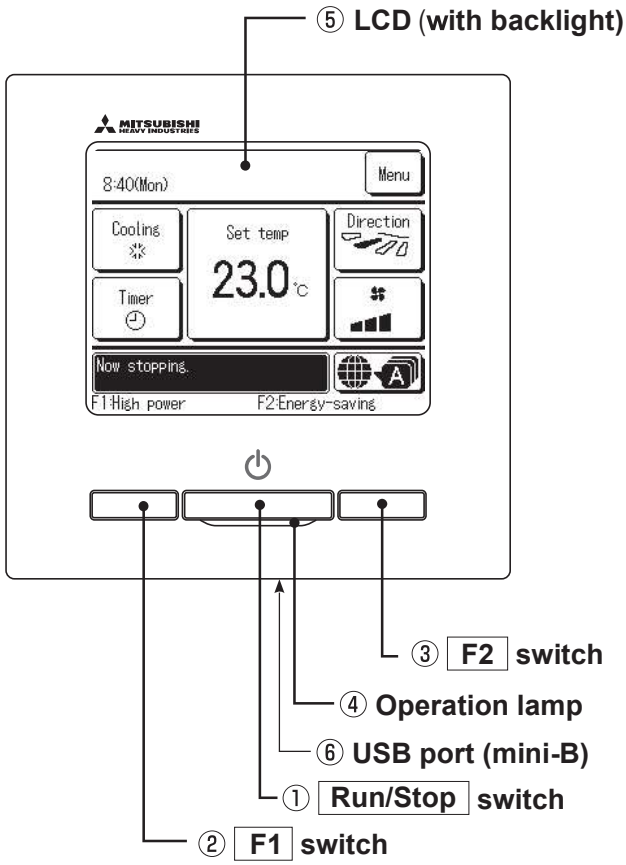
## 1.2 FDTC series

### 1.2.1 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**

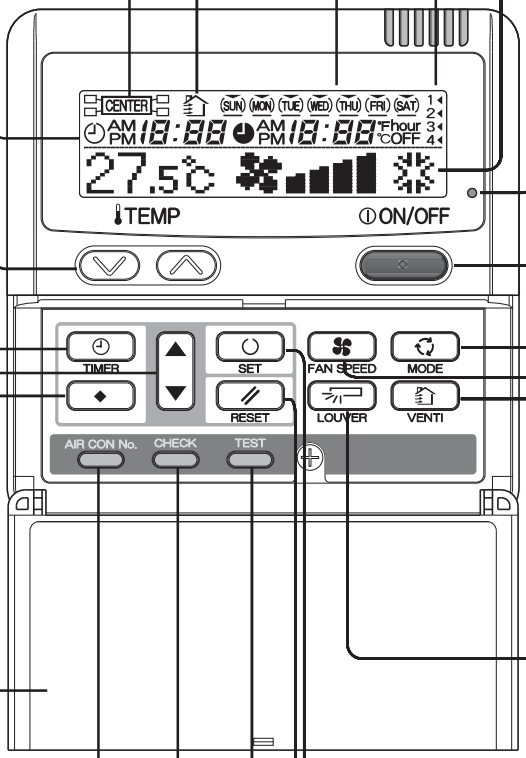
USB connector (mini-B) allows connecting to a personal computer.
For operating methods, refer to the instruction manual attached to the software for personal computer (remote control utility software).

Note(1) 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)

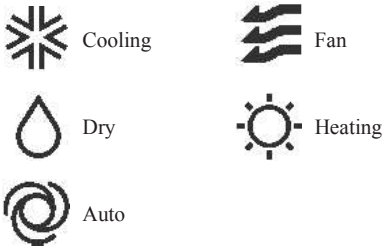
∗ All displays are described in the liguid crystal display for explanation.

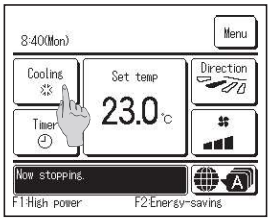
## 1.2.2 Operation control function by the wired remote control

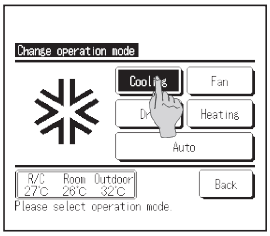
### ●Model RC-EX3A

#### (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.



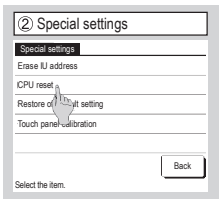

Notes(1) Operation modes which cannot be selected depending on combinations of indoor unit and outdoor unit are not displayed.
(2) When the Auto is selected,the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.

#### (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.

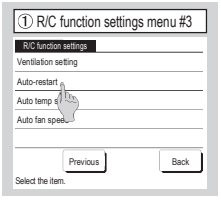
CPU reset

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

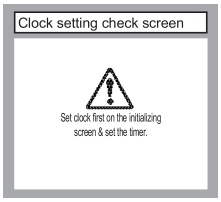
## (4) Alert displays

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

### (a) Communication check between indoor unit and remote control

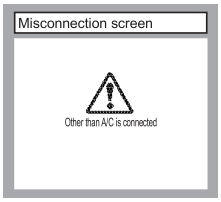

●This appears if communications cannot be established between the remote control and the indoor unit.
Check whether the system is correctly connected (indoor unit, outdoor unit, remote control) and whether the power source for the outdoor unit is connected.

### (b) Clock setting check




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

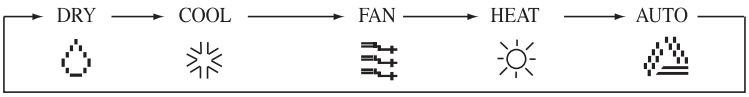
### (c) Misconnection




●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.

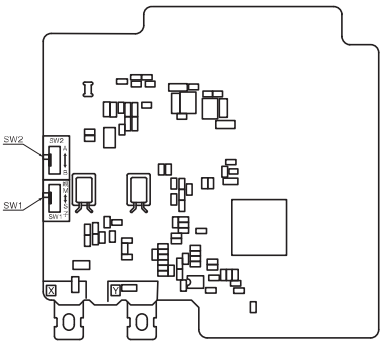
### (3) Power failure compensation function (Electric power source failure)

- 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.

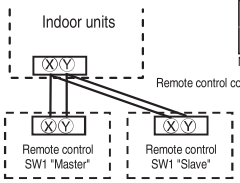
  (a) At power failure – Operating/stopped
  If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)
 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

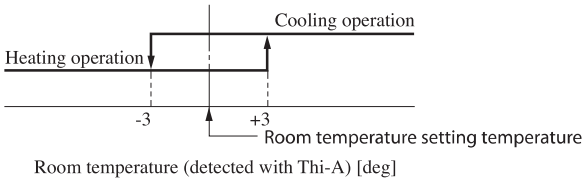
When using multiple remote controls, the following dispiays or settings cannot be done with the slave remote control. It is available only with the master remote control.

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

## 1.2.3 Operation control function by the indoor control

### (1) Auto operation

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

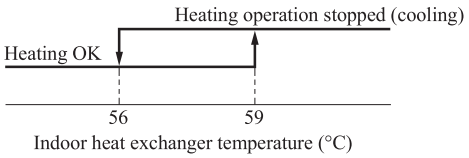



Room temperature (detected with Thi-A) [deg]

Notes (1) Temperature range of switching cooling/heating mode can be changed by RC-EX3 from ±1.0 – ±4.0.

(2) Room temperature control during auto cooling/auto heating is performed according to the room temperature setting temperature. (DIFF: ±1 deg)

(3) If the indoor heat exchanger temperature rises to 59°C or higher during heating operation, it is switched automatically to cooling operation. In addition, for 1 hour after this switching, the heating operation is not performed, regardless of the temperature shown at right.




(b) The following automatic controls are performed other than (a) above.

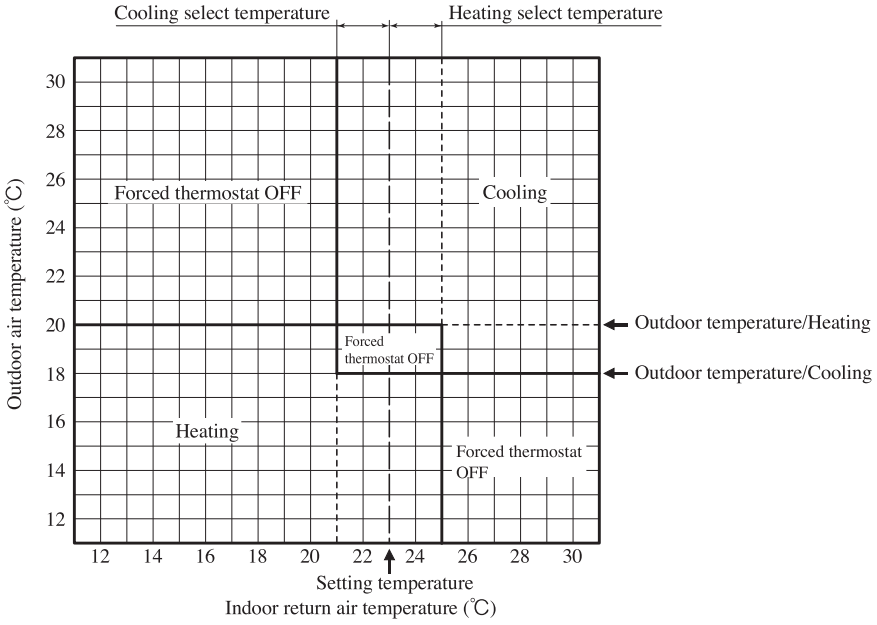
(i) Cooling or heating operation mode is judged according to the conditions of the "Judgment based on Setting temperature + Cooling select temperature and Indoor return air temperature" and the "Judgment based on Outdoor temperature".

1) In "Setting temperature - Cooling select temperature < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor return air temperature" ⇒ Operation mode: Cooling

2) "Setting temperature + Heating select temperature > Indoor return air temperature" and "Outdoor temperature/ Heating > Outdoor air temperature" ⇒ Operation mode: Heating

3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.

4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



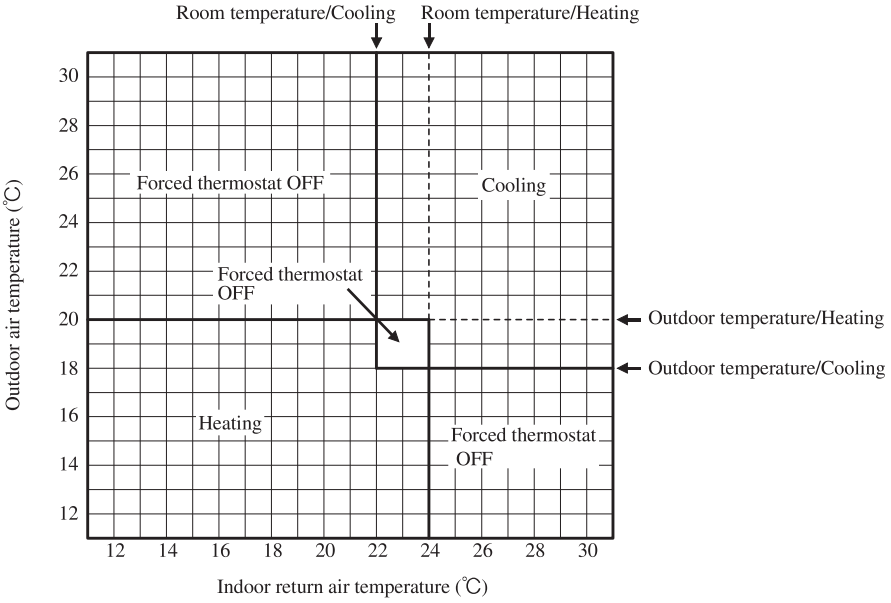
(ii) Regardless of the setting temperature, the cooling or heating operation mode is judged according to the "Judgment based on Room temperature/Cooling or Heating and Outdoor temperature/Cooling or Heating".

1) In case of "Room temperature/Cooling < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor air temperature" ⇒ Operation mode: Cooling

2) In case of "Room temperature/Heating > Indoor return air temperature" and "Outdoor temperature /Heating > Outdoor air temperature" ⇒ Operation mode: Heating

3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.

4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF




### (2) Operations of functional items during cooling/heating

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

Notes (1) ○: Operation ×: Stop ○/×: Turned ON/OFF by the control other than the room temperature control.
(2) ON during the drain pump motor delay control.
(3) Drain pump ON setting may be selected with the indoor unit function setting of the wired remote control.

### (3) Dehumidifying (DRY) operation

Indoor ambient temperatures and humidity are controlled simultaneously with the relative humidity sensor (HS) and the suction temperature sensor [Thi-A (or the remote control sensor when it is activated)], which are installed at the suction inlet.

(i) When the operation has been started with cooling, if there is a difference of 2°C or less between the suction and setting temperatures, the tap of indoor fan is lowered by one tap. This tap is retained for 3 minutes after changing the tap.

(ii) After the above condition, when a difference between suction and setting temperature is lower than 3°C, and the relative humidity is high, the tap of indoor unit fan is lowered by one tap.
When the difference between suction and setting temperature is larger than 3°C, the fan of indoor unit fan is raised by one tap. This tap is retained for 3 minutes after changing the tap.

(iii) When relative humidity becomes lower, the indoor unit fan tap is retained.

(iv) In case of the thermostat OFF, the indoor unit fan tap at the thermostat ON is retained.

### (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 activated only once or at every time. It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

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

(v) Set OFF timer by clock

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

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

(vi) Weekly timer

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

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

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

| | Sleep time | Set OFF timer by hour | Set ON timer by hour | Set OFF timer by clock | Set ON timer by clock | Weekly timer |
|---|---|---|---|---|---|---|
| Sleep time | | × | × | ○ | ○ | ○ |
| Set OFF timer by hour | × | | × | × | × | × |
| Set ON timer by hour | × | × | | × | × | × |
| Set OFF timer by clock | ○ | × | × | | ○ | × |
| Set ON timer by clock | ○ | × | × | ○ | | × |
| Weekly timer | ○ | × | × | × | × | |

Notes (1) ○: 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. Indoor temperature can be set simultaneously.

(iv) Weekly timer

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

(v) Timer operations which can be set in combination

| Item / Item | Timer | OFF timer | ON timer | Weekly timer |
|---|---|---|---|---|
| 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) Hot start (Cold draft prevention at heating)**

**(a) Operating conditions**

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

(i) From stop to heating operation

(ii) From cooling to heating operation

(iii) Form heating thermostat OFF to ON

(iv) After completing the defrost operation (only on units with thermostat ON)

**(b) Contents of operation**

(i) Indoor fan motor control at hot start

1) Within 7 minutes after starting heating operation, the fan mode is determined depending on the condition of thermostat (fan control with heating thermostat OFF).

a) Thermostat OFF

i) Operates according to the fan control setting at heating thermostat OFF.

ii) Even if it changes from thermostat OFF to ON, the fan continues to operate with the fan control at thermostat OFF till the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher.

iii) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set air flow volume.

b) Thermostat ON

i) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 25°C or lower, the fan is turned OFF and does not operate.

ii) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 25°C or higher, the fan operates with the fan control at heating thermostat OFF.

iii) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set air flow volume.

c) If the fan control at heating thermostat OFF is set at the "Set air flow volume" (from the remote control), the fan operates with the set air flow volume regardless of the thermostat ON/OFF.

2) Once the fan motor is changed from OFF to ON during the thermostat ON, the indoor fan motor is not turned OFF even if the heat exchanger temperature sensor detects lower than 25°C.

Note (1) When the defrost control signal is received, it complies with the fan control during defrost operation.

3) Once the hot start is completed, it will not restart even if the temperature on the heat exchanger temperature sensor drops.

(ii) During the hot start, the louver is kept at the horizontal position.

(iii) When the fan motor is turned OFF for 7 minutes continuously after defrost operation, the fan motor is turned ON regardless of the temperatures detected with the indoor heat exchanger temperature sensors (Thi-R1, R2).

**(c) Ending condition**

(i) If one of following conditions is satisfied during the hot start control, this control is terminated, and the fan is operated with the set air flow volume.

1) Heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher.

2) It has elapsed 7 minutes after starting the hot start control.

**(6) Hot keep**

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

(a) Control

(i) When the indoor heat exchanger temperature (detected with Thi-R1 or R2) drops to less than 35°C, the speed of indoor fan follows fan setting at the time of thermostat OFF.

(ii) During the hot keep, the louver is kept at the horizontal position.

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

**(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 seconds. 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.

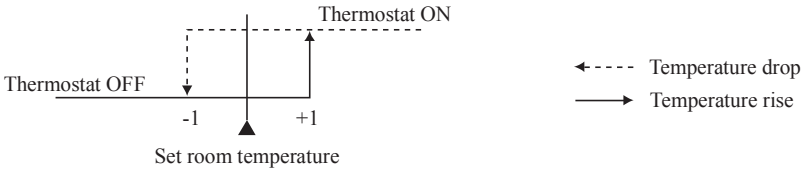
Note (1) When the indoor function of wired remote control "POSITION" has been switched, switch also the remote control function "POSITION" in the same way.

### (8) Thermostat operation

#### (a) Cooling

(i) Thermostat is operated with the room temperature control.

(ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.

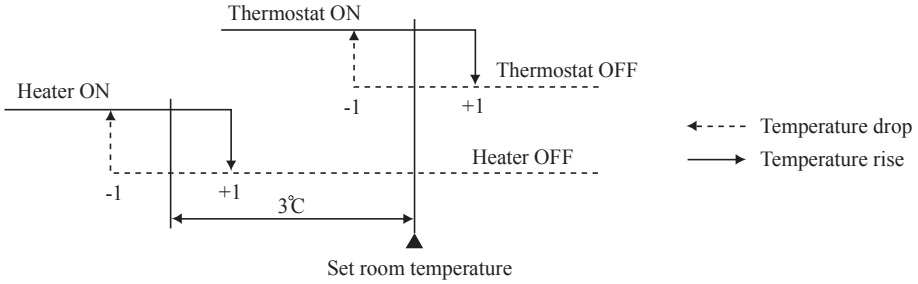



(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set temperature < +1 at the start of cooling operation (including from heating to cooling).

#### (b) Heating

(i) Thermostat is operated with the room temperature control.

(ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.




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

#### (c) Fan control during heating thermostat OFF

(i) Following fan controls during the heating thermostat OFF can be selected with the indoor function setting of the wired remote control.

① Low fan speed (Factory default), ② Set fan speed, ③ Intermittence, ④ Fan OFF

(ii) When the "Low fan speed (Factory default)" is selected, the following taps are used for the indoor fans.

・For DC motor : ULo tap

(iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.

(iv) If the "Intermittence" is selected, following controls are performed:

1) If the thermostat is turned OFF during the heating operation, the indoor unit moves to the hot control and turns OFF the indoor fan if the heat exchanger temperature sensors (both Thi-R1 and R2) detect 25°C or lower.
2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.
3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.
4) If the thermostat is turned ON, it moves to the hot start control.
5) When the heating thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
   The remote control uses the operation data display function to display temperatures and updates values of temperature even when the indoor fan is turned OFF.
6) When the defrost operation starts while the heating thermostat is turned OFF or the thermostat is turned OFF during defrost operation, the indoor fan is turned OFF. (Hot keep or hot start control takes priority.) However, the suction temperature is updated at every 7-minute.
7) When the heating thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.

(v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

**(d) Fan control during cooling thermostat OFF**

(i) Following fan controls during the cooling thermostat OFF can be selected with the indoor function setting of the wired remote control.

① Low fan speed, ② Set fan speed (Factory default), ③ Intermittence, ④ Fan OFF

(ii) When the "Low fan speed" is selected, the following taps are used for the indoor fans.

・For DC motor : ULo tap

(iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.

(iv) If the "Intermittence" is selected, following controls are performed:

1) If the thermostat is turned OFF during the cooling operation, the indoor unit fan motor stope.
2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.
3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.
4) If the thermostat is turned ON, the fan starts operation at set fan speed.
5) When the cooling thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.

By using operation data display function at wireless remote control, the tempenature as displayad and the value is updated including the fan stops.

6) When the cooling thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.

(v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

**(9) 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". (It is set at setting 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.

**(10) Compressor inching prevention control**

**(a) 3-minute timer**

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

**(b) 3-minute forced operation timer**

(i) Compressor will not stop for 3 minutes after the compressor ON. However, it stops immediately when the unit is stopped by means of the ON/OFF switch or by when the thermostat turned OFF the change of operation mode.

(ii) If the thermostat is turned OFF during the forced operation control of heating compressor, the louver position (with the auto swing) is returned to the level position.

Note (1) The compressor stops when it has entered the protective control.

### (11) Drain pump control

(a) This control is operated when the inverter frequency is other than 0 Hz during the cooling operation and automatic cooling and dehumidifying operations.

(b) Drain pump ON condition continues for 5 minutes even when it enters the OFF range according to (i) above after turning the drain pump ON, and then stops. The 5-minute delay continues also in the event of anomalous stop.

(c) The drain pump is operated with the 5-minute delay operation when the compressor is changed from ON to OFF.

(d) Even in conditions other than the above (such as heating, fan, stop, cooling thermostat OFF), the drain pump control is performed by the drain detection.

(e) Following settings can be made using the indoor function setting of the wired remote control.

(i) ❄◇〔Standard (in cooling & dry)〕: Drain pump is run during cooling and dry.

(ii) ❄◇AND☼〔Operate in standard & heating〕: Drain pump is run during cooling, dry and heating.

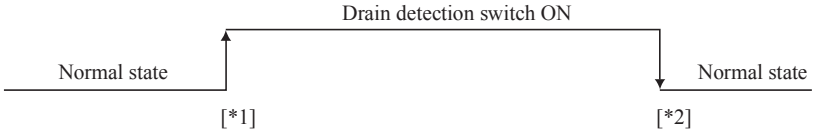
(iii) ❄◇AND☼AND≡〔Operate in heating & fan〕: Drain pump is run during cooling, dry, heating and fan.

(iv) ❄◇AND≡〔Operate in standard & fan〕: Drain pump is run during cooling, dry and fan.

Note (1) Values in〔 〕are for the RC-EX3A model.

### (12) Drain pump motor (DM) control

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




[＊1] Drain detection switch is turned “ON” when the float switch “Open” is detected for 3 seconds continuously in the drain detectable space.

[＊2] Drain detection switch is turned “OFF” when the float switch “Close” is detected for 10 seconds continuously.

(i) It detects always from 30 seconds after turning the power ON.

1) There is no detection of anomalous draining for 10 seconds after turning the drain pump OFF.

2) Turning the drain detection switch “ON” causes to turn ON the drain pump forcibly.

3) Turning the drain detection switch “OFF” releases the forced drain pump ON condition.

(b) Indoor unit performs the control A or B depending on each operating condition.

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

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

(i) Control A

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

2) It keeps operating while the float switch is detecting the anomalous condition.

(ii) Control B

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

### (13) Operation check/drain pump test run operation mode

(a) If the power is turned on by the DIP switch (SW7-1) on the indoor unit control PCB when electric power source is supplied, it enters the mode of operation check/drain pump test run. It is ineffective (prohibited) to change the switch after turning power on.

(b) When the communication with the remote control has been established within 60 seconds after turning power on by the DIP switch (SW7-1) ON, it enters the operation check mode. Unless the remote control communication is established, it enters the drain pump test run mode.

Note (1) To select the drain pump test run mode, disconnect the remote control connector (CNB) on the indoor PCB to shut down the remote control communication.

(c) Operation check mode

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

(d) Drain pump test run mode

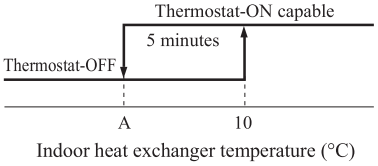
As the drain pump test run is established, the drain pump only operates and during the operation protective functions by the microcomputer of indoor unit become ineffective.

### (14) Cooling, dehumidifying frost protection

(a) To prevent frosting during cooling mode or dehumidifying mode operation, the thermostat-OFF if the indoor heat exchanger temperature (detected with Thi-R) drops to 1.0 °C or lower at 4 minutes after the thermostat-ON. If the indoor unit heat exchanger temperature is 1.0 °C or lower after 5 minutes, the indoor unit is controlled thermostat-OFF. If it becomes 10°C or higher, the control terminates. When the indoor heat exchanger temperature has become as show, the indoor unit send outdoor unit the "Anti-frost" signal.

• Frost prevention temperature setting can be selected with the indoor unit function setting of the wired remote control.

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




(b) Selection of indoor fan speed

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

(i) When the indoor return air detection temperature (detected with Thi-A) is 23°C or higher and the indoor heat exchanger temperature (detected with Thi-R) detects the compressor frequency drop start temperature A°C+1°C, of indoor fan speed is increased by 20min$^{-1}$.

(ii) If the phenomenon of (i) above is detected again after the acceleration of indoor fan, indoor fan speed is increased further by 20min$^{-1}$.

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

• Compressor frequency drop start temperature (FDTC only)

Hs > 50%

| Symbol \ Item | Low | High |
|---|---|---|
| A | 1.0 | 2.5 |
| B | 2.5 | 4.0 |

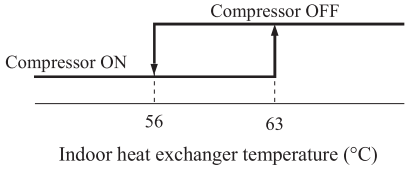
Hs ≦ 50%

| Symbol \ Item | Low | High |
|---|---|---|
| A | -0.5 | 1.0 |
| B | 1.0 | 2.5 |

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

### (15) Heating overload protection

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




(b) Indoor unit fan speed selection

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

### (16) Anomalous fan motor

(a) After starting the fan motor, if the fan motor speed is 200min$^{-1}$ or less is detected for 30 seconds continuously and 4 times within 60 minutes, then fan motor stops with the anomalous stop (E16).

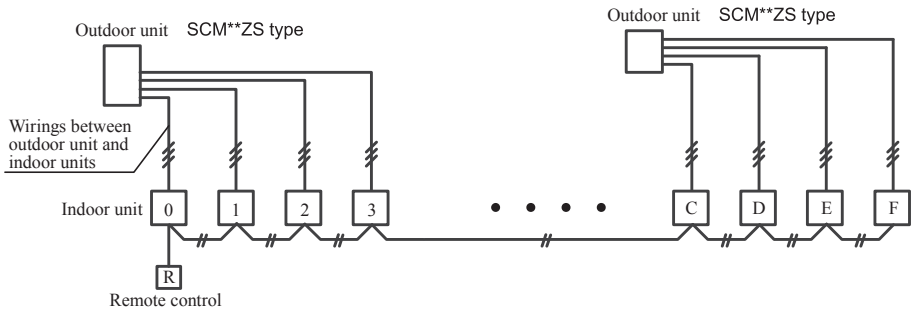
(b) If the fan motor fails to reach at -50min$^{-1}$ less than the required speed, it stops with the anomalous stop (E20).

### (17) 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 can operate or stop all units in the group one after another in the order of unit. No.(1). Thermostat and protective function of each unit function independently.

Note (1) Unit No. is set by SW2 on the indoor unit control PCB. Unit No. setting by SW2 is necessary for the indoor unit only.
SW2: For setting of 0 – 9, A – F




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

#### (b) Display to the remote control

(i) 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.

#### (c) Confirmation of connected units

(i) 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.

(ii) 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.

#### (d) 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.

#### (e) 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 the remote control wiring to each indoor unit via terminal block for the remote control.

Connect the remote control wiring separately from the power source cable or wires of other electric devices (AC220V or higher).

### (18) High ceiling control

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

| Fan tap | | Indoor unit air flow setting | | | | |
|---|---|---|---|---|---|---|
| | | - - - - | - - - | - - | - - | - |
| FAN SPEED SET | STANDARD | P-Hi - Hi - Me- Lo | Hi - Me - Lo | Hi - Lo | Hi - Me | |
| | HIGH SPEED1, 2 | P-Hi - P-Hi - Hi - Me | P-Hi - Hi - Me | P-Hi - Me | P-Hi - Hi | |

Notes (1) Factory default is STANDARD.
(2) At the hot-start and heating thermostat OFF, or other, the indoor unit fan is operated at the low speed tap of each setting.
(3) This function is not able to be set with wireless remote controls or simple remote control (RCH-E3)

### (19) Abnormal temperature sensor (return air/indoor heat exchanger) broken wire/short-circuit detection

#### (a) Broken wire detection

When the return air temperature sensor detects -55°C or lower or the heat exchanger temperature sensor detect -55°C or lower for 5 seconds continuously, the compressor stops. After a 3-minute delay, the compressor restarts but, if it is detected again within 60 minutes after the initial detection for 6 minutes continuously, stops again (the return air temperature sensor: E7, the heat exchanger temperature sensor: E6).

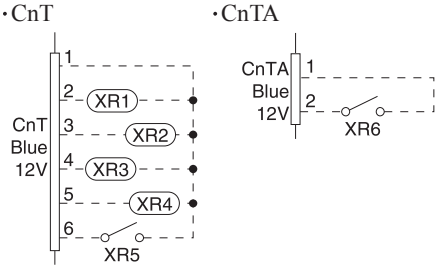
#### (b) Short-circuit detection

If the heat exchanger temperature sensor detects short-circuit for 5 seconds continuously at 2 minutes and 20 seconds after the compressor ON during cooling operation, the compressor stops (E6).

### (20) External input/output control (CnT or CnTA)

External input/output connectors are provided on the indoor unit control PCB, and each input/output is possible to be changed by RC-EX3A.

Be sure to connect the wired remote control to the indoor unit. Remote operation with CnT/CnTA only is not possible.




| Input/Output | Connector | Factory default setting | RC-EX3A function name |
|---|---|---|---|
| Output | CnT-2 (XR1) | Operation output | External output 1 |
| | CnT-3 (XR2) | Heating output | External output 2 |
| | CnT-4 (XR3) | Compressor ON output | External output 3 |
| | CnT-5 (XR4) | Inspection(Error) output | External output 4 |
| "Input | CnT-6 (XR5) | Remote operation input | External input 1 |
| (Volt-free contact)" | CnTA (XR6) | Remote operation input | External input 2 |

■ Priority order for combinations of CnT and CnTA input.

| | | CnTA | | | | | |
|---|---|---|---|---|---|---|---|
| | | ① Operation stop level | ② Operation stop pulse | ③ Operation permission/prohibition | ④ Operation permission/prohibition pulse | ⑤ Cooling/heating selection level | ⑥ Cooling/heating selection pulse |
| CnT | ① Operation stop level | CnT ① | CnT ① | CnT ① +CnTA ② | CnT ① | CnT ① /CnTA ⑤ | CnT ① /CnTA ⑥ |
| | ② Operation stop pulse | CnT ② | CnT ② | CnT ② +CnTA ③ | CnT ② | CnT ② /CnTA ⑤ | CnT ② /CnTA ⑥ |
| | ③ Operation permission/prohibition level | CnT ③ >CnTA ① | CnT ③ >CnTA ② | CnT ③ +CnTA ③ | CnT ③ | CnT ③ /CnTA ⑤ | CnT ③ /CnTA ⑥ |
| | ④ Operation permission/prohibition pulse | CnT ④ | CnT ④ | CnT ④ +CnTA ③※ | CnT ④ | CnT ④ /CnTA ⑤ | CnT ④ /CnTA ⑥ |
| | ⑤ Cooling/heating selection level | CnT ⑤ /CnTA ① | CnT ⑤ /CnTA ② | CnT ⑤ /CnTA ③ | CnT ⑤ /CnTA ④ | CnT ⑤ | CnT ⑤ |
| | ⑥ Cooling/heating selection pulse | CnT ⑥ /CnTA ① | CnT ⑥ /CnTA ② | CnT ⑥ /CnTA ③ | CnT ⑥ /CnTA ④ | CnT ⑥ | CnT ⑥ |

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

Individual operation command from remote control, test run command from outdoor unit and operation command from option device, CnT input.

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

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

(The "Number" above means ① - ⑥ in the table.)

#### (a) Output for external control (remote display)

Indoor unit outputs the following signal for operation status monitoring.

| | Output name | Condition |
|---|---|---|
| 1 | Operation output | During operation |
| 2 | Heating output | During heating operation |
| 3 | Compressor ON output | During compressor operation |
| 4 | Inspection(Error) output | When anomalous condition occurs. |
| 5 | Cooling output | During cooling operation |
| 6 | Fan operation output 1 | When indoor unit's fan is operating |
| 7 | Fan operation output 2 | When indoor unit's fan is operating, and fan speed is higher than Hi speed. |
| 8 | Fan operation output 3 | When indoor unit's fan is operating, and fan speed is Lower than Me speed. |
| 9 | Defrost/oil return output | When indoor unit receive defrost/oil return signal from the outdoor unit. |
| 10 | Ventilation output | When "Venti.ON" is selected from remote control |
| 11 | Free cooling output | When the ambient temperature is between 10 - 18°C in cooling and fan operation |
| 12 | Indoor unit overload alrm output | Refer to "IU overload alarm" |
| 13 | Heater output | Refer to "(8) Thermostat operation (b) Heating" |

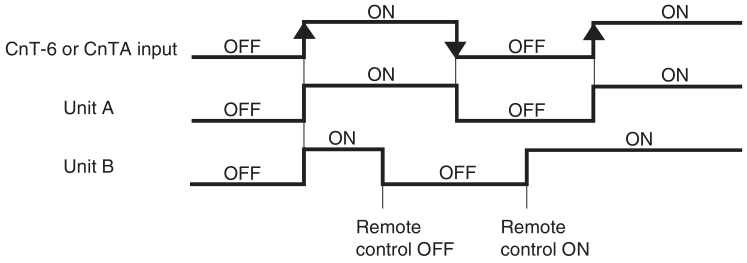
**(b) Input for external control**

The external input for the indoor unit can be selected from the following input.

| | Input name | Content |
|---|---|---|
| 1 | Run/Stop | Refer to [(20) (c) Remote operation input] |
| 2 | Premission/Prohibition | Refer to [(21) Operation permission/prohibition] |
| 3 | Cooling/Heating | Refer to [(23) Selection of cooling/heating external input function] |
| 4 | Emergency stop | Indoor/outdoor units stop the operation, and [E63] is displayed. |
| 5 | Setting temperature shift | Set temperature is shifted by +2/-2°C in cooling/heating. |
| 6 | Forced thermo-OFF | Unit goes thermo off. |
| 7 | Temporary stop | Refer to [(22) Temporary stop input] |
| 8 | Silent mode | Outdoor unit silent mode is activated. |

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

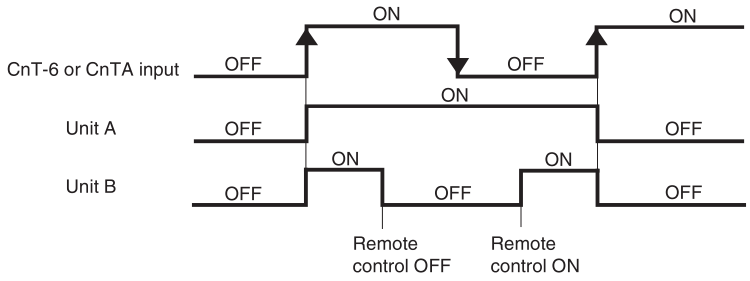
Input signal to CnT-6 or CnTA is OFF→ON …… unit ON
Input signal to CnT-6 or CnTA is ON→OFF …… unit OFF
Operation is not inverted.




Note (1) The latest operation has priority.
It is available to operate/stop by remote control or central control.

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

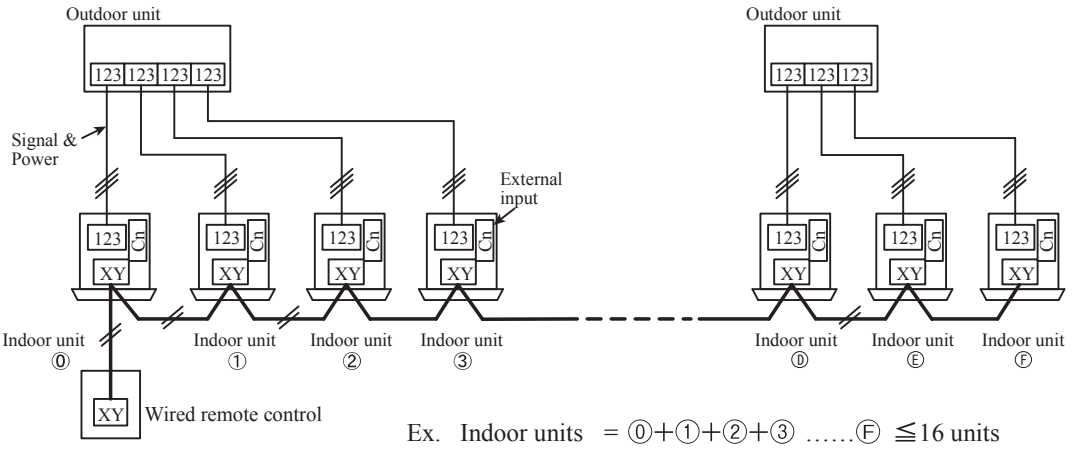
It is effective only when the input signal to CnT-6 or CnTA is changed OFF→ON, and at that time unit operation [ON/OFF] is inverted.




**(c) Remote operation**

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

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




Ex. Indoor units = ⓪+①+②+③ ……Ⓕ ≦16 units

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

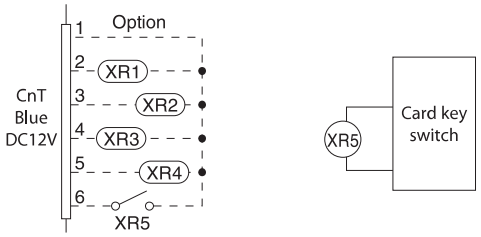
When more than one indoor unit (Max. 16 indoor units) are connected in one wired remote control system:
(1) With the factory default, external input to CnT-6 or CnTA is effective for only the unit ①.
(2) When setting "For all unit" (Local setting), all units in one remote control system can be controlled by external input to CnT-6 or CnTA on the indoor unit ①.
(3) External input to CnT-6 or CnTA on the other indoor unit than the unit ① is not effective.

**(21) Operation permission/prohibition**

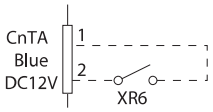
**(In case of adopting card key switches or commercially available timers)**

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

・CnT




・CnTA




Note (1) CnTA function can be changed by RC-EX3A.

| | Normal operation (Factory default) | | Operation permission/prohibition mode "Valid" (Local setting) | |
|---|---|---|---|---|
| CnT-6 or CnTA | ON | OFF | ON | OFF |
| | Operation | Stop | Operation permission*1 | Operation prohibition (Unit stops) |

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

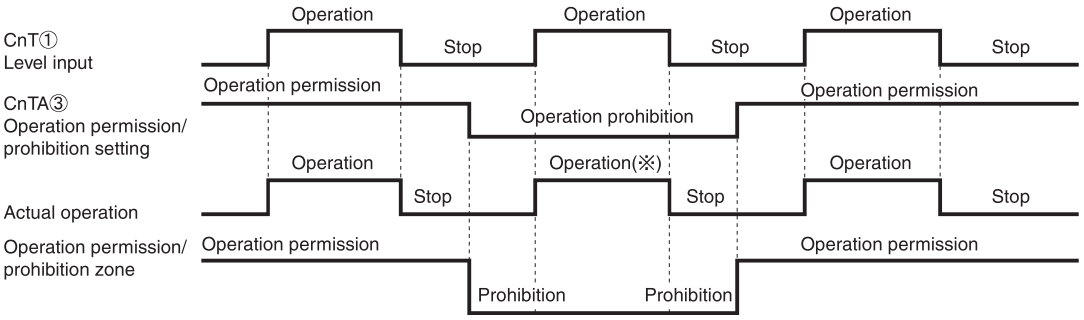
| In case of "Level input" setting | In case of "Pulse input" setting |
|---|---|
| Unit operation from the wired remote control becomes available*(1) | Unit starts operation *(2) |

*(1) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Level input (Factory default)";
① When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
② When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes unavailable.

*(2) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Pulse input (Local setting)";
① When card key switch is ON (Operation permission), the unit starts operation in conjunction with ON signal, and also start/stop operation of the unit from the wired remote control becomes available.
② When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes unavailable.

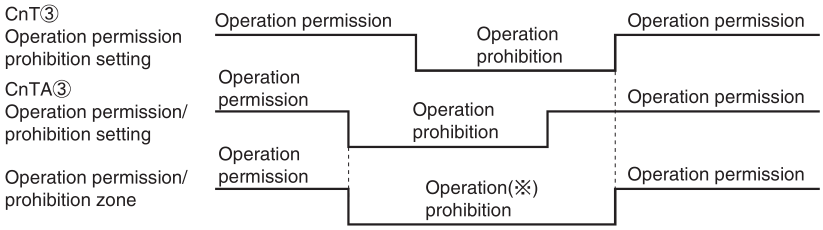
(3) This function is invalid only at "Center mode" setting done by central control.

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



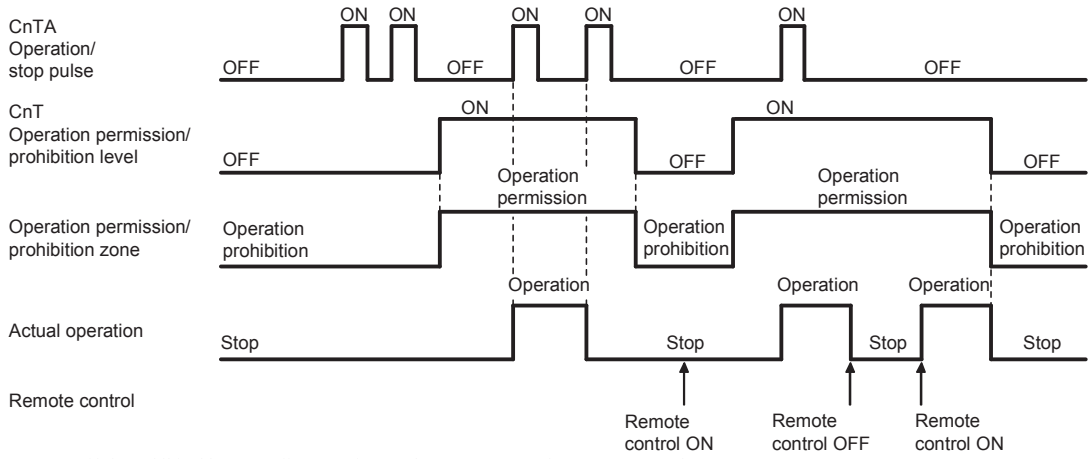

(※) CnT level input supersedes CnTA operation prohibition.

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



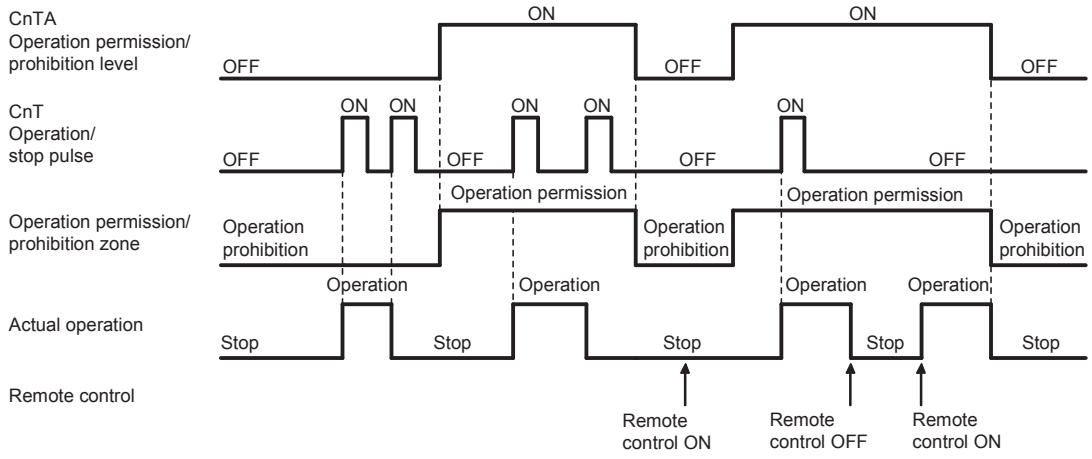

(※) Operation prohibition zone is determined by the OR judgment between CnT operation prohibition zone and CnTA operation prohibition zone.

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




Note (1) If it is prohibited by CnT, all "Operation" and "Stop" commands are not accepted.

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

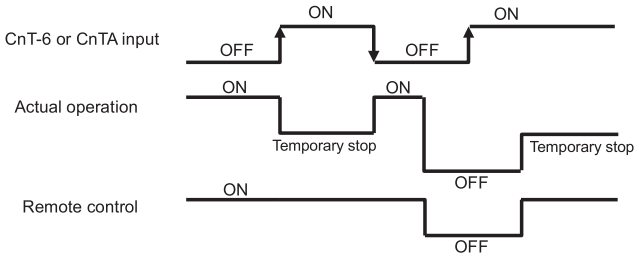


### (22) Temporary stop input

In case of temporary stop, operation lamp of remote control lights, but indoor/outdoor unit stop the operation.

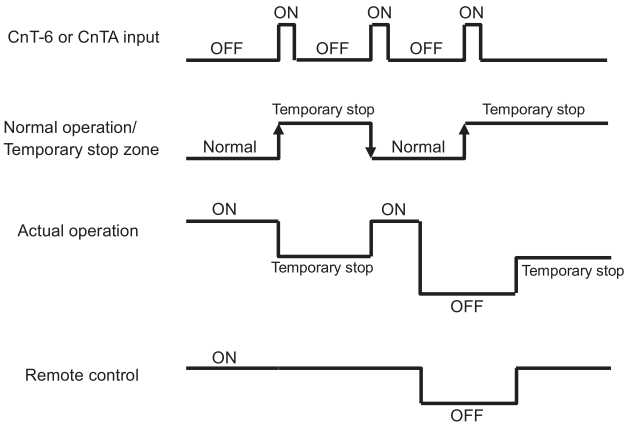
#### (a) In case of "level input" setting (Factory default)

Input signal to CnT-6 or CnTA is OFF → ON : Temporary stop
Input signal to CnT-6 or CnTA is OFF → ON : Normal operation




#### (b) In case of "pulse input" setting (Local setting)

It is effective only when the input signal is changed OFF→ON, and "temporary stop/normal operation" is inverted.




### (23) Selection of cooling/heating external input function

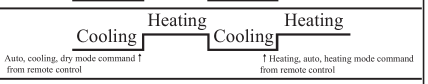
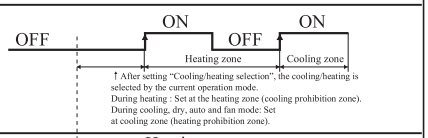
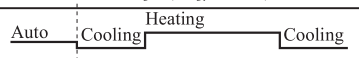
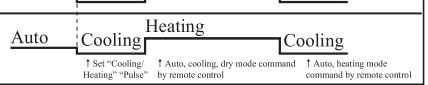
(a) When "External input 1 setting: Cooling/heating" is set by the indoor unit function from remote control, the cooling or heating is selected with CnT-6 or CnTA.

(b) When the external input 1 method selection: Level input is set by the indoor unit function:
- CnT-6 or CnTA: OPEN → Cooling operation mode
- CnT-6 or CnTA: CLOSE → Heating operation mode

(c) When the external input 1 method selection: Pulse input is set by the indoor unit function:
If the external input is changed OPEN → CLOSE, operation modes are inverted (Cooling → Heating or Heating → Cooling).

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

■ Selection of cooling/heating external input function

| External input selection | External input method | Operation | |
|---|---|---|---|
| External input selection Cooling/heating selection | ⑤ Level | External terminal input (CnT or CnTA) |   |
| | | Cooling/heating |   |
| | | Cooling/heating (Competitive) |   |
| | ⑥ Pulse | External terminal input (CnT or CnTA) |   |
| | | Cooling/heating |   |
| | | Cooling/heating (Competitive) |   |

Note (1) Regarding the priority order for combinations of CnT and CnTA, refer to Page 56.

### (24) Fan control at heating startup

#### (a) Starting conditions

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

#### (b) Contents of control

(i) Sampling is made at each minute and, when the indoor heat exchanger temperature (detected with Thi-R) is 37°C or higher, present number of revolutions of indoor fan speed is increased by $10min^{-1}$.

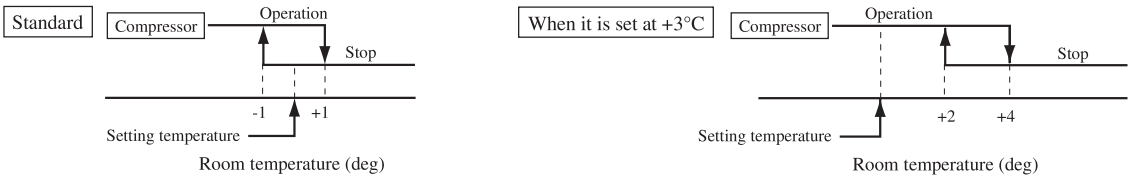
(ii) If the indoor heat exchanger temperature drops below 37°C at next sampling, present number of revolutions of indoor fan speed is reduced by $10min^{-1}$.

#### (c) Ending conditions

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

### (25) Room temperature detection temperature compensation during heating

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




### (26) Return air temperature compensation

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

(a) It is adjustable in the unit of 0.5°C with the wired remote control indoor unit function "RETURN AIR TEMP".

• +1.0°C, +1.5°C, +2.0°C • -1.0°C, -1.5°C, -2.0°C

(b) Compensated temperature is transmitted to the remote control and the compressor to control them.

Note (1) The detection temperature compensation is effective on the indoor unit temperature sensor only.

### (27) High power operation (RC-EX3A only)

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

### (28) Energy-saving operation (RC-EX3A only)

It operates with the setting temperature fixed at 28°C for cooling, 22°C for heating or 25°C for auto. When fan control in cooling/heating thermo-OFF setting is "Set fan speed", fan speed during thermo-OFF is changed to "Low". (Maximum capacity is restricted at 80%.)

### (29) Warm-up control (RC-EX3A only)

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

### (30) Home leave mode (RC-EX3A only)

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

(a) Cooling or heating is operated according to the outdoor temperature (factory setting 35°C for cooling, 0°C for heating) and the setting temperature. (factory setting 33°C for cooling, 10°C for heating)

(b) Setting temperature and indoor fan speed can be set by RC-EX3A.

### (31) Auto temperature setting (RC-EX3A only)

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

**(32) Fan circulator operation (RC-EX3A only)**

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

(a) If the invalid is selected with the remote control, the fan is operated continuously during the fan operation. (normal fan mode)

(b) If the valid is selected with the remote control, the fan is operated or stopped when on the difference of the remote control temperature sensor and the return air temperature sensor becomes bigger than 3°C.

**(33) The operation judgment is executed every 5 minutes (RC-EX3A only)**

Setting temperature Ts is changed according to outdoor temperature.

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

(a) Operate 5 minutes forcedly.

(b) Setting temperature is adjusted every 10 minutes.

(i) Cooling mode.
Ts = outdoor temperature − offset value

(ii) Heating mode.
Ts = outdoor temperature − offset value

(c) If the return air temperature lower than 18°C in cooling or return air temperature becomes higher than 25°C in heating, unit goes thermostat OFF.

**(34) Auto fan speed control (RC-EX3A only)**

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

・Auto 1: Changes the indoor fan tap within the range of Hi ↔ Me ↔ Lo.

・Auto 2: Changes the indoor fan tap within the range of P-Hi ↔ Hi ↔ Me ↔ Lo.

**(35) Indoor unit overload alarm (RC-EX3A only)**

If the following condition is satisfied at 30 minutes after starting operation, RC-EX3A shows maintenance code "M07" and the signal is transmitted to the external output (CnT-2-5).

・Cooling, Dry, Auto(Cooling) : Indoor air temperature = Set room temperature by remote control + Alarm temperature difference

・Heating, Auto(Heating) : Indoor air temperature = Set room temperature by remote control - Alarm temperature difference

Alarm temperature difference is selectable between 5 to 10°C.

If the following condition is satisfied or unit is stopped, the signal is disappeared.

・Cooling, Dry, Auto(Cooling) : Indoor air temperature = Set room temperature + Alarm temperature difference -2°C

・Heating, Auto(Heating) : Indoor air temperature = Set room temperature - Alarm temperature difference +2°C

**(36) Peak-cut timer (RC-EX3A only)**

Power consumption can be reduced by restricting the maximum capacity.

Set the [Start time], the [End time] and the capacity limit % (Peak-cut %).

・4-operation patterns per day can be set at maximum.

・The setting time can be changed by 5-minutes interval.

・The selectable range of capacity limit % (Peak-cut %) is from 0% to 40-80% (20% interval).

・Holiday setting is available.

### (37) Motion sensor control (RC-EX3A only)

The sensor determines the presence of people and the amount of activity, and the following controls are done by the motion sensor.

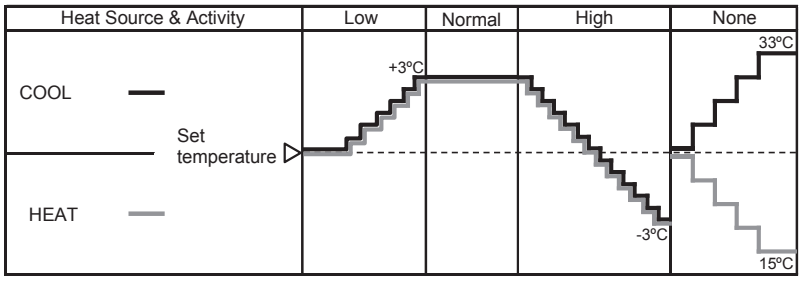
Following settings are necessary to activate motion sensor control.

(a) Infrared (motion) sensor setting: Installation setting of remote control
The indoor unit which is set to "Enable" become valid.

(b) Infrared (motion) sensor control: Energy-saving setting of remote control
The function which is set to "Enable" become valid.

(i) Power saving / comfort control
The set temperature is adjusted according to the presence of people and their amount of activity detected by the infrared (motion) sensor.

MODE:AUTO/COOL/HEAT mode operation




| | |
|---|---|
| **Low** | **When the extent of human activity is low** |
| **High** | **When the extent of human activity is high** |
| **None** | **When there is no one in the room** |

- When the "None" continues for 1 hour, the FAN SPEED is set Lo.

Notes (1) When the following operations are set, power saving control will be canceled.
① Energy-saving, Home leave mode, Warm-up control, Cooling operation check.
② When the operation mode is changed DRY or FAN.
(2) Not operable while the air-conditioner is OFF.

(ii) Auto-off control
When no activity is detected for 1 hour, unit will go stand-by mode.※ Unit will re-start operation automatically with the original set temperature by activity detection during the stand-by mode. When stand-by mode continues for 12 hours, unit stops.

※Compressor keeps stopped regardless of the set temperature.

# 1.3 Outdoor units

## 1.3.1 Outline of heating operation

### (1) Summary

#### (a) Capacity control

| Model | SCM40ZS-W | SCM45ZS-W |
|---|---|---|
| Capacity | 1.0 – 6.3 kW | 1.0 – 6.5 kW |

Capacity control is within the range shown above. If demand capacity of the indoor units exceeds the maximum capacity of the outdoor unit, the demand capacity will be proportionally distributed.

#### (b) Outdoor compressor speed control

| Indoor compressor total speed value | Decision speed |
|---|---|
| 0 rps | 0 rps |
| A rps or less | A rps |
| More than A rps, but B rps or less | A rps to B rps |
| More than B rps | B rps |

● Values of A, B

| Item \ Model | SCM40ZS-W | SCM45ZS-W |
|---|---|---|
| A | 20 rps | 20 rps |
| B | 120 rps | 120 rps |

### (2) Operation of major functional components in heating mode

| Functional components \ Operation | | Heating | Thermostat OFF (All indoor units) | Thermostat OFF (Some of indoor units) | Fan, stop, abnormal stop (Some of indoor units) | Failure (Outdoor unit) |
|---|---|---|---|---|---|---|
| Compressor speed | | Multi-operation rpm calculated based on the rpm required for each indoor unit | 0 (All indoor units) | 0 (Thermostat off units) | 0 (Fan, stop, abnormal stop units) | 0 (All units) |
| Indoor fan | Fixed | According to mode switching | Hot keep | According to mode switching | | Hot keep |
| | Automatic | According to command speed | Hot keep | According to command speed | | Hot keep |
| Outdoor fan | | According to outdoor fan speed | OFF | According to outdoor fan speed | | OFF |
| Electronic expansion valve | | According to decision speed | According to stop mode | According to heating stop unit control (Thermostat off units) | According to heating stop unit control (Fan, stop, abnormal stop units) | According to stop mode |
| Compressor | | ON | OFF | ON | ON | OFF |

### (3) 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 40 minutes. (Accumulated compressor operation time)

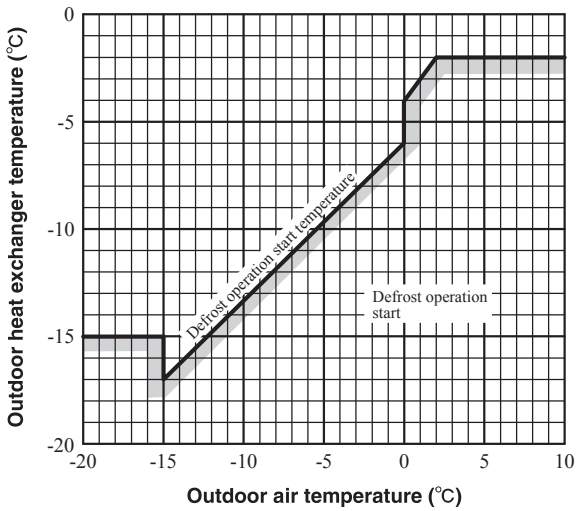
(ii) After finish of defrost operation

When it elapsed 40 minutes. (Accumulated compressor operation time)

(iii) Outdoor heat exchanger temperature (Tho-R)

When the temperature has been −2ºC or less for 3 minutes continuously.

(iv) The difference between the outdoor air sensor temperature (Tho-A) and outdoor heat exchanger sensor temperature (Tho-R) is as following.



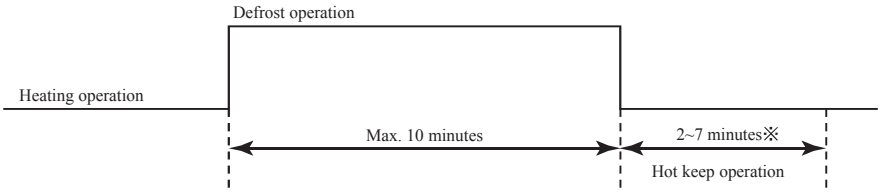

(v) During continuous compressor operation
In case satisfied all of following conditions.
- Connect compressor speed 0 rps 10 times or more.
- Satisfy i), ii) and iii) conditions above.
- Outdoor air temperature is 3°C or less.

**(b) Ending conditions**

Operation returns to the heating cycle when either one of the following conditions is satisfied.

(i) Outdoor heat exchanger sensor (Tho-R) temperature: 13°C or higher

(ii) Continued operation time of defrost → For more than 10 minutes




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

## 1.3.2 Outline of cooling operation

### (1) Summary

#### (a) Capacity control

**(i) Indoor unit SRK ** ZSX-W models only**

| Model | SCM40ZS-W | SCM45ZS-W |
|---|---|---|
| Capacity | 1.5 – 5.9 kW | 1.5 – 6.4 kW |

**(ii) Indoor unit except SRK ** ZSX-W models**

| Model | SCM40ZS-W | SCM45ZS-W |
|---|---|---|
| Capacity | 1.5 – 5.6 kW | 1.5 – 5.6 kW |

Capacity control is within the range shown above. If demand capacity of the indoor units exceeds the maximum capacity of the outdoor unit, the demand capacity will be proportionally distributed.

**(b) Outdoor compressor speed control**

| Indoor compressor total speed value | Decision speed |
|---|---|
| 0 rps | 0 rps |
| A rps or less | A rps |
| More than A rps, but B rps or less | A rps to B rps |
| More than B rps | B rps |

● Values of A, B

| Model | SCM40ZS-W | SCM45ZS-W |
|---|---|---|
| A | 20 rps | 20 rps |
| B | 100 rps | 120 rps |

**(2) Operation of major functional components in cooling mode**

| Functional components \ Operation | | Cooling | Thermostat OFF (All indoor units) | Thermostat OFF (Some of indoor units) | Fan, stop, abnormal stop (Some of indoor units) | Failure (Outdoor unit) |
|---|---|---|---|---|---|---|
| Compressor speed | | Multi-operation rpm calculated based on the rpm required for each indoor unit | 0 (All indoor units) | 0 (Thermostat off units) | 0 (Fan, stop, abnormal stop units) | 0 (All units) |
| Indoor fan | Fixed | According to mode switching | | | | |
| | Automatic | According to command speed | According to mode switching | According to command speed | | |
| Outdoor fan | | According to outdoor fan speed | OFF | According to outdoor fan speed | | OFF |
| Electronic expansion valve | | According to decision speed | According to stop mode | All closed (Thermostat off units) | All closed (Fan, stop, abnormal stop units) | According to stop mode |
| Compressor | | ON | OFF | ON | ON | OFF |

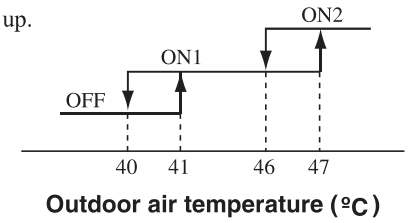
## 1.3.3 Protective control function

### (1) Cooling overload protective control

#### (a) Operating conditions

When the outdoor air temperature (Tho-A) has become continuously for 30 seconds at 41ºC or more, or 47ºC or more with the compressor running, the lower limit speed of compressor is brought up.

| Item \ Model | SCM40, 45ZS-W | |
|---|---|---|
| Outdoor air temperature | 41°C or more | 47°C or more |
| Lower limit speed | 30 rps | 40 rps |




#### (b) Detail of operation

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

#### (c) Reset conditions

When either of the following conditions is satisfied.

(i) The outdoor air temperature is lower than 40ºC.

(ii) The compressor speed is 0 rps.

### (2) Cooling high pressure control

#### (a) Purpose

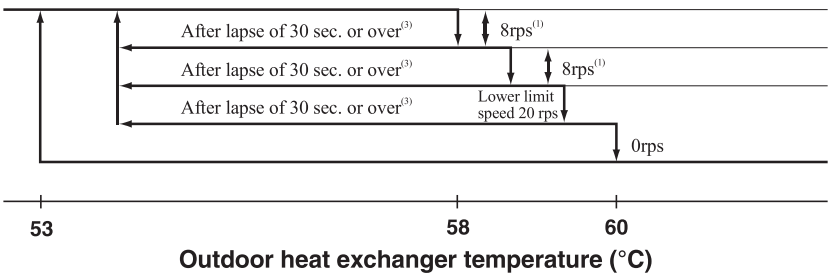
Prevents anomalous high pressure operation during cooling.

#### (b) Detector

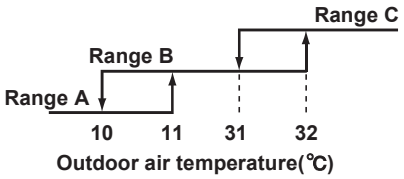
Outdoor heat exchanger sensor (Tho-R2).

#### (c) Detail of operation

(Example) Fuzzy



| | Tho-R2 (℃) | | |
|---|---|---|---|
| | P1 | P2 | P3 |
| Range A | 52 | 55 | 58 |
| Range B | 48 | 51 | 54 |
| Range C | 58 | 59.5 | 61 |




Notes (1) When the outdoor heat exchanger temperature is in the range of P2-P3℃, the speed is reduced by 8 rps at each 20 seconds.
(2) When the temperature is P3℃ or higher, the compressor is stopped.
(3) When the outdoor heat exchanger temperature is in the range of P1-P2℃, 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.

### (3) Cooling low outdoor temperature protective control

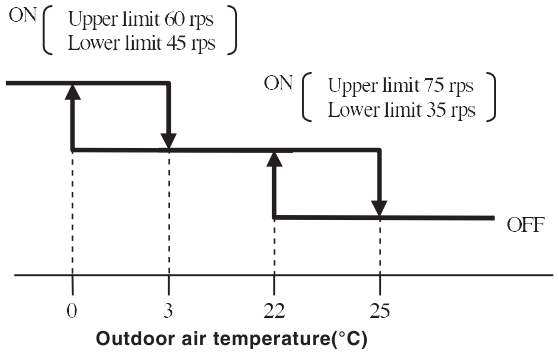
#### (a) Operating conditions

When the outdoor air temperature (Tho-A) is 22°C or lower continues for 20 seconds while compressor speed is other than 0 rps.

#### (b) Detail of operation

(i) The lower limit of compressor speed is set to 35 or 45 rps and even if the speed becomes lower than 35 or 45 rps, the speed is kept to 35 or 45 rps. However, when the thermostat OFF, the speed is reduced to 0 rps.

(ii) The upper limit of compressor speed is set to 75 or 60 rps, the speed is kept to 75 or 60 rps.




#### (c) Reset conditions

When the either of the following conditions is satisfied.

(i) When the outdoor air temperature (Tho-A) becomes 25°C or higher.

(ii) When the compressor speed is 0rps.

### (4) Heating high pressure control

#### (a) Starting condition

When the indoor heat exchanger temperature (Th2) has risen to a specified temperature while the compressor is turned on.

#### (b) Operating condition

Compressor speed (N) 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 < P4 | P4 ≦ Th2 |
|---|---|---|---|---|---|
| Compressor speed (N) | Normal | Retention | N–4rps | N–8rps | N = 0 |
| Sampling time (s) | – | 20 | 20 | 20 | – |

Unit: °C

| NP \ Th2 | P1 | P2 | P3 | P4 |
|---|---|---|---|---|
| 10 ≦ N < 115 | 45 | 52 | 56 | 61 |
| 115 ≦ N < 120 | 43 – 45 | 50 – 52 | 54 – 56 | 59 – 61 |
| 120 ≦ N | 43 | 50 | 54 | 59 |

### (5) Heating overload protective control

#### (a) Operating conditions

When the outdoor air temperature (Tho-A) is 10ºC or higher continues for 30 seconds while the compressor speed other than 0 rps.

#### (b) Detail of operation

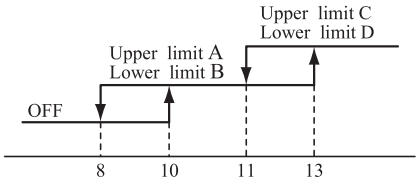
(i) Taking the upper limit of compressor speed range at A or C, if the output speed obtained with the fuzzy calculation exceeds the upper limit, the upper limit value is maintained.

(ii) The lower limit of compressor speed is set to B or D and even if the calculated result becomes lower than that after fuzzy calculation, the speed is kept to B or D. However, when the thermostat OFF, the speed is reduced to 0 prs.

(iii) Inching prevention control is activated and inching prevention control is carried out with the minimum speed set at B or D.

#### (c) Reset conditions

The outdoor air temperature (Tho-A) is lower than 8ºC.




Unit: rps

| Item | A | B | C | D |
|---|---|---|---|---|
| Comperssor speed | 90 | 35 | 75 | 40 |

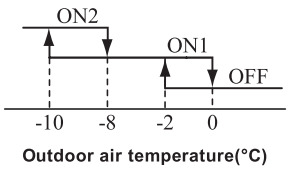
### (6) Heating low outdoor temperature protective control

#### (a) Operating conditions

When the outdoor air temperature (Tho-A) is -2ºC 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 change as shown in the figure below.




Unit: rps

| Item | | ON1 | ON2 |
|---|---|---|---|
| Compressor speed | Indoor unit : 1 unit | 35 | 45 |
| | Indoor unit : 2 units | 35 | 45 |

#### (c) Reset conditions

When either of the following conditions is satisfied.

(i) The outdoor air temperature (Tho-A) becomes 0ºC.

(ii) The compressor speed is 0 rps.

### (7) Refrigeration cycle system protective control

#### (a) Starting conditions

(i) When A minutes have elapsed after the compressor ON or the completion of the defrost operation

(ii) Other than the defrost operation

(iii) When, after satisfying the conditions of 1) and 2) above, the compressor speed, any indoor air temperature (Th1) and any indoor heat exchanger temperature (Th2) have satisfied the conditions in the following table for B minutes:

(iv) Except following mode

・Indoor unit fan speed "Hi" in heating mode

・Silent mode

| Operation mode | Operating indoor unit number | A | Compressor speed (N) | Room temperature (Th1) | Room temperature (Th1)/ Indoor heat exchanger temperature (Th2) | B | C |
|---|---|---|---|---|---|---|---|
| Cooling | 1 | 5 | 60≦N | 10≦Th1≦40 | Th1−4<Th2 | 5 | 1 |
| | 2 | 5 | 70≦N | | | | |
| Heating | 1 | 5 | 60≦N | 0≦Th1≦40 | Th2<Th1+6 | 5 | 2 |
| | 2 | 5 | 70≦N | | | | |

#### (b) Contents of control

(i) When the conditions of (i) above are met, the compressor stops.

(ii) Error stop occurs when the compressor has stopped C times within 60 minutes.

#### (c) Reset condition

When the compressor has been turned OFF

### (8) Service valve (gas side) closing operation

#### (a) Starting conditions

(i) Operation mode : Heating

(ii) Compressor conditions : OFF → ON

#### (b) Contents control

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

#### (c) Anomalous stop control

If the inverter output current value excceds the setting value within 80 seconds the compressor stops.

### (9) Compressor overheat protection

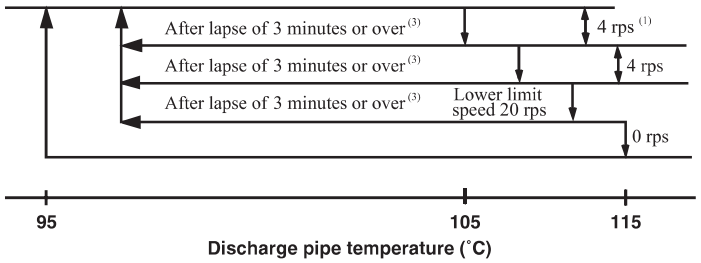
#### (a) Purpose

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 (Tho-D) 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.

(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.

### (10) 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.

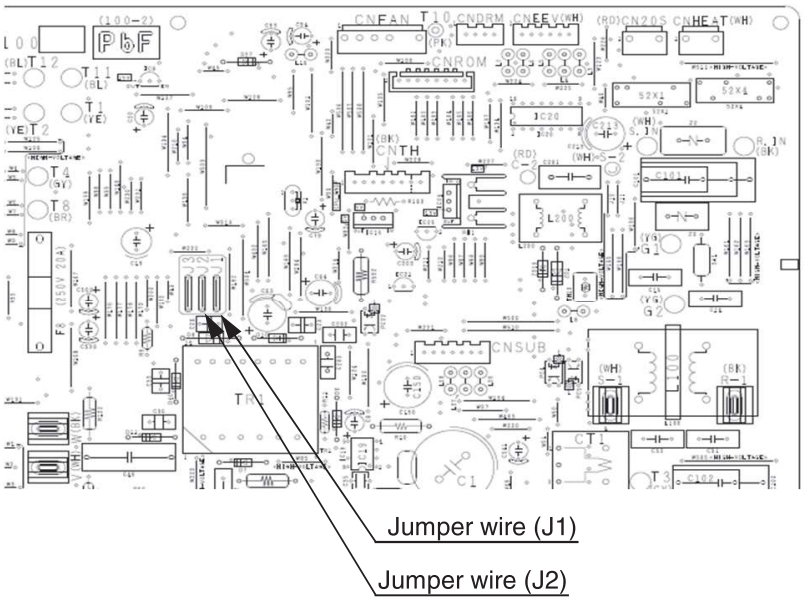
(ii) If the mechanism is actuated when the compressor speed is less than 30 rps, the compressor is stopped immediately. Operation starts again after a delay time of 3 minutes.

#### (C) Current safe control value

Set this using the jumper wire (J1 or J2) on the outdoor PCB. Control starts when it exceeds the control value.

**1) Switching with jumper wire**

| | | Jumper wire (J2) | |
|---|---|---|---|
| | | Short-circuit (At shipping from factory) | Short-circuit |
| Jumper wire (J1) | Short-circuit (At shipping from factory) | Current safe ① | Current safe ② |
| | Open | Current safe ③ | Current safe ③ |




**2) Control value**

Unit: A

| Current safe ① | | Current safe ② | | Current safe ③ | |
|---|---|---|---|---|---|
| Cooling | Heating | Cooling | Heating | Cooling | Heating |
| 10.0 | 12.0 | 10.0 | 10.0 | 7.5 | 7.5 |

### (11) 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.

### (12) 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 compressor sends a 0 rps signal to the indoor unit 3 times or more within 20 minutes of the power being turned on.

### (13) Discharge pipe sensor disconnection protection control

(a) When the compressor speed is other than 0 rps.

(i) Tho-D(10)−Tho-D(0) < 8 °C, and Tho-D(10)−Tho-A(10) < 5 °C

The compressor speed is set on A rps for 5 minutes. After 5 minutes, the compressor speed is set on B rps for 5 minutes.

(ii) Tho-D(20)−Tho-D(15) < 5 °C

The compressor speed is set on 0 rps.

Notes (1) Tho-D(X): After compressor operation, the discharge pipe temperature sensor after X minutes.
(2) Tho-A(X): After compressor operation, the outdoor air temperature sensor after X minutes.

(b) Once the unit is stopped by this function, it is not restarted.

• Values of A, B

| Model | SCM40ZS-W | SCM45ZS-W |
|---|---|---|
| A | 30 rps | 30 rps |
| B | 60 rps | 60 rps |

### (14) Regulation of outdoor air flow

(a) The fan operates as follows according to the compressor speed. (Except during defrost operation.)

| | Cooling | | Heating | | |
|---|---|---|---|---|---|
| Compressor speed (rps) | Less than 40 | 40 or more | Less than 30 | More than 30 but 56 or less | 56 or more |
| Outdoor fan speed | 5th speed | 6th speed | 4th speed | 5th speed | 6th speed |

(b) If the outdoor unit's fan speed drops, the outdoor fan is run for 1 minute at that speed.

### (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 minute 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) Outdoor fan motor protection

If the outdoor fan motor has operated at 75 $min^{-1}$ or under for more than 30 seconds, the compressor and fan motor are stopped.

### (18) Outdoor fan control at low outdoor temperature

#### (a) Cooling

##### (i) Operating conditions

When the outdoor air temperature (Tho-A) is 22ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps.

**(ii) Detail of operation**

After the outdoor fan operates at A speed for 60 seconds; the corresponding outdoor heat exchanger temperature shall implement the following controls.

● Value of A

| | Outdoor fan |
|---|---|
| Outdoor air temperature > 10˚C | 2nd speed |
| Outdoor air temperature ≦ 10˚C | 1st speed |

1) Outdoor heat exchanger temperature (Tho-R2) ≦ 34ºC

After the outdoor fan speed drops (down) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is lower than 34ºC, gradually reduce the outdoor fan speed by 1 speed.

● Lower limit speed

| | Lower limit speed |
|---|---|
| Outdoor air temperature > 16˚C | 2nd speed |
| Outdoor air temperature ≦ 16˚C | 1st speed |

2) 34ºC < Outdoor heat exchanger temperature (Tho-R) ≦ 45ºC

After the outdoor fan speed maintains at A speed for 20 seconds; if the outdoor heat exchanger temperature is 34ºC - 45ºC, maintain outdoor fan speed.

3) Outdoor heat exchanger temperature (Tho-R) > 45ºC

After the outdoor fan speed rises (up) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is higher than 45ºC, gradually increase outdoor fan speed by 1 speed. (Upper limit 4th speed)

**(iii) Reset conditions**

When either of the following conditions is satisfied.

1) The outdoor air temperature (Tho-A) is 24ºC or higher.
2) The compressor speed is 0 rps.

**(b) Heating**

**(i) Operating conditions**

When the outdoor air temperature (Tho-A) is 3ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps.

**(ii) Detail of operation**

The outdoor fan is stepped up by 1 speed. (Upper limit 7th speed)

**(iii) Reset conditions**

When either of the following conditions is satisfied.

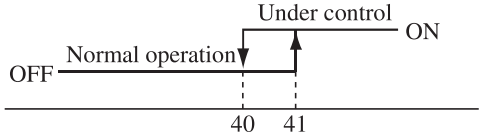
1) The outdoor air temperature (Tho-A) is 5ºC or higher.
2) The compressor speed is 0 rps.

**(19) Outdoor fan control at overload**

**(a) Cooling**

**(i) Starting condition**

When the outdoor air temperature (Tho-A) has risen higher than 41°C for 30 seconds continuously while the compressor is operating.




**Outdoor air temperature(ºC)**

**(ii) Contents of control**

The outdoor fan is stepped up by 3 speed. (Upper limit 7th speed)

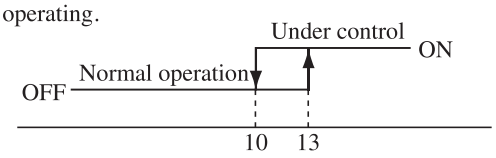
**(iii) Reset condition**

When the compressor is turned off or the outdoor air temperature (Tho-A) has dropped lower than 40°C.

**(b) Heating**

**(i) Starting condition**

When the outdoor heat exchanger temperature (Tho-R1) has risen higher than 13°C for 30 seconds continuously while the compressor is operating.




**(ii) Contents of control**

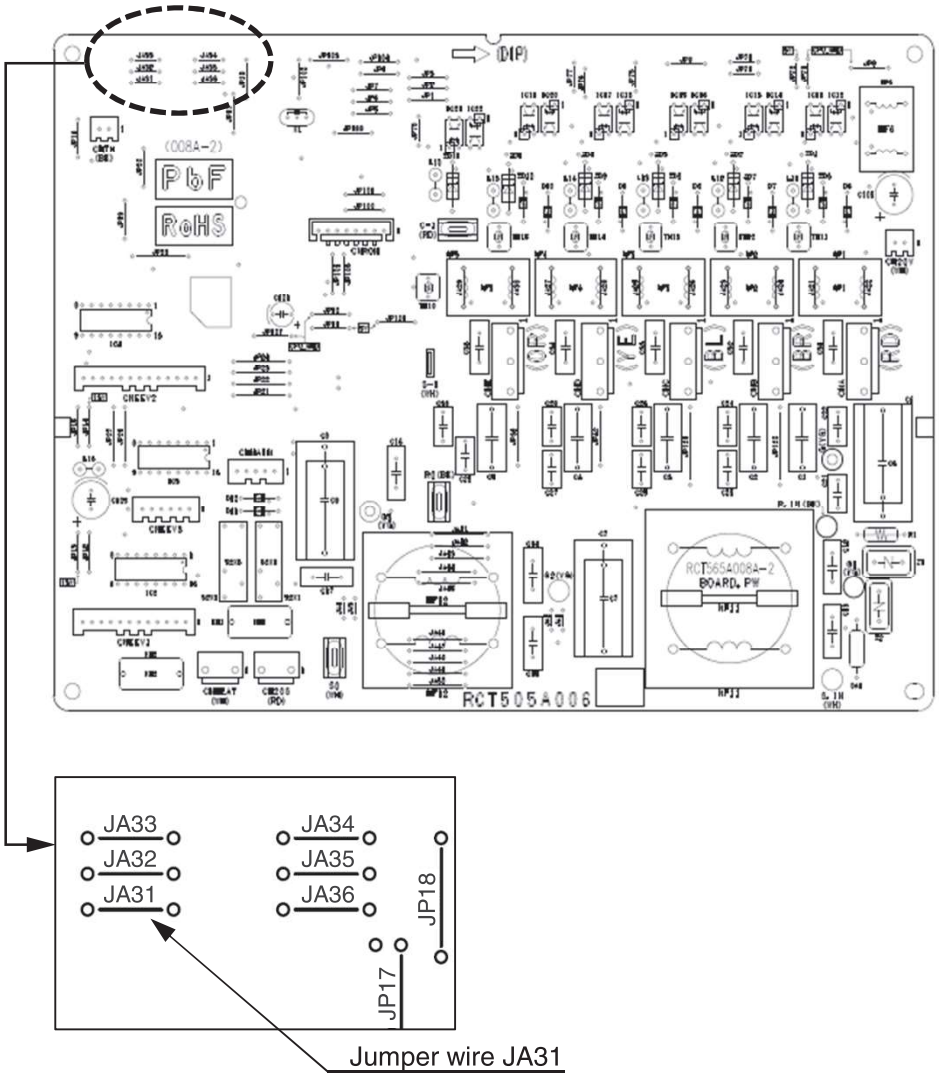
The outdoor unit fan is stepped down by 3 speed. (Lower limit is 2nd speed)

**(iii) Reset condition**

When the compressor is turned off or the outdoor heat exchanger temperature (Tho-R1) has dropped lower than 10°C.

**(20) Limit of the number of compressor starts**

Maximum number of compressor starts is limited to 6 times per hour by cutting jumper wire (JA31) on the outdoor sub PCB.



## 2.2 FDTC series

### 2.2.1 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).

**(i) Indoor unit**

| Remote control | | Indoor control PCB | | Location of trouble | Description of trouble | Repair method | Reference page |
|---|---|---|---|---|---|---|---|
| Error code | Red LED | Red LED | Green LED (1) | | | | |
| No-indication | Stays OFF | Stays OFF | Keeps flashing | — | • **Normal operation** | — | — |
| | | Stays OFF | Stays OFF | Indoor unit power source | • Power OFF, broken wire/blown fuse, broken transformer wire | Repair | 113 |
| | | * 3-time flash | Keeps flashing | Remote control wires | • Poor connection, breakage of remote control wire * For wire breaking at power ON, the LED is OFF. | Repair | 114 |
| | | | | Remote control | • Defective remote control PCB | Replacement of remote control | |
| WAIT or INSPECT I/U | | Stays OFF | Keeps flashing | Indoor-outdoor units connection wire | • Poor connection, breakage of indoor-outdoor units connection wire | Repair | 115-119 |
| | | | | 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 | 121 |
| | | | | Remote control indoor unit control PCB | *• Defective remote control or indoor unit control PCB (defective communication circuit)? | Replacement of remote control or PCB | |
| E 5 | | 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 | 122 |
| | | 2-time flash | 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 | |
| | | 2-time flash | Keeps flashing | Outdoor unit control PCB | • **Defective outdoor unit control PCB on the way of power source** | Replacement | |
| | | | | Fuse | • **Blown fuse** | | |
| E 6 | | 1-time flash | Keeps flashing | Indoor heat exchanger temperature sensor | • **Defective indoor heat exchanger temperature sensor** (defective element, broken wire, short-circuit) • Poor contact of temperature sensor connector | Replacement, repair of temperature sensor | 123 |
| | | | | Indoor unit control PCB | *• **Defective indoor unit control PCB (Defective temperature sensor input circuit)?** | Replacement of PCB | |
| E 7 | | 1-time flash | Keeps flashing | Indoor return air temperature sensor | • **Defective indoor return air temperature sensor** (defective element, broken wire, short-circuit) • Poor contact of temperature sensor connector | Replacement, repair of temperature sensor | 124 |
| | | | | Indoor unit control PCB | *• **Defective indoor unit control PCB (Defective temperature sensor input circuit)?** | Replacement of PCB | |
| E 8 | | 1-time flash | Keeps flashing | Installation or operating condition | • **Heating over-load** (Anomalously high indoor heat exchanger temperature) | Repair | 125 |
| | | | | Indoor heat exchanger temperature sensor | • **Defective indoor heat exchanger temperature sensor (short-circuit)** | Replacement of temperature sensor | |
| | | | | Indoor unit control PCB | *• **Defective indoor unit control PCB** (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E 9 | | 1-time flash | Keeps flashing | Drain trouble | • **Defective drain pump (DM), broken drain pump wire**, disconnected connector | Replacement, repair of DM | 126 |
| | | | | Float switch | • **Anomalous float switch operation** (malfunction) (In case of FDTC) | Repair | |
| | | | | Indoor unit control PCB | *• **Defective indoor unit control PCB** (Defective float switch input circuit) *• **Defective indoor unit control PCB** (Defective DM drive output circuit)? | Replacement of PCB | |
| | | | | Option | • **Defective option parts** (At optional anomalous input setting) | Repair | |
| 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 | 127 |
| E 11 | | Keeps flashing | Keeps flashing | Address setting error | • **Address setting error of indoor units** | Repair | 128 |
| E 14 | | 3-time flash | Keeps flashing | Indoor unit No. setting | • **No master is assigned to slaves.** | Repair | 129 |
| | | | | Remote control wires | • **A nomalous remote control wire connection, broken wire between master and slave units** | | |
| E 16 | | 1-time flash | Keeps flashing | Fan motor | • **Defective fan motor** | Replacement, repair | 130 |
| | | | | Indoor unit control PCB | • **Defective indoor unit control PCB** | Replacement | |
| E 19 | | 1-time flash | Keeps flashing | Indoor unit control PCB | • **Improper operation mode setting** | Repair | 131 |
| E 20 | | 1-time flash | Keeps flashing | Fan motor | • Indoor fan motor rotation speed anomaly | Replacement, repair | 132 |
| | | | | Indoor unit control PCB | • Defective indoor unit control PCB | Replacement | |
| E 28 | | Stays OFF | Keeps flashing | Remote control temperature sensor | • Broken wire of remote control temperature sensor | Repair | 133 |

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

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

### (ii) Outdoor unit

| Remote control | | Indoor control PCB | | Location of trouble | Description of trouble | Repair method | Reference page |
|---|---|---|---|---|---|---|---|
| Error code | Red LED | Red LED | Green LED | | | | |
| E35 | Keeps flashing | Stays OFF | Keeps flashing | Installation, operation status | • Higher outdoor heat exchanger temperature | Repair | 134 |
| | | | | Outdoor heat exchanger temperature sensor | • Defective outdoor heat exchanger temperature sensor | Replacement, repair of temperature sensor | |
| | | | | Outdoor unit main PCB | *• Defective outdoor unit main PCB (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E36 | | Stays OFF | Keeps flashing | Installation, operation status | • Higher discharge temperature | Repair | 135 |
| | | | | Discharge pipe temperature sensor | • Defective discharge pipe temperature sensor | Replacement, repair of temperature sensor | |
| | | | | Outdoor unit main PCB | *• Defective outdoor unit main PCB (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E37 | | Stays OFF | Keeps flashing | Outdoor heat exchanger temperature sensor | • Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection | Replacement, repair of temperature sensor | 136 |
| | | | | Outdoor unit main PCB | *• Defective outdoor unit main PCB (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E38 | | Stays OFF | Keeps flashing | Outdoor air temperature sensor | • Defective outdoor air temperature sensor, broken wire or poor connector connection | Replacement, repair of temperature sensor | 137 |
| | | | | Outdoor unit main PCB | *• Defective outdoor unit main PCB (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E39 | | Stays OFF | Keeps flashing | Discharge pipe temperature sensor | • Defective discharge pipe temperature sensor, broken wire or poor connector connection | Replacement, repair of temperature sensor | 138 |
| | | | | Outdoor unit main PCB | *• Defective outdoor unit main PCB (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E40 | | Stays OFF | Keeps flashing | Installation, operation status | • Service valve (gas side) closing operation | Replacement | 139 |
| E42 | | Stays OFF | Keeps flashing | Outdoor unit main PCB, compressor | • Current cut (Anomalous compressor over-current) | Replacement of PCB | 140• 141 |
| | | | | Installation, operation status | • Service valve closing operation | Repair | |
| E45 | | Stay OFF | Keeps flashing | Outdoor unit main PCB | • Anomalous outdoor unit main PCB commuication | Replacement of PCB | 142 |
| | | | | Outdoor unit sub PCB | • Anomalous outdoor unit sub PCB commuication | | |
| E47 | | Stays OFF | Keeps flashing | Outdoor unit sub PCB | • Defective active filter | Repair PCB replacement | 143 |
| E48 | | Stays OFF | Keeps flashing | Fan motor | • Defective fan motor | Replacement | 144 |
| | | | | Outdoor unit main PCB | • Defective outdoor unit main PCB | | |
| E51 | | Stays OFF | Keeps flashing | Power transistor error (outdoor unit main PCB) | • Power transistor error | Replacement of PCB | 145 |
| E53 | | Stays OFF | Keeps flashing | Outdoor suction pipe sensor | • Defective suction pipe temperature sensor, broken wire or poor connector connection | Replacement, repair of temperature sensor | 146 |
| | | | | Outdoor unit sub PCB | • Defective outdoor unit sub PCB (Defective temperature sensor input circuit)? | Replacement of PCB | |
| E57 | | Stays OFF | Keeps flashing | Operation status | • Shortage in refrigerant quantity | Repair | 147 |
| | | | | Installation status | • Service valve closing operation | Service valve opening check | |
| E58 | | Stays OFF | Keeps flashing | • Overload operation<br>• Overcharge<br>• Compressor locking | • Current safe stop | Replacement | 148 |
| E59 | | Stays OFF | Keeps flashing | Compressor, outdoor unit main PCB | • Anomalous compressor startup | Replacement | 149 |
| E60 | | Stays OFF | Keeps flashing | Compressor | • Anomalous compressor rotor lock | Replacement | 150 |

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

### (iii) Display sequence of error codes or inspection indicator lamps

■ **Occurrence of one kind of error**

Displays are shown respectively according to errors.

■ **Occurrence of plural kinds of error**

| Section | Category of display |
|---|---|
| **Error code on remote control** | • Displays the error of higher priority (When plural errors are persisting)<br>E1 E5 ·····E10>E3 >·····Eb0<br>• Displays the present errors. (When a new error has occurred after the former error was reset.) |
| **Red LED on indoor unit control PCB** | |
| **Red LED on outdoor unit main PCB** | |

■ **Error detecting timing**

| Section | Error description | Error code | Error detecting timing |
|---|---|---|---|
| Indoor | Drain trouble (Float switch activated) | E9 | Whenever float switch is activated after 30 second had past since power ON. |
| | Communication error at initial operation | "WAIT" | No communication between indoor and outdoor units is established at initial operation. |
| | Remote control communication circuit error | E1 | Communication between indoor unit and remote control is interrupted for mote than 2 minutes continuously after initial communication was established. |
| | Communication error during operation | E5 | Communication between indoor and outdoor units is interrupted for mote than 2 minutes continuously after initial communication was established. |
| | Excessive number of connected indoor units by controlling with one remote control | E10 | Whenever excessively connected indoor units is detected after power ON. |
| | Return air temperature sensor anomaly | E7 | -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 | E6 | -50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature.<br>Or 70°C or higher is detected for 5 seconds continuously. |
| Outdoor | Outdoor air temperature sensor anomaly | E38 | -55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor.<br>Or -55°C or higher is detected for 5 seconds continuously within 20 seconds after power ON. |
| | Outdoor heat exchanger temperature sensor anomaly | E37 | -55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor.<br>Or -55°C or lower is detected for 5 seconds continuously within 20 seconds after power ON. |
| | Discharge pipe temperature sensor anomaly | E39 | -25°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor. |
| | Suction pipe temperature sensor anomaly | E53 | -55°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous sensor.<br>Or -55°C or higher is detected for 5 seconds continuously within 20 seconds after power ON. |

■ **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.<br>• If the unit has recovered from anomaly, it can be operated. |
| Red LED on indoor unit control PCB | • Not memorized. | |
| Red LED on outdoor unit main PCB | • Memorizes a mode of higher priority. | |

■ **Resetting the error log**

• Resetting the memorized error log in the remote control

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

• Resetting the memorized error log

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.

Trouble → Confirmation of power source (Indoor/ outdoor unit) → Confirmation of remote control and LEDs on the PCB of indoor unit and outdoor unit (Indoor/ outdoor unit, remote control) → Check of the anomalous operation data on the remote control → Inspection of the unit/ control → Replacement/ repair of faulty part, test run, adjustment

### (3) Troubleshooting at the indoor unit

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

#### (a) Replacement part related to indoor PCB’s

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

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

#### (b) Instruction of how to replace indoor unit control PCB

**SAFETY PRECAUTIONS**

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the replacement in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, WARNING and CAUTION.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
  ⚠ WARNING — Wrong installation would cause serious consequences such as injuries or death.
  ⚠ CAUTION — Wrong installation might cause serious consequences depending on circumstances.
- After completing the replacement, do commissioning to confirm there are no anomaly.

**⚠ WARNING**

- Replacement should be performed by the specialist.
  If you replace the PCB by yourself, it may lead to serious trouble such as electric shock or fire.
- Replace the PCB correctly according to these instructions.
  Improper replacement may cause electric shock or fire.
- Shut off the power before electrical wiring work. Start the work after elapsing 1 minutes or more from power pff.
  Replacement during the applying the current would cause the electric shock, unit failure or improper running.
  It would cause the damage of connected equipment such as fan motor,etc.
- Fasten the wiring to the terminal securely, and hold the cable securely so as not to apply unexpected stress on the terminal.
  Loose connections or hold could result in abnormal heat generation or fire.
- Check the connection of wiring to PCB correctly before turning on the power, after replacement.
  Defectiveness of replacement may cause electric shock or fire.

**⚠ CAUTION**

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

PSC012D050C

Replace and set up the PCB according to this instruction.

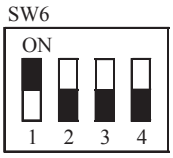
(i) Set to an appropriate address and function using switch on PCB.
Select the same setting with the removed PCB.

| Item | Switch | Content of control | |
|---|---|---|---|
| Address | SW2 | Plural indoor units control by 1 remote control | |
| Test run | SW7-1 | OFF | Normal |
| | | ON | Operation check/drain motor test run |

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

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

| SW6 | -1 | -2 | -3 | -4 |
|---|---|---|---|---|
| 25VH | ON | OFF | OFF | OFF |
| 35VH | OFF | ON | OFF | OFF |



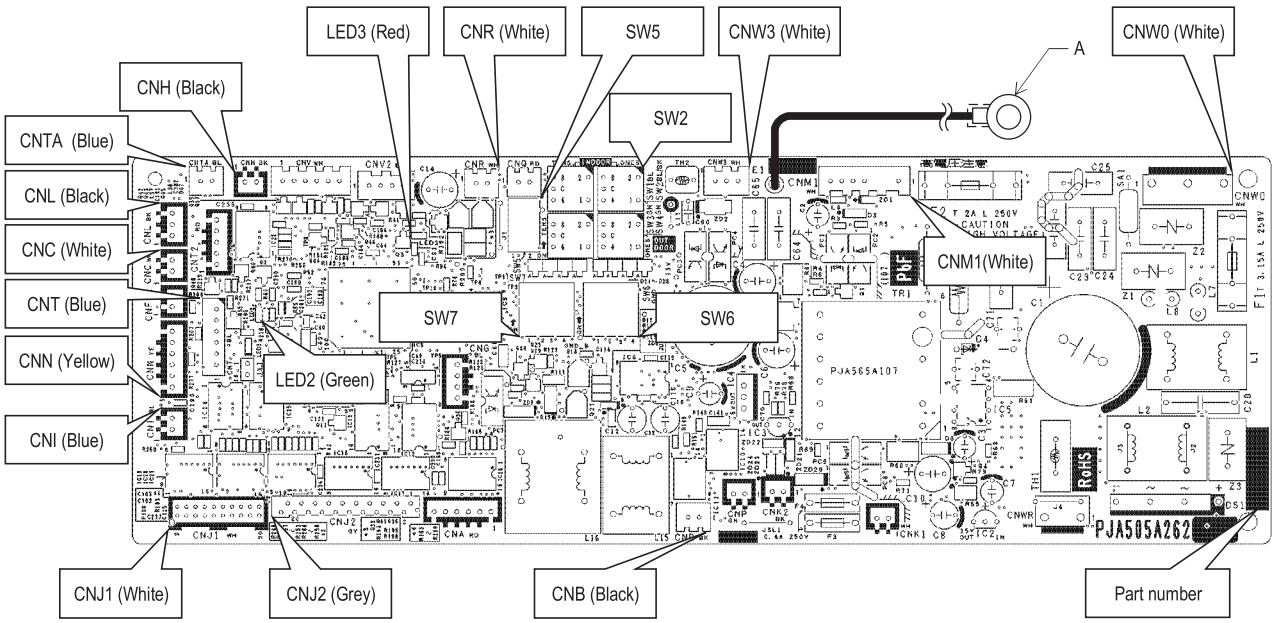
Example setting fro 25VH

(iii) Replace the PCB

a) Unscrew terminal (Arrow A) of the "E1" wiring (yellow/green) that is connected to PCB.
b) Replace the PCB only after all the wirings connected to the connector are removed.
c) Fix the board such that it will not pinch any of the wires.
d) Switch setting must be same setting as that of the removed PCB.
e) Reconnect the wirings to the PCB. Wiring connector color should match with the color of connector of the PCB.
f) Screw back the terminal (Arrow A) of the "E1" wiring, that was removed in a).

(iv) Control PCB

Parts mounting are different by the kind of PCB.



## ●DIP switch setting list

| Switches | Description | | Default setting | | Remarks |
|---|---|---|---|---|---|
| SW2 | Address No. setting at plural indoor units control by 1 R/C | | 0 | | 0-F |
| SW6-1<br>SW6-2<br>SW6-3<br>SW6-4 | Model selection | | As per model | | See table 1 |
| SW7-1 | Test run, Drain motor | Normal*/Test run | OFF | Normal | |
| SW7-2 | Reserved | | OFF | | Keep OFF |
| SW7-3 | Powerful mode | Valid*/Invalid | ON | Valid | |
| SW7-4 | Reserved | | OFF | | Keep OFF |
| SW8-1 | Reserved | | OFF | | Keep OFF |
| SW8-2 | Reserved | | OFF | | Keep OFF |
| SW8-3 | Reserved | | OFF | | Keep OFF |
| SW8-4 | Reserved | | OFF | | Keep OFF |
| JSL1 | Superlink terminal spare | Normal*/switch to spare | With | | |

* Default setting

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

| | 25VH | 35VH |
|---|---|---|
| SW6-1 | ON | OFF |
| SW6-2 | OFF | ON |
| SW6-3 | OFF | OFF |
| SW6-4 | OFF | OFF |

### (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 then proceed further inspection and remedy it.

Self-diagnosis system by microcomputor on indoor 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.

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 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 PCB, Temperature sensor (of outdoor heat exchanger, discharge pipe, outdoor air), Fuses (for power source and PCB) and Reactor.

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

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

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

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

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

| Number | Data Item | |
|---|---|---|
| 01 | ❄ | (Operation Mode) |
| 02 | SET TEMP ___℃ | (Set Temperature) |
| 03 | RETURN AIR ___℃ | (Return Air Temperature) |
| 04 | SENSOR ___℃ | (Remote Control Temperature) |
| 05 | THI-R1 ___℃ | (Indoor Heat Exchanger Temperature / U Bend) |
| 06 | THI-R2 ___℃ | (Indoor Heat Exchanger Temperature /Capillary) |
| 07 | THI-R3 ___℃ | (Indoor Heat Exchanger Temperature /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) |
| 23 | THO-R2 ___℃ | (Outdoor Heat Exchanger Temperature) |
| 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) |

**●Details of compressor protection status No. 33**

| No. | Contents of display |
|---|---|
| "0" | Normal |
| "1" | Discharge pipe temperature protection control |
| "2" | Discharge pipe temperature anomaly |
| "3" | Current safe control of inverter primary current |
| "4" | High pressure protection control |
| "5" | High pressure anomaly |
| "6" | Low pressure protection control |
| "7" | Low pressure anomaly |
| "8" | Anti-frost prevention control |
| "9" | Current cut |
| "10" | Power transistor protection control |
| "11" | Power transistor anomaly (Overheat) |
| "12" | Compression ratio control |
| "13" | Spare |
| "14" | Dewing prevention control |
| "15" | Current safe control of inverter secondary current |
| "16" | Stop by compressor rotor lock |
| "17" | Stop by compressor startup failure |

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

### (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) |
| 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) |
| 23 | THO-R2 ___℃ | (Outdoor Heat Exchanger Temperature) |
| 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) |

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.)

**●Details of compressor protection status No. 33**

| No. | Contents of display |
|---|---|
| "0" | Normal |
| "1" | Discharge pipe temperature protection control |
| "2" | Discharge pipe temperature anomaly |
| "3" | Current safe control of inverter primary current |
| "4" | High pressure protection control |
| "5" | High pressure anomaly |
| "6" | Low pressure protection control |
| "7" | Low pressure anomaly |
| "8" | Anti-frost prevention control |
| "9" | Current cut |
| "10" | Power transistor protection control |
| "11" | Power transistor anomaly (Overheat) |
| "12" | Compression ratio control |
| "13" | Spare |
| "14" | Dewing prevention control |
| "15" | Current safe control of inverter secondary current |
| "16" | Stop by compressor rotor lock |
| "17" | Stop by compressor startup failure |

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

### (6) Inverter checker for diagnosis of inverter output

●Checking method

(a) Setup procedure of checker.

(i) Power OFF (Turn off the breaker).

(ii) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.

(iii) Connect the wires U (Red) , V (White) and W (Black) of the checker to the terminal of disconnected wires (U, V, W) from compressor respectively.

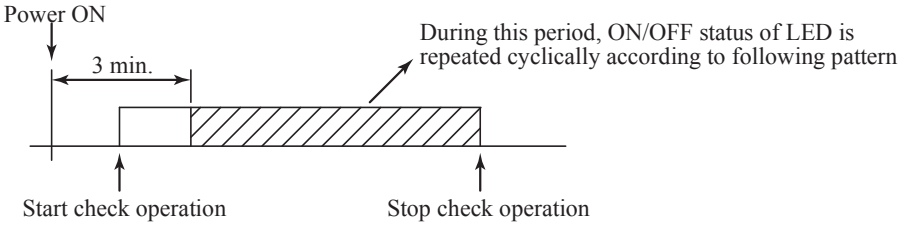
(b) Operation for judgment.

(i) Power ON and start check operation on cooling or heating mode.

(ii) Check ON/OFF status of 6 LED's on the checker.

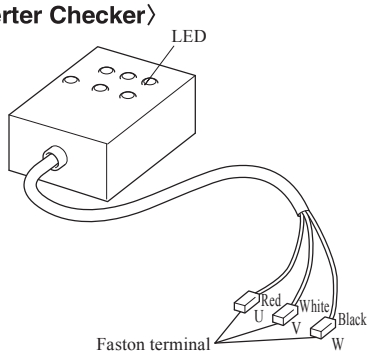
(iii) Judge the PCB by ON/OFF status of 6 LED's on the checker.

| 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 |
|---|---|---|
| Outdoor main PCB | Normal | Anomalous |



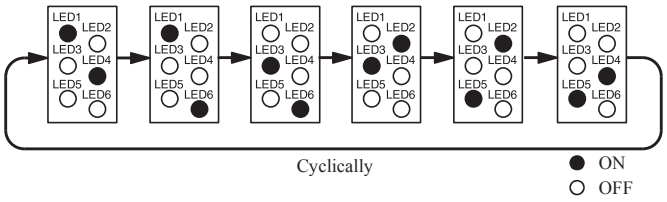

(iv) Stop check operation within about 2minutes after starting check operation.

〈Inverter Checker〉




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

LED ON/OFF pattern




### (7) Outdoor unit inspection points

●See page 93 to 94.

## 2.2.2 Troubleshooting flow

### (1) List of troubles

| Remote control display | Description of trouble | Reference page |
|---|---|---|
| None | Operates but does not cool | 106 |
| None | Operates but does not heat | 107 |
| None | Earth leakage breaker activated | 108 |
| None | Excessive noise/vibration | 109–111 |
| None | Louver motor failure | 112 |
| None | Power source system error (Power source to indoor unit control PCB) | 113 |
| None | Power source system error (Power source to remote control) | 114 |
| INSPECT I/U | INSPECT I/U (When 1 or 2 remote controls are connected) | 115 |
| INSPECT I/U | INSPECT I/U (Connection of 3 units or more remote controls) | 116 |
| WAIT | Communication error at initial operation | 117–119 |
| None | No display | 120 |
| E1 | Remote control communication circuit error | 121 |
| E5 | Communication error during operation | 122 |
| E6 | Indoor heat exchanger temperature sensor anomaly | 123 |
| E7 | Return air temperature sensor anomaly | 124 |
| E8 | Heating overload operation | 125 |
| E9 | Drain trouble | 126 |
| E10 | Excessive number of connected indoor units (more than 17 units) by controlling with one remote control | 127 |
| E11 | Address setting error of indoor units | 128 |
| E14 | Communication error between master and slave indoor units | 129 |
| E16 | Indoor fan motor anomaly | 130 |
| E19 | Indoor unit operation check, drain pump motor check setting error | 131 |
| E20 | Indoor fan motor rotation speed anomaly | 132 |
| E28 | Remote control temperature sensor anomaly | 133 |
| E35 | Cooling overload operation | 134 |
| E36 | Discharge pipe temperature error | 135 |
| E37 | Outdoor heat exchanger temperature sensor anomaly | 136 |
| E38 | Outdoor air temperature sensor anomaly | 137 |
| E39 | Discharge pipe temperature sensor anomaly | 138 |
| E40 | Service valve (gas side) closing operation | 139 |
| E42 | Current cut | 140·141 |
| E45 | Outdoor unit sub PCB communication error | 142 |
| E47 | Active filter voltage error | 143 |
| E48 | Outdoor fan motor anomaly | 144 |
| E51 | Power transistor anomaly | 145 |
| E53 | Suction pipe temperature sensor anomaly | 146 |
| E57 | Insufficient refrigerant amount or detection of service valve closure | 147 |
| E58 | Current safe stop | 148 |
| E59 | Compressor startup failure | 149 |
| E60 | Compressor rotor lock error | 150 |

**(2) Troubleshooting**

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Keeps flashing | Stays OFF | Operates but does not cool |

## 1. Applicable model

All models

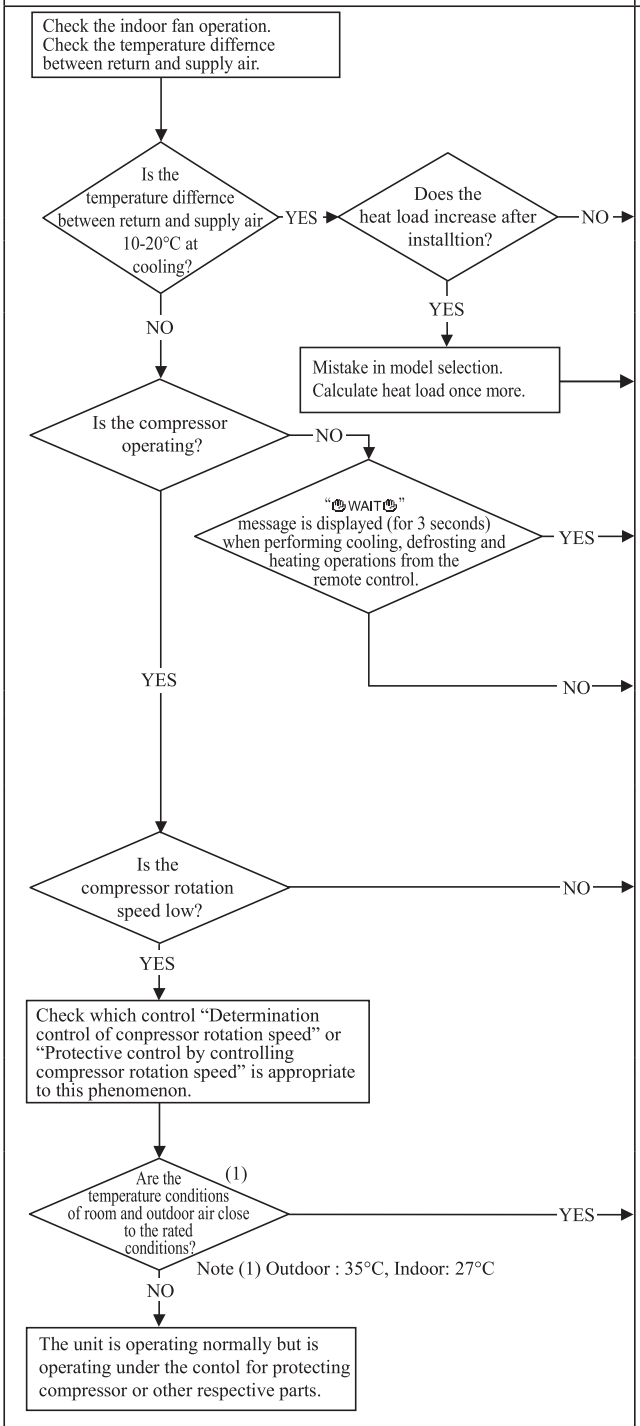
## 2. Error detection method

## 3. Condition of error displayed

## 4. Presumable cause

- Poor compression of compressor
- Faulty expansion valve operation

## 5. Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Keeps flashing | Stays OFF | Operates but does not heat |

## 1.Applicable model

All models

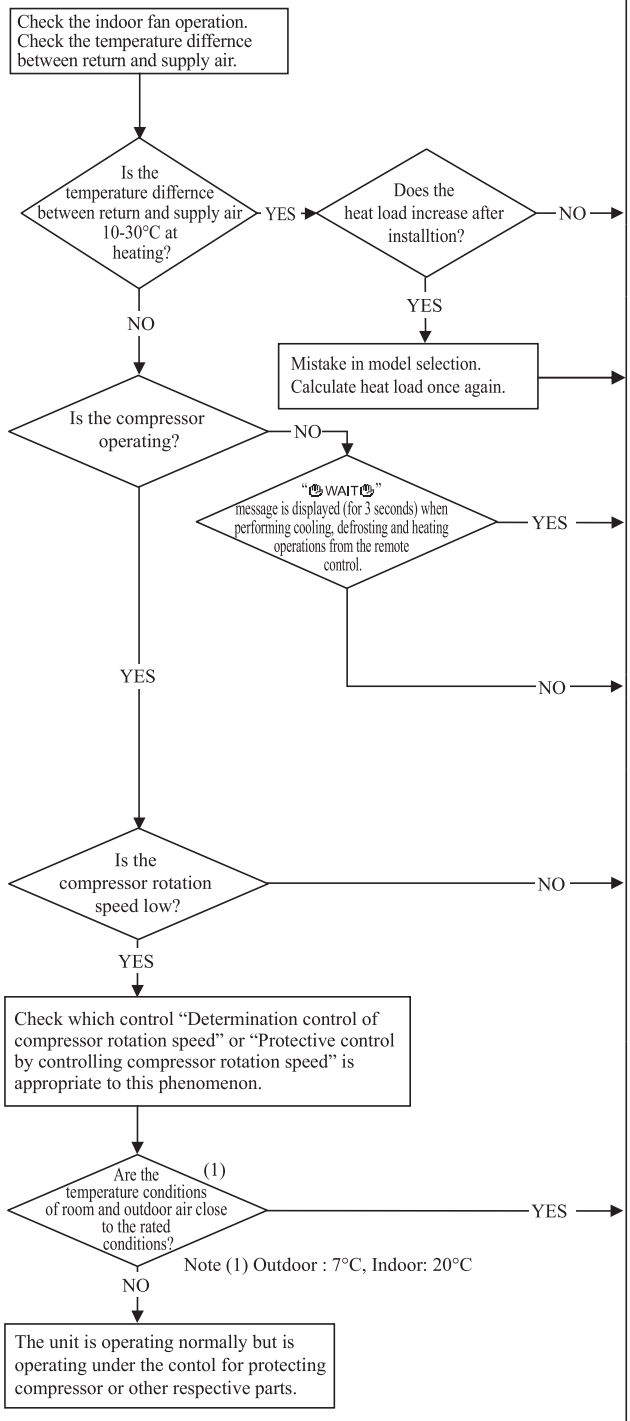
## 2.Error detection method

## 3. Condition of error displayed

## 4.Presumable cause

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

## 5.Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
|  | It is normal.<br>(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.<br><br>It is necessary to replace to higher capacity one or to install additional unit.<br><br>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.<br><br>Compressor may be stopped by the error detection control.<br>For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputor control functions.<br><br>Inspect the followings.<br>• Minor clogging of filter<br>• Minor clogging of heat exchanger<br>• Minor short-circuit<br>• Minor shortage of refrigerant amount<br>• Poor compression of compressor<br><br>Considering appropriate operation control, check suspicious points.<br>Inspect the followings for reference.<br>• Major clogging of filter<br>• Major clogging of heat exchanger<br>• Major short-circuit<br>• Major shortage of refrigerant amount<br>• Compressor protection ON<br>• Indoor fan tap<br>• Valid setting of silent mode |



Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Stays OFF | Stays OFF | Earth leakage breaker activated |

## 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 coil resistance of compressor? — NO | Replace compressor.* |
| 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 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 | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | – | – | Excessive noise/vibration (1/3) |

## 1.Applicable model

All models

## 2.Error detection method

## 3. Condition of error displayed

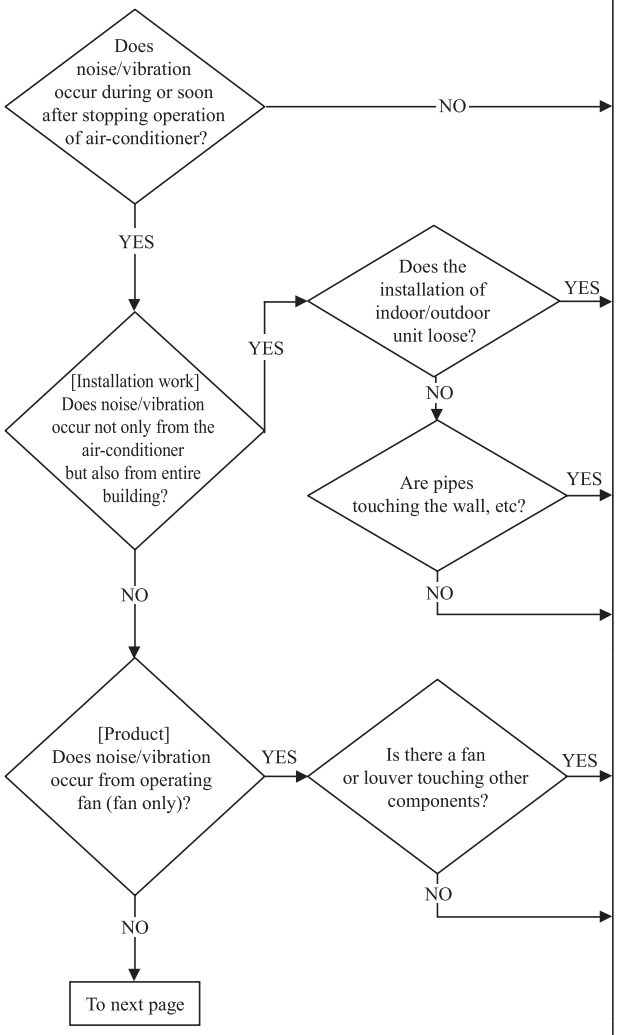
## 4.Presumable cause

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

② Defective product
- Before/after shipping from factory

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

## 5.Troubleshooting




| Diagnosis | Countermeasure |
|---|---|
| | If excessive noise/vibration persists when sufficient time has elapsed after stopping the unit, it is considered that the air-conditioner is not the source.<br><br>Check the installed condition carefully, and correct the position or insert rubber cushions or others into the gap, if necessary.<br><br>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.<br><br>Strength of ceiling wall, floor, etc. may be insufficient. Review the installing position or reinforce it.<br><br>Check for leaning of installed unit or anomalous mounting of fan, louver or motor and specify the contacting point and correct it.<br><br>When the heat exchanger or filter is clogged, clean them. In case that the unit is installed at the site where background noise is very low, small noise from indoor unit can be heard, but it is normal. Before installation, check for background noise. If backgound nois is very low, convince client prior to installation. |

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | – | – | Excessive noise/vibration (2/3) |

## 1.Applicable model

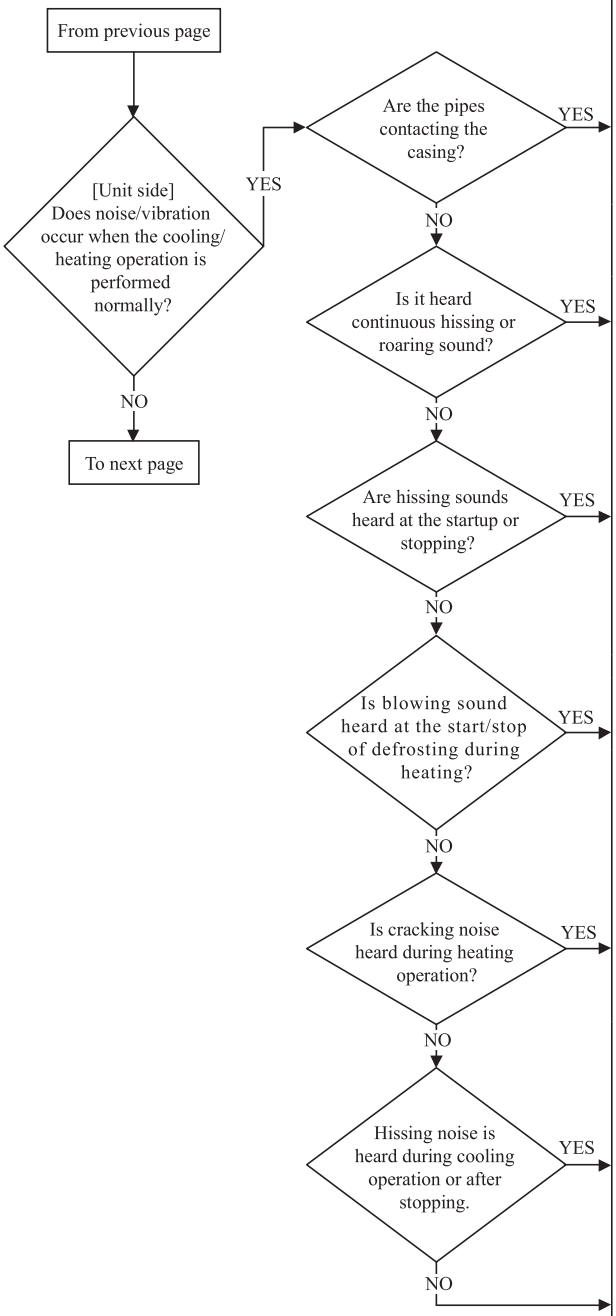
All models

## 2.Error detection method

## 3. Condition of error displayed

## 4.Presumable cause

## 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 defrosting 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 | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | – | – | Excessive noise/vibration (3/3) |

## 1.Applicable model

All models

## 2.Error detection method

## 3. Condition of error displayed

## 4.Presumable cause

## 5.Troubleshooting

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

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Keeps flashing | Stays OFF | Louver motor failure |

## 1.Applicable model

All models

## 2.Error detection method

## 3. Condition of error displayed

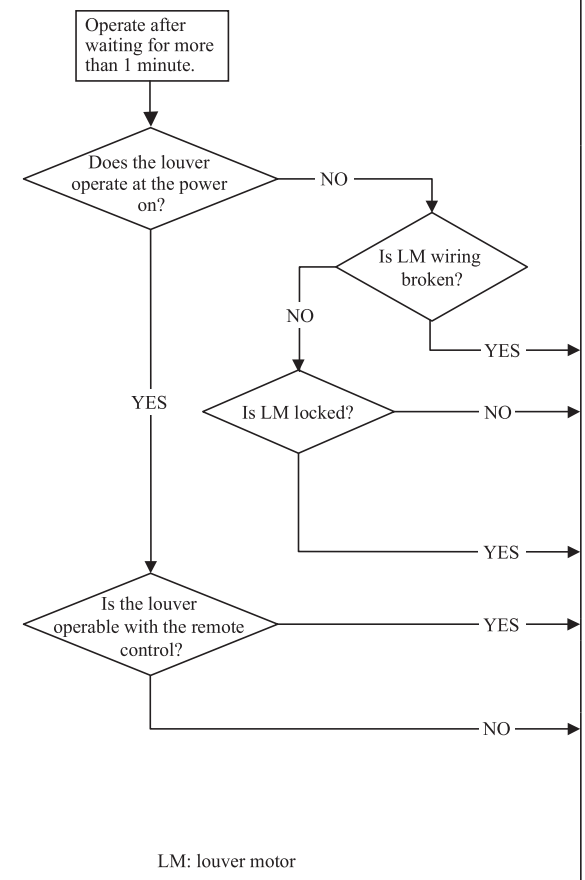
## 4.Presumable cause

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

## 5.Troubleshooting

| Diagnosis | Countermeasure |
|---|---|

▲ Check at the indoor unit side.




LM: louver motor

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Stays OFF | Stays OFF | Power source system error (Power source to indoor unit control PCB) |

## 1.Applicable model

All models

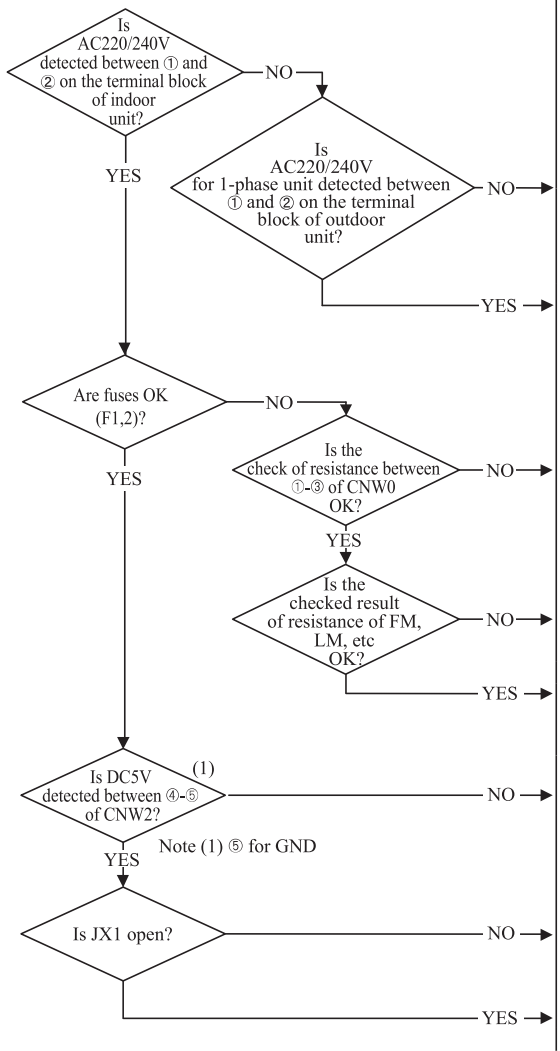
## 2.Error detection method

## 3. Condition of error displayed

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Keeps flashing | 3-time flash | Power source system error (Power source to remote control) |

## 1.Applicable model

All models

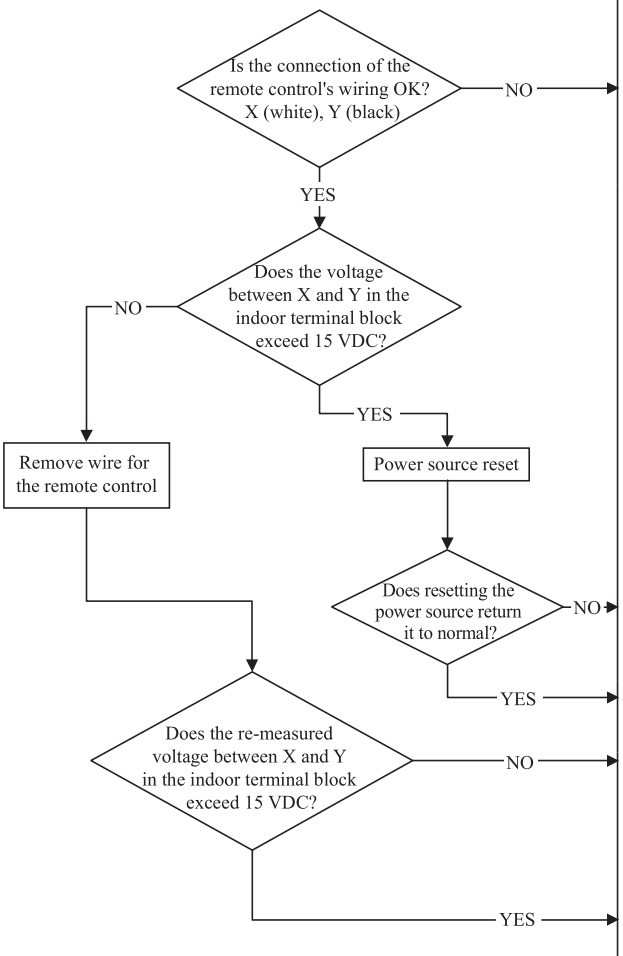
## 2.Error detection method

## 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

## 5.Troubleshooting




Note:

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

## 1.Applicable model

All models

## 2.Error detection method

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

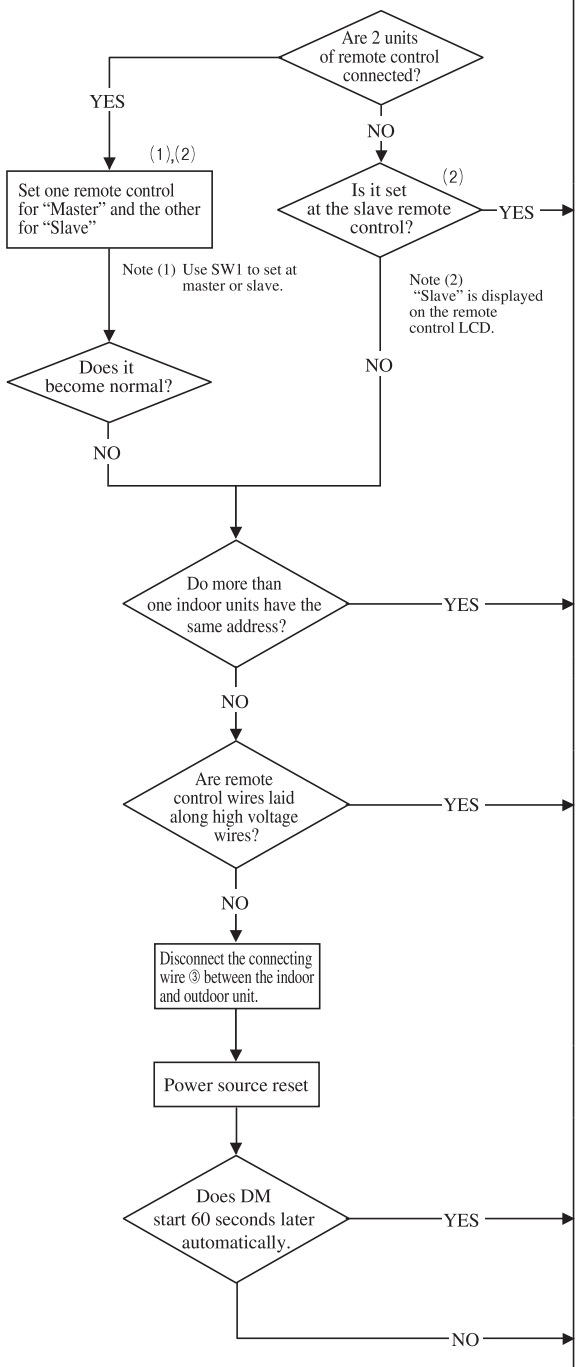
## 3.Condition of error displayed

Same as above

## 4.Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor unit control 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 | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: INSPECT I/U | Indoor | Keeps flashing | Stays OFF | INSPECT I/U (Connection of 3 units or more remote controls) |

## 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.

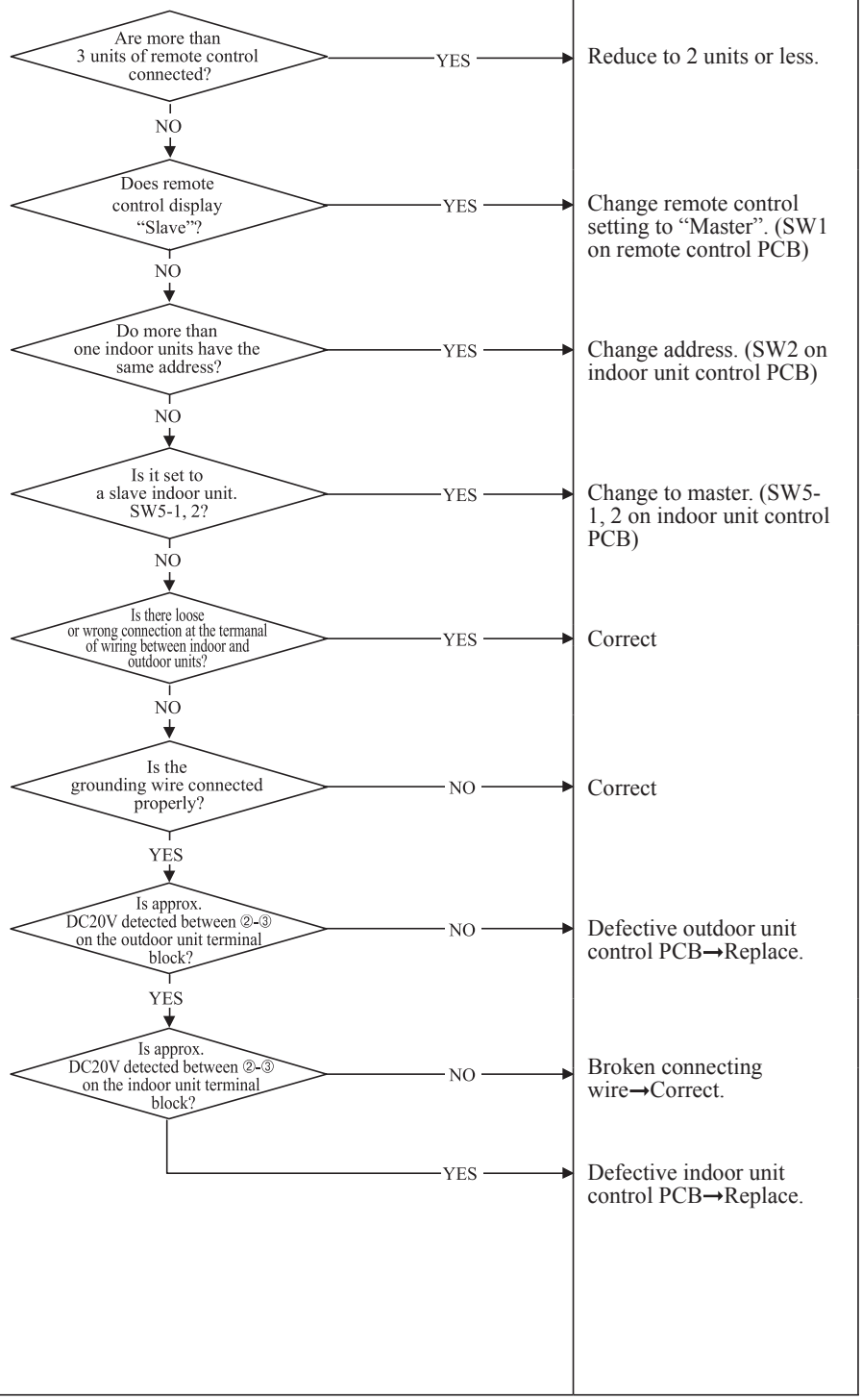
## 3.Condition of error displayed

Same as above

## 4.Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor unit control PCB
- Faulty outdoor unit sub 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 | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: WAIT | Indoor | Keeps flashing | Stays OFF | Communication error at initial operation (1/3) |

## 1.Applicable model

All Models

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

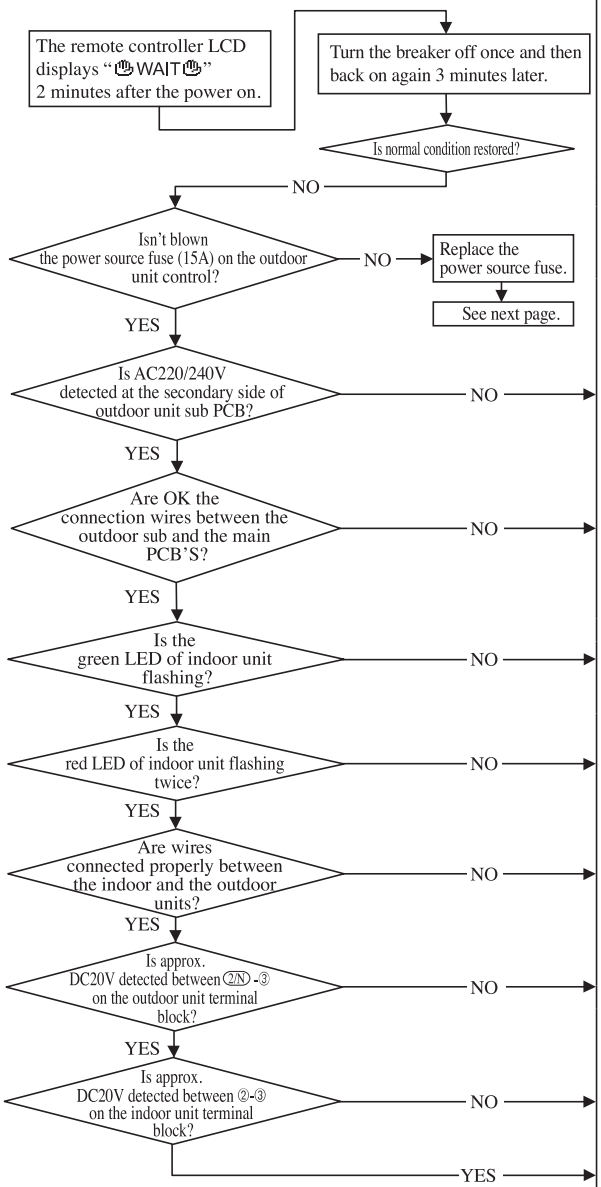
## 2.Error detection method

## 3.Condition of error displayed

## 4.Presumable cause

- Blown fuse
- Faulty outdoor unit sub PCB
- Connection between PCB's
- Blown fuse on single phase model
- 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 | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: WAIT | Indoor | Keeps flashing | Stays OFF | Communication error at initial operation (2/3) |

## 1.Applicable model

All Models

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

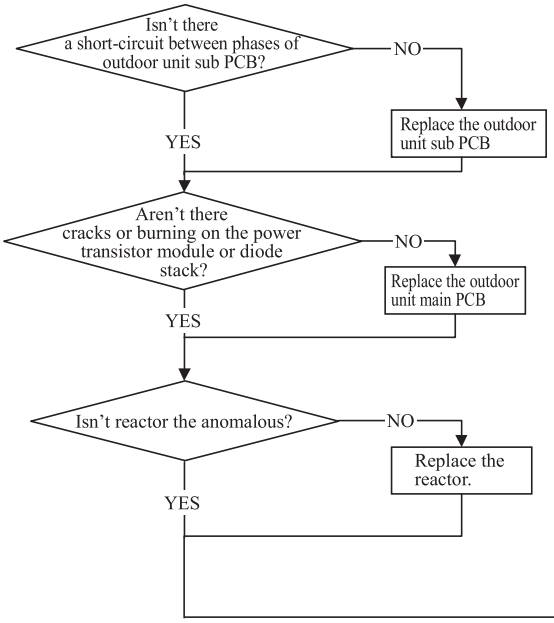
## 2.Error detection method

## 3.Condition of error displayed

## 4.Presumable cause

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

## 5.Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
|  | Replace fuse. |



Note:

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

## 1.Applicable model

All Models

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

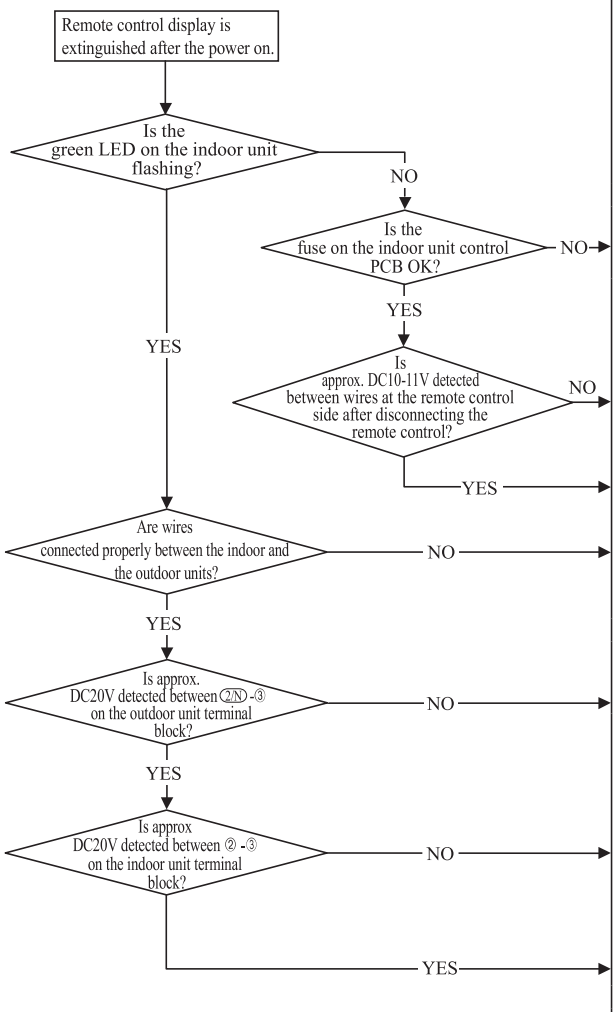
## 2.Error detection method

## 3.Condition of error displayed

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: None | Indoor | Stays OFF | Stays OFF | No display |

## 1.Applicable model

All models

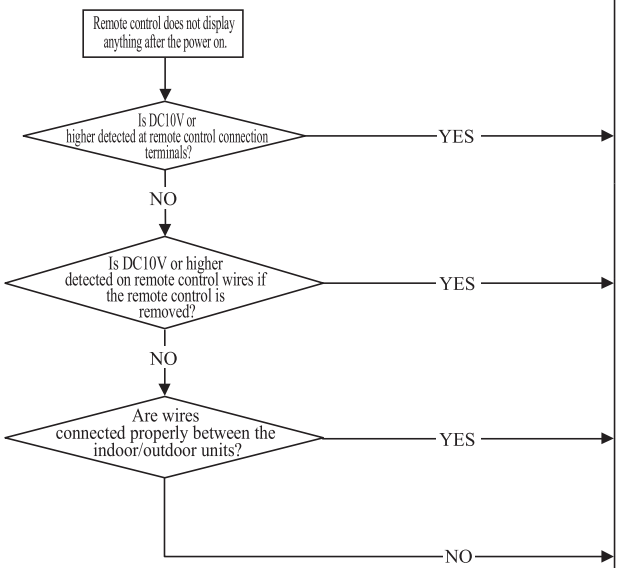
## 2.Error detection method

## 3.Condition of error displayed

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E1 | Indoor | Keeps flashing | Stays OFF | Remote control communication circuit error |

## 1. Applicable model

All models

## 2. Error detection method

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

## 3. Condition of error displayed

Same as above

## 4. Presumable cause

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

## 5. Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| Is it possible to reset normally by the power reset? — YES | Malfunction by noise Check peripheral environment. |
| NO → Turn SW7-1 to OFF. → ON Remove the wire ③ connecting between indoor/outdoor units. → Power source reset → Does the drain pump restart automatically 1 minute later? — YES | Defective indoor unit control PCB → Replace. |
| NO | Defective remote control → Replace. |

Note (1) 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 contnrol PCB starts to reset automatically.

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

## 1.Applicable model

All models

## 2.Error detection method

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

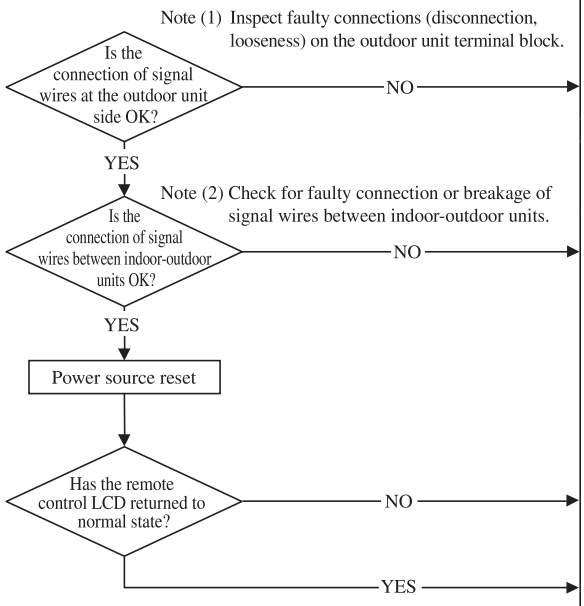
## 3.Condition of error displayed

Same as above is detected during operation.

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

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

## 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 (Thi-R1, R2 or R3).

## 3. Condition of error displayed

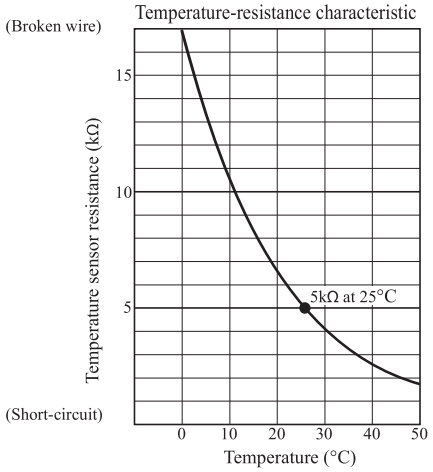
- When the temperature sensor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.
- Or if 70°C or higher is detected for 5 seconds continuously.

## 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. → 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 heat exchanger temperature sensor input circuit) |




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E7 | Indoor | Keeps flashing | 1-time flash | Return air temperature sensor anomaly |

## 1.Applicable model

All models

## 2.Error detection method

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

## 3.Condition of error displayed

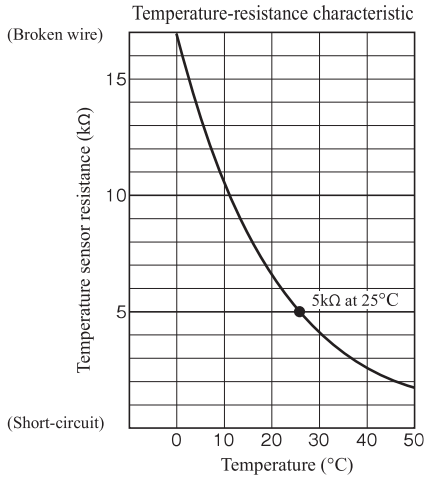
- When the temperature sensor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

## 4.Presumable cause

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

## 5.Troubleshooting

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




Note:

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

## 1.Applicable model

All models

## 2.Error detection method

Indoor heat exchanger temperature sensor (Thi-R1, R2, R3)

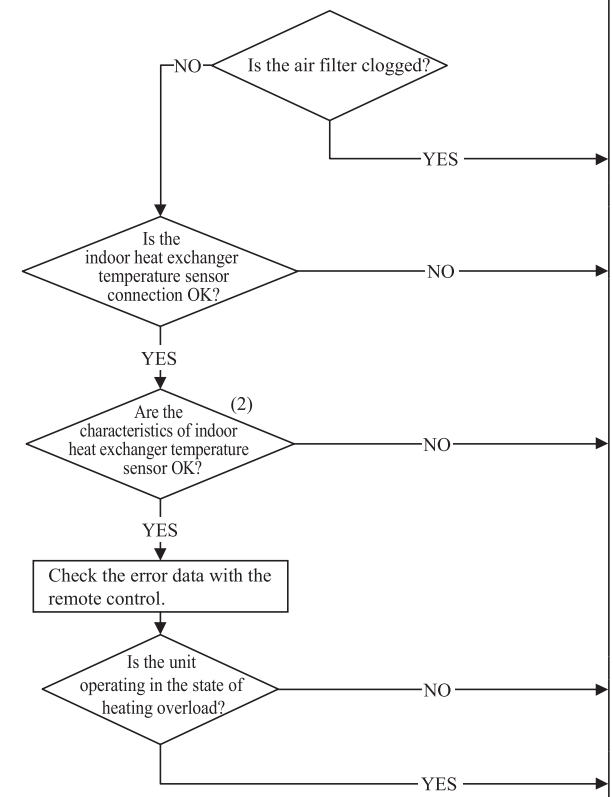
## 3.Condition of error displayed

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

## 4.Presumable cause

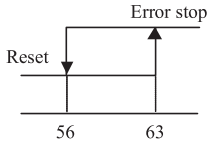
- Clogged air filter
- Defective indoor heat exchanger temperature sensor connector
- Defective indoor heat exchanger temperature sensor
- Anomalous refrigerant system

## 5.Troubleshooting




Note (1) Judge if it is in the state of overload or not as follows.
- Is there any short-circuit of air?
- Isn't there any fouling or clogging on the indoor heat exchanger?
- Is the outdoor fan control normal?
- Isn't the room and outdoor air temperature too high?

Note (2) For characteristics of indoor heat exchanger temperature sensor, see the error display E6.




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

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E9 | Indoor | Keeps flashing | 1-time flash | Drain trouble |

## 1. Applicable model

All models

## 2. Error detection method

Float switch is activated

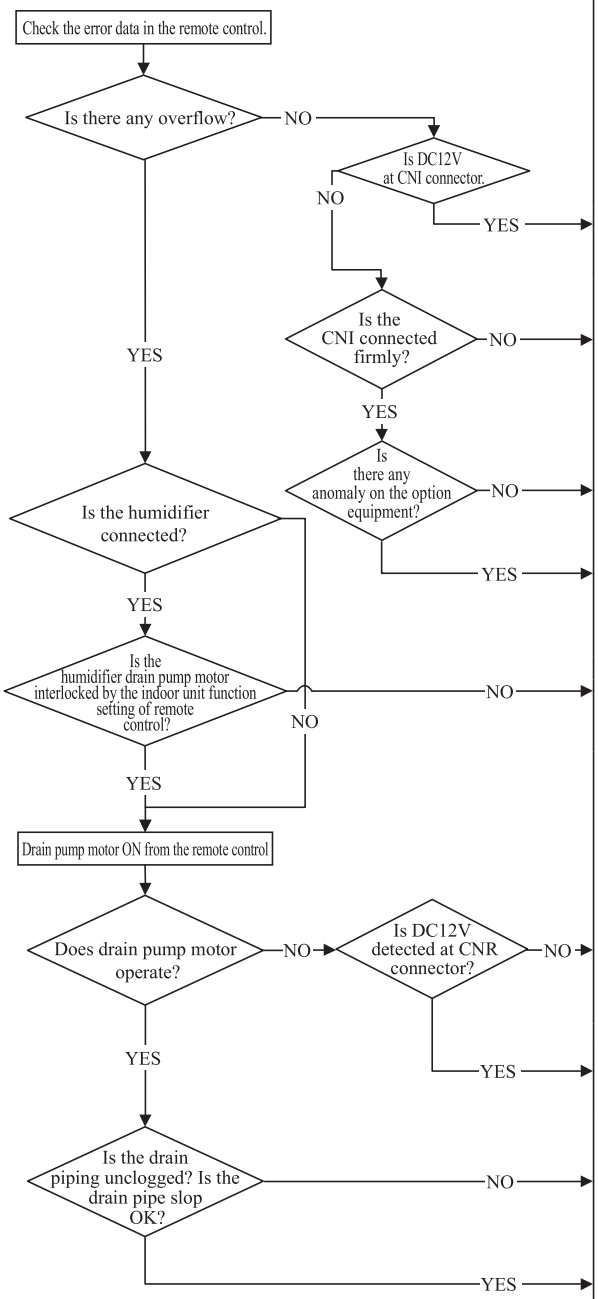
## 3. Condition of error displayed

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

## 4. Presumable cause

- Defective indoor unit control PCB
- Float switch setting error
- Humidifier drain pump motor interlock setting error
- Option equipment setting error
- Drain piping error
- Defective drain pump motor
- Disconnection of drain pump motor wiring

## 5. Troubleshooting




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

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E10 | Indoor | Keeps flashing | Stays OFF | Excessive number of connected indoor units (more than 17 units) by controlling with one remote control |

## 1.Applicable model

All models

## 2.Error detection method

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

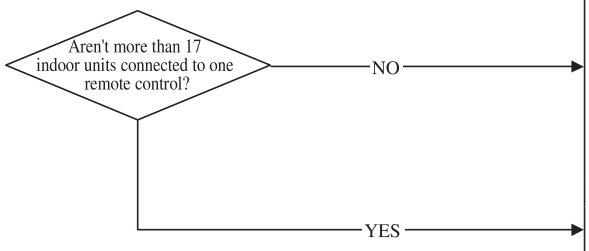
## 3.Condition of error displayed

Same as above

## 4.Presumable cause

- Excessive number of indoor units connected
- Defective remote control

## 5.Troubleshooting




| Diagnosis | Countermeasure |
|---|---|
| Aren't more than 17 indoor units connected to one remote control? NO | Defective remote control → Replace. |
| Aren't more than 17 indoor units connected to one remote control? YES | Reduce to 16 or less units. |

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E11 | Indoor | Keeps flashing | Keeps flashing | Address setting error of indoor units |

## 1.Applicable model

All models

## 2.Error detection method

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

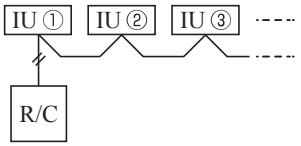
## 3.Condition of error displayed

Same as above

## 4.Presumable cause

Same as above

## 5.Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| E11 occurs<br>Is “Master IU address set” function of remote control used?<br>YES<br>In case the wiring is below and “Mastar IU address set” is used, E11 is appeared.<br>  | • In cases of RC-EX3A Menu → Service setting → IU settings → Select IU<br>• In cases of RC-E5 Return address No. to “IU …” using [ ▲ ] or [ ▼ ] button. |

Note:

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

## 1.Applicable model

All models

## 2.Error detection method

When communication error between master and slave indoor units occurs

## 3.Condition of error displayed

Same as above

## 4.Presumable cause

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

## 5.Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| Is it OK the unit address setting for master and slave indoor units? → NO | Correct unit address setting. |
| YES → Isn't the remote control 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<br>• Check surrounding environment. |

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

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

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E16 | Indoor | Keeps flashing | 1-time flash | Indoor fan motor anomaly |

## 1.Applicable model

All models

## 2.Error detection method

Detected by rotation speed of indoor fan motor

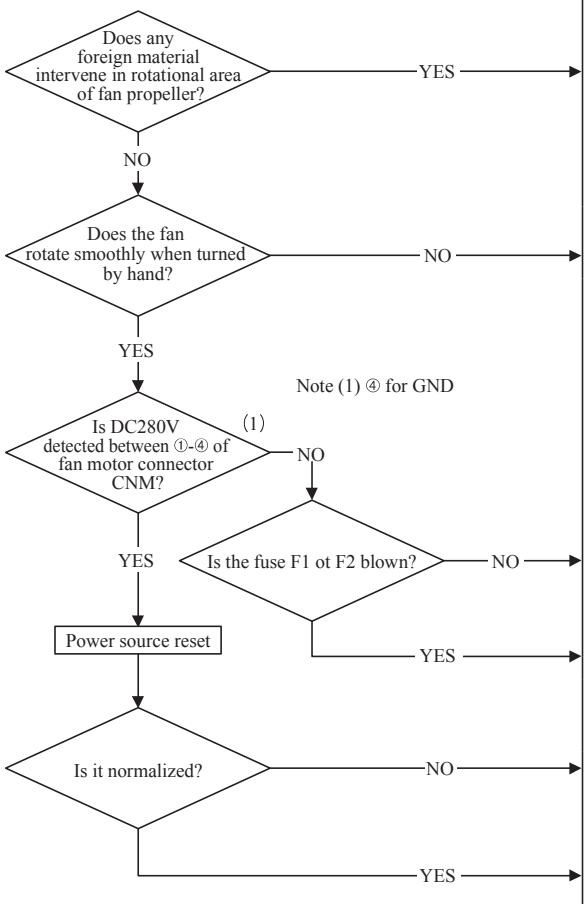
## 3.Condition of error displayed

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

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E19 | Indoor | Keeps flashing | 1-time flash | Indoor unit operation check, drain pump moter check setting error |

## 1.Applicable model

All models

## 2.Error detection method

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

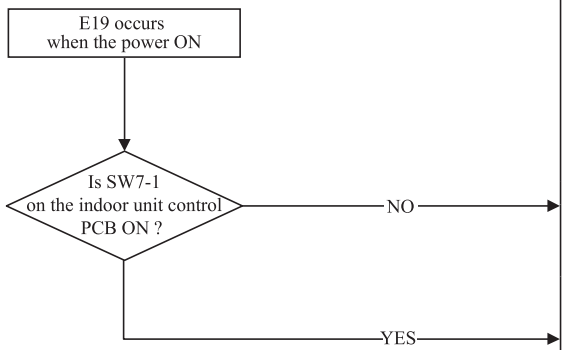
## 3.Condition of error displayed

Same as above

## 4.Presumable cause

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

## 5.Troubleshooting




| Diagnosis | Countermeasure |
|---|---|
| Is SW7-1 on the indoor unit control PCB ON ? NO | Defective indoor unit control PCB (Defective SW7)→Replace. |
| Is SW7-1 on the indoor unit control PCB ON ? YES | Turn SW7-1 on the indoor unit control PCB OFF and reset the power. |

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E20 | Indoor | Keeps flashing | 1-time flash | Indoor fan motor rotation speed anomaly |

## 1.Applicable model

All models

## 2.Error detection method

Detected by rotation speed of indoor fan motor

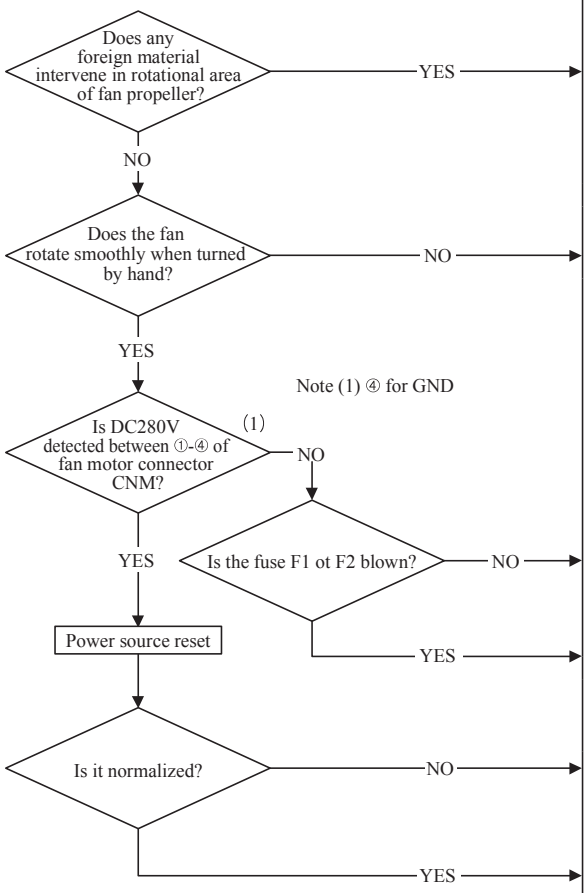
## 3.Condition of error displayed

When the actual fan rotation speed does not reach to the speed of [required speed -50 $min^{-1}$] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly.

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E28 | Indoor | Keeps flashing | Stays OFF | Remote control temperature sensor anomaly |

## 1.Applicable model

All models

## 2.Error detection method

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

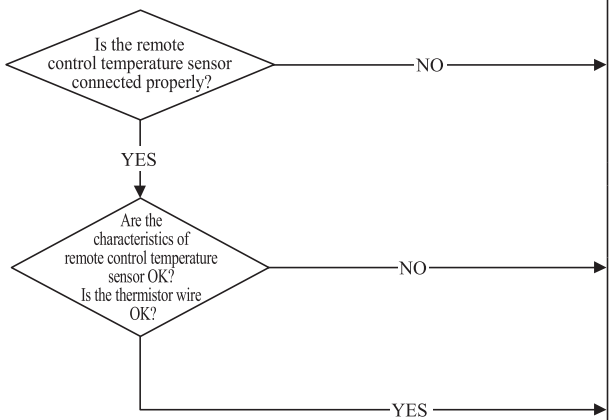
## 3.Condition of error displayed

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




Resistance-temperature 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 |

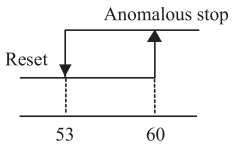
Note: After 10 seconds has passed since remote control temperature sensor was switched from valid to invalid, E28 will not be displayed even if the sensor harness is disconnected. At same time the sensor, which is effective, is switched from remote control temperature sensor to indoor return air temperature 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 | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E35 | Indoor | Keeps flashing | Stays OFF | Cooling overload operation |

## 1.Applicable model

All models

## 2.Error detection method




Outdoor heat exchanger temperature (°C)

## 3.Condition of error displayed

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

## 4.Presumable cause

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

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

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E36 | Indoor | Keeps flashing | Stays OFF | Discharge pipe temperature error |

## 1.Applicable model

All models

## 2.Error detection method

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

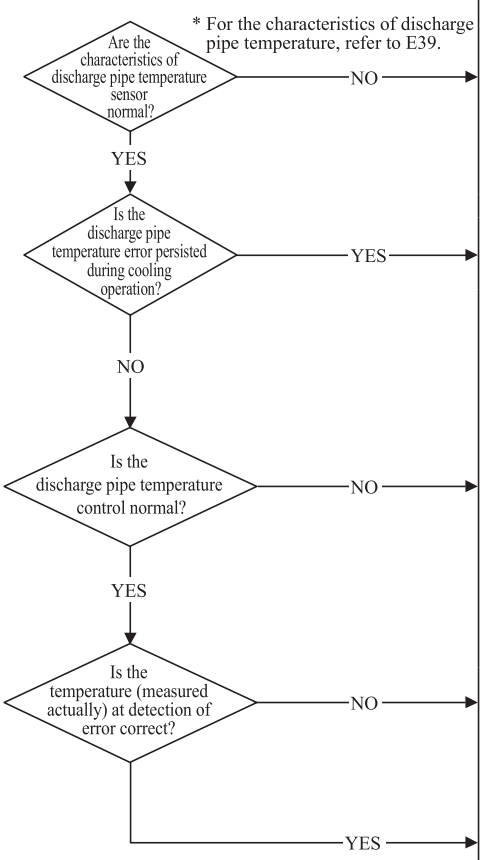
## 3.Condition of error displayed

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

## 4.Presumable cause

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

## 5.Troubleshooting




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

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E37 | Indoor | Keeps flashing | Stays OFF | Outdoor heat exchanger temperature sensor anomaly |

## 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

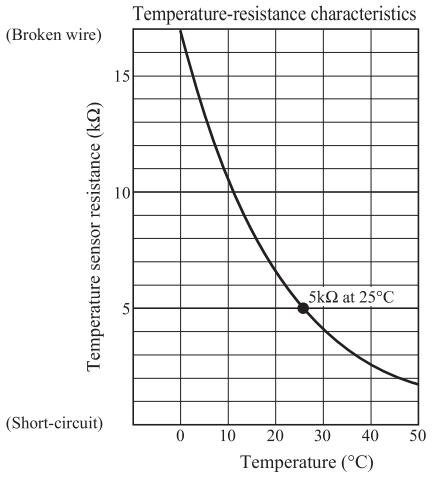
- When the temperature sensor detects-55°C or lower for 20 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.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

## 4.Presumable cause

- Defective outdoor unit main or sub 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 main or sub PCB→Replace. (Defective outdoor heat exchanger temperature sensor input circuit) |




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E38 | Indoor | Keeps flashing | Stays OFF | Outdoor air temperature sensor anomaly |

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

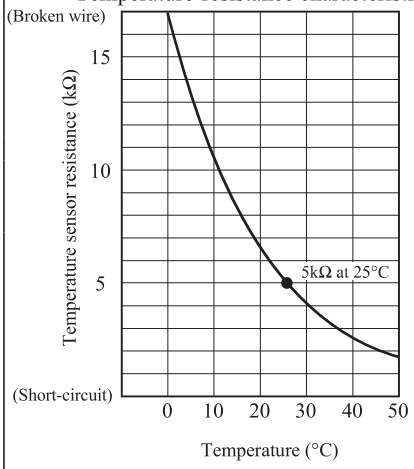
## 4. Presumable cause

- Defective outdoor unit 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 → Is the characteristics of the outdoor air temperature sensor OK? (For the characteristics of outdoor air temperature sensor, see the following graph.) — NO | Defective outdoor air temperature sensor→Replace. |
| YES | Defective outdoor unit main PCB→Replace. (Defective outdoor air temperature sensor input circuit) |

Temperature-resistance characteristics




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E39 | Indoor | Keeps flashing | Stays OFF | Discharge pipe temperature sensor anomaly |

## 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

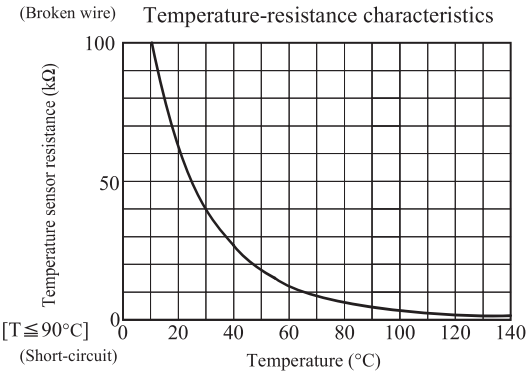
When the temperature sensor detects -25°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.

## 4.Presumable cause

- Defective outdoor unit 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 main PCB→Replace. (Defective temperature sensor input circuit) |




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E40 | Indoor | Keeps flashing | Stays OFF | Service valve (gas side) closing operation |

## 1.Applicable model

All models

## 2.Error detection method

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

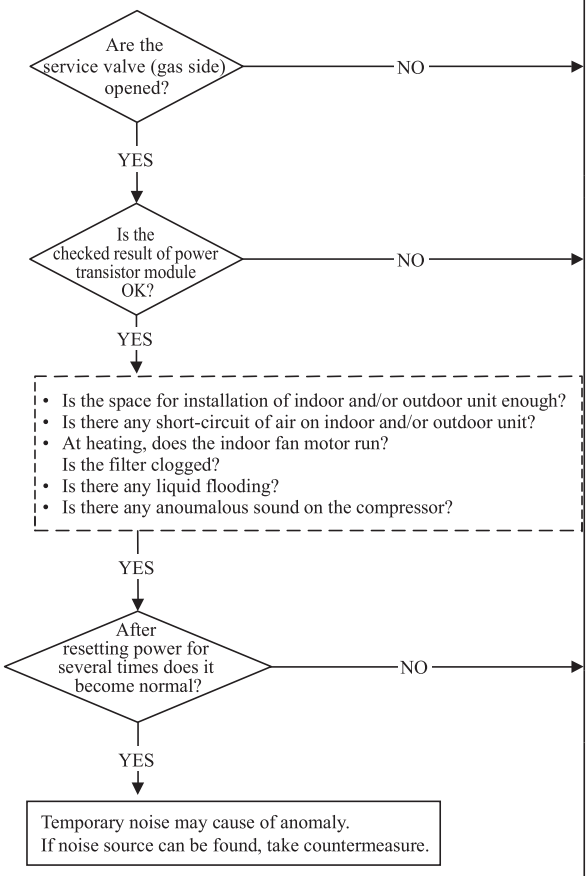
## 3.Condition of error displayed

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

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E42 | Indoor | Keeps flashing | Stays OFF | Current cut (1/2) |

## 1.Applicable model

All models

## 2.Error detection method

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

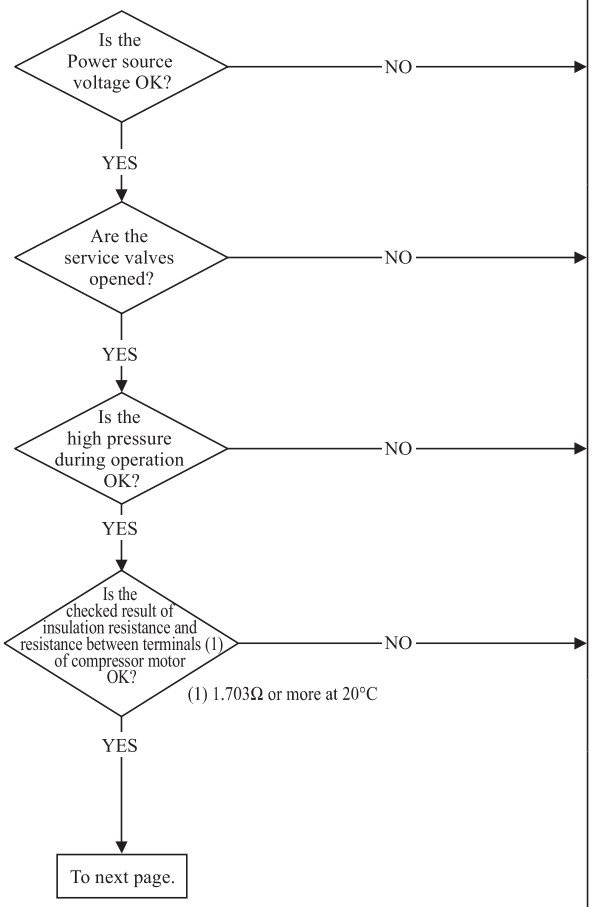
## 3.Condition of error displayed

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

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E42 | Indoor | Keeps flashing | Stays OFF | Current cut (2/2) |

## 1.Applicable model

All models

## 2.Error detection method

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

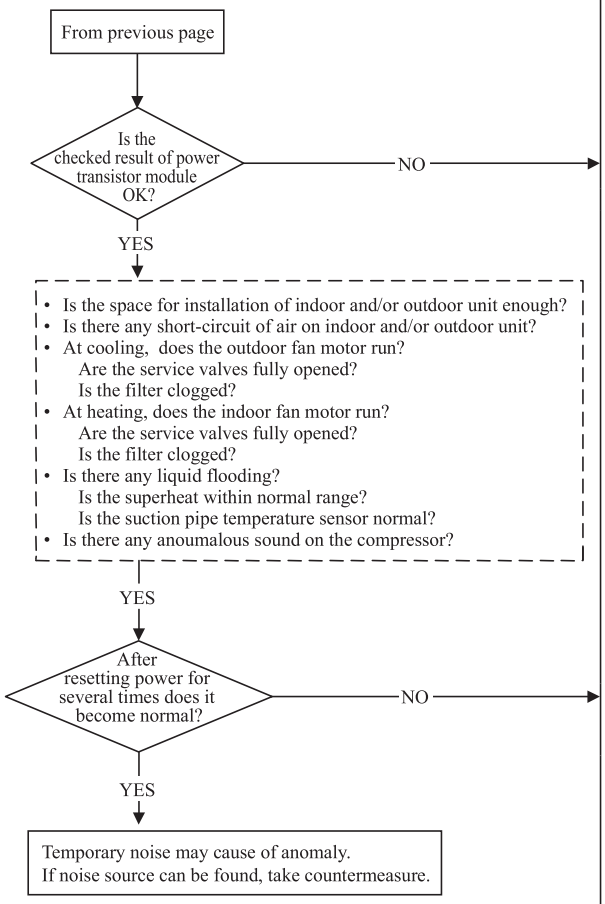
## 3.Condition of error displayed

- If the output current of inverter exceeds the specifications, it makes the compressor stopping.

## 4.Presumable cause

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

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E45 | Indoor | Keeps flashing | Stays OFF | Outdoor unit sub PCB communication error |

## 1.Applicable model

All models

## 2.Error detection method

Detected communication error of more than 15 seconds 4 times in 15 minutes.

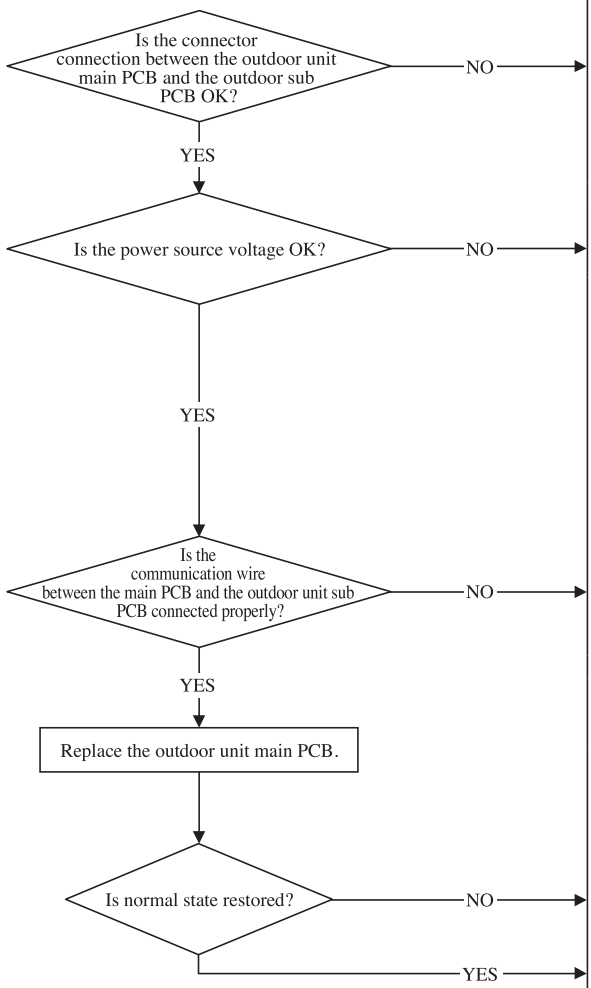
## 3.Condition of error displayed

When communication is not established between the outdoor unit sub PCB and the outdoor main PCB.

## 4.Presumable cause

- Defective outdoor unit sub PCB
- Defective connector between the outdoor unit main PCB and outdoor unit sub PCB
- Defective outdoor unit main PCB

## 5.Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E47 | Indoor | Keeps flashing | Stays OFF | Active filter voltage error |

## 1.Applicable model

All models

## 2.Error detection method

Error is displayed if the converter voltage exceeds DC340V (3 times within 20 minutes). Remote control may be set after 3-minute delay.

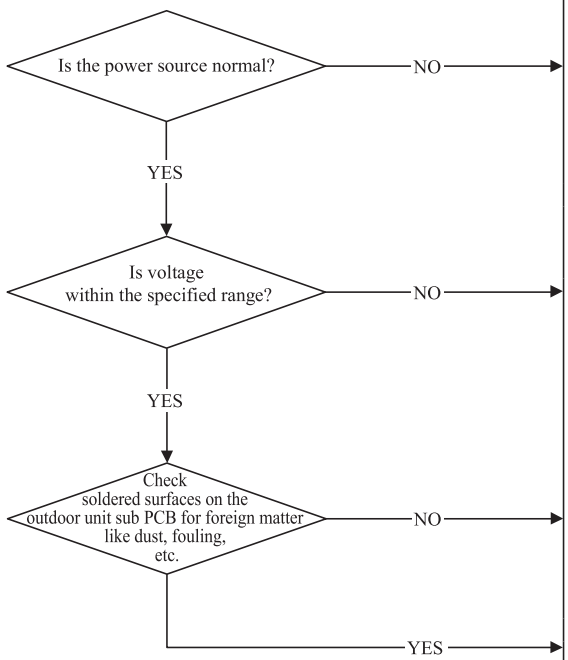
## 3.Condition of error displayed

Same as above

## 4.Presumable cause

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

## 5.Troubleshooting




- If the overvoltage (DC voltage is higher than 400V) occurs, the system shut down to protect the unit.

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E48 | Indoor | Keeps flashing | Stays OFF | Outdoor fan motor anomaly |

## 1.Applicable model

All models

## 2.Error detection method

Detected by rotation speed of outdoor fan motor

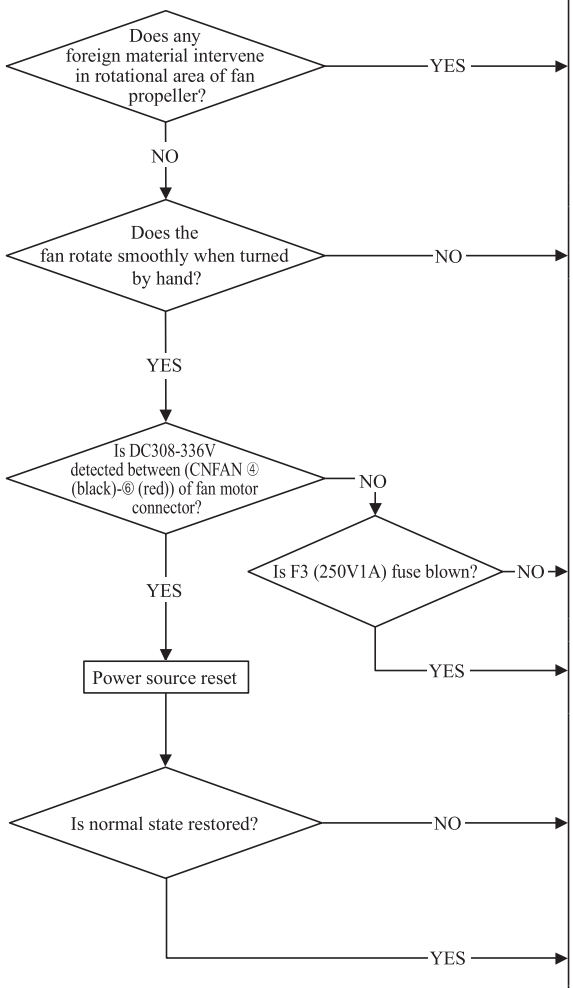
## 3.Condition of error displayed

When actual rotation speed of outdoor fan motor drops to 75min$^{-1}$ or lower for 30 minutes continuously, the compressor and the outdoor fan motor stop. After 3-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 main PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor unit main PCB
- Blown F3 fuse

## 5.Troubleshooting




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

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E51 | Indoor | Keeps flashing | Stays OFF | Power transistor anomaly |

## 1. Applicable model

All models

## 2. Error detection method

Power transistor primary current

## 3. Condition of error displayed

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

## 4. Presumable cause

- Outdoor unit main PCB anomaly
- Dust on outdoor unit main PCB
- Blown F2 fuse

## 5. Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| Check soldered surfaces on the outdoor unit main PCB for foreign matter like dust, fouling,etc. → NO | Remove foreign matter like dust, fouling, etc. |
| YES → Isn't F8 fuse (250V, 20A)blown? → YES | Replace fuse. |
| NO | Defective outdoor unit main PCB➞Replace. |

Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E53 | Indoor | Keeps flashing | Stays OFF | Suction pipe temperature sensor anomaly |

## 1.Applicable model

All models

## 2.Error detection method

Detection of anomalously low temperature (resistance) on suction pipe temperature sensor

## 3.Condition of error displayed

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

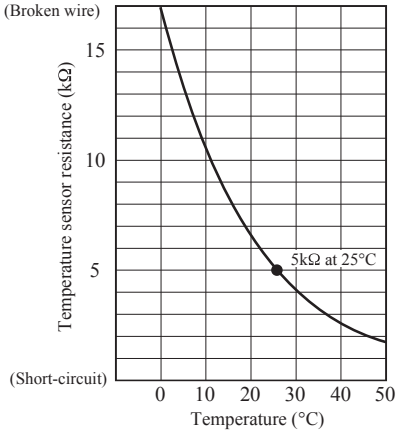
## 4.Presumable cause

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

## 5.Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| Is the suction pipe temperature sensor connector connected properly? → NO | Correct connector. |
| YES → Is the characteristics of the suction pipe temperature sensor OK? (For the characteristics of suction pipe temperature sensor, see the following graph.) → NO | Defective suction pipe temperature sensor→ Replace. |
| YES | Defective outdoor unit sub PCB→Replace. (Defective suction pipe temperature sensor input circuit) |

Temperature-resistance characteristics




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E57 | Indoor | Keeps flashing | Stays OFF | Insufficient refrigerant amount or detection of service valve closure |

## 1.Applicable model

All models

## 2.Error detection method

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

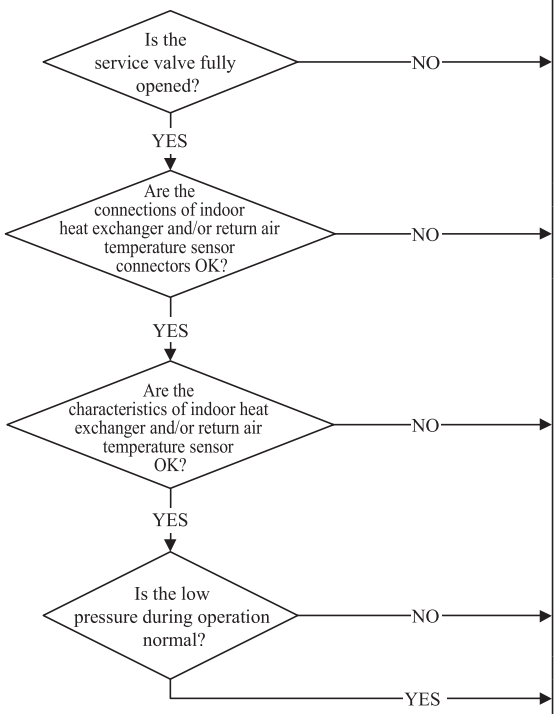
## 3.Condition of error displayed

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

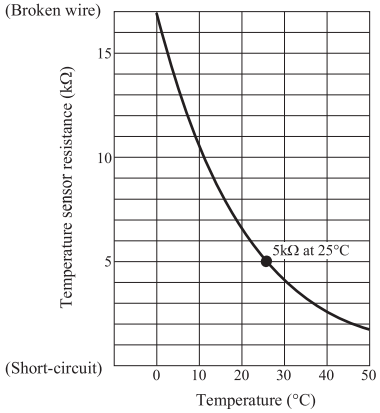
## 4.Presumable cause

- Defective indoor heat exchanger temperature sensor
- Defective indoor return air temperature sensor
- Defective indoor unit control PCB
- Insufficient refregerant amount

## 5.Troubleshooting




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




Note: When the compressor speed is 60 rps or under at 5 minutes after the start of compressor or the completion of defrost operation, the low refrigerant protection control judges, by detecting the difference between the indoor heat exchanger temperature (Thi-R) and the indoor return air temperature (Thi-A), that it is in the state of gas leakage, and stops the compressor.
Cooling: Indoor return air temperature (Thi-A) – Indoor heat exchanger temperature (Thi-R) ≧ 4℃
Heating: Indoor heat exchanger temperature (Thi-R) – Indoor return air temperature (Thi-A) ≦ 6℃

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E58 | Indoor | Keeps flashing | Stays OFF | Current safe stop |

## 1. Applicable model

All models

## 2. Error detection method

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

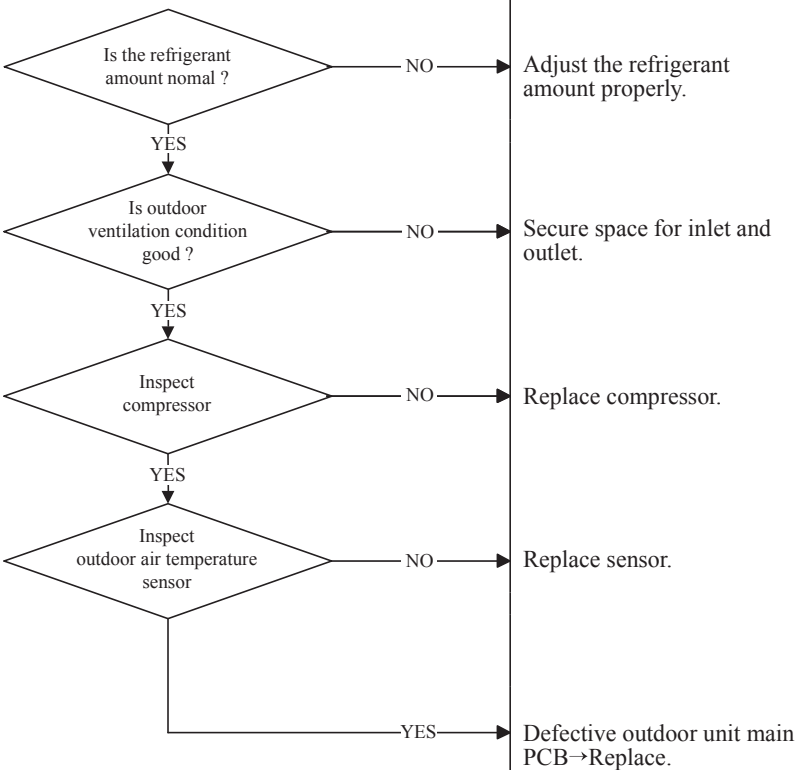
## 3. Condition of error displayed

Same as above

## 4. Presumable cause

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

## 5. Troubleshooting




Note:

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E59 | Indoor | Keeps flashing | Stays OFF | Compressor startup failure |

## 1.Applicable model

All models

## 2.Error detection method

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

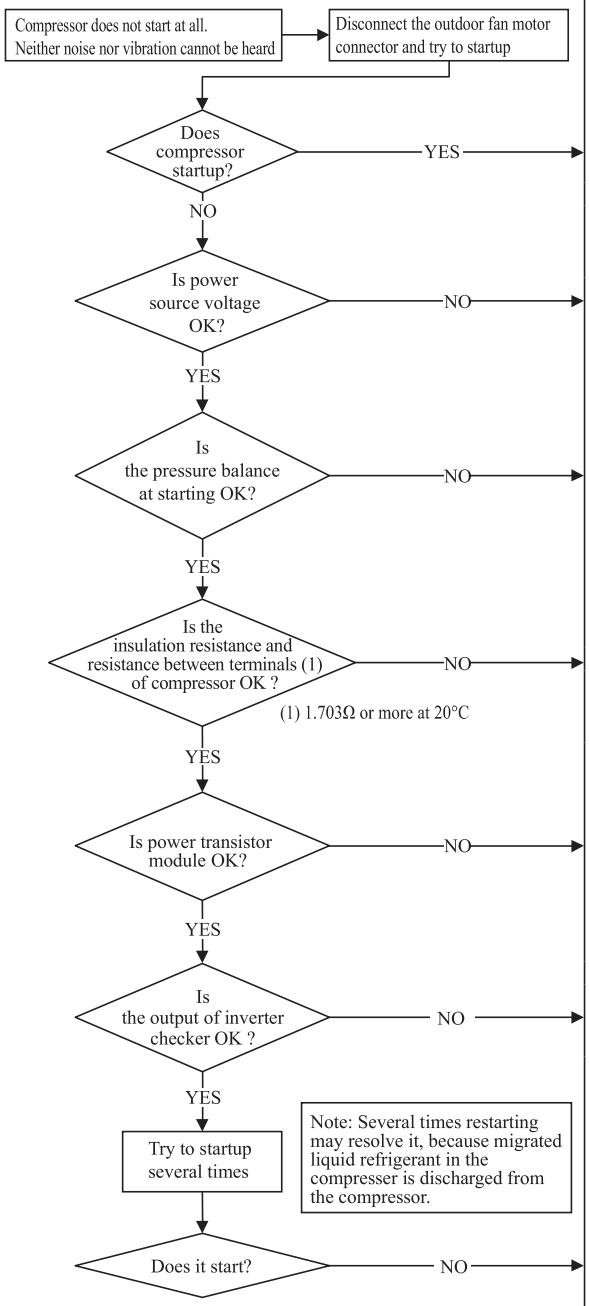
## 3.Condition of error displayed

If compressor fails to startup for 42 times

## 4.Presumable cause

- Outdoor fan motor anomaly
- Outdoor unit main PCB anomaly
- 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 whether the electric leakage breake conforms to high-hermonic specifications (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

| Error code | LED | Green | Red | Content |
|---|---|---|---|---|
| Remote control: E60 | Indoor | Keeps flashing | Stays OFF | Compressor rotor lock error |

## 1.Applicable model

All models

## 2.Error detection method

Compressor rotor position

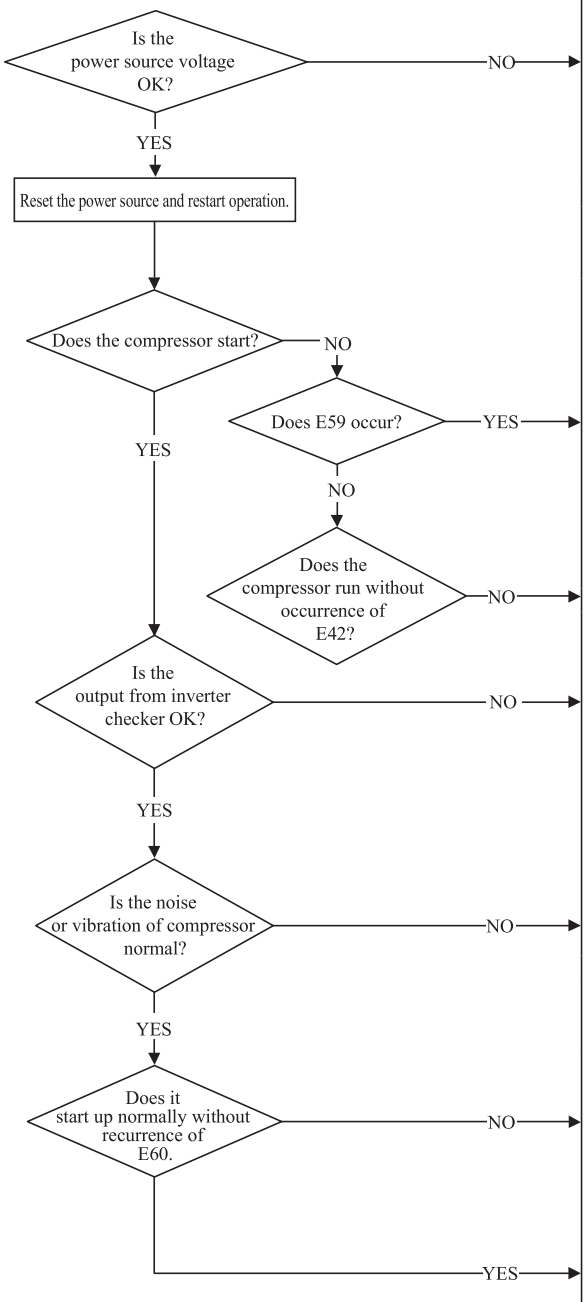
## 3.Condition of error displayed

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

## 4.Presumable cause

- Defective outdoor fan motor
- Defective outdoor unit main 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 whether the electric leakage breake conforms to high-hermonic specifications (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

# 3. ELECTRICAL WIRING

**(1) Outdoor unit**

**Models SCM40ZS-W, 45ZS-W**

Meaning of marks

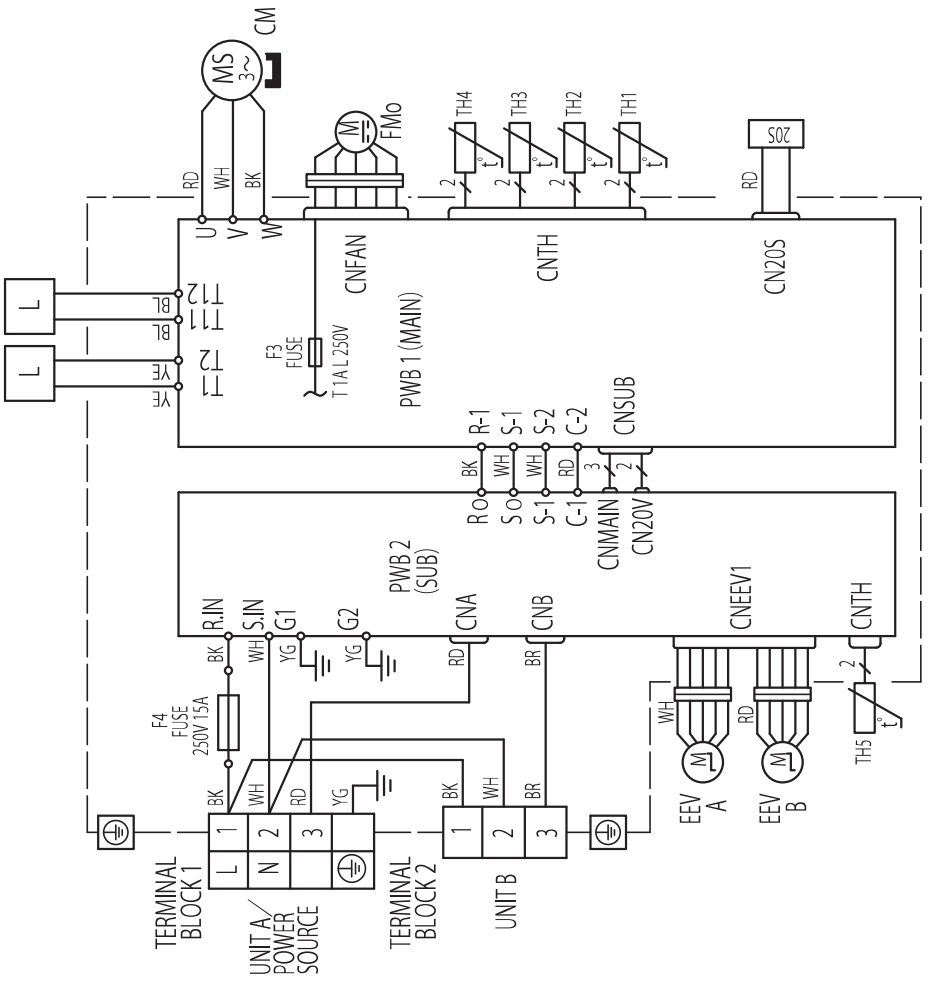
| Item | Description |
|---|---|
| CN20S<br>CN20V<br>CNA<br>CNB<br>CNEEV1<br>CNFAN<br>CNMAIN<br>CNSUB<br>CNTH | Connector |

| Item | Description |
|---|---|
| 20S | 4-way valve (coil) |
| CM | Compressor motor |
| EEV A,EEV B | Electric expansion valve (coil) |
| FMo | Fan motor |
| L | Reactor |
| TH1 | Heat exchanger temperature sensor 1 |
| TH2 | Outdoor air temperature sensor |
| TH3 | Discharge pipe temperature sensor |
| TH4 | Suction pipe temperature sensor |
| TH5 | Heat exchanger temperature sensor 2 |

Color marks

| Mark | Color |
|---|---|
| BK | Black |
| RD | Red |
| WH | White |
| BL | Blue |

| Mark | Color |
|---|---|
| YE | Yellow |
| YG | Yellow/Green |
| BR | Brown |




Power cable, indoor-outdoor connecting wires

| Model name | MAX running current (A) | Power cable wire size x number* | Power cable length (m) | Connecting cable wire size x number* |
|---|---|---|---|---|
| SCM40ZS-W<br>SCM45ZS-W | 14 | 2.5mm² x 3 | 18 | 1.5mm² x 4 |

* The wire numbers include earth wire (Yellow/Green).
- Switchgear or circuit breaker capacity should be chosen according to national or regional electricity regulations.
- The power 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 national or regional electricity regulations.

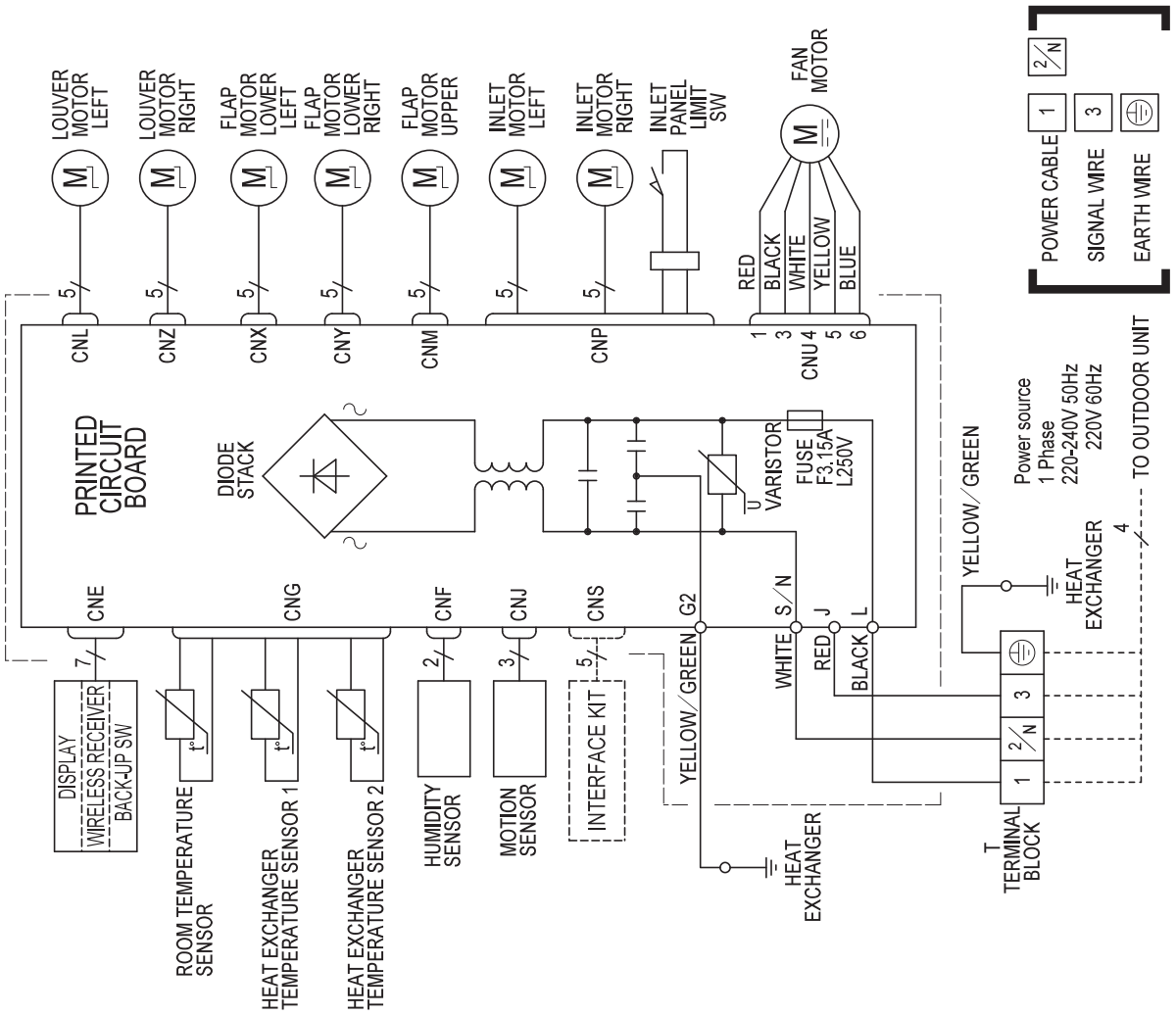
RWC000Z328

**(2) Indoor unit**

**(a) Wall mounted type (SRK, SKM)**

**Models SRK20ZSX-W, 25ZSX-W, 35ZSX-W**
**SRK20ZSX-WB, 25ZSX-WB, 35ZSX-WB**
**SRK20ZSX-WT, 25ZSX-WT, 35ZSX-WT**

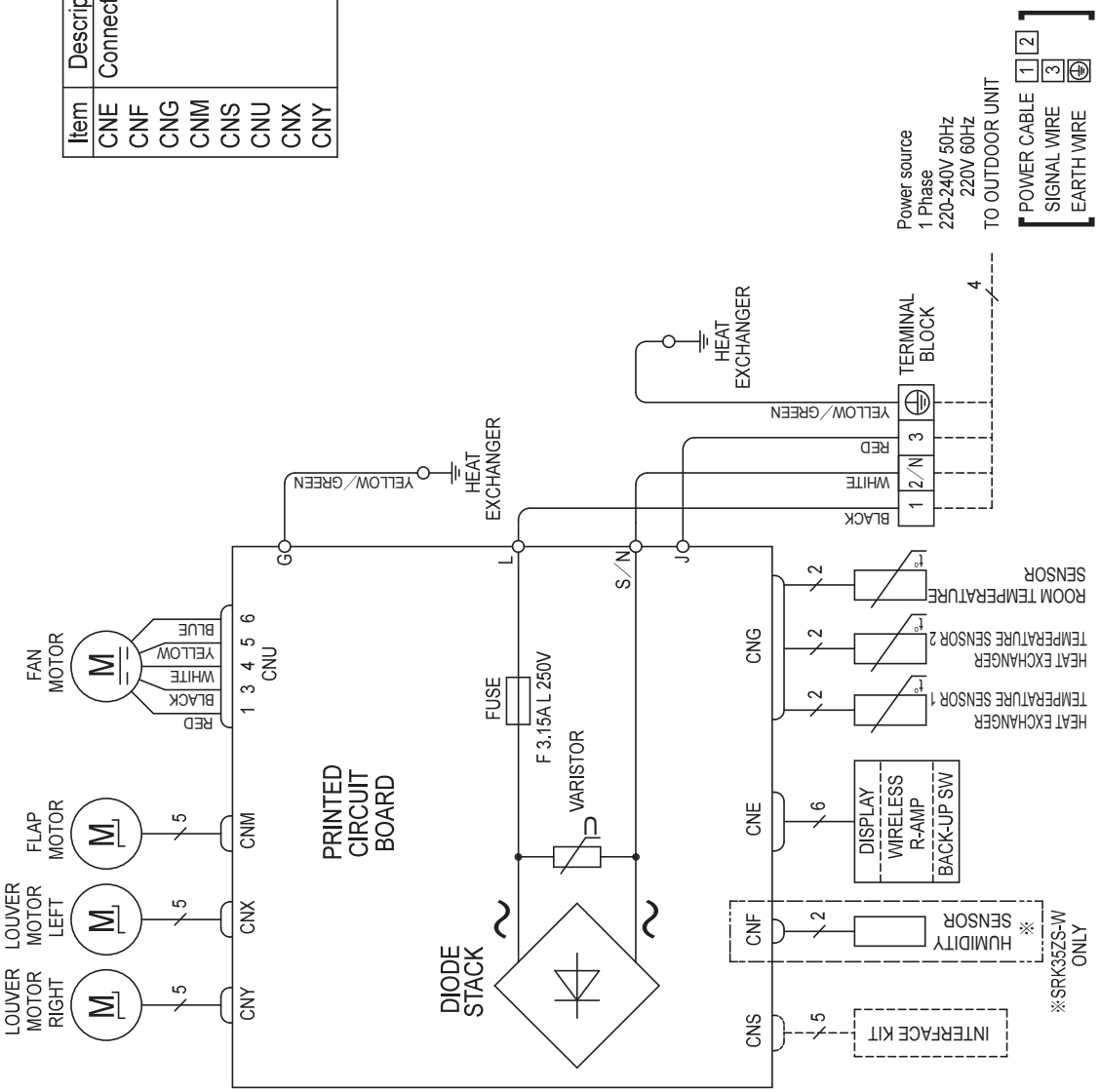
| Item | Description |
|---|---|
| | Connector |
| CNE | |
| CNF | |
| CNG | |
| CNJ | |
| CNL | |
| CNM | |
| CNP | |
| CNS | |
| CNU | |
| CNX | |
| CNY | |
| CNZ | |




RWA000Z413

**Models SRK20ZS-W, 25ZS-W, 35ZS-W**
**SRK20ZS-WB, 25ZS-WB, 35ZS-WB**
**SRK20ZS-WT, 25ZS-WT, 35ZS-WT**

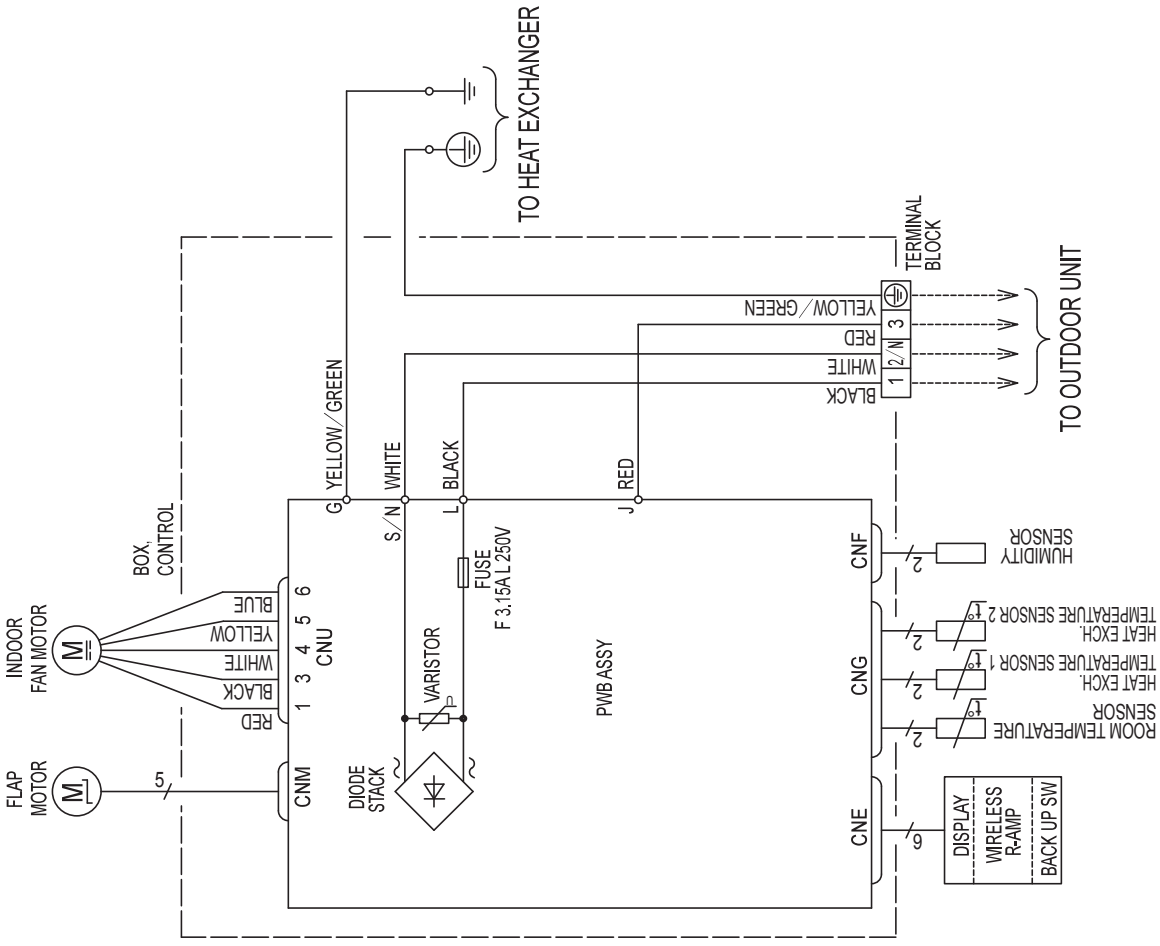
| Item | Description |
|---|---|
| CNE | Connector |
| CNF | |
| CNG | |
| CNM | |
| CNS | |
| CNU | |
| CNX | |
| CNY | |




RWA000Z416

**Models SKM20ZSP-W, 25ZSP-W, 35ZSP-W**

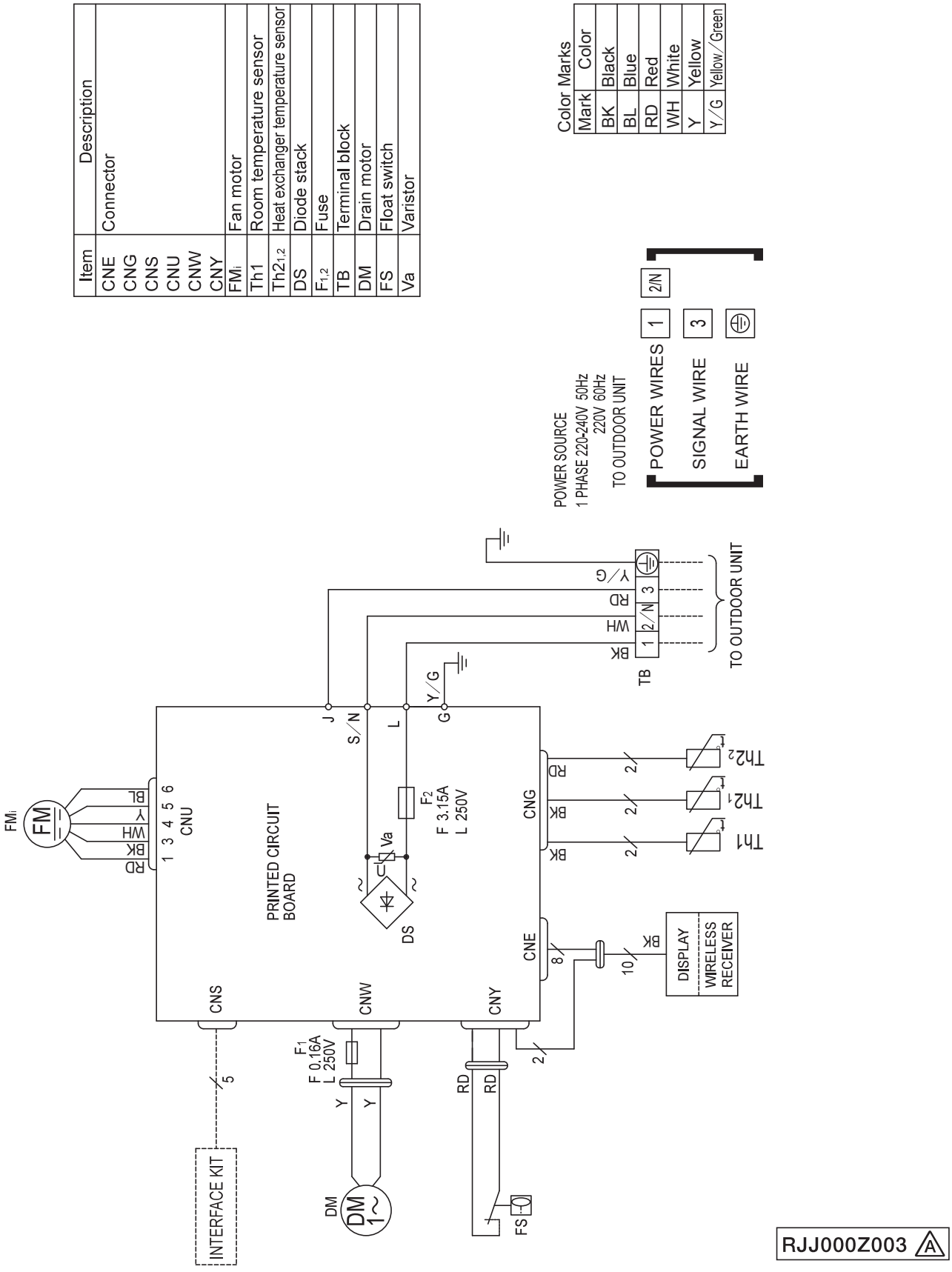
| Item | Description |
|---|---|
| CNE | Connector |
| CNF | |
| CNG | |
| CNM | |
| CNU | |




RLC000Z110

**(2) Ceiling concealed type**

**Models SRR25ZM-W, 35ZM-W**



### (3) 4-way ceiling cassette type (FDTC)

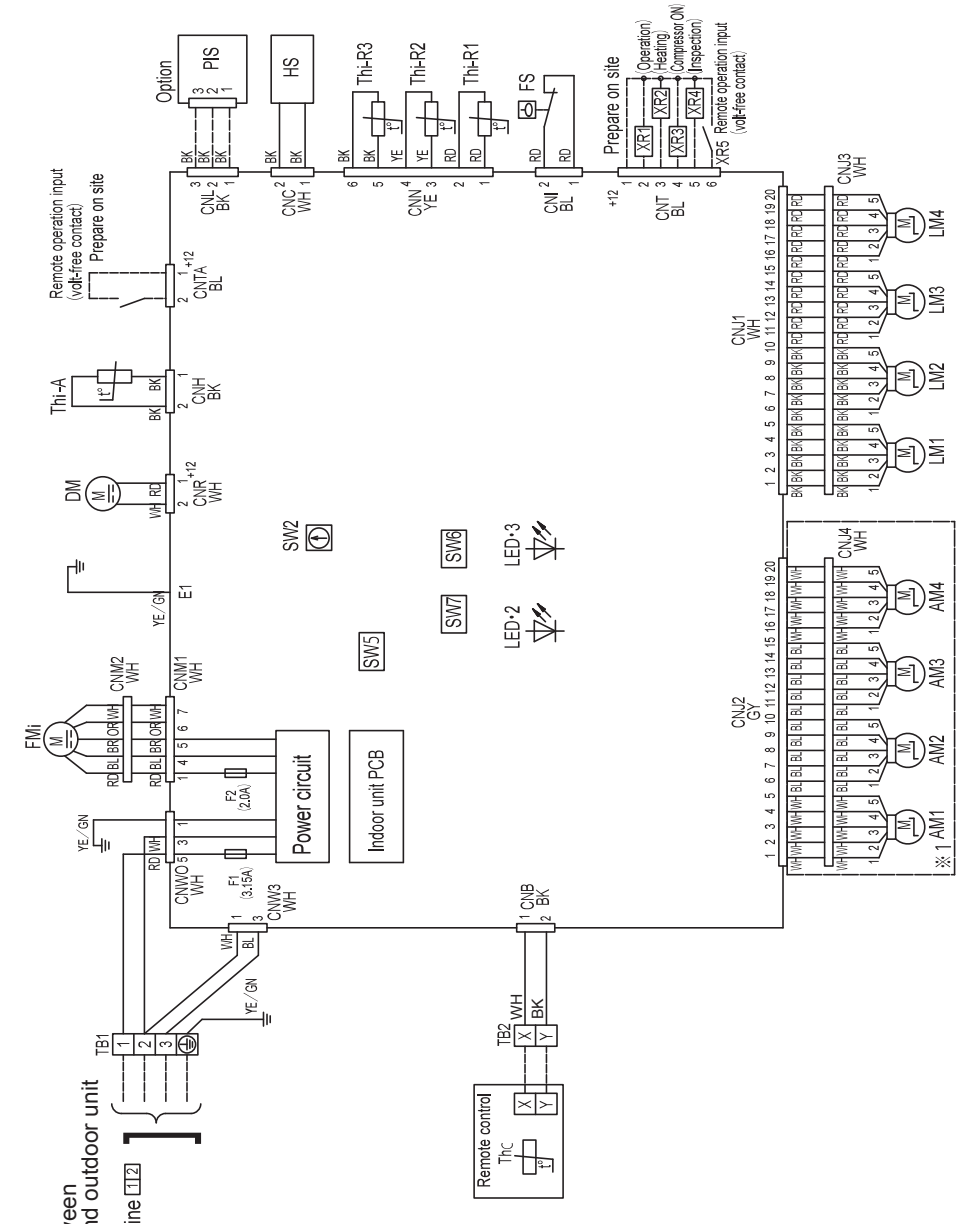
**Models FDTC25VH, 35VH**

Meaning of marks

| Item | Description |
|---|---|
| AM1 - 4 | Draft prevention function motor |
| CNB - Z | Connector |
| DM | Drain pump motor |
| F1,2 | Fuse |
| FMi | Fan motor |
| FS | Float switch |
| HS | Humidity sensor |
| LED･2 | Indication lamp (Green-Nomal operation) |
| LED･3 | Indication lamp (Red-Inspection) |
| LM1-4 | Louver motor |
| PIS | Motion sensor |
| SW2 | Remote control communication address |
| SW5 | Plural units Master/ Slave setting |
| SW6 | Model capacity setting |
| SW7-1 | Operation check,drain pump motor test run |
| TB1 | Terminal block (Power source) (□ mark) |
| TB2 | Terminal block (Signal line) (□ mark) |
| ThC | Temperature sensor (Remote control) |
| Thi-A | Temperature sensor (Return air) |
| Thi-R1,2,3 | Temperature sensor (Heat exchanger) |

Color marks

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

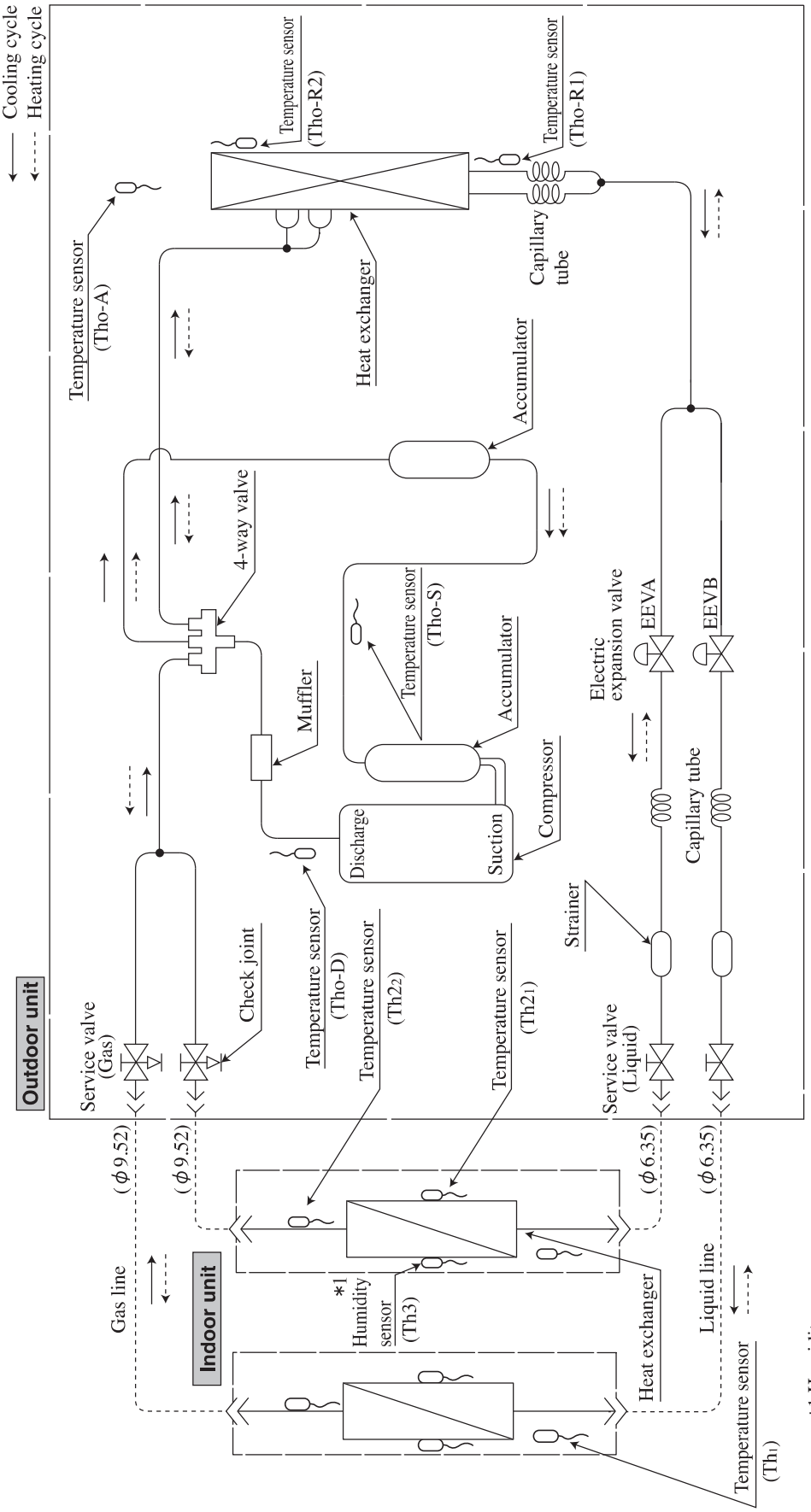



Notes 1. ---- indicates wiring on site.
2. See the wiring diagram of outdoor unit about the line between indoor unit and outdoor unit.
3. Use twin core cord (0.3mm$^2$) at remote control line.
See spec sheet of remote control in case that the total length is more than 100m.
4. Do not put remote control line alongside power source line.
5. Draft prevention function (※1) is provided on the panel TC-PSAE-5AW-E only.

PJF000Z516 A

# 4. PIPING SYSTEMS

**Models SCM40ZS-W, 45ZS-W**




*1 Humidity sensor
SRK-ZSX-W series, SRK35ZS-W, SKM-ZSP-W series and FDTC series only.

# INVERTER MULTI-SPLIT SYSTEM
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