



SUPER INVERTER SERIES

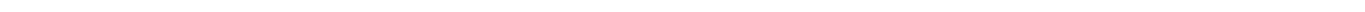
MULTI TYPE

Service Manual 2018

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※The specifications, designs, and information in this book are subject to change without notice for product improvement.



1. General information of Indoor Units

<p>Four-way cassette (compact)</p> 	<p>Silm cassette</p> 
<p>Console</p> 	<p>15C</p> 
<p>A5 Ducted</p> 	<p>A6 Ducted</p> 
<p>ODU</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>38QUS014DS2* 38QUS014DS2-2 38QUS018DS2* 38QUS018DS2-2 38QUS027DS3*</p> </div> <div style="text-align: center;">  <p>38QUS036DS4* 38QUS042DS5*</p> </div> </div>	

Model						
Four-way cassette (compact)	Super slim cassette	Console	15C	A5 Duct	A6 Duct	ODU
42QTD007D8S	42QTD024DS*	42QZA009DS*	42QHC007D8S	42QSS012DS*	42QSS007D8S	38QUS014DS2* 38QUS014DS2-2
42QTD009D8S		42QZA012DS*	42QHC009D8S		42QSS009D8S	38QUS018DS2* 38QUS018DS2-2
42QTD012D8S		42QZA018DS*	42QHC012D8S		42QSS012D8S	38QUS021DS3*
42QTD018D8S			42QHC018D8S		42QSS018DS*	38QUS027DS3*
			42QHC024D8S		42QSS024DS*	38QUS028DS4*
						38QUS036DS4*
						38QUS042DS5*

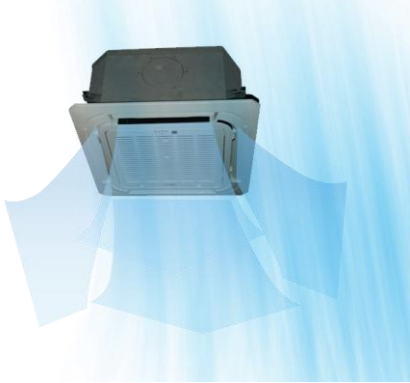
*Model with gray Mark was phased.

2. Features

2.1 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 ceiling 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.



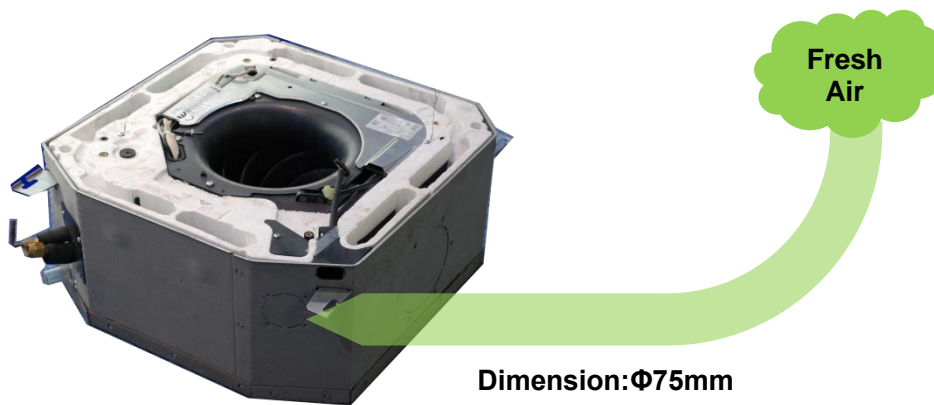
(3) Electric control box built-in design

- 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

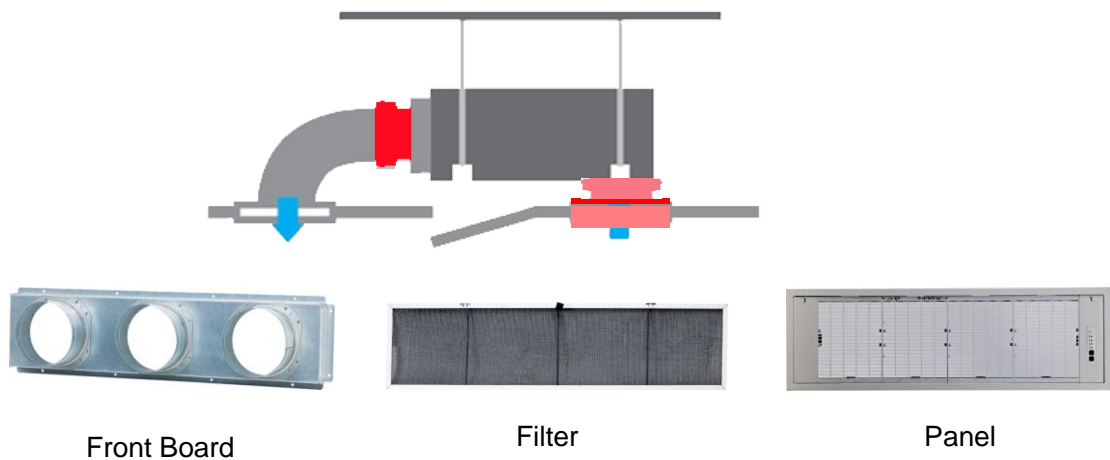
- Reserves the space for air outlet from the side of indoor unit; It's availed to connect air duct from the two sides to the nearby small rooms.



2.2 A5 Duct

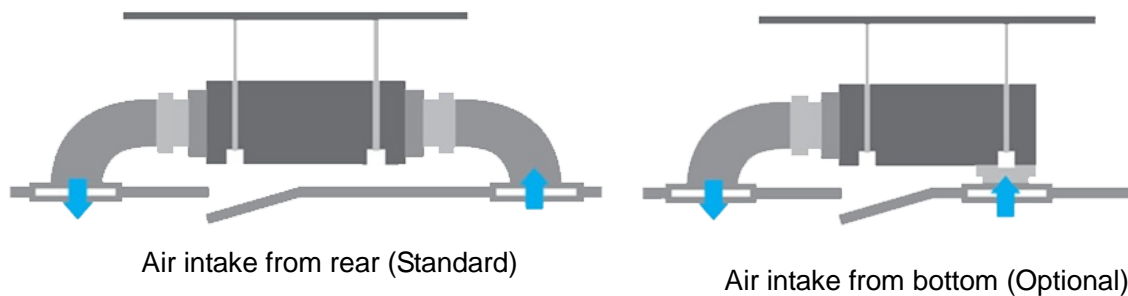
(1) Installation accessories: (Optional)

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



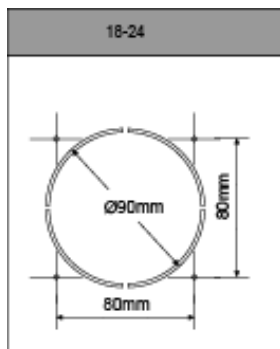
(2) Easy Installation: Two air inlet styles (Bottom side or Rear side)

- 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.



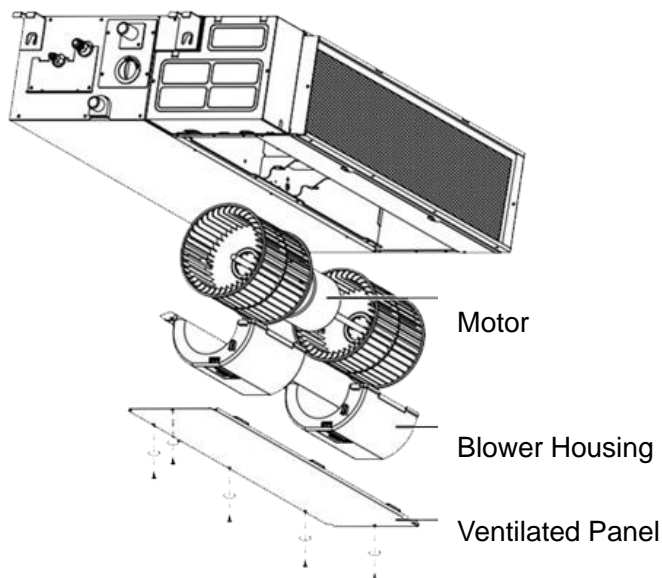
(4) Easy maintenance

- 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.



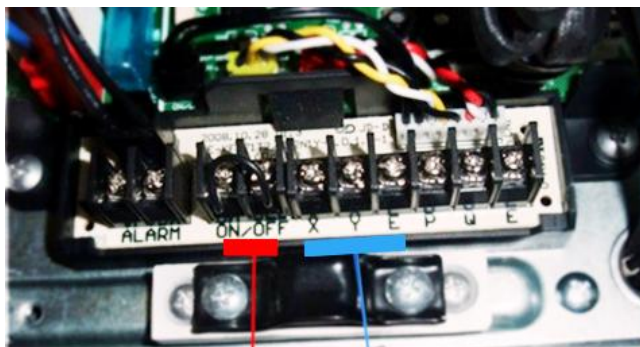
➤ **Replace the motor or centrifugal fan**

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

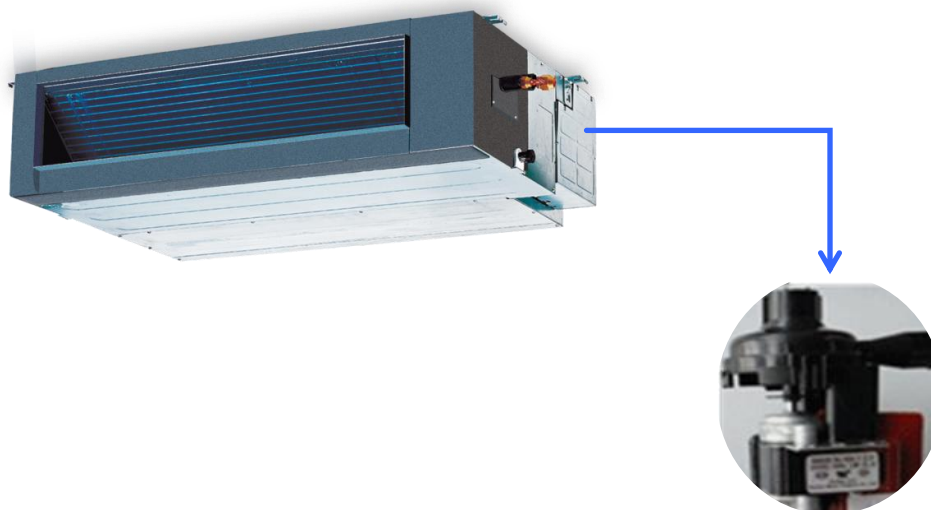
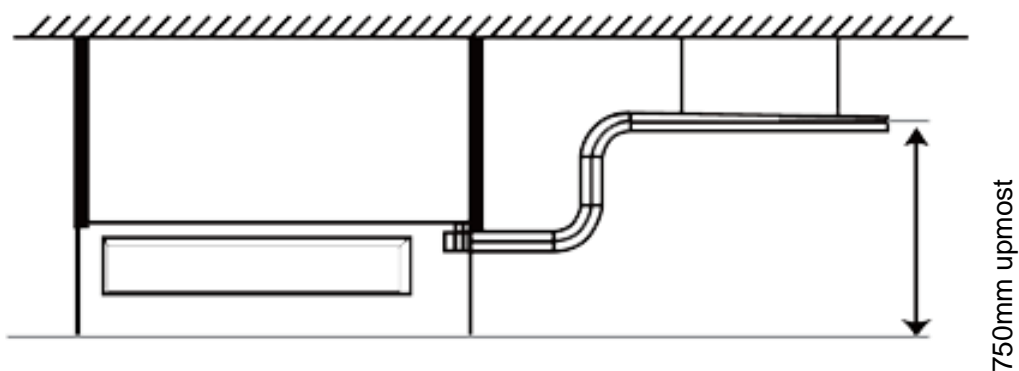
- Reserved remote on-off ports and central control ports, can connect the cable of an on-off controller or a central controller to realize remote on-off control function or group control function.



Remote on-off ports Central control ports

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

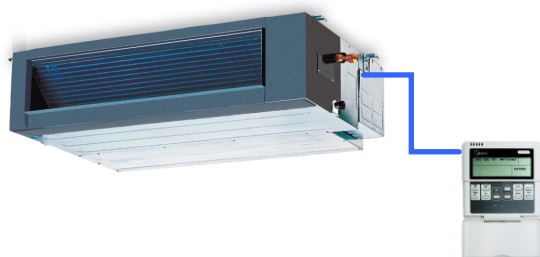
- Built-in drain pump can lift the water to 750mm upmost. It's convenient to install drainage piping under most space condition.



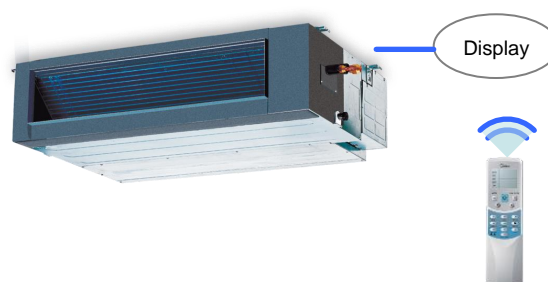
(7) Built-in display board

- 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)



2.3 Console

(1) Consumes up to 30% less energy than non-inverter units

- DC inverter compressor
- indoor fan motor adopts DC motor

(2) Achieves set temperature more quickly

- air supplying from top and bottom or from top only
- air inlet from four directions



(3) Compact unit body, space saving

- this unit body is very thin and harmonious with room. It is beautiful, elegant and space saving.
- light weight and compact.

(4) Flexible installation.

- can be used for floor standing or lower wall applications
- as a floor standing floor model, it can be semi or fully recessed without loss of capacity.

(5) High efficiency filter

- built in Formaldehyde nemesis filter
- active-carbon and biological anti-virus filter is optional.

(6) Comfort

- flexible air blow: vertical auto swing and wide angle louvers ensure that warm air reaches the furthest corners of the room and increase the air flow coverage
- Low noise operation, lowest to 23Db
- Low starting power and precise room temperature adjustment

(7) Powerful mode can be selected for rapid cooling or heating.

(8) Easy cleaning grille and maintenance

(9) Indoor unit adopts DC motor, it has five level fan speed meet different requirements.

7.4 Super slim cassette

(1) Overview

- Compact design, super slim body size, less space requiring in installation
- Each louver can be separately controlled, more comfort air blowing is possible.
- Auto-lifting panel design, more convenient to clean and maintain the filter. (optional)

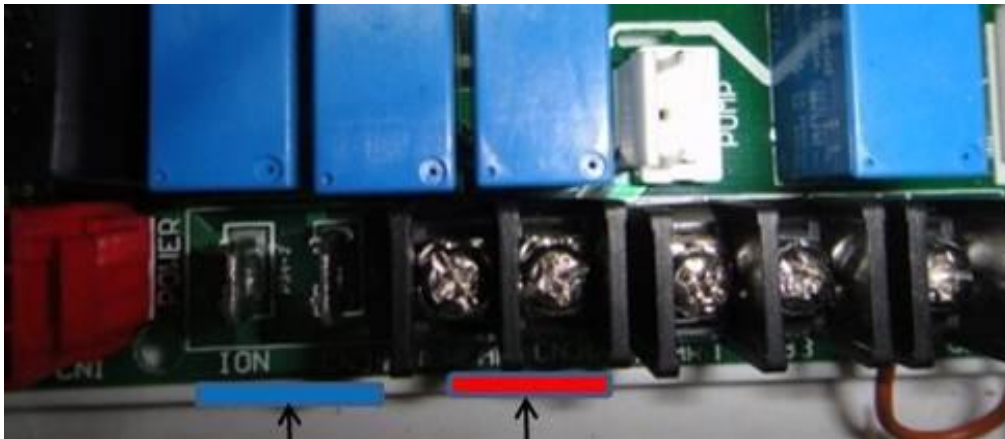
(2) Fresh air intake function

- Fresh air fulfills air quality more healthy and comfortable.
- Ventilation motor is optional to increase the effect of fresh air.



(3) Optional ionizer generator

- Ionizer generator is optional to get refreshing air to your room.



Ionizer generator
connector

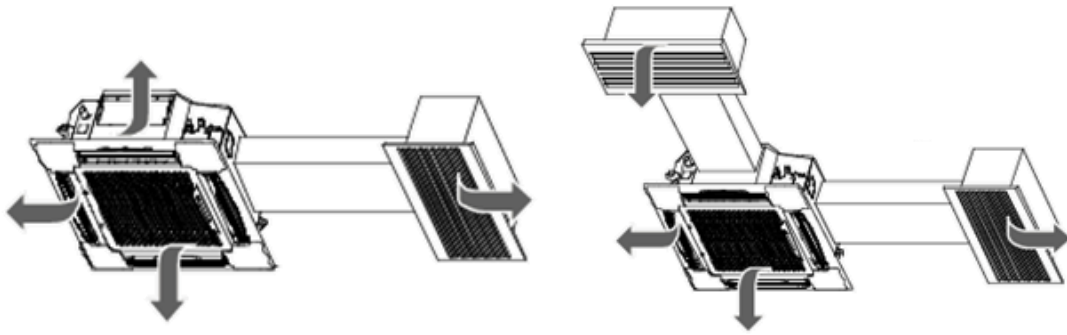
Ventilation motor
connector

- Ionizer can be switched on or off by remote controller.
When pressing the Clean Air button on the remote controller, Ionizer will work and the indicator light on display board will shine.



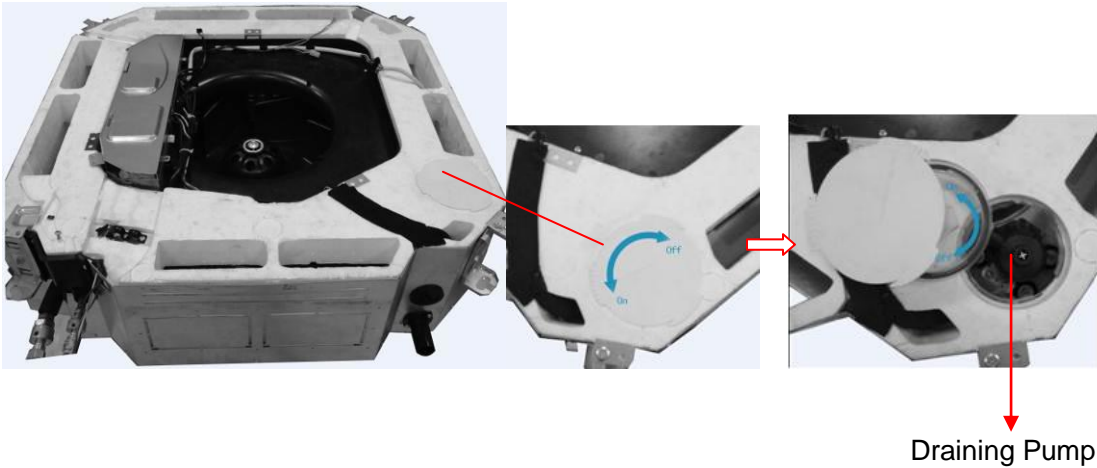
(4) External air duct design

- Reserve external air duct, more flexible for the air supply.

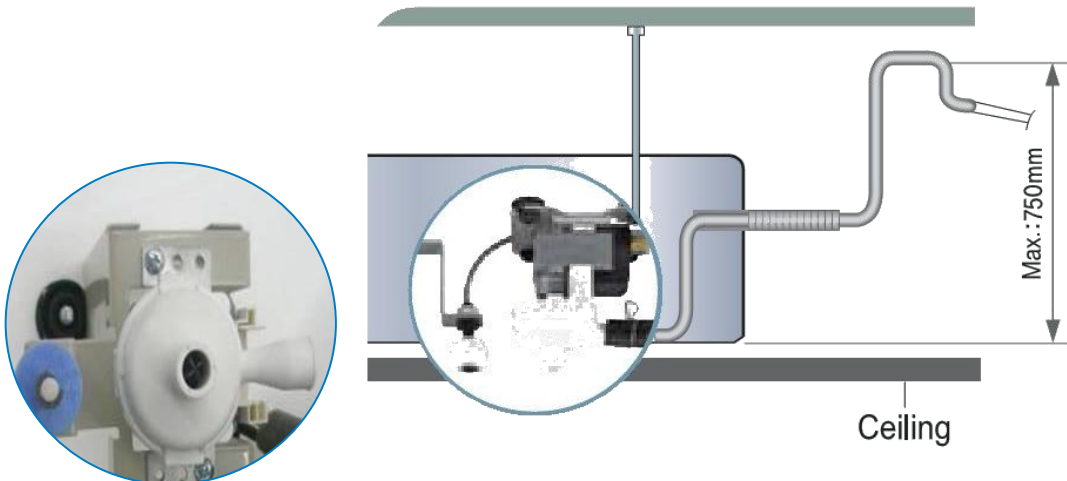


(5) Built-in draining pump

- Due to the improvement of structure, more convenient to repair or replace the draining pump.



- Built-in draining pump to make sure condensed water drain out reliably.



(6) Terminals for alarm lamp and long-distance on-off controller connection are standard

- Reserve terminals for the connection of alarm lamp and long-distance on-off controller, more human control.



Alarm lamp

Long-distance on-off controller

7.5 Ceiling-Floor

(1) New design, more modern and elegant appearance.



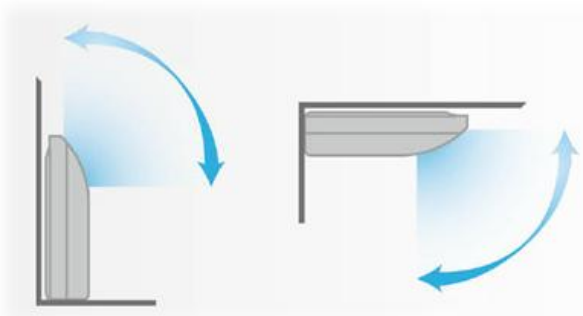
(2) Convenient installation

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

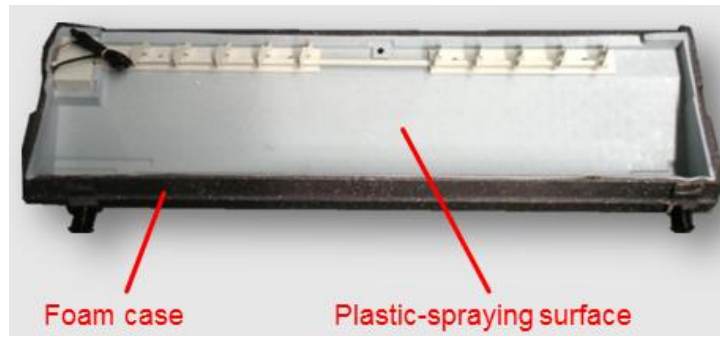
(3) Two direction auto swing (vertical & horizontal) and wide angle air flow,

--Air flow directional control minimizes the air resistance and produces wilder 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) New foam drain pan with plastic-spraying inner surface

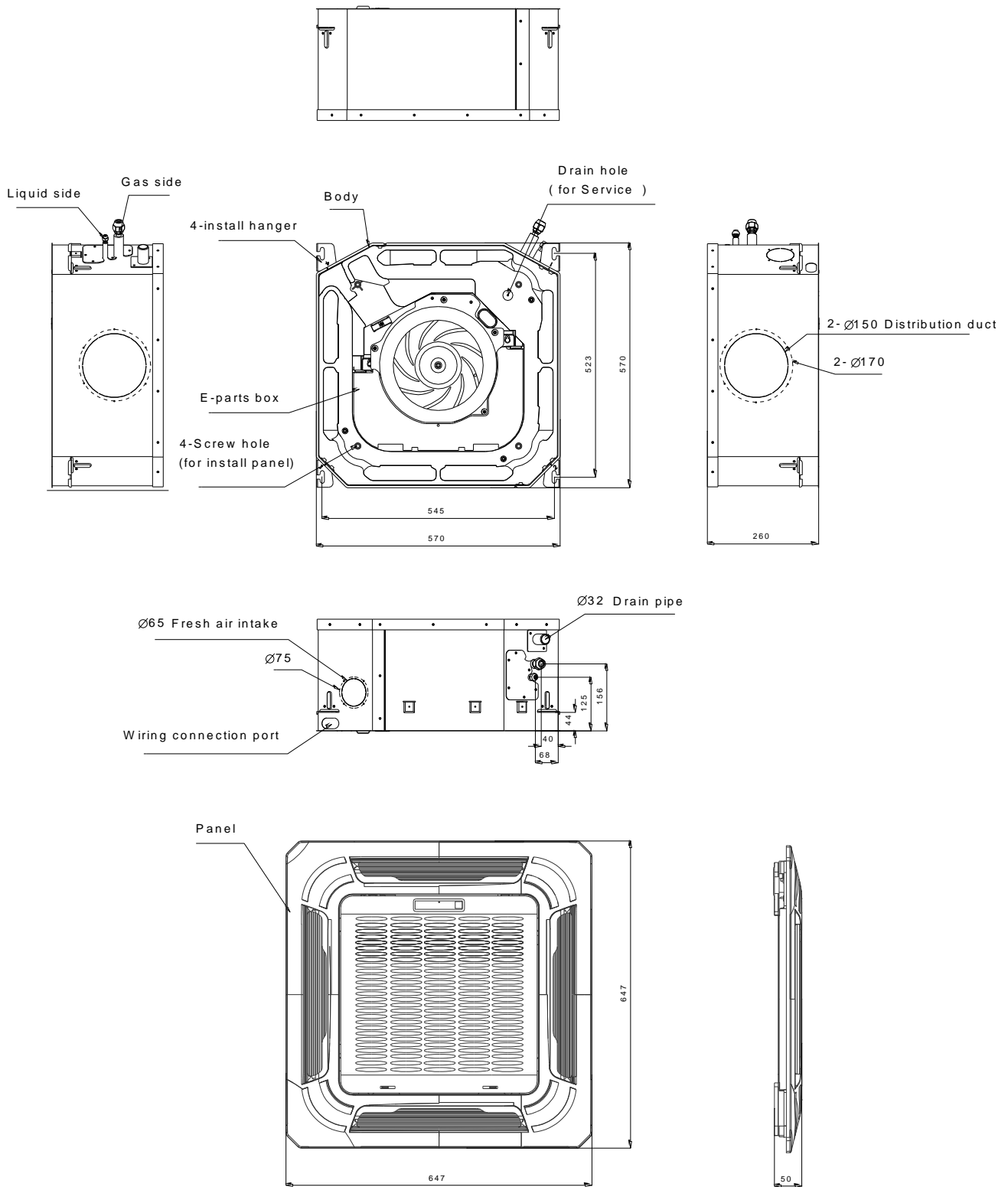


(5) Easy operation.

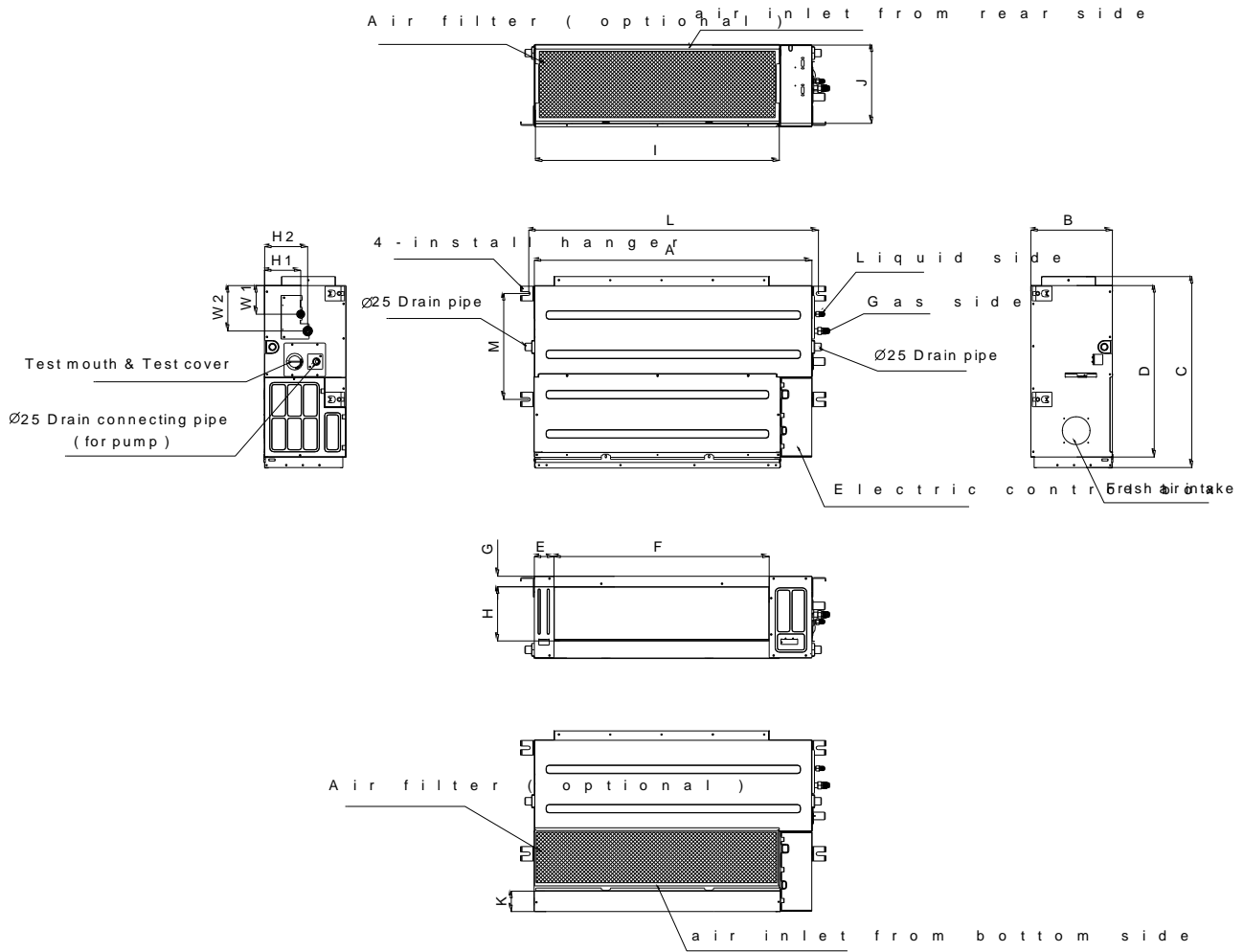
(6) Remote control and optional wired control method.

3. Dimensions

3.1 Four-way cassette type (compact):



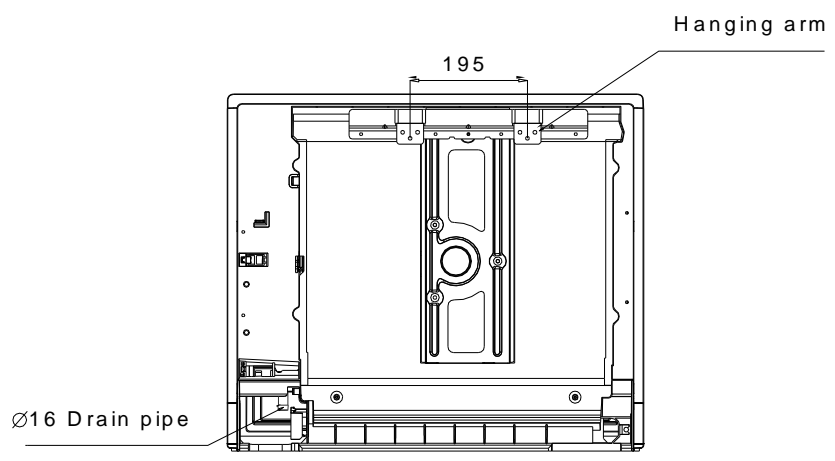
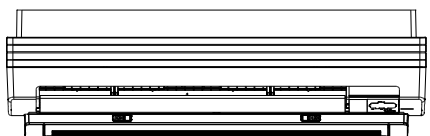
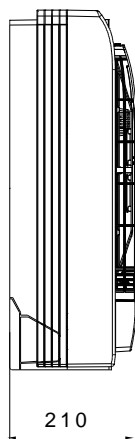
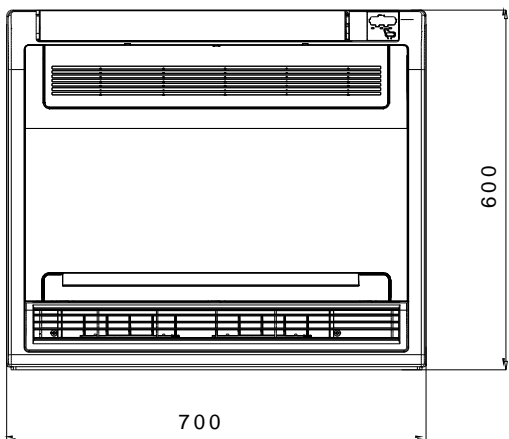
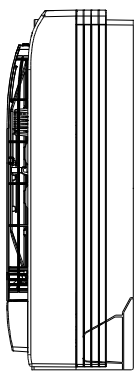
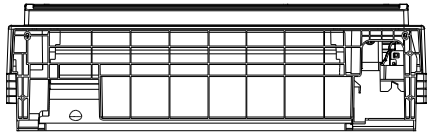
3.2 A5 Duct



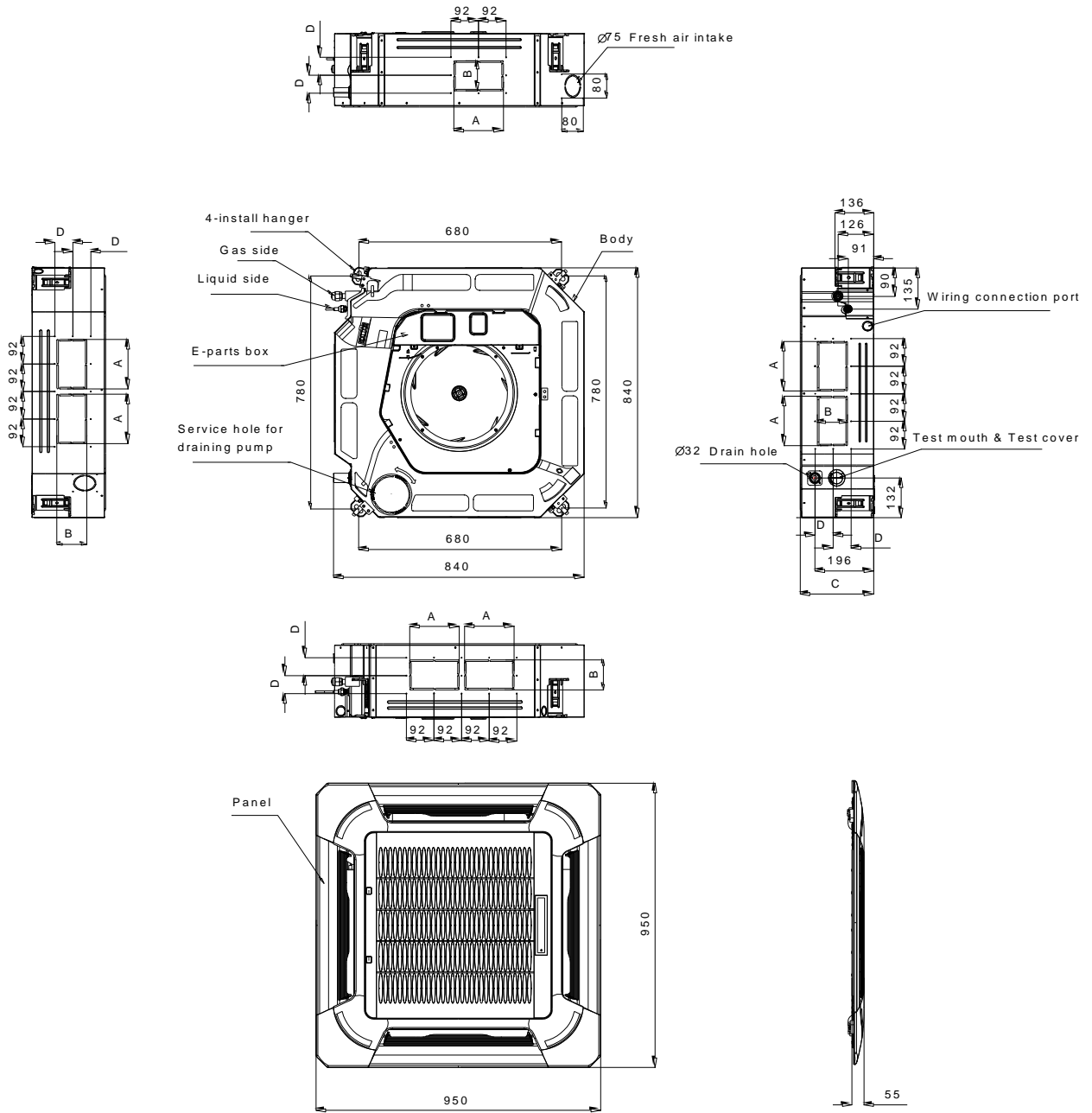
Note: standard product without filter Unit: mm

Model	Outline dimension(mm)				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
42QSS012DS*	700	210	635	570	65	493	35	119	595	200	80	740	350	120	143	95	150

3.3 Console

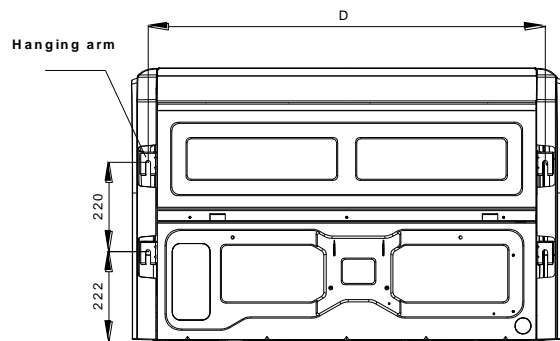
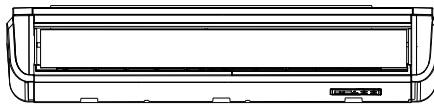
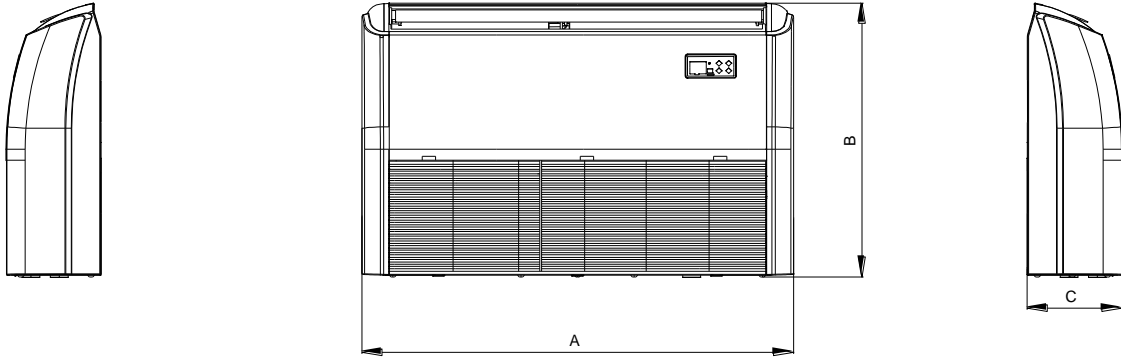
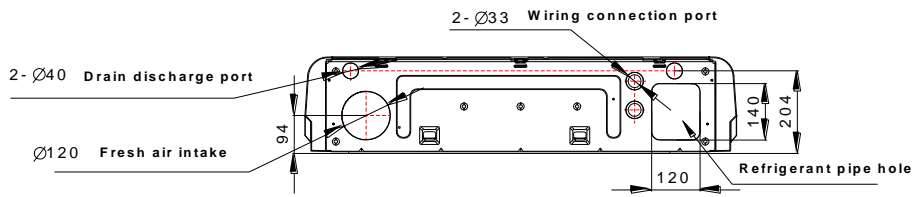


3.4 Super-Slim Cassette Type



Unit: mm				
Model	A	B	C	D
42QTD024DS*	160	95	245	60

3.5 Ceiling & Floor Type



Capacity (KBtu/h)	A	B	C	D
18/24	1068	675	235	983

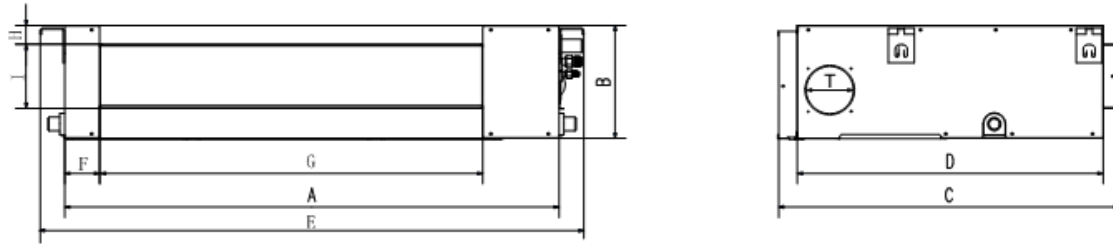
3.6 Ducted

A5

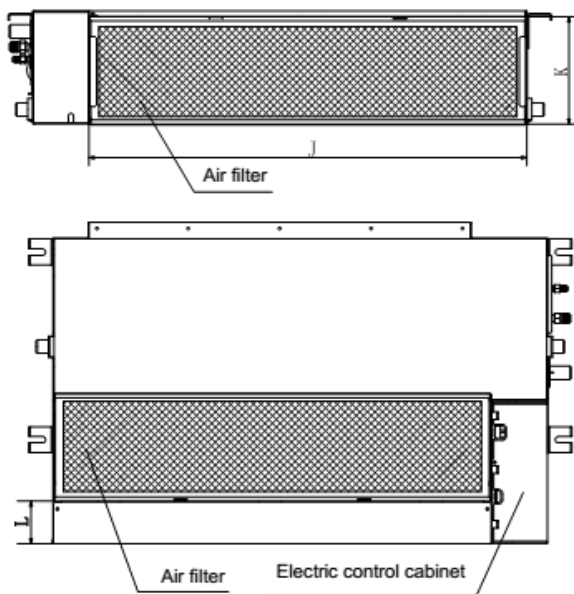
SPACE REQUIREMENT FOR INDOOR UNIT(42QSS009/012DS*)

Unit: mm

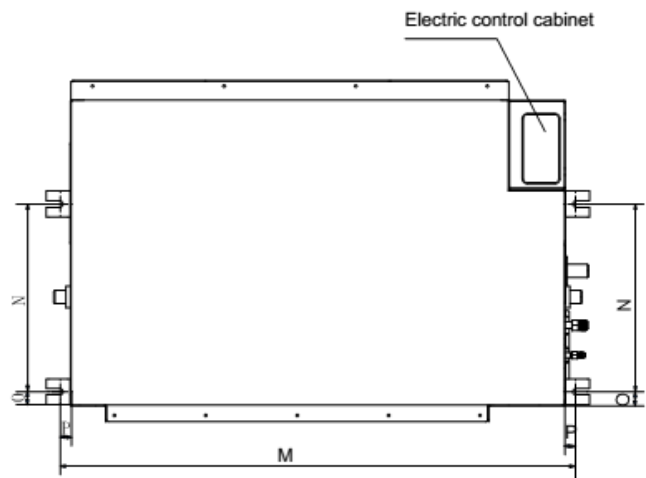
The size of outline dimension and air outlet opening



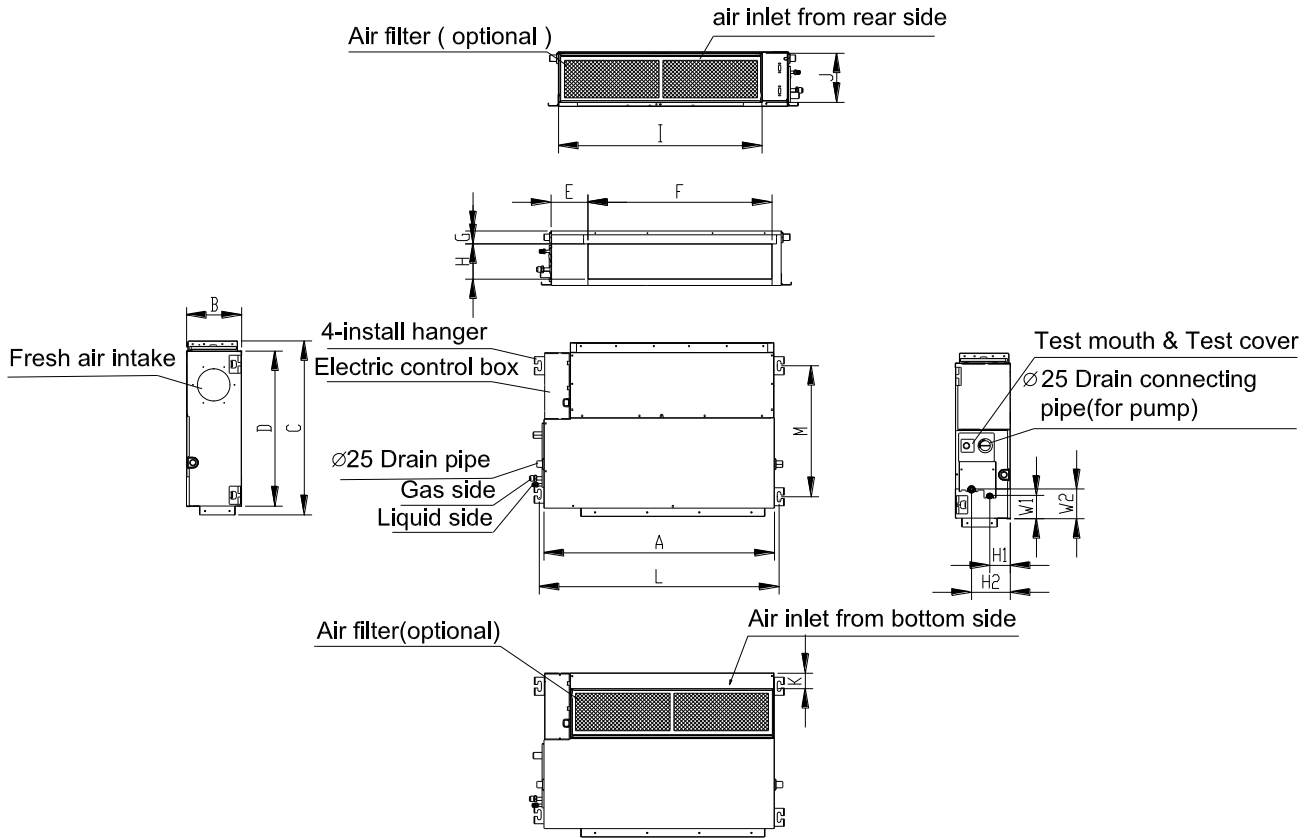
**The size of air return opening and
The size of descensional ventilation opening**



The size of mounted lug



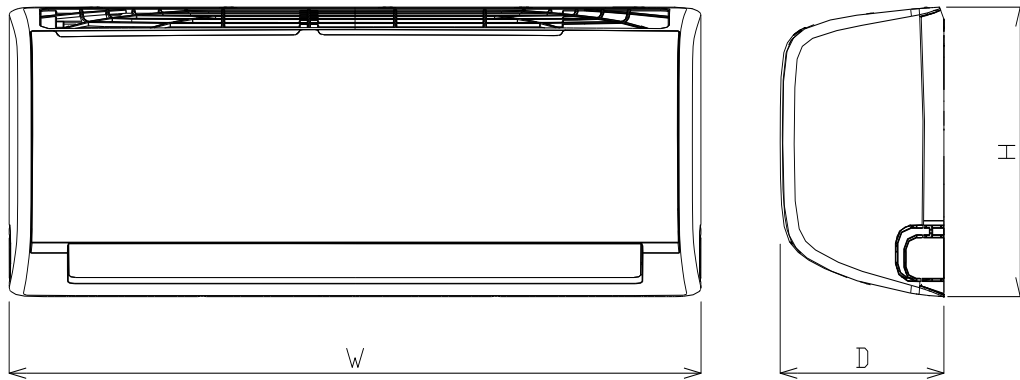
MODEL (QSS_DS)	Outline dimension					Air outlet opening size				Air return opening size			Size of mounted hook				New air inlet
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
009/012	700	210	635	570	790	65	493	35	119	595	200	80	740	350	26	20	Φ90



MODEL (42QSS)	Outline dimension				air outlet opening size		air return opening size		Size of mounted lug	
	A	B	C	D	E	F	G	H	I	J
012	700	200	506	450	152	537	186	599	741	360
018	880	210	674	600	136	706	190	782	920	508
024	1100	249	774	700	175	926	228	1001	1140	598
030/036	1360	249	774	700	175	1186	228	1261	1400	598
048/060	1200	300	874	800	227	1044	280	1101	1240	697

3.7 Hi-wall

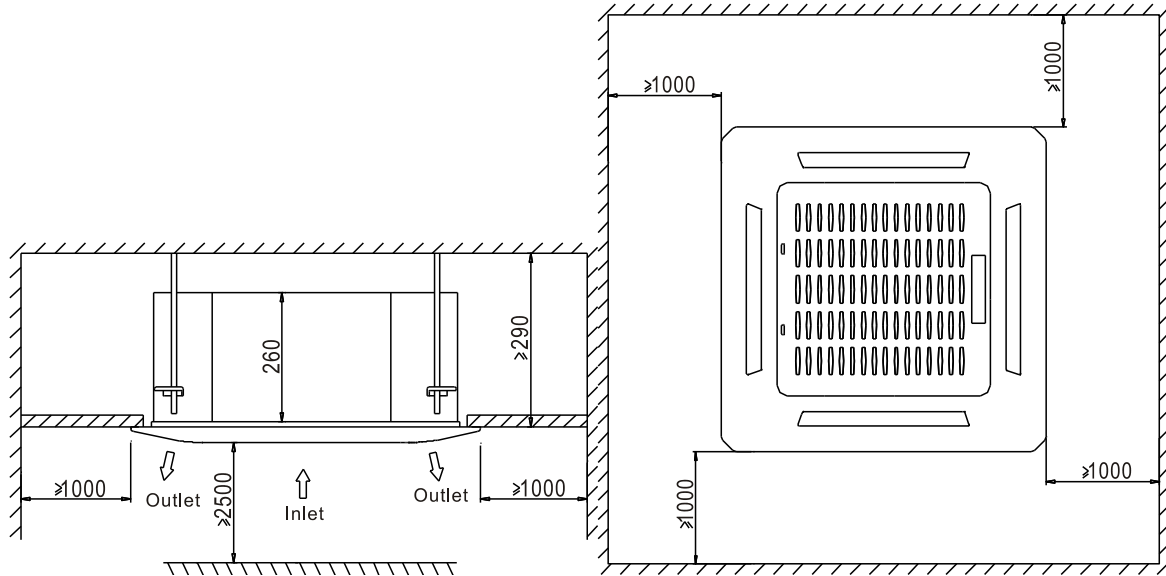
3.7.1 Indoor Unit



Model (KBTu/h)	W	D	H
42QHC007D8S 42QHC009D8S	730	192	291
42QHC012D8S	812	192	300
42QHC018D8S	973	218	319
42QHC024D8S	1082	225	338

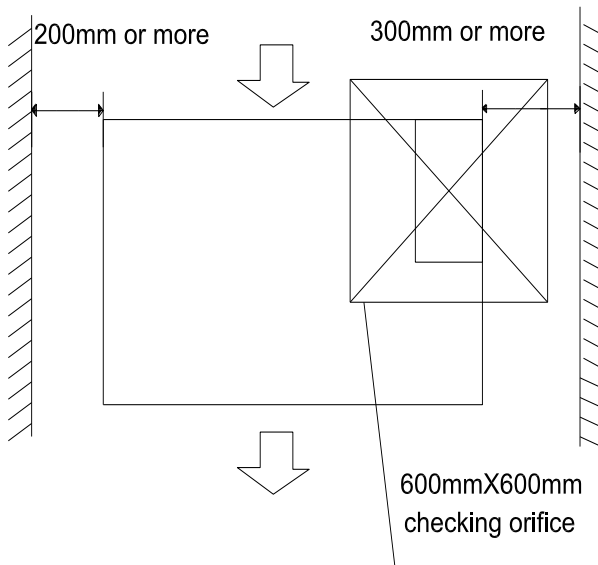
4. Service Space (unit: mm)

4.1 Four-way cassette (compact)

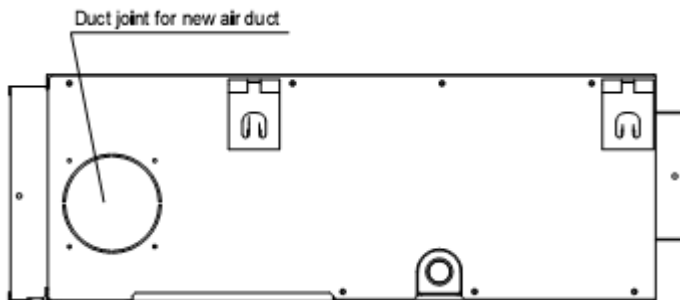


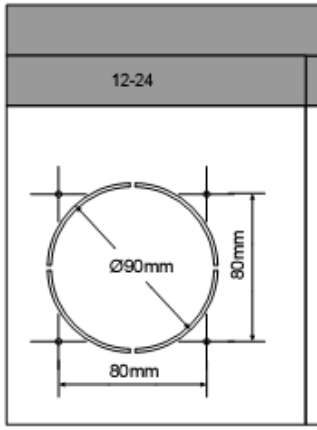
4.2 Duct

Ensure enough space required for installation and maintenance.

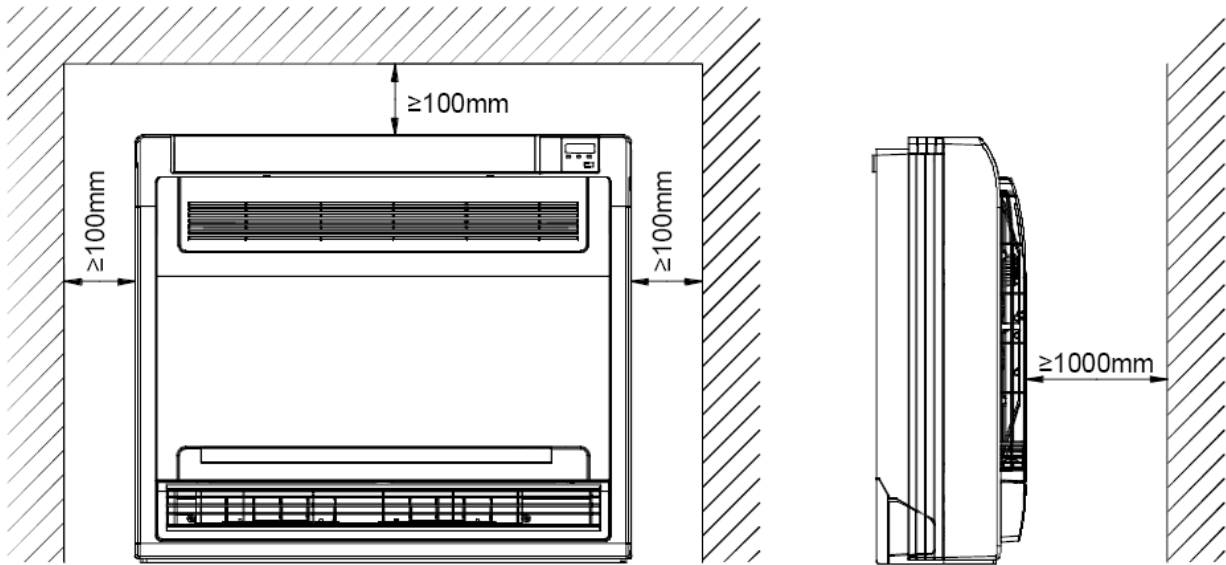


All the indoor units reserve the hole to joint the fresh air pipe. The hole size as following:

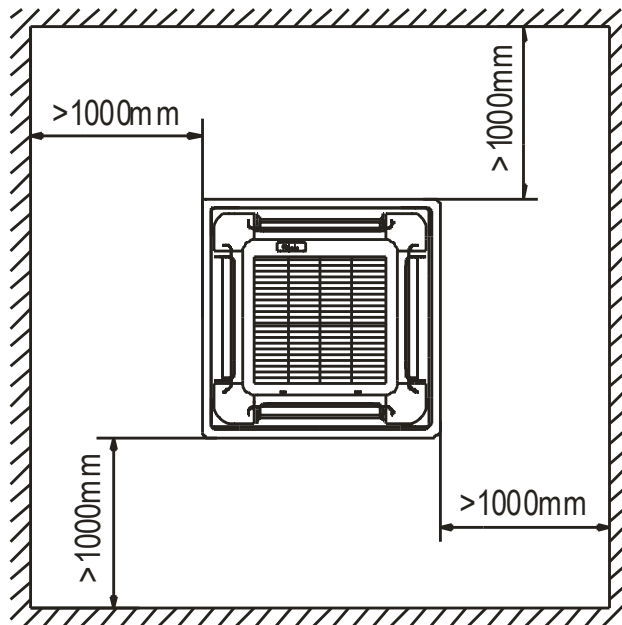




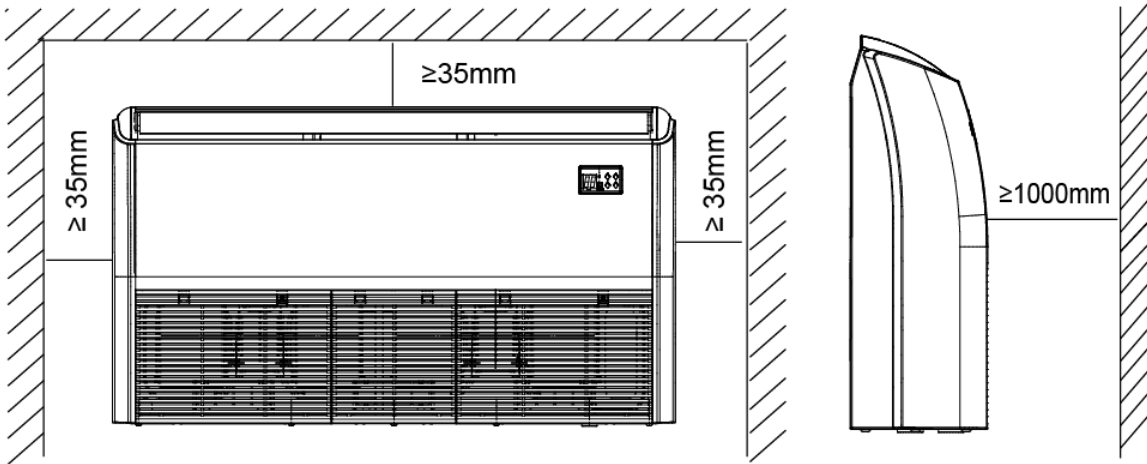
4.3 Console



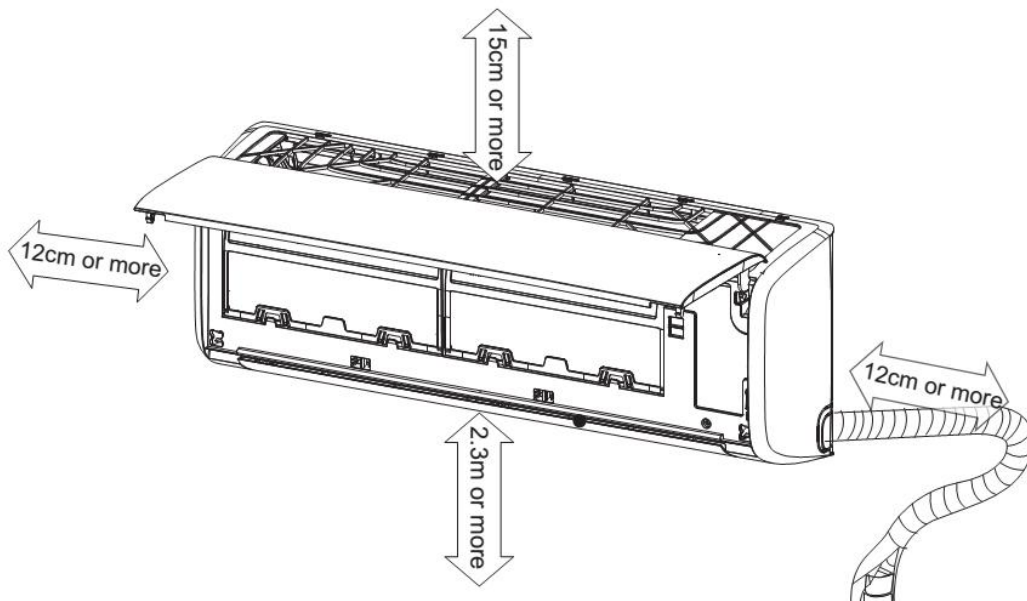
4.4 Super-Slim Cassette Type



4.5 Ceiling & Floor Type



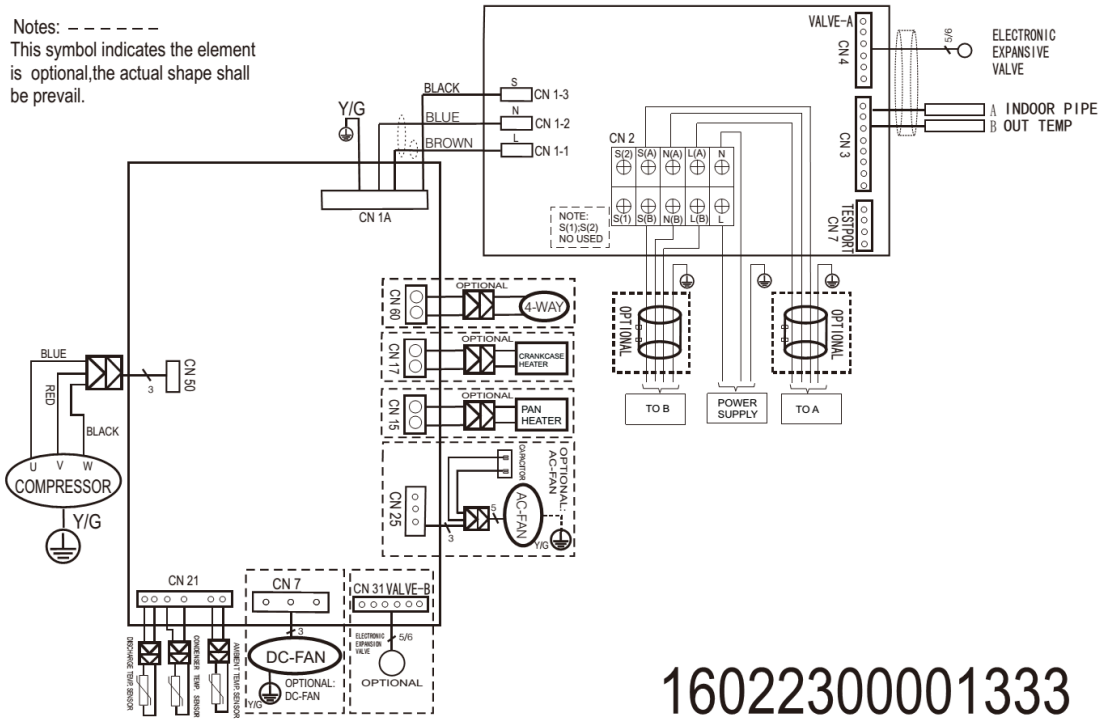
4.6 Hi-wall



5. Wiring diagram

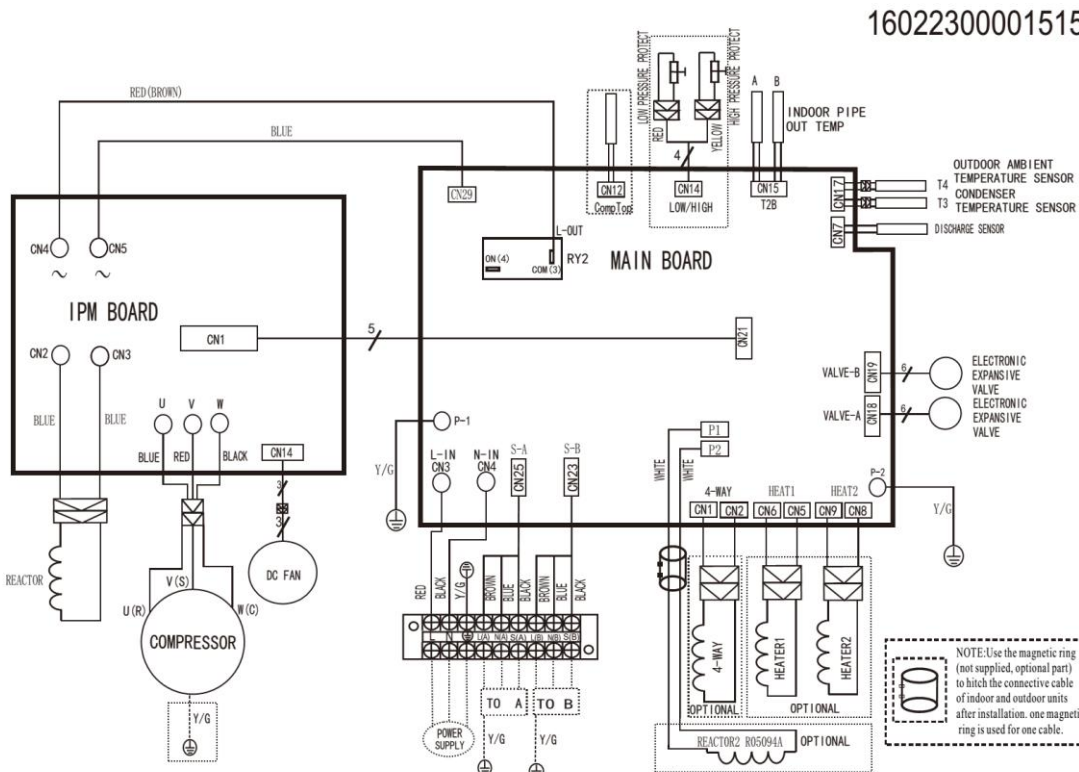
38QUS014DS2*/ 38QUS014DS2-2/ 38QUS018DS2-2

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



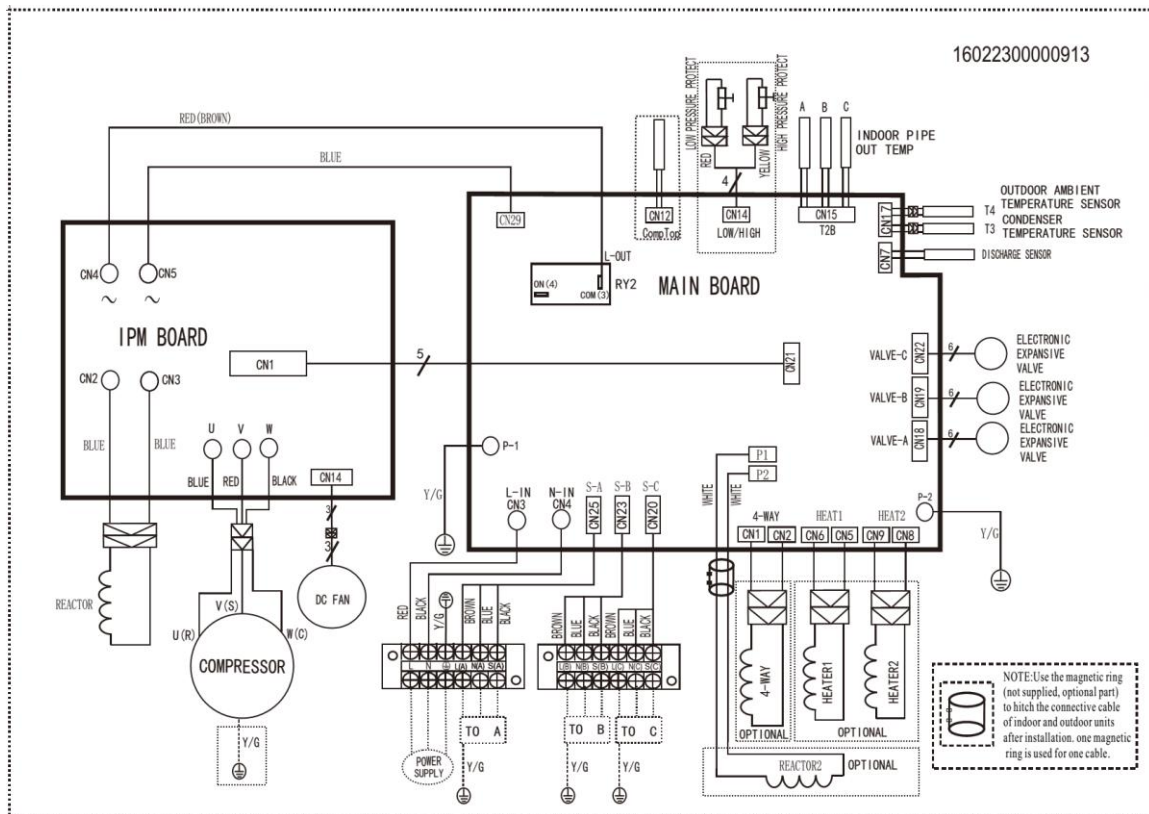
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38QUS018DS2*

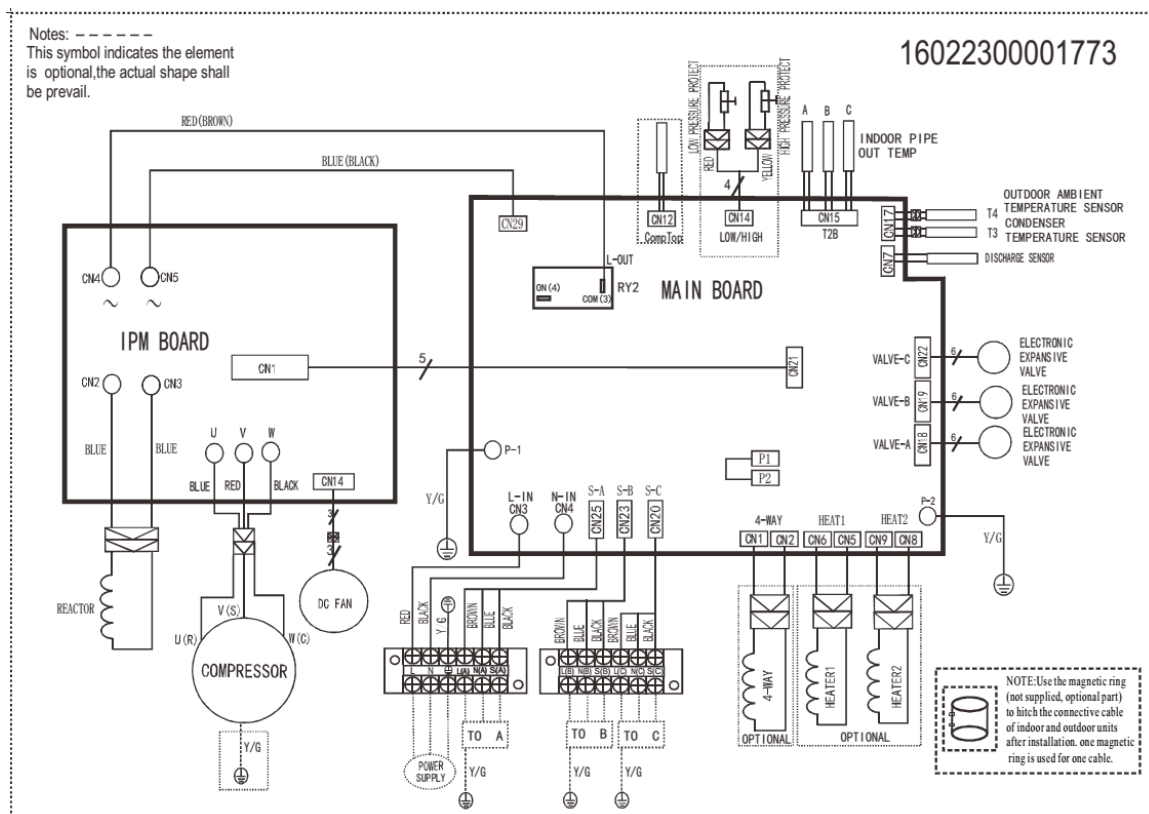


16022300001515

38QUS021DS3*

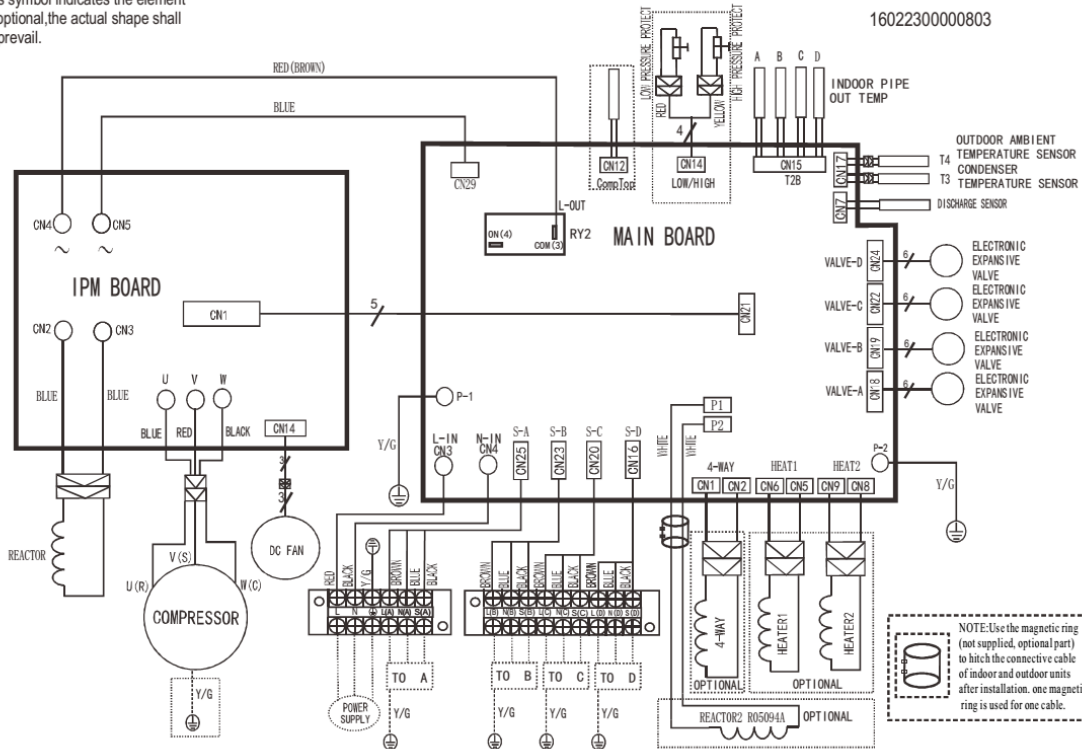


38QUS027DS3*

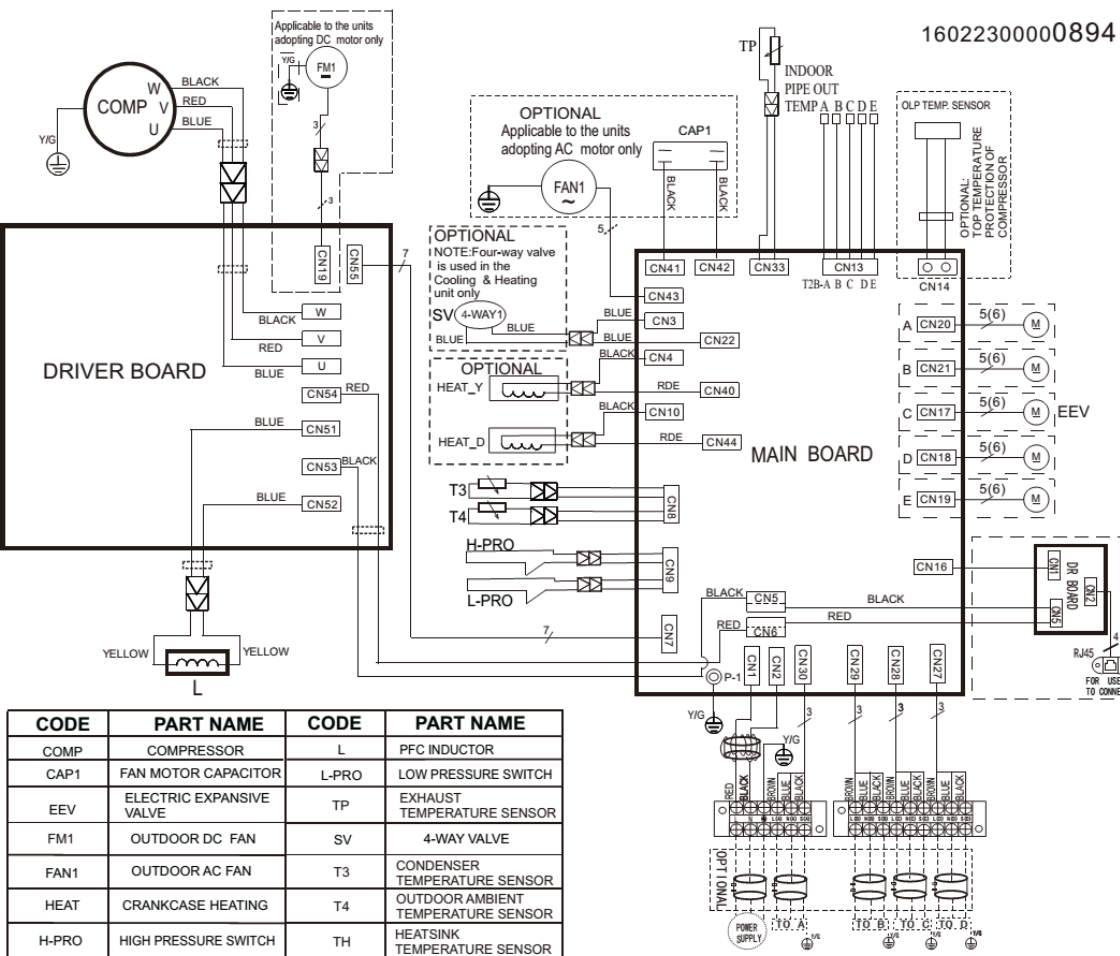


38QUS028DS4*

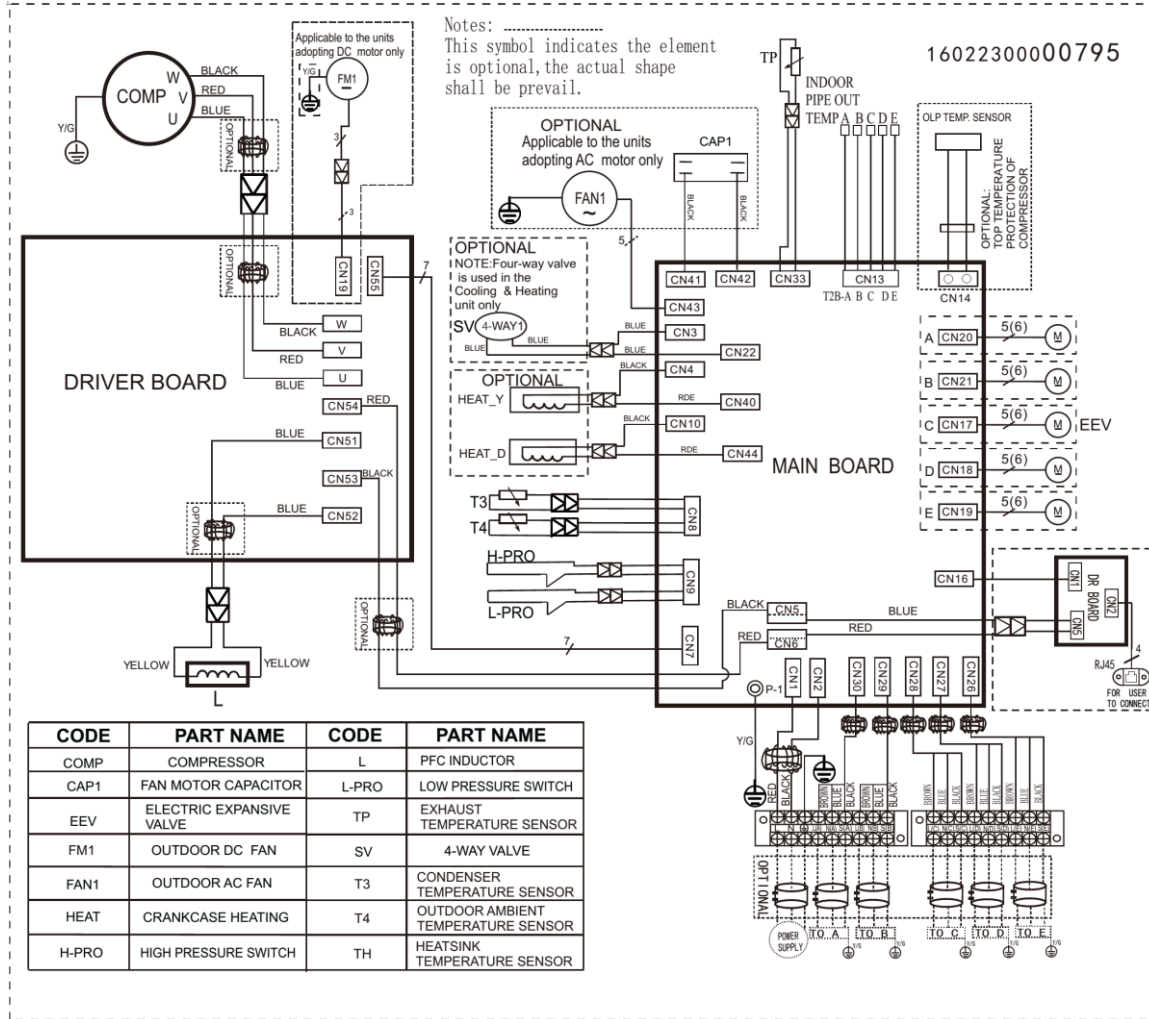
Notes: - - - - -
This symbol indicates the element is optional, the actual shape shall be previal.



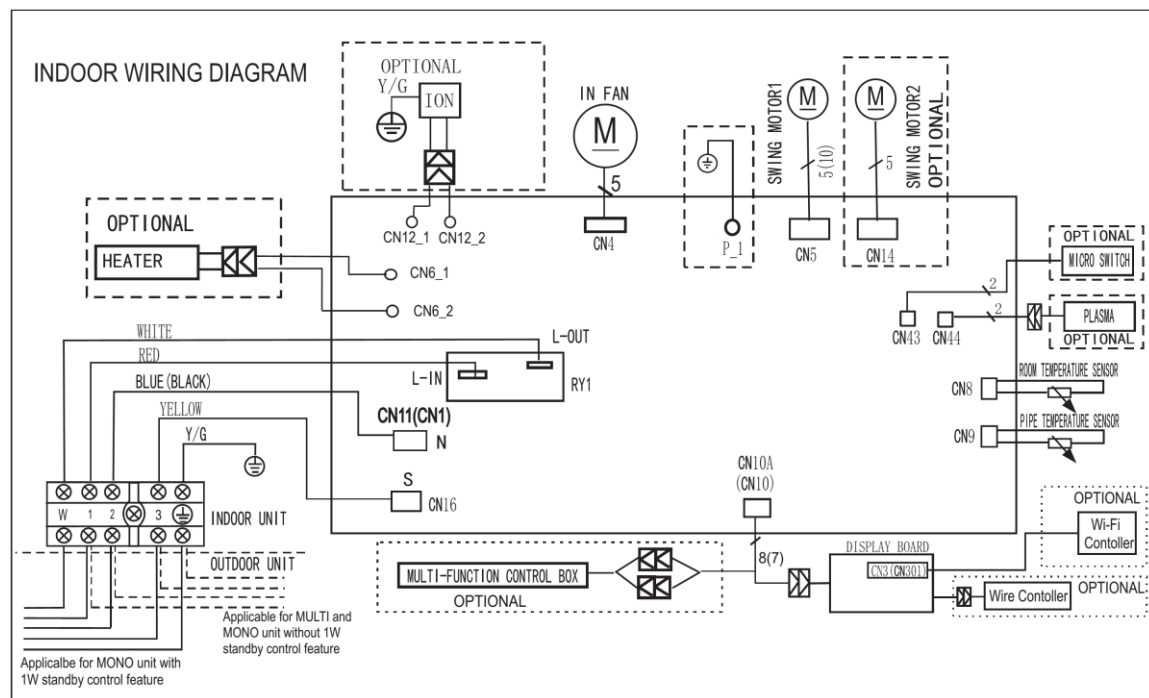
38QUS036DS4*



38QUS042DS5*



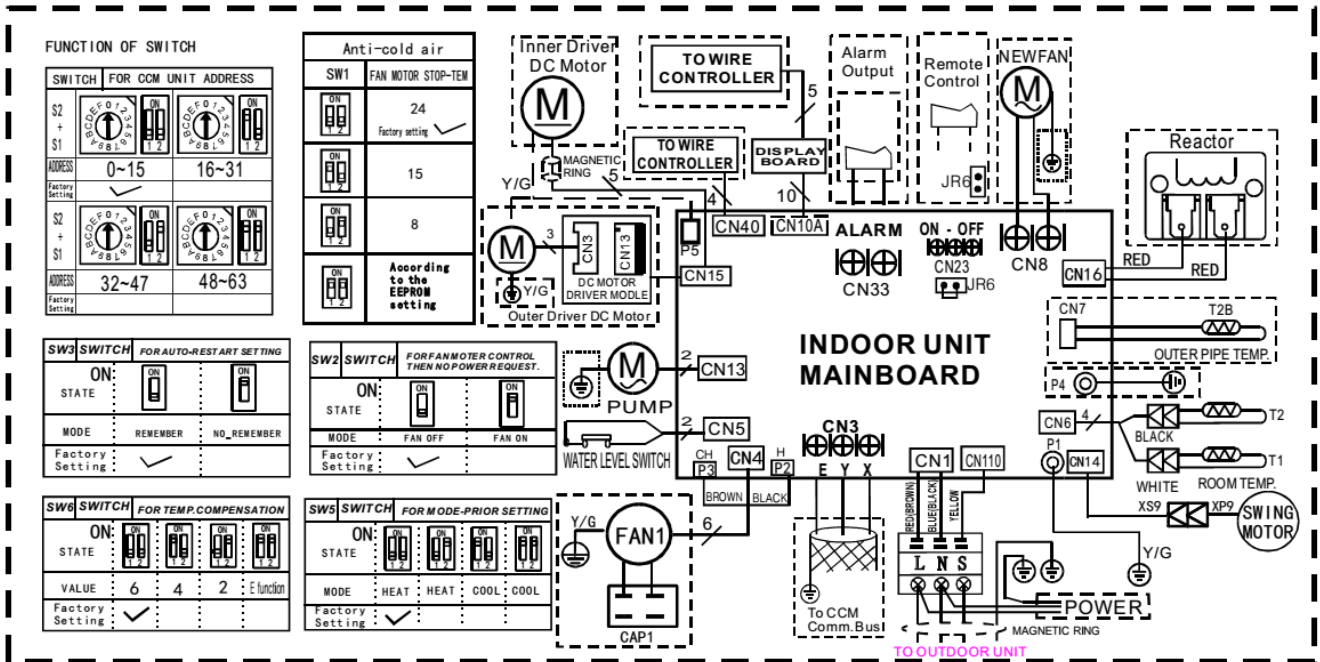
42QHC007D8S, 42QHC009D8S, 42QHC012D8S, 42QHC018D8S, 42QHC024D8S



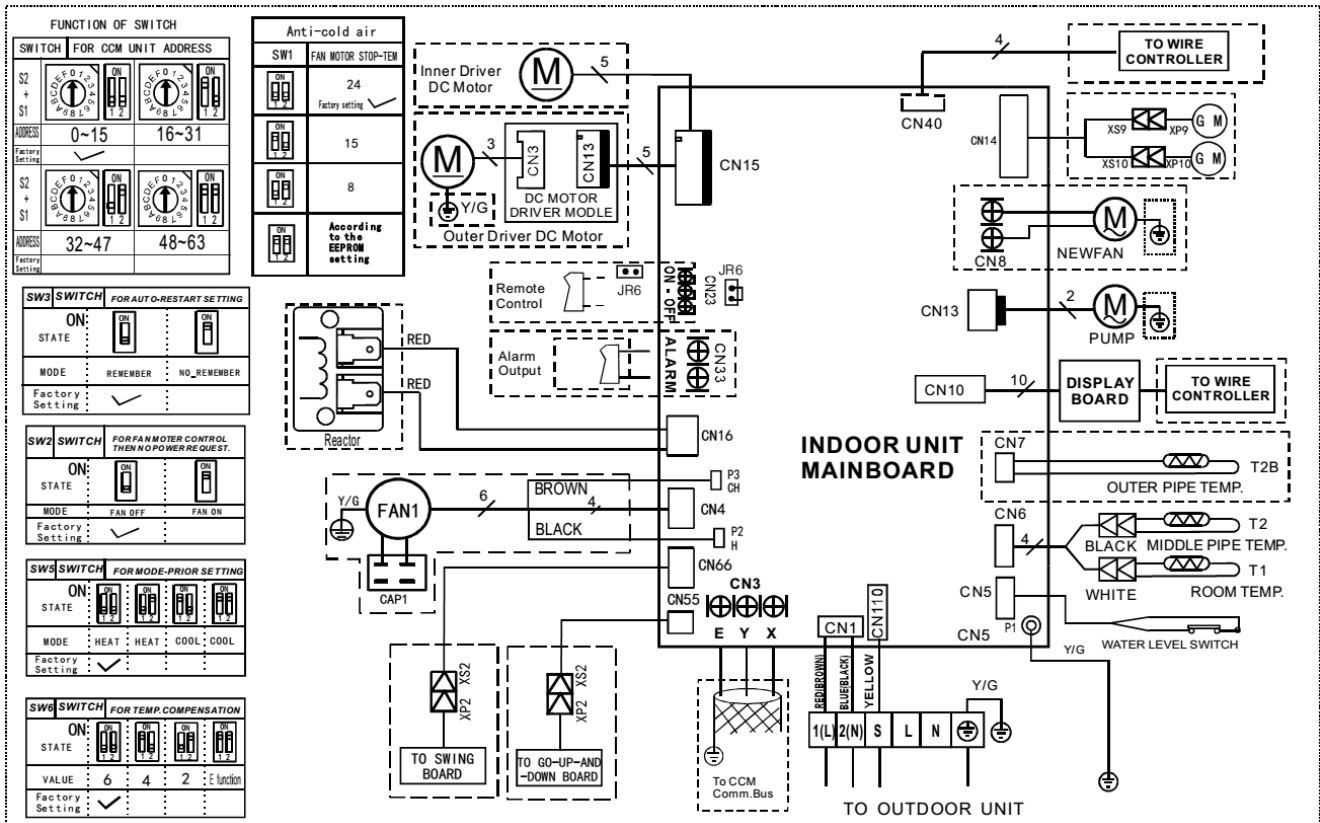
16022000A83297

42QTD007D8S/42QTD009D8S/42QTD012D8S/42QTD018D8S

42QTD009DS*、42QTD012DS*、42QTD018DS*

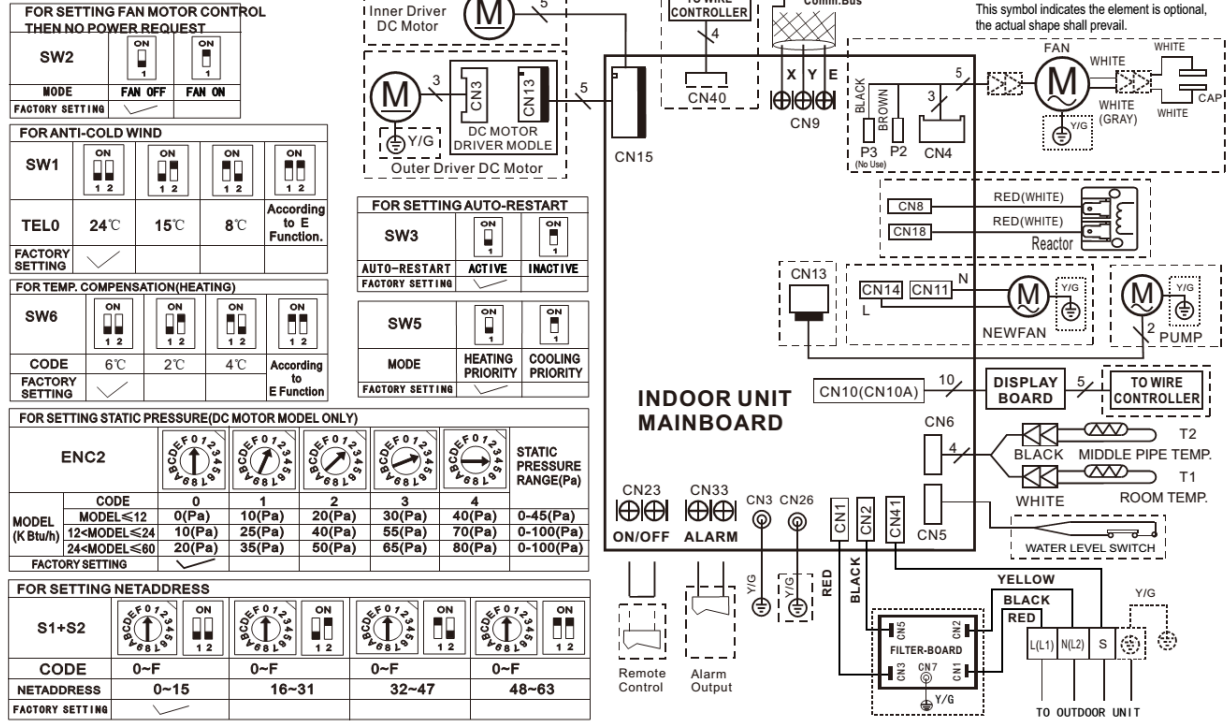


42QTD024DS*



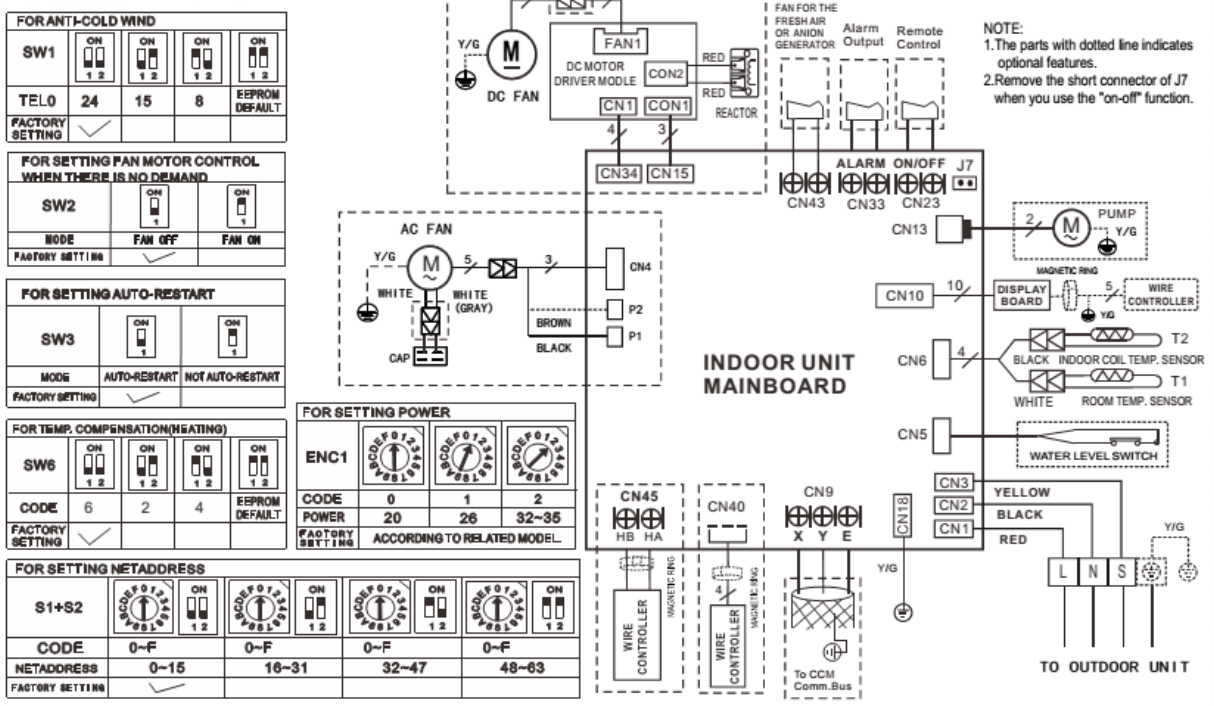
42QSS012DS*

WIRING DIAGRAM (INDOOR UNIT) 1602300007001

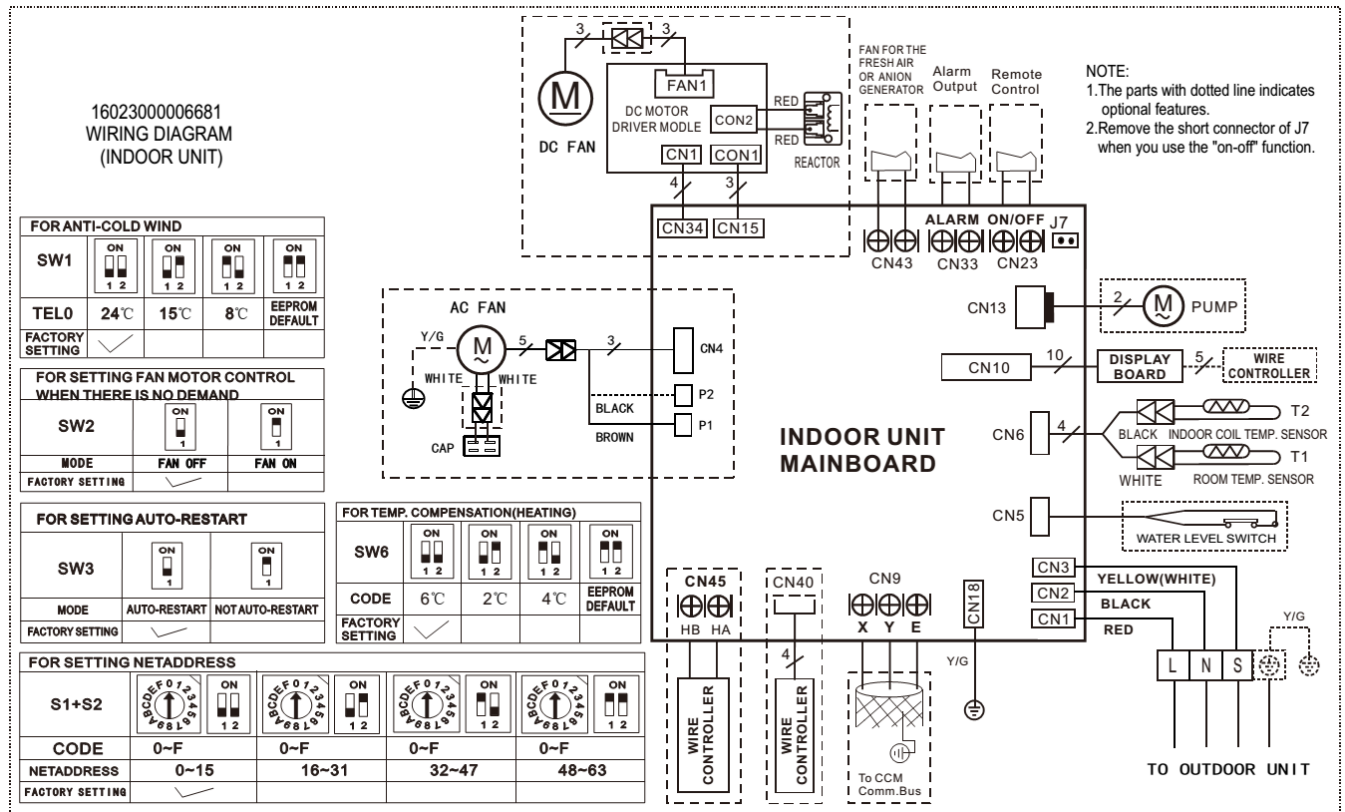


42QSS007D8S/42QSS009D8S/42QSS012D8S

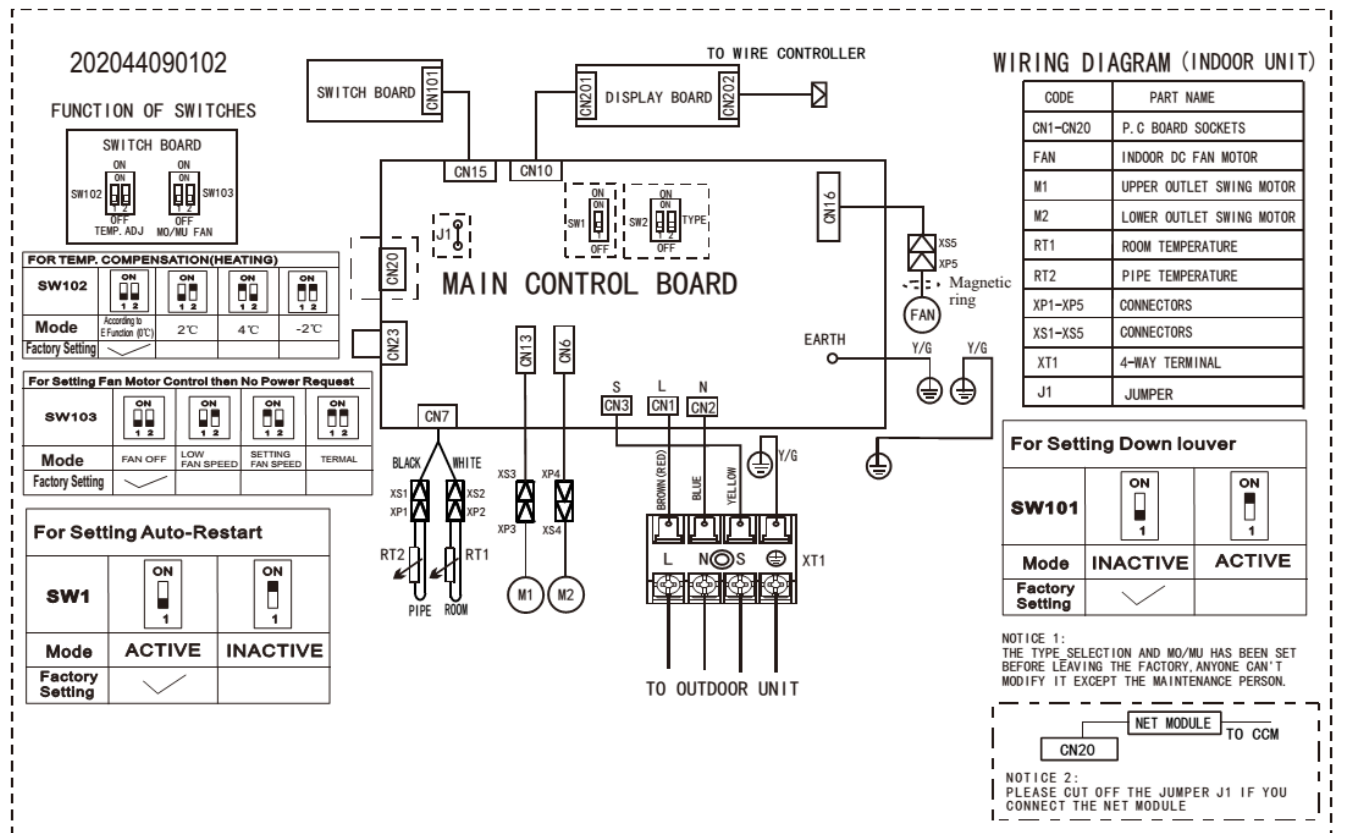
1602300007861 WIRING DIAGRAM









42QSS018DS*, 42QSS024DS*



42QZA009DS*, 42QZA012D8S, 42QZA018DS*

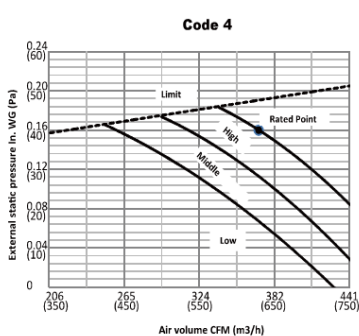
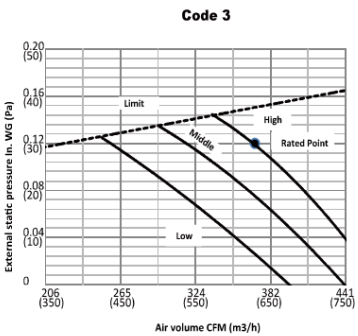
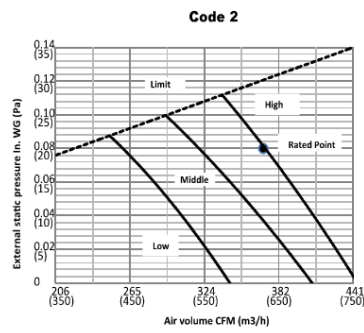
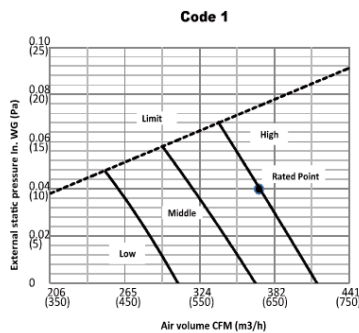
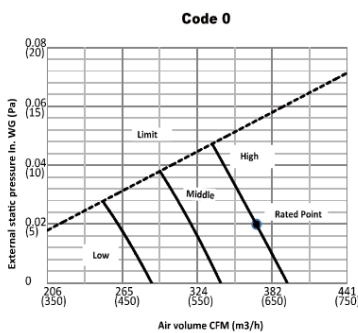


6. Static Pressure (A5 Ducted)

ENC2					
CODE	0	1	2	3	4
42QSS009/012DS	0	10	20	30	40
DEFAULT SETTING					

Fan performance curve at different static pressure setting.(cooling mode)

42QSS009DS*/42QSS012DS*



7. Operation temperature range

Temperature Mode	Cooling operation	Heating operation	Drying operation
Room temperature	18°C~32°C	0°C~27°C	18°C~32°C
Outdoor temperature	0°C~46°C	-15°C~24°C	0°C~46°C

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.

8. Electronic function

Note: Below function only for light commercial, for Hi-wall units, please refer to 1 drive 1 service manuals.

8.1 Abbreviation

T1: Indoor room temperature

T2: Indoor evaporator temperature

T2B: Coil temperature of indoor heat exchanger outlet(This sensor is located in outdoor unit)

T3: Coil temperature of outdoor heat exchanger

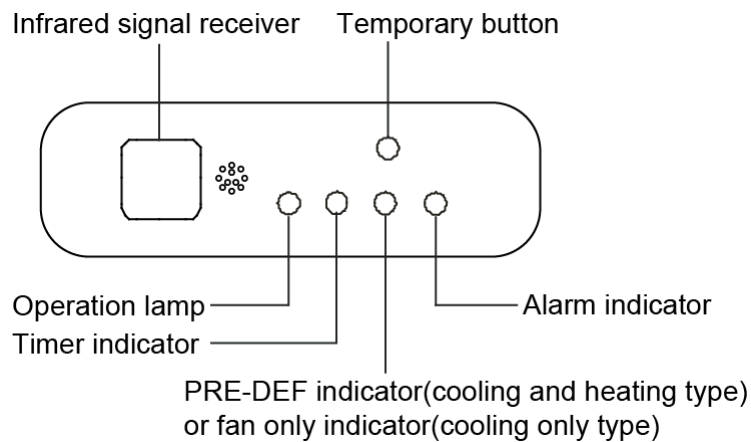
T4: Outdoor ambient temperature

T5: Compressor discharge temperature

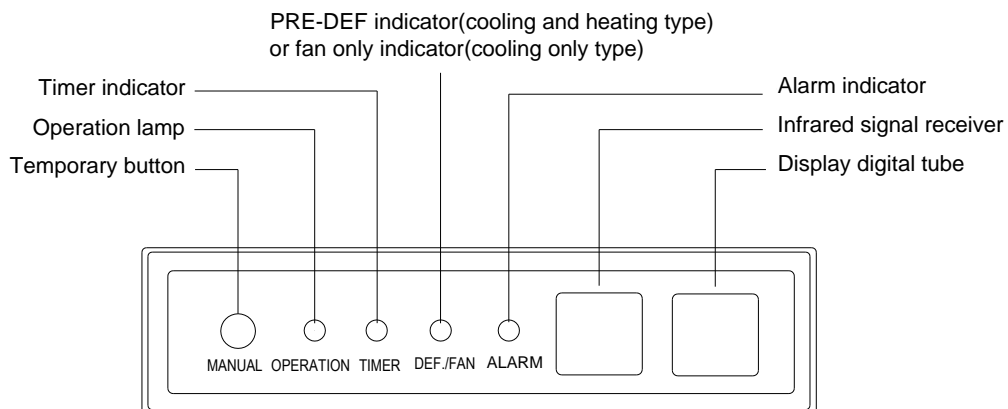
Ts: Setting temperature

8.2 Icon explanation on indoor display board

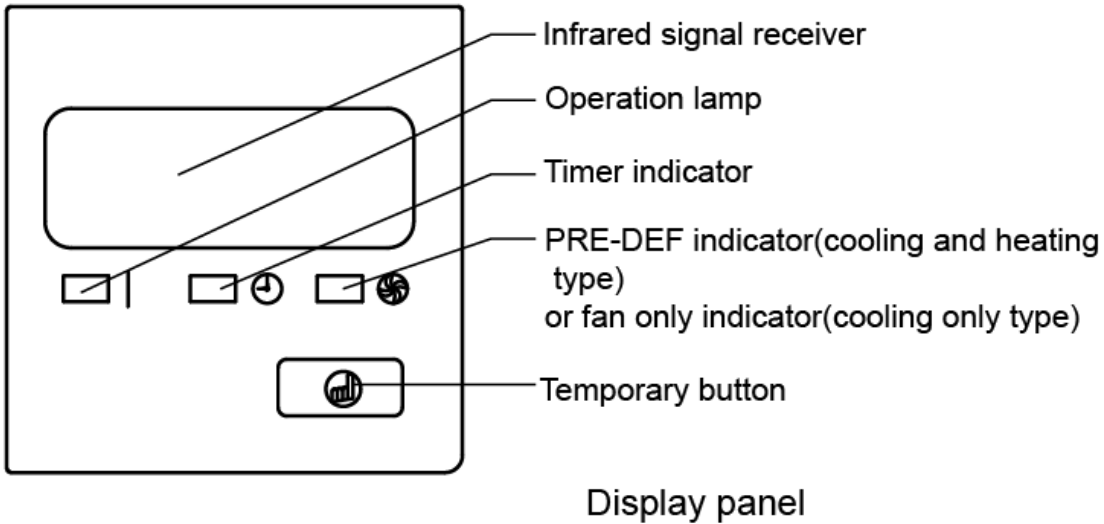
8.2.1 Four-way cassette (compact)



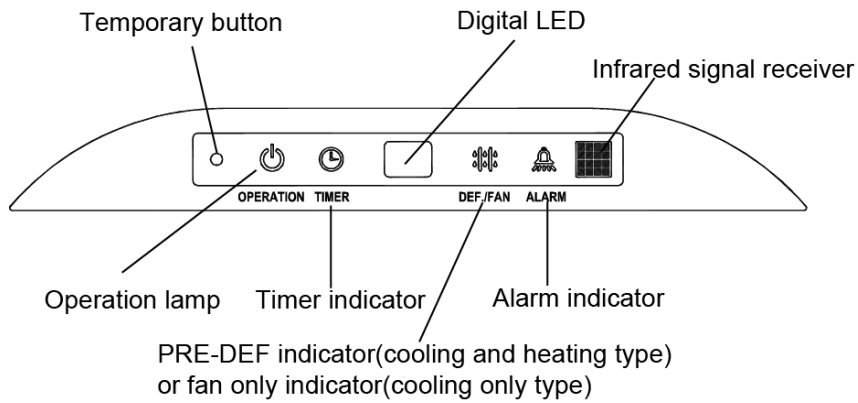
8.2.2 A5&A6 Duct



8.2.3 Console



8.2.4 Super slim cassette



8.2.5 Ceiling & floor



8.2.6 15C



8.3 Main Protection

8.3.1 Three minutes delay at restart for compressor.

8.3.2 Sensor protection at open circuit and breaking disconnection.

8.3.3 Indoor fan delayed open function

---When system starts up, the louver will be active immediately, and the indoor fan will open after certain time.

---If the system runs in heating mode, the anti-cold wind function has priority.

8.3.4 Fan speed is out of control (For the units used DC fan motor)

For console:

When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure.

For other models:

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

8.3.5 Inverter module protection

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

8.4 Operation Modes and Functions

8.4.1 Fan-only mode

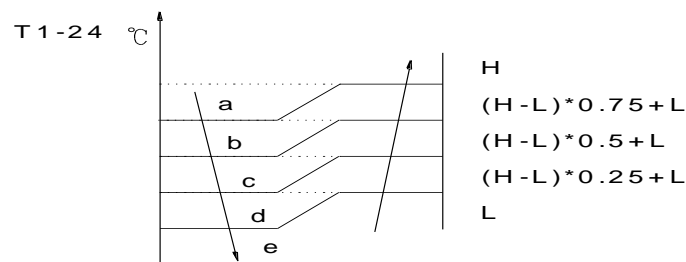
(1) Outdoor fan and compressor stop.

(2) For Console: Indoor fan can be set to high/med/low/breeze, for other models: Indoor fan can be set to high/med/low/auto.

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

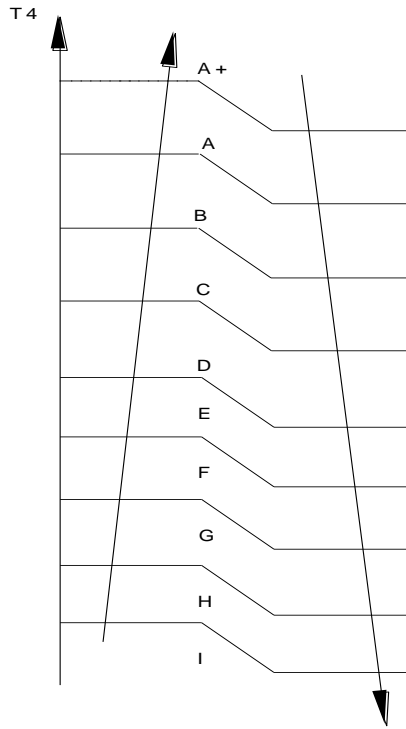
(4) Auto fan in fan-only mode acts as follow:

For all models:



8.4.2 Cooling mode

8.4.2.1 Outdoor fan running rules



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

8.4.2.2 Indoor fan running rules

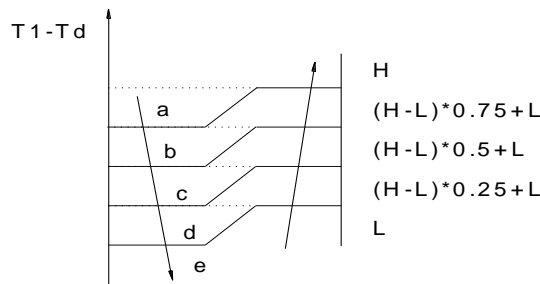
For all models:

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

When the compressor is running, the indoor fan is controlled as below:

Setting fan speed	T1-Td °C(°F)	Actual fan speed
H	A	H+ (H+=H+G)
	B	H (=H)
	C	H- (H-=H-G)
M	D	M+ (M+=M+Z)
	E	M (M=M)
	F	M- (M-=M-Z)
L	G	L+ (L+=L+D)
	H	L (L=L)
	I	L- (L-=L-D)

The auto fan acts as below rules:



8.4.2.3 Evaporator low temperature T2 protection

For all models: When $T_2 < 4^\circ\text{C}$ for 250s or $T_2 < 0^\circ\text{C}$, the indoor has no capacity demand and resume till $T_2 > 8^\circ\text{C}$

8.4.3 Dry mode

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

8.4.3.2 Low indoor room temperature protection

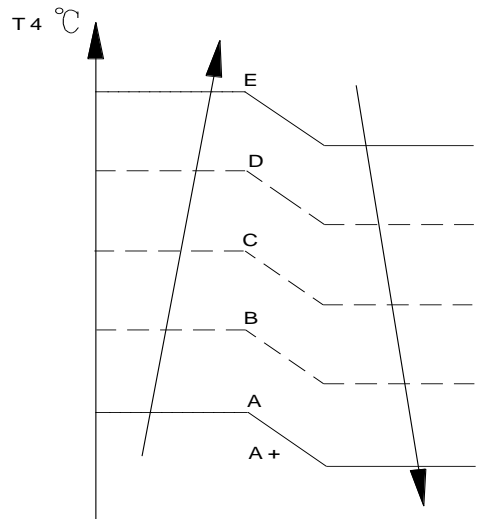
In drying mode, if room temperature is lower than 10°C, the indoor fan will stop and not resume until room temperature exceeds 12°C.

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

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

8.4.4 Heating mode

8.4.4.1 Outdoor fan running rules



8.4.4.2 Indoor fan running rules

For all models:

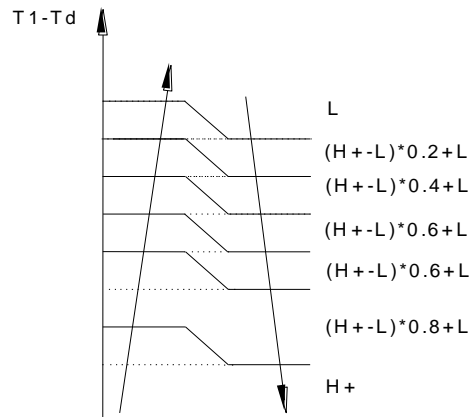
In heating mode, indoor fan can be selected as high, medium, low and auto. The anti-cold-wind function has the priority.

When the compressor is running, the indoor fan is controlled as below:

Setting fan speed	T1-Td°C	Actual fan speed
H		H-(H=H-G)
		H (=H)
		H+(H+=H+G)
M		M-(M=M-Z)
		M(M=M)
		M+(M+=M+Z)
L		L-(L=L-D)
		L(L=L)
		L+(L+=L+D)

If the compressor stops caused by the room temperature rising, the indoor fan will be forced to run 127 seconds with breeze. During this period, the anti-cold-wind is disabled.

Auto fan action in heating mode:



8.4.4.3 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 .

8.4.4.4 Prevent Over-Heating

In heating mode, when the indoor unit has no capacity requirement due to indoor room temperature increased, the Indoor fan will run in super breeze. (Anti-cold wind function has the priority)

8.4.4.5 Defrosting mode:

Condition of defrosting:

AC will enter the defrosting mode according to the value of temp. of T_3 and the value range of temp. change of T_3 and also the compressor running time.

Condition of ending defrosting:

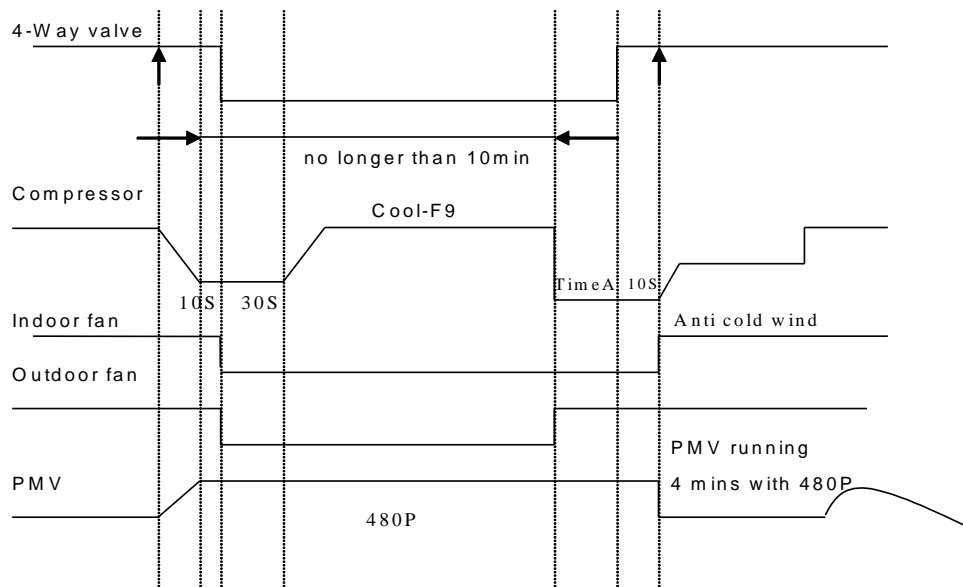
If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

---- T_3 rises to be higher than $TCDE1^\circ\text{C}$.

---- T_3 keeps to be higher than $TCDE2^\circ\text{C}$ for 80 seconds.

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

Defrosting action:



8.4.5 Auto-mode

This mode can be chosen by remote controller and the setting temperature can be changed between 17~30°C.

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

For all models:

T1-TS	Running mode
$T1-TS > 2^{\circ}\text{C}$	Cooling
$-2 < T1-TS \leq 2^{\circ}\text{C}$	Fan-only
$T1-TS \leq -2^{\circ}\text{C}$	Heating

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

The louver operates same as in relevant mode.

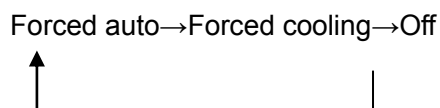
If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

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

8.4.6 Forced operation function

8.4.6.1 Enter forced operation function:

Press the touch button continually, the AC will run as below sequence:



When the machine is off, pressing the touch button will carry the machine to forced auto mode, after this, if pressing the button once again, the machine will turn into forced cooling mode.

In forced cooling mode, pressing touch button will turn off the machine.

8.4.6.2 In forced operation mode, all general protections and remote control are available.

8.4.6.3 Operation rules:

Forced cooling mode:

The compressor runs at F2 frequency and indoor fan runs as breeze. After running for 30 minutes, the machine will turn to auto mode as 24°C setting temperature.

Forced auto mode:

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

8.4.6.4 When there's 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, and turn to cooling mode at low speed with 24°C setting temperature.

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

8.4.7 Timer Function

8.4.7.1 Timing range is 24 hours.

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

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

8.4.7.4 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.

8.4.7.5 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.

8.4.7.6 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.

8.4.7.7 The setting time is relative time.

8.4.8 Sleep mode

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

8.4.8.2. 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.

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

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

8.4.9 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.

8.4.10 Drain pump control (For A5 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,

8.4.11 Follow me (optional)

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

same as that from wireless remote controller, but buzzer will not emit a sound. When the PCB receives turning-off follow-me signal from wired remote controller, the unit will quit follow-me function at once. The follow-me function controlled by wired remote controller prevails that by wireless remote controller.

8.4.12 Mode conflict

The indoor units can not 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

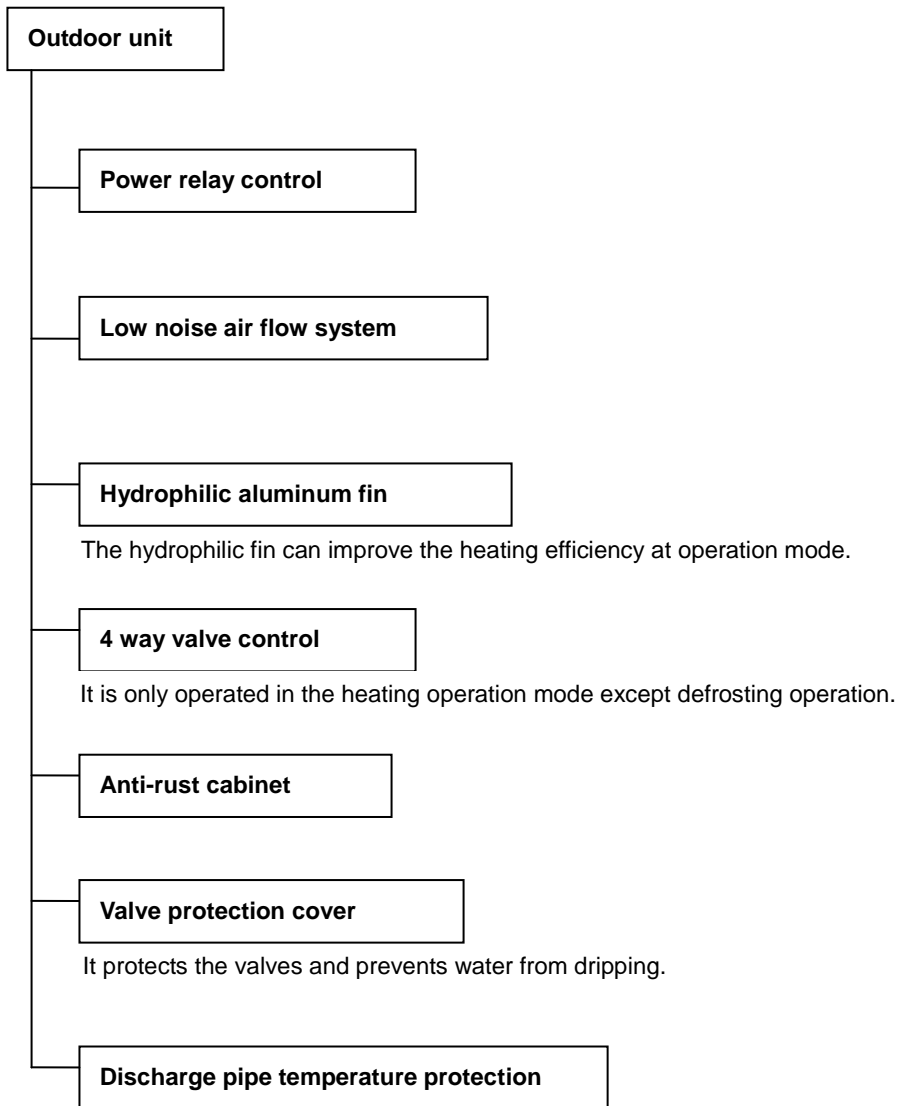
- In case of one Indoor unit working in cooling mode or fan mode, and another indoor unit is set to heating mode, the indoor unit working in cooling mode or fan mode will change to off. The outdoor unit will change to heating mode after compressor stop 3 minutes. .
- In case of one Indoor unit working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

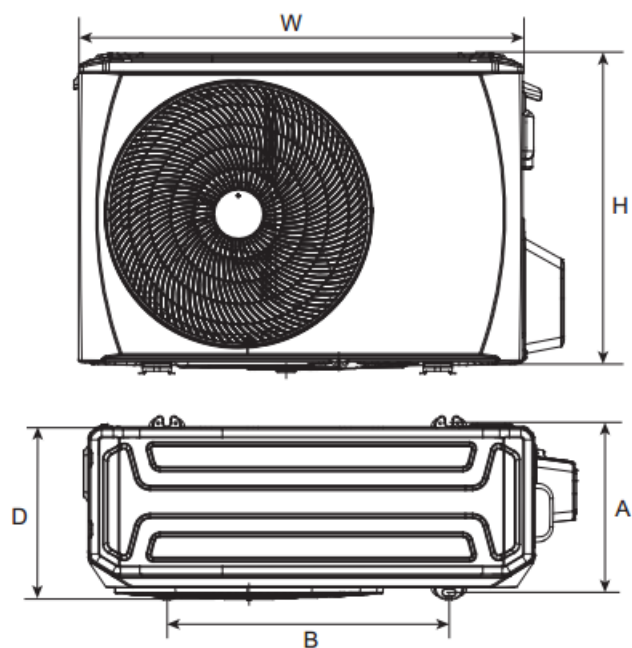
9. General information of Outdoor Units

Model name	Dimension (mm)	Compressor
38QUS014DS2*	800x333x554	ASN108D22UEZ
38QUS014DS2-2	800x333x554	ASN140D21UFZ
38QUS018DS2*	845x363x702	ASM135D23UFZ
38QUS018DS2-2	800x333x554	ASM135D23UFZ
38QUS021DS3*	845x363x702	ASM135D23UFZ
38QUS027DS3*	845x363x702	ATF235D22UMT
38QUS028DS4*	946x410x810	ATF235D22UMT
38QUS036DS4*	946x410x810	ATF310D43UMT
38QUS042DS5*	946x410x810	ATF310D43UMT

10. Features



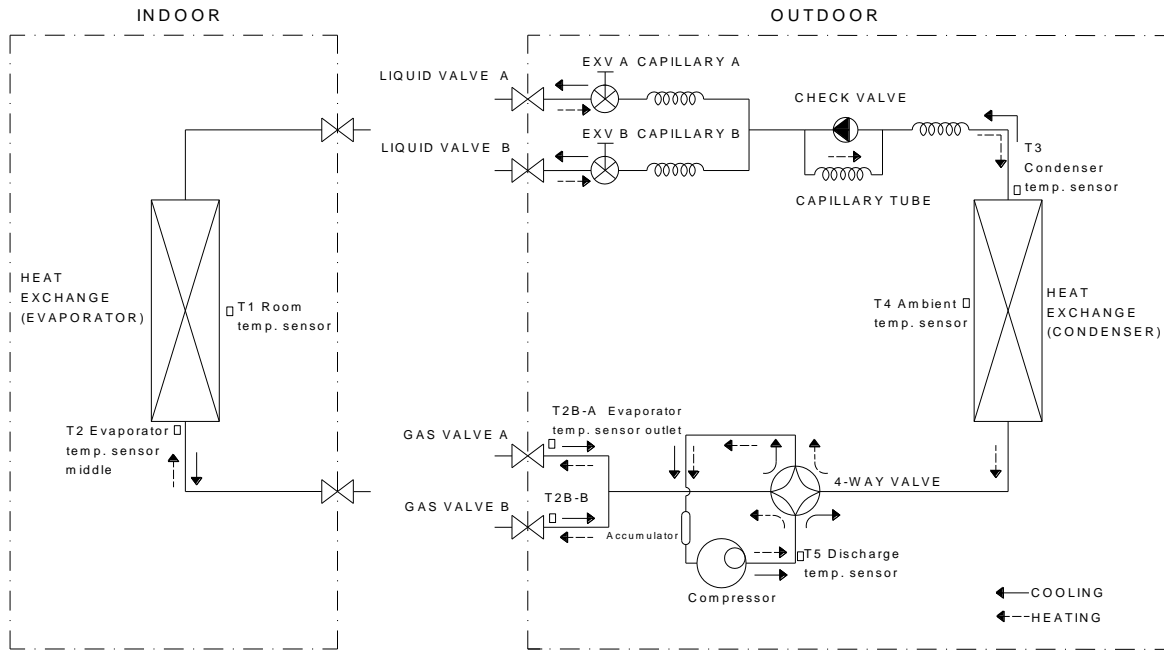
11. Dimensions



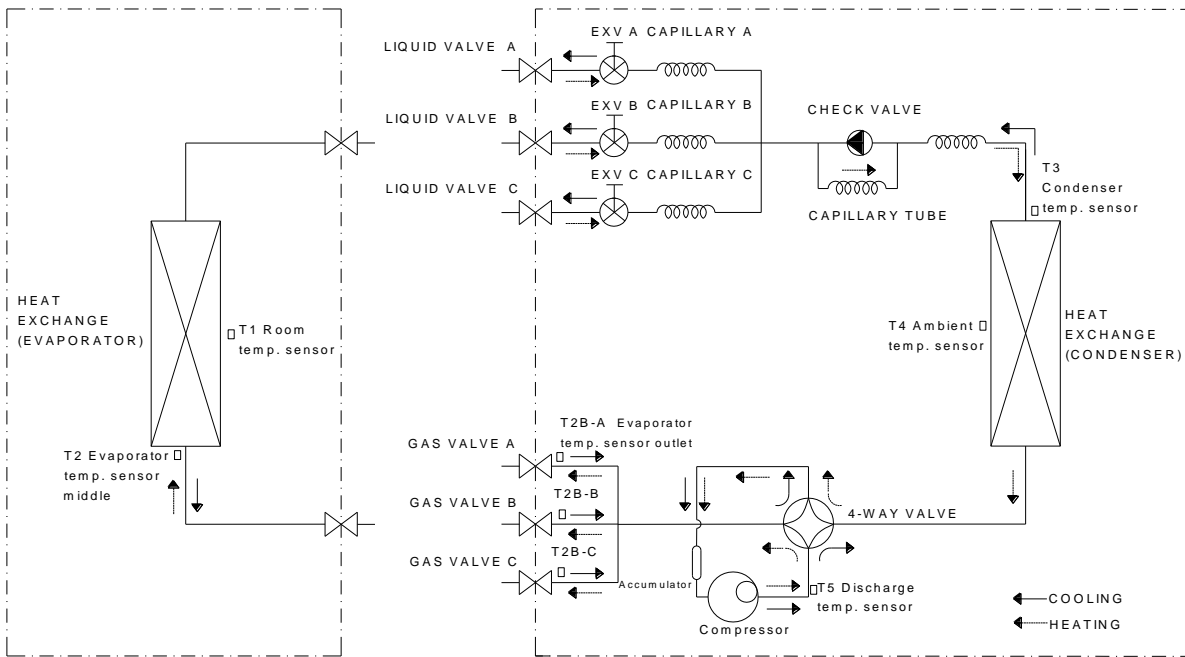
Model	Unit: mm					
	W	D	H	W1	A	B
38QUS014DS2-2 38QUS018DS2-2	800	333	554	860	514	340
38QUS021DS3*	845	363	702	923	540	350
38QUS027DS3*	845	363	702	923	540	350
38QUS028DS4* 38QUS036DS4*	946	410	810	1034	673	403
38QUS042DS5*	946	410	810	1034	673	403

12. Refrigeration Cycle Diagram

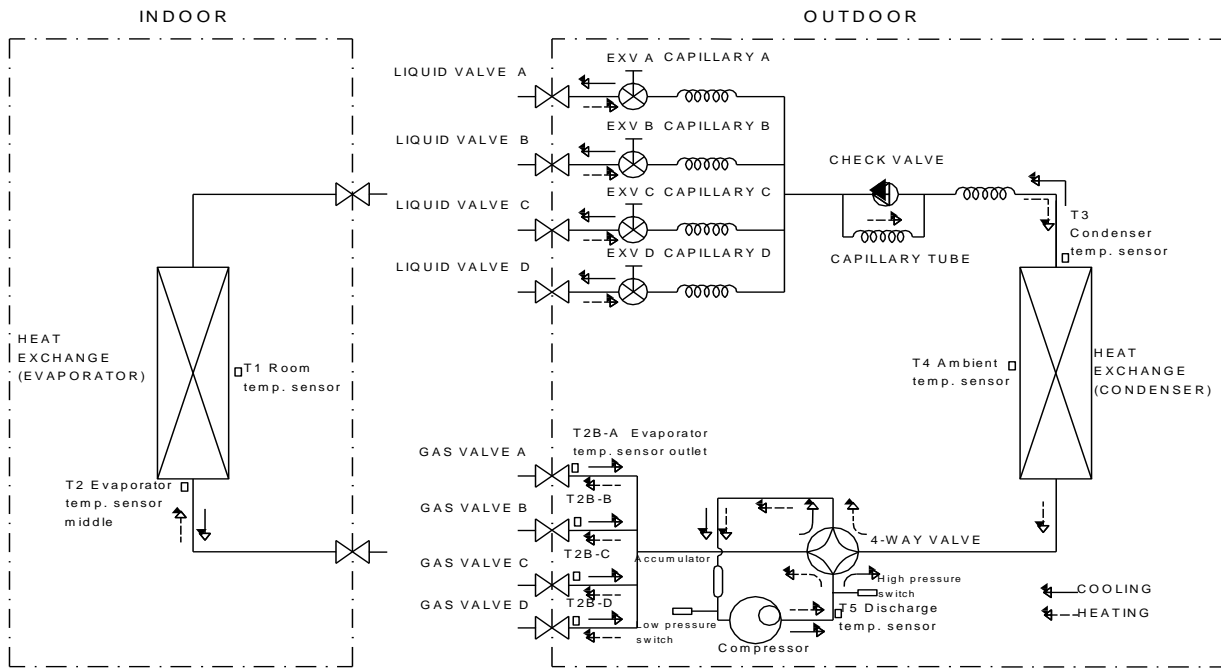
12.1 Refrigeration circuit drawing of inverter 1 drive 2 type



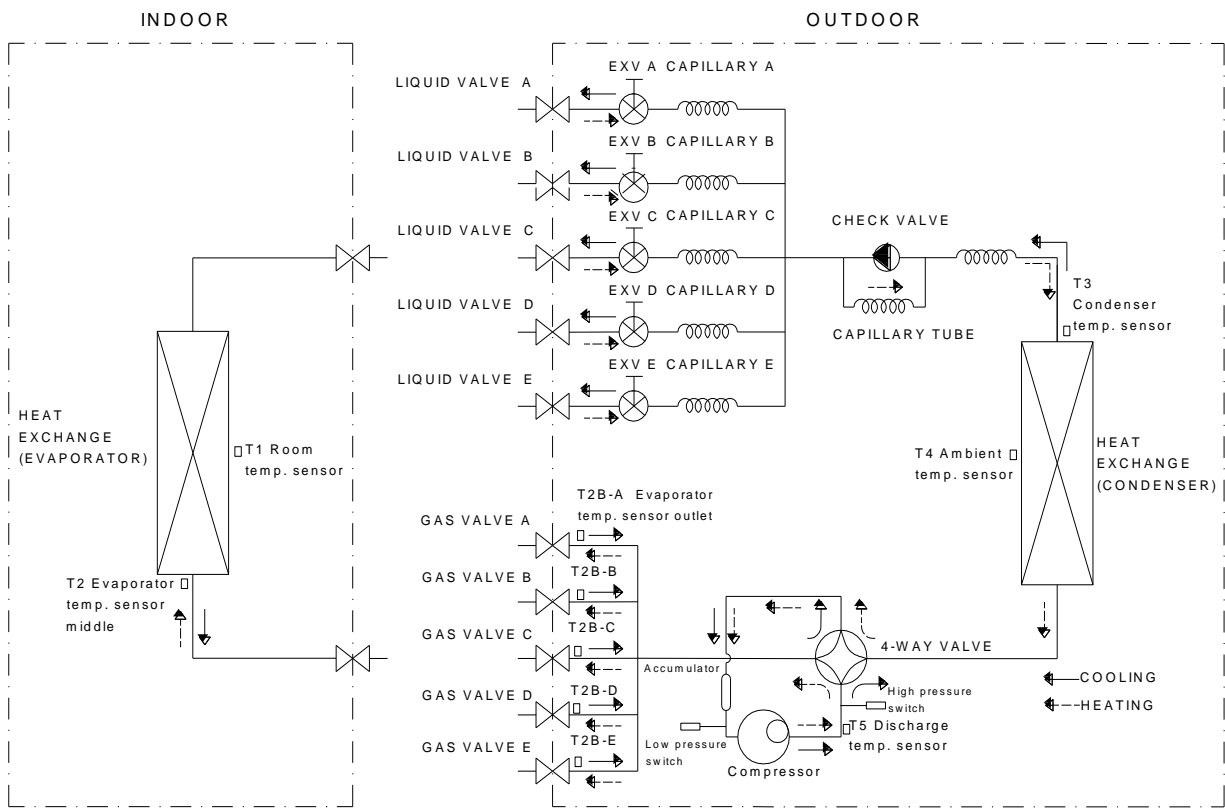
12.2 Refrigeration circuit drawing of inverter 1 drive 3 type



12.3 Refrigeration circuit drawing of inverter 1 drive 4 type

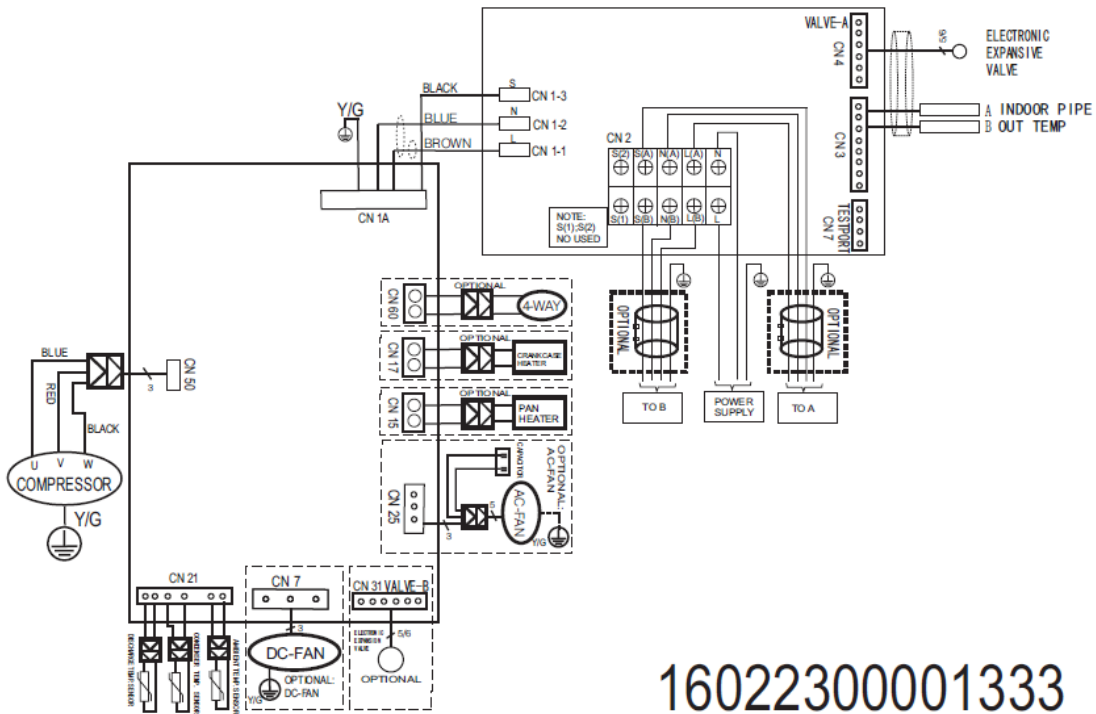


12.4 Refrigeration circuit drawing of inverter 1 drive 5 type

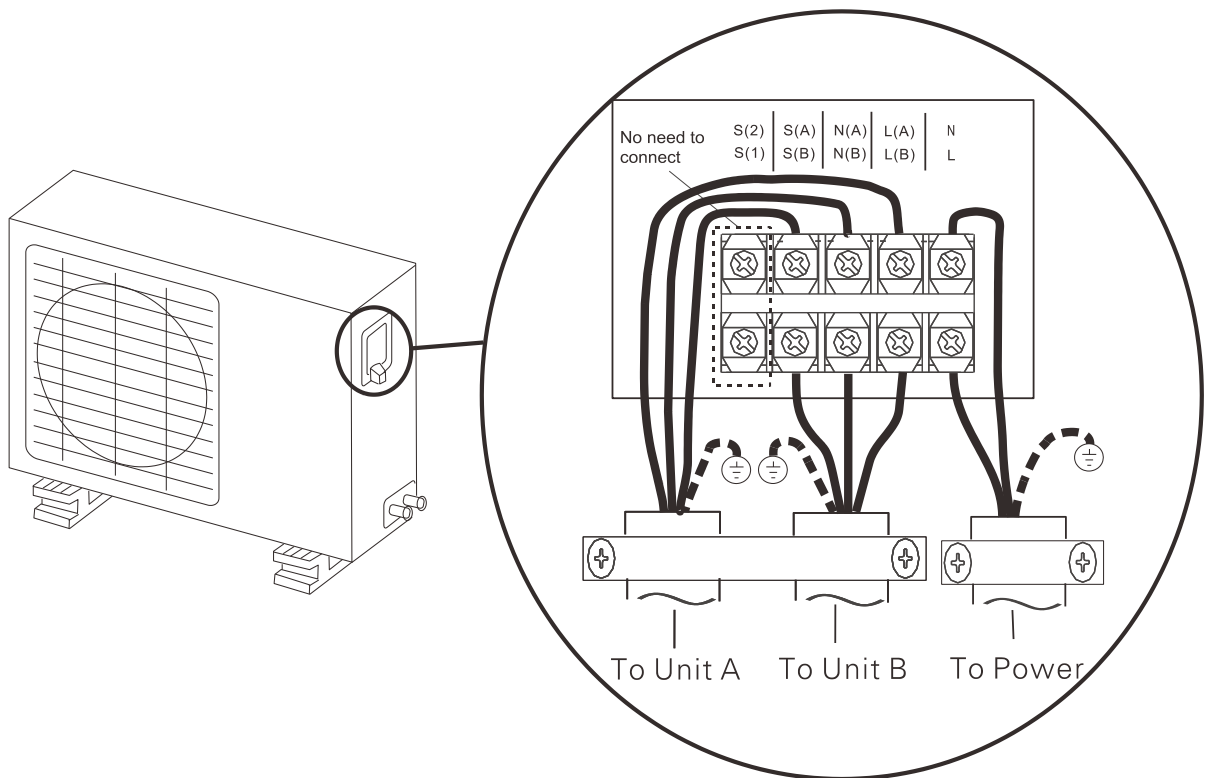


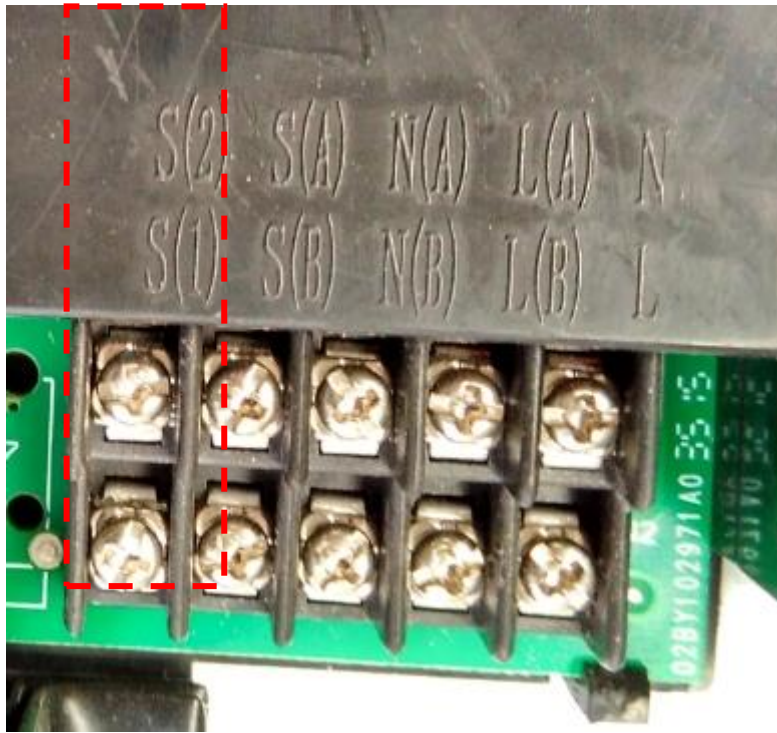
13. Wiring diagram

38QUS014DS2*/38QUS014DS2-2, 38QUS018DS2*/38QUS018DS2-2



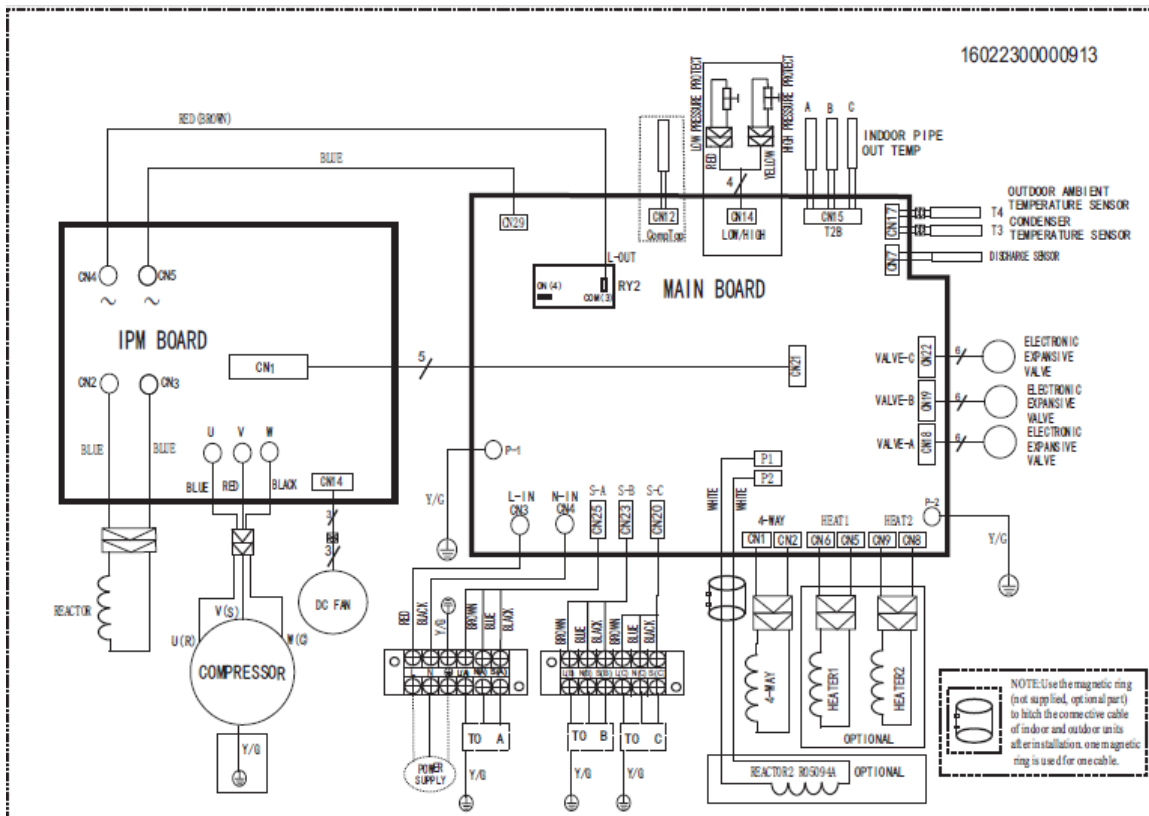
16022300001333





Note: S(1)&S(2) are used in other type of models. They don't need to be connected in multi models.

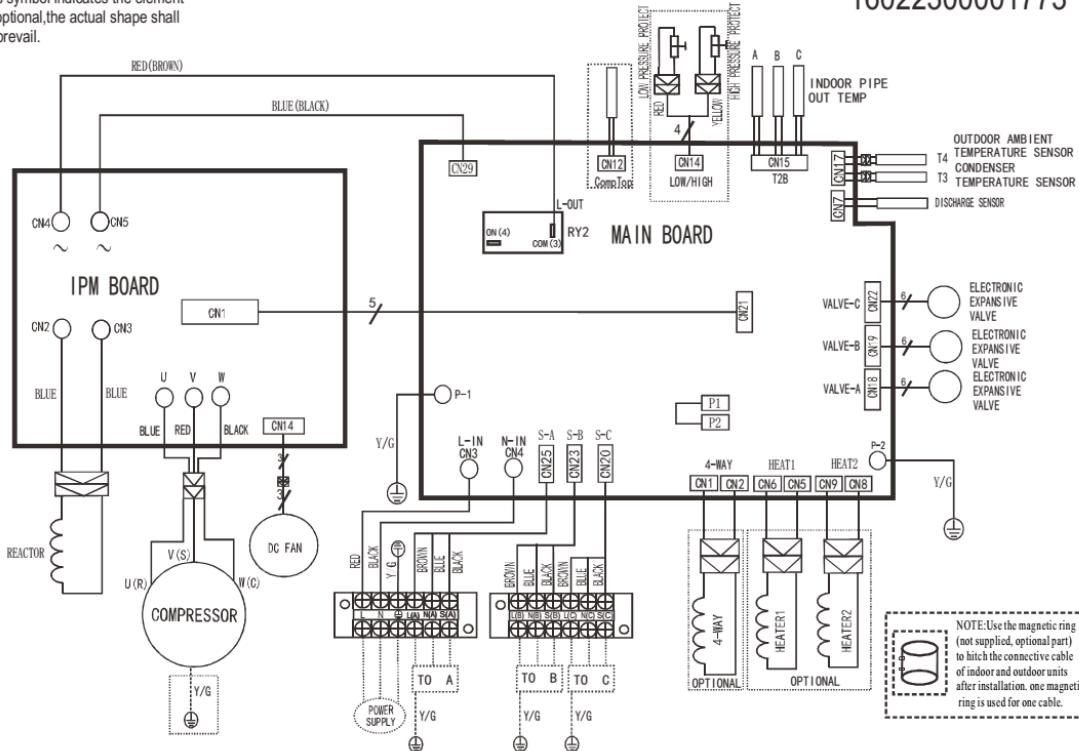
38QUS021DS3*



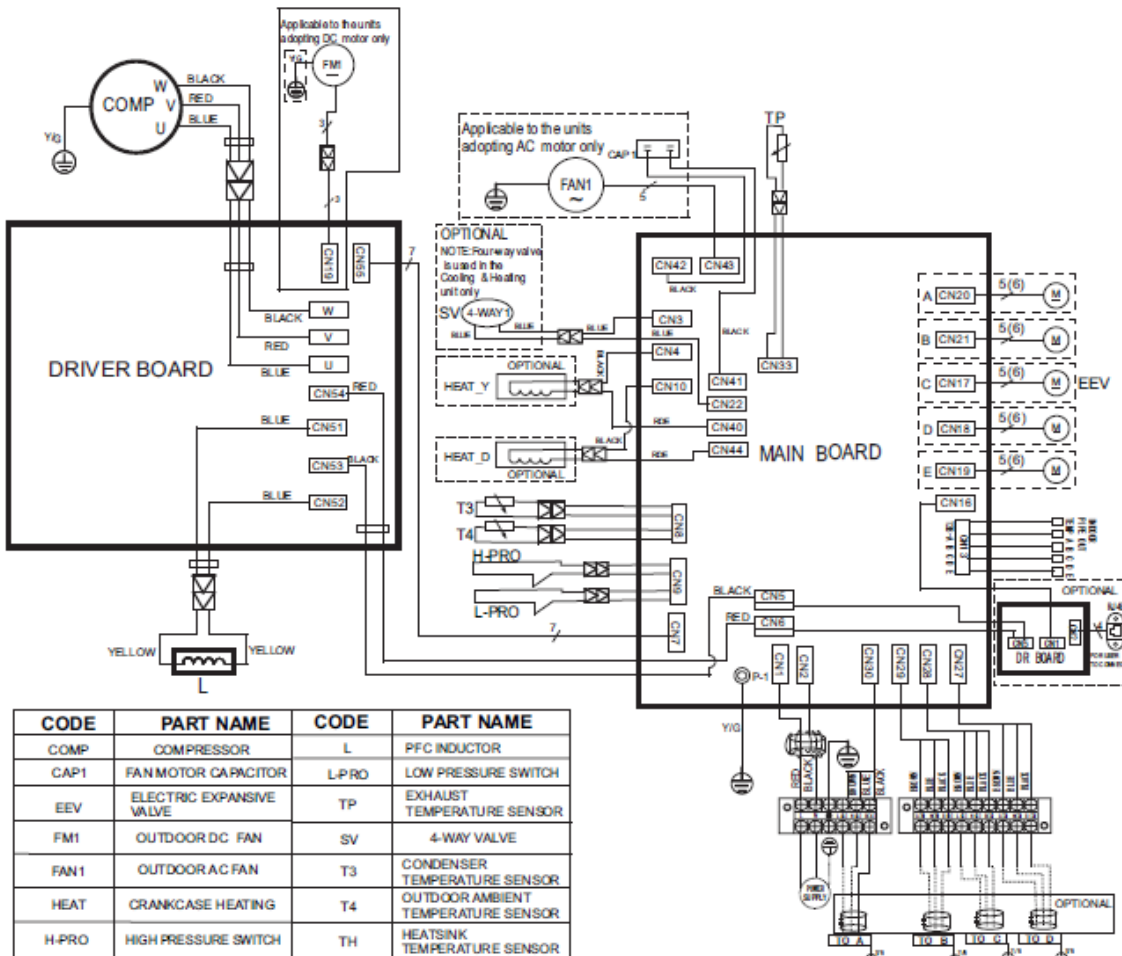
38QUS027DS3*

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

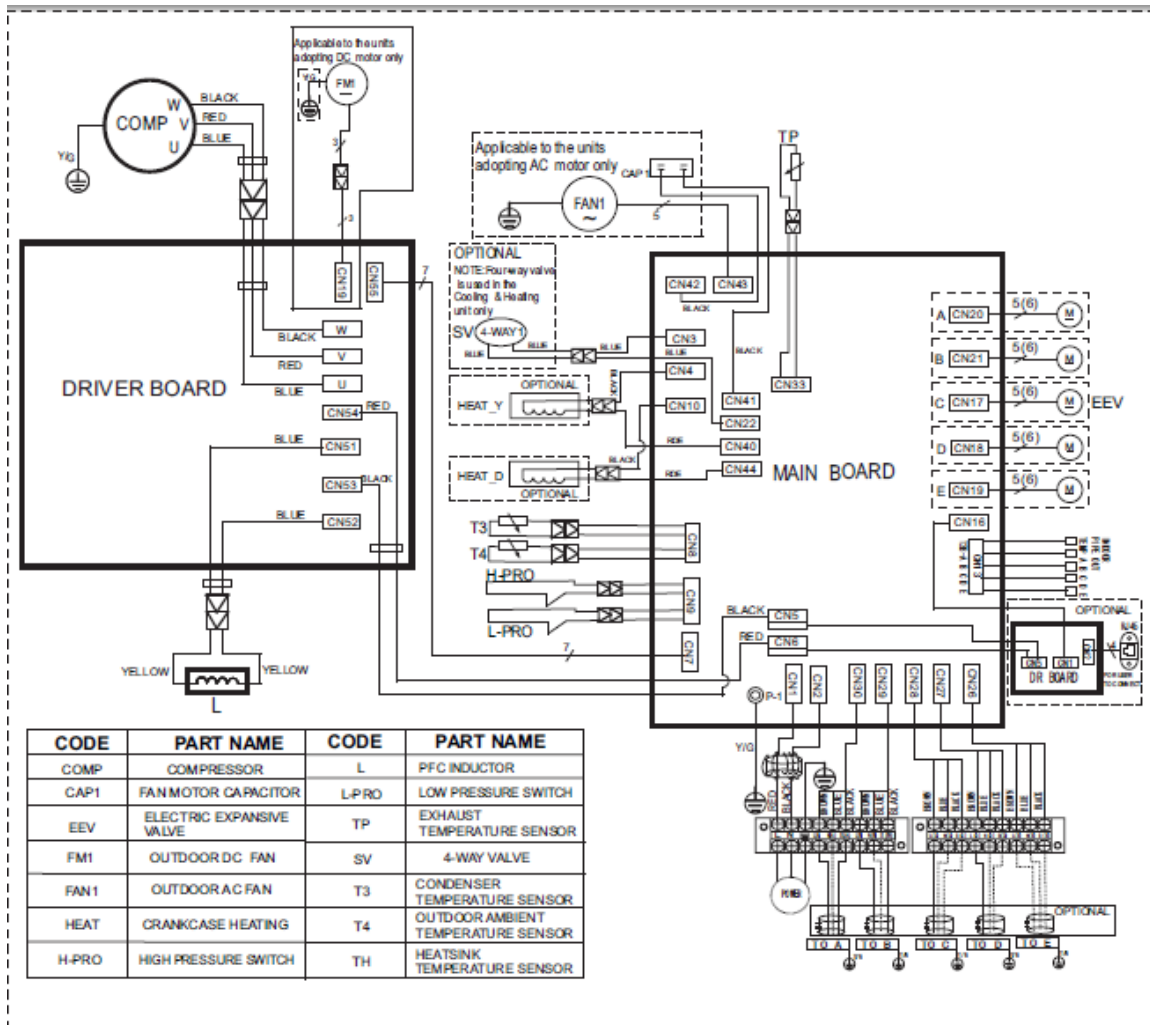
16022300001773



38QUS036DS4*



38QUS042DS5*



14. Indoor units combination

14.1 Indoor unit combination for 38QUS014DS2-2

38QUS014DS2-2		
One Unit	Two Unit	
7	7+7	9+9
9	7+9	9+12
12	7+12	
18		

14.2 Indoor unit combination for 38QUS018DS2*

38QUS018DS2-2		
One Unit	Two Unit	
7	7+7	9+9
9	7+9	9+12
12	7+12	9+18
18	7+18	12+12

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

14.3 Indoor unit combination for 38QUS021DS3*

38QUS021DS3-1				
One Unit	Two Unit		Three Unit	
7	7+7	9+9	7+7+7	9+9+9
9	7+9	9+12	7+7+9	
12	7+12	9+18	7+7+12	
18	7+18	12+12	7+9+9	

14.4 Indoor unit combination for 38QUS027DS3*

38QUS027DS3-1						
One Unit	Two Unit			Three Unit		
7	7+7	9+9	12+18	7+7+7	7+9+9	9+9+9
9	7+9	9+12		7+7+9	7+9+12	9+9+12
12	7+12	9+18		7+7+12	7+9+18	9+12+12
18	7+18	12+12		7+7+18	7+12+12	

14.5 Indoor unit combination for 38QUS028DS3*

38QUS028DS4-1								
One Unit	Two Unit			Three Unit			Four Unit	
7	7+7	9+9	12+18	7+7+7	7+9+12	9+9+18	7+7+7+7	7+9+9+9
9	7+9	9+12	12+24	7+7+9	7+9+18	9+12+12	7+7+7+9	9+9+9+9
12	7+12	9+18	18+18	7+7+12	7+12+12	12+12+12	7+7+7+12	
18	7+18	12+12		7+7+18	9+9+9		7+7+9+9	
24	7+24	9+24		7+9+9	9+9+12		7+7+9+12	

14.6 Indoor unit combination for 38QUS036DS4*

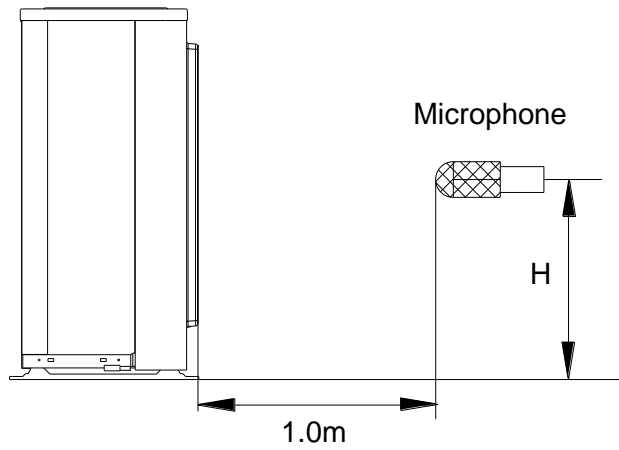
38QUS036DS4-1													
One Unit	Two Unit			Three Unit					Four Unit				
7	7+7	9+9	12+18	7+7+7	7+9+9	7+12+18	9+9+18	9+18+18	7+7+7+7	7+7+9+9	7+7+12+18	7+9+12+18	9+9+12+12
9	7+9	9+12	12+24	7+7+9	7+9+12	7+12+24	9+9+24	12+12+12	7+7+7+9	7+7+9+12	7+9+9+9	7+12+12+12	9+12+12+12
12	7+12	9+18	18+18	7+7+12	7+9+18	7+18+18	9+12+12	12+12+18	7+7+7+12	7+7+9+18	7+9+9+12	9+9+9+9	
18	7+18	9+24		7+7+18	7+9+24	9+9+9	9+12+18		7+7+7+18	7+7+9+24	7+9+9+18	9+9+9+12	
24	7+24	12+12		7+7+24	7+12+12	9+9+12	9+12+24		7+7+7+24	7+7+12+12	7+9+12+12	9+9+9+18	

14.7 Indoor unit combination for 38QUS042DS5*

38QUS042DS5-1																						
One Unit	Two Unit			Three Unit					Four Unit							Five Unit						
7	7+7	9+9	12+18	7+7+7	7+9+9	7+12+18	9+9+18	9+18+18	7+7+7+7	7+7+9+9	7+7+12+18	7+9+9+18	7+9+18+18	9+9+9+12	9+9+12+24	7+7+7+7+7	7+7+7+9+9	7+7+9+9+9	7+9+9+9+9	7+9+12+12+12	9+9+12+12+12	
9	7+9	9+12	12+24	7+7+9	7+9+12	7+12+24	9+9+24	12+12+12	7+7+7+9	7+7+9+12	7+7+12+24	7+9+9+18	7+12+12+12	9+9+9+18	9+12+12+12	7+7+7+7+9	7+7+7+9+12	7+7+9+9+12	7+9+9+9+12	7+9+9+9+12	9+9+9+9+9	9+9+9+9+9
12	7+12	9+18	18+18	7+7+12	7+9+18	7+18+18	9+12+12	12+12+18	7+7+7+12	7+7+9+18	7+7+18+18	7+9+12+12	7+12+12+18	9+9+9+24	9+12+12+18	7+7+7+7+12	7+7+7+9+18	7+7+9+9+18	7+9+9+9+18	9+9+9+9+18	9+9+9+9+12	
18	7+18	9+24		7+7+18	7+9+24	9+9+9	9+12+18		7+7+7+18	7+7+9+24	7+9+9+9	7+9+12+18	7+12+12+24	9+9+12+12	12+12+12+12	7+7+7+7+18	7+7+7+9+24	7+7+9+12+18	7+9+9+12+12	9+9+9+9+18	9+9+9+9+12	
24	7+24	12+12		7+7+24	7+12+12	9+9+12	9+12+24		7+7+7+24	7+7+12+12	7+9+9+12	7+9+12+24	9+9+9+9	9+9+12+18	12+12+12+18	7+7+7+7+24	7+7+7+12+18	7+7+12+12+12	7+9+9+12+18	9+9+9+12+12	9+9+9+12+12	

15 Sound Levels

Outdoor Unit



Note: H= 0.5 × height of outdoor unit

Model	Noise Power dB(A)	Noise level dB(A)
38QUS014DS2*	63	56
38QUS014DS2-2	64	56
38QUS018DS2*	66	59.5
38QUS018DS2-2	65	57
38QUS021DS3*	66	58
38QUS027DS3*	68	61
38QUS028DS4*	67	61
38QUS036DS4*	68	63
38QUS042DS5*	68	63

16 Installation Details

16.1.1 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)

16.1.2 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.

16.1.3 Pipe length and the elevation

Maximum piping length and height difference

	1 drive 2	1 drive 3	1 drive 4	1 drive 5
Max. length for all rooms (m)	30	45	60	75
Max. length for one IU (m)	25	30	35	35
Max. height difference between IU and OU (m)	15	15	15	15
Max. height difference between IUs (m)	10	10	10	10

Additional refrigerant charge

	1 drive 2	1 drive 3	1 drive 4	1 drive 5
Chargeless pipe length (m)	15	22.5	30	37.5
Additional refrigerant charge (g)	15 x (length for all rooms - 15)	15 x (length for all rooms - 22.5)	15 x (length for all rooms - 30)	15 x (length for all rooms - 37.5)

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&24K 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)			
7K9K12K	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)
24K	Liquid	9.52(3/8)	Liquid	9.52(3/8)
	Gas	15.9(5/8)	Gas	15.9(5/8)
Outdoor unit union diameter (mm/inch)				
Indoor unit A/B/C/D/E			Liquid	6.35(1/4)
			Gas	9.52(3/8)
				12.7(1/2)

16.1.4 Installation for the first time

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

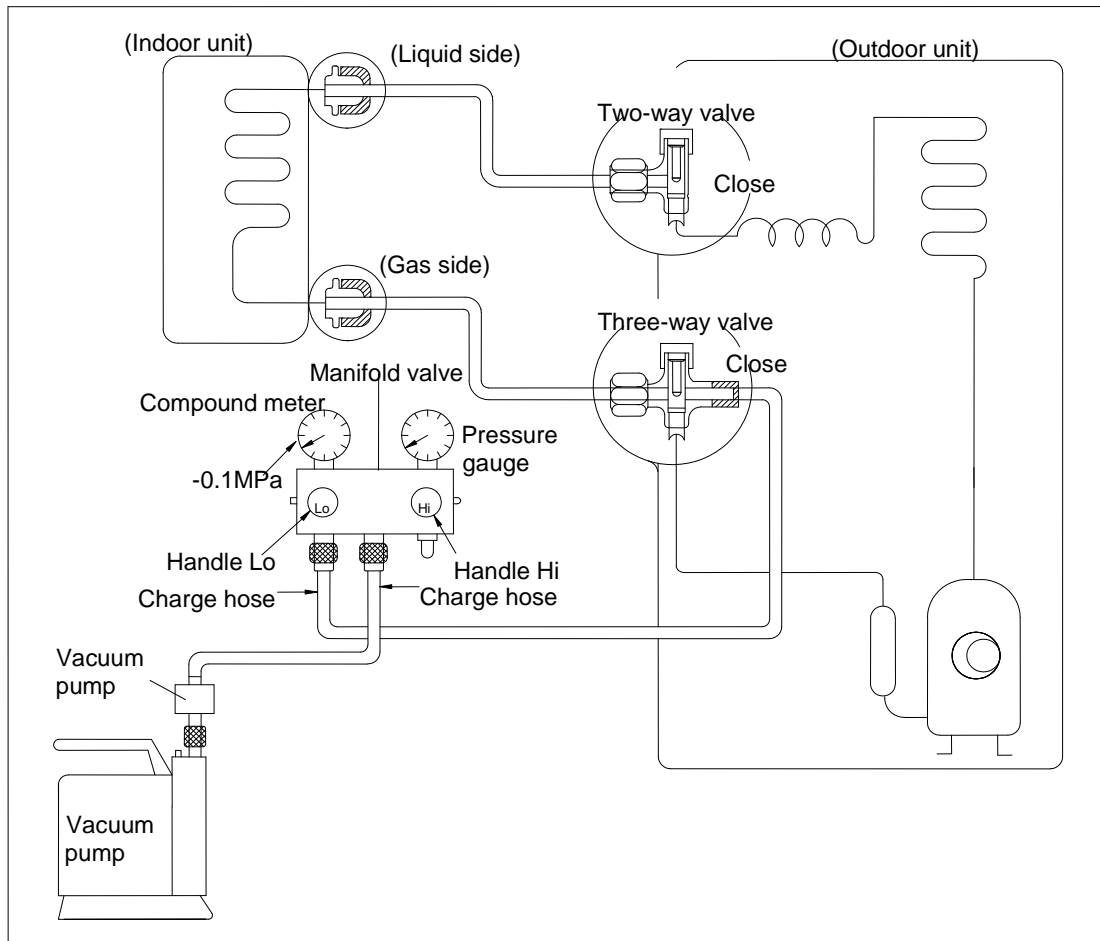
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

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):

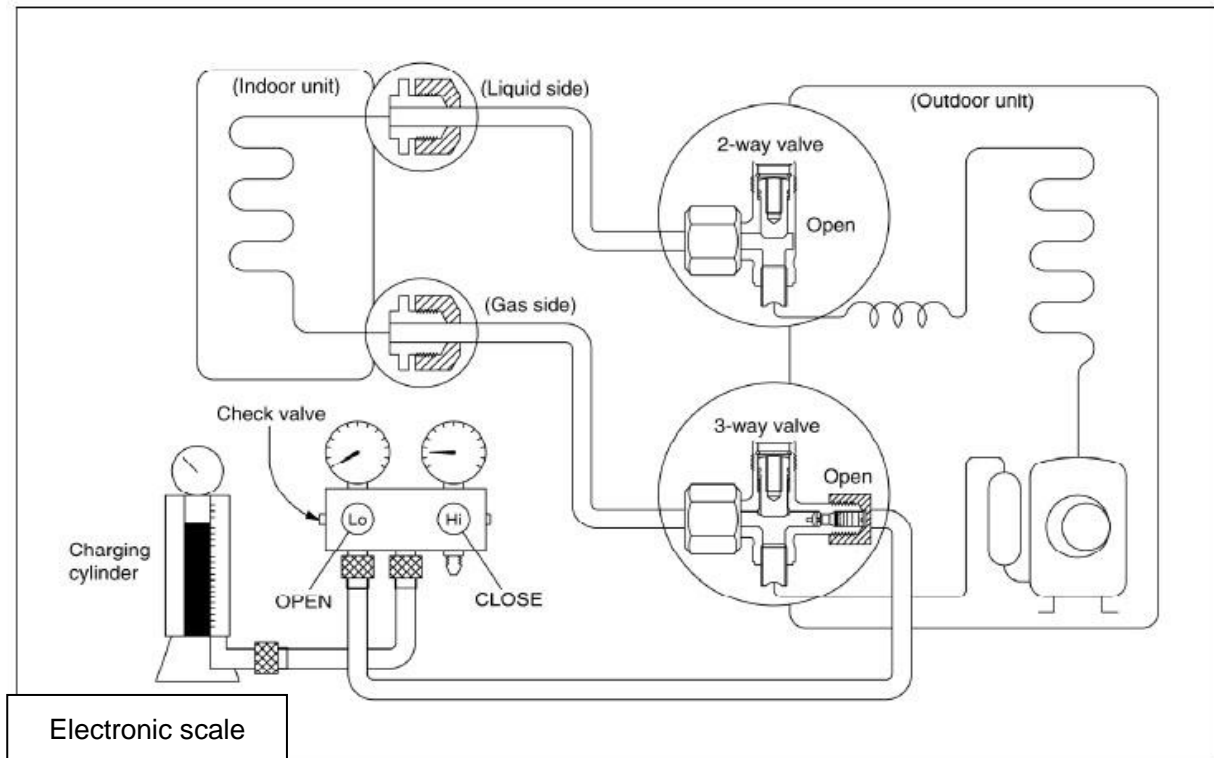
Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

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.

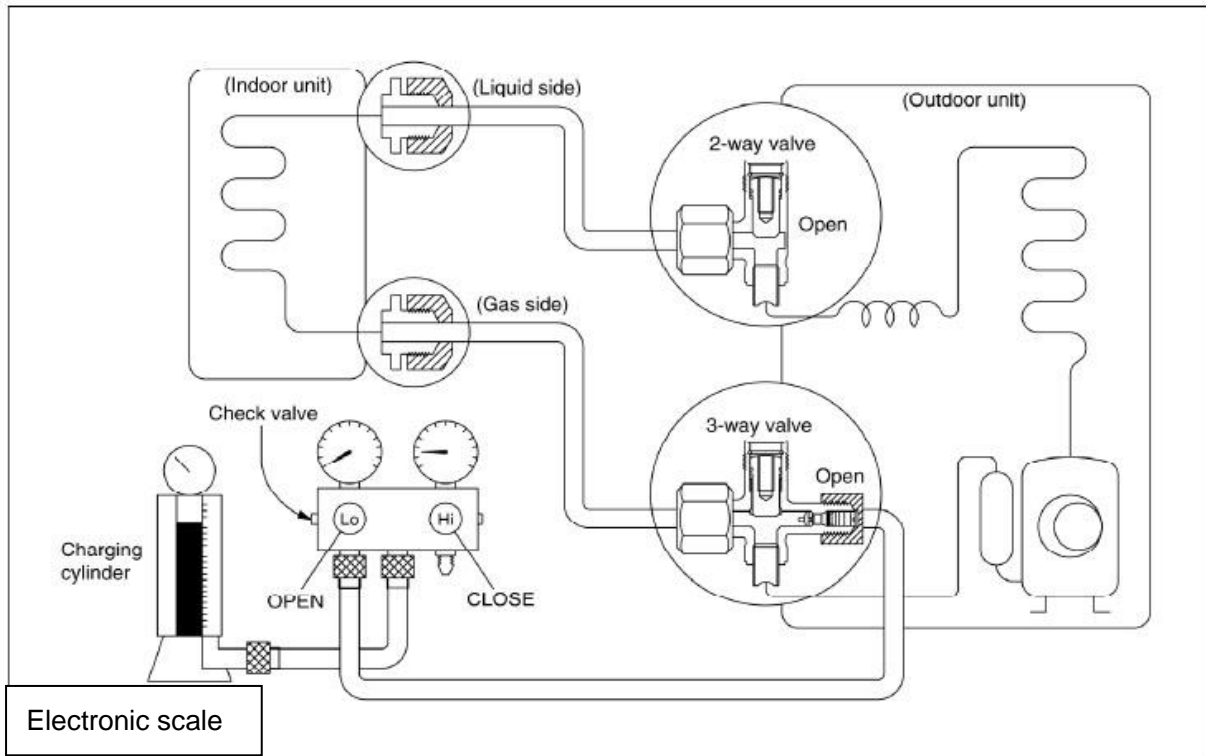
2. Adding the refrigerant if the pipe length >5m



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
Use torque wrench to tighten the service port cap to a torque of 18N.m.
Be sure to check for gas leakage.

16.1.5 Adding the refrigerant after running the system for many years

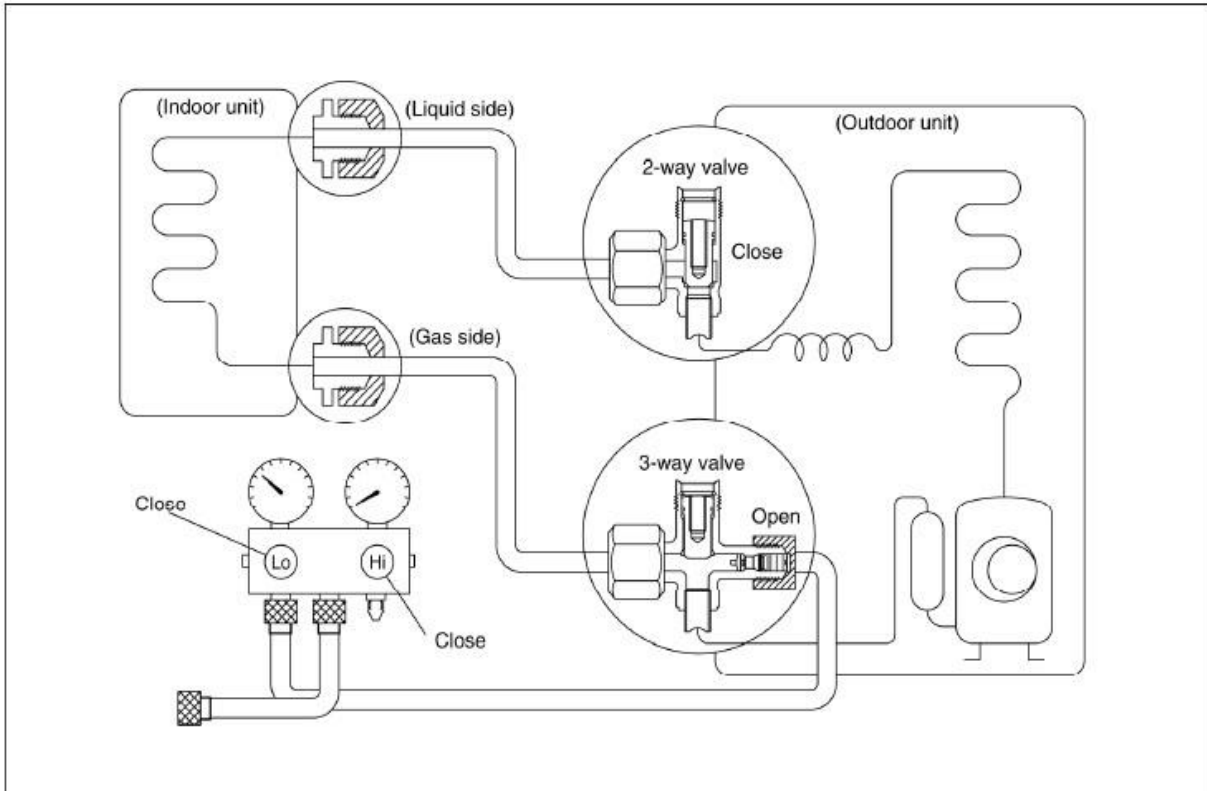


Procedure:

- 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
Use torque wrench to tighten the service port cap to a torque of 18N.m.
Be sure to check for gas leakage.

16.1.6 Re-installation while the indoor unit need to be repaired

1. Collecting the refrigerant into the outdoor unit

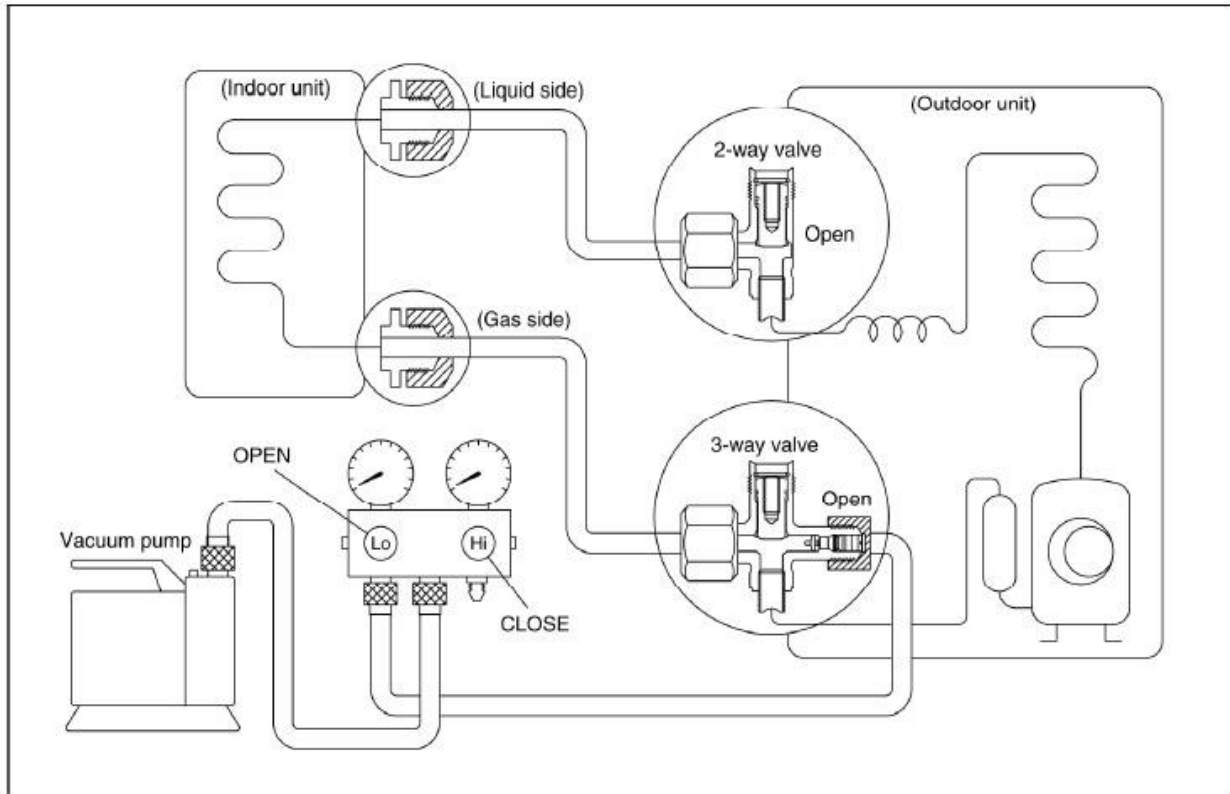


Procedure

- 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.
Use a torque wrench to tighten the 3-way valves service port cap to a torque of 1.8 kgf.m.
Be sure to check for gas leakage.

16.1.7 Re-installation while the outdoor unit need to be repaired

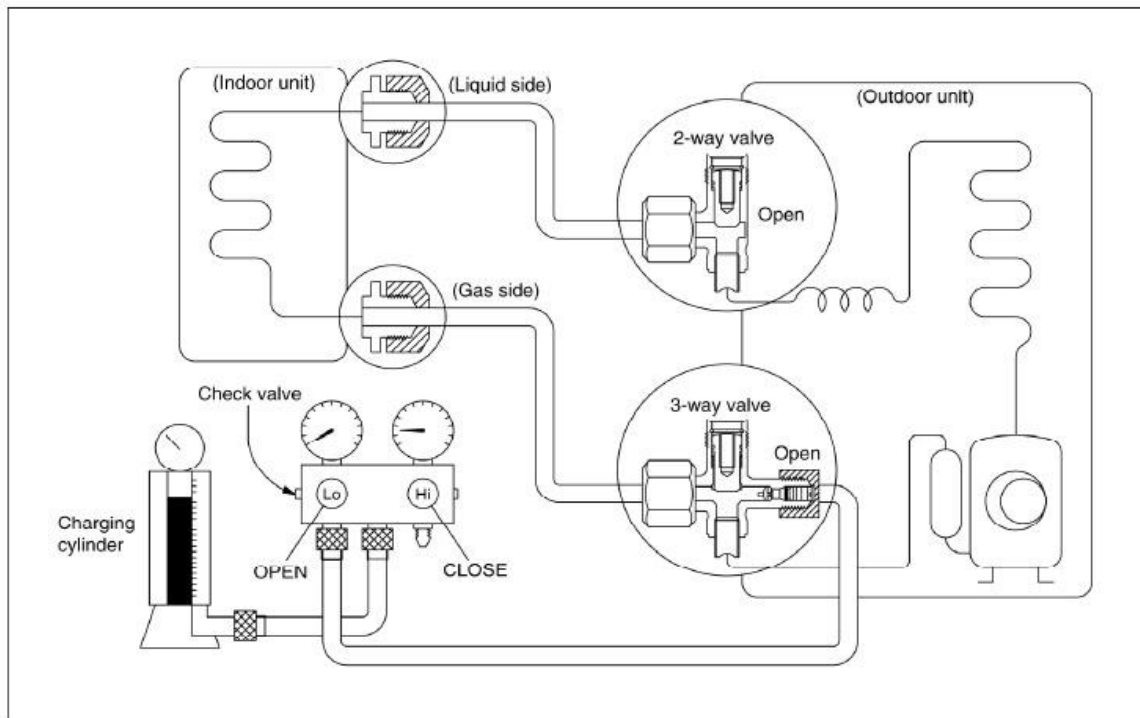
1. Evacuation for the whole system



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.
Be sure to check for gas leakage

17 Electronic control function

17.1 Abbreviation

T1: Indoor ambient temperature

T2: Coil temperature of indoor heat exchanger middle.

T2B: Coil temperature of indoor heat exchanger outlet(This sensor is located in outdoor unit)

T3: Coil temperature of outdoor heat exchanger

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

Ts: Setting temperature

17.2 Electric control working environment.

17.2.1 Input voltage: 198V~264V.

17.2.2 Input power frequency:50Hz.

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

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

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

17.3 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.

17.4 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	Standby:0,Fan only 1, Cooling:2, Heating:3, Forced cooling:4 Forced defrosting:5
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	
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 70 degree, the digital display tube will show "70". 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.

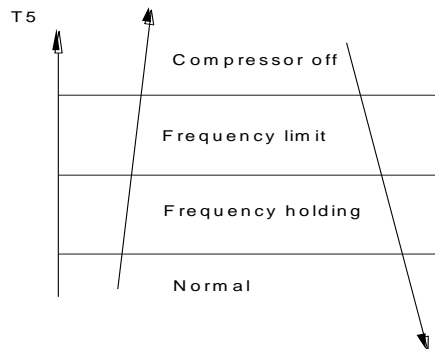
36	AD value of voltage	For example ,the digital display tube show “Cd”, it means AD value is 205.		
37	EXV open angle for A indoor unit	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example ,the digital display tube show “2.0”,it means 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)(cooling:T2B, heating:T2)		
44	Outdoor unit fan motor state	Fan 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		

17.5 Protection

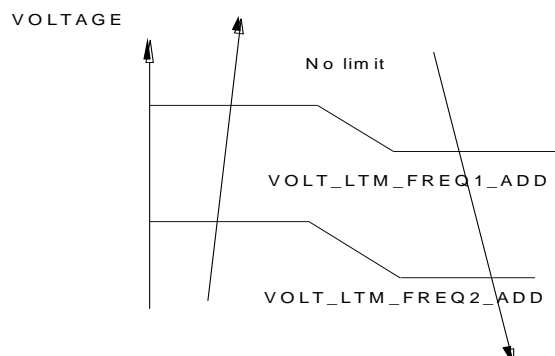
17.5.1 Three minutes delay at restart for compressor.

17.5.2 Temperature protection of compressor discharge.

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



17.5.3 Low voltage protection

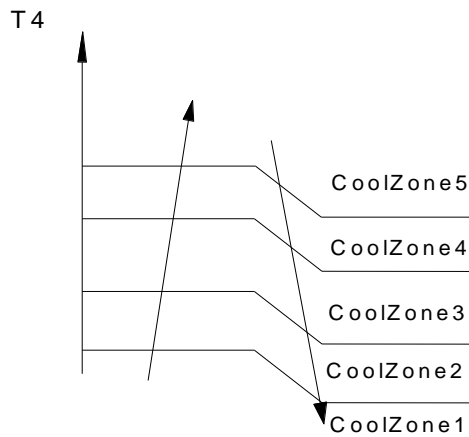


Note: if the low voltage protection occurs and not resumes within 3min, it will keep the protection always after restart the machine.

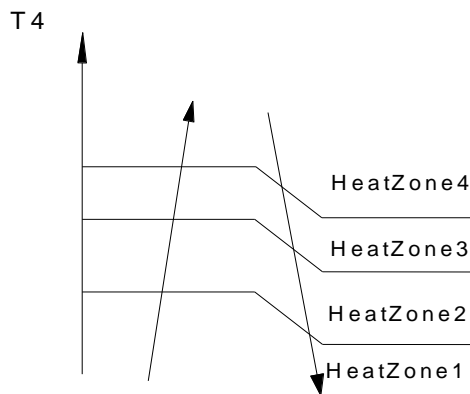
17.5.4 Compressor current limit protection

Temperature interval of current limit is same as range of T4 limited frequency.

Cooling mode:



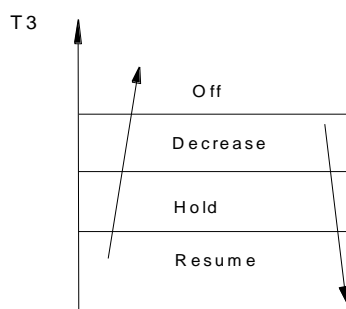
Heating mode:



17.5.5 Indoor / outdoor units communication protection

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

17.5.6 High condenser coil temp. protection.



17.5.7 Outdoor unit anti-freezing protection

When $T_2 < 4^\circ\text{C}$ for 250 seconds or $T_2 < 0^\circ\text{C}$, the indoor unit capacity demand will be zero and resume to normal when $T_2 > 8^\circ\text{C}$ and the time of protection is no less than 3 minutes.

17.5.8 Oil return

Running rules:

1. If the compressor frequency keeps lower than setting frequency for setting time, the AC will rise the frequency to setting frequency for setting time 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 setting frequency during the oil return, the AC quit oil return.

17.5.9 Low outdoor ambient temperature protection

When compressor is off, T4 is be lower than -35°C .for 10s, the AC will stop and display “LP”.

When compressor is on, T4 is be lower than -40°C .for 10s, the AC will stop and display “LP”.

When T4 is no lower than -32°C .for 10s, the unit will exit protection.

18 Troubleshooting

18.1 Indoor unit error code explanation:

For Console

Malfunction	Timer Lamp	Operation Lamp (flashes)
Indoor EEPROM malfunction	X	1
Communication malfunction between indoor and outdoor units	X	2
Indoor fan speed has been out of control	X	4
Open or short circuit of T1 temperature sensor	X	5
Open or short circuit of T2 temperature sensor	X	6
Overcurrent protection (For some units)	O	1
Open or short circuit of T4 temperature sensor	O	2
Open or short circuit of T3 temperature sensor	O	3
Open or short circuit of T5 temperature sensor	O	4
Outdoor EEPROM malfunction (For some units)	O	5
Outdoor fan speed is out of control	O	6
Open or short circuit of T2B temperature sensor (For free-match indoor units)	O	7
IPM module malfunction	☆	1
Over voltage or over low voltage protection	☆	2
Too low ambient temperature protection	☆	4
Inverter compressor drive protection	☆	5
Mode conflict	☆	6
Low pressure protection of compressor	☆	7
O (on) X(off) ☆(flash at 2Hz)		

For other type

Malfunction	Error Code	Timer Lamp	Operation Lamp (flashes)
Indoor EEPROM malfunction	E0	X	1
Communication malfunction between indoor and outdoor units	E1	X	2
Indoor fan speed has been out of control	E3	X	4
Open or short circuit of T1 temperature sensor	E4	X	5
Open or short circuit of T2 temperature sensor	E5	X	6
Water level alarm	EE	X	8
Overcurrent protection (For some units)	F0	O	1
Open or short circuit of T4 temperature sensor	F1	O	2
Open or short circuit of T3 temperature sensor	F2	O	3
Open or short circuit of T5 temperature sensor	F3	O	4
Outdoor EEPROM malfunction (For some units)	F4	O	5
Outdoor fan speed is out of control	F5	O	6
Open or short circuit of T2B temperature sensor (For free-match indoor units)	F6	O	7
Communication error between auto-lifting panel and slim cassette (For	F7	O	8

slim cassette with auto-lifting panel)			
Auto-lifting panel is faulty (For slim cassette with auto-lifting panel)	F8	O	9
Auto-lifting panel is not closed (For slim cassette with auto-lifting panel)	F9	O	10
IPM module malfunction	P0	☆	1
Over voltage or over low voltage protection	P1	☆	2
Too low ambient temperature protection	P3	☆	4
Error rotor position protection of compressor	P4	☆	5
Mode conflict	P5	☆	6
Low pressure protection of compressor	P6	☆	7
O (on) X(off) ☆(flash at 2Hz)			

18.2 Outdoor unit error code explanation:

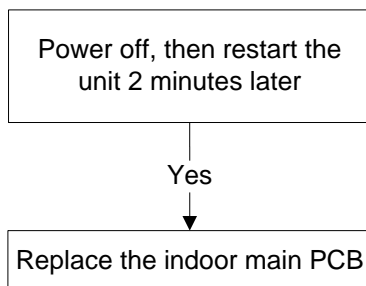
Display	LED STATUS
E0	Outdoor EEPROM malfunction
E2	Indoor / outdoor units communication error
E3	Communication malfunction between IPM board and outdoor main board
E4	Open or short circuit of outdoor unit temperature sensor
E5	Voltage protection
E8	Outdoor fan speed has been out of control
F1	No A Indoor 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 (ForM4OE-28HFN1-Q, 38QUS036DS4*, 38QUS042DS5*)
P2	Low pressure protection (ForM4OE-28HFN1-Q, 38QUS036DS4*, 38QUS042DS5*)
P3	Current protection of compressor
P4	Temperature protection of compressor discharge
P5	High temperature protection of condenser
P6	IPM module protection
LP	Low ambient temperature protection

Note: Once these error codes display, they will disappear in at least 30 seconds if the unit come back to normal.(Except E2&E3)

18.3 Trouble shooting

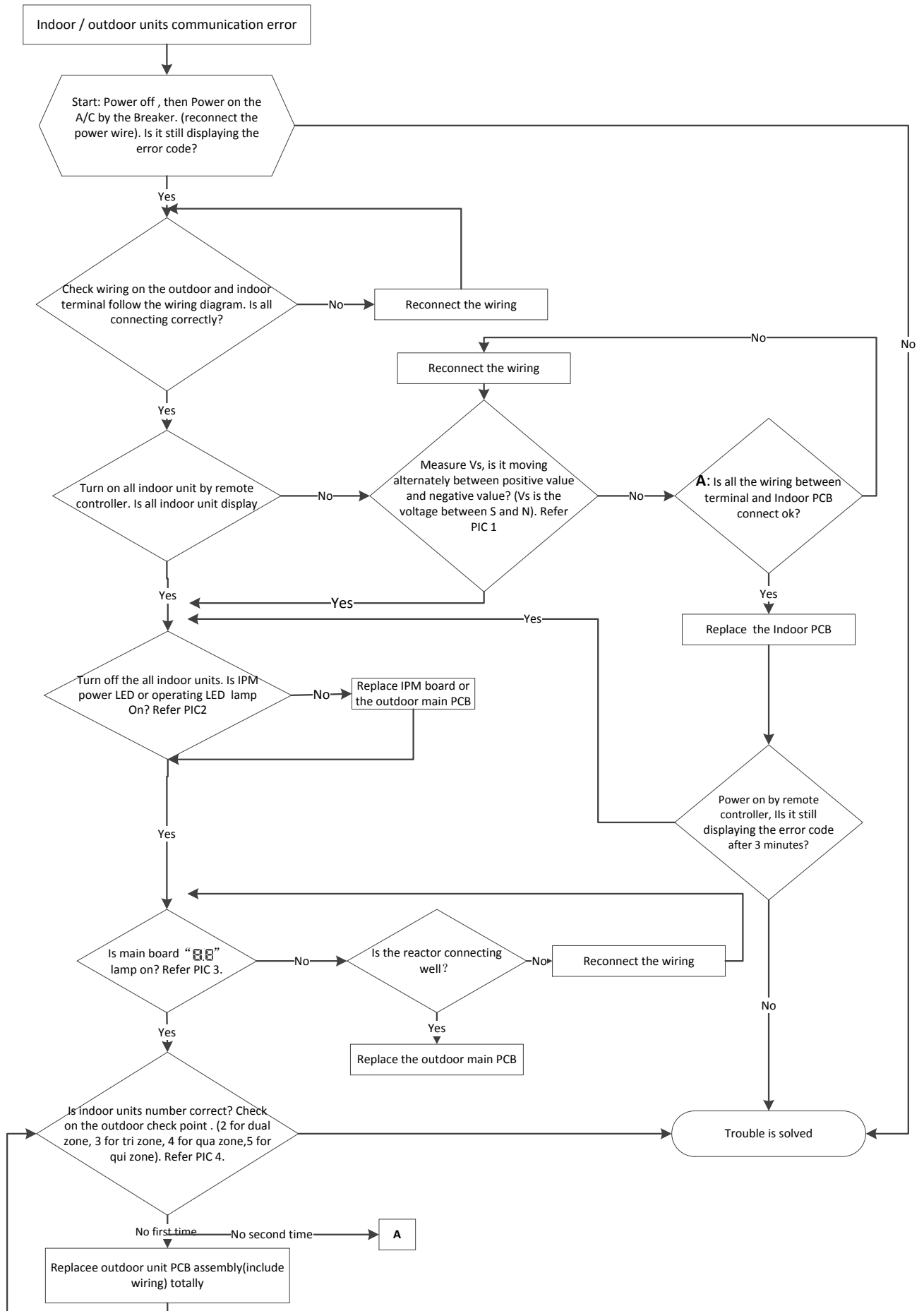
18.3.1 For the indoor unit

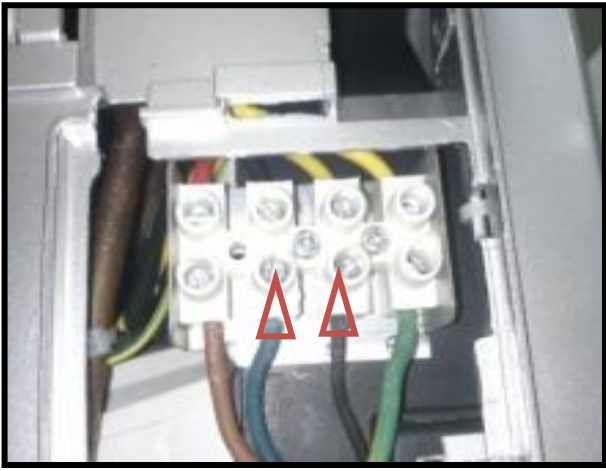
18.3.1.1 Indoor EEPROM malfunction



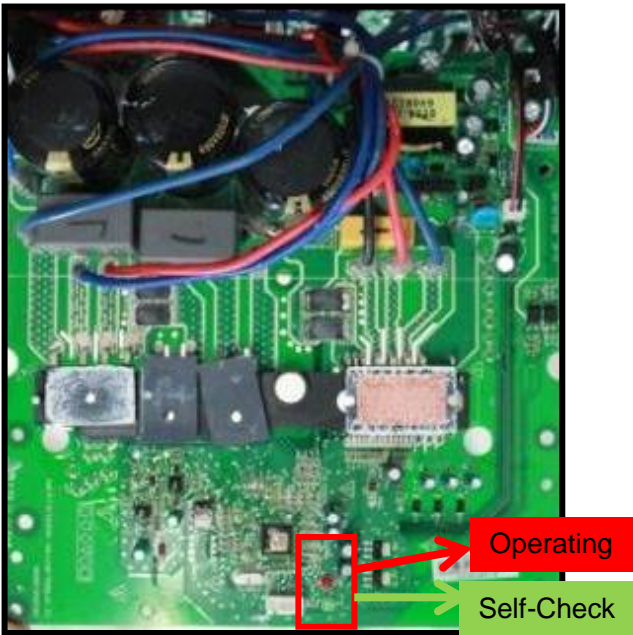
EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

18.3.1.2 Indoor / outdoor units communication error

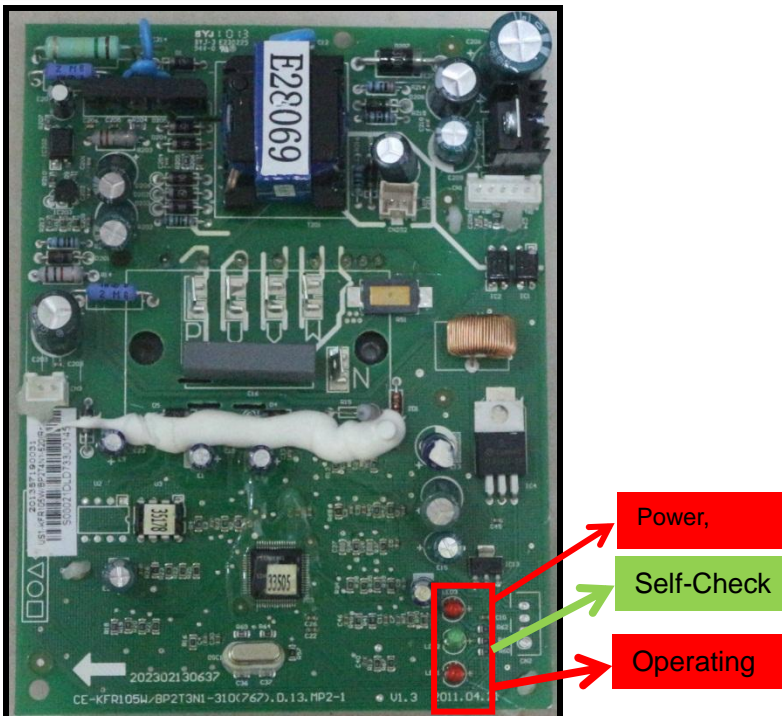




Pic 1: check the voltage of N to S (Vs), is it moving alternately between positive value and negative value?



Pic 2: IPM or outdoor main PCB



Pic 2: IPM or outdoor main PCB

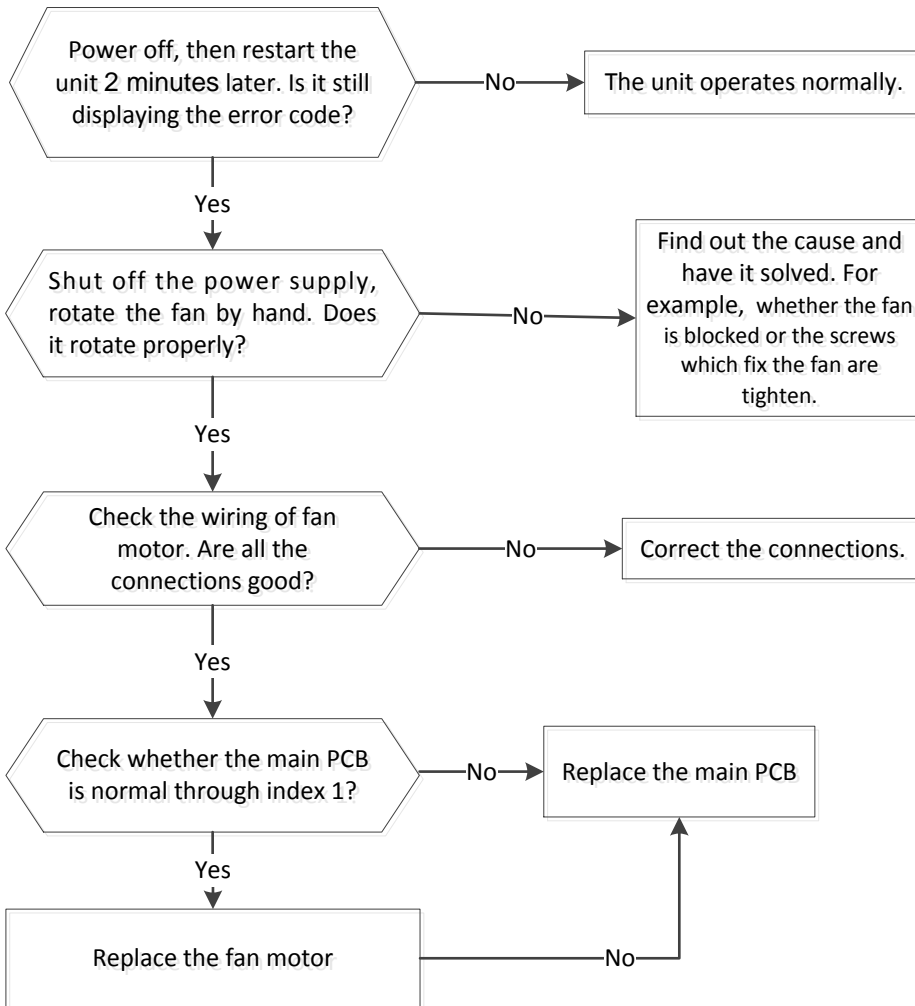


PIC3 : Main board LED when power on and unit standby.



PIC 4: check point button,
Press 1 time for check how many indoor units are connected

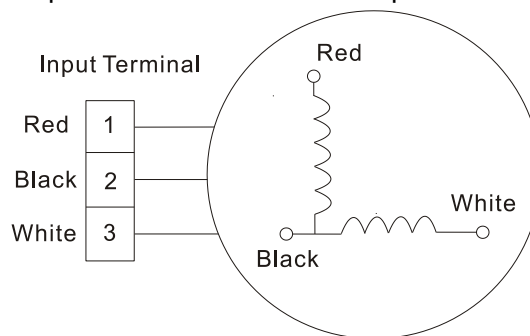
18.3.1.3 indoor unit fan speed has been out of control



Index 1:

1: Indoor AC fan motor

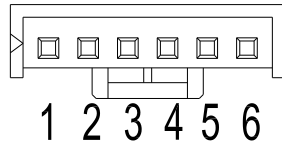
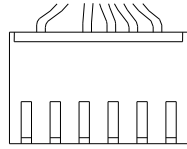
Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply) or 50V(115V power supply), the PCB must have problems and need to be replaced.



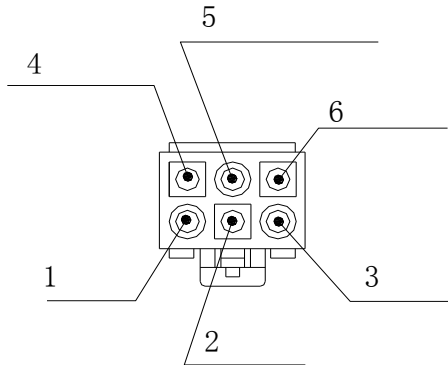
2. Indoor DC fan motor(control chip is inside fan motor)

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.

For other models:



For console:



DC motor voltage input and output

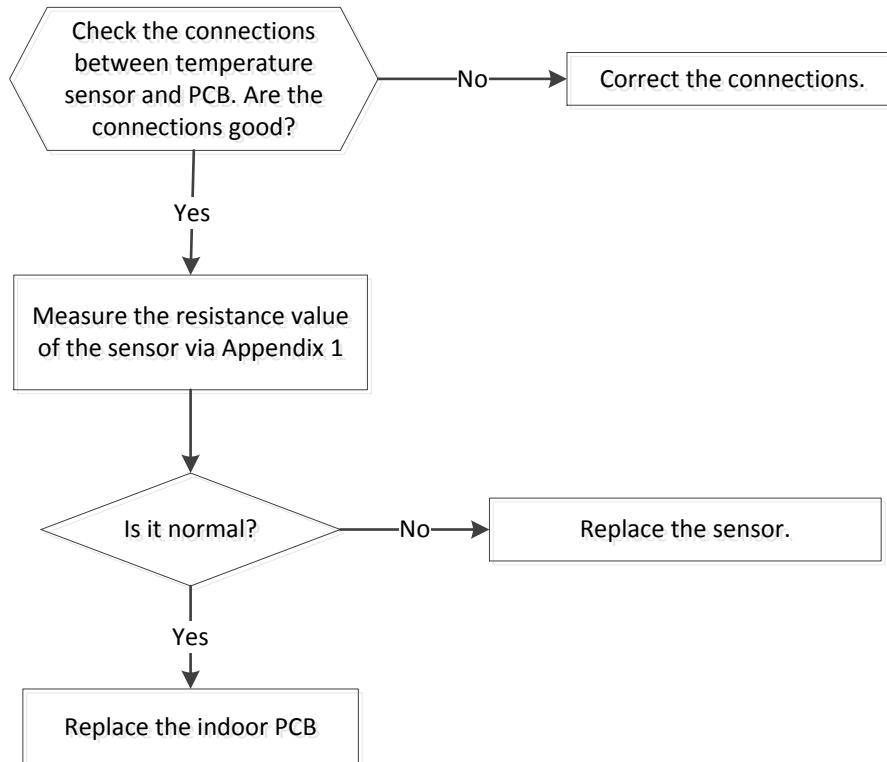
For split type:

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

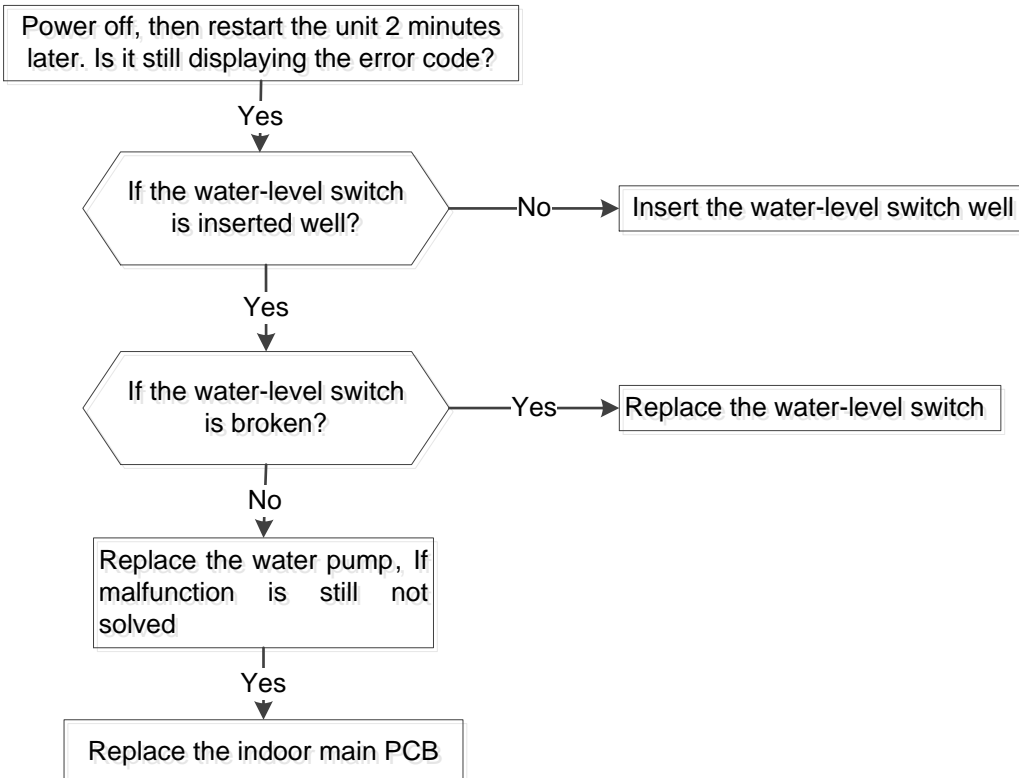
For other types:

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

18.3.1.4 Open or short circuit of temperature sensor.

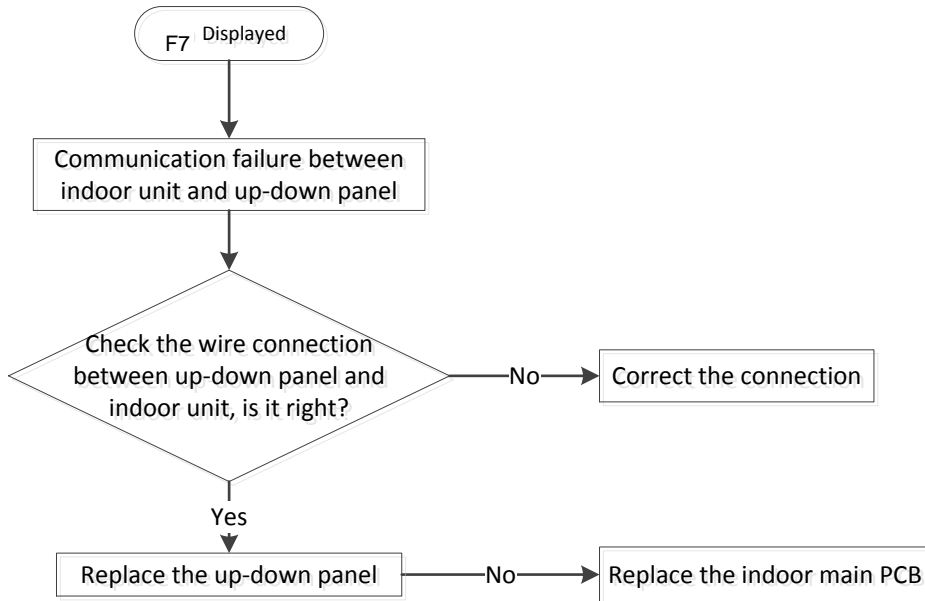


18.3.1.5 Full-water malfunction

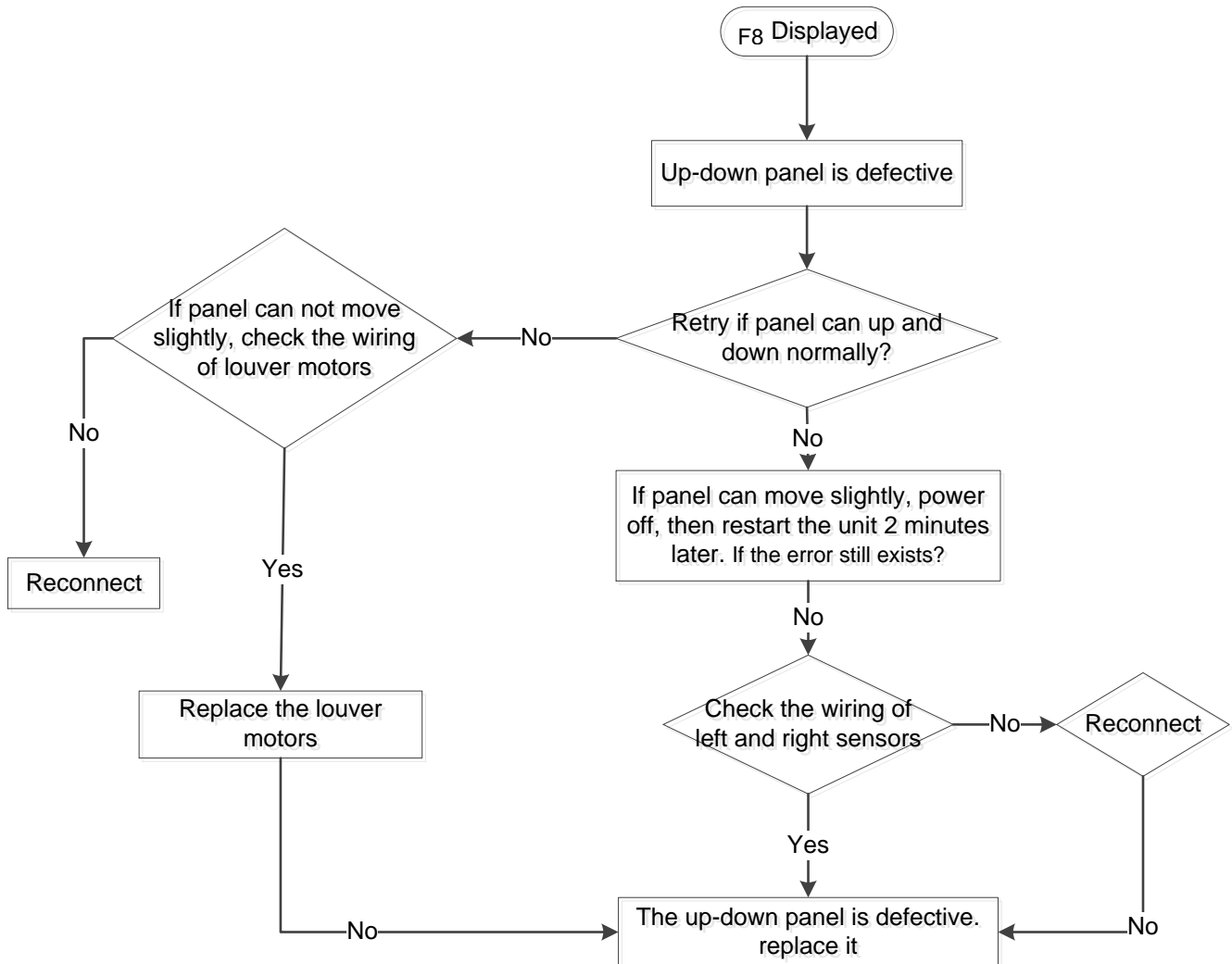


18.3.2 For the super-slim cassette with up-down panel

18.3.2.1 Communication error between indoor unit and up-down panel

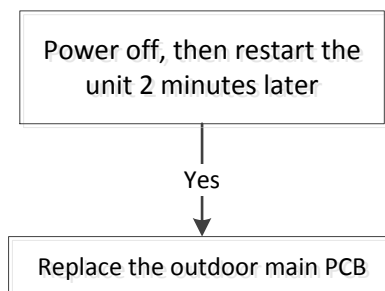


18.3.2.2 Up-down panel is defective



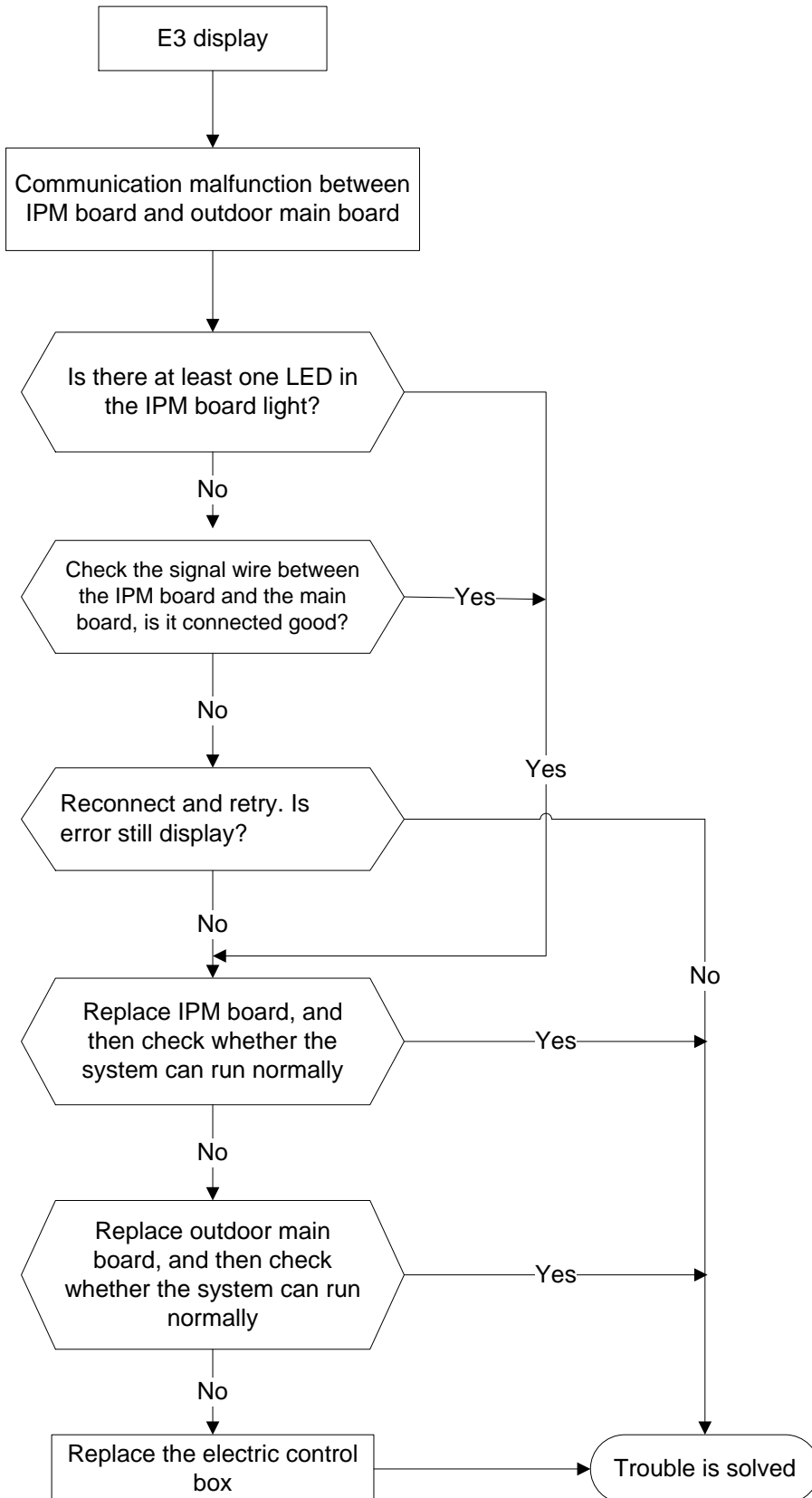
18.3.3 For the outdoor unit

18.3.3.1 Outdoor EEPROM malfunction(ODU E0)

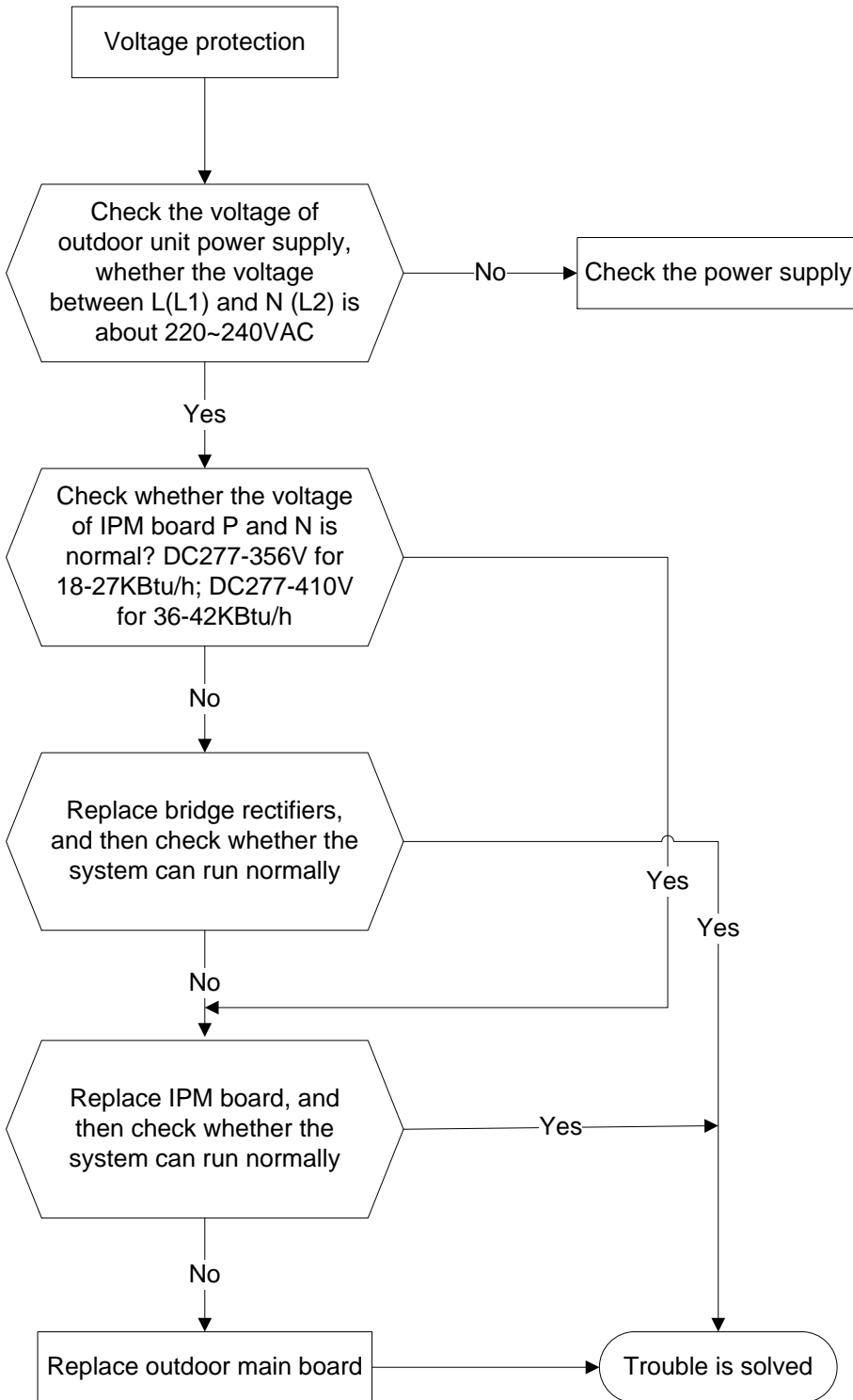


EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

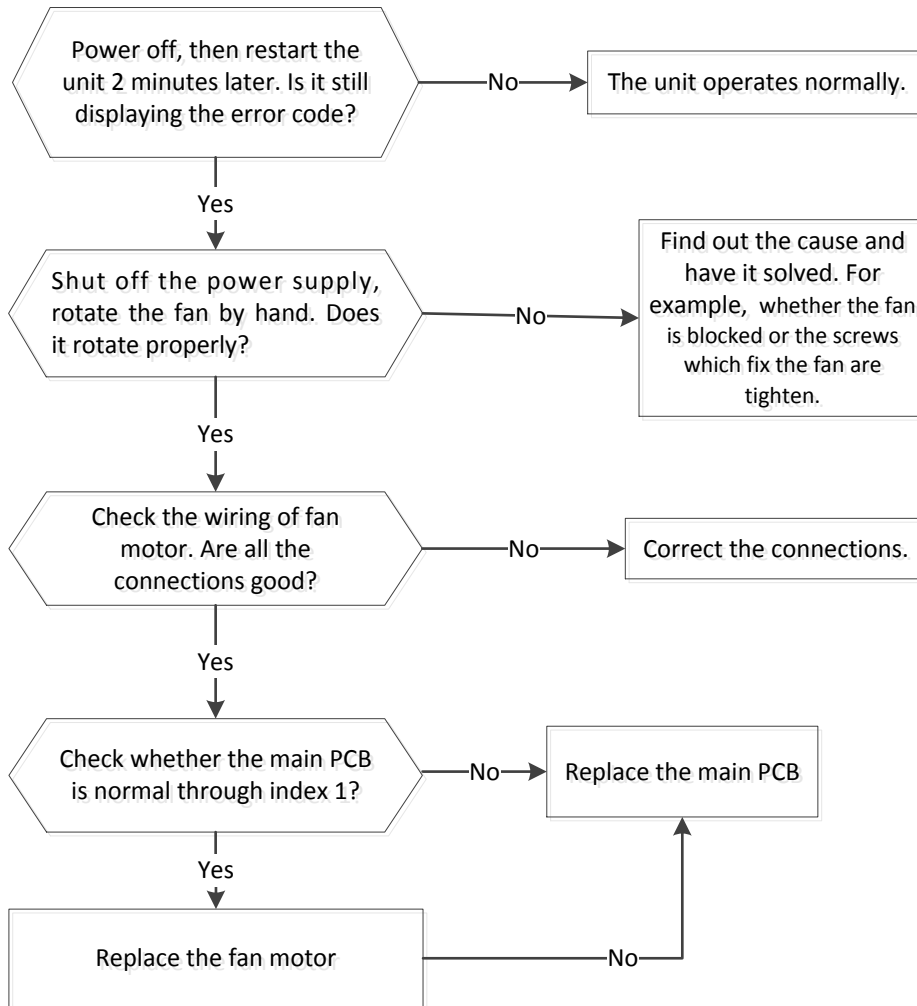
18.3.3.2 Communication malfunction between IPM board and outdoor main board(ODU E3)



18.3.3.3 Voltage protection(ODU E5)



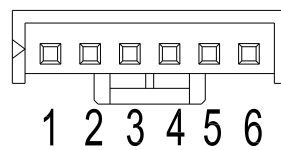
18.3.3.4 Outdoor unit fan speed has been out of control (E8)



Index 1:

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

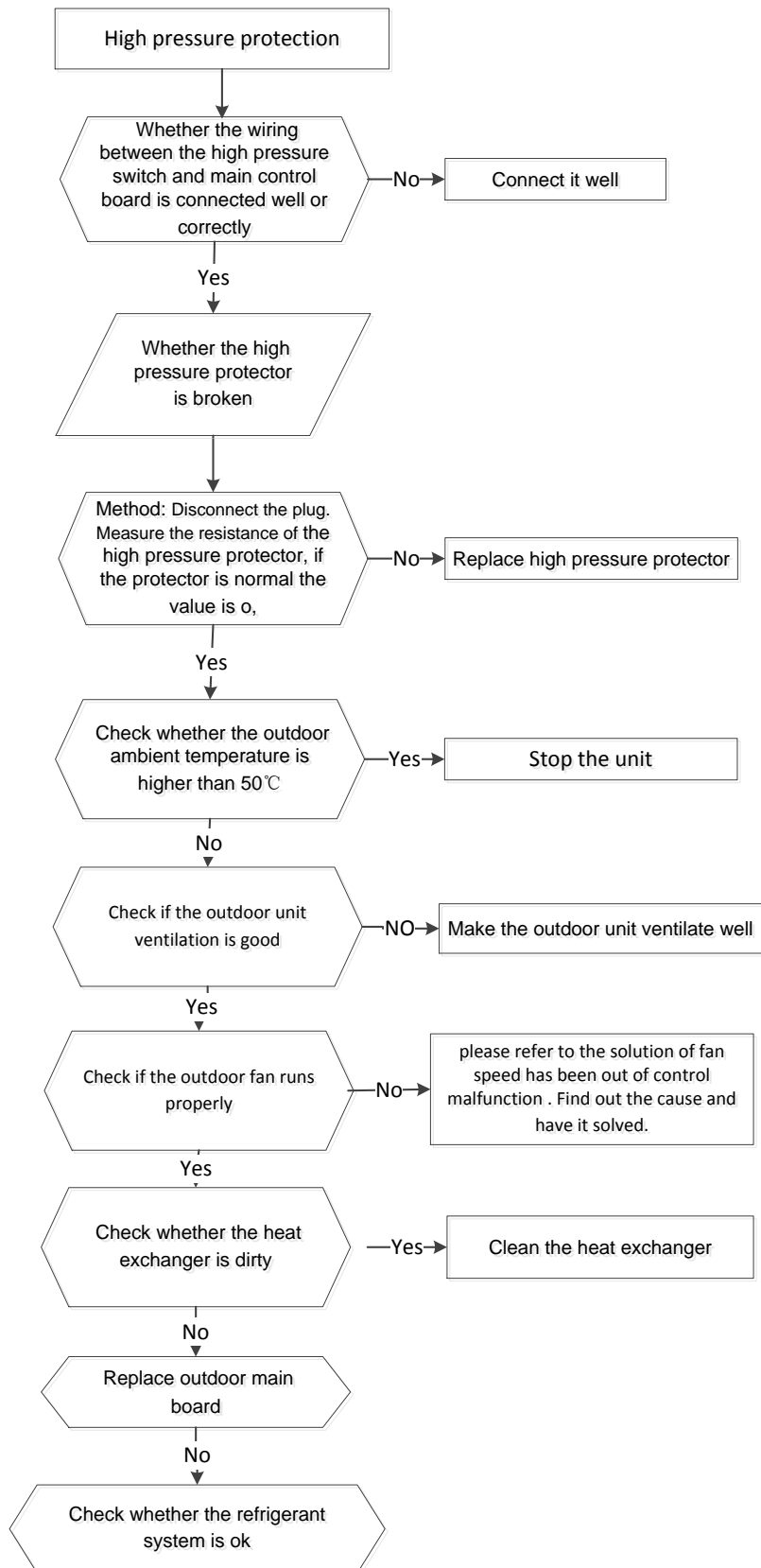
Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.



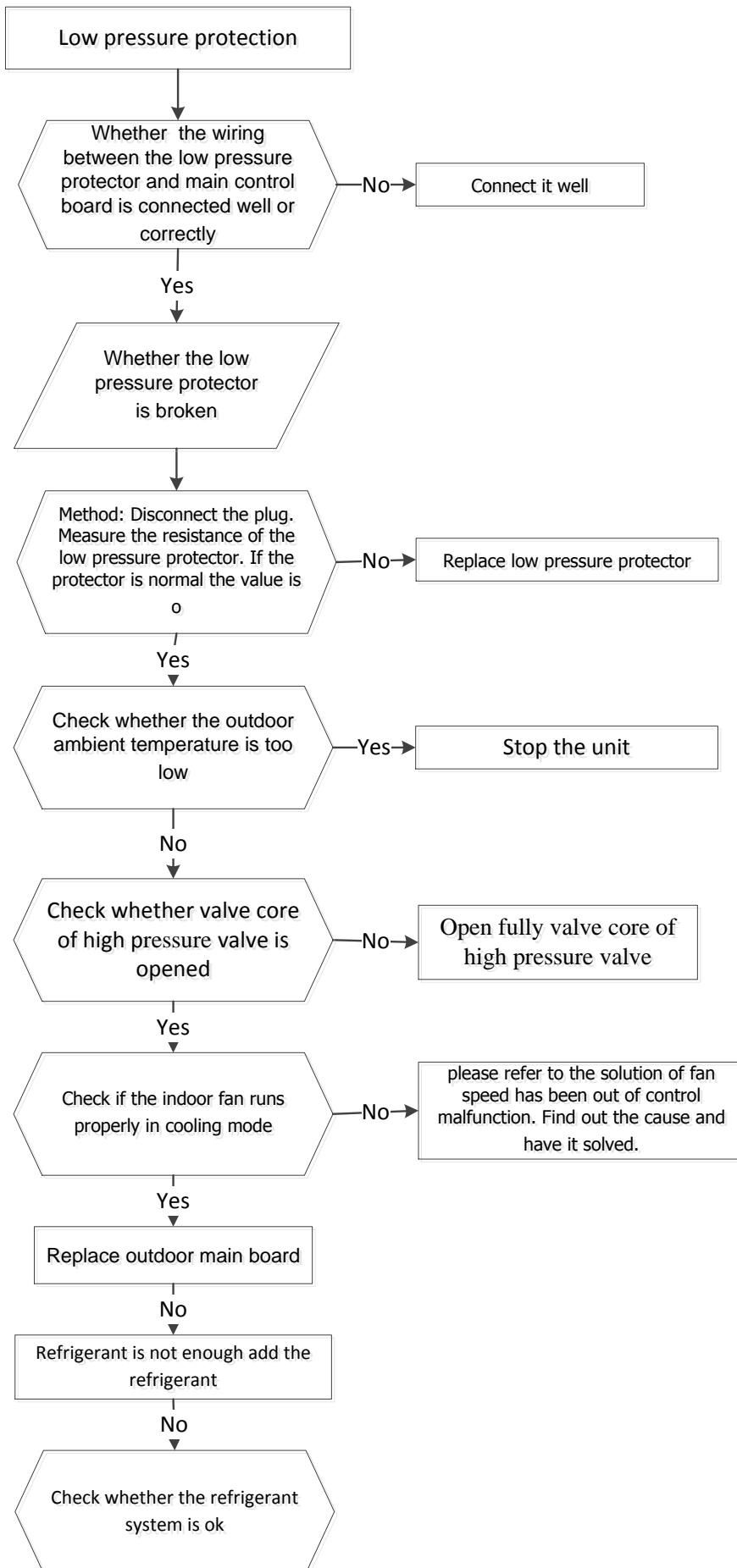
DC motor voltage input and output

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

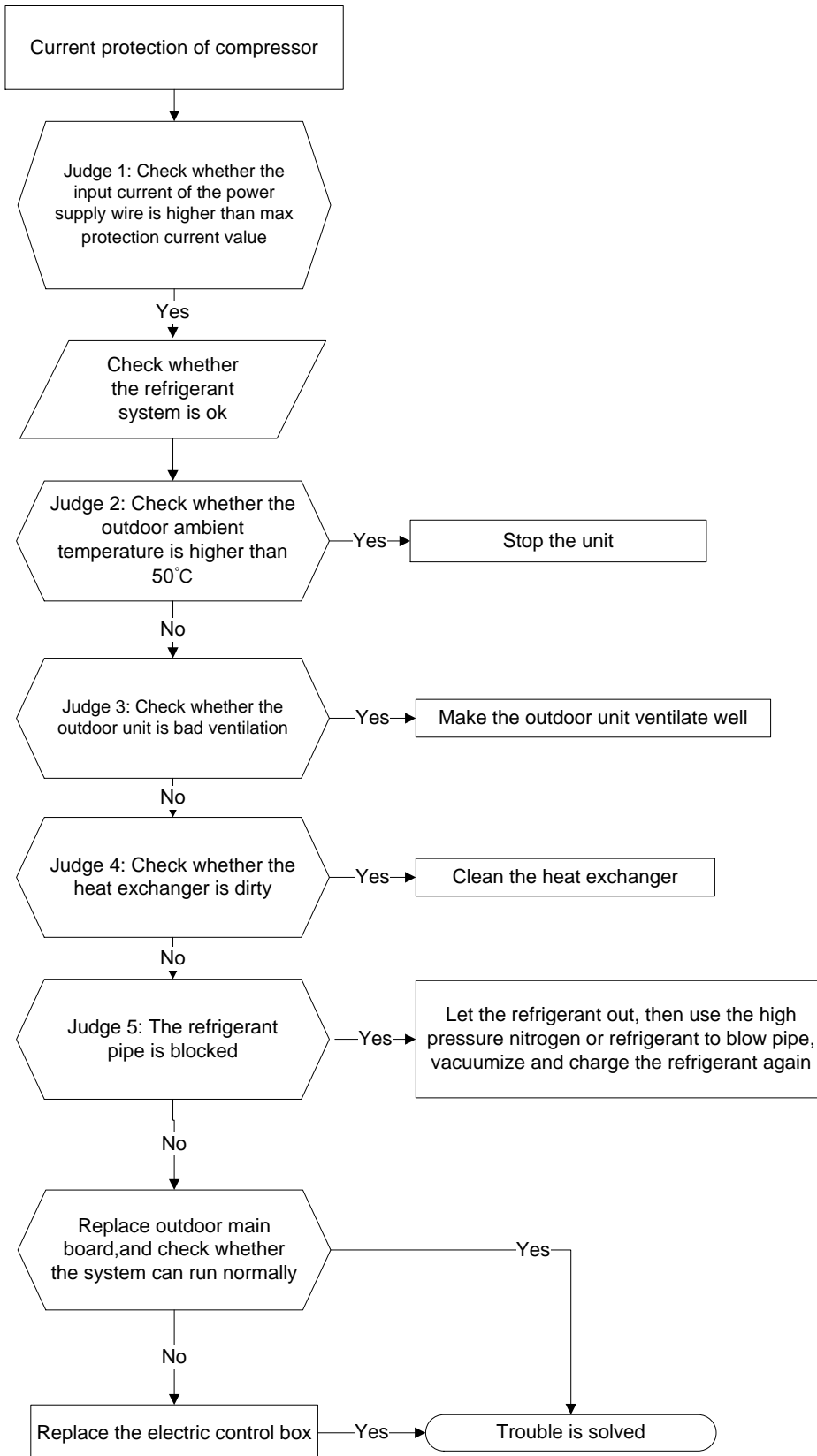
18.3.3.5 High pressure protection (ODU P1)(For 38QUS036DS4*, 38QUS042DS5*)



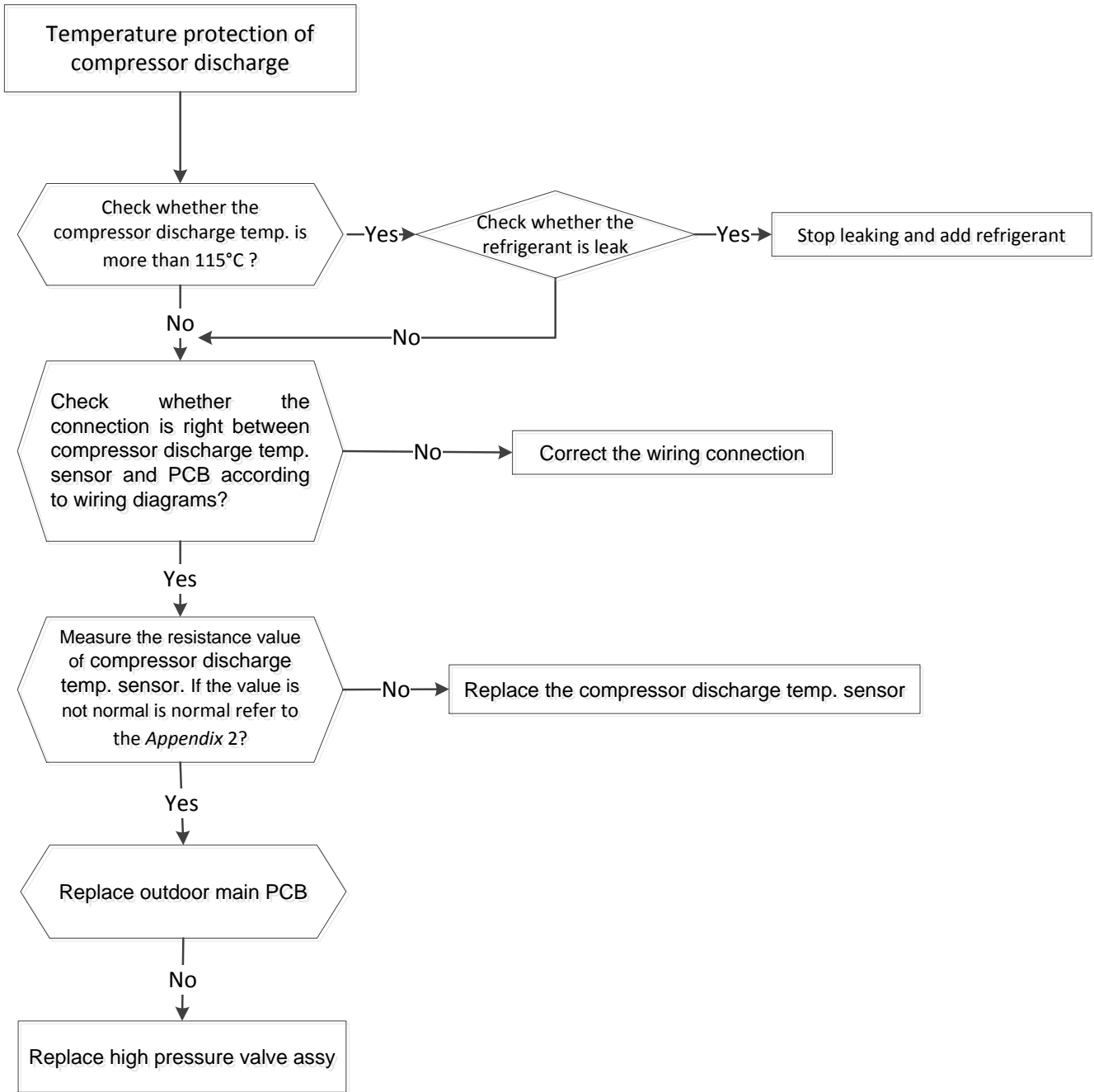
18.3.3.6 Low pressure protection (ODU P2)(For38QUS036DS4*, 38QUS042DS5*)



18.3.3.7 Current protection of compressor (ODU P3)

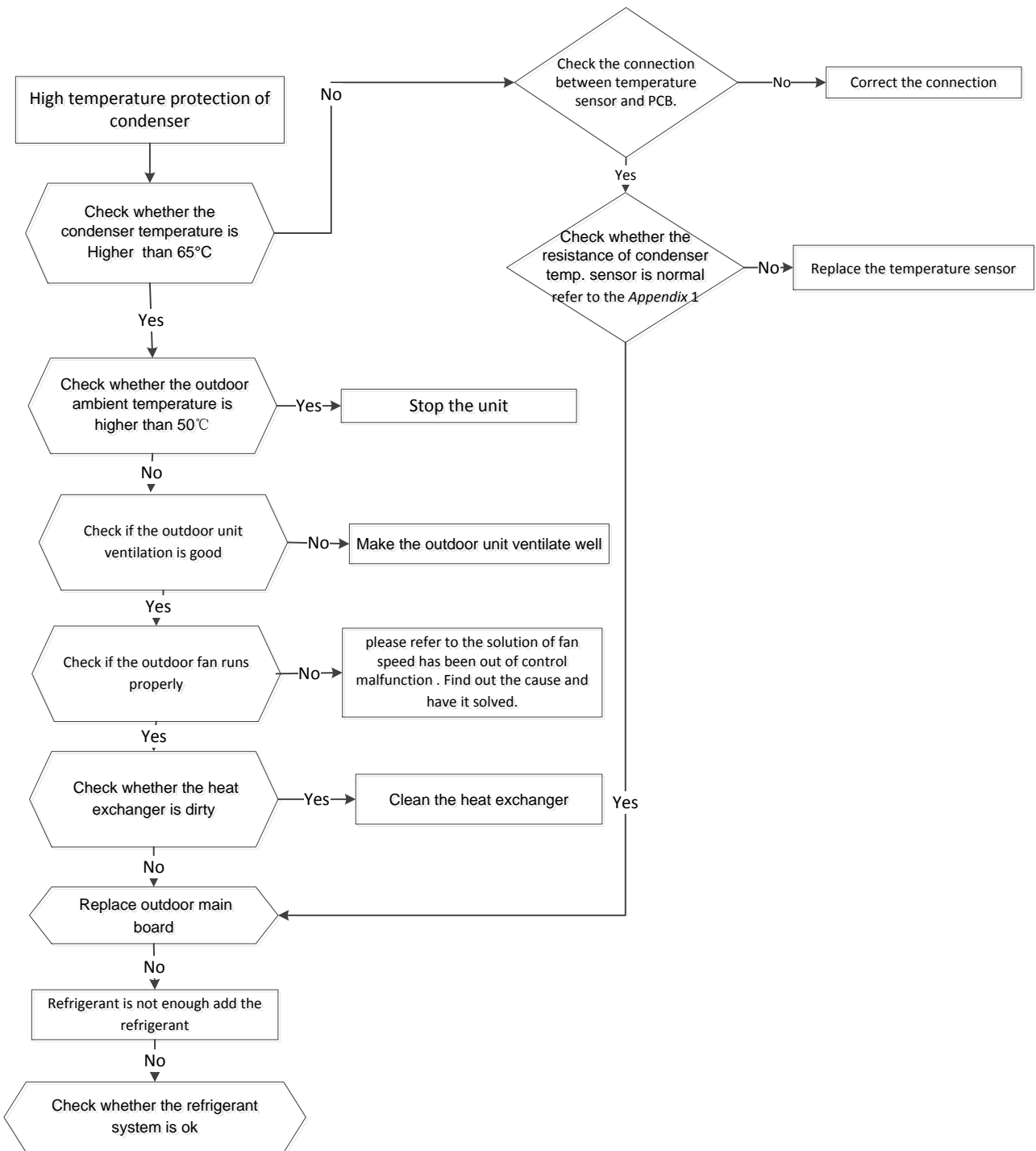


18.3.3.8 Temperature protection of compressor discharge (ODU P4)

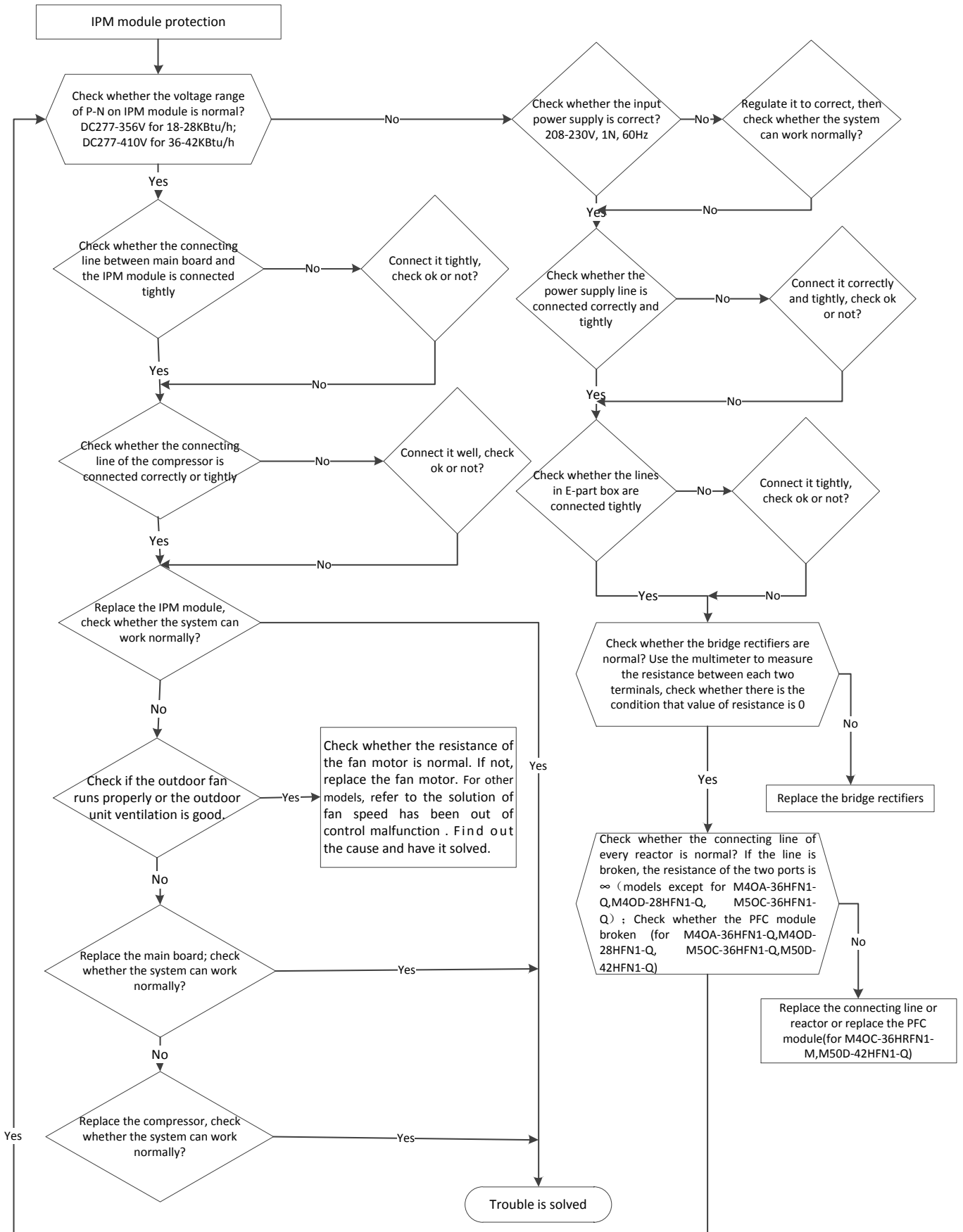


18.3.3.9 High temperature protection of condenser (ODU P5)

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



18.3.3.10 IPM module protection (ODU P6)



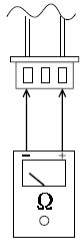
18.4 Main parts check

Spec.

Indoor unit				
Model	9K/12K/18K/24K Cassette	9K/12K/18K Console	9K/12K Ducted	18K/24K DL
Indoor fan motor	ZKFP-46-8-1	ZKFP-20-8-2	ZKFN-55-8-1	ZKFN-55-8-1
Model	24K Cassette		18K/24K Ducted	
Indoor fan motor	ZKFP-124-8-2		ZKFN-160-8-1-2	
Outdoor unit				
Model	1x2(14k)	1x2(18k)	1x3(21K)	1x3(27K)
Compressor	ASN108D22UEZ	ASM135D23UFZ	ASM135D23UFZ	ATF235D22UMT
Outdoor fan motor	ZKFN-40-8-1L	ZKFN-40-8-1L	ZKFN-50-8-2	ZKFN-50-8-2
Model	1x4(28K)	1x4(36K)	1x5(42K)	
Compressor	ATF235D22UMT	ATF310D43UMT	ATF310D43UMT	
Outdoor fan motor	ZKFN-120-8-2	ZKFN-120-8-2	ZKFN-120-8-2	

1. Temperature sensor checking

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



Tester

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

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

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

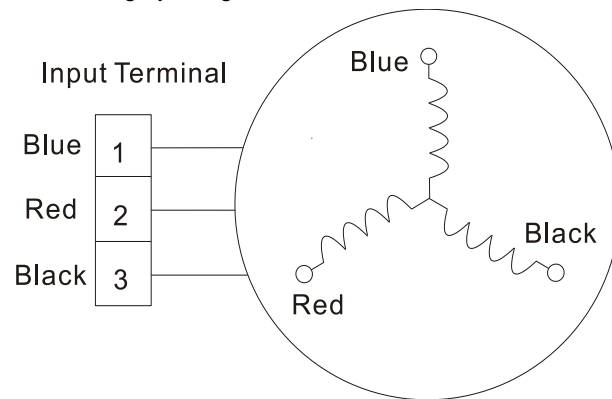
°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.000	65	1.96532	105	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			
	ASN108D22UEZ	ASM135D23UFZ	ATF235D22UMT	ATF310D43UMT
Blue - Red	1.57Ω(20°C)	1.75Ω(20°C)	0.75Ω(20°C)	0.65Ω(20°C)



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		