Part 1 General Information

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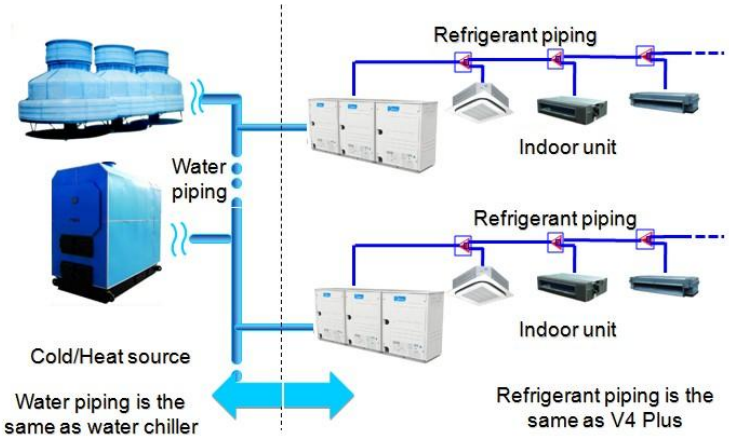
1. V4+W VRF system introduction

Midea water source heat pump central air-conditioning system is a kind of VRF air-conditioning system which uses water as the cold/heat source. In this system, water is transported from the cold/heat source to the main unit through the water pipe, after the heat exchange between water and the refrigerant, main unit will send the refrigerant to indoor units.



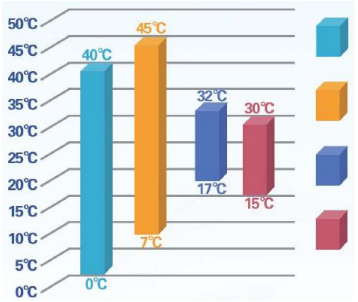
2. Features

2.1 Wide application range

2.1.1 Free combination, maximum capacity can be up to 36HP

The capacity range of main units is from 8HP to 36HP. Maximum 59 indoor units with capacity up to 130% of total main units can be connected in one system.

2.1.2 Wide operation range



Main unit ambient temperature: 0~40°C

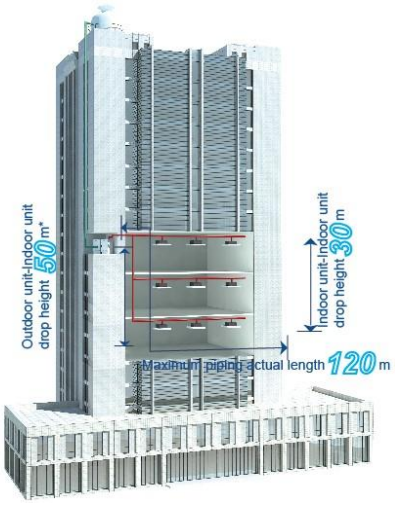
Main unit water inlet temperature: 7~45°C

Indoor temperature in cooling mode: 17~32°C

Indoor temperature in heating mode: 15~30°C

Main unit water inlet flow: 8HP (2.7~8.1m^3/h); 10HP (3~9 m^3/h); 12HP (3.6~10.8 m^3/h).

2.1.3 Long piping length



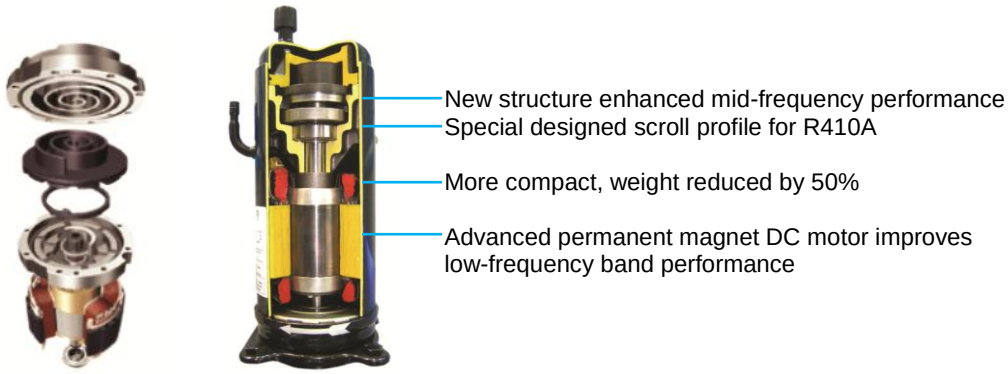
Piping length		Permitted value (m)
Actual total piping length		300
Longest piping	Actual length	120
	Equivalent length	150
Equivalent piping length from the farthest indoor unit to the first indoor branch joint		40/90*
Level difference between indoor and outdoor units	Main unit up	50
	Main unit down	40
Level difference between indoor units		30

*The allowable length extend to 90m should under certain conditions. Please refer to the installation manual for details.

2.2 High efficiency

2.2.1 High efficiency DC inverter compressor

All series of 8HP, 10HP and 12HP adopt one DC inverter compressor each. With DC inverter compressors, V4 Plus W Series offers increases energy efficiency by 25%.



2.2.2 High efficiency double-pipe heat exchanger

With the innovative designed double-pipe heat exchange technology, the water quality required is low. The water side has large circulation area, and it is not easy to get stuck, higher reliability, easy to clean and maintenance.

2.2.3 Wide side heat recovery

In the modern large-scale buildings, the load between the internal and external areas is different. It may occur situations that both cooling and heating are required. The V4 PLUS W series modular design, not only can realize meticulous system division in different areas but also can realize heat recovery at the same time, significantly improved energy efficiency.

2.3 High reliability

2.3.1 Cycle duty operation

V4+W intelligent control, according to the system load, cyclically changes start-up sequence of multiple main units, equalizes compressor duty and extends operation life-span.

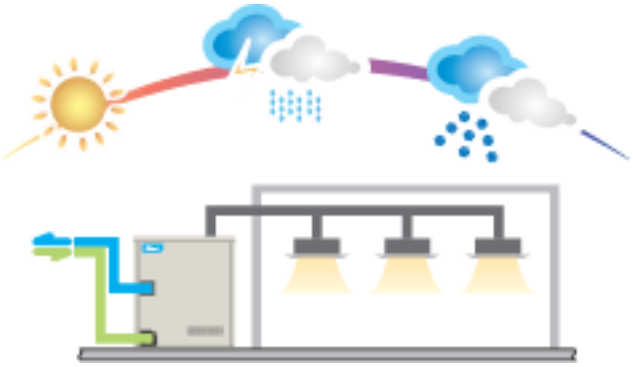
Note: Everytime after oil-returning/defrosting or restart, main unit will start in different sequence.

2.3.2 Backup operation

In a multiple system, if one module is failed, other modules can be backup instead of the failed one for continuing operation.

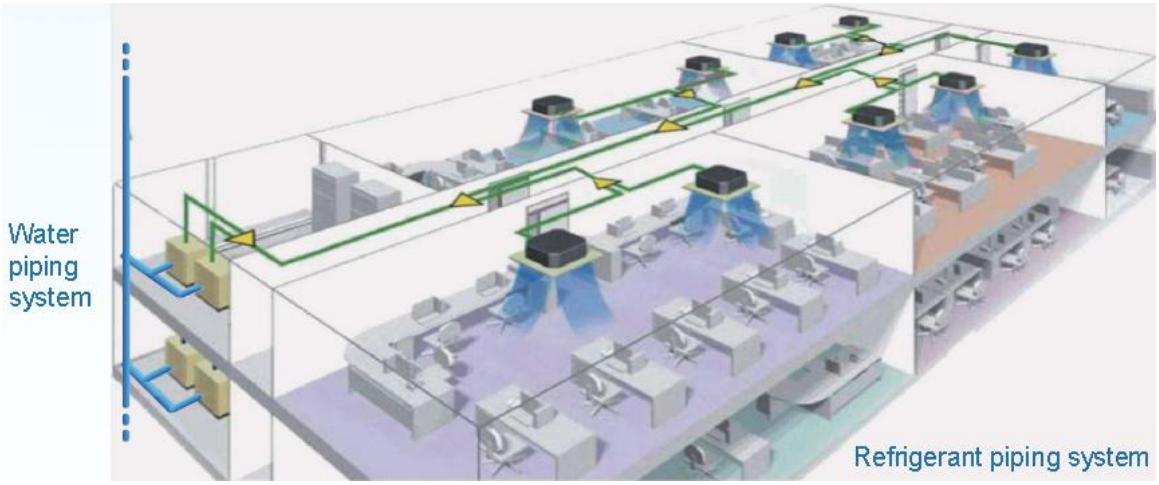
2.3.3 No effect of climate on the operation

Due to the stable source of water as the cold/heat source of the system, both in cold winter and hot summer, air conditioning capacity won't be influenced by the environmental temperature. Especially when heating in winter, the unit does not exist frost/defrost process, making the heating effect more stable and strong.



2.3.4 No water leakage

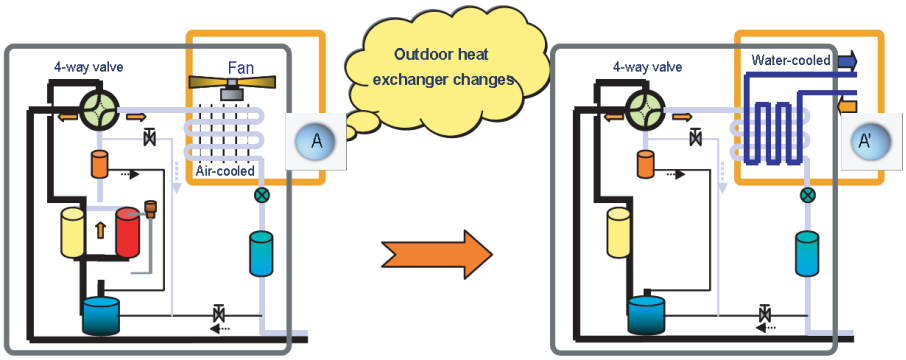
No water piping is installed in the indoor area for eliminating leakage risks.



2.4 Enhanced comfort

2.4.1 Low noise

Without outdoor units fan noise and fully enclosed design which realize lower noise.



2.5 Easy installation and service

2.5.1 Compact and lightweight

8,10,12HP three basic model with the same size and weight: W780mm×H1000mm×D550mm, 146kg.

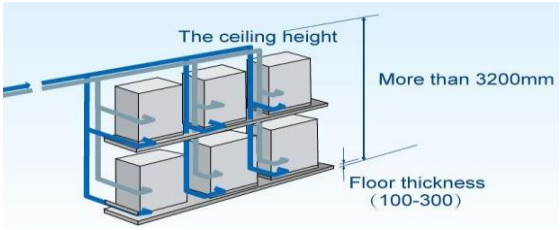
It can be transported through the elevator or forklift.

More compact, can also be installed in the narrow space of the engine room.

2.5.2 Modular design

Modular design, one main unit can be installed above another one and greatly saved installation space.

Various installation environment: Storehouse, basement, close balcony, corridor, plant room and so on.



2.5.3 Auto addressing

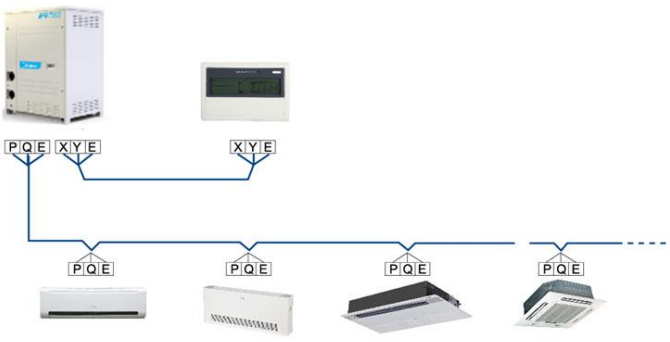
Outdoor unit can distribute address for each indoor unit automatically.

Wireless and wired controllers can enquire and modify each indoor unit's address.

2.5.4 Simple signal line connection

Installation is easier as communication wiring can be shared by indoor & outdoor units. It's easy for the user to retrofit the existing system with a centralized control by simply connecting to the outdoor units.

- PQE & XYE: only one set of PQE communication wires can achieve communication among indoor units, outdoor units and the network.
- Reversible communication, central controller can be connected from indoor side or outdoor side as you wish.



3. Main units lineup

8, 10, 12 HP	16 ,18 ,20, 22, 24 HP
	
26, 28, 30, 32, 34, 36 HP	
	

Main unit combinations

Capacity (HP)	Model	Recommend combination			Max. indoor units nos.
		8(HP)	10(HP)	12(HP)	
8	MDVS-252(8)W/DRN1	●			13
10	MDVS-280(10)W/DRN1		●		16
12	MDVS-335(12)W/DRN1			●	19
16	MDVS-504(16)W/DRN1	●●			23
18	MDVS-532(18)W/DRN1	●	●		29
20	MDVS-560(20)W/DRN1		●●		33
22	MDVS-615(22)W/DRN1		●	●	36
24	MDVS-670(24)W/DRN1			●●	39
26	MDVS-784(26)W/DRN1	●●	●		43
28	MDVS-812(28)W/DRN1	●	●●		46
30	MDVS-840(30)W/DRN1		●●●		50
32	MDVS-895(32)W/DRN1		●●	●	53
34	MDVS-950(34)W/DRN1		●	●●	56
36	MDVS-1005(36)W/DRN1			●●●	59

4. Indoor units lineup

Capacity (×100W)	Cassette type				
	One-way cassette		Two-way cassette	Compact four-way cassette	Four-way cassette & Four-way cassette silent type
					
18	●				
22	●		●	●	
28	●		●	●	●
36	●		●	●	●
45		●	●	●	●
56		●	●		●
71			●		●
80					●
90					●
100					●
112					●
140					●

Capacity (×100W)	Duct type					
	Low static pressure duct	A5 duct	High static pressure duct			
						
18	●					
22	●	●				
28	●	●				
36	●	●				
45	●	●				
56	●	●				
71	●	●	●			
80		●	●			
90		●	●			
112		●	●			
140		●		●		
160				●		
200					●	
250					●	
280					●	
400						●
450						●
560						●

Capacity (×100W)	Floor-standing/Ceiling & Floor/Console			
	Cased floor-standing	Uncased floor-standing	Ceiling & floor	console
				
22	●	●		●
28	●	●		●
36	●	●	●	●
45	●	●	●	●
56	●	●	●	
71	●	●	●	
80	●	●	●	
90			●	
112			●	
140			●	
160			●	

Capacity (×100W)	Wall mounted/Fresh air processing unit					
	Wall mounted (S panel)	Wall mounted (C panel)	Wall mounted (D panel)	Wall mounted (R panel)	Fresh air processing unit	
						
22	●	●	●			
28	●	●	●			
36	●	●	●			
45	●	●	●			
56	●	●	●			
71			●	●		
80				●		
90				●		
125					●	
140					●	
200						●
250						●
280						●

Note:

Due to continuous improvement, specifications are subject to change without prior notice.

5. Nomenclature

5.1 Main unit

MDV S – 252 (8) W / D R N1

- **Refrigerant type**
  N1:R410A Omit for R22
- **Power Supply**
  R: 380~415V, 50Hz, 3N
- **Inverter Type**
  D:DC Inverter Omit for AC Inverter
- **Main unit**
- **Rated Capacity (HP), (only for combinable type)**
- **Cooling Capacity (×100W)**
- **Water source type**
- **Midea VRF**

5.2 Indoor unit

MDV – D 28 Z / D D V N1 A

- **Series code**
- **Refrigerant type** N1: R410A
- **Power supply type**
  V: 220-240V~60Hz
  Omit: 220-240V~50Hz
- **Electrical Auxiliary Heater**
  D: with EAH
  Omit: without EAH
- **Motor Type**
  D: DC Fan Motor
  Omit: AC fan Motor
- **Indoor unit type* (refer to below table)**
- **Cooling Capacity (×100W)**
- **VRF Indoor Unit**
- **Midea**

Meaning of the code*

Type code	Meanings		Type code	Meanings
Q1	One way cassette		T3	Low static pressure duct
Q2	Two way cassette		G	Wall mounted
Q4	Four way cassette		DL	Ceiling & floor
Q4-A	Four way cassette (compact)		Z-F	Floor standing (F4/F5: Exposed ; F3: Concealed)
T1	High static pressure duct		Z	Console
T2	Medium static Pressure duct		T1-FA	Fresh air processing unit

Part 2 Selection Procedure

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1. Introduction

1.1 Model selection procedure

Select the model and calculate the capacity for each refrigerant system according to the procedure shown below.

- Calculate the indoor air-conditioning load, calculate the maximum air-conditioning load for each room or zone.

Selection of an air conditioning system

- Select the ideal air conditioning system for air conditioning of each room or zone.

Design of the control system

- Design a suitable control system for the selected air conditioning system.

Preliminary selection of indoor and outdoor units

- Make preliminary selections that are within the allowable range for the system.

Check the tubing length and elevation difference

- Check that the length of refrigerant tubing and the elevation difference are within the allowable ranges.

Calculation of the corrected outdoor unit capacity

- Capacity correction coefficient for model, outdoor temperature conditions, tubing length and elevation difference.
- Calculation of the actual capacity for each indoor unit
- Calculate the corrected indoor/outdoor capacity ratio, based on the corrected outdoor unit capacity and the total corrected capacity of all indoor units in the same system.

Recheck the actual capacity for each indoor unit

- If the capacity is inadequate, reexamine the unit combinations.

1.2 Indoor unit selection

Enter INDOOR UNIT CAPACITY TABLES at given indoor and outdoor temperature. Select the unit that the capacity is the nearest to and greater than given load.

Note:

Individual indoor unit capacity is subject to change by the combination. Actual capacity has to be calculated according to the combination by using outdoor unit capacity table.

1.2.1 Calculation of Actual Capacity of Indoor Unit

Because the capacity of a multi air-conditioner changes according to the temperature conditions, tubing length, elevation difference and other factors, select the correct model after taking into account the various correction values. When selecting the model, calculate the corrected capacities of the outdoor unit and each indoor unit. Use the corrected outdoor unit capacity and the total corrected capacity of all the indoor units to calculate the actual final capacity of each indoor unit.

Find the indoor unit capacity correction coefficient for the following items

Capacity correction for the indoor unit temperature conditions

- From the graph of capacity characteristics, use the indoor temperature to find the capacity correction coefficient.

Capacity distribution ratio based on the indoor unit tubing length and elevation difference.

- First, in the same way as for the outdoor unit, use the tubing length and elevation difference for each indoor unit to find the correction coefficient from the graph of capacity change characteristics

Capacity distribution ratio for each indoor unit = Correction coefficient for that indoor unit / Correction coefficient for the outdoor unit

1.3 Outdoor unit selection

Allowable combinations are indicated in INDOOR UNIT COMBINATION TOTAL CAPACITY INDEX TABLE.

In general, outdoor unit can be selected as follows though the location of the unit, zoning and usage of the rooms may be considered.

The indoor and outdoor unit combination is determined that the sum of indoor unit capacity index is nearest to and smaller than the capacity index at 100% combination ratio of each outdoor unit. Up to 13~20 indoor units can be connected to one outdoor unit. It is recommended to choose a larger outdoor unit if the installation space is large enough.

If the combination ratio is greater than 100%, the indoor unit selection shall be reviewed by using actual capacity of each indoor unit.

INDOOR UNIT COMBINATION TOTAL CAPACITY INDEX TABLE

Outdoor Unit	Indoor Unit Combination Ratio (kW)								
	130%	120%	110%	100%	90%	80%	70%	60%	50%
8HP	32.8	30.2	27.7	25.2	22.7	20.1	17.6	15.1	12.6
10HP	36.4	33.6	30.8	28.0	25.2	22.4	19.6	16.8	14.0
12HP	43.6	40.2	36.9	33.5	30.2	26.8	23.5	20.2	16.8
16HP	65.52	60.48	55.44	50.4	45.36	40.32	35.28	30.24	25.2
18HP	69.2	63.8	58.5	53.2	47.9	42.6	37.2	31.9	26.6
20HP	72.8	67.2	61.6	56.0	50.4	44.8	39.2	33.6	28.0
22HP	80.0	73.8	67.7	61.5	55.4	49.2	43.1	36.9	30.8
24HP	87.1	80.4	73.7	67.0	60.3	53.6	46.9	40.2	33.5
26HP	101.92	94.08	86.24	78.4	70.56	62.72	54.88	47.04	39.2
28HP	105.56	97.44	89.32	81.2	73.08	64.96	56.84	48.72	40.6
30HP	109.2	100.8	92.4	84.0	75.6	67.2	58.8	50.4	42
32HP	116.35	107.4	98.45	89.5	80.55	71.6	62.65	53.7	44.75
34HP	123.5	114	104.5	95	85.5	76	66.5	57	47.5
36HP	130.65	120.6	110.55	100.5	90.45	80.4	70.35	60.3	50.25

INDOOR UNIT CAPACITY INDEX

Unit Size	Model 22	Model 28	Model 36	Model 45	Model 56	Model 71	Model 80	Model 90	Model 112	Model 140
Capacity Index (kW)	2.2	2.8	3.6	4.5	5.6	7.1	8.0	9.0	11.2	14.0
Unit Size	Model 160	Model 200	Model 250	Model 280						
Capacity Index (kW)	16	20	25	28						

1.4 Actual performance date

Use OUTDOOR UNIT CAPACITY TABLES.

Determine correct table according to the outdoor unit model and combination ratio.

Enter the table at given indoor and outdoor temperature and find the outdoor unit capacity and power input. The individual indoor unit capacity (power input) can by calculated as follows.

IUC=OUC × INX/TNX

Where,

IUC: Each indoor unit capacity

OUC: Outdoors unit capacity

INX: Each indoor unit capacity index

TNX: Total capacity index

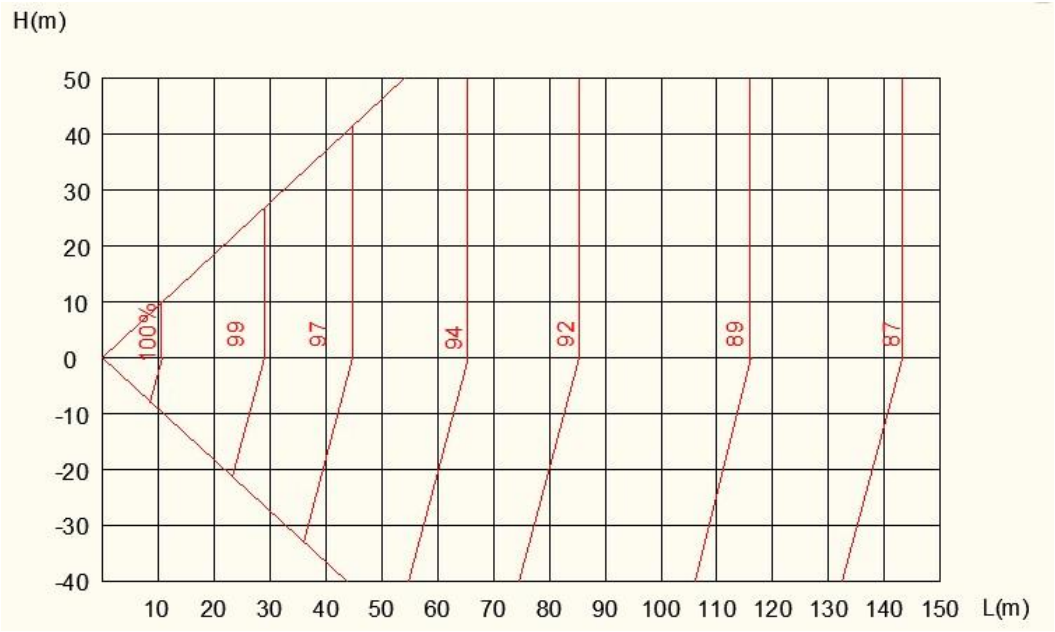
Then, correct the indoor unit capacity according to the piping length.

If the corrected capacity is smaller than the load, the size of indoor unit has to be increased and repeat the same selection procedure.

1.5 Variation in capacity in accordance with the length of refrigerant pipe

1.5.1 Cooling capacity modification

Modification coefficient of the length and high difference of refrigerant pipe:

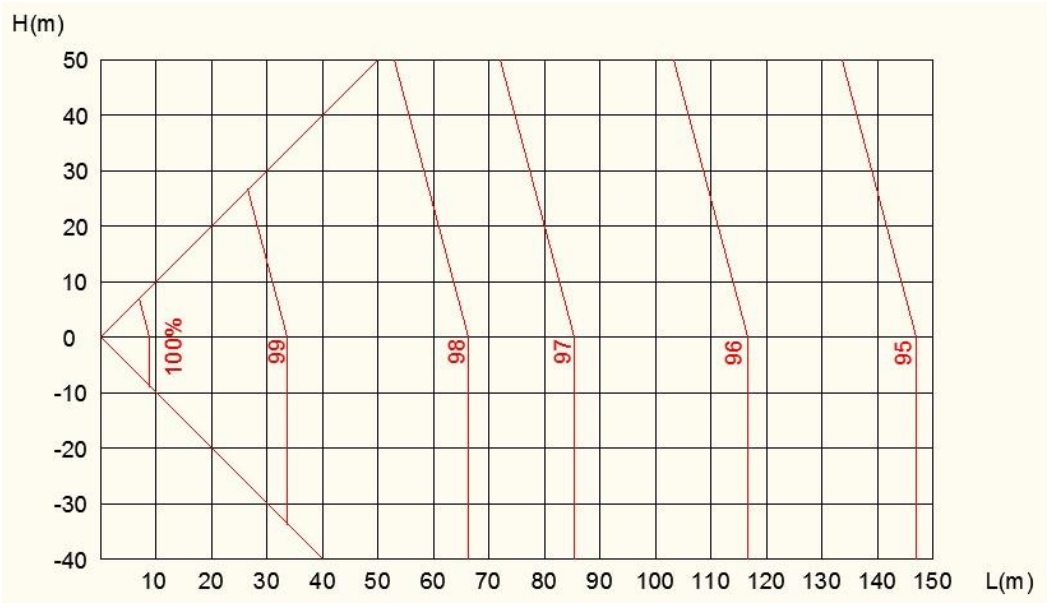


L: Refrigerant pipe equivalent length

H: Height difference between outdoor and indoor unit. Positive data means outdoor unit is top. Negative data means outdoor unit is down.

1.5.2 Heating capacity modification

Modification coefficient of the length and high difference of refrigerant pipe:



L: Refrigerant pipe equivalent length

H: Height difference between outdoor and indoor unit. Positive data means outdoor unit is top. Negative data means outdoor unit is down.

2. Unit Selection (Based on cooling load)

2.1 Given condition

- Design condition (Cooling: Indoor 20°C (WB), Outdoor 35°C (DB))
- Cooling load:

Location	Room A	Room B	Room C	Room D	Room E	Room F
Load (kW)	2.1	2.8	3.5	4.6	5.8	7.2

- Power supply unit: Outdoor 380~415V-3Ph-50Hz, Indoor 220~240V-1Ph-50Hz.
- Pipe length: 50m
- Height difference: 30m

2.2 Indoor unit selection

Select the suitable capacity for condition of 'Indoor 20°C (WB), Outdoor 35°C (DB)' using indoor unit capacity table. The selected result is as follows. (Assuming the indoor unit type is duct)

Location	Room A	Room B	Room C	Room D	Room E	Room F
Load (kW)	2.1	2.8	3.5	4.6	5.8	7.2
Unit size	22	28	36	45	56	71
Capacity (kW)	2.3	2.9	3.7	4.8	6.0	7.5

2.3 Outdoor unit selection

a) Assume the indoor unit and outdoor unit combination as follows

- Calculate the total nominal capacity of indoor units in the combination according to the above table: 2.2×1+2.8×1+3.6×1+4.5×1+5.6× 1+7.1×1=25.8kW
- Select outdoor unit: MDVS-280(10)W/DRN1 which has nominal cooling capacity: 28kW.
- Calculate the proportion between ① and ②: 258/280= 92%

b) Result : Because the proportion is within 50～130%, it is a **Right** selection.

c) Real function data with indoor unit combination

- For the 92% combination, calculate the cooling capacity of outdoor unit (MDV-280(10)W/DRN1(B)).

26.65KW ←90% (Indoor temperature : WB 20° C, Outdoor temperature: DB 35° C)

29.61KW ←100%(Indoor temperature : WB 20° C, Outdoor temperature: DB 35° C)

Then calculated the outdoor capacity in 92% combination index:

Therefore: 26.65+ {(29.61-26.65)/ 10} ×2= 27.24;

- Outdoor unit (MDVS-280(10)W/DRN1 cooling temperature: DB 35° C
- Capacity modification coefficient with pipe length (50m) and height difference (30m): 0.958
- Each indoor unit cooling capacity:

MDV-D22T2: 27.24 × 22/258 × 0.958 = 2.22(kW)

MDV-D28T2: 27.24 × 28/258 ×0.958 = 2.83 (kW)

MDV-D36T2: 27.24 × 36/258 ×0.958 = 3.64 (kW)

MDV-D45T2: 27.24 × 45/258 ×0.958 = 4.55 (kW)

MDV-D56T2: 27.24 × 56/258 ×0.958 = 5.66 (kW)

MDV-D71T2: 27.24 × 71/258 ×0.958 = 7.18 (kW)

Location	Room A	Room B	Room C	Room D	Room E	Room F
Load (kW)	2.1	2.8	3.5	4.6	5.8	7.2
Unit size	22	28	36	45	56	71
Capacity (kW)	2.22	2.83	3.64	4.55	5.66	7.18

2.4 Conclusion

Generally, we think this result is acceptable, so we can think we have accomplished the calculation. But if you think this result is not acceptable, you can repeat the above process.

Remark: In this sample, we don't consider the other capacity modification index and assume them are 1.0.

For more details about the effect factor such as outside ambient/inside ambient DB/WD, please refer to the performance table of indoor and outdoor units.

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1. Specifications

Model			MDVS-252(8)W/ DRN1	MDVS-280(10)W/ DRN1	MDVS-335(12)W /DRN1
Power supply		V-Ph-Hz	380~415V 3Ph ~ 50Hz		
Cooling (*1)	Capacity	W	25200	28000	33500
	Input	W	4800	6100	8000
	EER	W/W	5.25	4.59	4.19
Heating (*2)	Capacity	W	27000	31500	37500
	Input	W	4450	5830	7800
	COP	W/W	6.07	5.40	4.81
IPLV©			5.9	5.8	5.8
Max. input consumption		W	9454	9454	11188
Max. current		A	23	23	23
DC Inverter compressor	Model		E655DHD-65D2YG		
	Quantities		1		
	Type		DC Inverter		
	Brand		Hitachi		
	Capacity	W	31590		
	Input	W	10340		
	Power supply	V-Ph-Hz	380-415V~3Ph, 50Hz		
	Operating frequency	Hz	40~200		
	Crankcase	W	40～80		
	Refrigerant oil	ml	FVC68D / 500		
Heat exchanger	Type		Double-pipe heat exchanger		
	Rated water flow volume	m^3/h	5.4	6	7.2
	Pressure drop	kPa	35	40	48
	Max pressure of water pipe side	MPa	1.98		
Drainage pipe outside diameter		mm	Φ10		
Water side connecting pipe		mm	DN32 inner groove		
Outdoor sound level(*3)		dB(A)	51	52	52
Main unit	Dimension (W×H×D)	mm	780×1000×550		
	Packing (W×H×D)	mm	845×1170×600		
	Net/Gross weight	kg	146/155		147/156
Charged refrigerant type and volume		kg	R410A 2kg		
Throttle type			EXV		
Excessive operating pressure		MPa	4.4/2.6		
Refrigerant piping	Liquid side/ Gas side(*4)	mm	Φ9.53/Φ22.2	Φ9.53/Φ22.2	Φ12.7/Φ25.4
	Oil balance pipe	mm	Φ6.35		

	Total pipe length	m	300
	The farthest pipe length(actual)	m	120
	The farthest pipe length (equivalent)	m	150
	The farthest equivalent pipe length from the first distributor (*5)	m	40(90)
	Max. Vertical pipe length (When main units is above)	m	50
	Max. Vertical pipe length (When main units is below)	m	40
	Max. drop between indoor units	m	30
Connection wiring	Power wiring	mm^2	4×10+10(L≤20m); 4×16+10(L≤50m)
	Signal wiring	mm^2	3 core shielded wiring; wiring dia.≥0.75
Main unit water inlet temp.		℃	7℃－45℃
Main unit ambient temp. range		℃	0℃－40℃
Main unit ambient humidity			Below 80%

Notes:

1. The cooling conditions: indoor temp.: 27℃DB, 19℃WB, outdoor temp.: 35℃DB, water inlet temp. :30℃, equivalent pipe length: 5m, drop length: 0m.

2. The heating conditions: indoor temp.: 20℃DB, 15℃WB, outdoor temp.: 7℃DB, 6℃WB, water inlet temp. :20℃, equivalent pipe length: 5m drop length: 0m.

3. Sound level: Anechoic chamber conversion value, measured at a point 1 m in front of the unit at a height of 1 m. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

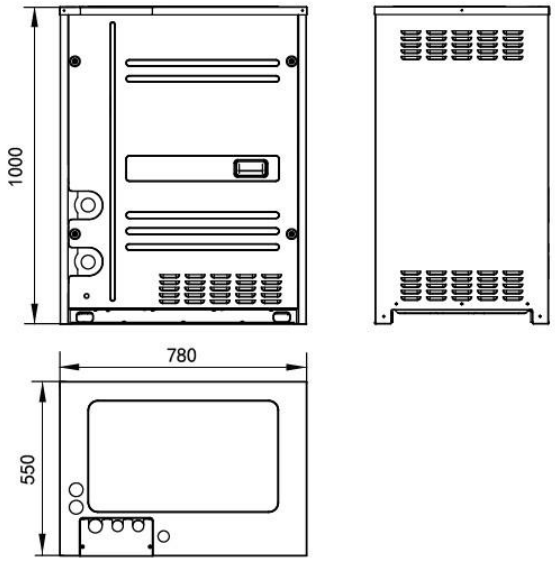
4. Connection piping diameter is based on the condition that the total equivalent liquid length is less than 90m. When the total equivalent liquid length is more than 90m, please refer to installation manual to choose the connection piping diameter.

5. The farthest equivalent pipe length should be equal to or shorter than 40m, but it can be up to 90m if meet the required conditions following part 4 installation sections.

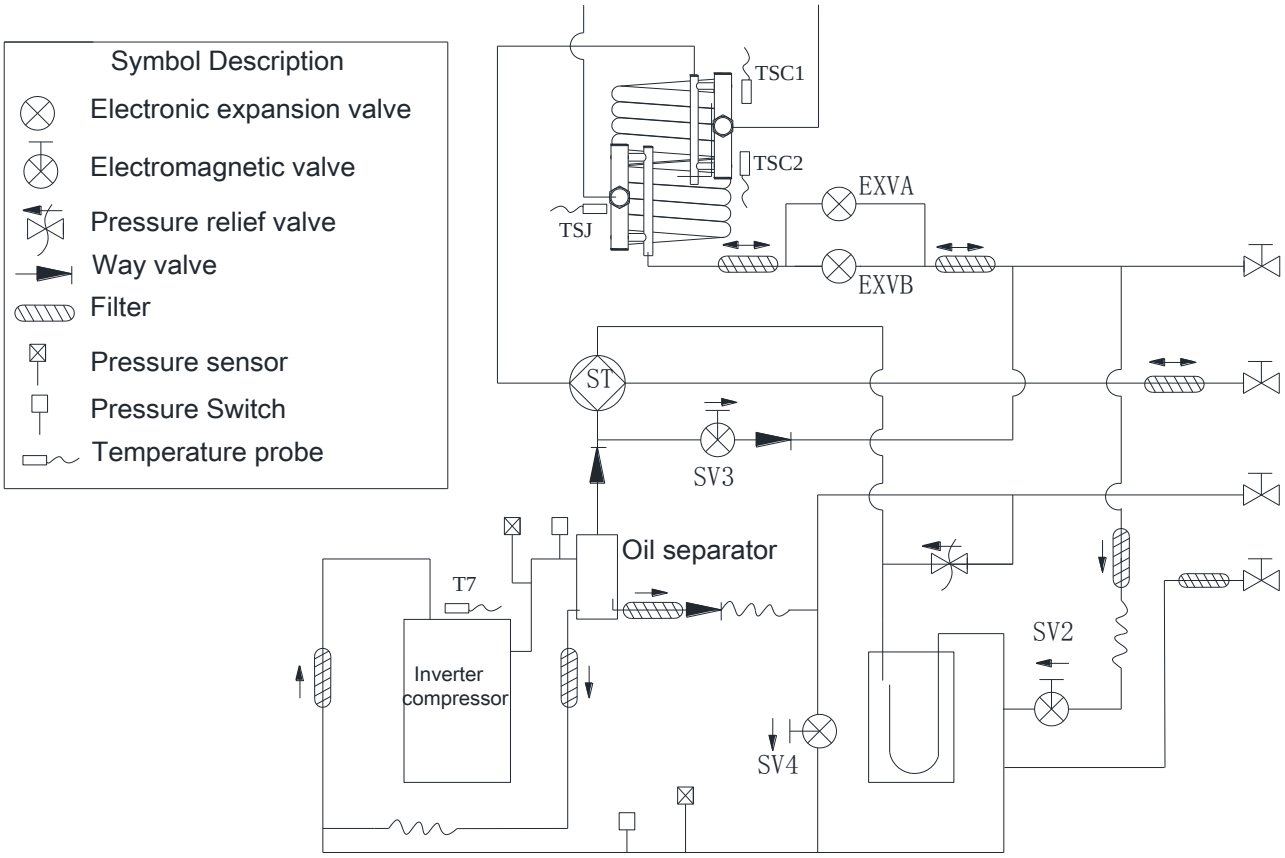
The above data may be changed without notice for future improvement on quality and performance.

2. Dimensions

8HP/10HP/12HP (unit: mm)



3. Piping diagrams



Remark:

TSC1: water outlet temp. of upper pipe

TSC2: water outlet temp. of lower pipe

TSJ: water inlet temp. of double-pipe heat exchanger

T5: inverter module temp.

Pc: discharge pressure

Ps: suction pressure

T7: discharge temp. of inverter compressor

Each model has one inverter compressor and two EXVs at the high-pressure pipe side.

Key Components:

Oil Separator: used to separate oil from high pressure & temperature gas refrigerant, which is pumped out from compressor. The separation efficiency is up to 99%, it makes the oil return back to each compressor very soon.

Low pressure receiver: It is used to store the liquid refrigerant and oil, it can protect the compressor from liquid hammer.

Four-way valve control (ST1): Closed in cooling mode and open in heating mode

EXV (electronic expansion valve) control:

1) Max. Open degree is 700 pulses.

2) When system power on, the EXV closes 700pulse first, then opens to 350 pulse and stand by. When then the unit started, it opens to the right pulse.

3) When the running main unit receives OFF signal, the EXV of slave unit will stop, while master unit is running and slave unit stopped at the same time. If all main units stopped, the EXV will close first, and then open to the pulse of stand-by.

SV2: spray a little liquid refrigerant to cooling compressor. Open when any compressor discharge temperature is higher than 100℃.

SV3: open when power on, closed after 60 seconds; open when discharge pressure is less than1.8MP in cooling mode, open when discharge pressure is greater than 4.0MPa in heating mode.

SV4: oil returning valve. Opens after the DC inverter compressor has been run for 5 minutes and then closes 15 minutes later. (For the system has only one main unit).

Every 20 minutes, SV4 of each main unit opens for 3 minutes. (For the system has more than one main unit)

High pressure sensor: To supervisor the discharge pressure of the compressor and to control the water temperature.

4. Electric Characteristics

Model	Main unit				Power Supply			Compressor		OFM	
	Hz	Voltage	Min.	Max.	MCA	TOCA	MFA	MSC	RLA	KW	FLA
MDVS-252(8)W/DRN1	50	380	342	440	21	16．2	32	-	-	/	/
MDVS-280(10)W/DRN1	50	380	342	440	21	16．2	32	-	-	/	/
MDVS-335(12)W/ DRN1	50	380	342	440	23	18．3	32	-	-	/	/

Remark:

MCA: Min. Current Amps. (A)

TOCA: Total Over-current Amps. (A)

MFA: Max. Fuse Amps. (A)

MSC: Max. Starting Amps. (A)

RLA: Rated Locked Amps. (A)

OFM: Outdoor Fan Motor.

FLA: Full Load Amps. (A)

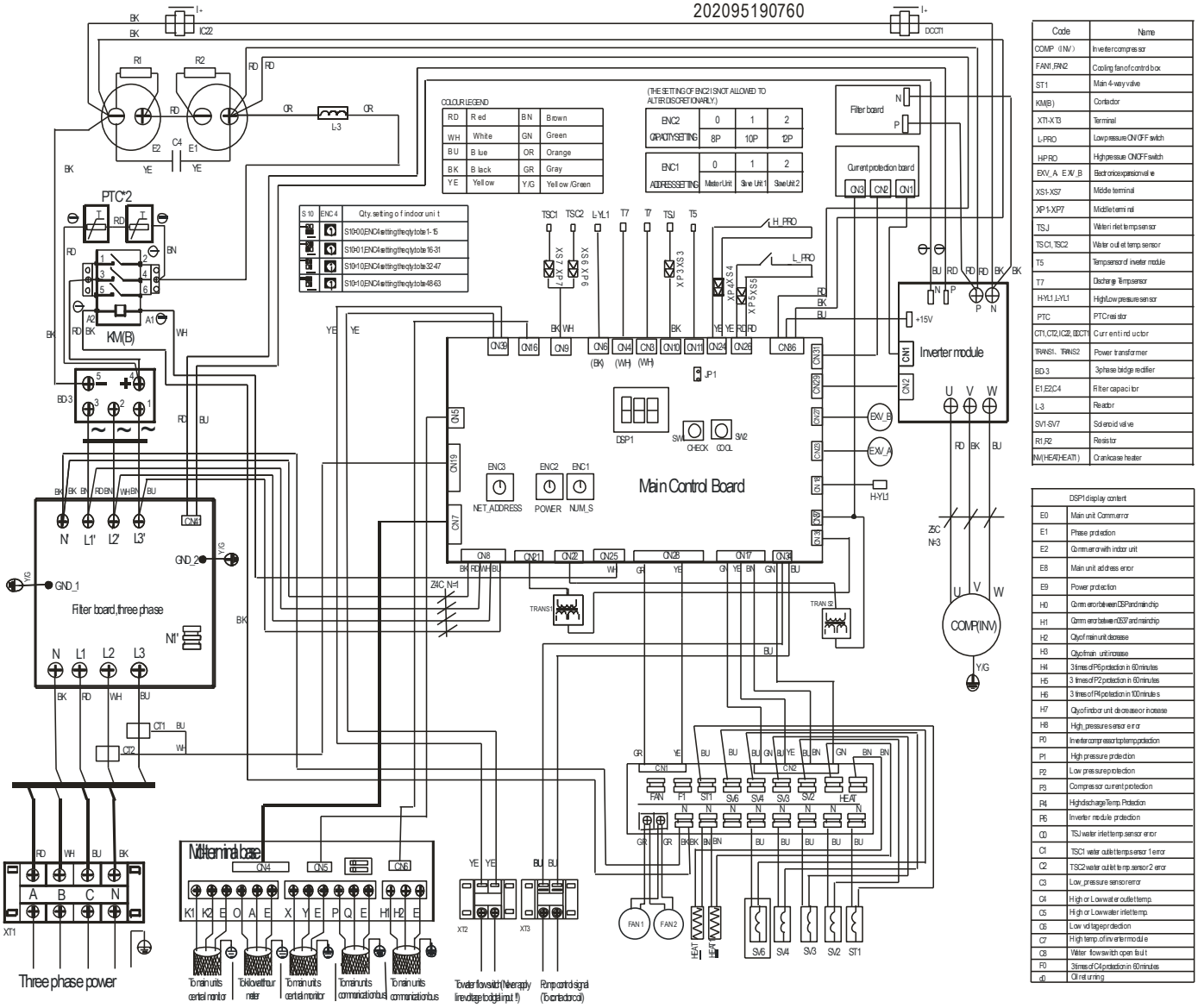
KW: Rated Motor Output (KW)

Notes:

1. RLA is based on the following conditions, Indoor temp. 27℃ DB/19℃ WB, Outdoor temp. 35℃ DB
2. TOCA means the total value of each OC set.
3. MSC means the Max. current during the starting of compressor.
4. Voltage range. Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.
5. Maximum allowable voltage variation between phases is 2%.
6. Selection wire size based on the larger value of MCA or TOCA.
7. MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).

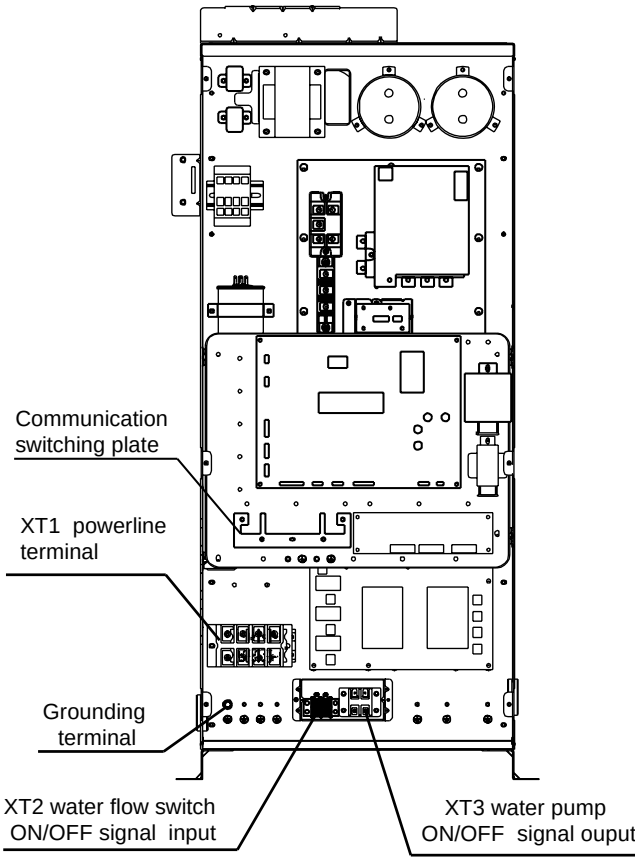
5. Electric wiring

5.1 Wiring diagram for 8,10,12HP



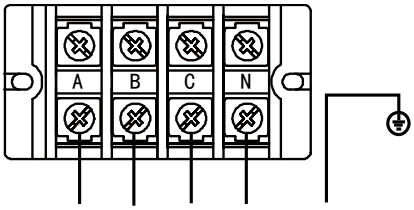
Code	Name
COMP (INV)	Inverter compressor
FAN1,FAN2	Cooling fan of control box
ST1	Main 4-way valve
KM(B)	Contactor
XT1-XT3	Terminal
L-PRO	Low pressure ON/OFF switch
H-PRO	High pressure ON/OFF switch
EXV_A EXV_B	Electronic expansion valve
XS1-XS7	Middle terminal
XP1-XP7	Middle terminal
TSJ	Water inlet temp sensor
TSC1, TSC2	Water outlet temp sensor
T5	Temp sensor of inverter module
T7	Discharge Temp sensor
H-YL1 ,L-YL1	High/Low pressure sensor
PTC	PTC resistor
CT1,CT2,IC22, DCCT1	Current inductor
TRANS1、TRANS2	Power transformer
BD-3	3phase bridge rectifier
E1,E2,C4	Filter capacitor
L-3	Reactor
SV1-SV7	Solenoid valve
R1,R2	Resistor
NM(HEAT)HEAT1)	Crankcase heater

5.2 Terminal base function

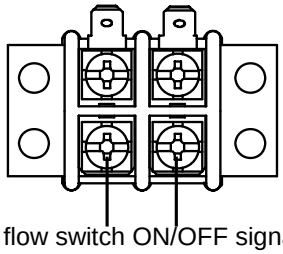


Electric control box diagram

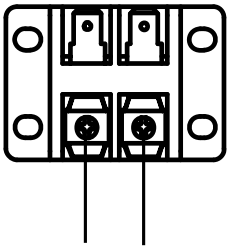
Note: Never apply line voltage to communication switching plate and XT2 water flow switch ON/OFF signal input terminal.



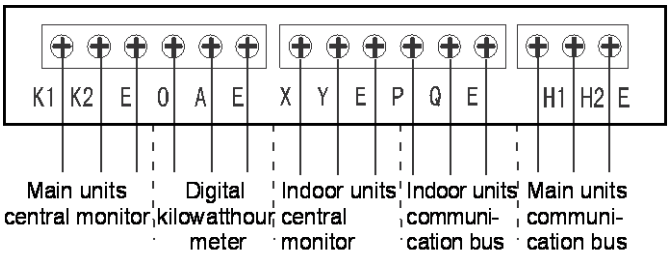
XT1 Powerline terminal
380-415V 3N~ 50Hz/60Hz



XT2 water flow switch ON/OFF signal input terminal
(Must be connected to weak current control circuit !)

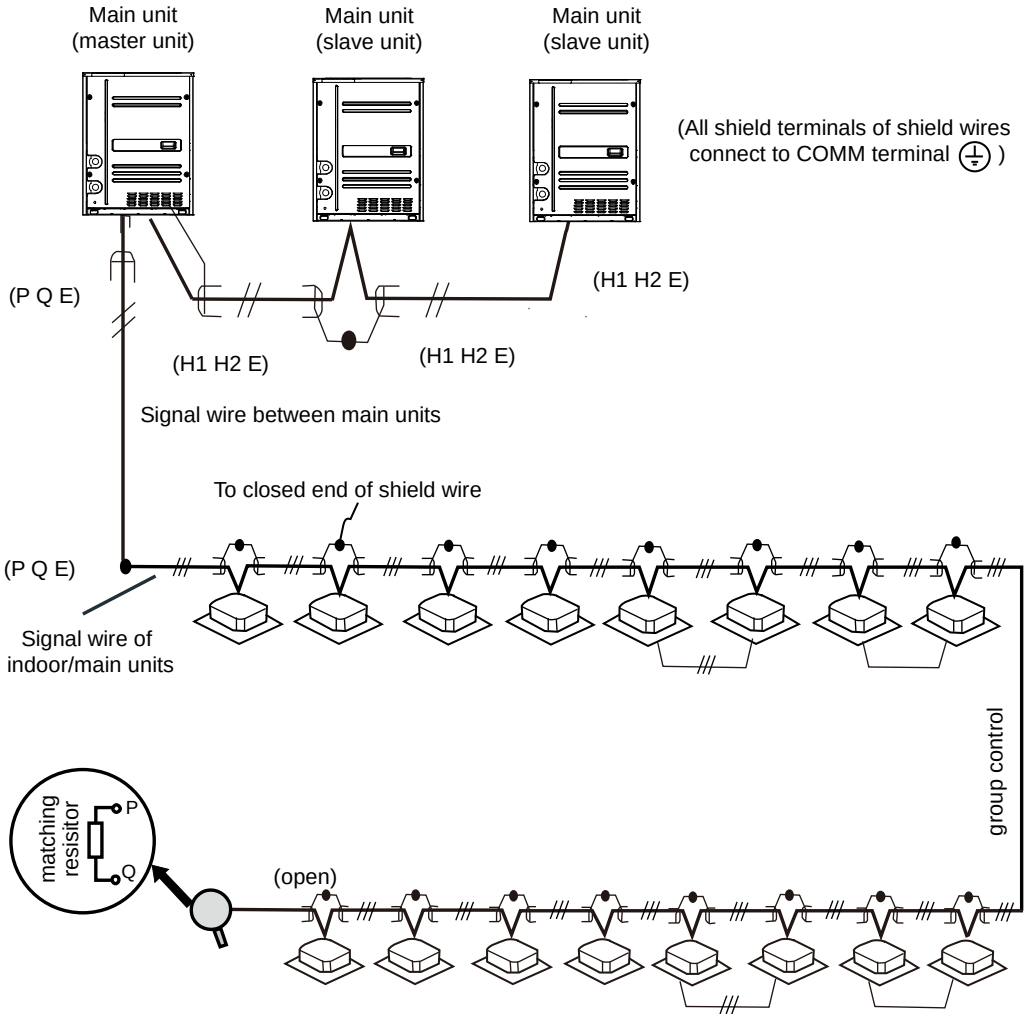


XT3 Water pump ON/OFF signal output terminals
(Dry contact)



5.3 Signal wire of indoor/main units

Signal wire of indoor/main unit adopts 3-core shielded wire (≥0.75mm2) which has polarity, please connect it correctly.

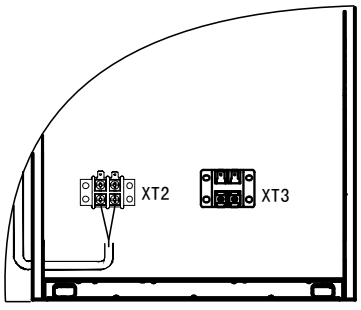


5.4 Electric wiring of water pipelines

5.4.1 Water flow ON/OFF signal wiring

1) Water flow switch should be wired during the installation. Each unit must be configured a water flow switch, and it cannot operate without a water flow switch.

2) The signal wire should apply 0.75mm2 shielding wire, and connected to the XT2 terminal in the electric control box



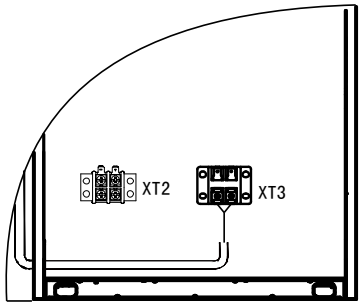
Water flow ON/OFF signal input

5.4.2 Water pump ON/OFF signal wiring

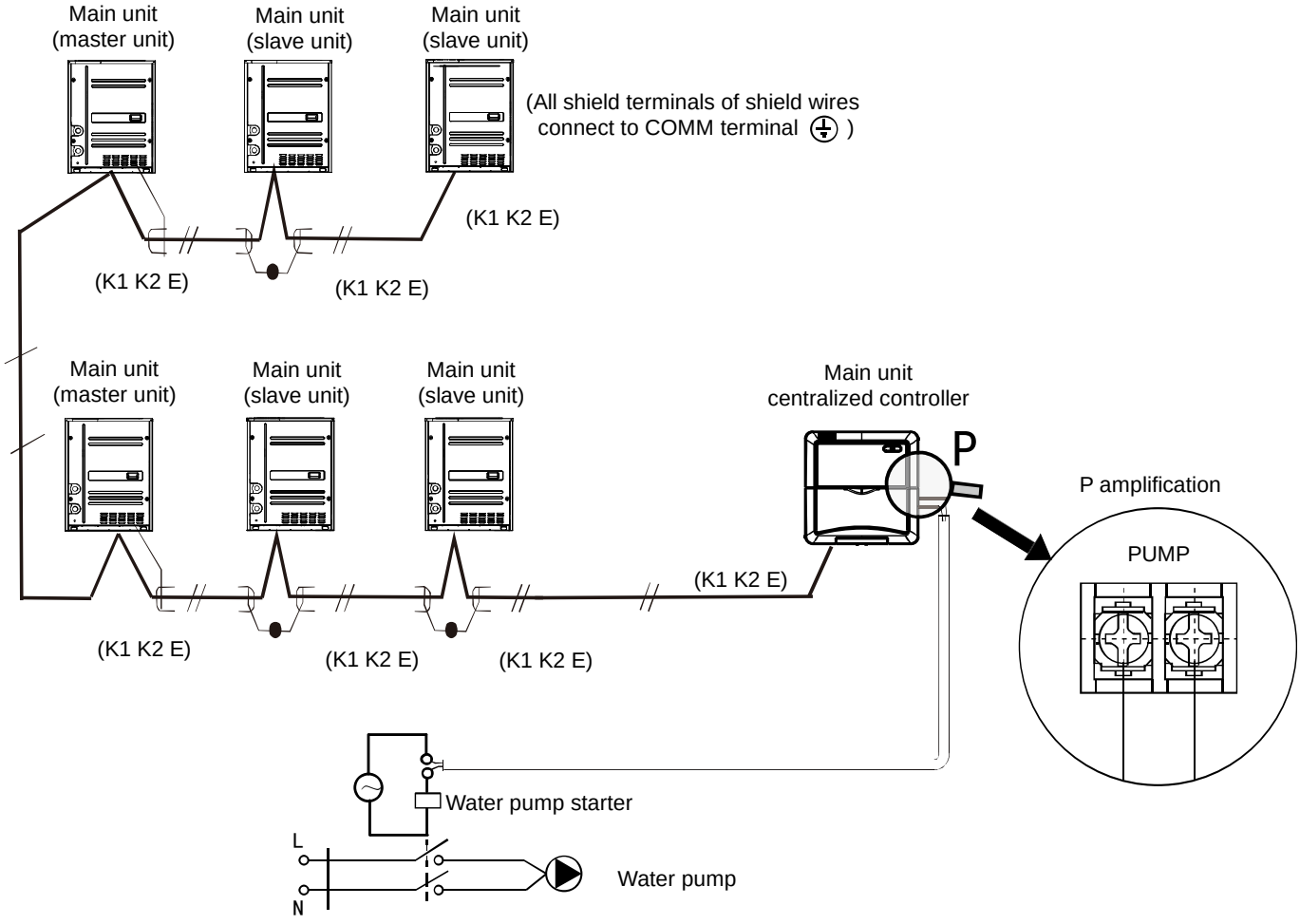
1)Each unit has configured a dry contact terminal for central control of the water pump (see Fig.3-3),this terminal cannot be connected to power terminal of the water pump directly, only should be connected to the control terminal of the water pump starter.

2)When the water pump ON/OFF signal wire has been connected to strong current, it should be wired the signal wires along with other strong current wires; when it has been connected to week current, it should be wired the signal wires along with the week current wires.

3) When the water pipeline has a single system, the water pump ON/OFF signal wire should be connected to the XT3 terminals in the main unit electric control box. When the water pipeline has several systems, the water pump ON/OFF signal should be controlled by the main unit centralized controller. The wiring of main unit centralized controller.



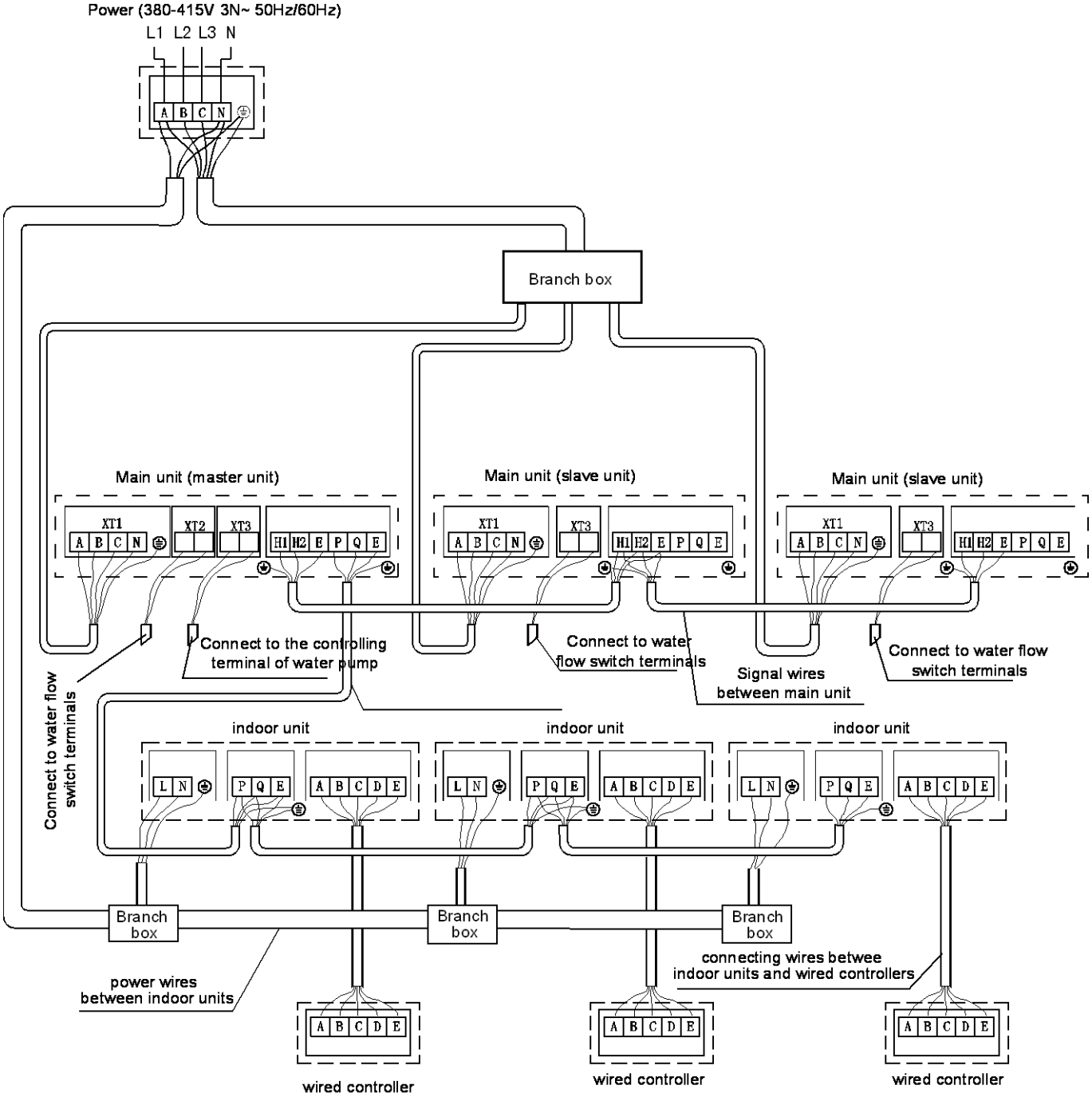
Water pump ON/OFF signal output



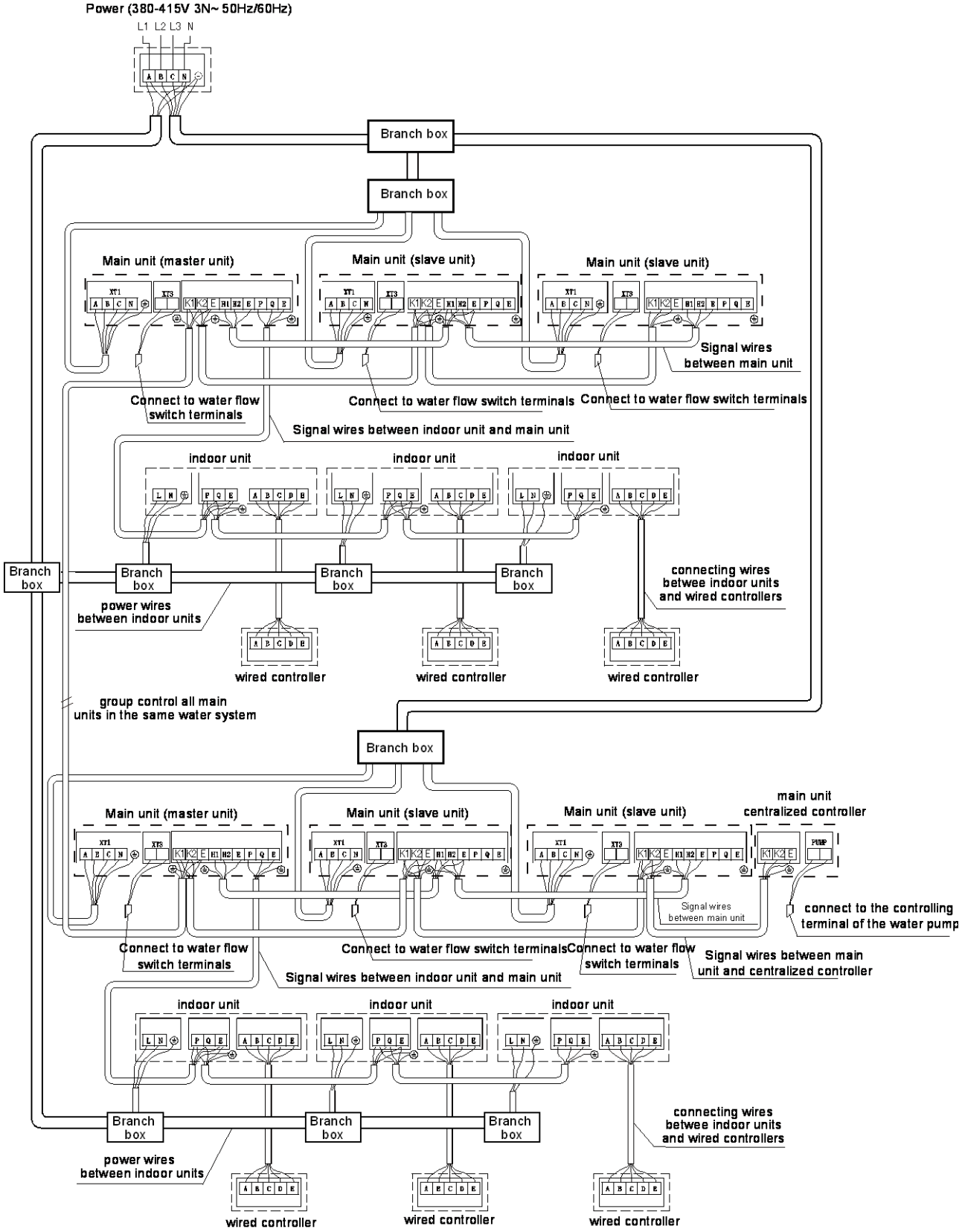
Group control all the main units in the same water system

5.5 Example for power wire connection

5.5.1 A water circuit for single system wiring



5.5.2 A water circuit for several systems wiring



Note:

1. The signal connecting line between main units, indoor and main units and indoor units has polarity. When connecting, be careful to prevent error connection.
2. Signal line shall adopt three-core shielded wire with an area above 0.75 mm2.
3. Do not bind signal line and copper pipe together with belting.
4. Make sure that the shield metal layer should be grounded well indoor control box in order to prevent interference.
5. It's forbidden to connect 200V or above high-volt power to the communication terminal.

5.6 Electric specifications of main units

Capacity	Outdoor unit				Power supply			Compressor		OFM	
	Voltage	Hz	Min.	Max.	MCA	TOCA	MFA	MSC	RLA	kW	FLA
8HP	380~415	50	342	440	13.5	18.6	20	-	17.4	-	-
10HP	380~415	50	342	440	14.5	18.6	20	-	17.4	-	-
12HP	380~415	50	342	440	21.0	20.9	25	-	17.4	-	-

Remark:

MCA: Min. Current Amps. (A)

TOCA: Total Over-current Amps. (A)

MFA: Max. Fuse Amps. (A)

MSC: Max. Starting Amps. (A)

RLA: Rated Locked Amps. (A)

OFM: Outdoor Fan Motor

kW: Rated Motor Output (KW)

FLA: Full Load Amps. (A)

Notes:

1. The current value of combination unit is the total value of each basic model

For example: 34HP=10HP+12HP×2

Power supply: MCA=14.5+21×2=56.5

TOCA=18.6+20.9×2=60.4

MFA=20+25×2=70

Compressor: RLA=17.4+17.4×2=52.2

2. RLA is based on the following conditions, Indoor temp. 27°C DB/19°C WB, Outdoor temp. 35°C DB

3. TOCA means the total value of each OC set.

4. MSC means the Max. current during the starting of compressor.

5. Voltage range units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.

6. Maximum allowable voltage variation between phase is 2%

7. Selection wire size based on the larger value of MCA or TOCA

8. MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).

6. Capacity Tables

8HP cooling mode

Combination (%)	Water inlet temperature(℃)	Water flow(L/min)	Indoor temperature℃WB													
			14		16		18		19		20		22		24	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
130%	20	90	22.1	2.78	26.3	3.69	28.1	3.97	28.5	4.00	28.9	4.00	29.5	4.04	30.0	4.05
	25		22.1	3.27	26.3	4.36	27.3	4.42	27.7	4.44	28.0	4.46	28.6	4.48	29.0	4.50
	30		22.1	3.87	25.5	4.82	26.3	4.86	26.6	4.89	27.0	4.90	27.5	4.93	27.8	4.94
	35		22.1	4.62	24.4	5.27	25.1	5.32	25.5	5.34	25.8	5.36	26.1	5.37	26.4	5.37
120%	20	90	20.4	2.44	24.4	3.24	27.7	3.95	28.0	3.97	28.4	3.99	29.1	4.02	29.6	4.04
	25		20.4	2.88	24.4	3.82	26.8	4.39	27.2	4.42	27.7	4.43	28.2	4.47	28.7	4.48
	30		20.4	3.41	24.4	4.53	25.9	4.84	26.2	4.86	26.5	4.88	27.1	4.91	27.6	4.93
	35		20.4	4.06	24.0	5.24	25.1	5.29	25.1	5.32	25.3	5.33	25.9	5.37	26.2	5.37
110%	20	90	18.7	2.14	22.3	2.82	26.0	3.59	27.5	3.95	27.8	3.96	28.6	4.00	29.2	4.02
	25		18.7	2.52	22.3	3.32	26.0	4.23	26.7	4.39	27.1	4.41	27.7	4.44	28.3	4.47
	30		18.7	2.97	22.3	3.93	25.4	4.81	25.8	4.83	26.0	4.86	26.7	4.89	27.2	4.92
	35		18.6	3.55	22.3	4.70	24.3	5.75	24.6	5.29	24.9	5.31	25.5	5.34	26.0	5.37
100%	20	90	17.0	1.85	20.3	2.42	23.6	3.07	25.2	3.43	26.8	3.80	29.8	3.97	28.6	4.00
	25		17.0	2.17	20.3	2.85	23.6	3.62	25.2	4.04	26.5	4.38	27.2	4.42	27.7	4.44
	30		17.0	2.56	20.3	3.38	23.6	4.30	25.2	4.80	25.6	4.82	26.2	4.86	26.7	4.90
	35		17.0	3.05	20.3	4.02	23.6	5.13	24.1	5.25	24.4	5.27	25.0	5.31	25.6	5.34
90%	20	90	15.3	1.59	18.2	2.06	21.2	2.60	22.7	2.89	24.2	3.20	27.1	3.86	28.0	3.97
	25		15.3	1.86	18.2	2.42	21.2	3.06	22.7	3.41	24.2	3.77	26.5	4.38	27.2	4.41
	30		15.3	2.19	18.2	2.86	21.2	3.80	22.7	4.04	24.2	4.47	25.6	4.82	26.1	4.86
	35		15.3	2.60	18.2	3.40	21.2	4.32	22.7	4.82	23.9	5.23	24.5	5.28	25.0	5.31
80%	20	90	13.6	1.35	16.2	1.73	18.9	2.17	20.2	2.40	21.4	2.65	24.1	3.18	26.7	3.77
	25		13.6	1.58	16.2	2.03	18.9	2.55	20.2	2.83	21.4	3.12	24.1	3.76	26.5	4.38
	30		13.6	1.85	16.2	2.39	18.9	3.00	20.2	3.34	21.4	3.69	24.1	4.46	25.6	4.82
	35		13.6	2.18	16.2	2.83	18.9	3.57	20.2	3.98	21.4	4.41	23.9	5.23	24.4	5.27
70%	20	90	11.9	1.13	14.2	1.43	16.5	1.78	17.6	1.96	18.8	2.16	21.0	2.57	23.4	3.03
	25		11.9	1.31	14.2	1.67	16.5	2.08	17.6	2.30	18.8	2.53	21.0	3.03	23.4	3.57
	30		11.9	1.54	14.2	1.97	16.5	2.45	17.6	2.71	18.8	2.99	21.0	3.59	23.4	4.24
	35		11.9	1.81	14.2	2.32	16.5	2.89	17.6	3.22	18.8	3.89	21.0	4.28	23.4	5.07
60%	20	90	10.2	0.92	12.2	1.16	14.2	1.42	15.1	1.56	16.1	1.71	18.0	2.03	20.0	2.38
	25		10.2	1.07	12.2	1.35	14.2	1.66	15.1	1.83	16.1	2.01	18.0	2.39	20.0	2.80
	30		10.2	1.26	12.2	1.58	14.2	1.95	15.1	2.15	16.1	2.36	18.0	2.82	20.0	3.30
	35		10.2	1.47	12.2	11.23	14.2	2.31	15.1	2.55	16.1	2.80	18.0	3.34	20.0	3.94
50%	20	90	8.5	0.75	10.1	0.92	11.8	1.11	12.6	1.22	13.4	1.32	15.1	1.55	16.7	1.81
	25		8.5	0.87	10.1	1.07	11.8	1.30	12.6	1.42	13.4	1.54	15.1	1.82	16.7	2.12
	30		8.5	1.00	10.1	1.24	11.8	1.51	12.6	1.66	13.4	1.81	15.1	2.14	16.7	2.49
	35		8.5	1.17	10.1	1.46	11.8	1.78	12.6	1.96	13.4	2.14	15.1	2.53	16.7	2.96

Note:
1. is shown as reference
2. The above table shows the average value of conditions may operate
3. It is recommended to connect less than 130%

8HP heating mode

Combination (%)	Water inlet temperature(℃)	Water flow(L/min)	Indoor temperature℃DB											
			16		18		20		21		22		24	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
130%	20	90	28.5	3.61	28.3	3.70	28.2	3.81	28.0	3.87	28.0	3.94	27.7	4.09
	25		31.3	3.79	31.2	3.91	30.9	4.03	30.8	4.10	30.6	4.17	30.4	4.33
	30		33.8	4.00	33.9	4.12	33.6	4.26	32.5	4.33	33.2	4.36	30.9	3.91
	35		37.0	4.22	36.7	4.35	35.5	4.23	33.3	4.02	33.2	3.94	30.9	3.43
120%	20	90	28.3	3.73	28.1	3.84	28.2	3.96	27.8	4.04	27.7	4.11	27.4	4.26
	25		31.1	3.95	30.8	4.07	30.6	4.20	30.5	4.27	30.3	4.36	28.5	3.99
	30		33.8	4.17	33.5	4.30	32.7	4.27	31.7	4.07	30.6	3.86	28.5	3.47
	35		36.5	4.40	34.8	4.12	32.7	3.74	31.7	3.56	30.6	3.39	28.5	3.05
110%	20	90	28.0	3.90	27.9	4.02	27.6	4.15	27.5	4.22	27.4	4.30	26.1	4.09
	25		30.7	4.13	30.5	4.26	30.0	4.32	29.0	4.11	28.0	3.90	26.1	3.50
	30		33.4	4.37	31.9	4.12	30.0	3.67	29.0	3.56	28.0	3.39	26.1	3.13
	35		33.8	3.94	31.9	3.60	30.0	3.29	29.0	3.19	28.0	2.98	26.1	2.69
100%	20	90	27.7	4.09	27.5	4.22	27.0	4.45	26.4	4.14	25.5	3.94	23.8	3.53
	25		30.3	4.34	29.0	4.11	27.0	3.73	26.4	3.55	25.5	3.37	23.8	3.04
	30		30.7	3.89	29.0	3.56	27.0	3.24	26.4	3.09	25.5	2.94	23.8	2.66
	35		30.7	3.41	29.0	3.13	27.0	2.86	26.4	2.73	25.5	2.60	23.8	2.36
90%	20	90	27.4	4.32	26.1	4.08	24.6	3.71	23.7	3.53	22.9	3.35	21.4	3.02
	25		27.7	3.82	26.1	3.50	24.6	3.19	23.7	3.04	22.9	2.89	21.4	2.62
	30		27.7	3.32	26.1	3.04	24.6	2.78	23.7	2.66	22.9	2.54	21.4	2.30
	35		27.7	2.93	26.1	2.69	24.6	2.47	23.7	2.36	22.9	2.25	21.4	2.05
80%	20	90	24.6	3.73	23.2	3.41	21.8	3.11	21.1	2.96	20.4	2.83	19.0	2.55
	25		24.6	3.20	23.2	2.94	21.8	2.69	21.1	2.57	20.4	2.45	19.0	2.23
	30		24.6	2.76	23.2	2.57	21.8	2.36	21.1	2.27	20.4	2.16	19.0	1.97
	35		24.6	2.51	23.2	2.29	21.8	2.10	21.1	2.02	20.4	1.93	19.0	1.77
70%	20	90	21.6	3.06	20.3	2.80	19.1	2.57	18.4	2.46	17.8	2.34	16.6	2.13
	25		21.6	2.64	20.3	2.44	19.1	2.23	18.4	2.14	17.8	2.05	16.6	1.87
	30		21.6	2.32	20.3	2.15	19.1	1.98	18.4	1.90	17.8	1.82	16.6	1.67
	35		21.6	2.07	20.3	1.92	19.1	1.77	18.4	1.69	17.8	1.64	16.6	1.51
60%	20	90	18.4	2.45	17.4	2.26	16.4	2.08	15.8	2.00	15.3	1.91	14.3	1.74
	25		18.4	2.14	17.4	1.98	16.4	1.83	15.8	1.76	15.3	1.69	14.3	1.55
	30		18.4	1.90	17.4	1.76	16.4	1.64	15.8	1.57	15.3	1.51	14.3	1.39
	35		18.4	1.70	17.4	1.59	16.4	1.48	15.8	1.42	15.3	1.37	14.3	1.27
50%	20	90	15.4	1.92	14.5	1.79	14.5	1.65	13.2	1.59	12.7	1.53	11.9	1.41
	25		15.4	1.69	14.5	1.58	14.5	1.47	13.2	1.41	12.7	1.36	11.9	1.26
	30		15.4	1.52	14.5	1.42	14.5	1.33	13.2	1.28	12.7	1.23	11.9	1.15
	35		15.4	1.38	14.5	1.29	14.5	1.21	13.2	1.17	12.7	1.13	11.9	1.05

Note:
1. is shown as reference
2. The above table shows the average value of conditions may operate
3. It is recommended to connect less than 130%

10HP cooling mode

Combination (%)	Water inlet temperature(℃)	Water flow(L/min)	Indoor temperature℃WB													
			14		16		18		19		20		22		24	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
130%	20	100	24.5	3.53	29.3	4.69	31.3	5.05	31.7	5.08	32.1	5.09	32.8	5.13	33.3	5.15
	25		24.5	4.16	29.3	5.54	30.3	5.61	30.7	5.64	31.1	5.67	31.8	5.70	32.2	5.72
	30		24.5	4.92	28.3	6.12	29.3	6.18	29.6	6.21	30.0	6.23	30.5	6.26	30.9	6.27
	35		24.5	5.88	27.1	6.70	27.9	6.76	28.3	6.79	28.6	6.81	29.0	6.83	29.4	6.83
120%	20	100	22.7	3.11	27.1	4.12	30.7	5.02	31.1	5.05	31.6	5.07	32.3	5.11	32.9	5.13
	25		22.7	3.66	27.1	4.86	29.8	5.58	30.2	5.61	30.7	5.63	31.4	5.68	31.9	5.70
	30		22.7	4.33	27.1	5.76	28.7	6.15	29.2	6.18	29.5	6.20	30.1	6.24	30.6	6.26
	35		22.7	5.16	26.6	6.66	27.9	6.73	27.9	6.76	28.1	6.78	28.7	6.82	29.2	6.83
110%	20	100	20.8	2.72	24.7	3.58	28.8	4.56	30.5	5.02	30.9	5.04	31.8	5.08	32.4	5.11
	25		20.8	3.20	24.7	4.22	28.8	5.38	29.7	5.57	30.1	5.60	30.8	5.64	31.5	5.68
	30		20.8	3.77	24.7	5.00	28.2	6.11	28.6	6.14	28.9	6.17	29.7	6.21	30.2	6.25
	35		20.7	4.51	24.7	5.97	27.0	7.31	27.4	6.72	27.7	6.75	28.3	6.79	28.8	6.82
100%	20	100	18.9	2.36	22.5	3.08	26.2	3.90	28.0	4.36	29.8	4.84	33.1	5.05	31.8	5.08
	25		18.9	2.76	22.5	3.62	26.2	4.60	28.0	5.14	29.5	5.56	30.2	5.61	30.8	5.64
	30		18.9	3.26	22.5	4.29	26.2	5.46	28.0	6.10	28.4	6.13	29.2	6.18	29.7	6.22
	35		18.9	3.87	22.5	5.11	26.2	6.52	26.7	6.67	27.2	6.70	27.8	6.75	28.4	6.79
90%	20	100	17.0	2.02	20.2	2.62	23.6	3.30	25.2	3.67	26.8	4.07	30.1	4.91	31.1	5.05
	25		17.0	2.37	20.2	3.08	23.6	3.88	25.2	4.33	26.8	4.80	29.5	5.56	30.2	5.60
	30		17.0	2.78	20.2	3.63	23.6	4.83	25.2	5.13	26.8	5.69	28.4	6.13	29.0	6.18
	35		17.0	3.30	20.2	4.32	23.6	5.49	25.2	6.13	26.5	6.65	27.3	6.71	27.8	6.75
80%	20	100	15.1	1.71	18.0	2.20	21.0	2.75	22.4	3.06	23.8	3.37	26.7	4.05	29.7	4.80
	25		15.1	2.00	18.0	2.58	21.0	3.24	22.4	3.59	23.8	3.97	26.7	4.77	29.5	5.56
	30		15.1	2.35	18.0	3.03	21.0	3.81	22.4	4.25	23.8	4.69	26.7	5.67	28.4	6.13
	35		15.1	2.77	18.0	3.60	21.0	4.54	22.4	5.06	23.8	5.60	26.5	6.65	27.2	6.70
70%	20	100	13.2	1.44	15.7	1.82	18.4	2.26	19.6	2.49	20.9	2.74	23.4	3.27	26.0	3.85
	25		13.2	1.67	15.7	2.12	18.4	2.64	19.6	2.92	20.9	3.22	23.4	3.85	26.0	4.54
	30		13.2	1.95	15.7	2.50	18.4	3.12	19.6	3.45	20.9	3.80	23.4	4.56	26.0	5.39
	35		13.2	2.30	15.7	2.95	18.4	3.67	19.6	4.10	20.9	4.94	23.4	5.44	26.0	6.44
60%	20	100	11.3	1.17	13.5	1.48	15.7	1.81	16.8	1.98	17.9	2.17	20.0	2.58	22.2	3.02
	25		11.3	1.37	13.5	1.72	15.7	2.11	16.8	2.33	17.9	2.55	20.0	3.03	22.2	3.56
	30		11.3	1.60	13.5	2.01	15.7	2.48	16.8	2.73	17.9	3.00	20.0	3.58	22.2	4.20
	35		11.3	1.87	13.5	14.27	15.7	2.93	16.8	3.24	17.9	3.56	20.0	4.25	22.2	5.01
50%	20	100	9.4	0.95	11.2	1.17	13.1	1.42	14.1	1.55	14.9	1.68	16.8	1.97	18.6	2.30
	25		9.4	1.10	11.2	1.36	13.1	1.65	14.1	1.80	14.9	1.96	16.8	2.32	18.6	2.69
	30		9.4	1.27	11.2	1.58	13.1	1.92	14.1	2.11	14.9	2.31	16.8	2.72	18.6	3.17
	35		9.4	1.49	11.2	1.85	13.1	2.27	14.1	2.49	14.9	2.72	16.8	3.22	18.6	3.76

Note:
1. is shown as reference
2. The above table shows the average value of conditions may operate
3. It is recommended to connect less than 130%

10HP heating mode

Combination (%)	Water inlet temperature(℃)	Water flow(L/min)	Indoor temperature℃DB											
			16		18		20		21		22		24	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
130%	20	100	33.2	4.73	33.0	4.84	32.9	5.00	32.7	5.07	32.6	5.16	32.3	5.35
	25		36.6	4.97	36.4	5.12	36.1	5.28	36.0	5.37	35.8	5.47	35.5	5.68
	30		39.4	5.24	39.6	5.40	39.2	5.58	37.9	5.68	38.7	5.71	36.1	5.13
	35		43.1	5.52	42.8	5.69	41.4	5.54	38.8	5.27	38.7	5.16	36.1	4.50
120%	20	100	33.0	4.89	32.8	5.03	32.9	5.19	32.4	5.29	32.3	5.38	32.0	5.58
	25		36.3	5.18	36.0	5.34	35.7	5.51	35.6	5.60	35.4	5.71	33.2	5.23
	30		39.5	5.47	39.1	5.64	38.2	5.60	37.0	5.33	35.8	5.06	33.2	4.54
	35		42.6	5.76	40.6	5.39	38.2	4.90	37.0	4.67	35.8	4.44	33.2	3.99
110%	20	100	32.7	5.11	32.5	5.26	32.2	5.44	32.1	5.53	31.9	5.63	30.5	5.35
	25		35.9	5.41	35.6	5.58	35.0	5.66	33.8	5.38	32.7	5.11	30.5	4.59
	30		39.0	5.72	37.3	5.39	35.0	4.81	33.8	4.67	32.7	4.44	30.5	4.10
	35		39.5	5.16	37.3	4.72	35.0	4.31	33.8	4.18	32.7	3.90	30.5	3.52
100%	20	100	32.3	5.36	32.1	5.53	31.5	5.83	30.8	5.43	29.8	5.16	27.8	4.63
	25		35.4	5.69	33.8	5.38	31.5	4.89	30.8	4.66	29.8	4.42	27.8	3.99
	30		35.9	5.10	33.8	4.67	31.5	4.25	30.8	4.05	29.8	3.85	27.8	3.48
	35		35.9	4.47	33.8	4.10	31.5	3.75	30.8	3.58	29.8	3.41	27.8	3.09
90%	20	100	31.9	5.67	30.5	5.35	28.7	4.85	27.7	4.63	26.8	4.39	24.9	3.96
	25		32.3	5.01	30.5	4.58	28.7	4.17	27.7	3.99	26.8	3.79	24.9	3.43
	30		32.3	4.34	30.5	3.99	28.7	3.65	27.7	3.48	26.8	3.32	24.9	3.01
	35		32.3	3.83	30.5	3.52	28.7	3.23	27.7	3.09	26.8	2.95	24.9	2.68
80%	20	100	28.7	4.88	27.1	4.47	25.5	4.07	24.6	3.88	23.8	3.70	22.2	3.34
	25		28.7	4.19	27.1	3.85	25.5	3.52	24.6	3.36	23.8	3.21	22.2	2.92
	30		28.7	3.62	27.1	3.37	25.5	3.10	24.6	2.98	23.8	2.83	22.2	2.58
	35		28.7	3.29	27.1	2.99	25.5	2.76	24.6	2.64	23.8	2.53	22.2	2.31
70%	20	100	25.1	4.00	23.7	3.67	22.3	3.36	21.5	3.22	20.8	3.07	19.4	2.79
	25		25.1	3.46	23.7	3.19	22.3	2.93	21.5	2.80	20.8	2.68	19.4	2.45
	30		25.1	3.04	23.7	2.81	22.3	2.59	21.5	2.48	20.8	2.38	19.4	2.18
	35		25.1	2.71	23.7	2.51	22.3	2.32	21.5	2.22	20.8	2.14	19.4	1.97
60%	20	100	21.5	3.21	20.3	2.97	19.1	2.73	18.5	2.62	17.9	2.50	16.7	2.29
	25		21.5	2.80	20.3	2.60	19.1	2.40	18.5	2.30	17.9	2.21	16.7	2.03
	30		21.5	2.48	20.3	2.30	19.1	2.14	18.5	2.06	17.9	1.97	16.7	1.82
	35		21.5	2.23	20.3	2.08	19.1	1.94	18.5	1.86	17.9	1.79	16.7	1.66
50%	20	100	18.0	2.52	17.0	2.34	17.0	2.16	15.4	2.09	14.8	2.00	13.8	1.84
	25		18.0	2.22	17.0	2.07	17.0	1.93	15.4	1.85	14.8	1.78	13.8	1.65
	30		18.0	1.99	17.0	1.86	17.0	1.74	15.4	1.67	14.8	1.61	13.8	1.50
	35		18.0	1.80	17.0	1.69	17.0	1.59	15.4	1.53	14.8	1.48	13.8	1.38

Note:
1. is shown as reference
2. The above table shows the average value of conditions may operate
3. It is recommended to connect less than 130%

12HP cooling mode

Combination (%)	Water inlet temperature(℃)	Water flow(L/min)	Indoor temperature℃WB													
			14		16		18		19		20		22		24	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
130%	20	120	29.4	4.63	35.0	6.16	37.4	6.62	37.9	6.66	38.4	6.67	39.3	6.73	39.9	6.75
	25		29.4	5.45	35.0	7.27	36.3	7.36	36.8	7.40	37.3	7.43	38.0	7.47	38.5	7.50
	30		29.4	6.45	33.9	8.03	35.0	8.11	35.4	8.15	35.9	8.17	36.5	8.21	37.0	8.23
	35		29.4	7.71	32.4	8.78	33.4	8.86	33.9	8.90	34.3	8.93	34.8	8.96	35.1	8.96
120%	20	120	27.1	4.07	32.4	5.40	36.8	6.58	37.3	6.62	37.8	6.65	38.6	6.70	39.4	6.73
	25		27.1	4.80	32.4	6.37	35.6	7.32	36.1	7.36	36.8	7.39	37.5	7.44	38.1	7.47
	30		27.1	5.68	32.4	7.55	34.4	8.07	34.9	8.11	35.3	8.13	36.0	8.19	36.6	8.21
	35		27.1	6.77	31.9	8.73	33.4	8.82	33.4	8.86	33.6	8.89	34.4	8.94	34.9	8.96
110%	20	120	24.8	3.57	29.6	4.70	34.5	5.98	36.5	6.58	37.0	6.61	38.0	6.66	38.8	6.70
	25		24.8	4.19	29.6	5.53	34.5	7.06	35.5	7.31	36.0	7.35	36.9	7.40	37.6	7.44
	30		24.8	4.95	29.6	6.55	33.8	8.01	34.3	8.05	34.6	8.09	35.5	8.15	36.1	8.20
	35		24.8	5.92	29.6	7.83	32.2	9.58	32.7	8.81	33.1	8.85	33.9	8.90	34.5	8.94
100%	20	120	22.6	3.09	27.0	4.03	31.4	5.12	33.5	5.72	35.6	6.34	39.6	6.62	38.0	6.66
	25		22.6	3.62	27.0	4.75	31.4	6.04	33.5	6.74	35.3	7.30	36.1	7.36	36.9	7.40
	30		22.6	4.27	27.0	5.63	31.4	7.16	33.5	8.00	34.0	8.04	34.9	8.11	35.5	8.16
	35		22.6	5.08	27.0	6.70	31.4	8.56	32.0	8.74	32.5	8.78	33.2	8.85	34.0	8.90
90%	20	120	20.3	2.65	24.2	3.44	28.2	4.33	30.1	4.82	32.1	5.33	36.0	6.43	37.3	6.62
	25		20.3	3.10	24.2	4.03	28.2	5.09	30.1	5.68	32.1	6.29	35.3	7.30	36.1	7.35
	30		20.3	3.65	24.2	4.76	28.2	6.33	30.1	6.73	32.1	7.46	34.0	8.04	34.8	8.11
	35		20.3	4.33	24.2	5.67	28.2	7.20	30.1	8.04	31.7	8.72	32.6	8.80	33.2	8.85
80%	20	120	18.1	2.24	21.6	2.88	25.1	3.61	26.9	4.01	28.5	4.42	32.0	5.31	35.5	6.29
	25		18.1	2.63	21.6	3.38	25.1	4.25	26.9	4.71	28.5	5.20	32.0	6.26	35.3	7.30
	30		18.1	3.08	21.6	3.98	25.1	5.00	26.9	5.57	28.5	6.16	32.0	7.43	34.0	8.04
	35		18.1	3.64	21.6	4.72	25.1	5.96	26.9	6.63	28.5	7.35	31.7	8.72	32.5	8.78
70%	20	120	15.8	1.88	18.8	2.39	22.0	2.96	23.5	3.26	25.0	3.60	28.0	4.29	31.1	5.05
	25		15.8	2.19	18.8	2.79	22.0	3.46	23.5	3.83	25.0	4.22	28.0	5.05	31.1	5.96
	30		15.8	2.56	18.8	3.28	22.0	4.09	23.5	4.52	25.0	4.99	28.0	5.98	31.1	7.07
	35		15.8	3.01	18.8	3.87	22.0	4.82	23.5	5.37	25.0	6.48	28.0	7.14	31.1	8.45
60%	20	120	13.6	1.54	16.2	1.94	18.8	2.37	20.1	2.60	21.5	2.85	24.0	3.38	26.6	3.97
	25		13.6	1.79	16.2	2.26	18.8	2.77	20.1	3.05	21.5	3.34	24.0	3.98	26.6	4.67
	30		13.6	2.10	16.2	2.64	18.8	3.25	20.1	3.58	21.5	3.94	24.0	4.70	26.6	5.51
	35		13.6	2.45	16.2	18.72	18.8	3.85	20.1	4.25	21.5	4.67	24.0	5.57	26.6	6.57
50%	20	120	11.3	1.25	13.4	1.54	15.7	1.86	16.8	2.03	17.8	2.20	20.1	2.59	22.2	3.01
	25		11.3	1.45	13.4	1.78	15.7	2.16	16.8	2.36	17.8	2.57	20.1	3.04	22.2	3.53
	30		11.3	1.67	13.4	2.07	15.7	2.52	16.8	2.77	17.8	3.02	20.1	3.57	22.2	4.15
	35		11.3	1.95	13.4	2.43	15.7	2.97	16.8	3.26	17.8	3.57	20.1	4.22	22.2	4.94

Note:
1. is shown as reference
2. The above table shows the average value of conditions may operate
3. It is recommended to connect less than 130%

12HP heating mode

Combination (%)	Water inlet temperature(℃)	Water flow(L/min)	Indoor temperature℃DB											
			16		18		20		21		22		24	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
			kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
130%	20	120	39.6	6.33	39.3	6.48	39.2	6.68	39.0	6.78	38.8	6.90	38.5	7.16
	25		43.5	6.65	43.3	6.85	42.9	7.06	42.8	7.19	42.6	7.32	42.2	7.59
	30		46.9	7.01	47.1	7.23	46.7	7.47	45.2	7.59	46.1	7.64	42.9	6.86
	35		51.3	7.39	51.0	7.62	49.3	7.42	46.2	7.05	46.1	6.90	42.9	6.01
120%	20	120	39.3	6.54	39.1	6.73	39.2	6.95	38.6	7.08	38.5	7.20	38.1	7.47
	25		43.2	6.92	42.8	7.14	42.4	7.37	42.3	7.49	42.1	7.64	39.6	7.00
	30		47.0	7.32	46.5	7.54	45.5	7.49	44.0	7.13	42.6	6.77	39.6	6.08
	35		50.7	7.71	48.3	7.21	45.5	6.56	44.0	6.24	42.6	5.94	39.6	5.34
110%	20	120	39.0	6.84	38.7	7.04	38.4	7.28	38.2	7.40	38.0	7.53	36.3	7.16
	25		42.7	7.24	42.3	7.47	41.7	7.57	40.3	7.20	39.0	6.84	36.3	6.14
	30		46.4	7.66	44.4	7.21	41.7	6.43	40.3	6.24	39.0	5.94	36.3	5.48
	35		47.0	6.90	44.4	6.32	41.7	5.76	40.3	5.60	39.0	5.22	36.3	4.71
100%	20	120	38.5	7.18	38.2	7.40	37.5	7.80	36.7	7.26	35.5	6.90	33.1	6.19
	25		42.1	7.61	40.3	7.20	37.5	6.54	36.7	6.23	35.5	5.91	33.1	5.33
	30		42.7	6.82	40.3	6.24	37.5	5.69	36.7	5.42	35.5	5.15	33.1	4.66
	35		42.7	5.98	40.3	5.48	37.5	5.02	36.7	4.79	35.5	4.56	33.1	4.13
90%	20	120	38.0	7.58	36.3	7.15	34.1	6.49	32.9	6.19	31.9	5.88	29.7	5.29
	25		38.5	6.70	36.3	6.13	34.1	5.58	32.9	5.33	31.9	5.07	29.7	4.59
	30		38.5	5.81	36.3	5.33	34.1	4.88	32.9	4.66	31.9	4.45	29.7	4.03
	35		38.5	5.13	36.3	4.71	34.1	4.32	32.9	4.13	31.9	3.94	29.7	3.59
80%	20	120	34.1	6.53	32.2	5.98	30.3	5.45	29.3	5.19	28.4	4.95	26.5	4.47
	25		34.1	5.61	32.2	5.15	30.3	4.71	29.3	4.50	28.4	4.30	26.5	3.90
	30		34.1	4.84	32.2	4.51	30.3	4.14	29.3	3.98	28.4	3.79	26.5	3.45
	35		34.1	4.40	32.2	4.01	30.3	3.69	29.3	3.54	28.4	3.39	26.5	3.10
70%	20	120	29.9	5.36	28.3	4.91	26.6	4.50	25.6	4.31	24.8	4.11	23.1	3.73
	25		29.9	4.62	28.3	4.27	26.6	3.92	25.6	3.75	24.8	3.59	23.1	3.27
	30		29.9	4.07	28.3	3.77	26.6	3.46	25.6	3.32	24.8	3.18	23.1	2.92
	35		29.9	3.63	28.3	3.36	26.6	3.11	25.6	2.97	24.8	2.87	23.1	2.64
60%	20	120	25.6	4.30	24.2	3.97	22.7	3.65	22.0	3.50	21.3	3.35	19.8	3.06
	25		25.6	3.75	24.2	3.47	22.7	3.21	22.0	3.08	21.3	2.96	19.8	2.72
	30		25.6	3.32	24.2	3.08	22.7	2.87	22.0	2.75	21.3	2.64	19.8	2.44
	35		25.6	2.98	24.2	2.78	22.7	2.59	22.0	2.49	21.3	2.40	19.8	2.22
50%	20	120	21.4	3.37	20.2	3.13	20.2	2.89	18.3	2.79	17.7	2.68	16.5	2.46
	25		21.4	2.97	20.2	2.77	20.2	2.58	18.3	2.48	17.7	2.39	16.5	2.21
	30		21.4	2.67	20.2	2.49	20.2	2.32	18.3	2.24	17.7	2.16	16.5	2.01
	35		21.4	2.41	20.2	2.26	20.2	2.12	18.3	2.05	17.7	1.98	16.5	1.84

Note:
1. is shown as reference
2. The above table shows the average value of conditions may operate
3. It is recommended to connect less than 130%

7. Accessories

7.1 Standard accessories

No	Name	Quantity	Purpose
1	Main unit installation manual	1	/
2	Main unit owner's manual	1	Be sure to deliver it to the customer
3	Indoor unit owner's manual	1	Be sure to deliver it to the customer
4	User's guideline	1	Be sure to deliver it to the customer
5	Bolts bag	1	Stone for service
6	Toggling flathead screw	1	For toggling of indoor and main units
7	Water outlet connector	1	For draining the internal condensed water of the unit
8	Water outlet plug	1	Block a drainage port of the unit chassis which do not need to drainage
9	Seal ring	2	For avoiding water leakage of the chassis
10	Y-shape water filter	1	Connect to the side of water inlet pie
11	Indoor unit branch pipes	1	
12	Main unit branch pipes installation	1	
13	Seal plug	8	For pipe cleaning
14	Connective pipe accessory	1	Connect to the side of liquid pipe
15	Air side connective pipe	1 or 2	Connect to the air pipe side(8/10HP 1pc,12HP 2pcs)

7.2 Optional accessories

Branch joint of outdoor & indoor unit

Optional accessories	Model name	Packing Size (mm)	Gross/net Weight (kg)	Function
Branch Joint of outdoor unit	FQZHW-02N1D	255×150×185	1.5/1.2	Distribute the refrigerant to Indoor Units and balance the resistance between each outdoor unit.
	FQZHW-03N1D	345×160×285	3.4/2.4	
Branch Joint of indoor unit	FQZHN-01D	290×105×100	0.4/0.3	
	FQZHN-02D	290×105×100	0.6/0.4	
	FQZHN-03D	310×130×125	0.9/0.6	
	FQZHN-04D	350×170×180	1.5/1.1	
	FQZHN-05D	365×195×215	1.9/1.4	

Other optional accessories

Optional accessories	Model name	Function
Outdoor controller	MD-CCM02/E	Monitor the outdoor operating parameter
Three phase electricity power protector	DPA51CM44 or HWUA/DPB71CM48	To stop the air-conditioner running in case of bad power supply such as Phase Error, Over-voltage, Under-voltage lose, phase lost and phase sequence inverse. Thus to protect the equipment.
Digital ammeter (WHM)	DTS634/DT636	Electricity Charge monitor

8. Functional parts and safety devices

Item	Symbol	Capacity	8HP	10HP	12HP
Compressor	Inverter	Inverter compressor	E655DHD-65D2YG	E655DHD-65D2YG	E655DHD-65D2YG
	Safety OLP	Current protection board	MDV-POWER-50A(IR341)-1		
	CCH	Crank case heater	DJRD-520A-1500-27.6W		
Temperature sensor	TSJ	Water inlet temp. of double-pipe heat exchanger	B:4100，R(25℃)：10KΩ		
	TSC1	Water outlet temp. of upper pipe	B:4100，R(25℃)：10KΩ		
	TSC2	Water outlet temp. of lower pipe	B:4100，R(25℃)：10KΩ		
	T7	Discharge temp. sensor	B:3950,R(25℃):56104.8Ω		
	T5	Temp. sensor of inverter module	B:3950,R(25℃):56104.8Ω		
Pressure sensor	HPS	High pressure sensor (discharge)	Model: YLCGQ-NSK-BD046I-U289 0-5Mpa		
	LPS	Low pressure sensor (suction)	YK-0.05/0.15-2000 0.05MPa		
Functional Parts	PMV	Electronic expansion valve	D32MISZ-1R 4.2MPa		
	4-W/V	4-way valve	STF-01VN1		
	SV	Solenoid valve	FDF6A-049-PK(ZB) or FDF6A11 4.2MPa		

Part 4 Installation

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1. Precautions

- Be sure only trained and qualified service personnel to install, repair or service the equipment.

Improper installation, repair, and maintenance may result in electric shocks, short-circuit, leaks, fire or other damage to the equipment.

If installation is defective, it will cause water leakage, electrical shock fire.

- When installing the unit in a small room, take measures against to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage. Contact the place of purchase for more information. Excessive refrigerant in a closed ambient can lead to oxygen deficiency.
- Use the attached accessories parts and specified parts for installation.

Otherwise, it will cause the set to fall, water leakage, electrical shock fire.

- Install at a strong and firm location which is able to withstand the set's weight.

If the strength is not enough or installation is not properly done, the set will drop to cause injury.

- The appliance shall be installed in accordance with national wiring regulations
- The appliance shall not be installed in the laundry.
- Before obtaining access to terminals, all supply circuits must be disconnected.
- The appliance must be positioned so that the plug is accessible.
- The enclosure of the appliance shall be marked by word, or by symbols, with the direction of the fluid flow.
- For electrical work, follow the local national wiring standard, regulation and this installation instructions. An independent circuit and single outlet must be used.

If electrical circuit capacity is not enough or defect in electrical work, it will cause electrical shock fire.

- Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal.

If connection or fixing is not perfect, it will cause heat-up or fire at the connection.

- Wiring routing must be properly arranged so that control board cover is fixed properly.

If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.

- If the supply cord is damaged, it must be replaced by the manufacture or its service agent or similarly qualified person in order to avoid a hazard.
- An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device(RCD)with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule.
- When carrying out piping connection, take care not let air substances go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.
- Do not modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.
- Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes.

Improper installation work may result in the equipment falling and causing accidents.

- The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
- The power cord type designation is H07RN-F. Equipment complying with IEC 61000-3-12.
- If the refrigerant leaks during installation, ventilate the area immediately.

Toxic gas may be produced if the refrigerant comes into the place contacting with fire.

- After completing the installation work, check that the refrigerant does not leak.

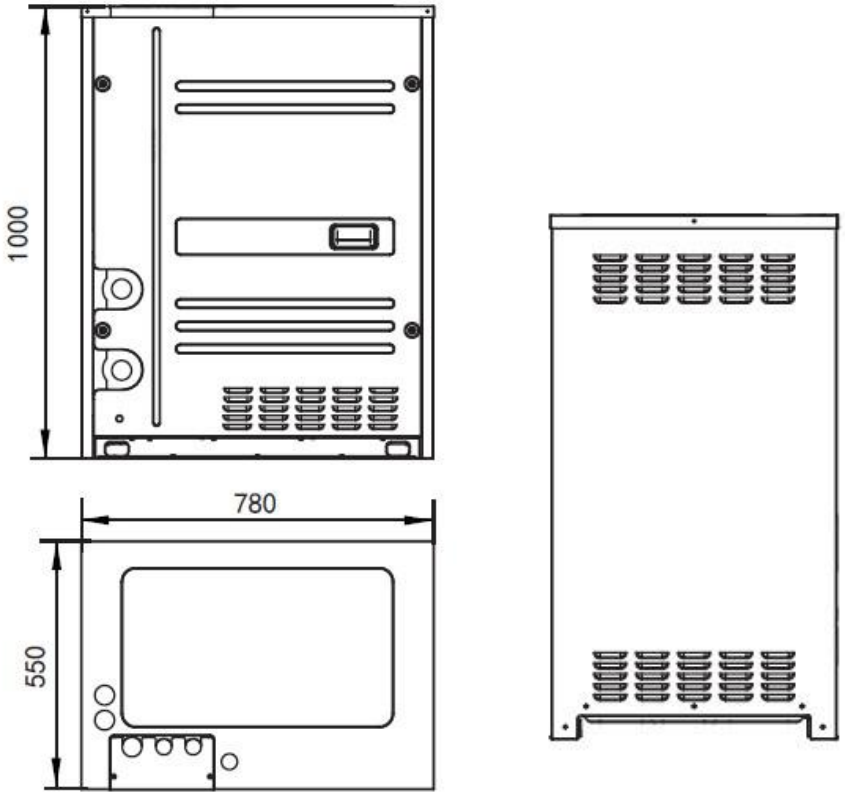
Toxic gas may be produced if the refrigerant leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.

2. Main units installation

2.1 Main unit combination

HP	Mode	Qty. of indoor unit	HP	Mode	Qty. of indoor unit
8	8HP×1	13	24	12HP×2	39
10	10HP×1	16	26	8HP×2+10HP	43
12	12HP×1	19	28	10HP×2+8HP	46
16	8HP×2	23	30	10HP×3	50
18	10HP+8HP	29	32	10HP×2+12HP	53
20	10HP+10HP	33	34	12HP×2+10HP	56
22	10HP+12HP	36	36	12HP×3	59

2.2 Dimension of main unit



2.3 Select installation position

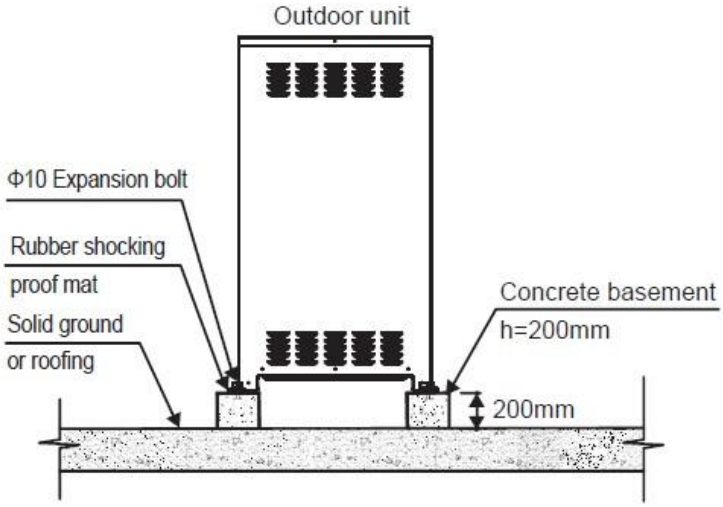
- Ensure that the main unit is installed in a place convenient to connect water, refrigerant and electricity.
- Ensure that the noise and exhaust ventilation of the main unit do not affect the neighbors of the property owner or the surrounding ventilation.
- Ensure that the main unit is installed in a well-ventilated place that is possibly closest to the indoor unit.
- Ensure that the main unit is installed in a cool place without direct sunshine exposure or direct radiation of high-temp heat source.
- Do not install the main unit in a dirty or severely polluted place, so as to avoid blockage of the heat exchanger in the main unit.
- Do not install the main unit in a place with oil pollution, salt or high content of harmful gases such as sulfurous gas.

2.4 Hoisting main unit

- It is banned to take wooden cork base as the force bearing point of lifting up the unit during hoisting, the correct method is use the braces or lifting ropes which can bear the unit's weight and go through the lifting holes of the front and back bottom plates in the unit for hoisting.
- It is banned to tear down any packages during hoisting installation; it should use two longer than 4m ropes to lift up the unit with the packages, and keep the unit in balance, lift it up stably. Under transporting the unit with no packages or the package has been damaged, it should use base plate or packaging materials for protection.
- Pay attention to keep the main unit vertical during transportation, hoisting, and make sure the safety during transportation and hoisting.

2.5 Base for main unit

- A solid, correct base can:
  - Avoid the main unit from sinking.
  - Avoid the abnormal noise generated due to base.
- Base types
  - Steel structure base
  - Concrete base (see the figure below for the general making method)



CAUTION:

The key points to make basement:

•The master unit's basement must be made on the solid concrete ground . Refer to the structure diagram to make concrete basement in detail, or make after field measurements.

•In order to ensure every point can contact equality, the basement should be on completely level.

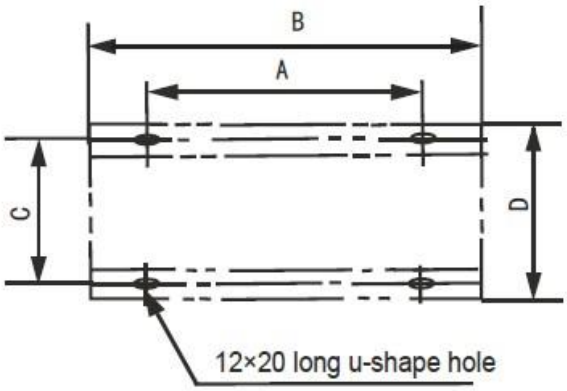
•If the basement is placed on the roofing, the detritus layer isn't needed, but the concrete surface must be flat. The standard concrete mixture ratio is cement 1/ sand 2/ carpolite 4, and add Φ10 strengthen reinforcing steel bar, the surface of the cement and sand plasm must be flat, border of the basement must be chamfer angle.

•Before construct the unit base, please ensure the base is directly supporting the rear and front folding edges of the bottom panel vertically, for the reason of these edges are the actual supported sites to the unit.

•In order to drain off the sweeper around the equipment, a discharge ditch must be setup around the basement.

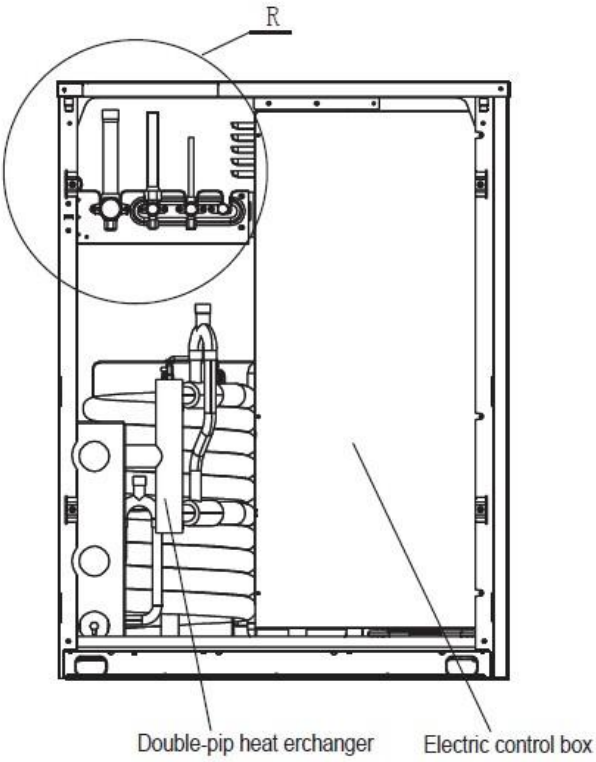
•Please check the afford ability of the roofing to ensure the load capacity.

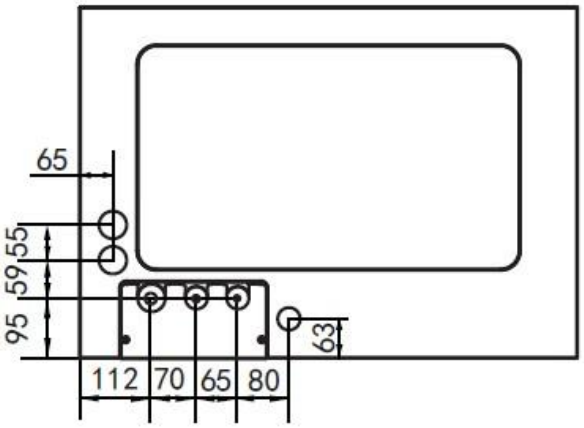
Position illustration of screw bolt (Unit: mm) (Unit: mm)

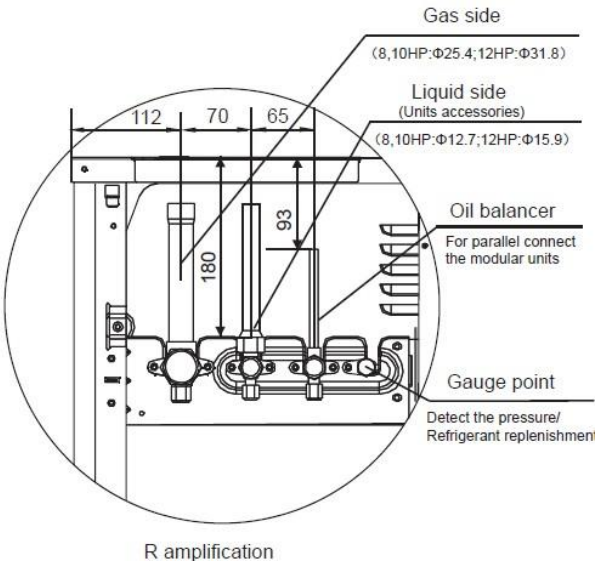


SIZE \ HP	8,10,12
A	650
B	780
C	518
D	550

Centering position illustration of each connective pipe (Unit: mm)





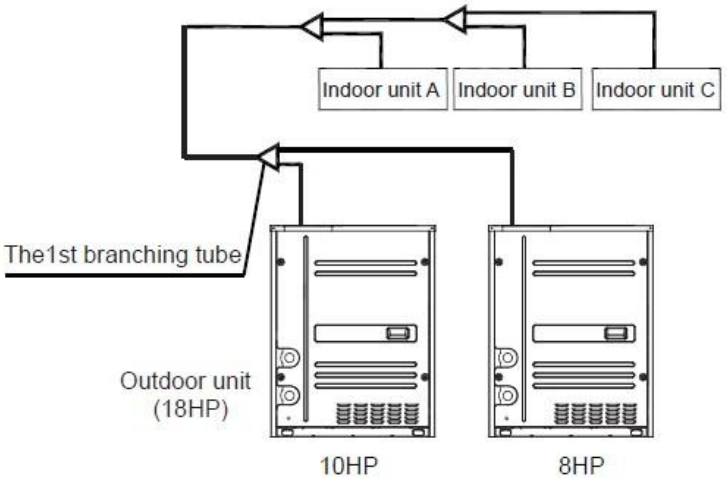


2.6 Main units' placement sequence & master and slave units' settings

A system, which provide with more than two main units, will be set as the followings method: The main units in this

system should place sequentially from the large to the small capacity; the largest capacity main unit must be mounted at the first branching site; and set the largest capacity main unit address as the master unit, while the other setting as the slave unit. Take 18HP (composed by 10HP, 8HP) as an example:

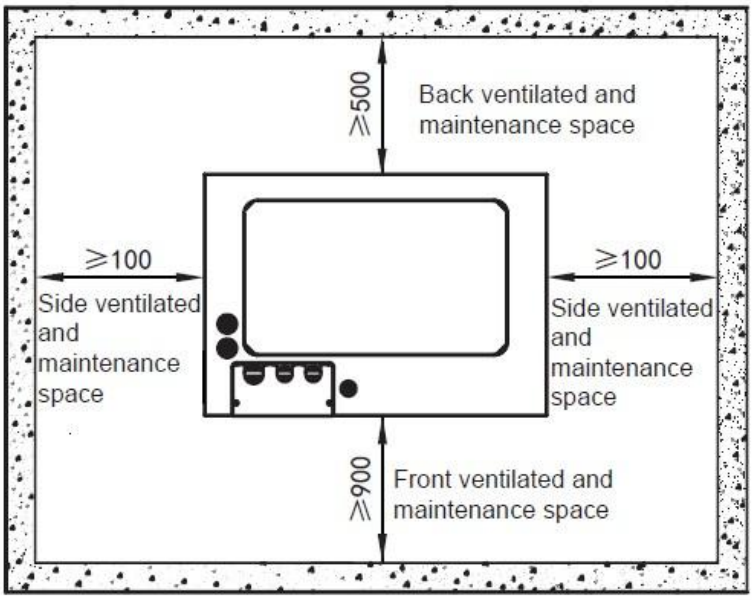
1) Place the 10HP at a side of the first branching site.
2) Place the unit from the large capacity to the small (See the detail placement illustration).
3) Set 10HP as the master unit, while the 8HP as the aux. unit.

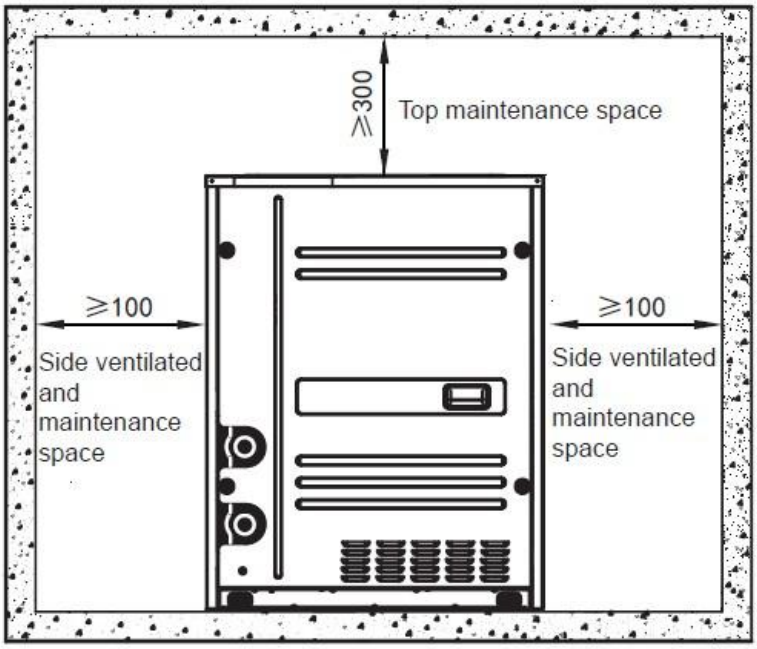


2.7 Installation space for main unit

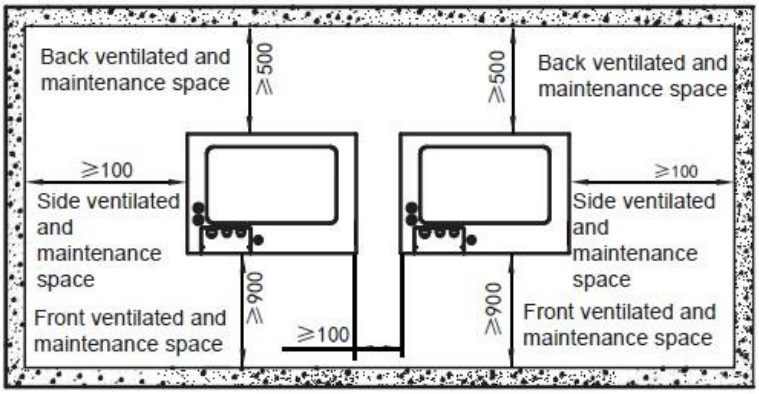
- Ensure enough space for maintenance. The modules in the same system must be on the same height.
- When installing the unit, leave a space for maintenance. Install the power supply at the side of the main unit. For installation procedure, see the power supply device installation manual.

Installation space of single main unit





Installation space of several main units



CAUTION:

When install several main units, please reserve the top maintenance space as the single main unit installation.

3. Water system installation

3.1 Basic requirements of connection of chilled water pipes

CAUTION:

•After the unit is in place, chilled water pipes can be laid.

•The relevant installation regulations should be abided with when conducting connection of water pipes.

•All water pipes must conform to local rules and regulations of pipeline engineering.

•The size of water pipe should be the same as or larger than the connector size of the unit (DN32).

•The heat exchanger of the unit is double-pipe heat exchanger. There are different operation and maintenance methods between the double-pipe heat exchanger double-pipe heat exchanger and the other heat exchangers.

1) All connected water pipes should be thoroughly flushed, and cannot be cleaned after connected to the double-pipe heat exchanger of the unit, for in case any impurity been flushed into the heat exchanger. After connection, all the water pipes should be washed down, and no any impurity left.

2) Water must enter the double-pipe heat exchanger through the inlet; otherwise the performance of the unit will decline.

3) The inlet pipe of each double-pipe heat exchanger in the unit must be provided with a target flow switch, to realize flow-break protection for the unit. Both ends of the water flow switch must be supplied with horizontal straight pipe sections whose diameter is 5 times that of the inlet pipe. The water flow switch must be installed in strict accordance with “Installation & Regulation Guide for Water Flow Switch” (See Section 4-5).The wires of the water flow switch should be led to the electric cabinet through shielded cable (see Electric Wiring section for details). After the pipelines are installed, the water flow switch will be set properly according to the rated water flow of the unit.

4) The pump installed in the water system should be equipped with starter and should be controlled by the unit. The unit only supplies the on, off controlling signal of water pump, and do not supply the power for the water pump.

5) The pipes and their ports must be independently supported but should not be supported on the unit.

6) The pipes and their ports of the double-pipe heat exchanger should be easy to disassemble for operation and cleaning, as well as inspection of port pipes of the evaporator.

7) The inlet of the double-pipe heat exchanger should be provided with a water filter with more than 40 meshes per inch (in the accessories). The filter should be installed near to the inlet port as much as possible, and be under heat preservation. Periodically clean the water filter according to the blocking condition of the filter.

8) The flexible connectors must be mounted between the double-pipe heat exchangers and the on-site pipes, to reduce transfer of vibration to the building.

9) To facilitate maintenance, the inlet and outlet pipes should be provided with thermometer or manometer. The unit is not equipped with pressure and temperature instruments, so they need to be purchased by the user.

10) All low positions of the water system should be provided with drainage valves, to drain water in the heat exchanger of water side and the system completely; and all high positions should be supplied with discharge valves, to facilitate expelling air from the pipeline. The discharge valves and drainage valves should not be under heat preservation, to facilitate maintenance.

11) All possible water pipes in the system to be chilled should be under heat preservation.

12) When the unit will not be used for a long time, water inside the unit should be drained and cut off the power. If the unit is not drained in winter, then the double-pipe heat exchanger and the water pipes system of the unit might be freezing and cracking under low temperature.

13) The rated water flow volume of different models is as follow:

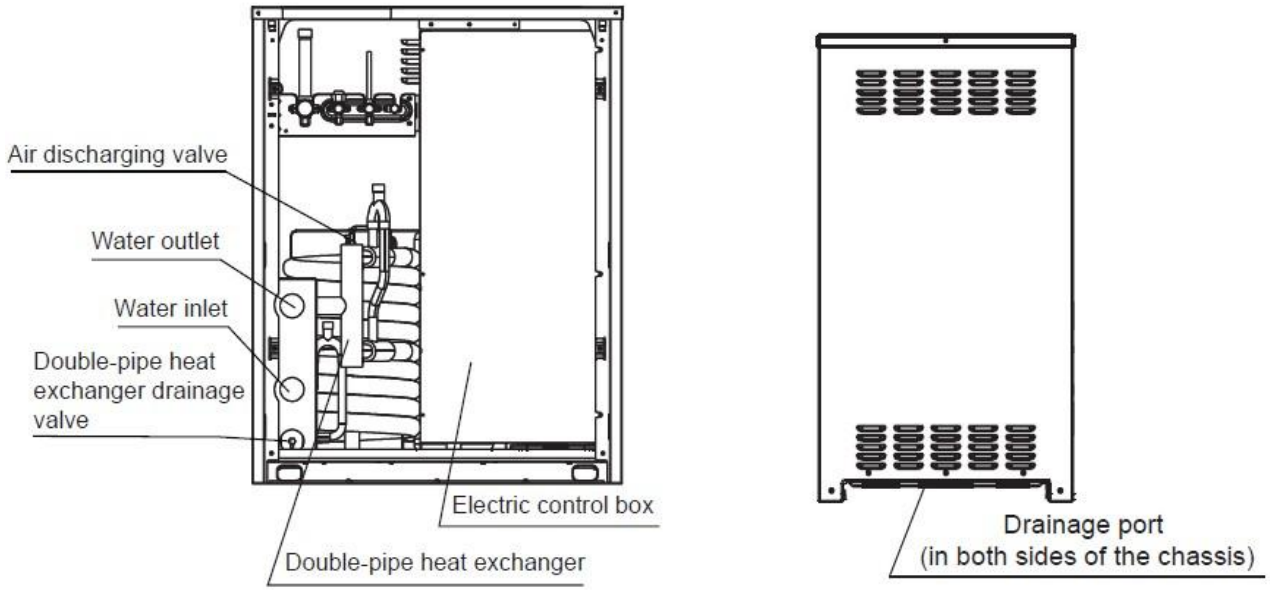
Model	Rated water flow volume(m3/h)
8HP	5.4
10HP	6.0
12HP	7.2

WARNING:

•The water pipes network including water filters and heat exchangers should be periodically cleaned, otherwise, dreg or dirt may seriously damages the heat exchangers and water pipes.

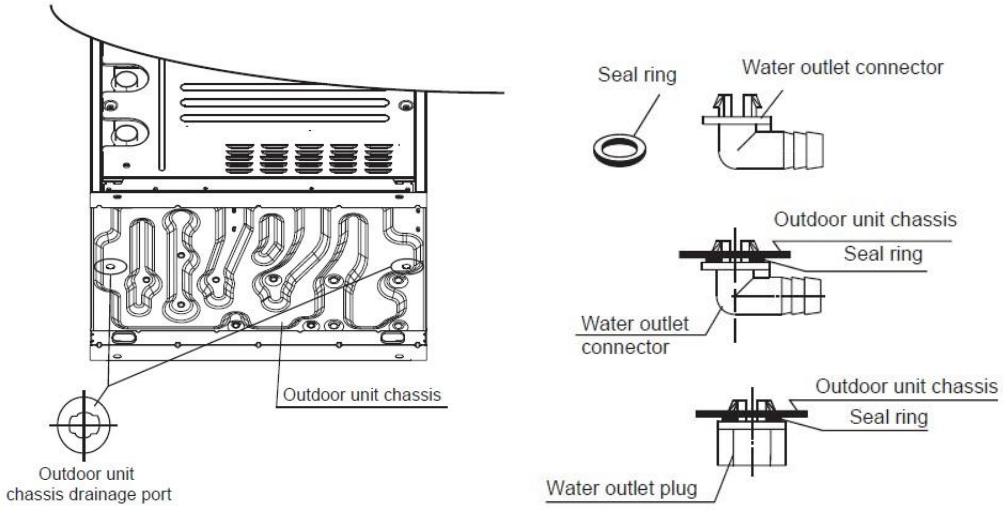
•The installation persons or the users must ensure the quality of chilled water, and de-icing salt mixtures and air should be excluded from the water system, since they may oxidize and corrode steel parts inside the heat exchanger.

3.2 Positions of water inlet, outlet and drainage port



3.3 Installation of drainage port connecting pipes

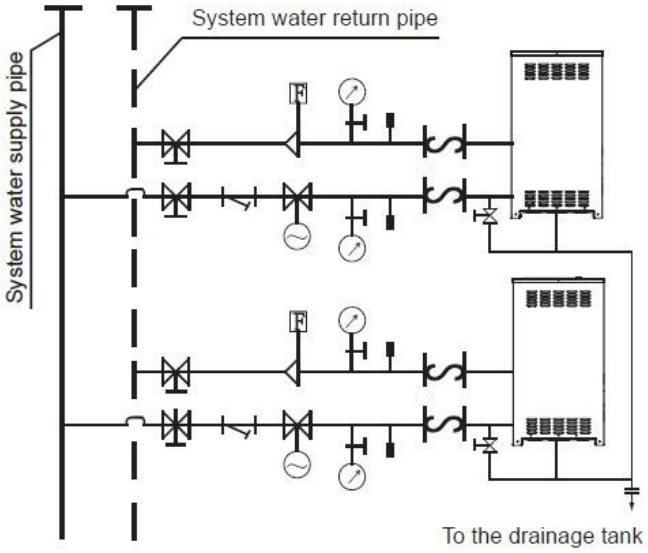
According to the field installation condition, it is selected the side which is draining easily for installing the drainage port connecting pipes. During installation, the seal ring should be put on the water outlet connector, then install into the drainage hole in the chassis from the bottom of the unit, and then rotate 90°, to make it firmly assembled. And connect a drainage pipe (commercially available) with the water outlet connector, for draining the condensed water of the main unit out to the suitable place. Main unit chassis seal ring Water outlet connector main unit chassis drainage port water outlet connector main unit chassis seal ring water outlet plug main unit chassis seal.



WARNING:

It is needed to block the water outlet in the side which do not need to be connected with drainage pipes with water outlet plug and seal ring, otherwise the condensed water produced during the system operation will drain near the installation place, to cause inconvenience.

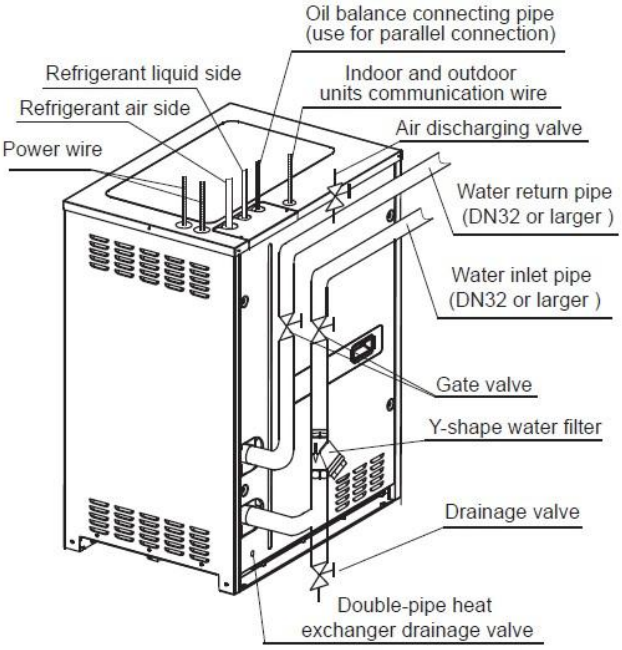
3.4 Installation of the main unit water pipelines



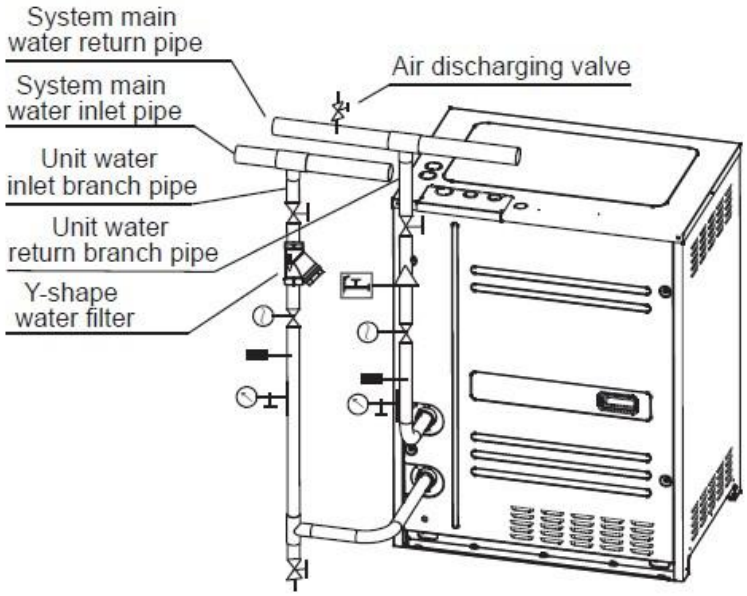
Symbols description

	Gate valve		Y-shape filter
	Pressure gage		Thermometer
	Water flow switch		Motorized valve
	Flexible connection		Drainage valve

Main unit side water pipelines connecting figure (Recommended)



Direction schematic diagram of water system pipes



Symbols description

	Gate valve		Thermometer
	Pressure gage		Motorized valve
	Water flow switch		Drainage valve

As the above Fig.3-5, when horizontal installing the water system main water inlet pipe and main water return pipe, the water inlet branch pipe and water return branch pipe which connected with the unit must be separate connected from the vertically lower direction of main water inlet pipe and main water return pipe; if connected from the side direction and the top direction will affect the unit performance.

3.5 Installation & regulation guide for water flow switch

3.5.1. Please carefully check flow switches before conducting installation of the water flow switch. Packing should be in good condition, and the appearance should be free of damage and deformation. If any problem, please contact the manufacturer.

3.5.2. Flow switches can be installed in the horizontal pipeline or the vertical pipeline with upward flowing direction but cannot be mounted in the pipeline with downward flowing direction. The inlet water of gravity should be taken into account when flow switches are installed in the pipeline with upward flowing direction.

3.5.3. Water flow switch must be installed on a section of straight-line pipeline, and its both ends must be supplied with straight-line pipes whose length is at least 5 times diameter of the pipe. In the meanwhile, the fluid flowing direction in the pipeline must be consistent with the direction of arrow on the switch. The connection terminal should be located where wiring connection can be easily done. (Fig.3-6).

3.5.4. Pay attention to the following items when conducting installation and wire connection:

1) Collision of the wrench with the soleplate of the flow switch is prohibited, since such collision may cause deformation and failure of the flow switch.

2) To avoid electric shock and damages to the devices, the power supply should be cut off, when wires are connected or adjustment is done.

3) When wiring connection is conducted, adjustment of other screws except connection terminals of micro switches and ground screws is prohibited. In the meanwhile, over great force should not applied when wires of micro switches are connected, otherwise micro switches may suffer displacement, thus leading to failure of

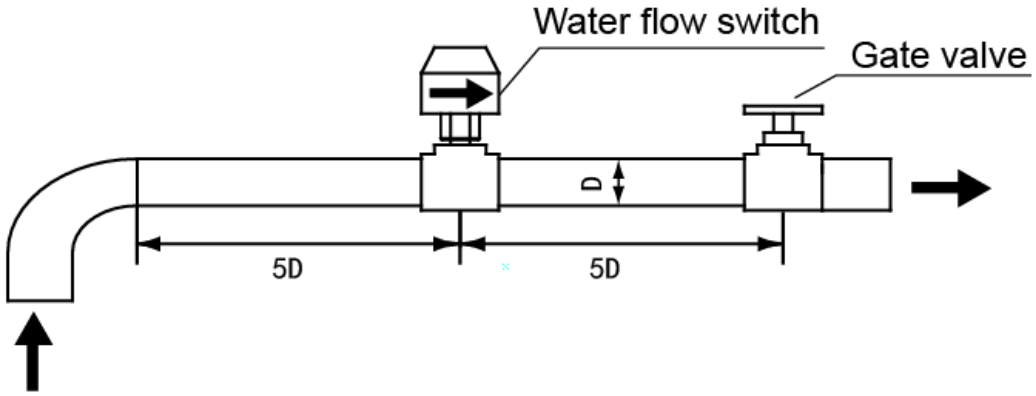
flow switches.

4) Special grounding screws should be used for earth connection. Bolts should not be installed or removed at will; otherwise flow switches may suffer deformation and failure.

5) Flow switches have been set at minimal flow value prior to ex-factory. They should not be adjusted below the ex-factory setting value, or they may suffer failure. After installing flow switches, please press the flow switch lever several times to check them. When the lever is found not to respond with “clatter”, rotate the screw in a clockwise direction, until “clatter” occurs.

6) Be sure to determine the model of target slice according to the rated flow of the unit, the diameter of the outlet pipe and the adjustment range of the target slice of the flow switch. Besides, the target slice should not contact with other restrictors in the pipeline or on the inner wall of the pipeline, or the flow switch cannot be reset normally.

3.5.5. Determine whether the flow switch and the system connected with it are in good operation according to the measured value by flow meter, namely, when the measured value on flow meter is less than 50% of rated water flow of the unit, the water flow controller should be cut off and observed for 3 working periods, and it should be covered with flow switch shell timely.



3.6 Operations and maintenance of double-pipe heat exchanger

3.6.1 Operations of double-pipe heat exchanger

1) Please note that correctly install the water inlet and outlet pipes. The thread of water inlet and outlet are inner thread G1-1/4.

2) For the double-pipe heat exchanger is internal thread copper pipe, and for avoiding the impurities enter into and affect the performance then cause corrosion of the double-pipe heat exchanger, it must
be installed the water filter (accessory) near the water inlet pipes of the unit.

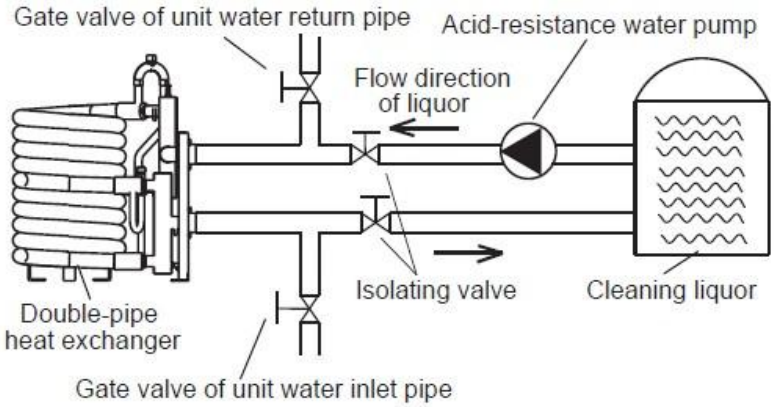
3) Please use water pipes which conform to local rules and regulations of pipeline engineering. The size of water pipe should not smaller than the connector size of the unit (DN32).

4) Periodically clean the water filter according to the water quality situation and the blocking condition of the filter. Otherwise, it might damage the filter screen of the water filter because of the abnormal pressure.

5) When the unit will not be used for a long time in winter, water inside the double-pipe heat exchanger and the water pipes should be drained out in case for being frozen. The water inside the double-pipe heat exchanger can be drained out by its drainage valve, the drain age valve position as Fig.3-1 display. The user can take down the front plate and open the drainage valve for water draining, and also can without taking down the front plate then use a straight screwdriver to go through the small hole in the front plate and open the drainage for water draining, the small hole position as Fig.3-5 display.

6) According to the different water quality the situations of double-pipe heat exchanger and water system pipelines are different. For removing the scale, it is needed to periodically clean the double-pipe heat exchanger and water system pipelines. It is suggested that set isolating valves in the suitable places during water system installation and it is convenient to connect the cleaning system for cleaning.

3.6.2 Double-pipe heat exchanger cleaning



Cleaning system schematic diagram of double-pipe heat exchanger

3.6.2.1 Preparation of cleaning liquor:

1) The material of water side double-pipe is red copper, and for general corrosion situation it is suggested that use the pickle liquor with 5% oxalic acid, 1.2% buffer and 0.8%surfactant, and the temperature should be controlled in 60°C, that will has prefect cleaning effect.

2) If use hydrochloric acid as the cleaning liquor, for avoiding to the corrosion and shorten the working life of the heat exchanger, it should limit the concentration of the hydrochloric acid to be 3%～5%, and add corrosion inhibitor with 0.2%～0.3% concentration. When it is cleaning, pay attention to the PH value change, when the PH=8, then stop cleaning immediately. Then change to fresh water for cleaning.

3.6.2.2 Cleaning method:

1) Before connecting to the cleaning system, it must stop the unit operation, close the circulating water pump of water system, and close the gate valves in inlet and outlet water return pipes.

2) Correctly connect the cleaning system as the above figure 3-7, make the cleaning liquor counter flush the double-pipe heat exchanger (opposite the general flow direction).

3) Acid cleaning: After make sure it will not leak water, and then open the water pump to make the double-pipe heat exchanger fill with acid liquor, and close the water pump, and then let the double-pipe heat exchanger static state for 2h. And open the water pump continuously dynamic loop for 3～4h. During that every 0.5h, it is done both side alternative cleaning. During the acid cleaning, it should timely do sampling test for acid concentration, if the continuous twice testing concentration difference is lower than 0.2%, which means the acid cleaning finish reaction. Put the waste liquor to the waste liquor tank.

4) Neutralization: After acid cleaning, use NaOH, Na3PO4 and soften liquid mixed accord to some proportion, and use dynamic loop to alkali cleaning for the heat exchanger, in order to alkalis counteract acids. Drain the waste liquor to the waste liquor tank.

5) Water cleaning: After alkali cleaning, use clean soften liquor repeatedly wash the heat exchanger for 0.5h, thoroughly wash the heat exchanger. Then drain the waste liquor to the waste liquor tank.

6) Passivating treatment : Expose the double-pipe heat exchanger in the air for 3～4h, or blow for 2h with high pressure air. Make the pipe surface form a oxidation passivating layer.

7) After cleaning, close the isolating valve, and take down the cleaning system devices and keeping properly for backup.

8) Please contact the waste liquor treating company to treat the collected waste liquor.

9) Connect the unit water system as the state before cleaning, thoroughly check the unit and assist devices whether work normally. Make sure there is no abnormal situation then re-operates the unit.

WARNING:

•The cleaning liquor flow direction must be correctly connected.

•Because different water quality and different using situations of the heat exchanger, the cleaning period and

method will be big different, the above method is only for reference.

•The double-pipe heat exchanger is internal thread red copper pipe, so that it cannot use nitric acid as cleaning agent!

•The cleaning liquor and neutralization will be irritated and corrosive to human eyes and skin, so please do well protection measurements during the cleaning.

•It is strongly suggested that the user calls for professional cleaning company to do component analysis of the water quality and scale, and make a effective cleaning solution and method, then do the cleaning.

3.7 System water quality requirements and management

3.7.1 The unit water system must select the closed cooling tower.

3.7.2 Circulating Chilled Water Processing Design Standard, other index also should meet with the below table.

3.7.3 It should periodically to detect and handle the chilled water quality in the water system. When handling the water, please make sure with the water dealing person to confirm that use any water scale inhibitor and antiseptic agent etc. will not have corrosion to the stainless steel and copper products.

ITEMS	CONCENTRATION (mg/L)
Chromaticity	≤15，and cannot display other colors
Turbidity NTU	≤1
Smell	None
Visible objects	None
PH Value	7.5～9
Total hardness(Take $CaCO_3$ for calculation)	≤200
Fe	＜0.5
AL	＜0.2
Mn	＜0.1
Cu	＜0.2
Zn	≤0.1
Alkalinity concentration(HCO_3-)	70～300
Sulfate radical（SO_4^{2}-)	＜70
HCO_3-/SO_4^{2}-	＞1
Conductivity	10～500 μs/cm(20°C)
NH_3	＜0.1
CL	＜100
Chlorine	＜1
H_2S	＜0.05
Free carbon dioxide（CO_2）	＜5
Nitrate radical（NO_3-)	＜100
Suspended matter	≤20
Soluble solid	500～1000
Oxygen consumption（Take O_2 for calculation）	≤3
Ammonium ion（NH_4+）	＜1
SiO_2 （Ion state）	＜50

4. Refrigerant pipe engineering

4.1 Length and drop height permitted of the refrigerant piping

Table.4-1

			Permitted value	piping
Pipe length	Total pipe length (Actual)		300m (Note1)	L1+(L2+L3+ L4+L5+L6+L7+ L8+L9)×2+a+ b+c+d+e+f+g+ h+i+j
	Maximum piping (L1)	Actual length	120m	L1+L5+L8 +L9+j
		Equivalent length	150m	
	Piping (farthest from the first line pipe branch) equivalent length(L2)		40m(90m,Note2)	L5+L8+L9+j
Drop height	Indoor unit main unit drop height	Main unit up	H=50m	
		Main unit down	H=40m	
	Indoor unit to indoor unit drop height		H=30m	

Table.4-2

No	Permitted value	Examples	Piping
1	The size of indoor unit main pipe should be bigger than the indoor unit aux. pipe. The indoor unit main pipe needn't increase when it is equal to main pipe .	L2~L9 need to increase the pipe diameter	φ9.52→φ12.7 φ12.7→φ15.9 φ15.9→φ19.1 φ19.1→φ22.2 φ22.2→φ25.4 φ25.4→φ28.6 φ28.6→φ31.8 φ31.8→φ38.1 φ38.1→φ41.3
2	The length of indoor unit aux. pipe is no longer than 40m.	a,b.....j ≤ 40m .	
3	The distance difference between [the main unit to the farthest indoor unit] and [the main unit to the nearest indoor unit] is ≤40m.	If the farthest indoor unit is N10, the nearest indoor unit is N1, i.e.(L1+L5+L8+ L9+j）-（L1+L2+L3+a） ≤40m.	

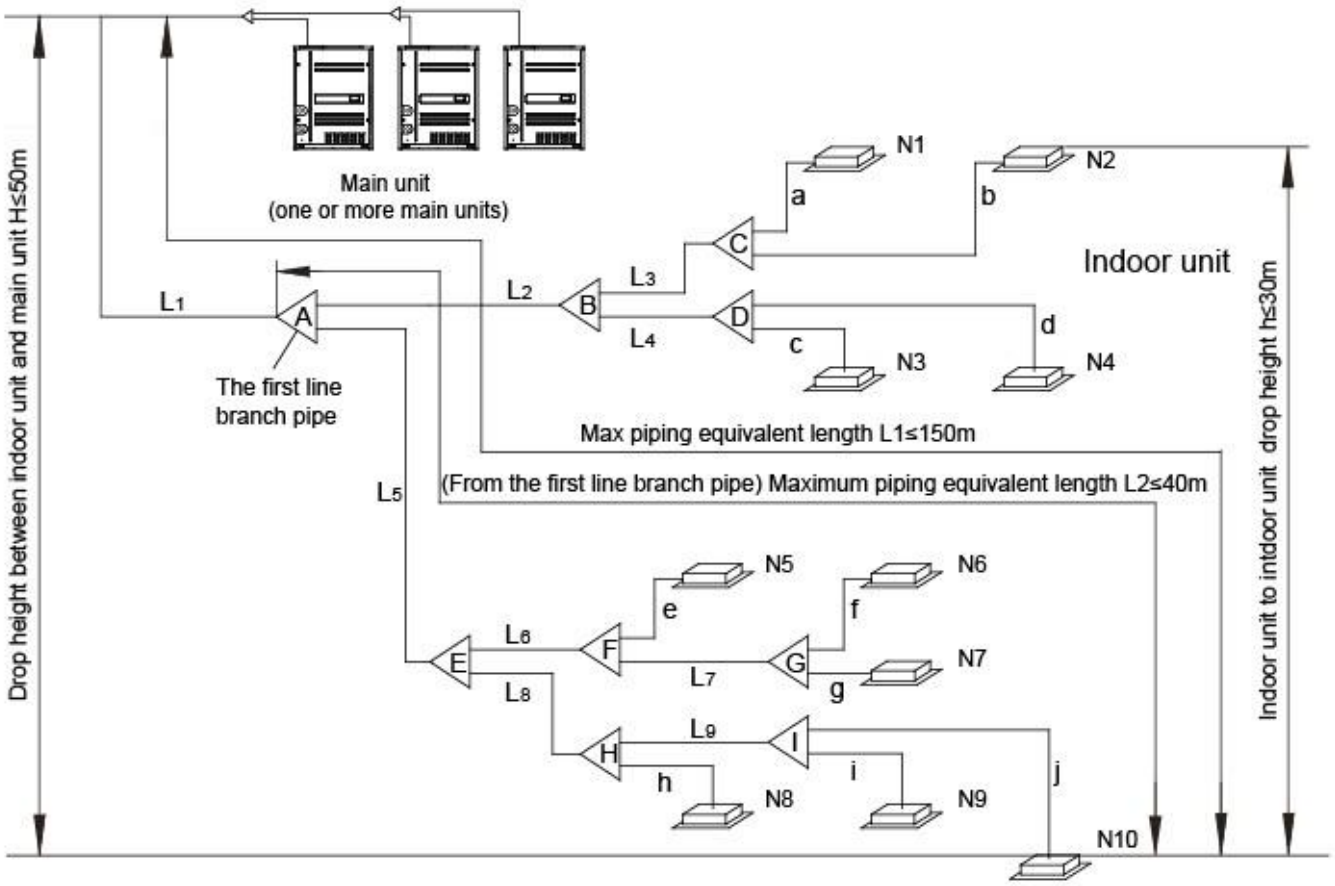


Fig.4-1

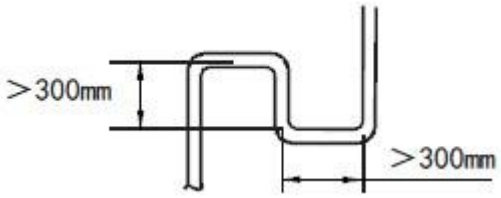


Fig.4-2

CAUTION:

1. All branch pipes must apply the branch pipes specified by Midea, otherwise, that will cause serious error of the system!
2. Indoor units should be placed as equally as possible at the both sides of the U-shape branch pipe.
3. When the main unit is over 20m from the above places, it is recommended to set a return oil bending every 10m of the air pipe in the main pipe, the return oil bending specification is as Fig. 4-2.

4.2 Select the Refrigerant Piping Type

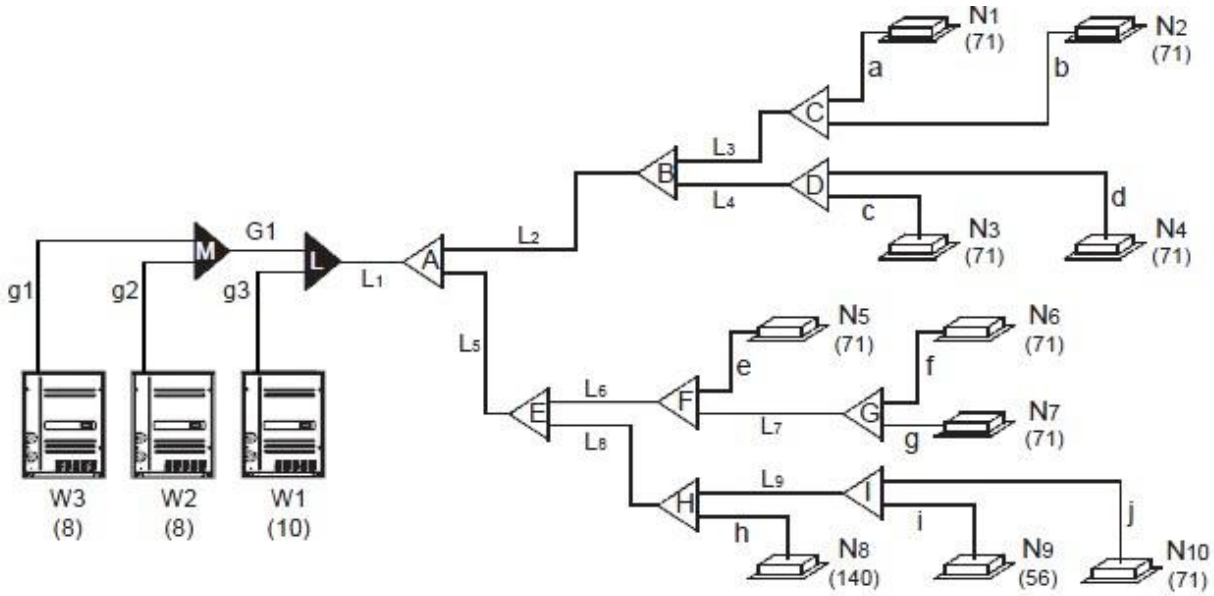


Table.4-3

Pipe name	Code (As per the Fig. 4-2)
Main pipe	L1
Indoor unit main pipe	L2~L9
Indoor unit aux. pipe	a, b, c, d, e, f, g, h, i, j
Indoor unit branching pipe assembly	A, B, C, D, E, F, G, H, I
Main unit branching pipe assembly	L, M
Main unit connective pipe	g1, g2, g3, G1

4.3 Size of joint pipes for indoor unit

Capacity of indoor unit (A)	Size of main pipe(mm)		Available branching pipe
	Gas side	Liquid side	
A＜166	Φ15.9	Φ9.5	FQZHN-01C
166≤A＜230	Φ19.1	Φ9.5	FQZHN-01C
230≤A＜330	Φ22.2	Φ9.5	FQZHN-02C
330≤A＜460	Φ28.6	Φ12.7	FQZHN-03C
460≤A＜660	Φ28.6	Φ15.9	FQZHN-03C
660≤A＜920	Φ31.8	Φ19.1	FQZHN-03C
920≤A<1350	Φ38.1	Φ19.1	FQZHN-05C

4.4 Size of joint pipes for main unit

Base on the following tables, select the diameters of the main unit connective pipes. In case of the main accessory pipe large than the main pipe, take the large one for the selection.

Example: parallel connect with the three main units 10+10+8 (the total capacity is 28HP), all indoor units total capacity is 812,provided that the equivalent length of all pipes are ≥90m, according to the Table 4-3 the main pipe diameter are Φ31.8/Φ22.2; in according to all indoor unit capacity 1360, we could find out the master unit diameter isΦ31.8/Φ19.1 base on Table 4-6. Take the large one for the selection, we final confirm the main pipe diameter isΦ38.1/Φ22.2.

Table.4-5 Size of joint pipes for 410A main unit

Model	When the equivalent length of all liquid pipes < 90m, the size of main pipe(mm)		
	Gas side	Liquid side	The 1st branching pipe
8HP	Φ22.2	Φ9.5	FQZHN-02D
10HP	Φ22.2	Φ9.5	FQZHN-02D
12HP	Φ25.4	Φ12.7	FQZHN-02D
16HP	Φ28.6	Φ12.7	FQZHN-03D
18~22HP	Φ28.6	Φ15.9	FQZHN-03D
24HP	Φ28.6	Φ15.9	FQZHN-03D
26~32HP	Φ31.8	Φ19.1	FQZHN-03D
34~36HP	Φ38.1	Φ19.1	FQZHN-04D

Table.4-6 Size of joint pipes for 410A main unit

Model	When the equivalent length of all liquid pipes ≥ 90m, the size of main pipe(mm)		
	Gas side	Liquid side	The 1st branching pipe
8HP	Φ22.2	Φ12.7	FQZHN-02D
10HP	Φ25.4	Φ12.7	FQZHN-02D
12HP	Φ28.6	Φ15.9	FQZHN-03D
16HP	Φ31.8	Φ15.9	FQZHN-03D
18~22HP	Φ31.8	Φ19.1	FQZHN-03D
24HP	Φ31.8	Φ19.1	FQZHN-03D
26~32HP	Φ38.1	Φ22.2	FQZHN-04D
34~36HP	Φ38.1	Φ22.2	FQZHN-04D

4.5 Branch pipes for main unit

Table.4-7

Model	Main unit pipe connective opening dimension(mm)	
	Gas side	Liquid side
8HP, 10HP	Φ25.4	Φ12.7
12HP	Φ31.8	Φ15.9

4.6 Branch pipes for indoor unit

Base on Table 4-8 and Table 4-9 select the multi connecting pipes of main unit. Before installation, please read the Main unit Branching Pipe Installation Manual carefully.

Table.4-8 Main unit multi-connective pipe assembly (Illustration)

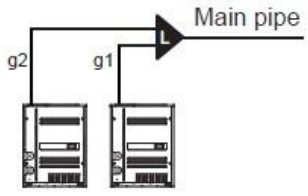
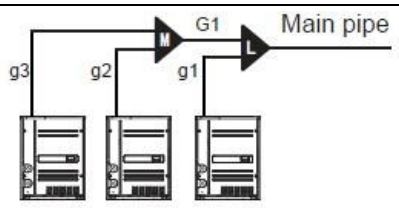
Main unit Qty.	Illustration
2 units	
3 units	

Table.4-9 Main unit multi-connective pipe assembly

Main unit Qty.	Main unit connective pipe diameter	Parallel connect with the branching pipes	Main pipe
2 units	g1, g2: 8, 10HP: Φ25.4/Φ12.7; 12HP: Φ31.8/Φ15.9	L: FQZHW-02N1C	Refer to Table 6-5 for main pipe dimension
3 units	g1, g2, g3: 8, 10HP: Φ25.4/Φ12.7; 12HP: Φ31.8/Φ15.9; G1: Φ38.1/Φ19.1	L+M: FQZHW-03N1C	

Note: The pipe assemblies in above table is special for this model, must be purchased separately

4.7 Example

1) Take (10+8+8) HP that composed by three modules as an example to clarify the pipe selection.

2) Take Fig.4-4 as an example. Provided that the equivalent length of all pipes in this system is larger than 90m.

Table.4-10 Unit: mm

Indoor unit capacity A(×100W)	When branching Pipe's length ≤10m		When branching Pipe's length＞10m	
	Gas side	Liquid side	Gas side	Liquid side
A≤45	Φ12.7	Φ6.4	Φ15.9	Φ9.5
A≥56	Φ15.9	Φ9.5	Φ19.1	Φ12.7

A. The branching pipe at the inside of the unit. There are a~j branching pipes at the inside of the unit, the branching pipe diameter should be select as per Table 4-10.

B. Main pipe at the inside the unit (Refer to Table 1-4)

1) The main pipe L3 with N1, N2 downstream indoor units that total capacity is 71×2=142, the pipe L3 diameter is Φ15.9/Φ9.5,thus select FQZHN-01C for the branching pipe C.
2) The main pipe L4 with N3, N4 downstream indoor units that total capacity is 71×2=142, the pipe L3 diameter is Φ15.9/Φ9.5,thus select FQZHN-01C for the branching pipe D.
3) The main pipe L2 with N1~N4 downstream indoor units that total capacity is 71×4=284, the pipe L2 diameter is Φ22.2/Φ9.5,thus select FQZHN-02C for the branching pipe B.
4) The main pipe L7 with N6, N7 downstream indoor units that total capacity is 56+71=127, the pipe L7 diameter is Φ15.9/Φ9.5, thus select FQZHN-01C for the branching pipe G.
5) The main pipe L6 with N5～N7 downstream indoor units that total capacity is 56+71×2=282, the pipe L6 diameter is Φ19.1/Φ9.5, thus select FQZHN-01C for the branching pipe F.
6) The main pipe L9 with N9, N10 downstream indoor units that total capacity is 56×2=112, the pipe L9 diameter is Φ15.9/Φ9.5,thus select FQZHN-01C for the branching pipe I.
7) The main pipe L8 with N8～N10 downstream indoor units that total capacity is 112+56×2=224 the pipe L8 diameter is Φ19.1/Φ9.5, thus select FQZHN-01C for the branching pipe H.
8) The main pipe L5 with N5～N10 downstream indoor units that total capacity is 112+56×3+71×2=366, the pipe L5 diameter is Φ28.6/Φ12.7, thus select FQZHN-03C for the branching pipe E.
9) The main pipe A with N1～N10 downstream indoor units that total capacity is 56×3+71×6+112=706, thus select FQZHN-03Cfor the branching pipe A.

C Main pipe (Refer to Table 5-4, Table 5-5, Table 5-6):Main pipe L1 in the Fig.6-2, which upstream main units total capacity is 10+8+8=26HP, based on table 6-5, the gas/liquid pipe diameter are Φ38.1/Φ22.2, total capacity of the downstream indoor unit is 56×3+71×6+112=706, based on table 5-4, the gas/liquid pipe diameter areΦ31.8/Φ19.1, take the large one for

your selection, final confirm the main pipe diameter is: gas/liquid pipeΦ38.1/Φ22.2.

D Parallel connect the main units

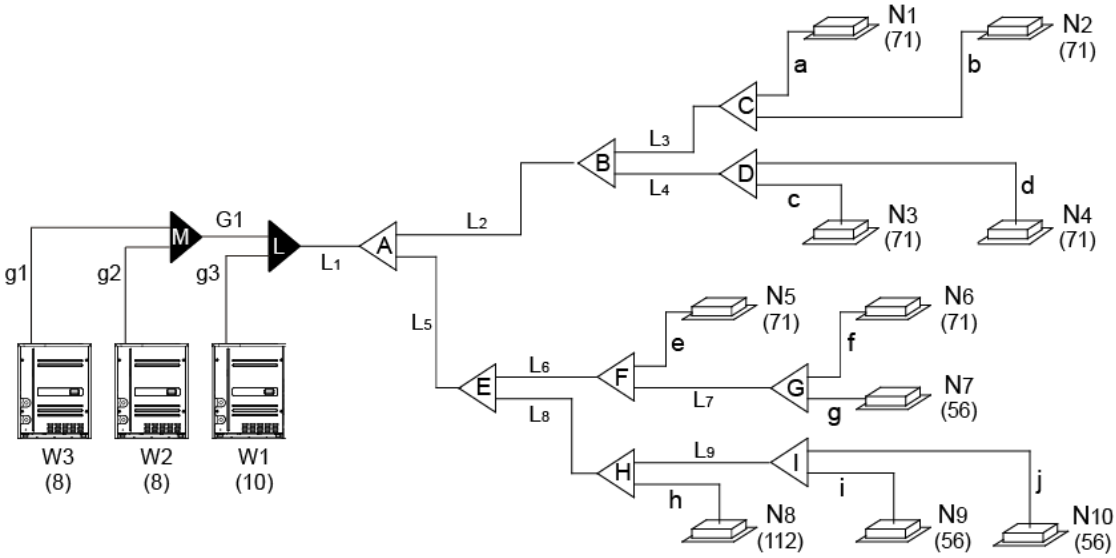
1) The main unit linked by Pipe g1 is 8HP, parallel connects with main unit. the connective pipe diameter to be selected according to its connector size isΦ25.4/Φ12.7;The main unit linked by Pipe g2 is 8HP, parallel connects with main unit. the connective pipe diameter to be selected according to its connector size isΦ25.4/Φ12.7;The main unit linked by Pipe g3 is 10HP, parallel connects with main unit. the connective pipe diameter to be selected according to its connector size isΦ25.4/Φ12.7.

2) The upstream of G1 is the two parallel connected main units, refer to Table 5-9 select the three parallel connected main unit, the pipe diameter isΦ38.1/Φ19.1.

3) Parallel connect the three main units, refer to Table 5-7 should select FQZHW-03N1C for main unit connective pipes (L+M).

4.8 Remove dirt or water in the piping

1. Make sure there is no any dirt or water before connecting the piping to the main units.
2. Wash the piping with high pressure nitrogen, never use refrigerant of the main unit.



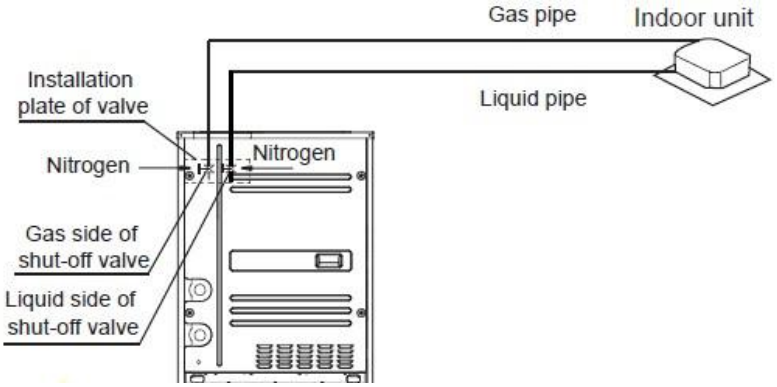
4.9 Gas tight test

1) Upon set up the indoor unit pipeline, please connect the Hi-pressure pipe with shut-off valve firstly.

2) Weld the pipe at the low pressure side to the meter connector.

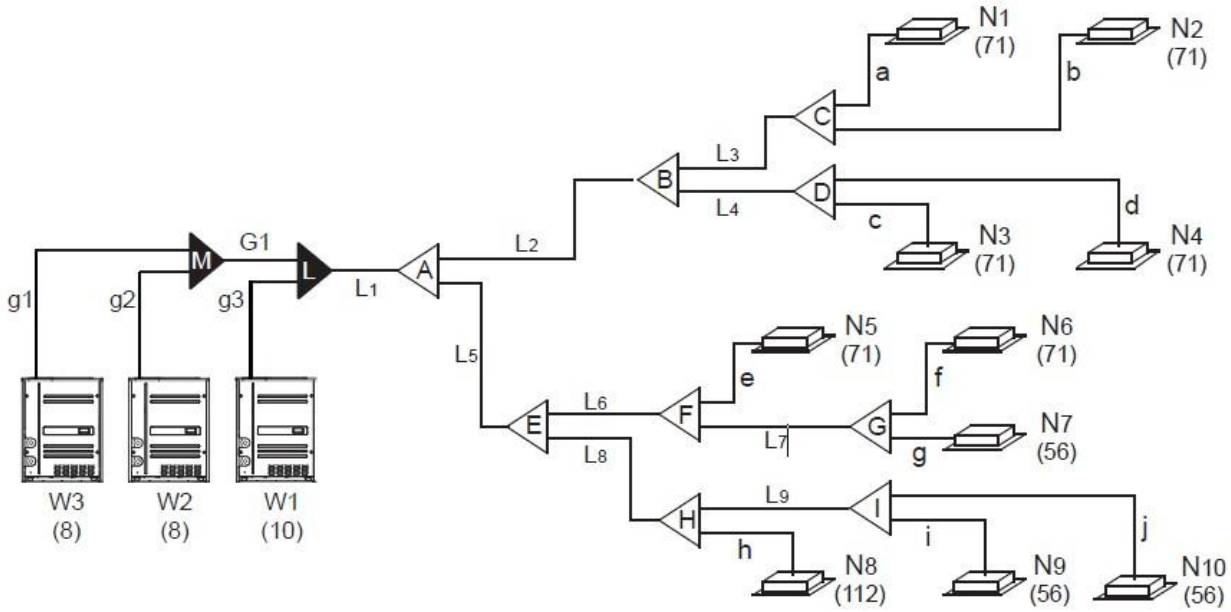
3) Use the vacuum pump discharging air inside the liquid side shut-off valve and meter connecter, until to the -0.1MPa.

4) Close the vacuum pump, charge 3.9MPa nitrogen gas from the piston of shut-off valve and from the meter connector. Pressure inside should be maintained at there no less than 24 hrs.



CAUTION:

1. Pressurized nitrogen（3.9MPa）is used for air tightness test.
2. It is not allow to use oxygen, combustible gas or toxic gas to conduct the air tightness test.
3. When welding, please use wet cloth insulating the low pressure valve for protection.
4. For avoid the equipment be damaged, the pressure maintained time should not last too long.

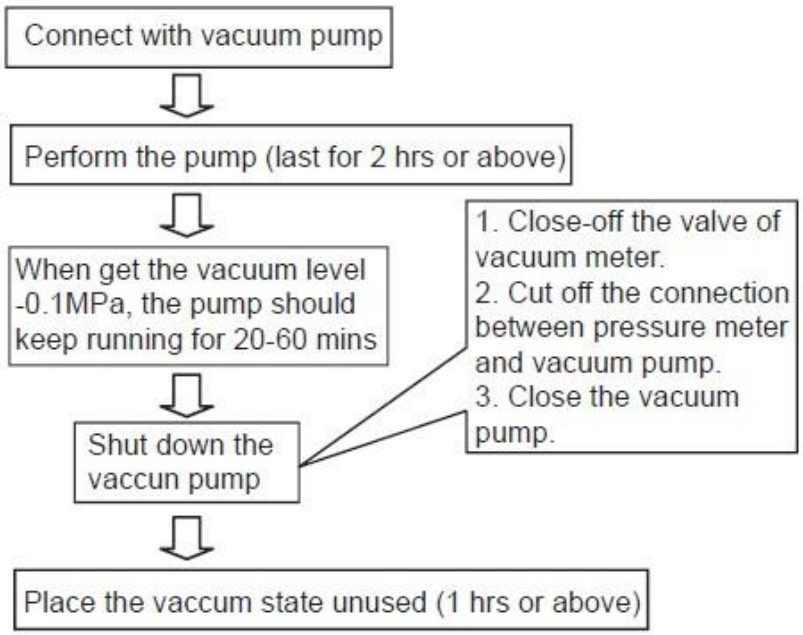


4.10 Vacuum with vacuum pump

1.Use the vacuum pump which vacuum level lower than -0.1MPa and the air discharge capacity above 40L/min.

2.The main unit is not necessary to vacuum, don't open the main unit gas and liquid pipe shut-off valves.

3.Make sure the vacuum pump could result as -0.1MPa or below after 2 hrs or above operation. If the pump operated 3 hrs or above could not achieve to -0.1MPa or below, please check whether water mix or gas leak inside of the pipe.



CAUTION:

1.Don't mix up the different refrigerants or abuse the tools and measurements which directly contact with refrigerants

2.Don't adopt refrigerant gas for air vacuuming.

3. If vacuum level could not get to -0.1MPa, please check whether resulted by leakage and confirm the leakage site. If no leakage, please operate the vacuum pump again 1 or 2 hrs.

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the main/indoor unit connection. The refrigerant is R410A.

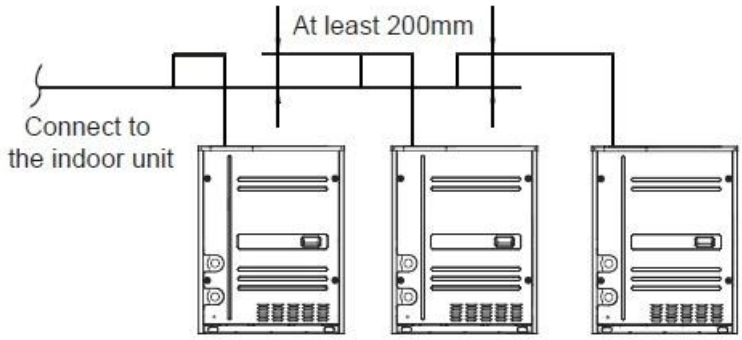
Table.4-11

Pipe size on liquid side	Refrigerant to be Added per meter
Φ6.4	0.022kg
Φ9.5	0.057kg
Φ12.7	0.110kg
Φ15.9	0.170kg
Φ19.1	0.260kg
Φ22.2	0.360kg
Φ25.4	0.520kg
Φ28.6	0.680kg

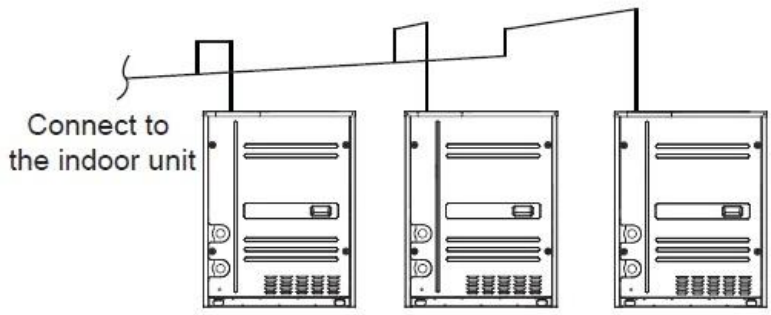
4.11 The Installation key points of connective pipes between main units

1) Connect the pipes between main units, the pipes should place horizontally (Fig.5-7, Fig.5-8), it is not allow the concave at junction site and set longer than 200mm bending pipes for saving oil.

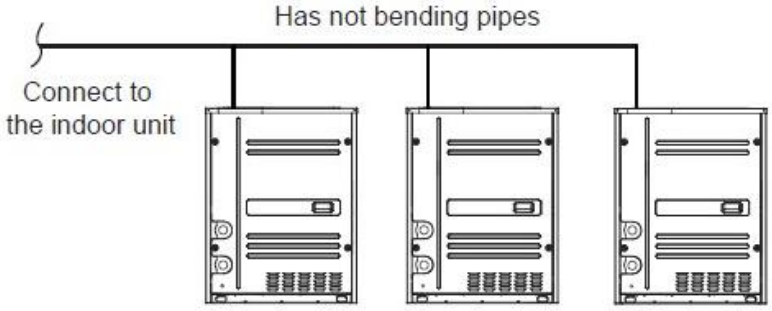
2) All connective pipes between the main units are not allowed to over than the height of every outlets of the pipes.



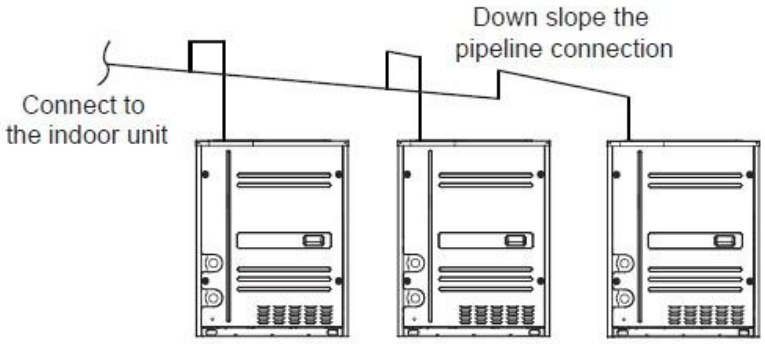
√ Correct Way



√ Correct Way

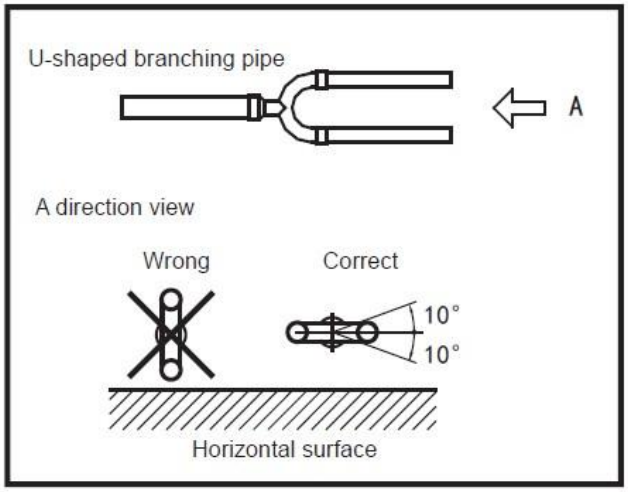


× Wrong Way



× Wrong Way

3) The branching pipe must be installed horizontally, error angle of it should not large than 10°. Otherwise, malfunction will be caused.



5. Trial run

5.1 Inspection and confirmation before commissioning

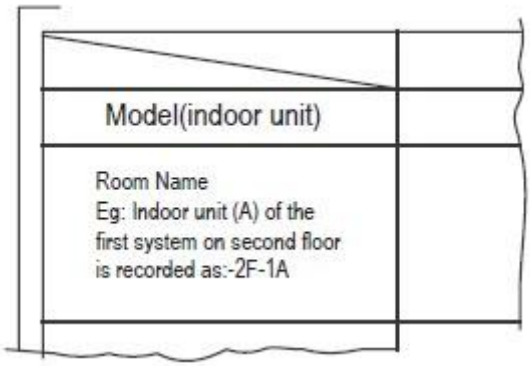
1) Check and confirm that refrigeration pipe line and communication wire with indoor and main unit have been connected to the same refrigeration system. Otherwise, operation troubles shall happen.
2) Power voltage is within ±10% of rated voltage.
3) Check and confirm that the power wire and control wire are correctly connected.
4) Before powering on, confirm there is no short circuit to each line.
5) Check whether all units have passed nitrogen pressure-keeping test for 24 hours with R410A: 40kg/cm2 .
6) Confirm whether the system to debugging has been carried out vacuum drying and packed with refrigeration as required.
7) Make sure all the water pipelines are correct, including the installation directions of water filter and water flow switch.
8) Check whether the water filter has been blocked, and clean the filter screen. If it is seriously blocked, then it should be checked whether the water quality has meet the requirements.
9) Open the gate valve, make sure the double-pipe heat exchanger have been filled with circulating water, and open the water pump and air discharge valve, after make sure the air in the water pipelines and unit has been drain out and then close the air discharge valve.
10) Check whether the pressure meters in the water inlet and water return pips of the unit, thermometer, water flow switch etc. work normally, and make sure the water pipelines system operate normal, and the water flow is suitable.

5.2 Preparation before debugging

1) Calculating the additional refrigerant quantity for each set of unit according to the actual length of liquid pipe.
2) Keep required refrigerant ready.
3) Keep system plan, system piping diagram and control wiring diagram ready.
4) Record the setting address code on the system plan.
5) Turn on power switches main unit in advance, and keep connected for above 12 hours so that heater heating up refrigerant oil in compressor.
6) Turn on air pipe stop valve, liquid pipe stop valve, oil balance valve and air balance valve totally. If the above valves do not be turned on totally, the unit should ¬be damaged.
7) Check whether the power phase sequence of main unit is correct.
8) All dial switch to indoor and main unit have been set according to the Technical Requirement of Product.

5.3 Fill the name of connected system

To clearly identify the connected systems between two or more indoor units and main unit, select names for every system and record them on the nameplate on the outdoor electric control box cover.

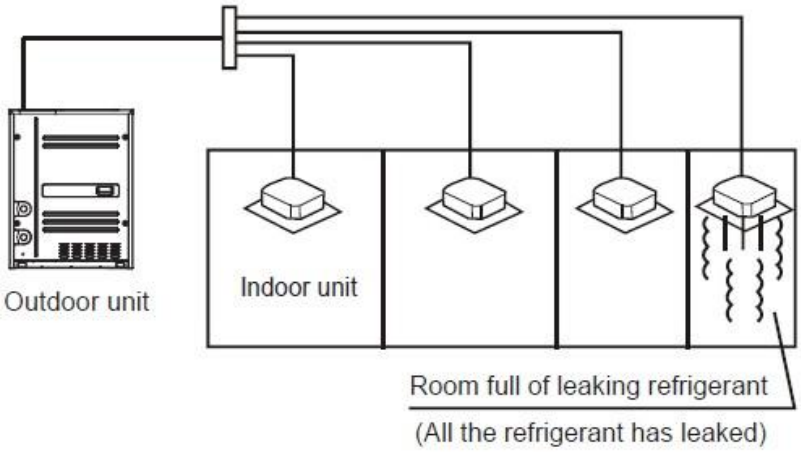


5.4 Caution on refrigerant leakage

1) This air conditioner adopts R410A as refrigerant, which is safe and noncombustible.

2) The room for air conditioner should be big enough that refrigerant leakage can not reach the critical thickness. Besides this, you can take some action on time.

3) Critical thickness-----the max thickness of Freon without any harm to person. R410A critical thickness: 0.3 [kg/m3]



4) Calculate the critical thickness through following steps, and take necessary actions.

·Calculate the sum of the charge volume (A[kg]) total refrigerant volume=refrigerant volume when delivered (nameplate)+super addition

·Calculate the indoor cubage (B[m3]) (as the minimum cubage)

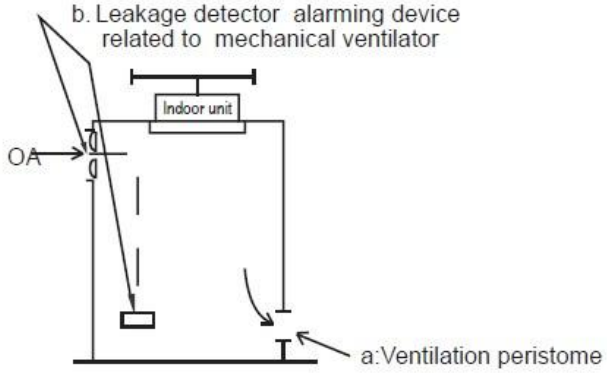
·Calculate the refrigerant thickness.

$\frac{A[kg]}{B[m3]} \leqslant$ Critical thickness：0.3 [kg/m3]

5) Counter measure against over high thickness

·Install mechanical ventilator to reduce the refrigerant thickness under critical level. (ventilate regularly)

·Install leakage detector alarming device related to mechanical ventilator if you cannot regularly ventilate.



Commissioning Report for Midea MDV Pro System

Date:dd mm yy

Item name:	
Address:	**Tel:**
Supplier:	**Delivery date: dd mm yy**
Installation section:	**Principal:**
Commissioning section:	**Principal:**
Remark: recharged refrigeration quantity to system: kg **Name of refrigerant: (R22, R407C, R410A)**	

Installing section:
(seal)

Signature:

Date: _____dd____mm____yy

Commissioning name:
(seal)

Signature:

Date: _____dd____mm____yy

Test Data for Test Run of _____System

Model of main unit	Production series no.

Operation data of main unit (Cooling)

Unit	No.1		No.2		No.3	
Run Voltage V						
Total current of run A						
Operation current of compressor A						
High-pressure pressure Kg/cm^2						
Low-pressure pressure Kg/cm^2						
Inlet air temperature °C						
Outlet air temperature°C						

Operation data of indoor unit

No.	Position	Model	Bar code of indoor unit	Inlet air temperature°C	Outlet air temperature°C
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

System parameter

SW1:

(CHECK)——Used to query main unit data. Check point sequence and corresponding actuality is as follows:

No.	Display content	Note	No.	Display content	Remark
1	Main unit address	0,1,2,3	14	TSC1, water outlet temp. of upper pipe	Actual value
2	Capacity of main unit	8,10,12	15	TSC2, water outlet temp. of lower pipe	Actual value
3	Qty. of modular main unit	Effective to master unit	16	Current 1 of inverter compressor	Actual value
4.	Total capacity of main unit	Capacity requirement	17	Current 2 of inverter compressor	Actual value
5	Total capacity requirement of indoor unit	Effective to master unit	18	High pressure	Actual value
6	Total capacity requirement of master unit after correction	Effective to master unit	19	Low pressure	Actual value
7	Operation mode	0,2,3,4	20	Opening degree of EEV A	Display value ×8
8	The actual operation capacity of main unit	Capacity requirement	21	Opening degree of EEV B	Display value ×8
9	Water flow switch	0-OFF,1-ON	22	Priority mode	0,1,2,3,4
10	T2B/T2 average temp.	Actual value	23	Quantity of communicated indoor units	Actual value
11	T5, inverter module temp.	Actual value	24	The qty. of installed indoor units	Actual value
12	T7, discharge temp. of inverter compressor	Actual value	25	The last time error or protective code	Without protection or error display code 00
13	TSJ, water inlet temp.	Actual value	26	——	Check end

Normal display:

1. When in standby mode, it displays number of indoor units that can communicate with outdoor unit. When it is operating, it will display the rotation frequency of the compressor.

2. Operating mode: 0---Off/Fan; 1---fan only; 2---Cooling; 3---Heating; 4---Forced cooling

3. Water flow switch state:0---close;1---open.

4. Priority mode:0---Heating priority mode;1---Cooling priority mode;2---Priority mode;3---Only respond the heating mode; 4---Only respond the cooling mode

5. EXV opening angle: pulse count=display value×8. ENC1: Outdoor unit address setting switch,

6. ENC1: Main unit address setting switch.

ENC2: Main unit capacity setting switch.

ECN3: Network address setting switch.

S10, ENC4: combination setting the qty. of the installed indoor units.

SW1: Query button; SW2: Constraint cooling.

Note: Setting 0 or 1, all mean install 1 set indoor unit.

Part 5 Troubleshooting

1. Normal air conditioner phenomenon.....65
2. Air conditioner protection in common 65
3. Malfunction code and troubleshooting 66

1. Normal air conditioner phenomenon

1.1 When main unit appears white vapor or water, the reasons is as follows:

1) The fan of main unit stops to begin defrosting.

2) The electromagnet valve sends out the noise when the defrosting begins and ends.

3) There is sound like water flowing when running or off; and the noise enlarges after running for 3 minutes. This is the sound of refrigerant flowing or discharging water gathered by dehumidifying.

1.2 Main units send out the noise of "pupu", for temperature changes to heat exchanger heat expanded or cool compact.

1.3 Indoor units send out odor smell, because it absorbs the smell of house, furniture or smoking.

1.4 The running light of indoor unit flickers, the reasons are generally as follows:

1) Power supply ever failed during running period.

2) For 1-to-several, the following induces the director lighting and the operation stopping

① Other indoor units running at heating mode induce to this indoor unit cannot run at cooling mode

② Setting mode conflicts with the fixed mode.

③ Stop fan to prevent discharging cool air.

1.5 The "no priority" or "waiting" director light of operation board lights.

1.6 Auto running or stopping for the timer wrong operation.

1.7 Cannot run, the reasons are as follows:

① Power is off.

② Manual switch is pulled to off side.

③ Fuse is cut.

④ Protect device starts, at the same time running director lights.

⑤ Timer's setting time is over, at the time running director lights.

1.8 Heating or cooling is inefficient.

① Filter is block by duct or rubbish.

② The place of air deflector is unfit.

③ Fan mode is "slight" or running mode is "fan".

④ Setting temperature is unfit.

⑤ Simultaneously choose the heating and cooling mode, at the time the "no priority" or "waiting" director light of panel lights.

2. Air conditioner protection in common

2.1 Compressor protection

When power is on, or machine stops then restarts right away, main unit will run in 3 minutes to protect the compressor from too frequent starts and stops.

2.2 When the protection device functions, running stops. Refer to the following

① Forced to start but not possess the start article, and display light lights.

② When cooling running, inlet and outlet of main unit are blocked, outside strong air blows into main unit's outlet.

③ When heating running, dust adheres to air filter to block inlet or outlet of main unit.

Note: when protecting, please cut manual power switch. After checking the reason and solving it, restart.

2.3 Power fails

① If power supply fails while machine is running normally, system will record this.

② When the machine is powered on again, the running light of wire controller would flash to inform user about this.

③ Press the on/off key of wire controller to confirm this before restart the system.

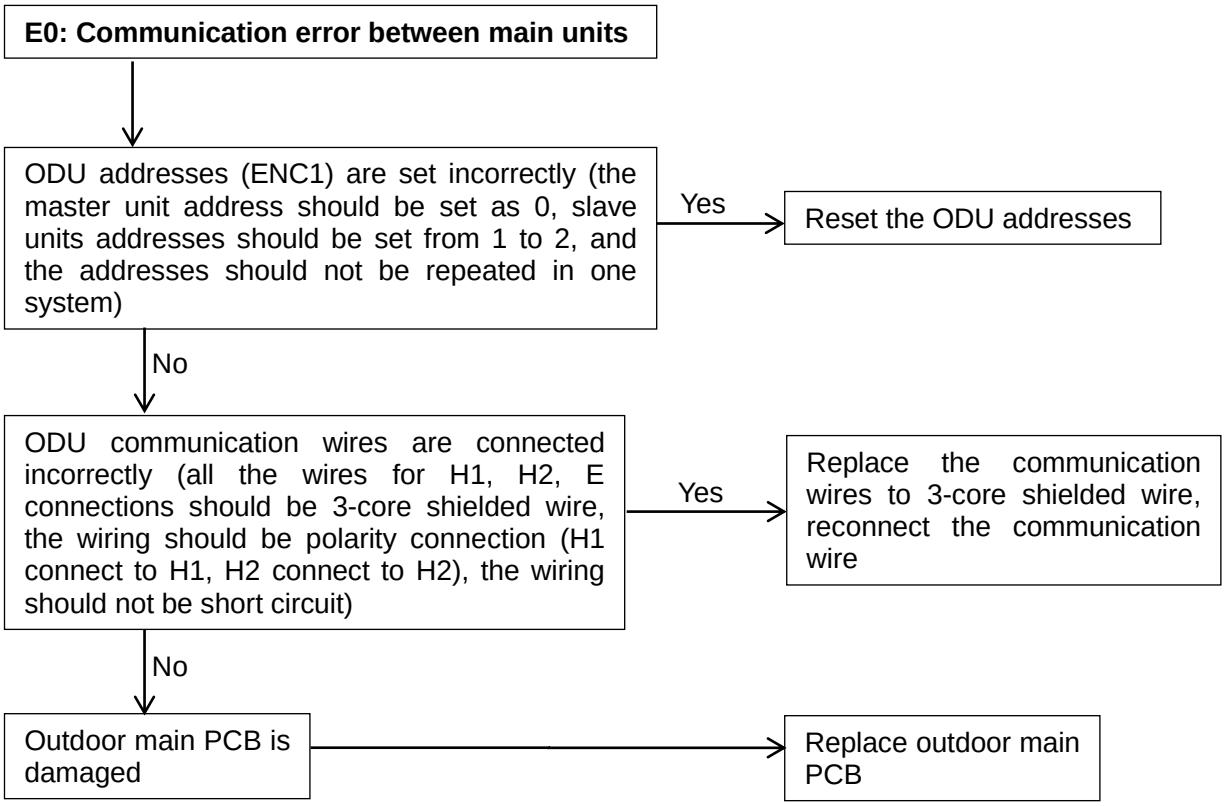
Note: When running, if system takes place mistaken operation or lighter, please pull down the power supply switch to cut it off. Before restarting machines, please press the on/off key again as above.

3. Malfunction code and troubleshooting

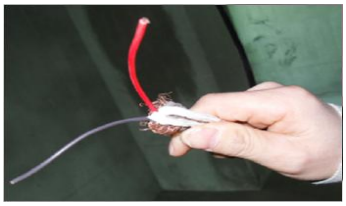
If there is phenomenon as follows, please stop air conditioner running and cut power supply and refer to the following. However, if the problem insists, please contact the customer service center of Midea commercial air conditioner company, and offer machine's model and detailed malfunction.

No.	Error code	Error or protection type	Note
1	E0	Communication error between main units	Only display in slave unit
2	E1	Phase sequence error	
3	E2	Communication error between indoors and the master unit	
4	E8	Main unit address error	
5	E9	Voltage error	
6	H0	Communication error between main control chip and inverter driver chip	
7	H1	Communication error between main control chip and communication chip	
8	H2	Main unit quantity decreased error	Only display in master unit
9	H3	Main unit quantity increased error	Only display in master unit
10	H4	P6 protection appears three times in 60 minutes	
11	H5	P2 protection appears three times in 60 minutes	
12	H6	P4 protection appears three times in 100 minutes	
13	H7	Quantity of indoor units decrease error	
14	H8	High pressure sensor error	
15	H9	Reserve	
16	P0	Top temperature protection of inverter compressor	
17	P1	High pressure protection	
18	P2	Low pressure protection	
19	P3	Over current protection of compressor	
20	P4	Discharge temperature protection	
21	P5	Reserve	
22	P6	Inverter module protection	
23	L0	Inverter module error	
24	L1	Low voltage protection	
25	L2	High voltage protection	
26	L3	Reserve	
27	L4	MCE error / synchronization / closed loop	
28	L5	Zero speed protection	
29	L7	Phase sequence error protection	
30	L8	Frequency difference in one second more than 15Hz	
31	L9	Frequency difference between the real and the setting frequency more than 15Hz	
32	C0	TSJ sensor fault	
33	C1	TSC1 sensor fault	
34	C2	TSC2 sensor fault	
35	C3	Low pressure sensor fault	Low pressure Ps≤0.2MPa
36	C4	TSC temperature too high or too low protection	
37	C5	TSJ temperature too high or too low protection	
38	C6	Low voltage protection	
39	C7	Temperature protection of inverter module	
40	C8	Flow switch break protection	
41	F0	C4 protection appears 3 times in 60 minutes	Need restart to recover

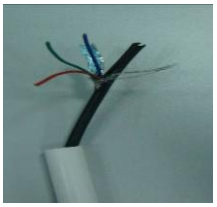
3.1 E0: Communication error between main units



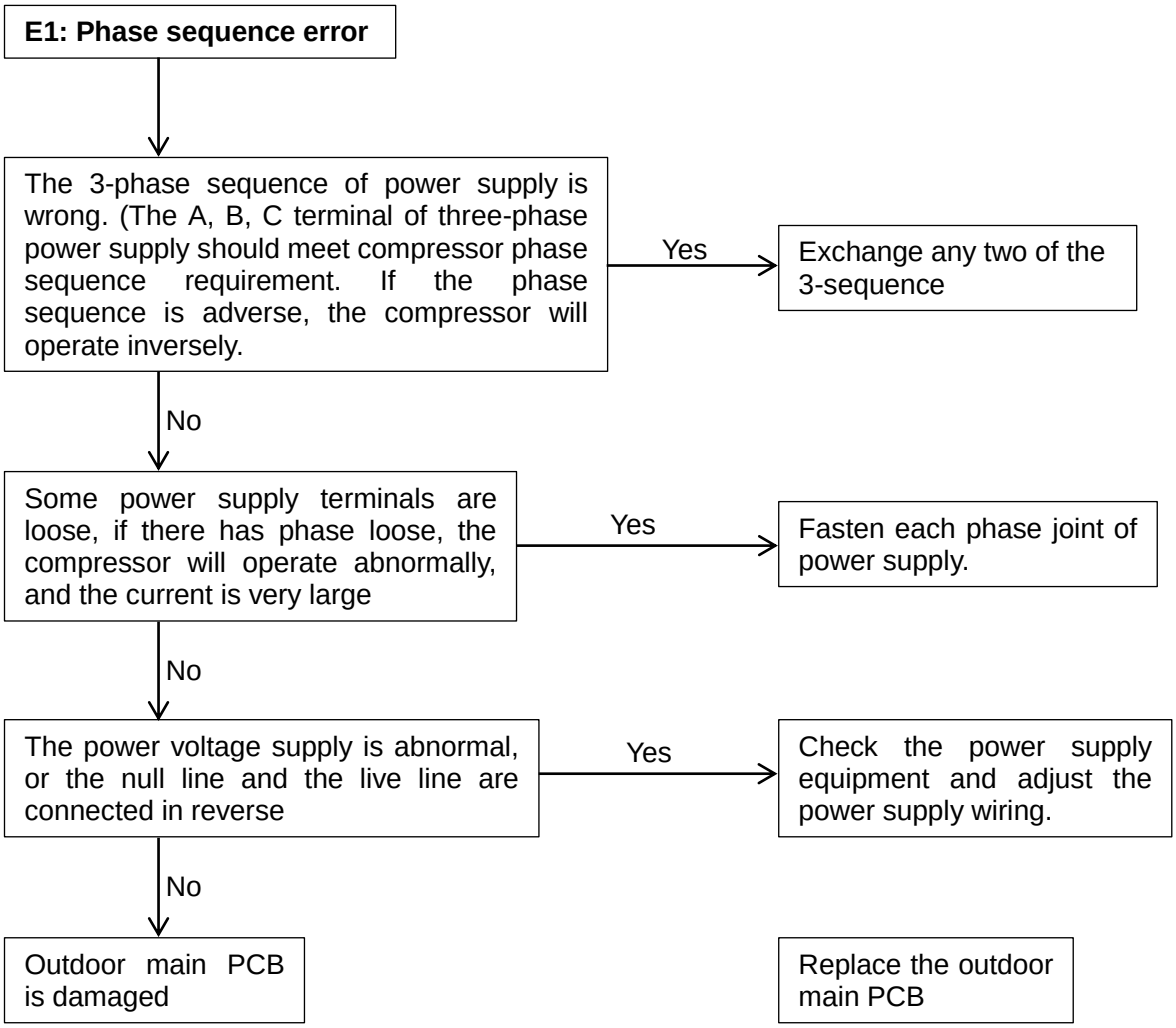
2-core shielded wire (×)



3-core shielded wire (√)



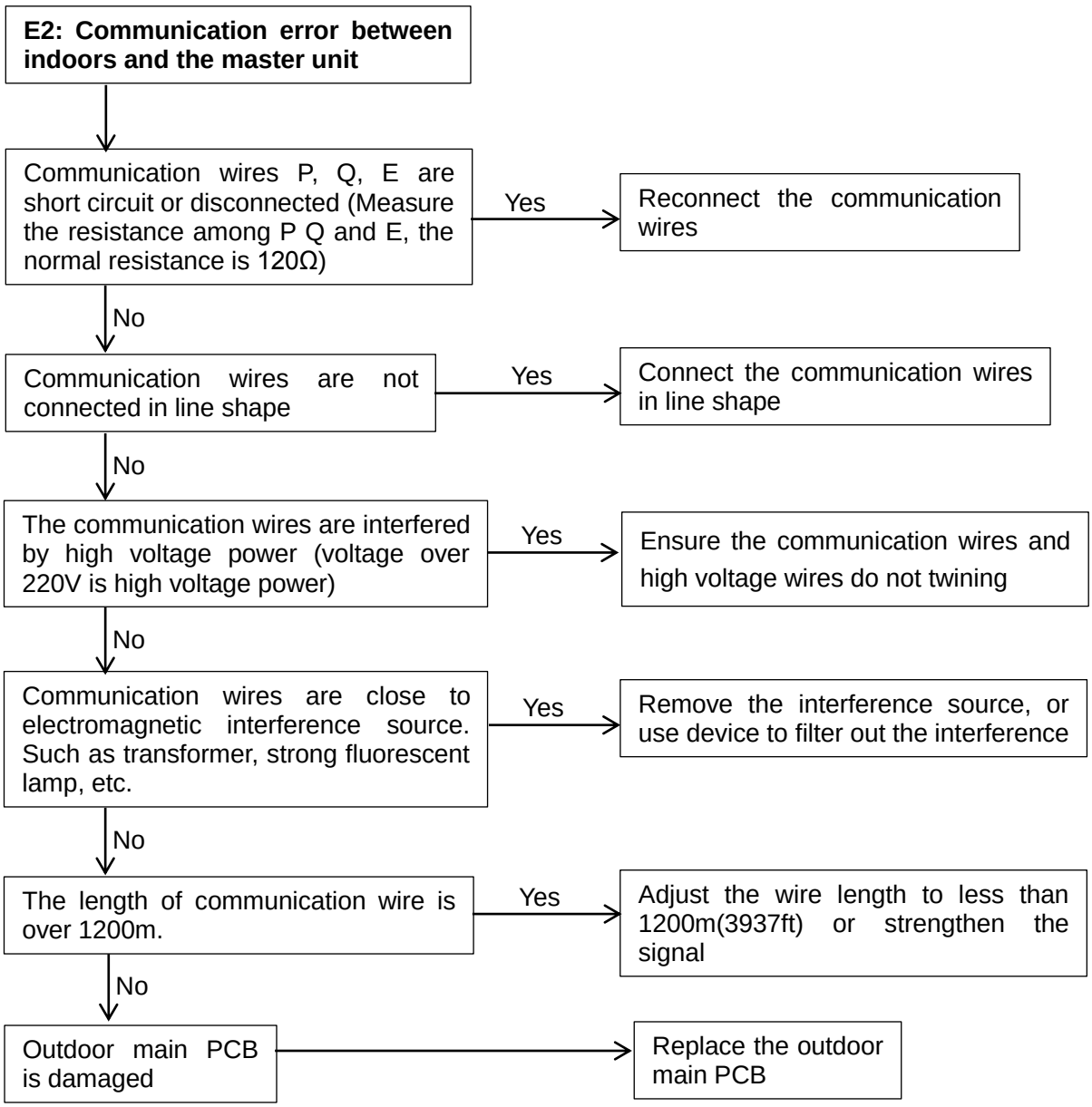
3.2 E1：Phase sequence error



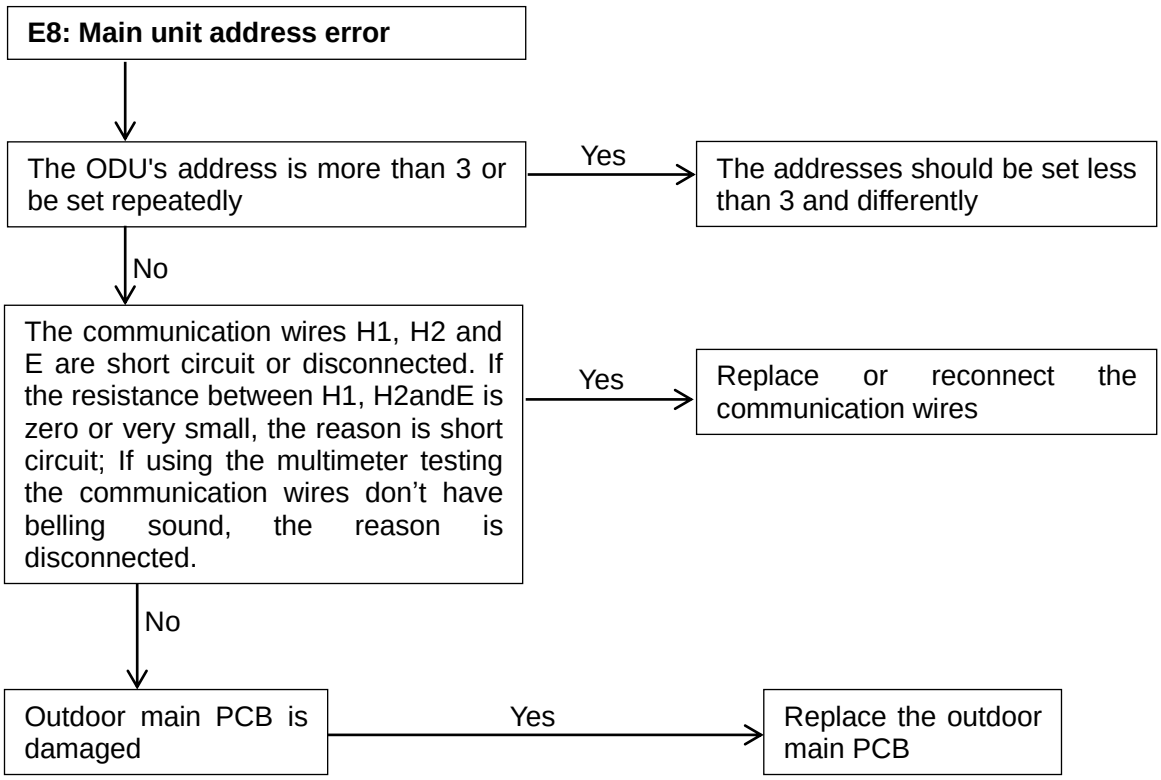
Note:

If the wiring connection of each outdoor unit is according to A, B, C phase sequence, when the quantity of outdoor units is large, the current difference between C phase and A, B phase will be very large for the power supply load of each outdoor unit is on C phase, it is very easy to lead to air switch break and wiring terminal burnout. So when the quantity of outdoor units is large, the phase sequence should be staggered, then the current can be distributed to the three phases equally.

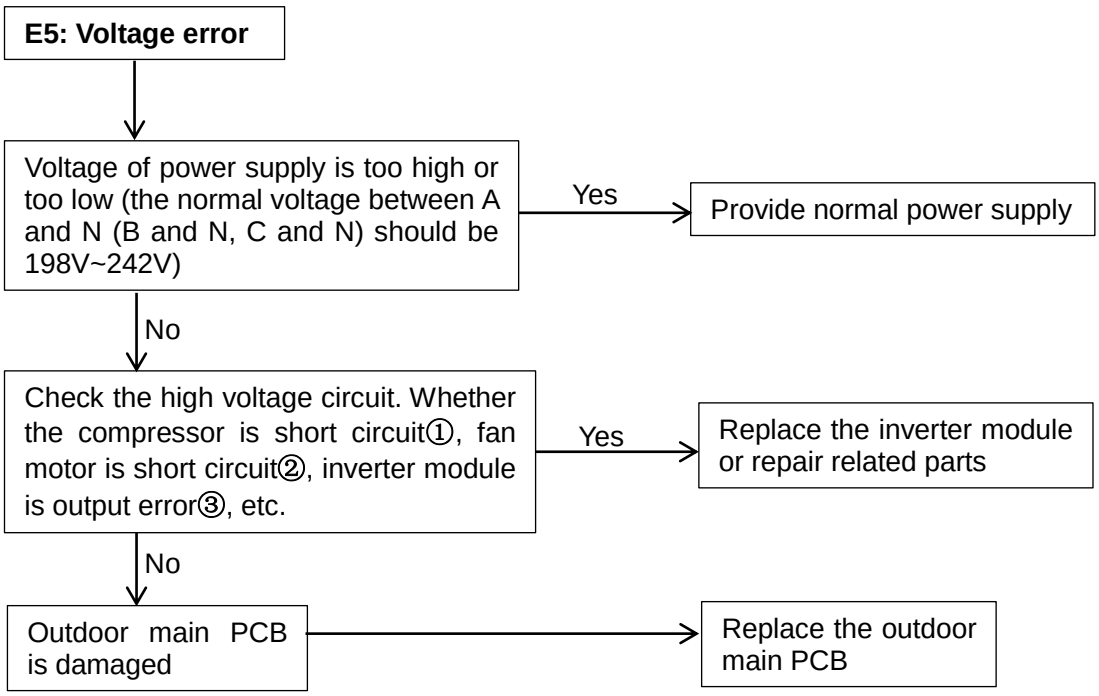
3.3 E2: Communication error between indoors and the master unit



3.3 E8: Main unit address error



3.4 E9: Voltage error



Note:

1. How to check whether the compressor is short circuit①:

The normal resistance value of inverter compressor among U V W is 0.7~1.5Ω, and infinity to earth. If the resistance value is out of the range, the compressor is abnormal.

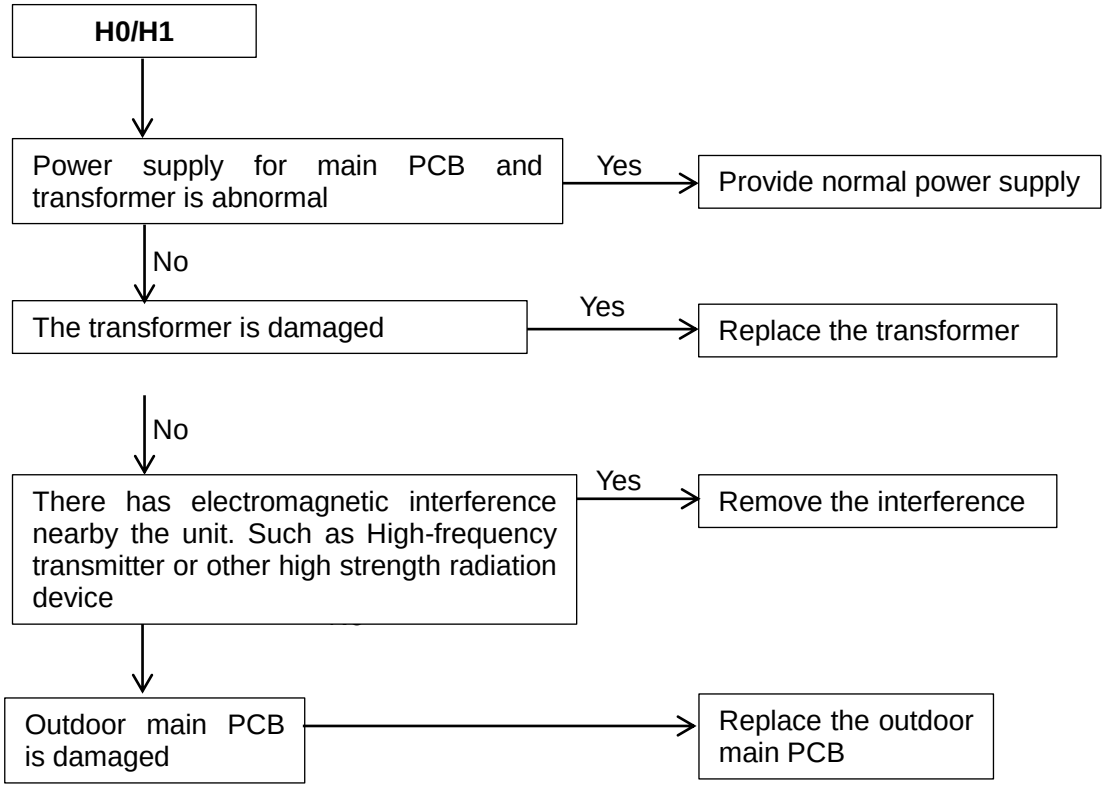
2. How to check whether the fan motor is short circuit②:

The normal value of DC fan motor coil among U V W is less than 10Ω, and the value of AC fan motor coil is from a few ohm to hundreds of ohm for different fan motor model. If the measured value is 0Ω, the fan motor is short circuit.

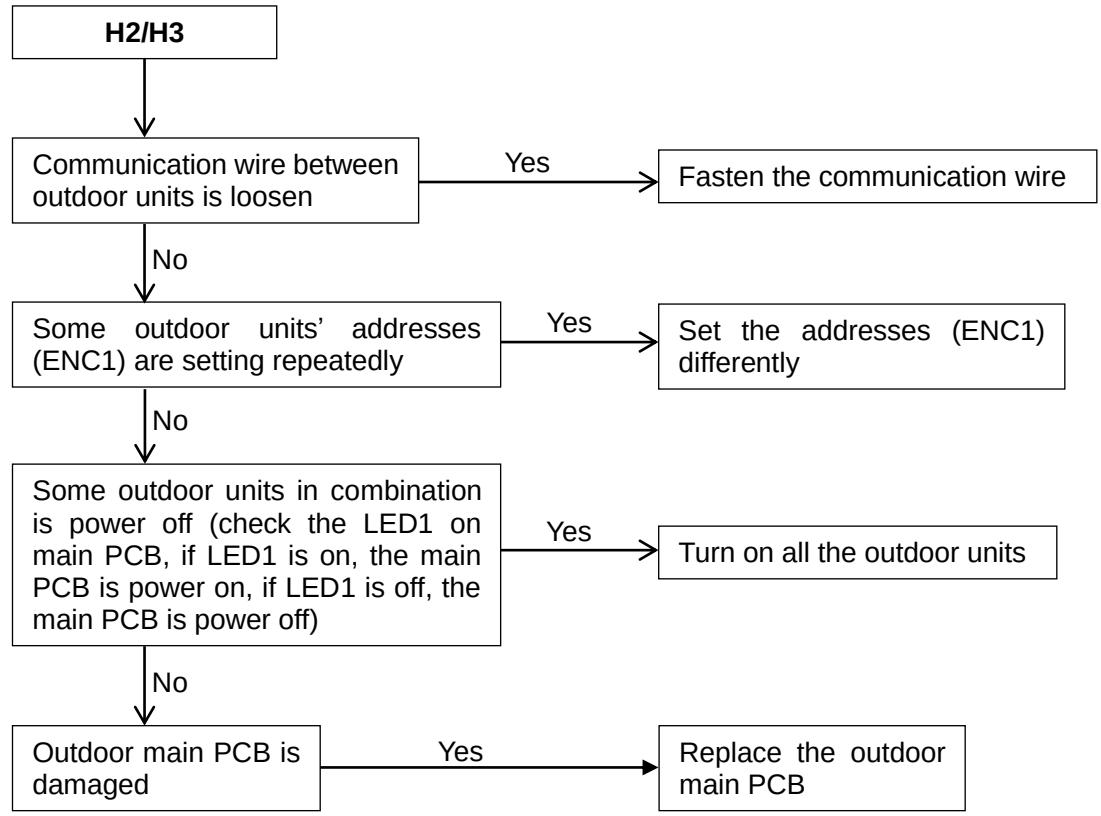
3. How to check whether the inverter module is output error③:

Dial the multimeter to diode file, black pen on P and red pen respectively on U,V,W, if the multimeter displays 0.4~0.7 V, it is normal; Red pen on N, black pen respectively on U,V,W, if the multimeter displays 0.4~0.7 V, it is normal. Satisfying the above two conditions at the same time indicates that the inverter module has no problem.

3.5 H0: Communication error between main control chip and inverter driver chip; H1: Communication error between main control chip and communication chip

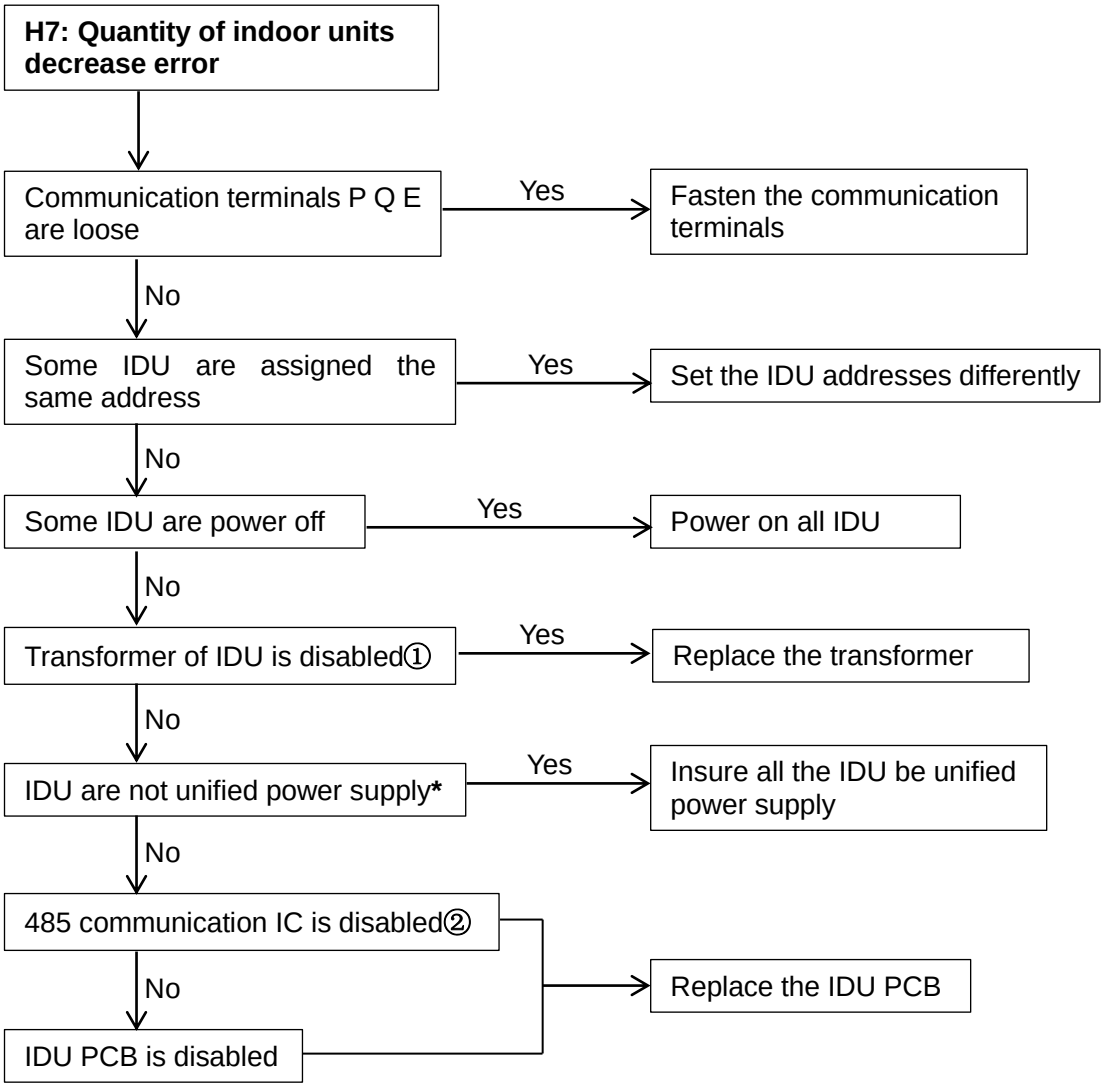


3.6 H2: Main unit quantity decreased error; H3: Main unit quantity increased error



Note: All the outdoor units should be unified power supply. If the outdoor units are not unified power supply, once some outdoor unit is power off, other outdoor units are still running, it may cause system unbalance and damage devices.

3.7 H7: Quantity of indoor units decrease error



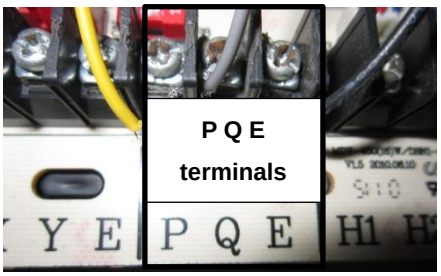
Note:

1. How to check whether the transformer of IDU is disabled①

The voltage input for IDU transformer is 220V, the voltage output of is AC9V (yellow-yellow) and AC13.5V (brown-brown)

2. How to check whether the 485 communication IC is disabled②

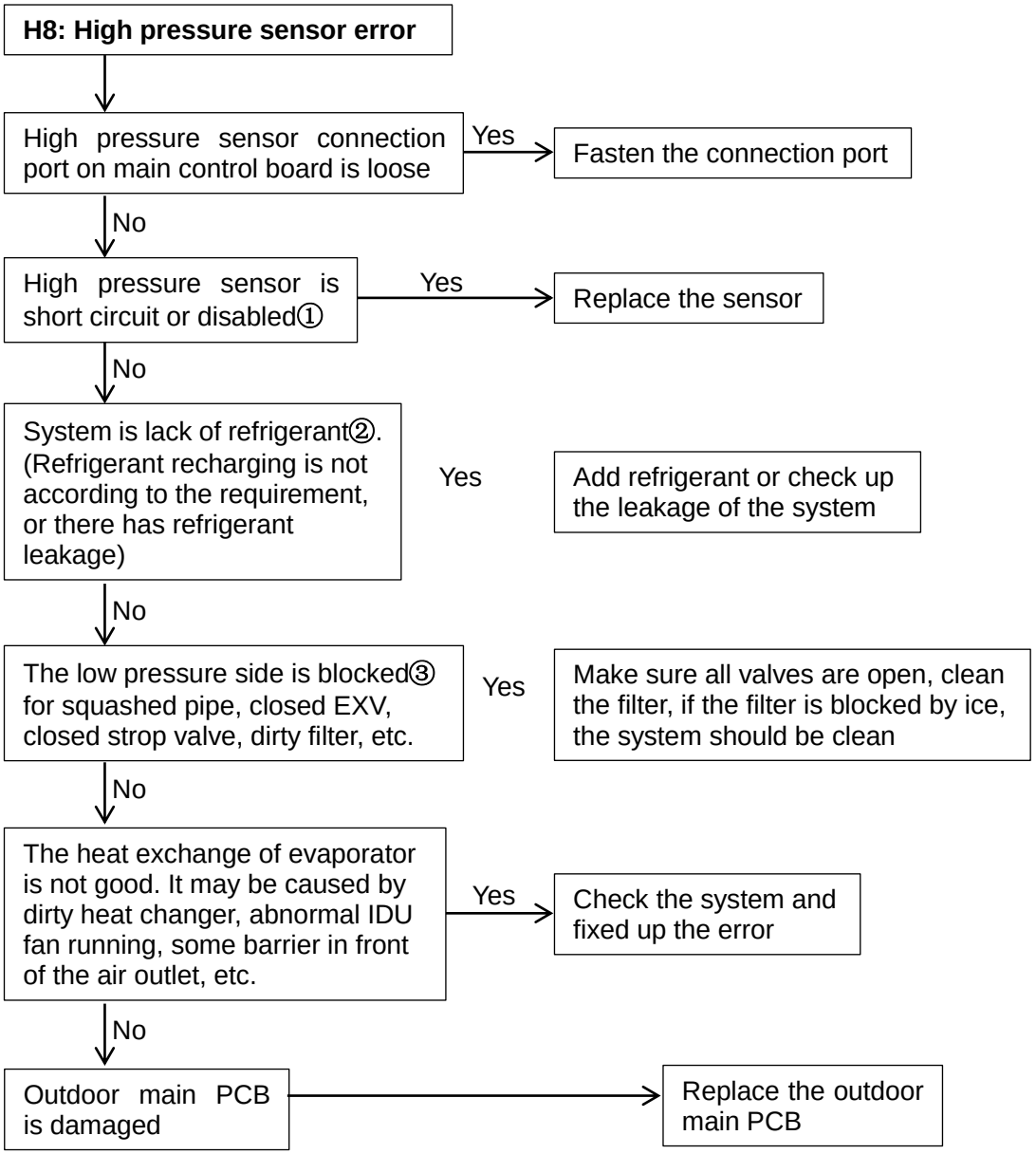
The normal voltage between “P” and “GND” is DC2.5~2.7V, between “Q” and “GND” is DC2.5~2.7V. If the voltage is out of the normal range, the 485 communication IC is disabled.



* Indoor units should be unified power supply, which can prevent compressor from liquid hammer caused by dropped indoor units with EXV unclosed.

3.8 H8: High pressure sensor error

When the discharge pressure is lower than 0.3MPa, the system will display H8 error, the ODU in standby. When the discharge pressure is back to normal, H8 disappears and normal operation resumes.



Note:

1. How to check whether the high pressure sensor is short circuit or disabled①

Measure the resistance among the three terminals of the pressure sensor, if the resistance value is megohm or infinite, the pressure sensor is disabled, otherwise, it may be normal.

2. The phenomenon of lack of refrigerant②:

Top temperature and discharge temperature of all compressors are higher than normal value, discharge pressure and suction pressure are both lower than normal value, current is lower than normal value, suction pipe may be frosting. All the phenomenon will disappear after recharging refrigerant.

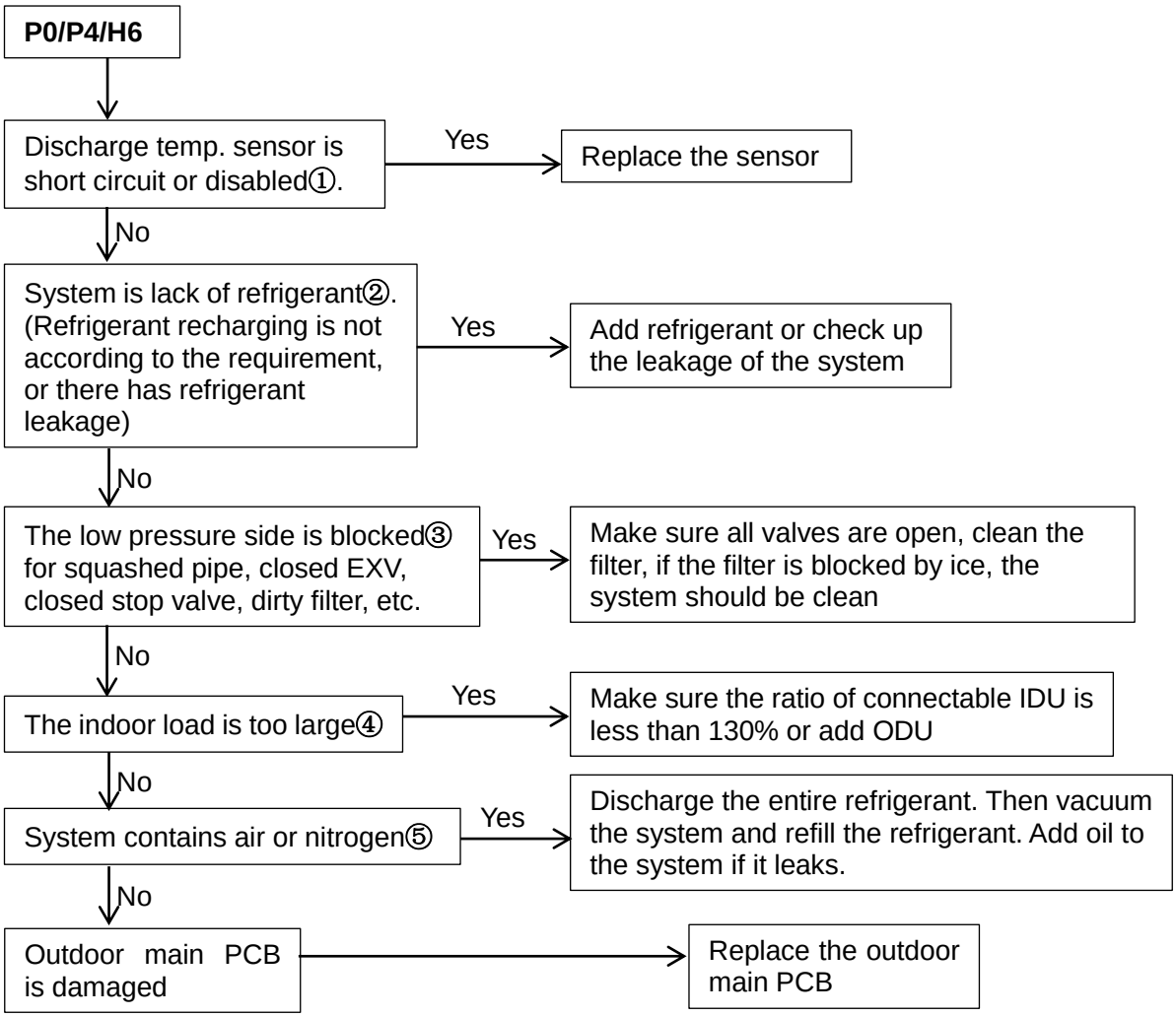
3. The phenomenon of the low pressure side is blocked③:

The discharge temperature is higher than normal value*, low pressure is lower than normal value*, current is lower than normal value* and suction pipe may be frosting.

*The normal system running parameters please refer to attached table 3.

3.9 P0: Top temperature protection of inverter compressor; P4: Discharge temperature protection; H6: P4 protection appears three times in 100 minutes

H6 error cannot resume automatically, and it can resume only by restarting the machine.



Note:

1. How to check whether the discharge temperature sensor is short circuit or disabled①:

Using a multi meter to measure resistance, if the resistance is too small, the sensor is short circuit, if the resistance in certain temperature is not consistent with attached table 2, the sensor is disabled

2. The phenomenon of lack of refrigerant②:

Top temperature and discharge temperature of all compressors are higher than normal value, discharge pressure and suction pressure are both lower than normal value, current is lower than normal value, suction pipe may be frosting. All the phenomenon will disappear after recharging refrigerant.

3. The phenomenon of the low pressure side is blocked③:

The discharge temperature is higher than normal value*, low pressure is lower than normal value*, current is lower than normal value* and suction pipe may be frosting.

4. The phenomenon of the indoor load is too large④:

The suction temperature and discharge temperature are both higher than normal value.

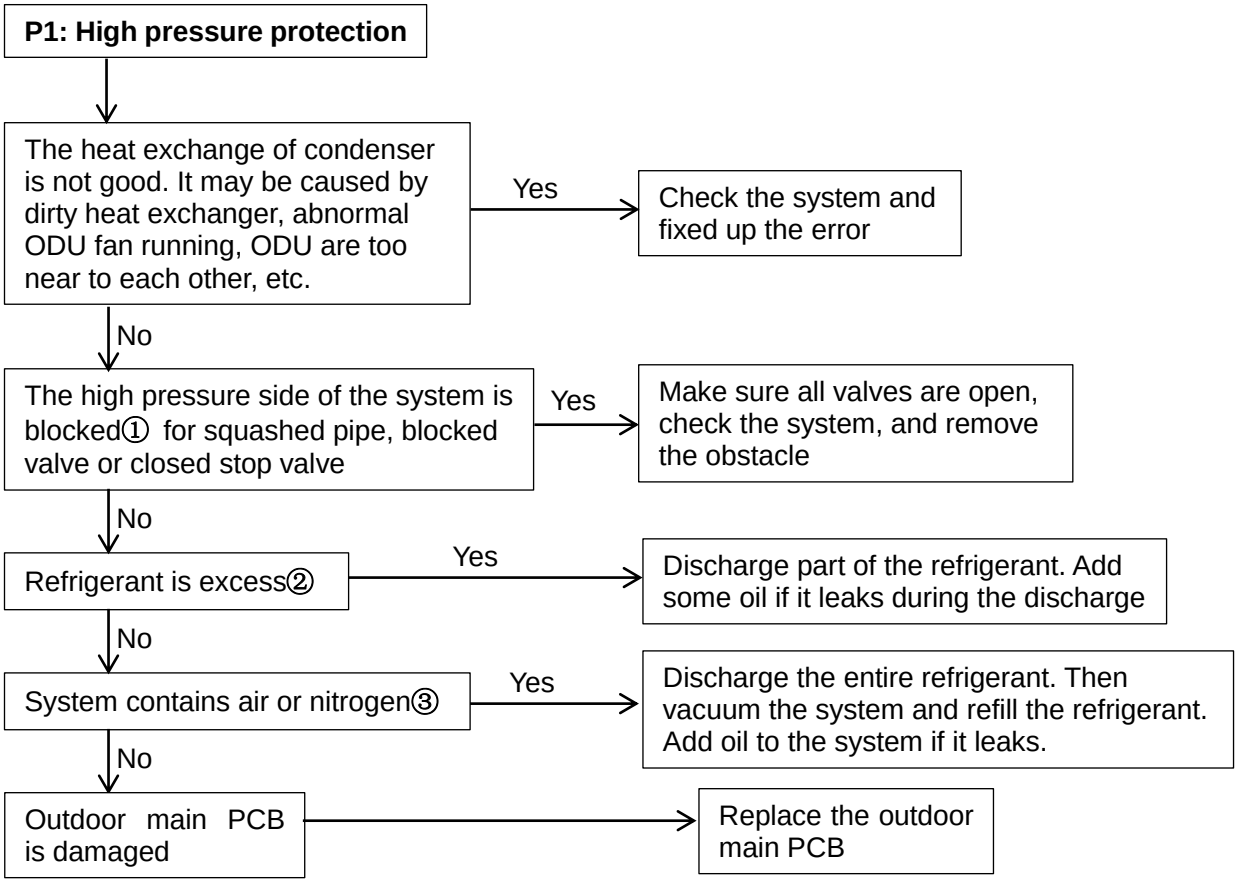
5. The phenomenon of the system contains air or nitrogen⑤:

The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

*The normal system running parameters please refer to attached table 3.

3.10 P1: High pressure protection

When the pressure is over 4.4MPa, the system will display P1 protection, the ODU in standby. When the pressure is lower than 3.2MPa, P1 disappears and normal operation resumes.



Note:

1. The phenomenon of The high pressure side of the system is blocked①:

The high pressure is higher than normal value, the low pressure is lower than normal value, and the discharge temperature is higher than normal value.

2. The phenomenon of the refrigerant is excess②:

The high pressure is higher than normal value, the low pressure is higher than normal value, and the discharge temperature is lower than normal value.

3. The phenomenon of the system contains air or nitrogen③:

The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

*The normal system running parameters please refer to attached table 3.

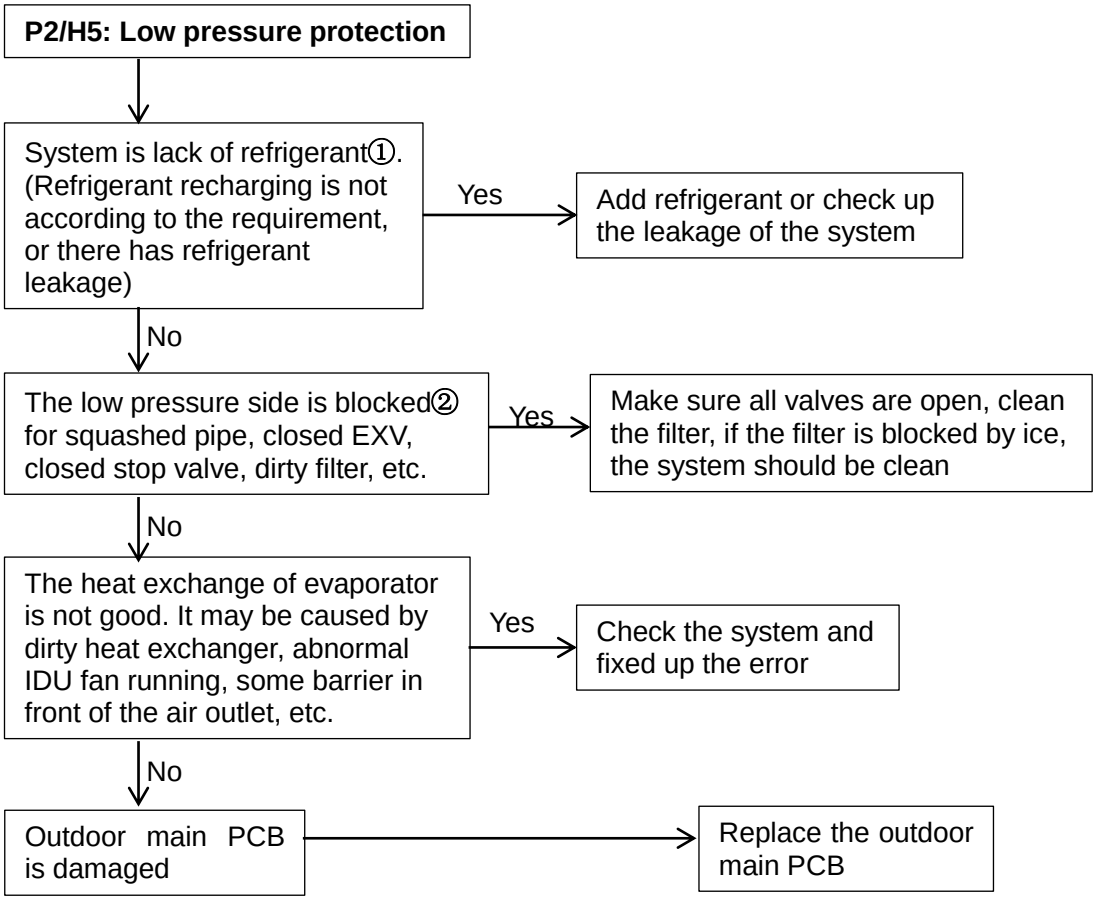
*If the system install three-phase protector, and the three-phase protector connect with high pressure switch in series connection, the system will display P1 protection when fist power on, and P1 protection will disappear after system is steady.

*If the system install three-phase protector, and the three-phase protector connect with low pressure switch in series connection, the system will display P2 protection when fist power on, and P2 protection will disappear after system is steady.

3.11 P2/H5: Low pressure protection

When the pressure is lower than 0.05MPa, the system will display P2 protection, the ODU in standby. When the pressure is higher than 0.15MPa, P2 disappears and resumes normal operation.

H5 error will display when system appear 3 times P2 protection in 60 minutes, it cannot resume automatically, and it can resume only by restarting the machine.



Note:

1. The phenomenon of lack of refrigerant①:

Top temperature and discharge temperature of all compressors are higher than normal value, discharge pressure and suction pressure are both lower than normal value, current is lower than normal value, suction pipe may be frosting. All the phenomenon will disappear after recharging refrigerant.

2. The phenomenon of the low pressure side is blocked②:

The discharge temperature is higher than normal value*, low pressure is lower than normal value*, current is lower than normal value* and suction pipe may be frosting.

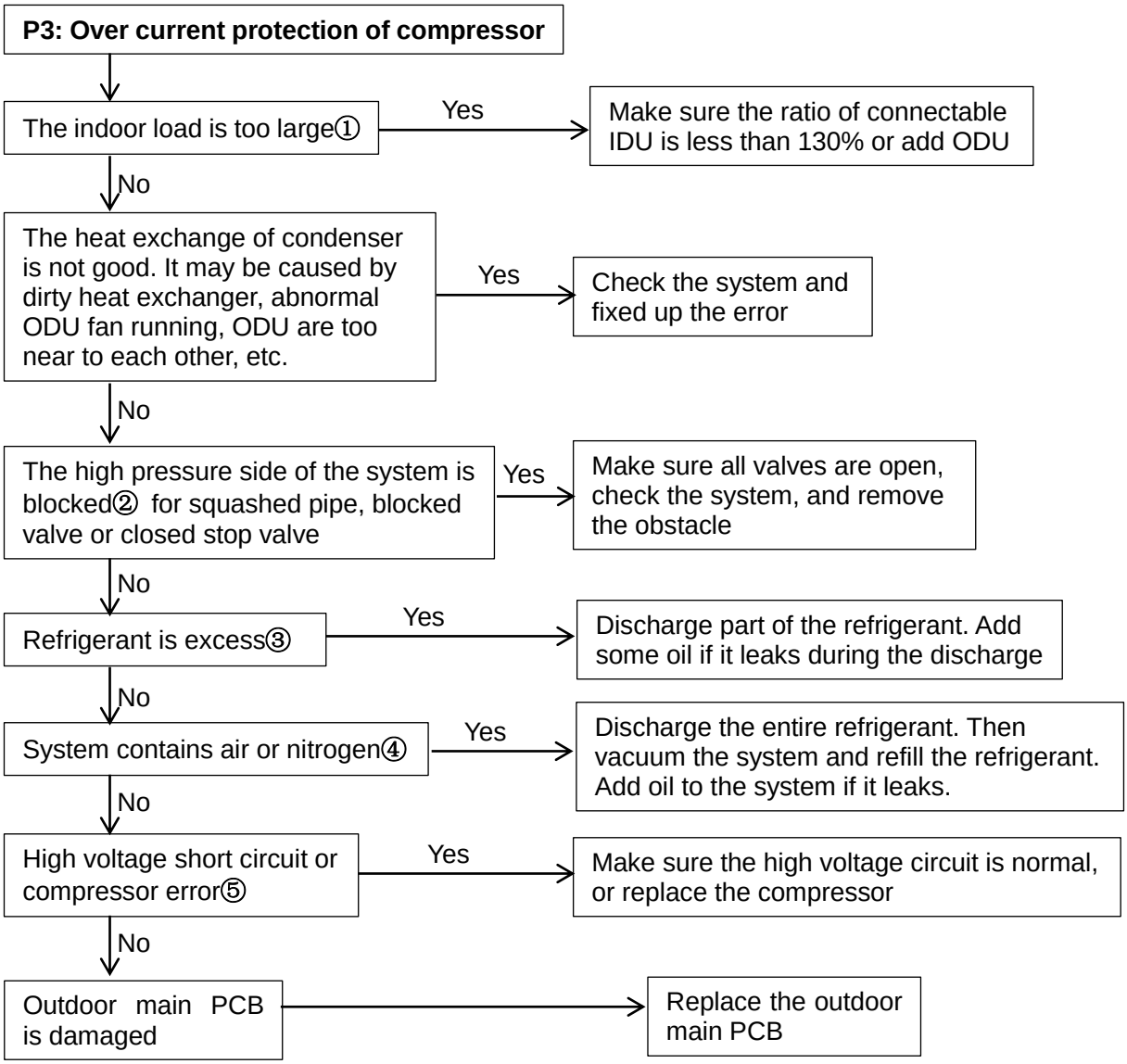
*The normal system running parameters please refer to attached table 3.

*If the system install three-phase protector, and the three-phase protector connect with high pressure switch in series connection, the system will display P1 protection when fist power on, and P1 protection will disappear after system is steady.

*If the system install three-phase protector, and the three-phase protector connect with low pressure switch in series connection, the system will display P2 protection when fist power on, and P2 protection will disappear after system is steady.

3.12 P3: Over current protection of compressor

When the current of inverter compressor is over12A, the system will display P3 protection, the ODU in standby. When the current goes back to normal range, P3 disappears and normal operation resumes.



Note:

1. The phenomenon of the indoor load is too large①:

The suction temperature and discharge temperature are both higher than normal value.

2. The phenomenon of the high pressure side of the system is blocked②:

The high pressure is higher than normal value, the low pressure is lower than normal value, and the discharge temperature is higher than normal value.

3. The phenomenon of the refrigerant is excess③:

The high pressure is higher than normal value, the low pressure is higher than normal value, and the discharge temperature is lower than normal value.

4. The phenomenon of the system contains air or nitrogen④:

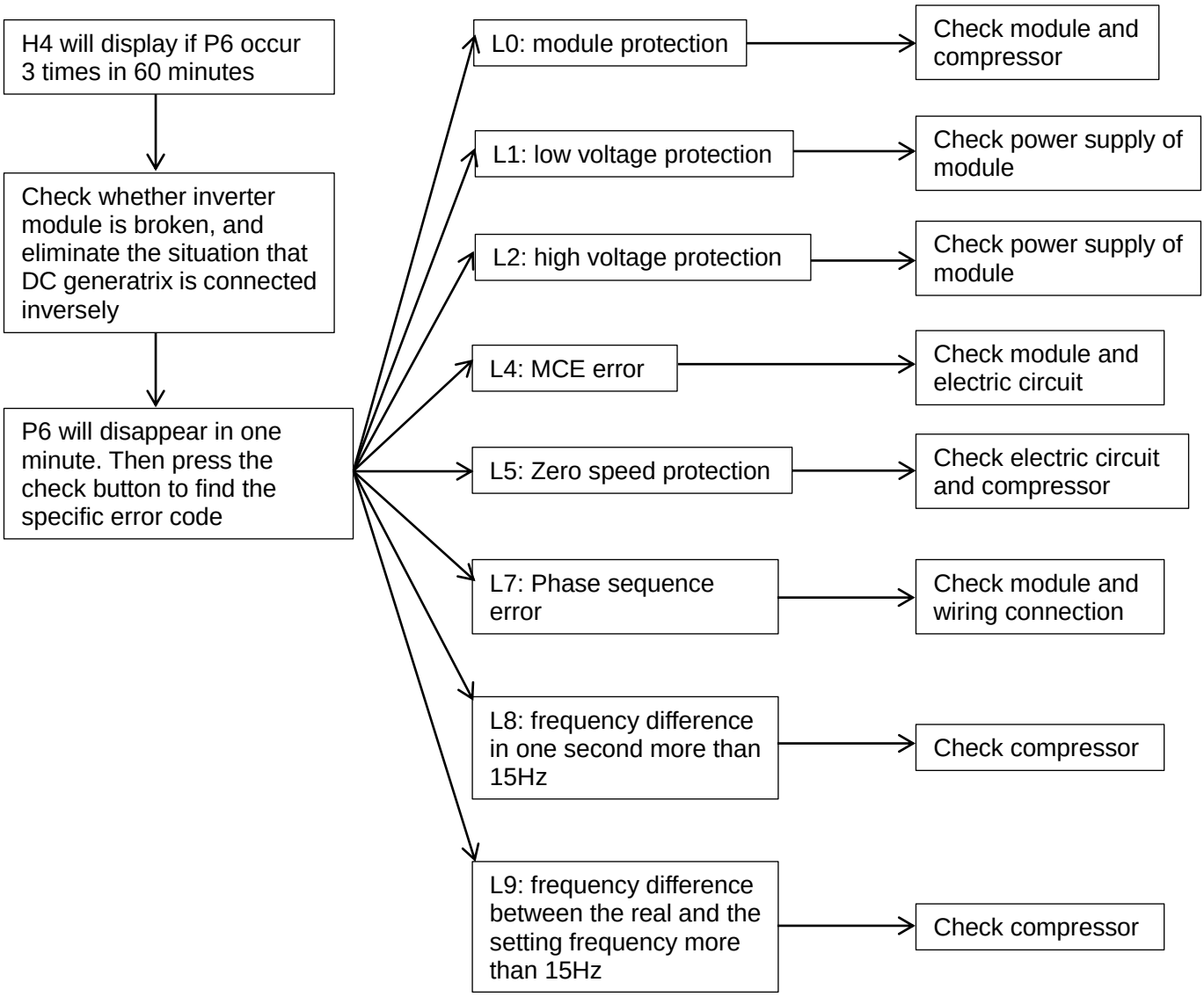
The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

5. How to check whether compressor is error⑤:

Measure the resistance between two terminals among the three terminals of compressor. The resistance between two terminals is 2-5Ω, the resistance between each terminal and ground is infinity, if the resistance is out of the normal range, the compressor is error.

3.13 P6: Inverter module protection; H4: P6 protection appears three times in 60 minutes

When the system displays H4 error code, the system can resume only by restarting the machine. At this time, malfunction should be disposed promptly to avoid further damage.



1) L0 troubleshooting

Step 1: Compressor check

Measure the resistance between each two of U, V, W terminals of the compressor, all the resistance should be the same and equal to 0.9~5 Ohms. (Fig. A and Fig. B)

Measure the resistance between each of U, V, W terminals of the compressor to ground (Fig. C), all the resistance should trend to infinity (Fig. D), otherwise the compressor has been malfunction, needs to be replaced.

Fig. A

Fig.B

Fig.C

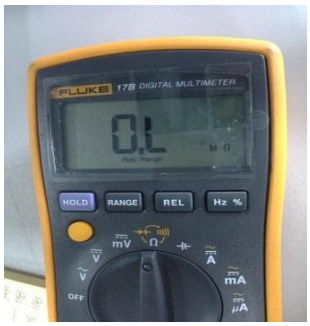
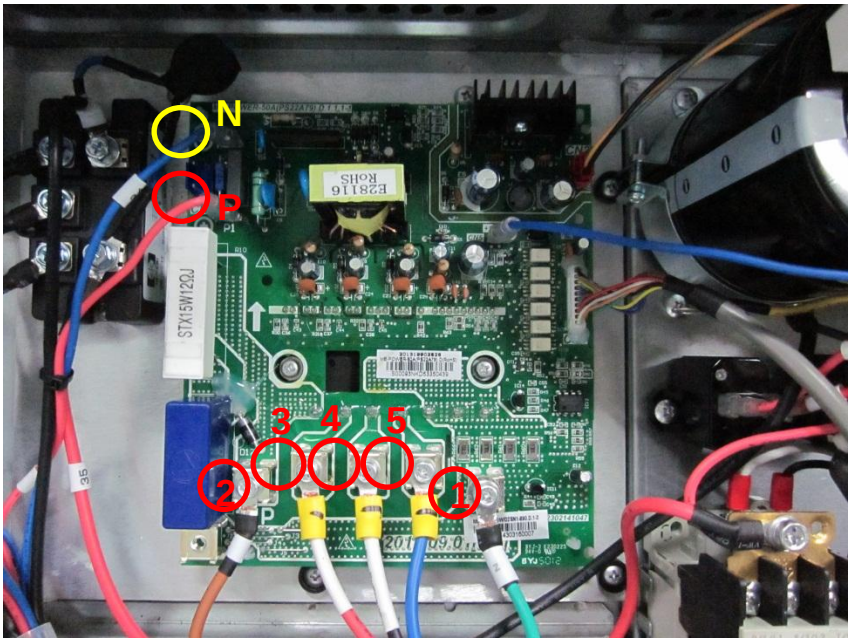


Fig.D

If the resistance value are normal, then go to step 2.

Step 2: Module check

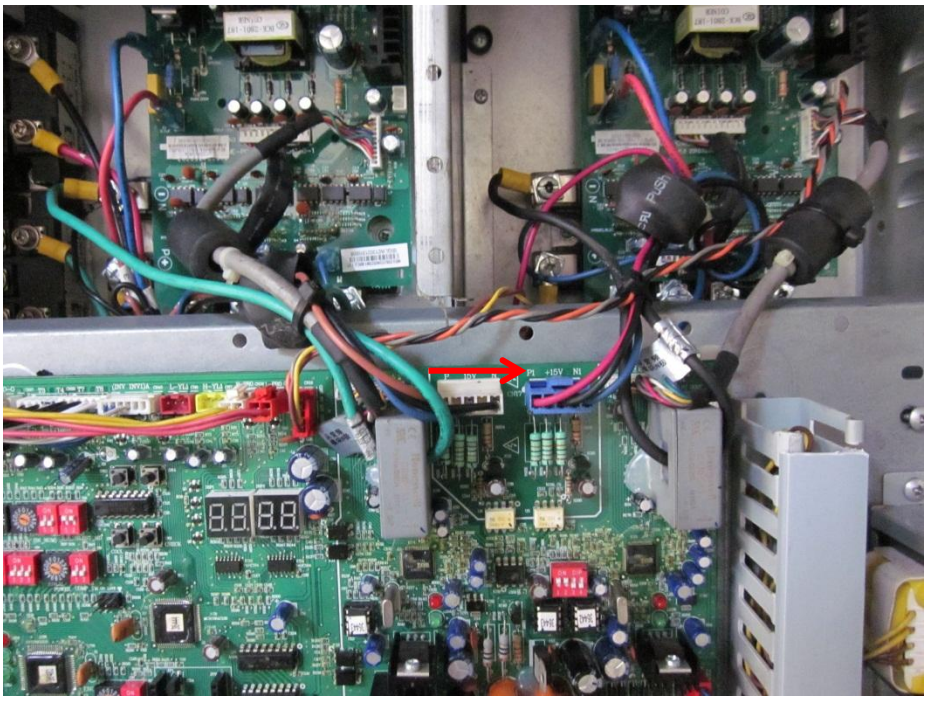


1) DC voltage between terminal P and terminal N should be 1.41 times of the local power supply voltage.
2) DC voltage between terminal 1 and 2 should be 510V～580V.
3) Discoonnect the terminal 3, 4, and 5 from inverter compressor. Measure the risistance between any two terminals among terminal 1, 2, 3, 4, 5. All the values should be infinity. If any of the value approximates to 0, the inverter module is damaged and should be replaced.

After replaced the inverter module, if the system is still abnormal, then go to step3.

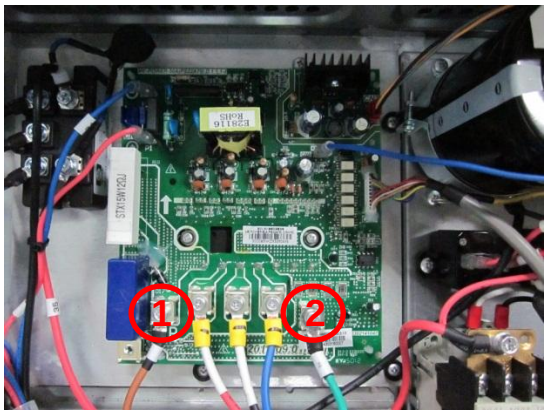
Step 3: DC generatrix check

Direction of the current in DC supply wire which is running through the inductor should be the same as the direction of arrow marked on the inductor.



2) L1/L4 troubleshooting

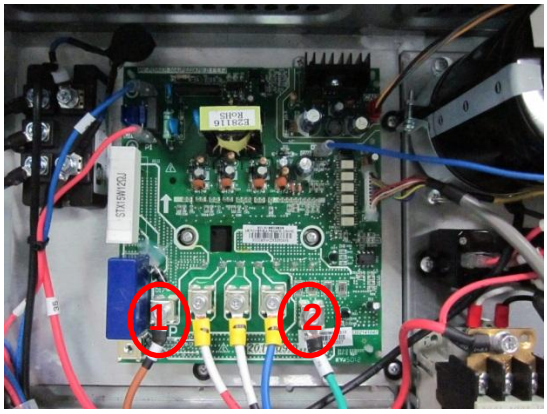
Step 1: Check the DC voltage between 1 and 2 terminal, the normal value should be 510V~580V, if the voltage is lower than 510V, go to step 2.



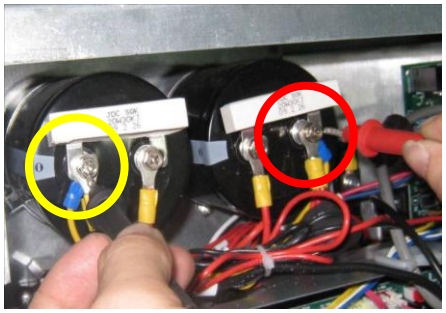
Step 2: Check whether the wires of rectifier circuit are loose or not. If wires are loosen, fasten the wires. If wires are OK, replace the main PCB.

3) L2 troubleshooting

Step 1: Check the DC voltage between 1 and 2 terminal, the normal value should be 510V~580V, if the voltage is higher than 580V, go to step 2.



Step 2: Check the voltage between the two electrolytic capacitors, the normal value should be 510V~580V.



Turn the measure range of the meter to 1kV, measure the voltage between two electrolytic capacitors

If the value is not in the range, that means the power supply for electrolytic capacitors has problem, you should check the power supply, whether the voltage is too high and whether the voltage is stable.

If the voltage value is normal, then the main PCB has malfunction, it needs to be replaced.

4) L8/L9 troubleshooting

Step 1: Compressor check

Measure the resistance between each two of U, V, W terminals of the compressor, all the resistance should be the same and equal to 0.9~5 Ohms. (Fig. A and Fig. B)

Measure the resistance between each of U, V, W terminals of the compressor to ground (Fig. C), all the resistance should trend to infinity (Fig. D), otherwise the compressor has been malfunction, needs to be replaced.

Fig. A

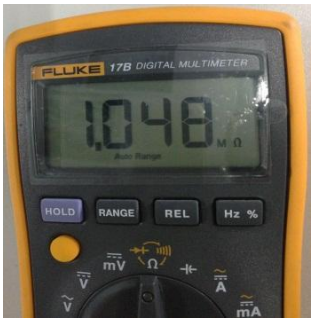


Fig. B

Fig. C

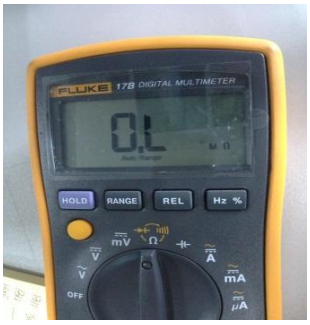


Fig. D

If the resistance value are normal, then go to step 2.

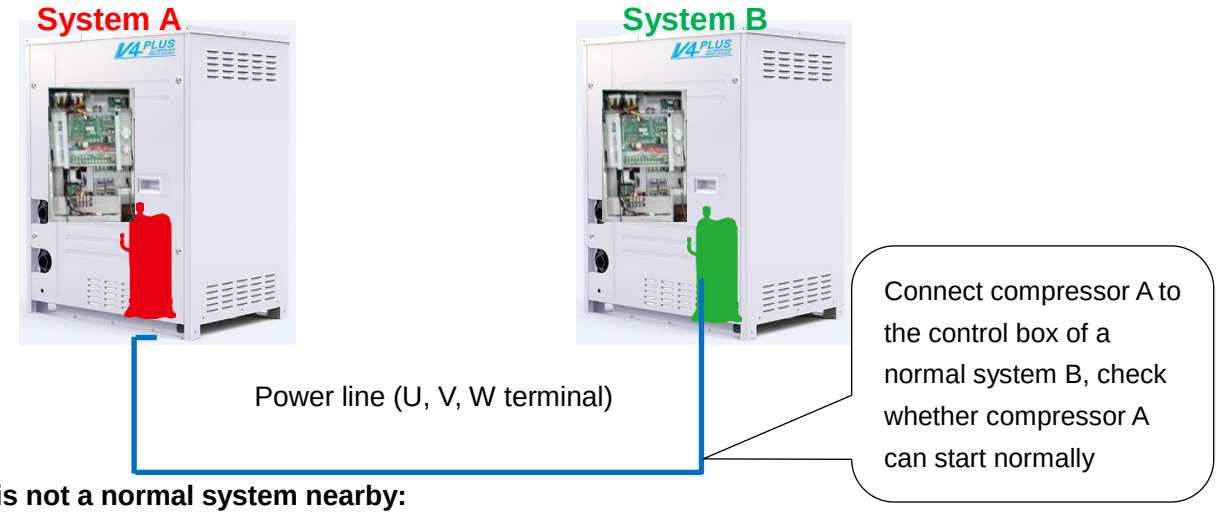
Step 2: Disconncet the power wiring from the compressor(named compressor A) of the faulted system(named system A).

If there is a system running normally nearby(named system B):

Extend the power line of the inverter compressor of system B, connect compressor A to the control box of system B, make sure that the U, V, W terminals are connected in right order, then start system B.

If compressor A can start normally, that means compressor is OK, the control box of system A is malfunction, then raplace the main PCB of system A with correct wire connection.

If compressor A can not start normally, that means compressor A is demaged, needs to be replaced.



If there is not a normal system nearby:

Replace the main PCB of system A with correct connection, if compressor A can start normally, it means the main PCB which is replaced is damaged. If compressor A still can't start normally, replace the compressor.

5) Guide for compressor replacement

Step 1: Take out the compressor from the faulted outdoor unit, pour out the oil from the compressor according to the method illustrated. Normally the oil will outflow from the discharge pipe of the compressor.

Step 2: check the oil of the system

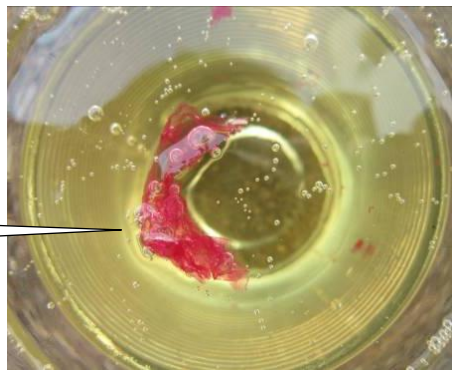
Normally the oil is clear and transparent, if it is a little yellowing, it is also OK. However, if the oil is become

black, feculent, or even there is impurity in the oil, that means the system has problems and the oil has gone bad, the oil need to be replaced.

The oil is black, it has been carbonized

The oil is a little yellowing, but it is clear and transparent, the quality is OK

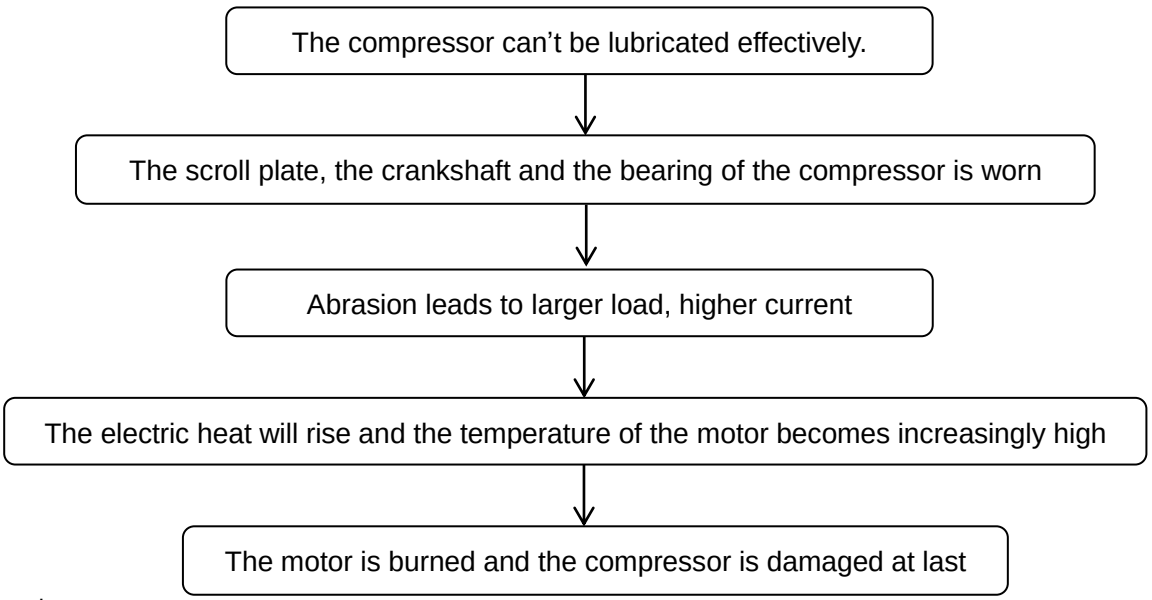
The oil is still transparent, but there is impunity in the oil, the impunity may clog the filter

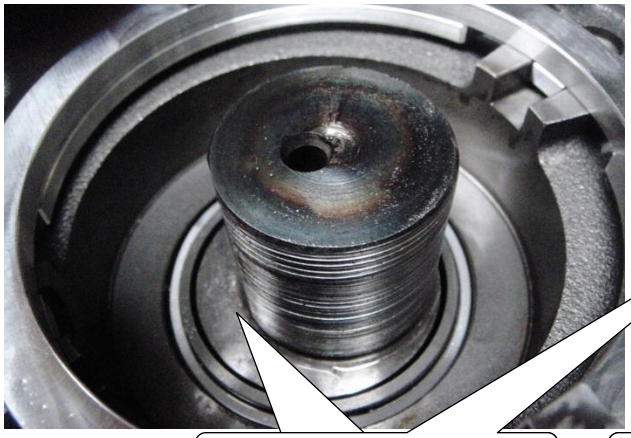


The oil becomes cloudy and gray

The oil contains a lot of copper scrap

If the oil has gone bad:

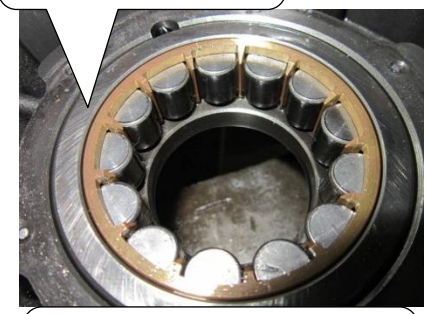




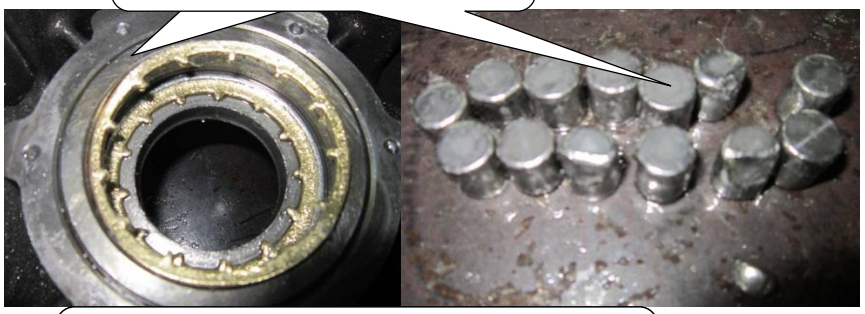
The crankshaft is worn.

The scroll plate is worn.

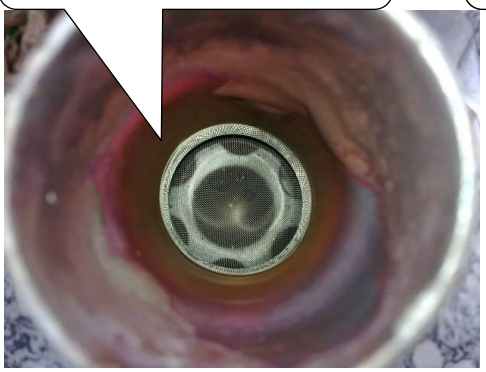
A normal bearing of the compressor



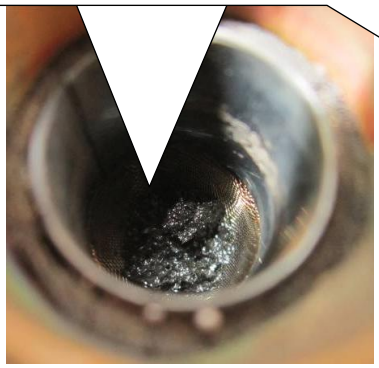
The bearing is worn seriously, it is damaged completely

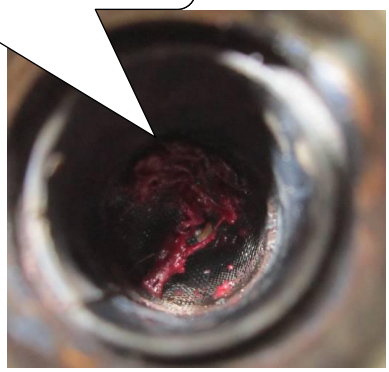


A clean filter (on the suction pipe of the system)

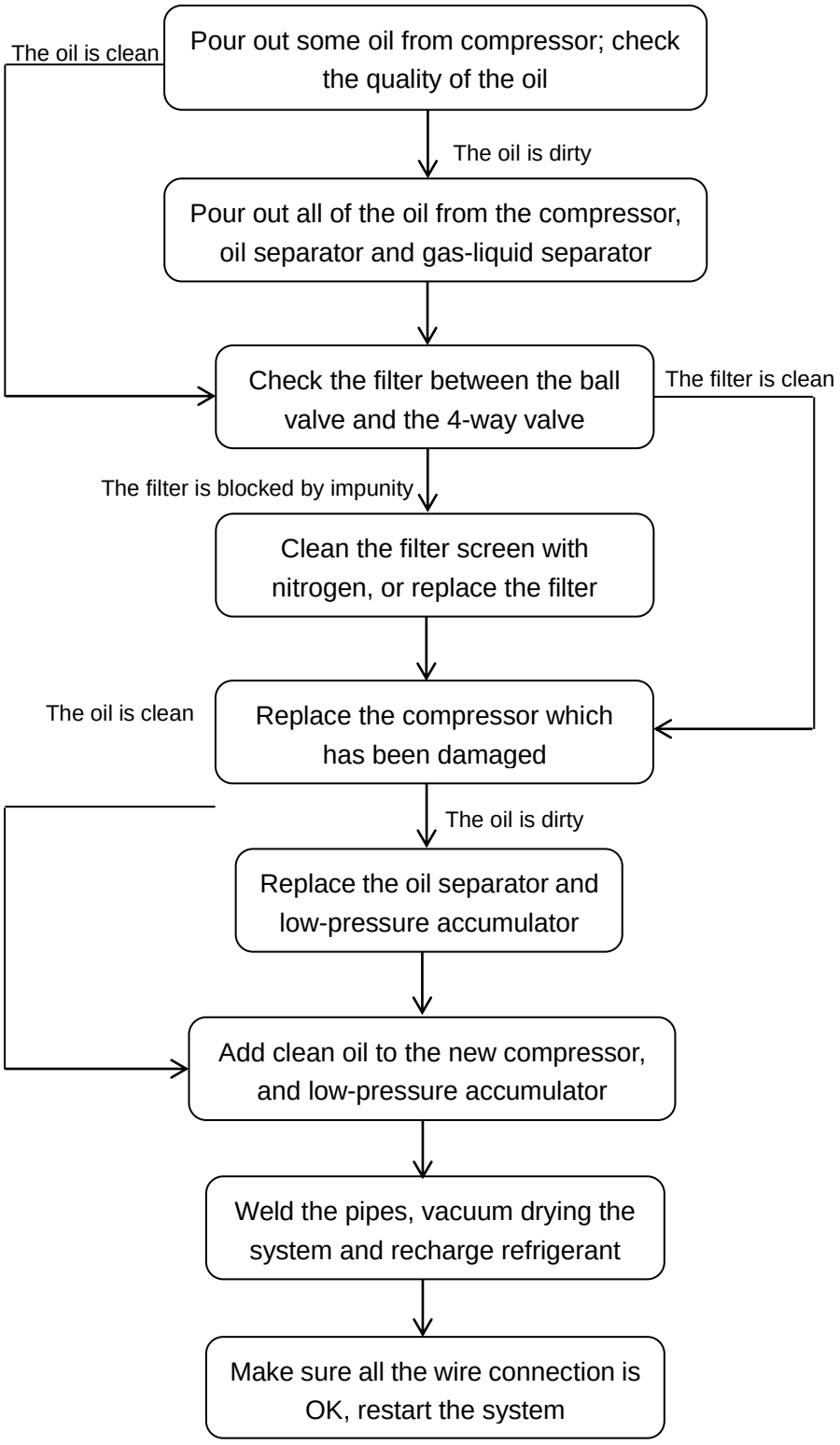


The filter is blocked by impunity, the suction of the compressor will be abnormal





Step 3: Replace the compressor

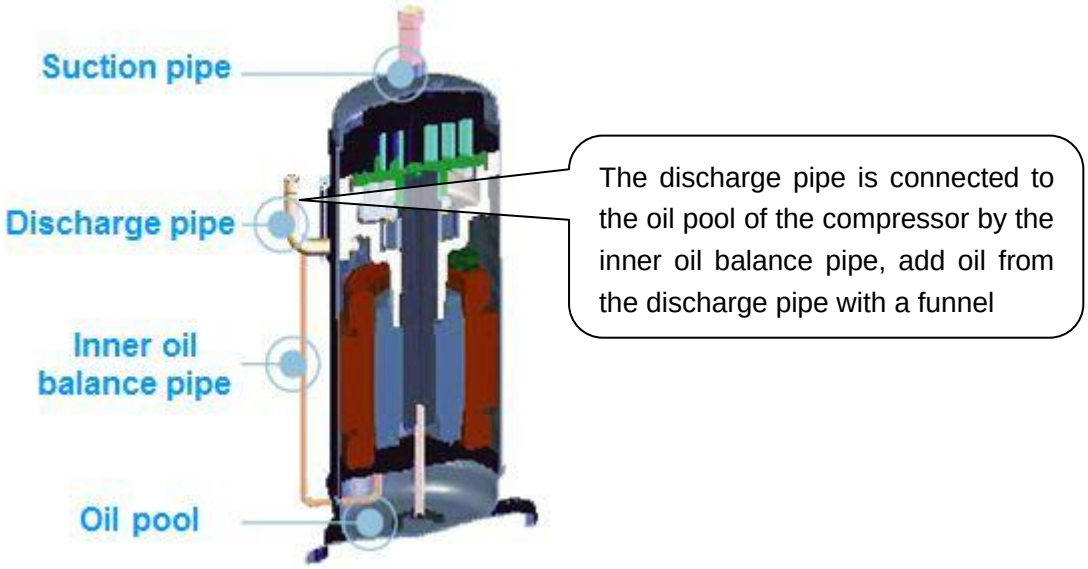


Note:

1. Before dumping the oil, shake the compressor, oil separator and gas-liquid separator first, because impunity may deposit at the bottom of the tank.
2. If the oil of the inverter compressor is clean, there's no need to check the oil of fixed compressors. If the oil of the inverter compressor has gone bad, check the oil of fixed compressors is necessary. If all the oil of an outdoor unit needs to be replaced, after adding oil to the compressors, the rest oil should be charged to the

low-pressure accumulator.

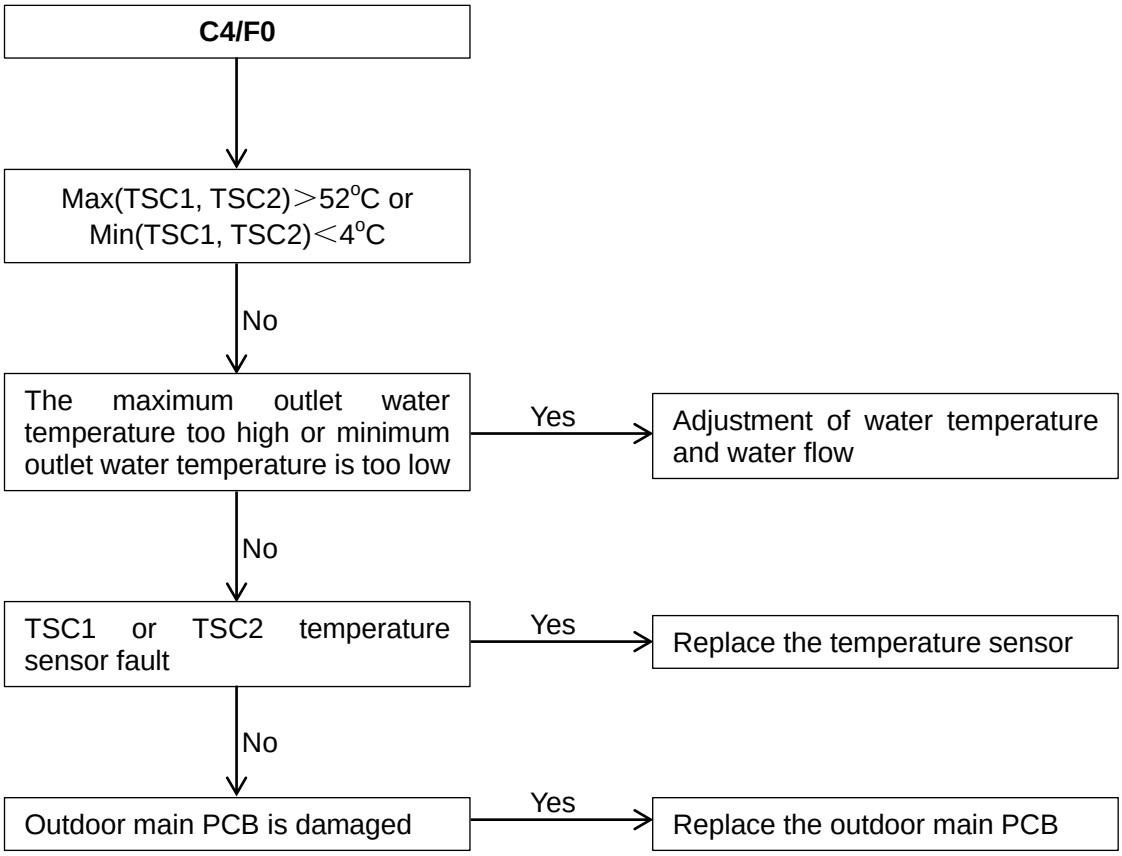
3. Add oil to the compressor from the **discharge pipe**.



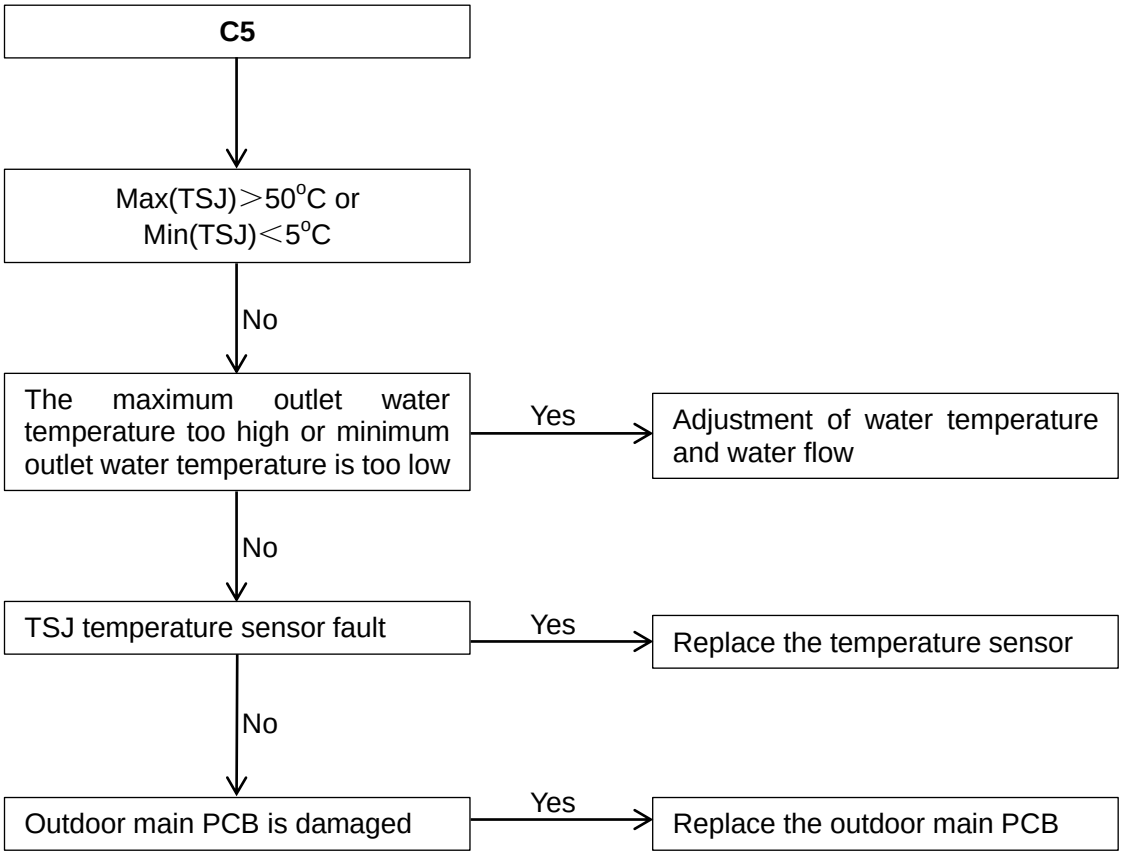
4. The type of the oil is FVC-68D, make sure the type of the oil is right because different compressor need different type of oil, if the type is wrong there will be various kinds of problems.

3.14 C4: TSC temperature too high or too low protection; F0: C4 protection appears 3 times in 60 minutes

F0 error will display when system appear 3 times C4 protection in 60 minutes, it cannot resume automatically, and it can resume only by restarting the machine. The error should be promptly investigated and handled, so as not to cause further damage.

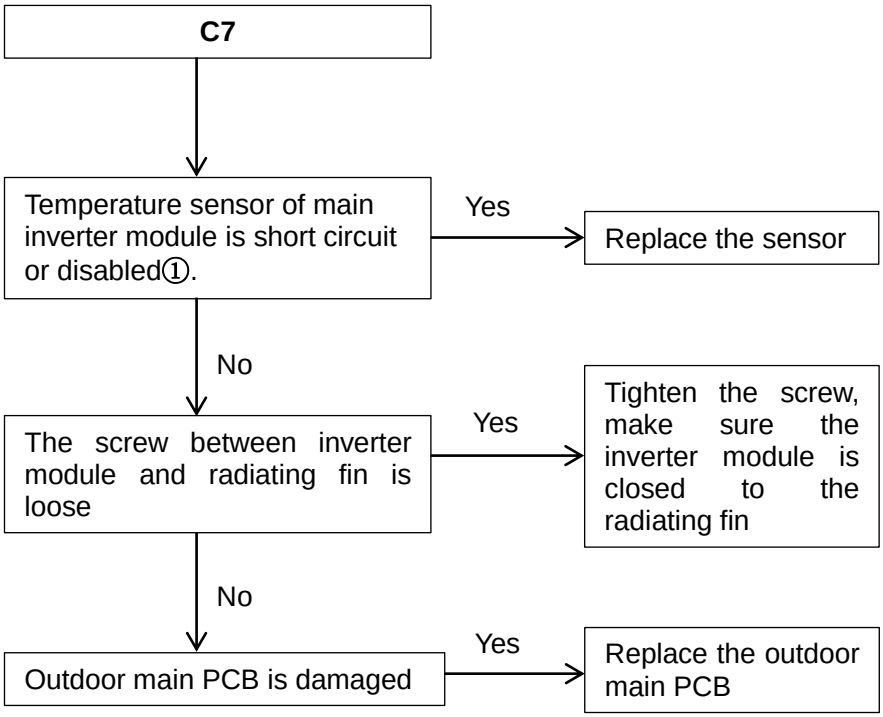


3.15 C5: TSJ temperature too high or too low protection



3.16 C7: Temperature protection of inverter module

When the temperature of inverter module is over 80°C, it will display C7 protection.



1. How to check whether the temperature sensor is short circuit or disabled①:

Using a multi-meter to measure resistance, if the resistance is too small, the sensor is short circuit, if the resistance in certain temperature is not consistent with attached table 2, the sensor is disabled

3.17 C8: Flow switch break protection