Manual No.'22・PAC-SM-422

MITSUBISHI HEAVY INDUSTRIES

SERVICE MANUAL

INVERTER PACKAGED AIR-CONDITIONERS

Wi-Fi model

(Split system, air to air heat pump type)

HYPER INVERTER
WALL MOUNTED TYPE
Single type
SRK100VNXWZRF
100VSXWZRF

MICRO INVERTER
WALL MOUNTED TYPE

Single type	Twin type
SRK100VNAWZRF	SRK200VSAWPZRF
100VSAWZRF	

STANDARD INVERTER
WALL MOUNTED TYPE
Single type
SRK100VNPWZRF

MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

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1. HYPER INVERTER PACKAGED AIR-CONDITIONERS

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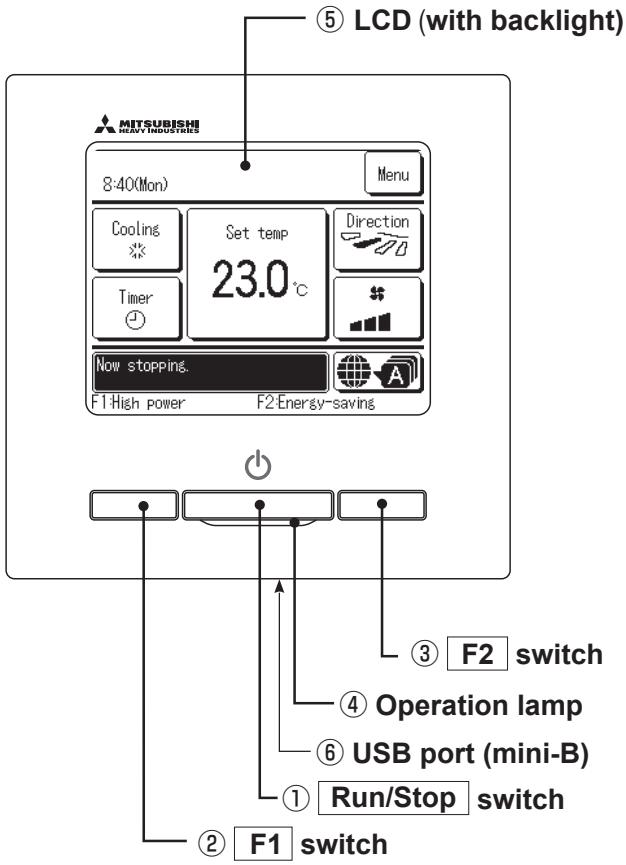
1.1 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

1.1.1 Remote control

(1) Wired remote control (Option parts)

Model RC-EX3A



Touch panel system, which is operated by tapping the LCD screen with a finger, is employed for any operations other than the ①Run/Stop, ②F1 and ③F2 switches.

① Run/Stop switch

One push on the button starts operation and another push stops operation.

② F1 switch③ F2 switch

This switch starts operation that is set in F1/F2 function change.

④ Operation lamp

This lamp lights in green (yellow-green) during operation. It changes to red (orange) if any error occurs.
Operation lamp luminance can be changed.

⑤ LCD (with backlight)

A tap on the LCD lights the backlight.
The backlight turns off automatically if there is no operation for certain period of time. Lighting period of the backlight lighting can be changed.
If the backlight is ON setting, when the screen is tapped while the backlight is turned off, the backlight only is turned on. (Operations with switches ①,② and ③ are excluded.)

⑥ USB port

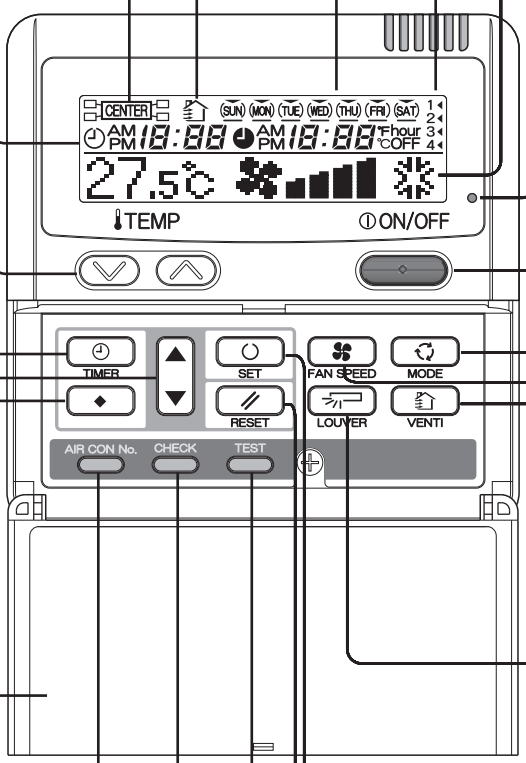
USB connector (mini-B) allows connecting to a personal computer.
For operating methods, refer to the instruction manual attached to the software for personal computer (remote control utility software).

Note When connecting to a personal computer, do not connect simultaneously with other USB devices.
Please be sure to connect to the computer directly,without going through a hub, etc.

Model RC-E5

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

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



Ventilaion display
Displayed during ventilation operation

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

ESP button
This button is used to select the auto static pressure adjustment mode.

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, air flow volume, operation mode and oparation message.

Operation/check indicator light
During oparation: 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 air flow volume.

VENT button
This button is used to operate external ventilator.

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

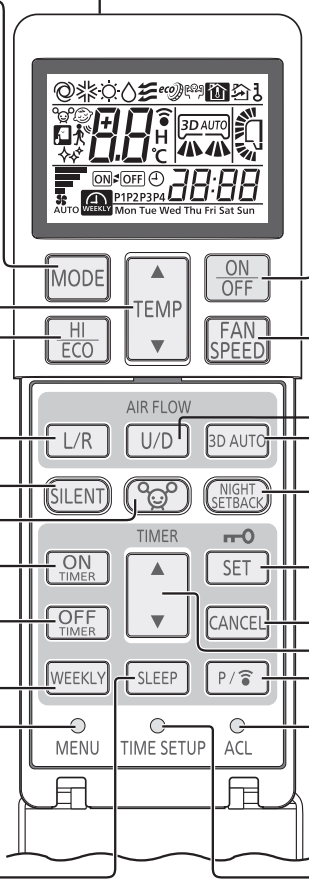
SET button
•This button is used to fix the setting.
•This button is used to set the silent mode.

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.

(2) Wireless remote control

Operation section



[View with the cover opened]

Transmission section

ON/OFF (luminous) button
Press to start operation, press again to stop.

FAN SPEED button
Each time the button is pressed, the fan speed changes.

AIR FLOW (UP/DOWN) button
This button changes the air flow (up/down) direction.

3D AUTO button
This button sets 3D AUTO operation.

NIGHT SETBACK button
This button sets NIGHT SETBACK operation.

SET/Child lock button
Use this button to set the timer and Child lock.

CANCEL button
This button cancels the ON timer, OFF timer, and SLEEP operation.

TIMER button
This button is used for setting the current time and timer function.

PROGRAM button
This button sets WEEKLY TIMER.

ACL switch
This switch resets the program to default state.

TIME SET UP switch
This switch is used for setting the time.

OPERATION MODE select button
Each time the button is pressed, the mode changes.

TEMPERATURE button
This button sets the room temperature.

HI/ECO button
This button changes the HIGH POWER/ ECONOMY operation.

AIR FLOW (LEFT/RIGHT) button
This button changes the air flow (left/right) direction.

SILENT button
This button sets the SILENT operation.

ALLERGEN CLEAR button
This button selects ALLERGEN CLEAR operation.

ON TIMER button
This button selects ON TIMER operation.

OFF TIMER button
This button selects OFF TIMER operation.

WEEKLY button
This button switches the WEEKLY TIMER to ON/OFF.

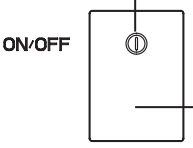
MENU switch
This switch selects the SELF CLEAN operation, wireless LAN communication setting, wireless LAN connection setting and PRESET operation.

SLEEP button
This button selects SLEEP operation.

The above illustration shows all controls, but in practice only the relevant parts are shown.

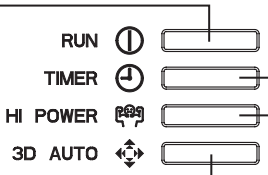
Unit display section

Unit ON/OFF button
This button can be used for turning on/off the unit when a remote control is not available.



Remote control signal receiver

RUN light (green)
- Illuminates during operation.
- Blinks slowly when SELF CLEAN operation (3 seconds ON, 1 second OFF).
- Blinks when air flow is stopped to prevent blowing out of cold air in heating operation. (1.5 seconds ON, 0.5 seconds OFF).
- RUN light blink quickly during invalid operation mode.



TIMER light (yellow)
Illuminates during TIMER operation.

HI POWER light (green)
Illuminates during HIGH POWER operation.

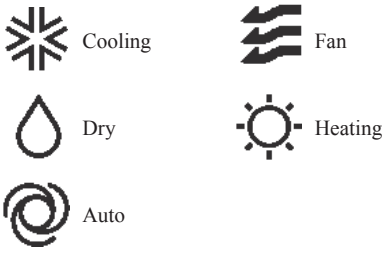
3D AUTO light (green)
Illuminates during 3D AUTO operation.

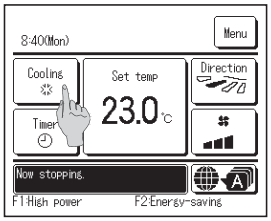
1.1.2 Operation control function by the wired remote control

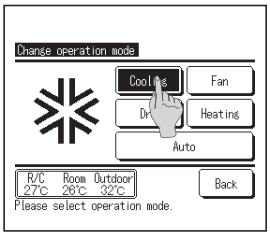
●Model RC-EX3A

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

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





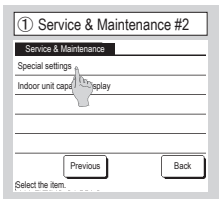


Notes (1) Operation modes which cannot be selected depending on combinations of indoor unit and outdoor unit are not displayed.
(2) When the Auto is selected,the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.

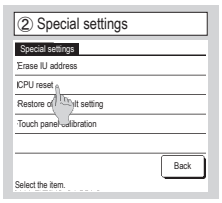
(2) CPU reset

Reset CPU from the remote control as follows.

TOP screen → Menu ⇒ Service setting ⇒ Service & Maintenance ⇒ Service password



The selected screen is displayed.



The selected screen is displayed.

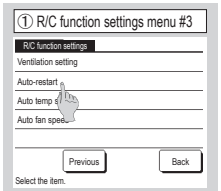
CPU reset

Microcomputers of indoor unit and outdoor unit connected are reset (State of restoration after power failure).

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

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

TOP screen → Menu ⇒ Service setting ⇒ R/C function settings ⇒ Service password



If the unit stops during operation,

Enable

It returns to the state before the power failure as soon as the power source is restored (After the end of the primary control at the power on).

Disable

It stops after the restoration of power source.

●Since the status of remote control is retained in memory always, it restarts operations according to the contents of memory as soon as the power source is restored. Although the timer mode is cancelled, the weekly timer, peak cut timer and silent mode timer operate according to the following contents:

・When the clock setting is valid : These timer settings are also valid.
・When the clock setting is invalid : These timer settings become “Invalid” since the clock setting is invalid.
These timer settings have to be changed to “Valid” after the timer setting.

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

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

(a) At power failure – Operating/stopped
If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized.

(b) Operation mode

(c) Air flow volume mode

(d) Room temperature setting

(e) Louver auto swing/stop
However, the stop position (4-position) is cancelled so that it returns to Position (1).

(f) "Remote control function items" which have been set with the administrator or installation function settings ("Indoor function items" are saved in the memory of indoor unit.)

(g) Weekly timer, peak-cut timer or silent mode timer settings

(h) Remote control function setting

(4) Alert displays

If the following (a) to (c) appear, check and repair as follows.

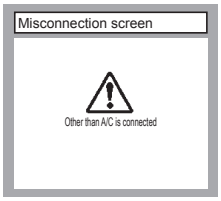
(a) Communication check between indoor unit and remote control

●This appears if communications cannot be established between the remote control and the indoor unit.
Check whether the system is correctly connected (indoor unit, outdoor unit, remote control) and whether the power source for the outdoor unit is connected.

(b) Clock setting check

●This appears when the timer settings are done without clock setting.
Set the clock setting before the timer settings.

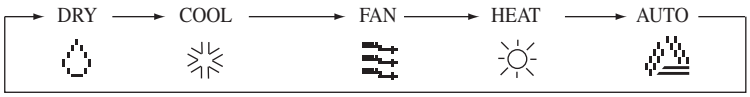
(c) Misconnection



●This appears when something other than the air-conditioner has been connected to the remote control.
Check the location to which the remote control is connected.

●Model RC-E5

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



(2) CPU reset

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

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

- This becomes effective if "Power failure compensation effective" is selected with the setting of remote control function.
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.
  After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.
- Content memorized with the power failure compensation are as follows.

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

(a) At power failure – Operating/stopped
If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)

(b) Operation mode

(c) Air flow volume mode

(d) Room temperature setting

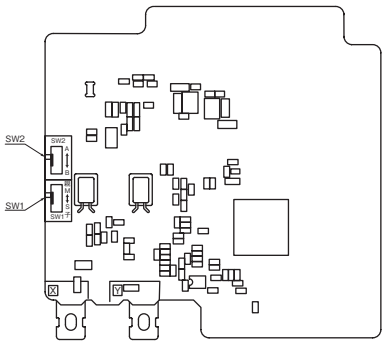
(e) Louver auto swing/stop
However, the stop position (4-position) is cancelled so that it returns to Position (1).

(f) "Remote control function items" which have been set with the remote control function setting ("Indoor function items" are saved in the memory of indoor unit.)

(g) Upper limit value and lower limit value which have been set with the temperature setting control

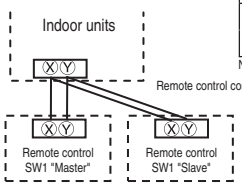
(h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

[Parts layout on remote control PCB]



Master/ slave setting when more than one remote controls are used

A maximum of two remote controls can be connected to one indoor unit (or one group of indoor units.)



Switch	Setting	Contents
SW1	M	Master remote control
	S	Slave remote control

Note (1) Don't change SW2 because it is not used normally.

Caution

When using multiple remote controls, the following dispiays or settings cannot be done with the slave remote control. It is available only with the master remote control.

①Louver position setting (set upper or lower limit of swinging range)
②Setting indoor unit functions
③Setting temperature range
④Operation data display
⑤Error data display
⑥Silent mode setting
⑦Test operation of drain pump
⑧Remote control sensor setting

1.1.3 Operation control function by the indoor control

(1) Unit ON/OFF button

When the wireless remote control batteries become weak, or if the wireless remote control is lost or malfunctioning, this button may be used to turn the unit on and off.

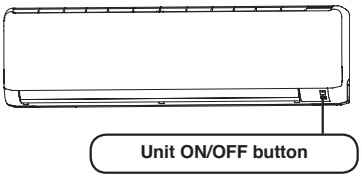
(a) Operation

Push the button once to place the unit in the automatic mode. Push it once more to turn the unit off.

(b) Details of operation

The unit will go into the automatic mode in which it automatically determines, from room temperature (as detected by sensor), whether to go into the COOL or HEAT mode.

Function / Operation mode	Roon temperature setting	Fan speed	Swing control	Timer switch
Cooling	About 24ºC	Auto	Auto	Continuous
Heating	About 26ºC			



(2) Auto restart function

(a) Auto restart function records the operational status of the air-conditioner immediately prior to be switched off by a power cut, and then automatically resumes operations after the power has been restored.

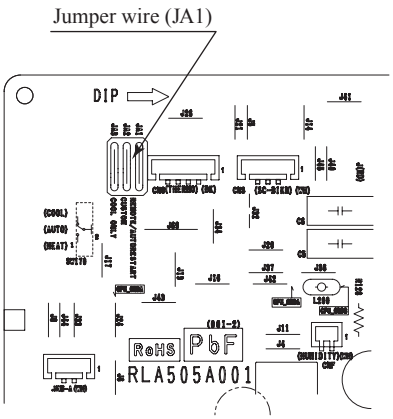
(b) The following settings will be cancelled:

(i) Timer settings

Notes (1) Auto restart function is set at on when the air-conditioner is shipped from the factory. Consult with your dealer if this function needs to be switched off.

(2) When power failure ocurrs, the timer setting is cancelled. Once power is resumed, reset the timer.

(3) If the jumper wire (JA1) "AUTO RESTART" is cut, auto restart is disabled. (See the diagram at right)



(3) Auto swing control

Note Even if [Auto Swing] is selected, the louver position with anti draft function is fixed to position 1.

(a) RC-EX3A

(i) Louver control

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

(ii) Automatic louver level setting during heating

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

(iii) Louver free stop control

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

(b) RC-E5

(i) Louver control

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

   Note (1) If you press the "LOUVER" button, the swing motion is displayed on the louver position LCD for 10 second. The display changes to the "SWING" display 3 seconds later.

(ii) Automatic louver level setting during heating

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

(iii) Louver free stop control

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

Note When the indoor function of wired remote control "POSITION" has been switched, switch also the remote control function "POSITION" in the same way.

(4) Timer operation

(a) RC-EX3A

(i) Sleep timer

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

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

(ii) Set OFF timer by hour

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

(iii) Set ON timer by hour

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

(iv) Set ON timer by clock

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

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

(v) Set OFF timer by clock

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

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

(vi) Weekly timer

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

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

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

	Sleep timer	Set OFF timer by hour	Set ON timer by hour	Set OFF timer by clock	Set ON timer by clock	Weekly timer
Sleep timer		×	×	○	○	○
Set OFF timer by hour	×		×	×	×	×
Set ON timer by hour	×	×		×	×	×
Set OFF timer by clock	○	×	×		○	×
Set ON timer by clock	○	×	×	○		×
Weekly timer	○	×	×	×	×	

Note ○: Allowed ×: Not

(b) RC-E5

(i) Sleep timer

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

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

(ii) OFF timer

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

(iii) ON timer

Time to turn ON the air-conditioner can be set in the unit of 10 minutes. Indoor temperature can be set simultaneously.

(iv) Weekly timer

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

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

Item / Item	Sleep timer	OFF timer	ON timer	Weekly timer
Sleep timer		×	○	×
OFF timer	×		○	×
ON timer	○	○		×
Weekly timer	×	×	×	

Notes (1) ○: Allowed ×: Not

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

(5) Wireless LAN connection function

(a) Operating conditions

When a signal of wireless LAN connection setting was received from a remote control during all air-conditioners stop

(b) Detail of operation

(i) A signal which corresponds to the signal received from a remote control is sent to air-conditioner.

(ii) A buzzer for confirmation of receipt rings.

(c) Reset conditions

When either of the following conditions is satisfied

(i) When a reception complete signal was received from interface

(ii) When an interface communication setting OFF signal was received from a remote control

(6) Outline of heating or cooling operation

(a) Operation of major functional components in heating mode

	Heating		
	Thermostat ON	**Thermostat OFF**	**Failure**
Compressor	ON	OFF	OFF
Indoor fan	ON	ON(HOT KEEP)	OFF
Outdoor fan	ON	OFF (few minutes ON)	OFF
4-way valve	ON	ON	OFF (3 minutes ON)

(b) Operation of major functional components in cooling mode

	Cooling		
	Thermostat ON	**Thermostat OFF**	**Failure**
Compressor	ON	OFF	OFF
Indoor fan	ON	ON	OFF
Outdoor fan	ON	OFF (few minutes ON)	OFF (few minutes ON)
4-way valve	OFF	OFF	OFF

(7) Indoor fan motor protection

When the air-conditioner is operating and the indoor fan motor is turned ON, if the indoor fan motor has operated at 300 min^{-1} or lower for more than 30 seconds, the unit enters first in the stop mode and then stops the entire system.

(8) Serial signal transmission error protection

(a) Purpose

Prevents malfunction resulting from error on the indoor ↔ outdoor signals

(b) Detail of operation

If the compressor is operating and a serial signal cannot be received from the indoor control with outdoor control having serial signals continues for 7 minutes and 35 seconds, the compressor is stopped. After the compressor has been stopped, it will be restarted after the compressor start delay if a serial signal can be received again from the indoor control.

(9) Plural unit control – Control of 16 units group by one remote control

(a) Function

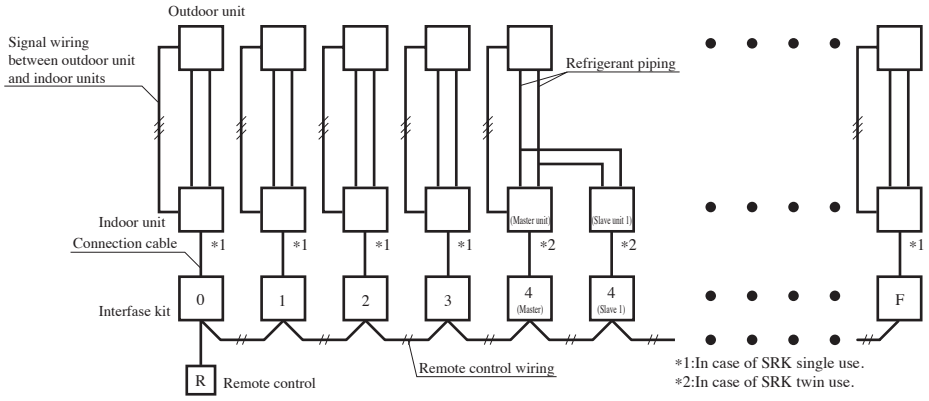
One remote control can control a group of multiple number of unit (Max. 16 indoor units). “Operation mode” which is set by the remote control switch can operate or stop all units in the group one after another in the order of unit No.(1). Thermostat and protective function of each unit function are independent.

Notes (1) Unit No. is set by SW1 on the interface PCB. Unit No. setting by SW1 is necessary for the interface only. In cases of the twin and triple specification, it is necessary set for the master and the slave units. This can be selected by SW3. (All are set for the master unit at the shipping from factory.)

SW1: For setting of 0 – 9, A – F
SW3: For setting of master and slave units
(See table shown at right.)

SW3 setting (For interface PCB)

Switch / Unit	SW3-1	SW3-2
Master	OFF	OFF
Slave1	OFF	ON



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

(b) Display to the remote control

(i) Central or each remote control basis, heating preparation
The smallest unit No. among the operating units in the remote mode (or the center mode unless the remote mode is available) is displayed.

(ii) Inspection display, filter sign
Any of unit that starts initially is displayed.

(iii) Confirmation of connected units

1) In case of RC-EX3A remote control
If you touch the buttons in the order of "Menu" → "Service setting" → "Service & Maintenance" → "Service password" → "IU address" on the TOP screen of remote control, the indoor units which are connected are displayed.

2) In case of RC-E5 remote control
Pressing "AIR CON No." button on the remote control displays the indoor unit address. If "▲" "▼" button is pressed at the next, it is displayed orderly starting from the unit of smallest No..

(c) In case of anomaly

If any anomaly occurs on a unit in a group (a protective function operates), that unit stops with the anomalous stop but any other normal units continue to run as they are.

(d) Signal wiring procedure

Signal wiring between indoor and outdoor units should be made on each unit same as the normal wiring. For the group control, connect with wiring between rooms using terminal blocks (X, Y) of interface kit.
Connect the remote control communication wire separately from the power source cable or wires of other electric devices (AC220V or higher).

(10) Filter sign

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

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

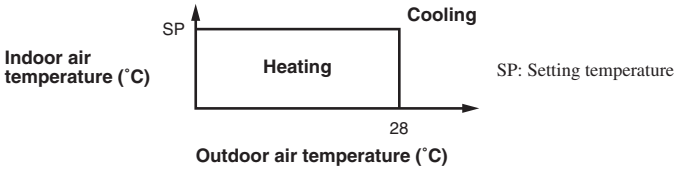
Filter sign setting	Function
Setting 1	Setting time: 180 hrs (Factory default)
Setting 2	Setting time: 600 hrs
Setting 3	Setting time: 1,000 hrs
Setting 4	Setting time: 1,000 hrs (Unit stop) (2)

(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.

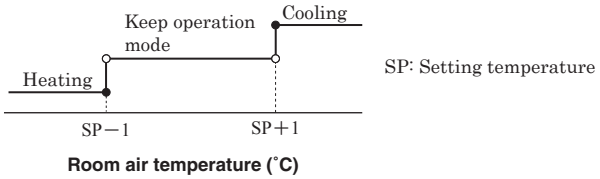
(11) Outline of automatic operation

(a) Determination of operation mode

Operation mode is determined by indoor air temperature and outdoor air temperature as following.



(b) Operation mode is changes when keep cooling and heating thermostat off 20 minutes and be satisfied following conditions. If the setting temperature is changed with the remote control, the operation mode is judged immediately.



※It can not be changed to heating mode if outdoor air temperature is 28℃ or higher.

(c) When the unit is started again within one hour after the stop of automatic operation or when the automatic operation is selected during heating, cooling or dehumidifying operation, the unit is operated in the previous operation mode.

(d) Setting temperature can be adjusted within the following range. There is the relationship as shown below between the signals of the wireless remote control and the setting temperature.

Unit : ℃

		Signals of wireless remote control (Display)												
		18	19	20	21	22	23	24	25	26	27	28	29	30
Setting temperature	Cooling	20	21	22	23	24	25	26	27	28	29	30	31	32
	Heating	19	20	21	22	23	24	25	26	27	28	29	30	31

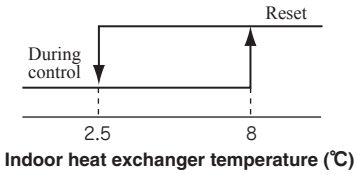
(12) Frost prevention control (During cooling or dehumidifying)

(a) Operating conditions

1) More than 8 minutes after starting the compressor
2) Indoor heat exchanger temperature (detected with Th2) is lower than 2.5℃.

(b) Contents of frosting operation

	During this control	Reset
Compressor ON/OFF command	Forced stop	Operation command
Indoor fan motor	Depending on the air flow setting with the remote control	



(c) Resetting condition

Indoor heat exchanger temperature (Th2) is higher than 8℃.

(13) Dew prevention control (During cooling or dehumidifying)

(i) Operating conditions

When the following conditions have been satisfied for more than 30 minutes after starting operation

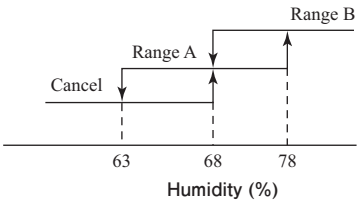
1) Command compressor speed is 20 rps or higher.
2) Detected value of humidity is 68% or higher.

(ii) Contents of operation

1) Air capacity control

Item \ Model	SRK100ZR-W
Upper limit of command compressor speed (1)	Range A: As per following table, Range B: 40 rps

Note Ranges A and B are as shown below.



● Condition for range A

Command compressor speed is controlled according to the indoor unit heat exchanger temperature (Th2) and the indoor unit room air temperature (Th1).

Condition	Command compressor speed
Th2 ≦ Th1−10	・Decreases the target max. compressor speed by 4 rps. ・If the condition is satisfied still 20 seconds later, the speed is decreased further by 4 rps. This process is repeated further so far as the condition is satisfied.〔Lower limit is 20 rps.〕
Th1−10 < Th2 ≦ Th1−6	Target max. compressor speed or changed value of the same is maintained.
Th1−6 < Th2	Changed target max. compressor speed is increased at a rate of 1 rps/20 seconds.

2) When this control has continued for more than 30 minutes continuously, the following wind direction control is performed.

When the vertical wind direction is set at other than the vertical swing, the flaps change to the horizontal position.

(iii) Reset conditions

When either of the following conditions is satisfied

1) Command compressor speed is less than 20 rps.
2) Detected value of humidity is less than 63%.

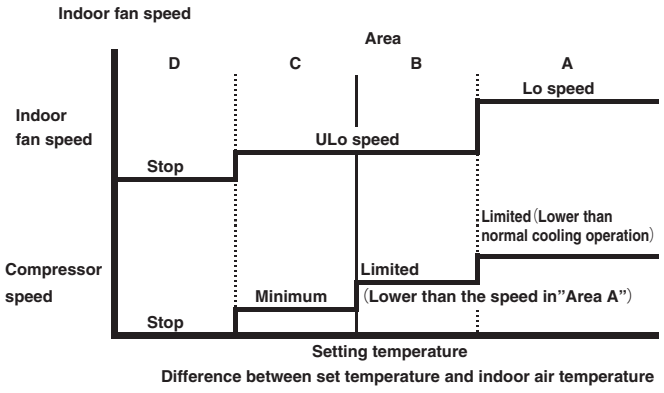
(14) Outline of dehumidifying (DRY) operation

(a) Purpose of DRY mode

The purpose is "Dehumidification", and not to control the humidity to the target condition.
Indoor/outdoor unit control the operation condition to reduce the humidity, and also prevent over cooling.

(b) Outline of control

(i) Indoor fan speed and compressor are controlled by the area which is selected by the temperature difference.



(ii) The indoor unit check the current area by every 5 minutes, and operate by the next checking.

1.1.4 Operation control function by the outdoor control

(1) Determination of compressor speed

Required compressor speed

(a) Cooling/dehumidifying operation Unit: rps

Model		FDC100
Max. required compressor speed	Usual operation	75
	Silent mode, outdoor air temperature ≦ 15°C	40
	Silent mode II (When SW4-1 ON)	36
Min. required compressor speed		11

(b) Heating operation Unit: rps

Model		FDC100
Max. required compressor speed	Usual operation	100
	Silent mode	39
	Silent mode II (When SW4-1 ON)	36
Min. required compressor speed		11

(c) If the indoor fan speed becomes “Me” or “Lo”, Max required compressor speed goes down accordingly depending on indoor unit model.

(d) Max. required compressor speed under high outdoor air temperature in cooling mode
Maximum required compressor speed is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC100
Max. required compressor speed	Outdoor air temperature is 37°C or higher	75
	Outdoor air temperature is 40°C or higher	75
	Outdoor air temperature is 46°C or higher	70

(e) Max. required compressor speed under outdoor air temperature in heating mode.
Maximum required compressor speed is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC100
Max. required compressor speed	Outdoor air temperature is 18°C or higher	80
	Outdoor air temperature is 10°C or higher	75

(f) Selection of max. required compressor speed by heat exchanger temperature

(i) Maximum required compressor speed is selected according to the outdoor heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor heat exchanger temperature (Th2) during heating mode.

(ii) When there are 2 indoor heat exchanger temperatures (Th2), whichever the higher applies.
When there are 2 outdoor heat exchanger temperatures (Tho-R), whichever the higher applies.

Unit: rps

Model			FDC100
Max. required compressor speed	Cooling/ dehumidifying	Outdoor heat exchanger temperature is 55°C or higher	70
	Heating	Indoor heat exchanger temperature is 55°C or higher	100

(g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required compressor speed.

(h) During heating, it is operated with the maximum required compressor speed until the indoor heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

(a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.

(b) However, at initial start after turning the power source breaker, it may enter the standby state for maximum 30 minutes (" PREPARATION" is displayed on the remote control) in order to prevent the oil loss in the compressor.
If the cooling/dehumidifying/heating operation is selected from the remote control when the outdoor unit is in the standby state, " PREPARATION" is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition] Normally, the compressor operation speed is raised in this start pattern.

[Control contents] (i) Starts with the target compressor speed at **A** rps.
However, when the outdoor air temperature (Tho-A) is 35°C or higher and the outdoor air temperature (Tho-A) is 10°C or higher during cooling/dehumidifying or the room air temperature (Th1) is 25°C or higher and the outdoor air temperature (Tho-A) is 10°C or higher during heating, it starts at **C** rps.

(ii) At 30 seconds after the start of compressor, its target compressor speed changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation speed fixed at **B** rps.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC100	Cooling/Dehumidifying	35	35	25
	Heating	35	35	25

(b) Compressor protection start III

[Control condition] Number of compressor starts is only 1 counted after the power source breaker ON.

[Control contents] Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

(i) Low operation compressor speed control during cooling/dehumidifying

[Control condition] Upon establishing the conditions of compressor protection start III, the low operation compressor speed control is performed during cooling/dehumidifying.

[Control contents] 1) Starts with the target compressor speed at **A** rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.
2) At 30 seconds after the compressor start, the target compressor speed is changed to **B** rps and the operation compressor speed is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC100	Cooling/Dehumidifying	35	35	25

(ii) Low operation compressor speed control during heating

[Control condition] When the conditions of compressor protection start III are established and one of following conditions 1) is satisfied, the low number of revolutions operation control is performed during heating.
1) At 30 minutes or more after turning the power source breaker on.

[Control contents] 1) Starts the compressor with its target compressor speed at **A** rps. However, when the room air temperature (Th1) is 25°C or higher, it starts at **C** rps.
2) At 30 seconds after the start of compressor, the compressor's target compressor speed is changed to **B** rps and the operation compressor speed is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC100	Heating	35	35	25

(4) Outdoor fan control

(a) Outdoor fan tap and fan motor speed

Unit: min^{-1}

Model	Mode	Fan motor tap						
		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
FDC100	Cooling/Dehumidifying	200	370	560	640	745	870	910
	Heating	200	370	560	650	830	870	910

(b) Fan tap control during cooling/defumidifying operation

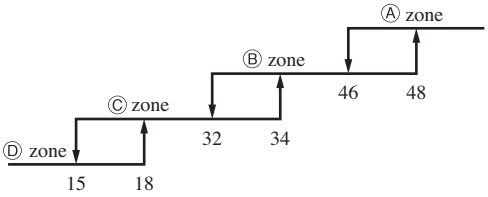
Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

Note It is detected by Tho-R1 or R2, whichever the higher.

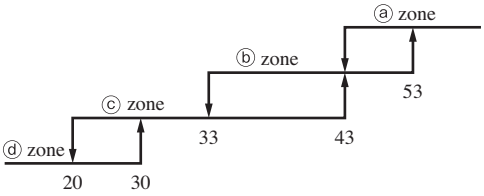
	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5	Tap 5	Tap 5	Tap 4
ⓑ zone	Tap 5	Tap 5	Tap 4	Tap 3
ⓒ zone	Tap 4	Tap 4	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

• Silent mode only

	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5	Tap 5	Tap 5	Tap 4
ⓑ zone	Tap 5	Tap 4	Tap 3	Tap 3
ⓒ zone	Tap 4	Tap 3	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1



Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

(c) Fan tap control during heating operation

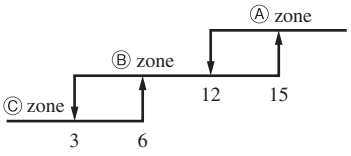
Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

Note It is detected by Tho-R1 or R2, whichever the lower.

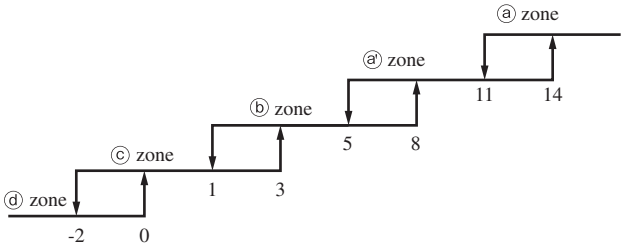
	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 4
ⓐ' zone	Tap 3	Tap 3	Tap 4
ⓑ zone	Tap 3	Tap 4	Tap 5
ⓒ zone	Tap 4	Tap 5	Tap 6
ⓓ zone	Tap 5	Tap 6	Tap 7

• Silent mode only

	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 3
ⓐ' zone	Tap 3	Tap 3	Tap 3
ⓑ zone	Tap 3	Tap 3	Tap 5
ⓒ zone	Tap 4	Tap 5	Tap 6
ⓓ zone	Tap 4	Tap 5	Tap 6



Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

(d) Outdoor fan control at cooling low outdoor air temperature

The outdoor heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 20 seconds.

(e) Outdoor fan control by the power transistor radiator fin temperature

When all the following conditions are established later than 3 minutes after the start of compressor, the following control is implemented.

(i) Cooling/dehumidifying

1) Outdoor air temperature (Tho-A) ≧ 33°C
2) Actual compressor speed ≧ **A** rps
3) Power transistor radiator fin temperature ≧ **C** °C

(ii) Heating

1) Outdoor air temperature (Tho-A) ≧ 16°C
2) Actual compressor speed ≧ **B** rps
3) Power transistor radiator fin temperature ≧ **C** °C

(iii) Control contents

1) Raises the outdoor fan tap by 1 tap.
2) When the sampling is for 60 seconds and the value of power transistor radiator fin temperature (Tho-P) is as follows
   a) When the power transistor radiator fin temperature (Tho-P) ≧ **C** °C, the outdoor fan tap is raised by 1 step further.
   b) When **C** °C > power transistor radiator fin temperature (Tho-P) > **D** °C, present outdoor fan tap is maintained.
   c) When the power transistor radiator fin temperature (Tho-P) ≦ **D** °C, the outdoor fan tap is dropped by 1 step.

(iv) Ending conditions

When the operation under the condition of item 2), c) above and with the outdoor fan tap, which is determined by the items (b) and (c) is detected 2 times consecutively

• Compressor speed and power transistor radiator fin temperature

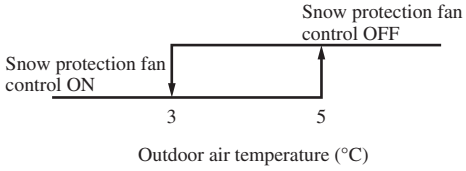
Item / Model	A	B	C	D
FDC100	65	65	72	68

(f) Caution at the outdoor fan start control (3 phase model only)

When the outdoor fan is running at 400min^{-1} or more before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan this is normal.

(g) Snow protection fan control

If the DIP switch (SW3-2) on the outdoor control PCB is turned ON, the outdoor fan is operated for 30 seconds at 4th speed once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.



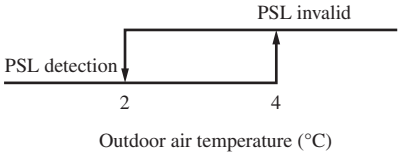
(5) Defrost operation

(a) Starting conditions

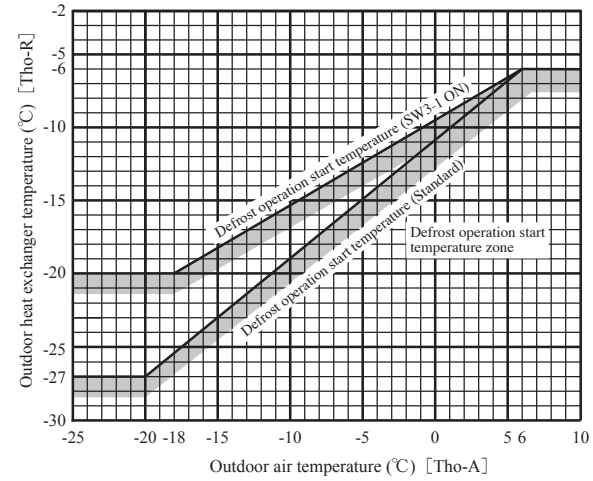
If all of the following defrost conditions A or conditions B are satisfied, the defrost operation starts.

(i) Defrost conditions A

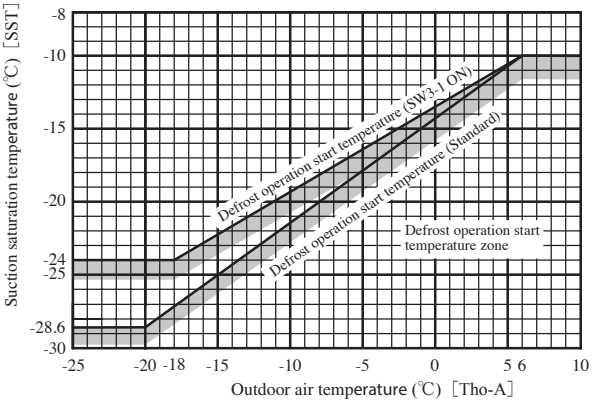
1) Accumulative compressor operation time after the end of defrost operation has elapsed 37 minutes, and the accumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.
2) After 5 minutes from the compressor ON
3) After 5 minutes from the start of outdoor fan
4) After satisfying all above conditions, if temperatures of the outdoor heat exchanger temperature sensor (Tho-R1, R2) and the outdoor air temperature sensor (Tho-A) become lower than the defrost operation start temperature as shown by the right figure for 15 seconds continuously, or the suction gas saturation temperature (SST) and the outdoor air temperature (Tho-A), which are obtained from the value detected by the low pressure sensor (PSL) stay for 3 minutes within the range below the defrost operation start temperature as shown by the right figure.However, it excludes for 10 minutes after the start of compressor and the outdoor air temperature is as shown by the lower figure.



Model FDC100



Model FDC100



(ii) Defrost conditions B

1) When previous defrost ending condition is the time out of defrost operation and it is in the heating operation after the accumulative compressor operation time after the end of defrost operation has become 30 minutes
2) After 5 minutes from the start of compressor
3) After 5 minutes from the start of outdoor fan

(b) Ending conditions

When any of the following conditions is satisfied, the heating operation starts

(i) When it has elapsed 13 minutes and 20 seconds after the start of defrost operation

(ii) When the outdoor heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 12°C or higher for 60 seconds continuously

(c) Switching of defrost control with SW3-1

(i) If SW3-1 on the outdoor control PCB is turned to ON, it becomes easier to enter the defrost operation. Use this when installing a unit at snowing regions.

(ii) Control contents

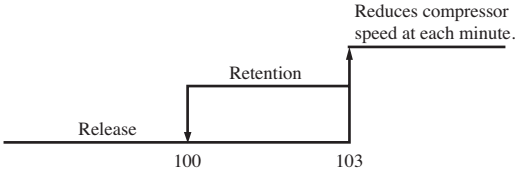
1) It allows entering the defrost operation under the defrost condition A when the cumulative heating operation time becomes 30 minutes. It is 37 minutes at SW3-1 OFF (Factory default).
2) It allows entering the defrost operation under the defrost condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).
3) It allows the defrost operation with the outdoor heat exchanger temperature (Tho-R) and suction pressure saturation temperature (SST) being higher than normal.

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

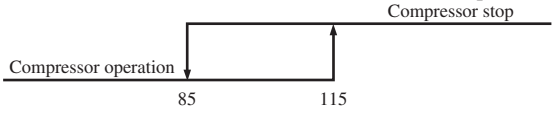
(i) Protective control

As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed is controlled to suppress the rise of discharge pipe temperature.



(ii) Anomalous stop control

1) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.
2) When it is detected 2 times within 60 minutes or after continuous 30 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



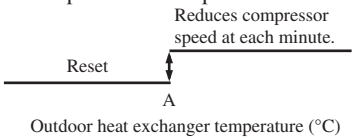
(iii) Reset of anomalous stop mode

As it drops to the reset value of 85°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

(i) Protective control

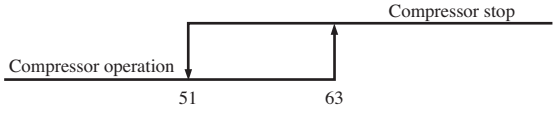
1) When the outdoor air temperature (Tho-A) is 40°C or higher and the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor speed is controlled to suppress the rise of high pressure.
2) Control value A is updated to an optimum value automatically according to the operating conditions.



Control value A
59–53°C

(ii) Anomalous stop control

1) As the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.
2) If it is detected 5 times within 60 minutes or 63°C or higher continues for 30 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.



(iii) Reset of anomalous stop mode

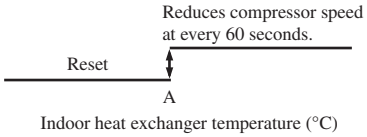
As it reaches the reset value of 51°C or lower, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

(i) Protective control

1) As the indoor heat exchanger temperature (Th2) exceeds the setting value, the compressor speed is controlled to suppress the rise of high pressure.

2) Control value A is updated to an optimum value automatically according to the operating conditions.



Model	Existing piping adaptation switch: SW5-1	
	OFF (Shipping)	ON
	Control value A (°C)	
FDC100	54–48	51–45

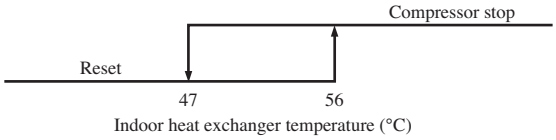
Note (1) Adaptation to existing piping is at ON.

(ii) Anomalous stop control

Operation control function by the indoor unit control

(iii) Adaptation to existing piping, stop control

If the existing piping adaptation switch, SW5-1 is turned ON, the compressor stops to protect existing piping when the indoor heat exchanger temperature (Th2) exceeds the setting value.



(d) Anomaly detection control by the high pressure switch (63H1)

(i) If the pressure rises and operates the high pressure switch (opens at 4.15MPa/closes at 3.15MPa), the compressor stops.

(ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.

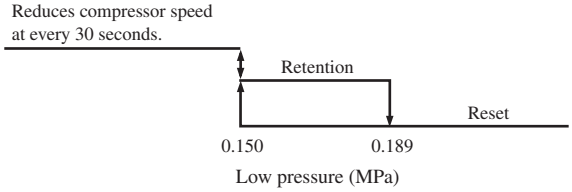
1) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1

2) When 63H1 has been in the open state for 30 minutes continuously, including the stop of compressor

(e) Low pressure control

(i) Protective control

If the value detected by the low pressure sensor (PSL) exceeds the setting value, the compressor speed is controlled to restrain the drop of pressure.



(ii) Anomalous stop control

1) When a value detected by the low pressure sensor (PSL) satisfies any of the following conditions, the compressor stops to run for its protection.

a) When the low pressure drops to 0.079MPa or under for 15 seconds continuously

b) At 10 minutes after the start of compressor, the suction overheat becomes 30°C or higher for 60 seconds continuously and the low pressure becomes 0.15MPa or under

2) E49 is displayed under any of the following conditions and it enters the anomalous stop mode.

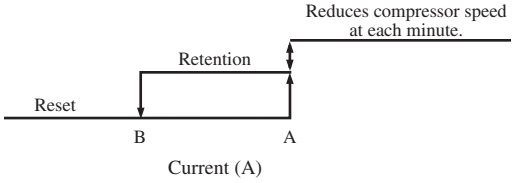
a) When the low pressure drops 5 times within 60 minutes and the compressor stops under any of the above conditions

b) When a value detected with the low pressure sensor becomes 0.079MPa or under for 5 minutes continuously, including the stop of compressor

3) However, when the control condition 1). a) is established during the compressor protection start III, E49 is displayed at initial stop and it enters the anomalous stop mode.

(f) Over-current protection current safe controls I, II

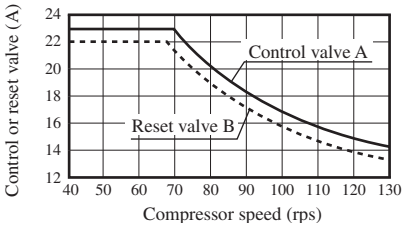
Detecting the outdoor inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed is controlled to protect the inverter.



(Fig. C) The control value "A" and the reset value vary depending on the compressor speed.

Model		Cooling		Heating	
		Control value A	Reset value B	Control value A	Reset value B
Primary current side	FDC100	11.0 (23.0)	10.0 (22.0)	11.0 (23.0)	10.0 (22.0)
Secandary current side	FDC100	11.5 (Fig.C)	10.5 (Fig.C-1)	11.5 (Fig.C)	10.5 (Fig.C-1)

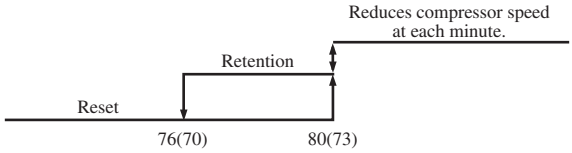
Note (1) Value in ( ) are for the single phase models.



(g) Power transistor temperature protection

(i) Protective control

If the power transistor temperature (detected with TIP) exceeds the setting value, the compressor speed is controlled to suppress the rise of power transistor temperature.



Note Value in ( ) are for the single phase model.

(h) Anomalous power transistor current

(i) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.

(ii) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.

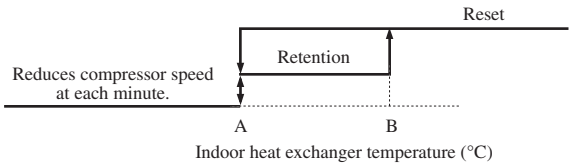
(i) Anomalous inverter PCB

If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.

(j) Anti-frost control by the compressor speed control

(i) If the indoor heat exchanger temperature (detected with Th2) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed is controlled to initiate the anti-frost control of indoor heat exchanger.

(ii) When there are 2 indoor heat exchanger temperatures (Th2), the lower temperature is detected.



	A	B
Relative humidity 50% or lower	−0.5	1.0
Relative humidity 50% over	1.0	2.5

(iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor control and the cooling, dehumidifying frost prevention of page 15.

(k) Dewing prevention control

[Control condition]

During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed is reduced to prevent dewing and water splash.

(i) Cooling electronic expansion valve aperture (EEVC) is 500 pulses.

(ii) Suction overheat is 10°C or higher.

(iii) Compressor speed is **A** rps or higher.

[Control contents]

(i) When the suction overheat is 10°C or higher, the compressor speed is reduced at each 1 minute.

(ii) Compressor speed does not rise till the cooling expansion valve becomes 460 pulses.

Model	**A** rps
FDC100	60

(iii) This control takes **A** rps as its lower limit so that compressor speed is not controlled when it is less than **A** rps.

(l) Refrigerant quantity shortage protection

Under the compressor protection start III control during cooling and dehumidifying operations, the following control is performed by detecting the indoor heat exchanger temperature (Th2) and the indoor return air temperature (Th1).

[Control condition]

When the state that the indoor heat exchanger temperature (Th2) does not become lower than the room air temperature (Th1) by 4°C or more continues for 1 minute.

[Control contents]

It judges that the flowing of refrigerant in to the indoor unit is insufficient so that the compressor is stopped and E57 is displayed on the remote control.

(m) Broken wire detection on temperature sensor and low pressure sensor

(i) Outdoor heat exchanger sensor, outdoor air temperature sensor and low pressure sensor

If the following is detected for 5 seconds continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Outdoor heat exchanger sensor: -50°C or lower
- Outdoor air temperature sensor: -45°C or lower
- Low pressure sensor: 0V or under or 4.0V or over

(ii) Discharge pipe temperature sensor, suction pipe temperature sensor

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

Note During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Discharge pipe temperature sensor: -10°C or lower
- Suction pipe temperature sensor: -50°C or lower

(n) Fan motor error

(i) If the fan speed of 100min^{-1} or under is detected for 30 seconds continuously under the outdoor fan control (with the operation command of fan tap at ① speed or higher), the compressor stops.

(ii) When the fan motor speed drops to 100min^{-1} or under 5 times within 60 minutes and the compressor stops, it enters the anomalous stop mode with E48 displayed on the remote control.

(o) Anomalous stop by the compressor start stop

(i) When it fails to shift to the compressor DC motor rotor position defection operation at 5 seconds after establishing the compressor starting condition, the compressor stops temporarily and restarts 3 minutes later.

(ii) If it fails to shift to the position detection operation again at second time, it judges the anomalous compressor start and stops the compressor by the anomalous stop (E59).

(7) Silent mode

(a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor fan speed and the compressor speed.

(b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the DIP switch on the outdoor unit control PCB.

SW3-3	ON	SW3-4	OFF	Cooling test run
			ON	Heating test run
	OFF	Normal and end of test run		

Make sure to turn SW3-3 to OFF after the end of operation.

(b) Test run control

(i) Operation is performed at the maximum compressor speed, which is determined for each model.

(ii) Each protective control and error detection control are effective.

(iii) If SW3-4 is switched during test run, the compressor is stopped for once by the stop control and the cooling/heating operation is switched.

(iv) Setting and display of remote control during test run

Item / Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

Turning ON the pump-down switch SW1 for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF) and SW7-1 is OFF, the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power source is turned OFF.)

(a) Control procedure

(i) Close the service valve at the liquid side. (It is kept open at the gas side.)

(ii) Compressor is started with the target speed at 35 rps in the cooling mode.

(iii) Red and green lamps (LED) flash continuously on the outdoor unit control PCB.

(iv) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.

(v) Outdoor fan is controlled as usual.

(vi) Electronic expansion valve is fully opened.

(b) Control ending conditions

Stop control is initiated depending on any of the following conditions.

(i) Low pressure of 0.087MPa or lower is detected for 5 seconds continuously.

1) Red LED: Light, Green LED: Flashing, Remote control: Displays stop.
2) It is possible to restart when the low pressure is more than 0.087MPa.
3) Electronic expansion valve (cooling/heating) is kept fully open.

(ii) Stop by the error detection control

1) Red LED: Keeps flashing, Green LED: Flashing
2) Restart is prohibited. To return to normal operation, reset the power source.
3) Electronic expansion valve (cooling/heating) is kept fully open.

(iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes

1) Red LED: Stays OFF, Green LED: Flashing, Remote control: Stop
2) It is possible to pump-down again.
3) Electronic expansion valve (cooling/heating) is kept fully open.

Note After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display "Transmission error – E5". This is normal.

(10) Base heater ON/OFF output control (Option)

(a) Base heater ON conditions

When all of following conditions are satisfied, the base heater is turned ON.

· Outdoor air temperature (detected with Tho-A) is 1ºC or lower.

· In the heating mode

· When the compressor is turned ON

· JSW1-4 is OFF.

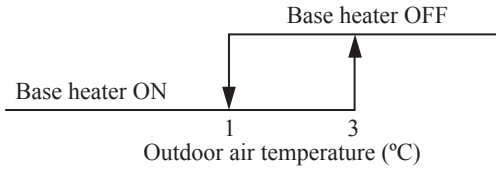
(b) Base heater OFF conditions

When either one of following conditions is satisfied, the base heater is turned OFF.

· Outdoor air temperature (detected with Tho-A) is 3ºC or higher.

· When the compressor stop has been detected for 30 minutes continuously

· In the cooling or dehumidifying mode



(11) Manual defrost (Need to activate SW4-4) *For maintenance only.

When unit is operated with SW4-4 ON, defrost operation will be activated in every 12 minutes.

Caution! This function is used for maintenance only.

Long term operation with this function will damage the compressor.

(12) Limit the number of compressor start (Need to activate SW7-2)

Maximum number of compressor start is to be limited up to 6 times per hour.

1.2 MAINTENANCE DATA

1.2.1 Diagnosing of microcomputer circuit

(1) Selfdiagnosis function

(a) Check indicator table

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

At the indoor unit side, errors are displayed with the combination of RUN light and TIMER light on the display panel.

(i) Indoor unit

Remote control		Indoor unit display		Outdoor unit control PCB		Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	RUN light	TIMER light	Red LED	Green LED				
No-indication	Stays OFF	ON	Stays OFF	Stays OFF	Keeps flashing	—	**•Normal operation**	—	—
		—	—	2-time flash	Stays OFF	Indoor unit power source	•Power OFF, broken wire/blown fuse, broken transformer wire	Repair	80
		—	—	Stays OFF	Keeps flashing	Remote control wires	•Poor connection, breakage of remote control wire * For wire breaking at power ON, the LED is OFF.	Repair	81
						Remote control	• Defective remote control PCB	Replacement of remote control	
✋WAIT✋ or INSPECT I/U		—	—	2-time flash	Keeps flashing	Indoor-outdoor units connection wire	• Poor connection, breakage of indoor-outdoor units connection wire	Repair	82—91
						Remote control	• Improper setting of master and slave by remote control		
E 1	Keeps flashing	—	—	Stays OFF	Keeps flashing	Remote control wires (Noise)	**•Poor connection of remote control signal wire (White)** * For wire breaking at power ON, the LED is OFF **•Intrusion of noise in remote control wire**	Repair	93
						Remote control indoor unit control PCB	*• Defective remote control or indoor unit control PCB (defective communication circuit)?	Replacement of remote control or PCB	
E5		ON	6-time flash	2-time flash	Keeps flashing	Indoor-outdoor units connection wire	**•Poor connection of wire between indoor-outdoor units during operation (disconnection, loose connection) •Anomalous communication between indoor-outdoor units by noise, etc.**	Repair	94
		ON	6-time flash	Stays OFF	Keeps flashing	(Noise)	**•CPU-runaway on outdoor unit control PCB**	Power reset or Repair	
						Outdoor unit control PCB	*•Occurrence of defective outdoor unit control PCB on the way of power source (defective communication circuit)?	Replacement of PCB	
		ON	6-time flash	Stays OFF	Keeps flashing	Outdoor unit control PCB	**•Defective outdoor unit control PCB on the way of power source**	Replacement	
						Fuse	**•Blown fuse**		
No-indication		1-time flash	ON	Stays OFF	6-time flash	Indoor heat exchanger temperature sensor 1	**•Defective indoor heat exchanger temperature sensor 1** (defective element, broken wire, short-circuit) • Poor contact of temperature sensor 1 connector	Replacement, repair of temperature sensor 1	95
						Indoor unit control PCB	**•Defective indoor unit control PCB (Defective temperature sensor input circuit)?**	Replacement of PCB	
		3-time flash	ON	Stays OFF	Keeps flashing	Indoor heat exchanger temperature sensor 2	**•Defective indoor heat exchanger temperature sensor 2** (defective element, broken wire, short-circuit) • Poor contact of temperature sensor 2 connector	Replacement, repair of temperature sensor 2	
						Indoor unit control PCB	**•Defective indoor unit control PCB (Defective temperature sensor input circuit)?**	Replacement of PCB	
No-indication		2-time flash	ON	Stays OFF	Keeps flashing	Indoor room air temperature sensor	**•Defective room air temperature sensor** (defective element, broken wire, short- circuit) •Poor contact of temperature sensor connector	Replacement, repair of temperature sensor	96
						Indoor unit control PCB	**•Defective indoor unit control PCB (Defective temperature sensor input circuit)?**	Replacement of PCB	
E 10		—	—	Stays OFF	Keeps flashing	Number of connected indoor units	**•When multi-unit control by remote control is performed, the number of units is over**	Repair	97
E 11		—	—	Stays OFF	Keeps flashing	Address setting error	•Address setting error of indoor units	Repair	98
E 14		—	—	Stays OFF	Keeps flashing	Indoor unit No. setting	•No master is assigned to slaves.	Repair	99
						Rcmote control wires	•Anomalous remote control wire connection, broken wire between master and slave units		
E 16		6-time flash	ON	Stays OFF	Keeps flashing	Fan motor	**•Defective fan motor**	Replacement, repair	100
						Indoor unit control PCB	**•Defective indoor unit control PCB**	Replacement	
E28		—	—	Stays OFF	Keeps flashing	Remote control temperature sensor	• Broken wire of remote control temperature sensor	Repair	101

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

(ii) Outdoor unit

1) FDC100VNX-W,100VSX-W
FCD100VNA-W,100VSA-W

Remote control		Indoor unit display		Outdoor unit control PCB		Outdoor inventer PCB	Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	RUN light	TIMER light	Red LED	Green LED	Yellow LED				
E35	Keeps flashing	ON	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Installation or operating condition	• Higher outdoor heat exchanger temperature	Repair	102
							Outdoor heat exchanger temperature thermistor	• Defective outdoor heat exchanger temperature sensor	Replacement of temperature thermistor	
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E36		ON	5-time flash	1-time flash	Keeps flashing		Installation or operating condition	• Higher discharge temperature	Repair	104
							temperature sensor	• Defective discharge pipe temperature sensor	Replacement, repair of temperature thermistor	
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E37		Keeps flashing	2-time flash	1-time flash	Keeps flashing		Outdoor heat exchanger temperature thermistor	• Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	106
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E38		Keeps flashing	1-time flash	1-time flash	Keeps flashing		Outdoor air temperature thermistor	• Defective outdoor air temperature sensor broken wire or poor connector connection	Replacement, repair of temperature thermistor	107
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39		Keeps flashing	4-time flash	1-time flash	Keeps flashing		Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor broken wire or poor connector connection	Replacement, repair of temperature thermistor	108
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E40		—	—	1-time flash	Keeps flashing		Installation or operating condition	• Rising high pressure (Operation of 63H1) • Service valve closing operation	Repair	109
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective 63H input circuit)?	Replacement of PCB	
E41		—	—	1-time flash	Keeps flashing	6-time flash	Inverter PCB or radiator fin	• Power transistor overheat	Replacement of PCB or Repair	112
E42		ON	1-time flash	1-time flash	Keeps flashing	1-time flash	Outdoor unit control PCB compressor	• Current cut (Anomalous compressor over-current)	Replacement of PCB	114•115
							Installation or operating condition	• Service valve closing operation	Repair	
E45		—	—	1-time flash	Keeps flashing	Keeps flashing	Outdoor unit control PCB	• Anomalous outdoor unit control PCB communication	Replacement of PCB	120
							Inverter PCB	• Anomalous inverter PCB communication		
E47		5-time flash	ON	1 time flash	Keeps flashing		Outdoor unit control PCB	• Defective outdoor unit control PCB	Replacement of PCB	122
							active filter	• Defective active filter of control		
E48		ON	7-time flash	1-time flash	Keeps flashing		Outdoor fan motor	• Anomalous outdoor fan motor	Replacement, repair	124•125
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective motor input circuit)?	Replacement of PCB	
E49		—	—	1-time flash	Keeps flashing		Installation or operating condition	• Low pressure error • Service valve closing operation	Repair	127•128
							Low pressure sensor	• Anomalous low pressure, broken wire of low pressure sensor or poor connector connection	Replacement, repair of sensor	
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective sensor input circuit)?	Replacement of control PCB	
ES1		ON	4-time flash	1-time flash	Keeps flashing	6-time flash	Inverter PCB	• Anomalous inverter PCB	Replacement of PCB	129
ES3		—	—	1-time flash	Keeps flashing	Keeps flashing	Suction pipe temperature sensor	• Defective suction pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	132
							Outdoor unit control PCB	*• Defective outdoor unit PCB (Defective sensor input circuit)?	Replacement of control PCB	
ES4		—	—	1-time flash	Keeps flashing		Low pressure sensor	• Defective low pressure sensor	Replacement of sensor	133
							Outdoor unit control PCB	• Defective outdoor unit control PCB (Defective sensor input circuit)?	Replacement of control PCB	
ES7		7-time flash	ON	1-time flash	Keeps flashing		Operation status	• Shortage in refrigerant quantity	Repair	135
							Installation status	• Service valve closing operation	Service valve opening check	
ES8		—	—	1-time flash	Keeps flashing	—	Compressor PCB	• Anomalous compressor by loss of synchronism (FDC100VNA-W / VSA-W only)	Replacement	137
ES9		—	—	5-time flash	Keeps flashing	Stays OFF	Compressor, inverter PCB	•Anomalous compressor startup	Replacement	139-142

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

2) FDC200VSA-W

Remote control		Indoor unit display		Outdoor unit control PCB		Outdoor inventer PCB	Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	RUN light	TIMER light	Red LED	Green LED	Yellow LED				
E35	Keeps flashing	ON	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Installation or operating condition	• Higher outdoor heat exchanger temperature	Repair	102
							Outdoor heat exchanger temperature thermistor	• Defective outdoor heat exchanger temperature sensor	Replacement of temperature thermistor	
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E36		ON	5-time flash	1-time flash	Keeps flashing		Installation or operating condition	• Higher discharge temperature	Repair	105
							temperature sensor	• Defective discharge pipe temperature sensor	Replacement, repair of temperature thermistor	
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E37		Keeps flashing	2-time flash	1-time flash	Keeps flashing		Outdoor heat exchanger temperature thermistor	• Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	106
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E38		Keeps flashing	1-time flash	1-time flash	Keeps flashing		Outdoor air temperature thermistor	• Defective outdoor air temperature sensor broken wire or poor connector connection	Replacement, repair of temperature thermistor	107
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39		Keeps flashing	4-time flash	1-time flash	Keeps flashing		Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor broken wire or poor connector connection	Replacement, repair of temperature thermistor	108
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E40		—	—	1-time flash	Keeps flashing		Installation or operating condition	• Rising high pressure (Operation of 63H1) • Service valve closing operation	Repair	110
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective 63H input circuit)?	Replacement of PCB	
E41		—	—	1-time flash	Keeps flashing	8-time flash	Inverter PCB or radiator fin	• Power transistor overheat	Replacement of PCB or Repair	113
E42		ON	1-time flash	1-time flash	Keeps flashing	9-time flash	Outdoor unit control PCB compressor	• Current cut (Anomalous compressor over-current)	Replacement of PCB	116 • 117
							Installation or operating condition	• Service valve closing operation	Repair	
E44		—	—	1-time flash	Keeps flashing	Keeps flashing	Outdoor control PCB	• Liquid flooding error	Replacement of PCB	118 • 119
E45		—	—	1-time flash	Keeps flashing		Outdoor unit control PCB	• Anomalous outdoor unit control PCB communication	Replacement of PCB	121
							Inverter PCB	• Anomalous inverter PCB communication		
E48		ON	7-time flash	1-time flash	Keeps flashing		Outdoor fan motor	• Anomalous outdoor fan motor	Replacement, repair	124
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective motor input circuit)?	Replacement of PCB	
E49		—	—	1-time flash	Keeps flashing		Installation or operating condition	• Low pressure error • Service valve closing operation	Repair	127 • 128
							Low pressure sensor	• Anomalous low pressure, broken wire of low pressure sensor or poor connector connection	Replacement, repair of sensor	
							Outdoor unit control PCB	*• Defective outdoor unit control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E51		ON	4-time flash	1-time flash	Keeps flashing	8-time flash	Inverter PCB	• Anomalous inverter PCB	Replacement of PCB	130
E53		—	—	1-time flash	Keeps flashing	Keeps flashing	Suction pipe temperature sensor	• Defective suction pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	132
							Outdoor unit control PCB	*• Defective outdoor unit PCB (Defective sensor input circuit)?	Replacement of control PCB	
E54		—	—	1-time flash	Keeps flashing		Low pressure sensor	• Defective low pressure sensor	Replacement of sensor	133
							Outdoor unit control PCB	• Defective outdoor unit control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E55		—	—	1-time flash	Keeps flashing		Compressor under-dome temperature sensor	• Defective compressor under-dome temperature sensor	Replacement of temperature sensor	134
							Outdoor control PCB	• Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E57		7-time flash	ON	1-time flash	Keeps flashing		Operation status	• Shortage in refrigerant quantity	Repair	135
							Installation status	• Service valve closing operation	Service valve opening check	
E59		—	—	5-time flash	Keeps flashing	4-time flash	Compressor, inverter PCB	•Anomalous compressor startup	Replacement	143 • 144

Note * mark in the Description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defecti ve.

3) FDC100VNP-W

Remote control		Indoor unit display		Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	RUN light	TIMER light				
E35	Keeps flashing	ON	Keeps flashing	Installation, operation status	• Higher outdoor heat exchanger temperature	Repair	103
				Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor	Replacement, repair of temperature sensor	
				Outdoor unit PCB	*• Defective outdoor unit PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E36		ON	5-time flash	Installation, operation status	• Higher discharge temperature	Repair	104
				Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor	Replacement, repair of temperature sensor	
				Outdoor unit PCB	*• Defective outdoor unit PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E37		Keeps flashing	2-time flash	Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	106
				Outdoor unit PCB	*• Defective outdoor unit PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E38		Keeps flashing	1-time flash	Outdoor air temperature sensor	• Defective outdoor air temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	107
				Outdoor unit PCB	*• Defective outdoor unit PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39		Keeps flashing	4-time flash	Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	108
				Outdoor unit PCB	*• Defective outdoor unit PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E40		—	—	Installation, operation status	• Service valve (gas side) closing operation	Replacement	111
E42		ON	1-time flash	Outdoor unit PCB, compressor	• Current cut (Anomalous compressor over-current)	Replacement of PCB	114・115
				Installation, operation status	• Service valve closing operation	Repair	
E47		5-time flash	ON	Outdoor unit PCB	• Over voltage • Defective active filter	Repair PCB replacement	123
E48		ON	7-time flash	Fan motor	• Defective fan motor	Replacement	126
				Outdoor unit PCB	• Defective outdoor unit PCB		
E51		ON	4-time flash	Power transistor error (Outdoor unit PCB)	• Power transistor error	Replacement of PCB	131
E57		7-time flash	ON	Operation status	• Shortage in refrigerant quantity	Repair	136
				Installation status	• Service valve closing operation	Service valve opening check	
E58		ON	3-time flash	• Overload operation • Overcharge • Compressor locking	• Current safe stop	Replacement	138
E59		—	—	Compressor, outdoor unit PCB	• Anomalous compressor startup • Voltage drop	Replacement	145
E60		2-time flash	2-time flash	Compressor	• Anomalous compressor rotor lock	Replacement	146

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

(iii) Option control in-use

		Indoor unit display panel		Outdoor unit control PCB		Description of trouble	Repair method
Error code	Red LED	RUN light	TIMER light	Red LED	Green LED		
E75	Keeps flashing	–	–	Stays OFF	Keeps flashing	• Communication error (Defective communication circuit on the main unit of SL2NA-E or SC-SL4-AE/BE) ete.	Replacement

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

■ **Occurrence of one kind of error**

Displays are shown respectively according to errors.

■ **Occurrence of plural kinds of error**

Section	Category of display
Error code on remote control **Red LED on outdoor unit control PCB (1)**	• Displays the error of higher priority (When plural errors are persisting) E1>E5>·····>E10>E35>·····>E60 • Displays the present errors. (When a new error has occurred after the former error was reset.)

■ **Error detecting timing**

Section	Error description	Error code	Error detecting timing
Indoor	Communication error at initial operation	"WAIT"	No communication between indoor and outdoor units is established at initial operation.
	Remote control communication circuit error	E1	Communication between indoor unit and remote control is interrupted for more than 2 minutes continuously after initial communication was established.
	Communication error during operation	E5	Communication between indoor and outdoor units is interrupted for more than 2 minutes continuously after initial communication was established.
	Excessive number of connected indoor units by controlling with one remote control	E10	Whenever excessively connected indoor units is detected after power ON.
	Return air temperature sensor anomaly	No-indication	-50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature.
	Indoor heat exchanger temperature sensor anomaly	No-indication	-50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature. Or 70°C or higher is detected for 5 seconds continuously
Outdoor	Outdoor air temperature sensor anomaly	E38	-45(-55)°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature. Or -45(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.
	Outdoor heat exchanger temperature sensor anomaly	E37	-50(-55)°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature. Or -50(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.
	Discharge pipe temperature sensor anomaly	E39	-10(-25)°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.
	Suction pipe temperature sensor anomaly	E53	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.
	Low pressure sensor anomaly	E54	0V or lower or 4.0V or higher is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous pressure.
	Compressor under dome temperature sensor anomaly	E55	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.

Notes (1) This LED isn't installed on models FDC100VNP-W.
(2) Value in ( ) are for the models FDC100VNP-W.

■ **Error log and reset**

Error indicator	Memorized error log	Reset
Remote control display	• Higher priority error is memorized.	• Stop the unit by pressing the ON/OFF switch of remote control. • If the unit has recovered from anomaly, it can be operated.
Red LED on outdoor unit control PCB	• Memorizes a mode of higher priority.	

■ **Resetting the error log**

1) RC-EX3A

• Resetting the memorized error log in the remote control

You touch the buttons in the order of "Menu" → "Service setting" → "Service & Maintenance" → "Service password" → "Error display" → "Error history" on the TOP screen of remote control.And if you touch "Delete" → "Yes" button,all error log and anomaly data memorized in the remote control are deleted.

• Resetting the memorized error log in the indoor unit

You touch the buttons in the order of "Menu" → "Service setting" → "Service & Maintenance" → "Service password" → "Error display" → "Error anomaly data" on the TOP screen of remote control.

The remote control transmits error log erase command to the indoor unit when "Yes" button is pressed on the erase anomaly data screen.

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

2) RC-E5

• Resetting the memorized error log in the remote control

Holding down "CHECK" button, press "TIMER" button to reset the error log memorized in the remote control.

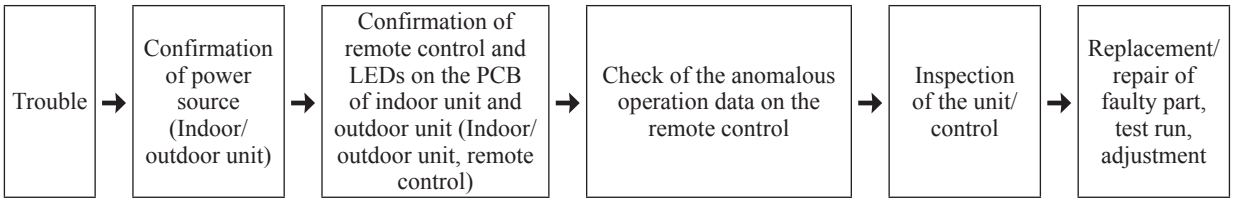
• Resetting the memorized error log in the indoor unit

The remote control transmits error log erase command to the indoor unit when "VENTI" button is pressed while holding down "CHECK" button.

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

(2) Troubleshooting procedure

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



(3) Troubleshooting at the indoor unit

(i) Cautions

1) If you are disassembling and checking an air-conditioner, be sure to turn off the power before beginning. When working on indoor units, let the unit sit for about 1 minute after turning off the power before you begin work.
2) When taking out printed circuit boards, be sure to do so without exerting force on the circuit boards or package components.
3) When disconnecting and connecting connectors, take hold of the connector housing and do not pull on the lead wires.

(ii) Items to check before troubleshooting

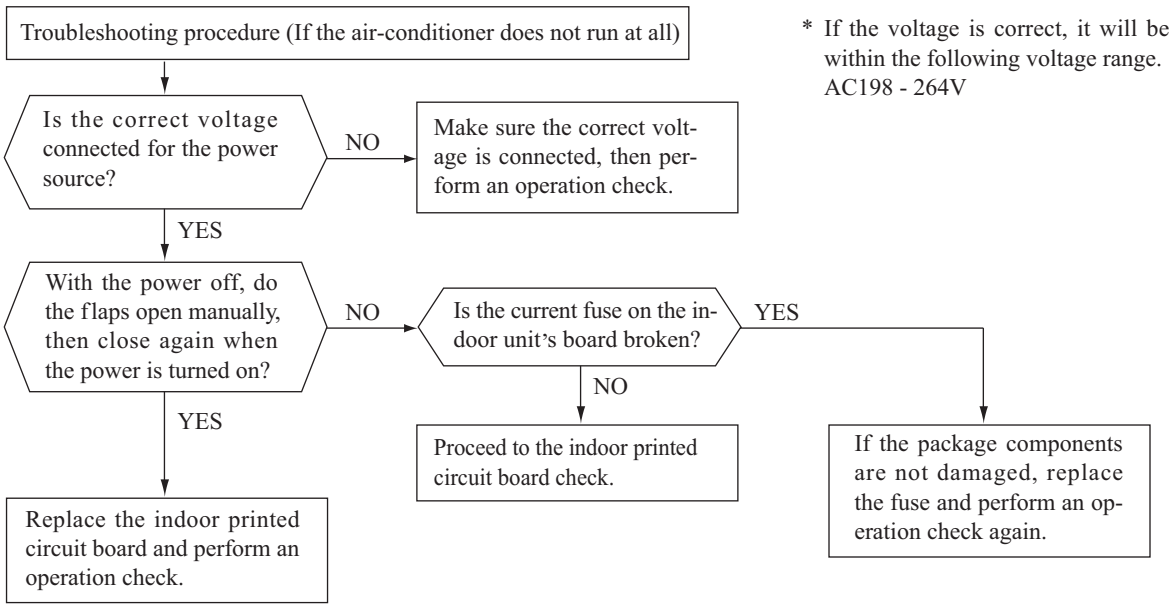
1) Is the air-conditioner running? Is it displaying any self-diagnosis information?
2) Is a power source with the correct voltage connected?
3) Are the control lines connecting the indoor and outdoor units wired correctly and connected securely?
4) Is the outdoor unit's service valve open?

(iii) Troubleshooting procedure (If the air-conditioner does not run at all)

If the air-conditioner does not run at all, diagnose the trouble using the following troubleshooting procedure.

Important When all the following conditions are satisfied, we say that the air-conditioner will not run at all.

1) The RUN light does not light up.
2) The flaps do not open.

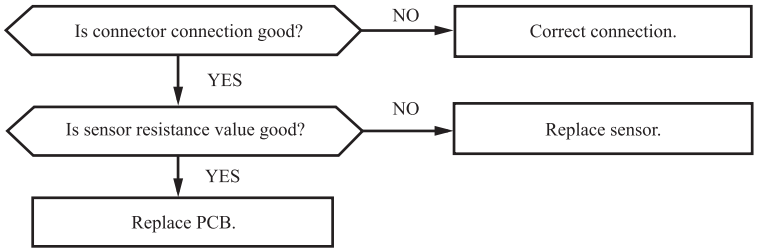


* If the voltage is correct, it will be within the following voltage range.
AC198 - 264V

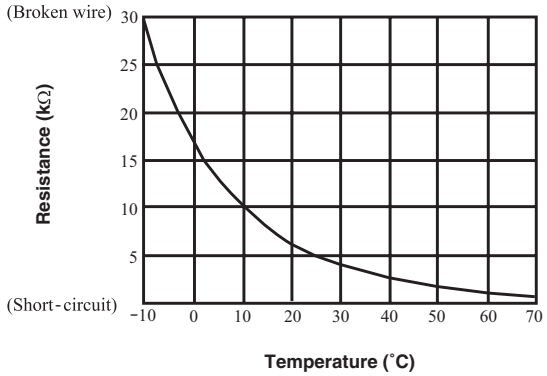
(iv) Inspection procedures corresponding to detail of trouble

Sensor error

[Broken sensor wire, connector poor connection]

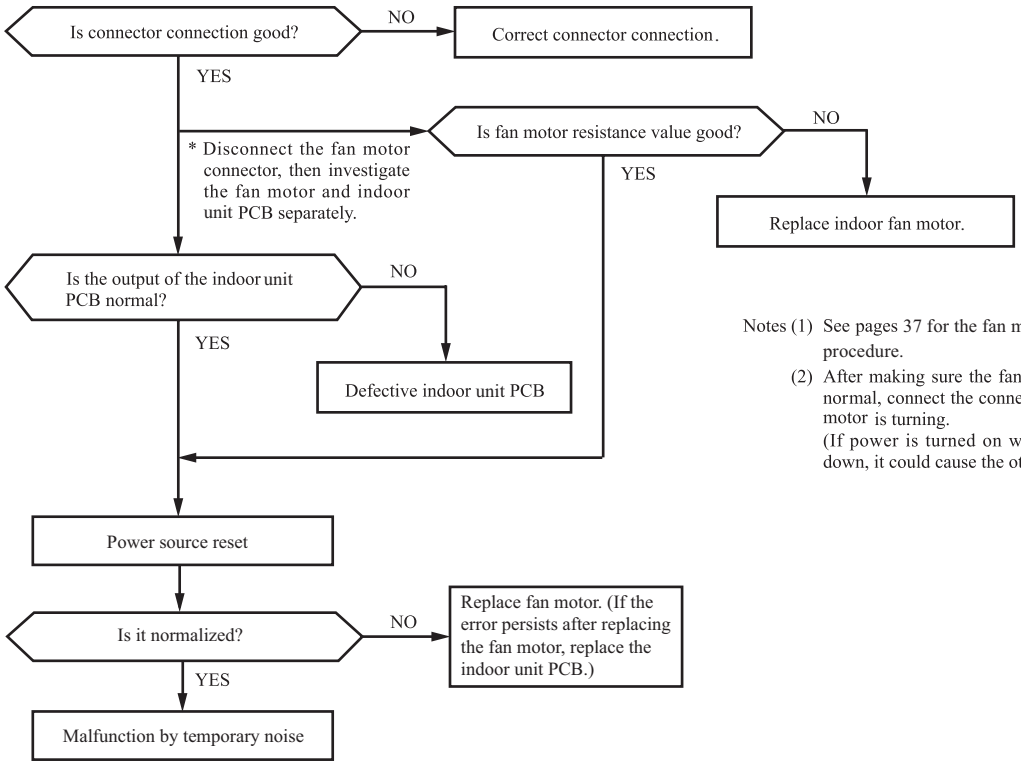


◆ **Sensor temperature characteristics (Room air temperature, indoor heat exchanger temperature)**



Indoor fan motor error

[Defective fan motor, connector poor connection, defective indoor unit PCB]

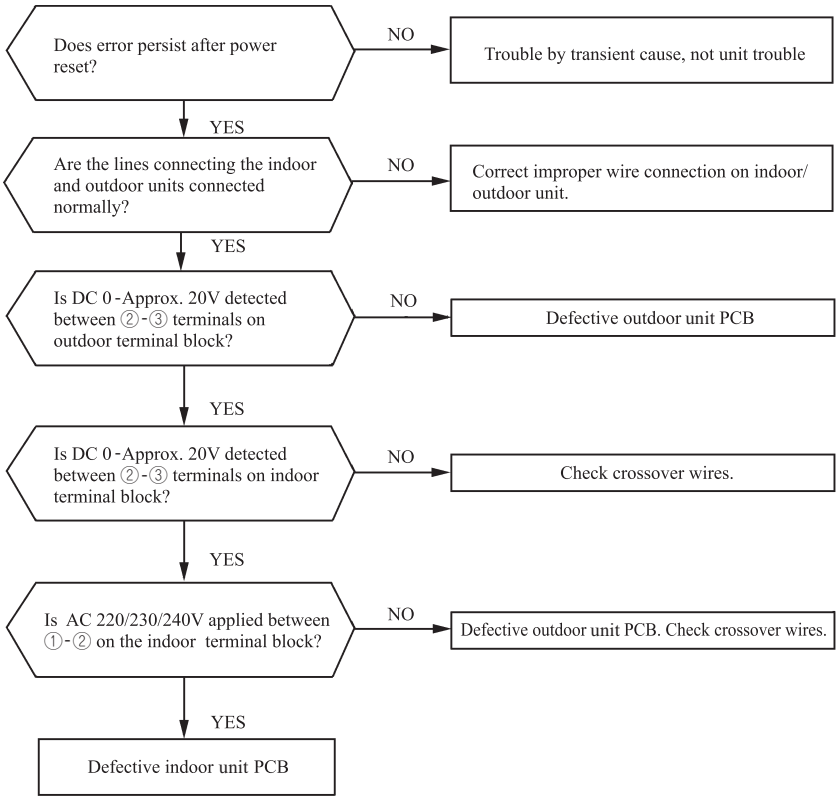


Notes (1) See pages 37 for the fan motor and indoor unit PCB check procedure.

(2) After making sure the fan motor and indoor unit PCB are normal, connect the connectors and confirm that the fan motor is turning.
(If power is turned on while one or the other is broken down, it could cause the other to break down also.)

Error of signal transmission

[Wiring error including power cable, defective indoor/ outdoor unit PCB]



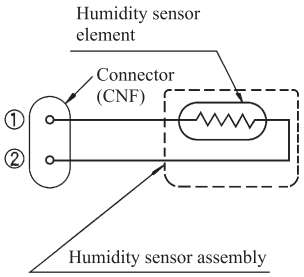
(v) Phenomenon observed after short-circuit, wire breakage on sensor

Sensor	Operation mode	Phenomenon	
		Short-circuit	Disconnected wire
Room air temperature sensor	Cooling	Release of continuous compressor operation command.	Continuous compressor operation command is not released.
	Heating	Continuous compressor operation command is not released.	Release of continuous compressor operation command.
Heat exchanger temperature sensor	Cooling	Freezing cycle system protection trips and stops the compressor.	Continiuous compressor operation command is not released. (Anti-frosting)
	Heating	High pressure control mode (Compressor stop command)	Hot keep (Indoor fan stop)
Humidity sensor	Cooling	Refer to the table below.	Refer to the table below.
	Heating	Normal system operation is possible.	

■ Humidity sensor operation

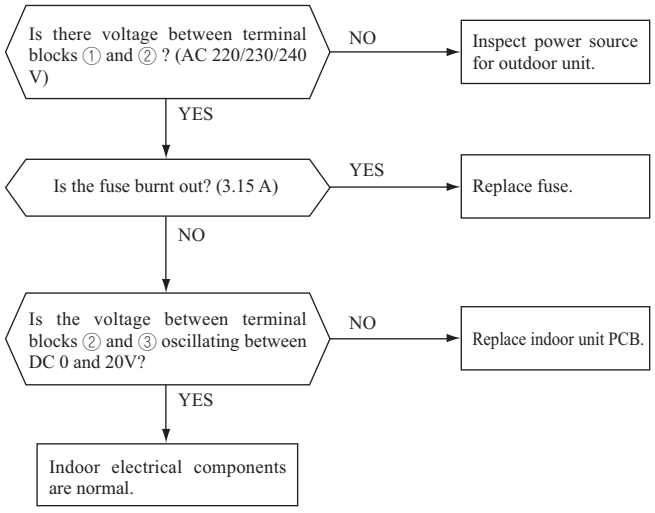
Failure mode		Control input circuit resding	Air-conditioning system operation
Disconnected wire	① Disconnected wire	Humidity reading is 0%.	Anti-condensation control is not done.
	② Disconnected wire		
	①② Disconnected wire		
Short-circuit	① and ② are short-circuited	Humidity reading is 100%.	Anti-condensation control keep doing.

Remark: Do not perform a continuity check of the humidity sensor with a tester. If DC current is applied, it could damage the sensor.



(vi) Checking the indoor electrical equipment

1) Indoor unit PCB check procedure



2) Indoor fan motor check procedure

This is a diagnostic procedure for determining if the indoor fan motor or the indoor unit PCB is broken down.

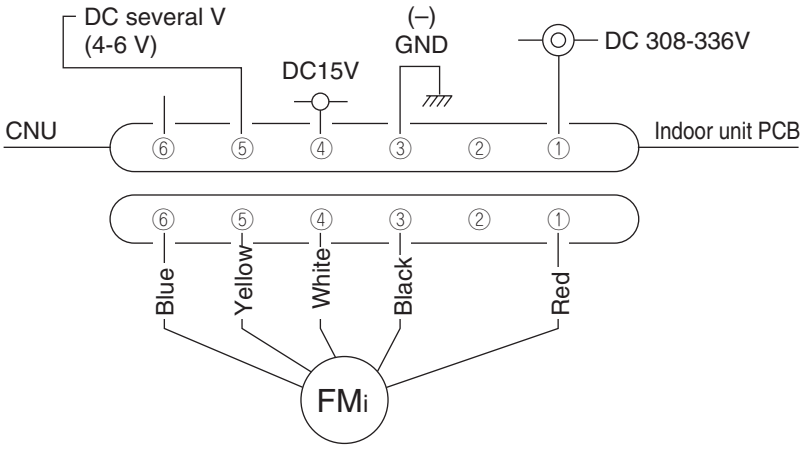
a) Indoor unit PCB output check

i) Turn off the power.

ii) Remove the front panel, then disconnect the fan motor lead wire connector.

iii) Turn on the power. If the unit operates when the ON/OFF button is pressed, if trouble is detected after the voltages in the following figure are output for approximately 30 seconds, it means that the indoor unit PCB is normal and the fan motor is broken down.

If the voltages in the following figure are not output at connector pins No. ①, ④ and ⑤, the indoor unit PCB has failed and the fan motor is normal.



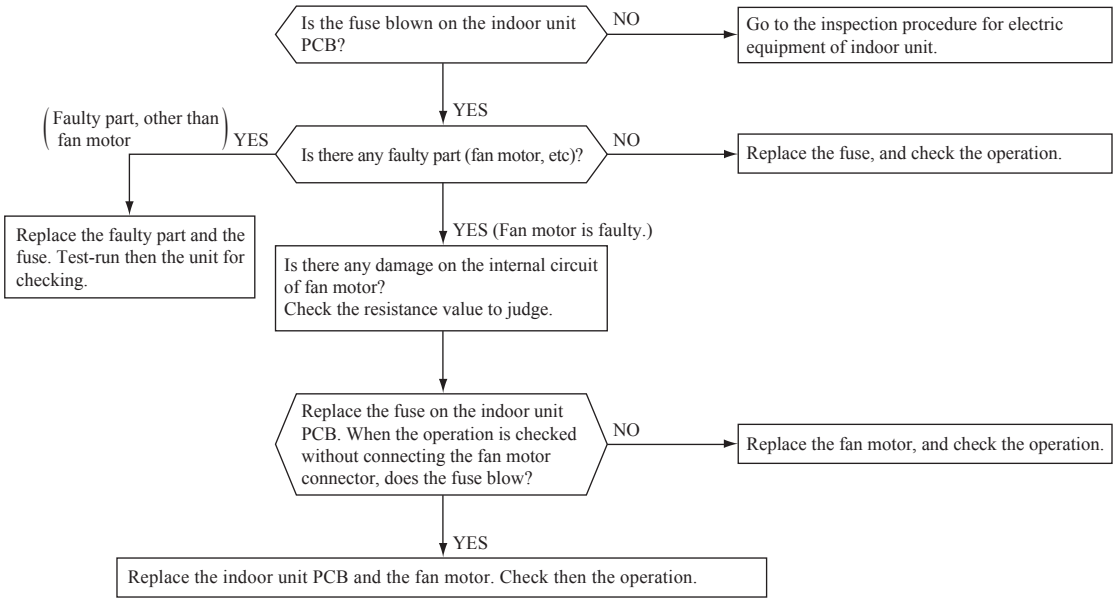
Measuring point	Voltage range when normal
① - ③	DC 308 - 336V
④ - ③	DC 15V
⑤ - ③	DC several V (4 - 6V)

b) Fan motor resistance check

Measuring point	Resistance when normal
① - ③ (Red - Black)	20 MΩ or higher
④ - ③ (White - Black)	20 kΩ or higher

Notes (1) Remove the fan motor and measure it without power connected to it.
(2) If the measured value is below the value when the motor is normal, it means that the fan motor is faulty.

(vii) Inspection procedure for blown fuse on the indoor unit PCB



(4) Troubleshooting at the outdoor unit

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

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

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

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

[Reset of power source]

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

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

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

Outdoor unit control PCB, Inverter PCB, Temperature sensor (of outdoor heat exchanger, discharge pipe, outdoor air, IPM, suction pipe and under dome), Fuses (for power source and control PCB), Noise filter, Capacitor and Reactor.

(b) Replacement procedure of outdoor unit control PCB

Precautions for Safety

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

⚠WARNING	Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.
⚠CAUTION	Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

⚠ WARNING

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

⚠ CAUTION

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

PCA012D043 C

(i) Models FDC100VNX-W
FDC100VSX-W

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently**.)
2) Disconnect the connectors from the control PCB.
3) Disconnect the white wiring passing through CT1 on the PCB before replacing the PCB.
4) Match the setting switches (SW3-5, JSW) with the former PCB.
5) Tighten up a screw after passing white wiring through CT1 of the changed.
6) Connect the connectors with the control PCB referring to the parts arrangement of Fig.1.
(Confirm the **connectors are not half inserted**.)

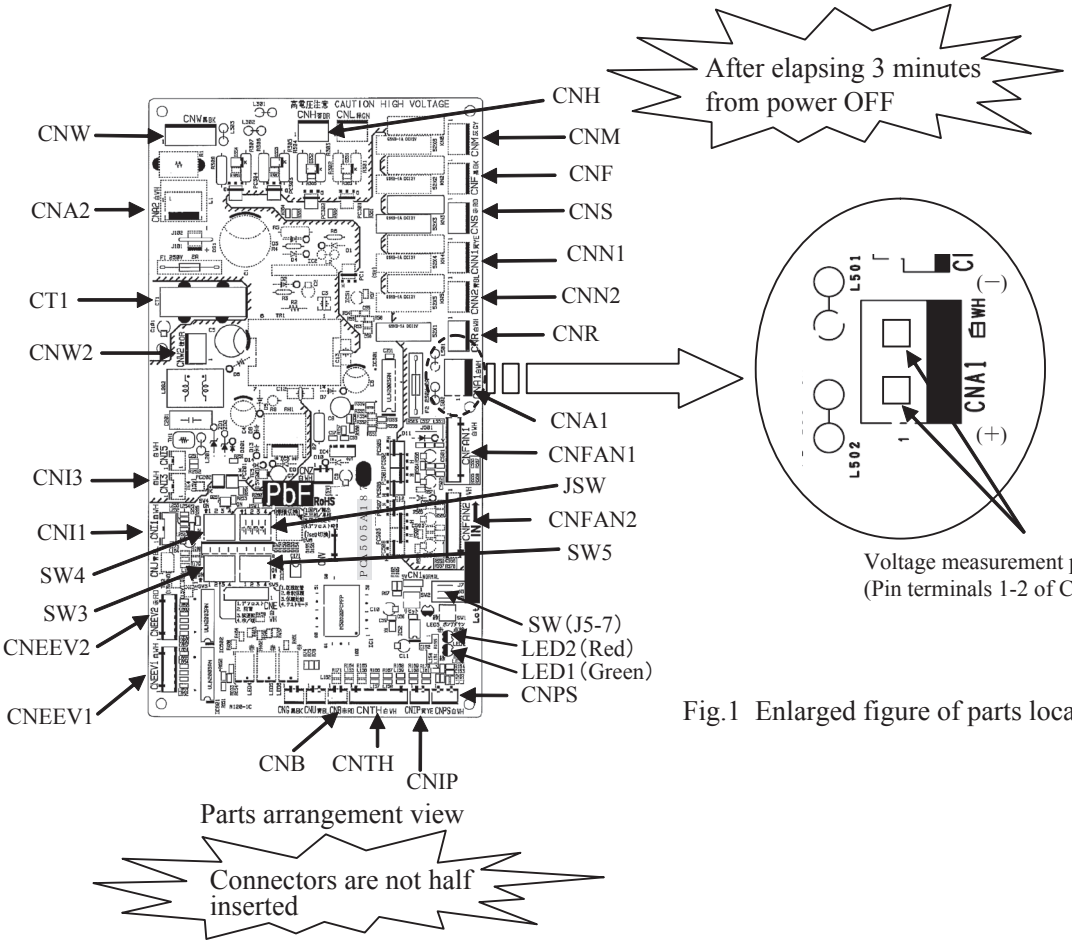


Fig.1 Enlarged figure of parts location

(ii) Model FDC100VNA-W

PCA012D083 A

1) Disassembly

a) After the breaker is shut down, remove the service panel, top panel and rear panel. (Refer to Fig.1).

b) Don't touch the main PCB until three minutes have passed after the breaker is shut doun.
(After having shut down the breaker, some capacitor is held by high voltage. It is very dangerous to touch the main PCB in this condition.)
In the situation that hamesses are connected to main PCB, **be sure to measure voltage (DC)** on main PCB, and **check that the voltage is discharged sufficientlv (DC voltage 30 V or less).** (Refer to Fig.2)

c) Disconnect the connectors, faston terminals and round terminals from the main PCB as shown in Fig.2.
And then remove the fixing screws (3 places) as shown in Fig.3.
After removing the main PCB, wipe off the heat conduction sheet neatly from the copper plate.

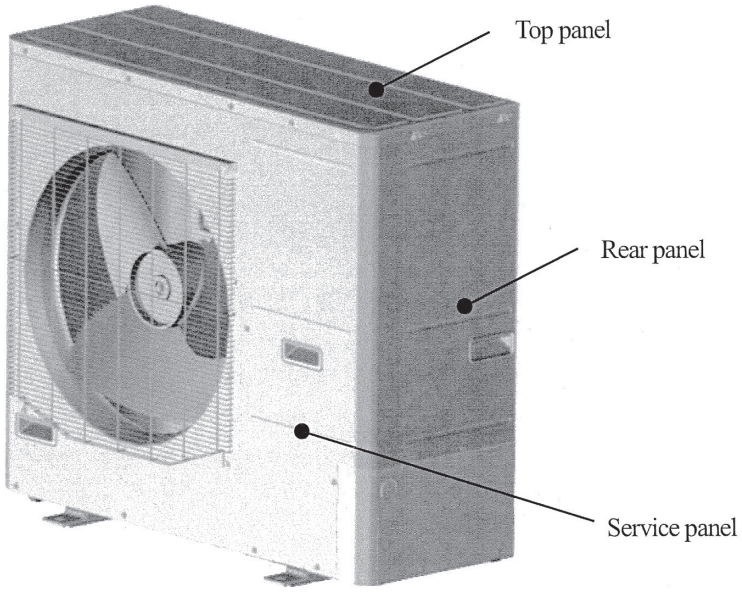


Fig.1 Outdoor unit overall view

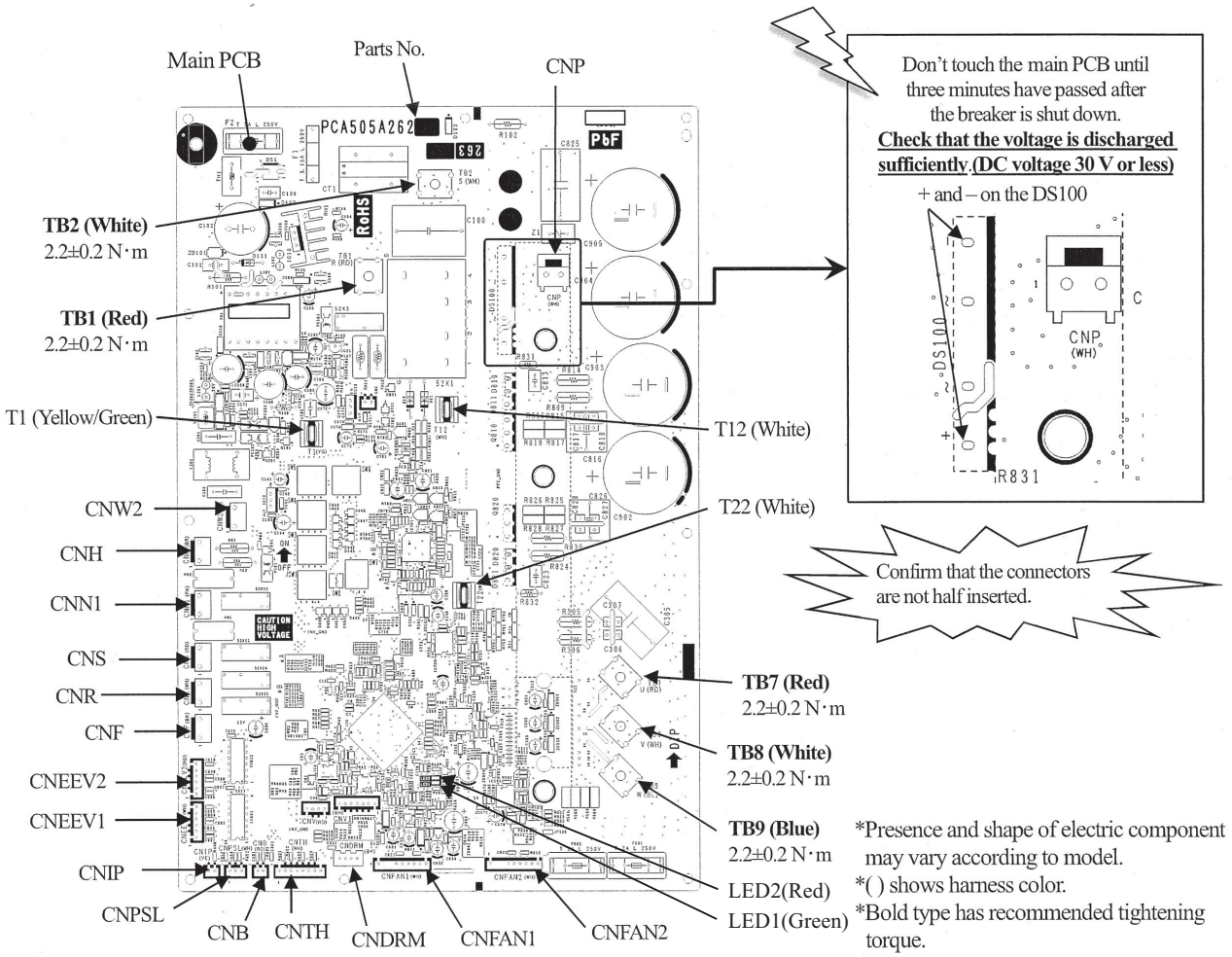


Fig.2 Parts arrangement view of main PCB and voltage measurement points

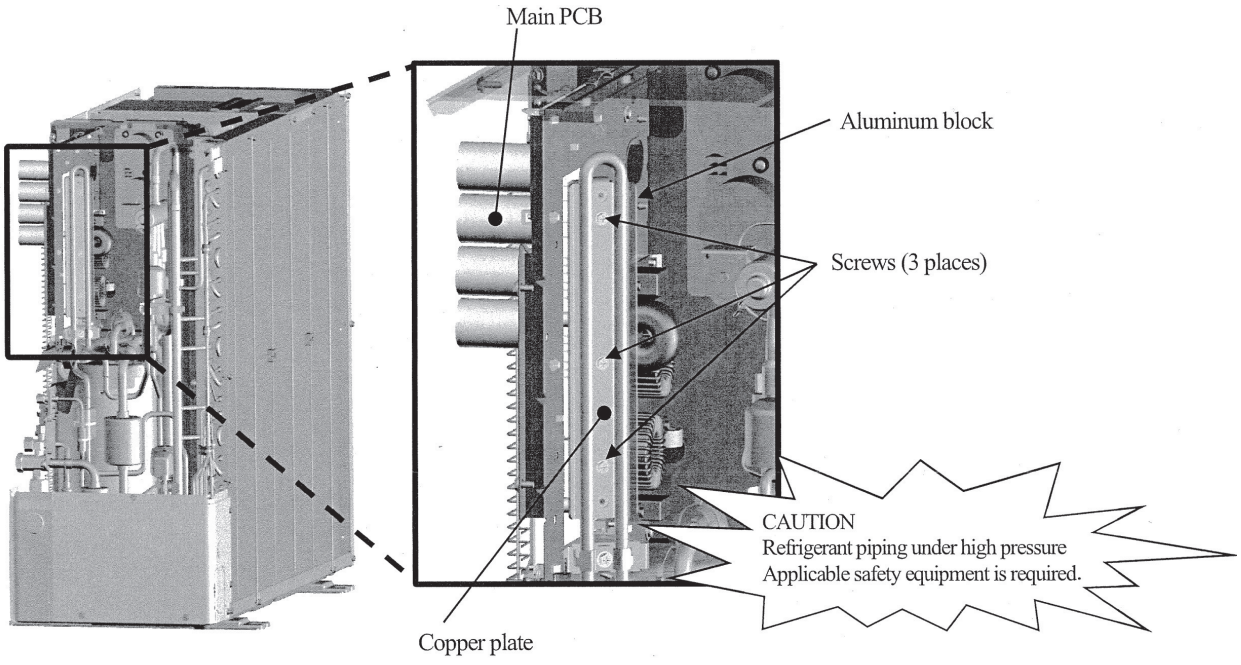


Fig.3 Outdoor unit side view

2) Exchange

a) Match the setting of new main PCB switches (JSW1, SW3-7) with former main PCB. (Refer to Fig.4)

b) Tum over the separator of new heat conduction sheet and paste the heat conduction sheet on the aluminum block. (Refer to Fig.5)

c) Install the attached hamess clip on the new main PCB as shown in Fig.6.

3) Installation

a) Install the new main PCB on the control and tighten the screw as shown in Fig.7.

b) Reconnect the connectors, faston terminals and round terminals to the main PCB as before. (Refer to Fig.2) (Confirm that the **connectors are not half inserted**.)

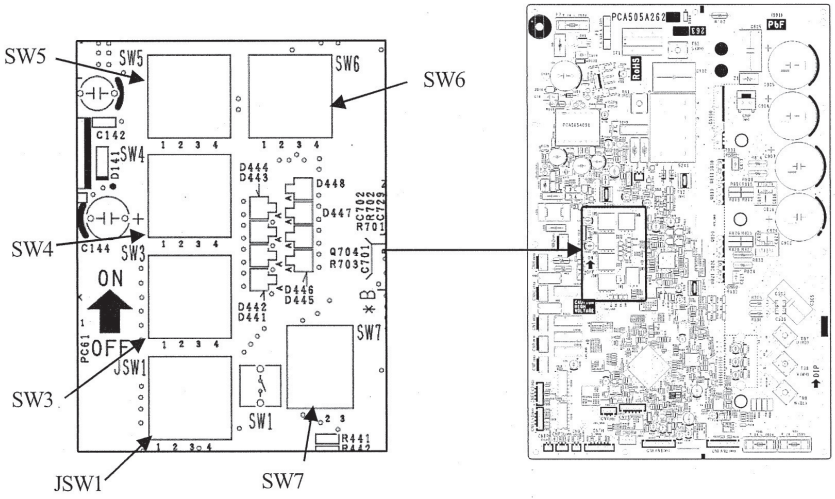


Fig.4 Switch position of main PCB

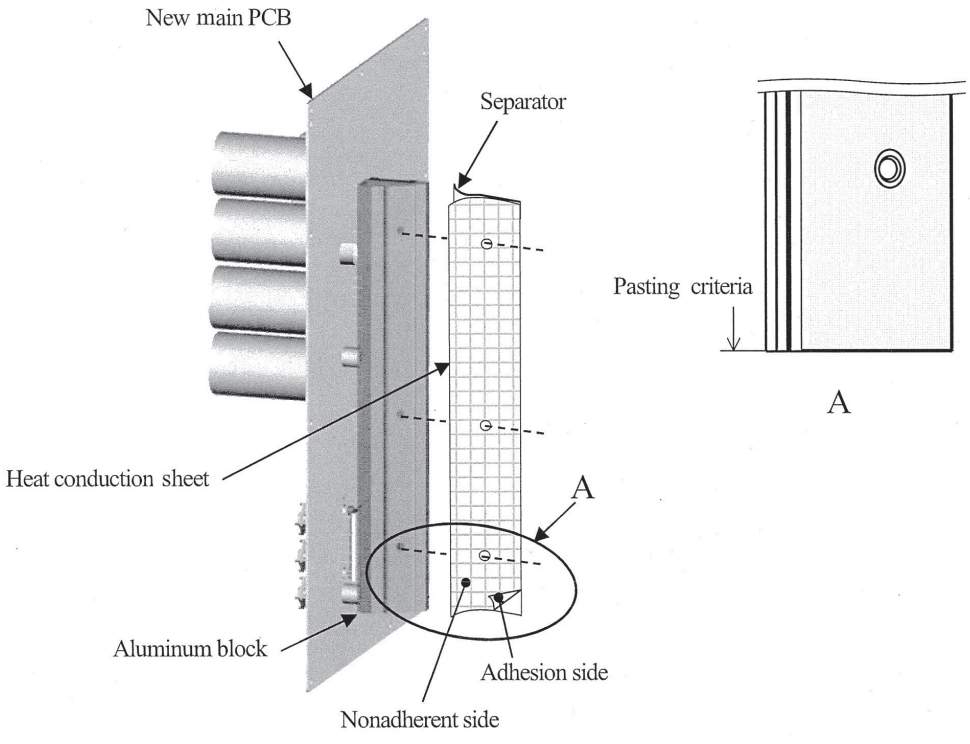


Fig.5 Detail of paste for the heat conduction sheet

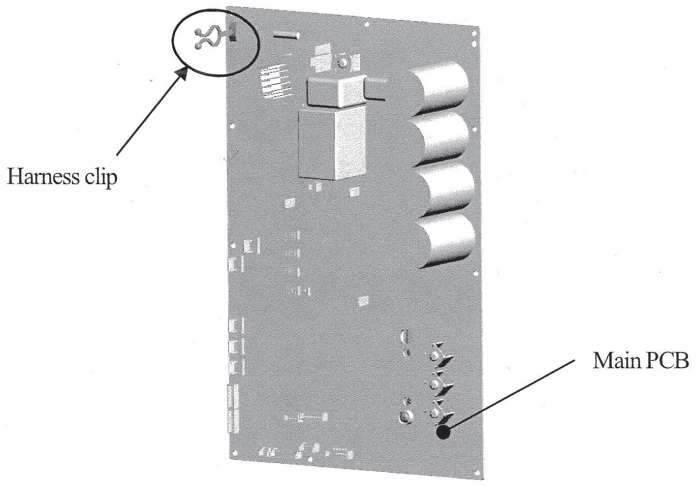


Fig.6 Install of the harness clip

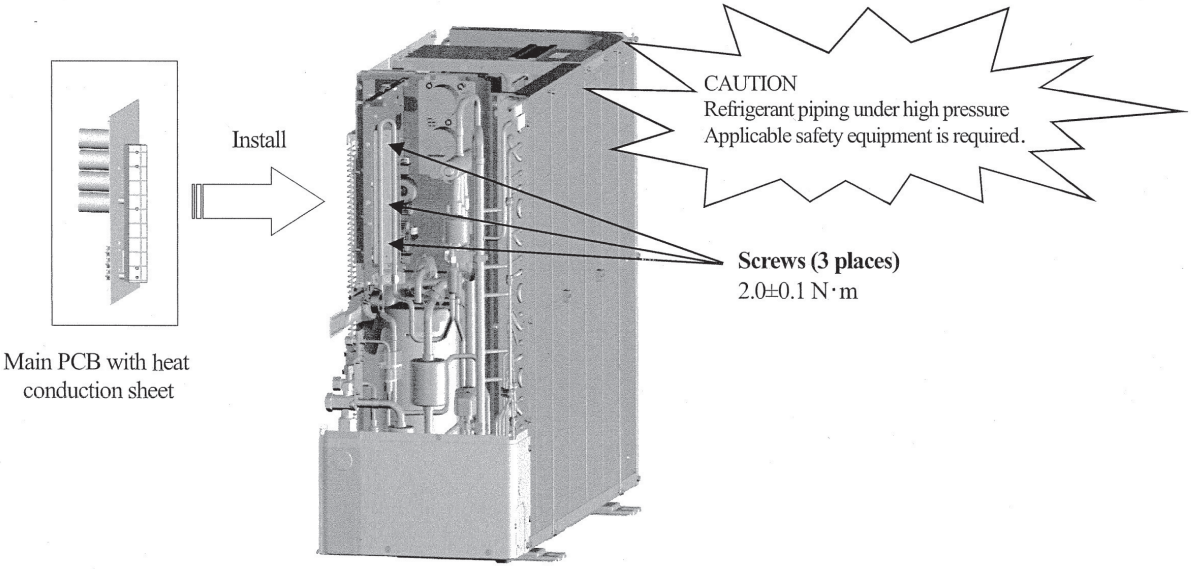
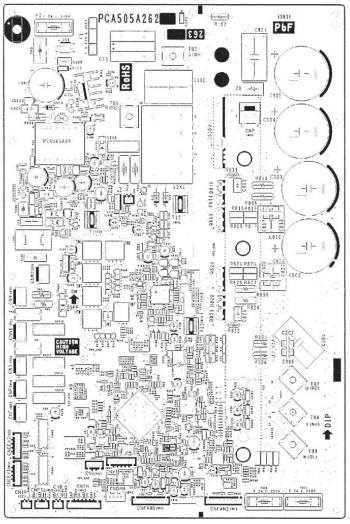


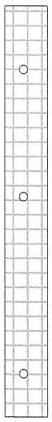
Fig.7 Install of the main PCB

●Accessories

Check the following accessories are packed in. (Except this manual)



Main PCB ×1



Heat conduction sheet
×1

Harness clip
×1

(iii) Model FDC100VSA-W

PCA012D084 A

1) Disassembly

a) After the breaker is shut down, remove the service panel, top panel and rear panel. (Refer to Fig.1).

b) Don't touch the main PCB until three minutes have passed after the breaker is shut doun.
(After having shut down the breaker, some capacitor is held by high voltage. It is very dangerous to touch the main PCB in this condition.)
In the situation that hamesses are connected to main PCB, **be sure to measure voltage (DC)** on main PCB, and **check that the voltage is discharged sufficientlv (DC voltage 30 V or less).** (Refer to Fig.2)

c) Disconnect the connectors, faston terminals and round terminals from the main PCB as shown in Fig.2.
And then remove the fixing screws (3 places) as shown in Fig.3.
After removing the main PCB, wipe off the heat conduction sheet neatly from the copper plate.

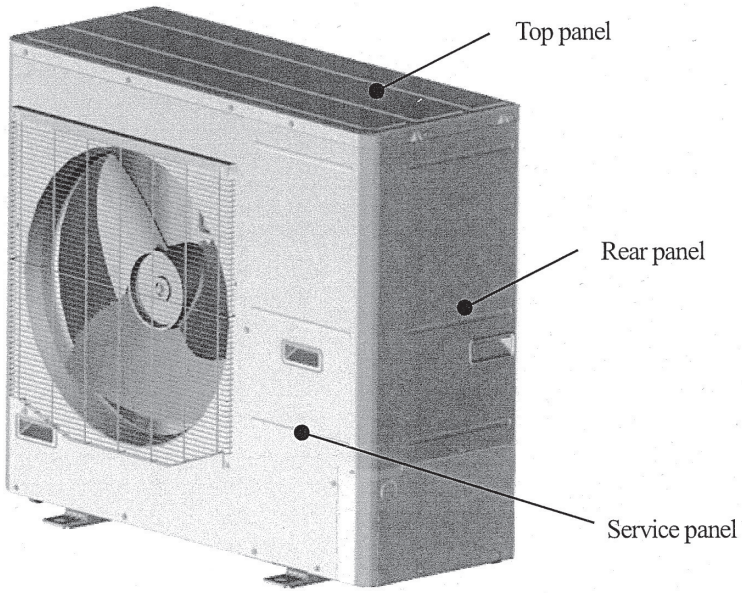


Fig.1 Outdoor unit overall view

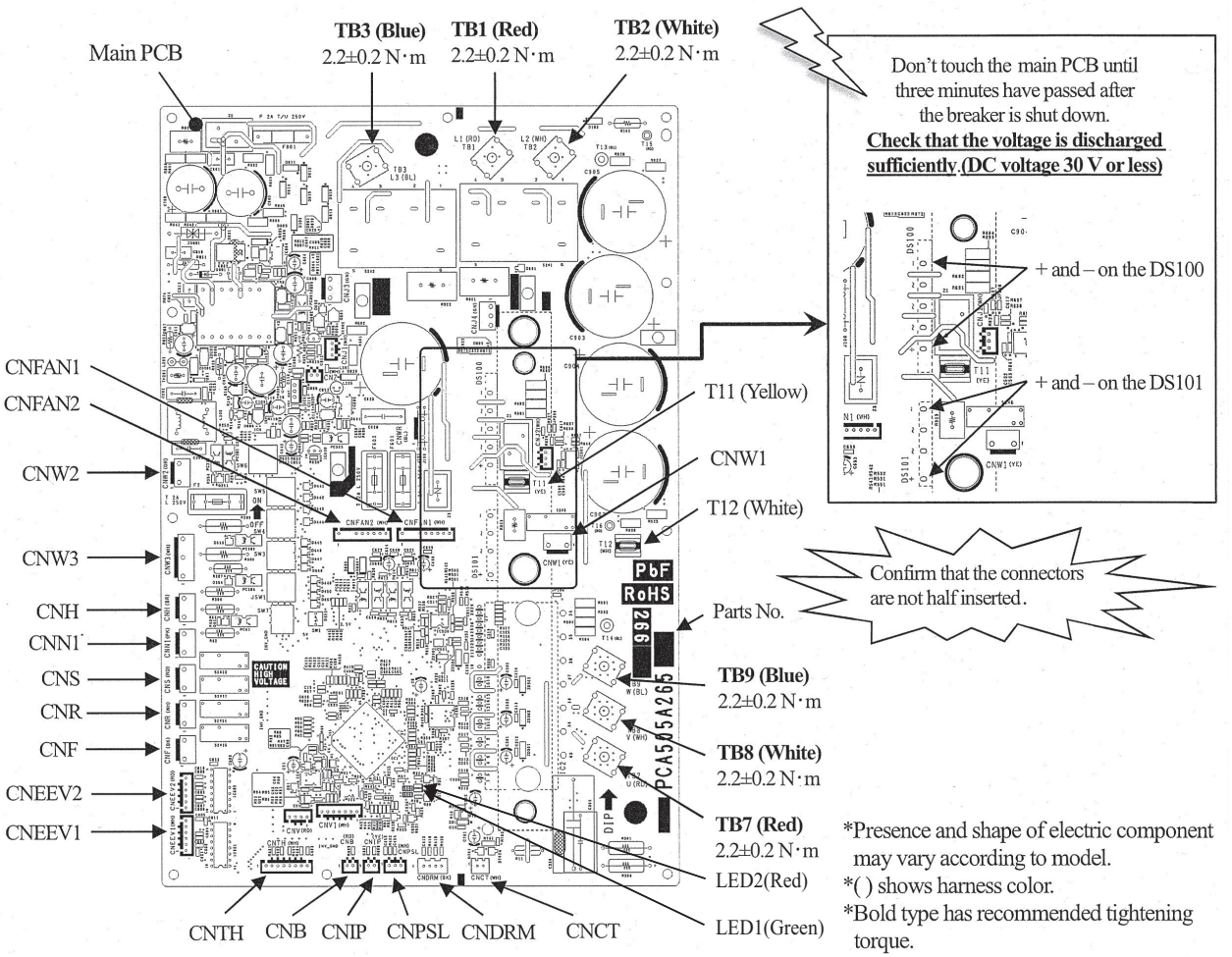


Fig.2 Parts arrangement view of main PCB and voltage measurement points

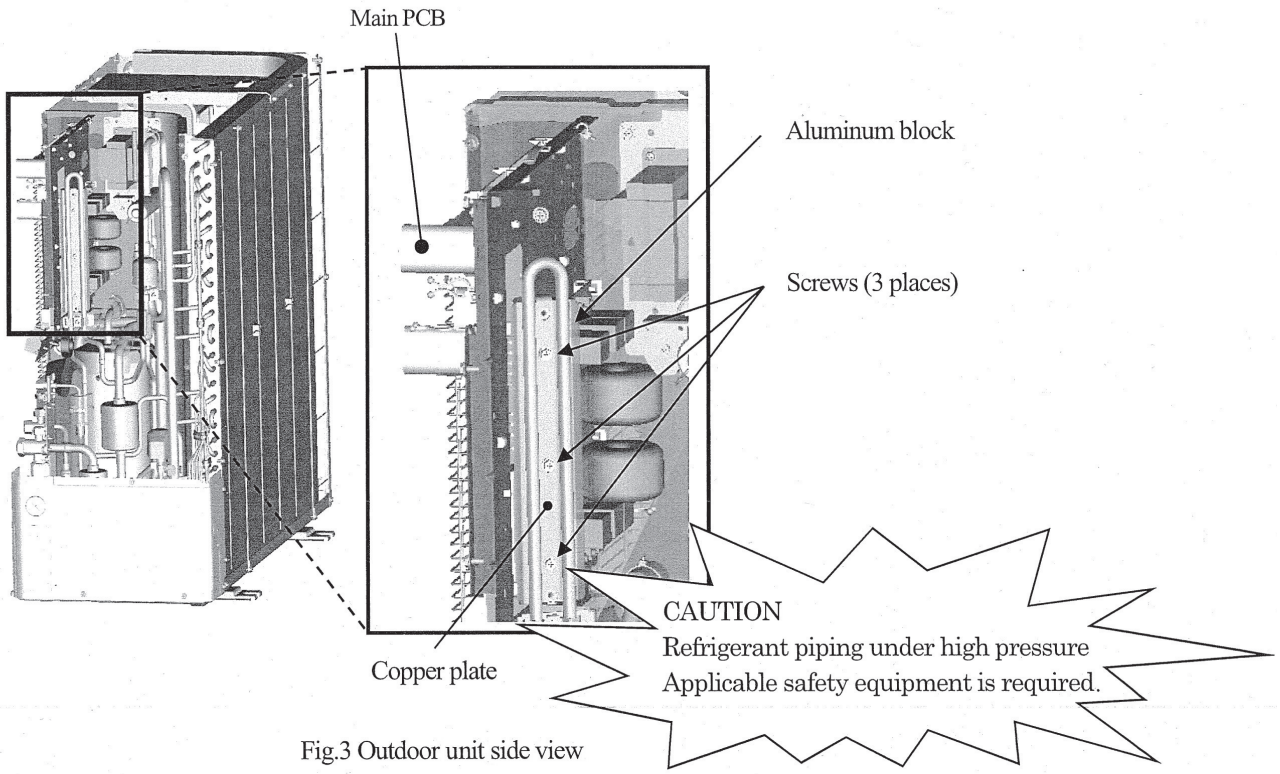


Fig.3 Outdoor unit side view

2) Exchange

a) Match the setting of new main PCB switches (JSW1, SW3-7) with former main PCB. (Refer to Fig.4)

b) Tum over the separator of new heat conduction sheet and paste the heat conduction sheet on the aluminum block. (Refer to Fig.5)

3) Installation

a) Install the new main PCB on the control and tighten the screw as shown in Fig.6.

b) After the new main PCB is installed on the control, reconnect the connectors, faston terminals, and round terminals to the main PCB as before. (Refer to Fig.2)
(Confirm that the **connectors are not half inserted**.)

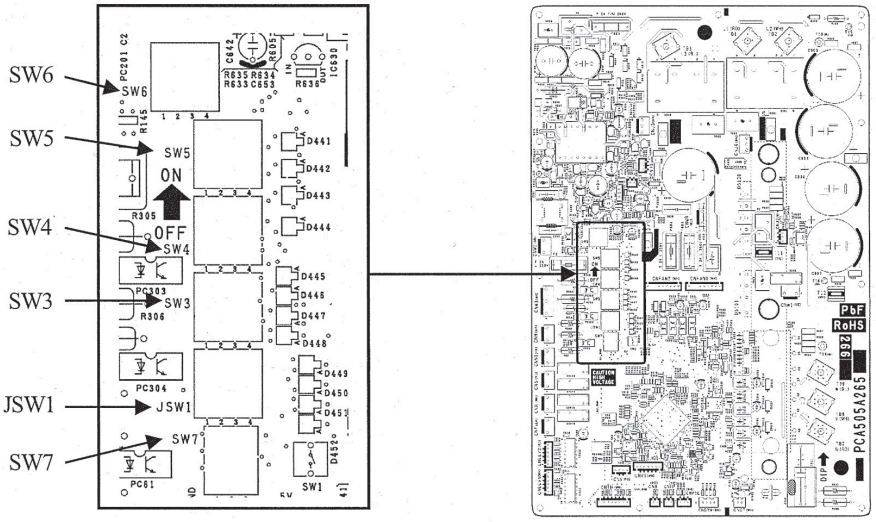


Fig.4 Switch position of main PCB

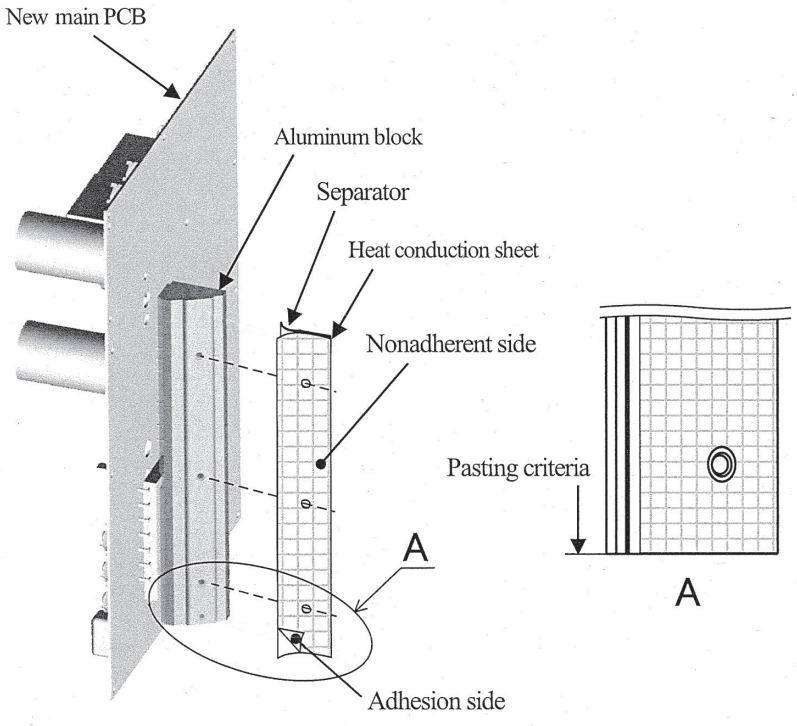


Fig.5 Detail of paste for the heat conduction sheet

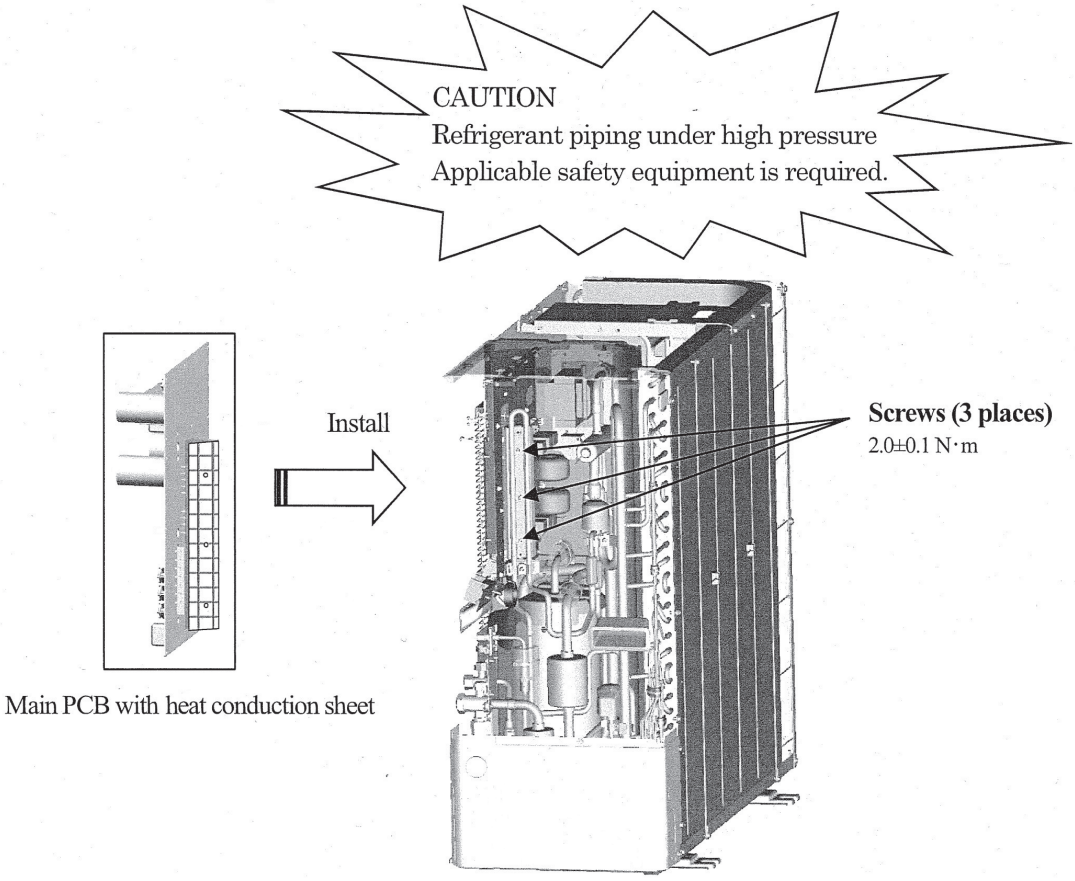
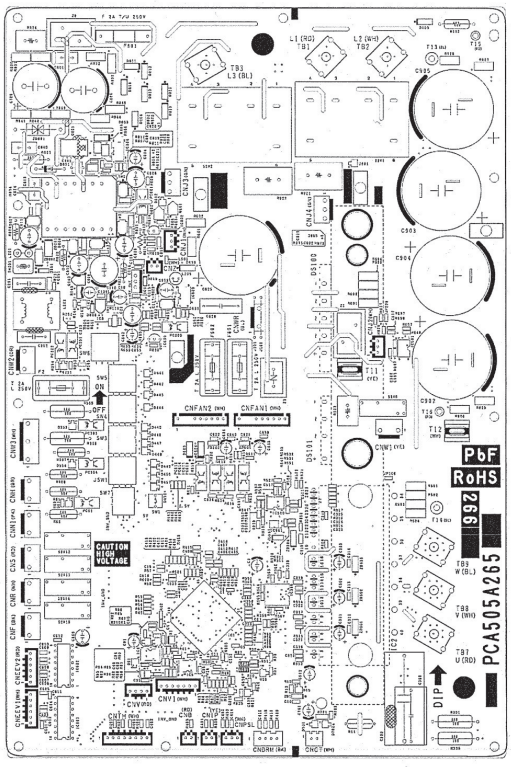


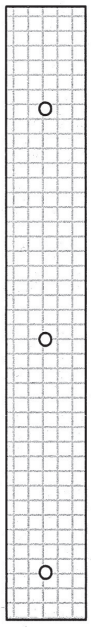
Fig.6 Installation of the main PCB

●Accessories

Check following accessories are packed in. (Except this manual)



Main PCB ×1



Heat conduction sheet ×1

(iv) Model FDC200VSA-W

PCA012D110

Exchange the control PCB according to the following procedure.

1. Exchange the PCB **after elapsing 3 minutes from power OFF**.
2. Measurement was done on both ends of connector (CNA1) during measurement, **the voltage (DC) might charged the electrolytic capacitor, be sure that the voltage is discharged sufficiently (10V of less)**. (Refer to Fig.2)
3. Disconnect the connectors from the control PCB. (Refer to Fig.1)
4. Disconnect the white or blue wiring passing through CT1 on the PCB before exchanging the PCB.
5. Match the setting switches (SW3-5, 7, JSW1) with the former PCB.
6. Tighten up a screw after passing white of blue wiring through CT1 of the changed.
7. Please connect the connectors with the same place. (Confirm the **connectors are not half inserted**.)

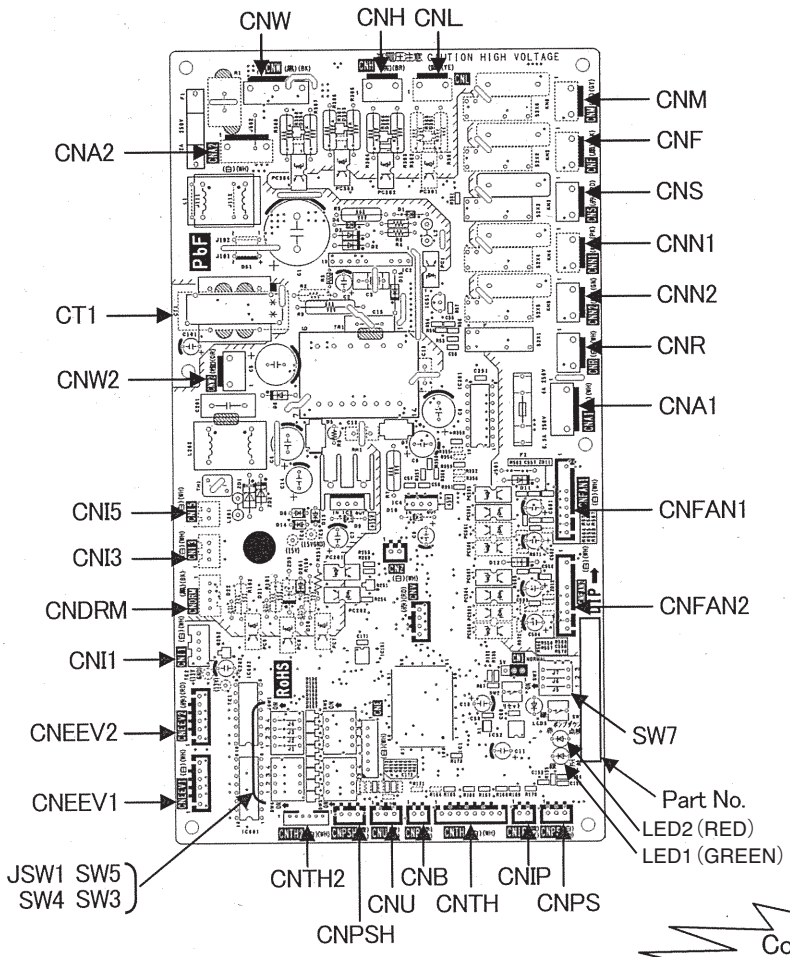
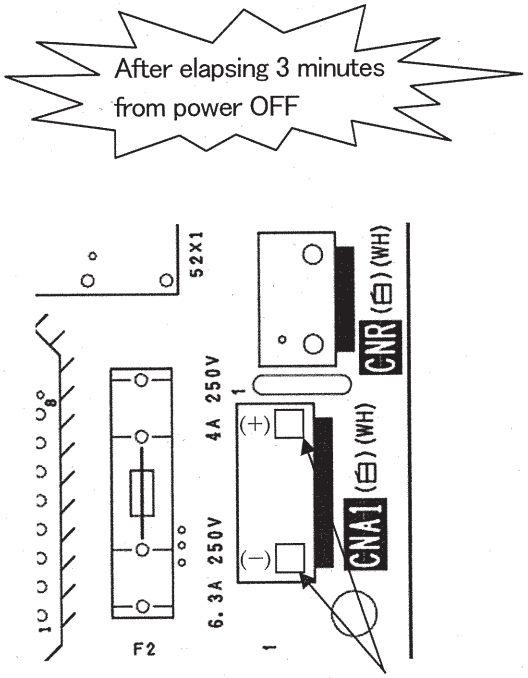
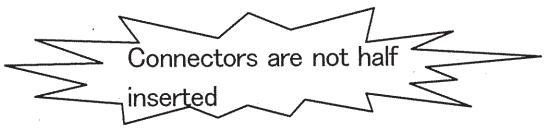


Fig. 1 Parts arrangement view



Voltage measurement parts
CNA1 (Between 1 pin and 4 pin)

Fig. 2 Enlarged view of parts arrangement



(c) Outdoor inverter PCB replacement procedure

Precautions for Safety

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

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

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

⚠ WARNING

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

⚠ CAUTION

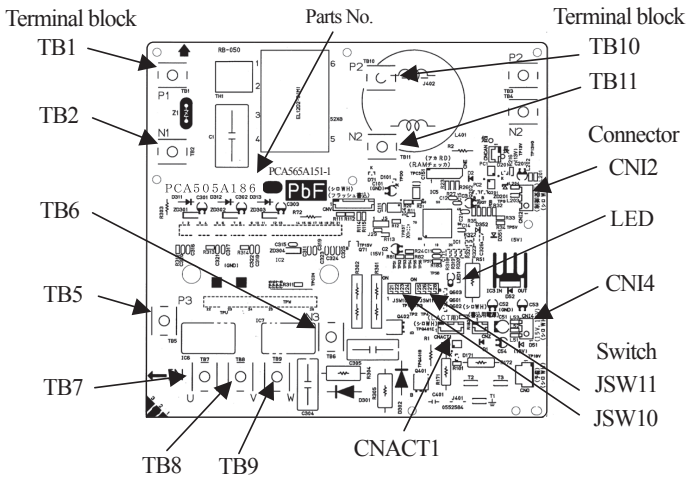
- Band the wiring so as not to tense because it will cause an electric shock.

Replace the inverter PCB according to the following procedure.

(i) Model FDC100VNX-W

PCA012D025D R

1) Replace the PCB **after elapsing 3 minutes from power OFF**. (**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently**.(Refer to Fig.1.))
2) Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
3) Match the setting switches (JSW10,11) of new PCB with the former PCB.
4) Before installing the power transistor on the new PCB, apply uniformly a bundled of silicon grease first on the surface of power transistor.Make sure it is applied to prevent damage on power transistor.
5) Tighten the screw of power transistor on inverter PCB and connect the terminal block.Confirm the connection and don't use soldering in the connection.Tighten properly the power transistor with a screw and make sure there is no slack.Power transistor can be damage if not properly tighten.(Recommended power transistor tightening torque:0.98 – 1.47N·m)



Parts arrangement view

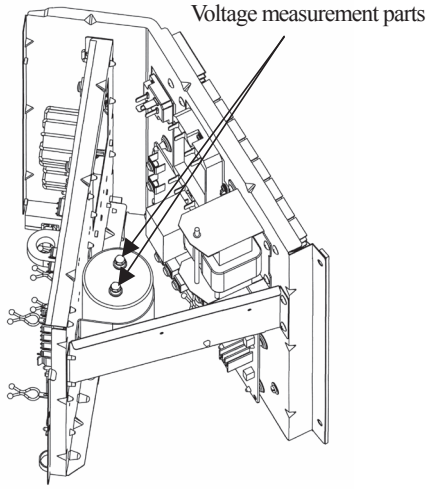


Fig.1 Position of capacitor

Table. 1 Switch setting

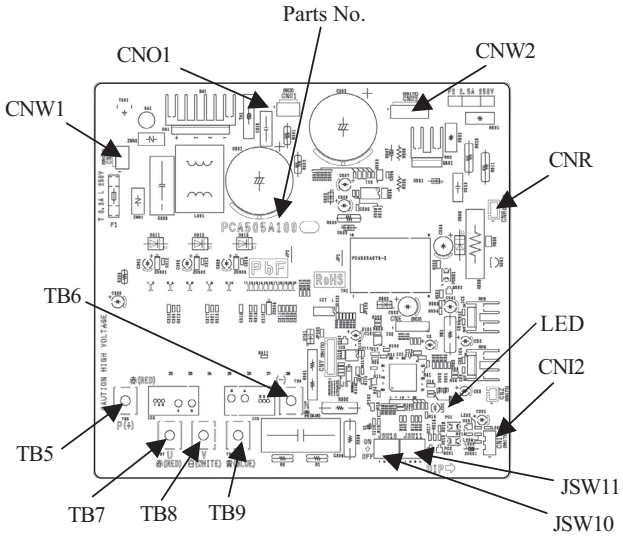
Model FDC100VNX-W

JSW10	-1	OFF	JSW11	-1	OFF
	-2	ON		-2	OFF
	-3	OFF		-3	OFF
	-4	OFF		-4	ON

PCA012D025F R/A

(ii) Model FDC100VSX-W

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently**.(Refer to Fig.1.))
2) Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
3) Match the setting switches (JSW10,11) of new PCB with the former PCB.
4) Before installing the power transistor on the new PCB, apply uniformly a bundled of silicon grease first on the surface of power transistor.Make sure it is applied to prevent damage on power transistor.
5) Tighten the screw of power transistor on inverter PCB and connect the terminal block.Confirm the connection and don't use soldering in the connection.Tighten properly the power transistor with a screw and make sure there is no slack.Power transistor can be damage if not properly tighten.(Recommended power transistor tightening torque:0.98 – 1.47N·m)



Parts arrangement view

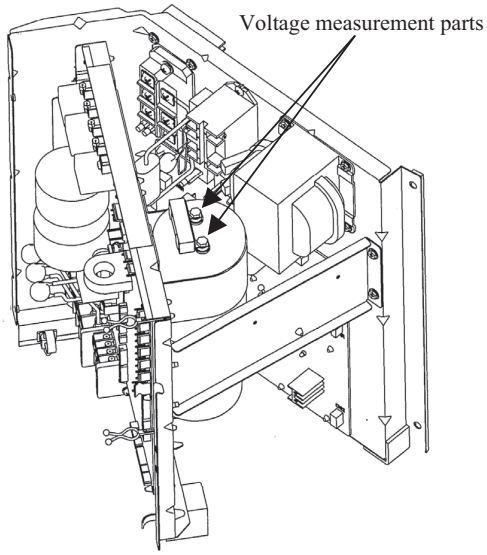


Fig.1 Position of capacitor

Table. 1 Switch setting

Models FDC100VSX-W, 125VSX-W, 140VSX-W

JSW10	-1	OFF	JSW11	-1	ON
	-2	ON		-2	ON
	-3	OFF		-3	ON
	-4	OFF		-4	OFF

PCB012D057A D

(iii) Model FDC200VSA-W

Replace the inverter PCB (Fig.1) according to the following procedure.

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
2) In the situation that harnesses are connected to control PCB, **be sure to measure voltage (DC) of two places ((A), (B))** and check that **the voltage is discharged sufficiently**. (Refer to Fig.2)
3) Remove the harnesses from bands, clips and connectors on the control PCB. Then, remove the appointed screws (4 places) of a control. (Refer toFig.3)
4) Open main layer and **measure voltage (DC) of aplace (C)** and check that **the voltage is discharged sufficiently**. (Refer to Fig.4)
5) Disconnect connectors from the inverter PCB (Refer to Fig.1), remove a snubber capacitor (Refer to Fig.4) and harnesses ("P", "N" ,"U", "V" and "W"), and exchange the inverter PCB then. In the situation of being opening main layer, do not press the control from above. It will cause the product deformation or injury.
6) Match the setting of switches (JSW10, 11) of new PCB with former PCB.
7) After exchanging the inverter PCB, install the snubber capacitor to power transistor (Refer to Fig.5), and reconnect the connectors and the harnesses as before. (Confirm the **connectors are not half inserted**.)
   Be careful not to pinch the wiring at the time of closing main layer. The wiring is damaged, and it will cause a short circuit or fire.

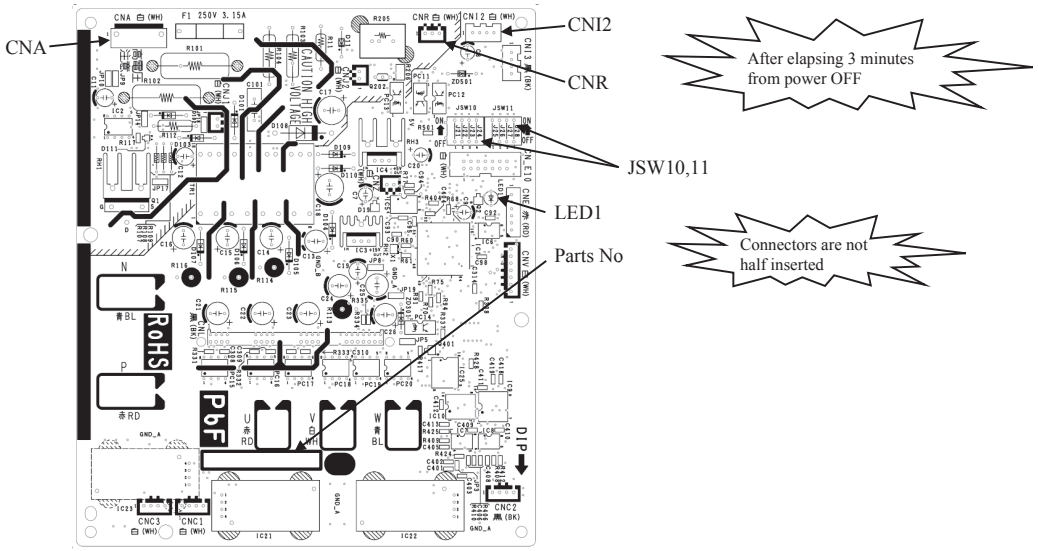


Fig.1 Parts arrangement view of inverter PCB

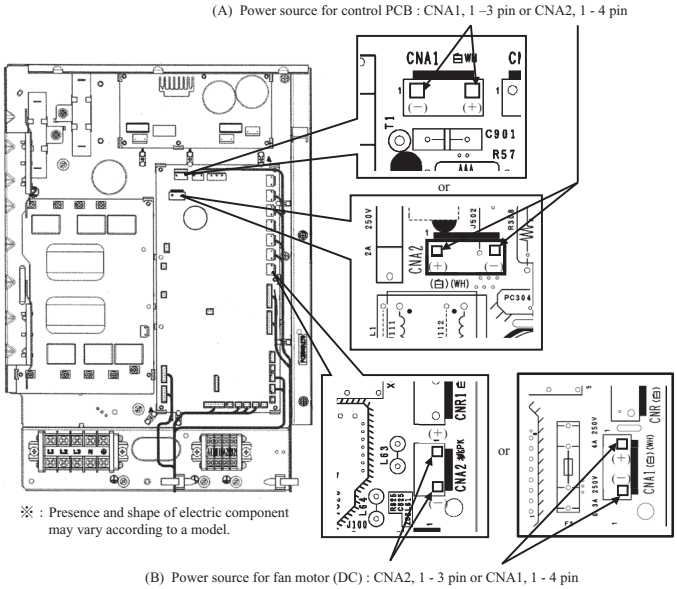


Fig.2 Voltage measurement points

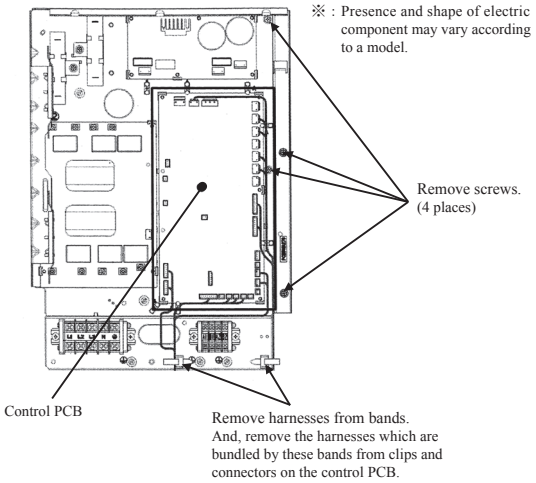


Fig.3 Target places which are removed harnesses and screws

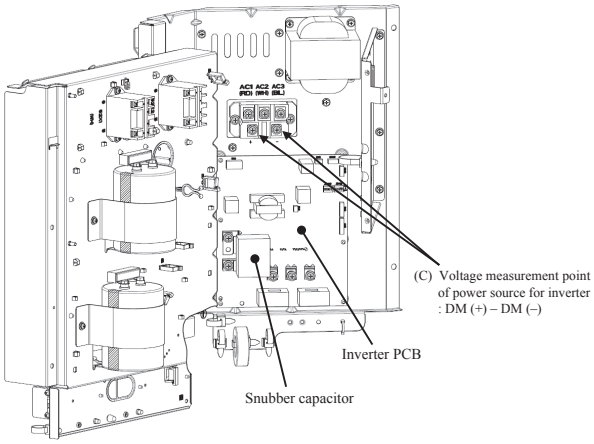
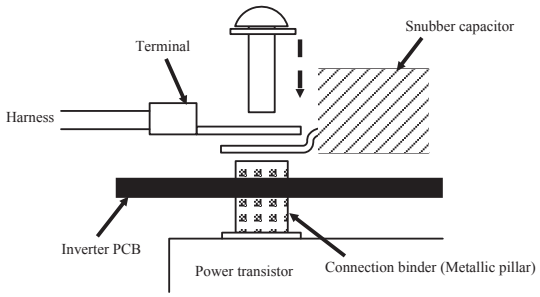


Fig.4 Installation place of inverter PCB



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.
(Set the harness wires to be fixed to "U" and "W" with screws in respective holes after passing them through IC21 and 22.)
(Connect the snubber capacitor with "P" and "N".)

Fig.5 Installation method to power transistor

●DIP switch setting list (Outdoor unit)

Models FDC100VNX-W, 100VSX-W

(1) Control PCB

Switch	Description		Default setting		Remark
SW1	Pump down operation	Normal*/Pump down	OFF	Normal	
JSW 1-1	Model selection		As per model		See table1.
JSW 1-2					
JSW 1-3					
JSW 1-4	Reserved		OFF		Keep OFF
SW 3-1	Defrost condition	Normal*/Cold region	OFF	Normal	
SW 3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	
SW 3-3	Test run switch	Normal*/Test run	OFF	Normal	
SW 3-4	Test run mode	Normal*/Heating	OFF	Cooling	
SW 4-1	Silent mode setting	Normal*/Silent	OFF	Normal	See page 17.
SW4-2	Model setting	3 phase/ Single phase	As per model		See table 1.
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Manual defrost	Normal*/Control activated	OFF	Normal	See page 27.
SW5-1	Control for existing pipnig	Normal*/Control activated	OFF	Normal	See Note 1.
SW5-2	High head-difference control	Normal*/Control activated	OFF	Normal	When the outdoor unit is installed 30m or higher than indoor unit.
SW5-3	Reserved		OFF		Keep OFF
SW5-4	Reserved		OFF		Keep OFF
SW7-1	SW1 function selection		OFF		See table 1.
SW7-2	Limit the number of compressor start	Normal*/Control activated	OFF	Normal	See page 27.
SW7-3	Reserved		OFF		Keep OFF

Table 1: Outdoor unit model setting with JSW1-1-JSW1-3 and SW4-2

	100VNX-W	100VSX-W
JSW 1-1	OFF	OFF
JSW 1-2	OFF	OFF
JSW 1-3	OFF	OFF
SW 4-2	ON	OFF

Table 2 : SW1 fuction selection

SW7-1	SW1 function allocation	Remark
OFF	Pump down operation	Refer to page 26.
ON	Reset cumulative time of compressor operation	Reset of cumulative operation time in such case the compressor is replaced.

(2) Inverter PCB

Switch	FDC100VNX-W	FDC100VSX-W
	Single phase models	3 phase models
JSW10-1	OFF	OFF
JSW10-2	ON	ON
JSW10-3	OFF	OFF
JSW10-4	OFF *	OFF *
JSW11-1	OFF	ON
JSW11-2	OFF	ON
JSW11-3	OFF	ON
JSW11-4	ON	OFF

* When checking inverter PCB of FDC100 model with inverter checker, turn JSW10-4 ON.
(Regarding the checking method of inverter PCB with inverter checker, refer to pages 50, 51 for details)

Models FDC100VNA-W, 100VSA-W

Switch	Description		Default setting		Remark
SW1	(See table 1.)		OFF		
JSW1-1 JSW1-2 JSW1-3	Model selection		As per model		See table 2.
JSW1-4	Reserved		OFF		Keep OFF
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	Refer to page 156.
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	Refer to page 155.
SW3-3	Test run SW	Normal*/Test run	OFF	Normal	Refer to page 159.
SW3-4	Test run mode	Cooling*/Heating	OFF	Cooling	Refer to page 159.
SW4-1	Reserved		OFF		Keep OFF
SW4-2	Cancel measuring of refrigerant leak	Normal*/Cancel	OFF	Normal	Detection function of error in E57 refrigeration system protection (OFF: Detection / ON: Cancel to detect)
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		OFF		Keep OFF
SW5-1	Utilization of existing piping control	Normal*/Existing piping control	OFF	Normal	See Note 1.
SW5-2	Hight difference of IU and OU control	Normal*/High head control	OFF	Normal	When the outdoor unit is positioned higher than 30m (OFF : Normal / ON : high head)
SW5-3	Reserved		OFF		Keep OFF
SW5-4	Reserved		OFF		Keep OFF
SW6-1	Reserved		OFF		Keep OFF
SW6-2	Reserved		OFF		Keep OFF
SW6-3	Reserved		OFF		Keep OFF
SW6-4	Inverter checker mode	Normal*/Check INV	OFF	Normal	Refer to page 62.
SW7-1	SW1 function selection		OFF		See table 1.
SW7-2	Frost protection by frequent external ON/OFF	Normal*/connected external device	OFF	Normal	In case external device switches ON/OFF frequently, switch to ON to start defrost operation even though short operation time.
SW7-3	Silent mode selection	Normal*/Silent mode	OFF	Normal	Refer to page 159.

* Default setting

Table 1: SW1 fuction selection

0: OFF 1:ON

SW7-1	SW1 function	Remark
0	Pump down operation	Refer to page 160.
1	Reset cumulative time of compressor operation	Reset of operation time after replacing a compressor

Table 2: Outdoor unit model selection with JSW1-1-JSW1-3

0: OFF 1:ON

	100VNA	100VSA
JSW1-1	0	0
JSW1-2	0	0
JSW1-3	0	0

Note 1: Utilization of existing pipe

1 In case of reusing annealed pipe Ø19.05 × t1.0, be sure to turn the DIP switch on the outdoor PCB ON as shown in the table because of its insufficient strength. If its material is 1/2H or its thickness is 1.2mm or more it is no necessary.

2 If bendng radius of existing pipe is less than R70mm, be sure to turn the DIP switch on the outdoor PCB shown in the table due to its insufficient strength.

Moedl FDC200VSA-W

(1) Control PCB

Switch	Description		Default setting	Remark
SW1	(See table 1.)		OFF	
JSW1-1 JSW1-2 JSW1-3	Model selection		As per model	See table 2.
JSW1-4	No function		OFF	
SW3-1	Defrost condition	Normal*/Cold region	OFF	Refer to page 165.
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Refer to page 164.
SW3-3	Test run SW	Normal*/Test run	OFF	Refer to page 171.
SW3-4	Test run mode	Cooling*/Heating	OFF	Refer to page 171.
SW4-1	SW1 function selection		OFF	See table1.
SW4-2	Reserve		OFF	
SW4-3	Reserve		OFF	
SW4-4	Forced defrost	Normal*/Valid	OFF	
SW5-1	Existing pipe system setting	Normal*/Valid	OFF	
SW5-3	Reserve		OFF	
SW5-4	Reserve		OFF	
SW7-1	Anti-frost control	Normal*/Valid	ON	
SW7-2	Reserve		ON	
SW7-3	Silent mode selection	Capacity priority*/Silent priority	ON	Refer to page 171.

* Default setting

Table 1: SW1 fuction selection

0: OFF 1:ON

SW4-1	SW1 function	Remark
0	Pump down operation	Refer to page 171.
1	Reset cumulative time of compressor operation	Reset of operation time after replacing a compressor

Table 2: Outdoor unit model selection with JSW1-1-JSW1-4

Switch	FDC200
JSW1-1	ON
JSW1-2	ON
JSW1-3	ON

(2) Inverter PCB

Switch	FDC200
JSW10-1	OFF
JSW10-2	ON
JSW10-3	OFF
JSW10-4	OFF *
JSW11-1	OFF
JSW11-2	OFF
JSW11-3	ON
JSW11-4	OFF

* When checking inverter PCB of FDC200 model with inverter checker, turn JSW10-4 ON.
(Regarding the checking method of inverter PCB with inverter checker, refer to page 62 for details)

(5) Check of anomalous operation data with the remote control

(a) In case of RC-EX3A remote control

[Operating procedure]

① On the TOP screen, touch the buttons in the order of "Menu" → "Service setting" → "Service & Maintenance" → "Service password" → "Set" → "Error display" → "Error history".

② When only one indoor unit is connected to the remote control, followings will be displayed.

1. When there is any anomaly: "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly

Contents of display

・Error code

・Number and data item

2. When there is no anomaly: "No anomaly" is displayed, and this mode is terminated.

③ When two or more indoor units are connected to the remote control, followings will be displayed.

1. When there is any anomaly: If the unit having anomaly is selected on the "Select IU" screen, "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly.

Contents of display

・Indoor unit No.

・Error code

・Number and data item

2. When there is no anomaly: "No anomaly" is displayed, ant this mode is terminated.

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

④ If you press [RUN/STOP] button, the display returns to the TOP screen.

◎ **If you touch "Back" button on the way of setting, the display returns to the last precious screen.**

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

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

Number		Data Item
01	✻	(Operation Mode)
02	SET TEMP	(Set Temperature)
03	RETURN AIR___℃	(Return Air Temperature)
04	SENSOR___℃	(Remote Control Temperature Sensor)
05	THI-R1___℃	(Indoor Heat Exchanger Temperature Sensor / U Bend)
06	THI-R2___℃	(Indoor Heat Exchanger Temperature Sensor /Capillary)
07	THI-R3___℃	(Indoor Heat Exchanger Temperature Sensor /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 Value)
12	TOTAL I/U RUN___H	(Total Running Hours of The Indoor Unit)
13	SUPPLY AIR___℃	(Supply Air Temperature)
21	OUTDOOR___℃	(Outdoor Air Temperature)
22	THO-R1___℃	(Outdoor Heat Exchanger Temperature Sensor)
23	THO-R2___℃	(Outdoor Heat Exchanger Temperature Sensor)
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)
30	TARGET SH___℃	(Target Super Heat)
31	SH___℃	(Super Heat)
32	TDSH___℃	(Discharge Pipe Super Heat)
33	PROTECTION No.__	(Protection State No. of The Compressor)
34	O/U FANSPEED___	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN___H	(Total Running Hours of The Compressor)
38	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)

●Number 33 details of compressor protection status
Models FDC100VNX-W, 100VSX-W

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.22, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.22, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.24, (6).(f)
"4"	High pressure protection control	P.22, (6).(b).(i), P.23, (6).(c).(i)
"5"	High pressure anomaly	P.22, (6).(b).(ii), P.23, (6).(c).(ii)
"6"	Low pressure protection control	P.23, (6).(e).(i)
"7"	Low pressure anomaly	P.23, (6).(e).(ii)
"8"	Anti-frost prevention control	P.24, (6).(j)
"9"	Current cut	P.24, (6).(f)
"10"	Power transistor protection control	P.24, (6).(g)
"11"	Power transistor anomaly (Overheat)	P.24, (6).(h)
"13"	Spare	
"14"	Dewing prevention control	P.25, (6).(k)
"15"	Current safe control of inverter secondary current	P.24, (6).(f)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.25, (6).(o)
"18"	Active filter anomaly	

Notes(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displayed.
(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

Models FDC100VNA-W, 100VSA-W

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.156, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.156, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.158, (6).(f)
"4"	High pressure protection control	P.156, (6).(b).(i), P.157, (6).(c).(i)
"5"	High pressure anomaly	P.157, (6).(b).(ii)
"6"	Low pressure protection control	P.157, (6).(e).(i)
"7"	Low pressure anomaly	P.157, (6).(e).(ii)
"8"	Anti-frost prevention control	P.158, (6).(i)
"9"	Current cut	P.158, (6).(f)
"11"	Power transistor anomaly (Overheat)	P.158, (6).(g)
"13"	Spare	
"14"	Dewing prevention control	P.158, (6).(j)
"15"	Current safe control of inverter secondary current	P.158, (6).(f)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.159, (6).(m)
"18"	Active filter anomaly	

Notes(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displaye
(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

Model FDC200VSA-W

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.166, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.166, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.169, (6).(g)
"4"	High pressure protection control	P.167, (6).(b).(i), P.168, (6).(c).(i)
"5"	High pressure anomaly	P.167, (6).(b).(ii)
"6"	Low pressure protection control	P.168, (6).(e).(i)
"7"	Low pressure anomaly	P.168, (6).(e).(ii)
"8"	Anti-frost prevention control	P.169, (6).(k)
"9"	Current cut	P.169, (6).(g)
"10"	Power transistor protection control	P.169, (6).(h)
"11"	Power transistor anomaly (Overheat)	P.169, (6).(i)
"12"	Compression ratio control	P.168, (6).(f)
"13"	Spare	
"14"	Dewing prevention control	P.170, (6).(1)
"15"	Current safe control of inverter secondary current	P.169, (6).(g)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.170, (6).(o)
"18"	Active filter anomaly	

Notes(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displayed.
(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

Model FDC100VNP-W

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P191, (11). (b). (i)
"2"	Discharge pipe temperature anomaly	P192, (11). (b). (ii)
"3"	Current safe control of inverter primary current	P192, (12)
"4"	High pressure protection control	P189, (6). (c), P190, (8), (b)
"5"	High pressure anomaly	P191, (11)
"8"	Anti-frost prevention control	
"9"	Current cut	P192, (13)
"11"	Power transistor anomaly (Overheat)	
"12"	Compression ratio control	
"13"	Spare	
"14"	Dewing prevention control	
"15"	Current safe control of inverter secondary current	
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	
"18"	Active filter anomaly	

Notes(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displayed.
(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

(b) In case of RC-E5 remote control

Operation data can be checked with remote control unit operation.

① Press the CHECK button.
The display change " OPER DATA ▼"

② Press the ○ (SET) button while " OPER DATA ▼ " is displayed.

③ When only one indoor unit is connected to remote control, " DATA LOADING " is displayed (blinking indication during data loading).
Next, operation data of the indoor unit will be displayed. Skip to step 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.

Number	Data Item	
01	※	(Operation Mode)
02	SET TEMP___℃	(Set Temperature)
03	RETURN AIR___℃	(Return Air Temperature)
04	SENSOR___℃	(Remote Control Temperature Sensor)
05	THI-R1___℃	(Indoor Heat Exchanger Temperature Sensor / U Bend)
06	THI-R2___℃	(Indoor Heat Exchanger Temperature Sensor /Capillary)
07	THI-R3___℃	(Indoor Heat Exchanger Temperature Sensor /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 Value)
12	TOTAL I/U RUN___H	(Total Running Hours of The Indoor Unit)
21	OUTDOOR___℃	(Outdoor Air Temperature)
22	THO-R1___℃	(Outdoor Heat Exchanger Temperature Sensor)
23	THO-R2___℃	(Outdoor Heat Exchanger Temperature Sensor)
24	COMP___Hz	(Compressor Frequency)
25	HP___MPa	(High Pressure)
26	LP____MPa	(Low Pressure)
27	Td___℃	(Discharge Pipe Temperature)
28	COMP BOTTOM___℃	(Compressor Bottom Temperature)
29	CT___AMP	(Current)
30	TARGET SH___℃	(Target Super Heat)
31	SH___℃	(Super Heat)
32	TDSH___℃	(Discharge Pipe Super Heat)
33	PROTECTION No.__	(Protection State No. of The Compressor)
34	O/U FANSPEED___	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN___H	(Total Running Hours of The Compressor)
38	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)

⑦ Upon operation of the ▲ ▼ button, the current operation data is displayed in order from data number 01.
The items displayed are in the above table.
*Depending on models, the items that do not have corresponding data are not displayed.

⑧ To display the data of a different indoor unit, press the AIR CON No. button, which allows you to go back to the indoor unit selection screen.

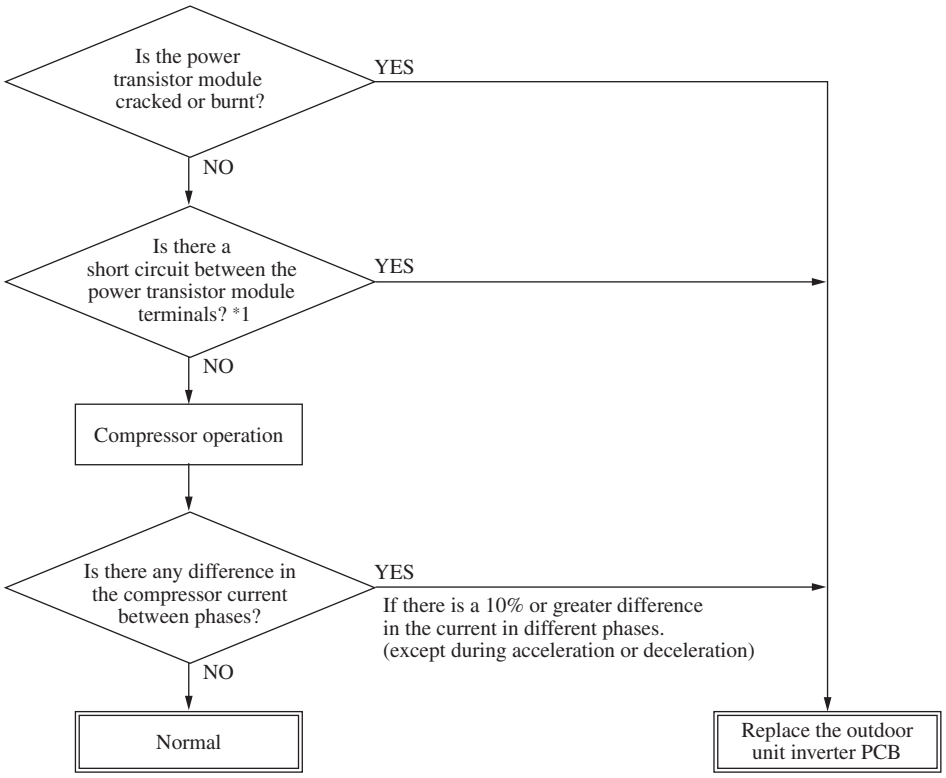
⑨ Pressing the ⏻ON/OFF button will stop displaying data.
Pressing the // (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

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

●Number 33 details of compressor protection status

Refer to pages 57 and 58.

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



***1 Power transistor module terminal short-circuit check procedure**

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

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P-N terminals.

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

P: Power transistor P terminal

N: Power transistor N terminal

U: End of red harness to compressor

V: End of white harness to compressor

W: End of black or blue harness to compressor

Check for a power transistor short-circuit.

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

Models FDC100VNX-W, 100VSX-W

Tester		Normal value (Ω)	
Terminal (+)	Terminal (-)	FDC100 VNX-W	FDC100 VSX-W
P	N	Approx. 230 k	Approx. 50 k
N	P	Approx. 570 k	Approx. 525 k
P	U	Approx. 420 k	Approx. 260 k
P	V		
P	W		
N	U	Approx. 250 k	Approx. 215 k
N	V		
N	W		
U	P		Approx. 235 k
V	P		
W	P		
U	N	Approx. 480 k	Approx. 280 k
V	N		
W	N		

If the measured values range from 0 - several kW, there is a possibility that the elements are damaged, so replace the power transistor parts.

Model FDC200VSA-W

Tester		Normal value (Ω)
Terminal (+)	Terminal (-)	Model FDC200
P	N	Scores of M
N	P	Approx. 8.9M
P	U	Scores of M
P	V	
P	W	
N	U	Approx. 4.6M
N	V	
N	W	
U	P	Approx. 4.8M
V	P	
W	P	
U	N	Scores of M
V	N	
W	N	

If the measured values range from 0 - several kW, there is a possibility that the elements are damaged, so replace the power transistor parts.

Model FDC100VNP-W

Tester		Normal value (Ω)	Diode mode (V)
Terminal (+)	Terminal (-)		
P	N	A few of MΩ (Not short)	—
N	P		
P	U		
P	V		
P	W		
N	U		Approx. 0.4V
N	V		
N	W		
U	P		
V	P		
W	P		
U	N		—
V	N		
W	N		

If the measured values range from 0 - several kΩ, there is a possibility that the elements are damaged, so replace the power transistor parts.

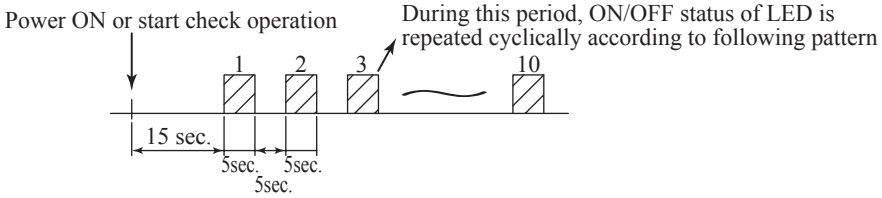
(7) Inverter checker for diagnosis of inverter output
Models FDC100VNX-W,100VSX-W
FDC100VNA-W,100VSA-W, 200VSA-W

●Checking method

(i) Setup procedure of checker.
1) Power OFF (Turn off the breaker).
2) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
3) Connect the wires U (Red) , V (White) and W (Black) of checker to the terminal of disconnected wires (U, V, W) from compressor respectively.

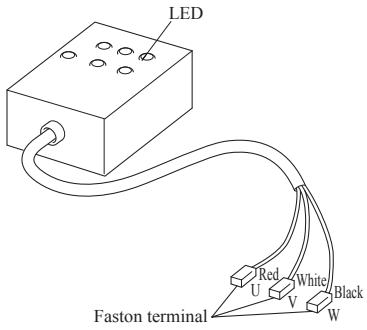
(ii) Operation for judgment.
1) Power ON after JSW10-4(SW6-4:FDC100VNA-W/VSA-W) on outdoor inverter PCB was turned ON.
2) After 15 seconds since power has turned ON, LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
3) Check ON/OFF status of 6 LED's on the checker.
4) Judge the PCB by ON/OFF status of 6 LED's on the checker.

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

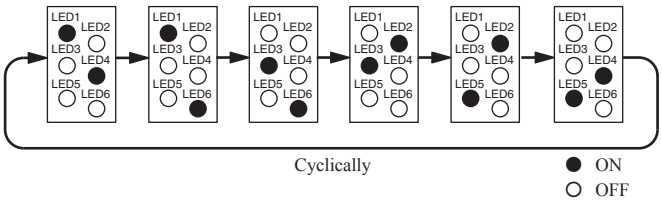


5) Be sure to turn off JSW10-4(SW6-4:FDC100VNA-W/VSA-W) on outdoor inverter PCB, after finishing the check operation.

〈Inverter checker〉



LED ON/OFF pattern



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

Model FDC100VNP-W

● Checking method

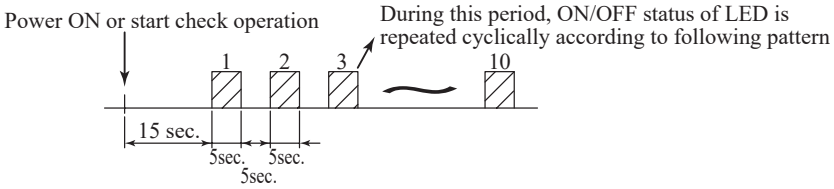
(i) Setup procedure of checker.

1) Power OFF (Turn off the breaker).
2) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
3) Connect the wires U (Red) , V (White) and W (Black) of checker to the terminal of disconnected wires (U, V, W) from compressor respectively.
4) Connect the short connector to CNROM on the main PCB.

(ii) Operation for judgment.

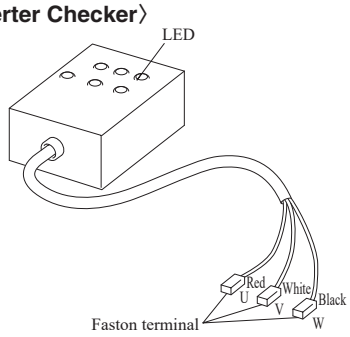
1) Power ON.
2) After 15 seconds since power has turned ON. LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
3) Check ON/OFF status of 6 LED's on the checker.
4) Judge the PCB by ON/OFF status of 6 LED's on the checker.

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



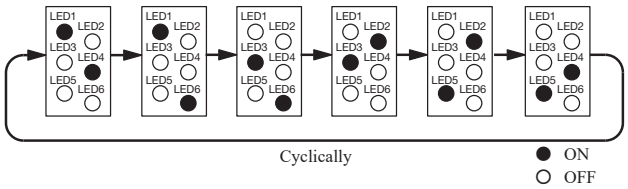
5) Be sure to disconnect the connector from CNROM, after finishing the check operation.

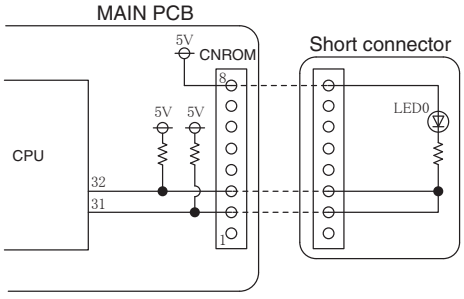
〈Inverter Checker〉



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

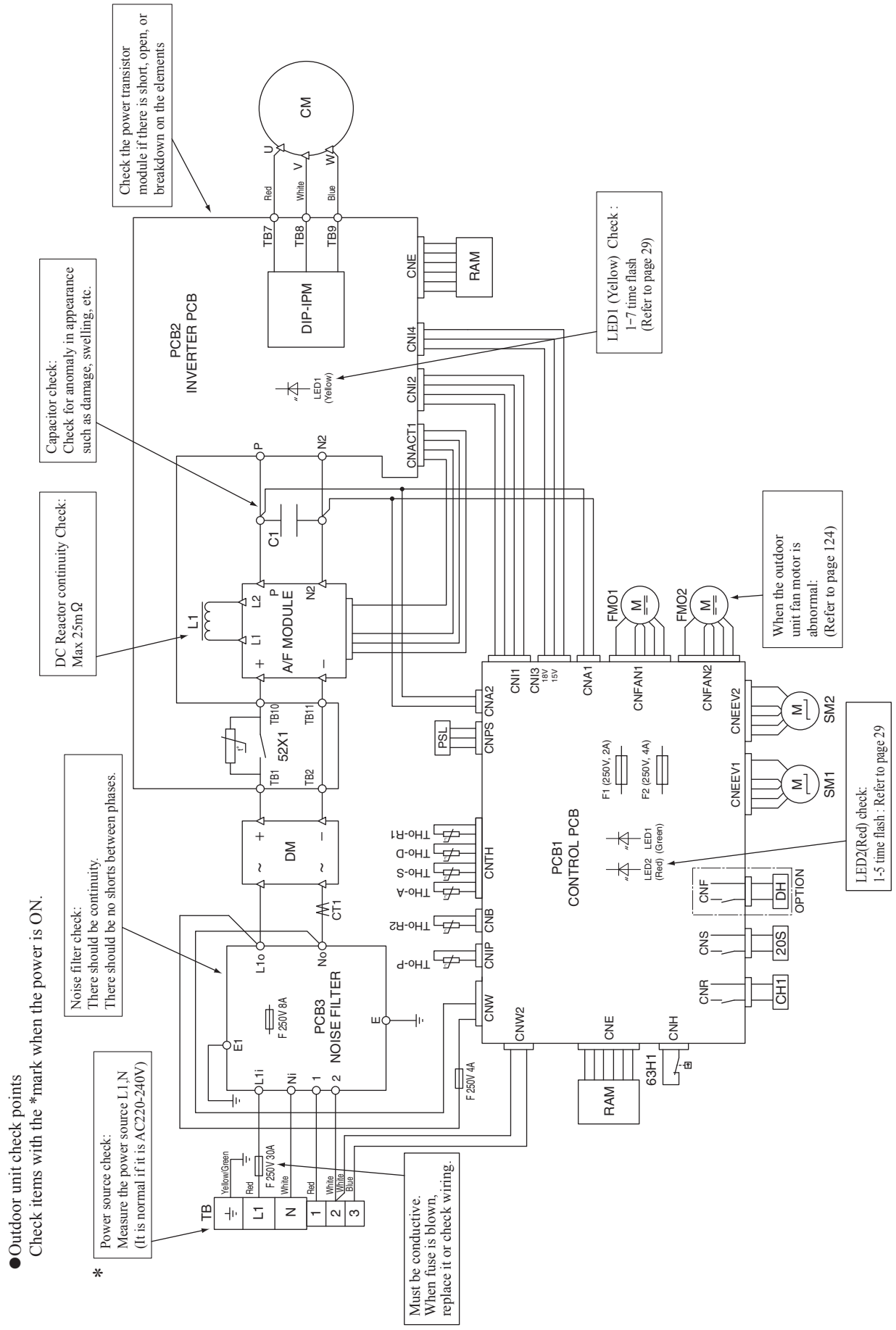
LED ON/OFF pattern



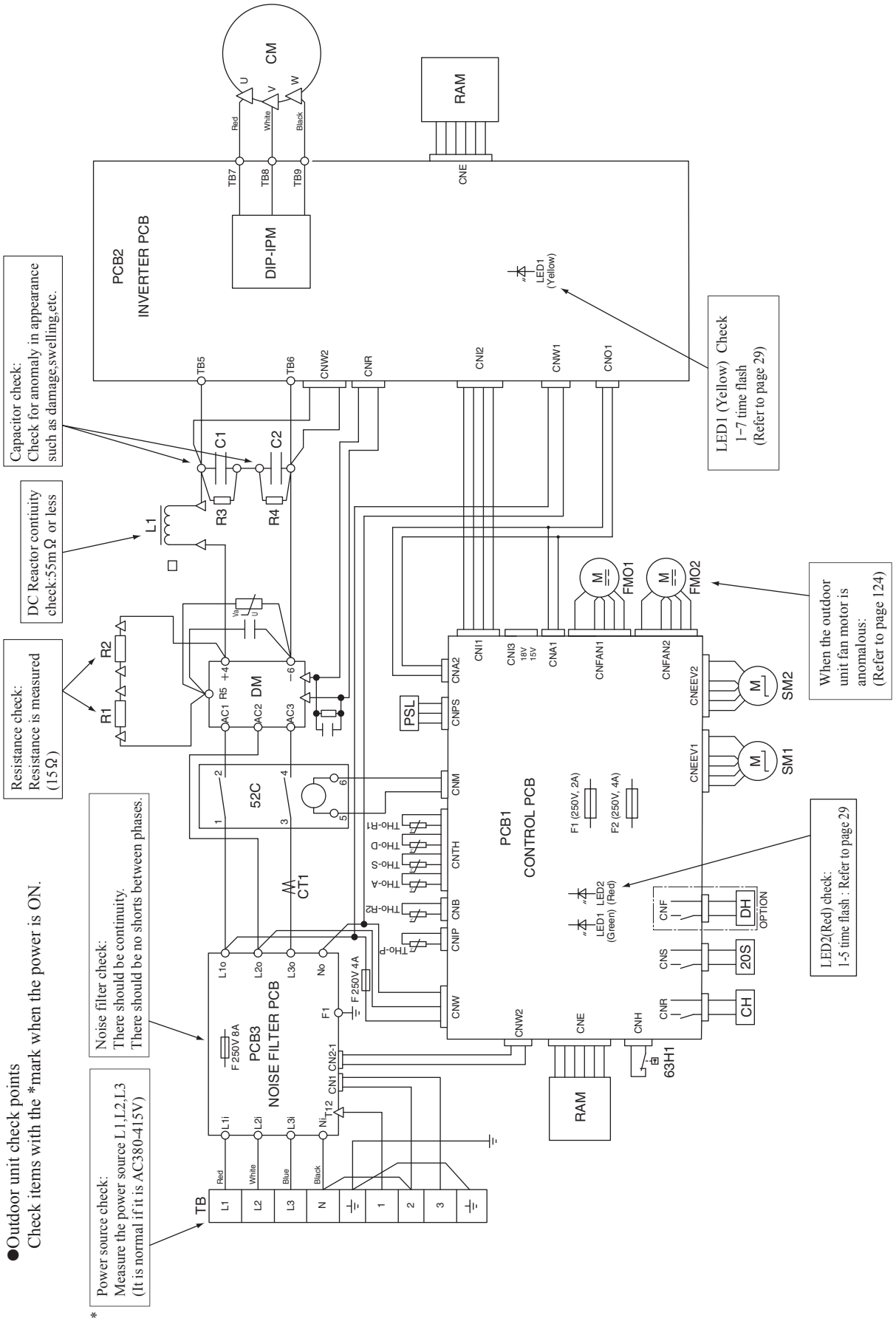


(8) Outdoor unit control failure diagnosis circuit diagram

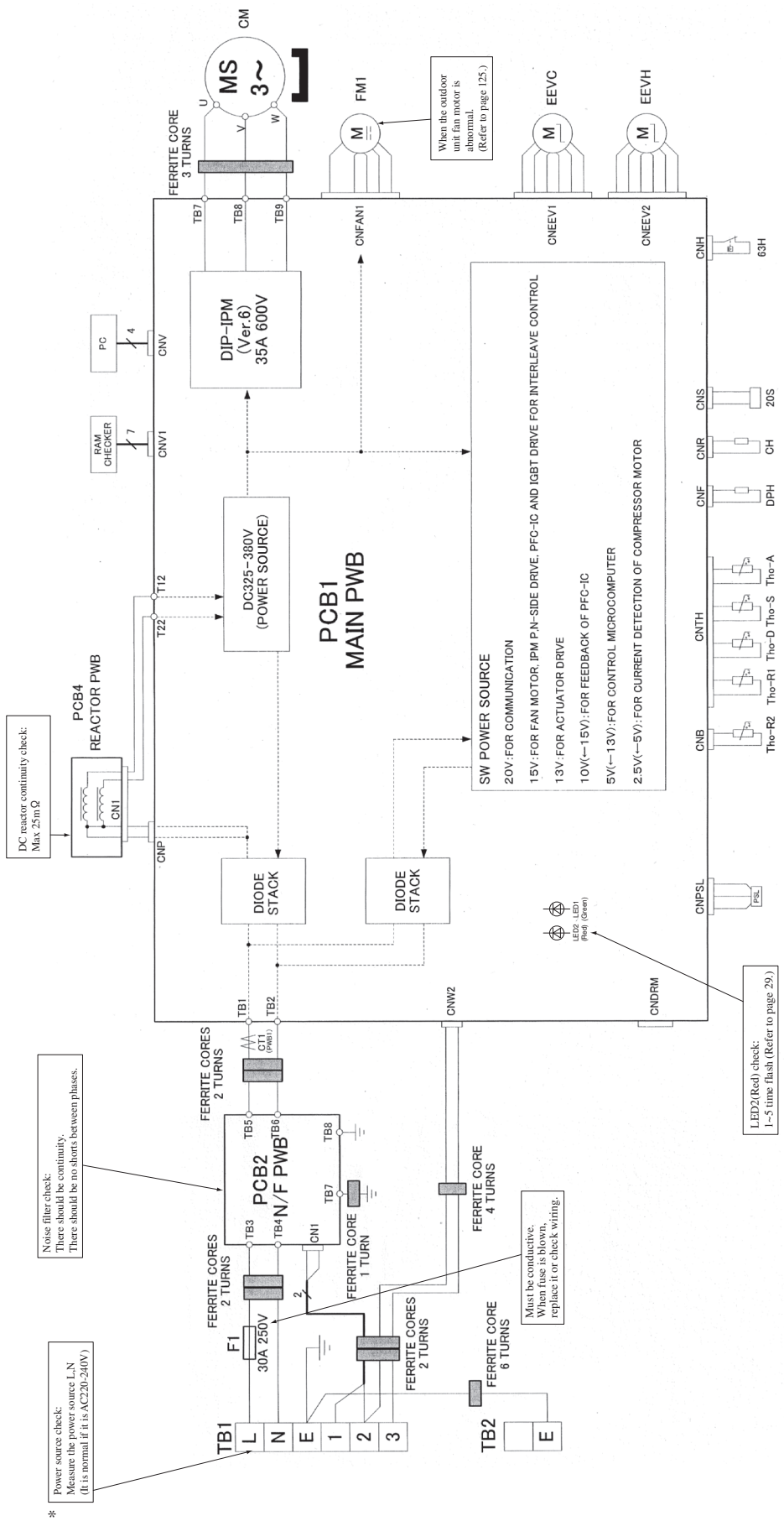
Model FDC100VNX-W



Model FDC100VSX-W



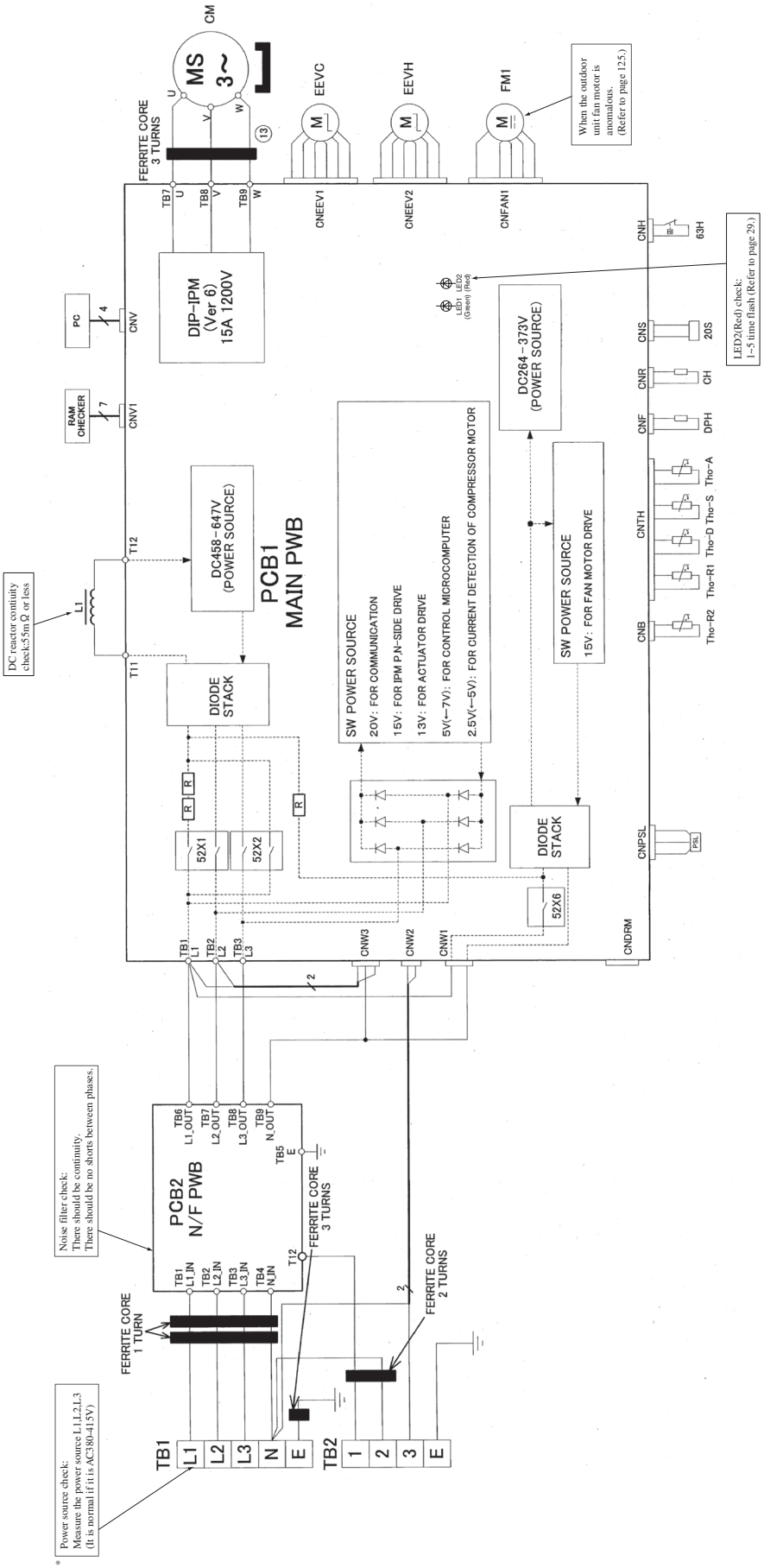
Model FDC100VNA-W



●Outdoor unit check points

Check items with the *mark when the power is ON.

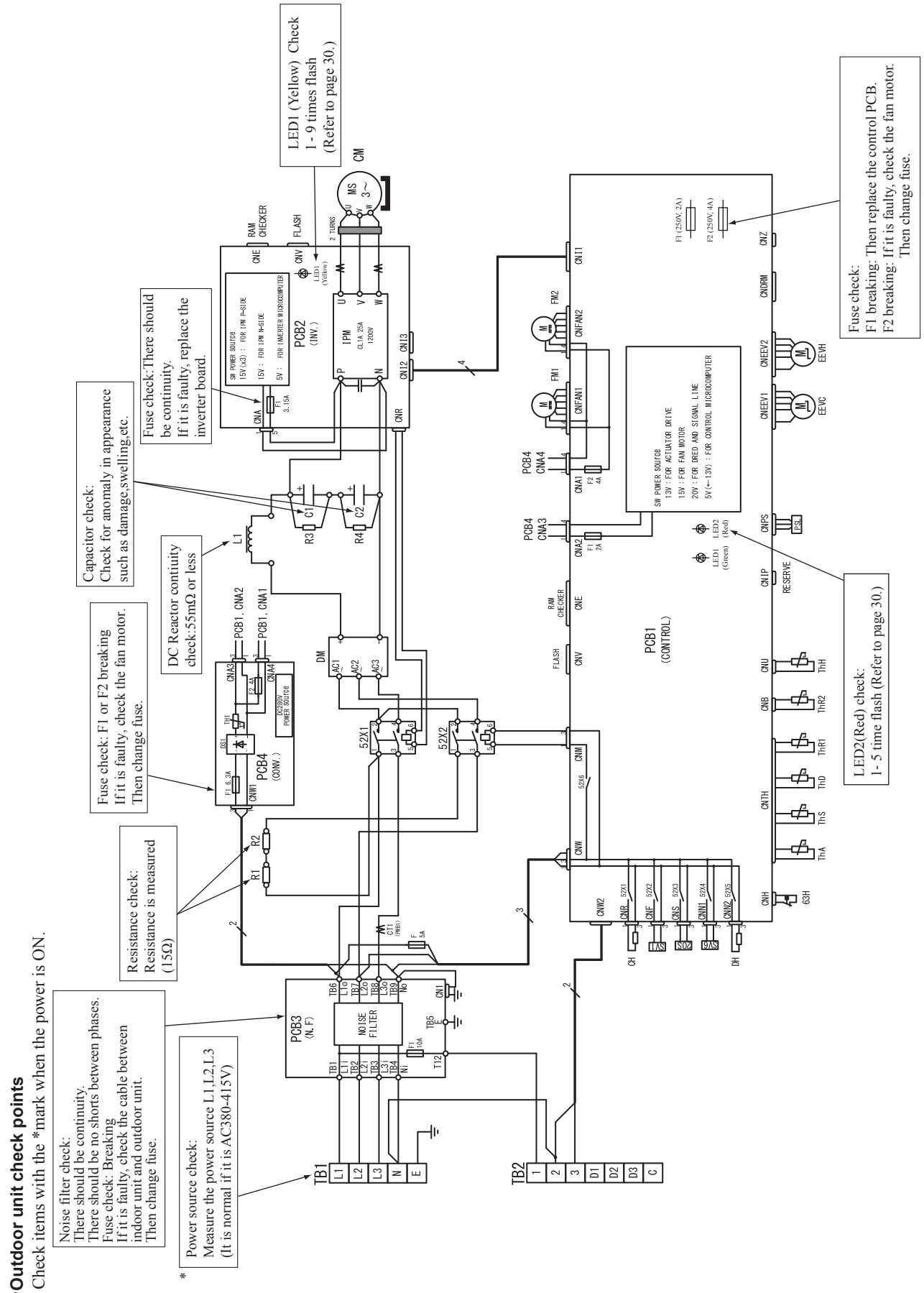
Model FDC100VSA-W



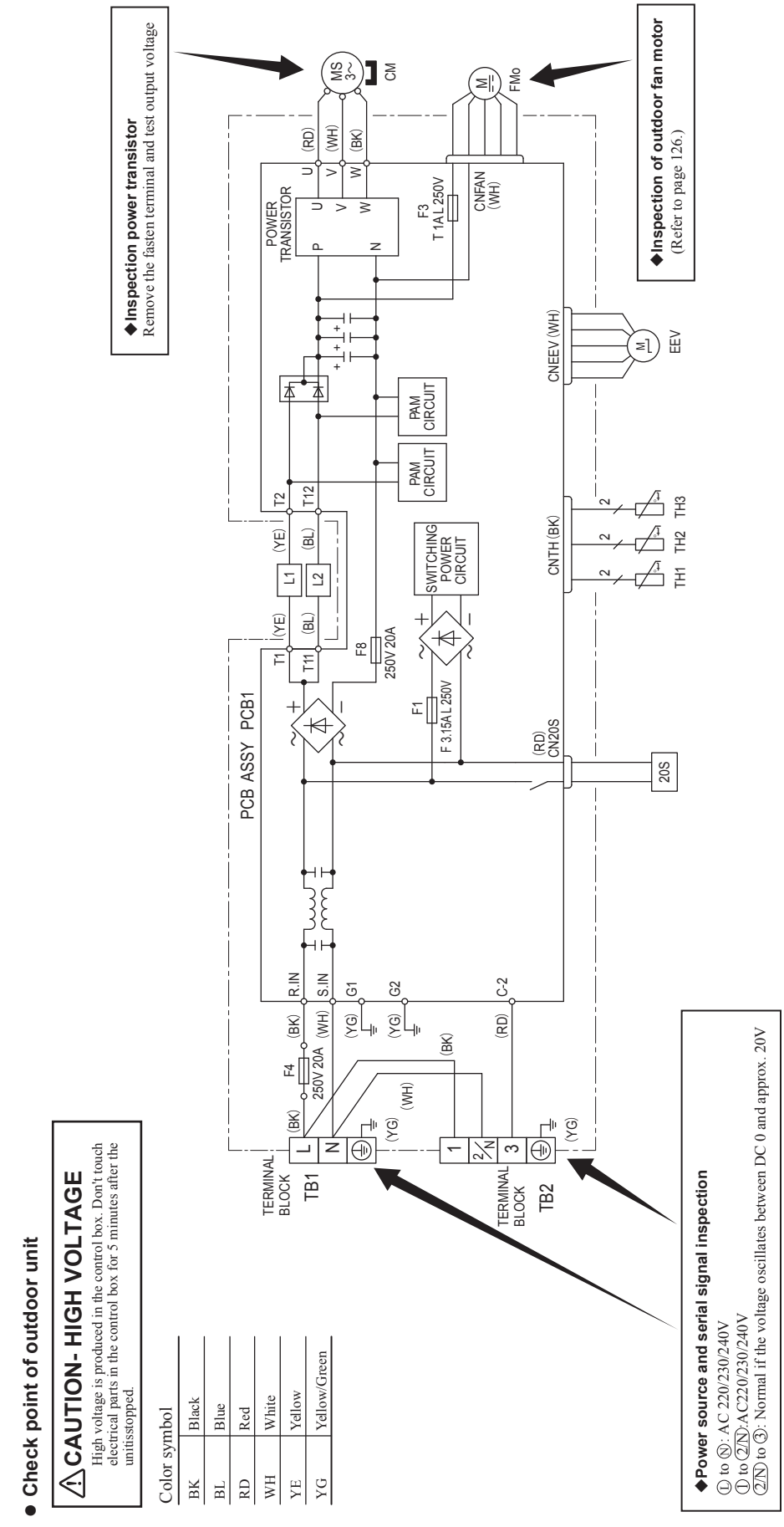
●Outdoor unit check points

Check items with the *mark when the power is ON.

Model FDC200VSA-W



Model FDC100VNP-W



● **Check point of outdoor unit**

⚠CAUTION- HIGH VOLTAGE

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

Color symbol

BK	Black
BL	Blue
RD	Red
WH	White
YE	Yellow
YG	Yellow/Green

1.2.2 Troubleshooting flow

(1) List of troubles

(a) Models FDC100VNX-W,100VSX-W
FDC100VNA-W,100VSA-W

Remote control display	Description of trouble	Reference page
None	Operates but does not cool.	73
None	Operates but does not heat.	74
None	Earth leakage breaker activated	75
None	Excessive noise/vibration (1/3)	76
None	Excessive noise/vibration (2/3)	77
None	Excessive noise/vibration (3/3)	78
None	Louver motor failure	79
None	Power source system error (Power source to indoor unit control PCB)	80
None	Power source system error (Power source to remote control)	81
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	82
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	83
WAIT	Communication error at initial operation	84-86
None	No display	92
E1	Remote control communication circuit error	93
E5	Communication error during operation	94
None	Indoor heat exchanger temperature sensor anomaly	95
None	Room air temperature sensor anomaly	96
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	97
E11	Address setting error of indoor units	98
E16	Indoor fan motor anomaly	100
E28	Remote control temperature sensor anomaly	101
E35	Cooling overload operation	102
E36	Discharge pipe temperature error	104
E37	Outdoor heat exchanger temperature sensor anomaly	106
E38	Outdoor air temperature sensor anomaly	107
E39	Discharge pipe temperature sensor anomaly	108
E40	High pressure error (63H1 activated)	109
E41	Power transistor overheat (Models FDC100VN(S)X-W only)	112
E42	Current cut	114 · 115
E45	Communication error between inverter PCB and outdoor unit control PCB (Models FDC100VN(S)X-W only)	120
E47	Control PCB A/F module anomaly (Model FDC100VNA-W only)	122
E48	Outdoor fan motor anomaly	124 · 125
E49	Low pressure error or low pressure sensor anomaly	127 · 128
E51	Inverter and fan motor anomaly	129
E53	Suction pipe temperature sensor anomaly	132
E54	Low pressure sensor anomaly	133
E57	Insufficient refrigerant amount or detection of service valve closure	135
E58	Anomalous compressor by loss of synchonism (Models FDC100VN(S)A-W only)	137
E59	Compressor startup failure	139-142

(b) Model FDC200VSA-W

Remote control display	Description of trouble	Reference page
None	Operates but does not cool.	73
None	Operates but does not heat.	74
None	Earth leakage breaker activated	75
None	Excessive noise/vibration (1/3)	76
None	Excessive noise/vibration (2/3)	77
None	Excessive noise/vibration (3/3)	78
None	Louver motor failure	79
None	Power source system error (Power source to indoor unit control PCB)	80
None	Power source system error (Power source to remote control)	81
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	82
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	83
WAIT	Communication error at initial operation	87·88
None	No display	92
E1	Remote control communication circuit error	93
E5	Communication error during operation	94
None	Indoor heat exchanger temperature sensor anomaly	95
None	Room air temperature sensor anomaly	96
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	97
E14	Communication error between master and slave indoor units	99
E16	Indoor fan motor anomaly	100
E28	Remote control temperature sensor anomaly	101
E35	Cooling overload operation	102
E36	Discharge pipe temperature error	105
E37	Outdoor heat exchanger temperature sensor anomaly	106
E38	Outdoor air temperature sensor anomaly	107
E39	Discharge pipe temperature sensor anomaly	108
E40	High pressure error (63H1 activated)	110
E41	Power transistor overheat	113
E42	Current cut	116·117
E44	Liquid back error	118·119
E45	Communication error between inverter PCB and outdoor unit control PCB	121
E48	Outdoor fan motor anomaly	124
E49	Low pressure error or low pressure sensor anomaly	127·128
E51	Inverter or power transistor anomaly	130
E53	Suction pipe temperature sensor anomaly	132
E54	Low pressure sensor anomaly	133
E55	Compressor under-dome temperature sensor anomaly	134
E57	Insufficient refrigerant amount or detection of service valve closure	135
E59	Compressor startup failure	143·144

(c) Model FDC100VNP-W

Remote control display	Description of trouble	Reference page
None	Operates but does not cool.	73
None	Operates but does not heat.	74
None	Earth leakage breaker activated	75
None	Excessive noise/vibration (1/3)	76
None	Excessive noise/vibration (2/3)	77
None	Excessive noise/vibration (3/3)	78
None	Louver motor failure	79
None	Power source system error (Power source to indoor unit control PCB)	80
None	Power source system error (Power source to remote control)	81
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	82
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	83
WAIT	Communication error at initial operation	89-91
E1	Remote control communication circuit error	93
E5	Communication error during operation	94
None	Indoor heat exchanger temperature sensor anomaly	95
None	Room air temperature sensor anomaly	96
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	97
E11	Address setting error of indoor units	98
E16	Indoor fan motor anomaly	100
E28	Remote control temperature sensor anomaly	101
E35	Cooling overload operation	103
E36	Discharge pipe temperature error	104
E37	Outdoor heat exchanger temperature sensor anomaly	106
E38	Outdoor air temperature sensor anomaly	107
E39	Discharge pipe temperature sensor anomaly	108
E40	Service valve (gas side) closing operation	111
E42	Current cut	114 · 115
E47	Active filter voltage error	123
E48	Outdoor fan motor anomaly	126
E51	Power transistor anomaly	131
E57	Insufficient refrigerant amount or detection of service valve closure	136
E58	Current safe stop	138
E59	Compressor startup failure	145
E60	Compressor rotor lock error	146

(2) Troubleshooting

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Operates but does not cool.
	Outdoor unit control PCB	Green LED	Red LED	
		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
- Faulty expansion valve operation

5. Troubleshooting

Diagnosis	Countermeasure
Check the indoor unit fan operation. Check the temperature difference between return and supply air.	
Is the temperature difference between return and supply air 10-20°C at cooling? YES → Does the heat load increase after installation? NO →	It is normal. (This unit is designed to start in the soft start mode by detecting the under dome temperature of compressor when it restart after power reset.)
YES → Mistake in model selection. Calculate heat load once more.	It is necessary to replace to higher capacity unit or to install additional unit.
NO → Is the compressor operating? NO → "WAIT" message is displayed (for 3 seconds) when performing cooling, dehumidifying and heating operations from the remote control. YES →	Compressor refrigerant oil protection control at starting is activated. For the contents of control, refer to the compressor start control of the microcomputer control functions.
NO →	Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputor control functions.
YES → Is the compressor rotation speed low? NO →	Inspect the followings. • Minor clogging of filter • Minor clogging of heat exchanger • Minor short-circuit • Minor shortage of refrigerant amount • Poor compression of compressor
YES → Check which control "Determination control of compressor rotation speed" or "Protective control by controlling compressor rotation speed" is appropriate to this phenomenon.	
Are the temperature conditions of room and outdoor air close to the rated conditions? (1) YES →	Considering appropriate operation control, check suspicious points. Inspect the followings for reference. • Major clogging of filter • Major clogging of heat exchanger • Major short-circuit • Major shortage of refrigerant amount • Compressor protection ON • Indoor fan tap • Valid setting of silent mode
Note (1) Outdoor: 35°CDB, Indoor: 27°CDB/19°CWB	
NO → The unit is operating normally but is operating under the contol for protecting compressor or other respective parts.	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Operates but does not heat.
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1.Applicable model

All models

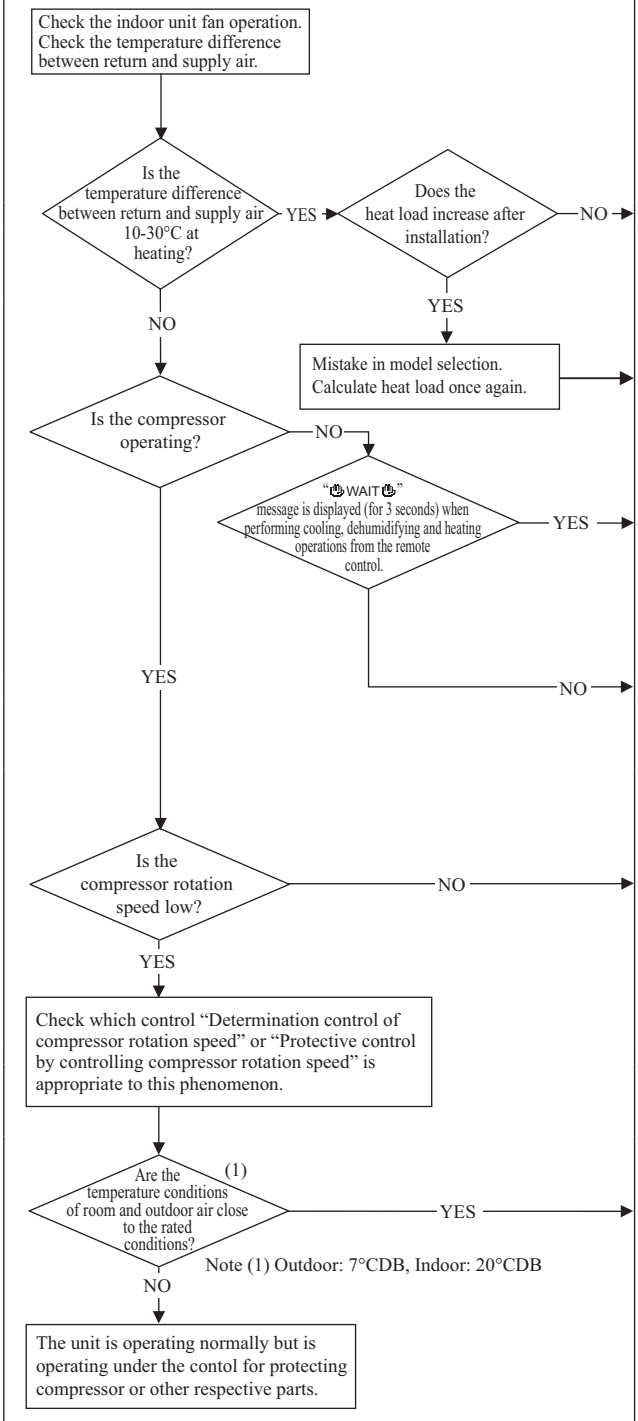
2.Error detection method

3. Condition of error displayed

4.Presumable cause

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

5.Troubleshooting



Countermeasure

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

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

Compressor refrigerant oil protection control at starting is activated. For the contents of control, refer to the compressor start control of the microcomputer control functions.

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

Inspect the followings.
- Minor clogging of filter
- Minor clogging of heat exchanger
- Minor short-circuit
- Minor shortage of refrigerant amount
- Poor compression of compressor

Considering appropriate operation control, check suspicious points.
Inspect the followings for reference.
- Major clogging of filter
- Major clogging of heat exchanger
- Major short-circuit
- Major shortage of refrigerant amount
- Compressor protection ON
- Indoor fan tap
- Valid setting of silent mode

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Earth leakage breaker activated
	Outdoor unit control PCB	Green LED	Red LED	
		Stays OFF	Stays OFF	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Defective compressor
- Noise

5. Troubleshooting

Diagnosis	Countermeasure
Are OK the insulation resistance and resistance between terminals (1) of compressor?	
NO	Replace compressor.*
(1) 1.044Ω or more at 20°C (Model FDC100VNX-W) 1.044Ω or more at 20°C (Model FDC100VSX-W) 0.448Ω or more at 20°C (Model FDC100VNA-W) 1.044Ω or more at 20°C (Model FDC100VSA-W) 0.309Ω or more at 20°C (Model FDC200VSA-W) 0.724Ω or more at 20°C (Model FDC100VNP-W)	
YES	
Is insulation of respective harnesses OK? Is any harness bitten between pannel and casing or etc?	
NO	Secure insulation resistance.
YES	
Check the outdoor unit grounding wire/earth leakage breaker.	

Check of the outdoor unit grounding wire/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 that it is conformed to higher harmonic regulation.

* Insulation resistance of compressor
• Immediately after installation or when the unit has been left for long time without power source, the insulation resistance may drop to a few MΩ because of refrigerant migrated in the compressor.
When the earth 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.(Except for FDC100VNP-W)
When power ON, crankcase heater heat up compressor and evaporate the refrigerant migrated in the compressor.
② Check if the earth leakage breaker is conformed to higher harmonic regulation or not.
Since the unit is equipped with inverter, it is necessary to use components conformed to higher harmonic regulation in order to prevent malfunction of earth leakage breaker.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Excessive noise/vibration (1/3)
	Outdoor unit control PCB	Green LED	Red LED	
		–	–	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

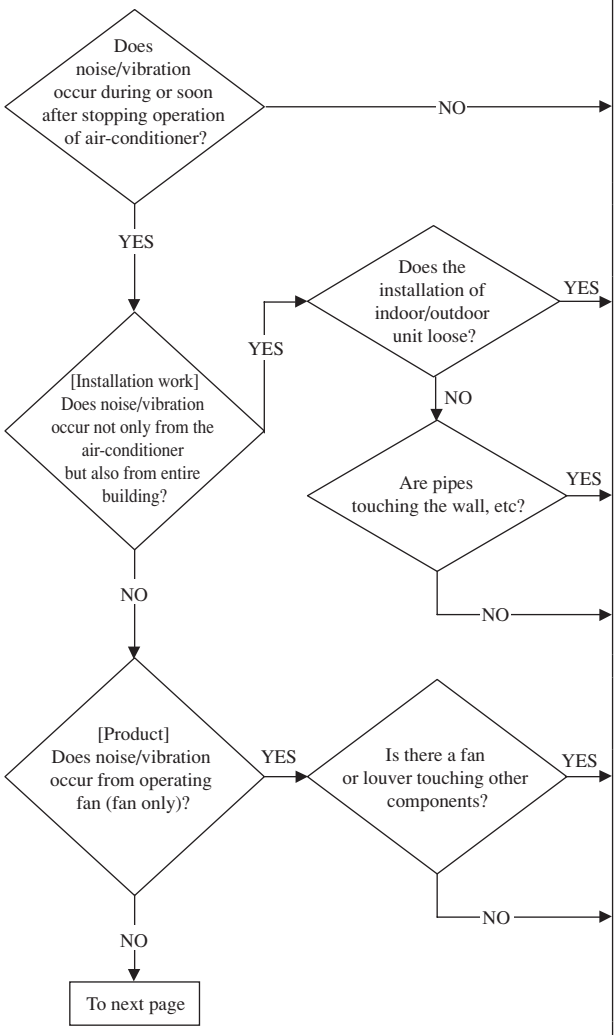
4. Presumable cause

① Improper installation work
- Improper anti-vibration work at installation
- Insufficient strength of mounting face

② Defective product
- Before/after shipping from factory

③ Improper adjustment during commissioning
- Excess/shortage of refrigerant, etc.

5. Troubleshooting



Countermeasure

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

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

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

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

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

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

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Excessive noise/vibration (2/3)
	Outdoor unit control PCB	Green LED	Red LED	
		–	–	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

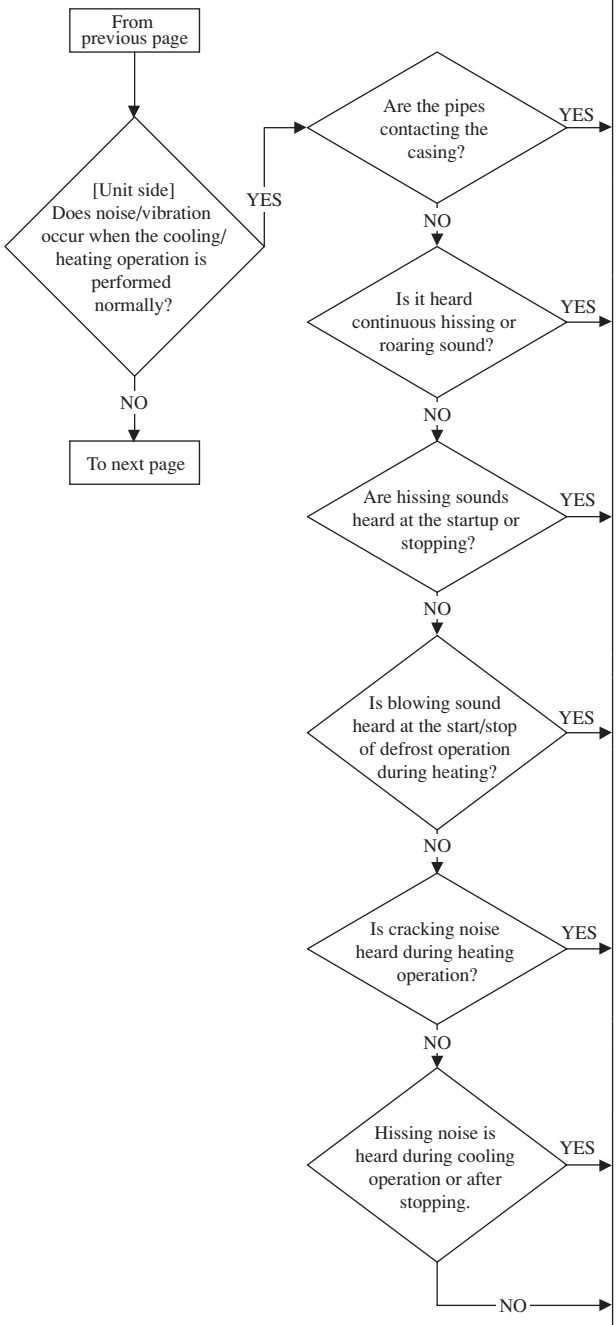
4. Presumable cause

① Improper installation work
- Improper anti-vibration work at installation
- Insufficient strength of mounting face

② Defective product
- Before/after shipping from factory

③ Improper adjustment during commissioning
- Excess/shortage of refrigerant, etc.

5. Troubleshooting



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

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Excessive noise/vibration (3/3)
	Outdoor unit control PCB	Green LED	Red LED	
		–	–	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

① Improper installation work
- Improper anti-vibration work at installation
- Insufficient strength of mounting face

② Defective product
- Before/after shipping from factory

③ Improper adjustment during commissioning
- Excess/shortage of refrigerant, etc.

5. Troubleshooting

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

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Louver motor failure
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Defective LM
- LM wire breakage
- Faulty indoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
▲ Check at the indoor unit side.	
Operate after waiting for more than 1 minute.	
Does the louver operate at the power on? — NO → Is LM wiring broken? — YES	Repair wiring.
Is LM wiring broken? — NO → Is LM locked? — NO	Defective indoor unit control PCB → Replace.
Is LM locked? — YES	Replace LM.
Does the louver operate at the power on? — YES → Is the louver operable with the remote control? — YES	Normal
Is the louver operable with the remote control? — NO	Adjust LM lever and then check again.
LM: louver motor	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Power source system error (Power source to indoor unit control PCB)
	Outdoor unit control PCB	Green LED	Red LED	
		Stays OFF	2-time flash	

1. Applicable model

All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Misconnection or breakage of connecting wires
- Blown fuse
- Faulty indoor unit control PCB
- Broken harness
- Faulty outdoor unit control PCB (Noise filter)

5. Troubleshooting

Diagnosis	Countermeasure
Is AC220/240V detected between 1 and 2 on the terminal block of indoor unit? → NO → Is AC380/415V for 3-phase unit detected between 1, 2 and 3 on the teminal block of outdoor unit or is AC220/240V for 1-phase unit detected between 1 and 2 on the terminal block of outdoor unit? → NO	Defective outdoor unit control PCB (Noise filter) → Replace.
→ YES	Misconnection or breakage of connecting wires
YES → Are fuse OK (250V 3.15A)? → NO	Replace fuse.
YES	Defective indoor unit control PCB → Replace.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	Power source system error (Power source to remote control)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

All models

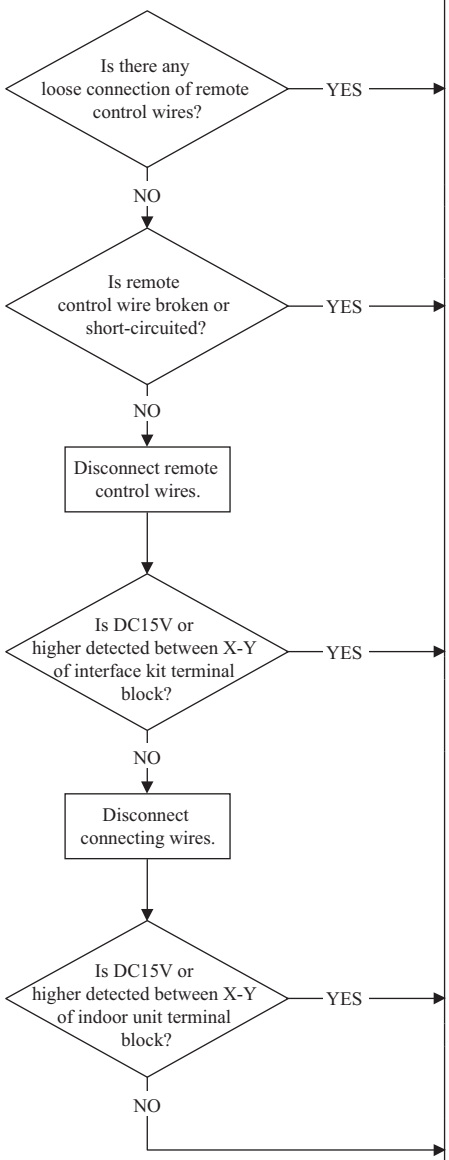
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Remote control wire breakage/short-circuit
- Defective remote control
- Malfunction by noise
- Broken harness
- Faulty indoor unit control PCB
- Faulty interface kit

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: INSPECT I/U		–	–	INSPECT I/U (When 1 or 2 remote controls are connected)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	2-time flash	

1. Applicable model

All models

2. Error detection method

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

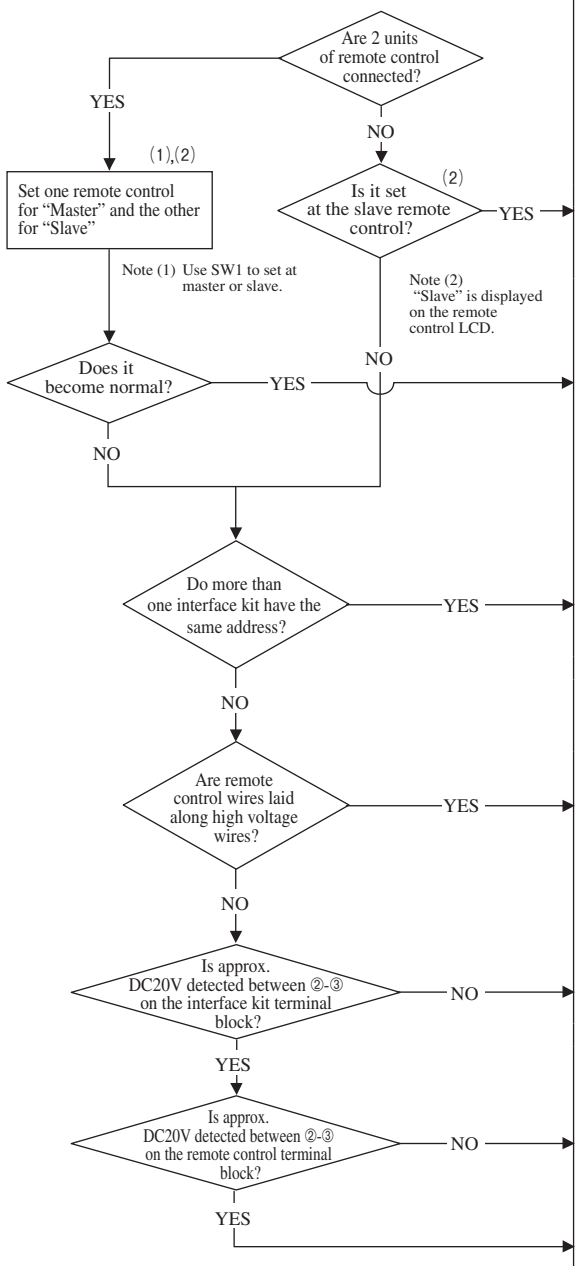
3. Condition of error displayed

Same as above

4. Presumable cause

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

5. Troubleshooting



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

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: INSPECT I/U		–	–	INSPECT I/U (Connection of 3 units or more remote controls)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	2-time flash	

1. Applicable model

All models

2. Error detection method

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

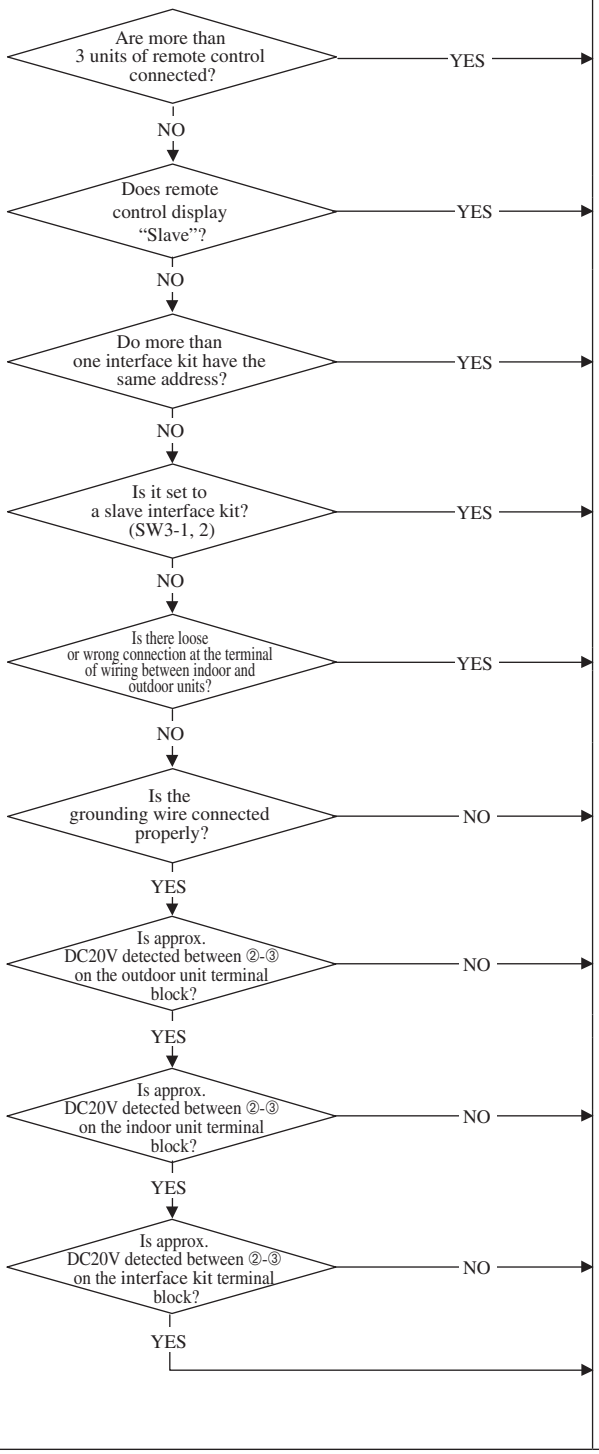
3. Condition of error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor unit control PCB
- Faulty outdoor unit control PCB
- Faulty interface kit PCB

5. Troubleshooting



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

Error code	Indoor display	RUN light	TIMER light	Content	Communication error at initial operation (1/3) (Models FDC100VN(S)X-W,100VN(S)A-W only)
Remote control: WAIT		–	–		
	Outdoor unit control PCB	Green LED	Red LED		
		Keeps flashing	2-time flash		

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W

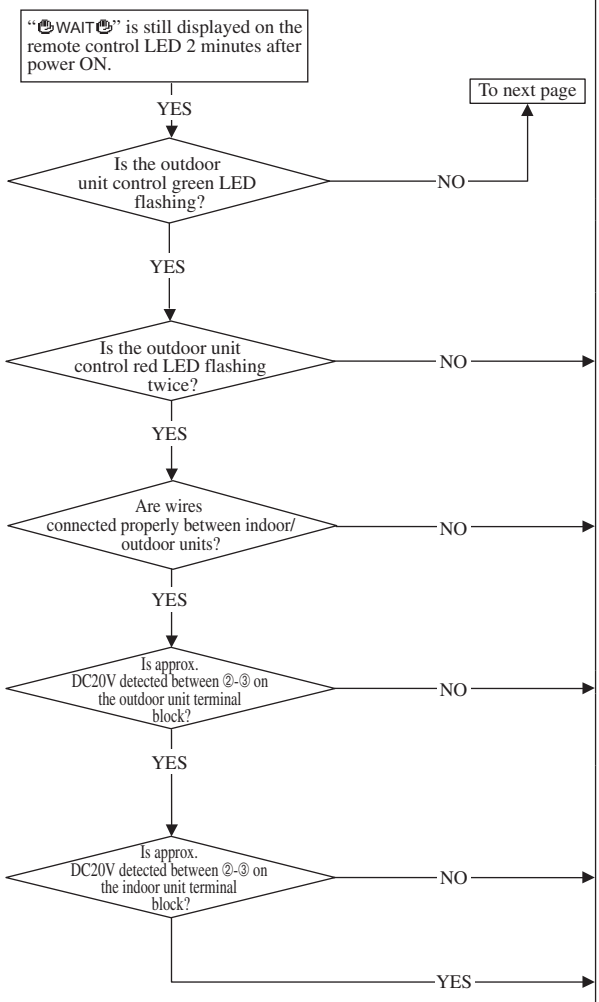
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire
- Faulty outdoor unit control PCB
- Broken connection wires

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: WAIT		–	–	Communication error at initial operation (2/3) (Models FDC100VN(S)X-W,100VN(S)A-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	2-time flash	

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W

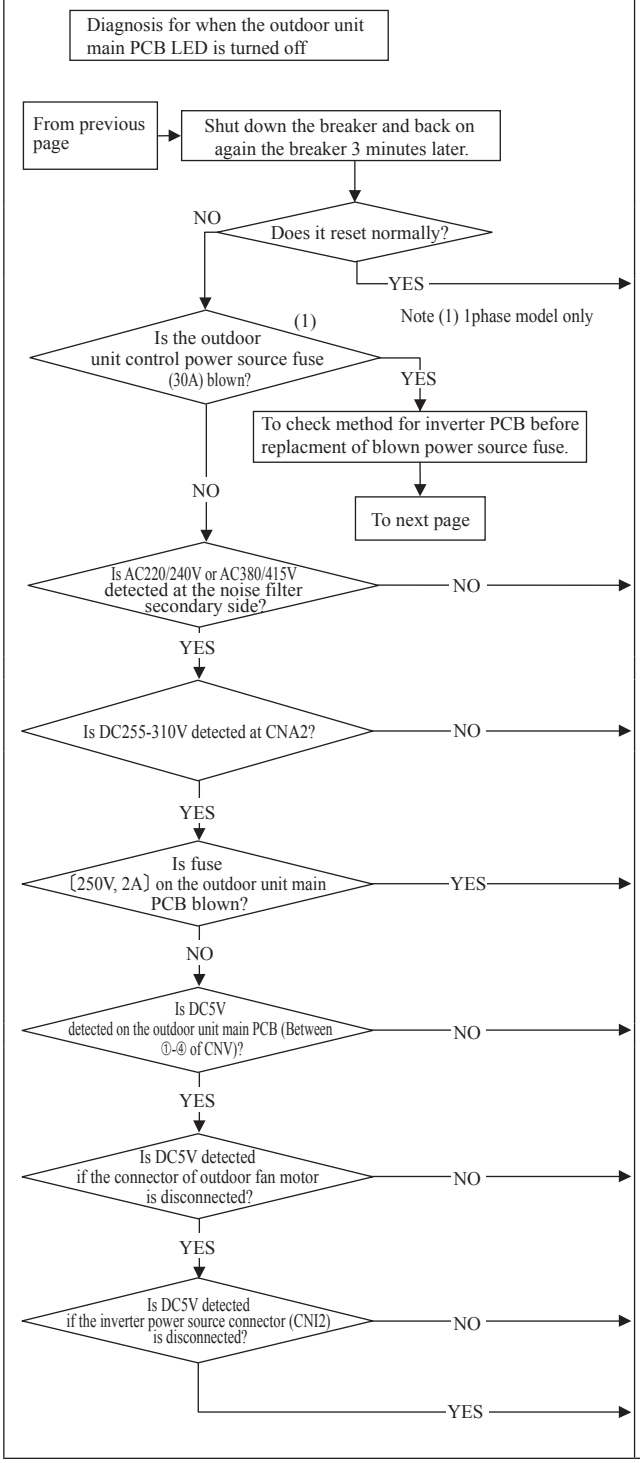
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty noise filter
- Faulty indoor unit control PCB
- Faulty outdoor unit control PCB
- Faulty fan motor

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content	Communication error at initial operation (3/3) (Models FDC100VN(S)X-W,100VN(S)A-W only)
Remote control: WAIT		–	–		
	Outdoor unit control PCB	Green LED	Red LED		
		Keeps flashing	2-time flash		

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W

2. Error detection method

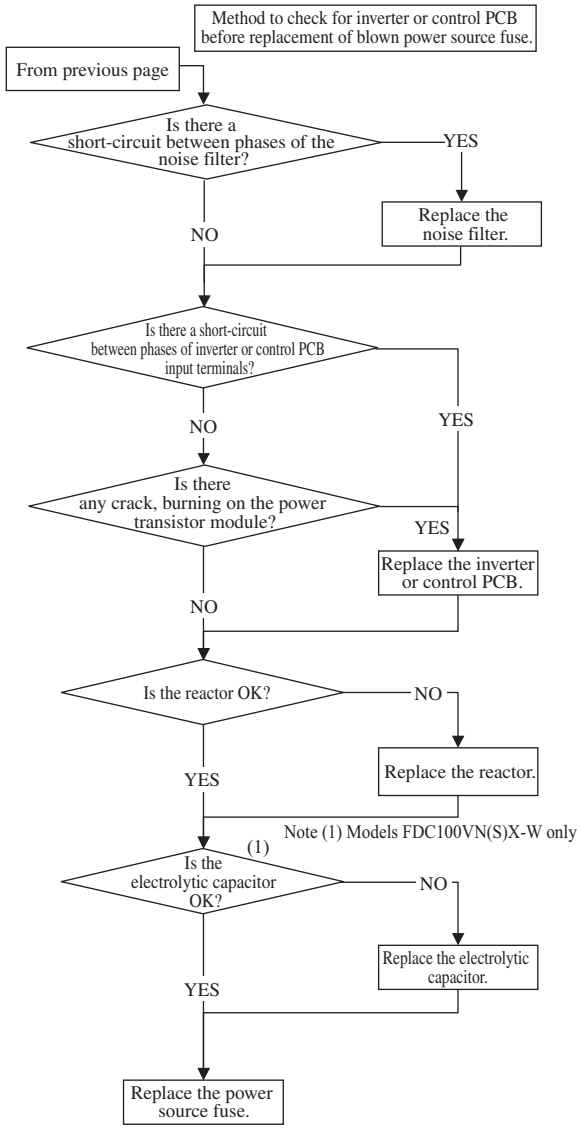
3. Condition of error displayed

4. Presumable cause

- Blown fuse
- Faulty noise filter
- Faulty inverter or control PCB
- Faulty reactor
- Faulty electrolytic capacitor

5. Troubleshooting

Diagnosis



Countermeasure

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: WAIT		–	–	Communication error at initial operation (1/2) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	2-time flash	

1. Applicable model

Model FDC200VSA-W

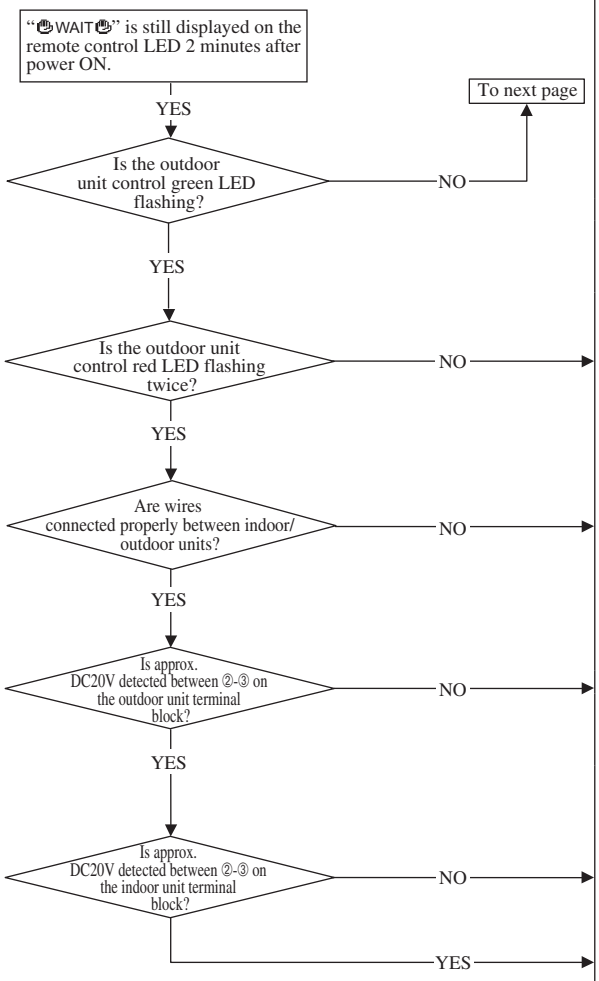
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire
- Faulty outdoor unit control PCB
- Broken connection wires

5. Troubleshooting



Diagnosis

Countermeasure

Note:

Error code	Indoor display	RUN light	TIMER light	Content	Communication error at initial operation (2/2) (Model FDC200VSA-W only)
Remote control: WAIT		–	–		
	Outdoor unit control PCB	Green LED	Red LED		
		Keeps flashing	2-time flash		

1. Applicable model

Model FDC200VSA-W

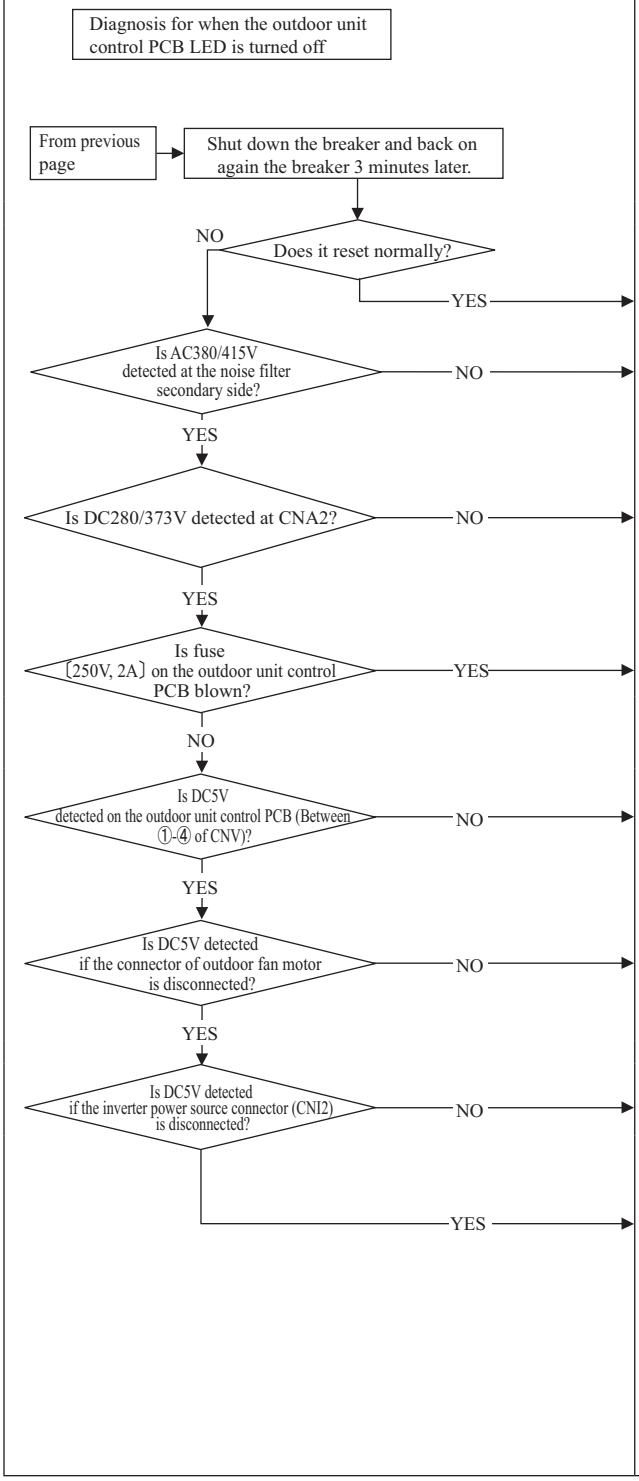
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty noise filter
- Faulty indoor unit control PCB
- Faulty outdoor unit control PCB
- Faulty inverter PCB
- Faulty fan motor

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: WAIT		–	–	Communication error at initial operation (1/3) (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

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

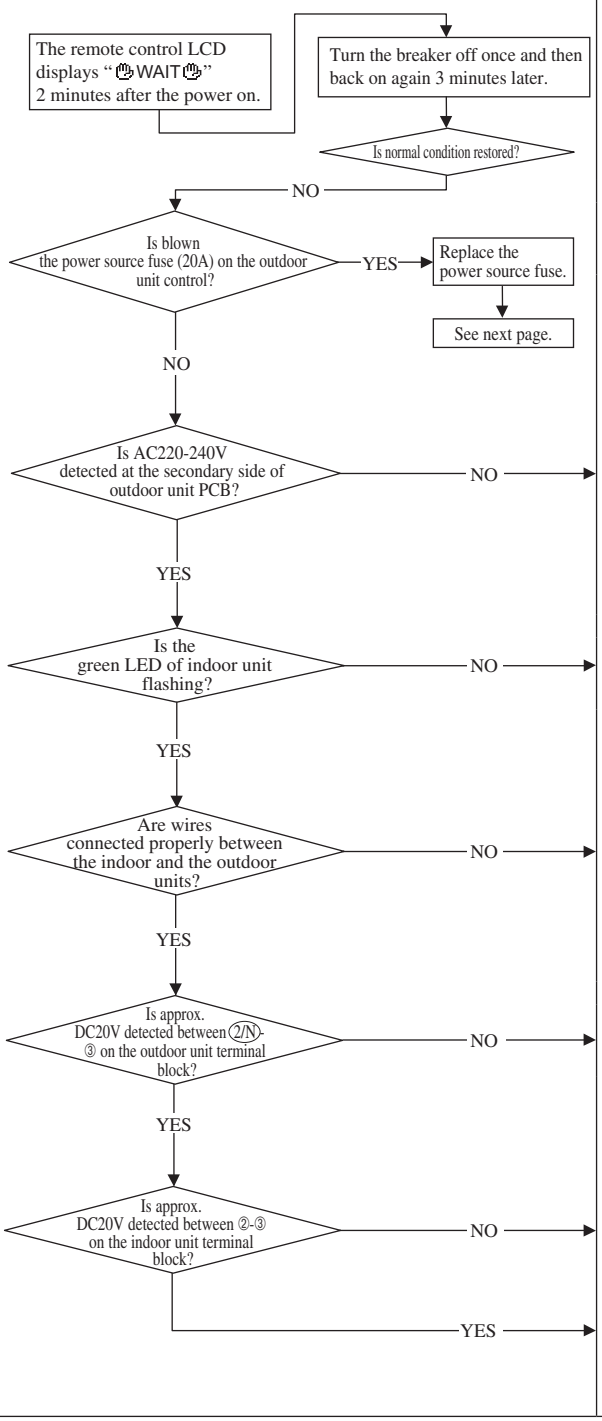
2. Error detection method

3. Condition of error displayed

4. Presumable cause

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

5. Troubleshooting



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

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: WAIT		–	–	Communication error at initial operation (2/3) (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

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

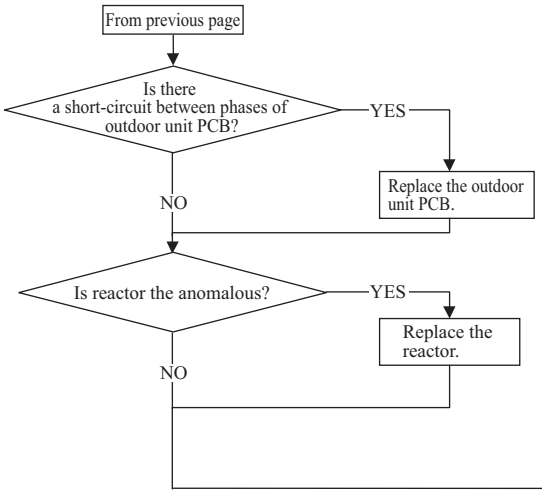
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Blown fuse
- Faulty outdoor unit PCB
- Faulty reactor

5. Troubleshooting

Diagnosis	Countermeasure
	Replace fuse.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: WAIT		–	–	Communication error at initial operation (3/3) (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

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

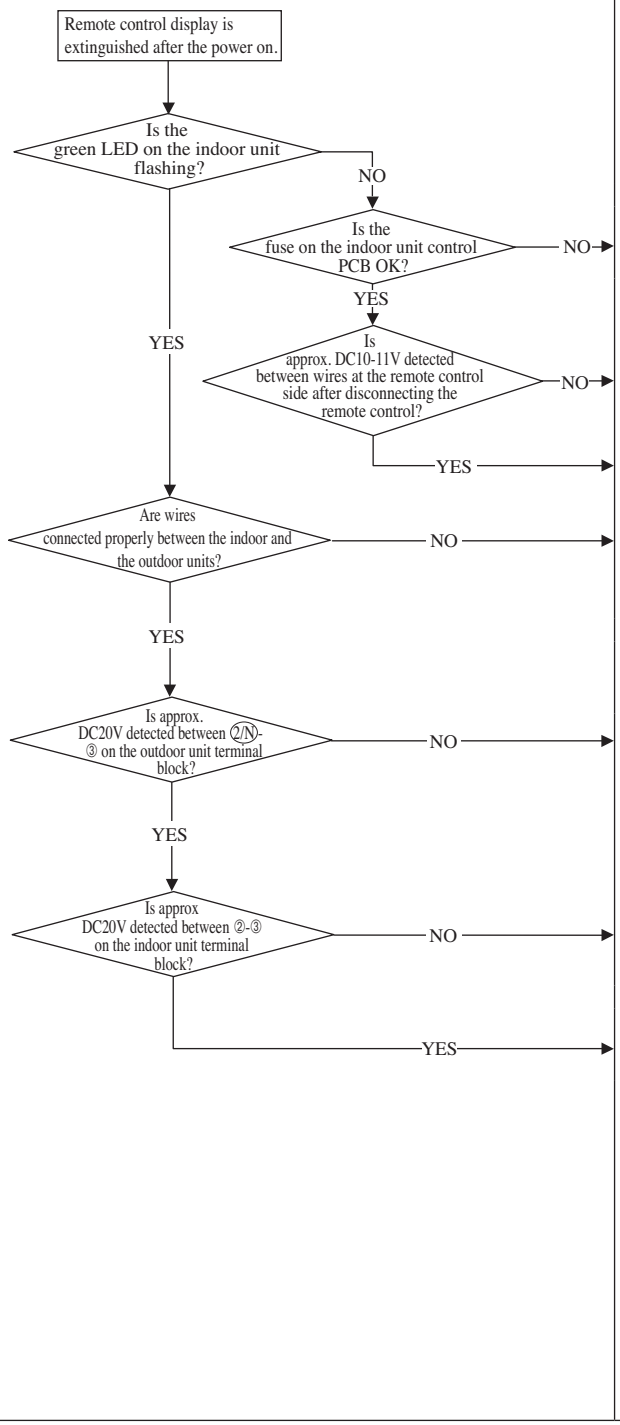
2. Error detection method

3. Condition of error displayed

4. Presumable cause

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

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		–	–	No display (Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Stays OFF	Stays OFF	

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W

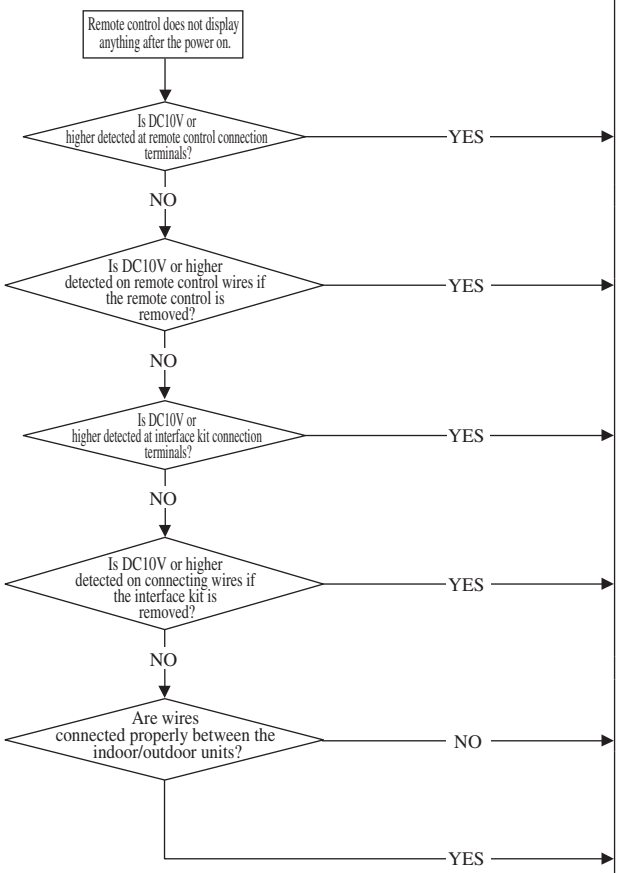
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire
- Defective interface kit

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E1		–	–	Remote control communication circuit error
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

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

3. Condition of error displayed

Same as above

4. Presumable cause

- Defective communication circuit between remote control-indoor unit
- Noise
- Defective remote control
- Faulty indoor unit control PCB
- Defective interface kit

5. Troubleshooting

Diagnosis	Countermeasure
Is it possible to reset normally by the power reset? YES	Malfunction by noise Check peripheral environment.
NO → Is DC10V or higher detected at remote control connection terminals? YES	Defective remote control
NO → Is DC10V or higher detected on remote control wires if the remote control is removed? YES	Defective remote control
NO → Is DC10V or higher detected at interface kit connection terminals? YES	Defective interface kit
NO → Is DC10V or higher detected on connecting wires if the interface kit is removed? YES	Defective interface kit
NO → Are wires connected properly between the indoor/outdoor units? YES	Defective connecting wire Defective remote control wire (Short-circuit, etc.)
NO	Defective indoor unit control PCB→Replace.

Note Does the remote control still display "WAIT" even after 3 minutes?

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

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E5		ON	6-time flash	Communication error during operation
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	See below	

1. Applicable model

All models

2. Error detection method

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

3. Condition of error displayed

Same as above is detected during operation.

4. Presumable cause

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

5. Troubleshooting

Diagnosis	Countermeasure
In case that the outdoor unit red LED flashes 2-times	
Note Inspect faulty connections (disconnection, looseness) on the outdoor unit terminal block. Is the connection of signal wires at the outdoor unit side OK? NO	Repair signal wires.
YES Note Check for faulty connection or breakage of signal wires between indoor-outdoor units. Is the connection of signal wires between indoor-outdoor units OK? NO	Repair signal wires.
YES Power source reset Has the remote control LCD returned to normal state? NO	To the diagnosis of "WAIT"
YES	Unit is normal. (Malfunction by temporary noise, etc.)
In case that the outdoor unit red LED stays OFF	
Power source reset Has the remote control LCD returned to normal state? NO	Defective outdoor unit control PCB (Defective network communication circuit) → Replace.
YES	Unit is normal. (Malfunction by temporary noise, etc.)

Note: Pressing the pump-down switch cancels communications between indoor and outdoor unit so that "communication error-E5" is displayed on indoor unit and remote control, but it is normal.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		1(3)-time flash(1)	ON	Indoor heat exchanger temperature sensor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

Note(1) Value in ( ) are the $Th2_2$.

1. Applicable model

All models

2. Error detection method

Anomalously low temperature or high temperature (resistance) is detected on the indoor heat exchanger temperature sensor ($Th2_1$, $Th2_2$).

3. Condition of error displayed

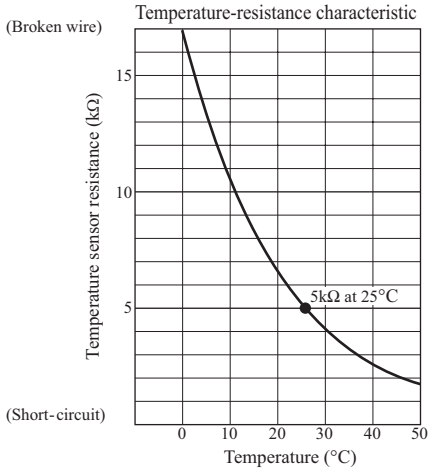
- When the temperature sensor detects -28°C or lower for 15 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

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

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of indoor heat exchanger temperature sensor connector OK? — NO	Correct it. → Insert connector securely.
YES → Are characteristics of indoor heat exchanger temperature sensor OK? — NO	Defective indoor heat exchanger temperature sensor → Replace.
YES	Defective indoor unit control PCB → Replace. (Defective indoor unit heat exchanger temperature sensor input circuit)



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: None		2-time flash	ON	Room air temperature sensor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Anomalously low temperature or high temperature (resistance) is detected by room air temperature sensor (Th1)

3. Condition of error displayed

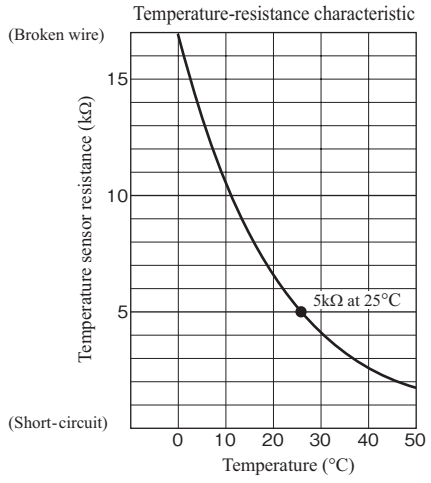
- When the temperature sensor detects -45°C or lower for 15 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Defective room air temperature sensor connector
- Defective room air temperature sensor
- Faulty indoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of room air temperature sensor connector OK? — NO	Correct it. → Connect connector.
YES → Are the characteristics of room air temperature sensor OK? — NO	Defective room air temperature sensor → Replace.
YES	Defective indoor unit control PCB → Replace. (Defective room air temperature sensor input circuit)



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E10		–	–	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control
	Outdoor unit control PCB	Green LED	Red LED	
		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 contorl

3. Condition of error displayed

Same as above

4. Presumable cause

- Excessive number of indoor units connected
- Defective remote control

5. Troubleshooting

Diagnosis	Countermeasure
Are more than 17 indoor units connected to one remote control? → NO	Defective remote control → Replace.
Are more than 17 indoor units connected to one remote control? → YES	Reduce to 16 or less units.

Note:

Error code	Indoor display	RUN light	TIMER light	Content	Address setting error of indoor units (Models FDC100 only)
Remote control: E11		–	–		
	Outdoor unit control PCB	Green LED	Red LED		
		Keeps flashing	stays OFF		

1. Applicable model

Models FDC100

2. Error detection method

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

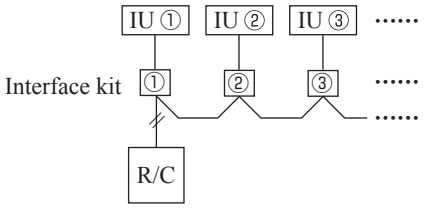
3. Condition of error displayed

Same as above

4. Presumable cause

Mistake of address setting method
(Address setting from remote control can't be done.)

5. Troubleshooting

Diagnosis	Countermeasure
E11 occurs ↓ Is "Master IU address set" function of remote control used? YES →	Change of address setting method Set the address by DIP switch SW2 on indoor unit control PCB.
In case the wiring is below and "Master IU address set" is used, E11 is appeared.  	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E14		–	–	Communication error between master and slave indoor units (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When communication error between master and slave indoor units occurs

3. Condition of error displayed

Same as above

4. Presumable cause

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

5. Troubleshooting

Diagnosis	Countermeasure
Is it OK the unit address setting for master and slave interface kit? → NO	Correct unit address setting.
YES → Is the remote control wiring between interface kit defective? → YES	Correct wiring.
NO → Is the interface kit wiring between indoor units defective? → YES	Correct wiring.
NO → Is it restored by resetting the power source? → NO	Defective indoor unit control PCB→Replace.
YES	• Malfunction by noise • Check surrounding environment.

Note (1) Set DIP switches SW3-1 and SW3-2 as shown in the following table.
(Factory default setting – "Master")

		Interface kit	
		Master	Slave1
Dip switch	SW3-1	OFF	OFF
	SW3-2	OFF	ON

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E16		6-time flash	ON	Indoor fan motor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Detected by rotation speed of indoor fan motor

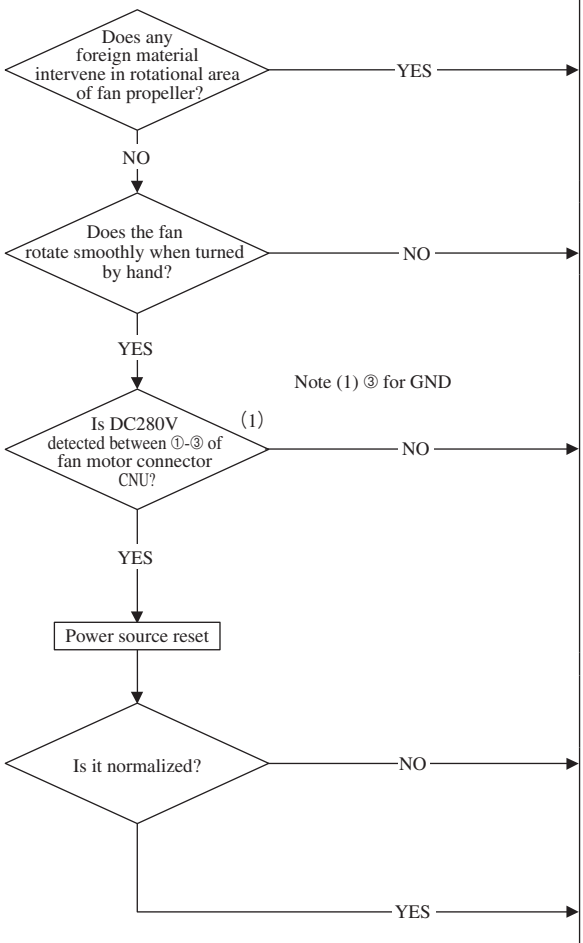
3. Condition of error displayed

- When actual rotation speed of indoor fan motor drops to lower than 300min^{-1} for 30 seconds continuously, the compressor and the indoor fan motor stop.

4. Presumable cause

- Defective indoor unit control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on indoor unit control PCB
- External noise, surge

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E28		–	–	Remote control temperature sensor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

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

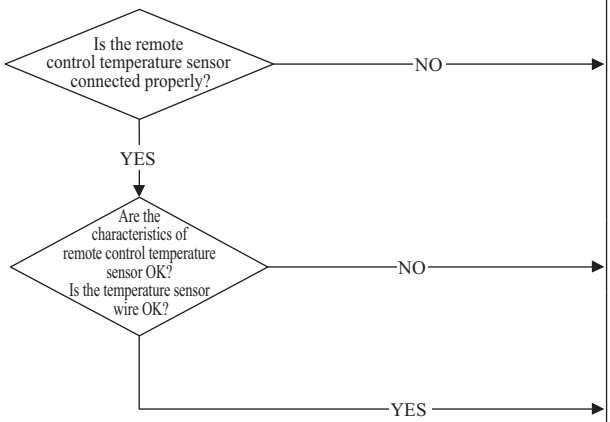
3. Condition of error displayed

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

4. Presumable cause

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

5. Troubleshooting



Temperature-resistance characteristics of remote control temperature sensor (Thc)

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

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

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E35		ON	Keeps flashing	Cooling overload operation (Models FDC100VN(S)X-W,100VN(S)A-W, 200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W

2. Error detection method

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

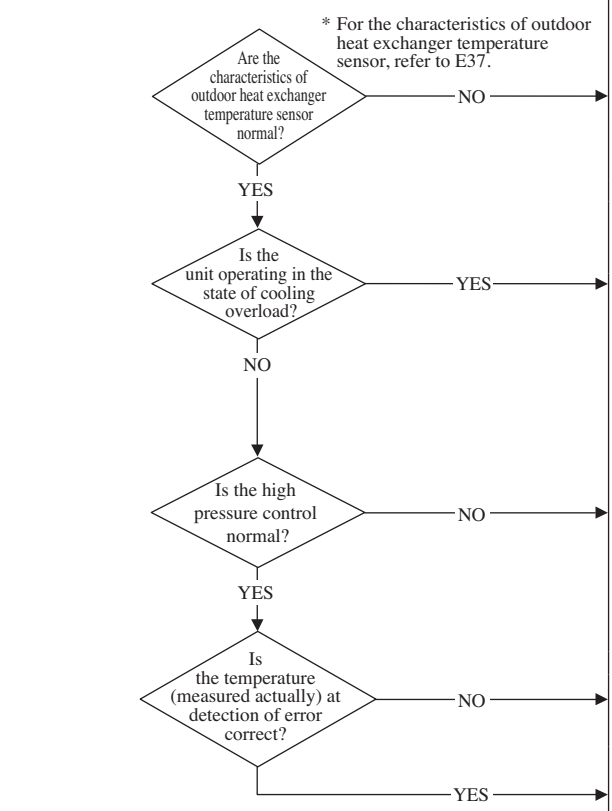
3. Condition of error displayed

When outdoor heat exchanger temperature anomaly is detected 5 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop

4. Presumable cause

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

5. Troubleshooting



* For the contents of control, refer to cooling high pressure protective control in the protective control by controlling compressor rotation speed of microcomputer control function for corresponding models.

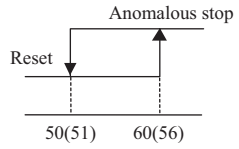
Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E35		ON	Keeps flashing	Cooling overload operation (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method



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

3. Condition of Error displayed

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

4. Presumable cause

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

5. Troubleshooting

Diagnosis	Countermeasure
* For the characteristics of outdoor heat exchanger temperature sensor, refer to E37.	
Are the characteristics of outdoor heat exchanger temperature sensor normal? — NO	Replace outdoor heat exchanger temperature sensor.
YES	
Is the unit operating in the state of cooling overload? — YES	Check unit side. • Isn't the air circulation of outdoor unit short-circuited? • Are installation spaces adequate? • Isn't there any fouling or clogging on heat exchanger?
NO	
Is the high pressure control normal? — NO	Control operation check*
YES	
Is the temperature (measured actually) at direction of error correct? — NO	Defective outdoor unit control PCB→Replace.
YES	Excessive refrigerant amount: Recharge refrigerant by weighing proper amount on a scale.

* For the contents of control, refer to cooling high pressure protective control in the protective control by controlling compressor rotation speed of microcomputer control function for corresponding models.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E36		ON	5-time flash	Discharge pipe temperature error (Models FDC100 only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100

2. Error detection method

For the error detection method, refer to compressor overheat in protective control in the protective control by controlling compressor rotation speed of microcomputer control function for corresponding models.

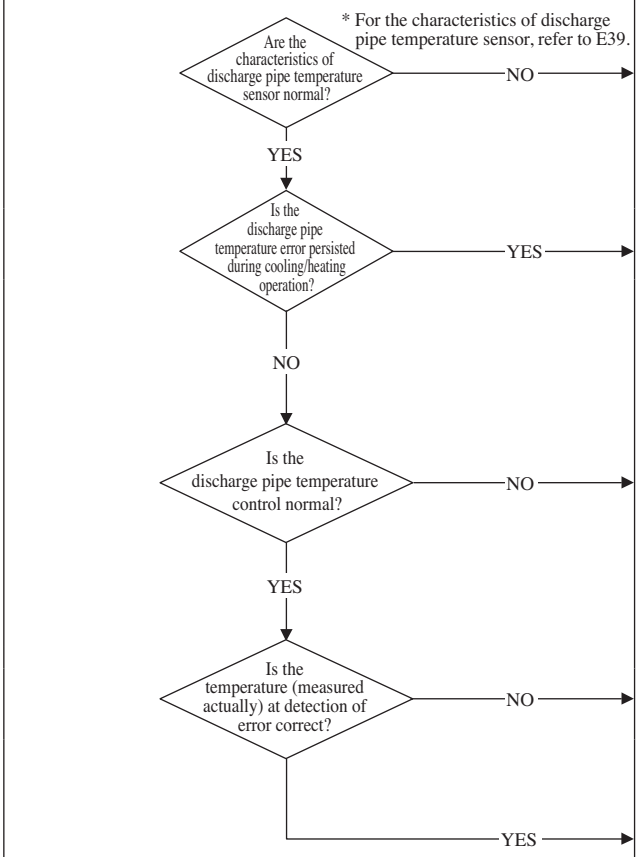
3. Condition of error displayed

When discharge pipe temperature anomaly is detected 2 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop

4. Presumable cause

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

5. Troubleshooting



* For the contents of control, refer to compressor overheat in protective control in the protective control by controlling compressor rotation speed of microcomputer control function for corresponding models.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E36		ON	5-time flash	Discharge pipe temperature error (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

For the error detection method, refer to compressor overheat protective control in the protective control by controlling compressor rotation speed of microcomputer control function for corresponding models.

3. Condition of error displayed

When discharge pipe temperature anomaly is detected 2 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop.

4. Presumable cause

- Defective outdoor unit control PCB
- Defective discharge pipe temperature sensor
- Clogged filter
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger
- Faulty solenoid valve SV1 (at heating mode)
- Clogging of capillary tube of SV1 circuit (at heating mode)
- Faulty coil of SV1
- Faulty control PCB
- Faulty body of SV1
- Clogging of the strainer on the upstream of SV1(at heating mode)
- Insufficient amount of refrigerant

5. Troubleshooting

Diagnosis	Countermeasure
* For the characteristics of discharge pipe temperature sensor, refer to E39. Are the characteristics of discharge pipe temperature sensor normal? — NO	Replace discharge pipe temperature sensor.
YES Is the discharge pipe temperature error persisted during cooling /heating operation? — YES	Insufficient refrigerant amount : Recharge refrigerant by weighing proper amount on a scale.
NO Is the discharge pipe temperature control normal? — NO	Control operation check *
YES Is the temperature (measured actually) at detection of error correct? — NO	Defective outdoor unit control PCB→Replace.
YES	Check unit side: • Isn't filter clogged? • Are indoor, outdoor unit installation spaces adequate? • Isn't there any short-circuit of air? • Isn't there any fouling, clogging on indoor heat exchanger? • In addition to the above, check the clogging and malfunction of the SV1 circuit by the flow chart * 1.
* For the contents of control, refer to compressor discharge pipe temperature protection in page 166.	
* 1 Check the following when SV1 is on. (Check On/OFF status of SV1 with Mente PC)	
Is there any problem with the coil of SV1 function? •Is the coil removed from the body of SV1? •Is the coil wiring broken? •Is the coil connector disconnected? — YES	Fix abnormal condition.
NO Is 220-240 VAC applied to the CNF terminal of the control PCB ? — NO	Change control PCB.
YES Is the temperature between capillary tube and compressor of the SV1 circuit below 40 °C when the compressor is running? — NO	Change the body of SV1, the capillary tube and/or the strainer in the SV1 circuit.
YES Is there a temperature difference between upstream and downstream of the strainer in the SV1 circuit? — YES	Change the strainer in the SV1 circuit.
NO Is the amount of refrigerant appropriate? — NO	Adjust to the appropriate amount of refrigerant.
YES	Due to suspected partial clogging of SV1 circuit, change the body of SV1, the capillary tube and/or the strainer in the SV1 circuit. or Check the other actuator.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E37		Keeps flashing	2-time flash	Outdoor heat exchanger temperature sensor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

All models

2. Error detection method

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

3. Condition of error displayed

- When the temperature sensor detects -50(-55)°C or lower for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- When -50(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON

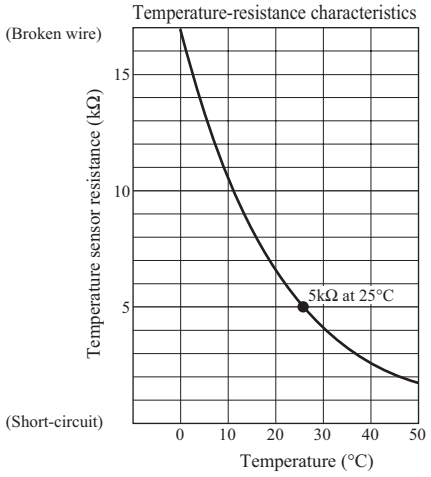
Note Value in ( ) are for the model FDC100VNP-W.

4. Presumable cause

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

5. Troubleshooting

Diagnosis	Countermeasure
Is the outdoor heat exchanger temperature sensor connector connected properly? → NO	Correct connector.
YES → For the characteristics of outdoor heat exchanger temperature sensor, see the following graph. Are the characteristics of outdoor heat exchanger temperature sensor OK? → NO	Defective outdoor heat exchanger temperature sensor→Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective outdoor heat exchanger temperature sensor input circuit)



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E38		Keeps flashing	1-time flash	Outdoor air temperature sensor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

All models

2. Error detection method

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

3. Condition of error displayed

- When the temperature sensor detects -45(-55)°C or lower for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- When -45(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON

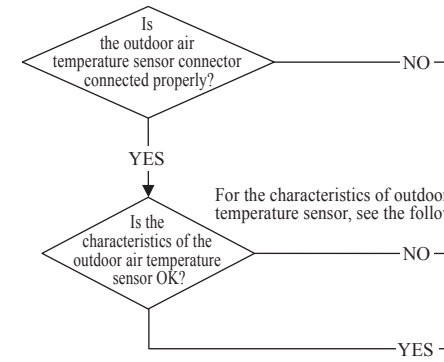
Note Value in ( ) are for the model FDC100VNP-W.

4. Presumable cause

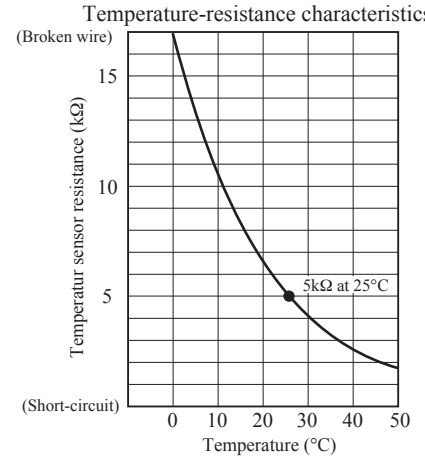
- Defective outdoor unit control (or main) PCB
- Broken sensor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)

5. Troubleshooting

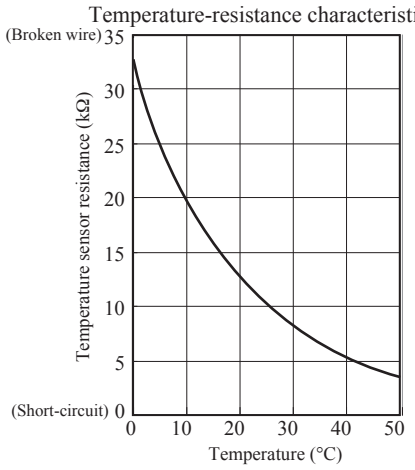
Diagnosis	Countermeasure
Is the outdoor air temperature sensor connector connected properly? → NO	Correct connector.
YES → For the characteristics of outdoor air temperature sensor, see the following graph. Is the characteristics of the outdoor air temperature sensor OK? → NO	Defective outdoor air temperature sensor→ Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective outdoor air temperature sensor input circuit)



• Model FDC100VNP-W



• Models FDC100, 200



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E39		Keeps flashing	4-time flash	Discharge pipe temperature sensor anomaly
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

All models

2. Error detection method

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

3. Condition of error displayed

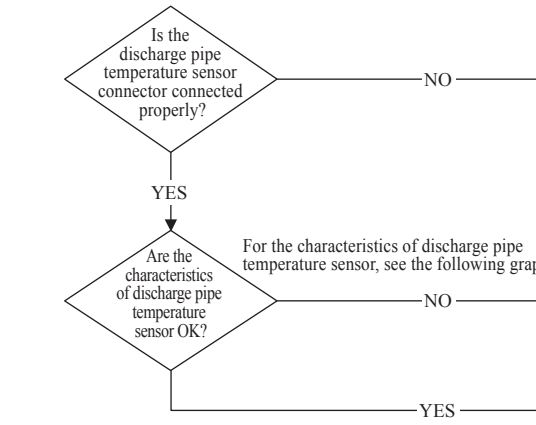
When the temperature sensor detects -10(-25)°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
Note Value in ( ) is for the model FDC100VNP-W.

4. Presumable cause

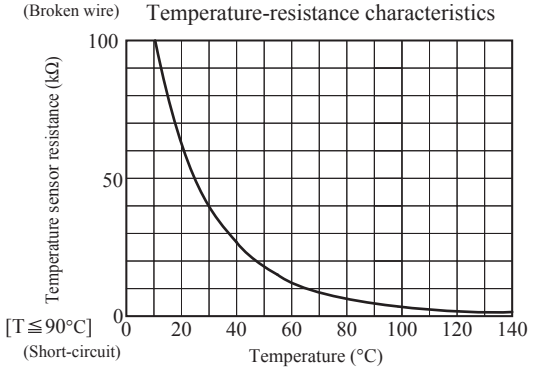
- Defective outdoor unit control (or main) PCB
- Broken sensor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)

5. Troubleshooting

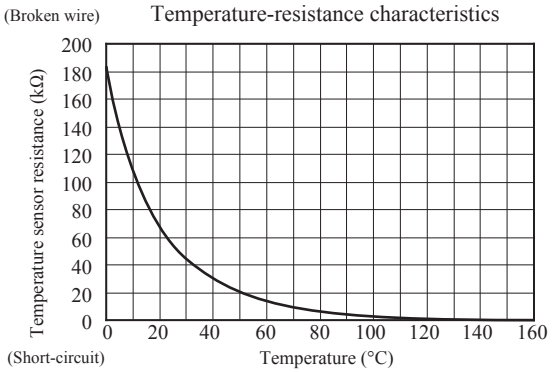
Diagnosis	Countermeasure
Is the discharge pipe temperature sensor connector connected properly? → NO	Correct connector.
YES → Are the characteristics of discharge pipe temperature sensor OK? (For the characteristics of discharge pipe temperature sensor, see the following graph.) → NO	Defective discharge pipe temperature sensor→ Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective discharge pipe temperature sensor input circuit)



• Model FDC100VNP-W



• Models FDC100, 200



Note:

Error code	Indoor display	RUN light	TIMER light
Remote control: E40		–	–
	Outdoor unit control PCB	Green LED	Red LED
		Keeps flashing	1-time flash
	Outdoor unit inverter PCB	Yellow LED	
		Keeps flashing	

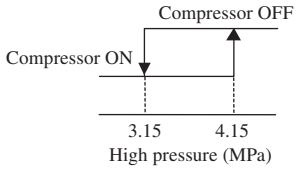
Content: **High pressure error (63H1 activated)**
(Models FDC100VN(S)X-W, 100VN(S)A-W only)

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W

2. Error detection method

When the high pressure switch 63H1 is activated



3. Condition of error displayed

If 63H1 turns OFF (opened), the compressor stops. After 3-minute delay, the compressor restarts. If this anomaly occurs 5 times within 60 minutes or continues for 60 minutes continuously.

4. Presumable cause

- Short-circuit of air flow, disturbance of air flow and clogging filter at outdoor heat exchanger/Breakdown of fan motor
- Defective outdoor unit control PCB
- Defective 63H1 connector
- Defective electronic expansion valve connector
- Closed service valve
- Mixing of non-condensing gas (nitrogen, etc.)

5. Troubleshooting

Diagnosis	Countermeasure
If the power source breaker is turned OFF and ON too quickly, E40 may be displayed. (This is normal.)	
Is the service valve fully opened? — NO	Open the service valve.
YES	
Has 63H1 activated? — NO	
On operation of 63H1 — YES	
1. During cooling ・ Is the outdoor fan motor running? ・ Isn't any short-circuit of air on the outdoor unit? ・ Are sufficient return air/supply air space secured? 2. During heating ・ Isn't the indoor heat exchanger temperature sensor disconnected from the sensor casing? ・ Isn't the filter clogged? * Under the condition of overcharging refirgerant, 63H1 may activate due to delay of starting the preventive control by compressor speed control, because detected heat exhanger temperature, which conducts compressor speed control, becomes lower than normal condition due to excess subcooling degree.	
Is 63H1 connector connected properly? — NO	Correct 63H1 connector.
YES	
Is the electronic expansion valve connector connection OK? — NO	Correct electronic expansion valve connector.
If any anomaly exists on the electronic expansion valve connector connection, the power source must be reset.	
YES	Defective outdoor unit control PCB→Replace. (Defective 63H1 input circuit)

Note: In the protective control range for compressor startup (initial startup after power ON), even if 63H1 is activated only once (63H1 turns OFF), immediately the error is displayed.

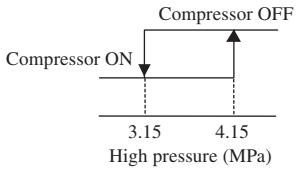
Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E40		–	–	High pressure error (63H1 activated) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When the high pressure switch 63H1 is activated.



3. Condition of error displayed

If 63H1 turns OFF (opened), the compressor stops. After 3-minute delay, the compressor restarts. If this anomaly occurs 5 times within 60 minutes or continues for 60 minutes continuously.

4. Presumable cause

- Short-circuit of air flow, disturbance of air flow and clogging filter at outdoor heat exchanger/Breakdown of fan motor
- Defective outdoor unit control PCB
- Defective 63H1 connector
- Defective electronic expansion valve connector
- Closed service valve
- Mixing of non-condensing gas (nitrogen, etc.)
- Faulty sensor(Tho-R1, Tho-R2, Thi-R1, Thi-R2, Tho-H, PSL)

5. Troubleshooting

Diagnosis	Countermeasure
If the power source breaker is turned OFF and ON too quickly, E40 may be displayed. (This is normal.)	
Is the service valve fully opened? — NO	Open the service valve.
YES	
Has 63H1 activated? — NO	
On operation of 63H1 — YES	
1. During cooling ・ Is the outdoor fan motor running? ・ Isn't any short-circuit of air on the outdoor unit? ・ Is Tho-R1, Tho-R2, Tho-H, PSL normal? ・ Is the sensor(Tho-R1, Tho-R2, Tho-H) detached from the sensor holder? ・ Is the sensor(Tho-H) covered with insulation? ・ Are sufficient return air/supply air space secured? 2. During heating ・ Isn't the indoor heat exchanger temperature sensor disconnected from the sensor casing? ・ Isn't the filter clogged? ・ Is Thi-R1, Thi-R2, Tho-H, PSL normal? ・ Is the sensor(Tho-R1, Tho-R2, Tho-H) detached from the sensor holder? ・ Is the sensor(Tho-H) covered with insulation? * Under the condition of overcharging refirgerant, 63H1 may activate due to delay of starting the preventive control by compressor speed control, because detected heat exhanger temperature, which conducts compressor speed control, becomes lower than normal condition due to excess subcooling degree.	
Is 63H1 connector connected properly? — NO	Correct 63H1 connector.
YES	
Is the electronic expansion valve connector connection OK? — NO	Correct electronic expansion valve connector.
If any anomaly exists on the electronic expansion valve connector connection, the power source must be reset.	
YES	Defective outdoor unit control PCB➞Replace. (Defective 63H1 input circuit)

Note: In the protective control range for compressor startup (initial startup after power ON), even if 63H1 is activated only once (63H1 turns OFF), immediately the error is displayed.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E40		7-time flash	1-time flash	Service valve (gas side) closing operation (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

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

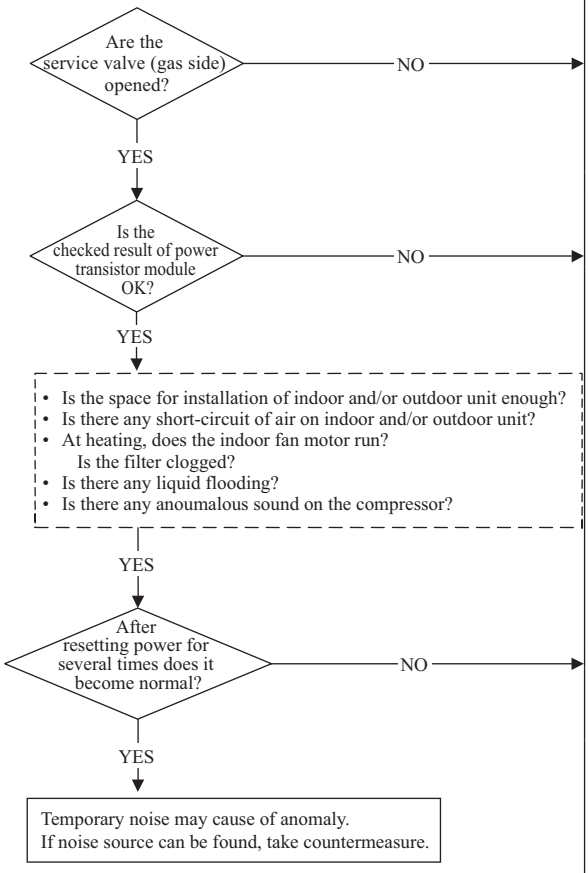
3. Condition of Error displayed

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

4. Presumable cause

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

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E41		–	–	Power transistor overheat (Models FDC100VN(S)X-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		6-time flash		

1. Applicable model

Models FDC100VN(S)X-W

2. Error detection method

When less than DC14V of the output voltage is detected between ② and ③ on CNI3, E41 is displayed (See "Note" mentioned below.)

3. Condition of error displayed

Same as above.

4. Presumable cause

- Defective inverter PCB
- Defective outdoor fan motor
- Defective outdoor unit control PCB
- Delective noise filter PCB

5. Troubleshooting

Diagnosis	Countermeasure
• Single phase models (FDC100VNX-W)	
(1) (2) Is DC15V detected between ② and ③ on CNI3? — YES →	Replace inverter PCB. If not solved, replace noise filter PCB as well.
NO ↓ Note(1) Under anomalous conditions, the voltage becomes less than DC14V.	
(1) Is DC15V detected after disconnecting outdoor fan motor? — YES →	Replace outdoor fan motor.
NO →	Replace outdoor unit control PCB. If not solved, replace inverter PCB as well.
Note(2) How to check the voltage between ② and ③ of CNI3? ⇒See E51	
• 3 phase models (FDC100VSX-W)	
E41⇒Replace inverter PCB.	

Note: The "Single phase models" of inverter PAC have no function to output the signal for the power transistor overheat. However since the power source for the power transistor and the outdoor fan motor is in the same line, when the anomaly of the outdoor fan motor occurs, E41 is displayed.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E41		–	–	Power transistor overheat (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		8-time flash		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When anomalously high temperature is detected by power transistor

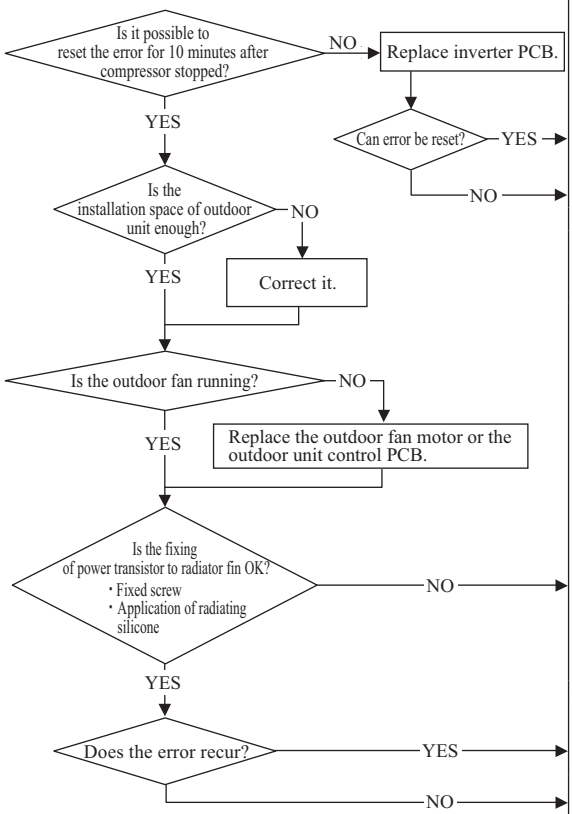
3. Condition of error displayed

Anomalously high temperature of power transistor is detected 5 times within 60 minutes.

4. Presumable cause

- Inverter PCB anomaly
- Outdoor fan motor anomaly
- Improperly fixing of power transistor to radiator fin
- Inadequate installation space of outdoor unit
- Outdoor unit control PCB anomaly
- Power transistor module anomaly

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E42		ON	1-time flash	Current cut (1/2) (Models FDC100 only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		1-time flash		

1. Applicable model

Models FDC100

2. Error detection method

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

3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection.(FDC100VN(S)X-W,FDC100VN(S)A-W only)

4. Presumable cause

- The service valves closed
- Faulty power source
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module

5. Troubleshooting

Diagnosis	Countermeasure
Is the power source voltage OK? — NO	Check power source.
YES → Are the service valves opened? — NO	Open the service valves.
YES → Is the high pressure during operation OK? — NO	Check refrigerant amount and refrigerant circuit *In case of transitional increase of high pressure and/or test run, several times restarting may recover it, because liquid refrigerant (migrated) in the compressor is discharged from the compressor.
YES → Is the checked result of insulation resistance and resistance between terminals (1) of compressor motor OK? — NO	Replace compressor.
(1) 1.044Ω or more at 20°C (Model FDC100VNX-W) 1.044Ω or more at 20°C (Model FDC100VSX-W) 0.448Ω or more at 20°C (Model FDC100VNA-W) 1.044Ω or more at 20°C (Model FDC100VSA-W) 0.724Ω or more at 20°C (Model FDC100VNP-W)	
YES → To next page.	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E42		ON	1-time flash	Current cut (2/2) (Models FDC100 only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		1-time flash		

1. Applicable model

Models FDC100

2. Error detection method

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

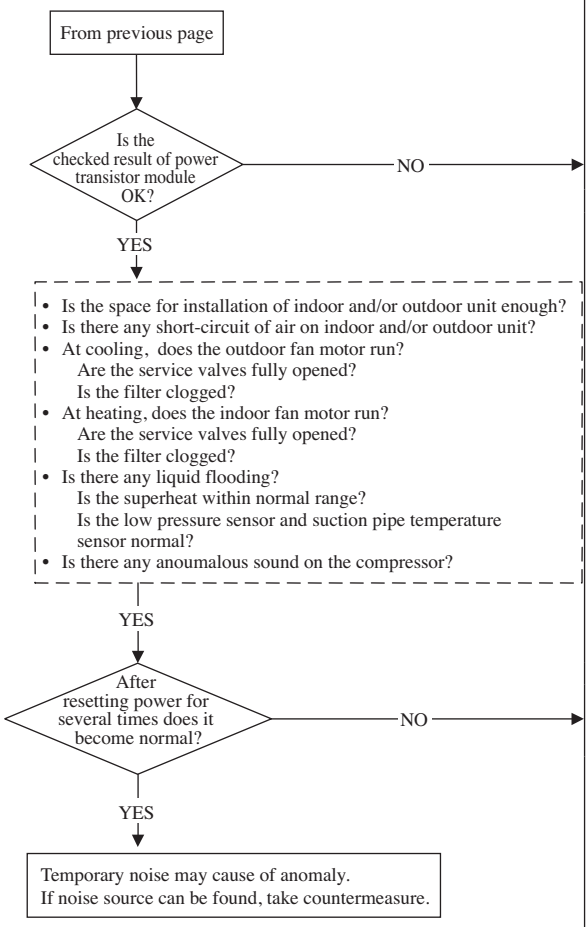
3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection. (FDC100VN(S) X-W, FDC100VN(S)A-W only)

4. Presumable cause

- Defective inverter or control PCB
- Faulty power source
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light
Remote control: E42		ON	1-time flash
	Outdoor unit control PCB	Green LED	Red LED
		Keeps flashing	1-time flash
	Outdoor unit inverter PCB	Yellow LED	
		9-time flash	

Content

Current cut (1/2) (Model FDC200VSA-W only)

1. Applicable model

Model FDC200VSA-W

2. Error detection method

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

3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection.

4. Presumable cause

- The service valves closed
- Faulty power source
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module
- Faulty body of SV1
- Faulty outdoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the power source voltage OK? — NO	Check power source.
YES	
Are the service valves opened? — NO	Open the service valves.
YES	
Is the high pressure during operation OK? — NO	Check refrigerant amount and refrigerant circuit. *In case of transitional increase of high pressure and/or test run, several times restarting may recover it, because liquid refrigerant (migrated) in the compressor is discharged from the compressor.
YES	
Is the checked result of insulation resistance and resistance between terminals (1) of compressor motor OK? — NO	Replace compressor.
(1) 0.309Ω or more at 20°C (Model FDC200VSA-W)	
YES	
To next page	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E42		ON	1-time flash	Current cut (2/2) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		9-time flash		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

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

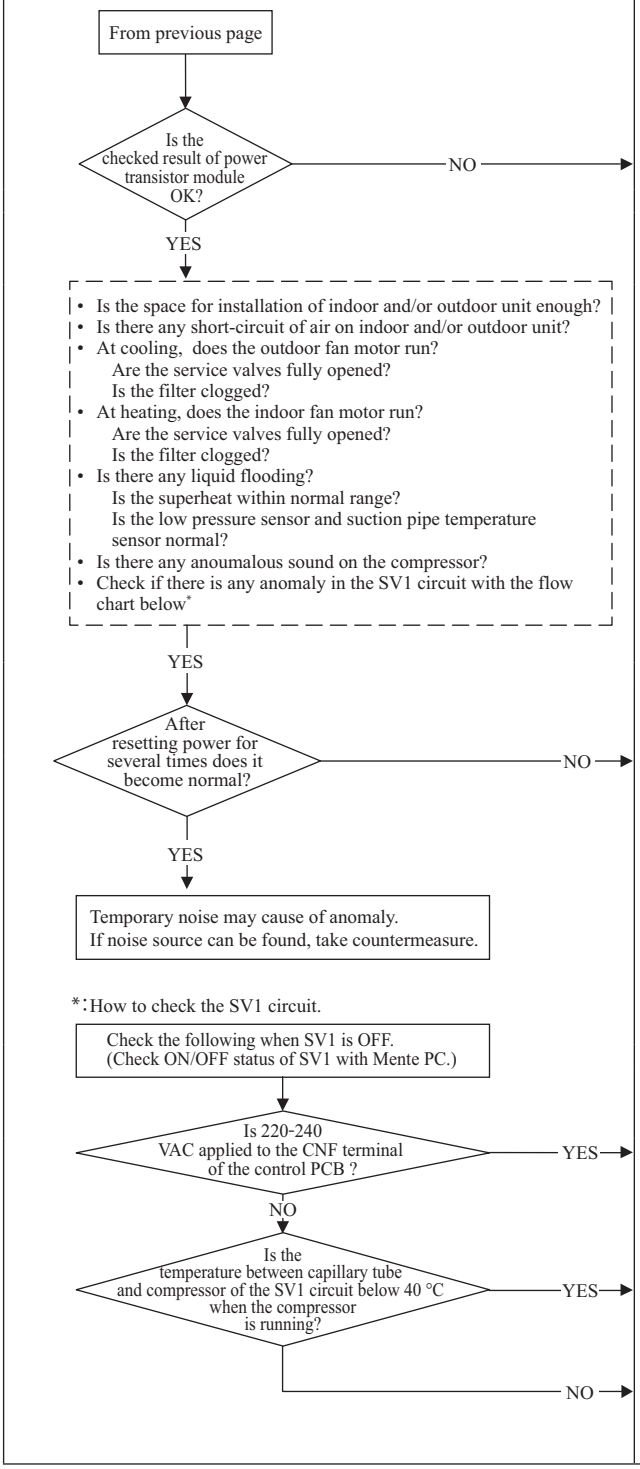
3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection.

4. Presumable cause

- Defective outdoor unit control PCB
- Defective inverter PCB
- Faulty power source
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E44		–	–	Liquid back error (Cooling mode) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

Detected by under-dome superheat.

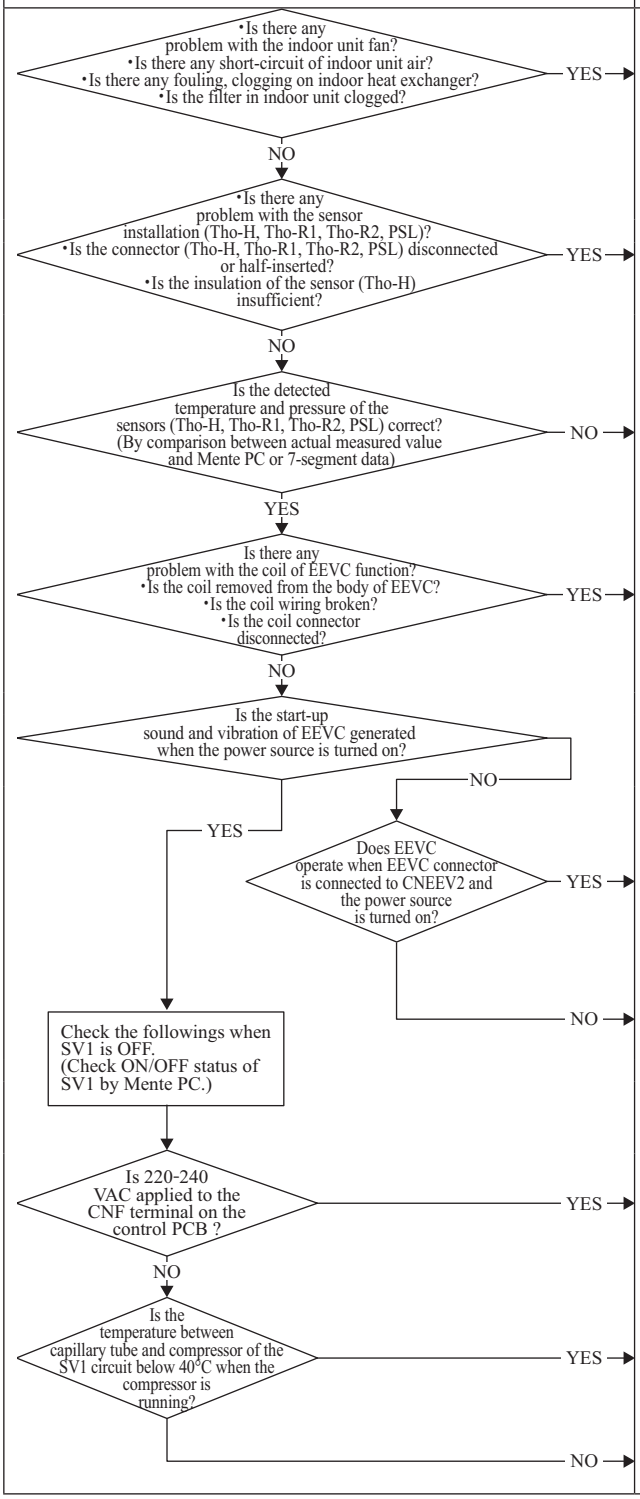
3. Condition of error displayed

When abnormal liquid back is detected 3 times within 90 minutes, the compressor stops.

4. Presumable cause

- Faulty indoor unit fan
- Faulty body of SV1
- Faulty outdoor unit control PCB
- Short-circuit of air on indoor units
- Fouling, clogging of heat exchanger
- Clogged filter
- Abnormal condition of Tho-H, Tho-R1, Tho-R2, PSL
- Faulty coil of EEVC
- Faulty body of EEVC

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E44		–	–	Liquid back error (Heating mode) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

Detected by under-dome superheat.

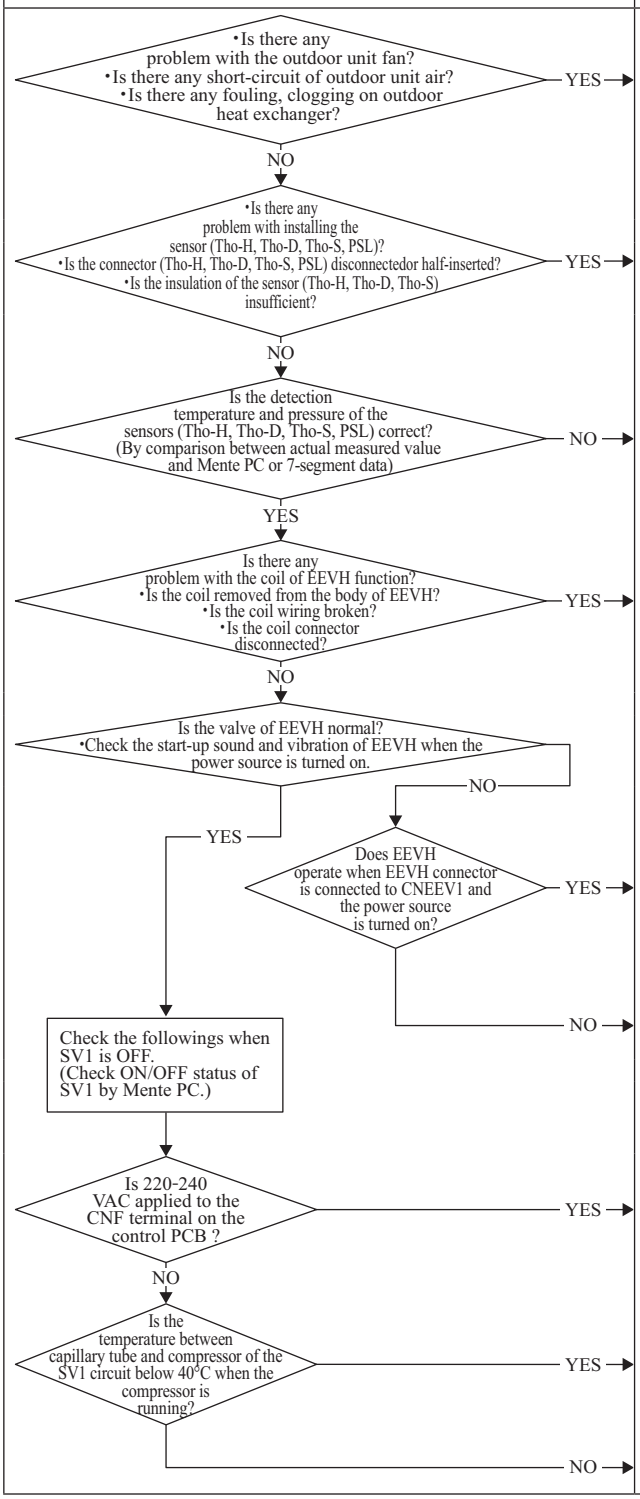
3. Condition of error displayed

When abnormal liquid back is detected 3 times within 90 minutes, the compressor stops.

4. Presumable cause

- Faulty outdoor unit fan
- Faulty body of SV1
- Faulty outdoor unit control PCB
- Short-circuit of air on outdoor units
- Fouling, clogging of heat exchanger
- Clogged filter
- Abnormal condition of Tho-H, Tho-D, Tho-S, PSL
- Faulty coil of EEVH
- Faulty body of EEVH

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E45		–	–	Communication error between inverter PCB and outdoor unit control PCB (Models FDC100VN(S)X-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W

2. Error detection method

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

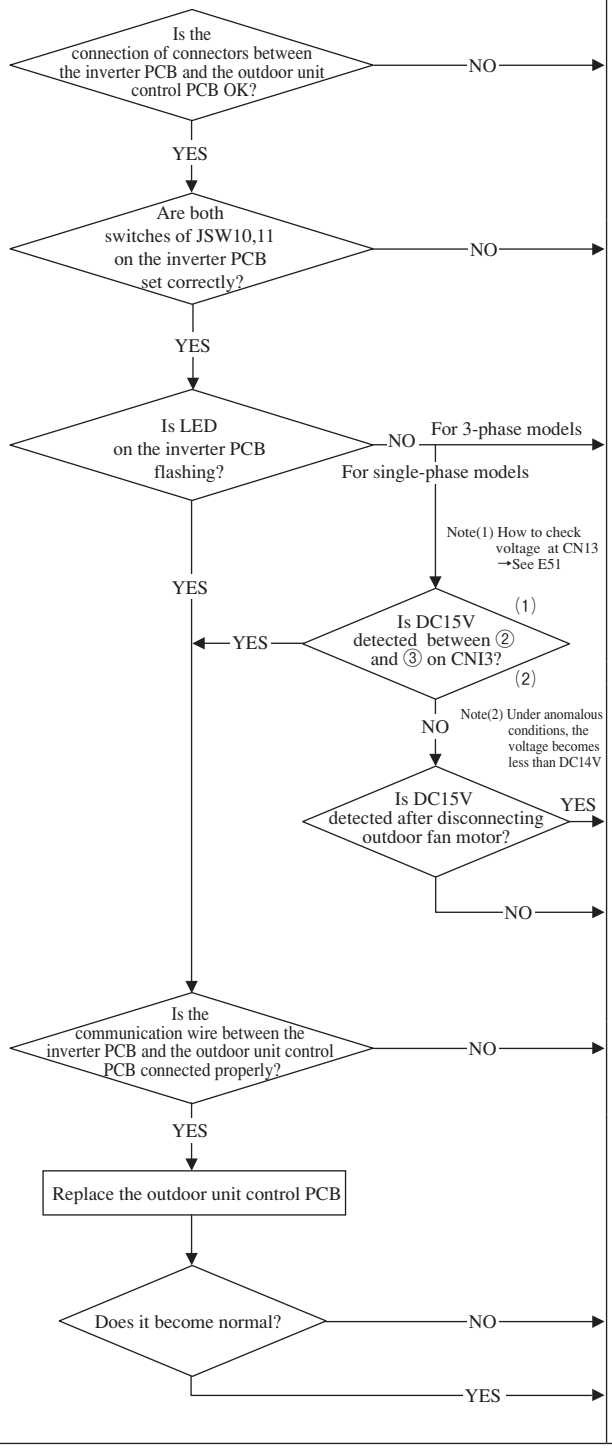
3. Condition of error displayed

Same as above

4. Presumable cause

- Defective inverter PCB
- Defective connector between the outdoor unit control PCB and inverter PCB
- Defective outdoor unit control PCB
- Defective outdoor fan motor

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E45		–	–	Communication error between inverter PCB and outdoor unit control PCB (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

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

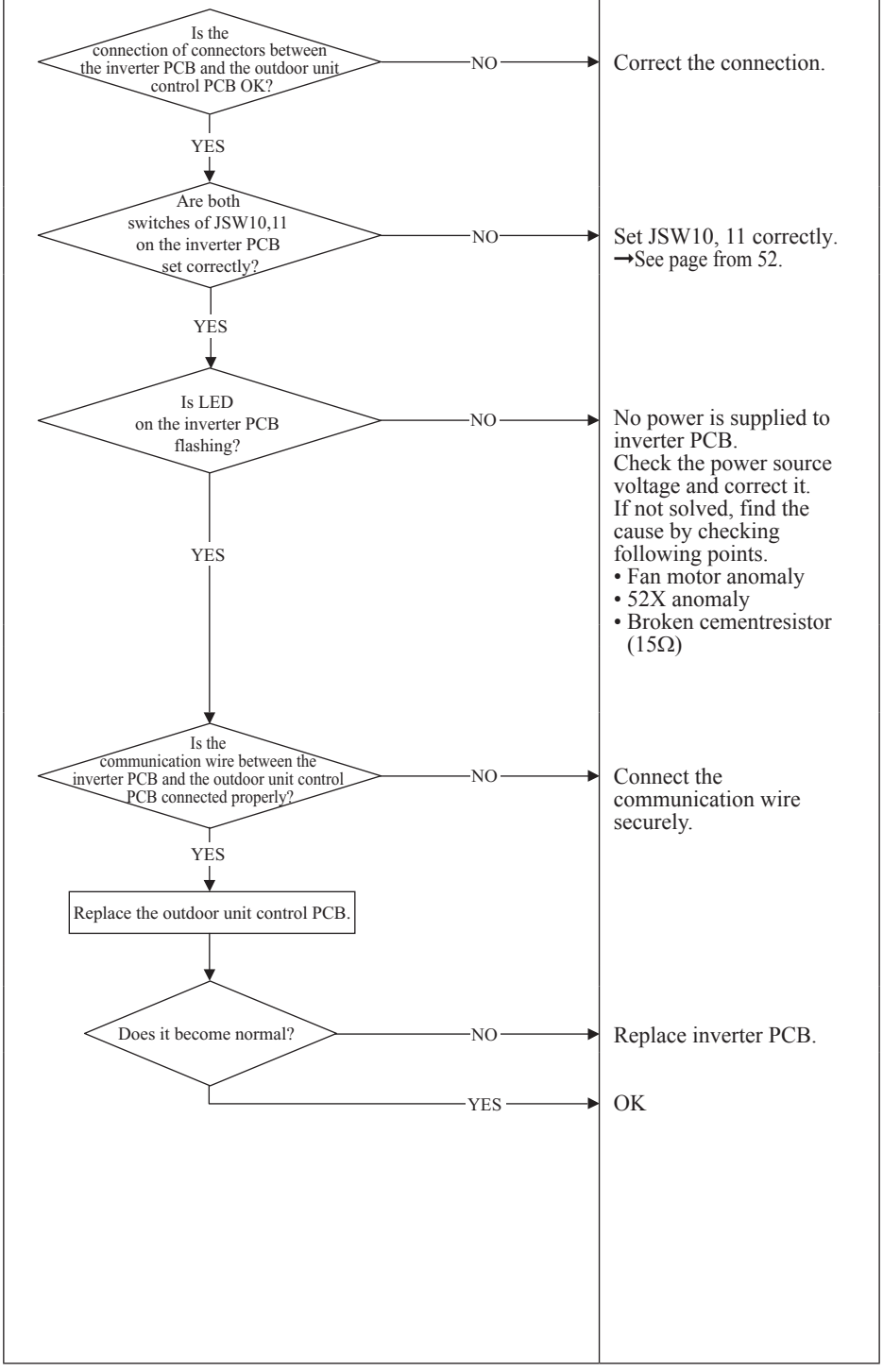
3. Condition of error displayed

Same as above

4. Presumable cause

- Inverter PCB anomaly
- Anomalous connection of connector between the outdoor unit control PCB and inverter PCB
- Outdoor unit control PCB anomaly
- Outdoor fan motor anomaly

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E47		5-time flash	ON	Control PCB A/F module anomaly (Model FDC100VNA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	

1. Applicable model

Model FDC100VNA-W

2. Error detection method

In order to avoid an unexpected trouble, if the protective circuit defect unexpected voltage, current and movement of the power element, it makes the compressor stopping.

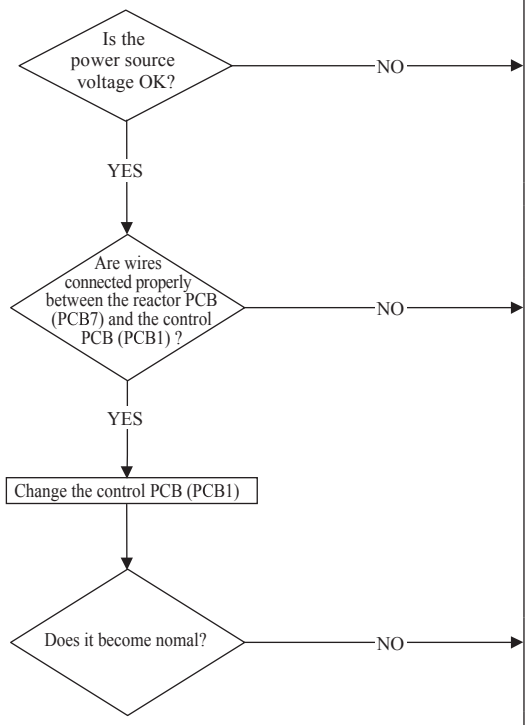
3. Condition of error displayed

- If the A/F anomaly occurs, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts if this anomaly occurs 4 times within 30minutes or continues for 15minutes continuously.

4. Presumable cause

- Defective control PCB
- Defective reactor PCB

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E47		5-time flash	ON	Active filter voltage error (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

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

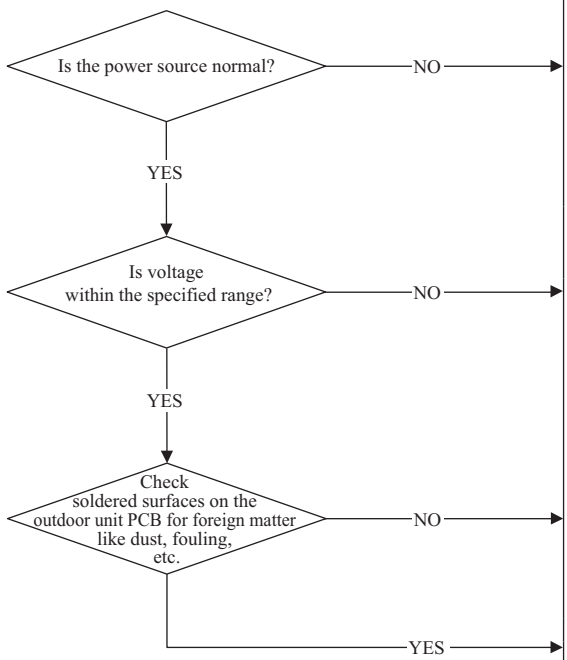
3. Condition of Error displayed

Same as above

4. Presumable cause

- Defective outdoor unit PCB
- Dust on outdoor unit PCB
- Anomalous power source

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E48		ON	7-time flash	Outdoor fan motor anomaly (Models FDC100VN(S)X-W, FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W, FDC200VSA-W

2. Error detection method

Detected by rotation speed of outdoor fan motor

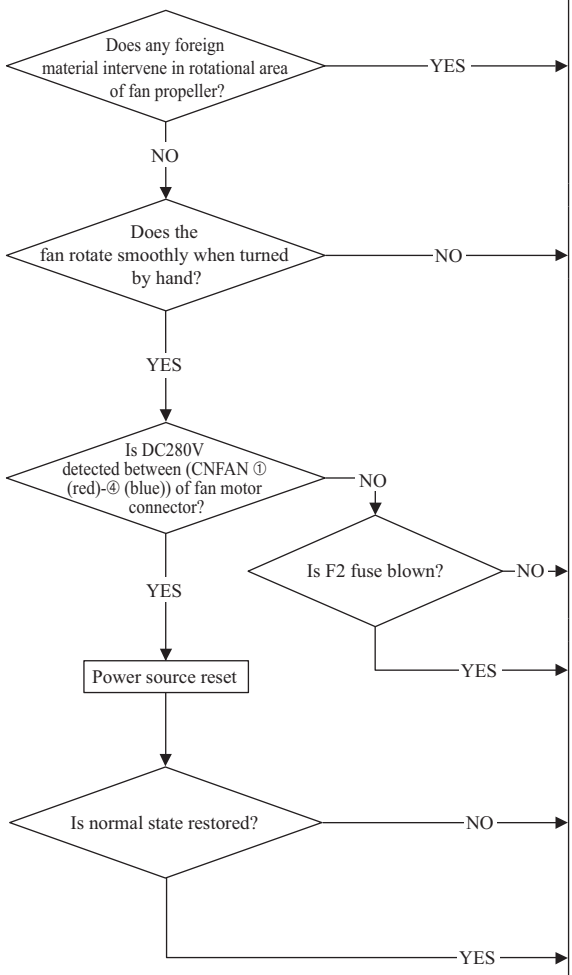
3. Condition of error displayed

When actual rotation speed of outdoor fan motor (FMo1, 2) drops to 100min^{-1} or lower for 30 seconds continuously, the compressor and the outdoor fan motor stop. After 3-minute delay, it starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor unit control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor unit control PCB
- Blow fuse
- External noise, surge

5. Troubleshooting



Note: When E48 error occurs, in almost cases F2 fuse (4A) on the outdoor unit control PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor unit control PCB (or fuse) is replaced,, another trouble (*1) could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.
After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)
*1 The error which does not seem to relate E48 may occur like as "WAIT", Stay OFF of LED on outdoor unit control PCB, inverter communication error (E45) and etc.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E48		ON	7-time flash	Outdoor fan motor anomaly (Models FDC100VN(S)A-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	

1. Applicable model

Models FDC100VN(S)A-W

2. Error detection method

Detected by rotation speed of outdoor fan motor

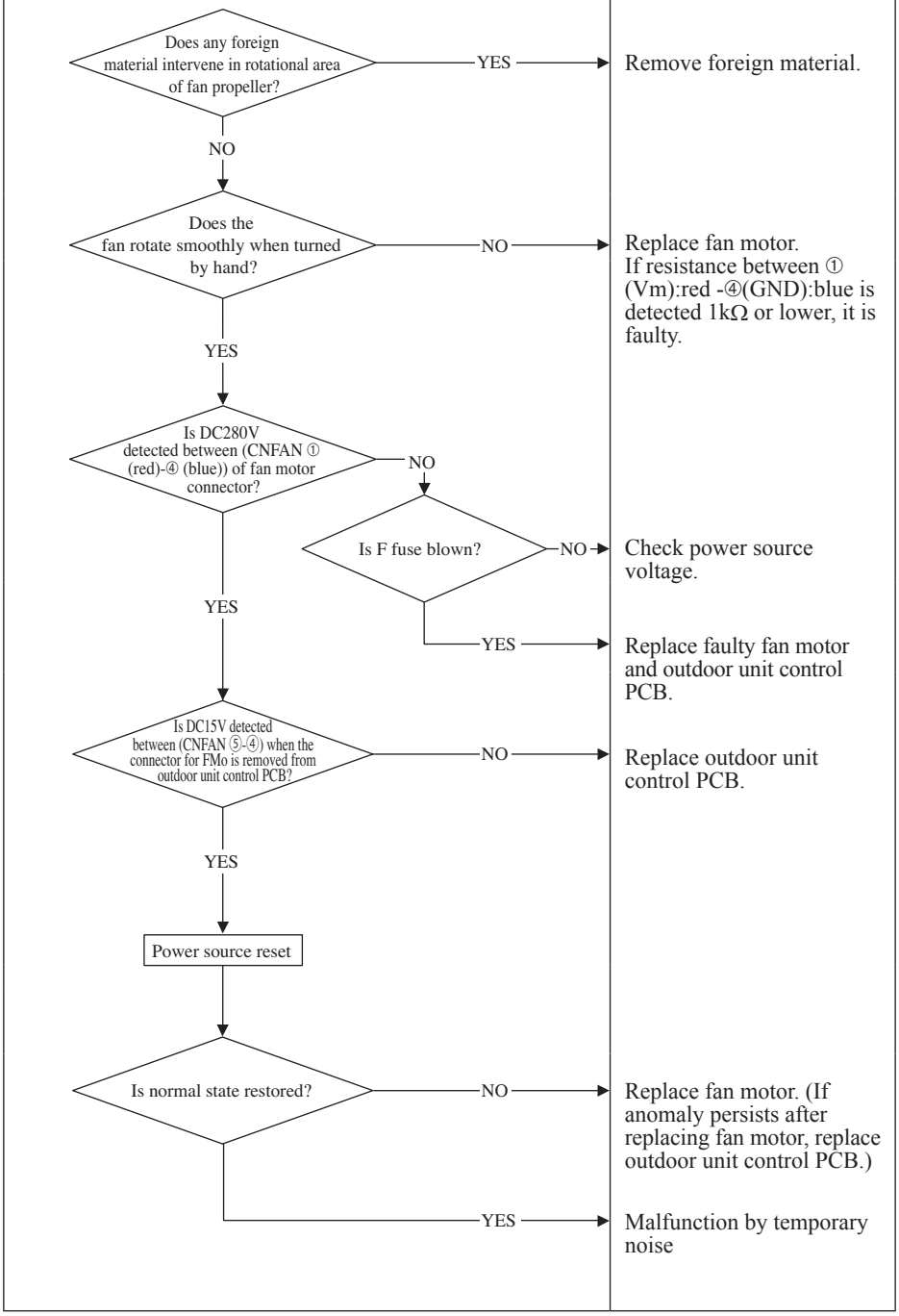
3. Condition of error displayed

When actual rotation speed of outdoor fan motor (FMo1) drops to 100min^{-1} or lower for 30 seconds continuously, the compressor and the outdoor fan motor stop. After 3-minute delay, it starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor unit control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor unit control PCB
- Blow fuse
- External noise, surge

5. Troubleshooting



Note: When E48 error occurs, in almost cases F fuse (2A) on the outdoor unit control PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor unit control PCB (or fuse) is replaced, another trouble (*1) could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.
After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)
*1 The error which does not seem to relate E48 may occur like as "WAIT", Stay OFF of LED on outdoor unit control PCB, inverter communication error (E45) and etc.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E48		ON	7-time flash	Outdoor fan motor anomaly (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

Detected by rotation speed of outdoor fan motor

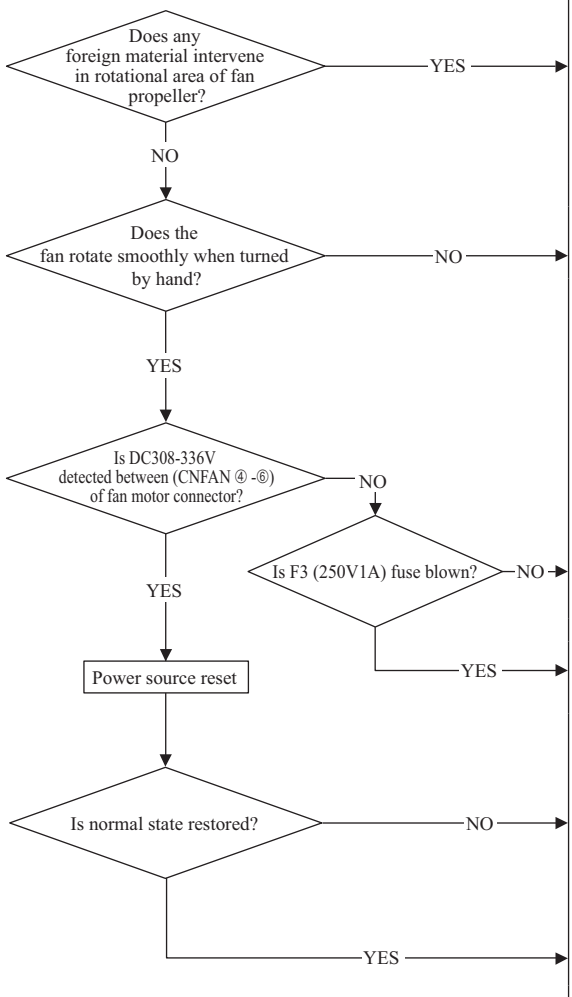
3. Condition of Error displayed

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

4. Presumable cause

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

5. Troubleshooting



Note: When E48 error occurs, in almost cases F3 fuse (1A) on the outdoor unit PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor unit PCB (or fuse) is replaced,, another trouble could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.
After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E49		–	–	Low pressure error or low pressure sensor anomaly (1/2) (Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W

2. Error detection method

Detected by low pressure drop and suction superheat

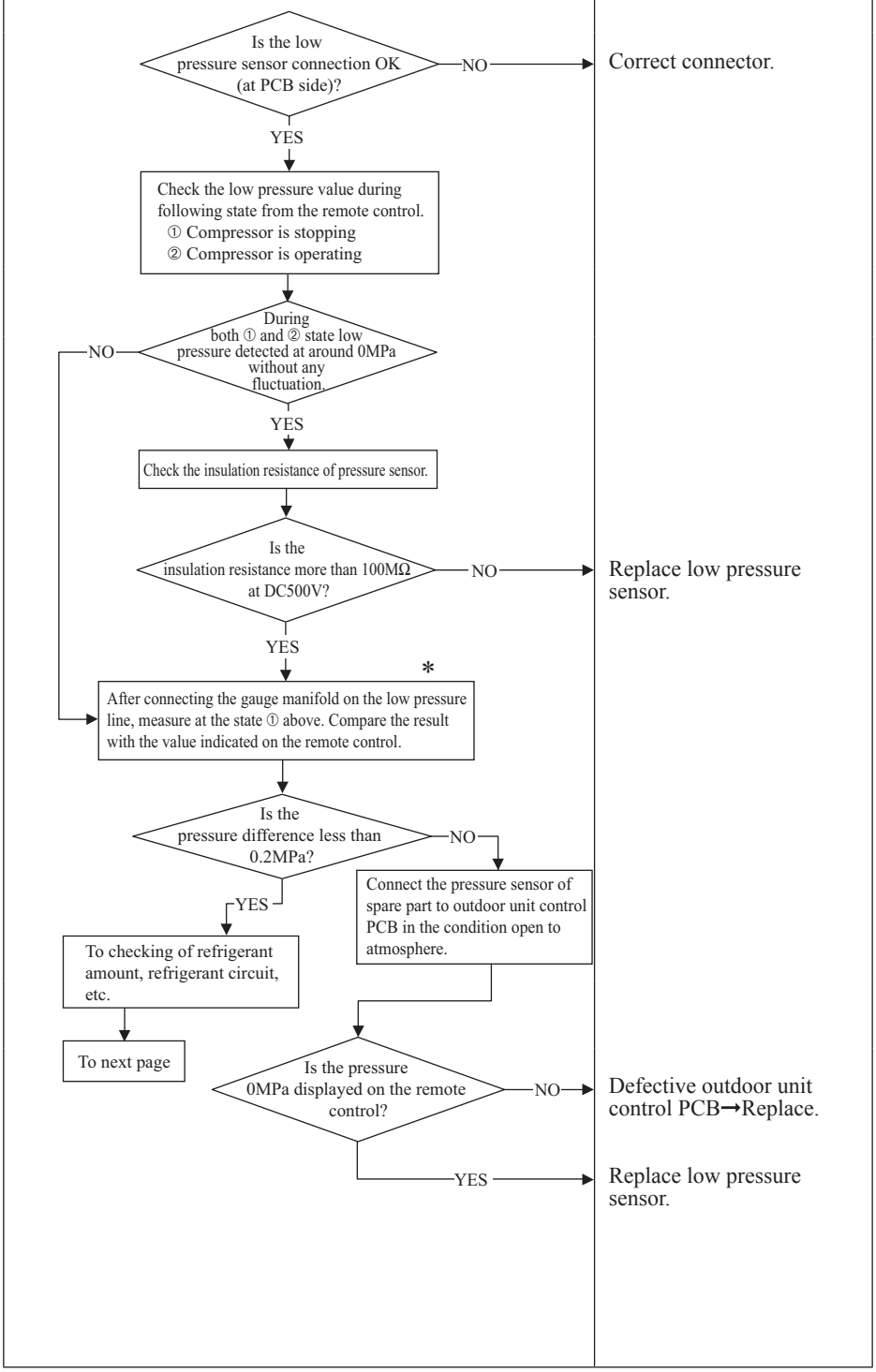
3. Condition of error displayed

① When the low pressure sensor detects 0.079MPa or lower for 15 seconds continuously, compressor stops and it restarts automatically after 3-minute delay, but if this anomaly occurs 5 times within 60 minutes.
② 10 minutes after the compressor starts, if the low pressure sensor detects 0.15MPa or lower for 60 seconds continuously and compressor suction superheat is detected 30degC or higher for 60 seconds continuously, but if this anomaly occurs 5 times within 60 minutes.
③ If low pressure sensor detects 0.079MPa or lower for 5 minutes continuously (Including the compressor stop status)

4. Presumable cause

- Defective outdoor unit control PCB
- Defective low pressure sensor connector
- Defective low pressure sensor
- Defective suction pipe temperature sensor connector
- Defective suction pipe temperature sensor

5. Troubleshooting



Note: * Connect the gauge manifold to the service valve check joint during cooling, or connect it to the check joint at internal piping of outdoor unit during heating.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E49		–	–	Low pressure error or low pressure sensor anomaly (2/2) (Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W

2. Error detection method

Detected by low pressure drop and suction superheat

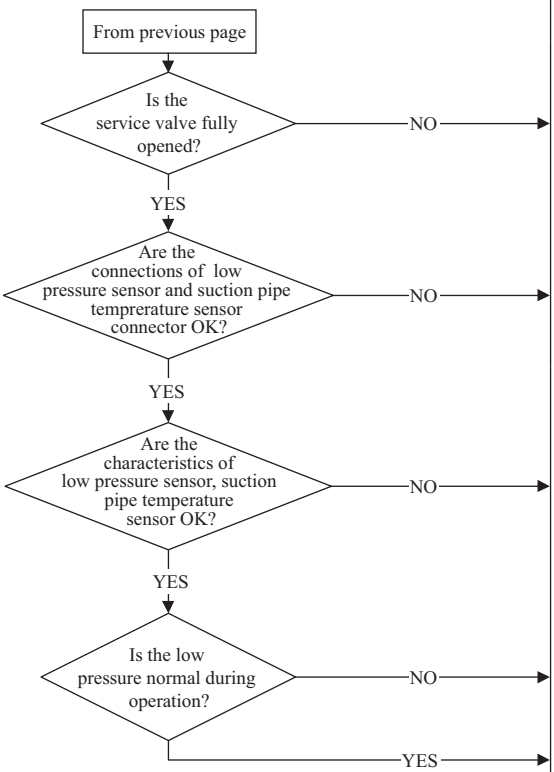
3. Condition of error displayed

① When the low pressure sensor detects 0.079MPa or lower for 15 seconds continuously, compressor stops and it restarts automatically after 3-minute delay, but if this anomaly occurs 5 times within 60 minutes.
② 10 minutes after the compressor starts, if the low pressure sensor detects 0.15MPa or lower for 60 seconds continuously and compressor suction superheat is detected 30degC or higher for 60 seconds continuously, but if this anomaly occurs 5 times within 60 minutes.
③ If low pressure sensor detects 0.079MPa or lower for 5 minutes continuously (Including the compressor stop status)

4. Presumable cause

- Defective outdoor unit control PCB
- Defective low pressure sensor connector
- Defective low pressure sensor
- Defective suction pipe temperature sensor connector
- Defective suction pipe temperature sensor

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E51		ON	4-time flash	Inverter and fan motor anomaly (Models FDC100VN(S)X-W, 100VN(S)A-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		6-time flash		

1. Applicable model

Model FDC100VN(S)X-W, 100VN(S)A-W

2. Error detection method

When power transistor anomaly is detected for 15 minutes continuously

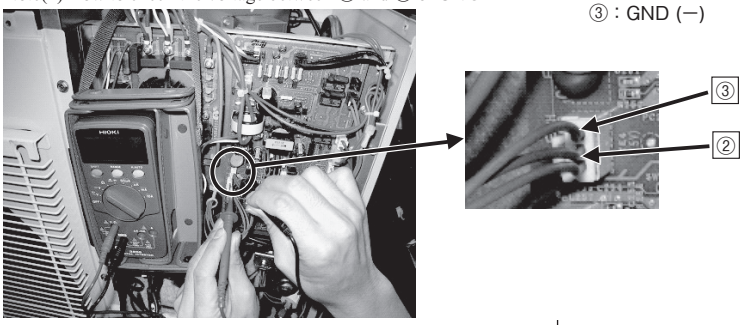
3. Condition of error displayed

Same as above

4. Presumable cause

- Defective outdoor fan motor
- Defective inverter PCB
- Defective outdoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
• Model FDC100VNX-W (1) (2) Is DC15V detected between ② and ③ on CNI3? — YES → Replace inverter PCB. If not solved, replace noise filter PCB as well. Note(1) Under anomalous conditions, the voltage becomes less than DC14V. NO (1) Is DC15V detected after disconnecting outdoor fan motor? — YES → Replace outdoor fan motor. NO → Replace outdoor unit control PCB. If not solved, replace inverter PCB as well.	
• Model FDC100VSX-W Replace immediately the inverter PCB and the power transistor.	
Note(2) How to check the voltage between ② and ③ of CNI3 ② : DC15V (+) ③ : GND (−) 	
• Models FDC100VNA/VSA-W Replace immediately the main PCB.	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E51		ON	4-time flash	Inverter or power transistor anomaly (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		8-time flash		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When power transistor anomaly is detected for 15 minutes continuously

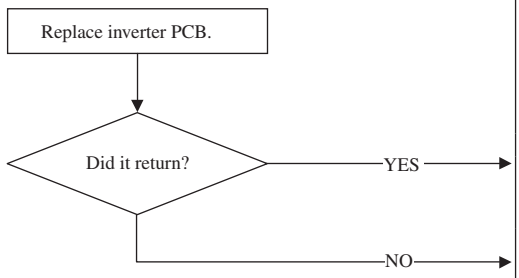
3. Condition of error displayed

Same as above

4. Presumable cause

- Inverter PCB anomaly
- Power transistor anomaly

5. Troubleshooting

Diagnosis	Countermeasure
	

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E51		ON	4-time flash	Power transistor anomaly (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

Power transistor primary current

3. Condition of Error displayed

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

4. Presumable cause

- Faulty outdoor unit PCB
- Dust on outdoor unit PCB

5. Troubleshooting

Diagnosis	Countermeasure
Check soldered surfaces on the outdoor unit PCB for foreign matter like dust, fouling,etc.	
NO →	Remove foreign matter like dust, fouling, etc.
YES →	Defective outdoor unit PCB→Replace.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E53		–	–	Suction pipe temperature sensor anomaly (Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W

2. Error detection method

When the suction pipe temperature sensor detects anomalously low temperature

3. Condition of error displayed

If the temperature sensor detects -50°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minute delay, but if this anomaly ocuurs 3 times within 40 minutes.

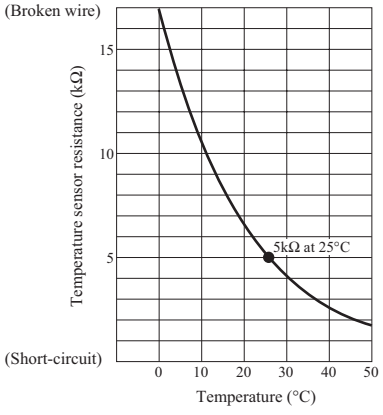
4. Presumable cause

- Defective suction pipe temperature sensor connection
- Defective suction pipe temperature sensor
- Defective outdoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of suction pipe temperature sensor connector OK? — NO	Correct connection of suction pipe temperature sensor connector.
YES → For the characteristics of suction pipe temperature sensor, see the following graph.	
Are the characteristics of suction pipe temperature sensor OK? — NO	Defective suction pipe temperature sensor→ Replace.
YES	Defective outdoor unit control PCB →Replace. (Defective suction pipe temperature sensor input circuit)

Temperature-resistance characteristics



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E54		–	–	Low pressure sensor anomaly (Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W, 100VN(S)A-W, 200VSA-W

2. Error detection method

When anomalous voltage (pressure) is detected

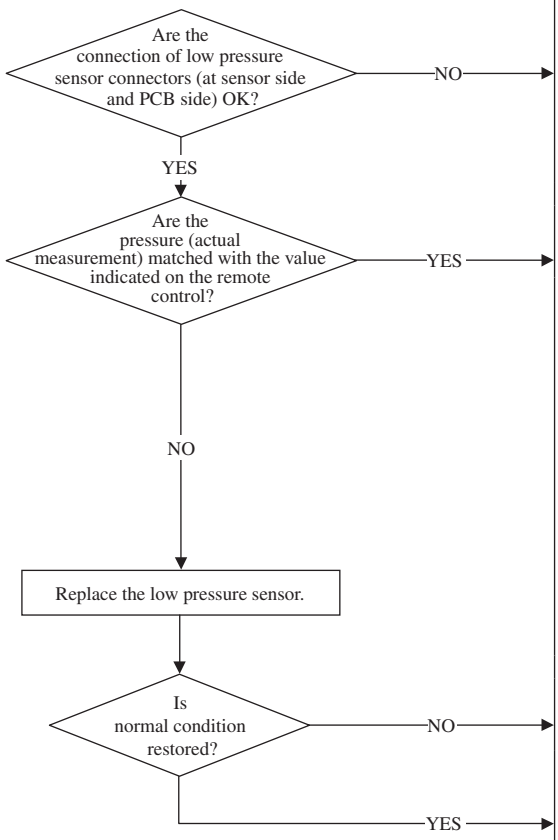
3. Condition of error displayed

If the pressure sensor detects DC0V or lower and DC4.0V or higher for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minute delay, but if this anomaly occurs 3 times within 40 minutes.

4. Presumable cause

- Defective low pressure sensor connection
- Defective low pressure sensor
- Defective outdoor unit control PCB
- Improper amount of refrigerant
- Anomalous refrigeration circuit

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control:E55		–	–	Compressor under-dome temperature sensor anomaly (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When anoumalous low temperature (resistance) is detected by the compressor under-dome temperature sensor

3. Condition of error displayed

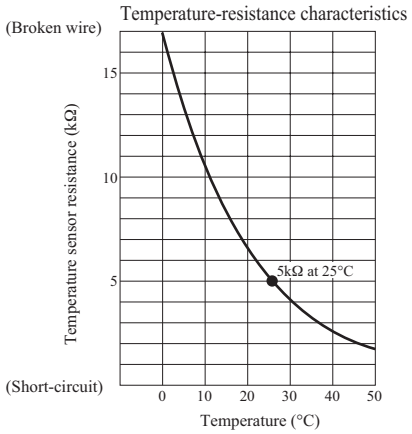
If the temperature sensor detcts -50°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly ocuurs 3 times within 40 minutes.

4. Presumable cause

- Defective under-dome temperature sensor connection
- Defective under-dome temperature sensor
- Defective outdoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of under-dome temperature sensor connector OK? → NO	Correct connection of under-dome temperature sensor connector.
YES → For the characteristics of under-dome temperature sensor, see the following graph. Are the characteristics of under-dome temperature sensor OK? → NO	Defective under-dome temperature sensor →Replace.
YES	Replace outdoor unit control PCB. (Defective under-dome temperature sensor input circuit)



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E57		7-time flash	ON	Insufficient refrigerant amount or detection of service valve closure (Models FDC100VN(S)X-W, FDC100VN(S)A-W, FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Keeps flashing		

1. Applicable model

Models FDC100VN(S)X-W, FDC100VN(S)A-W, FDC200VSA-W

2. Error detection method

- Judge insufficient refrigerant amount by detecting the temperature differnce between indoor heat exchanger (Th2) and room air (Th1).
- It detects at initial startup in cooling or dehumidifying mode after power ON.

3. Condition of error displayed

Anomalous stop at initial detection

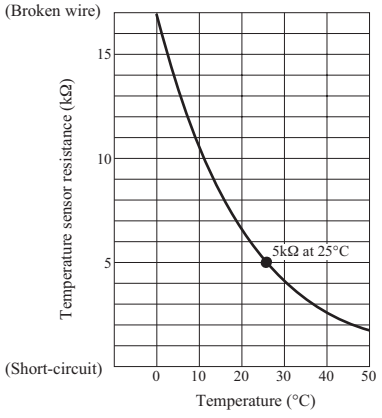
4. Presumable cause

- Defective indoor heat exchanger temperature sensor
- Defective indoor room air temperature sensor
- Defective indoor unit control PCB
- Insufficient refrigerant amount

5. Troubleshooting

Diagnosis	Countermeasure
Is the service valve fully opened? NO	Open fully.
YES → Are the connections of indoor heat exchanger and/or room air temperature sensor connectors OK? NO	Correct indoor heat exchanger, room air temperature sensor connector connections.
YES → For the characteristics of indoor heat exchanger, room air temperature sensor, see the following graph. Are the characteristics of indoor heat exchanger and/or room air temperature sensor OK? NO	Defective indoor heat exchanger, room air temperature sensor → Replace.
YES → Is the low pressure during operation normal? NO	Charge refrigerant.
YES	Defective indoor unit control PCB→Replace. (Defective indoor heat exchanger, room air temperature sensor input circuits)

Indoor heat exchanger, room air temperature sensor
Temperature-resistance characteristics



Note: Insufficient refrigerant amount preventive control makes compressor stopped, if it judges insufficient refrigerant amount by detecting the temperature difference between indoor heat exchanger (Th2) and room air (Th1) for 5 minutes after compressor ON in cooling or dehumidifying mode and for 9 minutes after compressor ON in heating mode. [in cooling mode: (Th1)-(Th2)<4degC, in heating mode: (Th2)-(Th1)<4degC]

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E57		7-time flash	ON	Insufficient refrigerant amount or detection of service valve closure (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

- Judge insufficient refrigerant amount by detecting the temperature differnce between indoor heat exchanger (Th2) and room air (Th1).

3. Condition of error displayed

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

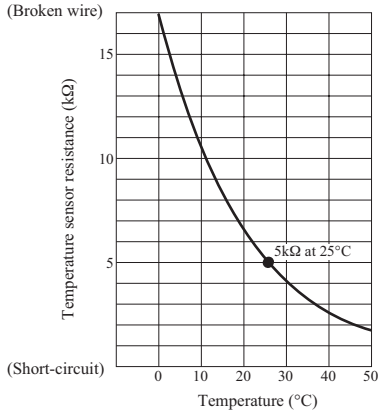
4. Presumable cause

- Defective indoor heat exchanger temperature sensor
- Defective indoor room air temperature sensor
- Defective indoor unit control PCB
- Insufficient refrigerant amount

5. Troubleshooting

Diagnosis	Countermeasure
Is the service valve fully opened? NO	Open fully.
YES → Are the connections of indoor heat exchanger and/or room air temperature sensor connectors OK? NO	Correct indoor heat exchanger, room air temperature sensor connector connections.
YES → For the characteristics of indoor heat exchanger,room air temperature sensor, see the following graph. Are the characteristics of indoor heat exchanger and/or room air temperature sensor OK? NO	Defective indoor heat exchanger, room air temperature sensor →Replace.
YES → Is the low pressure during operation normal? NO	Charge refrigerant.
YES	Defective indoor unit control PCB→Replace. (Defective indoor heat exchanger, room air temperature sensor input circuits)

Indoor heat exchanger, room air temperature sensor
Temperature-resistance characteristics



Note: When the compressor speed is faster than 40 rps or 60 rps ※1 after several minutes ※2 from compressor start, the low refrigerant protection control judges, by satisfying the under condition for 5 minutes, that it is in the state of gas leakage, and stops the compressor.
Cooling: Room air temperature (Th1) – Indoor heat exchanger temperature (Th2) < 4 deg C
Heating: Indoor heat exchanger temperature (Th2) – Room air temperature (Th1) < 4 deg C
※1 : In case of heating at low air temperature.
※2 : Cooling is 5 minutes, heating is 9 minutes.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E58		–	–	Anomalous compressor by loss of synchronism (Models FDC100VN(S)A-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	1-time flash	

1. Applicable model

Models FDC100VN(S)A-W

2. Error detection method

E58

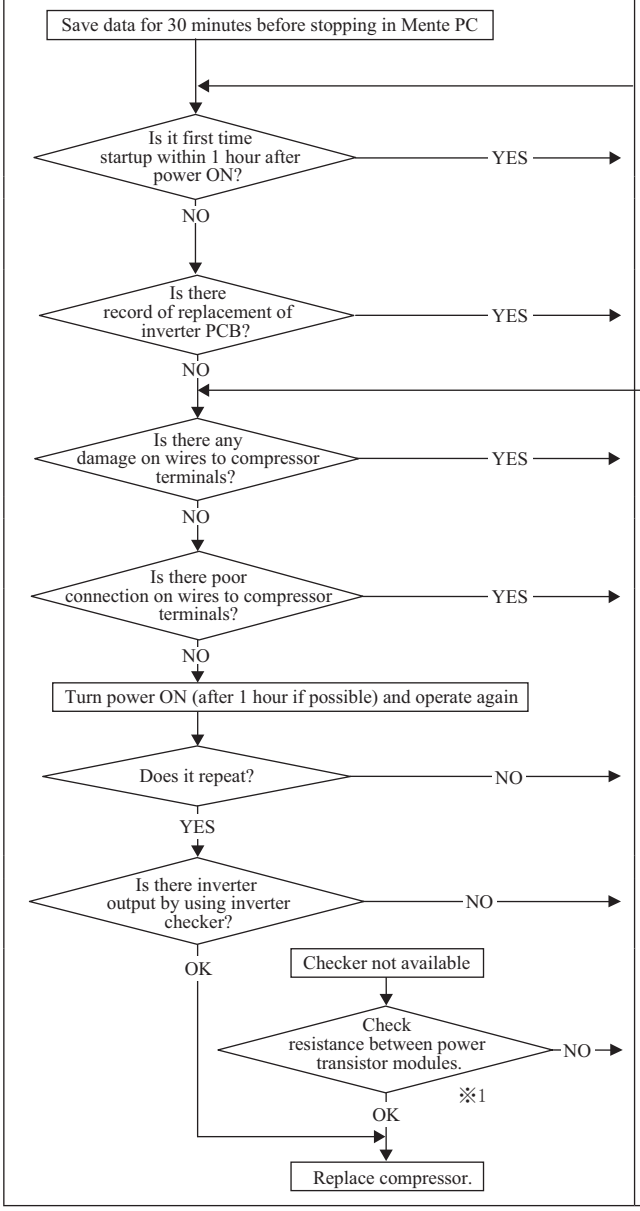
3. Condition of error displayed

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 without crankcase heater ON)
- Compressor anomaly
- PCB anomaly

5. Troubleshooting



Note: 1. ※ 1 Measurement position: Check resistance between P-U, P-V, P-W, N-U, N-V, N-W, P-N (Disconnect wires from compressor beforehand.)

2. Measurement position to check power transistor (Refer to page 60.)

Model name	P	N	U	V	W	Note
FDC100-140VNA-W	IC2 24 or 25 pin	IC2 18, 19 or 20 pin	U(RD) TB7	V(WH) TB8	W(BL) TB9	IC2:Power transistor
FDC100-140VSA-W	T12	IC2 34, 35 or 36 pin	U(RD) TB7	V(WH) TB8	W(BL) TB9	IC2:Power transistor

3. If it fails to repeat, connect the Mente PC, and continue to collect data.

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E58		ON	3-time flash	Current safe stop (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

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

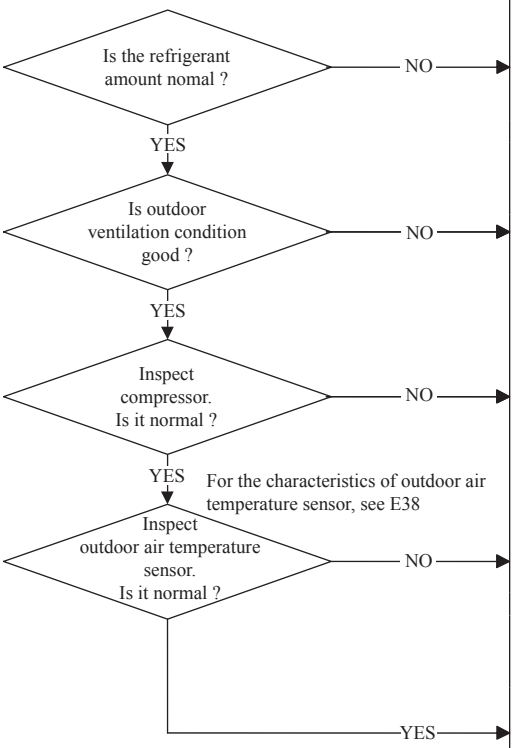
3. Condition of Error displayed

Same as above

4. Presumable cause

- Excessive refrigerant amount
- Indoor, outdoor unit installation spaces
- Faulty compressor
- Defective outdor air temperature sensor
- Defective outdoor unit PCB

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		–	–	Compressor startup failure (1/2) (Models FDC100VN(S)X-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Stays OFF		

1. Applicable model

Models FDC100VN(S)X-W

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

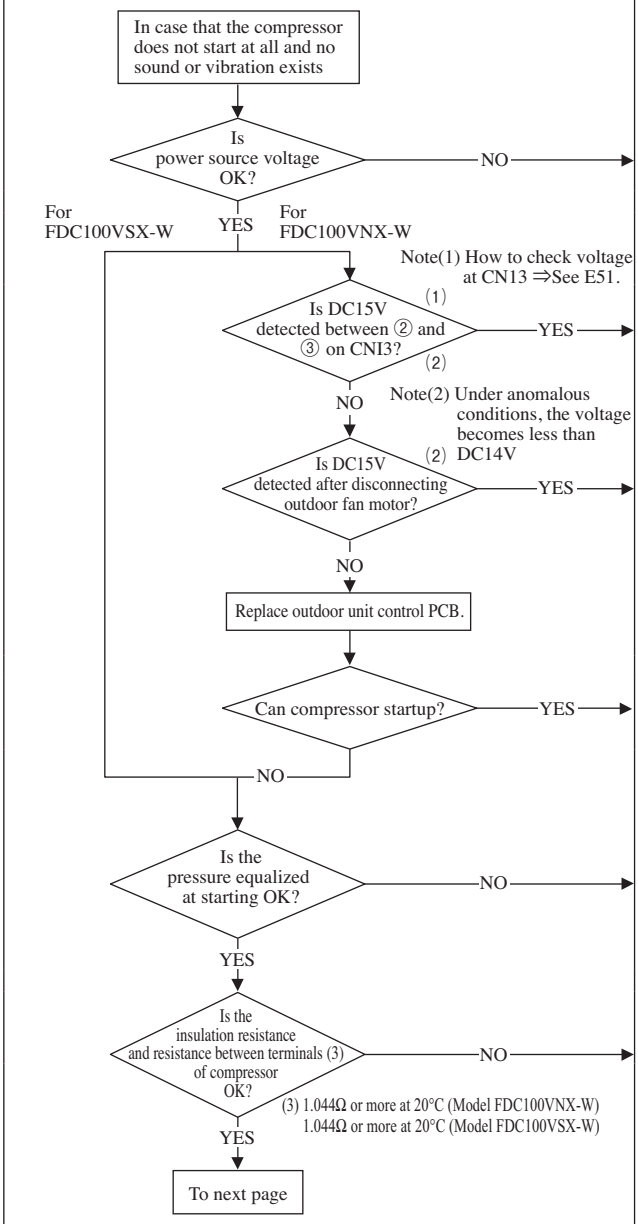
3. Condition of error displayed

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

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor unit control PCB
- Faulty inverter PCB
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.
  (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated.)
  ② Check whether the electric leakage breaker conforms to high-harmonic specifications.
  (As INVERTR PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type.)

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		–	–	Compressor startup failure (2/2) (Models FDC100VN(S)X-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Stays OFF		

1. Applicable model

Models FDC100VN(S)X-W

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

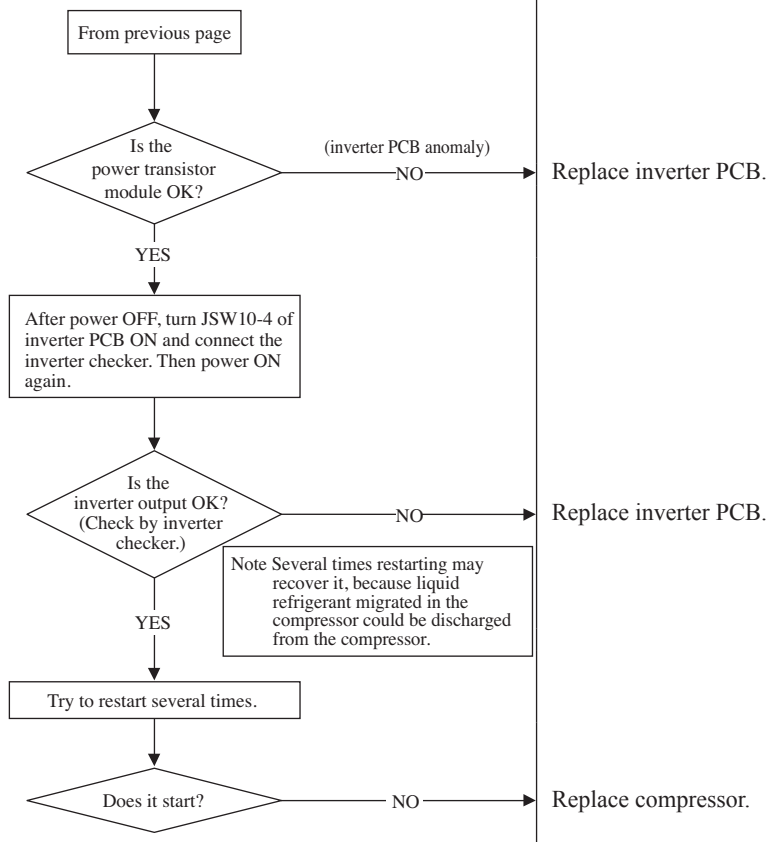
3. Condition of error displayed

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

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor unit control PCB
- Faulty inverter PCB
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		–	–	Compressor startup failure (1/2) (Models FDC100VN(S)A-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	

1. Applicable model

Models FDC100VN(S)A-W

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

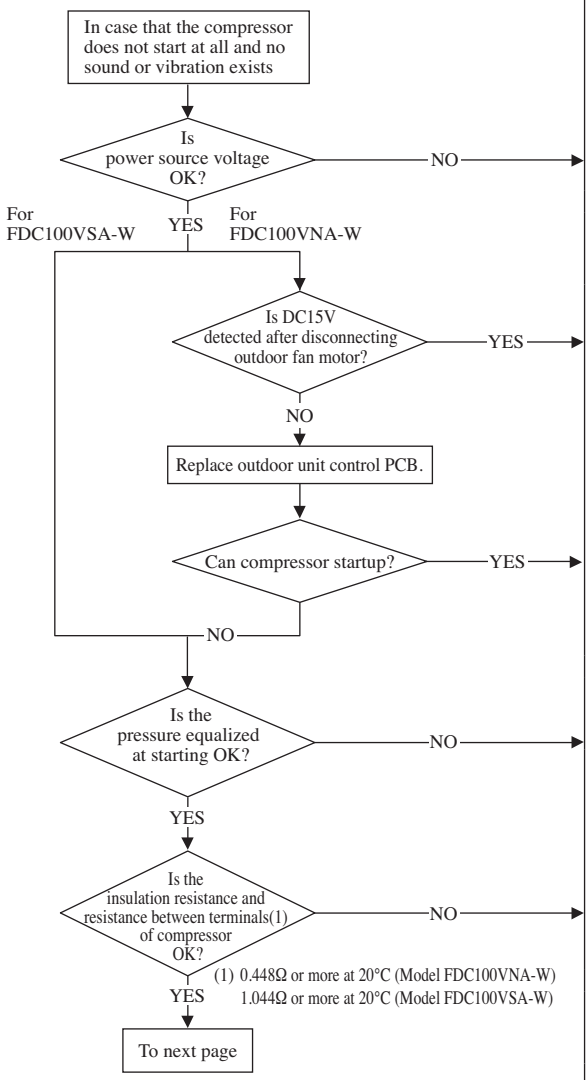
3. Condition of error displayed

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

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor unit control PCB
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.
  (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated.)
  ② Check whether the electric leakage breaker conforms to high-harmonic specifications.
  (As invertr PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type.)

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		–	–	Compressor startup failure (2/2) (Models FDC100VN(S)A-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	

1. Applicable model

Models FDC100VN(S)A-W

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

3. Condition of error displayed

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

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor unit control PCB
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting

Diagnosis	Countermeasure
From previous page	
YES	
Is the power transistor module OK? (Outdoor unit control PCB anomaly) NO	Replace outdoor unit control PCB.
YES	
After power OFF, turn SW6-4 of outdoor unit control PCB ON and connect the outdoor unit main checker. Then power ON again.	
Is the inverter output OK? (Check by inverter checker.) NO	Replace outdoor unit control PCB.
Note(1) Several times restarting may recover it, because liquid refrigerant migrated in the compressor could be discharged from the compressor.	
YES	
Try to restart several times.	
Does it start? NO	Replace compressor.

Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		–	–	Compressor startup failure (1/2) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		4-time flash		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

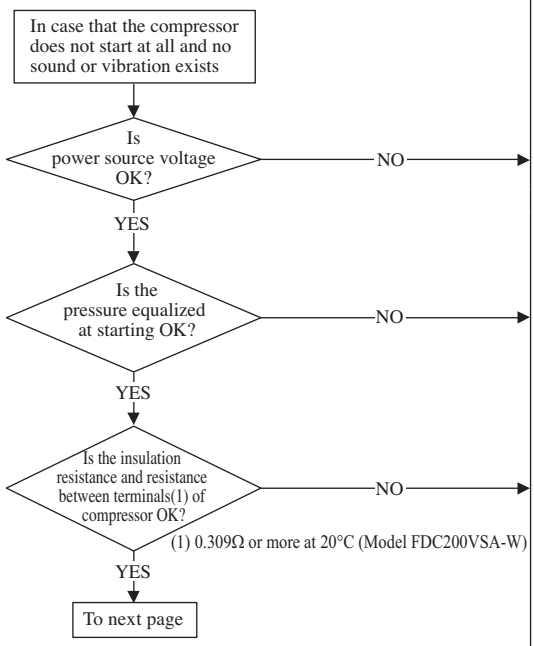
3. Condition of error displayed

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

4. Presumable cause

- Outdoor fan motor anomaly
- Outdoor unit control PCB anomaly
- Inverter PCB anomaly
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting

Diagnosis	Countermeasure
	Check the power source voltage and correct it. Check refrigerant amount and refrigerant circuit. Replace compressor.

Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.
  (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated.)
  ② Check whether the electric leakage breaker conforms to high-harmonic specifications.
  (As INV PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type.)

Error code	Indoor display	RUN light	TIMER light	Content
Remote control:E59		–	–	Compressor startup failure (2/2) (Model FDC200VSA-W only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		4-time flash		

1. Applicable model

Model FDC200VSA-W

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

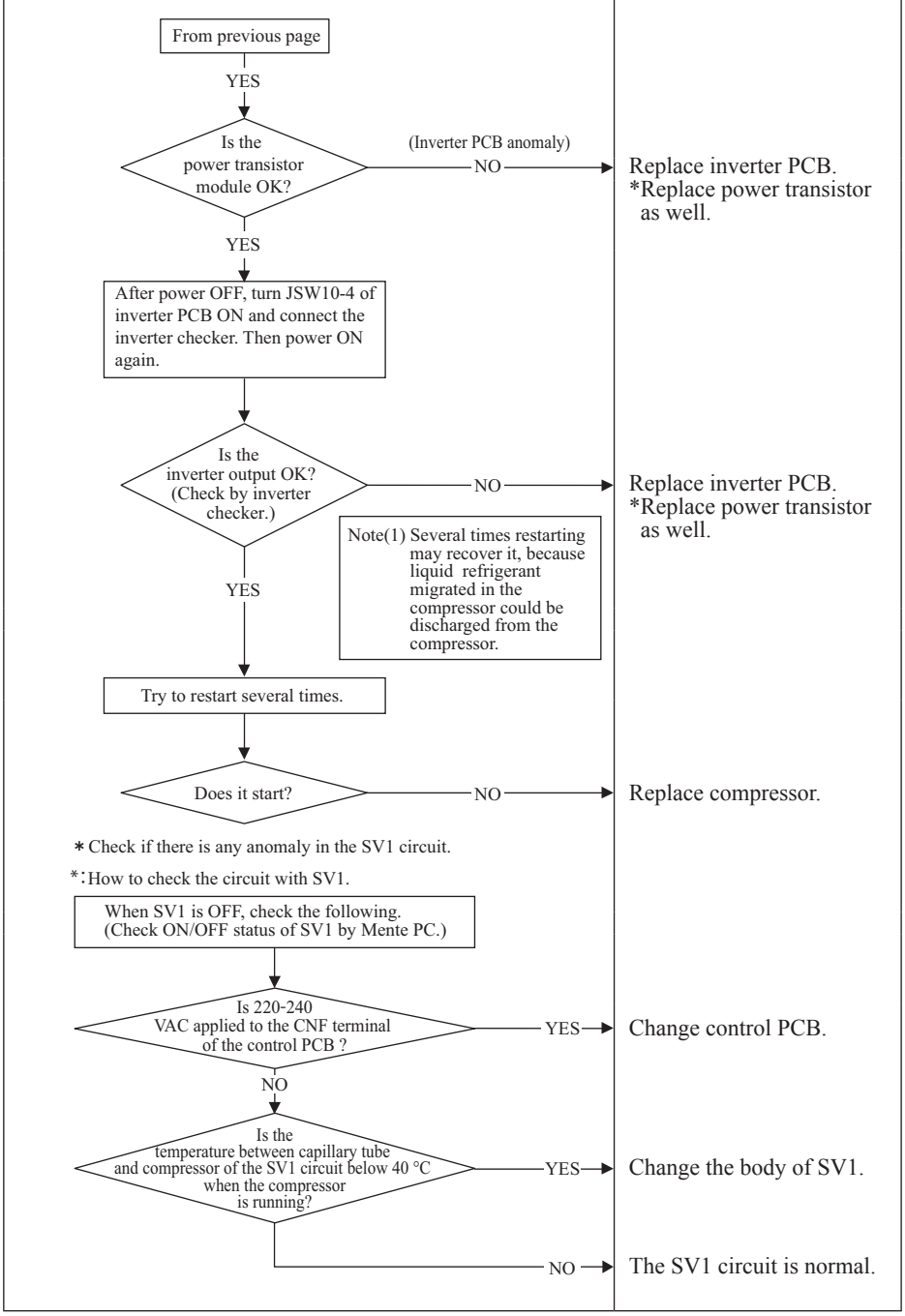
3. Condition of error displayed

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

4. Presumable cause

- Outdoor fan motor anomaly
- Outdoor unit control PCB anomaly
- Inverter PCB anomaly
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		ON	2-time flash	Compressor startup failure (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

- If it fails to change over to the rotor detection operation of compressor motor

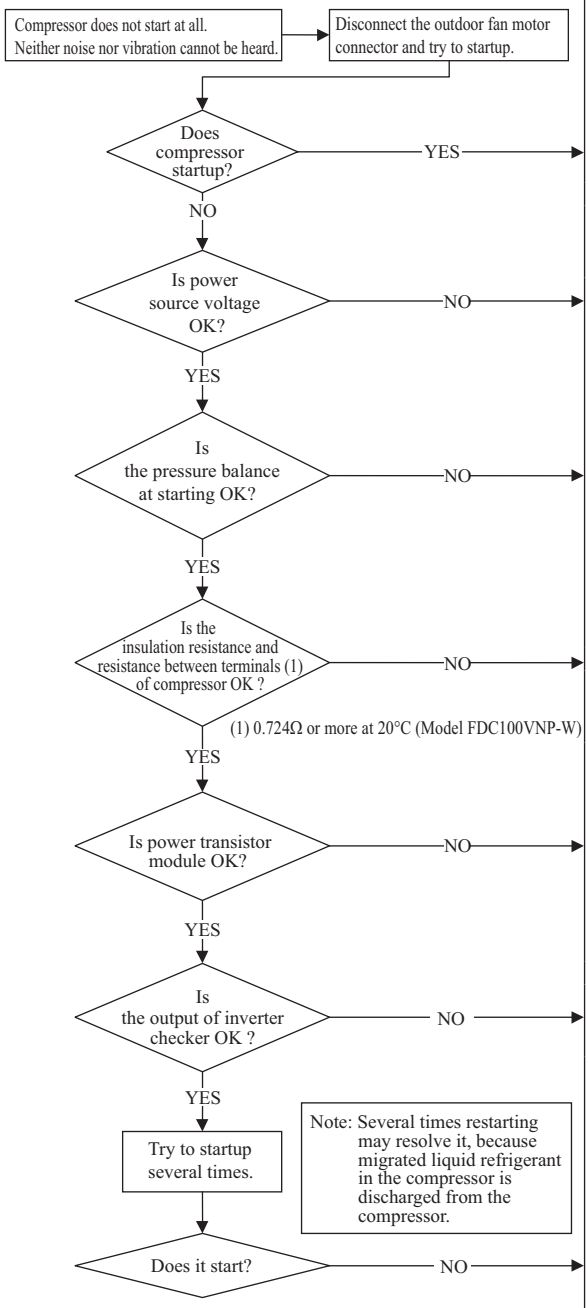
3. Condition of Error displayed

If compressor fails to startup for 42 times

4. Presumable cause

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

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several MΩ or lower. If the electric leakage breaker is activated due to low insulation resistance, check followings.

① Check whehter the insulation resistance can recover or not, after 6 hours has passed since power ON.
(By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated.)
② Check whether the electric leakage breaker conforms to high-harmonic specifications.
(As units has inverter, in order to prevent from improper operation, be sure to use high-harmonic one.)

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E60		2-time flash	2-time flash	Compressor rotor lock error (Model FDC100VNP-W only)

1. Applicable model

Model FDC100VNP-W

2. Error detection method

Compressor rotor position

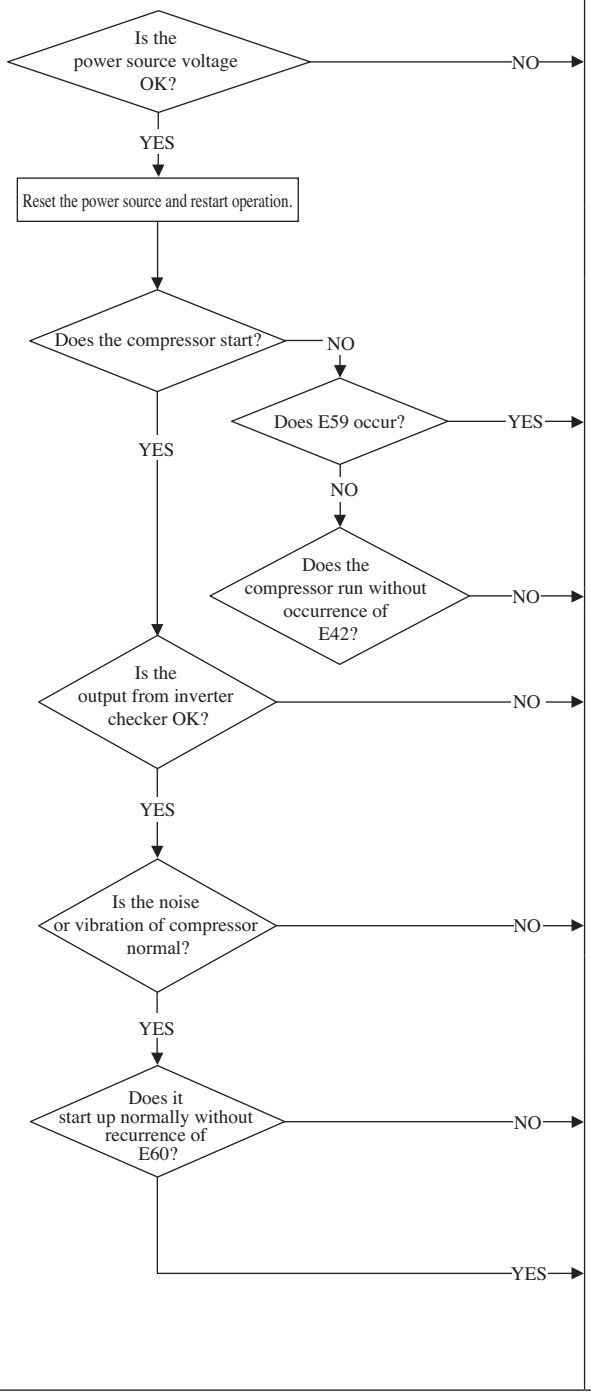
3. Condition of Error displayed

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

4. Presumable cause

- Defective outdoor fan motor
- Defective outdoor unit PCB
- Anomalous power source voltage
- Improper refrigerant amount and refrigerant circuit
- Defective compressor (motor, bearing)

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several MΩ or lower. If the electric leakage breaker is activated due to low insulation resistance, check followings.

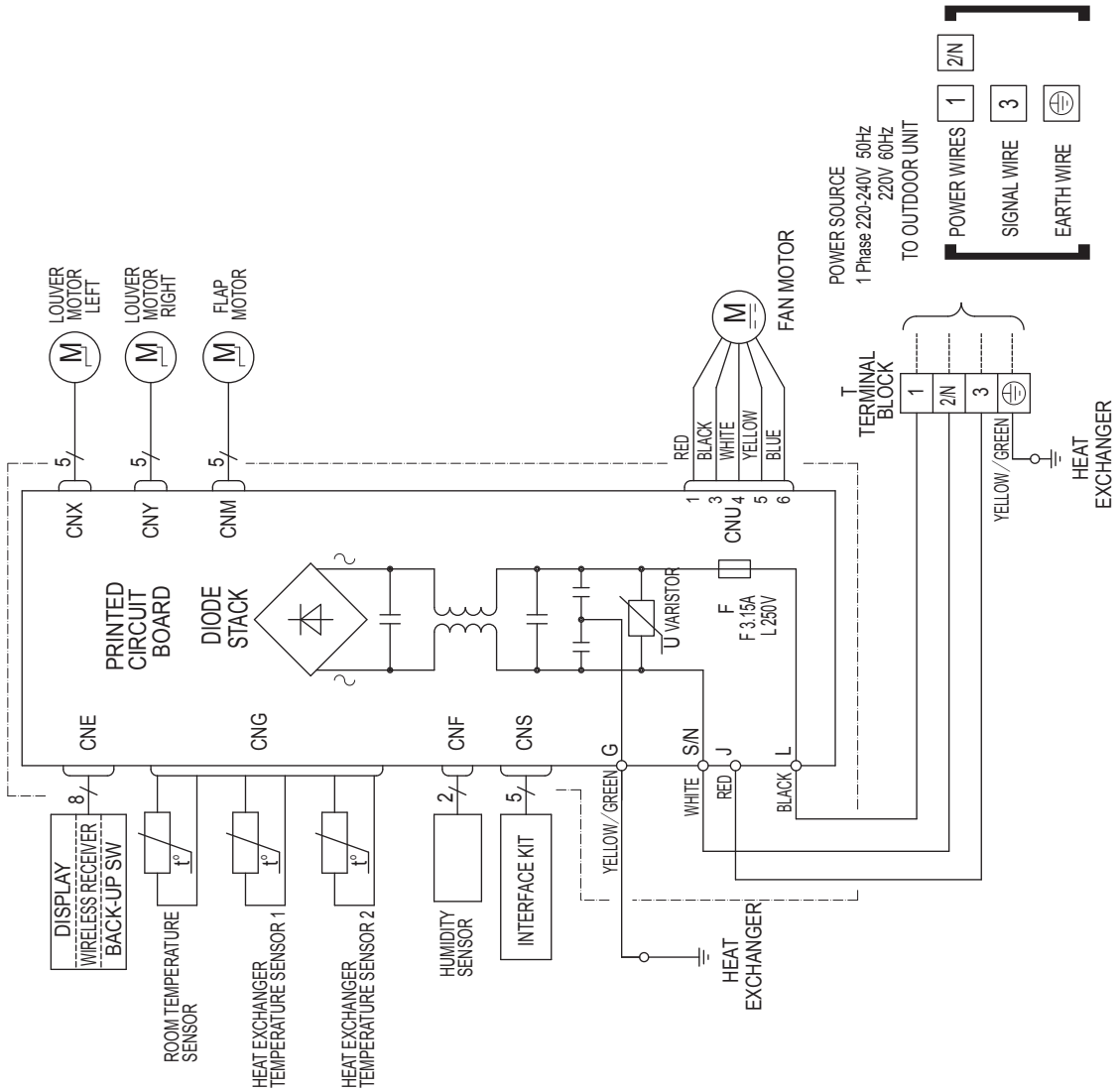
① Check whehter the insulation resistance can recover or not, after 6 hours has passed since power ON.
(By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated.)
② Check whether the electric leakage breaker conforms to high-harmonic specifications.
(As units has inverter, in order to prevent from improper operation, be sure to use high-harmonic one.)

1.3 ELECTRICAL WIRING

(1) Indoor unit

Model SRK100ZR-WF

Item	Description
CNE	Connector
CNF	
CNG	
CNM	
CNS	
CNU	
CNX	
CNY	



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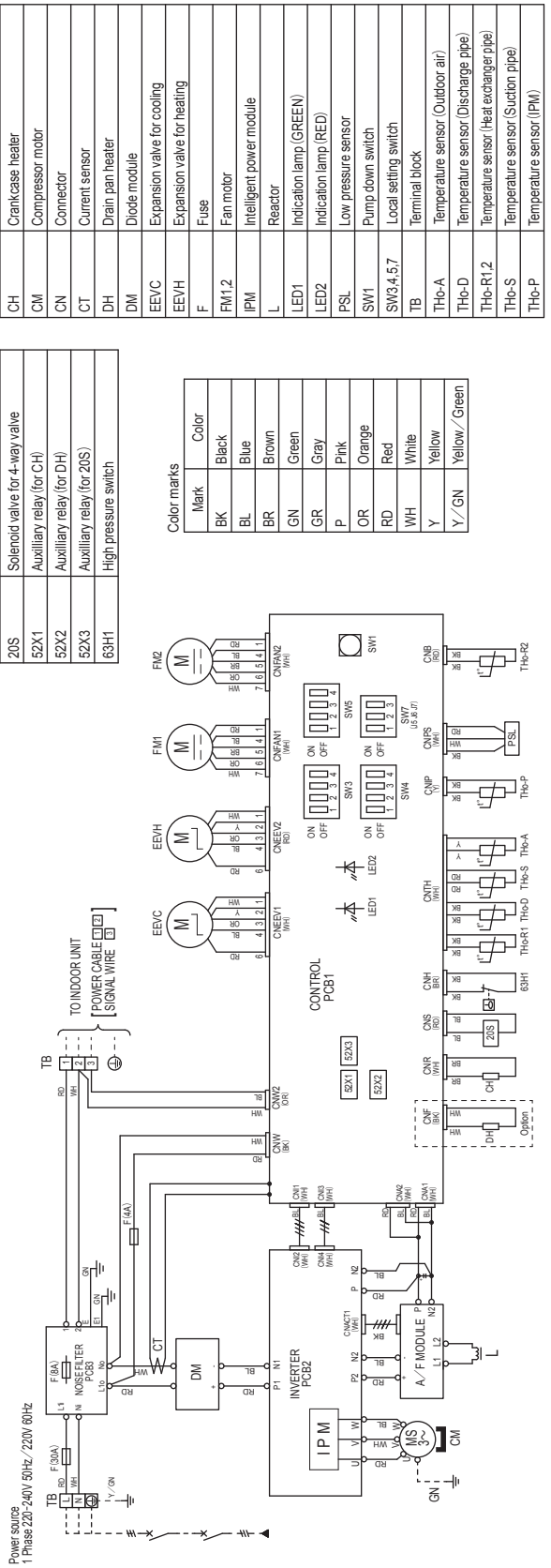
(2) Outdoor units

Model FDC100VNX-W



Meaning of marks

Item	Description
20S	Solenoid valve for 4-way valve
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
63H1	High pressure switch

Color marks

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

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1,2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
SW1	Pump down switch
SW3,4,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sensor (Discharge pipe)
THo-R1,2	Temperature sensor (Heat exchanger pipe)
THo-S	Temperature sensor (Suction pipe)
THo-P	Temperature sensor (IPM)

Local setting switch SW3,4,5 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not runnning when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW4-1	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size (mm)
100	25	5.5	21	ϕ1.6mm × 3	ϕ1.6

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- Power source cable: Use the cable which is conformed with 60245 IEC57.
  When selecting the power source cable length, make sure that voltage drop is less than 2% .
  If the wire length gets longer, increase the wire diameter.
- Indoor-outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.

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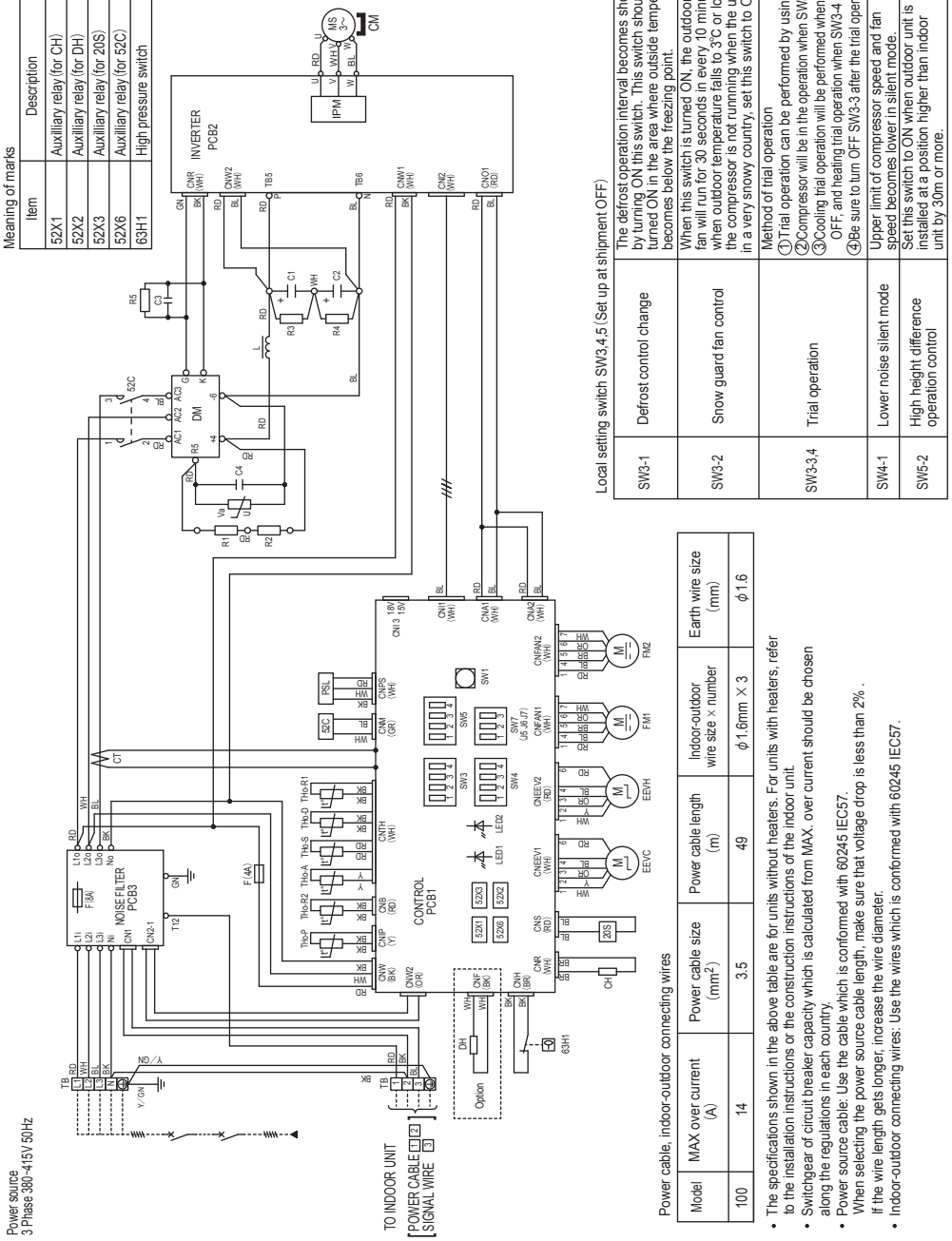
Model FDC100VSX-W



Local setting switch SW3,4,5 (Set up at shipment OFF)

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SW4-1	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size (mm)
100	14	3.5	49	ϕ1.6mm × 3	ϕ1.6

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- Power source cable: Use the cable which is conformed with 60245 IEC57.
  When selecting the power source cable length, make sure that voltage drop is less than 2% .
  If the wire length gets longer, increase the wire diameter.
- Indoor-outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.

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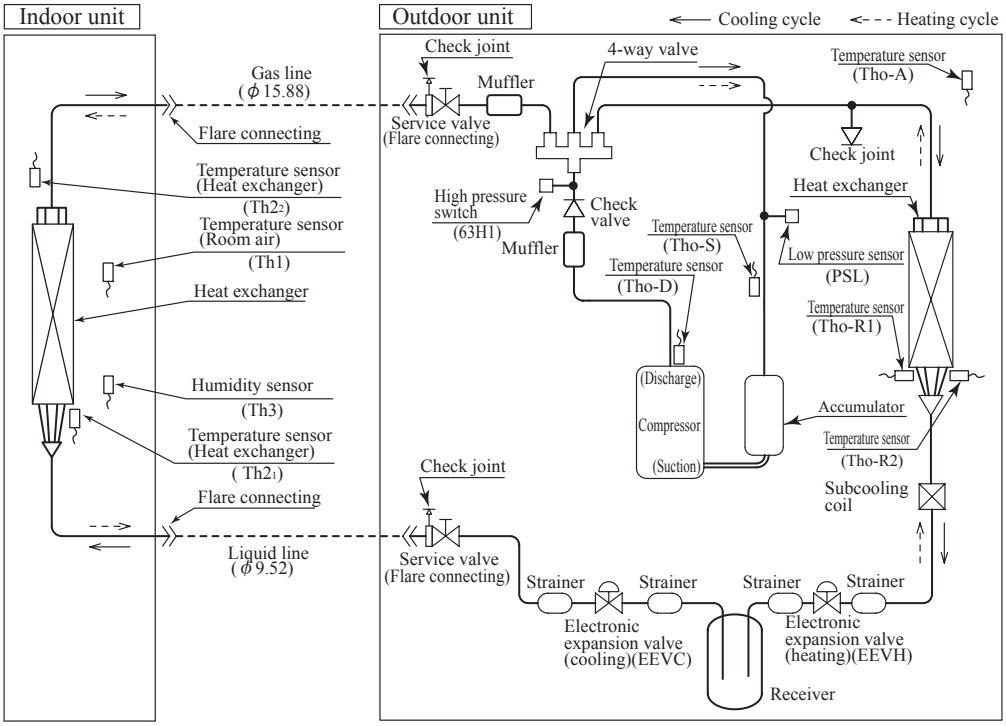
1.4 PIPING SYSTEM

Model 100



Preset point of the protective devices

Parts name	Mark	Equipped unit	100 model
Temperature sensor (for protection over-loading in heating)	**Tho-A**	Outdoor unit	Active 17˚C Inactive 16˚C
Temperature sensor (for frost prevention)	**Th2**	Indoor unit	Active 2.5˚C Inactive 8˚C
Temperature sensor (for protection high pressure in cooling)	**Tho-R**	Outdoor unit	Active 63˚C Inactive 51˚C
Temperature sensor (for detecting dis-charge pipe tempera-ture)	**Tho-D**	Outdoor unit	Active 115˚C Inactive 85˚C
High pressure switch (for protection)	**63H1**	Outdoor unit	Active 4.15MPa Inactive 3.15MPa
Low pressure sensor (for protection)	**PSL**	Outdoor unit	Active 0.079MPa Inactive 0.227MPa

2. MICRO INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

2.1 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

2.1.4 Operation control function by the outdoor control

(I) Models FDC100VNA-W, 100VSA-W

(1) Determination of compressor speed

Required compressor speed

(a) Cooling/dehumidifying operation Unit: rps

Model			100
Max. required compressor speed	Usual operation		90
	Silent mode, outdoor temperature ≦ 15°C	SW7-3 OFF	60
		SW7-3 ON	47
Min. required compressor speed			14

(b) Heating operation Unit: rps

Model			100
Max. required compressor speed	Usual operation		90
	Silent mode	SW7-3 OFF	60
		SW7-3 ON	47
Min. required compressor speed			15

(c) If the indoor unit fan speed becomes “Me” or “Lo”, Max required compressor speed goes down accordingly depending on indoor unit model.

(d) Max. required compressor speed under high outdoor air temperature in cooling mode
Maximum required compressor speed is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model	100
Max. required compressor speed	Outdoor air temperature is 40°C or higher	75
	Outdoor air temperature is 46°C or higher	75

(e) Max. required compressor speed under high outdoor air temperature in heating mode
Maximum required compressor speed is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model	100
Max. required compressor speed	Outdoor air temperature is 18°C or higher	60
	Outdoor air temperature is 10°C or higher	90

(f) Selection of max. required compressor speed by heat exchanger temperature

(i) Maximum required compressor speed is selected according to the outdoor heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor heat exchanger temperature (Th2) during heating mode.

(ii) When there are 2 indoor heat exchanger temperatures (Th2), whichever the higher applies.
When there are 2 outdoor heat exchanger temperatures (Tho-R), whichever the higher applies.

Unit: rps

Model			100
Max. required compressor speed	Cooling/ dehumidifying	Outdoor unit heat exchanger temperature is 55°C or higher	90
	Heating	Indoor unit heat exchanger temperature is 55°C or higher	90

(g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required compressor speed.

(h) During heating, it is operated with the maximum required compressor speed until the indoor heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

(a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.

(b) However, at initial start after turning the power source breaker, it may enter the standby state for maximum 30 minutes (" PREPARATION" is displayed on the remote control) in order to prevent the oil loss in the compressor.

If the cooling/dehumidifying/heating operation is selected from the remote control when the outdoor unit is in the standby state, " PREPARATION" is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition]

Normally, the compressor operation speed is raised in this start pattern.

[Control contents]

a) Starts with the target compressor speed at **A** rps.
However, when the outdoor air temperature (Tho-A) is 35°C or higher during cooling/dehumidifying or the room air temperature (Th1) is 25°C or higher during heating, it starts at **C** rps.

b) At 30 seconds after the start of compressor, its target compressor speed changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation speed fixed at **B** rps.

Model	Operation mode	**A** rps	**B** rps	**C** rps
100	Cooling/Dehumidifying	55	55	30
	Heating	55	55	30

(b) Compressor protection start III

[Control condition]

Number of compressor starts is only 1 counted after the power source breaker ON.

[Control contents]

Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

(i) Low operation compressor speed control during cooling/dehumidifying

[Control condition]

Upon establishing the conditions of compressor protection start III, the low operation compressor speed control is performed during cooling/dehumidifying.

[Control contents]

① Starts with the target compressor speed at **A** rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.

② At 30 seconds after the compressor start, the target compressor speed is changed to **B** rps and the operation compressor speed is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
100	Cooling/Dehumidifying	55	55	30

(ii) Low operation compressor speed control during heating

[Control condition]

When the conditions of compressor protection start III are established and the following condition is satisfied, the low number of revolutions operation control is performed during heating.

① At 30 minutes or more after turning the power source breaker on

[Control contents]

① Starts the compressor with its target compressor speed at **A** rps. However, when the indoor return air temperature (Th1) is 25°C or higher, it start at **C** rps.

② At 30 seconds after the start of compressor, the target compressor speed is changed to **B** rps and the operation compressor speed is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
100	Heating	55	55	30

(4) Outdoor fan control

(a) Outdoor fan tap and fan motor speed

Unit: min^{-1}

Model	Mode	Fan motor tap						
		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
FDC100	Cooling/Dehumidifying	200	350	600(1)	740	820	870	950
	Heating	200	350	600(1)	740	820	870	950

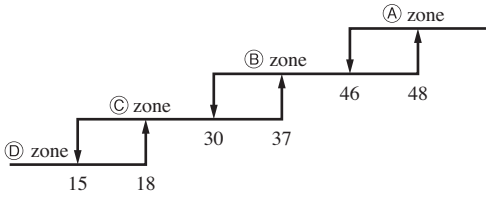
Note If the "silent mode start" signal is received from the remote control and SW7-3 is ON, the speed changes from 600 to 500.

(b) Fan tap control during Cooling/Defumidifying operation

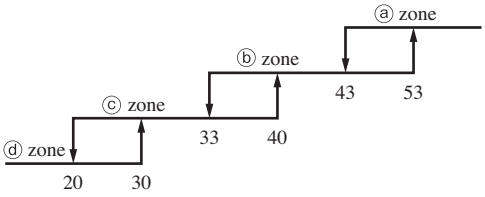
Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).
Note It is detected by Tho-R1 or R2, whichever the higher.

	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5	Tap 5	Tap 5	Tap 4
ⓑ zone	Tap 5	Tap 5	Tap 4(1)	Tap 3
ⓒ zone	Tap 4	Tap 4(1)	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

Note If the "silent mode start" signal is received from the remote control, the speed changes from Tap 4 to Tap 3.



Outdoor air temperature (˚C)



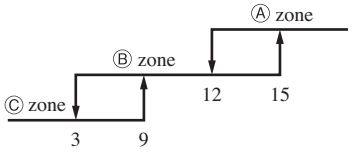
Outdoor heat exchanger temperature (˚C)

(c) Fan tap control during heating operation

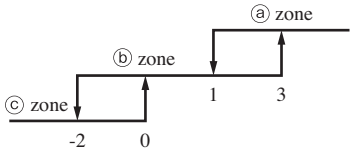
Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).
Note It is detected by Tho-R1 or R2, whichever the lower.

	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 4
ⓑ zone	Tap 3	Tap 4(1)	Tap 5
ⓒ zone	Tap 4	Tap 5	Tap 6

Note If the "silent mode start" signal is received from the remote control, the speed changes from Tap 4 to Tap 3.



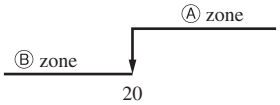
Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

(d) Outdoor fan control at cooling low outdoor air temperature

(i) If the outdoor air temperature (Tho-A) is in the zone Ⓑ in the cooling/dehumidifying mode, outdoor fan is controlled with ±5 – ±30min^{-1} to keep high pressure level which is controlled by outdoor heat exchanger temperature (Tho-R1, R2).
Note It is detected by Tho-R1 or R2, whichever the higher.



Outdoor air temperature (˚C)

(ii) The outdoor heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 20 seconds.

(iii) Range of the outdoor fan speed under this control is as follows.

a) Lower limit: 130min^{-1}

b) Upper limit: 350min^{-1}

(iv) As any of the following conditions is established, this control terminates.

a) When the outdoor air temperature is in the zone Ⓐ and the outdoor heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.

b) When the outdoor heat exchanger temperature at 40°C or higher is established for 40 seconds or more continuously.

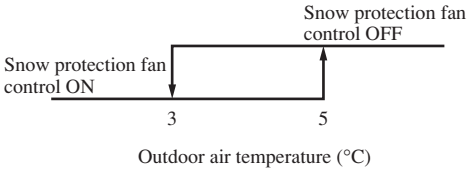
c) When the outdoor heat changer temperature at 50°C or higher is established.

(e) Caution at the outdoor fan start control (3 phase models only)

When the outdoor fan is running at 400min^{-1} or more before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan. This is normal.

(f) Snow protection fan control

If the DIP switch (SW3-2) on the outdoor unit control PCB is turned ON, the outdoor fan is operated for 30 seconds at 4th speed once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.



(5) Defrost operation

(a) Starting conditions

If either of the following defrost conditions A or conditions B or conditions C are satisfied, the defrost operation starts.

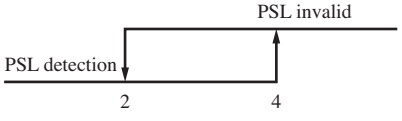
(i) Defrost conditions A

1) Accumulative compressor operation time after the end of defrost operation has elapsed 37 minutes, and the accumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.

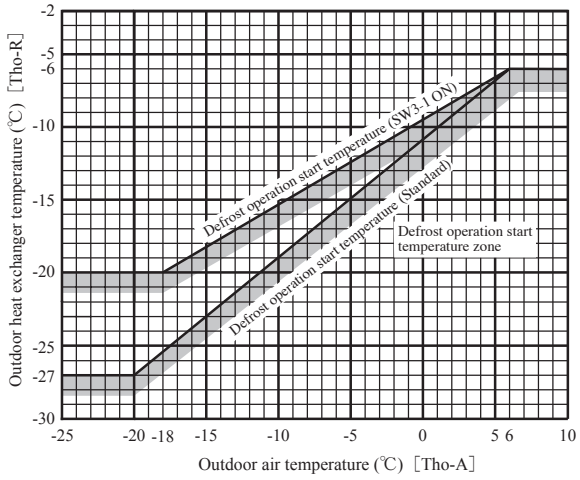
2) After 5 minutes from the compressor ON

3) After 5 minutes from the start of outdoor fan

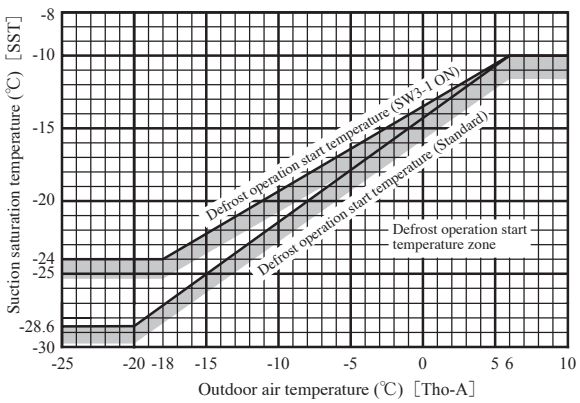
4) **After satisfying all above conditions, if temperatures of the outdoor heat exchanger temperature sensor (Tho-R1, R2) and the outdoor air temperature sensor (Tho-A) become lower than the defrost operation start temperature as shown by the right figure for 15 seconds continuously, or the suction gas saturation temperature (SST) and the outdoor air temperature (Tho-A), which are obtained from the value detected by the low pressure sensor (PSL) stay for 3 minutes within the range below the defrost operation start temperature as shown by the right figure.However, it excludes for 10 minutes after the start of compressor and the outdoor air temperature is as shown by the lower figure.**



Model FDC100



Model FDC100



(ii) Defrost conditions B

1) When previous defrost ending condition is the time out of defrost operation and it is in the heating operation after the accumulative compressor operation time after the end of defrost operation has become 30 minutes.
2) After 5 minutes from the start of compressor
3) After 5 minutes from the start of outdoor fan

(iii) Defrost condition C

After 12 minutes from the start of compressor with SW4-4 ON

(b) Ending conditions

When any of the following conditions is satisfied, the heating operation starts.

(i) When it has elapsed 13 minutes and 20 seconds after the start of defrost operation.
(ii) When the outdoor heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 12°C or higher for 10 seconds continuously.

(c) Switching of defrost operation with SW3-1

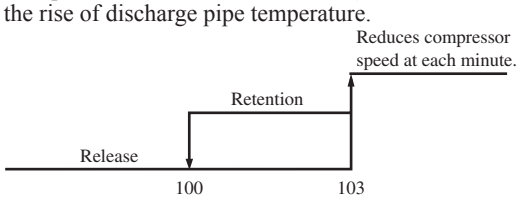
(i) If SW3-1 on the outdoor unit control PCB is turned to ON, it becomes easier to enter the defrost operation. Use this when installing a unit at snowing regions.
(ii) Control contents
a) It allows entering the defrost operation under the defrost condition A when the cumulative heating operation time becomes 30 minutes. It is 37 minutes at SW3-1 OFF (Factory default).
b) It allows entering the defrost operation under the defrost condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).
c) It allows the defrost operation with the outdoor heat exchanger temperature (Tho-R).

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

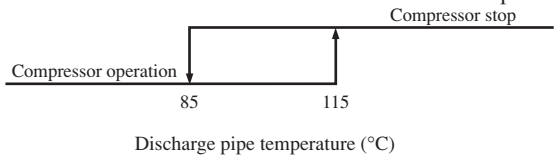
(i) Protective control

As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed is controlled to suppress the rise of discharge pipe temperature.



(ii) Anomalous stop control

a) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.
b) When it is detected 2 times within 60 minutes or after continuous 30 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



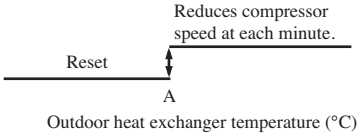
(iii) Reset of anomalous stop mode

As it drops to the reset value of 85°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

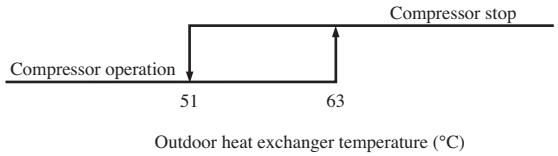
(i) Protective control

a) When the outdoor air temperature (Tho-A) is 40°C or higher and the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor speed is controlled to suppress the rise of high pressure.
b) Control value A is updated to an optimum value automatically according to the operating conditions.



Control value A
59−53°C

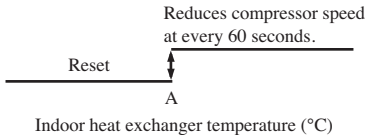
(ii) Anomalous stop control
a) As the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.
b) If it is detected 5 times within 60 minutes or 63°C or higher continues for 30 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.



(iii) Reset of anomalous stop mode
As it reaches the reset value of 51°C or lower for 3 minutes continuously, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

(i) Protective control
a) As the indoor unit heat exchanger temperature (Th2) exceeds the setting value, the compressor speed is controlled to suppress the rise of high pressure.
b) Control value A is updated to an optimum value automatically according to the operating conditions.

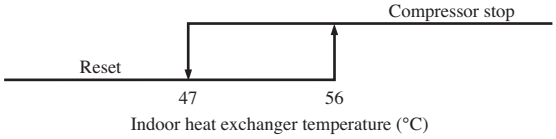


Model	Existing piping adaptation switch: SW5-1	
	OFF (Shipping)	ON
	Control value A (°C)	
FDC100	54−48	51−45

Note (1) Adaptation to existing piping is at ON.

(ii) Anomalous stop control
Operation control function by the indoor unit control

(iii) Adaptation to existing piping, stop control
If the existing piping adaptation switch, SW5-1, is turned ON, the compressor stops to protect existing piping when the indoor heat exchanger temperature (Th2) exceeds the setting value.

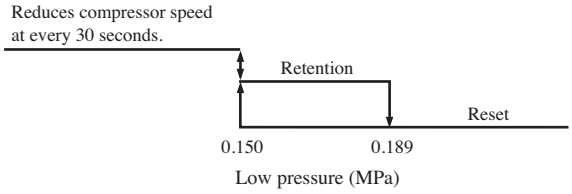


(d) Anomaly detection control by the high pressure switch (63H1)

(i) If the pressure rises and operates the high pressure switch (opens at 4.15MPa/closes at 3.15MPa), the compressor stops.
(ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.
a) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1.
b) When 63H1 has been in the open state for 30 minutes continuously, including the stop of compressor.

(e) Low pressure control

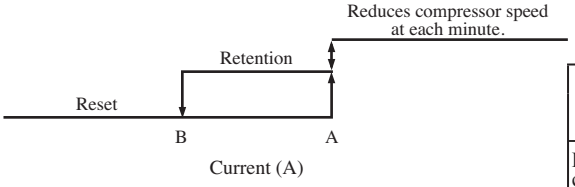
(i) Protective control
If the value detected by the low pressure sensor (PSL) exceeds the setting value, the compressor speed is controlled to restrain the drop of pressure.



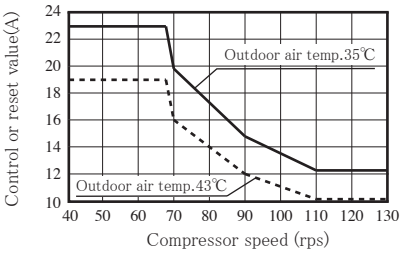
(ii) Anomalous stop control
1) When a value detected by the low pressure sensor (PSL) satisfies any of the following conditions, the compressor stops to run for its protection.
a) When the low pressure drops to 0.079MPa or under for 15 seconds continuously
b) At 10 minutes after the start of compressor, the suction superheat becomes 30°C or more and the low pressure becomes 0.15MPa or under for 60 seconds continuously.
2) E49 is displayed under any of the following conditions and it enters the anomalous stop mode.
a) When the low pressure drops 5 times within 60 minutes and the compressor stops under any of the above conditions
b) When a value detected with the low pressure sensor becomes 0.079MPa or under for 5 minutes, including the stop of compressor
3) However, when the control condition 1). a) is established during the compressor protection start III, E49 is displayed at initial stop and it enters the anomalous stop mode.

(f) Over-current protection current safe controls I, II

Detecting the outdoor unit inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed is controlled to protect the inverter.



(Fig. C) The control value "A" and the reset value vary depending on the compressor speed.



Model		Cooling		Heating	
		Control value A	Reset value B	Control value A	Reset value B
Primary current side	FDC 100	13.5 (23.0)	12.5 (22.0)	13.5 (23.0)	12.5 (22.0)
Secandary current side	FDC 100	12.0 (Fig.C)	11.0 (A-1)	12.0 (23)	11.0 (22)

Note Value in ( ) are for the single phase models.

(g) Anomalous power transistor current

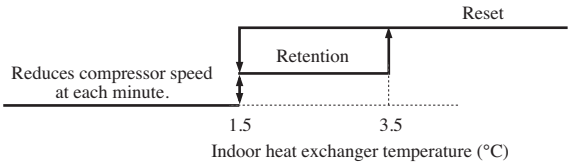
1) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.
2) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.

(h) Anomalous inverter PCB

If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.

(i) Anti-frost control by the compressor speed control

(i) If the indoor heat exchanger temperature (detected with Th2) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed is controlled to initiate the anti-frost control of indoor heat exchanger.
(ii) When there are 2 indoor heat exchanger temperatures (Th2), the lower temperature is detected.



(iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor unit control and the cooling, dehumidifying frost prevention of page 15.

(j) Dewing prevention control

[Control condition]

During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed is reduced to prevent dewing and water splash.

① Cooling electronic expansion valve aperture (EEVC) is 500 pulses.
② Suction overheat is 10°C or higher.
③ Compressor speed is 60 rps or higher.

[Control contents]

① When the suction overheat is 10°C or higher, the compressor speed is reduced at each 1 minute.
② Compressor speed does not rise till the cooling expansion valve becomes 460 pulses.
③ This control takes 60 rps as its lower limit so that compressor speed is not controlled when it is less than 60 rps.

(k) Broken wire detection on temperature sensor and low pressure sensor

(i) Outdoor heat exchanger temperature sensor, outdoor air temperature sensor and low pressure sensor

If the following is detected for 5 seconds continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Outdoor heat exchanger temperature sensor: -50°C or lower
- Outdoor air temperature sensor: -45°C or lower
- Low pressure sensor:0V or lower, 4.0V or more (Short-circuit)

(ii) Discharge pipe temperature sensor and suction pipe temperature sensor

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

Note During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Discharge pipe temperature sensor: -10°C or lower
- Suction pipe temperature sensor: -50°C or lower

(l) Fan motor error

(i) If the fan speed of 100 min^{-1} or under is detected for 30 seconds continuously under the outdoor fan control (with the operation command of fan tap at ① speed or higher), the compressor stops.

(ii) When the fan motor speed drops to 100 min^{-1} or under 5 times within 60 minutes and the compressor stops, it enters the anomalous stop mode with E48 displayed on the remote control.

(m) Anomalous stop by the compressor start stop

(i) When it fails to shift to the compressor DC motor's rotor position defection operation at 5 seconds after establishing the compressor starting condition, the compressor stops temporarily and restarts 3-minute later.

(ii) If it fails to shift to the position detection operation again at second time, it judges the anomalous compressor start and stops the compressor by the anomalous stop (E59).

(7) Silent mode

(a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor fan speed and the compressor speed.

(b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the DIP switch on the outdoor unit control PCB.

SW3-3	ON	SW3-4	OFF	Cooling test run
			ON	Heating test run
	OFF	Normal and end of test run		

Make sure to turn SW3-3 to OFF after the end of operation.

(b) Test run control

1) Operation is performed at the fuzzy compressor speed, which is determined for each model.

2) Each protective control and error detection control are effective.

3) If SW3-4 is switched during test run, the compressor is stopped for once by the stop control and the cooling/heating operation is switched.

4) Setting and display of remote control during test run

Item / Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

When SW7-1 is OFF, turning ON the pump-down switch SW1 for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF), the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power source is turned OFF.)

(a) Control contents

1) Close the service valve at the liquid side. (It is left open at the gas side.)
2) Compressor is started with the target speed at 55 rps in the cooling mode.
3) Red and green lamps (LED) flash continuously on the outdoor unit control PCB.
4) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.
5) Outdoor fan is controlled as usual.
6) Electronic expansion valve is fully opened.

(b) Ending conditions

Stop control is initiated depending on any of the following conditions.

(i) Suction pipe temperature of -38.7°C or lower is detected for 5 seconds continuously.
  a) Red LED: Light, Green LED: Flashing, Remote control: Displays stop.
  b) It is possible to restart when the suction pipe temperature of -38.7°C or higher.
  c) Electronic expansion valve (cooling/heating) is kept fully open.

(ii) Stop by the error detection control
  a) Red LED: Flashing, Green LED: Flashing
  b) Restart is prohibited. To return to normal operation, reset the power source.
  c) Electronic expansion valve (cooling/heating) is kept fully open.

(iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes
  a) Red LED: OFF, Green LED: Flashing, Remote control: Stop
  b) It is possible to pump-down again.
  c) Electronic expansion valve (cooling/heating) is kept fully open.

Note After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display "Transmission error – E5". This is normal.

(10) Base heater ON/OFF output control (Option)

(a) Base heater ON conditions

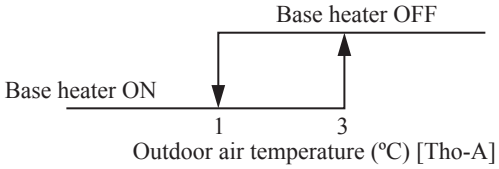
When all of following conditions are satisfied, the base heater is turned ON.

· Outdoor air temperature (detected with Tho-A) is 1ºC or lower.
· In the heating mode
· When the compressor is turned ON

(b) Base heater OFF conditions

When either one of following conditions is satisfied, the base heater is turned OFF.

· Outdoor air temperature (detected with Tho-A) is 3ºC or higher.
· When the compressor stop has been detected for 30 minutes continuously
· In the cooling or dehumidifying mode



(II) Model FDC200VSA-W

(1) Determination of compressor speed

Required compressor speed

(a) Cooling/dehumidifying operation. Unit: rps

Model		FDC200
Max. required compressor speed	Usual operation	120
	Outdoor air temperature ≦ 15°C or indoor return air temperature ≦ 20°C	68
	Silent mode	50 (68)
Min. required compressor speed		20

Note Value in ( ) are for the SW7-3 OFF.

(b) Heating operation. Unit: rps

Model		FDC200
Max. required compressor speed	Usual operation	120
	Silent mode	76 (94)
Min. required compressor speed		24

Note Value in ( ) are for the SW7-3 OFF.

(c) If the indoor fan speed becomes “Me” or “Lo”, Max required compressor speed goes down accordingly depending on indoor unit model.

(d) Max. required compressor speed under high outdoor air temperature in cooling mode.
Maximum required compressor speed is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC200
Max. required compressor speed	Outdoor air temperature is 35°C or higher	106
	Outdoor air temperature is 42°C or higher	90

(e) Max. required compressor speed under high outdoor air temperature in heating mode.
Maximum required compressor speed is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC200
Max. required compressor speed	Outdoor air temperature is 10°C or higher	120
	Outdoor air temperature is 18°C or higher	120

(f) Selection of max. required compressor speed by heat exchanger temperature.

(i) Maximum required compressor speed is selected according to the outdoor heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor heat exchanger temperature (Th2) during heating mode.

(ii) When there are 2 indoor heat exchanger temperatures (Th2), whichever the higher applies,
When there are 2 outdoor heat exchanger temperature (Tho-R), whichever the higher applies.

Unit: rps

Model			FDC200
Max. required compressor speed	Cooling/ dehumidifying	Outdoor heat exchanger temperature is 55°C or higher	120
	Heating	Indoor heat exchanger temperature is 55°C or higher	120

(g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required compressor speed.

(h) During heating, it is operated so that the required compressor speed adds 5 rps every 1 minute until the indoor heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

(a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.

(b) However, at initial start of heating mode after turning on the power source breaker, it may enter the standby state for maximum 30 minutes (" PREPARATION" is displayed on the remote control) in order to prevent the oil loss in the compressor.

If the heating operation is selected from the remote control when the outdoor unit is in the standby state, " PREPARATION" is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition]

Normally, the operation compressor speed is raised in this start pattern.

[Control contents]

(i) Starts with the target compressor speed at **A** rps.
However, when the outdoor air temperature (Tho-A) is 35°C or higher during cooling/dehumidifying or the room air temperature (Th1) is 25°C or higher during heating, it starts at **C** rps.

(ii) At 30 seconds after the start of compressor, its target compressor speed changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation compressor speed fixed at **B** rps.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC200	Cooling/Dehumidifying	55	55	30
	Heating	55	55	30

(b) Compressor protection start III

[Control condition]

Number of compressor starts is only 1 counted after the power source breaker ON.

[Control contents]

Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

(i) Low operation compressor speed control during cooling/dehumidifying.

[Control condition]

Upon establishing the conditions of compressor protection start III, the low operation compressor speed control is performed during cooling/dehumidifying.

[Control contents]

1) Starts with the target compressor speed at **A** rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.

2) At 30 seconds after the compressor start, the target compressor speed is changed to **B** rps and the operation compressor speed is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC200	Cooling/Dehumidifying	55	30	30

(ii) Low operation compressor speed control during heating.

[Control condition]

When the conditions of compressor protection start III are established and one of following conditions a), b) is satisfied, the low operation compressor speed control is performed during heating.

a) At 30 minutes or more after turning the power source breaker on

b) When compressor under-dome sensor temperature (Tho-H) is 4°C or higher and the difference between compressor under-dome sensor temperature and outdoor air sensor temperature (Tho-H-Tho-A) is 4°C or higher.

[Control contents]

a) Starts the compressor with its target compressor speed at **A** rps. However, when the room air temperature (Th1) is 25°C or higher, it starts at **C** rps.

b) At 30 seconds after the start of compressor, the target compressor speed is changed to **B** rps and the operation compressor speed is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC200	Heating	55	30	30

(4) Outdoor fan control

(a) Outdoor fan speed and fan motor revolution

Unit: min^{-1}

Model	Mode	Fan motor revolution						
		Speed ①	Speed ②	Speed ③	Speed ④	Speed ⑤	Speed ⑥	Speed ⑦
FDC200	Cooling/Dehumidifying	200	370	600	750	850	900	950
	Heating	200	370	600	820	850	910	950

(b) Fan speed control during Cooling/Defumidifying operation

Fan speeds are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

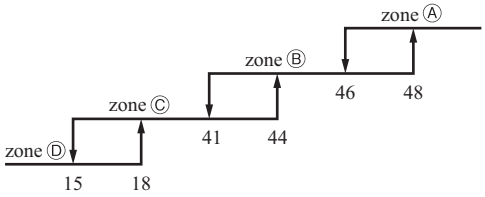
Note It is detected by Tho-R1 or R2, whichever the higher.

【FDC200】

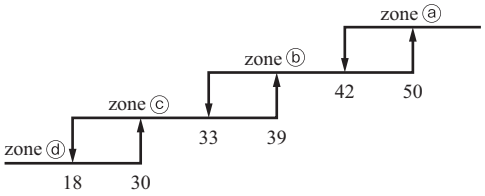
	zone Ⓐ	zone Ⓑ	zone Ⓒ	zone Ⓓ
zone ⓐ	Speed ⑥	Speed ⑥	Speed ⑥	Speed ④
zone ⓑ	Speed ⑤	Speed ⑤	Speed ※ 1	Speed ③
zone ⓒ	Speed ④	Speed ④	Speed ④	Speed ②
zone ⓓ	Speed ③	Speed ③	Speed ③	Speed ①

• Silent mode only

	zone Ⓐ	zone Ⓑ	zone Ⓒ	zone Ⓓ
zone ⓐ	Speed ⑤	Speed ⑤	Speed ⑤	Speed ④
zone ⓑ	Speed ④	Speed ④	Speed ④	Speed ③
zone ⓒ	Speed ④	Speed ③	Speed ③	Speed ②
zone ⓓ	Speed ③	Speed ③	Speed ②	Speed ①

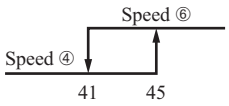


Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

※1 As shown below



Compressor speed (rps)

(c) Fan speed control during heating operation

Fan speeds are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

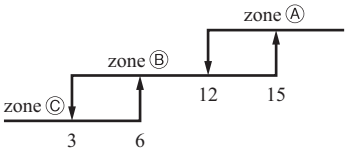
Note It is detected by Tho-R1 or R2, whichever the lower.

【FDC200】

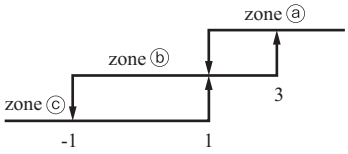
	zone Ⓐ	zone Ⓑ	zone Ⓒ
zone ⓐ	Speed ③	Speed ③	Speed ④
zone ⓑ	Speed ③	Speed ④	Speed ⑤
zone ⓒ	Speed ④	Speed ⑦	Speed ※2

• Silent mode only

	zone Ⓐ	zone Ⓑ	zone Ⓒ
zone ⓐ	Speed ③	Speed ③	Speed ③
zone ⓑ	Speed ③	Speed ③	Speed ④
zone ⓒ	Speed ④	Speed ⑤	Speed ⑥

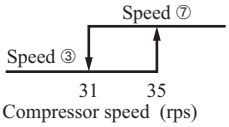


Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

※2 As shown below

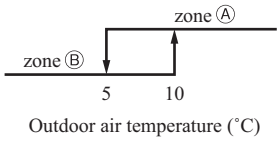


Compressor speed (rps)

(d) Outdoor fan control at cooling low outdoor air temperature

(i) When all the following conditions are established after the start of compressor, the following control is implemented. If the outdoor air temperature (Tho-A) is in the zone Ⓑ in the cooling/dehumidifying mode, it has elapsed 20 seconds from the start of outdoor fan and the outdoor fan is at the speed ①, the outdoor fan speed is controlled according to the outdoor heat exchanger temperature (Tho-R1, R2).

Note It is detected with Tho-R1 or R2, whichever the higher.



(ii) The outdoor heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 30 seconds.

(iii) Range of the outdoor fan speed under this control is as follows.

1) Lower limit: 130min^{-1}

※1:The fan stops if the outdoor air temperature is less than -5°C and 130min^{-1} is continuously operated for 30 seconds and outdoor heat exchanger temperature (either Tho-R1 or Tho-R2, whichever is higher) is 28°C or lower. If the outdoor air temperature is 0°C or higher or the heat exchanger temperature is 33°C or higher, the fan will resume operation at 130min^{-1}.

2) Upper limit: 500min^{-1}

(iv) As any of the following conditions is established, this control terminates.

1) When the outdoor air temperature is in the zone Ⓐ and the outdoor heat exchanger temperature at 29°C or higher is established for 40 seconds or more continuously

2) When the outdoor fan speed is 500min^{-1} and the outdoor heat exchanger temperature at 29°C or higher is established for 40 seconds or more continuously

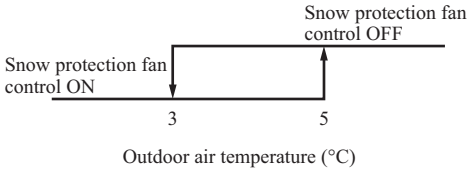
3) When the outdoor heat changer temperature at 44°C or higher is established for 40 seconds or more continuously

(e) Caution at the outdoor fan start control

When the outdoor fan is running at 400min^{-1} or more before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan. This is normal.

(f) Snow protection fan control

If the DIP switch (SW3-2) on the outdoor unit control PCB is turned ON, the outdoor fan is operated for 30 seconds at speed ④ once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.



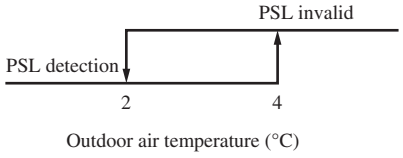
(5) Defrost operation

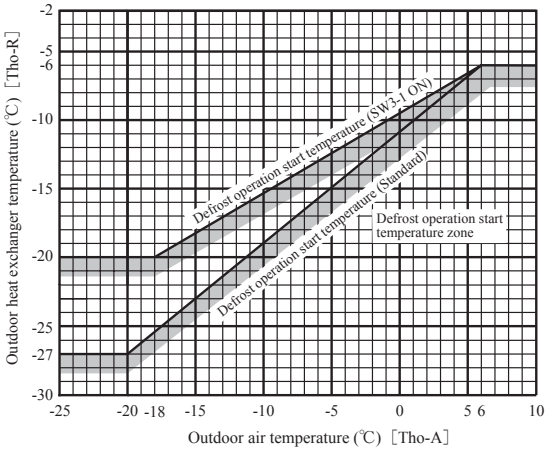
(a) Starting conditions

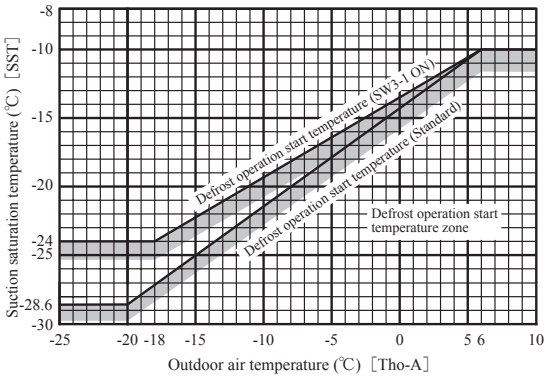
If all of the following defrost conditions A or conditions B are satisfied, the defrost operation starts.

(i) Defrost conditions A

1) Accumulative compressor operation time after the end of defrost operation has elapsed 37 minutes, and the accumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.
2) After 5 minutes from the compressor ON
3) After 5 minutes from the start of outdoor fan
4) After satisfying all above conditions, if temperatures of the outdoor heat exchanger temperature sensor (Tho-R1, R2) and the outdoor air temperature sensor (Tho-A) become lower than the defrost operation start temperature as shown by the right figure for 55 seconds continuously, or the suction gas saturation temperature (SST) and the outdoor air temperature (Tho-A), which are obtained from the value detected by the low pressure sensor (PSL) stay for 3 minutes within the range below the defrost operation start temperature as shown by the right figure. However, it excludes for 10 minutes after the start of compressor and the outdoor air temperature is as shown by the lower figure.







(ii) Defrost conditions B

1) When previous defrost ending condition is the time out of defrost operation and it is in the heating operation after the accumulative compressor operation time after the end of defrost operation has become 30 minutes.
2) After 5 minutes from the start of compressor.
3) After 5 minutes from the start of outdoor fan.

(iii) Defrost condition C

After 12 minutes from the start of compressor with SW4-4 ON

(b) Ending conditions

When any of the following conditions is satisfied, the heating operation starts.

(i) When it has elapsed 10 minutes and 20 seconds after the start of defrost operation.
(ii) When the outdoor heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 12°C or higher for 10 seconds continuously

(c) Switching of defrost control with SW3-1

(i) If SW3-1 on the outdoor unit control PCB is turned to ON, it becomes easier to enter the defrost operation. Use this when installing a unit at snowing regions.
(ii) Control contents

1) It allows entering the defrost operation under the defrost condition A when the cumulative heating operation time becomes 30 minutes. It is 37 minutes at SW3-1 OFF (Factory default).
2) It allows entering the defrost operation under the defrost condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).
3) It allows the defrost operation with the outdoor heat exchanger temperature (Tho-R) and suction pressure saturation temperature (SST) being higher than normal.

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

(i) Discharge pipe temperature control (Solenoid valve SV1 control(At heating mode))

The solenoid valve SV1 opens to suppress the rise of discharge pipe temperature.

1) SV1 open condition

In case the following conditions and other certain conditions are satisfied.

• Discharge pipe temperature (detected with Tho-D) is 100°C or higher.

• Low pressure is 0.7MPa or lower.

2) SV1 close condition

In case any of the following conditions are satisfied.

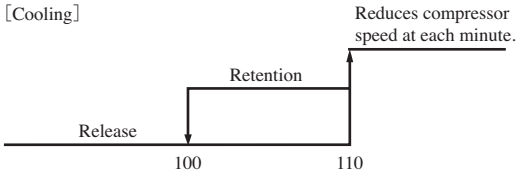
• Discharge pipe temperature (detected with Tho-D) is less than 50°C.

• Low pressure is more than 0.8MPa.

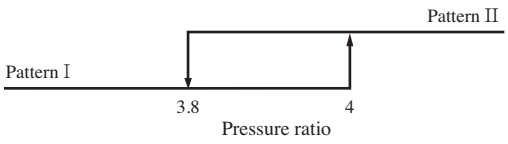
(ii) Protective control

As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed is controlled to suppress the rise of discharge pipe temperature.

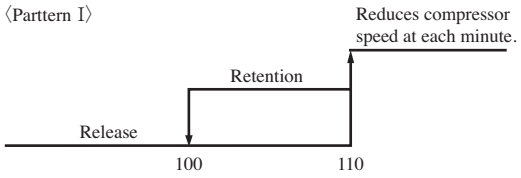
[Cooling]



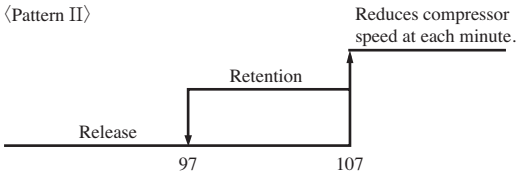
[Heating]



〈Parttern I〉



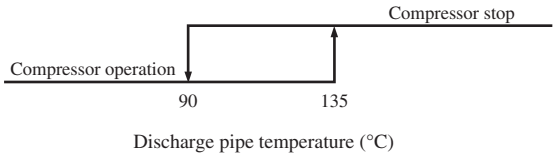
〈Pattern II〉



(iii) Anomalous stop control

1) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.

2) When it is detected 2 times within 60 minutes or after continuous 30 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



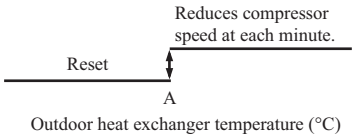
(iv) Reset of anomalous stop mode

As it drops to the reset value of 90°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

(i) Protective control 1 (Compressor speed control)

1) Outdoor heat exchanger temperature (Tho-R) exceeds the control value A.
Value A is changed from 59°C to 53°C by number of 63H1 operations.
2) When the outdoor air temperature (Tho-A) is 40°C or higher.
3) If outdoor heat exchanger temperature (Tho-R) is less than the control value A continuously for 6minutes, protective control finishes.



Control value A
59−53°C

(ii) High pressure control 1 (Electric expantion valve EEVC control 1)
The electric expantion valve EEVC opens to suppress the rise of high pressure.

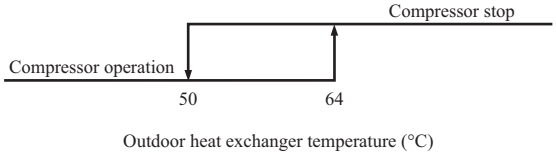
1) Operation condition
In case the following conditions are all satisfied.
• Outdoor heat exchanger temperature | Tho-R1 - Tho-R2 | is 8°C or higher (In case outdoor temperature is more than 42°C), 10°C or higher (In case outdoor temperature is 42°C or lower).
• Outdoor heat exchanger temperature (either Tho-R1 or Tho-R2, whichever is higher) is 54°C or higher.
• Under-dome temperature - suction saturation temperature (SST) is 30°C or higher.
2) Ending condition
In case any of the following conditions are satisfied.
• Outdoor heat exchanger temperature | Tho-R1 - Tho-R2 | is 4°C or lower (In case outdoor temperature is more than 42°C), 6°C or lower (In case outdoor temperature is 42°C or lower).
• Outdoor heat exchanger temperature (either Tho-R1 or Tho-R2, whichever is higher) is 50°C or lower.
• Under-dome temperature - suction saturation temperature (SST) is 8°C or lower (In case outdoor temperature is more than 42°C), 10°C or lower (In case outdoor temperature is 42°C or lower).

(iii) High pressure control 2 (Electric expantion valve EEVC control 2)
The electric expantion valve EEVC opens 30 pulse every 60 seconds to suppress the rise of high pressure.

1) Operation condition
In case the following conditions are all satisfied.
• Outdoor heat exchanger temperature (either Tho-R1 or Tho-R2, whichever is higher) is 58°C or higher.
• Under-dome temperature - suction saturation temperature (SST) is 15°C or higher.
• Outdoor temperature is 46°C or higher.
2) Ending condition
In case any of the following conditions are satisfied.
• Outdoor heat exchanger temperature (either Tho-R1 or Tho-R2, whichever is higher) is 50°C or lower.
• Under-dome temperature - suction saturation temperature (SST) is 8°C or lower.
• Outdoor temperature is 43°C or lower.

(iv) Anomalous stop control

1) As the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.
2) If it is detected 5 times within 60 minutes or 64°C or higher continues for 30 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.



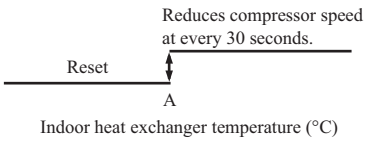
(v) Reset of anomalous stop mode
As it reaches the reset value of 50°C or lower, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

(i) Protective control

1) As the indoor heat exchanger temperature (Th2) exceeds the setting value, the compressor speed is controlled to suppress the rise of high pressure.

2) Control value A is changed from 57°C to 51°C by number of 63H1 operations.



Model	Control value A (°C)
FDC200	57−51

3) If indoor heat exchanger temperature(Th2) is less than the control value A continuously for 6minutes, protective control finishes.

(ii) Anomalous stop control

Operation control function by the indoor unit control

(d) Anomaly detection control by the high pressure switch (63H1)

(i) If the pressure rises and operates the high pressure switch (opens at 4.15MPa/closes at 3.15MPa), the compressor stops.

(ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.

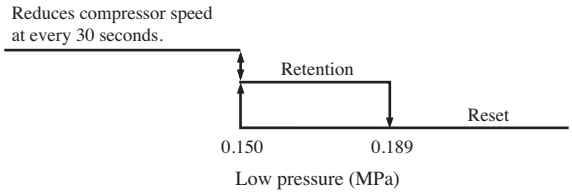
1) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1

2) When 63H1 has been in the open state for 30 minutes continuously, including the stop of compressor

(e) Low pressure control

(i) Protective control

1) If the value detected by the low pressure sensor (PSL) exceeds the setting value, the compressor speed is controlled to restrain the drop of pressure.



2) If low pressure sensor (PSL) is 0.189MPa or higher, protective control finishes.

(ii) Anomalous stop control

1) When a value detected by the low pressure sensor (PSL) satisfies any of the following conditions, the compressor stops for its protection.

a) When the low pressure drops to 0.079MPa or lower for 15 seconds continuously

b) At 10 minutes after the start of compressor, the suction superheat becomes 30°C or more for 60 seconds continuously and the low pressure becomes 0.15MPa or lower.

2) E49 is displayed under any of the following conditions and it enters the anomalous stop mode.

a) When the low pressure drops 5 times within 60 minutes and the compressor stops under any of the above conditions

b) When a value detected with the low pressure sensor becomes 0.079MPa or under for 5 minutes, including the stop of compressor

3) However, when the control condition 1). a) is established during the compressor protection start III, E49 is displayed at initial stop and it enters the anomalous stop mode.

4) If low pressure sensor (PSL) is 0.227MPa or higher and 3 minutes took after the compressor stops, it becomes possible to restart from the remote control.

(f) Compressor pressure ratio protection control

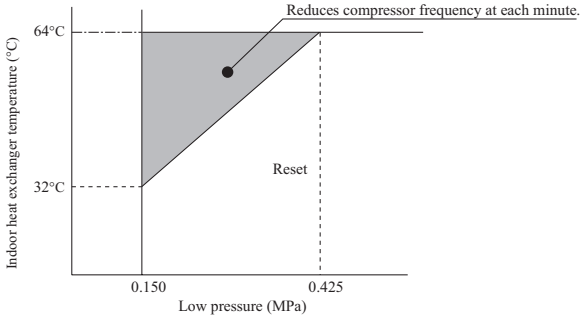
(i) During heating operation, if the indoor heat exchanger temperature (Th2) and low pressure sensor (PSL) exceed the setting values at 10 minutes after the start of compressor, the compressor speed (frequency) is controlled to protect the compressor.

(ii) This control is not performed during the outdoor fan ON and for 10 minutes from the start of outdoor fan.

(iii) This control is not performed during defrost operation and at 10 minutes after the reset of defrost operation.

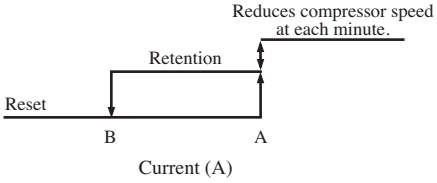
(iv) When there are 2 indoor heat exchanger temperatures (Th2), the higher temperature is detected.

(v) If the indoor heat exchanger temperature (Th2) and low pressure sensor (PSL) is without "Reduces compressor frequency at each minute" range in the following figure continuously for 6minutes, protective control finishes.



(g) Over-current protection current safe controls I, II

Detecting the outdoor inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed is controlled to protect the inverter.

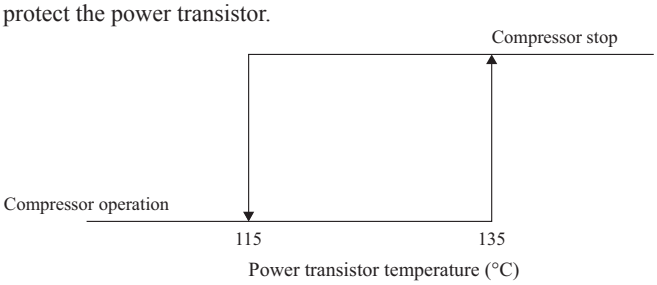


Model		Cooling		Heating	
		Control value A	Reset value B	Control value A	Reset value B
Primary current side	FDC200	16.0	15.0	16.0	15.0
Secandary current side	FDC200	15.5	14.5	15.5	14.5

(h) Power transistor temperature protection

(i) Anomalous stop control

If the power transistor temperature exceeds the setting value, the protective switch in the power transistor trips and stops the compressor to protect the power transistor.



(ii) Anomalous inverter PCB

1) If the power transistor detects anomaly 5 times within 60 minutes with compressor stop, E41 is displayed on the remote control and it enters the anomalous stop mode.
2) If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.
3) 3 minutes after the compressor stops, it becomes possible to restart from the remote control.

(i) Anomalous power transistor current

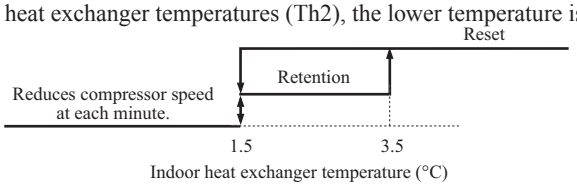
(i) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.
(ii) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.
(iii) 3 minutes after the compressor stops, it becomes possible to restart.

(j) Anomalous inverter communication

(i) When the answerback signal from the inverter cannot be received continuously for 15 seconds, the compressor stops.
(ii) If the power transistor defects anomalies 4 times within 15 minutes, including the stop of compressor, E45 is displayed on the remote control and it enters the anomalous stop mode.
3 minutes after the compressor stops, it becomes possible to restart from the remote control.

(k) Anti-frost control by the compressor speed control

(i) If the indoor heat exchanger temperature (detected with Th2) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed is controlled to initiate the anti-frost control of indoor heat exchanger.
(ii) When there are 2 indoor heat exchanger temperatures (Th2), the lower temperature is detected.



(iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor control and the cooling, dehumidifying frost prevention of page 15.

(l) Dewing prevention control

[Control condition]

During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed is reduced to prevent dewing and water splash.

(i) Cooling electronic expansion valve aperture (EEVC) is 500 pulses.

(ii) Suction superheat is more than 10°C.

(iii) Compressor speed is 60 rps or higher.

[Control contents]

(i) The compressor speed is reduced at each 1 minute until EEVC aperture is 460 or lower.

(ii) This control takes 60 rps as its lower limit of compressor speed.

(iii) If cooling electronic expansion valve aperture (EEVC) is less than 460 pulses continuously for 6minutes, protective control finishes.

(m) Broken wire detection on temperature sensor and low pressure sensor

(i) Outdoor heat exchanger temperature sensor, outdoor air temperature sensor and low pressure sensor

If the following is detected for 5 seconds continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON or 20 seconds after power on, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note During defrost operation, it is not detected.

- Outdoor heat exchanger temperature sensor: -50°C or lower
- Outdoor air temperature sensor: -45°C or lower
- Low pressure sensor: 0V or under or 4.0V or more

(ii) Discharge pipe temperature sensor, suction pipe temperature sensor, compressor under dome temperature sensor

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

Note During defrost operation, it is not detected.

- Discharge pipe temperature sensor: -10°C or lower
- Suction pipe temperature sensor: -50°C or lower
- Compressor under dome temperature sensor : -50°C or lower

(n) Fan motor error

(i) If compressor moves and the fan of revolution 100min^{-1} or less is detected for 30 seconds continuously , the compressor stops.

(ii) If the above (i) is detected 5 times within 60 minutes from first detection of the above (i), it enters the anomalous stop mode with E48 displayed on the remote control.

(o) Anomalous stop by the compressor start stop

(i) When a compressor startup failure is received from the inverter PCB, the compressor stops temporarily and restarts 3-minute later.

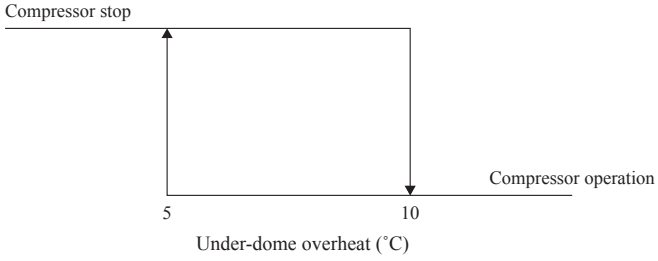
(ii) If the above (i) is detected 5 times, the compressor stops and E59 is displayed on the remote control.

(iii) 3 minutes after the compressor stops, it becomes possible to restart from the remote control.

(p) Anomaly liquid flooding

(i) Anomalous stop control

1) If the under-dome overheat exceeds the setting value continuously for 15 minutes (first anomalous stop) or 30 minutes (after the second anomalous stop), the compressor stops.



2) When it occurs 3 times within 90 minutes, E44 is displayed on the remote control and it enters the anomalous stop mode.

(ii) Reset of anomalous stop mode

3 minutes after the compressor stops, it becomes possible to restart from the remote control.

(7) Silent mode

(a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor fan speed and the compressor speed.

(b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the DIP switch on the outdoor unit control PCB.

SW3-3	ON	SW3-4	OFF	Cooling test run
			ON	Heating test run
	OFF	Normal and end of test run		

Make sure to turn SW3-3 to OFF after the end of operation.

(b) Test run control

(i) Operation is performed at required compressor speed, which is determined for each model.

(ii) Each protective control and error detection control are effective.

(iii) If SW3-4 is switched during test run, the compressor is stopped once by the stop control and the cooling/heating operation is switched.

(iv) Setting and display of remote control during test run

Item / Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

Turning ON the pump-down switch SW1 for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF) or SW4-1 is off, the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power source is turned OFF.)

(a) Control contents

(i) Close the service valve at the liquid side. (It is left open at the gas side.)

(ii) Compressor is started with the target speed at 55 rps in the cooling mode.

(iii) Red and green lamps (LED) keeps flashing on the outdoor unit control PCB.

(iv) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.

(v) Outdoor fan is controlled as usual.

(vi) Electronic expansion valve is fully opened.

(b) Control ending conditions

Stop control is initiated depending on any of the following conditions.

(i) Low pressure of 0.087MPa or lower is detected for 5 seconds continuously.
1) Red LED: Light, Green LED: keeps flashing, Remote control: Displays stop.
2) It is possible to restart when the low pressure is more than 0.087MPa.
3) Electronic expansion valve (cooling/heating) is kept fully open.

(ii) Stop by the error detection control
1) Red LED: keeps flashing, Green LED: keeps flashing
2) Restart is prohibited. To return to normal operation, reset the power source.
3) Electronic expansion valve (cooling/heating) is kept fully open.

(iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes
1) Red LED: stays OFF, Green LED: keeps flashing, Remote control: Stop
2) It is possible to pump-down again.
3) Electronic expansion valve (cooling/heating) is kept fully open.

Note After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display "Transmission error – E5". This is normal.

(10) Base heater ON/OFF output control (Option)

(i) Base heater ON conditions

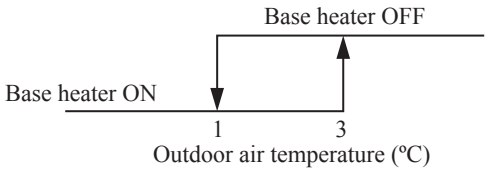
When all of following conditions are satisfied, the base heater is turned ON.

- Outdoor air temperature (detected with Tho-A) is 1ºC or lower.
- In the heating mode
- When the compressor is turned ON

(ii) Base heater OFF conditions

When either one of following conditions is satisfied, the base heater is turned OFF.

- Outdoor air temperature (detected with Tho-A) is 3ºC or higher.
- When the compressor stop has been detected for 30 minutes continuously
- In the cooling or dehumidifying mode



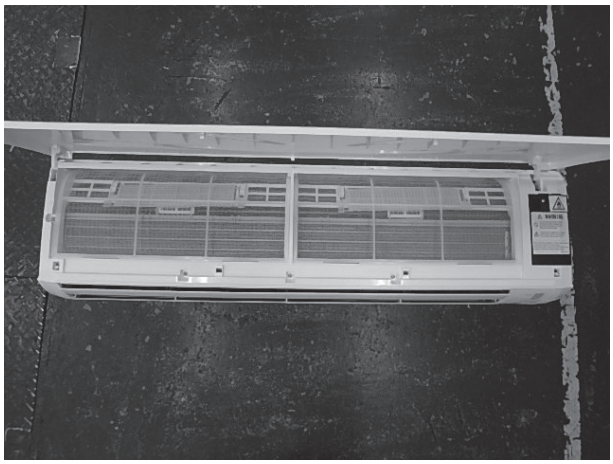
2.2 MAINTENANCE DATA

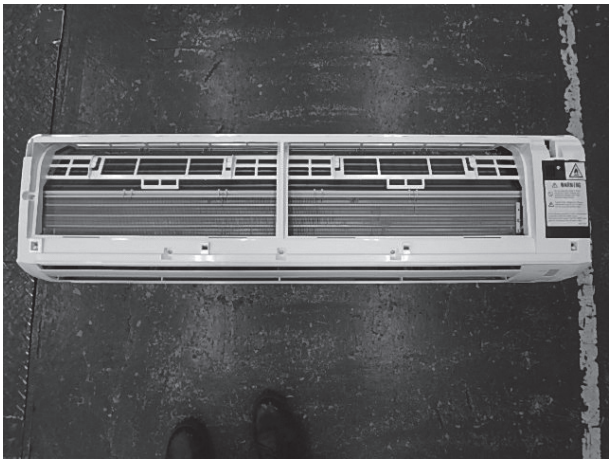
See page 28 of 1.2 chapter.

2.3 DISASSEMBLY PROCEDURE

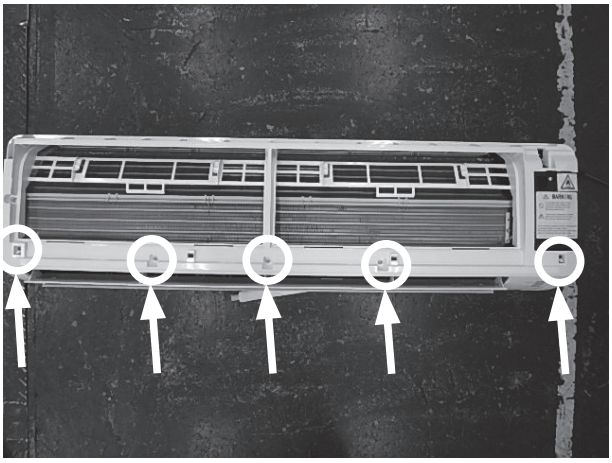
(1) Indoor unit

1) Remove the cover.

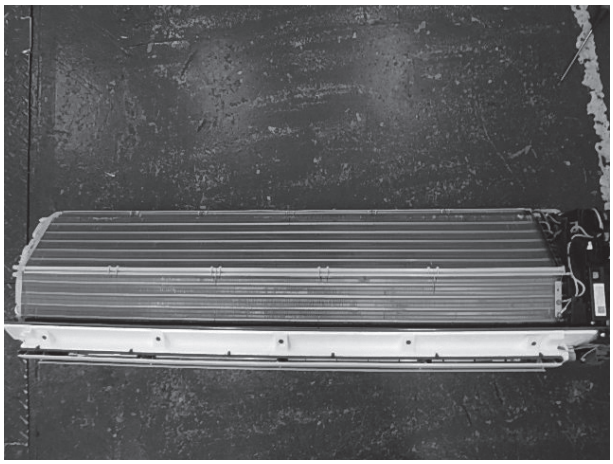




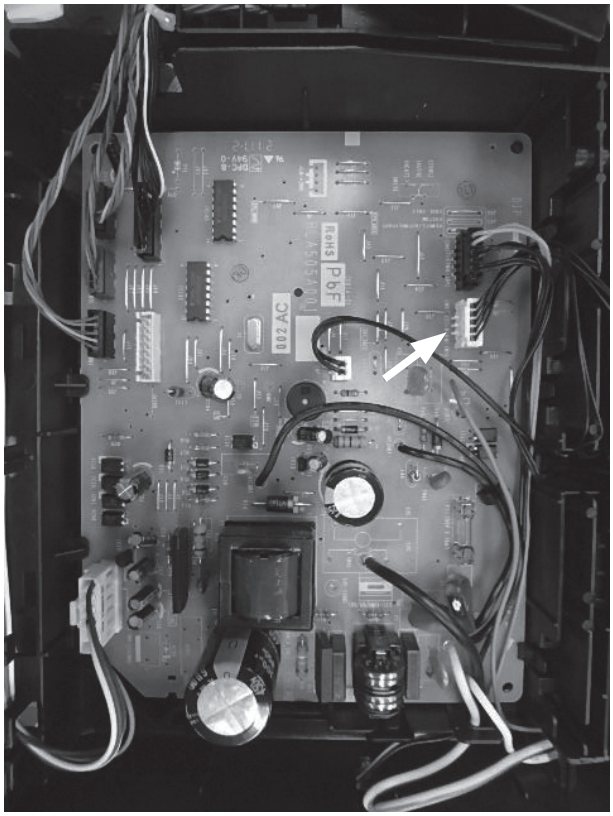
2) Remove the screw (The following 5 places).



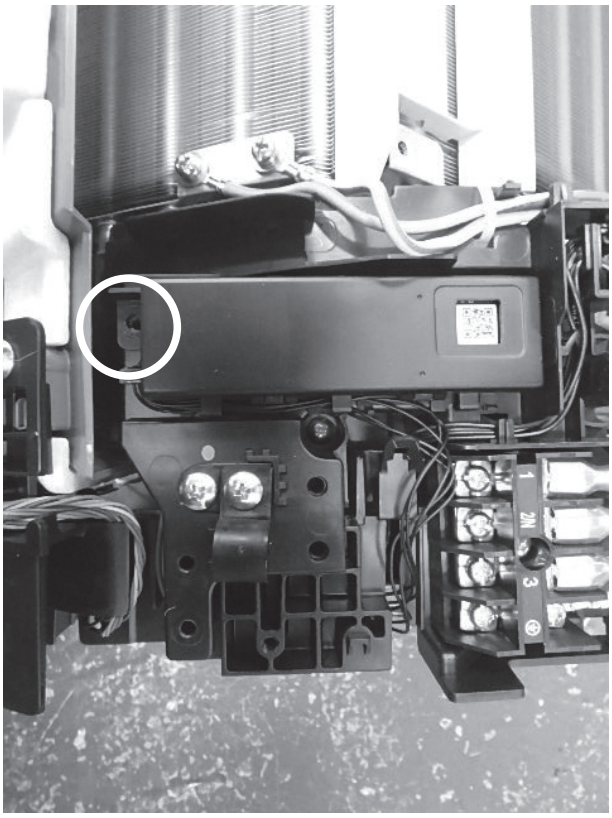
3) Remove the cover.



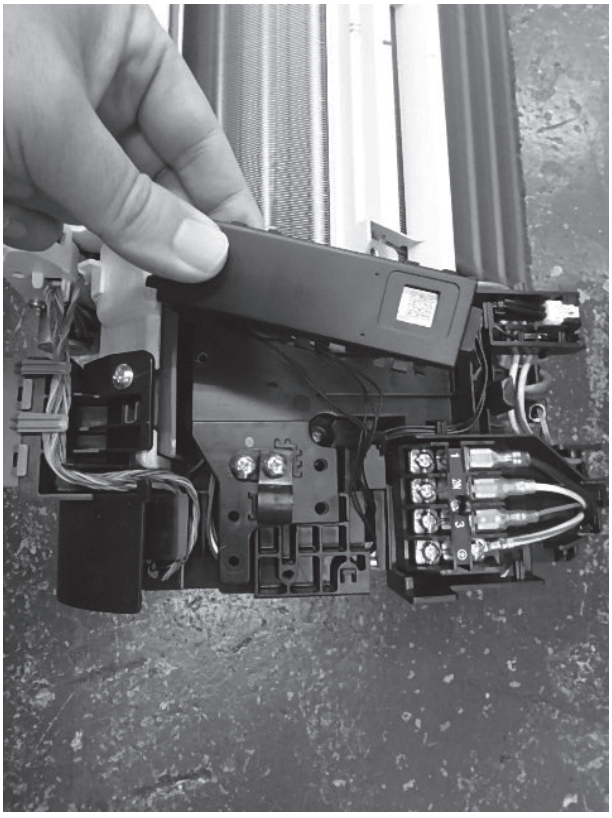
4) Unplug the connector.



5) Unscrew.



6) Pull out control.



SRK100ZR-WF Operation table

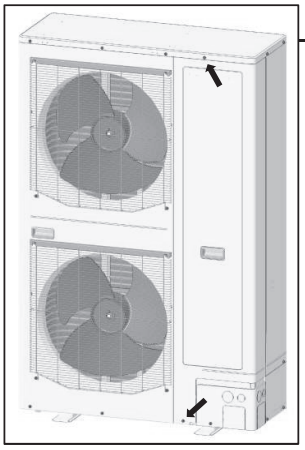
Function	Setting	Operation by remote control	Operation by Smart M-Air	Operation by wired remote control (SC-BIKN2) *1
ON/OFF	ON	○	○	○
	OFF	○	○	○
OPERATION MODE select	AUTO	○	○	○
	COOL	○	○	○
	HEAT	○	○	○
	DRY	○	○	○
	FAN	○	○	○
	SELF CLEAN	○	×	× (Displayed as OFF)
	ALLERGEN CLEAR	○	× (Displayed as FAN)	× (Displayed as FAN)
	NIGHT SETBACK	○	× (Displayed as HEAT)	× (Displayed as HEAT)
	Home leave mode	—	○ *2	○
	Vacant property mode	—	○	—
Temperature adjustment	18℃—30℃	○	○	○
FAN SPEED	AUTO	○	○	○
	HIGH POWER	○	× (Displayed as ■■■)	× (Displayed as Hi)
	Hi	○	○ (Displayed as ■■■■)	○ (Displayed as PHi)
	Me	○	○ (Displayed as ■■■)	○ (Displayed as Hi)
	Lo	○	○ (Displayed as ■■)	○ (Displayed as Me)
	ULo	○	○ (Displayed as ■)	○ (Displayed as Lo)
	ECONO	○	× (Displayed as ■)	× (Displayed as Lo)
Air flow direction adjustment	Up/down (1 step)	○	○	○
	Up/down (2 step)	○	○	○
	Up/down (3 step)	○	× (Displayed as 2 step)	× (Displayed as 2 step)
	Up/down (4 step)	○	○ (Displayed as 3 step)	○ (Displayed as 3 step)
	Up/down (5 step)	○	○ (Displayed as 4 step)	○ (Displayed as 4 step)
	Up/down (swing)	○	○	○
	Up/down (flap stopped)	○	× (Displayed as 2 step)	× (Displayed as 2 step)
	Left/right (leftmost)	○	○	○
	Left/right (left)	○	○	○
	Left/right (middle)	○	○	○
	Left/right (right)	○	○	○
	Left/right (rightmost)	○	○	○
	Left/right (wide)	○	○	○
	Left/right (spot)	○	○	○
	Left/right (swing)	○	○	○
	Left/right (louver stopped)	○	× (Displayed as middle)	× (Displayed as middle)
	3D AUTO	○	○	○
TIMER function	Various TIMERs	○	—	○
	WEEKLY TIMER	○	○	○
MENU function	Display brightness adjustment	—	—	—
	Fan control in heating thermo-OFF	—	—	○ *3
	SELF CLEAN setting	○	—	—
	Silent setting	—	—	—
	Wireless LAN connection setting	○	—	—
	Wireless LAN communication	○	—	—
Other function	Installation location setting	○	—	—
	Silent	○	—	○
	Initialization of wireless LAN	○	—	—
	Electricity bill display	—	○	○
	Shut-off reminder alert	—	○	—

○ : Operation/Setting Available
× : Operation/Setting/Display N/A
— : No function

*1 : Option part
*2 : Operates with the default settings of the indoor unit
(Operation switching is cooling or heating display)
*3 : Only fan stop can be set.

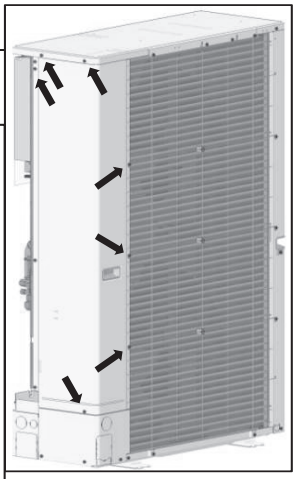
(2) Outdoor unit

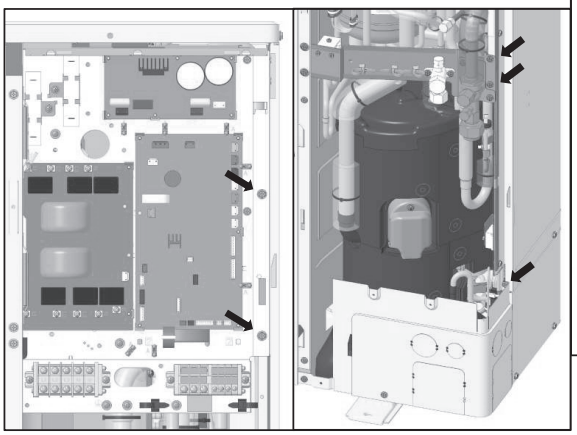
Model FDC200VSA-W



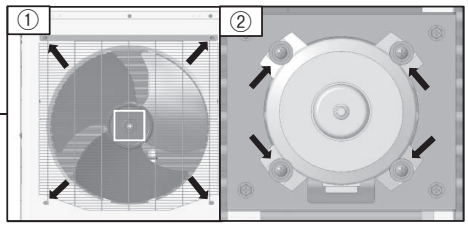
1. To remove the service panel
(1) Remove 2 service panel fixing screws and remove service panel.

2. To remove the rear panel
(1) Remove the service panel.(See No.1.)
(2) Remove 12 rear panel fixing screws and remove rear panel.

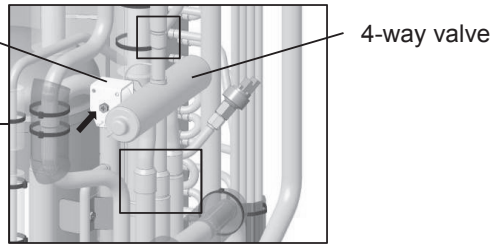




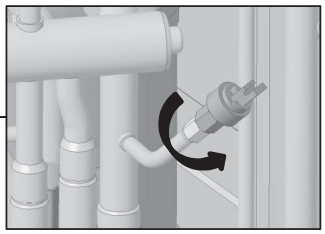
3. To remove the fan motor (FM)
(1) Remove the service panel.(See No.1.)
(2) Disconnect the motor connector(CNFANx) on PCB in control box.
(3) Remove 4 fan guard fixing screws and remove fan guard.(← mark, Pic.①)
(4) Remove the propeller fan fixing nut and remove propeller fan .
(□ mark, Pic.①)
(5) Remove the fan motor wiring fixing bands.
(6) Remove 4 fan motor fixing screws and remove fan motor.(← mark, Pic.②)



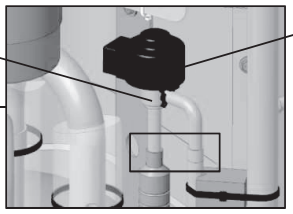
4. To remove the 4-way valve (20S)
(1) Remove the service panel and rear panel.(See No.1,2.)
(2) Disconnect the coil of 4-way valve connector(CNS) on PCB in control box.
(3) Remove the coil of 4-way valve wiring fixing bands.
(4) Remove the coil of 4-way valve fixing screw (← mark) and remove coil of 4-way valve.
(5) Remove welded part of 4-way valve by welding. (□ mark)



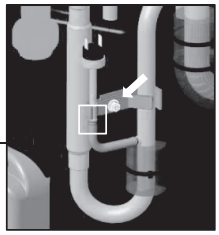
5. To remove the low pressure sensor
(1) Remove the service panel and rear panel.(See No.1,2.)
(2) Disconnect the PSL connector(CNPS) on PCB in control box.
(3) Remove the PSL wiring fixing bands.
(4) Turn PSL to the left and remove PSL.
(Double spanners are needed.)

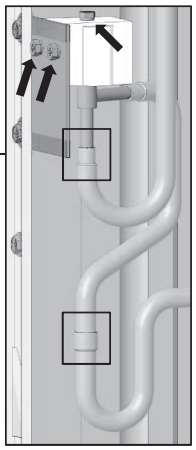


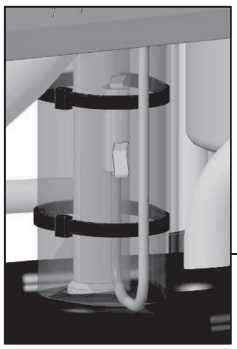
6. To remove the electronic expansion valves, (example"EEVC")
(1) Remove the service panel and rear panel.(See No.1,2.)
(2) Disconnect the EEVC connector(CNEEV1) on PCB in control box.
(3) Remove the EEVC coil wiring fixing bands.
(3) Remove the EEVC coil by pull out on the top.
(4) Remove welded part of EEV by welding. (□ mark)



7. To remove the high pressure switch (63H)
(1) Remove the service panel and rear panel.(See No.1,2.)
(2) Disconnect the 63H connector(CNH) on PCB in control box.
(3) Remove the high pressure switch wiring fixing bands.
(4) Remove the metal fitting fixing screws and remove metal fitting.(← mark)
(5) Remove welded part of high pressure switch by welding. (□ mark)



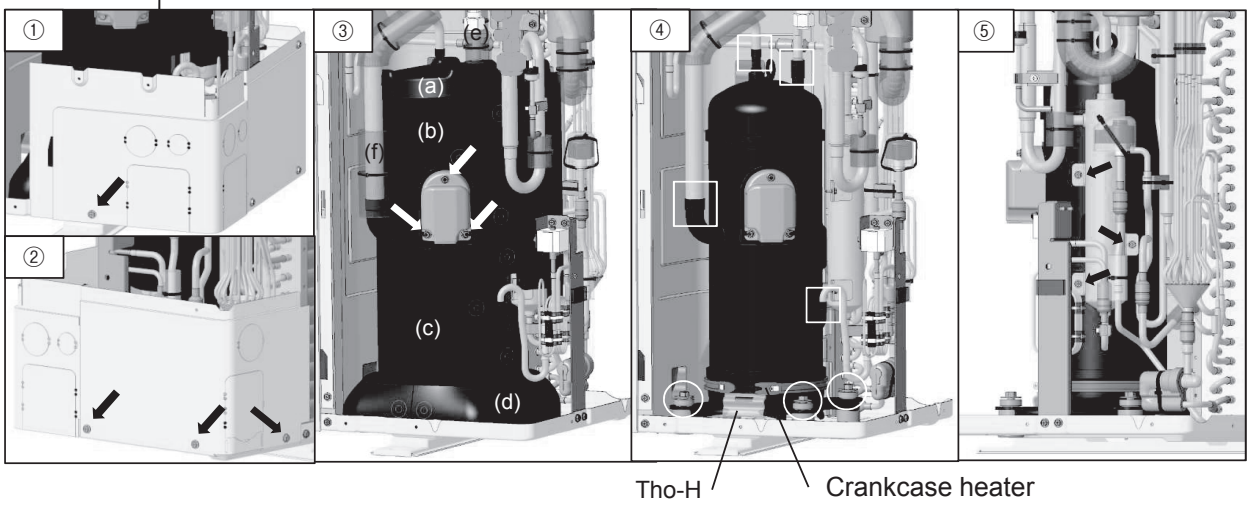


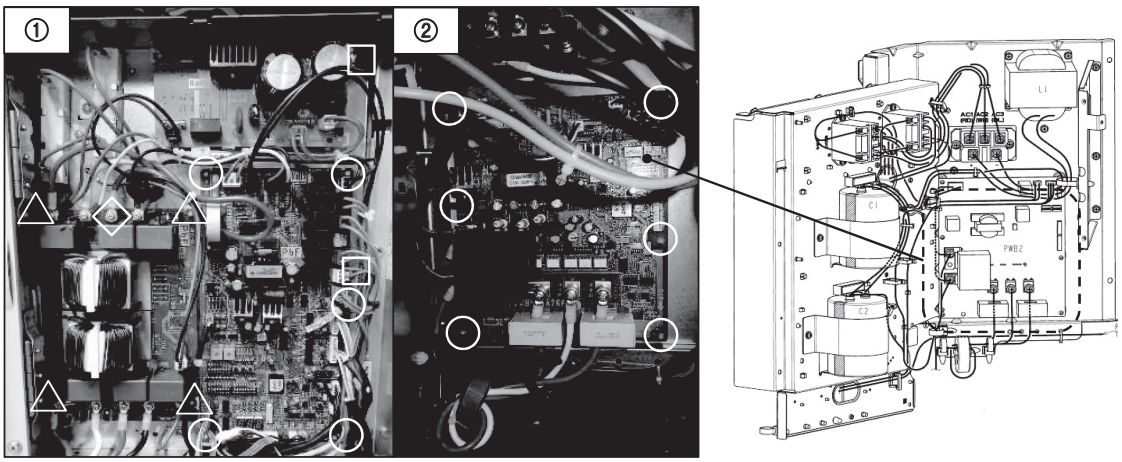


8. To remove bypass valves (example"SV1")
(1) Remove the service panel.(See No.1.)
(2) Disconnect the SV1 connector(CNF) on PCB in control box.
(3) Remove the coil of SV1 wiring fixing bands.
(4) Remove 3 coil of SV1 fixing screws and remove coil .(← mark)
(5) Remove welded part of SV1 by welding.(□ mark)

9. To remove the temperature sensors (example"Tho-D")
(1) Remove the service panel.(See No.1.)
(2) Remove the insulation which covers Tho-D.
(3) Disconnect the Tho-D connector(CNTH) on PCB in control box.
(4) Remove the Tho-D wiring fixing bands.
(5) Pull out the temperature sensor"Tho-D" from the sensor holder.

10. To remove the compressor (CM)
(1) Remove the service panel and rear panel.(See No.1,2.)
(2) Remove front cover fixing screw and remove front cover.(← mark, Pic.①)
(3) Remove 3 side cover fixing screws and remove side cover.(← mark, Pic.②)
(4) Remove the insulation ((a)-(d), Pic.③) which covers compressor. (Strings (b)-(d), Pic.③ should be loosen.)
(5) Remove 3 terminal cover fixing bolts(← mark, Pic.③) and remove terminal cover and disconnect the power wirings.
(6) Remove the crankcase heater.
(7) Pull out the temperature sensor"Tho-H" from the sensor holder.
(8) Remove the insulation ((e),(f), Pic. ③) which covers welded part.
(9) Remove welded part of compressor by welding.(□ mark, Pic.④)
(10) Remove 3 oil separator fixing screws and remove oil separator.(← mark, Pic.⑤)
(11) Remove 3 compressor fixing nuts(○ mark, Pic.④) using spanner or adjustable wrench.





11. To remove the printed circuit board (PCB)

≪Control PCB≫

(1) Remove the service panel.(See No.1.)
(2) Pull off all the inserted connectors of control PCB.(Pic.①)
(3) Remove wiring fixing screw of noise filter PCB.(◇ mark, Pic.①)
(4) Take off 5 control PCB fixing locking supports and remove control PCB.(○ mark, Pic.①)

≪Inverter PCB≫

(1) Remove the service panel.(See No.1.)
(2) Remove 2 plate fixing screws and open plate.(□ mark, Pic.①)
(3) Pull off all the inserted connectors of inverter PCB.(Pic.②)
(4) Remove all wiring fixing screws of inverter PCB.(Pic.②)
(5) Take off 6 inverter PCB fixing locking supports and remove inverter PCB.(○ mark, Pic.②)

≪Noise filter PCB≫

(1) Remove the service panel.(See No.1.)
(2) Pull off all the inserted connectors of noise filter PCB.(Pic.①)
(3) Remove all wiring fixing screws of noise filter PCB.(Pic.①)
(4) Take off 4 noise filter PCB fixing locking supports and remove noise filter PCB.(△ mark, Pic.①)

2.4 ELECTRICAL WIRING

(1) Indoor unit ..... **See page 147.**

(2) Outdoor units

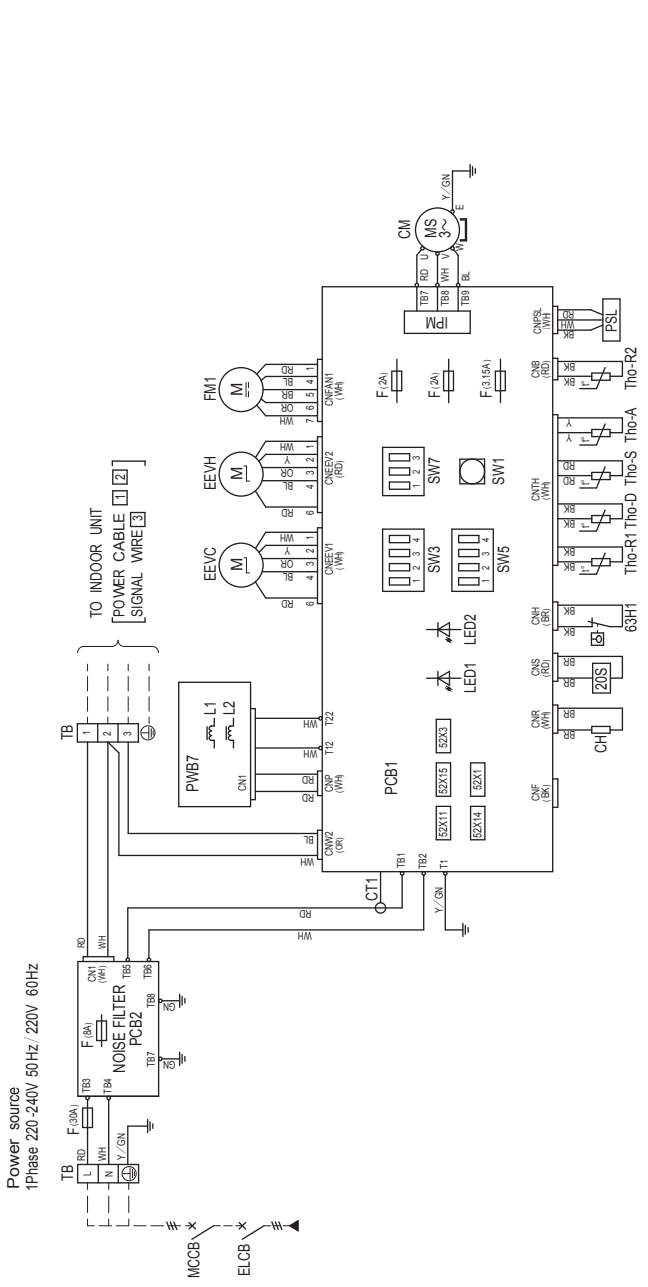
Model FDC100VNA-W

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
CT1	Current sensor
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1	Fan motor
IPM	Intelligent power module
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
L1,2	Reactor
PSL	Low pressure sensor
SW1	Switch
SW3,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sesor (Discharge pipe)
THo-R1,R2	Temperature sensor (Heat exchanger)
THo-S	Temperature sensor (Suction pipe)
20S	Solenoid valve for 4-way valve
52X1	Auxiliary relay
52X3	Auxiliary relay
52X11	Auxiliary relay (for 20S)
52X14	Auxiliary relay (for CH)
52X15	Auxiliary relay
63H1	High pressure switch

Color marks

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



Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
100	24	5.5	22	ϕ1.6mm x 3	ϕ1.6

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

Local setting switch SW3,5,7 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
SW7-2	Defrost control change	Set this switch to ON when managing unit operation by remote control connected external equipment.
SW7-3	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.

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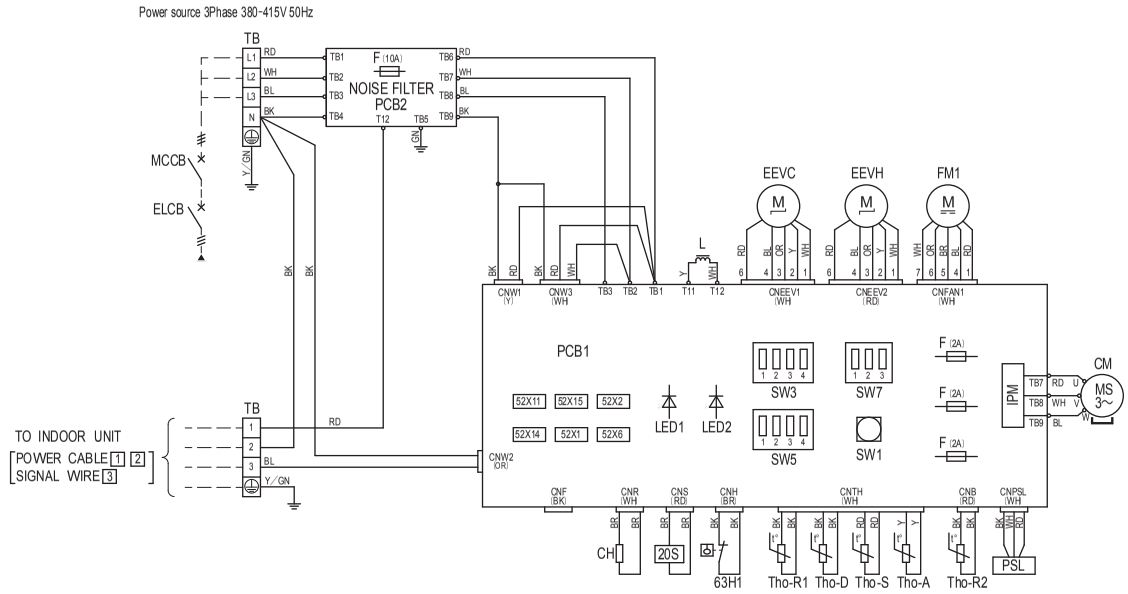


Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
100	15	3.5	46	ϕ1.6mm x 3	ϕ1.6

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

Local setting switch SW3,5,7 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
SW7-2	Defrost control change	Set this switch to ON when managing unit operation by remote control connected external equipment.
SW7-3	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
SW1	Switch
SW3,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sensor (Discharge pipe)
THo-R1,R2	Temperature sensor (Heat exchanger)
THo-S	Temperature sensor (Suction pipe)
20S	Solenoid valve for 4-way valve
52X1	Auxilliary relay
52X2	Auxilliary relay
52X6	Auxiliary relay (for FM1)
52X11	Auxilliary relay (for 20S)
52X14	Auxilliary relay (for CH)
52X15	Auxilliary relay
63H1	High pressure switch

Color marks

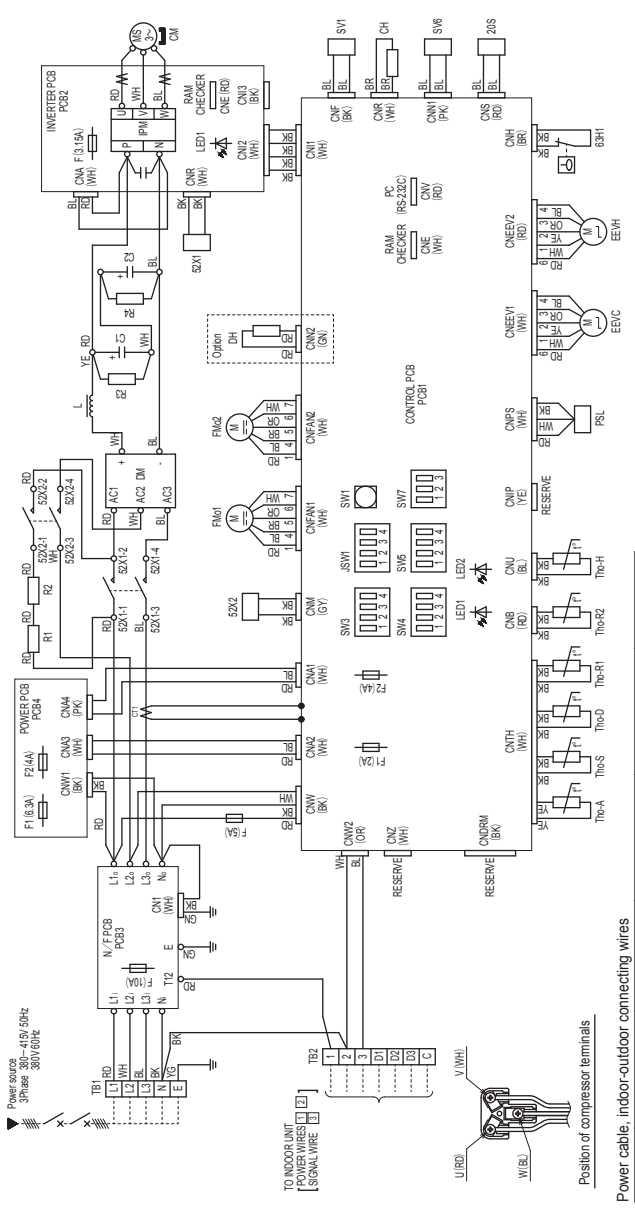
Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
Y	Yellow
Y／GN	Yellow／Green

PCA001Z855

Model FDC200VSA-W

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CNA-Z	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FMo 1, 2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
SW1	Pump down switch
SW3-5, 7	Local setting switch
TB	Terminal block
Tho-A	Temperature sensor (Outdoor air)
Tho- D	Temperature sensor (Discharge pipe)
Tho-R 1,R2	Temperature sensor (Heat exchanger)
Tho-H	Temperature sensor (Compressor under-dome)
Tho-S	Temperature sensor (Suction pipe)
20S	Solenoid coil for 4-way valve
SV1,6	Solenoid coil for 2-way valve
52X1, 2	Relay
63H1	High pressure switch



Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size
200V	19	5.5	72	ϕ 1.6mm × 3	ϕ 1.6mm

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

Color marks

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

Local setting switch SW3 (Set up at shipment OFF)

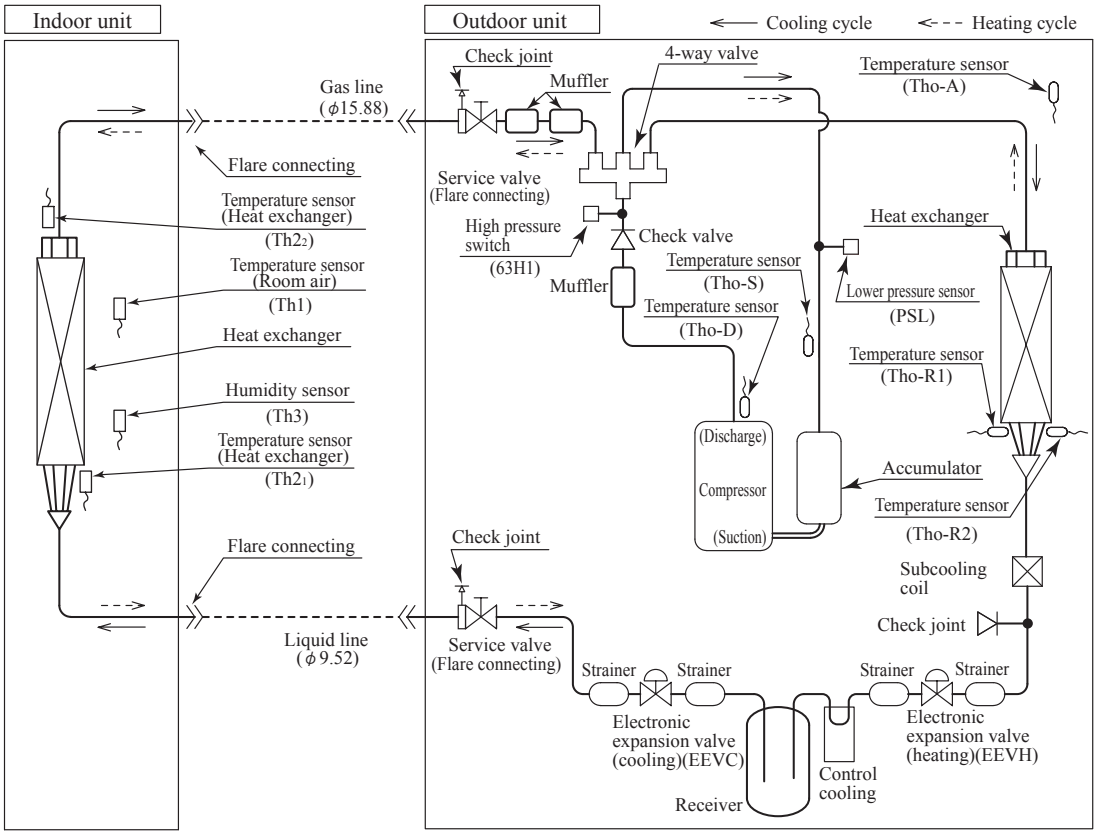
SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.

PCB004Z471 A

2.5 PIPING SYSTEM

(1) Single type

Model 100

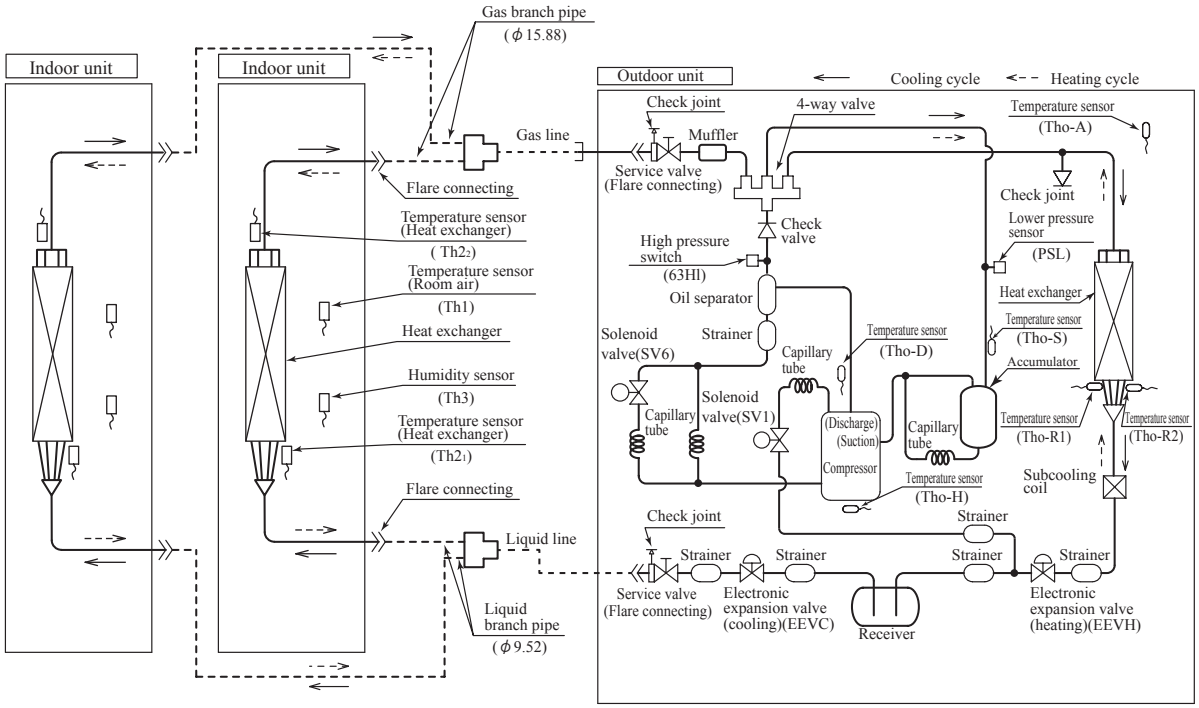


Preset point of the protective devices

Parts name	Mark	Equipped unit	100 model
Temperature sensor (for protection over-loading in heating)	**Tho-A**	Outdoor unit	Active 17˚C Inactive 16˚C
Temperature sensor (for frost prevention)	**Th2**	Indoor unit	Active 2.5˚C Inactive 8˚C
Temperature sensor (for protection high pressure in cooling)	**Tho-R**	Outdoor unit	Active 65˚C Inactive 51˚C
Temperature sensor (for detecting discharge pipe temperature)	**Tho-D**	Outdoor unit	Active 115˚C Inactive 85˚C
High pressure switch (for protection)	**63H1**	Outdoor unit	Active 4.15MPa Inactive 3.15MPa
Low pressure sensor (for protection)	**PSL**	Outdoor unit	Active 0.079MPa Inactive 0.227MPa

(2) Twin type

Model 200



●**Refrigerant line (one way) pipe size**

Model	Gas line	Liquid line
200	In case of ϕ22.22 : 35m In case of ϕ25.4 or ϕ28.58 : 70m (200)	In case of ϕ9.52 : 40m (200) In case of ϕ12.7 : 70m (200)

Preset point of the protective devices

Parts name	Mark	Equipped unit	200 model
Temperature sensor (for protection over-loading in heating)	**Tho-A**	Outdoor unit	Active 17˚C Inactive 16˚C
Temperature sensor (for frost prevention)	**Th2**	Indoor unit	Active 2.5˚C Inactive 8˚C
Temperature sensor (for protection high pressure in cooling)	**Tho-R**	Outdoor unit	Active 64˚C Inactive 50˚C
Temperature sensor (for detecting discharge pipe temperature)	**Tho-D**	Outdoor unit	Active 115˚C Inactive 85˚C
High pressure switch (for protection)	**63H1**	Outdoor unit	Active 4.15MPa Inactive 3.15MPa
Low pressure sensor (for protection)	**PSL**	Outdoor unit	Active 0.079MPa Inactive 0.227MPa

3. STANDARD INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

3.1 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

3.1.4 Operation control function by the outdoor control

(1) Compressor speed

Unit: rps

Item \ Mode	Cooling	Heating
Upper limit	120 (74)	120 (70)
Lower limit	12	12

Note Valuc in ( ) are for the silent mode.

(2) Compressor protection start

(a) Compressor protection start I

(i) Operating condition

When the compressor is turned ON from the state of OFF.

(ii) Detail of operation

During the protection start I control, the upper limit of compressor speed is restricted to the speeds as shown in the following table.

Unit: rps

			Time after establishment of operating conditions (Including acceleration time)				
			Less than 3 min	Less than 5 min	Less than 7 min	Less than 9 min	9 min or more
FDC 100	Cooling		120	120	120	120	End of control
	Heating(1)	TH2≧10°C	55	55	75	95	
		TH2<10°C	55	55	75	95	

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

(b) Compressor protection start II

(i) Operating condition

When the outdoor air temperature sensor (TH2) has detected lower than 10°C after starting the compressor during heating operation.

(ii) Detail of operation

During the protection start II control, the upper limit of compressor speed is restricted to the speeds as shown in the following table.

Unit: rps

		Time after compressor ON (Including acceleration time)				
		Less than 1 min	Less than 5 min	Less than 7 min	Less than 9 min	9 min or more
FDC 100	Tho-A≥-5°C	40	45	120	120	End of control
	Tho-A<-5°C	55	55	120	120	End of control

(3) Outdoor fan control

(a) Outdoor fan speed and fan motor speed

Unit: min^{-1}

Fan speed	1st speed	2nd speed	3rd speed	4th speed	5th speed	6th speed	7th speed	8th speed
FDC100	150	300	500	650	740	835	890	950

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

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

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

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

(c) Relationship between compressor speed and outdoor fan speed.

Outdoor fan speed is controlled according to the operation mode (Heating/cooling) and the compressor speed.

Unit: rps

Fan speed		1st speed	2nd speed	3rd speed	4th speed	5th speed	6th speed	7th speed	8th speed
FDC 100	Cooling	–	–	0-30	30-46	46-64	64-70	70-75	75-
	Heating	–	–	0-30	30-46	46-70	70-90	90-	–

(d) Outdoor fan control at low outdoor air temperature

(i) Cooling

1) Operating conditions

When the outdoor air temperature (TH2) is 22ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps

2) Detail of operation

After the outdoor fan operates at A speed for 60 seconds; the corresponding outdoor heat exchanger temperature shall implement the following controls.

● Value of A

	Outdoor fan
15˚C < Outdoor air temperature	15th speed
10˚C < Outdoor air temperature ≦ 15˚C	12th speed
Outdoor air temperature ≦ 10˚C	10th speed

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

b) 21ºC < Outdoor heat exchanger temperature ≦ 38ºC
After the outdoor fan speed maintains for 20 seconds; if the outdoor heat exchanger temperature is 21ºC-38ºC, maintain outdoor fan speed again.

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

3) Reset conditions

When either of the following conditions is satisfied

a) The outdoor air temperature (TH2) is 25ºC or higher and fan speed is 15th speed or more.

b) The compressor speed is 0 rps.

4) Outdoor fan speed and fan motor speed

Unit: min^{-1}

Fan speed	9th speed	10th speed	11th speed	12th speed	13th speed	14th speed	15th speed
FDC100	200	225	250	275	300	400	500

(ii) Heating

1) Operating condition

When the outdoor air temperature (TH2) is 4ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps

2) Detail of operation

The outdoor fan is stepped up by 2 speed step at each 20 seconds. (Upper limit 8th speed)

3) Reset conditions

When either of the following conditions is satisfied

a) The outdoor air temperature (TH2) is 6ºC or higher.

b) The compressor speed is 0 rps.

(e) Outdoor fan control at overload

(i) Cooling

1) Operating condition

When the outdoor air temperature (TH2) is 41ºC or higher continues for 30 seconds while the compressor command speed is other than 0 rps

2) Detail of operation

The outdoor fan is stepped up by 3 speed. (Upper limit 8th speed)

3) Reset conditions

When either of the following conditions is satisfied

a) The outdoor air temperature (TH2) is 40ºC or lower.

b) The compressor speed is 0 rps.

(ii) Heating

1) Operating conditions

When the outdoor air temperature (TH2) is 13ºC or higher continues for 30 seconds while the compressor speed is other than 0 rps

2) Detail of operation

After the outdoor fan operates at -3 speed for 60 seconds; the corresponding outdoor heat exchanger temperature shall implement the following controls.

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

b) 10ºC < Outdoor heat exchanger temperature ≦ 13ºC
After the outdoor fan speed maintains for 20 seconds; if the outdoor heat exchanger temperature is 10ºC−13ºC, maintain outdoor fan speed again.

c) Outdoor heat exchanger tempeature > 13ºC
After the outdoor fan speed drops (down) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is higher than 13ºC, gradually reduce outdoor fan speed by 1 speed. (Lower limit 2nd speed)

3) Reset conditions

When either of the following conditions is satisfied

a) The outdoor air temperature (TH2) is 11ºC or lower.

b) The compressor speed is 0 rps.

(f) Outdoor fan motor protection

If the outdoor fan motor has operated at 75 min^{-1} or lower for more than 30 seconds, the compressor and fan motor are stopped.

(4) Defrost operation

(a) Starting conditions (Defrost operation can be started only when all of the following conditions are satisfied.)

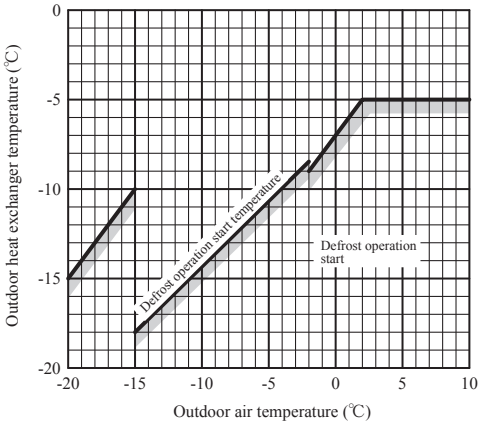
(i) After start of heating operation
When it elapsed 35 minutes (Accumulated compressor operation time)

(ii) After end of defrost operation
When it elapsed 35 minutes (Accumulated compressor operation time)

(iii) Outdoor heat exchanger sensor (TH1) temperature
When the temperature has been below −5ºC for 3 minutes continuously

(iv) The difference between the outdoor air sensor temperature and the outdoor heat exchanger sensor temperature (TH2-TH1)

- The outdoor air temperature ≧ −2ºC : 7ºC or higher
- −15ºC < The outdoor air temperature < −2ºC : 4/15 × The outdoor air temperature + 7ºC or higher
- The outdoor air temperature ≦ −15ºC : −5ºC or higher

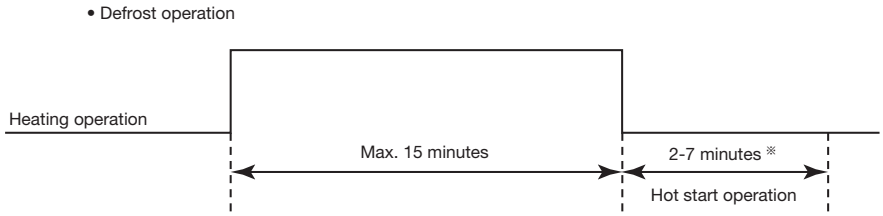


(v) During continuous compressor operation
In addition, when the speed command from the indoor control of the indoor unit during heating operation has counted 0 rps 10 times or more and all conditions of (i), (ii) above and the outdoor air temperature is 3ºC or less and the temperature for outdoor heat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

(b) Ending conditions (Operation returns to the heating cycle when either one of the following is satisfied.)

(i) Outdoor heat exchanger sensor (TH1) temperature: 10ºC or higher.

(ii) Continued operation time of defrost operation → For more than 15 minutes.



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

(5) Cooling overload protective control

(a) Operating conditions

When the outdoor air temperature (TH2) is 41°C or higher continues for 30 seconds than 0 rps while the compressor speed is other than 0 rps

(b) Detail of operation

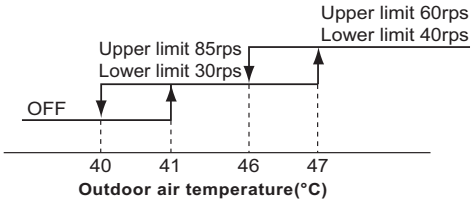
(i) Taking the upper limit of compressor speed range at 85(60)rps, if the output speed obtained with the fuzzy calculation exceeds the upper limit, the upper limit value is maintained.

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

Note Values in ( ) are for outdoor air temperature at 47°C.

(c) Reset conditions

The outdoor air temperature (TH2) is lower than 40ºC.



(6) Cooling high pressure control

(a) Purpose

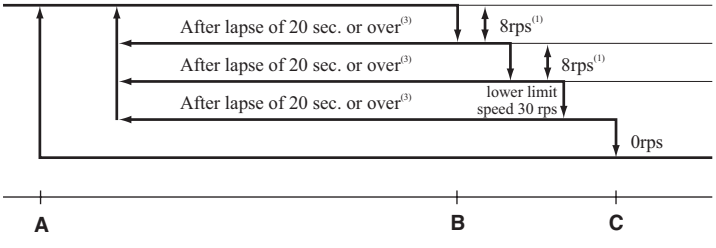
Prevents anomalous high pressure operation during cooling

(b) Detector

Outdoor heat exchanger sensor (TH1)

(c) Detail of operation:

(Example) Fuzzy



Outdoor heat exchanger temperature (°C)

Outdoor air temperature(TH2)	Time after compressor ON	A	B	C
TH2 ≧ 32ºC	Less than 10 min	50	58	60
	Less than 15 min	50	58	
	Less than 20 min	50	58	
	Less than 25 min	50	58	
	25 min or more	50	58	
TH2 < 32ºC	—	51	53	56

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

(7) Cooling low outdoor air temperature protective control

(a) Operating conditions

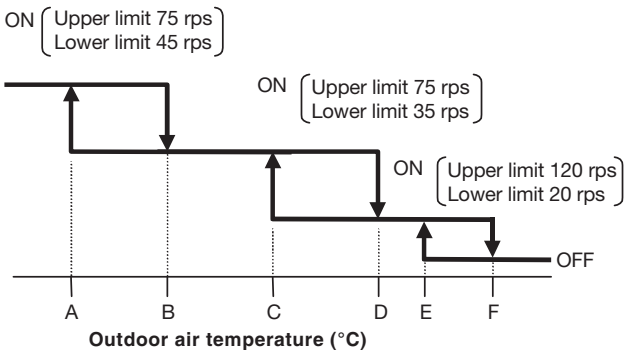
When the outdoor air temperature (TH2) is CºC or lower continues for 20 seconds while the compressor speed is other than 0 rps

(b) Detail of operation

(i) The lower limit of the compressor speed is set to 45 (35) <20> rps and even if the speed becomes lower than 45 (35) <20> rps, the speed is kept to 45 (35) <20> rps. However, when the thermostat OFF, the speed is reduced to 0 rps.

(ii) The upper limit of the compressor speed is set to 75 <120> rps and even if the calculated result becomes higher than that after fuzzy calculation, the speed is kept to 75 <120> rps.

Notes (1) Values in ( ) are for outdoor air temperature is C or D.
(2) Values in < > are for outdoor air temperature is E or F.



● Values of A, B, C, D, E, F
Model FDC100VNP-W

	Outdoor air temperature (˚C)					
	A	B	C	D	E	F
First time	9	11	22	25	26	28

(iii) Reset conditions

When either of the following condition is satisfied

1) The outdoor air temperature (TH2) is F ºC or higher.

2) The compressor speed is 0 rps.

(8) Heating high pressure control

(a) Operating conditions

When the indoor heat exchanger temperature (Th2) has risen to a specified temperature while the compressor is turned on

(b) Detail of operation

Compressor speed is controlled according to the zones of indoor heat exchanger temperature as shown by the following table.

	Th2 < P1	P1 ≦ Th2 < P2	P2 ≦ Th2 < P3	P3 ≦ Th2
Protection control speed (NP)	Normal	Retention	NP−4rps	NP−8rps
Sampling time (s)	Normal	10	10	10

Model FDC100VNP-W Unit: °C

NP \ Thi-R	P1	P2	P3
10 ≦ NP < 90	45	52	57
90 ≦ NP < 120	45 - 43	52 - 45	57 - 48
120 ≦ NP	43	45	48

(9) Heating overload protective control

(a) Operating conditions

When the outdoor air temperature (TH2) is 13°C or higher continues for 30 seconds while the compressor speed is other than 0 rps

(b) Detail of operation

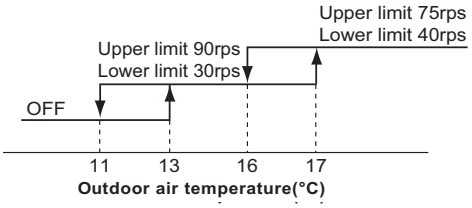
(i) Taking the upper limit of compressor speed range at 90(75)rps, if the output speed obtained with the fuzzy calculation exceeds the upper limit, the upper limit value is maintained.

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

Note Values in ( ) are for outdoor air temperature at 17°C.

(c) Reset conditions

The outdoor air temperature (TH2) is lower than 11ºC.



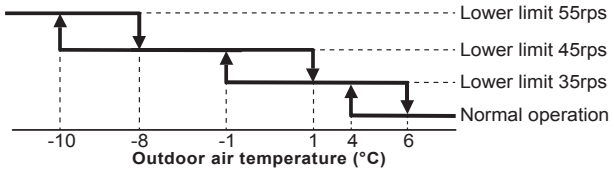
(10) Heating low outdoor air temperature protective control

(a) Operating conditions

When the outdoor air temperature (TH2) is 4ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps

(b) Detail of operation

The lower limit compressor speed is changed as shown in the figure below.



(c) Reset conditions

When either of the following condition is satisfied

(i) The outdoor air temperature (TH2) is higher than 6ºC.

(ii) The compressor speed is 0 rps.

(iii) Compressor protection start II is activate.

(11) Compressor overheat protection

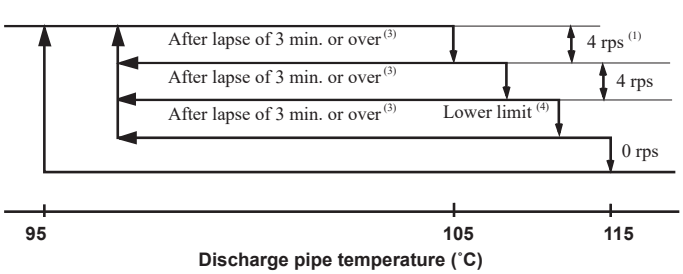
(a) Purpose

It is designed to prevent deterioration of oil, burnout of motor coil and other trouble resulting from the compressor overheat.

(b) Detail of operation

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

(Example) Fuzzy



Notes (1) When the discharge pipe temperature is in the range of 105-115ºC, the speed is reduced by 4 rps.

(2) When the discharge pipe temperature is raised and continues operation for 20 seconds without changing, then the speed is reduced again by 4 rps.

(3) If the discharge pipe temperature is in the range of 95-105ºC even when the compressor speed is maintained for 3 minutes when the temperature is in the range of 95-105ºC, the speed is raised by 1 rps and kept at that speed for 3 minutes. This process is repeated until the command speed is reached.

(4) Lower limit speed

	Cooling	Heating
Lower limit speed	25 rps	32 rps

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

(12) Current safe

(a) Purpose

Current is controlled not to exceed the upper limit of the setting operation current.

(b) Detail of operation

(i) Input current to the converter is monitored with the current sensor fixed on the printed circuit board of the outdoor unit and, if the operation current value reaches the limiting current value, the compressor speed is reduced.

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

(13) Current cut

(a) Purpose

Inverter is protected from overcurrent.

(b) Detail of operation

Output current from the inverter is monitored with a shunt resistor and, if the current exceeds the setting value, the compressor is stopped immediately. Operation starts again after a delay time of 3 minutes.

(14) Outdoor unit failure

This is a function for determining when there is trouble with the outdoor unit during air-conditioning.
The compressor is stopped if any one of the following in item (a), (b) is satisfied. Once the unit is stopped by this function, it is not restarted.

(a) When the input current is measured at 1 A or less for 3 continuous minutes or more

(b) If the outdoor unit sends a 0 rps signal to the indoor unit 3 times or more within 20 minutes of the power being turned on

(15) Serial signal transmission error protection

(a) Purpose

Prevents malfunction resulting from error on the indoor ↔ outdoor signals

(b) Detail of operation

(i) If the compressor is operating and a serial signal cannot be received from the indoor control with outdoor control having serial signals continues for 7 minutes and 35 seconds, the compressor is stopped.

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

(16) Rotor lock

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

(17) Refrigeration cycle system protection

(a) Starting conditions

(i) When 5 (Heating: 9) minutes have elapsed after the compressor ON or the completion of the defrost control

(ii) Other than the defrost control

(iii) When, after satisfying the conditions of (i) and (ii) above, the compressor speed, room air temperature (Th1) and indoor heat exchanger temperature (Th2) have satisfied the conditions in the following table for 5 minutes:

Operation mode	Compressor speed (N)	Room air temperature (Th1)	Room air temperature (Th1)/ Indoor heat exchanger temperature (Th2)
Cooling	40≦N	10≦Th1≦40	Th1−4<Th2
Heating	40≦N : Outdoor air temperature ≧ 0°C 60≦N : Outdoor air temperature < 0°C	0≦Th1≦40	Th2<Th1+6

(b) Contents of control

(i) When the conditions of (a) above are satisfied, the compressor stops.

(ii) Error stop occurs when the compressor has stopped 3 times within 60 minutes.

(c) Reset condition

When the compressor has been turned OFF

(18) Silent mode

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

Model \ Item	Outdoor fan tap (Upper limit)
FDC100VNP-W	Cooling: 7th speed, Heating: 5th speed

(19) Broken wire detection on temperature sensor

(a) Outdoor unit heat exchanger temperature sersor, outdoor air temperature sensor

If the following is detected for 5 seconds continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON or with in 20 seconds after power ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Outdoor unit heat exchanger temperature sensor: -55°C or lower.
- Outdoor air temperature sensor: -55°C or lower.

(b) Discharge pipe temperature sensor

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

Note During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

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

3.2 MAINTENANCE DATA

This chapter has described about an indoor unit. Look at 1.2 chapters about the outdoor unit.

(1) Cautions

(a) If you are disassembling and checking an air-conditioner, be sure to turn off the power before beginning. When working on indoor units, let the unit sit for about 1 minute after turning off the power before you begin work.

(b) When taking out printed circuit boards, be sure to do so without exerting force on the circuit boards or package components.

(c) When disconnecting and connecting connectors, take hold of the connector housing and do not pull on the lead wires.

(2) Items to check before troubleshooting

(a) Have you thoroughly investigated the details of the trouble which the customer is complaining about?

(b) Is the air-conditioner running? Is it displaying any self-diagnosis information?

(c) Is a power source with the correct voltage connected?

(d) Are the control lines connecting the indoor and outdoor units wired correctly and connected securely?

(e) Is the outdoor unit's service valve open?

(3) Troubleshooting procedure (If the air-conditioner does not run at all)

If the air-conditioner does not run at all, diagnose the trouble using the following troubleshooting procedure. If the air-conditioner is running but breaks down, proceed to troubleshooting step (4).

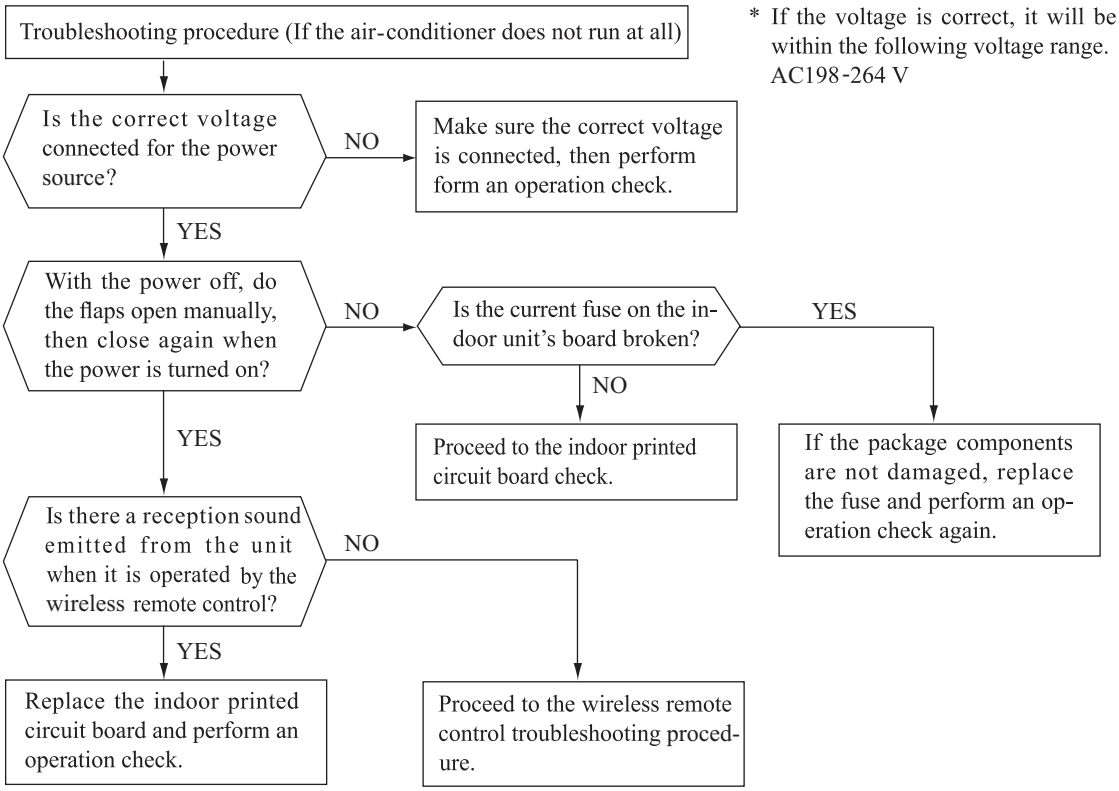
Important When all the following conditions are satisfied, we say that the air-conditioner will not run at all.

(a) The RUN light does not light up.

(b) The flaps do not open.

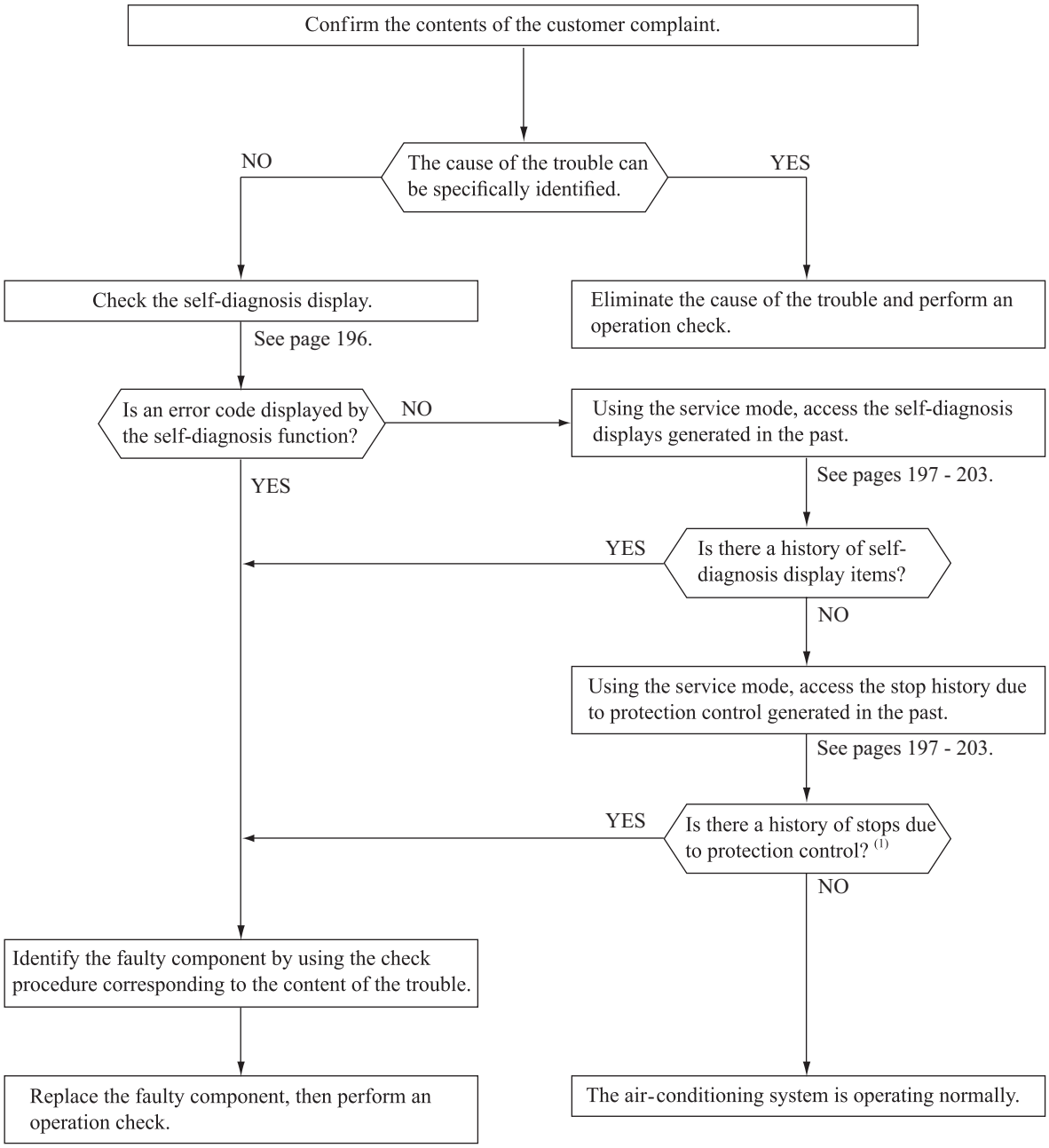
(c) The indoor unit fan motors do not run.

(d) The self-diagnosis display does not function.



* If the voltage is correct, it will be within the following voltage range.
AC198-264 V

(4) Troubleshooting procedure (If the air-conditioner runs)



Note Even in cases where only intermittent stop data are generated, the air-conditioning system is normal. However, if the same protective operation recurs repeatedly (3 or more times), it will lead to customer complaints. Judge the conditions in comparison with the contents of the complaints.

(5) Self-diagnosis table

When this air-conditioner performs an emergency stop, the reason why the emergency stop occurred is displayed by the flashing of display lights. If the air-conditioner is operated using the remote control 3 minutes or more after the emergency stop, the trouble display stops and the air-conditioner resumes operation. (1)

Indoor unit display panel		Wired (2) remote control display	Description of trouble	Cause	Display (flashing) condition
RUN light	TIMER light				
1-time flash	ON	—	Heat exchanger temperature sensor 1 error	• Broken heat exchanger temperature sensor 1 wire, poor connector connection • Indoor unit PCB is faulty	When a heat exchanger temperature sensor 1 wire disconnection is detected while operation is stopped. (If a temperature of –28ºC or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
2-time flash	ON	—	Room temperature sensor error	• Broken room temperature sensor wire, poor connector connection • Indoor unit PCB is faulty	When a room temperature sensor wire disconnection is detected while operation is stopped. (If a temperature of –45ºC or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
3-time flash	ON	—	Heat exchanger temperature sensor 2 error	• Broken heat exchanger temperature sensor 2 wire, poor connector connection • Indoor unit PCB is faulty	When a heat exchanger temperature sensor 2 wire disconnection is detected while operation is stopped. (If a temperature of –28ºC or lower is detected for 15 seconds, it is judged that the wire is disconnected.)(Not displayed during operation.)
6-time flash	ON	E 16	Indoor fan motor error	• Defective fan motor, poor connector connection	When conditions for turning the indoor fan motor on exist during air-conditioner operation, an indoor fan motor speed of 300min^{-1} or lower is measured for 30 seconds or longer. (The air-conditioner stops.)
Keeps flashing	1-time flash	E 38	Outdoor air temperature sensor error	• Broken outdoor air temperature sensor wire, poor connector connection • Outdoor unit PCB is faulty	–55ºC or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.Or –55ºC or higher is detected for within 20 seconds after power ON. (The compressor is stopped.)
Keeps flashing	2-time flash	E 37	Outdoor heat exchanger temperature sensor error	• Broken heat exchanger temperature sensor wire, poor connector connection • Outdoor unit PCB is faulty	–55ºC or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.Or –55ºC or higher is detected for within 20 seconds after power ON. (The compressor is stopped.)
Keeps flashing	4-time flash	E 39	Discharge pipe temperature sensor error	• Broken discharge pipe temperature sensor wire, poor connector connection • Outdoor unit PCB is faulty	–25ºC or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.(The compressor is stopped.)
ON	1-time flash	E 42	Current cut	• Compressor locking, open phase on compressor output, short-circuit on power transistor, service valve is closed	The compressor output current exceeds the set value during compressor start. (The air-conditioner stops.)
ON	2-time flash	E 59	Trouble of outdoor unit	• Broken compressor wire • Compressor blockage	When there is an emergency stop caused by trouble in the outdoor unit, or the input current value is found to be lower than the set value.(The air-conditioner stops.)
ON	3-time flash	E 58	Current safe stop	• Overload operation • Overcharge • Compressor locking	When the compressor command speed is lower than the set value and the current safe has operated. (the compressor stops)
ON	4-time flash	E 51	Power transistor error	• Broken power transistor	When the power transistor is judged breakdown while compressor starts.(The compressor is stopped.)
ON	5-time flash	E 36	Over heat of compressor	• Gas shortage, defective discharge pipe temperature sensor, service valve is closed	When the value of the discharge pipe temperature sensor exceeds the set value.(The air-conditioner stops.)
ON	6-time flash	E 5	Error of signal transmission	• Defective power source, Broken signal wire, defective indoor/outdoor unit PCB	When there is no signal between the indoor unit PCB and outdoor unit PCB for 10 seconds or longer (when the power is turned on), or when there is no signal for 7 minute 35 seconds or longer (during operation)(the compressor is stopped).
ON	7-time flash	E 48	Outdoor fan motor error	• Defective fan motor, poor connector connection	When the outdoor fan motor speed continues for 30 seconds or longer at 75 min^{-1} or lower. (3 times) (The air-conditioner stops.)
ON	Keeps flashing	E 35	Cooling high pressure protecton	• Overload operation, overcharge • Broken outdoor heat exchanger temperature sensor wire • Service valve is closed	When the value of the outdoor heat exchanger temperature sensor exceeds the set value.
2-time flash	2-time flash	E 60	Rotor lock	• Defective compressor • Open phase on compressor • Defective outdoor unit PCB	If the compressor motor's magnetic pole positions cannot be correctly detected when the compressor starts. (The air-conditioner stops.)
4-time flash	ON	—	Trouble of wireless LAN interface	• Defective wireless LAN interface boards, poor connector connection	When normal data cannot be received from wireless LAN interface for two minutes continuously
5-time flash	ON	E 47	Active filter voltage error	• Defective active filter	When the wrong voltage connected for the power source. When the outdoor unit PCB is faulty
7-time flash	ON	E 57	Refrigeration cycle system protective control	• Service valve is closed. • Refrigerant is insufficient	When refrigeration cycle system protective control operates.
7-time flash	1-time flash	E 40	Service valve (gas side) closed opertion	• Service valve (gas side) closed • Defective outdoor unit PCB	If the output current of inverter exceeds the specifications, it makes the compressor stopping. (In heating mode). After 3-minute delay, the compressor restarts, but if this anomaly occurs 2 times within 20 minutes after the initial detection.
—	—	E 1	Error of wired remote control wiring	• Broken wired remote control wire, defective indoor unit PCB	The wired remote control wire Y is open. The wired remote control wires X and Y are reversely connected. Noise is penetrating the wired remote control lines.The wired remote control or indoor unit PCB is faulty. (The communications circuit is faulty.)

Notes (1)The air-conditioner cannot be restarted using the remote control for 3 minutes after operation stops.
(2)The wired remote control is option parts.

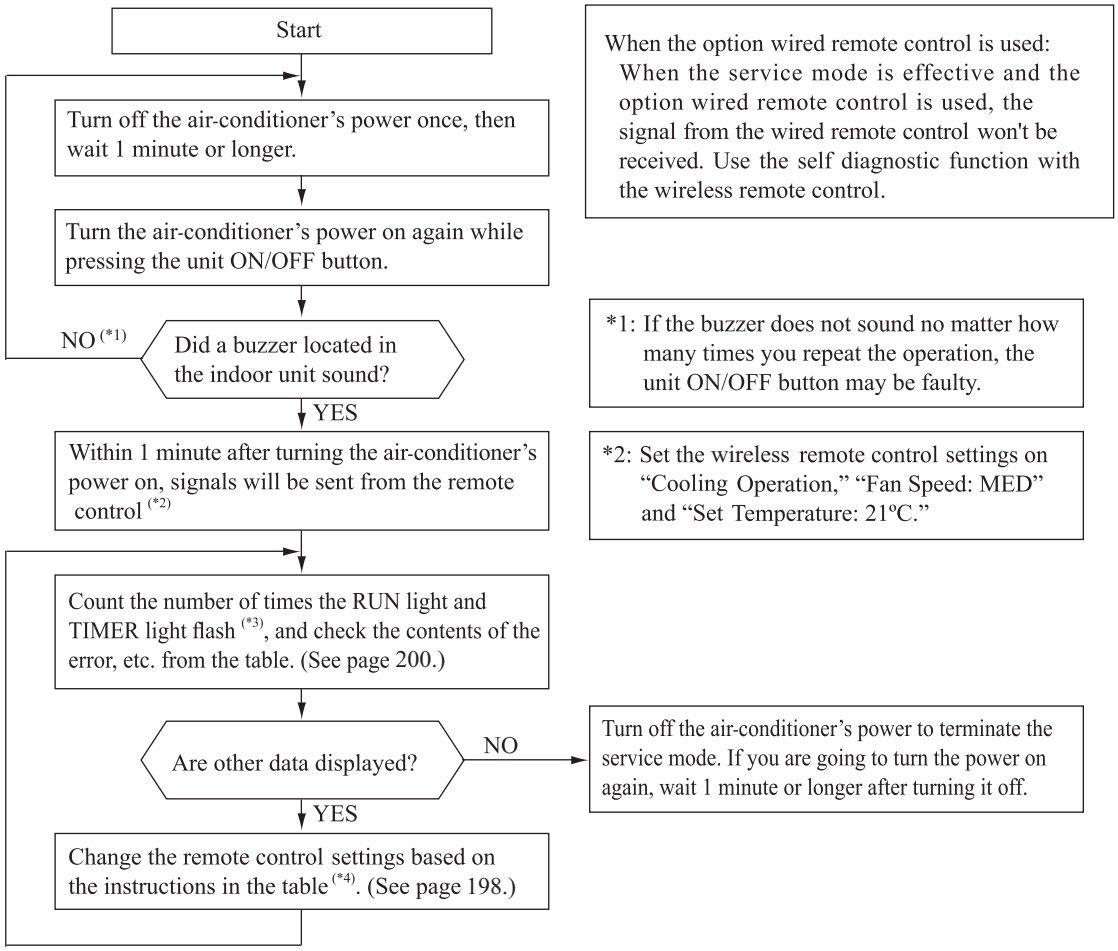
(6) Service mode (Trouble mode access function)

This air-conditioner is capable of recording error displays and protective stops (service data) which have occurred in the past. If self-diagnosis displays cannot be confirmed, it is possible to get a grasp of the conditions at the time trouble occurred by checking these service data.

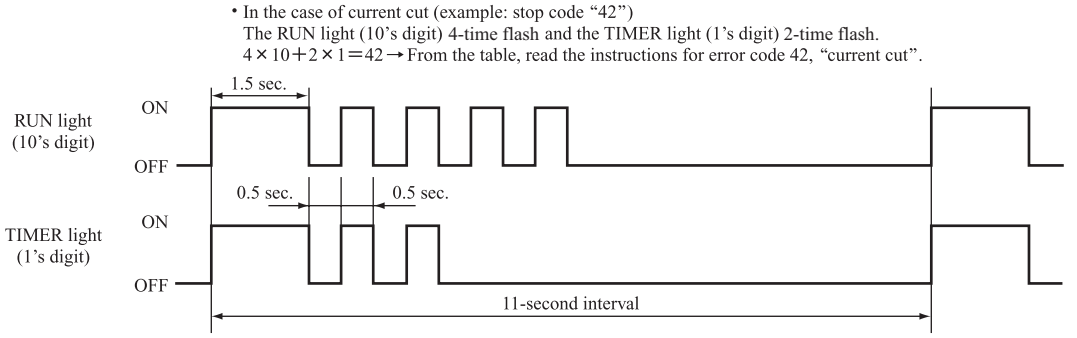
(a) Explanation of terms

Term	Explanation
Service mode	The service mode is the mode where service data are displayed by flashing of the display lights when the operations in item (b) below are performed with the indoor control.
Service data	These are the contents of error displays and protective stops which occurred in the past in the air-conditioner system. Error display contents and protective stop data from past anomalous operations of the air-conditioner system are saved in the indoor unit control's non-volatile memory (memory which is not erased when the power goes off). There are two types of data, self-diagnosis data and stop data, described below.
Self-diagnosis data	These are the data which display the reason why a stop occurred when an error display(self-diagnosis display) occurred in an indoor unit. Data are recorded for up to 5 previous occurrences. Data which are older than the 5th previous occurrence are erased. In addition, data on the temperature of each sensor (room temperature, indoor heat exchanger, outdoor heat exchanger, outdoor air temperature, discharge pipe), remote control information (operation switching, fan speed switching) are recorded when trouble occurs, so more detailed information can be checked.
Stop data	These are the data which display the reason by a stop occurred when the air-conditioning system performed protective stops, etc. in the past. Even if stop data alone are generated, the system restarts automatically. (After executing the stop mode while the display is normal, the system restarts automatically.) Data for up to 10 previous occasions are stored. Data older than the 10th previous occasion are erased. (Important) In cases where transient stop data only are generated, the air-conditioner system may still be normal. However, if the same protective stop occurs frequently (3 or more times), it could lead to customer complaints.

(b) Service mode display procedure



*3: To count the number of flashes in the service mode, count the number of flashes after the light lights up for 1.5 second initially (start signal). (The time that the light lights up for 1.5 second (start signal) is not counted in the number of flashes.)



*4: When in the service mode, when the wireless remote control settings (operation mode, fan speed mode, temperature setting) are set as shown in the following table and sent to the air-conditioner unit, the unit switches to display of service data.

(i) Self-diagnosis data

What are Self-diagnosis Data?

These are control data (reasons for stops, temperature at each sensor, wireless remote control information) from the time when there were error displays (a bnormal stops) in the indoor unit in the past.

Data from up to 5 previous occasions are stored in memory. Data older than the 5th previous occasion are erased.

The temperature setting indicates how many occasions previous to the present setting the error display data are and the operation mode and fan speed mode data show the type of data.

Wireless remote control setting		Contents of output data
Operation mode	Fan speed mode	
Cooling	MED	Displays the reason for stopping display in the past (error code).
	HI	Displays the room temperature sensor temperature at the time the error code was displayed in the past.
	AUTO	Displays the indoor heat exchanger sensor temperature at the time the error code was displayed in the past.
Heating	LO	Displays the wireless remote control information at the time the error code was displayed in the past.
	MED	Displays the outdoor air temperature sensor temperature at the time the error code was displayed in the past.
	HI	Displays the outdoor heat exchanger sensor temperature at the time the error code was displayed in the past.
	AUTO	Displays the discharge pipe sensor temperature at the time the error code was displayed in the past.

Wireless remote control setting	Indicates the number of occasions previous to the present the error display data are from.
Temperature setting	
21ºC	1 time previous (previous time)
22ºC	2 times previous
23ºC	3 times previous
24ºC	4 times previous
25ºC	5 times previous

Only for indoor heat exchanger temperature sensor 2

Wireless remote control setting	Indicates the number of occasions previous to the present the error display data are from.
Temperature setting	
26ºC	1 time previous (previous time)
27ºC	2 times previous
28ºC	3 times previous
29ºC	4 times previous
30ºC	5 times previous

(Example)

Wireless remote control setting			Displayed data
Operation mode	Fan speed mode	Temperature setting	
Cooling	MED	21ºC	Displays the reason for the stop (error code) the previous time an error was displayed.
		22ºC	Displays the reason for the stop (error code) 2 times previous when an error was displayed.
		23ºC	Displays the reason for the stop (error code) 3 times previous when an error was displayed.
		24ºC	Displays the reason for the stop (error code) 4 times previous when an error was displayed.
		25ºC	Displays the reason for the stop (error code) 5 times previous when an error was displayed.

(ii) Stop data

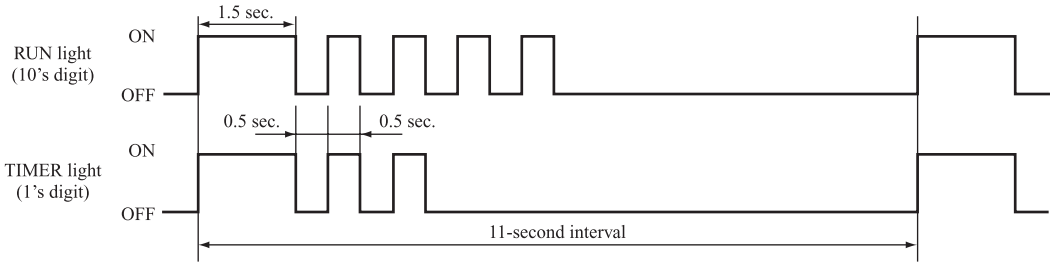
Wireless remote control setting			Displayed data
Operation mode	Fan speed mode	Temperature setting	
Cooling	LO	21ºC	Displays the reason for the stop (stop code) the previous time when the air-conditioner was stopped by protective stop control.
		22ºC	Displays the reason for the stop (stop code) 2 times previous when the air-conditioner was stopped by protective stop control.
		23ºC	Displays the reason for the stop (stop code) 3 times previous when the air-conditioner was stopped by protective stop control.
		24ºC	Displays the reason for the stop (stop code) 4 times previous when the air-conditioner was stopped by protective stop control.
		25ºC	Displays the reason for the stop (stop code) 5 times previous when the air-conditioner was stopped by protective stop control.
		26ºC	Displays the reason for the stop (stop code) 6 times previous when the air-conditioner was stopped by protective stop control.
		27ºC	Displays the reason for the stop (stop code) 7 times previous when the air-conditioner was stopped by protective stop control.
		28ºC	Displays the reason for the stop (stop code) 8 times previous when the air-conditioner was stopped by protective stop control.
		29ºC	Displays the reason for the stop (stop code) 9 times previous when the air-conditioner was stopped by protective stop control.
		30ºC	Displays the reason for the stop (stop code) 10 times previous when the air-conditioner was stopped by protective stop control.

(c) Error code, stop code table (Assignment of error codes and stop codes is done in common for all models.)

Number of flashes when in service mode		Stop code or Error code	Error content	Cause	Occurrence conditions	Error display	Auto recovery
RUN light (10's digit)	TIMER light (1's digit)						
OFF	OFF	0	Normal	—	—	—	—
	1-time flash	01	Error of wired remote control wiring (When wired remote control was connected) (When wireless LAN interface was connected, refer to page 196.)	Broken wired remote control wire defective indoor unit PCB.	The wired remote control wire Y is open. The wired remote control wires X and Y are reversely connected. Noise is penetrating the wired remote control lines. The wired remote control or indoor unit PCB is faulty.	—	○
	5-time flash	05	Can not receive signals for 35 seconds (if communications have recovered)	Power source is faulty Power source cables and signal lines are improperly wired. Indoor or outdoor unit PCB are faulty	When 35 seconds passes without communications signals from either the outdoor unit or the indoor unit being detected correctly.	○	—
3-time flash	5-time flash	35	Cooling high pressure control	Cooling overload operation. Outdoor unit fan speed drops. Outdoor heat exchanger temperature sensor is short-circuit.	When the outdoor heat exchanger temperature sensor's value exceeds the set value.	○ (5 times)	○
	6-time flash	36	Compressor overheat 110°C	Refrigerant is insufficient. Discharge pipe temperature sensor is faulty. Service valve is closed.	When the discharge pipe temperature sensor's value exceeds the set value.	○ (2 times)	○
	7-time flash	37	Outdoor heat exchanger temperature sensor is abnormal	Outdoor heat exchanger temperature sensor wire is disconnected. Connector connections are poor. Outdoor unit PCB is faulty	–55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after intial detection of this anomalous temperature. Or–55°C higher is detected for 5 seconds continuously within 20 seconds after power ON.	○ (3 times)	○
	8-time flash	38	Outdoor air temperature sensor is abnormal	Outdoor air temperature sensor wire is disconnected. Connector connections are poor. Outdoor unit PCB is faulty	–55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after intial detection of this anomalous temperature. Or–55°C higher is detected for 5 seconds continuously within 20 seconds after power ON.	○ (3 times)	○
	9-time flash	39	Discharge pipe temperature sensor is abnormal (anomalous stop)	Discharge pipe temperature sensor wire is disconnected. Connector connections are poor. Outdoor unit PCB is faulty	–25°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after intial detection of this anomalous temperature.	○ (3 times)	○
4-time flash	OFF	40	Service valve (gas side) closed operation	Service valve (gas side) closed Outdoor unit PCB is faulty.	If the inverter output current value exceeds the setting value within 80 seconds after the compressor ON in the heating mode, the compressor stops.	○ (2 times)	○
	2-time flash	42	Current cut	Compressor lock. Compressor wiring short circuit. Compressor output is open phase. Outdoor unit PCB is faulty Service valve is closed. Electronic expansion valve is faulty. Compressor is faulty.	Compressor start fails 42 times in succession and the reason for the final failure is current cut.	○ (2 times)	○
	7-time flash	47	Active filter voltage error	Defective active filter	When the wrong voltage connected for the power source. When the outdoor unit PCB is faulty.	○	—
	8-time flash	48	Outdoor fan motor is abnormal	Outdoor fan motor is faulty. Connector connections are poor. Outdoor unit PCB is faulty	When a fan speed of 75 min^{-1} or lower continues for 30 seconds or longer.	○ (3 times)	○
5-time flash	1-time flash	51	Short-circuit in the power transistor (high side) Current cut circuit breakdown	Outdoor unit PCB is faulty Power transistor is damaged.	When it is judged that the power transistor was damaged at the time the compressor started.	○	—
	7-time flash	57	Refrigeration cycle system protective control	Service valve is closed. Refrigerant is insufficient.	When refrigeration cycle system protective control operates.	○ (3 times)	○
	8-time flash	58	Current safe	Refrigerant is overcharge. Compressor lock. Overload operation.	When there is a current safe stop during operation.	—	○
	9-time flash	59	Compressor wiring is unconnection Voltage drop Low speed protective control	Compressor wiring is disconnected. Power transistor is damaged. Power source construction is defective. Outdoor unit PCB is faulty Compressor is faulty.	When the current is 1A or less at the time the compressor started. When the power source voltage drops during operation. When the compressor command speed is 1ower than 32 rps for 60 minutes.	○	○
6-time flash	OFF	60	Rotor lock	Compressor is faulty. Compressor output is open phase. Electronic expansion valve is faulty. Overload operation. Outdoor unit PCB is faulty	After the compressor starts, when the compressor stops due to rotor lock.	○ (2 times)	○
	1-time flash	61	Connection lines between the indoor and outdoor units are faulty	Connection lines are faulty. Indoor or outdoor unit PCB are faulty	When 10 seconds passes after the power is turned on without communications signals from the indoor or outdoor unit being detected correctly.	○	—
	2-time flash	62	Serial transmission error	Indoor or outdoor unit PCB are faulty Noise is causing faulty operation.	When 7 minute 35 seconds passes without communications signals from either the outdoor unit or the indoor unit being detected correctly.	○	—
8-time flash	OFF	80	Indoor fan motor is abnormal	Indoor fan motor is faulty. Connector connections are poor. Indoor unit PCB is faulty	When the indoor fan motor is detected to be running at 300min^{-1} or lower speed with the fan motor in the ON condition while the air-conditioner is running.	○	—
	2-time flash	82	Indoor heat exchanger temperature sensor is abnormal (anomalous stop)	Indoor heat exchanger temperature sensor wire is disconnected. Connector connections are poor.	When a temperature of –28°C or lower is sensed continuously for 40 minutes during heating operation. (the compressor stops).	○	—
	4-time flash	84	Anti-condensation control	High humidity condition.	Anti-condensation prevention control is operating.	—	○
	5-time flash	85	Anti-frost control	Indoor fan speed drops. Indoor heat exchanger temperature sensor is broken wire.	When the anti-frost control operates and the compressor stops during cooling operation.	—	○
	6-time flash	86	Heating high pressure control	Heating overload operation. Indoor fan speed drops. Indoor heat exchanger temperature sensor is short-circuit.	When high pressure control operates during heating operation and the compressor stops.	—	○

Notes (1) The number of flashes when in the service mode do not include the 1.5 second period when the lights light up at first (start signal). (See the example shown below.)

• In the case of current cut (example: stop code "42")
The RUN light (10's digit) 4-time flash and the TIMER light (1's digit) 2-time flash.
4 × 10 + 2 × 1 = 42 → From the table, read the instructions for error code 42, "current cut".



(2) Error display: – Is not displayed. (automatic recovery only)
○ Displayed.
If there is a ( ) displayed, the error display shows the number of times that an auto recovery occurred for the same reason has reached the number of times in ( ).
If no ( ) is displayed, the error display shows that the trouble has occurred once.

(3) Auto Recovery: – Does not occur
○ Auto recovery occurs.

(d) Operation mode, Fan speed mode information tables

(i) Operation mode

Display pattern when in service mode RUN light (10's digit)	Operation mode when there is an abnormal stop
–	AUTO
1-time flash	DRY
2-time flash	COOL
3-time flash	FAN
4-time flash	HEAT

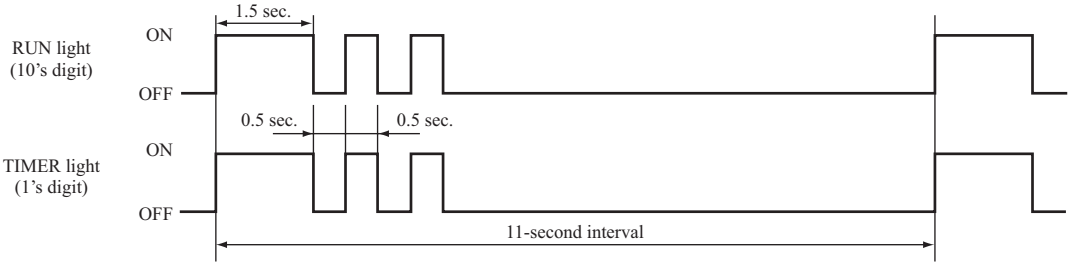
(ii) Fan speed mode

Display pattern when in service mode TIMER light (1's digit)	Fan speed mode when there is an abnormal stop
–	AUTO
2-time flash	HI
3-time flash	MED
4-time flash	LO
5-time flash	ULO
6-time flash	HI POWER
7-time flash	ECONO

* If no data are recorded (error code is normal), the information display in the operation mode and fan speed mode becomes as follows.

Mode	Display when error code is normal
Operation mode	AUTO
Fan speed mode	AUTO

(Example): Operation mode: COOL, Fan speed mode: HI



(e) Temperatare information

(i) Room air temperature sensor, indoor heat exchanger temperature sensor, outdoor air temperature sensor, outdoor heat exchanger temperature sensor temperature

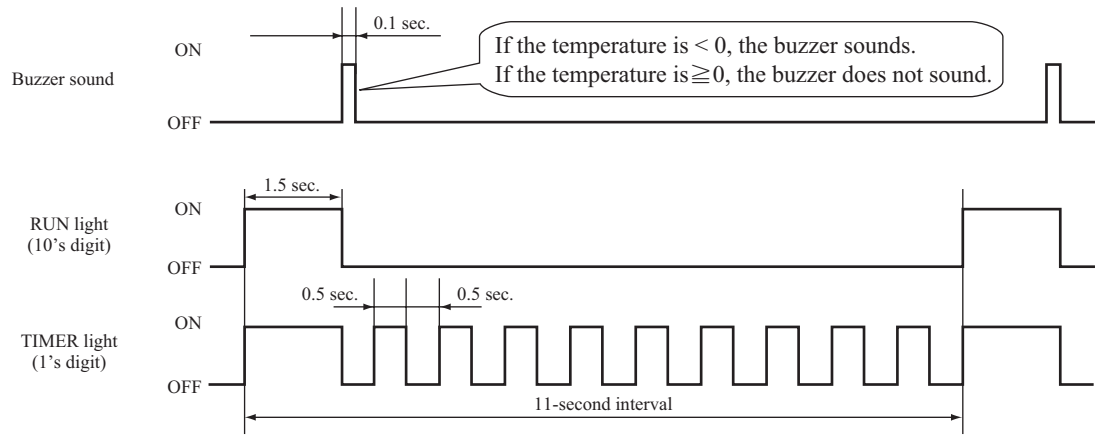
Unit: °C

Buzzer sound	RUN light (10's digit) \ TIMER light (1's digit)	0	1	2	3	4	5	6	7	8	9
Yes (sounds for 0.1 second)	6	-60	-61	-62	-63	-64					
	5	-50	-51	-52	-53	-54	-55	-56	-57	-58	-59
	4	-40	-41	-42	-43	-44	-45	-46	-47	-48	-49
	3	-30	-31	-32	-33	-34	-35	-36	-37	-38	-39
	2	-20	-21	-22	-23	-24	-25	-26	-27	-28	-29
	1	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19
	0		-1	-2	-3	-4	-5	-6	-7	-8	-9
No (does not sound)	0	0	1	2	3	4	5	6	7	8	9
	1	10	11	12	13	14	15	16	17	18	19
	2	20	21	22	23	24	25	26	27	28	29
	3	30	31	32	33	34	35	36	37	38	39
	4	40	41	42	43	44	45	46	47	48	49
	5	50	51	52	53	54	55	56	57	58	59
	6	60	61	62	63	64	65	66	67	68	69
	7	70	71	72	73	74	75	76	77	78	79
	8	80	81	82	83	84	85	86	87	88	89
	9	90	91	92	93	94	95	96	97	98	99

* If no data are recorded (error code is normal), the display for each temperature information becomes as shown below.

Sensor name	Sensor value displayed when the error code is normal
Room air temperature sensor	-64ºC
Indoor heat exchanger temperature sensor	-64ºC
Outdoor air temperature sensor	-64ºC
Outdoor heat exchanger temperature sensor	-64ºC

(Example) Outdoor heat exchanger temperature data: "-9ºC"



(ii) Discharge pipe sensor temperature

Unit: °C

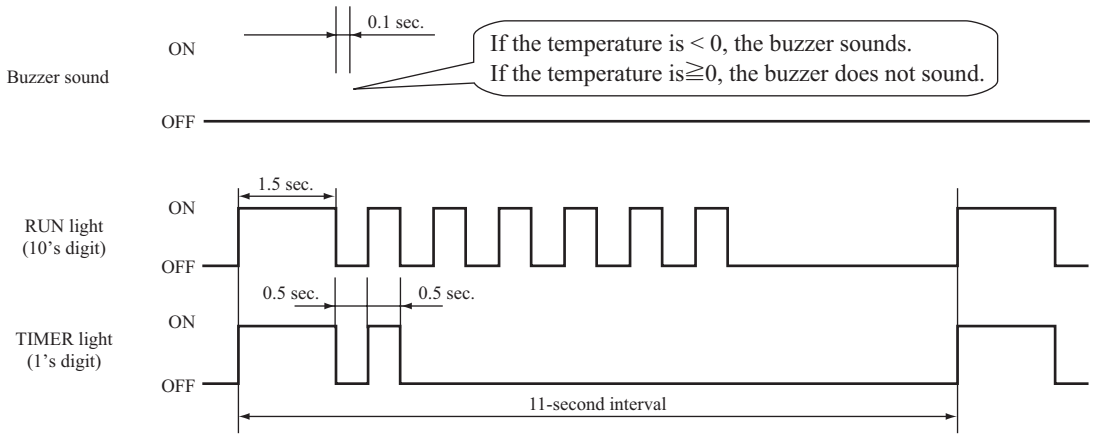
Buzzer sound	RUN light (10's digit) \ TIMER light (1's digit)	0	1	2	3	4	5	6	7	8	9
Yes (sounds for 0.1 second)	3	-60	-62	-64							
	2	-40	-42	-44	-46	-48	-50	-52	-54	-56	-58
	1	-20	-22	-24	-26	-28	-30	-32	-34	-36	-38
	0		-2	-4	-6	-8	-10	-12	-14	-16	-18
No (does not sound)	0	0	2	4	6	8	10	12	14	16	18
	1	20	22	24	26	28	30	32	34	36	38
	2	40	42	44	46	48	50	52	54	56	58
	3	60	62	64	66	68	70	72	74	76	78
	4	80	82	84	86	88	90	92	94	96	98
	5	100	102	104	106	108	110	112	114	116	118
	6	120	122	124	126	128	130	132	134	136	138
	7	140	142	144	146	148	150				

* If no data are recorded (error code is normal), the display for each temperature information becomes as shown below.

Sensor name	Sensor value displayed when the error code is normal
Discharge pipe sensor	-64ºC

(Example) Discharge pipe temperature data: "122ºC"

* In the case of discharge pipe data, multiply the reading value by 2. (Below, 61 x 2 = "122ºC")



Service data record form

Customer		Model	
Date of investigation			
Machine name			
Content of complaint			

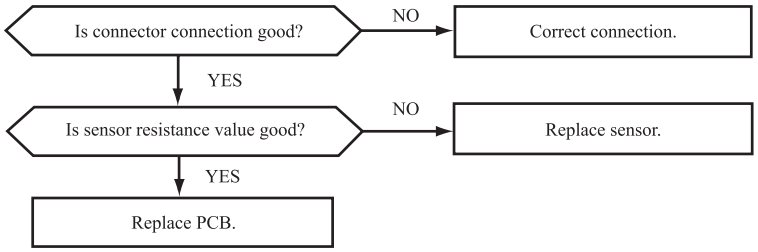
Wireless remote control settings			Content of displayed data	Display results			Display content
Temperature setting	Operation mode	Fan speed mode		Buzzer (Yes/No.)	RUN light (Times)	TIMER light (Times)	
21	Cooling	MED	Error code on previous occasion				
		HI	Room temperature sensor on previous occasion				
		AUTO	Indoor heat exchanger temperature sensor 1 on previous occasion				
	Heating	LO	Wireless remote control information on previous occasion				
		MED	Outdoor air temperature sensor on previous occasion				
		HI	Outdoor heat exchanger temperature sensor on previous occasion				
		AUTO	Discharge pipe temperature sensor on previous occasion				
26	Cooling	AUTO	Indoor heat exchanger temperature sensor 2 on previous occasion				
22	Cooling	MED	Error code on second previous occasion				
		HI	Room temperature sensor on second previous occasion				
		AUTO	Indoor heat exchanger temperature sensor 1 on second previous occasion				
	Heating	LO	Wireless remote control information on second previous occasion				
		MED	Outdoor air temperature sensor on second previous occasion				
		HI	Outdoor heat exchanger temperature sensor on second previous occasion				
		AUTO	Discharge pipe temperature sensor on second previous occasion				
27	Cooling	AUTO	Indoor heat exchanger temperature sensor 2 on second occasion				
23	Cooling	MED	Error code on third previous occasion				
		HI	Room temperature sensor on third previous occasion				
		AUTO	Indoor heat exchanger temperature sensor 1 on third previous occasion				
	Heating	LO	Wireless remote control information on third previous occasion				
		MED	Outdoor air temperature sensor on third previous occasion				
		HI	Outdoor heat exchanger temperature sensor on third previous occasion				
		AUTO	Discharge pipe temperature sensor on third previous occasion				
28	Cooling	AUTO	Indoor heat exchanger temperature sensor 2 on third occasion				
24	Cooling	MED	Error code on fourth previous occasion				
		HI	Room temperature sensor on fourth previous occasion				
		AUTO	Indoor heat exchanger temperature sensor 1 on fourth previous occasion				
	Heating	LO	Wireless remote control information on fourth previous occasion				
		MED	Outdoor air temperature sensor on fourth previous occasion				
		HI	Outdoor heat exchanger temperature sensor on fourth previous occasion				
		AUTO	Discharge pipe temperature sensor on fourth previous occasion				
29	Cooling	AUTO	Indoor heat exchanger temperature sensor 2 on fouth occasion				
25	Cooling	MED	Error code on fifth previous occasion				
		HI	Room temperature sensor on fifth previous occasion				
		AUTO	Indoor heat exchanger temperature sensor 1 on fifth previous occasion				
	Heating	LO	Wireless remote control information on fifth previous occasion				
		MED	Outdoor air temperature sensor on fifth previous occasion				
		HI	Outdoor heat exchanger temperature sensor on fifth previous occasion				
		AUTO	Discharge pipe temperature sensor on fifth previous occasion				
30	Cooling	AUTO	Indoor heat exchanger temperature sensor 2 on fifth occasion				
21	Cooling	LO	Stop code on previous occasion				
22			Stop code on second previous occasion				
23			Stop code on third previous occasion				
24			Stop code on fourth previous occasion				
25			Stop code on fifth previous occasion				
26			Stop code on sixth previous occasion				
27			Stop code on seventh previous occasion				
28			Stop code on eighth previous occasion				
29			Stop code on ninth previous occasion				
30			Stop code on tenth previous occasion				
Judgment							Examiner
Remarks							

Note In the case of indoor heat exchanger temperature sensor 2, match from 26 to 30 the temperature setting of wireless remote control. (Refor to page 198.)

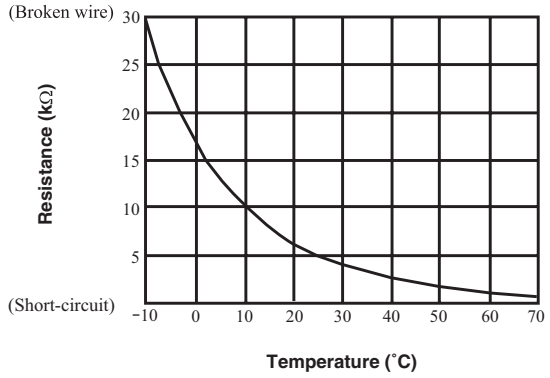
(7) Inspection procedures corresponding to detail of trouble

Sensor error

[Broken sensor wire, connector poor connection]

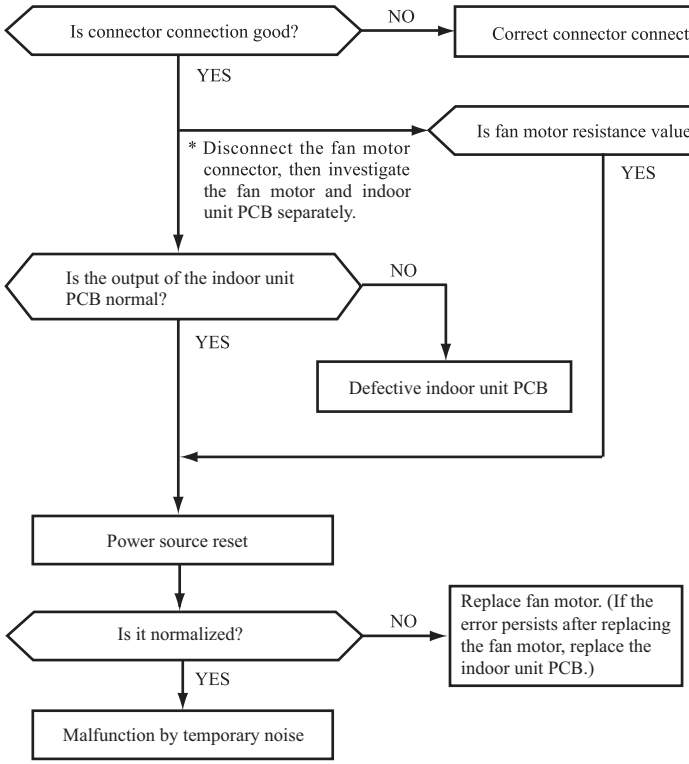


◆ **Sensor temperature characteristics (Room air temperature, indoor heat exchanger temperature)**



Indoor fan motor error

[Defective fan motor, connector poor connection, defective indoor unit PCB]

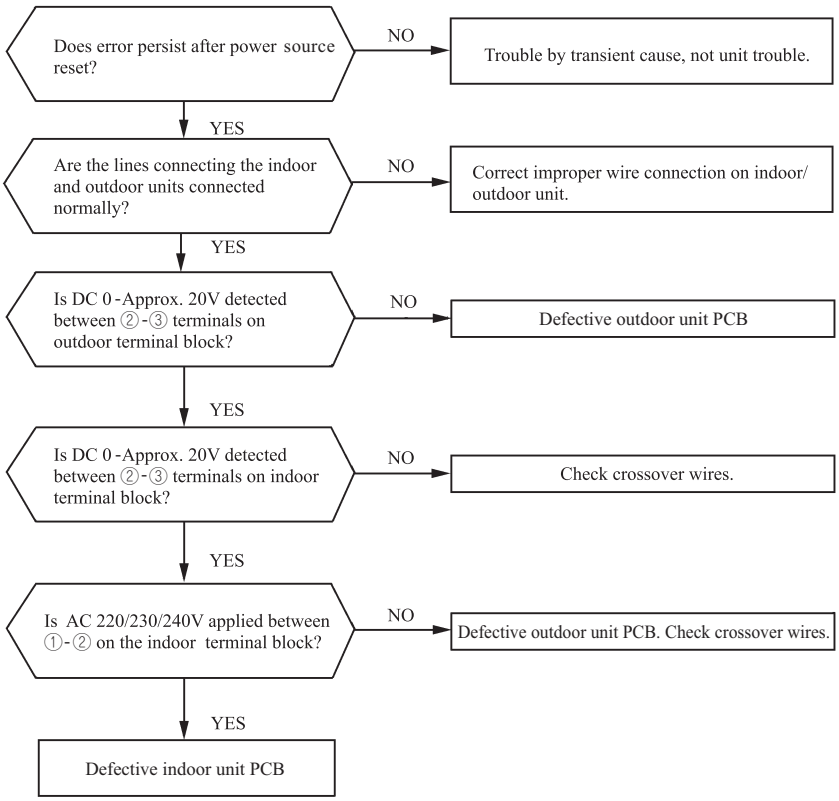


Notes (1) See pages 207 for the fan motor and indoor unit PCB check procedure.

(2) After making sure the fan motor and indoor unit PCB are normal, connect the connectors and confirm that the fan motor is turning.
(If power is turned on while one or the other is broken down, it could cause the other to break down also.)

Error of signal transmission

[Wiring error including power cable, defective indoor/ outdoor unit PCB]



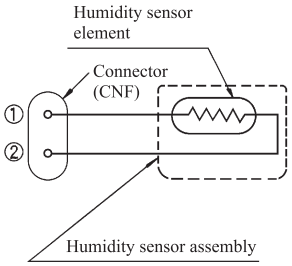
(8) Phenomenon observed after short-circuit, wire breakage on sensor

Sensor	Operation mode	Phenomenon	
		Short-circuit	Disconnected wire
Room air temperature sensor	Cooling	Release of continuous compressor operation command.	Continuous compressor operation command is not released.
	Heating	Continuous compressor operation command is not released.	Release of continuous compressor operation command.
Heat exchanger temperature sensor	Cooling	Freezing cycle system protection trips and stops the compressor.	Continiuous compressor operation command is not released. (Anti-frosting)
	Heating	High pressure control mode (Compressor stop command)	Hot keep (Indoor fan stop)
Humidity sensor	Cooling	Refer to the table below.	Refer to the table below.
	Heating	Normal system operation is possible.	

■ Humidity sensor operation

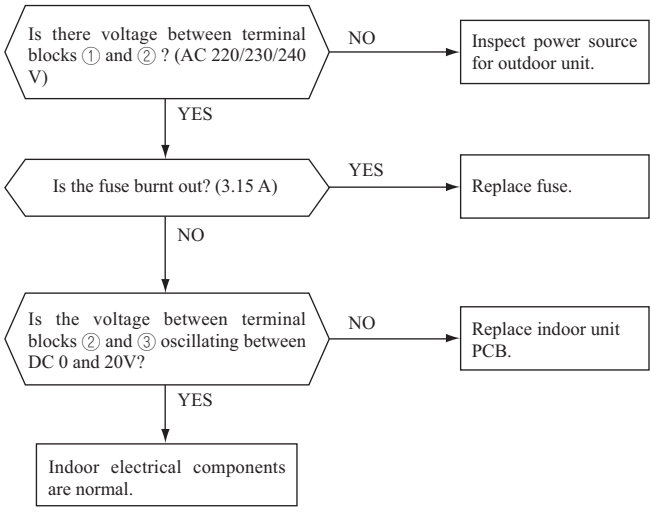
Failure mode		Control input circuit resding	Air-conditioning system operation
Disconnected wire	① Disconnected wire	Humidity reading is 0%	Anti-condensation control is not done.
	② Disconnected wire		
	①② Disconnected wire		
Short-circuit	① and ② are short-circuited	Humidity reading is 100%	Anti-condensation control keep doing.

Remark: Do not perform a continuity check of the humidity sensor with a tester. If DC current is applied, it could damage the sensor.



(9) Checking the indoor electrical equipment

(a) Indoor unit PCB check procedure



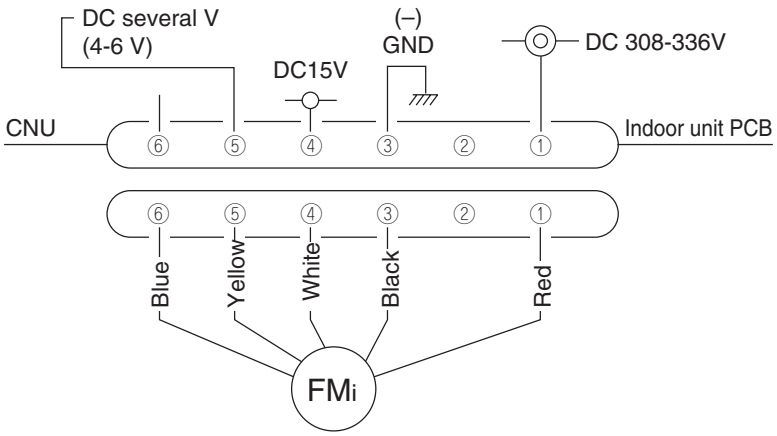
(b) Indoor fan motor check procedure

This is a diagnostic procedure for determining if the indoor fan motor or the indoor unit PCB is broken down.

(i) Indoor unit PCB output check

1) Turn off the power.
2) Remove the front panel, then disconnect the fan motor lead wire connector.
3) Turn on the power. If the unit operates when the ON/OFF button is pressed, if trouble is detected after the voltages in the following figure are output for approximately 30 seconds, it means that the indoor unit PCB is normal and the fan motor is broken down

   If the voltages in the following figure are not output at connector pins No. ①, ④ and ⑤, the indoor unit PCB has failed and the fan motor is normal.



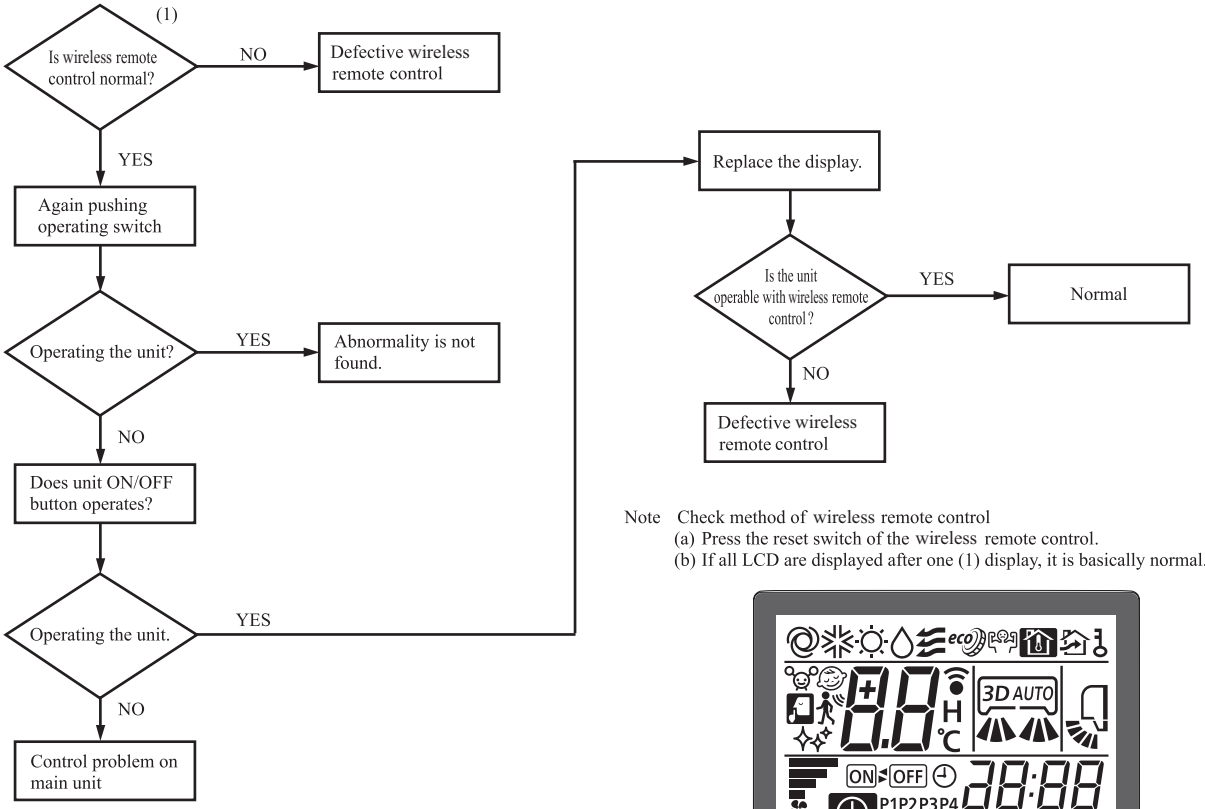
Measuring point	Voltage range when normal
① - ③	DC308-336V
④ - ③	DC15V
⑤ - ③	DC several V (4-6V)

(ii) Fan motor resistance check

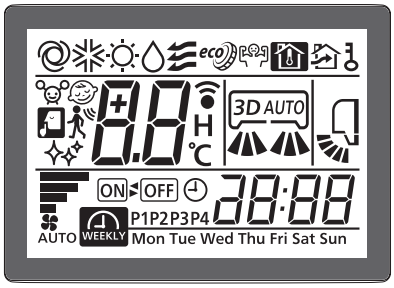
Measuring point	Resistance when normal
① - ③ (Red - Black)	20 MΩ or higher
④ - ③ (White - Black)	20 kΩ or higher

Notes (1) Remove the fan motor and measure it without power connected to it.
(2) If the measured value is below the value when the motor is normal, it means that the fan motor is faulty.

(10) How to make sure of wireless remote control

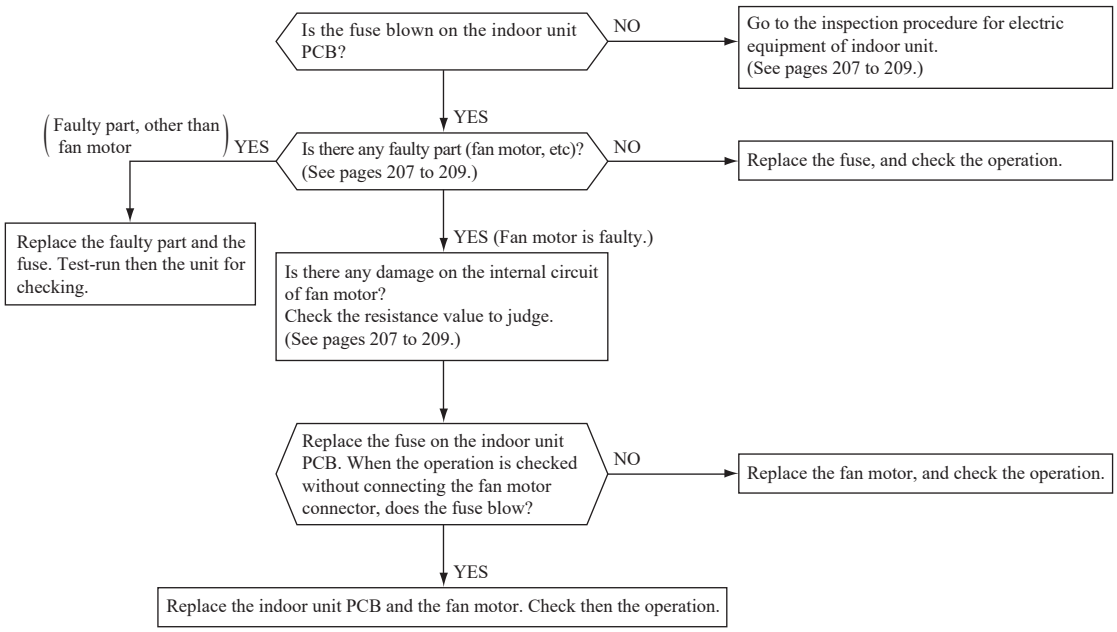


Note Check method of wireless remote control
(a) Press the reset switch of the wireless remote control.
(b) If all LCD are displayed after one (1) display, it is basically normal.



◆ Simplified check methd of wireless remote control
It is normal if the signal transmission section of the wireless remote control emits a whitish light at each transmission on the monitor of digital camera.

(11) Inspection procedure for blown fuse on the indoor unit PCB



3.3 ELECTRICAL WIRING

(1) Indoor unit ..... See page 147.

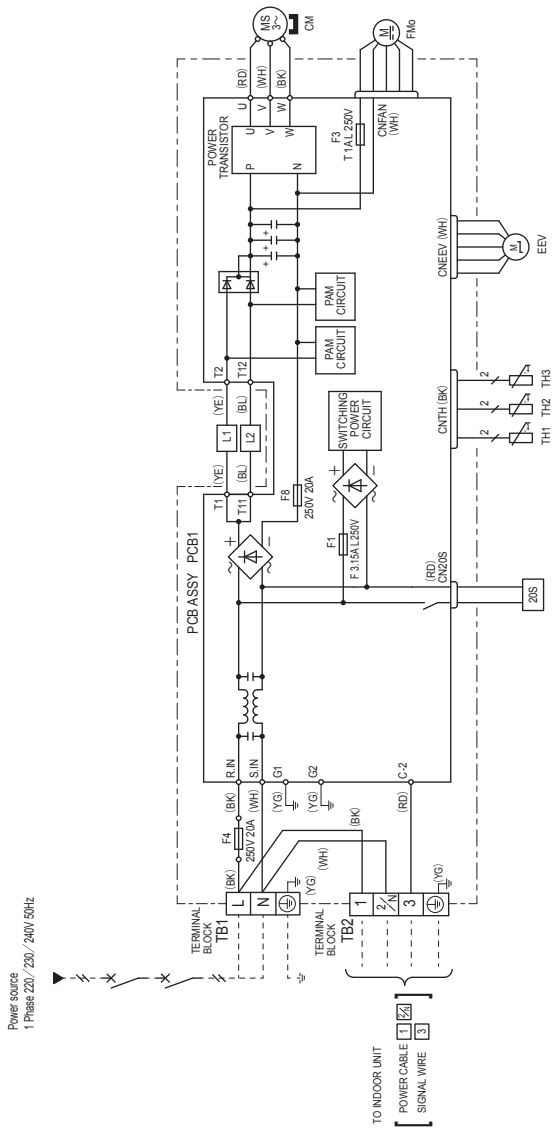
(2) Outdoor unit
Model FDC100VNP-W

Meaning of marks

Item	Description
CM	Compressor motor
CN20S CNTH CNEEV CNFAN	Connector
EEV	Electric expansion valve (coil)
FMo	Fan motor
L1,2	Reactor
TB1,2	Terminal block
TH1	Heat exchanger temperature sensor (outdoor unit)
TH2	Outdoor air temperature sensor
TH3	Discharge pipe temperature sensor
20S	Solenoid coil for 4-way valve

Color marks

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



Power cable, indoor-outdoor connecting wires

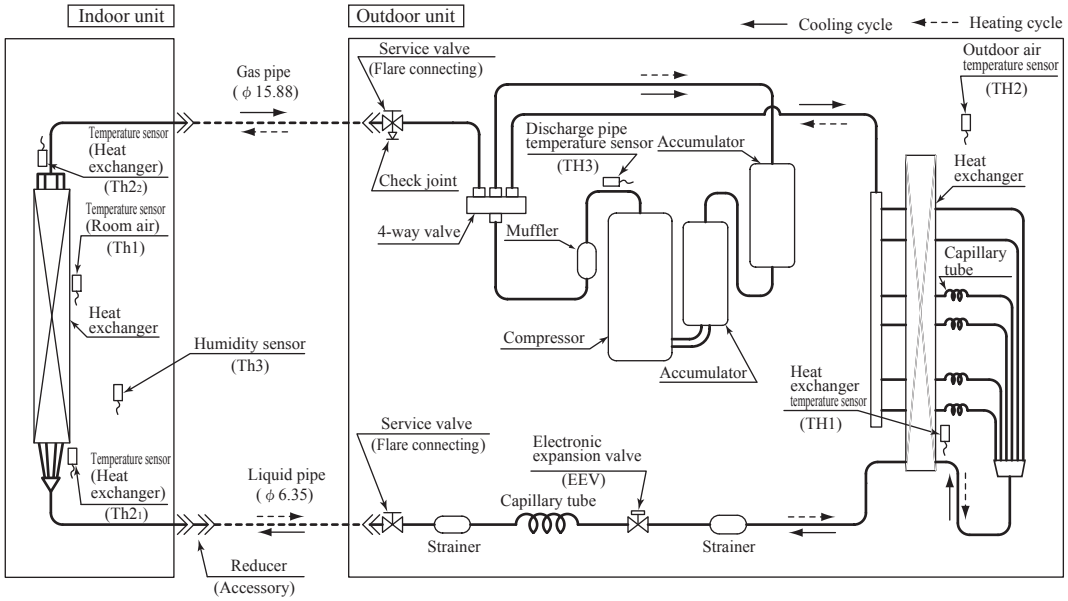
Model	MAX running current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size (mm^2)
100	19	2.5	14	1.5mm² × 4	1.5

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

PCA001Z876A

3.4 PIPING SYSTEM

Model 100



Preset point of the protective devices

Parts name	Mark	Equipped unit	100 model
Temperature sensor (for protection overloading in heating)	Thi-R1 or Thi-R2	Indoor unit	Active 63℃ , Inactive 56℃
Temperature sensor (for frost prevention)			Active 1.0℃ , Inactive 10℃
Temperature sensor (for protection high pressure in cooling)	TH1	Outdoor unit	Active 60℃ , Inactive 50℃
Temperature sensor (for detecting discharge pipe temperature)	TH3		Active 115℃ , Inactive 95℃

4. WIRELESS LAN INTERFACE SETTING MANUAL

- This document describes how to connect to network via Wireless LAN.
- Read this manual carefully, and store it in a safe place after reading.
- Be sure to also read the “Safety precautions” in the user’s manual included with the product.
- The contents of the application ”Smart M-Air” may change due to version upgrade.

Note on Wireless Communication (Radio Wave)

Wireless LAN and Radio Act

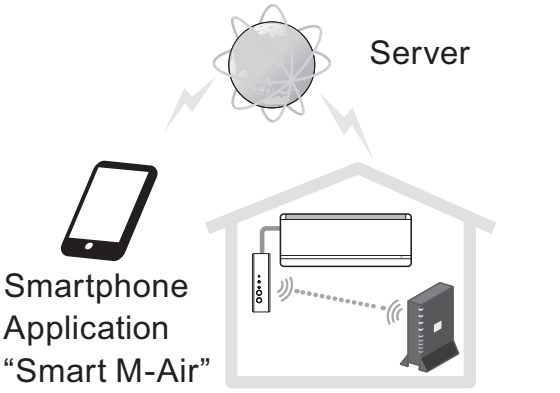
- This product has construction design certification. Therefore, application for the licence is not necessary.
- This product is certified to meet the technical standard as a wireless facility of a specified low-power radio station based on the Radio Act. Therefore, a radio station licence is not necessary when using this product.
- Wireless LAN may be subject to wiretapping or malicious access because it transmits and receives data using radio waves. Before using wireless LAN, thoroughly understand the risk. In addition, manage the SSID and KEY of this product and wireless LAN router and also the log-in ID and password for operation away from home so as to prevent them from being known by other people. In the event that the product is operated away from home by malicious access, turn OFF the function of the wireless LAN communication. (See the section “Wireless LAN communication setting” in the USER’S MANUAL.)
- This product cannot be connected directly to communication lines provided by telecommunication carriers. When connecting this product to the internet, be sure to connect it to the internet via a router.
- If a barrier that restricts radio waves (such as metal or reinforced concrete) is located between this product and a wireless LAN router the product may not operate due to interference, or a reduction in communication distance.
- Use of this product near a device emitting electric waves such as a microwave oven or cordless phone may affect communication via wireless LAN. If the product fails to communicate properly, or if a cordless phone fails to send/receive a call properly, be sure to use the product and the phone at least 1 metre away from each other.
- If you have any other problems, consult the sales outlet for the product.

RSA012A132

Preparation before connection

Prepare the following items.

- ☐ Smartphone (tablet PC)
  Supported OS
  Android™ 8 to 10
  iOS 12 to 14
- ☐ Internet line and communication equipment
  (modem, router, ONU etc.)
- ☐ Router (wireless LAN access point)
  A product that supports a 2.4 GHz band
- ☐ SSID, KEY, and MAC address
  The SSID and KEY confirmation method is described in section 6
- ☐ Your home Wi-Fi network password



System configuration
(for remote control)

Connect the smartphone (tablet PC) to the router via Wi-Fi.

Open “Wi-Fi” on the settings screen of the smartphone, and select SSID of the router to be used. Then, establish the connection by entering the password of the router.

(1) Install the application.

How to install “Smart M-Air”

How to install the “Smart M-Air” smartphone application	
For Android 1. Open [Google Play]. 2. Search for [Smart M-Air]. 3. Install the application according to the instructions on the screen.	**For iOS (iPhone)** 1. Open [App Store]. 2. Search for [Smart M-Air]. 3. Install the application according to the instructions on the screen.

- The application is free. Communication data charges by others are applied to download and operate.
- The application name “Smart M-Air” and download service names “Google Play” and “App Store” may be changed in the future.
- For the settings, contents, and latest supported OS of the application, refer to our home page or the User’s Manual on our home page.

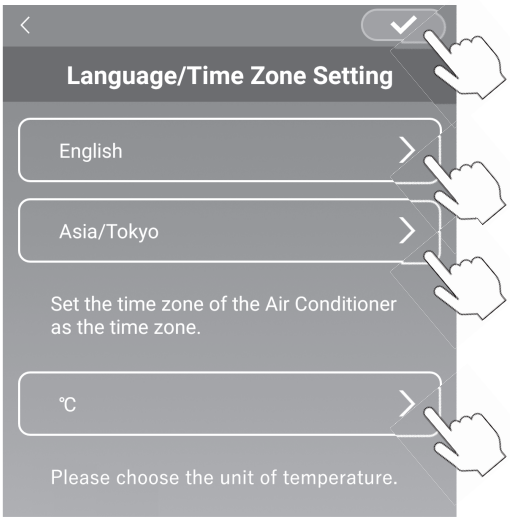
(2) Confirm connection method of router

WPS (Simple setting function): Add a new device to the network using WPS button on router.

AP: Add a new device to the network by connecting to the router using SSID and Key (Password).

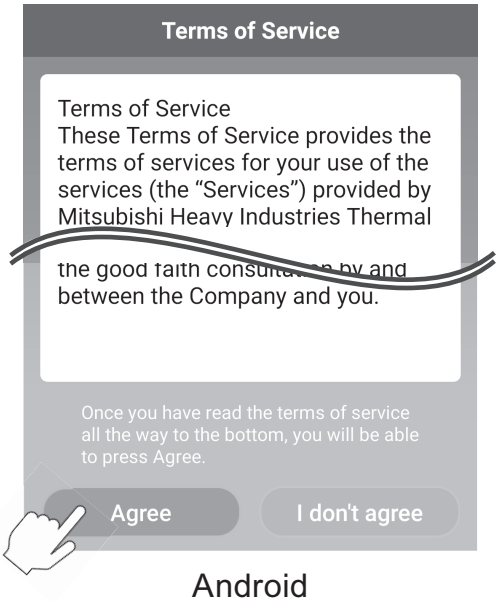
(3) Creating user account

1) Smartphone setting
   Turn on Wi-Fi of your smartphone and connect smartphone and router.
2) Application initial setting
   Initial application settings and the application starts.
3) After startup, the “Language / Time Zone Setting” screen appears.

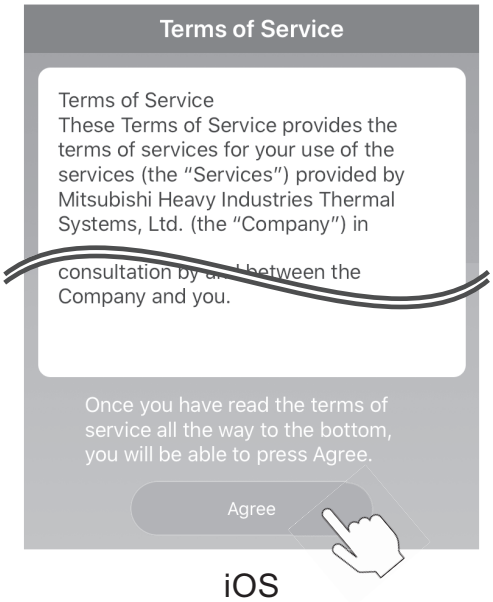


Select which language to use in the application.
Select the region in which the air conditioning unit is installed.
Select the unit of temperature displayed in the application.
Finally, tap on the top right to complete the setting.

4) The “Terms of Service” screen appears. Read and check the statement in full. To consent and proceed with using the application tap [Agree]. Selecting [I don’t agree] will exit the application.



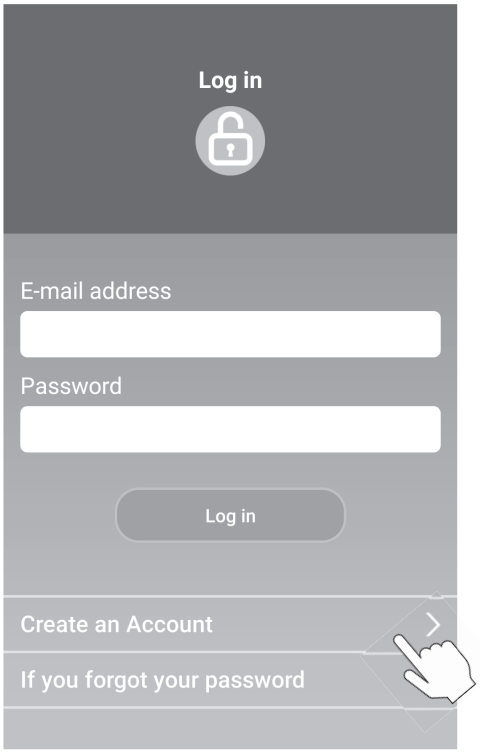
Android

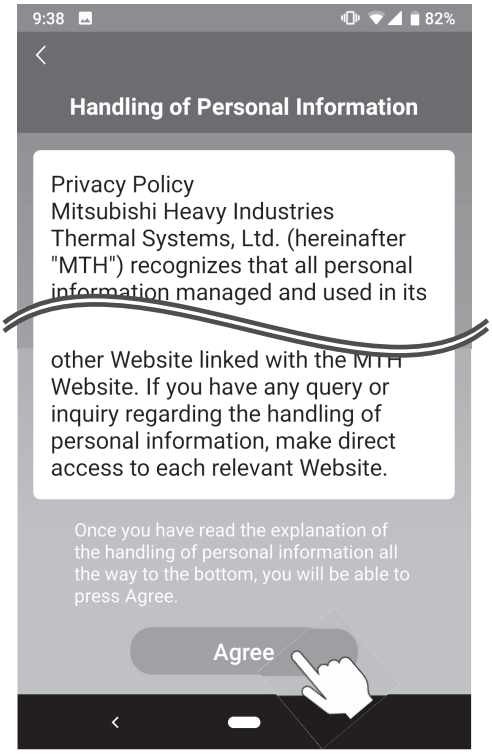


iOS

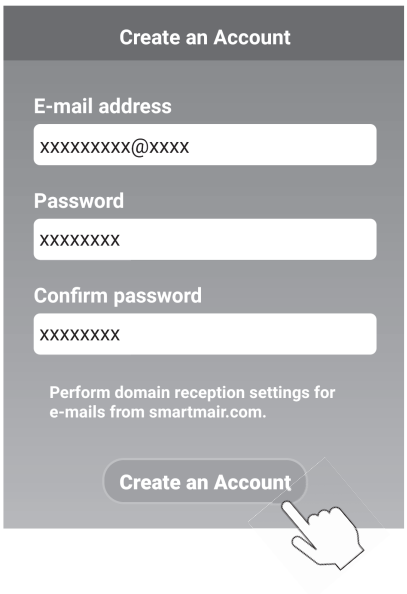
5) The “Startup” screen appears.
Tap [Operate Air Conditioner].

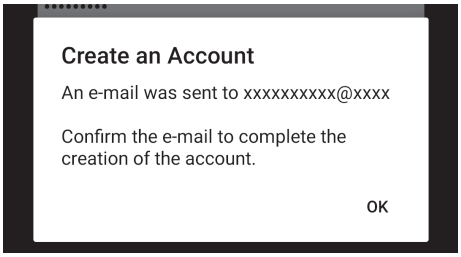
6) The “Log in” screen appears.
Tap [Create an Account].
The “Handling of Personal Information” screen appears.
Read and check the statement in full. To consent and proceed with using the application tap [Agree].





7) The “Create an Account” screen appears.
Enter your e-mail address and password
Tap the [Create an Account] button.
The pop-up message “Create an Account” appears, to confirm tap [OK].

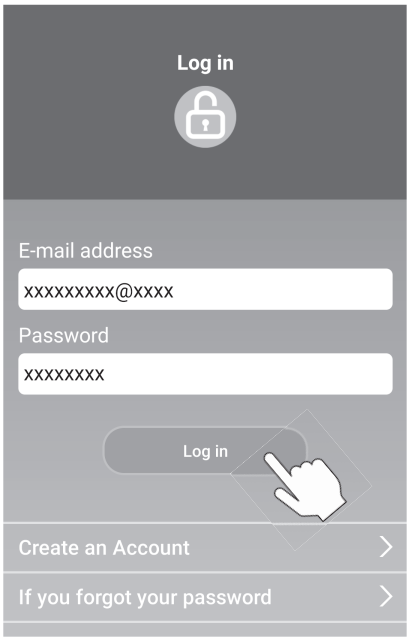




<Note>
A password must be between 8 to 16 characters including at least one alphabetic character and one numeric character.

An e-mail containing a link to confirm registration will be sent to the e-mail address provided which will expire after 24 hours. Click the link within the e-mail to complete account creation.

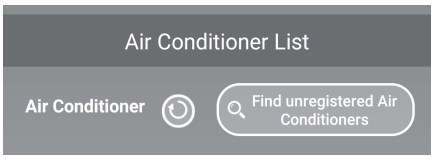
8) After creating an account the “Log in” screen is displayed when opening the application. Enter the registered e-mail address and password, and tap the [Log in] button.



<Note>
To reset your password tap “If you forgot your password”.

(4) Confirming the connection method with the wireless remote control (WPS/AP)

1) Please confirm the “Air Conditioner List” screen is displayed.



<Note>
If [Find unregistered Air Conditioners] button is not displayed confirm that section 3 step (1) has been performed correctly.

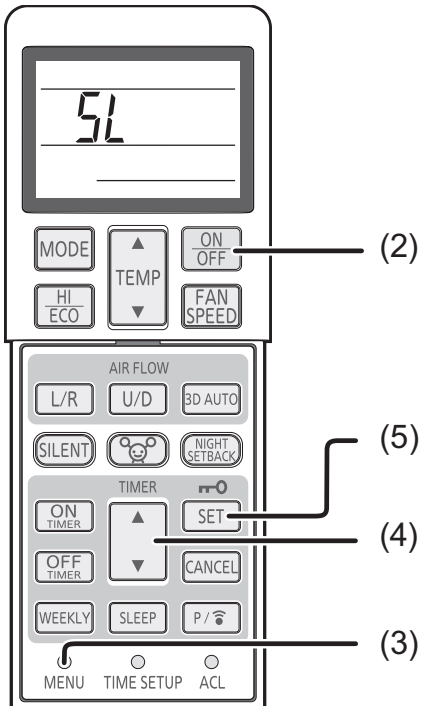
2) The Wireless LAN connection setting cannot be set whilst the unit is running. To turn off the air conditioner press the ON/OFF button on the wireless remote control.
3) Select the Wireless LAN connection setting “SL” by pressing the MENU switch on the wireless remote control.
4) Based on the router specifications confirmed in section 2, select “E1” (WPS mode) or “E2” (AP mode) using the ▲ and ▼ (TIMER) buttons on the wireless remote control.

SL ⇔ E1 ⇔ E2

WPS mode　　AP mode

<Note>
After performing step 5) below, it is necessary to complete up to step 5 (A) 3) within 2 minutes for WPS mode, and up to 5 (B) 3) within 5 minutes for AP mode.
Prepare the necessary information (SSID, KEY, MAC address, and your home Wi-Fi network password) in advance.

5) Press the SET button on the wireless remote control.
The indoor unit will emit “peep pip” to confirm setting of parameters, then the RUN and TIMER lights will also blink simultaneously at 1 second ON, 1 second OFF.
If no sound is emitted by the unit, return to step (3) and repeat the process.



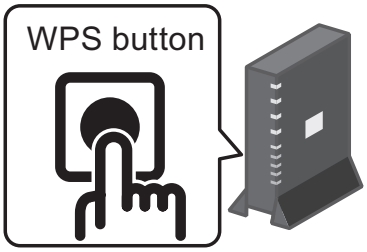
Wireless remote control

(5) Connect the air conditioner to the network.

The connection process will vary depending on the router specifications (WPS/AP).
See item (A) for WPS, and item (B) for AP.

(A) Connect the air conditioner to the network with WPS function

1) Press the WPS button.
Press the WPS button on the router*. The buttons generally look like this.
Operation to connect to the router using WPS may vary, refer to manufacturers installation guide for instructions.
* If using an automatic connection function other than WPS, refer to manufacturers installation guide.

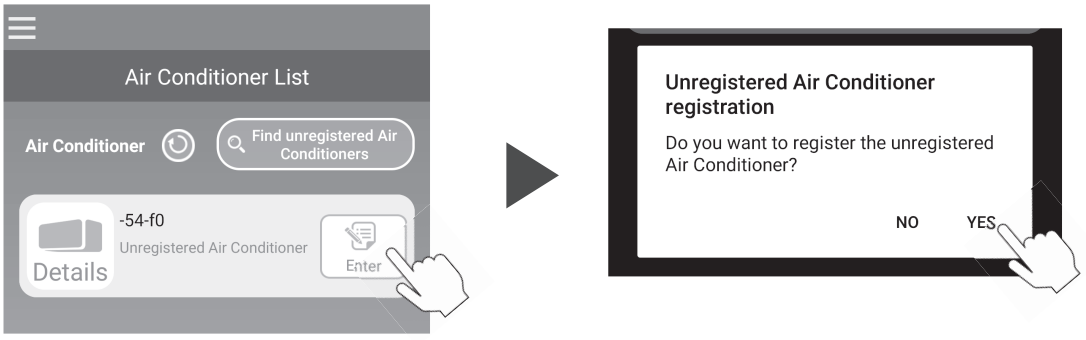


2) Use the “Air Conditioner List” screen to register an air conditioner to operate.
Tap the [Find unregistered Air Conditioners] button to display unregister air conditioners on the application.
The air conditioner name displays the last 6 digits of the SSID in the position indicated by in the image below. (Refer to section 6 for instructions on confirming SSID.)

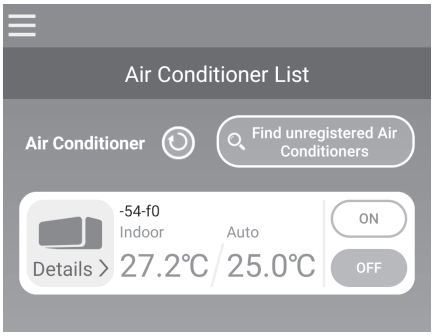
If it is not displayed, confirm again that the steps following section 4 have been performed properly.

- If it is not connected, wait at 2 minutes until the RUN and TIMER light on the indoor unit are no longer lit and repeat process from section 4.
- If the air conditioner still cannot be connected to the application, the number of devices connected with the wireless LAN router may have reached its upper limit, or the router may not be operating or may have failed. Therefore, check the wireless LAN router according to the user’s manual of the router.
- If the air conditioner cannot be connected to the application even by following the setting procedure in this manual, refer to FAQ in the menu of the application.

3) Tap the [Enter] button to select the air conditioner you want to add.
Tap the [YES] the displayed pop up message to confirm.

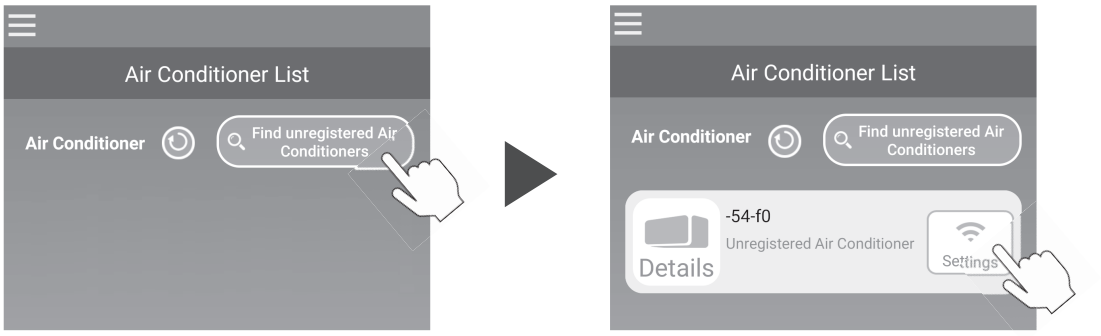


The following screen will be displayed when registration is complete.



(B) Connect the air conditioner to the network with AP

1) Change the Wi-Fi connection destination of your smartphone to enter "Smart M-Air-XXXX"* and KEY.
   *XXXX indicates the last 4 digits of the MAC address for the air conditioner.
   KEY and MAC address confirmation method is described in section 6.
2) On the "Air Conditioner List" screen, tap the [Find unregistered Air Conditioners] button.
   To add the air conditioner tap the [Settings] button.

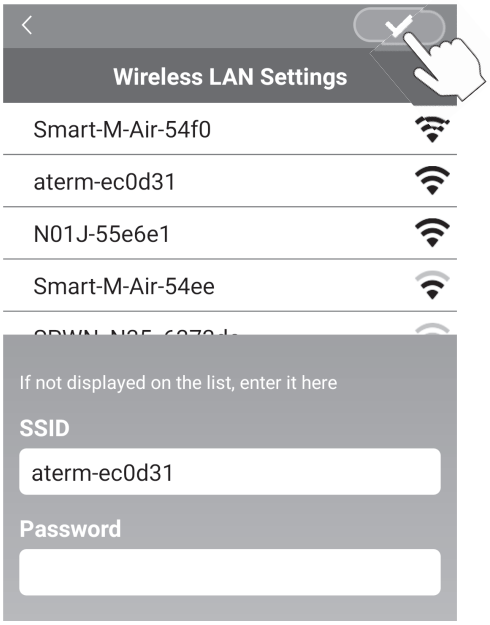


   If the air conditioner is not displayed, repeat steps in section 4.
   - If it is not connected, wait at 5 minutes until the RUN and TIMER light on the indoor unit are no longer lit and repeat process from section 4.
   - If the air conditioner still cannot be connected to the application, the number of devices connected with the wireless LAN router may have reached its upper limit, or the router may not be operating or may have failed. Therefore, check the wireless LAN router according to the user's manual of the router.
   - If the air conditioner still cannot be connected to the application after following the procedure in this manual, then refer to the FAQ section in the application menu.
3) If prompted to permit access to location information, please permit.

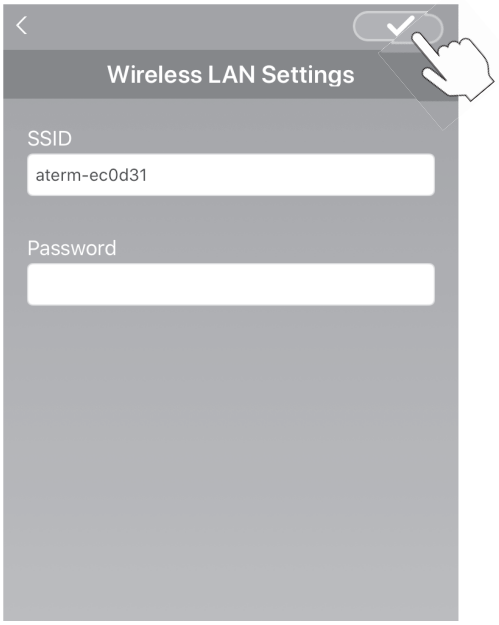
After selecting the network to connect to from the displayed list, the SSID will be pre-populated* in the entry field at the bottom of the screen.

Next, enter your home Wi-Fi network password and tap the ✓ at the top of the screen to confirm.

*If the home Wi-Fi network SSID number is not input automatically then it will need to be entered manually.

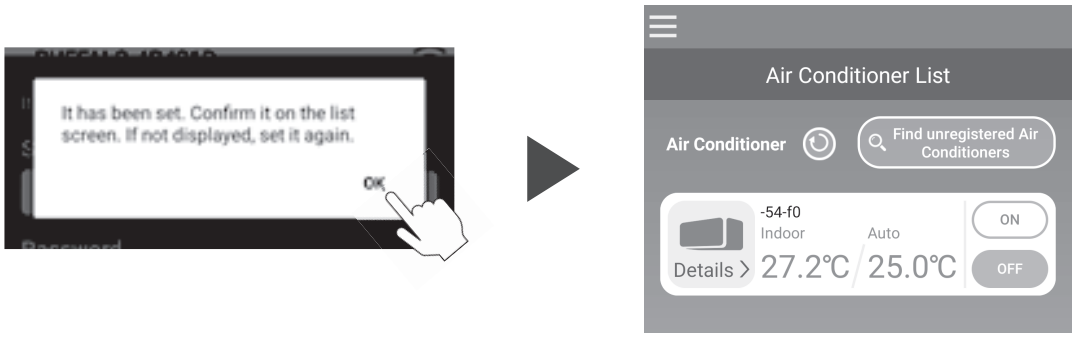


Android



iOS

The pop-up screen will appear to confirm air conditioner has been added. Tap the [OK] button to continue, the following screen will then be displayed showing the unit has been added.



(6) SSID, KEY and MAC address confirmation method

SSID, KEY and MAC address are printed on the label attached to the front of the indoor unit. Attach the label to this manual and keep it. This can also be viewed by scanning the QR code on the label.

<Note>
There is also a label showing this information inside the inlet panel.
See the section “Name of each part and its function” in the USER’S MANUAL for label location.
See the section “Maintenance” in the USER’S MANUAL for instructions to open the inlet panel.

Label attachment position

5. APPLICATION OPERATION MANUAL

Smart M-Air

Operation Manual

RKZ012A107 C

Table of contents

(1) Application features

You can operate the air conditioner in each room at home or from outside.

- Setting operation reservation of every day of the week for each air conditioner
- Checking the power consumption of an air conditioner
- Setting the shut-off reminder alert
- Alerting if an air conditioner is abnormal

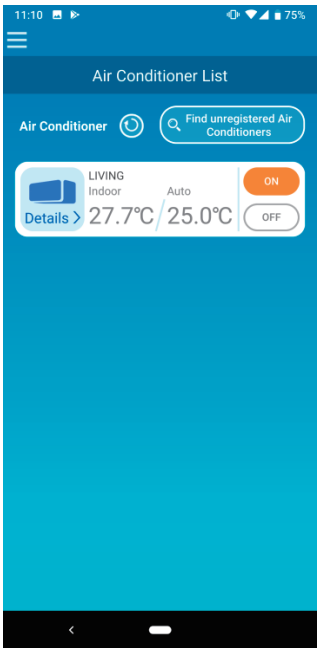


Figure 1-1

Figure 1-2

Note

Depending on the function of the connected air conditioner, the following operation will not be reflected in the operation of the air conditioner.

- Left/Right, 3D AUTO, Home leave mode, Electricity Bill Graph

Depending on the function of the connected air conditioner, the following operation will not appear on the screen:

- Home leave mode setting, LED ON

When the wireless LAN interface is connected, the timer setting is disabled on your home remote control depending on your air conditioner.
Please use the timer function of the application to set the timer.

(2) Manipulation modes

- Remote operation mode

  This mode allows you to operate the registered air conditioner via the smartphone application when you are out of the office.

  Also, you can register and operate the air conditioner at home through a smartphone application.

- Home restricted mode

  This mode allows you to register and operate the air conditioner at home via the smartphone application.

  You can operate without data communication to the server.

  Operation is not available when you are out.

- Demo mode

  If you don't have an air conditioner compatible with a smartphone app,This mode allows you to experience the operation feel of remote operation mode.

(3) Preparation for use

- Smartphone setting

  Turn on Wi-Fi of your smartphone.

Figure 3-1

- Application initial setting

  Tap the Smart M-Air icon.

Figure 3-2

The application starts.

Figure 3-3

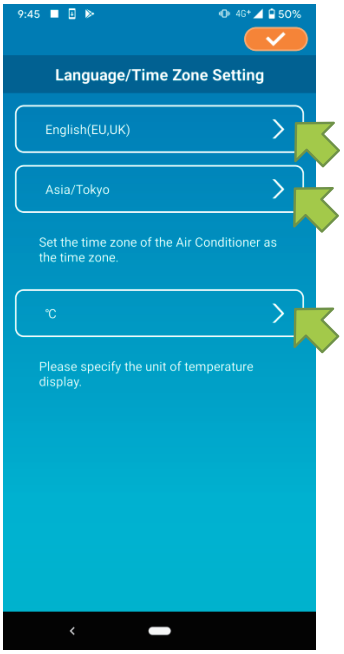


Figure 3-4

After startup, the “Language/Time Zone Settings” screen appears.

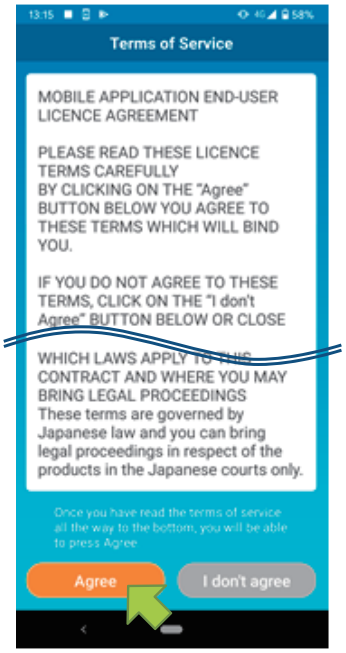
Select a language to use in the application.

Select a time zone. Select the time zone in which the air conditioner to operate via the application exists.

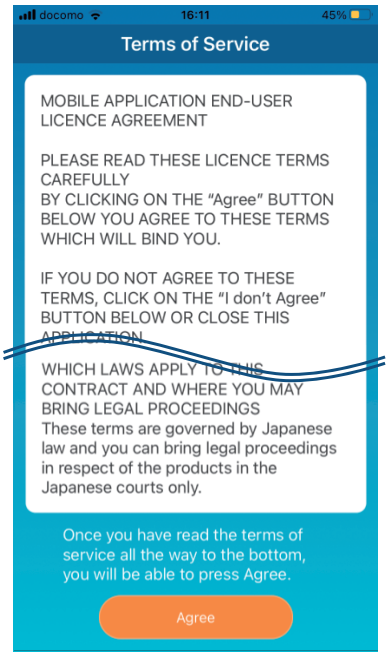
Choose the unit of temperature.

Finally, tap on the top right to complete the setting.

The “Terms of Service” screen appears.
Read the text to the bottom and check the description.
If you agree it and use the application, tap [Agree].
When you tap [I don’t agree], the application exits.



Android



iOS

Figure 3-5

On the startup screen, select a mode to use.

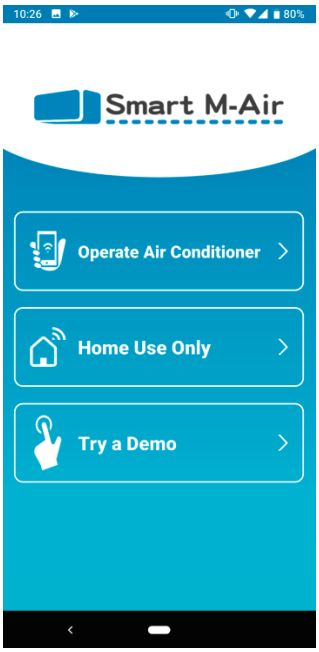


Figure 3-6

■ Operate Air Conditioner
(Remote operation mode)

Tap "Operate Air conditioner" for remote control or to use optional functions such as weekly timer.

→ To “Creating user account”

■ Home Use Only (Home restricted mode)

Tap "Home Use Only" to operate only at home. Some functions are restricted, but you can change to remote operation mode at any time.

→ To “Registering air conditioner”

Switching operation mode

→ To “Changing Application Settings”

■ Try a Demo (Demo Mode)

Tap "Try a Demo" to try out the app's features. (Some features only)

→ To “4. Basic Usage”

• Creating user account

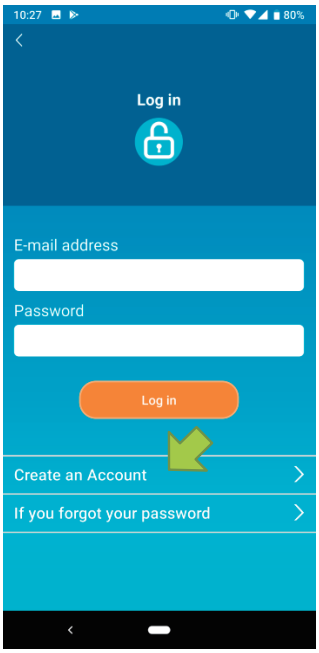


Figure 3-7

Tap [Create an Account].

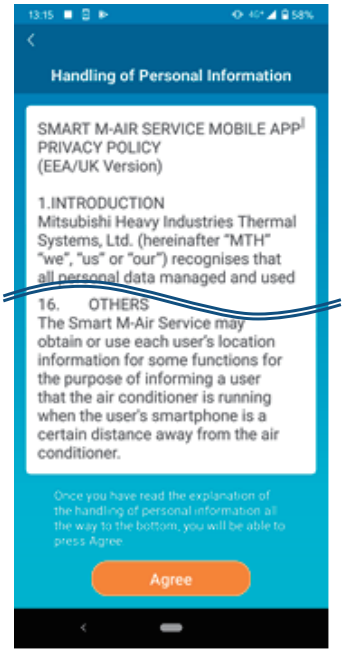


Figure 3-8

Read the text of Handling of Personal Information to the bottom and check the description.
If you agree it and use the application, tap [Agree].

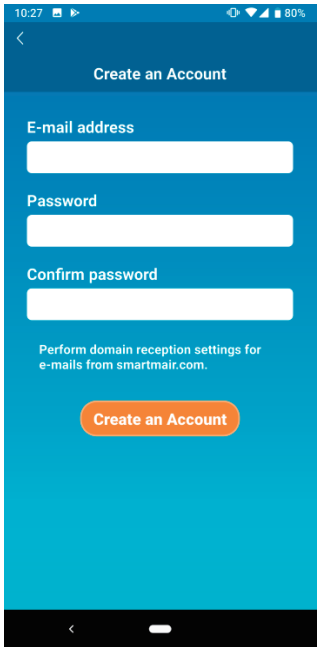


Figure 3-9

The "Create an Account" screen appears.
Enter your e-mail address and password and tap the [Create an Account] button.

Note

- A password must be between 8 to 16 characters including at least one alphabetic character and one numeric character.

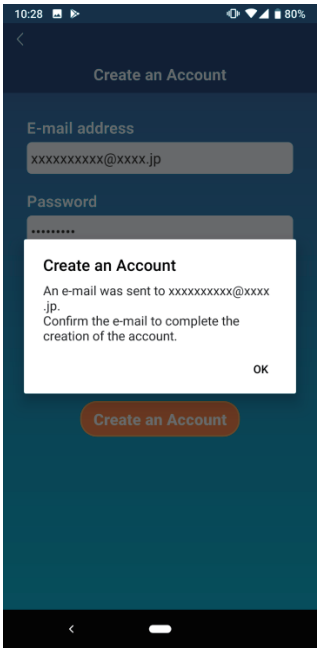


Figure 3-10

When the pop-up message “Create an Account” appears, tap [OK].

The email containing the URL of the authentication screen will be sent to the email address you entered, so please click the URL within 24 hours to complete the account creation.

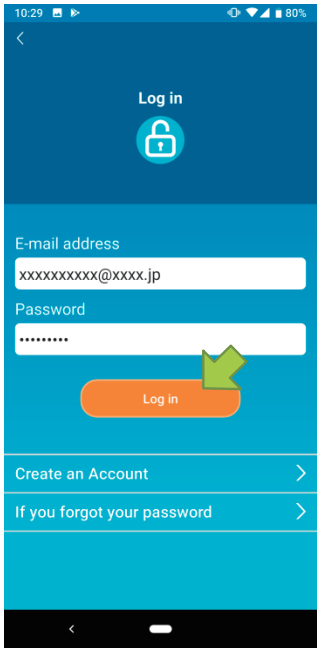


Figure 3-11

After the account is created, the “Log in” Screen appears on the application.

Click the URL written in the e-mail, enter the registered e-mail address and password, and tap the [Log in] button.

If you forget your password and cannot log in, tap "If you forgot your password" and set a new password.

→ To “Reset Password”

• Registering air conditioner

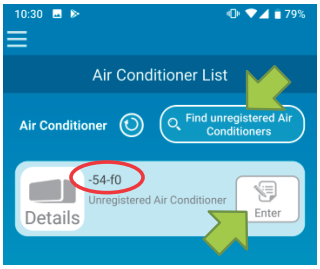


Figure 3-12

Use the “Air Conditioner List” screen to register an air conditioner to operate.

Tap the "Find unregistered Air Conditioners" button to display air conditioners that are not registered on your smartphone.

The air conditioner name (◯ locations) displays the last 6 digits of the SSID on the label of the wireless LAN interface.

Tap the [Enter] button.

・When the air conditioner is not displayed on the list screen
→ To “When the air conditioner that you want to register does not appear in the air conditioner list screen”

・To delete a registered air conditioner
→ To “How to delete a registered air conditioner”

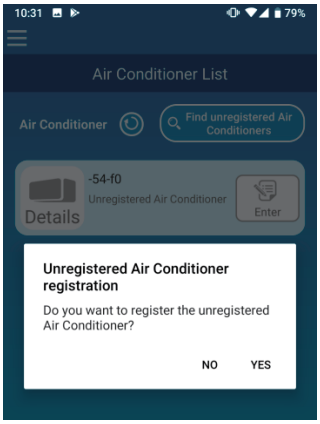


Figure 3-13

To register the air conditioner,
tap [YES] on the pop-up message displayed.

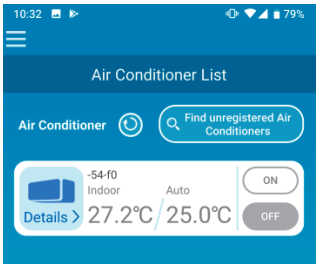


Figure 3-14

• Wireless LAN settings of air conditioner

If your wireless LAN router does not support WPS, manually make wireless LAN settings of your air conditioner.

Set the wireless LAN interface to the AP mode, and then change the Wi-Fi connection
destination of your smartphone to “Smart-M-Air-XXXX”.

“XXXX” is the last 4 alphanumeric characters of the MAC address of the wireless LAN interface.

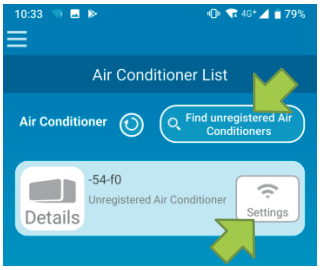


Figure 3-15

On the “Air Conditioner List” screen, tap the [Find unregistered Air Conditioners] button. The target air conditioner appears.

Tap the [Settings] button.

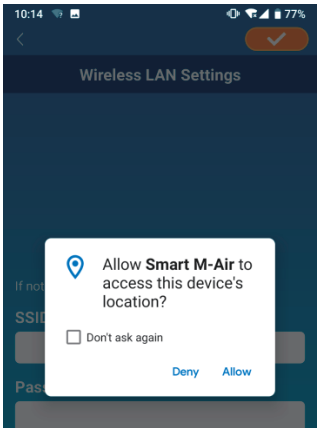
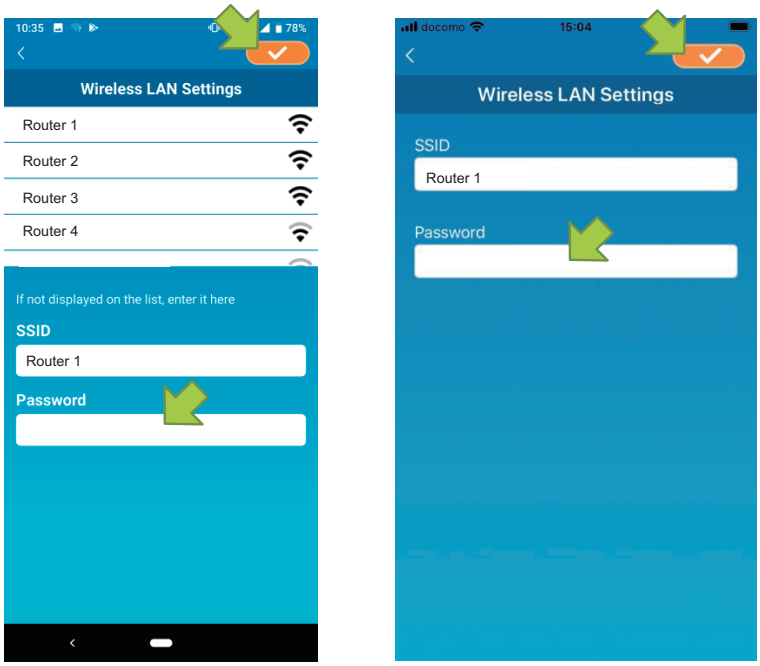


Figure 3-16

If you are prompted to permit access to location information, tap [Allow].

When you tap the network you want to set from the displayed list, the SSID appears in the "SSID" entry field at the bottom of the screen, enter "Your home Wi-Fi password" below it, and tap in the top right.

If the network you want to set is not displayed in the list, enter "SSID" and "Your home Wi-Fi password" directly, then tap on the top right to set.



Android iOS

Figure 3-17

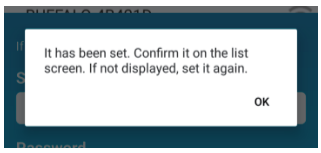


Figure 3-18

After the wireless LAN settings is completed, the air conditioner is registered.

• Naming air conditioner

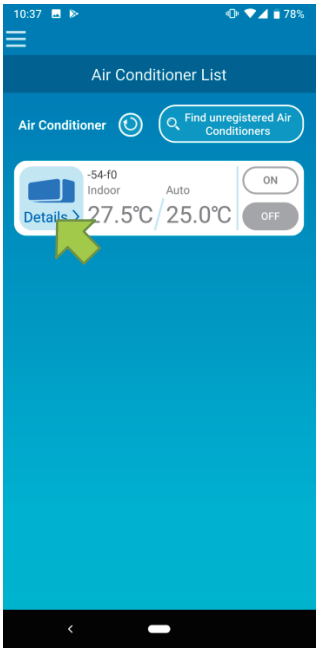


Figure 3-19

If you want to change the name of the air conditioner displayed in the application such as the air conditioner list screen, tap "Details" to display the detailed screen of the air conditioner.

Figure 3-20

Press and hold down (1 second) an air conditioner name. The “Edit Air Conditioner name” dialog appears. Use this to change the name.

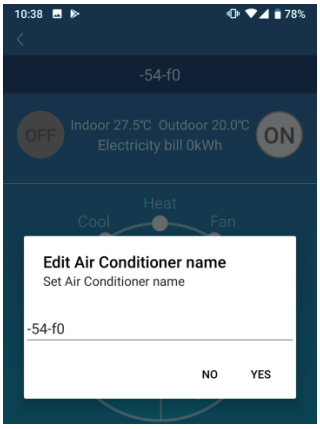


Figure 3-21

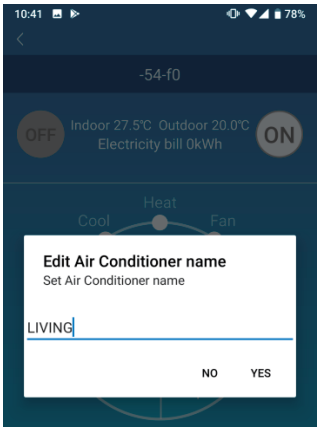


Figure 3-22

Enter a new air conditioner name and tap [YES].

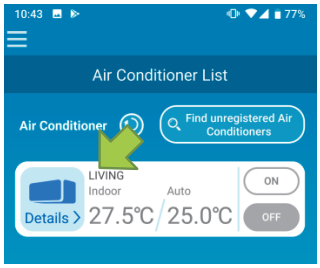


Figure 3-23

(4) Basic usage

• Starting / Stopping air conditioner operation

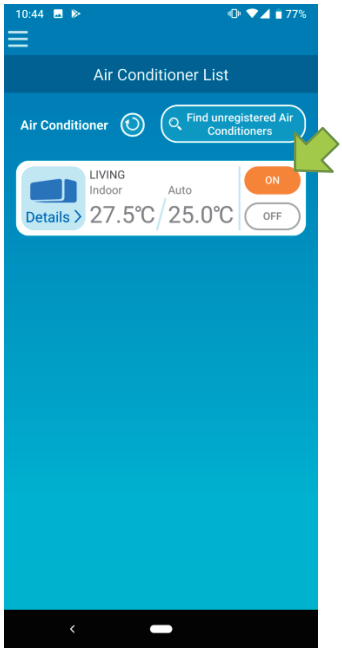


Figure 4-1

To start or stop the operation, tap the [ON] / [OFF] button of the air conditioner that you want to operate on the “Air Conditioner List” screen.

When the button color changes, switching is complete. (Grayed out when off)

To update to the latest information, tap  .

Note

- When operating an air conditioner from an external location, it may take up to one minute to complete the air conditioner operation.

• Switching operation mode

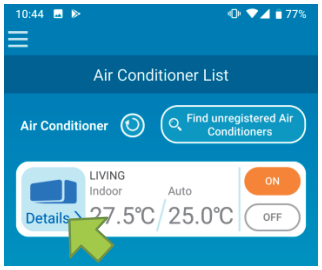


Figure 4-2

Tap an air conditioner that you want to switch the operation mode on the “Air Conditioner List” screen.

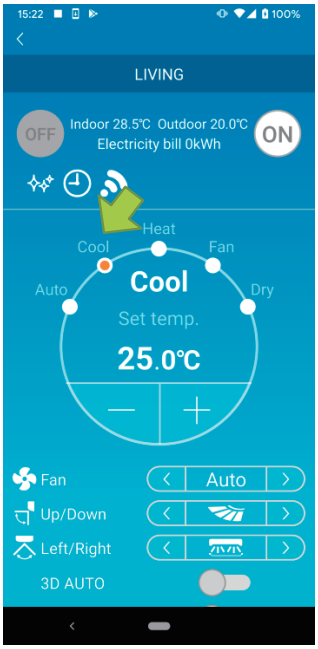


Figure 4-3

To change the “Operation mode”, tap each mode from “Auto” to “Dry”.

appears when the air conditioner is in clean mode. To cancel clean mode, tap OFF.
appears when the weekly timer is set by this application.
appears when the application is used at home where the air conditioner is set and connected to the application.

• Changing temperature

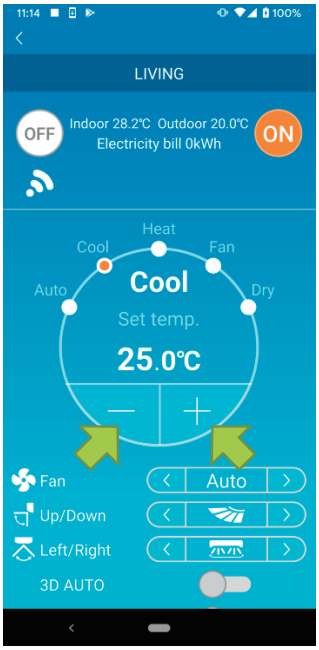


Figure 4-4

To set a desired temperature, tap − / +.
The current set temperature appears in the circle.

Figure 4-5

When the operation mode is Fan, Set temp. shows "-".

• Changing fan speed and air flow direction

Figure 4-6

Tap 〈 / 〉 to change settings.

• Switching Vacant Property Mode

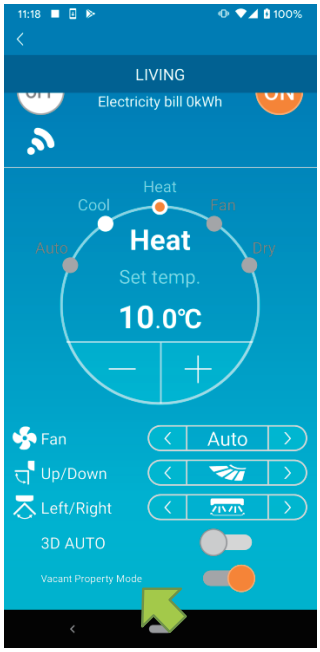


Figure 4-7

When Vacant Property Mode is ON, operation mode and Set temp. can be set as follows.

■ Cool : Set temp. 31°C to 33°C (at 1°C intervals)

■ Heat : Set temp. 10°C to 17°C (at 1°C intervals)

Only "Cool" or "Heat" can be set as an operation mode.

(5) Using Favourites

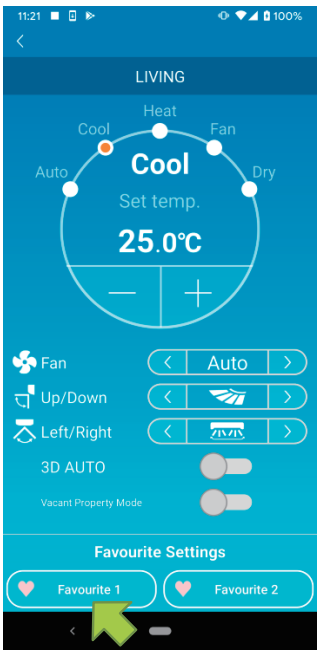


Figure 5-1

Register your desired settings of “Set temp”, “Operation mode”, “Fan”, “Up / Down” and “Left / Right” with Favourite. Tapping the [Favourite] button changes the current settings to the registered settings.

On the air conditioner details screen, press and hold down (1 sec) the [Favourite 1] or [Favourite 2] button. The “Favourite” screen appears.

Figure 5-2

Change each item to your favourite setting, and tap ✓ on the top right to add it to Favourites.

Press ‹ in the upper left of the screen to return to the operation screen.

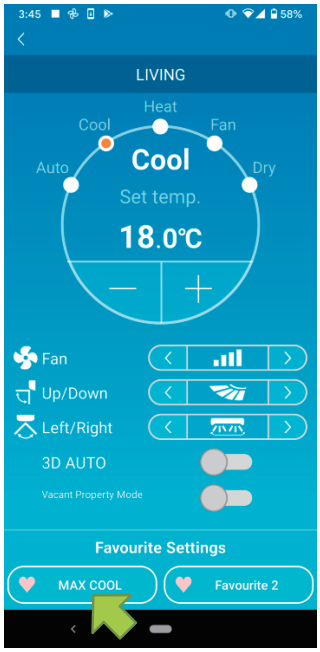


Figure 5-3

When you tap the [Favourite 1] or [Favourite 2] button, the current settings are changed to the favourite settings you tapped.

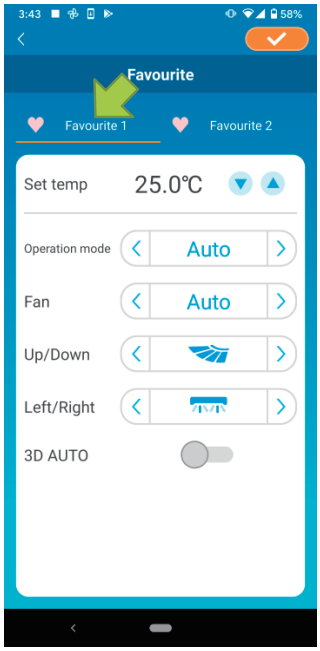


Figure 5-4

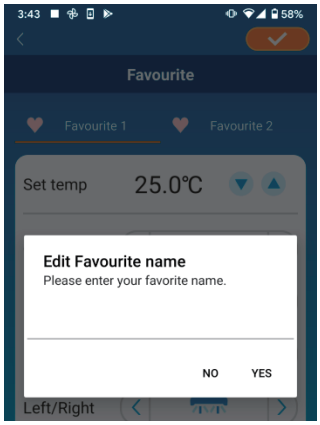


Figure 5-5

To change the name of the "Favourite" button, press and hold down the "Favourite" button for approximately 1 second. "Edit Favourite name" dialog appears to change the name.

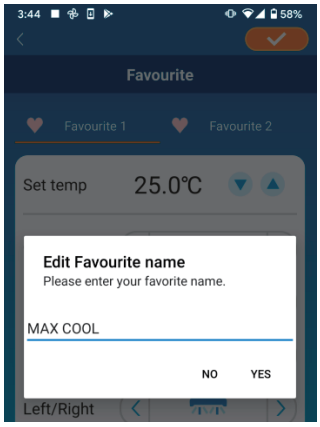


Figure 5-6

Enter the new favourite name and tap [YES].

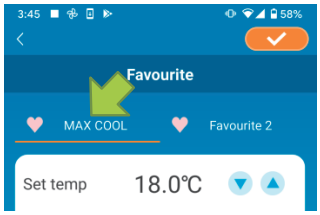


Figure 5-7

(6) Using Options

You can make various option settings such as alerts and LED lighting, and check the number of accounts registered with an air conditioner.

Home restricted mode : Only “Home Leave Mode”, “Cooling specific” and “LED ON” are operable.

Demo mode : Options are not operable.

You can switch to remote operation mode using "Changing Application Settings" in the main menu.

→ To “Changing Application Settings”

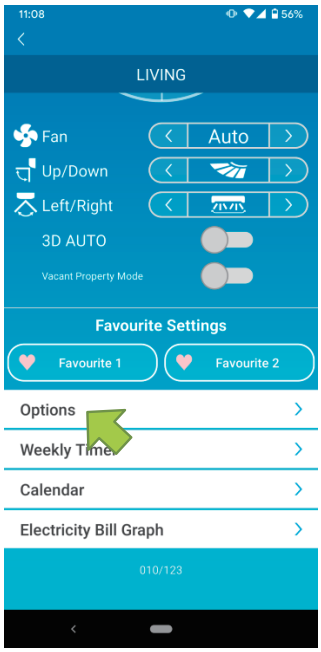


Figure 6-1

Tap [Options] on the lower part of the air conditioner details screen.
The “Options” screen appears.

Only "LED ON" is ON by default.

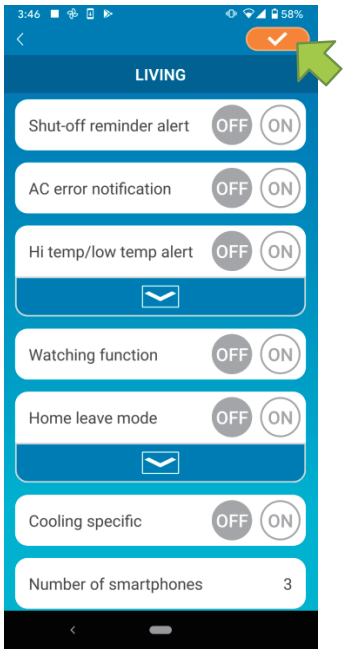


Figure 6-2

Switch between [ON] and [OFF], and tap on the top right of the screen to save the settings you changed.

Note

- Shut-off reminder alert, AC error notification, Hi temp/low temp alert ,Watching function can be used with "Remote operation mode".

• Shut-off reminder alert

If you are more than 1 km away from the air conditioner you are driving, you can receive a push notification to the smartphone application.

■ To receive alerts, tap [ON].

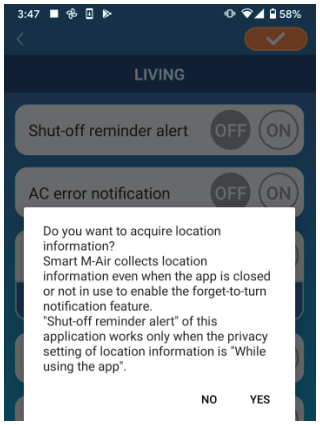


Figure 6-3

When the pop-up message appears, tap [YES] and then tap on the top right.

■ To not to receive alerts, tap [OFF].

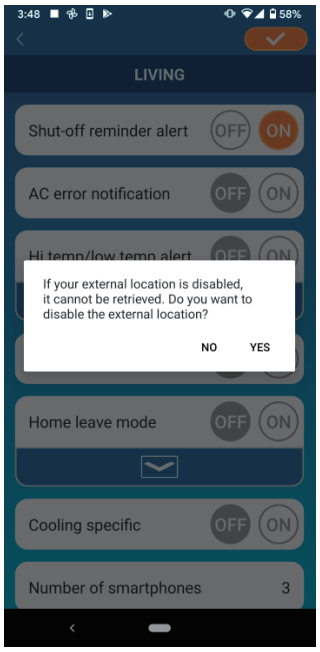


Figure 6-4

When the pop-up message “If your external location is disabled, it cannot be retrieved. Do you want to disable the external location?” appears, tap [YES] and then tap on the top right.

Note

• Acquisition of location information is performed by using the location of your smartphone as the location of the air conditioner. Perform location information acquisition near your air conditioner.

• AC error notification （Air conditioner error notification）

If any abnormality is detected in your air conditioner, an e-mail is sent to the registered e-mail address.

→ To “ When an abnormality notification appears in the air conditioner list”

■ To receive notifications, tap [ON] and then tap on the top right.
■ To not to receive notifications, tap [OFF] and then tap on the top right.

• Hi temp/low temp alert

When the air conditioner reaches the specified high/low temperature condition, a push notification is sent to the smartphone application.

■ To receive alerts, tap [ON] and enter the high and low temperatures and then tap on the top right.
■ To display the high and low temperatures input area, tap . To hide it, tap .

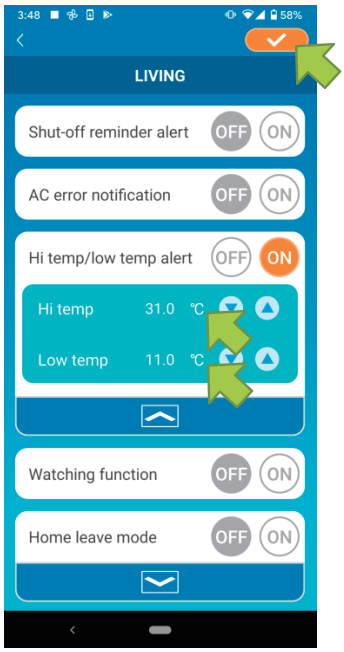


Figure 6-5

Note

- When the room temperature is higher / lower than the temperature specified here, alerts are sent.
  If you set the high temperature at 31°C, an alert is sent when the room temperature exceeds 31°C. No alert is sent at 31°C.
- Setting only either of high or low temperature receives alerts only for high or low temperature.

■ To not to receive alerts, tap [OFF] and then tap on the top right.

• Watching function

When the air conditioner is controlled other than your smartphone, an e-mail is sent to the registered e-mail address.

Note

- The notification also applies to the operation with the timer of the air conditioner itself and the end of internal clean operation.

■ To receive alerts, tap [ON] and then tap on the top right.
■ To not to receive alerts, tap [OFF] and then tap on the top right.

• Home leave mode

When the room temperature is lower than a setting temperature, heating is turned on automatically.
When the room temperature is higher than a setting temperature, cooling is turned on automatically.

■ To use “Home leave mode”, tap [ON].

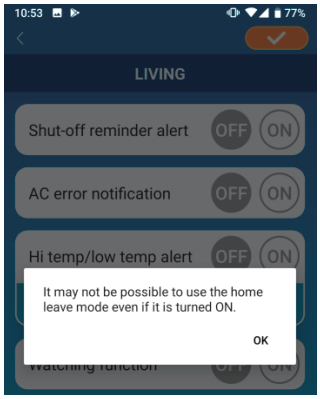


Figure 6-6

When the pop-up message “It may not be Possible to use the Home leave mode even if it is turned ON.” appears, tap [OK] and then tap on the top right.

Note

- There is no "Home leave mode" depending on the air conditioner connected.
  In this case, "ON" has no effect.

■ To not to use “Home leave mode”, tap [OFF] and then tap on the top right.

■ To change the setting of home leave mode, tap  . To hide them, tap  . The following settings can be changed.

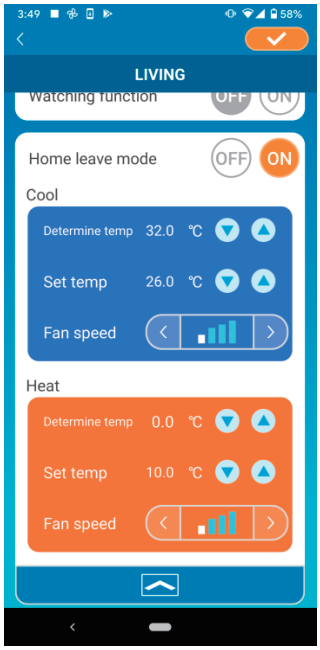


Figure 6-7

・Determine temp : Set the preferred outside temperature to start the operation of the air conditioner in cooling/heating mode.

Allowable setting range in cooling :
26°C to 35°C (at 3°C intervals)
Allowable setting range in heating :
0°C to 15°C (at 5°C intervals)

・Set temp : Set the preferred indoor temperature to operate in cooling/heating mode.

Allowable setting range in cooling :
26°C to 33°C (at 1°C intervals)
Allowable setting range in heating :
10°C to 18°C (at 1°C intervals)

・Fan speed : Set the fan speed in cooling/heating mode.

[example]
Cooling → When you input the determine temp. as 32°C, set temp. as 26°C and the fan speed at the slowest, the air conditioner will start operating at 26°C with the slowest fan speed when the outside temperature reaches to 32°C.

• Cooling specific

If you set it as an air conditioner for cooling only, you won't be able to use the heating in the smartphone application.

■ To use “Cooling specific”, tap [ON] and then tap on the top right.

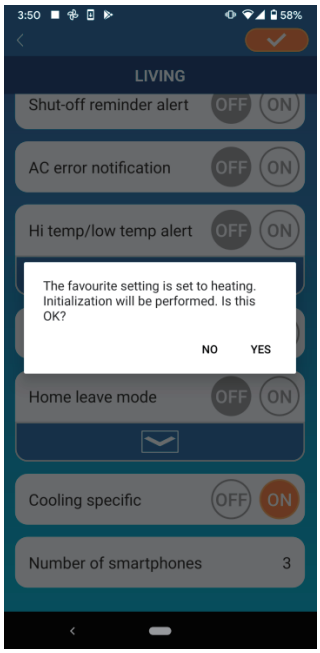


Figure 6-8

• When “ON” is set or “Heat” is set to favourites, the pop-up message asking whether to initialize favourites appears.

If you tap [YES] on the pop-up message, the “Cooling specific” setting is turned “ON” to initialize the favourite with heating set.

■ To not to use “Cooling specific”, tap [OFF] and then tap on the top right.

• LED ON

Lights up the LED of the wireless LAN interface.

■ To use LED lighting, tap [ON] and then tap on the top right.
■ To not to use LED lighting, tap [OFF] and then tap on the top right.

• Number of smartphones

Displays the number of smartphones registered with the air conditioner.

(7) Setting Weekly Timer

Makes the timer setting for every day of the week.

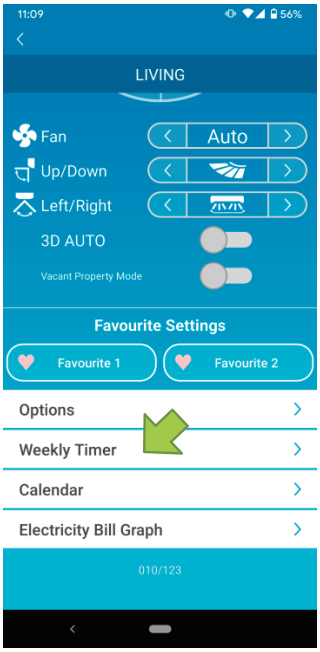


Figure 7-1

Tap [Weekly Timer] on the lower part of the air conditioner details screen.

The “Weekly Timer” screen appears.

Tap on the top right of the screen to save the settings you changed.

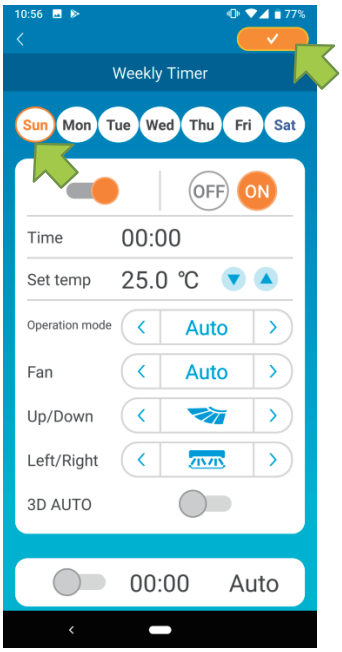


Figure 7-2

Tap the day of the week you want to set to display the timer list for that day of the week.

You can set up to six timers for each day of the week, but you cannot set the same time for the same day.

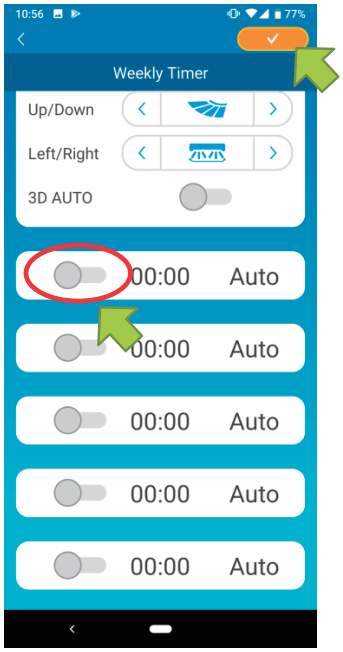


Figure 7-3

A disabled timer shows the time and operation mode only.

Tap the switch at ⬭ to enable and edit.

Edit each item and tap ✓ on the top right to set the timer on the target day.

Figure 7-4

When at least one timer setting is ON, the timer icon appears on the air conditioner detail screen.

The timer you set here is applied to every week on that day.

To turn off the timer only on a certain day, or to apply the timer of another day, set individually from the “Calendar” screen.

(8) Setting Timer by Specifying Date via Calendar

When you set the weekly timer, the same timer is applied to the same day every week. To turn off the timer or set the timer of a different day on a certain day, set individually from the “Calendar” screen.

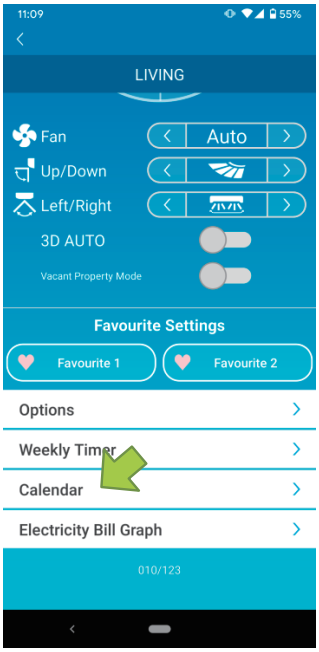


Figure 8-1

Tap [Calendar] on the lower part of the air conditioner details screen.

The [Calendar] screen appears.

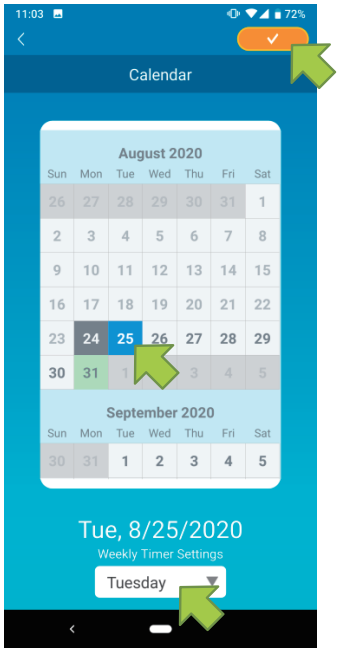


Figure 8-2

Tap the date of the calendar. Select the timer of the day of the week that you want to apply from "Weekly Timer Settings" and tap on the top right of the screen.

If you select "OFF" from "Weekly Timer Settings", the weekly timer is not applied.

When the timer of a different day of the week is applied or the timer is turned off, the date appears in green.

• Clear the timer set from the calendar

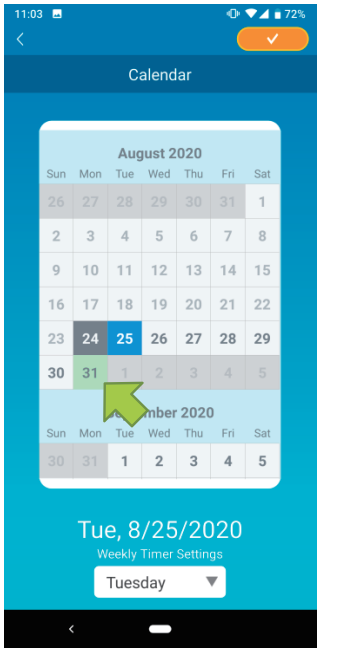


Figure 8-3

Tap the date whose timer you want to clear.

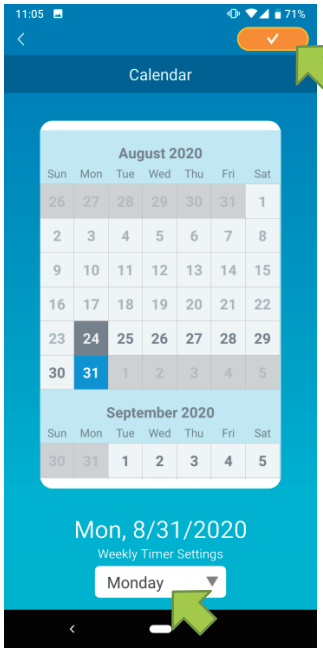


Figure 8-4

From “Weekly Timer Settings”, select the same day of the week as the date to clear and tap  .

Figure 8-5

When cleared, the background of the date is displayed in white.

(9) Displaying Electricity Bill Graph

Displays an electricity bill by month on a graph. You can also set the electricity unit cost.

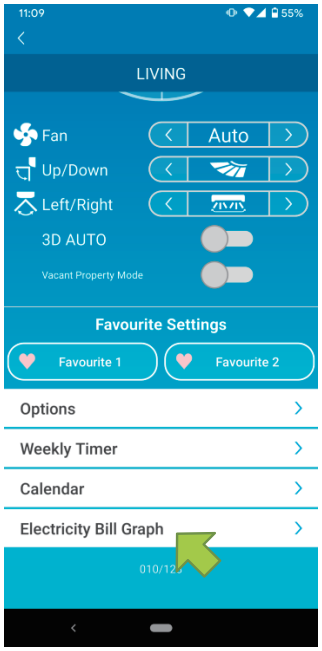


Figure 9-1

Note

Depending on the type of air conditioner you connect, the function may be disabled.

Tap [Electricity Bill Graph] on the lower part of the air conditioner details screen.

The “Electricity Bill Graph” screen appears.

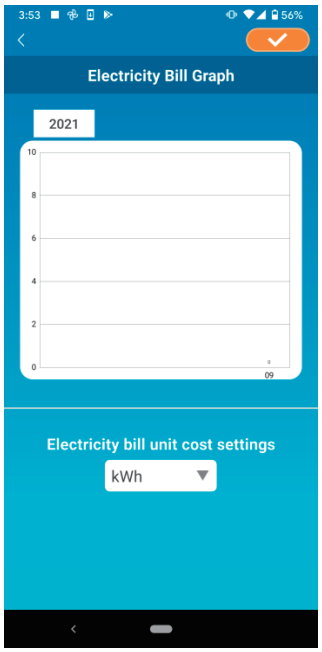


Figure 9-2

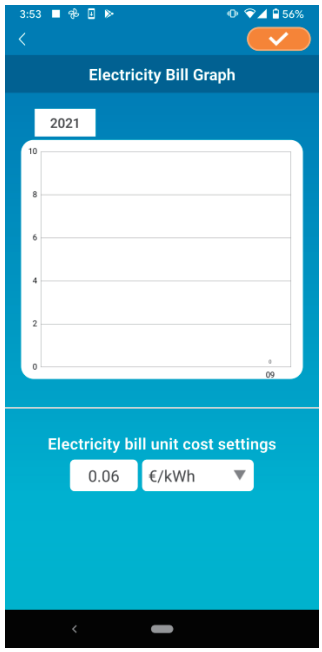


Figure 9-3

If you change the electricity bill unit cost settings, you can enter a unit price by changing the unit of measure.

After editing, tap ✓ to save the setting.

(10) Updating Firmware

If the firmware of your wireless LAN interface is not up to date, an exclamation mark ❗ appears on the “Air Conditioner List” screen.

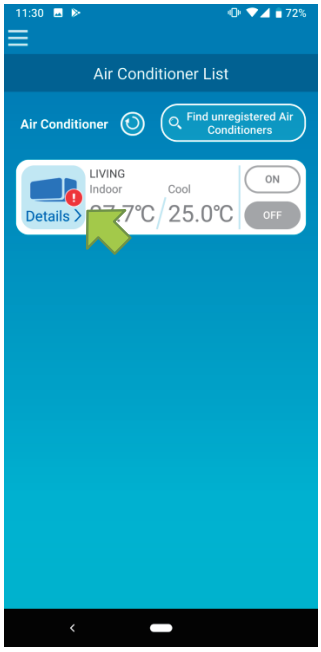


Figure 10-1

Tap [Details] to display the air conditioner details screen.

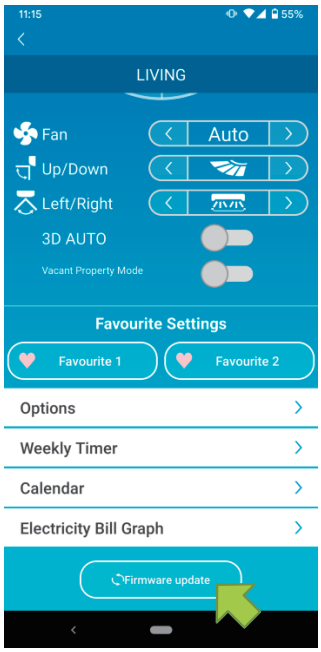


Figure 10-2

Tap the [Firmware update] button.

Note

- Perform the firmware update in the same wireless LAN area as the air conditioner.
- Please turn off the air conditioner in advance.
- If firmware update is disabled, the button is not enabled.

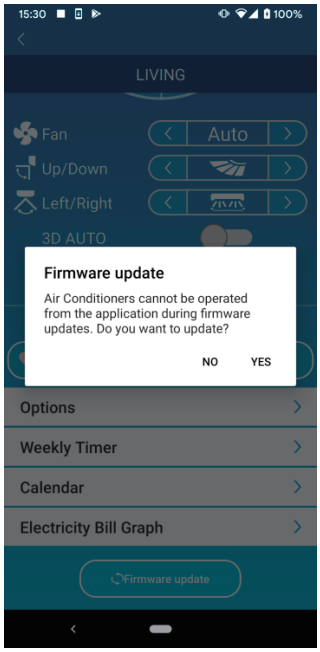


Figure 10-3

Tap [YES] to update the firmware to the latest one.

The firmware update takes 10 minutes (Max).
The operation from the application is not accepted during that period.

If after 10 minutes (Max) the "Firmware update" button appears, retry the firmware update.

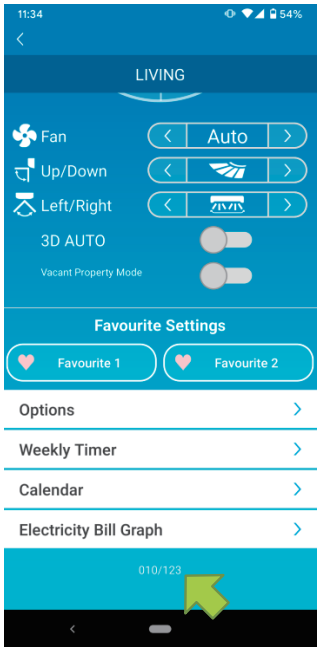


Figure 10-4

When the firmware becomes up to date, the firmware version appears instead of the [Firmware update] button.

(11) Main Menu

Tap the menu button ( ) that appears on the top left in the screen such as “Air Conditioner List”, to display the main menu.

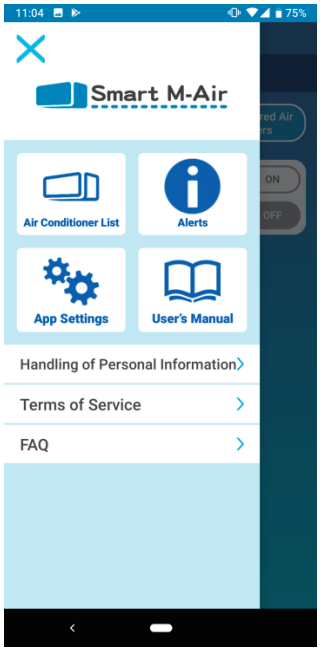


Figure 11-1

- ■ Air Conditioner List : Operates or sets an Air conditioner.
- ■ Alerts : Checks alerts.
- ■ App Settings : Switches the operation mode or sets the password.
- ■ User’s Manual : Displays the user’s manual.
- ■ Handling of Personal Information : Displays the handling of personal information.
- ■ Terms of Service : Displays the terms of service.
- ■ FAQ : Displays the FAQ.

• Canceling demo mode

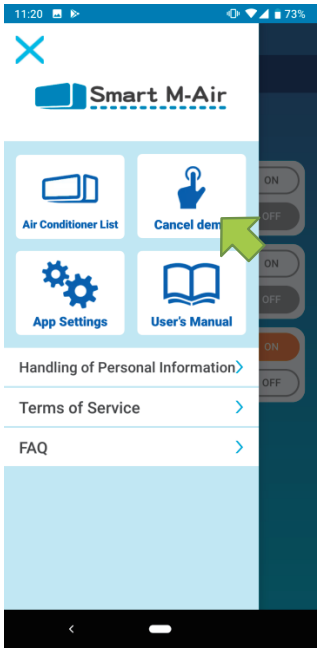


Figure 11-2

In the demo mode
Cancel demo : Exits the demo mode.

(12) Checking Alerts

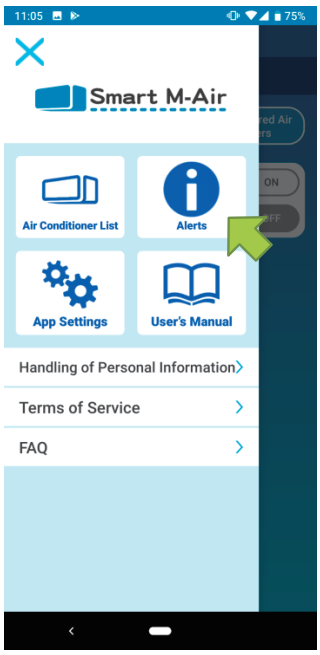


Figure 12-1

Open the main menu and tap [Alerts].

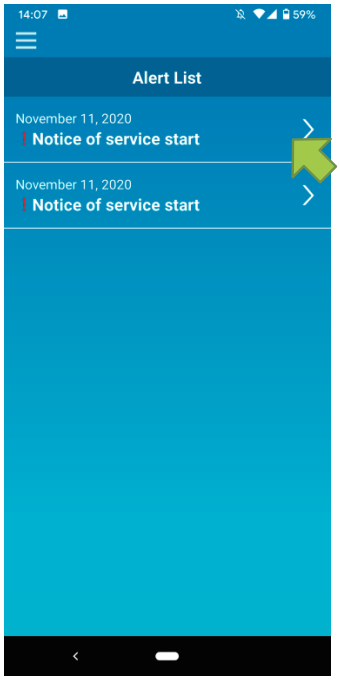


Figure 12-2

A list of alerts appears.

Tap each alert to display the alert details screen and check it.

! appears to the alert that is not checked in the alert details screen.

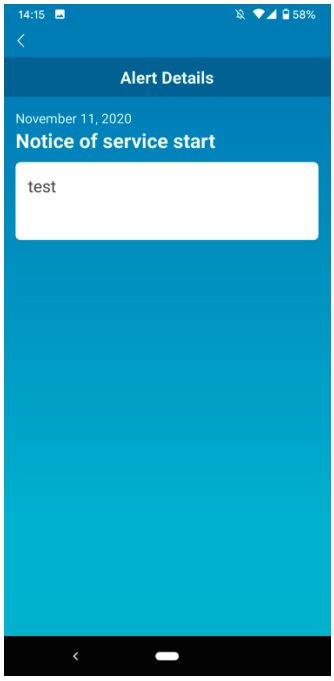

14:15
58%
Alert Details
November 11, 2020
Notice of service start
test

Figure 12-3

(13) Changing Application Settings

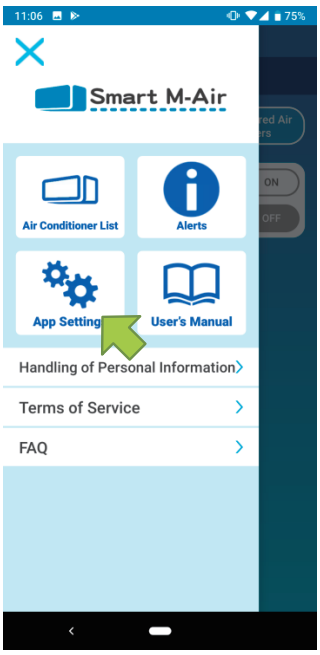


Figure 13-1

Open the main menu and tap [App Settings].

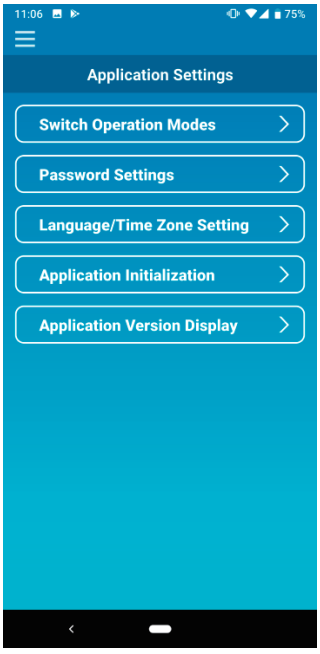


Figure 13-2

The “Application Settings” screen appears.

■ Switch Operation Modes: Switches between the remote operation mode and home restricted mode.

→ To “Switch Operation Modes”

■ Password Settings: Sets a password.

→ To “Reset Password”

■ Language/Time Zone Settings: Sets a language to use in the smartphone application and a time zone for an air conditioner.

→ To “Language/Time Zone Settings”

■ Application Initialization: Initializes the smartphone application.

→ To “Application Initialization”

■ Application Version Display: Displays the version of your smartphone application.

→ To “Application Version Display”

Note

• In "Home restricted mode", you cannot operate "Password Settings". In "Try a Demo", only "Language/Time Zone Settings" and "Application Version Display" can be operated.
Functions that cannot be operated are displayed in gray, and nothing is displayed even if you tap them.

• Switch Operation Modes

You can see the current operation mode.
To switch the operation mode, select the desired mode and tap  .

• Switching to “Remote operation mode”

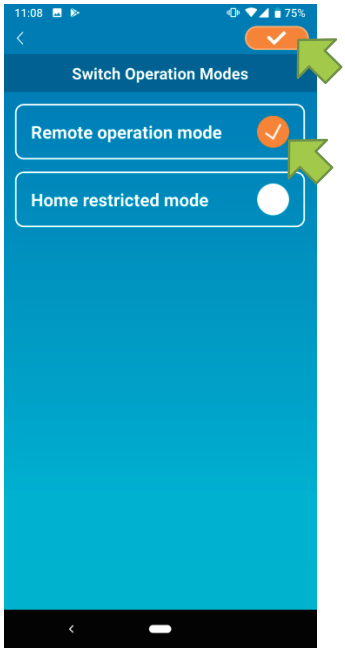


Figure 13-3

Tap [Remote operation mode] → Tap  on the top right to switch the mode.

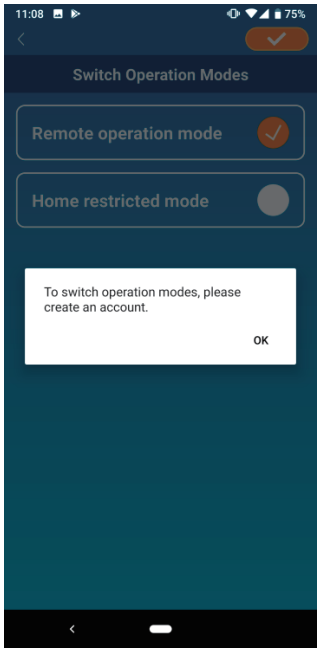


Figure 13-4

When the account creation pop-up message appears, tap [OK], agree with the handling of personal information, and create an account.

→ To “Creating user account”

• Switching to “Home restricted mode”

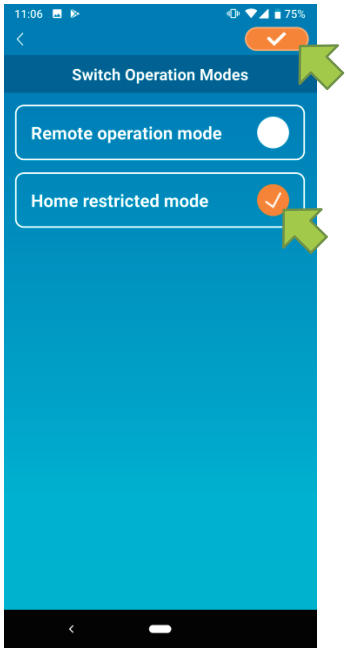


Figure 13-5

Tap [Home restricted mode] → Tap on the top right to switch the mode.

Note

- Note that if you switch the mode to “Home restricted mode”, the account information used in “Remote operation mode” is deleted.

The popup for remote control disabled and the popup for deleting server data will appear, so tap [YES].

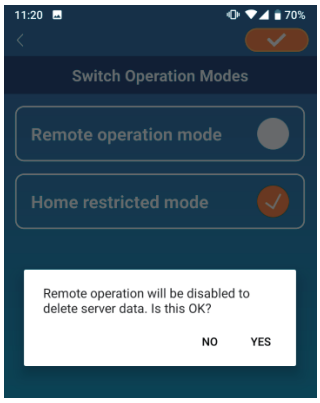


Figure 13-6

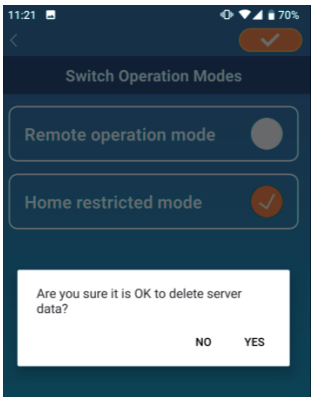


Figure 13-7

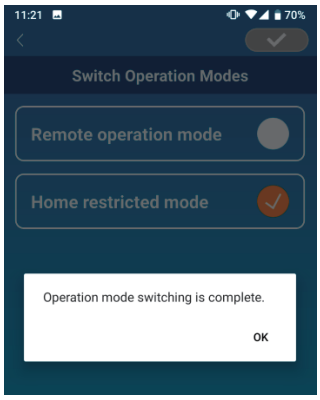


Figure 13-8

When the operation mode switching completion pop-up message appears, tap [OK].

• Reset Password

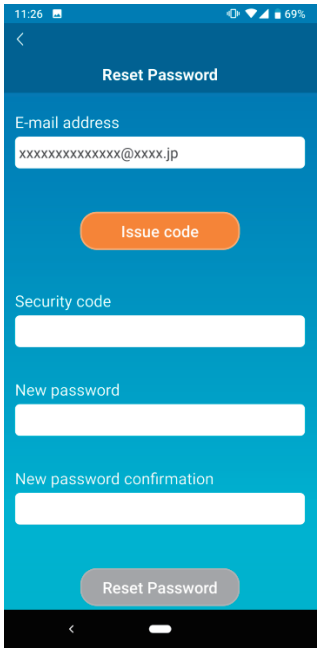


Figure 13-9

Enter the registered e-mail address and tap the [Issue code] button.

Note

- After tapping the [Issue code] button, keep this screen displayed until the password resetting is completed.
  If you tap < and return to the previous screen, these operations are canceled.

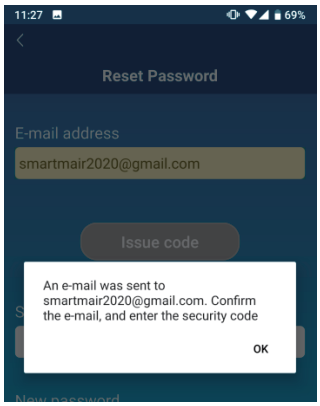


Figure 13-10

When the e-mail sending pop-up message appears, tap [OK].

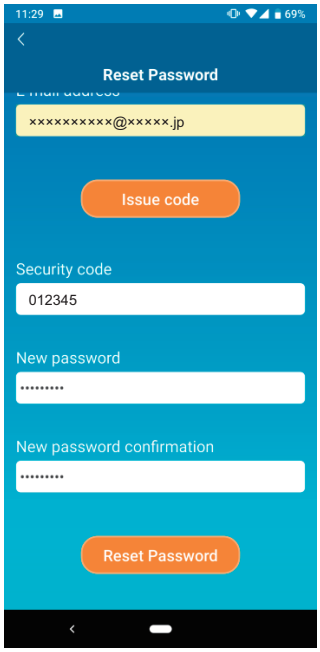


Figure 13-11

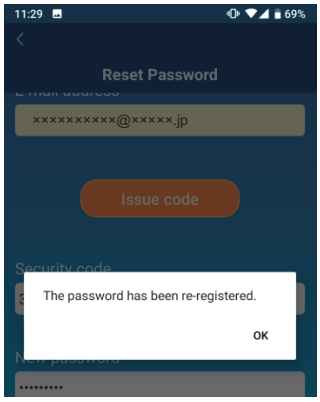


Figure 13-12

An e-mail with a security code will be sent to the e-mail address you entered. Enter “Security code” and “New password” and tap [Reset Password] to update your password.

Note

- A password must be between 8 to 16 characters including at least one alphabetic character and one numeric character.

• Language/Time Zone Settings

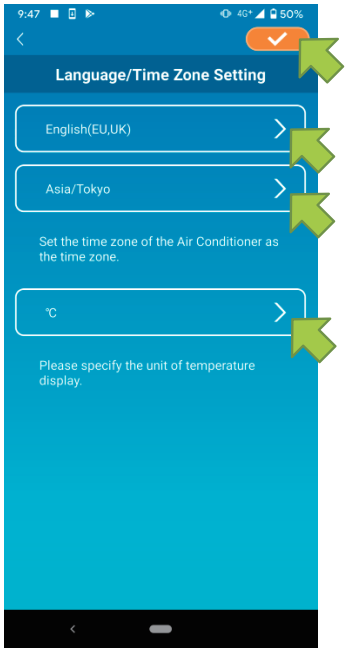


Figure 13-13

The “Language/Time Zone Settings” screen appears.

Select a language to use in the application.

Select a time zone. Select the time zone in which the air conditioner to operate via the application exists.

Choose the unit of temperature.

Finally, tap on the top right to complete the setting.

• Application Initialization

Initializes the smartphone application.

Note

• Note that if you initialize the application in “Remote operation mode”, the information of the account logged in is deleted.

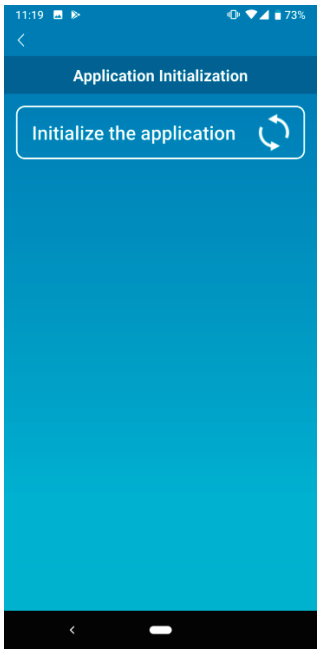


Figure 13-14

Tap [Initialize the application].

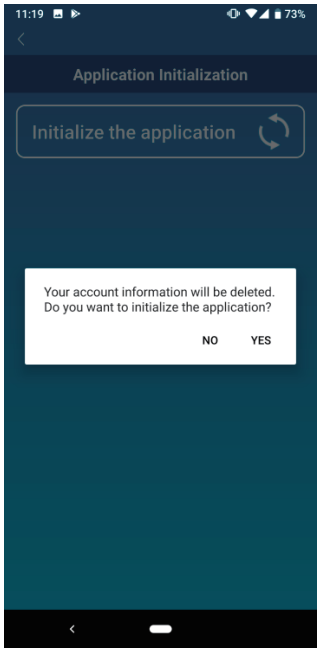


Figure 13-15

When the pop-up message “Your account information will be deleted.
Do you want to initialize the application?” appears, tap [YES].

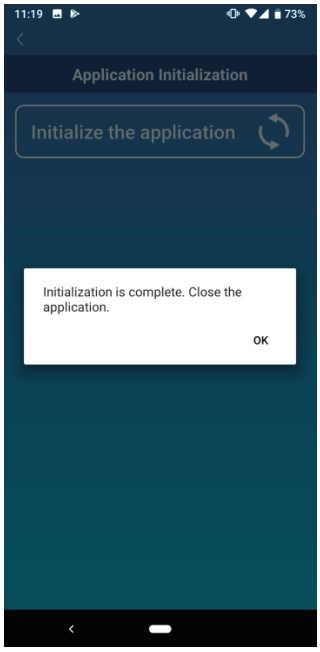


Figure 13-16

When the pop-up message "Initialization is complete. Close the application." appears, tap [OK] to close the application.

• Application Version Display

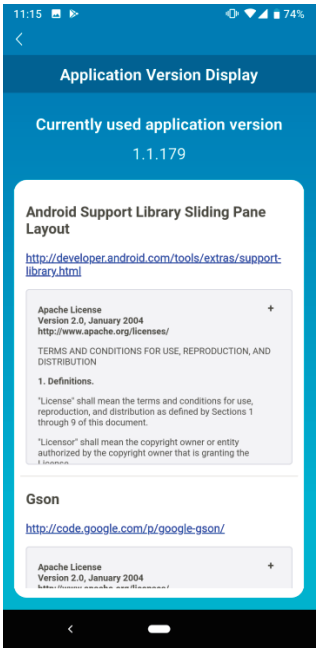


Figure 13-17

Displays the version of your smartphone application.

(14) Troubleshooting

- When the air conditioner that you want to register does not appear in the air conditioner list screen

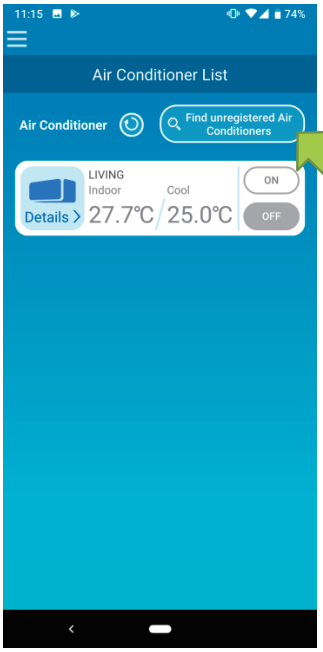


Figure 14-1

Tap the [Find unregistered Air Conditioners]

Button to search unregistered air conditioners and update the “Air Conditioner List” screen.

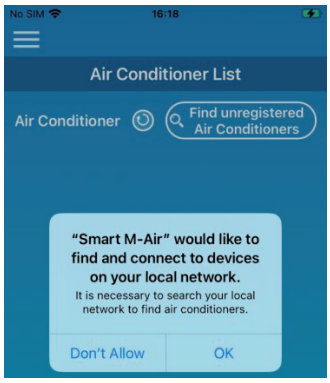


Figure 14-2

When asked for "search your local network" on iOS, tap the "OK" button.
If you accidentally tap the "Don’t Allow" button, change the Smart M-Air's "local network" in the iOS app permission settings to "ON", then tap the "Find unregistered Air Conditioner" button again.

• How to delete a registered air conditioner

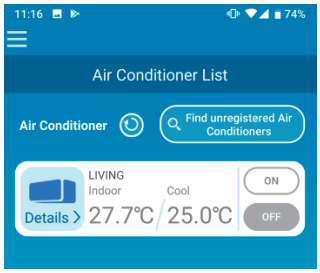


Figure 14-3

To delete a registered air conditioner, press and hold down (2 seconds) the icon of the target air conditioner.

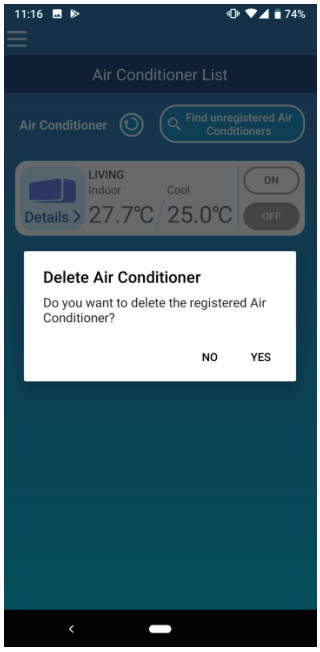


Figure 14-4

When the deleting air conditioner pop-up Message appears, tap [YES].

- When an abnormality notification appears in the air conditioner list

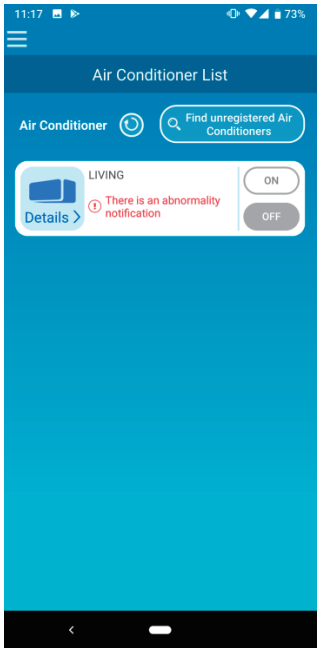


Figure 14-5

When an abnormality notification appears, air conditioner abnormality has been detected. Contact your dealer.

When “AC error notification” of the option settings is enabled, an e-mail is sent to the registered e-mail address.

- When you forget your password and cannot log in

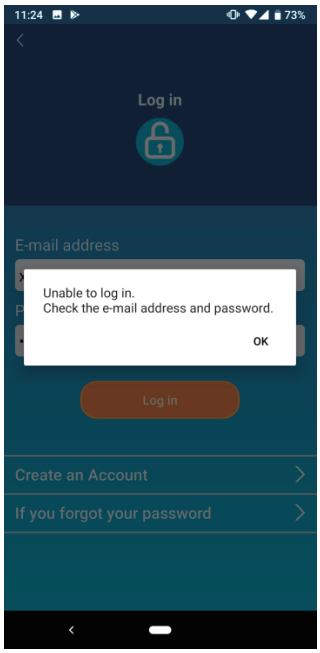


Figure 14-6

If you forgot your password and failed to log in, tap [OK] on the pop-up message, tap [If you forgot your password] to display the “Reset Password” screen, and set a new password.

→ To “Reset Password”

• When operation is performed by another account

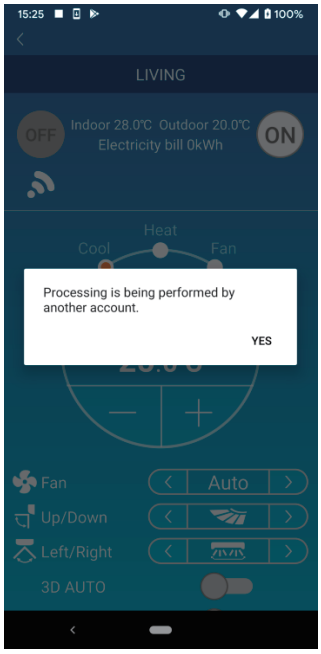


Figure 14-7

The message shows in the following cases:
- When the application is operated from other smartphones at the same time
- When the air conditioner is changing its operation status by its set control

The equipment is not malfunctioning, so please try again after a while.
(Approximately 1 minute)

• When "Shut-off reminder alert" does not turn on (For Android OS)

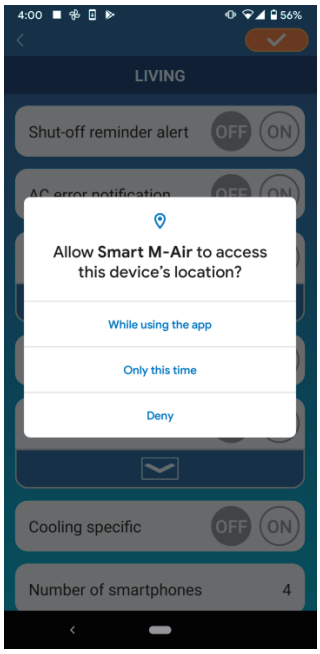


Figure 14-8

You must select "While using the app" when there is a request to allow access to your device information for this application.
If you accidentally tap other buttons such as "Only this time" or "Deny", you can change it to "While using the app" in Android OS Setting Screen.

INVERTER PACKAGED AIR-CONDITIONERS

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