

○For grid ceiling

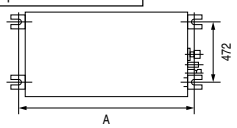
When the suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

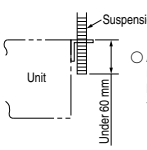
○In case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength.

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.

Suspension Bolt Location





○ Adhere to the measurements given below for the length of the suspension bolts.

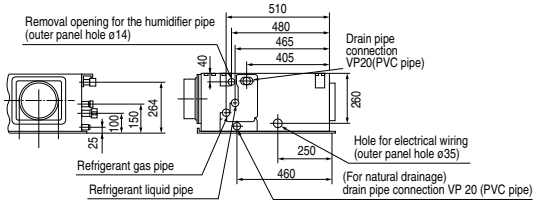
UNIT: mm

Multi type	22~56	71, 90	112, 140
Single type	50	60, 71	100~140
A	786	986	1406

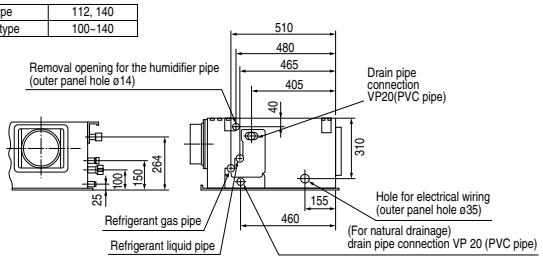
③Preparation before installation (continued)

Pipe locations UNIT: mm

Multi type	22~90
Single type	50~71



Multi type	112, 140
Single type	100~140

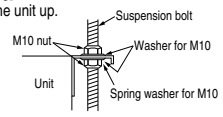


④Installation of indoor unit

Installation

[Hanging]

Hang the unit up.

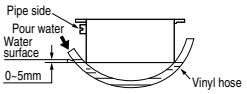


If the measurements between the unit and the ceiling hole do not match upon installation, it may be adjusted with the long holed installation tool.

Adjustment for horizontality

○Either 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.



Let the pipe side be slightly sloped.

○If the unit is not leveled, it may cause malfunctions or inoperation of the float switch.

⑤Duck Work

①A 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.

②Blowout duct

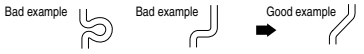
●Use according to the spot numbers shown in the table below with a 200 circular duct.

Multi type	22	36, 45, 56	71, 90	112, 140
Single type	-	20	25, 30	40~50
Spot numbers	1 spot	2 spots	3 or 2 spots	4 or 8 spots

●The difference of the duct lengths between each spot should be less than 2:1.

●The ducts should be at their minimum lengths.

●Keep the bends to a minimum. (The bending radius should be as large as possible.)



●Tie and secure the connection to the duct flange of the main unit/blowout hole with a band. Then, apply insulation materials to the secured part for dew condensation prevention.

●Use of the sound and heat insulated flexible duct is recommended for condensation prevention and soundproofing. (sold separately; 1m, 2m, 4m available)

●Conduct the duct work before ceiling attachment.

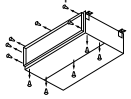
③Inlet port

●When shipped the inlet port lies on the back.

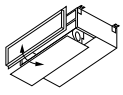
●When connecting the duct to the inlet port, remove the air filter if it is fitted to the inlet port.

⑤Duck Work (continued)

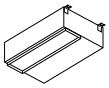
●When placing the inlet port to carry out suction from the bottom side, use the following procedure to replace the suction duct joint and the bottom plate.



●Remove the screws which fasten the bottom plate and the duct joint on the inlet port side of the unit.



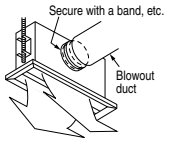
●Replace the removed bottom plate and duct joint.



●Fit the duct join with a screw; fit the bottom plate.

●Make sure to insulate the duct to prevent dewing on it.

④Install the specific blowout duct in a location where the air will circulate to the entire room.

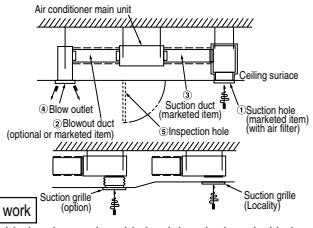


●The duct connection is specific to the 200 circular duct.

●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 elecric equipment, motor, functional components and cleaning of heat exchanger.



Bad example of duct work

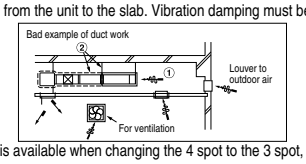
①If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.

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.

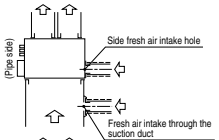


Notice

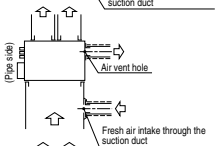
A specific cover plate is available when changing the 4 spot to the 3 spot, or when changing the 3 spot to the 2 spot.
Note: Do not change from 2 spot to 1 spot.

Connecting the air intake/vent ducts

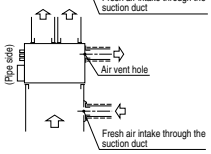
①Fresh Air Intake
[for air intake duct only]
○Use the side fresh air intake hole, or supply through a part of the suction duct.



[for simultaneous air intake/vent]
○Intake air through the suction duct.
(the side cannot be used)



②Air Vent
○Use the side air vent hole.
(always use together with the air intake)



○Use the duct flange for the air intake/vent (sold separately; for 125 circular duct connection), and connect the 125 circular duct (tighten with band).
○Insulate the duct to protect it from dew condensation.

⑥Refrigerant pipe

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.

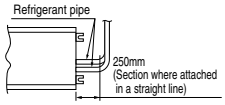
●Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) for refrigeration pipe installation.
In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.

●Do not use any refrigerant other than R410A.
Using other refrigerant except R410A (R22 etc.) may degrade inside refrigeration oil. And 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.

Piping work

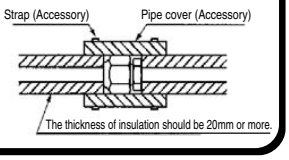


When conducting piping work, make sure to allow the pipes to be aligned in a straight line for at least 250 mm, as shown in the left illustration. (This is necessary for the drain pump to function)

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
•6.35	14 to 18
•9.52	34 to 42
•12.7	49 to 61
•15.88	68 to 82
•19.05	100 to 120



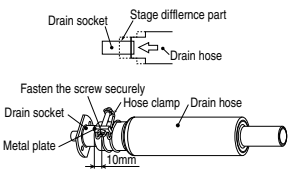
⑦Drain pipe

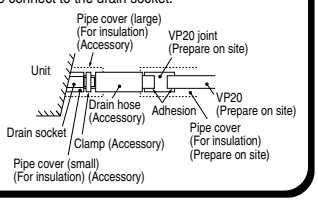
Caution

● 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

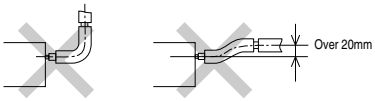
1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
●Do not apply adhesives on this end.
●Do not use acetone-based adhesives to connect to the drain socket.



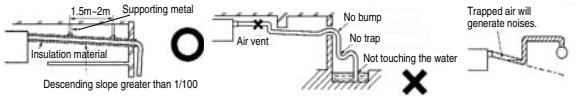


⑦Drain pipe (continued)

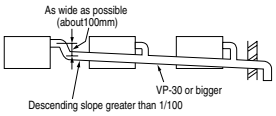
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   ● Make sure that the adhesive will not get into 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 not set up air vent.



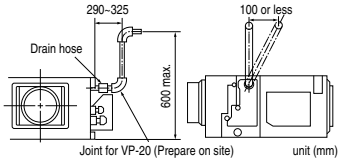
● When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

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.



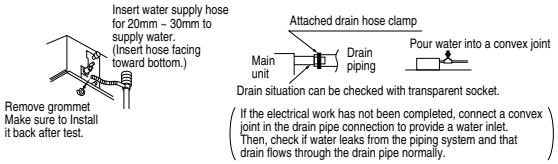
Otherwise, the construction point makes it same as drain pipe construction.

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.

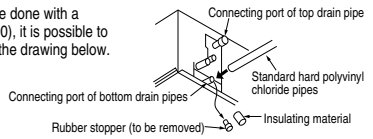
Procedures

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

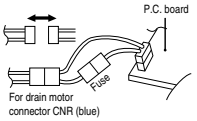
● If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.



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, drain water will be discharged from the upper drain pipe joint, causing a water leak.)



⑦Drain pipe (continued)

Drain pump operation

○In case electrical wiring work finished

Drain pump can be operated by remote controller (wired).
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.

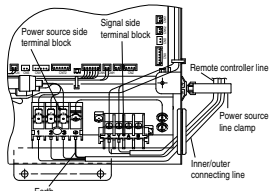
○In case electrical wiring work not finished

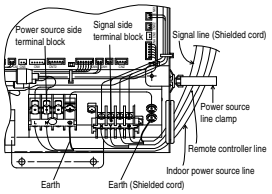
Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector CNB is disconnected, and then the power supply (230VAC on the terminal block ① and ②) is turned ON. Make sure to turn OFF "SW7-1" and reconnect the Connector CNB after the test.

⑧Wiring-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.

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.





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	

⑩Tap selection on blower unit (when the high peformance filter is used)

The fan tap's factory setting is "Standard." If you want to change it to the high static-pressure setting, you can avail yourself of the following two methods. Use one of the two methods to set the fan tap.
Make sure to perform the functional setting with remote controller.
Select [Indoor function] in the functional setting mode, and change the function number [01] [High wall setting].
For operation method, refer to the user's manual of the remote controller.

Function number A	Functional content B	Setting content C	Default setting
01	High wall setting	Standard	○
		High wall 1	

Unit: Pa

Multi type		22~90	112	140
Single type		50~71	100	125, 140
Static Pressure	Standard Tap	50	60	60
	High Tap	85	90	85

⚠ CAUTION

● Taps should not be used under static pressure outside the unit mentioned above. Dew condensation may occur with the unit and wet the ceiling or furniture.
● Do not use under static pressure outside the unit of 50Pa or less. Water drops may be blown from the diffuser outlet of the unit and wet the ceiling or furniture.

(h) Duct connected (Ultra thin) Low static pressure type (FDQS)

PJC012D013 b

○This model is low static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit.

①Before installation

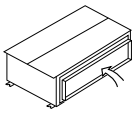
●Install correctly according to the installation manual.

●Confirm the following points:

○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For refrigerant pipe			For drain pipe			
Pipe cover(big)	Pipe cover (small)	Strap	Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp
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



Accessory parts are stored inside this suction side.

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 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.

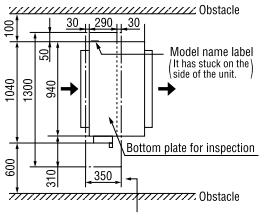
- Areas where TV and radio stays away more than 1m. (It could cause jamming and noise.)
- Areas where any items which will be damaged by getting wet are not placed such as food, table wares, server, or medical equipment under the unit.
- Areas where there is no influence by the heat which cookware generates.
- 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 controller and the air conditioner might not work properly.)

②Check 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.

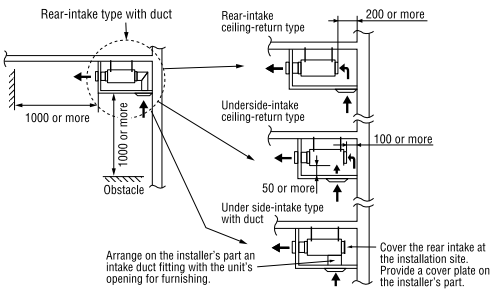
Space for installation and service

●Make installation altitude over 2.5m.

(Indoor Unit) Installation Space Unit : mm



An access measuring 350mm x 1300mm is required for servicing, so please provide a 350mm x 1300mm inspection opening right beneath it.
(For servicing the control, fan, fan motor and drain pump)



Notice Underside-intake type installation is not recommended for hotel and residential installations due to a high noise level.

③Preparation before installation

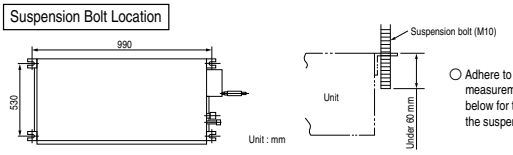
●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

○For grid 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.

○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.

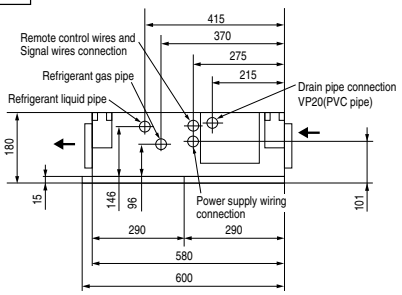
●Prepare four (4) sets of suspension bolt, nut and spring washer (M10) on site.

Suspension Bolt Location



○ Adhere to the measurements given below for the length of the suspension bolts.

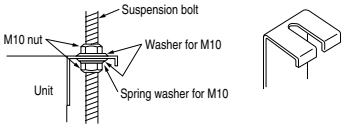
Pipe locations Unit: mm



④Installation of indoor unit

Installation

[Hanging]
Hang the unit up.

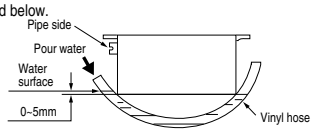


If the measurements between the unit and the ceiling hole do not match upon installation, it may be adjusted with the long holed installation tool.

Adjustment for horizontality

○Either use a level vial, or adjust the level according to the method below.

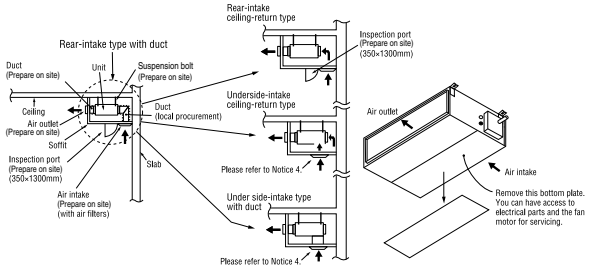
●Adjust so the bottom side of the unit will be leveled with the water surface as illustrated below.



Let the pipe side be slightly sloped.

○If the unit is not leveled, it may cause malfunctions or inoperation of the float switch.

⑤Duck Work



Notice

1. This unit is designed for installation in a soffit. It is not designed to inhale fresh air directly.
2. In the case of an underside-intake ceiling-return type installation, remove the bottom plate of the unit on the fan side to make it an underside intake type. The rear intake should be used together.

⑤Duck Work (continued)

3. The air conditioning unit main body is not equipped with air filters. Incorporate air filters in an air intake grille, which will facilitate the cleaning of air filters.
4. In the case of a rear-intake type with duct and a rear-intake ceiling-return type installation, be sure to provide a 350 mm x 1300 mm inspection opening right beneath the unit's fan side bottom plate to permit servicing of the unit as illustrated in installation geometries. In the case of an underside-intake type with duct and underside-intake ceiling-return type, provide an intake opening right beneath the unit's fan side bottom plate so that it will serve as an inspection opening as well. Also see to its dimensions so that the intake opening will be made to 350 mm x 1300 mm.
5. Take care to install a duct horizontally in connecting the unit with a diffuser.
6. When a canvas duct is used for either intake or outlet duct, install it with care so that it may not get flattened.
7. Select a desirable diffuser position and diffuser form to ensure the distribution of winds throughout the room and use a diffuser employing a structure that provides the capability to regulate winds.
8. Install the air conditioning unit main body via vibration-isolating rubbers to prevent vibrations from propagating directly from the air conditioning unit main body to the ceiling and slab.
9. Secure at least 0.15m² for the opening of an air intake.
10. Never fail to heat-insulate the ducts to prevent condensation on their surfaces.

⑥Refrigerant pipe

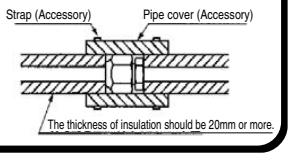
Caution

- ●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 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

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
••6.35	14 ~ 18
••9.52	34 ~ 42
••12.7	49 ~ 61



⑦Drain pipe

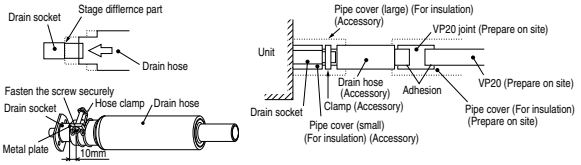
Caution

- ● 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.

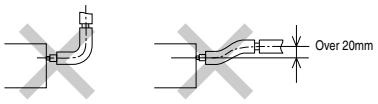
⑦Drain pipe (continued)

Work procedure

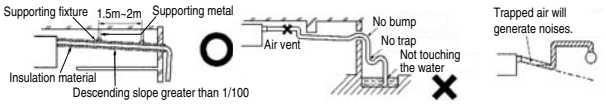
1. Insert the supplied drain hose (the end made of soft PVC) to the step of the drain socket on the indoor unit and fix it securely with the clamp. Attach the hose clamp to the drain hose around 10mm from the end.
   ●Do not apply adhesives on this end.
   ●Do not use acetone-based adhesives to connect the drain socket.



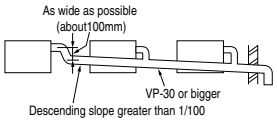
2. Prepare a joint for connecting VP-20 pipe, adhere and connect the joint to the drain hose (the end made of rigid PVC), and adhere and connect VP-20 pipe (prepare on site).
   ※As for drain pipe, apply VP-20 made of rigid PVC which is on the market.
   ●Make sure that the adhesive will not get into 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 the unit or installation of 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 not set up air vent.



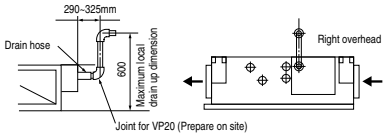
●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.



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.

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.

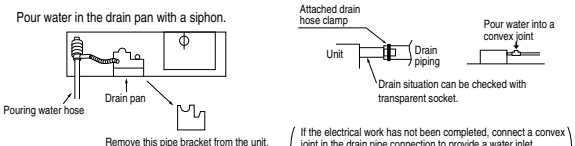


Drain test

1. Conduct a drainage test after completion of the electrical work.
2. During the trial, 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.



If the electrical work has not been completed, connect a convex joint in the drain pipe connection to provide a water inlet. Then, check if water leaks from the piping system and that drain flows through the drain pipe normally.

⑦Drain pipe (continued)

Drain pump operation

○In case electrical wiring work finished

Drain pump can be operated by remote controller (wired).

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

○In case electrical wiring work not finished

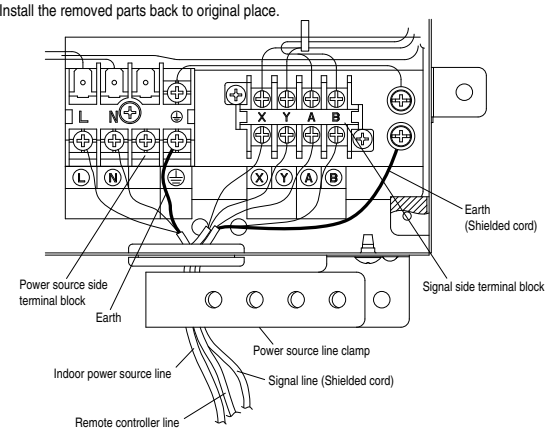
Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the Connector CNB is disconnected, and then the power supply (230VAC on the terminal block ① and ②) is turned ON.

Make sure to turn OFF "SW7-1" and reconnect the Connector CNB after the test.

⑧Wiring-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 grounding work.
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work.

1. Remove a lid of the control box (3 screws) and the wiring cover (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.



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	

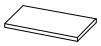
(i) Wallmounted type (FDK)

PHA012D033

①Before installation

●Install correctly according to the installation manual.
●Confirm the following points:
○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Installation-related items

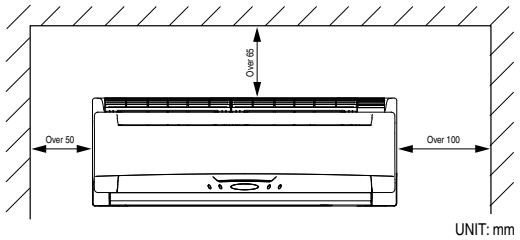
Mounting plate	Tapping screw	Insulation	Strap
			
1	10	1	4
Attached to the backside of the indoor unit.	For the mounting plate, 4mm (dia.) x 25mm (length)	For heat insulation, 50mm x 160mm	For wire clamp

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 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 controller and the air conditioner might not work properly.)

②Check 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



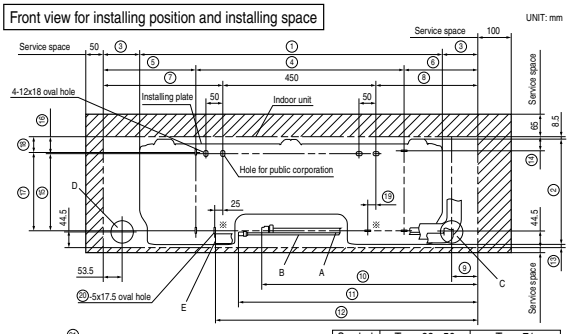
UNIT: mm

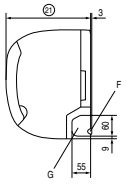
ATTENTION
●Secure a working space for inspection and maintenance.

③Preparation before installation

Front view for installing position and installing space

UNIT: mm





Symbol	
A	Gas piping
B	Liquid piping
C	Wall pulling hole for right rear piping
D	Wall pulling hole for left rear piping
E	Drain piping
F	Outlet for wiring
G	Outlet for piping

Symbol	Type 22 - 56	Type 71
①	693	886
②	284.2	301.8
③	73.5	106
④	-	610
⑤	-	269
⑥	-	219
⑦	207.5	349
⑧	182.5	299
⑨	63.5	77
⑩	533.5	633.5
⑪	603.5	703.5
⑫	515	772
⑬	5.3	7.7
⑭	-	43
⑮	220.5	221.5
⑯	47.5	49.5
⑰	-	225
⑱	-	46
⑲	0	25
⑳	2 (※)	6
㉑	259	248

④Installation of indoor unit

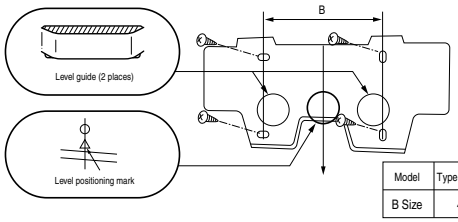
Haulage

ATTENTION
●In carrying the unit into an installation site, carry it in the original packaging to a point as close to the proposed installation site as possible.
●When the unit needs to be unpacked during haulage due to a compelling reason, wrap it with nylon slings or the like to prevent possible damages.
Note: Do not hold the unit by the diffuser louver in carrying it.
●When the unit needs to be laid on a floor after unpacking, always lay it with its front facing upward.

Installation of the mounting plate

ATTENTION
●This unit cannot be installed directly onto a wall surface. Regardless of the surface it is to be installed onto, you should use the mounting plate supplied with the unit.

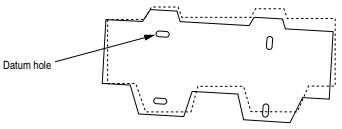
○Install it securely by spotting a structural member running underneath the wall (stud or the like) and after ascertaining its levelness.



UNIT: mm

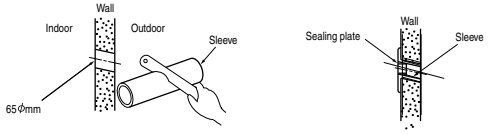
Model	Type 22~56	Type 71
B Size	450	450,610

○The levelness of the mounting plate should be adjusted with the four fixing screws fastened temporarily.



○Rotate the plate around the datum hole to achieve the levelness.

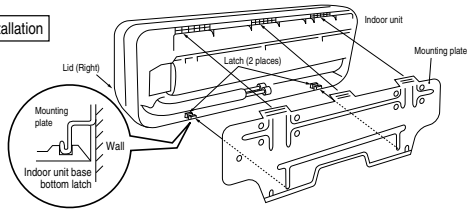
Hints for making a hole on a wall



○Give a descending grade of 5° from the interior to the exterior.

④Installation of indoor unit (continued)

Unit installation



• To remove the unit from the mounting plate, first remove the right and left lids and then disengage the indoor unit base bottom latches.

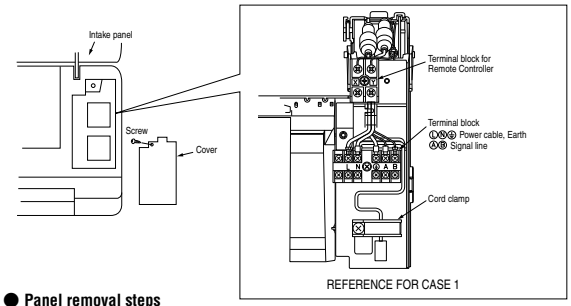
Installation steps	
 ①Hang the upper part of the indoor unit onto the mounting plate.	 ②Push the lower part of the indoor unit lightly against the wall for one-touch installation.

⑤Wiring-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.

CASE 1 : MODEL 22 ～ 56, CASE 2 : MODEL 71

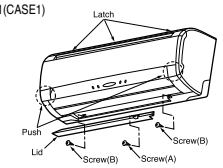
1. Open the intake panel. (Pull the lower part of the intake panel holding both ends, disengage the latches and then lift it until you feel some drag. The intake panel will stay open at an angle of about 60°)
2. Remove the screw and detach the cover.
3. Connect the remote control line to the upper one of the two terminal blocks provided in the control box.
4. Connect the power cable, grounding line and signal line to the lower terminal block.
5. Attach the cover and fasten the screw.
6. Close the intake panel.
   (Note)
   ・Connect each line to terminal block according to number on label of terminal block.



● Panel removal steps

1. Remove the cap.(CASE1.only)
2. Remove the fixing screw A and detach the unit bottom guide.(CASE1.only)
3. Remove the fixing screw B.
4. Pull the lower part of the front panel off the unit toward you, and then push it up to detach its upper part from the unit.
   (Disengage three hooks located on the top part)

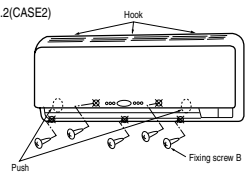
Fig.1(CASE1)



● Panel attachment steps

1. Always remove the air filter beforehand.
2. Place the front panel over the unit.
3. Engage it onto the unit by pressing the areas marked with ◌ in the drawing from the front.
4. Fasten the fixing screw B.
5. Set the air filter.
6. Attach the unit bottom guide and fasten the fixing screw A.(CASE1.only)
7. Attach the cap.
   (Plug it in securely until the end so that it won't come off easily) (CASE1.only)

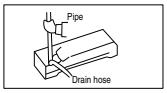
Fig.2(CASE2)



⑥Shaping of pipes and drain hoses

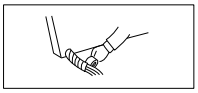
(When it is routed through the rear)

○Shaping of pipes



●Hold the root of the pipe to change its direction, straighten it and then shape it.

○Tape wrapping

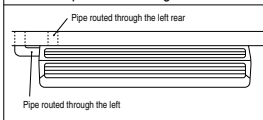
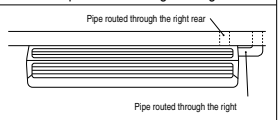


●Wrap a tape for the length that corresponds to a penetration through the wall.
●The connecting wires must be wrapped together with the pipe.

Make sure that wires are connected securely onto the terminal block, before you dress them with a tape after shaping the pipe.

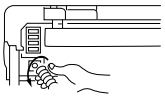
(Points for attention when the pipe is routed through the left or the rear of the unit.)

〈View from the top〉

Pipe routed through the left	Pipe routed through the right
	

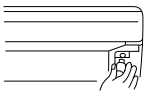
〈Steps to change drain hose connection positions〉

1. Remove the drain hose.



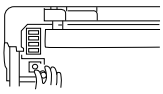
●Turn the drain hose and pull it out.

2. Remove the drain cap and heat insulating material.



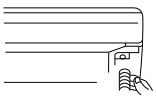
●Remove it either manually or with pliers.

3. Plug in the drain cap and heat insulating material.



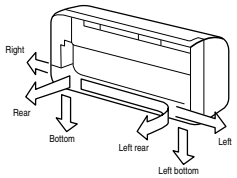
●Plug the drain cap removed in the step 2 securely into the hole with a hexagonal wrench or the like.
Note: Pay attention that a drain cap not properly plugged in can cause a water leak.

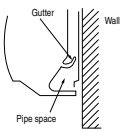
4. Connect the drain hose.



●Insert the drain hose securely by turning it.
Note: Pay attention that a drain hose not properly plugged in can cause a water leak.

The pipe can be routed through the rear, left, left rear, right or bottom of the unit.





This air conditioner is designed to collect dew formed on its back in the drain pan for discharging, so do not lay power cables, etc. in any part above the gutter.

⑦Refrigerant pipe

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 air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.

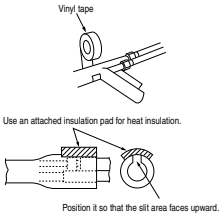
●Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.

●Use special tools for R410 refrigerant.

Work procedure

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
ϕ6.35	14 to 18
ϕ9.52	34 to 42
ϕ12.7	49 to 61
ϕ15.88	68 to 82



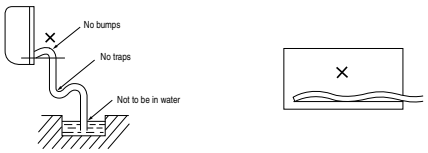
⑧Drain pipe

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.
1. A general-purpose hard PVC pipe VP-16 can be connected to the drain hose tip as a part of drain piping.
2. Drain piping must be given a descending grade so that drain water may flow smoothly and it must not have any trap or bump within the system.
(The pipe can be routed through the left, right, rear or bottom of the unit)
Hard PVC pipes (VP-16) laid indoors must be kept warm.

⑧Drain pipe (continued)

3. Pour water into the drain pan placed underneath the heat exchanger to make sure that it is properly drained outdoors.
(For removal of the front panel, refer to ⑤Wiring-out position and wiring connection in this manual.



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.

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	

PHA012D033

(j) Ceiling suspended type (FDE)

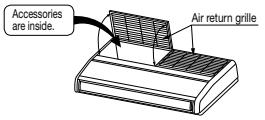
PFA012D618

①Before installation

- Install correctly according to the installation manual.
- Confirm the following points:
  ○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For unit 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)	Fixing bracket	Screw (M4)	Heay insulation	Screw
8	1	1	1	4	1	1	2	1	4
For unit hanging	For unit hanging and adjustment	For heat insulation of gas pipe	For heat insulation of liquid pipe	For fixing of pipe cover	For drain pipe connection	For fixing of drain hose	For installing of fixing bracket	For drain hose	For fixing air return grille



②Selection of installation location for the indoor unit

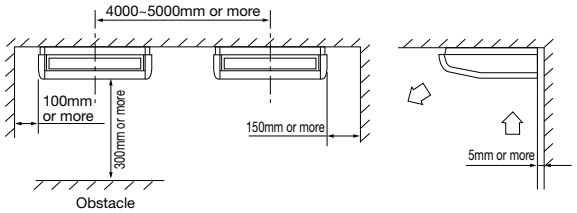
① Select the suitable areas to install the unit under approval of the user.
- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- Areas where there is enough 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 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 controller 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.

④ When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service



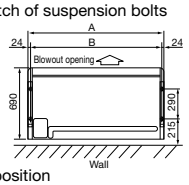
③Preparation before installation

- If suspension bolt becomes longer, do reinforcement of earthquake resistant.
  ○For grid 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.
  ○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

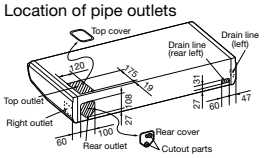
Pitch of suspension bolts



(mm)

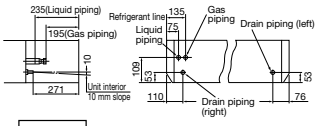
Series	type	A	B
Single Split (PAC) series	40 to 50type	1070	1022
	60 to 71type	1320	1272
	100 to 140type	1620	1572
VRF (KX) series	36 to 56type	1070	1022
	71type	1320	1272
	112 to 140type	1620	1572

Location of pipe outlets



※The outlet through which the pipings are taken out is available in three directions.

Pipe position

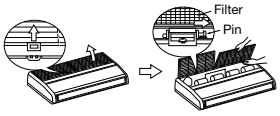


Haulage

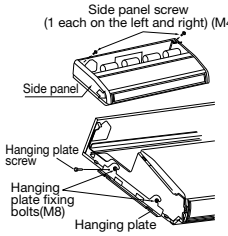
- Move the box as close to the installation area as possible packed.
- If it must be unpacked, wrap the unit with a nylon sling, and be careful not to damage the unit.
- If you need to lay the unit on a floor after unpacking, always put it with the intake grille facing upward.

Preparation before instalation

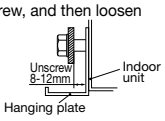
1. Remove the air return grille.
Slide stoppers (4 places) of the catches, then pull out the pins (4 or 6 places).



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



3. Remove the hanging plate.
Remove the screw, and then loosen the fixing bolts.



④Remote controller

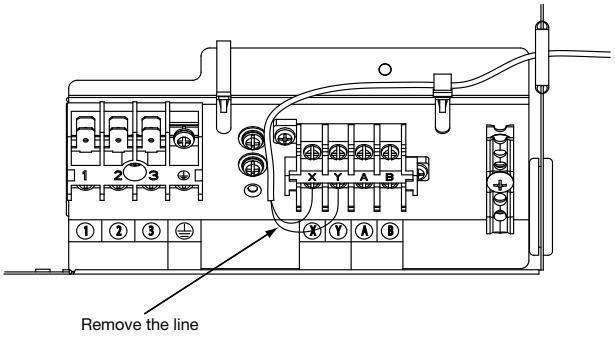
Installation of remote controller

Up to two receiver or wired remote controller can be installed in one indoor unit group.

● When both wired and wireless remote controller are used
It is necessary to set wired or wireless remote controller as slave.
(For the method of changing the setting, refer to the installtion manual attached to remote controller or wireless kit.)

● When wired remote controller 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).

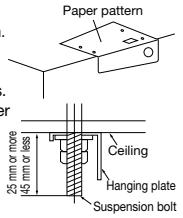
ATTENTION
①Insulate with tape the removed line.
②The LED of that removed connector will not be able to make any indication.



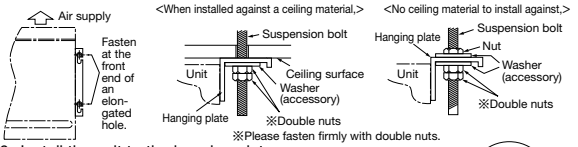
⑤Installation of indoor unit

Work procedure

1. 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 bolts.

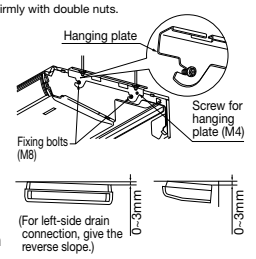


5. Fasten the hanging plate onto the suspension bolts.



※Please fasten firmly with double nuts.

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

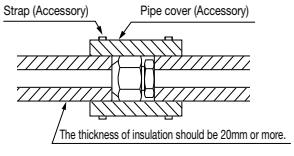
Caution

- ●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 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

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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.

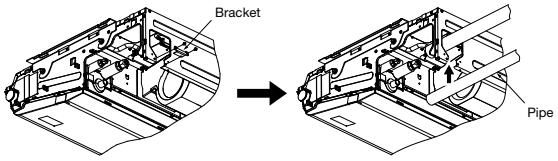
Pipe diameter	Tightening torque N·m
ø 6.35	14 to 18
ø 9.52	34 to 42
ø 12.7	49 to 61
ø 15.88	68 to 82
ø 19.05	100 to 120



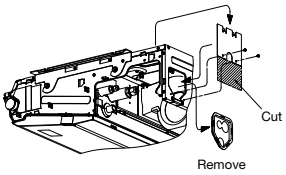
⑥Refrigerant pipe (continued)

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.



⑦Drain pipe

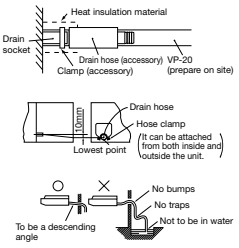
The drain pipes may face out towards the back to the left, or to the right side.

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 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 may occur upon removal of a drain plug.
2. Fix the drain hose at the lowest point with a hose clamp supplied as an accessory.
   ※Give a drain hose a gradient of 10mm 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.)
   ※ Use commercially available rigid PVC general pipe VP-20 for drain pipe.
4. 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.
5. 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

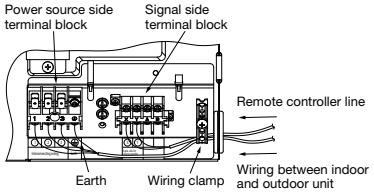
- After installation of drain pipe, make sure that drain system work in good condition and no water leakage from joint and drain pan.
- Do drain test even if installation of heating season.

⑧Wiring-out position and wiring connection

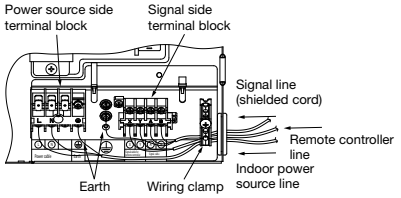
- Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country.
  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.

1. Remove a lid of the electrical box (2 screws).
2. Hold each wiring inside the unit and connect to a terminal block surely.
3. Fix the wiring by clamps.
4. Install the removed parts back to original place.

Single split (PAC) series



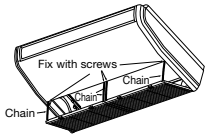
VRF(KX) series

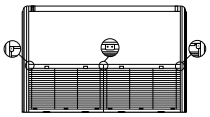


⑨Attaching the air return grille

- The air return grille must be attached when electrical cabling work is completed.

1. Fix the chains tied to the air return grille onto the indoor unit with screws supplied as accessories (4 pieces).
2. Close the air return grille.
   This completes the unit installtion work.





⑩Check list after installation

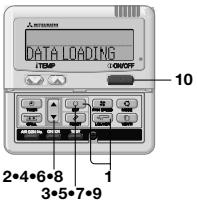
- Check the following items after all installation work completed.

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	

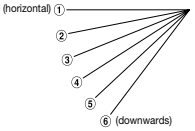
⑪How to set the airflow direction

It is possible to change the movable range of the louver on the air outlet from the wired remote controller. 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.

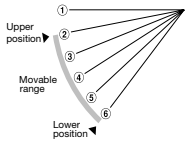
1. Stop the air conditioner and press SET button and LOUVER button simultaneously for three seconds or more.
   - The following is displayed if the number of the indoor units connected to the remote controller is one. Go to step 4.
     "DATA LOADING" → "No.1 ▲"
   - The following is displayed if the number of the indoor units connected to the remote controller are more than one.
     "SELECT I/U" → "I/U000 ▲"



2. Press ▲or▼button.(selection of indoor unit) ●Select the indoor unit of which the louver is set.
   [EXAMPLE]
   "I/U000 ▲" ⇔ "I/U001 ⇕" ⇔ "I/U002 ⇕" ⇔ "I/U003 ⇕"
3. Press SET button.(determination of indoor unit) ●Selected indoor unit is fixed.
   [EXAMPLE]
   "I/U001 " (displayed for two seconds) → "DATA LOADING" → "No.1 ▲"
4. Press▲or▼button.(selection of louver No.) ●Select the louver No. to be set according to the right figure.
   [EXAMPLE]
   "No.1 ▲" ⇔ "No.2 ⇕" ⇔ "No.3 ⇕" ⇔ "No.4 ▼"
5. Press 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 UPPER2 ⇕" ←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 setting, use "position --".



   "No.1 UPPER1 ▼" (the most horizotal)
   ⇔ "No.1 UPPER2 ⇕"
   ⇔ "No.1 UPPER3 ⇕"
   ⇔ "No.1 UPPER4 ⇕"
   ⇔ "No.1 UPPER5 ⇕"
   ⇔ "No.1 UPPER6 ▲" (the most downwards)
   ⇔ "No.1 UPPER-- ▲" (return to the default setting)
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 UPPER2 (displayed for two seconds)
   → No.1 LOWER5 ⇕ (shows current setting)
8. 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 LOWER1 ▼ (the most horizontal)
   No.1 LOWER2 ⇕
   No.1 LOWER3 ⇕
   No.1 LOWER4 ⇕
   No.1 LOWER5 ⇕
   No.1 LOWER6 ⇕ (the most downwards)
   No.1 LOWER-- ▲ (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 (displayed for two seconds)
   SET COMPLETE
   No.1 ▲
10. Press ⏻ON/OFF button.
    ●Louver adjusting mode ends and returns to the original display.

Caution
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.

ATTENTION
If you press RESET button during settings, the display will return to previous display.If you press ⏻ON/OFF 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 controllers are connected, louver setting operation cannot be set by slave remote controller.

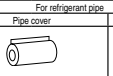
(k) Floor standing (with casing) type (FDFL)

PGD012D005

① Before installation

- Install correctly according to the installation manual.
- Confirm the following points:
  ○ Unit type/Power supply specification ○ Pipes/Wires/Small parts ○ Accessory items

Accessory item

For installation		For refrigerant pipe					For drain pipe
Floor bracket	Tapping screw	Pipe cover	Pipe cover		Strap	Joint pipe	Drain hose
							
2	2	2	1	1	8	1	1
	For installing remote controller (M4 x l 12)	For heat insulation of gas pipe	For on site side of liquid pipe (150 mm length)	For liquid pipe between Heat exchanger/ expansion valve box(70 mm length)	For pipe cover fixing	For connecting gas pipe	For drain pipe connecting

② Selection of installation location for the indoor unit

This indoor unit can be installed either to the floor or to the wall. Select a location with the following suitable conditions.

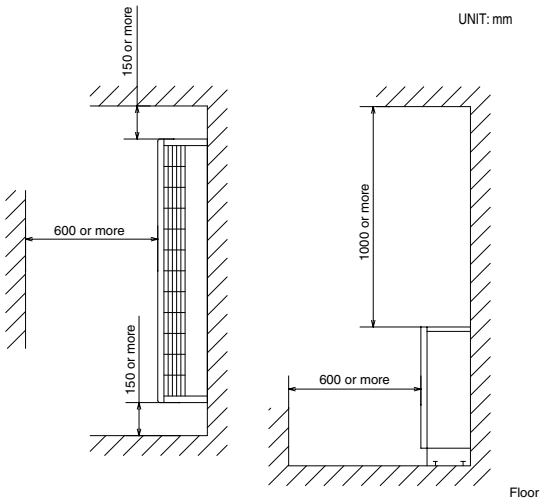
① Select the suitable areas to install the unit under approval of the user.
- Areas where the indoor unit can deliver hot and cold wind sufficiently.
- Areas where there is enough space to install and service.
- Areas where it can be drained properly. Areas where drain pipe descending slope can be taken.
- 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.
  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.
- 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 controller 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 the unit falling down and injury.

③ When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service

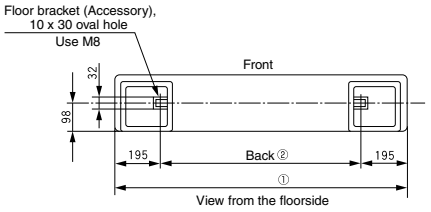
UNIT: mm



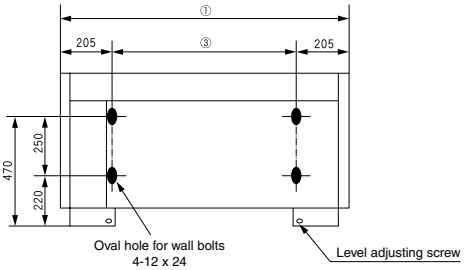
③ Preparation before installation

Position of bolts for floor bracket and for wall installation bolts

Position of floor bracket bolts

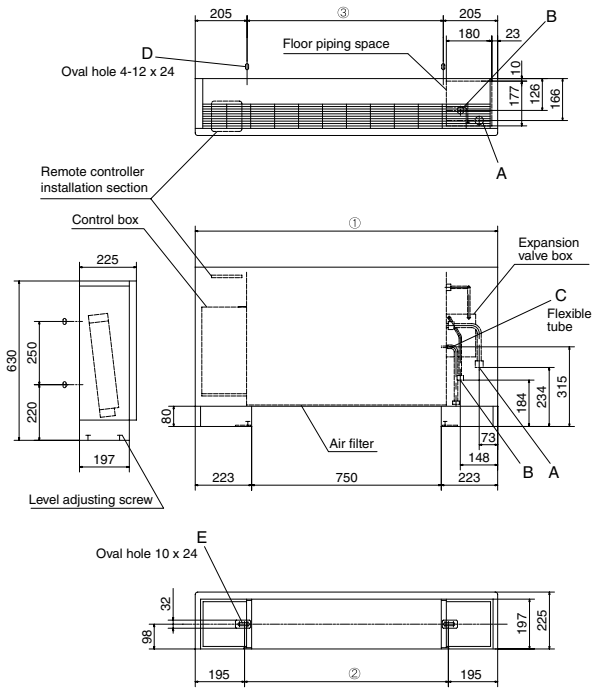


Position of wall installation bolts



UNIT:mm

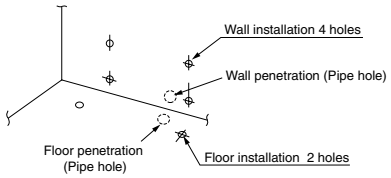
Item / Model No.	①	②	③
Type 28,45,56	1,196	806	786
Type 71	1,481	1,091	1,071



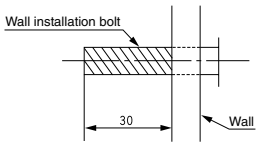
Symbol	Contents
A	Refrigerant gas side piping (provided)
B	Refrigerant liquid side piping
C	Drain piping (provided)
D	Wall installation hole
E	Floor bracket (provided)

④ Installation of indoor unit

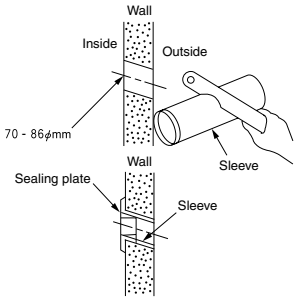
Choose the floor bracket bolt location or the wall installation bolt location, and the location of the pipe hole. Open the holes for the bolts and the pipe.
Choose the positions by the measured values.



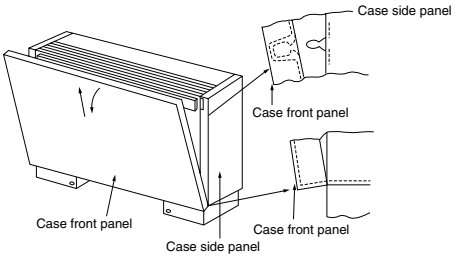
Strictly adhere to the following measurements for the wall installation bolts.

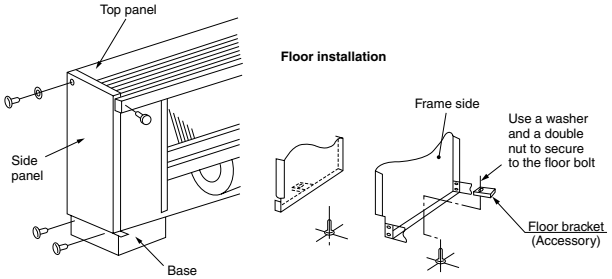


Here is the method to drill the holes on the wall.

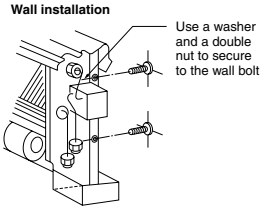


(1) Remove the front panel and the side panel.
(2) Eliminate looseness with a level adjusting screw.
(3) Firmly secure as instructed below.
The side panel and the front panel have been installed.





Wall installation



⑤ 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 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

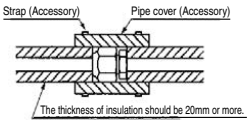
1. Remove the flare nut and blind flanges on the pipe of the indoor unit. (The connection of Liquid/Gas side of heat exchange, Inlet/outlet of the expansion valve box) (4 places)
   ※ Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with 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.
   ○ Make sure to connect the liquid pipe between the heat exchanger and expansion valuve box (indicated in Section A of the figure).
   ○ Pipes can be take out in 2 directions, from the rear and from the floor.
   ○ Use the provided joint pipes to connect gas pipes. Connect in the direction that the pipe will be removed.
   ※ 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 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.

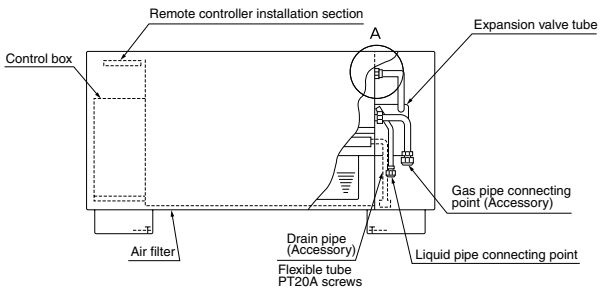
3. Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
   - Make sure to insulate both gas pipes and liquid pipes completely.
     ※ Incomplete insulation may cause dew condensation or water dropping.

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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



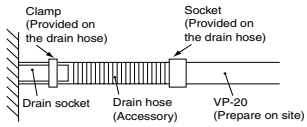
○ There are "System name" and "Refrigerant amount" columns on the name plate of the outdoor unit. Write the system name and the amount of the refrigerant in the columns.



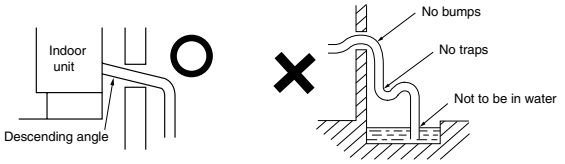
⑥ Drain pipe

Caution

Insert the attached drain hose to the indoor unit completely, tighten the drain hose with the attached clamp and secure it well.(Disapprove of the adhesive joint)



- 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.
- Insert the attached drain hose completely to the base.
- Tighten the drain hose with the strap and secure it well.



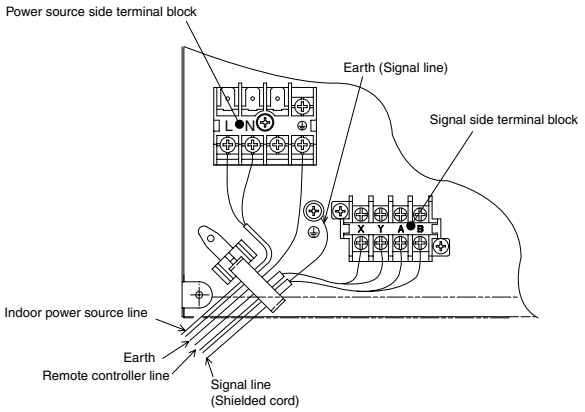
Drain test

- 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.

⑦ 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.
- Be sure to do D type earth work.
- 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.

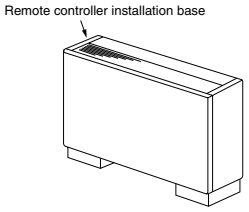


⑧ Remote Controller

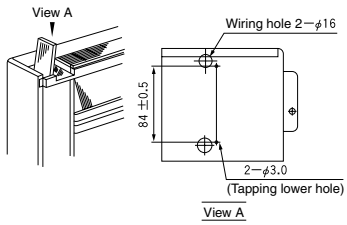
Caution

- Appearance

When installing the remote controller and selecting the line of remote controller of the unit, refer to the Electric Wiring Instruction Manual provided in the unit and Installation Manual provided for wired remote controller.

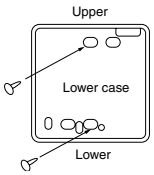


(1) Remove the front panel



(2) Installation of remote controller

- Install the lower case with the provided tapping screws (M4 x 12)

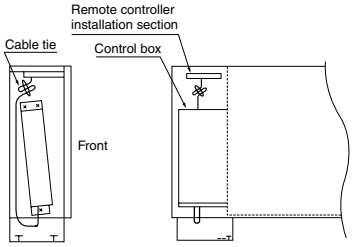


(3) Caution for Installing the remote controller

- Make sure that the cord length is too much long 30 cm or more. (It is necessary when remove the front panel and servicing the unit.)

(4) Wiring route

- Connect wires to the terminal block through the wiring hole on the back of the control box.
- Bind the remaining length of the wire with a band.



(Check)

- Ensure that the wires are not hitting the edges.
- Conduct a test run to confirm there are no problems.

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	

(I) Floor standing (without casing) type (FDFU)

PGD012D006

① Before installation

- Install correctly according to the installation manual.
- Confirm the following points:
  ○ Unit type/Power supply specification ○ Pipes/Wires/Small parts ○ Accessory items

Accessory item

For installation	For refrigerant pipe					For drain pipe
Floor bracket	Pipe cover	Pipe cover		Strap	Joint pipe	Drain hose
						
2	2	1	1	8	1	1
	For heat insulation of gas pipe	For on site side of liquid pipe (150 mm length)	For liquid pipe between Heat exchanger/ expansion valve box(70 mm length)	For pipe cover fixing	For connecting gas pipe	For drain pipe connecting

② Selection of installation location for the indoor unit

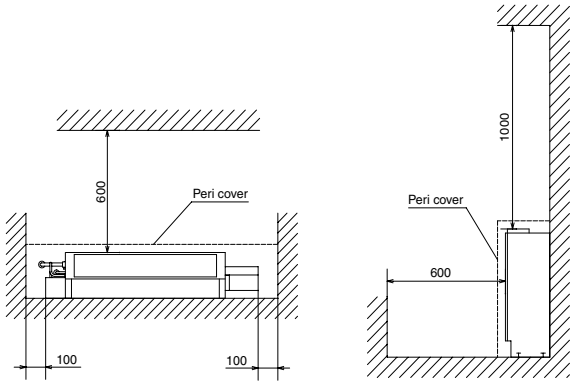
This indoor unit can be installed either to the floor or to the wall. Select a location with the following suitable conditions.

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.
- 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.
  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.
- 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 controller 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 the unit falling down and injury.

③ When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Installation spaces for the indoor unit

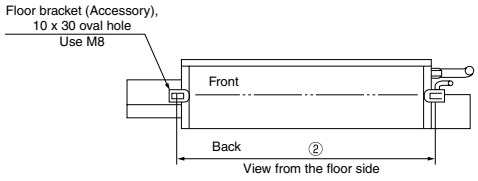


UNIT: mm

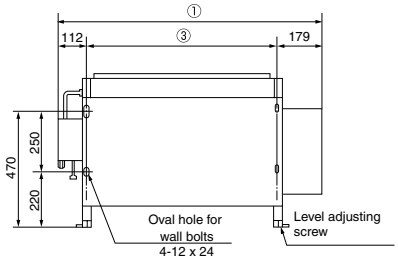
③ Preparation before installation

Position of bolts for floor bracket and for wall installation bolts

Position of floor bracket bolts

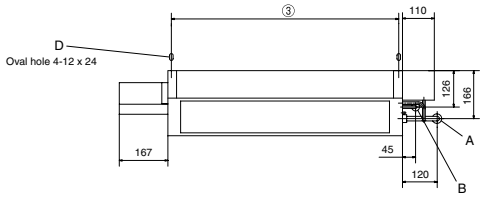


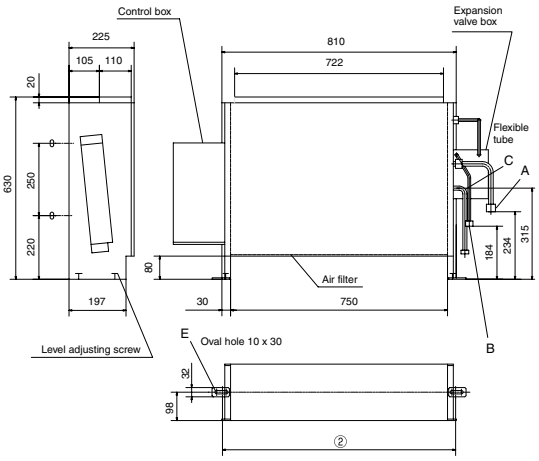
Position of wall installation bolts



UNIT:mm

Model No. \ Item	①	②	③
Type 28,45,56	1,150	806	786
Type 71	1,435	1,091	1,071

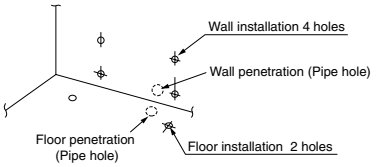




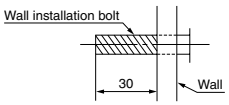
Symbol	Contents
A	Refrigerant gas side piping (provided)
B	Refrigerant liquid side piping
C	Drain piping (provided)
D	Wall installation hole
E	Floor bracket (provided)

④ Installation of indoor unit

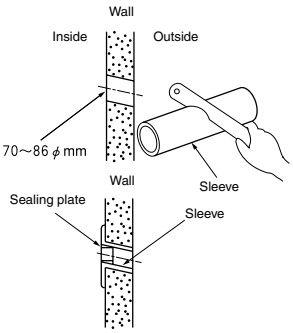
Choose the floor bracket bolt location or the wall installation bolt location, and the location of the pipe hole. Open the holes for the bolts and the pipe.
Choose the positions by the measured values.



Strictly adhere to the following measurements for the wall installation bolts.

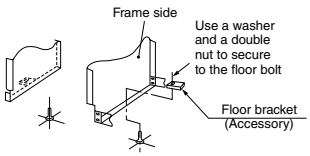


Here is the method to drill the holes on the wall.

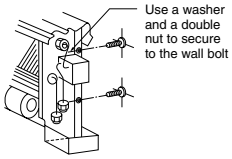


(1) Eliminate looseness with a level adjusting screw.
(2) Firmly secure as instructed below.

Floor installation

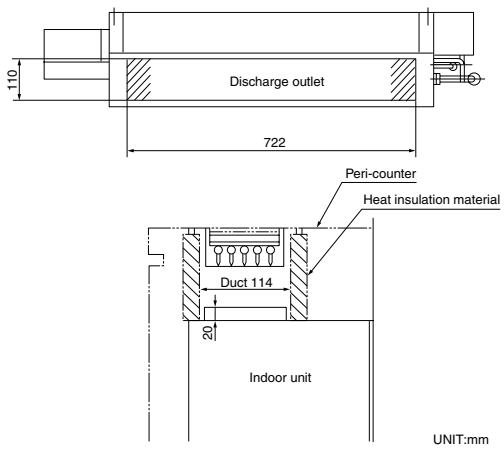


Wall installation



Example of discharge duct installation

○ Heat insulation materials, a discharge grille and a peri-counter are not included in the items supplied with a unit (to be prepared on site)
○ A duct must be installed securely so that cooled air may not leak inside the peri-counter.



UNIT:mm

⑤ Refrigerant piping

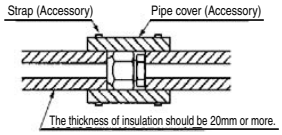
Caution

● 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 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.

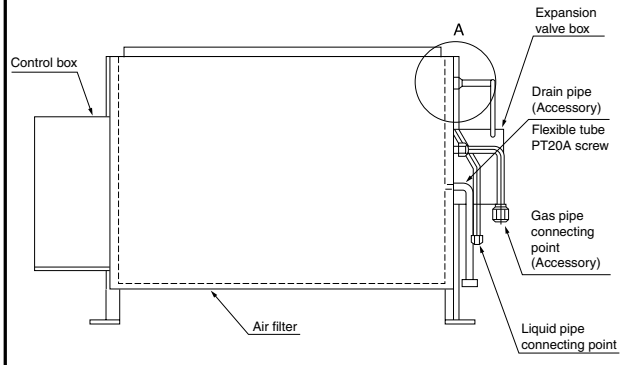
Work procedure

1. Remove the flare nut and blind flanges on the pipe of the indoor unit. (The connection of Liquid/Gas side of heat exchange, Inlet/outlet of the expansion valve box) (4 places)
※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.
○ Make sure to connect the liquid pipe between the heat exchanger and expansion valuve box (indicated in Section A of the figure).
○ Pipes can be take out in 2 directions, from the rear and from the floor.
○ Use the provided joint pipes to connect gas pipes. Connect in the direction that the pipe will be removed.
※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 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.
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 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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



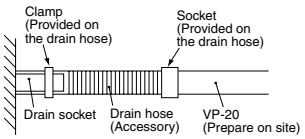
○ There are "System name" and "Refrigerant amount" columns on the name plate of the outdoor unit. Write the system name and the amount of the refrigerant in the columns.



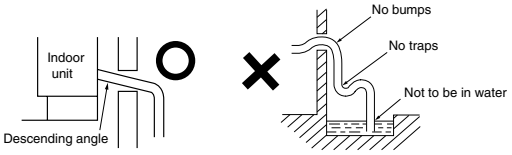
⑥ Drain pipe

Caution

Insert the attached drain hose to the indoor unit completely, tighten the drain hose with the attached clamp and secure it well.(Disapprove of the adhesive joint)



- 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.
- Insert the attached drain hose completely to the base.
- Tighten the drain hose with the strap and secure it well.



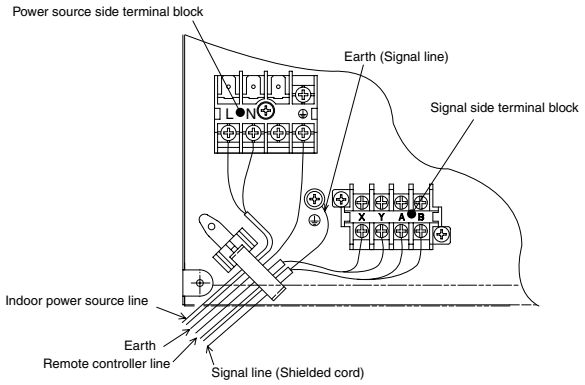
Drain test

- 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.

⑦ 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.
- Be sure to do D type earth work.
- 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.



⑧ 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	

(m) Duct Connected-Compact & Flexible type (FDUH)

PJC012D200 A

①Before installation

●Install correctly according to the installation manual.
●Confirm the following points:
○Unit type/Power supply specification ○Pipes/Wires/Small parts ○Accessory items

Accessory item

For refrigerant pipe			For drain pipe		
Pipe cover(big)	Pipe cover (small)	Strap	Transparent soft tube	Hose clamp (big)	Hose clamp (small)
					
1	1	4	1	1	1
For heat insulation of gas pipe	For heat insulation of liquid tube	For pipe cover fixing	For drain pipe connecting	For drain hose mounting	For drain hose mounting

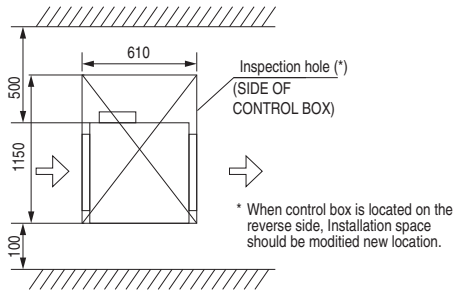
②Selection of installation location for the indoor unit

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 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.

②Check 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

●Install the indoor unit at a height of more than 2.5m above the floor.



③Preparation before installation

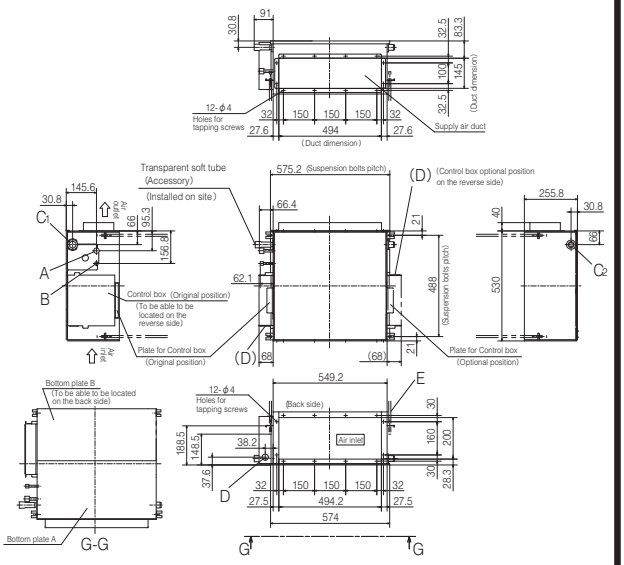
●If suspension bolt becomes longer, do reinforcement of earthquake resistant.
○For grid ceiling
When suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.
○In case the unit is hanged directly from the slab and is installed 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)

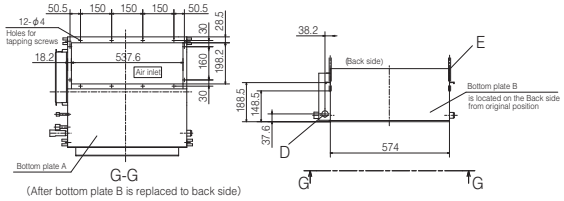
Ceiling opening, Suspension bolts pitch, Pipe position

Symbol	Content		
	Model	FDUH22KXE6,28KXE6	FDUH36KXE6
A	Gas piping	ϕ9.52(3/8") (Flare)	ϕ12.7(1/2") (Flare)
B	Liquid piping	ϕ6.35(1/4") (Flare)	
C_1	Drain piping	VP20 Note(2)	
C_2	Drain piping	To be used instead of "C_1"	
D	Hole for wiring	ϕ30	
E	Suspension bolts	(M10)	

Notes (1) The model name label is attached on the fan case inside the air return grille.
(2) Prepare the connecting socket(VP20)on site. (As for drain piping, it is possible to choose C_1 or C_2)



<Normal setting>

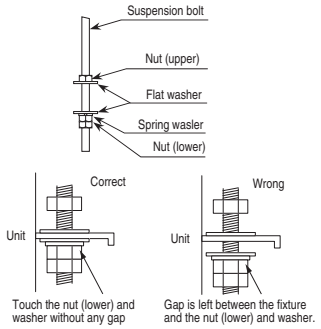


<Bottom Suction setting>

④Installation of indoor unit

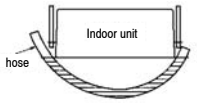
Work procedure

1. Arrange the suspension bolt at the right position (488mm×576mm).
2. Make sure to use four suspension bolts and fix them so as to be able to hold 500N load.



④Installation of indoor unit (continued)

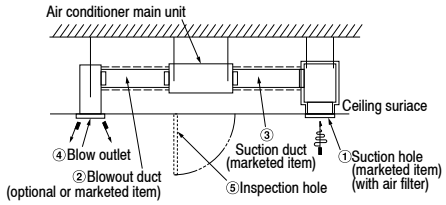
3. Make sure to install the indoor unit horizontally. Confirm the levelness of the indoor unit with a level gauge or transparent hose filled with water. Keep the height difference at both ends of the indoor unit within 3mm.
4. Tighten four upper nuts and fix the unit after height and levelness adjustment.



Caution

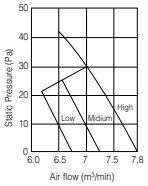
- ●Do not adjust the height by adjusting upper nuts. It will cause unexpected stress on the indoor unit and it will lead to deformation of the unit, failure of attaching a panel, and generating noise from the fan.
- ●Make sure to install the indoor unit horizontally and set the gap between the unit underside and the ceiling plane properly. Improper installation may cause air leakage, dew condensation, water leakage and noise.

⑤Duct work



Request

①●Calculate air capacity and the outside static pressure to select the duct's length and shape, and blow outlet.



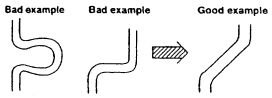
Caution

- ●Take care that the outside static pressure does not exceed 30 Pa. The unit has condensation owing to the decrease in air capacity, possibly causing the ceiling and household goods to become wet.

②The main body of the air conditioner is not provided with an air filter. Assemble it into the suction grill for which cleaning is easy.

③Blow duct

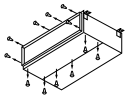
- ●Make the duct the shortest in length.
- ●Bend a lot less abruptly. (Make the bend radius a lot larger.)



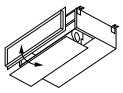
- ●When connecting the main body to the duct flange of the blow outlet, attach the insulation material to the fixed portion to protect it from condensation.
- ●Conduct the duct work before ceiling attachment.

④ Inlet port

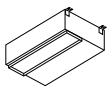
- ●When placing the inlet port to carry out suction from the bottom side, use the following procedure to replace the suction duct joint (prepare on site) and the bottom plate.



●Remove the screws which fasten the bottom plate and the duct joint (prepare on site) on the inlet port side of the unit.



●Replace the removed bottom plate and duct joint (prepare on site).



●Fit the duct join (prepare on site) with a screw; fit the bottom plate.

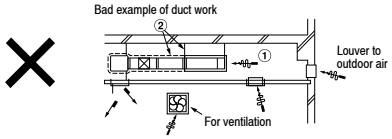
⑤ Make sure to keep the suction duct warm to protect it from condensation.

⑥ Install the blowout hole where air can flow all over the room.

⑦ Make sure to install the inspection opening in the ceiling. It is needed for the maintenance of electrical parts, the motor and other parts.

⑤Duct work (continued)

Example of bad duct work



①If the suction duct is made in the ceiling without using the suction side duct, the temperature inside the ceiling will be high owing to the ventilating fan's performance, the strength of any wind blowing against the outdoor air louver, weather (on a rainy day) and other factors.

- ●The outside plate of the unit may have condensation, causing water to drip on the ceiling. Also, in the case of a new house of a concrete structure, the temperature may be high without a duct inside the ceiling. In such a case, keep the whole unit warm using glass wool (25mm). (Cover the glass wool with wire netting or the like.)
- ●The unit may be beyond its operation limit, causing overloading of the compressor, and other trouble.
- ●Because the blowing capacity of the unit increases, owing to the ventilating fan's performance and any wind blowing against the outdoor air louver, up to its use limit, draining liquid from the heat exchanger does not flow into the drain pan, possibly flowing to the outside and causing water leaks (in which drained liquid drips on the ceiling).

⑥Refrigerant pipe

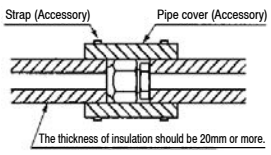
Caution

- ●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 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

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.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on 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 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.
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 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
ϕ 6.35	14 to 18
ϕ 9.52	34 to 42
ϕ 12.7	49 to 61
ϕ 15.88	68 to 82
ϕ 19.05	100 to 120



⑦Drain pipe

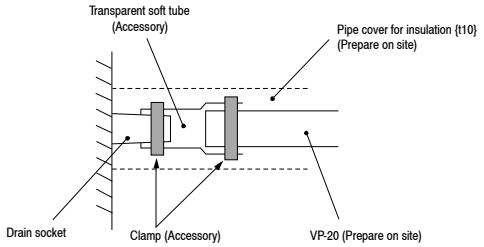
Caution

- 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.

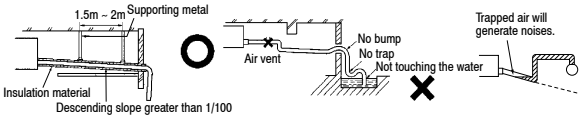
Work procedure

1. Connect the drain pipe (VP-20) to drain socket using "transparent soft tube (accessory)" and secure firmly with a clamp.
   - Do not apply adhesives on both side.

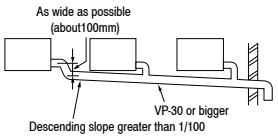
   {*1 If the drain tube is directly connected with drain socket, the drain socket and drain pan would not be able to be removed.}
   {*2 As optional setting, rubber hose (inside diameter ϕ19) can be connected directly with clamp to above drain socket under the later condition.}



2. 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.

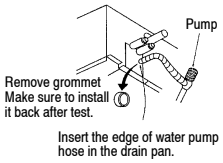


3. Insulate the drain pipe.
   - Be sure to insulate the drain socket and rigid PVC pipe installed indoors otherwise it may cause dew condensation and water leakage.
     ※ After drainage test implementation, cover the drain socket part with pipe cover (small size), then use the pipe cover (big size) 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.

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.
- For new building cases, make sure to complete the test before hanging the ceiling.

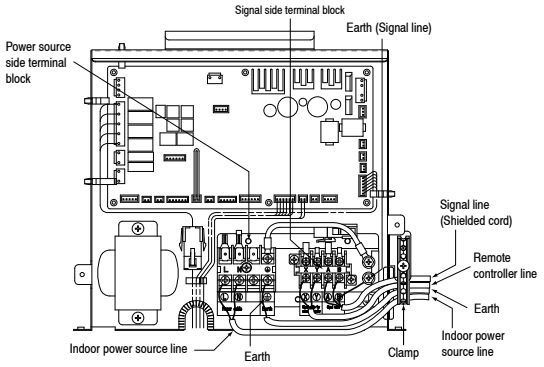
1. Remove the drain grommet, and pour water of about 1000cc into the drain pan in the indoor unit by pump so as not to get the electrical component wet.
2. Make sure that water is drained out properly and there is no water leakage from any joints of the drain pipe at the test.
3. Make sure to install the grommet back to original place.
4. Insulate the drain pipe properly finally.



⑧Wiring-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.

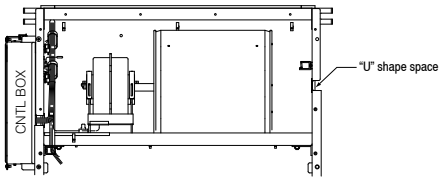
1. Remove a lid of the control box (2 screws).
2. Hold each wiring inside the unit and fasten them to terminal block securely.
3. Fix the wiring with clamps.
4. Install the removed parts back to original place.



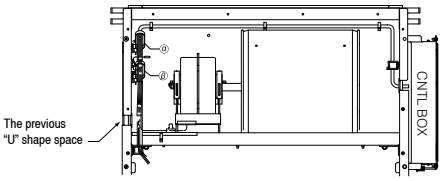
> Procedure for optional setting of control box

(i) Remove bottom plate.
(ii) Unfasten two (2) "straps" for wire.
(iii) Remove the plate for control box. (2 screws), and set it at optional position (oposite side).
(iv) Remove the control box (2 screws), and set it at optional position (oposite side).
(v) Cut insulation of "U" shape space.
Through this cutting, set and fix all wires by four (4) "clamps" and two (2) "straps".
(vi) Close the previous "U" shape wiring space by insulation, and set the bottom plate again.

① Wiring Location (Original)



② Wiring Location (Optional)
After fix ⓐ, the modification of wiring length should be done, by ⓑ



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	

5.2 Electrlc wiring work instruction

PSB012D922 A

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

● 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.

● Make sure there is no dust or clogging on both the plug and the socket nor loose connection of the socket before plugging, and plug in securely to the end of the blade.
Accumulation of dust, clogging on the socket or plug, or loose installation of the socket could cause electric shock and fire. Replace the socket if it is loose.

● 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.

● 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.

● 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.
Using the incorrect capacity 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 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 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

- Install an over-current and earth leakage breaker (threshold current: 30mA) specified for each unit without fail.
- 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.
- Set earth of D-type.
- Connection of a cable beyond 3.5 mm² is not permitted. When cables of over 5.5 mm² are in use, provide a dedicated pull box to take a branch to an indoor unit.
- Keep "remote controller line" and "power source line" away from each other on constructing of unit outside.
- Run the lines (power source, remote controller 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 (of indoor power source, remote controller 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.)
- 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.

① Electrical Wiring Connection (continued)

● 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:

① Do not use 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 60245 IEC 51), if allowed in the relant part 2;
–ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
–flat twin tinsel cord (code designation 60227 IEC 41);
–ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53);
② Provide a separate power outlet for each outdoor or indoor unit.
③ All indoor units grouped in one system must have power source that can be turned on or off simultaneously.
④ Pay extra attention 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.

● Connection of the line ("Between indoor and outdoor unit", Earth and Remote controller)

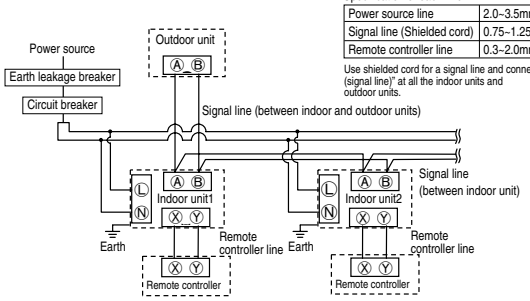
① Remove lid of control box before connect the above lines, and connect the lines to terminal block according to number pointed on label of terminal block.
In addition, pay enough attention to confirm the number to lines, because there is electrical polarity except earth line. Furthermore, connect earth line to earth position of terminal block of power source.
② Install earth leakage breaker on power source line. In addition, select the type of breaker for inverter circuit as earth leakage breaker.
③ If 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.

Cabling system diagram (Outdoor/indoor unit connection procedure)

Specification of each line

Power source line	2.0~3.5mm²
Signal line (Shielded cord)	0.75~1.25mm²
Remote controller line	0.3~2.0mm²

Use shielded cord for a signal line and connect "earth (signal line)" at all the indoor units and outdoor units.



Power source line specification

Wiring specification

Unit type	Earth leakage breaker	Circuit breaker		Wiring size				
		Switch breaker	Over-current protector rated capacity	Power source line	Wire length	Signal line	Remote controller line	Earth line
22-36	15A 30mA 0.1sec	30A	15A	2.0mm² ×2	304m	0.75~1.25mm²×2	0.3mm² ×2cores	2.0mm²
45-90					216m			
112-160					129m			
In case of Duct connected -High static pressure- type								
71-140	15A 30mA 0.1sec	30A	15A	2.0mm² ×2	87m	0.75~1.25mm²×2	0.3mm² ×2cores	2.0mm²
224,280					48m			

Note (1) The cord distances are calculated with a voltage drop of 2%. If the distance should exceed the above data, review the cord thickness to use in accordance with your extension cord regulations.
(2) When total extension of remote controller line is more than 100m, change the size of cord according to "③ Remote Control, Wiring and functions".

In case of Heat recovery 3-pipe systems

Branching controller of heat recovery 3-pipe systems wiring

- When this unit is used as a "Heat Recovery 3-pipe Systems", refer to the installation manual of a branching controller (option).

② Address setting

Address setting is done by (1) Manual address setting or (2) Automatic address setting.
In the case of (2) "Automatic address setting", it is possible to change address setting by wired remote controller after once complete setting.
As for details of setting procedure, refer to instructions attached to the outdoor unit for details.

③ Remote Control, Wiring and functions

- Do not install it on the following places.

(1) Place exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Place exposed to oil mist or steam directly.
(6) Uneven surface

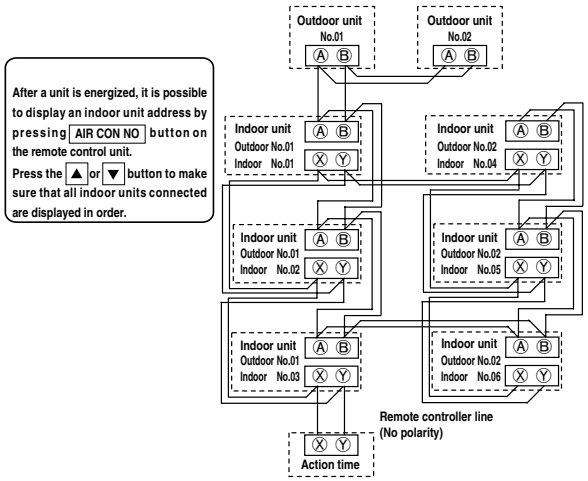
Installation and wiring of remote controller

① Install remote controller referring to the attached manual.
② Wiring of remote controller should use 0.3mm² x2 core wires or cables.
(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 controller 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 ..... 0.5mm²x2 core
Under 300m ..... 0.75mm² × 2 core
Under 400m ..... 1.25mm² × 2 core
Under 500m ..... 2.0mm² × 2 core
④ Avoid using multi-core cables to prevent malfunction.
⑤ Keep remote controller line away from earth (frame or any metal of building).
⑥ Make sure to connect remote controller line to the remote controller and terminal block of indoor unit. (No polarity)

③ Remote Control, Wiring and functions (continued)

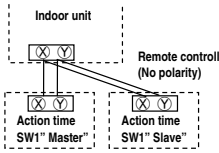
Control plural indoor units by a single remote controller

① A remote controller 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 controller line for group control.
③ Use the function of manual address setting to set the indoor and outdoor address number.
○Do not forget to set the number for the outdoor units.
④ As shown in the following figure, the remote control can be used to control multiple outdoor units.
⑤ One remote control is able to perform group control for multiple units (maximum 16 units).
○Use the rotary SW1 and SW2 provided on the indoor unit PCB (Printed circuit board) to set unique remote control communication address avoiding duplication.



Confirming method of indoor units

When indoor unit address number is displayed on remote controller, pushing the (MODE) button to make the indoor unit with that number blow air (Display example:"I/U01 ≋ ").
Push the (MODE) button again to stop the operation.
However, this operation is invalid on the air-conditioning running.



Switch	Setting	Contents
Wired remote controller: SW1 Wireless kit: SW1-2	Master	Master remote controller
	Slave	Slave remote controller

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.)
Latest "function setting" is superior than previous one.
Acceptable combination is "two (2) wired remote controllers", "one (1) wired remote controller and one (1) wireless kit" or "two (2) wireless kits".
Set SW1 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.

④ Trial 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 ⏻ON/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 ▼"
④When 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 ⏻ON/OFF button, the (TEMP) button or (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.

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 "OPER DATA ▼"
2. Press the (SET) button while "OPER DATA ▼" is displayed.
3. When only one indoor unit is connected to remote controller, "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 I/U" (blinking 1 seconds) → "I/U000 ♟" blinking.
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)
"I/U000" (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.
7. Upon operation of the ▲ ▼ button, the current operation data is displayed in order from data number 01.
The items displayed are in the following 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.
◎If two (2) remote controllers are connected to one (1) inside unit, only the master controller is available for trial operation and confirmation of operation data. (The slave remote controller is not available.)

Number		Data Item
01	❄	(Operation Mode)
02	SET TEMP___℃	(Set Temperature)
03	RETURN AIR___℃	(Return Air Temperature)
04	SENSOR___℃	(Remote Controller Thermistor Temperature)
05	THI-R1___℃	(Indoor Unit Heat Exchanger Thermistor / U Bend)
06	THI-R2___℃	(Indoor Unit Heat Exchanger Thermistor /Capillary)
07	THI-R3___℃	(Indoor Unit Heat Exchanger Thermistor /Gas Header)
08	I/U FANSPEED___	(Indoor Unit Fan Speed)
09	DEMAND___Hz	(Frequency Requirements)
10	ANSWER___Hz	(Response Frequency)
11	I/U EEV____P	(Pulse of Indoor Unit Expansion Valve)
12	TOTAL I/U RUN___H	(Total Running Hours of The Indoor Unit)
21	OUTDOOR___℃	(Outdoor Air Temperature)
22	THO-R1___℃	(Outdoor Unit Heat Exchanger Thermistor)
23	THO-R2___℃	(Outdoor Unit Heat Exchanger Thermistor)
24	COMP___Hz	(Compressor Frequency)
25	HP___MPa	(High Pressure)
26	LP___MPa	(Low Pressure)
27	Td___℃	(Discharge Pipe Temperature)
28	COMP BOTTOM___℃	(Comp Bottom Temperature)
29	CT___AMP	(Current)
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	O/U EEV1____P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	O/U EEV2____P	(Pulse of The Outdoor Unit Expansion Valve EEVH)

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.
①Press the TEST button for three seconds or longer.
The display will change "❄ TEST RUN ▼"
②Press the ▼ button once and cause "DRAIN PUMP ▲▼" to be displayed.
③When the (SET) button is pressed, a drain pump operation will start.
Display: "TO STOP"
2. To cancel a drain pump operation.
①If either (SET) or ⏻ON/OFF button is pressed, a forced drain pump operation will stop. The air conditioning system will become OFF.

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

⑤ Function Setting by Remote Controller

The functional setting.

• The initial function setting for typical using is performed automatically by the indoor unit connected, when remote controller 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 "◯ " , set your desired setting as for the selected item.
The procedure of functional setting is shown as the following diagram.

[Flow of function setting]

Start : Stop air-conditioner and press "(SET)" (SET) and "(MODE)" (MODE) buttons at the same time for over three seconds.
Finalize : Press "(SET)" (SET) button.
Reset : Press "(RESET)" (RESET) button.
Select : Press ▲ ▼ button.
End : Press ON/OFF button.
It is possible to finish above setting on the way, and unfinished change of setting is unavailable.

Record and keep the setting

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 controller function02	AUTO RUN SET	AUTO RUN ON	"Auto-RUN" mode selectable indoor unit.
		AUTO RUN OFF	Indoor unit without "Auto-RUN" mode
Remote controller function06	FAN SPEED SW	VALID	Indoor unit with two or three step of air flow setting
		INVALID	Indoor unit with only one of air flow setting
Remote controller function07	LOUVER SW	VALID	Indoor unit with automatically swing louver
		INVALID	Indoor unit without automatically swing louver
Remote controller 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 controller function15	MODEL TYPE	HEAT PUMP	Heat pump unit
		COOLING ONLY	Exclusive cooling unit

⑤ Function Setting by Remote Controller (continued)

(i) Remote controller function

"◯" : Initial settings
"※" : Automatic criterion

Stop air-conditioner and press (SET) + (MODE) buttons at the same time for over three seconds.

FUNCTION SET

FUNCTION

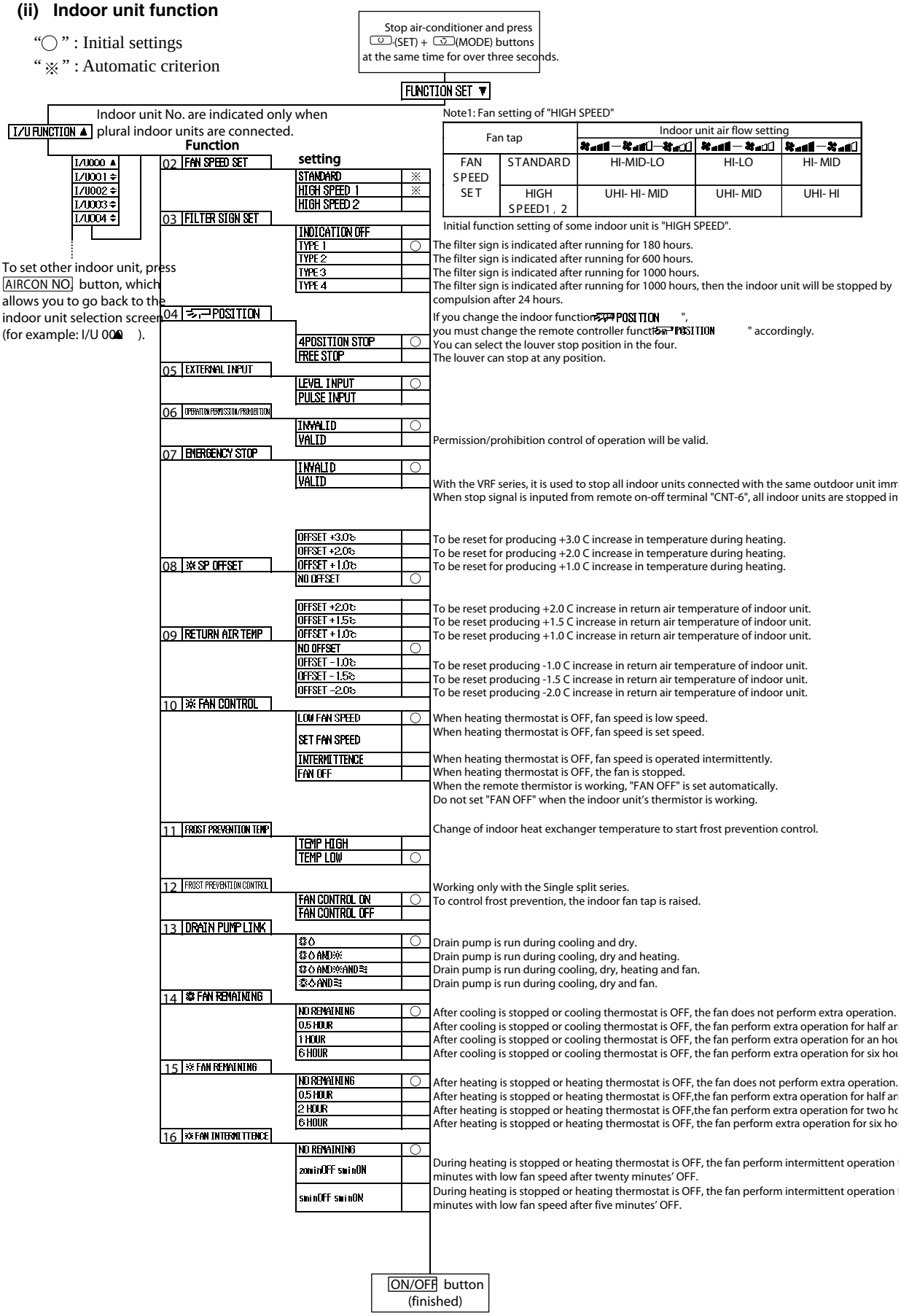
Function	setting		When you use at 50Hz area
01 GRILLE ↑↓ SET			
	↑↓ INVALID	◯	
	50Hz ZONE ONLY		When you use at 50Hz area
	60Hz ZONE ONLY		When you use at 60Hz area
02 AUTO RUN SET			
	AUTO RUN ON	※	
	AUTO RUN OFF	※	Automatical operation is impossible
03 TEMP SW			
	VALID	◯	
	INVALID		Temperature setting button is not working
04 MODE SW			
	VALID	◯	
	INVALID		Mode button is not working
05 ON/OFF SW			
	VALID	◯	
	INVALID		On/Off button is not working
06 FAN SPEED SW			
	VALID	※	
	INVALID	※	Fan speed button is not working
07 LOUVER SW			
	VALID	※	
	INVALID	※	Louver button is not working
08 TIMER SW			
	VALID	◯	
	INVALID		Timer button is not working
09 SENSOR SET			
	SENSOR OFF	◯	Remote thermistor is not working.
	SENSOR ON		Remote thermistor is working.
	SENSOR +3.0℃		Remote thermistor is working, and to be set for producing +3.0 C increase in temperature.
	SENSOR +2.0℃		Remote thermistor is working, and to be set for producing +2.0 C increase in temperature.
	SENSOR +1.0℃		Remote thermistor is working, and to be set for producing +1.0 C increase in temperature.
	SENSOR -1.0℃		Remote thermistor is working, and to be set for producing -1.0 C increase in temperature.
	SENSOR -2.0℃		Remote thermistor is working, and to be set for producing -2.0 C increase in temperature.
	SENSOR -3.0℃		Remote thermistor is working, and to be set for producing -3.0 C increase in temperature.
10 AUTO RESTART			
	INVALID	◯	
	VALID		
11 VENT LINK SET			
	NO VENT	◯	
	VENT LINK		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.
	NO VENT LINK		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.
12 TEMP RANGE SET			
	INDN CHANGE	◯	If you change the range of set temperature, the indication of set temperature will vary following the control.
	NO INDN CHANGE		If you change the range of set temperature, the indication of set temperature will not vary following the control, and keep the set temperature.
13 I/U FAN			
	HI-MID-LO	※	Airflow of fan becomes the three speed .
	HI-LO	※	Airflow of fan becomes the two speed .
	HI-MID		Airflow of fan becomes the two speed .
	1 FAN SPEED	※	Airflow of fan is fixed at one speed.
14 POSITION			If you change the remote controller function "POSITION ", you must change the indoor function "POSITION " accordingly.
	4POSITION STOP	◯	You can select the louver stop position in the four.
	FREE STOP		The louver can stop at any position.
15 MODEL TYPE			
	HEAT PUMP	※	
	COOLING ONLY	※	
16 EXTERNAL CONTROL SET			
	INDIVIDUAL	◯	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.
	FOR ALL UNITS		If you input into CNT of the indoor printed circuit board from external, all units which connect to the same remote controller are operated according to the input from external.
17 ROOM TEMP INDICATION SET			
	INDICATION OFF	◯	
	INDICATION ON		In normal working indication, indoor unit temperature is indicated instead of airflow. (Only the master remote controller can be indicated.)
18 ※ INDICATION			
	INDICATION ON	◯	
	INDICATION OFF		Heating preparation indication should not be indicated.
19 ℃/°F SET			
	℃	◯	Temperature indication is by degree C
	°F		Temperature indication is by degree F

ON/OFF button (finished)

⑤ Function Setting by Remote Controller (continued)

(ii) Indoor unit function

"◯" : Initial settings
"※" : Automatic criterion



Note1: Fan setting of "HIGH SPEED"

Fan tap		Indoor unit air flow setting		
		≋—≋—≋	≋—≋	≋—≋
FAN SPEED SET	STANDARD	HI-MID-LO	HI-LO	HI- MID
	HIGH SPEED1, 2	UHI- HI- MID	UHI- MID	UHI- HI

Initial function setting of some indoor unit is "HIGH SPEED".

The filter sign is indicated after running for 180 hours.
The filter sign is indicated after running for 600 hours.
The filter sign is indicated after running for 1000 hours.
The filter sign is indicated after running for 1000 hours, then the indoor unit will be stopped by compulsion after 24 hours.

If you change the indoor function "POSITION ", you must change the remote controller function "POSITION " accordingly.
You can select the louver stop position in the four.
The louver can stop at any position.

Permission/prohibition control of operation will be valid.

With the VRF series, it is used to stop all indoor units connected with the same outdoor unit imm
When stop signal is inputed from remote on-off terminal "CNT-6", all indoor units are stopped in

To be reset for producing +3.0 C increase in temperature during heating.
To be reset for producing +2.0 C increase in temperature during heating.
To be reset for producing +1.0 C increase in temperature during heating.

To be reset producing +2.0 C increase in return air temperature of indoor unit.
To be reset producing +1.5 C increase in return air temperature of indoor unit.
To be reset producing +1.0 C increase in return air temperature of indoor unit.

To be reset producing -1.0 C increase in return air temperature of indoor unit.
To be reset producing -1.5 C increase in return air temperature of indoor unit.
To be reset producing -2.0 C increase in return air temperature of indoor unit.

When heating thermostat is OFF, fan speed is low speed.
When heating thermostat is OFF, fan speed is set speed.

When heating thermostat is OFF, fan speed is operated intermittently.
When heating thermostat is OFF, the fan is stopped.
When the remote thermistor is working, "FAN OFF" is set automatically.
Do not set "FAN OFF" when the indoor unit's thermistor is working.

Change of indoor heat exchanger temperature to start frost prevention control.

Working only with the Single split series.
To control frost prevention, the indoor fan tap is raised.

Drain pump is run during cooling and dry.
Drain pump is run during cooling, dry and heating.
Drain pump is run during cooling, dry, heating and fan.
Drain pump is run during cooling, dry and fan.

After cooling is stopped or cooling thermostat is OFF, the fan does not perform extra operation.
After cooling is stopped or cooling thermostat is OFF, the fan perform extra operation for half ar
After cooling is stopped or cooling thermostat is OFF, the fan perform extra operation for an hou
After cooling is stopped or cooling thermostat is OFF, the fan perform extra operation for six hou

After heating is stopped or heating thermostat is OFF, the fan does not perform extra operation.
After heating is stopped or heating thermostat is OFF,the fan perform extra operation for half ar
After heating is stopped or heating thermostat is OFF,the fan perform extra operation for two ho
After heating is stopped or heating thermostat is OFF, the fan perform extra operation for six ho

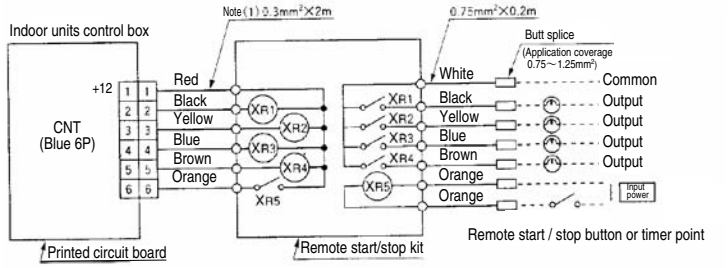
During heating is stopped or heating thermostat is OFF, the fan perform intermittent operation minutes with low fan speed after twenty minutes' OFF.
During heating is stopped or heating thermostat is OFF, the fan perform intermittent operation minutes with low fan speed after five minutes' OFF.

⑥ Control mode switching

●The control content of indoor units can be switched in following way. (☐ is the default setting)

Switch No.	control content	
SW1	Indoor unit address (tens place)	
SW2	Indoor unit address (ones place)	
SW3	Outdoor unit address (tens place)	
SW4	Outdoor unit address (ones place)	
SW5－1	ON	Fixed previous version of Super Link protocol
	☐OFF	Automatic adjustment of Super Link protocol
SW5－2	Indoor unit address (hundreds place)	
SW6－1 ~ 4	Model capacity setting	
SW7－1	ON	Operation check, Drain motor test run
	☐OFF	Normal operation

⑦ 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:	Operation output (there is output when unit is in operation.)	
Output 2:	Heating output (there is output when operation MODE is HEATING.)	
Output 3:	Thermo ON output	
Output 4:	Inspection output (there is out put when unit is stopped by error.)	
Input 5:	Factory set	X_{R5} OFF ⇒ON UNIT ON
		X_{R5} ON ⇒OFF UNIT OFF
	Local set	X_{R5} OFF⇔ON Receiving pulse signal, "ON/OFF" is reversed.

Refer to instruction manuals of "Branching controller", when the indoor unit is connected to "Heat recovery 3-pipe systems".

⑧Troubleshooting

The operation data is saved when the situation of abnormal operation happen, and the data can be confirmed by remote controller.

[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 ○ (SET) button and abnormal operation data mode is started.
4. When only one indoor unit is connected to remote controller, following is displayed.
   ①The 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 7.
   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.
   ①The 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)
   "I/U000 ♟" blinking
   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)
   "I/U000 ♟" (The address of selected indoor unit is blinking for 2 seconds.)
   ↓
   [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 ④ 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 ⏻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.

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

Error code of indoor unit

Display on remote controller	LED on indoor circuit board		Content		
	red (checking)	green (normal)			
Off	Off	Continuous blinking	Normal		
	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		
E2	blinking once	Continuous blinking	Duplication of indoor address No. (can only be detected during operation) Excess number of remote controllers (can only be detected during operation)		
E3	blinking twice	Continuous blinking	Outdoor power off or lack phase There is no corresponding outdoor unit address.		
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		
E9	blinking once	Continuous blinking	Float SW actions (only with FS)		
E10	Off	Continuous blinking	Excess number of remote controller connections		
E11	Off	Continuous blinking	The master indoor unit is not set properly.		
E12	blinking once	Continuous blinking	Super link	Indoor unit address SW	
				Indoor No.	Outdoor No.
			New specification	001～127	49
			Old specification	0～47	48，49
				48，49	0～47
E16	blinking once	Continuous blinking	Fan motor abnormal		
E18	blinking once	Continuous blinking	The address configuration fault for master-slave indoor units.		
E19	blinking once	Continuous blinking	Configuration fault on running checking model		
E28	Off	Continuous blinking	Remote controller sensor interrupted		
Over E30	Off	Continuous blinking	Outdoor unit checking (outdoor circuit board LED checking)		
E63	Off	Continuous blinking	Emergency stop.		

5.3 Installation manual for wired remote controller (Option parts)

Read together with 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.

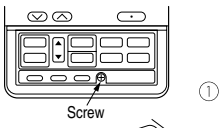
⚠CAUTION

- DO NOT install the remote controller at the following places in order to avoid malfunction.
  (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
- DO NOT leave the remote controller without the upper case.
  In case the upper cace needs to be detached, protect the remote controller with a packaging box or bag in order to keep it away from water and dust.

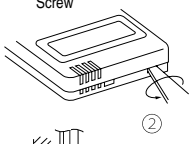
Accessories	Remote controller, wood screw (Φ3.5×16) 2 pieces
Prepare on site	Remote controller cord (2 cores) [In case of embedding cord] Erectrical box, M4 screw (2 pieces) [In case of exposing cord] Cord clamp (if needed)

Installation procedure

① Open the cover of remote controller , and remove the screw under the buttons without fail.

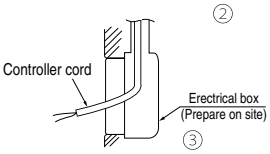


② Remove the upper case of remote controller.
Insert a flat-blade screwdriver into the dented part of the upper part of the remote controller, and wrench slightly.

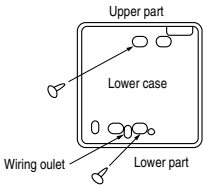


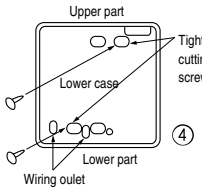
[In case of embedding cord]

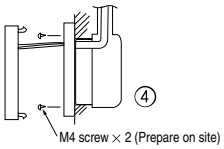
③ Embed the erectrical box and remote controller cord beforehand.



④ 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.

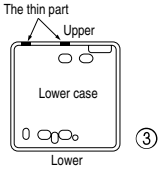






⑤ Connect the remote controller cord to the terminal block.
Connect the terminal of remote controller (X,Y) with the terminal of indoor unit (X,Y). (X and Y are no polarity)

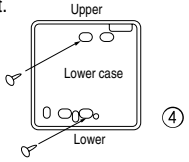
⑥ Install the upper case as before so as not to catch up the remote controller cord, and tighten with the screws.



[In case of exposing cord]

③ You can pull out the remote controller cord from left upper part or center upper part.
Cut off the upper thin part of remote controller 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.



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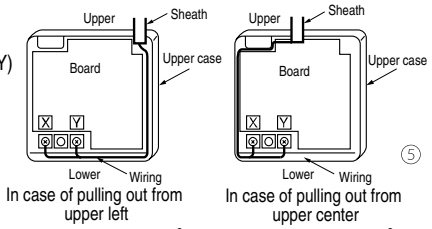
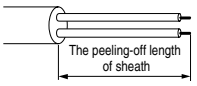
⑤ Connect the remote controller cord to the terminal block.
Connect the terminal of remote controller (X,Y) with the terminal of indoor unit (X,Y).
(X and Y are no polarity)
Wiring route is as shown in the right diagram depending on the pulling out direction.



The wiring inside the remote controller case should be within 0.3mm^2 (recommended) to 0.5mm^2.
The sheath should be peeled off inside the remote controller case.
The peeling-off length of each wire is as below.

Pulling out from upper left	Pulling out from upper center
X wiring : 215mm Y wiring : 195mm	X wiring : 170mm Y wiring : 190mm



⑥ Install the upper case as before so as not to catch up the remote controller cord, and tighten with the screws.
⑦ In case of exposing cord, fix the cord on the wall with cord clamp so as not to slack.

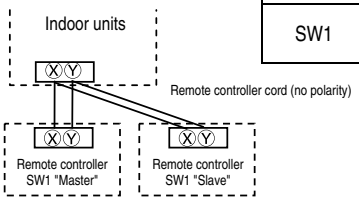
Installation and wiring of remote controller

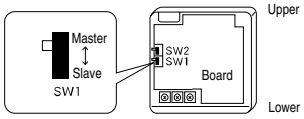
① Wiring of remote controller should use 0.3mm^2 × 2 core wires or cables. (on-site configuration)
② Maximum prolongation of remote controller wiring is 600 m.
If the prolongation is over 100m, change to the size below.
But, wiring in the remote controller case should be under 0.5mm^2 . Change the wire 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

Master/ slave setting when more than one remote controllers are used

A maximum of two remote controllers can be connected to one indoor unit (or one group of indoor units.)

Switch	Setting	Contents
SW1	M	Master remote controller
	S	Slave remote controller



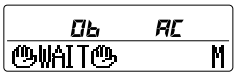


Set SW1 to "Slave" for the slave remote controller. It was factory set to "Master" for shipment.
Note: The setting "Remote controller thermistor enabled" is only selectable with the master remote controller in the position where you want to check room temperature.
The air conditioner operation follows the last operation of the remote controller regardless of the master/ slave setting of it.

The indication when power source is supplied

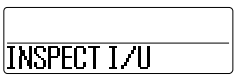
When power source is turned on, the following is displayed on the remote controller until the communication between the remote controller and indoor unit settled.
Master remote controller : "WAIT M"
Slave remote controller : "WAIT S"

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 controller, not an error cord.



※ The left mark is only an example. Other marks may appear.

When remote controller 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 : 16~30ºC (55~86ºF)

Except heating (cooling, fan, dry, automatic) : 18~30ºC (62~86ºF)

●Upper limit and lower limit of set temperature can be changed with remote controller.

Upper limit setting: valid during heating operation. Possible to set in the range of 20 to 30ºC (68 to 86ºF).

Lower limit setting: valid except heating (automatic, cooling, fan, dry) Possible to set in the range of 18 to 26ºC (62 to 79ºF).

When you set upper and lower limit by this function, control as below.

1. When ⑫TEMP RANGE SET, remote controller 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 ⑫TEMP RANGE SET, remote controller 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.

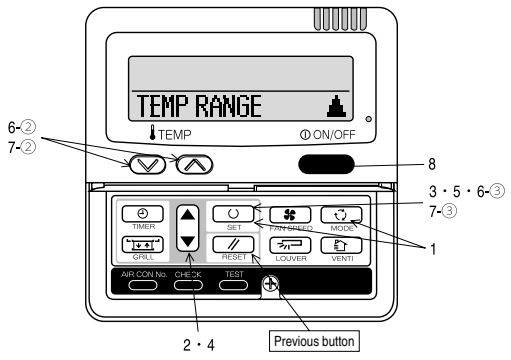
   【If lower limit value is set 】

   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: "☝∨∧SET UP" → "UPPER 30ºC ∨"
   ② Select the upper limit value with temperature setting button ▽ △. Indication example: "UPPER 26ºC∨∧" (blinking)
   ③ Press (SET) button to fix. Indication example: "UPPER 26ºC" (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 ▲" is selected (valid during cooling, dry, fan, automatic)
   ① Indication: "☝∨∧SET UP" → "LOWER 18ºC ∧"
   ② Select the lower limit value with temperature setting button ▽ △. Indication example: "LOWER 24ºC∨∧" (blinking)
   ③ Press (SET) button to fix. Indication for example: "LOWER 24ºC" (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.

- 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 (RESET) button, you return to the previous screen.



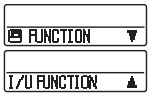
The functional setting

Refer to page 177

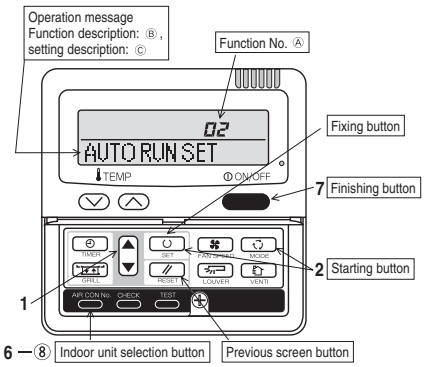
How to set function

1. **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.**
3. **Make sure which do you want to set, "FUNCTION ▼" (remote controller function) or "I/U FUNCTION ▲" (indoor unit function).**
4. **Press ▲ or ▼ button.**
   Selecct "FUNCTION ▼" (remote controller function) or "I/U FUNCTION ▲" (indoor unit function).



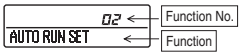
5. **Press (SET) button.**



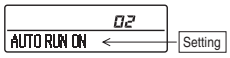
6. **【On the occasion of remote controller function selection】**

① "DATA LOADING" (Indication with blinking)
↓
Display is changed to "01 GRILLE ↑↓SET".

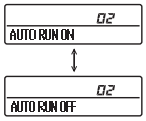
② Press ▲ or ▼ button.
"No. and function"are indicated by turns on the remote controller function table, then you can select from them.
(For example)



③ Press (SET) button.
The current setting of selected function is indicated.
(for example) "AUTO RUN ON" ← If "02 AUTO RUN SET" is selected



④ Press ▲ or ▼ button.
Select the setting.



⑤ 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.

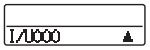
7. **Press ON/OFF button.**
   Setting is finished.

【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 "01 AUTO FILTER CLEANING".
Go to ②.

[Note]

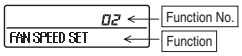
(1) If plural indoor units are connected to a remote controller, the indication is "I/U 000" (blinking) ← The lowest number of the indoor unit connected is indicated.



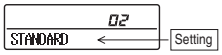
(2) Press ▲ or ▼ button.
Select the number of the indoor unit you are to set
If you select "ALL UNIT ▼", you can set the same setting with all unites.

(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.

⑤ 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 controller, press the AIRCON NO. button, which allows you to go back to the indoor unit selection screen. (example "I/U 000 ▲")

- 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 (RESET) button, you return to the previous screen.
- Setting is memorized in the controller 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.)

5.4 Installation of outdoor unit

MITSUBISHI HEAVY INDUSTRIES, LTD. MULTI AIR CONDITIONER OUTDOOR UNIT FOR BUILDINGS

KX SERIES INSTALLATION MANUAL

PCB012D015C H

Outdoor unit capacity
FDC224～335

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, please refer to the respective installation manuals supplied with your units.
◎Please read this manual carefully before you set to installation work and carry it out according to the instructions contained in this manual.

Precautions for safety

- Read these "Precautions for safty" carefully before starting installation work and do it in the proper way.
- Safety instructions listed here are grouped into ⚠ Warnings and ⚠Cautions. If a non-compliant installation method is likely to result in a serious consequence such as death or major injury, the instruction is grouped into ⚠ Warnings to emphasize its importance. However, a failure to observe a safety instruction listed under ⚠Cautions can also result in a serious consequence depending on the circumstances. Please observe all these instructions, because they include important points concerning safety.
- 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.**
- When you have completed installation work, perform a test run and make sure that the installation is working properly. Then, explain the customer how to operate and how to take care of the air-conditioner according to the user's manual. Please ask the customer to keep this installation manual together with the user's manual.
- This unit complies with EN61000-3-3.
  For outdoor unit, EN61000-3-2 is not applicable as consent by the utility company or notification to the utility company is given before usage. (Only 224, 280)
  For outdoor unit, EN61000-3-12 is not applicable as consent by the utility company or notification to the utility company is given before usage. (Only 335)

⚠WARNING

- Carry out installation work properly according to this installation manual.
  Improper installation work can result in a water leak, an electric shock, a fire, or injury from a fall of the unit.
- Ask your dealer or a specialized service provider to install the unit.
  Improper installation work performed on the part of a user can result in a water leak, an electric shock, a fire or injury from a fall of the unit.
- Always turn off power before you work inside the unit such as for installation or servicing.
  A failure to observe this instruction can result in an electric shock.
- When an indoor unit is installed in a small room, it is necessary to take some safety precaution to keep refrigerant gas from building up beyond the upper limit concentration even if it leaks in the room. For safety precautions to prevent a concentration build-up beyond the upper limit, please consult with the dealer.
  If refrigerant leaks and its concentration builds up beyond the upper limit, it can cause a lack-of-oxygen accident.
- Install the unit securely onto a structure that is strong enough to sustain its weight.
  Insufficient strength can cause a drop or fall of the unit and resultant injury.
- Install the unit according to the prescribed installation specifications so that it can withstand strong winds, such as typhoons, and earthquakes.
  Improper installation work can cause an accident such as from a fall of the unit.
- Wrap the unit with ropes properly rated for its weight at the specified points in hoisting it for haulage.
  An improper hauling method can cause a fall of the unit and resultant death or major injury.
- Use only parts supplied with the unit and approved supply parts for installation work.
  A failure to use genuine parts approved by the manufacturer may result in a fall of the unit, a water leak, a fire, an electric shock, a refrigerant leak, substandard performance or a control failure.
- Ask your dealer or a specialized service provider to install them.
  Improper installation work performed on the part of a user can result in a water leak, electric shock or fire.
- Electrical installation work must be performed by an electrical installation service provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country.
  A defect in power supply circuits such as insufficient capacity or improper installation can cause an electrical shock or fire.
- Always use specified cables and connect them securely. Fasten cables securely so that the terminal connections may not be subject to external force working through the cables.
  Improper connection or fastening can cause heat generation, a fire or an electric shock.
- In connecting the power cable, make sure that no anomalies such as dust deposits, socket clogging or wobble are found and insert the plug securely.
  Dust deposits, clogging or wobble can result in an electric shock or fire.
- Neatly arrange the cables so that they may not get loose, and put on the service panel securely. Improper installation can cause heat generation, a fire or an electric shock.
- In installing the unit, be sure to connect the refrigerant pipe before operating the compressor.
  If you run the compressor without connecting the refrigerant pipe and with the service valves open, you may incur frost bite or injury from an abrupt refrigerant outflow. An abnormal pressure build-up may also occur in the refrigeration cycle as a result of the inhalation of air, which can result in pipe rupture or injury.
- Never open the service valves (either liquid or gas side) until refrigerant pipe installation work, an air-tightness test and evacuation are completed.
  A failure to observe this instruction can result in frost bite or injury from an abrupt refrigerant outflow. If refrigerant gas leaks during installation work, immediately stop pipe blazing and other work and ventilate the room. Refrigerant gas, if it comes into contact with bare fire, can cause the generation of a toxic gas.
- Use pipes, flare nuts and tools specifically designed for R410A.
  The use of existing materials (designed for refrigerant other than R410A) can result in a unit failure as well as a serious accident such as refrigeration cycle rupture or injury.
- Tighten a flare nut to a specified torque with two torque wrenches used together as a set. Over-tightening a flare nut can cause a refrigerant gas leak from flare nut breakage after years of operation. If a flare gets loose or breaks off, refrigerant gas will leak, which can cause a lack-of-oxygen accident.
- In carrying out a pump-down process, stop the compressor before you detach the refrigerant pipe.
  If you detach the refrigerant pipe with the compressor running and the valves open, you may incur frost bite or injury from an abrupt refrigerant outflow. An abnormal pressure build-up may also occur in the refrigeration cycle as a result of the inhalation of air into the compressor, which can result in pipe rupture or injury.
- If refrigerant gas leaks during installation work, ventilate the room.
  Refrigerant gas, if it comes into contact with bare fire, can cause the generation of a toxic gas.
- When installation work is completed, check the system for refrigerant gas leaks.
  If refrigerant gas leaks indoors and comes into contact with bare fire such as of a fan heater, stove or cooking stove, it can cause the generation of a toxic gas.

- Don't open the operation valves (both for gas and fluid) till the refrigerant piping work, air tightness test and air purge are completed.
  It could cause frostbite or injury due to sudden leakage of refrigerant.
- Do not run the drain piping directly into the sewer where a toxic gas such as sulfuric gas is generated.
  This will pose a risk of a toxic gas flowing back into the room. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak.
- In installing or transferring an air conditioning system, never allow air or other foreign matters than specified refrigerant (R410A) to get into the refrigerant cycle. If air or other foreign matters gets into the refrigerant cycle, an abnormal pressure build-up will occur, which can result in pipe rupture or injury.

⚠CAUTION

- Secure a service space for inspection and maintenance as specified in the manual.
  An insufficient service space can result in a fall from the installation point and resultant injury.
- When the outdoor unit is installed on a roof top or in an elevated position, provide permanent ladders and handrails along the access path and fences or handrails surrounding the outdoor unit to prevent an accidental fall.
- Perform installation work properly according to this installation manual.
  Improper installation can cause abnormal vibrations or increased noise generation.
- When refrigerant pipe installation is completed, check the system for leaks by conducting an air-tightness test with nitrogen gas.
  Should refrigerant gas leak in a small room and exceed the upper limit concentration, it can cause a lack-of-oxygen accident.
- Dress the refrigerant piping with a heat insulation material to prevent condensation.
  Improper heat insulation given to refrigerant piping for condensation prevention can result in leaking or dripping water soaking household effects.
- Install an earth leakage breaker.
  A failure to install an earth leakage breaker can cause a fire or electric shock.
- Install drain piping according to the installation manual to ensure good drainage, and give it heat insulation to prevent condensation. Improper installation can result in a flood of water in the room and soaked household effects.

- Ensure that the unit is properly grounded. Do not connect the grounding wire to a gas pipe, a water pipe, a lightning rod, the grounding wire of a telephone or other appliances. Improper grounding can result in electric shocks or fire when any trouble or earth leakage occurs.
- **Never connect the grounding wire to a gas pipe because if gas leaks, it could cause explosion or ignition.**

- Don't use for any special purposes such as for storing of foods, animals or plants, precision devices or objects of art.
  It could deteriorate the quality of stored items.
- Do not install the outdoor unit in a place where small animals are likely to inhabit.
  If they enter the unit and touch electrical parts inside, they may cause a unit failure, smoke generation or ignition. Please ask the customer to keep the surroundings clean.
- Do not handle the package by holding a packing band.
- Do not handle wooden packaging materials with bare hands.
- Do not install the unit in a place with a risk of inflammable gas leaks or where an inflammable material exists. It can cause a fire where an inflammable gas leaks, flows out or in, or stagnates or where carbon fibers are suspended in the air.
- Do not install the outdoor unit where its fan winds directly hit an animal or plant. Fan winds can affect adversely to the plant etc.
- Do not operate the outdoor unit with any article placed on it, or you may incur property damage or personal injury from a fall of the article.
- Do not step onto the outdoor unit, or you may incur injury from a drop or fall.

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 unit designed for R410A has adopted a different size outdoor unit service 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 right 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. Please check connectable indoor unit models in a catalog, etc.
  (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

*

Caution
If superlink I (previous superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07 • KX • KXR-T-114). In addition to above limitations, all of new functions for KX6 such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

1. BEFORE BEGINNING INSTALLATION (Check that the models, power supply specifications, piping, wiring are correct.)

Caution

- Be sure to read this manual before installation to follow the proper installation methods.
- When installing the indoor unit, read the installation manual of indoor unit.
- Optional distribution parts are required for the piping (Branch pipe set, header set). For details, refer to the catalog, etc.
- Make sure to install the earth leakage breaker. (Select a product compatible with high frequency.)
- There is risk of damaging the compressor if the unit is operated while the discharge pipe thermistor, suction pipe thermistor, pressure sensor, etc. are removed. Never attempt to operation in such condition.

Accessory

Name	Quantity	Location of use	
Wire 	2	Insert this in CNG on the outdoor unit PCB when using the silencing mode or forced cooling mode	Secured in the control box with adhesive tape.
Edging 	1	Use it for protection of a knock-out hole.	It is attached to the bracket with an adhesive tape in the proximity of the service valve.
Attached wire 	1	Use this when connecting gas pipe.	Attached on the base below the operation valve.
Instruction manual	1	When the installation work is completed, give instructions to the customer and ask him/her to keep it.	Attached on the base below the operation valve.

Combination pattern

- Combination pattern of outdoor units, number of indoor units connected and capacity of connection are as show in the table at right.
- It can be used in combination with the following indoor unit.

Indoor unit	Remote controller	Connection OK/NO
FD○△△KXE6	RC-E3(2 cores)	OK
FD○A△△KXE4	RC-E1R(3 cores)	OK

Outdoor unit		Indoor unit	
Capacity	Combination pattern	Number of units connected (unit)	Range of total capacity of connected indoor units
224	Single	1～15	112～336
280	Single	1～19	140～420
335	Single	1～22	167～502

[Items sold separately]

Refrigerant pipe distribution parts, which are not contained in the package, will be required for installation.
As for refrigerant pipe distribution parts, we offer branching pipe sets (Model type: DIS) and header sets (Model type: HEAD) as parts used on the indoor side of piping.
Please select one suiting your application. In selecting distribution parts, please also refer to "4. REFRIGERANT PIPING."
Where the state of outdoor air temperature below 0ºC may continue for more than 12 hours, it is necessary to install the drain pan heater (optional item).If you are not sure which parts to select, please consult with your dealer or the manufacturer.
If you are not sure which parts to select, please consult with your dealer or the manufacture.
Use refrigerant branching pipe sets and header sets designed exclusively for R410A without fail.

2. INSTALLATION LOCATION (Obtain approval from the customer when selecting the installation area.)

2-1. Selecting the installation location

- ○ Where air is not trapped.
- ○ Where the installation fittings can be firmly installed.
- ○ Where any object does not prevent inlet or outlet air.
- ○ Out of the heat range of other heat sources.
- ○ Where strong winds will not blow against the outlet air.
- ○ A place where stringent regulation of electric noises is applicable.
- ○ Where it is safe for the drain water to be discharged.
- ○ Where noise and hot air will not bother neighboring residents.
- ○ Where snow will not accumulate.
- ○ A place where no TV set or radio receiver is placed within 5m. (If electrical interference is caused, seek a place less likely to cause the problem)

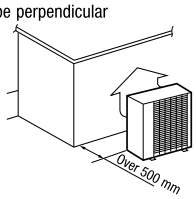
Please note

a) If there is a possibility of a short-circuit, then install a flex flow adapter.
b) When installing multiple units, provide sufficient intake space so that a short-circuit does not occur.
c) In areas where there is snowfall, install the unit in a frame or under a snow hood to prevent snow from accumulating on it. (Inhibition of collective drain discharge in a snowy country)
d) Do not install the equipment in areas where there is a danger for potential explosive atmosphere.
e) Install the equipment in a location that can sufficiently support the weight of the equipment.
f) If a unit is installed into a special environment as shown below, there will be a danger that the corrosion of the outdoor unit or its malfunctioning is caused. If this is the case, please consult with the distributor from whom you have purchased the unit.
  - Where corrosive gas is generated (such as a hot-spring resort area).
  - Where the unit is subject to sea breezes (coastal area).
  - Where the unit is subject to oil mists.
  - Where equipment generating electromagnetic waves exists in the vicinity.
g) When strong winds occur
  - Where it is likely that the unit is subjected to strong winds, provide wind guards according to the following guidelines. Strong winds can cause performance degradation, an accidental stop due to a rise of high pressure and a broken fan.

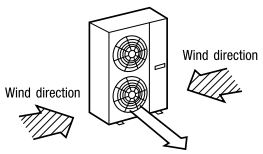
CAUTION
Please leave sufficient clearance around the unit without fail.
Otherwise, a risk of compressor and/or electric component failure may arise.

- Place the unit outlet pipe perpendicular to the wind direction.

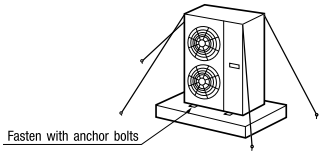
When installing units side by side, install the flex flow adaptor. (This is not required if a distance of 1,500 mm may be secured between the blowing outlet and the wall.)



- Please install so the direction of the air from the blowing outlet will be perpendicular to the direction of the wind.



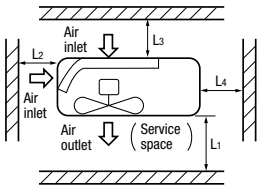
- When the foundation is not level, use wires to tie down the unit.



*

2-2. Installation space (Ex. servicing space)

a) Minimum installation space
(Please select an installation point with due attention to the direction of installation of the refrigerant pipe)
(If the installation conditions shown in this drawing are not satisfied, please consult with your dealer or the manufacturer.)
b) When units are installed side by side, leave a 10 mm or wider service space between the units.
c) Don't install at a place where it will be surrounded with walls in four directions.
Even when it is not surrounded with walls in four directions and it is met the installation conditions as shown by this figure, if there is risk of short-circuit, install the flex flow adaptor to prevent the short-circuit.
d) There must be a 1-meter or larger space in the above.
e) A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.



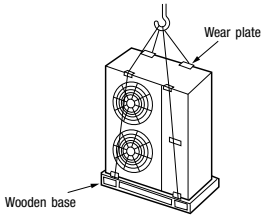
(Unit : mm)

Size \ Sample	I	II	III
L1	Open	Open	1500(500)
L2	300	5	Open
L3	300	300	300
L4	5	5	5

Figure in ( ) shows the value applicable when the flex flow adaptor is installed.

3. Unit delivery and installation

⚠ **Caution** Attach the ropes on the unit and carry it in avoiding displacement of gravity center. Improper slinging may cause the unit to lose balance and fall.



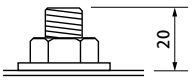
3-1. Delivery

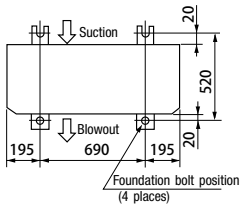
- Deliver the unit in the packing to the specified installation place.
- To hoist the unit, attach a pair of textile ropes with cushion materials attached to protect it.

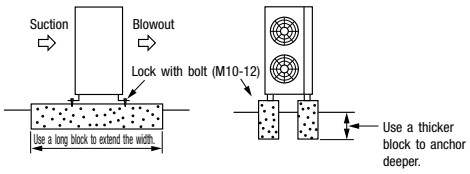
Request
Put cushion materials between the unit and the ropes to avoid damages.

3-2. Cautions for installation

- Make sure to lock the fixing legs of outdoor unit with 4 pieces of anchor bolt (M10). Best margin of protrusion for bolt above the floor is 20 mm.
- When installing the unit, make sure to lock its legs with the following bolts.







- 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.

⚠ **Important** **In case that the unit operates in cooling mode, when the outdoor temperature is –5°C or lower, please equip a flex flow adapter and a snow guard hood (option) on the unit.**

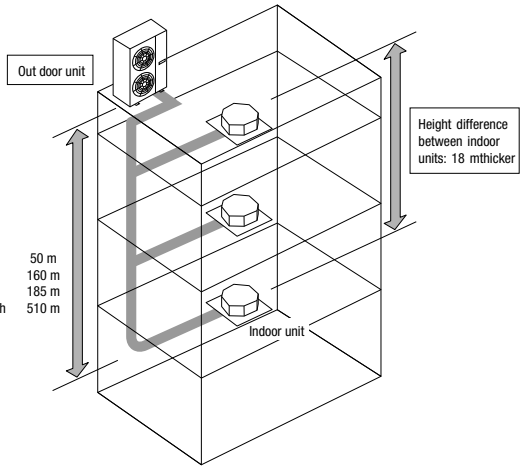
4. REFRIGERANT PIPING

4-1. Determination of piping specifications (Please select from the following matrix according to indoor unit specifications and installation site conditions)

(1) Limitation on use of pipes

CAUTION
Make sure to install within the range of limitation. Otherwise, resulting malfunction of compressor may not be warranted. Observe always the limitation of use during installation.

- When arranging pipes, observe the restrictions on use concerning the longest distance of (1), total piping length, allowable pipe length from initial branching and allowable difference of height (difference between heads).
- Avoid any trap ( ) or bump ( ) in piping as they can cause fluid stagnation.
- Maximum length (To the furthest indoor unit) ... Actual length Less than 160 m (Actual length less than 185 m)
It is required to change the pipe diameter when the actual length exceeds 90 m.
Determine the size of main pipe, referring to the table of main pipe selection table of (3) (a).
- Total piping length ..... 510 m or less
- Length of main pipe ..... 130 m or less
- Allowable pipe length from initial branching ..... 90 m or less
Difference in pipe lengths between indoor units, however, is 40 m or less.
- Allowable difference in height (Difference of heads)
(a) When an indoor unit is positioned at a higher place ..... 50 m or less
(b) When an outdoor unit is positioned at a lower place ..... 40 m or less
(c) Difference of heights between indoor units in a system ..... 18 m or less
(d) Difference of heights between initial branching and indoor unit ... 18 m or less



Height difference	50 m
Actual length	160 m
Equivalent length	185 m
Total piping length	510 m

(2) Selection of pipe material
- Use pipes with the inside clean and free from any harmful sulfur, oxides, dirt, chips & oil, or moisture (contamination).
- Use following refrigerant pipes.
Material ... Phosphate deoxidation treated seamless pipe (C1220T-O, 1/2H, JIS H3300)
C1220T-1/2H for O.D. ø19.05 or more, or C1220T-O for ø15.8 or less
- Wall thickness and size - Select according to the guide for pipe size selection
(This product uses R410A. Since, in case of pipes in the size of ø19.05 or more, materials of -O lacks sufficient capacity to withstand pressure, make sure to use pipes of 1/2H material and thickness larger than the minimum thickness.)
- When a pipe is branched, make sure to use our branching set or header set.
- When setting branching pipes, take care of the mounting direction and consult carefully with the instruction manual.
- Regarding the handling of operation valve, refer to 4-3 (1) Operating method of operation valve.

(3) Pipe size selection

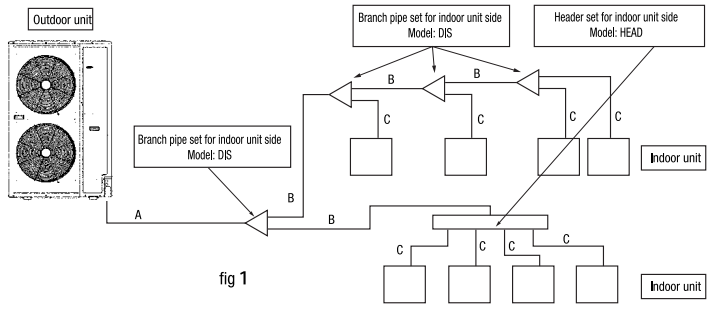


fig 1

(a) Main pipe (Between branch at outdoor unit side - initial branch at indoor unit side): Section A in Fig. 1

When the maximum length (to the furthest indoor unit from outdoor unit) is 90 m or more (actual length), change the size of main pipe as shown by the following table.

Outdoor unit	Main pipe size (Ordinary)		Pipe size for actual length longer than 90 m	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
224	ø19.5×t1.0	ø9.52×t0.8	ø22.22×t1.0	ø12.7×t0.80
280	ø22.22×t1.0		ø**25.4(**ø**28.58)**×**t1.0**	
335	ø**25.4(**ø**28.58)**×**t1.0**	ø12.7×t0.8		

Make sure to use the attached pipes in the length as shown at left.

For ø19.05 or larger, use C1220T-1/2H material.

(b) Between initial branch at indoor unit side- indoor unit side: Section B in Fig. 1

Select from following table based on the total capacity of indoor units connected at the downstream side. However, it should never exceed the size of main pipe (Section A in Fig. 1).

Total capacity of indoor units	Gas pipe	Liquid pipe
Less than 70	ø12.7 ×t1.0	ø 9.52×t0.8
70 - 180	ø15.88×t1.0	
180 - 371	ø19.05×t1.0 *1	ø12.7×t0.8
371 - 540	ø19.05×t1.0	ø15.88×t1.0

For ø19.05 or larger, use C1220T-1/2H material.

*1: When connecting indoor units of 280 at the downstream and the main gas pipe is of ø22.22 or larger, use the pipe of ø22.22x t1

(c) Between branching at indoor unit side - indoor unit side: Section C in Fig. 1

According to the table of pipe size for indoor unit. However, it should never exceed the size of main pipe (Section A in Fig. 1).

Capacity		Gas pipe	Liquid pipe
Indoor unit	22, 28	ø 9.52×t0.8	ø6.35×t0.8
	36, 45, 56	ø 12.7×t0.8	
	71, 80, 90, 112, 140, 160	ø15.88×t1.0	ø9.52×t0.8
	224	ø19.05×t1.0	
	280	ø22.22×t1.0	

For ø19.05 or larger, use C1220T-1/2H material.

(4) Selection of the branch set for indoor unit side

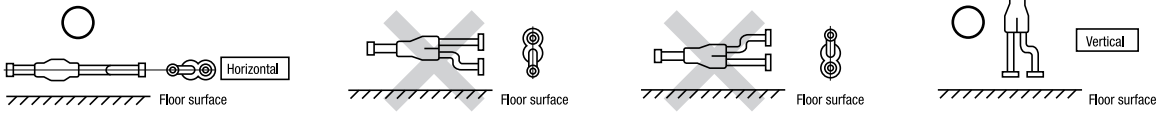
(a) Selection of the branch pipe set

Total capacity at downstream	Branch pipe set
Less than 180	DIS-22-1
180 - 371	DIS-180-1
371 - 540	DIS-371-1

- Size of branch pipe varies depending on the capacity of connected indoor units (total capacity at downstream). Select it from the table at right.

Request

- Adjust the indoor unit and the size of branch pipe at the indoor unit side according to the size of pipe connected to indoor unit.
- Install the branch joint (both of gas and fluid) so that it will become “Horizontal branching” or “Vertical branching”.



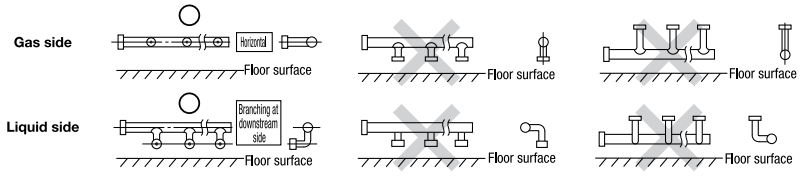
(b) Selection of the header set

Total capacity at downstream	Header set model	Number of branches
Less than 180	HEAD4-22-1	Max. 4 branches
180 - 371	HEAD6-180-1	Max. 6 branches
371 - 540	HEAD8-371-1	Max. 6 branches

- Connect a plugged pipe (field provided) at the branch point (indoor unit connecting side) depending on he number of units connected.
- For the size of plugged pipe, refer to the header set (optional item).

Request

- Adjust the header and indoor unit pipes to the size of pipes for connected indoor units.
- Install the header at the gas side to be “Horizontal branching” and, at the fluid side, that the branch is provided at the downstream side.
- Header is not allowed to receive indoor units of 224 or 280.



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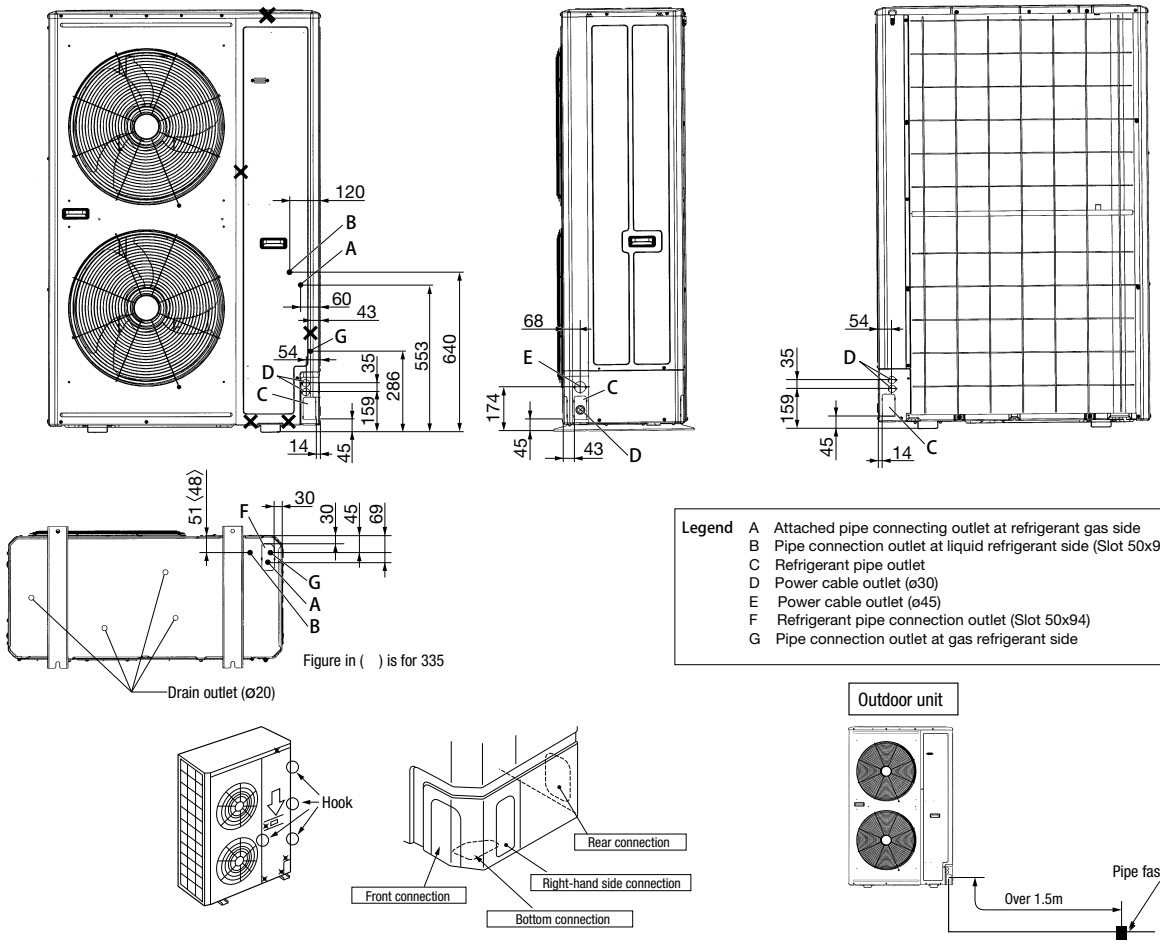
4-2. Piping work

(1) Pipe connecting position and pipe outgoing direction



Legend
A Attached pipe connecting outlet at refrigerant gas side
B Pipe connection outlet at liquid refrigerant side (Slot 50x94)
C Refrigerant pipe outlet
D Power cable outlet (ø30)
E Power cable outlet (ø45)
F Refrigerant pipe connection outlet (Slot 50x94)
G Pipe connection outlet at gas refrigerant side

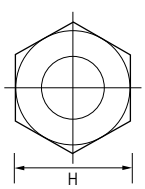
- First remove the five screws (✕ mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.
- The pipe can be laid in any of the following directions: side right, front, rear and downward.
- Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.
- In laying pipes on the installation site, cut off the casing's half blank that covers a hole for pipe penetration with nippers.
- If there is a risk of small animals entering from the pipe penetration part, close the part with some sealing material or the like (to be arranged on the installer's part).
- In the case of an installation using a collective drain system, use a port other than the bottom one to take out cables and pipes. If the bottom port is used, seal it thoroughly so that drain water may not spill out.
- Use an elbow (to be arranged on the user's part) to connect control valves to the piping.
- In anchoring piping on the installation site, give 1.5m or a longer distance between an outdoor unit and an anchoring point where the piping is secured as illustrated below. (A failure to observe this instruction may result in a pipe fracture depending on a method of isolating vibrations employed.)

(2) Field piping work

CAUTION
If you tighten it without using double spanners, you may deform the service valve, which can cause an inflow of nitrogen gas into the outdoor unit.

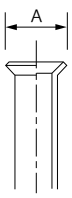
Important

- Please take care so that installed pipes may not touch components within a unit.
- **During the pipe installation at site, keep the service valves shut all the time**.
- Give **sufficient protections** (compressed and brazed or by an adhesive tape) **to pipe ends so that any water or foreign matters may not enter the pipes**.
- In bending a pipe, bend it **to the largest possible radius (at least four times the pipe diameter)**. Do not bend a pipe repeatedly to correct its form.
- An outdoor unit's pipe and refrigerant piping are to be flare connected. Flare a pipe after engaging a flare nut onto it. A flare size for R410A is different from that for conventional R407C. Although we recommend the use of flaring tools developed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- Be sure to use the accessory pipe for connection to the gas operation valve. For details, refer to the installation manual of the accessory pipe.
- Tighten a flare joint securely **with two spanners**. Observe flare nut tightening torque specified in the table below.



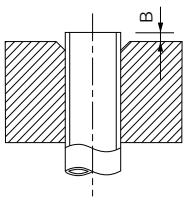
Flare nut parallel side measurement: H (mm)

Copper pipe outer diameter	H
ϕ6.35	17
ϕ9.52	22
ϕ12.7	26
ϕ15.88	29



Flared pipe end: A (mm)

Copper pipe outer diameter	A 0 −0.4
ϕ6.35	9.1
ϕ9.52	13.2
ϕ12.7	16.6
ϕ15.88	19.7

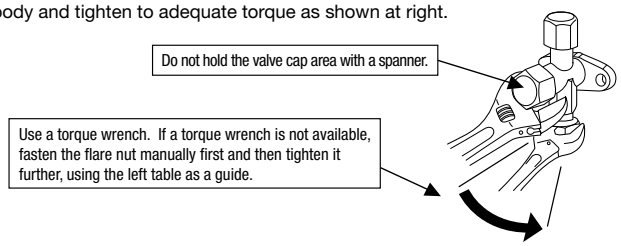


Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
ϕ6.35	0〜0.5	0.7〜1.3
ϕ9.52		
ϕ12.7		
ϕ15.88		

For operation valves both at the fluid and gas sides, fix the valve body and tighten to adequate torque as shown at right.

Operation valve size (mm)	Tightening torque (N•m)	Tightening angle (°)	Recommended length of tool handle (mm)
Ø6.35 (1/4")	14～18	45～60	150
Ø9.52 (3/8")	34～42	30～45	200
Ø12.7 (1/2")	49～61	30～45	250
Ø15.88(5/8")	68～82	15～20	300
Ø19.05 (3/4")	100～120	15～20	450

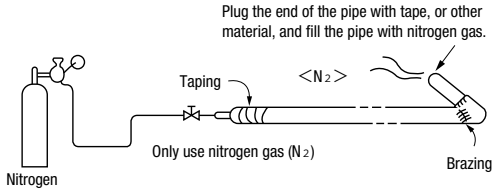


- Do not apply any oil on a flare joint.
- **Blazing must be performed under a nitrogen gas flow**. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.
- Brazing of the service valve and the pipes should be performed while cooling the valve body with a wet towel.
- Perform flushing. To flush the piping, charge nitrogen gas at about 0.02MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).

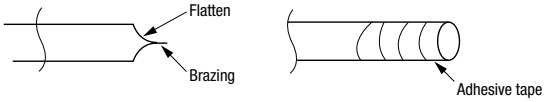
Operation procedure

① **During the pipe installation at site, keep the service valves shut all the time**.

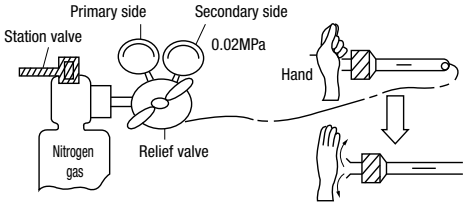
② **Blazing must be performed under a nitrogen gas flow**. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



③ Give **sufficient protections** (compressed and brazed or with an adhesive tape) **so that water or foreign matters may not enter the piping**.



④ Perform flushing. To flush the piping, charge nitrogen gas at about 0.02MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).



4-3. Air tightness test and air purge

(1) Air tightness test

① Although an outdoor unit itself has been tested for air tightness at the factory, please check the connected pipes and indoor units for air tightness from the check joint of the service valve on the outdoor unit side. While conducting a test, **keep the service valve shut all the time**.

② Since refrigerant piping is pressurized to the design pressure of a unit with nitrogen gas for testing air tightness, please connect instruments according the drawing below. Under no circumstances should chlorine-based refrigerant, oxygen or any other combustible gas be used to pressurize a system

Keep the service valve shut all the time. Do not open it under any circumstances.

Be sure to pressurize all of the liquid, gas pipes.

CAUTION

Applying excessive pressure can cause an inflow of nitrogen gas into an outdoor unit.

③ In pressurizing the piping, do not apply the specified level of pressure all at once, but gradually raise pressure.

a) **Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes or more** to see if the pressure drops.

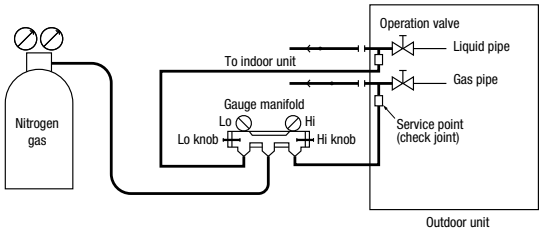
b) **Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes** to see if the pressure drops.

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 changes 1℃, the pressure also changes 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.

④Always pull air from the pipes after the airtightness test.

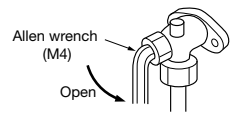


Standard torque at sections on operation valve

Operation valve size (mm)	Shaft tightening torque (N•m)	Cap tightening torque (N•m)	Check joint blind nut tightening torque (N • m)
Ø9.52 (3/8")	6～8	20～30	10～12
Ø12.7 (1/2")	14～16	25～35	10～12
Ø19.05 (3/4")	3	25～35	12～14

Securely tighten the cap and the blind nut after the adjustment.
Avoid applying any excessive force when operating the shaft or when tightening the cap or blind nut. Otherwise, it could cause malfunction or leakage from the shaft, cap or blind nut.

▶Allen wrench type

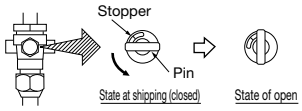


Fluid/gas operation valve

- Open the valve stem till it hits the stopper. No need to apply force more than that.
- After the adjustment, replace the blind nut as it was.

▶Pin type

Remove the cap and adjust as shown below



- After the adjustment, replace the cap as it was.

(2) Air purge

Perform the air purge from both the operation check joints at fluid side and gas side.

<Work flow>

Completion of air tightness test → Start of air purge → Operate the vacuum pump for more than 1 hour after achieving -10 kPa or under (-765 mmHg or under. → Completion of air purge → After letting it alone for more than 1 hour, the pointer needle of vacuum gauge should not creep up. → Degree of vacuum check → Refrigerant charge

When the needle pointer of vacuum gauge has crept up, it means that there is moisture in or leakage from the system. Identify and repair the leaking position and then perform the air purge again.

CAUTION

Insufficient degree of vacuum causes a capacity shortage, clogging by remaining moisture or malfunction of compressor

This product uses R410A. Take care of the following points.

○ To avoid contamination with different type of oil, use separate tools depending on the type of refrigerant. It is prohibited especially to use the gauge manifold and the charge hose for different types of refrigerant (R22, R407C).

○ Use a reverse flow prevention adaptor to prevent the contamination of refrigerant system with vacuum pump oil.

4-4. Additional charge of refrigerant

●Refrigerant must be in the state of fluid when charging.

●Make sure to use a measuring device when charging the refrigerant.
When it cannot charge whole required quantity because the outdoor unit is stopped, operate the unit in the test run mode and charge. (See Section 8 for the method of test run.)
Operating the unit for a long period of time with insufficient quantity of refrigerant could cause malfunction on the compressor. (When charging while operating the unit, especially, complete the charge within 30 minutes.)
This unit contains 11.5 kg of refrigerant.
Calculate necessary quantity of additional charge with the following formula, and record the quantity of additionally charged refrigerant on the refrigerant quantity list provided on the back of service panel.

●Charge the additional refrigerant depending on the size and length of fluid pipe. Determine the quantity of additional charge by rounding the second place after decimal point, which means in the unit of 0.1 kg.

Additional charge quantity (kg) = 2.5 + (L3×0.17) + (L4×0.11) + (L5×0.054) + (L6×0.022)

Standard additional refrigerant quantity

Make sure to charge this quantity in addition to the charge quantity for the refrigerant piping.

Charge quantity for the refrigerant piping

L3: Tot al length of ø15.88 pipes (m), L4: Total length of ø12.7 pipes (m)
L5: Total length of ø0.952 pipes (m), L6: Total length of ø6.35 pipes (m)

Refrigerant pipe size	ø15.88	ø12.7	ø9.52	ø6.35	Remark
Additional charge quantity(kg/m)	0.17	0.11	0.054	0.022	

●This product uses R410A. Take care of the following points.

· To avoid contamination with different type of oil, use separate tools depending on the type of refrigerant. It is prohibited especially to use the gauge manifold and the charge hose for different types of refrigerant (R22, R407C).

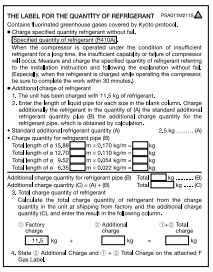
· Type of refrigerant is indicated with the color painted on the container (Yellow for R140A). Sufficient care must be taken to use correct refrigerant only.

· Never use a charge cylinder. Otherwise, the composition of refrigerant may change when introducing R410A into the cylinder.

· Make sure to charge the refrigerant in the state of fluid.

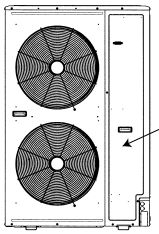
●Request

Record the refrigerant quantity calculated based on the piping length in the refrigerant quantity list provided on the back of service panel.



CAUTION

Make sure to enter the data. The data is required at maintenance or service.



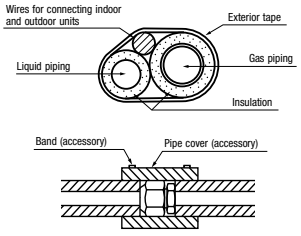
Attached on the back of service panel.

4-5. Heat insulation and moisture condensation proof

(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.

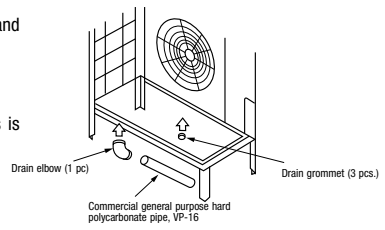
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.

- 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.
- Although it is verified in a test that this air conditioning unit shows satisfactory performance under JIS condensation test conditions, both gas and liquid pipes need to be dressed with 20mm, or over, heat insulation materials additionally above the ceiling where relative humidity exceeds 70%.



5. Drainage

- Where water drained from the outdoor unit may freeze, connect the drain pipe using optional drain elbow and drain grommet.
- Outdoor unit has 4 drain outlets on the bottom.
- When guiding drain water to a scupper, etc, install the parts on a flat stand (optional item), blocks, or other.
- Connect the drain elbow as shown by the figure. Seal remaining holes with grommets.
- When draining water collectively, use holes for wires and pipes opened other than on the bottom. When this is impracticable, sufficiently seal the drain pipe to prevent water leakage.



6. Electric wiring

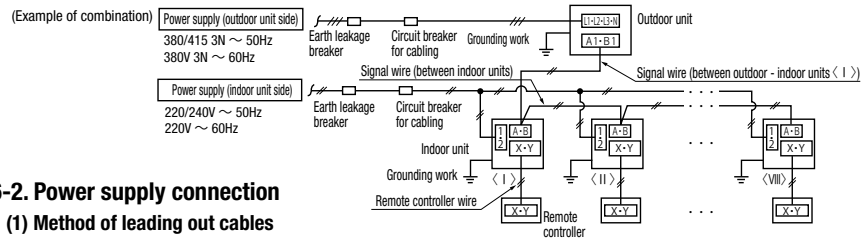
Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.
Please install an earth leakage breaker without fail. The installation of an earth leakage breaker is compulsory in order to prevent electric shocks or fire accidents.
⚠ (Since this unit employs inverter control, please **use an impulse withstanding type** to prevent an earth leakage breaker's false actuation.)

Please note

a) Use only copper wires.
Do not use any supply cord lighter than one specified in parentheses for each type below.
- braided cord (code designation 60245 IEC 51), if allowed in the relevant part 2;
- ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
- flat twin tinsel cord (code designation 60227 IEC 41)
- ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53).

Please do not use anything lighter than polychloroprene sheathed flexible cord (cord designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
b) **Use separate power supplies for the indoor and outdoor units**.
c) **The power supplies for indoor units in the same system should turn on and off simultaneously**.
d) Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire.
A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
If improperly grounded, an electric shock or malfunction may result.
e) **The installation of an impulse with standing type earth leakage breaker is necessary**. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire. Do not turn on the power until the electrical work is completed. Be sure to turn off the power when servicing.
f) Please do not use a condensive capacitor for power factor improvement under any circumstances. (It does not improve power factor, while it can cause an abnormal overheat accident)
g) For power supply cables, use conduits.
h) Please **do not lay electronic control cables (remote control and signaling lines) and other high current cables together outside the unit**. Laying them together can result in malfunctioning or a failure of the unit due to electric noises.
i) Power cables and signaling lines must always be connected to the terminal block and secured by cable fastening clamps provided in the unit.
j) Fasten cables so that they may not touch the piping, etc.
k) **When cables are connected, please make sure that all electrical components within the electrical component box are not free or not loose on the 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.)

6-1. Wiring system drawing



CAUTION
If the earth leakage breaker is exclusively for ground fault protection, then you will need to install a circuit breaker for wiring work.

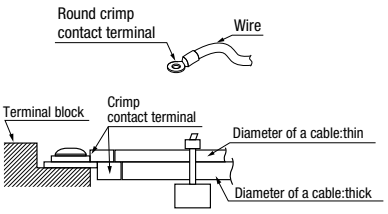
6-2. Power supply connection

(1) Method of leading out cables

- As shown on the drawing in Section 4-2, cables can be laid through the front, right, left or bottom casing.
- In wiring on the installation site, cut off a half-blank covering a penetration of the casing with nippers.
- In the case of an installation using a collective drain system, use a port other than the bottom one to take out cables and pipes. If the bottom port is used, seal it thoroughly so that drain water may not spill out.

(2) Notabilia in connecting power cables

- Connect the ground wire before you connect the power cable. When you connect a grounding wire to a terminal block, use a grounding wire longer than the power cable so that it may not be subject to tension.
- Do not turn on power until installation work is completed. Turn off power to the unit before you service the unit.
- Ensure that the unit is properly grounded.
- Always connect power cables to the power terminal block.
- To connect a cable to the power terminal block, use a round crimp contact terminal.
If two cables are to be connected to one terminal, arrange cables in such a manner that you put their crimp contact terminals together back to back. Further, put the thinner cable above the thicker one in arranging cables for such connection.
- Use specified wires in wiring, and fasten them securely in such a manner that the terminal blocks are not subject to external force.
- In fastening a screw of a terminal block, use a correct-size driver.
Fastening a screw of a terminal block with excessive force can break the screw.
- When electrical installation work is completed, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection.



(3) Outdoor unit power supply specification: 380/415V 3N~ 50Hz 380V 3N~ 60Hz

Model	Power source	Cable size for power source (mm²)	Wire length (m)	Moulded-case circuit breaker (A)		Earth leakage breaker	Earth wire	
				Rated current	Switch capacity		Size (mm²)	Screw type
224KXE6 280KXE6	Three-phase 380/415V 50Hz 380V 60Hz	5.5	28	30	30	30A, 30mA less than 0.1 sec	2	M5
335KXE6		8	36	30	30	30A, 30mA less than 0.1 sec	2	M5

Please note
a) The method of laying cables has been determined pursuant to the Japanese indoor wiring regulations (JEAC8001).
(Please adapt it to the regulations in effect in each country)
b) Wire length in the table above is the value for when the indoor unit is connect to the power cable in series also the wire size and minimum length when the power drop is less than 2% are shown. If the current exceeds the value in the table above, change the wire size according to the indoor wiring regulations.
(Please adapt it to the regulations in effect in each country)
c) For details, please refer to the installation manual supplied with the indoor unit.

(4) Indoor unit power source (Outdoor unit is another power source.) & signal line

Combined total capacity of indoor units	Cable size for power source(mm²)	Wire length(m)	Moulded-case circuit breaker (A)		Earth leakage breaker	Signal line (mm²)	
			Rated current	Switch capacity		outdoor-indoor	indoor-indoor
less than 7A	2	21	20	30	20A, 30mA less than 0.1 sec	2 core × 0.75 ※	
less than 11A	3.5						
less than 12A	5.5	33	20		30A, 30mA less than 0.1 sec		
less than 16A	5.5	24	30				

※ Please use a shielded cable.

Request
(a) Table at left shows the standard specification. Use the power supply of single phase 220/240V.
(b) Distance in the table shows the value obtained when indoor units are connected in series. The table shows the wire size and the distance provided voltage drop is within 2% for each total current of indoor unit. Where the current exceeds the values in the table, change the wire size according to the extension wiring regulations.
(c) Wires connected to indoor units are allowed up to 5.5 mm2. For 8 mm2 or more, use a dedicated pull box and branch to indoor units with 5.5 mm2 or less.
(d) Values in the table don't include electric heaters. When any electric heater is assembled, both the power supply specification and the wiring specification become different.
(e) ③ terminal on the terminal block is specified to connect only an optional auxiliary heater (power supply for heater).

6-3. How to connect signal cables

The communication protocol can be choosen from following two types. One of them is the conventional Superlink (hereinafter previous SL) and the other is the new Superlink Ⅱ (hereinafter new SL) . These two communication protocols have the following advantages and restrictions, so please choose a desirable one meeting your installation conditions such as connected indoor units and centralized controller. When signal cables are connected into a network involving outdoor units, indoor units or centralized control equipment that do not support new SL, please select communications in the previous SL mode, even if the refrigerant system is separated from theirs.

Communication protocol	Conventional communication protocol (previous SL)	New communication protocol (new SL)
Outdoor unit setting (SW5-5)	ON	OFF (Factory default)
No. of connectable indoor units	Max. 48	Max. 128
No. of connectable outdoor unitsin a network	Max. 48	Max. 32
No. of connectable outdoor units	Up to 1000m	Up to 2,000 m for wires other than shielding wire Up to 1,500 m for 0.75 mm² shielding wire (MVVS) Up to 1,000 m for 1.25 mm² shielding wire (MVVS)
Signal cable (furthest length)	Up to 1000m	Up to 1000m
Connectable units to a network	Units not supporting new SL (FD○A△△KXE4 series) Units supporting new SL (FD○△△KXE6 series) Can be used together.	Units supporting new SL (FD○△△KXE6 series)

Note: For FDT224 and 280 models, calculate the number of units taking 1 indoor unit as 2 units for the sake of communication.

● **Signal cables are for DC 5 V. Never connect wires for 220/240 V or 380/415 V.** Protective fuse on the PCB will trip.

① Confirm that signal cables are prevented from applying 220/240 V or 380/415 V

② Before turning the power on, check the resistance on the signal cable terminal block. If it is less than 100Ω, power supply cables may be connected to the signal cable terminal block.

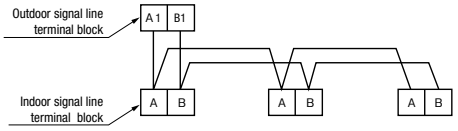
Standard resistance value = 46,000/(Number of FD○A△△KXE4 Series units connected × 5) + (Number of FD○△△KXE6 Series units connected x 9)

If the resistance value is less than 100Ω, disconnect the signal cables temporarily to divide to more than one network, to reduce the number of indoor units on the same network, and check each network

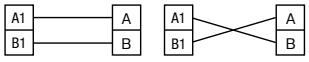
Indoor and outdoor units signal cables

- Connect the signal line between indoor unit and outdoor unit to A1 and B1.
- Connect the signal line between outdoor units to A2 and B2.
- Please use a shielded cable for a signal line and connect a shielding earth at all the indoor units and outdoor units.

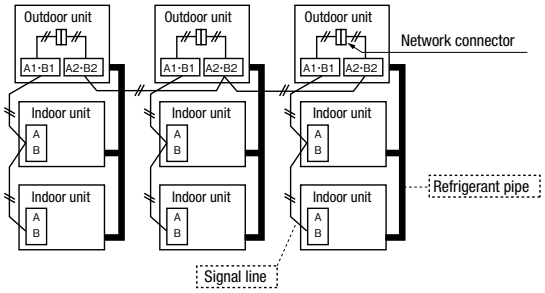
(1) When one outdoor unit is used.



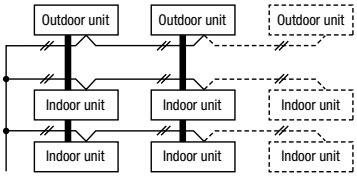
○Indoor and outdoor signal lines do not have a polarity.
Any of the connections in the following illustration can be made.



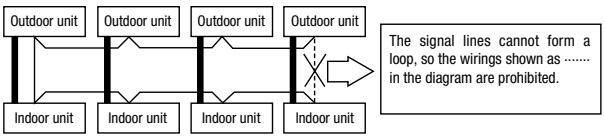
(2) When plural outdoor units are used



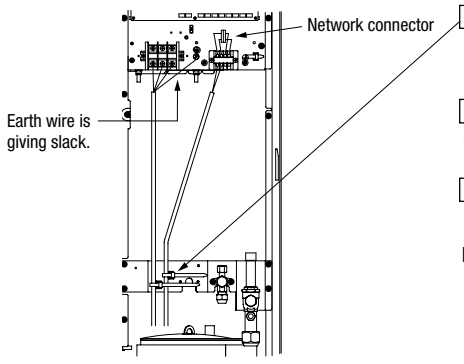
(1) The signal lines can also be connected using the method shown below.



⚠ Important ○Loop wiring prohibited.



Power cable and signal cable connection



Wiring clamp

- Fix the cables not to exert external force to the terminal connection.
- Give adequate slack to cables in fastening them.
- Fix power cables separately from signal cables.

Outgoing cable direction

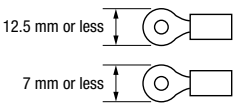
- As like the refrigerant pipe, it can be let out in any of 4 directions of right-hand side, front, rear and bottom.

Wiring label

- The wiring label is attached on the back of the service panel.

Request

- When connecting to the power supply terminal block, use the crimp terminals for M5 as shown at right.
- When connecting to the signal terminal block, use the crimp terminals for M3.5 as shown at right.



Remote controller wiring specifications

- For the remote controller the standard wire is 0.3 mm². The max. length is up to 600 m. When the wire is more than 100 m long, use the wire shown in the table.
- Use 3-core wires for FD○A△△KXE4 or 2-core wires for FD○△△KXE6.

Length (m)	Wire size
Within 100 - 200	0.5mm²
Within - 300	0.75mm²
Within - 400	1.25mm²
Within - 600	2.0mm²

7. CONTROLLER SETTINGS

7-1. Unit address setting

This control system controls the controllers of more than one air conditioner's outdoor unit, indoor unit and remote control unit through communication control, using the microcomputers built in the respective controllers. Address setting needs to be done for both outdoor and indoor units. Turn on power in the order of the outdoor units and then the indoor units.

Use 1 minute as the rule of thumb for an interval between them.

The communication protocol can be chosen from following two types. One of them is the conventional communication protocol (previous SL) and the other is the new communication protocol (new SL). These two communication protocols have their own features and restrictions as shown by Table 6-3. Select them according the indoor units and the centralized control to be connected.

When signal cables are connected into a network involving outdoor units, indoor units or centralized control equipment that do not support new SL, please select communications in the previous SL mode, even if the refrigerant system is separated from theirs.

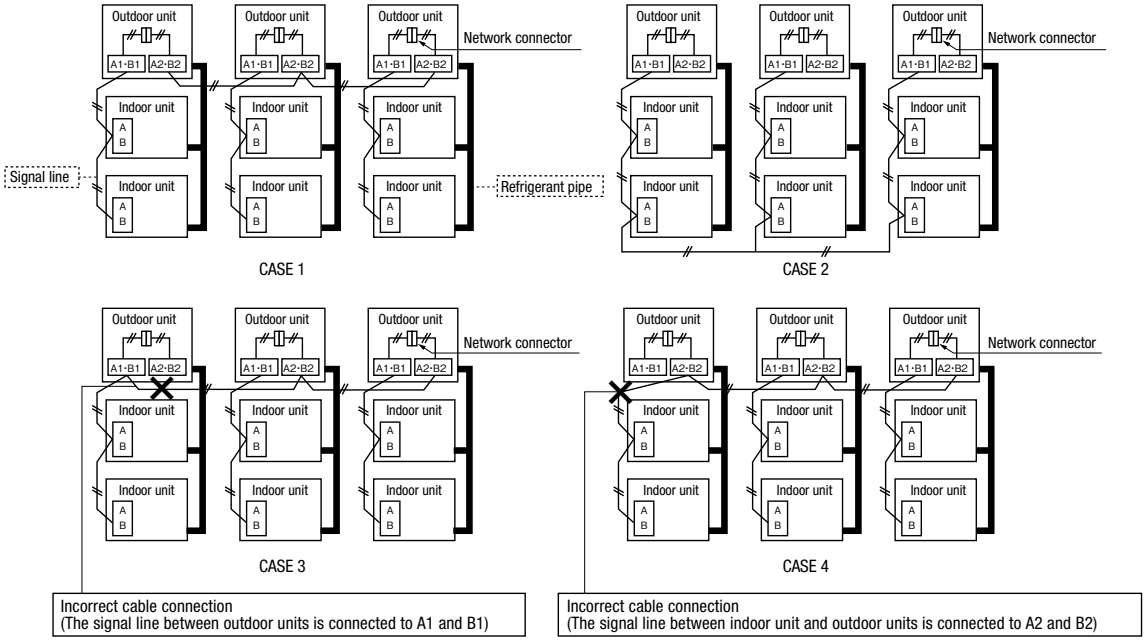
When communication is established after setting addresses, check the communication protocol with the 7 segment display panel of the outdoor unit.

●Address setting methods

The following address setting methods can be used. The procedure for automatic address setting is different from the conventional one.
Please use the automatic address setting function after reading this manual carefully.

Communication protocol		new SL		previous SL	
Address setting method		Automatic	Manual	Automatic	Manual
When plural refrigerant systems are linked with signal lines (e.g., to implement centralized control)	Case 1 When signal lines linking plural refrigerant systems are provided between outdoor units. (When the network connector is disconnected, refrigerant systems are separated each other)	OK※1	OK	×	OK
	Case 2 When signal lines linking plural refrigerant systems are provided between indoor units.	×※2	OK	×	OK
When only one refrigerant system is involved (signal lines do not link plural refrigerant systems)		OK	OK	OK	OK

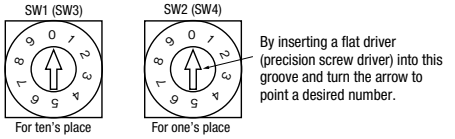
※1 Do not connect the signal line between outdoor units to A1 and B1. This may interrupt proper address setting. (Case 3)
Do not connect the signal line between indoor unit and outdoor unit to A2 and B2. This may interrupt proper address setting. (Case 4)
※2 In Case 2, automatic address setting is not available. Set addresses manually.



●Address No. setting

Set SW1 through 4 and SW5-2 provided on the PCB and SW1 & 2 provided on the outdoor unit PCB as shown in the drawings below.

Indoor PCB	SW1, 2 (blue)	For setting indoor No. (The ten's and one's)
	SW3, 4 (green)	For setting outdoor No. (The ten's and one's)
	SW5-2	Indoor No. switch (The hundred's Place) [OFF : 0, ON : 1]
Outdoor PCB	SW1, 2 (green)	For setting outdoor No. (The ten's and one's)



●Summary of address setting methods (figures in [ ] should be used with previous SL)

	Units supporting new SL			Units NOT supporting new SL		
	Indoor unit address setting		Outdoor unit address setting	Indoor unit address setting		Outdoor unit address setting
	Indoor No. switch	Outdoor No. switch	Outdoor No. switch	Indoor No. switch	Outdoor No. switch	Outdoor No. switch
Manual address setting (previous SL/new SL)	000～127[47]	00～31[47]	00～31[47]	00～47	00～47	00～47
Automatic address setting for single refrigerant system installation (previous SL/new SL)	000	49	49	49	49	49
Automatic address setting for multiple refrigerant systems installation (with new SL only)	000	49	00～31	×	×	×

Do not set numbers other than those shown in the table, or an error may be generated.

Note: When units supporting new SL are added to a network using previous SL such as one involving FD◯A△△KXE4 series units, choose previous SL for the communication protocol and set addresses manually. Since the models FDT224 and 280 have 2 PCBs per unit, set different indoor unit No. and SW on each PCB.

- An outdoor unit No., which is used to identify which outdoor unit and indoor units are connected in a refrigerant system, is set on outdoor unit PCB and indoor unit PCB. Give the same outdoor unit No. to all outdoor unit and indoor units connected in same refrigerant system.
- An indoor unit No. is used to identify individual indoor units. Assign a unique number that is not assigned to any other indoor units on the network.

Unless stated otherwise, the following procedures apply, when new SL is chosen for the communication protocol.
When previous SL is chosen, use figures shown in [ ] in carrying out these procedures.

Manual address setting Generally applicable to new SL/previous SL, use figures in [ ] with previous SL.

① Outdoor unit address setting
Set as follows before you turn on power. Upon turning on power, the outdoor unit address is registered.
Set **the Outdoor Unit No. switch to a number 00 - 31 [in the case of previous SL: 00 - 47]**.
Set a unique number by avoiding the numbers assigned to other outdoor units on the network.

② Indoor unit address setting
Set as follows before you turn on power. Upon turning on power, the indoor unit address is registered.
Set **the Indoor Unit No. switch to a number 000 - 127 [in the case of previous SL: 00 - 47]**.
Set **the Outdoor Unit No. switch** to the outdoor unit No. of the associated outdoor unit within the range of **00 - 31 [in the case of previous SL: 00 - 47].**
Set a unique number by avoiding the numbers assigned to other indoor units on the network.

③ Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them.
* When there are some units not supporting new SL connected in the network, set SW5-5 to ON to choose the previous SL communication mode.
In the case of previous SL, the maximum number of indoor units connectable in a network is 48.

Automatic address setting Generally applicable to new SL/previous SL, use figures in [ ] with previous SL.

With new SL, you can set indoor unit addresses automatically even for an installation involving multiple refrigerant systems connected with same network, in addition to the conventional automatic address setting of a single refrigerant system installation.
However, an installation must satisfy some additional requirements such as for wiring methods, so please read this manual carefully before you carry out automatic address setting.

(1) In the case of a single refrigerant system installation (Generally applicable to new SL/previous SL, use figures in [ ] with previous SL.)

① Outdoor unit address setting
Set as follows before you turn on power.
Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**

② Indoor unit address setting
Set as follows before you turn on power.
Make sure that the **Indoor Unit No. switch** is set to **000 [in the case of previous SL: 49] (factory setting)**
Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**

③ Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them. Unlike the procedure set out in (2) below, you need not change settings from the 7 segment display panel.

④ Make sure that the number of indoor units indicated on the 7 segment display panel agrees with the number of the indoor units that are actually connected to the refrigerant system.

(2) In the case of a multiple refrigerant systems installation (Applicable to new SL only. In the case of previous SL, set addresses with some other method.)

(This option is available when the interconnection wiring among refrigerant systems is on the outdoor side and new SL is chosen as the communication protocol.)

Address setting procedure (perform these steps for each outdoor unit)

[STEP1] (Items set before turning on power)

① Outdoor unit address setting
Set as follows before you turn on power.
Set the **Outdoor Unit No. switch** to a number **00 - 31**. Set a unique number by avoiding the numbers assigned to other outdoor units on the network.

② Indoor unit address setting
Set as follows before you turn on power.
Make sure that the **Indoor Unit No. switch** is set to **000 (factory setting)**
Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**

③ Isolate the present refrigerant system from the network.
Disengage the **network connectors (white 2P)** of the outdoor units. (Turning on power without isolating each refrigerant system will result in erroneous address setting.)

[STEP2] (Power on and automatic address setting)

④ Turn on power to the outdoor unit
Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them.

⑤ Select and enter "1" in P31 on the 7 segment display panel of each outdoor unit to input "Automatic address start."

⑥ Input a starting address and the number of connected indoor units.
Input a starting address in P32 on the 7 segment display panel of each outdoor unit.

⑦ When a starting address is entered, the display indication will switch back to the "Number of Connected Indoor Units Input" screen.
Input the number of connected indoor units from the 7 segment display panel of each outdoor unit. Please input the number of connected indoor units for each outdoor unit. (You can input it from P33 on the 7 segment display panel.)When the number of connected indoor units is entered, the 7 segment display panel indication will switch to "AUX" and start flickering.

[STEP3] (Automatic address setting completion check)

⑧ Indoor unit address determination

When the indoor unit addresses are all set, the 7 segment display panel indication will switch to "AUE" and start flickering.
If an error is detected in this process, the display will show "A○○."
Check the 7 segment display panel of each outdoor unit.
Depending on the number of connected indoor units, it may take **about 10 minutes** before the indoor unit addresses are all set.

[STEP4] (Network definition setting)

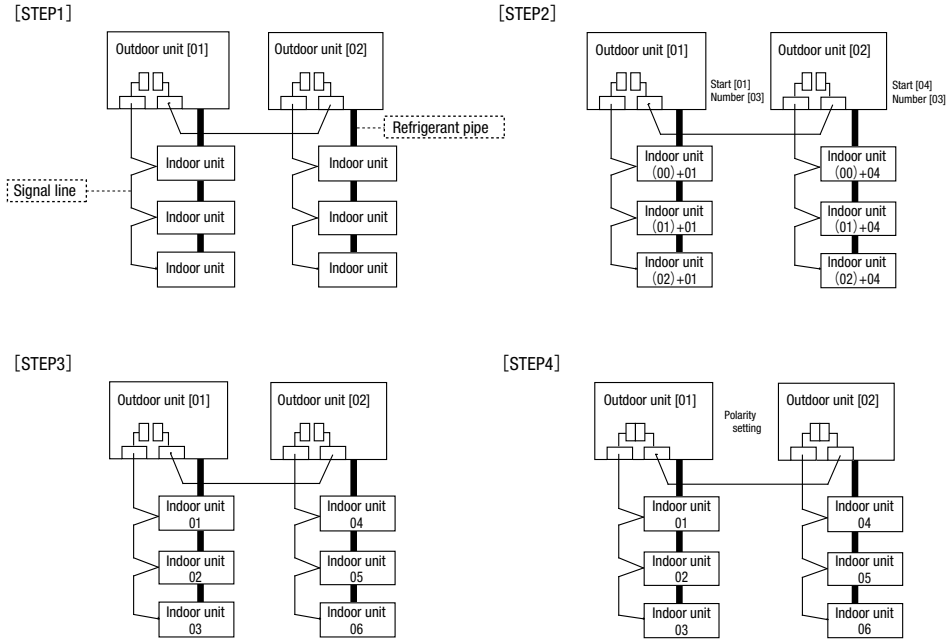
⑨ Network connection
When you have confirmed an "AUE" indication on the display of each outdoor unit, **engage the network connectors** again.

⑩ Network polarity setting

After you have made sure that the network connectors are engaged in ⑧, select and enter "1" in P34 on the 7 segment display panel of **any outdoor unit (on only 1 unit)** to specify network polarity.

⑪ Network setting completion check
When the network is defined, "End" will appear on the 7 segment display panel. An "End" indication will go off, when some operation is made from the 7 segment display panel or 3 minutes after.

	STEP1	STEP2	STEP3	STEP4
Indoor unit power source	②OFF	④ON	—	—
Outdoor unit power source	①OFF	④ON	—	—
Indoor unit (indoor/outdoor No.SW)	②indoor000/outdoor 49 (factory setting)	—	—	—
Outdoor unit (outdoor No.SW)	①01,02(Ex)	—	—	—
Network connectors	③Disconnect(each outdoor unit)	—	—	⑨Connect(each outdoor unit)
Start automatic address setting		⑤ Select "Automatic Address Start" on each outdoor unit.		
Set starting address		⑥outdoor 01:「01」(Ex) outdoor 02:「04」(Ex)	—	—
Set the number of indoor unit		⑦outdoor 01:「03」(Ex) outdoor 02:「03」(Ex)	—	—
Polarity setting		—	—	⑩ Set in P34 on the 7 segment display panel of any outdoor unit.
7 segment display		⑦ 「AUX」(Blink)	⑧ "AUE"(blink), or "A○○" in error events.	⑪ 「End」



- Within a refrigerant system, indoor units are assigned addresses in the order they are recognized by the outdoor unit. Therefore, they are not necessarily assigned addresses in order from the nearest to the outdoor unit first as depicted in drawings above.
- Make sure that power has been turned on to all indoor units.
- When addresses are set, you can have the registered indoor unit address No.'s and the outdoor unit address No. displayed on the remote control unit by pressing its Inspection switch.
- Automatic address setting can be used for an installation in which prulal indoor units are controlled from one remote control unit.
- Once they are registered, addresses are stored in microcomputers, even if power is turned off.
- If you want to change an address after automatic address setting, you can change it from the remote control unit with its "Address Change" function or by means of manual setting. Set a unique address by avoiding the address assigned to other indoor unit on the network when the address is changed.
- Do not turn on power to centralized control equipment until automatic address setting is completed.
- When addresses are set, be sure to perform a test run and ensure that you can operate all indoor and outdoor units normally. Also check the addresses assigned to the indoor units.

Address change (available only with new SL)

"Address Change" is used, **when you want to change an indoor unit address assigned with the "Automatic Address Setting" function from a remote control unit**.
Accordingly, the conditions that permit an address change from a remote control unit are as follows.

	Indoor unit address setting		Outdoor unit address setting
	Indoor No.SW	Outdoor No.SW	Outdoor No.SW
Automatic address setting forsingle refrigerant system installation	000	49	49
Automatic address setting for multiple refrigerant systems installation	000	49	00～31

If "CHANGE ADD. ▼" is selected with some addresses falling outside these conditions, the following indication will appear for 3 seconds on the remote controller "INVALID OPER" .

Operating procedure

(1) When single indoor unit is connected to the remote controller.

	Item	Operation	Display
1	Address change mode	① Press the AIR CON No. switch for 3 seconds or longer.	[CHANGE ADD.▼]
		② Each time when you press the ▲▼ switch, the display indication will be switched.	[CHANGE ADD.▼] ⇔[MASTER I/U▲]
		③ Press the Set switch when the display shows "CHANGE ADD. ▼" and then start the address change mode, changing the display indication to the "Indoor Unit No. Setting" screen from the currently assigned address.	[I/U 001 O/U 01] (1sec) →[▲▼ SET I/U ADD.] (1sec) →[I/U 001 ▲▼] (Blink)
2	To set a new indoor unit No.	④ Set a new indoor unit No. with the ▲▼ switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[I/U 000▲] ⇔[I/U 001 ▲▼] ⇔[I/U 002 ▲▼] ⇔ ・・・ ⇔[I/U 127▼]
		⑤ After selecting an address, press the Set switch, and then the indoor unit address No. is defined.	[I/U 002] (2sec)
3	To set a new outdoor unit No.	⑥ After showing the defined indoor address No. for 2 seconds, the display will change to the "Outdoor Address No. Setting" screen. The currently assigned address is shown as a default value.	[I/U 002] (2sec Lighting) →[▲▼SET O/U ADD.] (1sec) →[O/U 01 ▲▼] (Blink)
		⑦Set a new outdoor unit No. with the ▲▼ switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[O/U 00▲] ⇔[O/U 01 ▲▼] ⇔[O/U 02 ▲▼] ⇔ ・・・ ⇔[O/U 31▼]
		⑧ After selecting an address, press the Set switch, and then the outdoor unit No. and the indoor unit No. are defined.	[I/U 002 O/U 02] (2sec Lighting) →[SET COMPLETE] (2sec Lighting) →Returns to normal condition.

(2) When plural indoor units are connected to the remote controller.

When plural indoor units are connected, you can change their addresses without altering their cable connection.

	Item	Operation	Display
1	Address change mode	① Press the AIR CON Unit No. switch for 3 seconds or longer.	[CHANGE ADD▼]
		② Each time when you press the ▲▼ switch, the display indication will be switched.	[CHANGE ADD▼] ⇔[MASTER I/U▲]
		③ Press the Set switch when the display shows "CHANGE ADD. ▼" The lowest indoor unit No. among the indoor units connected to the remote control unit will be shown.	[▲▼SELECT I/U] (1sec) →[I/U 001 O/U 01▲] (Blink)
2	Selecting an indoor unit to be changed address	④ Pressing the ▲▼ switch will change the display indication cyclically to show the unit No.'s of the indoor units connected to the remote controller and the unit No.'s of the outdoor units connected with them.	[I/U 001 O/U 01▲] ⇔[I/U 002 O/U 01 ▲▼] ⇔[I/U 003 O/U 01 ▲▼] ⇔ ・・・ ⇔[I/U 016 O/U 01▼]
		⑤ Then the address No. of the indoor unit to be changed is determined and the screen switches to the display " ▲▼ SET I/U ADD."	[▲▼ SET I/U ADD.] (1sec) →[I/U 001 ▲▼](Blink)
3	Setting a new indoor unit No.	⑥ Set a new indoor unit No. with the ▲▼ switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[I/U 000▲] ⇔[I/U 001 ▲▼] ⇔[I/U 002 ▲▼] ⇔ ・・・ ⇔[I/U 127▼]
		⑦ After selecting an address, press the Set switch. Then the address No.of the indoor unit is determined.	[I/U 002] (2sec)
4	Setting a new outdoor unit No.	⑧ The display will indicate the determined indoor address No. for 2 seconds and then switch to the " ▲▼ SET O/U ADD." screen. A default value shown on the display is the current address.	[I/U 002] (2sec lighting) ⇔[▲▼ SET O/U ADD.](1sec) ⇔[O/U 01 ▲▼] (Blink)
		⑨ Set a new outdoor unit No. with the ▲▼ switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[O/U 00▲] ⇔[O/U 01 ▲▼] ⇔[O/U 02 ▲▼] ⇔ ・・・ ⇔[O/U 31▼]
		⑩ After selecting an address, press the Set switch. Then the address of the indoor unit and outdoor unit are determined.	[I/U 002 O/U 02](2sec lighting) →[▲▼ SELECT](1sec lighting) →[I/U SELECTION▼](lighting)
		⑪ If you want to continue to change addresses, return to step ④.	[Press the ▲▼switch](1sec) →[SET COMPLETE] (2～10sec lighting)
5	Ending the session	⑫ If you want to end the session (and reflect new address settings) In Step ⑩, press the ▼ switch to select "END ▲." If you have finished changing addresses, press the Set switch while "END ▲" is shown. While new settings are being transmitted, "SET COMPLETE" will be indicated. Then the remote controller display will change to the normal state.	[END▲] →[SET COMPLETE] (2～10sec lighting) →Normal state
		⑬ If you want to end the session (without reflecting new address settings) Before you complete the present address setting session, press the "ON/OFF" switch. Then the display is change to exit from this mode and switch the display to the normal state. All address settings changed in the session will be aborted and not reflected.	[ON/OFF] →Forced termination

The ▲▼switch will continuously change the display indication to the next one in every 0.25 seconds when it is pressed for 0.75 seconds or longer.
If the Reset switch is pressed during an operation, the display indication returns to the one that was shown before the last Set switch operation.
Even if an indoor unit No. is changed in this mode, the registered indoor unit No. before address change mode is displayed when [I/U SELECTION▼] is shown.
When "SET COMPLETE" is shown, indoor unit No.'s are registered.

NOTICE Turn on power to centralized control equipment after the addresses are determined.
Turning on power in wrong order may result in a failure to recognize addresses.

● 7 segment display indication in automatic address setting

Items that are to be set by the customer

Code	Contents of a display
P30	Communication protocol 0: Previos SL mode 1: New SL mode (The communication plotocol is displayed ; display only)
P31	Automatic address start
P32	Input starting address Specify a starting indoor unit address in automatic address setting.
P33	Input number of connected indoor units Specify the number of indoor units connected in the refrigerant system in automatic address setting.
P34	Polarity difinition 0: Network polarity not defined. 1: Network polarity defined.

7 segment display indication in automatic address setting.

Code	Contents of a display
AUX	During automatic address setting. X: The number of indoor units recognized by the outdoor unit.
AUE	Indoor unit address setting is completed normally.
End	Polarity is defined. (Automatic address) Completed normally.

Address setting failure indication

Code	Contents of a display	Please check
A00	Unable to find any indoor unit that can be actually communicated with.	Are signal lines connected properly without any loose connections? Is power for indoor units all turned on?
A01	The number of the indoor units that can be actually communicated with is less than the number specified in P33 on the 7 segment display panel.	Are signal lines connected properly without any loose connections? Input the number of connected indoor units again.
A02	The number of the indoor units that can be actually communicated with is more than the number specified in P33 on the 7 segment display panel.	Are signal lines connected properly without any loose connections? Are the network connectors coupled properly? Input the number of connected indoor units again.
A03	Starting address (P32) + Number of connected indoor units (P33) > 128	Input the starting address again. Input the number of connected indoor units again.
A04	While some units are operating in the previous SL mode on the network, the automatic address setting on multiple refrigerant systems is attempted.	Perform manual address setting. Separate old SL setting unit from the network Arrange all units to operate in the new SL.

Error indication

Code	Contents of a display	Cause
E2	Duplicating indoor unit address.	・Incorrect manual address setting
E3	Incorrect pairing of indoor-outdoor units.	・An outdoor unit number that does not exist in the network is specified ・No master unit exists in combination outdoor unit.
E11	Address setting for plural remote controllers.	・Indoor unit address is set from plural remote controllers.
E12	Incorrect adderess setting of indoor units.	・Automatic address setting and manual address setting are mixed.
E31	Duplicating outdoor unit address.	・Plural outdoor units are exist as same address in same network.
E46	Incorrect setting.	・Automatic address setting and manual address setting are mixed.

7-2. Selection of controls

Controls of outdoor unit may be selected as follows using the dip switches on the PCB and P○○ on the 7-segment.
To change P○○ on the 7-segment, hold down SW8 (7-segement display increment up: 1-digit), SW9 (7-segment increment up: 10-digit) and SW7 (Data write/Enter).

Control selecting method		Content of control
SW setting on PCB	P○○ on 7-segment	
SW3-7 to ON=1 *1	Set external input function allocation to "2" *1	Forced cooling mode (It can be fixed at cooling with external input terminals opened, or at heating with them closed.)
SW5-1 to ON + SW5-2 to ON	—	Cooling test run
SW5-1 to ON + SW5-2 to OFF	—	Heating test run
Close the fluid operation valve on outdoor unit and set as follows: (1) SW5-2 on PCB to ON (2) SW5-3 on PCB to ON (3) SW5-1 on PCB to ON	—	Pump down operation
SW4-5:OFF, SW4-6:OFF*1 80% (Factory default) SW4-5:ON , SW4-6:OFF*1 60% SW4-5:OFF, SW4-6:ON*1 40% SW4-5:ON , SW4-6:ON*1 00%	Set allocation of external input function to "1" *1	Inputting signals to external input terminals selects the demand mode. (J13 short-circuited: Level input, J13 open: Pulse input)
SW5-5	—	Communication method selection ON: Previous SL communication, OFF: New SL communication
J13: Closed (Factory default), J13:	—	External input selection (CnS1, CnS2 only) Closed: Level input, Opened: Pulse input)
J15: Closed (Factory default), J15: Opened	—	Defrost selection Closed: Normal defrosting, Opened: Forced defrosting
—	P01	Operation priority selection 0: First push priority (at shipping) 1: Last push priority
—	P02	Outdoor unit fan snow protection control 0: Control disabled (at shipping) 1: Control enabled
—	P03	Outdoor unit fan snow protection control ON time setting - 30 sec (at shipping) 10, 30-600 sec
—	P04	Energy saving mode *2 OFF: Disabled (at shipping) 000, 040, 060, 080 [%]
—	P05	Silencing mode setting 0 (at shipping) - 3: Larger values for larger effect
—	P06	Allocation of external output (CnZ1)
—	P07	Allocation of external input (CnS1)
—	P08	Allocation of external input (CnS2)
—	P09	Allocation of external input (CnG1)
—	P10	Allocation of external input (CnG2)
—	P11～	Spare

*1 Control is switched when both the allocation of external input function (P07-10) and SW are changed.
(Example: To use CnS1 for the input of forced cooling mode, set P07 at 2 and SW3-7 at ON. To use CnS2 for the input of forced cooling mode, set P08 at 2 and SW3-7 atON.)
*2 In the energy saving mode, the capacity restriction becomes effective even if no signals are input at external input terminals.

By changing the allocation of external input functions (P07-19) on the 7-segment, functions of external input terminals may be selected. Inputting signals to external input terminals enable the following functions.

Setting value for allocation of external input function	With external input terminals closed	With external input terminals opened
"0" : External operation input	Invalid	Valid
"1" : Demand input	Invalid	Valid
"2" : Cooling/heating forced input	Valid	Invalid
"3" : Silent mode input	Valid	Invalid
"4" : Spare		
"5" : Outdoor fan snow guard control input	Valid	Invalid
"6" : Test run external input 1 (equivalent to SW5-1)	Test run start	Normal
"7" : Test run external input 2 (equivalent to SW5-2)	Cooling	Heating
"8" : Silent mode 2	Valid	Invalid
"9" : Spare		

The external output function of CnZ1 can be changed by changing the setting in P06 on the 7 segment display panel.

"0" : Operation output
"1" : Error output
"2" : Compressor ON output
"3" : Fan ON output
"4-9" : Spare

7-3. External input and output terminals specifications

Name	Purpose (Factory default)	Specification	Operating side connector
External input CnS1	External operation input (Closed at shipping)	Non-voltage contactor (DC12V)	NICHIATSU B02B-XAMK-1 (LF) (SN)
External input CnS2	Demand input (Closed at shipping)	Non-voltage contactor (DC12V)	NICHIATSU B02B-XARK-1 (LF) (SN)
External input CnH1	Cooling / Heating forced input (Opened at shipping)	Non-voltage contactor (DC12V)	NICHIATSU B02B-XAEK-1 (LF) (SN)
External input CnG2	Silencing mode input (Opened at shipping)	Non-voltage contactor (DC12V)	NICHIATSU B02B-XASK-1 (LF) (SN)
External output CnZ1	Spare output (External output)	DC12V output	MOLEX 5566-02A-RE
External output CnH	Operation output	DC12V output	MOLEX 5286-02A-BU
External output CnY	Error output	DC12V output	MOLEX 5266-02A

8. TEST OPERATION AND TRANSFER

8-1. Before starting operation

(1) **Make sure that a measurement between the power supply terminal block and ground, when measured with a 500V megger tester, is greater than 1 MΩ.**

(2) When the resistance of the signaling line terminal block is 100Ω or less before turning the power on, the power cables may be connected to the signaling line terminal block. Check the wiring referring to the standard resistance value of 6-3.

(3) **Be sure turn ON the power supply to supply power to the crank case heater 6 hours before operation.**
After supplying the power to the crank case heater, the compressor may not start unless the time mentioned above elapses. (For protection of compressor)
In such occasion, the 7-segment LED shows "dL○○○○". Wait till the temperature in the compressor rises sufficiently after turning power on to the crank case heater, before starting the test run.

(4) **Make sure that the bottom of the compressor casing is warm.**

(5) Be sure to fully open the service valves (liquid, gas) for the outdoor unit.
Operating the outdoor unit with the valves closed may damage the compressor.

(6) **Confirm that the power is supplied to all indoor units. It could cause trouble if there is any indoor unit which is not powered.**

> **CAUTION**
> Please make sure that the service valves (gas, liquid) are full open before a test run. Conducing a test run with any of them in a closed position can result in a compressor failure.

8-2. Test run

(1) Test run from an outdoor unit.

Whether CnS1 is set to ON or OFF, you can start a test run by using the SW5-1 and SW5-2 switches provided on the outdoor unit PCB.
Select the test run mode first.
Please set SW5-2 to ON for a cooling test run or OFF for a heating test run. (It is set to OFF at the factory for shipment)
Turning SW5-1 from OFF to ON next will cause all connected indoor units to start.
When a test run is completed, please set SW5-1 to OFF.
Note: During a test run, an indoor unit cannot be operated from the remote control unit (to change settings). ("Under centralized control" is indicated)

(2) Method of starting a test run for a cooling operation from an outdoor unit: please operate a remote control unit according to the following steps.

(a) Start of a cooling test run
○Operate the unit by pressing the [START/STOP] button.
○Select the "COOLING" mode with the [MODE] button.
○Press the [TEST RUN] button for 3 seconds or longer.
The screen display will be switched from "Select with ITEM ▲▼"→"Determine with [SET] "→"Cooling test run▼."
○When the [SET] button is pressed while "Cooling test run▼ " is displayed, a cooling test run will start. The screen display will be switched to "COOLING TEST RUN."

(b) Termination of a cooling test run
○When the [START/STOP] button or the "TEMP SET [▽] [△] " button is pressed, a cooling test run will be terminated.

8-3. Transfer

- After completing the installation and test run, explain methods of use and maintenance to the customer, referring to the Instruction Manual. Ask the customer to keep the installation manual safely together with the Instruction Manual.
- Instruct the customer that the power should not be turned off even if the unit is not to be used for a long time. This will enable operation of the air conditioner any time. (Since the compressor bottom is warmed by the crank case heater, seasonal compressor trouble can be prevented.)

9. CAUTIONS FOR SERVICING (for R410A and compatible machines)

(1) To avoid mixing of different types of oil, use separate tools for each type of refrigerant.

(2) To avoid moisture from being absorbed by the ice machine oil, the time for when the refrigerant circuit is open should be kept as short as possible. (Within 10 min. is ideal.)

(3) For other piping work, airtighteness testing , vacuuming, and refrigerant charging, refer to section 4, REFRIGERANT PIPING.

(4) Diagnostic Inspection Procedures
For the meanings of failure diagnosis messages, please refer to the technical manual.

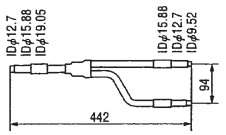
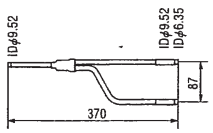
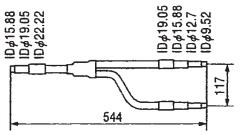
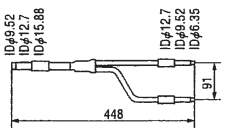
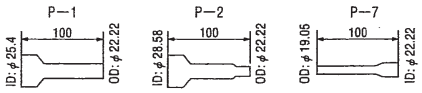
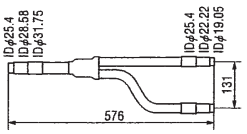
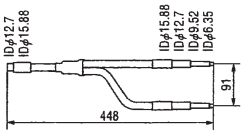
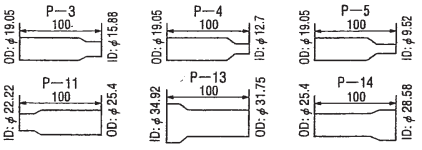
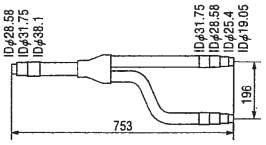
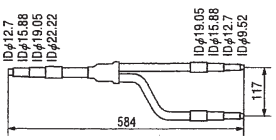
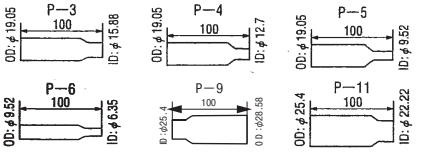
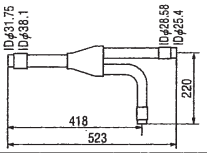
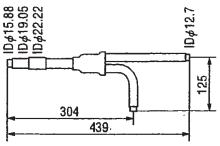
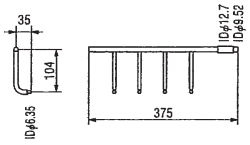
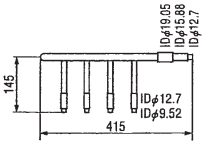
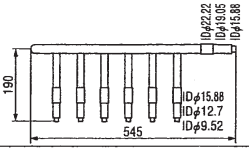
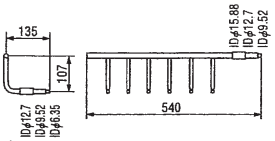
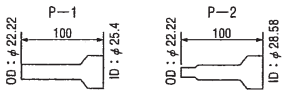
(5) 7-segment LED indication
Data are indicated when so chosen with the indication selector switch. For the details of indication, please refer to the technical manual.

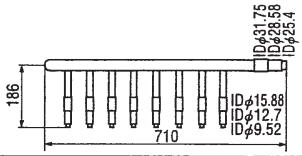
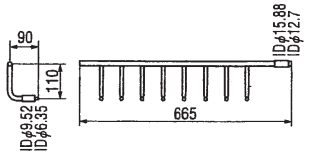
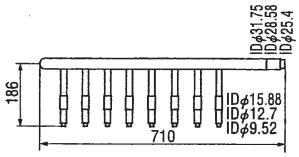
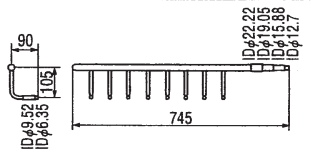
5.5 Instructions for installing the branch pipe set

PSB012D855B

◎This manual describes the specifications of branching pipe set and header set installation. For outdoor unit installation and indoor unit installation, please refer to the respective installation manuals supplied with your outdoor unit and indoor unit.
◎Before you set about installation work, please read this manual carefully so that you can carry out installation work according to the instructions contained herein.
●Please read the safety instructions contained in the installation manual supplied with your outdoor unit carefully and carry out installation work unerringly.
●When installation work is completed, conduct a test run to check the installation for any anomaly. Please also give the customer necessary instructions as to the operation and maintenance of the unit pursuant to the instruction manual (supplied with the indoor unit).
●Please ask the customer to keep the installation manual on the customer's part together with the instruction manual.

PARTS LIST

Branching pipe set type	Gas side	liquid side	Different diameter pipe joint
DIS-22-1			None
DIS-180-1			
DIS-371-1			
DIS-540-2			
DOS-2A-1 (Outdoor units used in combination)			None
HEAD4-22-1			None
HEAD6-180-1			

Branching pipe set type	Gas side	liquid side	Different diameter pipe joint
HEAD8-371-1			None
HEAD8-540-2			

INSTALLATION PROCEDUCE

1. Please select an appropriate branching pipe set model and a pipe size by consulting with the installation manual of the indoor unit or other relevant technical documents.

Attention

①Use a pipe conforming to a pipe size specified for indoor unit connection for the section between an indoor unit and a branching pipe.

②Use a pipe conforming to a pipe size specified for outdoor unit connection for the section between an outdoor branching pipe and an outdoor unit.

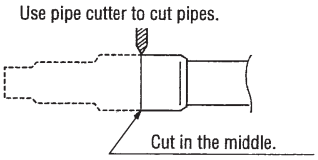
2. Cut a branching pipe set or a different diameter joint with a pipe cutter to make it fit for a selected pipe size before application.

Attention

① In cutting pipes, always use a pipe cutter. Remove burrs from a cut end when you cut a pipe. In doing so, keep a cut end downward so that no chips or burrs may enter the pipe.

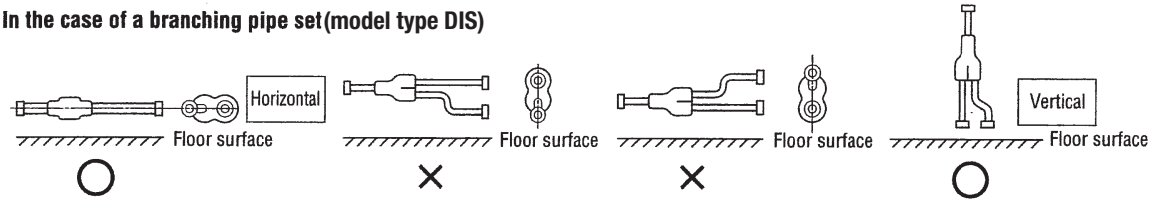
② Take utmost care so that no foreign matter such as dust or water may enter piping during installation work.

- Please cover all the open ends of piping until installation work is completed. Particularly, any openings in the section of piping laid outdoors should be sealed stringently.
- As long as possible, avoid open ends left facing upward. Make them face either horizontally or downward.

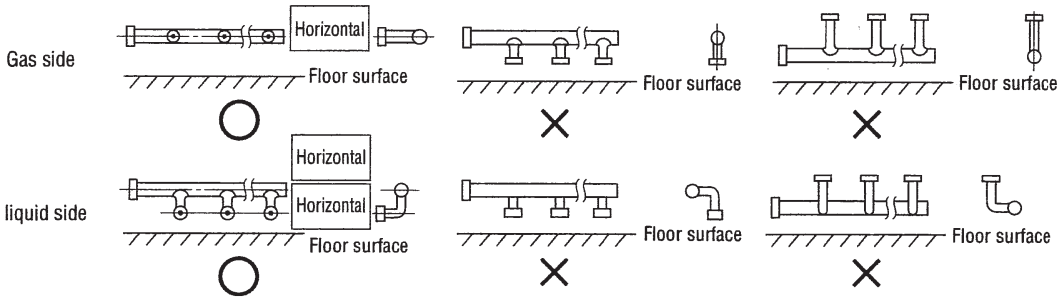


③ A branching joint (for both gas and liquid) must always be positioned in such a way that it branches either horizontally or vertically.

- **In the case of a branching pipe set (model type DIS)**



- **In the case of a header set (model type HEAD)**



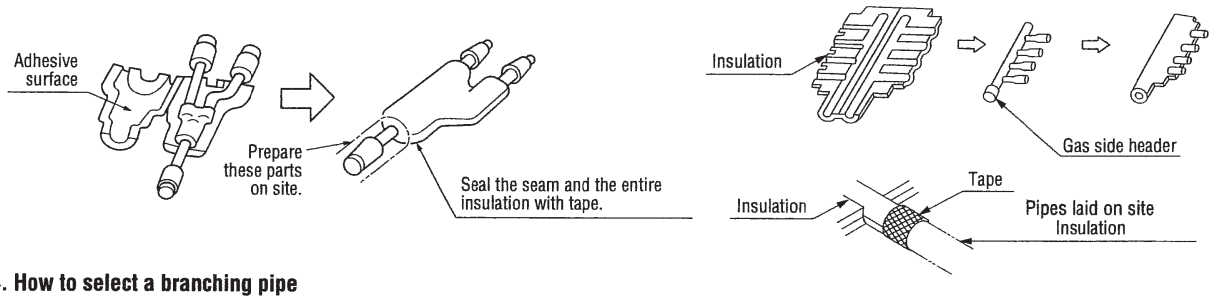
④ Always apply nitrogen gas when soldering joints. If nitrogen gas is not applied, a large amount of film oxide will be formed which could lead to a critical failure in the unit. Use caution to prevent moisture or any foreign matters from entering the pipe when connecting pipe ends.
For the method of air tightness testing and pulling air, please refer to the installation manual of the outdoor unit.

⑤ Do not leave piping with any open ends uncovered to prevent water or foreign matters from entering inside.

3. Please dress it with an attached insulation sheet for heat insulation. (Please dress both liquid and gas sides)

Attention

① Apply an attached insulation sheet along a pipe, tape the joining line with a joint tape (to be procured on the installer's part) for complete sealing, and wrap the pipe and insulation sheet entirely with a tape.
② Dress both liquid and gas pipes with attached insulation sheets for heat insulation.
③ Ensure that the liquid pipe is given the heat insulation as good as that of the gas pipe. The absence of heat insulation can cause dripping water from dew condensing on the pipe or performance degradation.



4. How to select a branching pipe

(1) How to select a branching pipe set

- An appropriate branching pipe size varies depending on the capacity of connected indoor units (combined total capacity connected downstream), so please choose from the table below.
- In the case of a 140/160 (5/6HP) outdoor unit, however, select DIS-22-1. (Even if the capacity of connected indoor units reaches 180 or higher, select DIS-22-1.)

Total capacity downstream	Branching pipe set model type
less than 180	DIS-22-1
180 or higher – less than 371	DIS-180-1
371 or higher – less than 540	DIS-371-1
540 or more	DIS-540-2

Attention

① Use a pipe conforming to a pipe size specified for indoor unit connection for the section between an indoor unit and an indoor unit side branching pipe.
② A branching joint (for both gas and liquid) must always be positioned in such a way that it branches either horizontally or vertically.

(2) How to select a header set

- Depending on the number of units connected, connect plugged pipes (to be procured on the installer's part) at a branching point (on the indoor unit connection side).
- For the size of a plugged pipe, please refer to the documentation for a header set (optional part).
- In the case of a 140/160 (5/6HP) outdoor unit, however, select HEAD4-22-1. (Even if the capacity of connected indoor units reaches 180 or higher, select HEAD4-22-1.)

Total capacity downstream	Header set model type	Number of branches
less than 180	HEAD4-22-1	Up to 4 branches
180 or higher – less than 371	HEAD6-180-1	Up to 6 branches
371 or higher – less than 540	HEAD8-371-1	Up to 8 branches
540 or more	HEAD8-540-2	Up to 8 branches

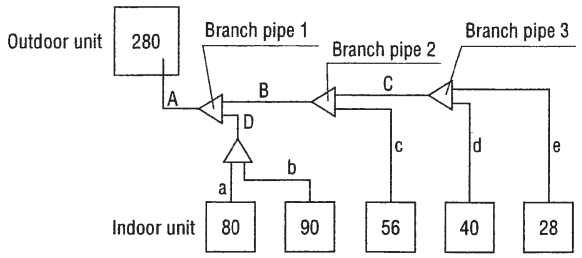
Attention

① Use a pipe conforming to a pipe size specified for indoor unit connection for the section between a header and an indoor unit.
② Always position a header (both gas and liquid headers) in such a way that it branches horizontally.
③ No 224 or 280 indoor unit is connectable to a header.

5. Example of piping

Example 1: Branching type configuration

Connected capacity: 294

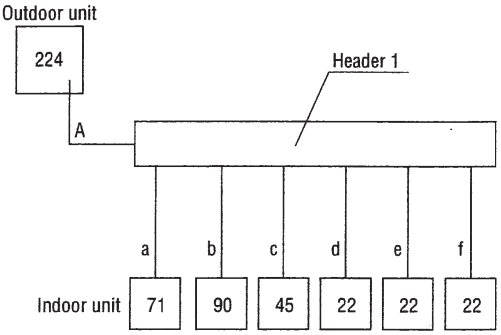


Selection of a branching pipe set

Mark	Selection procedure	Branching pipe set
Branch pipe 1	Combined total capacity of indoor units connected downstream (80+90+56+40+28)=294	DIS-180-1
Branch pipe 2	Combined total capacity of indoor units connected downstream (56+40+28)=124	DIS-22-1
Branch pipe 3	Combined total capacity of indoor units connected downstream (40+28)=68	DIS-22-1

Example 2: Header type configuration

Connected capacity: 272

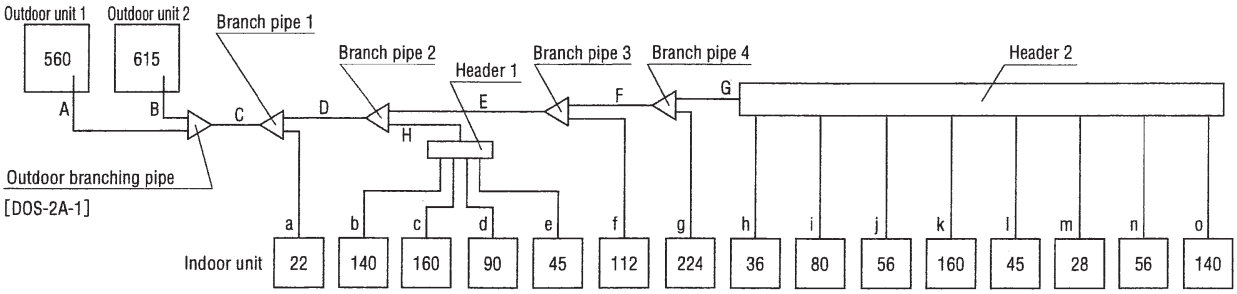


Selection of a header set

Mark	Selection procedure	Header set
Header 1	Combined total capacity of indoor units connected downstream (71+90+45+22+22+22)=272	HEAD6-180-1

Example 3: Branching + Header mixed type configuration

Connected capacity: 1394



Selection of a branching pipe set

Mark	Selection procedure	Branching pipe set
Branch pipe 1	Combined total capacity of indoor units connected downstream (22+140+160+90+45+112+224+36 +80+56+160+45+28+56+140)=1394	DIS-540-2
Branch pipe 2	Combined total capacity of indoor units connected downstream (140+160+90+45+112+224+36+80 +56+160+45+28+56+140)=1372	DIS-540-2
Branch pipe 3	Combined total capacity of indoor units connected downstream (112+224+36+80+56+160+45+28 +56+140)=937	DIS-540-2
Branch pipe 4	Combined total capacity of indoor units connected downstream (224+36+80+56+160+45+28+56 +140)=825	DIS-540-2

Selection of a header set

Mark	Selection procedure	Header set
Header 1	Combined total capacity of indoor units connected downstream (140+160+90+45)=435	HEAD8-371-1
Header 2	Combined total capacity of indoor units connected downstream (36+80+56+160+45+28+56+140)=601	HEAD8-540-2

INVERTER DRIVEN MULTI-INDOOR-UNIT CLIMATE CONTROL SYSTEM

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