



## TECHNICAL MANUAL

### EEV-KIT For single refrigeration system

EEVKIT6-E-C/A, /B

In this manual, For multiple refrigeration system of EEV-KIT is shown.

Regarding the others manual please see below table.

Manual	No.
General information	'19 · KX-T-335
For multiple refrigeration system (EEVKIT6-E-M/A, /B, -C/A, /B)	'19 · KX-T-337

Preliminary information, all of contents are subject to final confirmation by MHI.

**MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.**

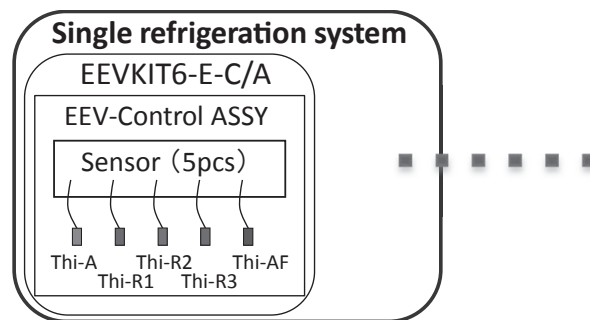


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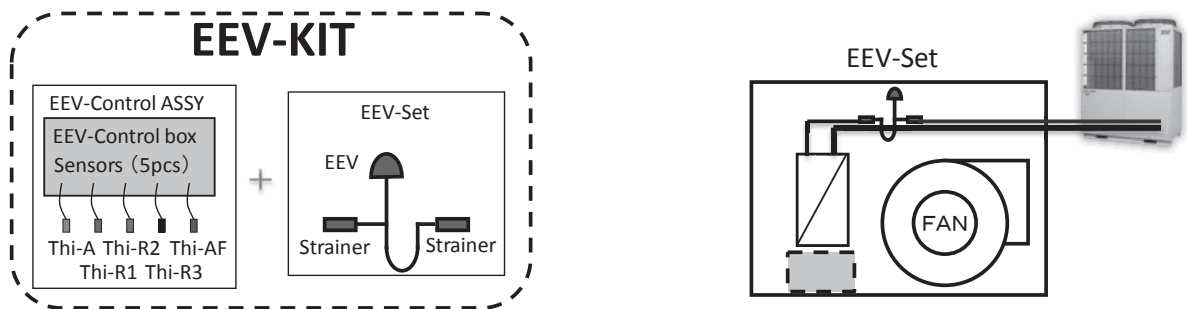
# 1. What is a single refrigeration system

- A single refrigeration system is one that can have multiple outdoor units on one refrigerant pipe work circuit.
- There are 2 types of EEV-KIT systems that can be built into the single refrigeration system.
- System A : one EEV-KIT.
- System B : multiple EEV-KIT's.

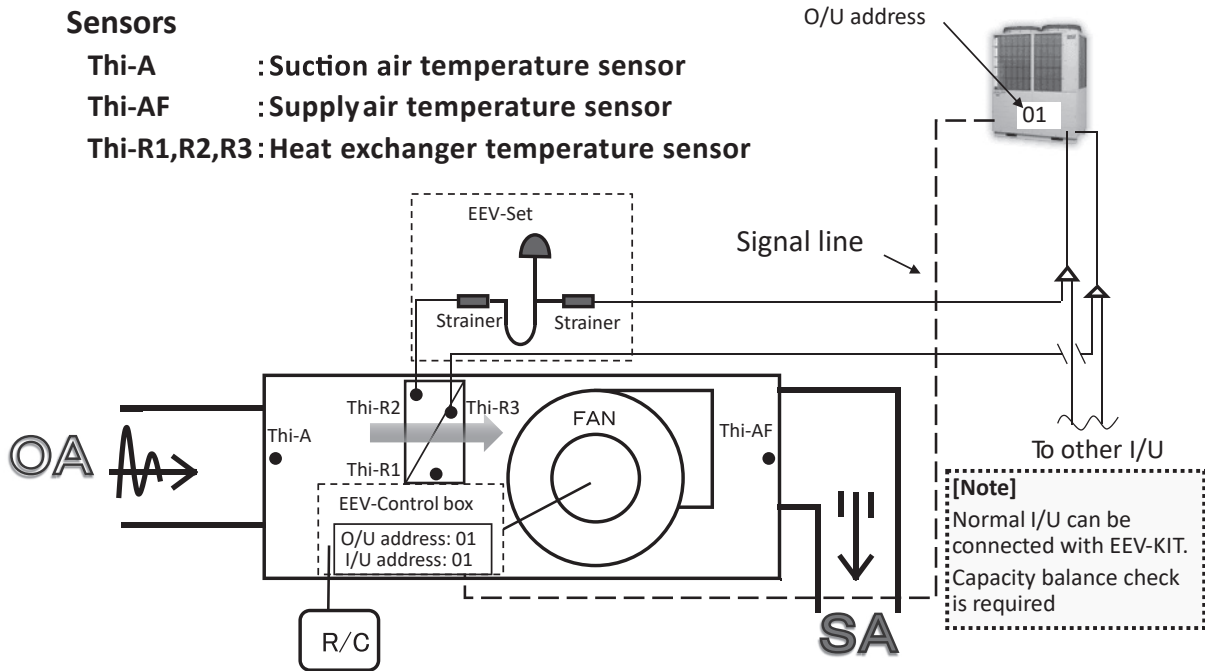


## 1.1 System A

This system has only one set of EEV-KIT built into one indoor unit with only one heat exchanger. This system can be applied to an indoor unit whose capacity is up to 10HP.



- One EEV-KIT controls one EEV
- Maximum capacity is 10HP (equivalent to 280)
- Capacity setting of EEV-Control Box is required (default : 280)

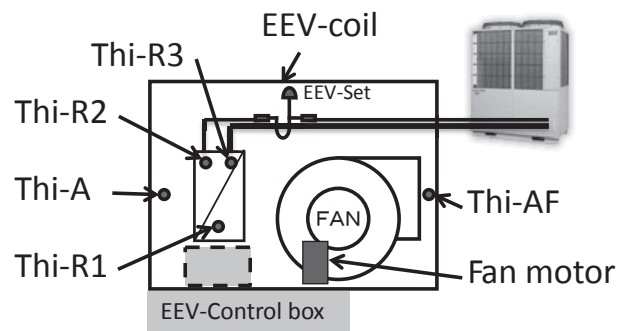


### Total capacity limitation

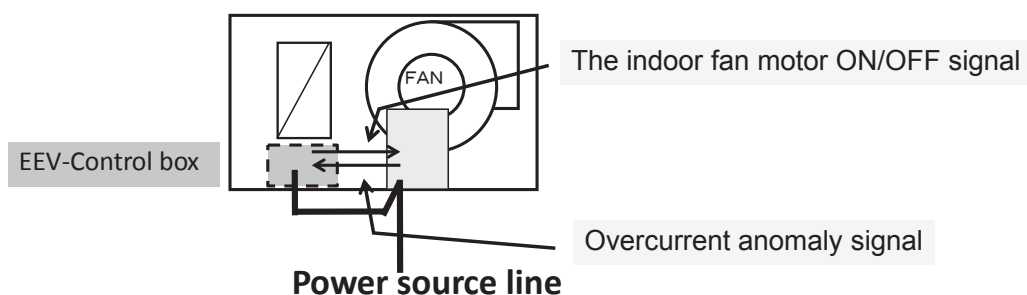
	Unit type	Maximum indoor unit capacity include EEV-KIT
1	Air-conditioning mode (STANDARD pressure control mode)	Same as normal KXE6 or KXZE1,2 (Max : 130% - 200%)
2	Fresh air mode (TYPE1 pressure control mode)	100%

Fresh air mode : 100% fresh air intake without total heat exchanger  
 (same as FDU-F units)

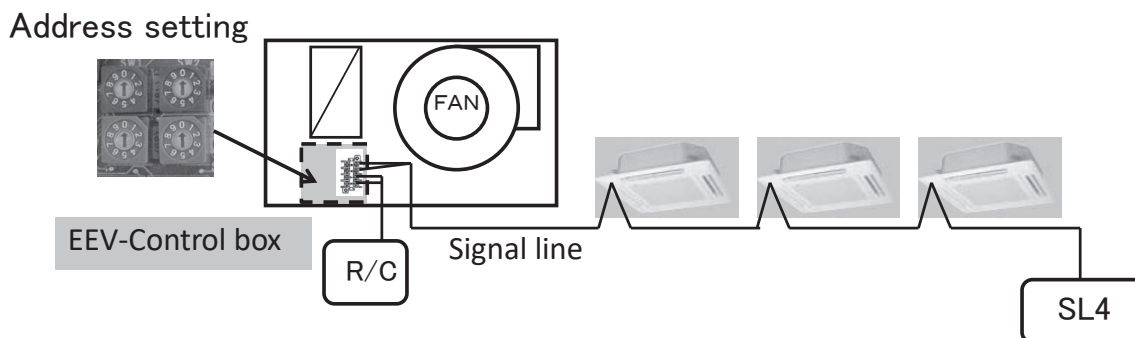
- All wiring for the 5 sensors, EEV-coil, operation command to indoor fan motor, remote control and Superlink line must be connected to the EEV-Control box.
- Check both return/supply air temperature sensors. (Thi-A,AF) whether the temperature is detected correctly.
- Confirm whether the heat exchanger temperature sensors(Thi-R1,R2,R3) detect the correct temperature. Incorrect mounting of any sensor will cause problems with the compressors.
- Check during commissioning



- The overcurrent relay and magnetic contactor for the fan motor should be provided locally.
- Check whether the anomaly signal can be detected or not by inputting the overcurrent anomaly signal from the fan motor to the EEV- Control box.
- Power source to the fan motor should be provided independently and not from the EEV- Control box.

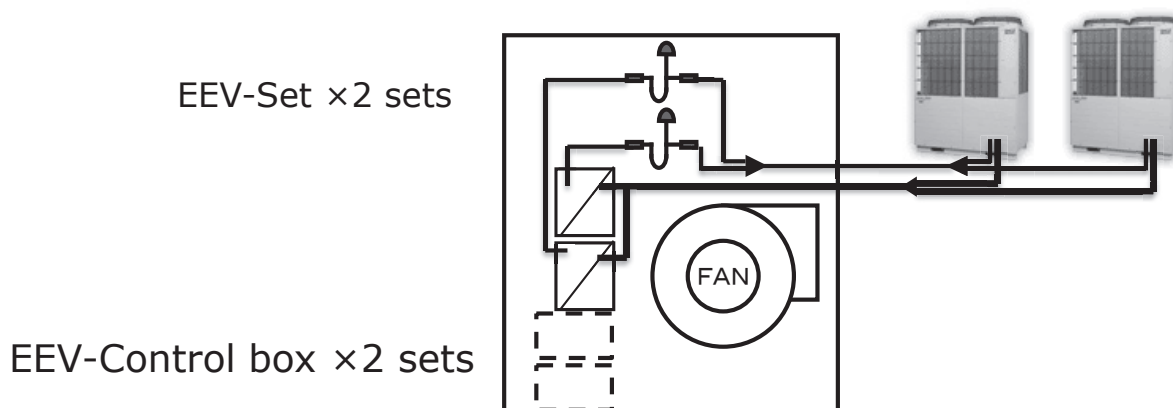


- The remote control for the KXE6 system shall be provided separately if required.
- Central control (SC-SL4) can be use for controlling together with other indoor units.
- The limitations of the address settings, capacity selection and cable length of the Superlink line are the same as the KXE6 systems.  
(See technical manual of KXE6 for details.)

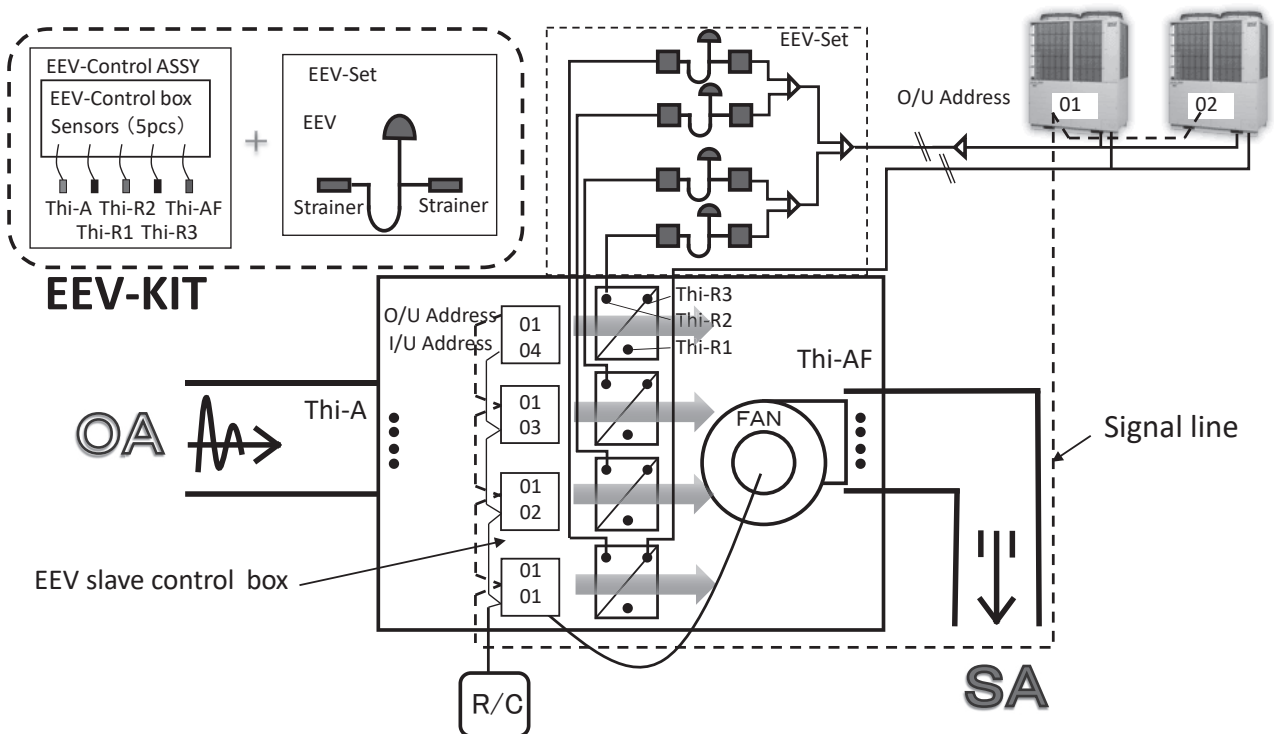


## 1.2 System B

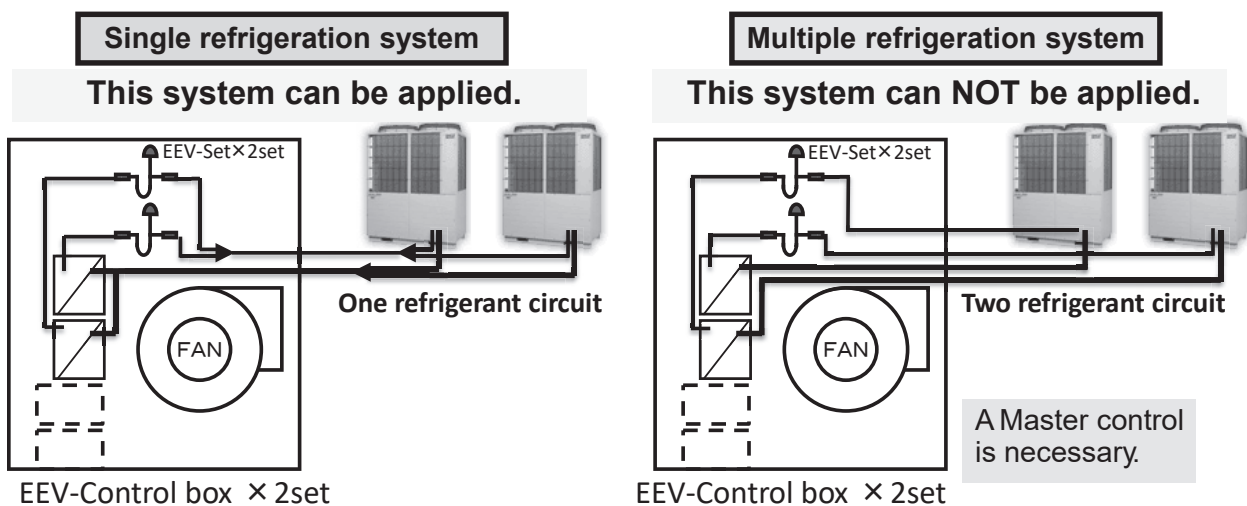
- System B is a system that has multiple EEV-KIT's built into one indoor unit with multiple heat exchangers on one refrigerant circuit.
- This system can be applied up to 48HP for KXE6 AHU capacity.
- This system can be applied up to 60HP for KXZ AHU capacity.



In case of a multiple refrigeration system, use the EEV-KIT for multiple refrigeration systems.

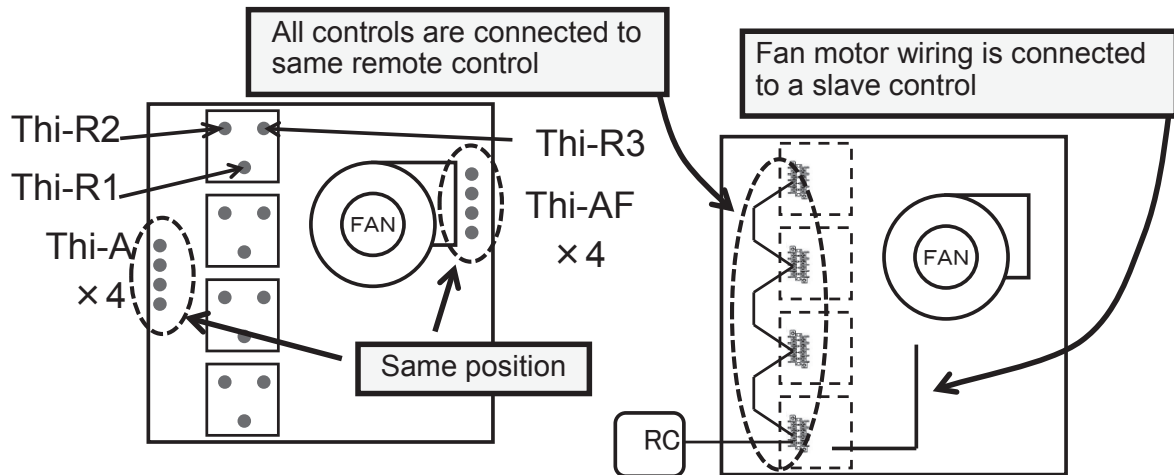


- System B is a system that multiple EEV-KIT's are built into one AHU and KXE6 or KXZ outdoor units are used.
- However, multiple refrigeration systems used with one AHU can not be applied to system B. In such cases, please use the master EEV-KIT for multiple refrigeration system applications.

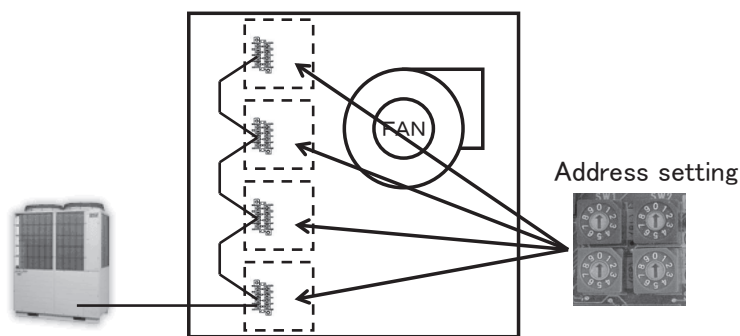




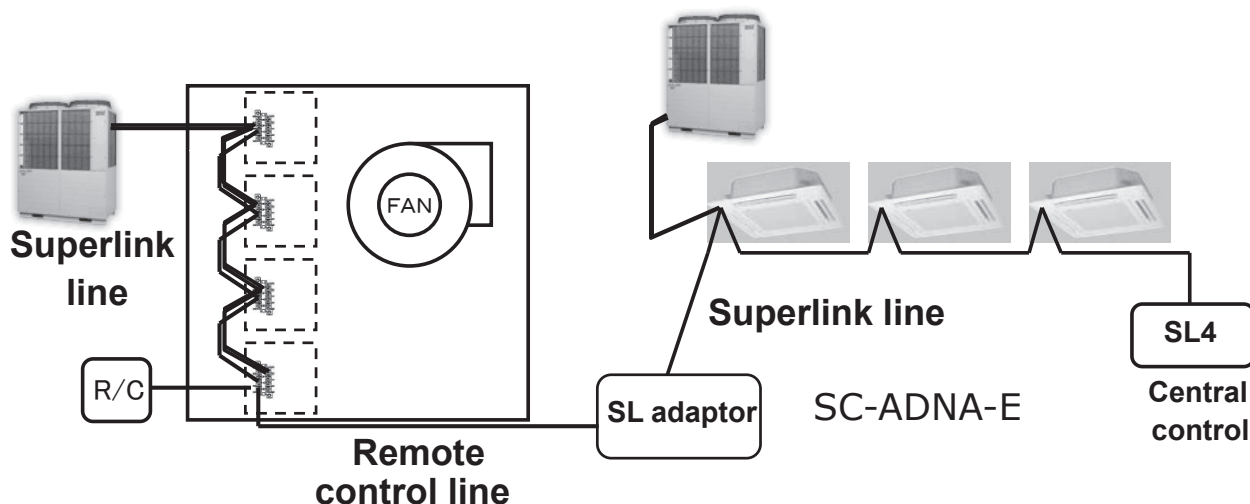
1. The wiring connection method for each EEV-KIT is basically the same as that for system A.
2. All of the return/supply air temperature sensors for all the EEV-KIT's shall be placed and connected individually.
3. The wiring for the fan motor command signal should be connected to one of the EEV-Control boxes.
4. The remote control wiring shall be connected to all the EEV-Control boxes.



- The Superlink line must be connected to all EEV-Control boxes and the outdoor unit according to the standard rules of the KXE6 system.
- Set an address for each EEV-Control box.



- When controlling the AHU via a central control connected with normal indoor unit in another refrigerant systems, it is recommend to connect the Superlink line to the central control through Superlink adaptor (SC-ADNA-E) in order to control all EEV-KIT with same settings and to prevent duplication of SL addresses.



## 2. Components of a single refrigeration system

Components of a single DX AHU refrigeration system

- (1) Slave EEV Control ASSY (EEVKIT6-E-C/A, /B)
    - ① Slave EEV-Control box
    - ② 2 air sensor Assy. (Thi-A, Thi-AF)
    - ③ 3 heat exchanger sensor Assy. (Thi-R1, Thi-R2, Thi-R3)
  - (2) EEV-Set
  - (3) Outdoor unit for KXE6 or KXZ system
- Check the applicable models in the following tables.

KXZE2 series

Model	Compatibility
FDC-KXZE2	○
FDC-KXZXE2	○
FDC-KXZE2M	○
FDC-KXZXE2M	○
FDC(S)-(C)KXZA2	○
FDC(S)-(C)KXZA2	○
FDC-KXZRE2	-
FDC-KXZRXE2	-

KXZE1 series

Model	Compatibility
FDC-KXZEN1	○
FDC-KXZES1	○
FDC-KXZEN1-W	-
FDC-KXZES1-W	-
FDC-KXZPE1	○
FDC-KXZME1	○
FDC(S)-KXZE1	○
FDCL-KXZE1	○
FDC-KXZXE1	○
FDC-KXZE1M	○
FDCB-KXZE1	○ *2
FDC-KXZRE1	-
FDC-KXZRXE1	-
FDC-KXZWE1	-

KXE6 series

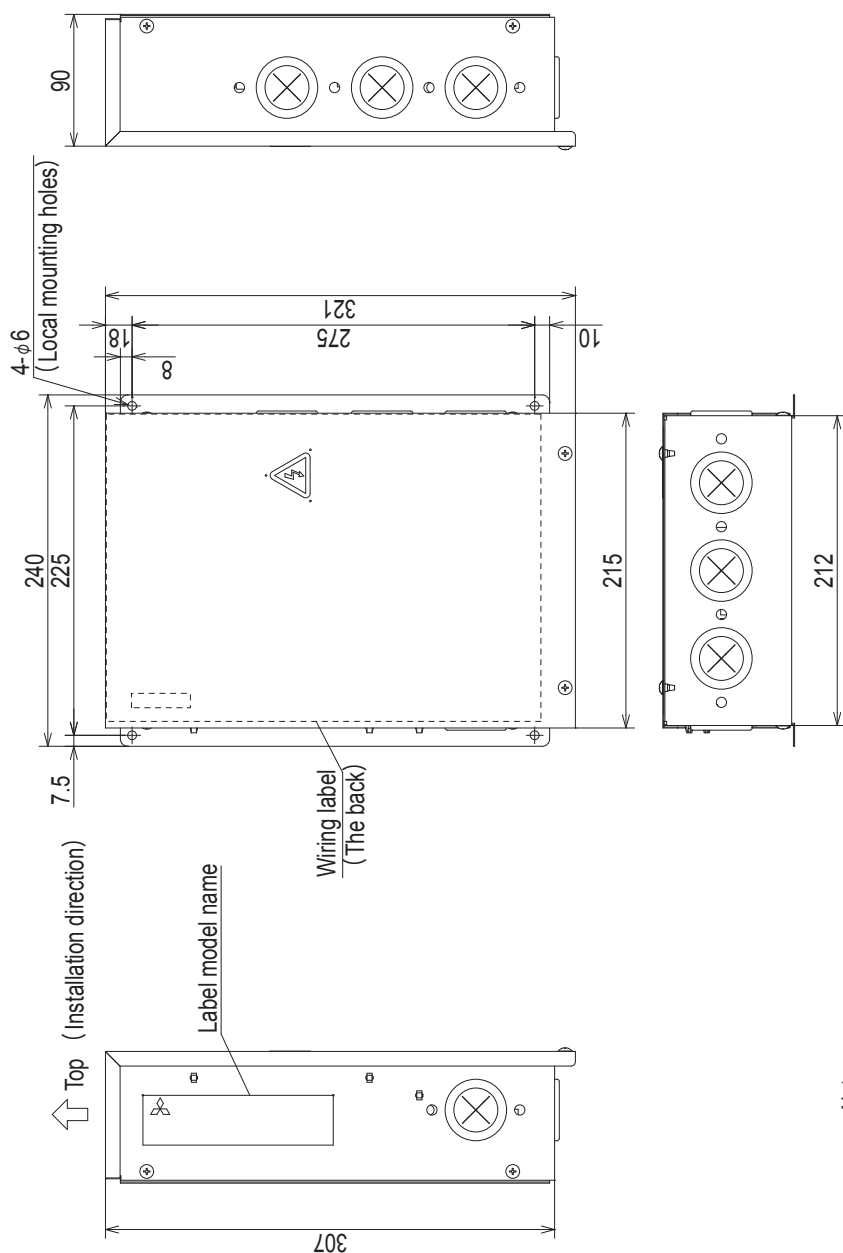
Model	Compatibility
FDC(S)-KXEN6	○
FDC(S)-KXES6	○
FDC(S)-KXE6	○
FDC(S)-KXE6M	○
FDC-KXRE6	○ *1
FDCB-KXE6	○ *2
FDCR-KXE6	-
FDCH-CKXE6G	-
FDCH-KXE6	-

\*1:Not possible to change the evaporating/condensing temperature

\*2:If air drawing condition of AHU can be regarded as that of FDC-KXZE1, it is applicable.

### 3. Functions

#### (1) Outline

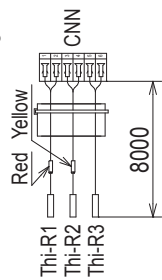


#### Notes

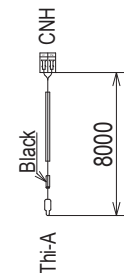
- (1) Take note that this control box is not waterproof. Do not allow water or dust to enter the control box.
- (2) Mount the control box firmly using the four holes shown in the figure and confirm that it will not come loose due to vibration.
- (3) Use the tie-wraps included in the control box to fix the wiring. Confirm that there is no tension on the wiring to the terminal blocks and that the wiring connections are fixed tight in the terminal blocks.
- (4) The label for the model name is located on the left side of the control box.
- (5) Take note that the wiring diagram is located on the left side of the lid. If you do not use the lid of the control box, then use the wiring diagram that comes with the control box.
- (6) Ensure a gap of more than 15mm at the top of the control box to remove the lid of the control box.
- (7) Always install this control box in a secure location inside a locked enclosure. (As there is danger of electric shock or incorrect operation)
- (8) Provide the following clearances above, below, to the right and to the left to ensure enough space for ventilation and service work of the control box.

Bottom clearance	Min. 30mm	.....	Space for cooling
Top clearance	Min. 30mm	.....	Space for cooling
Left clearance	Min. 100mm (Recommended length of 200mm or more)	.....	Space for wiring and service
Right clearance	Min. 100mm (Recommended length of 200mm or more)	.....	Space for wiring and service
Front clearance	Min. 30mm	.....	Space for cooling

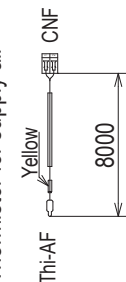
Thermistor for heat exchanger



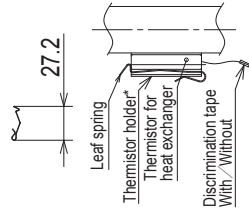
Thermistor for return air



Thermistor for supply air

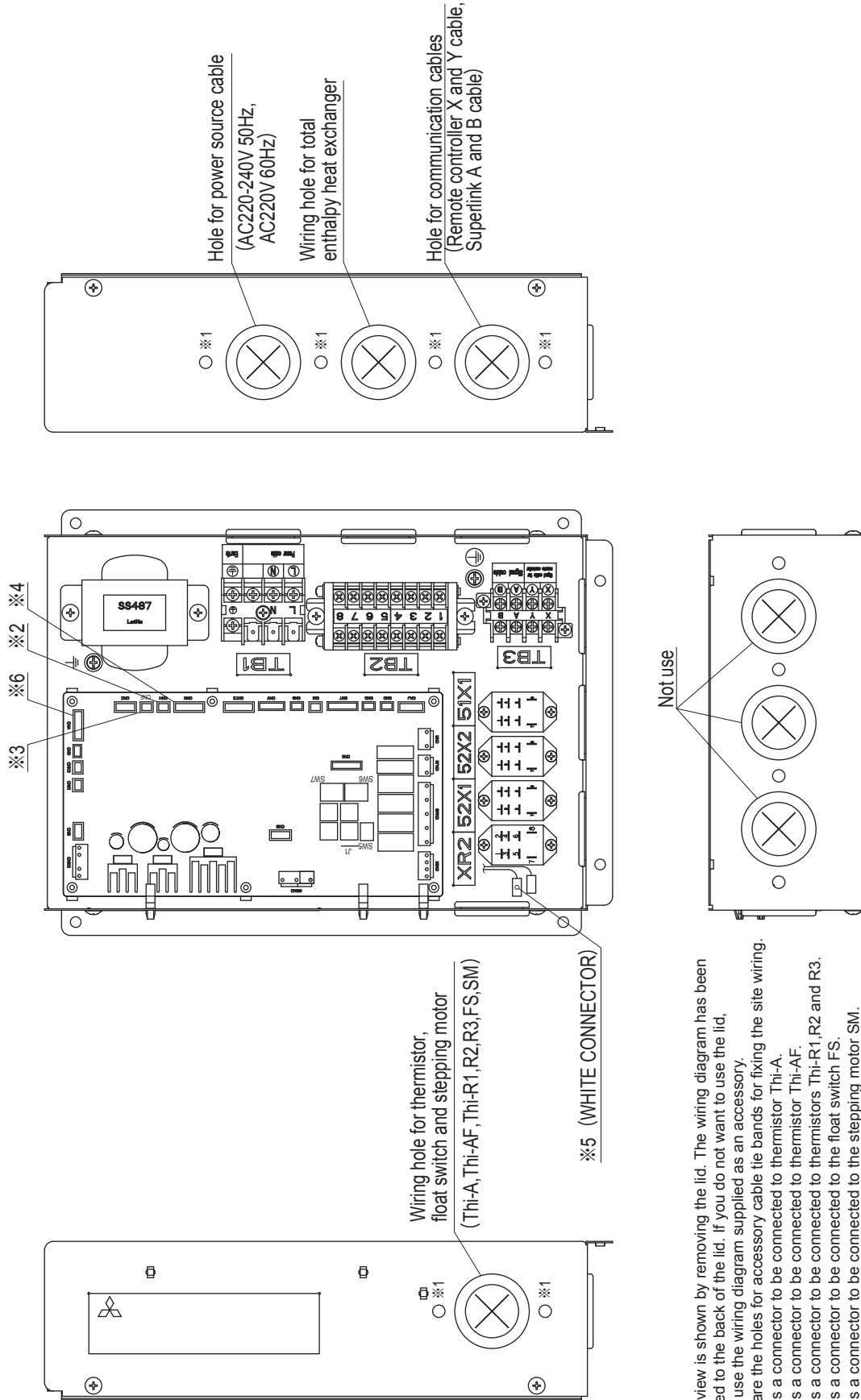


Leaf spring for heat exchanger  
(Use when heat exchanger thermistor is installed.)



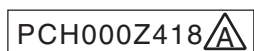
\*Thermistor holder: Provided locally

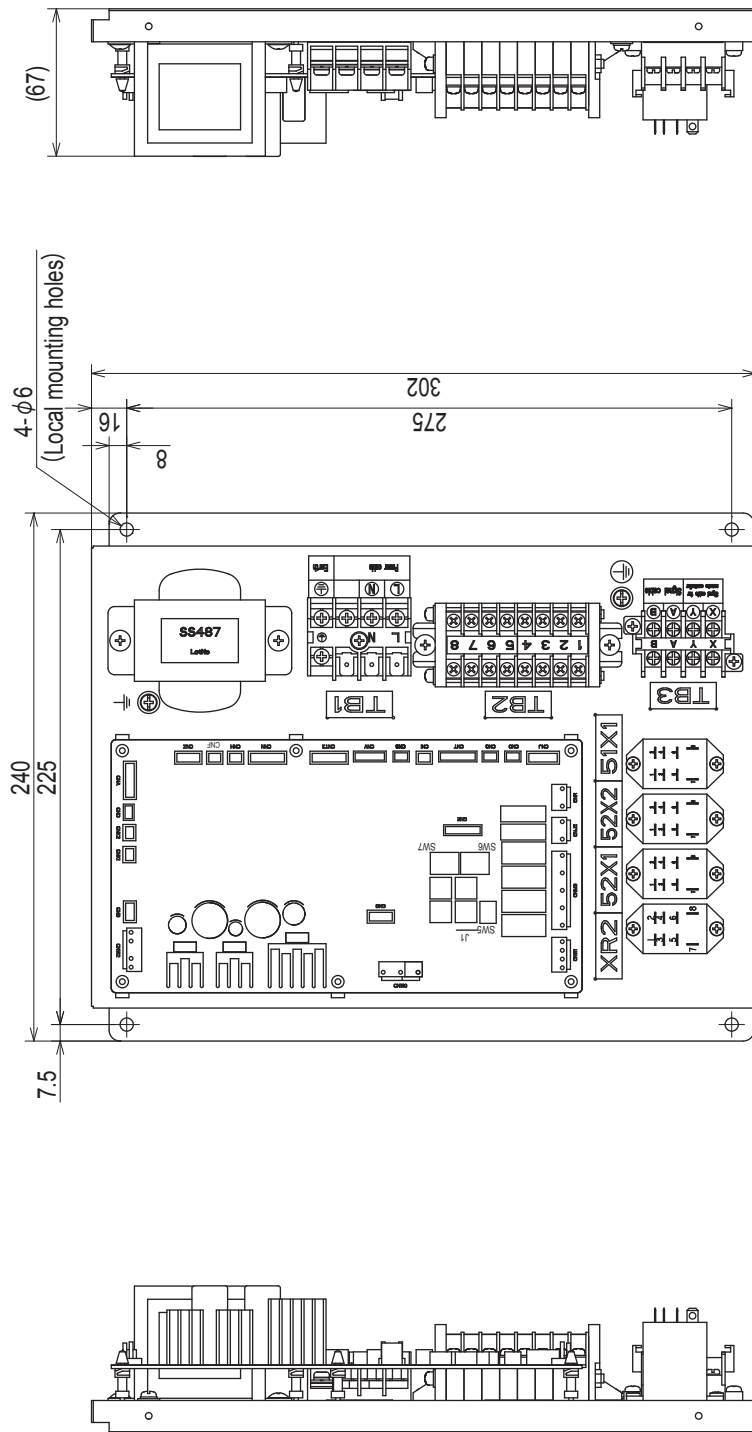
Thermistor	φ	Material
For Thi-R3	φ9.52x0.6	Copper tube
For Thi-R1-R2	φ8.0x0.6	Copper tube



Notes

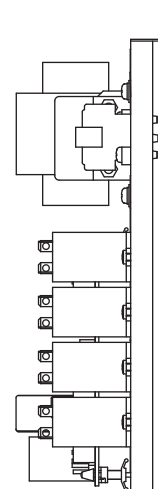
- (1) This view is shown by removing the lid. The wiring diagram has been pasted to the back of the lid. If you do not want to use the lid, then use the wiring diagram supplied as an accessory.
- (2) ※1 are the holes for accessory cable tie bands for fixing the site wiring.
- (3) ※2 is a connector to be connected to thermistor Thi-A.
- (4) ※3 is a connector to be connected to thermistor Thi-AF.
- (5) ※4 is a connector to be connected to thermistors Thi-R1, R2 and R3.
- (6) ※5 is a connector to be connected to the float switch FS.
- (7) ※6 is a connector to be connected to the stepping motor SM.



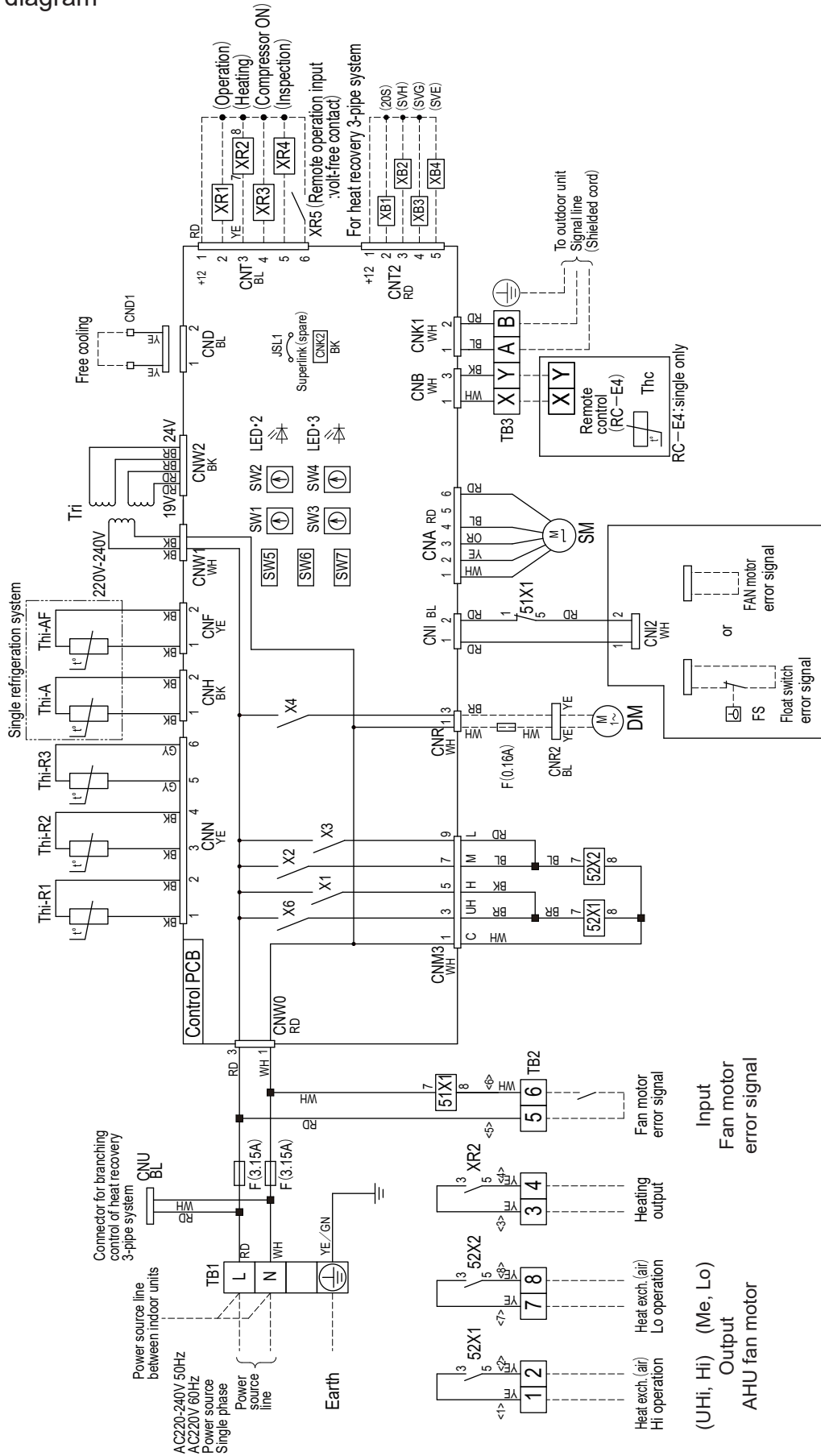


Notes

- (1) When removing the sheet metal cover take care not to damage the internal control box wiring.
- (2) After connecting the local wiring, confirm that there is no direct tension of the local wiring onto the terminal blocks or the connectors of printed circuit board (PCB).
- (3) If you are using the control box as shown in the figure, take note the following points.
  - Ensure that the exposed high-temperature and the high-voltage parts do not come into contact with any wiring.
  - Ensure that there is an air gap of more than 90mm above the high-temperature and the high-voltage parts.



(2) Wiring diagram



PCH000Z420

		Input/output summary	Capacity	
TB1	*1	Power source terminal block	AC300V, 25A	
TB2	1,2	Output for fan [ Fan speed : UHi, Hi ]	AC600V 15A	AC250V, max 10A DC125V, max 10A
	3,4	Heating output		Dry contact
	5,6	Input for AHU anomaly		
	7,8	Output for fan [ Fan speed : Me, Lo ]		AC250V, max 10A DC125V, max 10A
TB3	*1	Remote control/ Superlink line		
CNT	*1	Available	Relay capacity: DC12V max 160mA at total use	
CNT2	*1	Available	Relay capacity: DC12V max 160mA at total use	
CND	*2	Free cooling Output	Relay capacity: DC12V max 75mA	

\*1 : Same as normal KXE6 indoor units

\*2 : CND connector is included in control unit

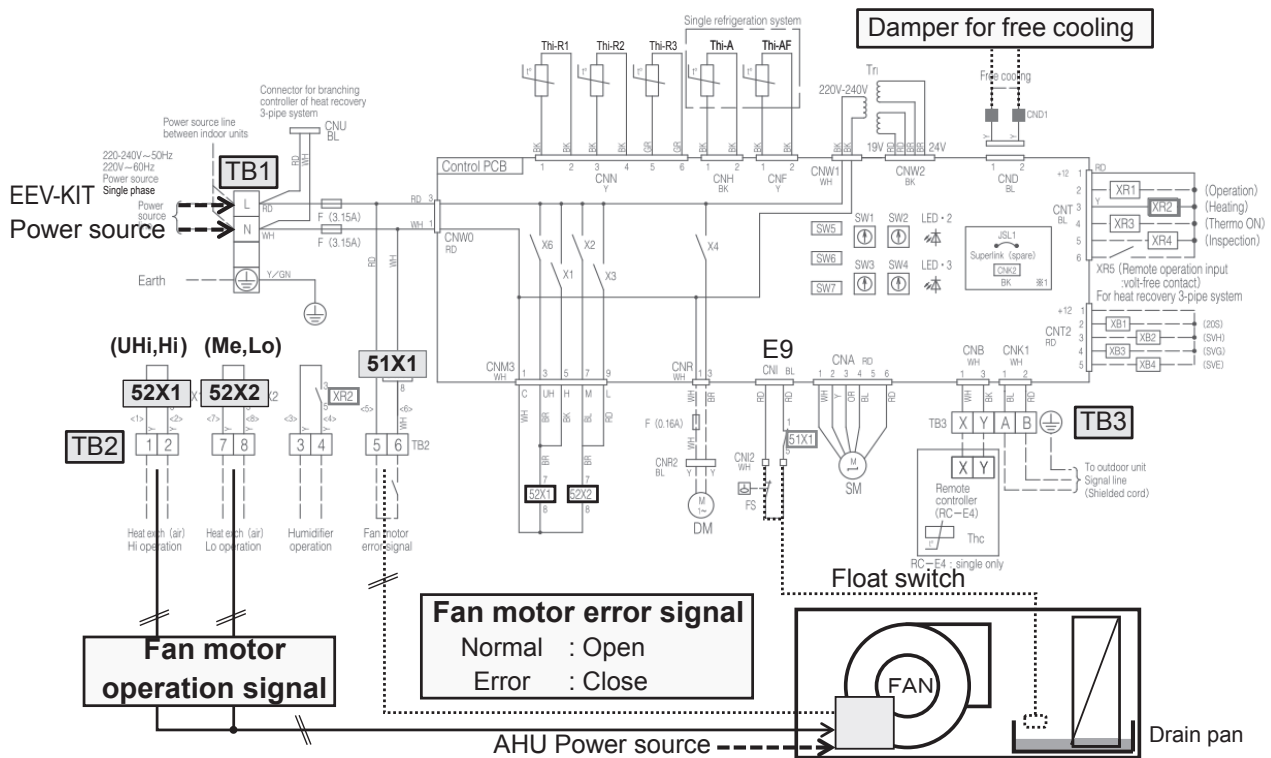
### Mark list

Mark	Parts name	
	Single refrigeration system	Multiple refrigeration system
CAN-Z	Connector	Connector
DM	Drain pump motor	Drain pump motor
F	Fuse	Fuse
FS	Float switch	Float switch
JSL1	Spare Superlink terminal setting (for spare)	Spare Superlink terminal setting (for spare)
LED• 2	Indication lamp (Green-Normal operation)	Indication lamp (Green-Normal operation)
LED• 3	Indication lamp (Red-Inspection)	Indication lamp (Red-inspection)
SM	Stepping motor (for electronic expansion valve)	Stepping motor (for electronic expansion valve)
SW1	Indoor unit address: tens place	Slave box address: tens place
SW2	Indoor unit address: ones place	Slave box address: ones place
SW3	Outdoor unit address: tens place	Outdoor unit address: tens place
SW4	Outdoor unit address: ones place	Outdoor unit address: ones place
SW5-1	Switching PCB setting for single/multiple refrigeration system (☆OFF=single/ON=multiple)	Switching PCB setting for single/multiple refrigeration system (☆OFF=single/ON=multiple)
SW5-2	Indoor unit address: hundreds place (☆OFF)	Reserved (keep off)
SW6-1-4	Model capacity setting (☆ON)	Model capacity setting (☆ON)
SW7-1	Test run, drain pump motor test (☆OFF)	Reserved(keep off)
SW7-2	Target supply air temperature adjustment (heating mode) (☆OFF)	+15deg.C setting at supply air temperature control in heating (☆OFF)
SW7-3	Switching return/supply air temperature control (☆OFF)	Switching the control method of refrigerant flow volume (☆OFF=Super heat control , ON=Supply air temperature control)
SW7-4	Automatic supply air temperature adjust control (☆OFF)	Reserved (keep off)
TB1	Terminal block (Power source line) (□mark)	Terminal block (Power source line) (□mark)
TB2	Terminal block (□mark)	Terminal block (□mark)
TB3	Terminal block (Signal line) (□mark)	Terminal block (Signal line) (□mark)
Thc	Temperature sensor (Remote control)	
Thi-A	Temperature sensor (Return air)	It is not used in the multiple system.
Thi-AF	Temperature sensor (Supply air)	
Thi-R1,2,3	Temperature sensor (Heat exchanger)	Temperature sensor (Heat exchanger)
Tri	Transformer	Transformer
X1-3,6	Relay for FM	Relay for FM
X4	Relay for DM	Relay for DM
XR2	Relay (DC12V)	Relay (DC12V)
52X1.52X2.51X1	Relay (AC200V)	Relay (AC200V)
■mark	Closed-end connector	Closed-end connector

☆ Factory default

※1 The method of setting the address of the multiple system is different than usual.  
Refer to the technical documentation.

### Wiring connection example



#### 1) FAN motor operation signal

The AHU fan motor should be controlled by the EEV-KIT control.

If the fan is controlled independently, it may cause oil return problems. (During oil return operation, the fan should not operate.)

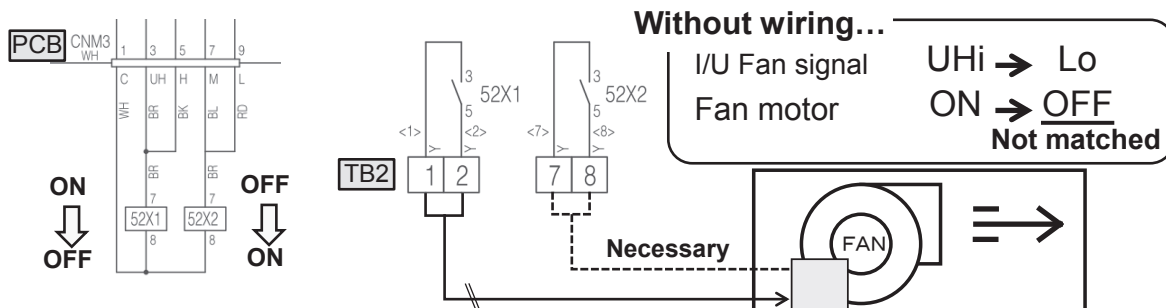
### Fan step control

The slave control has two relays for the fan motor control.

52X1 ⇒ UHi , Hi

52X2 ⇒ Me , Lo

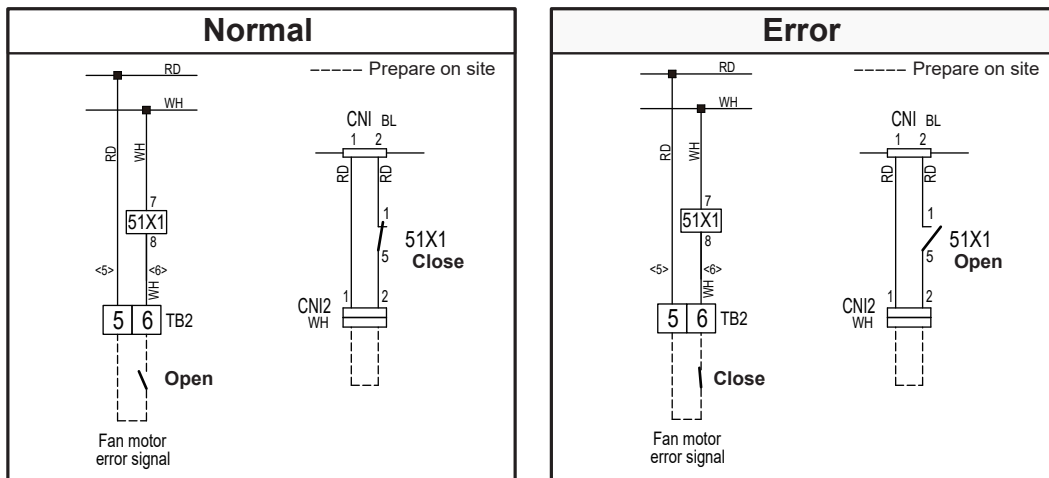
Even if only one step is necessary, the wiring connection for the other step is also required. Fan speed is changed by control. (hot keep)





2) FAN motor error signal

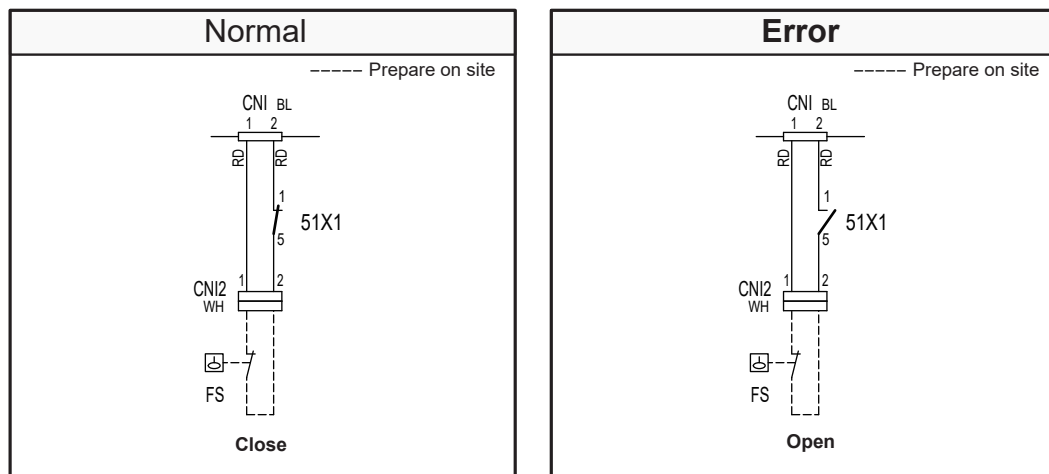
The AHU fan motor should be controlled by the EEV-KIT control.  
 If the AHU fan motor can not operate, the outdoor unit system must stop.



The fan motor error signal is sent to the float switch connector(CNI). When the error signal is sent, “E16” is shown.

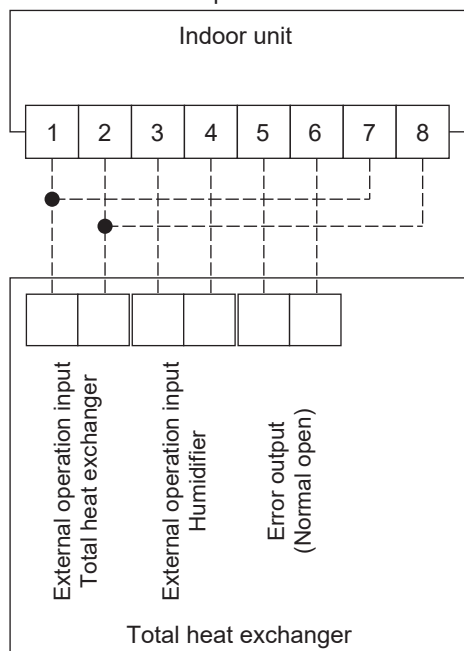
3) Float switch error signal

Please connect as follows if you attach the float switch to slave control.  
 CNI on PCB . When the error signal is sent, “E16” is shown.



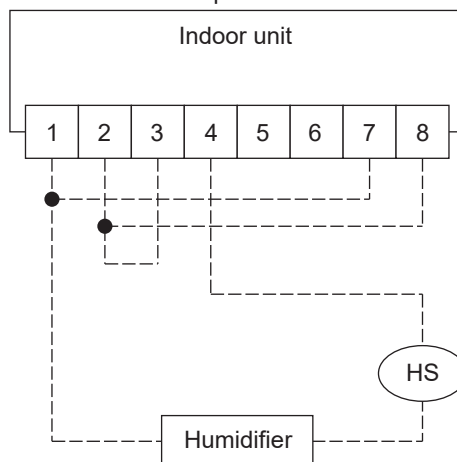
#### 4) Signal for humidifier

a) Wire connection example with total heat exchanger



- Make sure to connect wires so that the total heat exchanger is operated synchronized with the operation of EEVKIT.
- For details, refer to the installation manual and the instruction manual of total heat exchanger.

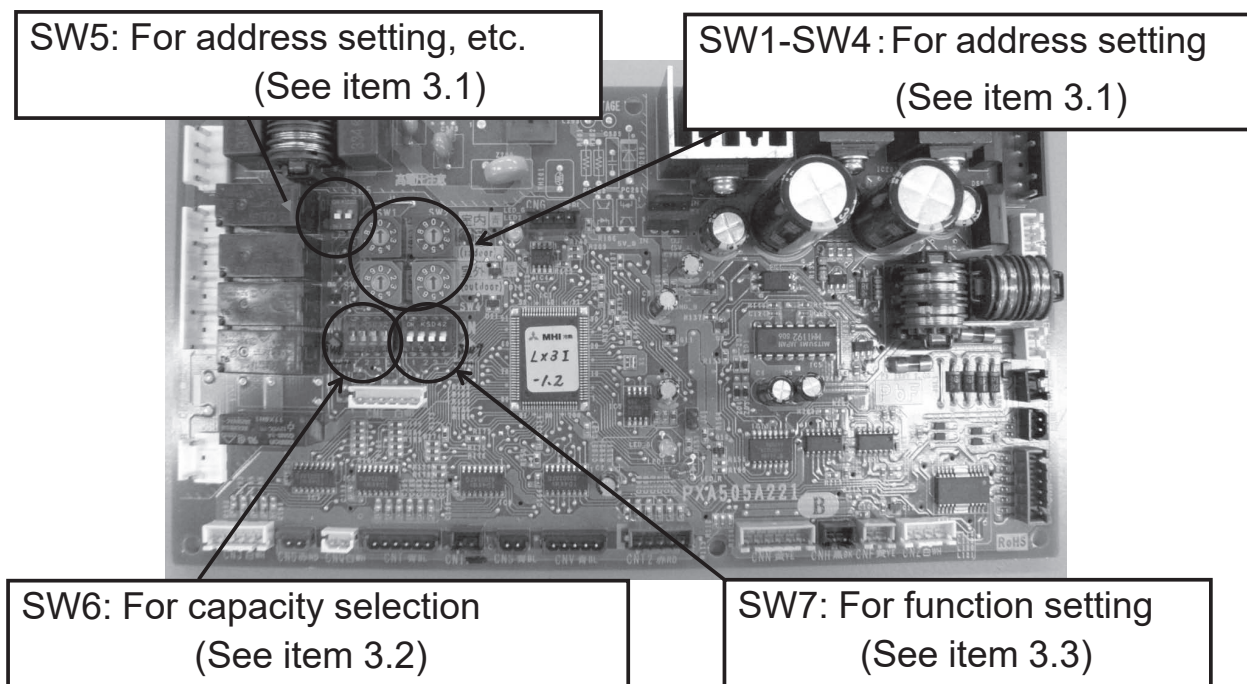
b) Wire connection example with humidifier alone



- The heating output 3-4 is output in heating mode regardless of operation / stop. Make sure to connect wires so that the humidifier is operated synchronized with the operation of EEVKIT.

#### Error code list

Display on remote control	LED on indoor circuit board		Content	
	Red (checking)	Green (normal)		
OFF	Stays OFF	Keeps flashing	Normal	
	Stays OFF	Stays OFF	Fault in power source, indoor power off or one phase down	
E1	Stays OFF	Keeps flashing	Fault on the transmission between indoor circuit board and remote control	
	Not sure	Not sure	Indoor computer abnormal	
E2	1-time flash	Keeps flashing	Duplication of indoor address No.(can only be detected during operation) Excess number of remote controls(can only be detected during operation)	
E3	2-time flash	Keeps flashing	Outdoor power off or one phase down There is no corresponding outdoor unit address.	
E5	2-time flash	Keeps flashing	Fault on outdoor-indoor transmission	
E6	1-time flash	Keeps flashing	Indoor heat exchanger temperature sensor interrupted or short-circuit	
E7	1-time flash	Keeps flashing	Return air temperature sensor interrupted or short-circuit	
E10	Stays OFF	Keeps flashing	Excess number of remote control connections	
E11	Stays OFF	Keeps flashing	The master indoor unit is not set properly.	
E12	1-time flash	Keeps flashing	Superlink	
			Indoor unit address switch	
			Indoor No.	Outdoor No.
			New specification	001-127
Old specification	0-47	48,49		
	48,49	0-47		
E15	1-time flash	Keeps flashing	Indoor supply air temperature sensor interrupted or short-circuit	
E16	1-time flash	Keeps flashing	Float switch activation (only with FS), Fan motor (Faulty)	
E18	1-time flash	Keeps flashing	The address configuration fault for master-slave indoor units.	
E19	1-time flash	Keeps flashing	Indoor unit operation check/drain motor check mode faulty	
E28	Stays OFF	Keeps flashing	Remote control temperature sensor anomaly	
Over E30	Stays OFF	Keeps flashing	Outdoor unit checking (outdoor circuit board LED checking )	
E63	Stays OFF	Keeps flashing	Emergency stop	



SW1-SW4 and SW6 can be set according to the required specifications.  
(Same method as the KXE6 indoor unit)

### 3.1 SW1-SW5 (Address setting)

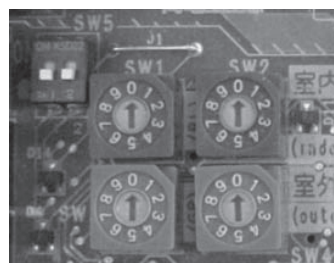
Set address in the same manner as KXE6 or KXZ system.

Switch		Contents
SW1	Rotary switch (Blue)	Indoor address (10's)
SW2	Rotary switch (Blue)	Indoor address (1's)
SW3	Rotary switch (Green)	Outdoor address (10's)
SW4	Rotary switch (Green)	Outdoor address (1's)
SW5-2	DIP switch	Indoor address (100's) *

\* OFF: 100's=0 ON : 100's=1

SW5-1 should be kept OFF.

Automatic address setting can be used,  
but we recommend to use the manual  
address setting method.



### 3.2 SW6 (Model capacity selection)

Set the model capacity according to the heat exchanger capacity. The capacity setting is the same as the KXE6 or KXZ indoor unit rule.

	Model capacity											
	22	28	36	45	56	71	90	112	140	160	224	280
SW6-1	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
SW6-2	OFF	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF	ON	ON
SW6-3	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON
SW6-4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON

Default

### 3.3 SW7 (Function setting)

★ Factory default

Switch	Function	On/Off	Setting
SW7-1	Test run, drain pump motor test	★ Off	Normal
		On	Test run
SW7-2	Target supply air temperature adjustment (Heating mode)	★ Off	Normal
		On	Target supply air temperature reduces -12 deg.C
SW7-3	Switching return/supply air temperature control	★ Off	Return air temperature control
		On	Supply air temperature control
SW7-4	Automatic supply air temperature. adjust. control	★ Off	Invalid
		On	Valid

1. SW7-1 is the same function as for the KXE6 indoor unit.

### Return/supply air temperature control

Control	Pressure control mode	Target pressure / supply air temperature setting guideline
Return air temperature control	STANDARD	<b>Evaporating temperature: 5-12°C</b> <b>Condensing temperature: 42-47°C</b>
	TYPE1	<b>Evaporating temperature: 5-12°C</b> <b>Condensing temperature: 32-37°C</b>
Supply air temperature control	STANDARD	<b>Cooling supply air temperature: 12-18°C</b> <b>Heating supply air temperature: 32-40°C</b>
	STANDARD (SW7-2 ON)	<b>Cooling supply air temperature: 12-18°C</b> <b>Heating supply air temperature: 20-28°C</b>
	TYPE1	<b>Cooling supply air temperature: 22-28°C</b> <b>Heating supply air temperature: 20-28°C</b>

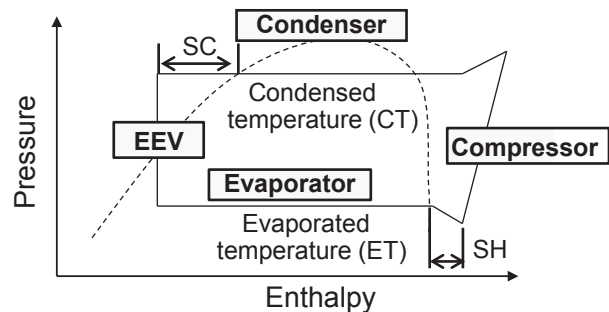
Cooling mode and heating mode must use same pressure control mode.  
(STANDARD mode or TYPE1 mode)

### 3.4 Switching return/supply air temperature control

Normal KX indoor unit's are control by their EEV's to keep system reliability.

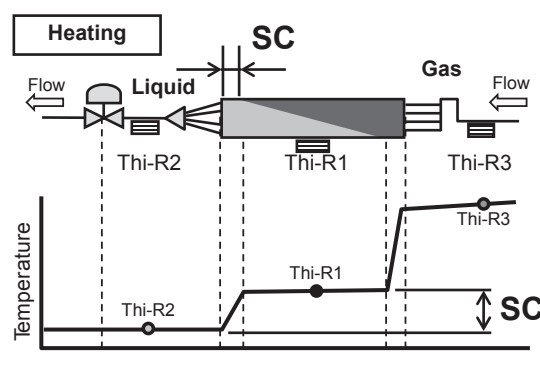
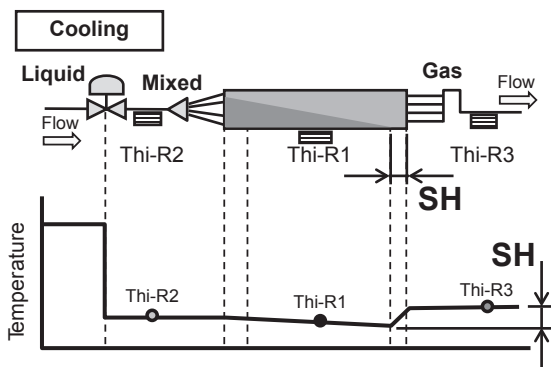
[ Cooling ] Superheat (SH)

[ Heating ] Subcool (SC)



$SH = \text{Compressor suction temperature} - ET$

$SC = CT - \text{liquid temperature at EEV}$



**Return air control:** Same control as normal KX indoor unit

**Supply air control:** Indoor unit adjust refrigerant volume by EEV

Comparison of both control

	Return air	Supply air
Capacity	Maximum	<b>Adjustable</b>
Heat exchange efficiency	<b>Normal</b>	worse
Supply air temperature balance	<b>Normal</b>	worse
Supply air temperature	Different	<b>Constant</b>
System design	Difficult	<b>Easy</b>

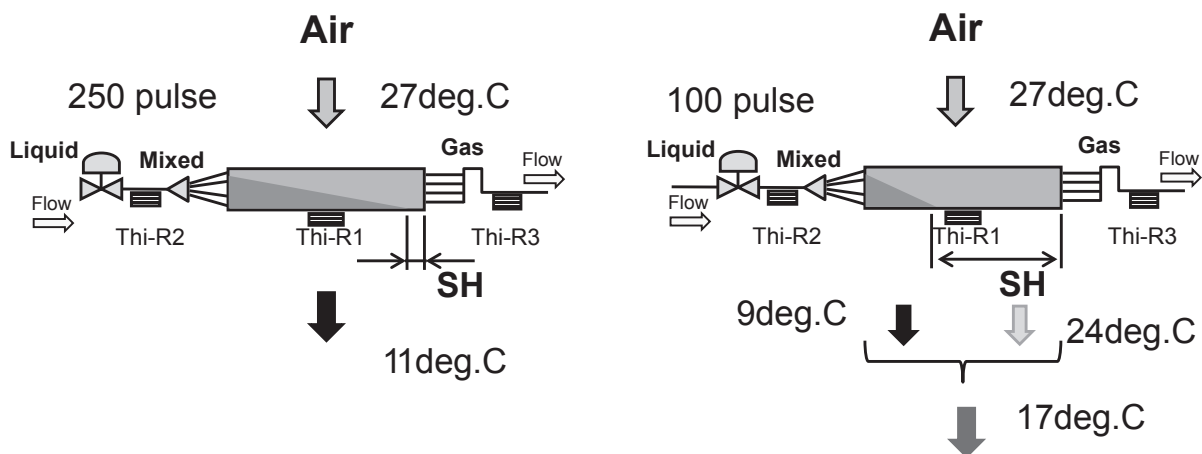
Function setting

	SW7-3	Air temperature control	EEV control
1	OFF	<b>Return air</b> temperature control	SH*(Cooling) / SC*(Heating) of indoor unit heat exchanger become constant.
2	ON	<b>Supply air</b> temperature control	Supply air temperature becomes constant.

EEV control during supply air temperature control

To change supply air temperature

- 1) Change evaporating/condensing temperature ➡ Target pressure is constant
- 2) Change air flow volume ➡ Difficult for AHU
- 3) Change refrigerant flow volume ➡ Possible



### 3.4.1 Return air temperature control

- Same control as normal air-conditioner, RAC, PAC, KX...
- Thermo ON/OFF control :

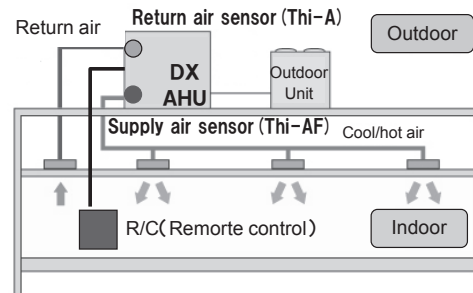
Temperature difference between R/A temperature sensor (or remote control (R/C) sensor) and set temperature by R/C.

#### Return air (R/A) temperature control

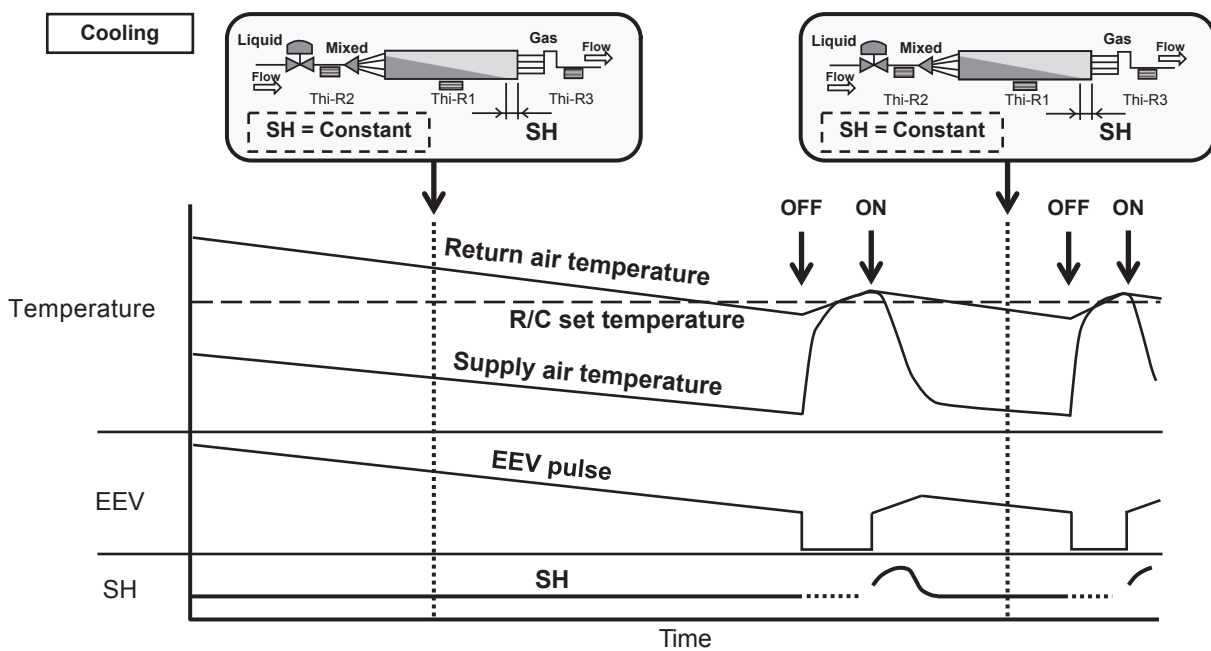
R/A temperature setting : R/C



When R/A temperature becomes Set R/A temperature = Thermo OFF

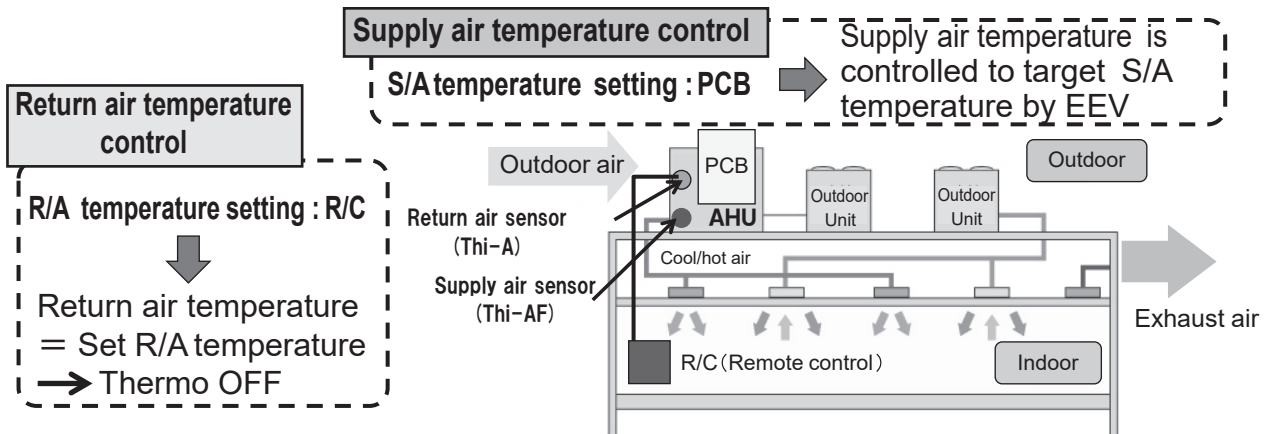


When R/A temperature becomes set R/A temperature = Thermo OFF

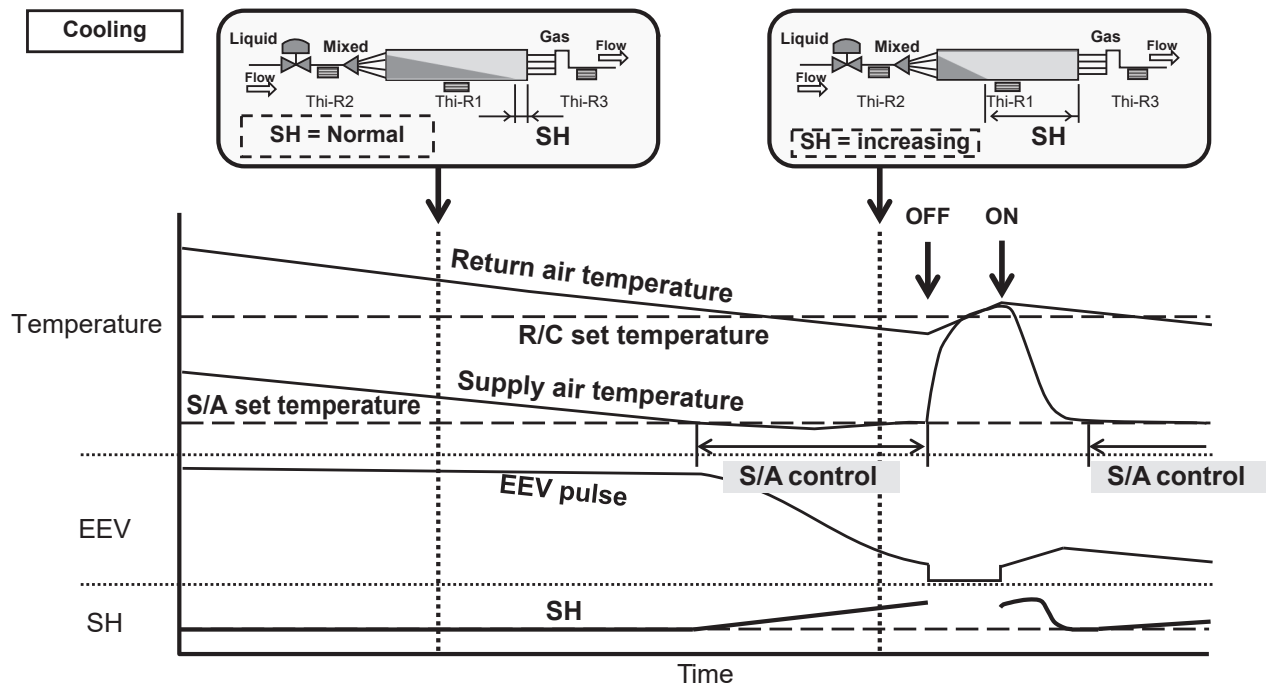


### 3.4.2 Supply air temperature control

- Target S/A temperature is fixed and can be adjusted by R/C function setting.
- Thermo ON/OFF control :  
Temperature difference between return air temperature sensor (or R/C sensor) and set temperature by R/C. (same as return air temperature control)
- Cooling : Set return air temperature must be greater than target supply temperature.  
Heating : Set return air temperature must be less than target supply temperature.  
(If not, set temperature becomes target supply temperature.)



When R/A temperature becomes set R/A temperature = Thermo OFF





## Information

- The EEV-KIT can control supply temperature by the EEV, but the control range of the EEV is limited.
- It is therefore important to select and use the correct EEV size and correct settings.
- EEV control range - Min : 50 – 470 pulses

### 3.4.3 Supply air temperature control setting (cooling)

- The target supply air temperature is fixed by the R/C function setting.
- The target supply air temperature and the target low pressure are different between STANDARD and TYPE1.

Default setting (cooling)

Pressure control mode	STANDARD	TYPE1 *1
Target supply air set temperature	15°C	25°C
Target low pressure	(LP≒0.65–0.76MPa)	(LP≒0.65–0.76MPa plus 0.22MPa)

\*1 TYPE1 is set by indoor unit function No.17(Pressure control) of R/C.

- Pressure control for cooling/heating must be the same.
- Target low pressure should be adjusted to the AHU design conditions.
- In case of TYPE 1, if the return air temperature becomes lower than 16deg.C, the unit will go to thermo OFF.

Target supply air temperature can be changed to ±3deg.C by indoor unit function No. 01 and 08 of R/C.

**Target supply air temperature range**

[Important]

[	STANDARD	: 12–18°C
	TYPE1	: 22–28°C

RC-E \* have no function for No.01.

For No.01 function, special RC-E \* software is necessary.

★ default

Indoor unit function			Actual meaning	
No.	Function	Display on R/C	Function	Meaning
01	Auto filter cleaning	★ Invalid	Switching Plus/Minus	★ Plus
		Valid		Minus
08	Heating SP offset	★ No offset	Target supply air temperature offset	★ No offset
		Offset +1.0°C		Offset +1.0°C
		Offset +2.0°C		Offset +2.0°C
		Offset +3.0°C		Offset +3.0°C

### 3.4.4 Supply air temperature control setting (heating)

- Target supply air temperature is fixed by the R/C function setting.
- The target supply air temperature and target high pressure are different between the STANDARD and TYPE1.

Pressure control mode	STANDARD	TYPE1 *1
Target supply air set temperature	36°C	24°C
Target high pressure	(HP≒2.75MPa)	(HP≒1.77MPa)

\*1 TYPE1 is set by indoor unit function No.17(PRESSURE CONTROL) of R/C.

- Pressure control for cooling/heating must be same.
- Target high pressure should be adjusted to AHU design condition.

The target supply air temperature can be changed to ±4deg.C by the indoor unit function No. 09 of the R/C.

**Target supply air temperature range** [ STANDARD : 32–40°C  
TYPE1 : 20–28°C

★ factory default

Indoor unit function			Actual meaning		Standard
No.	Function	Display on R/C	Function	Meaning	
09	Return air temperature	Offset +2.0°C	Target supply air temperature offset	Offset +4.0°C	40°C
		Offset +1.5°C		Offset +3.0°C	39°C
		Offset +1.0°C		Offset +2.0°C	38°C
		★ No offset		★ No offset	36°C
		Offset -1.0°C		Offset -2.0°C	34°C
		Offset -1.5°C		Offset -3.0°C	33°C
		Offset -2.0°C		Offset -4.0°C	32°C

- Cooling mode and heating mode must use the same pressure control mode. (STANDARD or TYPE1 )
- If the customer wants to reduce the target supply air temperature in heating of STANDARD mode, the option function to change the target supply air temperature to -12 deg.C is available. (SW7-2)

### 3.5 Target supply air temperature adjustment (heating mode)

- This adjustment is available in STANDARD and supply air control. This adjustment cannot be used in case of TYPE1 or return air temperature control.
- With SW7-2 ON this adjustment is activated.
- The target supply air temperature becomes -12 degrees from set target supply air temperature.

	Pressure control	EEV control	Adjustment
1	STANDARD	Supply air temperature control (SW7-3 ON)	OK
2	STANDARD	Return air temperature control	N/A
3	TYPE1	Supply air temperature control	N/A

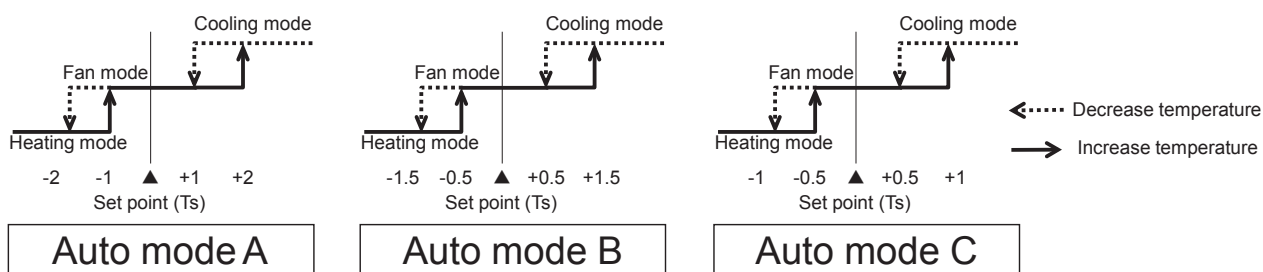
	SW7-2	Cooling mode target supply air temperature	Heating mode target supply air temperature
1	OFF	15°C (12–18°C)	36°C (32–40°C)
2	ON	15°C (12–18°C)	24°C (20–28°C)

### 3.6 Auto mode changeover temperature

- The switching temperature between cooling/heating can be changed the same as a normal indoor unit. ( $\pm 2^{\circ}\text{C}$ )
- Function setting is different from normal indoor units.

★ Factory default

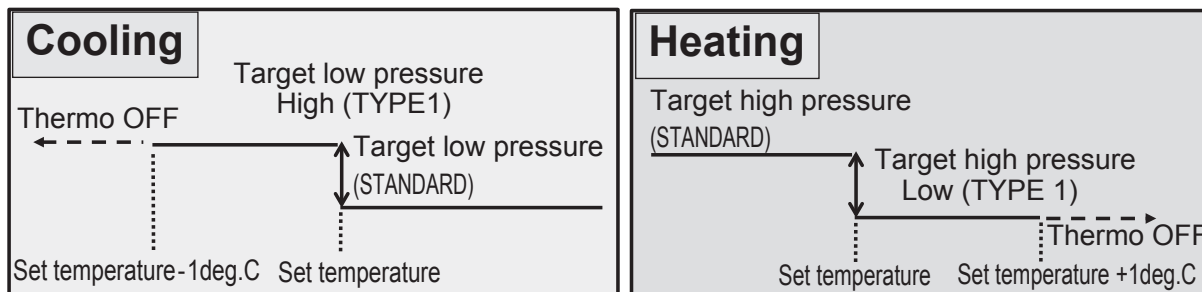
Remote control function			Actual meaning
No.	Function	Display on R/C	
11	VENT LINK SET	★ NO VENT	★ Auto mode A $\pm 2^{\circ}\text{C}$
		VENT LINK	Auto mode B $\pm 1.5^{\circ}\text{C}$
		NO VENT LINK	Auto mode C $\pm 1^{\circ}\text{C}$



[ Note ] Auto mode can be set by R/C function No.2.

### 3.7 Automatic supply air temperature adjust control

- In the case that SW7-4 is ON, when the room temperature becomes the set temperature, the target pressure is changed automatically.
- Indoor unit function setting No.17 is ignored.



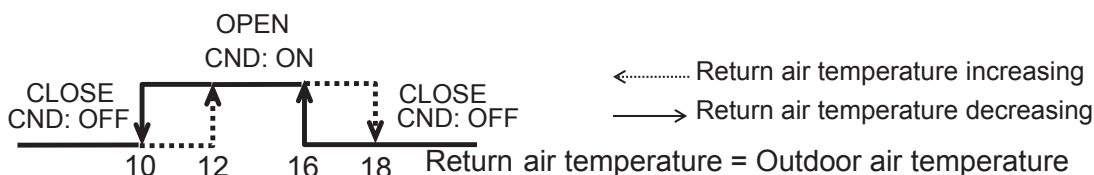
The control checks the return air temperature every 2 minutes and decides the target pressure mode. The purpose of this control is to prevent overcooling / overheating.

Application condition is as follows;

1. System has only EEV-KIT connected.
2. Detect room temperature. (Use remote control sensor or remote thermistor) If there are several EEV-KITs installed, only when all EEV-KITs require TYPE1, then the outdoor unit is going to change to TYPE 1 pressure mode.

### 3.8 Free cooling control

- Free cooling is the function to control the opening of the by-pass damper of the total heat exchanger in cooling mode.



- The by-pass damper of the total heat exchanger can be controlled by CND. CND outputs on PCB is ON/OFF signal according to outdoor temperature (= return air temperature).
- When using this function, the return air temperature sensor should be relocated to the position where the outdoor air temperature can be detected. The remote control sensor cannot be used.

## 4. Outdoor unit

### 4.1 Target pressure adjustment

The target pressure difference between an MHI indoor unit and a AHU with DXC is ...

1) MHI indoor unit

Adjusted for nominal indoor unit capacity

2) EEV kit

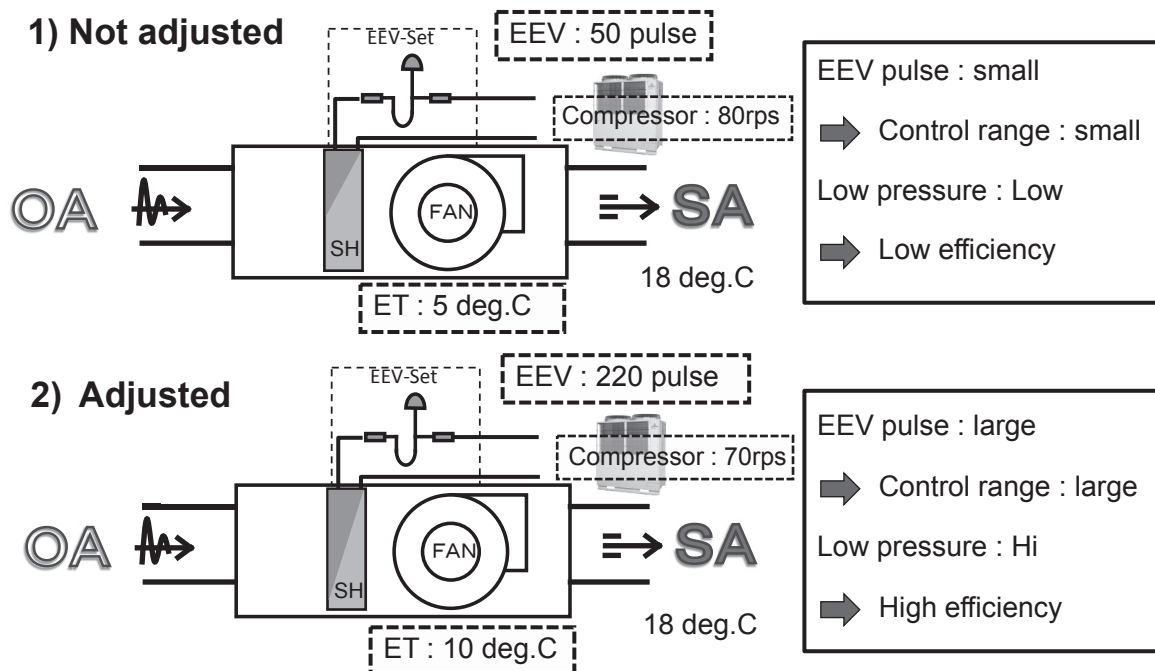
Decided by AHU specification and customer's requirement.

In case of EEV-KIT, target pressure should be adjusted to the system.

Advantage

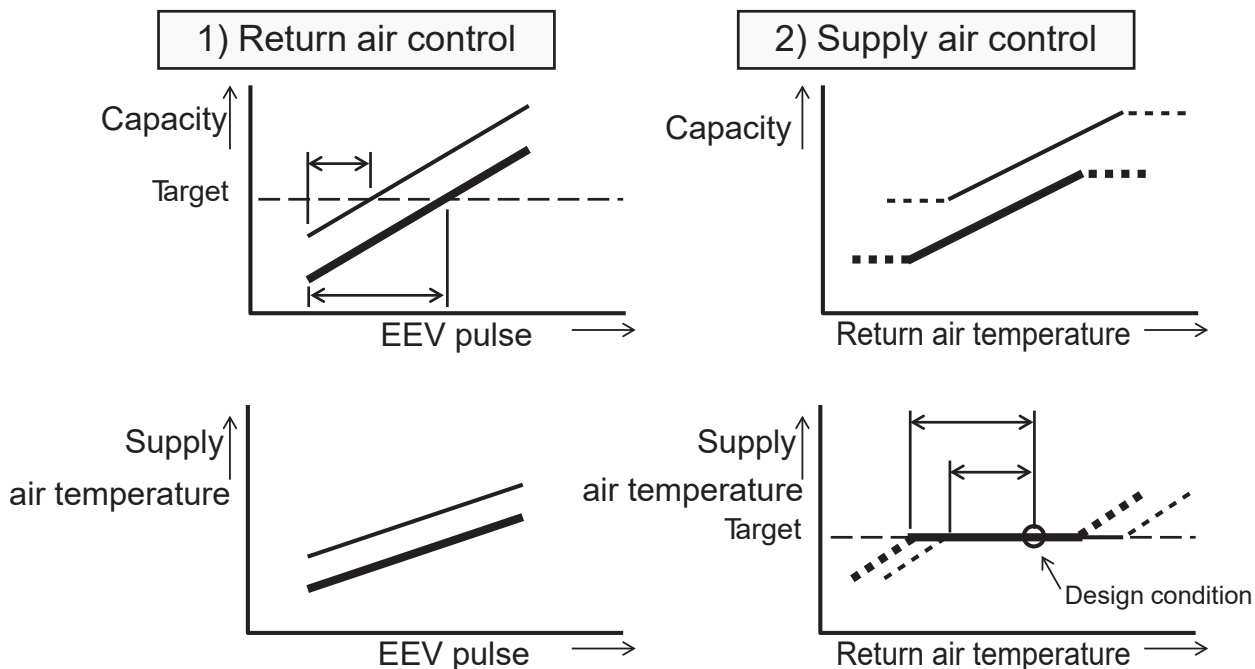
- Keeps required condition ( Supply air, capacity)
- Energy saving
- Suitable EEV control

### Advantage of target pressure adjustment [ Supply air temperature control ]



### Image of EEV control range ( Cooling )

— Adjusted  
 — Not adjusted



## 4.2 Target pressure change procedure

Target pressure can be changed to meet suitable evaporating / condensing temperature by 7-segment display.

Setting item	Micro	KXZM	KXZP		KXZE1,2	
	FDC121-155 KXZEN1, KXZES1	FDC224-335 KXZME1	Standard	TYPE1	Standard	TYPE1
Cooling target low pressure	P11	P11	P40	P73	P40	P73
Heating target high pressure	P12	P12	P41	P74	P41	P74

1. Select 7-segment code by SW8 and SW9
2. Push SW7 (Data setting/deleting) more than 3 seconds.
3. 7-segment right side starts blinking. (Every 0.5 seconds)  
(If there is no operation for more than 10 seconds, it goes back to normal display and changed setting is cancelled.)
4. Push SW8 (ones digit) and select the **adjusting value**.  
Cooling (Standard value is 0.83MPa (5°C) in STANDARD mode  
1.05MPa (12°C) in TYPE1 mode)  
0.00 → 0.01 → 0.02 ..... → 0.50 → -0.30 → -0.29 → ..... → -0.01 → 0.00  
Heating (Standard value is 2.75MPa(47°C) in STANDARD mode  
1.77MPa(30°C) in TYPE1 mode)  
0.00 → 0.10 → 0.20 ..... → 0.70 → -0.90 → -0.80 → ..... → -0.10 → 0.00
5. Display the required adjusting pressure, then push SW7 for 3 seconds.  
The setting is memorized in EEPROM.
6. Confirm the setting by selecting 7-segment code again.

### Example1

1. FDC400KXE6
2. Air-conditioning mode
3. Target condensing temperature is 40°C → High pressure in heating 2.35 MPa

↓

1. Select C73
2. Select “-0.40”  
(=2.35 - 2.75)

### Example2

1. FDC450KXE6
2. OA processing mode(TYPE1)
3. Target evaporating temperature is 8°C → Cooling pressure in cooling 0.92 MPa

↓

1. Select C72
2. Select “-0.13”  
(= 0.92 - 1.05 = -0.13)

Official adjustable range

Cooling	STANDARD	0 - +0.22
	TYPE 1	-0.22 - 0
Heating	STANDARD	0 - -0.9
	TYPE 1	+0.7 - 0

7-segment code display

7-segmen data display

SW8, SW9  
SW7  
(Data setting/  
deleting)





- Check the outdoor unit software version by 7-segment display “98”.
- It is not possible to change the pressure in case of old software versions.
- Please change the outdoor unit software version if the version is older than below.

	Software version
FDC112-155KXE6	3.501
FDC224-335KXE6	3.101
FDC400-680KXE6	2.53
FDC224-680KXRE6	1.102

#### How to change the outdoor unit software

1. Preparation - Power OFF → Change the pin position → Connect RS-232C cable → Power ON (Green LED stays ON)
2. Rewriting software - Start the rewriting software “FlashSta” → Select software → Execute rewriting.
3. Back to normal - Power OFF → Change back the pin position → Power ON (Green LED starts blinking)
4. Confirmation - Check the software version by 7-segment 98.  
In case of KXZ series, it is not necessary to change the outdoor unit software version.  
The version was applied in KXZ series.

## 5. Summary

1. Single refrigeration systems just use slave EEV Control boxes.
2. We recommend to use the SC-ADNA-E when system B (Several slave EEV Control boxes are used in 1 AHU) is established and is needed to connect with other indoor unit through the Superlink network.
3. In case of system B, all return/supply air temperature sensors need to be put in the same position, and one remote control needs to connect with all the EEV Control boxes.
4. Both supply air temperature control and return air temperature control are available.
5. EEV Control boxes have two pressure modes, STANDARD mode and TYPE1 mode.
6. Target supply air temperature is fixed and can adjust by using the R/C.
7. In case of STANDARD mode and supply air temperature control, the target supply air temperature in heating can reduce by –12 deg.C
8. Auto mode changeover temperature can be adjustable.

# 6. Instruction of how to replace indoor unit control PCB

PCO12D015A

### SAFETY PRECAUTIONS

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

#### WARNING

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

#### CAUTION

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

#### ① Check the model type

Applicable model	Setting according to the model *1	
	I/U FAN	LOUVER SW
SAF-DXP, SAF-DX-6	HI	INVALID
EEVKIT3-C		
EEVKIT6-E-C	HI-MD	

- 1 There is a unit having plural applicable PCB depending on a model.
- 2 Set the function setting corresponding the spare PCB
- 3 Do "Setting according to the model \*1" refer to "⑥Function setting of wired remote control" after turning on the power source when

#### ② Set to an appropriate address and function using switch on PCB.

Select the same setting with the removed PCB.  
Applied differently depending on the model set.  
For more information please see also the back side.

#### ③ Set to an appropriate capacity using the model selector switch(SW6).

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

SW6	-1	-2	-3	-4
22	OFF	OFF	OFF	OFF
28	ON	OFF	OFF	OFF
36	OFF	ON	OFF	OFF
45	OFF	OFF	ON	OFF
56	OFF	ON	ON	OFF

SW6	-1	-2	-3	-4
71	OFF	OFF	OFF	ON
80	ON	OFF	OFF	ON
90	OFF	ON	OFF	ON
112	ON	ON	OFF	ON
140	OFF	OFF	ON	ON

SW6	-1	-2	-3	-4
160	ON	OFF	ON	ON
224	OFF	ON	ON	ON
280	ON	ON	ON	ON



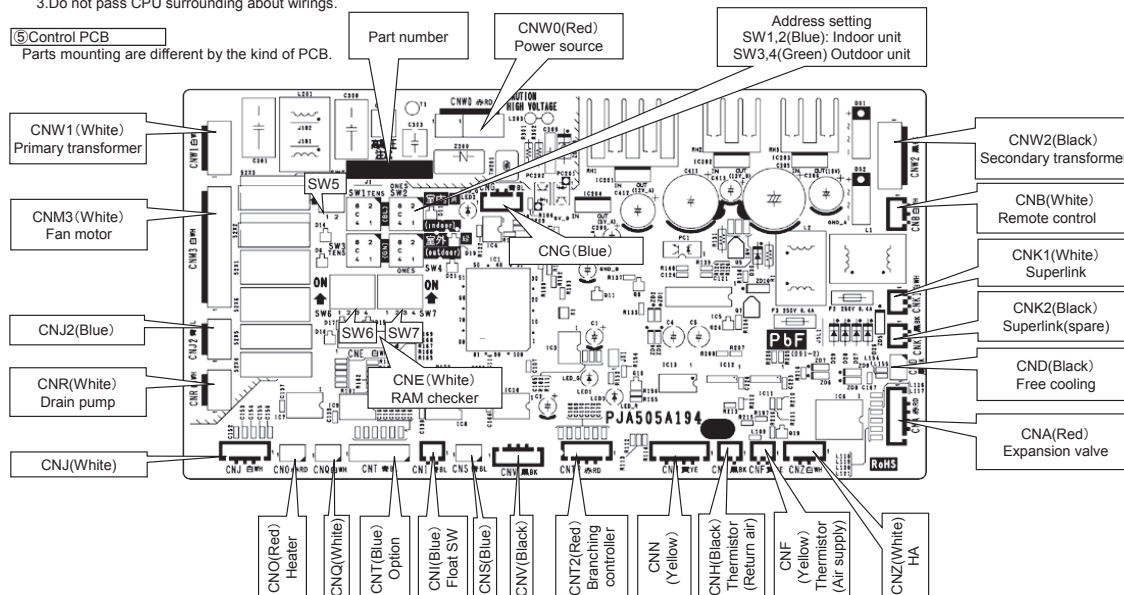
Example setting for 56

#### ④ Replace the PCB

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

#### ⑤ Control PCB

Parts mounting are different by the kind of PCB.



⑥ Function setting of wired remote control

Operation message  
Function description

Function No.

During air-conditioner stopping, push SET and MODE button simultaneously for over 3 seconds.

Set the function setting corresponding the applicable model. The display changes into the function setting if pushing two buttons at the same time for over three seconds.

[Flow of function setting]  
Fixed : Push SET button  
Return : Push RESET button  
Select : Push ▲▼ button  
Finished: Push ON/OFF button  
Confirm the detail of each function by the technical manual.

FUNCTION	FUNCTION	SETTING
01	GRILL ↑ ↓ SET	↑ ↓ INVALID ○ 50Hz ZONE ONLY 60Hz ZONE ONLY
02	AUTO RUN	AUTO RUN ON ○ AUTO RUN OFF
03	TEMP SW	VALID ○ INVALID
04	MODE SW	VALID ○ INVALID
05	ON/OFF SW	VALID ○ INVALID
06	FAN SPEED SW	VALID ○ INVALID
07	LOUVER SW	VALID ○ INVALID
08	TIMER SW	VALID ○ INVALID
09	SENSOR SET REMOTE CONTROL	SENSOR OFF ○ SENSOR ON SENSOR +3.0°C SENSOR +2.0°C SENSOR +1.0°C SENSOR -1.0°C SENSOR -2.0°C SENSOR -3.0°C
10	AUTO RESTART	INVALID ○ VALID
★	VENT LINK SET	NO VENT ○ VENT LINK NO VENT LINK
12	TEMP RANGE SET	INDN CHANGE ○ NO INDN CHANGE
13	I/U FAN	HI-MI-LO ○ HI-LO HI-MID ○ 1 FAN SPEED
14	LOUVER POSITION	4POSITION STOP ○ FREE STOP
15	MODEL TYPE	HEAT PUMP ○ COOLING ONLY
16	EXTERNAL CONTROL SET	INDIVIDUAL ○ FOR ALL UNIT
17	ROOM TEMP INDICATION SET	INDICATION OFF ○ INDICATION ON
18	HEATING PREPARATION	INDICATION OFF ○ INDICATION ON
19	TEMP UNIT SET	°C ○ °F

FUNCTION	FUNCTION	SETTING
02	FAN SPEED SET	STANDARD ○ HIGH SPEED1 HIGH SPEED2
03	FILTER SIGN SET	INDICATION OFF ○ TYPE1 TYPE2 TYPE3 TYPE4
04	LOUVER POSITION	4POSITION STOP ○ FREE STOP
05	EXTERNAL INPUT	LEVEL INPUT ○ PULSE INPUT
06	OPERATION PERMISSION/PROHIBITION	INVALID ○ VALID
07	EMERGENCY STOP	INVALID ○ VALID
★		OFFSET +3.0°C OFFSET +2.0°C
08	HEATING SP OFFSET	OFFSET +1.0°C ○ NO OFFSET
★		OFFSET +2.0°C OFFSET +1.5°C
09	RETURN AIR TEMP	OFFSET +1.0°C ○ NO OFFSET OFFSET -2.0°C OFFSET -1.5°C OFFSET -1.0°C
10	HEATING FAN CONTROL	LOW FAN SPEED ○ SET FAN SPEED INTERMITTENCE FAN STOP
11	FROST PREVENTION TEMP	TEMP HIGH ○ TEMP LOW
12	FROST PREVENTION CONTROL	FAN CONTROL ON ○ FAN CONTROL OFF
13	DRAIN PUMP LINK	STANDARD ○ +HEATING +HEATING,FAN +FAN
14	COOLING FAN REMAINING	NO REMAINING ○ 0.5HR 1HOUR 6HOUR
15	HEATING FAN REMAINING	NO REMAINING ○ 0.5HR 2HOUR 6HOUR
16	HEATING FAN INTERMITTENCE	NO REMAINING ○ 5minOFF,5minON
★		
17	PRESSURE CONTROL	STANDARD ○ TYPE 1

Only when plural indoor units are connected, Indoor No. selection

If to change re-set with other indoor unit, push AIRCON NO. button, and indoor selection indication (for example: I/U 000) is set back.

★ is EEK1T's function. Confirm the detail by the technical manual.

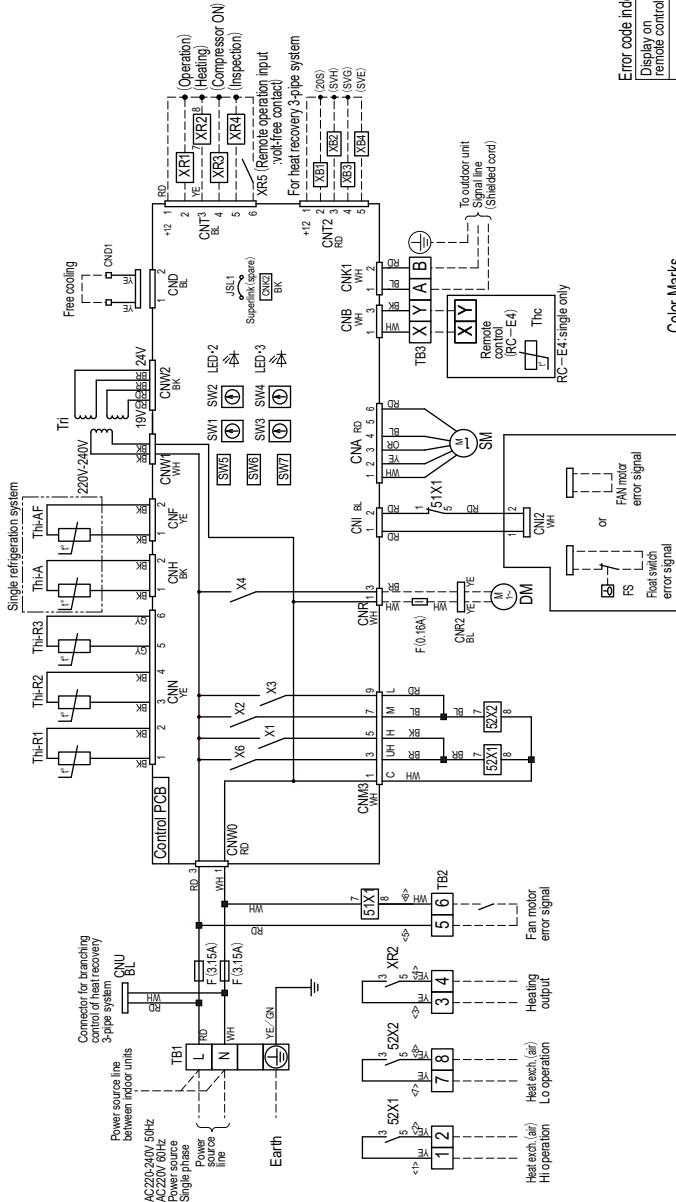
ON/OFF button (finished)

PCH012D015A

Meaning of marks

Mark	Parts name	Multiple refrigeration system
CNA-Z	Connector	Multiple refrigeration system
DM	Drain pump motor	
FS	Fuse	
LS	Line switch	
LS-1	Slave Start/stop terminal setting (for slave)	
LED-2	Slave Start/stop terminal setting (for slave)	
LED-3	Slave Start/stop terminal setting (for slave)	
SM	Sliding motor (for electronic expansion valve)	
SW1	Indoor unit address: tens place	
SW2	Indoor unit address: tens place	
SW3	Indoor unit address: tens place	
SW4	Indoor unit address: tens place	
SW5-1	Slave Start/stop terminal setting (for slave)	
SW5-2	Slave Start/stop terminal setting (for slave)	
SW5-3	Slave Start/stop terminal setting (for slave)	
SW5-4	Slave Start/stop terminal setting (for slave)	
SW5-5	Slave Start/stop terminal setting (for slave)	
SW5-6	Slave Start/stop terminal setting (for slave)	
SW5-7	Slave Start/stop terminal setting (for slave)	
SW5-8	Slave Start/stop terminal setting (for slave)	
SW5-9	Slave Start/stop terminal setting (for slave)	
SW5-10	Slave Start/stop terminal setting (for slave)	
SW5-11	Slave Start/stop terminal setting (for slave)	
SW5-12	Slave Start/stop terminal setting (for slave)	
SW5-13	Slave Start/stop terminal setting (for slave)	
SW5-14	Slave Start/stop terminal setting (for slave)	
SW5-15	Slave Start/stop terminal setting (for slave)	
SW5-16	Slave Start/stop terminal setting (for slave)	
SW5-17	Slave Start/stop terminal setting (for slave)	
SW5-18	Slave Start/stop terminal setting (for slave)	
SW5-19	Slave Start/stop terminal setting (for slave)	
SW5-20	Slave Start/stop terminal setting (for slave)	
SW5-21	Slave Start/stop terminal setting (for slave)	
SW5-22	Slave Start/stop terminal setting (for slave)	
SW5-23	Slave Start/stop terminal setting (for slave)	
SW5-24	Slave Start/stop terminal setting (for slave)	
SW5-25	Slave Start/stop terminal setting (for slave)	
SW5-26	Slave Start/stop terminal setting (for slave)	
SW5-27	Slave Start/stop terminal setting (for slave)	
SW5-28	Slave Start/stop terminal setting (for slave)	
SW5-29	Slave Start/stop terminal setting (for slave)	
SW5-30	Slave Start/stop terminal setting (for slave)	
SW5-31	Slave Start/stop terminal setting (for slave)	
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SW5-97	Slave Start/stop terminal setting (for slave)	
SW5-98	Slave Start/stop terminal setting (for slave)	
SW5-99	Slave Start/stop terminal setting (for slave)	
SW5-100	Slave Start/stop terminal setting (for slave)	

☆ Factory default  
 ※1 The method of setting the address of the multiple system is different than usual.  
 Refer to the technical documentation.

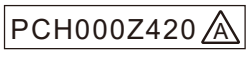


1. --- indicates wiring on site.
2. Use twin core cable (0.75-1.25mm) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Terminal [A][B] are signal terminal. (DC 5V)
4. Use twin core cable (0.3mm<sup>2</sup>) at remote control line.  
See spec sheet of remote control in case that the total length is more than 100m.
5. Do not put signal line and remote control line alongside power source line.

Display on remote control	LED on indoor circuit board	Content
Off	Reg (checking)	Green (normal)
Stays Off	Keeps flashing	Normal
Stays Off	Stays Off	Failure in power source, indoor power off or one phase down
E1	Keeps flashing	Failure on the transmission between indoor circuit board and remote control
E2	1-time flash	Indoor computer abnormal
E3	2-time flash	Duplication of indoor address No. (can only be detected during operation)
E5	2-time flash	Outdoor power off or one phase down
E6	1-time flash	There is no corresponding outdoor unit address.
E7	1-time flash	Failure on outdoor-indoor transmission
E10	Stays Off	Return air temperature sensor interrupted or short-circuit
E11	Stays Off	Excess number of remote control connections
E12	1-time flash	The master indoor unit is not set properly
E15	1-time flash	Indoor supply air temperature sensor interrupted or short-circuit
E16	1-time flash	Failure on heat exchanger (only with FS). Fan motor (Failure)
E18	1-time flash	The address configuration fault for master-slave mode units.
E19	1-time flash	Indoor unit operation check / drain motor check mode faulty
E28	Stays Off	Remote control temperature sensor anomaly
Over E30	Stays Off	Outdoor unit checking / outdoor circuit board LED checking
E63	Stays Off	Emergency stop

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

Mark	Terminal	Use	Capacity	Note
TB1	L, N, ⊕	Input for power source line	AC300V, 25A	Screw : M4
TB2	1, 2	Output for heat exch. (air) Hi operation		
TB2	7, 8	Output for heat exch. (air) Lo operation	DC5V, max 2mA	Screw : M3.5
TB2	3, 4	Heating output		
TB2	5, 6	Input for fan motor error signal	AC200V, 1A	Connector : Made by Molex 5264-06 Terminal : Made by Molex 5263T
CNT	6P	Output for operation mode	Relay capacity, DC12V, max 160mA at total use	
CNT2	5P	Output for heat recovery 3-pipe system	Relay capacity, DC12V, max 160mA at total use	
CND	2P	Output for free cooling	Relay capacity, DC12V, max 160mA at total use	Connector includes control unit





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**EEV-KIT  
FOR SINGLE REFRIGERATION SYSTEM**

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Because of our policy of continuous improvement, we reserve the right to make changes in all specifications without notice.

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