



SERVICE MANUAL

VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS

(OUTDOOR UNIT)

KXZ series (Heat pump type)

FDC121KXZEN1, 140KXZEN1, 155KXZEN1 (1 Phase)
FDC121KXZES1, 140KXZES1, 155KXZES1 (3 Phase)

- Note:
(1) Regarding the Indoor unit series, refer to the No. '17 • KX-T-266 and '18 • KX-T-281.

CONTENTS

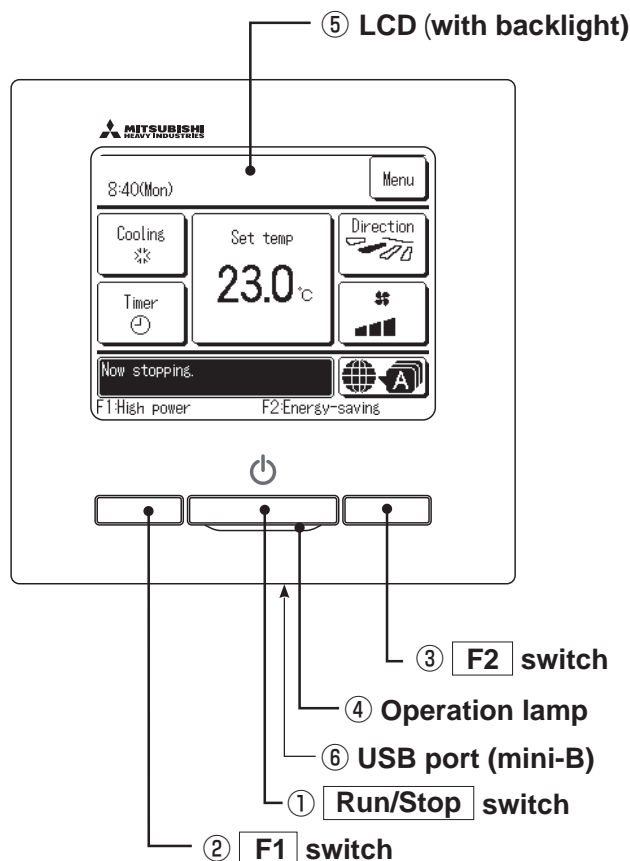
1. OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER	2
1.1 Remote control (Option parts)	2
1.2 Operation control function by the wired remote control	5
1.3 Operation control function by the indoor control	10
1.4 Operation control function by the outdoor control	25
2. SYSTEM TROUBLESHOOTING PROCEDURE	59
2.1 Basics of troubleshooting	59
2.2 Explanation of troubleshooting	60
2.3 Contents of troubleshooting	61
2.4 Outdoor unit control PCB replacement procedure	116
3. ELECTRICAL WIRING	121
4. PIPING SYSTEM.....	123
5. APPLICATION DATA	124
6. OUTDOOR UNIT DISASSEMBLY PROCEDURE	140
7. INDOOR UNIT DISASSEMBLY PROCEDURE	142

1. OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

1.1 Remote control (Option parts)

(1) Wired remote control

(a) 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.

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.)

② F1 switch ③ F2 switch

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

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).

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.

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.

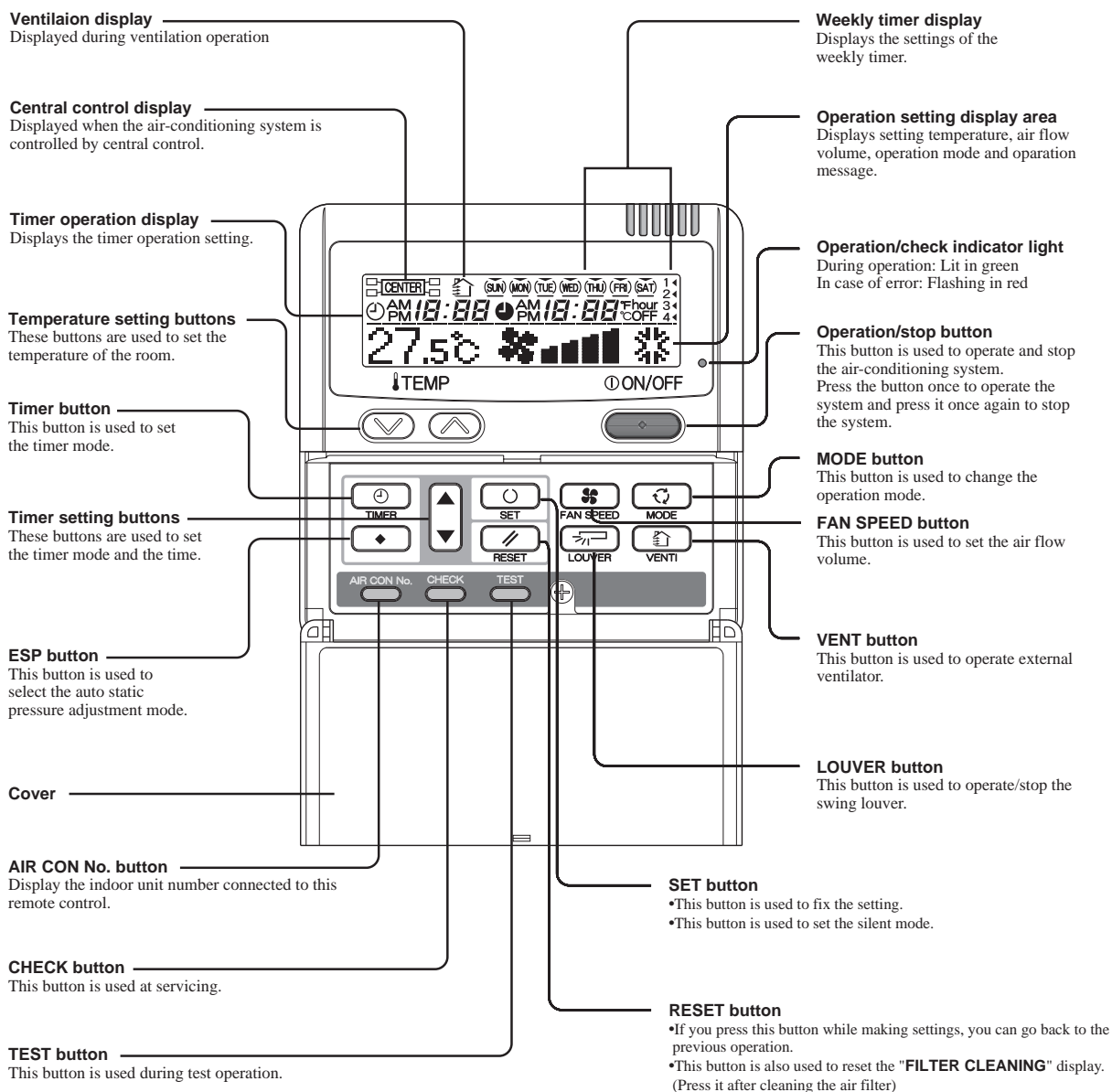
⑤ LCD (with backlight)

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.

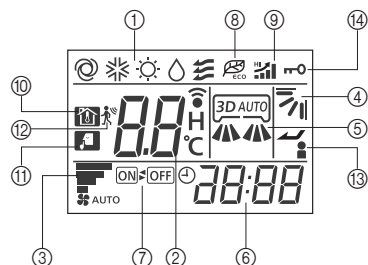
(b) Model RC-E5

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.

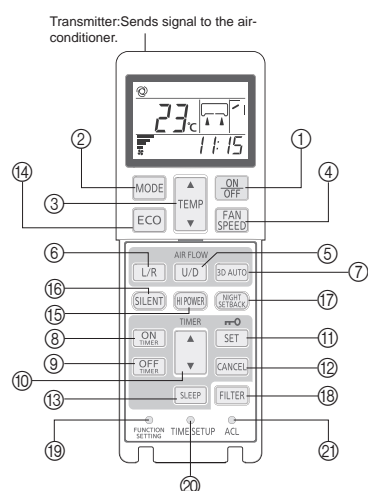
The figure below shows the remote control with the cover opened.



* All displays are described in the liquid crystal display for explanation.

(2) Wireless remote control**Model RCN-E2****Indication section**

①	OPERATION MODE display SET TEMP display	Indicates selected operation mode. Indicates set temperature.
②	SLEEP TIMER time display Indoor function setting number display	Indicates the amount of time remaining on the sleep timer. Indicates the setting number of the indoor function setting.
③	FAN SPEED display	Indicates the selected air flow volume.
④	UP/DOWN AIR FLOW display	Indicates the up/down louver position.
⑤	LEFT/RIGHT AIR FLOW display	Indicates the left/right louver position.
⑥	Clock display	Indicates the current time. If the timer is set, the ON TIMER and OFF TIMER setting times are indicated.
⑦	ON/OFF TIMER display	Displayed when the timer is set.
⑧	ECO mode display	Displayed when the energy-saving operation is active.
⑨	HI POWER display	Displayed when the high power operation is active.
⑩	NIGHT SETBACK display	Displayed when the home leave mode is active.
⑪	SILENT display	Displayed when the silent mode control is active.
⑫	Motion sensor display	Displayed when the infrared sensor control(motion sensor control) is enabled.
⑬	Anti draft setting display	Displayed when anti draft setting is enabled.
⑭	Child lock display	Displayed when child lock is enabled.

Operation section

①	ON/OFF button	When this is pressed once, the air-conditioner starts to operate and when this is pressed once again, it stops operating.
②	MODE button	Every time this button is pressed, displays switch as below <div style="border: 1px solid black; padding: 2px; display: inline-block;"> (AUTO) → (COOL) → (HEAT) (FAN) ← (DRY) </div>
③	TEMP button	Change the set temperature by pressing ▲ or ▼ button.
④	FAN SPEED button	The fan speed is switched in the following order: 1-speed → 2-speed → 3-speed → 4-speed → AUTO → 1-speed.
⑤	U/D button	Used to determine the up/down louver position.
⑥	L/R button	Used to determine the left/right louver position.
⑦	3D AUTO button	Used to switch whether or not to enable or disable 3D AUTO mode.
⑧	ON TIMER button	Used to set the ON TIMER.
⑨	OFF TIMER button	Used to set the OFF TIMER.
⑩	SELECT button	Used to switch the time when setting the timer or adjusting the time. Used to switch the settings of the indoor function.
⑪	SET button	Used to determine the setting when setting the timer or adjusting the time. Used to determine the settings of the indoor function. When press and hold SET button ,Child Lock is enabled.
⑫	CANCEL button	Used to cancel the timer setting.
⑬	SLEEP button	Used to set the sleep timer.
⑭	ECO button	Pressing this button starts the energy-saving operation. Pressing this button again cancels it.
⑮	HI POWER button	Pressing this button starts the high power operation. Pressing this button again cancels it.
⑯	SILENT button	Pressing this button starts the silent mode control. Pressing this button again cancels it.
⑰	NIGHT SETBACK button	Pressing this button starts the home leave mode. Pressing this button again cancels it.
⑱	FILTER button	Pressing this button resets FILTER SIGN.
⑲	FUNCTION SETTING switch	Used to set the indoor function.
⑳	TIME SETUP switch	Used to set the current time.
㉑	ACL switch	Used to reset the microcomputer.

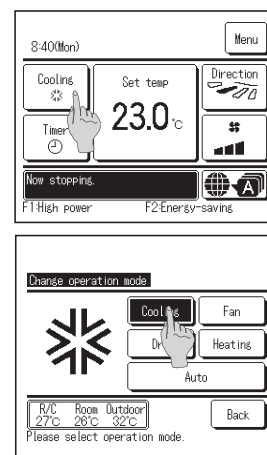
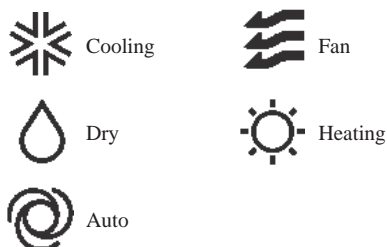
1.2 Operation control function by the wired remote control

(1) Model RC-EX3A

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

- Tap the change operation mode button on the TOP screen.
- When the change operation mode screen is displayed, tap the button of desired mode.
- When the operation mode is selected, the display returns to the TOP screen.

Icons displayed have the following meanings.



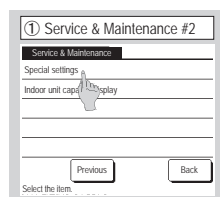
Notes(1) Operation modes which cannot be selected depending on combinations of indoor unit and outdoor unit are not displayed.

- When the Auto is selected, the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.

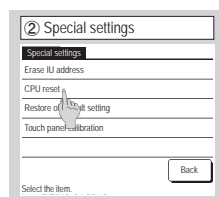
(b) CPU reset

Reset CPU from the remote control as follows.

TOP screen ⇒ ⇒ ⇒



The selected screen is displayed.



The selected screen is displayed.

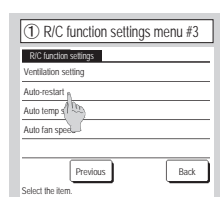
CPU reset

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

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

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

TOP screen ⇒ ⇒ ⇒



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.

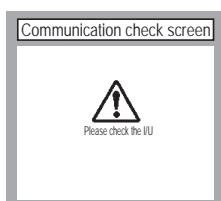
Note(1) Items f) and g) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

- At power failure – Operating/stopped
If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized.
- Operation mode
- Air flow volume mode
- Room temperature setting
- Louver auto swing/stop
However, the stop position (4-position) is cancelled so that it returns to Position (1).
- “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.)
- Weekly timer, peak-cut timer or silent mode timer settings
- Remote control function setting

(d) Alert displays

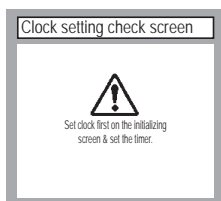
If the following a) to c) appear, check and repair as follows.

- Communication check between indoor unit and remote control



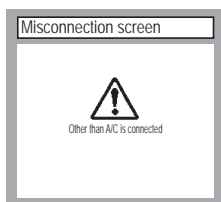
- This appears if communications cannot be established between the remote control and the indoor unit.
Check whether the system is correctly connected (indoor unit, outdoor unit, remote control) and whether the power source for the outdoor unit is connected.

- Clock setting check



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

- 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.

(2) Model RC-E5

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



(b) 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.

(c) 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

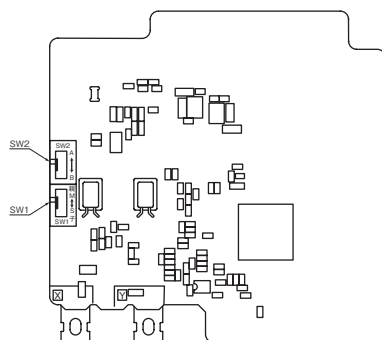
However, the stop position (4-position) is cancelled so that it returns to Position (1).

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

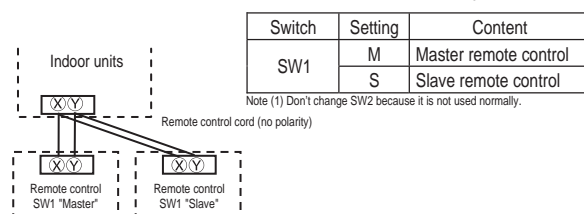
h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

[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.)



Caution

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

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

(3) Operation and setting from wired remote control

A : Refer to the instruction manual for RC-EX series
 B : Refer to the installation manual for RC-EX series
 C : Loading a utility software via Internet

○ : Nearly same function setting and operations are possible.
 △ : Similar function setting and operations are possible.

Setting & display item		Description	RC-EX3A	RC-E5	
1.Remote control network					
1	Control plural indoor units by a single remote control	A remote control can control plural indoor units up to 16 (in one group of remote control network). An address is set to each indoor unit.		○	
2	Main/sub setting of remote controls	A pair of remote controls (including optional wireless remote control) can be connected within the remote control network. Set one to "Main" and the other to "Sub" .	B	○	
2.TOP screen, Switch manipulation					
1	Menu	"Control", "State", or "Details" can be selected. (3-8)	A		
2	Operation mode	"Cooling", "Heating", "Fan", "Dry" or "Auto" can be set.	A	○	
3	Set temp.	"Set temperature" can be set by 0.5°C interval.	A	○	
4	Air flow direction	"Air flow direction" [Individual flap control] can be set. Select Enable or Disable for the "3D AUTO" (in case of FDK). *1	A	△	
5	Fan speed	"Fan speed" can be set.	A	○	
6	Timer setting	"Timer operation" can be set.	A	○	
7	ON/OFF	"On/Off operation of the system" can be done.	A	○	
8	F1 SW	The system operates and is controlled according to the function specified to the F1 switch.	A		
9	F2 SW	The system operates and is controlled according to the function specified to the F2 switch.	A		
3.Useful functions					
1	Individual flap control	The moving range (the positions of upper limit and lower limit) of the flap for individual flap can be set. Set also the left and right limit positions for FDK.	A	△	
2	Anti draft setting When the panel with the anti-draft function is assembled.	When the panel with the anti draft function is assembled, select to Enable or Disable the anti draft setting for each operation mode and for each blow outlet.	A		
3	Timer settings	Set On timer by hour	The period of time to start operation after stopping can be set. • The period of set time can be set within range of 1hour-12hours (1hr interval). • The operation mode, set temp. and fan speed at starting operation can be set.	A	△
		Set Off timer by hour	The period of time to stop operation after starting can be set. • The period of set time can be set within range of 1hour-12hours (1hr interval).	A	△
		Set On timer by clock	The clock time to start operation can be set. • The set clock time can be set by 5 minutes interval. • [Once (one time only)] or [Everyday] operation can be switched. • The operation mode, set temp. and fan speed at starting operation can be set.	A	△
		Set Off timer by clock	The clock time to stop operation can be set. • The set clock time can be set by 5 minutes interval. • [Once (one time only)] or [Everyday] operation can be switched.	A	△
		Confirmation of timer settings	Status of timer settings can be seen.	A	
4	Favorite setting [Administrator password]	Set the operation mode, setting temperature, air flow capacity and air flow direction for the choice setting operations. Set them for the Favorite set 1 and the Favorite set 2 respectively.	A		
5	Weekly timer	On timer and Off timer on weekly basis can be set. • 8-operation patterns per day can be set at a maximum. • The setting clock time can be set by 5 minutes interval. • Holiday setting is available. • The operation mode, set temp. and fan speed at starting operation can be set.	A	△	
6	Home leave mode [Administrator password]	When leaving home for a long period like a vacation leave, the unit can be operated to maintain the room temperature not to be hotter in summer or not to be colder in winter. • The judgment to switch the operation mode (Cooling ⇄ Heating) is done by the both factors of the set temp. and outdoor air temp. • The set temp. and fan speed can be set.	A		
7	External Ventilation When the ventilator is combined.	On/Off operation of the external ventilator can be done. It is necessary to set from [Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Ventilation setting]. • If the "Independent" is selected for the ventilation setting, the ventilator can be operated or stopped.	A	○	
8	Select the language	Select the language to display on the remote control. • Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian, Polish, Japanese and Chinese.	A		
4.Energy-saving setting					
		Administrator password			
1	Sleep timer	To prevent the timer from keeping ON, set hours to stop operation automatically with this timer. • The selectable range of setting time is from 30 to 240 minutes. (10 minutes interval) • When setting is "Enable", this timer will activate whenever the ON timer is set.	A	△	
2	Peak-cut timer	Power consumption can be reduced by restructuring 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.	A		
3	Automatic temp. set back	After the elapse of the set time period, the current set temp. will be set back to the [Set back time.] • The setting can be done in cooling and heating mode respectively. • Selectable range of the set time is from 20 min. to 120 min. (10 min. interval). • Set the [Set back temp.] by 1°C interval.	A	△	
4	Infrared sensor control (Motion sensor control) When the panel with the infrared sensor (motion sensor) is assembled.	When the infrared sensor (motion sensor) is used, it is necessary to set Enable or Disable for the "Power control" and the "Auto-off".	A		
5.Filter					
1	Filter sign reset	Filter sign reset	The filter sign can be reset.	A	
	Setting next cleaning date	Setting next cleaning date	The next cleaning date can be set.	A	
6.User setting					
1	Internal settings	Clock setting	The current date and time can be set or revised. • If a power failure continues no longer than 80 hours, the clock continues to tick by the built-in power source.	A	△
		Date and time display	[Display] or [Hide] the date and/or time can be set, and [12H] or [24H] display can be set.	A	
		Summer time	When select [Enable], the +1-hour adjustment of current time can be set. When select [Disable], the [Summer time] adjustment can be reset.	A	
		Contrast	The contrast of LCD can be adjusted higher or lower.	A	
		Backlight	Switching on/off a light can be set and period of the lighting time can be set within the range of 5sec-90 sec (5sec interval).	A	
		Control sound	It can set with or without [Control sound (beep sound)] at touch panel.	A	
		Operation lamp luminance	This is used to adjust the luminance of operation lamp.	A	
2	Administrator settings [Administrator password]	Permission/Prohibition setting	• Permission/Prohibition setting of operation can be set. [On/Off] [Change set temp] [Change operation mode] [Change flap direction] [Change fan speed] [High power operation] [Energy-saving operation] [Timer] Request for administrator can be set. [Individual flap control] [Weekly timer] [Select the language] [Anti draft setting]	A	△
		Outdoor unit silent mode timer	The period of time to operate the outdoor unit by prioritizing the quietness can be set. • The [Start time] and the [End time] for operating outdoor unit in silent mode can be set. • The period of the operation time can be set once a day by 5 minutes interval.	A	△
		Setting temp. range	The upper/lower limit of temp. setting range can be set. • The limitation of indoor temp. setting range can be set for each operation mode in cooling and heating.	A	△
		Temp. increment setting	The temp. increment setting can be changed by 0.5°C or 1.0°C.	A	
		Set temp. display	Ways of displaying setting temperatures can be selected.	A	

Setting & display item		Description	RC-EX3A	RC-E5
2 Administrator settings [Administrator password]	R/C display setting	Register [Room name] [Name of I/U] Display [Indoor temp. display] or not. Display [Error code display] or not. Display [Heating stand-by display] [Defrost operation display] [Auto cooling/heating display] [Display temp. of R/C, Room, Outdoor] or not	A	△
	Change administrator password	The administrator password can be changed. (Default setting is "0000") The administrator password can be reset.	A B	
	F1/F2 function setting	Functions can be set for F1 and F2. Selectable functions: [High power operation], [Energy-saving operation], [Silent mode cont.], [Home leave mode], [Favorite set 1], [Favorite set 2] and [Filter sign reset].	A	
7. Service setting				
1 Installer settings [Service password]	Installation date	The [Installation date] can be registered. • When registering the [Installation date], the [Next service date] is displayed automatically. (For changing the [Next service date], please refer the item of [Service & Maintenance])	B	
	Company information	The [Company information] can be registered and can be displayed on the R/C. • The [Company] can be registered within 26 characters. • The [Phone No.] can be registered within 13 digits.	B	
	Test run	On/Off operation of the test run can be done.		
	Cooling test run	The [Cooling test run] can be done at 5°C of set temp. for 30 minutes.	B	○
	Drain pump test run	Only drain pump can be operated.		
	Static pressure adjustment	In case of combination with only the ducted indoor unit which has a function of static pressure adjustment, the static pressure is adjustable. • It can be set for each indoor unit individually.	B	
	Change auto-address	The set address of each indoor unit decided by auto-address setting method can be changed to any other address. (For multiple KX units only)	B	△
	Address setting of main IU	Main indoor unit address can be set. • Only the Main indoor unit can change operation mode and the Sub indoor units dominated by the Main indoor shall follow. • The Main indoor unit can domain 10 indoor units at a maximum.	B	△
	IU back-up function	When a pair of indoor units (2 groups) is connected to one unit of remote control, it can be set Enable or Disable for the [IU rotation], [IU capacity back-up] and [IU fault back-up]	B	
	Infrared sensor setting (Motion sensor setting) When the panel with the infrared sensor (motion sensor) is assembled.	Set Enable or Disable for the infrared sensor detectors of indoor units connected to the remote control. If Disable is selected, it cannot be control the infrared sensor control for the energy-saving setting.	B	
2 R/C function setting [Service password]	Main/Sub R/C	The R/C setting of [Main/Sub] can be changed.	B	○
	Return air temp.	When two or more indoor units are connected to one unit of remote control, suction sensors, which are used for the judgement by thermostat, can be selected. • It can be selected from [Individual], [Master IU] and [Average temp.].	B	
	R/C sensor	It can be set the mode to switch to the remote control sensor. It can be selected from cooling and heating.	B	△
	R/C sensor adjustment	The offset value of [R/C sensor] sensing temp. can be set respectively in heating and cooling.	B	△
	Operation mode °C / °F	Enable or Disable can be set for each operation mode. Set the unit for setting temperatures. • °C or °F can be selected.	B	△
	Fan speed	Fan speeds can be selected.	B	○
	External input	When two or more indoor units are connected to one unit of remote control, the range to apply CnT inputs can be set.	B	○
	Upper/lower flap control	[Stop at fixed position] or [Stop at any position] can be selected for the upper and lower louvers.	B	○
	Left/right flap control	[Fixed position stop] or [Stop at any position] can be selected for the right and left louvers.	B	
	Ventilation setting	Combination control for ventilator can be set.	B	○
	Auto-restart	The operation control method after recovery of power failure happened during operation can be set.	B	○
	Auto temp. setting	[Enable] or [Disable] of [Auto temp. setting] can be selected.	B	
	Auto fan speed	[Enable] or [Disable] of [Auto fan speed] can be selected.	B	
	Fan speed setting	The fan speed for indoor units can be set.	B	○
	Filter sign	The setting of filter sign display timer can be done from following patterns.	B	○
	External input 1	The connect of control by external input 1 can be changed.	B	○
	External input 1 signal	The type of external input 1 signal can be changed.	B	○
3 IU settings [Service password]	External input 2	The connect of control by external input 2 can be changed.	B	
	External input 2 signal	The type of external input 2 signal can be changed.	B	
	Heating thermo-OFF temp. adjustment	The judgement temp. of heating thermo-off can be adjusted within the range from 0 to +3°C (1°C interval)	B	△
	Return temperature adjustment	The sensing temp. of return air temp. sensor built in the indoor unit can be adjusted within the range of ±2°C.	B	△
	Fan control in cooling thermo-OFF	Fan control, when the cooling thermostat is turned OFF, can be changed.	B	○
	Fan control in heating thermo-OFF	Fan control, when the heating thermostat is turned OFF, can be changed.	B	○
	Anti-frost temp.	Judgment temperature for the anti-frost control during cooling can be changed.	B	○
	Anti-frost control	When the anti-frost control of indoor unit in cooling is activated, the fan speed can be changed.	B	○
	Drain pump operation	In any operation mode in addition to cooling and dry mode, the setting of drain pump operation can be done.	B	○
	Keep fan operating after cooling is stopped	The time period residual fan operation after stopping or thermo-off in cooling mode can be set.	B	○
	Keep fan operating after heating is stopped	The time period residual fan operation after stopping or thermo-off in heating mode can be set.	B	○
	Intermittent fan operation in heating	The fan operation rule following the residual fan operation after stopping or thermo-off in heating mode can be set.	B	○
	Fan circulator operation	In case that the fan is operated as the circulator, the fan control rule can be set.	B	
	Control pressure adjust	When only the OA processing units are operated, control pressure value can be changed.	B	
	Auto operation mode	The [Auto rule selection] for switching the operation mode automatically can be selected from 3 patterns.	B	
	Thermo. rule setting	When selecting [Outdoor air temp. control], the judgment temp. can be offset by outdoor temp..	B	
	Auto fan speed control	Auto switching range for the auto fan speed control can be set.	B	
	IU overload alarm	If the difference between the setting temperature and the suction temperature becomes larger than the temperature difference set for the overload alarm, at 30 minutes after the start of operation, the overload alarm signal is transmitted from the external output (CnT-5).	B	
	External output setting	Functions assigned to the external outputs 1 to 4 can be changed.	B	
4 Service & Maintenance [Service password]	IU address	Max 16 indoor units can be connected to one remote control, and all address No. of the connected indoor units can be displayed. • The indoor unit conforming to the address No. can be identified by selecting the address No. and tapping [Check] to operate the indoor fan.	B	○
	Next service date	The [Next service date] can be registered. • The [Next service date] and [Company information] is displayed on the message screen.	A B	○
	Operation data	The [Operation data] for indoor unit and outdoor unit can be displayed.	B	○
	Error display			
	Error history	The error history can be displayed.		
	Display anomaly data	The operation data just before the latest error stop can be displayed.		
	Erase anomaly data	Anomaly operation data can be erased.	B	△
	Reset periodical check	The timer for the periodical check can be reset.		
	Saving IU settings	The IU settings memorized in the indoor PCB connected to the remote control can be saved in the memory of the remote control.	B	
	Special settings	[Erase IU address] [CPU reset] [Restore of default setting] [Touch panel calibration]	B	△
Indoor unit capacity display			B	
8. Contact company				
9. Inspection				
Confirmation of Inspection		This is displayed when any error occurs.	A	△
10. PC connection				
USB connection		Weekly timer setting and etc., can be set from PC.	C	

◆ Listed items may not function depending on the specifications of indoor and outdoor units which are combined.

1.3 Operation control function by the indoor control

(1) 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: × ⁽³⁾

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

(2) ON during the drain motor delay control.

(3) Drain pump ON setting may be selected with the indoor unit function setting of the wired remote control.

(2) 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.

- 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.
- 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.
- When relative humidity becomes lower, the indoor unit fan tap is retained.
- In case of the thermostat OFF, the indoor unit fan tap at the thermostat ON is retained.

(3) Timer operation

(a) RC-EX3A

- 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.
- 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).
- 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.
- 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.
- 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.
- 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	○	×	×	×	×	

Note (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.

(4) 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) From 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 operation 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 sensor (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.

(5) 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 35°C or lower, set the indoor fan to the low speed tap of each setting.
- (ii) During the hot keep, the louver is kept at the horizontal position.

(b) Ending condition

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

(6) 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 louver will move up and down. To fix the swing louver at a position, touch one of [1] - [4] buttons. The swing louver will stop at the selected position.
- 3) Louver operation at the power on with a unit having the louver 4-position control function

The louver swings one time automatically (without operating the remote control) at the power on.

This allows the microcomputer recognizing and inputting the louver motor (LM) position.

(ii) Automatic louver level setting during heating

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

(iii) Louver free stop control

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

(b) RC-E5

(i) Louver control

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

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

(ii) Automatic louver level setting during heating

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

(iii) Louver-free stop control

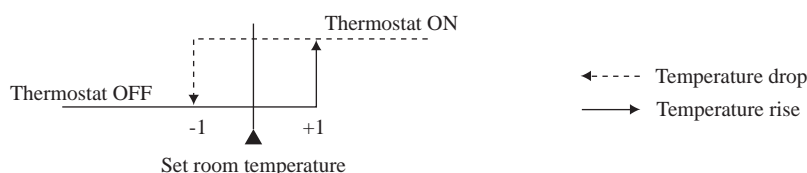
When the louver-free stop has been selected with the indoor function of wired remote control "𐄂𐄃 POSITION", the louver motor stops when it receives the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position where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

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

(7) Thermostat operation

(a) Cooling

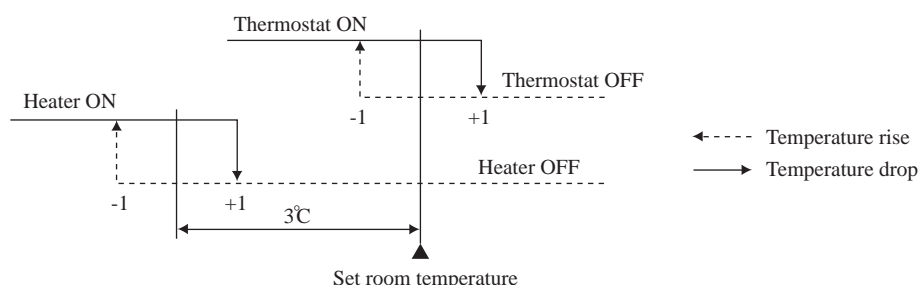
- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



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

(c) Fan control during heating thermostat OFF

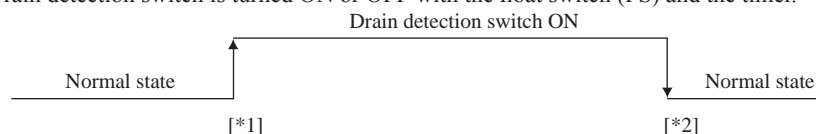
- (i) Following fan controls during the heating thermostat OFF can be selected with the indoor function setting of the wired remote control.
 - ① Low fan speed (Factory default), ② Set fan speed, ③ Intermittence, ④ Fan OFF
- (ii) When the “Low fan speed (Factory default)” is selected, the following taps 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 fan stops.
 - 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 (Except FDTTC, FDTQ, FDUT15-56, FDK, FDFL, FDFU)

- (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 fan stops.
 - 2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes.
 - 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 temperature 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.

(11) Drain pump abnormalities detection

- (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 drain condition, the unit stops with the anomalous stop (displays E9) and the drain pump starts. After detecting the anomalous condition, the drain motor continues to be ON.
 - 2) It keeps operating while the float switch is detecting the anomalous condition.
- (ii) Control B
- If the float switch detects any anomalous drain condition, the drain motor is turned ON for 5 minutes, and at 10 seconds after the drain 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.)

(12) 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

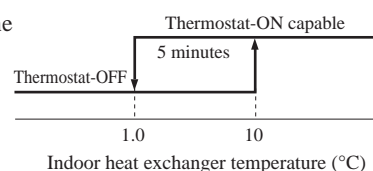
As the drain pump test run is established, the drain pump only operates and during the operation protective functions by the microcomputer of indoor unit become ineffective.

(13) Cooling, dehumidifying frost protection

- (a) To prevent frosting during cooling mode or dehumidifying mode operation, the of 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 heat source 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

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.

(14) Anomalous fan motor

- (a) After starting the fan motor, if the fan motor speed is 200 min⁻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 -50 min⁻¹ less than the required speed, it stops with the anomalous stop (E20).

(15) 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 SW1, SW2, and SW5-2 on the indoor control PCB.

(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).

(16) 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				Series
		Hi - Lo	Hi - Me	Hi - Lo	Hi - Me	
FAN SPEED SET	STANDARD	P-Hi1 - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me	Except FDT, FDE
		P-Hi2 - Hi - Me - ULo	Hi - Me - Lo	Hi - Lo	Hi - Me	Only FDT
		P-Hi2 - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me	Only FDE
	HIGH SPEED1	P-Hi1 - PHi1 - Hi - Me	P-Hi1 - Hi - Me	P-Hi1 - Me	P-Hi1 - Hi	Except FDT, FDTW, FDTs, FDE, FDK
		P-Hi2 - PHi1 - Hi - Me	P-Hi1 - Hi - Me	P-Hi1 - Me	P-Hi1 - Hi	Only FDT, FDTW, FDTs, FDK
		P-Hi1 - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me	Only FDE
	HIGH SPEED2	P-Hi2 - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me	Only FDT, FDTW, FDTs, FDE, FDK

Notes (1) Factory default is STANDARD.

(2) At the hot-start and heating thermostat OFF, or other, the indoor fan is operated at the low speed tap of each setting.

(3) This function is not able to be set with wireless remote control or simple remote control (RCH-E3).

(17) Abnormal temperature sensor (return air/indoor heat exchanger) broken wire/short-circuit detection**(a) Broken wire detection**

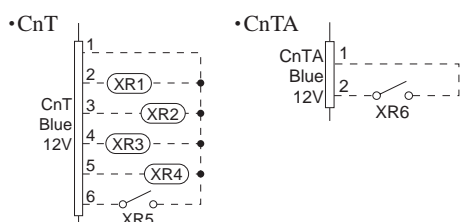
If the return air temperature sensor detects broken wire for 5 seconds continuously, the compressor stops (E7). If the heat exchanger temperature sensor detects broken wire for 5 seconds continuously at 2 minutes and 20 seconds after the compressor ON, the compressor stops (E6).

(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).

(18) 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)	Thermostat ON output	External output 3
	CnT-5 (XR4)	Inspection (Error) output	External output 4
Input (Volt-free contact)	CnT-6 (XR5)	Remote operation input	External input 1
	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	⑦ Emergency stop
CnT	① Operation stop level	CnT ①	CnT ①	CnT ① + CnTA ②	CnT ①	CnT ① / CnTA ⑤	CnT ① / CnTA ⑥	CnT ① < CnTA ⑦
	② Operation stop pulse	CnT ②	CnT ②	CnT ② + CnTA ③	CnT ②	CnT ② / CnTA ⑤	CnT ② / CnTA ⑥	CnT ② < CnTA ⑦
	③ Operation permission/prohibition level	CnT ③ > CnTA ①	CnT ③ > CnTA ②	CnT ③ + CnTA ③	CnT ③	CnT ③ / CnTA ⑤	CnT ③ / CnTA ⑥	CnT ③ < CnTA ⑦
	④ Operation permission/prohibition pulse	CnT ④	CnT ④	CnT ④ + CnTA ③※	CnT ④	CnT ④ / CnTA ⑤	CnT ④ / CnTA ⑥	CnT ④ < CnTA ⑦
	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	CnT ⑤ / CnTA ⑦
	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	CnT ⑥ / CnTA ⑦
	⑦ Emergency stop	CnT ⑦ > CnTA ①	CnT ⑦ > CnTA ②	CnT ⑦ > CnTA ③	CnT ⑦ > CnTA ④	CnT ⑦ / CnTA ⑤	CnT ⑦ / CnTA ⑥	CnT ⑦ + CnTA ⑦

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

- In case of CnT "Number", the CnT "Number" is adopted and CnTA is invalidated.
 - In case of CnTA "Number", the CnTA "Number" is adopted and CnT is invalidated.
 - In case of CnT "Number"/CnTA "Number", the CnT "Number" and the CnTA "Number" become independent functions each other.
 - In case of CnT "Number" + CnTA "Number", the CnT "Number" and the CnTA "Number" become competing functions each other.
 - In case of CnT "Number" > CnTA "Number", the function of CnT "Number" supersedes that of CnTA "Number".
 - 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 Thermostat 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 temp. is between 10-18 °C in cooling and fan operation
12 Indoor unit overload alarm output	Refer to "IU overload alarm"

(b) Input for external control

The external input for the indoor unit can be selected from the following input by the wired remote control.

The input connectors (CnT-6 and CnTA) are equipped on the indoor unit control PCB.

"LEVEL INPUT(Factory default)" or "PULSE INPUT" is selectable from the wired remote control.

	Input name	Content
1	Run/Stop (Factory default)	Refer to [(19) (c) Remote operation input]
2	Permission/Prohibition	Refer to [(20) Operation permission/prohibition]
3	Cooling/Heating	Refer to [(22) Selection of cooling/heating external input function]
4	Emergency stop	Refer to [(23) Emergency stop input]
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 [(21) Temporary stop input]
8	Silent mode	Outdoor unit silent mode is activated.

(c) Remote operation input

The indoor unit operation can be controlled by external input.

However it is not effective when "Center mode" is selected by central control.

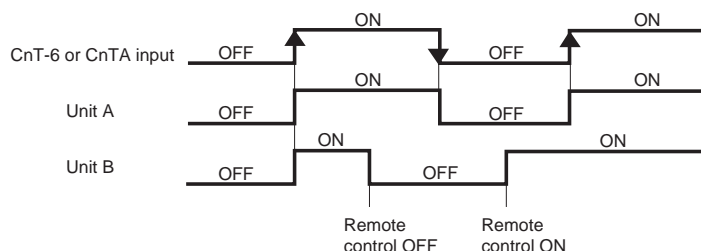
Only the "LEVEL INPUT" is recommended for this input, and operation status is changed as follows.

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

Input signal to CnT-6 or CnTA is OFF→ON unit ON

Input signal to CnT-6 or CnTA is ON→OFF unit OFF

Operation is not inverted.

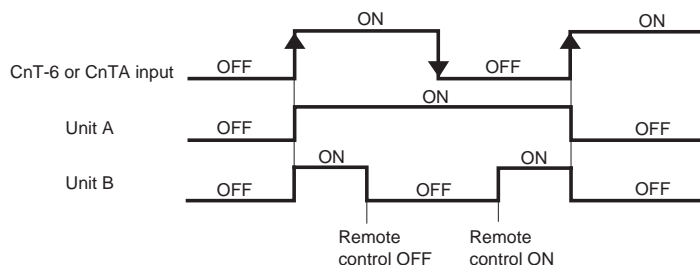


Note: The latest operation has priority.

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



(iii) 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.

(19) Operation permission/prohibition

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

When the external input is selected to "Permission/Prohibition", this control becomes effective.

However it is not effective when "Center mode" is selected by central control.

Connector	Indoor function	
	RC-EX3A	RC-E5
CnT	External input 1 : Permission/Prohibition	Operation permission/Prohibition : Valid
CnTA	External input 2 : Permission/Prohibition	No function

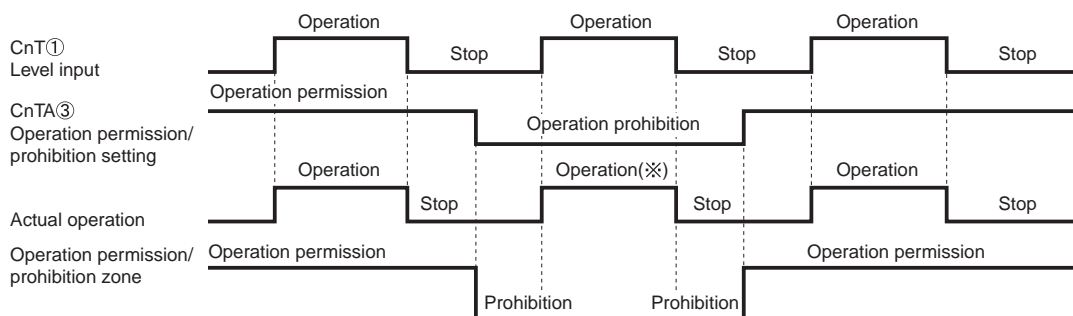
Only the "LEVEL INPUT" is recommended for this input, and operation status is changed as follows.

(a) In case of “Level input” setting (Factory default)

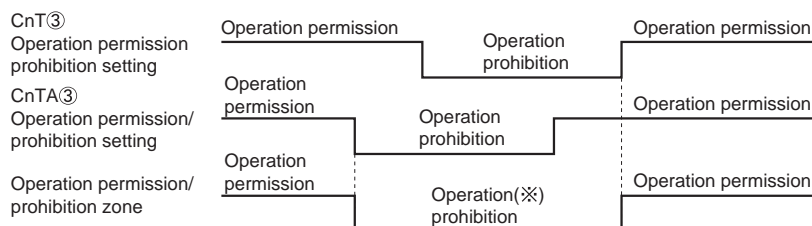
- (i) When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
- (ii) When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.

(b) In case of “Pulse input” setting (Local setting)

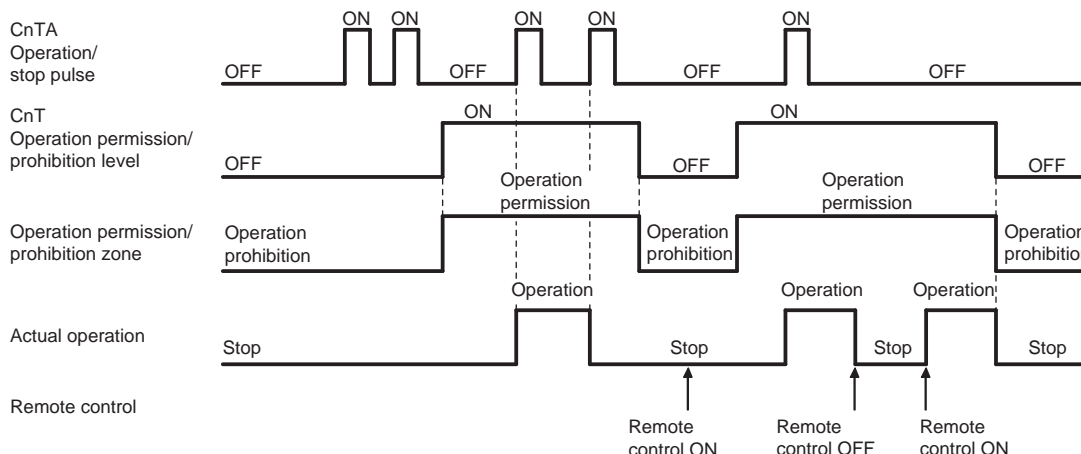
- (i) When card key switch is ON (Operation permission), the unit starts operation in conjunction with ON signal, and also start/stop operation of the unit from the wired remote control becomes available.
- (ii) When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.

(c) In case of CnT ① operation stop level > CnTA ③ operation permission/prohibition level

(※) CnT level input supersedes CnTA operation prohibition.

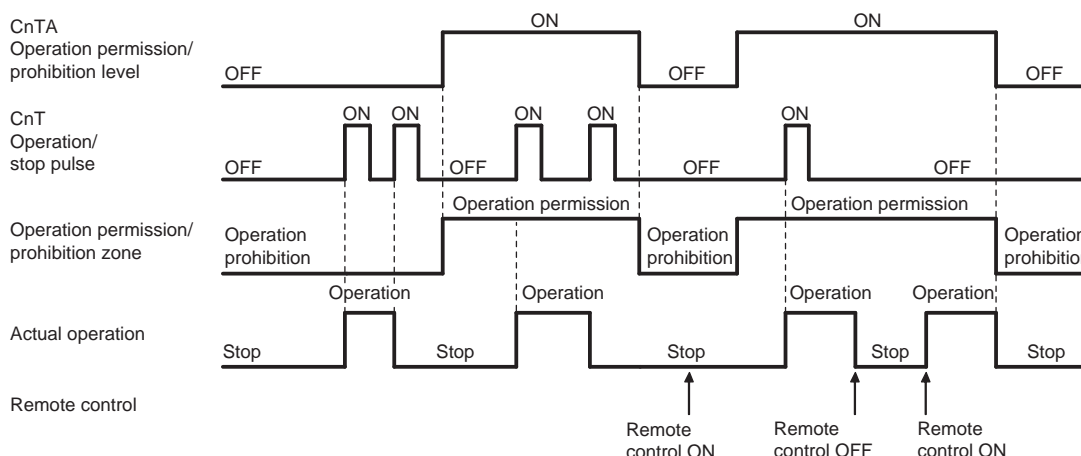
(d) In case of CnT ③ operation permission/prohibition level + CnTA ③ operation permission/prohibition level

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

(e) 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.

(f) In case of CnT② operation/stop pulse + CnTA ③ operation permission/prohibition level



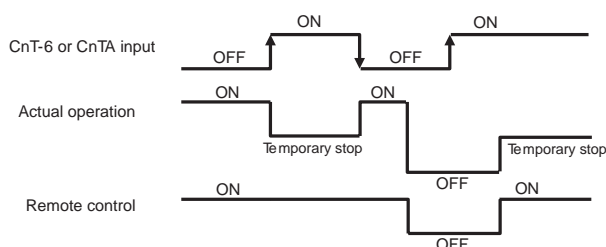
(20) Temporary stop input

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

(a) In case of “Level input” setting (Factory default)

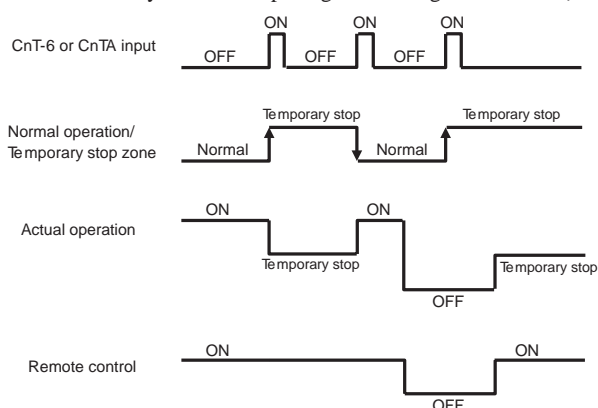
Input signal to CnT-6 or CnTA is OFF → ON : Temporary stop

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.



(21) Selection of cooling/heating external input function

When “External input 1 or 2 setting: Cooling/heating” is set by the indoor unit function from remote control, the cooling or heating is selected with CnT-6 or CnTA.

(a) In case of “Level input” setting (Factory default)

• CnT-6 or CnTA: OPEN → Cooling operation mode

• CnT-6 or CnTA: CLOSE → Heating operation mode

(b) In case of “Pulse input” setting (Local setting)

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

(c) 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	
Cooling/heating selection	Level	External input (CnT or CnTA)	
		Cooling/heating	
		Cooling/heating (Competitive)	
	Pulse	External input (CnT or CnTA)	
		Cooling/heating	
		Cooling/heating (Competitive)	

(22) Emergency stop input

When the external input is selected to “Emergency stop”, it is possible to stop the outdoor unit operation by the external input to the indoor unit.

(a) Function setting

Emergency stop input can be selected by the indoor function of wired remote control.

Connector	Indoor function	
	RC-EX3A	RC-E5
CnT	External input 1 : Emergency stop	Emergency stop : Valid
CnTA	External input 2 : Emergency stop	No function

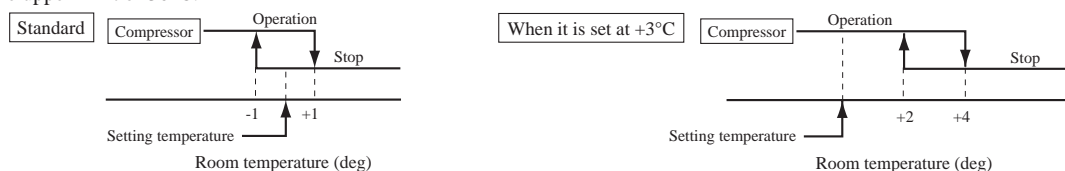
(b) Emergency stop control

When the external input is OFF, the indoor and outdoor units stop.

The indoor unit receive the external input stops the operation, and the outdoor unit which the stopped indoor unit are connected stops with [E-63].

(23) 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.



(24) 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 outdoor unit.

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

(25) High power operation (RC-EX3A only)

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

(26) 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%.)

(27) 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.

(28) 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.

(29) 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.

(30) 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.

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

Setting temperature T_s 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
 $T_s = \text{outdoor temperature} - \text{offset value}$
 - (ii) Heating mode
 $T_s = \text{outdoor temperature} - \text{offset value}$
- (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.

(32) 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 automatically.

- 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.

(33) 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).

It is necessary to select "Indoor unit overload alarm output" by the external output setting.

- 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

(34) 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.

(35) 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 control
The set temperature is adjusted according to the presence of people and their amount of activity detected by the infrared sensor.
 - (ii) Auto-off control
When no activity is detected for 1 hour, unit will go stand-by mode. Unit will re-start operation automatically by activity detection during the stand-by mode.

1.4 Operation control function by the outdoor control

(A) Normal control

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

Operation mode Functional components	Cooling/Dehumidifying			Heating		
	Compressor ON	Compressor OFF	All stop by remote control	Compressor ON	Compressor OFF	All stop by remote control
Magnetic contactor for compressor (52C1)	ON	ON	OFF	ON	ON	OFF
Crankcase heater (CH1)	ON/OFF*1	ON/OFF*1	ON	ON/OFF*1	ON/OFF*1	ON
Compressor (CM1)	Cooling low pressure control	Stop	Stop	Heating high pressure control	Stop	Stop
Fan motor (FMo1)	Normal control	Stop	Stop	Normal control	Stop	Stop
4-way valve (20S)	OFF	OFF	OFF	ON	ON	ON→OFF*2
Electronic expansion valve for sub-cooling coil (EEVSC)	Normal control	Fully closed	Fully closed	Fully closed	Fully closed	Fully closed
Electronic expansion valve for heating (EEVH)	Fully open	Fully open	Fully open	Normal control	Fully closed	Fully closed

Notes (1) Above list shows the conditions at steady state under each operation mode.

(2) *1 According to discharge superheat

(3) *2 It turns OFF after retaining ON condition for a certain minutes

(2) Compressor control

Compressor rotation speed at cooling (dehumidifying) and heating operations are as follows.

Unit: rps

Item	Cooling (Dehumidifying) operation	Heating operation
Model		
FDC121KXZE1	40 - 77	20 - 110
FDC140KXZE1	40 - 100	20 - 110
FDC155KXZE1	40 - 106	20 - 110

(3) Outdoor fan control

(a) Control contents of fan tap and fan speed

Outdoor fan tap	Fan speed	
	Cooling	Heating
	FMo1 [min ⁻¹]	FMo1 [min ⁻¹]
0th speed	0	0
1th speed	200	130
2th speed	300	300
3th speed	400	400
4th speed	500	500
5th speed	600	600
6th speed	740	740
7th speed	820	820
8th speed	870	870

(b) Fan control during cooling

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

(i) Initial fan speeds are as follows.

Initial outdoor fan speed at cooling

Model	Ambient air temp. ≤ 5°C	5°C < Ambient air temp. < 10°C	10°C ≤ Ambient air temp.
All models	1th speed	3th speed	5th speed

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

(c) Fan control during heating

During heating, fan speed is controlled in accordance with the low pressure (sensed by PSL).

(i) Initial fan speeds are as follows.

- Outdoor fan initial speed during heating

Model	Speed
All models	6th speed

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

(4) Defrost operation

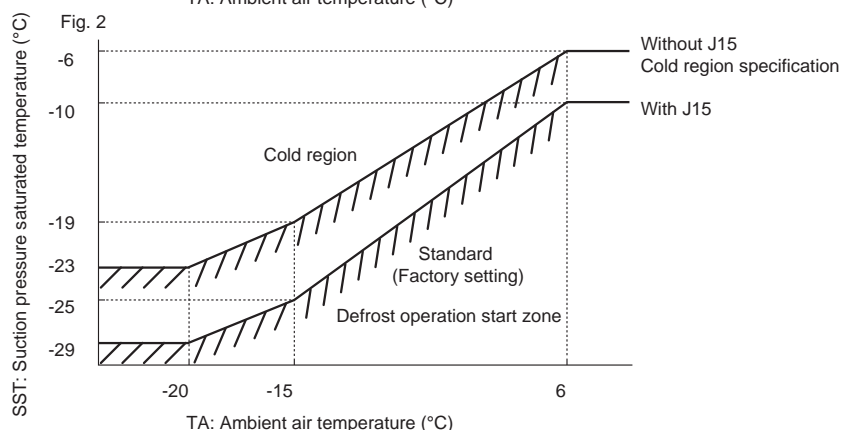
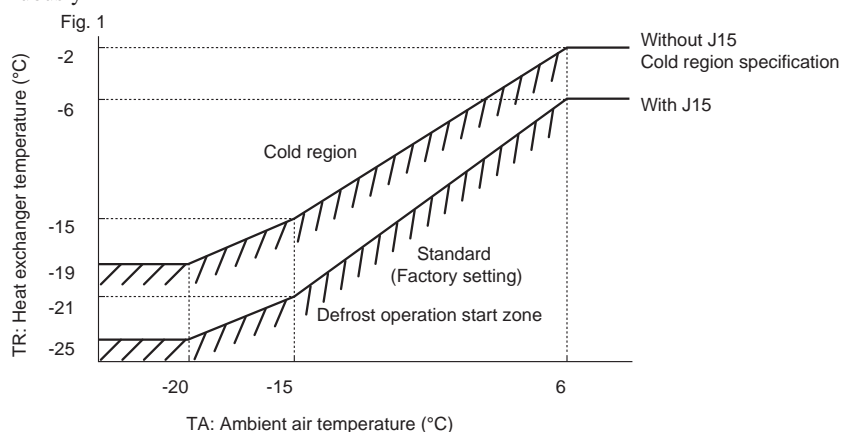
- Temperature condition of defrost operation

(a) Starting conditions

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

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

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

**(b) Ending conditions**

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

- When 12 minutes has passed since defrost operation started
- When the outdoor heat exchanger temperature (sensed by Tho-R) is detected 12°C or higher continuously for 10 seconds
- When it has detected the high pressure (HP) $\geq 3.0\text{MPa}$

(5) Protective control

(a) Discharge pipe temperature control

If the discharge pipe temperature exceeds 105°C, compressor speed is reduced to suppress the rising of discharge pipe temperature.

- (i) If the discharge pipe temperature sensor detects 115°C or higher for 2 seconds continuously, it makes compressor stopped. And if this anomaly occurs 5 times within 60 minute, it makes the unit anomalous stop. (E36-1)
- (ii) If the discharge overheat sensor (Td-DST) detects 5degC or lower for 10 minutes continuously, it makes compressor stopped (liquid flooding anomaly).

And if this anomaly occurs 3 times within 60 minutes, it makes the unit anomalous stop. (E36-3)

(b) High pressure control

- (i) Compressor rotation speed protection control

- ① If high pressure sensor (PSH) detects 3.70MPa or higher, it makes compressor rotaion speed decreasing.
- ② If high pressure sensor (PSH) still detects 3.70MPa or higher 5 seconds after ① control, it makes compressor rotation speed decreasing more.
- ③ If high pressure sensor (PSH) detects lower than 3.70MPa, this protective control is released.

- (ii) High pressure protective control

If high pressure switch (63H1) is activated or if high pressure sensor (PSH) detects 4.14MPa or higher for 10 seconds continuously, it makes compressor stopped (High pressure anomaly).

And if this anomaly occurs 5 times within 60 minute, it makes the unit anomalous stop.(E40)

(c) Low pressure control

- (i) Compressor rotation speed protection control

- ① If low pressure sensor (PSL) detects 0.18MPa or lower for 10 seconds continuously, it makes compressor rotaion speed decreasing.
- ② If low pressure sensor (PSL) still detects 0.18MPa or lower 30 seconds after ① control, it makes compressor rotation speed decreasing more.
- ③ If low pressure sensor (PSL) detects higher than 0.236MPa, this protective control is released.

- (ii) Low pressure protective control

If low pressure sensor (PSL) detects 0.134MPa or lower for 30 seconds continuously, or if it detects 0.003MPa or lower for 5 seconds continuously, it makes compressor stopped (Low pressure anomaly).

And if this anomaly occurs 5 times within 60 minutes, it makes the unit anomalous stop.(E49)

(d) High pressure ratio protective control

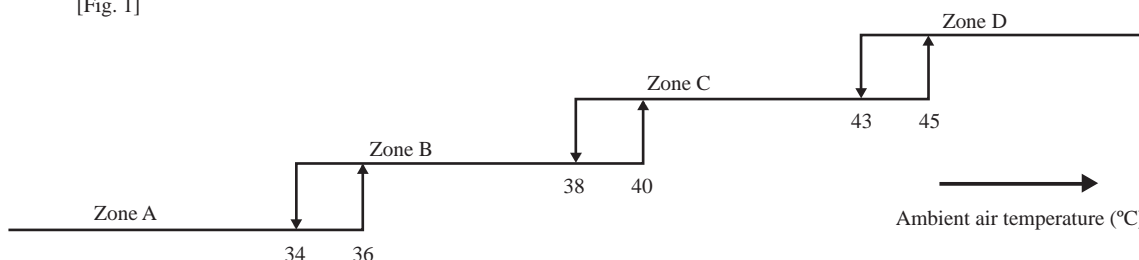
- ① If pressure ratio is 8.0 or higher, it makes compressor rotaion speed decreasing.
- ② If pressure ratio is 8.0 or higher 60 seconds after ① control, it makes compressor rotation speed decreasing more.
- ③ If pressure ratio is 7.9 or lower, this protective control is released.

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

- (i) Compressor capacity control

- ① Compressor speed is controlled by detecting the inverter's T-phase current or secondary current.
- ② The control is changed at every ambient air temperature zone.

[Fig. 1]



• Current safe setting value

Power source	Current safe value [A]									
	Inverter primary (T-phase) current					Inverter secondary current				
	Cooling				Heating	Cooling				Heating
	Zone A	Zone B	Zone C	Zone D		Zone A	Zone B	Zone C	Zone D	
1-phase	21	21	19	15	23	21				
3-phase	13.5	13.5	11.5	11.5	13.5	13				

③ Ending condition

This control ends when the inverter's T-phase current or secondary current drops below the current safe setting value minus 1 ampere for 3 minutes continuously or below the current safe setting value in the table shown above for 6 minutes continuously.

(ii) Compressor upper limit frequency control

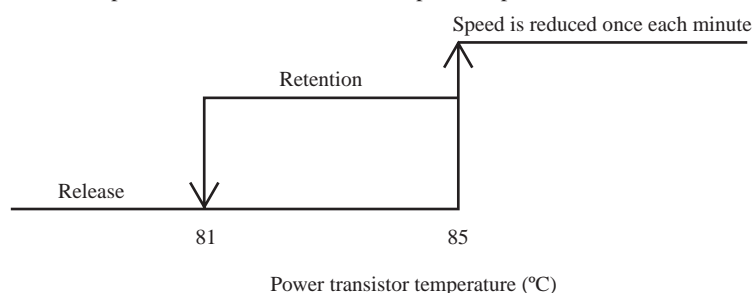
When it enters any zone other than the zone A (Fig. 1), the upper limit of compressor speed is changed.

Power source	Compressor upper limit speed (rps)				
	Cooling				Heating
	Zone A	Zone B	Zone C	Zone D	
1-phase	98	92	82	54	110
3-phase	106	98	92	54	

However, the priority is given to the upper limit compressor speed by this control or the compressor speed under normal condition, whichever the lower.

(f) Power transistor temperature (PT) protective control

If the power transistor temperature exceeds 85°C, the compressor speed is controlled.



(6) Test run

(a) Starting conditions

- (i) Turn ON the test run switch (SW5-1). The switch is invalid if it is turned ON before the power ON.
- (ii) Pump down switch (SW5-3) must be turned OFF.

(b) Contents of control

- (i) Turning ON the dip switch (SW5-2) conducts cooling operation and turning OFF (SW5-2) conducts heating operation.
 - 1) Cooling operation
Compressor operation frequency control is operated under the cooling low pressure control.
 - 2) Heating operation
Compressor operation frequency control is operated under the heating high pressure control.
- (ii) Test run start signal under corresponding operation mode is transmitted to all indoor units connected.

(c) Ending conditions

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

(B) Option controls

Outdoor unit control settings can be changed with the DIP switch and 7-segment display PXX setting on the PCB. In changing settings in PXX on the 7-segment display panel, you can use SW8 (increasing a number shown on the 7-segment display panel: one's place), SW9 (increasing a number shown on the 7-segment display panel: tens place) and SW7 (data write/enter) by pressing them for a prolonged time.

Contents of control switching	Method of control setting	
	DIP switch setting	P00 setting on the 7-segment display panel
Forced cooling/heating mode*2	Switch SW3-7 to ON*1	Select "2" in P07. *1
Cooling test operation	Switch SW5-1 to ON + SW 5-2 to ON	—
Heating test operation	Switch SW5-1 to ON + SW 5-2 to OFF	—
Pump down	Close the outdoor unit service valves and perform the following operations in the stated order: (1) Switch SW5-2 to ON (2) Switch SW5-3 to ON (3) Switch SW5-1 to ON	—
Demand mode *2 (J13 closed: level input J13 open: pulse input)	SW4-7:OFF, SW4-8:OFF*1 80% (factory setting) SW4-7:ON, SW4-8:OFF*1 60% SW4-7:OFF, SW4-8:ON*1 40% SW4-7:ON, SW4-8:ON*1 00%	Select "1" in P07. *1
Communication protocol setting	SW5-5 ON: previous SL communication, OFF: new SL communication	—
CnS1 input setting	J13: closed (factory setting) for level input, J13: open for pulse input	—
Defrost setting	J15: closed (factory setting) for normal defrost, J15: open for enhanced defrost	—
Operation priority change	—	P01 0: earlier entry priority (factory setting) 1: later entry priority
Outdoor fan snow guard control	—	P02 0: invalid (factory setting) 1: valid
Outdoor fan snow guard control operation time setting	—	P03 30sec (factory setting) 10, 30-600sec
Capacity save mode *3	—	P04 OFF: invalid (factory setting) 000, 040, 060, 080 [%]
Silent mode setting *2	—	P05 0 (factory setting) - 3: the larger the number, the stronger the effect.
External output (CnZ1) function assignment	—	P06
External input (CnS1) function assignment	—	P07
Spare	—	P8-29

*1 The switching activated when both SW and PXX are changed.

*2 The switching activated when a signal is input to CnS1

*3 Capacity restriction is effected without a signal input to CnS1 in the capacity save mode.

• Functions of outdoor PCB connectors CnS1 and CnZ1

- ① CnS1 connector: Following functions can be selected by selecting with [P07] on 7-segment display.

(Note) More than one function cannot operate at same time.

	CnS1 short-circuit	CnS1 open
"0": External operation input	Operation allowed	Operation prohibited
"1": Demand input	Invalid	Valid
"2": Forced cooling/heating input	Heating	Cooling
"3": Silent mode input 1	Valid	Invalid
"4": Spare	-	-
"5": Outdoor fan snow protection control input	Valid	Invalid
"6": Test run external input 1 (Equal to SW5-1)	Test run start	Normal operation
"7": Test run external input 2 (Equal to SW5-2)	Cooling test run	Heating test run
"8": Silent mode input 2	Valid	Invalid
"9": Spare	-	-

- ② CnZ1 connector: Following functions can be selected by selecting with [P06] on 7-segment display.

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

(1) External input and demand input**(a) Operation permission and prohibition modes**

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

- 1) Operation permission or operation prohibition mode is switched with the connector (CnS1) and the jumper wire (J13) on the outdoor PCB.

J13: Switching of CnS1 input method

J13 short-circuited: CnS1 is for the level input.

J13 open: CnS1 is for the pulse input.

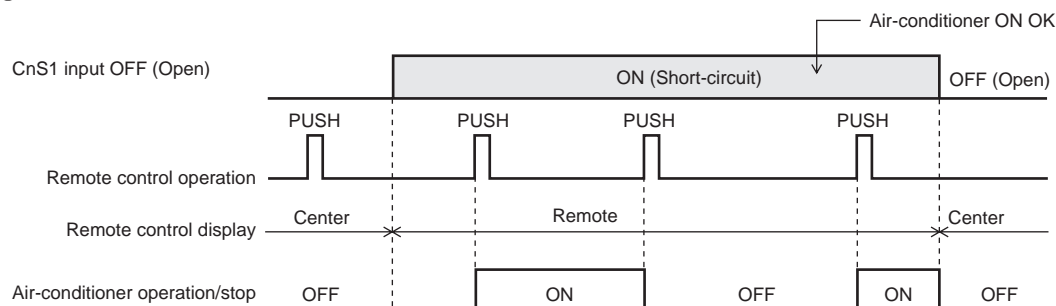
- 2) Operation permission/prohibition control by the external input CnS1 of outdoor unit

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

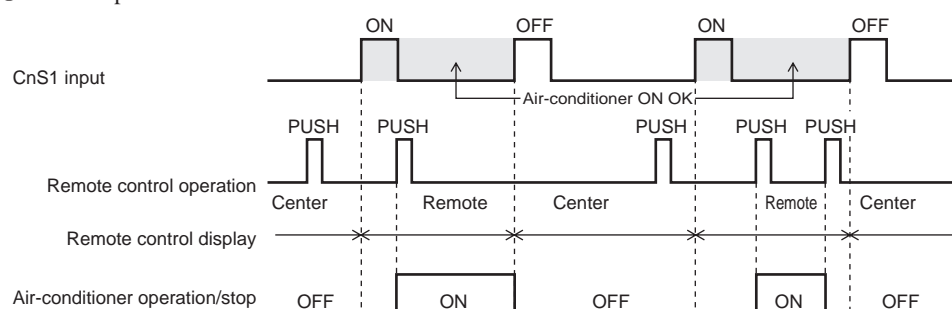
Note (1) Factory setting – J13: Short-circuit, CnS1: Short-circuit (Short-circuit pin connected)

- 3) Remote control displays the operating conditions. Operation conditions are transferred to option central control.
- 4) When the control command from remote control is not accepted (Under the condition of the system all stop status by external input), “Center” is displayed. See Item 5) mentioned below.
- 5) CnS1 performs the following operations depending on the short-circuit or open of the jumper wire (J13). In case of pulse input, the pulse width is 500 ms or larger.

① J13 – Short-circuit



② J13 - Open

**(b) Demand control**

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

- 1) Demand control and normal operation are switched with the connector (CnS1) and the jumper wire (J13) on the outdoor unit PCB.

J13: Switching of CnS1 input method

J13 short-circuit: CnS1 is for the level input

J13 open: CnS1 is for the pulse input

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

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

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

3) Remote control displays the operating conditions. Operation conditions are transferred to option central control.

4) Demand control

Demand ratio can be switched with the DIP switches (SW4-7, 4-8) on the outdoor PCB.

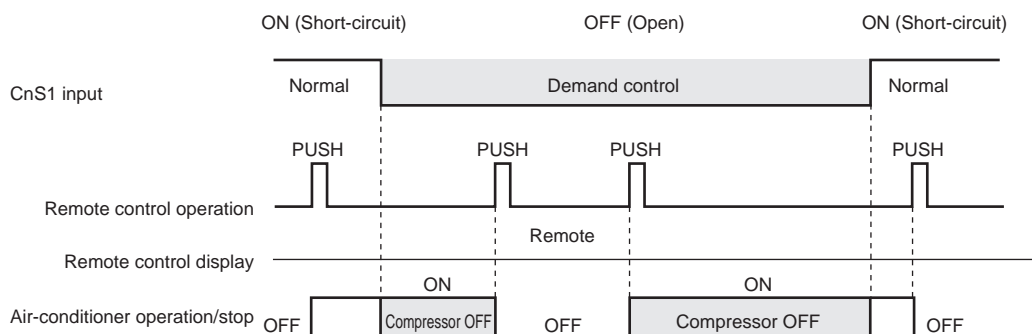
SW4-7, SW4-8 demand switching: 0 – Open, 1 – Short-circuit

SW4-7	SW4-8	Compressor upper limit speed (rps)					
		FDC121KXZEN/S1		FDC140KXZEN/S1		FDC155KXZEN/S1	
		Cooling	Heating	Cooling	Heating	Cooling	Heating
0	0	57	65	74	76	78	76
1	0	42	49	56	57	58	57
0	1	29	33	37	38	40	38
1	1	0	0	0	0	0	0

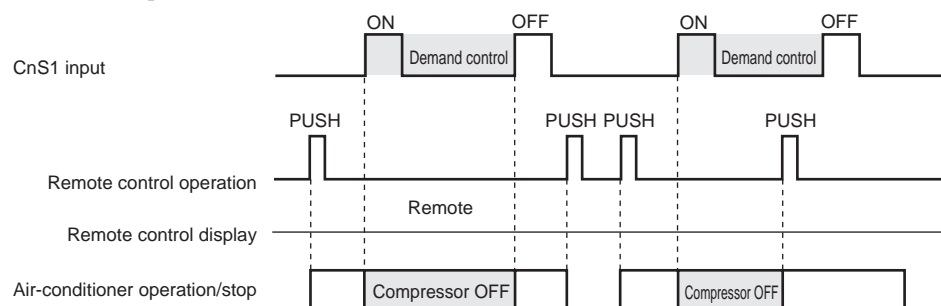
5) CnS1 performs the following operations depending on the short-circuited or open of the jumper wire (J13).

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

① J13 – Short-circuit



② J13 - Open



(2) Silent mode control

(Note) With 7-segment display [P07]-[3] for silent mode 1
or with 7-segment display [P07]-[8] for silent mode 2

(a) Starting conditions

When all the followings are satisfied

- (i) When the strat command of silent mode input from indoor unit or from external input terminal of outdoor unit has become effective.

Silent mode 1: when [07]=3 and CnS1 is shorted

Silent mode 2: when [07]=8 and CnS1 is shorted

(Note) Silent mode 1 and 2 can not be set at same time.

- (ii) When the outdoor operation mode is "Operation"

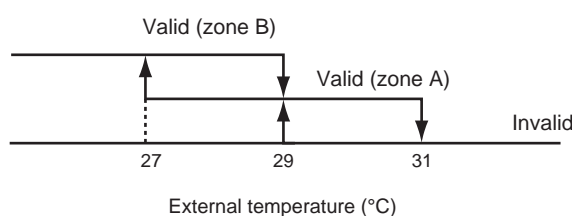
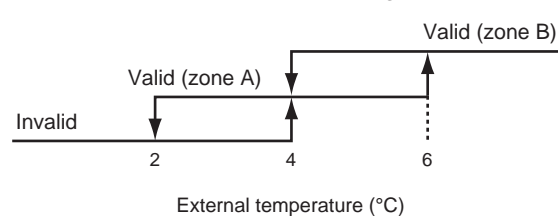
- (iii) In case of external input of silent mode 1, the ambient air temperature should be satisfied with the following conditions.

(Note) In case of external input of silent mode 2, these conditions can be disregarded.

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

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

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

<Outdoor operation mode - Cooling>**<Outdoor operation mode - Heating>****(b) Sound level (Reference data)**

Model	SPL Sound pressure level for cooling	SPL Sound pressure level for heating	SPL Silent mode setting 0	SPL Silent mode setting 1	SPL Silent mode setting 2	SPL Silent mode setting 3
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
FDC121KXZEN1	53	56	50	47	46	44
FDC140KXZEN1	53	57	52	49	47	45
FDC155KXZEN1	54	57	53	50	47	46
FDC121KXZES1	53	56	50	47	46	44
FDC140KXZES1	53	57	52	49	47	45
FDC155KXZES1	54	57	53	50	47	46

Model	PWL Sound power level for cooling	PWL Sound power level for heating	PWL Silent mode setting 0	PWL Silent mode setting 1	PWL Silent mode setting 2	PWL Silent mode setting 3
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
FDC121KXZEN1	70	72	66	65	63	62
FDC140KXZEN1	71	72	69	66	64	63
FDC155KXZEN1	71	74	69	66	65	64
FDC121KXZES1	70	72	66	65	63	62
FDC140KXZES1	71	72	69	66	64	63
FDC155KXZES1	71	74	69	66	65	64

(c) Ending condition

- When the starting conditions are not established

(3) Outdoor fan snow protection control

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

(b) Outdoor fan control switching operation

[Starting conditions]

When following conditions are established for 10 minutes continuously.

- (i) Snow protection control setting is valid ([P02]=1) and ambient air temperature < 3°C or external input of outdoor fan snow protection control ON. ([P07]=5 and CnS1 is shorted)
 - ① Set the Code No. to "P02".
 - ② "0" or "1" is displayed at the data display area.
 "0": Outdoor fan control disabled (Factory setting)
 "1": Outdoor fan control enabled
 - ③ Press SW7 (Data write/delete) for 3 seconds continuously.
 - ④ "0" or "1" blinks every 0.5 second at the data display area.
 - ⑤ Press SW8 (one digit) to toggle between the blinking "0" and "1" display.
 - ⑥ If SW7 is pressed for 3 minutes or longer continuously while "0" and "1" is blinking, the blinking stops.
 With this operation, the enabled/disabled setting of outdoor fan control is stored in memory of EEPROM, and henceforth the outdoor fan is controlled according to the contents of memory.
 - ⑦ Contents of the outdoor fan control are retained even if the power is turned off and backed on again.

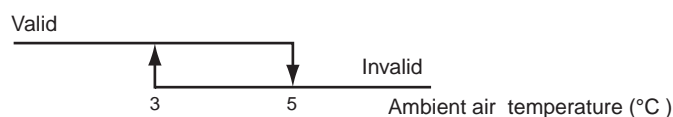
(c) Contents pf outdoor fan snow protection control

- ① If the ambient air temperature drops 3°C or lower when the unit is all stop or error stop, the outdoor fan runs at the maximum speed (4th speed) once every 10 minutes.
- ② The outdoor fan runs for 30 seconds.*
*Operation time outdoor fan is changeable from 10 to 600 seconds by [P03]
- ③ During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

(d) Ending conditions of outdoor fan snow protection control

When following conditions are established.

- (i) Snow protection control setting is invalid ([P02]=0) or ambient air temperature > 5°C and external input of outdoor fan snow protection control OFF (opened).
- (ii) Compressor ON
- (iii) During all stop by anomaly
 <Ambient air temperature condition at snow protection control>



(4) External output

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

[External output function]

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

0: Operation output

- When the outdoor unit operation mode is "Operation", the external output relay is turned ON.
(Note) The "Operation" includes not only compressor ON mode but also fan mode and thermostat OFF mode under the condition of remote control ON. But the anomalous stop is excluded.

1: Error output

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

2: Compressor ON output

- It is turned ON when the compressor is ON.

3: Fan ON output

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

(5) Energy saving mode control

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

(a) Control contents

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

OFF: Normal (Factory setting)

80%: 80% of rating compressor upper limit speed

60%: 60% of rating compressor upper limit speed

40%: 40% of rating compressor upper limit speed

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

(Note) Compressor upper limit speed (rps) on energy saving mode is shown in following table

P04	Compressor upper limit speed (rps)					
	FDC121KXZEN/S1		FDC140KXZEN/S1		FDC155KXZEN/S1	
	Cooling	Heating	Cooling	Heating	Cooling	Heating
080	57	65	74	76	78	76
060	42	49	56	57	58	57
040	29	33	37	38	40	38
000	0	0	0	0	0	0

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

- 4-way valve switching safeguard
- Defrost operation
- Oil return control
- Pump down operation control at removal of the unit
- Pump down control at start/stop

(6) Forced cooling/heating operation

- (a) With this control, SW3-7 on the outdoor PCB is turned ON and CnS1 (equipped with short-circuit pin) is shorted or opened so as to forcibly determined whether the indoor unit is operated for cooling or heating. (It is valid at [P07]=2)
- (b) If any operation mode other than the forcible mode is commanded from indoor unit, the mode unmatched message is displayed on the remote control or others and operation enters in the FAN mode.

SW3-7	CnS1	Operation
ON	Open	Cooling only
	Close	Heating only

(7) Emergency stop control

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

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

- (a) When it receives the “Emergency stop” command from the indoor unit, it makes all stop by error.
- (b) It shows the Error display “E63” and transmits the “Emergency stop” command to all indoor units.
- (c) If the “Emergency stop reset” command is received from the indoor unit, the “Emergency stop reset” command is transmitted to all indoor units.

(8) Pump down operation control at removal of unit

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

(a) Starting conditions

This is implemented with the liquid service valve closed.

- (i) Outdoor unit operation mode – Stop
- (ii) Turn ON the test run cooling switch SW5-2 (cooling).
- (iii) Turn ON the pump down switch SW5-3 (pump down).
- (iv) Turn ON the test run switch SW5-1 when the above (i)-(iii) statuses are satisfied.

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

(b) Control contents

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

Model \ Item	Hp	Target compressor speed at pump down operation	
		Number of compressors	Compressor speed
FDC121KXZEN/S1	4	1	37rps
FDC140KXZEN/S1	5		45rps
FDC155KXZEN/S1	6		

- (ii) As the starting conditions are established, both red LED and green LED on the outdoor PCB flash continuously. 7-segment display shows “PdS” (Channel 0) at the code display area.
- (iii) During the pump down operation control, the protective controls (excluding low pressure protective control, anomalous low pressure control and pressure ratio protection control) and the error detection control are effective.
- (iv) The sub-cooling coil expansion valve (EEVSC) closes fully during the pump down control.

(c) Ending conditions

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

- (i) If a low pressure (LP) $\leq 0.01\text{MPa}$ is detected for 5 seconds continuously, it ends normally and initiates the followings.
 - ① Red LED: keeps lighting
 - ② Green LED: keeps flashing
 - ③ 7-segment display: PdE
 - ④ Remote control: Stop
- (ii) Anomalous all stop by the error detection control
- (iii) If the cumulative compressor operation time under the pump down control totals 15 minutes (ending by time count up), it stops and initiates the following.
 - ① Red LED: stays OFF
 - ② Green LED: keeps flashing
 - ③ 7-segment display: No display
 - ④ Remote control: Stop

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

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

(9) Pump-down operation by external input

If an error stop is raised by an external input by refrigerant leaking alarm unit, the pump-down operation is performed at the outdoor unit side in order to prevent the refrigerant from leaking.

They are local arrangements.

- ① Refrigerant leaking alarm unit
- ② Valve to shut liquid pipe
- ③ Valve to shut gas pipe
- ④ Equipment to shut down the liquid service valve at emergency call

Valves of ② and ③ should be selected what the pressure loss of refrigerant piping doesn't increase.

(a) Status 1: Pump-down operation**(i) Starting condition**

- ① When the external input function is assigned to "0: External operation input" and the external input terminal is open (by refrigerant leaking alarm unit).
- ② If the pump-down control is valid when the error stop is raised by the setting on 7-segment. ([P75] = "1")

(ii) Contents of control

- ① The pump-down operation for replacement is performed.

(iii) Ending condition

- ① When starting conditions are lost.
- ② When the pump-down operation has ended.

(b) Status 2: Emergency stop operation**(i) Starting condition**

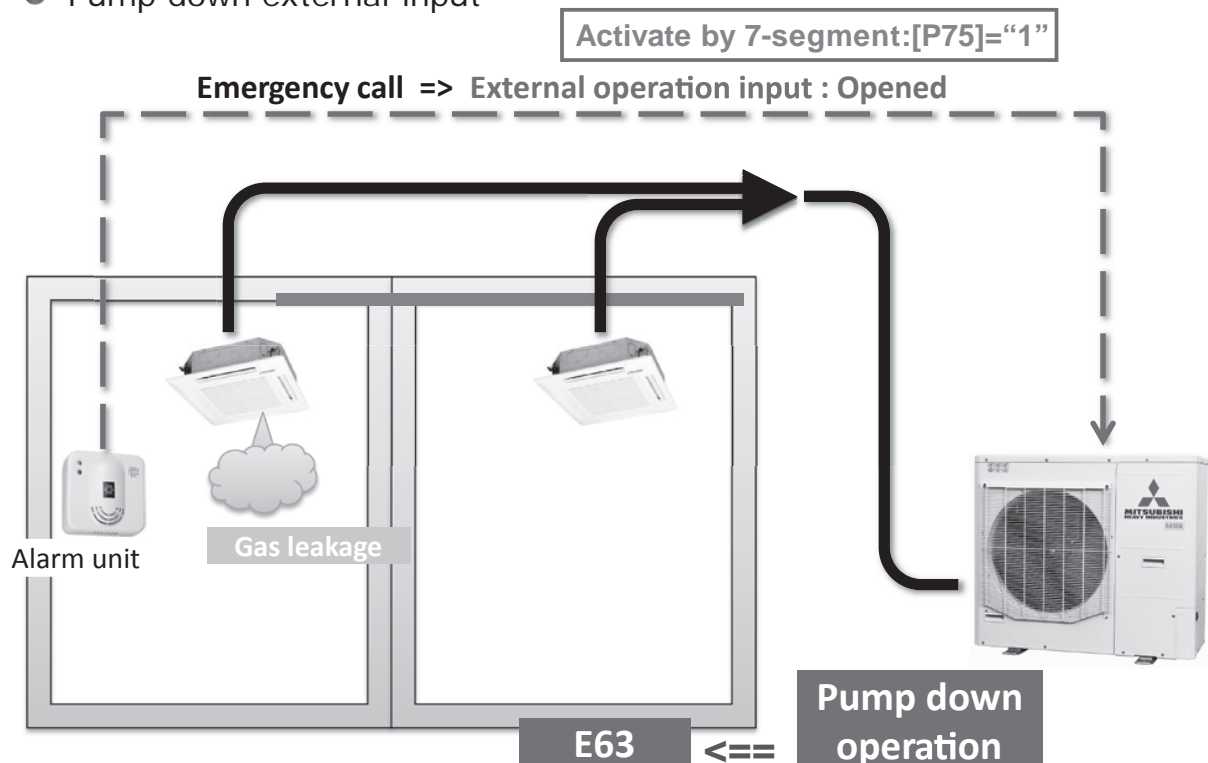
- ① When the pump-down operation has ended in the status 1.

(ii) Contents of control

- ① ON is output to CnZ1, and the gas service valve is shut down if it is connected on CnZ1.
- ② Operation stops with the error full stop. ([E63] is displayed.)

(iii) Ending condition

- ① When starting conditions for the status 1 are lost.
- ② State of error continues for 3 minutes after the error full stop. It cannot be reset in this condition from the remote control. If the starting conditions for status 1 are not yet established later, this can be reset by the remote control inspection reset.

● Pump down external input

(10) Outdoor operation mode

On the standard models of 2-pipe system, the outdoor operation mode of Stop/Cooling/Heating is selected based on the information of indoor units, and then respective controls are performed.

<Contents of control>

(a) Determination of outdoor operation mode

Operation mode of outdoor unit is determined based on respective signals of Operation/Stop and Cooling/Heating.

(b) Type of outdoor operation mode

- 1) Outdoor operation mode - Stop
- 2) Outdoor operation mode - Cooling
- 3) Outdoor operation mode - Heating

(c) Priority in operation mode selection.

- 1) First priority is given to the forced cooling/heating operation.
- 2) Second priority is given as follows

Priority in the operation mode selection can be changed using the 7-segment setting [P01].

P01 setting	Mode
0 (Factory default)	First unit's operation mode
1	Last unit's operation mode
2	Priority of master unit's setting operation mode
3	Priority of required major operation mode

- First unit's operation mode: Operation mode of the indoor unit which is operated first time after stop of the outdoor unit operation mode

- Last unit's operation mode: Operation mode of the indoor unit which is operated at the last time

- Priority of master unit's setting operation mode: Operation mode of indoor unit of which the address No. is smallest (Master indoor unit). When the master indoor unit is turned off, it become valid the first push priority on other indoor units' remote controls.

- Priority of required major operation mode: Operation mode of which the total capacity of operating indoor units is larger. There is no renewed judgment for 10 minutes after a change on the operation mode.

The judgment, however, is renewed in following cases.

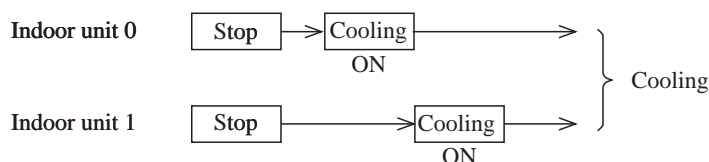
- At the stop
- When the P01 setting is changed.

3) In the event that agreement of operation mode is lost between indoor units and outdoor units by selecting the first or second priority after determining the operation mode, it is changed forcibly to the "Fan" mode. The operation mode LCD flickers to warn the "Mode unmatched"

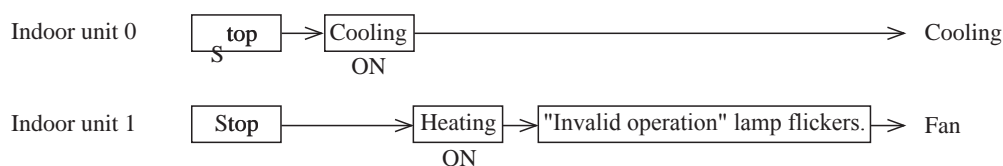
4) Example of operation mode selection

<First unit's operation mode>

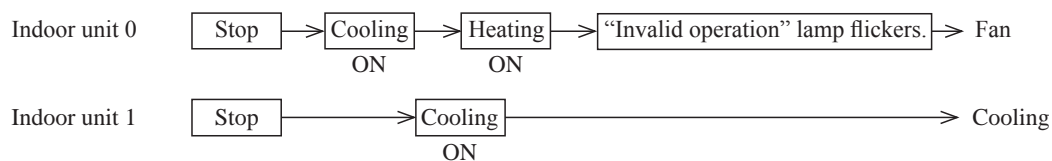
① If both of indoor units 0 and 1 have the same operation mode, it operates with the mode.



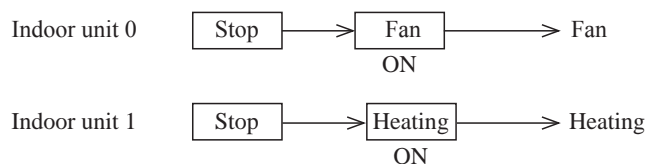
② Cooling does not match on indoor units 0 and 1 (Priority is given to previous operation.)



③ When it is changed from same mode to unmatched.

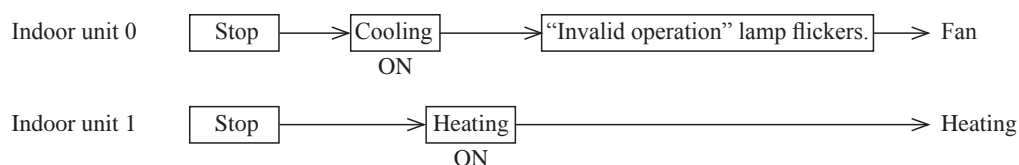


④ Operation mode is prepared for change in the fan mode.

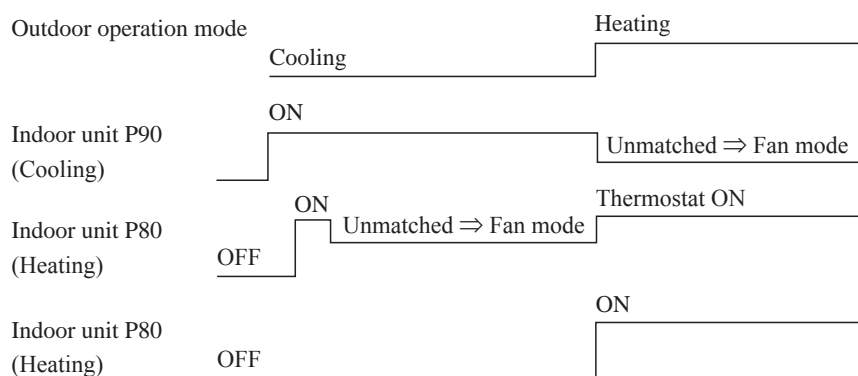


<Last unit's operation mode>

① If the indoor unit 1 of which operation mode is different has joined in when the indoor units 0 is operating.



<Priority of required major operation mode>



5) Reset of unmatched condition (Cooling/heating unmatched)

When unmatched occurs among indoor units, it can be reset by either one of followings.

- ① If the operation mode of outdoor unit is matched with that of indoor unit.
- ② If the operation mode is changed to “Fan” or “Stop” on the indoor units on which Cooling/heating is unmatched.

(d) Forced cooling /heating operation (Master unit)

(Note) Following explanation is based on using CnG1 terminal and setting function [P09]-[2] with 7-segment display.

However other terminals can be used with following function setting of 7-segment display.

CnS1: [P07]-[2]

CnS2: [P08]-[2]

CnG2: [P10]-[2]

- 1) When SW3-7 on the outdoor control PCB is turned ON after setting function [P09]-[2] with 7-segment display, if CnG1 is shorted, forced heating operation is performed, but if CnG1 is open, forced cooling operation is performed.
- 2) If the different mode from the forced operation mode is commanded from indoor unit, the "mode unmatched" message is displayed on the LCD of remote control and the operation is entered in FAN mode.

SW3-7	ON	CnG1	Open	Operation in cooling only
			Shorted	Operation in heating only
	OFF	Normal operation		

- 3) With the forced mode from indoor unit, if a different operation mode is commanded, following operations take place based on the forced cooling/heating operation set with the 7-segment [P38].

P38 = 0: The operation mode unmatched is displayed on the remote control, etc., and it is changed to the fan operation.

P38 = 1: It is operated with the forced cooling/heating operation mode.

Setting temperature for cooling ... 28°C

Setting temperature for heating ... 20°C

(11) VTCC : Variable Temperature and capacity control (VRF inverter Multi-system energy save control)

On the multi-system, target pressures are set uniformly so that indoor units operate with a constant capacity and repeat the ON/OFF control with which thermostats are turned OFF when temperatures become near the setting temperature.

Owing to the tuning of target high/low pressure near the setting temperature, it becomes possible to perform the high efficiency operation near the setting temperature.

For this reason, duration of time for highly efficient operation is increased by providing the compressor upper limit speed according to the thermostat ON capacity.

- Thermostat ON capacity ... Total capacity of indoor units which are operating with the thermostat ON

(a) Correction of target high/low pressure**(i) Starting condition (either of ① or ②)**

- ① When the external input function assignment [P07] : Multi-system energy save control = Valid
- ② When 7-segment [P39] (Multi-system energy save control I) = ON, if the external input function assignment
- ③ [P07] is not assigned this control.

(ii) Contents of control

- ① During the outdoor unit operation mode at cooling
 - Indoor load more than 50% → Corrected to the target cooling low pressure lower.
 - Indoor load less than 50% → Corrected to the target cooling low pressure higher.
- ② During the outdoor unit operation mode at heating
 - Indoor load more than 50% → Corrected to the target heating high pressure higher.
 - Indoor load less than 50% → Corrected to the target heating high pressure lower.

$$\text{(Note) Indoor load condition (\%)} = \frac{\text{(Total capacity of indoor units of which load is high)}}{\text{Total capacity of indoor units with the thermostat ON}}$$

(iii) Ending condition

- ① When the starting conditions are lost.

(C) Data output

(1) 7-segment and operation data retention

(a) 7-segment display

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

(i) Operation information display

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

② Display is controlled with the following buttons.

SW9: Setting button for order of 10 of display code display

SW8: Setting button for order of 1 of display code display

SW7: Data erase/write button

③ 3 seconds after fixing display code, data are displayed according to the code display.

(During setting buttons, Code No. is displayed)

If SW9 or SW8 is pressed during the data display, it returns to corresponding code display

If SW9 or SW8 is pressed during the code display, code No. is changed according the button setting.

Example) If it is required to display the data of code [C23] instead of the data of code[C00] displayed,

(i) Press SW9 or SW8 and it turns from data display to code display of [C00]

(ii) Press 2-time of SW9 and 3-time of SW8 in the state of [C00] display, the code display changes to [C23]

(iii) After 3 seconds passed, the data corresponding to [C23] is displayed.

④ Code [C96] is operable item. It is possible to delete the retained operation data (data of 30 minutes preceding an anomalous stop) by following resetting procedure.

<Resetting operation>

- Select code [C96]. If any anomalous data is retained, the data display [dEL] is shown 3 seconds later.
- Pressing SW7 for 3 seconds erases the memory data on RAM.
(EEPROM data are not erased.)
- As the data are erased, the data display shows [- - -].
When no anomalous data are retained, it displays [---] as well.
- Unless the reset operation is performed, data are retained. Therefore, if normal operation is resumed without the reset operation and an anomalous stop occurs again, no new anomalous data cannot be retained, but former anomalous data are still retained unchanged.

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

⑥ If you press SW9 (order of 10), the number jumps to the leading code of each order of 10.

Data display [CXX] and setting value display [PXX] are considered to be continuous.

Example: Pressing SW9 at [C07] it changes to [C10], and press SW9 again, it changes to [C20].

: Pressing SW9 at [C90], it changes to [P00], and press SW9 again, it changes to [P10].

⑦ Codes [C44] and [C45] are operable items. With the following reset operation, the cumulative compressor operation time corresponding to the code No. can be erased (reset). (Reset of operation time after replacing the compressor)

<Resetting operation>

- Select codes [C44] and [C45]. Cumulative compressor operation time to the present is displayed 3 seconds later.
- Pressing SW7 for 3 seconds erases the memory data.
However, the cumulative compressor operation time data in the 30 minutes log data preceding an anomalous stop (if this retained log data are not deleted) are not erased by this procedure.

⑧ Data display for spare items is left in blank.

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

(iii) Precedence of display

① [EXX] > [Related to check operation ([CHJ] > [CHU])] > [PdE] > [PdS] > [oPX] > [CXX]

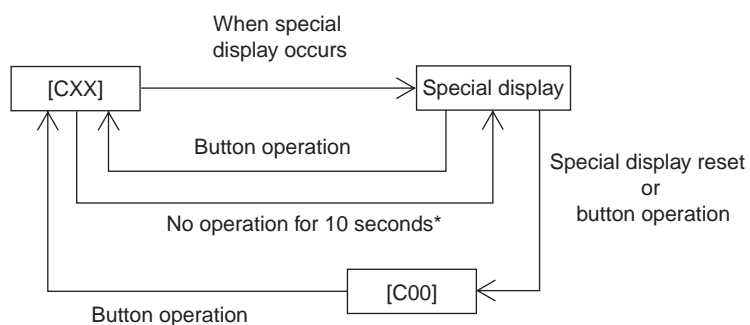
② If resetting from the display of ①, it is switched to [C00].

③ If SW8 or SW9 is pressed during the display of ①, it changes to [C00].

However, unless no button input is done for 10 seconds after change to [C00], it changes to the display of ① automatically according to the precedence.

④ Display switching

Special display is the display other than [CXX].



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

(b) List of 7-segment displays

Code No.	Contents of display	Data display range	Minimum unit	Remarks
Error display	[EXX]			
Caution display	[oPX]			
Special display	[PdS][PdE][CHx][CHE] [CHL][CHU][CHJ][CHO] and etc.			
Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<Sensor value, actuator information>				
C00	CM1 operation frequency	0 - 130	1Hz	
C01	(Spare) CM2 operation frequency	0 - 130	1Hz	
C02	Tho-A Ambient air temperature	L,-20 - 43	1Hz	
C03	Tho-R1 Heat exchanger temperature 1	L,-25 - 73	1°C	
C04	Tho-R2 Heat exchanger temperature 2	L,-25 - 73	1°C	
C05	(Spare) Tho-R3 Heat exchanger temperature 3	L,-25 - 73	1°C	
C06	(Spare) Tho-R4 Heat exchanger temperature 4	L,-25 - 73	1°C	
C07	Tho-D1 Discharge pipe temperature (CM1)	L,31 - 136	1°C	
C08	(Spare) Tho-D2 Discharge pipe temperature (CM2)	L,31 - 136	1°C	
C09	(Spare)			
C10	(Spare) Tho-C1 Under-dome temperature (CM1)	L,5 - 90	1°C	
C11	(Spare) Tho-C2 Under-dome temperature (CM2)	L,5 - 90	1°C	
C12	Tho-P1 Power transistor temperature (CM1)	L,5 - 136	1°C	
C13	(Spare) Tho-P2 Power transistor temperature (CM2)	L,5 - 136	1°C	
C14	Tho-SC Sub-cooling coil temperature 1	L,18 - 73	1°C	
C15	Tho-H Sub-cooling coil temperature 2	L,-25 - 73	1°C	
C16	Tho-S Suction pipe temperature	L,-25 - 73	1°C	
C17	(Spare) Temperature sensor (Active filter)			
C18	CT1 (CM1) current	0 - 50	1A	
C19	(Spare) CT2 (CM2) current	0 - 50	1A	
C20	EEVH1 Heating expansion valve opening angle	0 - 500	1 pulse	
C21	(Spare) EEVH2 Heating expansion valve opening angle	0 - 500	1 pulse	
C22	EEVSC Sub-cooling coil expansion valve opening angle	0 - 500	1 pulse	
C23	FMo1 Actual fan speed	0 - 999	10min ⁻¹	
C24	(Spare) FMo2 Actual fan speed	0 - 999	10min ⁻¹	
C25	PSH High pressure sensor	0 - 4.15	0.01MPa	
C26	PSL Low pressure sensor	0 - 1.70	0.01MPa	
C27	(Spare)			
C28	(Spare)			
C29	(Spare)			

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
C30	Pressure switch	0,1 (0: Close, 1: Open)	—	Order of 100: 63H1-1
				Order of 10: (Spare) 63H1-R
				Order of 1: (Spare)
C31	External input	0,1 (0: Close, 1: Open)	—	Order of 100: CnS1
				Order of 10: (Spare) CnS2
				Order of 1: (Spare) CnG1
C32	External input	0,1 (0: Close, 1: Open)	—	Order of 100: (Spare) CnG2
				Order of 10: (Spare)
				Order of 1: (Spare)
C33	Relay output	0,1 (0: Close, 1: Open)	—	Order of 100: 52C-1
				Order of 10: 20S
				Order of 1: Crankcase heater 1
C34	Relay output	0,1 (0: Close, 1: Open)	—	Order of 100: (Spare) SV6
				Order of 10: (Spare) SV7
				Order of 1: (Spare) Cooling fan
C35	Relay output	0,1 (0: Close, 1: Open)	—	Order of 100: (Spare) SV1
				Order of 10: (Spare) SV11
				Order of 1: (Spare) SV12
C36	Relay output	0,1 (0: Close, 1: Open)	—	Order of 100: (Spare)
				Order of 10: (Spare)
				Order of 1: (Spare)
C37	External output	0,1 (0: Close, 1: Open)	—	Order of 100: External output (CnZ1)
				Order of 10: (Spare) Operation output
				Order of 1: (Spare) Anomalous output
C38	(Spare)	0,1 (0: Close, 1: Open)	—	Order of 100:
				Order of 10:
				Order of 1:
C39	(Spare)	0,1 (0: Close, 1: Open)	—	Order of 100:
				Order of 10:
				Order of 1:
<Outdoor unit information>				
C40	Number of connected indoor units	0 - 50	1	
C41	Capacity of connected indoor units	0 - 200		
C42	Number of indoor units with thermostat ON	0 - 50	1	
C43	Required Hz total	0 - 999	1Hz	
C44	Cumulative compressor operation time (CM1)	0 - 655	100h	
C45	(Spare) Cumulative compressor operation time (CM2)	0 - 655	100h	
C46	Discharge pressure saturated temperature	-50 - 70	0.1℃	Range unable to display (-10℃ or under) is in the unit of 1℃.
C47	Suction pressure saturated temperature	-50 - 30	0.1℃	Range unable to display (-10℃ or under) is in the unit of 1℃.
C48	Sub-cooling coil temperature sensor 1 saturated pressure	-0.68 - 4.15	0.01 MPa	0 is omitted in negative range. -0.68 → [-.68]
C49	Cooling sub-cooling	0 - 50	0.1deg	
C50	Heating overheat	0 - 50	0.1deg	
C51	Sub-cooling coil overheat	0 - 50	0.1deg	
C52	Discharge pipe overheat 1	0 - 50	0.1deg	
C53	(Spare) Under-dome overheat 1	0 - 50	0.1deg	
C54	Target cooling low pressure	0.00 - 2.00	0.01MPa	
C55	Target heating high pressure	1.60 - 4.15	0.01MPa	

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
C56	Target Fk	0 - 999	1Hz	
C57	Inverter 1 operation frequency command	0 - 130	1Hz	
C58	Demand ratio	0 - 100	1 %	
C59	FMo1 Fan Speed command	0 - 999	10min ⁻¹	
C60	(Spare) FMo2 Fan Speed command	0 - 999	10min ⁻¹	
<Control status>				
C61	Control status	0,1 (0: Close, 1: Open)	–	Order of 100: Oil return control ON
				Order of 10: Defrosting ON
				Order of 1: (Spare)
C62	Control status	0,1 (0: Close, 1: Open)	–	Order of 100: Test run control ON
				Order of 10: Demand control ON
				Order of 1: Silent mode control ON
C63	Control status	0,1 (0: Close, 1: Open)	–	Order of 100: Capacity measurement mode ON
				Order of 10: (Spare)
				Order of 1: (Spare)
C64	(Spare)	0,1 (0: Close, 1: Open)	–	Order of 100:
				Order of 10:
				Order of 1:
C65	Protection control status	0,1 (0: Close, 1: Open)	–	Order of 100: HP control by compressor speed down control ON
				Order of 10: LP control by compressor speed down control ON
				Order of 1: Td control by compressor speed down control ON
C66	Protection control status	0,1 (0: Close, 1: Open)	–	Order of 100: Compression ratio control by compressor speed down control ON
				Order of 10: CS control by compressor speed down control ON
				Order of 1: PT control by compressor speed down control ON
C67	(Spare)	0,1 (0: Close, 1: Open)	–	Order of 100: Tc control by compressor speed down control ON
				Order of 10: (Spare)
				Order of 1: (Spare)
C68	Compressor stop cause	0 - 127	1	→ *1
C69	(Spare)	0,1 (0: Close, 1: Open)	–	Order of 100:
				Order of 10:
				Order of 1

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<Anomalous counter information>				
C70	Counter · Sensor wire disconnected	0 - 3	1	
C71	Counter · High pressure protection	0 - 5	1	
C72	Counter · Anomalous low pressure ③ (During operation)	0 - 5	1	
C73	Counter · Anomalous low pressure ① (During stop)	0 - 5	1	
C74	Counter · Discharge pipe 1 anomalous temperature	0 - 5	1	
C75	Counter · Anomalous FMO1 stop	0 - 5	1	
C76	(Spare) Counter · Anomalous FMO2 stop	0 - 127	1	
C77	Counter · Current cut (CM1)	0 - 4	1	
C78	Counter · Compressor 1 starting failure	0 - 20	1	
C79	Counter · Inverter 1 communication error	0 - 4	1	
C80	(Spare) Counter · Power transistor 1 overheat	0 - 127	1	
C81	(Spare) Counter · Compressor 1 rotor lock	0 - 127	1	
C82	Counter · Inverter 1 desynchronism error	0 - 127	1	
C83	Counter · Inverter 1 communication error cumulative	0 - 127	1	
C84	Counter · Indoor/outdoor communication error	0 - 255	1	
C85	Counter · CPU reset	0 - 255		
C86	(Spare) Counter · Anomalous low pressure ② (Immediately after startup)			
C87	(Spare) Counter · Discharge pipe 2 anomalous temperature			
C88	(Spare) Counter · Current cut (CM2)			
C89	(Spare) Counter · Power transistor 2 overheat			
C90	(Spare) Counter · Compressor 2 starting failure			
C91	(Spare) Counter · Compressor 2 rotor lock			
C92	(Spare) Counter · Inverter 2 communication error			
C93	(Spare)			
C94	(Spare)			
<Others>				
C95	(Spare)			
C96	Data reset			
C97		0 - 991	—	
C98	Program · POL version	0.00 - 9.99	0.01	Graphic language version Display position was changed from C79.
C99		—		

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<User setting>				
P00	(Spare)	----	—	
P01	Operation preference switching	<u>0 : (Factory default)</u> 0,1,2,3	—	0: First unit's operation mode 1: Last unit's operation mode 2: Priority of master unit's setting operation mode 3: Priority of required major operation mode
P02	Outdoor fan snow protection control	<u>0 : (Factory default)</u> 0,1 - 4	—	0: Outdoor fan snow protection control invalid (Factory default) 1- 4: Outdoor fan snow protection control
P03	Outdoor fan snow protection control ON time setting	<u>30 : (Factory default)</u> 10, 30 - 600 [Sec]	30	valid Changes like 10, 30, 60 90 ... 600
P04	Demand ratio change value	<u>OFF : (Factory default)</u> OFF,000,040, 060,080		0: OFF, 1: 0%, 2: 40%. 3: 60%, 4: 80% Factory default is 0: OFF.
P05	Silent setting	<u>0 : (Factory default)</u> 0 - 9	1	
P06	External output function quota	<u>0 : (Factory default)</u> 0 - 9	1	
P07	External input (CnS1) function quota	<u>0 : (Factory default)</u> 0 - 20	1	
P08	(Spare) External input (CnS2) function quota	<u>1 : (Factory default)</u> 0 - 20	1	
P09	(Spare) External input (CnG1) function quota	<u>2 : (Factory default)</u> 0 - 20	1	
P10	(Spare) External input (CnG2) function quota	<u>3 : (Factory default)</u> 0 - 20	1	

Code No.	Contents of data display	Data display range	Minimum unit	Remarks
<New Superlink setting>				
P30	Superlink communication status	0,1	–	0: Current Superlink 1: New Superlink
P31	Start automatic address setting	0 : (Factory default) 0,1	–	0: Automatic address setting standby. 1: Automatic address setting start.
P32	Input starting indoor address	1 : (Factory default) 0 - 127	1	Specify the starting indoor address connected in one refrigerant system for automatic address setting.
P33	Input the number of connected indoor units	1 : (Factory default) 1 - 24 (*)	1	Specify the number of indoor units connected in one refrigerant system for automatic address setting. (*) Maximum connectable number of indoor units for each outdoor unit
P34	Polarity definition	0 : (Factory default) 0,1	–	0: Network polarity not defined 1: Network polarity defined
P35	Indoor address clear transmission 2	0 : (Factory default) 0,1	–	0: Does not transmit clear setting signal 1: Transmits clear setting signal (* Interlocked with [P34].) For operation error protection
P36	(Spare)	–		
P37	(Spare)	–		
P38	(Spare)			
P39	(Spare)			

*1 Compressor stop cause

[definition of signal]

It shows the latest compressor anomalous stop cause

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

(c) Saving of operation data

Mainly for investigating causes of market claims, operation data are always saved in memory. If any trouble occurs, the data writing is stopped and only the operation data prior to the time when the trouble occurs are recorded. These data can be loaded to a PC via RS-232C connector of PCB and utilized for identifying causes.

- (i) Operation data for a period of 30 minutes prior to the present operation are saved and updated continuously.
- (ii) If an anomalous stop occurs, the data are not updated any more.
- (iii) Data are written in based on 1 minute sampling interval and next data will be transmitted to PC upon demand.

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

Outdoor unit composition	Outdoor unit capacity data	Remarks
Single type	Example: 24HP - [S24]	S: Display with Horse Power of single type or single use of combination type
Master unit of combination type	Example: 46HP - [S46]	S: Display with Horse Power of master unit of combination type
Slave unit of combination type	Example: 20HP - [C20]	C: Display with Horse Power of slave unit of combination type

(iv) Error retention and monitoring data

Code No.	Write contents	Record data			
		Data write range	Unit of write	Number of bytes	Contents
0	Indoor 1 Thi-A	-14 - 50	A/D value	1	Suction
1	Indoor 1 Thi-R1	0 - 72	A/D value	1	Heat exchanger 1
2	Indoor 1 Thi-R2	0 - 72	A/D value	1	Heat exchanger 2
3	Indoor 1 Thi-R3	0 - 72	A/D value	1	Heat exchanger 3
4	Indoor 1 EEV	0 - 470	1 pulse	2	
5	Indoor 1 operation/stop	0,1	-	1	0 Stop
					1 Operation
6	Indoor 1 operation mode	0 - 4	-	1	0 Auto
					1 Dehumidifying
					2 Cooling
					3 Fan
					4 Heating
7	Indoor 1 request Hz	0 - 255	1Hz	1	
8	Indoor 1 answer Hz	0 - 255	1Hz	1	
9	Indoor 1 indoor local	-	-	1	Bit0 Anti-frost
					Bit1 EEV opening angle implementation
10	Indoor 1 Thi spare	-14 - 50	A/D value	1	Discharge
11	Indoor 1 type	0 - 8	-	1	0 FDT
					1 FDK
					2 Others
					3 FDE
					4 FDTC
					5
					6
					7
12	Indoor 1PID	-	-	1	60 -

The data of indoor unit No.2-16 are continued. (contents are same as above)

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

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
37	FM01 Fan speed command	0 - 65535	10min ⁻¹	2			
38	(Spare) FMO2 Fan speed command	0 - 65535	10min ⁻¹	2			
39	EEVH1 opening degree	0 - 65535	1 pulse	2			
40	EEVSC opening degree	0 - 65535	1 pulse	2			
41	Compressor target cooling low pressure	0.00 - 2.00	0.01MPa	1			
42	Compressor target heating high pressure	0.00 - 4.15	0.01MPa	2			
43	Outdoor EEVH target overheat	0 - 25.5	0.1°C	1	Actual range: 5°C – 11°C		
44	Outdoor EEVH initial learning opening position	0 - 255	1 pulse	1			
45	Outdoor EEVSC target overheat	0 - 25.5	0.1°C	1			
46		0 - 2550	10cc	1			
47		0 - 255	3 min.	1			
<PCB hardware input>							
48	External input	—	—	1	Bit0	63H1	0: Open, 1: Short-circuit
					Bit1	(Spare) 63H1-R	0: Open, 1: Short-circuit
					Bit2	CnS1	0: Open, 1: Short-circuit
					Bit3	(Spare) CnS2	0: Open, 1: Short-circuit
					Bit4	(Spare) CnG1	0: Open, 1: Short-circuit
					Bit5	(Spare) CnG2	0: Open, 1: Short-circuit
					Bit6	(Spare)	0: Open, 1: Short-circuit
					Bit7	(Spare)	0: Open, 1: Short-circuit
49	DIP switch [SW3]	—	—	1	Bit0	SW3-1	0: OFF, 1: ON
					Bit1	SW3-2	0: OFF, 1: ON
					Bit2	SW3-3	0: OFF, 1: ON
					Bit3	SW3-4	0: OFF, 1: ON
					Bit4	SW3-5	0: OFF, 1: ON
					Bit5	SW3-6	0: OFF, 1: ON
					Bit6	SW3-7	0: OFF, 1: ON
					Bit7	SW3-8	0: OFF, 1: ON
50	DIP switch [SW4]	—	—	1	Bit0	SW4-1	0: OFF, 1: ON
					Bit1	SW4-2	0: OFF, 1: ON
					Bit2	SW4-3	0: OFF, 1: ON
					Bit3	SW4-4	0: OFF, 1: ON
					Bit4	SW4-5	0: OFF, 1: ON
					Bit5	SW4-6	0: OFF, 1: ON
					Bit6	SW4-7	0: OFF, 1: ON
					Bit7	SW4-8	0: OFF, 1: ON
51	DIP switch [SW5]	—	—	1	Bit0	SW5-1	0: OFF, 1: ON
					Bit1	SW5-2	0: OFF, 1: ON
					Bit2	SW5-3	0: OFF, 1: ON
					Bit3	SW5-4	0: OFF, 1: ON
					Bit4	SW5-5	0: OFF, 1: ON
					Bit5	SW5-6	0: OFF, 1: ON
					Bit6	SW5-7	0: OFF, 1: ON
					Bit7	SW5-8	0: OFF, 1: ON

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
52	DIP switch [SW6]	—	—	1	Bit0	(Spare) SW6-1	0 : OFF, 1 : ON
					Bit1	(Spare) SW6-2	0 : OFF, 1 : ON
					Bit2	(Spare) SW6-3	0 : OFF, 1 : ON
					Bit3	(Spare) SW6-4	0 : OFF, 1 : ON
					Bit4	(Spare) SW6-5	0 : OFF, 1 : ON
					Bit5	(Spare) SW6-6	0 : OFF, 1 : ON
					Bit6	(Spare) SW6-7	0 : OFF, 1 : ON
					Bit7	(Spare) SW6-8	0 : OFF, 1 : ON
53	Jumper wire	—	—	1	Bit0	J11	0: Open, 1: Short-circuit
					Bit1	J12	0: Open, 1: Short-circuit
					Bit2	J13	0: Open, 1: Short-circuit
					Bit3	J14	0: Open, 1: Short-circuit
					Bit4	J15	0: Open, 1: Short-circuit
					Bit5	J16	0: Open, 1: Short-circuit
					Bit6	(Spare)	
					Bit7	(Spare)	
<PCB hardware output>							
54	Relay output	—	—	1	Bit0	52C1	0 : OFF, 1 : ON
					Bit1	20S	0 : OFF, 1 : ON
					Bit2	CH1	0 : OFF, 1 : ON
					Bit3	(Spare) SV1	0 : OFF, 1 : ON
					Bit4	(Spare) SV6	0 : OFF, 1 : ON
					Bit5	(Spare) SV11	0 : OFF, 1 : ON
					Bit6	(Spare) SV12	0 : OFF, 1 : ON
					Bit7	(Spare) FMC1,2	0 : OFF, 1 : ON
55	Relay output	—	—	1	Bit0	Operation output (CnH)	0 : OFF, 1 : ON
					Bit1	Error output (CnY)	0 : OFF, 1 : ON
					Bit2	External output (CnZ)	0 : OFF, 1 : ON
					Bit3	(Spare)	0 : OFF, 1 : ON
					Bit4	(Spare)	0 : OFF, 1 : ON
					Bit5	(Spare)	0 : OFF, 1 : ON
					Bit6	(Spare)	0 : OFF, 1 : ON
					Bit7	(Spare)	0 : OFF, 1 : ON
<Related to compressor>							
56	CM1 Cumulative operation hours (Approx.)	0 - 65535	1h	2			
57	CM1 Starting times	0 - 65535	× 20 times	2			
58	CM1 3-minute delay timer	0 - 180	1 sec.	1			
59	Energizing time count down	0 - 255	1 min.	1			
60	Control status CH Compressor protection timer	0 - 360	3 min.	1			
61	Control status CH Compressor protection start	0 - 15	—	1	15	Protection start complete	
					0 -14	Protection start ON	

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
<Control status>							
62	Control status Oil return	0 - 2	—	1	0	None	
					1	Oil return ON	
63	Control status Defrost condition	0 - 3	—	1	0	None	
					1	Temperature condition	
					2	Time condition	
64	Control status Defrost status	0 - 4	—	1	0	None	
					1	Defrost status 1	
					2	Defrost status 2	
					3	Defrost status 3	
					4	Defrost status 4	
65	Control status Cooling low pressure anomaly recovering status	0 - 4	—	1	0	None	
					1	Status 1	
					2	Status 2	
					3	Status 3	
					4	Status 4	
66	Control status 1			1	Bit0	Test run control implementing	0: Normal, 1: Implementing
					Bit1	Demand control implementing	0: Normal, 1: Implementing
					Bit2	Silent mode implementing	0: Normal, 1: Implementing
					Bit3		0: Normal, 1: Implementing
					Bit4		0: Normal, 1: Implementing
					Bit5	(Spare)	0: Normal, 1: Implementing
					Bit6	Implementing pump down control at start/stop	0: Normal, 1: Implementing
					Bit7	Low ambient air temperature control implementing (→ *1)	0: Normal, 1: Implementing
67	Control status 2			1	Bit0	Pump-down control for removal of unit implementing	0: Normal, 1: Implementing
					Bit1	Compressor dilution protection (→ *1)	0: Normal, 1: Implementing
					Bit2	(Spare) Forced out refrigerant from outdoor heat exchanger	0: Normal, 1: Implementing
					Bit3	Forced out refrigerant from indoor heat exchanger	0: Normal, 1: Implementing
					Bit4	(Spare)	0: Normal, 1: Implementing
					Bit5	(Spare)	0: Normal, 1: Implementing
					Bit6	(Spare)	0: Normal, 1: Implementing
					Bit7	(Spare)	0: Normal, 1: Implementing

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
<Protection control status>							
68	Protection control Status 1			1	Bit0	HP protection 1 Compressor capacity control	0: Normal, 1: Implementing
					Bit1	HP protection 2 (→ *1) Indoor EEV minimal opening control at heating stop	0: Normal, 1: Implementing
					Bit2	HP protection 3 Indoor EEV Control at heating overload	0: Normal, 1: Implementing
					Bit3	HP protection 4 Indoor unit forced thermostat OFF control under heating at overload	0: Normal, 1: Implementing
					Bit4	LP protection 1 Compressor capacity control	0: Normal, 1: Implementing
					Bit5	LP protection 2 Compressor speed increasing rate control	0: Normal, 1: Implementing
					Bit6	LP protection 3 (→ *1) Outdoor EEV control	0: Normal, 1: Implementing
					Bit7	Td protection 1 Compressor capacity control	0: Normal, 1: Implementing
69	Protection control Status 2			1	Bit0	Td protection 2 (→ *1) Compressor dilution ratio protection control	0: Normal, 1: Implementing
					Bit1	Td protection 3 (→ *1) Indoor EEV minimal opening control at heating stop	0: Normal, 1: Implementing
					Bit2	Td protection 4 (→ *1) Outdoor EEV control	0: Normal, 1: Implementing
					Bit3	Compression ratio protection 1 Compressor capacity control	0: Normal, 1: Implementing
					Bit4	Compression ratio protection 2 (→ *1) Outdoor EEV control	0: Normal, 1: Implementing
					Bit5	CS protection 1 Compressor capacity control	0: Normal, 1: Implementing
					Bit6	PT protection 1 Compressor capacity control	0: Normal, 1: Implementing
					Bit7	(Spare) Tc protection 1 Compressor capacity control	0: Normal, 1: Implementing
70	Protection control Status 3			1	Bit0	CS protection 2 Compressor frequency upper limit control	0: Normal, 1: Implementing
					Bit1	(Spare)	0: Normal, 1: Implementing
					Bit2	(Spare)	0: Normal, 1: Implementing
					Bit3	(Spare)	0: Normal, 1: Implementing
					Bit4	(Spare)	0: Normal, 1: Implementing
					Bit5	(Spare)	0: Normal, 1: Implementing
					Bit6	(Spare)	0: Normal, 1: Implementing
					Bit7	(Spare)	0: Normal, 1: Implementing
71	Cause of compressor stop	0 - 127	—	1	→ 18 – 1. Operation information		

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
<Error counter information>							
72	Control status HP (63H1) anomaly counter	0 - 5	1	1			
73	Control status LP anomaly counter while running	0 - 5	1	1			
74	Control status LP anomaly counter while stopping	0 - 5	1	1			
75	Control status Td1 error counter	0 - 5	1	1			
76	Control status DC fan motor 1 error counter	0 - 5	1	1			
77	(Spare) Control status DC fan motor 2 error counter	0 - 127	1	1			
78	Control status sensor wire disconnected counter	0 - 3	1	1			
79	Control status INV1 current cut error counter	0 - 4	1	1			
80	Control status INV1 starting failure counter	0 - 20	1	1			
81	Control status INV1 communication error counter	0 - 4	1	1			
82	Control status INV1 desynchronism error counter	0 - 127	1	1			
83	Control status INV1 communication error counter cumulative	0 - 255	1	1			
84	(Spare) Control status INV1 power transistor overheat error counter	0 - 127	1	1			
85	(Spare) Control status INV1 rotor lock error counter	0 - 127	1	1			
<Setting value display>							
86	Operation priority switching outdoor fan snow protection control	0,1	—	1	0	First push priority	
					1	Last push priority	
87	Outdoor fan snow protection control	0,1		1	0	Invalid	
					1	Valid	
88	Outdoor fan snow protection control ON time setting	30: (Factory default) 10, 30 – 600 [sec.]	10 sec.	1			
89	Demand ratio change value	OFF, 000, 040, 060, 080 Factory default 0: OFF	—	1			
90	Silent mode setting	0 - 9	—	1			
91	(Spare) CnS1 function quota value	0 - 9	—	1			
92	(Spare) CnS2 function quota value	0 - 9	—	1			
93	(Spare) CnG1 function quota value	0 - 9	—	1			
94	(Spare) CnG2 function quota value	0 - 9	—	1			
95	External output function quota	0 - 9	—	1			

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
<Other>							
104	Override number	0 -	—	1			
<Indoor unit information>							
105				1	Bit0		
					Bit1		
					Bit2		
					Bit3		
					Bit4 (Spare)		
					Bit5 (Spare)		
					Bit6 (Spare)		
					Bit7 (Spare)		
106	Registered indoor 1 – 8 operation mode	0 - 4	—	8	0	Auto	
					1	Humidifying	
					2	Cooling	
					3	Fan	
					4	Heating	
107	Registered indoor 1 – 8 request Hz	0 - 255	1Hz	8			
108	Registered indoor 1 – 8 answer Hz	0 - 255	1Hz	8			
<Check operation information>							
109	Check operation status	0 - 7	—	1	0	Normal	
					1	Check operation starting condition insufficient	
					2	Check operation preparation operation	
					3	Check operation implementation	
					4	Check operation interrupted	
					5	Service valve closing failure	
					6	Indoor unit failure	
					7	Check operation normal ending	
<Refrigerant amount judgment information>		—	—	—	—	—	—
110	(Spare) Refrigerant amount judgment control status	0 - 255	—	1			

Code No.	Write contents	Record data Data write range	Unit of write	Number of bytes	Contents		
<Piping washing operation information>							
111		0 - 7	—	1	0		
					1		
					2		
					3		
					4		
					5		
					6		
					7		
112	Registered indoor 1 – 8 unmatch check error	—	—	1	Bit0	Indoor 1 unmatch check error	0 : OFF, 1 : ON
					Bit1	Indoor 2 unmatch check error	0 : OFF, 1 : ON
					Bit2	Indoor 3 unmatch check error	0 : OFF, 1 : ON
					Bit3	Indoor 4 unmatch check error	0 : OFF, 1 : ON
					Bit4	Indoor 5 unmatch check error	0 : OFF, 1 : ON
					Bit5	Indoor 6 unmatch check error	0 : OFF, 1 : ON
					Bit6	Indoor 7 unmatch check error	0 : OFF, 1 : ON
					Bit7	Indoor 8 unmatch check error	0 : OFF, 1 : ON
113	Registered indoor 1 – 8 EEV check error	—	—	1	Bit0	Indoor 1 EEV check error	0 : OFF, 1 : ON
					Bit1	Indoor 2 EEV check error	0 : OFF, 1 : ON
					Bit2	Indoor 3 EEV check error	0 : OFF, 1 : ON
					Bit3	Indoor 4 EEV check error	0 : OFF, 1 : ON
					Bit4	Indoor 5 EEV check error	0 : OFF, 1 : ON
					Bit5	Indoor 6 EEV check error	0 : OFF, 1 : ON
					Bit6	Indoor 7 EEV check error	0 : OFF, 1 : ON
					Bit7	Indoor 8 EEV check error	0 : OFF, 1 : ON
114	Registered indoor 1 – 8 EEV opening pulse	0 - 127	Pulse	8			

(2) Outdoor unit PCB setting

Code	Input	Remarks
SW1	Outdoor address No. (Order of 10)	
SW2	Outdoor address No. (Order of 1)	
SW3-1	Inspection LED reset	
SW3-7	Forced heating/cooling	
SW5-1	Test run switch	
SW5-2	Test run Heating/Cooling	
SW5-3	Pump down switch	
SW7	Data erase/Write	
SW8	7-segment display code No. increasing (order of 1)	
SW9	7-segment display code No. increasing (order of 10)	
SW4-1	Model selection	See following table.
SW4-2		
SW4-3		
SW4-4		
SW4-7	Demand ratio selection	See following table.
SW4-8	Demand ratio selection	See following table.
J13	External input Level/Pulse	
J15	Defrost start temperature Normal/Cold region	

Notes (1) Jumper wires J13, J15 indicate short-circuit/open.

(2) Dip switch SW's indicate OFF/ON.

■ Model selection with SW4-1 – SW4-4

Model Switch	FDC121KXZEN1	FDC121KXZES1	FDC140KXZEN1	FDC140KXZES1	FDC155KXZEN1	FDC155KXZES1
SW4-1	0	0	1	1	0	0
SW4-2	0	0	0	0	1	1
SW4-3	1	1	1	1	1	1
SW4-4	1	0	1	0	1	0

Note (1) 0: OFF, 1: ON

■ Demand ratio selection with SW4-7, SW4-8

SW4-7	SW4-8	Compressor capacity (%)
0	0	80
1	0	60
0	1	40
1	1	0

Note (1) 0: OFF, 1: ON

2. SYSTEM TROUBLESHOOTING PROCEDURE

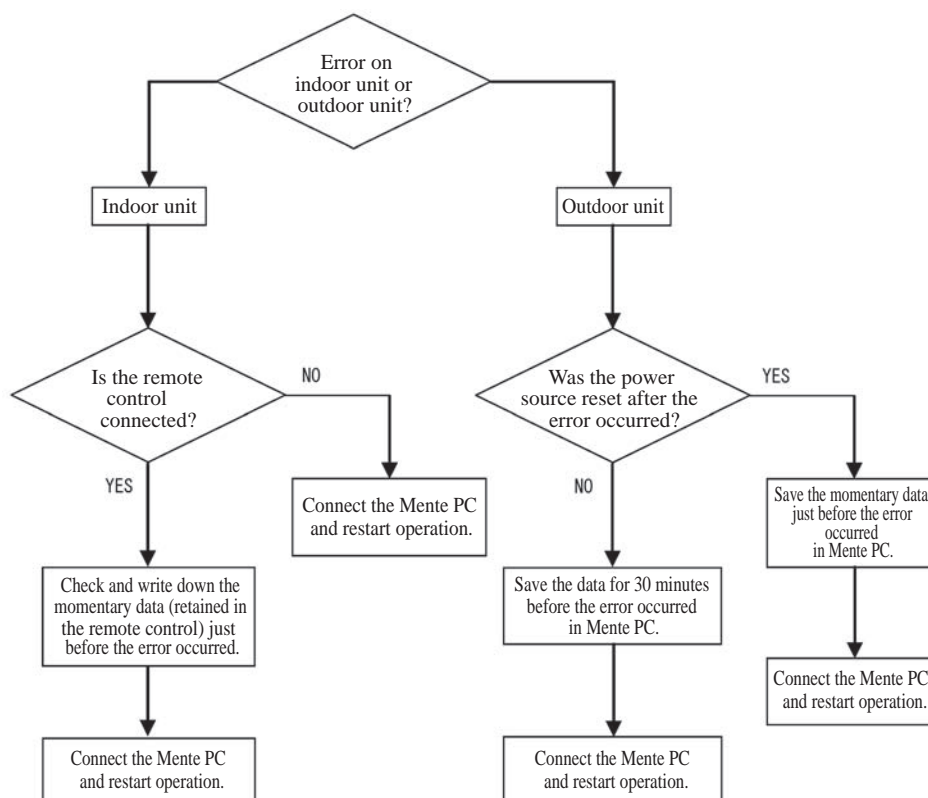
2.1 Basics of troubleshooting

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

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

Method of error data analysis (Basic procedure)

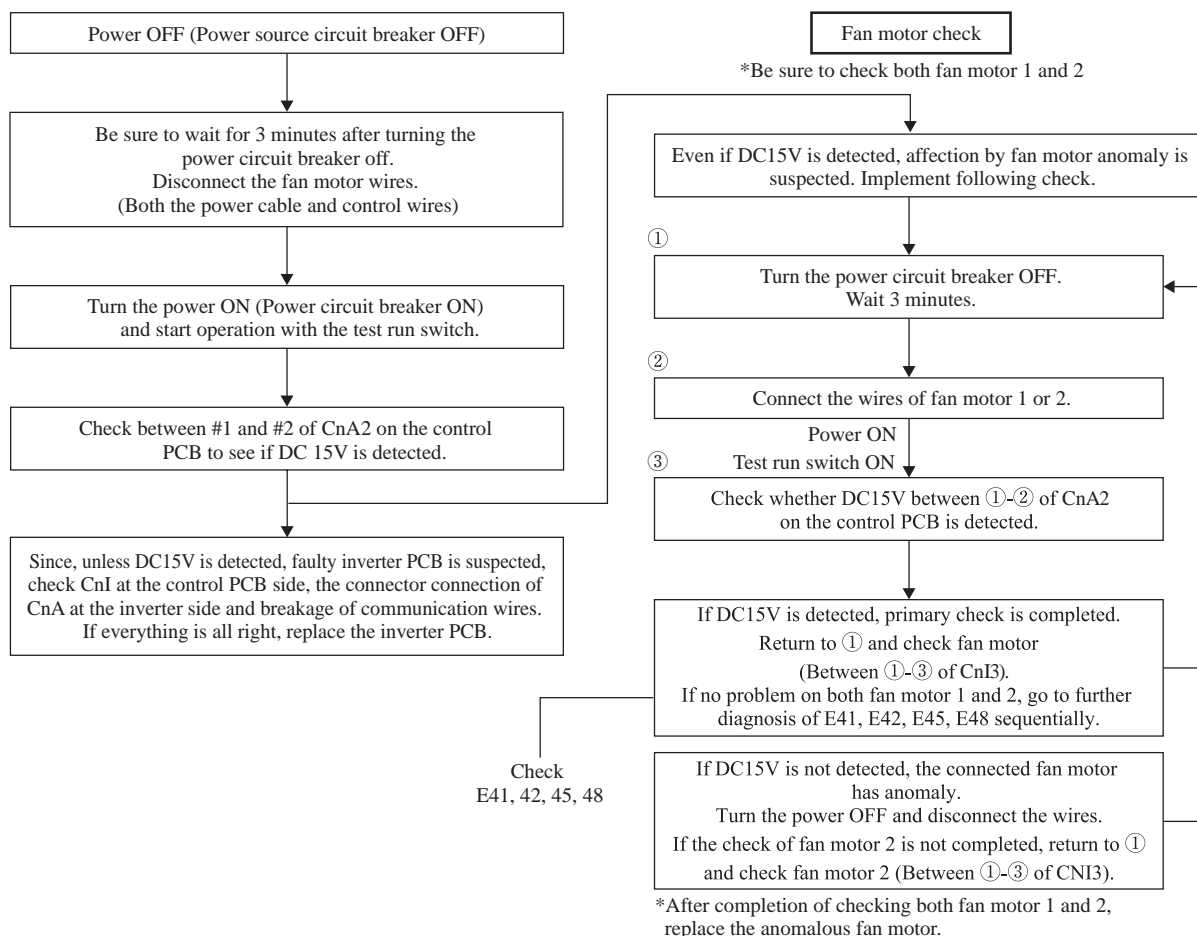
- Identify whether particular error occurred during operation or stopping.
- Is it caused by the installation conditions of outdoor/indoor unit? (Refrigerant quantity, pipe length, short-circuit, clogged filter, etc.)
- Isn't there any beginner's mistake at the installation? (Wrong address, mistake in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



2.2 Explanation of troubleshooting

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

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



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

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

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

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

P: P terminal of power transistor

N: N terminal of power transistor

U: End of red harness to compressor

V: End of white harness to compressor

W: End of blue harness to compressor

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

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

2.3 Contents of troubleshooting

(a) List of inspection displays

1) Indoor and outdoor units

Remote control error code	7-segment display	Name of inspection	Classification	Page
E1	—	Remote control communication error	Communication error	80
E2	—	Duplicated indoor unit address	Address setting error	81
E3	—	Outdoor unit signal line error	Address pairing setting error	82
E5	—	Communication error during operation	Communication error	83
E6	—	Indoor unit heat exchanger temperature sensor anomaly (Thi-R)	Sensor wire breakage	84
E7	—	Indoor return air temperature sensor anomaly (Thi-A)	Sensor wire breakage	85
E9	—	Drain trouble	System error	86
E10	—	Excessive number of indoor units (more than 17 units) by controlling one remote control	Communication error	87
E12	—	Address setting error by mixed setting method	Address setting error	88
E16	—	Indoor fan motor anomaly (FDT, FDTC series)	DC fan motor error	89
	—	Indoor fan motor anomaly (FDK series)	DC fan motor error	90
E19	—	Indoor unit operation check, drain pump motor check mode anomaly	Setting error	91
E28	—	Remote control temperature sensor anomaly (Thc)	Sensor wire breakage	92
E30	E30	Unmatch connection of indoor and outdoor unit	System error	93
E31	E31	Duplicated outdoor unit address No.	Address setting error	94
E32	E32	Open L3 Phase on power source at primary side	Site setting error	95
E36	E36-1	Discharge pipe temperature error (Tho-D1)	System error	96
	E36-3	Liquid flooding anomaly	System error	97
E37	E37-1 E37-5, 6	Outdoor unit heat exchanger temperature sensor (Tho-R) and subcooling coil temperature sensor (Tho-SC, -H) anomaly	Sensor wire breakage	98
E38	E38	Outdoor air temperature sensor anomaly (Tho-A)	Sensor wire breakage	99
E39	E39-1	Discharge pipe temperature sensor anomaly (Tho-D1)	Sensor wire breakage	100
E40	E40	High pressure anomaly (63H1-1 activated)	System error	101
E41 (E51)	E41 (E51)-1	Power transistor overheat	System error	102
E42	E42	Current cut (1) (2)	System error	103 • 104
E43	E43-1 E43-2	Excessive number of indoor units connected, excessive total capacity of connection	Site setting error	105
E45	E45	Communication error between inverter PCB and outdoor unit control PCB	Communication error	106
E46	E46	Mixed address setting methods coexistent in same network	Address setting error	107
E48	E48	Outdoor DC fan motor anomaly	DC fan motor error	108
E49	E49	Low pressure error	System error	109
E53	E53	Suction pipe temperature sensor anomaly (Tho-S)	Sensor wire breakage	110
E54	E54-1 E54-2	High pressure sensor anomaly (PSH)/Low pressure sensor anomaly (PSL)	Sensor wire breakage	111
E56	E56-1	Power transistor temperature sensor anomaly (Tho-P1)	Sensor wire breakage	112
E58	E58-1	Anomalous compressor by loss of synchronism	System error	113
E59	E59	Compressor startup failure	System error	114
E63	E63	Emergency stop	Site setting error	115

2) Option control in-use

SL1N-E SL2NA-E SL4-AE/BE		Indoor unit control PCB		Outdoor unit control PCB		Location of trouble	Description of trouble	Repair method
Error code	Red LED	Red LED	Green LED	Red LED	Green LED			
E75	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Keep flashing	SL1N-E SL2NA-E SL4-AE/BE	• Communication error (Defective communication circuit on the main unit of SL1N-E, SL2NA-E or SL4-AE/BE)	Replacement

(b) Troubleshooting

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

1. Applicable model	5. Troubleshooting
All models	
2. Error detection method	Diagnosis
	<p>Check the indoor fan operation Check the temperature difference between return and suction air of indoor unit</p> <p>Is the temperature difference between return and suction air 10-20°C at cooling?</p> <p>YES → Does the heat load increase after installation?</p> <p>NO → It is normal. (This unit is designed to start in the soft start mode by detecting the compressor under-dome temperature when it restart after power reset.)</p> <p>YES → Mistake in model selection. Calculate heat load once more.</p> <p>Is the compressor operating?</p> <p>NO → "WAIT" message is displayed [for 3 seconds] when performing cooling, defumidifying or heating operation from remote control?</p> <p>YES → It is necessary to replace to higher capacity unit or to install additional unit.</p> <p>NO → Compressor refrigerant oil protective control at starting is activated. For the contents of control, refer to the compressor start control.</p> <p>YES → Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputer control function.</p> <p>Is the compressor rotation speed low?</p> <p>NO → Check the followings</p> <ul style="list-style-type: none"> • Minor clogging of filter • Minor fouling of heat exchanger • Minor short-circuit of air flow • Slightly insufficient or excessive refrigerant amount • Poor compression of compressor <p>YES → Check suspicious points considering appropriate operation control.</p> <p>Check following operation control function.</p> <ul style="list-style-type: none"> • Control for determining compressor rotation speed • Protective control by controlling compressor rotation speed <p>Which control is appropriate to this phenomenon</p> <p>Is the operating conditions of indoor/outdoor unit under rated condition?</p> <p>YES → Check the followings for reference</p> <ul style="list-style-type: none"> • Severe clogging of filter • Severe clogging of heat exchanger • Severe short-circuit of air flow • Severely insufficient or excessive refrigerant amount • Under protective control of compressor • Indoor unit fan tap setting • Valid setting of silent mode <p>NO → The unit is operating normally, but is operating under the protective control of compressor or other respective components</p> <p>Note (1) Outdoor: 35°C Indoor : 27°CDB/19°CWB</p>
3. Condition of error displayed	Countermeasure
4. Presumable cause	
<ul style="list-style-type: none"> • Poor compression of compressor • Expansion valve anomaly 	

Note:

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

1.Applicable model	5.Troubleshooting				
All models	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>Check the indoor fan operation Check the temperature difference between return and suction air of indoor unit</p> <pre> graph TD Start([Start]) --> Q1{Is the temperature difference between return and suction air 10-30°C at heating?} Q1 -- YES --> Q2{Does the heat load increase after installation?} Q1 -- NO --> Q3{Is the compressor operating?} Q2 -- YES --> B1[Mistake in model selection. Calculate heat load once more.] Q2 -- NO --> C1[It is normal. (This unit is designed to start in the soft start mode by detecting the compressor under-dome temperature when it restart after power reset.)] B1 --> C2[It is necessary to replace to higher capacity unit or to install additional unit.] Q3 -- NO --> Q4{WAIT message is displayed (for 3 seconds) when performing cooling, defumidifying or heating operation from remote control?} Q3 -- YES --> Q5{Is the compressor rotation speed low?} Q4 -- YES --> C3[Compressor refrigerant oil protective control at starting is activated. For the contents of control, refer to the compressor start control.] Q4 -- NO --> C4[Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputer control function.] Q5 -- NO --> C5[Check the followings • Minor clogging of filter • Minor fouling of heat exchanger • Minor short-circuit of air flow • Slightly insufficient or excessive refrigerant amount • Poor compression of compressor] Q5 -- YES --> B2[Check following operation control function. • Control for determining compressor rotation speed • Protective control by controlling compressor rotation speed Which control is appropriate to this phenomenon] B2 --> Q6{Is the operating conditions of indoor/outdoor unit under rated condition?} Q6 -- YES --> C6[Check suspicious points considering appropriate operation control. Check the followings for reference • Severe clogging of filter • Severe clogging of heat exchanger • Severe short-circuit of air flow • Severely insufficient or excessive refrigerant amount • Under protective control of compressor • Indoor unit fan tap setting • Valid setting of silent mode] Q6 -- NO --> B3[The unit is operating normally, but is operating under the protective control of compressor or other respective components] </pre> </td><td></td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>Check the indoor fan operation Check the temperature difference between return and suction air of indoor unit</p> <pre> graph TD Start([Start]) --> Q1{Is the temperature difference between return and suction air 10-30°C at heating?} Q1 -- YES --> Q2{Does the heat load increase after installation?} Q1 -- NO --> Q3{Is the compressor operating?} Q2 -- YES --> B1[Mistake in model selection. Calculate heat load once more.] Q2 -- NO --> C1[It is normal. (This unit is designed to start in the soft start mode by detecting the compressor under-dome temperature when it restart after power reset.)] B1 --> C2[It is necessary to replace to higher capacity unit or to install additional unit.] Q3 -- NO --> Q4{WAIT message is displayed (for 3 seconds) when performing cooling, defumidifying or heating operation from remote control?} Q3 -- YES --> Q5{Is the compressor rotation speed low?} Q4 -- YES --> C3[Compressor refrigerant oil protective control at starting is activated. For the contents of control, refer to the compressor start control.] Q4 -- NO --> C4[Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputer control function.] Q5 -- NO --> C5[Check the followings • Minor clogging of filter • Minor fouling of heat exchanger • Minor short-circuit of air flow • Slightly insufficient or excessive refrigerant amount • Poor compression of compressor] Q5 -- YES --> B2[Check following operation control function. • Control for determining compressor rotation speed • Protective control by controlling compressor rotation speed Which control is appropriate to this phenomenon] B2 --> Q6{Is the operating conditions of indoor/outdoor unit under rated condition?} Q6 -- YES --> C6[Check suspicious points considering appropriate operation control. Check the followings for reference • Severe clogging of filter • Severe clogging of heat exchanger • Severe short-circuit of air flow • Severely insufficient or excessive refrigerant amount • Under protective control of compressor • Indoor unit fan tap setting • Valid setting of silent mode] Q6 -- NO --> B3[The unit is operating normally, but is operating under the protective control of compressor or other respective components] </pre>	
Diagnosis	Countermeasure				
<p>Check the indoor fan operation Check the temperature difference between return and suction air of indoor unit</p> <pre> graph TD Start([Start]) --> Q1{Is the temperature difference between return and suction air 10-30°C at heating?} Q1 -- YES --> Q2{Does the heat load increase after installation?} Q1 -- NO --> Q3{Is the compressor operating?} Q2 -- YES --> B1[Mistake in model selection. Calculate heat load once more.] Q2 -- NO --> C1[It is normal. (This unit is designed to start in the soft start mode by detecting the compressor under-dome temperature when it restart after power reset.)] B1 --> C2[It is necessary to replace to higher capacity unit or to install additional unit.] Q3 -- NO --> Q4{WAIT message is displayed (for 3 seconds) when performing cooling, defumidifying or heating operation from remote control?} Q3 -- YES --> Q5{Is the compressor rotation speed low?} Q4 -- YES --> C3[Compressor refrigerant oil protective control at starting is activated. For the contents of control, refer to the compressor start control.] Q4 -- NO --> C4[Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputer control function.] Q5 -- NO --> C5[Check the followings • Minor clogging of filter • Minor fouling of heat exchanger • Minor short-circuit of air flow • Slightly insufficient or excessive refrigerant amount • Poor compression of compressor] Q5 -- YES --> B2[Check following operation control function. • Control for determining compressor rotation speed • Protective control by controlling compressor rotation speed Which control is appropriate to this phenomenon] B2 --> Q6{Is the operating conditions of indoor/outdoor unit under rated condition?} Q6 -- YES --> C6[Check suspicious points considering appropriate operation control. Check the followings for reference • Severe clogging of filter • Severe clogging of heat exchanger • Severe short-circuit of air flow • Severely insufficient or excessive refrigerant amount • Under protective control of compressor • Indoor unit fan tap setting • Valid setting of silent mode] Q6 -- NO --> B3[The unit is operating normally, but is operating under the protective control of compressor or other respective components] </pre>					
2.Error detection method					
3. Condition of error displayed					
4.Presumable cause					

Note:

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

1.Applicable model	5.Troubleshooting				
All models	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>Are the insulation resistance and coil resistance of compressor OK?</p> <p>NO → Replace compressor. *</p> <p>YES →</p> <p>Is insulation of respective harnesses OK?</p> <p>NO → Secure insulation resistance.</p> <p>YES →</p> <p>Is any harness bitten between pannel and casing or etc.?</p> <p>YES → Secure insulation resistance.</p> <p>NO →</p> <p>Check the outdoor unit grounding wire and earth leakage breaker</p> <p>Check of the outdoor unit grounding wire and earth leakage breaker</p> <p>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.)</p> <p>② In order to prevent malfunction of the earth leakage breaker itself, confirm the conformity of high harmonic regulation.</p> <p>* Insulation resistance of compressor</p> <ul style="list-style-type: none"> Immediately after installation or when the unit has been left for long period without power source, the insulation resistance may drop to a few MΩ because of refrigerant migrated in the compressor. <p>When the earth leakage breaker is activated at lower insulation resistance, check the following points.</p> <p>① 6 hours after power ON, check if the insulation resistance recovers to normal.</p> <p>When power ON, crankcase heater heat up compressor and evaporates the refrigerant migrated in the compressor.</p> <p>② Check if the earth leakage breaker is conformed to higher harmonic regulation or not.</p> <p>Since the unit has inverter, it is necessary to use components conformed to high harmonic regulation in order to prevent malfunction of earth leakage breaker.</p> </td><td></td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>Are the insulation resistance and coil resistance of compressor OK?</p> <p>NO → Replace compressor. *</p> <p>YES →</p> <p>Is insulation of respective harnesses OK?</p> <p>NO → Secure insulation resistance.</p> <p>YES →</p> <p>Is any harness bitten between pannel and casing or etc.?</p> <p>YES → Secure insulation resistance.</p> <p>NO →</p> <p>Check the outdoor unit grounding wire and earth leakage breaker</p> <p>Check of the outdoor unit grounding wire and earth leakage breaker</p> <p>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.)</p> <p>② In order to prevent malfunction of the earth leakage breaker itself, confirm the conformity of high harmonic regulation.</p> <p>* Insulation resistance of compressor</p> <ul style="list-style-type: none"> Immediately after installation or when the unit has been left for long period without power source, the insulation resistance may drop to a few MΩ because of refrigerant migrated in the compressor. <p>When the earth leakage breaker is activated at lower insulation resistance, check the following points.</p> <p>① 6 hours after power ON, check if the insulation resistance recovers to normal.</p> <p>When power ON, crankcase heater heat up compressor and evaporates the refrigerant migrated in the compressor.</p> <p>② Check if the earth leakage breaker is conformed to higher harmonic regulation or not.</p> <p>Since the unit has inverter, it is necessary to use components conformed to high harmonic regulation in order to prevent malfunction of earth leakage breaker.</p>	
Diagnosis	Countermeasure				
<p>Are the insulation resistance and coil resistance of compressor OK?</p> <p>NO → Replace compressor. *</p> <p>YES →</p> <p>Is insulation of respective harnesses OK?</p> <p>NO → Secure insulation resistance.</p> <p>YES →</p> <p>Is any harness bitten between pannel and casing or etc.?</p> <p>YES → Secure insulation resistance.</p> <p>NO →</p> <p>Check the outdoor unit grounding wire and earth leakage breaker</p> <p>Check of the outdoor unit grounding wire and earth leakage breaker</p> <p>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.)</p> <p>② In order to prevent malfunction of the earth leakage breaker itself, confirm the conformity of high harmonic regulation.</p> <p>* Insulation resistance of compressor</p> <ul style="list-style-type: none"> Immediately after installation or when the unit has been left for long period without power source, the insulation resistance may drop to a few MΩ because of refrigerant migrated in the compressor. <p>When the earth leakage breaker is activated at lower insulation resistance, check the following points.</p> <p>① 6 hours after power ON, check if the insulation resistance recovers to normal.</p> <p>When power ON, crankcase heater heat up compressor and evaporates the refrigerant migrated in the compressor.</p> <p>② Check if the earth leakage breaker is conformed to higher harmonic regulation or not.</p> <p>Since the unit has inverter, it is necessary to use components conformed to high harmonic regulation in order to prevent malfunction of earth leakage breaker.</p>					
2.Error detection method					
3. Condition of error displayed					
4.Presumable cause					
<ul style="list-style-type: none"> Compressor anomaly Noise 					

Note:

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

1.Applicable model	5.Troubleshooting			
All models	Diagnosis		Countermeasure	
2.Error detection method	<pre> graph TD Q1{Does noise/vibration occur during or soon after stopping operation of air-conditioner?} -- NO --> C1[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.] Q1 -- YES --> Q2{[Installation work] Does the noise/vibration occur not only from the air-conditioner but also from entire building?} Q2 -- YES --> Q3{Does the installation of indoor/outdoor unit have looseness?} Q3 -- YES --> C2[Check the installed condition carefully, and correct the installed position or insert rubber cushions into the gap or take other measure in order to eliminate looseness.] Q3 -- NO --> Q4{Are pipes touching the wall and etc?} Q4 -- YES --> C3[Prevent the vibration from transmitting to wall and etc by fixing pipes on the wall tightly or wrapping rubber cushion around the pipe which goes through the hole in the wall or applying other appropriate means.] Q4 -- NO --> C4[Strength of ceiling wall, floor, etc. may be insufficient. Review the installation place or apply reinforcement to increase the strength.] Q2 -- NO --> Q5{[Units] Does noise/vibration occur when only the fan is operating?} Q5 -- YES --> Q6{Is fan or louver touching other components?} Q6 -- YES --> C5[Check for leaning of installed unit or incorrect mounting of fan, louver or motor, and then specify the contacting point and correct it.] Q6 -- NO --> C6[When the heat exchanger or filter is clogged, clean them.] Q5 -- NO --> C7[In case that the unit is installed at the site where background noise is very low, even the low level noise from indoor unit like as refrigerant flow noise can be heard, but it is normal. Before installation, check for background noise. If background noise is very low, convince client prior to installation.] Q1_N[To 2/3] </pre>			
3. Condition of error displayed				
4.Presumable cause	<ul style="list-style-type: none"> ① Improper installation work <ul style="list-style-type: none"> • Improper vibration-proof work at installation • Insufficient strength of mounting surface ② Anomaly of product <ul style="list-style-type: none"> • Before/after shipment from factory ③ Improper adjustment during commissioning <ul style="list-style-type: none"> • Excessive/insufficient refrigerant. 			

Note:

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

1.Applicable model	5.Troubleshooting	
All models	Diagnosis	Countermeasure
2.Error detection method	<pre> graph TD Start([From 1/3]) --> D1{[Unit] Does noise/vibration occur when the cooling/ heating operation is performing normally?} D1 -- YES --> D2{Are the pipes contacting with the casing?} D1 -- NO --> End([To 3/3]) D2 -- YES --> C1[Rearrange the piping to avoid contact with the casing.] D2 -- NO --> D3{Is continuous hissing or roaring sound occurred?} D3 -- YES --> C2[Noise/vibration is generated when the refrigerant gas or liquid flows through inside of piping of air-conditioner. It is likely to occur particularly during cooling or defrost operation in the heating mode. It is normal.] D3 -- NO --> D4{Is hissing sounds occurred at the startup or stopping?} D4 -- YES --> C3[The noise/vibration occurs when the refrigerant starts or stops flowing. It is normal.] D4 -- NO --> D5{Is blowing sound occurred at the start/stop of defrost operation during heating mode?} D5 -- YES --> C4[When the defrost operation starts or stops during heating mode, 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 also accompany the hissing sound as mentioned above. This is normal.] D5 -- NO --> D6{Is cracking noise occurred during heating operation?} D6 -- YES --> C5[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.] D6 -- NO --> D7{Is hissing noise occurred during cooling operation or after operation stopped?} D7 -- YES --> C6[It is the sound produced by the drain pump that discharges drain from indoor unit. The pump continues to run for 5 minutes after stopping the cooling operation. This is normal.] D7 -- NO --> C7[Apply the damper sealant at the place considered to be the sources such as the pressure reducing mechanism. (Expansion valve, capillary tube, etc.)] </pre>	
3. Condition of error displayed		
4.Presumable cause		

Note:

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

1.Applicable model	5.Troubleshooting	
All models	Diagnosis	Countermeasure
2.Error detection method	<p>From 2/3</p> <p>[Adjustment during commissioning] Does noise/vibration occur when the cooling/heating operation is performed under anomalous condition?</p> <p>YES →</p>	
3. Condition of error displayed	<p>If insufficient cooling heating problem happens due to anomalous operating conditions at cooling/heating, followings are suspicious.</p> <ul style="list-style-type: none"> • Excessive charged amount of refrigerant • Insufficient charge amount of refrigerant • Intrusion of air, nitrogen, etc. <p>In such case, it is necessary to recover refrigerant, vacuum-dry and recharge refrigerant.</p> <p>* Since there could be many causes of noise/vibration, the above may not cover all. In such case, check the conditions when, where, how the noise/vibration occurs according to following check points and ask our consultation.</p> <ul style="list-style-type: none"> • Indoor/outdoor unit • Cooling/heating/fan mode • Startup/stop/during operation • Operating condition (Indoor/outdoor temperatures and pressures) • Time it occurred • Operation data retained by remote control or Mente PC such as compressor rotation speed, heat exchanger temperature, EEV opening degree and etc. • Tone (If available, record the noise) • Any other anomalies 	
4.Presumable cause		

Note:

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

1.Applicable model	5.Troubleshooting				
All models	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td colspan="2"> <p>~Check at the indoor unit side.</p> <p>Operate after waiting for more than 1 minute.</p> <p>Does the louver operate when power on?</p> <p>NO → Is there any disconnection or breakage of LM connector? → YES → Correct it.</p> <p>NO → Is LM harness broken? → YES → Repair harness.</p> <p>NO → Is LM locked? → NO → Check connector (CnJ). Replace louver motor.</p> <p>YES → Does LM turn smoothly? → NO → Correct it.</p> <p>NO → Is there any problem on the connection link? → YES → Correct it.</p> <p>NO → Is the setting of air flow direction change prohibited? → YES → Correct it.</p> <p>NO → Check the remote control whether it is fixed free flow setting.</p> <p>In cases of FDTW, FDTS and FDTQ</p> <p>It is normal if LM can be stopped by pressing LS two times. → Check how LS reacts when the power is turned OFF and ON again.</p> <p>NO → Does the louver link press LS till crick sound can be heard? → NO → Adjust LM lever and then check again.</p> <p>YES → • LS anomaly → Replace.</p> <p>• Indoor unit control PCB anomaly → Replace.</p> <p>Notes (1) LM: Louver motor (2) LS: Limit switch</p> <p>In cases of FDT, FDTC, FDE and FDK</p> <p>Check the remote control whether it is fixed free flow setting or not.</p> </td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>~Check at the indoor unit side.</p> <p>Operate after waiting for more than 1 minute.</p> <p>Does the louver operate when power on?</p> <p>NO → Is there any disconnection or breakage of LM connector? → YES → Correct it.</p> <p>NO → Is LM harness broken? → YES → Repair harness.</p> <p>NO → Is LM locked? → NO → Check connector (CnJ). Replace louver motor.</p> <p>YES → Does LM turn smoothly? → NO → Correct it.</p> <p>NO → Is there any problem on the connection link? → YES → Correct it.</p> <p>NO → Is the setting of air flow direction change prohibited? → YES → Correct it.</p> <p>NO → Check the remote control whether it is fixed free flow setting.</p> <p>In cases of FDTW, FDTS and FDTQ</p> <p>It is normal if LM can be stopped by pressing LS two times. → Check how LS reacts when the power is turned OFF and ON again.</p> <p>NO → Does the louver link press LS till crick sound can be heard? → NO → Adjust LM lever and then check again.</p> <p>YES → • LS anomaly → Replace.</p> <p>• Indoor unit control PCB anomaly → Replace.</p> <p>Notes (1) LM: Louver motor (2) LS: Limit switch</p> <p>In cases of FDT, FDTC, FDE and FDK</p> <p>Check the remote control whether it is fixed free flow setting or not.</p>	
Diagnosis	Countermeasure				
<p>~Check at the indoor unit side.</p> <p>Operate after waiting for more than 1 minute.</p> <p>Does the louver operate when power on?</p> <p>NO → Is there any disconnection or breakage of LM connector? → YES → Correct it.</p> <p>NO → Is LM harness broken? → YES → Repair harness.</p> <p>NO → Is LM locked? → NO → Check connector (CnJ). Replace louver motor.</p> <p>YES → Does LM turn smoothly? → NO → Correct it.</p> <p>NO → Is there any problem on the connection link? → YES → Correct it.</p> <p>NO → Is the setting of air flow direction change prohibited? → YES → Correct it.</p> <p>NO → Check the remote control whether it is fixed free flow setting.</p> <p>In cases of FDTW, FDTS and FDTQ</p> <p>It is normal if LM can be stopped by pressing LS two times. → Check how LS reacts when the power is turned OFF and ON again.</p> <p>NO → Does the louver link press LS till crick sound can be heard? → NO → Adjust LM lever and then check again.</p> <p>YES → • LS anomaly → Replace.</p> <p>• Indoor unit control PCB anomaly → Replace.</p> <p>Notes (1) LM: Louver motor (2) LS: Limit switch</p> <p>In cases of FDT, FDTC, FDE and FDK</p> <p>Check the remote control whether it is fixed free flow setting or not.</p>					
2.Error detection method					
3. Condition of error displayed					
4.Presumable cause	<ul style="list-style-type: none"> • Louver motor anomaly • Disconnection/breakage of LM harness • Limit switch anomaly 				

Note:

Error code Remote control: None 7-segment display:	LED	Green	Red	Content Power source system anomaly (Power source to indoor unit PCB)
	Indoor	Stays OFF	Stays OFF	
	Outdoor	Stays OFF	2-time flash	

1.Applicable model	5.Troubleshooting
FDT, FDTC, FDK series only	
2.Error detection method	
3. Condition of error displayed	
4.Presumable cause	
<ul style="list-style-type: none">• Wrong connection or breakage of connecting wires• Blown fuse• Indoor unit PCB anomaly• Broken harness	

Diagnosis	Countermeasure
<div><div><div>Is AC 220-240V detected between L-N on the indoor terminal block?</div><div>NO</div><div>Is AC 380/415V for 3-phase unit detected between L1, L2, and L3 on the outdoor terminal block respectively?</div><div>NO</div><div>Outdoor noise filter PCB anomaly → Replace it.</div><div>YES</div><div>Wrong wiring or broken wires between outdoor and indoor units</div></div><div><div>Note (1) Check the fuse at the power source side.</div><div>(1)</div><div>Are fuses OK?</div><div>NO</div><div>Is resistance between①-③ of CNW0 OK?</div><div>NO</div><div>Indoor unit PCB anomaly → Replace it.</div><div>YES</div><div>Is resistance to FM, LM and etc. OK?</div><div>YES</div><div>Replace FM, LM and etc.</div><div>NO</div><div>Replace fuse.</div><div>Note (2) LM: Louver motor FM: Fan motor</div></div><div><div>Is DC280V detected between CNM FDT, FDTC: ①-④, FDK: ①-③?</div><div>NO</div><div>Indoor unit PCB anomaly → Replace it.</div><div>YES</div><div>Is DC8V detected between CNP ①-②?</div><div>NO</div><div>None of actuator, etc. is short-circuited?</div><div>NO</div><div>Replace related parts.</div><div>YES</div><div>Defective indoor unit PCB → Replace.</div></div><div><div>Is JX1 open?</div><div>NO</div><div>Open JX1.</div><div></div><div>Defective indoor unit PCB → Replace.</div></div></div>	

Note:

Error code Remote control: None 7-segment display:	LED	Green	Red	Content Power source system anomaly (Power source to indoor unit PCB)
	Indoor	Stays OFF	Stays OFF	
	Outdoor	Stays OFF	2-time flash	

1.Applicable model	5.Troubleshooting	
Except FDT, FDTC, FDK series	Diagnosis	Countermeasure
2.Error detection method	<div><div><div>Is AC 220-240V detected between L-N on the outdoor terminal block?</div><div>NO</div><div>Is AC 380/415V for 3-phase unit detected between L1, L2, and L3 on the outdoor terminal block respectively?</div><div>NO</div><div>Outdoor noise filter PCB anomaly → Replace it.</div><div>YES</div><div>Wrong wiring or broken wires between outdoor and indoor units</div><div>YES</div><div>Note (1) Check the fuse at the power source side.</div><div>Are fuses OK?</div><div>NO</div><div>Is power source between①-③ of CNW0 OK?</div><div>NO</div><div>Indoor unit control PCB or power PCB anomaly → Replace it.</div><div>YES</div><div>Note (2) Disconnect CNW1 on models equipped with transformer.</div><div>Is power source to FM, LM and etc. OK?</div><div>YES</div><div>Replace FM, LM and etc.</div><div>NO</div><div>Replace fuse.</div><div>Model equipped with transformer (Tri)</div><div>Models other than shown at left</div><div>Note (3) LM: Louver motor FM: Fan motor</div><div>Is DC5V detected between ④-⑤ of CNW2?</div><div>NO</div><div>Indoor unit power PCB anomaly → Replace it.</div><div>YES</div><div>Indoor unit control PCB anomaly → Replace it.</div><div>Is DC18V or higher detected between Red-Red (CNW2) at the transformer secondary side?</div><div>NO</div><div>Replace transformer.</div><div>YES</div><div>Indoor unit control PCB anomaly → Replace it.</div></div></div>	
3. Condition of error displayed		
4.Presumable cause	<div><div><div>Wrong connection or breakage of connecting wires</div><div>Blown fuse</div><div>Transformer anomaly</div><div>Indoor unit power PCB anomaly</div><div>Broken harness</div><div>Indoor unit control PCB anomaly</div></div></div>	

Note:

Error code	LED	Green	Red	Content
Remote control:None 7-segment display:	Indoor	Keeps flashing	Stays OFF	Power source system error (Power source to remote control)
	Outdoor	Keeps flashing	2-time flash	

1.Applicable model	5.Troubleshooting
FDT, FDTC, FDK series only	
2.Error detection method	Diagnosis
	<pre> graph TD D1{Is the connection of the remote control's wiring OK? X (white), Y (black)} -- NO --> C1[Correct.] D1 -- YES --> D2{Does the voltage between X and Y in the indoor terminal block exceed 15 VDC?} D2 -- NO --> A1[Remove wire for the remote control] A1 --> D3{Does the re-measured voltage between X and Y in the indoor terminal block exceed 15 VDC?} D2 -- YES --> A2[Power source reset] A2 --> D4{Does resetting the power source return it to normal?} D4 -- YES --> C2[Malfunction by temporary noise] D4 -- NO --> C3[Remote control wire breakage? Replace remote control.] D3 -- YES --> C3 D3 -- NO --> C4[Defective indoor unit control PCB → Replace.] </pre>
3. Condition of error displayed	Countermeasure
	<p>Correct.</p> <p>Remote control wire breakage? Replace remote control.</p> <p>Malfunction by temporary noise</p> <p>Defective indoor unit control PCB → Replace.</p> <p>Remote control wire breakage? Replace remote control.</p>
4.Presumable cause	
<ul style="list-style-type: none"> • Remote control wire breakage/short-circuit • Defective remote control • Malfunction by noise • Broken harness • Faulty indoor unit control PCB 	

Note:

Error code	LED	Green	Red	Content
Remote control:None 7-segment display:	Indoor	Keeps lighting	Stays OFF	Power source system error (Power source to remote control)
	Outdoor	Keeps lighting	2-time flash	

1.Applicable model	5.Troubleshooting
Except FDT, FDTC, FDK series	
2.Error detection method	Diagnosis
	<pre> graph TD Q1{Isn't there any loose connection of remote control wires?} -- YES --> C1[Correct it.] Q1 -- NO --> Q2{Isn't remote control wire broken or short-circuited?} Q2 -- YES --> C2[Replace wires.] Q2 -- NO --> P1[Disconnect the remote control wires.] P1 --> Q3{Is DC15V or higher detected between X-Y of indoor unit terminal block?} Q3 -- YES --> C3[Replace remote control.] Q3 -- NO --> J1{ } J1 -- "Model equipped with transformer (Tri)" --> Q4{Is 23V or higher detected between Brown-Brown at the transformer secondary side?} J1 -- "Models other than shown at left" --> Q5{Is DC18V detected between ①-② of CNW2?} Q4 -- YES --> C4[Indoor unit control PCB anomaly → Replace it.] Q4 -- NO --> C5[Replace transformer.] Q5 -- YES --> C6[Indoor unit control PCB anomaly → Replace it.] Q5 -- NO --> C7[Indoor unit power PCB anomaly → Replace it.] </pre>
3. Condition of error displayed	Countermeasure
	<p>Correct it.</p> <p>Replace wires.</p> <p>Replace remote control.</p> <p>Indoor unit power PCB anomaly → Replace it.</p> <p>Indoor unit control PCB anomaly → Replace it.</p> <p>Replace transformer.</p> <p>Indoor unit control PCB anomaly → Replace it.</p>
4.Presumable cause	
<ul style="list-style-type: none"> • Remote control wire breakage/short-circuit • Remote control anomaly • Malfunction by noise • Indoor unit power PCB anomaly • Broken harness • Indoor unit control PCB anomaly 	

Note:

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

1.Applicable model	5.Troubleshooting		
All models (In case that WAIT is kept on displaying on the remote control for more than 2 minutes after power ON)	Diagnosis		Countermeasure
2.Error detection method	<pre> graph TD Start[WAIT is kept on displaying on the remote control for more than 2 minutes after power ON] --> Step1[Once turn OFF the breaker and turn ON it again at 3 minute after power OFF] Step1 --> Dec1{Does it become normal?} Dec1 -- YES --> End1[Refer next page] Dec1 -- NO --> Dec2{Isn't the power fuse (5A) on the outdoor unit control PCB blown?} Dec2 -- YES --> Act1[Replace fuse] Dec2 -- NO --> Dec3{Is AC380-415V detected at the secondary side of noise filter PCB terminal?} Dec3 -- NO --> Act2[Replace noise filter PCB.] Dec3 -- YES --> Dec4{Is the connection of wire between noise filter and inverter PCBs OK?} Dec4 -- NO --> Act3[Connect wires correctly.] Dec4 -- YES --> Dec5{Does indoor green LED keep flashing?} Dec5 -- NO --> Act4[Indoor unit control PCB anomaly → Replace it.] Dec5 -- YES --> Dec6{Does indoor green LED flash 2 times?} Dec6 -- NO --> Act5[Indoor/outdoor unit control PCB anomaly → Replace it. Remote control anomaly → Replace it. Breakage of connecting wires of remote control → Replace it.] Dec6 -- YES --> Dec7{Are the wires between indoor and outdoor units connected properly?} Dec7 -- NO --> Act6[Correct the connecting wires between indoor and outdoor units.] Dec7 -- YES --> Dec8{Is AC380-415V detected between L1-L2, L2-L3, L3-L1 respectively at outdoor unit terminal block?} Dec8 -- NO --> Act7[Outdoor unit control PCB anomaly → Replace it.] Dec8 -- YES --> Dec9{Is AC220-240V detected between L-N at indoor unit terminal block?} Dec9 -- NO --> Act8[Breakage of connecting wire. Noise] Dec9 -- YES --> Act9[Indoor unit control PCB anomaly → Replace it.] </pre>		Refer next page
3. Condition of error displayed			Replace noise filter PCB.
4.Presumable cause			Connect wires correctly.
			Indoor unit control PCB anomaly → Replace it.
			Indoor/outdoor unit control PCB anomaly → Replace it. Remote control anomaly → Replace it. Breakage of connecting wires of remote control → Replace it.
			Correct the connecting wires between indoor and outdoor units.
			Outdoor unit control PCB anomaly → Replace it.
			Breakage of connecting wire. Noise
			Indoor unit control PCB anomaly → Replace it.

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

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

1.Applicable model	5.Troubleshooting	
All models (In case of fuse blown, how to check the unit before replacement of fuse)	Diagnosis	Countermeasure
2.Error detection method	<pre> graph TD D1{Isn't there any short circuit between phases of noise filter?} -- YES --> A1[Replace noise filter] D1 -- NO --> D2{Isn't there any crack or damage on power transistor module or diode stack?} D2 -- YES --> A2[Replace inverter PCB] D2 -- NO --> D3{Isn't there any anomaly on reactor?} D3 -- YES --> A3[Replace reactor] D3 -- NO --> A4[Replace fuse.] </pre>	
3. Condition of error displayed		
4.Presumable cause	<ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly 	

Note:

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

1.Applicable model	5.Troubleshooting	
All models (No display on the remote control after power ON)	Diagnosis	Countermeasure
2.Error detection method	<pre> graph TD Start([No display on the remote control after power ON]) --> D1{Does indoor green LED keep flashing?} D1 -- NO --> D2{Is the fuse on indoor unit control PCB OK?} D2 -- NO --> C1[Fuse blown -> Replace fuse.] D2 -- YES --> D3{Is AC18V or higher is detected between Red-Red at secondary side of indoor unit transformer? (1)} D3 -- NO --> C2[Transformer anomaly.] D3 -- YES --> D4{Is DC10-11V between X-Y at indoor unit control PCB side when removing remote control?} D4 -- NO --> C3[Remote control wire short-circuited.] D4 -- YES --> C4[Remote control anomaly.] D1 -- YES --> D5{Does outdoor red LED flash 2-time?} D5 -- NO --> C5[Indoor unit control PCB anomaly. Remote control anomaly. Breakage of connecting wires of remote control] D5 -- YES --> D6{Is the connecting wires between indoor and outdoor units connected properly?} D6 -- NO --> C6[Correct the connecting wires properly.] D6 -- YES --> D7{Is AC380-415V detected between L1-L2, L2-L3, L3-L1 respectively at outdoor unit terminal block?} D7 -- NO --> C7[Outdoor unit control PCB anomaly -> Replace it.] D7 -- YES --> D8{Is AC220-240V detected between L-N at indoor unit terminal block?} D8 -- NO --> C8[Breakage of connecting wire. Noise] D8 -- YES --> C9[Indoor unit control PCB anomaly -> Replace it.] </pre>	
3. Condition of error displayed		
4.Presumable cause	<ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly 	

Note:

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

1.Applicable model	5.Troubleshooting				
<p>All models</p> <p>(In case that WAIT is kept on displaying on the remote control for more than 2 minutes after power ON)</p>	<table> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> <tr> <td> <pre> graph TD Start[WAIT is kept on displaying on the remote control for more than 2 minutes after power ON] --> Q1{Does outdoor green LED keep flashing?} Q1 -- NO --> A[A] Q1 -- YES --> Q2{Does indoor green LED keep flashing?} Q2 -- NO --> C1[Indoor unit control PCB anomaly -> Replace it.] Q2 -- YES --> Q3{Does outdoor red LED flash 2-time?} Q3 -- NO --> C2[Indoor unit control PCB anomaly -> Replace it. Remote control anomaly -> Replace it. Breakage of connecting wires of remote control -> Replace it.] Q3 -- YES --> Q4{Are the wires between indoor and outdoor units connected properly?} Q4 -- NO --> C3[Correct the connecting wires between indoor and outdoor units.] Q4 -- YES --> Q5{Is AC380-415V detected between L1-L2, L2-L3, L3-L1 respectively at outdoor unit terminal block?} Q5 -- NO --> C4[Outdoor unit control PCB anomaly -> Replace it.] Q5 -- YES --> Q6{Is AC220-240V detected between L-N at indoor unit terminal block?} Q6 -- NO --> C5[Breakage of connecting wire Noise] Q6 -- YES --> C6[Indoor unit control PCB anomaly -> Replace it.] </pre> </td><td> <p>Refer next page</p> <p>Indoor unit control PCB anomaly → Replace it.</p> <p>Indoor unit control PCB anomaly → Replace it. Remote control anomaly → Replace it. Breakage of connecting wires of remote control → Replace it.</p> <p>Correct the connecting wires between indoor and outdoor units.</p> <p>Outdoor unit control PCB anomaly → Replace it.</p> <p>Breakage of connecting wire Noise</p> <p>Indoor unit control PCB anomaly → Replace it.</p> </td></tr> </table>	Diagnosis	Countermeasure	<pre> graph TD Start[WAIT is kept on displaying on the remote control for more than 2 minutes after power ON] --> Q1{Does outdoor green LED keep flashing?} Q1 -- NO --> A[A] Q1 -- YES --> Q2{Does indoor green LED keep flashing?} Q2 -- NO --> C1[Indoor unit control PCB anomaly -> Replace it.] Q2 -- YES --> Q3{Does outdoor red LED flash 2-time?} Q3 -- NO --> C2[Indoor unit control PCB anomaly -> Replace it. Remote control anomaly -> Replace it. Breakage of connecting wires of remote control -> Replace it.] Q3 -- YES --> Q4{Are the wires between indoor and outdoor units connected properly?} Q4 -- NO --> C3[Correct the connecting wires between indoor and outdoor units.] Q4 -- YES --> Q5{Is AC380-415V detected between L1-L2, L2-L3, L3-L1 respectively at outdoor unit terminal block?} Q5 -- NO --> C4[Outdoor unit control PCB anomaly -> Replace it.] Q5 -- YES --> Q6{Is AC220-240V detected between L-N at indoor unit terminal block?} Q6 -- NO --> C5[Breakage of connecting wire Noise] Q6 -- YES --> C6[Indoor unit control PCB anomaly -> Replace it.] </pre>	<p>Refer next page</p> <p>Indoor unit control PCB anomaly → Replace it.</p> <p>Indoor unit control PCB anomaly → Replace it. Remote control anomaly → Replace it. Breakage of connecting wires of remote control → Replace it.</p> <p>Correct the connecting wires between indoor and outdoor units.</p> <p>Outdoor unit control PCB anomaly → Replace it.</p> <p>Breakage of connecting wire Noise</p> <p>Indoor unit control PCB anomaly → Replace it.</p>
Diagnosis	Countermeasure				
<pre> graph TD Start[WAIT is kept on displaying on the remote control for more than 2 minutes after power ON] --> Q1{Does outdoor green LED keep flashing?} Q1 -- NO --> A[A] Q1 -- YES --> Q2{Does indoor green LED keep flashing?} Q2 -- NO --> C1[Indoor unit control PCB anomaly -> Replace it.] Q2 -- YES --> Q3{Does outdoor red LED flash 2-time?} Q3 -- NO --> C2[Indoor unit control PCB anomaly -> Replace it. Remote control anomaly -> Replace it. Breakage of connecting wires of remote control -> Replace it.] Q3 -- YES --> Q4{Are the wires between indoor and outdoor units connected properly?} Q4 -- NO --> C3[Correct the connecting wires between indoor and outdoor units.] Q4 -- YES --> Q5{Is AC380-415V detected between L1-L2, L2-L3, L3-L1 respectively at outdoor unit terminal block?} Q5 -- NO --> C4[Outdoor unit control PCB anomaly -> Replace it.] Q5 -- YES --> Q6{Is AC220-240V detected between L-N at indoor unit terminal block?} Q6 -- NO --> C5[Breakage of connecting wire Noise] Q6 -- YES --> C6[Indoor unit control PCB anomaly -> Replace it.] </pre>	<p>Refer next page</p> <p>Indoor unit control PCB anomaly → Replace it.</p> <p>Indoor unit control PCB anomaly → Replace it. Remote control anomaly → Replace it. Breakage of connecting wires of remote control → Replace it.</p> <p>Correct the connecting wires between indoor and outdoor units.</p> <p>Outdoor unit control PCB anomaly → Replace it.</p> <p>Breakage of connecting wire Noise</p> <p>Indoor unit control PCB anomaly → Replace it.</p>				
2.Error detection method					
3. Condition of error displayed					
4.Presumable cause	<ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly 				

Note:

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

1.Applicable model	5.Troubleshooting				
<p>All models</p> <p>(In case that LED on outdoor unit control PCB stays OFF)</p>	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>In case that LED on outdoor unit control PCB stays OFF</p> <pre> graph TD A[A] --> B[Once turn OFF the breaker and turn ON it again at 3 minute after power OFF] B --> C{Does it become normal?} C -- YES --> D[Normal (Malfunction by temporary noise)] C -- NO --> E{Is power fuse (5A) on the outdoor unit control PCB blown?} E -- NO --> F[Check inverter before replacement of 52C] F --> G[B] E -- YES --> H{Is AC380-415V detected at secondary side of noise filter?} H -- NO --> I[Replace noise filter.] H -- YES --> J{Are connecting wires between noise filter and inverter PCB connected properly?} J -- NO --> K[Connect the connecting wire properly.] J -- YES --> L{Is the connection of connecting wire of reactor OK?} L -- NO --> M[Correct connection. (In case of breakage of wire replace it)] L -- YES --> N{Is there any anomaly on outdoor fan motor?} N -- NO --> O[Outdoor unit control PCB anomaly → Replace it.] N -- YES --> P[Outdoor unit fan motor anomaly → Replace it.] </pre> </td><td> <p>Normal (Malfunction by temporary noise)</p> <p>Refer next page</p> <p>Replace noise filter.</p> <p>Connect the connecting wire properly.</p> <p>Correct connection. (In case of breakage of wire replace it)</p> <p>Outdoor unit control PCB anomaly → Replace it.</p> <p>Outdoor unit fan motor anomaly → Replace it.</p> </td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>In case that LED on outdoor unit control PCB stays OFF</p> <pre> graph TD A[A] --> B[Once turn OFF the breaker and turn ON it again at 3 minute after power OFF] B --> C{Does it become normal?} C -- YES --> D[Normal (Malfunction by temporary noise)] C -- NO --> E{Is power fuse (5A) on the outdoor unit control PCB blown?} E -- NO --> F[Check inverter before replacement of 52C] F --> G[B] E -- YES --> H{Is AC380-415V detected at secondary side of noise filter?} H -- NO --> I[Replace noise filter.] H -- YES --> J{Are connecting wires between noise filter and inverter PCB connected properly?} J -- NO --> K[Connect the connecting wire properly.] J -- YES --> L{Is the connection of connecting wire of reactor OK?} L -- NO --> M[Correct connection. (In case of breakage of wire replace it)] L -- YES --> N{Is there any anomaly on outdoor fan motor?} N -- NO --> O[Outdoor unit control PCB anomaly → Replace it.] N -- YES --> P[Outdoor unit fan motor anomaly → Replace it.] </pre>	<p>Normal (Malfunction by temporary noise)</p> <p>Refer next page</p> <p>Replace noise filter.</p> <p>Connect the connecting wire properly.</p> <p>Correct connection. (In case of breakage of wire replace it)</p> <p>Outdoor unit control PCB anomaly → Replace it.</p> <p>Outdoor unit fan motor anomaly → Replace it.</p>
Diagnosis	Countermeasure				
<p>In case that LED on outdoor unit control PCB stays OFF</p> <pre> graph TD A[A] --> B[Once turn OFF the breaker and turn ON it again at 3 minute after power OFF] B --> C{Does it become normal?} C -- YES --> D[Normal (Malfunction by temporary noise)] C -- NO --> E{Is power fuse (5A) on the outdoor unit control PCB blown?} E -- NO --> F[Check inverter before replacement of 52C] F --> G[B] E -- YES --> H{Is AC380-415V detected at secondary side of noise filter?} H -- NO --> I[Replace noise filter.] H -- YES --> J{Are connecting wires between noise filter and inverter PCB connected properly?} J -- NO --> K[Connect the connecting wire properly.] J -- YES --> L{Is the connection of connecting wire of reactor OK?} L -- NO --> M[Correct connection. (In case of breakage of wire replace it)] L -- YES --> N{Is there any anomaly on outdoor fan motor?} N -- NO --> O[Outdoor unit control PCB anomaly → Replace it.] N -- YES --> P[Outdoor unit fan motor anomaly → Replace it.] </pre>	<p>Normal (Malfunction by temporary noise)</p> <p>Refer next page</p> <p>Replace noise filter.</p> <p>Connect the connecting wire properly.</p> <p>Correct connection. (In case of breakage of wire replace it)</p> <p>Outdoor unit control PCB anomaly → Replace it.</p> <p>Outdoor unit fan motor anomaly → Replace it.</p>				
2.Error detection method					
3. Condition of error displayed					
4.Presumable cause	<ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly 				

Note:

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

1.Applicable model	5.Troubleshooting	
All models (In case of fuse blown, how to check the unit before replacement of fuse)	Diagnosis	Countermeasure
2.Error detection method	<pre> graph TD B[B] --> D1{Isn't there any short circuit between phases of noise filter?} D1 -- YES --> A1[Replace Noise filter] D1 -- NO --> D2{Isn't there any short circuit between phases at input terminal of inverter PCB?} D2 -- YES --> A2[Replace inverter PCB] D2 -- NO --> D3{Isn't there any crack or damage on power transistor module or diode stack?} D3 -- YES --> A2 D3 -- NO --> D4{Isn't there any anomaly on reactor?} D4 -- YES --> A3[Replace reactor] D4 -- NO --> D5{Isn't there any anomaly on electrolytic capacitor?} D5 -- YES --> A4[Replace electrolytic capacitor] D5 -- NO --> A5[Replace power fuse] </pre>	
3. Condition of error displayed		
4.Presumable cause	<ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly 	

Note:

Error code	LED	Green	Red	Content
Remote control: [No display] 7-segment display:	Indoor	Stays OFF	Stays Off	[No display]
	Outdoor	Stays OFF	Stays Off	

1.Applicable model	5.Troubleshooting				
All models (No display on the remote control after power ON)	<table> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> <tr> <td> <p>No display on the remote control after power ON</p> <pre> graph TD Start([No display on the remote control after power ON]) --> D1{Is DC10V or higher between X-Y detected at remote control terminal?} D1 -- NO --> C1[Remote control anomaly.] D1 -- YES --> D2{Is DC10V or higher between X-Y wires detected when removing remote control?} D2 -- NO --> C2[Remote control anomaly.] D2 -- YES --> D3{Are connecting wires between indoor and outdoor units connected properly?} D3 -- NO --> C3[Correct connecting wire.] D3 -- YES --> C4[Indoor unit control PCB anomaly] </pre> </td><td></td></tr> </table>	Diagnosis	Countermeasure	<p>No display on the remote control after power ON</p> <pre> graph TD Start([No display on the remote control after power ON]) --> D1{Is DC10V or higher between X-Y detected at remote control terminal?} D1 -- NO --> C1[Remote control anomaly.] D1 -- YES --> D2{Is DC10V or higher between X-Y wires detected when removing remote control?} D2 -- NO --> C2[Remote control anomaly.] D2 -- YES --> D3{Are connecting wires between indoor and outdoor units connected properly?} D3 -- NO --> C3[Correct connecting wire.] D3 -- YES --> C4[Indoor unit control PCB anomaly] </pre>	
Diagnosis	Countermeasure				
<p>No display on the remote control after power ON</p> <pre> graph TD Start([No display on the remote control after power ON]) --> D1{Is DC10V or higher between X-Y detected at remote control terminal?} D1 -- NO --> C1[Remote control anomaly.] D1 -- YES --> D2{Is DC10V or higher between X-Y wires detected when removing remote control?} D2 -- NO --> C2[Remote control anomaly.] D2 -- YES --> D3{Are connecting wires between indoor and outdoor units connected properly?} D3 -- NO --> C3[Correct connecting wire.] D3 -- YES --> C4[Indoor unit control PCB anomaly] </pre>					
2.Error detection method					
3. Condition of error displayed					
4.Presumable cause					
<ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly 					

Note:

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

1.Applicable model	5.Troubleshooting				
All models					
2.Error detection method					
When normal communication is interrupted for more than 2 minutes between the remote control and the indoor unit (Detectable only with the remote control)					
3. Condition of error displayed					
Same as above					
4.Presumable cause					
<ul style="list-style-type: none"> Defective communication circuit between remote control and indoor unit Noise 	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>(3) Is it possible to reset normally by the power source reset?</p> <p>YES →</p> <p>NO</p> <p>(1) Note (1) SW7-1: OFF → ON</p> <p>Turn SW7-1 to OFF → ON Disconnect the wire [A] or [B] between indoor and outdoor units.</p> <p>Reset power source.</p> <p>(2) Note (2) Only unit with drain pump</p> <p>Does the drain pump restart automatically 1 minute later?</p> <p>YES →</p> <p>NO</p> <p>Connect the wire [A] or [B] between indoor and outdoor units.</p> <p>Note (3) Does the remote control displays "Internal check ON" [] even after 3 minutes?</p> </td><td> <p>Malfunction by noise Check peripheral environment.</p> <p>Defective remote control or defective indoor PCB → Replace.</p> <p>Move to E5(Communication error during operation)diagnosis.</p> </td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>(3) Is it possible to reset normally by the power source reset?</p> <p>YES →</p> <p>NO</p> <p>(1) Note (1) SW7-1: OFF → ON</p> <p>Turn SW7-1 to OFF → ON Disconnect the wire [A] or [B] between indoor and outdoor units.</p> <p>Reset power source.</p> <p>(2) Note (2) Only unit with drain pump</p> <p>Does the drain pump restart automatically 1 minute later?</p> <p>YES →</p> <p>NO</p> <p>Connect the wire [A] or [B] between indoor and outdoor units.</p> <p>Note (3) Does the remote control displays "Internal check ON" [] even after 3 minutes?</p>	<p>Malfunction by noise Check peripheral environment.</p> <p>Defective remote control or defective indoor PCB → Replace.</p> <p>Move to E5(Communication error during operation)diagnosis.</p>
Diagnosis	Countermeasure				
<p>(3) Is it possible to reset normally by the power source reset?</p> <p>YES →</p> <p>NO</p> <p>(1) Note (1) SW7-1: OFF → ON</p> <p>Turn SW7-1 to OFF → ON Disconnect the wire [A] or [B] between indoor and outdoor units.</p> <p>Reset power source.</p> <p>(2) Note (2) Only unit with drain pump</p> <p>Does the drain pump restart automatically 1 minute later?</p> <p>YES →</p> <p>NO</p> <p>Connect the wire [A] or [B] between indoor and outdoor units.</p> <p>Note (3) Does the remote control displays "Internal check ON" [] even after 3 minutes?</p>	<p>Malfunction by noise Check peripheral environment.</p> <p>Defective remote control or defective indoor PCB → Replace.</p> <p>Move to E5(Communication error during operation)diagnosis.</p>				

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

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

1.Applicable model	5.Troubleshooting
All models	Diagnosis
	Countermeasure
	<pre> graph TD Q1{Is the number of connected indoor units up to 128 units?} Q2{Is the different address No. assigned to each indoor unit?} R1[Reset the power source and restart.] C1[Caution: Unless the power source is reset, addresses will not be confirmed.] Q3{Is E2 displayed?} C2["* Before replacement, confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)"] Q1 -- NO --> CM1[Review number of connected units.] Q1 -- YES --> Q2 Q2 -- NO --> CM2[Correct indoor unit address setting.] Q2 -- YES --> R1 R1 --> C1 C1 --> Q3 Q3 -- NO --> CM3[Implement test run.] Q3 -- YES --> CM4[Replace indoor unit control PCB. *] </pre> <p>* Before replacement, confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)</p>

Note:

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

1.Applicable model	5.Troubleshooting				
All models	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td colspan="2"> <p>E3 is a communication error that occurs when communication between indoor and outdoor units is not established at all. Once the communication between indoor and outdoor units is established, it changes to E5. In both cases, check signal wires (between indoor-outdoor units) locally.</p> <p>Reset the power source and restart.</p> <pre> graph TD Start([Reset the power source and restart.]) --> D1{Does E3/E5 occurs?} D1 -- NO --> C1[Temporary malfunction by noise. Identify the source of noise and correct it.] D1 -- YES --> D2{Is protective fuse for the Superlink circuit blown?} D2 -- YES --> C2[Change to spare circuit.] D2 -- NO --> D3{Is the LED on indoor unit control PCB OK?} D3 -- NO --> C3[Indoor unit control PCB anomaly → Replace it.] D3 -- YES --> D4{Is the power source to outdoor unit OK?} D4 -- NO --> C4[Correct it.] D4 -- YES --> D5{Is the outdoor unit address set on the indoor unit OK?} D5 -- NO --> C5[Correct it.] D5 -- YES --> D6{Is the signal wires (between indoor ~ outdoor units) connection OK?} D6 -- NO --> C6[Correct it.] D6 -- YES --> C7[Outdoor unit control PCB anomaly → Replace it.] </pre> </td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>E3 is a communication error that occurs when communication between indoor and outdoor units is not established at all. Once the communication between indoor and outdoor units is established, it changes to E5. In both cases, check signal wires (between indoor-outdoor units) locally.</p> <p>Reset the power source and restart.</p> <pre> graph TD Start([Reset the power source and restart.]) --> D1{Does E3/E5 occurs?} D1 -- NO --> C1[Temporary malfunction by noise. Identify the source of noise and correct it.] D1 -- YES --> D2{Is protective fuse for the Superlink circuit blown?} D2 -- YES --> C2[Change to spare circuit.] D2 -- NO --> D3{Is the LED on indoor unit control PCB OK?} D3 -- NO --> C3[Indoor unit control PCB anomaly → Replace it.] D3 -- YES --> D4{Is the power source to outdoor unit OK?} D4 -- NO --> C4[Correct it.] D4 -- YES --> D5{Is the outdoor unit address set on the indoor unit OK?} D5 -- NO --> C5[Correct it.] D5 -- YES --> D6{Is the signal wires (between indoor ~ outdoor units) connection OK?} D6 -- NO --> C6[Correct it.] D6 -- YES --> C7[Outdoor unit control PCB anomaly → Replace it.] </pre>	
Diagnosis	Countermeasure				
<p>E3 is a communication error that occurs when communication between indoor and outdoor units is not established at all. Once the communication between indoor and outdoor units is established, it changes to E5. In both cases, check signal wires (between indoor-outdoor units) locally.</p> <p>Reset the power source and restart.</p> <pre> graph TD Start([Reset the power source and restart.]) --> D1{Does E3/E5 occurs?} D1 -- NO --> C1[Temporary malfunction by noise. Identify the source of noise and correct it.] D1 -- YES --> D2{Is protective fuse for the Superlink circuit blown?} D2 -- YES --> C2[Change to spare circuit.] D2 -- NO --> D3{Is the LED on indoor unit control PCB OK?} D3 -- NO --> C3[Indoor unit control PCB anomaly → Replace it.] D3 -- YES --> D4{Is the power source to outdoor unit OK?} D4 -- NO --> C4[Correct it.] D4 -- YES --> D5{Is the outdoor unit address set on the indoor unit OK?} D5 -- NO --> C5[Correct it.] D5 -- YES --> D6{Is the signal wires (between indoor ~ outdoor units) connection OK?} D6 -- NO --> C6[Correct it.] D6 -- YES --> C7[Outdoor unit control PCB anomaly → Replace it.] </pre>					
2.Error detection method					
No outdoor unit exists in the same Superlink system.					
3. Condition of error displayed					
Same as above					
4.Presumable cause					
<ul style="list-style-type: none"> Power is not supplied to the outdoor unit Unmatch of pairing between indoor and outdoor units Indoor unit control PCB anomaly Outdoor unit control PCB anomaly Missing local wiring 					

Note:

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

1.Applicable model	5.Troubleshooting
All models	Diagnosis
	Countermeasure
2.Error detection method	<p>* In case that indoor unit red LED flashes 2 times</p> <p>Note (1) Check the connection (disconnection, looseness) of signal wires at outdoor unit terminal block</p> <p>Is the connection of signal wires at the outdoor unit side OK?</p> <p>NO → Repair signal wires.</p> <p>YES → Note (2) Check the connection (disconnection, looseness, brakage) of signal wires (between indoor and outdoor units)</p> <p>Is the connection of signal wires (between indoor and outdoor units) OK?</p> <p>NO → Repair signal wires.</p> <p>YES → Reset the power source and restart.</p> <p>Does the remote control LCD becomes normal?</p> <p>NO → Go to the diagnosis of 🌀WAIT🌀 (1).</p> <p>YES → Unit is normal. (Malfunction by temporary noise, etc.)</p> <p>* In case that indoor unit red LED stays OFF</p> <p>Reset the power source and restart.</p> <p>Does the remote control LCD becomes normal?</p> <p>NO → Outdoor unit control PCB anomaly (Network communicaion circuit anomaly) → Replace it.</p> <p>YES → Unit is normal. (Malfunction by temporary noise, etc.)</p>
When the communication between indoor and outdoor units is interrupted for more than 2 minutes	
3. Condition of error displayed	
When this anomaly is detected during operation.	
4.Presumable cause	
<ul style="list-style-type: none"> • Unit address No. setting error • Remote control wires broken • Poor connection/disconnection of remote control wires • Indoor unit control PCB anomaly 	

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

<div>Error code</div> Remote control: E6 7-segment display: -	LED	Green	Red	<div>Content</div> Indoor unit heat exchanger temperature sensor anomaly (Thi-R)
	Indoor	Keeps flashing	1 time flash	
	Outdoor	Keeps flashing	Stays Off	

1.Applicable model	5.Troubleshooting																																
All models	<table> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> <tr> <td> <pre> graph TD Q1{Is the connector of sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of sensor OK? *1} Q2 -- NO --> C2[Replace sensor (Thi-R).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>Regarding the characteristics of the sensor, see the following chart</p> </td><td></td></tr> <tr> <td>2.Error detection method</td><td></td></tr> <tr> <td>Detection of anomalously low temperature (resistance) of Thi-R1, R2, R3</td><td></td></tr> <tr> <td>3. Condition of error displayed</td><td></td></tr> <tr> <td> <ul style="list-style-type: none"> If -50°C or lower is detected for 5 seconds continuously, compressor stops. After 3 minutes delay, the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection. Or if 70°C or higher is detected for 5 seconds continuously. </td><td></td></tr> <tr> <td>4.Presumable cause</td><td></td></tr> <tr> <td> <ul style="list-style-type: none"> Anomalous connection of indoor unit heat exchanger temperature sensor Indoor unit heat exchanger temperature sensor anomaly Indoor unit control PCB anomaly </td><td> <p>*1 Check several times to prove any poor connection.</p> <p>Temperature-resistance characteristics of indoor unit heat exchanger temperature sensor (Thi-R1, R2, R3)</p> <table border="1"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>15</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>20</td><td>6</td></tr> <tr><td>25</td><td>5</td></tr> <tr><td>30</td><td>4</td></tr> <tr><td>40</td><td>3</td></tr> <tr><td>50</td><td>2</td></tr> </tbody> </table> </td></tr> </table>	Diagnosis	Countermeasure	<pre> graph TD Q1{Is the connector of sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of sensor OK? *1} Q2 -- NO --> C2[Replace sensor (Thi-R).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>Regarding the characteristics of the sensor, see the following chart</p>		2.Error detection method		Detection of anomalously low temperature (resistance) of Thi-R1, R2, R3		3. Condition of error displayed		<ul style="list-style-type: none"> If -50°C or lower is detected for 5 seconds continuously, compressor stops. After 3 minutes delay, the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection. Or if 70°C or higher is detected for 5 seconds continuously. 		4.Presumable cause		<ul style="list-style-type: none"> Anomalous connection of indoor unit heat exchanger temperature sensor Indoor unit heat exchanger temperature sensor anomaly Indoor unit control PCB anomaly 	<p>*1 Check several times to prove any poor connection.</p> <p>Temperature-resistance characteristics of indoor unit heat exchanger temperature sensor (Thi-R1, R2, R3)</p> <table border="1"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>15</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>20</td><td>6</td></tr> <tr><td>25</td><td>5</td></tr> <tr><td>30</td><td>4</td></tr> <tr><td>40</td><td>3</td></tr> <tr><td>50</td><td>2</td></tr> </tbody> </table>	Temperature (°C)	Resistance (kΩ)	0	15	10	10	20	6	25	5	30	4	40	3	50	2
Diagnosis	Countermeasure																																
<pre> graph TD Q1{Is the connector of sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of sensor OK? *1} Q2 -- NO --> C2[Replace sensor (Thi-R).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>Regarding the characteristics of the sensor, see the following chart</p>																																	
2.Error detection method																																	
Detection of anomalously low temperature (resistance) of Thi-R1, R2, R3																																	
3. Condition of error displayed																																	
<ul style="list-style-type: none"> If -50°C or lower is detected for 5 seconds continuously, compressor stops. After 3 minutes delay, the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection. Or if 70°C or higher is detected for 5 seconds continuously. 																																	
4.Presumable cause																																	
<ul style="list-style-type: none"> Anomalous connection of indoor unit heat exchanger temperature sensor Indoor unit heat exchanger temperature sensor anomaly Indoor unit control PCB anomaly 	<p>*1 Check several times to prove any poor connection.</p> <p>Temperature-resistance characteristics of indoor unit heat exchanger temperature sensor (Thi-R1, R2, R3)</p> <table border="1"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>15</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>20</td><td>6</td></tr> <tr><td>25</td><td>5</td></tr> <tr><td>30</td><td>4</td></tr> <tr><td>40</td><td>3</td></tr> <tr><td>50</td><td>2</td></tr> </tbody> </table>	Temperature (°C)	Resistance (kΩ)	0	15	10	10	20	6	25	5	30	4	40	3	50	2																
Temperature (°C)	Resistance (kΩ)																																
0	15																																
10	10																																
20	6																																
25	5																																
30	4																																
40	3																																
50	2																																

Note:

<div>Error code</div> Remote control: E7 7-segment display: -	LED	Green	Red	<div>Content</div> Indoor return air temperature sensor anomaly (Thi-A)
	Indoor	Keeps flashing	1 time flash	
	Outdoor	Keeps flashing	Stays Off	

<div>1.Applicable model</div> All models	<div>5.Troubleshooting</div> <div> <div>Diagnosis</div> <div> <pre> graph TD Q1{Is the connector of sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of sensor OK? *1} Q2 -- NO --> C2[Replace sensor (Thi-A).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>Regarding the characteristics of the sensor, see the following chart</p> <p>*1 Check several times to prove any poor connection.</p> <p>Temperature-resistance characteristics of indoor return air temperature sensor (Thi-A)</p> <table border="1"> <caption>Temperature-resistance characteristics of indoor return air temperature sensor (Thi-A)</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>15</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>20</td><td>6</td></tr> <tr><td>25</td><td>5</td></tr> <tr><td>30</td><td>4</td></tr> <tr><td>40</td><td>3</td></tr> <tr><td>50</td><td>2</td></tr> </tbody> </table> </div> <div>Countermeasure</div> </div>	Temperature (°C)	Temperature sensor resistance (kΩ)	0	15	10	10	20	6	25	5	30	4	40	3	50	2
Temperature (°C)	Temperature sensor resistance (kΩ)																
0	15																
10	10																
20	6																
25	5																
30	4																
40	3																
50	2																
<div>2.Error detection method</div> Detection of anomalously low temperature (resistance) of Thi-A																	
<div>3. Condition of error displayed</div> <ul style="list-style-type: none"> • If -50°C or lower is detected for 5 seconds continuously, compressor stops. After 3 minutes delay the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection. • Or if 48°C or higher is detected for 5 seconds continuously. 																	
<div>4.Presumable cause</div> <ul style="list-style-type: none"> • Anomalous connection of indoor return air temperature sensor • Indoor return air temperature sensor anomaly • Indoor unit control PCB anomaly 																	

Note:

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

1.Applicable model	5.Troubleshooting
FDT, FDTC, FDTW, FDTQ, FDTS, FDR, FDU, FDUM, and FDUT series	
2.Error detection method	Diagnosis
Float switch is activated	<p>Check the error data in the remote control.</p> <p>Is there any overflow?</p> <p>NO → Is DC 12V detected at CnI connector?</p> <p>YES → Check float switch.</p> <p>NO → Is the CnI connected firmly?</p> <p>NO → Check the connection of CnI. If it is loose, connect it securely.</p> <p>YES → Is there any anomaly on the option equipment?</p> <p>NO → Replace indoor unit control PCB.</p> <p>YES → Check option equipment.</p> <p>YES → Is the humidifier connected?</p> <p>NO → Correct setting to "Humidifier drain pump motor interlock".</p> <p>YES → Is the humidifier drain pump motor interlocked by the indoor unit function setting of remote control?</p> <p>NO → Correct setting to "Humidifier drain pump motor interlock".</p> <p>YES → Drain pump motor ON from the remote control.</p> <p>Does the drain pump motor operate?</p> <p>NO → Is AC220/240V detected at CnR?</p> <p>NO → Indoor unit control PCB anomaly → Replace it.</p> <p>YES → Check the wiring of drain pump motor.</p> <p>YES → Is the drain piping unclogged? Is the drain pipe slop OK?</p> <p>NO → Correct it.</p> <p>YES → Check drain pump motor.</p>
3. Condition of error displayed	Countermeasure
If the float switch OPEN is detected for 3 seconds continuously or if float switch connector is disconnected or wire broken.	
4.Presumable cause	
<ul style="list-style-type: none"> Indoor unit control PCB anomaly Mistake in setting of float switch Mistake in setting of humidifier drain pump motor interlock Mistake in setting of option equipment Mistake in drain piping Drain pump motor anomaly Disconnection/breakage of drain pump motor wires 	

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

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

1.Applicable model	5.Troubleshooting	
All models	Diagnosis	Countermeasure
	<pre> graph LR A{Aren't more than 17 indoor units connected to one remote control?} -- NO --> B[Remote control anomaly → Replace it.] A -- YES --> C[Reduce to 16 or less units.] </pre>	

2.Error detection method
When it detects more than 17 of indoor units connected to one remote control

3. Condition of error displayed
Same as above

4.Presumable cause
<ul style="list-style-type: none"> • Excessive number of indoor units connected. • Remote control anomaly.

Note:

<div>Error code</div> Remote control: E12 7-segment display: -	LED	Green	Red	<div>Content</div> <h2>Address setting error by mixed setting method</h2>
	Indoor	Keeps flashing	Keeps flashing	
	Outdoor	Keeps flashing	Stays Off	

1.Applicable model	5.Troubleshooting																																																														
All models	Diagnosis					Countermeasure																																																									
	<div>Isn't the automatic setting and manual setting mixed in the address setting method for indoor units?</div> <div>YES</div> <div>NO</div>					Review address setting.																																																									
						Replace indoor unit control PCB.																																																									
2.Error detection method	Address setting method list (Figures in [] are for Previous Superlink models)																																																														
Automatic address setting and manual adress setting are mixed when setting adress of indoor units	<table><tr><th colspan="2" rowspan="3"></th><th colspan="3">Models for new Superlink protocol</th><th colspan="3">Models for Previous Superlink protocol</th></tr><tr><th colspan="2">Indoor unit address setting</th><th>Outdoor unit address setting</th><th colspan="2">Indoor unit address setting</th><th>Outdoor unit address setting</th></tr><tr><th>Indoor unit No. switch</th><th>Outdoor unit No. switch</th><th>Outdoor unit No. switch</th><th>Indoor unit No. switch</th><th>Outdoor unit No. switch</th><th>Outdoor unit No. switch</th></tr><tr><td rowspan="2">Manual address setting</td><td>(New SL)</td><td>000-127</td><td>00-31</td><td>00-31</td><td rowspan="2">00-47</td><td rowspan="2">00-47</td><td rowspan="2">00-47</td></tr><tr><td>(Previous SL)</td><td>[00-47]</td><td>[00-47]</td><td>[00-47]</td></tr><tr><td rowspan="2">Automatic address setting for single refrgerant system</td><td>(New SL)</td><td>000</td><td>49</td><td>49</td><td rowspan="2">49</td><td rowspan="2">49</td><td rowspan="2">49</td></tr><tr><td>(Previous SL)</td><td>000</td><td>49</td><td>49</td></tr><tr><td rowspan="2">Automatic address setting for multiple refrigerant systems</td><td>(New SL)</td><td>000</td><td>49</td><td>00-31</td><td colspan="3" rowspan="2">Not available</td></tr><tr><td>(Previous SL)</td><td colspan="3">Not available</td></tr></table>									Models for new Superlink protocol			Models for Previous Superlink protocol			Indoor unit address setting		Outdoor unit address setting	Indoor unit address setting		Outdoor unit address setting	Indoor unit No. switch	Outdoor unit No. switch	Outdoor unit No. switch	Indoor unit No. switch	Outdoor unit No. switch	Outdoor unit No. switch	Manual address setting	(New SL)	000-127	00-31	00-31	00-47	00-47	00-47	(Previous SL)	[00-47]	[00-47]	[00-47]	Automatic address setting for single refrgerant system	(New SL)	000	49	49	49	49	49	(Previous SL)	000	49	49	Automatic address setting for multiple refrigerant systems	(New SL)	000	49	00-31	Not available			(Previous SL)	Not available		
		Models for new Superlink protocol			Models for Previous Superlink protocol																																																										
		Indoor unit address setting		Outdoor unit address setting	Indoor unit address setting		Outdoor unit address setting																																																								
		Indoor unit No. switch	Outdoor unit No. switch	Outdoor unit No. switch	Indoor unit No. switch	Outdoor unit No. switch	Outdoor unit No. switch																																																								
Manual address setting	(New SL)	000-127	00-31	00-31	00-47	00-47	00-47																																																								
	(Previous SL)	[00-47]	[00-47]	[00-47]																																																											
Automatic address setting for single refrgerant system	(New SL)	000	49	49	49	49	49																																																								
	(Previous SL)	000	49	49																																																											
Automatic address setting for multiple refrigerant systems	(New SL)	000	49	00-31	Not available																																																										
	(Previous SL)	Not available																																																													
3. Condition of error displayed																																																															
Same as above																																																															
4.Presumable cause																																																															
Mistake in address setting for indoor unit																																																															

Note:

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

1.Applicable model	5.Troubleshooting
FDT, FDTC series only	
2.Error detection method	Diagnosis
Detected by revolution speed of indoor fan motor	<pre> graph TD Q1{Does any foreign matter intervene in rotational area of fan?} -- YES --> C1[Remove foreign matter.] Q1 -- NO --> Q2{Does the fan rotate smoothly when turned by hand?} Q2 -- YES --> Q3{Is DC280V detected between ①-④ of fan motor connector CnM?} Q2 -- NO --> C2[Replace the fan motor.] Q3 -- YES --> R1[Reset the power source and restart.] Q3 -- NO --> Q4{Is the fuse F2 blown?} Q4 -- YES --> C3[Replace fan motor and power PCB.] Q4 -- NO --> C4[Check power source voltage.] R1 --> Q5{Does it become normal?} Q5 -- YES --> C5[Malfunction by temporary noise] Q5 -- NO --> C6[Replace fan motor. (If the anomaly persists after replacing the fan motor, replace the indoor unit control PCB.)] </pre> <p>Note (1) ④ is GND</p>
3. Condition of error displayed	Countermeasure
When actual revolution speed of indoor fan motor drops to lower than 200min ⁻¹ for 30 seconds continuously, the compressor and the indoor fan motor stop. After 2 seconds delay, fan motor starts again automatically, but if this anomaly occurs 4 times within 60 minutes after the initial detection.	<p>Remove foreign matter.</p> <p>Replace the fan motor.</p> <p>Check power source voltage.</p> <p>Replace fan motor and power PCB.</p> <p>Replace fan motor. (If the anomaly persists after replacing the fan motor, replace the indoor unit control PCB.)</p> <p>Malfunction by temporary noise</p>
4.Presumable cause	
<ul style="list-style-type: none"> Indoor fan motor anomaly Foreign matter at rotational area of fan propeller Fan motor anomaly Dust on control PCB Blown fuse External noise, surge 	

Note:

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

1.Applicable model	5.Troubleshooting
FDK series only	
2.Error detection method	Diagnosis
Detected by revolution speed of indoor fan motor	Countermeasure
	<pre> graph TD D1{Does any foreign matter intervene in rotational area of fan impeller?} -- YES --> C1[Remove foreign matter.] D1 -- NO --> D2{Does the fan rotate smoothly when turned by hand?} D2 -- YES --> D3{Is DC280V detected between (1)-(3) of fan motor connector CnM?} D2 -- NO --> C2[Replace fan motor.] D3 -- YES --> C3[Replace fan motor and power PCB.] D3 -- NO --> P1[Reset the power source and restart.] P1 --> D4{Does it become normal?} D4 -- YES --> C4[Malfunction by temporary noise] D4 -- NO --> C5[Replace fan motor. (If this anomaly persists after replacing the fan motor, replace indoor unit control PCB.)] Note1["Note (1) ③ for GND"] -.-> D3 </pre>
3. Condition of error displayed	
When actual revolution speed of indoor fan motor drops to lower than 200min ⁻¹ for 30 seconds continuously, the compressor and the indoor fan motor stop. After 3 seconds delay, fan motor starts again automatically, but if this anomaly occurs 4 times within 60 minutes after the initial detection.	
4.Presumable cause	
<ul style="list-style-type: none"> • Indoor fan motor anomaly • Foreign matter at rotational area of fan impeller • Fan motor anomaly • Dust on control PCB • Blown fuse • External noise, surge 	

Note:

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

1.Applicable model	5.Troubleshooting	
All models	Diagnosis	Countermeasure
2.Error detection method	<pre> graph TD Start[E19 occurs when the power ON] --> Decision{Is SW7-1 on the indoor unit control PCB ON?} Decision -- YES --> Countermeasure1[Turn SW7-1 on the indoor unit control PCB OFF and reset the power.] Decision -- NO --> Countermeasure2[Indoor unit control PCB anomaly (Anomalous SW7) -> Replace.] </pre>	
E19 occurs		
3. Condition of error displayed		
Same as above		
4.Presumable cause		
Mistake in SW7-1 setting Due to forgetting to turn OFF SW7-1 after indoor unit operation check)		

Note: Indoor unit operation check/drain pump check mode

If the power is ON after SW7-1ON, indoor unit operation check/drain pump check mode can be established.

- 1) When the communication between remote control and indoor unit PCB is established 15 seconds after power ON, it goes to indoor unit operation check.
- 2) When the communication between remote control and indoor unit PCB is not established, it goes to drain pump check (CnB connector should be open before power ON)

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

1.Applicable model	5.Troubleshooting
All models	
2.Error detection method	
Detection of anomalously low temperature (resistance) of Thc	
3. Condition of error displayed	
4.Presumable cause	
<ul style="list-style-type: none">Anomalous connection of remote control temperature sensorRemote control temperature sensor anomalyRemote control PCB anomaly	

Diagnosis		Countermeasure					
<div><div>Is the connector of sensor connected properly ?</div><div>NO</div><div>Insert the connector securely.</div></div> <div><div>YES</div><div>Regarding the characteristics of the sensor, see the following table</div><div>Are the characteristics of sensor OK? Is the sensor wire OK *1</div><div>NO</div><div>Replace sensor (Thc).</div><div>YES</div><div>Replace indoor unit control PCB.</div></div> <div><div>*1</div><div>Check several times to prove any poor connection.</div></div>							
Temperature-resistance characteristics of remote control temperature sensor (Thc)							
Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
0	65	14	33	30	16	46	8.5
1	62	16	30	32	15	48	7.8
2	59	18	27	34	14	50	7.3
4	53	20	25	36	13	52	6.7
6	48	22	23	38	12	54	6.3
8	44	24	21	40	11	56	5.8
10	40	26	19	42	9.9	58	5.4
12	36	28	18	44	9.2	60	5.0

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

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

1.Applicable model	5.Troubleshooting
Outdoor unit	
2.Error detection method	Diagnosis
3. Condition of error displayed	Countermeasure
4.Presumable cause	
<ul style="list-style-type: none"> Indoor unit control PCB anomaly Outdoor unit control PCB anomaly 	<p>Is the wiring connection between indoor and outdoor units correctly?</p> <p>NO → Correct the wiring.</p> <p>YES</p> <p>Is the voltage between L1-L2, L2-L3 and L3-L1 at the terminal block on outdoor unit AC380/415V respectively?</p> <p>NO → Replace outdoor unit control PCB.</p> <p>YES</p> <p>Is the voltage between L1-N at the terminal block on indoor unit AC220/240V?</p> <p>NO → Disconnection or breakage of wire between indoor and outdoor unit</p> <p>YES → Replace indoor unit PCB.</p>

Note:

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

1. Applicable model	5. Troubleshooting				
Outdoor unit	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>Save data for 30 minutes before stopping in Mente PC.</p> <p>Reset the power and restart operation.</p> <p>Does it recur? Is E31 displayed?</p> <p>NO →</p> <p>YES →</p> <p>Check outdoor unit address Nos. in the same Superlink system</p> <p>Does the same address No. exist?</p> <p>YES →</p> <p>NO →</p> </td><td> <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation. Check the address Nos. of outdoor units connected in same Superlink system.</p> <p>Caution: Address will not be confirmed, unless the power is reset after changing address.</p> <p>During test run No action is taken by judging that the power reset was not done after changing address.</p> <p>Caution: Address No. of outdoor unit with new Superlink specification should be set 00-31</p> <p>Correct address.</p> <p>Replace outdoor unit control PCB. *</p> <p>* Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)</p> </td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>Save data for 30 minutes before stopping in Mente PC.</p> <p>Reset the power and restart operation.</p> <p>Does it recur? Is E31 displayed?</p> <p>NO →</p> <p>YES →</p> <p>Check outdoor unit address Nos. in the same Superlink system</p> <p>Does the same address No. exist?</p> <p>YES →</p> <p>NO →</p>	<p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation. Check the address Nos. of outdoor units connected in same Superlink system.</p> <p>Caution: Address will not be confirmed, unless the power is reset after changing address.</p> <p>During test run No action is taken by judging that the power reset was not done after changing address.</p> <p>Caution: Address No. of outdoor unit with new Superlink specification should be set 00-31</p> <p>Correct address.</p> <p>Replace outdoor unit control PCB. *</p> <p>* Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)</p>
Diagnosis	Countermeasure				
<p>Save data for 30 minutes before stopping in Mente PC.</p> <p>Reset the power and restart operation.</p> <p>Does it recur? Is E31 displayed?</p> <p>NO →</p> <p>YES →</p> <p>Check outdoor unit address Nos. in the same Superlink system</p> <p>Does the same address No. exist?</p> <p>YES →</p> <p>NO →</p>	<p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation. Check the address Nos. of outdoor units connected in same Superlink system.</p> <p>Caution: Address will not be confirmed, unless the power is reset after changing address.</p> <p>During test run No action is taken by judging that the power reset was not done after changing address.</p> <p>Caution: Address No. of outdoor unit with new Superlink specification should be set 00-31</p> <p>Correct address.</p> <p>Replace outdoor unit control PCB. *</p> <p>* Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)</p>				
2. Error detection method					
When it finds any duplicated address No. existed in the same Superlink system by scanning the address No. set for each outdoor unit with microcomputer.					
3. Condition of error displayed					
When duplicated outdoor unit address No. exists in the same Superlink system.					
4. Presumable cause					
<ul style="list-style-type: none"> Mistake in the address setting of outdoor units More than 129 indoor units connected [Maximum number of setting address switch is for 128 units] No setting of Master/Slave selection switch for combination use 					

Note: After the above procedure, confirm no error display occurs.

Address will not be confirmed unless the power is reset.

In case of combination use, set the same address to both master and slave units. Distinction of master or slave unit is done by setting of SW4-7. (Refer the instruction manual and technical manual in detail.)

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

1.Applicable model	5.Troubleshooting
Outdoor unit	
2.Error detection method	Diagnosis
By checking the power source voltage at primary side of the outdoor unit control PCB (Check only L3 phase)	<p>Save data for 30 minutes before stopping in Mente PC</p> <p>Is the power source voltage (between phases) at the primary side OK?</p> <p>NO → Propose an improvement to the customer.</p> <p>YES → Reset the power source and restart operation.</p> <p>Does E32 recur?</p> <p>YES → Replace outdoor unit control PCB.</p> <p>NO → Wait and see without taking any action.</p>
3. Condition of error displayed	Countermeasure
When the power source voltage between L1-L3 or L2-L3 becomes 0V and/or the current of L3 decrease to 0A	<p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. (It will be useful to persuade the customer why an improvement of power source is required by showing these data.)</p> <p>Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.</p>
4.Presumable cause	
<ul style="list-style-type: none"> Anomalous power source at primary side Outdoor unit control PCB anomaly. 	

Note:

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

1.Applicable model	5.Troubleshooting	
Outdoor unit	Diagnosis	Countermeasure
	<div>Save data for 30 minutes before stopping in Mente PC.</div> <div>Is the unit installation environment within the range of limitation?</div> <div>NO</div> <div>YES</div> <div>Are the refrigerant amount and piping length OK?</div> <div>NO</div> <div>YES</div> <div>Is the sensor connector inserted to the PCB connector properly?</div> <div>NO</div> <div>YES</div> <div>Is the discharge pipe temperature sensor normal?</div> <div>NO</div> <div>YES</div> <div>Reset the power and restart operation.</div> <div>Does it recur after restarting operation?</div> <div>NO</div> <div>YES</div>	<div>Check and save the data of operating condition. Check the ROM version.</div> <div>Propose an improvement to the customer.</div> <div>Adjust the refrigerant amount properly. (Check whether the refrigerant amount is insufficient or not.) (Check the gas leakage.)</div> <div>Insert connectors securely.</div> <div>Check if characteristics are correct, referring to the characteristics list of E39 (Page 100) . And if necessary, replace the discharge pipe temperature sensor.</div> <div>Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.</div> <div>Wait and see. Continue to obtain data, if possible. (Keep connecting the Mente PC.)</div> <div>Check refrigerant amount again.</div>
2.Error detection method		
Detection of anomalously high temperature by the discharge pipe temperature sensor		
3. Condition of error displayed		
When the discharge pipe temperature sensor detects 115°C or higher the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection.		
4.Presumable cause		
<ul style="list-style-type: none">• Defective discharge pipe temperature sensor• Defective outdoor unit control PCB• Insufficient amount of refrigerant• Insufficient air flow volume• Short-circuit		

Note:

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

1. Applicable model	5. Troubleshooting	
Outdoor unit	Diagnosis	Countermeasure
2. Error detection method	<p>Save data for 30 minutes before stopping in Mente PC.</p> <pre> graph TD Start([Start]) --> Q1{Is the unit installation environment within the range of limitation?} Q1 -- NO --> C1[Propose the client to improve.] Q1 -- YES --> Q2{Is the refrigerant amount and piping length OK?} Q2 -- NO --> C2[Adjust refrigerant amount properly. (Check whether the charged amount is excess.) If the piping length is less than 5m, calculate the correct charging amount and reduce excessive refrigerant amount.] Q2 -- YES --> Q3{Is the connected number of indoor units checked by Mente PC same as that mentioned in utility drawing?} Q3 -- NO --> C3[Connect the signal wires between indoor and outdoor units securely.] Q3 -- YES --> Q4{Is insertion of the sensor connector into the connector on outdoor unit control PCB OK?} Q4 -- NO --> C4[Insert the connector securely.] Q4 -- YES --> Q5{Is the temperature sensors of discharge pipe, suction pipe, Tho-H and indoor heat exchanger OK? Is high pressure sensor OK?} Q5 -- NO --> C5[Replace the sensor after checking whether the sensor characteristics is OK or not.] Q5 -- YES --> R1[Reset the power source and restart.] R1 --> Q6{After restarting, does it recur?} Q6 -- NO --> C6[Wait and see. If possible, continue to collect data. (Keep connecting Mente PC.)] Q6 -- YES --> Q7{Is the operation of indoor EEV OK? (at cooling) Is the operation of outdoor EEVH OK? (at heating) Is the operation of outdoor EEVSC OK? (at heating and cooling)} Q7 -- NO --> C7[Replace EEV coil or EEV main body.] Q7 -- YES --> C8[Check refrigerant amount again.] </pre>	
3. Condition of error displayed	<p>If the overheat temperature of discharge pipe is detected 5°C or lower for 10 minute continuously. If the compressor stop is detected 3 times within 60 minutes</p>	
4. Presumable cause	<ul style="list-style-type: none"> Faulty discharge pipe temperature sensor Faulty high pressure sensor Faulty connection signal wires between indoor and outdoor units Excessive refrigerant amount Faulty indoor EEV Faulty indoor heat exchanger temperature sensor Faulty outdoor EEVH Faulty suction pipe temperature sensor or faulty low pressure sensor Faulty outdoor EEVSC Faulty Tho-H temperature sensor Piping length is out of limitation range 	

Note:

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

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

1.Applicable model	5.Troubleshooting	
Outdoor unit	Diagnosis	Countermeasure
	<div>Save data for 30 minutes before stopping in Mente PC</div> <div><div>Is the connector of sensor connected properly?</div><div>NO</div><div>YES</div><div>Are the characteristics of sensor OK?*2</div><div>NO</div><div>YES</div></div> <div>*2 Check several times to prove any poor connection.</div>	<div>Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</div> <div>Insert the connector securely.</div> <div>Replace sensor . (Tho-SC, Tho-H, Tho-R)</div> <div>Replace outdoor unit control PCB.</div>
2.Error detection method		
Detection of anomalously low temperature (resistance) of Tho-R or Tho-SC or Tho-H		
3. Condition of error displayed		
<div>If -50°C or lower is detected for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. And after 3 minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection.</div> <div>If -50°C or lower is detected for 5 seconds continuously within 20 seconds after power ON</div>		
4.Presumable cause		
<div>Broken sensor harness or the internal wire of sensing section (Check the molded section as well)</div> <div>Disconnection of sensor harness connection (connector)</div> <div>Outdoor unit control PCB anomaly</div>	<div>Outdoor heat exchanger temperature sensor (Tho-R1) Sub-cooling coil sensor (Tho-SC, Tho-H) Temperature-resistance characteristics</div> <div><div>Temperature sensor resistance (kΩ)</div><div><div>15</div><div>10</div><div>5</div></div><div><div>0</div><div>10</div><div>20</div><div>30</div><div>40</div><div>50</div></div><div>5kΩ at 25°C</div></div>	

Note:

<div>Error code</div> Remote control: E38 7-segment display: E38	LED	Green	Red	<div>Content</div> Outdoor air temperature sensor anomaly (Tho-A)
	Indoor	Keeps flashing	Stays Off	
	Outdoor	Keeps flashing	1 time flash	

<div>1.Applicable model</div> Outdoor unit	<div>5.Troubleshooting</div> <div> <div>Diagnosis</div> <div> <div>Save data for 30 minutes before stopping in Mente PC</div> <div> <div>Is the connector of sensor connected properly?</div> <div> <div>NO</div> <div>Insert the connector securely.</div> </div> <div> <div>YES</div> <div>Are the characteristics of sensor OK?*1</div> <div> <div>NO</div> <div>Replace sensor (Tho-A).</div> </div> <div> <div>YES</div> <div>Replace outdoor unit control PCB.</div> </div> </div> </div> <div> <div>*1</div> <div>Check several times to prove any poor connection.</div> </div> <div> <div>Temperature-resistance characteristics of Outdoor air temperature sensor (Tho-A)</div> <table border="1"> <caption>Temperature-resistance characteristics of Outdoor air temperature sensor (Tho-A)</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>-20</td><td>100</td></tr> <tr><td>-10</td><td>70</td></tr> <tr><td>0</td><td>40</td></tr> <tr><td>10</td><td>25</td></tr> <tr><td>20</td><td>15</td></tr> <tr><td>30</td><td>10</td></tr> <tr><td>40</td><td>7</td></tr> <tr><td>50</td><td>5</td></tr> </tbody> </table> </div> </div> <div> <div>Countermeasure</div> <div> <div>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</div> </div> </div> </div>	Temperature (°C)	Temperature sensor resistance (kΩ)	-20	100	-10	70	0	40	10	25	20	15	30	10	40	7	50	5
Temperature (°C)	Temperature sensor resistance (kΩ)																		
-20	100																		
-10	70																		
0	40																		
10	25																		
20	15																		
30	10																		
40	7																		
50	5																		
<div>2.Error detection method</div> Detection of anomalously low temperature (resistance) of Tho-A																			
<div>3. Condition of error displayed</div> <ul style="list-style-type: none"> If -30°C or lower is detected for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. And after 3 minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection. If -30°C or lower is detected for 5 seconds continuously within 20 seconds after power ON. 																			
<div>4.Presumable cause</div> <ul style="list-style-type: none"> Broken sensor harness or the internal wire of sensing section (Check the molded section as well) Disconnection of sensor harness connection (connector) Outdoor unit control PCB anomaly 																			

Note:

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

1.Applicable model	5.Troubleshooting																				
Outdoor unit																					
2.Error detection method	Diagnosis																				
Detection of anomalously low temperature (resistance) of Tho-D1	<div>Save data for 30 minutes before stopping in Mente PC</div> <pre> graph TD A{Is the connector of sensor connected properly?} -- NO --> B[Insert the connector securely.] A -- YES --> C{Are the characteristics of sensor OK? *3} C -- NO --> D[Replace sensor (Tho-D1).] C -- YES --> E[Replace outdoor unit control PCB.] </pre> <p>*3 Check several times to prove any poor connection.</p> <p>Temperature-resistance characteristics of discharge pipe temperature sensor (Tho-D1)</p> <table border="1"> <caption>Temperature-resistance characteristics of discharge pipe temperature sensor (Tho-D1)</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>180</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>60</td></tr> <tr><td>60</td><td>35</td></tr> <tr><td>80</td><td>20</td></tr> <tr><td>100</td><td>10</td></tr> <tr><td>120</td><td>5</td></tr> <tr><td>140</td><td>2</td></tr> <tr><td>160</td><td>1</td></tr> </tbody> </table>	Temperature (°C)	Temperature sensor resistance (kΩ)	0	180	20	100	40	60	60	35	80	20	100	10	120	5	140	2	160	1
Temperature (°C)	Temperature sensor resistance (kΩ)																				
0	180																				
20	100																				
40	60																				
60	35																				
80	20																				
100	10																				
120	5																				
140	2																				
160	1																				
3. Condition of error displayed	Countermeasure																				
<ul style="list-style-type: none"> If 3°C or lower is detected for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after the compressor ON, the compressor stops. And after 3 minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection. 	<p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace sensor (Tho-D1).</p> <p>Replace outdoor unit control PCB.</p>																				
4.Presumable cause																					
<ul style="list-style-type: none"> Broken sensor harness or the internal wire of sensing section (Check the molded section as well) Disconnection of sensor harness connection (connector) Outdoor unit control PCB anomaly 																					

Note:

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

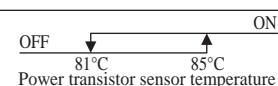
<div>1.Applicable model</div> Outdoor unit	<div>5.Troubleshooting</div> <div> <div>Diagnosis</div> <div> <div>Save data for 30 minutes before stopping in Mente PC</div> <div> <div>Was 63H1 activated at 4.15MPa or higher?</div> <div> <div>NO</div> <div>Does the sensed value of the high pressure sensor show 4.15MPa? (Normal?)</div> <div> <div>NO</div> <div>YES</div> </div> </div> </div> </div> </div> <div> <div>Countermeasure</div> <div> <p>Check and save the data of operating condition. Check the sensed value of high pressure sensor when the 63H1-1 is activated. Check whether the high pressure switch is activated at the sensed value of high pressure sensor.</p> <p>High pressure sensor anomaly is suspicious. Check high pressure sensor itself according to the troubleshooting procedure of E54, after retarting operation. (If the high pressure sensor [PSH] fails, replace it)</p> <p>If the connector is disconnected or the harness is broken, correct it. Also check whether the high pressure switch is properly mounted or not.</p> <p>Open operation valve.</p> <p>Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.</p> <p>Replace outdoor control PCB.</p> <p>Remove clogs.</p> <p>Check items (condenser side):</p> <ul style="list-style-type: none"> • Filter clogging • Air flow volume (Fan motor) • Short-circuit of air flow </div> </div>
<div>2.Error detection method</div> When high pressure switch 63H1-1 is activated	<div> <div> <div>YES</div> <div>Are the service valves fully open?</div> <div> <div>NO</div> <div>YES</div> </div> </div> <div> <div>Connect a pressure gauge and restart operation.</div> <div> <div>Is it stop at 4.15MPa of gauge pressre ?</div> <div> <div>NO</div> <div>YES</div> </div> </div> <div> <div>Is there any clogging in the refrigerant circuit ?</div> <div> <div>YES</div> <div>NO</div> </div> </div> </div> </div>
<div>3. Condition of error displayed</div> <ul style="list-style-type: none"> • If high pressure exceeds 4.15MPa • If 63H1-1 is activated 5 times within 60 minutes • If 63H1-1 is activated for 60 minutes continuously 	
<div>4.Presumable cause</div> <ul style="list-style-type: none"> • Short-circuit of airflow at condenser side of heat exchanger/Disturbance of airflow/Clogging filter/Fan motor anomaly • Disconnection of high pressure switch connector • Breakage of high pressure switch harness • Closed service valves • High pressure sensor anomaly • High pressure switch anomaly 	

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

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

1.Applicable model	5.Troubleshooting				
Outdoor unit	<table> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> <tr> <td> <p>Save data for 30 minutes before stopping in Mente PC</p> <p>Does the outdoor fan run ?</p> <p>NO →</p> <p>YES</p> <p>Reset power source and restart</p> <p>Does the error recur when restarting?</p> <p>NO →</p> <p>YES</p> <p>Is the cooling fan for inverter running?</p> <p>NO →</p> <p>YES</p> <p>Is 15V of power for control PCB detected?</p> <p>NO →</p> <p>YES</p> <p>After power OFF</p> <p>Is the connection of power transistor temperature sensor OK? (Check short-circuit or breakage of harness)</p> <p>NO →</p> <p>YES</p> <p>Is the characteristics of power transistor temperature sensor OK? *</p> <p>NO →</p> <p>YES</p> <p>Is the fixing of power transistor OK? (Check tightening of screws or application of radiation silicon)</p> <p>NO →</p> <p>YES →</p> </td><td> <p>Check and save the data of operating conditions. Check the temperature of power transistor. Check the operation of outdoor fan and cooling fan.</p> <p>Repair it according to the troubleshooting procedure of E48. Check it as much as possible under the operating conditions for 30 minutes before error occurred.</p> <p>Wait and see. Continue to obtain data, if possible (Keep connecting the Mente PC).</p> <p>If the cooling fan does not run in spite of the operation ON range, check the voltage at the connector of cooling fan. If the 220/240V is detected, replace cooling fan motor. If 0V is detected, replace outdoor unit control PCB.</p> <p>After checking the loose connection of connector or breakage of harness, replace inverter PCB.</p> <p>Connect the connector of thermistor securely. Or replace power transistor temperature sensor.</p> <p>Replace power transistor temperature sensor.</p> <p>* Refer the characteristics of power transistor temperature sensor to E56</p> <p>Fix power transistor on to the radiation fin with proper application of radiation silicon.</p> <p>Replace power transistor.</p> </td></tr> </table>	Diagnosis	Countermeasure	<p>Save data for 30 minutes before stopping in Mente PC</p> <p>Does the outdoor fan run ?</p> <p>NO →</p> <p>YES</p> <p>Reset power source and restart</p> <p>Does the error recur when restarting?</p> <p>NO →</p> <p>YES</p> <p>Is the cooling fan for inverter running?</p> <p>NO →</p> <p>YES</p> <p>Is 15V of power for control PCB detected?</p> <p>NO →</p> <p>YES</p> <p>After power OFF</p> <p>Is the connection of power transistor temperature sensor OK? (Check short-circuit or breakage of harness)</p> <p>NO →</p> <p>YES</p> <p>Is the characteristics of power transistor temperature sensor OK? *</p> <p>NO →</p> <p>YES</p> <p>Is the fixing of power transistor OK? (Check tightening of screws or application of radiation silicon)</p> <p>NO →</p> <p>YES →</p>	<p>Check and save the data of operating conditions. Check the temperature of power transistor. Check the operation of outdoor fan and cooling fan.</p> <p>Repair it according to the troubleshooting procedure of E48. Check it as much as possible under the operating conditions for 30 minutes before error occurred.</p> <p>Wait and see. Continue to obtain data, if possible (Keep connecting the Mente PC).</p> <p>If the cooling fan does not run in spite of the operation ON range, check the voltage at the connector of cooling fan. If the 220/240V is detected, replace cooling fan motor. If 0V is detected, replace outdoor unit control PCB.</p> <p>After checking the loose connection of connector or breakage of harness, replace inverter PCB.</p> <p>Connect the connector of thermistor securely. Or replace power transistor temperature sensor.</p> <p>Replace power transistor temperature sensor.</p> <p>* Refer the characteristics of power transistor temperature sensor to E56</p> <p>Fix power transistor on to the radiation fin with proper application of radiation silicon.</p> <p>Replace power transistor.</p>
Diagnosis	Countermeasure				
<p>Save data for 30 minutes before stopping in Mente PC</p> <p>Does the outdoor fan run ?</p> <p>NO →</p> <p>YES</p> <p>Reset power source and restart</p> <p>Does the error recur when restarting?</p> <p>NO →</p> <p>YES</p> <p>Is the cooling fan for inverter running?</p> <p>NO →</p> <p>YES</p> <p>Is 15V of power for control PCB detected?</p> <p>NO →</p> <p>YES</p> <p>After power OFF</p> <p>Is the connection of power transistor temperature sensor OK? (Check short-circuit or breakage of harness)</p> <p>NO →</p> <p>YES</p> <p>Is the characteristics of power transistor temperature sensor OK? *</p> <p>NO →</p> <p>YES</p> <p>Is the fixing of power transistor OK? (Check tightening of screws or application of radiation silicon)</p> <p>NO →</p> <p>YES →</p>	<p>Check and save the data of operating conditions. Check the temperature of power transistor. Check the operation of outdoor fan and cooling fan.</p> <p>Repair it according to the troubleshooting procedure of E48. Check it as much as possible under the operating conditions for 30 minutes before error occurred.</p> <p>Wait and see. Continue to obtain data, if possible (Keep connecting the Mente PC).</p> <p>If the cooling fan does not run in spite of the operation ON range, check the voltage at the connector of cooling fan. If the 220/240V is detected, replace cooling fan motor. If 0V is detected, replace outdoor unit control PCB.</p> <p>After checking the loose connection of connector or breakage of harness, replace inverter PCB.</p> <p>Connect the connector of thermistor securely. Or replace power transistor temperature sensor.</p> <p>Replace power transistor temperature sensor.</p> <p>* Refer the characteristics of power transistor temperature sensor to E56</p> <p>Fix power transistor on to the radiation fin with proper application of radiation silicon.</p> <p>Replace power transistor.</p>				
2.Error detection method					
When anomalously high temperature is detected by power transistor temperature sensor (Tho-P1)					
3. Condition of error displayed					
Anomalously high temperature of power transistor is detected 5 times within 60 minutes (E41). Or it is detected for 15 minutes continuously (E51)					
4.Presumable cause					
<ul style="list-style-type: none"> Power transistor anomaly Power transistor temperature sensor anomaly Improperly fixing of power transistor to radiator fin Inverter PCB anomaly Outdoor fan motor anomaly Anomalous cooling fan motor for inverter Inadequate installation space of outdoor unit 					

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



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

1. Applicable model	5. Troubleshooting				
Outdoor unit					
2. Error detection method					
In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.					
3. Condition of error displayed					
If the output current of inveter exceeds the specifications, it makes the compressor stopping. After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection.					
4. Presumable cause					
<ul style="list-style-type: none"> • Open the valves • Faulty power source • Insufficient refrigerant amount • Faulty compressor • Faulty power transistor module 	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>Is the power source voltage OK?</p> <p>NO →</p> <p>YES ↓</p> <p>Are the service valves opened?</p> <p>NO →</p> <p>YES ↓</p> <p>Is the high pressure during operation OK?</p> <p>NO →</p> <p>YES ↓</p> <p>Is the checked result of insulation resistance and resistance between terminals (1) of compressor motor OK?</p> <p>NO →</p> <p>Continue to next page</p> <p>(1) FDC121-155KXZEN1: 0.293Ω or more at 20°C FDC121-155KXZES1: 1.172Ω or more at 20°C</p> </td><td> <p>Check power source.</p> <p>Open the valves.</p> <p>Check refrigerant amount and refrigerant circuit. *In case of transitional increase of high pressure and/or test run, several times restarting may recover it, because liquid refrigerant in the compressor is discharged from the compressor.</p> <p>Replace compressor.</p> </td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>Is the power source voltage OK?</p> <p>NO →</p> <p>YES ↓</p> <p>Are the service valves opened?</p> <p>NO →</p> <p>YES ↓</p> <p>Is the high pressure during operation OK?</p> <p>NO →</p> <p>YES ↓</p> <p>Is the checked result of insulation resistance and resistance between terminals (1) of compressor motor OK?</p> <p>NO →</p> <p>Continue to next page</p> <p>(1) FDC121-155KXZEN1: 0.293Ω or more at 20°C FDC121-155KXZES1: 1.172Ω or more at 20°C</p>	<p>Check power source.</p> <p>Open the valves.</p> <p>Check refrigerant amount and refrigerant circuit. *In case of transitional increase of high pressure and/or test run, several times restarting may recover it, because liquid refrigerant in the compressor is discharged from the compressor.</p> <p>Replace compressor.</p>
Diagnosis	Countermeasure				
<p>Is the power source voltage OK?</p> <p>NO →</p> <p>YES ↓</p> <p>Are the service valves opened?</p> <p>NO →</p> <p>YES ↓</p> <p>Is the high pressure during operation OK?</p> <p>NO →</p> <p>YES ↓</p> <p>Is the checked result of insulation resistance and resistance between terminals (1) of compressor motor OK?</p> <p>NO →</p> <p>Continue to next page</p> <p>(1) FDC121-155KXZEN1: 0.293Ω or more at 20°C FDC121-155KXZES1: 1.172Ω or more at 20°C</p>	<p>Check power source.</p> <p>Open the valves.</p> <p>Check refrigerant amount and refrigerant circuit. *In case of transitional increase of high pressure and/or test run, several times restarting may recover it, because liquid refrigerant in the compressor is discharged from the compressor.</p> <p>Replace compressor.</p>				

Note:

Error code	LED	Green	Red	Content
Remote control: E42 7-segment display: E42	Indoor	Keeps flashing	Stays Off	Current cut (2)
	Outdoor	Keeps flashing	1 time flash	

1.Applicable model	5.Troubleshooting				
Outdoor unit	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <p>Continue from previous page</p> <p>↓</p> <p>Is the checked result of power transistor module OK?</p> <p>NO → Replace inverter PCB.</p> <p>YES ↓</p> <div style="border: 1px dashed black; padding: 5px;"> <ul style="list-style-type: none"> • Is the installation space of indoor and/or outdoor unit enough? • Is there any short-circuit of air on indoor and/or outdoor unit? • At cooling, does the outdoor fan motor run? Are the operation valves fully opened? Is the filter clogged? • At heating, does the indoor fan motor run? Are the service valves fully opened? Is the filter clogged? • Is there any liquid flooding? Is the superheat within normal range? Is the low pressure sensor and suction pipe temperature normal? • Is there any anomalous sound on the compressor? </div> <p>YES ↓</p> <p>After resetting power for several times does it become normal?</p> <p>NO → Replace inverter PCB.</p> <p>YES ↓</p> <div style="border: 1px solid black; padding: 5px;"> <p>Temporary noise may cause of anomaly. If noise source can be found, take countermeasure.</p> </div> </td><td></td></tr> </tbody> </table>	Diagnosis	Countermeasure	<p>Continue from previous page</p> <p>↓</p> <p>Is the checked result of power transistor module OK?</p> <p>NO → Replace inverter PCB.</p> <p>YES ↓</p> <div style="border: 1px dashed black; padding: 5px;"> <ul style="list-style-type: none"> • Is the installation space of indoor and/or outdoor unit enough? • Is there any short-circuit of air on indoor and/or outdoor unit? • At cooling, does the outdoor fan motor run? Are the operation valves fully opened? Is the filter clogged? • At heating, does the indoor fan motor run? Are the service valves fully opened? Is the filter clogged? • Is there any liquid flooding? Is the superheat within normal range? Is the low pressure sensor and suction pipe temperature normal? • Is there any anomalous sound on the compressor? </div> <p>YES ↓</p> <p>After resetting power for several times does it become normal?</p> <p>NO → Replace inverter PCB.</p> <p>YES ↓</p> <div style="border: 1px solid black; padding: 5px;"> <p>Temporary noise may cause of anomaly. If noise source can be found, take countermeasure.</p> </div>	
Diagnosis	Countermeasure				
<p>Continue from previous page</p> <p>↓</p> <p>Is the checked result of power transistor module OK?</p> <p>NO → Replace inverter PCB.</p> <p>YES ↓</p> <div style="border: 1px dashed black; padding: 5px;"> <ul style="list-style-type: none"> • Is the installation space of indoor and/or outdoor unit enough? • Is there any short-circuit of air on indoor and/or outdoor unit? • At cooling, does the outdoor fan motor run? Are the operation valves fully opened? Is the filter clogged? • At heating, does the indoor fan motor run? Are the service valves fully opened? Is the filter clogged? • Is there any liquid flooding? Is the superheat within normal range? Is the low pressure sensor and suction pipe temperature normal? • Is there any anomalous sound on the compressor? </div> <p>YES ↓</p> <p>After resetting power for several times does it become normal?</p> <p>NO → Replace inverter PCB.</p> <p>YES ↓</p> <div style="border: 1px solid black; padding: 5px;"> <p>Temporary noise may cause of anomaly. If noise source can be found, take countermeasure.</p> </div>					
2.Error detection method					
In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.					
3. Condition of error displayed					
If the output current of inveter exceeds the specifications, it makes the compressor stopping. After 3-minutes delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection.					
4.Presumable cause					
<ul style="list-style-type: none"> • Open the valves • Faulty power source • Insufficient refrigerant amount • Faulty compressor • Faulty power transistor module 					

Note:

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

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

1.Applicable model	5.Troubleshooting	
Outdoor unit	Diagnosis	Countermeasure
	<div>Save data for 30 minutes before stopping in Mente PC.</div> <div>Reset the power source.</div> <div>Is E43 dispalyed?</div> <div>Caution: Address will not be confirmed, unless the power is reset after changing address.</div> <div>NO</div> <div>YES</div> <div>Does the number of indoor units connected and/or total capacity exceed limitation?</div> <div>YES</div> <div>NO</div> <div>Check the connected number of indoor units with 7-segment display code 40 or Mente PC with reference to the utilities drawing. (Check not only one system, but also other systems.)</div> <div>Are there any indoor units which is not expected to exist in this signal line?</div> <div>YES</div> <div>NO</div> <div>Check the resistance between A and B of signal line as well.</div> <div>General checking of indoor/outdoor unit addresses by means of: ◇ Outdoor unit: Mente PC, 7-Segemnt display C40 and rotary switch (SW1, 2) ◇ Indoor unit: Remote control, rotary switch (SW1, 2, 3, 4) and SW5-2 * It is recommended to use means other than the rotary switch, which could be defective.</div>	<div>Check and save the data of operating condition.</div> <div>Test run No action is taken because it is judged that the power reset was not done after changing address.</div> <div>Check indoor unit addresses and correct. In order to operate the unit tentatively, even if total capacity of connected indoor units exceeds 150% of outdoor unit capacity, turn ON the dip switch SW5-4 on outdoor unit control PCB. (However since this tentative solution could cause trouble, be sure to correct it as soon as possible)</div> <div>Signal wire may be connected to other systems. Separate the signal wire.</div> <div>Correct addresses. (Either one of addresses is wrong.) If the address corrected with rotary switch is still wrong, replace control PCB (Defective rotary switch)</div> <div>* Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)</div>
2.Error detection method		
When the number of connected indoor units exceeds the limitation. When the total capacity of connected indoor units exceeds the limitation. (When the total capacity of connected indoor units exceeds 150% of outdoor unit capacity)		
3. Condition of error displayed		
<ul style="list-style-type: none">Excessive number of connected indoor unitsExcessive total capacity of connected indoor unitsThe total capacity of connected indoor units exceeds 150% of outdoor unit capacity		
4.Presumable cause		
<ul style="list-style-type: none">Mistake in setting of indoor/outdoor unit addressesMistake in signal wire connection		

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

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

1. Applicable model	5. Troubleshooting																								
Outdoor unit																									
2. Error detection method																									
3. Condition of error displayed																									
If the communication between inverter PCB and outdoor unit control PCB is not established.																									
4. Presumable cause																									
<ul style="list-style-type: none"> Faulty inverter PCB Faulty connector between inverter PCB and outdoor unit control PCB Faulty outdoor unit control PCB 	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td>Save data for 30 minutes before stopping in Mente PC.</td><td>Check and save the data of operating conditions.</td></tr> <tr> <td>Are the connectors of inverter PCB and outdoor unit control PCB OK?</td><td>NO → Insert the connectors securely.</td></tr> <tr> <td>YES</td><td></td></tr> <tr> <td>Are both JSW10, 11 on the inverter PCB OFF?</td><td>NO → Switch OFF all</td></tr> <tr> <td>YES</td><td></td></tr> <tr> <td>Is LED on the inverter PCB flashing?</td><td>NO → No power on inverter PCB → Find the cause. • Anomalous fan motor (FDC121-155KXZEN1 only) • Faulty power circuit of control PCB (FDC121-155KXZEN1 only)</td></tr> <tr> <td>YES</td><td></td></tr> <tr> <td>Is the connection between inverter PCB and outdoor unit control PCB OK?</td><td>NO → Connect the signal wires correctly.</td></tr> <tr> <td>YES</td><td></td></tr> <tr> <td>Replace outdoor unit control PCB.</td><td></td></tr> <tr> <td>Does it become normal?</td><td>NO → Replace inverter PCB. YES → OK</td></tr> </tbody> </table>	Diagnosis	Countermeasure	Save data for 30 minutes before stopping in Mente PC.	Check and save the data of operating conditions.	Are the connectors of inverter PCB and outdoor unit control PCB OK?	NO → Insert the connectors securely.	YES		Are both JSW10, 11 on the inverter PCB OFF?	NO → Switch OFF all	YES		Is LED on the inverter PCB flashing?	NO → No power on inverter PCB → Find the cause. • Anomalous fan motor (FDC121-155KXZEN1 only) • Faulty power circuit of control PCB (FDC121-155KXZEN1 only)	YES		Is the connection between inverter PCB and outdoor unit control PCB OK?	NO → Connect the signal wires correctly.	YES		Replace outdoor unit control PCB.		Does it become normal?	NO → Replace inverter PCB. YES → OK
Diagnosis	Countermeasure																								
Save data for 30 minutes before stopping in Mente PC.	Check and save the data of operating conditions.																								
Are the connectors of inverter PCB and outdoor unit control PCB OK?	NO → Insert the connectors securely.																								
YES																									
Are both JSW10, 11 on the inverter PCB OFF?	NO → Switch OFF all																								
YES																									
Is LED on the inverter PCB flashing?	NO → No power on inverter PCB → Find the cause. • Anomalous fan motor (FDC121-155KXZEN1 only) • Faulty power circuit of control PCB (FDC121-155KXZEN1 only)																								
YES																									
Is the connection between inverter PCB and outdoor unit control PCB OK?	NO → Connect the signal wires correctly.																								
YES																									
Replace outdoor unit control PCB.																									
Does it become normal?	NO → Replace inverter PCB. YES → OK																								

Note:

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

1.Applicable model	5.Troubleshooting											
Outdoor unit	Diagnosis	Countermeasure										
	<div>Save data for 30 minutes before stopping in Mente PC.</div> <div>Reset the power source and restart operation.</div> <div>Is E46 displayed?</div> <div>NO</div> <div>YES</div> <div>Is it manual address setting?</div> <div>NO</div> <div>YES</div> <div>Turn ON the power source of outdoor unit system one by one and check the unit that starts up with the auto address setting.</div> <div><div><Reference></div><div>Error display at mixed address setting</div><table><tr><td></td><td>Auto</td><td>Manual</td></tr><tr><td>Auto address setting</td><td>E31</td><td>E46</td></tr><tr><td>Manual address setting</td><td>E46</td><td>Normal</td></tr></table></div>		Auto	Manual	Auto address setting	E31	E46	Manual address setting	E46	Normal	<div>Check and save the data of operating condition. Check which address setting method (auto or manual setting) is applied to the outdoor unit system on which the error exists.</div> <div>Caution: Address will not be confirmed, unless the power is reset after changing address.</div> <div>Test run * No action is taken because it is judged that the power source reset was not done after changing address.</div> <div>Set address manually.</div> <div>Replace outdoor unit PCB.* (Defective rotary switch)</div> <div>* Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.) And confirm too whether the indoor SW5-2 (100 of order for indoor address setting) is OK or not.</div>	
	Auto	Manual										
Auto address setting	E31	E46										
Manual address setting	E46	Normal										
2.Error detection method												
If the auto address setting and manual address setting are mixed in one Superlink network.												
3. Condition of error displayed												
In case that the units with old and new Superlink systems are mixed in one Superlink network, if both auto address setting and manual address setting are exsited.												
4.Presumable cause												
<ul style="list-style-type: none">Mistake in the address settingMistake in the signal wire connection												

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

Error code	LED	Green	Red	Content
Remote control: E48	Indoor	Keeps flashing	Stays Off	Outdoor DC fan motor anomaly
7-segment display: E48	Outdoor	Keeps flashing	1 time flash	

1.Applicable model	5.Troubleshooting				
Outdoor unit	<table border="1"> <thead> <tr> <th>Diagnosis</th><th>Countermeasure</th></tr> </thead> <tbody> <tr> <td> <div>Save data for 30 minutes before stoopping in Mente PC.</div> <pre> graph TD A{Does any foreign material intervene in rotational area of fan propeller?} -- YES --> B[Remove foreign material.] A -- NO --> C{Does the fan rotate smoothly when turned by hand?} C -- NO --> D[Replace fan motor. If the resistance between ①(Vm : Red) and ④(GND Blue) is 1Ω or lower, it is defective.] C -- YES --> E{Is the voltage between ①(Red) ④(Blue) of fan motor connector(CNFAN1) DC280V?} E -- NO --> F{Is the fuse blown ?} F -- NO --> G[Check the power source voltage.] F -- YES --> H[Replace defective fan motor and outdoor unit control PCB.] E -- YES --> I[Reset the power source.] I --> J{Does it become normal?} J -- NO --> K[Replace fan motor. After replacement of fan motor, if this error still occurs, replace outdoor unit control PCB as well.] J -- YES --> L[Temporary noise may cause] </pre> </td><td></td></tr> </tbody> </table>	Diagnosis	Countermeasure	<div>Save data for 30 minutes before stoopping in Mente PC.</div> <pre> graph TD A{Does any foreign material intervene in rotational area of fan propeller?} -- YES --> B[Remove foreign material.] A -- NO --> C{Does the fan rotate smoothly when turned by hand?} C -- NO --> D[Replace fan motor. If the resistance between ①(Vm : Red) and ④(GND Blue) is 1Ω or lower, it is defective.] C -- YES --> E{Is the voltage between ①(Red) ④(Blue) of fan motor connector(CNFAN1) DC280V?} E -- NO --> F{Is the fuse blown ?} F -- NO --> G[Check the power source voltage.] F -- YES --> H[Replace defective fan motor and outdoor unit control PCB.] E -- YES --> I[Reset the power source.] I --> J{Does it become normal?} J -- NO --> K[Replace fan motor. After replacement of fan motor, if this error still occurs, replace outdoor unit control PCB as well.] J -- YES --> L[Temporary noise may cause] </pre>	
Diagnosis	Countermeasure				
<div>Save data for 30 minutes before stoopping in Mente PC.</div> <pre> graph TD A{Does any foreign material intervene in rotational area of fan propeller?} -- YES --> B[Remove foreign material.] A -- NO --> C{Does the fan rotate smoothly when turned by hand?} C -- NO --> D[Replace fan motor. If the resistance between ①(Vm : Red) and ④(GND Blue) is 1Ω or lower, it is defective.] C -- YES --> E{Is the voltage between ①(Red) ④(Blue) of fan motor connector(CNFAN1) DC280V?} E -- NO --> F{Is the fuse blown ?} F -- NO --> G[Check the power source voltage.] F -- YES --> H[Replace defective fan motor and outdoor unit control PCB.] E -- YES --> I[Reset the power source.] I --> J{Does it become normal?} J -- NO --> K[Replace fan motor. After replacement of fan motor, if this error still occurs, replace outdoor unit control PCB as well.] J -- YES --> L[Temporary noise may cause] </pre>					
2.Error detection method					
By detecting the rotation speed of outdoor fan motor.					
3. Condition of error displayed					
If the actual rotation speed of outdoor fan motor (FMo1) is 100min ⁻¹ or lower for 30 seconds continuously, outdoor fan stops. After 3-minute delay, it restarts automatically, but if this anomaly occurs 5 times within 60 minutes after the initial stop.					
4.Presumable cause					
<ul style="list-style-type: none"> Faulty outdoor unit control PCB Foreign material in rotational area of fan propeller Faulty fan motor Dust on the outdoor unit control PCB Blown fuse 					

Note: When E48 error occurs, in almost cases F3 fuse (4A) on the harness is blown. There are a lot of cases that fuse is blown due to defective fan motor. And even though only the fuse is replaced,, another trouble (*) could occur. Therefore when replacing fuse, 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.)

* The error which does not seem to relate E48 may occur like as "WAIT", Stay OFF of LED on outdoor unit control PCB, inverter communication error (E45) and etc.

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

1.Applicable model	5.Troubleshooting	
Outdoor unit	Diagnosis	Countermeasure
2.Error detection method	<div>Save data for 30 minutes before stopping in Mente PC.</div> <div>Reset the power and restart operation.</div> <div>Does it occur immediately after the startup?</div> <div>YES</div> <div>NO</div> <div>Does the low pressure fluctuate after the startup?</div> <div>NO</div> <div>YES</div> <div>Is the opening degree of indoor EEV flucturing?</div> <div>NO</div> <div>YES</div> <div>Is the checked result of harness and insulation of EEV coil OK?</div> <div>NO</div> <div>YES</div> <div>Does the EEV operate normally by judgement from Mente PC data, etc?</div> <div>NO</div> <div>YES</div> <div>Is the sensor connector OK?</div> <div>NO</div> <div>YES</div> <div>Are the sensor characteristics OK?*</div> <div>NO</div> <div>YES</div> <div>Is the sensor connector of indoor heat exchanger OK?</div> <div>NO</div> <div>YES</div> <div>Are the sensor characteristics OK?</div> <div>NO</div> <div>YES</div> <div>Isn't EEV or strainer clogged?</div> <div>YES</div> <div>NO</div>	
Detected by low pressure sensor		
3. Condition of error displayed	Check and save the data of operating condition. Check error status. Is the refrigerant amount OK? Check additional refrigerant amount filled in locally according to the piping length instructed on the label pasted on the panel.	
At startup with power on: Low pressure ≤0.18 MPa is detected for 30 seconds, and this anomaly occurs 5 times within 60 minutes. During operation: Low pressure ≤0.134 MPa is detected for 30 seconds or <0.003 Mpa is detected for 5 seconds. This anomaly occurs 5 times within 60 minutes.	Check whether the service valve opened.	
4.Presumable cause	Correct low pressure sensor connector.	
• Low pressure sensor (defective PSL) • Service valve closed • EEV closed (malfunction) • Insufficient refrigerant amount • Clogging (EEV, strainer)	Replace low pressure sensor.	
	Replace outdoor unit control PCB.	
	Correct temperature sensor connector.	
	Replace heat exchanger temperature sensor.	
	Replace indoor unit control PCB.	
	Replace EEV coil.	
	Replace EEV main body or strainer.	
	Check for short-circuit of air flow at indoor unit side and failure of indoor fan motor.	

Note: Check whether the outdoor unit is connected to the indoor units in another Superlink network?
If it does not recur, connect the Mente PC and continue to collect data.

Error code	LED	Green	Red	Content
Remote control: E53 7-segment display: E53	Indoor	Keeps flashing	Stays Off	Suction pipe temperature sensor anomaly (Tho-S)
	Outdoor	Keeps flashing	1 time flash	

1. Applicable model	5. Troubleshooting																
Outdoor unit																	
2. Error detection method																	
Detection of anomalously low temperature (resistance)																	
3. Condition of error displayed																	
<ul style="list-style-type: none"> If -50°C is detected for 5 seconds within 2-minutes to 2-minutes 20-seconds after the compressor ON and if this anomaly occurs 3 times within 40 minutes after the initial detection. If this anomaly occurs 1 time within 20 seconds after power ON. 																	
4. Presumable cause																	
<ul style="list-style-type: none"> Disconnection of the sensor harness or the internal wire of sensing part (Check the molded part.) Disconnection of the sensor connector Defective outdoor unit control PCB 																	
	<p>Save data for 30 minutes before stopping in Mente PC.</p> <pre> graph TD A{Is connection of sensor connector OK?} -- NO --> C[Insert the connector firmly.] A -- YES --> B{Are the characteristics of sensor OK?} B -- NO --> D[Replace sensor.] B -- YES --> E[Replace control PCB.] </pre> <p>* Check several times the temperature-resistance characteristics of sensor a few times to find out any poor connection.</p> <p>Suction pipe temperature sensor (Tho-S) Temperature-resistance characteristics</p> <table border="1"> <caption>Temperature-resistance characteristics data (approximate)</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>15</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>20</td><td>6</td></tr> <tr><td>25</td><td>5</td></tr> <tr><td>30</td><td>4</td></tr> <tr><td>40</td><td>3</td></tr> <tr><td>50</td><td>2</td></tr> </tbody> </table>	Temperature (°C)	Temperature sensor resistance (kΩ)	0	15	10	10	20	6	25	5	30	4	40	3	50	2
Temperature (°C)	Temperature sensor resistance (kΩ)																
0	15																
10	10																
20	6																
25	5																
30	4																
40	3																
50	2																

Note:

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

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

1.Applicable model	5.Troubleshooting
Outdoor unit	
2.Error detection method	
Detection of anomalous pressure (voltage) of PSH or PSL [Operation range High pressure : 0-4.15MPa Low pressure : 0-1.7MPa]	
3. Condition of error displayed	
If anomalous sensor output voltage (0V or lower or 3.49V or higher) is detected for 5 seconds within 2 minutes to 2 minutes 20 seconds after the compressor ON	
4.Presumable cause	
<ul style="list-style-type: none"> Broken sensor harness Disconnection of sensor harness connection (connector) Sensor (PSH, PSL) anomaly Outdoor unit control PCB anomaly Anomalous installation conditions Insufficient air flow volume Excessive or insufficient refrigerant amount 	
	<div> <div> <p>Save data for 30 minutes before stopping in Mente PC</p> <p>Check the data for 30 minutes before stopping</p> <p>Is anomalous pressure detected?</p> <p>NO</p> <p>Reset the power and restart operation.</p> <p>E54 Does it recur?</p> <p>NO</p> <p>YES</p> <p>Does the pressure converted from the sensor output voltage match the actual pressure measure by pressure gauge?</p> <p>NO</p> <p>YES</p> </div> <div> <p>Is the connector of the sensor inserted properly to the connector on the outdoor control PCB?</p> <p>NO</p> <p>YES</p> </div> </div> <div> <p>Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value.</p> <p>Insert the connector securely and restart operation.</p> <p>Temporary malfunction by noise. Correct if the source of noise is specified.</p> <p>Replace sensor (PSH, PSL).</p> <p>Replace outdoor unit control PCB.</p> </div> <div> <p>High pressure sensor output characteristics</p> <p>Low pressure sensor output characteristics</p> <p>Sensor output Black (GND) – White; Output voltage (Black – Red; DC5V)</p> </div>

Note:

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

1. Applicable model	5. Troubleshooting																		
Outdoor unit																			
2. Error detection method																			
Detection of anomalously low temperature (resistance) of Tho-P1																			
3. Condition of error displayed																			
When the outdoor air temperature is above 0°C, if -10°C or lower is detected for 20 seconds continuously within 10 minutes to 10 minutes 30 seconds after compressor ON, compressor stops. When the compressor is restarted automatically after 3-minutes delay, if this anomaly occurs 3 times within 40 minutes																			
4. Presumable cause																			
<ul style="list-style-type: none"> Broken sensor harness or the internal wire of sensing section (Check the molded section as well) Disconnection of sensor harness connection (connector) Outdoor unit control PCB anomaly 	<p>Save data for 30 minutes before stopping in Mente PC</p> <pre> graph TD A{Is the connector of sensor connected properly OK?} -- NO --> B[Insert the connector securely.] A -- YES --> C{Are the characteristics of sensor OK? *1} C -- NO --> D[Replace power transistor temperature sensor (Tho-P1).] C -- YES --> E[Replace outdoor unit control PCB.] </pre> <p>*1 Check several times to prove any poor connection</p> <p>Temperature-resistance characteristics of power transistor temperature sensor (Tho-P1)</p> <table border="1"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Power transistor sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>180</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>50</td></tr> <tr><td>60</td><td>25</td></tr> <tr><td>80</td><td>10</td></tr> <tr><td>100</td><td>5</td></tr> <tr><td>120</td><td>2</td></tr> <tr><td>140</td><td>1</td></tr> </tbody> </table>	Temperature (°C)	Power transistor sensor resistance (kΩ)	0	180	20	100	40	50	60	25	80	10	100	5	120	2	140	1
Temperature (°C)	Power transistor sensor resistance (kΩ)																		
0	180																		
20	100																		
40	50																		
60	25																		
80	10																		
100	5																		
120	2																		
140	1																		

Note:

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

1.Applicable model	5.Troubleshooting	
Outdoor unit	Diagnosis	Countermeasure
2.Error detection method	<div style="text-align: center;"> <div>Save data for 30 minutes before stopping in Mente PC</div> <div>Check the data for 30 minutes before stopping</div> <div>↓</div> <div>Is this the first startup within one hour after power is supplied?</div> <div>↓</div> <div>Is there any replacement record of inverter PCB ?</div> <div>↓</div> <div>Compressor could be locked Replace the compressor</div> </div>	
3. Condition of error displayed		
4.Presumable cause		

Check and save the data of operating condition.

Refrigerant might be migrated in the refrigerant oil in the compressor. Wait for about one hour under the condition of power ON and start again. (Turn the on crankcase heater ON and evaporate the liquid refrigerant migrated in the compressor.

The model setting could be wrong. Check the DIP switch for model setting on the outdoor unit control PCB.

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

Error code	LED	Green	Red	Content
Remote control: E59 7-segment display: E59	Indoor	Keeps flashing	Stays Off	Compressor startup failure
	Outdoor	Keeps flashing	5 times flash	

1.Applicable model	5.Troubleshooting
Outdoor unit	
2.Error detection method	Diagnosis
If it fails to change over to the operation for rotor detection of compressor motor	<p>Save data for 30 minutes before stopping in Mente PC.</p> <p>In case that the compressor does not start at all and no sound or vibration is heard → Start up by disconnecting connector of outdoor fan motor</p> <p>Does compressor startup?</p> <p>YES → Replace outdoor fan motor.</p> <p>NO → Is power source voltage OK?</p> <p>NO → Check power source voltage.</p> <p>YES → Is the pressure balance at starting OK?</p> <p>NO → Check refrigerant amount and refrigerant circuit.</p> <p>YES → Is the insulation resistance and resistance between terminals (1) of compressor OK?</p> <p>NO → Repalce compressor. (1) FDC121-155KXZEN1: 0.293Ω or more at 20°C FDC121-155KXZES1: 1.172Ω or more at 20°C</p> <p>YES → Is power transistor module OK?</p> <p>NO (Inverter PCB is defective) → Replace inverter PCB.</p> <p>YES → After power OFF, turn JSW10-4 on the inverter PCB ON and connect the inverter checker. And then power ON again. (Regarding the checking method of inverter PCB with inverter checker, refer to page 120 in detail)</p> <p>Is the output of inverter checker OK?</p> <p>NO → Replace inverter PCB.</p> <p>YES → Try to restart several times.</p> <p>Does it start?</p> <p>NO → Repalce compressor.</p> <p>Note : Several times restarting may recover it, because liquid refrigerant migrated in the compressor is discharged from the compressor.</p>
3. Condition of error displayed	Countermeasure
If compressor fails to startup for 20 times (10 patterns x 2 times). (It is available to reset by remote control after 3 minutes delay)	
4.Presumable cause	
<ul style="list-style-type: none"> Faulty fan motor Faulty outdoor unit control PCB Faulty inverter PCB Anomalous power source voltage Nonconformity of refrigerant amount and refrigerant circuit Faulty compressor 	

Note: Insulation resistance

- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
 - Check whehter the insulation resistance can recover or not, after 6 hours has passed since power ON.
(By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated.)
 - Check whether the electric leakage breaker conforms to high-harmonic specifications.
(As KXZE1 units has inverter, in order to prevent from improper operation, be sure to use high-harmonic one.)





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

1.Applicable model	5.Troubleshooting	
Indoor unit	Diagnosis	Countermeasure
2.Error detection method	<div>Save data for 30 minutes before stopping in Mente PC</div> <pre> graph TD A{Is the remote control setting of Emergency Stop "Valid"?} -- NO --> B[Replace remote control PCB.] A -- YES --> C{Is ON signal inputted to the CnT terminal of indoor unit control PCB?} C -- NO --> D[Replace indoor unit control PCB.] C -- YES --> E[Check the cause of emergency stop. (It is better to have the data for 30 minutes before stopping, when instructing the installer.)] </pre>	
3. Condition of error displayed		
Same as above		
4.Presumable cause		
Factors for emergency stop		

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

2.4 Outdoor unit control PCB replacement procedure

(a) Control PCB

Precautions for safety	
<ul style="list-style-type: none"> Since the following precaution is the important contents for safety, be sure to observe them. WARNING and CAUTION are described as follows: 	
 WARNING	Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.
 CAUTION	Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.
 WARNING	
<ul style="list-style-type: none"> Securely replace the PCB according to this procedure. If the PCB is incorrectly replaced, it will cause an electric shock or fire. Be sure to check that the power source for the outdoor unit is turned OFF before replacing the PCB. The PCB replacement under current-carrying will cause an electric shock or fire. After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire. 	
 CAUTION	
<ul style="list-style-type: none"> Band the wiring so as not to tense because it will cause an electric shock. 	

Replacement the control PCB according to the following procedure.

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

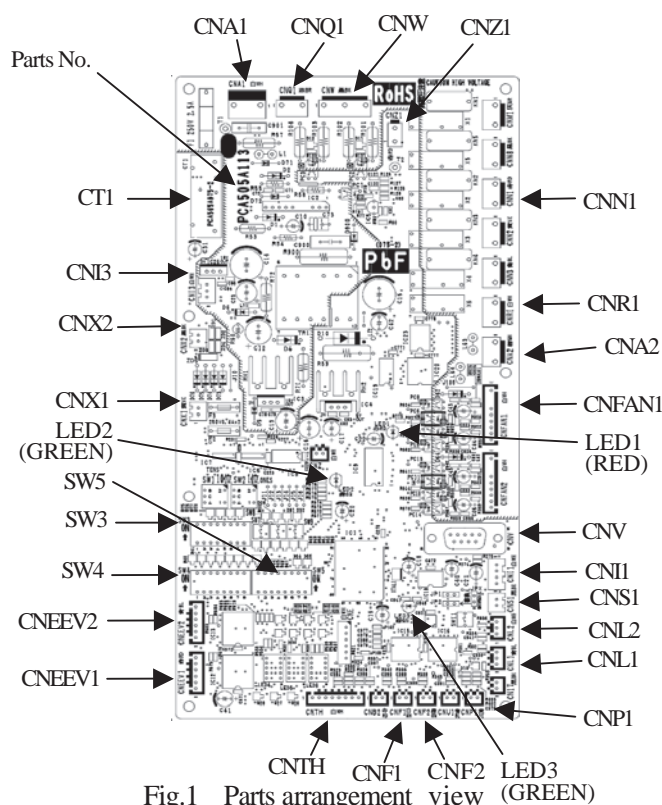


Fig.1 Parts arrangement view

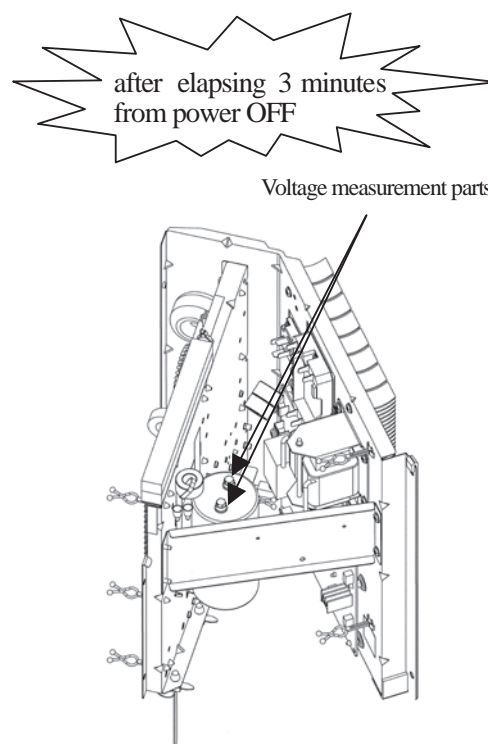


Fig.2 Position of capacitor

connectors are not half inserted

(b) Inverter PCB

1) FDC121, 140, 155KXZEN1 model

- Exchange the PCB **after elapsing 3 minutes from power OFF.**
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently.**(Refer to Fig.2))
- Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
- Refer to table1 for the setting of switch (JSW10,11) of new PCB.
- Before installing the power transistor on the new PCB, apply uniformly a bundled of silicon grease first on the surface of power transistor. Make sure it is applied to prevent damage on power transistor.
- Tighten the screw of power transistor on inverter PCB and connect the terminal block. Confirm the connection and don't use soldering in the connection. Tighten properly the power transistor with a screw and make sure there is no slack. Power transistor can be damage if not properly tighten.(Recommended power transistor tightening torque:0.98-1.47N·m)

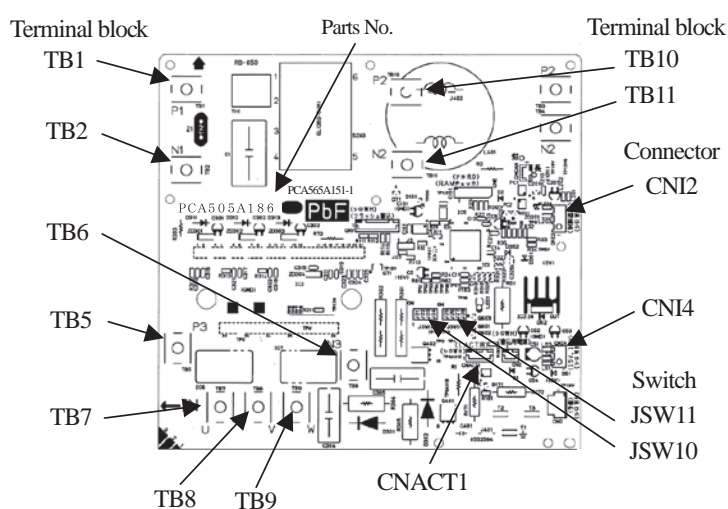


Fig.1 Parts arrangement view

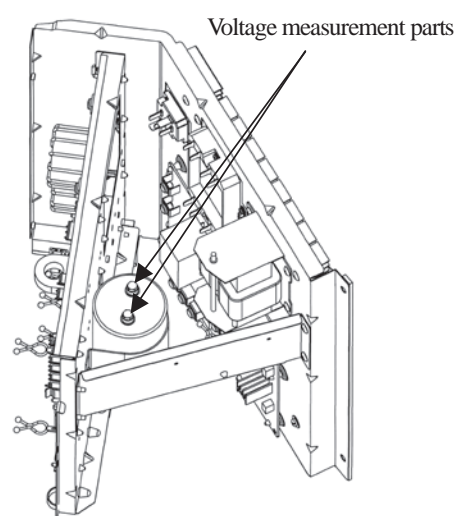


Fig.2 Position of capacitor

Table. 1 Switch setting

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

2) FDC121, 140, 155KXZES1 model

- Exchange the PCB **after elapsing 3 minutes from power OFF.**
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently.**(Refer to Fig.2))
- Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
- Refer to table1 for the setting of switch (JSW10,11) of new PCB.
- Before installing the power transistor on the new PCB, apply uniformly a bundled of silicon grease first on the surface of power transistor. Make sure it is applied to prevent damage on power transistor.
- Tighten the screw of power transistor on inverter PCB and connect the terminal block. Confirm the connection and don't use soldering in the connection. Tighten properly the power transistor with a screw and make sure there is no slack. Power transistor can be damage if not properly tighten.(Recommended power transistor tightening torque:0.98-1.47N·m)

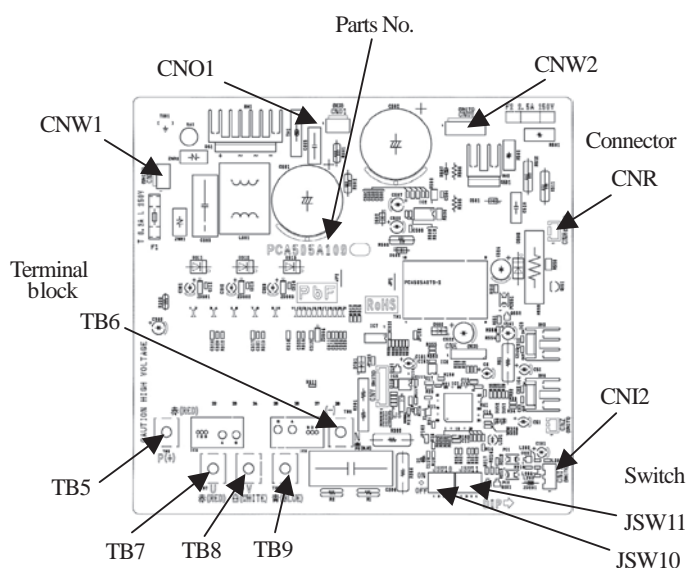


Fig.1 Parts arrangement view

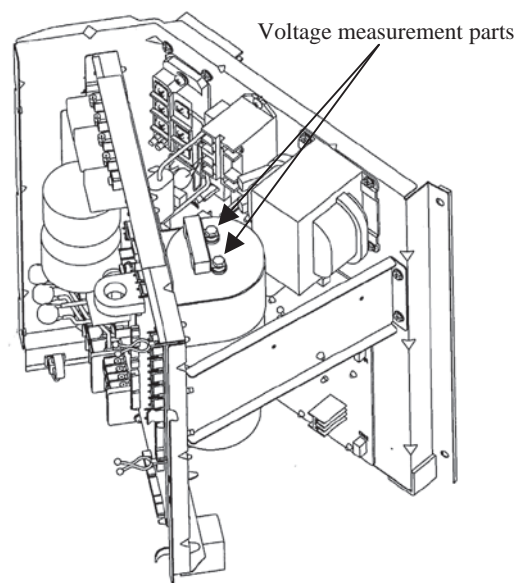


Fig.2 Position of capacitor

Table. 1 Switch setting

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

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

• SW3 (Function setting)

Switch		Function
SW3-1	ON	Inspection LED reset
	OFF	Normal
SW3-5	ON	Check operation start
	OFF	Normal
SW3-7	ON	Forced cooling/heating
	OFF	Normal

• SW4 (Change demand ratio)

Switch		Function
SW4-7	ON	OFF Compressor capacity 60
		ON Compressor capacity 0
	OFF	OFF Compressor capacity 80
		ON Compressor capacity 40

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

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

• SW4 (Model selection)

Model Switch	FDC121KXZE1	FDC140KXZE1	FDC155KXZE1
SW4-1	OFF	ON	OFF
SW4-2	OFF	OFF	ON

• SW4 (Overseas)

Model Switch	All models
SW4-3	ON

• SW4 (Power source voltage)

Model Switch	FDC121KXZEN1 FDC140KXZEN1 FDC155KXZEN1	FDC121KXZES1 FDC140KXZES1 FDC155KXZES1
SW4-4	ON	OFF

• SW5 (Function setting)

Switch		Function
SW5-1	ON	Test run switch Test run
	OFF	Test run switch Normal
SW5-2	ON	Test run operation mode Cooling
	OFF	Test run operation mode Heating
SW5-3	ON	Pump down switch Pump down
	OFF	Pump down switch Normal

• SW7, 8, 9 (Function setting)

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

■ Function of connector

Connector	Function	Connector	Function
CNA1	Power source	CNL1	High pressure sensor
CNQ1	High pressure switch (CN1)	CNP1	Power transistor temperature sensor
CNW	Open phase	CNEEV1	Heating EEV
CNN1	4-way valve	CNEEV2	Sub-cooling coil EEV
CNR1	Crankcase heater	CNX1	Superlink signal
CNA2	Power fan motor	CNF1	Sub-cooling coil temperature sensor (liquid)
CNS1	External input	CNF2	Sub-cooling coil temperature sensor (gas)
CNL2	Low pressure sensor		

■ Inverter checker for diagnosis of inverter output

● Checking method

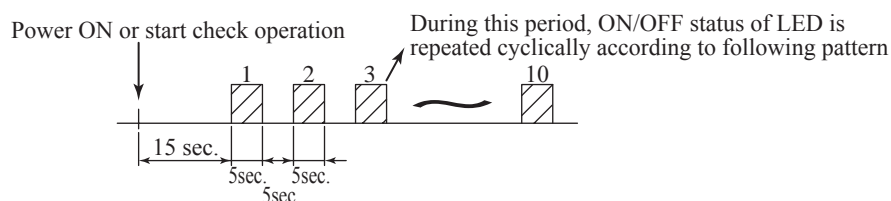
(a) Setup procedure of checker.

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

(b) Operation for judgment.

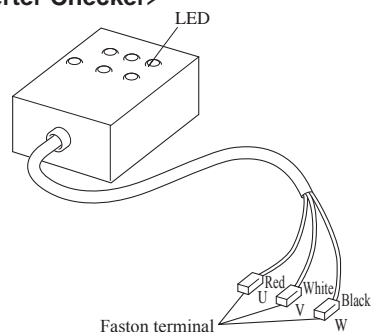
- 1) Power ON after JSW10-4 on outdoor inverter PCB was turned ON.
- 2) After 15 seconds since power has turned ON, LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
- 3) Check ON/OFF status of 6 LED's on the checker.
- 4) Judge the PCB by ON/OFF status of 6 LED's on the checker.

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



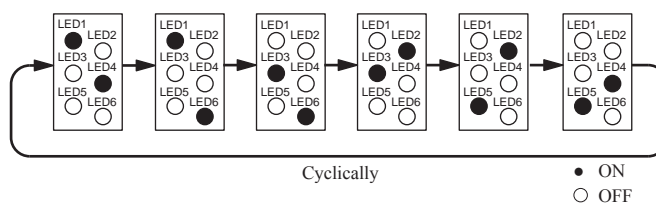
- 5) Be sure to turn off JSW10-4 on outdoor inverter PCB, after finishing the check operation.

<Inverter Checker>



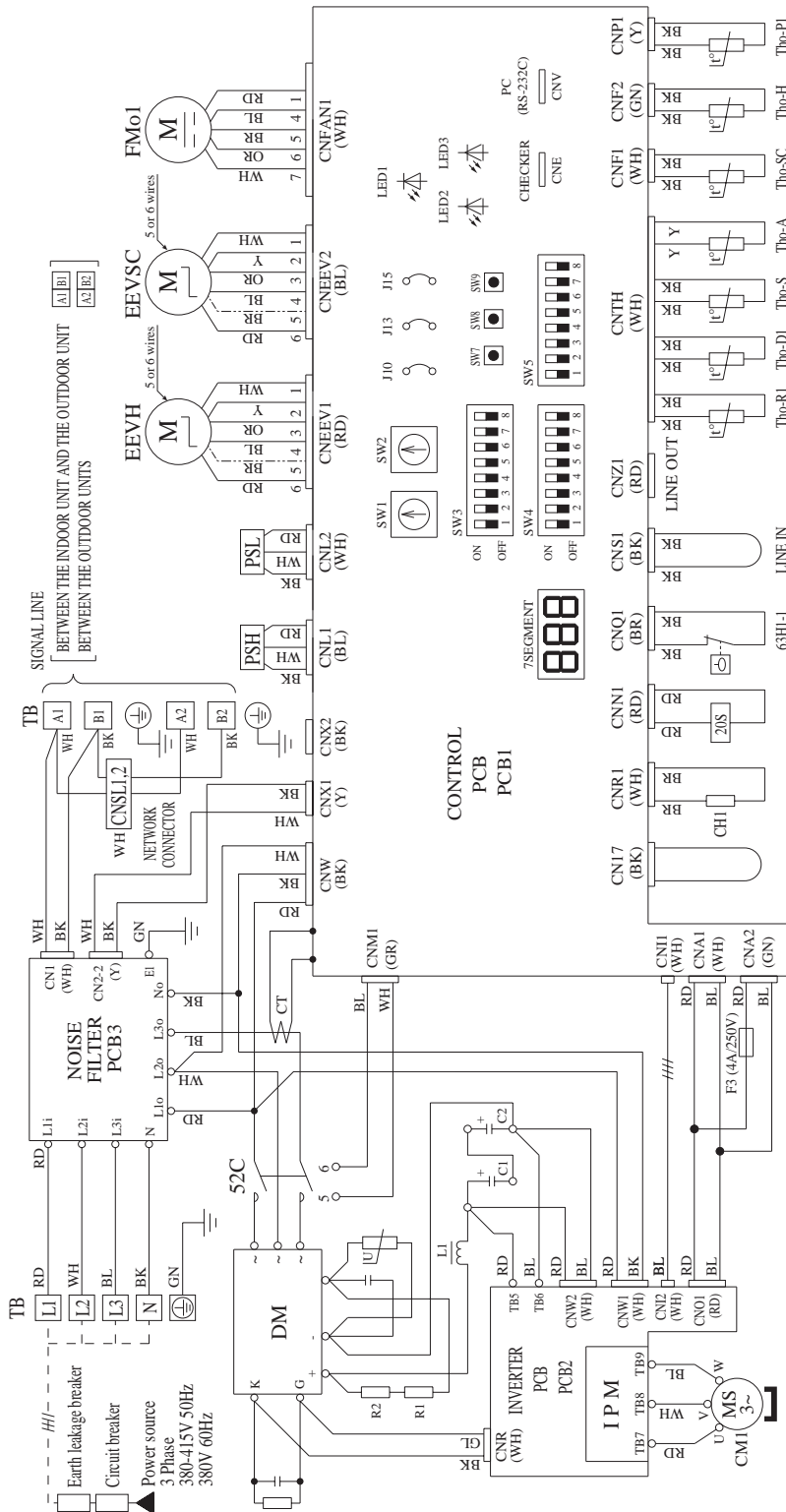
Connect to the terminal of the wires which are disconnected from compressor.

LED ON/OFF pattern



● ON
○ OFF

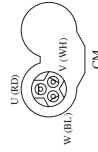
Models FDC121KXZES1, 140KXZES1, 155KXZES1



Meaning of marks

Mark	Name	Mark	Name
C	Electrolytic capacitor	SW3-1	Inspection LED reset
CH	Crankcase heater	SW3-5	Check operation start
CM	Compressor motor	SW3-7	Forced cooling/heating switching
GNA-Z	Connector	SW4-7	Demand switching
CT	Current sensor	SW4-8	Demand switching
DM	Diode module	SW5-1	Test run start (normal/start)
EEVSC	Electronic expansion valve (For overcooling)	SW5-2	Test run cooling setting (heating/cooling)
EEVH	Electronic expansion valve (For heating)	SW5-3	Pump down (normal/valid)
FMo1	Fan motor	SW5-5	Superlink protocol setting (new/previous)
F	Fuse	SW7 (button)	Data erasing/writing
IPM	High pressure sensor	SW8 (button)	7-segment display UP, one's place number
IPM	Intelligent power module	SW9 (button)	7-segment display UP, ten's place number
J10	Superlink terminal setting (spare/normal)	TB	Terminal board
J13	External input switch (pulse/level)	Th-A	Temperature sensor (outdoor air temperature)
J15	Defrost stat (temperature cold weather district/normal)	Th-D	Temperature sensor (discharge pipe)
L	Reactor	Th-P1	Temperature sensor (power transistor)
LED1	Indicator lamp (Red-Inspection indicator)	Th-R1	Temperature sensor (heat exchanger)
LED2	Indicator lamp (Green-Microcomputer normality indication)	Th-S	Temperature sensor (suction pipe)
LED3	Indicator lamp (Green-For service)	Th-SC	Temperature sensor (sub-cooling coil, liquid)
PSL	Low pressure sensor	Th-H	Temperature sensor (sub-cooling coil, gas)
SW1	Outdoor unit No. (ten's place number)	20S	4-way valve coil
SW2	Outdoor unit No. (one's place number)	63H1-1	High pressure switch (Protection)

Compressor terminal arrangement

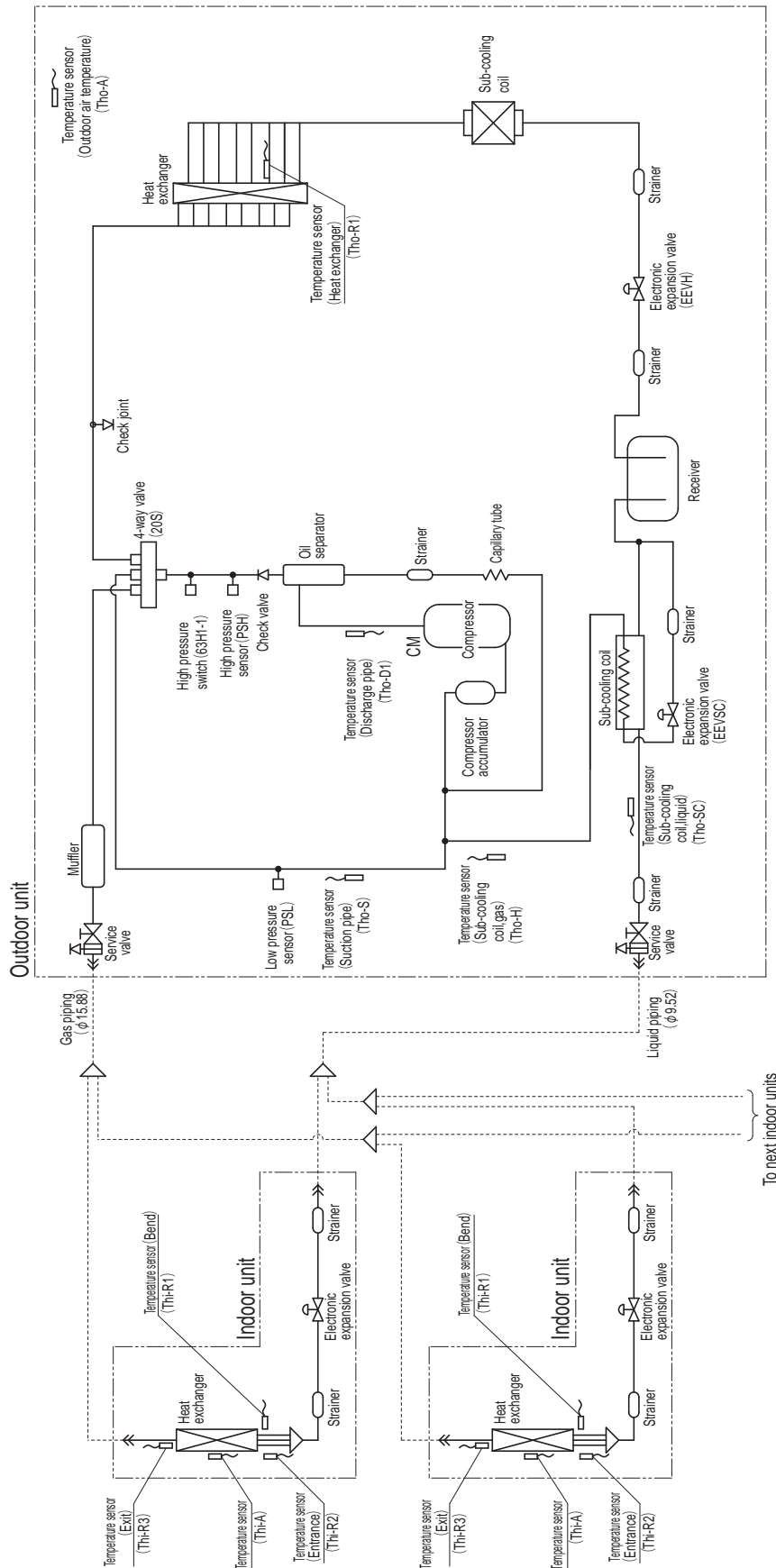


Color marks

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

4. PIPING SYSTEM

All models



Notes (1) Pressure switch setting value

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

(2) Function of temperature sensor

Low pressure sensor (PSL) : Compressor control

Protection

0.18 ON/0.236 OFF (MPa)

Error:

0.134 ON/0.18 OFF (MPa)

High pressure sensor (PSH) : Compressor control

Protection

Cooling: 3.70 ON (MPa)

Heating: 3.00 ON (MPa)

Thi-R1,2:Heating operation:Indoor fan control

Cooling operation:Frost prevention control

Superheat control

Thi-R3:Superheat control

Tho-R1 : For control of defrost operation

Tho-A : For heating and cooling to low outdoor temperature,

for control of defrost operation

Tho-D1 : For control of discharge pipe temperature

Tho-S : For control of suction pipe temperature

Sub-cooling coil temperature sensor 1 (Tho-SC) :

Sub-cooling coil control during cooling

Sub-cooling coil temperature sensor 2 (Tho-H) :

Sub-cooling coil control during cooling

5. APPLICATION DATA

- This manual describes outdoor unit installation work.
- For indoor unit installation and electrical cabling, please refer to the indoor unit installation manual and the installation guide.
- When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

Designed for R410A refrigerant

Outdoor unit capacity
FDC121 — 155

PSB012D926W



Precautions for safety

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into **⚠ WARNINGS** and **⚠ CAUTIONS**. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the **⚠ WARNINGS** and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in **⚠ CAUTIONS**. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown on the right.

⊘ Never do it under any circumstance. **⚠ Always do it according to the instruction.**

- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user
- For 3phase outdoor unit, EN61000-3-2 is not applicable as consent by the utility company or notification to the utility company is given before usage.
- 5 and 6HP units of single phase power source are equipment complying with IEC61000-3-12.

⚠ WARNING	⚠ CAUTION
<p>⊘ Installation must be carried out by the qualified installer.</p> <p>If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.</p> <p>⚠ Install the system in full accordance with the instruction manual.</p> <p>Incorrect installation may cause burst, personal injury, water leaks, electric shocks and fire.</p> <p>⚠ Use the original accessories and the specified components for installation.</p> <p>If parts other than those prescribed by us are used, it may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.</p> <p>⚠ When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.</p> <p>Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.</p> <p>⚠ Ventilate the working area well in the event of refrigerant leakage during installation.</p> <p>If the refrigerant comes into contact with naked flames, poisonous gas is produced.</p> <p>⚠ After completed installation, check that no refrigerant leaks from the system.</p> <p>If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.</p> <p>⚠ Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.</p> <p>An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit.</p> <p>⚠ Install the unit in a location with good support.</p> <p>Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.</p> <p>⚠ Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.</p> <p>Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.</p> <p>⚠ The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.</p> <p>Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.</p> <p>⚠ Be sure to shut off the power before starting electrical work.</p> <p>Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.</p> <p>⚠ Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.</p> <p>Unconformable cables can cause electric leak, anomalous heat production or fire.</p> <p>⚠ Use the prescribed cables for electrical connection, lighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.</p> <p>Loose connections or cable mountings can cause anomalous heat production or fire.</p> <p>⚠ Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.</p> <p>Incorrect installation may result in overheating and fire.</p> <p>⚠ When connecting the power cable, make sure that no anomalies such as dust deposits, socket clogging or wobble are found and insert the plug securely.</p> <p>Accumulation of dust, clogging on the socket, or looseness of plugging can cause electric shocks and fire.</p> <p>⚠ Be sure not to reuse existing refrigerant pipes</p> <p>Conventional refrigerant oil or chlorine contained in the conventional refrigerant which is remaining in the existing refrigerant pipes can cause deterioration of refrigerant oil of new unit. And 1.6 times higher pressure of R410A refrigerant than conventional one can cause burst of existing pipe, personal injury or serious accident.</p> <p>⚠ Do not perform brazing work in the airtight room.</p> <p>It can cause lack of oxygen.</p> <p>⚠ Use the prescribed pipes, flare nuts and tools for R410A.</p> <p>Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.</p> <p>⚠ Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.</p> <p>Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.</p> <p>⚠ Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.</p> <p>If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant.</p> <p>⚠ Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulphide gas can occur.</p> <p>Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. It can also cause the corrosion of the indoor unit and resultant unit failure or refrigerant leak.</p> <p>⚠ Only use prescribed optional parts. The installation must be carried out by the qualified installer.</p> <p>If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.</p> <p>⚠ Do not perform any change of protective device itself or its setup condition</p> <p>The forced operation by short-circuiting protective device of pressure switch and temperature control or the use of non specified component can cause fire or burst.</p> <p>⚠ Be sure to switch off the power source in the event of installation, inspection or servicing.</p> <p>If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.</p> <p>⚠ Consult the dealer or an expert regarding removal of the unit.</p> <p>Incorrect installation can cause water leaks, electric shocks or fire.</p> <p>⚠ Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.</p> <p>If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit.</p>	<p>⊘ Use the circuit breaker for all pole with correct capacity.</p> <p>Using the incorrect circuit breaker, it can cause the unit malfunction and fire.</p> <p>⚠ Take care when carrying the unit by hand.</p> <p>If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.</p> <p>⚠ Dispose of any packing materials correctly.</p> <p>Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.</p> <p>⚠ Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.</p> <p>If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.</p> <p>⚠ Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.</p> <p>Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.</p> <p>⚠ Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.</p> <p>If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.</p> <p>⚠ Perform installation work properly according to this installation manual.</p> <p>Improper installation can cause abnormal vibrations or increased noise generation.</p> <p>⚠ Earth leakage breaker must be installed</p> <p>If the earth leakage breaker is not installed, it can cause fire or electric shocks.</p> <p>⊘ Carry out the electrical work for ground lead with care.</p> <p>Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks or fire due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks, it could cause explosion or ignition.</p> <p>⚠ Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.</p> <p>Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.</p> <p>⚠ Do not install the unit near the location where leakage of combustible gases can occur.</p> <p>If leaked gases accumulate around the unit, it can cause fire.</p> <p>⚠ Do not install the unit where corrosive gas (such as sulfuric acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.</p> <p>Corrosive gas can cause corrosion of heat exchanger, breaker of plastic parts and etc. And combustible gas can cause fire.</p> <p>⚠ Secure a space for installation, inspection and maintenance specified in the manual.</p> <p>Insufficient space can result in accident such as personal injury due to falling from the installation place.</p> <p>⚠ When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.</p> <p>If safety facilities are not provided, it can cause personal injury due to falling from the installation place.</p> <p>⚠ Do not install near the system close to the equipment that generates electromagnetic fields or high frequency harmonics</p> <p>Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.</p> <p>⚠ Do not install the outdoor unit in a location where insects and small animals can inhabit.</p> <p>Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.</p> <p>⚠ Do not use the base frame for outdoor unit which is corroded or damaged due to long periods of operation.</p> <p>Using an old and damaged base frame can cause the unit falling down and cause personal injury.</p> <p>⚠ Do not install the unit in the locations listed below.</p> <ul style="list-style-type: none"> • Locations where carbon fiber, metal powder or any powder is floating. • Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur. • Vehicles and ships • Locations where cosmetic or special sprays are often used. • Locations with direct exposure of oil mist and steam such as kitchen and machine plant. • Locations where any machines which generate high frequency harmonics are used. • Locations with salty atmospheres such as coastlines • Locations with heavy snow if installed, be sure to provide base frame and snow hood mentioned in the manual • Locations where the unit is exposed to chimney smoke • Locations at high altitude (more than 1000m high) • Locations with ammoniac atmospheres (e.g. organic fertilizer) • Locations with calcium chloride (e.g. snow melting agent) • Locations where heat radiation from other heat source can affect the unit • Locations without good air circulation. • Locations with any obstacles which can prevent inlet and outlet air of the unit • Locations where short-circuit of air can occur (in case of multiple units installation) • Locations where strong air blows against the air outlet of outdoor unit <p>It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.</p> <p>⚠ Do not install the outdoor unit in the locations listed below.</p> <ul style="list-style-type: none"> • Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood. • Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc. • Locations where vibration can be amplified and transmitted due to insufficient strength of structure. • Locations where vibration and operation sound generated by the outdoor unit can affect seriously. <p>(on the wall or at the place near bed room)</p> <ul style="list-style-type: none"> • Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m) • Locations where drainage cannot run off safely. <p>It can affect surrounding environment and cause a claim</p> <p>⚠ Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.</p> <p>It can cause the damage of the items.</p> <p>⚠ Do not touch any buttons with wet hands.</p> <p>It can cause electric shocks.</p> <p>⚠ Do not shut off the power source immediately after stopping the operation.</p> <p>Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.</p> <p>⚠ Do not control the system with main power switch.</p> <p>It can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.</p> <p>⚠ Do not touch any refrigerant pipes with your hands when the system is in operation.</p> <p>During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.</p> <p>⚠ Do not operate the outdoor unit with any article placed on it.</p> <p>You may incur property damage or personal injury from a fall of the article.</p> <p>⚠ Do not step onto the outdoor unit.</p> <p>You may incur injury from a drop or fall.</p>
<p>⊘ Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.</p> <p>If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.</p> <p>⚠ Do not run the unit with removed panels or protections.</p> <p>Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.</p> <p>⚠ Be sure to fix up the service panels.</p> <p>Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.</p> <p>⚠ Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.</p> <p>If you repair or modify the unit, it can cause water leaks, electric shocks or fire.</p>	

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant.
- A unit designed for R410A has adopted a different size outdoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Please check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

Dedicated R410A tools	
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. BEFORE BEGINNING INSTALLATION

(Check that the models, power source specifications, piping, wiring are correct.)

Indoor and outdoor unit combinations

(1) Combination can be arranged with the conditions (number of units, capacity) shown below.

Indoor unit	Remote control	Connectability
FD○△△KXE6 KXZ Series indoor unit	RC—EX1A (2 cores) RC—E5 (2 cores) RC—E4 (2 cores) RC—E3 (2 cores)	OK
FD○△△KXE4 Series indoor unit	RC—E1 (3 cores)	×



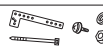
* Only indoor units of the above-listed series can be connected in the refrigerant system.

(2) The combination is possible if in the table below condition (number of units, capacity).

Indoor unit	Outdoor unit		
	121	140	155
Number of connectable units	1—8	1—10※	1—10※
Total capacity of indoor units	97—181	112—210	124—232

※ When connecting 9 units or more, set the total capacity as follows:
140 : 110% or less
150 : 100% or less

[Accessory]

Name	Quantity	Usage location	Attachment position
Edging 	1	Use it for protection of a knock-out hole.	It is attached to the bracket with an adhesive tape in the proximity of the service valve.
User's manual 	1	When the installation work is completed, give instructions to the customer and ask him/her to keep it.	It is attached to the front of a unit.
Installation kit 	1	Use it to fix the wiring.	It is attached in the unit.

[Items sold separately]

Refrigerant pipe distribution parts, which are not contained in the package, will be required for installation.
As for refrigerant pipe distribution parts, we offer branching pipe sets (Model type: DIS) and header sets (Model type: HEAD) as parts used on the indoor side of piping.
Please select one suiting your application. In selecting distribution parts, please also refer to "4. REFRIGERANT PIPING."
If you are not sure which parts to select, please consult with your dealer or the manufacturer.
Use refrigerant branching pipe sets and header sets designed exclusively for R410A without fail.

2. INSTALLATION LOCATION

(Obtain approval from the customer when selecting the installation area.)

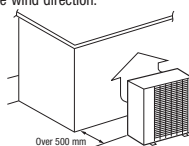
2-1. Selecting the installation location

- Where air is not trapped.
- Where the installation fittings can be firmly installed.
- Where any object does not prevent inlet or outlet air.
- Out of the heat range of other heat sources.
- Where strong winds will not blow against the outlet air.
- A place where stringent regulation of electric noises is applicable.
- Where it is safe for the drain water to be discharged.
- Where noise and hot air will not bother neighboring residents.
- Where snow will not accumulate.
- A place where no TV set or radio receiver is placed within 5m.
(If electrical interference is caused, seek a place less likely to cause the problem)

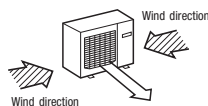
Please note

- If there is a possibility of a short-circuit, then install a flex flow adapter.
- When installing multiple units, provide sufficient intake space so that a short-circuit does not occur.
- In areas where there is snowfall, install the unit in a frame or under a snow hood to prevent snow from accumulating on it.
(Inhibition of collective drain discharge in a snowy country)
- Do not install the equipment in areas where there is a danger for potential explosive atmosphere.
- Install the equipment in a location that can sufficiently support the weight of the equipment.
- If a unit is installed into a special environment as shown below, there will be a danger that the corrosion of the outdoor unit or its malfunctioning is caused. If this is the case, please consult with the distributor from whom you have purchased the unit.
 - Where corrosive gas is generated (such as a hot-spring resort area).
 - Where the unit is subject to sea breezes (coastal area).
 - Where the unit is subject to oil mists.
 - Where equipment generating electromagnetic waves exists in the vicinity.
- When strong winds occur
 - Where it is likely that the unit is subjected to strong winds, provide wind guards according to the following guidelines.
Strong winds can cause performance degradation, an accidental stop due to a rise of high pressure and a broken fan.

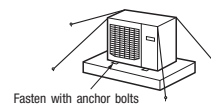
① Place the unit outlet pipe perpendicular to the wind direction.



② Please install so the direction of the air from the blowing outlet will be perpendicular to the direction of the wind.



③ When the foundation is not level, use wires to tie down the unit.



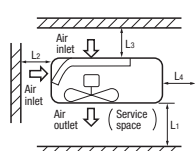
CAUTION

Please leave sufficient clearance around the unit without fail. Otherwise, a risk of compressor and/or electric component failure may arise.

2-2. Installation space (Ex. servicing space)

- Minimum installation space
(Please select an installation point with due attention to the direction of installation of the refrigerant pipe)
(If the installation conditions shown in this drawing are not satisfied, please consult with your dealer or the manufacturer.)
- When units are installed side by side, leave a 10 mm or wider service space between the units.
- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

* Please ask to the dealer regarding the options such as the flex flow adapter and the snow guard hood.



(Unit : mm)

Sample	I	II	III
L 1	Open	Open	500
L 2	300	5	Open
L 3	150	300	150
L 4	5	5	5

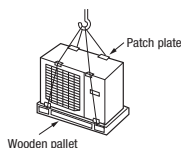
3. UNIT DELIVERY AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

CAUTION

When you sling the unit for portage, do not fail to take into consideration the deviation of the gravity center from its center. Improper slinging may cause the unit to lose balance and fall.

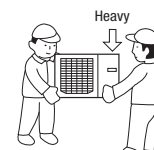
Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- If unpacked and delivery cannot be avoided, use a nylon sling or a rope with pads placed where the rope contacts the unit so it is not scratched.

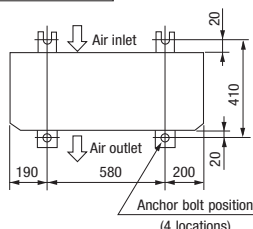


Portage

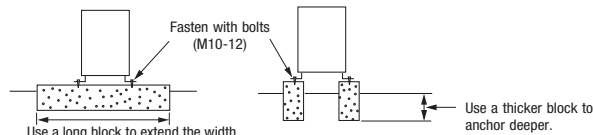
- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



Bolt fastening positions



- In installing the unit, fix the unit's legs with bolts specified below.



- The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the above illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5 mm or less.)

Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

Important



In case that the unit operates in cooling mode, when the outdoor temperature is -5°C or lower, please equip a flex flow adapter and a snow guard hood (option) on the unit.

4. REFRIGERANT PIPING

4-1. Determination of piping specifications (Please select from the following matrix according to indoor unit specifications and installation site conditions)

Refrigerant piping restrictions

Please do not fail to observe the following pipe sizes and limitations of use. A failure to observe this instruction can result in a compressor failure or performance degradation.

- Please avoid forming any trap () or bump () in piping as they can cause fluid stagnation.
- Maximum length (To the farthest indoor unit) Within 70m
- Equivalent length (To the farthest indoor unit) Within 95m
- Total pipe length (Combined total length of pipes) Within 100m
- ϕ 9.52 pipe length Within 50m
- Height difference
 - (1) When the outdoor unit is above the indoor unit Within 30m
 - (2) When the outdoor unit is below the indoor unit Within 15m
 - (3) Height difference between indoor units in the same system Within 15m
 - (4) Height difference between indoor units and first branch Within 15m

Refrigerant piping size selection

- Please use pipes clean on both the inside and outside and free from contaminants harmful to operation such as sulfur, oxides, dust, chips, oil, fat and water.
- Use the following material for refrigerant piping.
Material: phosphorus deoxidized seamless copper pipe (C1120T-0, JIS H 3300)
- Thickness and size: Please select proper pipes according to the pipe size selection guideline.
(Since this unit uses R410A, Select pipes having a wall thickness larger than the specified minimum pipe thickness.)
- For branching pipes, use a genuine branching pipe set or header set at all times.
- Install a branching pipe set, paying attention to the direction of attachment, after you have perused through the installation manual supplied with it.
- The length of piping from outdoor unit to first branch is 1.5m or more.
- For the handling of service valves, please refer to 4-2. Piping work.

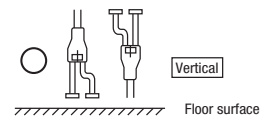
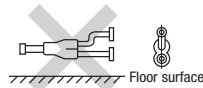
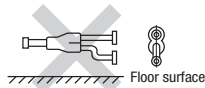
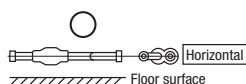
(1) Individual flow division method

- For determination of appropriate branching joint or different diameter pipe joint sizes, please refer to "Branching Pipe Set," (which can be purchased separately).

Attention

- Please use pipes of the pipe size specified for the outdoor unit for the section between the outdoor unit and the first branching joint.
- An appropriate pipe size between branching joints can vary depending on the connected indoor unit capacity (total capacity connected downstream), please select an appropriate pipe size from the table shown on the right.
- The pipe size between the branch pipe and the indoor unit should match that of the indoor unit.
- Always install branch pipes either horizontally or vertically.

Item	Model	Gas pipe	Liquid pipe
Outdoor unit Main pipe	121, 140, 155	ϕ 15.88	ϕ 9.52
Total capacity of indoor units	less than 70	ϕ 12.7	ϕ 9.52
	70 or more	ϕ 15.88	ϕ 9.52

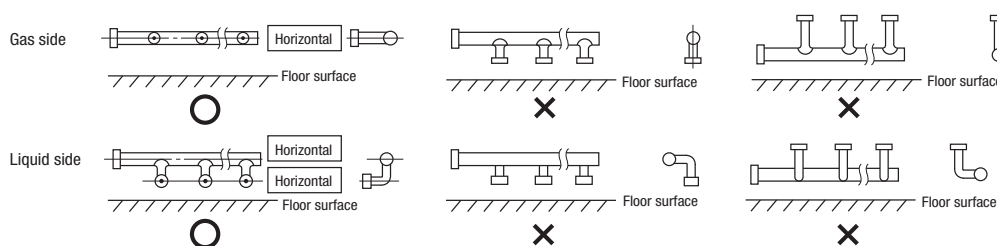


(2) Header Method

- Depending on the number of units connected, connect blind pipes to header branching points (on the indoor unit connection side).
- For determination of appropriate header, different diameter pipe joint and blind pipe sizes, please refer to "Header Set," (which can be purchased separately).

Attention

- For the section between an indoor unit and the header, use a pipe of the diameter specified for the indoor unit.
- To couple with the header, use a different diameter pipe joint to adjust to the pipe diameter specified for the indoor unit.
- The header must be so installed that it branches horizontally. (for both gas and liquid)



Unit piping specifications The piping material should be phosphorus deoxidized copper seamless steel pipes. (C1220T, JIS H 3300)

Item	Model	Gas side			Liquid side		
		Pipe diameter (mm)	Minimum pipe wall thickness (mm)	Connection method	Pipe diameter (mm)	Minimum pipe wall thickness (mm)	Connection method
Outdoor unit	121, 140, 155	φ 15.88	1.0	Flare	φ 9.52	0.8	Flare
	15	φ 9.52	0.8		φ 6.35	0.8	
	22	φ 9.52	0.8		φ 6.35	0.8	
	28	φ 9.52	0.8		φ 6.35	0.8	
	36	φ 12.7	0.8		φ 6.35	0.8	
	45	φ 12.7	0.8		φ 6.35	0.8	
	56	φ 12.7	0.8		φ 6.35	0.8	
	71	φ 15.88	1.0		φ 9.52	0.8	
	90	φ 15.88	1.0		φ 9.52	0.8	
	112	φ 15.88	1.0		φ 9.52	0.8	
Indoor unit	140	φ 15.88	1.0	Flare	φ 9.52	0.8	Flare
	160	φ 15.88	1.0		φ 9.52	0.8	

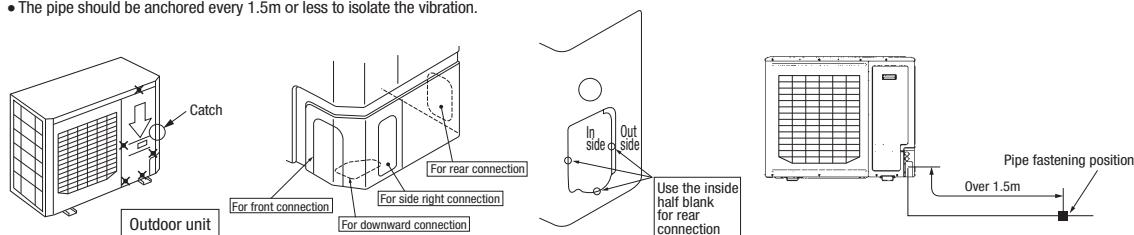
Attention

- Always select pipes meeting the minimum wall thickness requirement.

4-2. Piping work

Piping connection position and the piping remove direction

- First remove the five screws (X mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.
- The pipe can be laid in any of the following directions: side right, front, rear and downward.
- Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.
- In laying pipes on the installation site, cut off the casing's half blank that covers a hole for pipe penetration with nippers.
- If there is a risk of small animals entering from the pipe penetration part, close the part with some sealing material or the like (to be arranged on the installer's part).
- In the case of an installation using a collective drain system, use a port other than the bottom one to take out cables and pipes. If the bottom port is used, seal it thoroughly so that drain water may not spill out.
- Use an elbow (to be arranged on the user's part) to connect control valves to the piping.
- In anchoring piping on the installation site, give 1.5m or a longer distance between an outdoor unit and an anchoring point where the piping is secured as illustrated below. (A failure to observe this instruction may result in a pipe fracture depending on a method of isolating vibrations employed.)
- The pipe should be anchored every 1.5m or less to isolate the vibration.



(1) On-site piping work

Important

- Please take care so that installed pipes may not touch components within a unit.
- **During the pipe installation at site, keep the service valves shut all the time.**
- Give **sufficient protections** (compressed and brazed or by an adhesive tape) **to pipe ends so that any water or foreign matters may not enter the pipes.**
- In bending a pipe, bend it **to the largest possible radius (at least four times the pipe diameter)**. Do not bend a pipe repeatedly to correct its form.
- An outdoor unit's pipe and refrigerant piping are to be flare connected. Flare a pipe after engaging a flare nut onto it. A flare size for R410A is different from that for conventional R407C. Although we recommend the use of flaring tools developed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- Tighten a flare joint securely **with two spanners**. Observe flare nut tightening torque specified in the table below.

CAUTION

If you tighten it without using double spanners, you may deform the service valve, which can cause an inflow of nitrogen gas into the outdoor unit.

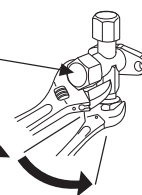
Flare nut parallel side measurement: H (mm)		Flared pipe end: A (mm)		Copper pipe protrusion for flaring: B (mm)		
Copper pipe outer diameter	H	Copper pipe outer diameter	A	In the case of a rigid (clutch) type		
φ 6.35	17	φ 6.35	9.1	0—0.5	0.7—1.3	With an R410A tool
φ 9.52	22	φ 9.52	13.2			With a conventional tool
φ 12.7	26	φ 12.7	16.6			
φ 15.88	29	φ 15.88	19.7			

Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

Service valve size (mm)	Tightening torque (N · m)	Tightening angle (°)	Recommended length of a tool handle (mm)
φ6.35 (1/4")	14—18	45—60	150
φ9.52 (3/8")	34—42	30—45	200
φ12.7 (1/2")	49—61	30—45	250
φ15.88(5/8")	68—82	15—20	300

Use a torque wrench. If a torque wrench is not available, fasten the flare nut manually first and then tighten it further, using the left table as a guide.

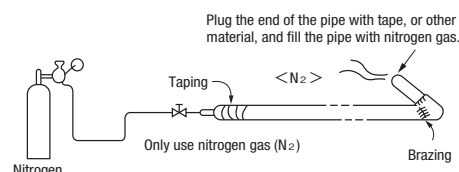
Do not hold the valve cap area with a spanner.



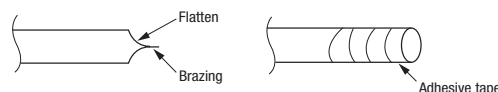
- Do not apply any oil on a flare joint.
- **Blazing must be performed under a nitrogen gas flow.** Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.
- Brazing of the service valve and the pipes should be performed while cooling the valve body with a wet towel.
- Perform flushing. To flush the piping, charge nitrogen gas at about 0.02MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).

Operation procedure

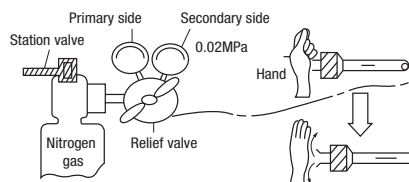
- ① **During the pipe installation at site, keep the service valves shut all the time.**
- ② **Blazing must be performed under a nitrogen gas flow.** Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



- ③ Give **sufficient protections** (compressed and brazed or with an adhesive tape) **so that water or foreign matters may not enter the piping.**



- ④ Perform flushing. To flush the piping, charge nitrogen gas at about 0.02MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).



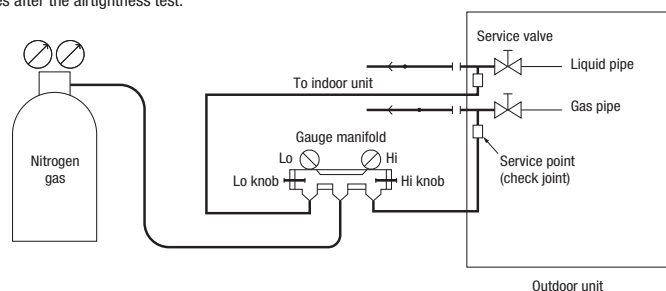
4-3. Air tightness test and air purge (Carry them out according to the following steps.)

Air tightness test

- ① Although an outdoor unit itself has been tested for air tightness at the factory, please check the connected pipes and indoor units for air tightness from the check joint of the service valve on the outdoor unit side. While conducting a test, **keep the service valve shut all the time.**
- ② Since refrigerant piping is pressurized to the design pressure of a unit with nitrogen gas for testing air tightness, please connect instruments according to the drawing below. Under no circumstances should chlorine-based refrigerant, oxygen or any other combustible gas be used to pressurize a system. **Keep the service valve shut all the time.** Do not open it under any circumstances. **Be sure to pressurize all of the liquid, gas pipes.**
- ③ In pressurizing the piping, do not apply the specified level of pressure all at once, but gradually raise pressure.
 - a) **Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes or more** to see if the pressure drops.
 - b) **Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes** to see if the pressure drops.
 - c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
 - d) **If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable.** When the ambient temperature changes 1°C, the pressure also changes approximately 0.01 MPa. The pressure, if changed, should be compensated for.
 - e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.
- ④ Always pull air from the pipes after the airtightness test.

CAUTION

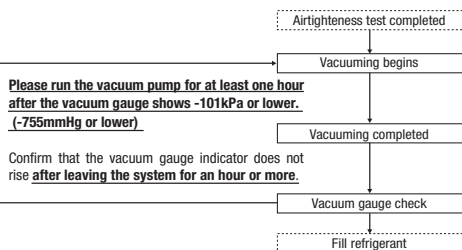
Applying excessive pressure can cause an inflow of nitrogen gas into an outdoor unit.



Vacuumping Please pull air **from the check joints of the service valves on both liquid and gas sides.**

< Work flow >

When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.



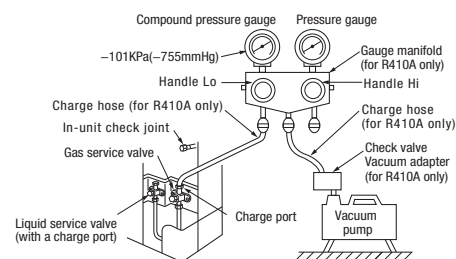
CAUTION

Insufficient vacuuming may result in poor performance falling short of the design capacity, pipe clogging due to residue moisture and/or a compressor failure.

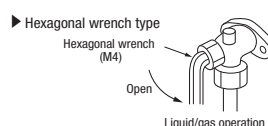
Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

When a vacuum air purge is completed, remove the valve rod cap nuts and open the service valves (both liquid and gas sides) as illustrated below. After you have made sure that the valves are in the full-open position, tighten the cap nuts (for the valve rods and charge ports).

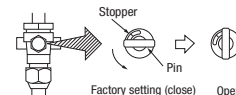


- You can purge air with either liquid service valve or gas service valve.



- Open the valve rod until it touches the stopper. You need not apply force to push it further.

Pin type
Remove the hexagon cap nut, set it as illustrated in the drawing below.



For tightening torque, refer to the table below.

Service valve size (mm)	Tightening torque (N · m)	Cap tightening torque (N · m)	Cap nut tightening torque of check joint (N · m)
φ 9.52 (3/8")	6—8	20—30	13
φ 15.88(5/8")	14—16	30—35	13

- When an operation is completed, replace the cap nut and tighten it as before.
- Shaft operation, cap and cap nut is performed by excessive torque, it will become failure and a cause of a leak, please follow a table.

4-4. Additional refrigerant charge

Additional refrigerant charge

Charge additional refrigerant **in the liquid state.**

Be sure to measure the quantity **with a scale in adding refrigerant.**

If you cannot charge all refrigerant with the outdoor unit lying idle, charge it with the unit running in the test run mode. (For the test run method, please refer to Section 8)
If operated for a long time with insufficient refrigerant the compressor will be damaged. (In particular, when adding refrigerant during operation, complete the job within 30min.)
Fill this unit only with the standard amount of refrigerant (piping length 0m fill quantity).

Determine the amount of refrigerant to be charged additionally using the following formula and put down the amount of refrigerant added on the refrigerant charge volume recording plate provided on the back of the side panel.

● Adding additional refrigerant

Charge additional refrigerant according to the size and length of the liquid piping.

Determine additional charge volume by rounding to the nearest 0.1 kg.

Item	Standard refrigerant charge volume (kg)	Pipe length for baseline charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
Capacity					
121, 140, 155	3.38	0	0.054 (Liquid piping φ9.52)	5.0	30

Refrigerant pipe size	φ 9.52	φ 6.35
Additional charge volume (kg)	0.054	0.022

● A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.

● **This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping.**

When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.

Formula to calculate the volume of additional refrigerant required

Model 121,140,155	Total refrigerant (necessary) charge volume (kg) = Standard refrigerant charge 3.38kg + φ9.52 Total length of liquid pipes (m) x 0.054(kg/m) + φ6.35 Total length of liquid pipes (m) x 0.022 Additional charge volume (kg) = Total refrigerant (necessary) charge volume (kg) - Factory charged volume 5 (kg)
-------------------	---

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

● **If the pipe length is shorter than 5 m, you should charge a reduced refrigerant volume.**

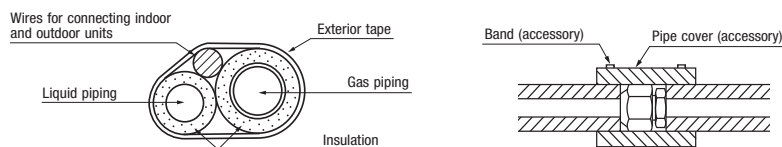
Recover the refrigerant from the system and charge the standard refrigerant charge + the amount for liquid pipe.

Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- Refrigerant types are indicated by color at the top of the cylinder. (Pink for R410A). Always confirm this.
- Do not use a charge cylinder under any circumstances. There is a danger that the composition of the refrigerant will change when R410A is transferred to a cylinder.
- When charging refrigerant, use liquid refrigerant from a cylinder.
- Use a adverse current prevention adapter so that vacuum pump oil does not mix in a system.

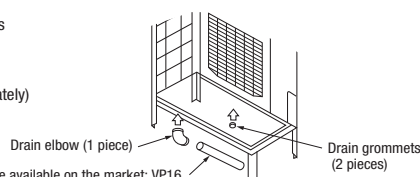
4-4. Heat insulation for prevention of dew condensation

- (1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation. Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- (2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
 - All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
 - Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
 - Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
 - Although it is verified in a test that this air conditioning unit shows satisfactory performance under JIS condensation test conditions, both gas and liquid pipes need to be dressed with 10-20mm heat insulation materials additionally above the ceiling where relative humidity exceeds 70%.



5. DRAINAGE

- Where drain water from the outdoor unit causes problems, implement drain piping with drain elbows and drain grommets, which are supplied separately as option parts.
- There are 3 holes in the bottom panel of the outdoor unit to drain condensation.
- Where condensate is guided to a drain, install the unit on a flat base (an option part supplied separately) or concrete blocks.
- Connect a drain elbow as illustrated and plug the other holes with grommets.



6. ELECTRICAL WIRING WORK

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country. Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

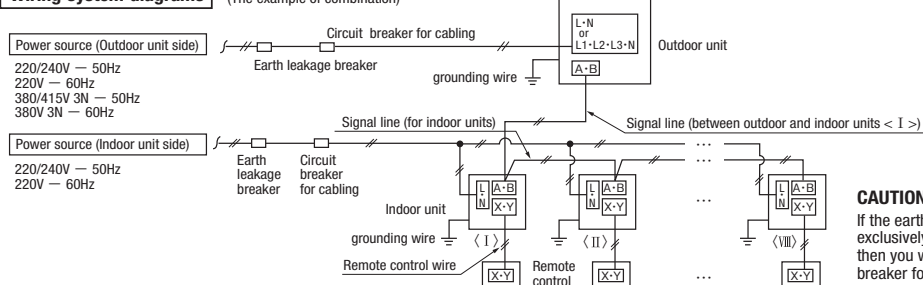
Please install an earth leakage breaker without fail. The installation of an earth leakage breaker is compulsory in order to prevent electric shocks or fire accidents. (Since this unit employs inverter control, please **use an impulse withstanding type** to prevent an earth leakage breaker's false actuation.)

Please note

- a) Use only copper wires.
 - Do not use any supply cord lighter than one specified in parentheses for each type below.
 - braided cord (code designation 60245 IEC 51), if allowed in the relevant part 2;
 - ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
 - flat twin tinsel cord (code designation 60227 IEC 41)
 - ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53).
- Please do not use anything lighter than polychloroprene sheathed flexible cord (cord designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- b) **Use separate power sources for the indoor and outdoor units.**
- c) **The power sources for indoor units in the same system should turn on and off simultaneously.**
- d) Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable. If improperly grounded, an electric shock or malfunction may result. Don't connect the grounding wire to a gas pipe because it could cause explosion or ignition if gas leaks.
- e) **The installation of an impulse with standing type earth leakage breaker is necessary.** A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire. Do not turn on the power until the electrical work is completed. Be sure to turn off the power when servicing.
- f) Please do not use a condensive capacitor for power factor improvement under any circumstances. (It does not improve power factor, while it can cause an abnormal overheat accident)
- g) For power source cables, use conduits.
- h) Please **do not lay electronic control cables (remote control and signaling lines) and other high current cables together outside the unit.** Laying them together can result in malfunctioning or a failure of the unit due to electric noises.
- i) Power cables and signaling lines must always be connected to the terminal block and secured by cable fastening clamps provided in the unit.
- j) Fasten cables so that they may not touch the piping, etc.
- k) **When cables are connected, please make sure that all electrical components within the electrical component box are not free or not loose on the terminal connection** and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- l) Make sure to use circuit breakers (earth leakage breaker and circuit breaker) of proper capacity. Use of breakers of larger capacity could result in trouble on components or fire accident. The circuit breaker should isolate all poles under over current.
- m) Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations. The isolator should be locked in OFF state in accordance with EN60204-1.
- n) After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.

Wiring system diagrams

(The example of combination)



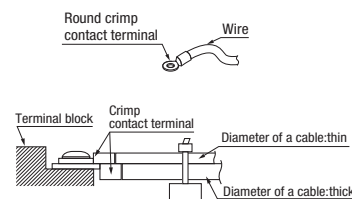
Method of connecting power cables

(1) Method of leading out cables

- As shown on the drawing in Section 4-2, cables can be laid through the front, right, left or bottom casing.
- In wiring on the installation site, cut off a half-blank covering a penetration of the casing with nippers.
- In the case of an installation using a collective drain system, use a port other than the bottom one to take out cables and pipes. If the bottom port is used, seal it thoroughly so that drain water may not spill out.

(2) Notabilia in connecting power cables

- Connect the ground wire before you connect the power cable. When you connect a grounding wire to a terminal block, use a grounding wire longer than the power cable so that it may not be subject to tension.
- Do not turn on power until installation work is completed. Turn off power to the unit before you service the unit.
- Always connect power cables to the power terminal block.
- To connect a cable to the power terminal block, use a round crimp contact terminal.
- If two cables are to be connected to one terminal, arrange cables in such a manner that you put their crimp contact terminals together back to back. Further, put the thinner cable above the thicker one in arranging cables for such connection.
- Use specified wires in wiring, and fasten them securely in such a manner that the terminal blocks are not subject to external force.
- In fastening a screw of a terminal block, use a correct-size driver.
- Fastening a screw of a terminal block with excessive force can break the screw.
- When electrical installation work is completed, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection.



Power source specifications

(1) Outdoor unit power source (Indoor unit is another power source.)

Model	Power source	Cable size for power source (mm ²)	Wire length (m)	Moulded-case circuit breaker (A)		Earth leakage breaker	Earth wire	
				Rated current	Switch capacity		Size (mm ²)	Screw type
121KXZEN1	Single-phase 220/240V 50Hz 220V 60Hz	8	32	40	50	40A, 30mA less than 0.1 sec	2	M5
140KXZEN1								
155KXZEN1								
121KXZES1	Three-phase 380/415V 50Hz 380V 60Hz	3.5	46	20	30	20A, 30mA less than 0.1 sec	2	M4
140KXZES1								
155KXZES1								

Please note

- The method of laying cables has been determined pursuant to the Japanese indoor wiring regulations (JEAC8001). (Please adapt it to the regulations in effect in each country)
- Wire length in the table above is the value for when the indoor unit is connect to the power cable in series also the wire size and minimum length when the power drop is less than 2% are shown. If the current exceeds the value in the table above, change the wire size according to the indoor wiring regulations. (Please adapt it to the regulations in effect in each country)
- For details, please refer to the installation manual supplied with the indoor unit.

How to connect signal cables

The communication protocol can be chosen from following two types. One of them is the conventional Superlink (hereinafter previous SL) and the other is the new Superlink II (hereinafter new SL). These two communication protocols have the following advantages and restrictions, so please choose a desirable one meeting your installation conditions such as connected indoor units and central control. When signal cables are connected into a network involving outdoor units, indoor units or central control equipment that do not support new SL, please select communications in the previous SL mode, even if the refrigerant system is separated from theirs.

Communication protocol	Conventional communication protocol (previous SL)	New communication protocol (new SL)
Outdoor unit setting (SW5-5)	ON	OFF (factory setting)
No. of connectable indoor units in a network	Max. 48	Max. 128
No. of connectable outdoor units in a network	Max. 48	Max. 32
Signal cable (total length)	Up to 1000m	Up to 1500m (When 0.75mm ² shielded cable used) Up to 1000m (When 1.25mm ² shielded cable used)
Signal cable (furthest length)	Up to 1000m	Up to 1000m
Connectable units to a network	Units not supporting new SL (FD○A△△KXE4 series) Units supporting new SL (FD○△△KXE6 series) Can be used together. (*1)	Units supporting new SL (FD○△△KXE6 KXZ series)

※1 New SL supporting units and non-supporting units cannot be used together in a same refrigerant system.

●A signal cable system is operated at DC5V, so never connect it to the power source 220/240V or 380/415V. If the power source is applied, a protective fuse provided on the board will be actuated. If the protective fuse is actuated, follow the procedure set out below.

- Turn off power and make sure that 220/240V or 380/415V is not applied to signaling wires.
- In the case of an indoor unit, switch from CNK1 to CNK2 and cut the jumper line JSL1.
- In the case of an outdoor unit, switch from CNX1 to CNX2 and cut the jumper line J10.
- Check signal cable terminal block resistance before you turn on power. If the resistance value is 100 ohms or less, there is possibility that a power cable is connected to a signal cable terminal block.

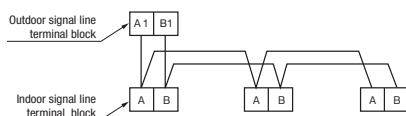
A typical resistance value is $146000 / (\text{No. of connected FD○A△△KXE4 and KXE5 series units} \times 5) + (\text{No. of connected FD○△△KXE6 and KXZ series units} \times 9)$.

If the resistance value is 100 ohms or less, tentatively detach signal cables and thus, divide the network into more than one block (to reduce the number of indoor units connected in a network) to check for cabling errors in each such block.

Indoor and outdoor signal wires

- Connect the signal line between indoor unit and outdoor unit to A1 and B1.
- Connect the signal line between outdoor units to A2 and B2.
- Please use a shielded cable for a signal line and connect a shielding earth at all the indoor units and outdoor units.

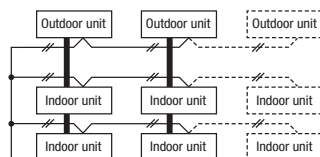
(1) When one outdoor unit is used.



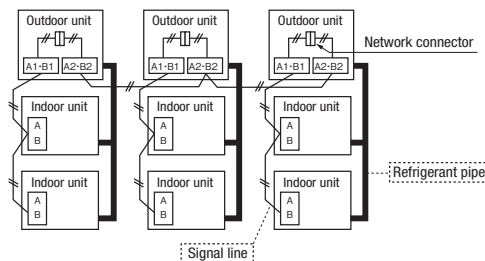
○ Indoor and outdoor signal lines do not have a polarity.
Any of the connections in the following illustration can be made.



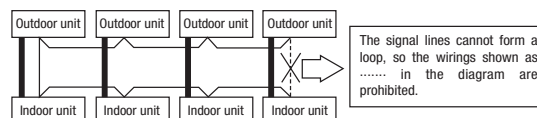
(1) The signal lines can also be connected using the method shown below.



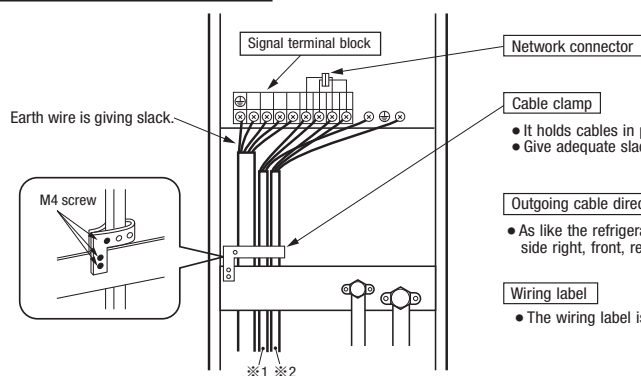
(2) When plural outdoor units are used



Important ○ Loop wiring prohibited.



Power cable and signal line connection



- It holds cables in place and protect the terminal connection from external force.
- Give adequate slack to cables in fastening them.

Outgoing cable direction

- As like the refrigerant pipe, it can be let out in any of the following directions: side right, front, rear and downward.

Wiring label

- The wiring label is attached on the back side of the service panel.

※1 Signal line between the indoor unit and the outdoor unit.
※2 Signal line between the outdoor units.

Attention

- For cabling of the power source terminal block, use crimp terminals of the figure shown below.

FDC121-155KXZEN1 (Single-phase)

12 mm or less

FDC121-155KXZES1 (Three-phase)

9.5 mm or less

6.6 mm or less

Remote control wiring specifications

(1) For the remote control the standard wire is 0.3mm² x 2 cores. The max. length is up to 600m. When the wire is more than 100m long, use the wire shown in the table.

Main fuse specification

Specification	Part No.
250V 30A	SSA564A161

Length (m)	Wire size
100 to 200	0.5mm ² × 2 cores
to 300	0.75mm ² × 2 cores
to 400	1.25mm ² × 2 cores
to 600	2.0mm ² × 2 cores

7. CONTROL SETTINGS

7-1. Unit address setting

This control system controls the controls of more than one air-conditioner's outdoor unit, indoor unit and remote control unit through communication control, using the microcomputers built in the respective controls. Address setting needs to be done for both outdoor and indoor units. Turn on power in the order of the outdoor units and then the indoor units.

Use 1 minute as the rule of thumb for an interval between them.

The communication protocol can be chosen from following two types. One of them is the conventional Superlink (hereinafter previous SL) and the other is the new Superlink II (hereinafter new SL). These two communication protocols have their advantages and restrictions as summarized in a table in "6. ELECTRICAL WIRING WORK" so please choose a desirable one meeting your installation conditions such as connected indoor units and central control.

When signal cables are connected into a network involving outdoor units, indoor units or central control equipment that do not support new SL, please select communications in the previous SL mode, even if the refrigerant system is separated from theirs.

When communication is established after setting addresses, check the communication protocol with the 7 segment display panel of the outdoor unit.

●Address setting methods

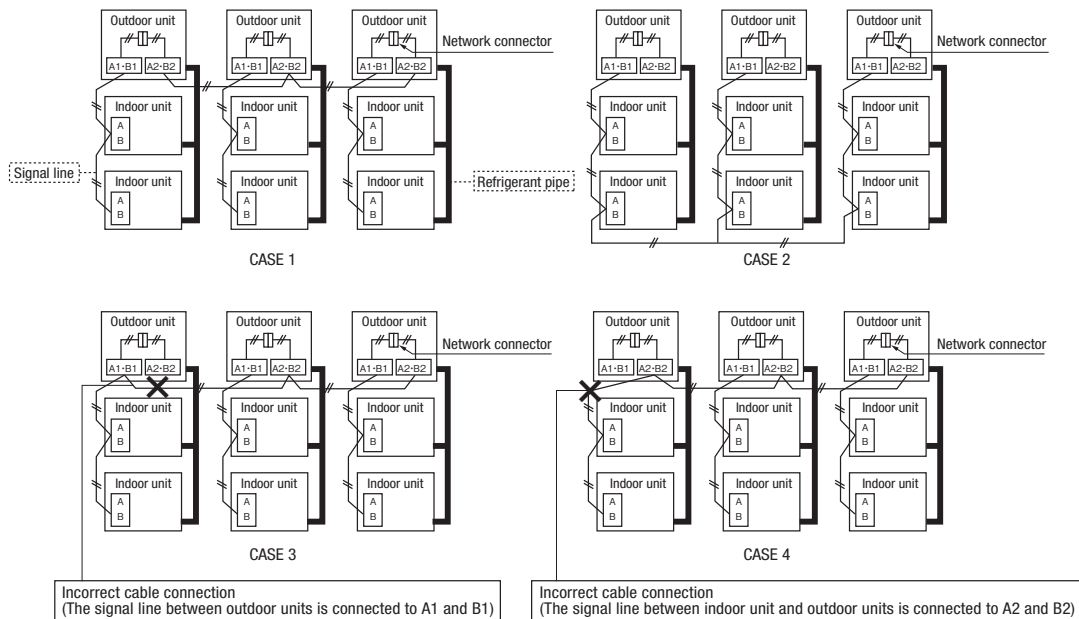
The following address setting methods can be used. The procedure for automatic address setting is different from the conventional one. Please use the automatic address setting function after reading this manual carefully.

Communication protocol		new SL		previous SL	
Address setting method		Automatic	Manual	Automatic	Manual
When only one refrigerant system is involved (signal lines do not link with plural refrigerant systems)		OK	OK	OK	OK
When plural refrigerant systems are linked with signal lines (e.g., to implement central control)	Case 1 When signal lines linking plural refrigerant systems are provided between outdoor units. (When the network connector is disconnected, refrigerant systems are separated each other)	OK ^{※1}	OK	×	OK
	Case 2 When signal lines linking plural refrigerant systems are provided between indoor units.	×	OK	×	OK

※1 Do not connect the signal line between outdoor units to A1 and B1. This may interrupt proper address setting. (Case 3)

Do not connect the signal line between indoor unit and outdoor unit to A2 and B2. This may interrupt proper address setting. (Case 4)

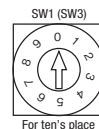
※2 In Case 2, automatic address setting is not available. Set addresses manually.



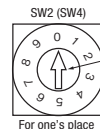
●Address No. setting

Set SW1 through 4 and SW5-2 provided on the PCB and SW1 & 2 provided on the outdoor unit PCB as shown in the drawings below.

Indoor PCB	SW1, 2 (blue)	For setting indoor No. (The ten's and one's)
	SW3, 4 (green)	For setting outdoor No. (The ten's and one's)
Outdoor PCB	SW5-2	Indoor No. switch (The hundred's place) [OFF : 0, ON : 1]
	SW1, 2 (green)	For setting outdoor No. (The ten's and one's)



For ten's place



For one's place

By inserting a flat driver (precision screw driver) into this groove and turn the arrow to point a desired number.

●Summary of address setting methods (figures in [] should be used with previous SL)

	Units supporting new SL			Units NOT supporting new SL		
	Indoor unit address setting		Outdoor unit address setting	Indoor unit address setting		Outdoor unit address setting
	Indoor No. switch	Outdoor No. switch	Outdoor No. switch	Indoor No. switch	Outdoor No. switch	Outdoor No. switch
Manual address setting (previous SL/new SL)	000—127[47](^{※1})	00—31[47]	00—31[47]	00—47	00—47	00—47
Automatic address setting for single refrigerant system installation (previous SL/new SL)	000	49	49	49	49	49
Automatic address setting for multiple refrigerant systems installation (with new SL only)	000	49	00—31	×	×	×

(^{※1}) Do not set numbers other than those shown in the table, or an error may be generated.

Note: When units supporting new SL are added to a network using previous SL such as one involving FD○A△△KXE4 series units, choose previous SL for the communication protocol and set addresses manually.

- An outdoor unit No., which is used to identify which outdoor unit and indoor units are connected in a refrigerant system, is set on outdoor unit PCB and indoor unit PCB. Give the same outdoor unit No. to all outdoor unit and indoor units connected in same refrigerant system.
- An indoor unit No. is used to identify individual indoor units. Assign a unique number that is not assigned to any other indoor units on the network.

Unless stated otherwise, the following procedures apply, when new SL is chosen for the communication protocol.

When previous SL is chosen, use figures shown in [] in carrying out these procedures.

Manual address setting Generally applicable to new SL/previous SL, use figures in [] with previous SL.

- ① Outdoor unit address setting
Set as follows before you turn on power. Upon turning on power, the outdoor unit address is registered.
Set **the Outdoor Unit No. switch to a number 00 - 31 [in the case of previous SL: 00 - 47]**.
Set a unique number by avoiding the numbers assigned to other outdoor units on the network.
- ② Indoor unit address setting
Set as follows before you turn on power. Upon turning on power, the indoor unit address is registered.
Set **the Indoor Unit No. switch to a number 000 - 127 [in the case of previous SL: 00 - 47]**.
Set **the Outdoor Unit No. switch** to the outdoor unit No. of the associated outdoor unit within the range of **00 - 31 [in the case of previous SL: 00 - 47]**.
Set a unique number by avoiding the numbers assigned to other indoor units on the network.
- ③ Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them.
* When there are some units not supporting new SL connected in the network, set SW5-5 to ON to choose the previous SL communication mode.
In the case of previous SL, the maximum number of indoor units connectable in a network is 48.

Automatic address setting Generally applicable to new SL/previous SL, use figures in [] with previous SL.

With new SL, you can set indoor unit addresses automatically even for an installation involving multiple refrigerant systems connected with same network, in addition to the conventional automatic address setting of a single refrigerant system installation.

However, an installation must satisfy some additional requirements such as for wiring methods, so please read this manual carefully before you carry out automatic address setting.

(1) In the case of a single refrigerant system installation (Generally applicable to new SL/previous SL, use figures in [] with previous SL.)

- ① Outdoor unit address setting
Set as follows before you turn on power.
Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**.
- ② Indoor unit address setting
Set as follows before you turn on power.
Make sure that the **Indoor Unit No. switch** is set to **000 [in the case of previous SL: 49] (factory setting)**.
Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**.
- ③ Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them. Unlike the procedure set out in (2) below, you need not change settings from the 7 segment display panel.
- ④ Make sure that the number of indoor units indicated on the 7 segment display panel agrees with the number of the indoor units that are actually connected to the refrigerant system.

(2) In the case of a multiple refrigerant systems installation (Applicable to new SL only. In the case of previous SL, set addresses with some other method.)

(This option is available when the interconnection wiring among refrigerant systems is on the outdoor side and new SL is chosen as the communication protocol.)

Address setting procedure (perform these steps for each outdoor unit)

[STEP1] (Items set before turning on power)

- ① Outdoor unit address setting
Set as follows before you turn on power.
Set the **Outdoor Unit No. switch** to a number **00 - 31**. Set a unique number by avoiding the numbers assigned to other outdoor units on the network.
- ② Indoor unit address setting
Set as follows before you turn on power.
Make sure that the **Indoor Unit No. switch** is set to **000 (factory setting)**.
Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**.
- ③ Isolate the present refrigerant system from the network.
Disengage the **network connectors (white 2P)** of the outdoor units. (Turning on power without isolating each refrigerant system will result in erroneous address setting.)

[STEP2] (Power on and automatic address setting)

- ④ Turn on power to the outdoor unit
Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them.
- ⑤ Select and enter "1" in P31 on the 7 segment display panel of each outdoor unit to input "Automatic address start."
- ⑥ Input a starting address and the number of connected indoor units.
Input a starting address in P32 on the 7 segment display panel of each outdoor unit.
- ⑦ When a starting address is entered, the display indication will switch back to the "Number of Connected Indoor Units Input" screen.
Input the number of connected indoor units from the 7 segment display panel of each outdoor unit. Please input the number of connected indoor units for each outdoor unit. (You can input it from P33 on the 7 segment display panel.) When the number of connected indoor units is entered, the 7 segment display panel indication will switch to "AUX" and start flickering.

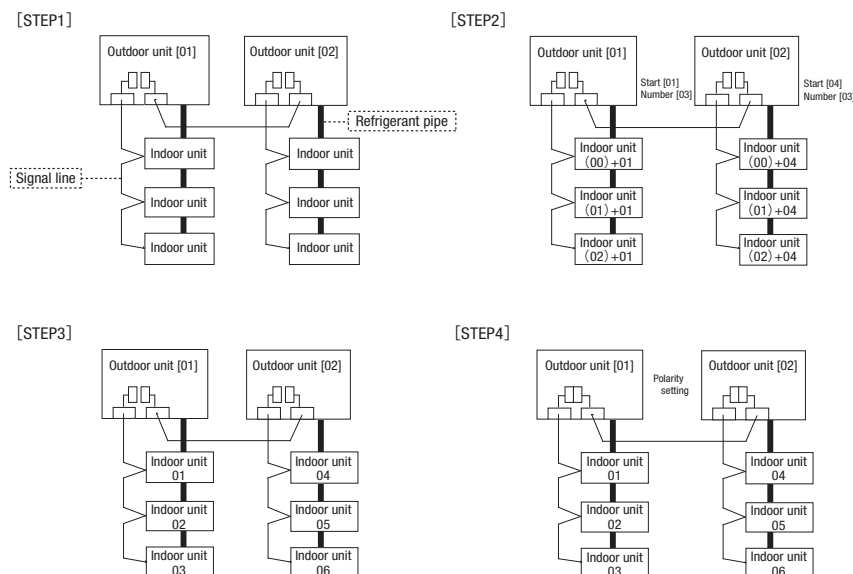
[STEP3] (Automatic address setting completion check)

- ⑧ Indoor unit address determination
When the indoor unit addresses are all set, the 7 segment display panel indication will switch to "AUE" and start flickering.
If an error is detected in this process, the display will show "A○○."
Check the 7 segment display panel of each outdoor unit.
Depending on the number of connected indoor units, it may take **about 30 minutes** before the indoor unit addresses are all set.

[STEP4] (Network definition setting)

- ⑨ Network connection
When you have confirmed an "AUE" indication on the display of each outdoor unit, **engage the network connectors** again.
- ⑩ Network polarity setting
After you have made sure that the network connectors are engaged, select and enter "1" in P34 on the 7 segment display panel of **any outdoor unit (on only 1 unit)** to specify network polarity.
- ⑪ Network setting completion check
When the network is defined, "End" will appear on the 7 segment display panel. An "End" indication will go off, when some operation is made from the 7 segment display panel or 3 minutes after.

	STEP1	STEP2	STEP3	STEP4
Indoor unit power source	② OFF	④ ON	—	—
Outdoor unit power source	① OFF	④ ON	—	—
Indoor unit (indoor/outdoor No.switch)	② indoor000/outdoor 49 (factory setting)	—	—	—
Outdoor unit (outdoor No.switch)	① 01,02(Ex)	—	—	—
Network connectors	③ Disconnect(each outdoor unit)	—	—	⑨ Connect(each outdoor unit)
Start automatic address setting		⑤ Select "Automatic Address Start" on each outdoor unit.		
Set starting address		⑥ outdoor 01:[01](Ex) outdoor 02:[04](Ex)	—	—
Set the number of indoor unit		⑦ outdoor 01:[03](Ex) outdoor 02:[03](Ex)	—	—
Polarity setting		—	—	⑩ Set in P34 on the 7-segment display panel of any outdoor unit.
7-segment display		⑦ [AUX] (Blink)	⑧ "AUE"(blink), or "A○○" in error events.	⑪ [End]



- Within a refrigerant system, indoor units are assigned addresses in the order they are recognized by the outdoor unit. Therefore, they are not necessarily assigned addresses in order from the nearest to the outdoor unit first as depicted in drawings above.
- Make sure that power has been turned on to all indoor units.
- When addresses are set, you can have the registered indoor unit address No.'s and the outdoor unit address No. displayed on the remote control unit by pressing its inspection switch.
- Automatic address setting can be used for an installation in which plural indoor units are controlled from one remote control unit.
- Once they are registered, addresses are stored in microcomputers, even if power is turned off.
- If you want to change an address after automatic address setting, you can change it from the remote control unit with its "Address Change" function or by means of manual setting. Set a unique address by avoiding the address assigned to other indoor unit on the network when the address is changed.
- Do not turn on power to central control equipment until automatic address setting is completed.
- When addresses are set, be sure to perform a test run and ensure that you can operate all indoor and outdoor units normally. Also check the addresses assigned to the indoor units.

Address change (available only with new SL)










"Address Change" is used, **when you want to change an indoor unit address assigned with the "Automatic Address Setting" function from a remote control unit.** Accordingly, the conditions that permit an address change from a remote control unit are as follows.

	Indoor unit address setting		Outdoor unit address setting
	Indoor No.switch	Outdoor No.switch	Outdoor No.switch
Automatic address setting for single refrigerant system installation	000	49	49
Automatic address setting for multiple refrigerant systems installation	000	49	00—31

If "CHANGE ADD. ▼" is selected with some addresses falling outside these conditions, the following indication will appear for 3 seconds on the remote control "INVALID OPER".




















Operating procedure


(1) When single indoor unit is connected to the remote control.

Item	Operation	Display
1 Address change mode	① Press the AIR CON No. switch for 3 seconds or longer.	[CHANGE ADD.▼]
	② Each time when you press the  switch, the display indication will be switched.	[CHANGE ADD.▼] ⇔[MASTER I/U▲]
	③ Press the Set switch when the display shows "CHANGE ADD. ▼" and then start the address change mode, changing the display indication to the "Indoor Unit No. Setting" screen from the currently assigned address.	[I/U 001 O/U 01] (1sec) →[ SET I/U ADD.] (1sec) →[I/U 001 ] (Blink)
2 To set a new indoor unit No.	④ Set a new indoor unit No. with the  switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[I/U 000▲] ⇔[I/U 001] ⇔[I/U 002] ⇔ . . . ⇔[I/U 127▼]
	⑤ After selecting an address, press the Set switch, and then the indoor unit address No. is defined.	[I/U 002] (2sec)
	⑥ After showing the defined indoor address No. for 2 seconds, the display will change to the "Outdoor Address No. Setting" screen. The currently assigned address is shown as a default value.	[I/U 002] (2sec Lighting) →[ SET O/U ADD.] (1sec) →[O/U 01 ] (Blink)
3 To set a new outdoor unit No.	⑦ Set a new outdoor unit No. with the  switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[O/U 00▲] ⇔[O/U 01 ] ⇔[O/U 02 ] ⇔ . . . ⇔[O/U 31▼]
	⑧ After selecting an address, press the Set switch, and then the outdoor unit No. and the indoor unit No. are defined.	[I/U 002 O/U 02] (2sec Lighting) →[SET COMPLETE] (2sec Lighting) →Returns to normal condition.

(2) When plural indoor units are connected to the remote control.

When plural indoor units are connected, you can change their addresses without altering their cable connection.

Item	Operation	Display
1 Address change mode	① Press the AIR CON Unit No. switch for 3 seconds or longer.	[CHANGE ADD.▼]
	② Each time when you press the  switch, the display indication will be switched.	[CHANGE ADD.▼] ⇔[MASTER I/U▲]
	③ Press the Set switch when the display shows "CHANGE ADD. ▼" and then start the address change mode, changing the display indication to the "Indoor Unit No. Setting" screen from the currently assigned address.	[ SELECT I/U] (1sec) →[I/U 001 O/U 01▲] (Blink)
2 Selecting an indoor unit to be changed address	④ Pressing the  switch will change the display indication cyclically to show the unit No.'s of the indoor units connected to the remote control and the unit No.'s of the outdoor units connected with them.	[I/U 001 O/U 01▲] ⇔[I/U 002 O/U 01 ] ⇔[I/U 003 O/U 01 ] ⇔ . . . ⇔[I/U 016 O/U 01▼]
	⑤ Then the address No. of the indoor unit to be changed is determined and the screen switches to the display "  SET I/U ADD."	[ SET I/U ADD.] (1sec) →[I/U 001 ] (Blink)
3 Setting a new indoor unit No.	⑥ Set a new indoor unit No. with the  switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[I/U 000▲] ⇔[I/U 001 ] ⇔[I/U 002 ] ⇔ . . . ⇔[I/U 127▼]
	⑦ After selecting an address, press the Set switch. Then the address No. of the indoor unit is determined.	[I/U 002] (2sec)
4 Setting a new outdoor unit No.	⑧ The display will indicate the determined indoor address No. for 2 seconds and then switch to the "  SET O/U ADD." screen. A default value shown on the display is the current address.	[I/U 002] (2sec lighting) ⇔[ SET O/U ADD.](1sec) ⇔[O/U 01 ] (Blink)
	⑨ Set a new outdoor unit No. with the  switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively.	[O/U 00▲] ⇔[O/U 01 ] ⇔[O/U 02 ] ⇔ . . . ⇔[O/U 31▼]
	⑩ After selecting an address, press the Set switch. Then the address of the indoor unit and outdoor unit are determined.	[I/U 002 O/U 02] (2sec lighting) →[ SELECT] (1sec lighting) →[I/U SELECTION▼] (lighting)
	⑪ If you want to continue to change addresses, return to step ④.	[Press the  switch] (1sec) →[SET COMPLETE] (2—10sec lighting)
5 Ending the session	⑫ If you want to end the session (and reflect new address settings) In Step ⑩, press the ▼ switch to select "END ▲." If you have finished changing addresses, press the Set switch while "END ▲" is shown. While new settings are being transmitted, "SET COMPLETE" will be indicated. Then the remote control display will change to the normal state.	[END▲] →[SET COMPLETE] (2—10sec lighting) →Normal state
	⑬ If you want to end the session (without reflecting new address settings) Before you complete the present address setting session, press the "ON/OFF" switch. Then the display is change to exit from this mode and switch the display to the normal state. All address settings changed in the session will be aborted and not reflected.	[ON/OFF] →Forced termination

The  switch will continuously change the display indication to the next one in every 0.25 seconds when it is pressed for 0.75 seconds or longer.

If the Reset switch is pressed during an operation, the display indication returns to the one that was shown before the last Set switch operation.
Even if an indoor unit No. is changed in this mode, the registered indoor unit No. before address change mode is displayed when [I/U SELECTION▼] is shown.
When "SET COMPLETE" is shown, indoor unit No.'s are registered.

NOTICE Turn on power to central control equipment after the addresses are determined.
Turning on power in wrong order may result in a failure to recognize addresses.

● 7-segment display indication in automatic address setting

Items that are to be set by the customer

Code	Contents of a display	
P30	Communication protocol	1: New SL mode 0: previous SL mode (The communication protocol is displayed ; display only)
P31	Automatic address start	0: Automatic address standby 1: Automatic address start
P32	Input starting address	Specify a starting indoor unit address in automatic address setting.
P33	Input number of connected indoor units	Specify the number of indoor units connected in the refrigerant system in automatic address setting.
P34	Polarity definition	0: Network polarity not defined. 1: Network polarity defined.

7-segment display indication in automatic address setting.

Code	Contents of a display
AUX	During automatic address setting. X: The number of indoor units recognized by the outdoor unit.
AUE	Indoor unit address setting is completed normally.
End	Polarity is defined. (Automatic address) Completed normally.

Address setting failure indication

Code	Contents of a display	Please check
A00	Unable to find any indoor unit that can be actually communicated with.	Are signal lines connected properly without any loose connections? Is power for indoor units all turned on?
A01	The number of the indoor units that can be actually communicated with is less than the number specified in P33 on the 7-segment display panel.	Are signal lines connected properly without any loose connections? Are the network connectors coupled properly? Input the number of connected indoor units again.
A02	The number of the indoor units that can be actually communicated with is more than the number specified in P33 on the 7-segment display panel.	Are signal lines connected properly without any loose connections? Are the network connectors coupled properly? Input the number of connected indoor units again.
A03	Starting address (P32) + Number of connected indoor units (P33) > 128	Input the starting address again. Input the number of connected indoor units again.
A04	While some units are operating in the previous SL mode on the network, the automatic address setting on multiple refrigerant systems is attempted.	Perform manual address setting. Arrange all units to operate in the new SL.

Error indication

Code	Contents of a display	Cause
E2	Duplicating indoor unit address.	• Incorrect manual address setting
E3	Incorrect pairing of indoor-outdoor units.	• An outdoor unit number that does not exist in the network is specified • No master unit exists in combination outdoor unit.
E11	Address setting for plural remote controls.	• Indoor unit address is set from plural remote controls.
E12	Incorrect address setting of indoor units.	• Automatic address setting and manual address setting are mixed.
E31	Duplicating outdoor unit address.	• Plural outdoor units are exist as same address in same network.
E46	Incorrect setting.	• Automatic address setting and manual address setting are mixed.

7-2. CONTROL SWITCHING

Outdoor unit control settings can be changed with the dipswitch and 7-segment display P $\bigcirc\bigcirc$ setting on the PCB. In changing settings in P $\bigcirc\bigcirc$ on the 7-segment display panel, you can use SW8 (increasing a number shown on the 7-segment display panel: one's place), SW9 (increasing a number shown on the 7-segment display panel: tens place) and SW7 (data write/enter) by pressing them for a prolonged time.

Contents of Control switching	Method of control setting	
	DIP switch SW setting	P $\bigcirc\bigcirc$ setting on the 7-segment display panel.
Forced cooling/heating mode*2	Switch SW3-7 to ON*1	Select "2" in P07. *1
Cooling test operation	Switch SW5-1 to ON + SW5-2 to ON	—
Heating test operation	Switch SW5-1 to ON + SW5-2 to OFF	—
Pump down	Close the outdoor unit service valves and perform the following operations in the stated order: (1) Switch SW5-2 to ON (2) Switch SW5-3 to ON (3) Switch SW5-1 to ON	—
Demand mode *2 (J13 closed: level input J13 opened: pulse input)	SW4-7:OFF, SW4-8:OFF*1 80% (factory setting) SW4-7:ON, SW4-8:OFF*1 60% SW4-7:OFF, SW4-8:ON*1 40% SW4-7:ON, SW4-8:ON*1 00%	Select "1" in P07. *1
Communication protocol setting	SW5-5 ON: previous SL communication, OFF: new SL communication	—
CnS1 input setting	J13: closed (factory setting) for level input, J13: opened for pulse input	—
Defrost setting	J15: closed (factory setting) for normal defrost, J15: opened for enhanced defrost	—
Operation priority change	—	P01 0: earlier entry priority (factory setting) 1: later entry priority
Outdoor fan snow guard control	—	P02 0: invalid (factory setting) 1: valid
Outdoor fan snow guard control operation time setting	—	P03 30sec (factory setting) 10, 30—600sec
Capacity save mode *3	—	P04 OFF: invalid (factory setting) 000, 040, 060, 080 [%]
Silent mode setting *2	—	P05 0 (factory setting) — 3: the larger the number, the stronger the effect.
External output (CnZ1) function assignment	—	P06
External input (CnS1) function assignment	—	P07
Spare	—	P8—29

*1 The switching is activated when both SW and P $\bigcirc\bigcirc$ are changed.

*2 The switching is activated when a signal is input to CnS1.

*3 Capacity restriction is effected without a signal input to CnS1 in the capacity save mode.

The external input function of CnS1 can be changed by changing the setting in P07 on the 7-segment display panel. When a signal is input to CnS1, the following functions are enabled.

	CnS1 closed	CnS1 opened
"0" : External operation input	Operation permitted	Operation prohibition
"1" : Demand input	Invalid	Valid
"2" : Cooling/heating forced input	Heating	Cooling
"3" : Silent mode input 1 *1	Valid	Invalid
"4" : Spare	—	—
"5" : Outdoor fan snow guard control input	Valid	Invalid
"6" : Test run external input 1 (equivalent to SW5-1)	Test run start	Normal operation
"7" : Test run external input 2 (equivalent to SW5-2)	Cooling test run	Heating test run
"8" : Silent mode 2 *2	Valid	Invalid
"9" : Spare	—	—

*1 Switch valid/invalid depending on the outdoor temperature.

*2 Any time valid not depending on the outdoor temperature.

The external output function of CnZ1 can be changed by changing the setting in P06 on the 7 segment display panel.

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

7-3. External input and output specifications.

Contents	Specification	Connector on PCB
External input CnS1	Non-voltage contact (DC12V)	J.S.T(NICHIAITSU) B02B-XAKS-1-T
External output CnZ1	DC12V output	MOLEX 5566-02A-RE

8. TEST OPERATION

Before beginning operation

- (1) **Make sure that a measurement between the power source terminal block and ground, when measured with a 500V megger tester, is greater than 1 MΩ.**
When the unit is left for a long time with power OFF or just after the installation, there is possibility that the refrigerant is accumulated in the compressor and the insulation resistance between the contact terminals for power source and grounding decreases to 1MΩ or around.
When the insulation resistance is 1MΩ or more, the insulation resistance will rise with crank case heater power ON for 6 hours or more because the refrigerant in the compressor is evaporated.
- (2) Please check the resistance of the signaling line terminal block before power is turned on. If a resistance measurement is 100Ω or less, it suggests a possibility that power cables are connected to the signaling line terminal block. (Please check wiring refer to section 6.ELECTRICAL WIRING WORK)
- (3) **Be sure to turn on the crank case heater 6 hours before operation.**
- (4) **Make sure that the bottom of the compressor casing is warm.** (Outdoor temperature + 5°C or more)
- (5) Be sure to fully open the service valves (liquid, gas) for the outdoor unit.
Operating the outdoor unit with the valves closed may damage the compressor.
- (6) **Check that the power to all indoor units has been turned on. If not, a failure may occur.**

CAUTION

Please make sure that the service valves (gas, liquid) are full open before a test run. Conducting a test run with any of them in a closed position can result in a compressor failure.

Check operation

It is recommended to practice the check operation before the test run.

(You may test run or perform normal operation even if the check operation is not performed.)

For details of check operation, refer to the technical manual.

Important:

- Before starting the check operation, complete the address setting of indoor and outdoor units and the refrigerant charge.
- You cannot check precisely unless proper quantity of refrigerant is charged.
- You cannot perform the check operation when the system is stopped under abnormal condition.
- You cannot perform the check operation when total capacity of connected indoor units is less than 80% of outdoor units.
- You cannot perform the check operation if the communication protocol is previous SL.
- Don't perform the check operation at the same time on a plural number of refrigerant systems. You cannot check precisely.
- Perform the check operation within the applicable temperature range (Outdoor air temperature: 0 - 43°C, indoor air temperature: 10 - 32°C). You cannot start the check operation if it is out of the applicable temperature range.
- You cannot check the fresh air ventilation indoor unit. (You can check indoor units other than the fresh air ventilation indoor unit on the same refrigerant system.)
- You cannot perform the check operation if the connected indoor unit is only one in one refrigerant system.
- You cannot perform the check operation if it is set at 0% in the demand mode or capacity save mode.

(1) Check item

Check operation allows confirming the following points.

- Whether the service valve is closed or not (Open/close check)
- Whether refrigerant pipes and signal line are connected properly on indoor/outdoor units or not (Mismatch check)
- Whether the indoor unit expansion valve operates properly or not (Expansion valve failure check)

(2) Procedure of check operation

- (a) Start of check operation
- Confirm that all of SW3-7 (Forced cooling/heating mode), SW-5-1 (Test run), SW5-2 (Test run cooling setting) and SW5-3 (Pump-down operation) are turned OFF.
 - Change then SW3-5 (Check operation) OFF→ON to start the check operation.
 - It takes normally about 15 - 30 minutes from the start to the end of check operation. (Max. 80 minutes)
- (b) Termination of check operation and result display
- As the check operation terminates, the system stops automatically and displays the result on the 7-segment indicator.
- <Normal termination>
- "CHO End" is shown on the 7-segment indicator.
 - Return SW3-5 to OFF setting. 7-segment indicator returns to normal display.
- <Termination by error>
- Error is displayed on the 7-segment indicator.
 - Correct the abnormal condition referring to the "Check Point" column, and return SW3-5 to OFF.
 - Restart then the check operation from (2) (a).

7-segment display during check operation

Code	Data	Content
H1	Max. remaining time	• Preparing for check operation. Indicates the maximum remaining time (minute).
H2	Max. remaining time	• During the check operation. Indicates the maximum remaining time (minute).
CHO	End	• Normal termination of check operation.

Display on 7-segment indicator after check operation

Code	Data	Content	Check Point
CHL	---	Service valve is closed. (Refrigerant circuit is choked somewhere.)	<ul style="list-style-type: none"> • Is the service valve of outdoor unit closed? • Is the low pressure sensor normal? (Detection pressure can be confirmed on 7-segment indicator.) • Is the coil connector of indoor unit expansion valve connected? • Is the expansion valve coil of indoor unit detached from the valve body? • Is the heat exchanger sensor of indoor unit normal? (Check for sensor disconnection.)
CHU	Abnormal indoor unit No.	Mismatch of refrigerant pipes/signal line. Refrigerant is not circulated in the abnormal indoor unit.	<ul style="list-style-type: none"> • Are refrigerant pipes/signal line connected properly between indoor and outdoor units? • Is the coil connector of indoor unit expansion valve connected? • Is the expansion valve coil of indoor unit detached from the valve body? • Is the heat exchanger sensor of indoor unit normal? (Check for sensor disconnection.)
CHJ	Abnormal indoor unit No.	Expansion valve does not operate properly on the abnormal indoor unit.	<ul style="list-style-type: none"> • Is the coil connector of indoor unit expansion valve connected? • Is the expansion valve coil of indoor unit detached from the valve body? • Is the heat exchanger sensor of indoor unit normal? (Check for sensor disconnection.)
CHE	---	Termination of check operation by error	<ul style="list-style-type: none"> • Is any error (E??) indicated on indoor or outdoor units? • Is signal line connected without loose? • Was any SW setting changed during check operation?
CHE	Abnormal indoor unit No.	Termination of check operation by error. Indicated indoor unit is under abnormal condition.	<ul style="list-style-type: none"> • Is any error (E??) indicated on indoor or outdoor units? • Is signal line connected without loose? • Is the power source turned ON at the indoor unit side?

*Errors other than the above may be indicated by the detection of error. In such occasion, correct the matter by referring to the technical manual.

*Code and Data are indicated alternately by 4-second intervals.

Test operation

(1) Test run from an outdoor unit.

- Whether CnS1 is set to ON or OFF, you can start a test run by using the SW5-1 and SW5-2 switches provided on the outdoor unit PCB.
- Select the test run mode first.
- Please set SW5-2 to ON for a cooling test run or OFF for a heating test run. (It is set to OFF at the factory for shipment.)
- Turning SW5-1 from OFF to ON next will cause all connected indoor units to start.
- When a test run is completed, please set SW5-1 to OFF.
- Note: During a test run, an indoor unit cannot be operated from the remote control unit (to change settings). ("Under centralized control" is indicated.)

(2) Method of starting a test run for a cooling operation from an outdoor unit: please operate a remote control unit according to the following steps.

- (a) Start of a cooling test run
- Operate the unit by pressing the [START/STOP] button.
 - Select the "COOLING" mode with the [MODE] button.
 - Press the [TEST RUN] button for 3 seconds or longer.
- The screen display will be switched from "Select with ITEM" → "Determine with [SET]" → "Cooling test run".
- When the [SET] button is pressed while "Cooling test run" is displayed, a cooling test run will start. The screen display will be switched to "COOLING TEST RUN."
- (b) Termination of a cooling test run
- When the [START/STOP] button or the "TEMP SET" button is pressed, a cooling test run will be terminated.

Transfer

- Use the instruction manual that came with the outdoor unit to explain the operation method to the customer.
- Please ask the customer to keep this installation manual together with the user's manual of his indoor units.
- Instruct the customer that the power should not be turned off even if the unit is not to be used for a long time. This will enable operation of the air-conditioner any time. (Since the compressor bottom is warmed by the crank case heater, seasonal compressor trouble can be prevented.)

9. CAUTIONS FOR SERVICING (for R410A and compatible machines)

- (1) To avoid mixing of different types of oil, use separate tools for each type of refrigerant.
- (2) To avoid moisture from being absorbed by the ice machine oil, the time for when the refrigerant circuit is open should be kept as short as possible. (Within 10 min. is ideal.)
- (3) For other piping work, airtightness testing, vacuuming, and refrigerant charging, refer to section 4, REFRIGERANT PIPING.
- (4) Diagnostic Inspection Procedures
For the meanings of failure diagnosis messages, please refer to the technical manual.
- (5) 7-segment LED indication
Data are indicated when so chosen with the indication selector switch. For the details of indication, please refer to the technical manual.

6. OUTDOOR UNIT DISASSEMBLY PROCEDURE

DISASSEMBLY PROCEDURE



WARNING

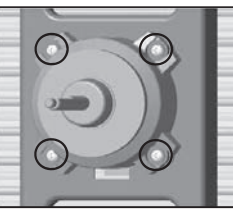
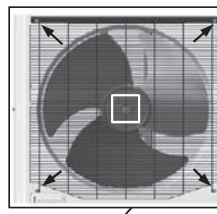
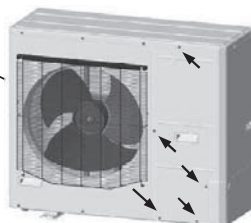
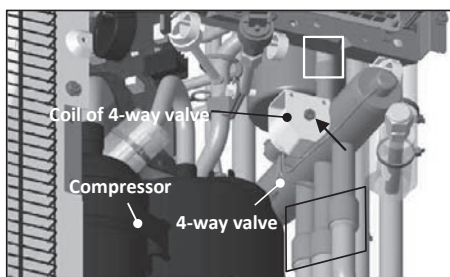
Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDC•SCM series)

1. To remove the service panel

- (1) Remove 5 service panel fixing screws and remove it.

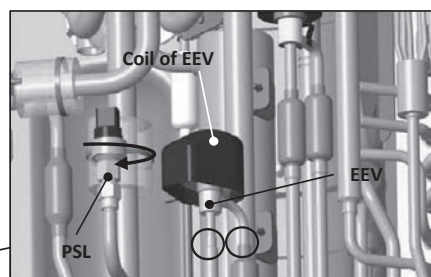


2. To remove the fan motor (FM)

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the motor connector(FMxx or CNFxx) on PCB in control box.
- (3) Remove 4 fan guard fixing screws and remove it.(← mark)
- (4) Remove the propeller fan fixing nut and remove it.(□ mark)
- (5) Remove 4 fan motor fixing nuts and remove it.(○ mark)

3. To remove the 4-way valve (20S)

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the coil of 4-way valve connector(CNNx or CNS,CN20S) on PCB in control box.
- (3) Remove the coil of 4-way valve fixing screw and remove it.(← mark)
- (4) Remove welded part of 4-way valve by welding.(□ mark)

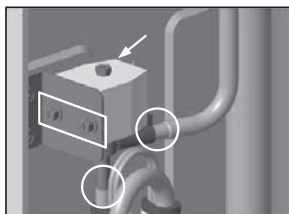


4. To remove the low pressure sensor (PSL)

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the PSL connector(CNLx or CNPS) on PCB in control box.
- (3) Turn PSL to the left and remove it.
(Double spanners are needed.)

5. To remove the electronic expansion valve (EEV)

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the EEV connector(CNEEVx) on PCB in control box.
- (3) Remove the coil of EEV by pull out on the top.
- (4) Remove welded part of EEV by welding.(○ mark)

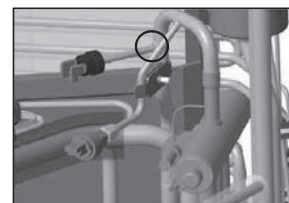


7. To remove bypass valve (SV)

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the SV connector on PCB in control box.
- (3) Remove the coil of SV fixing screws.
(← mark)
- (4) Remove 2 coil of SV fixing screws and remove it.(□ mark)
- (5) Remove welded part of SV by welding.
(○ mark)

6. To remove the temperature sensors (example "Tho-D1")

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the Tho-D1 connector(CNTH) on PCB in control box.
- (3) Pull out the temperature sensors "Tho-D1" from the sensor holder.



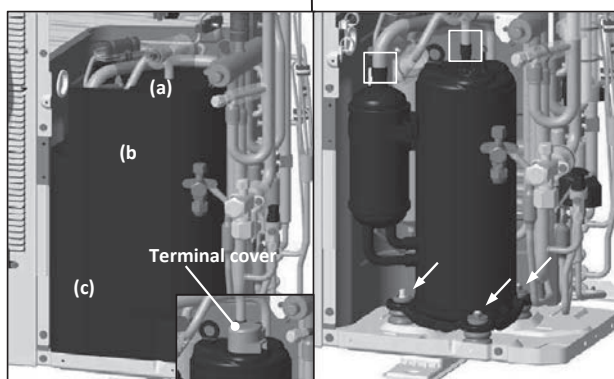
8. To remove the high pressure switch (63H)

- (1) Remove the service panel.(See No.1)
- (2) Disconnect the 63H connector(CNH or CNQx) on PCB in control box.
- (3) Remove welded part of high pressure switch by welding.

PROCEDURE & PICTURES

9. To remove the compressor (CM)

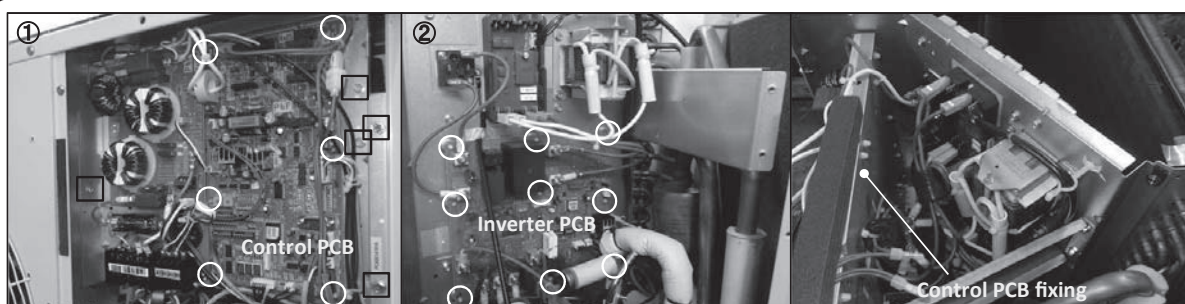
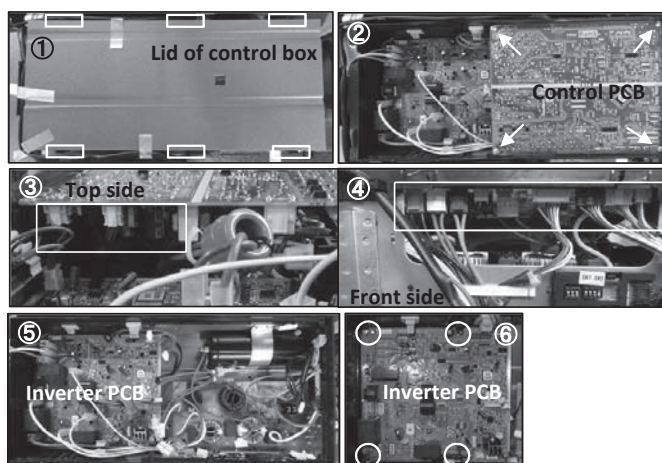
- (1) Remove the service panel.(See No.1)
- (2) Remove the insulation which covers compressor. (Strings (a)~(c) should be loosen.)
- (3) Remove the terminal cover fixing bolt and remove it, and disconnect the power wiring.
- (4) Remove welded part of compressor by welding. (□ mark)
- (5) Remove 3 compressor fixing nuts(← mark) using spanner or adjustable wrench.



10. To remove the printed circuit board (PCB)

«Control box service top side type»

- (1) Remove the service panel and top panel.
- (2) Take off 6 hooks of lid and remove it. (□ mark, Pic.①)
- (3) Pull off all the inserted connectors of control PCB.(□ mark, Pic.③④)
- (4) Remove 4 cotrol PCB fixing screws and remove it.(← mark, Pic.②)
- (5) Pull off all the inserted connectors of inverter PCB.(Pic.⑤)
- (6) Remove 4 inverter PCB fixing screws and remove it.(○ mark, Pic.⑥)



11. To remove the printed circuit board (PCB)

«Control box service front side type»

- (1) Remove the service panel and top panel.
- (2) Pull off all the inserted connectors of control PCB.(Pic.①)
- (3) Take off 6 control PCB fixing locking supports and remove it.(○ mark, Pic.①)
- (4) Remove 5 plate fixing screws and open it.(□ mark, Pic.①)
- (5) Pull off all the inserted connectors of inverter PCB.(Pic.②)
- (6) Take off 9 inverter PCB fixing locking supports and remove it.(○ mark, Pic.②)

7. INDOOR UNIT DISASSEMBLY PROCEDURE

DISASSEMBLY PROCEDURE

WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDT series)

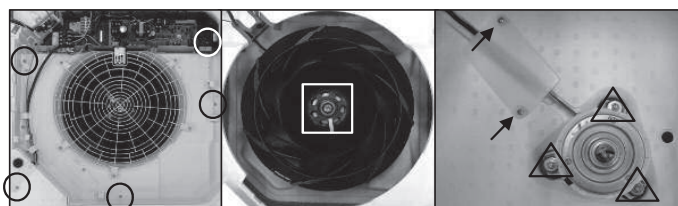
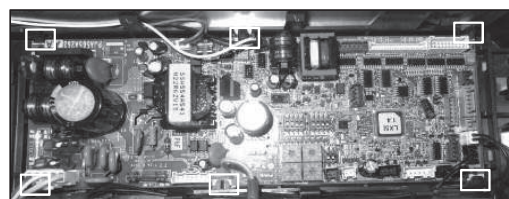


1. To remove the lid of control box

- (1) Remove 2 lid fixing screws and remove it.

2. To remove the printed circuit board (PCB)

- (1) Remove the lid of control box.(See No.1)
- (2) Pull off all the inserted connectors.
- (3) Take off 6 fixing hooks and remove it.

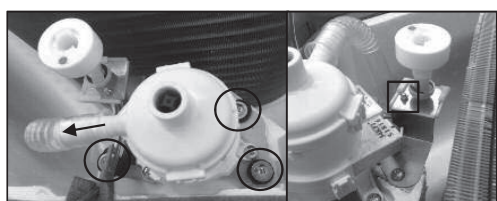


3. To remove the impeller and motor (FM)

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the motor connector(CNMx) on PCB in control box.
- (3) Remove 5 bellmouth fixing screws and remove it.(○ mark)
- (4) Remove the impeller fixing nut and remove it.(□ mark)
- (5) Remove 2 plate fixing screws and remove it.(← mark)
- (6) Remove 3 motor fixing nuts and remove it.(△ mark)

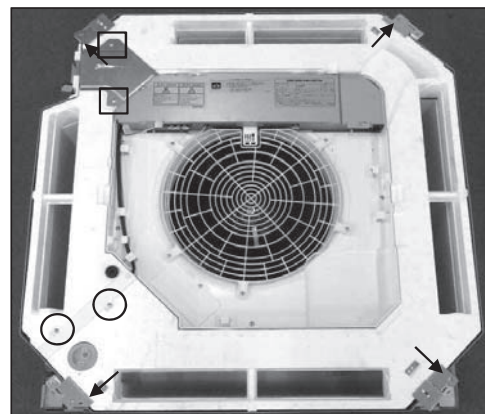
4. To remove the drain pan

- (1) Remove the lid of control box.(See No.1)
- (2) Pull off all the inserted connectors.
- (3) Remove 2 plate fixing screws and remove it.
(○ mark)
- (4) Remove 2 lid fixing screws and remove it.
(□ mark)
- (5) Remove 4 drain pan fixing screws and remove it.
(← mark)



5. To remove drain pump (DM) and float switch (FS)

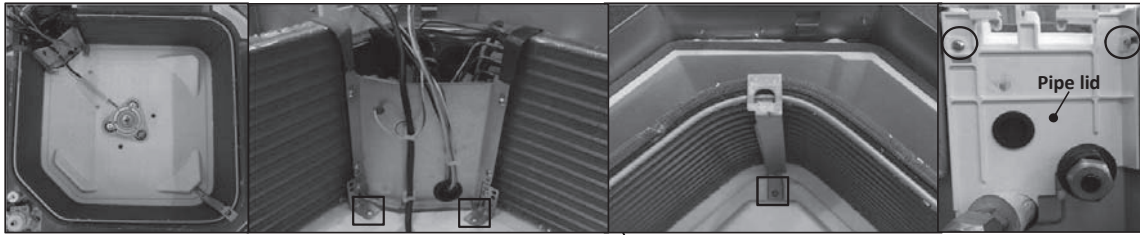
- (1) Remove the drain pan.(See No.4)
- (2) Pull the hose to the arrow direction and remove it.
- (3) Remove 3 drain pump fixing screws and remove it.(○ mark)
- (4) Remove the float switch fixing screw and remove it.(□ mark)



6. To remove the temperature sensors (example "Thi-R1")

- (1) Remove the drain pan.(See No.4)
- (2) Pull out the temperature sensor "Thi-R1" from the sensor holder.

PROCEDURE & PICTURES

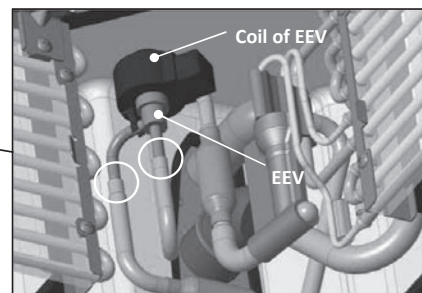


7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.4)
- (2) Remove 2 pipe lid fixing screws and remove it.(○ mark)
- (3) Remove 3 heat exchanger assembly fixing screws and remove it.(□ mark)

8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.7)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



General view

DISASSEMBLY PROCEDURE



WARNING

Precautions for safety

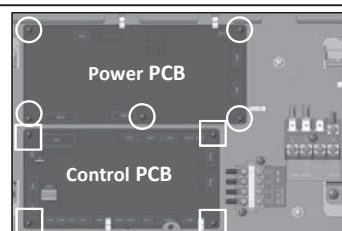
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDTC series)



1. To remove the lid of control box

- (1) Remove the lid fixing screw and remove it.

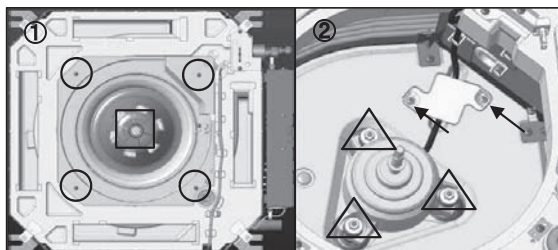


2. To remove the printed circuit board (PCB)

- (1) Remove the lid of control box.(See No.1)
- (2) Pull off all the inserted connectors.
- **Power PCB**
(3) Take off 5 power PCB fixing locking supports and remove it.(○ mark)
- **Control PCB**
(4) Take off 4 control PCB fixing locking supports and remove it.(□ mark)

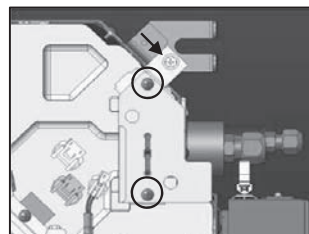
3. To remove the impeller and motor (FM)

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the motor connector(CNMx) in the middle of wiring.
- (3) Remove 4 bellmouth fixing screws and remove it.(○ mark)
- (4) Remove the impeller fixing nut and remove it.(□ mark)
- (5) Remove 2 plate fixing screws and remove it.(← mark)
- (6) Remove 3 motor fixing nuts and remove it.(△ mark)



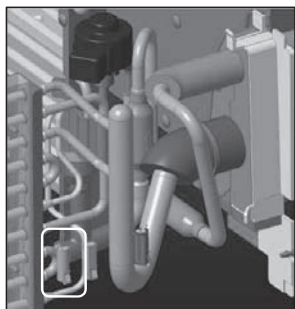
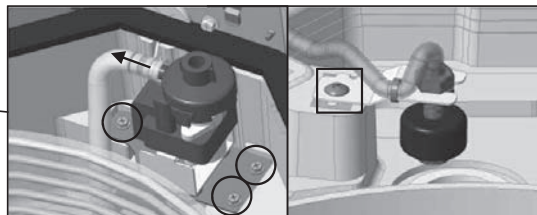
4. To remove the drain pan

- (1) Remove 2 plate fixing screws and remove it.
(○ mark)
- (2) Remove 4 drain pan fixing screws and remove it.
(← mark, Four corners)



5. To remove drain pump (DM) and float switch (FS)

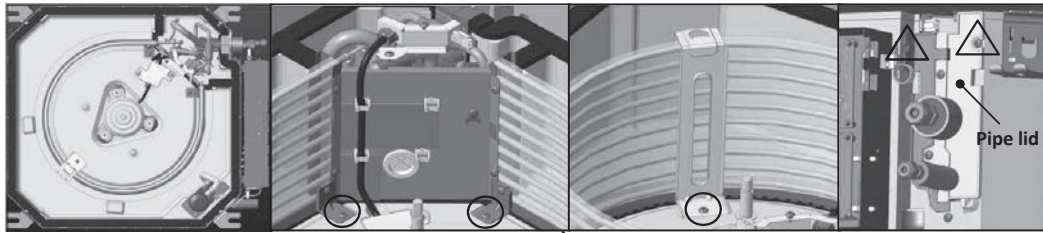
- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the drain pump connector(CNRx) and float switch connector(CNlx) in the middle of wiring.
- (4) Remove the drain pan.(See No.4)
- (5) Pull the hose to the arrow direction and remove it.
- (6) Remove 3 drain pump fixing screws and remove it.(○ mark)
- (7) Remove the float switch fixing screw and remove it.(□ mark)



6. To remove the temperature sensors (example "Thi-R1")

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the Tho-R1 connector(CNNx) in the middle of wiring.
- (3) Remove the drain pan.(See No.3)
- (4) Pull out the temperature sensor "Thi-R1" from the sensor holder.

PROCEDURE & PICTURES

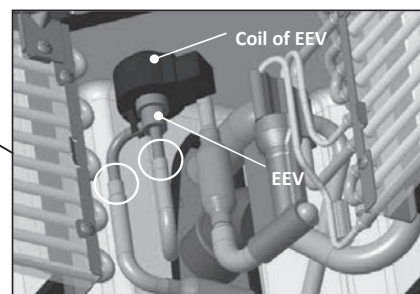


7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.4)
- (2) Remove 2 plate fixing screws and remove it.(△ mark)
- (3) Remove 3 heat exchanger assembly fixing screws and remove it.(○ mark)

8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.7)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



General view

DISASSEMBLY PROCEDURE

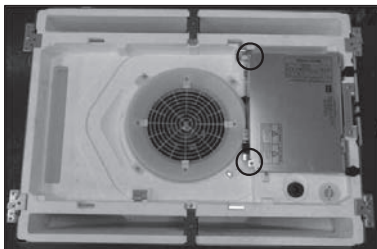


WARNING

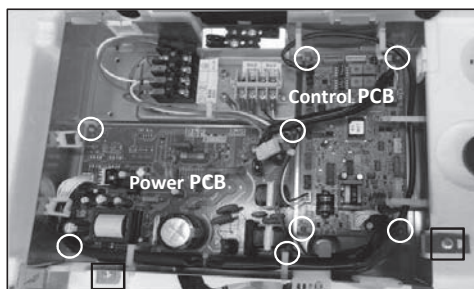
Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDTW series)

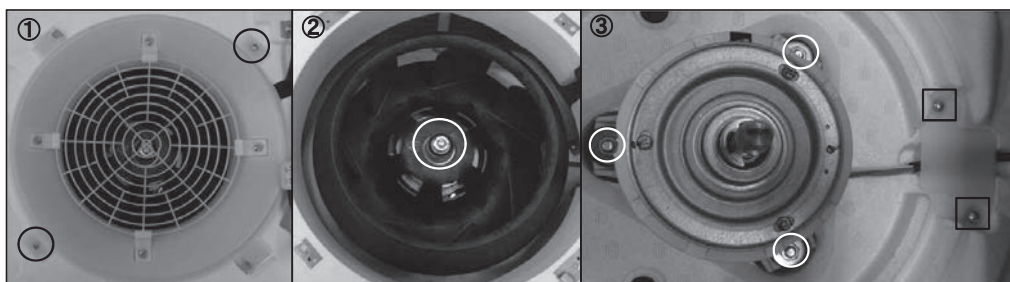


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

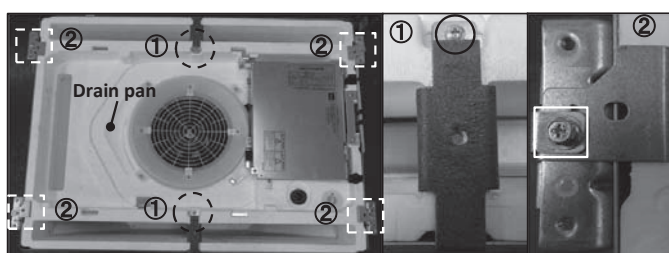


- 2. To remove the printed circuit board (PCB)**
 - (1) Remove the lid of control box.(See No.1)
 - (2) Pull off all the inserted connectors.
 - **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it.(○ mark)
 - **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it.(○ mark)

- 3. To remove the control box**
 - (1) Remove the lid of control box.(See No.1)
 - (2) Pull off all the inserted connectors.
 - (3) Remove 2 control box fixing screws(□ mark) and remove it.

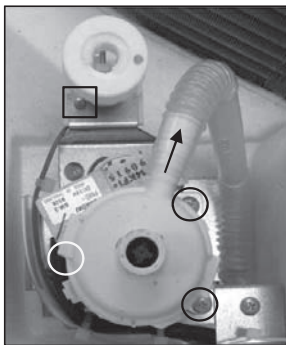


- 4. To remove the impeller and motor (FM)**
 - (1) Remove the lid of control box.(See No.1)
 - (2) Disconnect the motor connector(CNMx) on PCB in control box.
 - (3) Remove 2 fan guard fixing screws and remove it.(Pic.①)
 - (4) Remove the impeller fixing nut and remove it.(Pic.②)
 - (5) Remove 2 plate fixing screws and remove it.(Pic.③, □ mark)
 - (6) Remove 3 motor fixing nuts and remove it.(Pic.③, ○ mark)

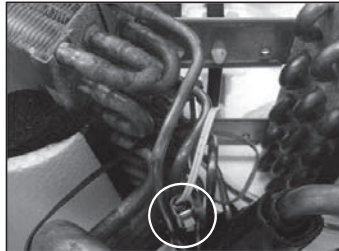


- 5. To remove the drain pan**
 - (1) Remove the control box.(See No.3)
 - (2) Remove the plate fixing screw and remove it.
(Pic.①, ○ mark)
 - (3) Remove the bracket fixing screw.(Pic.②, □ mark)
 - (4) Pull drain pan off.

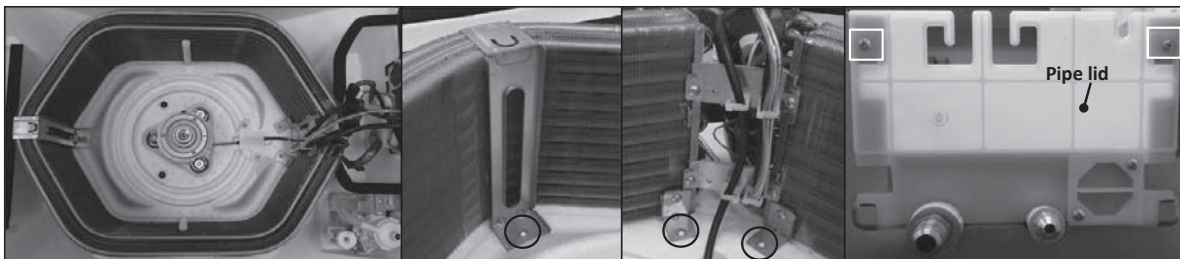
PROCEDURE & PICTURES



- 6. To remove the drain pump(DM) and float switch(FS)**
- (1) Remove the drain pan.(See No.5)
 - (2) Pull a hose to the arrow direction and remove it.
 - (3) Remove 3 drain pump fixing screws and remove it.(○ mark)
 - (4) Remove the float switch fixing screw and remove it.(□ mark)

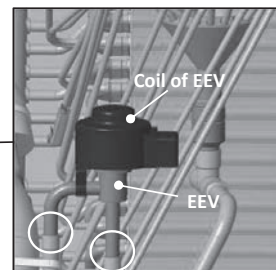


- 7. To remove the temperature sensors (example "Thi-R1")**
- (1) Remove the drain pan.(See No.5)
 - (2) Pull out the temperature sensor "Thi-R1" from the sensor holder.



- 8. To remove the heat exchanger assembly**
- (1) Remove the drain pan.(See No.5)
 - (2) Remove 2 pipe lid fixing screws and remove it.(□ mark)
 - (3) Remove 3 heat exchanger assembly fixing screws and remove it.(○ mark)

- 9. To remove the Electronic Expansion Valve (EEV)**
- (1) Remove the heat exchanger assembly.(See No.8)
 - (2) Remove the coil of EEV by pull out on the top.
 - (3) Remove welded part of EEV by welding.(○ mark)



General view

DISASSEMBLY PROCEDURE

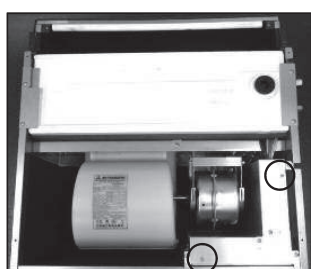


WARNING

Precautions for safety

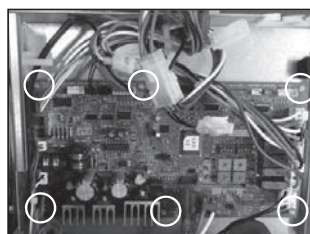
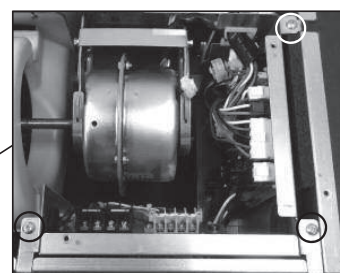
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDTQ series)



- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

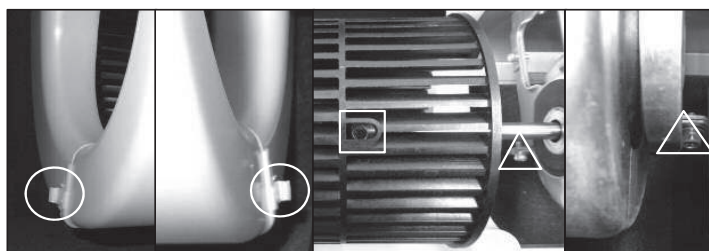
- 2. To remove the control box**
(1) Remove the lid of control box.(See No.1)
(2) Pull off all the inserted connectors.
(3) Remove 3 control box fixing screws and remove it.
(4) Pull out the control box.



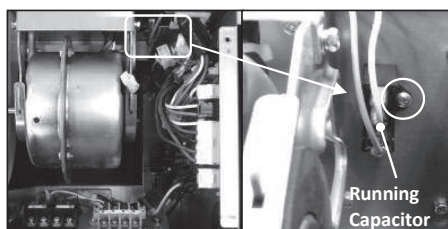
- 3. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1)
(2) Remove control box.(See No.2)
(3) Take off 6 PCB fixing locking supports and remove it.



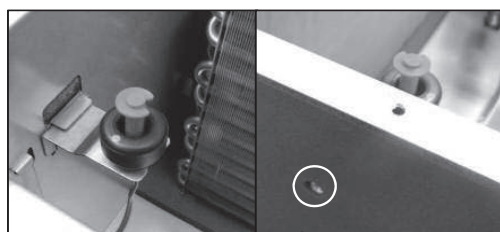
- 4. To remove the drain pan.**
(1) Remove 2 plate fixing screws and remove it.(right and left)
(2) Pull out the control box.



- 5. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1)
(2) Disconnect the float switch connector(CNfx) in the middle of wiring.
(3) Take off 2 impeller casing hooks and remove it.(O mark)
(4) Remove the impeller fixing bolt and remove it.(□ mark)
(5) Remove 2 motor fixing screws and remove it.(△ mark)

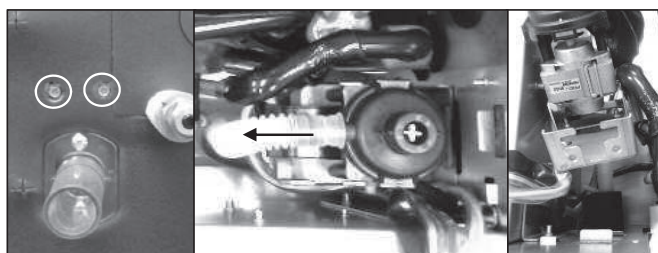


- 6. To remove the running capacitor of fan motor**
(1) Remove the running capacitor fixing screw and remove it.



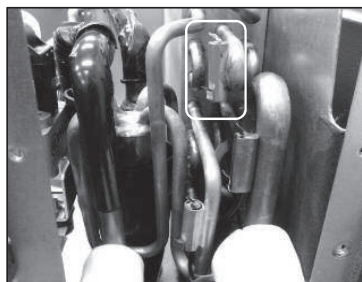
- 7. To remove the float switch (FS)**
(1) Remove the lid of control box.(See No.1)
(2) Disconnect the float switch connector(CNfx) in the middle of wiring.
(3) Remove the drain pan.(See No.4)
(4) Remove the float switch fixing screw and remove it.

PROCEDURE & PICTURES



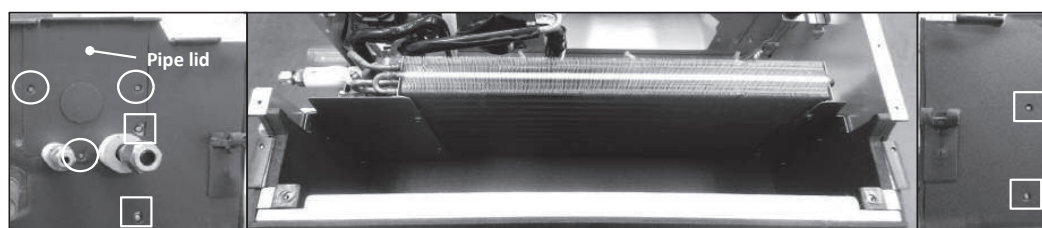
8. To remove drain pump (DM)

- (1) Remove the lid of control box.(See No.1)
- (2) Remove the drain pan.(See No.4)
- (3) Disconnect the drain pump connector(CNRx) in the middle of wiring.
- (4) Pull a hose to the arrow direction and remove it.
- (5) Remove 2 drain pump assembly fixing screws and remove it.



9. To remove the temperature sensors (example "Thi-R1")

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the Tho-R1 connector(CNNx) on PCB in control box.
- (3) Remove the drain pan.(See No.4)
- (4) Pull out the temperature sensor "Thi-R1" from the sensor holder.

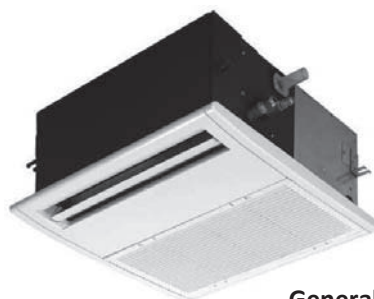
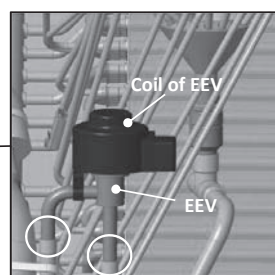


10. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.3)
- (2) Remove 3 pipe lid fixing screws and remove it.(○ mark)
- (3) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

11. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.10)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



General view

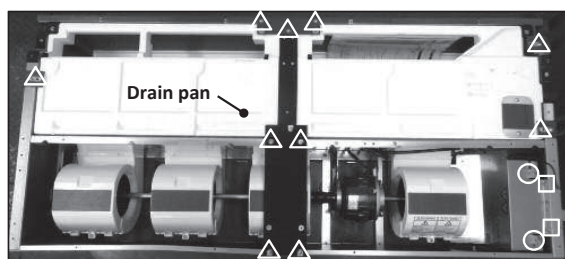
DISASSEMBLY PROCEDURE

WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

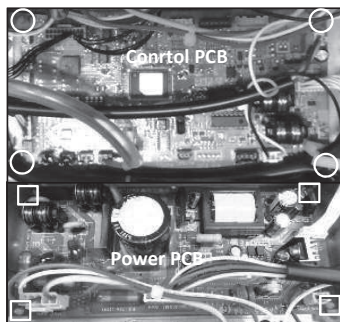
PROCEDURE & PICTURES (FDTS series)



- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.(○ mark)

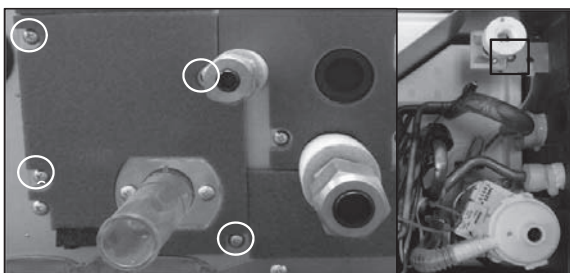
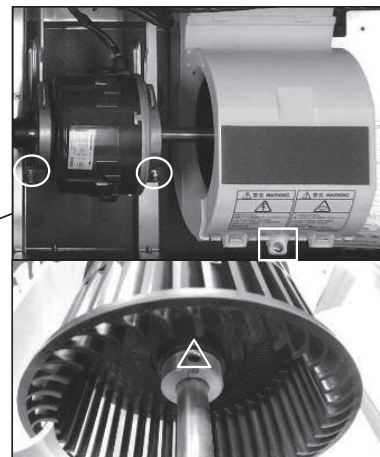
- 2. To remove the control box**
(1) Remove the lid of control box.(See No.1)
(2) Pull off all the inserted connectors.
(3) Remove 2 control box fixing screws and remove it.(□ mark)

- 3. To remove the drain pan**
(1) Remove 10 drain pan fixing screws and remove it.
(Δ mark)



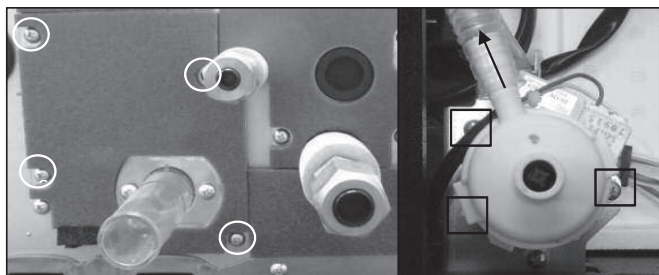
- 4. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1)
(2) Pull off all the inserted connectors.
▪ **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it.(○ mark)
▪ **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it.(□ mark)

- 5. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1)
(2) Disconnect the motor connector(CNMx) on PCB in control box.
(3) Remove 2 motor fixings screw and remove it.(○ mark)
(4) Remove the fan casing fixing screw and remove it.(□ mark)
(5) Remove the impeller fixing bolt and remove it.(Δ mark)



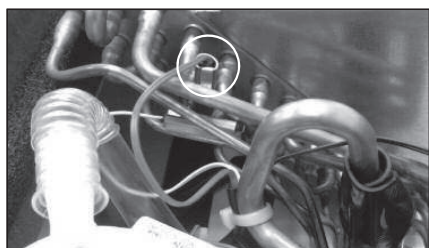
- 6. To remove the flot switch (FS)**
(1) Remove the lid of control box.(See No.1)
(2) Disconnect the flot switch connector(CNI) on PCB in control box.
(3) Remove 4 drain pump assembly fixing screws and remove it.(○ mark)
(4) Remove the flot switch fixing screw and remove it.(□ mark)

PROCEDURE & PICTURES



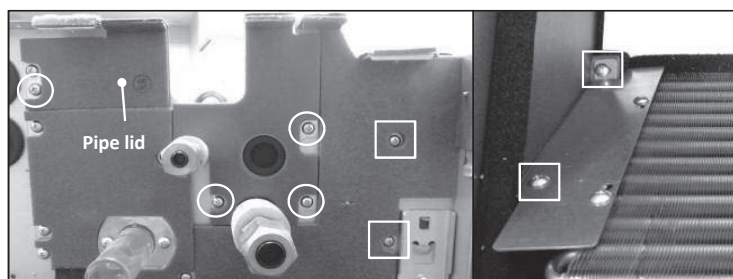
7. To remove drain pump (DM)

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the drain pump connector(CNR) on PCB in control box.
- (3) Remove 4 drain pump assembly fixing screws and remove it.(○ mark)
- (4) Pull a hose to the arrow direction and remove it.
- (5) Remove 3 drain pump fixing screws and remove it.(□ mark)



8. To remove the temperature sensors (example"Thi-R1")

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the Tho-R1 connector(CNNx) on PCB in control box.
- (3) Remove the drain pan.(See No.3)
- (4) Pull out the temperature sensor "Thi-R1" from the sensor holder.

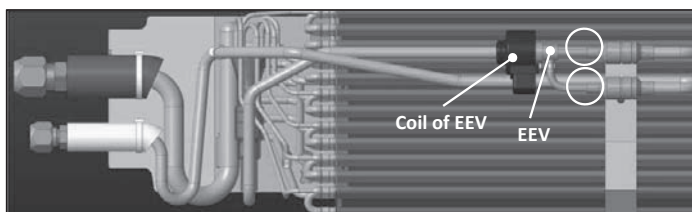


9. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.3)
- (2) Remove 4 pipe lid fixing screws and remove it.(○ mark)
- (3) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

10. To remove the electronic expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.7)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (○ mark)



General view

DISASSEMBLY PROCEDURE

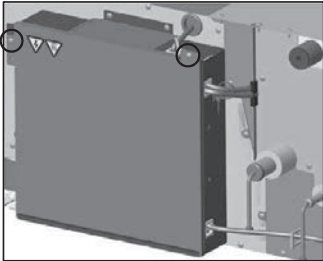


WARNING

Precautions for safety

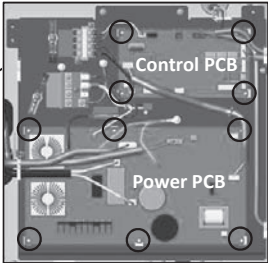
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDU·FDUM series)

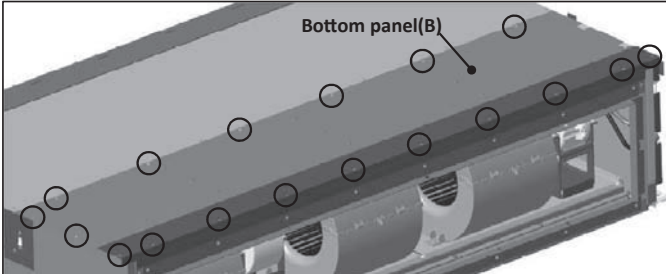


(Bottom)

1. To remove the lid of control box
(1) Remove 2 lid fixing screws and remove it.

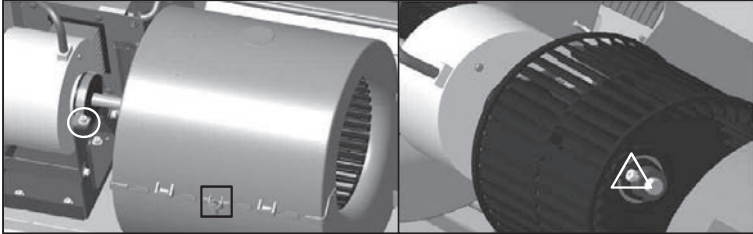


Control PCB
Power PCB

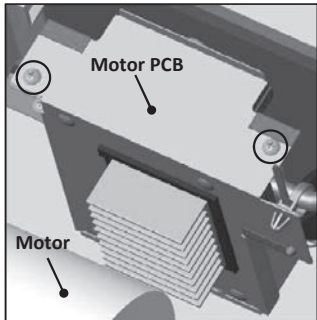


Bottom panel(B)

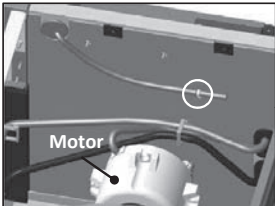
3. To remove the bottom panel(B)
(1) Remove 18 panel fixing screws and remove it.



4. To remove the impellers and motors(FM)
(1) Remove the lid of control box.(See No.1)
(2) Remove the bottom panel(B).(See No.3)
(3) Disconnect the motor connector(CNFMx or CNMx) on PCB in control box.
(4) Remove the motor fixing screw and remove it.
(○ mark/right and left side)
(5) Remove the fan casing fixing screw and remove it.(□ mark)
(6) Remove the sirocco fan fixing bolt and remove it.(△ mark)

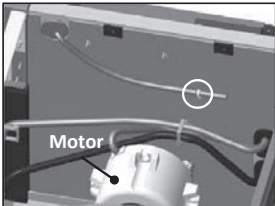


Motor PCB
Motor



Motor

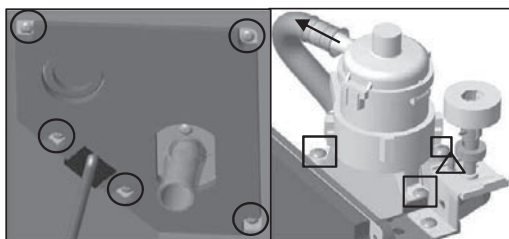
5. To remove the motor PCB
(1) Remove the lid of control box.
(See No.1)
(2) Remove the bottom panel(B).
(See No.3)
(3) Disconnect the motor PCB connector
(CNFMx or CNMx)on PCB in control box.
(4) Remove 2 motor PCB fixing screws
and remove it.



Motor

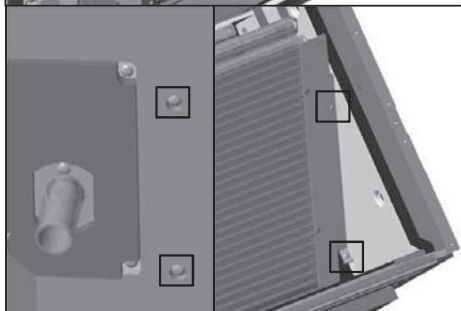
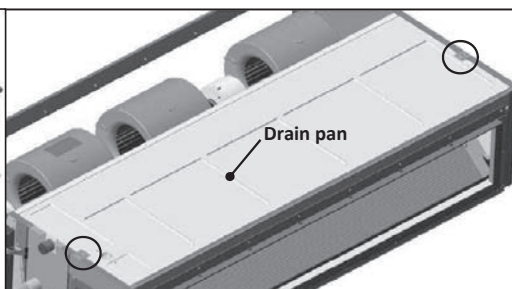
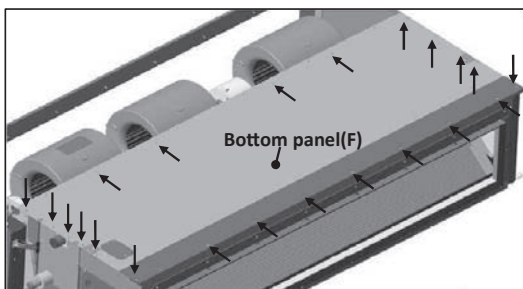
6. To remove the temperature sensors (example"Thi-A")
(1) Remove the lid of control box.(See No.1)
(2) Remove the bottom panel(B).(See No.3)
(3) Disconnect the Thi-A connector(CNH) on PCB in control box.
(4) Pull the temperature sensor fixing clip and remove it.(○ mark)

PROCEDURE & PICTURES



7. To remove the drain pump(DM) and float switch(FS)

- (1) Remove the lid of control box.(See No.1)
- (2) Remove 5 drain pump assembly fixing screws and remove it. (○ mark)
- (3) Disconnect the drain pump connector(CNR) on PCB in control box.
- (4) Pull a hose to the arrow direction and remove it.
- (5) Remove 3 drain pump fixing screws and remove it.(□ mark)
- (6) Disconnect the float switch connector(CNI) on PCB in control box.
- (7) Remove the float switch fixing screw and remove it.(△ mark)

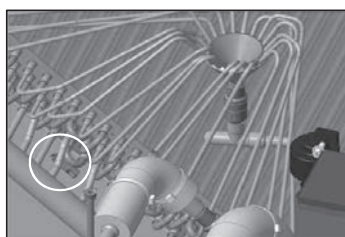
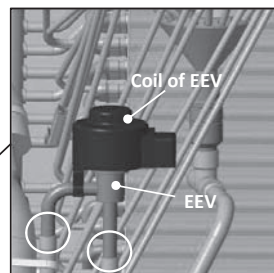


8. To remove the heat exchanger assembly

- (1) Remove the bottom panel(B).(See No.3)
- (2) Remove 22 bottom panel(F) fixing screws and remove it.(← mark)
- (3) Remove 2 drain pan fixing screws and remove it.(○ mark)
- (4) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

9. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.8)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



10. To remove the temperature sensors (example "Thi-R3")

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the Thi-R3 connector(CNN) on PWB in control box.
- (3) Remove the drain pan.(See No.8)
- (4) Pull out the temperature sensor "Thi-R3" from the sensor holder.



General view

DISASSEMBLY PROCEDURE

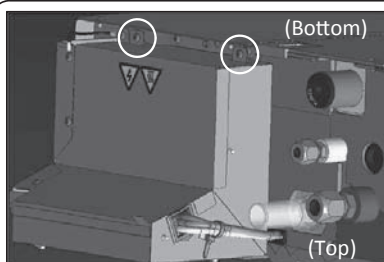


WARNING

Precautions for safety

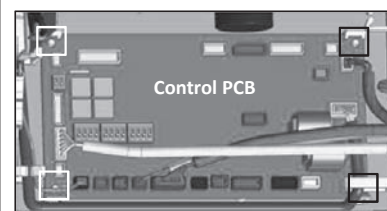
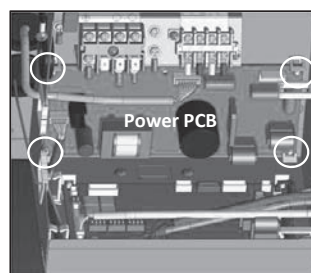
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDUT series)

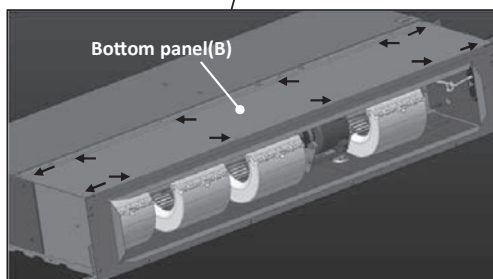


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

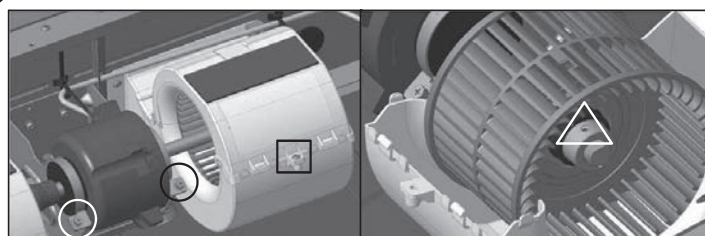
- 3. To remove the bottom panel(B)**
(1) Remove 12 panel fixing screws and remove it.



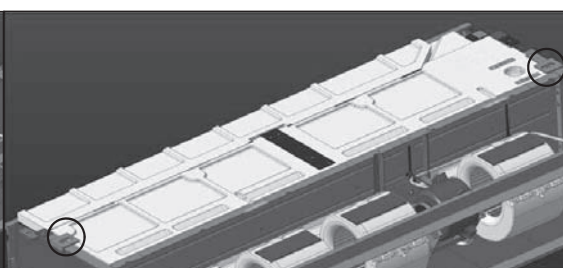
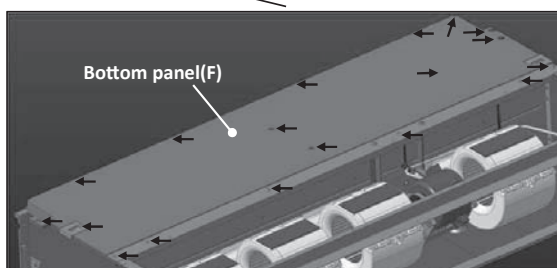
- 2. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1)
(2) Pull off all the inserted connectors.
- **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it. (□ mark)
 - **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it. (○ mark)



- 5. To remove the drain pan**
(1) Remove the bottom panel(B).(See No.3)
(2) Remove 18 bottom panel(F) fixing screws and remove it.(← mark)
(3) Remove 2 drain pan fixing screws and remove it.(○ mark)



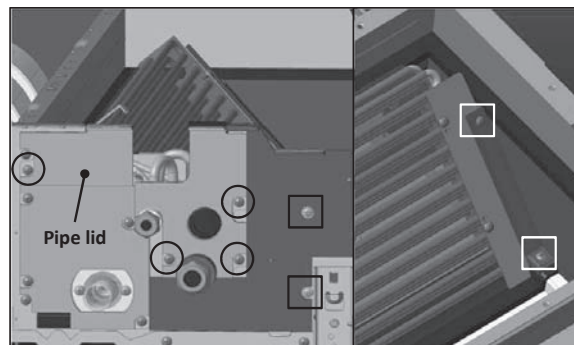
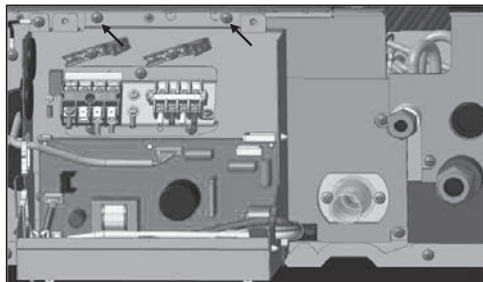
- 4. To remove the impellers and motors(FM)**
(1) Remove the lid of control box.(See No.1)
(2) Remove the bottom panel(B).(See No.3)
(3) Disconnect the motor connector(CNM1) on PCB in control box.
(4) Remove 2 motor fixing screws and remove it.(○ mark)
(5) Remove the fan casing fixing screw and remove it.(□ mark)
(6) Remove the sirocco fan fixing bolt and remove it.(△ mark)



PROCEDURE & PICTURES

6. To remove the control box

- (1) Remove the lid of control box.(See No.1)
- (2) Pull off all the inserted connectors.
- (3) Remove 2 cotrol box fixing screws and remove it.

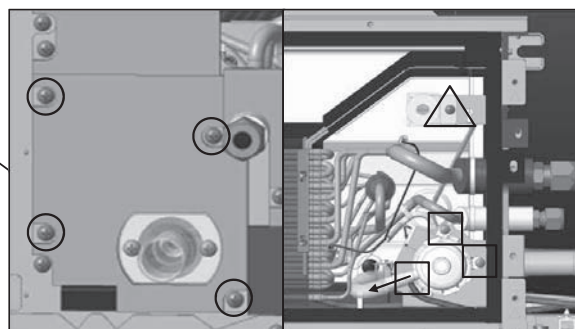


7. To remove the heat exchanger assembly

- (1) Remove the bottom panel(B).(See No.3)
- (2) Remove the drain pan.(See No.5)
- (3) Remove the control box.(See No.6)
- (4) Remove 4 pipe lid fixing screws and remove it.(○ mark)
- (5) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

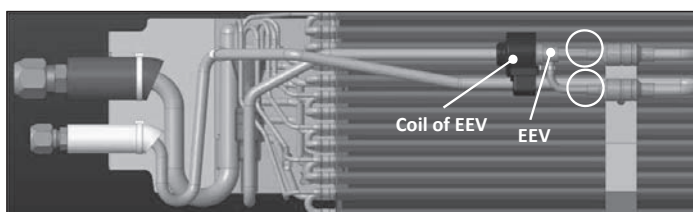
8. To remove the drain pump(DM) and flot switch(FS)

- (1) Remove the control box.(See No.6)
- (2) Disconnect the drain pump connector(CNR) on PCB in control box.
- (3) Disconnect the flot switch connector(CNI) on PCB in control box.
- (4) Remove 4 drain pump assembly fixing screws and remove it.(○ mark)
- (5) Pull a hose to the arrow direction and remove it.
- (6) Remove 3 drain pump fixing screws and remove it.(□ mark)
- (7) Remove the flot switch fixing screw and remove it.(△ mark)



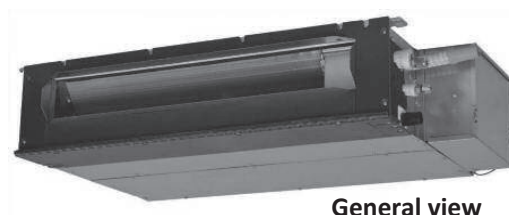
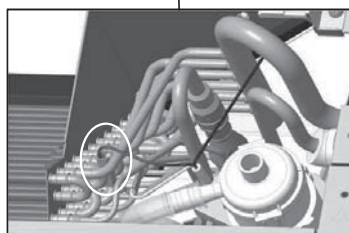
9. To remove the electronic expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.7)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (○ mark)



10. To remove the temperature sensors (example "Thi-R1")

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the Thi-R1 connector(CNN) on PCB in control box.
- (3) Remove the drain pan.(See No.5)
- (4) Pull out the temperature sensor "Thi-R3" from the sensor holder.



General view

DISASSEMBLY PROCEDURE

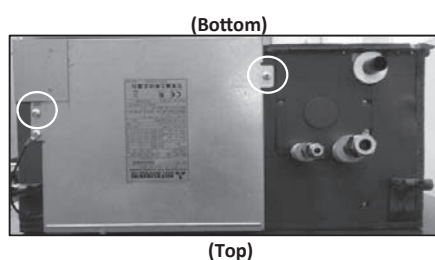


WARNING

Precautions for safety

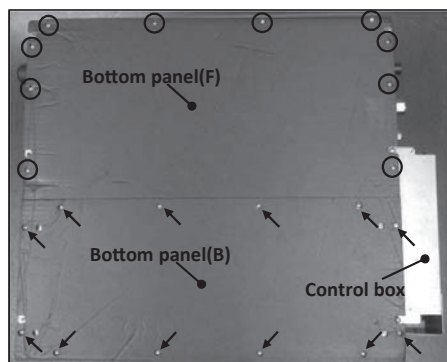
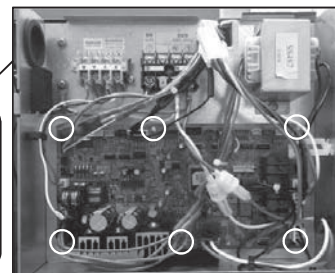
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDUH series)



- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

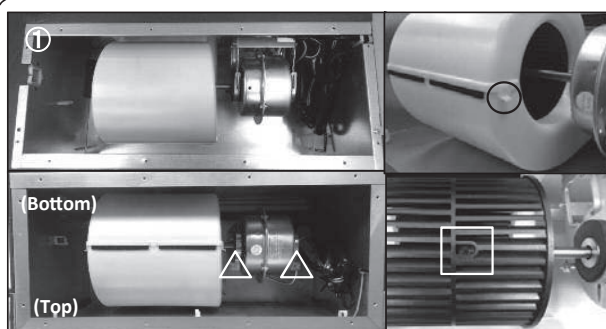
- 2. To remove the printed circuit board**
(1) Remove the lid of control box. (See No.1)
(2) Pull off all the inserted connectors.
(3) Take off 6 control PCB fixing locking supports and remove it.



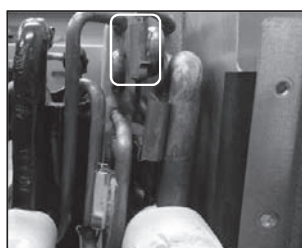
- 3. To remove the bottom panel(B) and bottom panel(F)**
(1) Remove 12 bottom panel panel(B) fixing screws and remove it. (→ mark)
(2) Remove 10 bottom panel panel(F) fixing screws and remove it. (○ mark)



- 4. To remove the drain pan.**
(1) Remove the bottom panel(B) and bottom panel(F). (See.No.3)
(2) Pull out the control box.

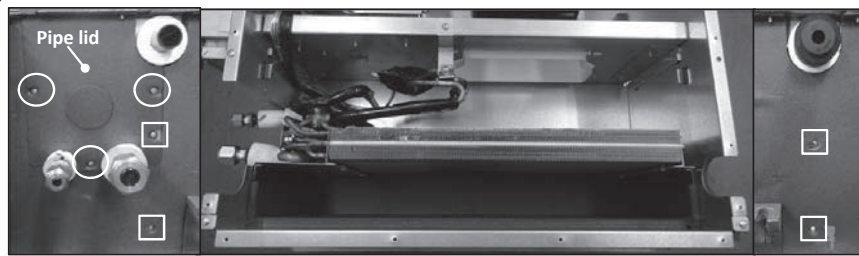


- 5. To remove the impeller and motor (FM)**
(1) Remove the lid of control box. (See No.1)
(2) Remove the bottom panel(B). (See No.2) <Pic.①>
(3) Disconnect the motor connector(CNFx) in the middle of wiring.
(4) Take off the right and left hooks of the fan casing and remove it. (○ mark)
(5) Remove the impeller fixing bolt and remove it. (□ mark)
(6) Remove 2 motor fixing screws and remove it. (△ mark)



- 6. To remove the temperature sensors (example "Thi-R1")**
(1) Remove the lid of control box. (See No.1)
(2) Disconnect the Tho-R1 connector(CNNx) on PCB in control box.
(3) Remove the drain pan. (See No.4)
(4) Pull out the temperature sensor "Thi-R1" from the sensor holder.

PROCEDURE & PICTURES

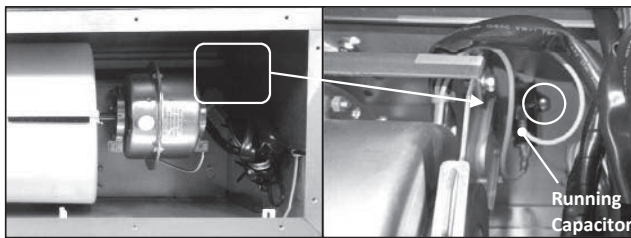
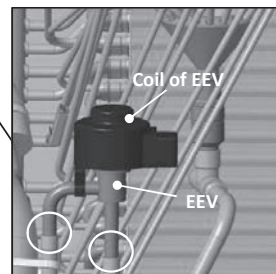


7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.3)
- (2) Remove 3 pipe lid fixing screws and remove it.(○ mark)
- (3) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

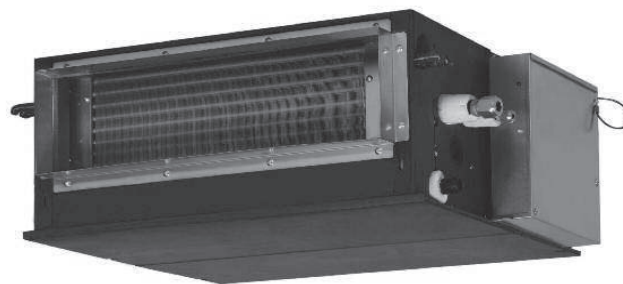
8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.9)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



8. To remove the running capacitor of fan motor

- (1) Remove the running capacitor fixing screw and remove it.






General view

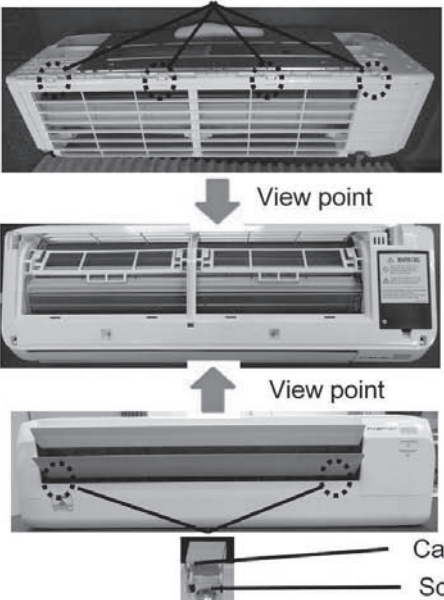
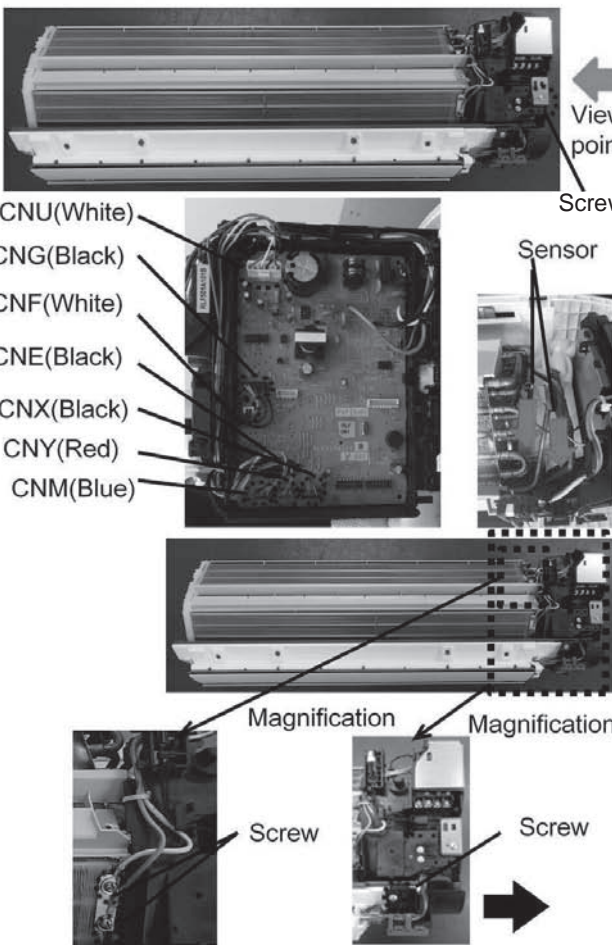
DISASSEMBLY PROCEDURE

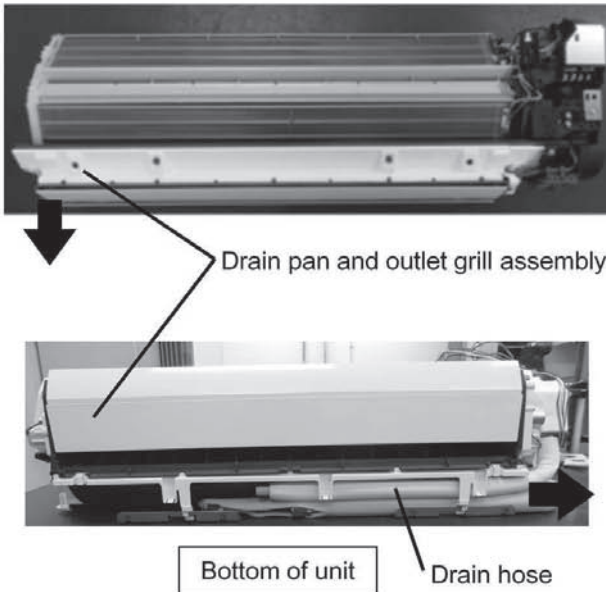
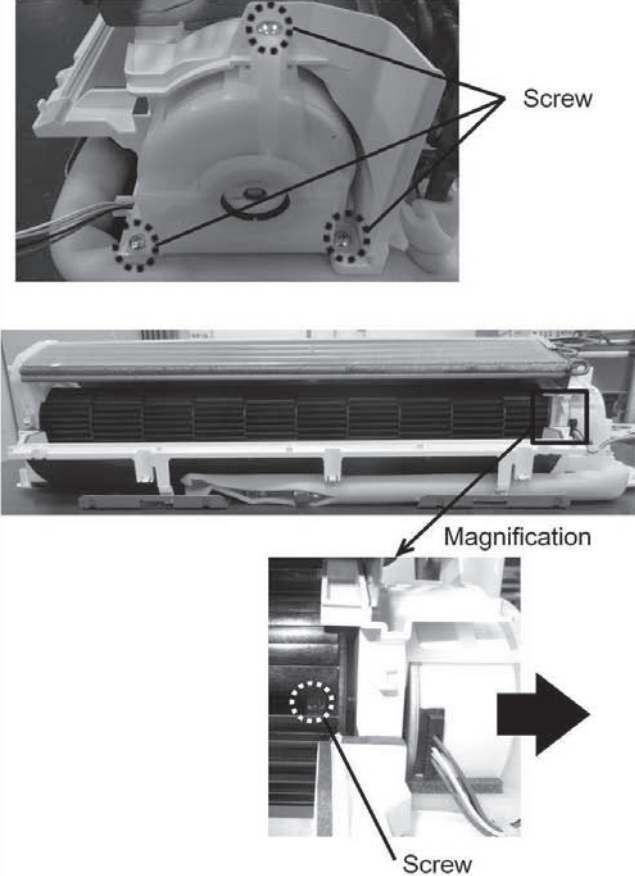
⚠ WARNING**Precautions for safety**

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (SRK-ZS,FDK series)

Item	Illustration	Operating procedure
①	<p>Air inlet panel</p> 	<p>[Removing the air inlet panel] 1. Hold lower edge of the air inlet panel, and then open it to about 80°.</p>
②	<p>Air filter</p>  <p>Air cleaning filter</p> 	<p>[Removing the filter] 1. Remove the air filter ×2.</p> <p>2. Remove the air-cleaning filter ×2</p> <p>3. Holding both sides of the air inlet panel, pull the left and right sides forward at the same time to remove the panel.</p>

Item	Illustration	Operating procedure
<p>③</p> <p>Removing the front panel</p>	 <p>Hook</p> <p>View point</p> <p>View point</p> <p>Cap</p> <p>Screw</p>	<p>1. Open the caps, and then remove the screw ×2 (circled in the illustration below)</p> <p>2. Draw the front panel above after removing 4 hooks</p> <p>Caution</p> <ul style="list-style-type: none"> • Be sure to use a fine-tipped tool (such as a precision screwdriver) to open the cap. • Be careful not to damage the panel surface when opening the caps.
<p>④</p> <p>Removing the electrical control and peripheral parts</p>	 <p>View point</p> <p>Screw</p> <p>Sensor</p> <p>CNU(White)</p> <p>CNG(Black)</p> <p>CNF(White)</p> <p>CNE(Black)</p> <p>CNX(Black)</p> <p>CNY(Red)</p> <p>CNM(Blue)</p> <p>Magnification</p> <p>Magnification</p> <p>Screw</p> <p>Screw</p>	<p>[Removing the Control]</p> <p>1. Remove screw x1 so as to remove a metal lid.</p> <p>2. Remove a metal lid then unplug the following connector x7</p> <ul style="list-style-type: none"> CNU(White) CNG(Black) CNF(White) CNE(Black) CNX(Black) CNY(Red) CNW(Blue) <p>3. Pull the each sensor out from the case into the indicated directions in red arrows.</p> <p>4. Remove screw x3 then draw the control toward right direction.</p>

Item	Illustration	Operating procedure
⑤ Removing drain pan & outlet grill assembly	 <p>Drain pan and outlet grill assembly</p> <p>Bottom of unit</p> <p>Drain hose</p>	<p>[Removing the drain pan]</p> <p>1. Draw the left of the drain pan and outlet grill assembly toward lower side so as to come off it from heat exchanger assembly.</p> <p>2. Draw the drain pan and outlet grill assembly toward the right with drawing the drain hose.</p>
⑥ Removing fan & motor	 <p>Screw</p> <p>Magnification</p> <p>Screw</p>	<p>[Removing fan & motor]</p> <p>1. Remove screw x3</p> <p>2. Look into the area surrounded the black rectangle, adjust the screw position with rotating the cross flow fan, then remove a screw.</p> <p>3. Draw the motor and its bracket toward the right.</p>

Item	Illustration	Operating procedure
<div> Disassemble the motor </div>	<div> </div> <div> Hook </div> <div> </div>	<div> <p>[Removing the motor case] 1.Release the hook ×4 (circled in the illustration), and then remove the motor case (U).</p> </div>
<div> Removing the fan and heat exchanger </div>	<div> </div> <div> Screw </div> <div> </div>	<div> <p>1.Remove the screw ×2 (circled in the illustration) on the left side of the heat exchanger.</p> </div> <div> <p>2.While lifting up and supporting the left side of the heat exchanger, pull out the fan to the left, keeping it angled down.</p> </div>

DISASSEMBLY PROCEDURE

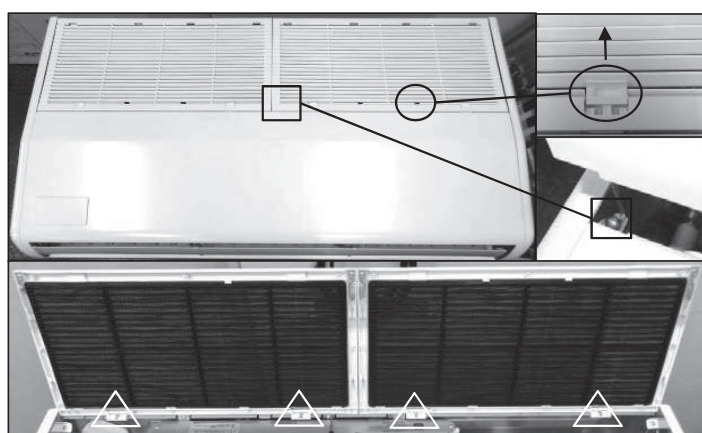


WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDE series)



1. To remove air inlet grille.

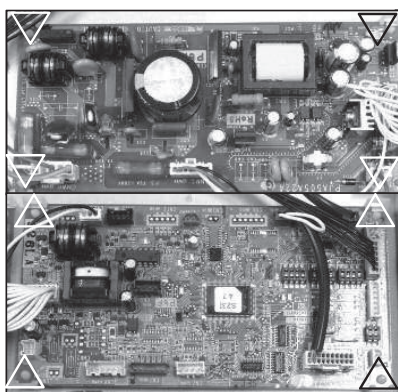
- (1) Slide the hook in the direction of the arrow.(○ mark)
- (2) Remove 4 wire fixing screws.(□ mark)
- (3) Remove 4 air inlet grille fixing screws.(△ mark)

2. To remove the lid of control box

- (1) To remove air inlet grille.(See.No.1)
- (2) Remove 2 wire fixing screws and remove it.(← mark)
- (3) Remove 2 lid fixing screws and remove it.(○ mark)

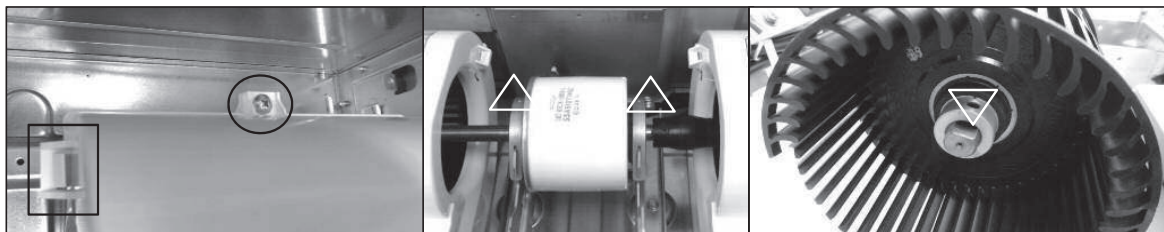
3. To remove the control box

- (1) Remove the lid of control box.(See No.2)
- (2) Pull off all the inserted connectors.
- (3) Remove 2 control box fixing screws and remove it.(□ mark)
- (4) Pull out the control box.



4. To remove the printed circuit board (PCB)

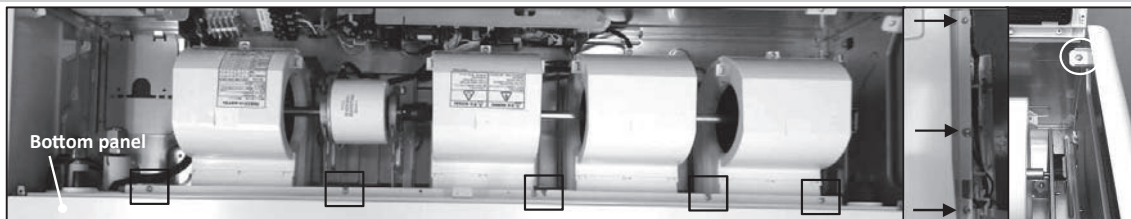
- (1) Remove the lid of control box.(See No.2)
- (2) Pull off all the inserted connectors.
- **Control PCB**
- (3) Take off 4 control PCB fixing locking supports and remove it.(△ mark)
- **Power PCB**
- (4) Take off 4 power PCB fixing locking supports and remove it.(▽ mark)



5. To remove the impeller and motor (FM)

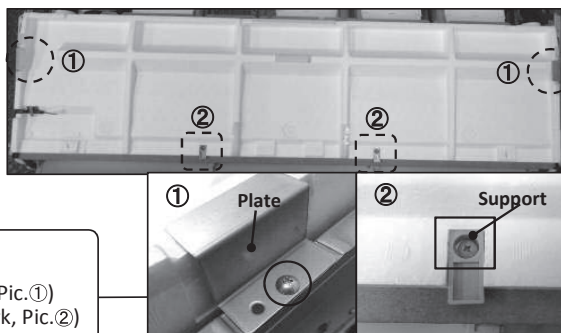
- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the motor connector(CNFx) in the middle way of wiring.
- (3) Remove the fan casing fixing screw.(○ mark) Take off the fan casing fixing hook and remove it.(□ mark)
- (4) Remove the impeller fixing screw and remove it.(▽ mark)
- (5) Remove 2 motor fixing screws and remove it.(△ mark)

PROCEDURE & PICTURES



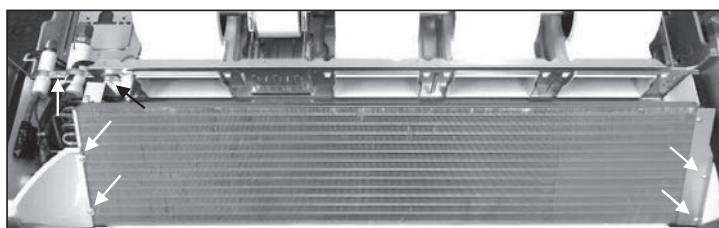
6. To remove side panel and bottom panel

- (1) Remove air inlet grille.(See No.1)
- (2) Remove the right and left side panel fixing screws and remove it.(○ mark)
- (3) Remove 5 bottom panel fixing screws.(□ mark)
Remove 6 bottom panel fixing screws and remove it. (← mark, left and right side)



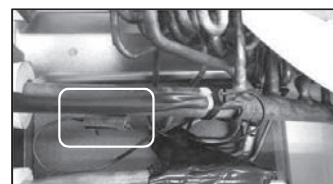
7. To remove drain pan

- (1) Remove side panel and bottom panel.(See No.5)
- (2) Remove 2 plate fixing screws and remove it.(○ mark, Pic.①)
- (3) Remove 2 support fixing screws and remove it.(□ mark, Pic.②)
- (4) Pull out the drain pan.



8. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.6)
- (2) Remove 6 heat exchanger assy fixing screws and remove it.(← mark)

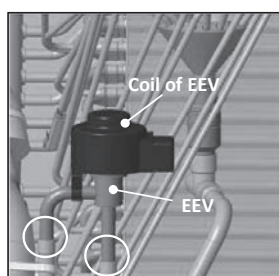


9. To remove the louver motor (LM)

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the louver motor connector (CNJ) on PCB in control box.
- (3) Remove side panel.(See No.5)
- (4) Remove 2 louver motor fixing screws and remove it.

10. To remove the temperature sensors (example "Thi-R3")

- (1) Remove the lid of control box.(See No.1)
- (2) Disconnect the Tho-R3 connector(CNNx) on PCB in control box.
- (3) Remove the drain pan.(See No.3)
- (4) Pull out the temperature sensor "Thi-R1" from the sensor holder.



11. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.9)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



General view

DISASSEMBLY PROCEDURE

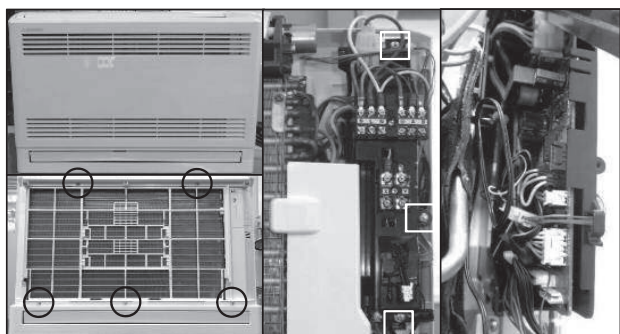


WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDFW series)

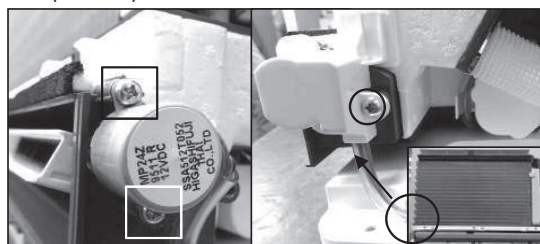


1. To remove the control box

- (1) Remove hooks of the front panel and remove it.
- (2) Remove 5 filter assembly fixing screws and remove it.(○ mark)
- (3) Remove 3 control box and lid fixing screws, and remove it.(□ mark)
- (4) Pull the control box forward.

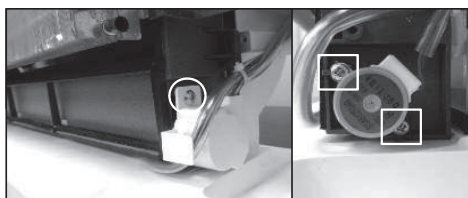
2. To remove the lower flap motor (LFM)

- (1) Remove the control box.(See No.1)
- (2) Disconnect the lower flap motor connector(CNJ3) in the way of wiring.
- (3) Remove the cover fixing screw and remove it.(○ mark)
- (4) Remove 2 lower flap motor screws and remove it.(□ mark)



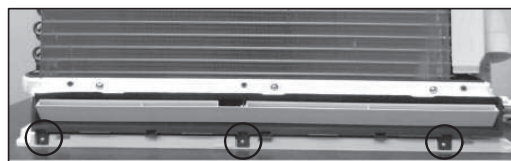
3. To remove the upper flap motor (UFM)

- (1) Remove the control box.(See No.1)
- (2) Disconnect the upper flap motor connector(CNJ4) in the way of wiring.
- (3) Remove 2 upper flap motor fixing screws and remove it.(□ mark)



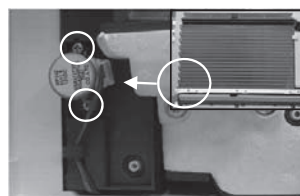
4. To remove drain pan

- (1) Remove the lower flap motor.(See No.3)
- (2) Remove 3 drain pan fixing screws and remove it.(○ mark)



5. To remove the damper arm motor (DAM)

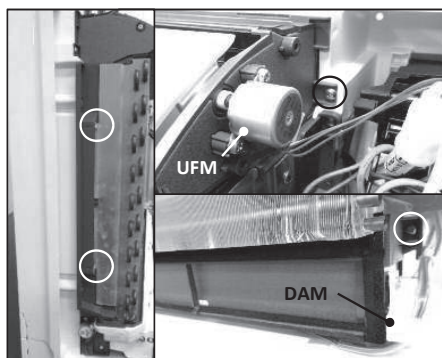
- (1) Remove the control box.(See No.1)
- (2) Disconnect the damper arm motor connector(CNJ2) in the way of wiring.
- (3) Remove the cover fixing screw and remove it.(○ mark)
- (4) Remove 2 damper arm motor fixing screws and remove it.(□ mark)



6. To remove the damper motor (DM)

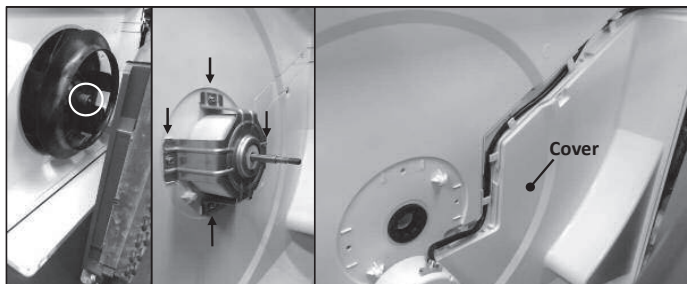
- (1) Remove the control box.(See No.1)
- (2) Disconnect the damper motor connector(CNJ1) in the way of wiring.
- (3) Remove 2 damper arm motor fixing screws and remove it.(○ mark)

PROCEDURE & PICTURES



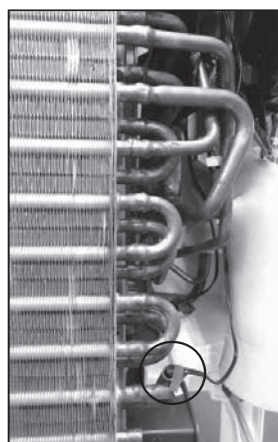
7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.4)
- (2) Remove 4 heat exchanger assy fixing screws and remove it.(O mark)



8. To remove the impeller and motor (FM)

- (1) Remove control box.(See No.1)
- (2) Disconnect the motor connector(CNM) on PCB in control box.
- (3) Remove the heat exchanger assembly.(See No.7)
- (4) Remove the impeller fixing nut and remove it.(O mark)
- (5) Remove 4 motor fixing bolts and remove it.(← mark)
- (6) Take off the hooks of cover and remove it.

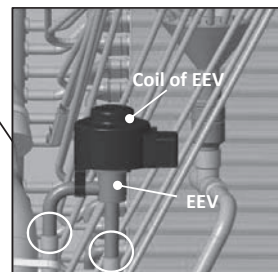


9. To remove the temperature sensors (example"Thi-R1")

- (1) Remove control box.(See No.1)
- (2) Disconnect the Tho-R1 connector(CNN) on PCB in control box.
- (3) Pull out the temperature sensor "Thi-R1" from the sensor holder.

10. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.7)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(O mark)



General view

DISASSEMBLY PROCEDURE



WARNING

Precautions for safety

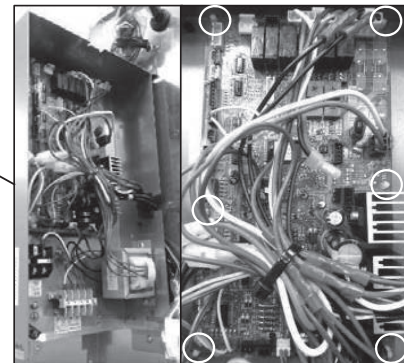
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDFU • FDFL series)

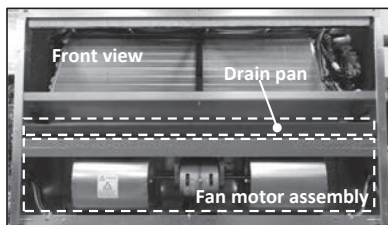
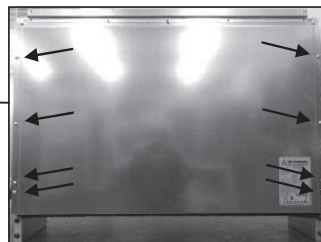


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

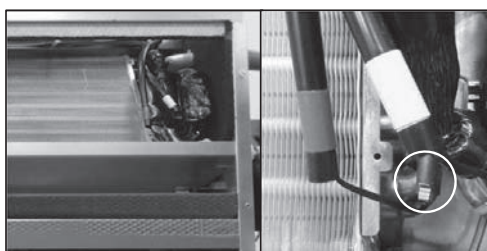
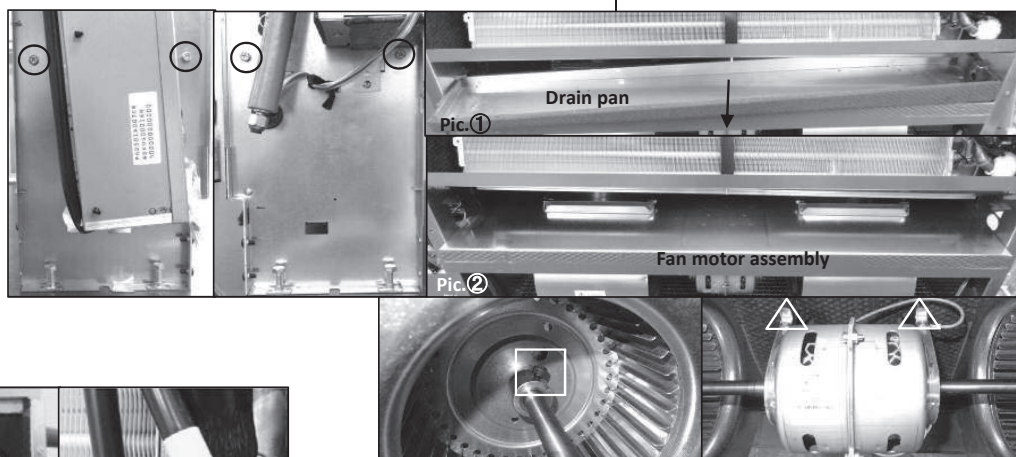
- 2. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box. (See No.1)
(2) Pull off all the inserted connectors.
(3) Take off 6 power PCB fixing locking supports and remove it.



- 3. To remove the front panel (FDFU)**
(1) Remove 8 front panel fixing screws and remove it.

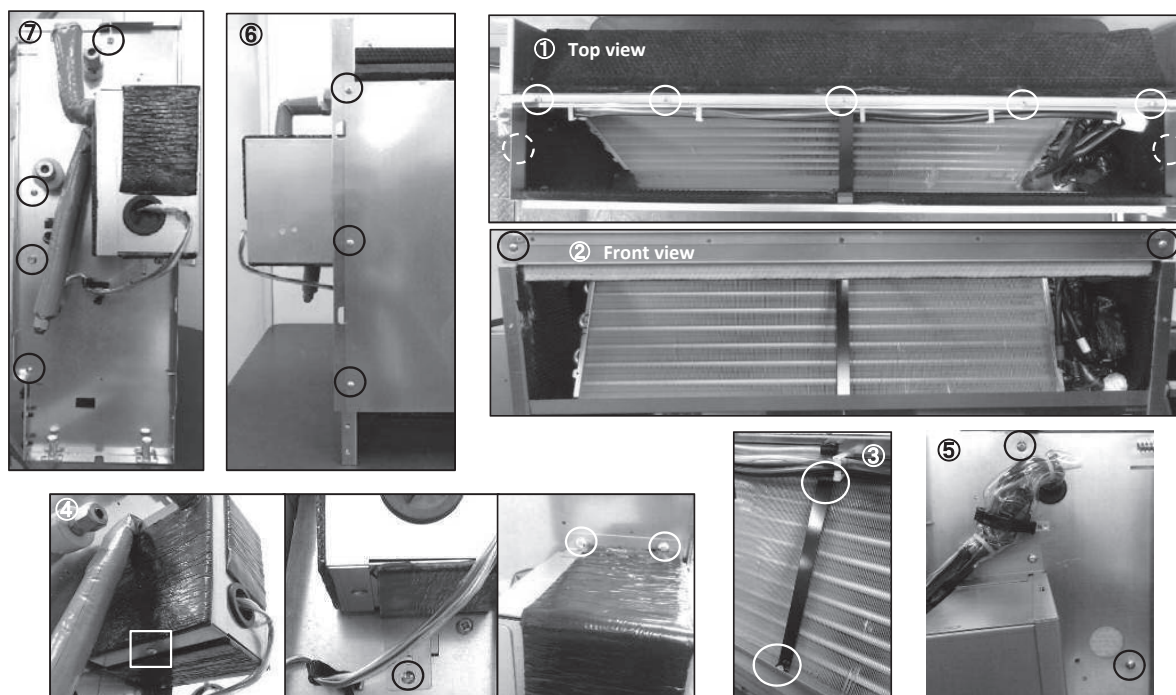


- 4. To remove the impeller and motor (FM)**
(1) Remove the lid of control box. (See No.1), remove the front panel. (See No.3)
(2) Disconnect the motor connector (CNF1) in the way of wiring.
(3) Pull drain pan in the direction of the arrow and remove. (Pic.①)
(4) Remove 4 fan base fixing screws and remove fan motor assembly. (○ mark)
(5) Remove the impeller fixing bolt and remove it. (□ mark)
(6) Remove 2 motor fixing screws and remove it. (△ mark)



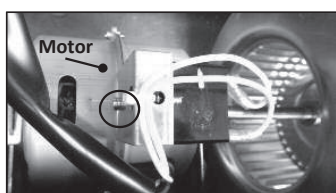
- 5. To remove the temperature sensors (example "Thi-R1")**
(1) Remove the lid of control box. (See No.1)
(2) Disconnect the Tho-R1 connector (CNNx) in the way of wiring.
(3) Remove the front panel. (See No.3)
(4) Pull out the temperature sensor "Thi-R1" from the sensor holder.

PROCEDURE & PICTURES



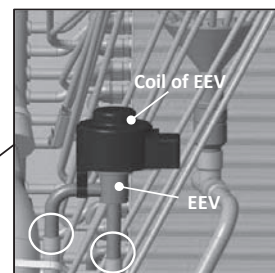
6. To remove the heat exchanger assembly

- (1) Remove 9 top panel fixing screws and remove it. (Pic. ① ②)
- (2) Remove 2 support fixing screws and remove it. (Pic. ③)
- (3) Remove the lid of EEV box fixing screw and remove it. (□ mark, Pic. ④)
- Remove 3 EEV box fixing screws and remove it. (○ mark, Pic. ④)
- (4) Remove 2 screws on the left side panel. (Pic. ⑤)
- (5) Remove 3 screws on the back side panel. (Pic. ⑥)
- (6) Remove 4 screws on the right side panel and pull the heat exchanger assembly to the right. (Pic. ⑦)



7. To remove the running capacitor of fan motor

- (1) Remove the fan motor assembly. (See No.4)
- (2) Remove faston terminal.
- (3) Remove the running capacitor fixing screw and remove it.



8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.9)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (○ mark)



General view
(FDFL)



General view
(FDFU)

DISASSEMBLY PROCEDURE



WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (SAF-DX series)

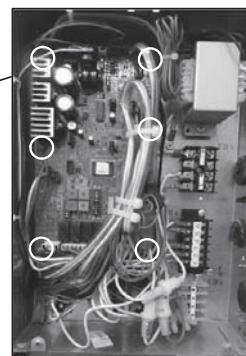


1. To remove the lid of control box

- (1) Remove 2 lid fixing screws and remove it.

2. To remove the printed circuit board (PCB)

- (1) Remove the lid of control box.(See No.1)
- (2) Pull off all the inserted connectors.
- (3) Take off 6 PCB fixing locking supports(○ mark)

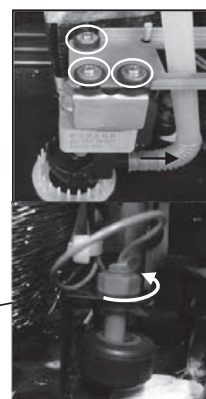


3. To remove the drain pan

- (1) Remove 10 bottom panel fixing screws and remove it.
- (2) Pull the drain pan and remove it.

4. To remove the heat exchanger assembly

- (1) Remove the bottom panel. (See No.3)
- (2) Remove 4 fixing screws on the attached plate of heat exchanger and remove it.

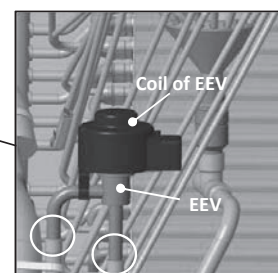


5. To remove the drain pump(DM) and float switch(FS)

- (1) Remove the lid of control box.(See No.1)
- (2) Remove the drain pan.(See No.3)
- (3) Disconnect the drain pump connector(CNRx) in the middle of wiring.
- (4) Disconnect the float switch connector(CNlx) in the middle of wiring.
- (5) Pull a hose to the arrow direction and remove it.
- (6) Remove 3 drain pump fixing screws and remove it.(○ mark)
- (7) Turn float switch to the left and remove it.

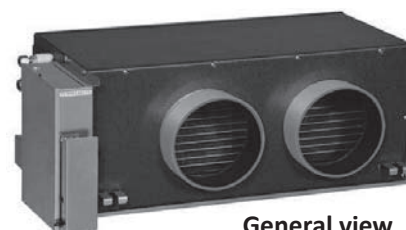
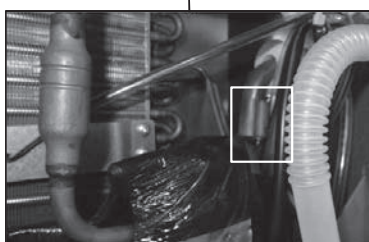
6. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.8)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



7. To remove the temperature sensors, (example "Thi-R3")

- (1) Remove the drain pan.(See No.3)
- (2) Pull out the temperature sensor "Thi-R3" from the sensor holder.



General view

DISASSEMBLY PROCEDURE

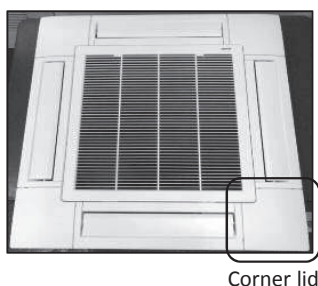
WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- These contents are an example. Please refer to a similar part of actual unit.

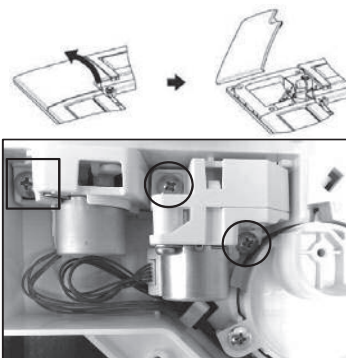
PROCEDURE & PICTURES

FDT series

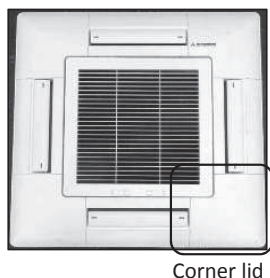


Corner lid

- 1. To remove the corner lid**
 - (1) Remove the inlet grille.
 - (2) Pull the corner lid toward the direction indicated by the arrow and remove it.
(The four corner lids are the same way.)
- 2. To remove the louver motor (LM)**
 - (1) Remove the corner lid.(See No.1)
 - (2) Remove the louver motor fixing screw and remove it.(□ mark)
- 3. To remove anti draft motor (AM)**
 - (1) Remove the corner lid.(See No.1)
 - (2) Remove 2 gear box fixing screws and remove it.(O mark)

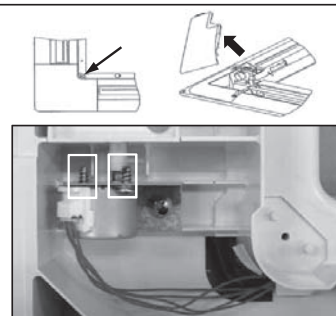


FDTC series

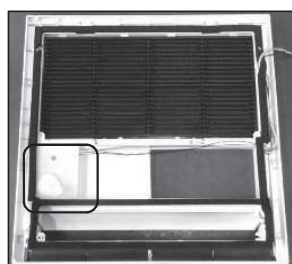


Corner lid

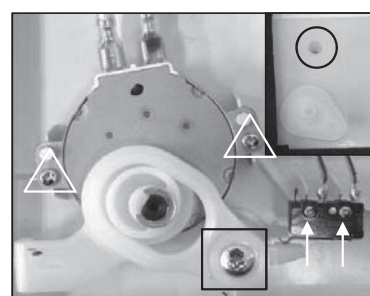
- 1. To remove the corner lid**
 - (1) Remove the inlet grille.
 - (2) Remove the screw(← mark), pull the corner lid toward the direction indicated by the arrow mark.
(The four corner lids are the same way.)
- 2. To remove the louver motor (LM)**
 - (1) Remove the corner lid.(See No.1)
 - (2) Remove 2 louver motor fixing screws and remove it.(□ mark)



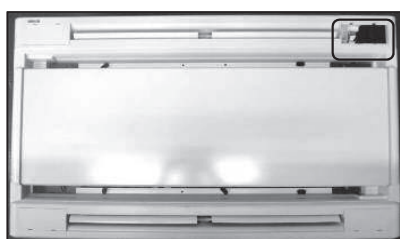
FDTs•FDTQ series



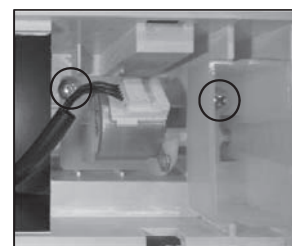
- 1. To remove the louver motor (LM)**
 - (1) Remove the cover fixing screw and remove it.(O mark)
 - (2) Remove the cam fixing screw and remove it.(□ mark)
 - (3) Remove 2 louver motor fixing screws and remove it.(△ mark)
- 2. To remove the limit switch (LS)**
 - (1) Remove the cover fixing screw and remove it.(O mark)
 - (2) Remove 2 limit switch fixing screws and remove it.(← mark)



FDTW series



- 1. To remove the corner lid**
 - (1) Take off the corner panel fixing hooks by a flathead screwdriver and remove it.
- 2. To remove the louver motor (LM)**
 - (1) Remove the corner lid.(See No.1)
 - (2) Remove 2 louver motor fixing screws and remove it.(O mark)



VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS



MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

16-5 Konan 2-chome, Minato-ku, Tokyo, 108-8215, Japan
<http://www.mhi-mth.co.jp/en/>

Because of our policy of continuous improvement, we reserve the right to make changes in all specifications without notice.

© Copyright MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.