R454B

Commercial Air Conditioners

Service

Atom X Series

Model:

208/230V 60Hz

MDV V18WMN10T

MDV V24WMN10T

MDV V30WMN10T

MDV V36WMN10T

MDV V48WMN10T

MDV V60WMN10T

CONTENTS

Part 1

General Information

1 Indoor and Outdoor Unit Capacities

1.1 Indoor Units

Table 1-1.1: Indoor unit abbreviation codes

Abbreviation code	Type
Q4C	Compact Four-way Cassette
Q4	Four-way Cassette
T3	Low Static Pressure Duct

Abbreviation code	Type
T2	Medium Static Pressure Duct
G	Wall-mounted
V	AHU

Table 1-1.2: Indoor unit capacity range

Capacity			index	Q4C	Q4	T3	T2	V	G
	kBtu/h	HP							
1.5	5	0.5		—	—			—	05
2.2	7	0.8	22	07	—	07			07
2.8	9	1	28	09	09	09			09
3.6	12	1.25	36	12	12	12	12	12	12
4.5	15	1.6	45	15	15	15			15
5.6	18	2		—	18	18	18	18	18
7.1	24	2.5		—	24	24	24	24	24
8.0	27	3		—					27
9.0	30	3.2		—	30	30	30		
11.2	36	4		—	36	36	36	—	—
14.0	48	5		—	48		48	—	—

1.2 Outdoor Units

Table 1-1.5: Outdoor unit capacity range

Capacity (kBtu/h)	
18.2 24.4	MDV-V18WMN10T MDV-V24WMN10T
30.0	MDV-V30WMN10T
36.0	MDV-V36WMN10T
48.0	MDV-V48WMN10T
60.0	MDV-V60WMN10T

Notes:

1. Mini Series outdoor units could not be combined.

2 External Appearance

2.1 Indoor Units

Table 1-2.1: Indoor unit appearance

Compact Four-way Cassette Q4C 	Four-way Cassette Q4 
Low Static Pressure Duct T3 	Medium Static Pressure Duct T2 
AHU V 	Wall-mounted G 

2.2 Outdoor Units

Table 1-2.2: Outdoor unit appearance

MDV-V18WMN10T	MDV-V30WMN10T	MDV-V48WMN10T
		

3 Nomenclature

3.1 Indoor Units

3.1.1 Standard indoor units

Indoor units

M _ _ _ _ _ _ _ _

1 2 3 4 5 6 7

Legend		
No.		
1	M	Midea
2		VRF indoor unit
3	H	Function code H: HyperLink function
4	07	Capacity index (the capacity in kBtu/
5	Q1	Indoor unit type Q4C: Compact Four-way Cassette Q4: Four-way Cassette T3: Low Static Pressure Duct T2: Medium Static Pressure Duct G: Wall-mounted V: AHU
6	M	Power supply M: 208/230V-60Hz
7	N1	Refrigerant type N10: R454B

3.2 Outdoor Units

MDV _ _ _ _ _ _ _ _

1 2 3 4 5 6 7

Legend		
No.		
1	MD	
2	V	All DC inverter
3	18	Capacity index (the capacity in kBtu/
4	W	Unit category (W: VRF outdoor unit)
5	M	Power supply M: 208/230V-60Hz
6	N1	Refrigerant type N10: R454B
7	T	Function code Triple application

4 Combination Ratio

Combination ratio = Sum of capacity indexes of the indoor

Table 1-4.1: Indoor and outdoor unit combination ratio limitations

Units (kBtu/h)	Minimum combination ratio	Maximum combination ratio
18/24	65%	
	50%	130%

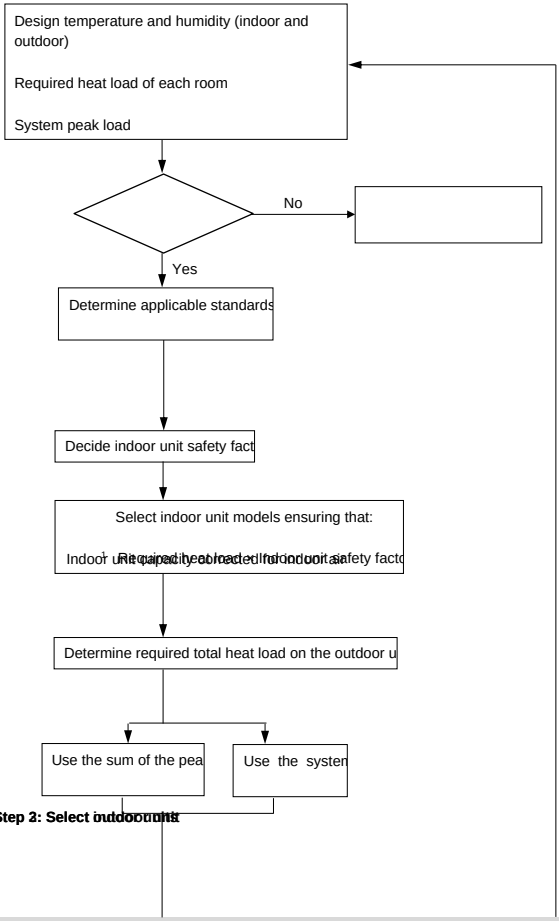
Table 1-4.2: Combinations of Indoor and outdoor units

Ton	Capacity index	Sum of capacity indexes of connected VRF indoor units	Maximum number of indoor units
1.5	18	36 to 115.2	3
2.0	24	46.5 to 144	4
2.5	30	61.5 to 196.8	5
3.0	36	70 to 224	5
4.0	48	77.5 to 248	7
5.0	60	87.5 to 280	9

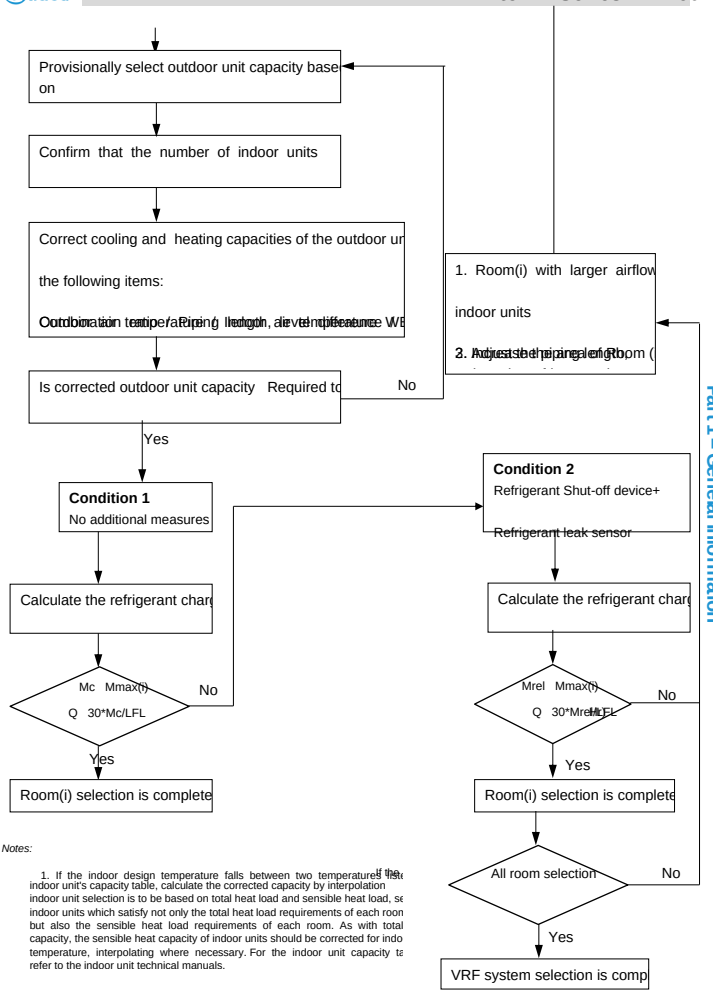
5 Selection Procedure

5.1 Procedure

Step 1: Establish design conditions



Step 2: Select outdoor units



Notes:

1. If the indoor design temperature falls between two temperatures liste
indoor unit's capacity table, calculate the corrected capacity by interpolation
indoor unit selection is to be based on total heat load and sensible heat load, se
indoor units which satisfy not only the total heat load requirements of each roon
but also the sensible heat load requirements of each room. As with total
capacity, the sensible heat capacity of indoor units should be corrected for indo
temperature, interpolating where necessary. For the indoor unit capacity ta
refer to the indoor unit technical manuals.

Part 2

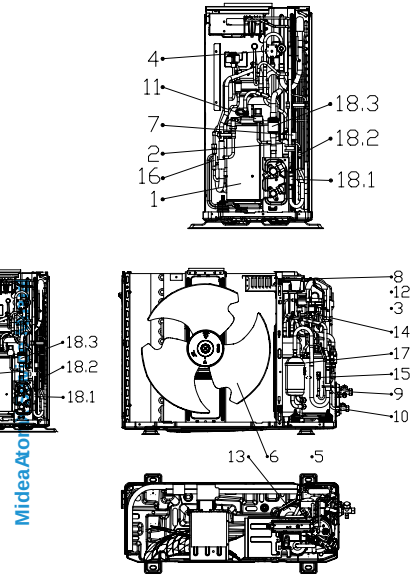
Component Layout an

Refrigerant Circ

1 Layout of Functional Components

1.1 1.5/2.0ton layout of functional components

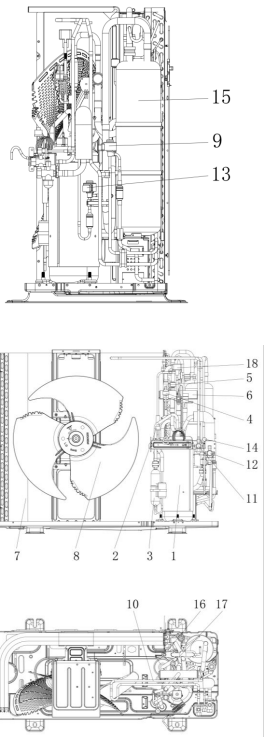
Figure 2-1.1: 1.5/2.0ton layout of functional components



Legend	
No.	**Parts name**
1	Compressor
2	One way valve
3	High pressure switch
4	4-way valve(ST1)
5	Heat exchanger
6	Fan
7	Electronic expansion valve (EEVA)
8	Radiator
9	Stop valve (liquid side)
10	
11	
12	
13	
14	
15	
16	
17	
18	

1.2 2.5/3.0ton layout of functional components

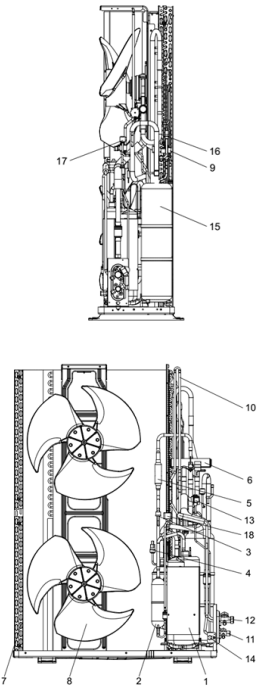
Figure 2-1.2: 2.5/3.0ton layout of functional components



Legend	
No.	**Parts name**
1	Compressor
2	High pressure switch
3	Oil separator
4	High pressure sensor
5	One way valve
6	4-way valve(ST1)
7	Heat exchanger
8	Fan
9	Electronic expansion valve (EEVA)
10	Radiator
11	Stop valve (liquid side)
12	Stop valve (gas side)
13	Electronic expansion valve (EEVD)
14	Services valve
15	Gas-liquid separator
16	Fusible plug
17	Low pressure sensor
18	Solenoid valve

1.3 4.0/5.0ton layout of functional component

Figure 2-1.3: 4.0/5.0ton layout of functional components

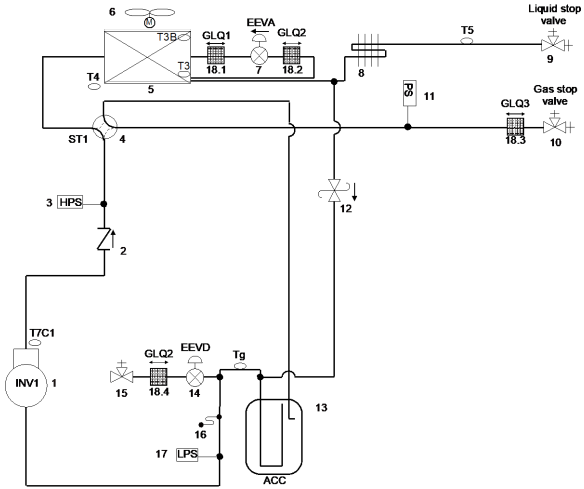


Legend	
No.	**Parts name**
1	Compressor
2	Oil separator
3	High pressure switch
4	High pressure sensor
5	One way valve
6	4-way valve(ST1)
7	Heat exchanger
8	Fan
9	Electronic expansion valve (EEVA)
10	Radiator
11	Stop valve (liquid side)
12	Stop valve (gas side)
13	Electronic expansion valve (EEVD)
14	Services valve
15	Gas-liquid separator
16	Fusible plug
17	Low pressure sensor
18	Solenoid valve

2 Piping Diagrams

2.1 1.5/2.0ton piping diagram

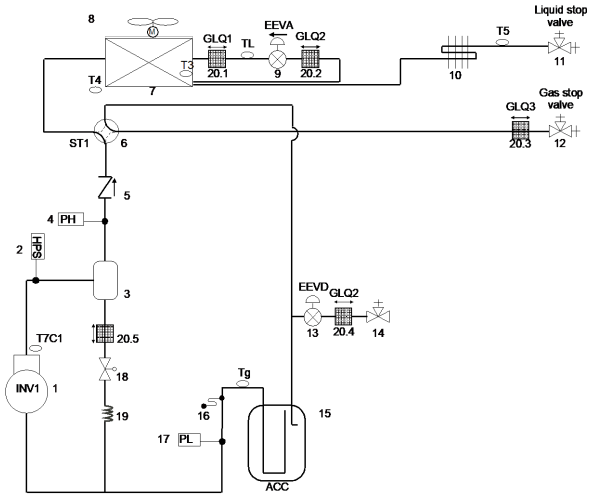
Figure 2-2.1: 1.5/2.0ton piping diagram



Legend			
No.	**Parts name**	**No.**	**Parts name**
1	Compressor	14	Electronic expansion valve (EEVD)
2	One-way valve	15	Services valve
3	High pressure switch	16	Fusible plug
4	Four-way valve	17	Low pressure switch
5	Fan	18.1-18.3	Filter
6	High pressure sensor	**Sensor Cod**	**Description**
7	Electronic expansion valve (EEV		Heat exchanger deicer temperature sensor
8	Radiator	T4	Outdoor air temperature sensor
9	Stop valve(gas side)	T5	Liquid pipe temperature sensor
10		T7C1	Compressor discharge temperature sens
11		T3B	Temperature sensor in the middle of the heat exchanger pipe
12		Tg	Gas pipe temperature sensor
13			

2.2 2.5/3.0ton piping diagram

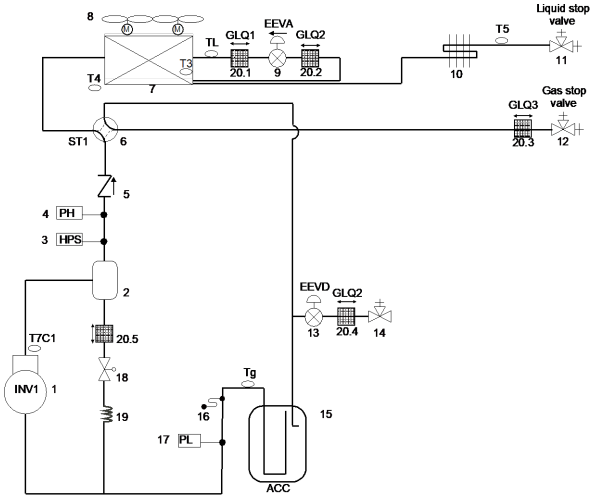
Figure 2-2.2: 2.5/3.0ton piping diagram



Legend			
No.	**Parts name**	**No.**	**Parts name**
1	Compressor	15	Gas-liquid separator
2	High pressure switch	16	Fusible plug
3	Oil separator	17	Low pressure sensor
4	High pressure sensor	18	Solenoid valve
5	One-way valve	19	Capillary tube
6	Four-way valve	20.1-20.5	Filter
7	Heat exchanger	**Sensor Cod**	**Description**
8	Fan	T3	Heat exchanger deicer temperature sens
9	Electronic expansion valve (EEV		Outdoor air temperature sensor
10		T5	Liquid pipe temperature sensor
11		T7C1	Discharge temperature sensor
12		Tg	Gas pipe temperature sensor
13			Heat exchanger liquid temperature sens
14			

2.3 4.0/5.0ton piping diagram

Figure 2-2.3: 4.0/5.0ton piping diagram



Legend			
No.	**Parts name**	**No.**	**Parts name**
1	Compressor	15	Gas-liquid separator
2	Oil separator	16	Fusible plug
3	High pressure switch	17	Low pressure sensor
4	High pressure sensor	18	Solenoid valve
5	One-way valve	19	Capillary tube
6	Four-way valve	20.1-20.5	Filter
7	High pressure sensor	**Sensor Cod**	**Description**
8	Fan	T3	Heat exchanger deicer temperature sensor
9	Electronic expansion valve (EEV		Outdoor air temperature sensor
10		T5	Liquid pipe temperature sensor
11		T7C1	Discharge temperature sensor
12		Tg	Gas pipe temperature sensor
13			Heat exchanger liquid temperature sens
14			

2.4 Key components

1. **Oil separator:**
   of the compressor and quickly returns it to the compressor.
   Separates oil from gas refrigerant pumped out

   efficiency is up to 99%.
2. **Gas-liquid separator:**
   Separates liquid refrigerant from gas refrigerant, stores liquid refrigerant and oil to protect compressor
   liquid

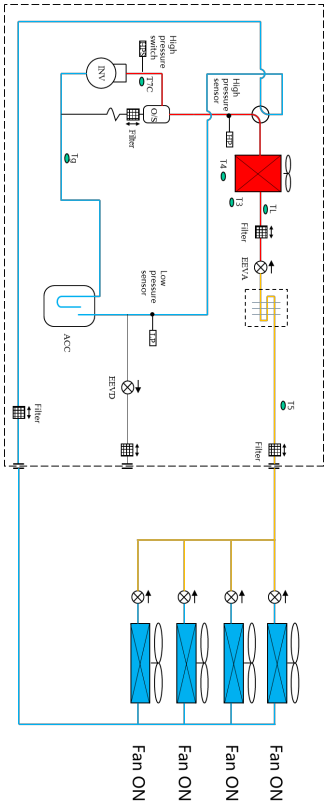
   hammering.

3. **Electronic expansion valve:**
   ".
   Controls refrigerant flow and throttling. When open, the heat exchanger functions as an evaporator; When closed, th
4. **Four-way valve:**
   Controls refrigerant flow direction. When open, the heat exchanger functions as a condenser. Refer to part 3, "Heat Exchanger Control
5. **High pressure switch:**
   Regulate system pressure. When system pressure rises above the upper limit, the high pressure switch turn off
   stopping
6. **High/Low pressure sensor**
   the compressor. When the high pressure protection recovers, the compressor restarts.
   Used to detect the system high/low pressure.

3 Refrigerant Flow Diagrams

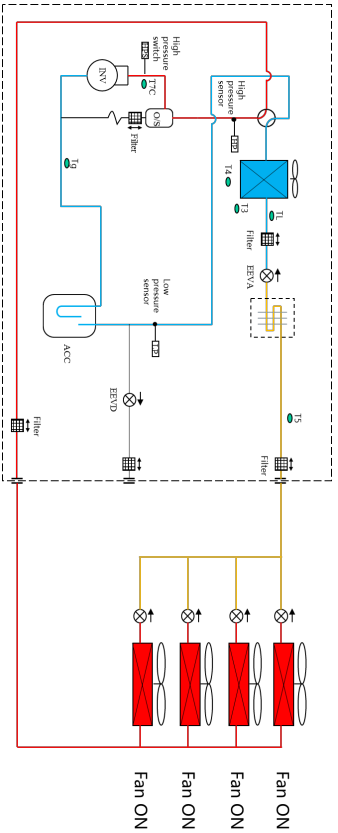
3.1 Cooling operation

Figure 2-3.1: Refrigerant flow during cooling operation



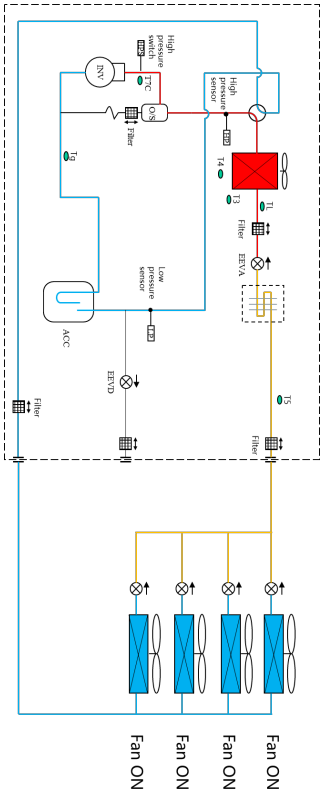
3.2 Heating operation

Figure 2-3.2: Refrigerant flow during heating operation



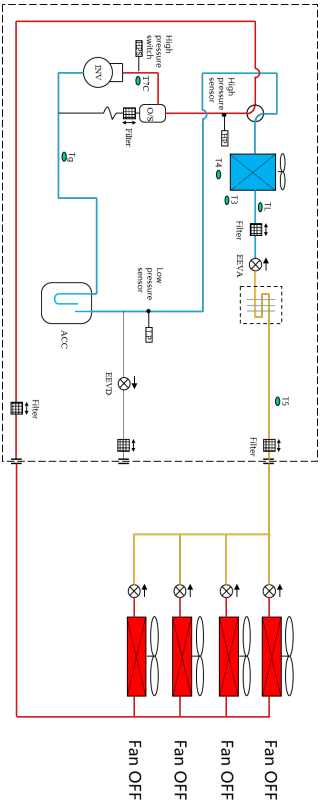
3.3 Oil return operation in cooling mode

Figure 2-3.3: Refrigerant flow during oil return operation in cooling mode



3.4 Oil Return/Defrost operation in heating mode

Figure 2-3.3: Refrigerant flow during oil return/defrost operation in heating mode



Part Control

1 Stop Operation

The stop operation occurs for one of the four following reasons:

will makes a 'stop

1. Abnormal shutdown: in order to protect the compressors, if an abnormal state occurs, the system
with thermos-off' operation and an error code will be displayed on the outdoor unit digital displays.
2. The system stops when the set temperature of all indoor unit has been reached, or all indoor units has stop or er
3. The ambient temperature is out of range, the thermo-ON capacity of cooling IDU is lower than 12 MBH (1.5-3ton
the thermo-ON capacity of cooling IDU is lower than 18 MBH (4-5ton).
4. The system stops when the operation mode is switching

Table 3-2.1: Component control during stop operation

		Symbol	Stop control
Part Name	Inverter compressor	INV	OFF
ODU	Inverter fan	[redacted]	
		ST1	Keep the state before stop
		EEV	300 pulse
IDU	Fan	Fan	
		EEV	Keeps for 3min, then open to 1200 pulse (2000P EEV) or 300 pulse (50

Notes: Inverter fan FANB is only available for 4/5ton.

1. The

2 Standby Control

2.1 Crankcase Heater Control

The crankcase heater is used to prevent refrigerant from mixing with compressor oil when the compressors are stop

crankcase heater is controlled mainly according to the minimum of discharge temperatures.
When the minimum of discharge temperatures is above 113 , the crankcase heater is off
When the minimum of ambient temperature < 50 and the compressor stops for more than 4 hours, the crankcase heater

turns on.

3 Startup Control

3.1 Third-part AHU start control

Outdoor unit receives 24V electrical signal from thermostat and determines operation mode. Continuous square sig
from

30 to 80 Hz which lasts more than 3 seconds is effective signal.

O type:

When thermostat is set with O type, and run into cooling mode, it will send 24V electrical signal from O/B and Y port
mode.

When thermostat is set with O type, board of outdoor unit receives the signal and operates in cooling mode.

When thermostat is set with O type, and run into heating mode, it will send 24V electrical signal from Y port on
thermostat

B type:

to Y port on signal board of outdoor unit. Outdoor unit receives the signal and operates in heating mode.

When thermostat is set with B type, and run into cooling mode, it will send 24V electrical signal from O/B port on therm

When thermostat is set with B type, and run into heating mode, it will send 24V electrical signal from O/B and Y port

3.2 Startup Control for Cooling Operation

Table 3-4.1: Component control during startup in cooling mode

Part Name		Symbol	Startup control
ODU	Inverter compressor	INV	32Hz for 60s, then start platform
	Inverter fan	FANA	
	Four way valve	ST1	OFF (cooling)
	Electronic expansion valves	EEV	320 pulse
IDU	Fan	Fan	Self-judge
	Electronic expansion valve	EEV	Initial open value for 5min, then PI control

Notes:

Inverter fan FANB is only available for 4/5ton.

1. The

3.3 Startup Control for Heating Operation

Table 3-4.2: Component control during startup in heating mode

Part Name		Symbol	Startup control
ODU	Inverter compressor	INV	32Hz for 60s, then start platform
	Inverter fan	FANA	
	Four way valve	ST1	ON (heating)
	Electronic expansion valves	EEV	More than 80 pulse
IDU	Fan	Fan	Self-judge
	Electronic expansion valve	EEV	Initial open value for 5min, then PI control

Notes:

Inverter fan FANB is only available for 4/5ton.

1. The

4 Normal Operation Control

4.1 Component Control during Normal Operation

Table 3-5.1: Outdoor unit component control during normal operation

Part Name	Symbol	Function of Functional Part	
		Cooling	Heating
Inverter compressor	INV	Pressure control: Compressor is used to maintain constant evaporating pressure in cool mode, and constant condensing pressure in heating mode Protection control: High pressure protection, Low pressure protection, Discharge temper Protection, Inverter protection	
Inverter fan	FANA		
Four way valve	ST1	OFF	ON
Electric expansion valve	EEVA	EEV is used to control discharge superheat, HEX outlet subcool and liquid pipe pressure	EEV is used to control discharge superhe and HEX outlet superheat

Notes:

Inverter fan FANB is only available for 4/5ton.

1. The

Table 3-5.2: Indoor unit component control during normal operation

Indoor unit actuator		Normal cooling	Normal heating
Fan	Thermo-ON unit	Remote controller setting	Remote controller setting
	Stopping unit	OFF	OFF
	Thermo-OFF unit	Remote controller setting	Remote controller setting
Electronic expansion valve (EEV)	Thermo-ON unit	PI control : Evaporator outlet superheat degree (SH) constant	PI control : Condenser outlet subcooling (SC) constant
	Stopping unit	0 pulse (500P EEV) or 24 pulse (2000P EEV	54~96 pls adjust(500P EEV) or 120~288pl adjust(2000P EEV)[2][3]
	Thermo-OFF unit	0 pls(500P EEV) or 24pls(2000P EEV)[1]	72 pls(500P EEV) or 224pls(2000P EEV)*

Notes:

1. The Standby Opening about 50P or 200P EEV, please refer to the outdoor unit service manual.
2.On the case ODU stopping, the standby opening should be 1200pls (2000P EEV) or 300pls(500P EEV) for pressure equalization.
3.

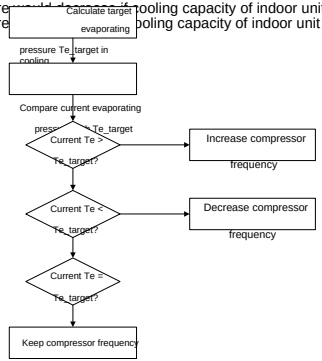
4.2 Compressor Control

Cooling operation

Compressor frequency is controlled to keep IDU evaporating pressure (Te) at target pressure (Tes).

The default target pressure in cooling mode is 39.2 °C, which could be changed by menu settings on main board;

Target evaporating pressure would decrease if cooling capacity of indoor unit is too low;
Target evaporating pressure would increase if cooling capacity of indoor unit is too much;

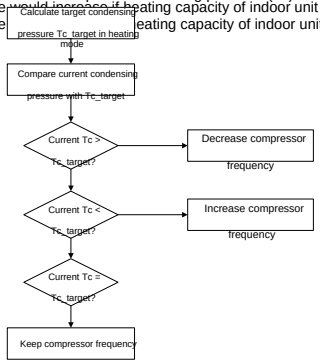


Heating operation

The default target pressure in heating mode is 46 °C, which could be changed by menu settings on main board;

Compressor frequency is controlled to keep IDU condensing pressure (Tc) at target pressure (Tcs).

Target condensing pressure would increase if heating capacity of indoor unit is too low;
Target condensing pressure would decrease if heating capacity of indoor unit is too much;



Operating frequency ranges

During normal operation, the minimum frequency is always 18Hz for all outdoor units and the maximum one is limited as the table below.

Table 3-5.3: Outdoor unit frequency ranges during operation

Model	Frequency Range in Cooling or main Cooling			
	Min	Max	Min	Max
MDV-V18WMN10TM	18 Hz	80 Hz	18 Hz	100 Hz
MDV-V24WMN10TM	18 Hz	90 Hz	18 Hz	108 Hz
MDV-V30WMN10TM	18 Hz	76 Hz	18 Hz	100 Hz
MDV-V36WMN10TM	18 Hz	80 Hz	18 Hz	110 Hz
MDV-V48WMN10TM	18 Hz	90 Hz	18 Hz	110 Hz
MDV-V60WMN10TM	18 Hz	90 Hz	18 Hz	110 Hz

5.4 Heat Exchanger Control

The ODU heat exchanger operates as condenser in cooling mode, and operates as evaporator in heating mode.

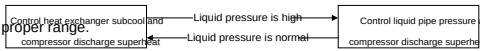
Table 3-5.4: Heat exchanger arrangement

Operation mode	State	Four-way Valve
Cooling	Condenser	OFF
Heating	Evaporator	ON
Oil return/Defrost	Condenser	OFF

5.5 Electronic Expansion Valve Control

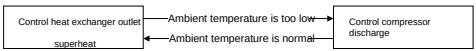
In cooling mode:

The target of EEVA control in cooling mode, is to keep compressor superheat, heat exchanger outlet subcooling, ar
liquid
pipe pressure in proper range.



In heating mode:

The target of EEVA control in heating mode, is to keep compressor superheat and heat exchanger outlet superheat in
proper range.



5.6 Outdoor Fan Control

The speed of the outdoor unit fans is adjusted in steps, as shown in Table 3-5.9.

Table 3-5.9: Outdoor fan speed steps

Fan speed index	Fan speed (rpm)				
	1.5/2.0ton	2.5/3.0ton	2.5/3.0ton		
	0	0	0	FANA \	FANB
	120	210	150	\	
0	130	210	180	\	
	140	210	210	\	
	150	240	240	\	
	170	280	270	150	
	190	320	300	180	
	250	360	330	210	
	250	410	360	240	
	250	460	\	260	
	280	510	\	280	
	310	570	\	310	
	340	630	\	340	
	370	690	\	370	
	400	730	\	400	
	430	760	\	460	
	460	800	\	480	
	\	\	\	520	
	\	\	\	560	
	\	\	\	600	
	\	\	\	640	
	\	\	\	690	
	\	\	\	740	
	\	\	\	780	800

5 Special Control

7.1 Oil Return Operation

In order to prevent compressors from running out of oil, the oil return operation is conducted to recover oil that has flowed

out of the compressor and into the piping system. This operation is performed for all units including units that are in standby. d0".

When the outdoor unit is running in Oil Return Operation, the digital display on outdoor main PCB will display "

Calculated oil discharge has reached to specified level. The higher the compressor frequency step is, the more oil

discharge.

Cumulative compressor operating time reaches 8 hours.

7.1.1 Cooling Mode Oil Return Control

Table 5-1 show component control during oil return operation in cooling

Table 5-1 Outdoor component control during oil return operation

Part Name		Symbol	Step1	Step2			Step3
			Prepare for oil returning	Oil returning			After oil returning
ODU	Inverter	INV	Pressure control	1.5/2.0ton:	2.5/3.0ton:	4.0/5.0ton:	Pressure control
	Inverter fan	FANA					
		ST					
		EEV	Discharge superheat contro				Discharge superheat control

Notes:

Inverter fan FANB is only available for 4/5ton.

1. The

7.1.2 Heating Oil Return Control

Cumulative compressor operating time reaches 8 hours.

Part Name		Symbol	Step1	Step2	Step3
				Oil returning	After oil returning
ODU	Inverter	INV	Prepare for oil returning Decrease to 32Hz	45-82 Hz	Start platform
	Inverter fan	FANA		OFF	
		ST	ON	OFF	
		EEV	Discharge temperature control	300	Self-judge

Notes:

Inverter fan FANB is only available for 4/5ton.

1. The

7.2 Defrosting Operation

In order to recover heating capacity, the defrosting operation is conducted when the outdoor unit heat excha is

performing as an evaporator. The defrosting operation is controlled according to outdoor ambient temperature, outd

heat exchanger temperature, indoor heat exchanger temperature and outdoor units running time. When the outdoor unit

If cumulative operating time is more than 40 minutes, and T3 is continuously below X°C for more than 5 minutes is running in defrosting, the digital display on outdoor main PCB will display " after

Reverse Cycle Defrosting Operation

If the defrosting operation more than Y minutes after the last defrosting or oil returning, the system wou the last defrosting or oil returning, the system would enter defrosting mode according to T3. X = -12 + 0.8 T4

Ambient Temperature T4	Y
defrosting mode.	120
-15 T4 < 5	180
T4 < -15	240

Table 3-7.3: Outdoor unit component control during defrosting operation

Part Name		Symbol	Step1	Step2	Step3
					After oil returning
ODU	Inverter	INV	**Prepare for oil returning** Decrease to 32Hz **Oil returning**	45-82 Hz	Start platform
	Inverter fan 1			OFF	
		FANB			
		ST	ON	OFF	ON
	Expansion valve	EEV	Discharge temperature	300	Self-judge

Notes:

Inverter fan FANB is only available for 4/5ton.

1. The

7.3 Refrigerant auto-charge

Refrigerant auto-charging is only recommended when the conditions below are

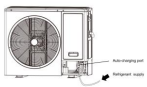
Refrigerant pipe's length is not certain;

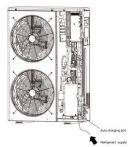
Indoor unit which is AHU with thermostatic expansion valve, is connected to outdoor unit;

The matching ratio (IDU/ODU) is between 80% and 100%;

The ambient temperature is met with table below:

	5 ~ 43 °C
Outdoor ambient temperature	21 ~ 32 °C





3. Refrigerant auto-charging is available only after successfully commissioning. Do not enter auto-charging mode w
the

system is initializing.

4. The refrigerant auto-charging function is only available in cooling operation. Before entering auto-charging mode
please

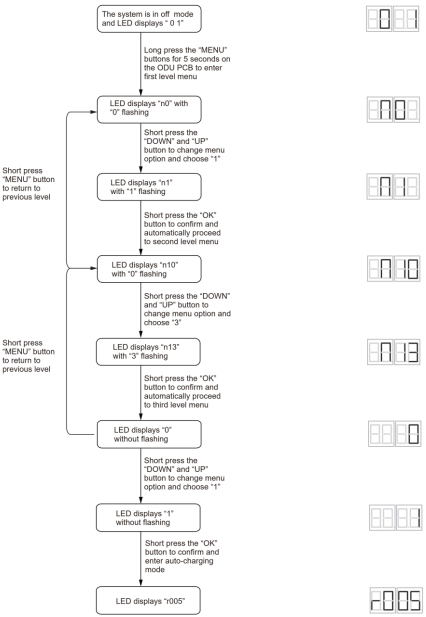
Table 3-7.4: Indoor unit operation mode during auto-charging mode

Indoor unit operation mode	Operation
Off mode	Enter refrigerant auto-charging function, then operate IDU in cooling mode, or Opera
Cooling mode	Enter refrigerant auto-charging function
Heating mode	Change IDU into cooling mode, then enter refrigerant auto-charging function.

Notes:

1. Before entering auto-charging mode, make sure the system is not in heating mode.
2. If no refrigerant in the system after vacuum operation, the outdoor unit may display "P22/P25" error.

5. Enter refrigerant auto-charging mode from outdoor unit menu:



Notes:

1. The refrigerant charging process should be controlled by the outdoor unit.
2. During refrigerant charging, do not power off the system.

6. Operate IDU in cooling mode with highest fan speed (high fan mode).

7. Turn on refrigerant supply, the system will charge refrigerant automatically in 30 to 60 minutes. The refrigerant amount charged should be calculated and recorded.

8. When refrigerant auto-charging is over successfully, the LED will display “END”, then press “OK” for 5s to quit auto-charging mode.

9. Stop refrigerant supply, and remove refrigerant charging pip

The situation below could lead to a display of “FAIL” on LED after entering refrigerant auto-charging mode, please chec

1. The refrigerant auto-charging time is too long.

Ambient Temperature ( )	Auto-charging time (min.)
41 T4 < 50	120
50 T4 < 59	110
59 T4 < 68	105
68 T4 < 77	100
77 T4 < 86	90
86 T4 < 95	85
95 T4 < 104	75
104 T4 < 111.2	65

There are several reasons could lead to this situation:

Refrigerant supply is not enough

The refrigerant needed is more than the refrigerant charged, and the refrigerant supply is not enough (e.g. refrigerant canister is empty). Please check the refrigerant supply, press “OK” and hold for 5 seconds to quit auto-charging mode, and reenter this mode as described above.

Sensors of outdoor unit go wrong

If temperature sensors and pressure sensors of outdoor unit are broken, the auto-charging function may not go well. Please check the sensors whether any of them is broken.

Indoor unit runs in heating mode

The auto-charging function can only work in cooling mode.

7.4 Chassis electric heating belt control

Chassis electric heating belt control is used to prevent chassis from being freeze by condensate water and ice rain,

ambient temperature is less than 89.6 . Accumulated ice on chassis would block drain hole and damage condenser,

which can melted by electrical heating.

The heater will take effect when both conditions below are met

1. Ambient temperature T4 is less than 35.6
2. Outdoor unit starts heating mode, or stop heating within 30 minutes.

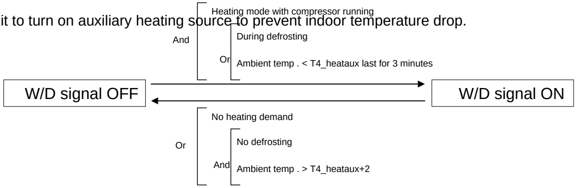
The heater will be turned off when either condition below is met

1. Ambient temperature T4 is less than 35.6
2. Outdoor unit has stopped heating for more than 30 minutes.

7.5 W/D signal control

When ambient temperature is too low, and during defrosting period, "W/D" would send 24V signal to thermostat and

indoor unit to turn on auxiliary heating source to prevent indoor temperature drop.



7.6 Test Operation Control

Test operation is used to debug malfunction because of incorrect installation. Press “1”or2 PCB to enter test operation.

Before proceeding test operation, debug malfunction in stop mode, such as temperature sensor error, communication error and so on.

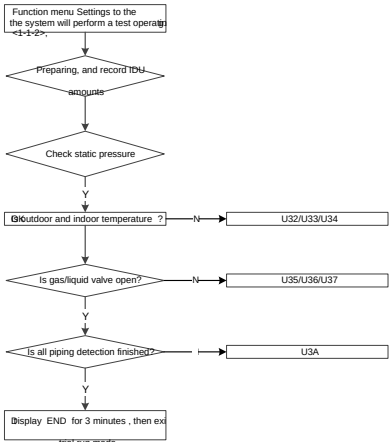


Table 3-7.5: Error code during test operation

Test item	Object	Malfunction reason	Error code
Outdoor ambient temperature	T4	and [T1 < 109 .4 ; or [T4 < -22 ; T1 53 .6 and T4 131 ; T1 < 53 .6 and T4 86]]	U32
Indoor ambient temperature Average T1		[-22 T4 131 ; [T1 95 and T4 < 23 ; T1 109.4 and T4 23]]	U33
Indoor and outdoor ambient temperature	T4 and average T1		U34
Gas/liquid valve is open or not	High/Low pressure	Pressure protection	U35/U36/U37

Refrigerant and electrical signal are matching		Refrigerant and electrical signal are not matching	

7.7 Heating prohibition control

This control is used to set ambient temperature T4 for heating permitted temperature range. When T4 < T4set, the i

units operating in heating mode with auxiliary heating source (please check function instruction of indoor unit) will tu
to

"8-b-" settings	
	No limitation (default)

thermo-OFF. When T4 ≥ T4set+1°C, the indoor units will recover to operate in heating mode.

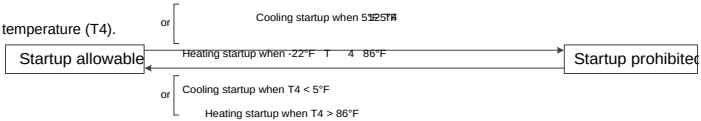
Heating prohibition T4 settings

	-14.8
	-7.6
	-0.4
	6.8
	14.0
	21.2
	28.4
	35.6
	42.8
	50.0
	57.2
	64.4
	71.6
	78.8
	86.0

7.8 Operation Limits Control

Before compressors are about to start, the outdoor unit judge whether it's suitable to operate or not by the value of ambient

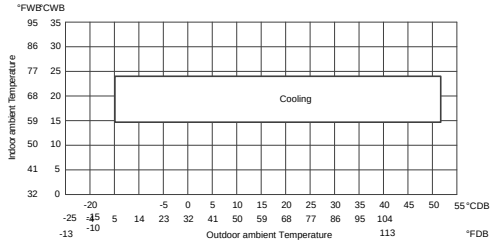
temperature (T4).



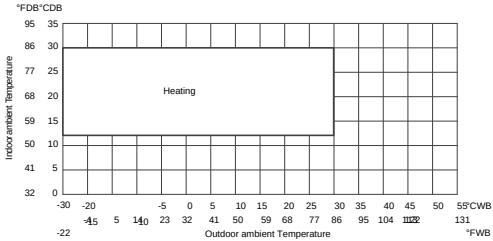
Notice:

When T4 < 23°F, there is a minimum operating capacity for cooling start and operation, which is 50%.

Cooling



Heating



Operating Temperature Range

Mode	Outdoor Temperature	Indoor Temperature
Cooling		59~75 °F WB (15~23.9°C
Heating		

Part 4 Field Settings

1. Overview

This chapter describes how the system configuration can be implemented once the installation is completed, and other

relevant information.

Implement field settings

It Energy saving and optimization

Using the Check function

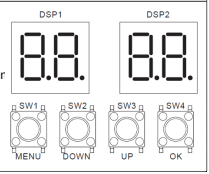
INFORMATION

The installation personnel should read this chapter.

2. Digital display and button settings

2.1 Digital display output

Table 4-2.1: Digital display output

Outdoor unit state			Digital display output
Parameters displayed on DSP1 Standby **Parameters displayed on DSP2**	Pressure of outdoor unit	The number of indoor units in communication with the outdoor units	
Normal operation	---	Running speed of the compressor in rotations per second	
Error or protection			
In menu mode	Display menu mode code		
System check	Display system check code		

2.2 Function of buttons SW3 to SW6

Table 4-2.2 Function of buttons SW3 to SW6

Button	Function
SW3(UP)	In menu mode: previous and next buttons for menu modes.
	Not in menu mode: previous and next buttons for system check information.
SW1(MENU)	Enter / exit menu mode.
SW4(OK)	Confirm to enter specified menu mode.

2.3 Menu mode

Only master unit has the full menu functions, slave units only have error codes check and cleaning functions.

l: √ r r ı c d a h d t al display will display
r ", "n3", "n4" or "nc".

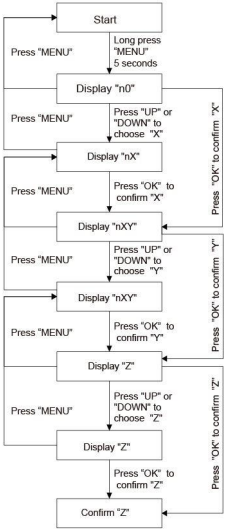
√ C ", te "n07e.
√ C d level menu from "n3 " mode.
5. Press SW4 "OK" button to enter s umple, enter "
6. Press SW3 / SW2 "UP / DOWN" b

CAUTION

- Operate the switches and push buttons with an insulated stick (such as a closed ball-point pen) to avoid touching of live parts.

Menu mode selection flowchart:

Figure 4-2.1 Menu mode selection flowchart:



Menu mode function:

Menu mode function:

First level menu			Description	Default
Second level menu				
Specified menu mode	0	0	Query History error (last ten error codes)	-
n0		1		
(Information query)		0	Query Indoor unit's address	
	2	1	Driver's version(compressor and fan displayed in turn)	
n1 (Installation and commissioning)	0	-	Service mode	-
	1[1]	0	Cooling Test	
		1	Heating Test	
	2 (Refrigerant)	0	Recycle Refrigerant to outdoor unit	
		1	Recycle Refrigerant to indoor unit	
		2	Balance system refrigerant	
	5	-	Vacuum mode[2]	
	6	-	Setting the VIP IDU address (Default:No.63)	

Notes:

2.4 Special mode introduction

1. This setting must be performed when vacuumizing.
2. For details of mode, refer to

Table 4-2.3 Menu mode function(continue)

First level menu Specified Menu				Default
n2 (Mode setting)	0[1] (Priority mode)	0	Automatic priority mode	
		1	Cooling priority mode	-
		2	VIP indoor unit voting priority mode	
		3	In response to heating mode only	
		4	In response to cooling mode only	
		5	Heating priority mode	
		9	Capability requirements priority mode	
	1 (Silent mode)	0	Non silent mode	
		1	Silent mode 1	-
		2	Silent mode 2	
		3	Silent mode 3	
		4	Silent mode 4	
		5	Silent mode 5	
	5 (IQ...°F)	0	Celsius will be enable on indoor unit display	
		1	Fahrenheit will be enable on indoor unit display	-
	9[2] (Automatic priority	0	Mode Switching temperature :10°C	
		1	Mode Switching temperature :16°C	-
		2	Mode Switching temperature :21°C	
n3 (Installation parameters)	2[3] (Level difference)	0	0m level difference between indoor unit and outdoor unit	
		1	10m level difference between indoor unit and outdoor unit	
		2	20m level difference between indoor unit and outdoor unit	
		3	30m level difference between indoor unit and outdoor unit	-
		4	40m level difference between indoor unit and outdoor unit	
		5	50m level difference between indoor unit and outdoor unit	
	3 (Malfunction after refrigerant leakage)	0	Malfunction immediately after refrigerant leakage occur	
		1	Malfunction after refrigerant leakage occur 12 hours	-
		2	Malfunction after refrigerant leakage occur 24 hours	-
		3	Malfunction after refrigerant leakage occur 48 hours	-
		4	Malfunction and refrigerant auto recycle immediately a	-
	7 (Ambient	0	External ambient temperature sensor(T10) ineffective	
		1	External ambient temperature sensor(T10) effective	-
n4 (address)	1	-	Set Network address of Outdoor unit	-
	2	-	Set number of indoor units	1
	4	0	Auto addressing (indoor and outdoor units address)	-
		1	Clear address (indoor and outdoor units address, network	

Notes:

1. When the outdoor unit is in standby, the fan will turn on to clear the snow on the fan blade, and the effect of mode 2 is better than that of mode 1.
2. For details of mode, refer to *2.4 Special mode introduction*
3. If the horizontal height of the outdoor unit is higher than that of the indoor units, it needs to be set to improve the reliability of the system.

Table 4-2.3 Menu mode function(continue)

First level menu			Description	Default
Second level menu		0	Evaporation temperature setting (Ke0=-3)	
Specified menu mode		1	Evaporation temperature setting (Ke0=0)	-
		2	Evaporation temperature setting (Ke0=2)	
	0	3	Evaporation temperature setting (Ke0=4)	
	(target evaporation	4	Evaporation temperature setting (Ke0=6)	
	temperature of the	5	Evaporation temperature setting (Ke0=8)	
n6	indoor unit)	6	Evaporation temperature setting (Ke0=9)	-
(evaporation		7	Evaporation temperature setting (Ke0=10)	
and		8	Evaporation temperature setting (Ke0=11)	
condensation		0	Condensation temperature setting (Kc0=41)	
temperature)		1	Condensation temperature setting (Kc0=42)	
	2	2	Condensation temperature setting (Kc0=43)	
	(target	3	Condensation temperature setting (Kc0=44)	-
	condensation	4	Condensation temperature setting (Kc0=45)	
	temperature of the	5	Condensation temperature setting (Kc0=46)	
		6	Condensation temperature setting (Kc0=48)	
		7	Condensation temperature setting (Kc0=51)	-
	A	0	Refrigerant shut-off device unavailable	
		1	Refrigerant shut-off device available	-
		0	No compressor lockout temperature	
		1	-22 °F compressor lockout temperature	-
		2	-15°F compressor lockout temperature	-
		3	-8°F compressor lockout temperature	-
		4	0°F compressor lockout temperature	-
		5	7°F compressor lockout temperature	-
		6	14°F compressor lockout temperature	-
	b	7	21°F compressor lockout temperature	-
	(compressor	8	28°F compressor lockout temperature	-
	lockout)	9	36°F compressor lockout temperature	-
n8		10	43°F compressor lockout temperature	-
		11	50°F compressor lockout temperature	-
		12	59°F compressor lockout temperature	-
		13	68°F compressor lockout temperature	-
		14	77°F compressor lockout temperature	-
		15	86°F compressor lockout temperature	-
		0	Without heataux	
		1	-22 °F heataux operate temperature	-
		2	-15°F heataux operate temperature	-
	E	3	-8°F heataux operate temperature	-
	(heat-auxiliary	4	0°F heataux operate temperature	-
	operate)	5	7°F heataux operate temperature	-
		6	14°F heataux operate temperature	-
		7	21°F heataux operate temperature	-

Table 4-2.3 Menu mode function(continue)

First level menu		Specified menu mod		Default
Second level menu		8	28°F heataux operate temperature	-
		9	36°F heataux operate temperature	-
		10	43°F heataux operate temperature	-
n8[1]	E (heat-auxiliary operate)	11	50°F heataux operate temperature	-
		12	59°F heataux operate temperature	-
		13	68°F heataux operate temperature	-
		14	77°F heataux operate temperature	-
		15	86°F heataux operate temperature	-
n9	1	0	Non -detection of over-connection ratio faults	-
		1	When operating ratio exceeds 102%, the indoor unit air fl turns to low speed	
	4	0	Force defrosting	-
		1	Forced oil return	-
	5	-	Release central controller emergency stop statue	-
	7	0	Digital electricity meter	
		1	Pulse electricity meter	-
nc[2] (Dry contact function)	0	0	Dry contact 1 function selection (Force cooling only)	-
		1	Dry contact 1 function selection (Force heating only)	
		2	Dry contact 1 function selection (Force incapacity requirements)	
		3	Dry contact 1 function selection (Force stop)	
	1	0	Dry contact 2 function selection (Force cooling only)	-
		1	Dry contact 2 function selection (Force heating only)	
		2	Dry contact 2 function selection (Force incapacity requirements)	
		3	Dry contact 2 function selection (Force stop)	
	2	0	Dry contact 3 function selection (Operation signal)	-
		1	Dry contact 3 function selection (Alarm signal)	
		2	Dry contact 3 function selection (Compressor running sign	
		3	Dry contact 3 function selection (Defrosting signal)	-
		4	Dry contact 3 function selection (Refrigerant leakage sign	
nd (night silent mode)	0	0	Without night silent mode	
		1	6 hours judgement time / 10 hours operation time	-
		2	6 hours judgement time / 12 hours operation time	-
		3	8 hours judgement time / 10 hours operation time	-
		4	8 hours judgement time / 12 hours operation time	-
	1	0	Night silent mode 1	-
		1	Night silent mode 2	-
		2	Night silent mode 3	-
		3	Night silent mode 4	-

Notes:

1. Using with setting [n2-8-0] or [n2-8-1].
2. Only for VRF system

2.4 Function of switch ENC1

Switch	Setting	Switch positions	Description
ENC1	Model setting		Outdoor unit model setting (Valid at 0-5 ,default is 0) 0 - MDV-V18WMN10T 1 - MDV-V24WMN10T 2 - MDV-V30WMN10T

2.5 Special mode introduction

2.5.1 Mode priority control

Mode priority control

Choose priority mode from menu "2-0-0" to "2-0-9".

Menu		Mode priority
2-0-	0	Ambient temperature priority mode
	1	Cooling priority mode
	2	VIP priority mode
	3	Heating only mode
	4	Cooling only mode
	5	Heating priority mode
	9	Demand priority mode

Ambient temperature priority mode (Auto priority mode)

If ambient temperature T4 is no less than preset value of ambient temperature Ta (°F), ODU is in cooling priority mode.

If ambient temperature T4 is less than Ta-37.4 (°F), ODU is in heating priority mode.

Ta could be set by menu "2-9-" settings

	T4 (°F)	
	50	
"2-9-" settings	60	
	70	

Demand priority mode

Notice:

*1. Nt4C: Cooling demand of IDUs.

2. Nt4H: Heating demand of IDUs.

Nt4C / Nt4H > 105%, ODU operate in cooling mode.

Nt4C / Nt4H ≤ 105%, ODU operate in heating mode.

The minimum period between mode switch is 20 minutes

Heating priority mode

ODU in cooling mode

If ODU receive heating demand, ODU will stop and turn to operate in heating mode. The indoor units with cooling demand are thermo-OFF and display "not priority

ODU in heating mode

If ODU receive cooling demand, ODU will continue to operate in heating mode. The indoor units with cooling demand thermo-OFF and display "not priority".

Cooling priority mode

ODU in heating mode

ODU without heating demand

If ODU receive cooling demand, ODU will stop and turn to operate in cooling mode. The indoor units with heating demand

”.

are thermo-OFF and display “not priority

ODU in cooling mode

If ODU receive heating demand, ODU will continue to operate in cooling mode. The indoor units with heating demand are thermo-OFF and display “not priority

VIP priority mode

ODU without cooling demand

Press “2-0-2” to set VIP IDU address.

If VIP IDU has already exists, ODU will stop and turn to operate in heating mode. The ODU can operate in the same mode.

If there is no VIP IDU, or VIP IDU operates in fan mode, ODU operation mode depends on the majority indoor units

same mode.

Heating only mode

ODU can operate only in heating mode

Cooling only mode

ODU can operate only in cooling mode

2.5.2 System test

Cooling Test Control

Press "**1-1-0**" on PCB to enter cooling test mode, and all indoor units downstairs operate in cooling mode set at 62.6

high wind. The system operates in cooling mode normally.

Exit cooling test mode

2. If any error happened, then exit cooling test mode automatically.
3. Operate for 240 minutes, then exit cooling test mode automatically.
1. Press "OK" for 5sec to exit cooling test mode.

Heating Test Control

Press "**1-1-1**" on PCB to enter heating test mode, and all indoor units downstairs operate in heating mode set at

Heating test control is used to check whether the system can operate heating mode normally.

high wind. The system operates in heating mode normally.

Exit heating test mode

2. If any error happened, then exit heating test mode automatically.
3. Operate for 240 minutes, then exit heating test mode automatically.
1. Press "OK" for 5sec to exit heating test mode.

"1-1-2" on PCB to enter test

Test Operation Control

Test operation is used to debug malfunction because of incorrect installation. Press

Before entering test operation, please debug malfunction in stop mode, such as temperature sensor error, communication

error and so on.

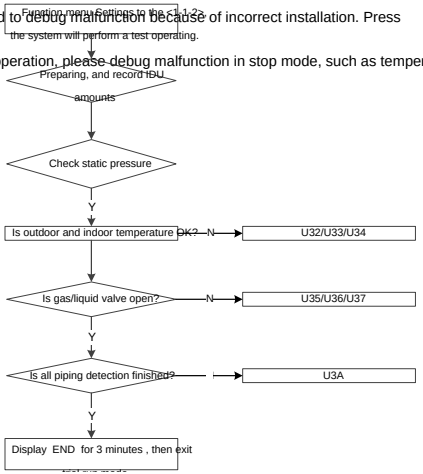
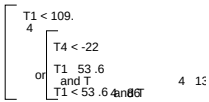
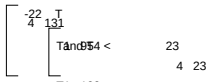


Table 3-7.5: Error code during test operation

Test item	Object	Malfunction reason	Error code
Outdoor ambient temperature	T4		U32
Indoor ambient temperature Average T1			U33
Indoor and outdoor ambient temperature	T4 and average T1		U34
Gas/liquid valve is open or not	High/Low pressure	Pressure protection	U35/U36/U37
Refrigerant and electrical signal are matching		Refrigerant and electrical signal are not matching	

3. System Parameter Check

3.1 UP / DOWN system check button

Before pressing UP or DOWN button, allow the system to operate steadily for more than an hour. On pressing UP or DOWN button, the parameters listed in below table will be displayed in sequence.

Table 4-3 system check list

DISP.	CONTENT	DESCRIPTION
--	"Standby (ODU address+ IDU quantity)/frequency/special status"	
0	ODU address	0
1	ODU capacity	Unit: Ton
2	Quantity of ODU	1
3	Quantity of IDUs	1~9
4	Reserved	
5	Target frequency of ODU	Displacement frequency (1)
6	Reserved	
7	Actual frequency of compressor	Actual frequency
8	Reserved	
9	Operating mode	0: OFF 2: Cooling 3: Heating
10	Fan1 speed	Unit: RPM
11	Fan2 speed	Unit: RPM
12		°C
13	T2B Average	Actual temperature=DISP. Unit: °C
14	T3	Actual temperature=DISP. Unit: °C
15	T4	Actual temperature=DISP. Unit: °C
16		°C
17		°C
18		°C
19	T7C1	Actual temperature=DISP. Unit: °C
20	Reserved	
21	Reserved	
22	Reserved	
23		°C
24	Ntc	Actual temperature=DISP. Unit: °C
25	Tg	Actual temperature=DISP. Unit: °C
26	Reserved	
27		°C
28	Primary current	Actual current=DISP./10 Unit: A
29	Inverter compressor current	Actual current=DISP./10 Unit: A
30	Reserved	
31	EEVA position	Actual Value=DISP. *24
32	Reserved	
33	Reserved	

Table 4-3.1 system check list(continue):

DISP.	CONTENT	DESCRIPTION
34	EEVD position	Actual Value=DISP. *4
35	High pressure of unit	Actual Pressure=DISP. /100 Unit: MPa
36	Low pressure of unit	Actual Pressure=DISP. /100 Unit: MPa
37	Quantity of online IDUs	Actual quantity
38	Quantity of running IDUs	Actual quantity
39	Heat exchanger status	[0] OFF
		[1] C1: Condenser
		[2] D1: Reserved
		[3] D2: Reserved
		[4] E1: Evaporator
		[5] F1:Reserved
		[6] F2:Reserved
40	Special mode	[0] Not in special mode
		[1] Oil return
		[2] Defrost
		[3] Startup
		[4] Stop
		[5] Quick check
		[6] Reserved
41	Silent mode	1-5
42	Reserved	
43	TES	Actual temperature=DISP. Unit: °C
44	TCS	Actual temperature=DISP. Unit: °C
45	DC Voltage	Actual voltage. Unit: V
46	AC Voltage	Actual voltage. Unit: V
47	Quantity of cooling mode IDUs	
48	Quantity of heating mode IDUs	
49	Capacity of cooling mode IDUs	
50	Capacity of heating mode IDUs	
51	Reserved	
52	Reserved	
53	Fan error	
54	Software version	
55	Last error code	Service code
56	VRF/Unitary	0: VRF 1: Unitary
57	Reserved	
58	Reserved	
59	Reserved	

Notes:

(1) Used to convert to current compressor output volume, example: compressor output volume is 70, Target frequency =Actual frequency*70 / 60.

(2) Te: Low pressure equivalent saturation temperature (°C) Tes: Target Te value.

Tc: High pressure equivalent saturation temperature (°C) Tcs: Target Tc value.

Part

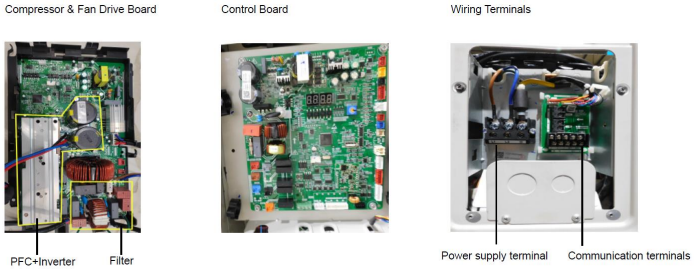
Electrical Components an

Wiring Diagrams

1. Outdoor Unit Electric Control Box Layout

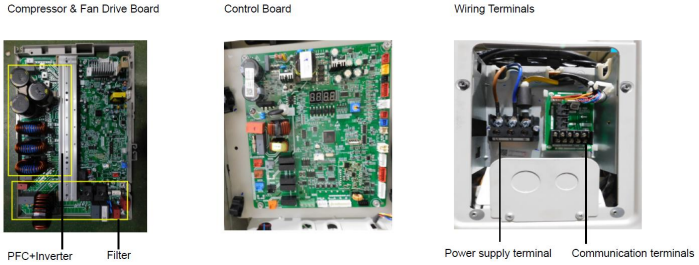
1.1 1.5/2.0ton electric control box

Figure 5-1.1: 1.5/2.0ton electric control box



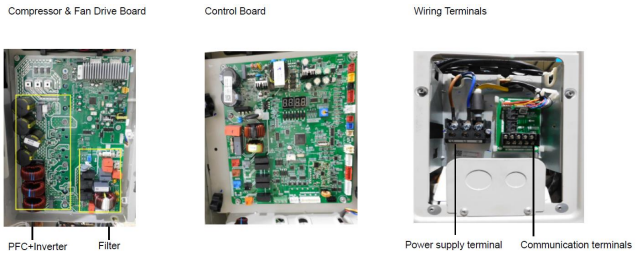
1.2 2.5/3.0ton electric control box

Figure 5-1.2: 2.5/3.0ton electric control box



1.3 4.0/5.0ton electric control box

Figure 5-1.2: 4.0/5.0ton electric control box



Note: The Compressor & Fan Drive Board of 1.5/2Ton and 2.5/3Ton are placed upside down

2. Outdoor Unit Main Control Board

2.1 Outdoor unit main Control Board ports

Figure 5-2.1: Outdoor unit main Control Board ports

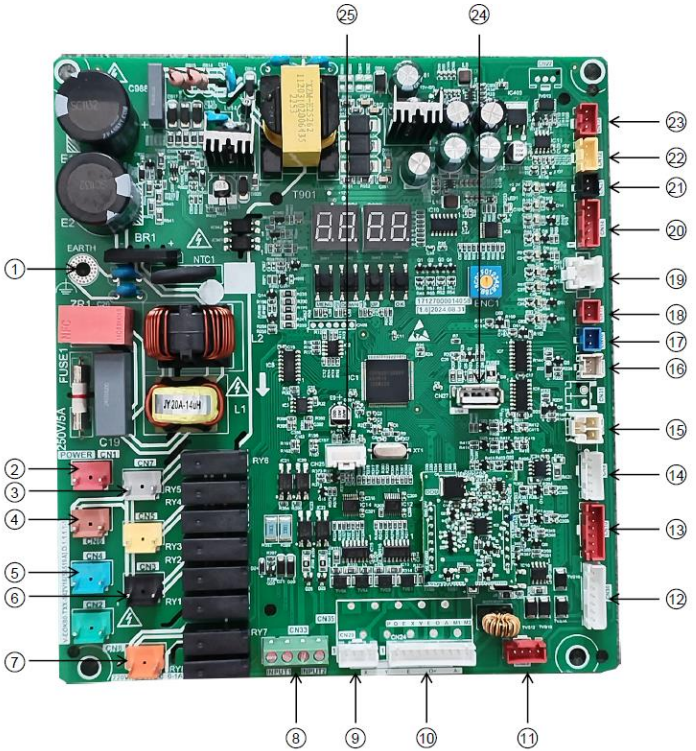


Table 5-2.1: Main Control Board port

Notes:

.

Label descriptions are given in

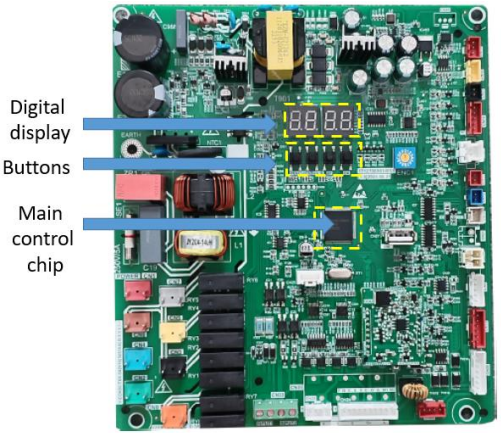
Table 5-2.1: Main Control Board port

Label in Figure 1-1	Port code	Content	Port voltage
1	EARTH	Earth	0VDC
2	CN1	Power input	220VAC
3	CN7	HEAT: Compressor crankcase heater	220VAC
4	CN6	HEATB: Chassis electric heating belt	220VAC
5	CN4	ST1: Four-way valve	220VAC
6	CN3	SV4: Solenoid valve (Only for 2.5/3Ton and 4/5Ton)	220VAC
7	CN8	DCO: Dry contact output (Passive)	Passive
8	CN33	DCI 1&2: Dry contact input 1&2	5VDC
9	CN29	Conventional 24VAC non-communicating control signal	24VAC
10	CN24	X/Y/E/M1/M2/O/A communication port (From left to right)	5VDC+24VDC
11	CN28	Smart module communication	5VDC
12	CN30	Communication port between the Control Board and the Drive Board	5VDC+12VDC
13	CN10	EEVD: Electronic expansion valve D	12VDC
14	CN9	EEVA: Electronic expansion valve A	12VDC
15	CN32	L-PRO: Low pressure switch	3.3VDC
16	CN15	T3: Heat exchanger temperature sensor	3.3VDC
17	CN16	T4: Outdoor ambient temperature sensor	3.3VDC
18	CN34	T5: Liquid pipe temperature sensor	3.3VDC
19	CN18	T10: Additional ambient temperaturesensor (optional)	3.3VDC
20	CN14	T3B: Heat exchanger middle temperature sensor (Only for 1.5/2Ton) (Down) TL: Heat exchanger liquid temperature sensor (2.5/3Ton and 4/5Ton) (Down) Tg: Suction temperature sensor (Up)	3.3VDC
21	CN21	T7C1: Discharge temperature sensor	3.3VDC
22	CN12	Pc/Pe: Pressure sensor (Only for 1.5/2Ton) Pc: High pressure sensor (Only for 2.5/3Ton & 4/5Ton)	5VDC
23	CN13	Pe: Low pressure sensor (Only for 2.5/3Ton & 4/5Ton)	5VDC
24	CN27	USB port	5VDC
25	CN25	Debug port	3.3VDC

2.2 Outdoor unit main Control Board components

2.2.1 Layout

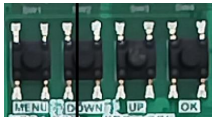
Figure 5-2.2: Outdoor unit main Control Board components



2.2.2 Function of buttons SW3 to SW6

Table 5-2.2: Function of buttons SW3 to SW6

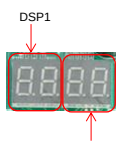
Button	Function
SW3 (UP)	In menu mode: previous and next buttons for me modes.
SW2 (DOWN)	Not in menu mode: previous and next buttons fo system check information.
SW1 (MENU)	Enter / exit menu mode.
SW4 (OK)	Confirm to enter specified menu mode.



2.2.3 Digital display output

Table 5-2.3: Digital display output in different operating states

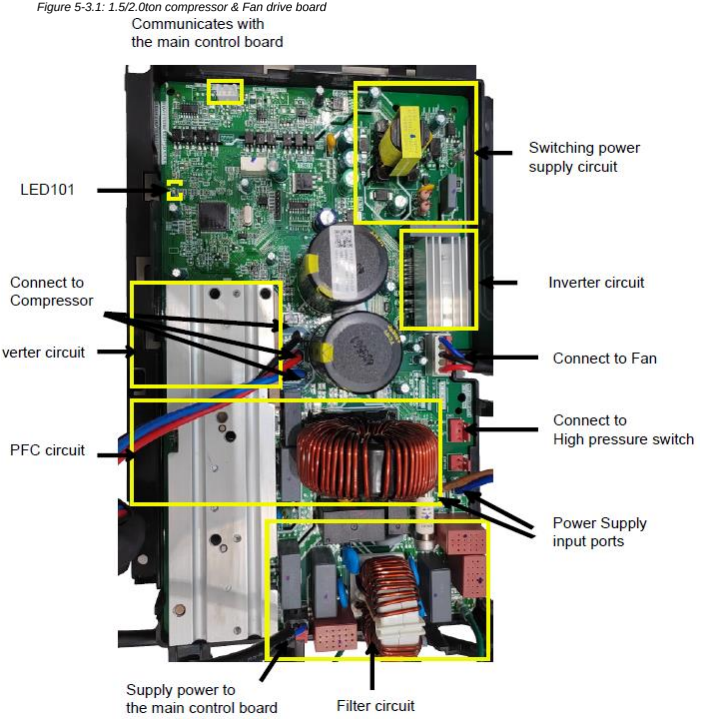
Outdoor unit state	Parameters displayed on DSI	Parameters displayed on DSP2
Standby	The address of outdoor unit	The number of indoor units in communication with the outdoor units
Normal operation	--	Running speed of the compressor i rotations per second
Error or protection	Placeholder and error or protection cod	
In menu mode	Display menu mode code Refer to *Table 4-2.3 Menu mode function:*	
System check	Display system check code Refer to *Table 4-3.1 system check list*	



3. Compressor & Fan drive board

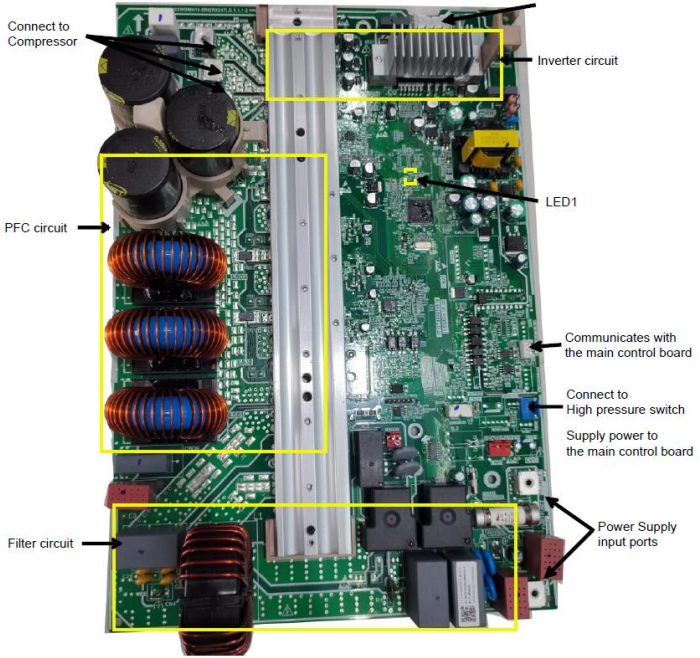
3.1 1.5/2.0ton Compressor & Fan drive board

Figure 5-3.1: 1.5/2.0ton compressor & Fan drive board



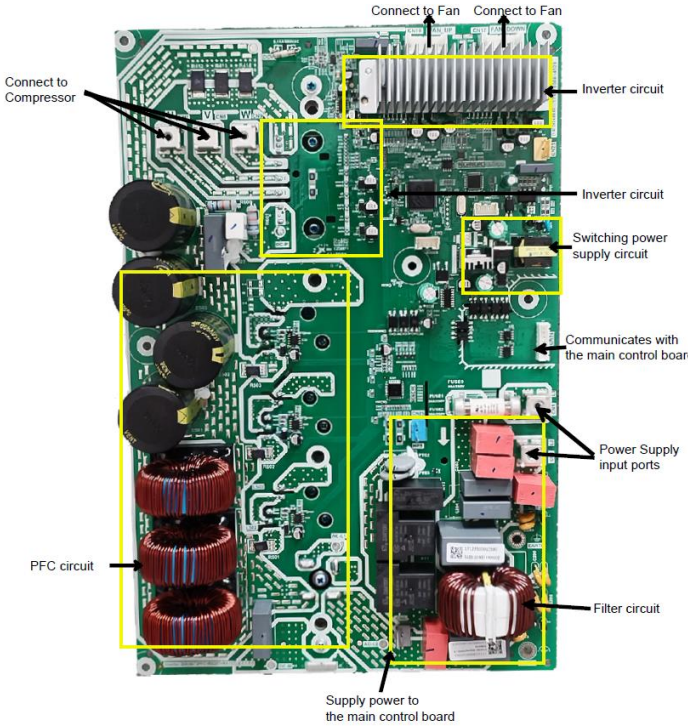
3.2 2.5/3.0ton Compressor & Fan drive board of 35A

Figure 5-3.2: 2.5/3.0ton compressor & Fan drive board of 35A



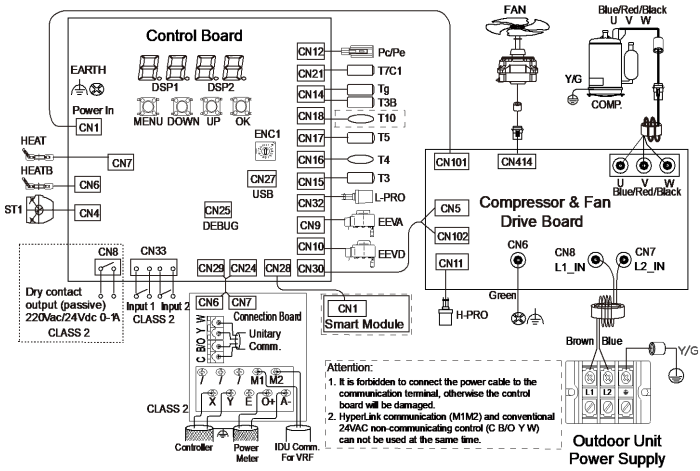
3.3 4.0/5.0ton Compressor & Fan drive board

Figure 5-3.5: 4.0/5.0ton compressor & Fan drive board ports of 50A



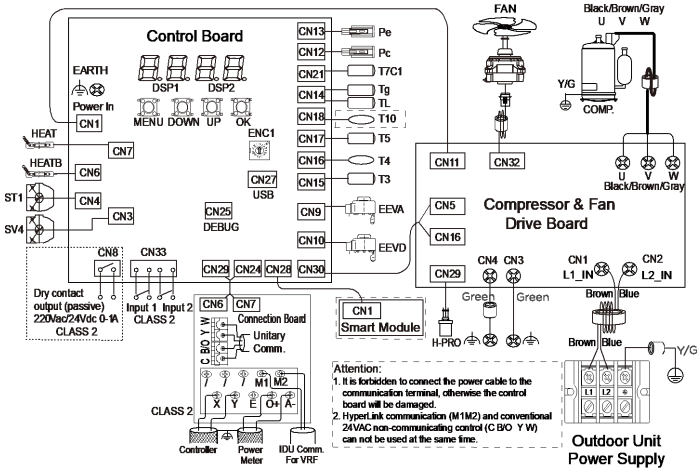
4. Wiring Diagrams

Figure 5.4.1: 1.5/2.0Ton model wiring diagram



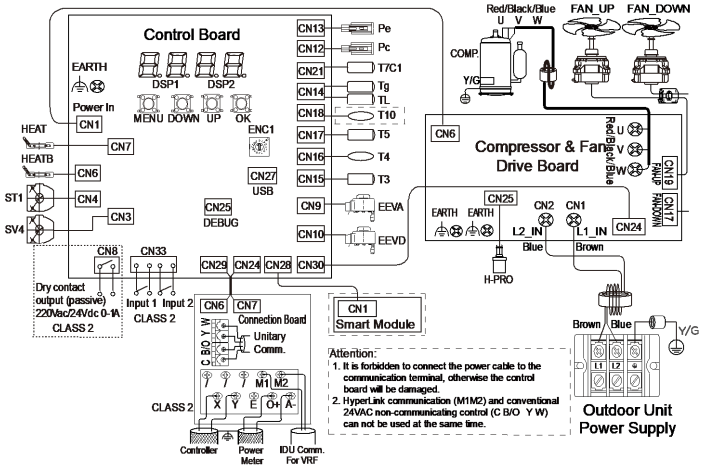
Legend				
Code	**Name**		**Code**	**Name**
COMP	Compressor		Pc	High pressure sensor
EEVA/D	Electronic expansion valve		Pe	Low pressure sensor
FAN	DC Fan		T3B	Heat exchanger middle temperature sensor
HEAT	Crankcase heater		T4	Outdoor ambient temperature sensor
HEATB	Chassis electric heating belt		T5	Liquid pipe temperature sensor
H-PRO	High pressure switch		Tg	Suction temperature sensor
L-PRO	Low pressure switch		T10	Additional ambient temperature sensor (optional)
ST1	Four-way valve		T7C1	Compressor discharge temperature sensor
T3	Heat exchanger temperature sens			

Figure 5-4.2: 2.5/3.0Ton model wiring diagram



Legend				
Code	**Name**		**Code**	**Name**
COMP	Compressor		Pe	Low pressure sensor
EEVA/D	Electronic expansion valve		T3	Heat exchanger temperature sensor
FAN	DC Fan		T4	Outdoor ambient temperature sensor
HEAT	Crankcase heater		T5	Liquid pipe temperature sensor
HEATB	Chassis electric heating belt		Tg	Suction temperature sensor
H-PRO	High pressure switch		T10	Additional ambient temperature sensor (optional)
ST1	Four-way valve		T7C1	Compressor discharge temperature sensor
SV4	Solenoid valve		TL	Heat exchanger liquid temperature sensor
Pc	High pressure sensor			

Figure 5-4.3: 4.0/5.0Ton model wiring diagram



Legend				
Code	**Name**		**Code**	**Name**
COMP	Compressor		Pe	Low pressure sensor
EEVA/D	Electronic expansion valve		T3	Heat exchanger temperature sensor
FAN_UP/ FAN_DOWN	DC Fan		T4	Outdoor ambient temperature sensor
HEAT	Crankcase heater		T5	Liquid pipe temperature sensor
HEATB	Chassis electric heating belt		Tg	Suction temperature sensor
H-PRO	High pressure switch		T10	Additional ambient temperature sensor (optional
ST1	Four-way valve		T7C1	Compressor discharge temperature sensor
SV4	Solenoid valve		TL	Heat exchanger liquid temperature sensor
Pc	High pressure sensor			

Part

Diagnosis and Troubleshooting

1 Error Code Table

1.1 Outdoor Error code table

Table 6-1.1 Outdoor Error code table

Error code	Error description	Manual re-start
A01	Emergency stop	NO
		YES
		NO
Ad1	Refrigerant shut-off device error	NO
		NO
		NO
C28	Number of indoor units detected by the outdoor unit has increased	NO
		NO
		NO
E41	Outdoor ambient temperature sensor (T4) error (open/short)	NO
		NO
		NO
F42	T3 temperature sensor overtemperature protection	NO
		NO
		NO
F6A	F62 protection occurs 3 times in 100 minutes	YES
		YES
		NO
F75	Compressor discharge insufficient superheat protection	NO
		YES
		NO
F91	Liquid pipe temperature sensor (T5) error (open/short)	NO
		NO
		NO
1L--	Compressor error. Refer to Table 19.3 for indications of "	YES
		YES
	--"	YES
1J01	1J1* error occurs 10 times in 60 minutes. Refer to Table 19-4 for indications of "*"	YES
		YES
		YES
P11	High pressure sensor error	NO
		NO
		NO
P14	P12 protection occurs 3 times in 60 minutes	YES
		YES
		NO
P23	Suction pipe low pressure switch protection	NO
		NO
		YES

Table continued on next page …

Table 6-1.1 Outdoor Error code table (continued)

Error code	Error description	Manual re-start require
1P32	Compressor high DC bus current protection (software protection)	NO
		YES
		NO
P52	Low AC voltage protection	NO
		NO
		YES
1P57	Inverter module DC bus high voltage error	YES
		YES
		YES
P71	EEPROM error	YES
		YES
		NO
pd1	Anti-condensation protection	NO
		YES

Table 6-1.2 Installation and debugging error code

Error code	Error description	Manual re-start require
U02	Technology barrier	NO
		YES
U12	Capacity setting error	YES
		YES
		YES
U31	The test run is not performed or was not successful	YES
		YES
		YES
U34	Outdoor and indoor temperature out of operating range	YES
		YES
		YES
U38	No address	YES
		NO
		YES
U3C	Auto mode error	NO
U41	Common indoor unit exceeds the allowable connection range	YES

Table 6-1.2 Compressor driver error code

Error code	Error description	Manual re-start require
1L1E	Hardware overcurrent	NO
		NO
1L12	Software overcurrent protection last 30s	NO
		NO

Table continued on next page …

Table 6-1.2 Compressor driver error code (continued)

Error code	Error description	Manual re-start require
1L3E	Low bus voltage error	NO
		NO
		NO
1L43	Abnormal current sampling	NO
		YES
		NO
1L47	Module type mismatch	YES
		NO
		NO
1L52	No load protection	NO
		NO
		NO
1Lb7	Other check exceptions/908 diagnosis error	NO

Table 6-1.3 Fan motor driver error code

Error code	Error description	Manual re-start require
1J1E	Hardware overcurrent	NO
		NO
1J12	Software overcurrent protection in last 30s	NO
		NO
		NO
1J31	High bus voltage error	NO
		NO
		NO
1J5E	Startup failed	NO
		NO
		NO
1J6E	Motor phase loss protection	NO

Table 6-1.3 Shut-off device error code

Error code	Error description	Manual re-start require
3b01	The electronic ball valve is in error	Yes
C2A	Communication error between outdoor unit and refrigerant shut-off device	Yes
		NO
		NO
P5d	Supercapacitor voltage over rated operational voltage	NO
		NO

Table 6-1.4 Status code

Error code	Error description	Manual re-start require
d0x	Oil return running, x represents oil return operation steps	NO
dfx	Defrost running, x represents defrosting operation steps	NO
		NO
		NO
d33	Refrigerant quantity judgment, Slightly excessive	NO
		NO
		NO
d36	Refrigerant quantity judgment, Significantly insufficient	NO
d41	There is a no power indoor unit in the system, HyperLink is controlling the indoor unit's valve	NO

2 Error in Main Control

2.1 A01: Emergency Stop

2.1.1 Digital display output

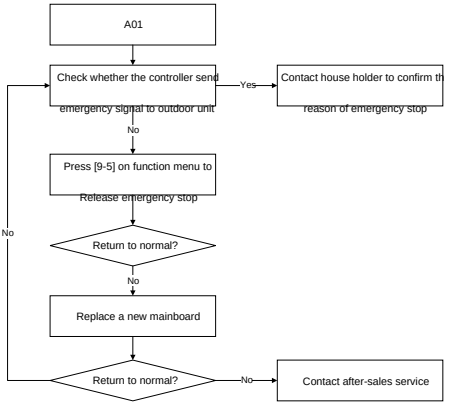
2.1.2 Description

2.1.3 Possible causes

The emergency stop signal is detected

Detective mainboard

Controller send emergency signal to outdoor unit



2.2 A11: Refrigerant leakage error

2.2.1 Digital display output

2.2.2 Description

Refrigerant leak detected in some indoor units

The fan of the indoor unit with refrigerant leakage is detected running at the highest air speed and the electronic

2.2.3

expansion valve is closed (note: re-powering the unit does not lift the fault), while the buzzer on the displa

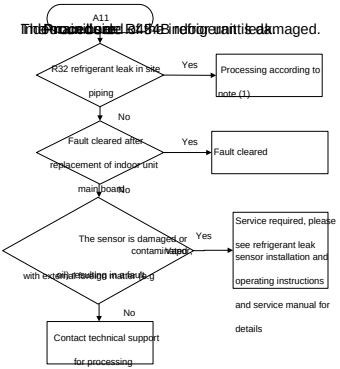
board of the faulty indoor unit and the buzzer on the line control connected to the faulty indoor unit continuously chirp

If the R454B refrigerant leak detection sensor is found to be damaged or contaminated with external foreign matt

2.2.4

the sensor, a new sensor is required if the fault cannot be lifted after the sensor is found to be d

If the R454B refrigerant leak detection sensor is damaged.



Notes:

(1) Follow the steps below for refrigerant leaks:

shut-off device

shut-off device

Use the refrigerant recovery device to recover the refrigerant in the service valve on the outdoor unit (when the outdoor unit leaks, the refrigerant respectively, and at the same time, when recovering the refrigerant, select the menu on the outdoor unit to enter the evacuation mode to ensure clean refrigerant recovery);

Once the repair is complete, the system piping is tested for airtightness, as described in the piping installation section of the outdoor unit installation instructions. If the airtightness test is passed, proceed to the next step, otherwise repeat the previous repair process until the

Recharge the refrigerant according to the installation instructions for the outdoor unit.

Replace the R454B leak detection sensor and indoor unit display the fault.

2.3 1b01/4b01: Electronic expansion valve (EEVA/D) error

2.3.1 Digital display output

2.3.2 Description

2.3.3 Possible causes

Error code is displayed on the outdoor unit with the error.

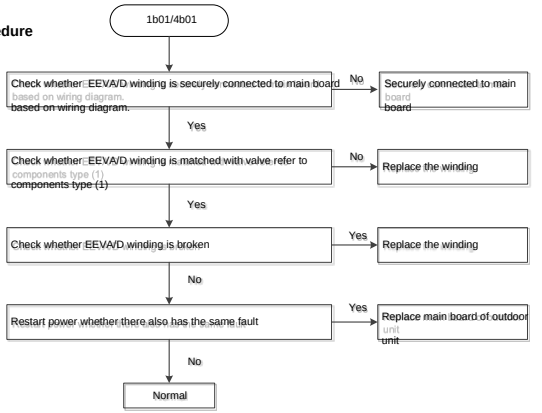
The electronic expansion valve signal was not detected by the mainboard for 2 minutes

The electronic expansion valve (EEVA/D) winding is mismatching

Defective electric expansion valve (EEVA/D) winding

Electronic expansion valve (EEVA/D) winding is disconnected to mainboard

2.3.4 Procedure



2.3.5 Units stop running

Note:

1. Refer to key components and parts type in Appendix
2. "4b01" error only happened during refrigerant auto-charging mode

2.4 C21: Communication error between indoor units and outdoor unit

2.4.1 Digital display output

2.4.2 Description

Communication error between IDU and ODU

2.4.3 Possible causes

All units stop running.

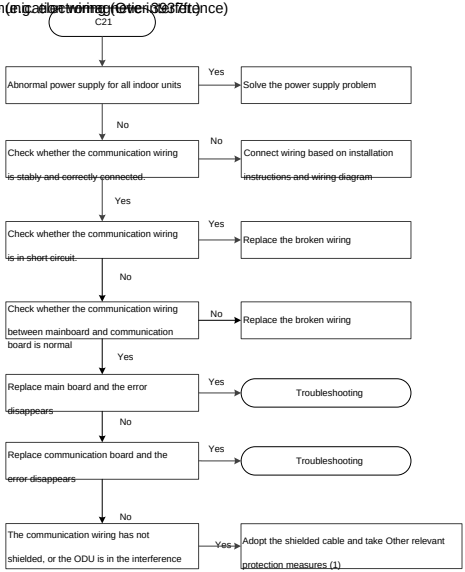
Communication cables between ODU and IDUs are not stably connected, or in poor contact, or in short circuit.

Damaged main board or communication board

Abnormal power supply for all IDUs

External cause (e.g. electromagnetic interference)

Procedure



Note

1. Make sure that the matched resistance has been connected in the last indoor unit.

2.5 C26/C28: Number of indoor units detected by the outdoor unit has decreased/increased

2.5.1 Digital display output

2.5.2 Description

The number of online indoor units is smaller/greater than the configured number of indoor units.

2.5.3 Possible causes

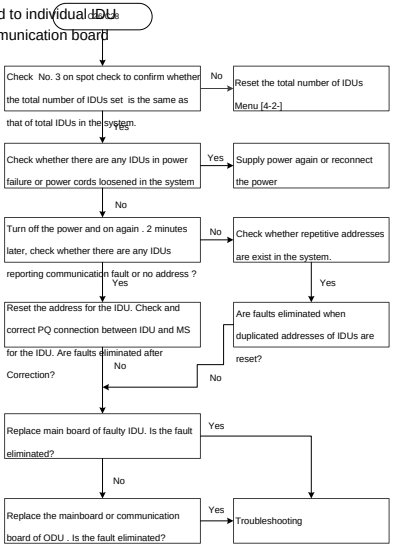
Repetitive addresses exist in the IDUs in the refrigerant system

Communication cable from some IDUs to ODU is improperly connected or in short circuit.

Defective ODU mainboard

Defective main board to individual IDU

Defective ODU communication board



2.6 1C41: Communication error between main control chip and inverter driver chip

2.6.1 Digital display output

2.6.2 Description

The communication between the main control board and inverter driver board is

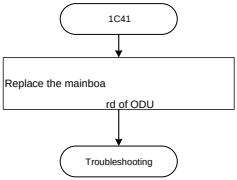
2.6.3

Error code is displayed on the unit with the error

2.6.4 Possible causes

Defective ODU mainboard

Procedure



2.7 E41/F41/F43/F91/FC1/F81: T4/T3/T3B/T5/TL/Tg error (open/short)

2.7.1 Digital display output

Error code	Error description	Remarks	Digital display output
E41	Outdoor ambient temperature sensor (**T4**) error(open/short)	sensor error	
F41	Main heat exchanger pipe temperatur sensor (**T3**) error(open/short)	sensor error	
F43	Temperature sensor in the middle of the heat exchanger pipe (T3B) error (open/short)	sensor error	
F91	Liquid pipe temperature sensor (**T5**) error (open/short)	sensor error	
FC1	Outdoor heat exchanger liquid temperature sensor (**TL**) error (open/short)	sensor error	
F81	Gas pipe temperature sensor (Tg) err (open/short)	sensor error	

2.7.2 Description

Temperature sensor error

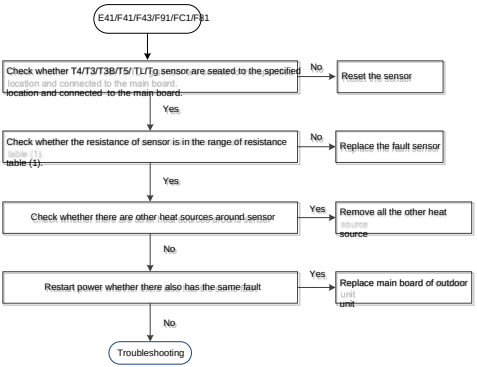
Detects voltage > 4.95V or < 0.05V

2.7.3 Error code is displayed on the unit with the error

Possible causes

Contact failure between sensor and main board
Temperature sensor failure
The temperature sensor is located at wrong place
Defective main board of ODU
Obstacles around the sensor

2.7.4 Procedure



Note

1. The sensor resistance table refer to Part 6.2.

2.8 F71: Discharge temperature sensor (T7C) error (open/short)

2.8.1 Digital display output

2.8.2 Description

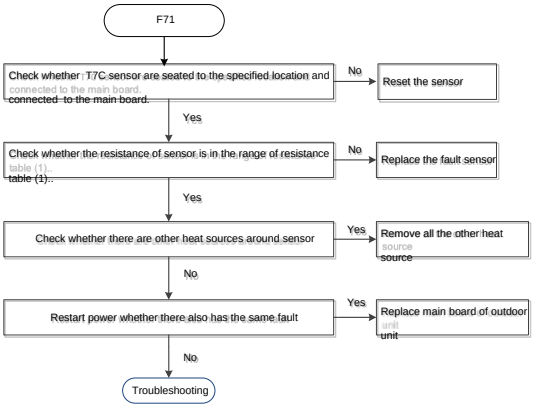
Temperature sensor error
All units stop running.

2.8.3 Error code is displayed on the unit with the error

Possible causes

Contact failure between sensor and main board
Temperature sensor failure
The temperature sensor is located at wrong place
Defective main board of ODU
Heat source around the sensor

Procedure



Note

1. The sensor resistance table refer to Part 6.3

2.9 F62/F6A: Inverter module temperature (Tf) protection

2.9.1 Digital display output

2.9.2 Description

F62: The temperature of the internal NTC of the compressor module board or fan module is higher than 100°C.

F6A: The temperature of the HMIC radiator is too high.

2.9.3 Method to detect

Error code is displayed on the outdoor unit with the Error

2.9.4 Possible causes

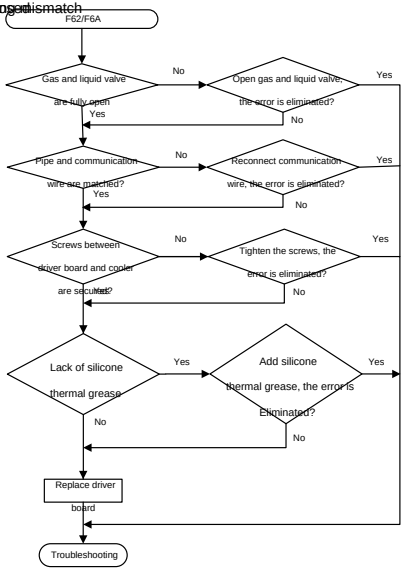
Poor contact between driver board and cooler

Defective driver board

Lack of silicone thermal grease

Pipe and signal wire dislodged

2.9.5 Procedure



2.10 F72/F7A: Discharge temperature (T7C) protection

2.10.1 Digital display output

2.10.2 Description

°C.

F72: Discharge Temperature (T7C) 115

Discharge temperature is over the limit.

F7A: F72 protection occurs 3 times in 100 minutes

All outdoor Unit stop running

2.10.3 Possible causes

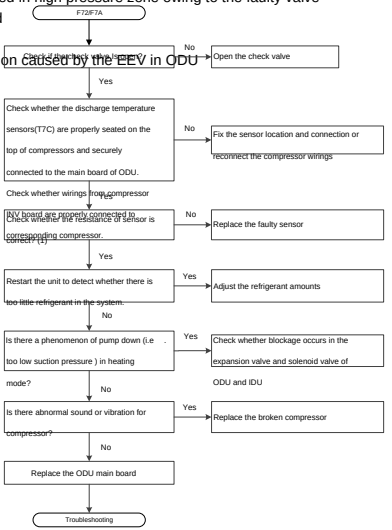
Error judgment caused by faulty sensor

The refrigerant blocked in high pressure zone owing to the faulty valve

Defective main board

Lack of cooling function caused by the EEV in ODU

2.10.4 Procedure



Note

1. The sensor resistance table refer to Part 6.2

2.11 F75: Compressor discharge insufficient superheat protection

2.11.1 Digital display output

2.11.2 Description

The discharge temperature superheat of compressor is less than 43°F (6°C) for more than 60 minutes

2.11.3 Determination and operation of outdoor unit

All units stop running.

The error code is displayed on the outdoor unit with error.

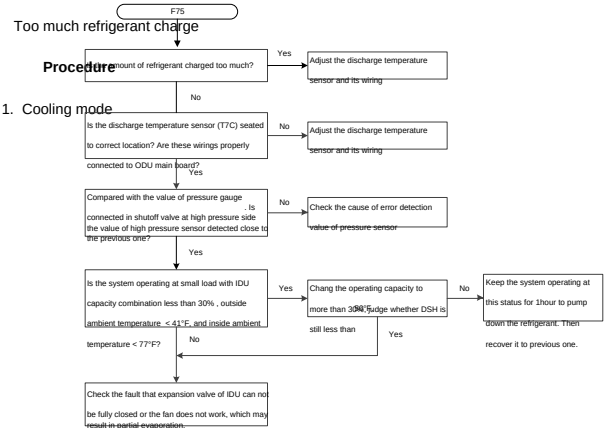
2.11.4 Possible causes

Too much refrigerant charge

Discharge temperature sensor failed or fell off

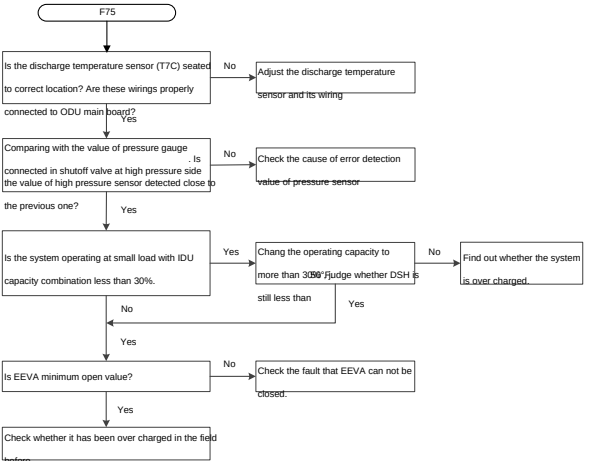
Damaged ODU main board

Procedure



1. Cooling mode

2. Heating mode



2.12 P11: High pressure sensor malfunction

2.12.1 Digital display output

2.12.2 Description

All units stop running

Open/short circuit error of high pressure sensor

The error code is displayed on the Outdoor Unit with error.

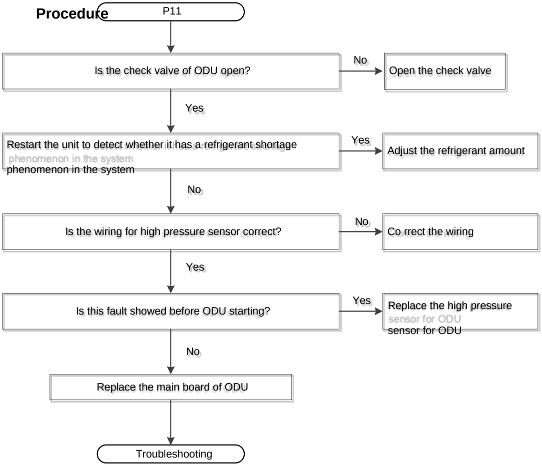
2.12.3 Possible causes

Misjudgment caused by faulty high pressure sensor caused by less refrigerant in the system

2.12.4 Defective main board of outdoor unit

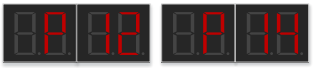
The ambient temperature is extremely high and the value of temperature sensor (T4) is distorted.

Procedure



2.13 P12/P14: High pressure protection

2.13.1 Digital display output



2.13.2

Description

P14: 3 times P12 in 100 minutes

P12: The high pressure is over the limit.

The detected high pressure is higher than 3.9 MPa

All units stop running

2.13.3

The error code is displayed on the unit with the Error

Possible causes

Extremely high pressure block in high pressure zone owing to the valve fault

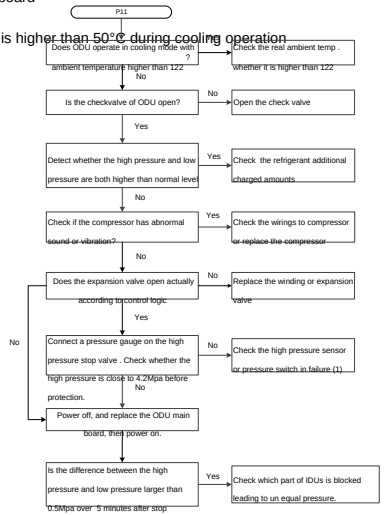
Compressor operating reversely due to wrong wiring sequence during service w ork

2.13.4

Defective ODU main board

Procedure

Ambient temperature is higher than 50°C during cooling operation



Note

1. The sensor resistance table refer to Part 6.4

2.14 P13: High pressure switch protection

2.14.1 Digital display output

2.14.2 Description

The detected high pressure is higher than 4.2 MPa

2.14.3 Possible causes

The outdoor unit's check valve is not open.

The pressure switch is either not connected correctly or is damaged.

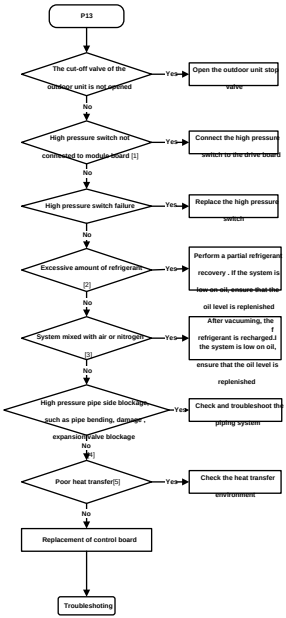
The system is contaminated with air or nitrogen.

There is a blockage on the high-pressure side.

The system has excessive refrigerant.

The outdoor unit's control board has malfunctioned.

2.14.4 Procedure



Note:

[1] The high-pressure switch interface is located at the outdoor unit's module board connector CN29.

[2] Excessive refrigerant can lead to lower discharge temperatures, higher discharge pressures, and higher suction pressures. Refer to Chapter 5, Tables 5.2.1

[3] Air or nitrogen in the system can cause higher discharge temperatures, higher discharge pressures, higher compressor currents, abnormal compre noise, and unusual pressure fluctuations. Refer to Chapter 5, Tables 5.2.1 and 5.2.2 for 'Normal Refrigerant System Parameters'.

[4] High-pressure pipe side blockage can lead to higher discharge temperatures, higher discharge pressures, and higher suction pressures. Refer to Chapter 5, Ta

[5] For cooling, inspect the outdoor unit's heat exchanger, fan, and discharge opening for blockages. For heating, inspect the indoor unit's heat exchanger, fan,

discharge opening for blockages.

2.15 P21: Low pressure sensor error

2.15.1 Digital display output

2.15.2 Description

Open/short circuit error in suction pressure sensor

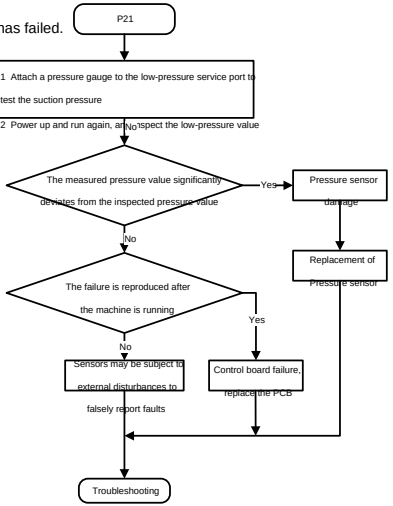
2.15.3 Possible causes

The pressure sensor is not correctly connected to the main board.

Pressure sensor is damaged.

Outdoor unit main board is damaged.

2.15.4 Procedure



2.16 P22/P25: Low pressure protection

2.16.1 Digital display output

2.16.2 Description

P22: Low pressure protection

The detected low pressure is lower than 0.12 MPa

P25: Low pressure protection occurs 3 times in 60 min.

All units stop running.

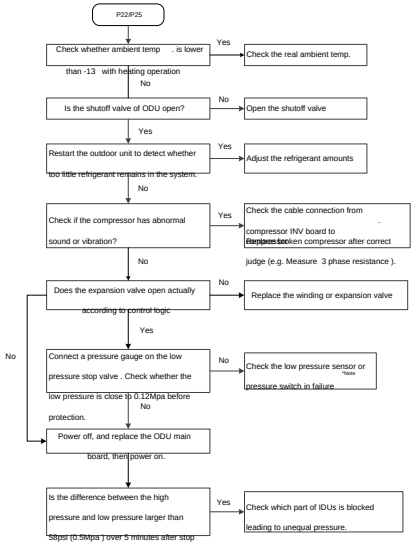
2.16.3 Error code is displayed on the unit with the error.

Possible causes

This is normally caused by the following:

Refrigerant has been blocked in high pressure zone owing to the valve fault

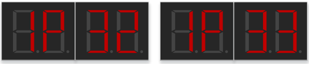
Procedure



Note: 1. The sensor resistance table refer to Part 6.5

2.17 1P32/1P33: Compressor high DC bus current protection

2.17.1 Digital display output



2.17.2 Description

Compressor current is higher than 17A (single fan model)/24A (double fan model)

Error code is displayed on the unit with the error.

All units stop running.

2.17.3 Possible causes

Stop valve is closed

Abnormal voltage of power supply

Too much refrigerant in the system

Faulty valve or filter resulting in large pressure ratio

Damaged main board

Outdoor ambient temp is too high during cooling operation

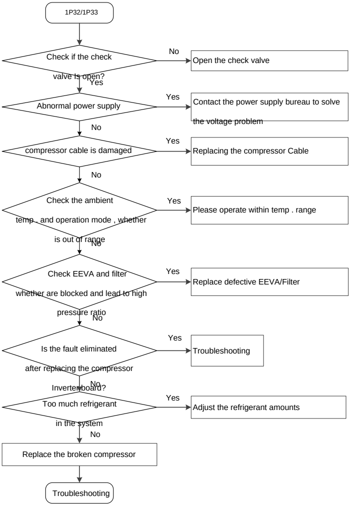
Indoor ambient temp is too high during heating operation

Incorrect power wiring of compressor

Defective compressor

Faulty electronic expansion valve in IDU

2.17.4 Procedure



2.18 P51/P52: Power voltage protection

2.18.1 Digital display output

2.18.2 Description

The detected voltage of ODU is not within the range of accepted value

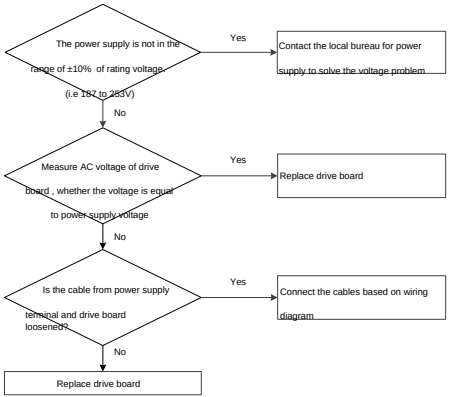
2.18.3 Possible causes

The voltage of ODU power supply is not within ±10% of rated voltage

Damaged drive board of ODU

Loose wiring from power supply terminal to drive board

2.18.4 Procedure



2.19 1P56: Inverter module DC bus low voltage error

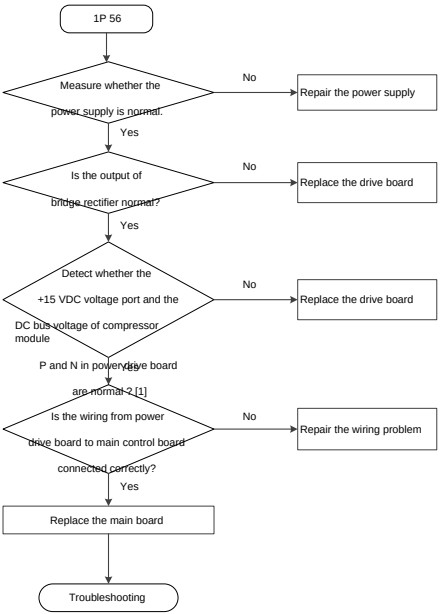
2.19.1 Digital display output

2.19.2 Description

Inverter driver board DC bus voltage is too low

2.19.3 Possible causes

Under voltage of the electric control power supply
Driver board PCB damage



Note:

1. Refer to *6.7 Compressor & Fan drive board ports detection*

2.20 1P57/1P58: Inverter module DC bus high voltage error

2.20.1 Digital display output

2.20.2

Description over voltage

All units stop running.

Inverter driver board DC bus

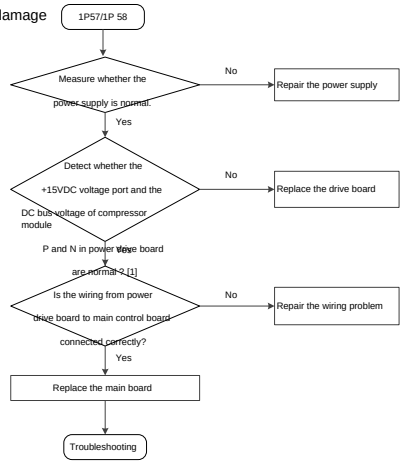
2.20.3

Error code is displayed on the unit with the error

Possible causes

ODU power supply overvoltage

Driver board PCB damage



Note:

1. Refer to *6.7 Compressor & Fan drive board ports detection*

2.21 1P59: Inverter module DC bus voltage drop protection

Definition and inspection of faults

Driver board DC bus over voltage

Supposed causes

Driver board PCB damages
Loose internal wiring in the electric control box

2.22 1P71: EEPROM error

2.22.1 Digital display output

2.22.2 Description

EEPROM can't communicate with main chip.

The EEPROM parameter of the ODU main control board is incorrect

2.22.3 Unit stop display

Unit stops displayed on the unit with the error

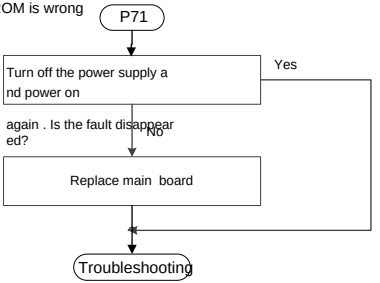
Possible causes

EEPROM is broken

Wrong EEPROM model

Software in EEPROM is wrong

Procedure



2.23 Pb1: HyperLink overcurrent error

2.23.1 Digital display output

2.23.2 Description

HyperLink overcurrent error

2.23.3 Possible causes

All units stop running.

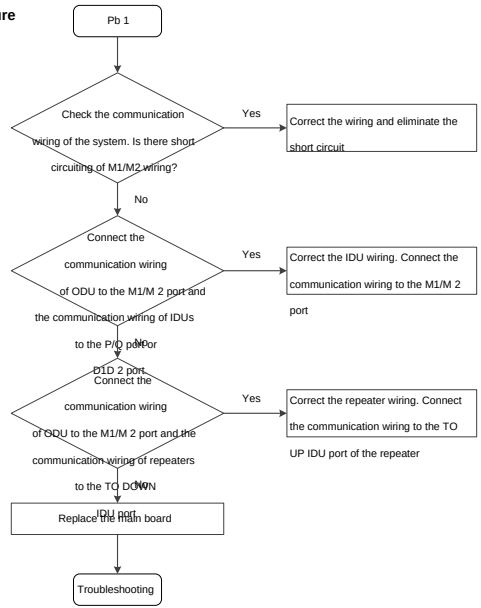
The M1M2 communication wiring of the master ODU is short-circuited.

The M1M2 communication wiring of the master ODU is connected to other communication wiring (not M1M2) of t IDU. " of the repeater.

The M1M2 communication board is damaged.

The M1M2 communication wiring of the master ODU is connected to port "TO DOWN IDU

Procedure



2.24 Pd1/Pd2: Anti-condensation protection

2.24.1 Digital display output

2.24.2 Description

Anti-condensation protection

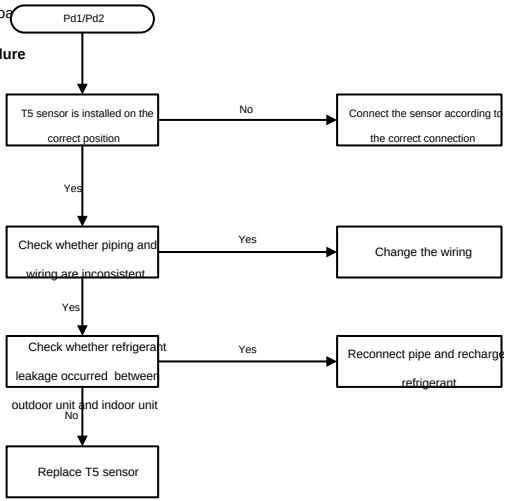
2.24.3 Possible causes

Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and communication wiring is connected to system B.

Temperature sensor T5 are not installed in designated positions.

Temperature sensor T5 are damaged.

2.24.4 Procedure



2.25 U13: Indoor unit type setting error

2.25.1 Digital display output

2.25.2 Description

Error code is displayed on ODU. Anti-condensation protection

2.25.3 Possible causes

Error code is displayed on the unit with the error

All units stop running.

Indoor Unit is VRF unit, while system setting is unitary system.

3 Error in Compressor Driver

3.1 1L01: Compressor error occurs 3 times in 60 minutes

3.1.1 Digital display output

3.1.2 Description

3.1.3 Compressor error occurs 3 times in 60 minutes

Possible Cause

3.1.4

Spot check to inquire about the code. Find out the cause by the error code.

Procedure

Spot check to inquire about the error code. Refer to the process for the error code.

3.2 1L1E: Hardware overcurrent

3.2.1 Digital display output

3.2.2 Description

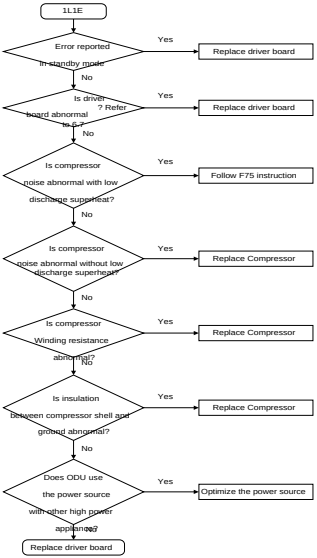
The compressor current exceeds the protection value. After the compressor stops running for a few minutes, the error disappears and the compressor starts again

3.2.3 Possible causes

Impurities in the refrigerant system

The compressor cylinder is stuck instantaneously
Compressor windings interphase short circuit
The system power supply voltage drops or is interrupted for a short time
Water on IPM module on account of condensation, resulting in short circuit between chip pins;
Liquid refrigerant in the compressor;
Abnormal driver board
When the compressor starts, the rotor has a certain speed

3.2.4 Procedure



3.3 1L11, 1L12: Compressor software overcurrent

3.3.1 Digital display output

3.3.2

Description

by the software.

The compressor will shut down when the motor current exceeds the protection value set by the software. If the error disappears one minute later, the compressor will start again.

3.3.3

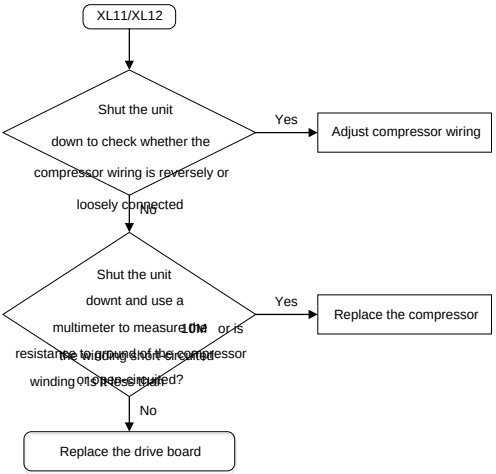
Possible causes

There are impurities in the refrigerant system or the compressor is instantaneously locked.

The system is faulty, due to reasons such as liquid return and impurities.

The compressor drive board is faulty.

3.3.4 Procedure



3.4 1L2E: Compressor inverter module high temperature protection

3.4.1 Digital display output

3.4.2

Description

The temperature of the compressor drive board (IPM) exceeds the set value (212).

3.4.3 The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again

Possible causes

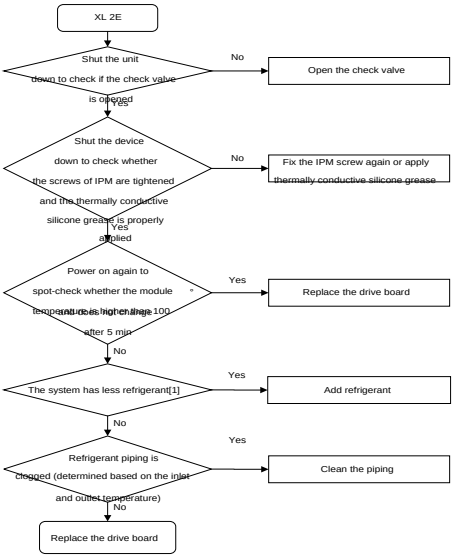
Poor heat dissipation due to uneven application of heat dissipation silicone gel on the module;

3.4.4 The compressor drive power module (IPM) is loose on the drive board or not tightened enough, leading to poor heat dissipation;

Abnormal refrigerant in the system or blocked pipeline;

Abnormal module board;

Procedure



Notes:

[1] Less refrigerant system results in higher Discharge temperature of the compressor, lower Discharge and suction pressure, lower current, and frost on the ga return pipe. Refer to Table 5.2.1 and 5.2.2 "Normal Refrigerant System parameters" in Chapter 5 for normal system parameters.

3.5 1L43: Compressor current sampling bias is abnormal

3.5.1 Digital display output

3.5.2

Description 212).

3.5.3 Once this fault occurs, the compressor cannot be started up and the drive board must be checked.

This temperature of the compressor drive board (PIM) exceeds the set value (

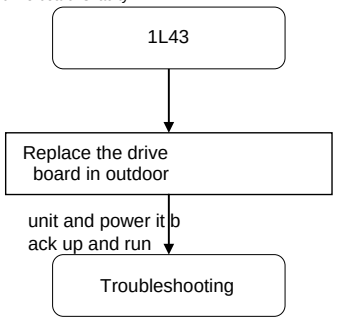
3.5.4

Possible causes

Replace the compressor and fan drive board.

Procedure

The compressor and fan drive board is faulty.



3.6 1L45: Compressor motor code mismatch

3.6.1 Digital display output

3.6.2 Description

The compressor parameters set by the main control board do not match the compressor parameters of the drive board.

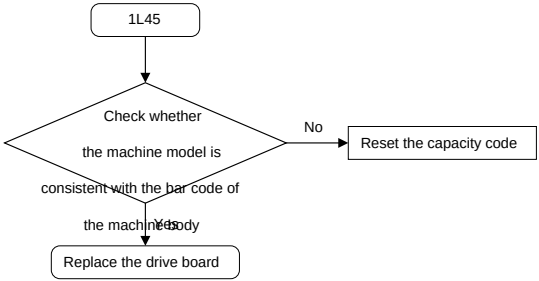
3.6.3 Possible causes

Once this fault occurs, the compressor cannot be started up, and the drive board must be checked.

The capacity DIP switch on the drive board or main control board is incorrectly set.

The main control board or compressor drive board is faulty.

3.6.4 Procedure



3.7 1L5E: Compressor startup failed

3.7.1 Digital display output

3.7.2 Description

The compressor fails to start after the error occurs. If the error disappears one minute later, the compressor sta
3.7.3 again.

Possible causes

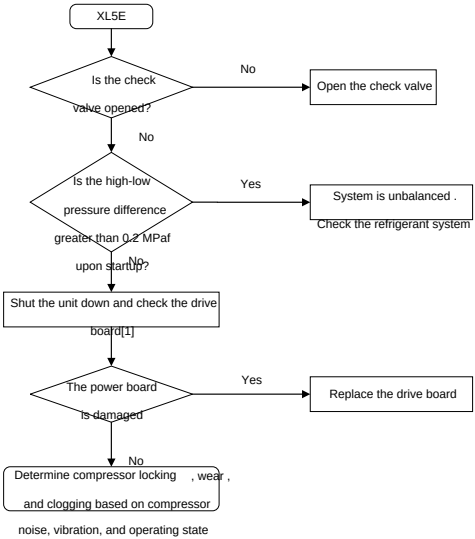
There is a pressure difference at system startup

Compressor suction/exhaust system blockage

3.7.4

Abnormal compressor drive board

Procedure



Notes:

[1] Refer to *6.7 Quick Field Test Guide on Compressor & Fan Drive Board*

3.8 1L51: Compressor zero speed protection

3.8.1 Digital display output

3.8.2 Description

3.8.3

Compressor locked-rotor occurred

Possible causes

The system has impurities or lacks oil, causing compressor locked

3.9 1L52: Compressor locked-rotor Protection

3.9.1 Digital display output

3.9.2 Description

The compressor is blocked.

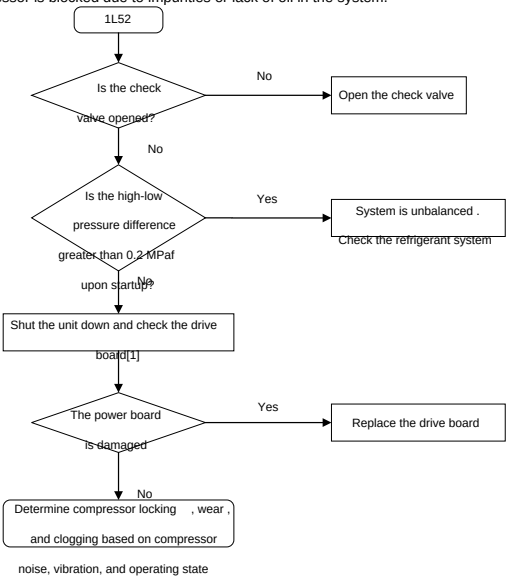
3.9.3 Procedure

again.

The compressor stops running after the error occurs. If the error disappears one minute later, the compressor sta

3.9.4 Possible causes

The compressor is blocked due to impurities or lack of oil in the system.



Notes:

[1] Refer to *6.7 Quick Field Test Guide on Compressor & Fan Drive Board*

3.10 1L6E: Compressor motor phase loss protection

3.10.1 Digital display output

3.10.2 Description

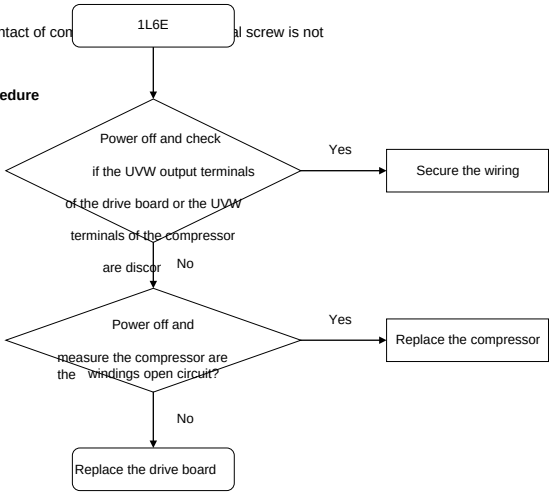
3.10.3

Compressor phase loss protection occurred

3.10.4 Supposed causes

Poor contact of con al screw is not tightened

Procedure



3.11 1L65: Compressor IPM short circuit

3.11.1 Digital display output

3.11.2 Description

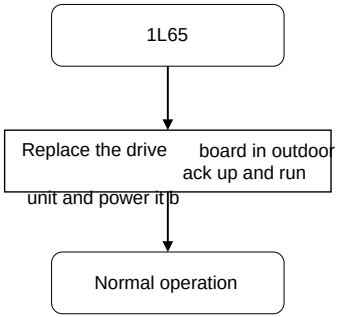
3.11.3 Suppossed causes

Compressor IPM short circuit

3.11.4

Abnormal control board in outdoor unit:
damaged

Procedure



3.12 1Lbe: High pressure switch protection

3.12.1 Digital display output

3.12.2

Description

When the fault occurs, the compressor stops operation. If the fault disappears in 1 min, the compressor is started
The high pressure switch connected to the drive board acts.
again.

3.12.3

Possible causes

The high pressure switch is faulty.
3. System pressure is too high.
The drive board is faulty.

3.12.4

Procedure

Refer to P13 Troubleshooting

3.13 1LCE: PFC hardware overcurrent

3.13.1 Digital display output

3.13.2 Description

PFC hardware over current protection

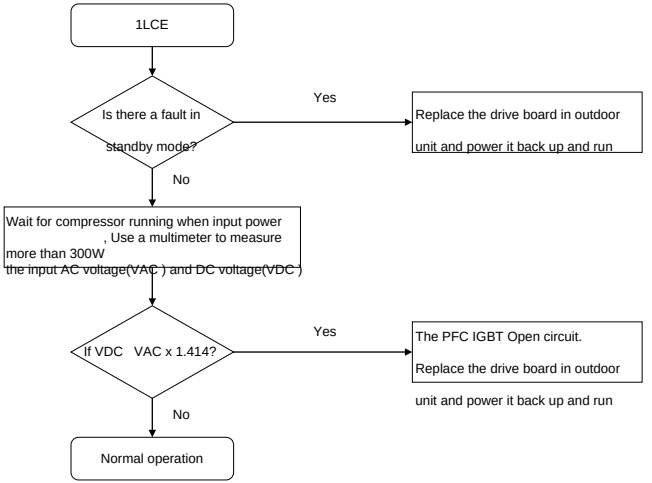
3.13.3 Possible causes

The PFC IGBT Open circuit

The Power supply voltage fluctuation

The Power supply voltage distortion

3.13.4 Procedure



3.14 1LC1: PFC software overcurrent

3.14.1 Digital display output

3.14.2 Description

PFC software over current protection

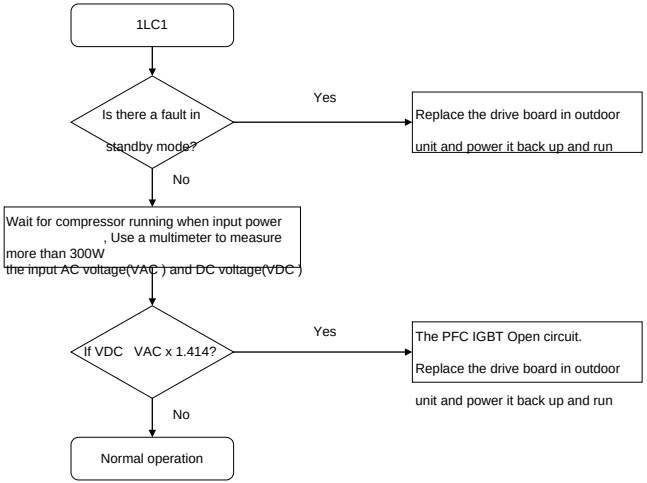
3.14.3 Possible causes

The PFC IGBT Open circuit

The Power supply voltage fluctuation

The Power supply voltage distortion

3.14.4 Procedure



4 Error in Fan Driver

4.1 1J01: Fan error occurs 3 times in 60 minutes

4.1.1 Digital display output

4.1.2 Description

4.1.3 Fan error occurs 3 times in 60 minutes

Possible Cause

4.1.4

Spot check to inquire about the code. Find out the cause by the error code.

Procedure

Spot check to inquire about the error code. Refer to the process for the error code.

4.2 1J1E: Fan hardware overcurrent

4.2.1 Digital display output

4.2.2 Description

Fan driver board detects overcurrent 3 times in 60 minutes

4.2.3 Possible Cause

Fan driver board

4.2.4 Procedure

Spot check to inquire about the code. Find out the cause by the error code.

Spot check to inquire about the error code. Refer to the process for the error code.

4.3 1J11, 1J12: Fan software overcurrent

4.3.1 Digital display output

4.3.2

Description

will start

4.3.3 The fan will stop when the protection. If the error happens five seconds later, the fan

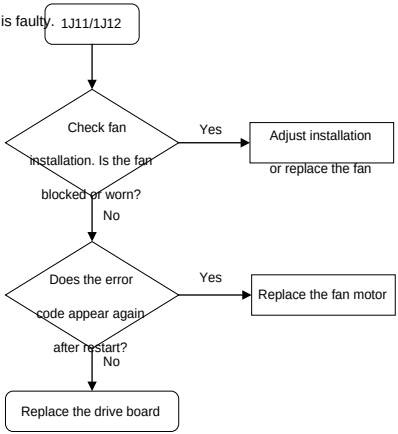
Possible causes

4.3.4

Severe fan wear.

Procedure

The fan drive board is faulty.



4.4 1J2E: Fan inverter module high temperature protection

4.4.1 Digital display output

4.4.2

Description

will start

4.4.3 The fan will stop when the error occurs. If the error disappears five seconds later, the fan

The fan current exceeds the protection value set for the software.

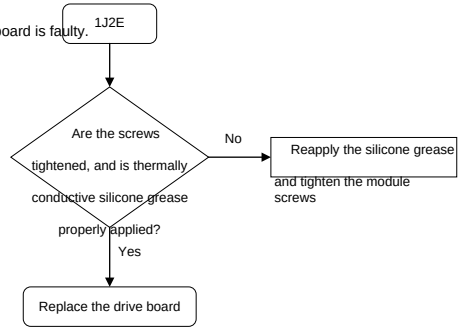
Possible causes

4.4.4

Severe fan wear.

Procedure

The fan drive board is faulty.



4.5 1J43: Fan current sampling is abnormal

4.5.1 Digital display output

4.5.2 Description

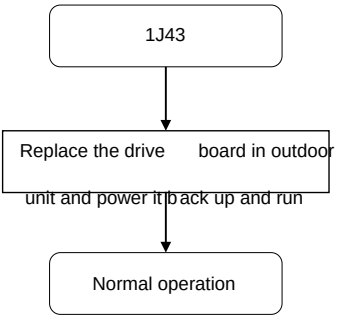
The temperature of the fan drive board (IPM) exceeds the set value (212).

4.5.3 Possible causes

The compressor and fan drive board is faulty.

4.5.4 Procedure

Replace the compressor and fan drive board.



4.6 1J45: Fan motor code mismatch

4.6.1 Digital display output

4.6.2 Description

The compressor parameters set by the main control board do not match the compressor parameters of the drive board.

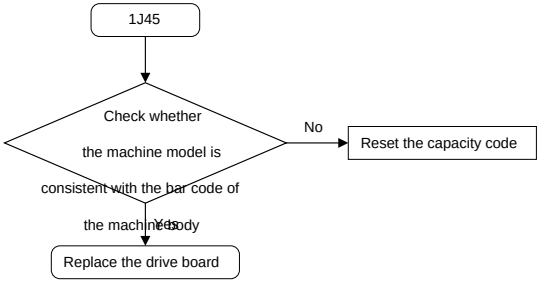
4.6.3 Possible causes

Once this fault occurs, the fan cannot be started up, and the drive board must be checked.

4.6.4 Procedure

The capacity code switches on the DIP switch of the main control board is incorrectly set.

The drive board is faulty.



4.7 1J5E: Fan startup failed

4.7.1 Digital display output

4.7.2 Description

The fan fails to be started.

4.7.3 Method to recover the error

The fan stops running after the error. If the error disappears after five seconds, the fan starts again.

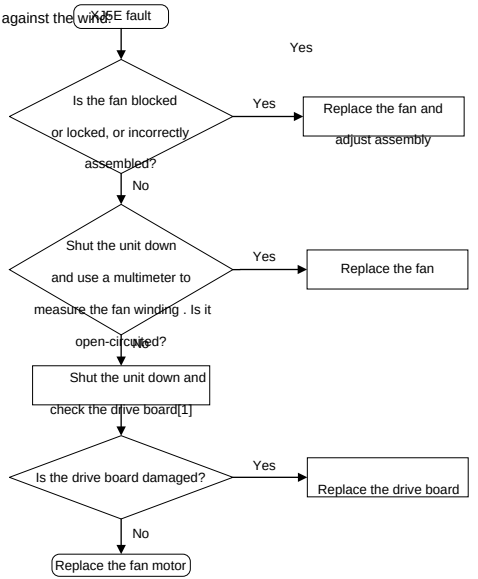
4.7.4 Possible causes

Fan motor stuck

Fan motor is abnormal:

Fan is started against the wind.

Procedure



Notes:

[1] Refer to *6.7 Quick Field Test Guide on Compressor & Fan Drive Board*

4.8 1J51: Fan zero speed protection

4.8.1 Digital display output

4.8.2 Description

Fan zero speed protection

4.8.3 Possible causes

Fan zero speed protection	The system has impurities or lacks oil, causing fan locked

4.9 1J52: Fan locked-rotor Protection

4.9.1 Digital display output

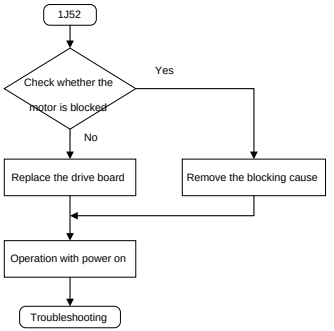
4.9.2 Description

The fan is stopped during the error. If the error disappears after five seconds, the fan starts again.

4.9.3 Possible causes

The fan is blocked.

4.9.4 Procedure



4.10 1J6E: Fan motor phase loss protection

4.10.1 Digital display output

4.10.2 Description

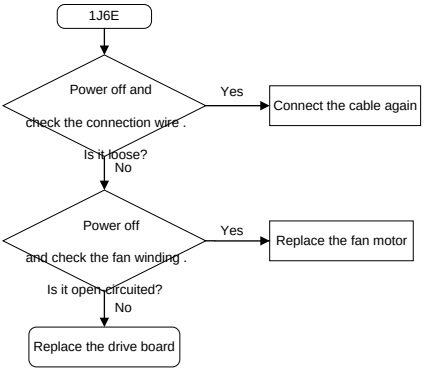
4.10.3 The fan stops running after the error. If the error disappears after five seconds, the fan starts again

4.10.4 Possible causes

The IPM of inverter board is damaged

The motor cable is in poor contact or the terminal screw is not tightened.

Procedure



4.11 1J65: Fan IPM short circuit

4.11.1 Digital display output

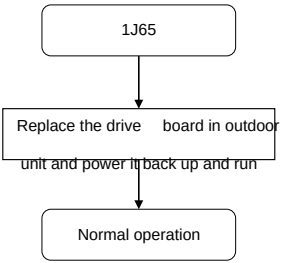
4.11.2 Description

Fan IPM short circuit

4.11.3 Possible causes

Abnormal control board in outdoor unit:
damaged

4.11.4 Procedure



5 Error in Shut-off Device

5.1 3b01 : The electronic ball valve is error

5.1.1 Digital display output

5.1.2 Description

Ad1

5.1.3 Possible causes

All units stop running.

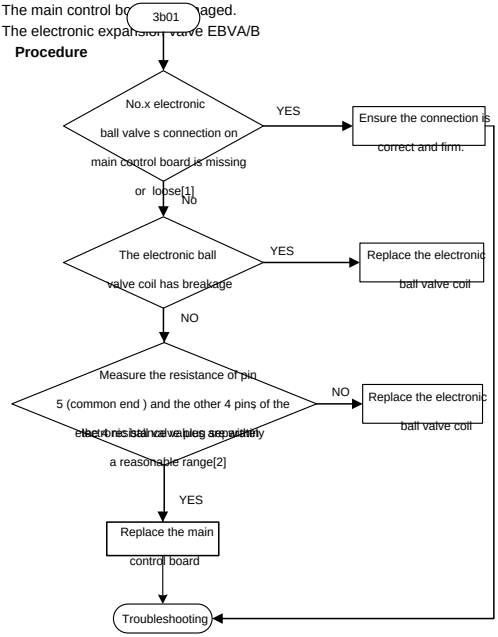
Shut-off device displays error code 3b01, the outdoor unit displays error code 3b04.

Electronic expansion valve EBVA/B is not connected to main control board correctly.

Electronic expansion valve EBVA/B coil is damaged.

The main control board is damaged.

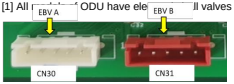
5.1.4 Procedure



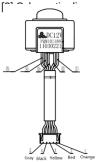
Notes:

31.

[1] All [redacted] of ODU have ele[redacted]ll valves A and B, which are connected to the main boards CN30 and CN



[redacted] of coil resistance measurement of electronic ball valve and reference range of resistance



The coil	Valve A/B
Measurement point	Resistance
1-5	
2-5	
3-5	
4-5	

5.2 C2A: Communication error between outdoor unit and refrigerant shut-off device.

5.2.1 Digital display output

5.2.2 Description

All units stop running.

Communication error between outdoor unit and refrigerant shut-off device.

5.2.3

Shut-off device displays error code C2A, the outdoor unit displays error code

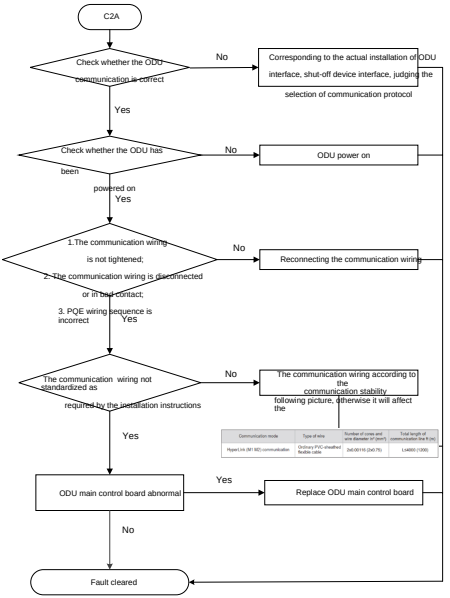
Ad1

Table 5-1.6 Error caused by communication table

Shut-off devic		Error code	Recover
ODU PQE	M1M2	C2A	Recommended shut-off device

1. Error caused by communication

5.2.4 Procedure



5.3 P71: Error in EEPROM

5.3.1 Digital display output

5.3.2 Description

All units stop running.

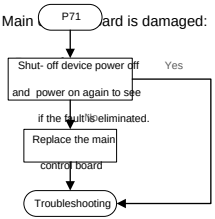
The EEPROM parameter of the shut-off device main control board is incorrect

Shut-off device displays error code

5.3.3 Possible causes

EEPROM units damaged:

Main board is damaged:



5.4 Ab1: Error in power-down

5.4.1 Digital display output

5.4.2

Description

.

All units stop running.

The power supply to the shut-off device is disconnected.

5.4.3

Shut-off device displays error code

Possible causes

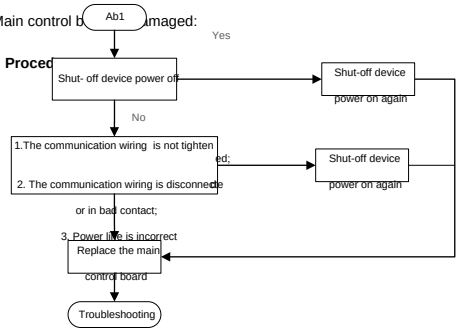
Power switch jumped turns;

5.4.4

Loose power cord;

Main control b maged:

Proced



5.5 P5d: Supercapacitor voltage over rated operational voltage

5.5.1 Digital display output

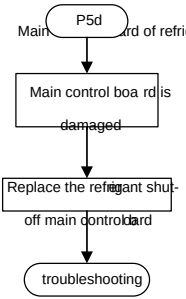
5.5.2 Description

Supercapacitor voltage is seriously too high

Shut-off device displays error code P5d, the outdoor unit displays error code

5.5.3

5.5.4 Possible causes



5.6 P5E: Supercapacitor voltage lower than rated operational voltage

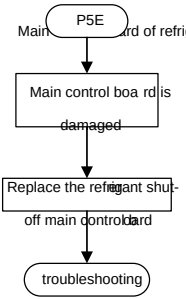
5.6.1 Digital display output

5.6.2 Description

Supercapacitor voltage is seriously too low

5.6.3 Shut-off device displays error code P5E, the outdoor unit displays error code

5.6.4 Possible causes



6 Appendix

6.1 Resistance characteristics of temperature sensor

Table 6-6.1: Temperature probe symbol and position

Temperature probe symbol and position		The probe type
T3	Bottom of heat exchanger	Type A
T4	Outdoor ambient temperature	Type A
T5	Liquid pipe stop valve	Type A
T7C1/T7C2	Inverter compressor A discharge	Type B
TL	Outdoor Heat exchanger liquid pipe	Type A
Tg	Gas pipe stop valve	Type A

Notes: Type A is mainly used for general pipe temperature and ambient temperature detection

Type B is mainly used for compressor discharge temperature detection

6.2 Resistance of Temperature sensor A

Table 6-6.2: Temperature sensor temperature resistance characteristic table

T( )	Rmin(K)	Rnom(K)	Rmax(K)		Rmin(K)	Rnom(K)	Rmax(K)
-40	337.762	388.619	446.732	-3	37.558	40.376	43.365
-39	315.441	362.171	415.45	-2	35.647	38.259	41.025
-38	294.802	337.767	386.646	-1	33.843	36.264	38.824
-37	275.699	315.226	360.096	0	32.14	34.385	36.753
-36	258.001	294.386	335.6	1	30.532	32.613	34.803
-35	241.589	275.1	312.977	2	29.013	30.941	32.968
-34	226.358	257.238	292.067	3	27.578	29.364	31.238
-33	212.21	240.679	272.721	4	26.221	27.876	29.609
-32	199.059	225.317	254.809	5	24.938	26.471	28.074
-31	186.823	211.053	238.21	6	23.725	25.145	26.626
-30	175.432	197.799	222.817	7	22.578	23.892	25.26
-29	164.82	185.475	208.531	8	21.492	22.708	23.972
-28	154.925	174.007	195.264	9	20.464	21.59	22.757
-27	145.695	163.33	182.934	10	19.491	20.532	21.609
-26	137.078	153.381	171.467	11	18.569	19.532	20.526
-25	129.03	144.105	160.797	12	17.696	18.586	19.502
-24	121.508	135.452	150.861	13	16.868	17.69	18.536
-23	114.473	127.375	141.604	14	16.084	16.843	17.622
-22	107.892	119.832	132.974	15	15.341	16.041	16.758
-21	101.73	112.783	124.925	16	14.635	15.281	15.941
-20	95.959	106.193	117.413	17	13.966	14.562	15.169
-19	90.551	100.028	110.399	18	13.332	13.88	14.438
-18	85.48	94.259	103.846	19	12.729	13.234	13.746
-17	80.724	88.857	97.721	20	12.157	12.621	13.091
-16	76.26	83.796	91.994	21	11.614	12.041	12.471
-15	72.07	79.054	86.636	22	11.099	11.49	11.884
-14	68.134	74.607	81.62	23	10.608	10.967	11.327
-13	64.436	70.436	76.924	24	10.143	10.471	10.8
-12	60.96	66.521	72.525	25	9.7	10	10.3
-11	57.691	62.847	68.402	26	9.254	9.553	9.853
-10	54.615	59.396	64.536	27	8.83	9.128	9.428
-9	51.721	56.153	60.911	28	8.429	8.725	9.024
-8	48.996	53.106	57.509	29	8.048	8.342	8.639
-7	46.43	50.241	54.315	30	7.686	7.977	8.273
-6	44.012	47.546	51.317	31	7.342	7.631	7.924
-5	41.733	45.01	48.5	32	7.016	7.302	7.592
-4	39.585	42.623	45.853	33	6.706	6.988	7.276

Table 6-6.2: Temperature sensor temperature resistance characteristic table (continues)

T( )	Rmin(K)	Rnom(K)	Rmax(K)		Rmin(K)	Rnom(K)	Rm ax(K)
34	6.412	6.69	6.975	71	1.455	1.585	1.725
35	6.132	6.407	6.688	72	1.403	1.53	1.668
36	5.866	6.137	6.414	73	1.354	1.478	1.613
37	5.613	5.88	6.153	74	1.307	1.428	1.559
38	5.373	5.635	5.905	75	1.261	1.38	1.509
39	5.144	5.402	5.667	76	1.218	1.334	1.46
40	4.926	5.179	5.441	77	1.176	1.289	1.412
41	4.718	4.968	5.225	78	1.136	1.247	1.367
42	4.521	4.766	5.019	79	1.098	1.206	1.323
43	4.333	4.573	4.822	80	1.06	1.166	1.281
44	4.154	4.39	4.634	81	1.025	1.128	1.24
45	3.983	4.215	4.455	82	0.99	1.091	1.201
46	3.821	4.047	4.283	83	0.958	1.056	1.164
47	3.666	3.888	4.12	84	0.926	1.022	1.127
48	3.518	3.736	3.963	85	0.895	0.99	1.092
49	3.377	3.59	3.813	86	0.866	0.958	1.059
50	3.243	3.451	3.67	87	0.838	0.928	1.026
51	3.114	3.318	3.533	88	0.811	0.899	0.995
52	2.991	3.192	3.402	89	0.785	0.87	0.965
53	2.874	3.07	3.276	90	0.76	0.843	0.935
54	2.762	2.954	3.156	91	0.735	0.817	0.907
55	2.656	2.843	3.041	92	0.712	0.792	0.88
56	2.553	2.737	2.931	93	0.689	0.768	0.854
57	2.456	2.635	2.825	94	0.668	0.744	0.829
58	2.362	2.538	2.723	95	0.647	0.722	0.804
59	2.273	2.444	2.626	96	0.627	0.7	0.781
60	2.187	2.355	2.533	97	0.607	0.679	0.758
61	2.105	2.269	2.444	98	0.589	0.659	0.736
62	2.027	2.187	2.358	99	0.571	0.639	0.715
63	1.952	2.109	2.276	100	0.553	0.62	0.694
64	1.88	2.033	2.197	101	0.537	0.602	0.674
65	1.811	1.961	2.121	102	0.52	0.584	0.655
66	1.745	1.892	2.048	103	0.505	0.567	0.637
67	1.682	1.825	1.978	104	0.49	0.551	0.619
68	1.622	1.761	1.911	105	0.475	0.535	0.602
69	1.564	1.7	1.847	106	0.461	0.52	0.585
70	1.508	1.641	1.785	107	0.448	0.505	0.569

Table 6-6.2: Temperature sensor temperature resistance characteristic table (continues)

T( )	Rmin(K)	Rnom(K)	Rmax(K)		Rmin(K)	Rnom(K)	Rmax(K)
108	0.434	0.49	0.553	145	0.16	0.186	0.216
109	0.422	0.477	0.538	146	0.156	0.181	0.211
110	0.41	0.463	0.523	147	0.152	0.177	0.206
111	0.398	0.45	0.509	148	0.148	0.173	0.201
112	0.386	0.438	0.495	149	0.145	0.169	0.197
113	0.375	0.425	0.482	150	0.142	0.165	0.192
114	0.365	0.414	0.469				
115	0.354	0.402	0.456				
116	0.344	0.391	0.444				
117	0.335	0.381	0.433				
118	0.325	0.37	0.421				
119	0.317	0.361	0.41				
120	0.308	0.351	0.4				
121	0.299	0.342	0.389				
122	0.291	0.332	0.379				
123	0.283	0.324	0.37				
124	0.276	0.315	0.36				
125	0.268	0.307	0.351				
126	0.261	0.299	0.342				
127	0.254	0.291	0.334				
128	0.247	0.284	0.325				
129	0.241	0.277	0.317				
130	0.234	0.269	0.309				
131	0.228	0.263	0.302				
132	0.222	0.256	0.294				
133	0.217	0.25	0.287				
134	0.211	0.243	0.28				
135	0.206	0.237	0.273				
136	0.2	0.231	0.267				
137	0.195	0.226	0.26				
138	0.19	0.22	0.254				
139	0.186	0.215	0.248				
140	0.181	0.21	0.242				
141	0.177	0.205	0.237				
142	0.172	0.2	0.231				
143	0.168	0.195	0.226				
144	0.164	0.19	0.221				

6.3 Resistance of Temperature sensor B

Table 6-6.3: Temperature sensor temperature resistance characteristic table

T( )	Rmin(K)	Rnom(K)	Rmax(K)		Rmin(K)	Rnom(K)	Rmax(K)
-40	1447.607	1780.01	2186.77	-3	182.421	210.39	242.429
-39	1357.115	1665.411	2041.903	-2	173.595	199.903	229.992
-38	1273.241	1559.403	1908.162	-1	165.241	189.994	218.258
-37	1195.401	1461.215	1784.53	0	157.334	180.628	207.184
-36	1123.073	1370.157	1670.097	1	149.846	171.772	196.729
-35	1055.793	1285.615	1564.057	2	142.754	163.397	186.857
-34	993.138	1207.036	1465.683	3	136.035	155.474	177.532
-33	934.733	1133.925	1374.327	4	129.667	147.978	168.721
-32	880.24	1065.838	1289.407	5	123.632	140.882	160.394
-31	829.351	1002.371	1210.396	6	117.909	134.164	152.522
-30	781.789	943.162	1136.821	7	112.481	127.802	145.078
-29	737.301	887.881	1068.252	8	107.332	121.775	138.036
-28	695.659	836.229	1004.299	9	102.447	116.064	131.373
-27	656.652	787.933	944.609	10	97.809	110.651	125.067
-26	620.092	742.746	888.861	11	93.406	105.52	119.098
-25	585.802	700.441	836.76	12	89.225	100.654	113.444
-24	553.625	660.811	788.039	13	85.253	96.038	108.09
-23	523.412	623.665	742.452	14	81.479	91.658	103.016
-22	495.03	588.83	699.774	15	77.892	87.501	98.207
-21	468.353	556.146	659.8	16	74.483	83.555	93.649
-20	443.269	525.464	622.339	17	71.24	79.808	89.326
-19	419.671	496.649	587.217	18	68.156	76.249	85.225
-18	397.461	469.575	554.273	19	65.222	72.867	81.335
-17	376.55	444.126	523.359	20	62.43	69.653	77.642
-16	356.853	420.196	494.338	21	59.772	66.598	74.137
-15	338.293	397.684	467.082	22	57.241	63.693	70.808
-14	320.799	376.5	441.475	23	54.831	60.93	67.646
-13	304.302	356.556	417.407	24	52.535	58.301	64.642
-12	288.742	337.775	394.779	25	50.346	55.799	61.787
-11	274.059	320.082	373.497	26	48.255	53.411	59.065
-10	260.2	303.408	353.473	27	46.262	51.138	56.478
-9	247.115	287.69	334.627	28	44.361	48.974	54.017
-8	234.756	272.869	316.884	29	42.549	46.912	51.676
-7	223.08	258.888	300.175	30	40.819	44.947	49.449
-6	212.045	245.697	284.433	31	39.169	43.075	47.329
-5	201.614	233.246	269.598	32	37.594	41.291	45.31
-4	191.751	221.491	255.615	33	36.091	39.59	43.389

Table 6-6.3: Temperature sensor temperature resistance characteristic table (continues)

T( )	Rmin(K)	Rnom(K)	Rmax(K)		Rmin(K)	Rnom(K)	Rmax(K)
34	34.655	37.967	41.558	74	8.048	8.427	8.817
35	33.284	36.419	39.814	75	7.788	8.147	8.515
36	31.973	34.942	38.152	76	7.537	7.877	8.225
37	30.722	33.533	36.568	77	7.297	7.618	7.946
38	29.525	32.187	35.057	78	7.064	7.368	7.678
39	28.381	30.902	33.617	79	6.841	7.128	7.42
40	27.288	29.675	32.243	80	6.625	6.896	7.172
41	26.242	28.503	30.932	81	6.417	6.673	6.933
42	25.241	27.383	29.681	82	6.217	6.458	6.704
43	24.283	26.313	28.487	83	6.024	6.252	6.483
44	23.367	25.29	27.347	84	5.837	6.053	6.27
45	22.49	24.312	26.258	85	5.658	5.861	6.065
46	21.65	23.376	25.218	86	5.485	5.676	5.868
47	20.845	22.481	24.224	87	5.317	5.497	5.678
48	20.075	21.625	23.274	88	5.156	5.325	5.496
49	19.337	20.806	22.367	89	5	5.16	5.32
50	18.629	20.022	21.499	90	4.85	5	5.15
51	17.951	19.271	20.669	91	4.696	4.846	4.996
52	17.301	18.552	19.875	92	4.548	4.697	4.847
53	16.678	17.863	19.116	93	4.405	4.554	4.703
54	16.08	17.204	18.389	94	4.267	4.415	4.565
55	15.507	16.572	17.693	95	4.134	4.282	4.431
56	14.957	15.966	17.028	96	4.006	4.153	4.301
57	14.429	15.385	16.39	97	3.882	4.028	4.176
58	13.922	14.828	15.779	98	3.763	3.908	4.055
59	13.435	14.294	15.194	99	3.648	3.792	3.938
60	12.968	13.782	14.634	100	3.537	3.68	3.825
61	12.519	13.291	14.097	101	3.43	3.572	3.716
62	12.089	12.819	13.582	102	3.326	3.467	3.61
63	11.674	12.367	13.089	103	3.226	3.366	3.508
64	11.277	11.933	12.616	104	3.13	3.268	3.409
65	10.894	11.516	12.162	105	3.037	3.174	3.314
66	10.527	11.115	11.727	106	2.947	3.082	3.221
67	10.173	10.731	11.309	107	2.86	2.994	3.132
68	9.833	10.361	10.908	108	2.776	2.909	3.045
69	9.506	10.006	10.523	109	2.695	2.826	2.961
70	9.192	9.665	10.154	110	2.617	2.746	2.88
71	8.889	9.337	9.799	111	2.541	2.669	2.802
72	8.598	9.022	9.459	112	2.468	2.594	2.725
73	8.317	8.719	9.132	113	2.397	2.522	2.652

Table 6-6.3: Temperature sensor temperature resistance characteristic table (continues)

T( )	Rmin(K)	Rnom(K)	Rmax(K)		Rmin(K)	Rnom(K)	Rmax(K)
114	2.328	2.452	2.58	153	0.841	0.912	0.989
115	2.262	2.384	2.511	154	0.825	0.896	0.972
116	2.198	2.319	2.444	155	0.81	0.88	0.955
117	2.136	2.255	2.379	156	0.795	0.864	0.938
118	2.076	2.194	2.316	157	0.78	0.848	0.921
119	2.018	2.134	2.255	158	0.765	0.833	0.905
120	1.962	2.077	2.196	159	0.751	0.818	0.889
121	1.908	2.021	2.139	160	0.737	0.803	0.873
122	1.855	1.967	2.083	161	0.723	0.788	0.858
123	1.804	1.914	2.029	162	0.709	0.773	0.842
124	1.755	1.863	1.977	163	0.696	0.759	0.827
125	1.707	1.814	1.926	164	0.683	0.745	0.812
126	1.661	1.766	1.877	165	0.669	0.731	0.798
127	1.616	1.72	1.829	166	0.657	0.717	0.783
128	1.573	1.675	1.783	167	0.644	0.704	0.769
129	1.531	1.632	1.738	168	0.631	0.691	0.755
130	1.49	1.59	1.695	169	0.619	0.678	0.741
131	1.45	1.549	1.652	170	0.607	0.665	0.728
132	1.412	1.509	1.611	171	0.595	0.652	0.714
133	1.375	1.47	1.571	172	0.584	0.64	0.701
134	1.339	1.433	1.532	173	0.572	0.628	0.688
135	1.304	1.397	1.495	174	0.561	0.616	0.675
136	1.27	1.361	1.458	175	0.55	0.604	0.662
137	1.237	1.327	1.423	176	0.539	0.592	0.65
138	1.205	1.294	1.388	177	0.528	0.581	0.638
139	1.175	1.262	1.355	178	0.517	0.569	0.626
140	1.145	1.231	1.322	179	0.507	0.558	0.614
141	1.115	1.2	1.29	180	0.497	0.547	0.602
142	1.087	1.171	1.26	181	0.486	0.536	0.591
143	1.06	1.142	1.23	182	0.477	0.526	0.579
144	1.033	1.114	1.201	183	0.467	0.515	0.568
145	1.007	1.087	1.172	184	0.457	0.505	0.557
146	0.982	1.061	1.145	185	0.448	0.495	0.546
147	0.958	1.035	1.118	186	0.439	0.485	0.536
148	0.934	1.011	1.092	187	0.43	0.475	0.525
149	0.911	0.987	1.067	188	0.421	0.466	0.515
150	0.889	0.963	1.042	189	0.412	0.456	0.505
151	0.873	0.946	1.024	190	0.403	0.447	0.495
152	0.857	0.929	1.006				

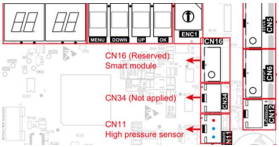
6.4 High Pressure Sensor Voltage Characteristics

Table 6-6.4: High pressure sensor voltage characteristic table

High pressure (MPa)	High pressure (psi)	Resistance (K)	Output voltage(V)
0.1	14.5	225.5555556	0.5869565
0.2	29	192.5806452	0.673913
0.3	43.5	167.1428571	0.7608696
0.4	58	146.9230769	0.8478261
0.5	72.5	130.4651163	0.9347826
0.6	87	116.8085106	1.0217391
0.7	101.5	105.2941176	1.1086957
0.8	116	95.45454545	1.1956522
0.9	130.5	86.94915254	1.2826087
1	145	79.52380952	1.3695652
1.1	159.5	72.98507463	1.4565217
1.2	174	67.18309859	1.5434783
1.3	188.5	62	1.6304348
1.4	203	57.34177215	1.7173913
1.5	217.5	53.13253012	1.8043478
1.6	232	49.31034483	1.8913043
1.7	246.5	45.82417582	1.9782609
1.8	261	42.63157895	2.0652174
1.9	275.5	39.6969697	2.1521739
2	290	36.99029126	2.2391304
2.1	304.5	34.48598131	2.326087
2.2	319	32.16216216	2.4130435
2.3	333.5	30	2.5
2.4	348	27.98319328	2.5869565
2.5	362.5	26.09756098	2.673913
2.6	377	24.33070866	2.7608696
2.7	391.5	22.67175573	2.8478261
2.8	406	21.11111111	2.9347826
2.9	420.5	19.64028777	3.0217391
3	435	18.25174825	3.1086957
3.1	449.5	16.93877551	3.1956522
3.2	464	15.69536424	3.2826087
3.3	478.5	14.51612903	3.3695652
3.4	493	13.39622642	3.4565217
3.5	507.5	12.33128834	3.5434783
3.6	522	11.31736527	3.6304348
3.7	536.5	10.35087719	3.7173913
3.8	551	9.428571429	3.8043478
3.9	565.5	8.547486034	3.8913043
4	580	7.704918033	3.9782609
4.1	594.5	6.898395722	4.0652174
4.2	609	6.12565445	4.1521739
4.3	623.5	5.384615385	4.2391304

4.4	638	4.673366834	4.326087
4.5	652.5	3.990147783	4.4130435
4.6	667	3.333333333	4.5

Measure the voltage between the middle and the lower pin (blue one)



**Outdoor unit: high pressure sensor

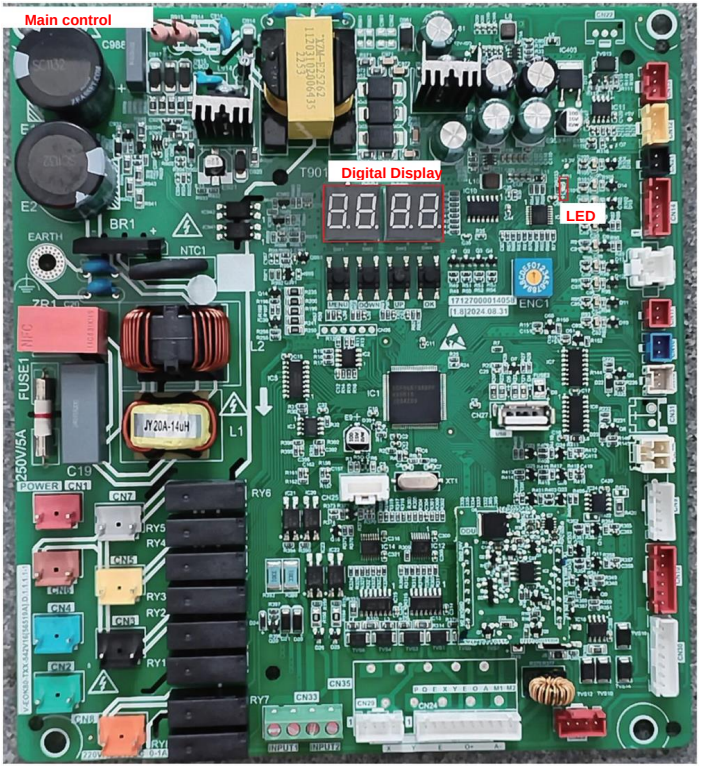
6.5 Low Pressure Sensor Voltage Characteristics

Table 6-6.5: Low pressure sensor voltage characteristic table

Low pressure (MPa)	Low pressure (psi)	Resistance (K)	Output voltage(V)	L	(MPa)	Low pressure (psi)	Resistance (K)	Output voltage(V)
0.1	14.5	184.285714	0.7		0.68	98.6	50.6451613	1.86
0.11	16	178.333333	0.72		0.7	102	48.9473684	1.9
0.12	17.4	172.702703	0.74		0.73	106	46.5306122	1.96
0.13	18.9	167.368421	0.76		0.76	110	44.2574257	2.02
0.14	20.3	162.307692	0.78		0.78	113	42.815534	2.06
0.15	21.8	157.5	0.8		0.81	117	40.754717	2.12
0.16	23.2	152.926829	0.82		0.84	122	38.8073394	2.18
0.17	24.7	148.571429	0.84		0.87	126	36.9642857	2.24
0.18	26.1	144.418605	0.86		0.9	131	35.2173913	2.3
0.19	27.6	140.454545	0.88		0.93	135	33.559322	2.36
0.21	30.5	133.043478	0.92		0.96	139	31.9834711	2.42
0.22	31.9	129.574468	0.94		0.99	144	30.483871	2.48
0.23	33.4	126.25	0.96		1.02	148	29.0551181	2.54
0.24	34.8	123.061224	0.98		1.06	154	27.2519084	2.62
0.26	37.7	117.058824	1.02		1.09	158	25.9701493	2.68
0.27	39.2	114.230769	1.04		1.13	164	24.3478261	2.76
0.29	42.1	108.888889	1.08		1.16	168	23.1914894	2.82
0.3	43.5	106.363636	1.1		1.2	174	21.7241379	2.9
0.32	46.4	101.578947	1.14		1.24	180	20.3355705	2.98
0.33	47.9	99.3103448	1.16		1.27	184	19.3421053	3.04
0.35	50.8	95	1.2		1.31	190	18.0769231	3.12
0.37	53.7	90.9677419	1.24		1.35	196	16.875	3.2
0.38	55.1	89.047619	1.26		1.39	202	15.7317073	3.28
0.4	58	85.3846154	1.3		1.43	207	14.6428571	3.36
0.42	60.9	81.9402985	1.34		1.48	215	13.3526012	3.46
0.44	63.8	78.6956522	1.38		1.52	220	12.3728814	3.54
0.46	66.7	75.6338028	1.42		1.56	226	11.4364641	3.62
0.48	69.6	72.739726	1.46		1.61	233	10.3225806	3.72
0.5	72.5	70	1.5		1.65	239	9.47368421	3.8
0.52	75.4	67.4025974	1.54		1.7	247	8.46153846	3.9
0.54	78.3	64.9367089	1.58		1.75	254	7.5	4
0.56	81.2	62.5925926	1.62		1.8	261	6.58536585	4.1
0.58	84.1	60.3614458	1.66		1.85	268	5.71428571	4.2
0.61	88.5	57.2093023	1.72		1.9	276	4.88372093	4.3
0.63	91.4	55.2272727	1.76		1.95	283	4.09090909	4.4
0.65	94.3	53.3333333	1.8		2	290	3.33333333	4.5

6.6 Quick Field Test Guide on Main Control Board

Figure 6.6.4: Main Control Board



6.6.1 Main Control Board Test:

The Control board is powered from the Drive board. While Control board start working, the Digital Display and LED1 will

light up.

Normally, the Digital Display indicates running conditions of the unit.

If the Digital Display or LED1 do not light up, please refer to Figure 6.5 and Table 6.6 to test and adjust Normal Value.

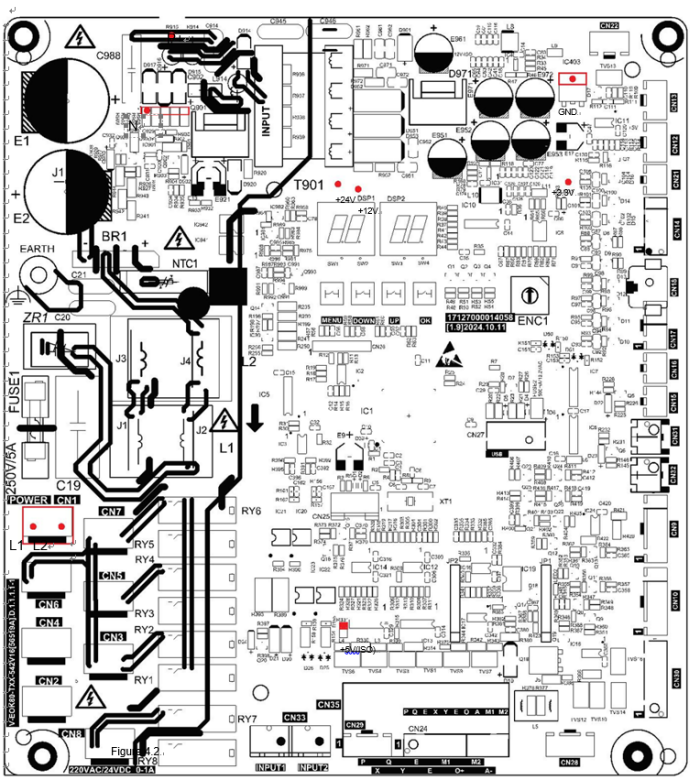


Figure 6.6.6: Main Control Board Port measurement guidelines

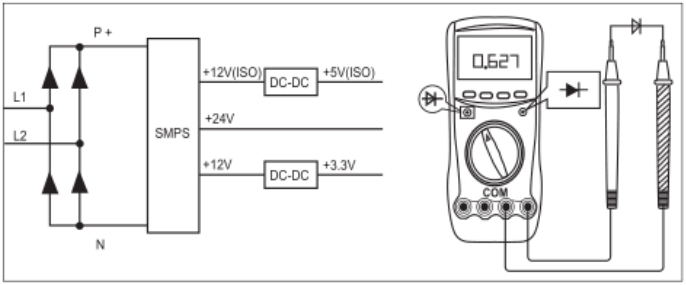


Table 6-6.6: Main control board definition table

System Status	Multimeter Stalls	Multimeter Red Probe (+)	Multimeter Black Probe (+)	Normal Value	Notes	
Power off		L1	P+	0.3~0.7V	0V or are abnormal	Rectifier bridge
Power off		L2	P+	0.3~0.7V	0V or are abnormal	
Power off Diodes		N	L1	0.3~0.7V	0V or are abnormal	
Power off		N	L2	0.3~0.7V	0V or are abnormal	
Power on Diodes	AC Voltage	L1	L2	187~264Vac	Other values are abnormal	Power input
Power on	DC Voltage	P+	N	2*(L1-L2)Vdc When system p	but not running	Rectifier bridge
Power on	DC Voltage	+24V	GND	22~26V	Other values are abnormal	DC output
Power on	DC Voltage	+12V	GND	10~14V	Other values are abnormal	
Power on	DC Voltage	+5V(ISO)	GND	4.5~5.5V	Other values are abnormal	
Power on	DC Voltage	+3.3V	GND	3~3.6V	Other values are abnormal	

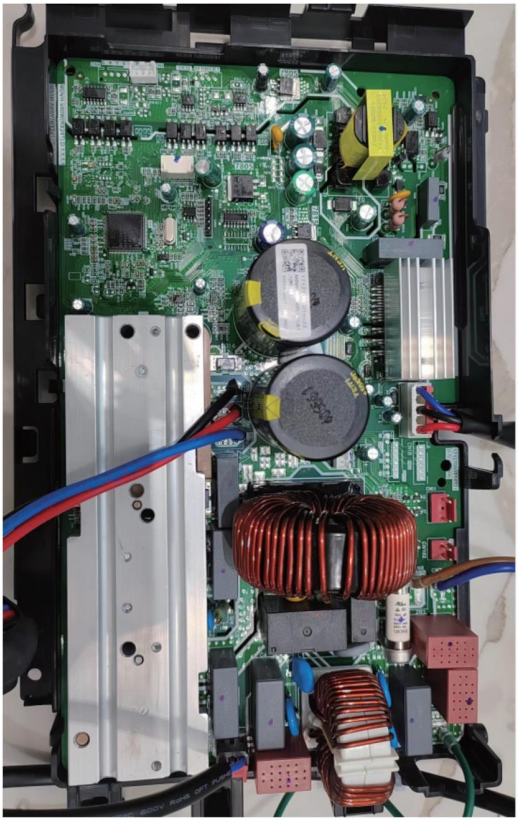
6.7 Quick Field Test Guide on Compressor & Fan Drive Board

There three different drive boards for different outdoor units. The following items are three different drive boards

diagrams.

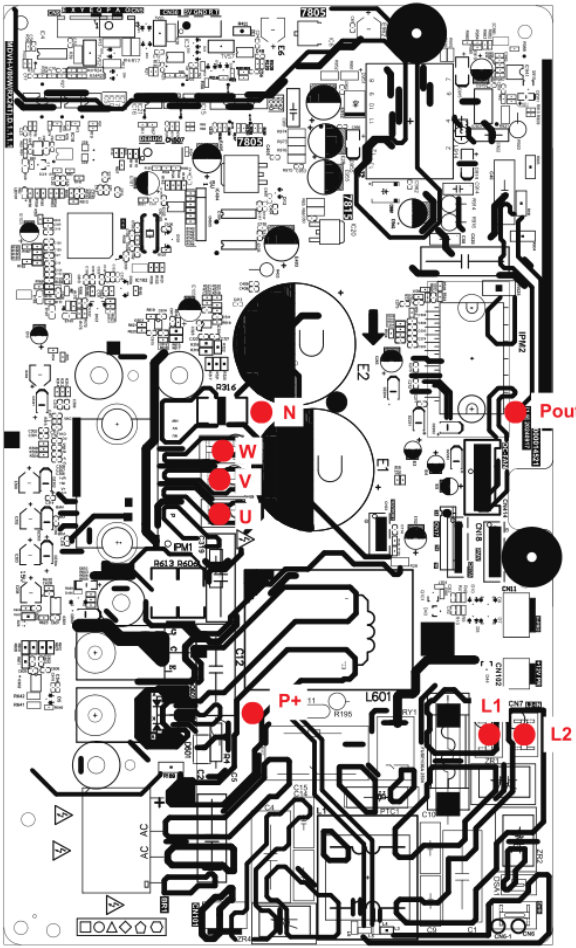
6.7.1 1.5/2.0ton Compressor & Fan Drive Board Test

Please refer to 1.5/2.0ton Compressor & Fan Drive Board Test Diagram to fing the test points, then refer to Table 4.8 for Normal Value.



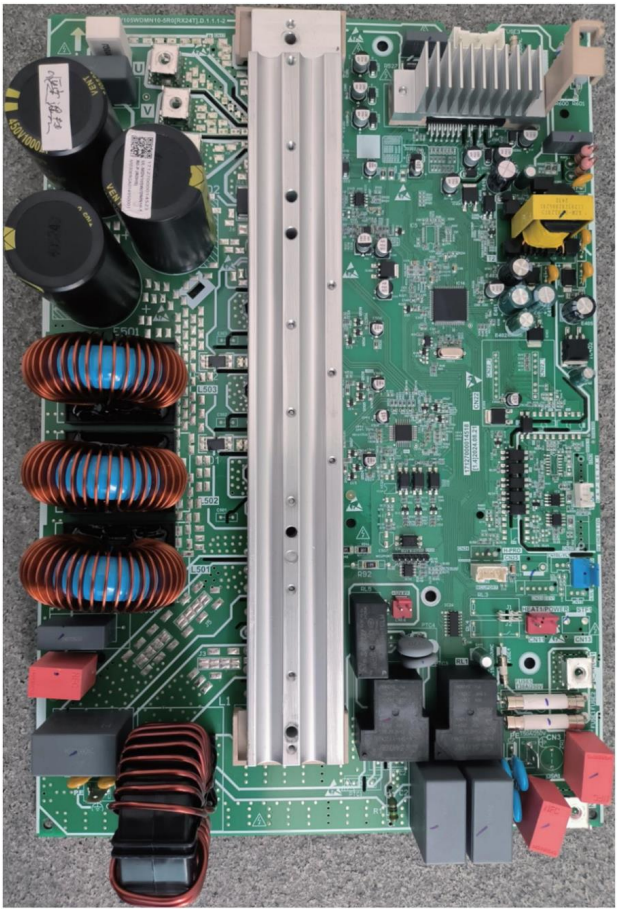
Test points of drive board, please refer to Figure 6.6.8 and Table 6.6.7 for test method and Normal Value.

Figure 6.6.8: Main Control Board Port



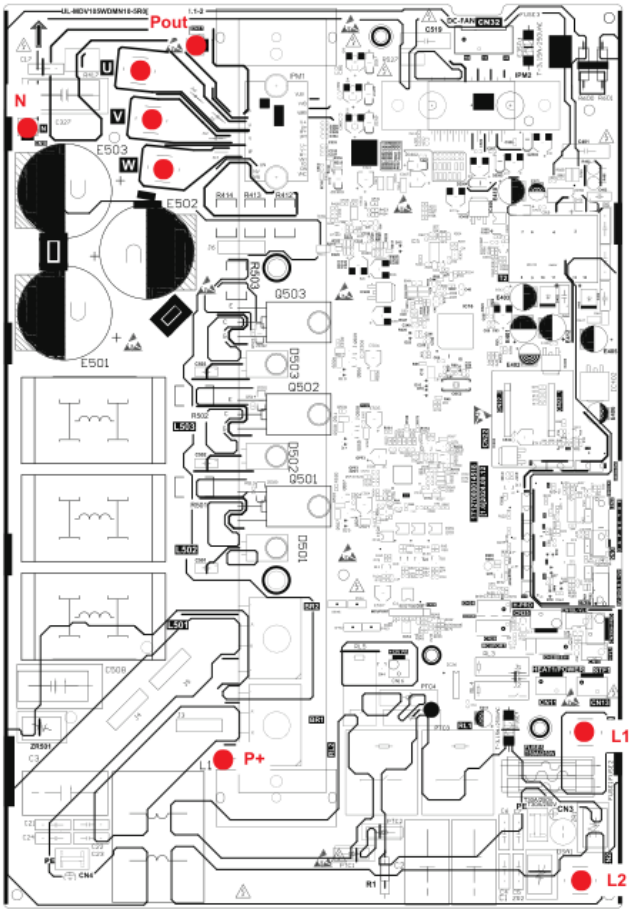
6.7.2 2.5/3.0ton Compressor & Fan Drive Board Test

Figure 6.6.7: Compressor & Fan Drive Board



Test points of drive board, please refer to Figure 6.6.8 and Table 6.6.7 for test method and Normal Value.

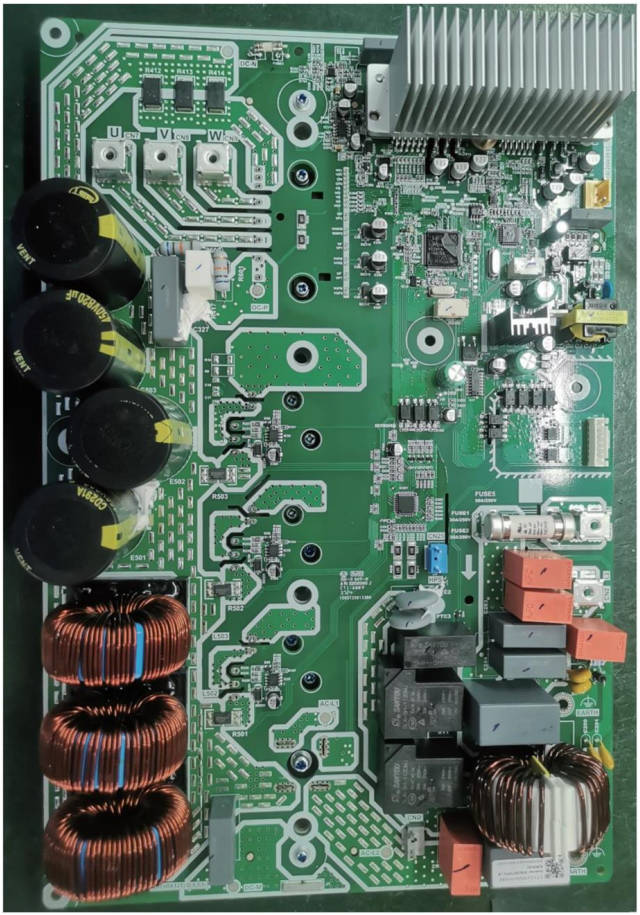
Figure 6.6.8: Main Control Board Port



Note: The drive boards of 1.5/2.0ton and 2.5/3.0ton are installed upside down, it must be turned over to be test.

6.7.3 4.0/5.0ton Compressor & Fan Drive Board Test

Figure 6.6.9: Compressor & Fan Drive Board



Test points of drive board, please refer to Figure 6.6.10 and Table 6.6.7 for test method and Normal Value.

Figure 6.6.10: Main Control Board Port

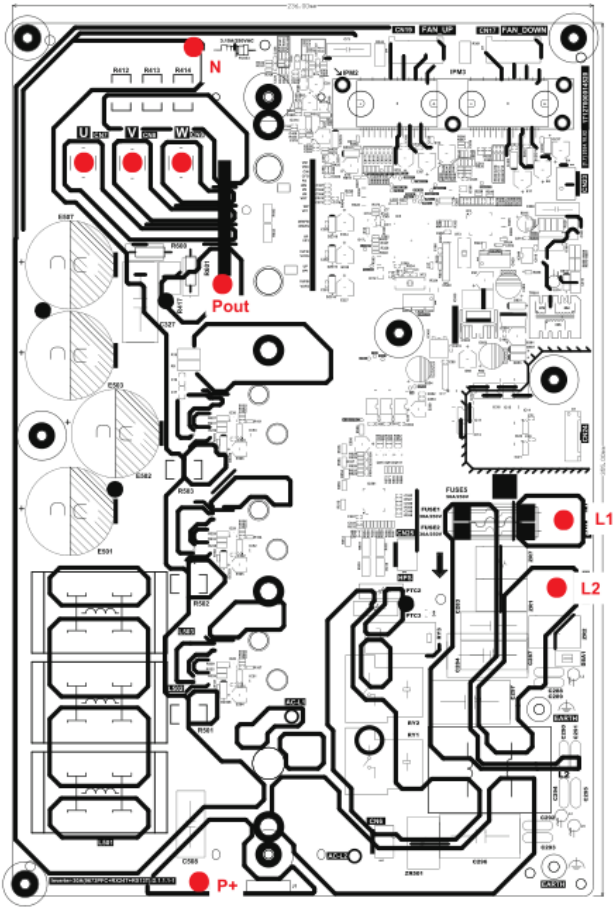


Figure 6.6.11: Compressor & Fan Drive Board measurement guidelines

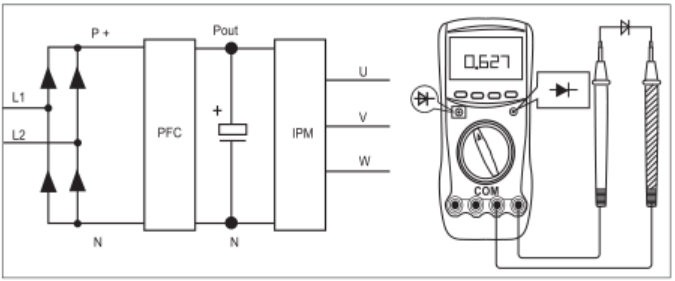


Table 6-6.7: Compressor & Fan Drive Board definition table

System Status	Multimeter Stalls	Multimeter	Multimeter	Normal Value Notes		
Power off		L1 Probe (+)	P+obe (+)	0.3~0.7V	0V or are abnormal	
		L2	P+	0.3~0.7V		
		N	L1	0.3~0.7V		
		N	L2	0.3~0.7V		
		U	Pout	187~264V	0V or are abnormal	
		V	Pout	187~264V		
		W	Pout	187~264V		
		N	U	187~264V		
		N	V	187~264V		
		N	W	187~264V		al
	AC Voltage	L1	L2	187~264Vac		
	DC Voltage P+		N	2*(L1-L2)Vdc		Rectifier bridge
Power on			N	370~385Vac	Other values are abnorma	

DC Voltage
Pout

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