



Service Manual

AIR CONDITIONER

DC INVERTER MULTI TYPE

This manual applies to models:

High Wall	42QHF009DS
	42QHF012DS
	42QHF018DS
Duct	42QSM009DS
	42QSM012DS
	42QSM018DS
Cassette	42QTD009DS
	42QTD012DS
	42QTD018DS
Console	42QFA009DS
	42QFA012DS
	42QFA018DS
Universal CDU	38QUS018DS2
	38QUS027DS3
	38QUS036DS4

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1. General information of Outdoor& Indoor Units

■ Outdoor

Model name	Dimension (mm)	Compressor
38QUS018DS2	845x320x700	DA130M1C-31FZ
38QUS027DS3	900x315x860	DA250S2C-30MT
38QUS036DS4	990x345x965	TNB306FPGMC-L

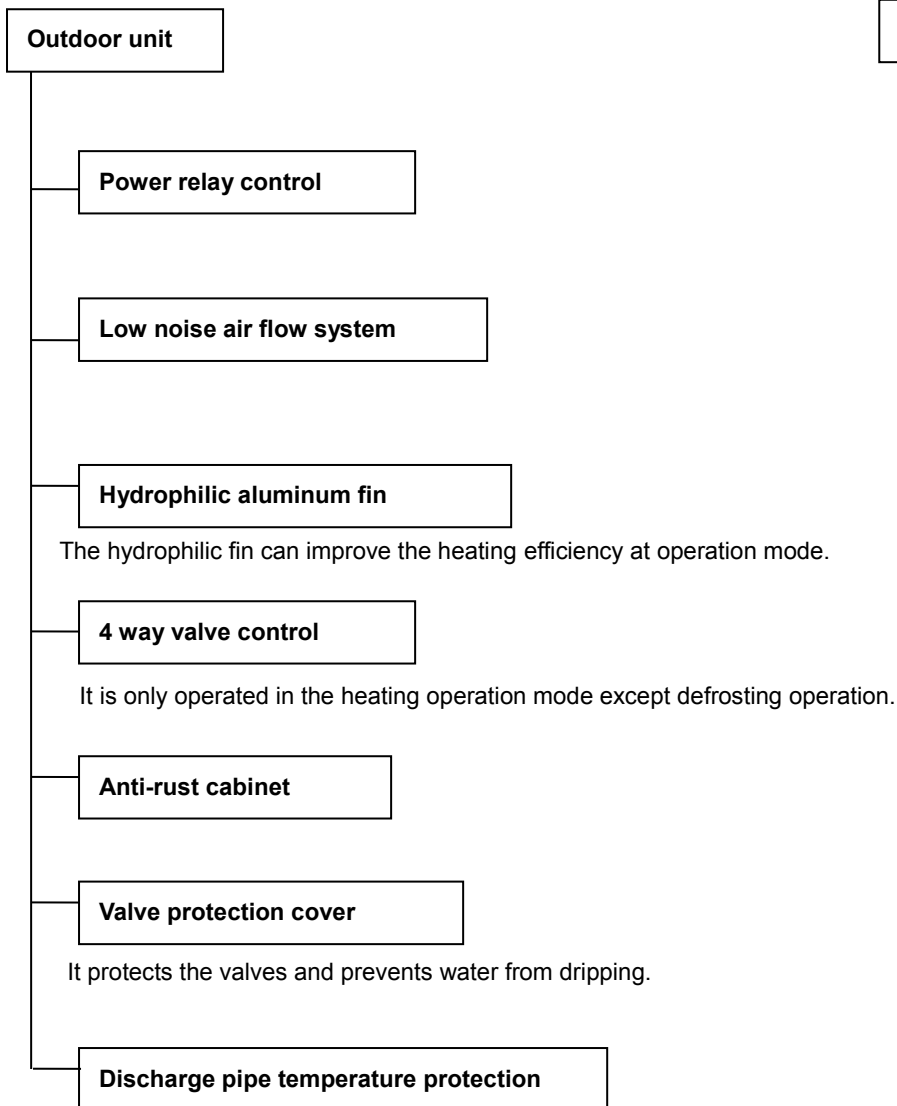
■ Indoor

<p>High wall</p> 	<p>A5 Duct</p> 
<p>Four-way cassette (compact):</p> 	<p>Console:</p> 

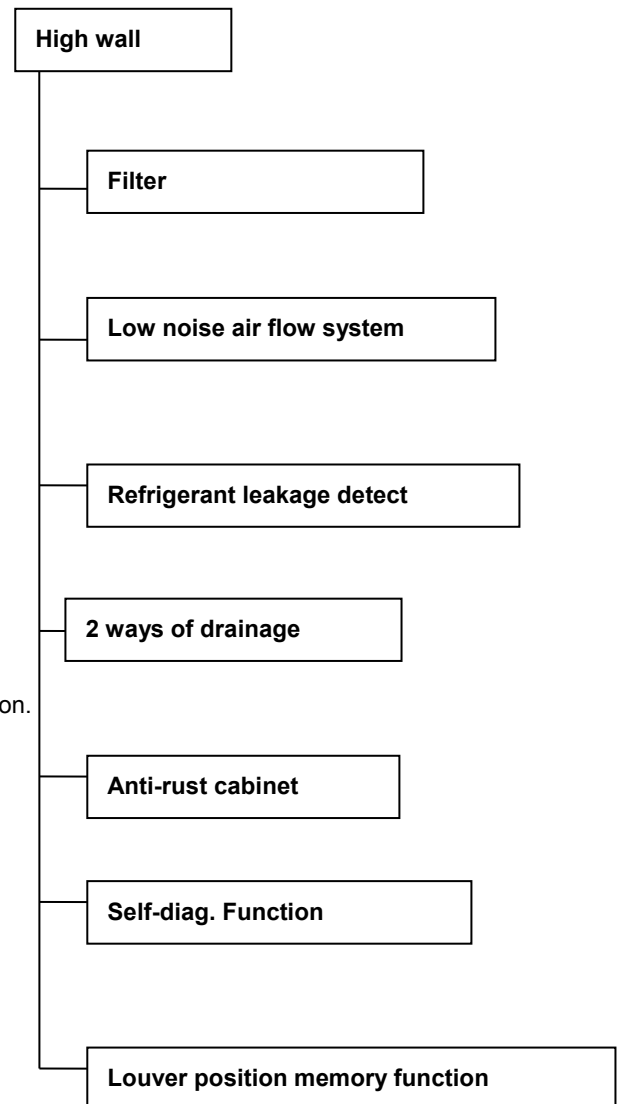
Model name	Dimension (mm)
42QHF009DS	800x188x275
42QHF012DS	800x188x275
42QHF018DS	940x205x275
42QSM009DS	700x635x210
42QSM012DS	700x635x210
42QSM018DS	920x635x210
42QTD009DS	570x570x260
42QTD012DS	570x570x260
42QTD018DS	570x570x260
42QFA009DS	700x600x210
42QFA012DS	700x600x210
42QFA018DS	700x600x210

2. Features

2.1 Outdoor unit



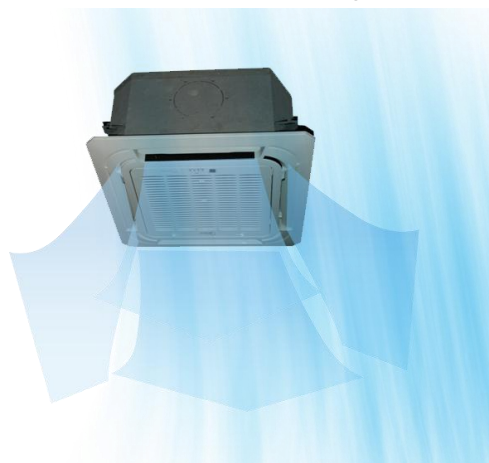
2.2 High wall



2.3 Four-way cassette type(compact)

(1) New panel

- 360°surrounding air outlet design, affords comfortable feeling



(2) Compact design

- The body size is 570×260×570mm, it's just smaller than the console board, so it's very easy for installation and will not damage the decoration. The panel size is 647×50×647mm.
- The hooks are designed in the four corners of the body, which can save installation space.



(3) Electric control box built-in design

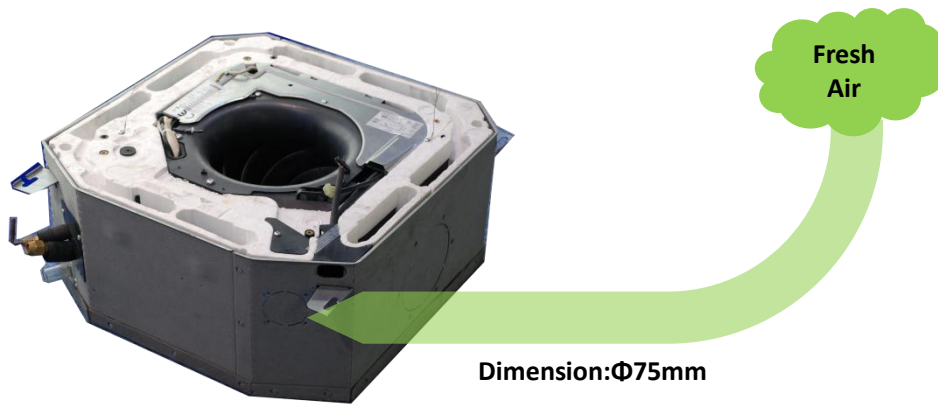
- The E-box is simply and safely built inside the indoor unit. It's convenient for installation and maintenance. Can check the control part easily, you only need to open the air return grille.



(4) Fresh air intake function:

- Fresh air fulfills air quality more healthy and comfortable.





(5) Air passage function

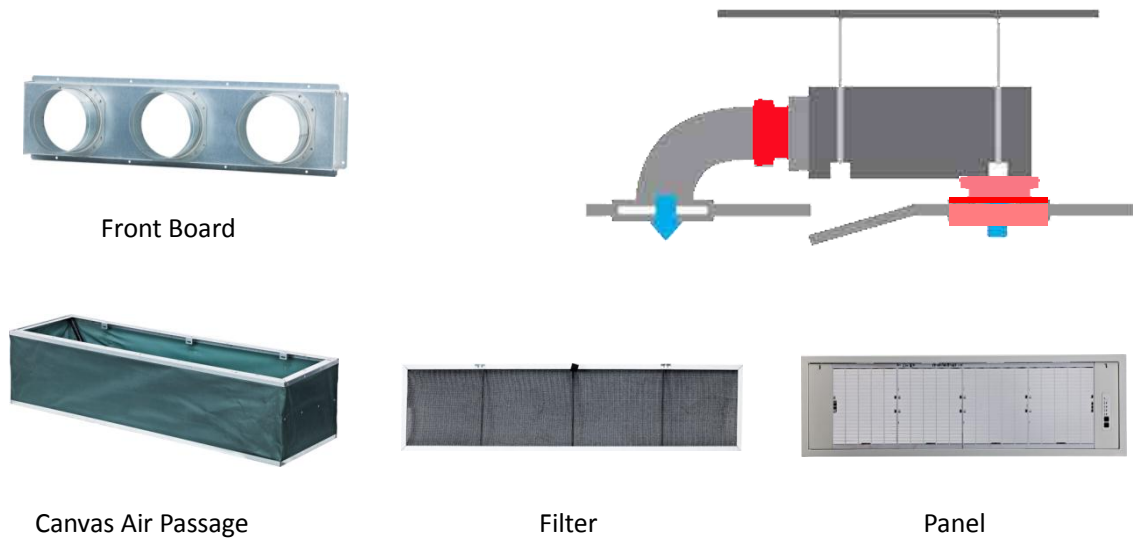
- Reserves the space for air outlet from the side of indoor unit; It's availed to connect air duct from the two sides to the nearby small rooms.



2.4 A5 Duct

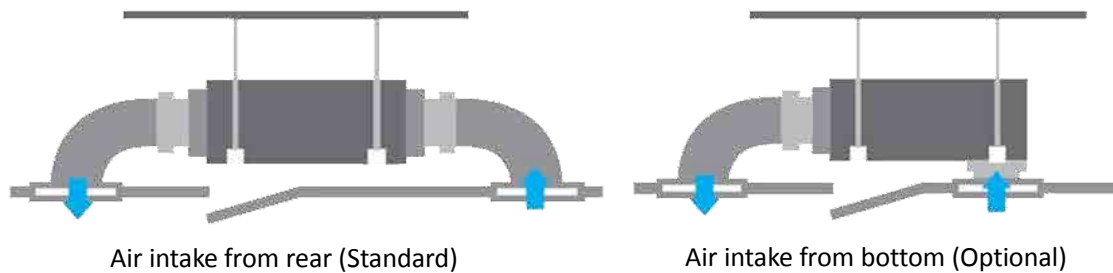
(1) Installation accessories: (Optional)

- Front Board, Canvas Air Passage, Filter, Panel, for easy installation



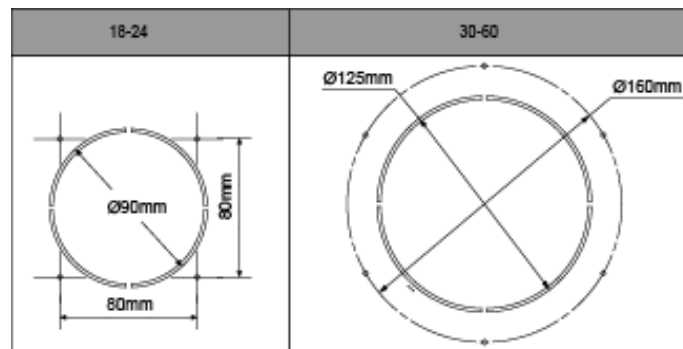
(2) Easy Installation: Two air inlet styles (Bottom side or Rear side)

- Air inlet from rear is standard for all capacity; air inlet from bottom is optional.
- The size of air inlet frame from rear and bottom is same, it's very easy to move the cover from bottom to rear side, or from rear to the bottom, in order to matching the installation condition.



(3) Fresh air intake function

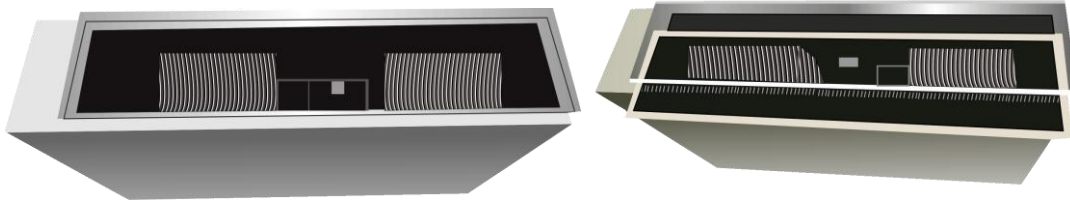
- Install one duct from the reserved fresh-air intake to outdoor.
Continually inhale the fresh air to improve the quality of the indoor air, fulfills air quality more healthy and comfortable.



(4) Easy maintenance

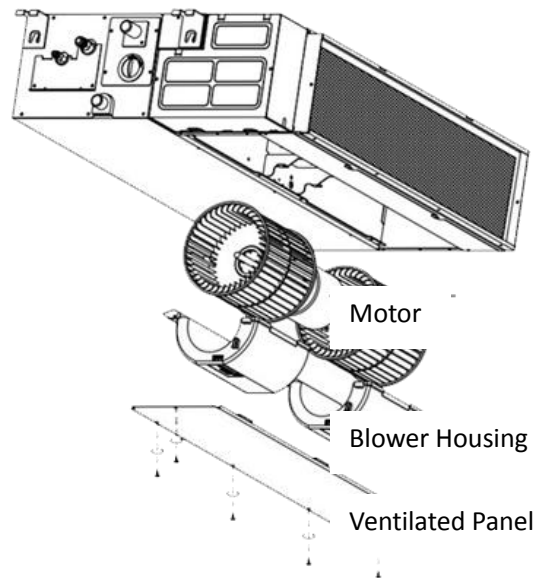
- Clean the filter (Optional, standard product without filter)

It is easy to draw out the filter from the indoor unit for cleaning, even the filter is installed in rear side or bottom side.



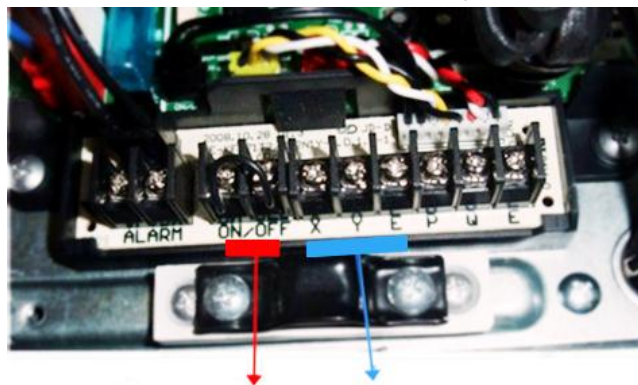
- Replace the motor or centrifugal fan

Remove the ventilated panel firstly. Remove a half of blower housing and take out the motor with centrifugal fan. Directly remove two bolts, and then replace the motor or centrifugal fan easily.



(5) Reserved remote on-off and central control ports

- Reserved remote on-off ports and central control ports, can connect the cable of an on-off controller or a central controller to realize remote on-off control function or group control function.

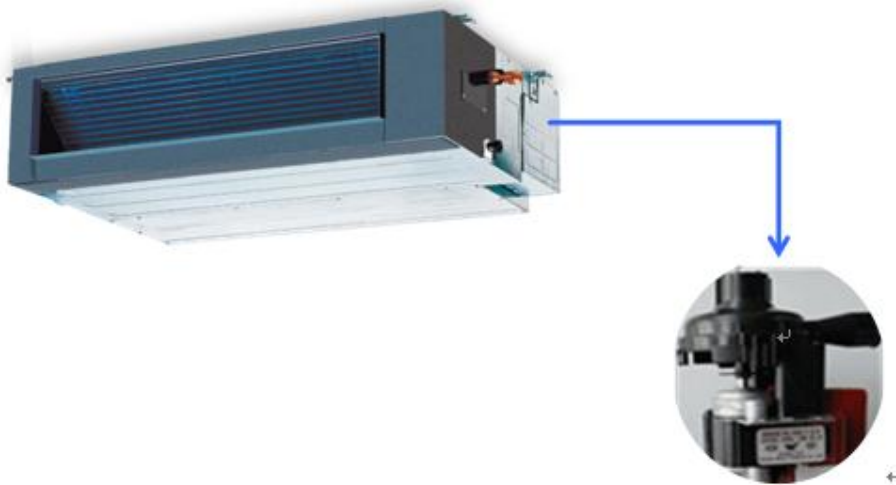
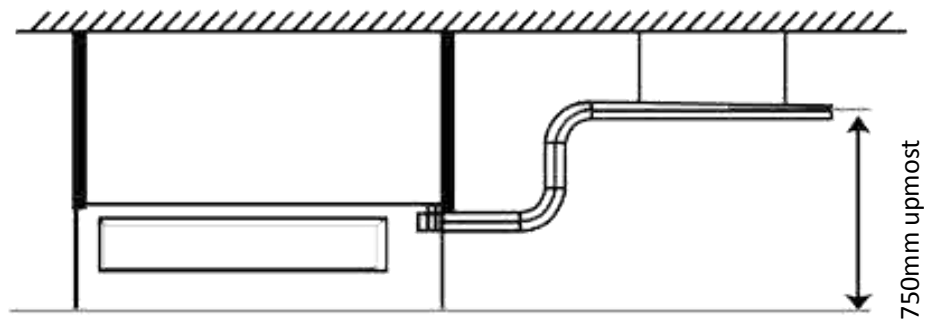


Remote on-off ports

Central control ports

(6) Built-in drain pump (Optional):

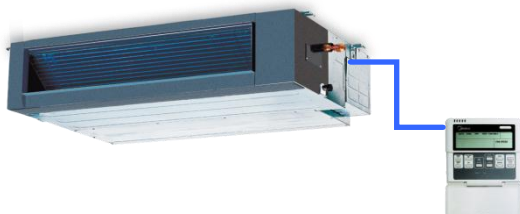
- Built-in drain pump can lift the water to 750mm upmost. It's convenient to install drainage piping under most space condition.



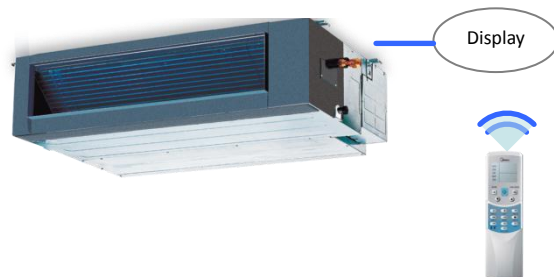
(7) Built-in display board

- The standard indoor unit can be controlled by wired controller.
- There is a display board with a receiver in the E-box. Move out the display, and fix it in other place, even in the distance of 10m. The unit will realized remoter control.
- The wired controller and the display board can display the error code or production code when the chips detect some failure.

Wired Controller (Standard)



Remote Controller (Optional)



2.5 Console

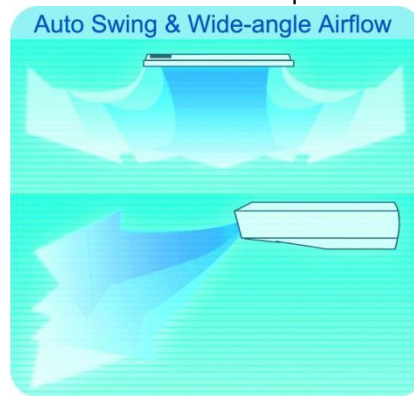
- (1) New design, more modern and elegant appearance.**
- (2) Convenient installation**

--The console type can be easily installed into a corner of the console even if the console is very narrow
--It is especially useful when installation of an air conditioner in the center of the console is impossible due to a structure such as one lighting.

(3) Two direction auto swing (vertical & horizontal) and wide angle air flow,

--Air flow directional control minimizes the air resistance and produces wider air flow to vertical direction.

--The range of horizontal air discharge is widened which secures wider air flow distribution to provide more comfortable air circulation no matter where the unit is set up



(4) Three level fan speed, more humanism design, meets different air-supply requirement.

(5) Water proof by utilizing the absorbing plastic film on water collector

(6) Easy operation. Auto-restart function, remote control and optional wire control method.

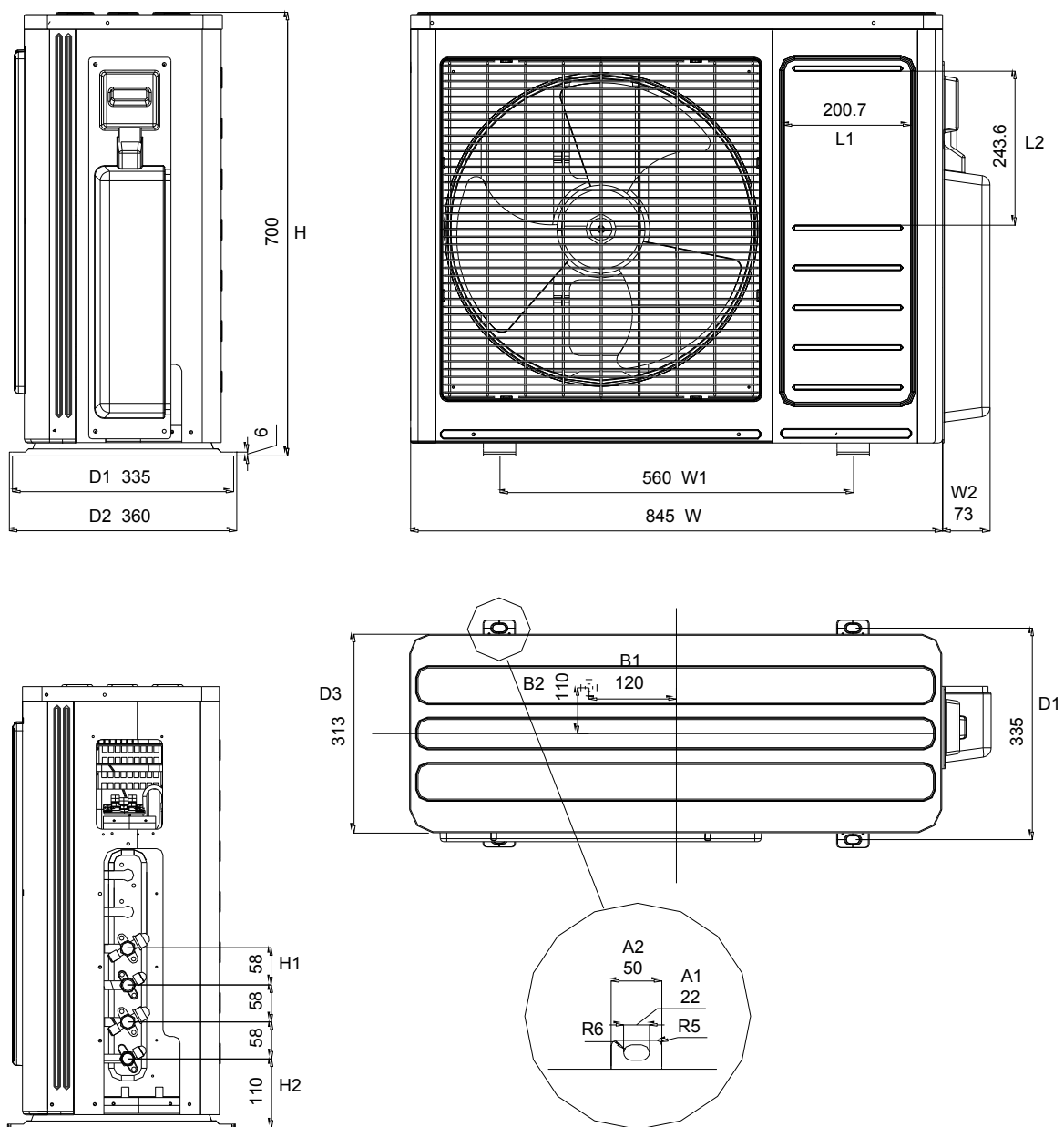
(7) Low noise level plus compact size

--Shape of the blades has been improved to prevent noise caused by turbulence.

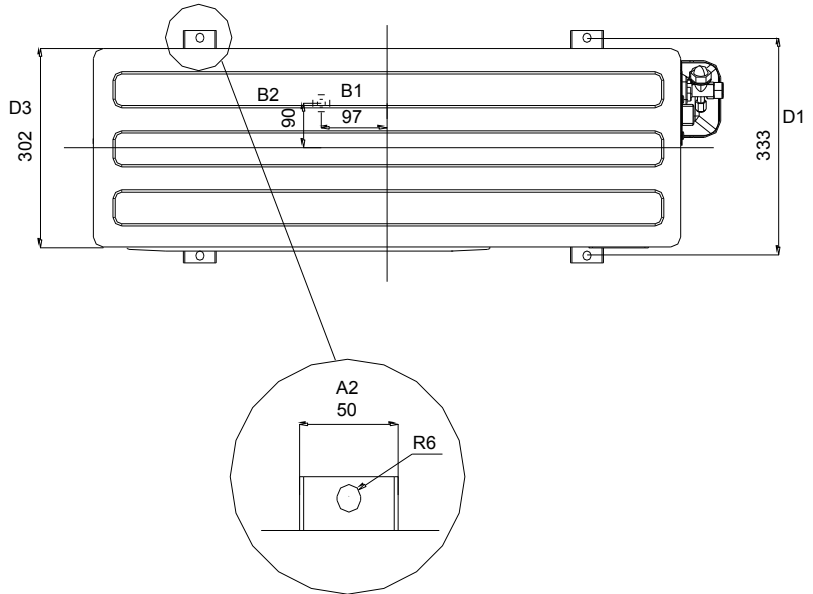
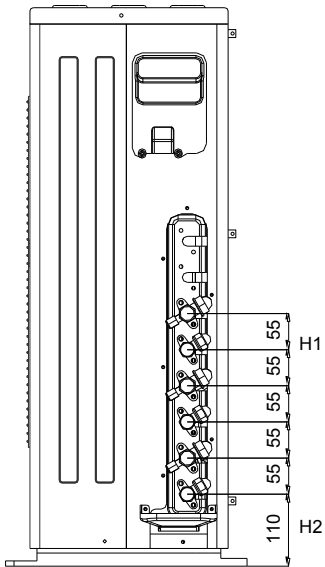
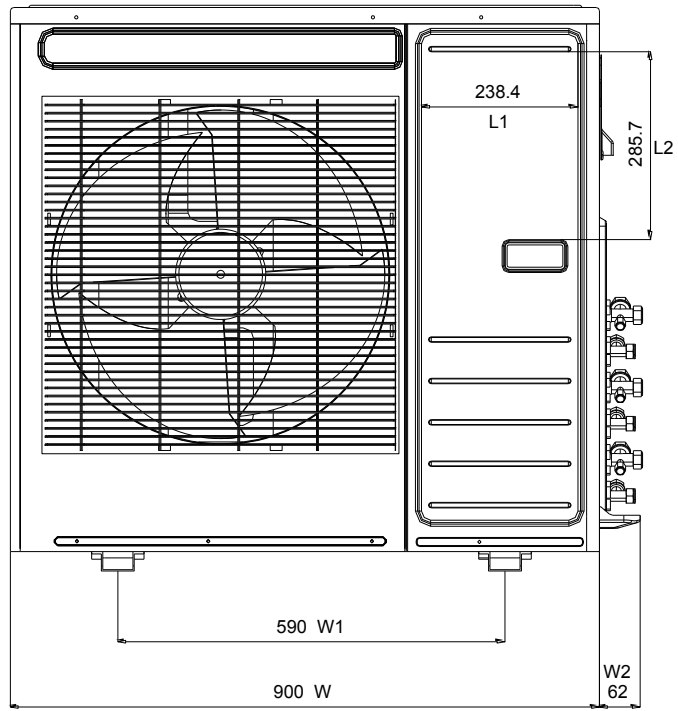
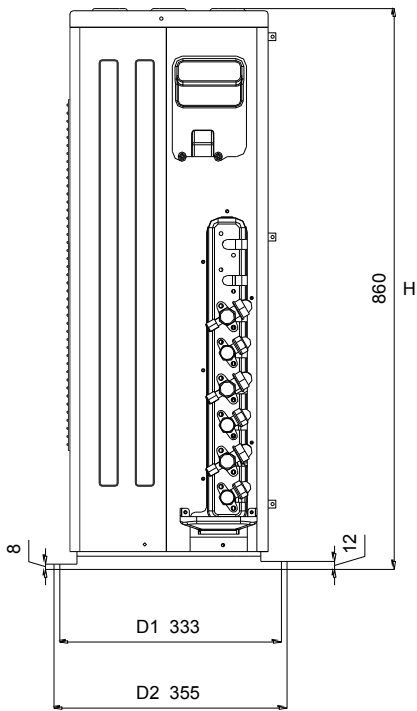
3. Dimensions

3.1 Out door

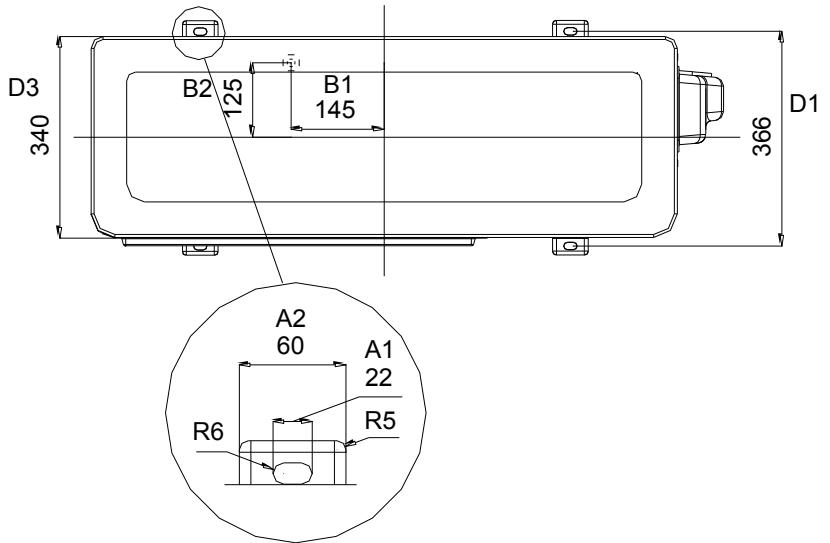
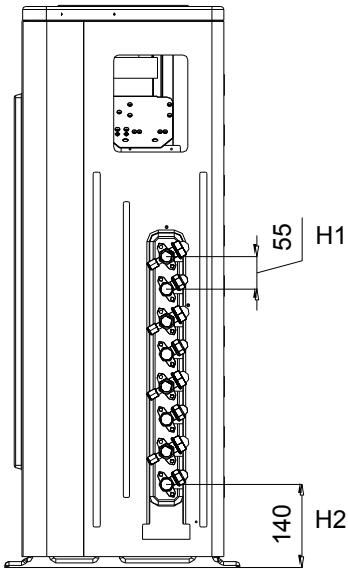
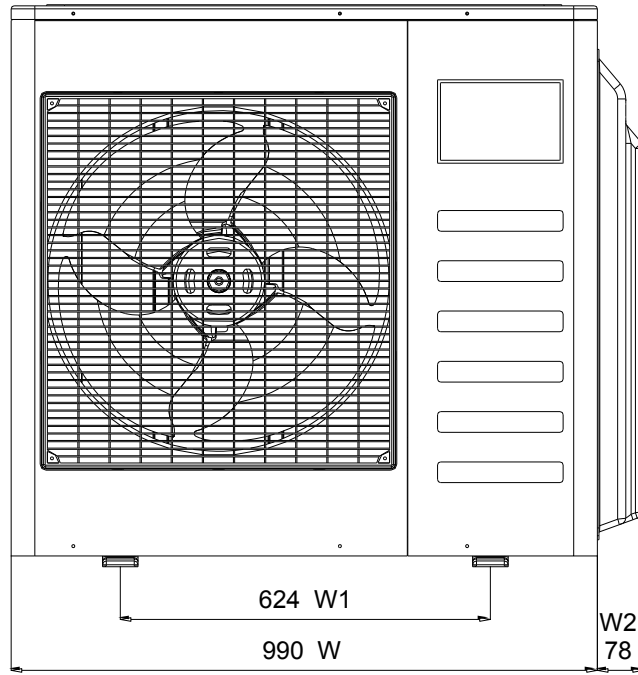
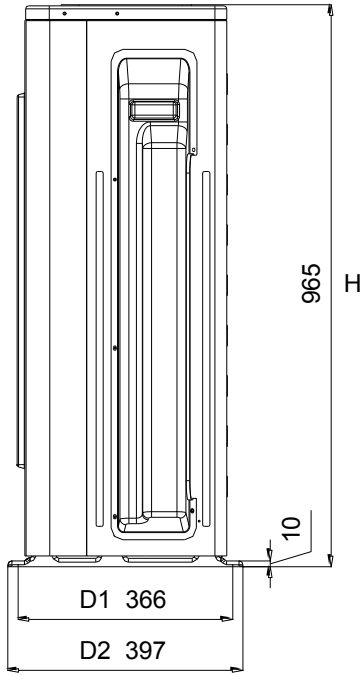
38QUS018DS2



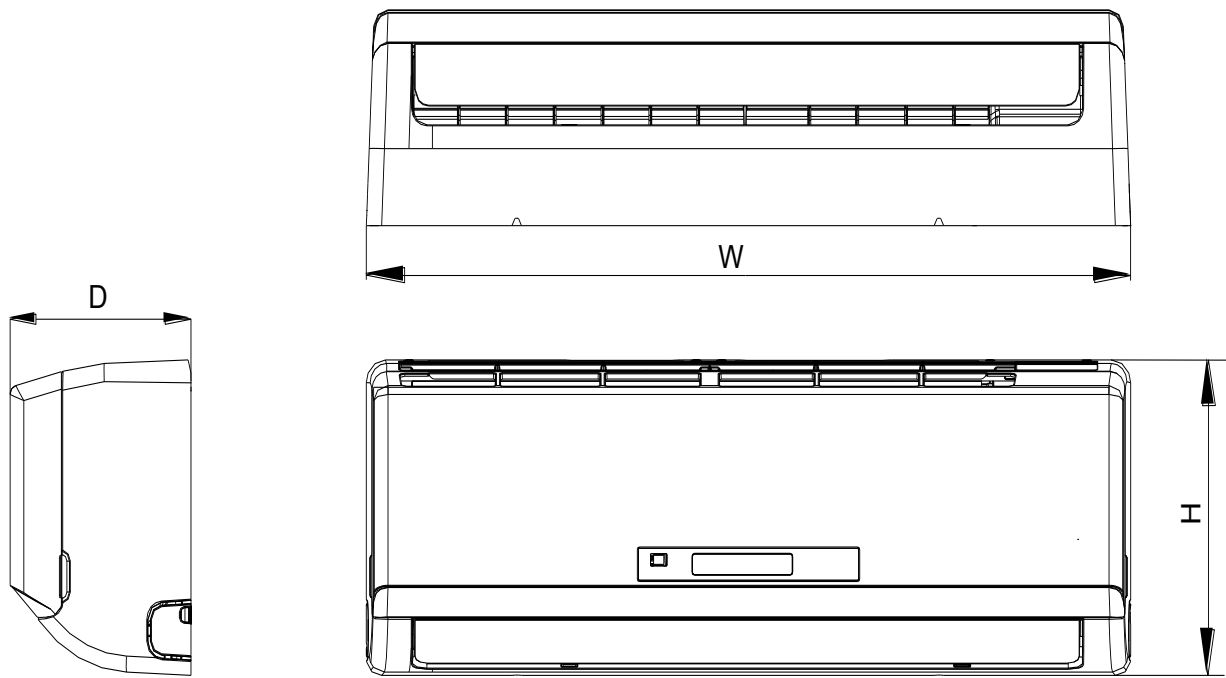
38QUS027DS3



38QUS036DS4

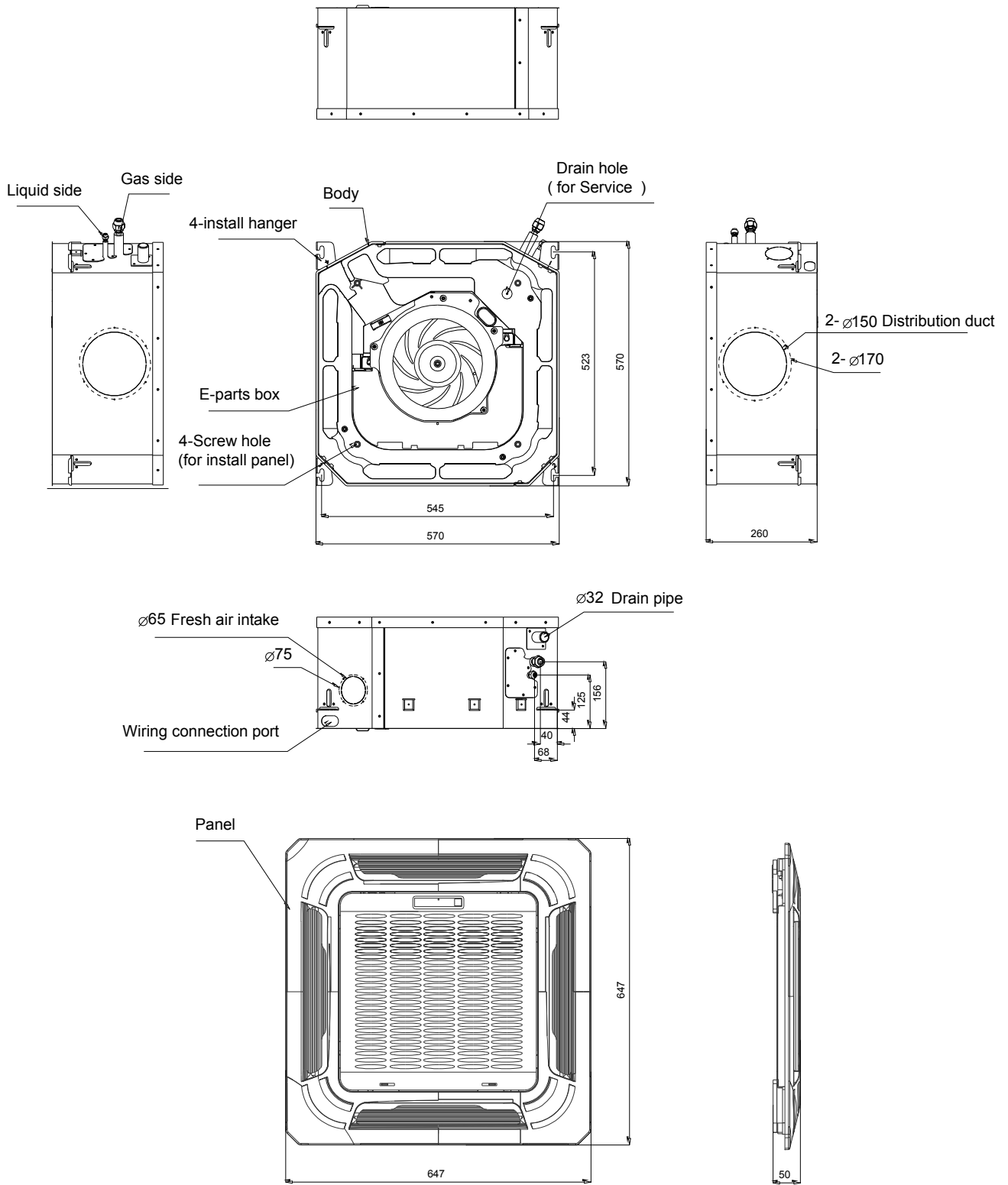


3.2 High wall



Model	W	D	H
42QHF009DS / 42QHF012DS	800	188	275
42QHF018DS	940	205	275

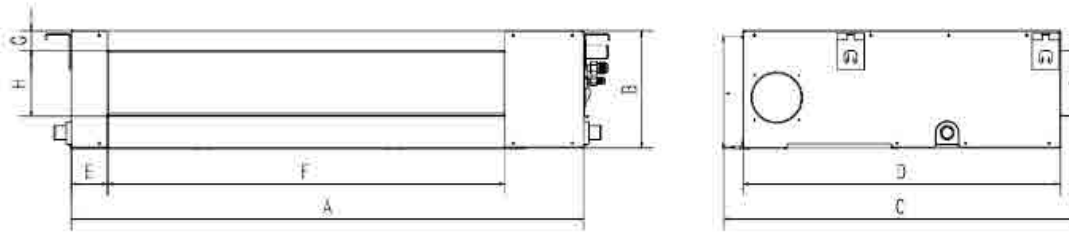
3.3 Four-way cassette (compact):



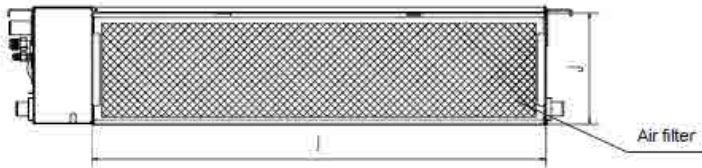
3.4 A5 Duct

Outline dimension and air outlet opening size

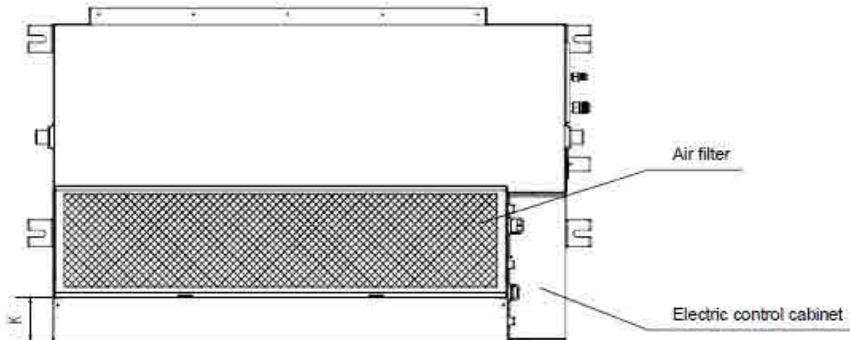
Unit: mm



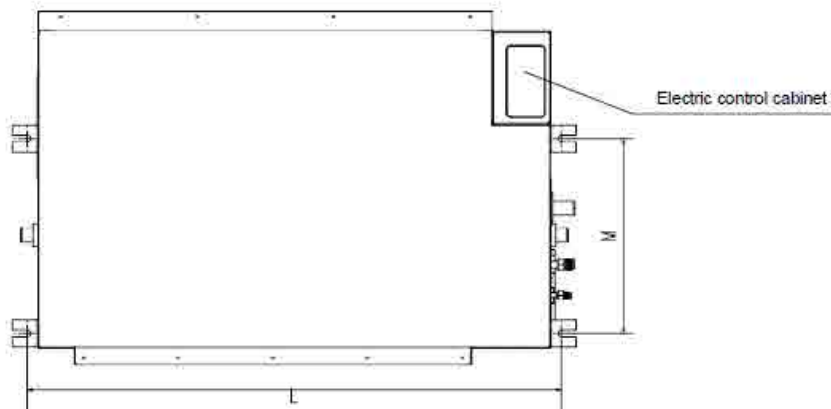
Air return opening size



Position size of descensional ventilation opening



Size of mounted lug

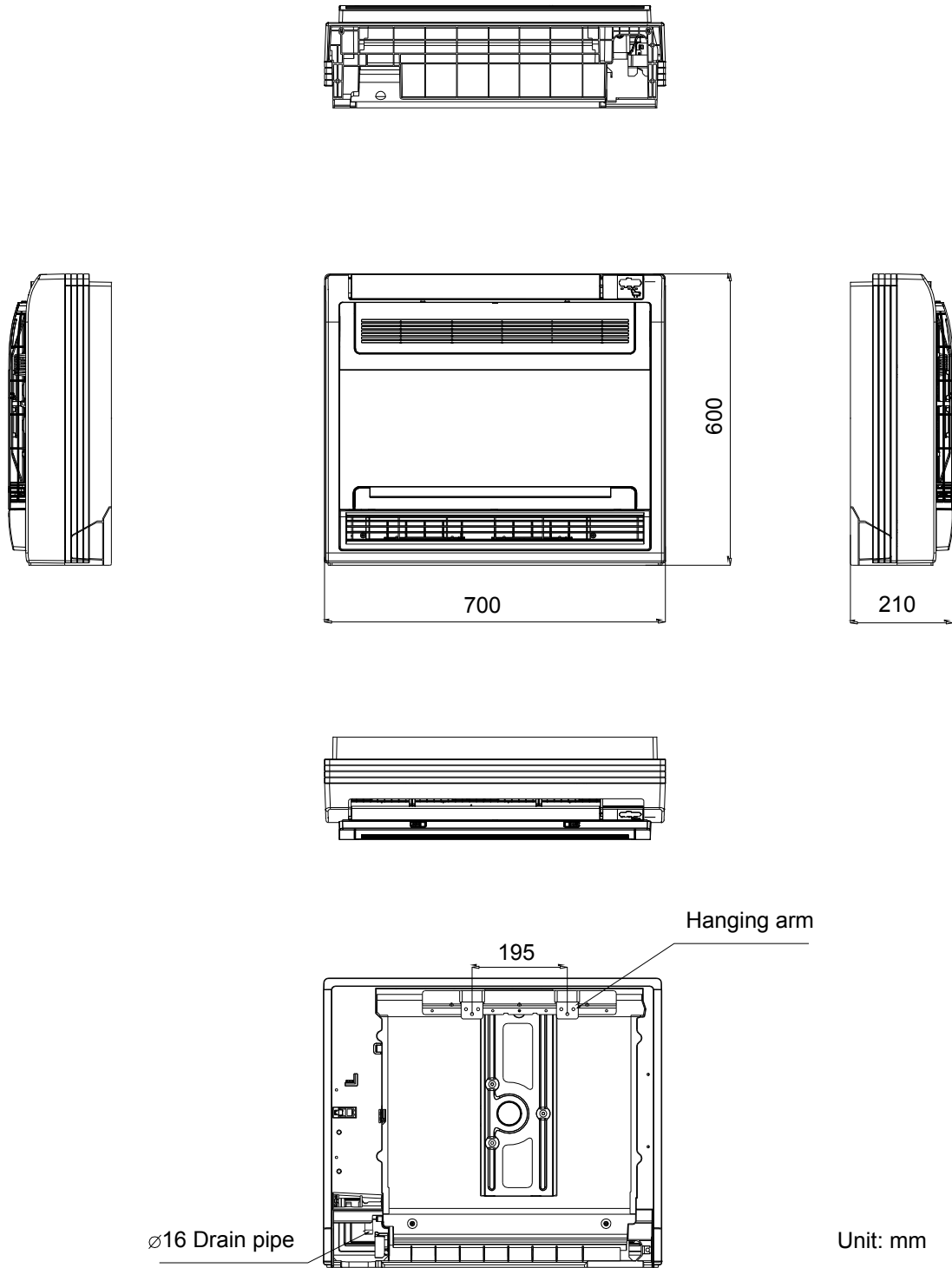


Note: standard product without filter

Unit: mm

Model (K)	Outline dimension				Air outlet opening size				Air return opening size			Size of install hanger		Size of refrigerant pipe			
	A	B	C	D	E	F	G	H	I	J	K	L	M	H1	H2	W1	W2
09/12	700	210	635	570	65	493	35	119	595	200	80	740	350	120	143	95	150
18	920	210	635	570	65	713	35	119	815	200	80	960	350	120	143	95	150

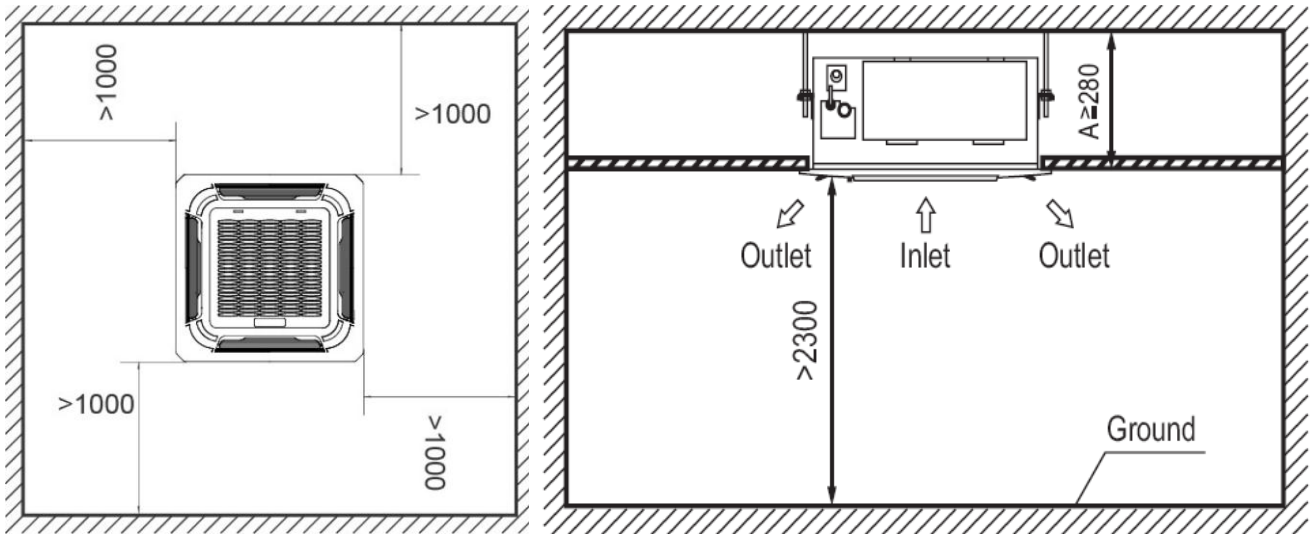
3.5 Console:
a. Wall mounting installation



Mode \ Dimension	A	B	C	D
42QFA009DS	700	600	210	195
42QFA012DS	700	600	210	195
42QFA018DS	700	600	210	195

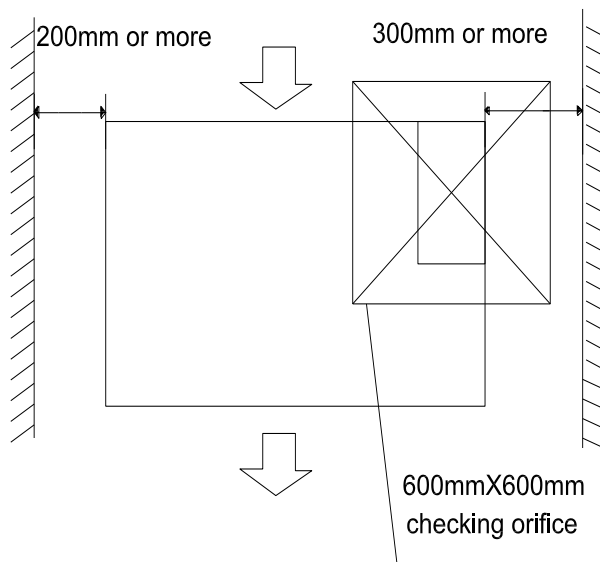
4. Service space for light commercial indoor

4.1 Four-way cassette (compact) (unit: mm)

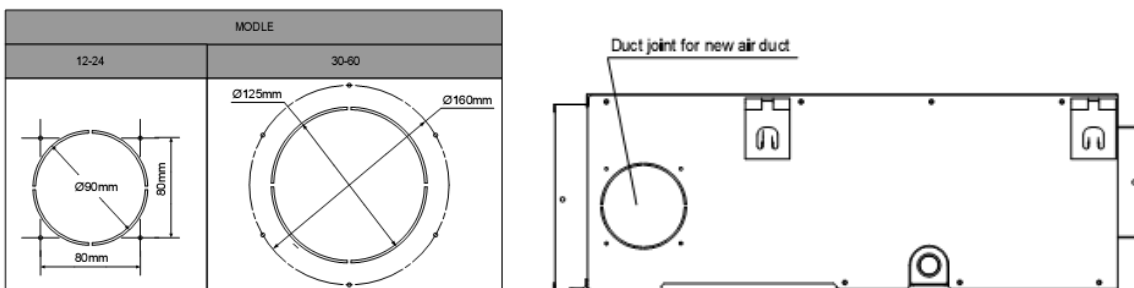


4.2 A5 Duct (unit: mm)

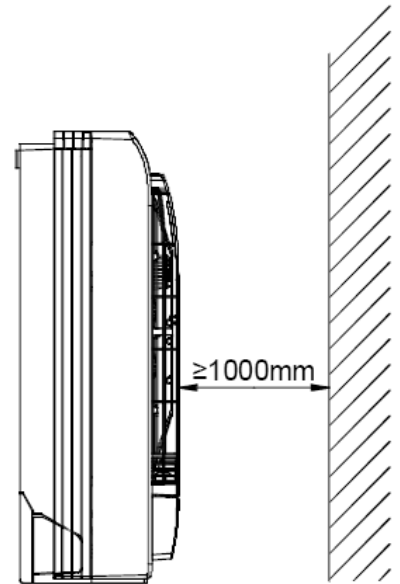
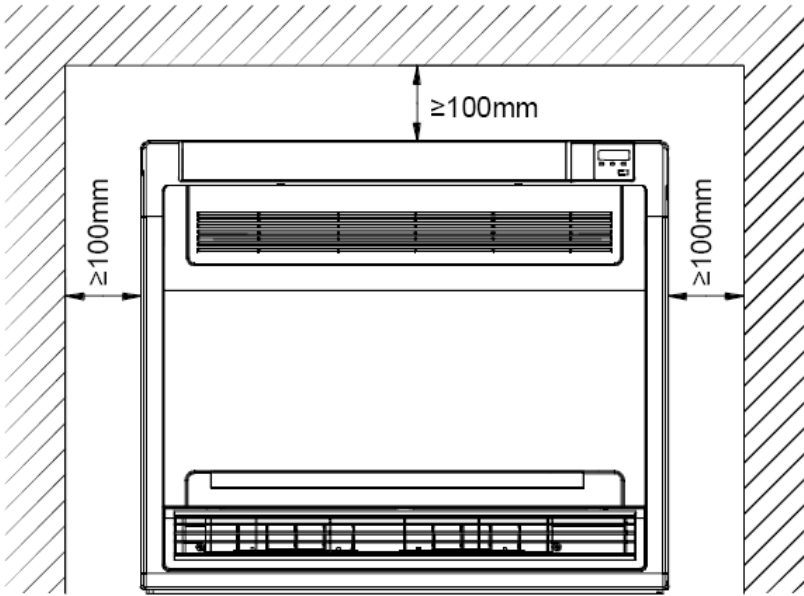
Ensure enough space required for installation and maintenance.



All the indoor units reserve the hole to joint the fresh air pipe. The hole size as following:

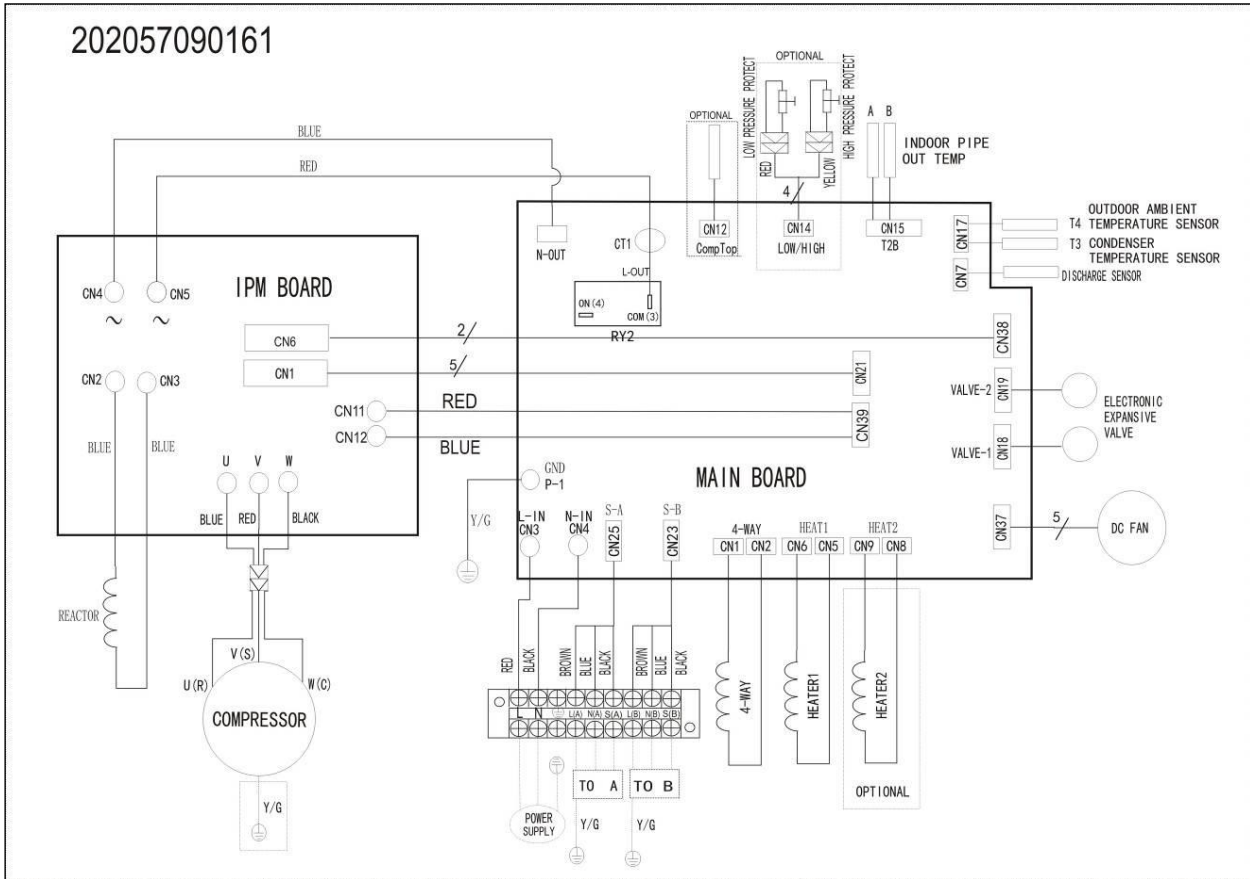


4.3 Console (unit: mm)

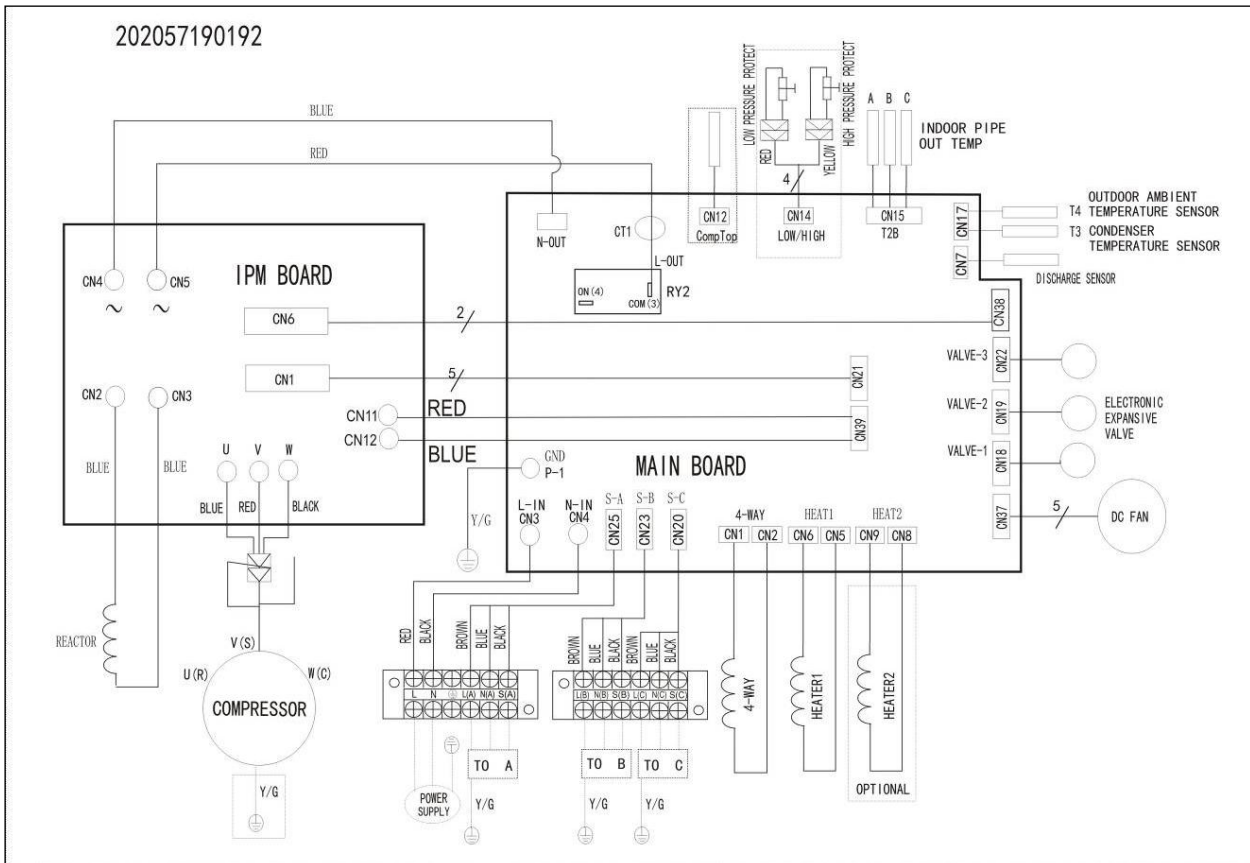


5. Wiring Diagram

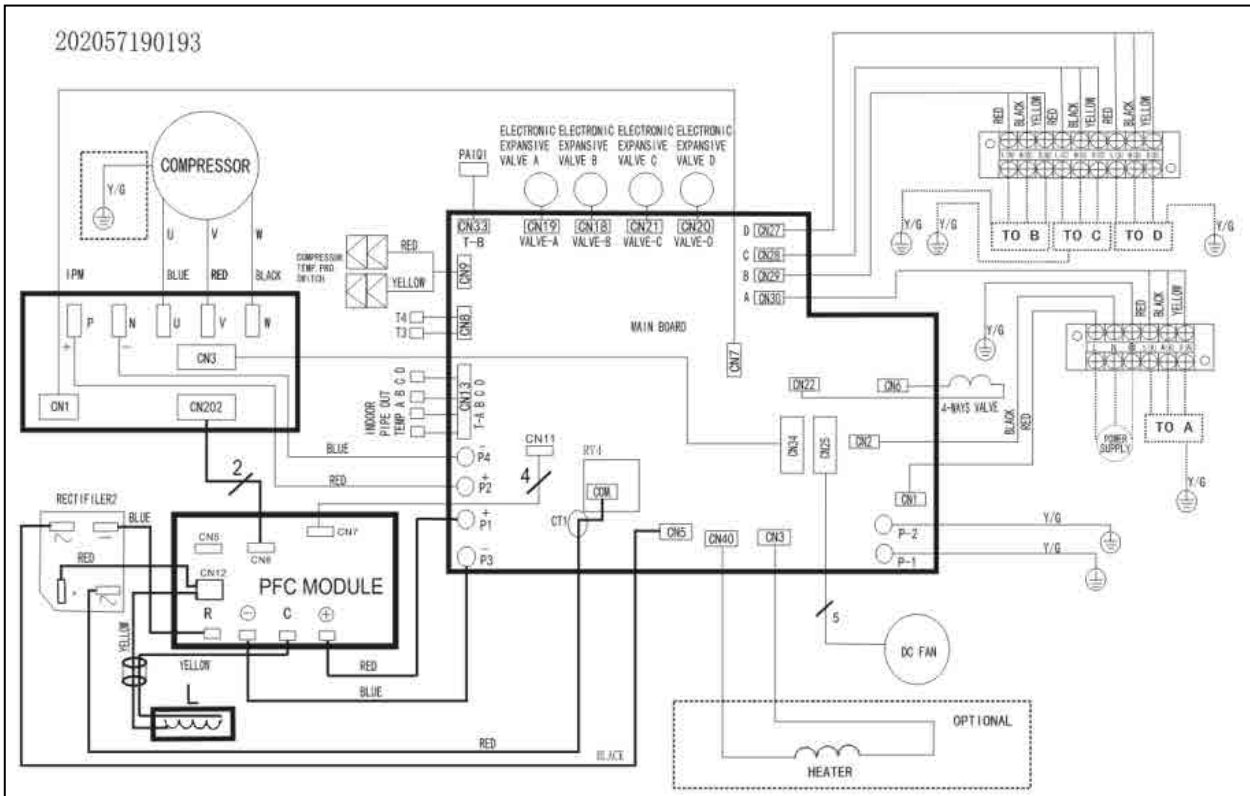
Outdoor (38QUS018DS2)



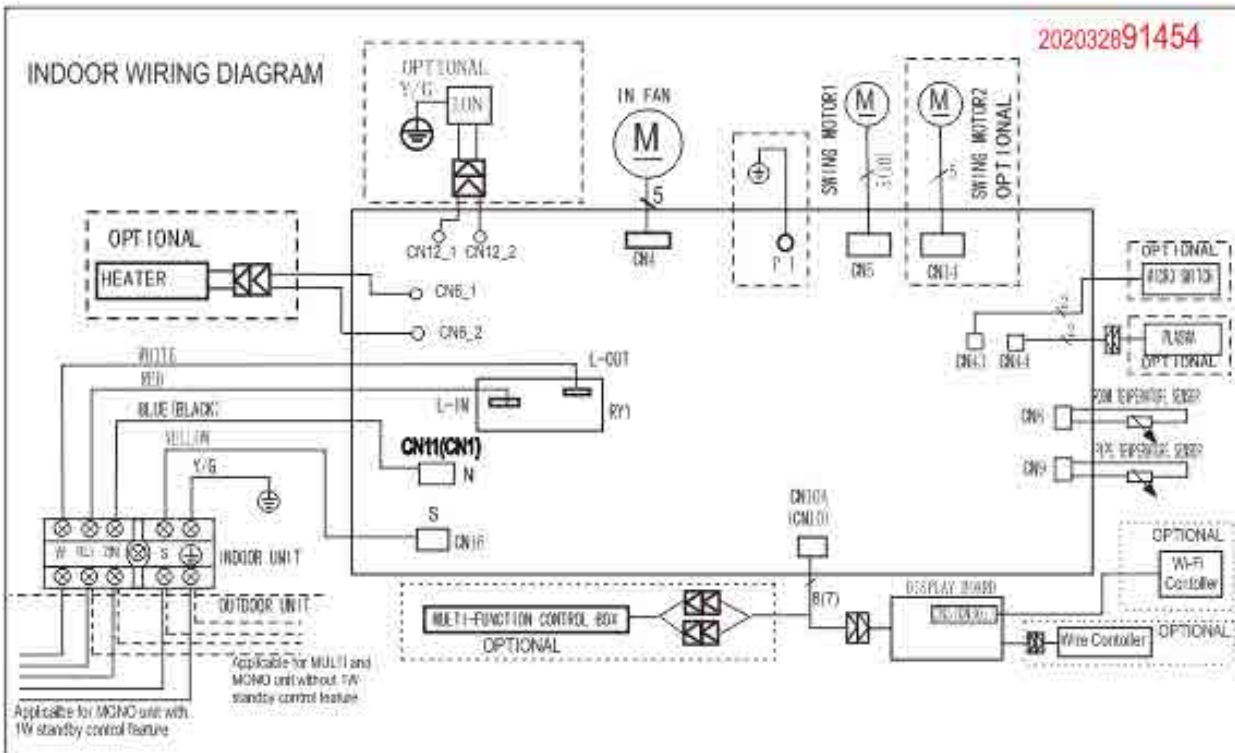
Outdoor (38QUS027DS3)



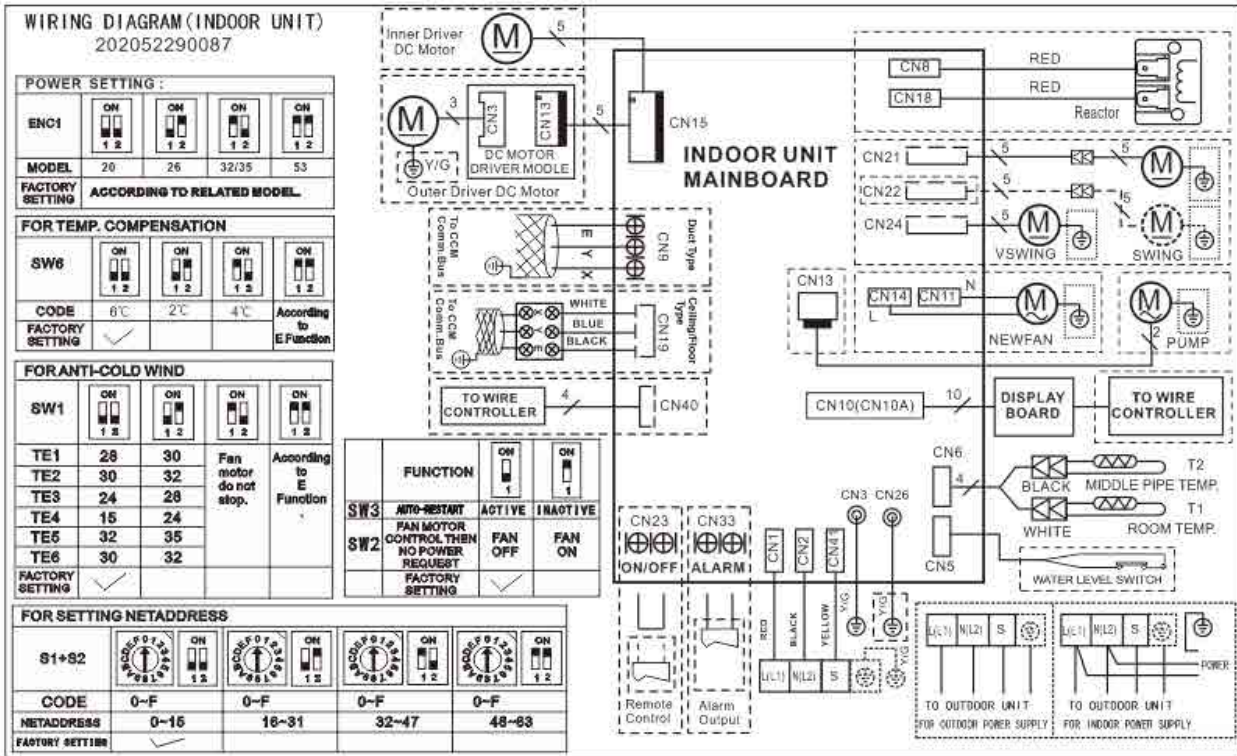
Outdoor (38QUS036DS4)



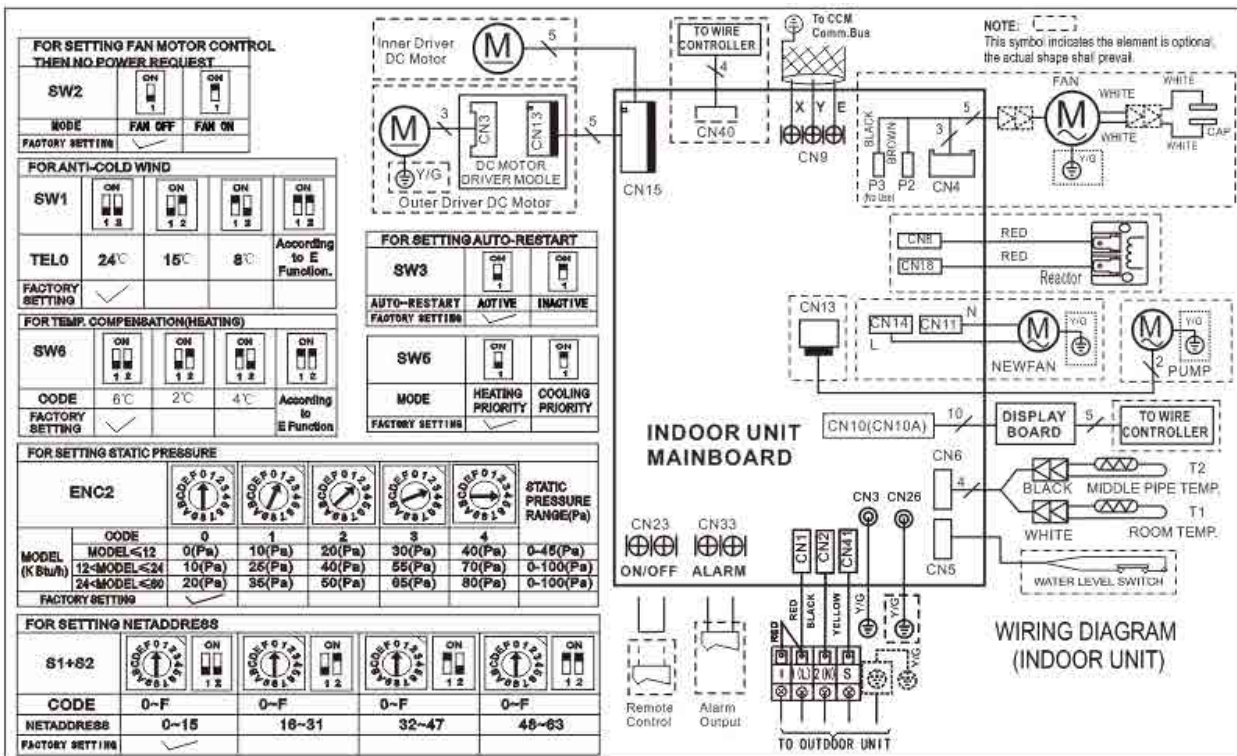
High wall (42QHF009DS & 42QHF012DS & 42QHF018DS)



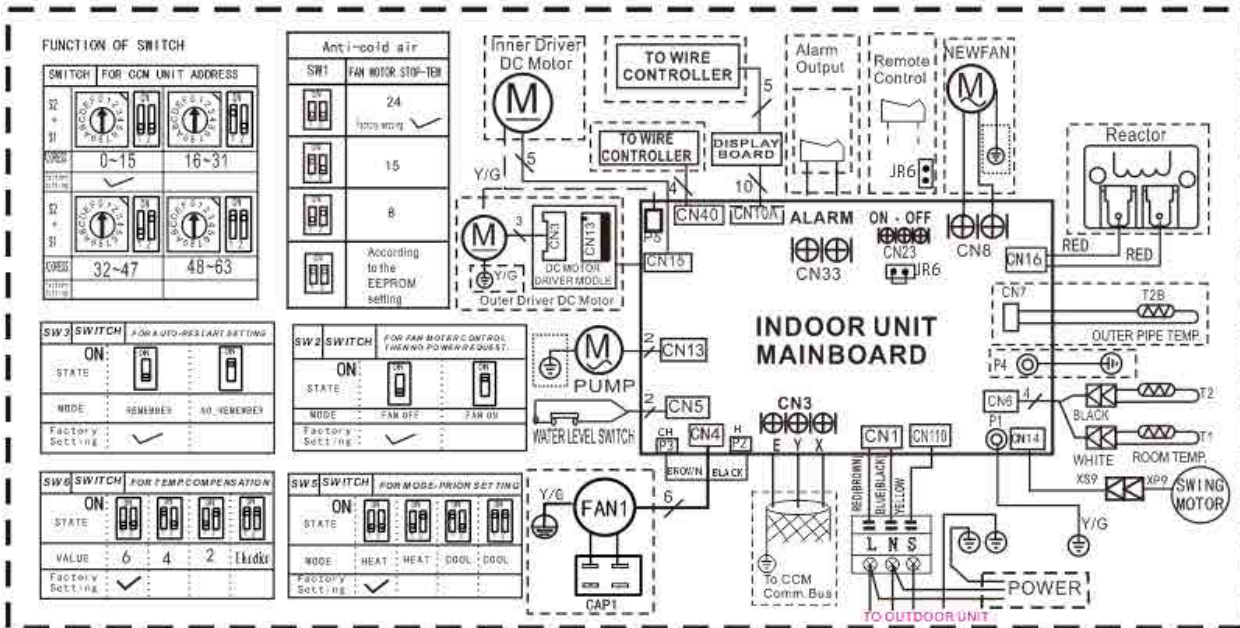
A5 Duct (42QSM009DS)



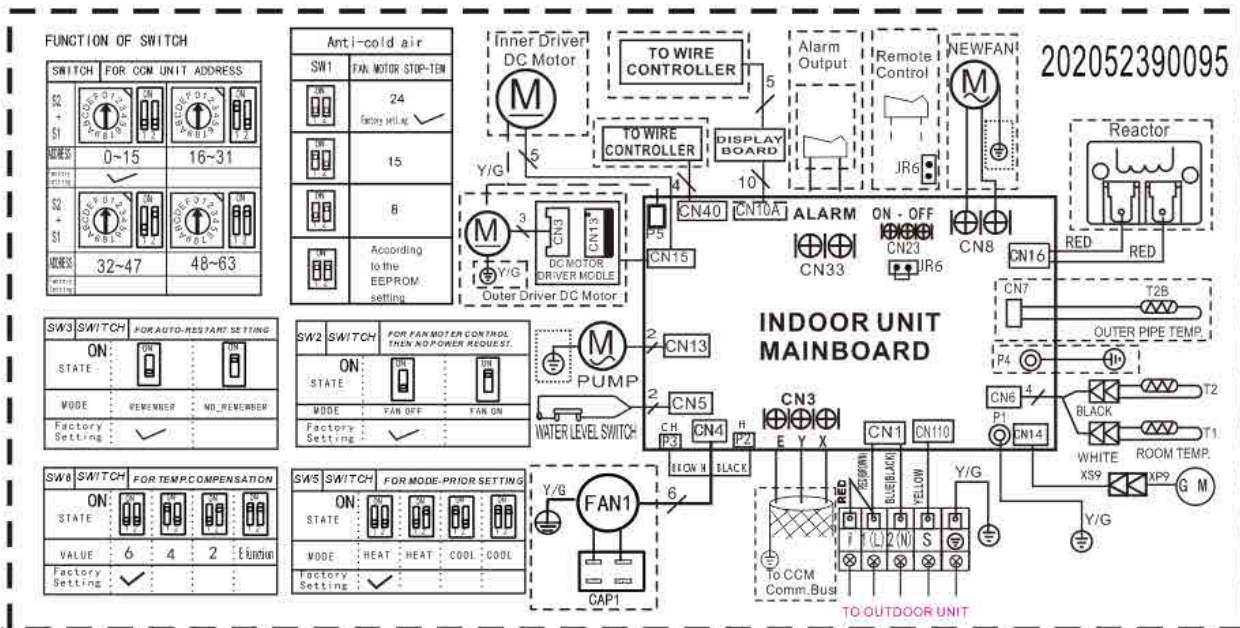
A5 Duct (42QSM012DS & 42QSM018DS)



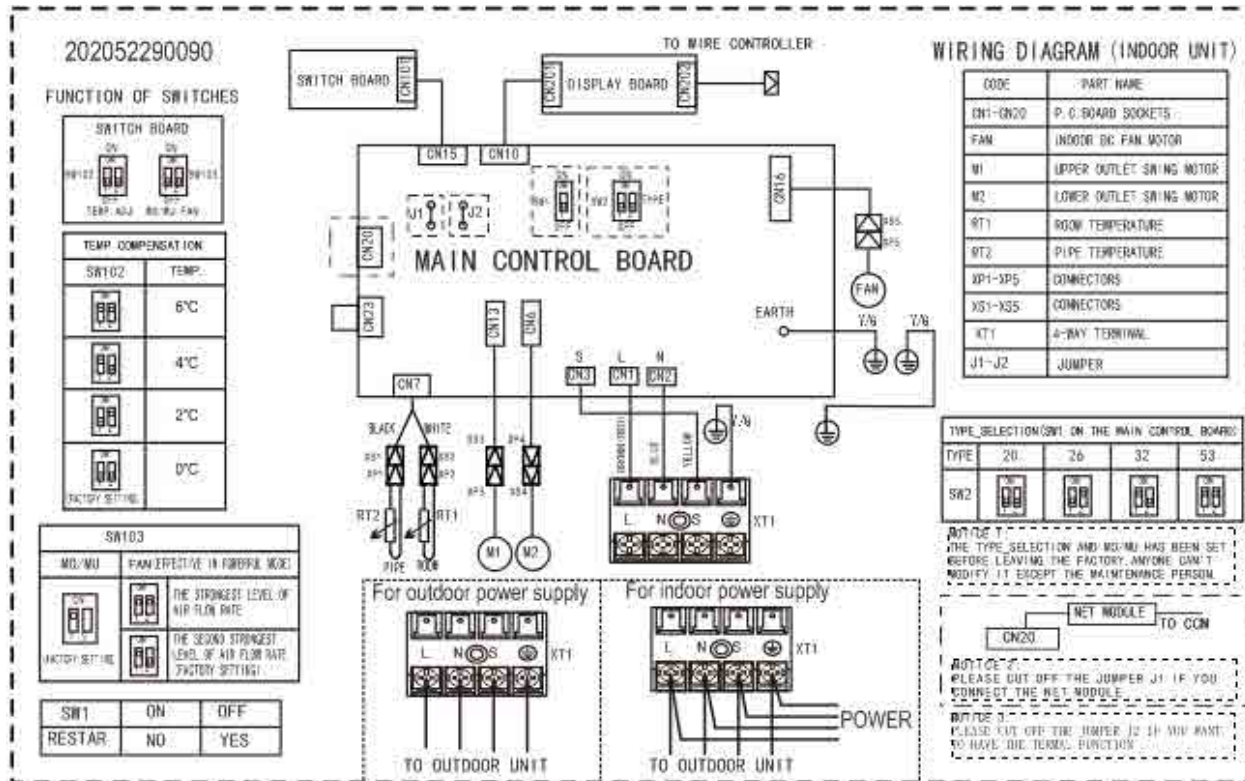
Four-way cassette (42QTD009DS)



Four-way cassette (42QTD012DS & 42QTD018DS)

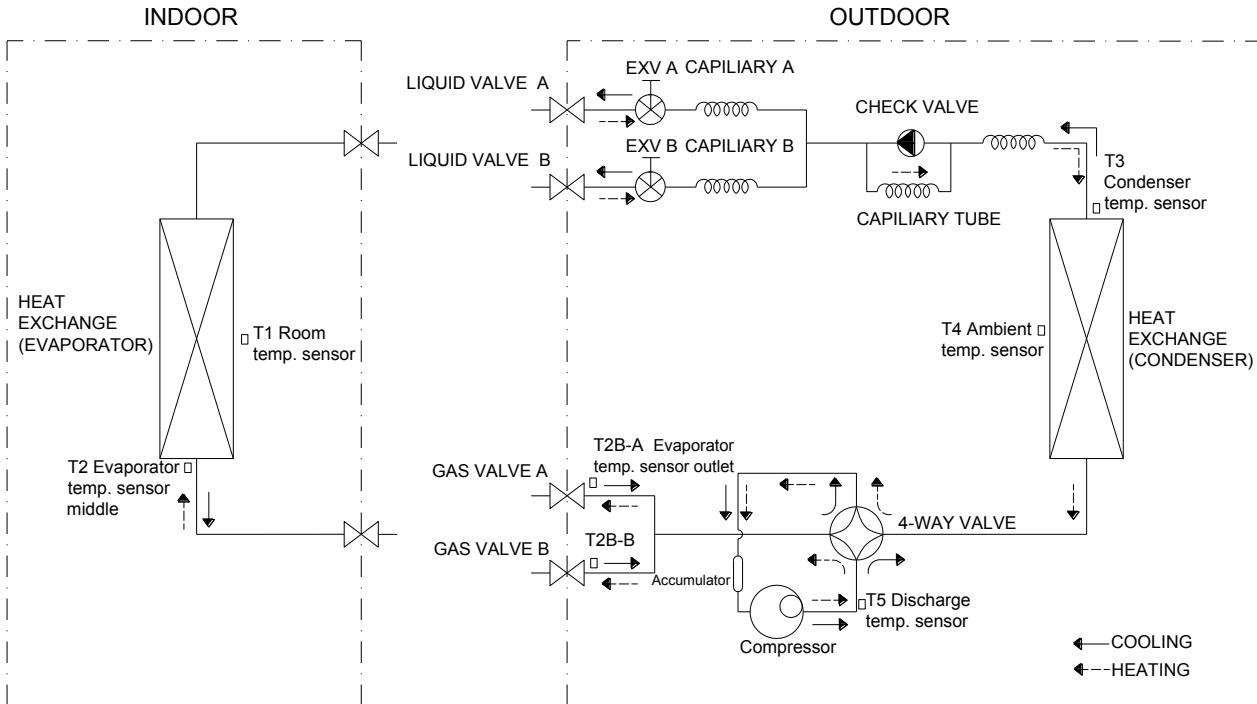


Console

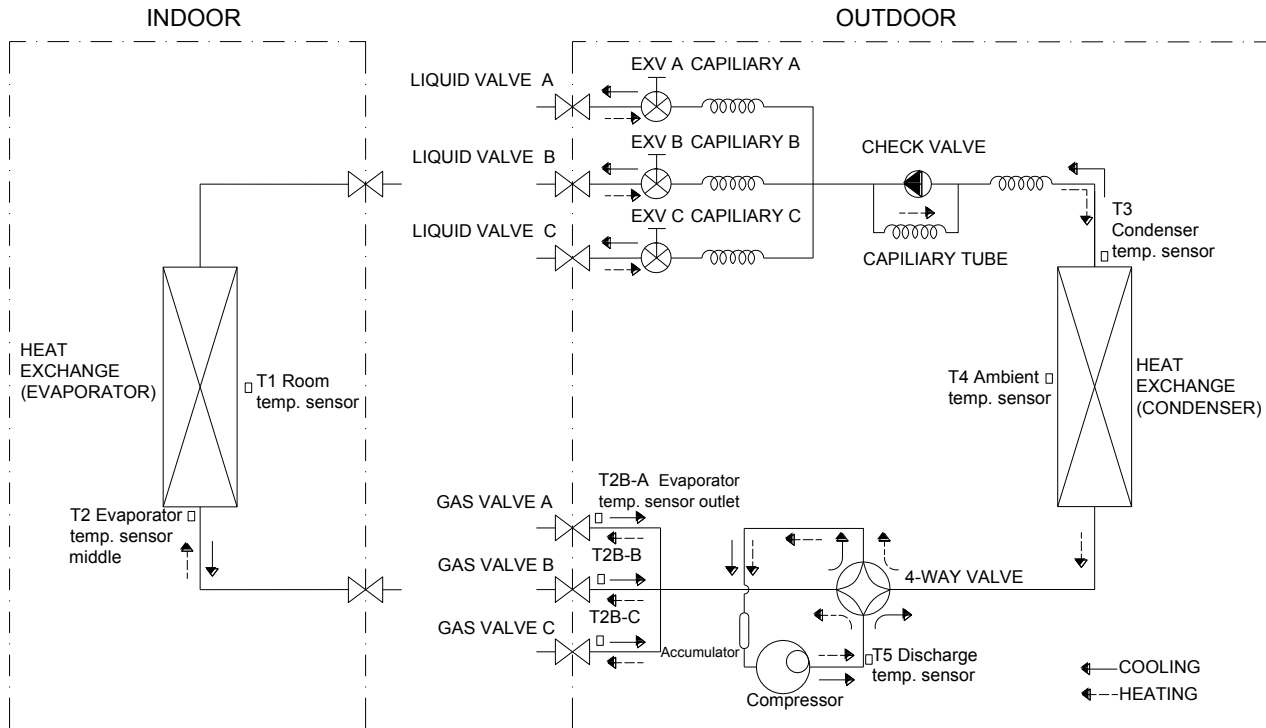


6. Refrigeration Cycle Diagram

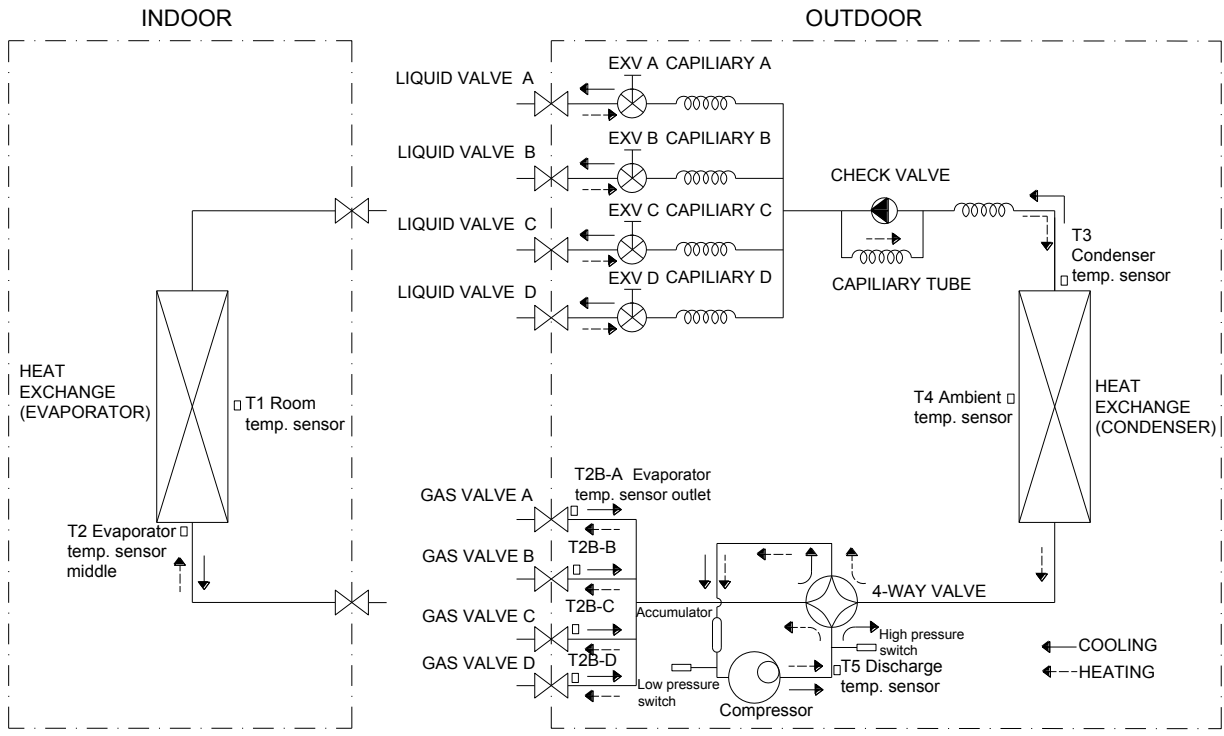
6.1 Refrigeration circuit drawing of 38QUS018DS2



6.2 Refrigeration circuit drawing of 38QUS027DS3



6.3 Refrigeration circuit drawing of 38QUS036DS4



7. Indoor units combination.

7.1 Indoor unit combination for 38QUS018DS2

One unit	Two unit
/	9+9
9	9+12
12	12+12
18	18+09*
/	18+12*

[*] means two indoor unit shall not operate simultaneously due to performance reduction.

7.2 Indoor unit combination for 38QUS027DS3

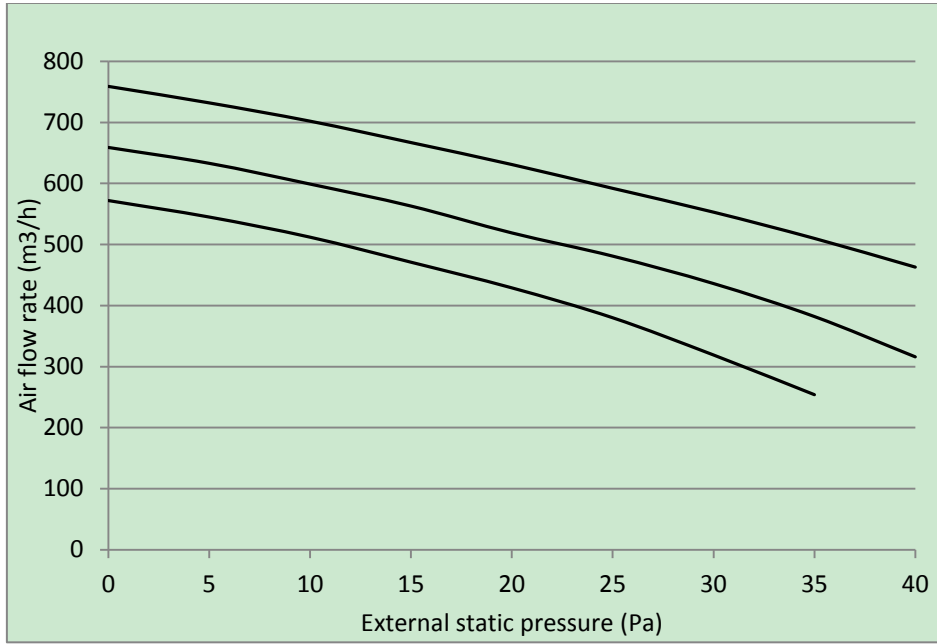
One unit	Two unit		Three unit	
9	9+9	12+18	9+9+9	9+12+12
12	9+12	12+18	9+9+12	12+12+12
18	9+18	18+18	9+9+18	/

7.3 Indoor unit combination for 38QUS036DS4

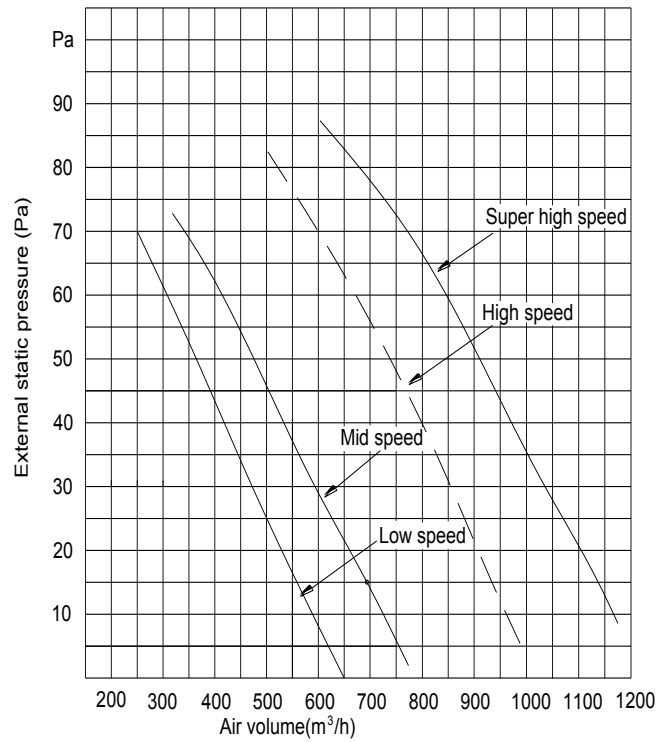
One unit	Two unit		Three unit			Four unit		
9	9+9	12+12	9+9+9	9+12+12	12+12+12	9+9+9+9	9+9+12+12	9+12+12+18
12	9+12	12+18	9+9+12	9+12+18	12+12+18	9+9+9+12	9+9+12+18	12+12+12+12
18	9+18	18+18	9+9+18	9+18+18	12+18+18	9+9+9+18	9+12+12+12	/

8. Static Pressure (Duct)

7,000-12,000Btu/h



18,000Btu/h



9.Operation Characteristics

Mode \ Temperature	Cooling operation	Heating operation
Room temperature	17°C ~ 32°C	0°C ~ 30°C
Outdoor temperature	0°C ~ 50°C	-15°C ~ 24°C
	(-15°C ~ 50°C : For the models with low temperature cooling system)	

CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.
2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.
3. The optimum performance will be achieved during this operating temperature zone.

10. Installation Details

10.1 Wrench torque sheet for installation

Outside diameter	Torque	Additional tightening torque
mm	N.cm	N.cm
Φ6.35	1500(153kgf.cm)	1600(163kgf.cm)
Φ9.52	2500(255kgf.cm)	2600(265kgf.cm)
Φ12.7	3500(357kgf.cm)	3600(367kgf.cm)

10.2 Connecting the cables

The power cord of connect should be selected according to the following specifications sheet.

Rated current of appliance	Nominal cross-sectional area (mm ²)
>3 and ≤6	0.75
>6 and ≤10	1
>10 and ≤16	1.5
>16 and ≤25	2.5

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

10.3 Pipe length and the elevation

Maximum piping length and height difference

		1 drive 2	1 drive 3	1 drive 4
Max. length for all rooms (m)		30	45	60
Max. length for one IU (m)		20	25	30
Max. height difference between IU and OU (m)	OU higher than IU	10	10	10
	OU lower than IU	15	15	15
Max. height difference between IUs (m)		10	10	10
Charge less length(m)		10	15	20

Additional refrigerant charge(R410A) = (Max. length for all rooms- Charge less length)*15 g/m

Note: When the pipe length is longer than charge less length, the additional refrigerant should be added according to the pipe length.

Caution:

- Refrigerant pipe diameter is different according to indoor unit to be connected. When using the extension pipe, refer to the tables below.
- When refrigerant pipe diameter is different from that of outdoor unit union (for 18K indoor unit), additional transfer connector needs to be used on outdoor unit union.

Indoor unit		Extension pipe diameter (mm/inch)		
Model	Pipe diameter (mm/inch)			
9K/12K	Liquid	6.35(1/4)	Liquid	6.35(1/4)
	Gas	9.52(3/8)	Gas	9.52(3/8)
18K	Liquid	6.35(1/4)	Liquid	6.35(1/4)
	Gas	12.7(1/2)	Gas	12.7(1/2)
Outdoor unit union diameter (mm/inch)				
Indoor unit A/B/C/D			Liquid	6.35(1/4)
			Gas	9.52(3/8)

10.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

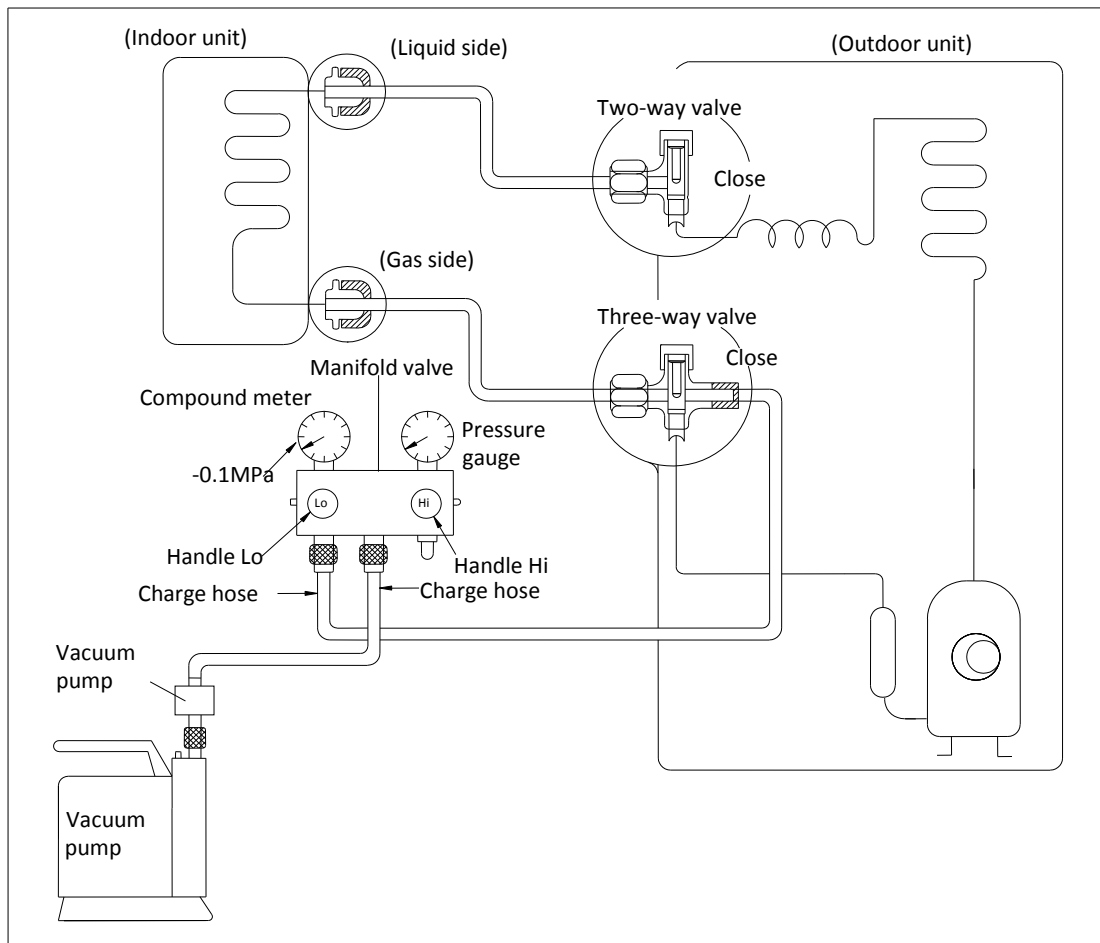
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

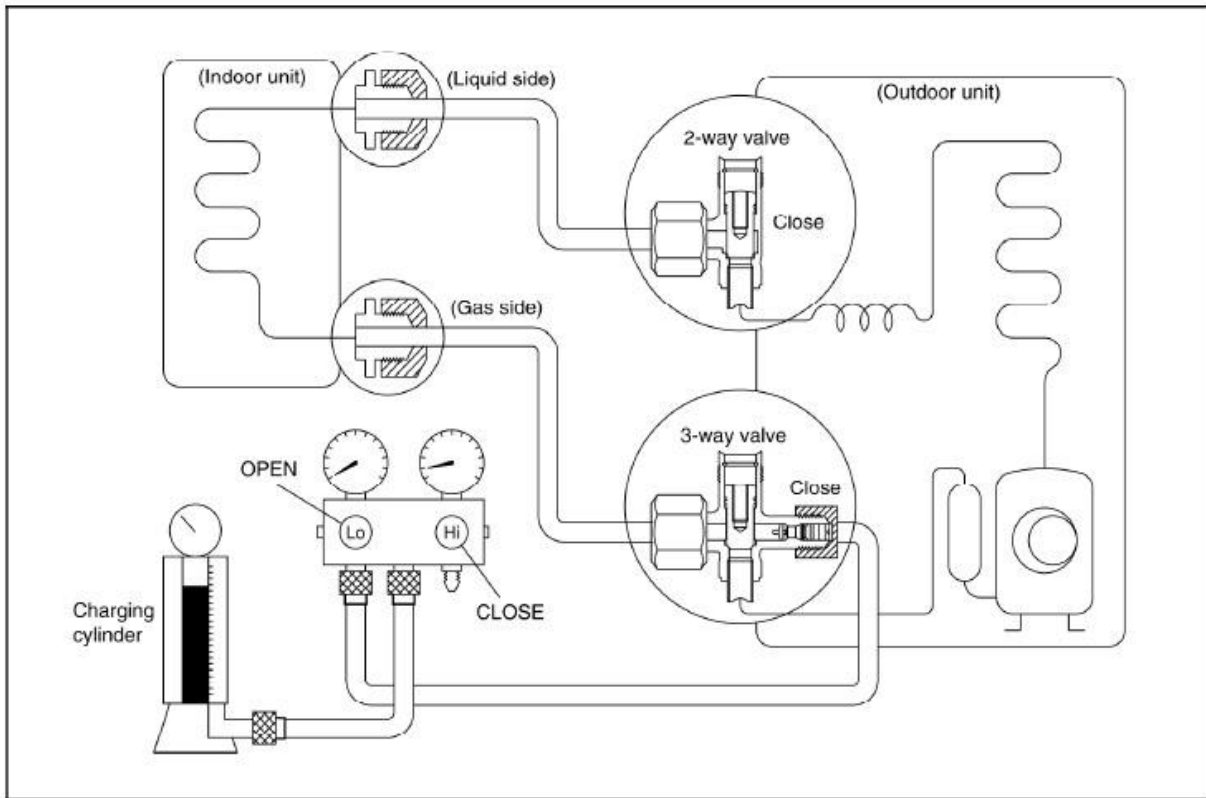
Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump



- 1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
- 2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
- 3) Connect the charge hose of handle hi connection to the vacuum pump.
- 4) Fully open the handle Lo of the manifold valve.
- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points. Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.
- 8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

2. Air purging by refrigerant



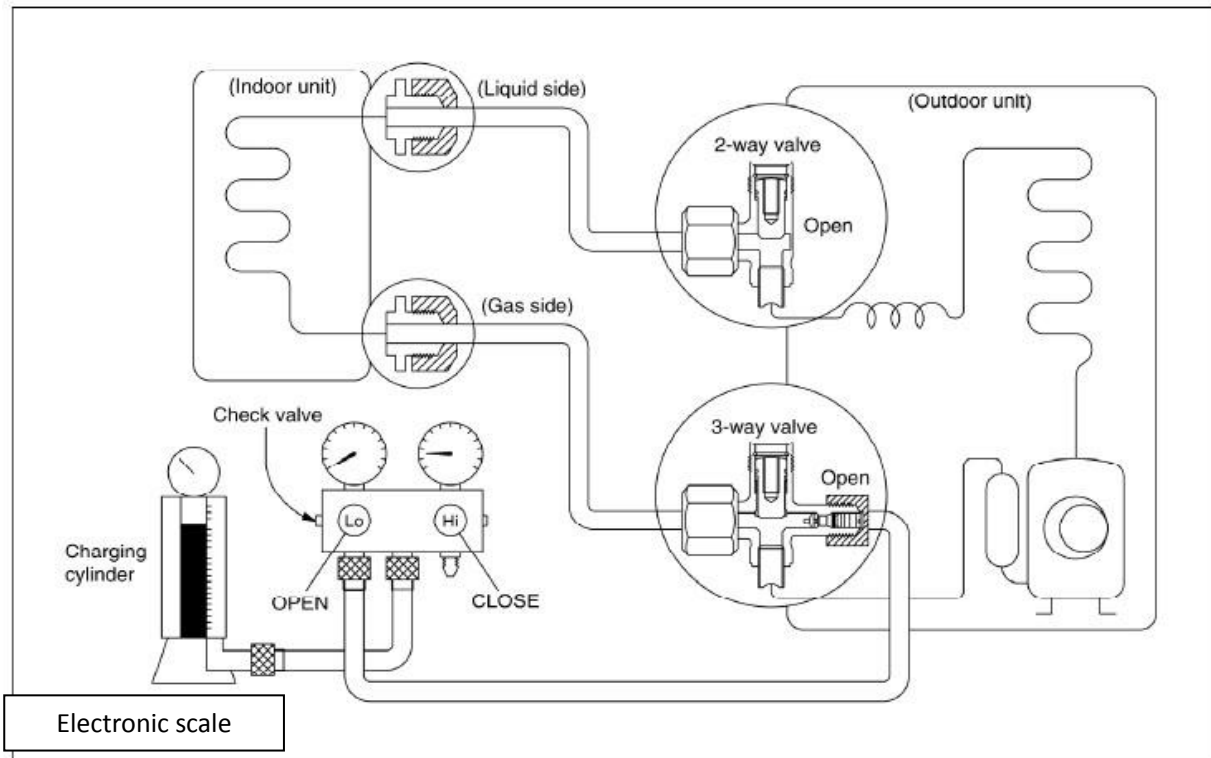
Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the closed position.
- 2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.
- 3). Air purging.
Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.
After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.
- 4). Check the gas leakage.
Check the flare connections for gas leakage.
- 5). Discharge the refrigerant.
Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45° until the gauge indicates 0.3 to 0.5 M Pa.
- 6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.
Be sure to use a hexagonal wrench to operate the valve stems.
- 7). Mount the valve stems nuts and the service port cap.
- 8) Be sure to check the gas leakage.
Brush some bubble water at connections which have been connected during installation especially for the valve connections

Note:

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

3. Adding the refrigerant if the pipe length >5m



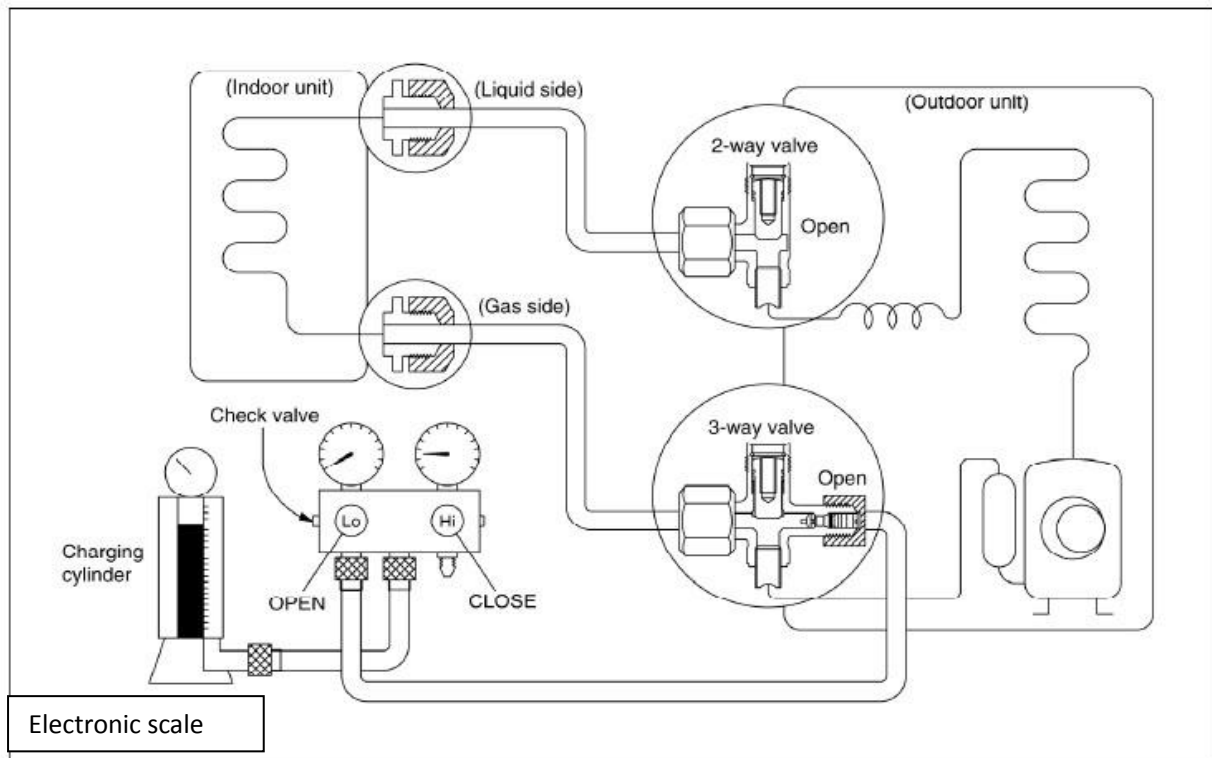
Procedure:

- 1) Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.
Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.
- 2) Purge the air from the charge hose.
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4) Operate the air conditioner at the cooling mode.
- 5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.
- 6) When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- 7) Mount the valve stem caps and the service port
- 8) Be sure to check the gas leakage.
Brush some bubble water at connections which have been connected during installation especially for the valve connections

Note:

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m..

10.5 Adding the refrigerant after running the system for many years



Procedure:

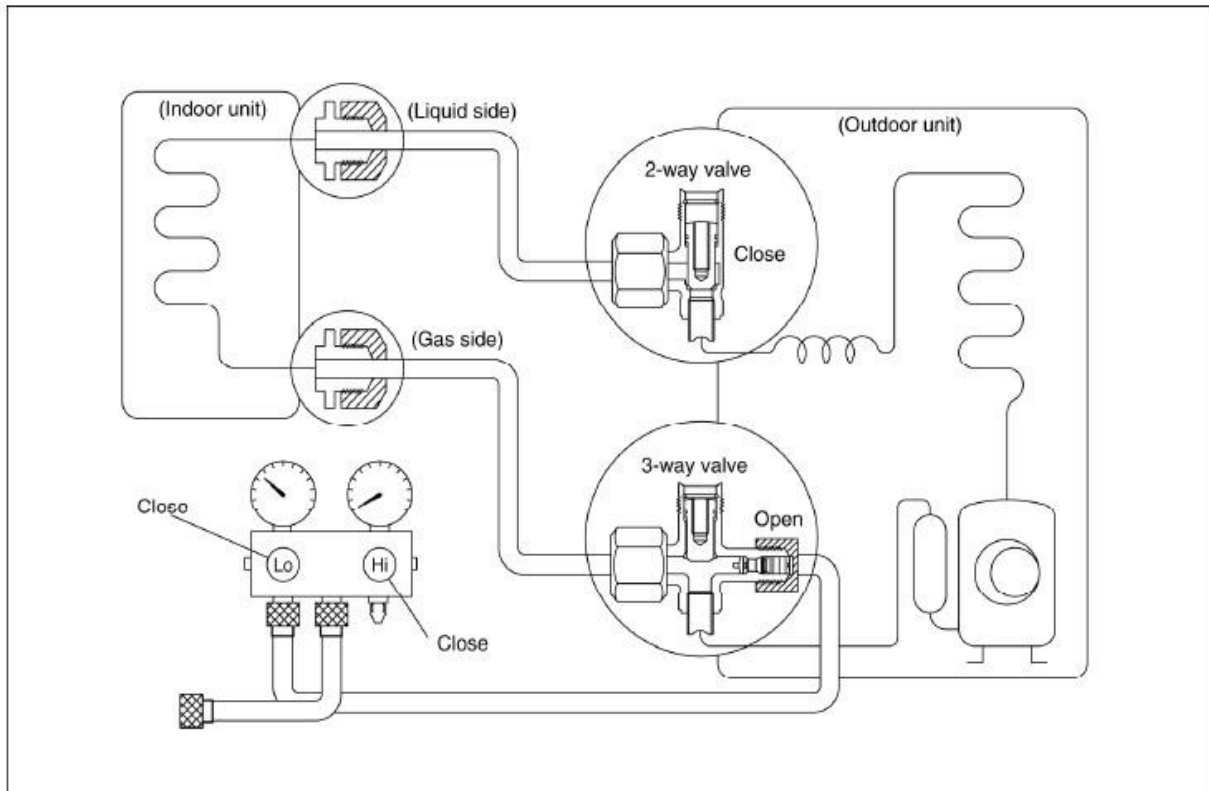
- 1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve. Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.
- 2). Purge the air from the charge hose.
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4) Operate the air conditioner at the cooling mode.
- 5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.
- 6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- 7). Mount the valve stem caps and the service port
- 8) Be sure to check the gas leakage.
Brush some bubble water at connections which have been connected during installation especially for the valve connections

Note:

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

10.6 Re-installation while the indoor unit needs to be repaired

1. Collecting the refrigerant into the outdoor unit



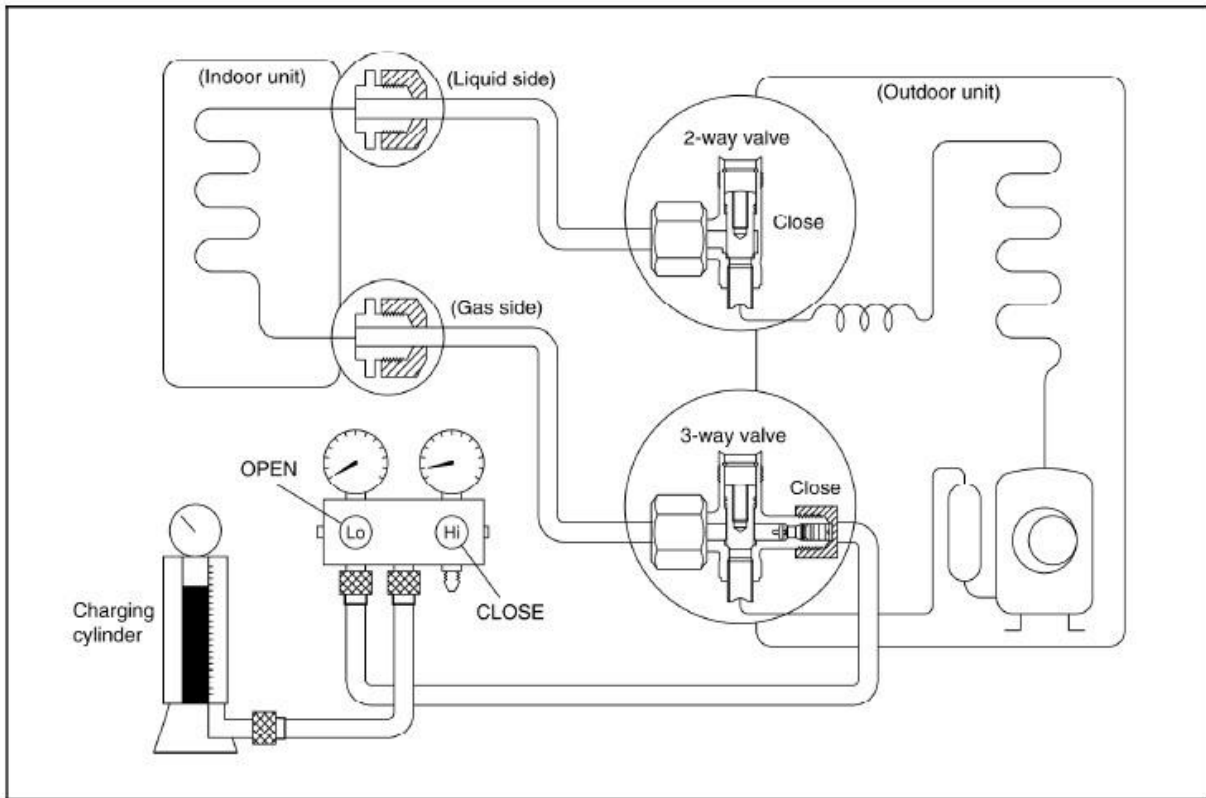
Procedure

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position
Remove the valve stem caps and confirm that the valve stems are in the opened position.
Be sure to use a hexagonal wrench to operate the valve stems.
- 2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.
- 3). Air purging of the charge hose.
Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.
- 4). Set the 2-way valve to the close position.
- 5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.
- 6). Set the 3-way valve to the closed position immediately
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.
Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.
- 7) Be sure to check the gas leakage.
Brush some bubble water at connections which have been connected during installation especially for the valve connections

Note:

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

2. Air purging by the refrigerant



Procedure:

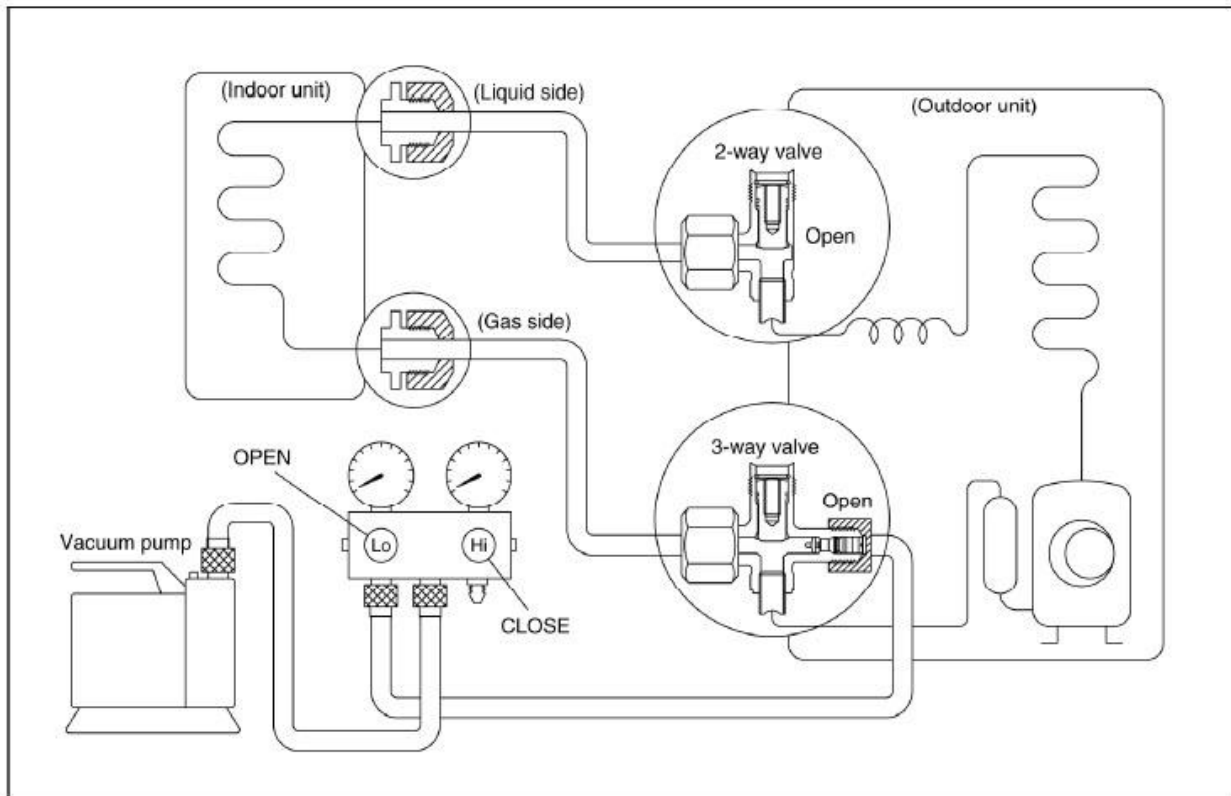
- 1). Confirm that both the 2-way and 3-way valves are set to the closed position.
- 2). Connect the charge set and a charging cylinder to the service port of the 3-way valve
Leave the valve on the charging cylinder closed.
- 3). Air purging.
Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.
After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.
- 4). Check the gas leakage
Check the flare connections for gas leakage.
- 5). Discharge the refrigerant.
Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45° until the gauge indicates 0.3 to 0.5 MPa.
- 6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position
Be sure to use a hexagonal wrench to operate the valve stems.
- 7). Mount the valve stems nuts and the service port cap
- 8) Be sure to check the gas leakage.
Brush some bubble water at connections which have been connected during installation especially for the valve connections

Note:

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

10.7 Re-installation while the outdoor unit needs to be repaired

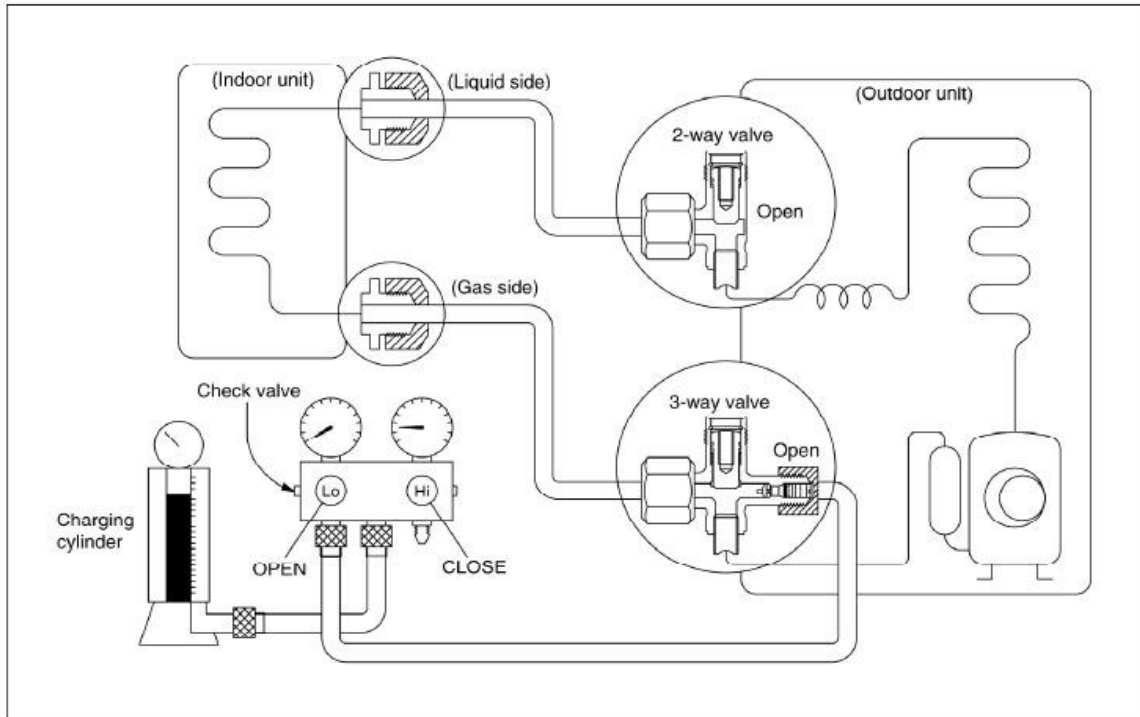
1. Evacuation for the whole system



Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position.
- 2). Connect the vacuum pump to 3-way valve's service port.
- 3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa .
- 4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

- 1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve
Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.
- 2). Purge the air from the charge hose
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant
If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.
- 5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately
If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.
- 6). Mounted the valve stem caps and the service port
Use torque wrench to tighten the service port cap to a torque of 18N.m.
- 7) Be sure to check for gas leakage
Brush some bubble water at connections which have been connected during installation especially for the valve connections

11. Electronic control function

11.1 Abbreviation

T1: Indoor ambient temperature

T2: Coil temperature of indoor heat exchanger middle.

T2B: Coil temperature of indoor heat exchanger outlet.

T3: Coil temperature of outdoor heat exchanger

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

T s: Setting temperature

11.2 Electric control working environment.

9.2.1 Input voltage: 198V~264V.

9.2.2 Input power frequency: 50Hz.

9.2.3 Indoor fan normal working amp. is less than 1A.

9.2.4 Outdoor fan. normal working amp. is less than 1.5A.

9.2.5 Four-way valve normal working amp. is less than 1A.

11.3 Outdoor unit's digital display tube

There is a digital display tube in outdoor PCB.

Digital display tube display function

- In standby , the LED displays “- -”
- In compressor operation, the LED display the running frequency,
- In defrosting mode, The LED displays “dF” or alternative displays between running frequency and “dF”(each displays 0.5s)
- In compressor pre-heating, The LED displays “PH” or alternative displays between running frequency and “PH”(each displays 0.5s)
- During the oil return process, The LED displays “RO” or alternative displays between running frequency and “RO”(each displays 0.5s)
- In low ambient cooling mode, the LED displays “LC” or alternative displays between running frequency and “LC”(each displays 0.5s)
- In forced cooling mode, the LED displays “FC” or alternative displays between running frequency and “FC”(each displays 0.5s)
- When PFC module protection occurs three times within 15 minutes, the LED displays “E6” or alternative displays between running frequency and “E6”(each displays 0.5s)
- In protection or malfunction, the LED displays error code or protection code.

11.4 Outdoor unit point check function

There is a check switch in outdoor PCB.

Press the switch N times it will display the content corresponding to No. N. After getting into the check function, it will display No. N with 1.5s, meanwhile the low bit decimal of digit display flashing, indicated to get into the check function display. After 1.5s, it will display the content corresponding to No. N.

the digital display tube will display the follow procedure when push SW1 each time.

	Display	Remark
0	Normal display	Display running frequency, running state or malfunction code
1	No. of indoor units in good connection	Actual data
2	Outdoor unit running mode code	Off:0,Fan only 1, Cooling:2, Heating:3, Forced cooling:4
3	A indoor unit capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display tube will show: "____" (7K:0.8HP, 9K:1HP,12K:1.2HP,18K:1.5HP)
4	B indoor unit capacity	
5	C indoor unit capacity	
6	D indoor unit capacity	
7	E indoor unit capacity	
8	A Indoor unit capacity demand code	Norm value*HP (7K:0.8HP, 9K:1HP,12K:1.2HP,18K:1.5HP)
9	B Indoor unit capacity demand code	
10	C Indoor unit capacity demand code	
11	D Indoor unit capacity demand code	
12	E Indoor unit capacity demand code	
13	Total indoor units amendatory capacity demand code	Forced cooling:7
14	The frequency corresponding to the total indoor units amendatory capacity demand	
15	The frequency after the frequency limit	
16	The frequency sending to compressor control chip	
17	A indoor unit evaporator outlet temp.(T _{2B} A)	If the temp. is lower than -9 degree, the digital display tube will show "-9".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "____"
18	B indoor unit evaporator outlet temp.(T _{2B} B)	
19	C indoor unit evaporator outlet temp.(T _{2B} C)	
20	D indoor unit evaporator outlet temp.(T _{2B} D)	
21	E indoor unit evaporator outlet temp.(T _{2B} E)	
22	A indoor unit room temp.(T ₁ A)	If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 50 degree, the digital display tube will show "50". If the indoor unit is not connected, the digital display tube will show: "____"
23	B indoor unit room temp.(T ₁ B)	
24	C indoor unit room temp.(T ₁ C)	
25	D indoor unit room temp.(T ₁ D)	
26	E indoor unit room temp.(T ₁ E)	
27	A indoor unit evaporator temp.(T ₂ A)	If the temp. is lower than -9 degree, the digital display tube will show "-9".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "____"
28	B indoor unit evaporator temp.(T ₂ B)	
29	C indoor unit evaporator temp.(T ₂ C)	
30	D indoor unit evaporator temp.(T ₂ D)	
31	E indoor unit evaporator temp.(T ₂ E)	
32	Condenser pipe temp.(T ₃)	
33	Outdoor ambient temp.(T ₄)	
34	Compressor discharge temp.(T ₅)	The display value is between 30~129 degree. If the temp. is lower than 30 degree, the digital display tube will show "30".If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. For example, the digital display tube show "0.5",it means the compressor discharge temp. is 105 degree.)
35	AD value of current	The display value is hex number.
36	AD value of voltage	For example, the digital display tube shows "Cd", it means AD value is 205.

37	EXV open angle for A indoor unit	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example, the digital display tube show "2.0", it means the EXV open angle is 120×4=480p.)		
38	EXV open angle for B indoor unit			
39	EXV open angle for C indoor unit			
40	EXV open angle for D indoor unit			
41	EXV open angle for E indoor unit			
42	Frequency limit symbol	Bit7	Frequency limit caused by IGBT radiator	The display value is hex number. For example, the digital display tube show 2A, then Bit5=1, Bit3=1, Bit1=1. It means frequency limit caused by T4, T3 and current.
		Bit6	Frequency limit caused by PFC	
		Bit5	Frequency limit caused by T4.	
		Bit4	Frequency limit caused by T2.	
		Bit3	Frequency limit caused by T3.	
		Bit2	Frequency limit caused by T5.	
		Bit1	Frequency limit caused by current	
		Bit0	Frequency limit caused by voltage	
43	Average value of T2	(Sum T2 value of all indoor units)/(number of indoor units in good connection)		
44	Outdoor unit fan motor state	Off:0, High speed:1, Med speed:2, Low speed:3 Breeze:4, Super breeze:5		
45	The last error or protection code	00 means no malfunction and protection		

The following items from 11.4.1 to 11.4.5 are for the explanation of the point check functions.

11.4.1 Frequency of compressor:

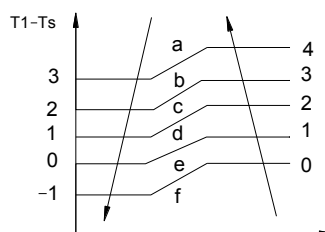
Display	Frequency of compressor (Hz)
30	30
--	Stand by
60	60

11.4.2 Running mode:

Display	Corresponding mode
0	Off
1	Fan only
2	Cooling mode
3	Heating mode
4	Forced cooling

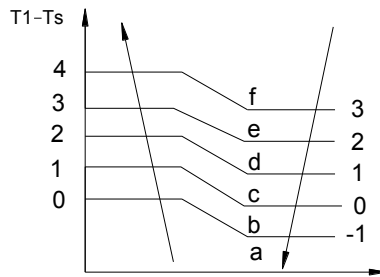
11.4.3 Capacity demand:

Cooling mode



Capacity area	a	b	c	d	e	f
Norm value (N)	3	2	1.5	1	0.5	0

Heating mode



Capacity area	a	b	c	d	e	f
Norm value (N)	3	2	1.5	1	0.5	0

11.4.4 Number of indoor unit

Display	Number of indoor unit
1	1
2	2
3	3
4	4

11.4.5 Opening degree of electronic expansion valve:

Actual opening degree equals the display data times 4

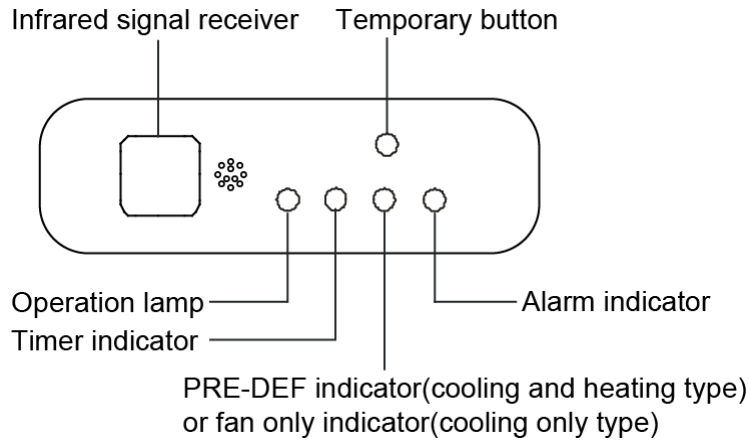
11.5 Icon explanation on indoor display board

11.5.1 High wall

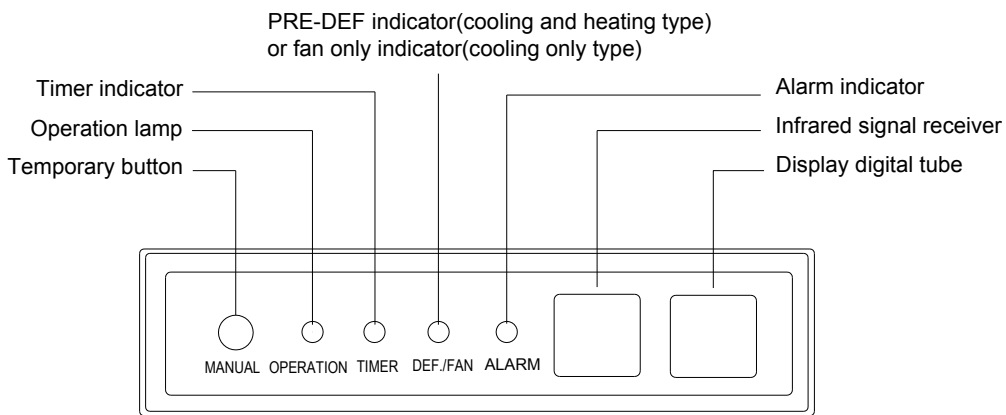


1		DEFROST indication lamp(For cooling & heating models only): Lights up when the air conditioner starts defrosting automatically or when the warm air control feature is activated in heating operation.
2		OPERATION indication lamp: This lamp illuminates when the air conditioner is in operation.
3		TIMER indication lamp: Lights up during Timer operation.
4		Temperature indicator: Displays the temperature settings when the air conditioner is operational. Displays the malfunction code.

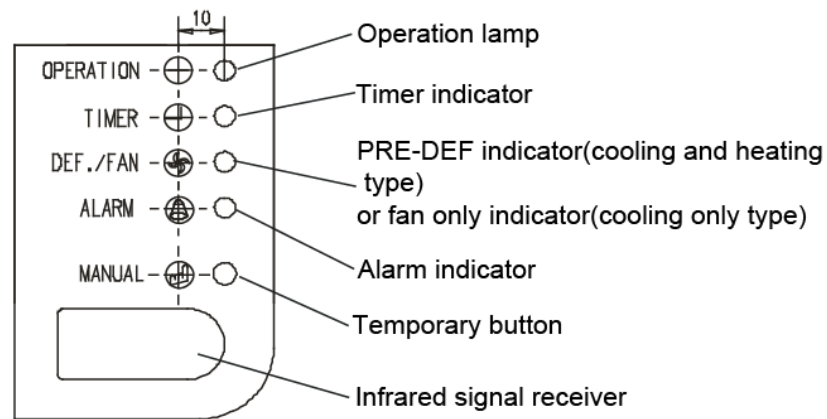
11.5.2 Four-way cassette (compact)



11.5.3 A5 Duct



11.5.4 Console



11.6 Main Protection

11.6.1 Three minutes delay at restart for compressor.

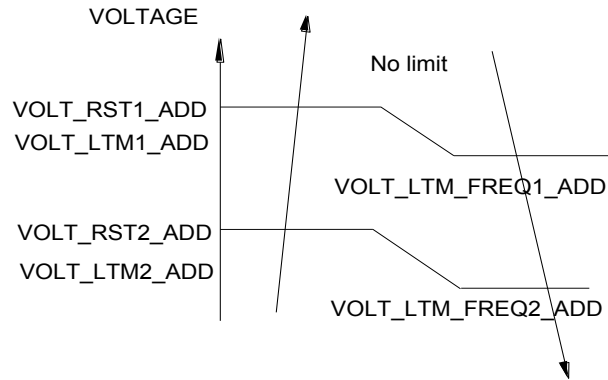
11.6.2 Temperature protection of compressor discharge.

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

---If $102^{\circ}\text{C} < T_5 < 115^{\circ}\text{C}$, decrease the frequency to the lower level every 2 minutes till to F1.

---If $T_5 > 115^{\circ}\text{C}$ for 10 seconds, the compressor will stop and restart till $T_5 < 90^{\circ}\text{C}$.

11.6.3 Low voltage protection



Note: if the low voltage protection occurs and not resumes within 3min, it will keep the protection always after restart the machine.

11.6.4 Compressor current limit protection

If the compressor current exceeds the current limit value for 10 seconds, the compressor frequency will be limited as below table.

Cooling mode:

Current frequency (Hz)	Current limit value (A)	Frequency limit
COOL_F16	ICOOLLMT12	Decrease the frequency to COOL_F4 and run at COOL_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency > COOL_F4 via capacity demand).
COOL_F15	ICOOLLMT11	
COOL_F14	ICOOLLMT10	
COOL_F13	ICOOLLMT9	
COOL_F12	ICOOLLMT8	
COOL_F11	ICOOLLMT7	
COOL_F10	ICOOLLMT6	
COOL_F9	ICOOLLMT5	
COOL_F8	ICOOLLMT4	
COOL_F7	ICOOLLMT3	
COOL_F6	ICOOLLMT2	
COOL_F5	ICOOLLMT1	
If the current frequency is lower than COOL_F4, the frequency will not be limited. After 10s of the compressor start, if the current > ICOOL, the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

Heating mode:

Current frequency (Hz)	Current limit value (A)	Frequency limit
HEAT_F16	IHEATLMT12	Decrease the frequency to HEAT_F4 and run at HEAT_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency > Heat_F4 via capacity demand).
HEAT_F15	IHEATLMT11	
HEAT_F14	IHEATLMT10	
HEAT_F13	IHEATLMT9	
HEAT_F12	IHEATLMT8	
HEAT_F11	IHEATLMT7	

HEAT_F10	IHEATLMT6	
HEAT_F9	IHEATLMT5	
HEAT_F8	IHEATLMT4	
HEAT_F7	IHEATLMT3	
HEAT_F6	IHEATLMT2	
HEAT_F5	IHEATLMT1	
<p>If the current frequency is lower than HEAT_F4, the frequency will not be limited.</p> <p>After 10s of the compressor start, if the current>IHEAT, the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.</p>		

11.6.5 Indoor / outdoor units communication protection

If the indoor units can not receive the feedback signal from the outdoor units for 2 minutes, the AC will stop and display the failure.

11.6.6 High condenser coil temp. protection.

When $T3 > 65^{\circ}\text{C}$ for 3 seconds, the compressor will stop while the indoor fan and outdoor fan will continue.

When $T3 < 52^{\circ}\text{C}$, the protection will release and the compressor will restart after 3 minutes.

11.6.7 Outdoor unit anti-freezing protection

For other models: When $T2B < 0^{\circ}\text{C}$ for 250 seconds, the indoor unit capacity demand will be zero and resume to normal when $T2B > 10^{\circ}\text{C}$.

For M2OD-16HFN1-Q, M2OD-18HFN1-Q, M50D-42HFN1-Q: When $T2 < 4^{\circ}\text{C}$ for 250 seconds or $T2 < 0^{\circ}\text{C}$, the indoor unit capacity demand will be zero and resume to normal when $T2 > 8^{\circ}\text{C}$ and the time of protection is no less than 3 minutes.

11.6.8 Oil return

Running rules:

1. If the compressor frequency keeps lower than RET_OIL_FREQ1_ADD for RET_OIL_TIME1_ADD, the AC will rise the frequency to RET_OIL_FREQ2_ADD for RET_OIL_TIME2_ADD and then resume to former frequency.
2. The EXV will keep 300p while the indoor units will keep the current running mode.

If the outdoor ambient is higher than TempT4HeatLimit_ADD during the oil return, the AC quit oil return.

11.6.9 Inverter module protection

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

11.6.10 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will open 10s later.

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

11.7 Operation Modes and Functions

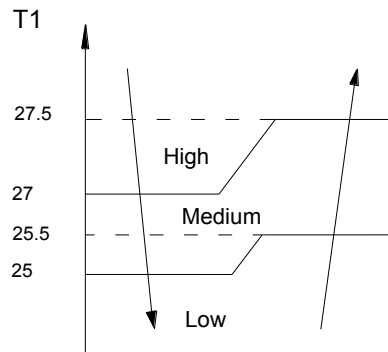
11.7.1 Fan-only mode

- (1) Outdoor fan and compressor stop.
- (2) Indoor fan can be set to high/med/low/auto.

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

(4) Auto fan in fan-only mode acts as follow:

For Console, A5 Duct:



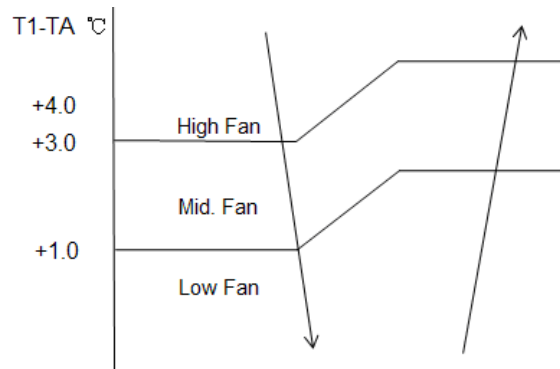
When $T1-24 \leq 27^{\circ}\text{C}$, transfer high to medium speed,

When $T1 \leq 25^{\circ}\text{C}$, transfer medium speed to low.

When $T1 > 25.5^{\circ}\text{C}$, transfer low to medium speed,

When $T1 > 27.5^{\circ}\text{C}$, transfer medium speed to high.

For the other types:



When $T1-TA \leq 3^{\circ}\text{C}$, transfer high to medium speed,

When $T1-TA \leq 1^{\circ}\text{C}$, transfer medium speed to low.

When $T1-TA > 1^{\circ}\text{C}$, transfer low to medium speed,

When $T1-TA > 4^{\circ}\text{C}$, transfer medium speed to high.

For Four-way cassette (compact): $TA=23$

For A2 four-way cassette (compact)&A5 Duct: $TA=24$

(5) PTC function and sleep mode are invalid

11.7.2 Cooling mode

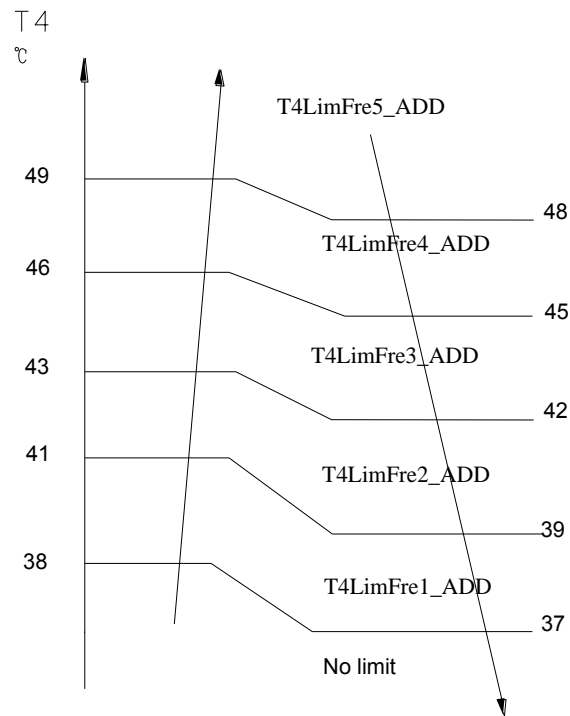
11.7.2.1 Compressor running rules

The compressor will run at corresponding frequency according to the gross amendatory capacity demand.

Frequency	COOL_F0	COOL_F1	COOL_F2	COOL_F15	COOL_F16
-----------	---------	---------	---------	-------	----------	----------

Amendatory capacity demand.	0	1	2	15	16
------------------------------------	---	---	---	-------	----	----

Meanwhile the maximum running frequency will be adjusted according to the outdoor ambient temp.

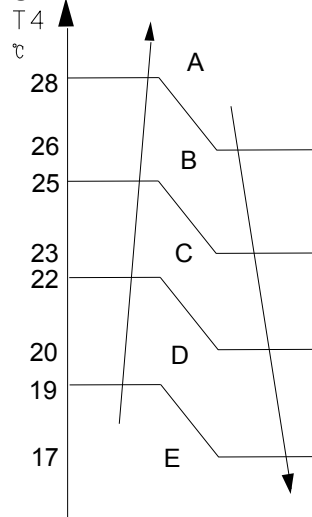


11.7.2.2 Outdoor fan running rules

Heating

21	A
19	B
18	
16	C
15	
13	D
12	
10	E

Cooling



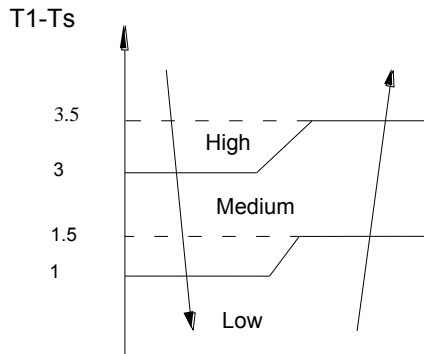
While A,B,C...means different fan speed of outdoor unit.

11.7.2.3 Indoor fan running rules

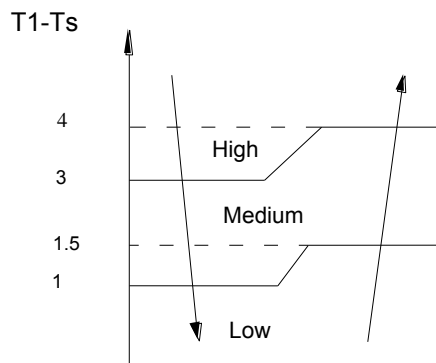
(1) Indoor fan keeps running, fan speed can be set in high/mid/low/ Auto by using a remote controller:

(2) Auto fan in cooling mode acts as follow:

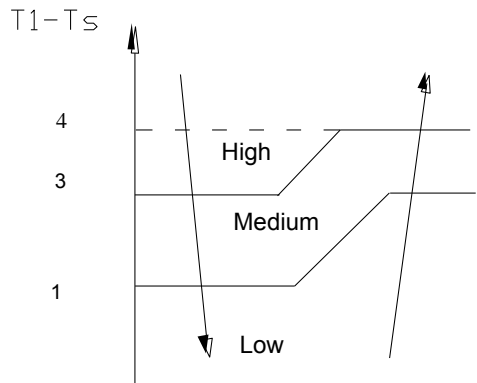
For Console& A3 four-way cassette (compact):



For A5 duct:



For the other types:



(3) Anti-freezing control to indoor evaporator in cooling mode

	Evaporator Temp.	Compressor
Console, A5 duct	$T2 \leq 4^{\circ}\text{C}$	Off
	$T2 > 8^{\circ}\text{C}$	On
A3 four-way cassette (compact)	$T2B < 0^{\circ}\text{C}$ for 250s	Off
	$T2B > 10^{\circ}\text{C}$	On
The other types	$T2 \leq 3^{\circ}\text{C}$	Off(After 3 minutes)
	$T2 > 7^{\circ}\text{C}$	On

(4) PTC function is invalid and sleep mode can be set by using a remote controller.

11.7.2.4 Evaporator low temperature T2 protection

When $T2 < 4^{\circ}\text{C}$, the indoor has no capacity demand and resume till $T2 > 8^{\circ}\text{C}$

11.7.3 Dry mode

11.7.3.1 Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.

11.7.3.2 Low indoor room temperature protection

In drying mode, if room temperature is lower than 10°C , the indoor fan will stop and not resume until room temperature exceeds 12°C .

11.7.3.3 Evaporator anti-freezing protection and condenser high temperature protection are active and the same as that in cooling mode.

11.7.3.4 The outdoor fan operates the same as in cooling mode.

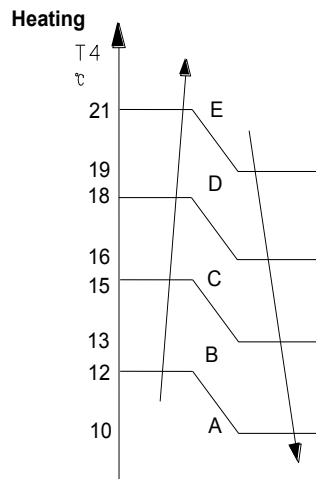
11.7.4 Heating mode

11.7.4.1 Compressor running rules

The compressor will run at corresponding frequency according to the gross amendatory capacity demand.

Frequency	0	HEAT_F1	HEAT_F2	HEAT_F15	HEAT_F16
Amendatory capacity demand.	0	1	2	15	16

11.7.4.2 Outdoor fan running rules



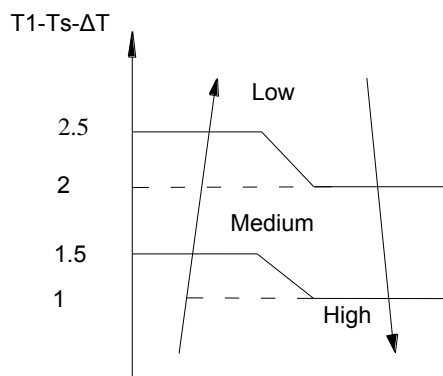
11.7.4.3 Indoor fan running rules

(1) Indoor Fan actions in heating mode

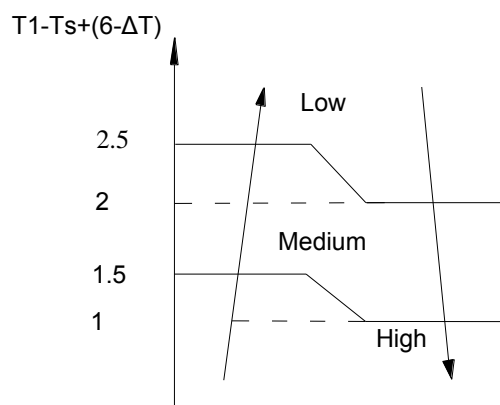
Indoor Fan can be set at HIGH/MID/LOW/AUTO by using a remote controller, but Anti-cold wind function prevails. Anti-cold wind control function in heating mode:

(2) Auto wind in heating mode

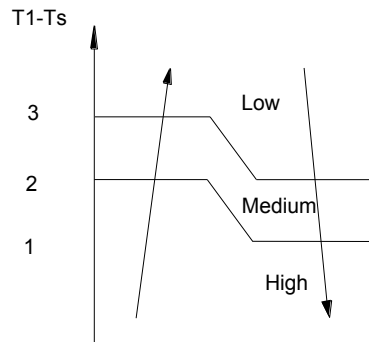
For Console:



For A5 duct:



For the other types



(3) Indoor evaporator high-temperature protection in heating mode
For A5 duct, A3 four-way cassette (compact)::

$T_2 > 63^\circ\text{C}$, the compressor will stop and restart when $T_2 < 48^\circ\text{C}$.

For the other types

$T_2 > 60^\circ\text{C}$, the compressor will stop and restart when $T_2 < 48^\circ\text{C}$.

11.7.4.4 High evaporator coil temp.T2 protection:

If $T_2 > 63^\circ\text{C}$, the indoor unit has no capacity demand and resume till 48°C .

11.7.4.5 Prevent Over-Heating(except for old four-way cassette (compact))

For console, A5 Duct and A3 four-way cassette (compact): In heating mode, when the indoor unit has no capacity requirement due to indoor room temperature increased, the Indoor fan will run in breeze. (Anti-cold wind function has the priority)

For A2 four-way cassette (compact): In heating mode, when the indoor unit has no capacity requirement due to indoor room temperature increased, if outdoor fan and compressor stop, the Indoor fan will run in setting fan speed, otherwise, the Indoor fan will run in low. (Anti-cold wind function has the priority)

11.7.4.6 Defrosting mode:

Condition of defrosting:

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

After the compressor starts up and keeps running, mark the minimum value of T_3 from the 10th minutes to 15th minutes as T_{30} .

1)If the compressor cumulate running time is up to 29 minutes and $T_3 < T_{CDI1}$, $T_3 + T_{30} \text{SUBT} T_{3ONE} \leq T_{30}$.

2)If the compressor cumulate running time is up to 35 minutes and $T_3 < T_{CDI2}$, $T_3 + T_{30} \text{SUBT} T_{3TWO} \leq T_{30}$.

3)If the compressor cumulate running time is up to 29 minutes and $T_3 < T_{CDI3}$ for 3 minutes.

4)If the compressor cumulate running time is up to 120 minutes and $T_3 < -15^\circ\text{C}$.

Condition of ending defrosting:

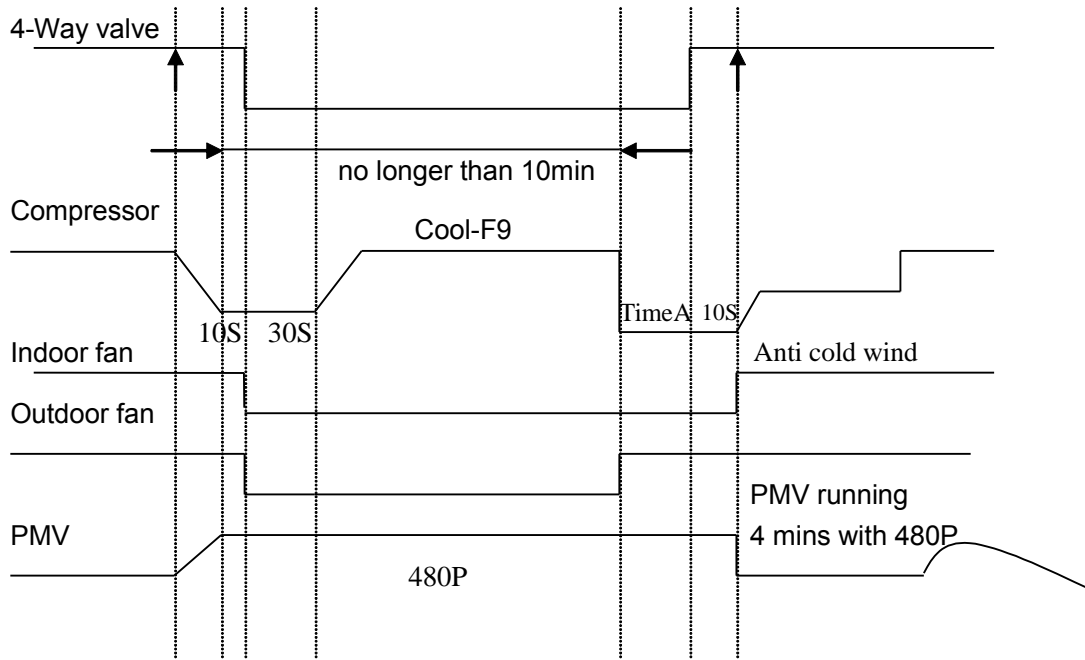
If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

---- T_3 rises to be higher than $T_{CDE1}^\circ\text{C}$.

---- T_3 keeps to be higher than $T_{CDE2}^\circ\text{C}$ for 80 seconds.

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

Defrosting action:



11.7.5 Auto-mode

This mode can be chosen by remote controller and the setting temperature can be changed between 18~30°C.

In auto mode, the machine will choose cooling, heating or fan-only mode according to the difference between T1 and TS.

T1-TS	Running mode
$T1-TS > 1^{\circ}\text{C}$	Cooling
$-1 < T1-TS \leq 1^{\circ}\text{C}$	Fan-only
$T1-TS \leq -1^{\circ}\text{C}$	Heating

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

The louver operates same as in relevant mode.

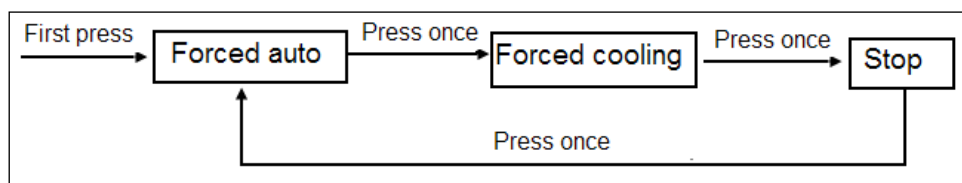
If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

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

11.7.6 Forced operation function

11.7.6.1 Enter forced operation function:

Pressing the touch button once, the machine will transfer into forced auto mode, if pressing the button once again, the machine will turn into forced cooling mode, the third pressing will stop the unit, and the fourth pressing is the start of the cycle of forced auto mode, forced cooling mode and stop. Refer the following chart:



11.7.6.2 In forced operation mode, all general protections and remote control are valid.

11.7.6.3 Operation rules:

Forced cooling mode:

The indoor fan will work in low speed (For console, the indoor fan will work in breeze speed), compressor and outdoor fan open unconditionally, after 30mins, the unit will transfer into forced auto mode. All the protections are valid during forced cooling mode

When there's one indoor unit running in forced cooling, it is the master forced cooling unit. Other indoor units will run at forced cooling mode too and they will be the slave forced cooling units. The slave forced cooling units can not quit forced cooling mode until the master forced cooling unit quit.

The slave forced cooling units will not be controlled by other signals.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24°C setting temperature.

All the protections are valid during forced auto mode

11.7.7 Timer Function

11.7.7.1 Timing range is 24 hours.

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

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

11.7.7.4 Timer on/off. The machine will turn on automatically when reaching the setting "on" time, and then turn off automatically when reaching the setting "off" time.

11.7.7.5 Timer off/on. The machine will turn off automatically when reaching the setting "off" time, and then turn on automatically when reaching the setting "on" time.

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

11.7.7.7 The setting time is relative time.

11.7.8 Sleep mode

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

11.7.8.2. Operation process in sleep mode is as follow.

After pressing ECONOMIC or SLEEP button on controller, the machine will turn into sleep mode.

When cooling, The set temperature rise 1°C per hour (be lower than 30°C). Two hours later, the set temperature will maintain as a constant and the fan speed is kept at low speed.

When heating, The set temperature decrease 1°C per hour (be higher than 17°C). Two hours later, the set temperature will maintain as a constant and the fan speed is kept at low speed (Anti-cold function takes precedence over all).

When auto, After an hour running under economic mode ,if it is under cooling mode the set temp will rise 1°C, if it is under heating mode the set temp will decrease 1°C, if it is under fan-only mode the set temp will be changeless; the condition will be the same after the air conditioner running under economic mode after 2 hours, and during the next time the set temp do not change.

11.7.8.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and the AC will turn off.

11.7.8.4 Timer off and remote controller off signals have the priority compared with sleep function.

11.7.9 Auto-Restart function

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

If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes and turn to auto mode as 24°C setting temp.

If AC is off before power off and AC is required to start up now, the compressor will have 1 minute delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

11.7.10 Drain pump control (For Duct & Cassette)

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

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

1. When the A/C operates with cooling (including auto cooling) and forced cooling mode or dry mode, the pump will start running immediately and continuously, till stop cooling or dry or no capacity demand.
2. Once the water level increase and up to the control point, LED will alarm and the drain pump open and continue checking the water level. If the water level falls down below the control point (drain pump delay close 1 minute) and operate with the last mode. Otherwise the entire system stop operating (including the pump) and LED remain alarming after 3 minutes,

11.7.11 Mode conflict

The indoor units can't work cooling mode and heating at same time.

Heating mode has a priority.

(1) Definition

	Cooling mode	Heating Mode	Fan	Off
Cooling mode	No	Yes	No	No
Heating Mode	Yes	No	Yes	No
Fan	No	Yes	No	No
Off	No	No	No	No

No: No mode conflict;

Yes: Mode conflict

(2) Unit action

- In case of one Indoor unit working in cooling mode or fan mode, and another indoor unit is set to heating mode, the indoor unit working in cooling mode or fan mode will change to off. The outdoor unit will change to heating mode after compressor stop 3 minutes. .
- In case of one Indoor unit working in heating mode, and another indoor unit is set to cooling mode or fan mode, the indoor unit setting to cooling mode or fan mode will change to stand by. The outdoor unit will continue working in heating mode.

If heating mode stops (not including the indoor unit in heating mode reaching the set temperature), 3 minutes after the outdoor unit restarts and works in cooling mo

12.Troubleshooting

12.1 Indoor unit error code explanation:

HIWALL (42QHF009DS, 42QHF012DS, 42QHF018DS)

Display	Operation lamp flash times	Timer lamp	Failure
E0	1	X	Indoor EEPROM malfunction
E1	2	X	Indoor / outdoor units communication error
E3	4	X	Indoor fan speed has been out of control
E4	5	X	Open or short circuit of T1 temperature sensor
E5	6	X	Open or short circuit of T2 temperature sensor
F1	2	O	Open or short circuit of T4 temperature sensor
F2	3	O	Open or short circuit of T3 temperature sensor
F3	4	O	Open or short circuit of T5 temperature sensor
F4	5	O	Outdoor EEPROM parameter error
F5	6	O	Outdoor fan speed out of control
F6	7	O	Open or short circuit of T2B temperature sensor
P0	1	☆	IPM module protection
P1	2	☆	Voltage protection
P4	5	☆	Inverter compressor drive protection
P5	6	☆	Mode conflict
P6	7	☆	Low pressure protection(Just matching with 38QUS036DS4)

O (light) X (off) ☆ (flash)

Light Commercial series (Cassette/Duct)

NO.	MALFUNCTION	RUN	Timer	DEF	Alarm	DISPLAY DIGITAL TUBE
1	Open or short circuit of T1 temperature sensor	☆	X	X	X	E0
2	Open or short circuit of T2 temperature sensor	X	X	☆	X	E1
3	Indoor / outdoor units communication error	X	☆	X	X	E2
4	Full-water malfunction	X	X	X	☆	E3
5	Indoor EEPROM malfunction	☆	☆	X	X	E4
6	IPM module protection	☆	X	X	O	E5
7	Open or short circuit of T3 or T4 temperature sensor or Outdoor EEPROM malfunction	☆	O	X	X	E6
8	Outdoor fan speed has been out of control	☆	O	☆	X	E7
9	Indoor fan speed has been out of control	☆	O	O	X	F5
10	Voltage protection	☆	O	X	O	P0
11	Outdoor unit over-current protection	☆	☆	☆	X	P2
12	Inverter compressor drive protection	☆	◎	X	X	P4
13	Mode conflict	☆	X	O	O	P5

☆ Flash(at 2.5Hz) ◎ Flash(at 0.5Hz) O light X (off)
 Note: Digital display is only available for duct type.

Console series:

Operation	Timer	De-frost	LED STATUS
★	X	X	Open or short circuit of T1 temperature sensor
X	X	★	Open or short circuit of T2 temperature sensor

X	★	X	Indoor / outdoor units communication error
★	★	X	Indoor EEPROM malfunction
★	X	★	IPM module protection
★	★	★	Open or short circuit of T3 or T4 temperature sensor
★	★	●	Outdoor unit voltage protection
★	●	●	Outdoor unit over-current protection
★	●	X	Top temperature protection of compressor
★	◎	X	Inverter compressor drive protection
★	X	●	Mode conflict
★	●	★	Indoor fan speed has been out of control
X	★	●	Outdoor fan malfunction

★ flash at 5Hz, ● light, ◎flash at 0.5Hz, X extinguished

12.2 Outdoor unit error code explanation:

Display	LED STATUS
E0	Outdoor EEPROM malfunction
E2	Indoor / outdoor units communication error
E3	Communication malfunction between IPM board and outdoor main board
E4	Open or short circuit of outdoor unit temperature sensor
E5	Voltage protection
E8	Outdoor fan speed has been out of control
F1	No A Indoor unit coil outlet temperature sensor or connector of sensor is defective
F2	No B Indoor unit coil outlet temperature sensor or connector of sensor is defective
F3	No C Indoor unit coil outlet temperature sensor or connector of sensor is defective
F4	No D Indoor unit coil outlet temperature sensor or connector of sensor is defective
F5	No E Indoor unit coil outlet temperature sensor or connector of sensor is defective
P1	High pressure protection (For 38QUS036DS4)
P2	Low pressure protection (For 38QUS036DS4)
P3	Current protection of compressor
P4	Temperature protection of compressor discharge
P5	High temperature protection of condenser
P6	IPM module protection

Note: Once these error codes display, they will disappear in at least 30 seconds if the unit come back to normal.(Except E3&E4)

12.3 Trouble shooting

12.3.1 For the indoor unit

12.3.1.1 Indoor EEPROM malfunction

Shut off the power supply and turn it on 1 minute later. Is it still displaying the error code?

Yes

If the EEPROM chip is welded on PCB, replace the PCB directly. Otherwise, check whether the EEPROM chip plugged in PCB well?

No

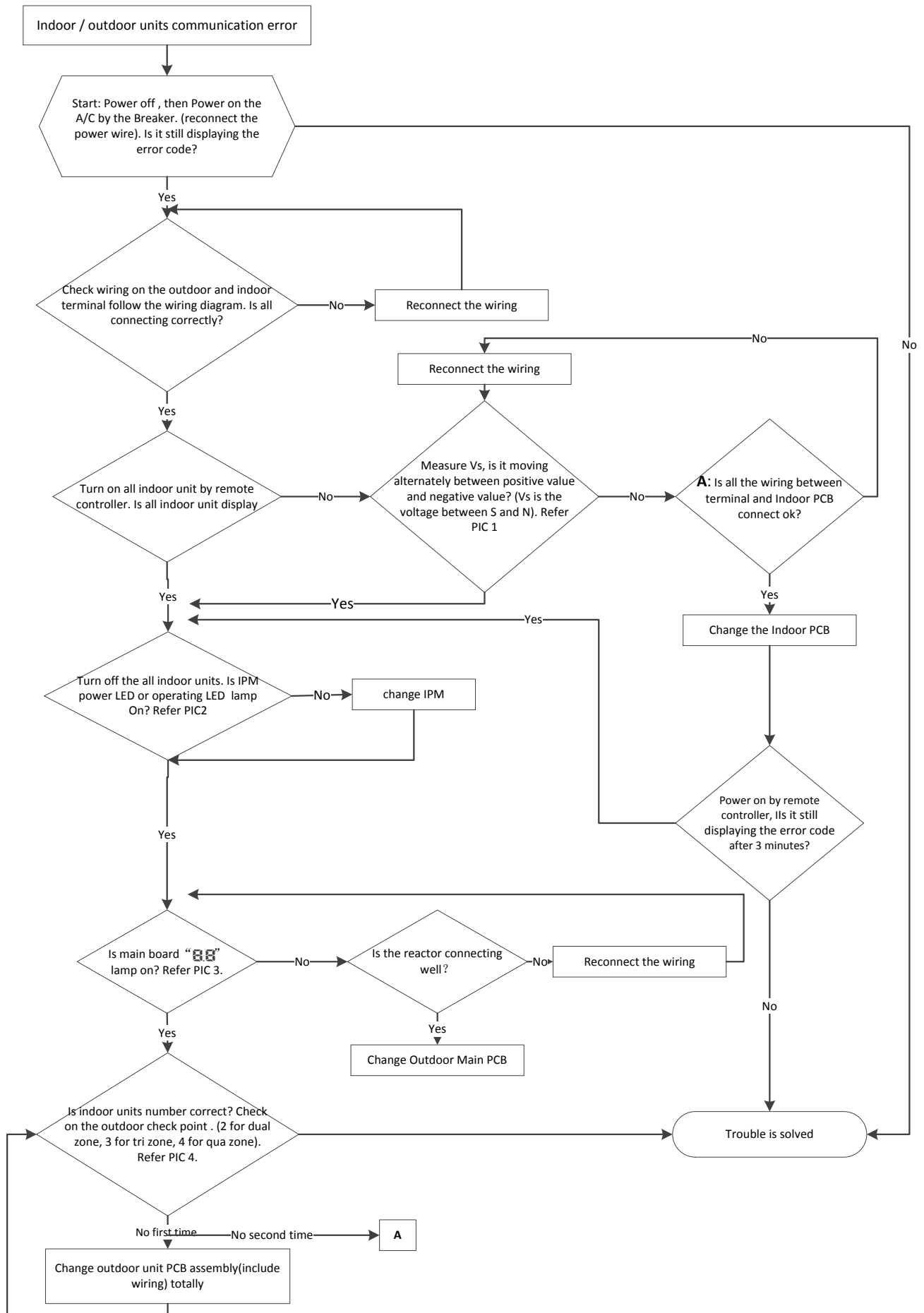
Insert the EEPROM well

Yes

Replace the indoor PCB.

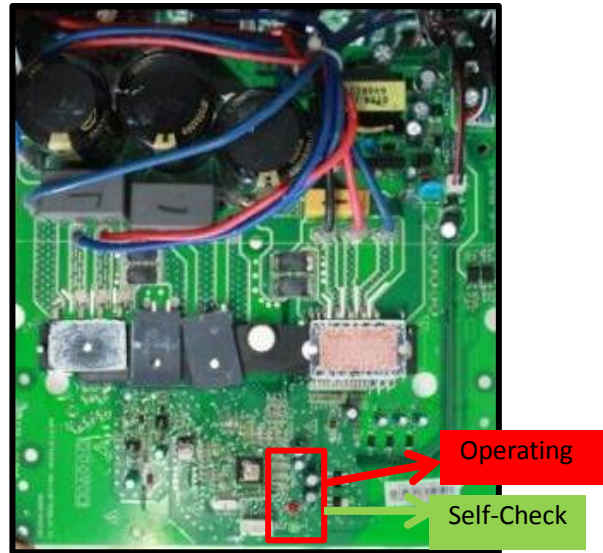
EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

12.3.1.2 Indoor / outdoor units communication error

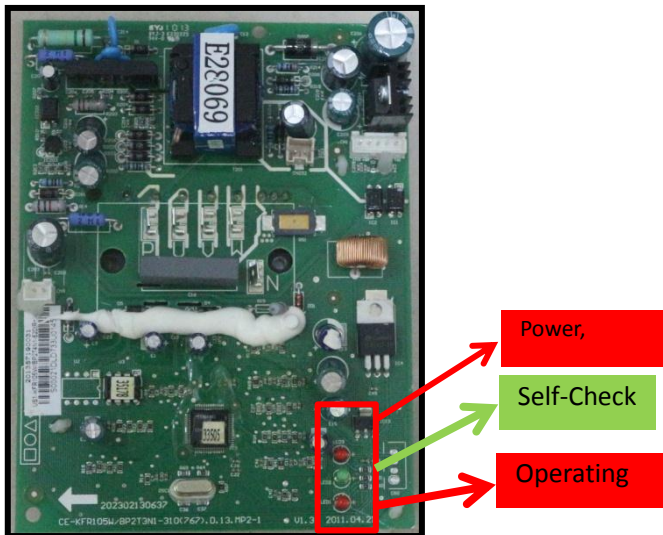




Pic 1: check the voltage of N to S (Vs), is it moving alternately between positive value and negative value?



Pic 2: IPM or outdoor main PCB (For 38VNM218713)



Pic 3: IPM or outdoor main PCB (For 38VNM327713 / 38VNM436713)

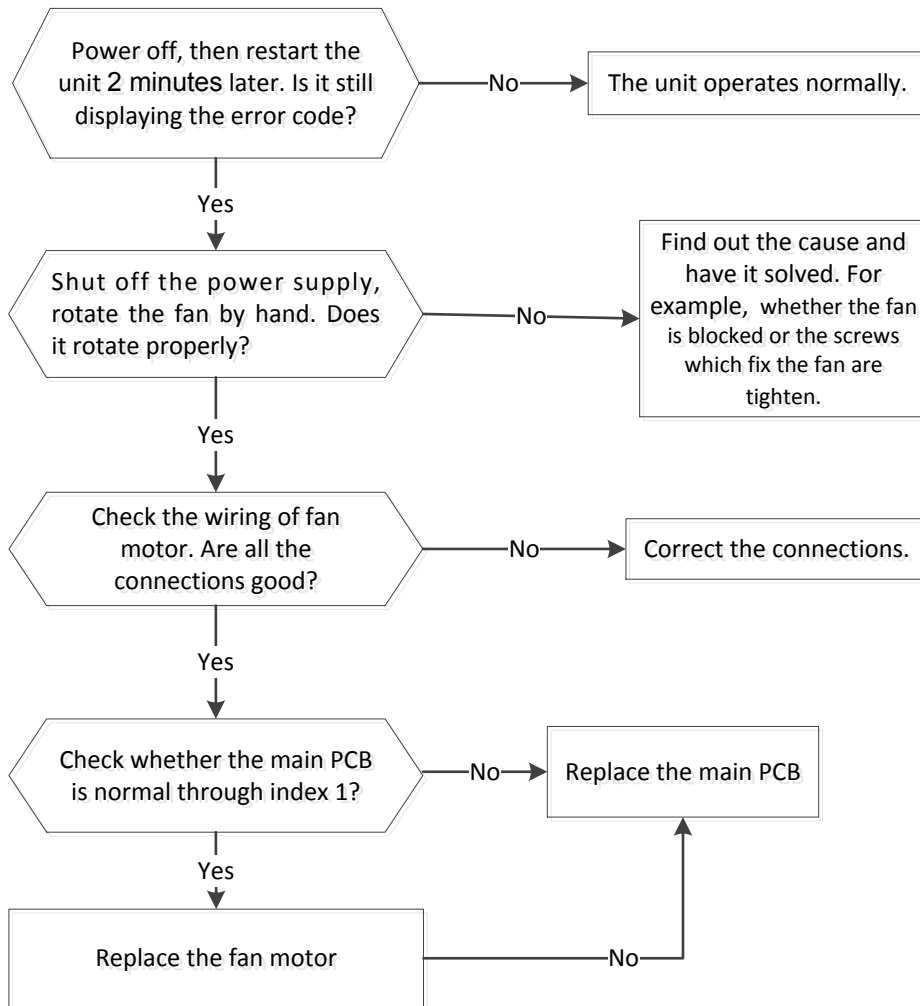


PIC 4 :Main board LED when power on and unit standby.



PIC 5: check point button, Press 1 time for check how many indoor units are connected

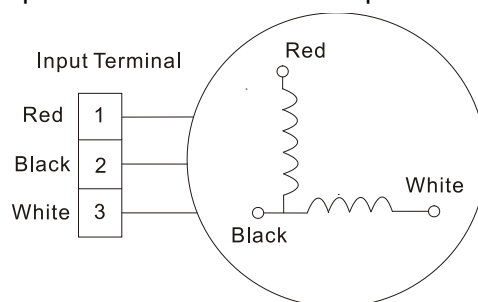
12.3.1.3 indoor unit fan speed has been out of control



Index 1:

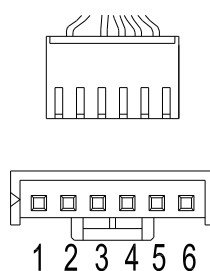
1: Indoor AC fan motor

Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply) or 50V(115V power supply), the PCB must have problems and need to be replaced.



2. Indoor DC fan motor(control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.



DC motor voltage input and output

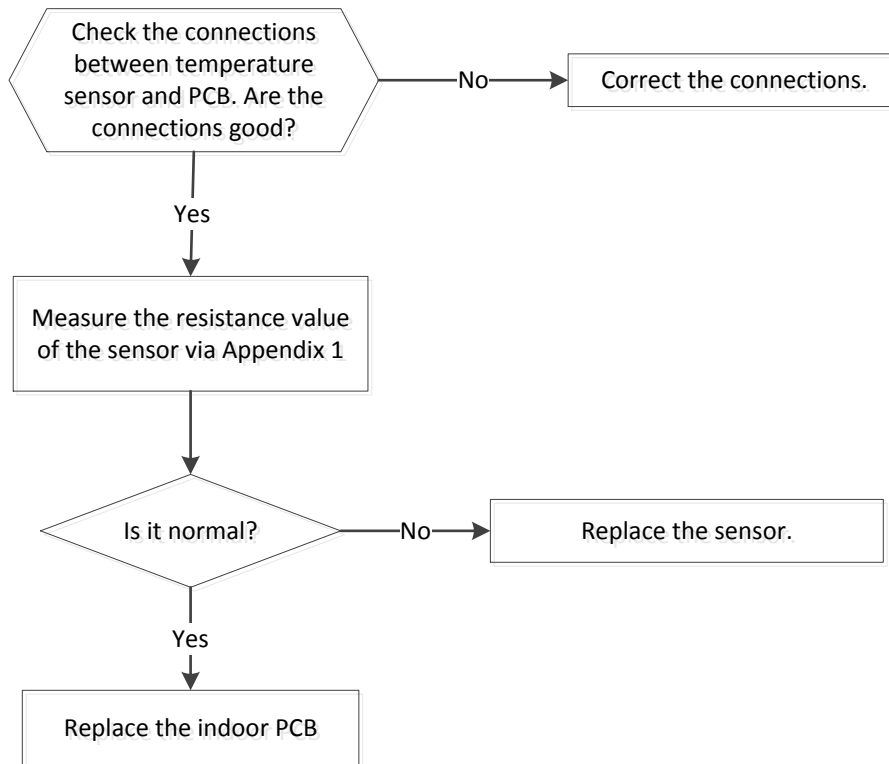
For split type:

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

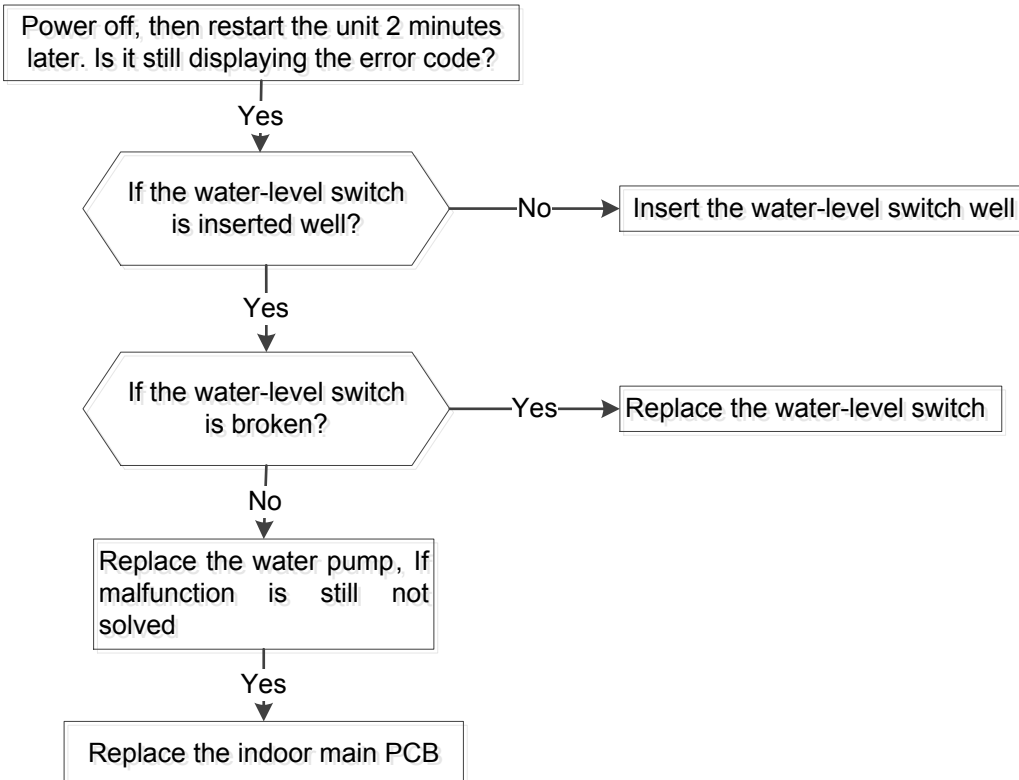
For other types:

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

12.3.1.4 Open or short circuit of temperature sensor.

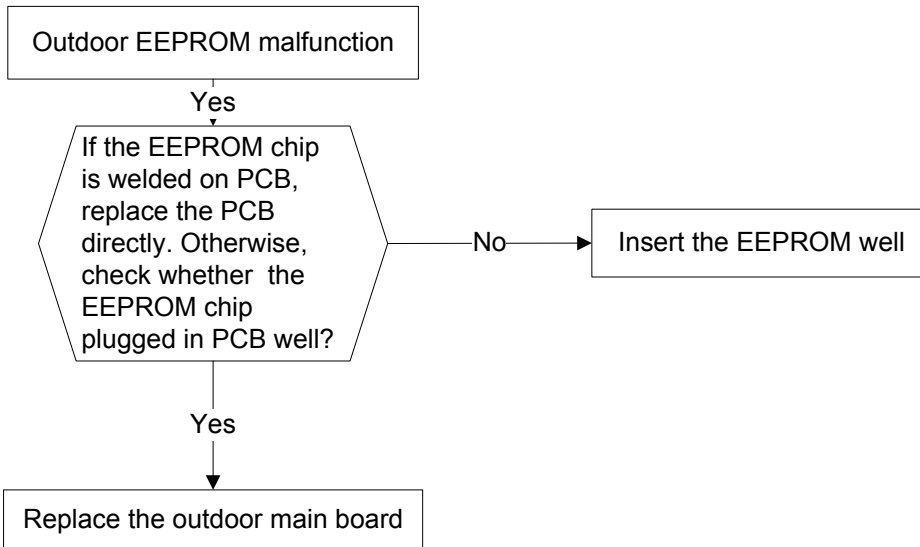


12.3.1.5 Full-water malfunction(For cassette / A5 duct)



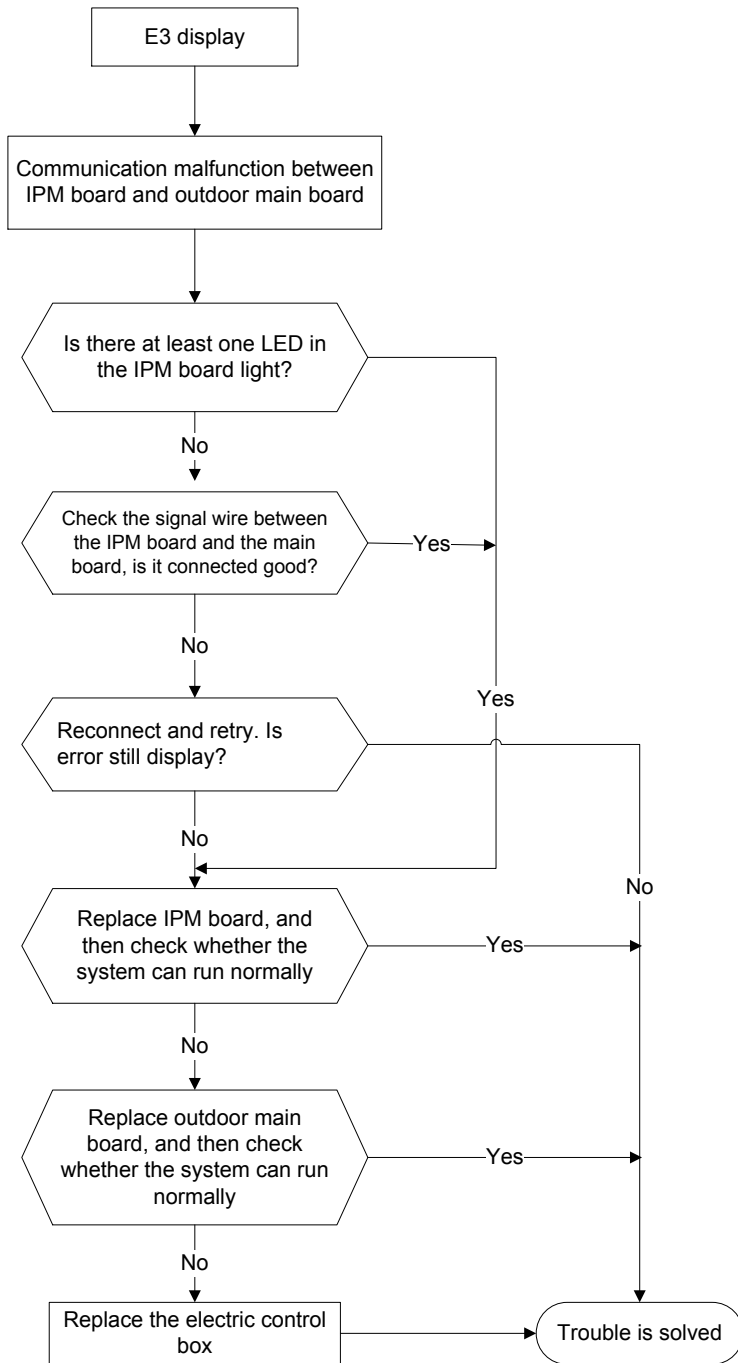
12.3.2 For the outdoor unit

12.3.2.1 Outdoor EEPROM malfunction(ODU E0)

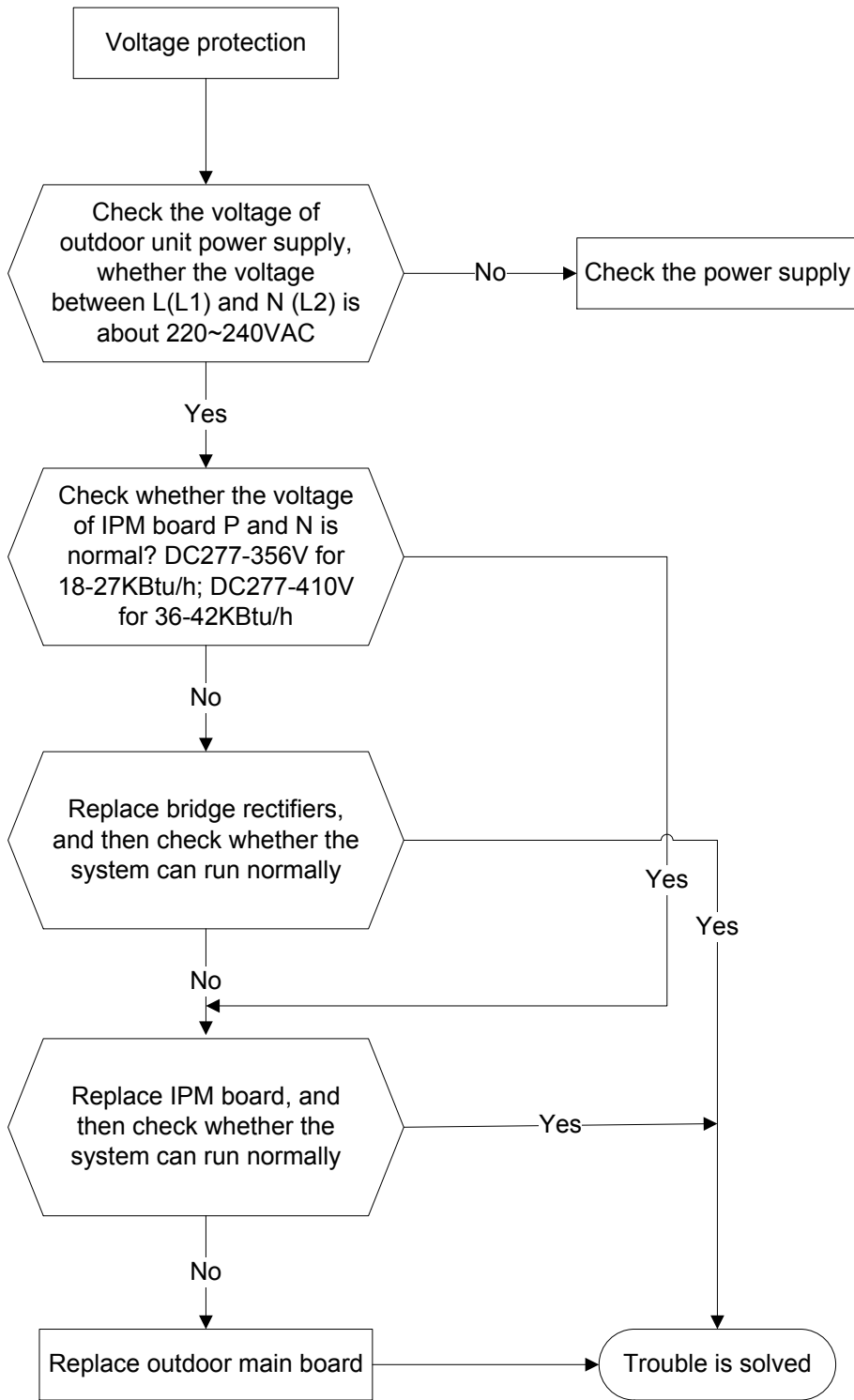


EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

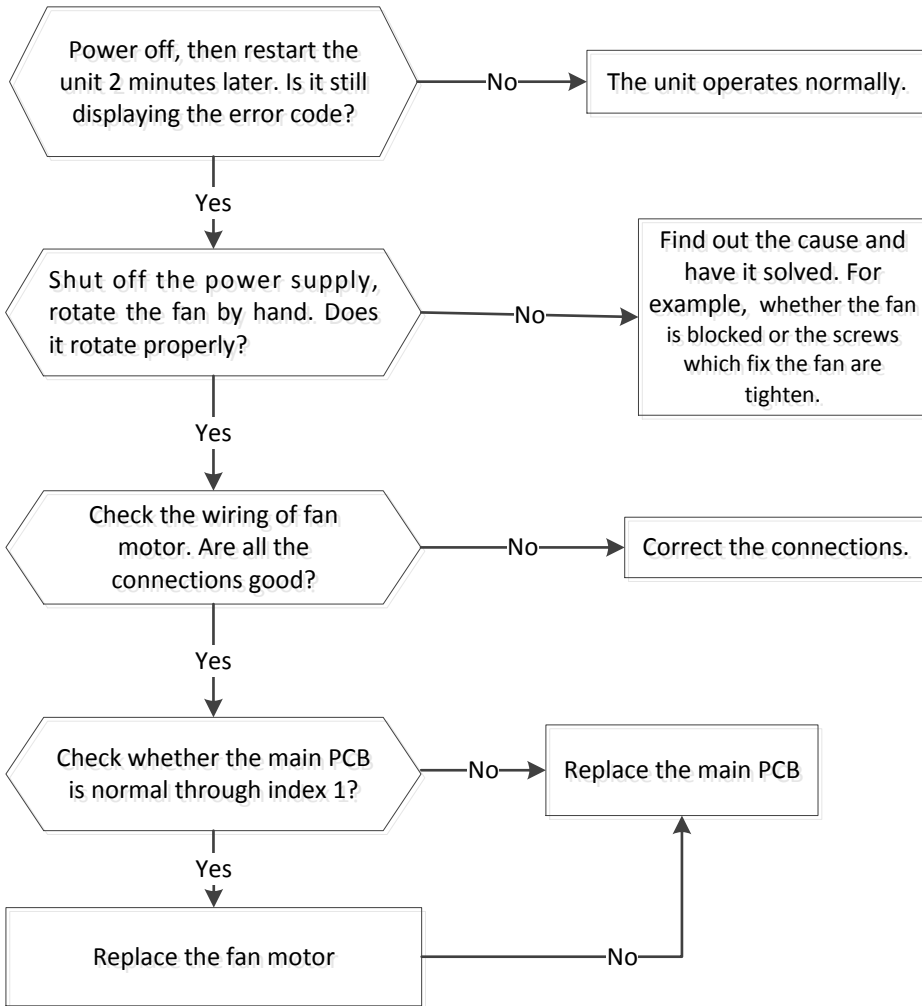
12.3.2.2 Communication malfunction between IPM board and outdoor main board(ODU E3)



12.3.2.3 Voltage protection(ODU E5)



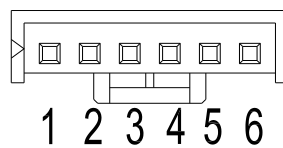
12.3.2.4 Outdoor unit fan speed has been out of control (E8)



Index 1:

1. Outdoor DC fan motor(control chip is inside fan motor)

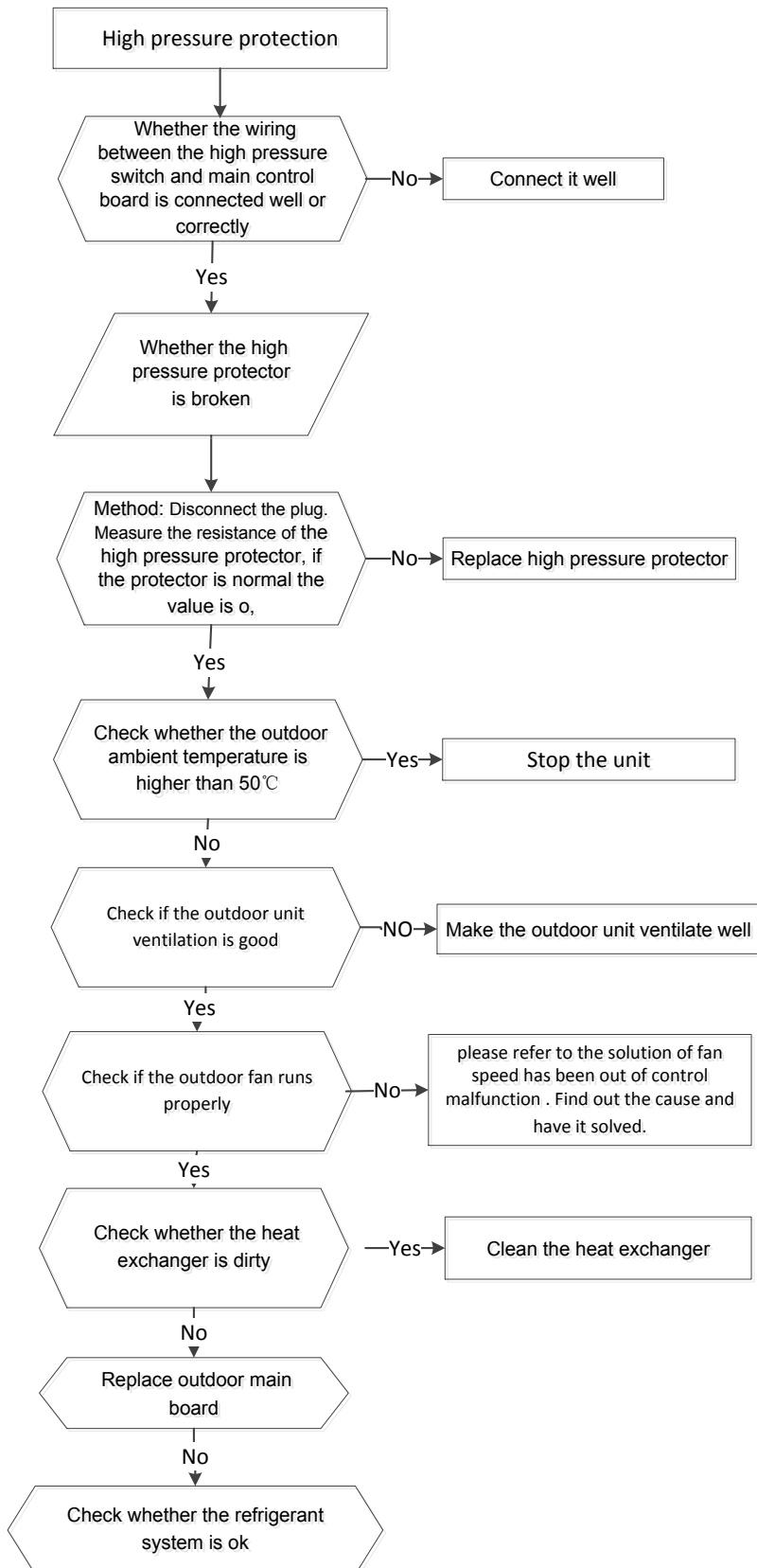
Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.



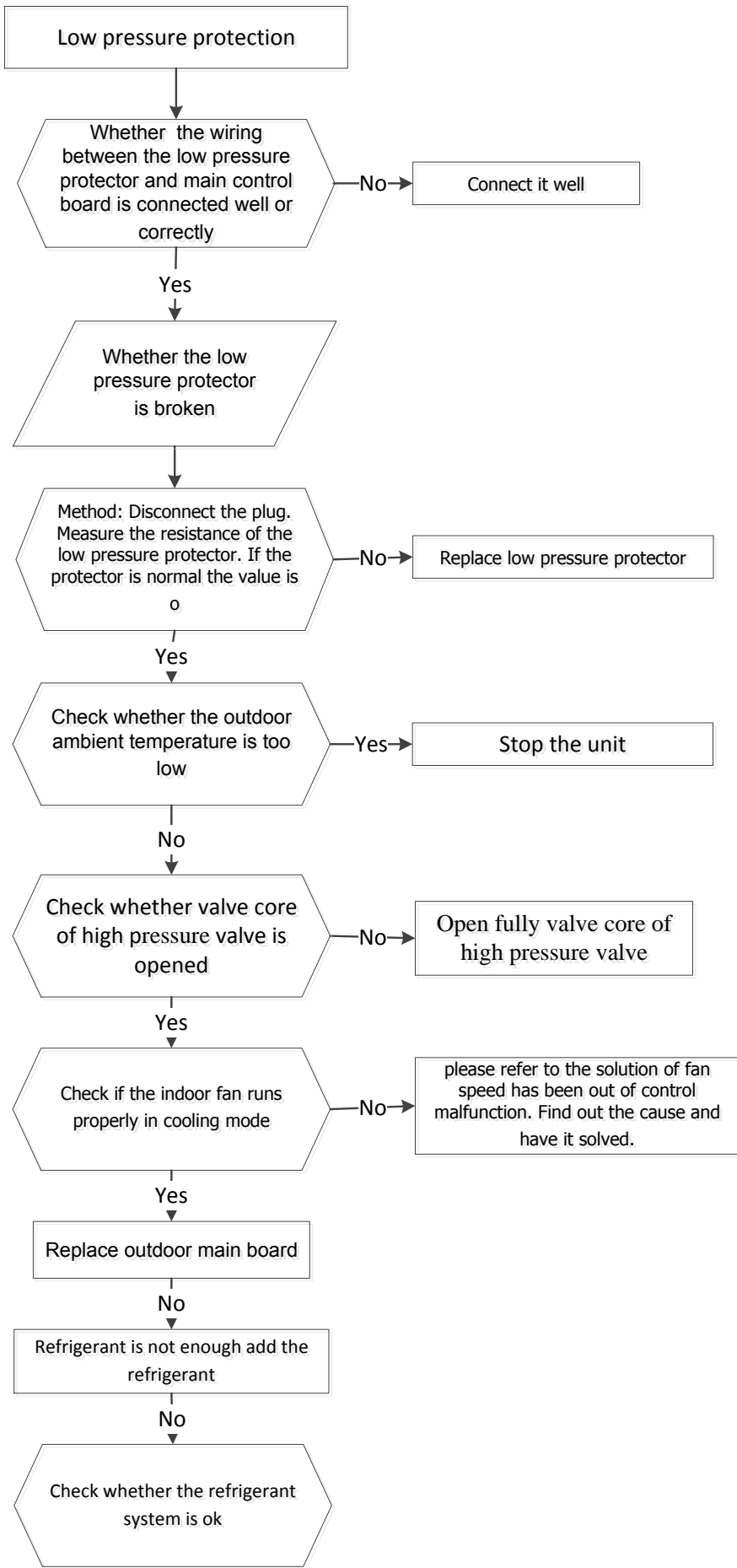
DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	140V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	15V

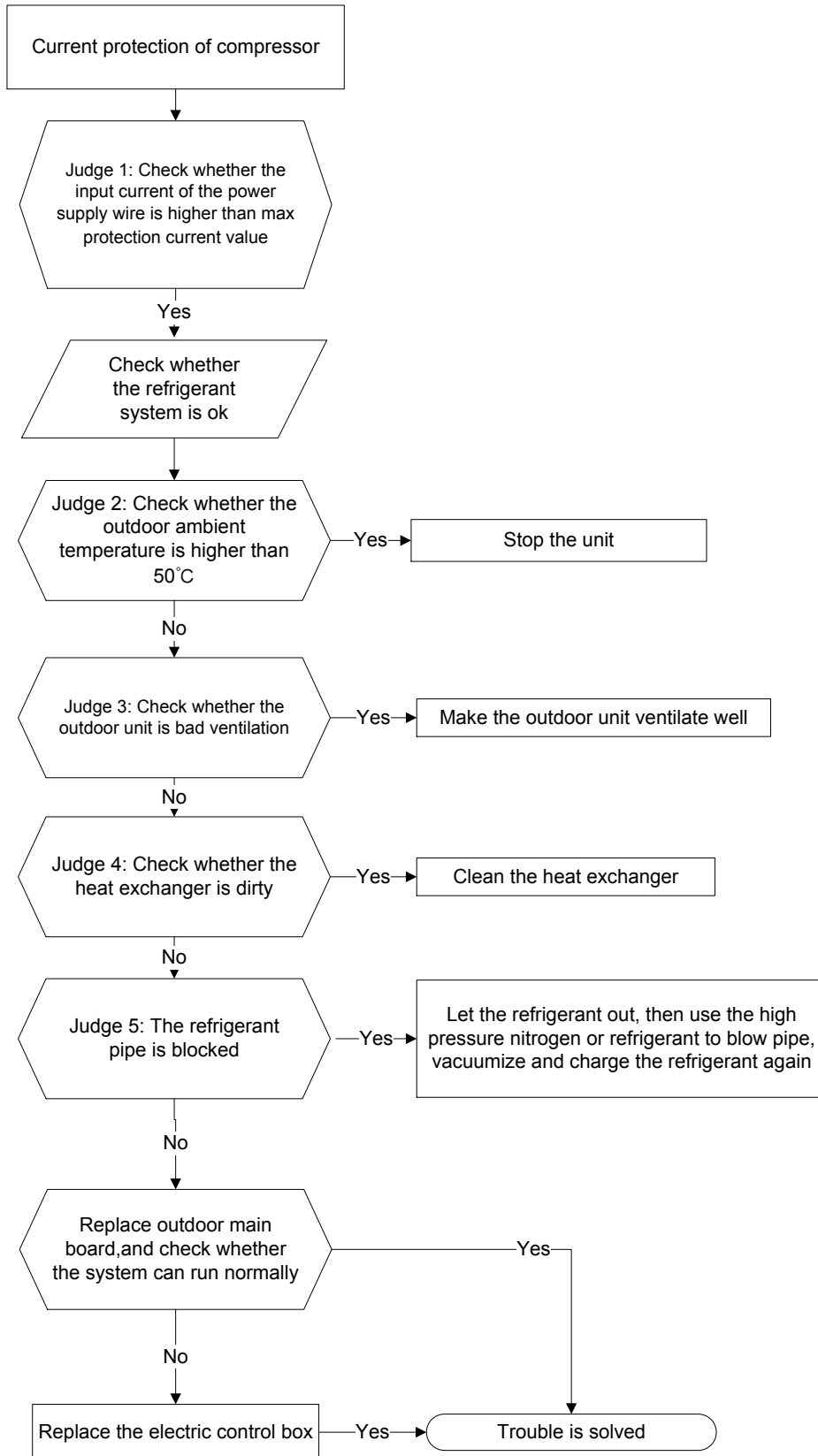
12.3.2.5 High pressure protection (ODU P1) (For 38QUS036DS4)



12.3.2.6 Low pressure protection (ODU P2) (For 38QUS036DS4)

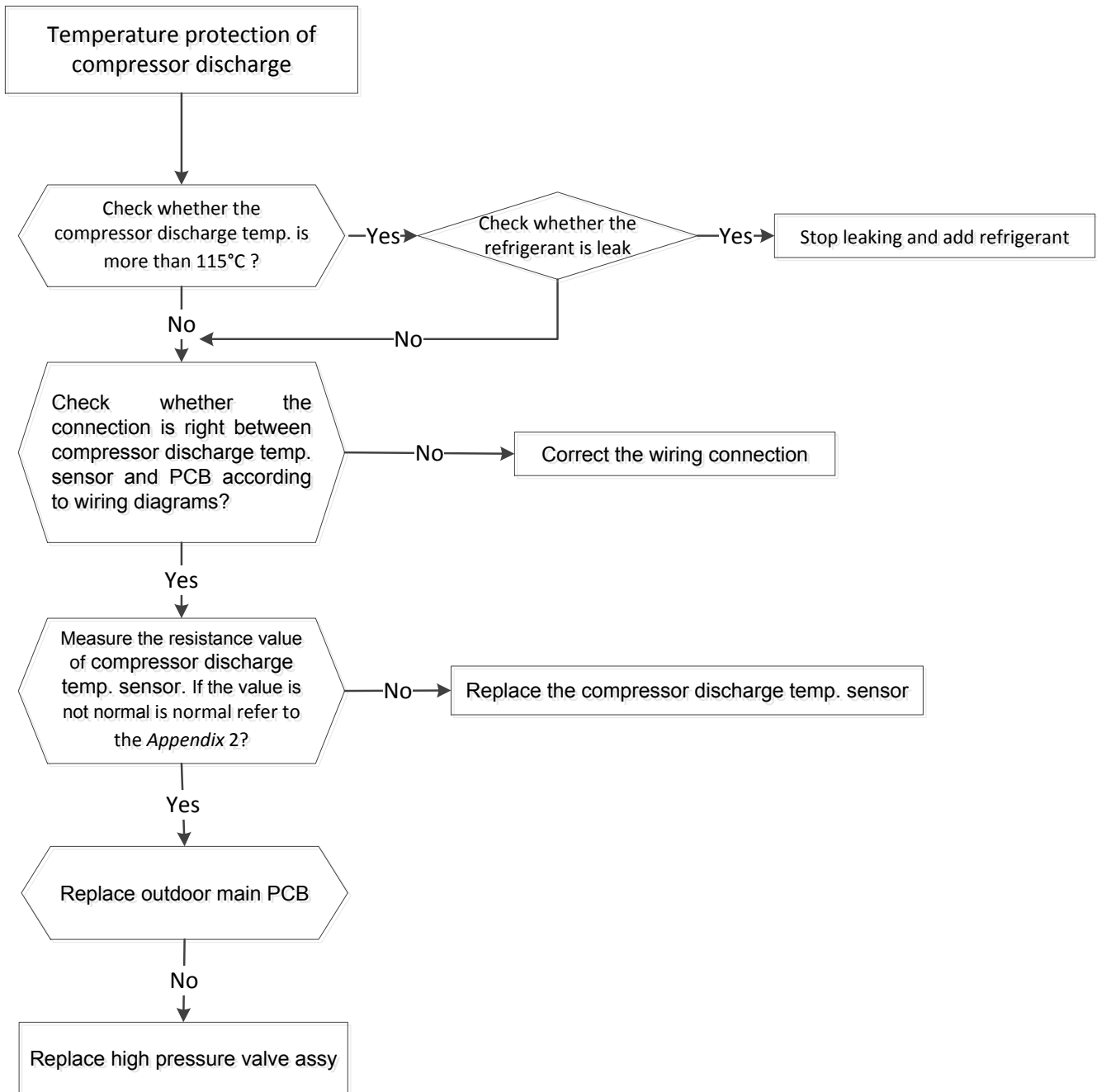


12.3.2.7 Current protection of compressor (ODU P3)



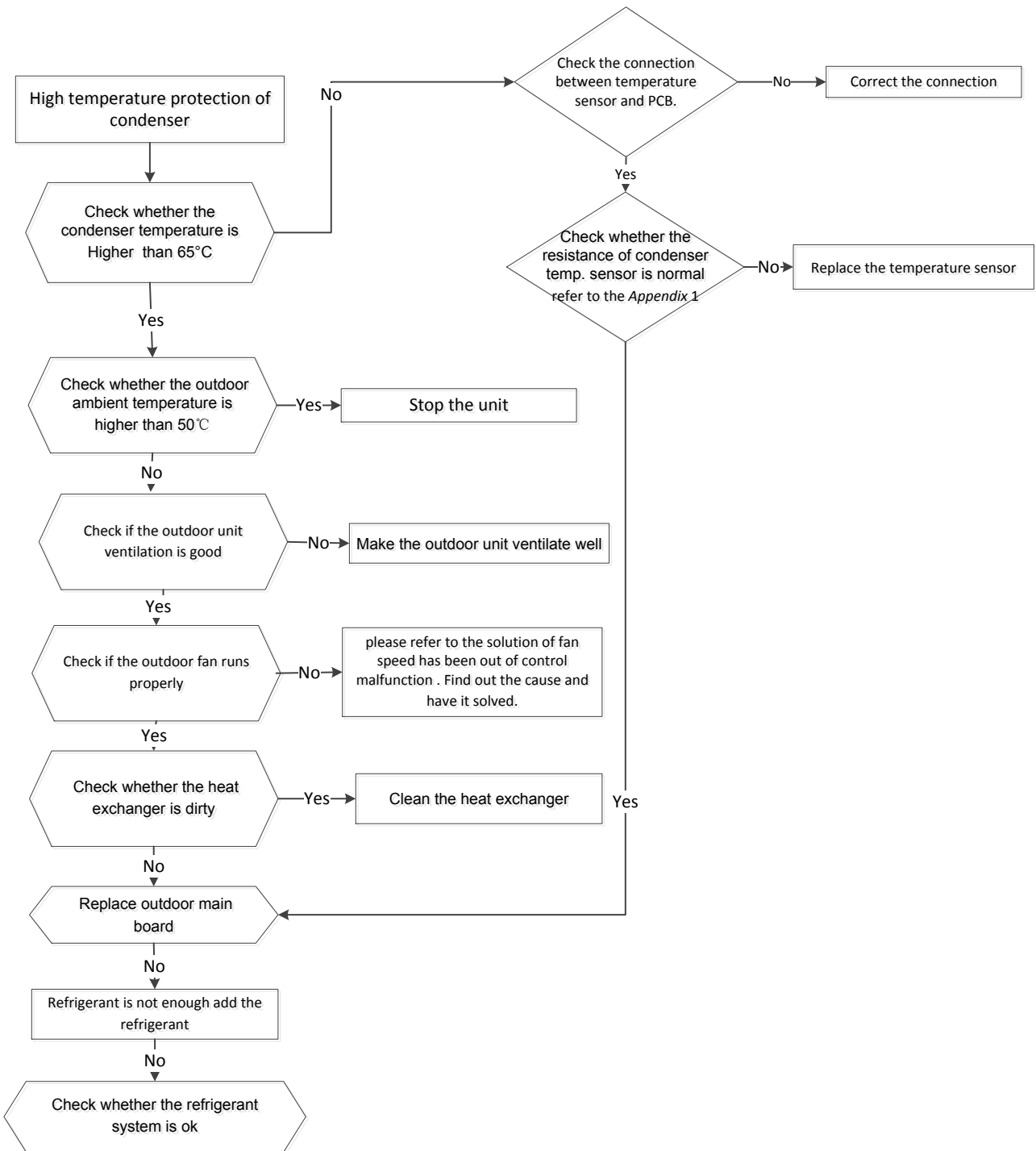
Model	38QUS018DS2	38QUS027DS3	38QUS036DS4
Max protection current	14.5A	16.5A	21.5A

12.3.2.8 Temperature protection of compressor discharge (ODU P4)

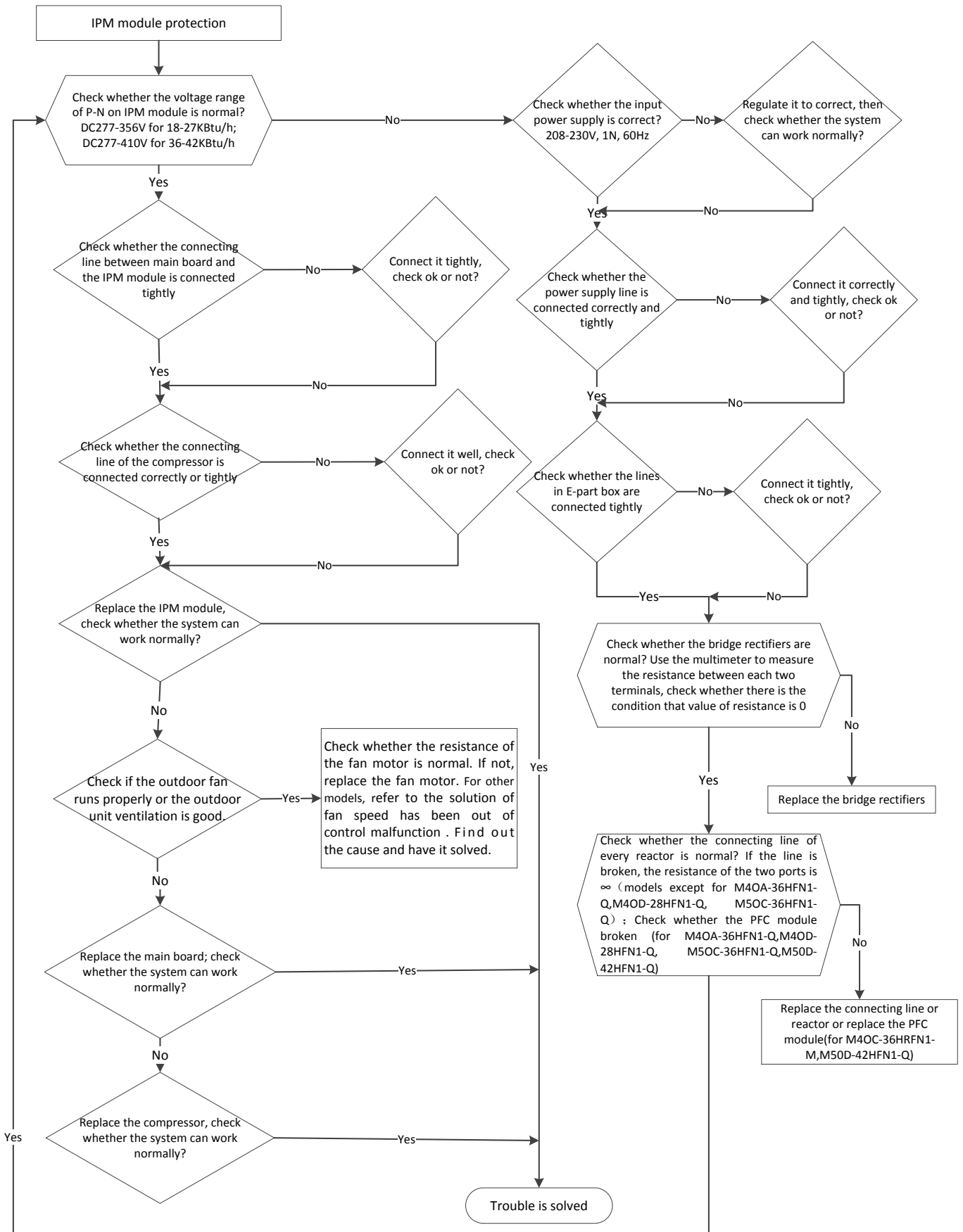


12.3.2.9 High temperature protection of condenser (ODU P5)

When outdoor pipe temperature is more than 65°C, the unit will stop, and unit runs again when outdoor pipe temp. less than 52°C.



12.3.2.10 IPM module protection (ODU P6)



12.4 Main parts check

1. Temperature sensor checking

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

Temperature Sensors.

Room temp.(T1) sensor,

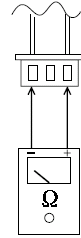
Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

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



Tester

Appendix 1 Temperature Sensor Resistance Value Table for T1,T2,T3,T4,T2B (°C--K)

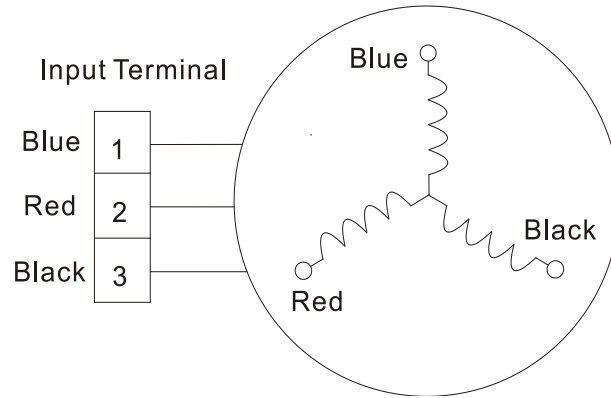
°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.0000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

Appendix 2 Temperature Sensor Resistance Value Table for T5 (°C--K)

°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294	B(25/50)=3950K	
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045	R(90°C)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

2. Compressor checking

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



Position	Resistance Value		
Unit model	38QUS018DS2	38QUS027DS3	38QUS036DS4
Compressor	DA150S1C-20FZ	DA250S2C-30MT	TNB306FPGMC-L
Blue - Red	0.95Ω(20℃)	0.55Ω(20℃)	0.53Ω(20℃)



3. IPM continuity check

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

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