SERVICE MANUAL

MOOVAIR MODEL	FACTORY CODE	PRODUCT CODE
DUA09HICU230X5	CCA3U-09HRFN1-M(C)	22022511000703
DUA12HICU230X5	CCA3U-12HRFN1-M(C)	22022511000710
DUA18HICU230X5	CCA3U-18HRFN1-M(C)	22022511000711
DUA24HICU230X5	MCD1-24HRFN1-MT0W(GA)	22022511003396
DUA36HICU230X5	MCD1-36HRFN1-M(GA)	22022511003496
DUA48HICU230X5	MCD1-48HRFN1-M(GA)	22022511003497
DMA09HOS25230E8	MOX230-09HFN1-MW5W	22022016016320
DMA12HOS25230E8	MOX230-12HFN1-MV5W	22022016016322
DMA18HOS25230E8	MOX430-18HFN1-MU0W	22022016018180
DMA24HOS25230E8	MOD32-24HFN1-MT0W	22022016016500
DMA09HOS28230E8	MOX330-09HFN1-MY5W	22022016016162
DMA12HOS28230E8	MOX330-12HFN1-MW5W	22022016016220
DMA18HOS28230E8	MOX430-17HFN1-MT0W	22022016015900
DMA24HOS28230E8	MOD30-24HFN1-MU0W	22022016015920
DMA36HOS28230E8	MOE30U-36HFN1-M(GA)	22022516001923
DMA48HOS28230E8	MOE30U-48HFN1-M-[X](GA)	22022516001922
DMA36HOS18230S5	MOD30U-36HFN1-MP0(GA)	22023116000121
DMA48HOS18230S5	MOE30U-48HFN1-MP0(GA)	22023116000122

LIGHT COMMERCIAL MONO 3D AIR CONDITIONER

SERVICE MANUAL *Mono DC*

Revision D: 2403, Content updated.

Table of Contents

Model Numbers:

Indoor Unit:

MCA3U-09HRFN1-M(C); MCA3U-12HRFN1-M(C); MCA3U-18HRFN1-M(C);

MCD1-24HRFN1-MT0W(GA), MCD1-36HRFN1-M(GA), MCD1-48HRFN1-M(GA)

Outdoor Unit:

MOX230-09HFN1-MW5W; MOX330-09HFN1-MY5W; MOX230-12HFN1-MV5W;

MOX330-12HFN1-MW5W; MOX430-18HFN1-MU0W; MOX430-17HFN1-MT0W,

MOD30-24HFN1-MU0W; MOD33-24HFN1-MT0W; MOD30U-36HFN1-MP0(GA); MOE30U-36HFN1-M(GA);

MOE30U-48HFN1-MP0(GA); MOE30U-48HFN1-M-[X](GA)

WARNING

- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.
- This service is only for service engineer to use.

AHRI CERTIFIED

c UL us LISTED

c ETL us Intertek

R-410A

CONTENTS

1. Precaution

1.1 Safety Precaution

■ **To prevent injury to the user or other people and property damage, the following instructions must be followed.**

■ **Incorrect operation due to ignoring instruction will cause harm or damage.**

■ **Before service the unit, be sure to read this service manual at first.**

1.2 Warning

➢ Installation

■ **Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.**

There is risk of fire or electric shock.

■ **For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.**

Do not disassemble or repair the product, there is risk of fire or electric shock.

■ **Always ground the product.**

There is risk of fire or electric shock.

■ **Install the panel and the cover of control box securely.**

There is risk of fire of electric shock.

■ **Always install a dedicated circuit and breaker.**

Improper wiring or installation may cause electric shock.

■ **Use the correctly rated breaker of fuse.**

There is risk of fire or electric shock.

■ **Do not modify or extend the power cable.**

There is risk of fire or electric shock.

■ **Do not install, remove, or reinstall the unit by yourself (customer).**

There is risk of fire, electric shock, explosion, or injury.

■ **Be caution when unpacking and installing the product.**

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

■ **For installation, always contact the dealer or an authorized service center.**

■ **Do not install the product on a defective installation stand.**

■ **Be sure the installation area does not deteriorate with age.**

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

■ **Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**

■ **Take care to ensure that power cable could not be pulled out or damaged during operation.**

There is risk of fire or electric shock.

■ **Do not place anything on the power cable.**

There is risk of fire or electric shock.

■ **Do not plug or unplug the power supply plug during operation.**

There is risk of fire or electric shock.

■ **Do not touch (operation) the product with wet hands.**

■ **Do not place a heater or other appliance near the power cable.**

There is risk of fire and electric shock.

■ **Do not allow water to run into electrical parts.**

It may cause fire, failure of the product, or electric shock.

■ **Do not store or use flammable gas or combustible near the product.**

There is risk of fire or failure of product.

■ **Do not use the product in a tightly closed space for a long time.**

Oxygen deficiency could occur.

■ **When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.**

■ **If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.**

There is risk of electric shock or fire.

■ **Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.**

There is risk of property damage, failure of product, or electric shock.

■ **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

There is risk of physical injury, electric shock, or product failure.

■ **When the product is soaked, contact an authorized service center.**

There is risk of fire or electric shock.

■ **Be caution that water could not enter the product.**

There is risk of fire, electric shock, or product damage.

■ **Ventilate the product from time to time when operating it together with a stove etc.**

There is risk of fire or electric shock.

■ **Turn the main power off when cleaning or maintaining the product.**

There is risk of electric shock.

■ **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**

There is risk of product damage or failure, or unintended operation.

■ **Take care to ensure that nobody could step on or fall onto the outdoor unit.**

This could result in personal injury and product damage.

➢ CAUTION

■ **Always check for gas (refrigerant) leakage after installation or repair of product.**

Low refrigerant levels may cause failure of product.

■ **Install the drain hose to ensure that water is drained away properly.**

A bad connection may cause water leakage.

■ **Keep level even when installing the product.**

It can avoid vibration of water leakage.

■ **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**

It may cause a problem for your neighbors.

■ **Use two or more people to lift and transport the product.**

■ **Do not install the product where it will be exposed to sea wind (salt spray) directly.**

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

➢ Operational

■ **Do not expose the skin directly to cool air for long time. (Do not sit in the draft).**

■ **Do not use the product for special purposes, such as preserving foods, works of art etc. It is a consumer air conditioner, not a precision refrigerant system.**

There is risk of damage or loss of property.

■ **Do not block the inlet or outlet of air flow.**

■ **Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

There is risk of fire, electric shock, or damage to the plastic parts of the product.

■ **Do not touch the metal parts of the product when removing the air filter. They are very sharp.**

■ **Do not step on or put anything on the product. (outdoor units)**

■ **Always insert the filter securely. Clean the filter every two weeks or more often if necessary.**

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

■ **Do not insert hands or other objects through air inlet or outlet while the product is operated.**

■ **Do not drink the water drained from the product.**

■ **Use a firm stool or ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

■ **Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.**

There is risk of fire or explosion.

■ **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**

They may burn of explode.

■ **If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.**

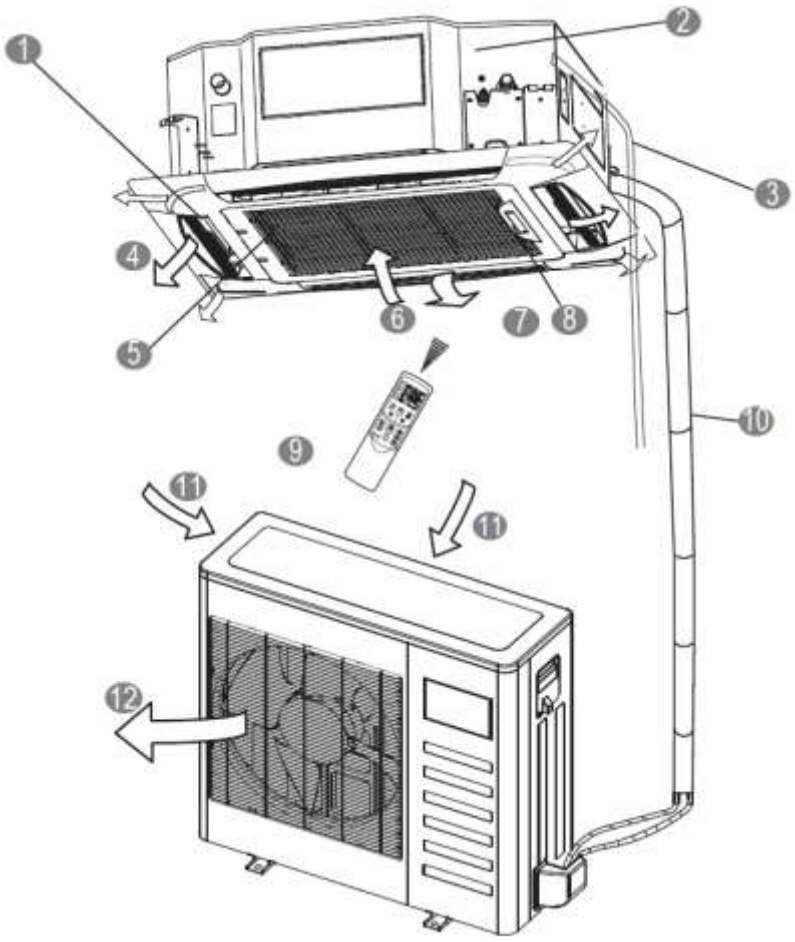
2. Part Names and Features

2.1 Model Names of Indoor/Outdoor units

Series	Capacity	Indoor units	Outdoor units
Compact Cassette	9K	MCA3U-09HRFN1-M(C)	MOX230-09HFN1-MW5W; MOX330-09HFN1-MY5W
	12K	MCA3U-12HRFN1-M(C)	MOX230-12HFN1-MV5W; MOX330-12HFN1-MW5W
	18K	MCA3U-18HRFN1-M(C)	MOX430-17HFN1-MT0W MOX430-18HFN1-MU0W
New Cassette	24K	MCD1-24HRFN1-MT0W(GA)	MOD30-24HFN1-MU0W MOD33-24HFN1-MT0W
	36K	MCD1-36HRFN1-M(GA)	MOD30U-36HFN1-MP0(GA) MOE30U-36HFN1-M(GA)
	48K	MCD1-48HRFN1-M(GA)	MOE30U-48HFN1-MP0(GA) MOE30U-48HFN1-M-[X](GA)

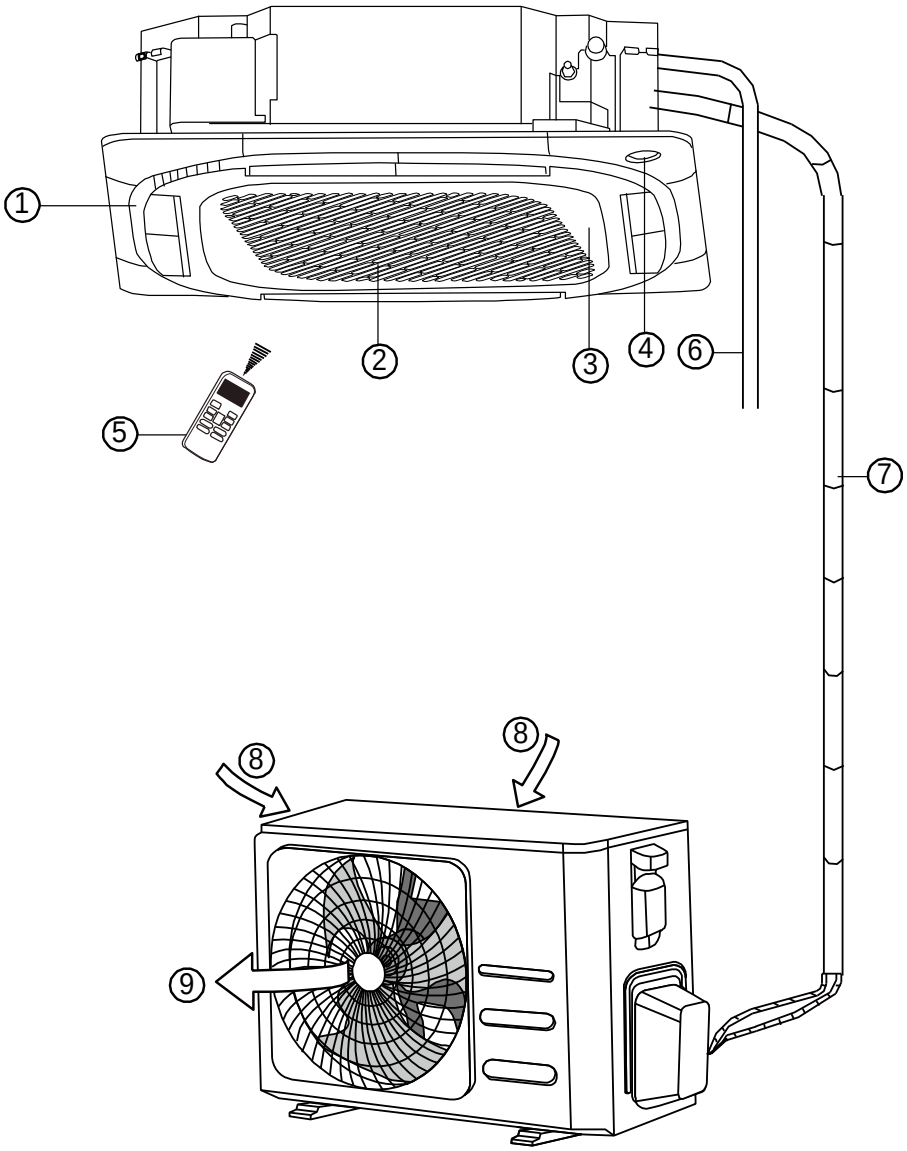
2.2 Part names of Indoor/Outdoor units

Compact Cassette Units



1. Air flow louver(at air outlet)
2. Drain pump(drain water from indoor unit)
3. Drain pipe
4. Air outlet
5. Air filter(inside air-in grill)
6. Air inlet
7. Air-in grill
8. Display panel
9. Remote controller
10. Refrigerant pipe
11. Air inlet
12. Air outlet

New Cassette Units



① Air outlet
② Air inlet
③ Front grille
④ Display panel
⑤ Remote controller
⑥ Drain pipe

⑦ Connecting pipe
⑧ Air inlet
⑨ Air outlet

2.3 Features

2.3.1 Cassette Units

2.3.1.1 *Fresh Air*

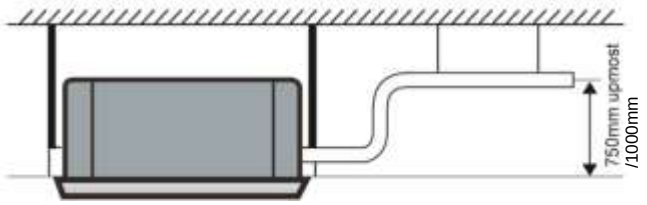
- Fresh air intake function bring you fresh and comfortable air feeling.

2.3.1.2 Wired Controller (Optional)

- Compared with infrared remote controller, wired controller can be fixed on the wall and avoid mislaying. It's mainly used for commercial zone and makes air conditioner control more convenient.

2.3.1.3 *Build-in Drain Pump*

- The drain pump can lift the condensing water up to 750mm(compact cassette)/1000mm(new cassette) upmost.
- It's convenient to install drainage piping under most space condition.



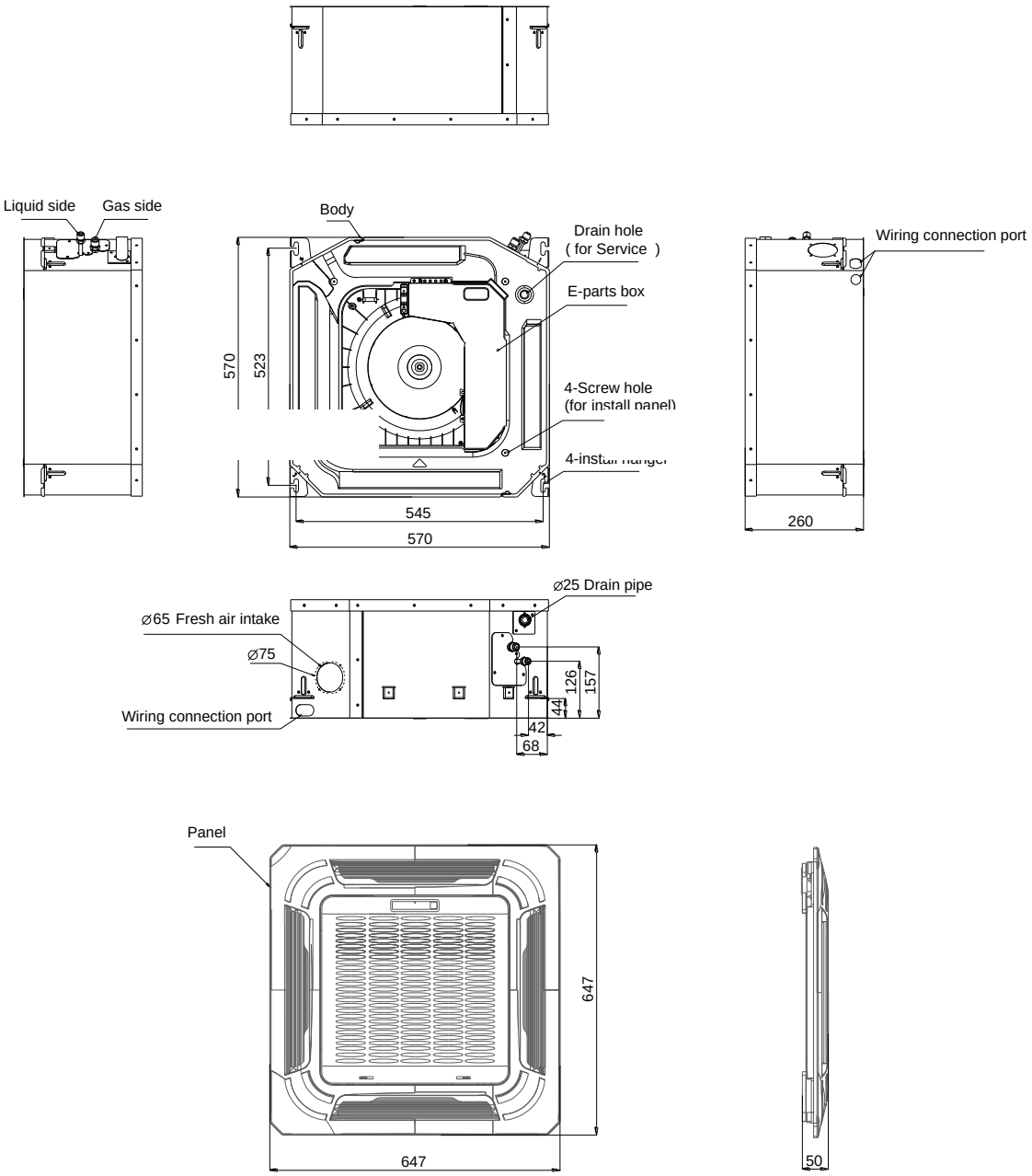
2.3.1.4*Terminals For Alarm Lamp and Long-distance On-off Controller Connection Are Standard*

- Remote on-off: With the reserved ports. a remote switch can be easily connected to realize remote control.
- Alarm: The built-in PCB can output alarm signal, which achieve setting up an external alarm light or vibration gauge

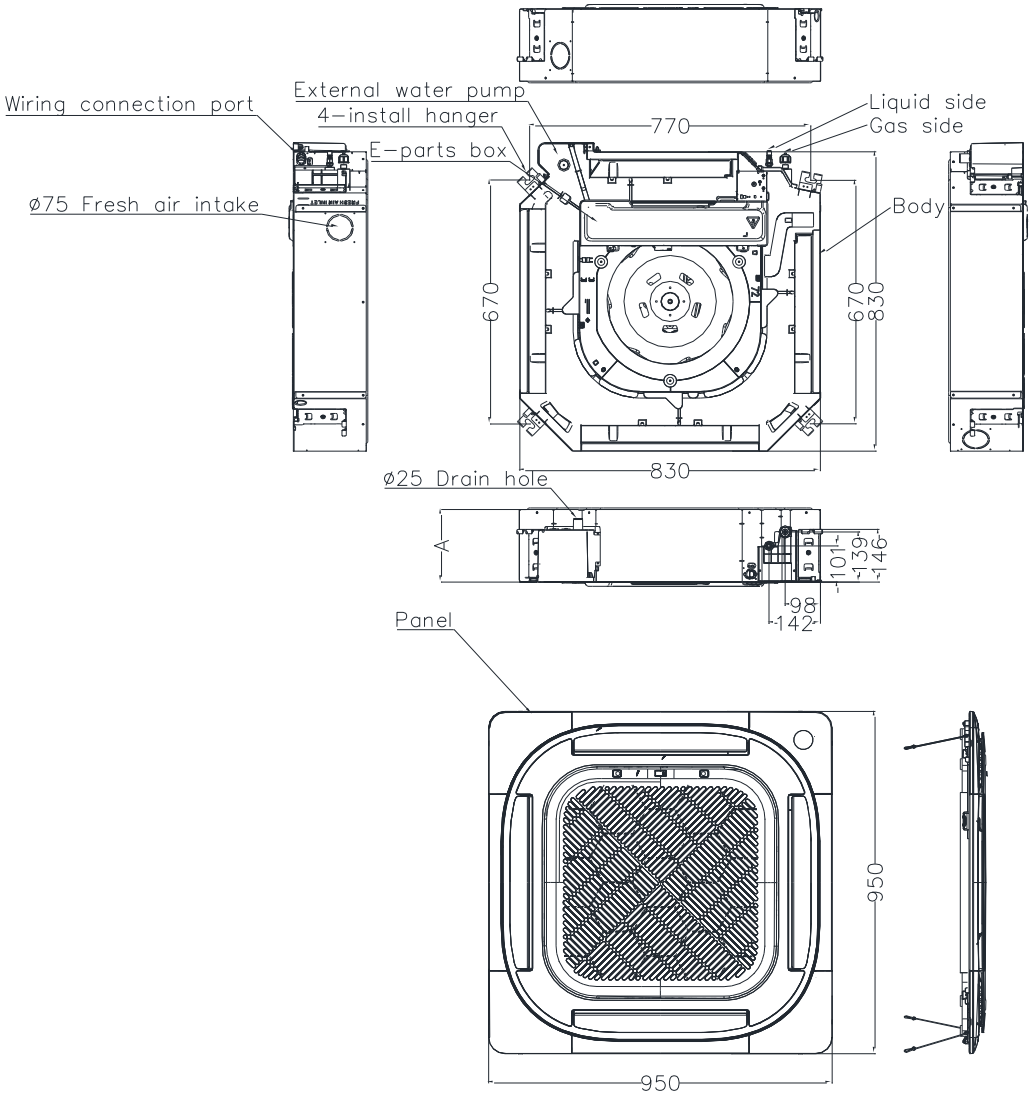
3. Dimension

3.1 Indoor Unit

Cassette Units (9K, 12K, 18K)

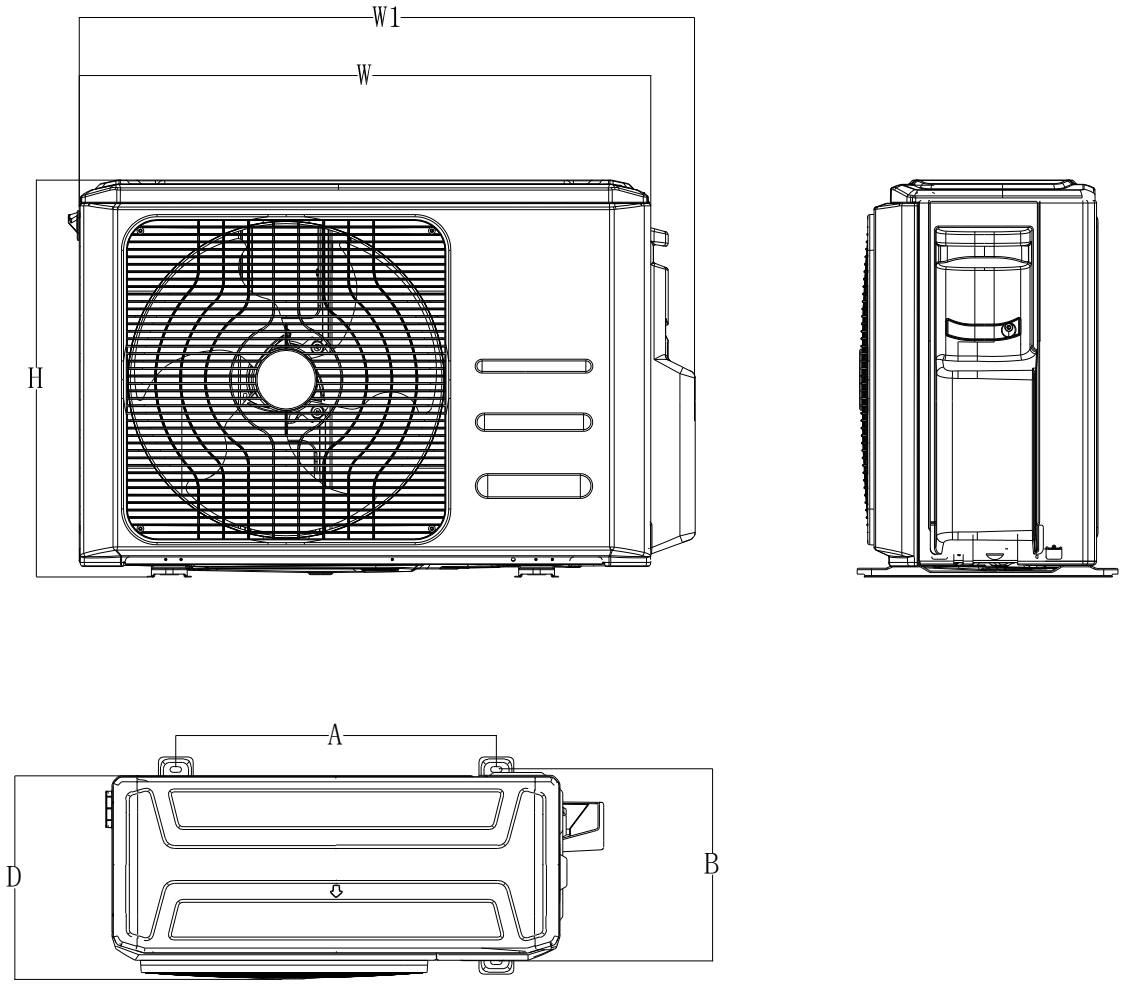


New Cassette Units (24K, 36K, 48K)



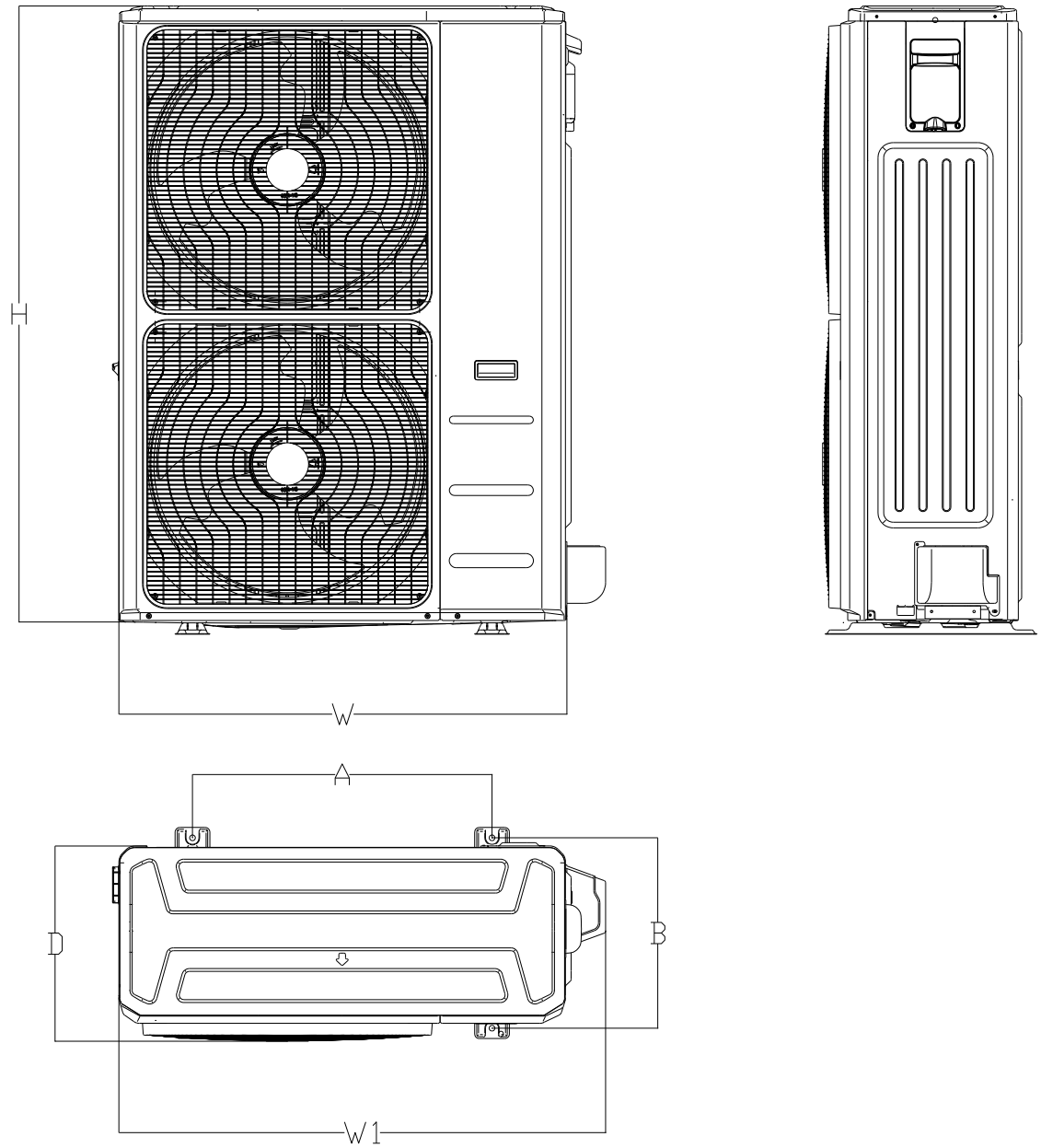
Capacity (Btu/h)	Unit	A
24K	mm	205
	inch	8.07
36K	mm	245
	inch	9.65
48K	mm	287
	inch	11.30

3.2 Outdoor Unit



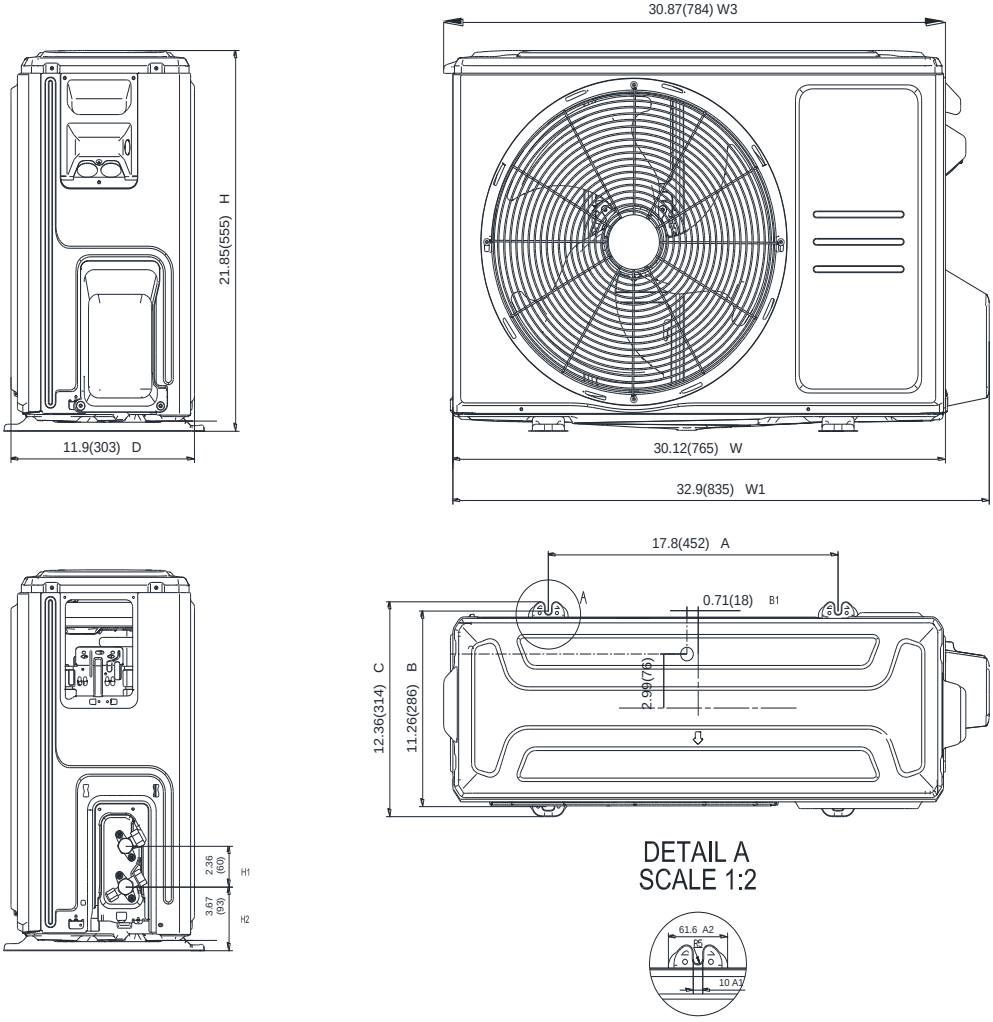
Note: The above drawing is only for reference. The appearance of your units may be different.

Model	unit	W	D	H	W1	A	B
MOD30-24HFN1-MU0W MOD33-24HFN1-MT0W MOD30U-36HFN1-MP0(GA)	mm	946	410	810	1030	673	403
	inch	37.2	16.1	31.9	40.6	26.5	15.9

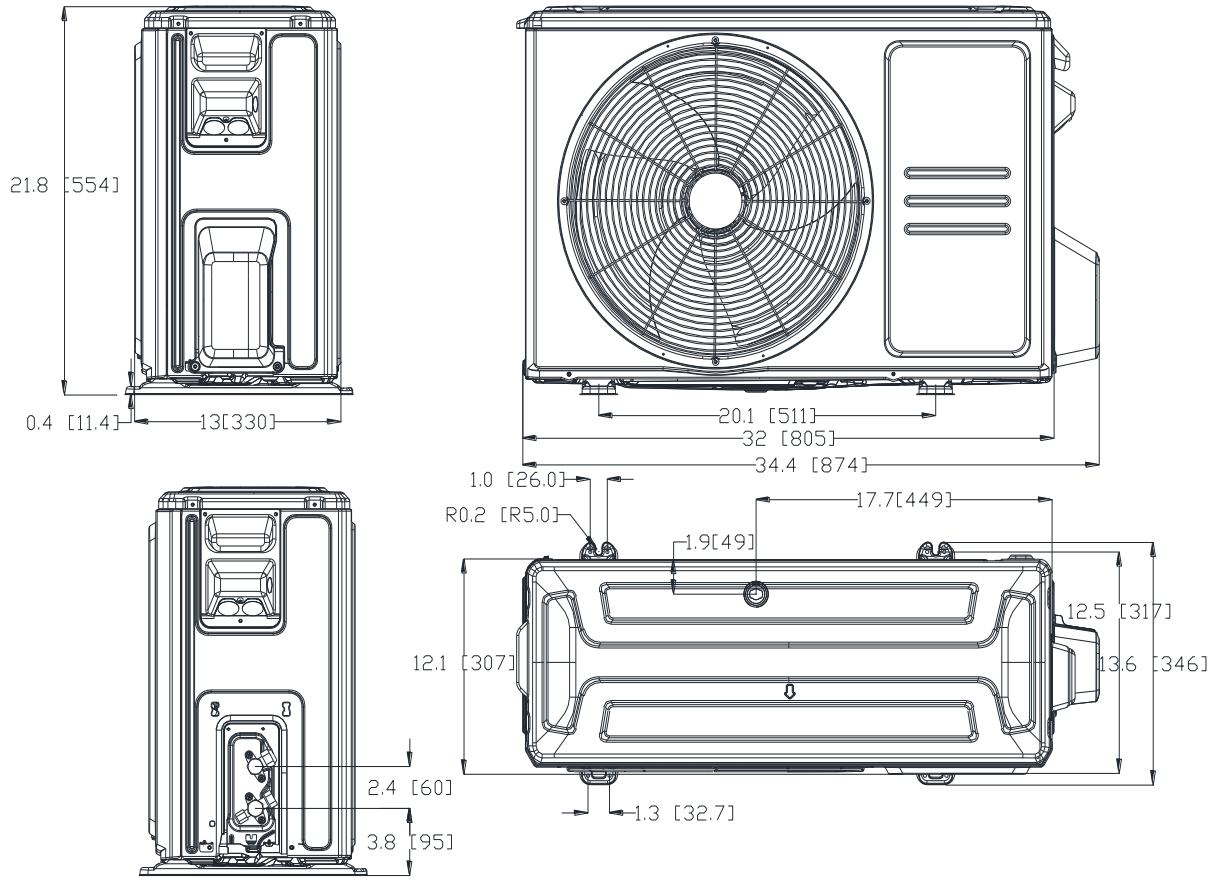


Model	Unit	W	D	H	W1	A	B
MOE30U-36HFN1-M(GA) MOE30U-48HFN1-MP0(GA) MOE30U-48HFN1-M-[X](GA)	mm	952	415	1333	1045	634	404
	inch	37.5	14.3	52.5	41.1	25.0	15.9

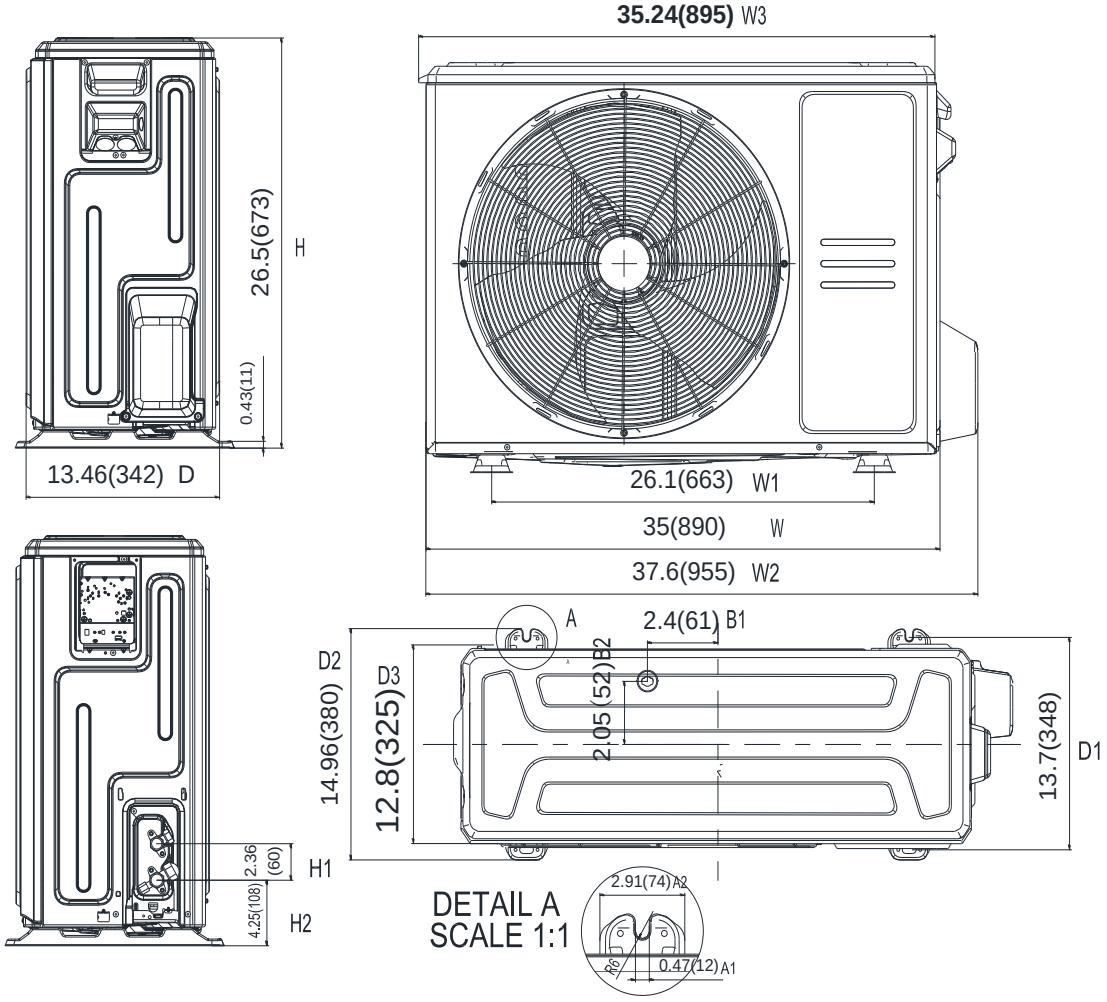
MOX230-09HFN1-MW5W, MOX230-12HFN1-MV5W



MOX330-09HFN1-MY5W, MOX330-12HFN1-MW5W



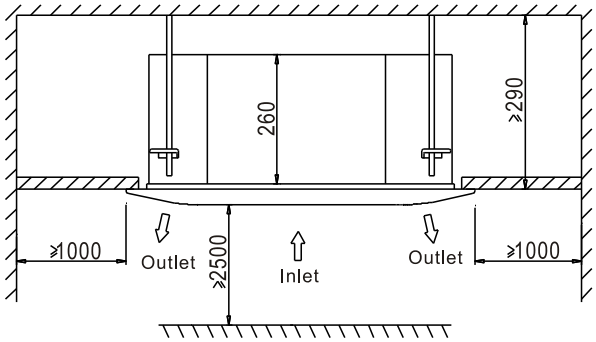
MOX430-17HFN1-MT0W, , MOX430-18HFN1-MU0W



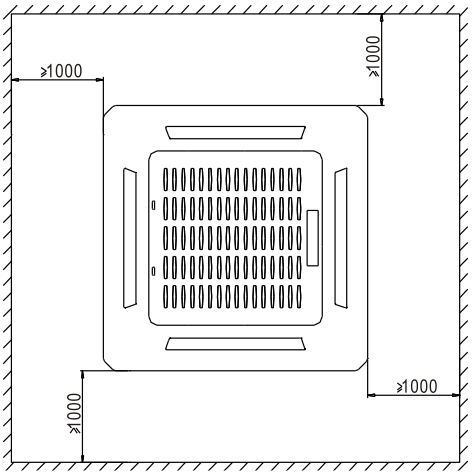
4. Service Space

4.1 Indoor Unit

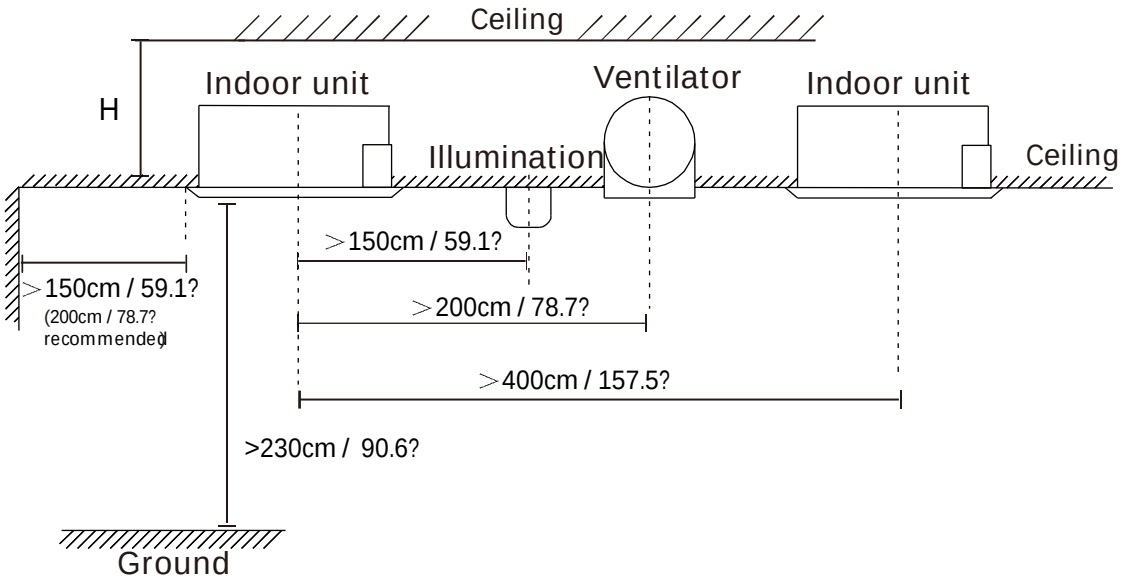
Compact Cassette Units

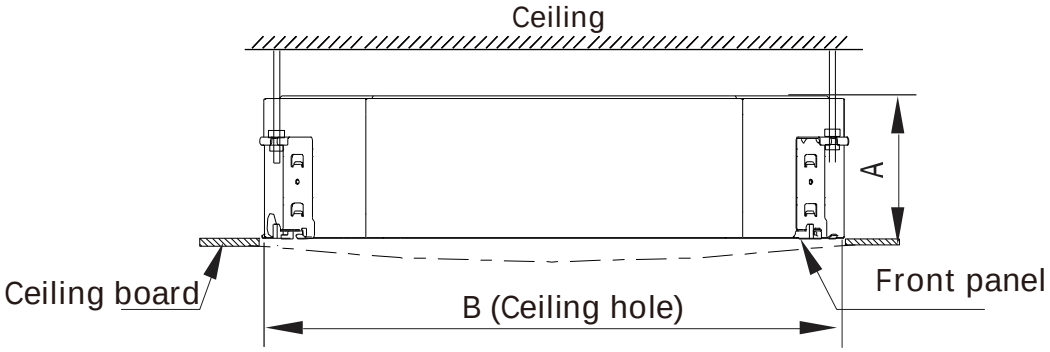


Unit: mm



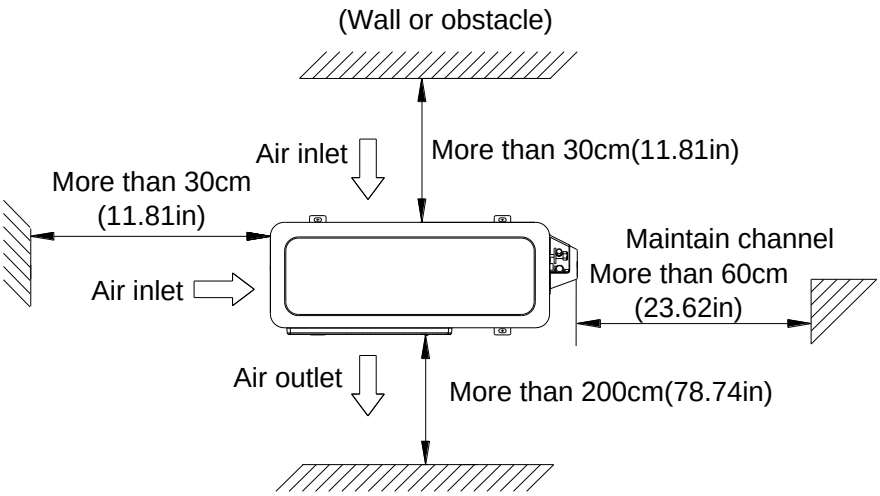
New Cassette Units

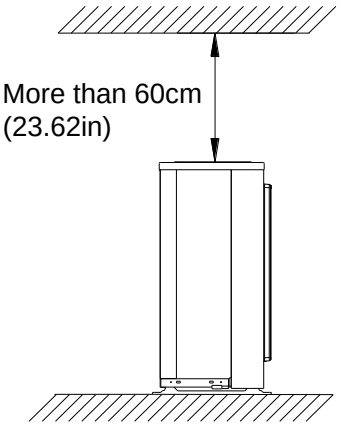




Capacity (kBtu/h)	A(mm/inch)	H(mm/inch)	B(mm/inch)
24	205/8.07	>230/9.06	900/35.4
36	245/9.65	>271/10.7	
48	287/11.3	>313/12.3	

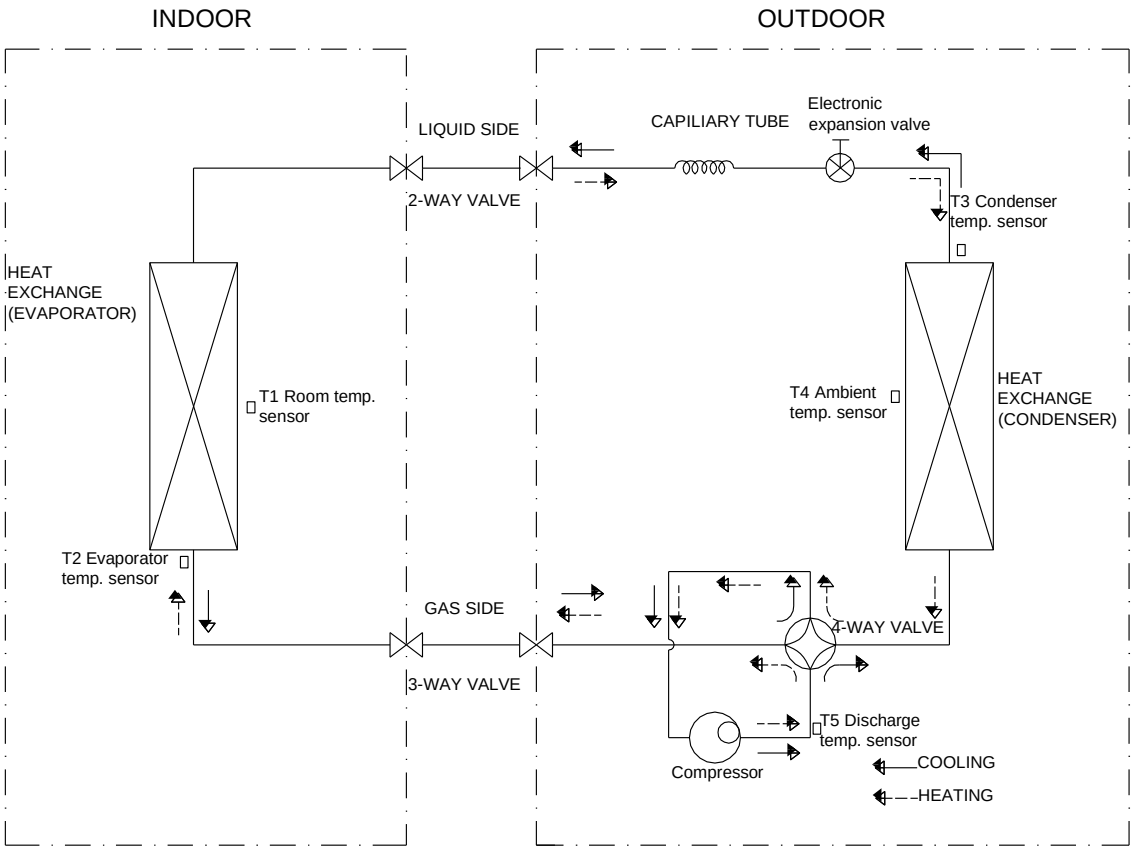
4.2 Outdoor Unit



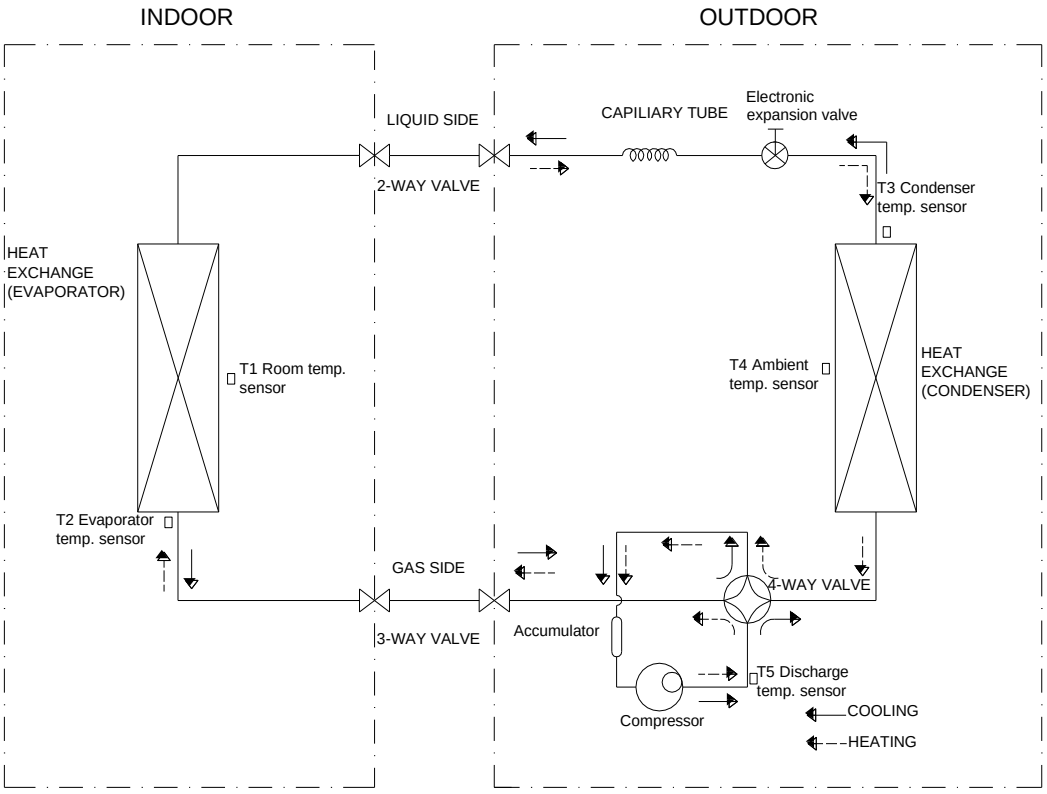


5. Refrigerant Cycle Diagram

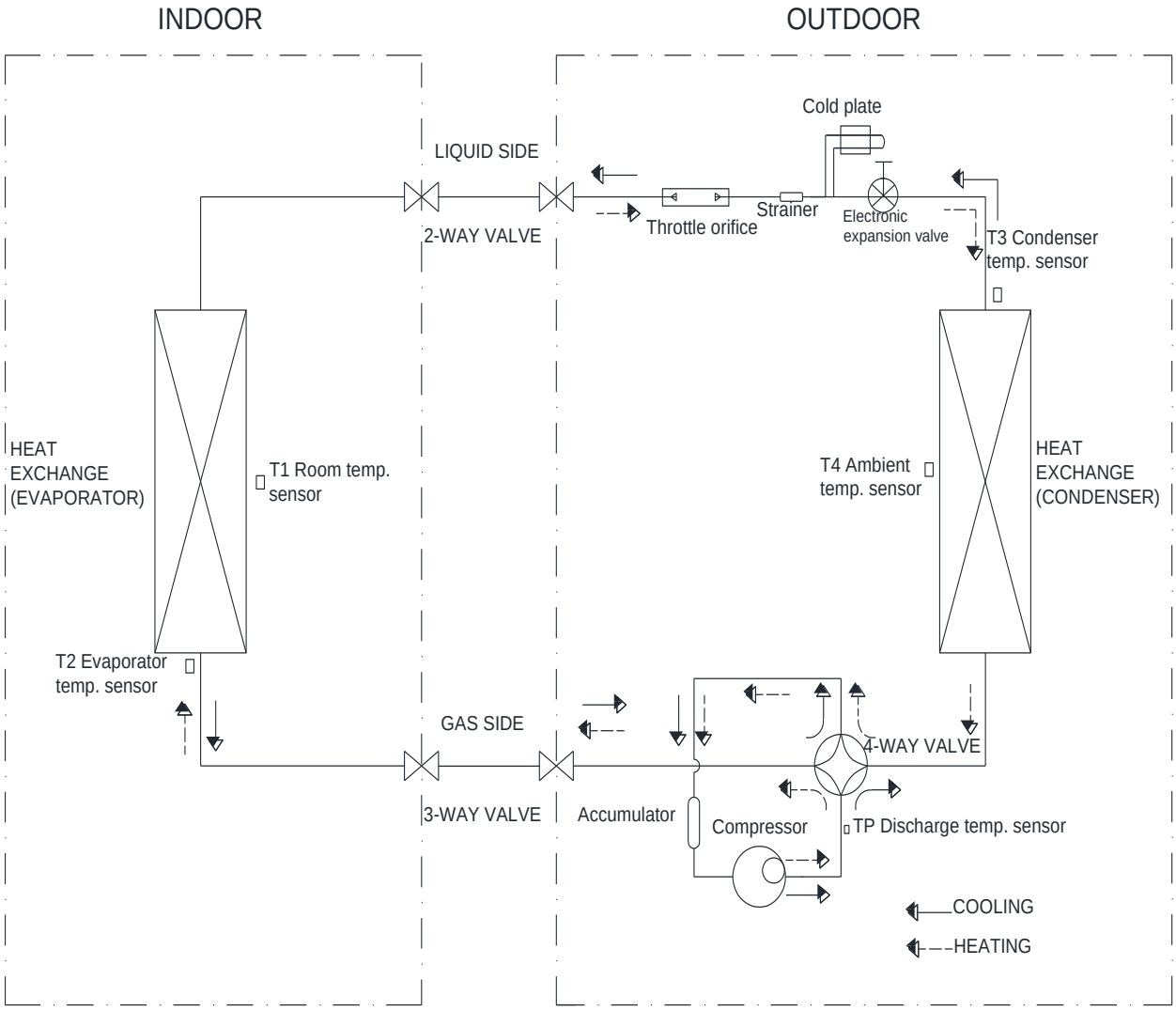
MOX330-09HFN1-MY5W, MOX330-12HFN1-MW5W



MOX230-09HFN1-MW5W, MOX230-12HFN1-MV5W

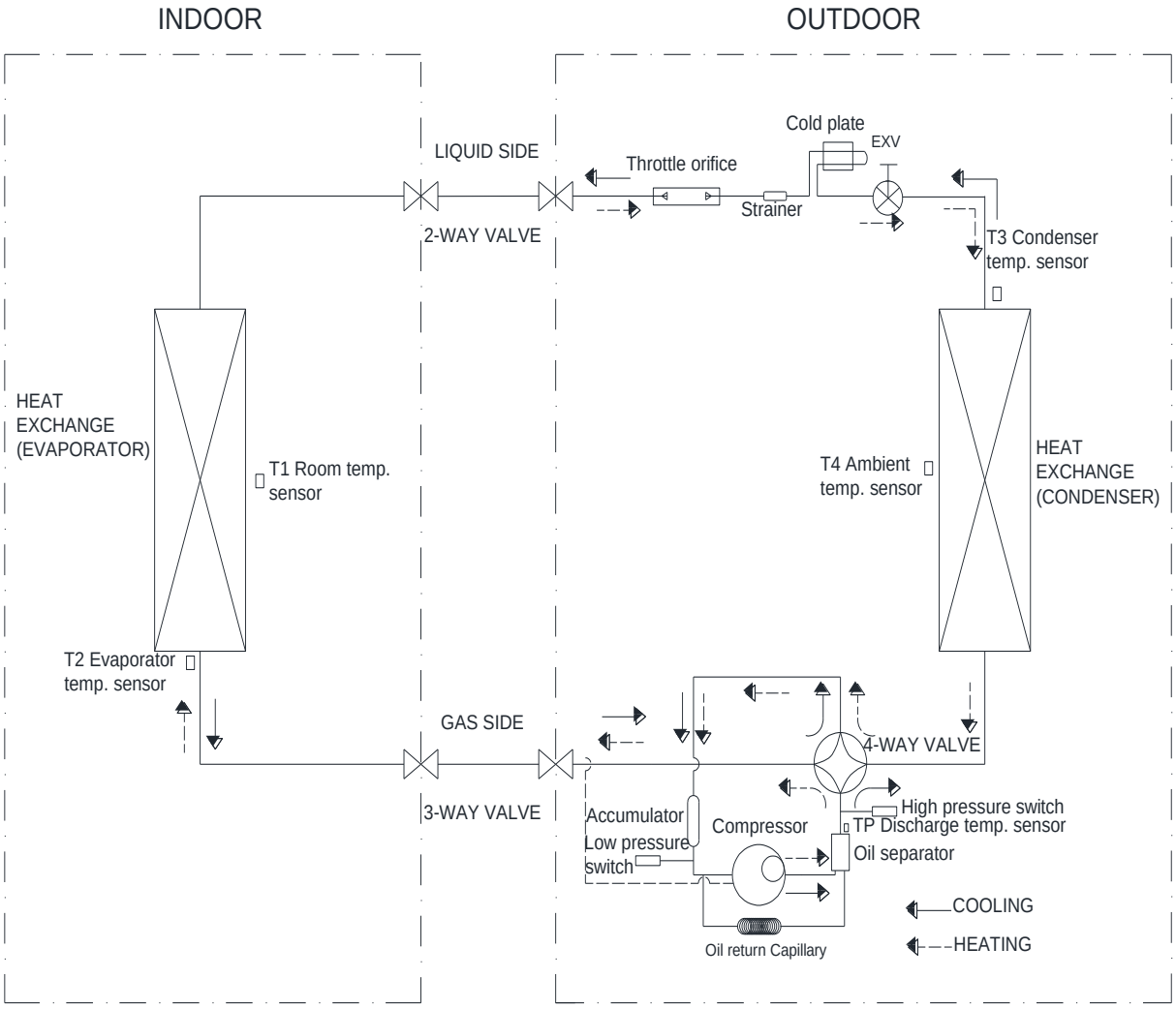


MOX430-17HFN1-MT0W, MOX430-18HFN1-MU0W, MOD30-24HFN1-MU0W, MOD33-24HFN1-MT0W

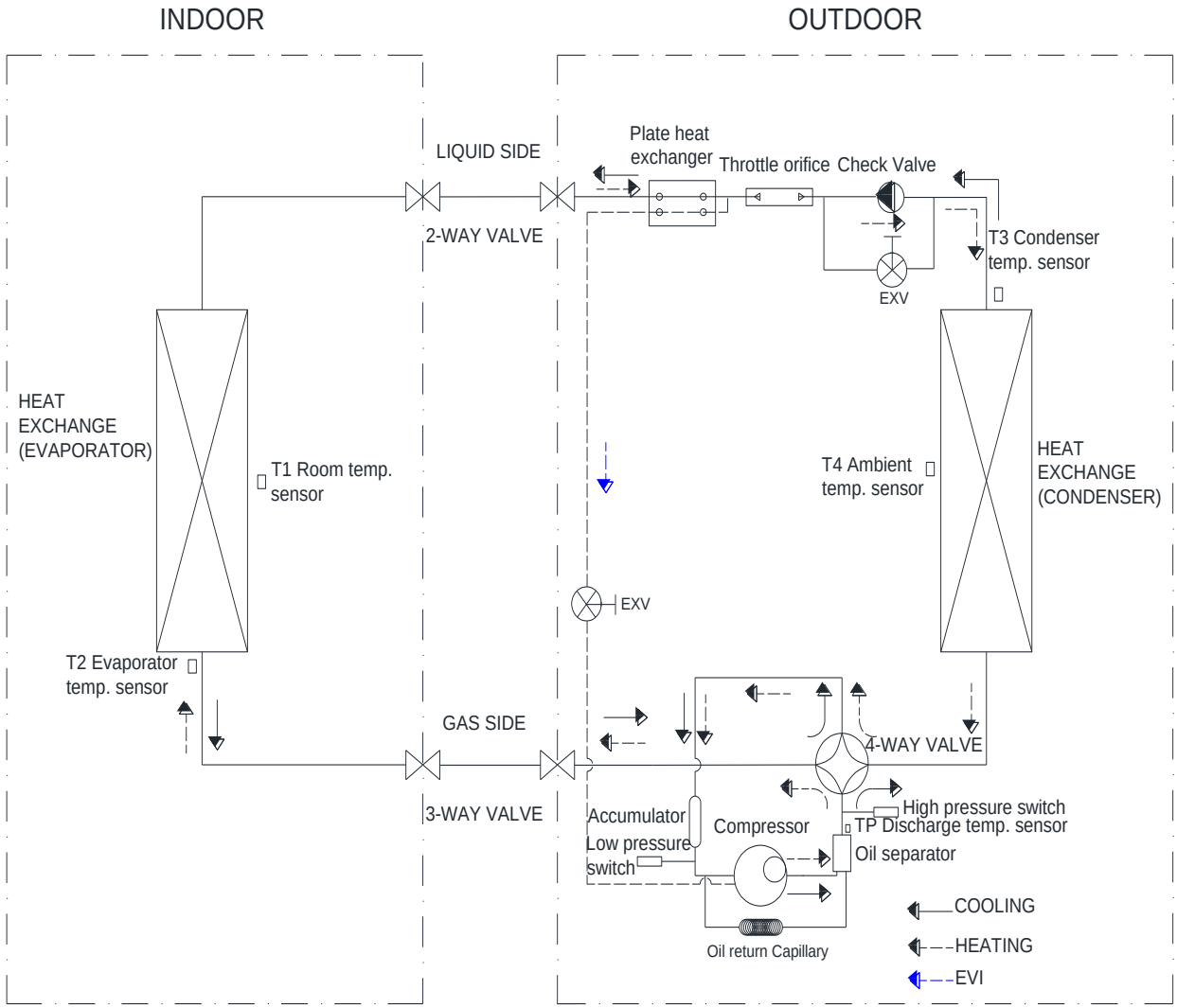


For MOX430-17HFN1-MT0W, there is an accumulator.

MOD30U-36HFN1-MP0(GA), MOE30U-48HFN1-MP0(GA),



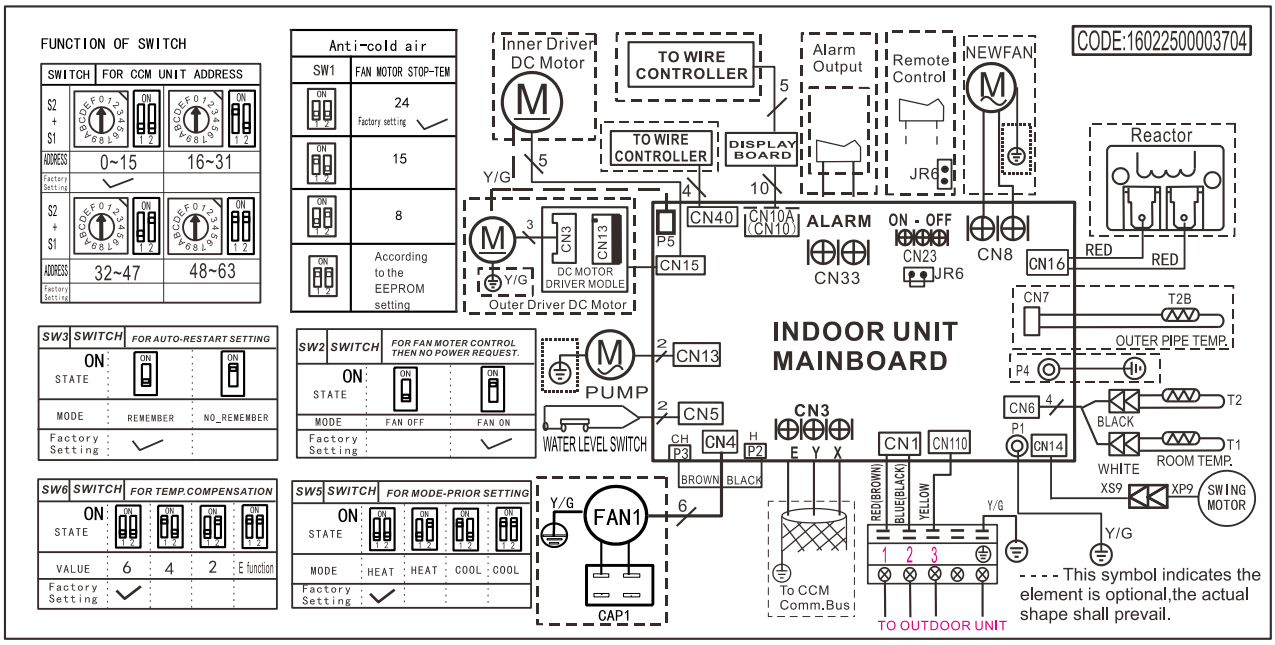
MOE30U-36HFN1-M(GA), MOE30U-48HFN1-M-[X](GA)



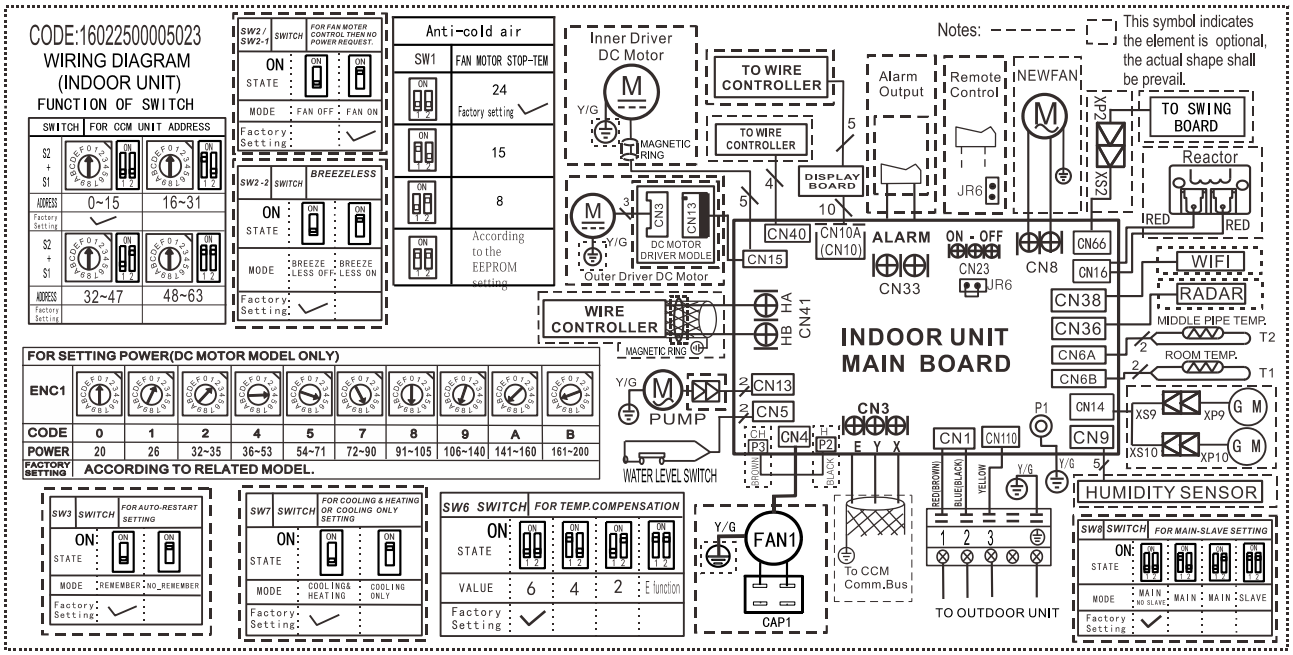
6. Wiring Diagram

6.1 Indoor Unit

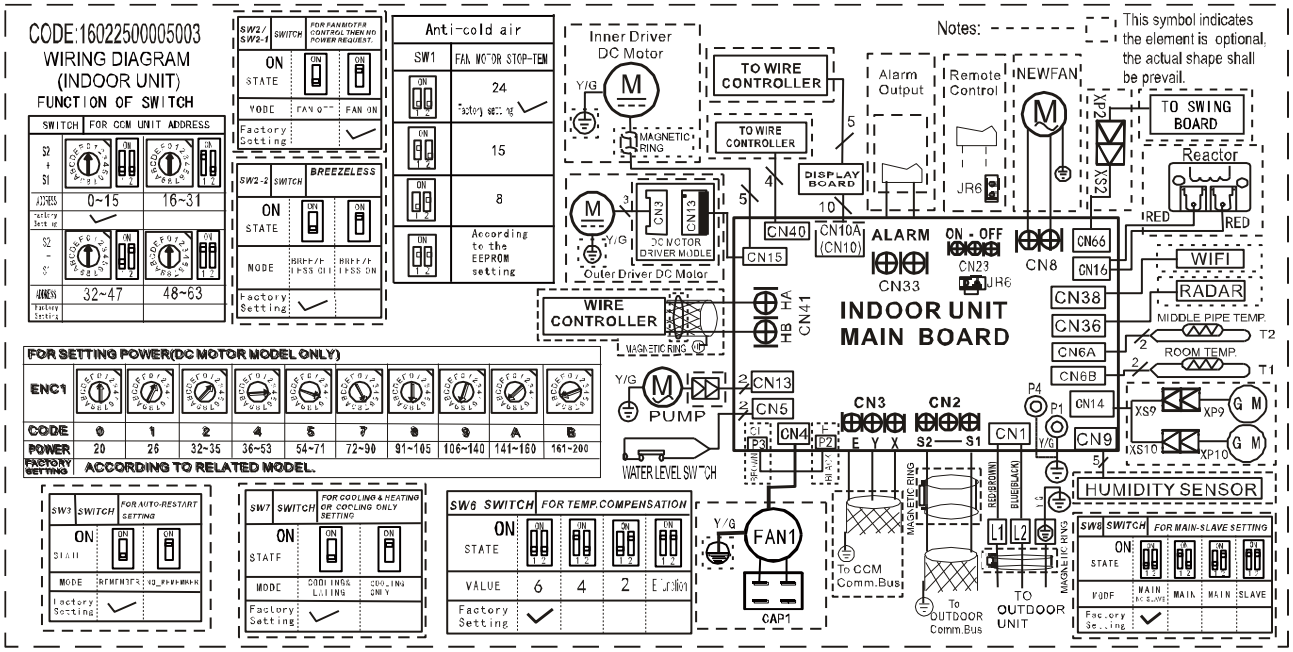
MCA3U-09HRFN1-M(C), MCA3U-12HRFN1-M(C), MCA3U-18HRFN1-M(C)



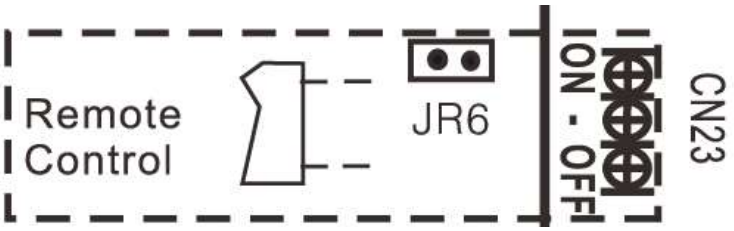
MCD1-24HRFN1-MT0W(GA)



MCD1-36HRFN1-M(GA), MCD1-48HRFN1-M(GA)



6.1.1 Some connectors introduce:



A For remote control (ON-OFF) terminal port CN23 and short connector of JR6

1. Remove the short connector of JR6 when you use ON-OFF function;

2. When remote switch off (OPEN), the unit would be off;

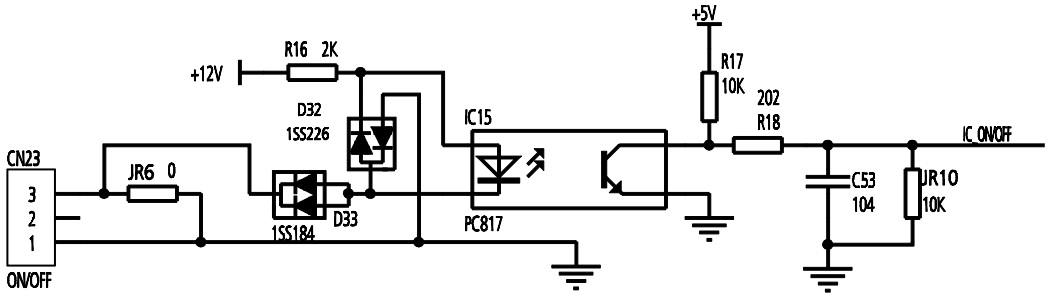
3. When remote switch on (CLOSE), the unit would be on;

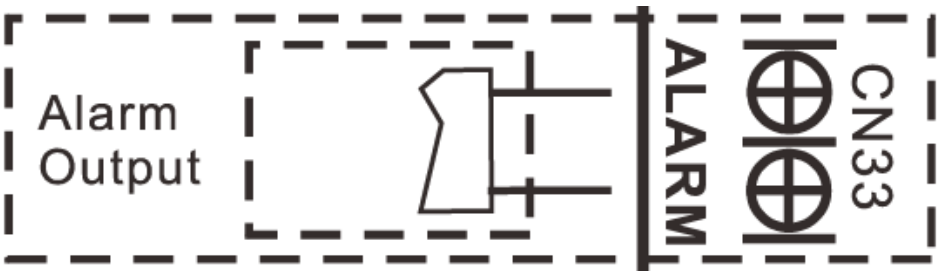
4. When close/open the remote switch, the unit would be responded the demand within 2 seconds;

5. When the remote switch on. you can use remote controller/ wire controller to select the mode what you want ;when the remote switch off , the unit would not respond the demand from remote controller/wire controller.

When the remote switch off, but the remote controller / wire controller are on, CP code would be shown on the display board.

6. The voltage of the port is 12V DC , design Max. current is 5mA.



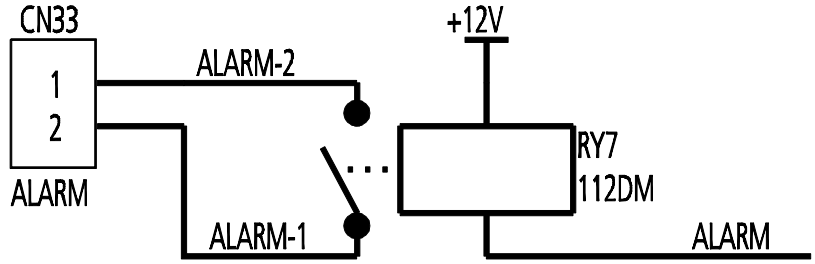


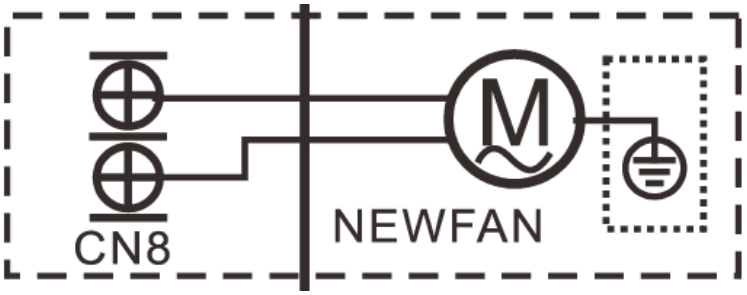
B For ALARM terminal port CN33

1. Provide the terminal port to connect ALARM, but no voltage of the terminal port , the power from the ALARM system (not from the unit)

2. Although design voltage can support higher voltage, but we strongly ask you connect the power less than 24V, current less than 0.5A

3. When the unit occurs the problem, the relay would be closed, then ALARM works





C. For new fresh motor terminal port CN8

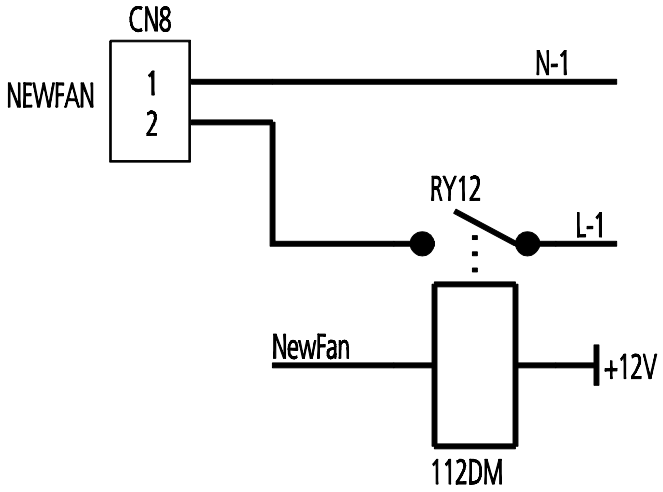
1. Connect the fan motor to the port, no need care L/N of the motor;

2. The output voltage is the power supply;

3. The fresh motor cannot excess 200W or 1A, follow the smaller one;

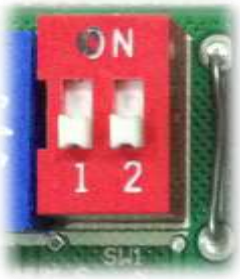
4. The new fresh motor will be worked when the indoor fan motor work ;when the indoor fan motor stops , the new fresh motor would be stopped ;

5. When the unit enter force cooling mode or capacity testing mode, the fresh motor isn't work .



6.1.2 Micro-Switch Introduce:

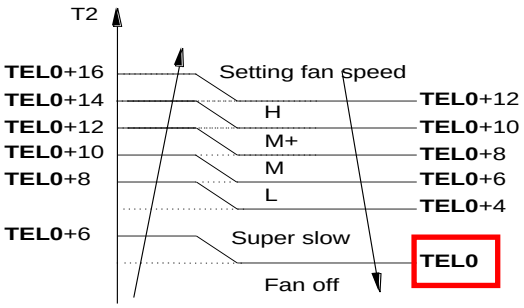
Compact Cassette Units(9K,12K,18K)



Anti-cold air	
SW1	FAN MOTOR STOP-TEM
ON 1 2	24 Factory setting ✓
ON 1 2	15
ON 1 2	8
ON 1 2	According to the EEPROM setting

A. Micro-switch SW1 is for selection of indoor fan stop temperature (TEL0) when it is in anti-cold wind action in heating mode.

Range: 24ºC, 15ºC, 8 ºC, according to EEROM setting (reserved for special customizing).



SW2 SWITCH	FOR FAN MOTER CONTROL THEN NO POWER REQUEST.	
ON: STATE	ON	ON
MODE	FAN OFF	FAN ON
Factory Setting		✓

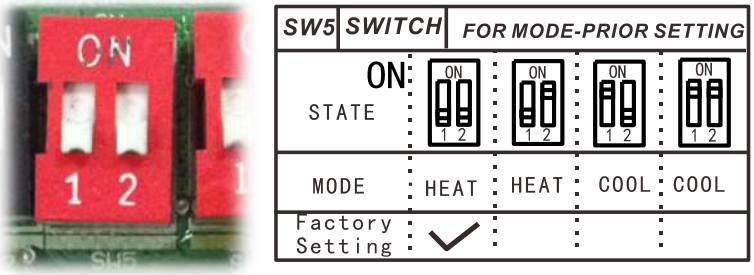
B. Micro-switch SW2 is for selection of indoor FAN ACTION if room temperature reaches the setpoint and the compressor stops.

Range: OFF (in 127s), Keep running.

SW3 SWITCH	FOR AUTO-RESTART SETTING	
ON: STATE	ON	ON
MODE	REMEMBER	NO_REMEMBER
Factory Setting	✓	

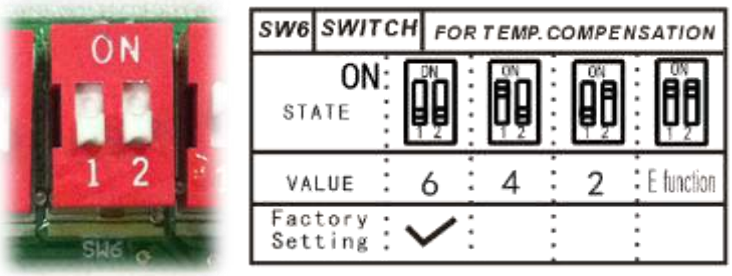
C. Micro-switch SW3 is for selection of auto-restart function.

Range: Active, inactive



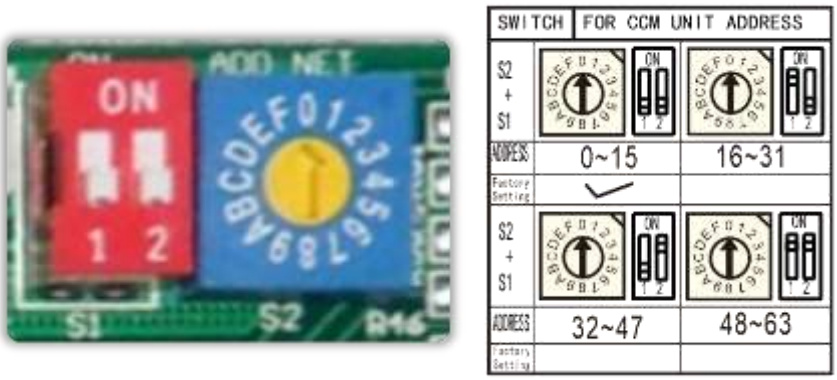
D. Micro-switch SW5 is for setting mode priority of multi connection.

Range: Heat, cool.



E.Micro-switch SW6 is for selection of temperature compensation in heating mode. This helps to reduce the real temperature difference between ceiling and floor so that the unit could run properly. If the height of installation is lower, smaller value could be chosen.

Range: 6ºC, 4ºC, 2ºC, E function (reserved for special customizing)



F. Micro-switch S1 and dial-switch S2 are for address setting when you want to control this unit by a central controller.

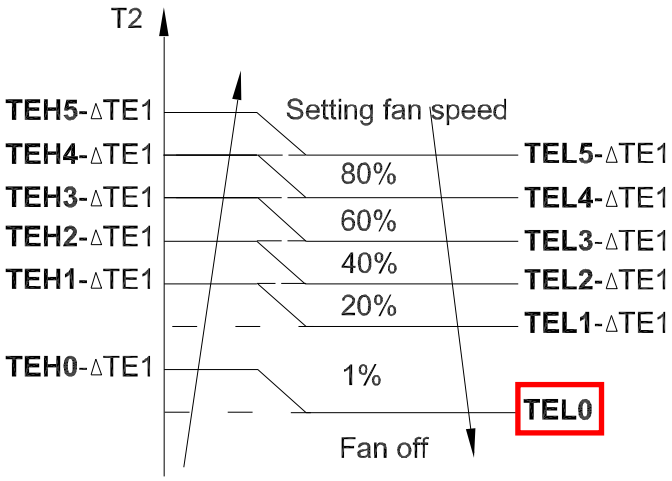
Range: 00-63

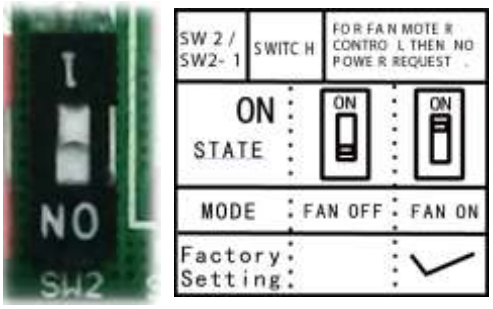
New Cassette Units(24K,36K,48K)

Anti-cold air	
SW1	FAN MOTOR STOP-TEM
	24 Factory setting
	15
	8
	According to the EEPROM setting

A. Micro-switch SW1 is for selection of indoor fan stop temperature (TEL0) when it is in anti-cold wind action in heating mode.

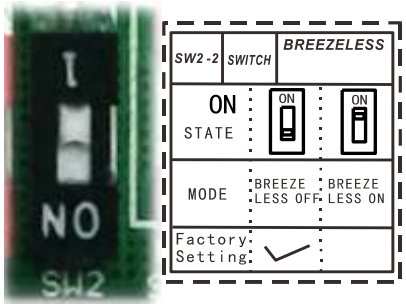
Range: 24ºC, 15ºC, 8 ºC, according to EEROM setting (reserved for special customizing).





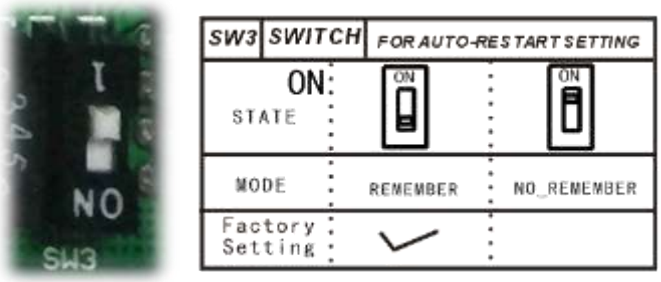
B. Micro-switch SW2/SW2-1 is for selection of indoor FAN ACTION if room temperature reaches the setpoint and the compressor stops.

Range: OFF (anti-cold wind is available in heating mode), keep running (No anti-cold wind function).



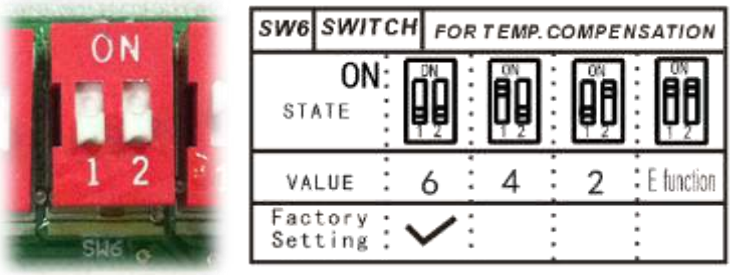
C. Micro-switch SW2-2 is for selection of Breezeless function.

Range: OFF, ON.



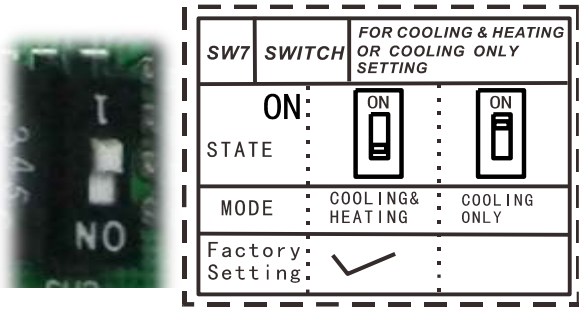
D. Micro-switch SW3 is for selection of auto-restart function.

Range: Active, inactive



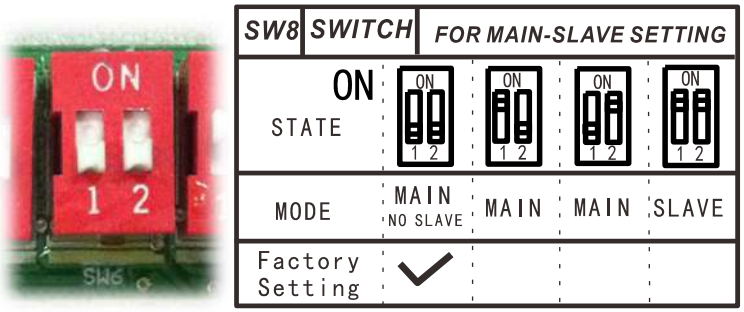
E.Micro-switch SW6 is for selection of temperature compensation in heating mode. This helps to reduce the real temperature difference between ceiling and floor so that the unit could run properly. If the height of installation is lower, smaller value could be chosen.

Range: 6ºC, 4ºC, 2ºC, E function (reserved for special customizing)



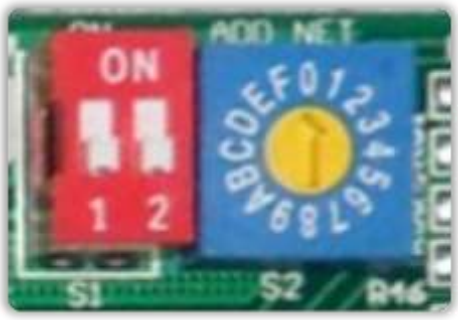
F. Micro-switch SW7 is for setting cooling &heating or cooling only.

Range: cooling &heating, cooling.



G. Micro-switch SW8 is for setting the master or slave unit when the unit is in twin connection.

Range: Master no slave (Normal 1 drive 1 connection), Master (2 positions without difference), Slave



SWITCH	FOR CCM UNIT ADDRESS	
S2 + S1		
ADDRESS	0~15	16~31
Factory Setting	✓	
S2 + S1		
ADDRESS	32~47	48~63
Factory Setting		

H.Micro-switch S1 and dial-switch S2 are for address setting when you want to control this unit by a central controller.

Range: 00-63

FOR SETTING POWER(DC MOTOR MODEL ONLY)										
ENC1										
CODE	0	1	2	4	5	7	8	9	A	B
POWER	20	26	32~35	36~53	54~71	72~90	91~105	106~140	141~160	161~200
FACTORY SETTING	ACCORDING TO RELATED MODEL.									

I.Dial-switch ENC1: The indoor PCB is universal designed for whole series units from 7K to 68K. This ENC1 setting will tell the main program what size the unit is.

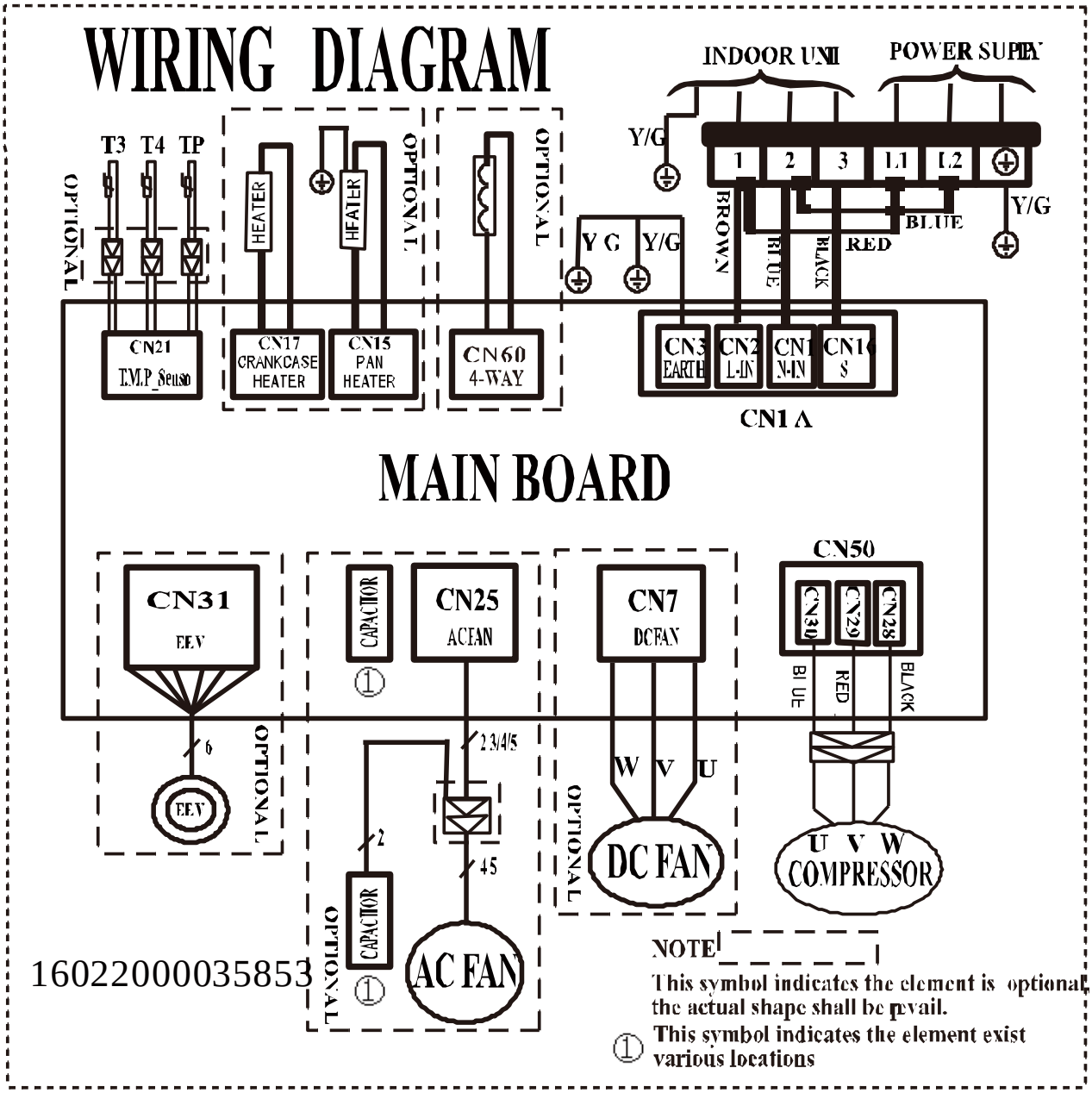
NOTE: Usually there is glue on it because the switch position cannot be changed at random unless you want to use this

PCB as a spare part to use in another unit. Then you have to select the right position to match the size of the unit.

“20” means 2kW (7K),“105” means 10.5kW(36K), and so on.

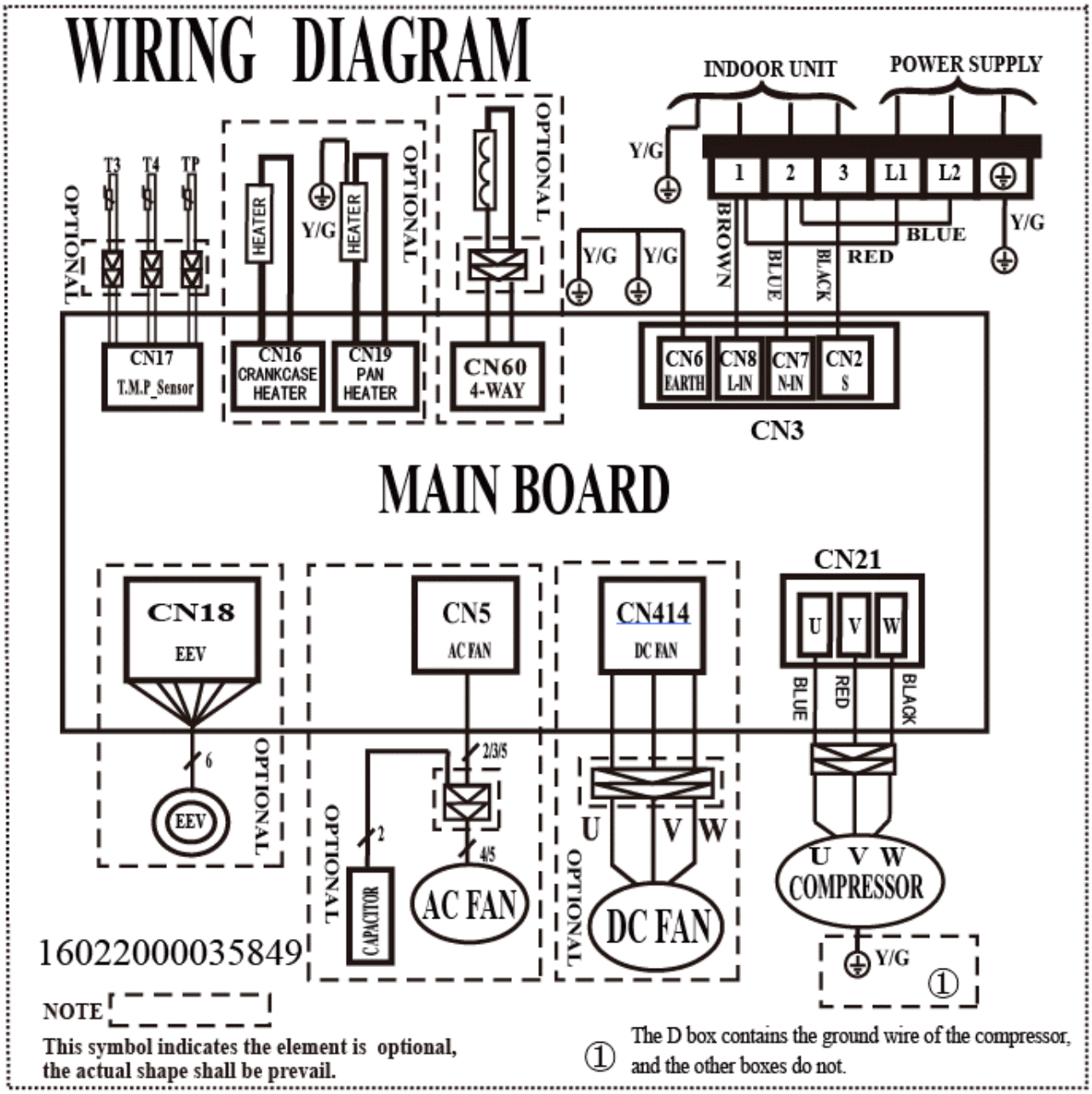
6.2 Outdoor Unit

MOX230-09HFN1-MW5W, MOX230-12HFN1-MV5W, MOX330-09HFN1-MY5W, MOX330-12HFN1-MW5W

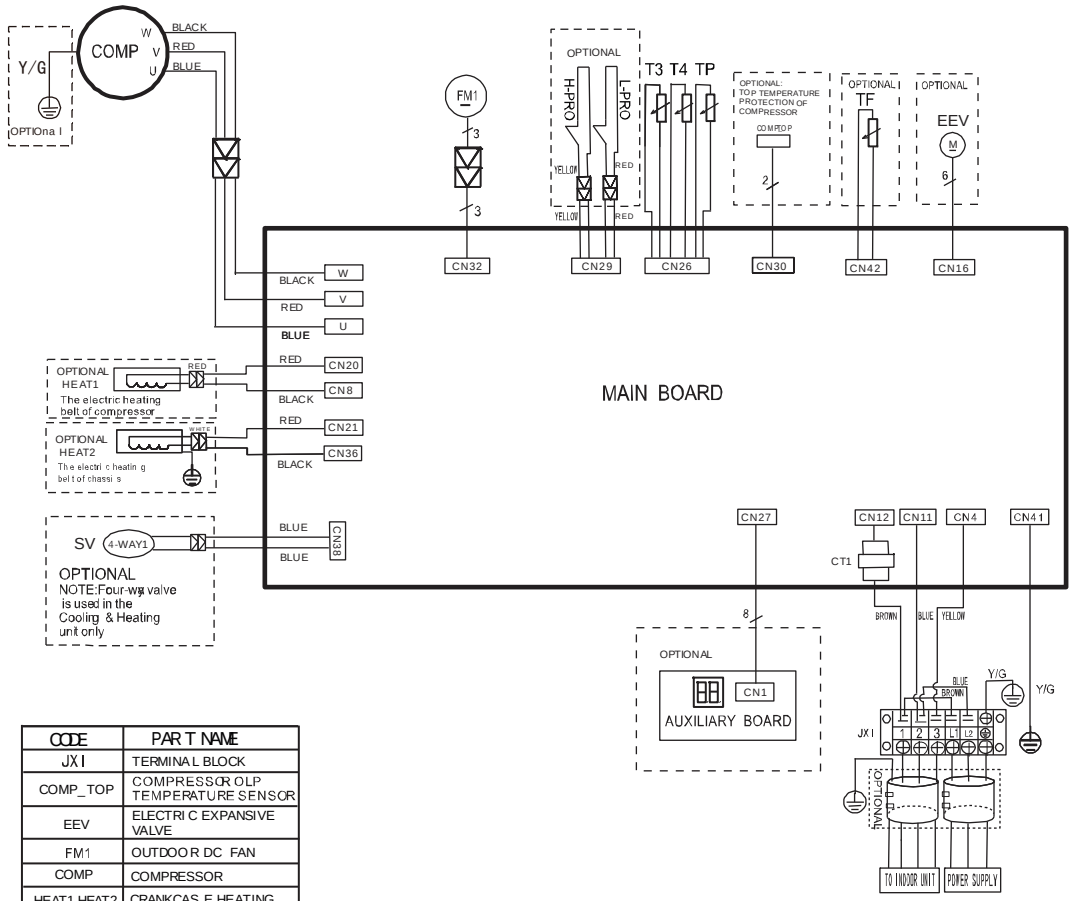


16022000035853

MOX430-17HFN1-MT0W, MOX430-18HFN1-MU0W, MOD33-24HFN1-MT0W



MOD30-24HFN1-MU0W

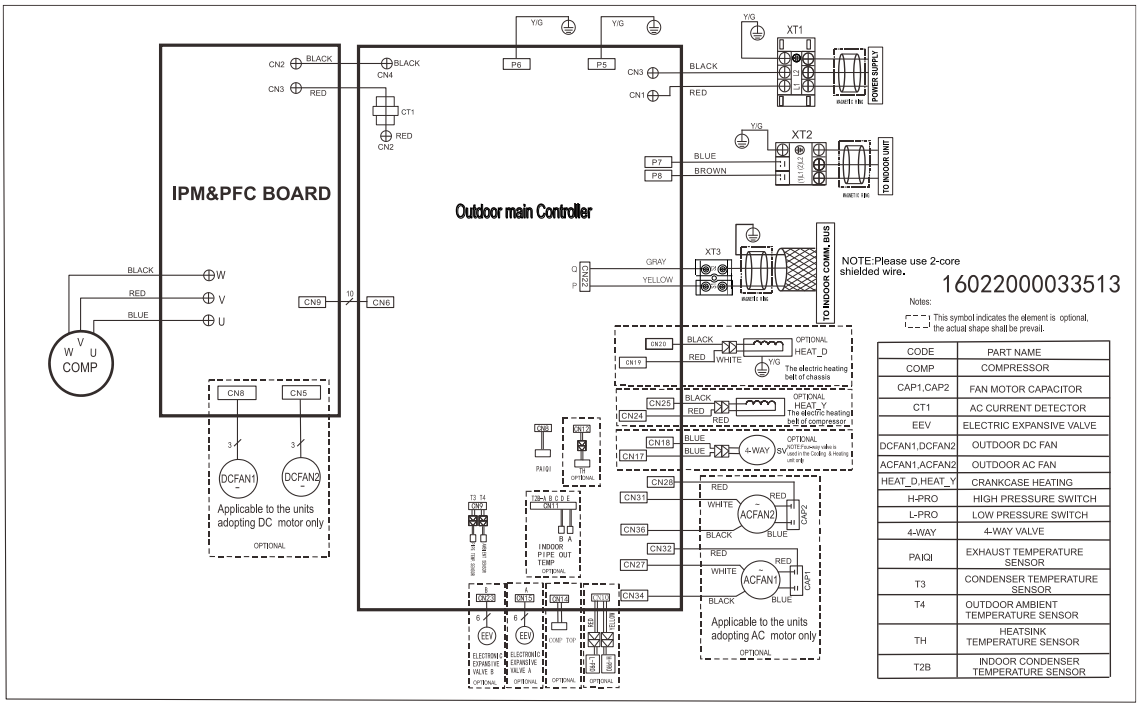


CODE	PART NAME
JX1	TERMINAL BLOCK
COMP_TOP	COMPRESSOR OLP TEMPERATURE SENSOR
EEV	ELECTRIC EXPANSIVE VALVE
FM1	OUTDOOR DC FAN
COMP	COMPRESSOR
HEAT1,HEAT2	CRANKCASE HEATING
CT1	AC CURRENT DETECTOR
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	4-WAY VALVE
TP	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
TF	TUBE FOR HEATSINK TEMPERATURE SENSOR

Notes: ⋯⋯
This symbol indicates the element is optional, the actual shape shall be prevail.

16022000036331

MOE30U-36HFN1-M(GA), MOE30U-48HFN1-M-[X](GA)

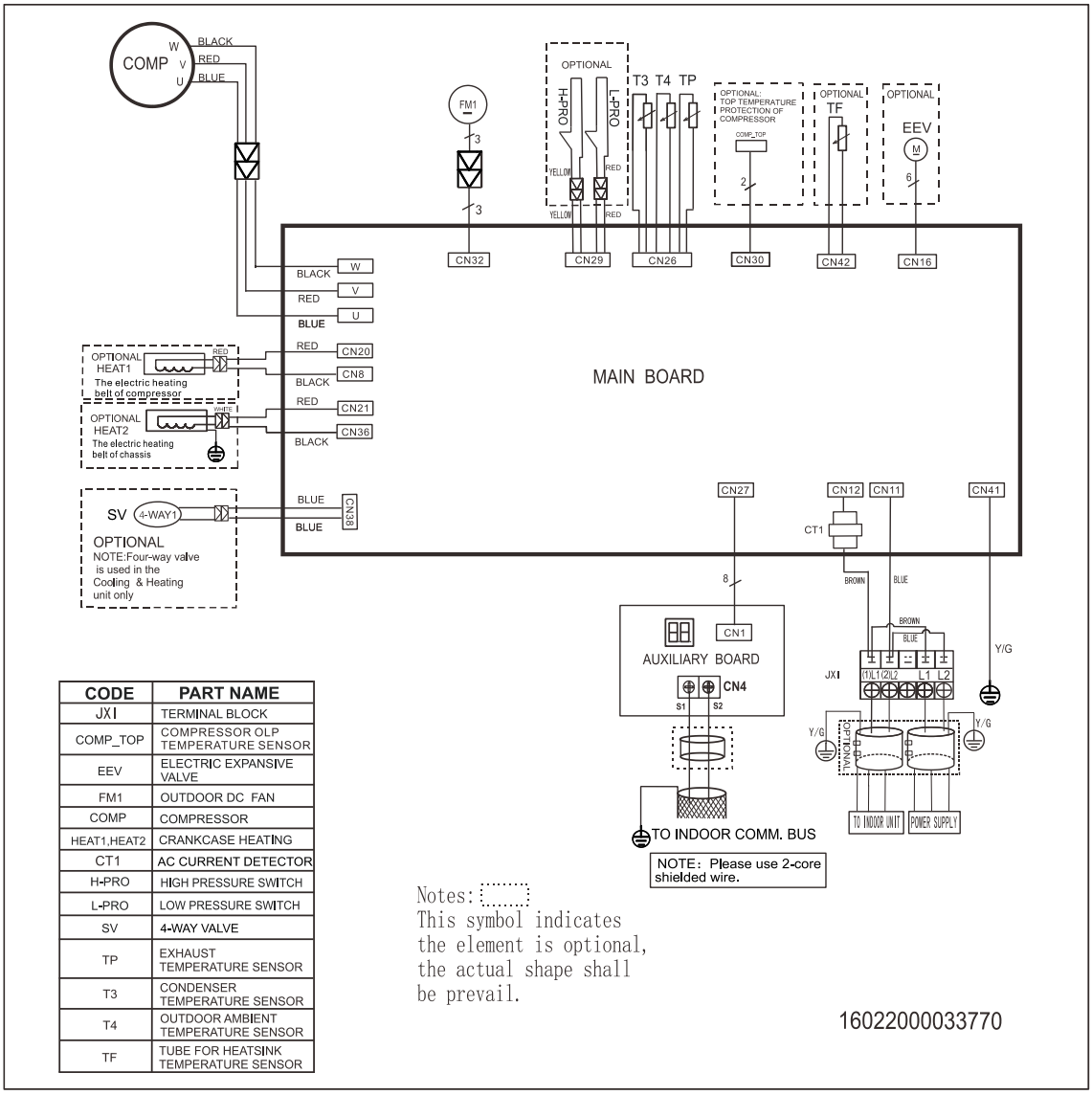


Notes:

This symbol indicates the element is optional, the actual shape shall be prevail.

CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
ACFAN1,ACFAN2	OUTDOOR AC FAN
HEAT_D,HEAT_Y	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
4-WAY	4-WAY VALVE
PAIQI	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
TH	HEATSINK TEMPERATURE SENSOR
T2B	INDOOR CONDENSER TEMPERATURE SENSOR

MOD30U-36HFN1-MP0(GA)

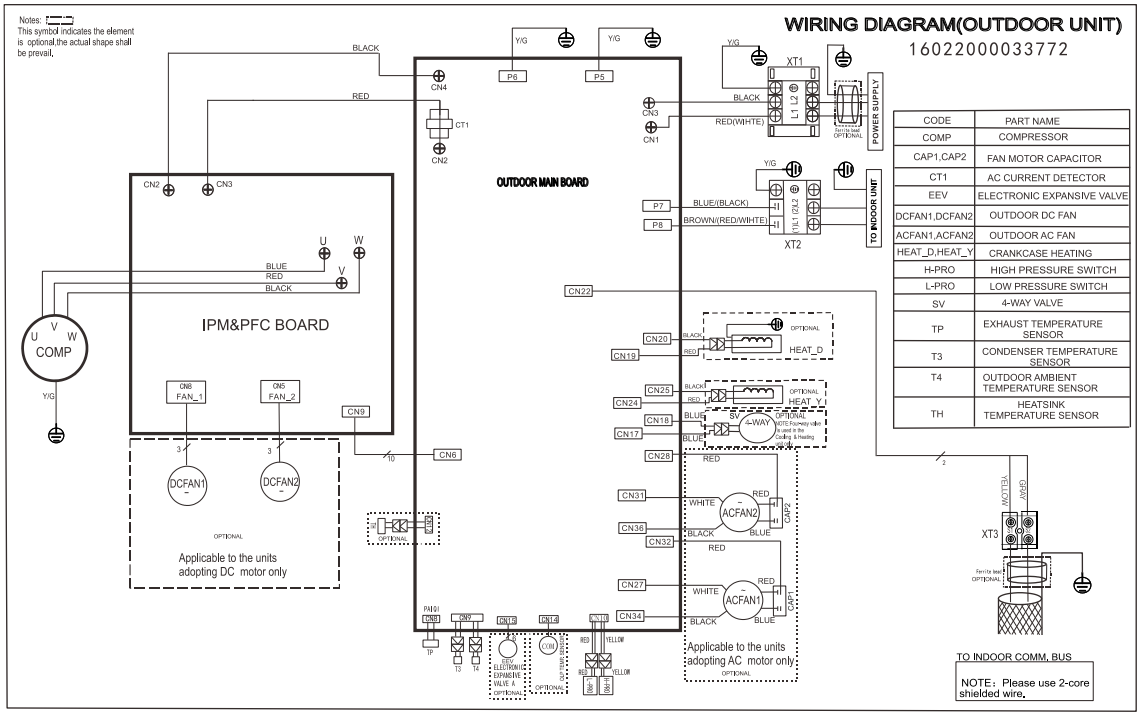


CODE	PART NAME
JX1	TERMINAL BLOCK
COMP_TOP	COMPRESSOR OLP TEMPERATURE SENSOR
EEV	ELECTRIC EXPANSIVE VALVE
FM1	OUTDOOR DC FAN
COMP	COMPRESSOR
HEAT1,HEAT2	CRANKCASE HEATING
CT1	AC CURRENT DETECTOR
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	4-WAY VALVE
TP	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
TF	TUBE FOR HEATSINK TEMPERATURE SENSOR

Notes: ⋯⋯
This symbol indicates the element is optional, the actual shape shall be prevail.

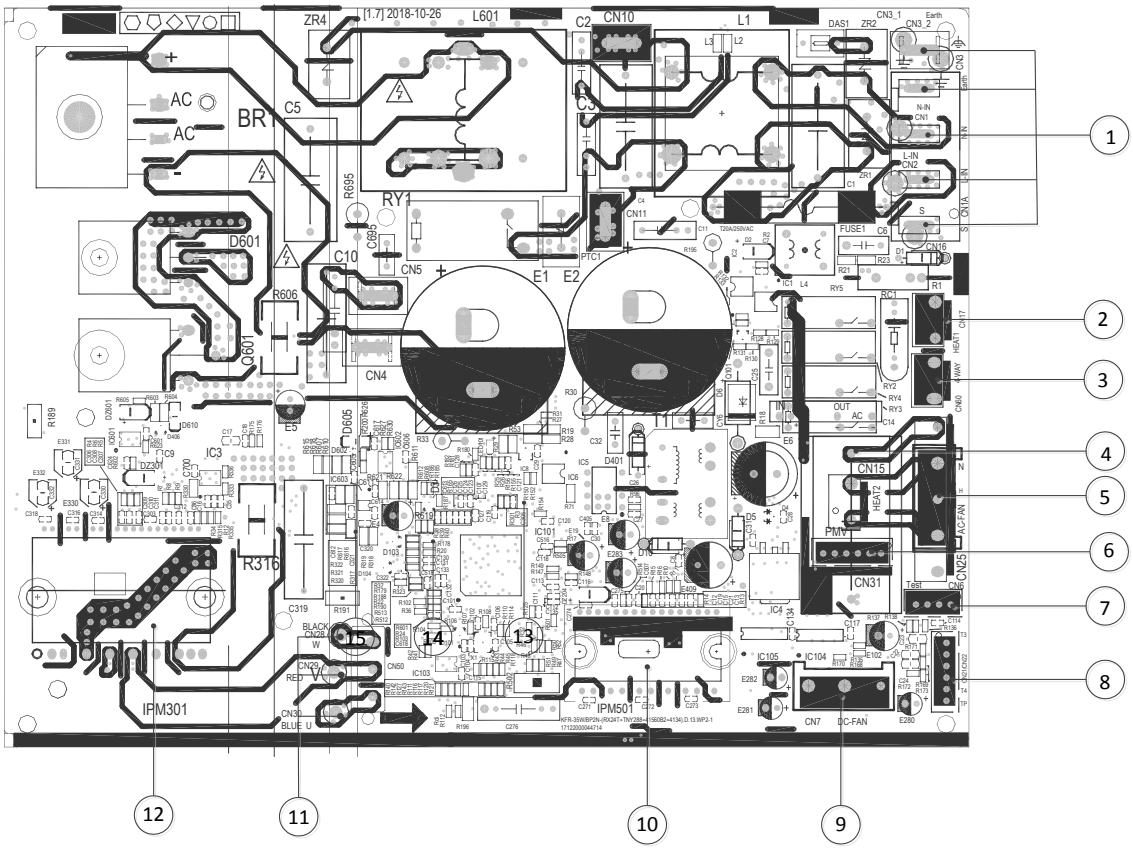
16022000033770

MOE30U-48HFN1-MP0(GA)



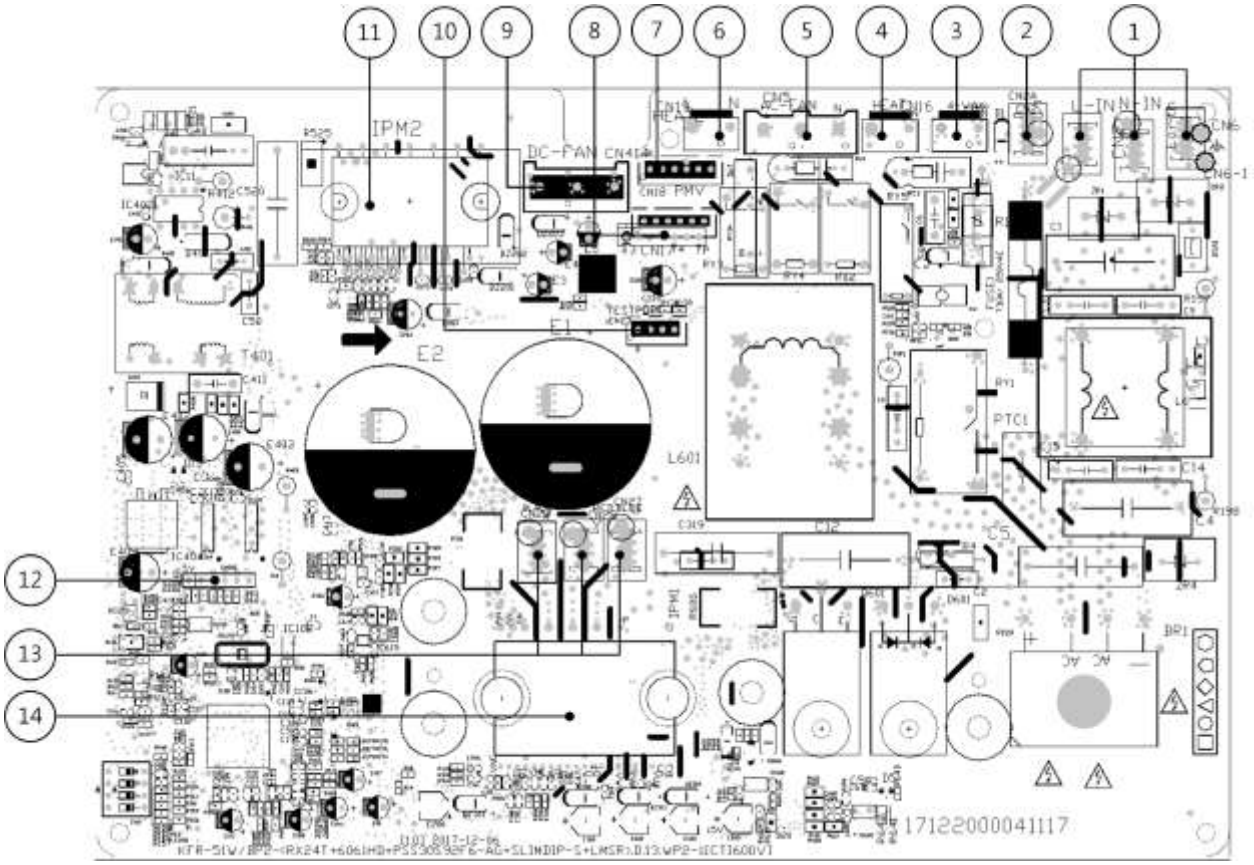
CODE	PART NAME
COMP	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CT1	AC CURRENT DETECTOR
EEV	ELECTRONIC EXPANSIVE VALVE
DCFAN1,DCFAN2	OUTDOOR DC FAN
ACFAN1,ACFAN2	OUTDOOR AC FAN
HEAT_D,HEAT_Y	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	4-WAY VALVE
TP	EXHAUST TEMPERATURE SENSOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
TH	HEATSINK TEMPERATURE SENSOR

PCB board of MOX230-09HFN1-MW5W, MOX230-12HFN1-MV5W, MOX330-09HFN1-MY5W MOX330-12HFN1-MW5W, MOD33-24HFN1-MT0W



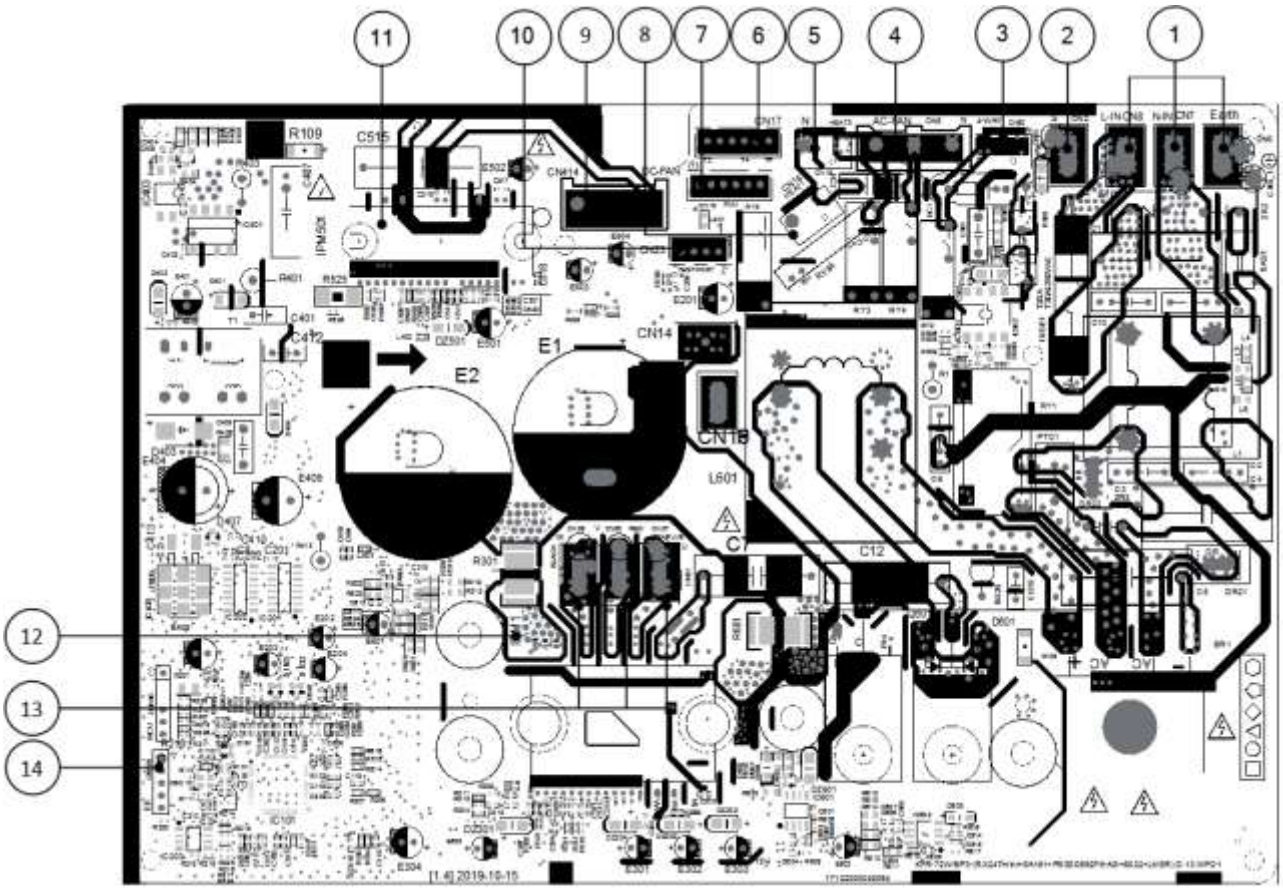
No.	Name	CN#	Meaning
1	Power Supply (CN1A)	CN3	Earth: connect to Ground
		CN1	N_in: connect to N-line (208-230V AC input)
		CN2	L_in: connect to L-line (208-230V AC input)
		CN16	S: connect to indoor unit communication
2	HEAT1	CN17	connect to compressor heater, 208-230V AC when is ON
3	4-WAY	CN60	connect to 4 way valve, 208-230V AC when is ON.
4	HEAT2	CN15	connect to chassis heater, 208-230V AC when is ON
5	AC-FAN	CN25	connect to AC fan
6	PMV	CN31	connect to Electric Expansion Valve
7	TESTPORT	CN6	used for testing
8	T5 T4 T3	CN21/CN22	connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor T5
9	DC-FAN	CN7	connect to DC fan
10	FAN_IPM	IPM 501	IPM for DC fan
11	W	CN28	connect to compressor
	U	CN29	0V AC (standby)
	V	CN30	10-200V AC (running)
12	COMP_IPM	IPM 301	IPM for compressor

PCB board of MOX430-17HFN1-MT0W



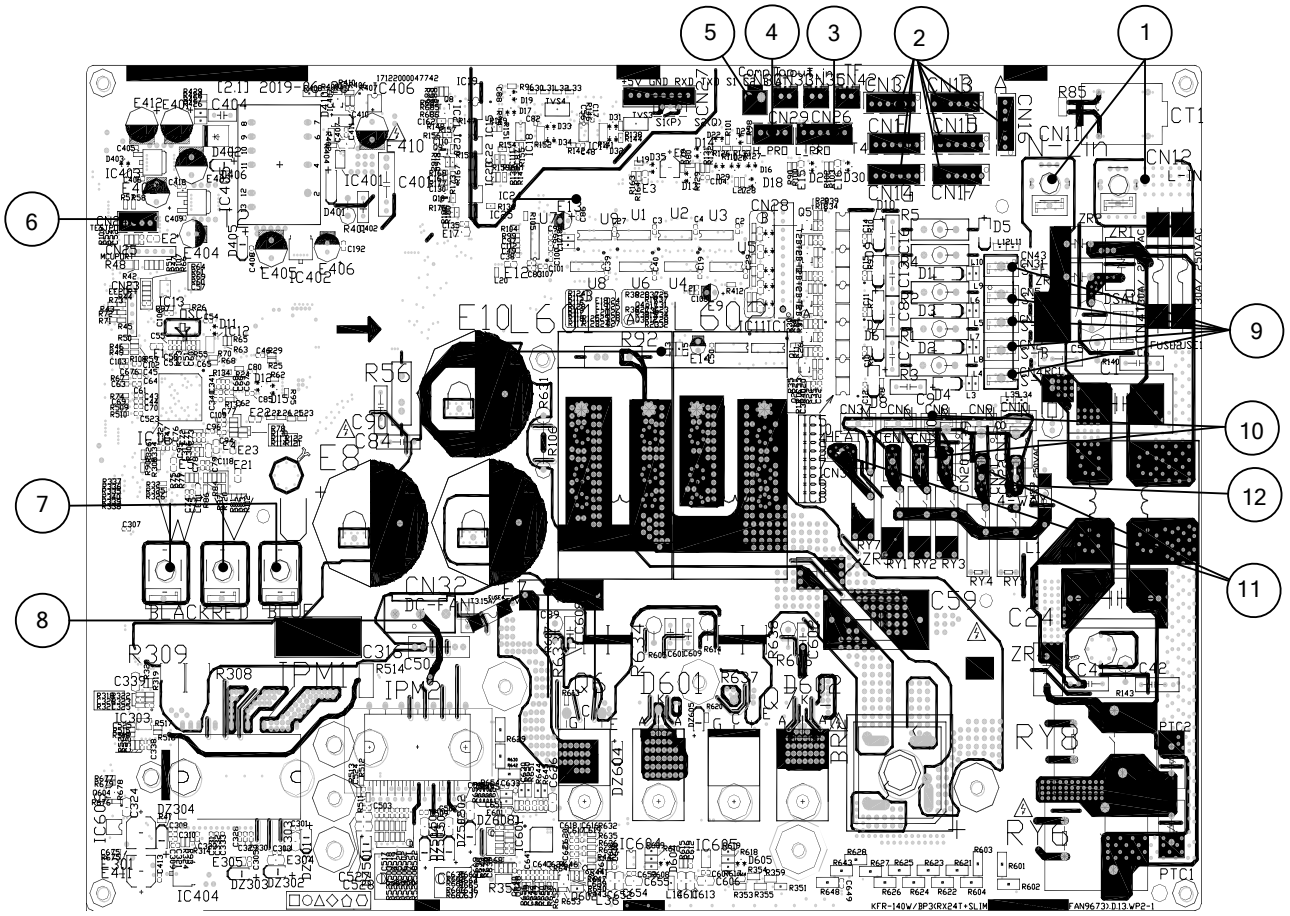
No.	Name	CN#	Meaning
1	Power Supply (CN3)	CN6	Earth: connect to Ground
		CN7	N_in: connect to N-line (208-230V AC input)
		CN8	L_in: connect to L-line (208-230V AC input)
2	S	CN2	S: connect to indoor unit communication
3	4-WAY	CN60	connect to 4 way valve, 208-230V AC when is ON.
4	HEAT1	CN16	connect to compressor heater, 208-230V AC when is ON
5	AC-FAN	CN5	connect to AC fan
6	HEAT2	CN19	connect to chassis heater, 208-230V AC when is ON
7	PMV	CN18	connect to Electric Expansion Valve
8	T5 T4 T3	CN17	connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor T5
9	DC-FAN	CN41	connect to DC fan
10	TESTPORT	CN23	used for testing
11	FAN_IPM	IPM2	IPM for DC fan
12	EE_PORT	CN505	EEPROM programmer port
13	U	CN28	connect to compressor
	V	CN29	0V AC (standby)
	W	CN30	10-200V AC (running)
14	COMP_IPM	IPM1	IPM for compressor

PCB board of MOX430-18HFN1-MU0W



No.	Name	CN#	Meaning
1	Power Supply	CN6	Earth: connect to Ground
		CN7	N_in: connect to N-line (208-230V AC input)
		CN8	L_in: connect to L-line (208-230V AC input)
2	S	CN2	S: connect to indoor unit communication
3	4-WAY	CN60	connect to 4 way valve, 208-230V AC when is ON.
4	AC-FAN	CN5	connect to AC fan
5	HEAT2	CN19	connect to chassis heater, 208-230V AC when is ON
6	T5 T4 T3	CN17	connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor T5
7	PMV	CN18	connect to Electric Expansion Valve
8	HEAT1	CN16	connect to compressor heater, 208-230V AC when is ON
9	DC-FAN	CN414	connect to DC fan
10	TESTPORT	CN23	used for testing
11	FAN_IPM	IPM501	IPM for DC fan
12	COMP_IPM	IPM1	IPM for compressor
13	U	CN27	connect to compressor
	V	CN28	0V AC (standby)
	W	CN29	200-300V AC (running)
14	EE_PORT	CN505	EEPROM programmer port

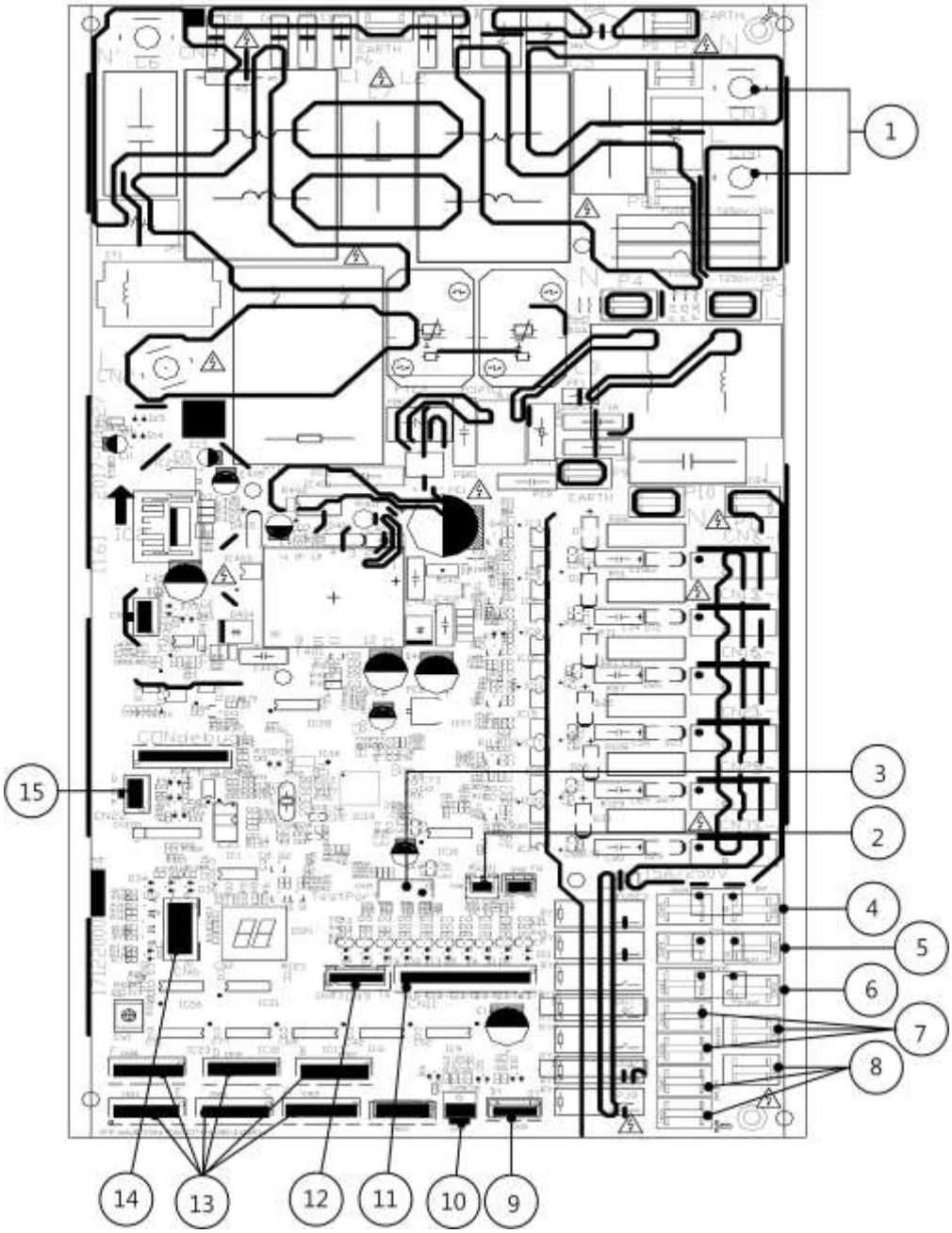
PCB board of MOD30-24HFN1-MU0W, MOD30U-36HFN1-MP0(GA)



No.	Name	CN#	Meaning
1	Power Supply	CN11	N_in: connect to N-line (208-230V AC input)
		CN12	L_in: connect to L-line (208-230V AC input)
2	EEV-A	CN16	connect to electric expansion valve
	EEV-B	CN13	
	EEV-C	CN3	
	EEV-D	CN15	
	EEV-E	CN1	
	EEV-F	CN17	
	EEV-G	CN14	
3	T5 T4 T3	CN26	connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor T5
4	H-PRO,L-RPO	CN29	connect to high and low pressure switch(pin1-pin2&pin3-pin4:5VDC pulse wave)
5	OLP TEMP. SENSOR	CN30	connect to compressor top temp. sensor (5VDC Pulse Wave)
6	TESTPORT	CN24	used for testing
7	COMPRESSOR	U	connect to compressor
		V	0V AC (standby)
		W	10-200V AC (running)
8	DC-FAN	CN32	connect to DC fan

9	S-E	CN31	S: connect to indoor unit communication(pin1-pin2: 24VDC Pulse wave; pin2-pin3: 208-230V AC input)
	S-D	CN5	
	S-C(mono)	CN34	
	S-B	CN2	
	S-A	CN4	
10	HEAT_D	CN8	connect to chassis heater, 208-230V AC when is ON
		CN20	
11	HEAT_Y	CN21	connect to compressor heater, 208-230V AC when is ON
		CN36	
12	4-WAY	CN38	connect to 4 way valve, 208-230V AC when is ON.

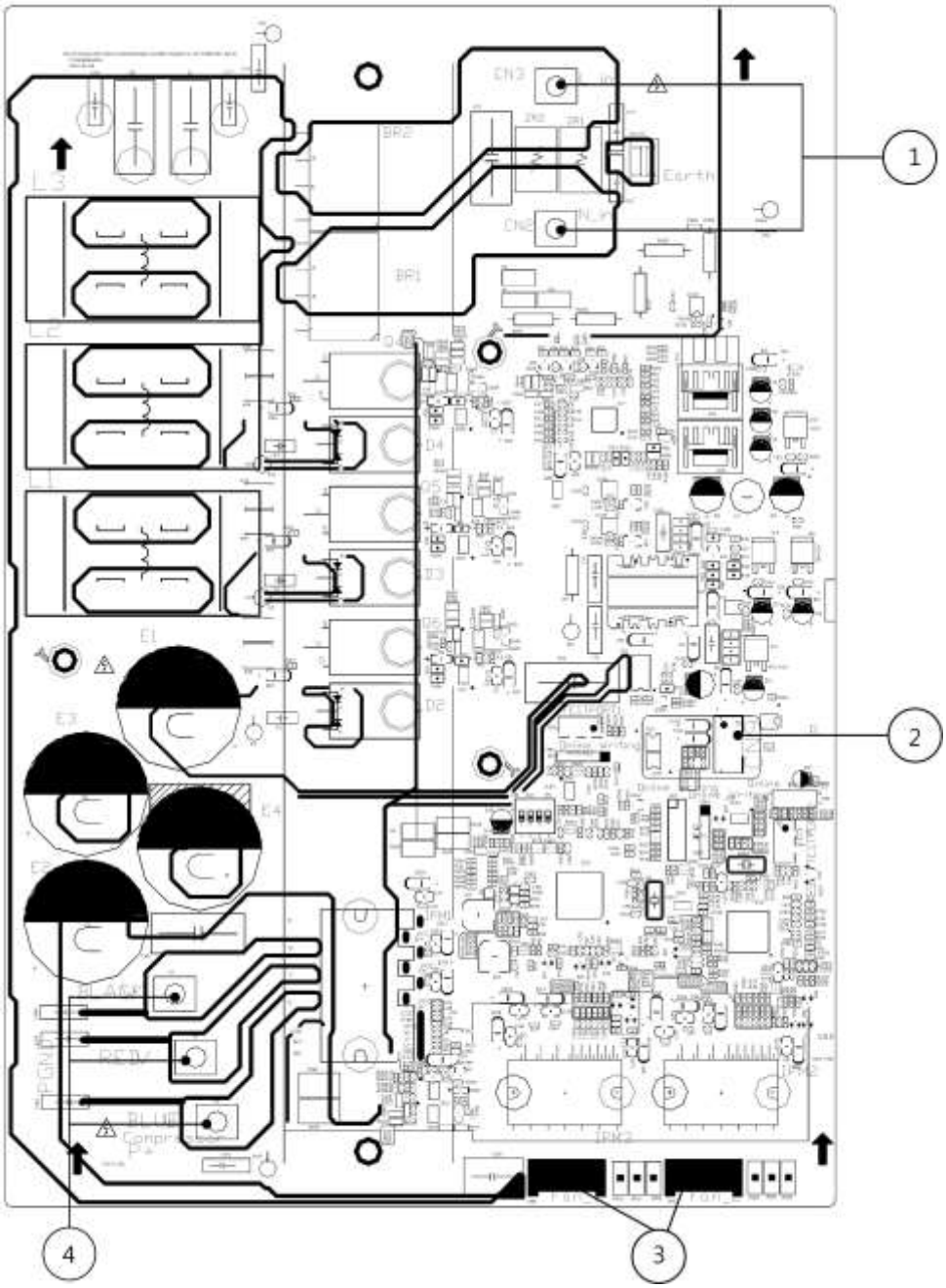
PCB board of MOE30U-36HFN1-M(GA), MOE30U-48HFN1-MP0(GA), MOE30U-48HFN1-M-[X](GA)



No.	Name	CN#	Meaning
1	Power Supply	CN1	L1_in: connect to L1-line (230V AC input)
		CN3	L2_in: connect to L2-line (230V AC input)
2	T5	CN8	Exhaust temp. sensor T5
3	TESTPORT	CN35	used for testing
4	HEAT1	CN19/CN20	connect to chassis heater, 208-230V AC when is ON
5	HEAT2	CN24/CN25	connect to compressor heater, 208-230V AC when is ON
6	4-WAY	CN17/CN18	connect to 4 way valve, 208-230V AC when is ON.
7	AC-FAN2	CN31/CN36/CN28	connect to AC fan2
8	AC-FAN1	CN27/CN34/CN32	connect to AC fan1
9	H-PRO,L-RPO	CN10	connect to high and low pressure switch

			(pin1-pin2&pin3-pin4:5VDC pulse wave)
10	Compressor Top	CN14	connect to compressor top temperature sensor
11	T2B	CN11	connect to pipe temp. sensor T2B
12	T4 T3	CN9	connect to pipe temp. sensor T3, ambient temp. sensor T4
13	PMV	CN15/CN23/CN26/ CN30/CN33/CN38	connect to Electric Expansion Valve(A~F)
14	/	CN6	connect to IPM&PFC board CN9
15	PQE	CN22	Communication to indoor unit

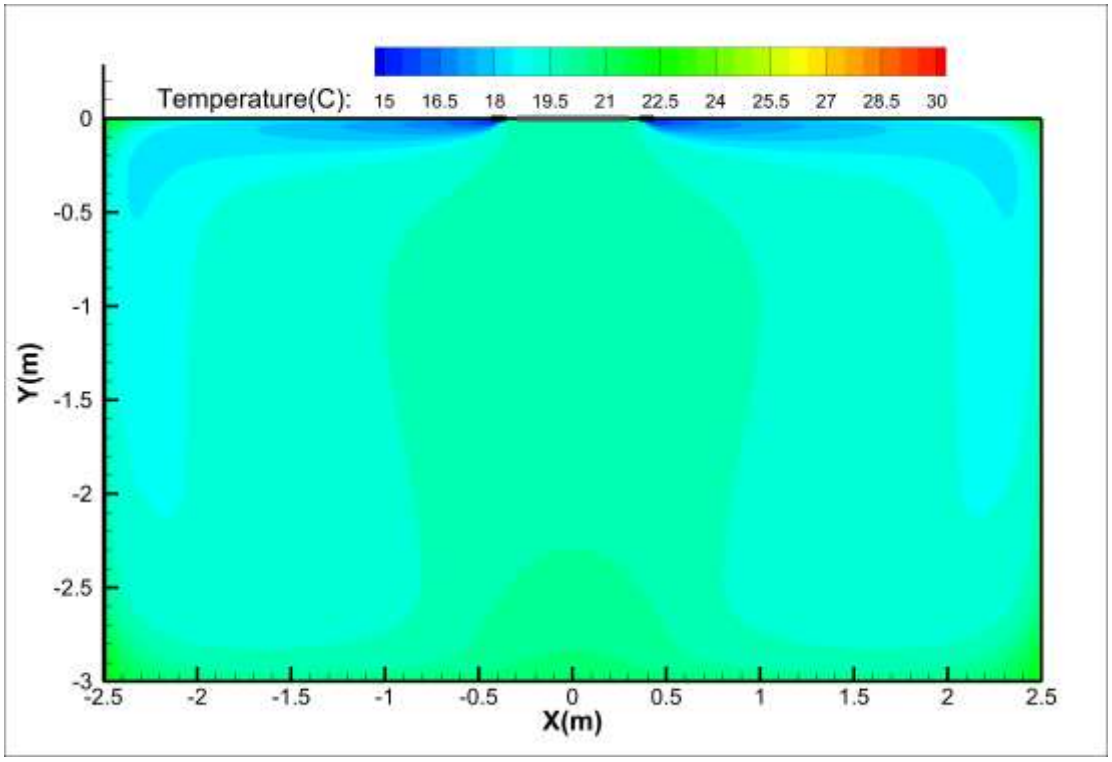
IPM board of MOE30U-36HFN1-M(GA), MOE30U-48HFN1-MP0(GA),MOE30U-48HFN1-M-[X](GA)

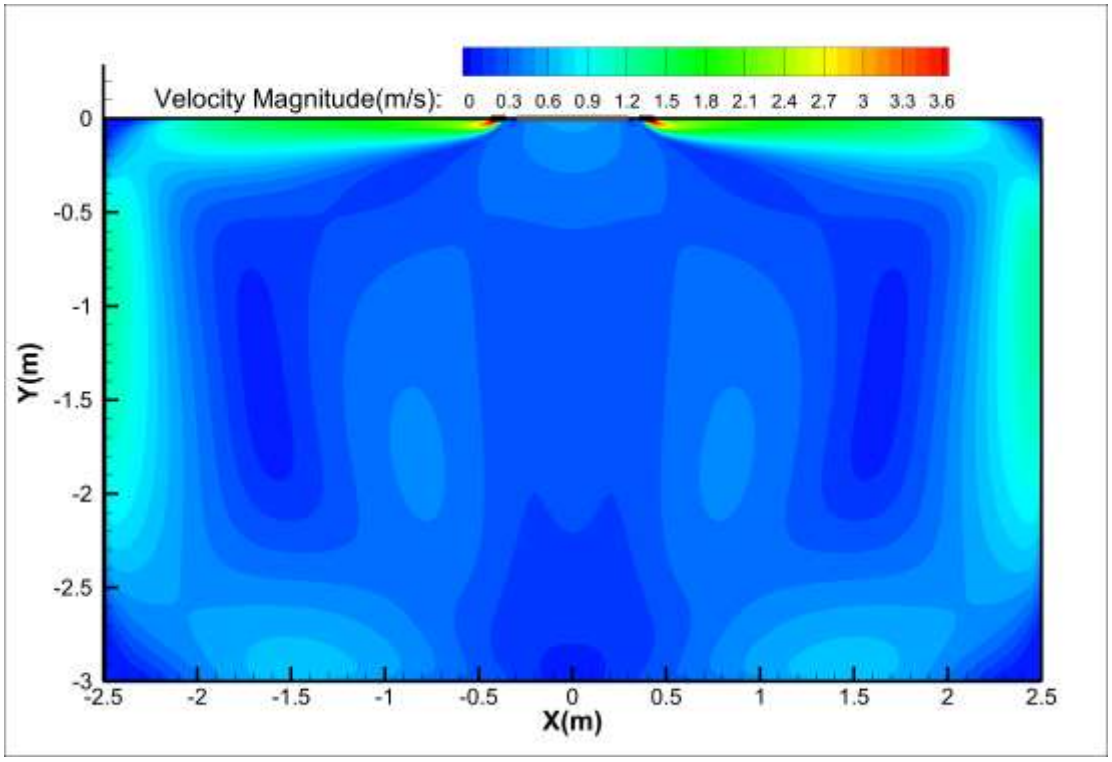


No.	Name	CN#	Meaning
1	Power Supply	CN3	connect to main board L-Out
		CN2	connect to main board N-Out
2	CN9	CN9	Connect to main PCB CN6
3	FAN_DC	FAN_1/FAN_2	connect to outdoor DC fan 1& DC fan 2
4	CN_COMP	U1	Connect to compressor
		V1	
		W1	

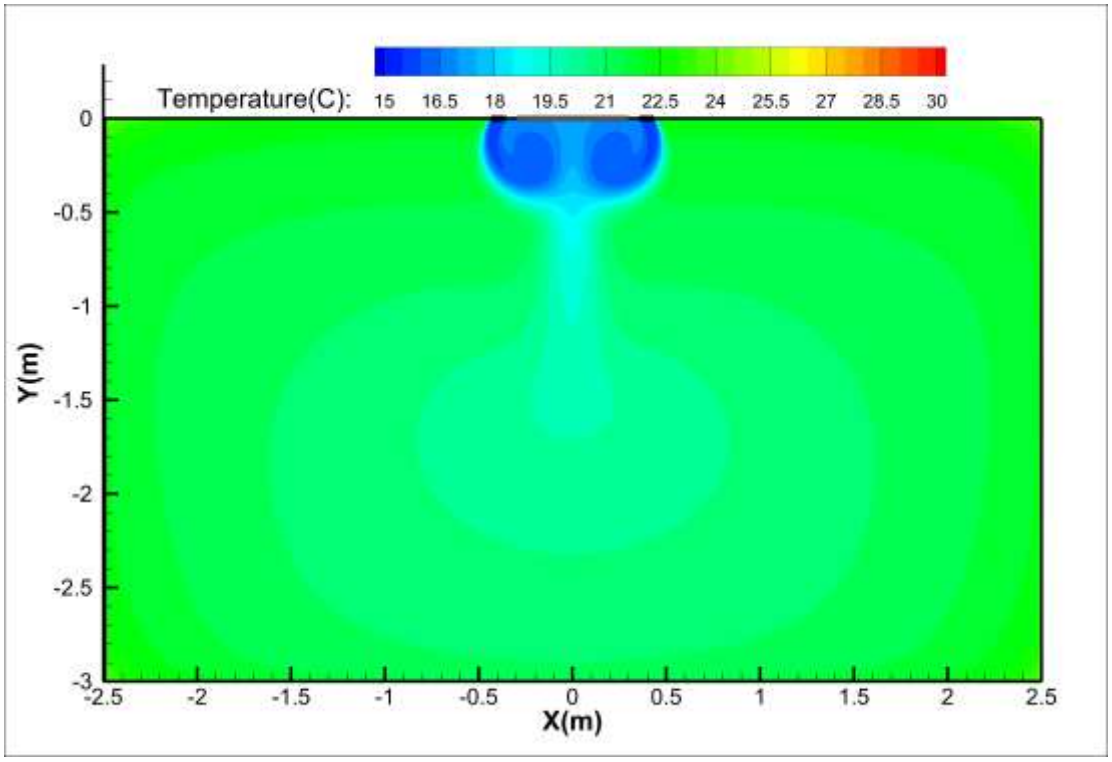
7. Air Velocity Distributions

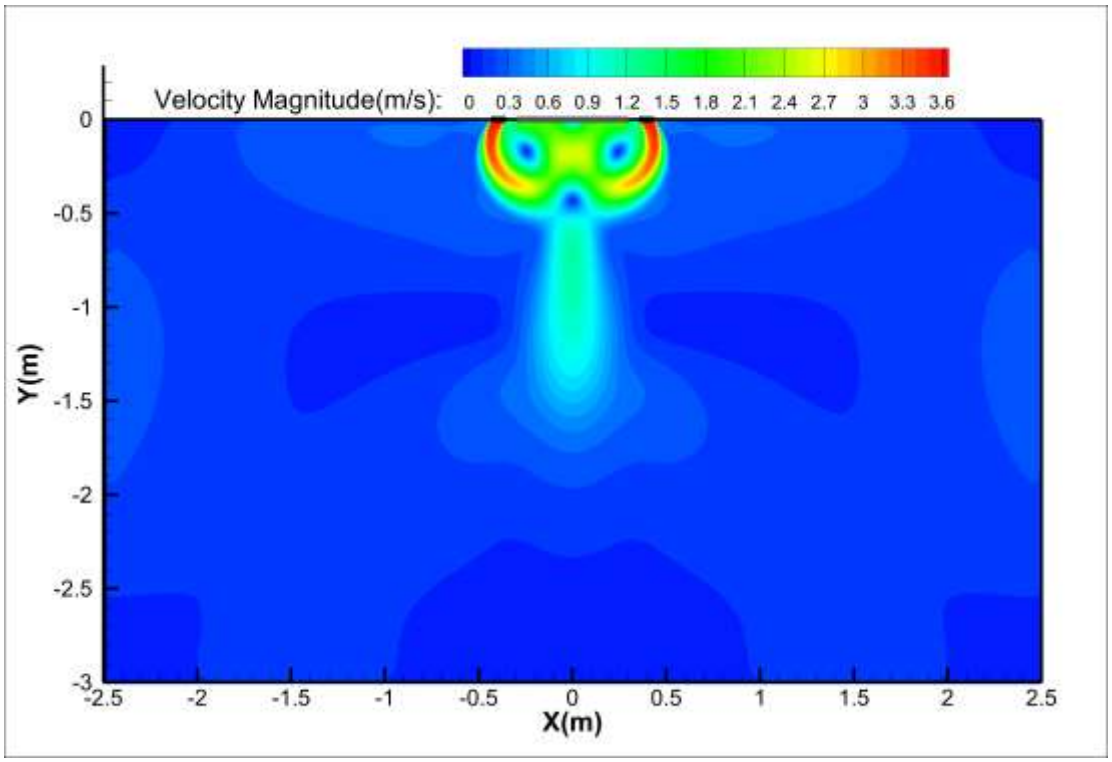
Cassette Units
9K/12K
Cooling
Discharge Angle 30°





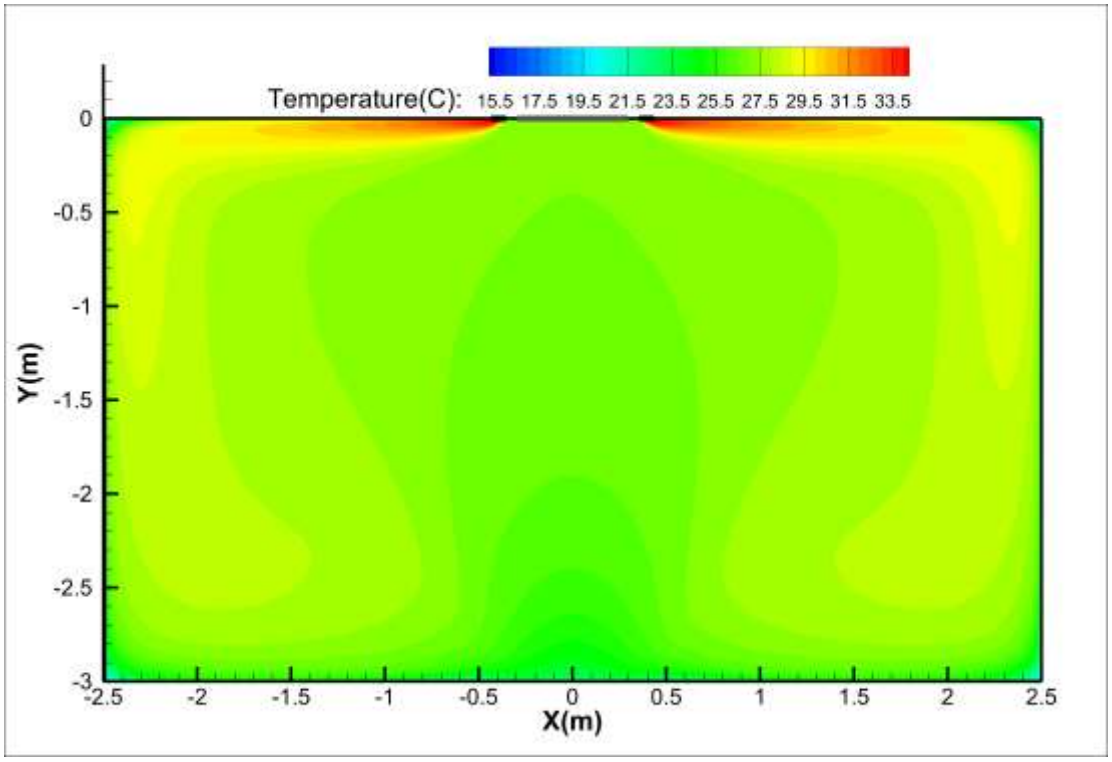
Discharge Angle 60°

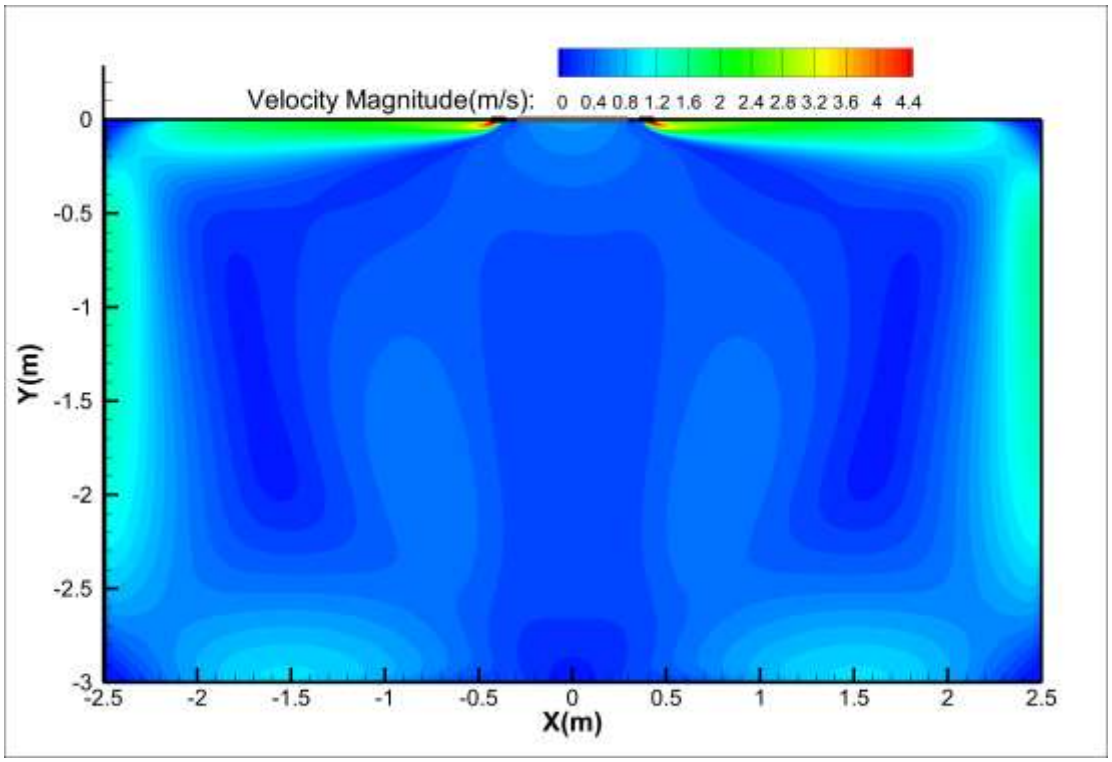




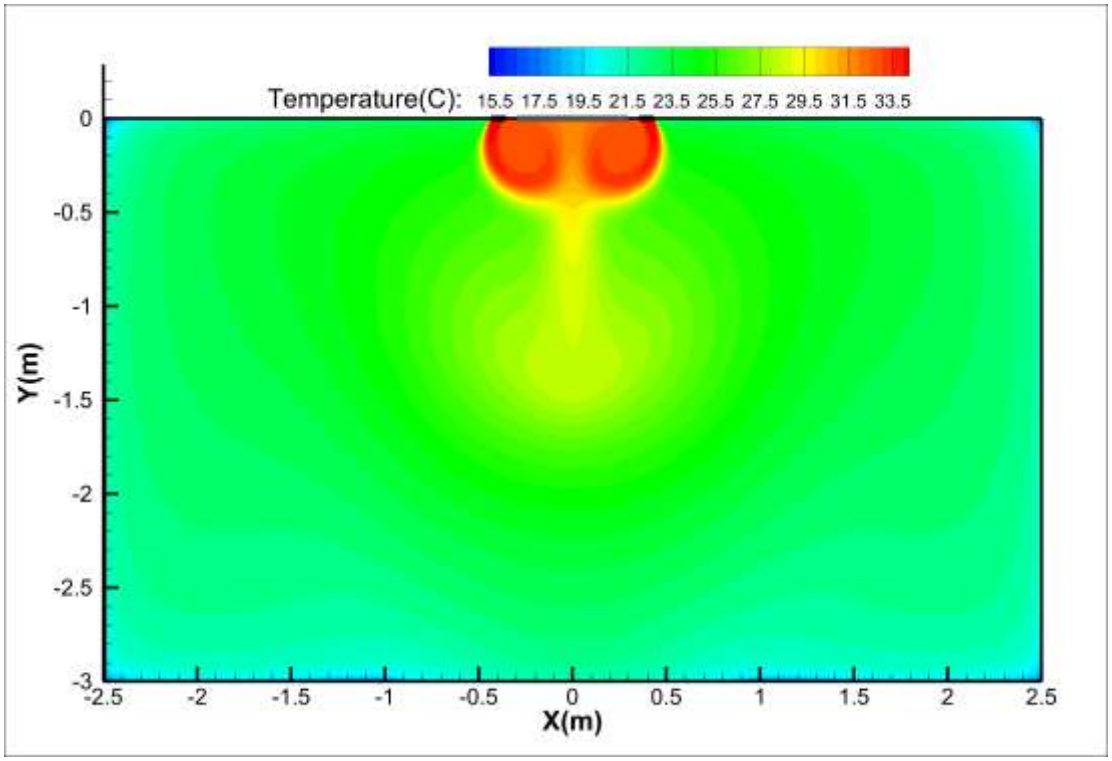
Heating

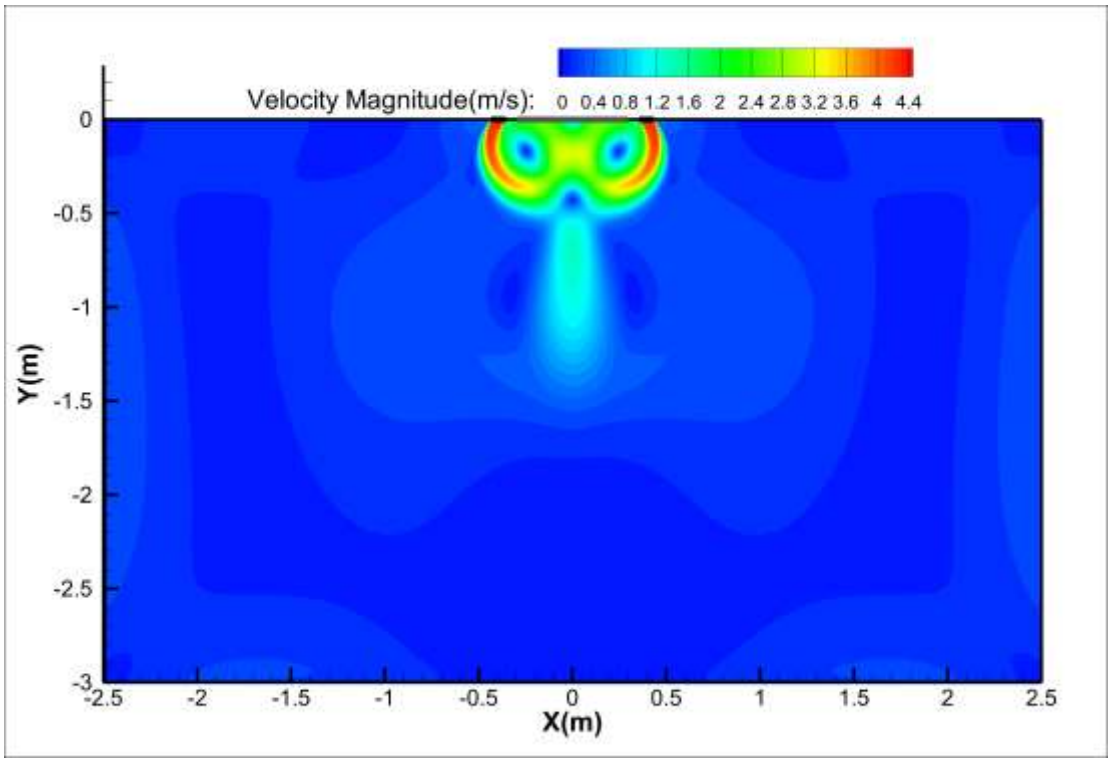
Discharge Angle 30°





Discharge Angle 60°

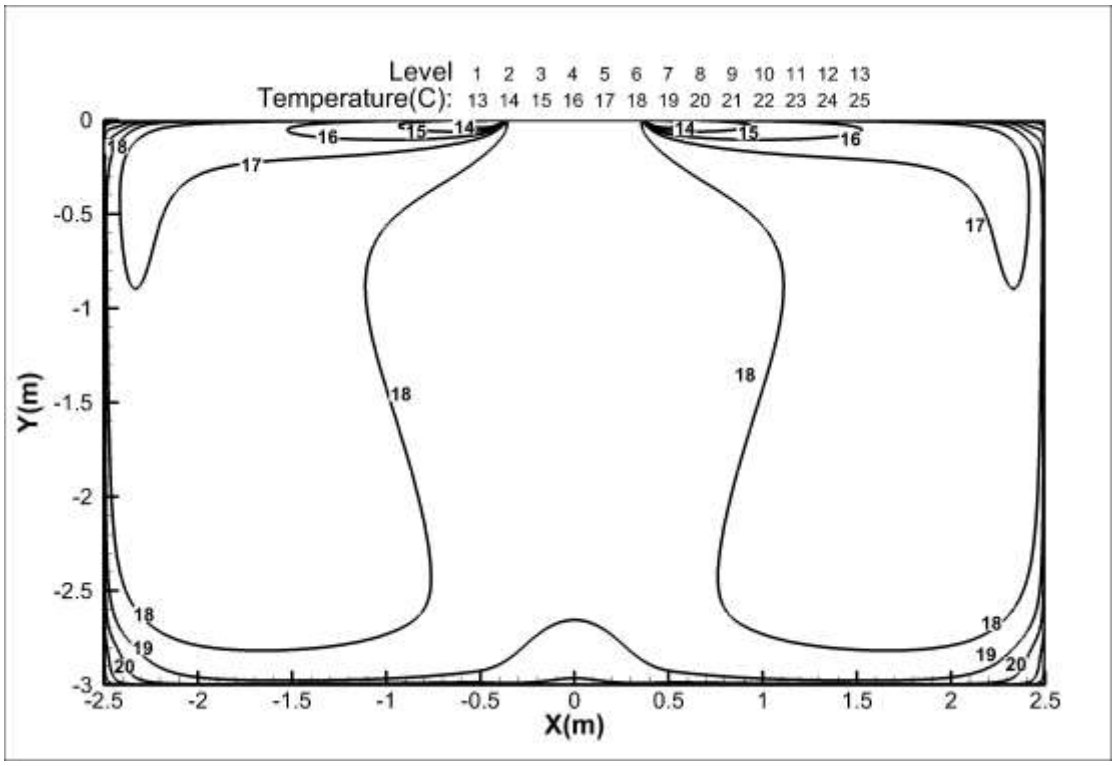


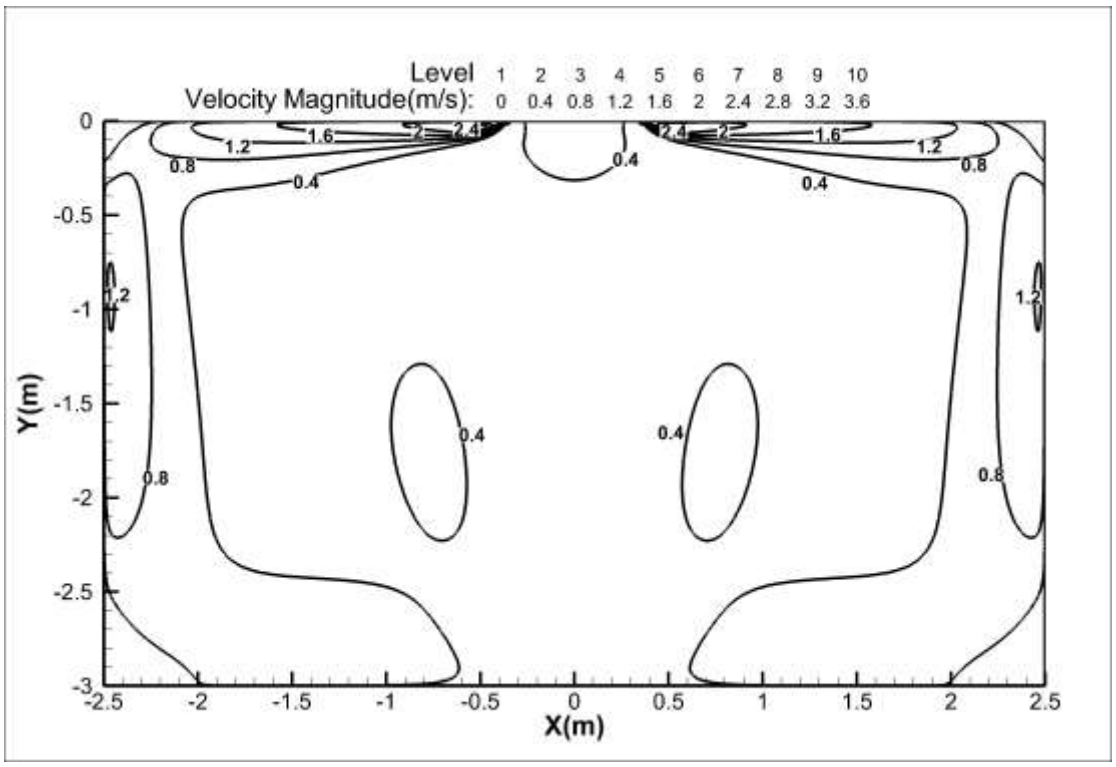


18K

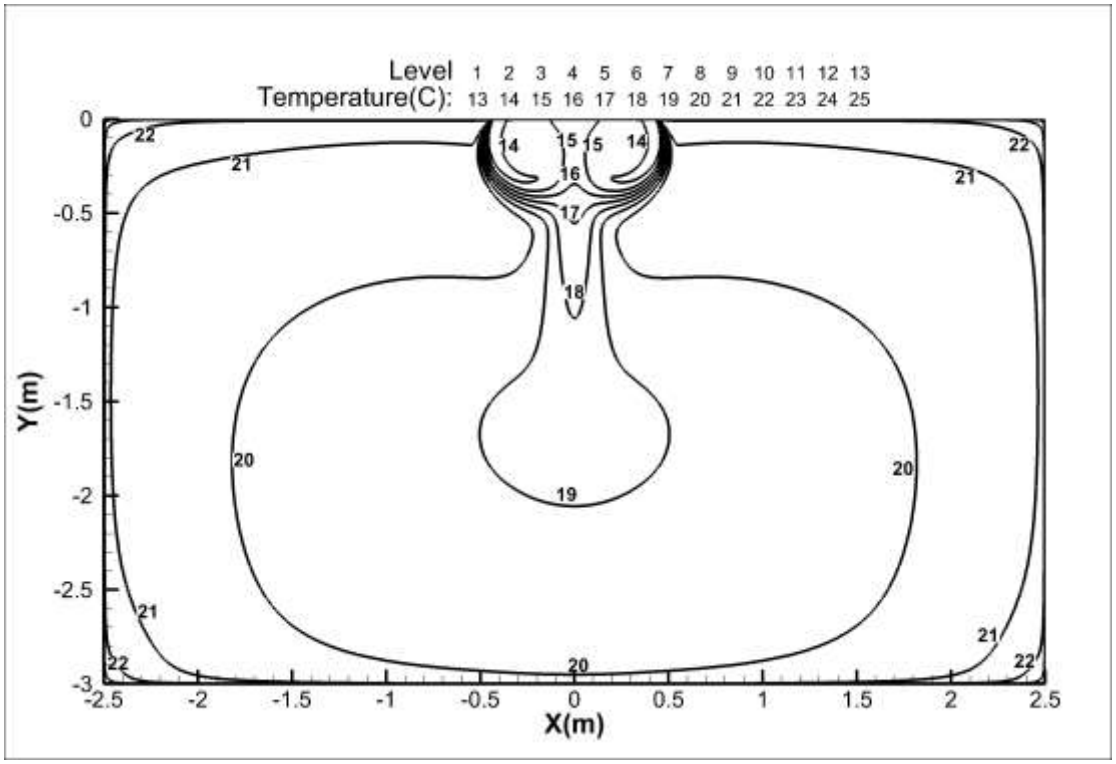
Cooling

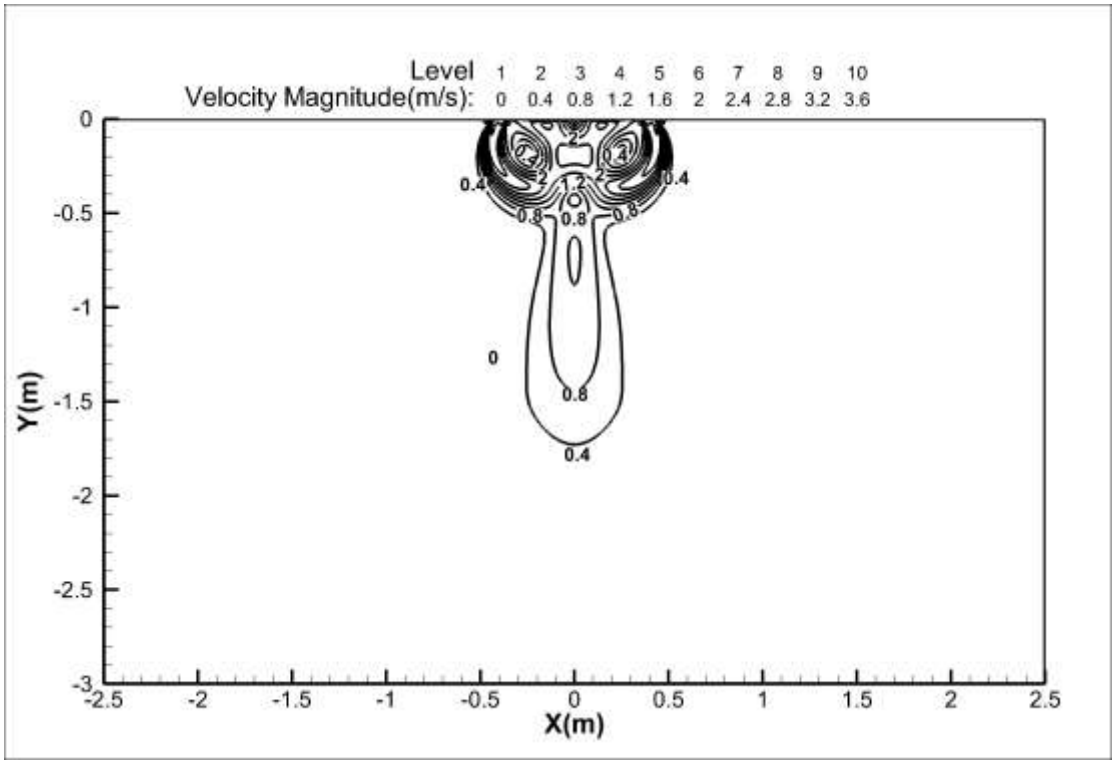
Discharge Angle 30°





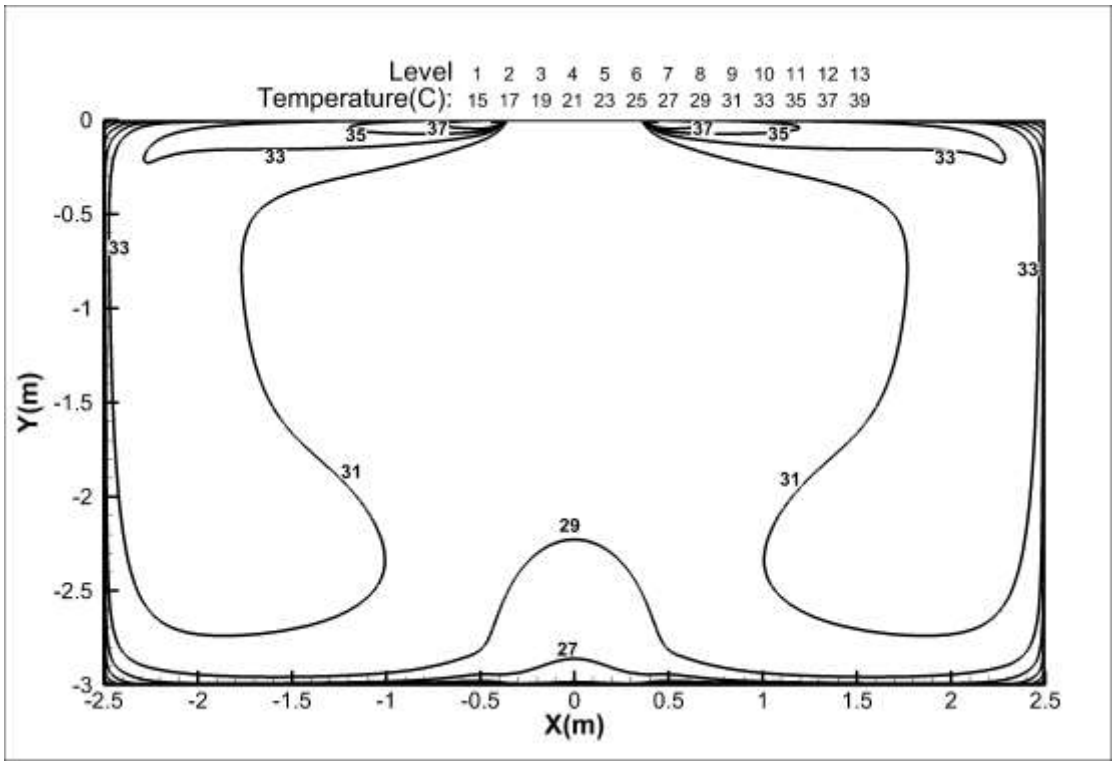
Discharge Angle 60°

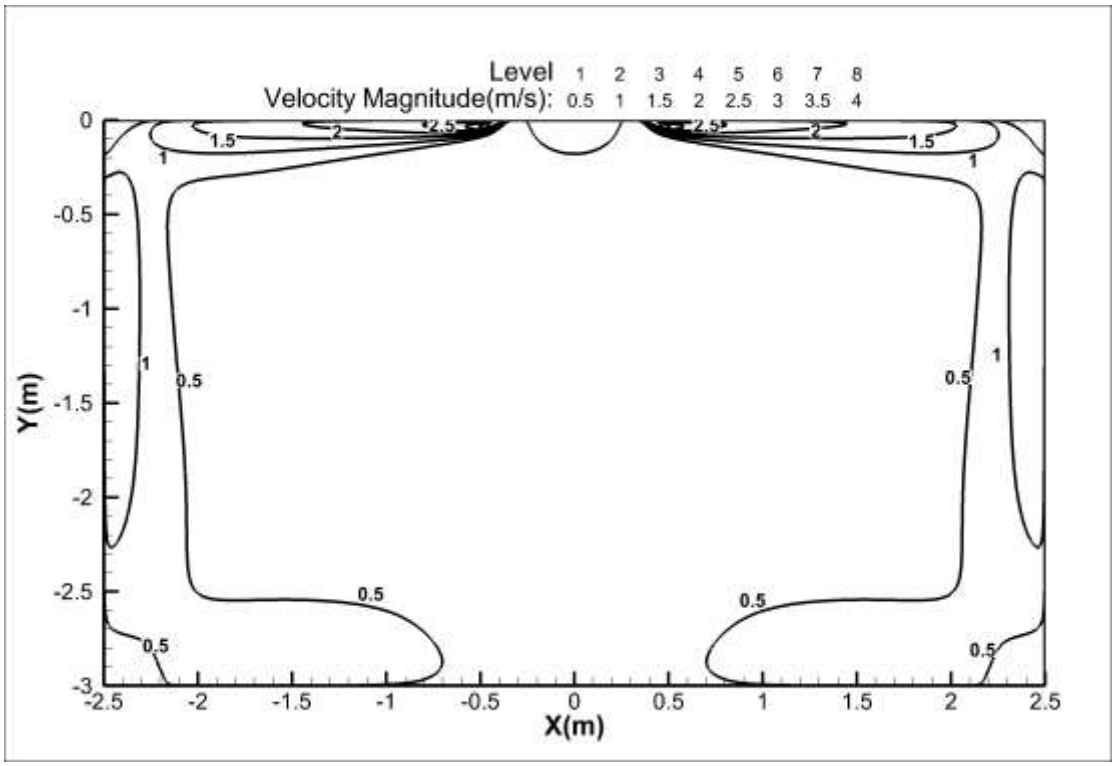




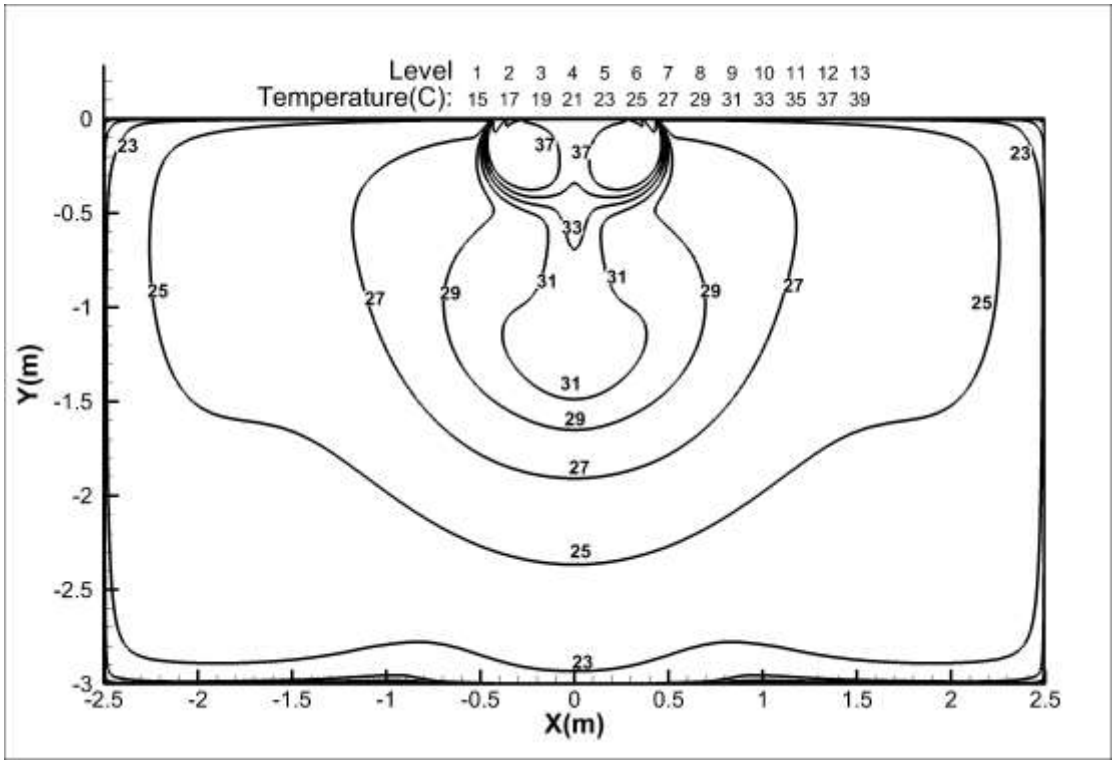
Heating

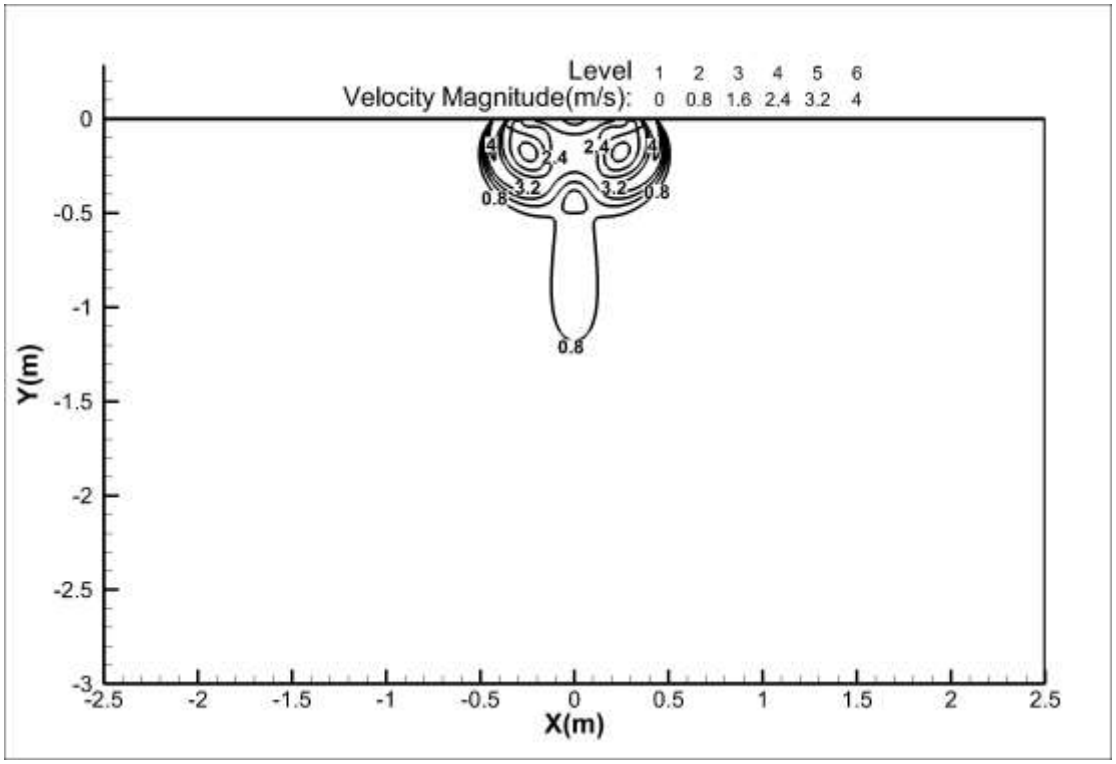
Discharge Angle 30°





Discharge Angle 60°

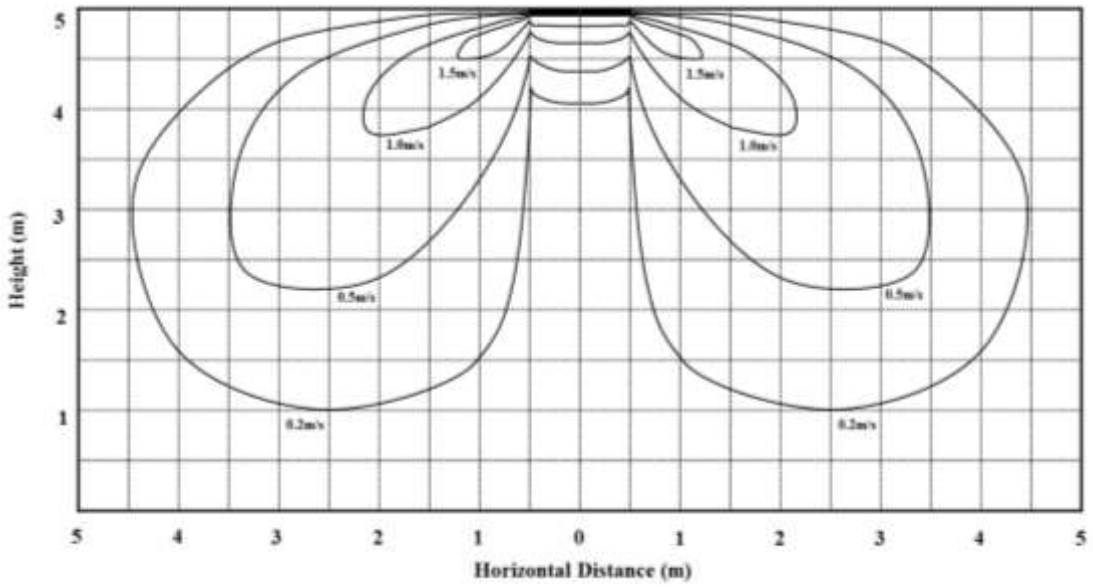


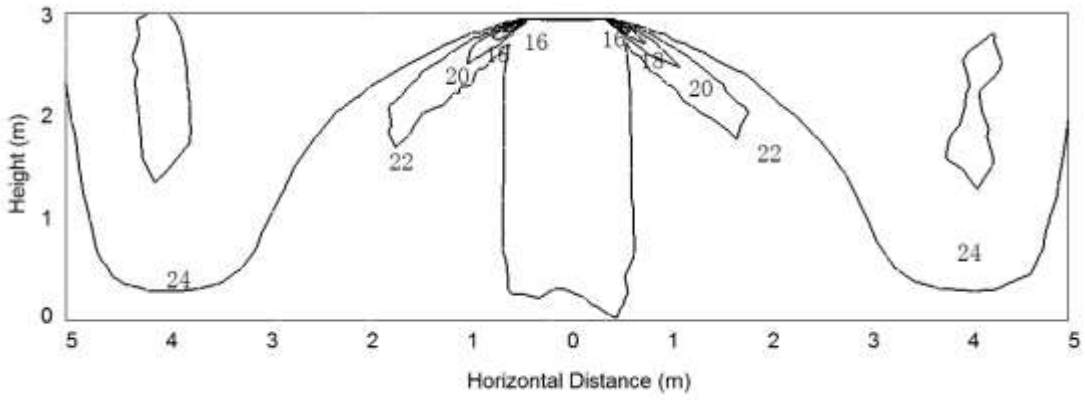


24K

Cooling

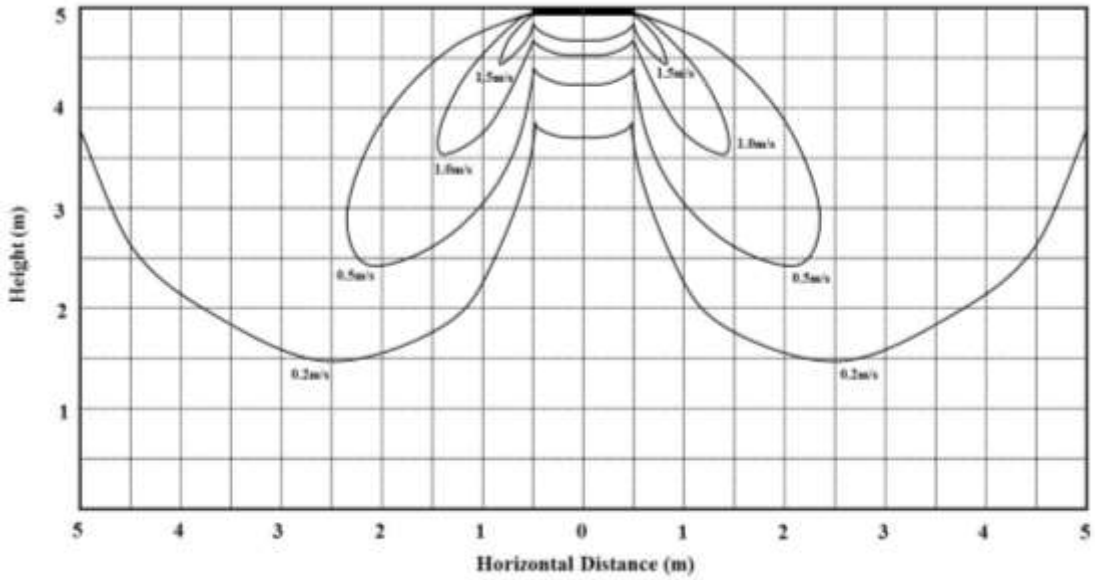
Discharge Angle 30°

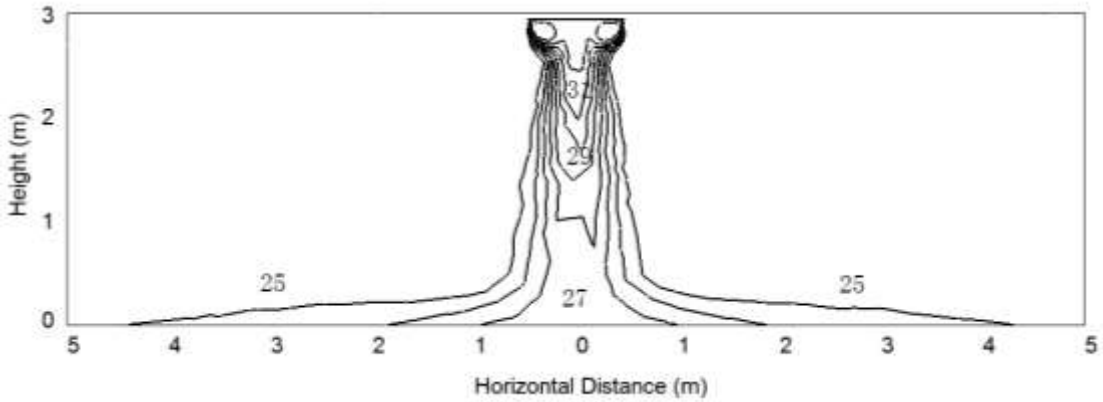




Heating

Discharge Angle 30°

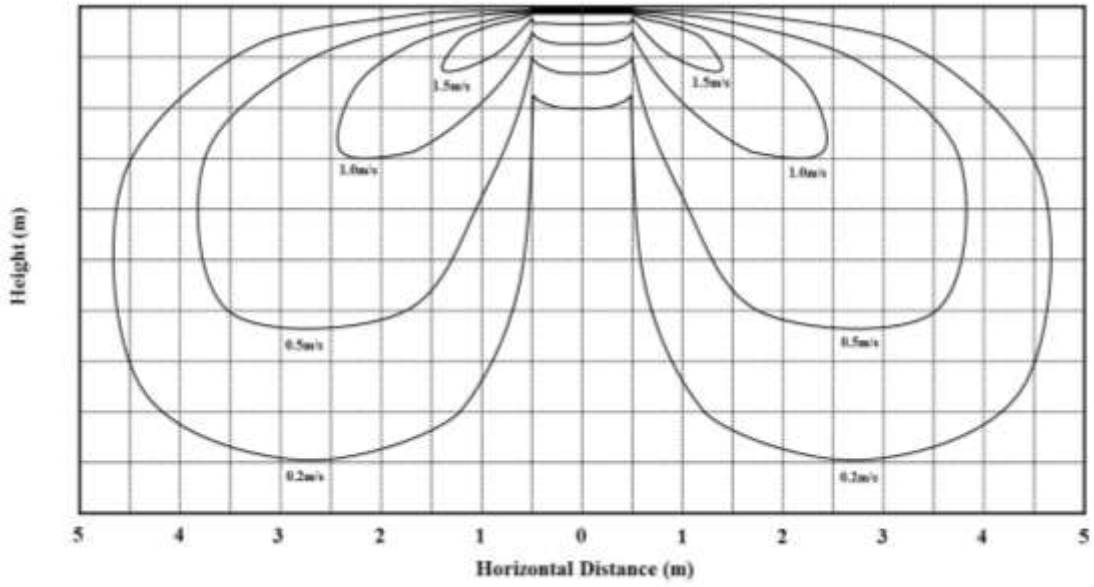


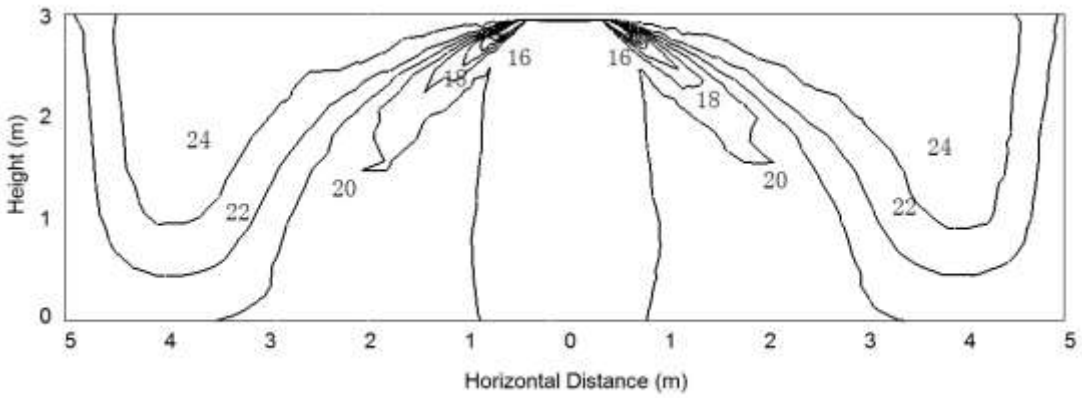


36K

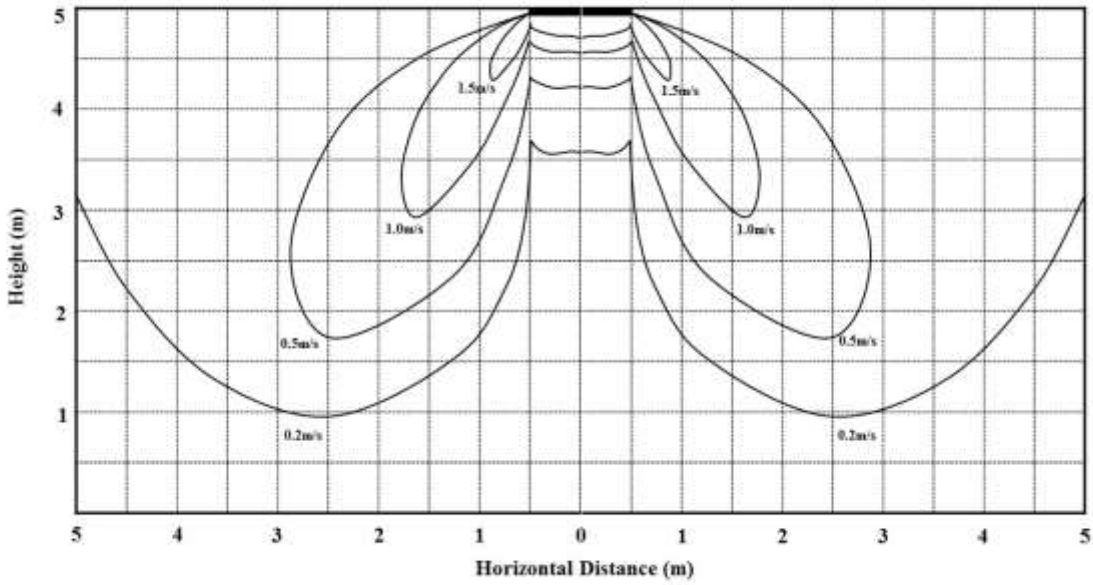
Cooling

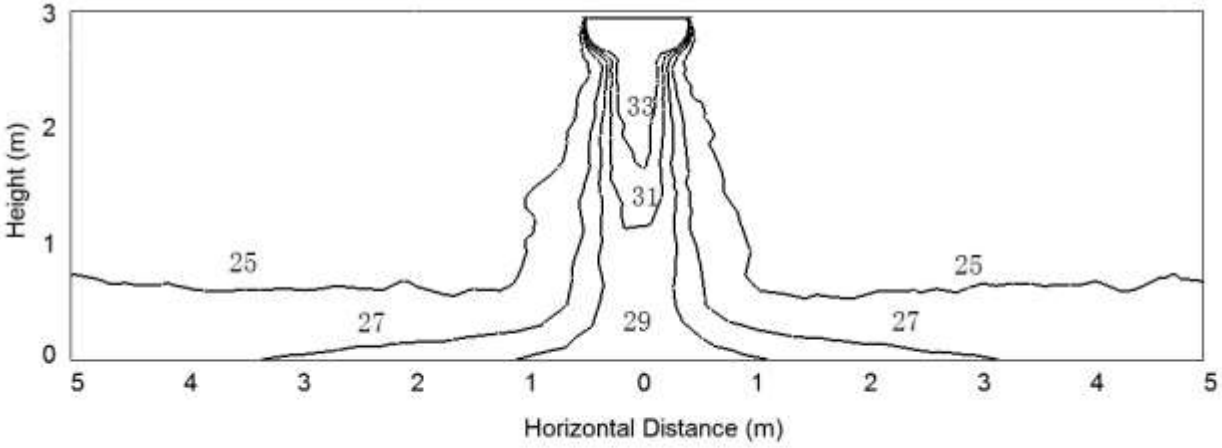
Discharge Angle 30°





Heating
Discharge Angle 30°

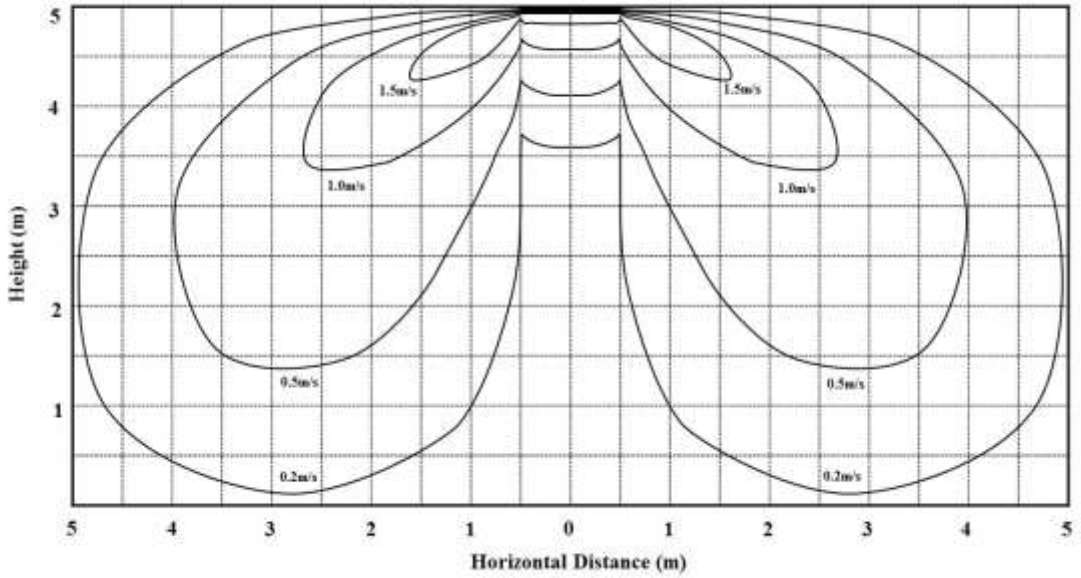


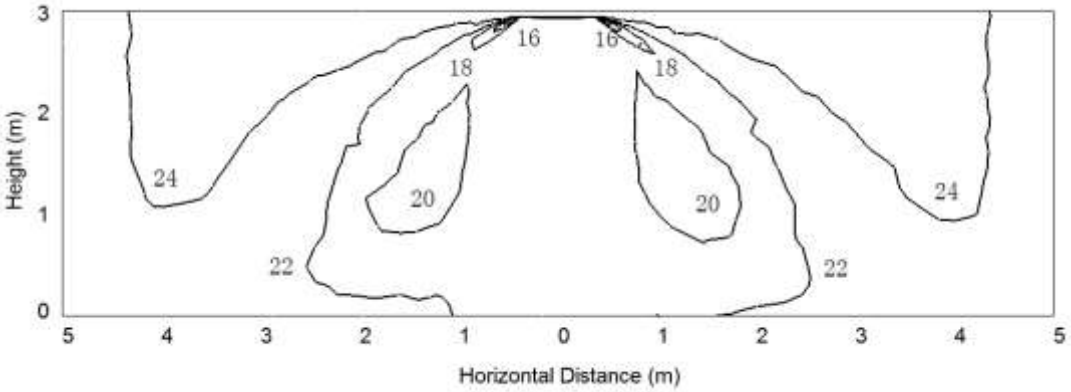


48K

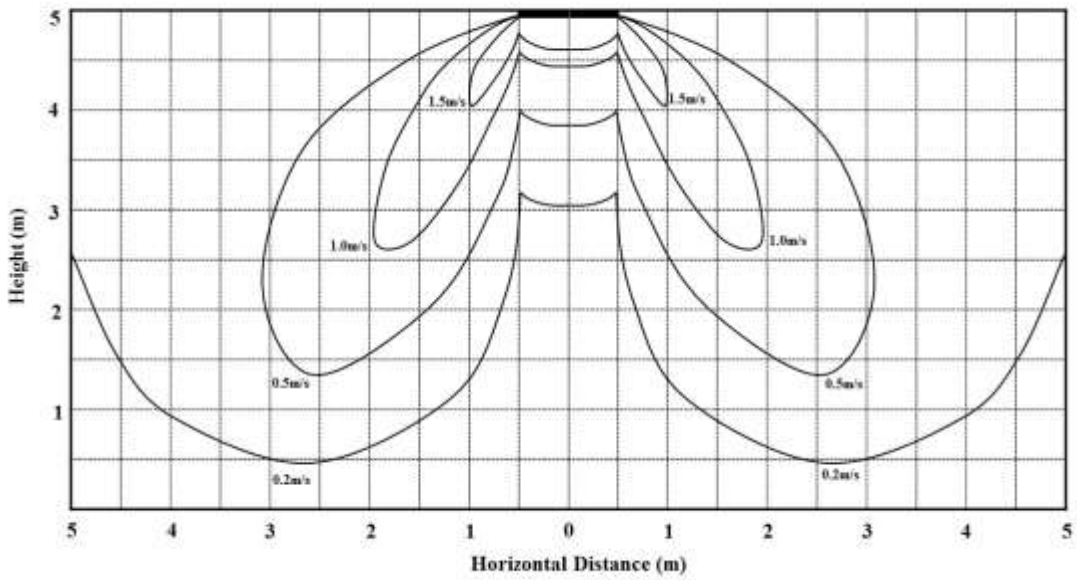
Cooling

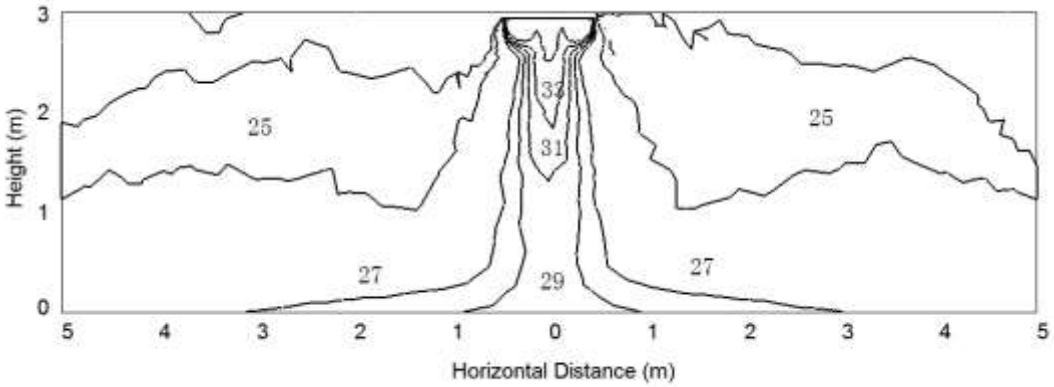
Discharge Angle 30°





Heating
Discharge Angle 30°



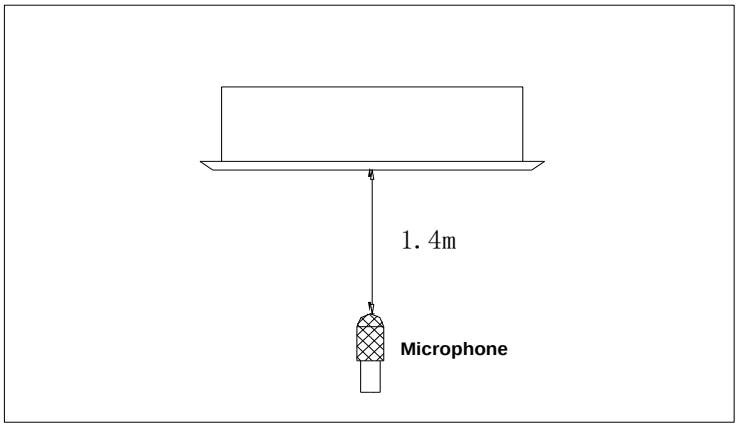


8. Electric Characteristics

Model	Indoor Unit			
	Hz	Voltage	Min.	Max.
MCA3U-09HRFN1-M(C)	60	208-230V	187V	253V
MCA3U-12HRFN1-M(C)	60	208-230V	187V	253V
MCA3U-18HRFN1-M(C)	60	208-230V	187V	253V
MCD1-24HRFN1-MT0W(GA)	60	208-230V	187V	253V
MCD1-36HRFN1-M(GA)	60	208-230V	187V	253V
MCD1-48HRFN1-M(GA)	60	208-230V	187V	253V

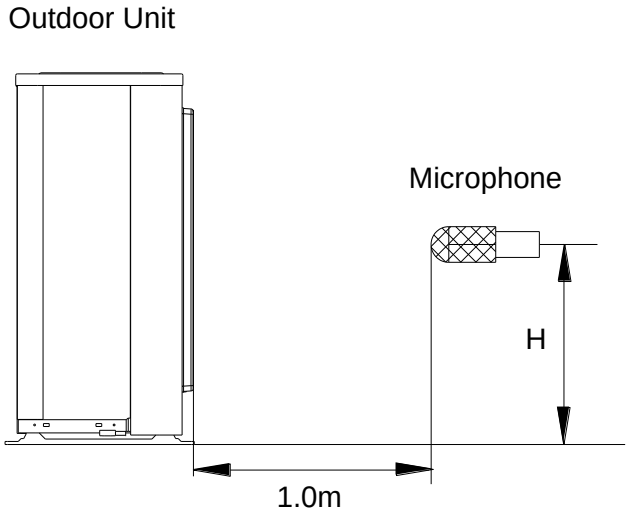
9. Sound Level

9.1 Indoor unit



Model	Noise level dB(A)		
	H	M	L
MCA3U-09HRFN1-M(C)	41	39	37
MCA3U-12HRFN1-M(C)	41	38	35
MCA3U-18HRFN1-M(C)	46	43	41
MCD1-24HRFN1-MT0W(GA)	49	46	43
MCD1-36HRFN1-M(GA)	52.5	50	46.5
MCD1-48HRFN1-M(GA)	55	53	50

9.2 Outdoor unit

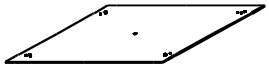
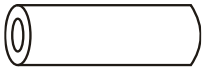
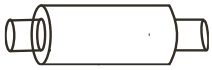
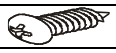
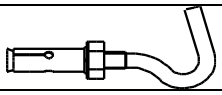
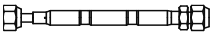


Note: H= 0.5 × height of outdoor unit

Model	Noise Level dB(A)
MOX230-09HFN1-MW5W	55
MOX230-12HFN1-MV5W	54
MOX330-09HFN1-MY5W	55
MOX330-12HFN1-MW5W	54
MOX430-17HFN1-MT0W	59
MOX430-18HFN1-MU0W	60.5
MOD30-24HFN1-MU0W	62.5
MOD33-24HFN1-MT0W	61
MOD30U-36HFN1-MP0(GA)	65
MOE30U-36HFN1-M(GA)	65
MOE30U-48HFN1-MP0(GA)	65
MOE30U-48HFN1-M-[X](GA)	66.5

10. Accessories

Cassette Units

	Name	Shape	Quantity
Installation Fittings	Installation paper board		1
Tubing & Fittings	Soundproof / insulation sheath		1
Drainpipe Fittings	Out-let pipe sheath		1
	Out-let pipe clasp		1
	Drain joint		1
	Seal ring		1
Remote controller & Its Frame(The product you have might not be provided the following accessories)	Remote controller & Its Frame		1
	Remote controller holder		1
	Mounting screw(ST2.9×10-C-H)		2
	Remote controller manual		1
	Alkaline dry batteries (AM4)		2
Others	Manual		2-3
Installation accessory (The product you have might not be provided the following accessories	Expansible hook		4
	Installation hook		4
	Orifice		1

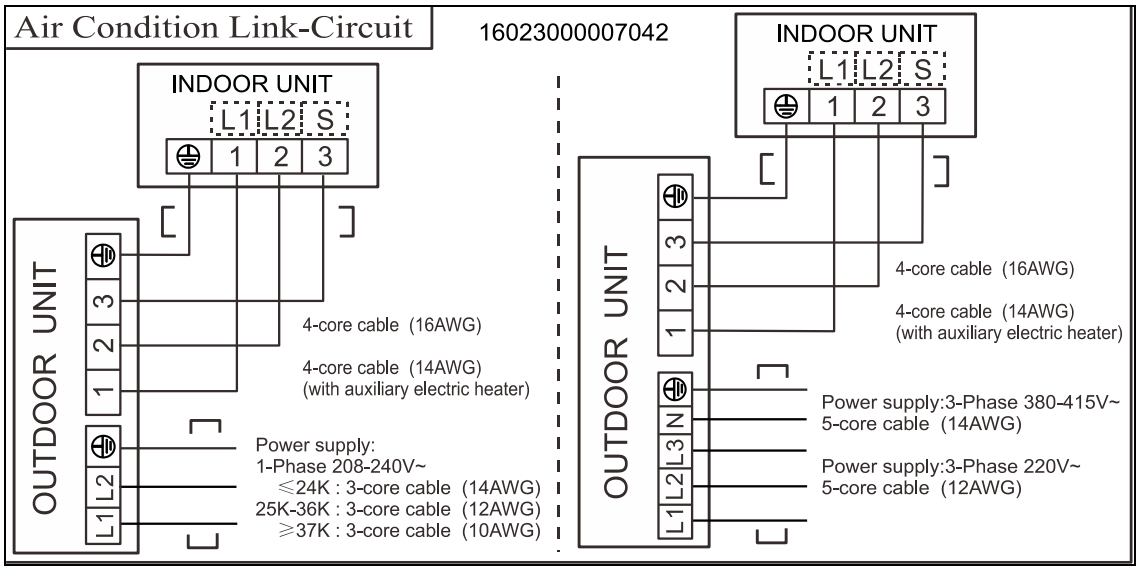
11. The Specification of Power

Type		9K-18K	24K
Power	Phase	1-phase	1-phase
	Frequency and Voltage	208-230V, 60Hz	208-230V, 60Hz
Circuit Breaker/ Fuse (A)		25/20	25/20
Indoor Unit Power Wiring		——	——
Indoor/Outdoor Connecting Wiring	Outdoor Unit Power Wiring	3-core cable (14AWG)	3-core cable (14AWG)
	Strong Electric Signal	4-core cable (16AWG)	4-core cable (16AWG)
		4-core cable (14AWG)(with auxiliary electric heater)	4-core cable (14AWG)(with auxiliary electric heater)
	Weak Electric Signal	——	——

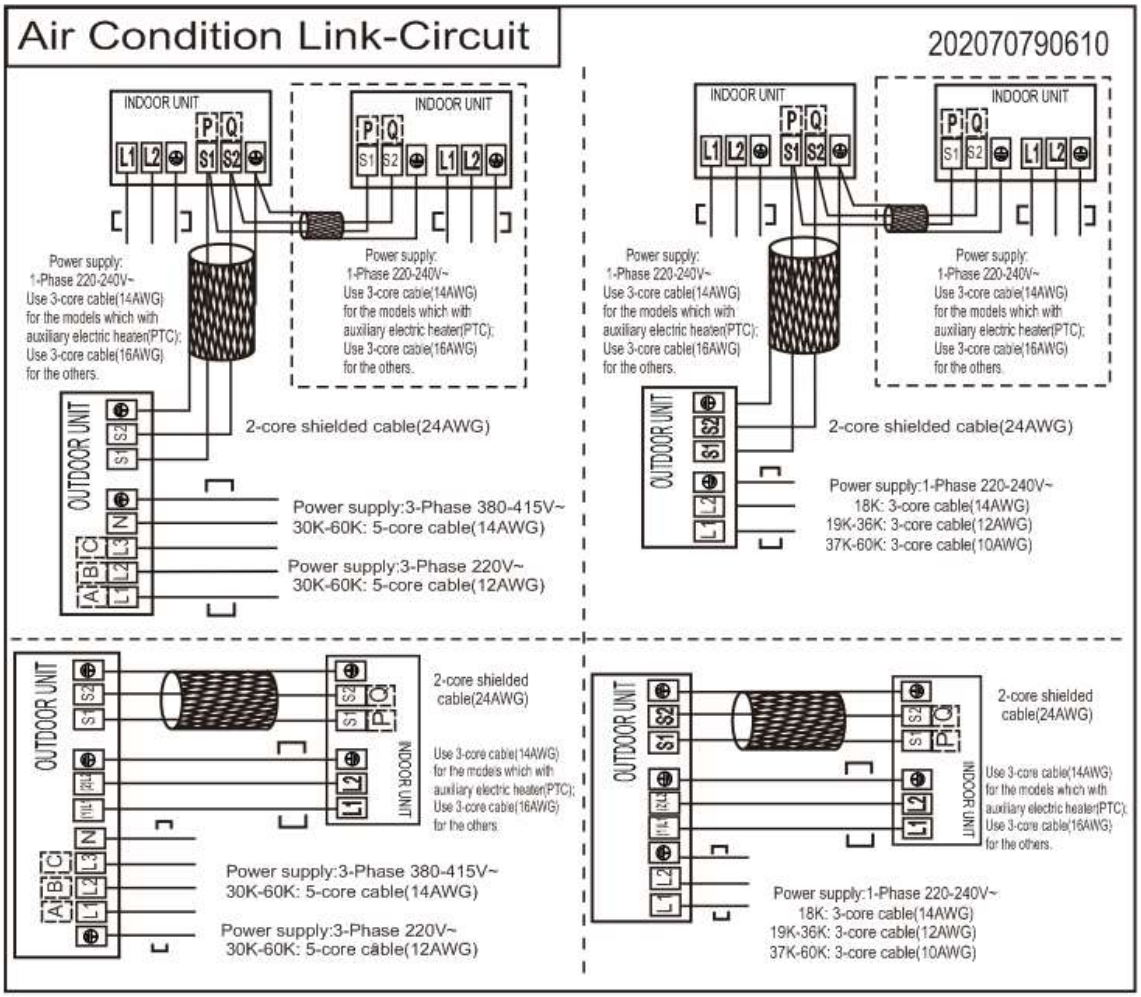
Model		36K	48K
Power	Phase	1-phase	1-phase
	Frequency and Voltage	208-230V, 60Hz	208-230V, 60Hz
Circuit Breaker/ Fuse (A)		40/30	50/40
Indoor Unit Power Wiring		——	——
Indoor/Outdoor Connecting Wiring	Outdoor Unit Power Wiring	3-core cable 12AWG	3-core cable 10AWG
	Strong Electric Signal	3-core cable 16AWG	3-core cable 16AWG
		4-core cable (14AWG)(with auxiliary electric heater)	4-core cable (14AWG)(with auxiliary electric heater)
	Weak Electric Signal	2-core shielded cable 24AWG	2-core shielded cable 24AWG

12. Field Wiring

9K~24K



36K, 48K



13. Operation Characteristics

Temperature / Mode	Cooling operation	Heating operation	Drying operation
Room temperature	17℃ ~ 32℃(62℉ ~ 90℉)	0℃ ~ 30℃ (32℉ ~ 86℉)	10℃ ~ 32℃ (50℉ ~ 90℉)
Outdoor temperature (Entry level)	0℃ ~ 50℃ (32℉ ~ 122℉) (-15℃ ~ 50℃(5℉ ~ 122℉) : For the models with low temperature cooling system)	-15℃ ~ 24℃ (5℉ ~ 75.2℉)	0℃ ~ 50℃ (32℉ ~ 122℉)
Outdoor temperature (E-Star level)	-25℃ ~ 50℃(-13℉ ~ 122℉)	-25℃ ~ 24℃ (-13℉ ~ 75.2℉)	
Outdoor temperature (Hyper heat)	-30℃ ~ 50℃(-22℉ ~ 122℉)	-30℃ ~ 24℃ (-22℉ ~ 75.2℉)	

CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.

2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. The optimum performance will be achieved during this operating temperature zone.

14. Electronic Function

14.1 Abbreviation

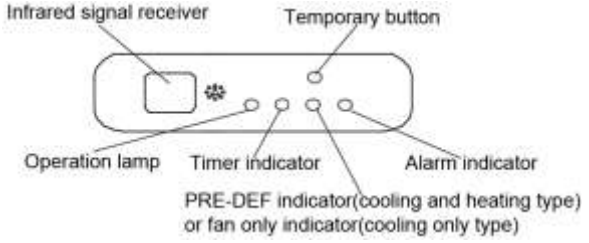
T1: Indoor room temperature
T2: Coil temperature of indoor heat exchanger
T3: Coil temperature of condenser
T4: Outdoor ambient temperature
T5: Compressor discharge temperature

Td: Target temperature

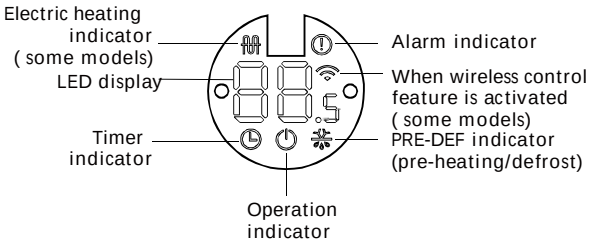
Tsc: Adjusted setting temperature

14.2 Display function

14.2.1 Icon explanation on indoor display board (Compact cassette).



14.2.2 Icon explanation on indoor display board (New Cassette).



14.3 Main Protection

14.3.1 Three minutes delay at restart for compressor

1 minute delay for the 1st time stand-up and 3 minutes delay for others.

14.3.2 Temperature protection of compressor top

The unit will stop working when the compressor top temp. protector cut off, and will restart after the compressor top temp. protector restart.

14.3.3 Temperature protection of compressor discharge

When the compressor discharge temp. is getting higher, the running frequency will be limited as below rules:

---Compressor discharge temp. T5>115 ℃ (239°F) for 5s, compressor stops and restarts up till T5<90℃(194°F)

---110<T5<115℃(239°F), decrease the frequency to the lower level every 2 minutes.

---105(221°F)<T5<110℃(230°F), keep running at the current frequency.

----T5<105℃(221°F), no limit for frequency.

14.3.4 Fan speed malfunction

When indoor fan speed keeps too low (lower than 300RPM) for 50s, the indoor fan will shut off and restart 30s later, if protection happened 3 times when fan motor restarts continuously, the unit will stop and the LED will display the failure.

When outdoor fan speed keeps too low (lower than 100RPM) or too high (higher than 1500RPM) for 60s, the unit will stop and the LED will display the failure. Malfunction is cleared 30s later.

14.3.5 Inverter module protection

The Inverter module has a protection function about current, voltage and temperature. If these protections happen, the corresponding code will display on indoor unit and the unit will stop working.

14.3.6 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will open 7s later.

If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold wind function.

14.3.7 Compressor preheating functions

Preheating permitting condition:

If T4＜3℃(37.4°F)/1℃(33.8°F)(for 36k~60k models) and the machine connects to power supply newly within 5 seconds or if T4＜3℃(37.4°F)/ 1℃(33.8°F) (for 36k~60k models) and compressor has stopped for over 3 hours, the compressor heating cable will work.

Preheating mode:

A weak current flow through the coil of compressor from the wiring terminal of the compressor, then the compressor is heated without operation.

Preheating release condition:

If T4≥5℃(41°F) or the compressor starts running, the preheating function will stop.

Only for MCD1-24HRFN1-MT0W(GA),

Preheating permitting condition:

After T1<=12℃(53.6°F) condition turns on the outdoor power relay, if T4<=1℃(33.8°F) then enter preheating.

Preheating mode:

A weak current flow through the coil of compressor from the wiring terminal of the compressor, then the compressor is heated without operation.

Preheating release condition:

If T4≥3℃(37.4°F) or T1>12℃(53.6°F) for 3 minutes or the compressor starts running, the preheating function will stop.

14.3.8 Condenser high temperature T3 protection

---55°C(131°F)<T3<60°C(140°F), the compressor frequency will decrease to the lower level until to F1 and then runs at F1.If T3<54°C(129.2°F), the compressor will keep running at the current frequency.

---T3<52°C(125.6°F), the compressor will not limit the frequency and resume to the former frequency.

---T3>60°C(140°F) for 5 seconds, the compressor will stop until T3<52°C(125.6°F).

14.3.9 Evaporator low temperature T2 protection

---T2<0°C(32°F), the compressor will stop and restart when T2≧5°C(41°F).

---0°C(32°F)≦T2<4°C(39.2°F), the compressor frequency will be limited and decreased to the lower level

---4°C(39.2°F)≤T2≤7°C(44.6°F), the compressor will keep the current frequency.

---T2>7°C(44.6°F), the compressor frequency will not be limited.

14.4 Operation Modes and Functions

14.4.1 Fan mode

(1) Outdoor fan and compressor stop.

(2) Temperature control is disabled and no temperature setting is displayed.

(3) Indoor fan can be set to 1%~100%, or low, medium, high and auto.

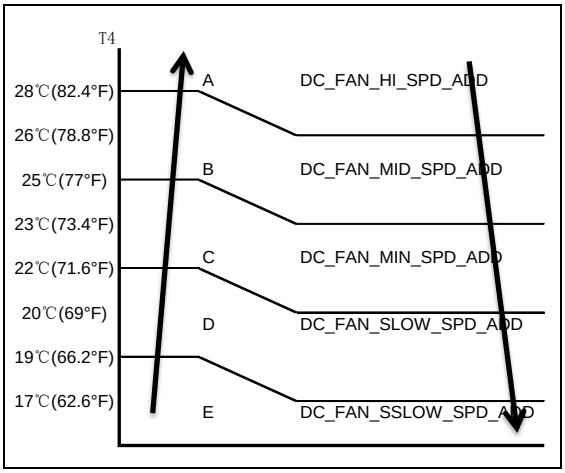
(4) The louver operates same as in cooling mode.

(5) Auto fan:

In fan-only mode, AC operates the same as auto fan in cooling mode with the temperature set at 24°C.

14.4.2 Cooling Mode

14.4.2.1 Outdoor fan running rules



14.4.2.2 Indoor fan running rules

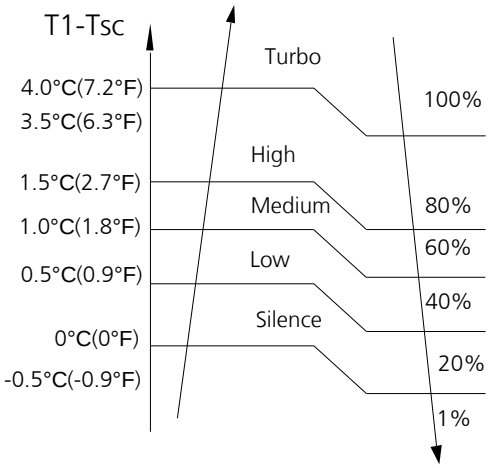
In cooling mode, indoor fan runs all the time and the speed can be selected as 1%~100%, or low, medium, high and auto.

The indoor fan is controlled as below:

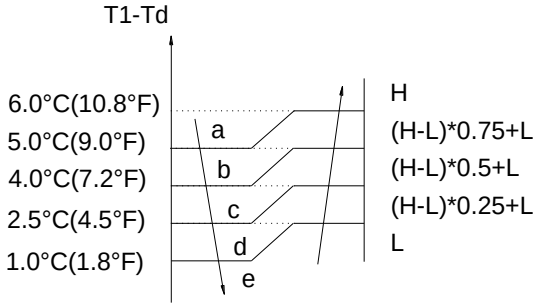
Setting fan speed	T1-Td ℃(°F)		Actual fan speed
H	4.5(8.1) 3.0(5.4) 1.5(2.7)	A B C	H+(H+=H+G) H (=H) H- (H-=H-G)
M	4.5(8.1) 3.0(5.4) 1.5(2.7)	D E F	M+(M+=M+Z) M(M=M) M-(M-=M-Z)
L	4.5(8.1) 3.0(5.4) 1.5(2.7)	G H I	L+(L+=L+D) L(L=L) L-(L-=L-D)

Auto fan in cooling mode acts as follow:

For new cassette units,

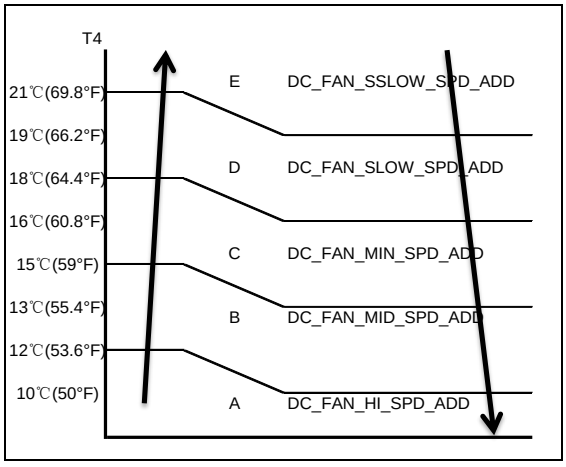


For compact cassette units,



14.4.3 Heating Mode

14.4.3.1 Outdoor fan running rules



14.4.3.2 Indoor fan running rules

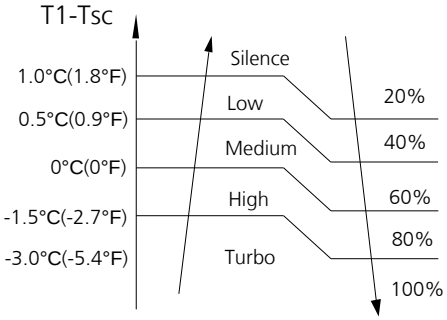
When the compressor is on, the indoor fan can be set to high/med/low/auto. And the anti-cold wind function has the priority.

The indoor fan is controlled as below:

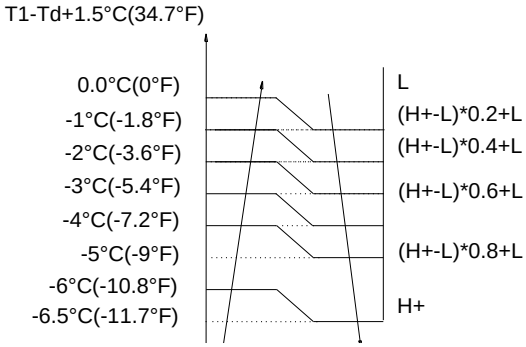
Setting fan speed	T1-Td+1.5 ℃(34.7°F)	Actual fan speed
H	-1.5(-2.7° F)	H-（H-=H-G)
	-3.0(-4.8° F)	H（=H）
	-4.5(-8.1° F)	H+(H+=H+G)
M	-1.5(-2.7° F)	M-(M-=M-Z)
	-3.0(-4.8° F)	M(M=M)
	-4.5(-8.1° F)	M+(M+=M+Z)
L	-1.5(-2.7° F)	L-(L-=L-D)
	-3.0(-4.8° F)	L(L=L)
	-4.5(-8.1° F)	L+(L+=L+D)

Auto fan action in heating mode:

For new cassette units,



For compact cassette units,



14.4.3.3 Defrosting mode

If any one of the following items is satisfied, AC will enter the defrosting mode.

After the compressor starts up and keeps running, mark the minimum value of T3 from the 10th minutes to 15th minutes as T30.

1)If the compressor cumulate running time is up to 29 minutes and T3< TCDI1, T3 + T30SUBT3ONE<T30, T4＞-22℃(-7.6°F).

2)If the compressor cumulate running time is up to 35 minutes and T3< TCDI2, T3 + T30SUBT3TWO<T30, T4＞-22℃(-7.6°F).

3)If the compressor cumulate running time is up to 29 minutes and T3< -24℃(-11.2°F), T4＞-22℃(-7.6°F) for 3 minutes.

4) If the compressor cumulate running time is up to 120 minutes and T3 < -15℃(5°F), T4＞-22℃(-7.6°F).

5) If the compressor cumulate running time is up to 30 minutes and T4-T3 > (0.5T4+ KDELTT_ADD), T3 < TCDIN5_ADD, T4＞-22℃(-7.6°F).

6) If the compressor cumulate running time is up to TIMING_DEFROST_TIME and T4 ≦ -22℃(-7.6°F).

7). If any one of the following conditions is satisfied, the unit enters defrosting mode.

• compressor running time is more than 90 minutes, Ts-T1<5°C(9°F) and T3 or T4 is lower than -3°C(26.6°F) for 30s.

• compressor running time is more than 120 minutes and T3 or T4 is lower than -3°C(26.6°F) for 30s.

Condition of ending defrosting:

If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

----T3 rises to be higher than TCDE1.

----T3 keeps to be higher than TCDE2 for 80 seconds.

----The machine has run for 15 minutes in defrosting mode.

If the sixth item is satisfied and any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

----T3 rises to be higher than 10℃(50°F).

---The machine has run for 10 minutes in defrosting mode.

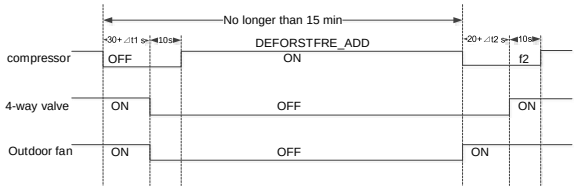
If the seventh item is satisfied and any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

----T3 rises to be higher than TCDE1+4℃(39.2°F).

----T3 keeps to be higher than TCDE2+4℃(39.2°F) for 80 seconds.

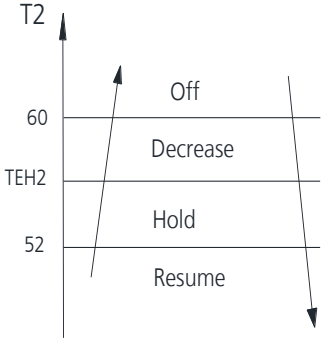
----The machine has run for 15 minutes in defrosting mode.

Defrosting action：

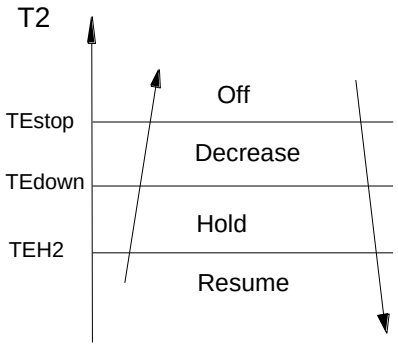


14.4.3.5 Evaporator coil temperature protection

For new cassette units,



For compact cassette units,



Off: Compressor stops.

Decrease: Decrease the running frequency to the lower level.

Hold: Keep the current frequency.

Resume: No limitation for frequency.

14.4.4 Auto-mode

For compact cassette units,

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃(63~86°F).

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).

ΔT=T1-Ts	Running mode
ΔT>2℃(3.6°F)	Cooling
-2℃(-3.6°F) ≤ΔT≤2℃	Fan-only

(3.6°F)	
ΔT<-2℃(-3.6°F)	Heating

Indoor fan will run at auto fan of the relevant mode.

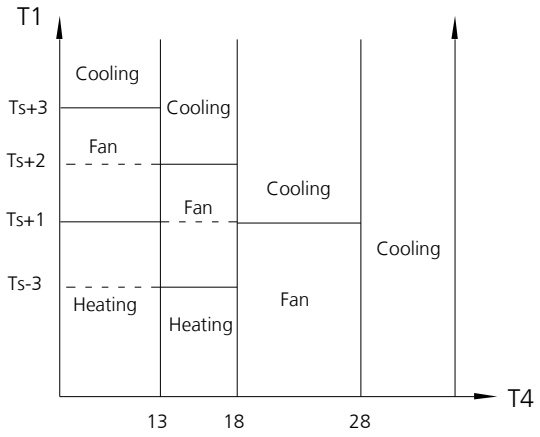
The louver operates same as in relevant mode.

If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

For new cassette units,

In auto mode, the machine selects cooling, heating or fan-only mode on the basis of T1,Ts and T4.



14.4.5 Drying mode

For compact cassette units,

Drying mode works the same as cooling mode in breeze speed.

All protections are active and the same as that in cooling mode.

For new cassette units,

In drying mode, AC operates the same as auto fan in cooling mode.

All protections are activated and operate the same as they do that in cooling mode.

Low Room Temperature Protection

If the room temperature is lower than 10°C, the compressor ceases operations and does not resume until room temperature exceeds 12°C.

14.4.6 Timer function

14.4.6.1 Timing range is 24 hours.

14.4.6.2 Timer on. The machine will turn on automatically when reaching the setting time.

14.4.6.3 Timer off. The machine will turn off automatically when reaching the setting time.

14.4.6.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

14.4.6.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

14.4.6.6 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

14.4.6.7 The setting time is relative time.

14.4.7 Sleep function mode

14.4.7.1 The sleep function is available in cooling, heating or auto mode.

14.4.7.2. Operation process in sleep mode is as follow:

When cooling, the setting temperature rises 1℃ (1.8°F) (be lower than 30℃(86°F)) every one hour, 2 hours later the setting temperature stops rising and the indoor fan is fixed at low speed.

When heating, the setting temperature decreases 1℃(1.8°F) (be higher than 17℃ (62.6°F)/ 16℃(60.8°F) (for new cassette units) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at low speed. (Anti-cold wind function has the priority).

14.4.7.3 Operation time in sleep mode is 7 hours. After 7 hours, the unit does not switch off.

14.4.7.4 Timer setting is available.

14.4.8 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including sleep function) automatically after 3 minutes when power returns.

14.4.9 Follow me

1) If the indoor PCB receives the signal which results from pressing the FOLLOW ME button on remote controller or wired remote controller, the buzzer will emit a sound and this indicates the follow me function is initiated. But when the indoor PCB receives signal which sent from remote controller every 3 minutes, the buzzer will not respond. When the unit is running with follow me function, the PCB will control the unit according to the temperature from follow me signal, and the temperature collection function of room temperature sensor will be shielded.
2) When the follow me function is available, the PCB will control the unit according to the room temperature from the remote controller and the setting temperature.
3) The PCB will take action to the mode change information from remote controller signal, but it will not affected by the setting temperature.
4) When the unit is running with follow me function, if the PCB doesn't receive any signal from remote controller for 7 minutes or pressing FOLLOW ME button again, the follow me function will be turned off automatically, and the temperature will control the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

14.4.10 8℃ Heating

In heating operation, the preset temperature of the air conditioner can be as lower as 8℃ (46.4°F), which keeps the room temperature steady at 8℃(46.4°F) and prevents household things freezing when the house is unoccupied for a long time in severe cold weather.

14.4.11 Drain pump control

Adopt the water-level switch to control the action of drain pump.

Main action under different condition :(every 5 seconds the system will check the water level one time)

1. When the A/C operates with cooling (including auto cooling), dehumidifying, and forced cooling mode, the pump will start running immediately and continuously, till stop cooling.
2. Once the water level increase and up to the control point, LED will alarm and the drain pump open and continue checking the water level. If the water level fall down and LED disalarmed (drain pump delay close 1 minute) and operate with the last mode. Otherwise the entire system stop operating (including the pump) and LED remain alarming after 3 minutes,

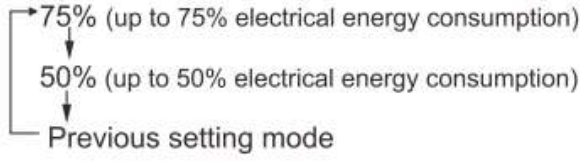
14.4.12 Silence

Press "Silence" or keep pressing Fan button for more than 2 seconds on the remote control to enable the SILENCE function. While this function is active, the compressor frequency is maintained at a lower level than F3. The indoor unit will run at faint breeze(1%), which reduces noise to the lowest possible level.

When match with multi outdoor unit, this function is disabled.

14.4.13 Electrical energy consumption control function (standard for new cassette units)

Press the "Gear" button on remote controller to enter the energy efficient mode in a sequence of following:



Turn off the unit or activate ECO, sleep, Super cool, 8°C Heating, Silence or self clean function will quit this function.

14.4.14 ECO Function(standard for new cassette units)

Used to enter the energy efficient mode.

Under cooling mode, press ECO button, the remote controller will adjust the temperature automatically to 24°C/75°F, fan speed of Auto

to save energy (but only if the set temperature is less than 24°C/75°F).
If the set temperature is more than 24°C/75°F and 30°C/86°F, press the ECO button, the fan speed will change to Auto, the set temperature will remain unchanged.
When pressing the ECO button, or modifying the mode or adjusting the set temperature to less than 24°C/75°F, the AC will quit the ECO operation.
Operation time in ECO mode is 8 hours. After 8 hours the AC quits this mode.

14.4.15 Breeze Away function(standard for new cassette units)

This feature avoids direct airflow blowing on the body and makes you feel indulging in silky coolness.

• NOTE: This feature is available under cooling mode, fan-only mode and drying mode.

14.4.16 Active Clean function(standard for new cassette units)

The Active Clean Technology washes away dust, mold, and grease that may cause odors when it adheres to the heat exchanger by automatically freezing and then rapidly thawing the frost. The internal wind wheel then keeps operating to blow-dry the evaporator, thus preventing the growth of mold and keeping the inside clean.
When this function is turned on, the indoor unit display window appears “CL”, after 20 to 45 minutes, the unit will turn off automatically and cancel Active Clean function.

14.4.17 Point check function

For compact cassette units,

Press the LED DISPLAY or LED or MUTE button of the remote controller three times, and then press the AIR DIRECTION or SWING button three times in ten seconds, the buzzer will keep ring for two seconds. The air conditioner will enter into the information enquiry status. You can press the LED DISPLAY or AIR DIRECTION button to check the next or front item’s information.

When the AC enter the “information enquiry” status, it will display the code name in 2 seconds, the details are as follows.

Enquiry information	Displaying code	Meaning
T1	T1	T1 temp.
T2	T2	T2 temp.
T3	T3	T3 temp.
T4	T4	T4 temp.
T2B	Tb	T2B temp.
T5	T5	T5 temp.
TH	TH	TH temp.
Targeted Frequency	FT	Targeted Frequency
Actual Frequency	Fr	Actual Frequency
Indoor fan speed	IF	Indoor fan speed
Outdoor fan speed	OF	Outdoor fan speed
EXV opening angle	LA	EXV opening angle
Compressor continuous running time	CT	Compressor continuous

		running time
Causes of compressor stop.	ST	Causes of compressor stop.
Reserve	A0	
Reserve	A1	
Reserve	b0	
Reserve	b1	
Reserve	b2	
Reserve	b3	
Reserve	b4	
Reserve	b5	
Reserve	b6	
Reserve	dL	
Reserve	Ac	
Reserve	Uo	
Reserve	Td	

When the AC enter into the information enquiry status, it will display the code value in the next 25s, the details are as follows.

Enquiry information	Display value	Meaning	Remark
T1,T2,T3,T4, T2B,T5,TH, Targeted Frequency, Actual Frequency	-1F,-1E,-1d,-1c,-1b,-1A	-25,-24,-23,-22,-21,-20	1. All the displaying temperature is actual value. 2. All the temperature is °C no matter what kind of remote controller is used. 3. T1,T2,T3,T4,T2B display range:-25~70, T5 display range:-20~130. 4. Frequency display range: 0~159HZ. 5. If the actual value exceeds the range, it will display the maximum value or minimum value.
	-19—99	-19—99	
	A0,A1,…A9	100,101,…109	
	b0,b1,…b9	110,111,…119	
	c0,c1,…c9	120,121,…129	
	d0,d1,…d9	130,131,…139	
	E0,E1,…E9	140,141,…149	
	F0,F1,…F9	150,151,…159	
Indoor fan speed /Outdoor fan speed	0	OFF	
	1,2,3,4	Low speed, Medium speed, High speed, Turbo	For some big capacity motors.
	14-FF	Actual fan speed=Display value turns to decimal value and then multiply 10. The unit is RPM.	For some small capacity motors, display value is from 14-FF(hexadecimal), the corresponding fan speed range is from 200-2550RPM.
EXV opening angle	0-FF	Actual EXV opening value=Display value turns to decimal value and then	

		multiply 2.	
Compressor continuous running time	0-FF	0-255 minutes	If the actual value exceeds the range, it will display the maximum value or minimum value.
Causes of compressor stop.	0-99	For the detailed meaning, please consult with engineer	Decimal display
Reserve	0-FF		

For new cassette units,

• To enter engineer mode, in power-on or standby mode, and in non-locked state, press the key combination “ON/OFF + Air Speed” for 7s:

• After entering the engineer mode, the remote control will display icons of “Auto, Cool, Dry, Heat”, and the Battery icon; at the same time, it will also display the numeric code of the current engineer mode (for the initial engineer mode, the numeric code displayed is 0), and all other icons are inactive.

• In engineer mode, the value of the current numeric code can be adjusted circularly through the Up/Down key, with the setting range of 0 to 30.

Code	Query Content	Additional Notes
0	Error code	Refer to next list of error code
1	Room temperature	T1 temperature
2	Indoor coil temperature	T2 temperature
3	Outdoor coil temperature	T3 temperature
4	Ambient temperature	T4 temperature
5	Discharge temperature	TP temperature
6	Compressor Target Frequency FT	Targeted Frequency
7	Compressor Running Frequency Fr	Actual Frequency
8	Current dL	N/A
9	Current AC Voltage Uo	N/A
10	Current indoor capacity test state Sn	N/A
11	Running mode od	
12	Set Speed Pr of the outdoor fan	Outdoor fan speed=value*8
13	Opening Lr of EEV	EXV opening angle-value*8
14	Actual Running Speed ir of the indoor fan	Indoor fan speed=value*8
15	Indoor Humidity Hu	N/A
16	Set Temperature TT after compensation	N/A
17		N/A
18		N/A
19	/	N/A
20	Indoor Target Frequency oT	N/A
21	Reserve	
22		
23		
24		
25		
26		
27		
28		
29		
30		

In Channel 1~30 settings of the engineer mode, long press the On/off key to return the previous engineer mode.

Exit of engineer mode:

1)In engineer mode, press the key combination of “On/Off + Air speed” for 2s;

2)The engineer mode will be exited if there are no valid key operations for continuous 60s.

Error code of engineer mode

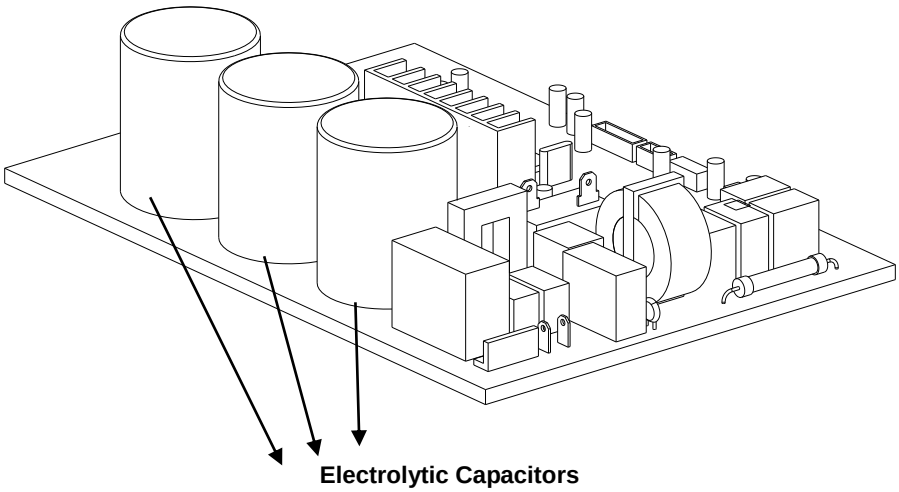
Display	Error Information
EH 00/ EH 0A	Indoor unit EEPROM parameter error
EL 01	Indoor / outdoor unit communication error
EH bA	Communication error between indoor unit and indoor external fan module
EH 30	Parameters error of indoor external fan
EH 35	Phase failure of indoor external fan
EH 36	Indoor external fan current sampling bias fault
EH 37	Indoor external fan zero speed failure
EH 38	Indoor external fan stall failure
EH 39	Out of step failure of indoor external fan
EH 3A	Low voltage protection of indoor external fan DC bus
EH 3b	Indoor external fan DC bus voltage is too high fault
EH 3E	Indoor external fan overcurrent fault
EH 3F	Indoor external fan module protection/hardware Current overload protection
EH 03	The indoor fan speed is operating outside of the normal range
EC 51	Outdoor unit EEPROM parameter error
EC 52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
EC 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
EC 54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC 55	IGBT temperature sensor TH is in open circuit or has short circuited
EC 0d	Outdoor unit malfunction
Eh 60	Indoor room temperature sensor T1 is in open circuit or has short circuited
Eh 61	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
EC 71	Outdoor external fan overcurrent fault
EC 75	Outdoor external fan module protection/hardware Current overload protection
EC 72	Outdoor external fan phase failure
EC 74	Outdoor external fan current sampling bias fault
EC 73	Zero speed failure of outdoor unit DC fan
EC 07	The outdoor fan speed is operating outside of the normal range(
EL 0C	Refrigerant leak detected
EH 0E	Water-level alarm malfunction
PC 00	IPM malfunction or IGBT over-strong current protection
PC 10	Over low voltage protection
PC 11	Over voltage protection
PC 12	DC voltage protection
pc 02	Top temperature protection of compressor or High temperature protection of IPM module
PC 40	Communication error between outdoor main chip and compressor driven chip
PC 41	Current Input detection protection
PC 42	Compressor start error
PC 43	Lack of phase (3 phase) protection
PC 44	No speed protection
PC 45	341PWM error

PC 46	Compressor speed malfunction
PC 49	Compressor over current protection
PC 06	Compressor discharge temperature protection
PC 08	Outdoor current protection
PH 09	Anti-cold air in heating mode
pc 0f	PFC module malfunction
pc 30	System overpressure protection
pc 31	System pressure is too low protection
PC 03	Pressure protection
pc 0l	Outdoor low ambient temperature protection
PH 90	Evaporator coil temperature over high protection
PH 91	Evaporator coil temperature over low Protection
PC 0A	Condenser high temperature protection
PH 0c	Indoor unit humidity sensor failure
LH 00	Frequency limit caused by T2
lh 30	Indoor external fan current limit
lh 31	Indoor external fan voltage limit
LC 01	Frequency limit caused by T3
LC 02	Frequency limit caused by TP
LC 05	Frequency limit caused by voltage
LC 03	Frequency limit caused by current
LC 06	Frequency limit caused by PFC
LC 30	Frequency limit caused by high pressure
LC 31	Frequency limit caused by low pressure
LH 07	Frequency limit caused by remote controller
--	Indoor units mode conflict(match with multi outdoor unit)

15. Troubleshooting

Safety

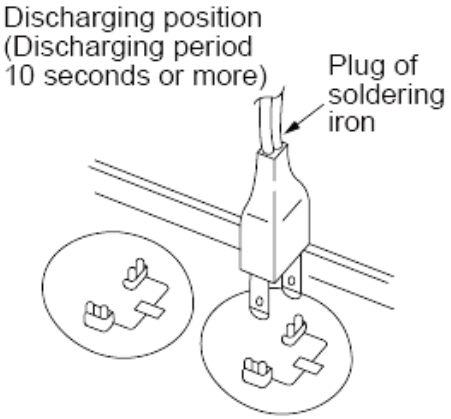
Electricity is stored in capacitors, even when the power supply is shut off. Do not forget to discharge the electricity in the capacitors.



Electrolytic Capacitors

(HIGH VOLTAGE! CAUTION!)

For other models, For other models, connect a discharge resistor (approx.100Ω 40W) or a soldering iron plug between the + and - terminals of the electrolytic capacitor on the opposite side of the outdoor printed circuit board (PCB).



Note: The picture above is for reference purposes only. The design of the devices depicted may vary by model.

15.1 Indoor Unit Error Display

For compact cassette units,

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E0	Indoor unit EEPROM parameter error
☆ 2 times	X	E1	Communication malfunction between indoor and outdoor units
☆ 4 times	X	E3	Indoor fan speed malfunction
☆ 5 times	X	E4	Indoor room temperature sensor (T1) malfunction
☆ 6 times	X	E5	Evaporator coil temperature sensor (T2) malfunction
☆ 7 times	X	EC	Refrigerant leakage detection
☆ 8 times	X	EE	Water-level alarm malfunction
☆ 1 time	O	F0	Current overload protection
☆ 2 times	O	F1	Outdoor ambient temperature sensor (T4) malfunction
☆ 3 times	O	F2	Condenser coil temperature sensor (T3) malfunction
☆ 4 times	O	F3	Compressor discharge temperature sensor (T5) malfunction
☆ 5 times	O	F4	Outdoor unit EEPROM parameter error
☆ 6 times	O	F5	Outdoor fan speed malfunction
☆ 1 times	☆	P0	Inverter module (IPM) malfunction
☆ 2 times	☆	P1	Over-voltage or under-voltage protection
☆ 3 times	☆	P2	Compressor top high temperature protection (OLP)/ High temperature protection of IPM board
☆ 4 times	☆	P3	Low ambient temperature cut off in heating
☆ 5 times	☆	P4	Compressor drive malfunction
☆ 6 times	☆	P5	Indoor units mode conflict
☆ 7 times	☆	P6	High pressure protection or low pressure protection (for some models)
☆ 8 times	☆	P7	Outdoor IPM temperature sensor error

O（light） X（off） ☆（flash）

For new cassette units,

Operation Lamp	Timer Lamp	Display	Error Information
1 time	OFF	EH 00/EH 0A	Indoor unit EEPROM parameter error
2 times	OFF	EL 01	Indoor / outdoor unit communication error
4 times	OFF	EH 03	The indoor fan speed is operating outside of the normal range(for some models)
6 times	OFF	EH 60	Indoor room temperature sensor T1 is in open circuit or has short circuited
6 times	OFF	EH 61	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
8 times	OFF	EL 0C	Refrigerant Leakage Detection(for some models)
13 times	OFF	EH 0E	Water-level alarm malfunction
5 times	OFF	EC 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
5 times	OFF	EC 52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
5 times	OFF	EC 54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
5 times	OFF	EC 56	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units)
5 times	ON	EC 51	Outdoor unit EEPROM parameter error
12 times	OFF	EC 07	The outdoor fan speed is operating outside of the normal range(for some models)
7 times	FLASH	PC 00	IPM malfunction or IGBT over-strong current protection
2 times	FLASH	PC 01	Over voltage or over low voltage protection
3 times	FLASH	PC 02	Top temperature protection of compressor or High temperature protection of IPM module
5 times	FLASH	PC 04	Inverter compressor drive error
7 times	FLASH	PC 03	High pressure protection or low pressure protection (for some models)
14 times	OFF	EC 0d	Outdoor unit malfunction
--	--	EH b A	Communication malfunction between external fan module and indoor unit
4 times	OFF	EH 3A	External fan DC bus voltage is too low protection
4 times	OFF	EH 3b	External fan DC bus voltage is too high fault
1 time	ON	--	Indoor units mode conflict(match with multi outdoor unit)

15.2 Error Display on Two Way Communication Wired Controller

Display	LED STATUS
F0	Communication error between wired controller and indoor unit
EH b3	Communication error between wired controller and indoor unit(for KJR-120X series wired controller)
F1	The cassette panel is abnormal
E1	Communication malfunction between indoor and outdoor units
E2	Indoor room temperature sensor (T1) is in open circuit or has short circuited
E3	Evaporator coil temperature sensor (T2) is in open circuit or has short circuited
E4	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match units)
E5	Outdoor ambient temperature sensor (T4) or condenser coil temperature sensor (T3) or compressor discharge temperature sensor (T5) is in open circuit or has short circuited
E7	Indoor unit EEPROM parameter error
E8	Indoor fan speed is operating outside of the normal range
EA	Current overload protection
Eb	Inverter module (IPM) malfunction
Ed	Outdoor unit malfunction
EE	Water-level alarm malfunction
EF	Other malfunction

For new cassette type, error display on two way communication wired controller is the same as that of indoor display.

15.3 Outdoor unit error display

For MOE30U-36HFN1-M(GA), MOE30U-48HFN1-MP0(GA), MOE30U-48HFN1-M-[X](GA):

Display	LED STATUS
EC 51	Outdoor EEPROM malfunction
EL 01	Indoor / outdoor units communication error
PC 40	Communication malfunction between IPM board and outdoor main board
PC 08	Outdoor overcurrent protection
PC 10	Outdoor unit low AC voltage protection
PC 11	Outdoor unit main control board DC bus high voltage protection
PC 12	Outdoor unit main control board DC bus high voltage protection /341 MCE error
PC 00	IPM module protection
PC 0F	PFC module protection
EC 71	Over current failure of outdoor DC fan motor
EC 72	Lack phase failure of outdoor DC fan motor
EC 07	Outdoor fan speed has been out of control
PC 43	Outdoor compressor lack phase protection
PC 44	Outdoor unit zero speed protection
PC 45	Outdoor unit IR chip drive failure
PC 46	Compressor speed has been out of control
PC 49	Compressor overcurrent failure
PC 30	High pressure protection
PC 31	Low pressure protection
PC 0A	High temperature protection of condenser
PC 06	Temperature protection of compressor discharge
PC 0L	Low ambient temperature protection
PC 02	Top temperature protection of compressor
EC 52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
EC 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
EC 54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC 55	Outdoor IPM module temperature sensor malfunction

Outdoor check function

• A check switch is included on the outdoor PCB.

• Push SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 is pushed.

N	Display	Remark
00	Normal display	Display running frequency, running state or malfunction code
01	Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0)
02	Amendatory capacity demand code	
03	The frequency after the capacity requirement transfer	
04	The frequency after the frequency limit	
05	The frequency of sending to 341 chip	
06	Indoor unit evaporator temperature	If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70".
07	Condenser pipe temp.(T3)	If the temp. is lower than -9 degree, the digital display tube will show "-9".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——"
08	Outdoor ambient temp.(T4)	
09	Compressor discharge temp.(T5)	The display value is between 13~129 degree. If the temp. is lower than 13 degree, the digital display tube will show "13".If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "0.5",it means the compressor discharge temp. is 105 degree. the digital display tube show "1.6",it means the compressor discharge temp. is 116 degree)
10	AD value of current	The display value is hex number.
11	AD value of voltage	
12	Indoor unit running mode code	Standby:0, Fan only: 1,Cooling:2, Heating:3, Forced cooling:4, Drying:6, Self clean:8, Forced defrosting:10
13	Outdoor unit running mode code	Standby:0, Fan only: 1,Cooling:2, Heating:3, Forced cooling:4, Drying:6, Self clean:8, Forced defrosting:10
14	EXV open angle	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example, the digital display tube show "2.0",it means the EXV open angle is 120×4=480p.)

<table>
<tr><td rowspan="8">15</td><td rowspan="8">Frequency limit symbol</td><td>Bit7</td><td>Frequency limit caused by IGBT radiator</td><td rowspan="8">The display value is hex number. For example, the digital display tube show 2A, then Bit5=1, Bit3=1, Bit1=1.
It means frequency limit caused by T4, T3 and current.</td></tr>
<tr><td>Bit6</td><td>Frequency limit caused by PFC</td></tr>
<tr><td>Bit5</td><td>Frequency limit caused by high temperature of T2.</td></tr>
<tr><td>Bit4</td><td>Frequency limit caused by low temperature of T2.</td></tr>
<tr><td>Bit3</td><td>Frequency limit caused by T3.</td></tr>
<tr><td>Bit2</td><td>Frequency limit caused by T5.</td></tr>
<tr><td>Bit1</td><td>Frequency limit caused by current</td></tr>
<tr><td>Bit0</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>16</td><td>DC fan motor speed</td><td colspan="3">0:off 1:High 2:Medium 3:Low 4: Breeze 21:Turbo 30~34: Low temperature cooling 5~1 gear, corresponding gear value conversion hexadecimal display</td></tr>
<tr><td>17</td><td>IGBT radiator temp.</td><td colspan="3">The display value is between 0~130 degree. If the temp. is lower than 30 degree, the digital display tube will show “30”.If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “0.5”,it means the IGBT radiator temp. is 105 degree. the digital display tube show “1.6”,it means the IGBT radiator temp. is 116 degree)</td></tr>
<tr><td>18</td><td>Indoor unit number</td><td colspan="3">The indoor unit can communicate with outdoor unit well.
General:1, Twins:2</td></tr>
<tr><td>19</td><td>Evaporator pipe temp. T2 of 1# indoor unit</td><td colspan="3" rowspan="3">If the temp. is lower than 0 degree, the digital display tube will show “0”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”</td></tr>
<tr><td>20</td><td>Evaporator pipe temp. T2 of 2# indoor unit</td></tr>
<tr><td>21</td><td>Evaporator pipe temp. T2 of 3# indoor unit</td></tr>
<tr><td>22</td><td>1# Indoor unit capacity demand code</td><td colspan="3" rowspan="3">Actual data*HP*10
If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “5.0”,it means the capacity demand is 15. the digital display tube show “60”,it means the capacity demand is 6.0). If the indoor unit is not connected, the digital display tube will show: “——”</td></tr>
<tr><td>23</td><td>2# Indoor unit capacity demand code</td></tr>
<tr><td>24</td><td>3# Indoor unit capacity demand code</td></tr>
<tr><td>25</td><td>Room temp. T1 of 1# indoor unit</td><td colspan="3" rowspan="3">If the temp. is lower than 0 degree, the digital display tube will show “0”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”</td></tr>
<tr><td>26</td><td>Room temp. T1 of 2# indoor unit</td></tr>
<tr><td>27</td><td>Average room temp. T1</td></tr>
<tr><td>28</td><td>Reason of stop</td><td colspan="3"></td></tr>
<tr><td>29</td><td>Evaporator pipe temp. T2B of 1# indoor unit</td><td colspan="3">If the temp. is lower than 0 degree, the digital display tube</td></tr>
</table>

30	Evaporator pipe temp. T2B of 2# indoor unit	will show “0”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”
31	EVI valve open angle(only for MOE30U-36HFN1-M(GA) MOE30U-48HFN1-M-[X](GA))	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example, the digital display tube show “2.0”,it means the EXV open angle is 120×4=480p.)

15.4 Diagnosis and Solution

15.4.1 EEPROM parameter error diagnosis and solution

Error Code	E0/ EH 00/EH 0A/F4/ EC 51
Malfunction conditions	Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.
Potential causes	● Installation mistake ● Faulty PCB

Trouble shooting:

Power off, then restart the unit 2 minutes later. Does a problem still remain?

Yes

Replace the indoor/outdoor main PCB.

EEPROM: a type of read-only memory. The contents can be erased and reprogrammed using a pulsed voltage. To locate the EEPROM chip,

Indoor PCB

Outdoor PCB

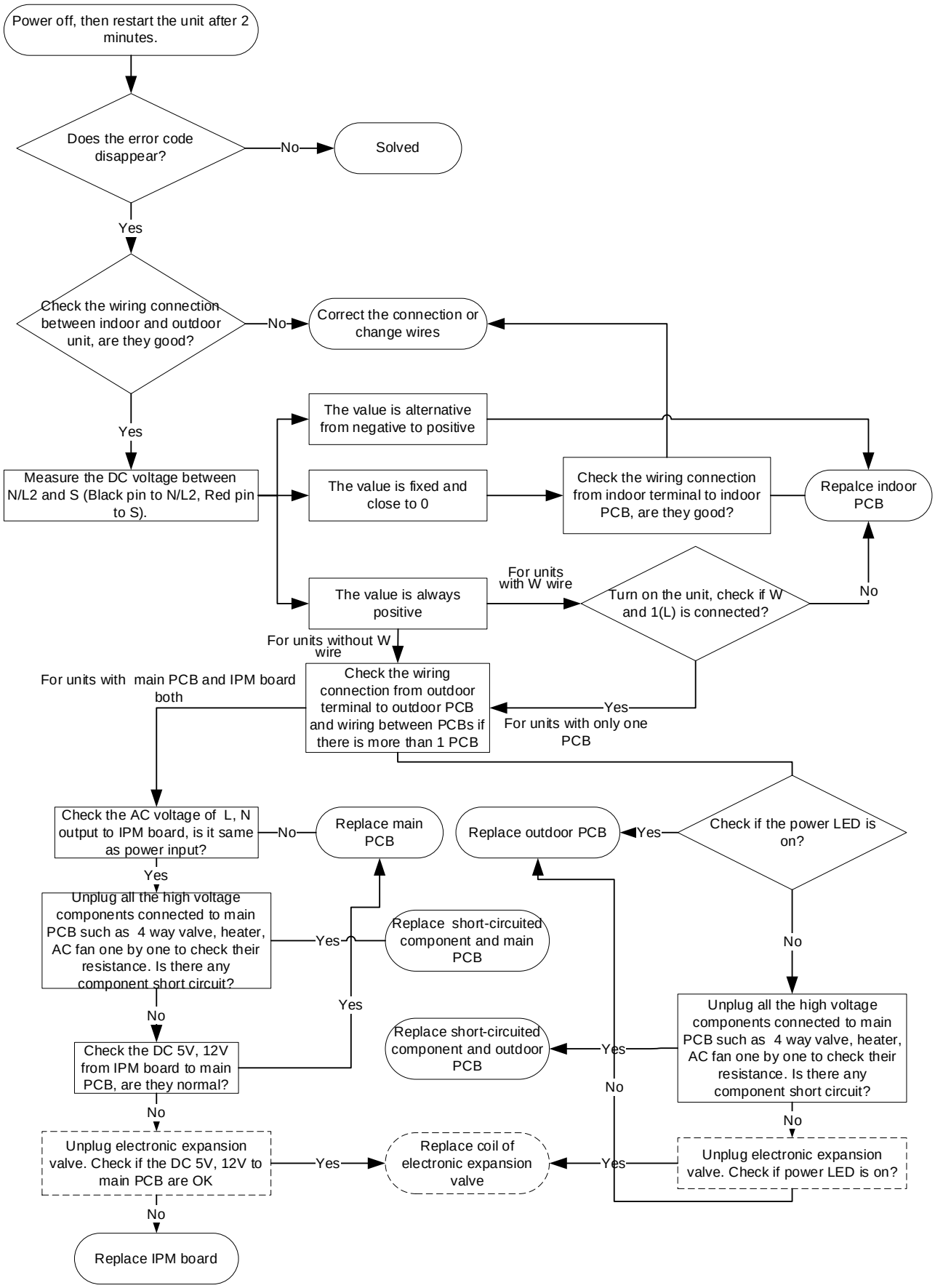
Note: The two photos above are only for reference purposes only. The design of the devices depicted may vary by model.

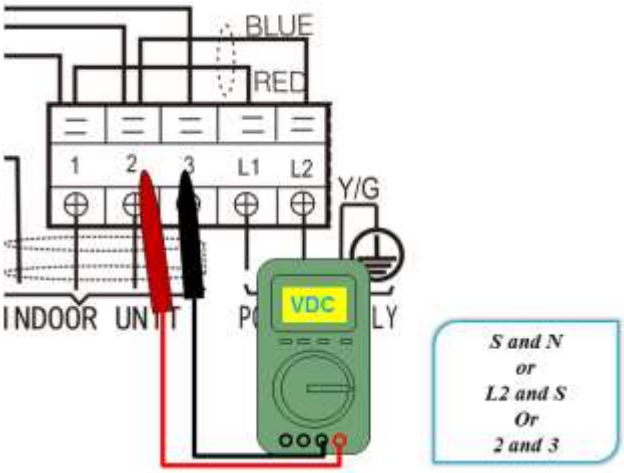
15.4.2 Communication malfunction between indoor and outdoor units diagnosis and solution (E1)

For 9K-24K:

Error Code	E1/ EL 01
Malfunction conditions	If the indoor unit does not receive feedback from outdoor unit for 110 seconds 4 consecutive times.
Potential causes	● Wiring mistake ● Faulty indoor or outdoor PCB

Trouble shooting:


Power off, then restart the unit after 2 minutes.
Does the error code disappear?
No
Solved
Yes
Check the wiring connection between indoor and outdoor unit, are they good?
No
Correct the connection or change wires
Yes
Measure the DC voltage between N/L2 and S (Black pin to N/L2, Red pin to S).
The value is alternative from negative to positive
The value is fixed and close to 0
The value is always positive
Check the wiring connection from indoor terminal to indoor PCB, are they good?
Repalce indoor PCB
For units with W wire
Turn on the unit, check if W and 1(L) is connected?
No
Yes
For units without W wire
For units with main PCB and IPM board both
Check the wiring connection from outdoor terminal to outdoor PCB and wiring between PCBs if there is more than 1 PCB
For units with only one PCB
Check the AC voltage of L, N output to IPM board, is it same as power input?
No
Replace main PCB
Yes
Unplug all the high voltage components connected to main PCB such as 4 way valve, heater, AC fan one by one to check their resistance. Is there any component short circuit?
Yes
Replace short-circuited component and main PCB
Yes
No
Check the DC 5V, 12V from IPM board to main PCB, are they normal?
No
Unplug electronic expansion valve. Check if the DC 5V, 12V to main PCB are OK
Yes
Replace coil of electronic expansion valve
No
Replace IPM board
Replace outdoor PCB
Yes
Check if the power LED is on?
No
Unplug all the high voltage components connected to main PCB such as 4 way valve, heater, AC fan one by one to check their resistance. Is there any component short circuit?
Yes
Replace short-circuited component and outdoor PCB
No
Unplug electronic expansion valve. Check if power LED is on?
Yes

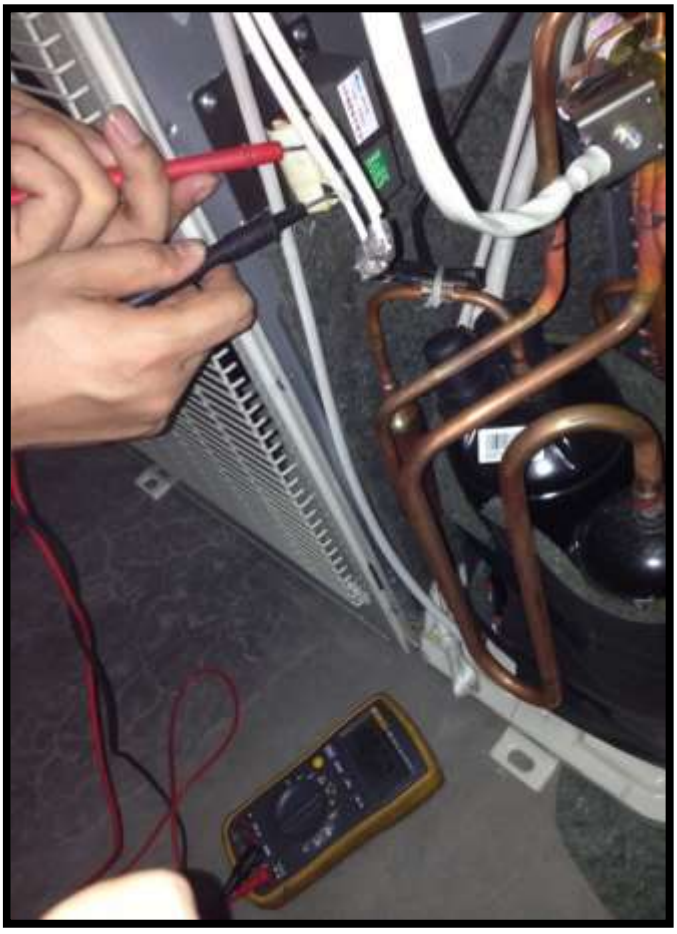


Remark:
Use a multimeter to test the DC voltage between 2 port and 3 port of outdoor unit. The red pin of multimeter connects with 2 port while the black pin is for 3 port.

When AC is normal running, the voltage will move alternately between -50V to 50V.

If the outdoor unit has malfunction, the voltage will move alternately with positive value.

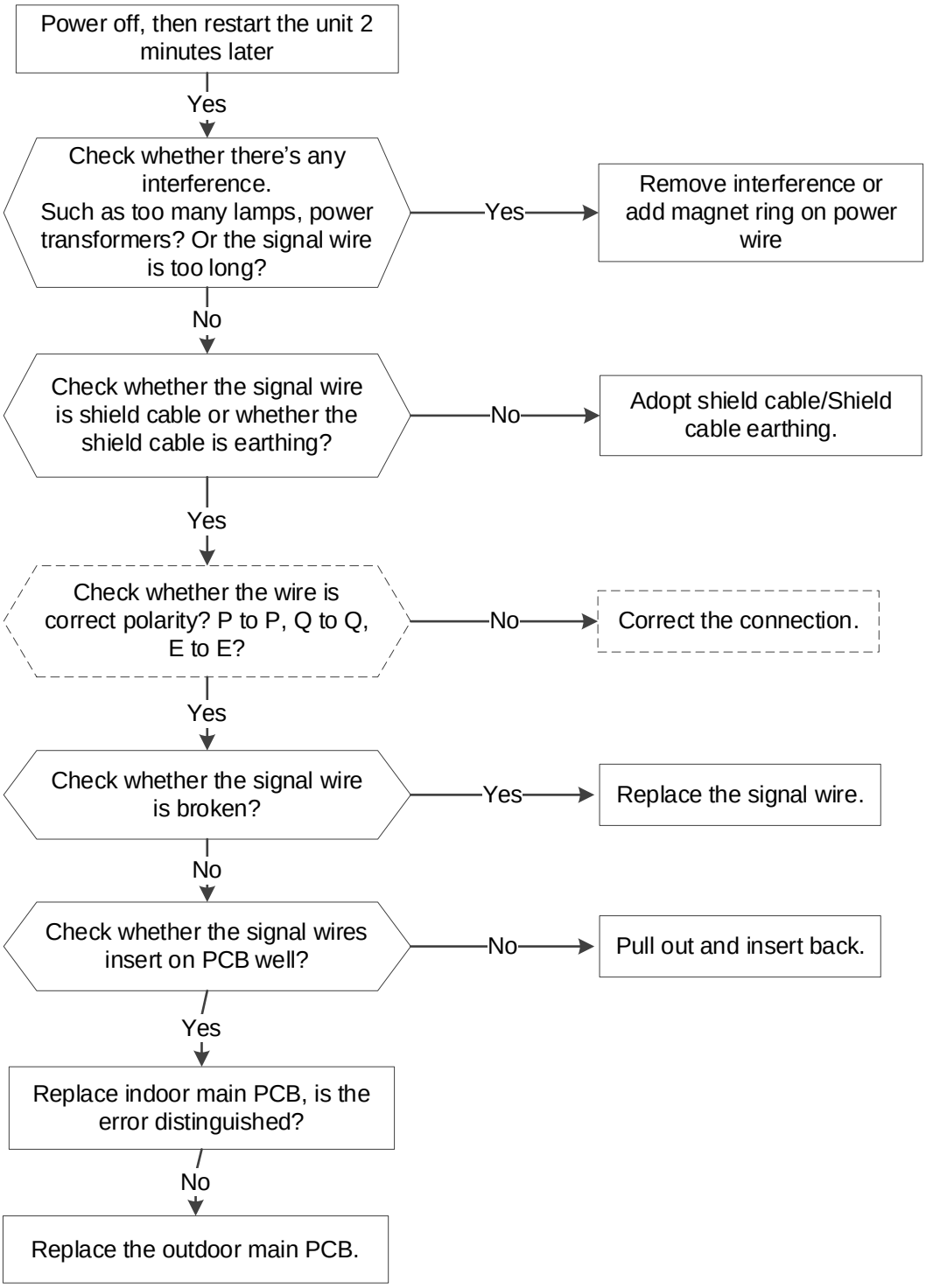
While if the indoor unit has malfunction, the voltage will be a certain value.
Remark,
The old label is L1,L2,S, L1,L2
The new label is 1, 2, 3, L1,L2



Remark:
Use a multimeter to test the resistance of the reactor which does not connect with capacitor.
The normal value should be around zero ohm. Otherwise, the reactor must have malfunction and need to be replaced.

For 36K-60K:

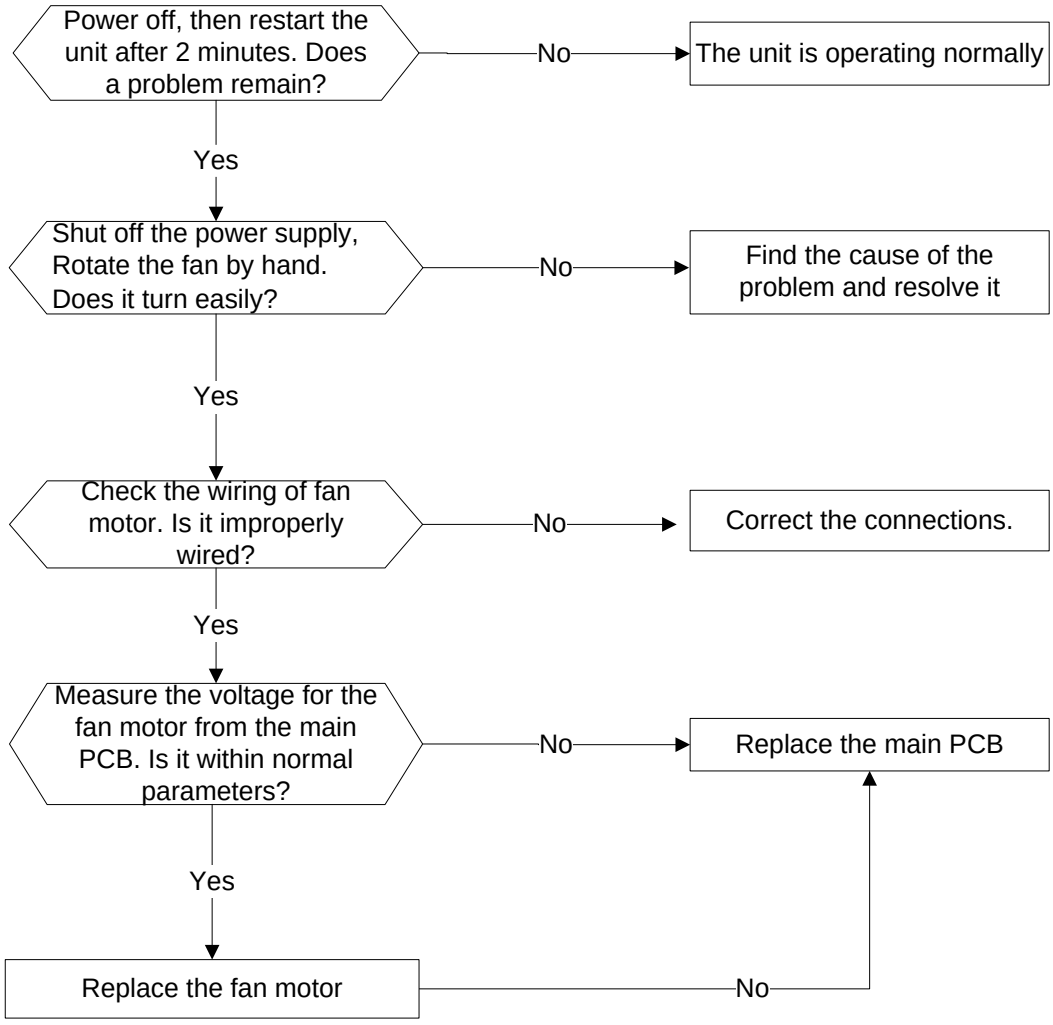
Malfunction conditions	Indoor unit does not receive feedback from outdoor unit for 60 seconds OR outdoor unit does not receive feedback from indoor unit for 120 seconds.
Possible causes	● Wiring mistakes ● Faulty indoor or outdoor PCB



15.4.3 Fan speed malfunction diagnosis and solution

Error Code	E3/EH 03
Malfunction conditions	When indoor fan speed is too low (300RPM) for a certain period of time, the unit ceases operation and the LED displays a failure code.
Potential Causes	● Wiring mistake ● Faulty fan assembly ● Faulty fan motor ● Faulty PCB

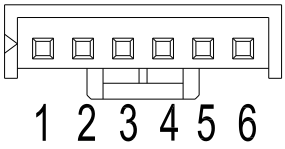
Trouble shooting:



Index 1:

1. Indoor or outdoor DC fan motor (Control Chip is in Fan Motor)

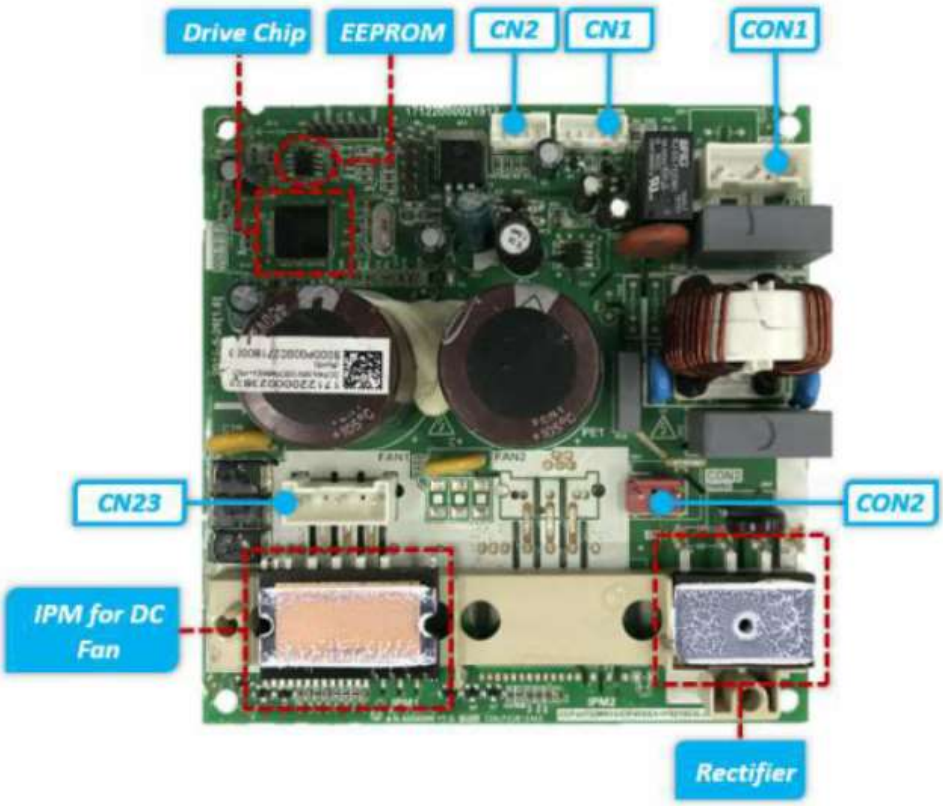
Turn power on and while the unit is on standby, measure the voltage between pin1 and pin3 as well as between pin4 and pin3 in fan motor connector. If the value of the voltage is not within the range shown in the following table, the PCB may be experiencing problems and need to be replaced.



DC motor voltage input and output

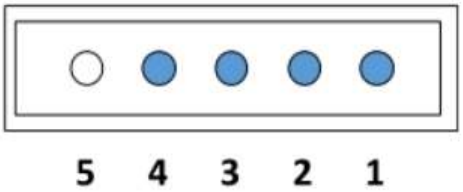
NO.	Color	Signal	Voltage
1	Red	Vs/Vm	200~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5~16.5V

2. Indoor DC Fan IPM Board (Duct and Ceiling-floor Unit)



Port	Description	Parameter	Remark
CON1	Power input for the PCB	230V/AC	
CN1	Communication with main PCB	DC	
CN2	Test port	5V/DC	For debugging board
CN23	UVW output for DC fan motor		
CON2	Ports for reactor		

CN1 Communication with main PCB

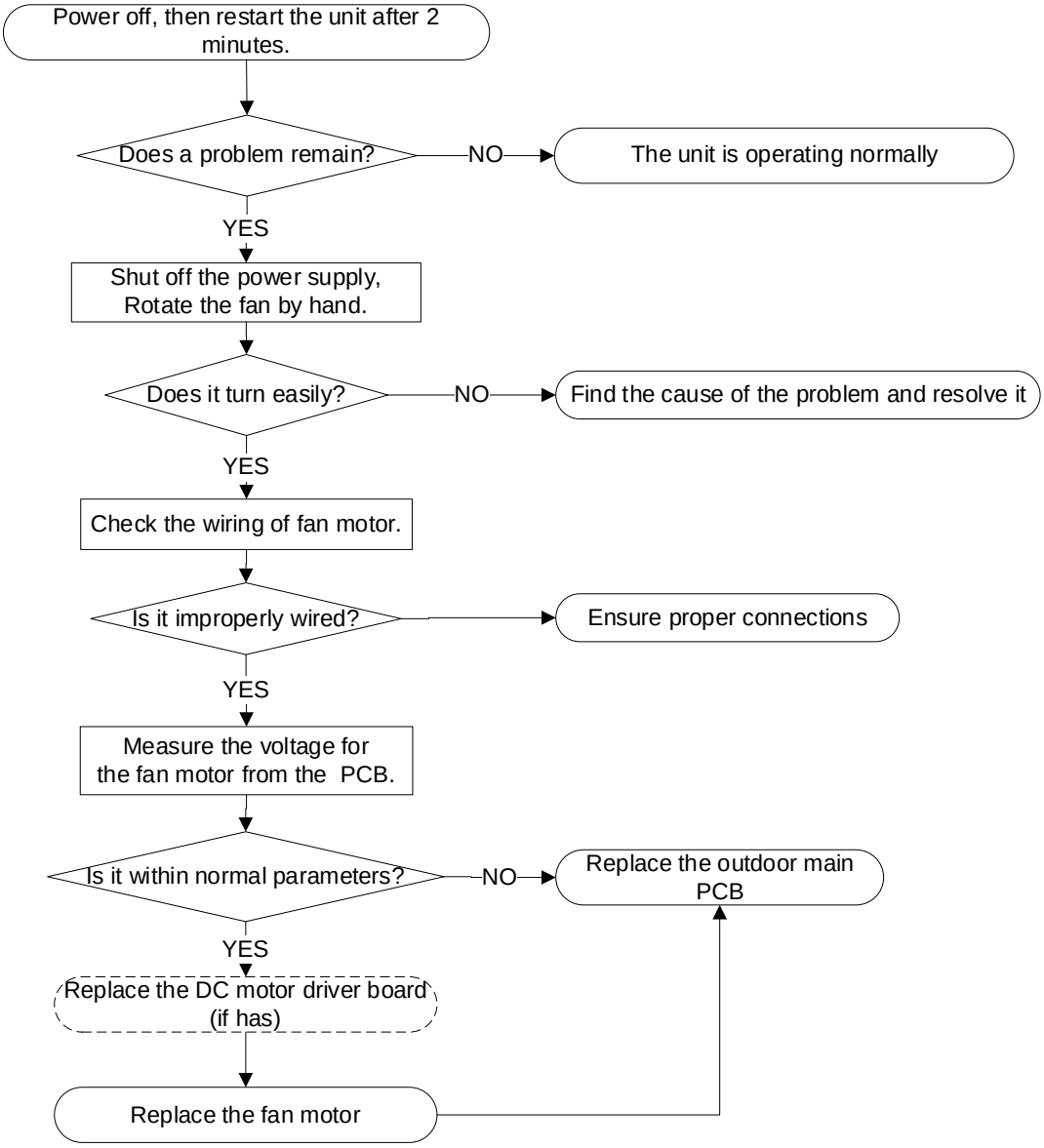


NO.	Signal	Voltage
1	Vcc	+15V
2	GND	
3	TXD	0~6V
4	RXD	0~15V
5	--	--

15.4.4 Fan speed malfunction diagnosis and solution

Error Code	F5/EC 07/EC 71
Malfunction conditions	When outdoor fan speed is too low or too high for a certain period of time, the unit ceases operation and the LED displays a failure code.
Potential Causes	● Wiring mistake ● Faulty fan assembly ● Faulty fan motor ● Faulty PCB

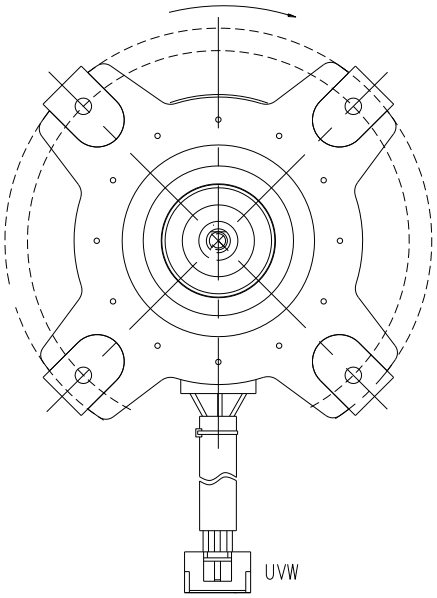
Trouble shooting:



Index 1:

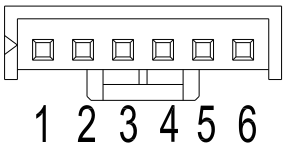
1. DC Fan Motor (control chip is in PCB)

Release the UVW connector. Measure the resistance of U-V, U-W, and V-W. If the resistances are not equal to each other, the fan motor may be experiencing problems and need to be replaced. Otherwise, the PCB must has problems and need to be replaced.



2. DC fan motor (Control Chip is in Fan Motor)

Turn power on and while the unit is on standby, measure the voltage between pin1 and pin3 as well as between pin4 and pin3 in fan motor connector. If the value of the voltage is not within the range shown in the following table, the PCB may be experiencing problems and need to be replaced.



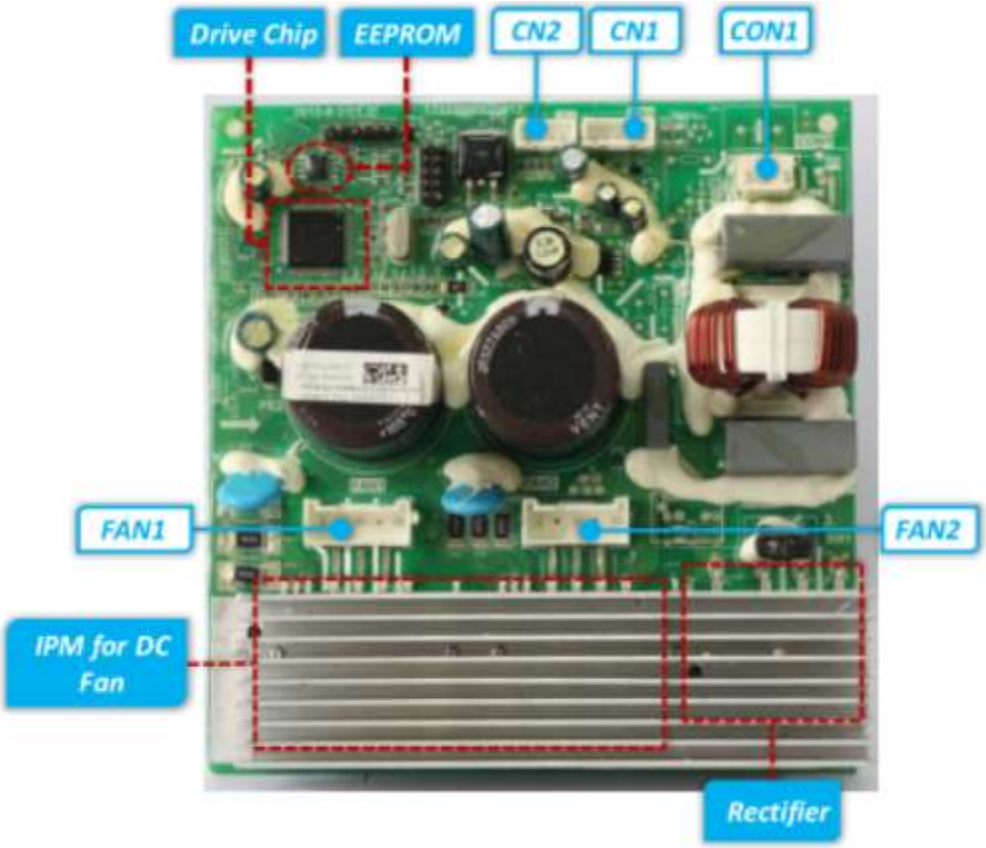
DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	192~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5~16.5V

3. DC Fan Motor(for some double fan models)

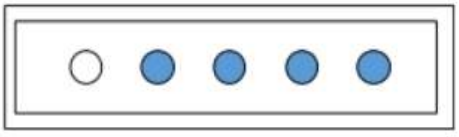
Power on and when the unit is in standby, measure the voltage of CON1, pin1-pin2 and pin3-pin2 of CN1 in DC motor driver board. If the value of the voltage is not in the range

showing in below tables, the outdoor main PCB must has problems and need to be replaced.



Port	Description	Parameter	Remark
CON1	Power input for the PCB	192-380V/DC	
CN1	Communication with main PCB	DC	
CN2	Test port	5V/DC	For debugging board
FAN1	UVW output for DC fan motor		
FAN2	UVW output for DC fan motor		

CN1 Communication with main PCB

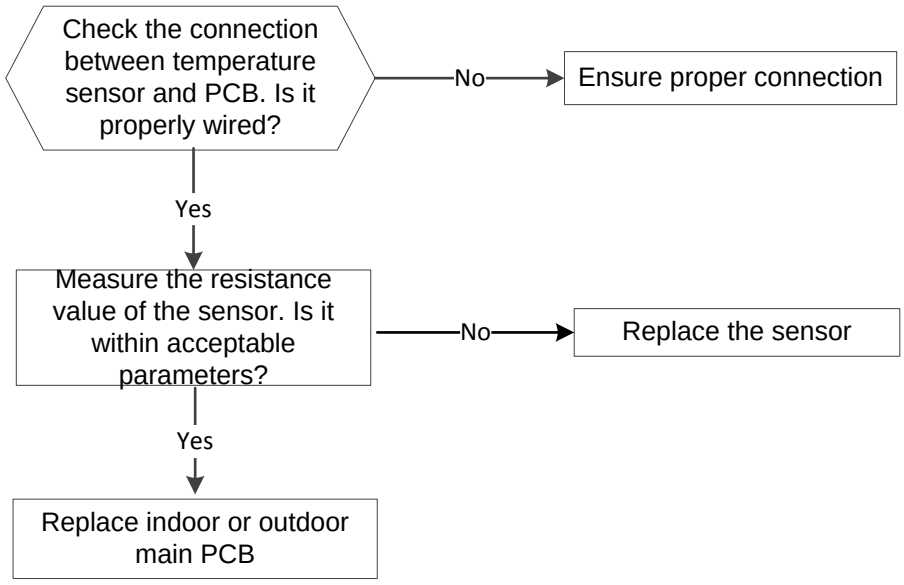


NO.	Signal	Voltage
1	Vcc	+15V
2	GND	
3	TXD	0~6V
4	RXD	0~15V
5	--	--

15.4.5 Open or short circuit of temperature sensor diagnosis and solution

Error Code	E4/E5/F1/F2/F3/EH 60/EH 61EC 53/EC 52/EC 54
Malfunction conditions	If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays a failure.
Potential causes	● Wiring mistake ● Faulty sensor

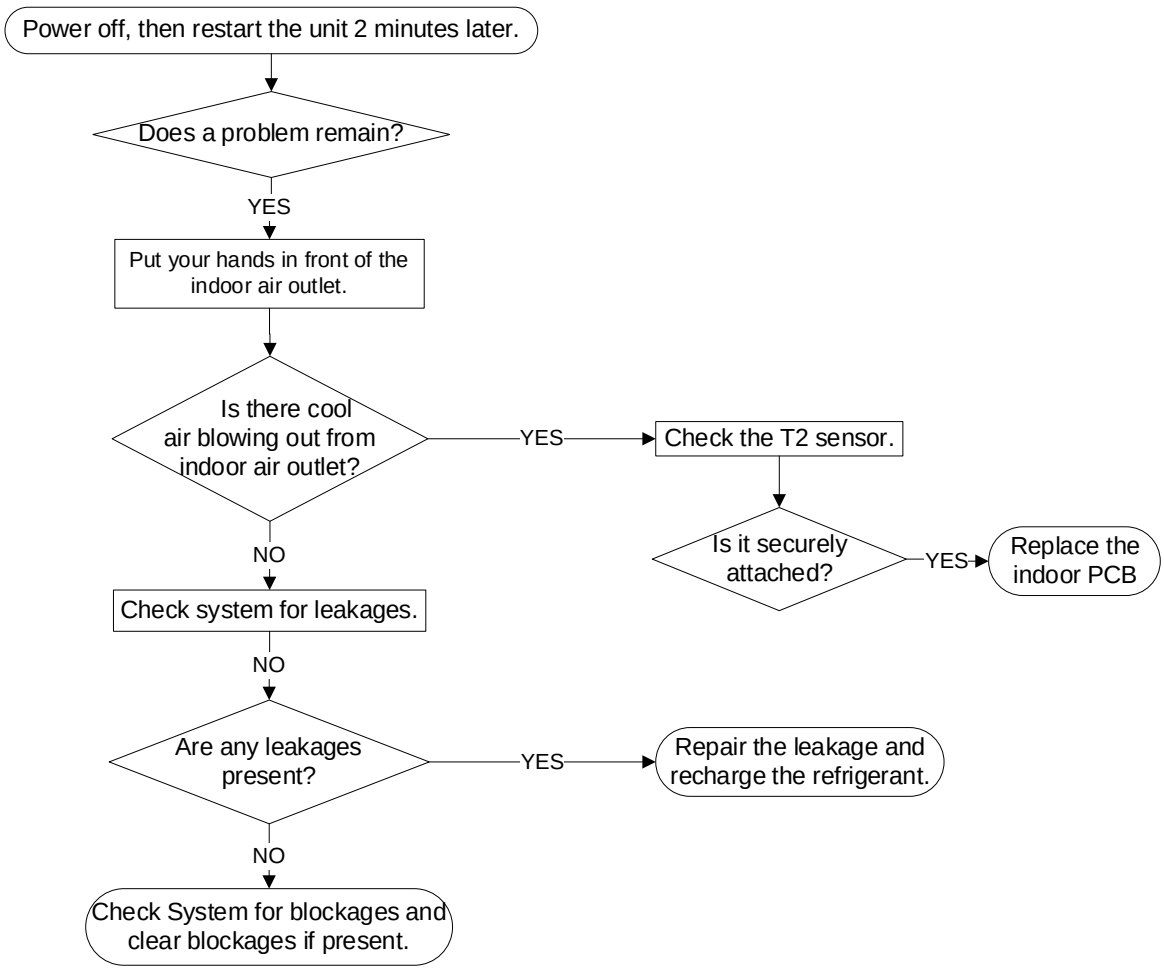
Trouble shooting:



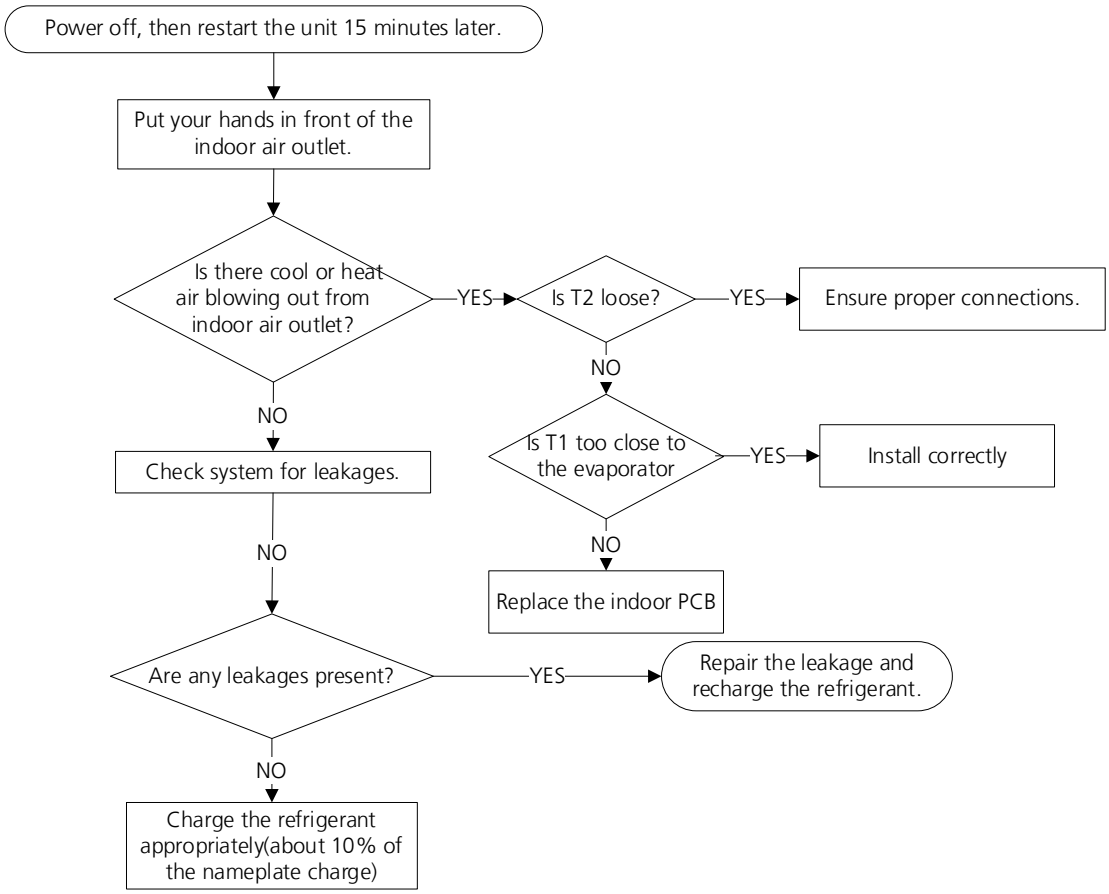
15.4.6 Refrigerant Leakage Detection diagnosis and solution

Error Code	EC/EL 0C
Malfunction conditions	Define the evaporator coil temperature T2 of the compressor starts running as Tcool. If the following occurs 3 times, the display shows "EC" and the unit switches off: In the first 8 minutes after the compressor starts up, if T2 ＜Tcool－2℃ is not maintained for 4 seconds and compressor running frequency is not higher than 50Hz for 3 minutes. For new cassette: Judging the abnormality of the refrigeration system according to the number of compressor stops and the changes in operating parameters caused by excessive exhaust temperature.
Potential Causes	● Faulty T2 sensor ● Faulty indoor PCB ● System problems, such as leakage or blockages

Trouble shooting:

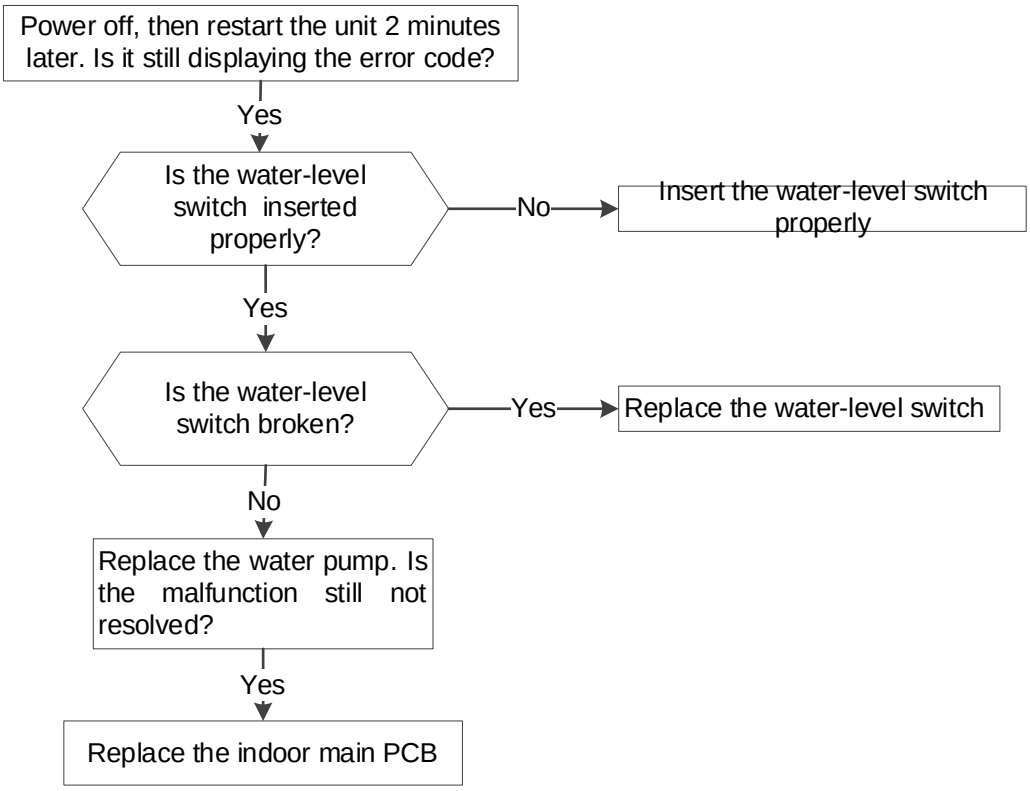


For new cassette:



15.4.7 Water-level alarm malfunction diagnosis and solution

Error Code	EE/EH 0E
Malfunction conditions	If the sampling voltage is not 5V, the LED will display the failure code.
Possible causes	● Wiring mistakes ● Faulty water-level switch ● Faulty water pump ● Faulty indoor PCB

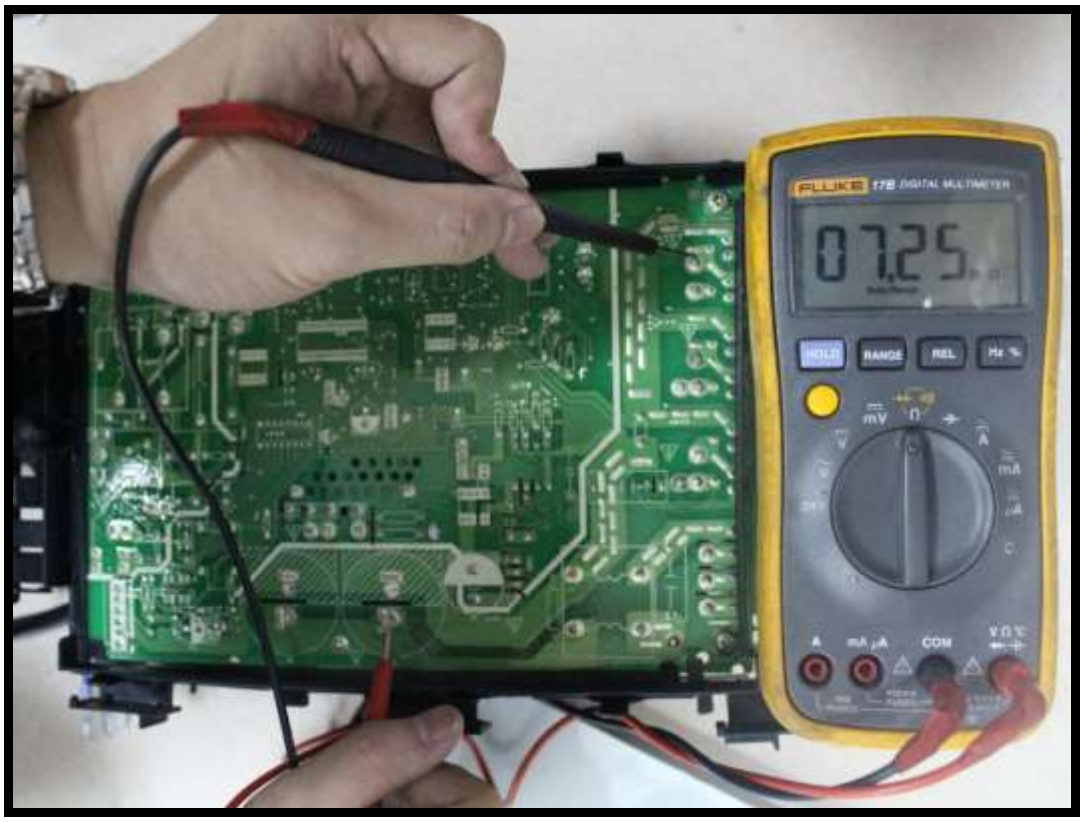


15.4.8 IPM malfunction or IGBT over-strong current protection diagnosis and solution

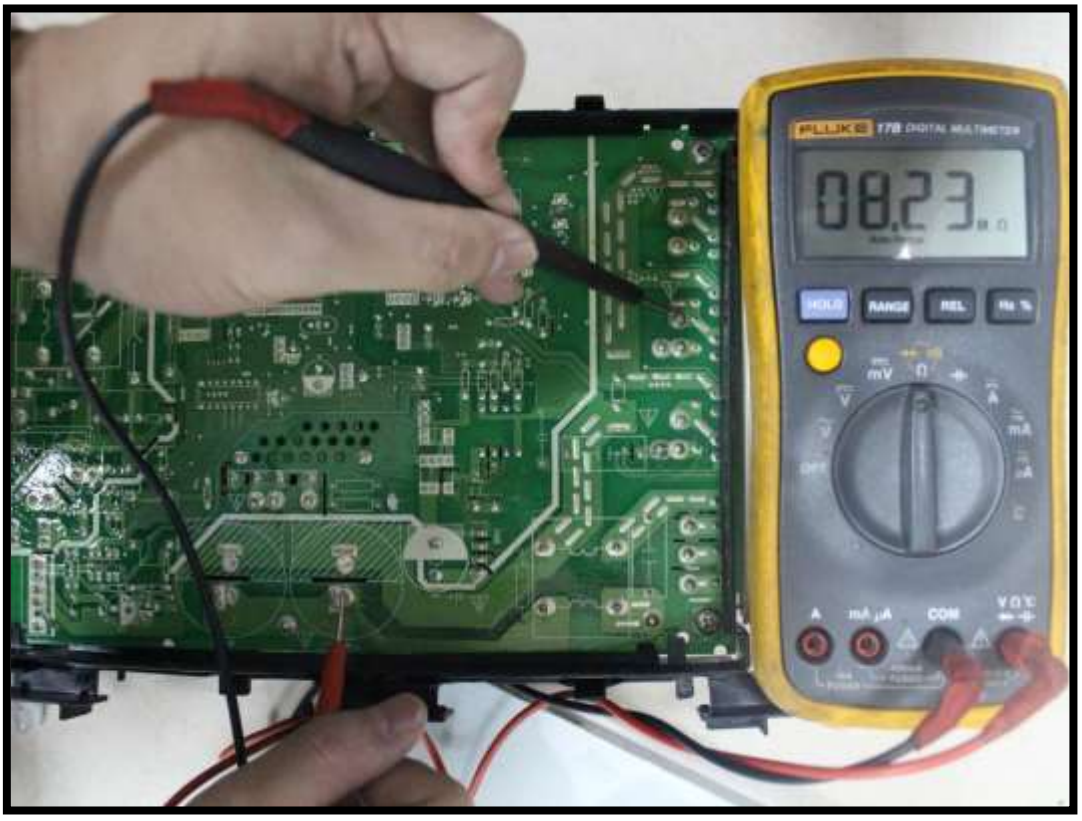
Error Code	P0/PC 00
Malfunction conditions	When the voltage signal the IPM sends to the compressor drive chip is abnormal, the display LED shows failure code and the AC turn off.
Possible causes	● Wiring mistake ● IPM malfunction

Trouble shooting:

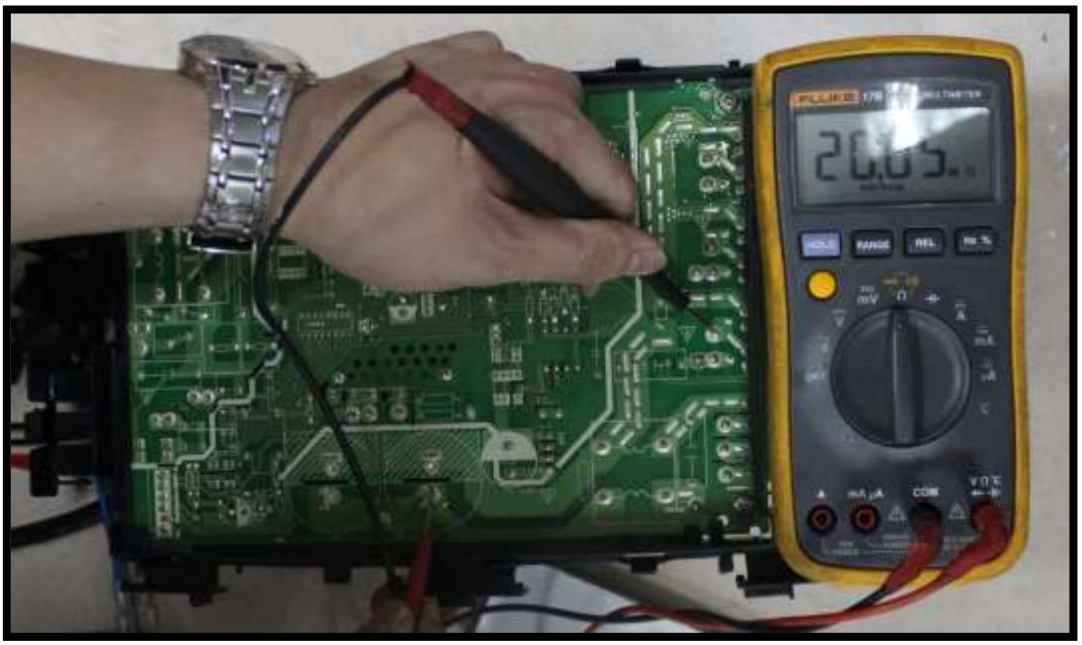
First, test the resistance between every two ports of U, V, the W of the IPM and P, N. If any of the results is 0 or close to 0, the IPM is defective. If not, follow the following procedure:


FLUKE 17B DIGITAL MULTIMETER
07.25
HOLD
RANGE
REL
COM

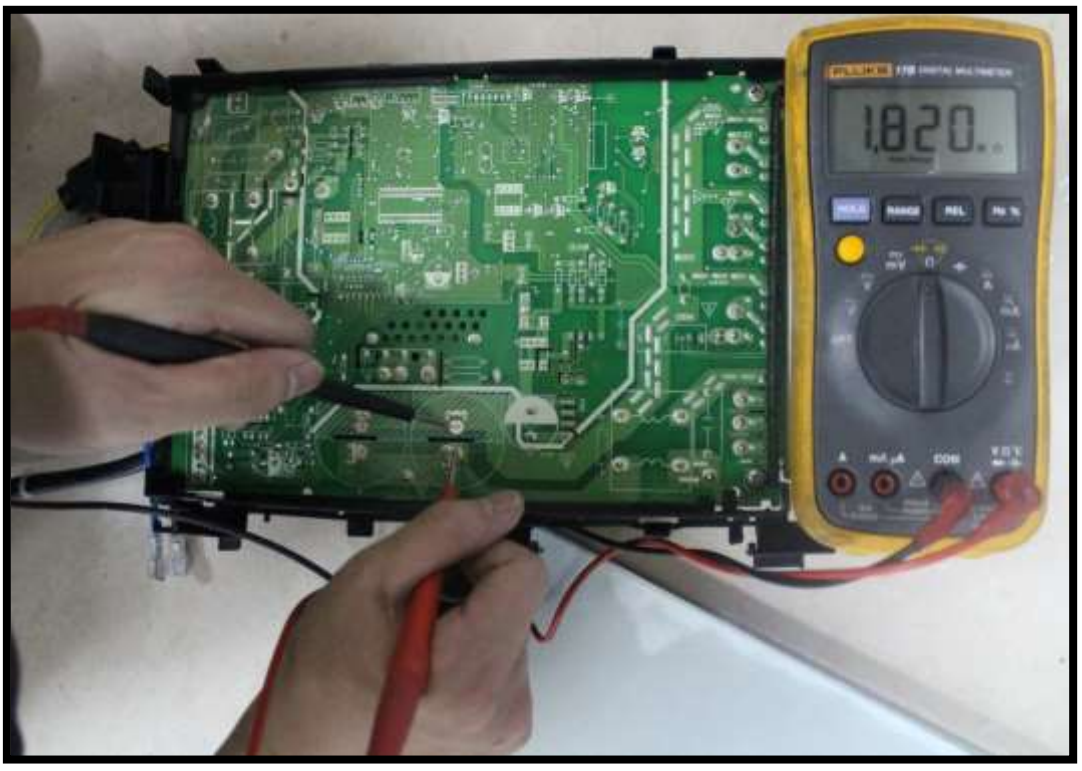
P-U


FLUKE 17B DIGITAL MULTIMETER
08.23
HOLD
RANGE
REL
COM

P-V



P-W

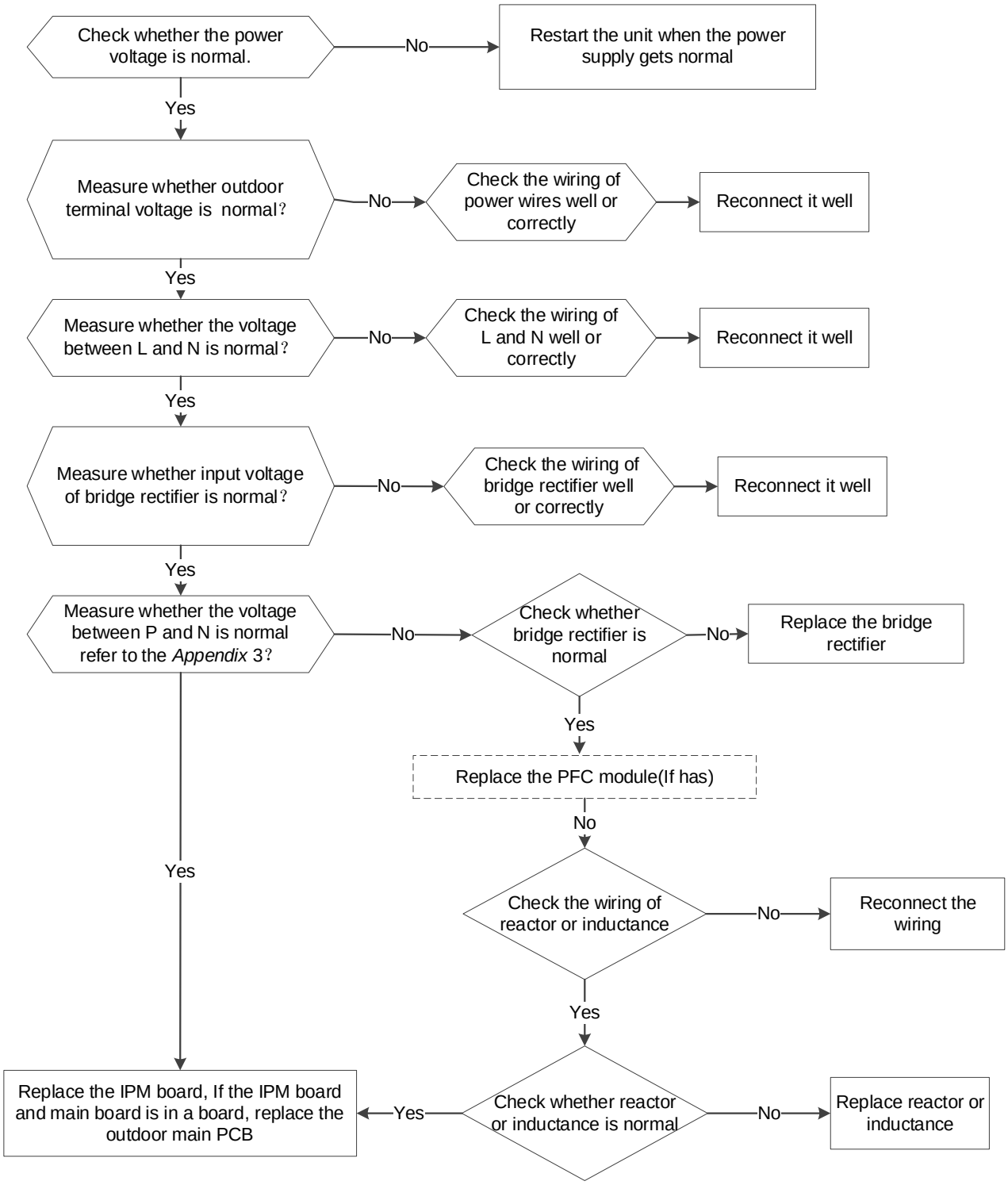


P-N

15.4.9 Over-voltage or under-voltage protection diagnosis and solution

Error Code	P1/ PC 01/ PC 10/ PC 11/ PC 12
Malfunction conditions	Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.
Potential causes	● Power supply issues ● System leakage or blockage ● Faulty PCB

Trouble shooting:

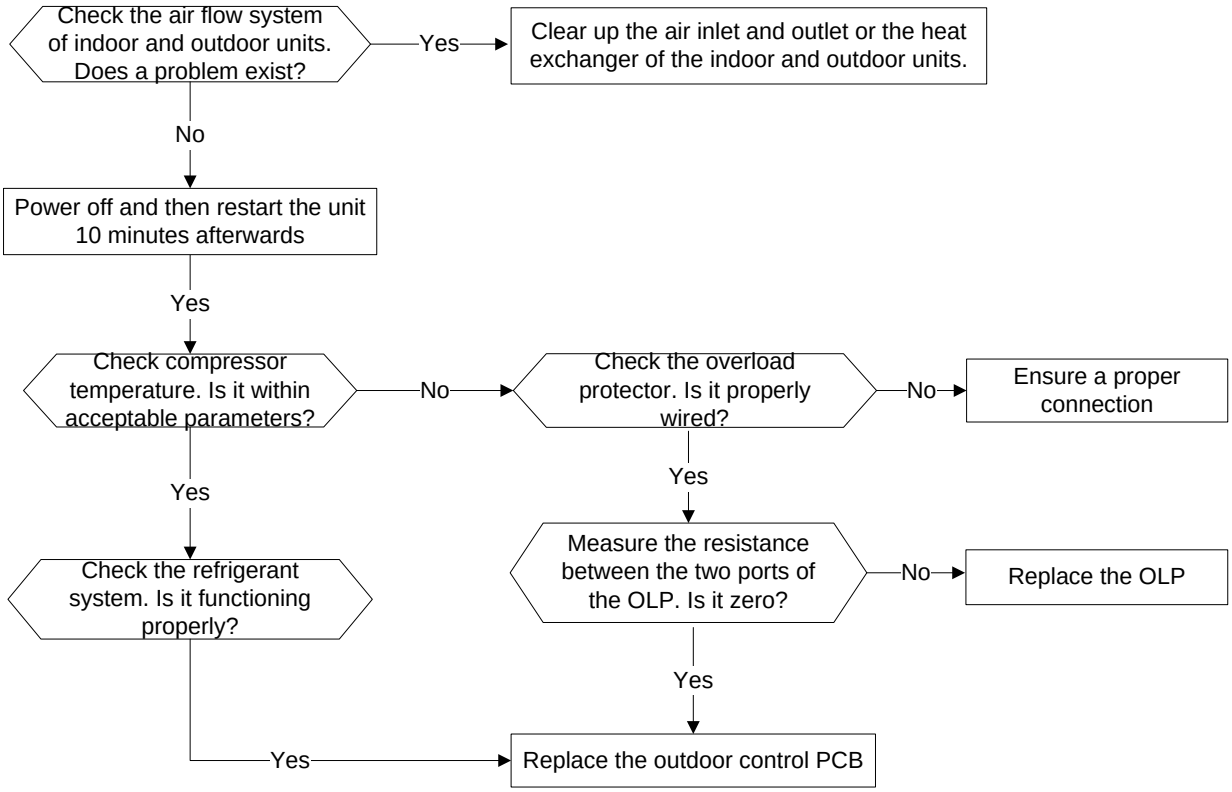


Remark:
Measure the DC voltage between P and N port. The normal value should be around 310V.340V or 380V

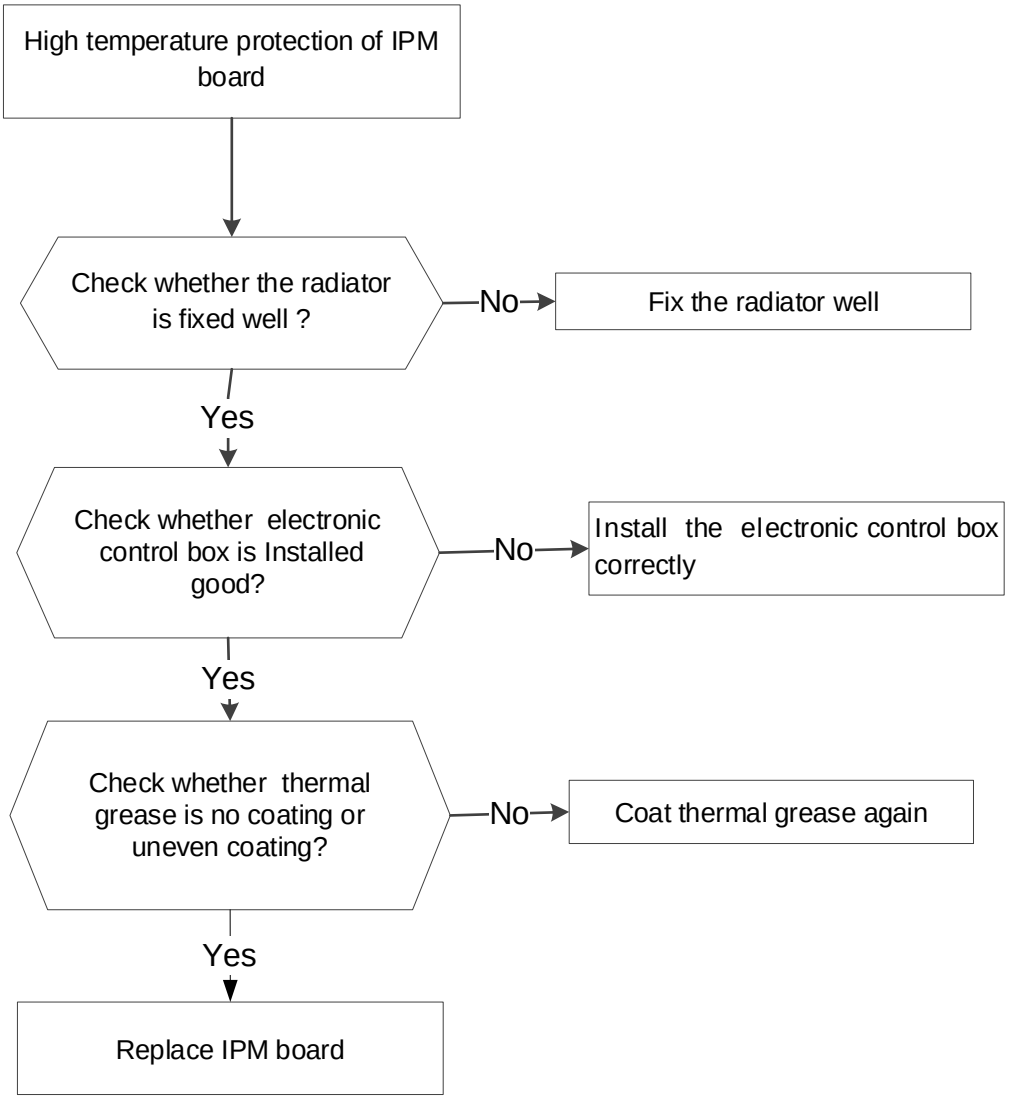
15.4.10 High temperature protection of compressor top diagnosis and solution

Error Code	P2/PC 02
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	● Power supply problems. ● System leakage or block ● PCB faulty

Trouble shooting:



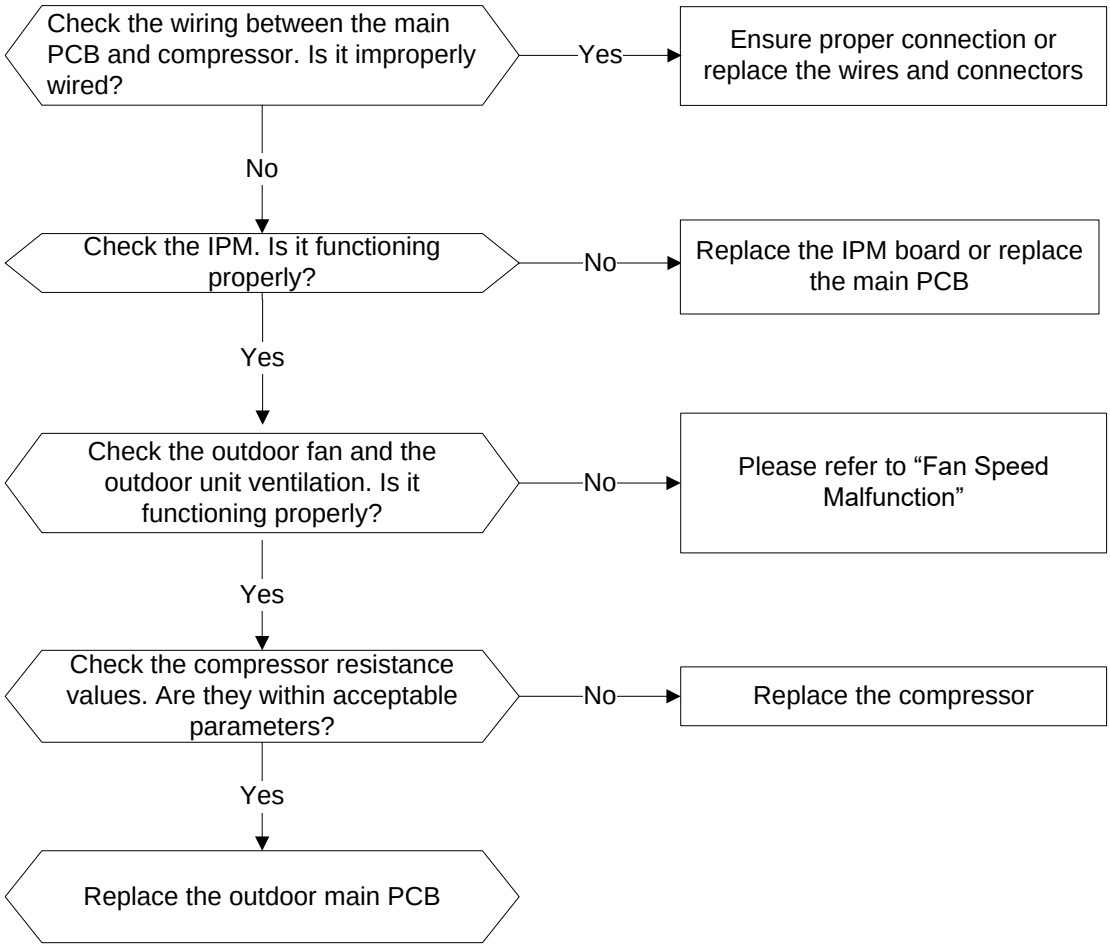
High temperature protection of IPM board diagnosis and solution (P2)



15.4.11 Inverter compressor drive error diagnosis and solution

Error Code	P4/ PC 04
Malfunction conditions	Abnormalities in the inverter compressor drive is detected by a special detection circuit, which can perform communication signal detection, voltage detection, and compressor rotation speed signal detection.
Potential causes	● Wiring mistake ● IPM malfunction ● Faulty outdoor fan assembly ● Compressor malfunction ● Faulty outdoor PCB

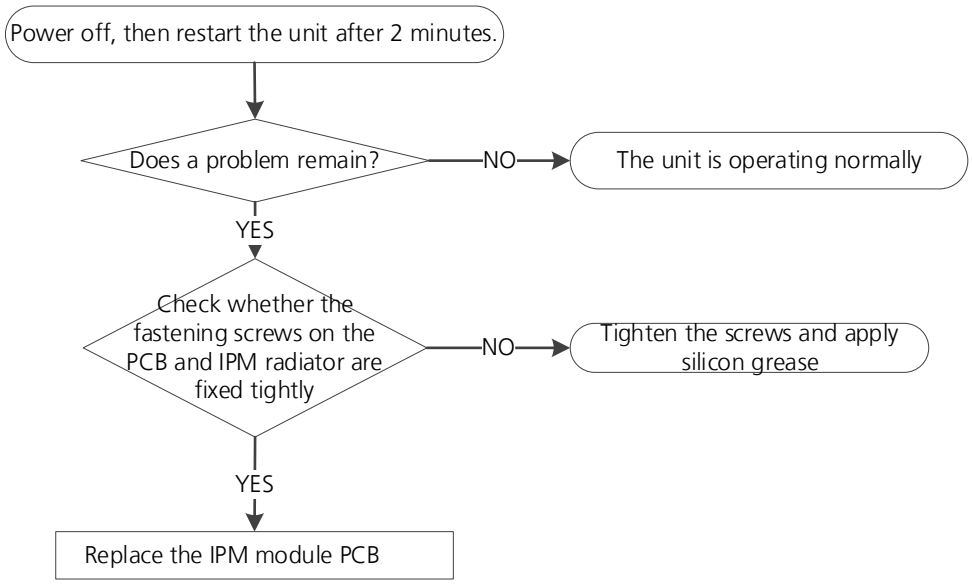
Trouble shooting:



15.4.12 Outdoor IPM module temperature sensor malfunction diagnosis and solution

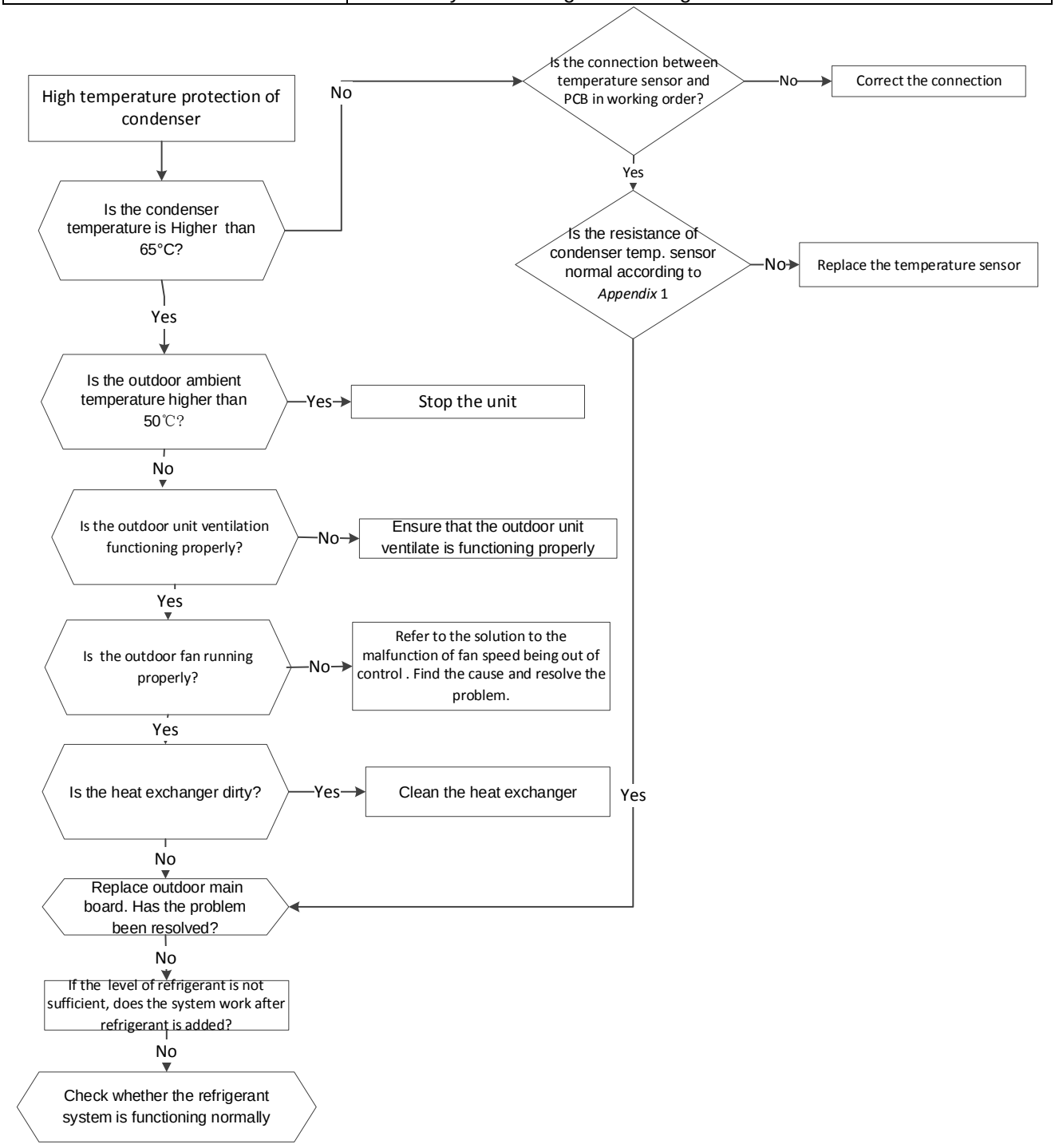
Error Code	P7/ EC 55
Malfunction conditions	If the sampling voltage is 0V or 5V, the LED displays a failure.
Potential causes	● Faulty IPM module

Trouble shooting:



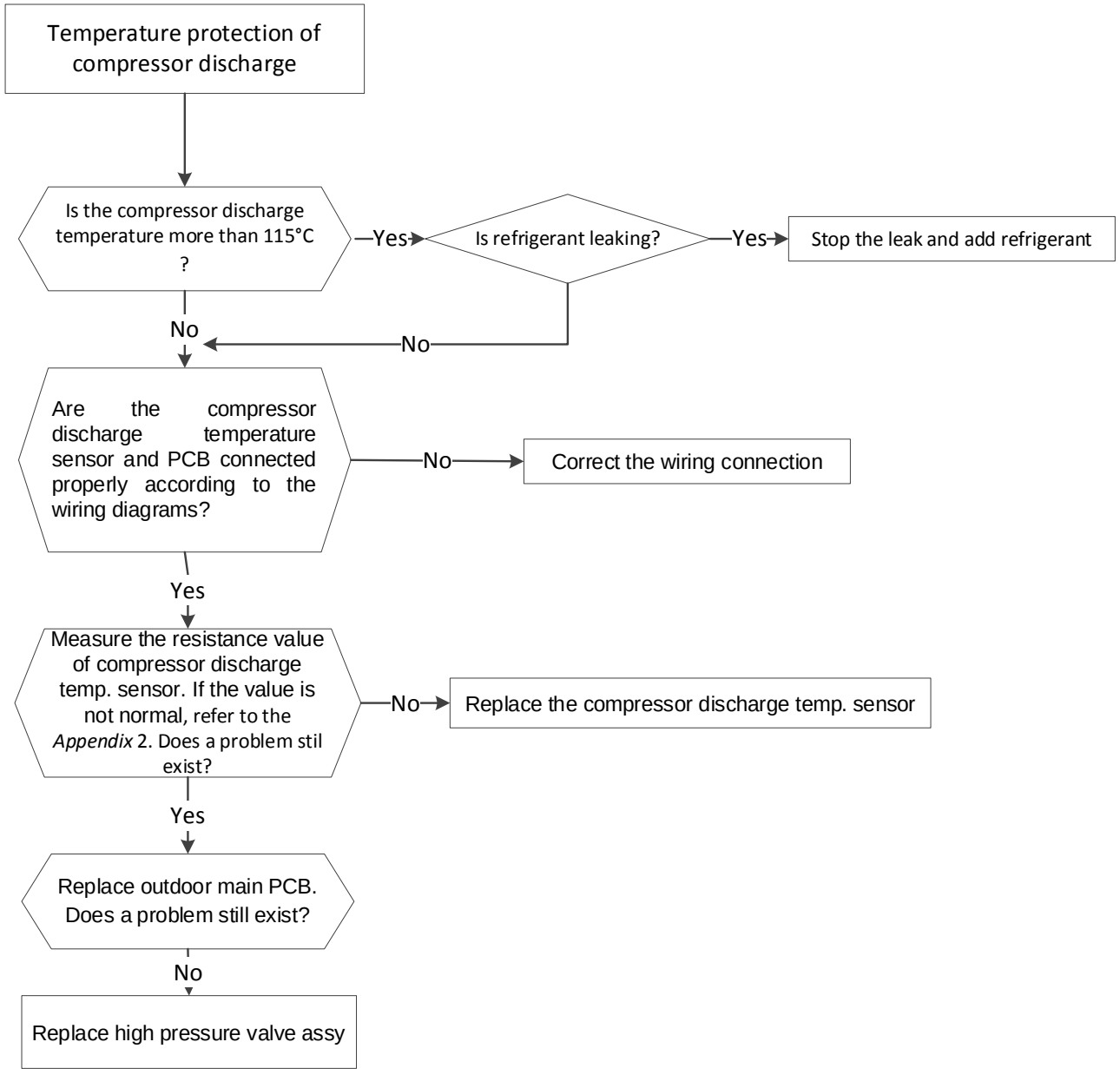
15.4.14. PC 0A Malfunction

Error Code	PC 0A
Malfunction conditions	When the outdoor pipe temperature is more than 65°C, the unit stops. It starts again only when the outdoor pipe temperature is less than 52°C.
Possible causes	● Faulty condenser temperature sensor ● Dirty heat exchanger ● System leakage or blockages



15.4.15. PC 06 Malfunction

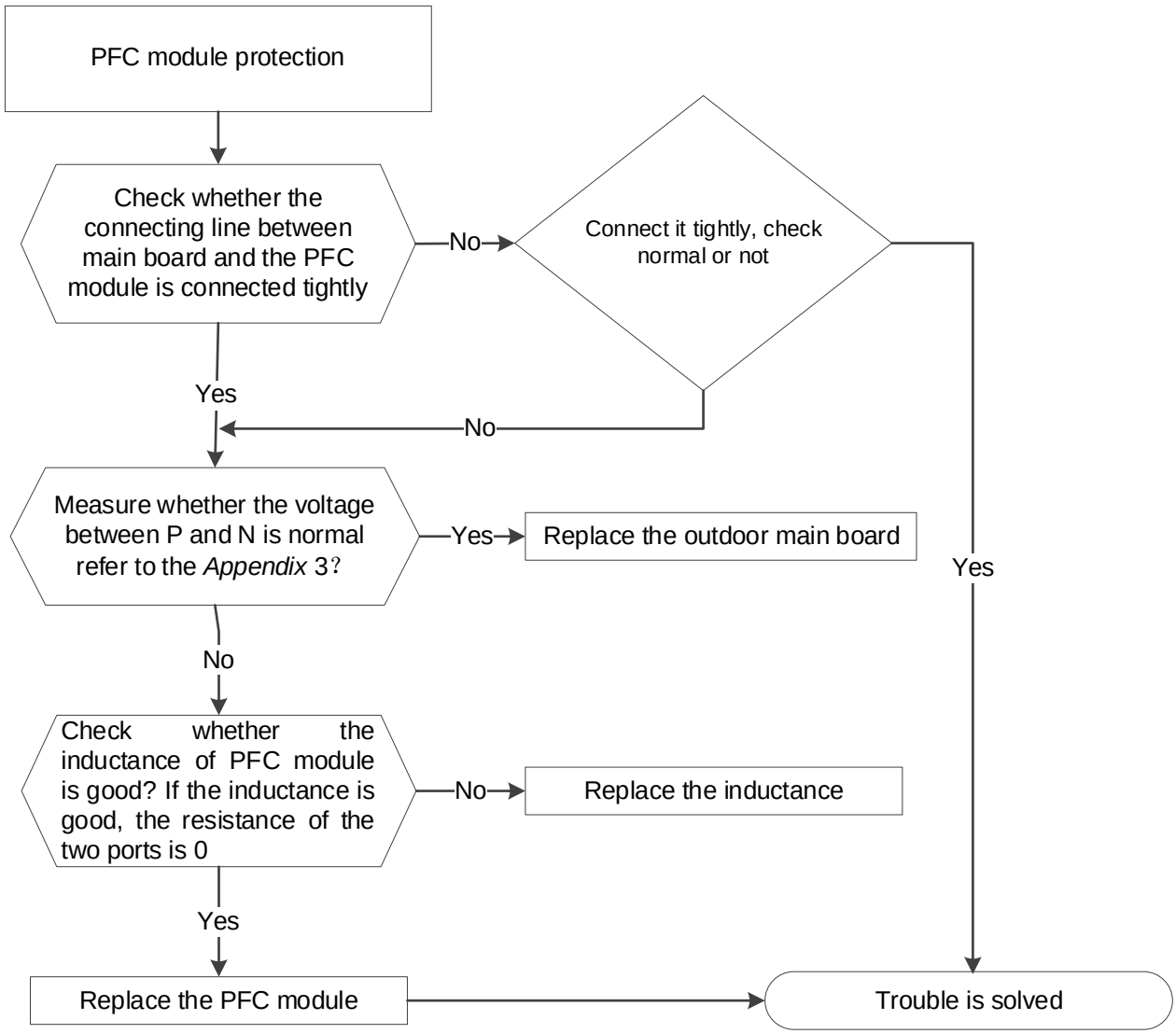
Error Code	PC 06
Malfunction conditions	When the compressor discharge temperature (T5) is more than 115℃ for 10 seconds, the compressor will stop and not restart until T5 is less than 90℃.
Possible causes	● Refrigerant leakage ● Wiring mistake ● Faulty discharge temperature sensor ● Faulty outdoor PCB



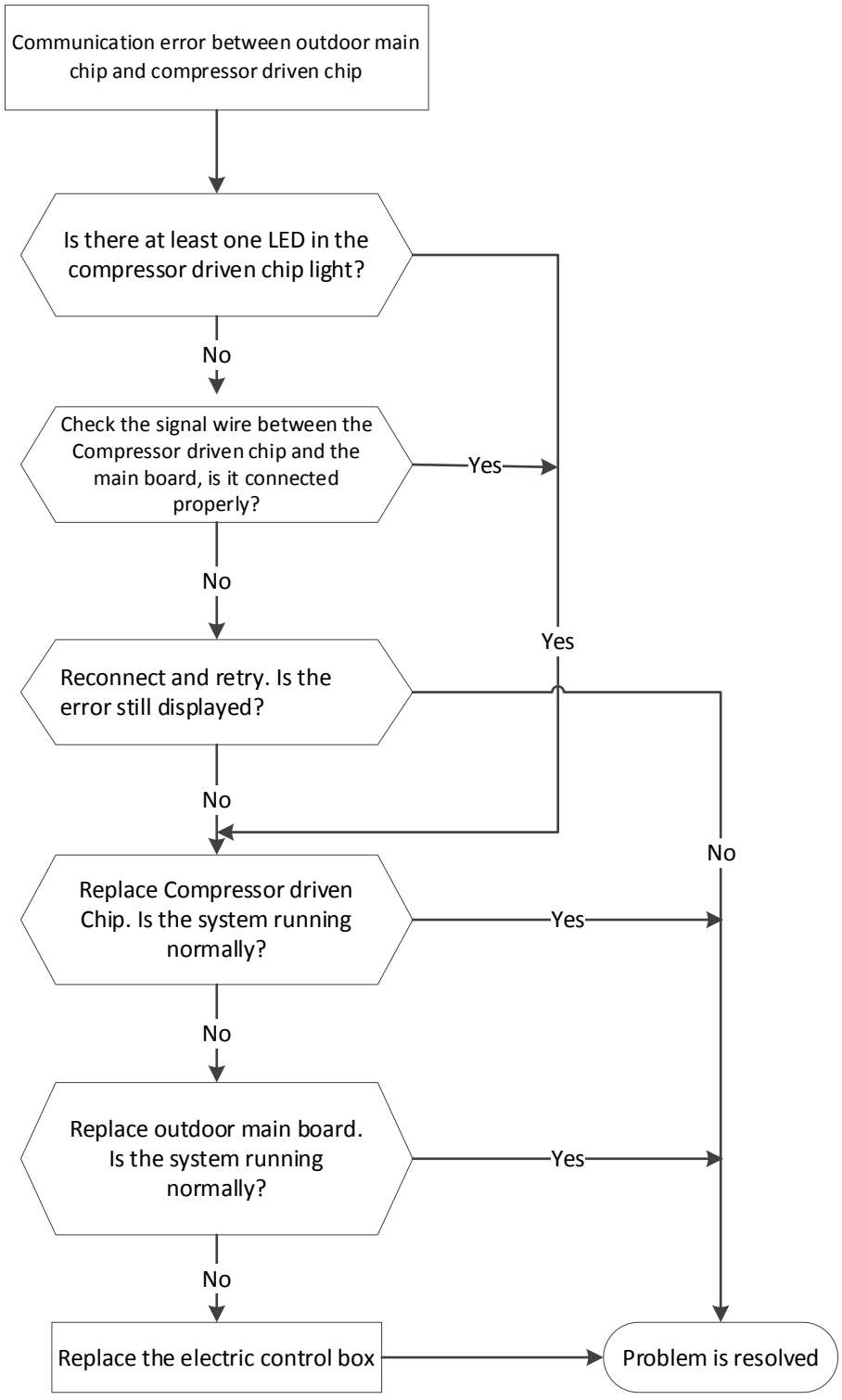
15.4.16. PC 0F Malfunction

Error Code	PC 0F
Malfunction decision conditions	When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show failure code and AC will turn off.
Supposed causes	● Wiring mistake ● Faulty IPM board ● Faulty outdoor fan ass'y ● Compressor malfunction ● Faulty outdoor PCB

At first test the resistance between every two ports of U, V, W of IPM and P, N. If any result of them is 0 or close to 0, the IPM is defective. Otherwise, please follow the procedure below:

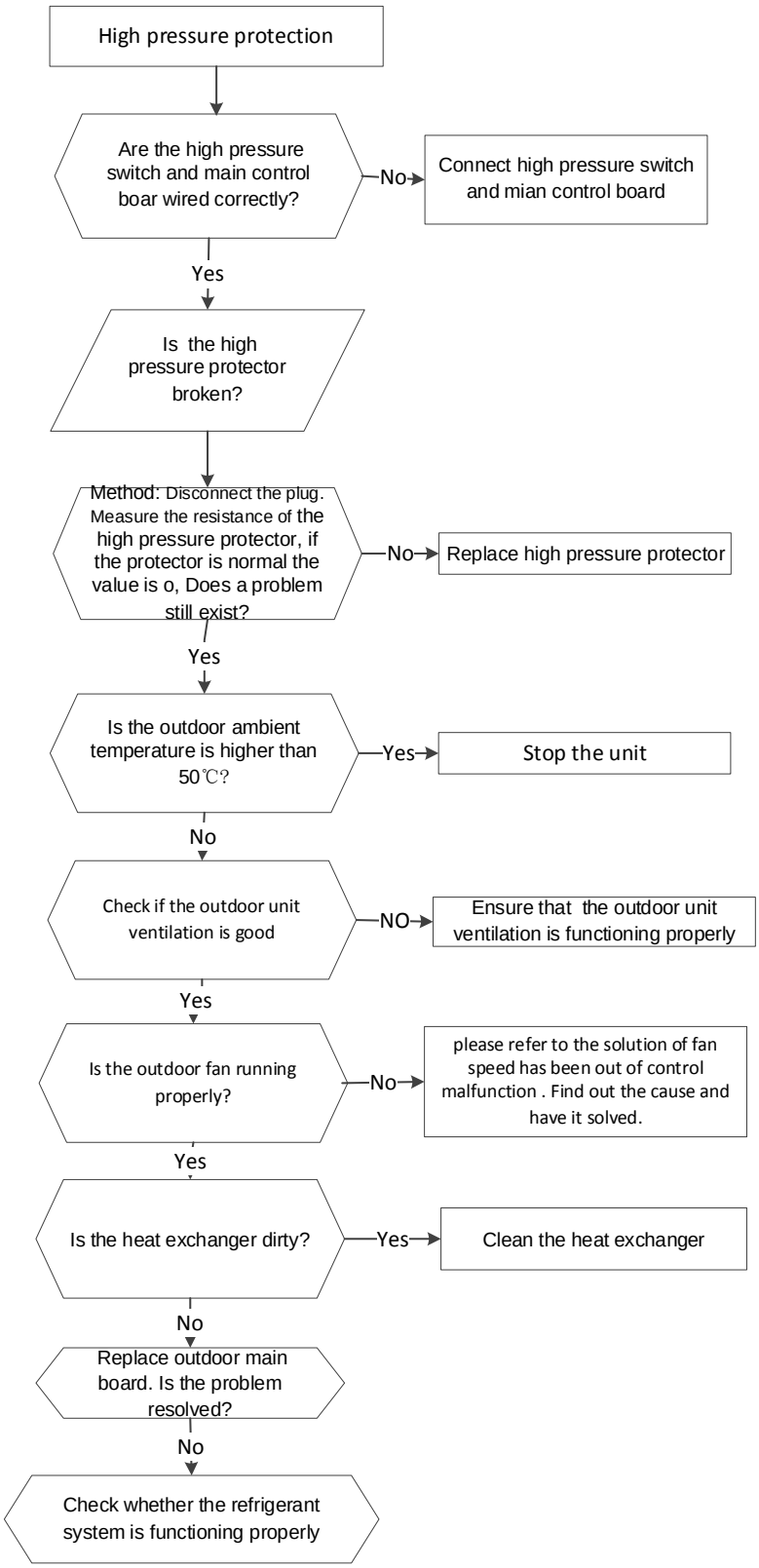


15.4.17. PC 40 Malfunction



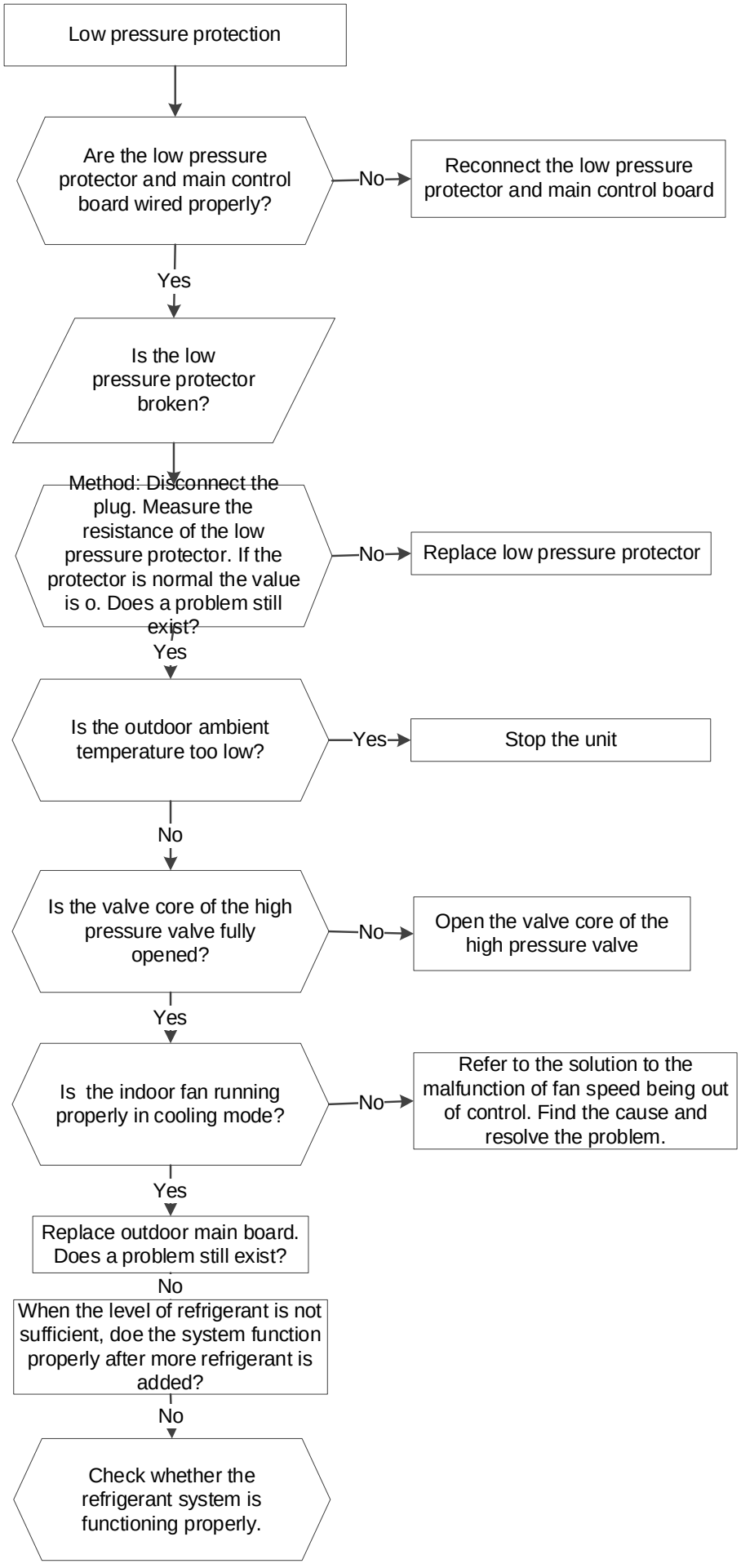
15.4.18. P6/PC 30 Malfunction

Error Code	P6/ PC 30
Malfunction conditions	Outdoor pressure switch cut off the system because high pressure is higher than 4.4 MPa.
Possible causes	● Wiring mistakes ● Faulty pressure protector ● Faulty outdoor fan ● System blockages ● Faulty outdoor PCB



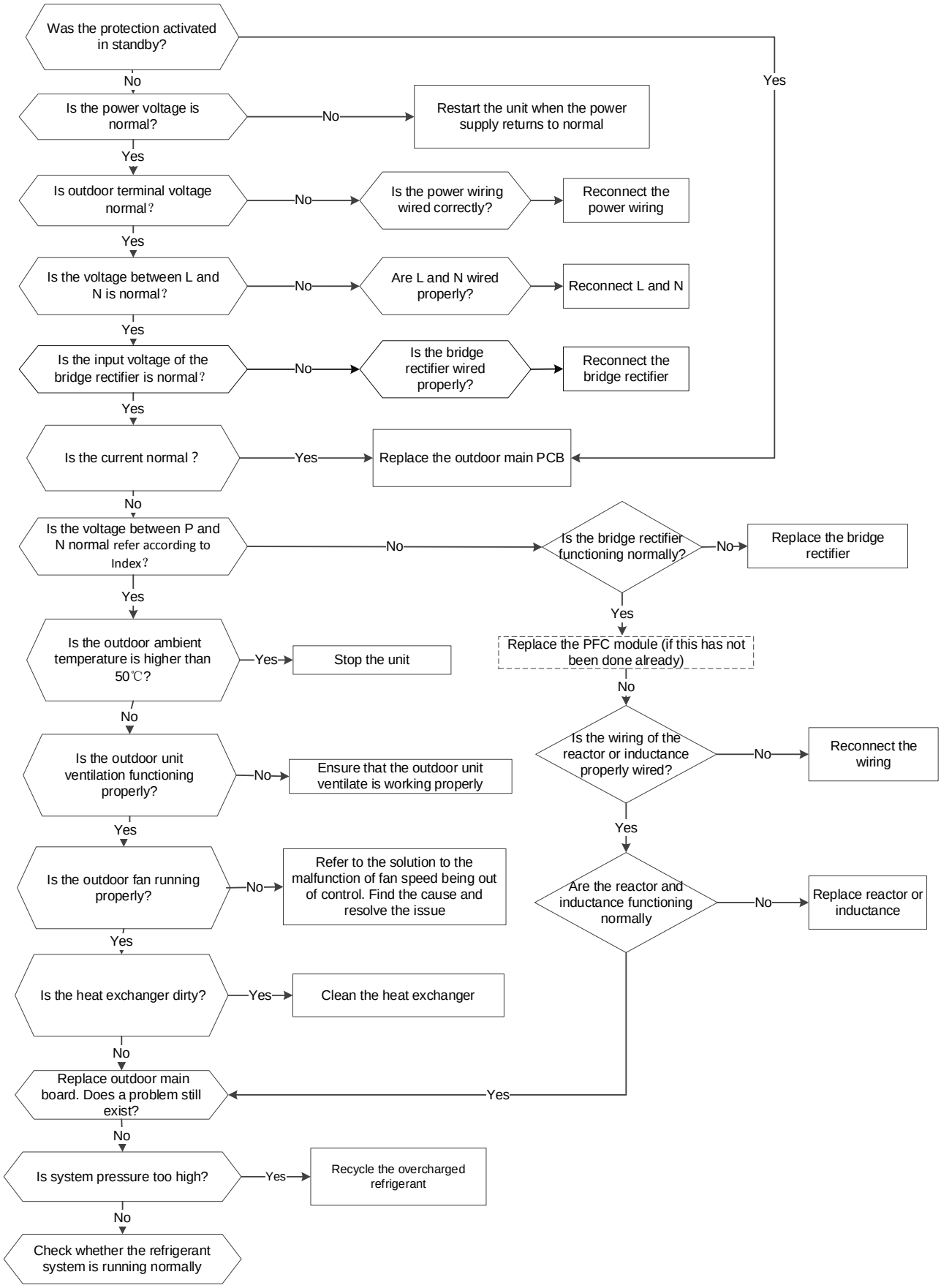
15.4.19. P6/PC 31 Malfunction

Error Code	P6/PC 31
Malfunction conditions	Outdoor pressure switch cut off the system because low pressure is lower than 0.13 MPa.
Possible causes	● Wiring mistake ● Faulty pressure protector ● System blockages ● Faulty outdoor PCB

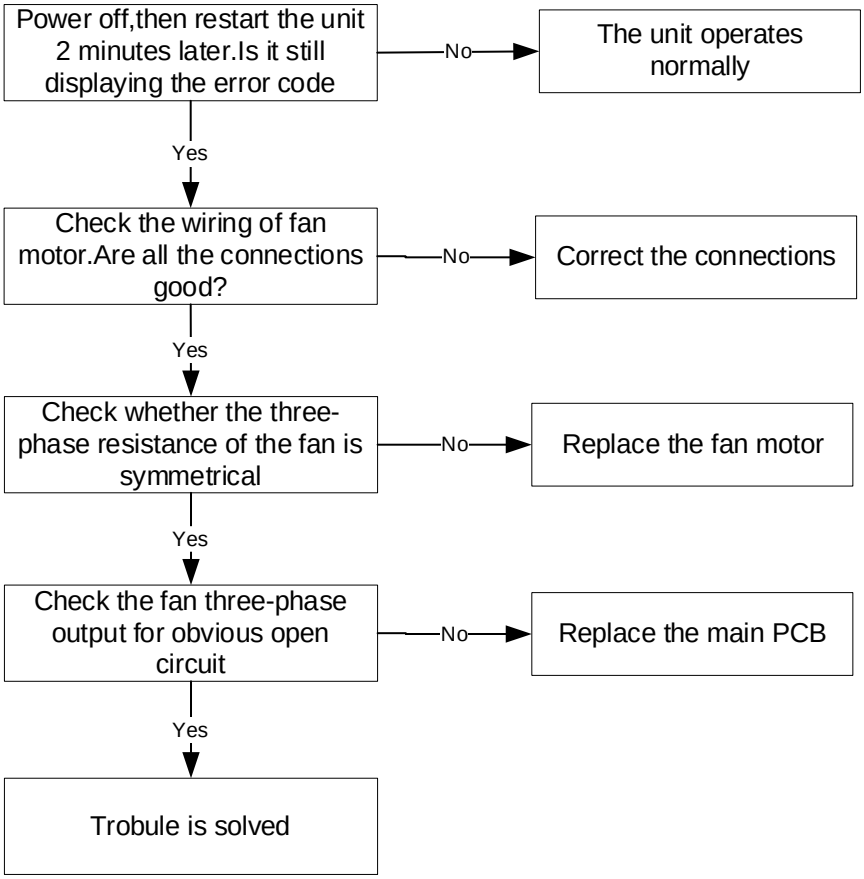

Low pressure protection
Are the low pressure protector and main control board wired properly?
No
Reconnect the low pressure protector and main control board
Yes
Is the low pressure protector broken?
Method: Disconnect the plug. Measure the resistance of the low pressure protector. If the protector is normal the value is o. Does a problem still exist?
No
Replace low pressure protector
Yes
Is the outdoor ambient temperature too low?
Yes
Stop the unit
No
Is the valve core of the high pressure valve fully opened?
No
Open the valve core of the high pressure valve
Yes
Is the indoor fan running properly in cooling mode?
No
Refer to the solution to the malfunction of fan speed being out of control. Find the cause and resolve the problem.
Yes
Replace outdoor main board. Does a problem still exist?
No
When the level of refrigerant is not sufficient, doe the system function properly after more refrigerant is added?
No
Check whether the refrigerant system is functioning properly.

15.4.20 Current overload protection

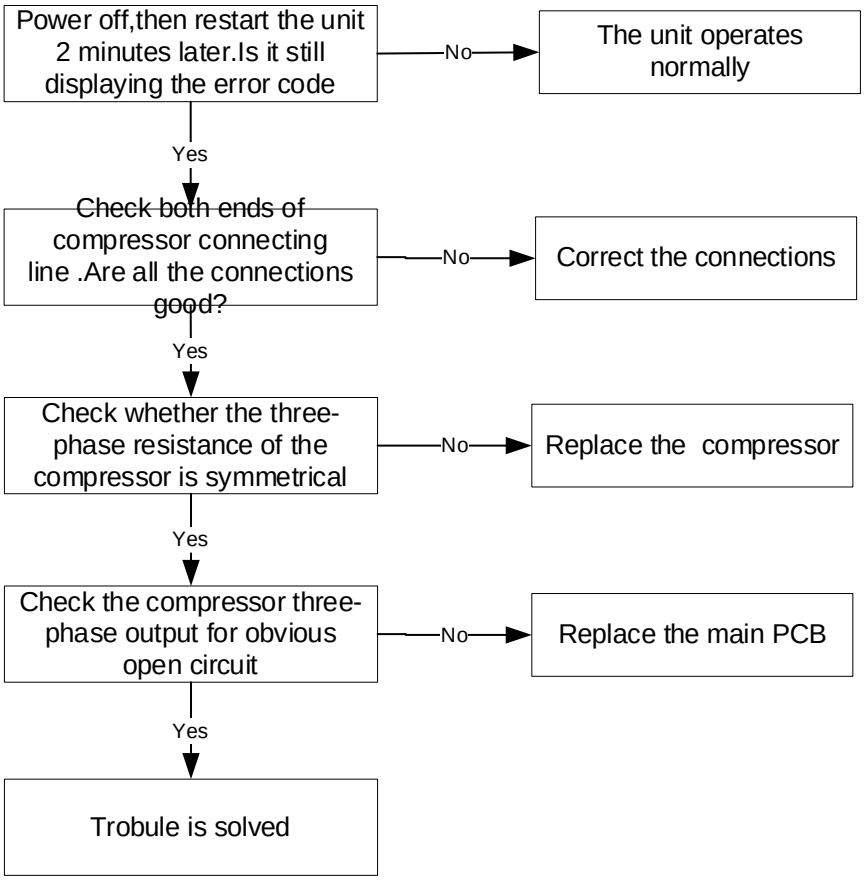
Error code	F0/ PC 08/ PC 44/PC 46/PC 49
Malfunction decision conditions	If the outdoor current exceeds the current limit value, the LED displays a failure code.
Possible causes	● Wiring mistakes ● Faulty bridge rectifier ● System blockages ● Faulty outdoor PCB


Was the protection activated in standby?
Yes
No
Is the power voltage is normal?
No
Restart the unit when the power supply returns to normal
Yes
Is outdoor terminal voltage normal?
No
Is the power wiring wired correctly?
Reconnect the power wiring
Yes
Is the voltage between L and N is normal?
No
Are L and N wired properly?
Reconnect L and N
Yes
Is the input voltage of the bridge rectifier is normal?
No
Is the bridge rectifier wired properly?
Reconnect the bridge rectifier
Yes
Is the current normal ?
Yes
Replace the outdoor main PCB
No
Is the voltage between P and N normal refer according to Index?
No
Is the bridge rectifier functioning normally?
No
Replace the bridge rectifier
Yes
Yes
Is the outdoor ambient temperature is higher than 50℃?
Yes
Stop the unit
Replace the PFC module (if this has not been done already)
No
No
Is the outdoor unit ventilation functioning properly?
No
Ensure that the outdoor unit ventilate is working properly
Is the wiring of the reactor or inductance properly wired?
No
Reconnect the wiring
Yes
Yes
Is the outdoor fan running properly?
No
Refer to the solution to the malfunction of fan speed being out of control. Find the cause and resolve the issue
Are the reactor and inductance functioning normally
No
Replace reactor or inductance
Yes
Is the heat exchanger dirty?
Yes
Clean the heat exchanger
No
Replace outdoor main board. Does a problem still exist?
Yes
No
Is system pressure too high?
Yes
Recycle the overcharged refrigerant
No
Check whether the refrigerant system is running normally

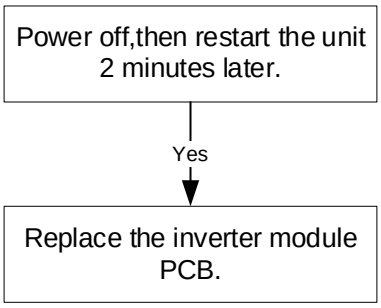
15.4.21 Lack phase failure of outdoor DC fan motor(EC 72)



15.4.22 Outdoor compressor lack phase protection(PC 43)



15.4.23 Outdoor unit IR chip drive failure(PC45)

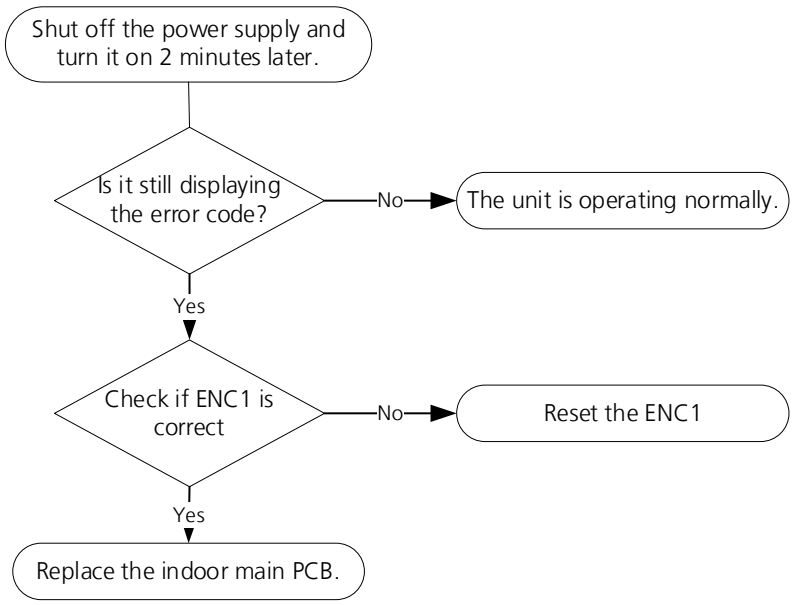


15.4.24 Communication malfunction between external fan module and indoor unit(EH b A)

External fan DC bus voltage is too low protection(EH 3A)

External fan DC bus voltage is too high fault(EH 3A)

Trouble shooting:



15.5 Main parts check

1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

Appendix 1 Temperature Sensor Resistance Value Table for T1,T2,T3,T4 (℃--K)

℃	℉	K Ohm	℃	℉	K Ohm	℃	℉	K Ohm	℃	℉	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	14.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

A**ppendix 2** Temperature Sensor Resistance Value Table for T5,TH (℃--K)

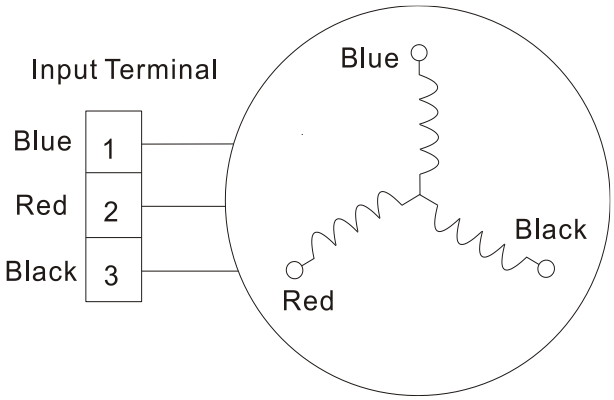
℃	℉	K Ohm	℃	℉	K Ohm	℃	℉	K Ohm	℃	℉	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	14.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

Appendix 3:

℃	10	11	12	13	14	15	16	17	18	19	20	21	22
℉	48	50	52	54	56	58	60	62	64	66	68	70	72
℃	23	24	25	26	27	28	29	30	31	32	33	34	35
℉	74	76	78	80	82	84	86	88	90	92	94	96	98

2. Compressor checking

Measure the resistance value of each winding by using the tester.



Position	Resistance Value		
	KSK103D33UEZ3	KTN110D42UFZ	KSN140D58UFZ
Blue - Red	2.13 Ω	0.82 Ω	1.86Ω
Blue - Black			
Red - Blue			
	KTM240D43UKT	ATF310D43UMT KTF310D43UMT	EAPQ420D1UMUA KTQ420D1UMU
Blue - Red	1.03Ω	0.65 Ω	0.37Ω
Blue - Black			
Red - Blue			
Blue - Black			
Red - Blue			

3. IPM continuity check

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Digital tester		Normal resistance value	Digital tester		Normal resistance value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞ (Several MΩ)	U	N	∞ (Several MΩ)
	U		V		
	V		W		
	W		(+)Red		

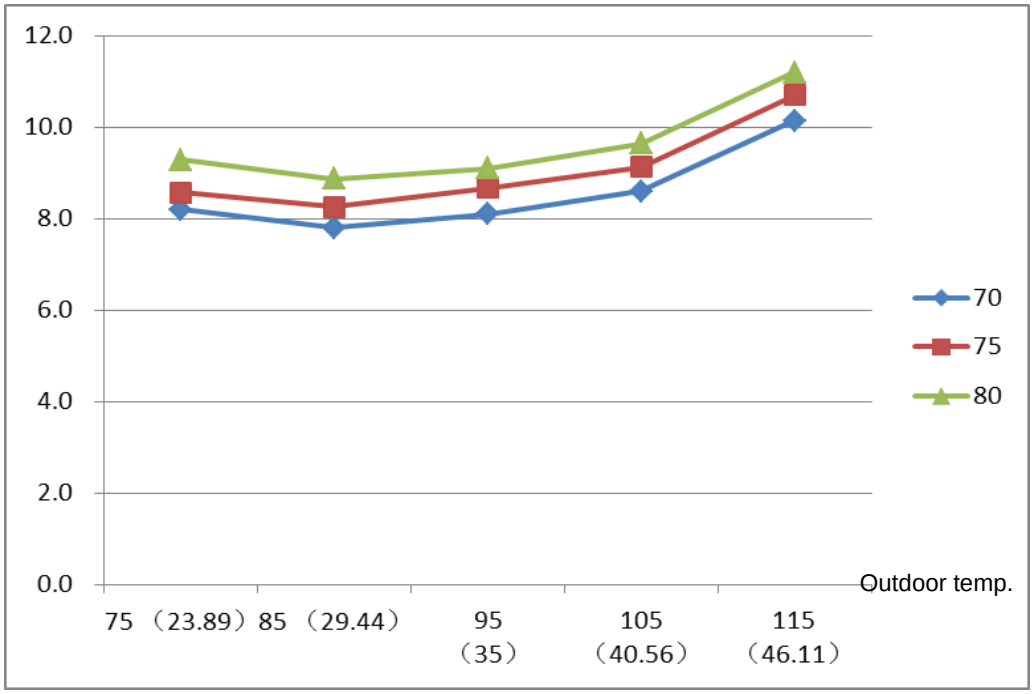
4: Pressure on Service Port

Cooling chart:

COOLING MODE

℉ (℃)	Indoor Temp.	Outdoor temp.				
		75 （23.89）	85 （29.44）	95 （35）	105 （40.56）	115 （46.11）
BAR	70	8.2	7.8	8.1	8.6	10.1
BAR	75	8.6	8.3	8.7	9.1	10.7
BAR	80	9.3	8.9	9.1	9.6	11.2
PSI	70	119	113	117	125	147
PSI	75	124	120	126	132	155
PSI	80	135	129	132	140	162
MPA	70	0.82	0.78	0.81	0.86	1.01
MPA	75	0.86	0.83	0.87	0.91	1.07
MPA	80	0.93	0.89	0.91	0.96	1.12

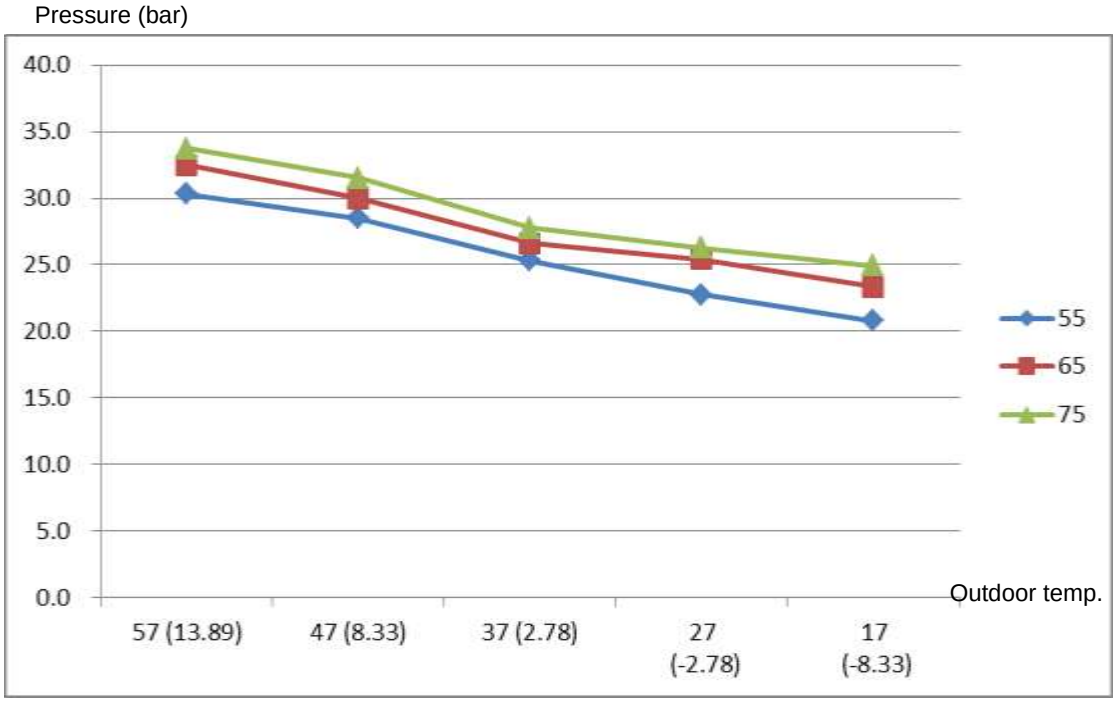
Pressure (bar)



Heating Chart:

HEATING MODE

℉ (℃)	Indoor Temp.	Outdoor temp.				
		57 (13.89)	47 (8.33)	37 (2.78)	27 (-2.78)	17 (-8.33)
BAR	55	30.3	28.5	25.3	22.8	20.8
BAR	65	32.5	30.0	26.6	25.4	23.3
BAR	75	33.8	31.5	27.8	26.3	24.9
PSI	55	439	413	367	330	302
PSI	65	471	435	386	368	339
PSI	75	489	457	403	381	362
MPA	55	3.03	2.85	2.53	2.28	2.08
MPA	65	3.25	3.00	2.66	2.54	2.33
MPA	75	3.38	3.15	2.78	2.63	2.49



16. Disassembly Instructions

Note: This part is for reference, the photos may have slight difference with your machine.

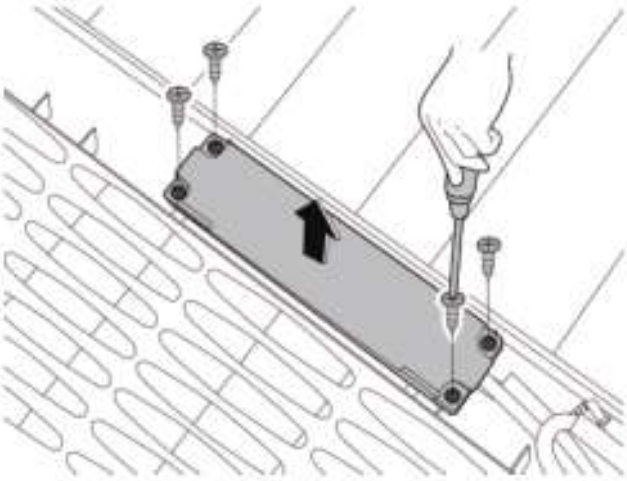
16.1 Indoor unit

- **Compact Cassette Unit**

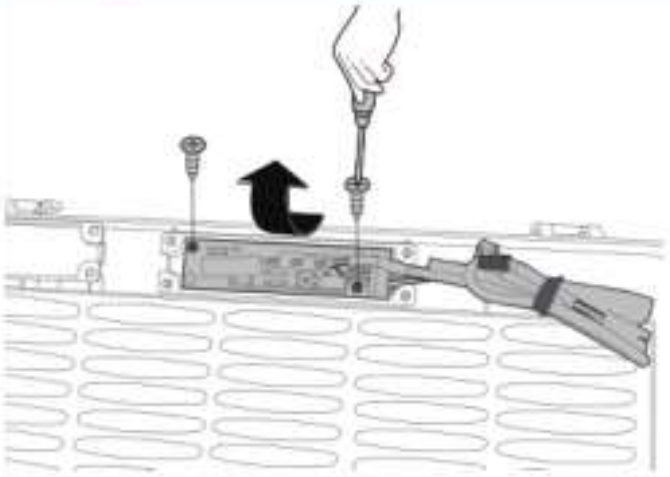
1.1 Front Panel and Display Board

Procedure	Illustration
1) Release 2 hooks and open the panel. (see CJ_MCA_001)	 CJ_MCA_001
2) Remove two screws of wire line. (see CJ_MCA_002)	 CJ_MCA_002

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Release the hook then pull up the filter(see CJ_MCA_003)	 CJ_MCA_003
4) Remove 4 screws of cover and remove the display board(see CJ_MCA_004)	 CJ_MCA_004

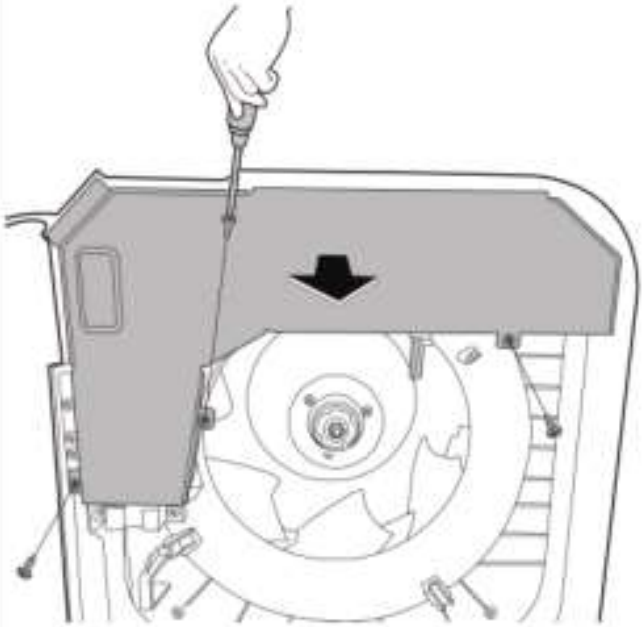
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
5) Remove 2 screws of display board and remove PCB.(see CJ_MCA_005)	 CJ_MCA_005

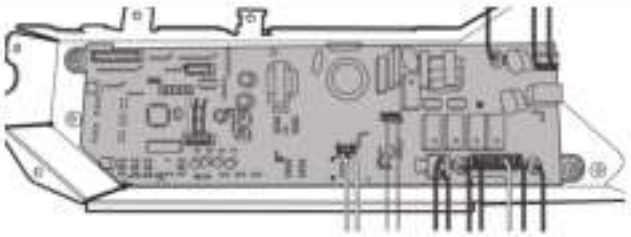
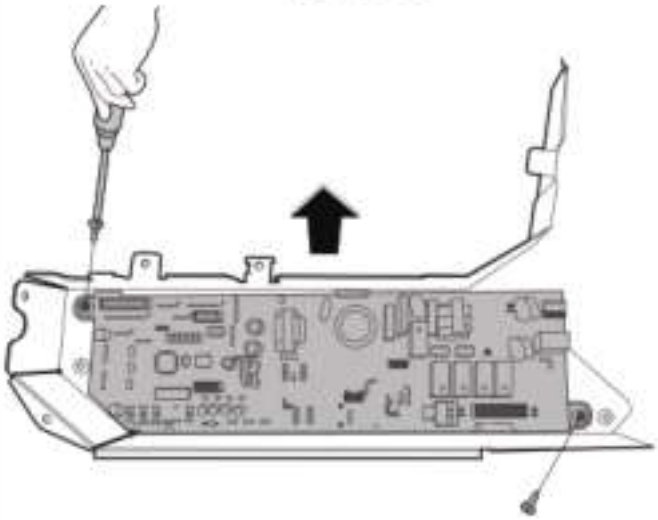
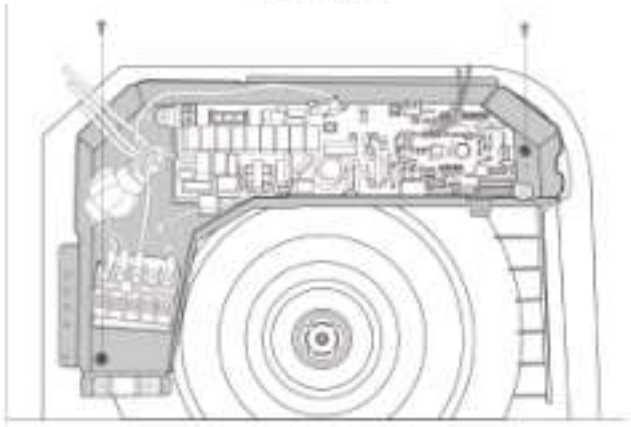
Note: This section is for reference only. Actual unit appearance may vary.

1.2 Electrical Parts(Antistatic gloves must be worn.)

Note: Remove the front panel (refer to 1.1 Front Panel and display) before disassembling electrical parts.

Procedure	Illustration
1) Remove 4 screws of the panel and pull up the panel. (see CJ_MCA_006)	 CJ_MCA_006
2) Remove 3 screws of electrical cover. (see CJ_MCA_007)	 CJ_MCA_007

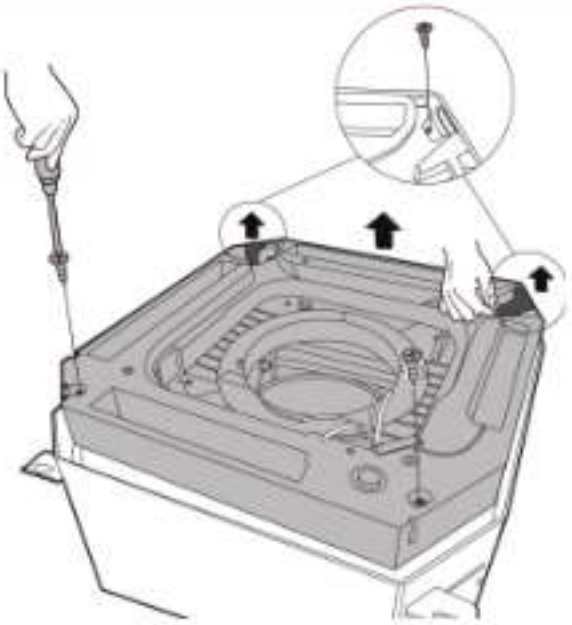
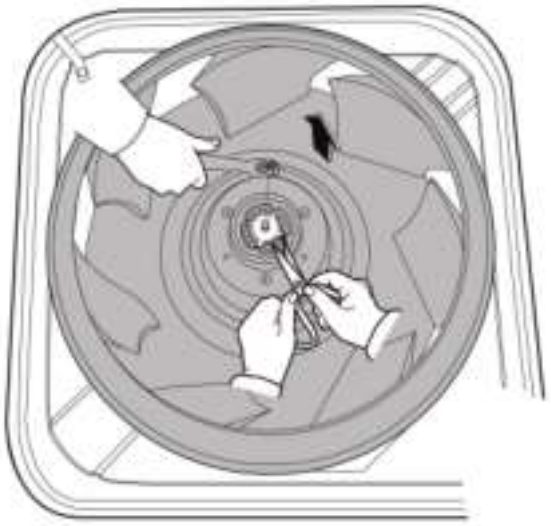
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Disconnect the connectors of PCB. (see CJ_MCA_008)	 CJ_MCA_008
4) Remove 2 screws of main control board and remove PCB (see CJ_ MCA_009)	 CJ_MCA_009
5) Remove 2 screws of electronic control box and remove electronic control box (see CJ_MCA_010)	 CJ_MCA_010

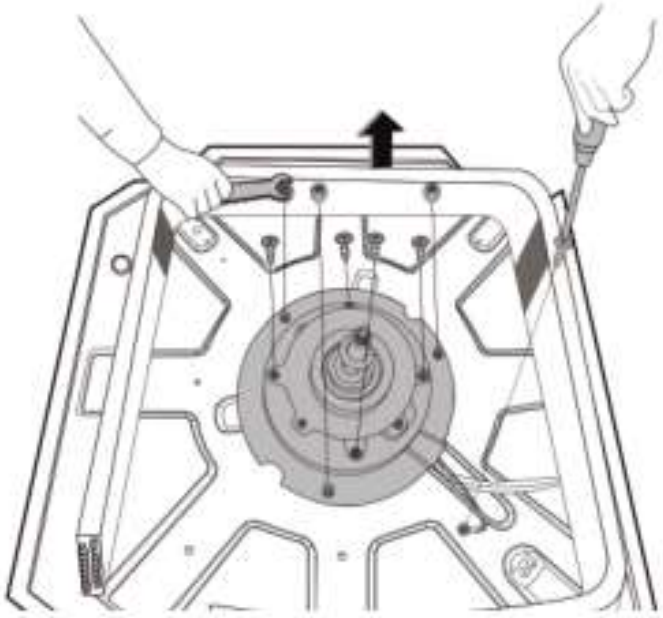
Note: This section is for reference only. Actual unit appearance may vary.

1.3 Fan motor and fan

Note: Remove the front panel and electrical parts (refer to 1.1 &1.2) before disassembling fan motor.

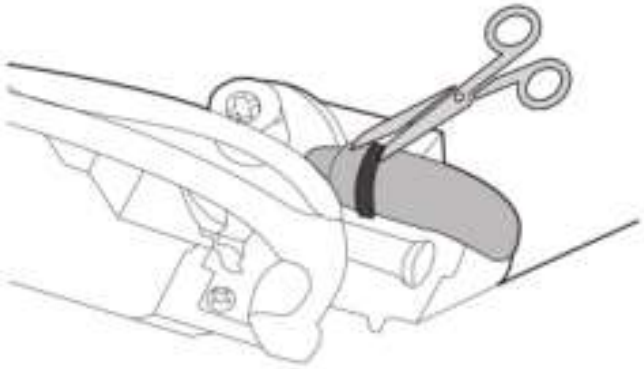
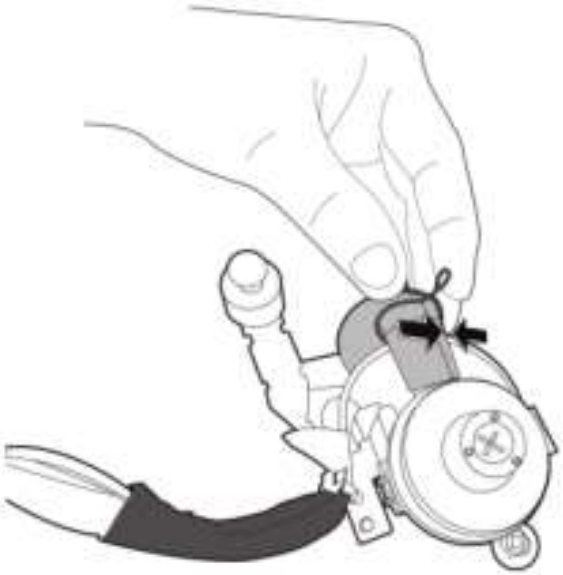
Procedure	Illustration
1) Remove 4 screws of water collector then remove it.(see CJ_MCA_011)	 CJ_MCA_011
2) Remove the nut of the fan and then pull up the fan (see CJ_MCA_012)	 CJ_MCA_012

Note: This section is for reference only. Actual unit appearance may vary.

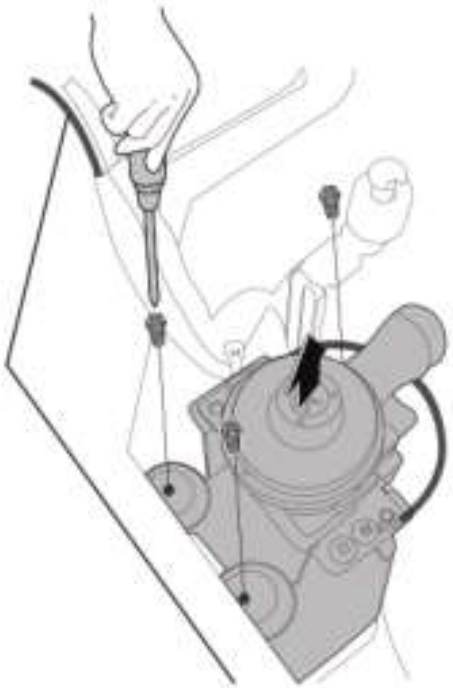
Procedure	Illustration
3) Remove the nuts and remove the fan motor(see CJ_MCA_013)	 CJ_MCA_013

1.4 Water Pump

Note: Remove the front panel, electrical parts and water collector (refer to 1.1,1.2 &1.3) before disassembling water pump.

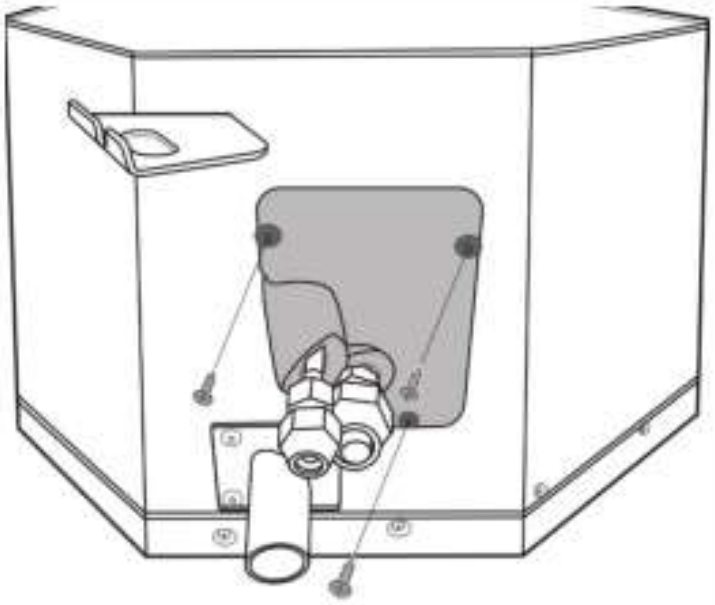
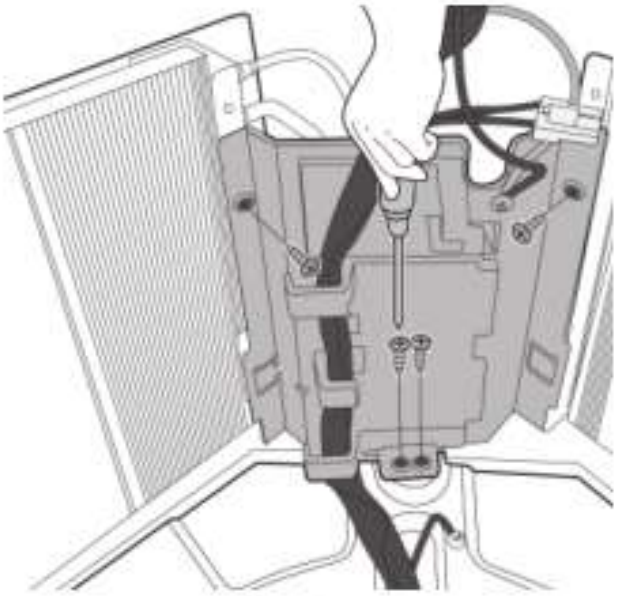
Procedure	Illustration
1) Take off the fasten belt of the water pump. (see CJ_MCA_014)	 CJ_MCA_014
2) Pinch the metal wire in the direction shown in the figure to release it. (see CJ_MCA_015)	 CJ_MCA_015

Note: This section is for reference only. Actual unit appearance may vary.

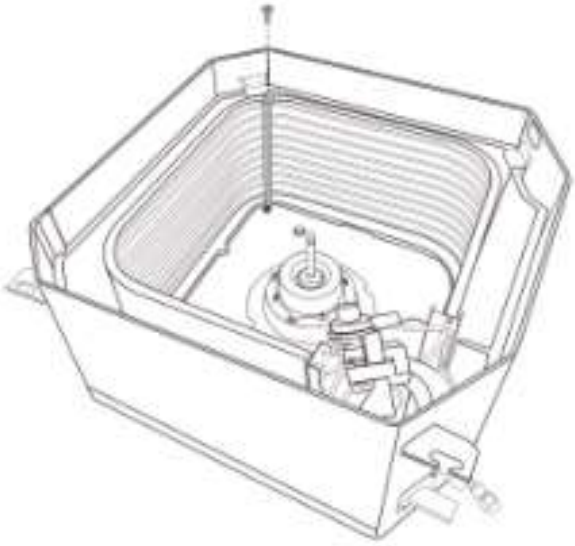
Procedure	Illustration
3) Remove 3 screws and then remove the water pump. (see CJ_MCA_016)	 CJ_MCA_016

1.5 Evaporator

Note: Remove the front panel, electrical parts and fan(refer to 1.1,1.2 &1.3) before disassembling evaporator.

Procedure	Illustration
1) Remove 3 screws of pipe clamp board assembly then remove it.(see CJ_MCA_017)	 CJ_MCA_017
2) Remove 4 screws of evaporator fixing board then remove it.(see CJ_MCA_018)	 CJ_MCA_018

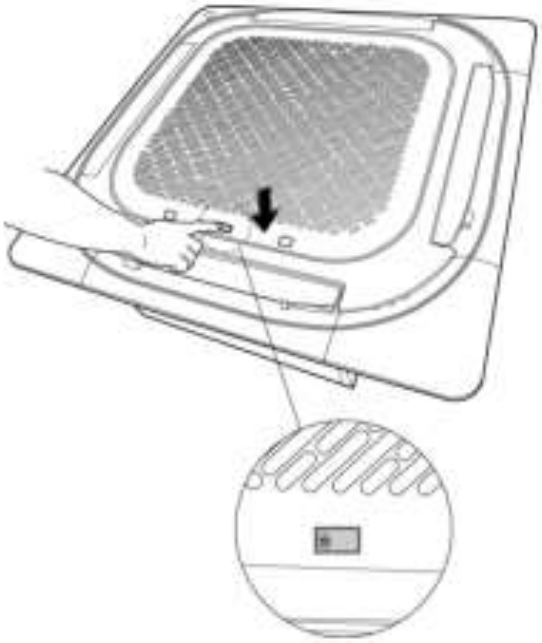
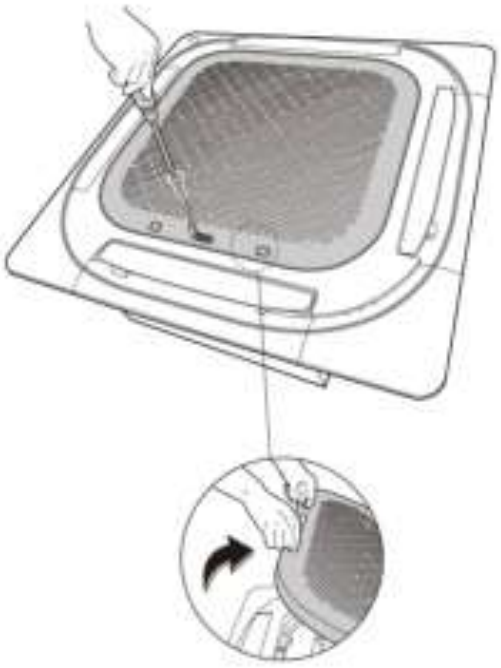
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Remove 1 screw of evaporator fixing hook and remove it. (see CJ_MCA_019)	 CJ_MCA_019

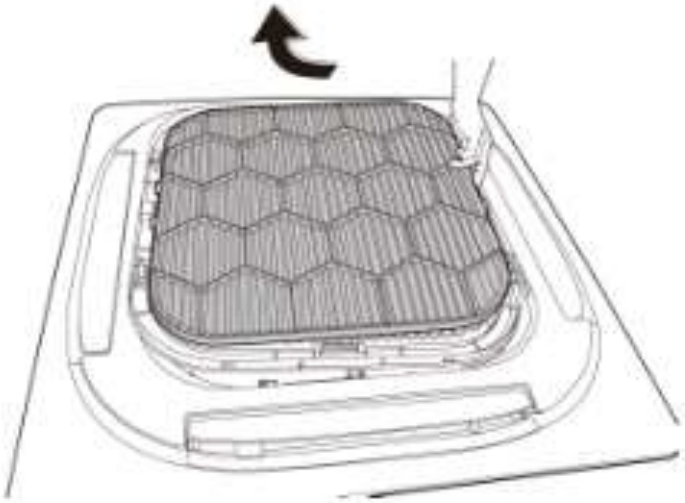
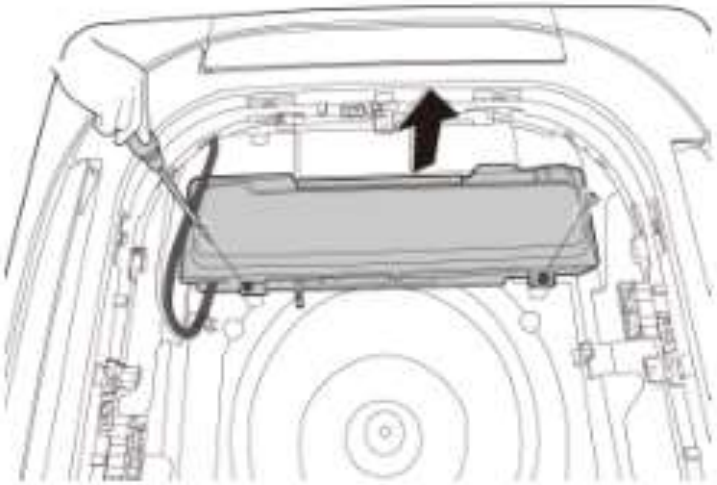
Note: This section is for reference only. Actual unit appearance may vary.

➢ New Cassette Unit

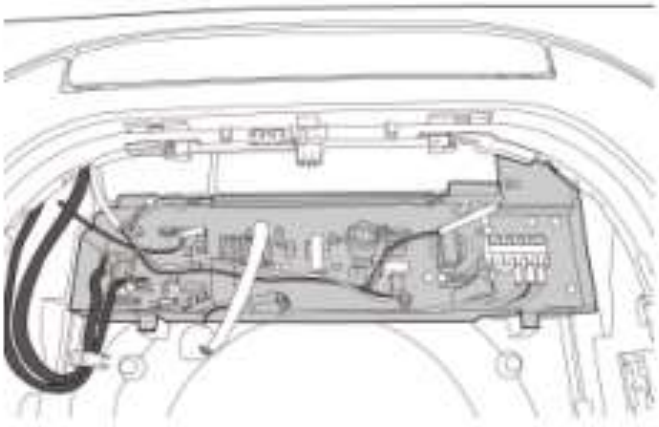
1.1 Front Panel

Procedure	Illustration
1) Push one side of the grille clamp. (see CJ_MCD1_001)	 CJ_MCD1_001
2) Remove one screw then push two grille clamps to remove the air inlet grille assembly.(see CJ_MCD1_002)	 CJ_MCD1_002

Note: This section is for reference only. Actual unit appearance may vary.

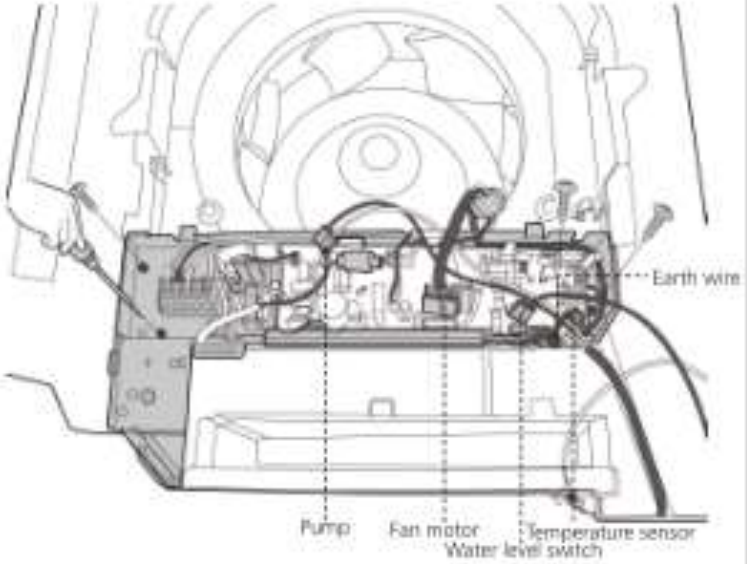
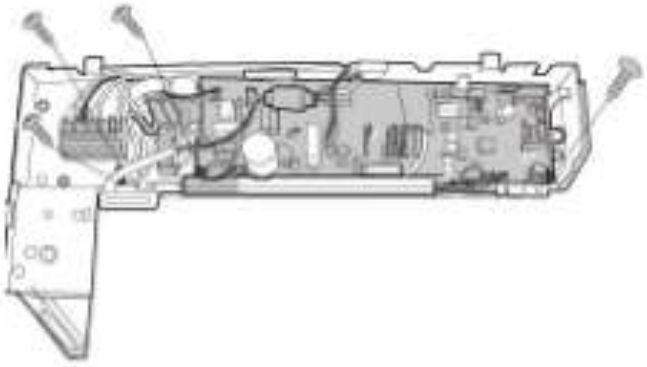
Procedure	Illustration
3) Turn over the air inlet grille assembly then pull up the filter. (see CJ_ MCD1_003)	 CJ_MCD1_003
4) Remove 2 screws and remove the cover of electronic control box. (see CJ_MCD1_004)	 CJ_MCD1_004

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
5) Disconnect the connectors of display board and stepper motor and release the panel. (see CJ_MCD1_005)	 CJ_MCD1_005

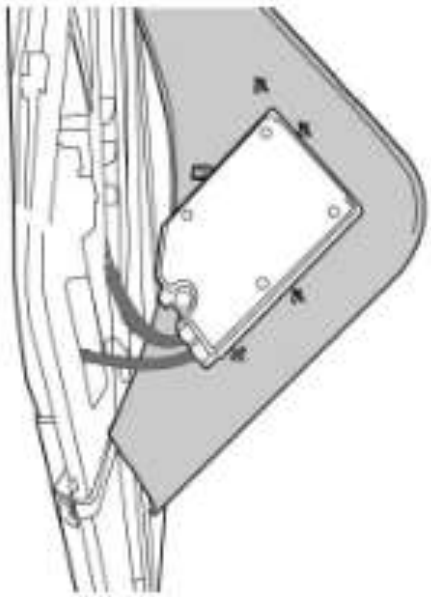
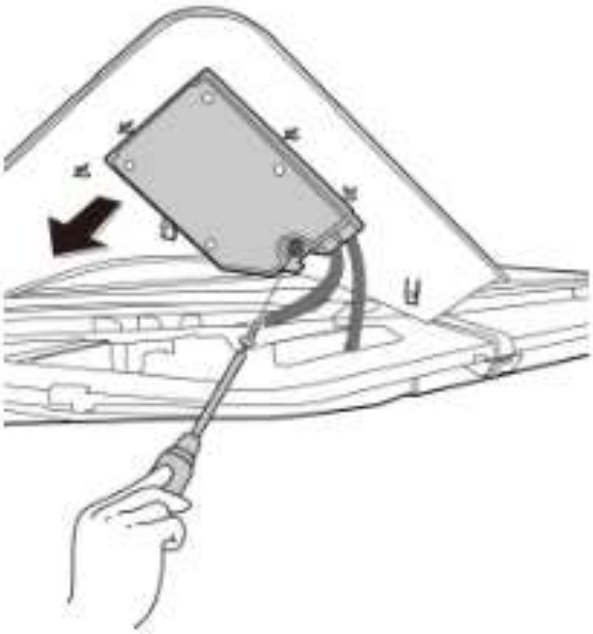
Note: This section is for reference only. Actual unit appearance may vary.

1.2 Electrical Parts (Antistatic gloves must be worn.)

Procedure	Illustration
1) Remove 3 screws of electronic control box and 1 screw of earth wire.(see CJ_MCD1_006) 2) Disconnect the connectors of temperature sensor, pump, motor and water level switch. (see CJ_MCD1_006) 3) Remove the electronic control box subassembly. (see CJ_MCD1_006)	 CJ_MCD1_006
4) Remove 2 screws of the main control board and 2 screws of earth wire. (see CJ_MCD1_007) 5) Disconnect connectors and then remove the main control board. (see CJ_MCD1_007)	 CJ_MCD1_007

Note: This section is for reference only. Actual unit appearance may vary.

1.3 Display Board

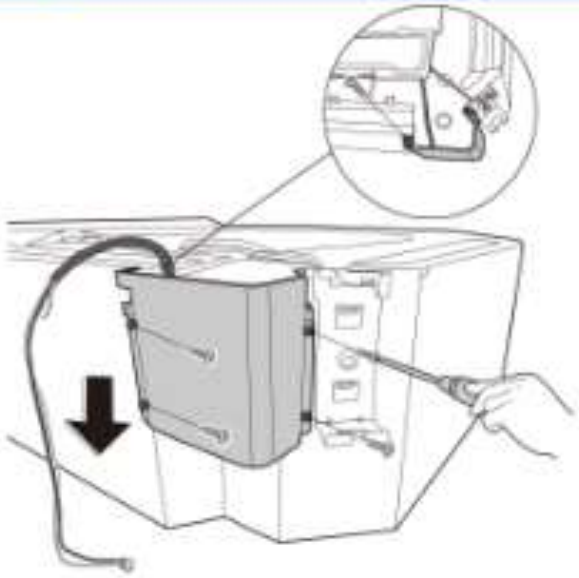
Procedure	Illustration
1) Open the install cover assembly(with display board) (see CJ_MCD1_008)	 CJ_MCD1_008
2) Remove 1 screw of display window board. (see CJ_MCD1_009)	 CJ_MCD1_009

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Turn over the display board, push the swtich to remove the display board (see CJ_MCD1_010)	 CJ_MCD1_010

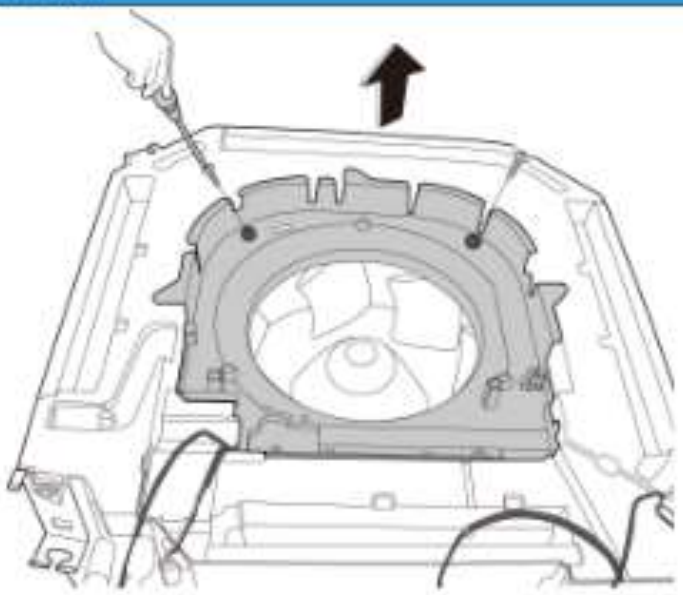
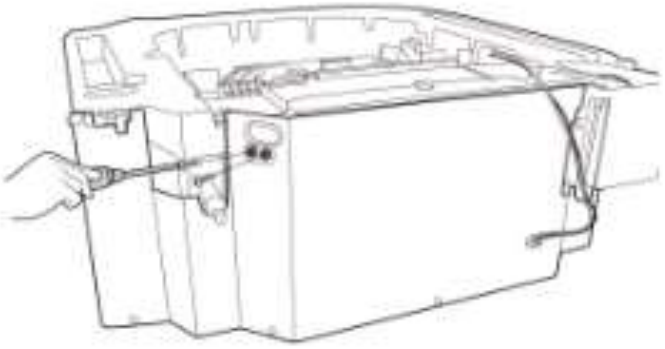
Note: This section is for reference only. Actual unit appearance may vary.

1.4 Water Pump

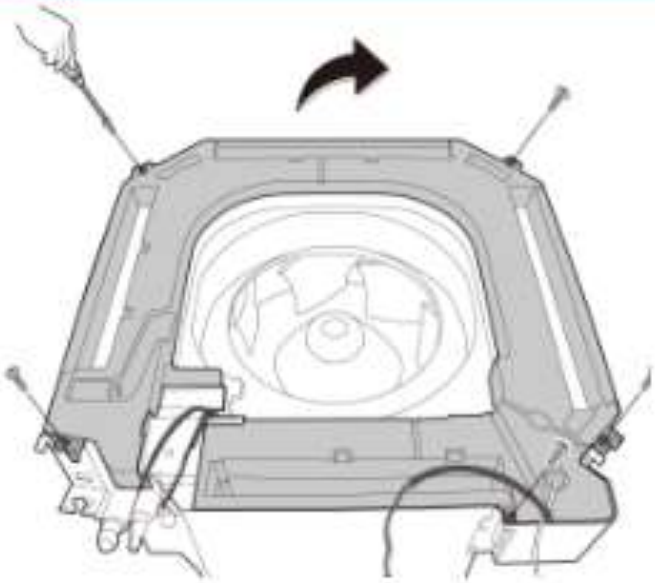
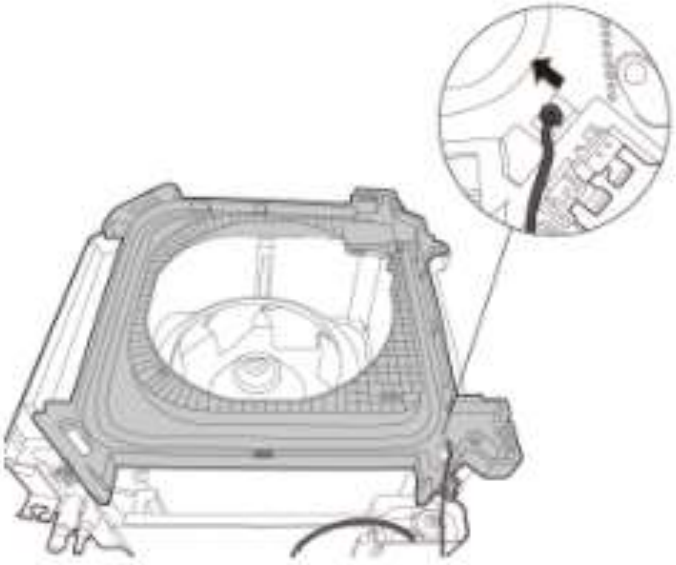
Procedure	Illustration
1) Remove 5 screws fixing external water pump box assembly.(see CJ_MCD1_011)	 CJ_MCD1_011
2) Remove the water pump box assembly. (see CJ_MCD1_012)	 CJ_MCD1_012

Note: This section is for reference only. Actual unit appearance may vary.

1.5 Water Collector and Water Level Switch

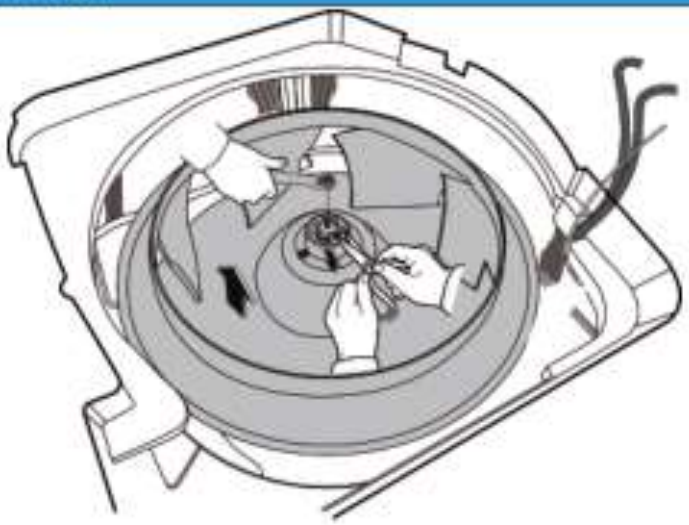
Procedure	Illustration
1) Remove the 2 screws of the ventilation ring. (see CJ_MCD1_013)	 CJ_MCD1_013
2) Remove the 2 screws fixing the water collector. (see CJ_MCD1_014)	 CJ_MCD1_014

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Remove the 5 screws of the water collector subassembly. (see CJ_ MCD1_015)	 CJ_MCD1_015
4) Turn over the water collector subassembly and remove the water level switch. (see CJ_MCD1_016)	 CJ_MCD1_016

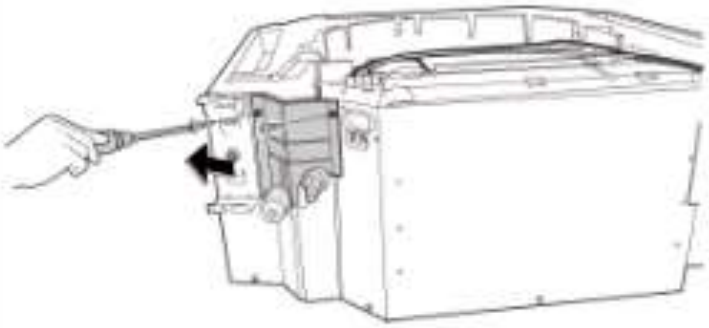
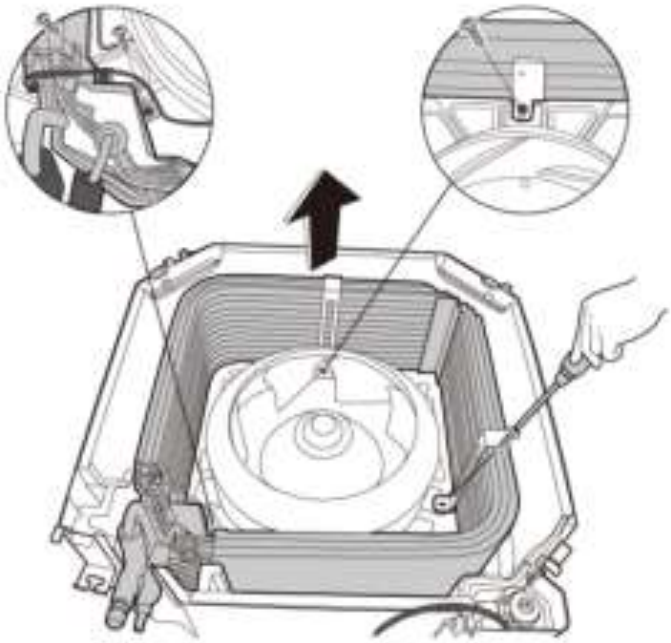
Note: This section is for reference only. Actual unit appearance may vary.

1.6 Fan Motor and Fan

Procedure	Illustration
1) Remove the nut of the fan and then pull up the fan. (see CJ_MCD1_017)	 CJ_MCD1_017
2) Remove 2 screws of fixing board and 3 nuts of fan motor. (see CJ_MCD1_018)	 CJ_MCD1_018

Note: This section is for reference only. Actual unit appearance may vary.

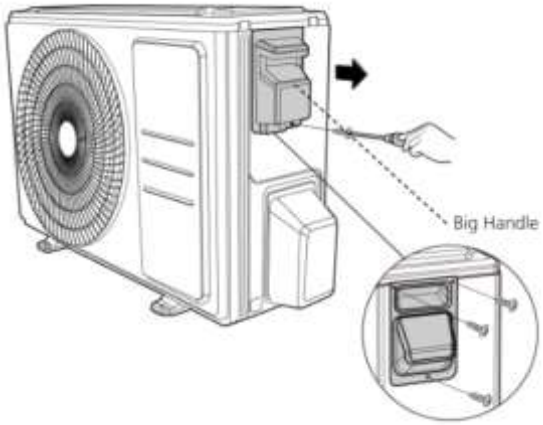
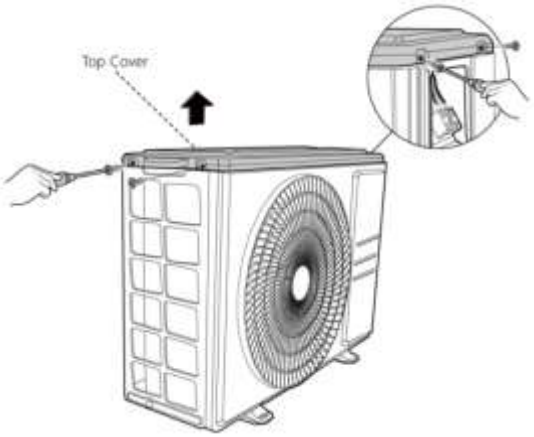
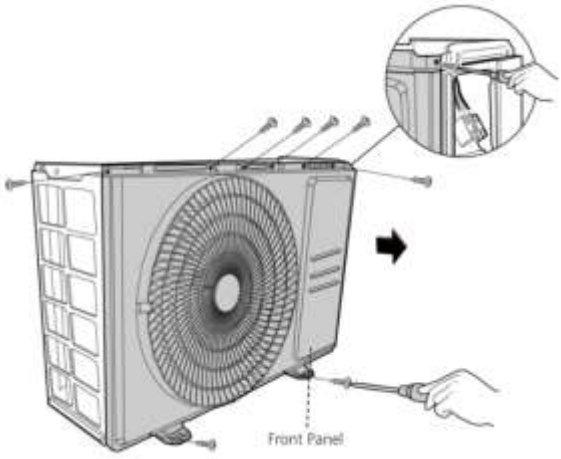
1.7 Evaporator

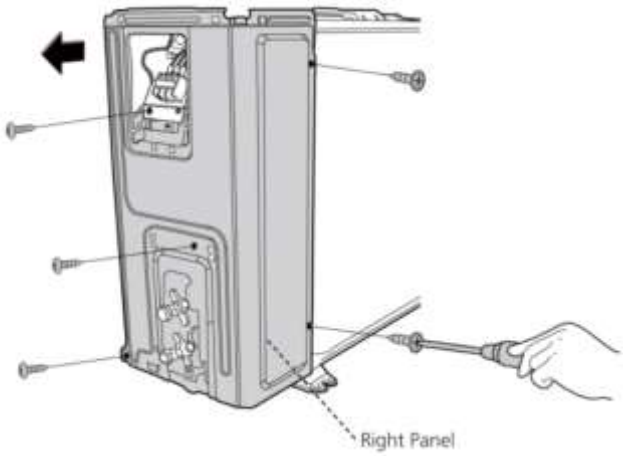
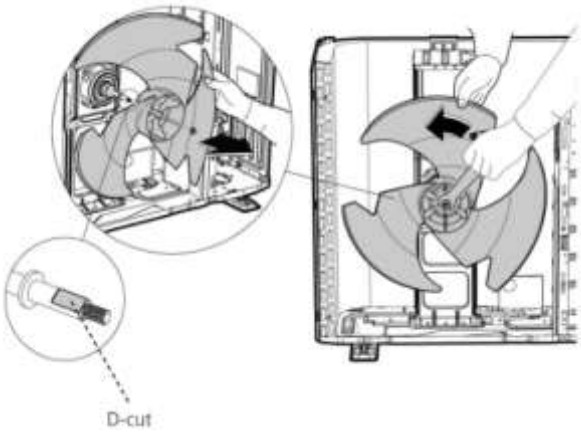
Procedure	Illustration
1) Remove 2 screws of pipe clamp board. (see CJ_MCD1_019)	 CJ_MCD1_019
2) Remove 4 screws of the evaporator fixing bracket and then remove it. (see CJ_MCD1_020)	 CJ_MCD1_020

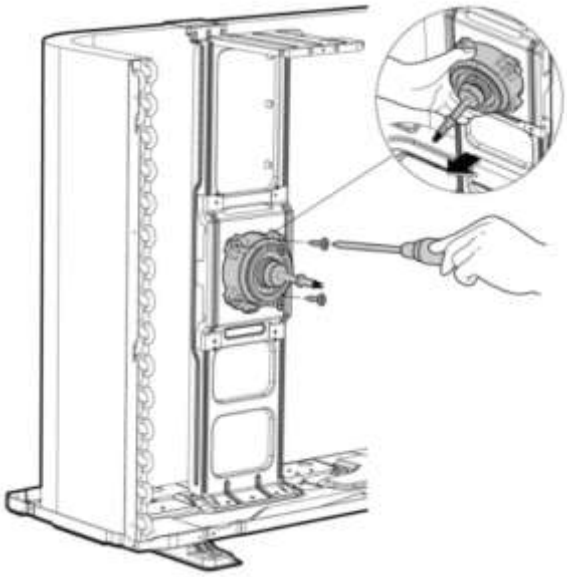
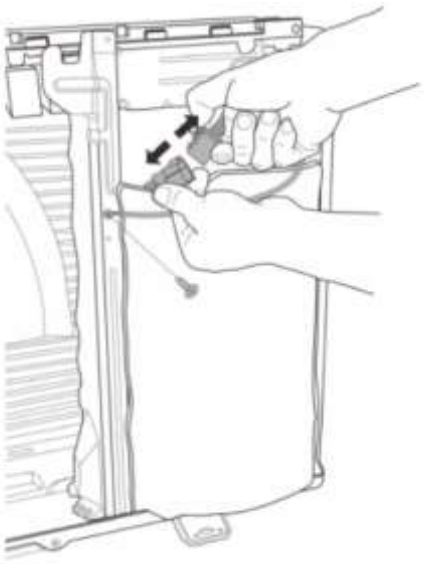
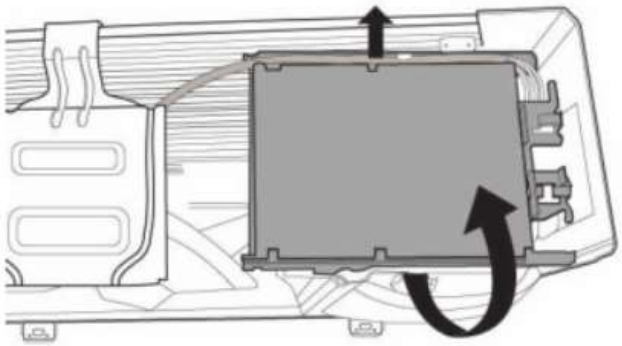
Note: This section is for reference only. Actual unit appearance may vary.

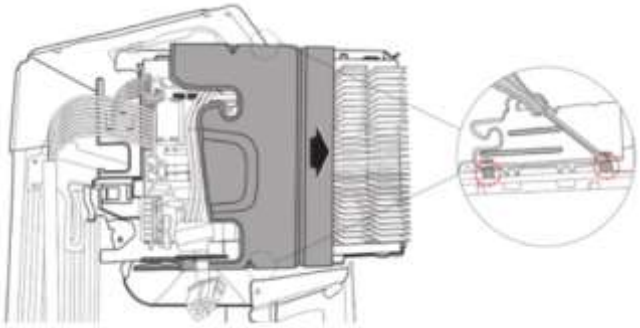
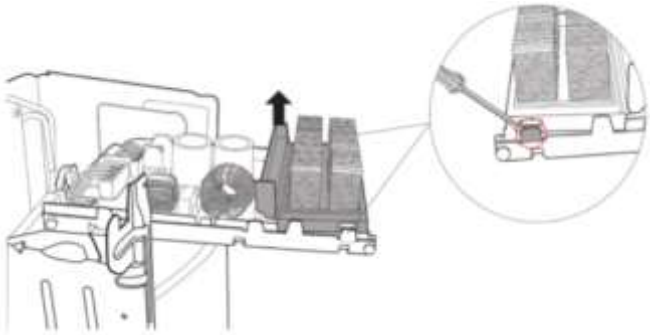
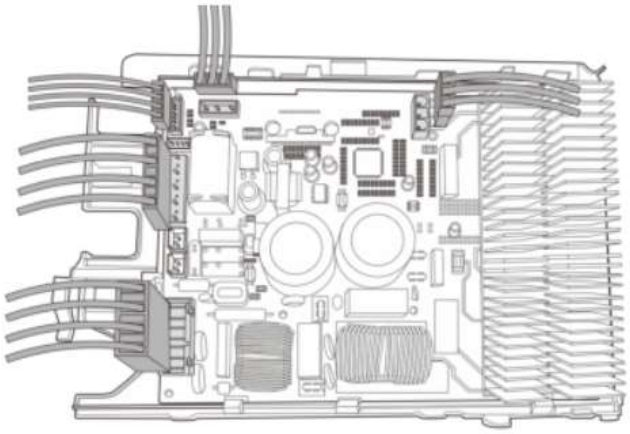
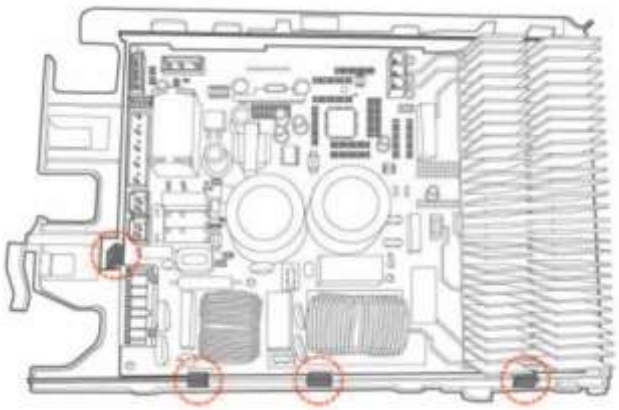
16.2 Outdoor unit

- **MOX230-09HFN1-MW5W, MOX230-12HFN1-MV5W, MOX330-09HFN1-MY5W, MOX330-12HFN1-MW5W**

No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1)Stop operation of the air conditioner and turn "OFF" the power breaker. 2) Remove the big handle first(3 screws) 3) Remove the top cover (4 screws) 4)Remove the screws of front panel(9 screws)	  

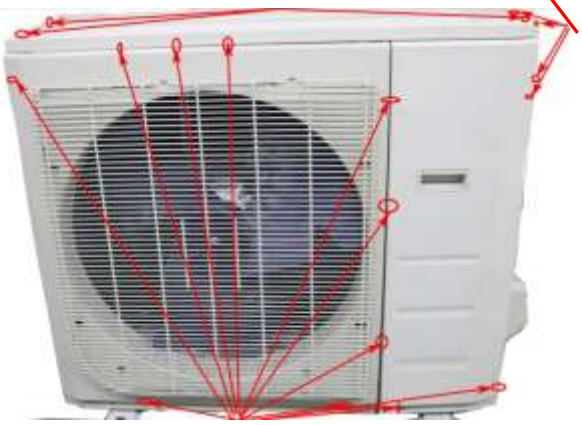
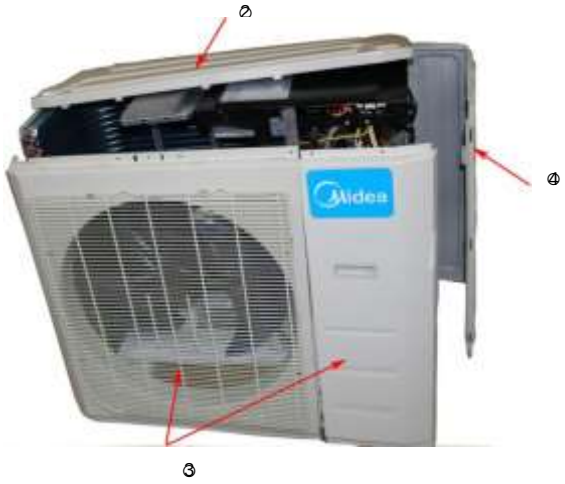
		5) Remove the screws of the right side panel(5 screws)	
2	Fan ass'y	How to remove the fan ass'y. 1)After remove the panel plate following procedure 1 2) Remove the nut fixing the fan, and remove the fan. 3) Remove the four fixing screws of the fan motor, then remove the motor.	

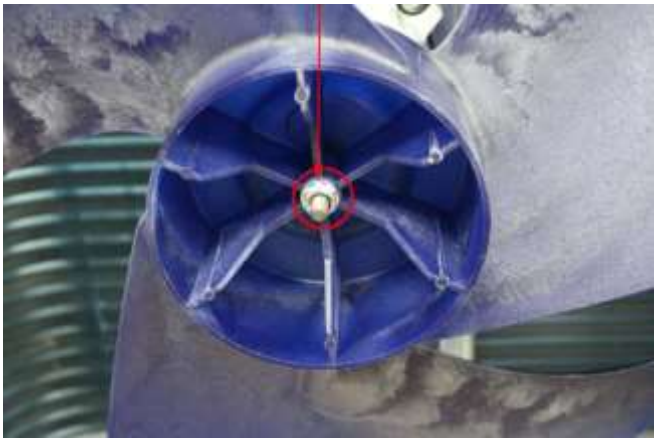
			
3	Electrical parts	How to remove the electrical parts. 1) After finish work of item 1 and item 2, disconnect the connector for compressor and release the ground wire(1 screw). 2) Pull out the wires from electrical supporting plate and turn over the electronic control assembly. 3) Remove the electronic installing box subassembly	 

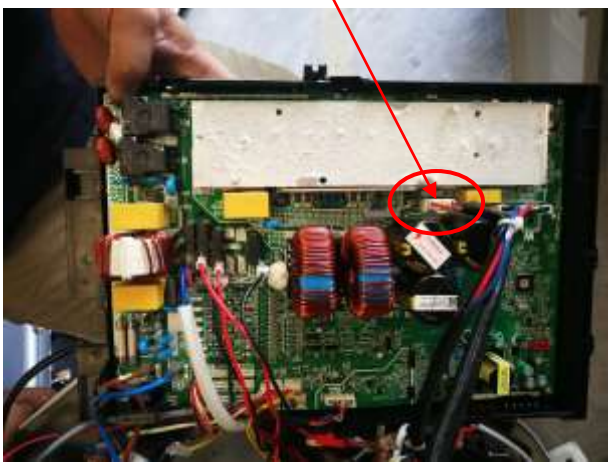
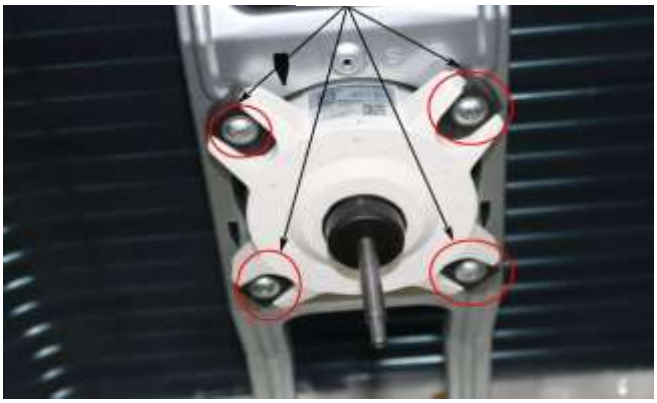
		4) Remove the fixing board (2 hooks) 5) Disconnect the connectors from the electronic control board. 6) Then remove the electronic control board (4 hooks)	   

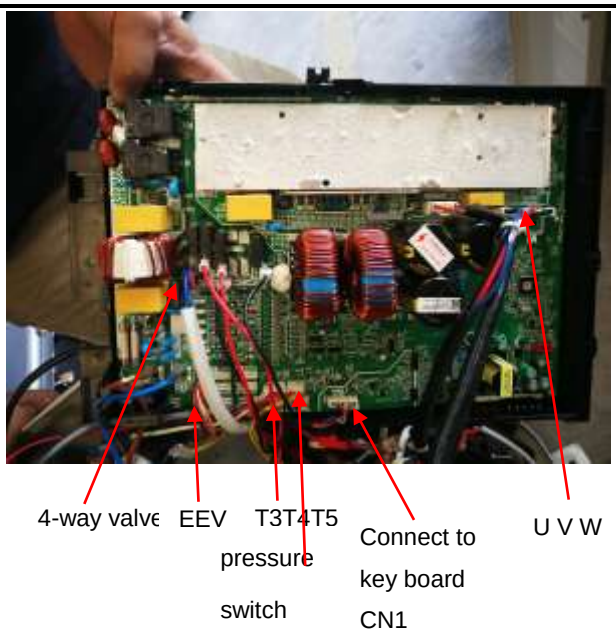
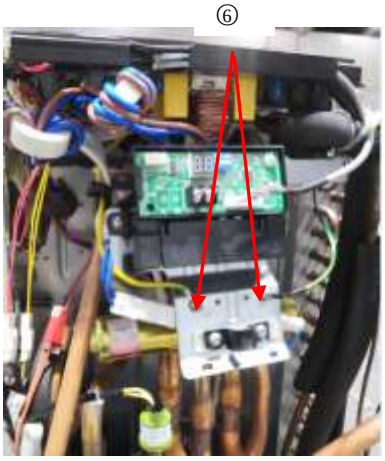
4	Four-way valve	How to remove the four-way valve. 1) Perform work of item 1,2,3. 2) Recover refrigerant from the refrigerant circuit. 3) Remove the screw of the coil and then remove the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed	The picture of four-way valve may be different from the one on your side. ③ ④ 
5	Compressor	How to remove the compressor. 1) After perform work of item1,2,3. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	②   ③

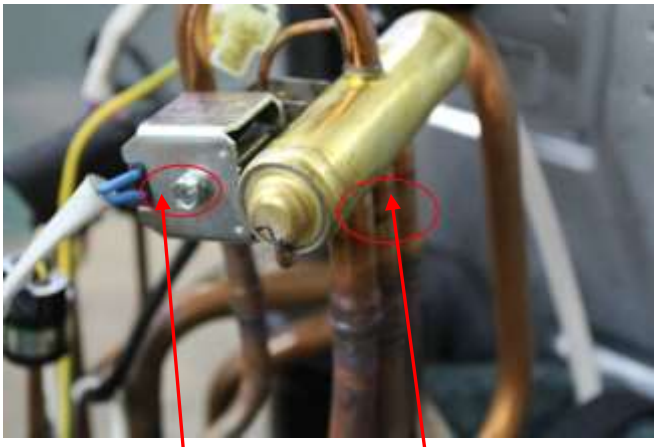
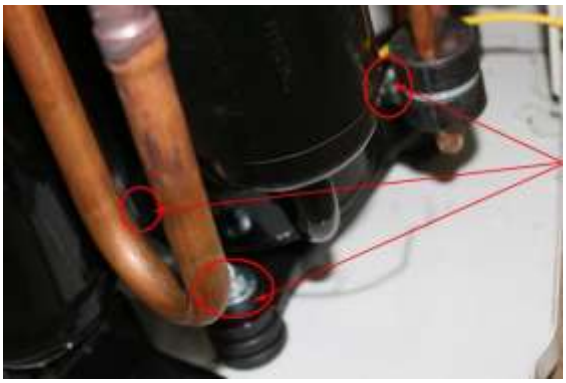
➢ **MOD30-24HFN1-MU0W, MOD30U-36HFN1-MP0(GA)**

No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the big handle first,then remove the top cover (7 screws) 3)Remove the screws of front panel(11 screws) (4) Remove the screws of the right side panel(13 screws)	4 screws of big handle **Screws of top panel(3screws,1screws is under the big handle)**  \ **Screws of front panel(11 screws)** 

2	Fan ass'y	How to remove the fan ass'y. 1) After remove the panel plate following procedure 1 2) Remove the nut fixing the fan,and remove the fan. 3) Unfix the hooks and then open the electronic control box cover (4 hooks). 4) Remove 6 screws on the electronic control board and then turn over the electronic control board.	fan Electronic control box  compressor ②  

		5) Disconnect the connector of fan motor from the electronic control board. 6) Remove the four fixing screws of the fan motor, then remove the motor.	 ⑤  ⑥ 
3	Electrical parts	How to remove the electrical parts. 1) After finish work of item 1 and item 2, remove	①

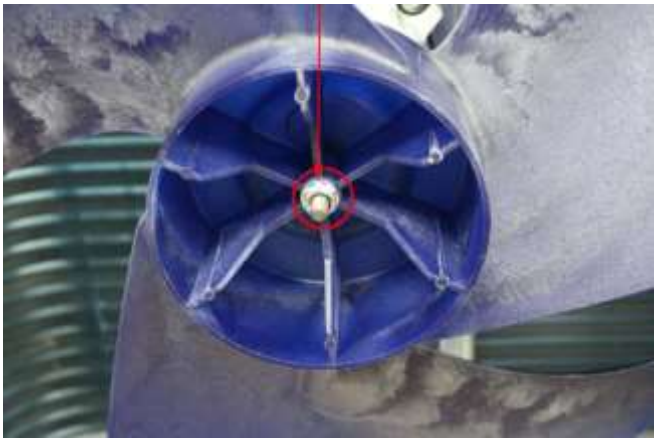
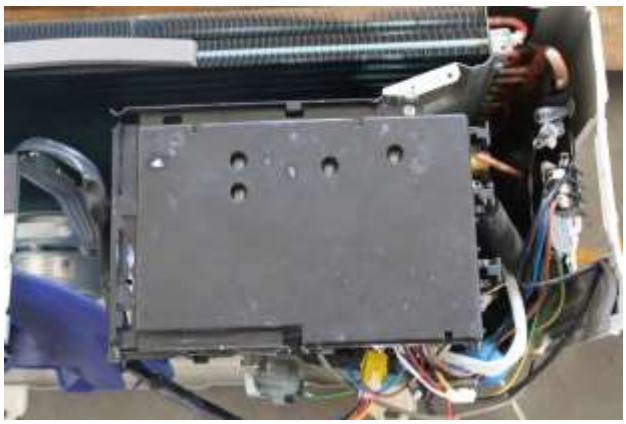
		the connector for the compressor 1) Pull out the connectors from the electronic control board. 5) Pull out the connector, remove one screw and then remove the key board subassembly on terminal board. 6) Remove the ground wires .	  ⑥ 

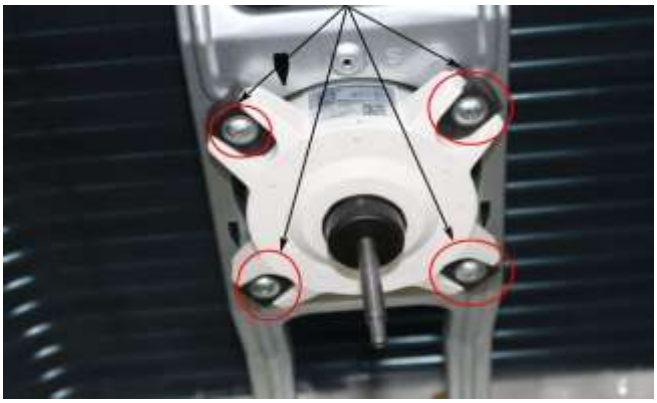
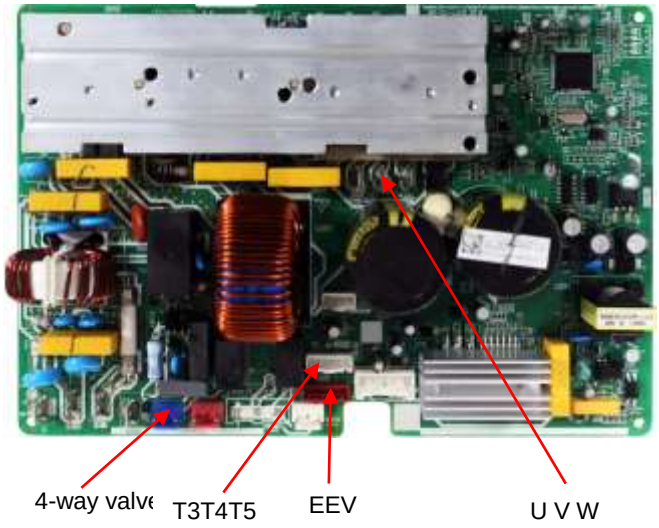
4	Four-way valve	How to remove the four-way valve. 1) Perform work of item 1,3. 2) Recover refrigerant from the refrigerant circuit. 3) Remove the screw of the coil and then remove the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed	The picture of four-way valve may be different from the one on your side.  ③ ④
5	Compressor	How to remove the compressor. 1) After perform work of item1,3. Recover refrigerant from the refrigerant circuit. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	⊘   ③

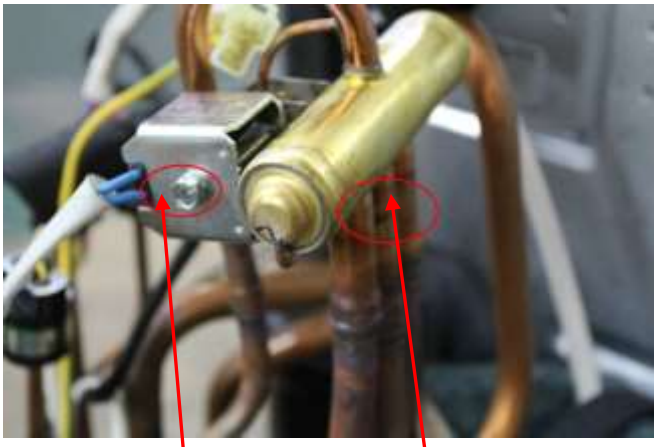
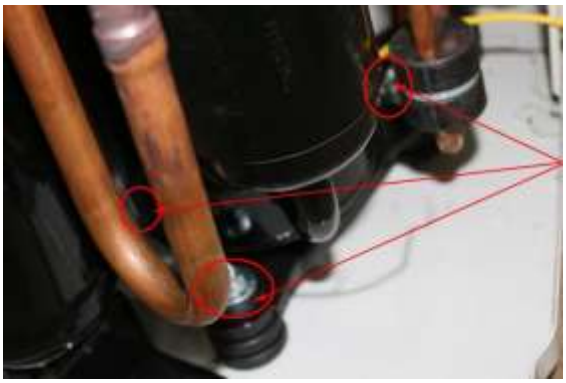
➢ **MOX430-17HFN1-MT0W, , MOX430-18HFN1-MU0W**

No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the big handle first(3 screws) 3) Remove the top cover, (3 screws) One of the screws is located underneath the big handle. 4)Remove the screws of front panel(9 screws)	   

		5) Remove the screws of the right side panel(6 screws)	

2	Fan ass'y	How to remove the fan ass'y. 1) After remove the panel plate following procedure 1 2) Remove the nut fixing the fan,and remove the fan. 3) Remove 5 screws on the electronic control board and then turn over the electronic control board.	fan Electronic control box  compressor  

		4) Disconnect the connector of fan motor from the electronic control board. 5) Remove the four fixing screws of the fan motor, then remove the motor.	④  ⑤ 
3	Electrical parts	How to remove the electrical parts. 1) After finish work of item 1 and item 2, remove the connector for the compressor 4) Pull out the connectors from the electronic control board.	

4	Four-way valve	How to remove the four-way valve. 1) Perform work of item 1,3. 2) Recover refrigerant from the refrigerant circuit. 3) Remove the screw of the coil and then remove the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed	The picture of four-way valve may be different from the one on your side.  ③ ④
5	Compressor	How to remove the compressor. 1) After perform work of item1,3. Recover refrigerant from the refrigerant circuit. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	②   ③

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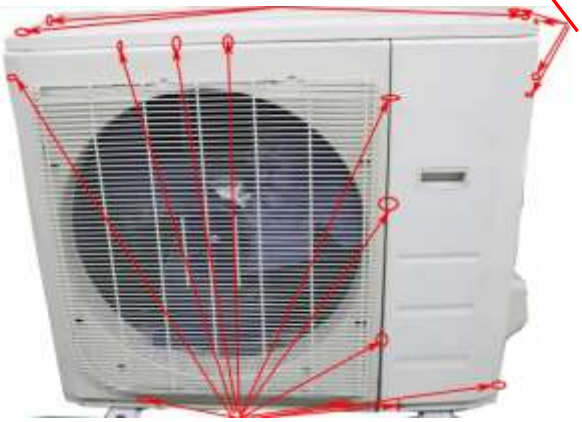
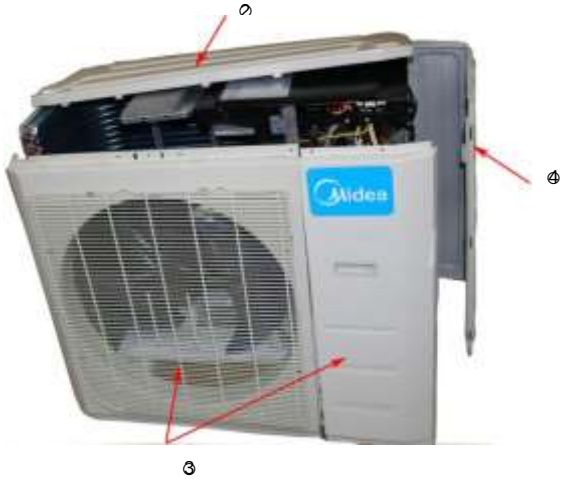
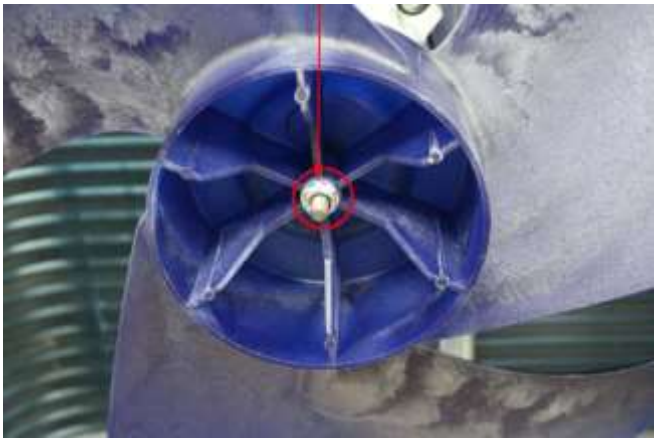
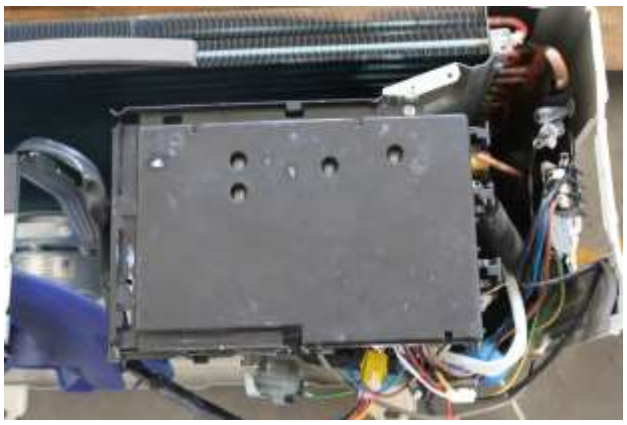
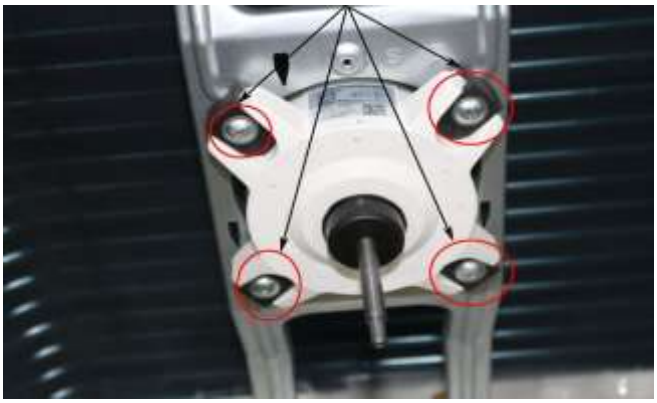
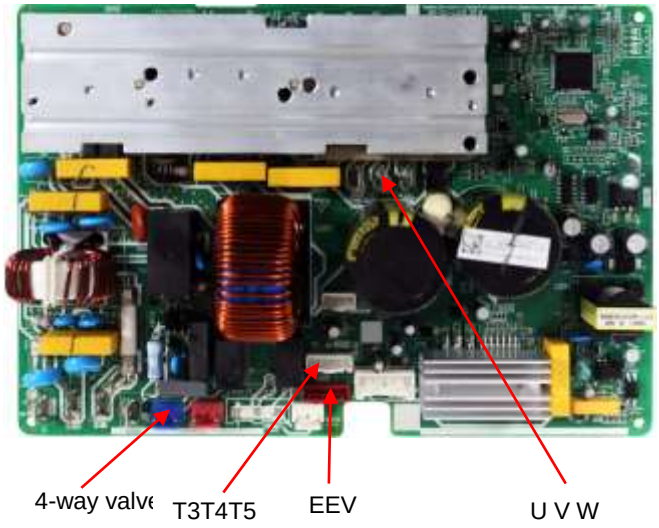
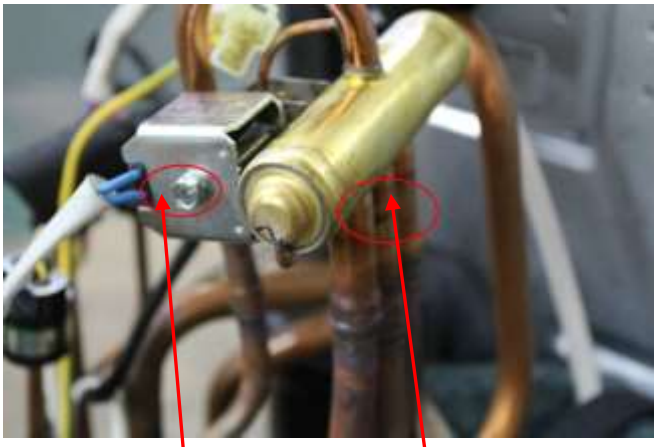
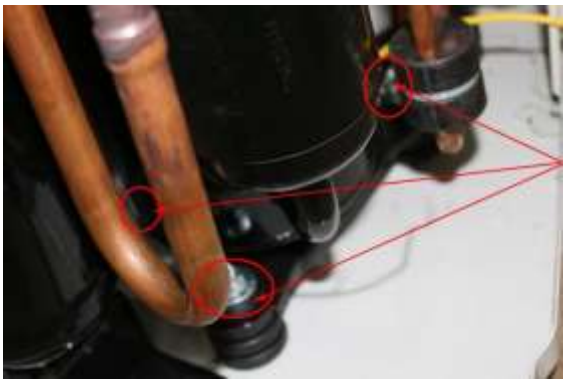
➢ **MOD33-24HFN1-MT0W**

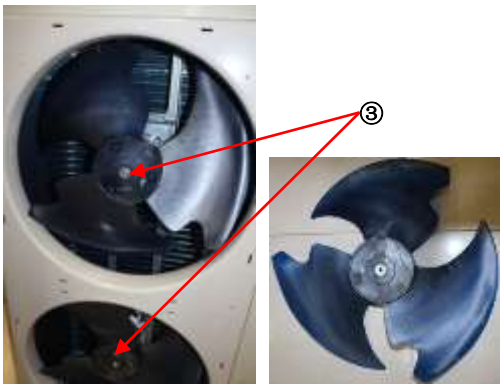
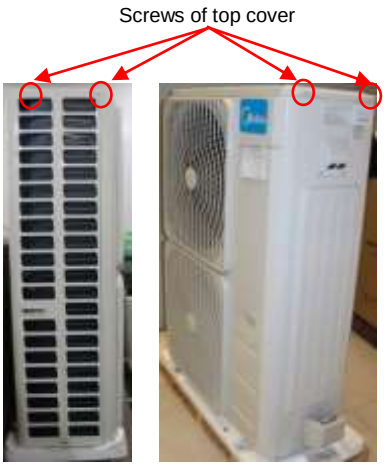
No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn “OFF” the power breaker. 2) Remove the big handle first,then remove the top cover (7 screws) 3)Remove the screws of front panel(11 screws) (4) Remove the screws of the right side panel(13 screws)	4 screws of big handle **Screws of top panel(3screws,1screws is under the big handle)**  **Screws of front panel(11 screws)** 

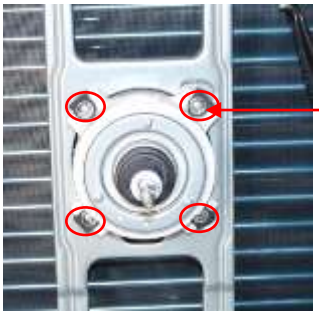
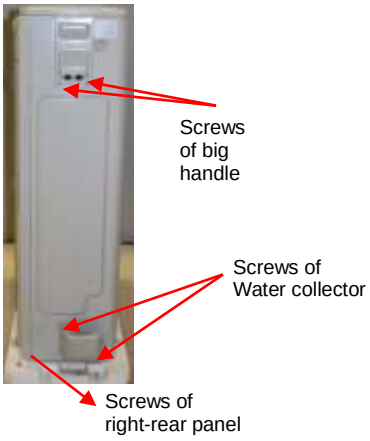
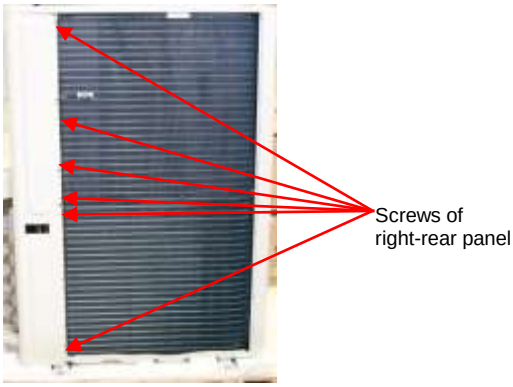
2	Fan ass'y	How to remove the fan ass'y. 1) After remove the panel plate following procedure 1 2) Remove the nut fixing the fan,and remove the fan. 3) Remove 5 screws on the electronic control board and then turn over the electronic control board.	fan Electronic control box  compressor ②  

		4) Disconnect the connector of fan motor from the electronic control board. 5) Remove the four fixing screws of the fan motor, then remove the motor.	④  ⑤ 
3	Electrical parts	How to remove the electrical parts. 1) After finish work of item 1 and item 2, remove the connector for the compressor 5) Pull out the connectors from the electronic control board.	

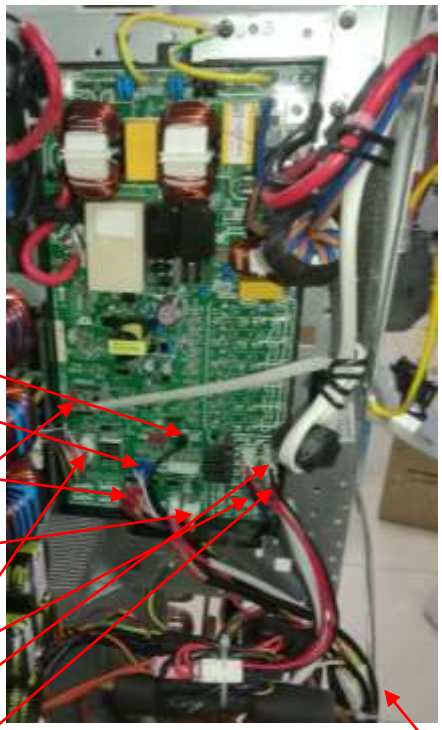
4	Four-way valve	How to remove the four-way valve. 1) Perform work of item 1,3. 2) Recover refrigerant from the refrigerant circuit. 3) Remove the screw of the coil and then remove the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed	The picture of four-way valve may be different from the one on your side.  ③ ④
5	Compressor	How to remove the compressor. 1) After perform work of item1,3. Recover refrigerant from the refrigerant circuit. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	②   ③

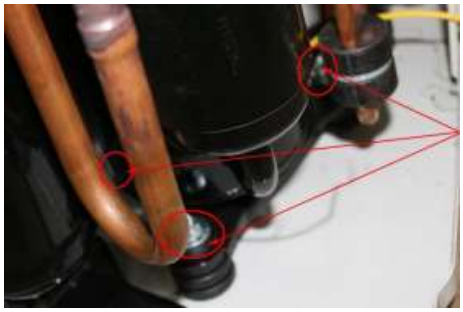
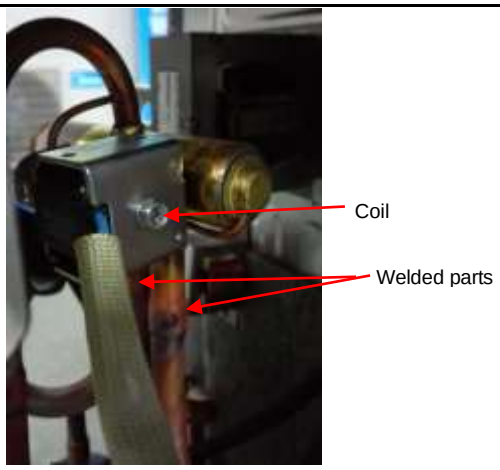
➢ **MOE30U-36HFN1-M(GA), MOE30U-48HFN1-MP0(GA), MOE30U-48HFN1-M-[X](GA)**

No.	Part name	Procedures	Remarks
1	Fan ass'y	How to remove the fan ass'y. 1) Stop operation of the air conditioner and turn "OFF" the power breaker. 2) Remove the screws of air outlet grille(8 screws) 3) Remove the hex nut fixing the fan. 4) Remove the fan. 5) Remove the screws of top cover, and remove the top cover. (4 screws) 6) Remove the screws of right front side panel, and remove the right front side panel (1	  

		screw) 7) Disconnect the fan motor connectors FAN1(3p,white) and FAN2(3p,white) from IPM board. 8) Remove the fan motor after unfastening fixing screws.	 
2	Panel plate	How to remove the panel plate. 1) Remove big handle.(2 screws) and water collector(2 screws) 2) Remove two screws of terminal board and seven screws of right-rear panel, and remove the right-rear panel.	 

3	Electrical parts	How to remove the electrical parts. 1) Perform work of item 1 step 5~6 and item 2. 2) Disconnect following 6 pieces of connection wires and connectors between IPM and other parts. CN3(red) CN2(black) U(blue),V(red),W(black) CN9(10p,white) CN8,CN5(3p) 3) Remove the 4 screws and unfix the 4 hooks and then remove the IPM module board.	  ②

		4) Disconnect the connectors and wires connected from PCB and other parts. Connectors: CN8: Discharge temperature sensor (2p,black) CN9:T3/T4 temperature sensor (2p/2p,blue) CN15/CN23: Electronic expansion valve (6p,red) CN10: High and low pressure switch (2p/2p, white) CN22:S1 and S2(1p/1p,red) Wires: CN17/CN18: 4-way valve (blue-blue) CN19/CN20: connected to crankcase heating cable. (black-red) CN24/CN25: Electric heater of chassis (black-red) CN6(10p,white) 5) Remove the 4 screws and unfix the 6 hooks and then remove the main control board.	 ④
4	Compressor	How to remove the compressor. 1) Perform work of item 1 step 5~6 and item 2. 2) Extract refrigerant gas. 3) Remove the sound insulation material and crankcase heating cable. 4) Remove terminal cover of compressor, and disconnect wires of crankcase electric	 ⑤

		heater and compressor from the terminal. 5) Remove the discharge pipe and suction pipe with a burner. 6) Remove the hex nuts and washers fixing the compressor to bottom plate. 7) Lift the compressor.	
5	The 4-way valve	How to remove the 4-way valve 1) Perform work of item 1 step 5~6 and item 2. 2) Extract refrigerant gas. 3) Remove the electrical parts from item 3. 4) Remove fixing screw of the coil, and remove the coil. 5) Detach the welded parts of 4-way valve and pipe.	
6	The expansion valve	How to remove the expansion valve 1) Perform work of item 1,2. 2) Remove the electrical parts from item 3. 3) Remove the coil. 4) Detach the welded parts of expansion valves and pipes.