

DC INVERTER SERIES

Service Manual 2014

LIS-B-1411

Part 2

Indoor Units

New Four-way Cassette Type (Compact)

Super Slim Cassette Type

Duct Type

New Four-way Cassette Type (Compact)

1. Features	10
2. Dimensions	12
3. Service Space	14
4. Wiring Diagrams	15
5. Air Velocity and Temperature Distributions(Reference Data)	17
6. Electric Characteristics	18
7. Sound Levels	18
8. Accessories	19
9. The Specification of Power	19
10. Field Wiring	20

1. Features

1.1 New panel

- 360°surrounding air outlet design, affords comfortable feeling



1.2 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.



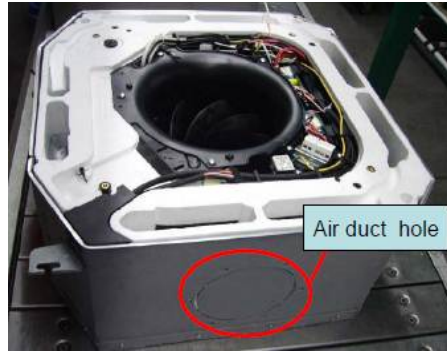
1.3 Electric control box built-in design

- 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.



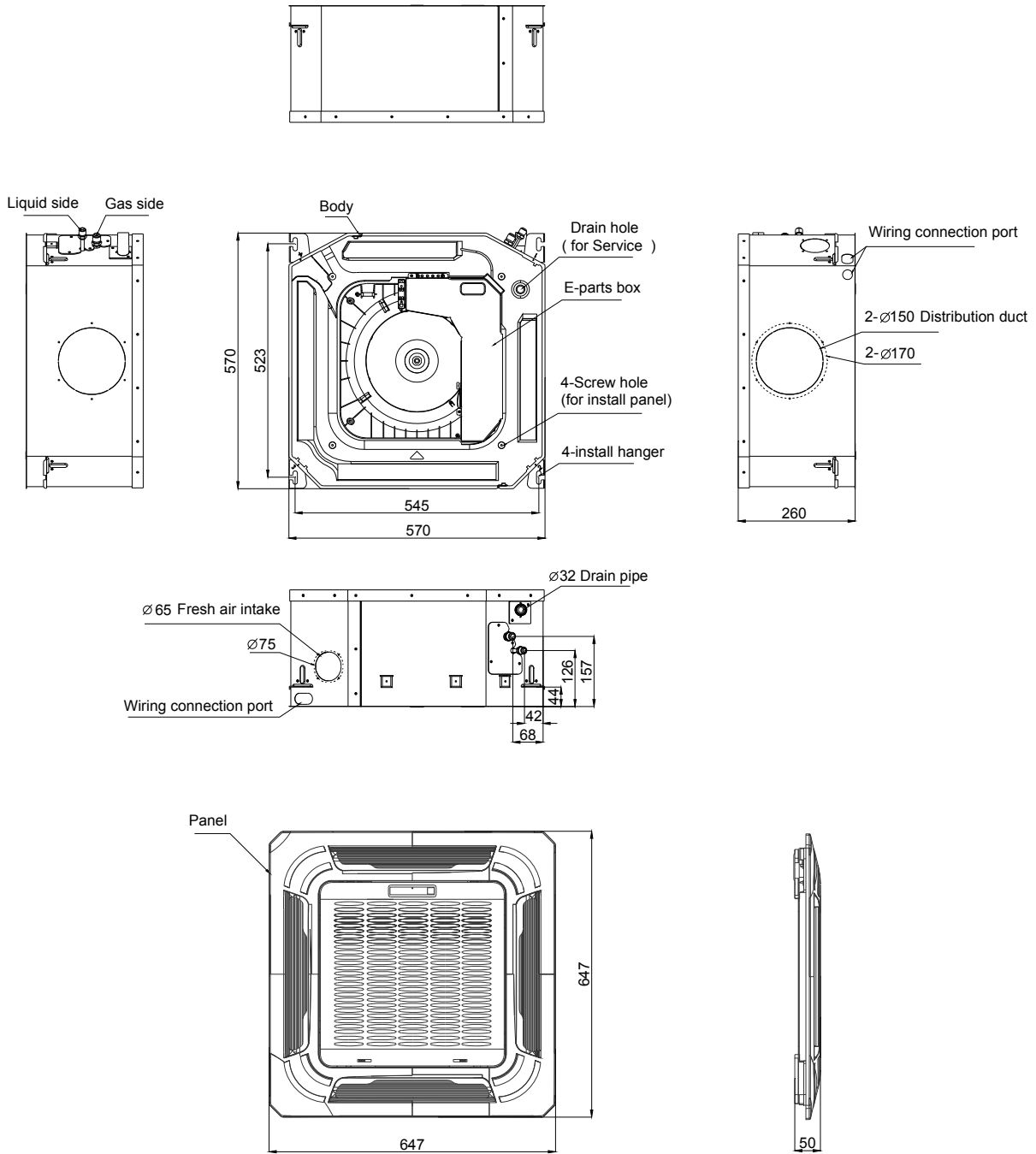
1.4 Air passage function

- 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.

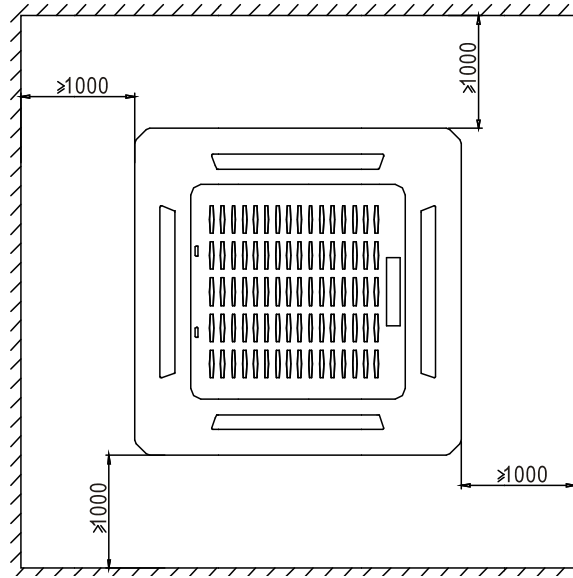
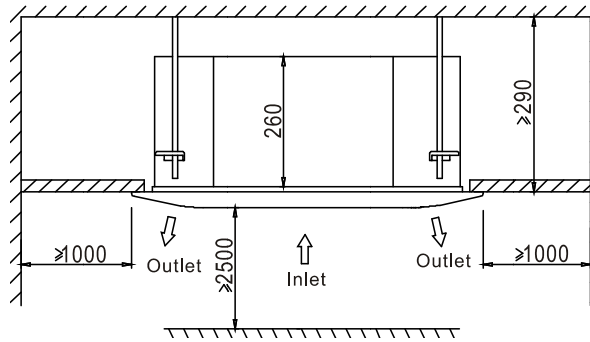


2. Dimensions

MDCA3-12HRDN1 MDCA3-18HRDN1

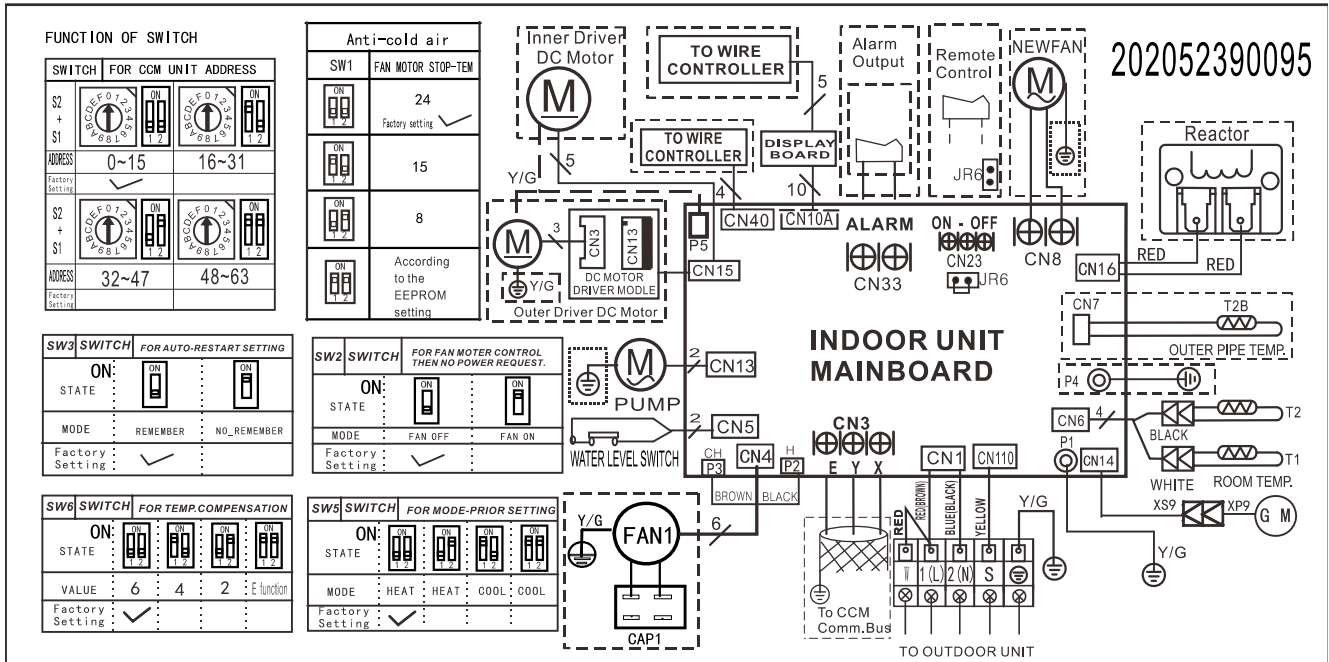


3. Service Space

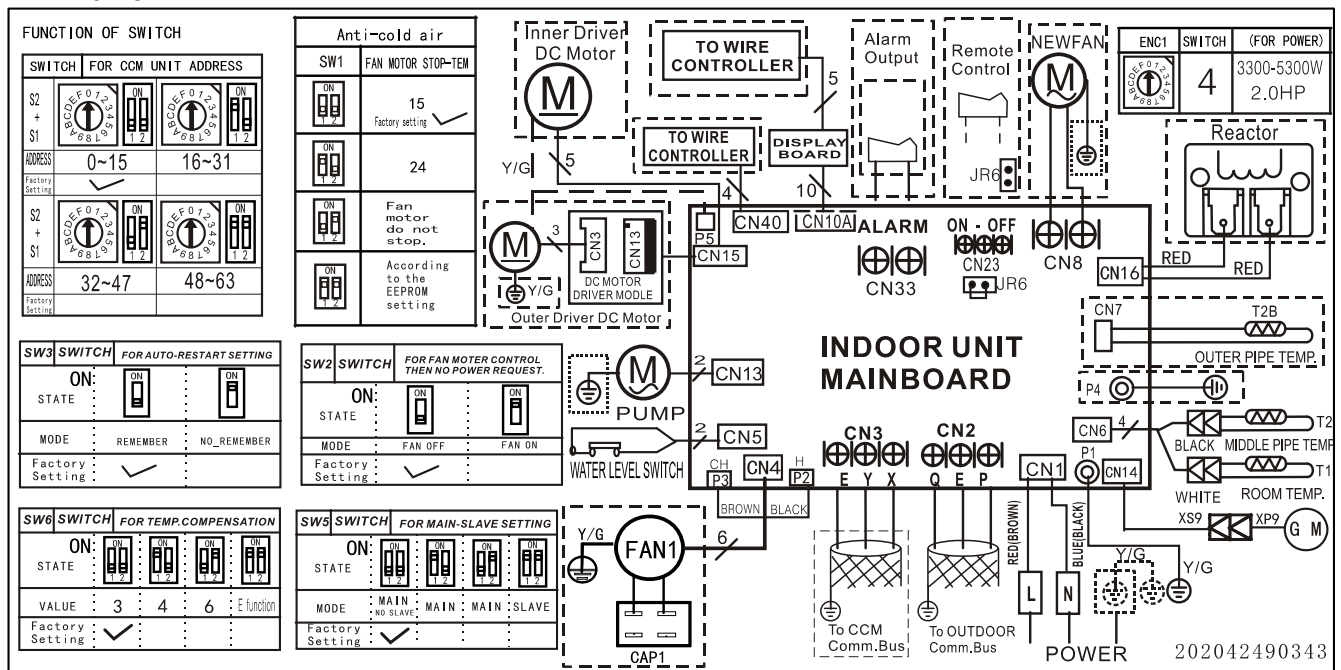


4. Wiring Diagrams

MDCA3-12HRDN1

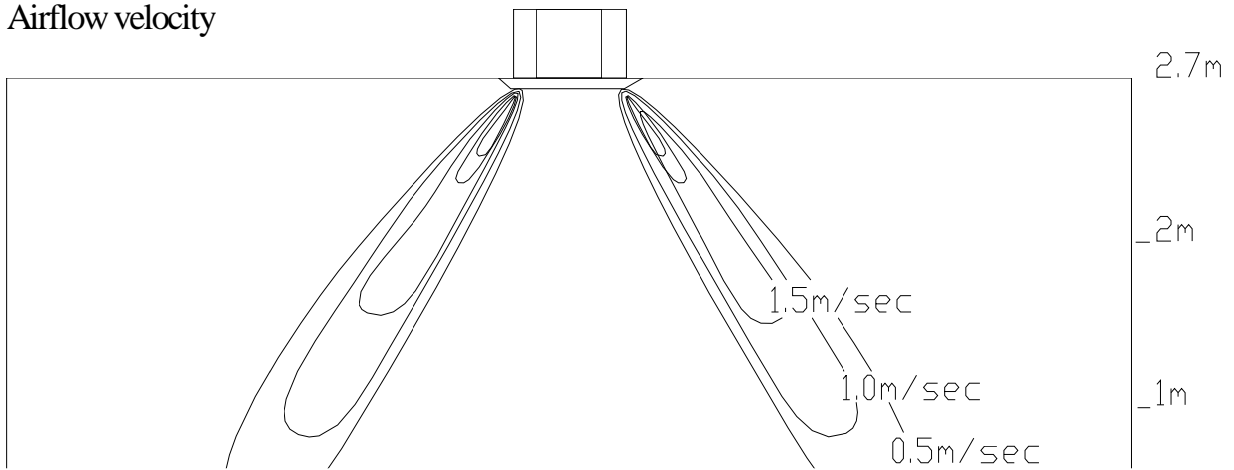


MDCA3-18HRDN1

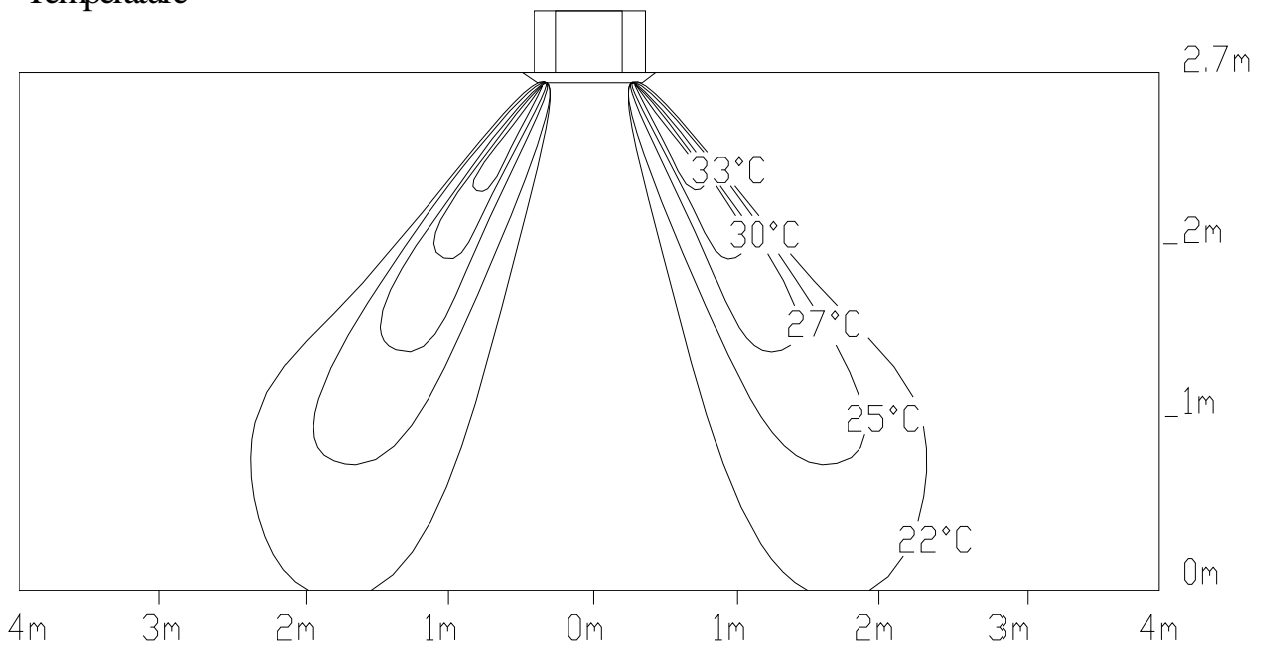


5. Air Velocity and Temperature Distributions(Reference Data)

Airflow velocity



Temperature



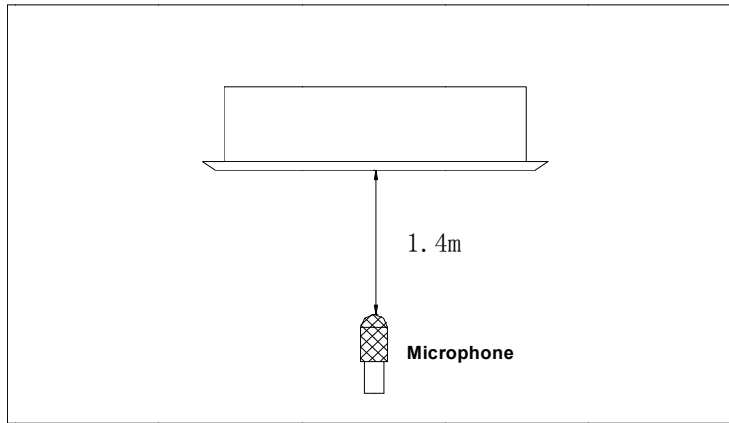
6. Electric Characteristics

Model	Indoor Units				Power Supply
	Hz	Voltage	Min.	Max.	MFA
MCA3-12HRDN1-Q	50	220-240V	198V	254V	/
MCA3-18HRDN1-Q	50	220-240V	198V	254V	15

Note:



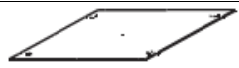







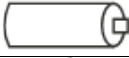


MFA: Max. Fuse Amps. (A)

7. Sound Levels



Model	Noise level dB(A)		
	H	M	L
MCA3-12HRDN1-Q	44	39	34
MCA3-18HRDN1-Q	48	42	38

8. Accessories

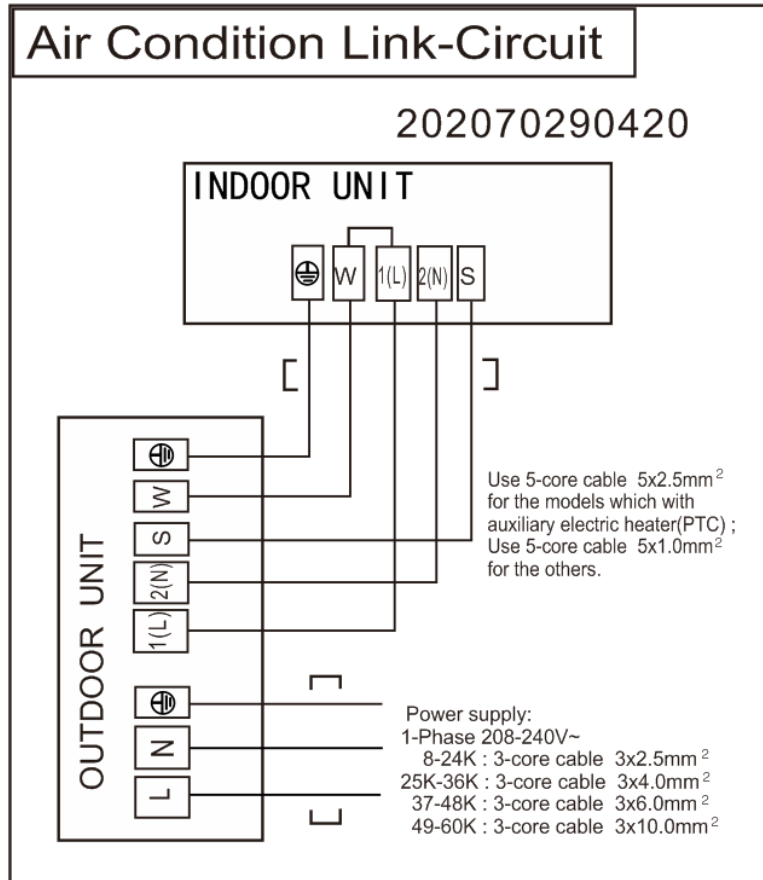
	Name	Shape	Quantity
Installation fittings	1. Expansible hook		4
	2. Installation hook		4
	3. Installation paper board		1
Drainpipe Fittings	4. Out-let pipe sheath		1
	5. Out-let pipe clasp		1
	6. Tightening band		20
	7. Drain joint		1
Remote controller & Its holder	8. Remote controller		1
	9. Remote controller holder		1
	10. Mounting screw(ST2.9×10-C-H)		2
	11. Alkaline dry batteries (AM4)		2
Others	12. Owner's manual		1
	13. Installation manual		1

9. The Specification of Power

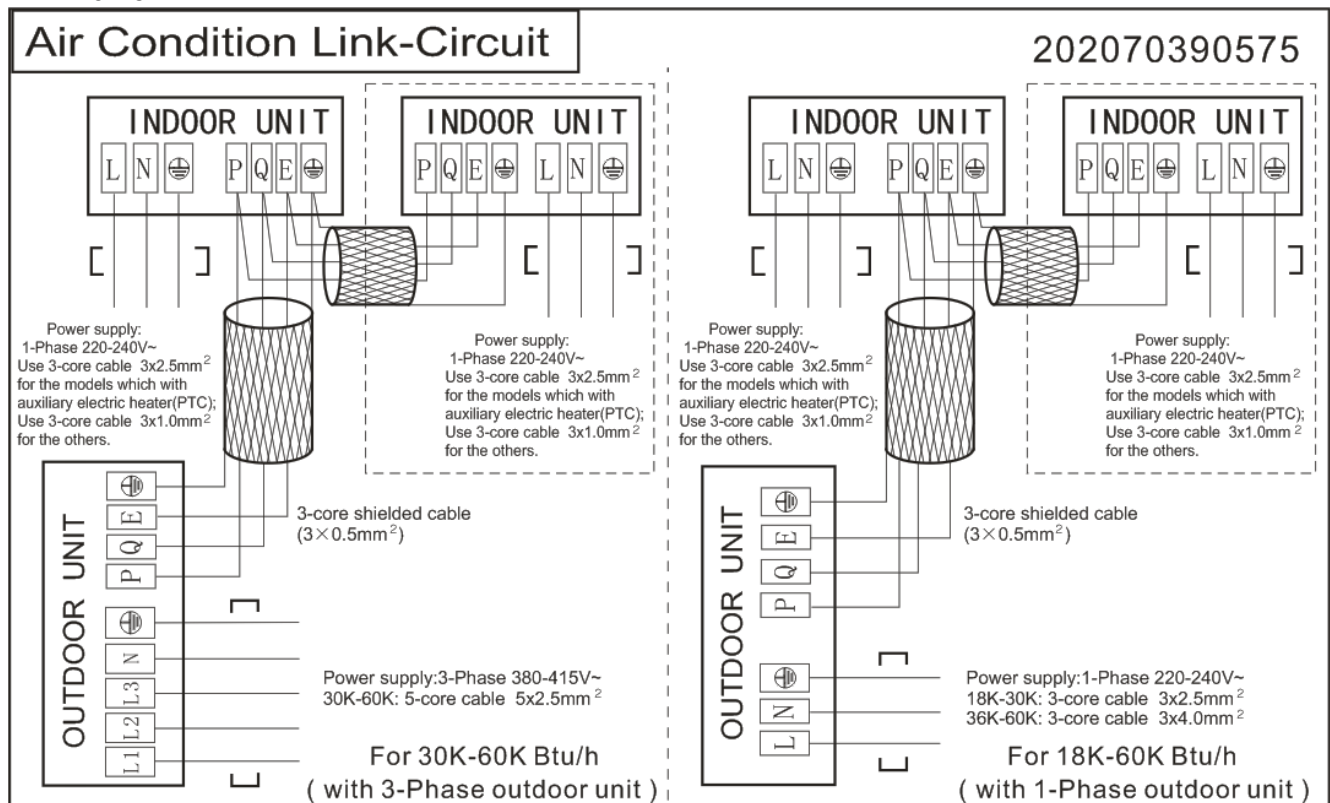
Model		MDCA3-12HRN1	MDCA3-18HRDN1
INDOOR UNIT POWER	Phase	—	1-phase
	Frequency and Voltage	—	220-240V, 50Hz
	POWER WIRING (mm ²)	—	3×1.0
	CIRCUIT BREAKER/ FUSE (A)	—	15/10
OUTDOOR UNIT POWER	Phase	1-phase	1-phase
	Frequency and Voltage	220-240V, 50Hz	220-240V, 50Hz
	POWER WIRING (mm ²)	3×2.5	3×2.5
	CIRCUIT BREAKER/ FUSE (A)	20/16	30/20
Indoor/Outdoor Connecting Wiring (Weak Electric Signal) (mm ²)		—	3×0.5
Indoor/Outdoor Connecting Wiring (Strong Electric Signal) (mm ²)		5×1.0	—

10. Field Wiring

MDCA3-12HRDN1



MDCA3-18HRDN1



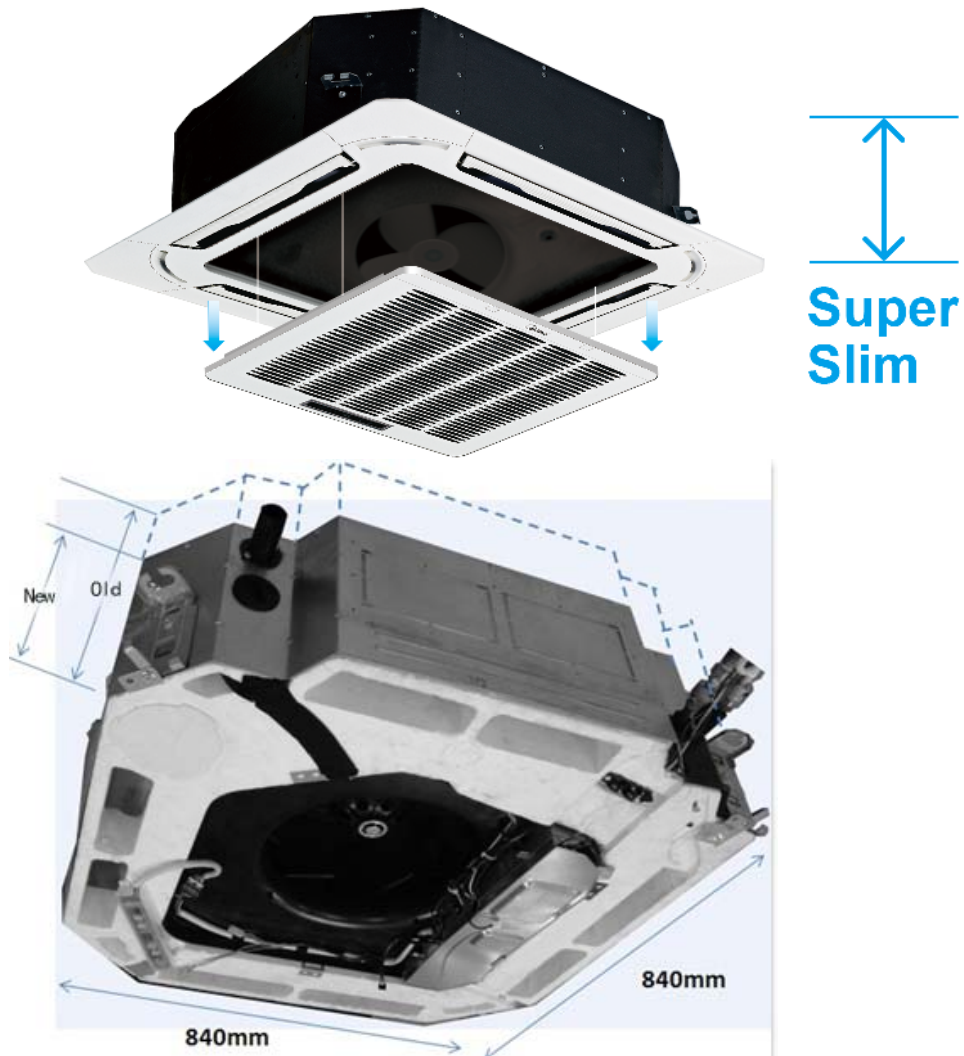
Super Slim Cassette Type

1. Features	28
2. Dimensions	32
3. Service Space	33
4. Wiring Diagrams	34
5. Air Velocity and Temperature Distributions(Reference Data)	35
6. Electric Characteristics	36
7. Sound Levels	37
8. Accessories	38
9. The Specification of Power	39
10.Field Wiring	40

1. Features

1.1 Overview

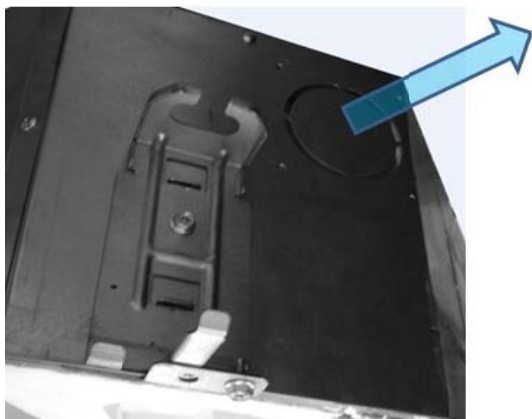
- Compact design, super slim body size, less space requiring in installation
- Each louver can be separately controlled, more comfort air blowing is possible.
- Auto-lifting panel design, more convenient to clean and maintain the filter. (optional)



	Old Cassette	New Slim Cassette	Reduction
18K-24K	840*230*840	840*205*840	11%↓
30K	840*300*840	840*205*840	32%↓
36K-48K	840*300*840	840*245*840	18%↓
60K	840*300*840	840*287*840	4%↓

1.2 Fresh air intake function

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

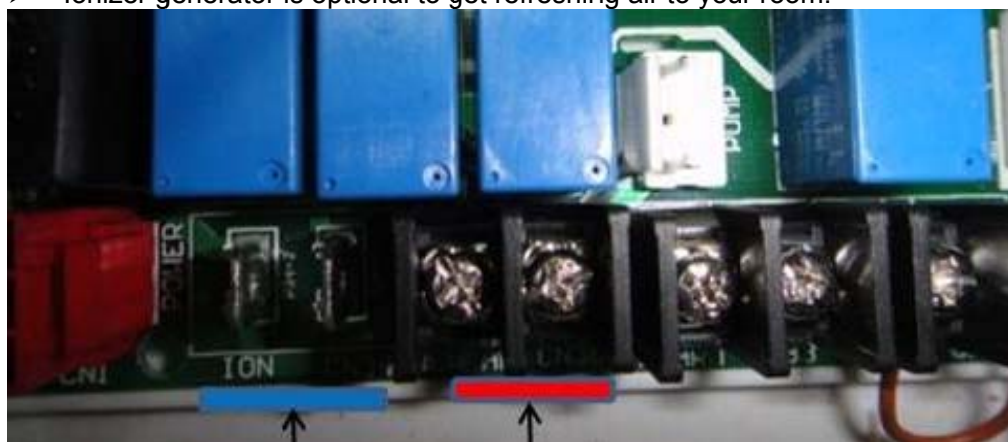


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1.3 Optional ionizer generator

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



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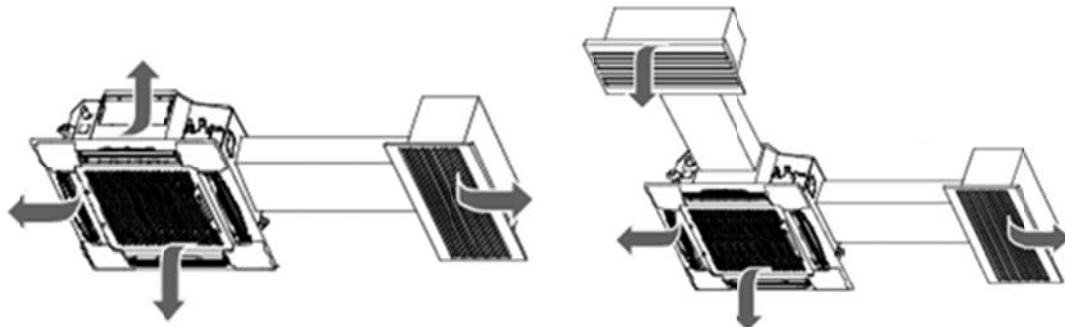
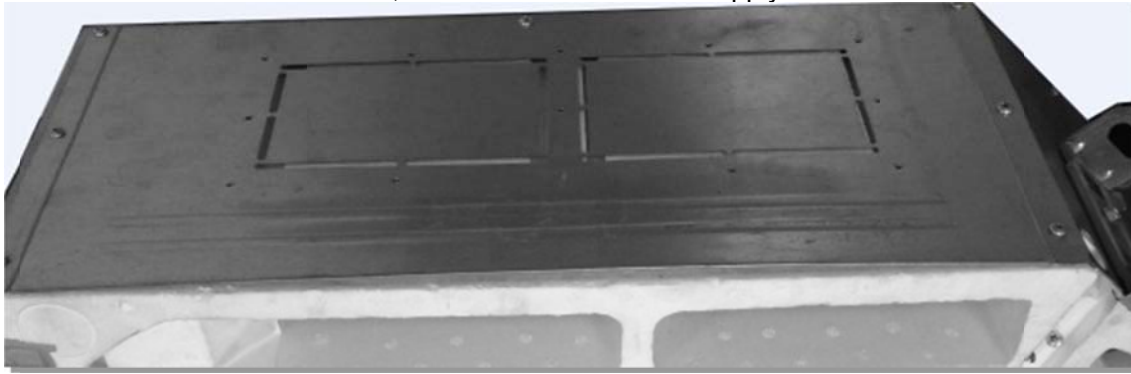
motor
:tor

- 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.



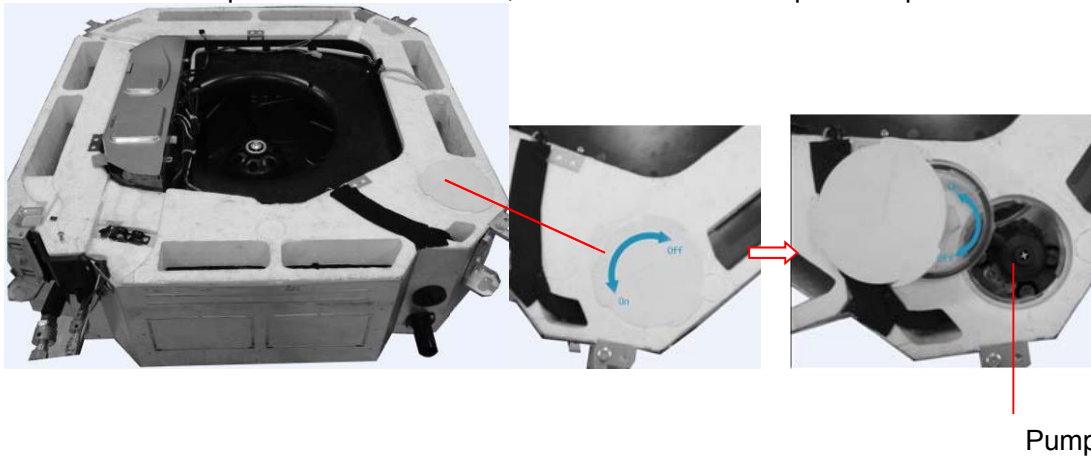
1.4 External air duct design

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

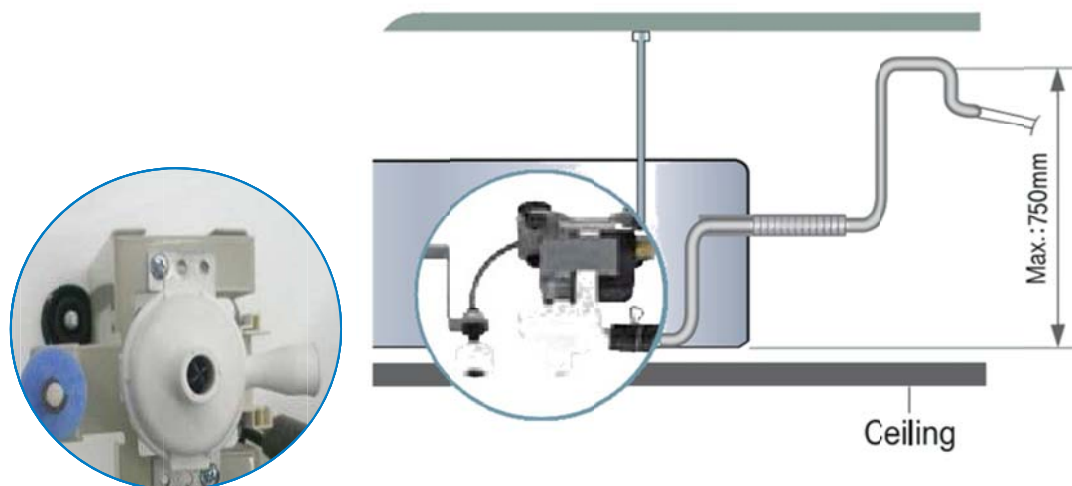


1.5 Built-in draining pump

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

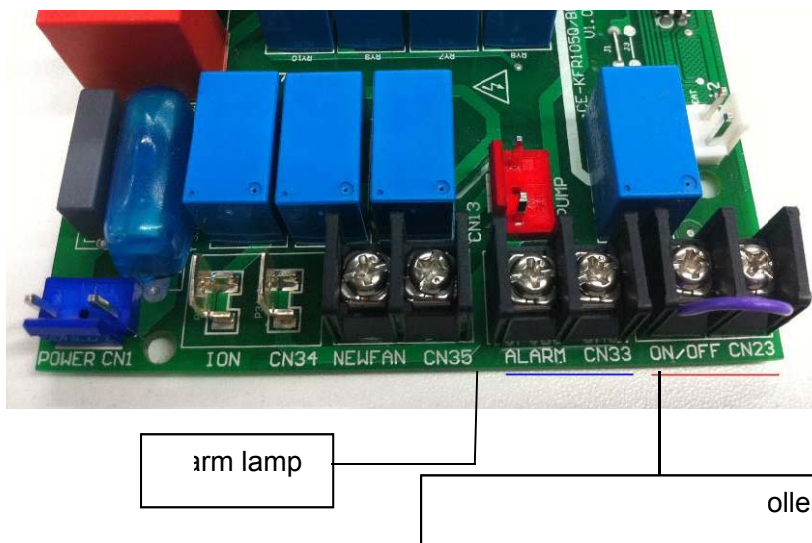


- Built-in draining pump to make sure condensed water drain out reliably.



1.6 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.



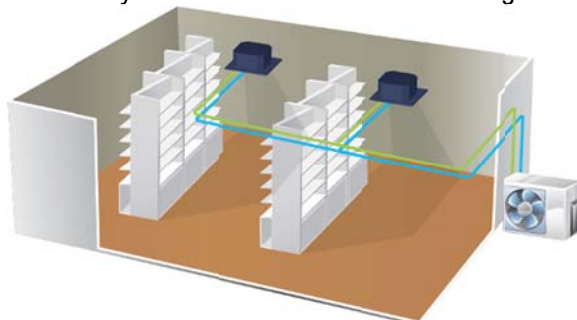
1.7 Optional touch screen wired controller

- Touch screen wired controller is optional, with error code indication function. Better man-machine conversation interface.
- Undated structure design, 4-way wire layout design, no raised part at backside, more convenient to place the wires and install the device.

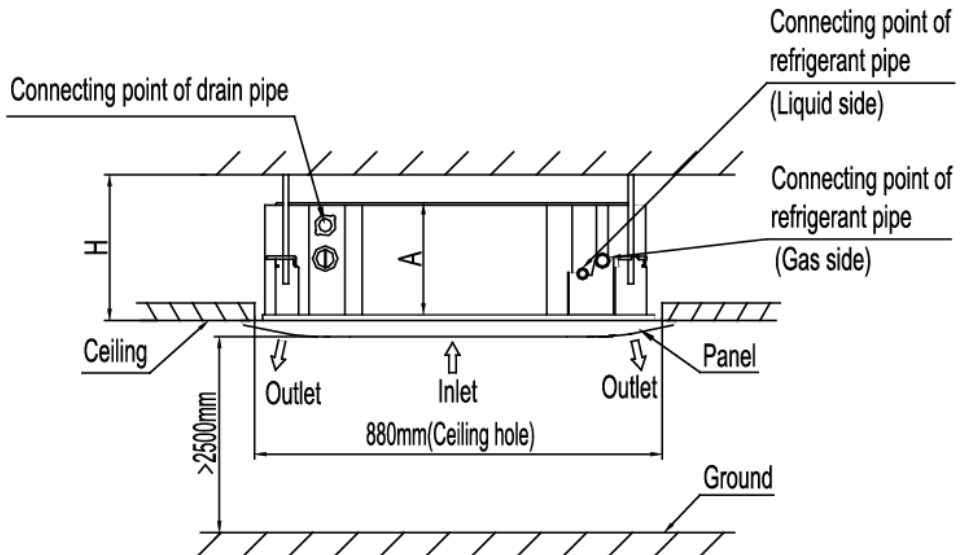
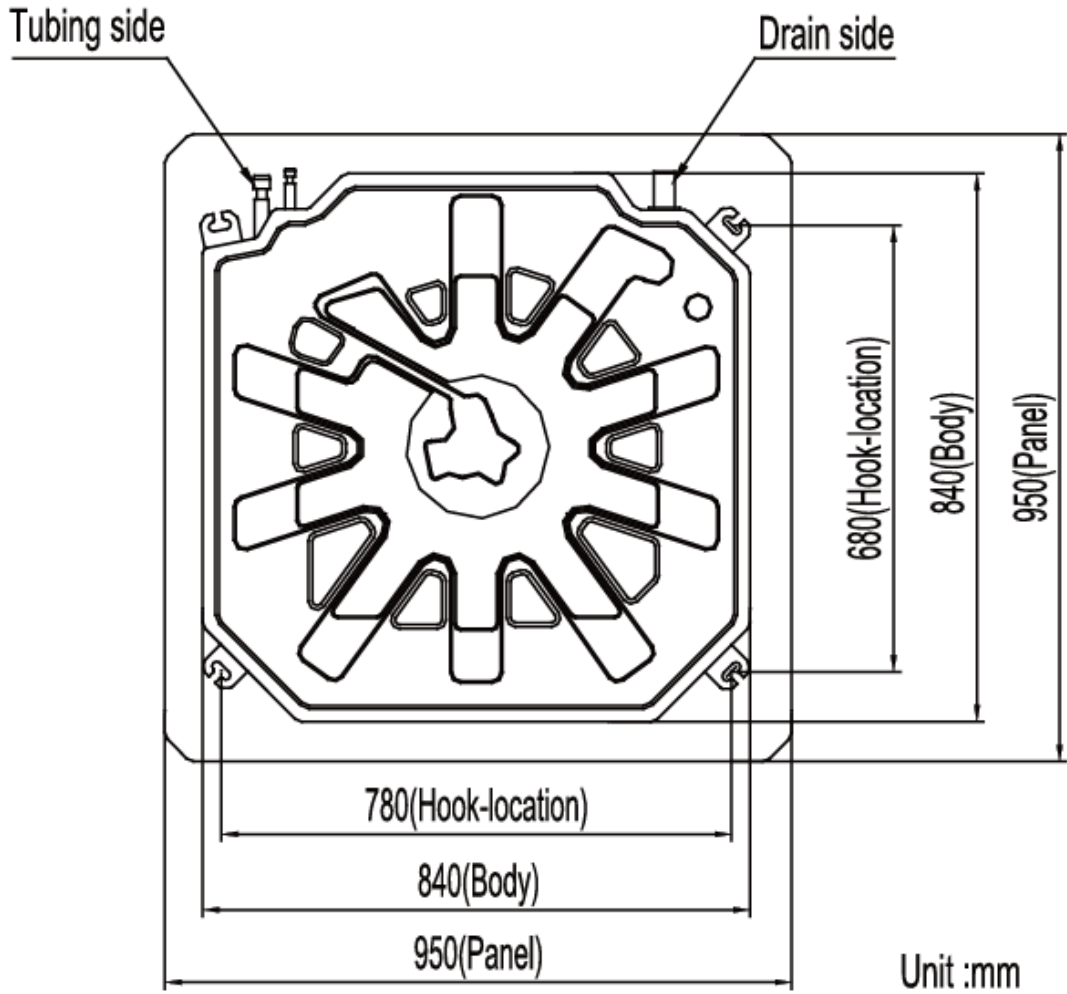


1.8 Twins Combination(18k-30k)

- The units can be installed as Twin systems: one outdoor unit can connect with two indoor units. The indoor units can be combined in any of the different available ratings.

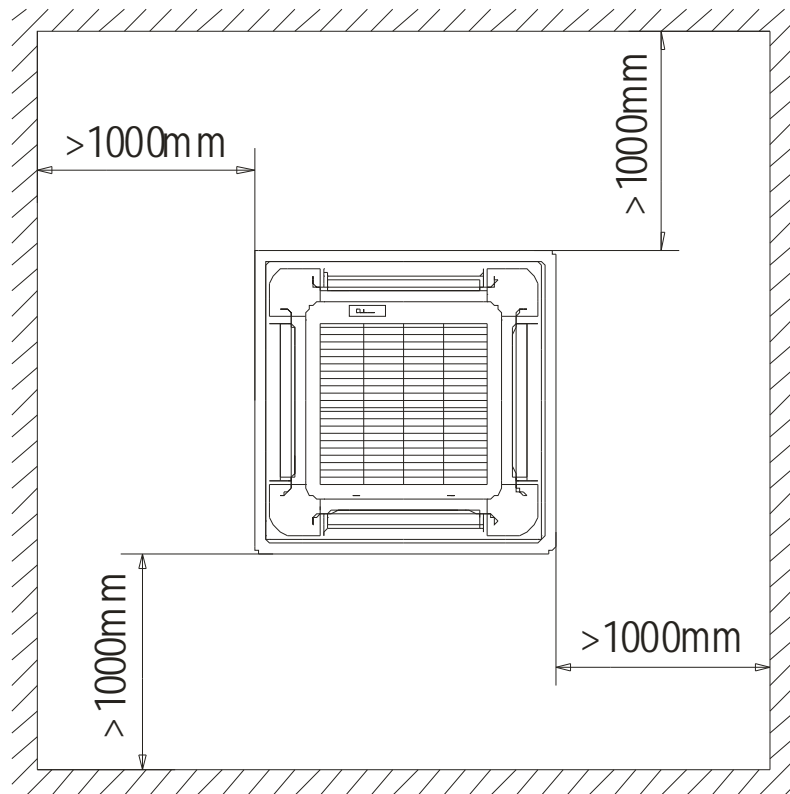


2. Dimensions



Model	A	H
18-30	205	>235
36-48	245	>275
60	287	>317

3. Service Space



4. Wiring Diagrams

MDCD-18HRDN1 MDCD-24HRDN1 MDCD-36HRDN1 MDCD-48HRDN1

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INDOOR UNIT

FUNCTION OF SWITCH

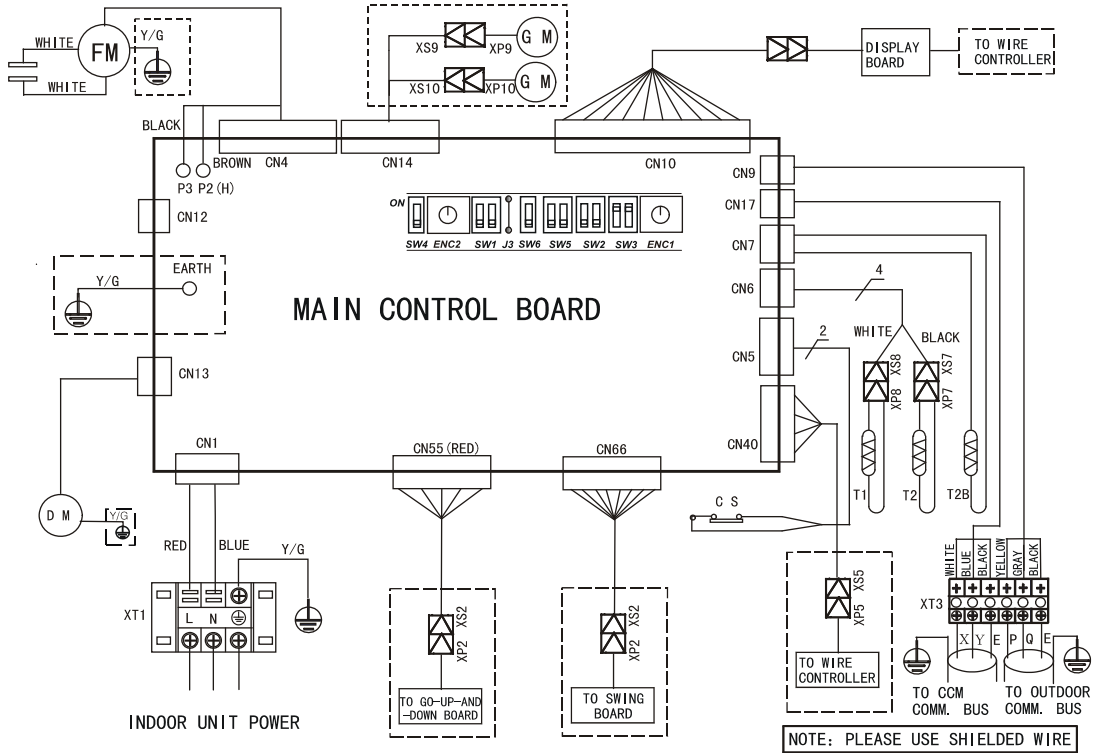
ENC1 SWITCH (FOR POWER)	
NUMBER	POWER
0	2200W (0.8HP)
1	2800W (1.0HP)
2	3600W (1.2HP)
3	4500W (1.7HP)
4	5600W (2.0HP)
5	7100W (2.5HP)
6	8000W (3.0HP)
7	9000W (3.2HP)
8	10500W (4.0HP)
9	14000W (5.0HP)
	16000W (6.0HP)

SW2 SWITCH (FOR PREVENT COLD WIND)	
ON STATE	MODE
<input type="checkbox"/>	1 2 3 4

SW3 SWITCH (FOR TEMP COMPENSATION)	
ON STATE	VALUE
<input type="checkbox"/>	8 4 6 3

SW5 SWITCH (FOR MAIN-SLAVE SETTING)	
ON STATE	MODE
<input type="checkbox"/>	MAIN NO SLAVE MAIN SLAVE SLAVE

SW4 SWITCH (FOR POWER LOST REMEMBER)	
ON STATE	MODE
<input type="checkbox"/>	REMEMBER NO_REMEMBER



NOTE: PLEASE USE SHIELDED WIRE

MDCD-60HRDN1

ENC1 SWITCH (FOR POWER)	
NUMBER	POWER
0	/
1	/
2	/
3	/
4	5300W (2.0HP)
5	7100W (2.5HP)
6	/
7	9000W (3.2HP)
8	10500W (4.0HP)
9	14000W (5.0HP)
A	16000W (6.0HP)

FUNCTION OF SWITCH			
SWITCH FOR COM UNIT ADDRESS		SWITCH FOR COM UNIT ADDRESS	
ENC2 + SW1	ADDRESS	ENC2 + SW1	ADDRESS
<input type="checkbox"/>	0-15	<input type="checkbox"/>	32-47
<input type="checkbox"/>	16-31	<input type="checkbox"/>	48-63

WIRING DIAGRAM

INDOOR UNIT

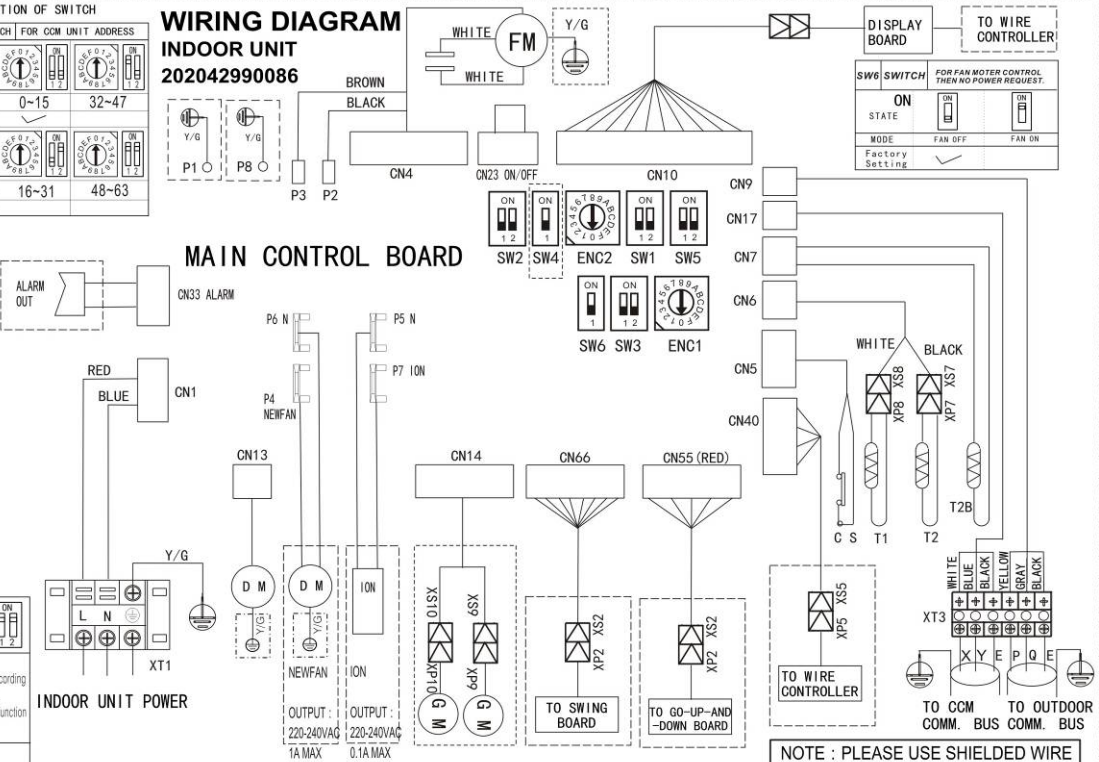
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SW3 SWITCH (FOR TEMP COMPENSATION)	
ON STATE	VALUE
<input type="checkbox"/>	3 4 6 E function

SW4 SWITCH (FOR POWER LOST REMEMBER)	
ON STATE	MODE
<input type="checkbox"/>	REMEMBER NO_REMEMBER

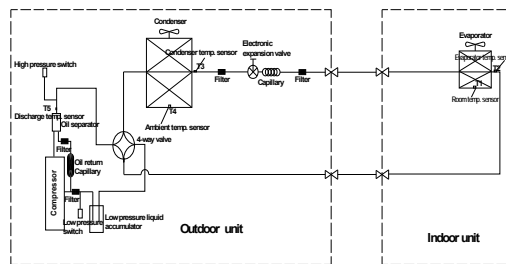
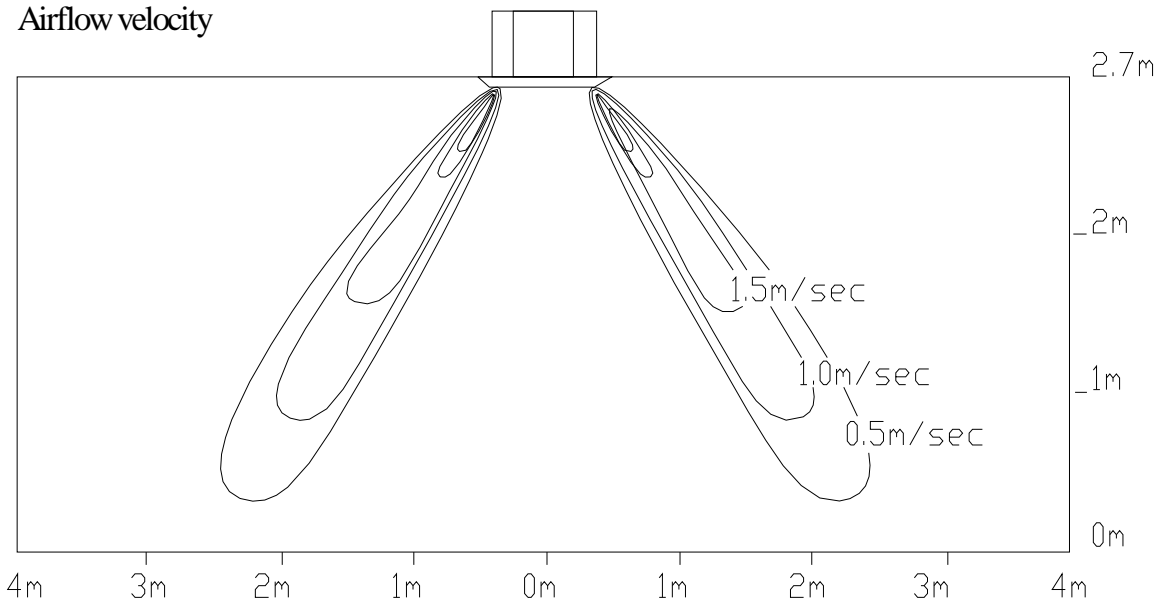
SW5 SWITCH (FOR MAIN-SLAVE SETTING)	
ON STATE	MODE
<input type="checkbox"/>	MAIN NO SLAVE MAIN SLAVE SLAVE

SW2 SWITCH (SELECT TEMP.)	
ON STATE	MODE
<input type="checkbox"/>	TE1 28 30 TE2 30 32 TE3 24 28 TE4 15 24 TE5 32 35 TE6 30 32



NOTE: PLEASE USE SHIELDED WIRE

5. Air Velocity and Temperature Distributions(Reference Data)



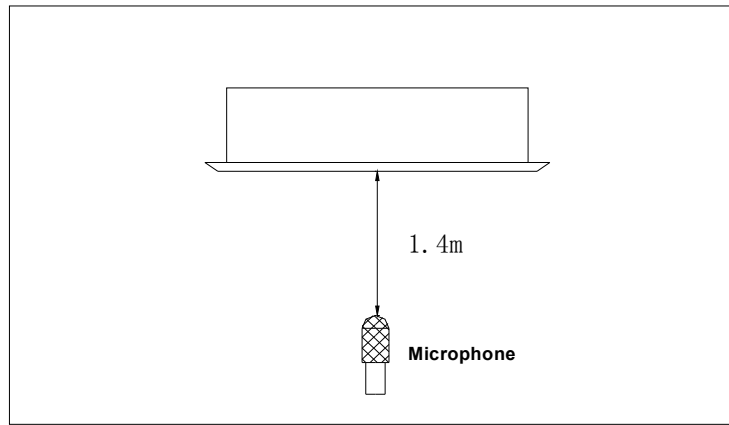
6. Electric Characteristics

Model	Indoor Unit				Power Supply
	Hz	Voltage	Min	Max	MFA
MDCD-18HRDN1	50	220-240	198	254	15
MDCD-24HRDN1	50	220-240	198	254	15
MDCD-30HRDN1	50	220-240	198	254	15
MDCD-36HRDN1	50	220-240	198	254	15
MDCD-48HRDN1	50	220-240	198	254	15
MDCD-60HRDN1	50	220-240	198	254	15

Note:















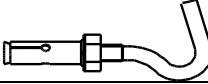


MFA: Max. Fuse Amps. (A)

7. Sound Levels



Model	Noise level dB(A)		
	H	M	L
MDCD-18HRDN1	44	38	32
MDCD-24HRDN1	51	45	38
MDCD-30HRDN1	46	45	43
MDCD-36HRDN1	52	48	45
MDCD-48HRDN1	52	49	46
MDCD-60HRDN1	53	47	44

8. Accessories

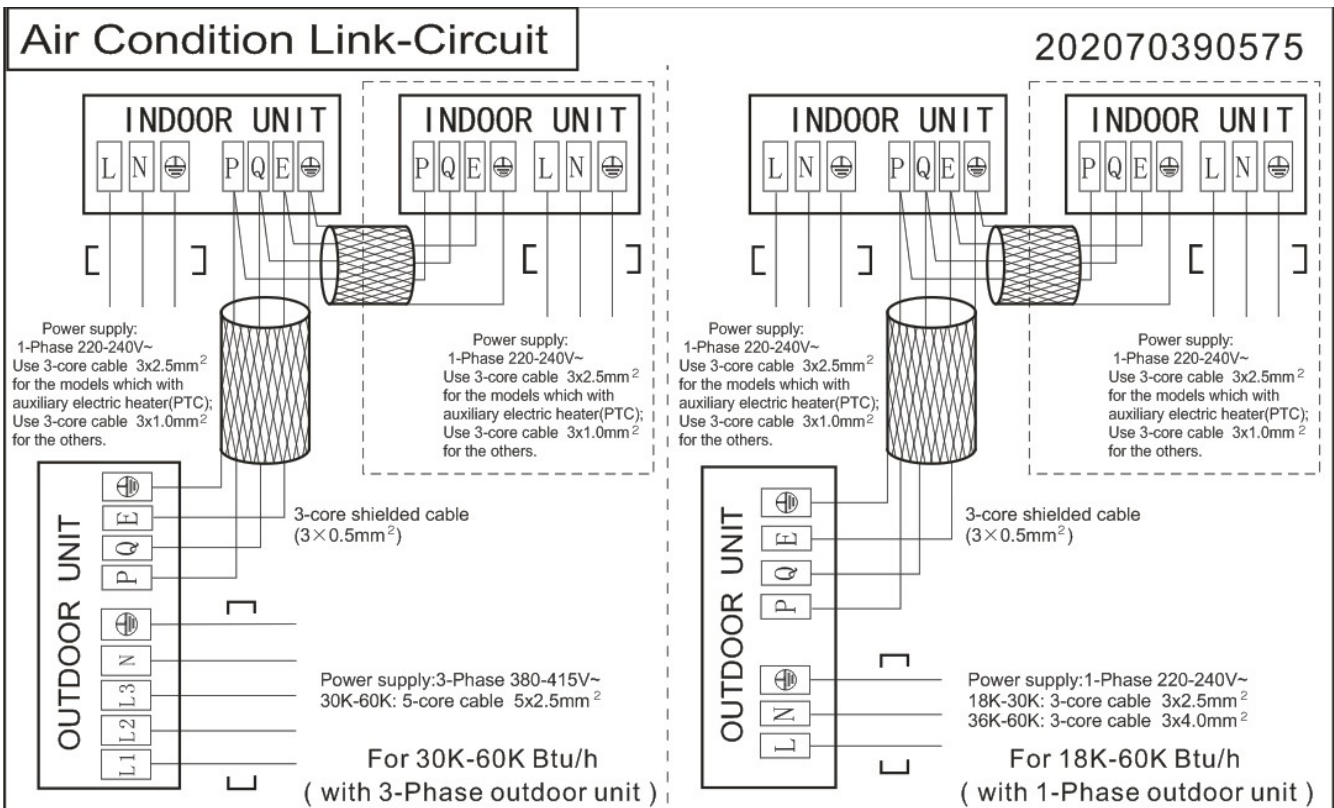
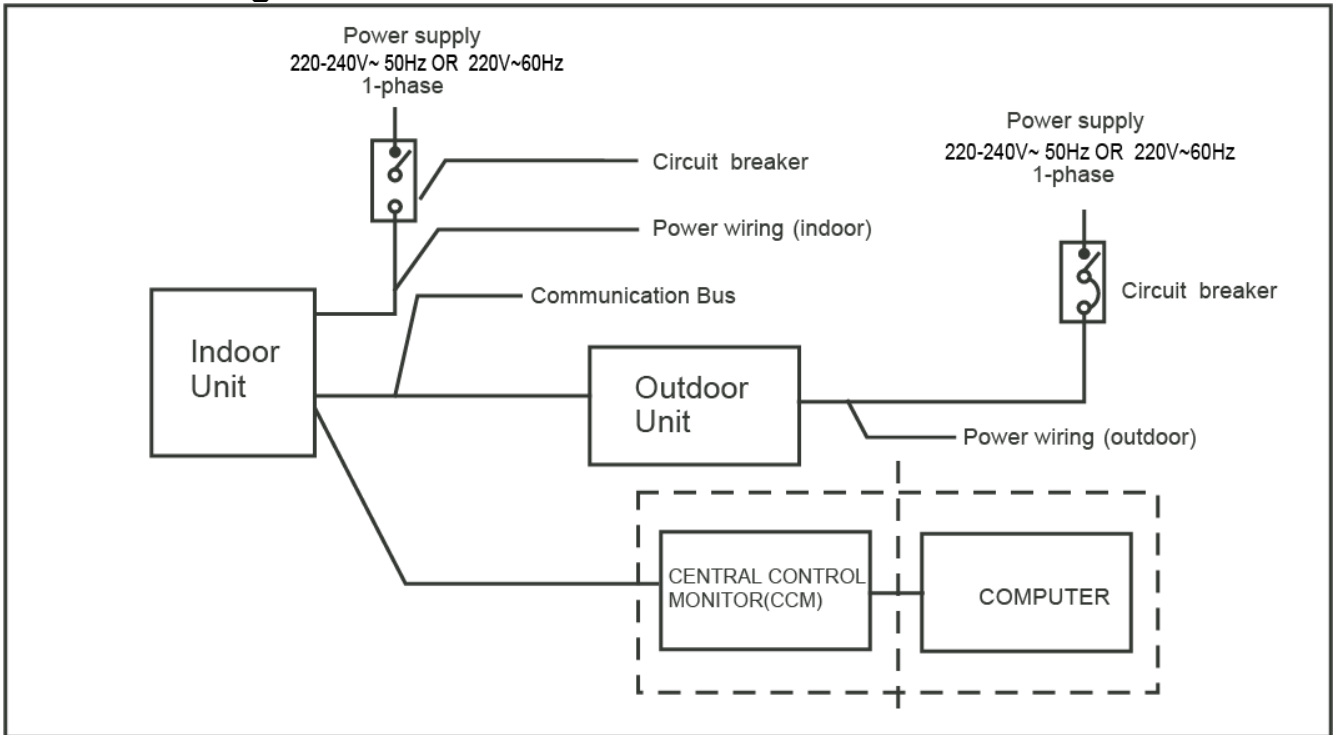
	Name	Shape	Quantity
INSTALLATION FITTINGS	Installation paper board		1
	Bolt M5		4
Tubing & Fittings	Soundproof / insulation sheath		2
Drainpipe Fittings	Out-let pipe		1
	Out-let pipe sheath		1
	Out-let pipe clasp		1
Remote controller & Its Frame	Remote controller & Its Frame		1
	Remote controller holder		1
	Mounting screw(ST2.9×10-C-H)		2
	Remote controller manual		1
	Alkaline dry batteries (AM4)		2
Others	Owner's manual		1
	Installation manual		1
	Network wires		1
Installation accessory (The product you have might not be provided the following accessories)	Expansable hook		4
	Installation hook		4
	Orifice		1

9. The Specification of Power

Model		18000-24000Btu/h	30000 Btu/h	36000Btu/h	48000Btu/h	60000 Btu/h
INDOOR UNIT POWER	Phase	1-phase	1-phase	1-phase	1-phase	1-phase
	Frequency and Voltage	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
	POWER WIRING (mm ²)	3×1.0	3×1.0	3×1.0	3×1.0	3×1.0
	CIRCUIT BREAKER /FUSE (A)	15/10	15/10	15/10	15/10	15/10
OUTDOOR UNIT POWER	Phase	1-phase	1-phase	1-phase	1-phase	1-phase
	Frequency and Voltage	220-240V, 50H	220-240V, 50H	220-240V, 50H	220-240V, 50H	220-240V, 50H
	POWER WIRING (mm ²)	3×2.5	3×2.5	3×4.0	3×4.0	3×4.0
	CIRCUIT BREAKER /FUSE(A)	30/20	40/30	40/30	40/35	50/40
Indoor/Outdoor Connecting Wiring(Weak Electric Signal) (mm ²)		3×0.5	3×0.5	3×0.5	3×0.5	3×0.5
Indoor/Outdoor Connecting Wiring(Strong Electric Signal) (mm ²)		—————	—————	—————	—————	—————

Model		36000Btu/h	48000-60000Btu/h
INDOOR UNIT POWER	Phase	1-phase	1-phase
	Frequency and Voltage	220-240V, 50Hz	220-240V, 50Hz
	POWER WIRING (mm ²)	3×1.0	3×1.0
	CIRCUIT BREAKER/FUSE (A)	15/10	15/10
OUTDOOR UNIT POWER	Phase	3-phase	3-phase
	Frequency and Voltage	380-415V, 50H	380-415V, 50H
	POWER WIRING (mm ²)	5×2.5	5×2.5
	CIRCUIT BREAKER/FUSE(A)	30/20	30/25
Indoor/Outdoor Connecting Wiring (Weak Electric Signal) (mm ²)		3×0.5	3×0.5
Indoor/Outdoor Connecting Wiring (Strong Electric Signal) (mm ²)		—————	—————

10. Field Wiring



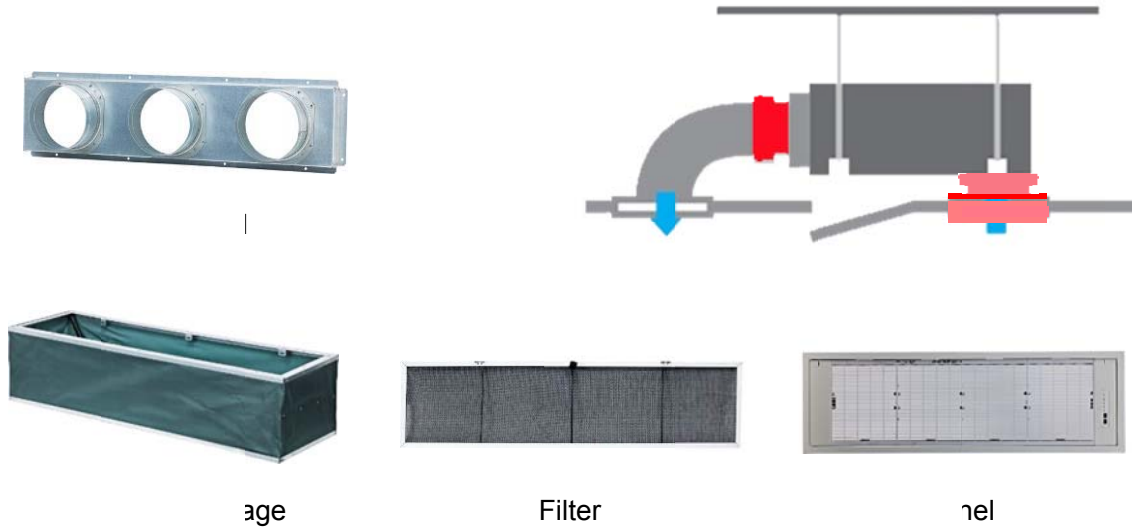
Duct Type

1. Features	42
2. Dimensions	45
3. Service Space	46
4. Wiring Diagrams	47
5. Static Pressure	49
6. Electric Characteristics	51
7. Sound Levels	52
8. Accessories	53
9. The Specification of Power	54
10. Field Wiring.....	55

1. Features

1.1 Installation accessories: (Optional)

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



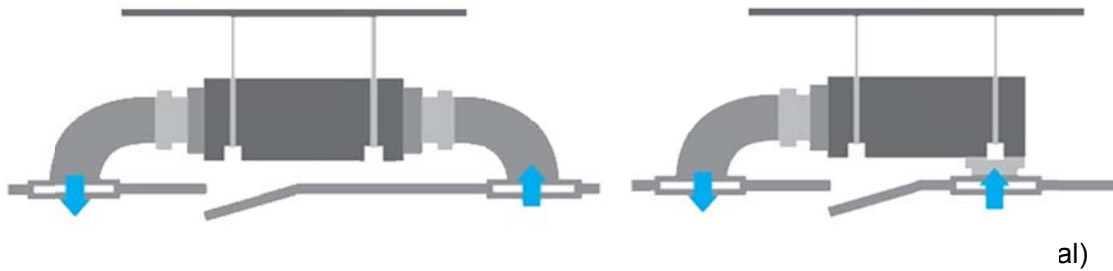
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Filter

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

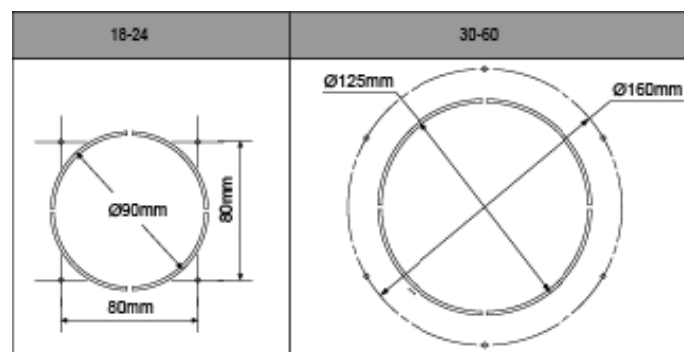
- Air inlet from rear is standard for all capacity; air inlet from bottom is optional.
- The size of air inlet frame from rear and bottom is same, it's very easy to move the cover from bottom to rear side, or from rear to the bottom, in order to matching the installation condition.



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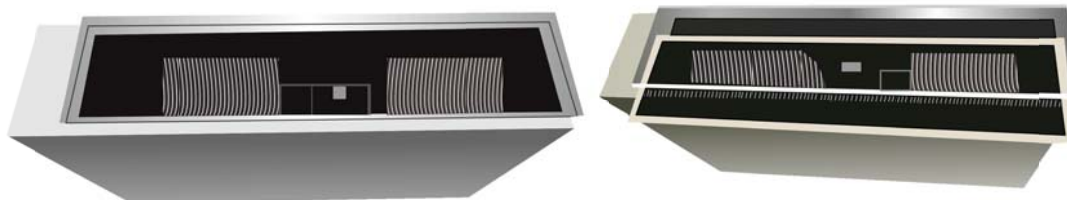
1.3 Fresh air intake function(Optional for 18~60k)

- 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.

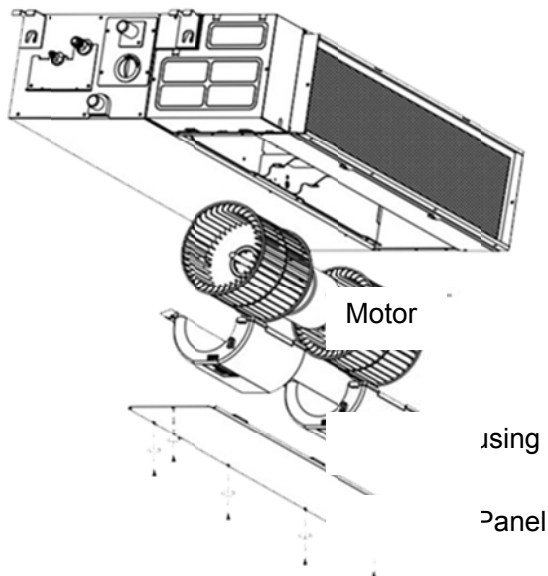


1.4 Easy maintenance

- 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.

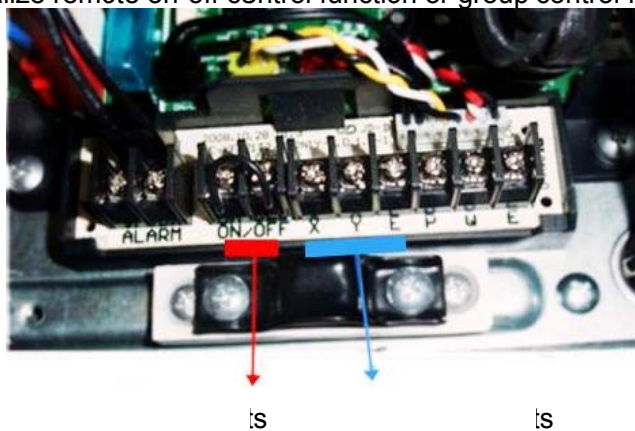


- Replace the motor or centrifugal fan
Remove the ventilated panel firstly. Remove a half of blower housing and take out the motor with centrifugal fan. Directly remove two bolts, and then replace the motor or centrifugal fan easily.



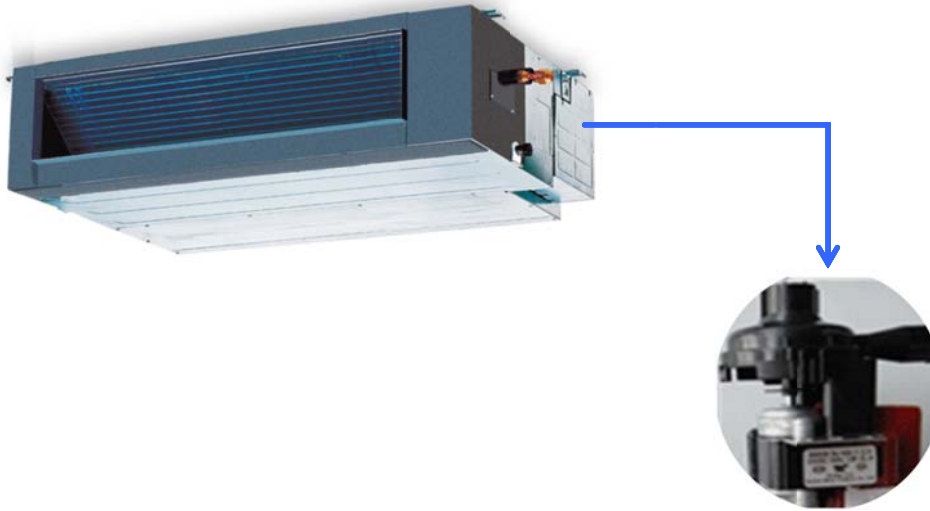
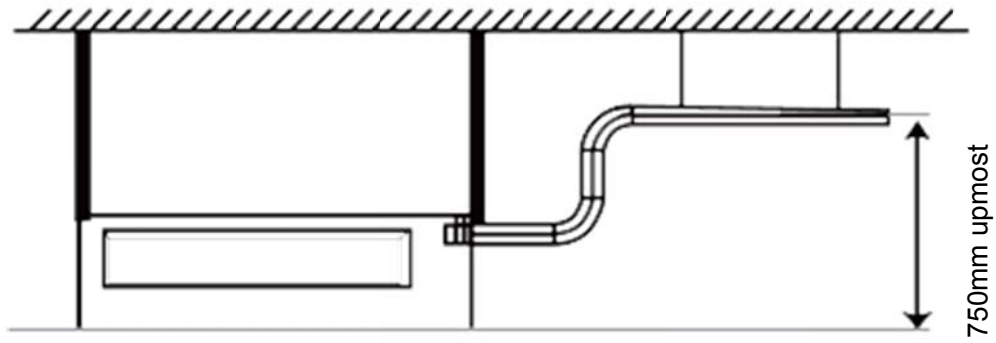
1.5 Reserved remote on-off and central control ports

- 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.



1.6 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.



1.7 Built-in display board

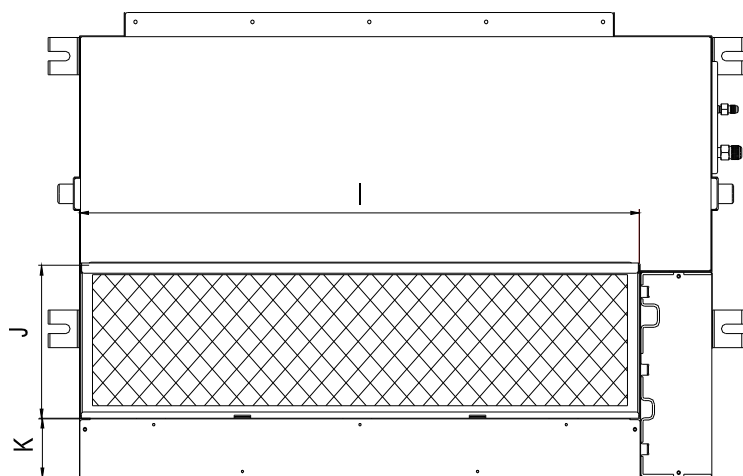
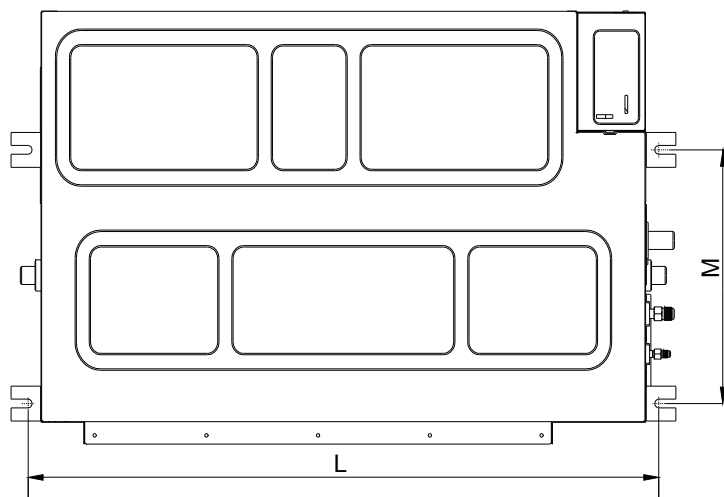
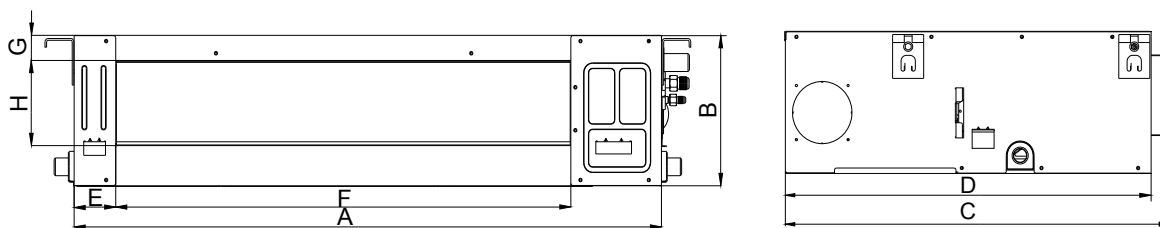
- The standard indoor unit can be controlled by wired controller.
- There is a display board with a receiver in the E-box. Move out the display, and fix it in other place, even in the distance of 10m. The unit will realized remoter control.
- The wired controller and the display board can display the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



1.8 Twins Combination(18k-30k)

- The units can be installed as Twin systems: one outdoor unit can connect with two indoor units. The indoor units can be combined in any of the different available ratings.

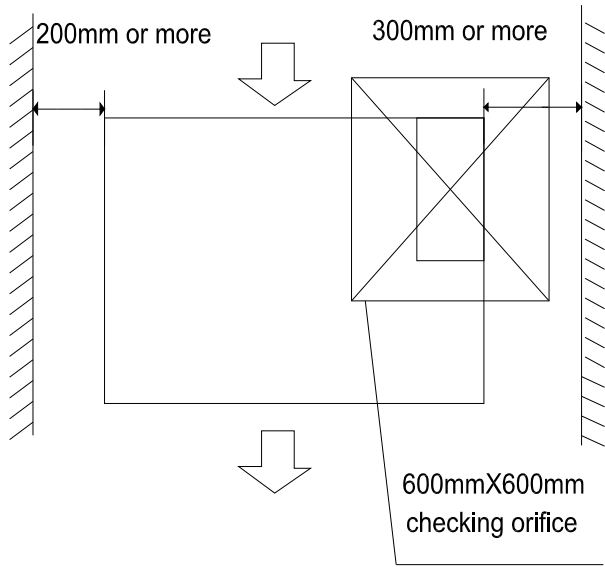
2. Dimensions



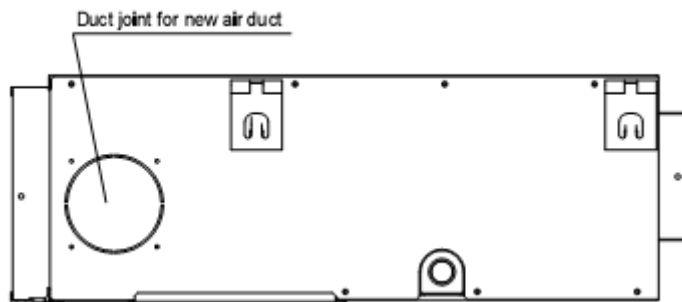
Capacity (KBtu)	Outline dimension(mm)				Air outlet opening size				Air return opening size			Size of outline dimension mounted plug	
	A	B	C	D	E	F	G	H	I	J	K	L	M
12	700	210	635	570	65	493	35	119	595	200	80	740	350
18	920	210	635	570	65	713	35	119	815	200	80	960	350
24	920	270	635	570	65	713	35	179	815	260	20	960	350
30/36	1140	270	775	710	65	933	35	179	1035	260	20	1180	490
48/60	1200	300	865	800	80	968	40	204	1094	288	45	1240	500

3. Service Space

Ensure enough space required for installation and maintenance.



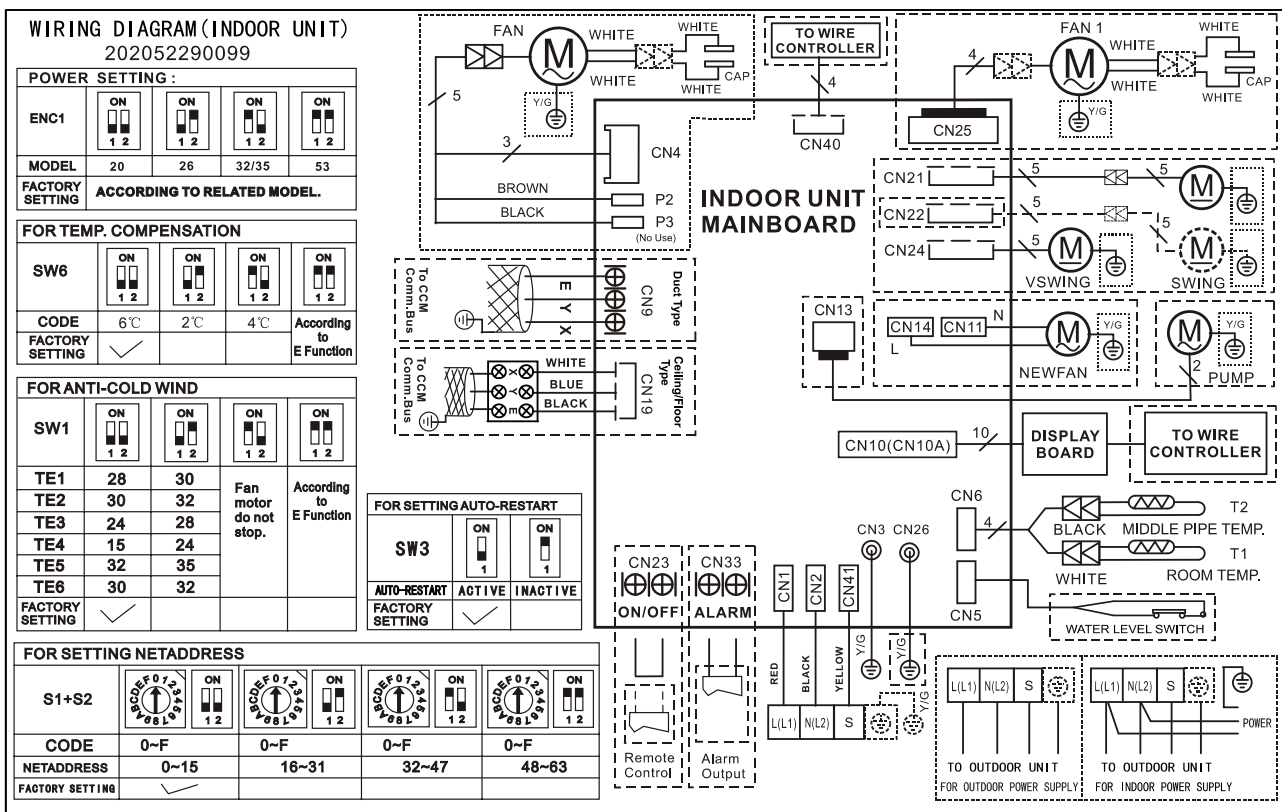
All the indoor units reserve the hole to joint the fresh air pipe. The hole size as following:



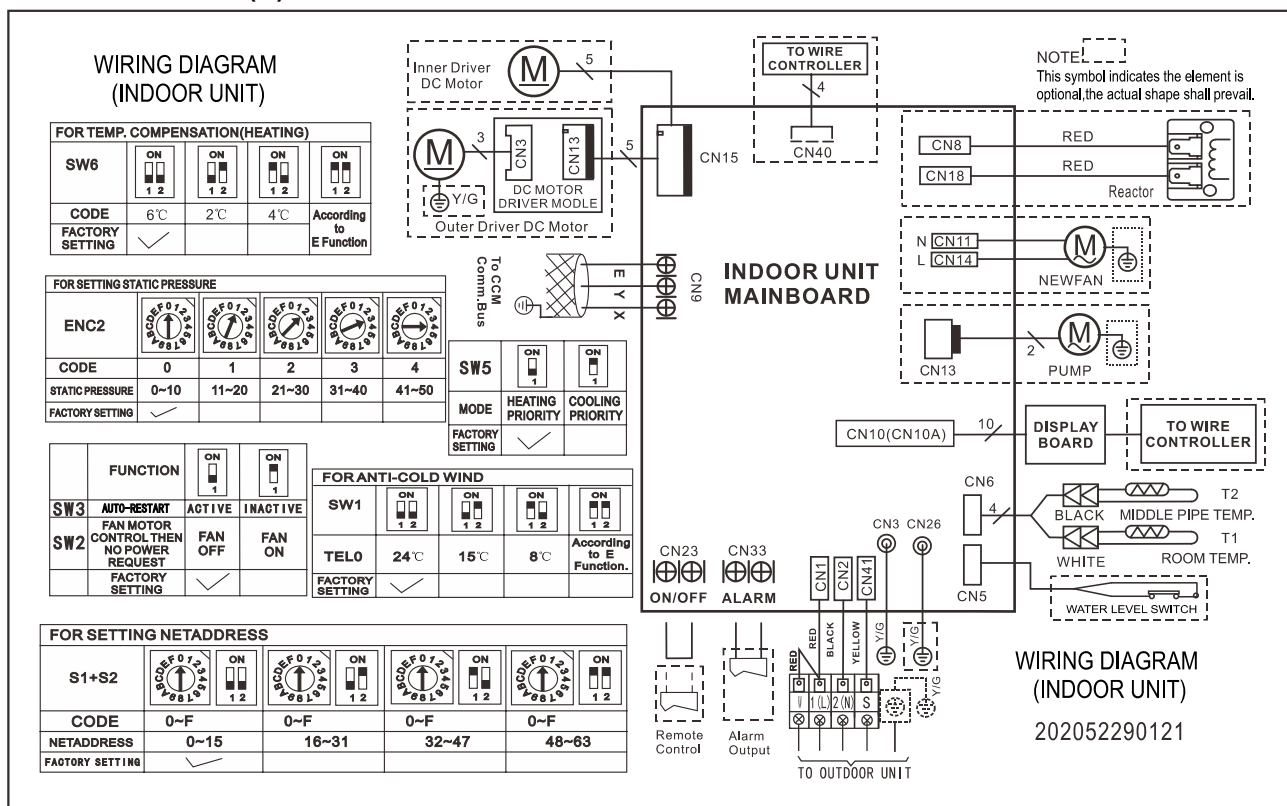
MODLE	
12-24	30-60
<p>Ø90mm</p> <p>80mm</p> <p>80mm</p>	<p>Ø125mm</p> <p>Ø160mm</p>

4. Wiring Diagrams

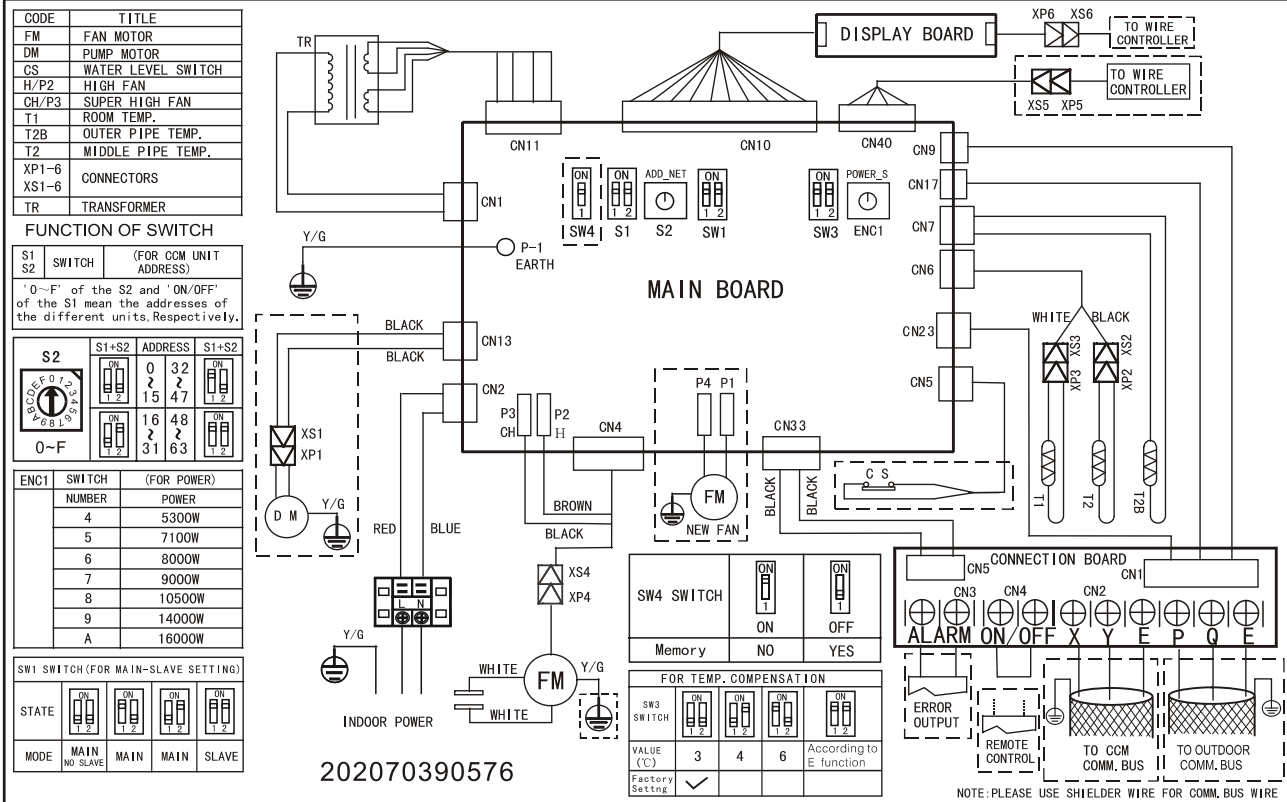
MDTB1-12HWDN1



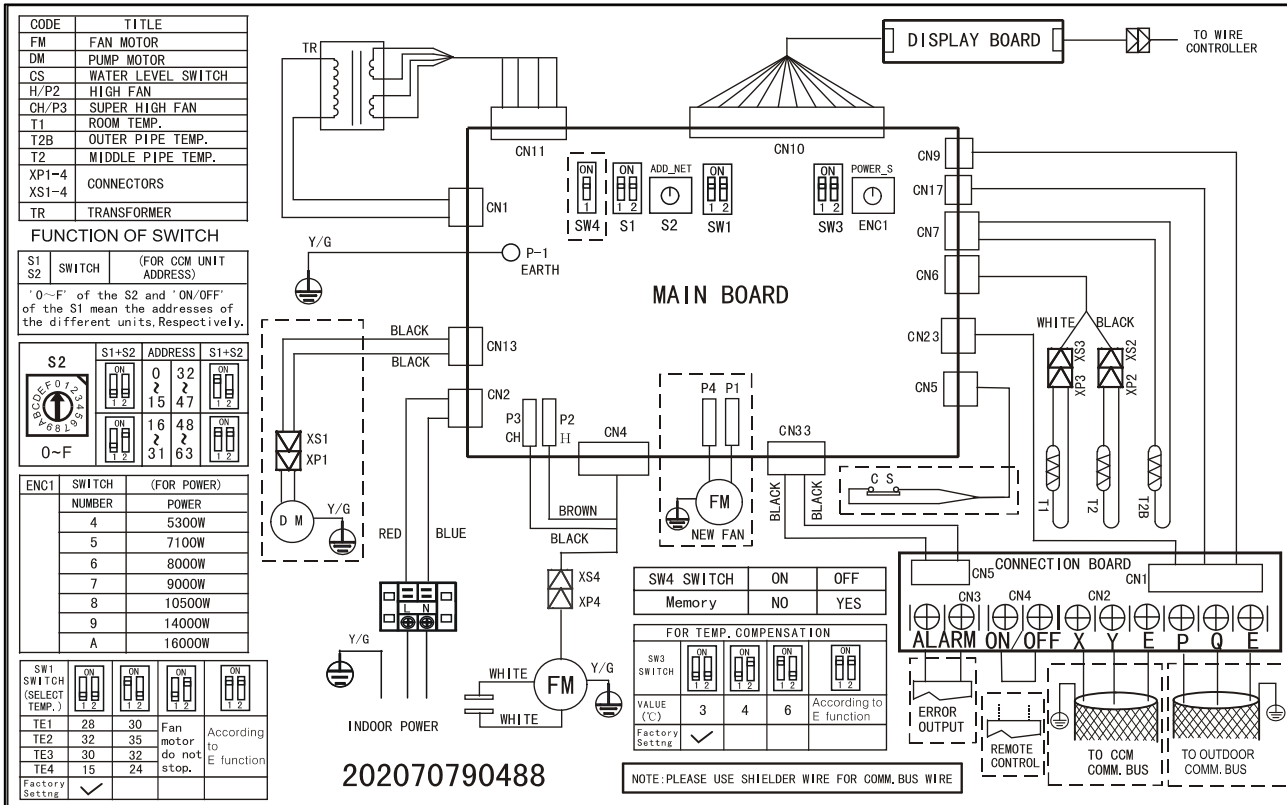
MDTB1-12HWDN1(B)



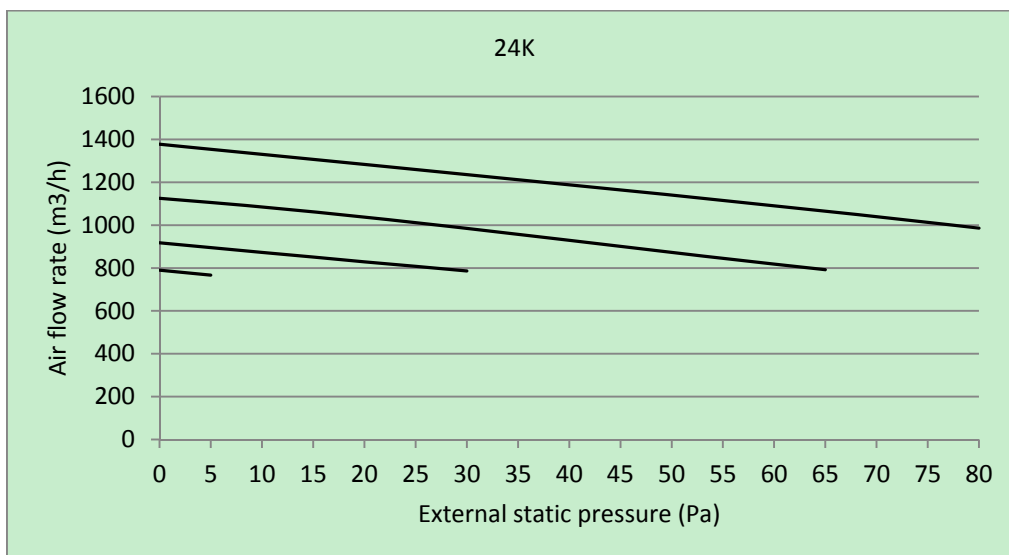
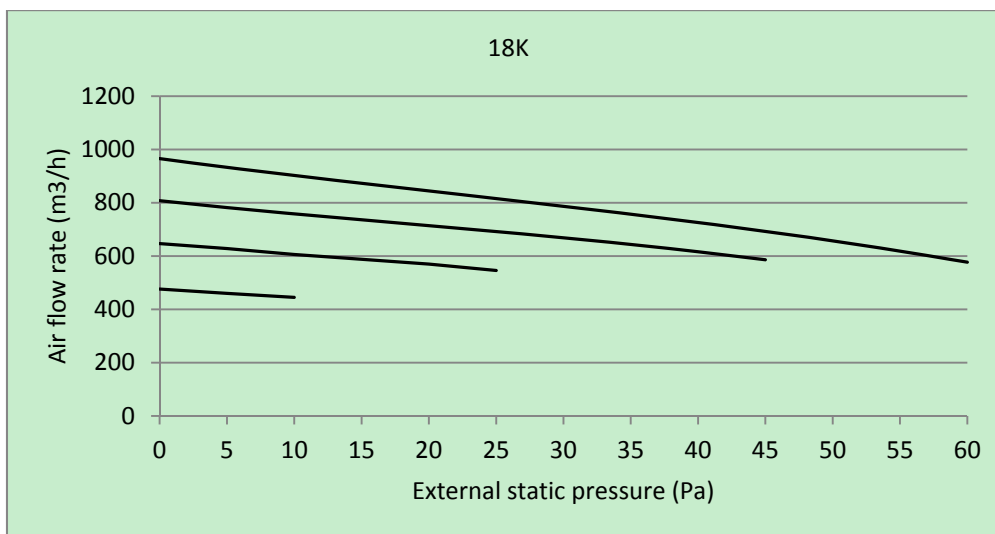
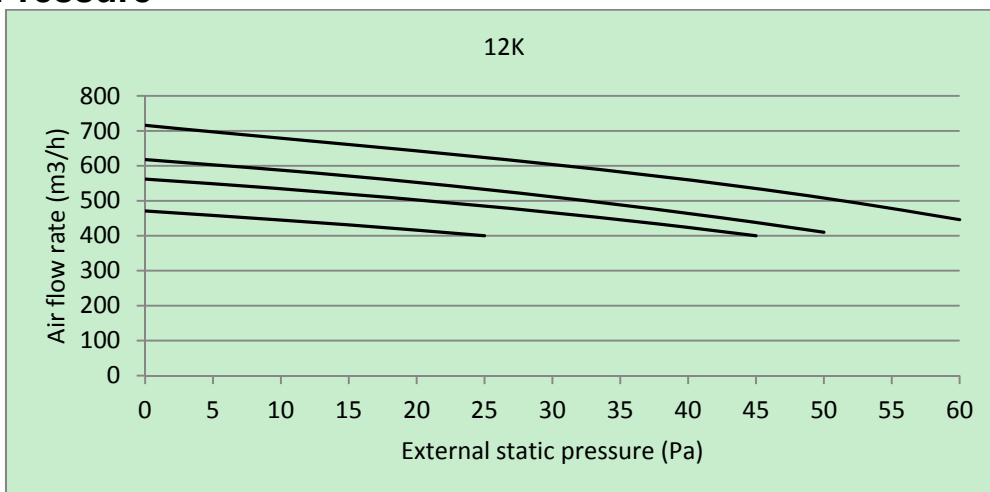
MDTB-18HWDN1 MDTB-24HWDN1

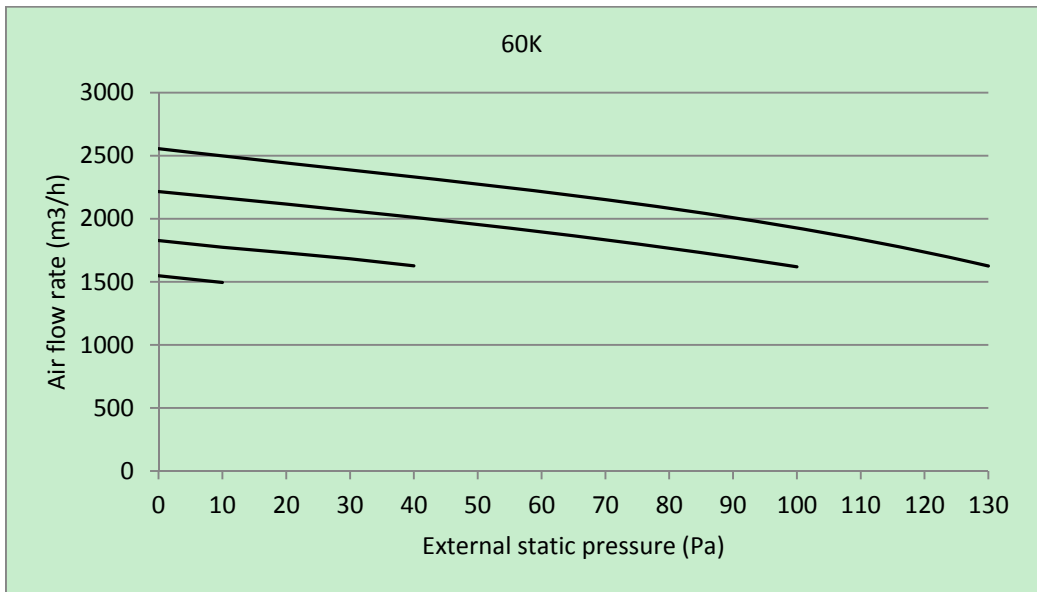
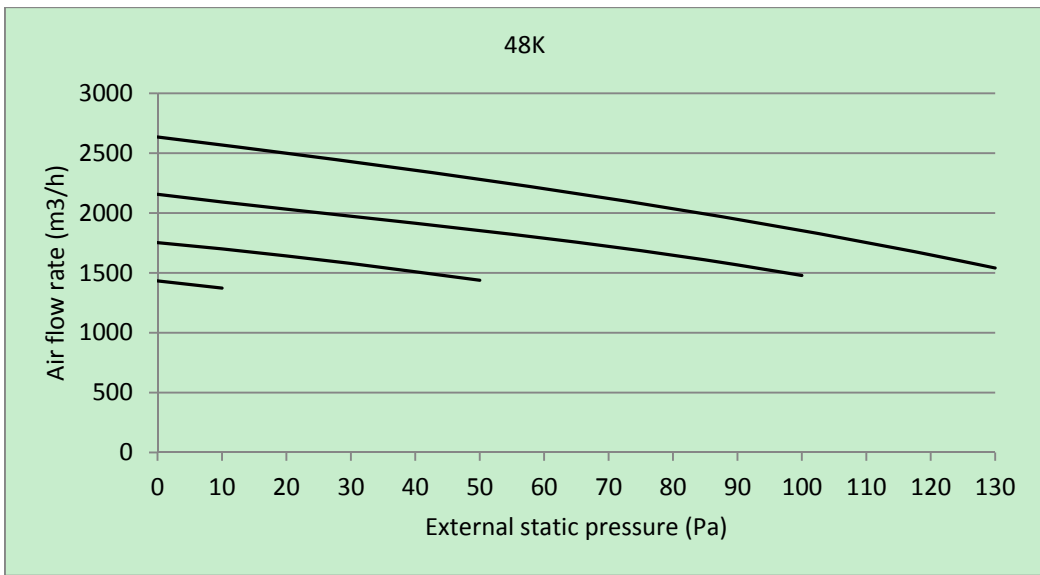
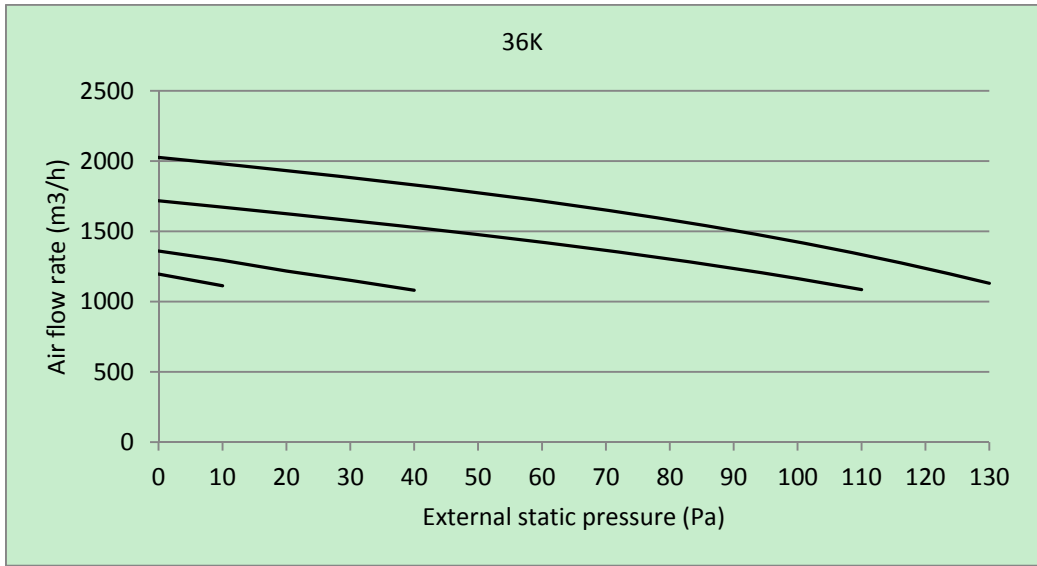


MDTB-36HWDN1 MDTB-48HWDN1 MDTB-60HWDN1



5. Static Pressure





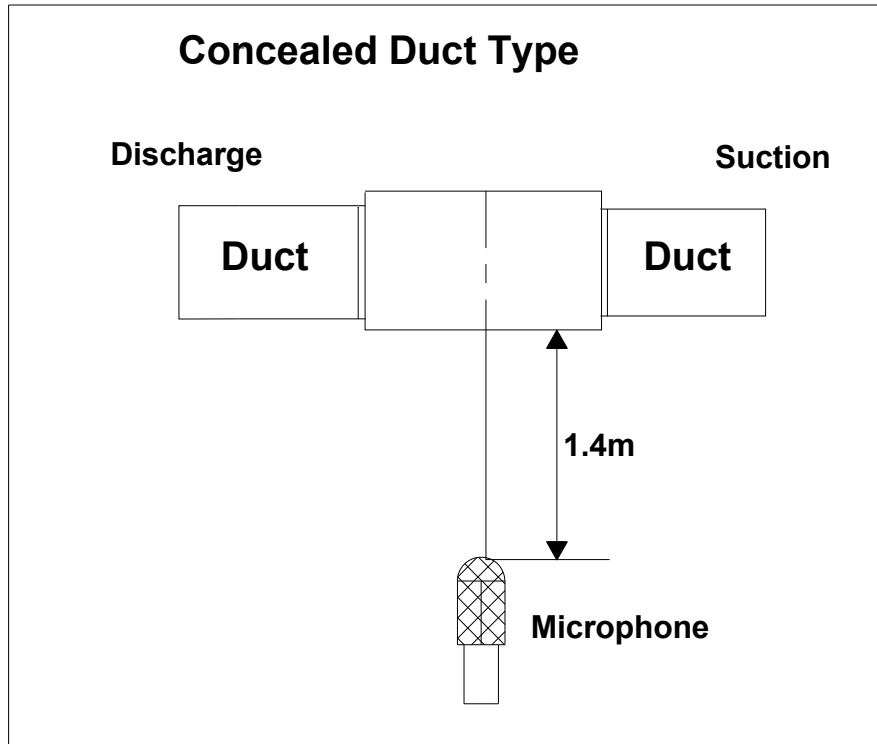
6. Electric Characteristics

Model	Indoor Unit				Power Supply
	Hz	Voltage	Min.	Max.	MFA
MDTB1-12HWDN1	50	220-240	198	254	15
MDTB1-12HWDN1(B)	50	220-240	198	254	/
MDTB-18HWDN1	50	220-240	198	254	15
MDTB-24HWDN1	50	220-240	198	254	15
MDTB-36HWDN1	50	220-240	198	254	15
MDTB-48HWDN1	50	220-240	198	254	15
MDTB-60HWDN1	50	220-240	198	254	15

Note:









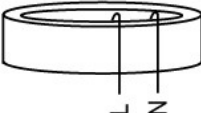
MFA: Max. Fuse Amps. (A)

7. Sound Levels



Model	Noise level dB(A)		
	H	M	L
MDTB1-12HWDN1	37	30	26
MDTB1-12HWDN1(B)	41	37	30
MDTB-18HWDN1	44	36	33
MDTB-24HWDN1	45	43	41
MDTB-36HWDN1	46	44	42
MDTB-48HWDN1	47	41	37
MDTB-60HWDN1	47	45	43

8. Accessories

	Name	Shape	Quantity
Tubing & Fittings	Soundproof / insulation sheath		2
	Binding tape		1
	Seal sponge		1
Drainpipe Fittings (for cooling & heating)	Drain joint		1
	Seal ring		1
Wired controller & Its Frame	Wired controller		1
Others	Owner' s manual		1
	Installation manual		1
EMS & It's fitting	Magnetic ring (twist the electric wires L and N around it to five circles)		1

9. The Specification of Power

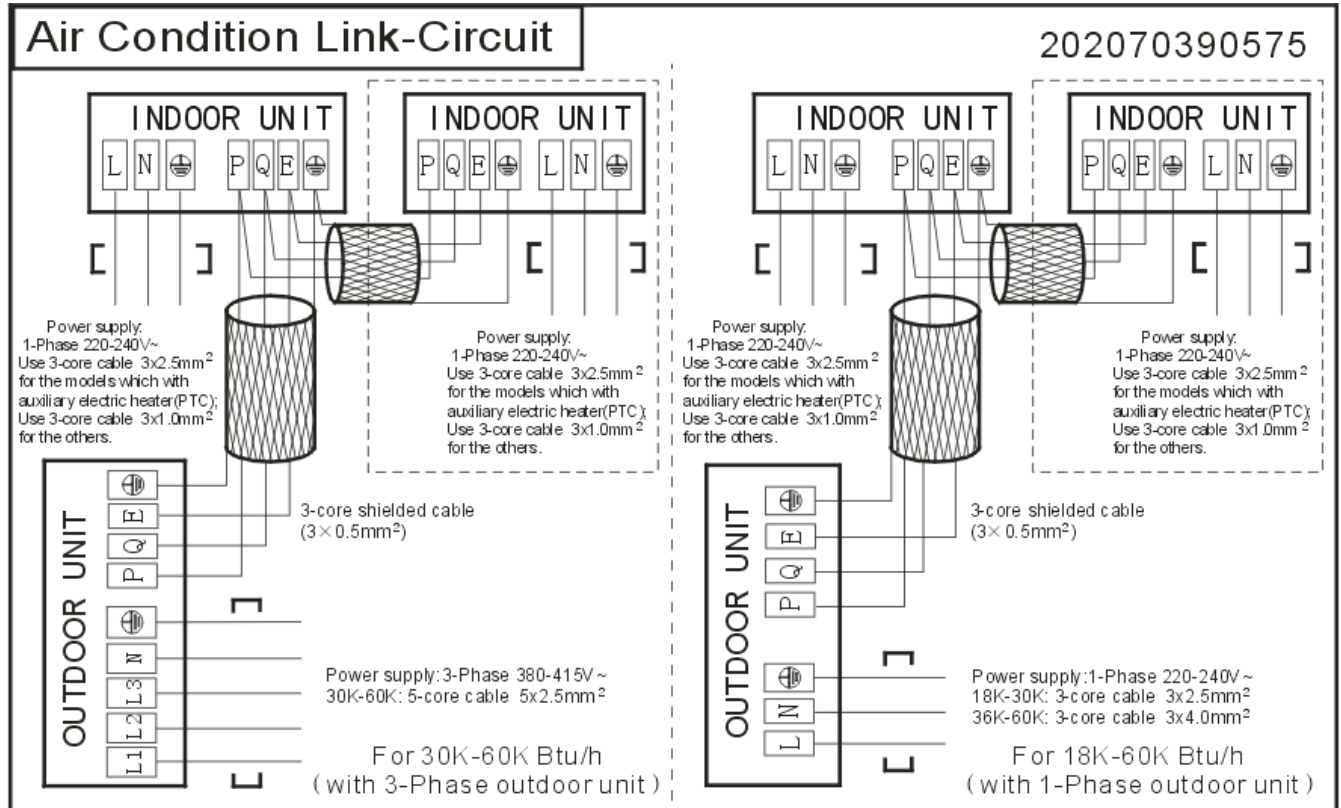
Model		MDTB1-12HWDN1	18000-24000Btu/h	30000 Btu/h	36000Btu/h
INDOOR UNIT POWER	Phase	1-phase	1-phase	1-phase	1-phase
	Frequency and Voltage	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
	POWER WIRING (mm ²)	3×1.5	3×1.0	3×1.0	3×1.0
	CIRCUIT BREAKER / FUSE (A)	20	15/10	15/10	15/10
OUTDOOR UNIT POWER	Phase	—————	1-phase	1-phase	1-phase
	Frequency and Voltage	—————	220-240V, 50H	220-240V, 50H	220-240V, 50H
	POWER WIRING (mm ²)	—————	3×2.5	3×2.5	3×4.0
	CIRCUIT BREAKER / FUSE(A)	—————	30/20	40/30	40/30
Indoor/Outdoor Connecting Wiring(Weak Electric Signal) (mm ²)		4×1.5	3×0.5	3×0.5	3×0.5
Indoor/Outdoor Connecting Wiring(Strong Electric Signal) (mm ²)		—————	—————	—————	—————

Model		48000Btu/h	60000 Btu/h	36000Btu/h	48000-60000Btu/h
INDOOR UNIT POWER	Phase	1-phase	1-phase	1-phase	1-phase
	Frequency and Voltage	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
	POWER WIRING (mm ²)	3×1.0	3×1.0	3×1.0	3×1.0
	CIRCUIT BREAKER/FUSE (A)	15/10	15/10	15/10	15/10
OUTDOOR UNIT POWER	Phase	1-phase	1-phase	3-phase	3-phase
	Frequency and Voltage	220-240V, 50H	220-240V, 50H	380-415V, 50H	380-415V, 50H
	POWER WIRING (mm ²)	3×4.0	3×4.0	5×2.5	5×2.5
	CIRCUIT BREAKER / FUSE(A)	40/35	50/40	30/20	30/25
Indoor/Outdoor Connecting Wiring (Weak Electric Signal) (mm ²)		3×0.5	3×0.5	3×0.5	3×0.5
Indoor/Outdoor Connecting Wiring (Strong Electric Signal) (mm ²)		—————	—————	—————	—————

Model		MDTB1-12HWDN1(B)
INDOOR UNIT POWER	Phase	—————
	Frequency and Voltage	—————
	POWER WIRING (mm ²)	—————
	CIRCUIT BREAKER/ FUSE (A)	—————
OUTDOOR UNIT POWER	Phase	1-phase
	Frequency and Voltage	220-240V, 50Hz
	POWER WIRING (mm ²)	3×2.5
	CIRCUIT BREAKER/ FUSE (A)	20/16
Indoor/Outdoor Connecting Wiring (Weak Electric Signal) (mm ²)		—————
Indoor/Outdoor Connecting Wiring (Strong Electric Signal) (mm ²)		5×1.0

10. Field Wiring

For model 18-60

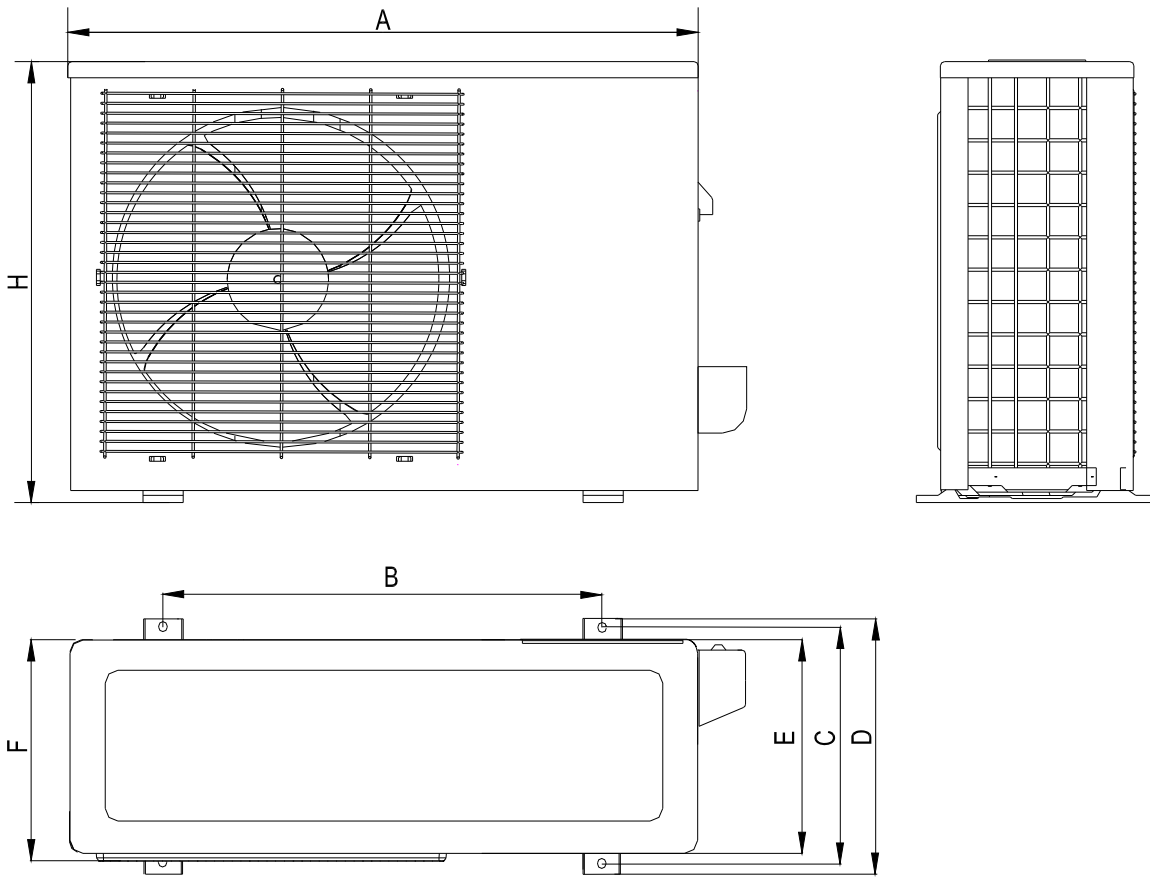


Part 3

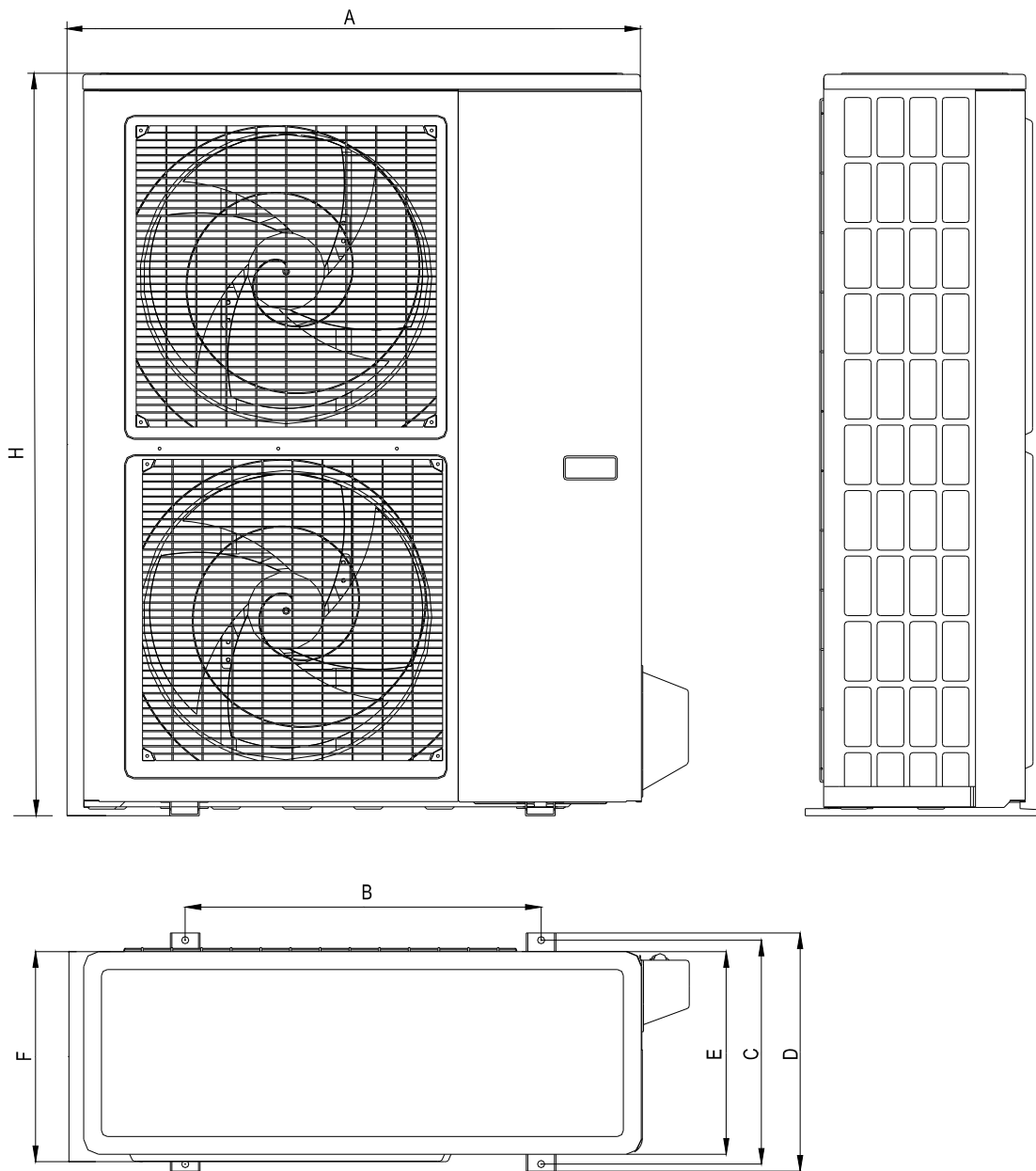
Outdoor Units

1. Dimensions	124
2. Service Space	127
3. Piping Diagrams	128
4. Wiring Diagrams	131
5. Electric Characteristics	139
6. Operation Limits	140
7. Sound Levels	141

1. Dimensions

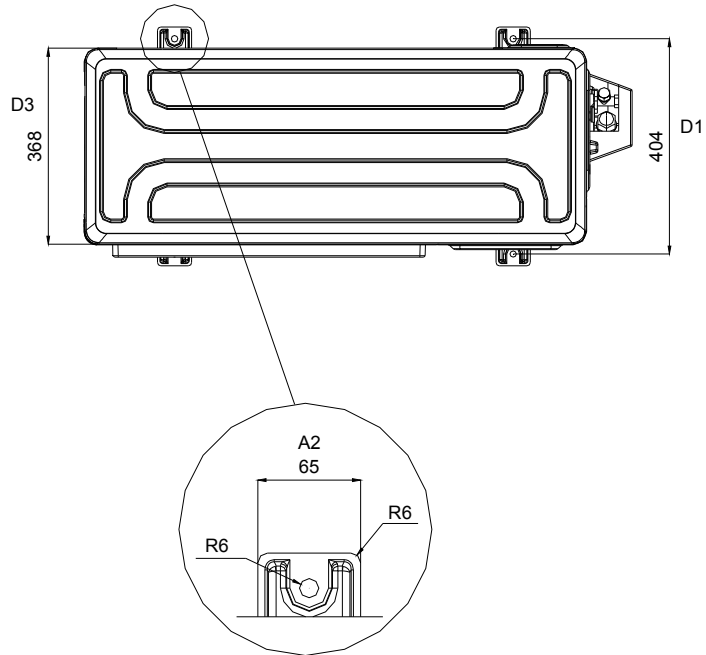
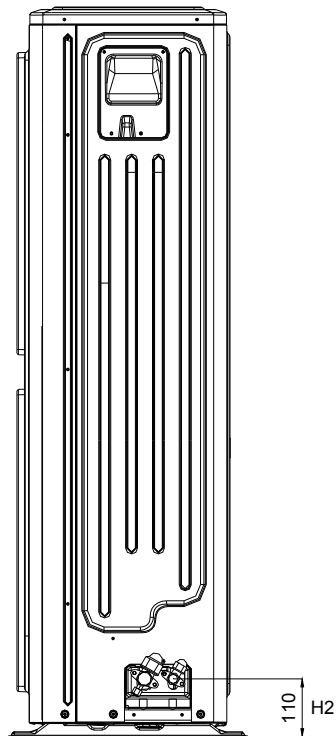
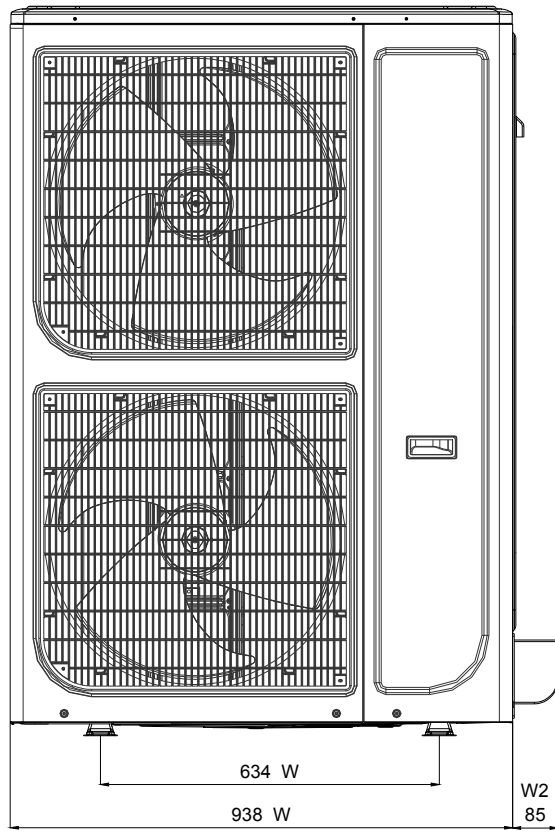
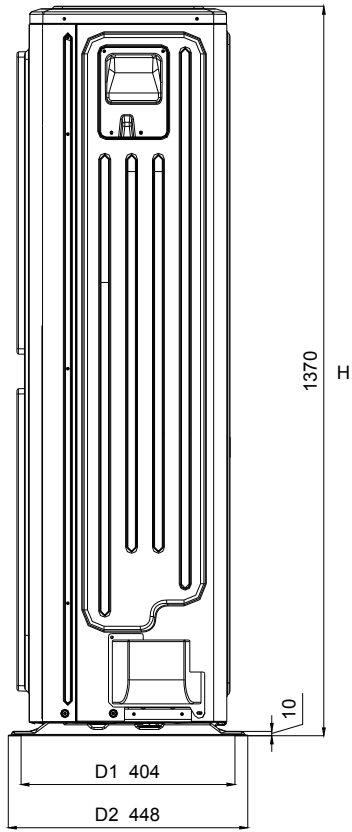


Model	Unit: mm						
	A	B	C	D	E	F	H
MDOU-12HDN1	760	530	290	315	270	285	590
MDOU-18HDN1	760	530	290	315	270	285	590
MDOZU-12HDN1	810	549	325	350	305	310	558
MDOU-18HFN1	810	549	325	350	305	310	558
MDOU-24HDN1	845	560	335	360	312	320	700
MDOU-36HDN1	990	624	366	396	340	345	965

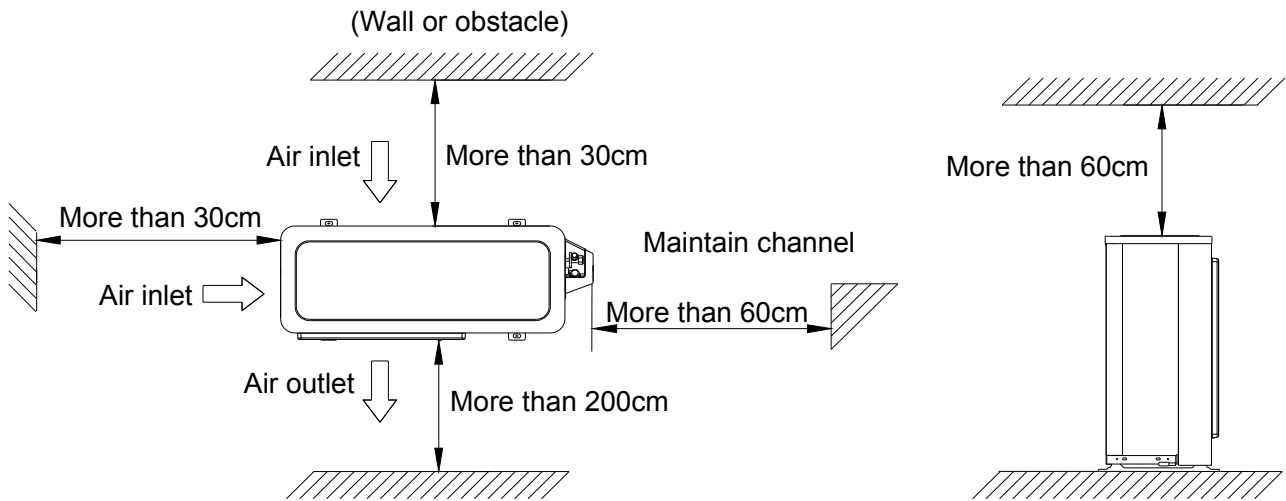


Model	Unit: mm						
	A	B	C	D	E	F	H
MDOU-48HDN1	940	600	376	400	340	360	1245
MDOU-60HDN1							

New MDOU-48HDN1 MDOU-60HDN1

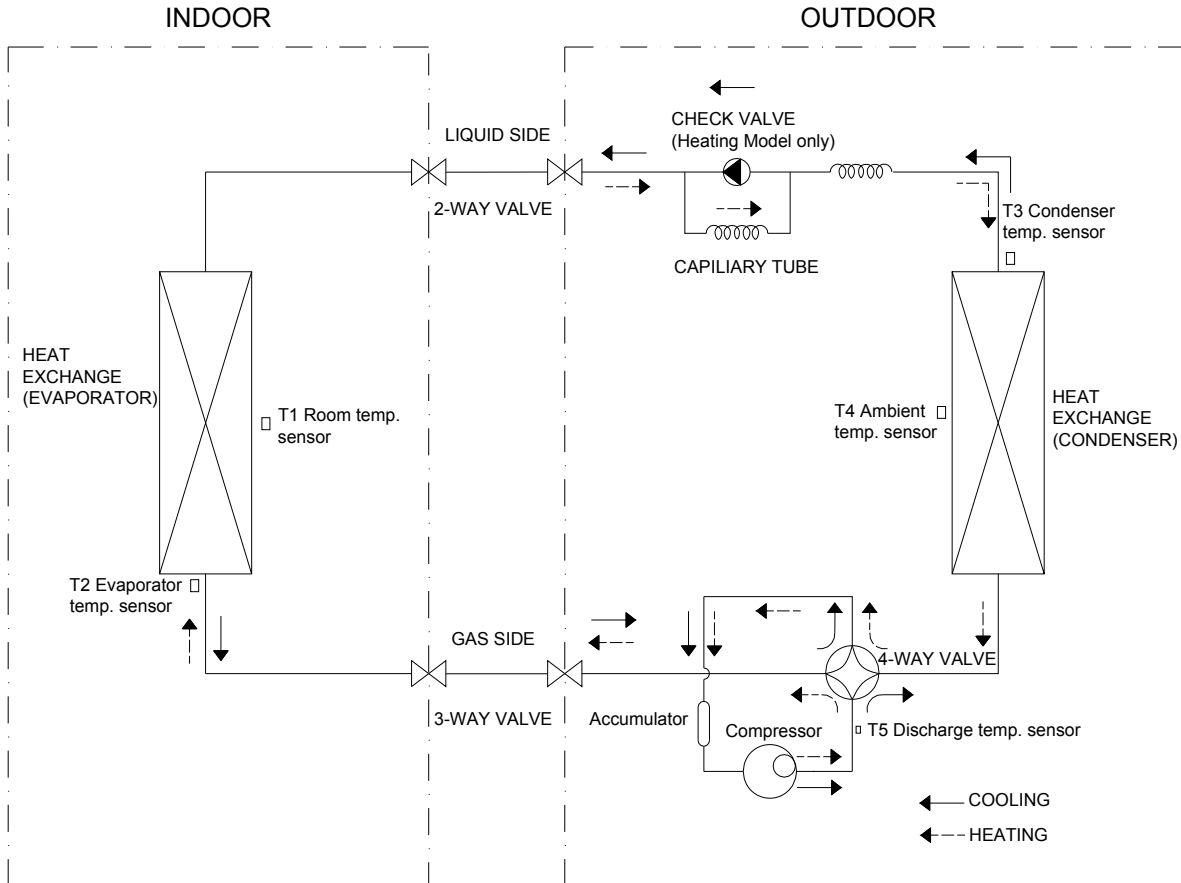


2. Service Space



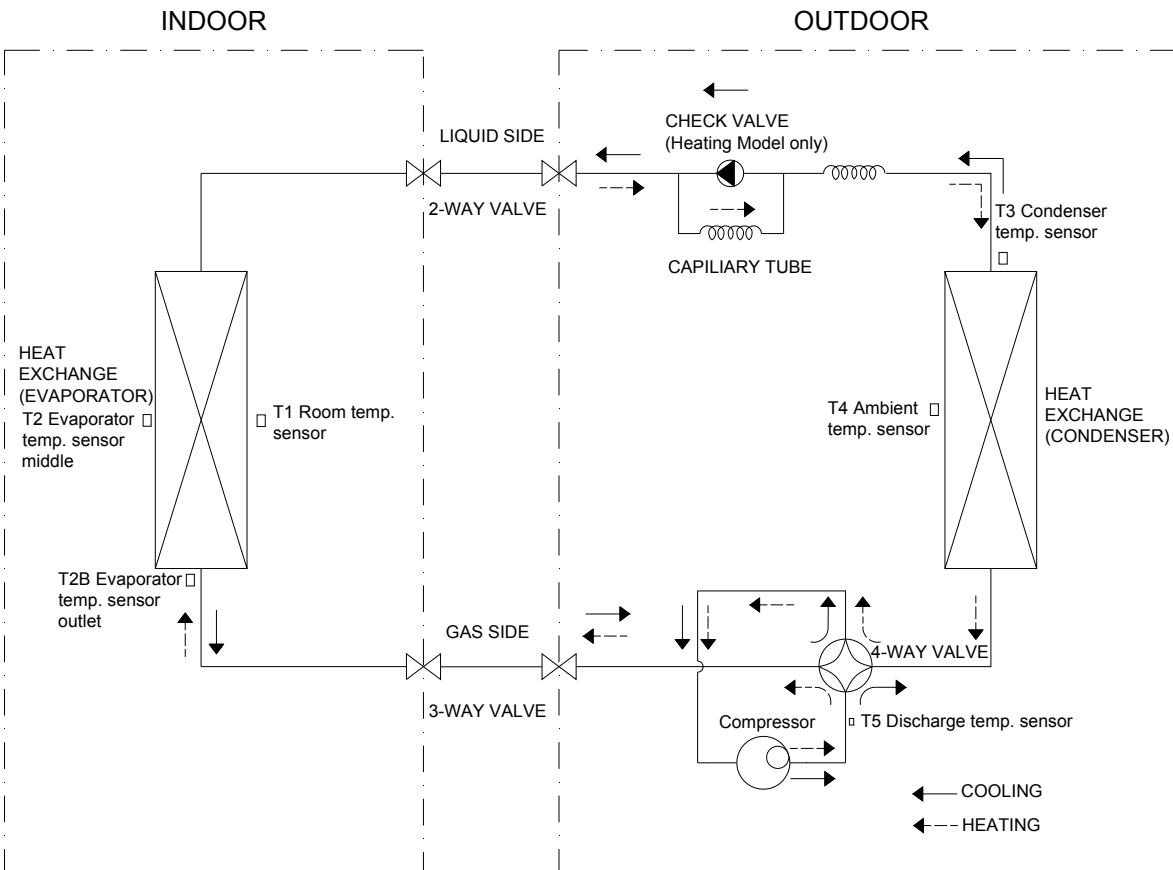
3. Piping Diagrams

MDOU-12HDN1 MDOZU-12HDN1

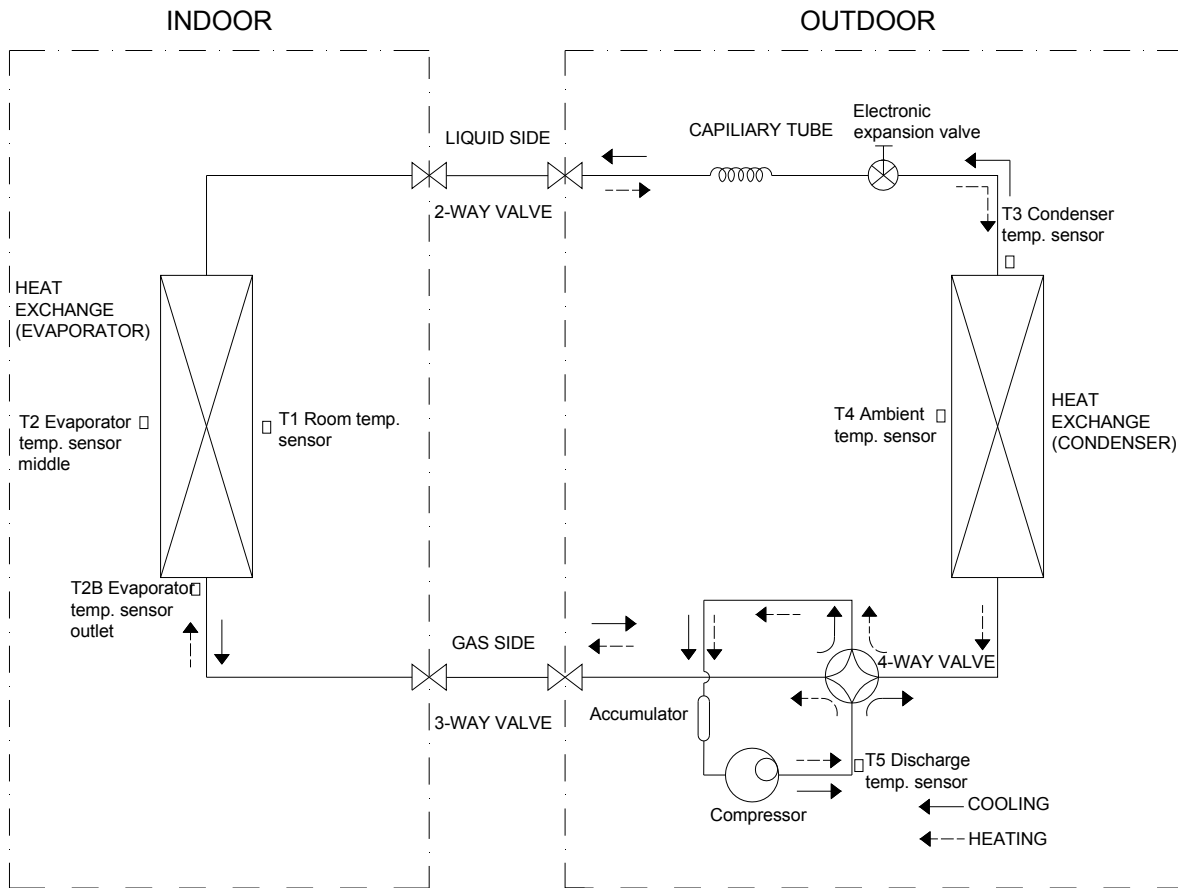


Note: For MOZU-12HDN1-Q, there is no accumulator.

MDOU-24HDN1(220075301401)

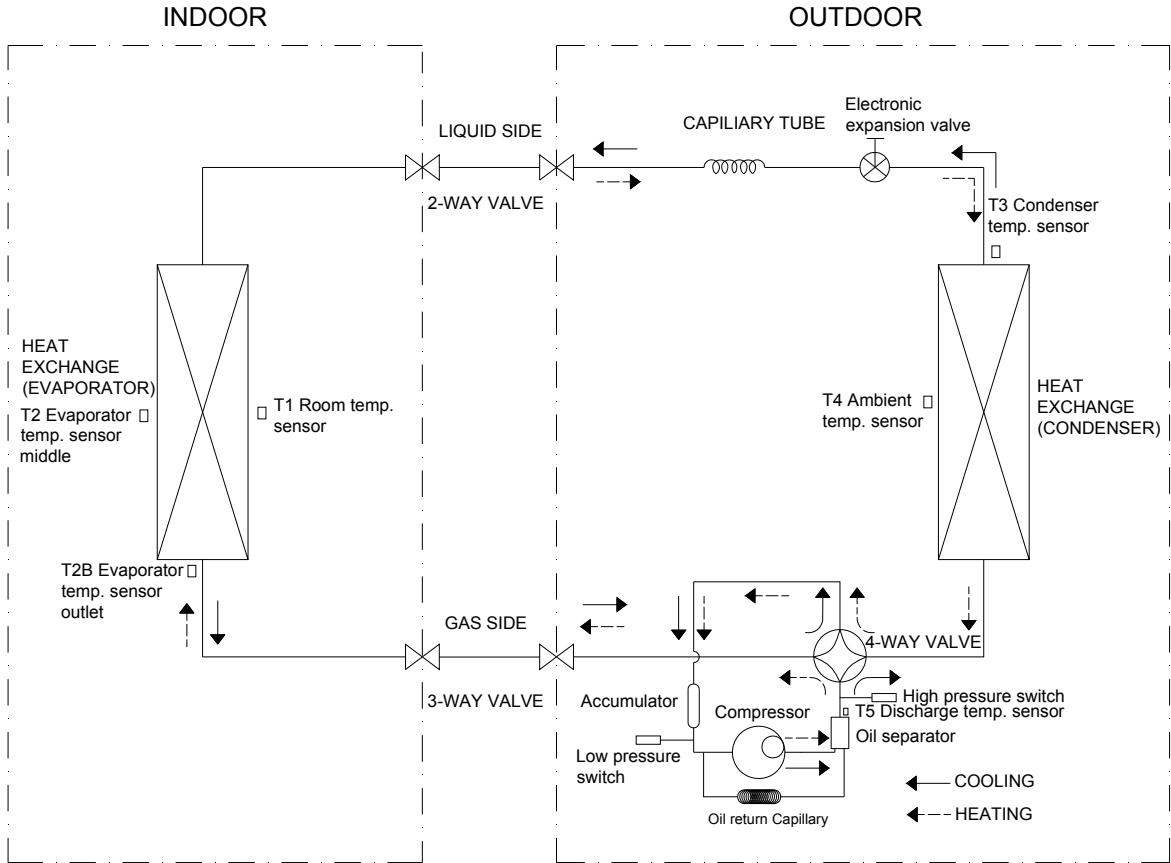


MDOU-18HDN1 MDOU-18HFN1 MDOU-24HDN1(220075301400)

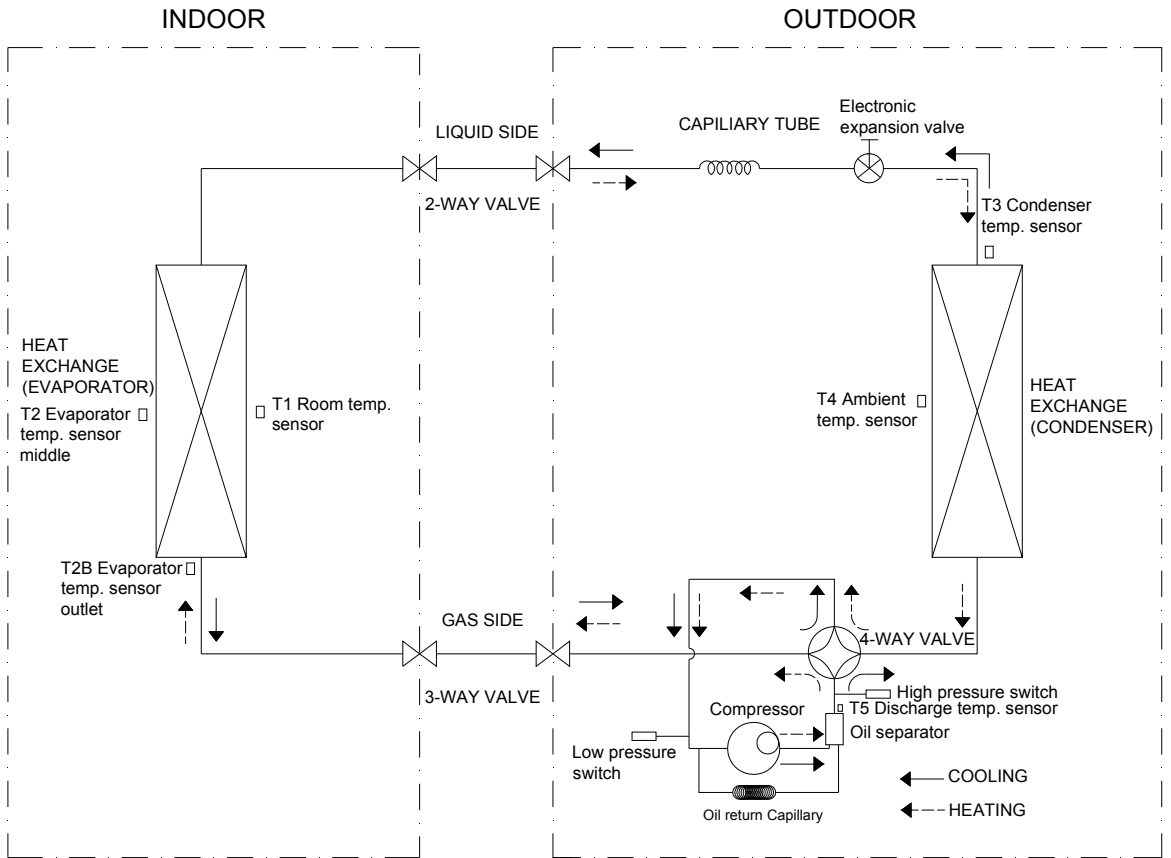


For MDOU-24HDN1, the accumulator is not included.

MDOU-36HDN1

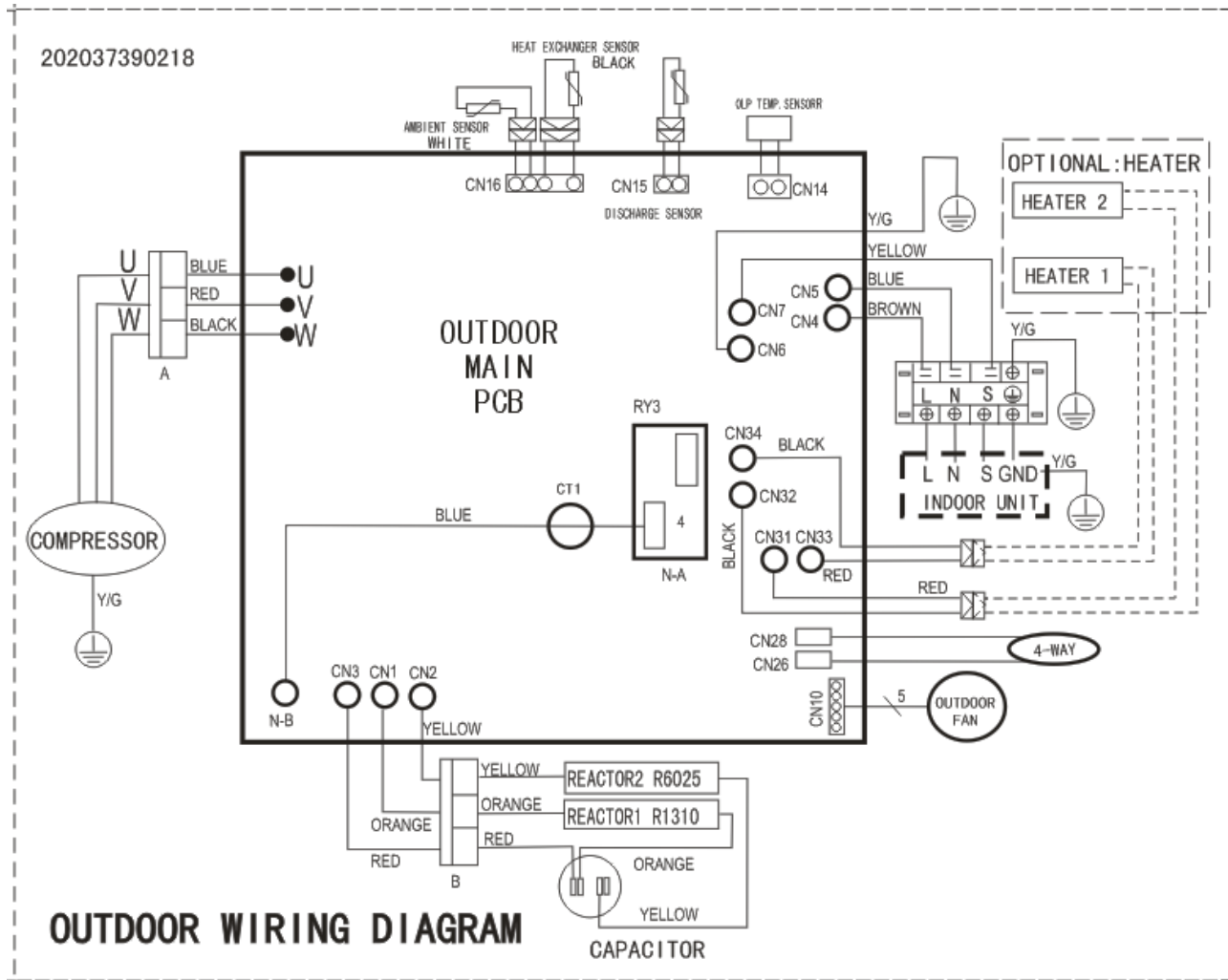


MDOU-48HDN1 MDOU-60HDN1



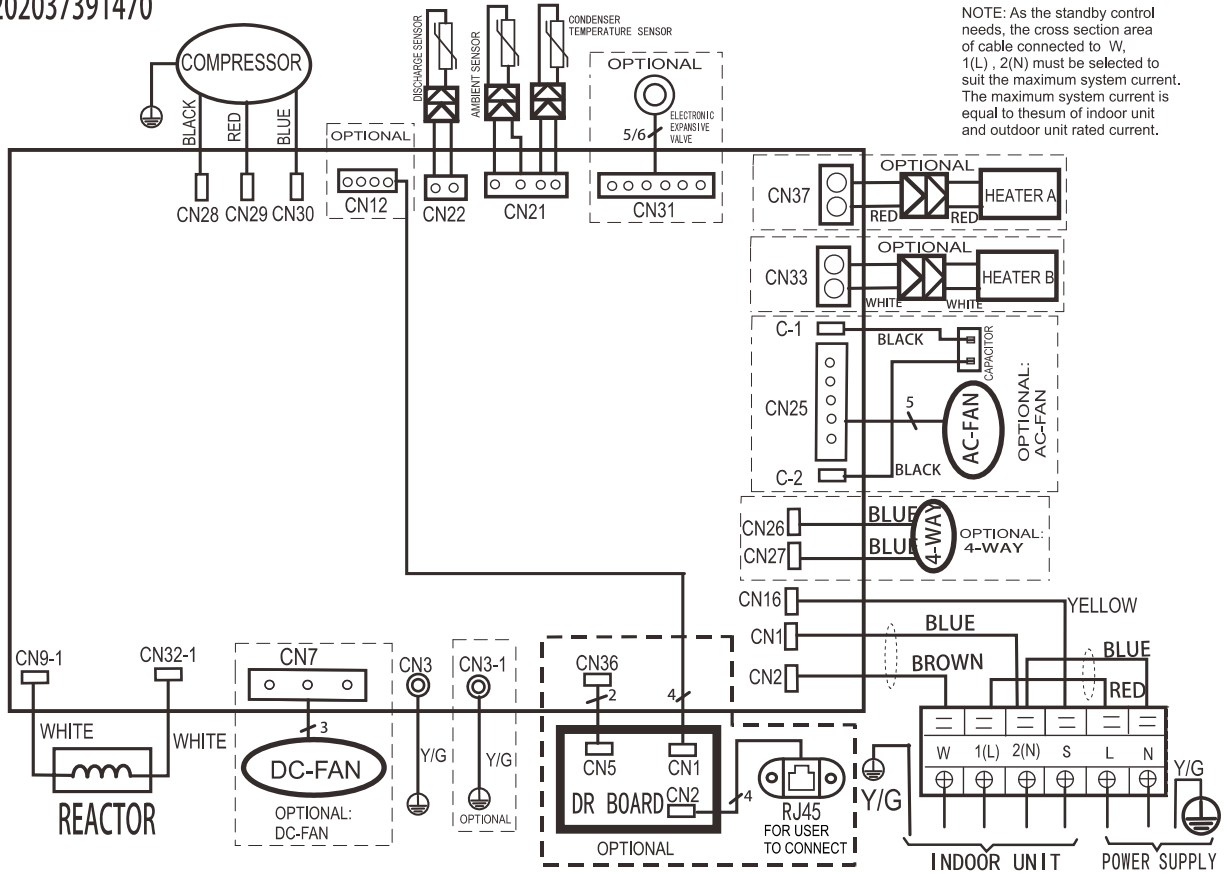
4. Wiring Diagrams

MDOU-12HDN1

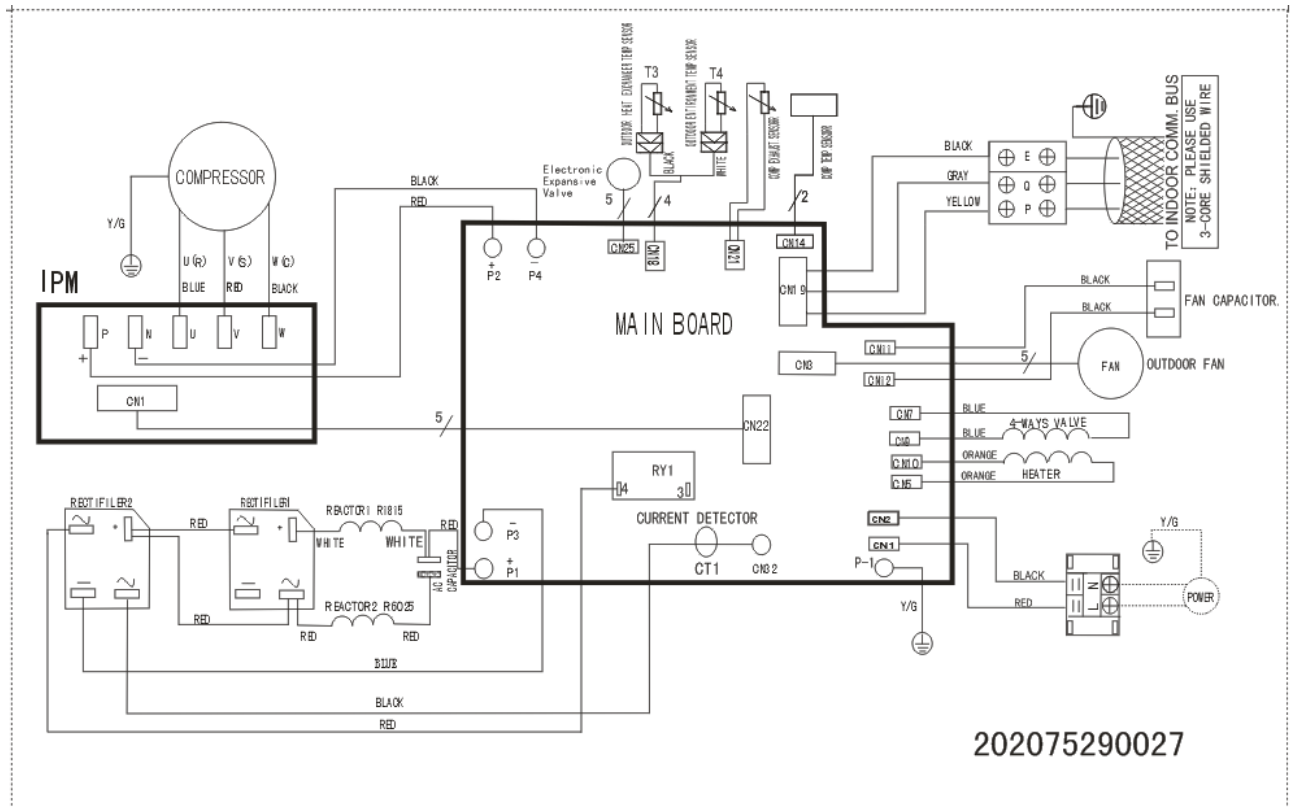


MDOZU-12HDN1

202037391470

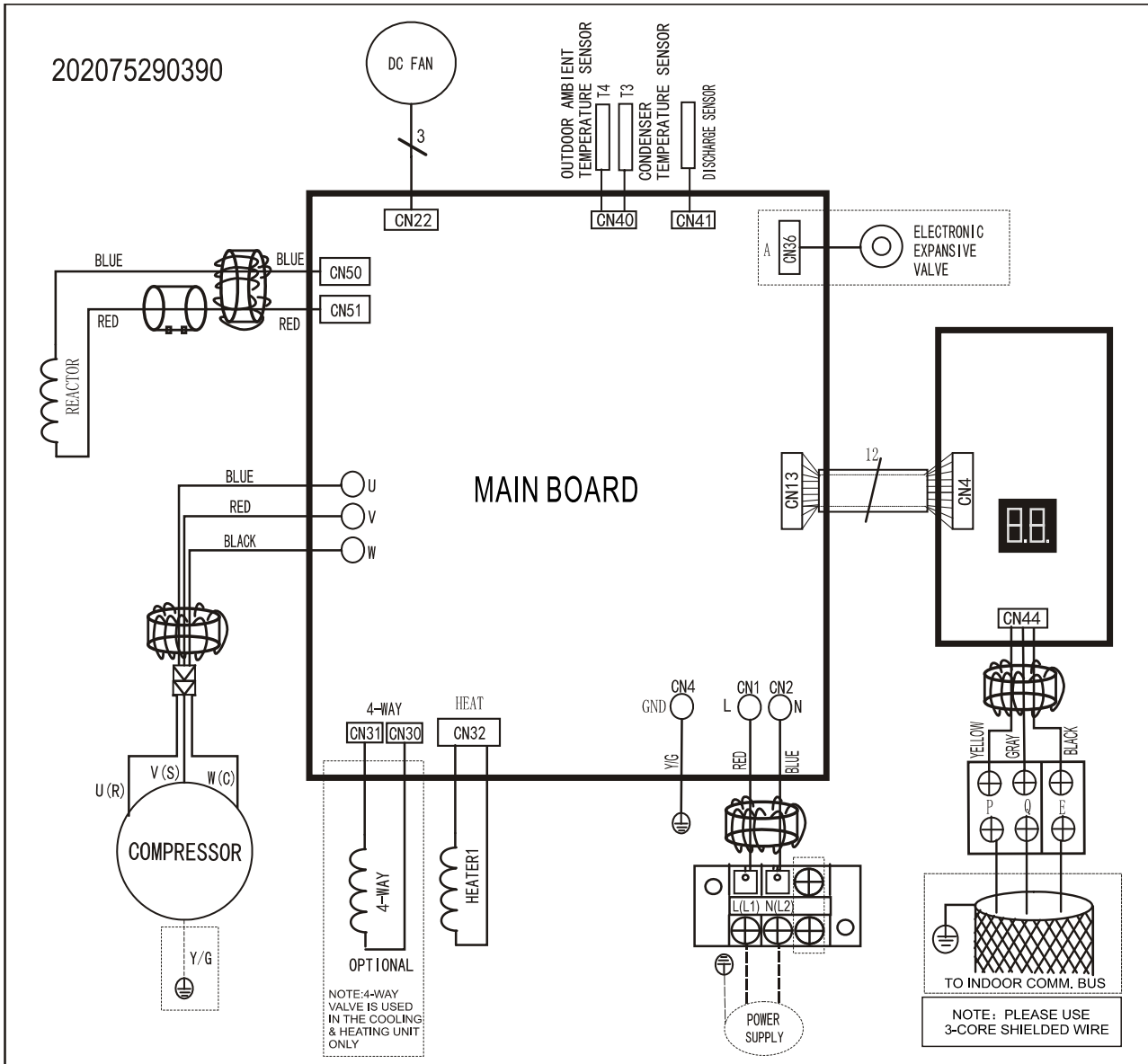


MDOU-18HDN1

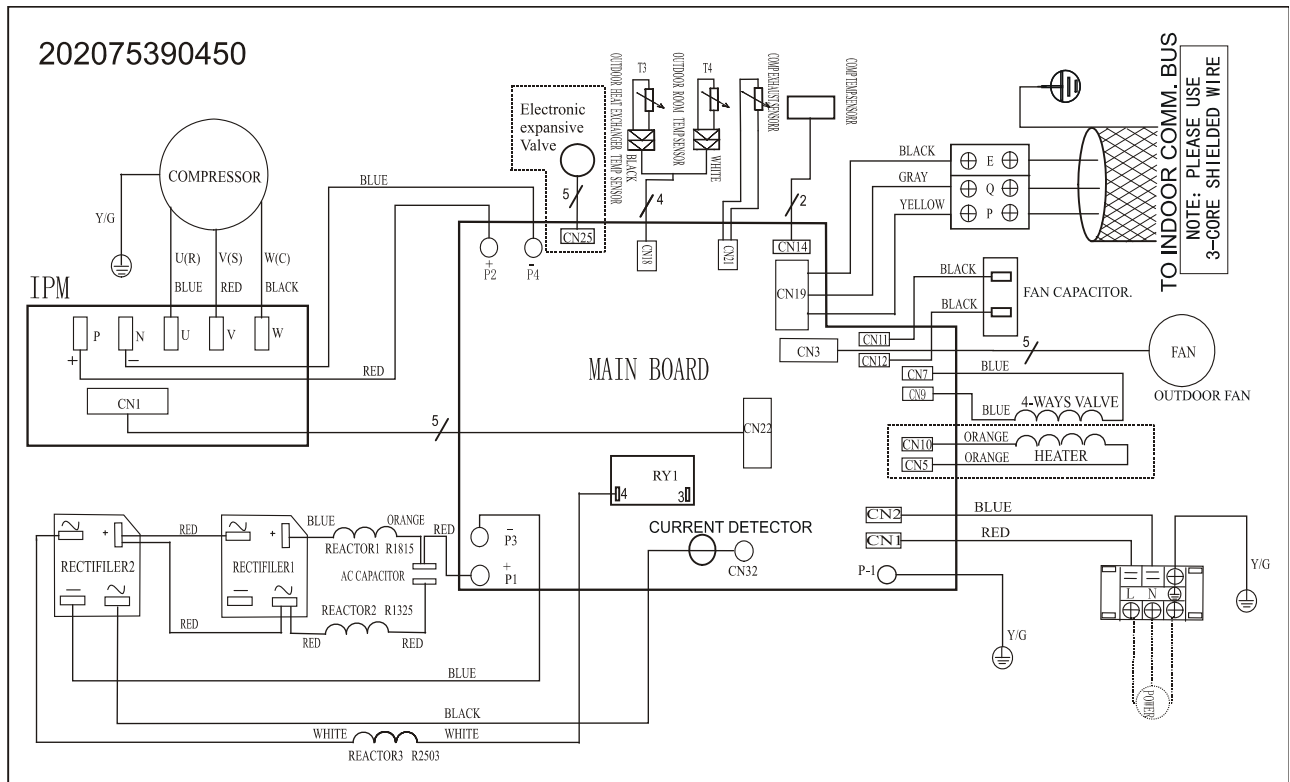


202075290027

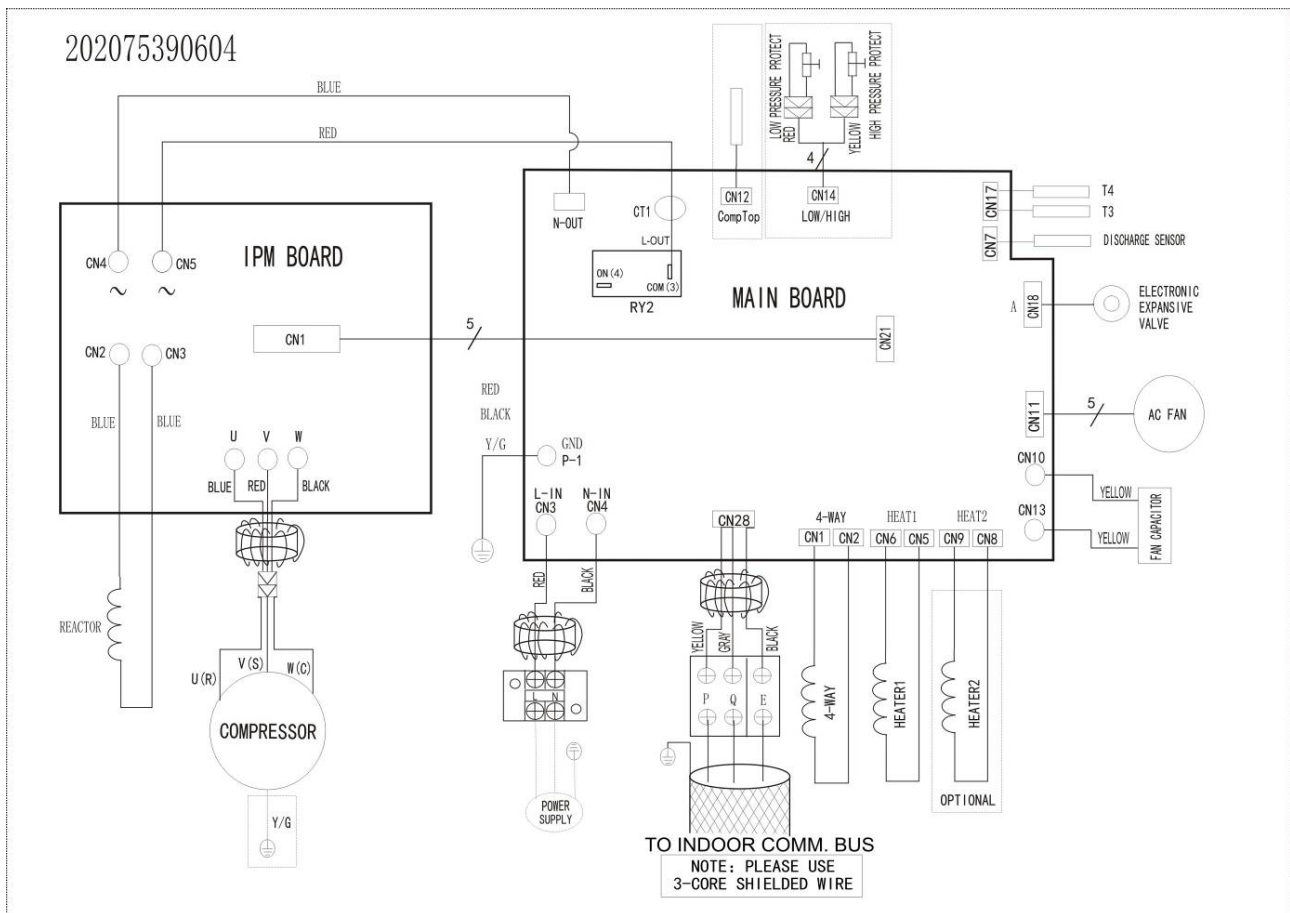
MDOU-18HFN1



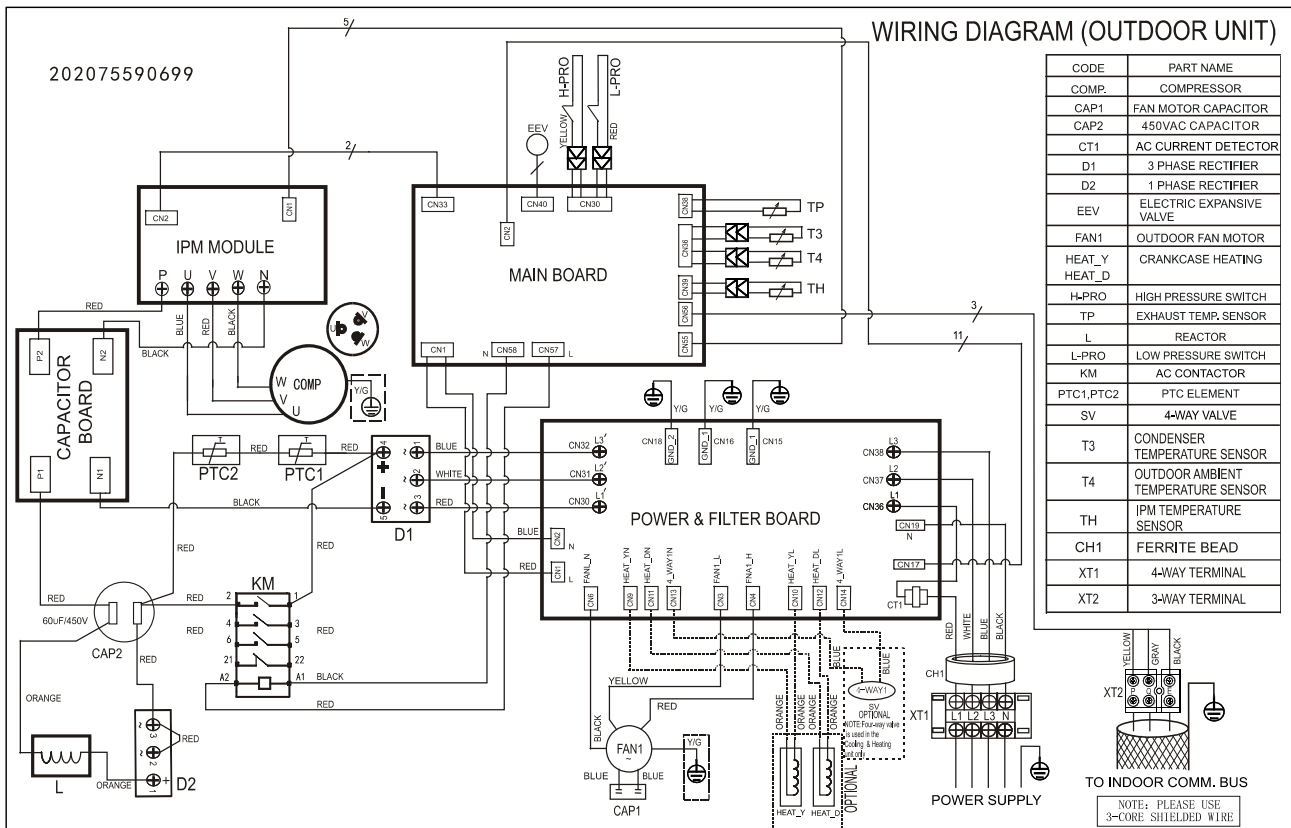
MDOU-24HDN1 (220075301400)



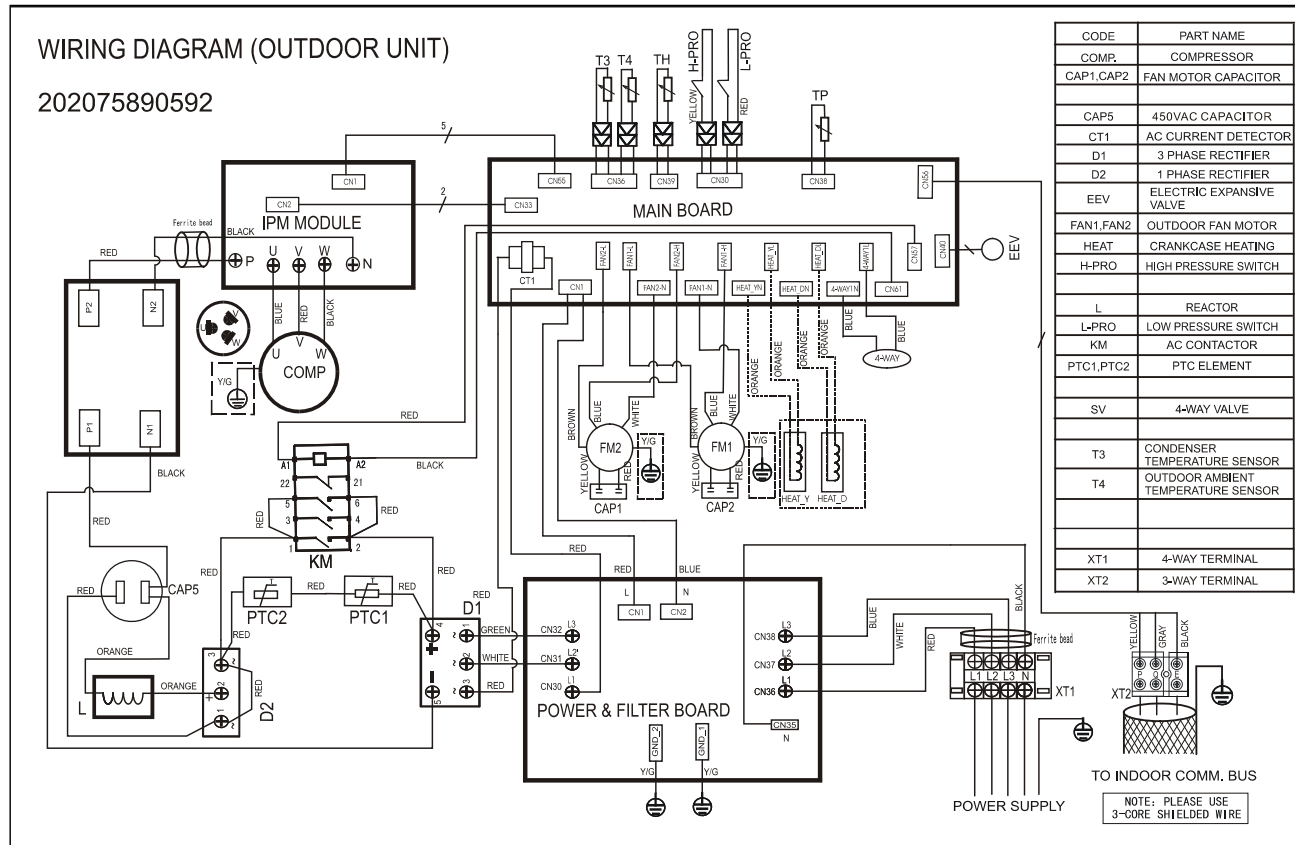
MDOU-24HDN1 (220075302030)



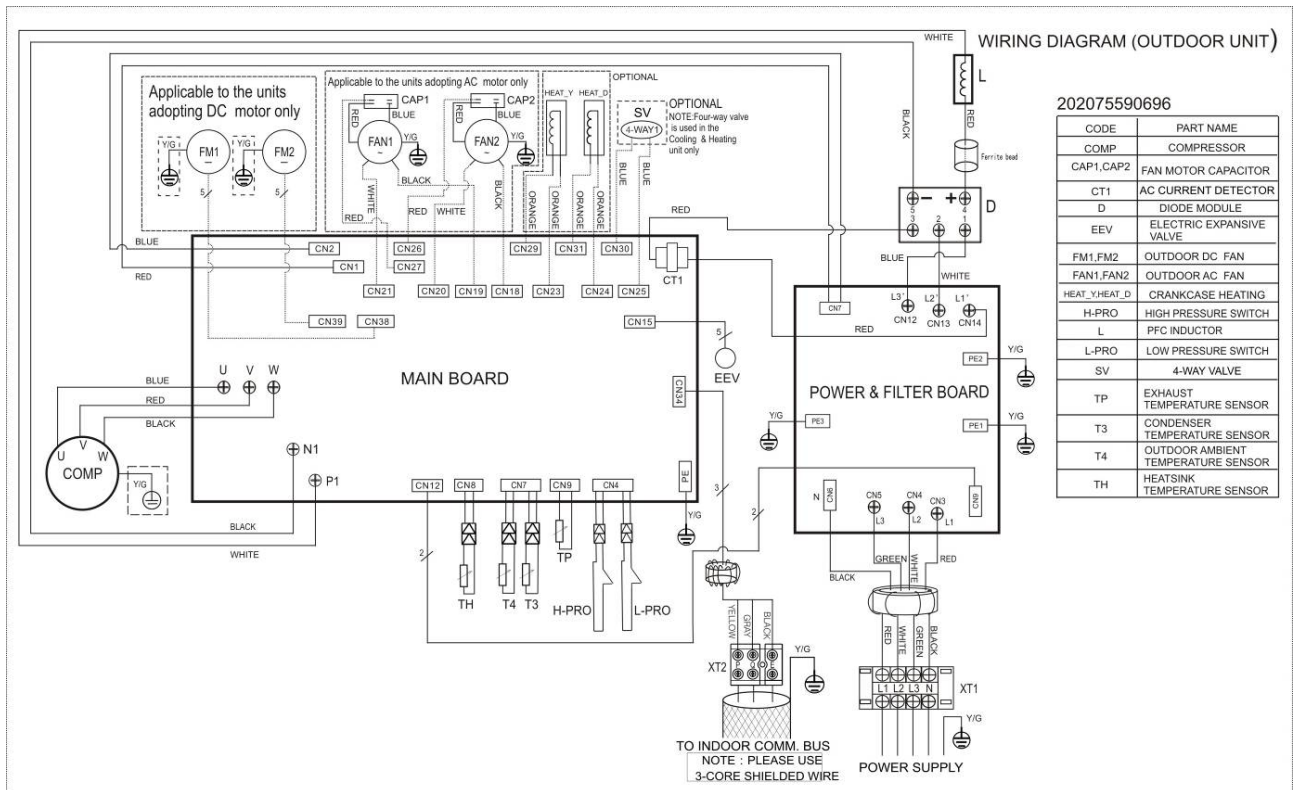
MDOU-36HDN1



MDOU-48HDN1 MDOU-60HDN1



MDOU-48HDN1 MDOU-60HDN1 (New Body)



5. Electric Characteristics

Model	Outdoor Unit				Power Supply
	Hz	Voltage	Min.	Max.	MFA
MDOU-12HDN1	50	220-240	198	254	/
MDOU-18HDN1	50	220-240	198	254	/
MDOZU-12HDN1	50	220-240	198	254	16
MDOU-18HFN1	50	220-240	198	254	20
MDOU-24HDN1	50	220-240	198	254	30
MDOU-36HDN1	50	380-420	342	440	30
MDOU-48HDN1	50	380-420	342	440	30
MDOU-60HDN1	50	380-420	342	440	30

Note:

MFA: Max. Fuse Amps. (A)

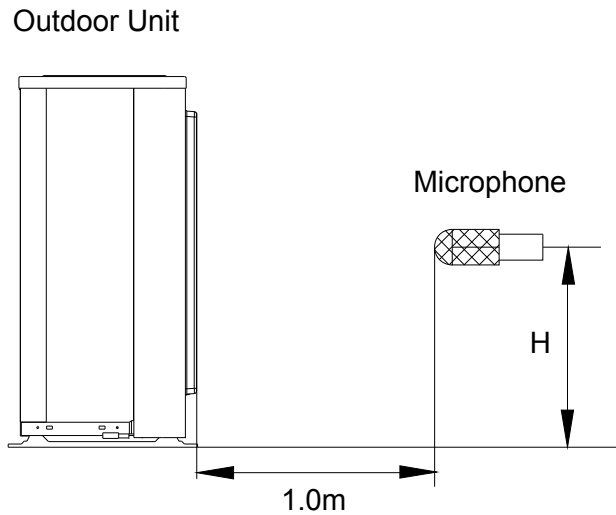
6. Operation Limits

Mode \ Temperature	Cooling operation	Heating operation	Drying operation
Room temperature	17°C~32°C	0°C~30°C	17°C~32°C
Outdoor temperature	0°C~50°C	-15°C~24°C	0°C~50°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.

7. Sound Levels



Note: H= 0.5 × height of outdoor unit

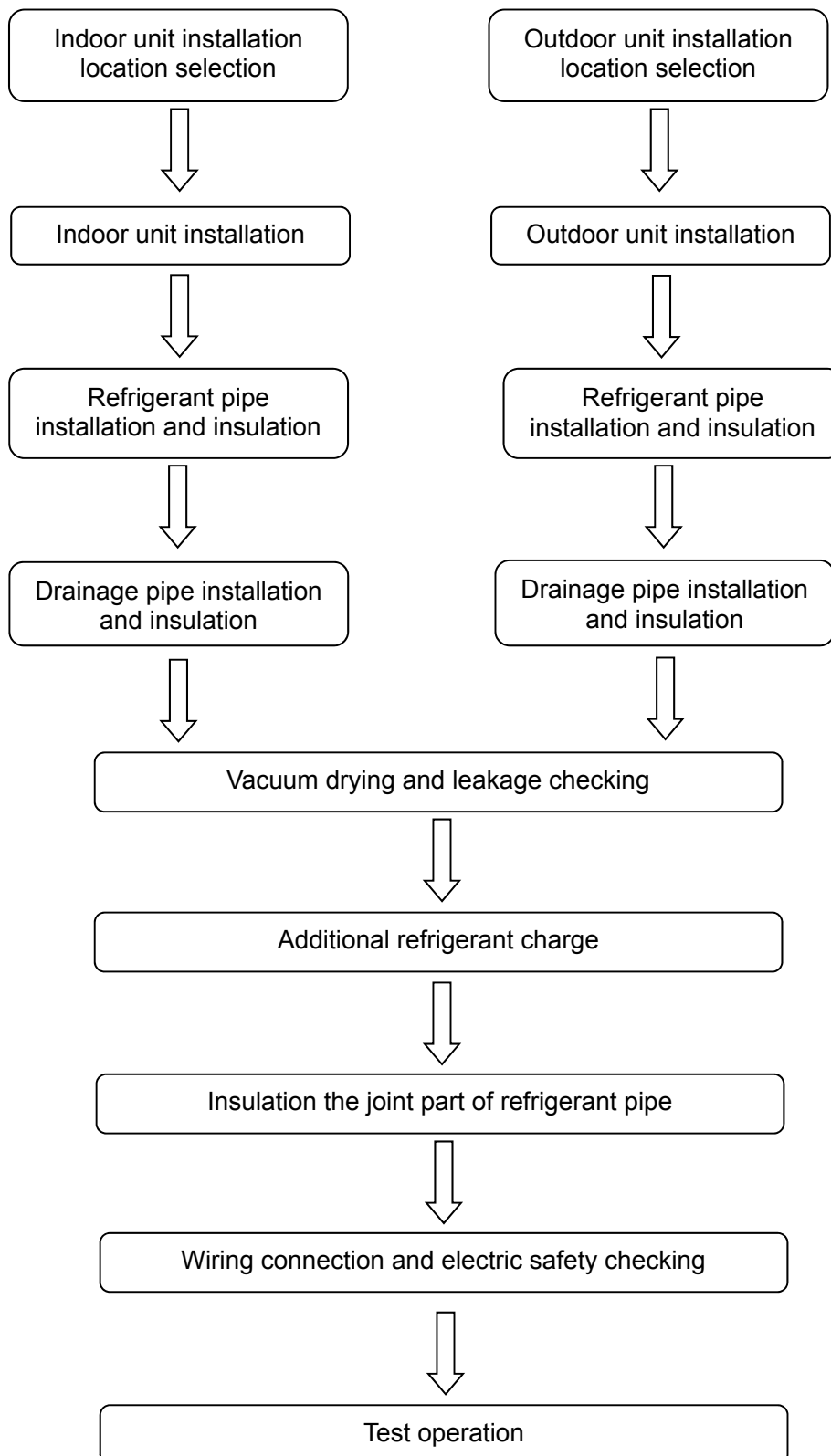
Model	Noise level dB(A)
	H
MDOU-12HDN1	48
MDOZU-12HDN1	57
MDOU-18HDN1	51
MDOU-18HFN1	57
MDOU-24HDN1 (220075301400)	54
MDOU-24HDN1 (220075301401)	59
MDOU-24HDN1 (220075302030)	55
MDOU-36HDN1	63
MDOU-48HDN1	62
MDOU-48HDN1 (New Body)	62.5
MDOU-60HDN1	63
MDOU-60HDN1 (New Body)	62

Part 4

Installation

1. Installation Procedure.....	143
2. Location selection.....	144
3. Indoor unit installation.....	145
4. Outdoor unit installation (Side Discharge Unit).....	170
5. Refrigerant pipe installation.....	171
6. Drainage pipe installation.....	175
7. Vacuum Drying and Leakage Checking.....	179
8. Additional refrigerant charge.....	180
9. Engineering of insulation.....	181
10. Engineering of electrical wiring.....	182
11. Test operation.....	183

1. Installation Procedure



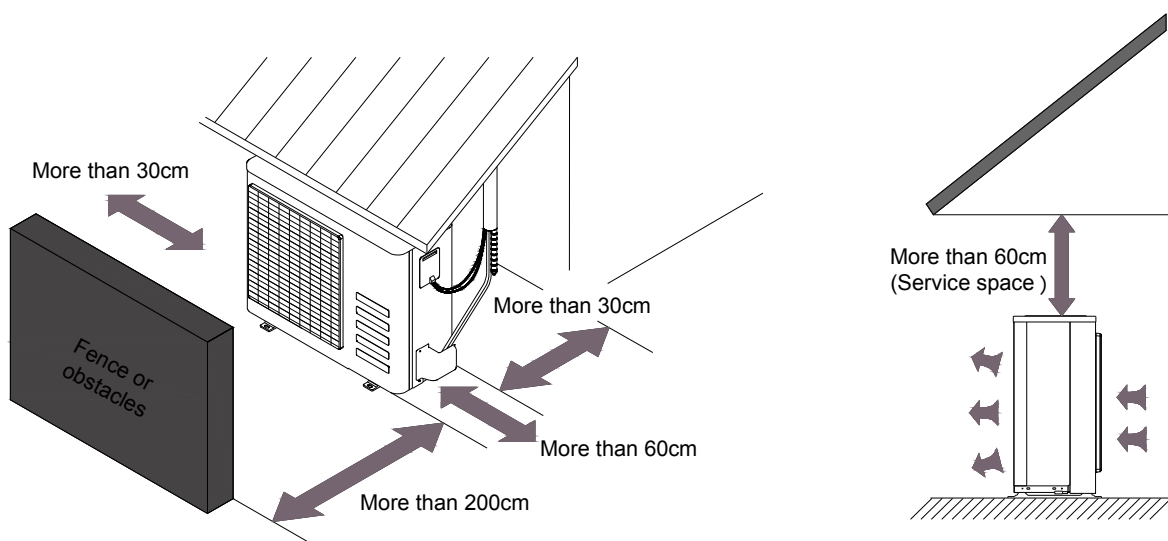
2. Location selection

2.1 Indoor unit location selection

- The place shall easily support the indoor unit's weight.
- The place can ensure the indoor unit installation and inspection.
- The place can ensure the indoor unit horizontally installed.
- The place shall allow easy water drainage.
- The place shall easily connect with the outdoor unit.
- The place where air circulation in the room should be good.
- There should not be any heat source or steam near the unit.
- There should not be any oil gas near the unit
- There should not be any corrosive gas near the unit
- There should not be any salty air near the unit
- There should not be strong electromagnetic wave near the unit
- There should not be inflammable materials or gas near the unit
- There should not be strong voltage vibration.

2.2 Outdoor unit location selection

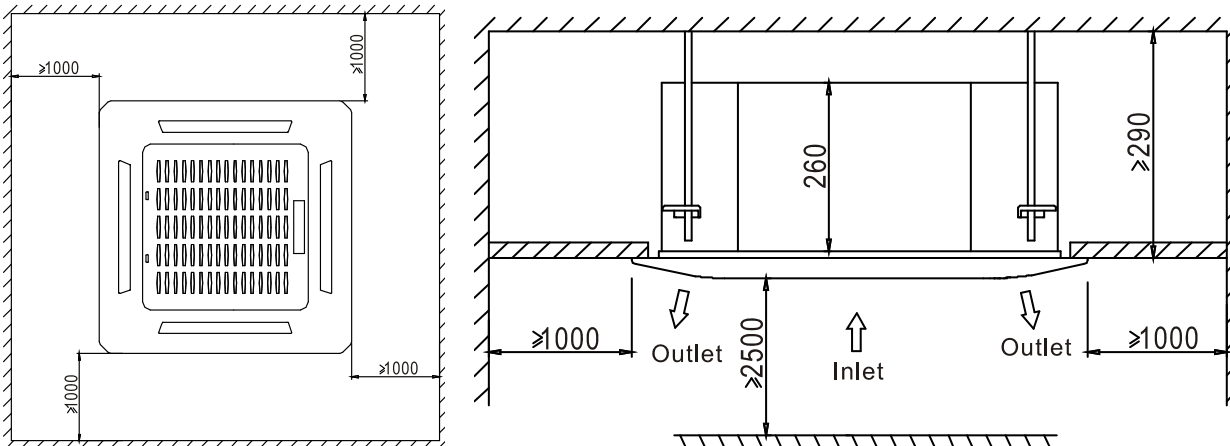
- The place shall easily support the outdoor unit's weight.
- Locate the outdoor unit as close to indoor unit as possible
- The piping length and height drop can not exceed the allowable value.
- The place where the noise, vibration and outlet air do not disturb the neighbors.
- There is enough room for installation and maintenance.
- The air outlet and the air inlet are not impeded, and not face the strong wind.
- It is easy to install the connecting pipes and cables.
- There is no danger of fire due to leakage of inflammable gas.
- It should be a dry and well ventilation place
- The support should be flat and horizontal
- Do not install the outdoor unit in a dirty or severely polluted place, so as to avoid blockage of the heat exchanger in the outdoor unit.
- If is built over the unit to prevent direct sunlight, rain exposure, direct strong wind, snow and other scraps accumulation, make sure that heat radiation from the condenser is not restricted.



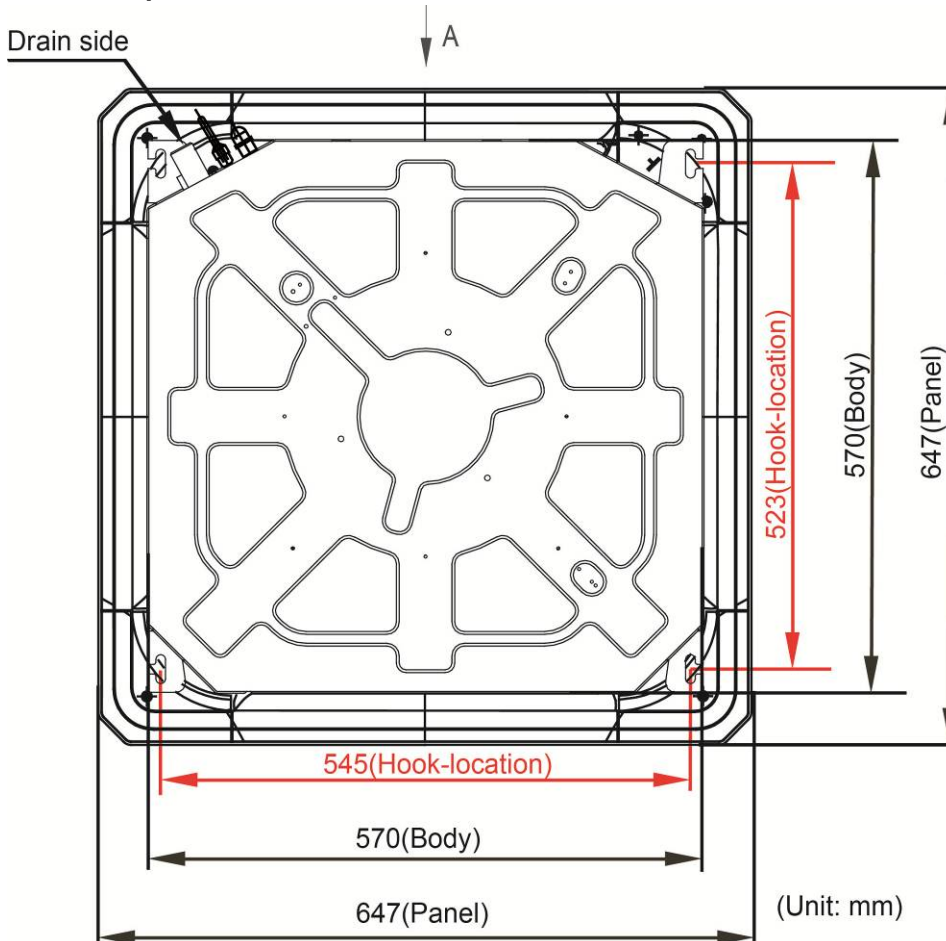
3. Indoor unit installation

3.1 Compact cassette indoor unit installation

3.1.1 Service space for indoor unit

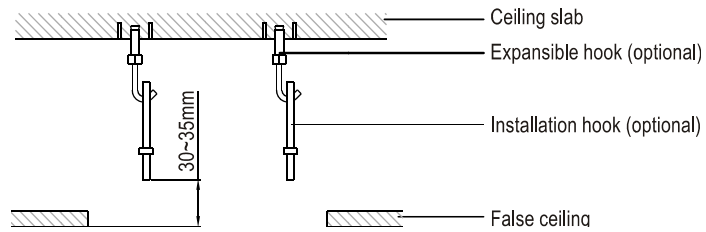


3.1.2 Bolt pitch



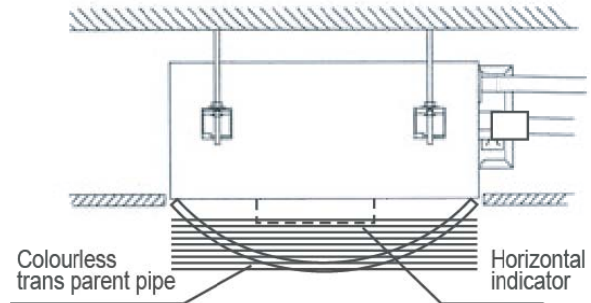
3.1.3 Install the installation hooks. (Use either a M8 or M10 size bolt.)

Use expansible hooks, sunken anchors or other field supplied parts to reinforce the ceiling in order to bear the weight of the unit. Adjust clearance from the ceiling before proceeding further. Installation example see figure below

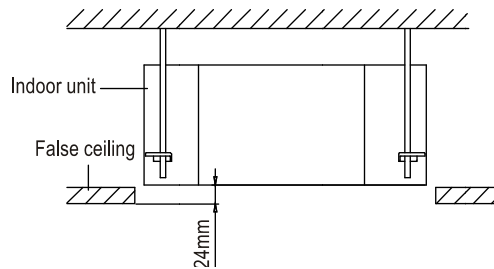


3.1.4 Install the main body

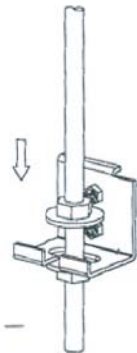
Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 24 mm. In general, L is half of the screw length of the installation hook.

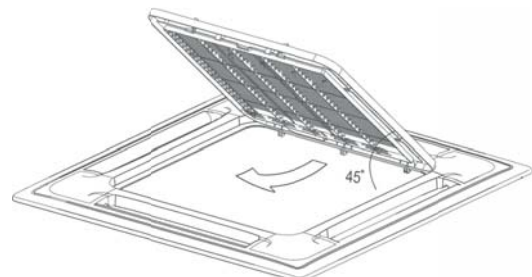
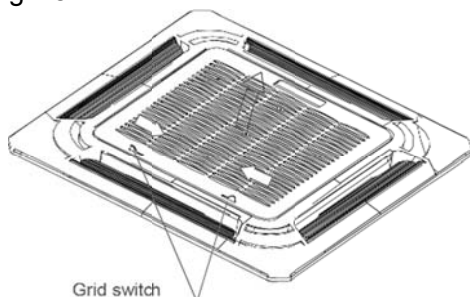


Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

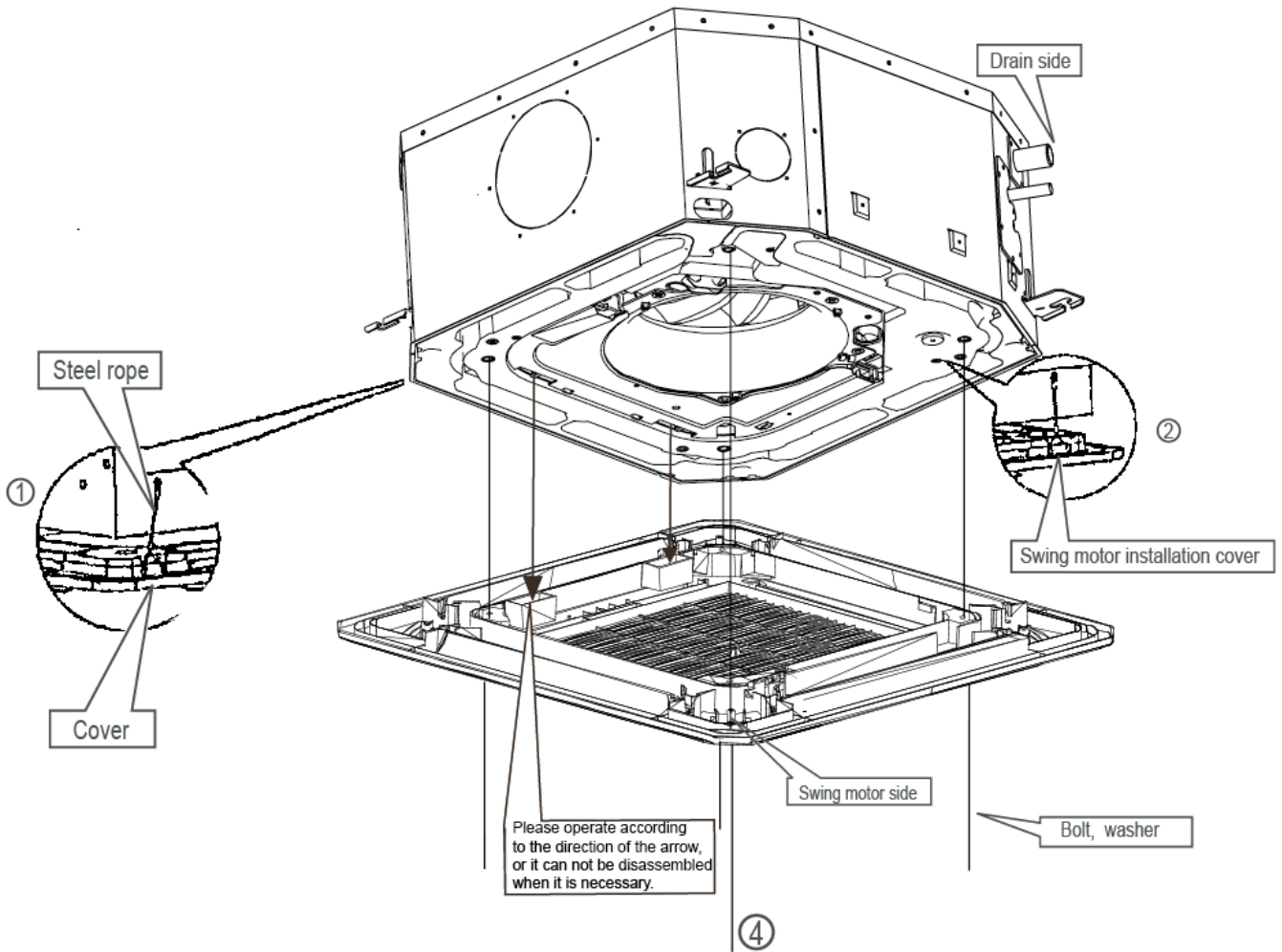


3.1.5 Install the panel

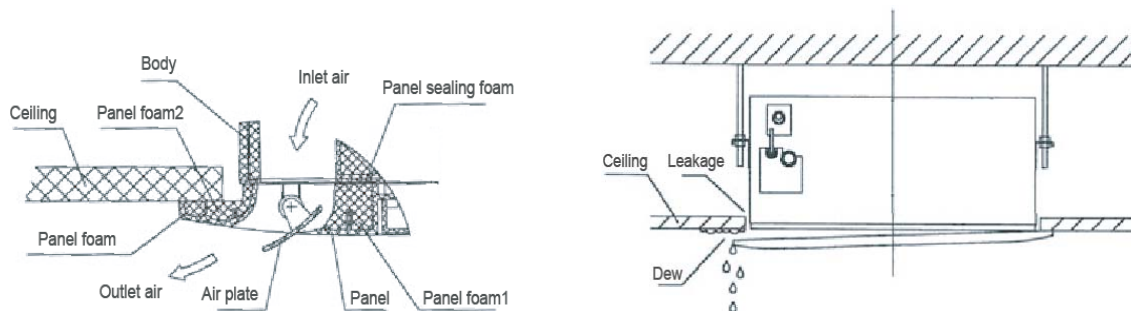
Remove the grille



Hang the panel to the hooks on the mainbody.



Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.

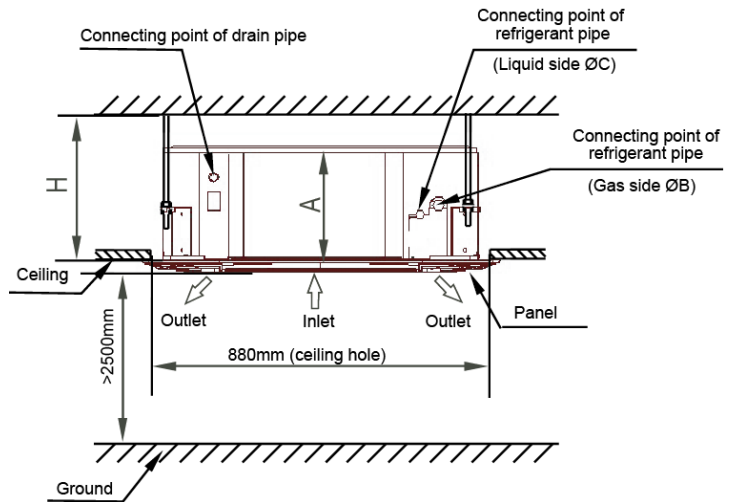
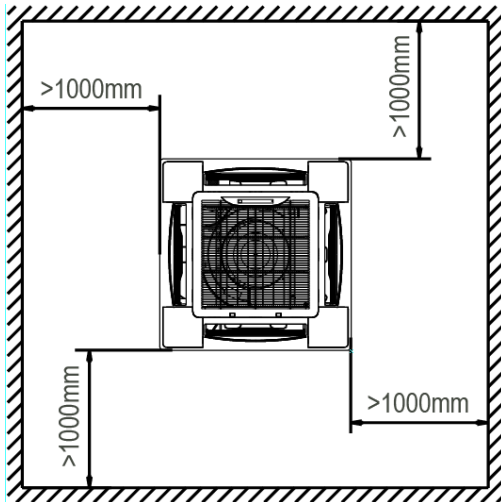


Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

Note: The panel shall be installed after the wiring connected.

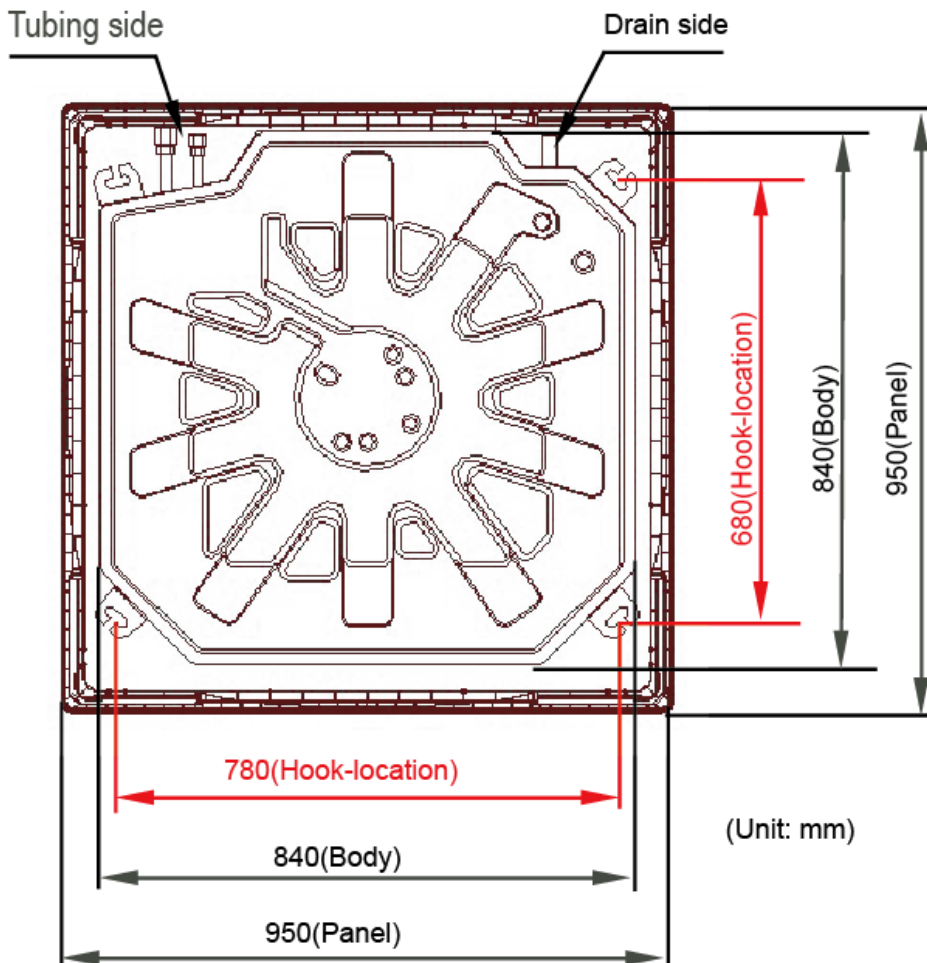
3.2 Big cassette indoor unit installation

3.2.1 Service space for indoor unit



Model	A	H
18	230	>260
24	230	>260
30-60	300	>330

3.2.2 Bolt pitch



3.2.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of $\text{Ø}12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).

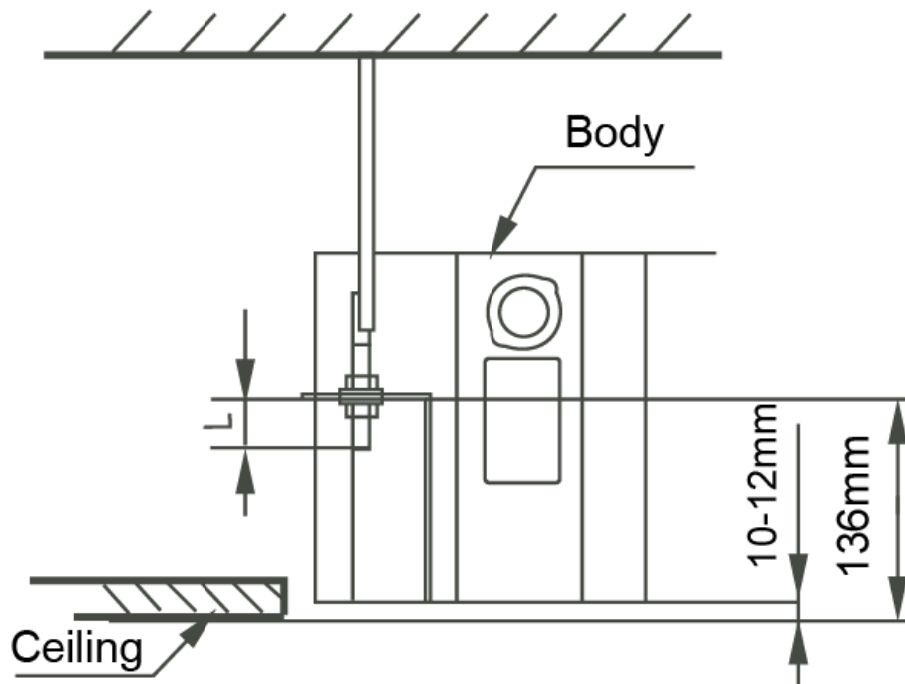


3.2.4 Install the main body

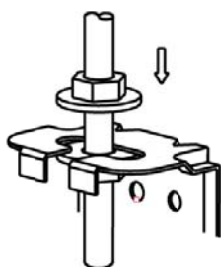
Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10~12 mm. In general, L is half of the screw length of the installation hook.

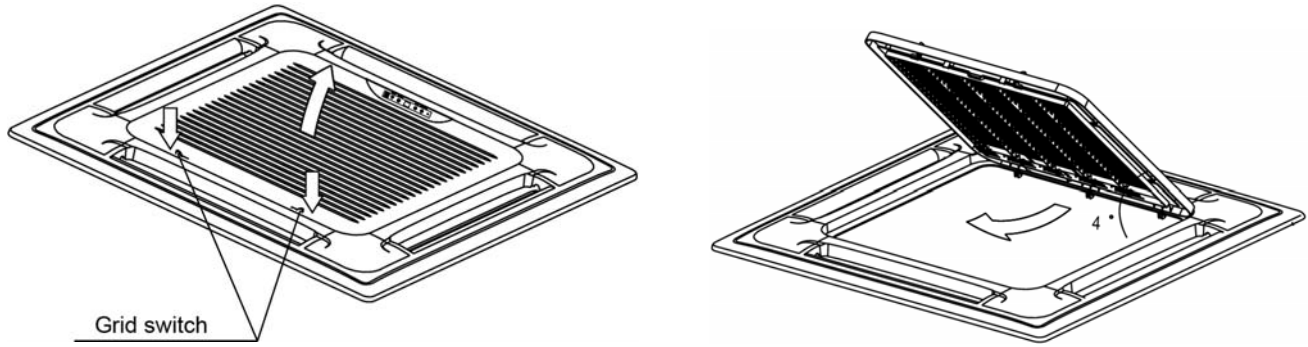


Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

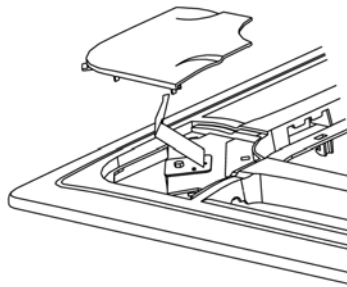


3.2.5 Install the panel

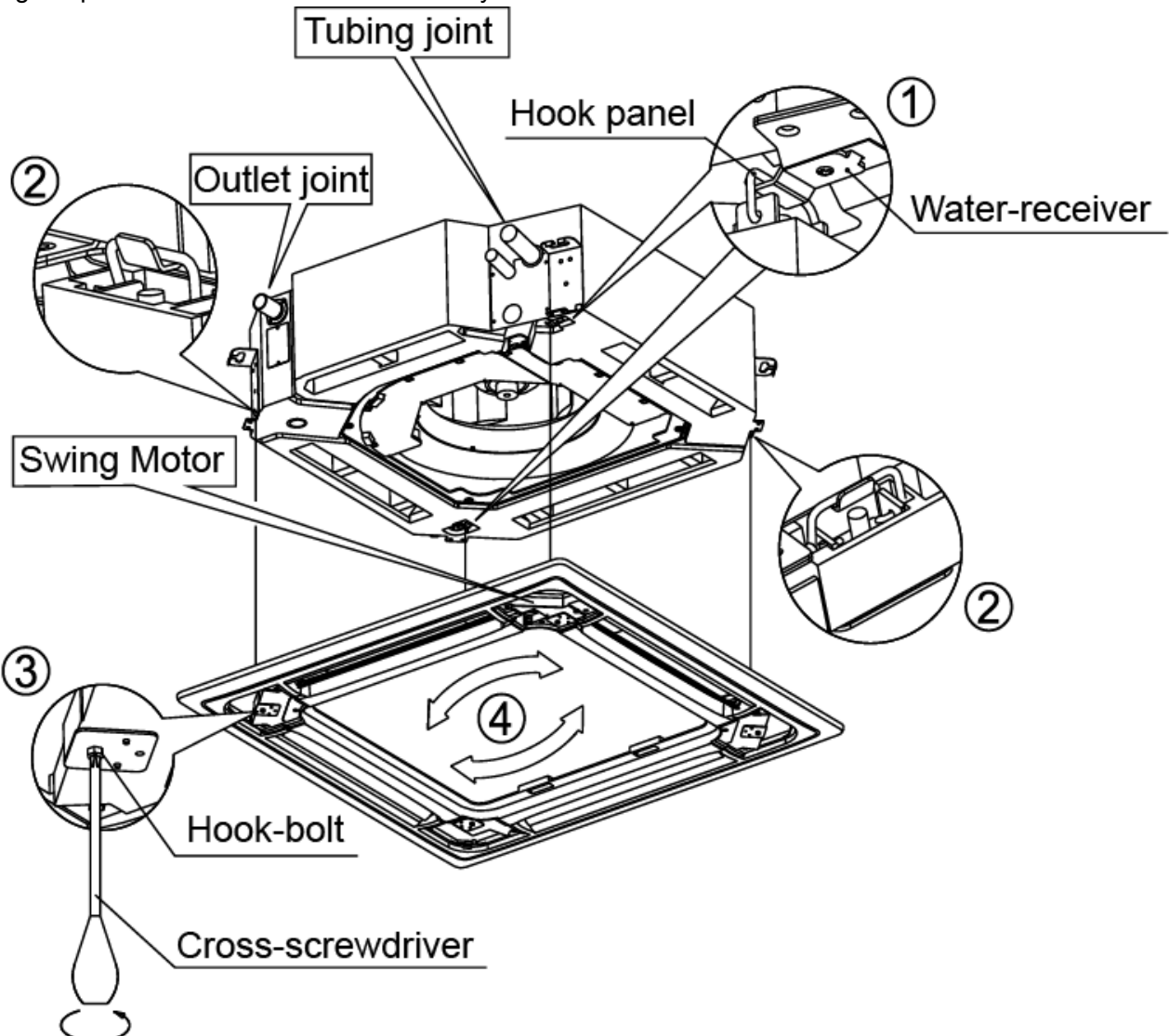
Remove the grille



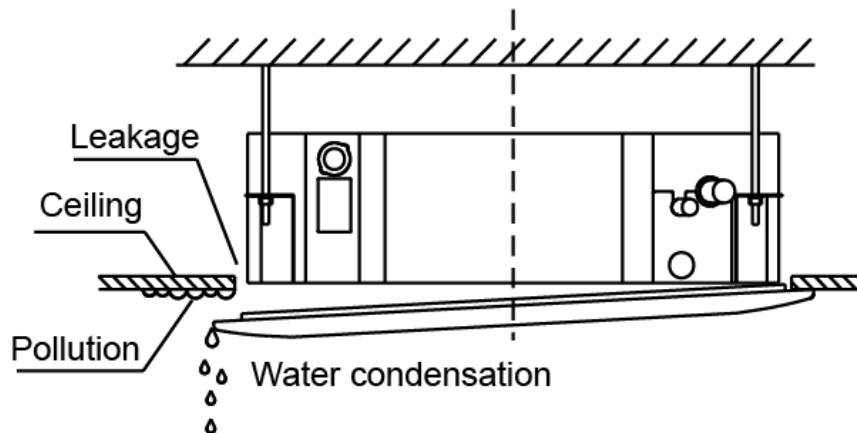
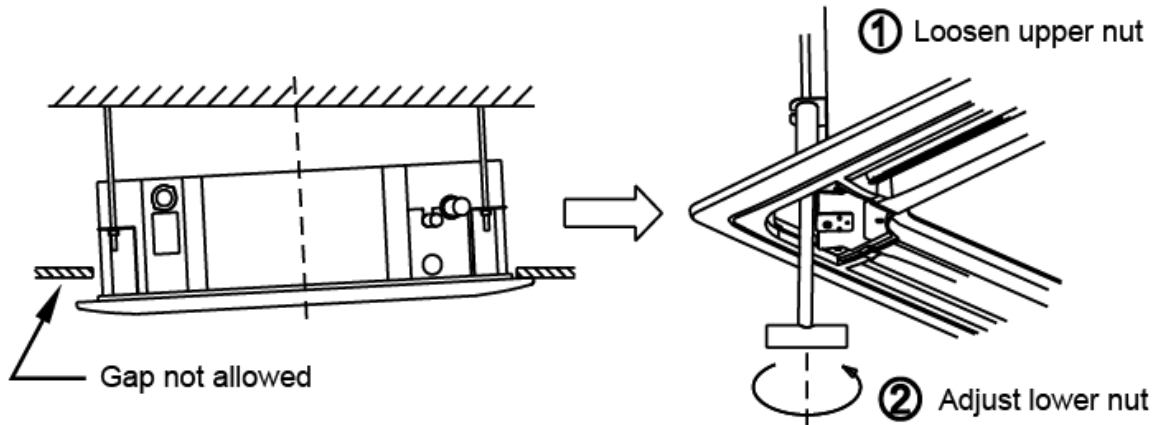
Remove the 4 corner covers.



Hang the panel to the hooks on the mainbody.

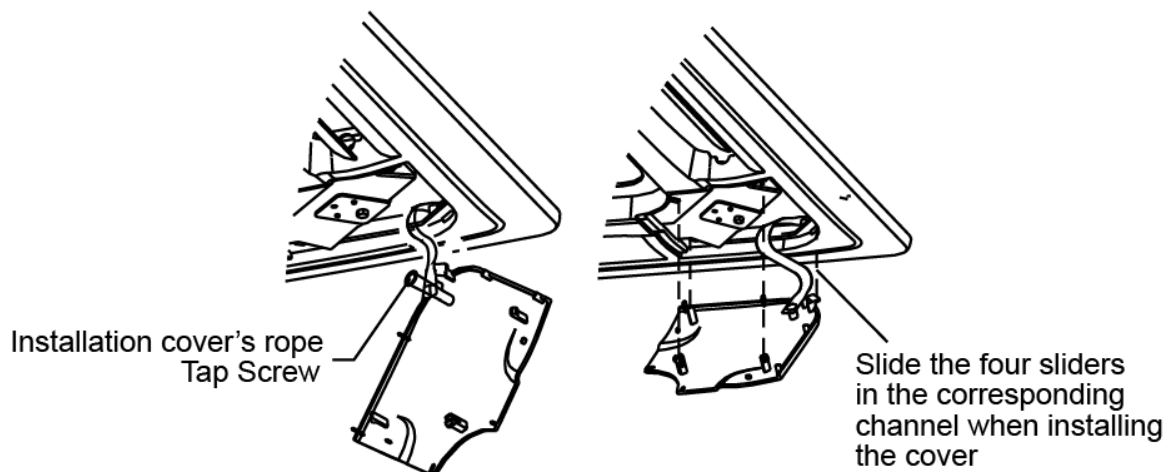


Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.



Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

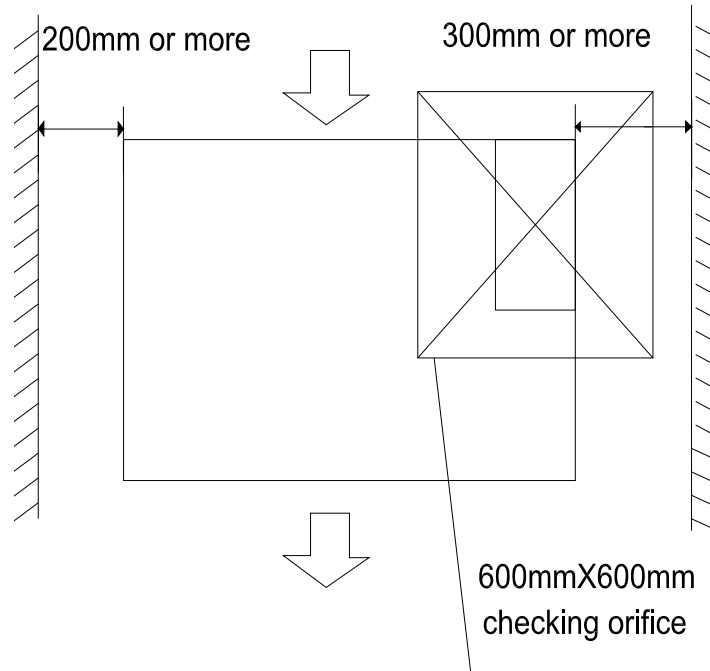
Install the 4 corner covers back.



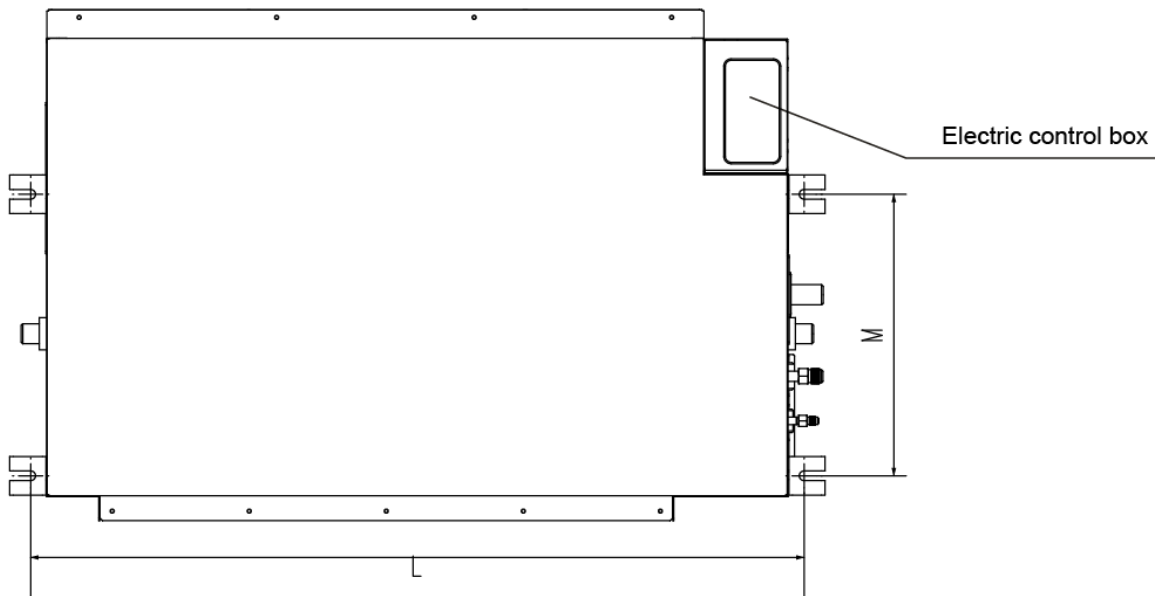
Note: The panel shall be installed after the wiring connected.

3.3 A5 duct indoor unit installation

3.3.1 Service space for indoor unit



3.3.2 Bolt pitch



Capacity(KBtu)	Size of outline dimension mounted plug	
	L	M
12	740	350
18	960	350
24	960	350
30/36	1180	490
48/60	1240	500

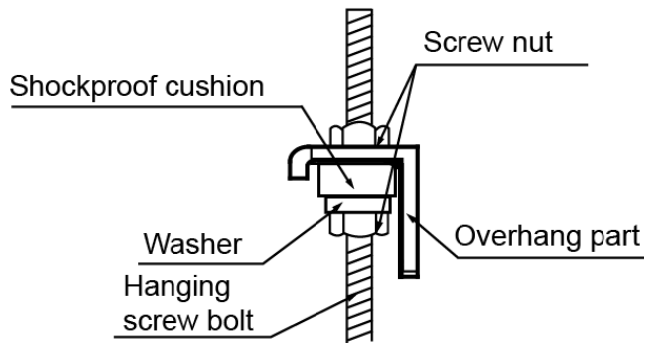
3.3.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\text{Ø}12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



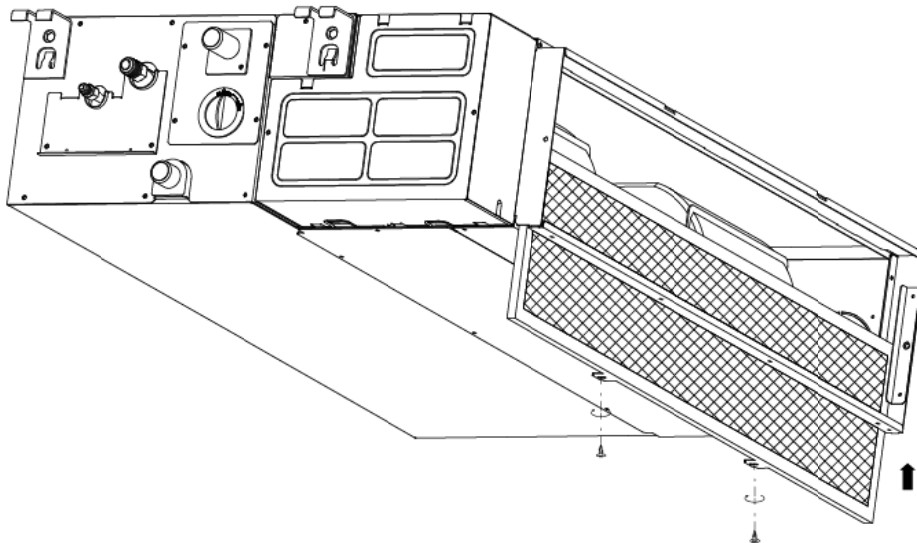
3.3.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



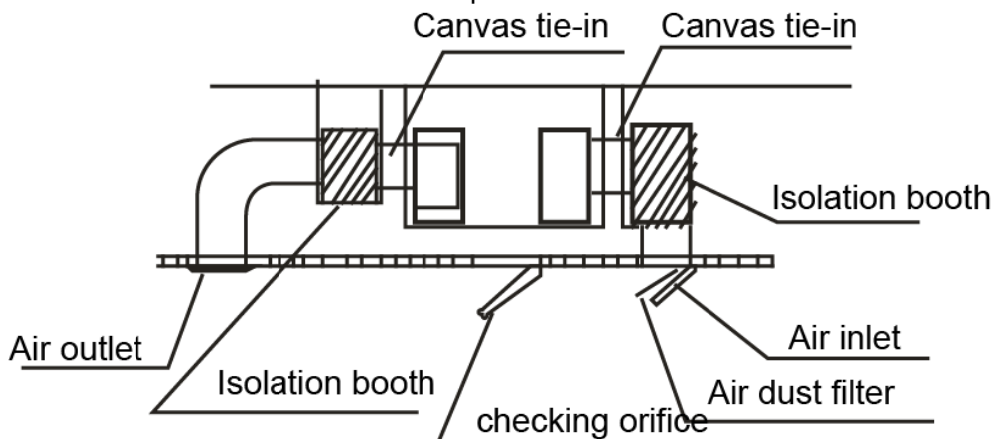
3.3.5 Install the air filter

Insert the air filter through the filter slot and fix it with 2 screws.



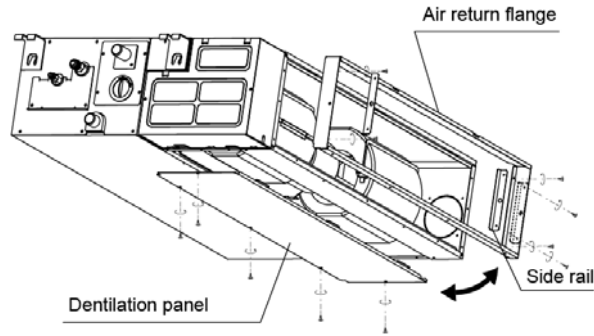
3.3.6 Install the air duct

Please design the air duct as below recommended picture

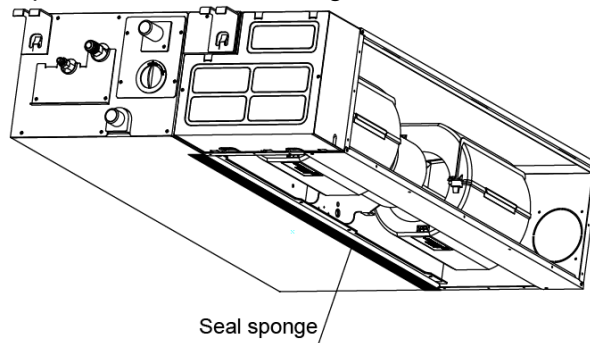


3.3.7 Change the air inlet direction

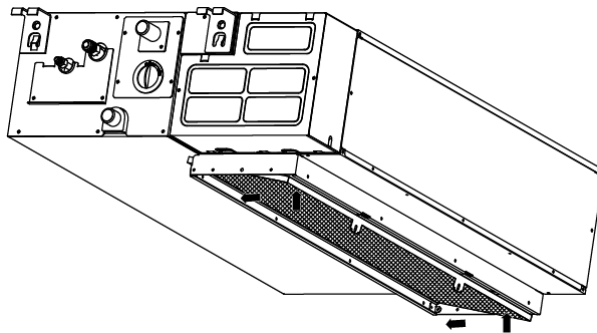
- ① Take off ventilation panel and flange, cut off the staples at side rail.



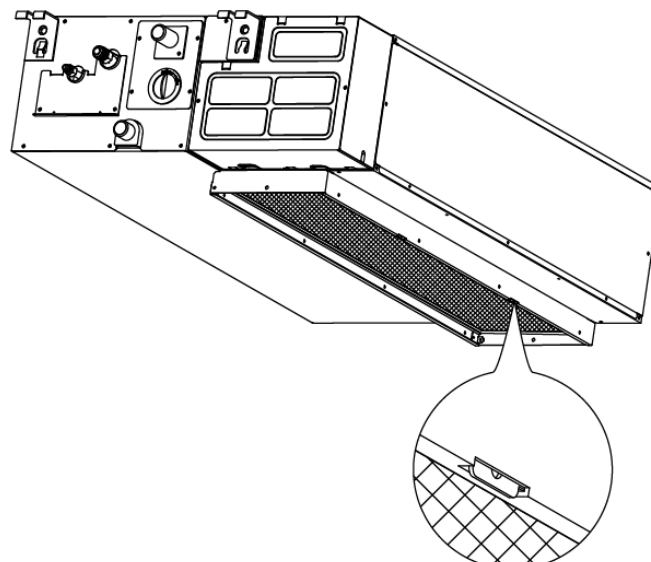
- ② Stick the attached seal sponge as per the indicating place in the following fig, and then change the mounting positions of air return panel and air return flange .



- ③ When install the filter mesh, please plug it into flange inclined from air return opening, and then push up.

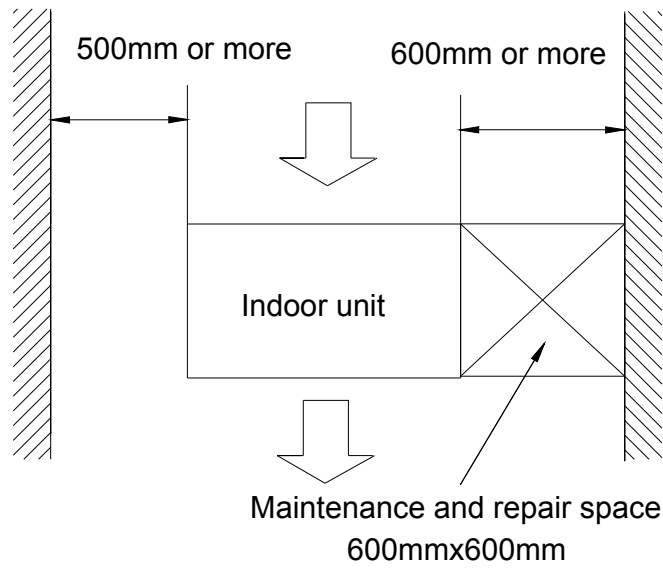


- ④ The installation has finish, upon filter mesh which fixing blocks have been insert to the flange positional holes.



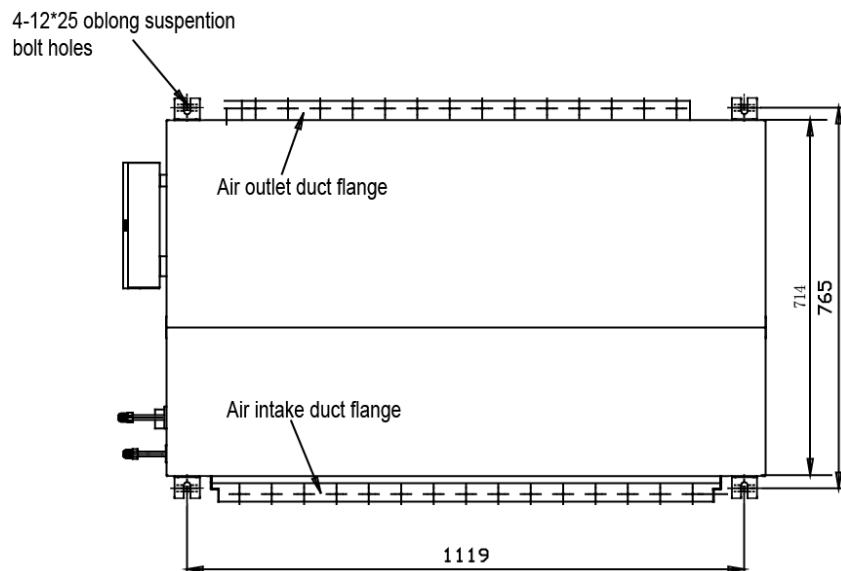
3.4 HESP duct indoor unit installation

3.4.1 Service space for indoor unit

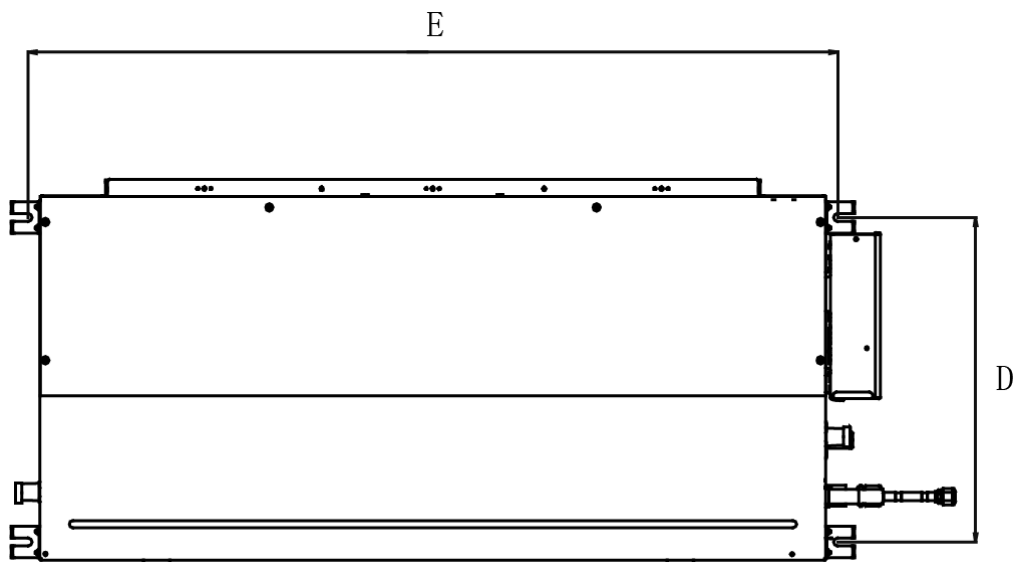


3.4.2 Bolt pitch

MHD:



MHG:



Capacity (KBtu)	Size of mounted lug	
	D	E
36	397	1146
48~60	495	1236

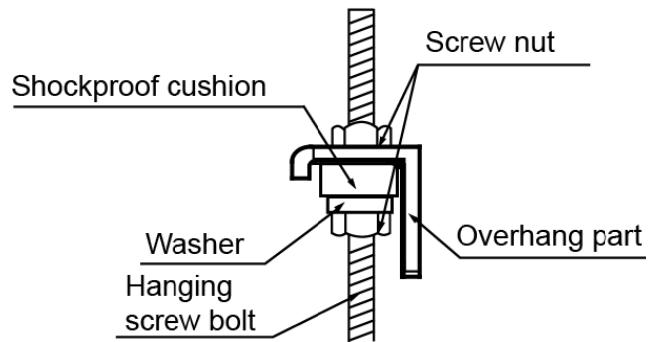
3.4.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\varnothing 12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



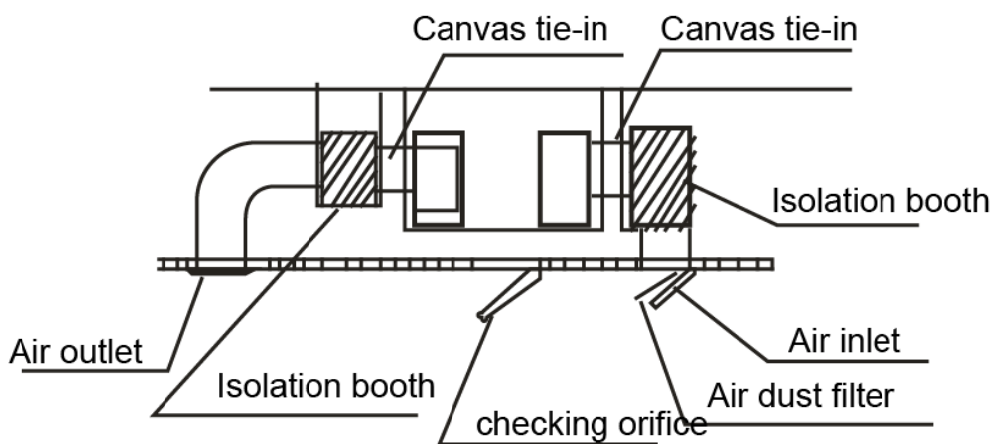
3.4.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



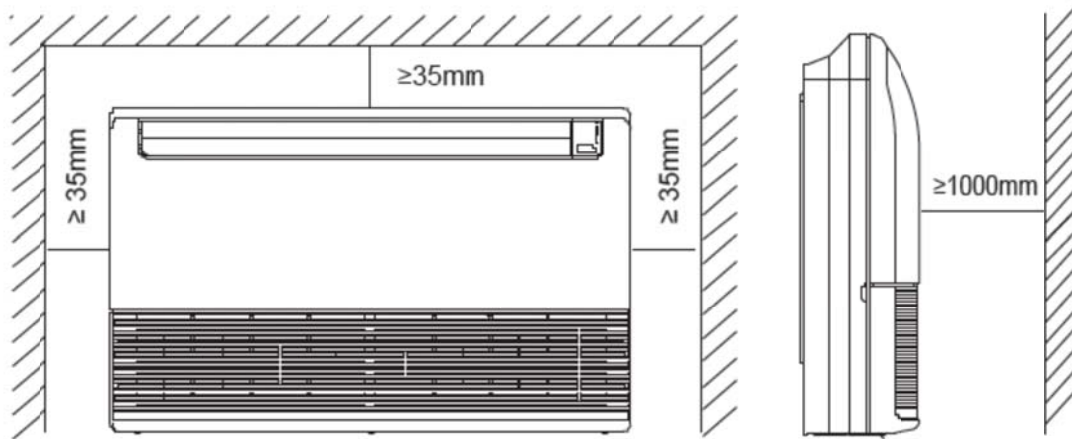
3.4.5 Install the air duct

Please design the air duct as below recommended picture



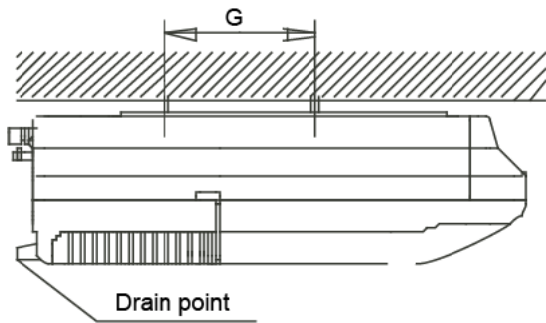
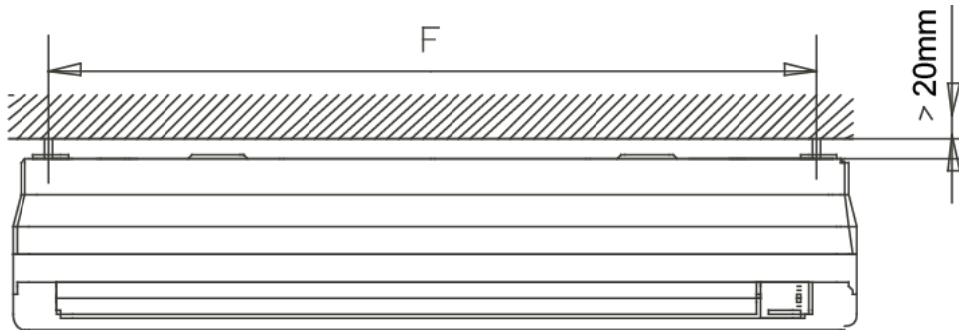
3.5 Ceiling & floor indoor unit installation

3.5.1 Service space for indoor unit



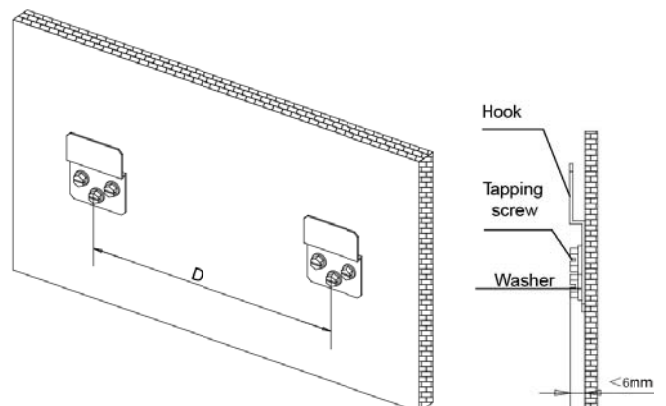
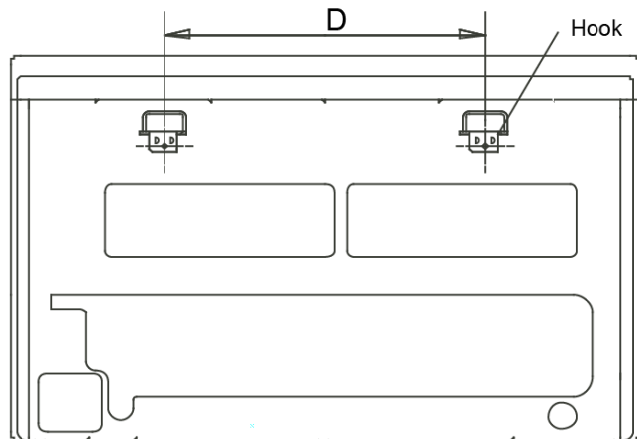
3.5.2 Bolt pitch

① Ceiling installation



Capacity (Btu/h)	D	F	G
12K, 24K	505	907	200
36K	795	1195	200
48K, 60K	1070	1542	200

② Floor standing installation



3.5.3 Install the pendant bolt

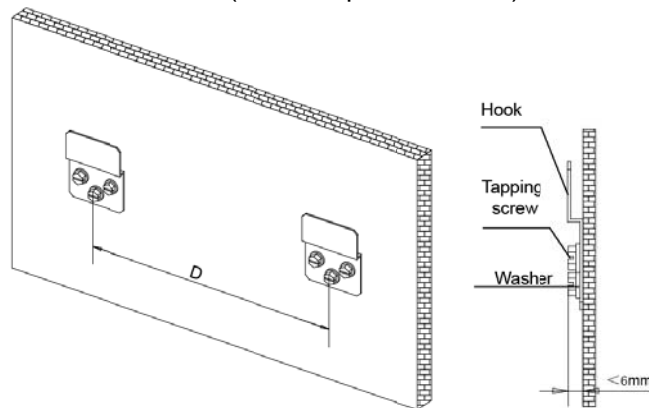
① Ceiling installation

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\varnothing 12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



② Floor standing installation

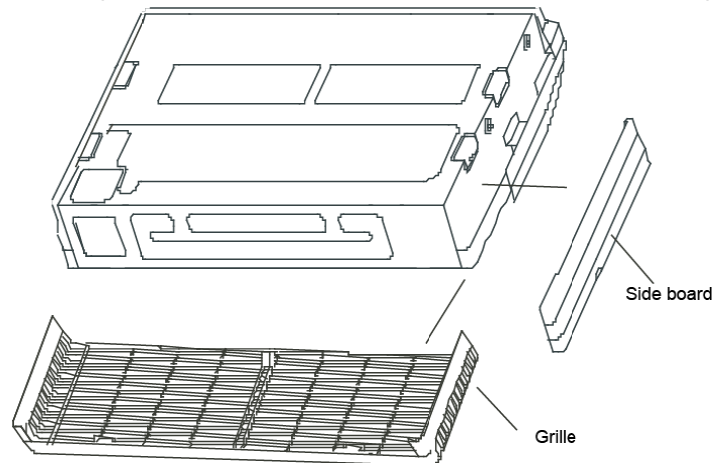
Fix the hook with tapping screw onto the wall. (Refer to picture below)



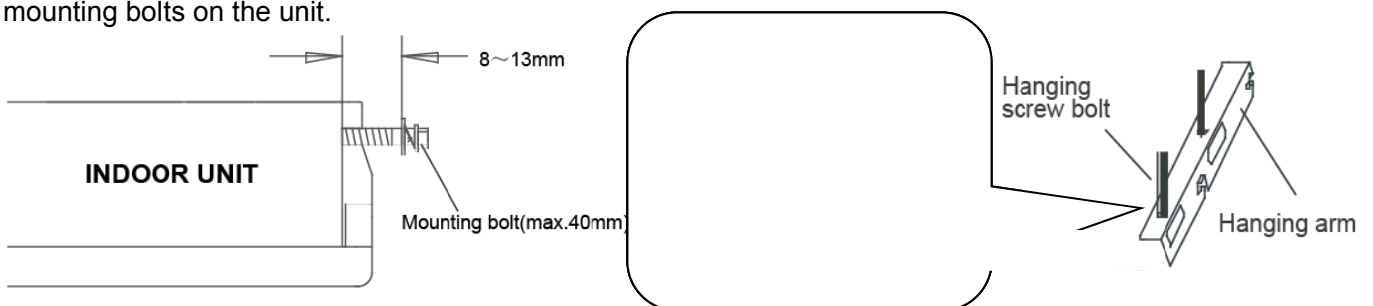
3.5.4 Install the main body

① Ceiling installation (The only installation method for the unit with drain pump)

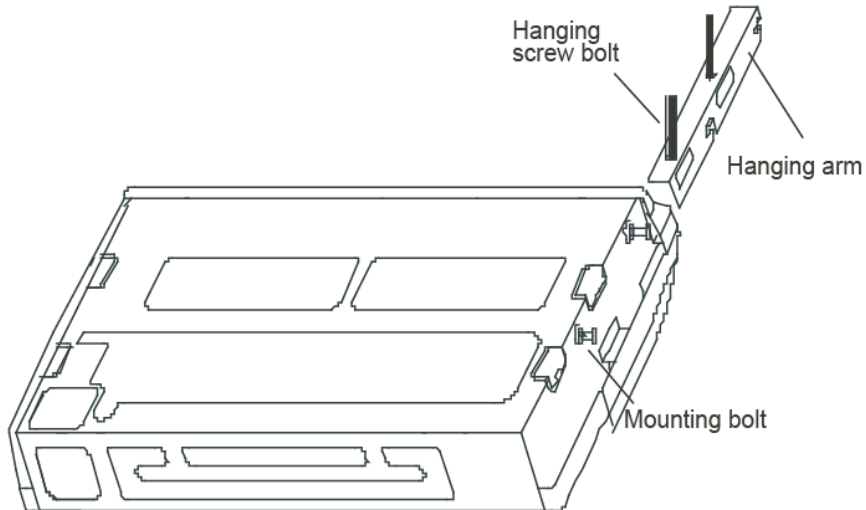
Remove the side board and the grille. (For models 48 and 60, do not remove the grille.)



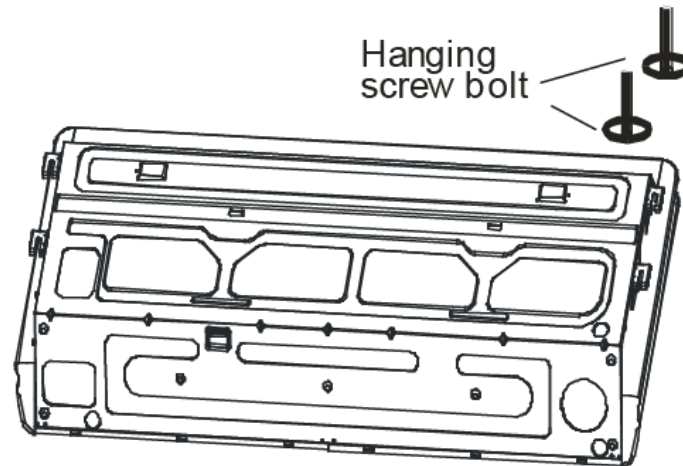
Locate the hanging arm on the hanging screw bolt. (for some of the models 60, do not do this). Prepare the mounting bolts on the unit.



Hang the unit on the hanging arm by sliding backward. Securely tighten the mounting bolts on both sides. (some of the models 60 do not do this)



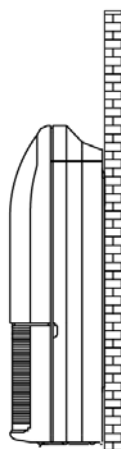
For some of the models 60 please securely tighten the mounting bolts on both sides.



Then install the side panels and grilles back to the main unit.

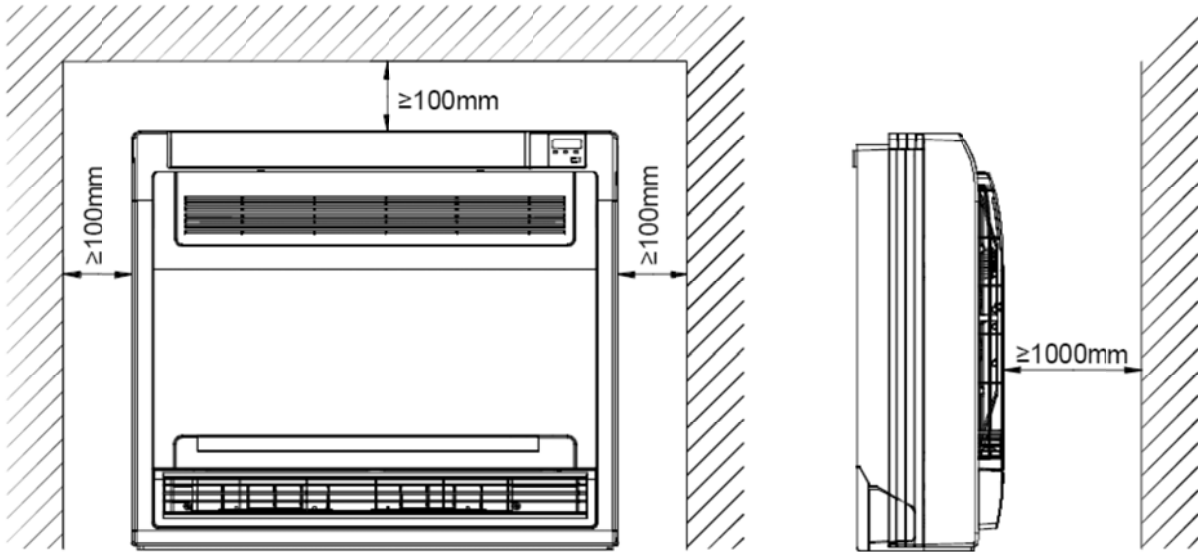
② Floor standing installation

Hang the indoor unit on the hook. (The bottom of body can touch with floor or suspended, but the body must install vertically.)



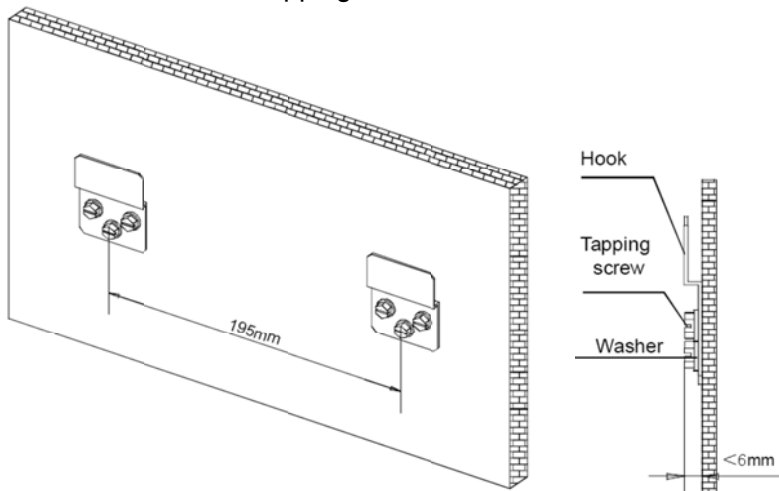
3.6 Console indoor unit installation

3.6.1 Service space for indoor unit

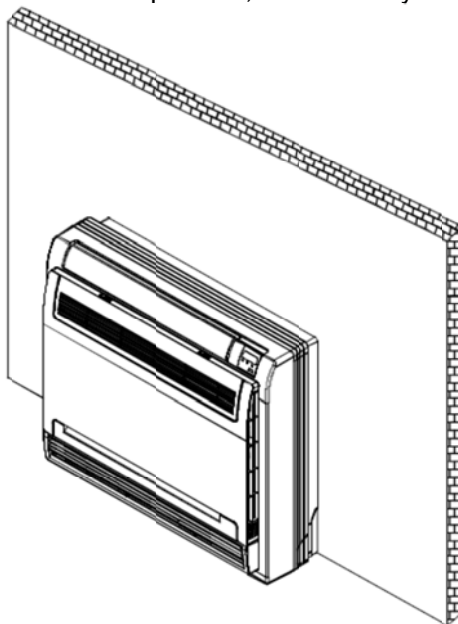


3.6.2 Install the main body

- Fix the hook with tapping screw onto the wall

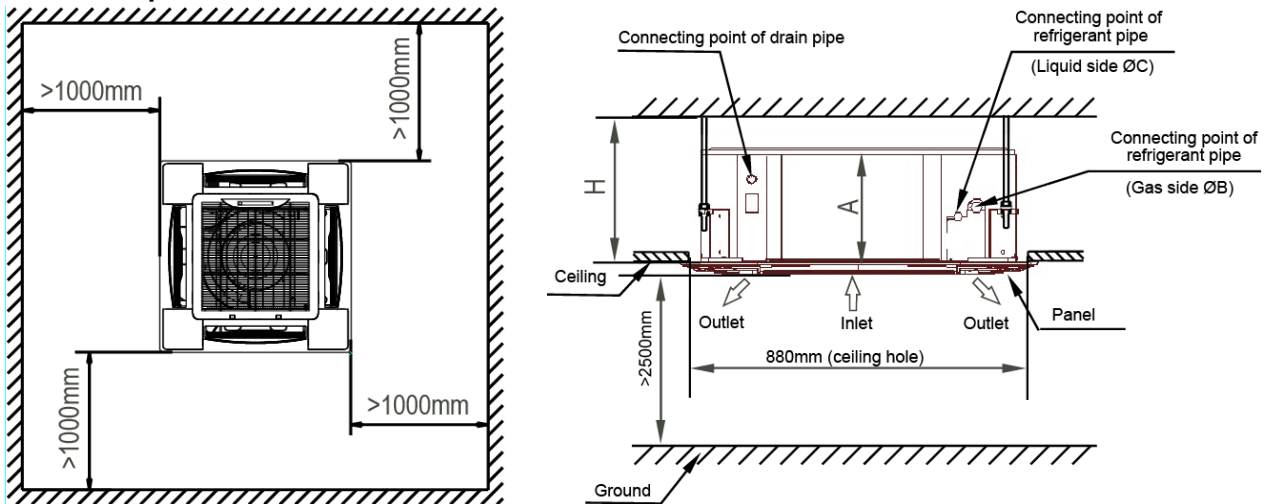


- Hang the indoor unit on the hook.
(The bottom of body can touch with floor or suspended, but the body must install vertically.)



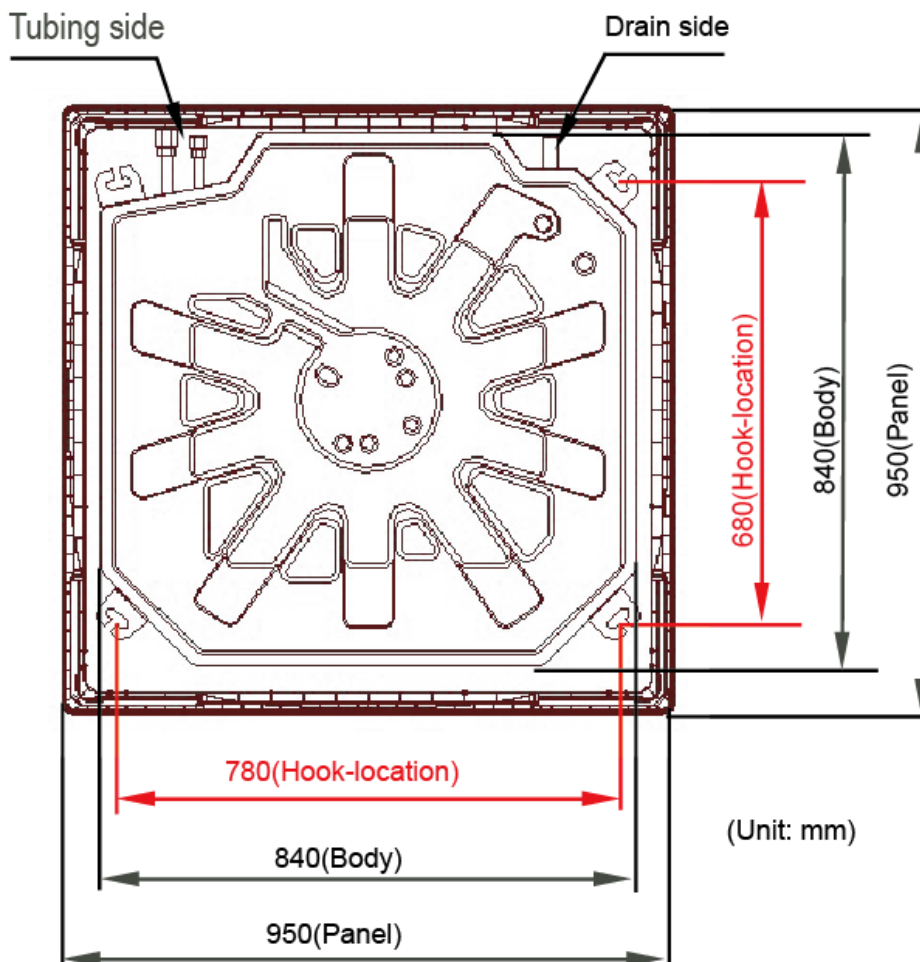
3.7 Super slim cassette indoor unit installation

3.7.1 Service space for indoor unit



Model	A	H
18-30	205	>235
36-48	245	>275
60	287	>317

3.7.2 Bolt pitch



3.7.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\text{Ø}12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expandable hooks (fittings).

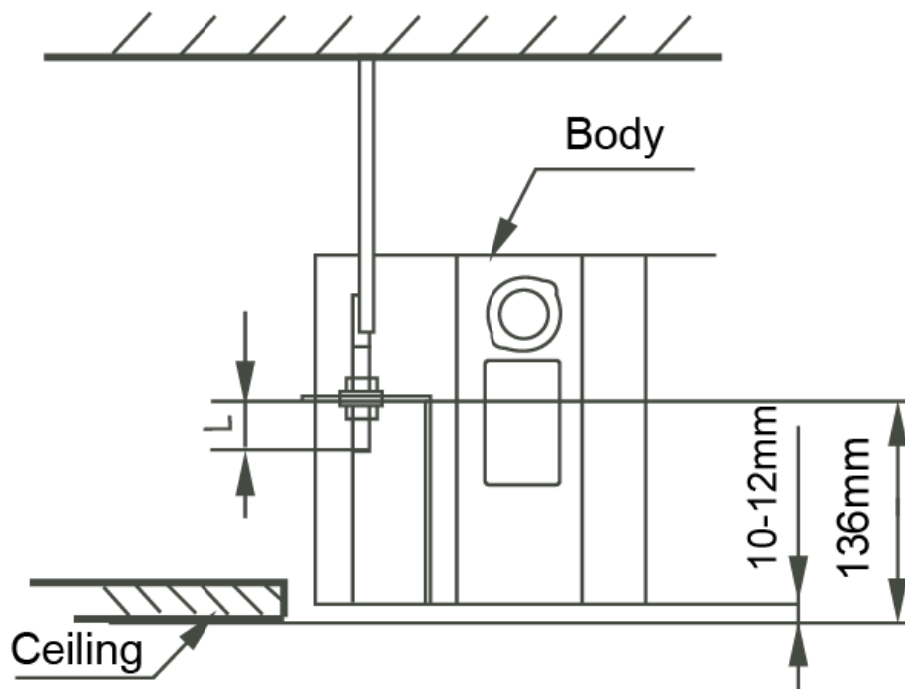


3.7.4 Install the main body

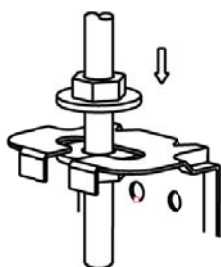
Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10~12 mm. In general, L is half of the screw length of the installation hook.

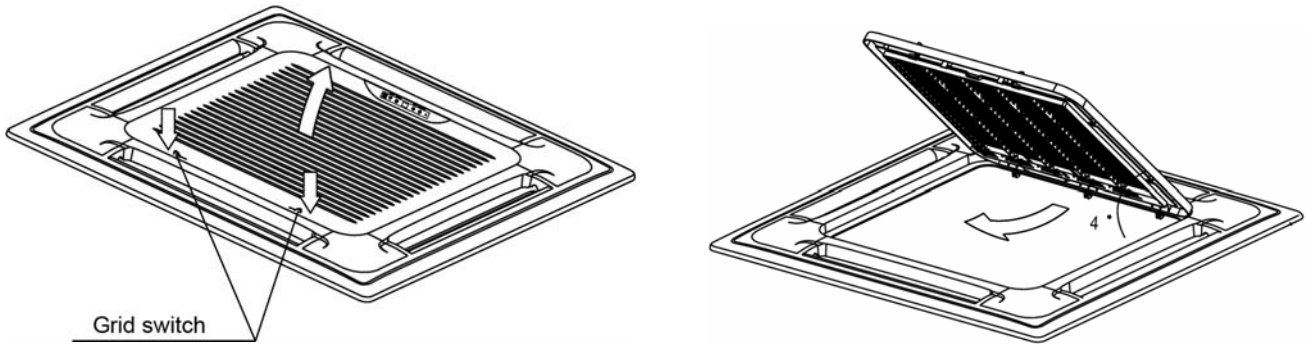


Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

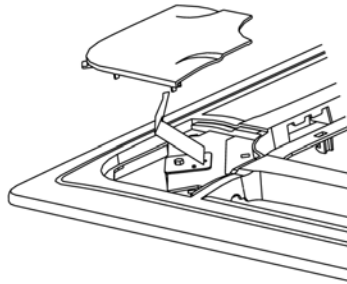


3.7.5 Install the panel

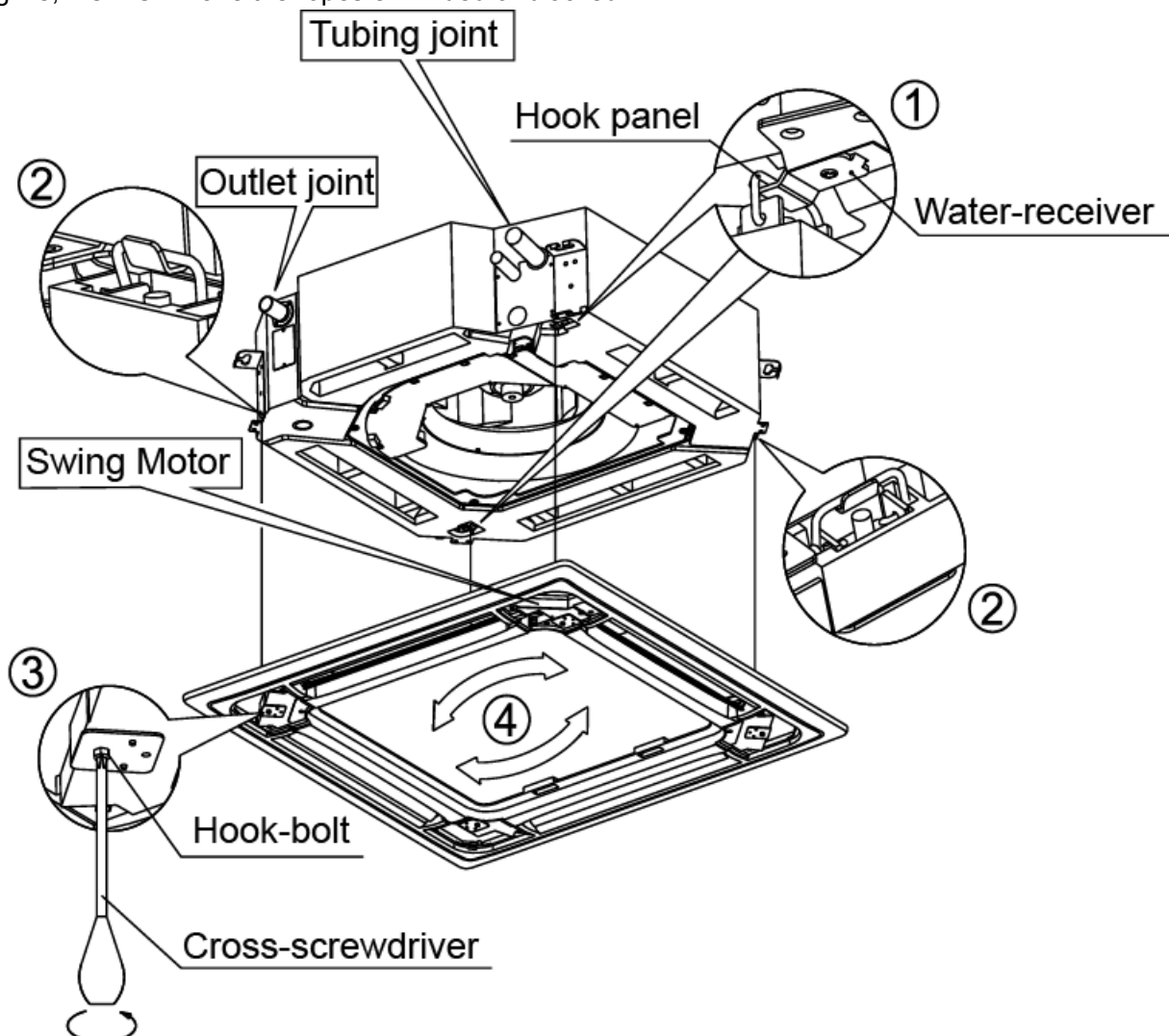
Remove the grille



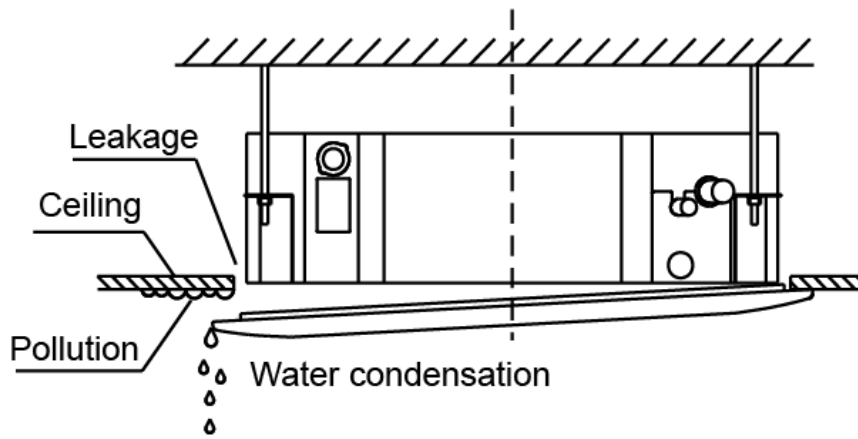
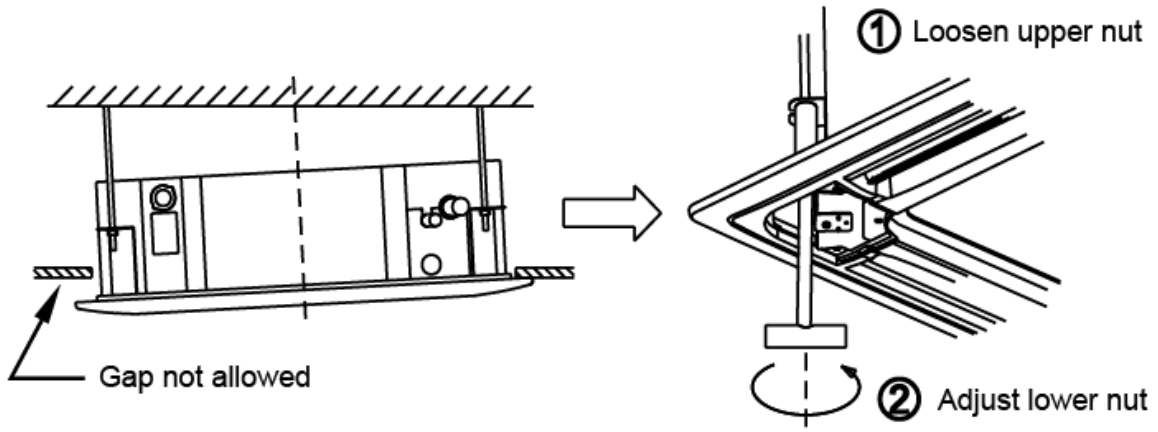
Remove the 4 corner covers.



Hang the panel to the hooks on the mainbody. If the panel is with auto-lift grille, please watch the ropes lifting the grille, DO NOT make the ropes entwined or blocked.

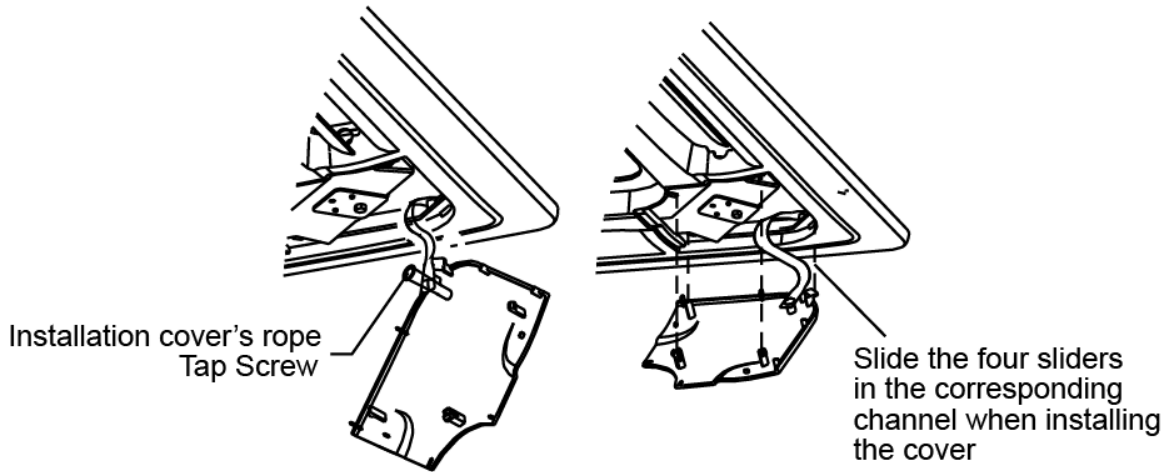


Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.



Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

Install the 4 corner covers back.



Note: The panel shall be installed after the wiring connected.

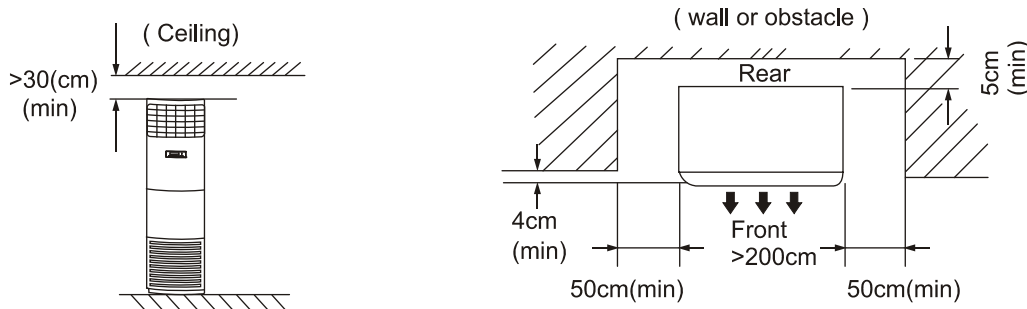
3.8 GA floor standing indoor unit installation

3.8.1 Service space for indoor unit

- A place which provides the spaces around the indoor unit as required above in the diagram.
- A place where is no obstacle near the inlet and outlet area.
- A place which can bear the weight of the indoor unit.
- A place which allows the air filter to be removed downward.
- A place where the reception range is not exposed to direct sunlight.
- In the center of the room where possible.

3.8.1.1 Please stand the unit in hard and flat ground;

Please reserve space for installation and maintenance.



3.8.1.2 Please check the elevation difference between the indoor unit and the outdoor unit, the length of the refrigerant pipe, and the curved places (bend) of the pipe are no more than the following numbers:

Elevation difference: no more than 12M(24K),20M(36K),30M(48K,60K) (if the elevation difference between indoor and outdoor unit is more than 12M(24K),20M(36K),30M(48K,60K), it is recommended that the indoor unit be located higher than the outdoor unit.)

Pipe length: no more than 25M(24K),30M(36K),65M(48K,60K).

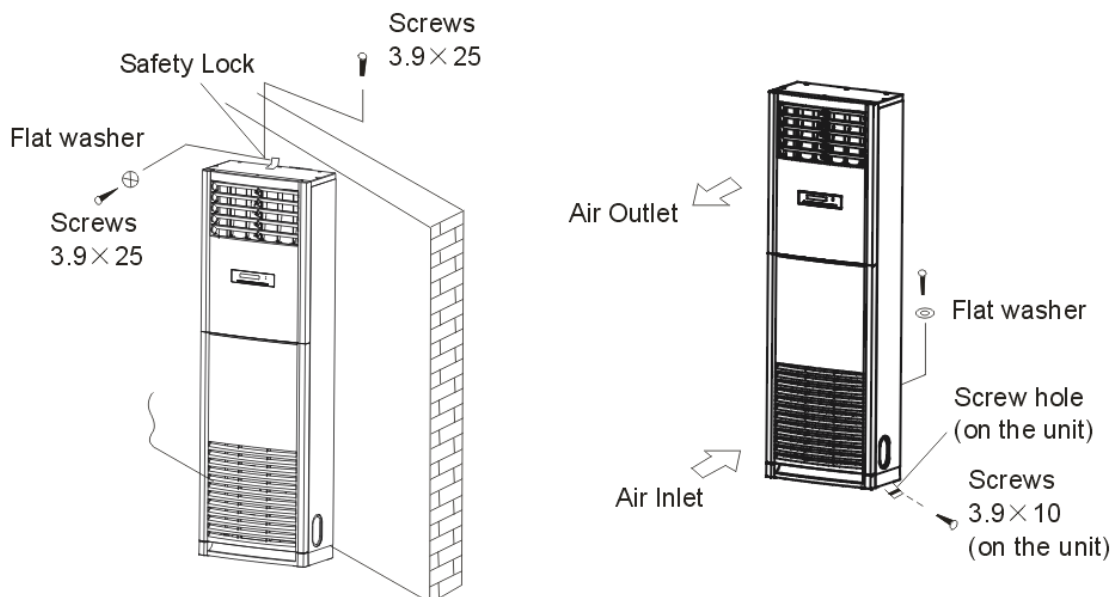
Bends: no more than 3 places.

3.8.2 Installing

3.8.2.1. Anti-falling;

To prevent the indoor unit from falling, you must:

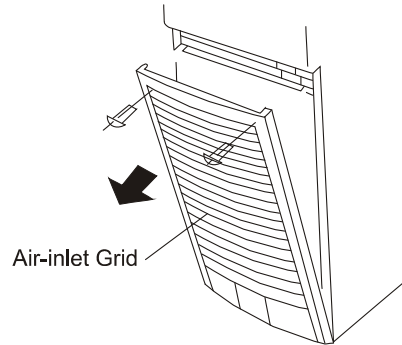
- Pay full attention to the unit because its long outer shape makes it easy to fall;
- Firmly fix the unit to the wall or in the ground to avoid accidental falling.



3.8.2.2. Dismounting the lower front panel

Please take off the lower front panel before connecting the pipes/wires.

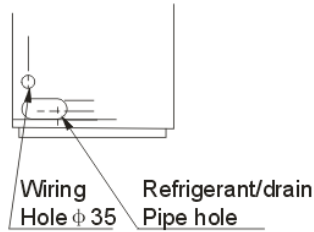
Pull down the two knobs on the grille, take off the two screws, then the air-inlet grille goes free.



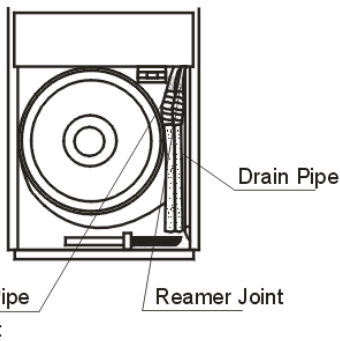
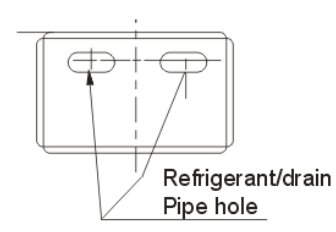
3.8.2.3. Take the Pipe Clip off before connecting the pipes and wiring; fit it when these finished.

Use accessories to connect the pipes/wires on both sides and back side.

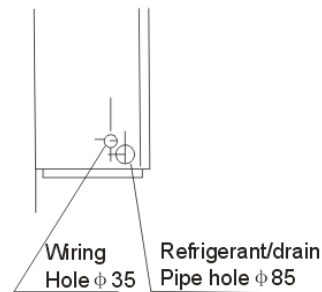
Pipe/wire-hole position on back side



Pipe/wire-hole position on the bottom

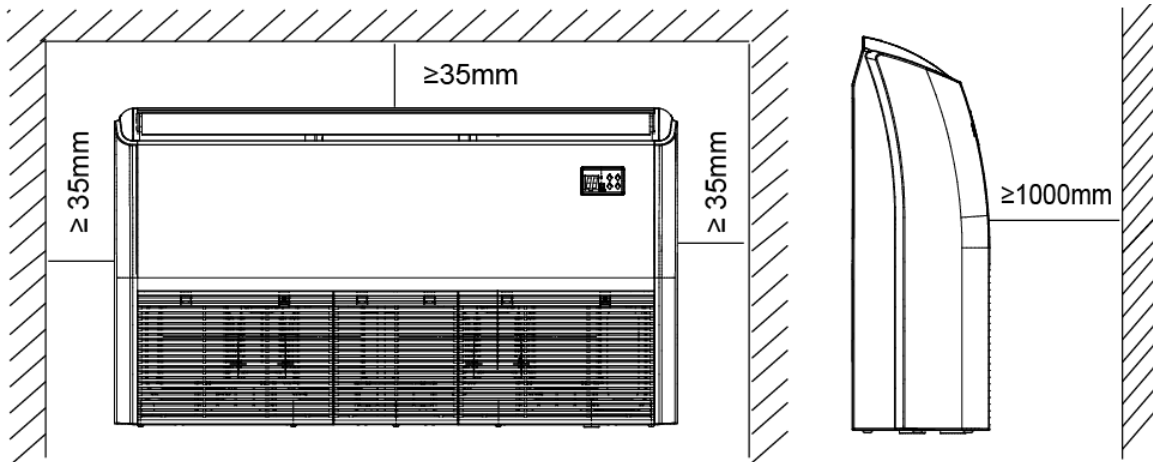


Pipe/wire-hole positions on both sides



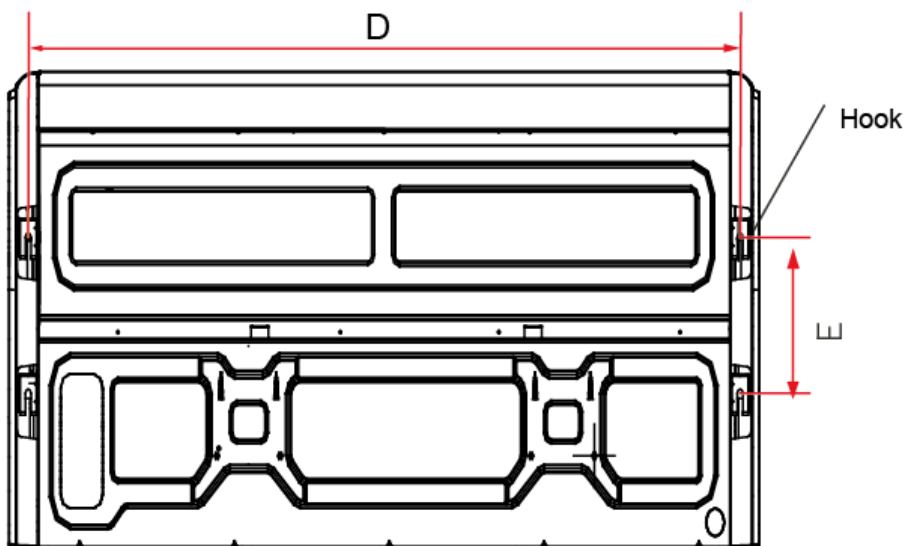
3.9 3rd generation ceiling & floor indoor unit installation

3.9.1 Service space for indoor unit



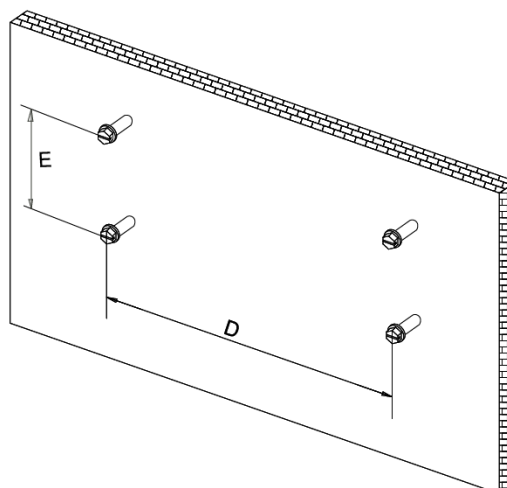
3.9.2 Bolt pitch

① Ceiling installation



Capacity (Btu/h)	D	E
18K, 24K	983	220
36K	1200	220
48K, 60K	1565	220

② Wall-mounted installation



3.9.3 Install the pendant bolt

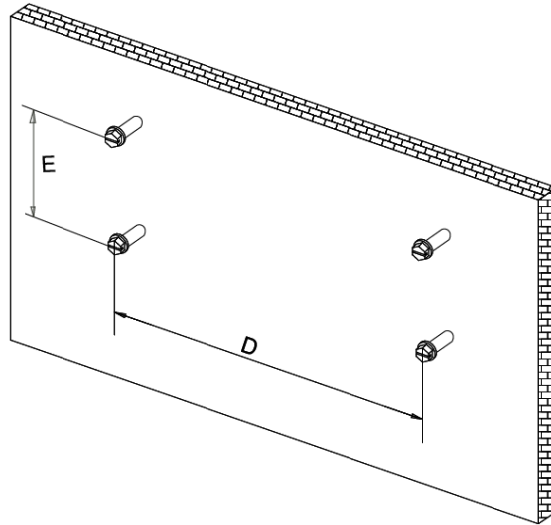
① Ceiling installation

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\varnothing 12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



② Wall-mounted installation

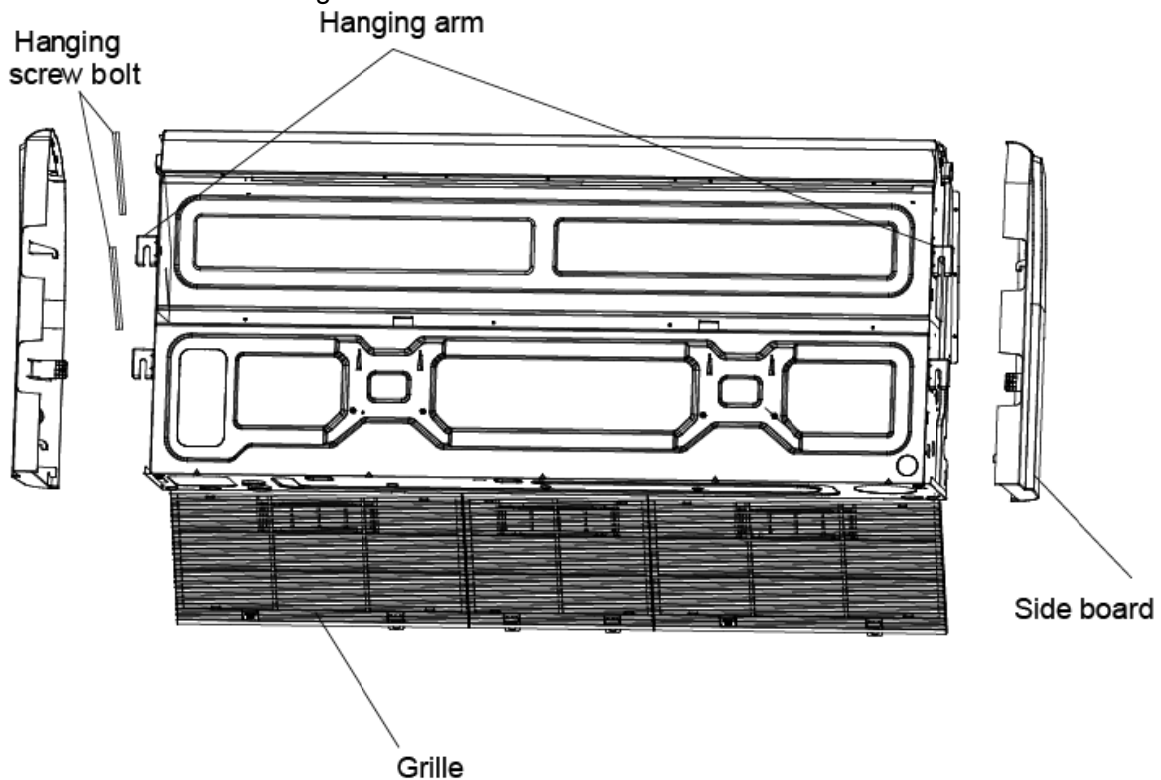
Install the tapping screws onto the wall.(Refer to picture below)



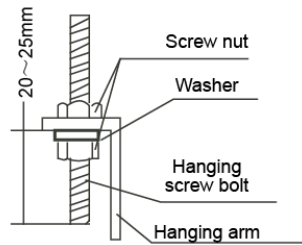
3.9.4 Install the main body

① Ceiling installation (The only installation method for the unit with drain pump)

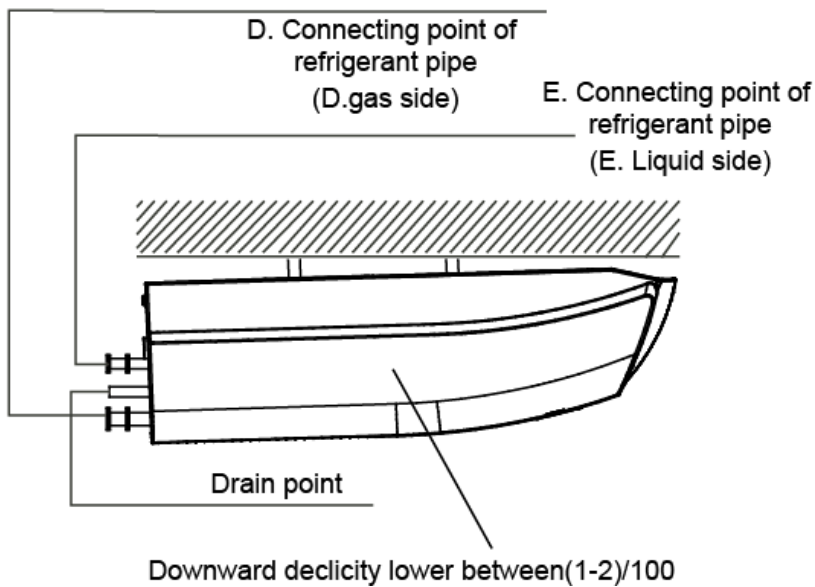
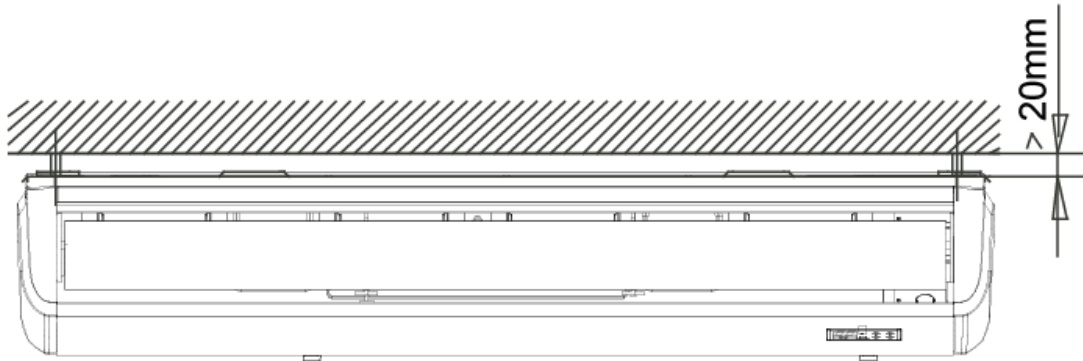
Remove the side board and the grille.



Locate the hanging arm on the hanging screw bolt. Prepare the mounting bolts on the unit.

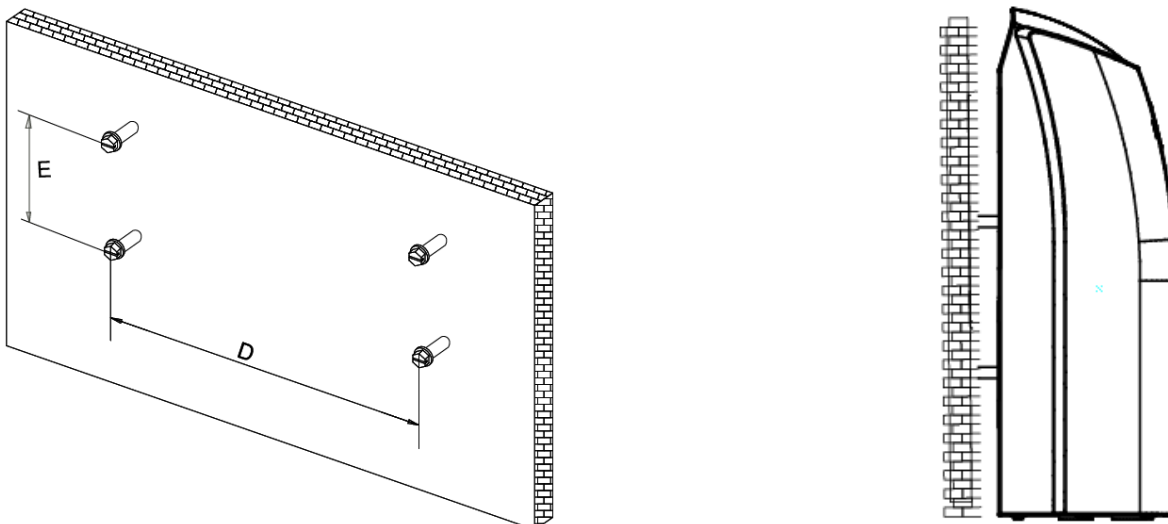


Put the side panels and grilles back.



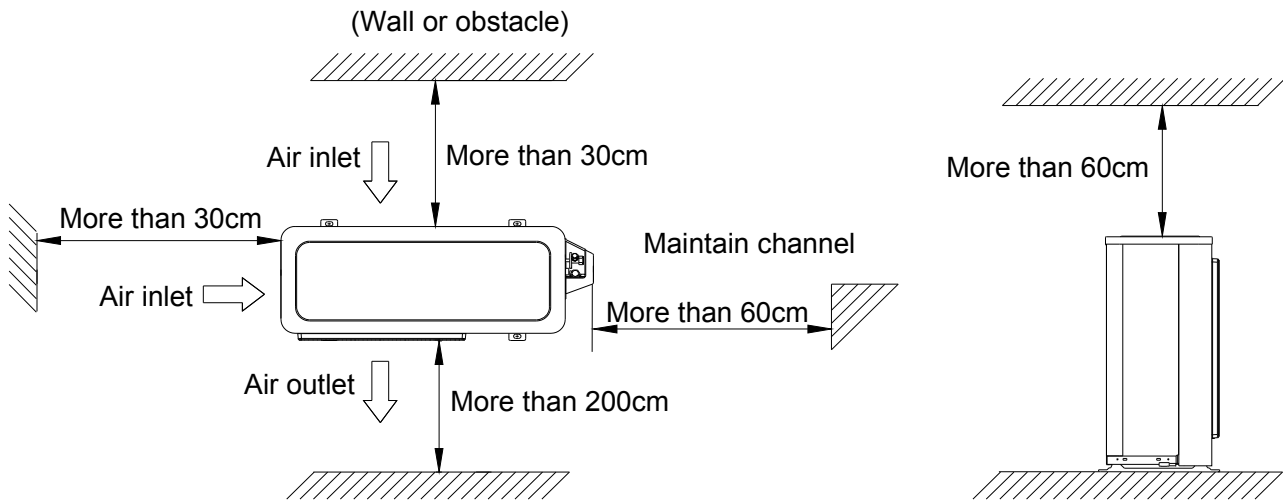
② Wall-mounted installation

Hang the indoor unit by insert the tapping screws into the hanging arms on the main unit. (The bottom of body can touch with floor or suspended, but the body must install vertically.)

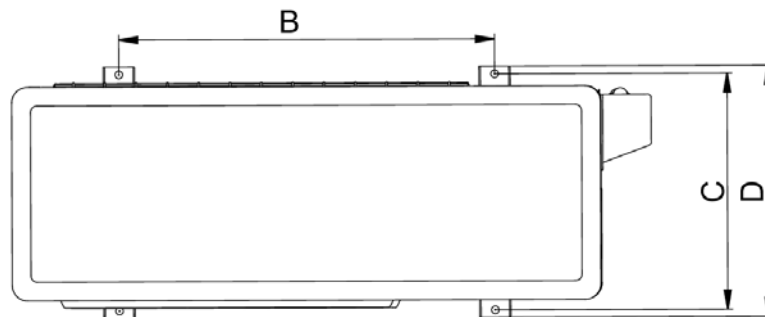


4. Outdoor unit installation (Side Discharge Unit)

4.1 Service space for outdoor unit



4.2 Bolt pitch



Model	B	C	D
12K	530	290	315
12K(W190)	549	325	350
18K	530	290	315
18K(W190)	549	325	350
24K	560	335	360
30K	590	333	355
36K	624	366	396
48K	600	376	400
60K	600	376	400
48K (New)	634	404	448
60K (New)	634	404	448

4.3 Install the Unit

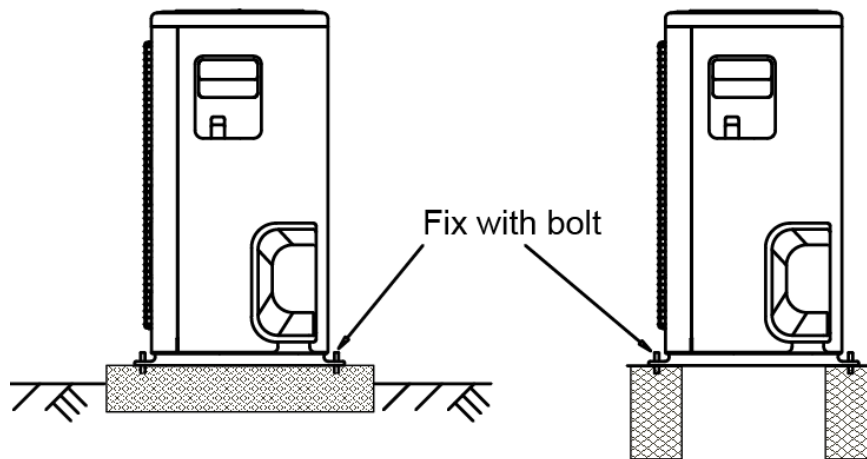
Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling. Never hold the inlet of the outdoor unit to prevent it from deforming.

Do not touch the fan with hands or other objects.

Do not lean it more than 45°, and do not lay it sidelong.

Make concrete foundation according to the specifications of the outdoor units.

Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind.



5. Refrigerant pipe installation

5.1 Maximum pipe length and height drop

Considering the allowable pipe length and height drop to decide the installation position. Make sure the distance and height drop between indoor and outdoor unit not exceeded the data in the following table.

Model	Max. Length	Max. Elevation
12,000Btu/h	25m	10m
18,000Btu/h	30m	20m
24,000Btu/h~30,000Btu/h	50m	25m
36,000Btu/h ~60,000Btu/h	65m	30m

5.2 The procedure of connecting pipes

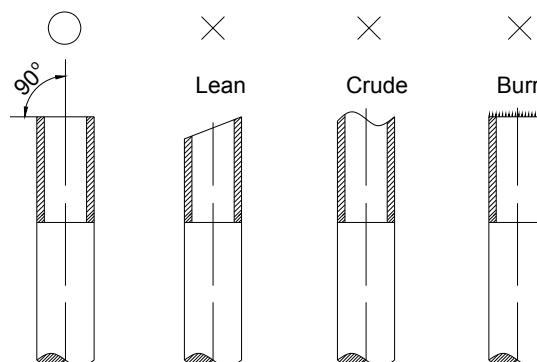
5.2.1 Choose the pipe size according to the specification table.

5.2.2 Confirm the cross way of the pipes.

5.2.3 Measure the necessary pipe length.

5.2.4 Cut the selected pipe with pipe cutter

- Make the section flat and smooth.

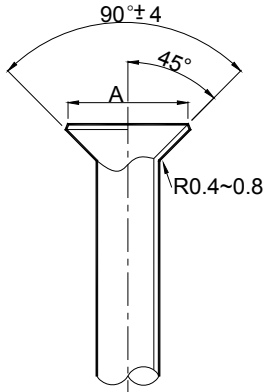


5.2.5 Insulate the copper pipe

- Before test operation, the joint parts should not be heat insulated.

5.2.6 Flare the pipe

- Insert a flare nut into the pipe before flaring the pipe
- According to the following table to flare the pipe

Pipe diameter	Flare dimension A (mm)		Flare shape
	Min	Max	
1/4" (6.35)	8.3	8.7	
3/8" (9.52)	12.0	12.4	
1/2" (12.7)	15.4	15.8	
5/8" (15.9)	18.6	19.1	
3/4" (19)	22.9	23.3	

➤ After flared the pipe, the opening part must be seal by end cover or adhesive tape to avoid duct or exogenous impurity come into the pipe.

5.2.7 Drill holes if the pipes need to pass the wall.

5.2.8 According to the field condition to bend the pipes so that it can pass the wall smoothly.

5.2.9 Bind and wrap the wire together with the insulated pipe if necessary.

5.2.10 Set the wall conduit

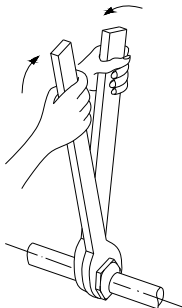
5.2.11 Set the supporter for the pipe.

5.2.12 Locate the pipe and fix it by supporter

- For horizontal refrigerant pipe, the distance between supporters should not be exceed 1m.
- For vertical refrigerant pipe, the distance between supporters should not be exceed 1.5m.

5.2.13 Connect the pipe to indoor unit and outdoor unit by using two spanners.

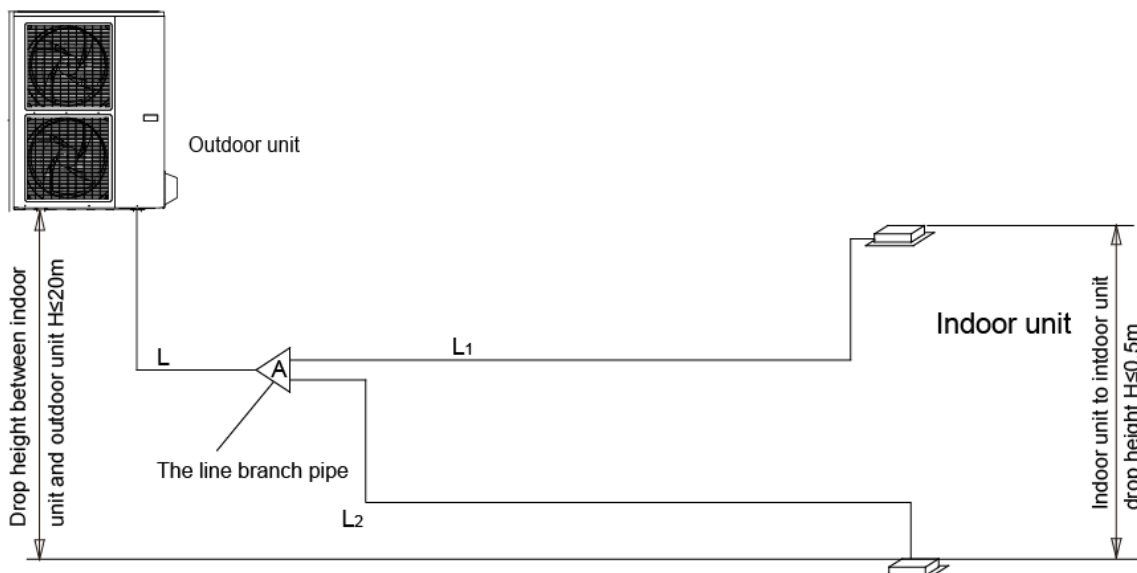
➤ Be sure to use two spanners and proper torque to fasten the nut, too large torque will damage the bellmouthing, and too small torque may cause leakage. Refer the following table for different pipe connection.

Pipe Diameter	Torque		Sketch map
	(kgf.cm)	(N.cm)	
1/4" (6.35)	144~176	1420~1720	
3/8" (9.52)	333~407	3270~3990	
1/2" (12.7)	504~616	4950~6030	
5/8" (15.9)	630~770	6180~7540	
3/4" (19)	990~1210	9270~11860	

5.3 For Units with Twins Function

5.3.1 Length and drop height permitted of the refrigerant piping

Note: Reduced length of the branching tube is the 0.5m of the equivalent length of the pipe.



Note: All used branch pipe must be produced by Midea, otherwise it causes malfunction. The indoor units should be installed equivalently at the both side of the U type branch pipe.

		Permitted Value		Piping
Pipe Length	Total pipe length (Actual)	18K+18K	30m	L+L1+L2
		24K+24K	50m	
		30K+30K	50m	
	Max. branch pipe length		15m	L1, L2
	Max. branch pipe length difference		10m	L1-L2
Drop Height	Max. height difference between indoor unit and outdoor unit		20m	H1
	Max. height difference between indoor units		0.5m	H2

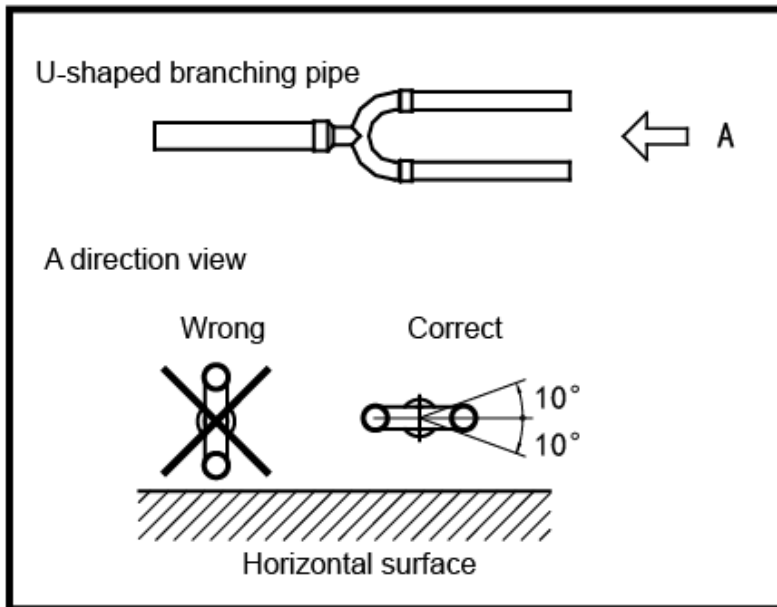
5.3.2 Size of joint pipes for indoor unit (R410a)

Capacity of indoor unit (A)	Size of main pipe(mm)		
	Gas side	Liquid side	Available branching pipe
18K	Φ12.7	Φ6.35	CE-FQZHN-01C
24K	Φ15.9	Φ9.5	CE-FQZHN-01C
30K	Φ15.9	Φ9.5	CE-FQZHN-01C

5.3.3 Size of joint pipes for outdoor unit (R410a)

Model	the size of main pipe(mm)		
	Gas side	Liquid side	The 1st branching pipe
36K	Φ15.9	Φ9.5	CE-FQZHN-01C
48K	Φ15.9	Φ9.5	CE-FQZHN-01C
60K	Φ15.9	Φ9.5	CE-FQZHN-01C

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



8. Additional refrigerant charge

- After the vacuum drying process is carried out, the additional refrigerant charge process need to be performed.
- The outdoor unit is factory charged with refrigerant. The additional refrigerant charge volume is decided by the diameter and length of the liquid pipe between indoor and outdoor unit. Refer the following formula to calculate the charge volume.

Diameter of liquid pipe (mm)	Φ6.35	Φ9.52
Formula	$V=15g/m \times (L-5)$	$V=30g/m \times (L-5)$

V: Additional refrigerant charge volume (g).

L : The length of the liquid pipe (m).

Note:

- Refrigerant may only be charged after performed the vacuum drying process.
- Always use gloves and glasses to protect your hands and eyes during the charge work.
- Use electronic scale or fluid infusion apparatus to weight refrigerant to be recharged. Be sure to avoid extra refrigerant charged, it may cause liquid hammer of the compressor or protections.
- Use supplementing flexible pipe to connect refrigerant cylinder, pressure gauge and outdoor unit. And The refrigerant should be charged in liquid state. Before recharging, The air in the flexible pipe and manifold gauge should be exhausted.
- After finished refrigerant recharge process, check whether there is refrigerant leakage at the connection joint part.(Using gas leakage detector or soap water to detect).

Part 5

Electrical Control System

1. Electrical Control Function.....	185
2. Troubleshooting.....	202
3. Controller.....	235

1. Electrical Control Function

1.1 Definition

- T1: Indoor room temperature
 T2: Coil temperature of indoor heat exchanger middle.
 T2B: Coil temperature of indoor heat exchanger outlet.
 T3: Coil temperature of condenser
 T4: Outdoor ambient temperature
 T5: Compressor discharge temperature
 Td: Target temperature

1.2 Main Protection

1.2.1 Time delay at restart for compressor.

1.2.2 Temperature protection of compressor top

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

1.2.3 Temperature protection of compressor discharge

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

For MDOU-12HDN1 :

- Compressor discharge temp. $T5 > 115^{\circ}\text{C}$ for 5s, compressor stops.
- $108 < T5 < 115^{\circ}\text{C}$, decrease the frequency to the lower level every 3 minutes till F1.
- $90 < T5 < 105^{\circ}\text{C}$, keep running at the current frequency.
- $T5 < 90^{\circ}\text{C}$, no limit for frequency.

For MDOZU-12HDN1-Q:

- Compressor discharge temp. $T5 > 115^{\circ}\text{C}$ for 5s, compressor stops and restarts up till $T5 < 90^{\circ}\text{C}$
- $110 < T5 < 115^{\circ}\text{C}$, decrease the frequency to the lower level every 2 minutes.
- $105 < T5 < 110^{\circ}\text{C}$, keep running at the current frequency.
- $T5 < 105^{\circ}\text{C}$, no limit for frequency.

For other models:

- If $102^{\circ}\text{C} < T5 < 115^{\circ}\text{C}$, decrease the frequency to the lower level every 2 minutes till to F1.
- If $T5 > 115^{\circ}\text{C}$ for 10 seconds, the compressor will stop and restart till $T5 < 90^{\circ}\text{C}$.

1.2.4 Sensor protection at open circuit and breaking disconnection.

1.2.5 Indoor fan delayed open function

- When system starts up, the louver will be active immediately and the indoor fan will open 10s (for MDCA3-12HRDN1, MDTB1-12HWDN1 and MDFA-12HRFN1, it is 7s) later..
- If the system runs in heating mode, the anti-cold wind function has priority.

1.2.6 Fan speed is out of control (Only for Console)

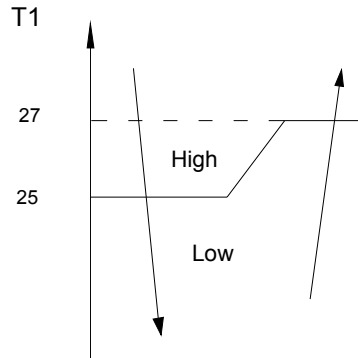
When Indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure

1.3 Operation Modes and Functions

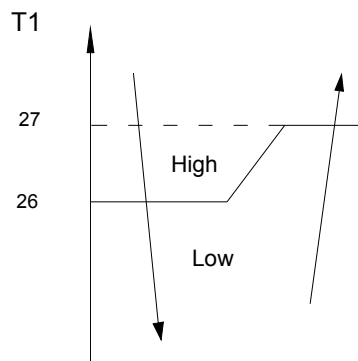
1.3.1 Fan mode

- (1) Outdoor fan and compressor stop.
- (2) Temperature setting function is disabled, and no setting temperature is displayed.
- (3) Indoor fan can be set to high/(med)/low/auto.
- (4) The louver operates same as in cooling mode.
- (5) Auto fan:

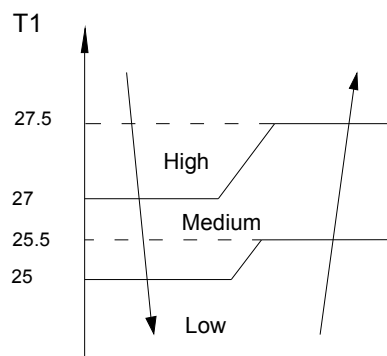
For MDCA2-12HRDN1:



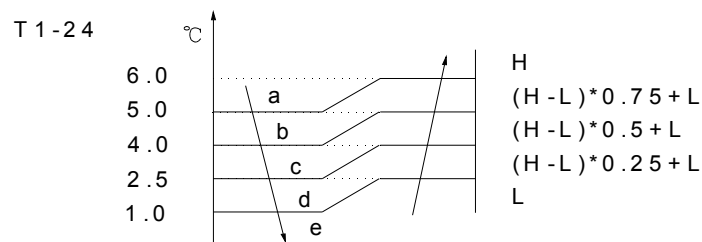
For GA floor standing:



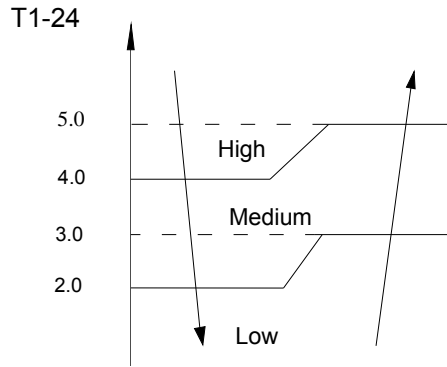
For 12k models(excluding MDCA2-12HRDN1 MDFA-12HRFN1):



For MDFA-12HRFN1:



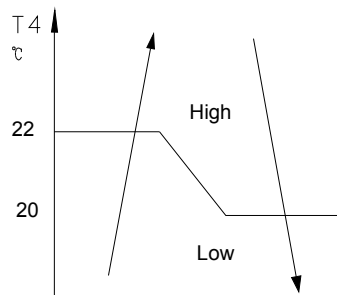
For other models:



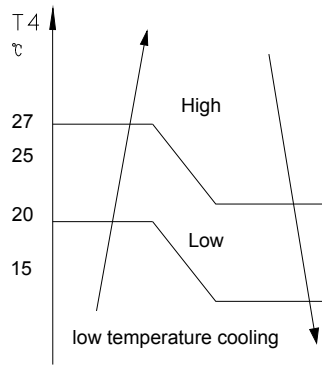
1.3.2 Cooling Mode

1.3.2.1 Outdoor fan running rules

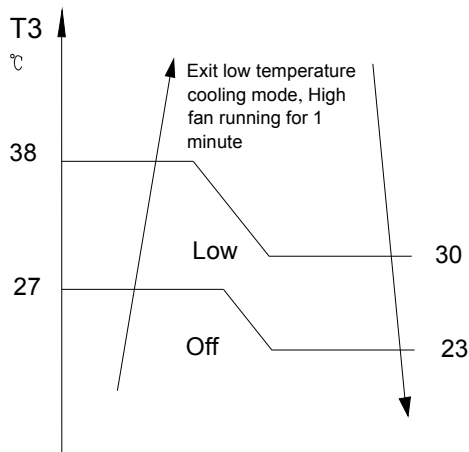
For 12k models:



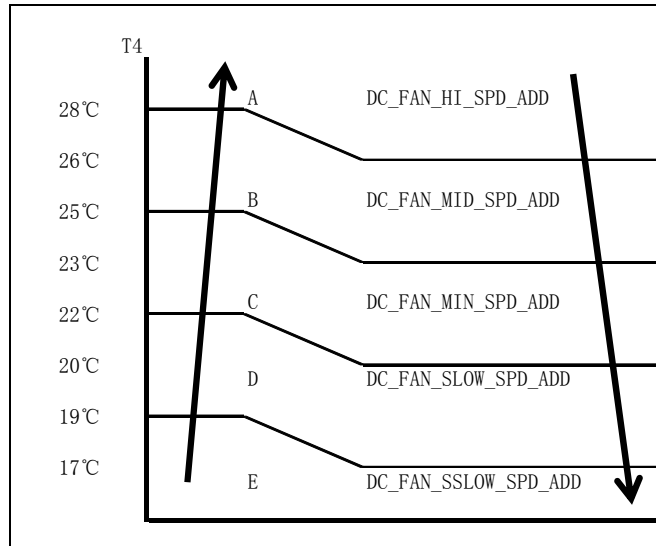
For other models:



Outdoor fan in low temperature cooling mode acts as follow:



MDOU-18HFN1:

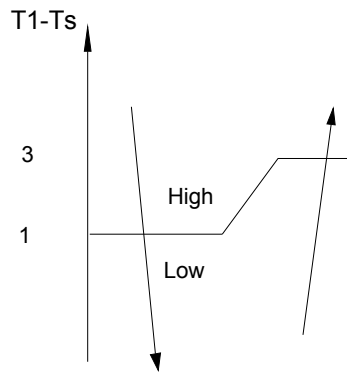


1.3.2.2 Indoor fan running rules

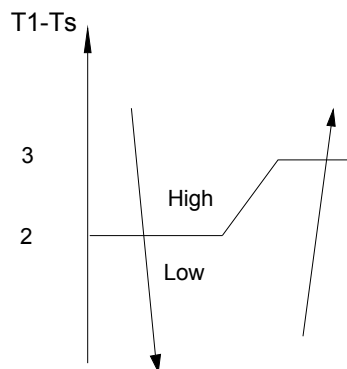
In cooling mode, indoor fan runs all the time and the speed can be selected as high, (medium), low and auto.

The auto fan:

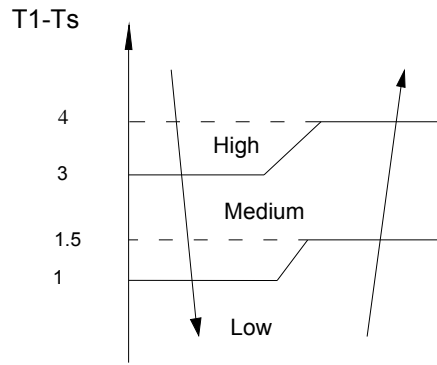
For MDCA2-12HRDN1



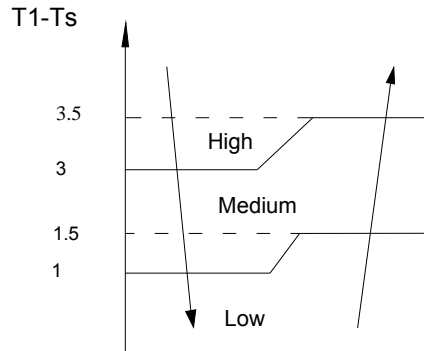
For GA floor standing:



For MDUB-12HRDN1 & MDTB1-12HWDN1 :



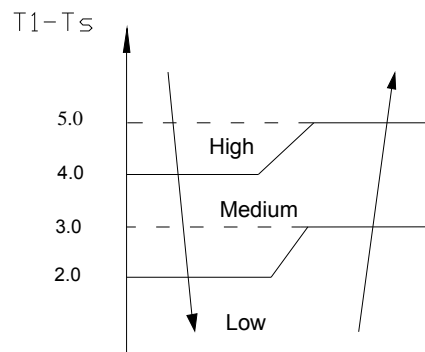
For MDFA-12HRDN1, MDCA3-12HRDN1, MDTB1-12HWDN1:



For MDFA-12HRFN1:

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

For other models:



1.3.2.3 Evaporator low temperature T2 protection.

For 12k models:

---T2<0°C, the compressor will stop and restart when T2≥5°C.

--- $0^{\circ}\text{C} \leq T2 < 4^{\circ}\text{C}$, the compressor frequency will be limited and decreased to the lower level every 1 minute till off.

--- $4^{\circ}\text{C} \leq T2 \leq 7^{\circ}\text{C}$, the compressor will keep the current frequency.

--- $T2 > 7^{\circ}\text{C}$, the compressor frequency will not be limited.

For other models: When $T2 < 2^{\circ}\text{C}$ and lasts for 3 minutes, the indoor has no capacity demand and resume till $T2 \geq 7^{\circ}\text{C}$.

1.3.2.4 Condenser high temperature T3 protection

For 12k models(Excluding MDCA3-12HRDN1, MDTB1-12HWDN1, MDFA-12HRFN1) :

--- $55^{\circ}\text{C} < T3 < 60^{\circ}\text{C}$, the compressor frequency will decrease to the lower level every 3 minutes till F1 and then runs at F1. If $T3 < 54^{\circ}\text{C}$, the compressor will keep running at the current frequency.

--- $T3 < 52^{\circ}\text{C}$, the compressor will not limit the frequency and resume to the former frequency.

--- $T3 > 60^{\circ}\text{C}$ for 5 seconds, the compressor will stop until $T3 < 52^{\circ}\text{C}$.

For MDCA3-12HRDN1, MDTB1-12HWDN1, MDFA-12HRFN1:

--- $61 < T3 < 66$, the compressor frequency will decrease to the lower level until to F1 and then runs at F1 per minute. If $T3 < 61$, the compressor will keep running at the current frequency.

--- $T3 < 58$, the compressor will not limit the frequency and resume to the former frequency.

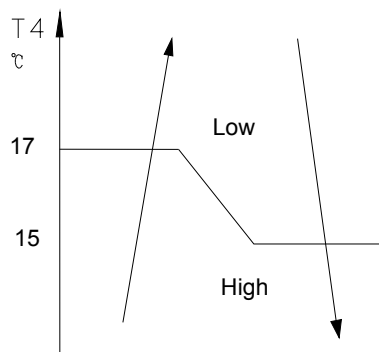
--- $T3 > 66$ for 5 seconds, the compressor will stop until $T3 < TP3-3$.

For other models: When $T3 \geq 65^{\circ}\text{C}$ for 3 seconds, the compressor will shut off. When $T3 < 52$, the compressor will restart.

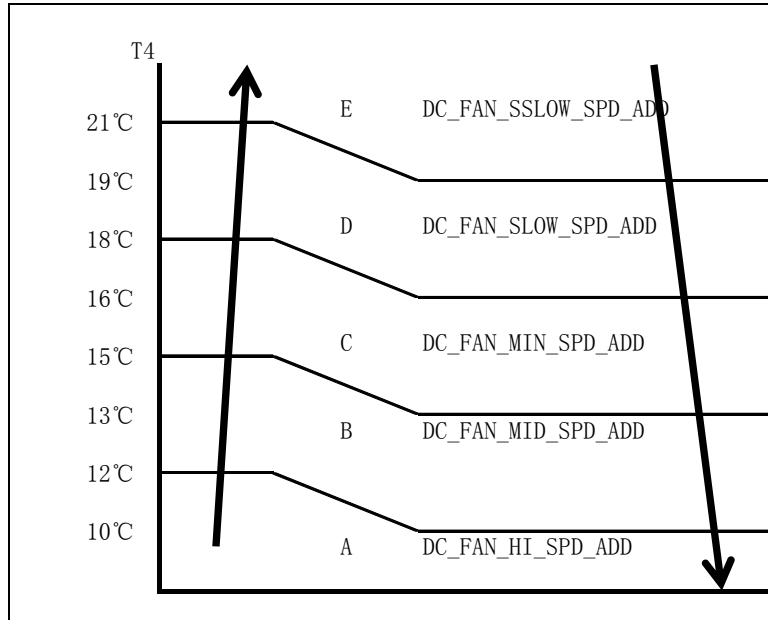
1.3.3 Heating Mode

1.3.3.1 Outdoor fan running rules:

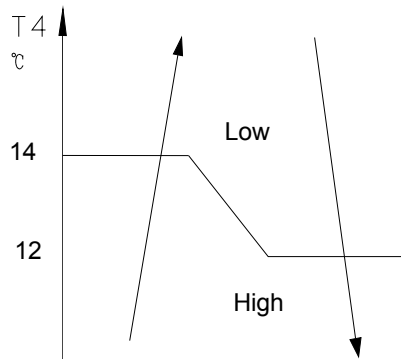
For 12k models:



MOZU-18HFN1-QRC8:



For other models:

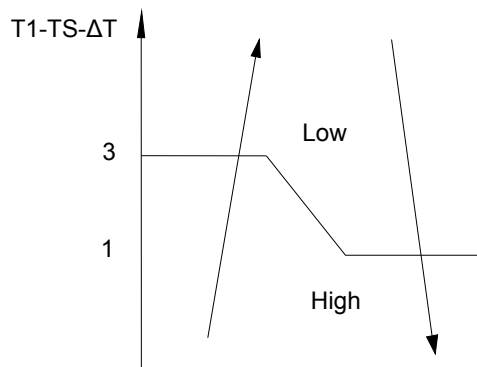


1.3.3.2 Indoor fan running rules:

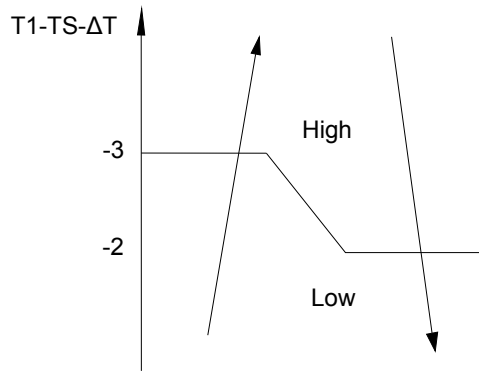
When the compressor is on, the indoor fan can be set to high/(med)/low/auto. And the anti-cold wind function has the priority.

Auto fan action:

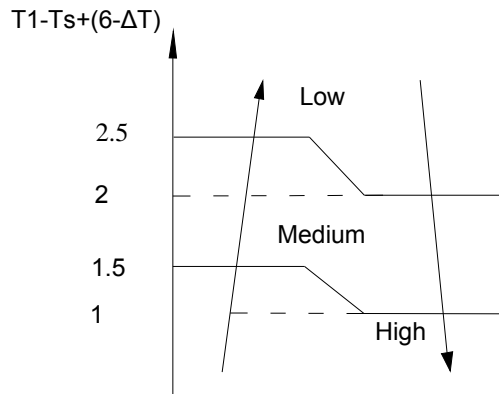
For MDCA2-12HRDN1:



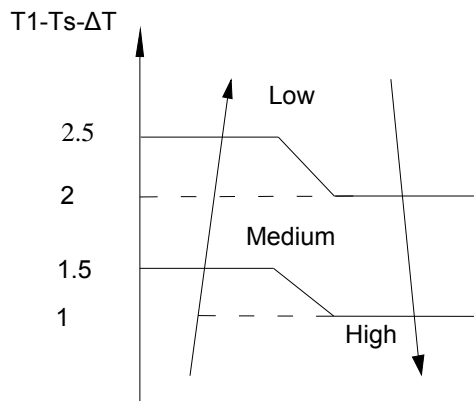
For GA floor standing:



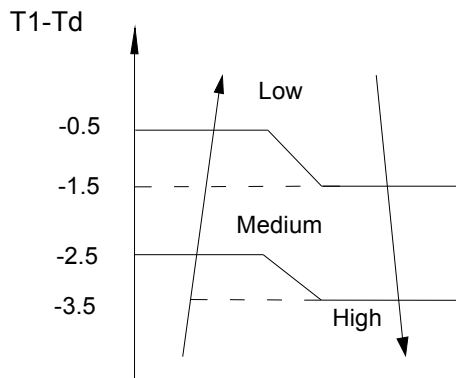
For MDUB-12HRDN1 & MDTB1-12HWDN1:



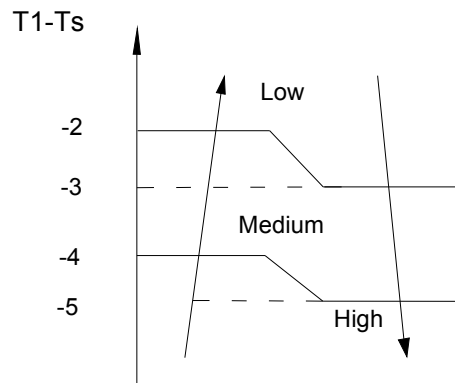
For MDFA-12HRDN1:



For MDCA3-12HRDN1, MDTB1-12HWDN1, MDFA-12HRFN1:



For other models:



1.3.3.4 Defrosting mode:

For 12k models(Excluding MDOU-12HDN1):

Condition of defrosting:

---- $T_4 > 0^{\circ}\text{C}$,

Defrosting starts when either of the following ①&②:

- ② The units run with $T_3 < 3^{\circ}\text{C}$ for 40 minutes and T_3 keeps lower than $\text{TCDI}^{\circ}\text{C}$ for more than 3 minutes.
- ②: The units run with $T_3 < 3^{\circ}\text{C}$ for 80 minutes and T_3 keeps lower than $(\text{TCDI}+2)^{\circ}\text{C}$ for more than 3 minutes..

---- $T_4 < 0^{\circ}\text{C}$,

If ① and ② are satisfied, then the program judges if T_2 has decreased more than 5°C . When T_2 has decreased more than 5°C , enter the defrosting mode.

----No matter what value of the T_4 is and whether the T_2 drops more than 5°C or not, if the machine runs with $T_3 < 3^{\circ}\text{C}$ for more than 120 minutes and T_3 keeps lower than $(\text{TCDI}+4)^{\circ}\text{C}$ for more than 3 minutes, the machine will enter defrosting mode.

Condition of ending defrosting:

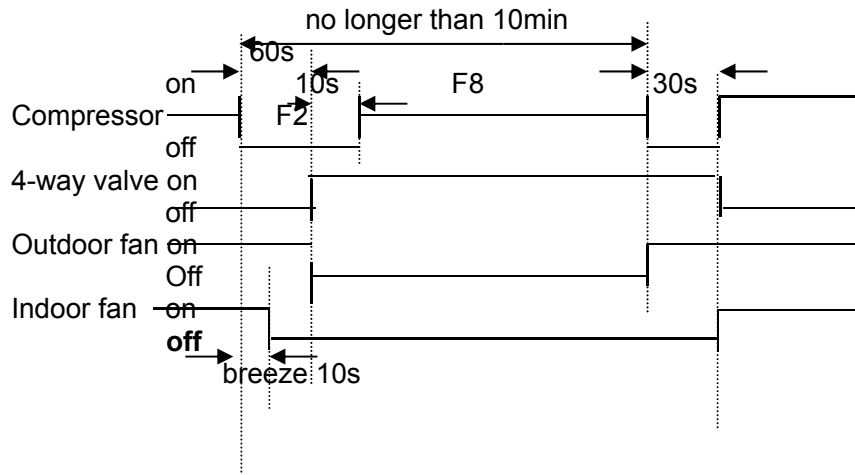
If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

---- T_3 rises to be higher than $\text{TCDE}1^{\circ}\text{C}$.

---- T_3 keeps to be higher than $\text{TCDE}2^{\circ}\text{C}$ for 80 seconds.

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

- **Defrosting action:**

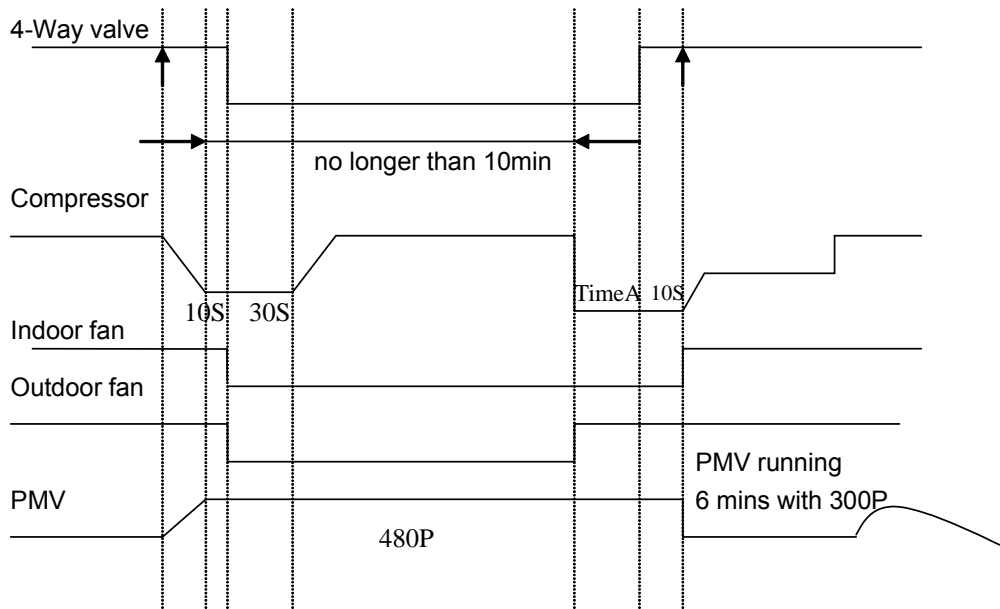


For 18-36K(1-Phase) models(Excluding MDOU-18HFN1):

Condition of defrosting:

$T3 \leq \text{TempEnterDefrost_ADD } ^\circ\text{C}$ and lasts for 40 minutes.

Defrosting action:



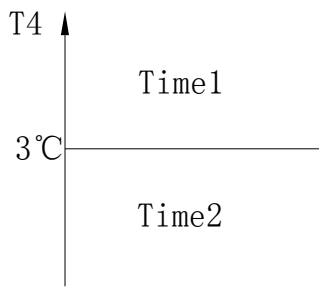
Condition of ending defrosting:

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

- ① $T3 > \text{TempQuitDefrost_ADD } ^\circ\text{C}$;
- ② The defrosting time achieves 10min.

For 48K(1-Phase), 36-60K(3-Phase) , MDOU-18HFN1models:

Condition of defrosting:



Time conditions:

time1

Time conditions (Meet the following conditions)

1. Running in heating mode
 2. $T4 \geq 3^{\circ}\text{C}$
 3. Compressor is on
 4. $T3 \leq \text{TempEnterDefrost_ADD } ^{\circ}\text{C}$
- Cleared conditions (Meet any one of the following conditions)

1. Compressor is off.
2. $T3 > \text{TempEnterDefrost_ADD } ^{\circ}\text{C}$

Time2

Time conditions (Meet the following conditions)

1. Running in heating mode
2. $T4 < 3^{\circ}\text{C}$
3. Compressor is on
4. $T3 \leq \text{TempEnterDefrost_ADD } ^{\circ}\text{C}$

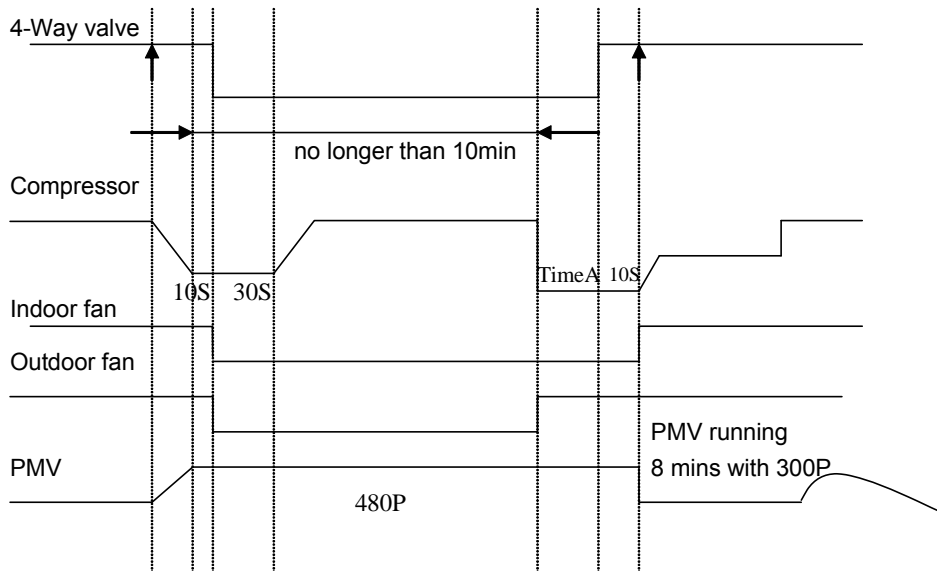
Cleared conditions (Meet any one of the following conditions)

1. Compressor is off and $T3 > \text{TempEnterDefrost_ADD} + 2^{\circ}\text{C}$ last for 20 minutes
2. Running in cooling mode.
3. Compressor is off for 1 hour.

Condition of entry defrosting:

$\text{time1} + \text{time2} \geq 40$ minutes, When defrosting is end, time1 and time2 are cleared.

Defrosting action:



Condition of ending defrosting:

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

- ① The defrosting time achieves 10min;
- ② $T3 \geq 15^{\circ}\text{C}$;
- ③ $T3 \geq 7^{\circ}\text{C}$ for 60seconds.

For MDOU-12HDN1 :

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 T3 from the 10th minutes to 15th minutes as T30.

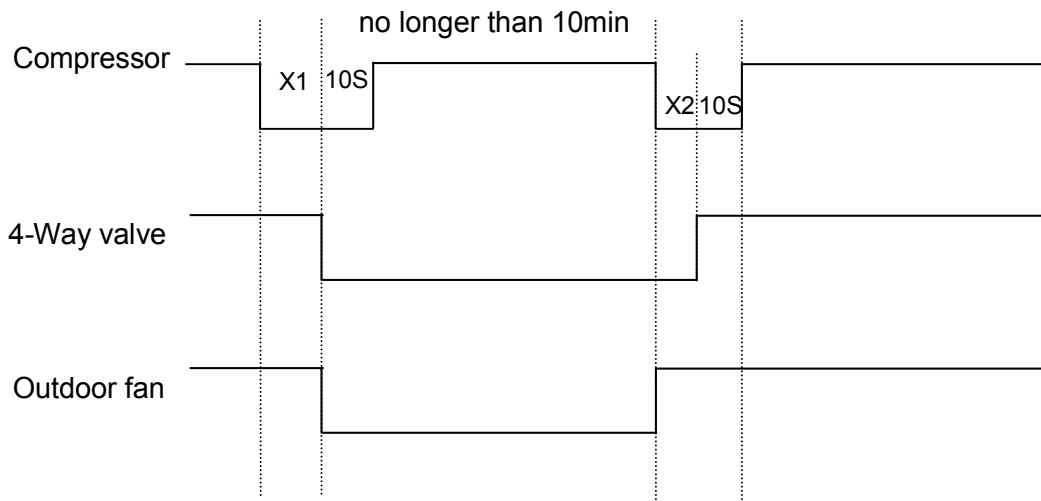
- 1) If the compressor cumulate running time is up to 29 minutes and $T3 < TCDI1$, $T3 + T30SUBT3ONE \cong T30$.
- 2) If the compressor cumulate running time is up to 35 minutes and $T3 < TCDI2$, $T3 + T30SUBT3TWO \cong T30$.
- 3) If the compressor cumulate running time is up to 40 minutes and $T3 < TCDI3$ for 3 minutes.
- 4) If the compressor cumulate running time is up to 120 minutes and $T3 < -15^{\circ}\text{C}$.

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.

- T3 rises to be higher than $TCDE1^{\circ}\text{C}$.
- T3 keeps to be higher than $TCDE2^{\circ}\text{C}$ for 80 seconds.
- The machine has run for 10 minutes in defrosting mode.

Defrosting action:



1.3.3.5 High evaporator coil temp.T2 protection:

For 12k models(Excluding MDCA3-12HRDN1, MDTB1-12HWDN1,MDFA-12HRFN1) :

---T2> TEH2°C, the compressor running frequency decreases to the lower level every 20s.

When the frequency decreases to F2 and the T2 is still over TEH2°C for 3 minutes, the compressor will stop.

---T2<48°C or TEH2°C<T2<48°C for 6 minutes , the frequency will not be limited.

---T2>60°C, the compressor will stop and restart when T2<48°C.

Console 18k: T2>63°C, the compressor will stop and restart when T2<52°C.

For MDCA3-12HRDN1, MDTB1-12HWDN1,MDFA-12HRFN1: T2>60°C, the compressor will stop and restart when T2<56°C.

For other models: T2>60°C, the compressor will stop and restart when T2<54°C.

1.3.4 Auto-mode

This mode can be chosen with 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 ΔT ($\Delta T = T1 - Ts$).

For 12k models(Excluding MDCA3-12HRDN1, MDTB1-12HWDN1,MDFA-12HRFN1):

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

For MDCA3-12HRDN1, MDTB1-12HWDN1,MDFA-12HRFN1:

$\Delta T = T1 - Ts$	Running mode
$\Delta T > 2^\circ\text{C}$	Cooling
$-2 < \Delta T < 2^\circ\text{C}$	Fan-only
$\Delta T < -2^\circ\text{C}$	Heating

For other models:

$\Delta T = T_1 - T_s$	Running mode
$\Delta T \geq 2^\circ\text{C}$	Cooling
$-1 \leq \Delta T < 2^\circ\text{C}$	Fan-only
$\Delta T < -1^\circ\text{C}$	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 $T_1 - T_s$.

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

1.3.5 Drying mode**For 12k models(Excluding MDCA3-12HRDN1, MDTB1-12HWDN1, MDFA-12HRFN1):**

1.3.5.1 Indoor fan speed is fixed in low(for console, it is fixed in breeze) and can't be changed. The louver angle is the same as in cooling mode.

1.3.5.2 Low indoor room temperature protection

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

1.3.5.3 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

For other models:

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

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

1.3.6 Timer function

1.3.6.1 Timing range is 24 hours.

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

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

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

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

1.3.6.6 Only for MCA2-12HRDN1-Q:

The timer function will change the AC current operation mode. Suppose users set the "timer off" function and AC is off now, the AC will turn on firstly and then turn off when reaching the setting time.

For other models:

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.

1.3.6.7 The setting time is relative time.

1.3.7 Economy function

For 12k models(Excluding MDCA3-12HRDN1, MDTB1-12HWDN1,MDFA-12HRFN1):

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

1.3.7.2. Operation process in sleep mode is as follow:

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

When heating, the setting temperature decreases 1°C (be higher than 17°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at low speed. (Anti-cold wind function has the priority).

1.3.7.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off

1.3.7.4 Shutdown, change the mode or speed setting will cancel the economic operation.

1.3.7.5 When user uses timer off function in sleep mode (or sleep function in timer off mode), if the timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

For console 18k & GA floor standing:

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

1.3.7.2. Operation process in sleep mode is as follow:

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

When heating, the setting temperature decreases 1°C (be higher than 17°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at auto speed. (Anti-cold wind function has the priority).

1.3.7.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off

1.3.7.4 Shutdown, change the mode or speed setting will cancel the economic operation.

1.3.7.5 When user uses timer off function in sleep mode (or sleep function in timer off mode), if the timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

For other models:

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

1.3.7.2. Operation process in sleep mode is as follow:

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

When heating, the setting temperature decreases 1°C (be higher than 17°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at low speed. (Anti-cold wind function has the priority).

1.3.7.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode but doesn't turns off

1.3.7.4 Timer setting is available

1.3.8 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting automatically after 3 minutes when power returns.

1.3.9 Drain pump control

For 12k models(Excluding MDCA3-12HRDN1, MDTB1-12HWDN1,MDFA-12HRFN1:

1.3.9.1 Water level check

The water lever will be checked every 5 seconds, if the feedback signal is abnormal, it will be considered as drain water full by the control system.

1.3.9.2 Drain pump control

If there is no water full error, the drain pump will be on when the unit is in cooling mode (including auto-cooling and forced cooling) and dry mode. It will be off when the unit is in heating mode, fan only mode or off state or compressor is stopped (if the pump is on before the unit is off, it will delay 2 minutes to be off).

If there is a water full error, the drain pump will be on when the error occurs. Afterwards:

If the error disappears in 2 minutes, the drain pump will work as normal state. (if it is necessary to turn off the pump, it will be off in 2 minute delay.)

The other models:

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

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

1. When the A/C operates with cooling (including auto cooling), dehumidifying, and forced cooling mode, the pump will start running immediately and continuously, till stop cooling.
2. Once the water level increase and up to the control point, LED will alarm and the drain pump open and continue checking the water level. If the water level fall down and LED disarmed (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,

1.3.10 Point Check Function(Except 12k models)

There is a check switch in outdoor PCB.

Press the switch SW1 to check the states of unit when the unit is running.

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.

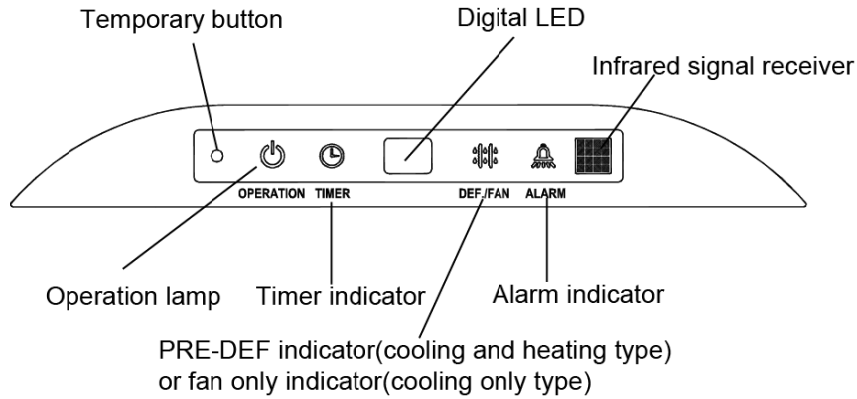
N	Display	Remark
00	Normal display	Display running frequency, running state or malfunction code
01	Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0)
02	Amendatory capacity demand code	
03	The frequency after the capacity requirement transfer	

04	The frequency after the frequency limit			
05	The frequency of sending to 341			
06	Indoor unit evaporator outlet temp.(T2)	If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70".		
07	Condenser pipe temp.(T3)	If the temp. is lower than -9 degree, the digital display tube will show "-9".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——"		
08	Outdoor ambient temp.(T4)			
09	Compressor discharge temp.(Tp)	The display value is between 30~120 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. the digital display tube show "1.6",it means the compressor discharge temp. is 116 degree)		
10	AD value of current	The display value is hex number.		
11	AD value of voltage			
12	Indoor unit running mode code	Off:0, Fan only 1,Cooling:2, Heating:3, Forced cooling:4		
13	Outdoor unit running mode code			
14	EXV open angle	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example ,the digital display tube show "2.0",it means the EXV open angle is $120 \times 4 = 480p$.)		
15	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 Tp.	
		Bit1	Frequency limit caused by current	
Bit0	Frequency limit caused by voltage			
16	DC fan motor speed			
17	IGBT radiator temp.(Reserved)	The display value is between 13~120 degree. If the temp. is lower than 13 degree, the digital display tube will show "13".If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "0.5",it means the IGBT radiator temp. is 105 degree. the digital display tube show "1.6",it means the IGBT radiator temp. is 116 degree)		
18	Indoor unit number	The indoor unit can communicate with outdoor unit well.		
19	Condenser pipe temp. of 1# indoor unit	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 capacity demand is 0, , the digital display tube will show "0. If the indoor unit is not connected, the digital display tube will show: "——"		
20	Condenser pipe temp. of 2# indoor unit			
21	Condenser pipe temp. of 3# indoor unit			
22	1# Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0). If the indoor unit is not connected, the digital display tube will show: "——"		
23	2# Indoor unit capacity demand code			
24	3# Indoor unit capacity demand code			

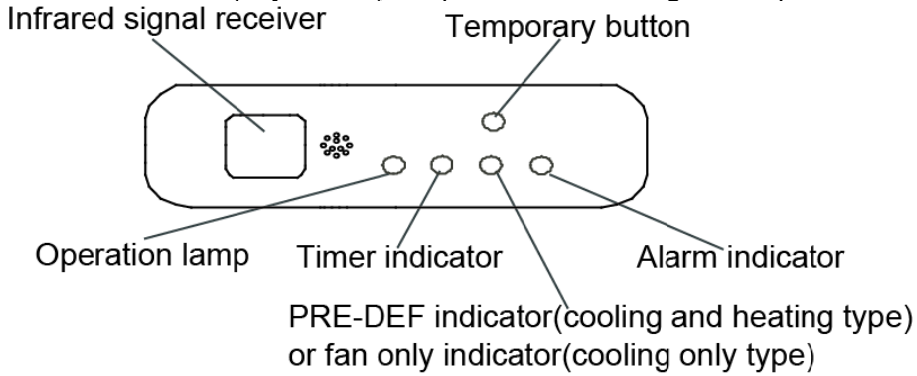
2. Troubleshooting

2.1 Display board

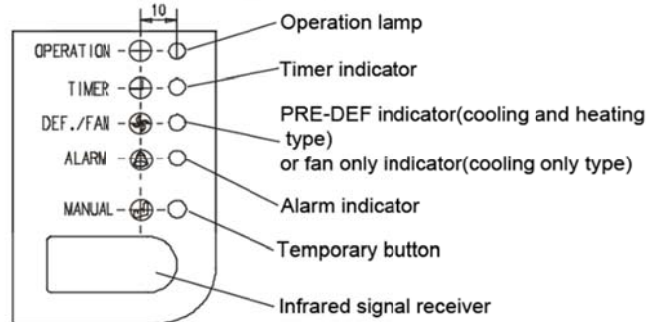
2.1.1 Icon explanation on indoor display board (Big cassette).



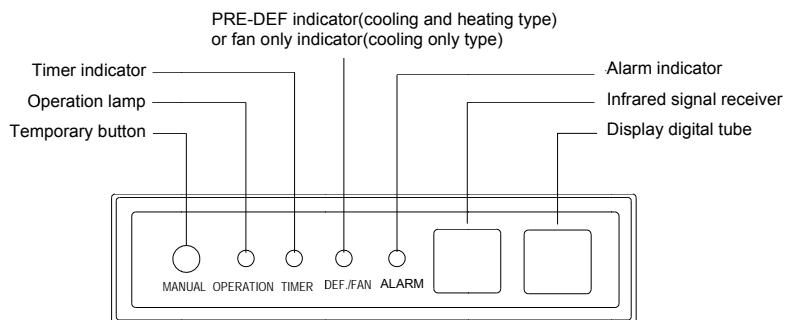
2.1.2 Icon explanation on indoor display board (Compact cassette & High static pressure Duct(MHD).)



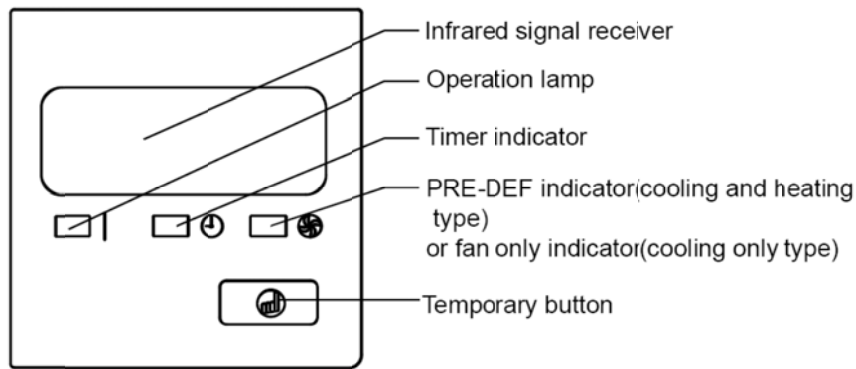
2.1.3 Icon explanation on indoor display board (Ceiling & floor)



2.1.4 Icon explanation on indoor display board (A5 Duct & High static pressure Duct(MHG))



2.1.5 Icon explanation on indoor display board (Console)

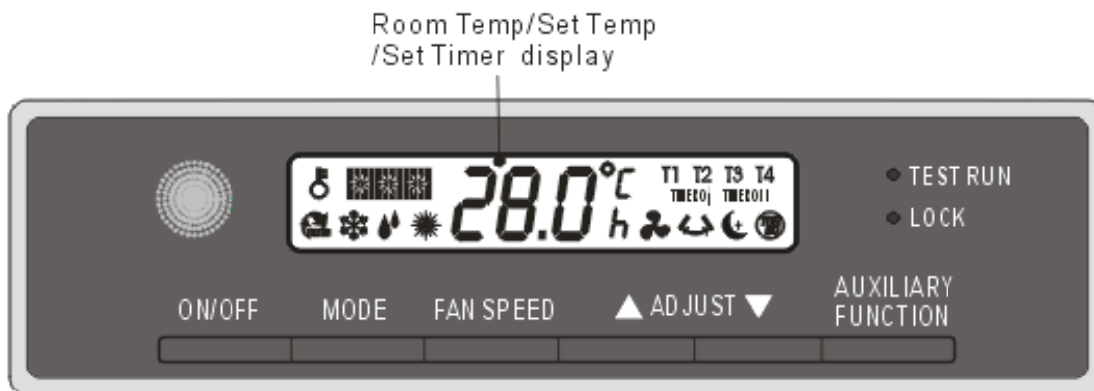


2.1.6 Display board of auto-lifting panel of 4 way cassette



2.1.7 Display board of GA floor standing

Unit Control Panel

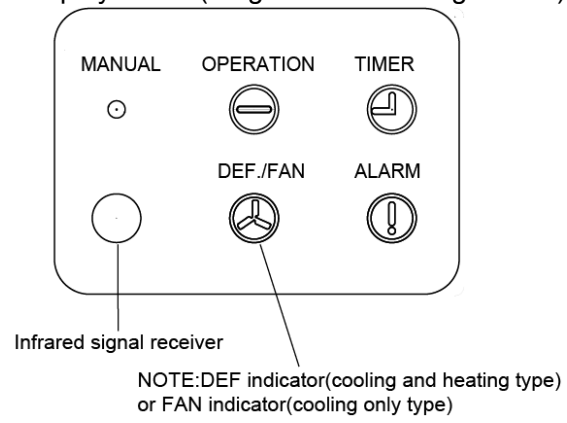


Indicators

- Auto operation display
- Cooling operation display
- Dry operation display
- Heating operation display
- Fan operation display

- Swing operation display
- Sleep operation display
- Turbo operation display
- TIMER ON On timer operation display
- TIMER OFF Off timer operation display
- Lock operation display
- Fan speed display

2.1.8 Icon explanation on indoor display board (3rd generation ceiling & floor)



2.2 Indoor unit malfunction

For MDCA2-12HRDN1:

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X
2	Open or short circuit of T1 temperature sensor	☆	X	X	X
3	Open or short circuit of T2 temperature sensor	X	X	☆	X
4	Water-level alarm malfunction	X	X	X	☆
5	Indoor EEPROM malfunction	☆	☆	X	X
6	IPM module protection	☆	X	X	O
7	Open or short circuit of T3 or T4 temperature sensor	☆	O	X	X
8	Outdoor unit voltage protection	☆	O	X	O
9	Outdoor unit over-current protection	☆	☆	X	☆
10	Top temperature protection of compressor	☆	☆	☆	☆
11	Inverter compressor drive protection	☆	◎	X	X
12	Discharge temperature protection of compressor	☆	X	O	X

O(light) X(off) ☆(flash at 2.5Hz) ◎(flash at 0.5Hz)

For MDUB-12HRDN1 & MDTB1-12HWDN1:

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(nixie tube)
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X	E0
2	Open or short circuit of T1 temperature sensor	☆	X	X	X	E1
3	Open or short circuit of T2 temperature sensor	X	X	☆	X	E2
4	Water-level alarm 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 unit voltage protection	☆	O	X	O	P0
9	Outdoor unit over-current protection	☆	☆	☆	X	P1
10	Top temperature protection of compressor	☆	X	O	X	P2
11	Inverter compressor drive protection	☆	◎	X	X	P4

O(light) X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)
Note: Digital display is only available for duct type.

For MDFA-12HRDN1:

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp
1	Communication malfunction between indoor and outdoor units.	X	☆	X
2	Open or short circuit of T1 temperature sensor	☆	X	X
3	Open or short circuit of T2 temperature sensor	X	X	☆
4	Indoor EEPROM malfunction	☆	☆	X
5	IPM module protection	☆	X	☆
6	Open or short circuit of T3 or T4 temperature sensor	☆	☆	☆
7	Outdoor unit voltage protection	☆	☆	O
8	Outdoor unit over-current protection	☆	O	O
9	Top temperature protection of compressor	☆	O	X
10	Inverter compressor drive protection	☆	◎	X
11	Indoor fan Speed has been out of control.	☆	O	☆
12	Outdoor fan malfunction	X	☆	O

O(light) X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)

For console type(18K)

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp
1	Indoor EEPROM malfunction	☆	☆	☆
2	Indoor fan Speed has been out of control.	☆	X	☆
3	Open or short circuit of T1 or T2 temperature sensor	☆	☆	X
4	Communication malfunction between indoor and outdoor units.	X	☆	X
5	Outdoor unit malfunction	X	X	◎

X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)

For MDCA2-18HRDN1&ceiling & floor(18-30K)

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X
2	Open or short circuit of T1 or T2 temperature sensor	☆	X	X	X
3	Water-level alarm malfunction	X	X	X	☆
4	Outdoor unit malfunction	X	X	X	◎

X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)

For Normal 4-way cassette(24K-30K)

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(nixie tube)
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X	E1
2	Open or short circuit of T1 temperature sensor	☆	X	X	X	E2
3	Open or short circuit of T2 temperature sensor	☆	X	X	X	E3
4	Open or short circuit of T2B temperature sensor	☆	X	X	X	E4
5	Water-level alarm malfunction	X	X	X	☆	EE
6	Indoor EEPROM malfunction	◎	X	X	X	E7
7	Outdoor unit malfunction	X	X	X	◎	Ed
X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)						

For Duct type(18-30K)

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(nixie tube)
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X	E1
2	Open or short circuit of T1 temperature sensor	☆	X	X	X	E2
3	Open or short circuit of T2 temperature sensor	☆	X	X	X	E3
4	Open or short circuit of T2B temperature sensor	☆	X	X	X	E4
5	Water-level alarm malfunction	X	X	X	☆	EE
6	Indoor EEPROM malfunction	X	X	☆	X	E7
7	Outdoor unit malfunction	X	X	X	◎	Ed
X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)						

For Normal 4-way cassette(36K-60K), ceiling & floor(36K-60K), Duct type(36K-60K), High pressure static duct

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(nixie tube)
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X	E1
2	Open or short circuit of T1 temperature sensor	☆	X	X	X	E2
3	Open or short circuit of T2 temperature sensor	☆	X	X	X	E3
4	Open or short circuit of T2B temperature sensor	☆	X	X	X	E4
5	Water-level alarm malfunction	X	X	X	☆	EE
6	Indoor EEPROM malfunction	X	X	☆	X	E7
7	Outdoor unit malfunction	X	X	X	◎	Ed
X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)						
Note: Digital display is only available for normal 4-way cassette & duct type.						

For Super-slim 4-way Cassette & MDCA3-18HRDN1

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(digital tube)
1	Communication malfunction between indoor and outdoor units.	X	☆	X	X	E1
2	Open or short circuit of T1 temperature sensor	☆	X	X	X	E2
3	Open or short circuit of T2 temperature sensor	☆	X	X	X	E3
4	Open or short circuit of T2B temperature sensor	☆	X	X	X	E4
5	Water-level alarm malfunction	X	X	X	☆	EE
6	Indoor EEPROM malfunction	◎	X	X	X	E7
7	Outdoor unit malfunction	X	X	X	◎	Ed
8	Indoor fan speed is out of control	☆	☆	X	X	E8
9	Communication malfunction between main PCB and up-down panel PCB	☆	☆	☆	X	F0
10	Up-down panel malfunction	☆	☆	X	☆	F1
11	Up-down panel is not closed	☆	☆	X	O	F2
12	Communication malfunction between master unit and slave unit	X	☆	X	☆	F3
13	Other malfunction of master unit or slave unit	X	☆	☆	X	F4

O (on) X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)

F0,F1,F2 are only available for super-slim cassette with up-down panel

For GA floor standing:

Codes	Contents
P0	Evaporator low temp. protection
P1	Defrosting or anti-cold air
Ed	Outdoor unit protection / Open or short circuit of outdoor temp. sensor
E1	Indoor / outdoor units communication error
E2	Open or short circuit of T1 temperature sensor
E3	Open or short circuit of T2 temperature sensor
E4	Open or short circuit of T2B temperature sensor
E7	EEPROM malfunction

For MDCA3-12HRDN1, MDTB1-12HWDN1, MDFA-12HRFN1

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E0	Indoor unit EEPROM error
☆ 2 times	X	E1	Communication malfunction between indoor and outdoor units.
☆ 4 times	X	E3	Indoor fan speed has been out of control(only for MFA-12HRFN1-Q)
☆ 5 times	X	E4	Indoor room temperature sensor T1 open circuit or short circuit
☆ 6 times	X	E5	Evaporator coil temperature sensor T2 open circuit or short circuit
☆ 7 times	X	EC	Refrigerant leakage detection
☆ 8 times	X	EE	Water-level alarm malfunction
☆ 2 times	O	F1	Open circuit or short circuit of outdoor ambient temperature sensor T4
☆ 3 times	O	F2	Open circuit or short circuit of condenser coil temperature sensor T3
☆ 4 times	O	F3	Open circuit or short circuit of Compressor discharge temperature sensor T5
☆ 5 times	O	F4	Outdoor unit EEPROM error
☆ 1 times	☆	P0	IPM malfunction
☆ 2 times	☆	P1	Over voltage or over low voltage protection
☆ 3 times	☆	P2	High temperature protection of compressor top
☆ 5 times	☆	P4	Inverter compressor drive error

O (light) X (off) ☆ (flash)

**2.3 Outdoor unit malfunction
12k(Excluding MDOU-12HDN1)**

Malfunction or Protection	LED6 (Green)	LED5 (Red)	Indoor Display
IGBT over-strong current protection	☆	X	P0
Voltage protection of compressor	O	O	P1
Communication malfunction between indoor and outdoor units.	☆	☆	P4
O(light) X(off) ☆(flash at 2.5Hz)			

MDOU-12HDN1:

No.	Problems	LED2(Green)	LED1 (Red)	Indoor Display
1	standby for normal	O	X	
2	Operation normally	X	O	
3	Compressor drive board EEPROM error	O	☆	E5
4	IPM malfunction or IGBT over-strong current protection	☆	X	P0
5	Over voltage or too low voltage protection	O	O	P1
6	Inverter compressor drive error	X	☆	P4

7	Inverter compressor drive error	☆	O	P4
8	Communication malfunction between main control board and driver board	☆	☆	P4
O(light) X(off) ☆(flash at 2.5Hz)				

18~60k

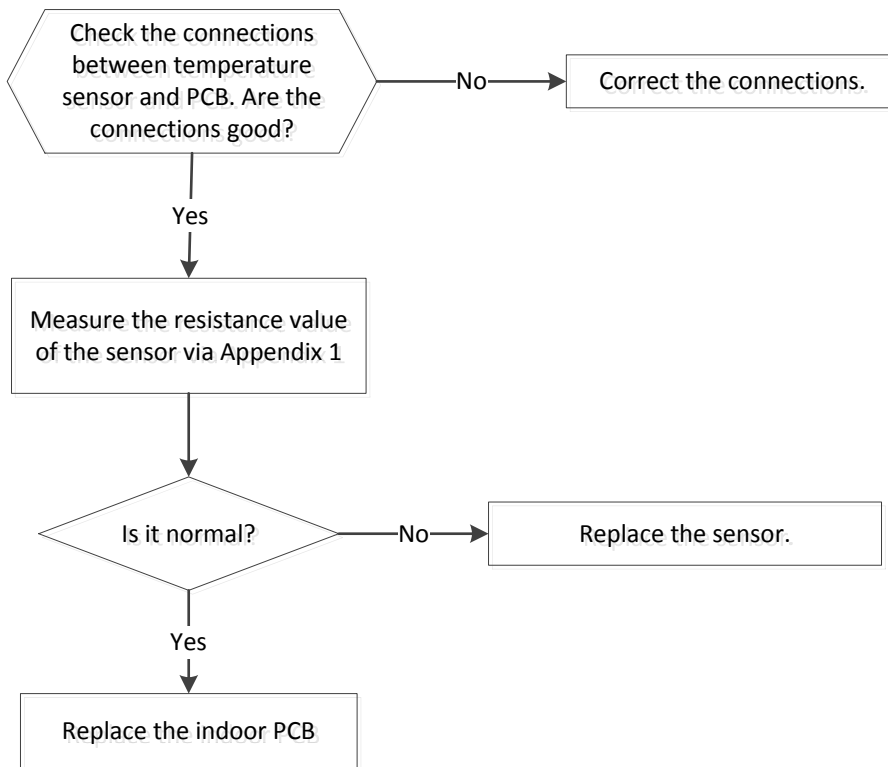
Display	Malfunction or Protection
E0	Outdoor EEPROM malfunction
E2	Communication malfunction between indoor and outdoor units.
E3	Communication malfunction between IPM board and outdoor main board
E4	Open or short circuit of T3 or T4 temperature sensor
E5	Voltage protection of compressor
E6	PFC module protection (Only for 36K, 48K with 1 phase)
P0	Top temperature protection of compressor
P1	High pressure protection(Only for 30K~60K)
P2	Low pressure protection(Only for 30K~60K)
P3	Current protection of compressor
P4	Discharge temperature protection of compressor
P5	High temperature protection of condenser
P6	IPM module protection
P7	High temperature protection of evaporator

In low ambient cooling mode, the LED displays “LC” or alternative displays between running frequency and “LC”(each displays 0.5s)

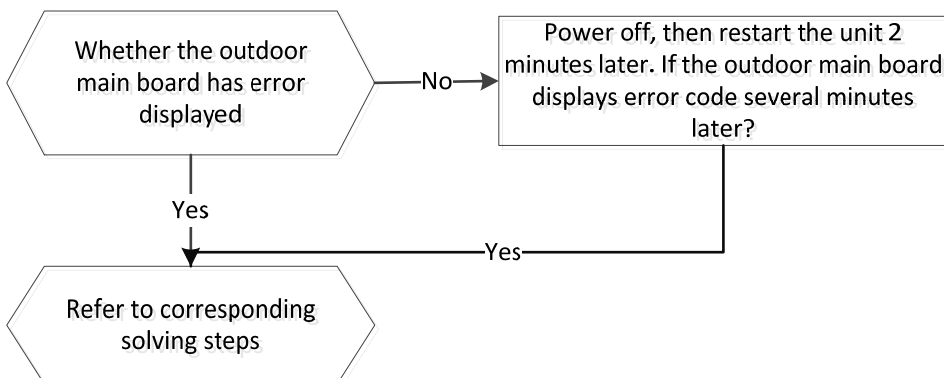
2.4 Solving steps for typical malfunction

2.4.1 For the indoor unit

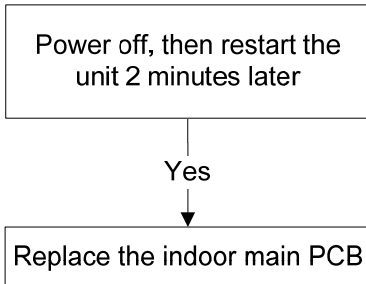
2.4.1.1 Open or short circuit of temperature sensor



2.4.1.2. Outdoor unit malfunction

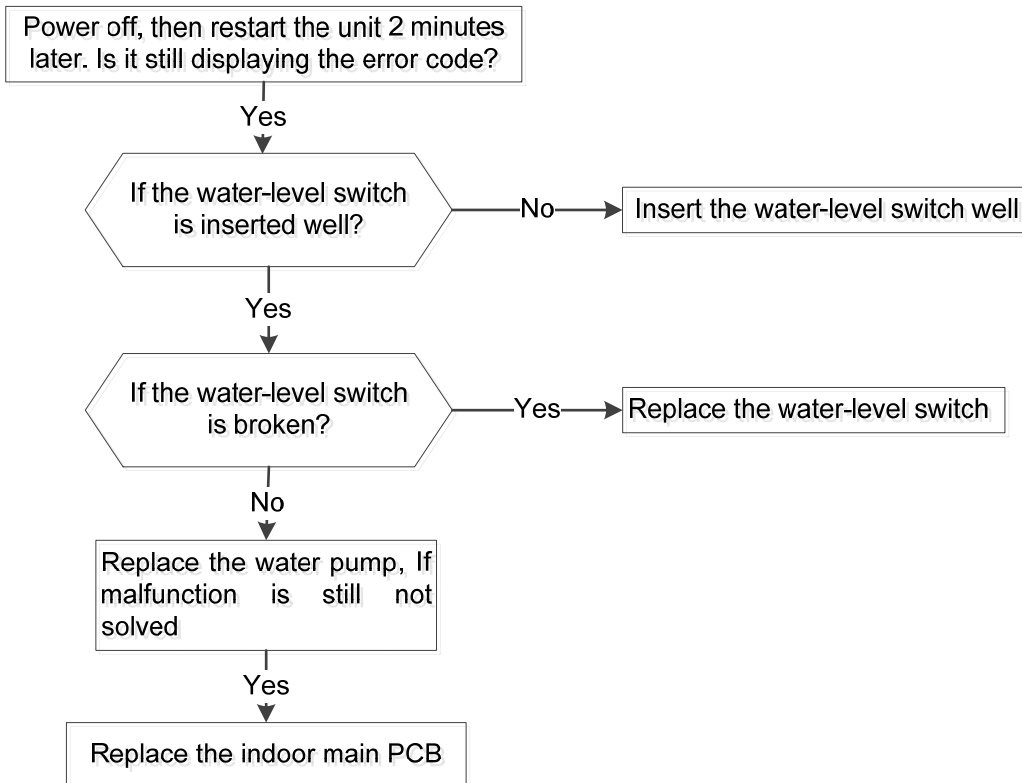


2.4.1.3. Indoor EEPROM malfunction

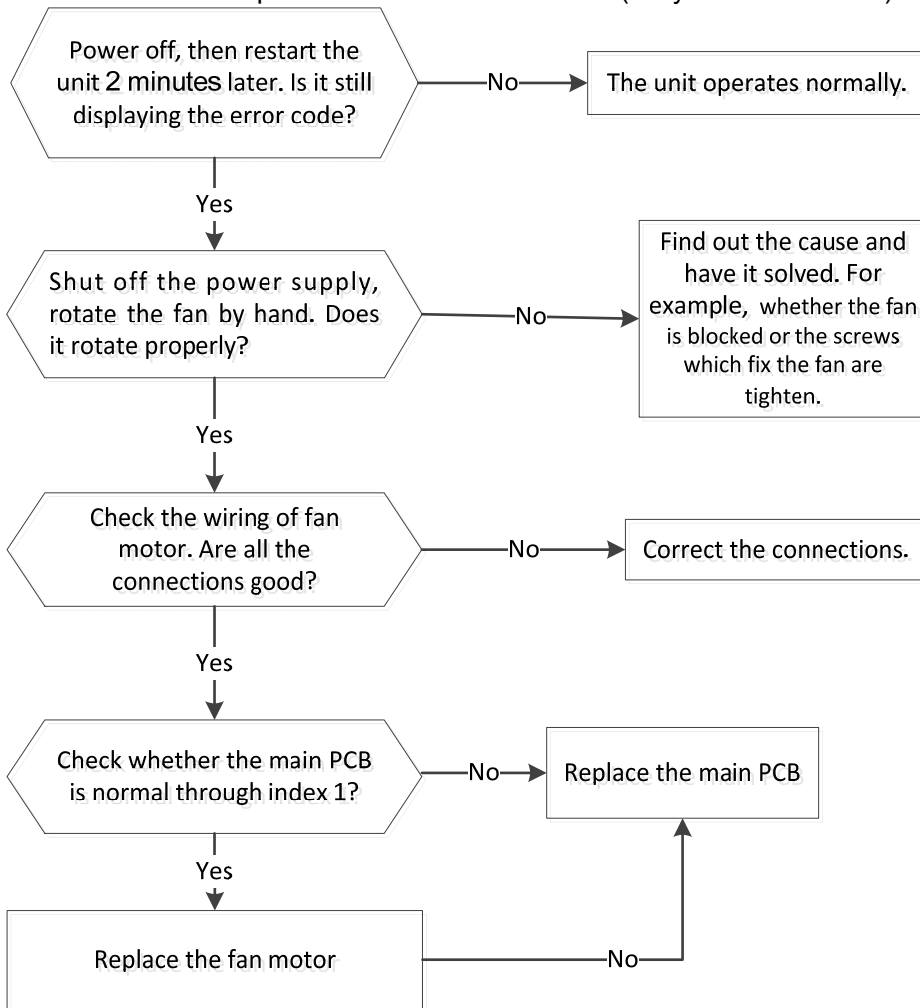


EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

2.4.1.4. Water-level alarm malfunction



2.4.1.5. Indoor fan Speed has been out of control.(Only for console 12k)

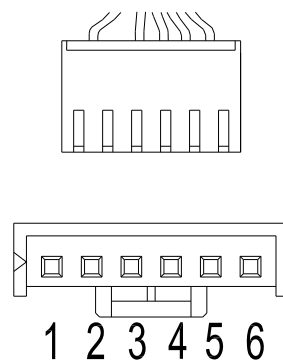


Index 1:

1. 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:



DC motor voltage input and output

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

2.4.1.6. Inverter compressor drive protection (Only for compact cassette 12k & console 12k)

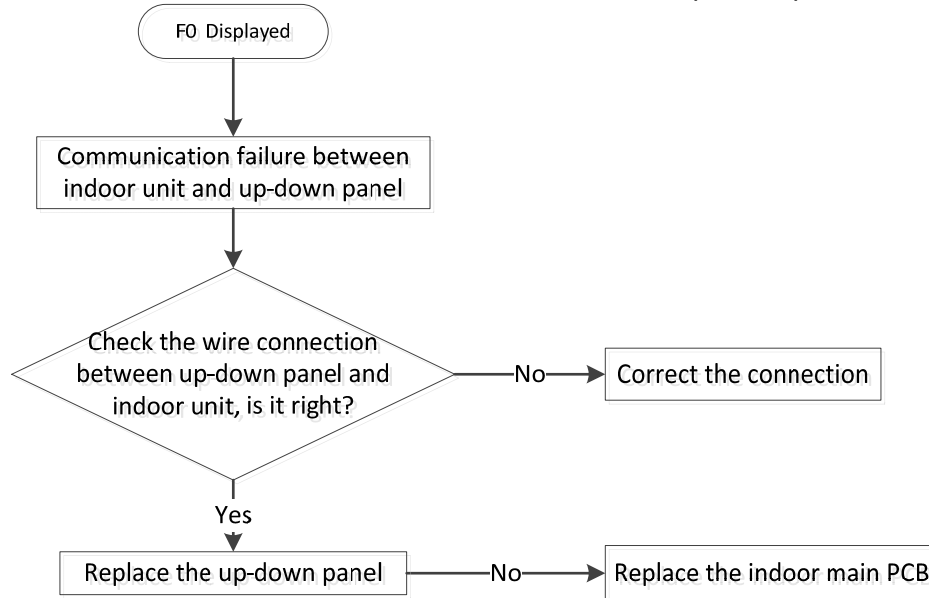
Refer to the outdoor unit P6 malfunction part to solve this problem.

2.4.1.7 Communication malfunction between indoor and outdoor units.

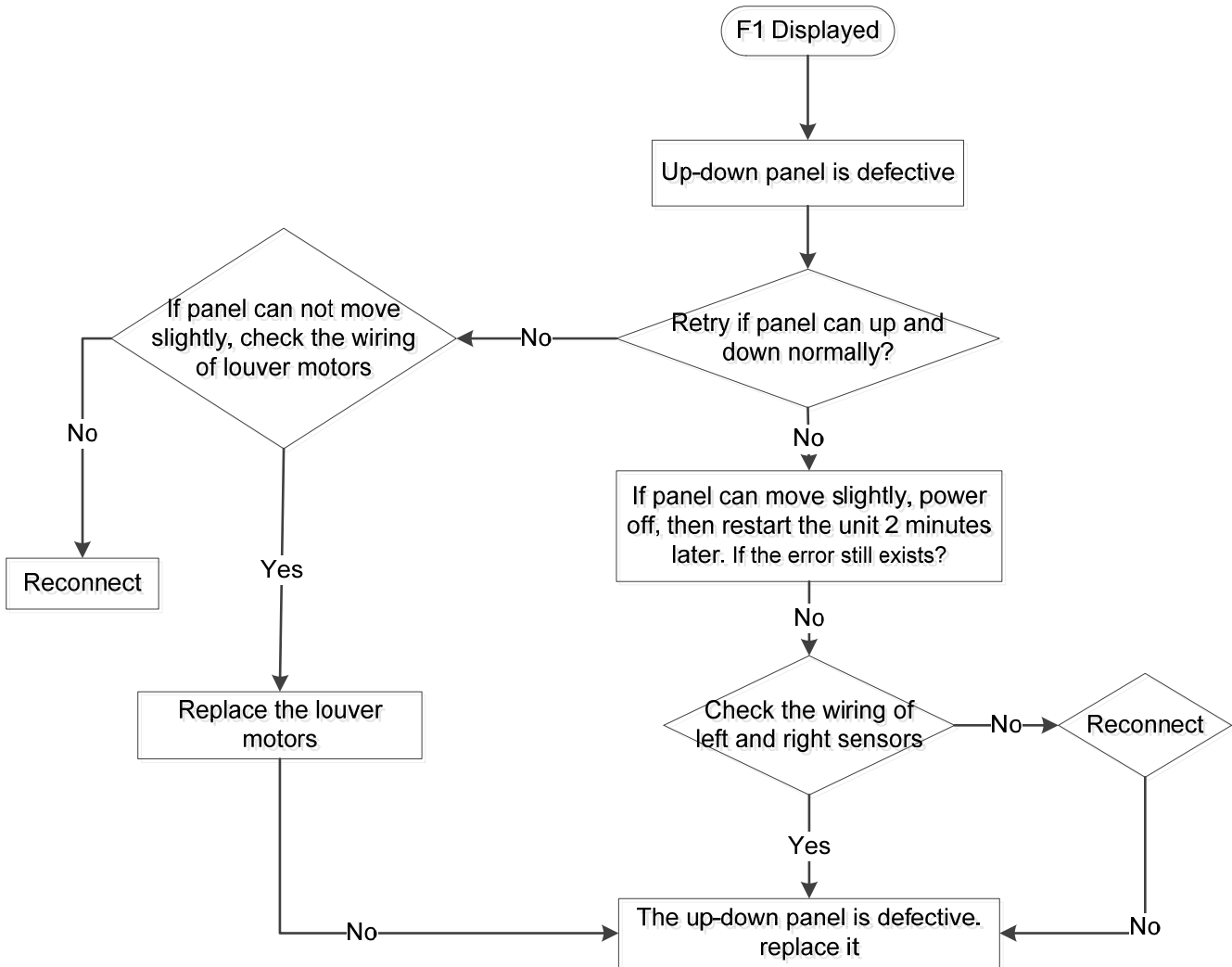
The same as E2 in outdoor.

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

2.4.2.1 Communication error between indoor unit and up-down panel

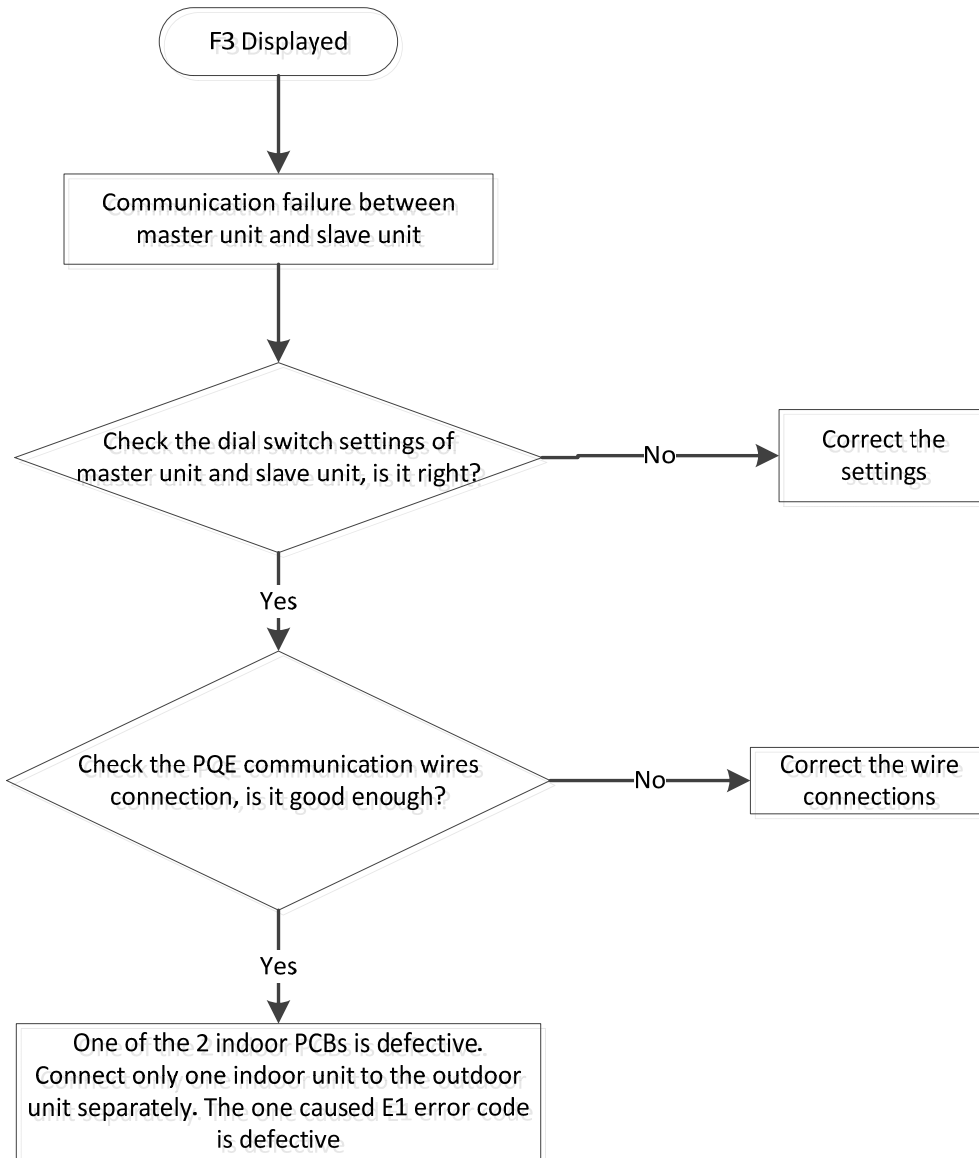


2.4.2.2 Up-down panel is defective



2.4.3 For the unit with TWINS function(For the super-slim cassette & A5 duct)

2.4.3.1 Communication malfunction between master unit and indoor unit

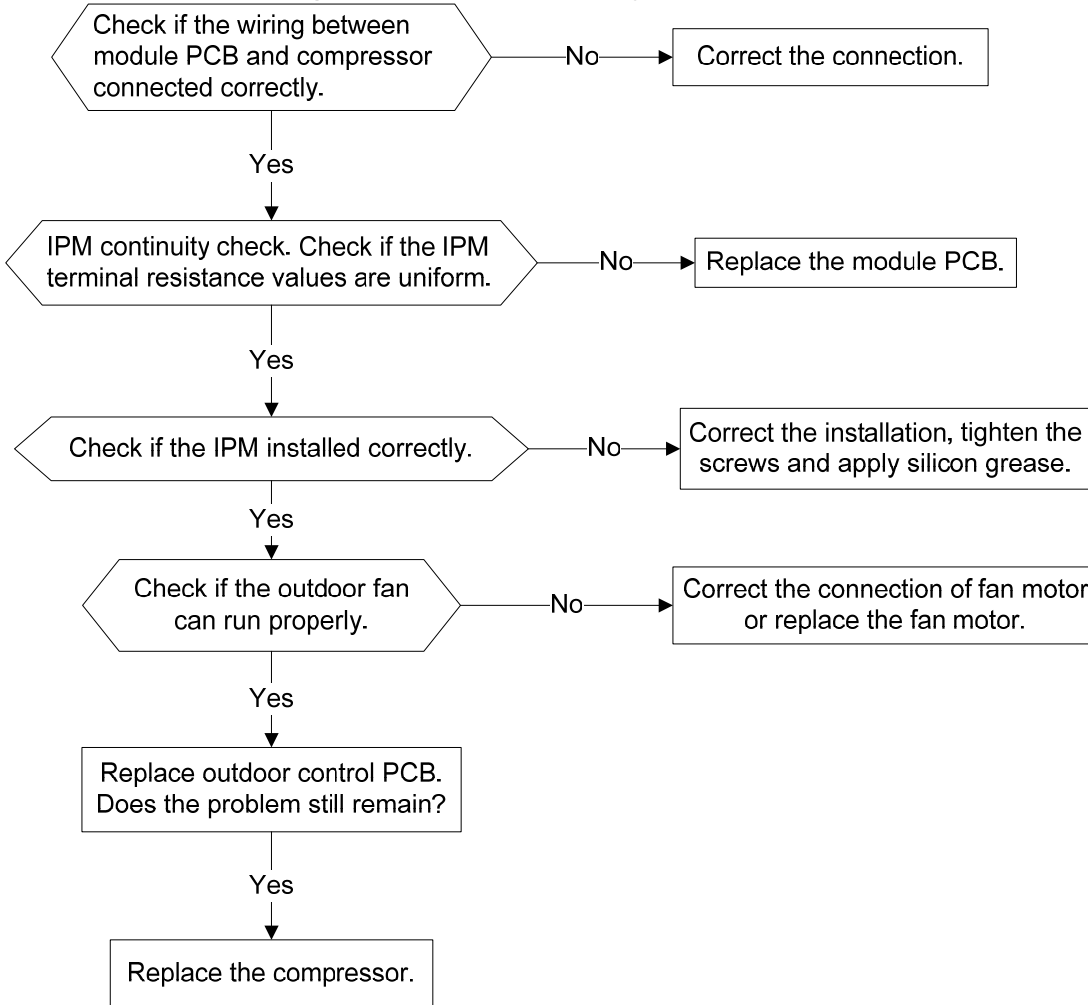


2.4.3.2 Other malfunction between master unit and indoor unit

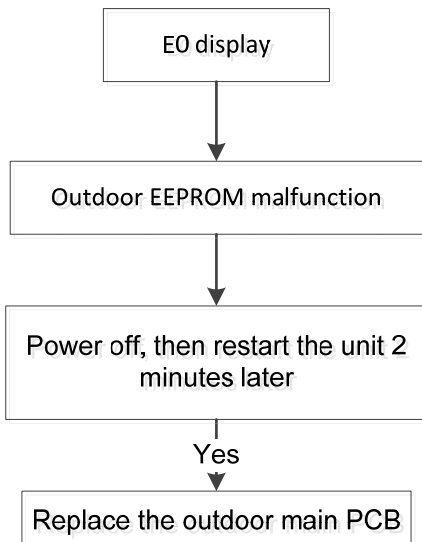
One indoor unit displays "F4", which means another indoor unit is faulty. Check another indoor unit's error code and then follow the appropriate solutions to solve the malfunction.

2.4.4 For the outdoor unit

2.4.4.1 IGBT over-strong current protection(Only for 12k)

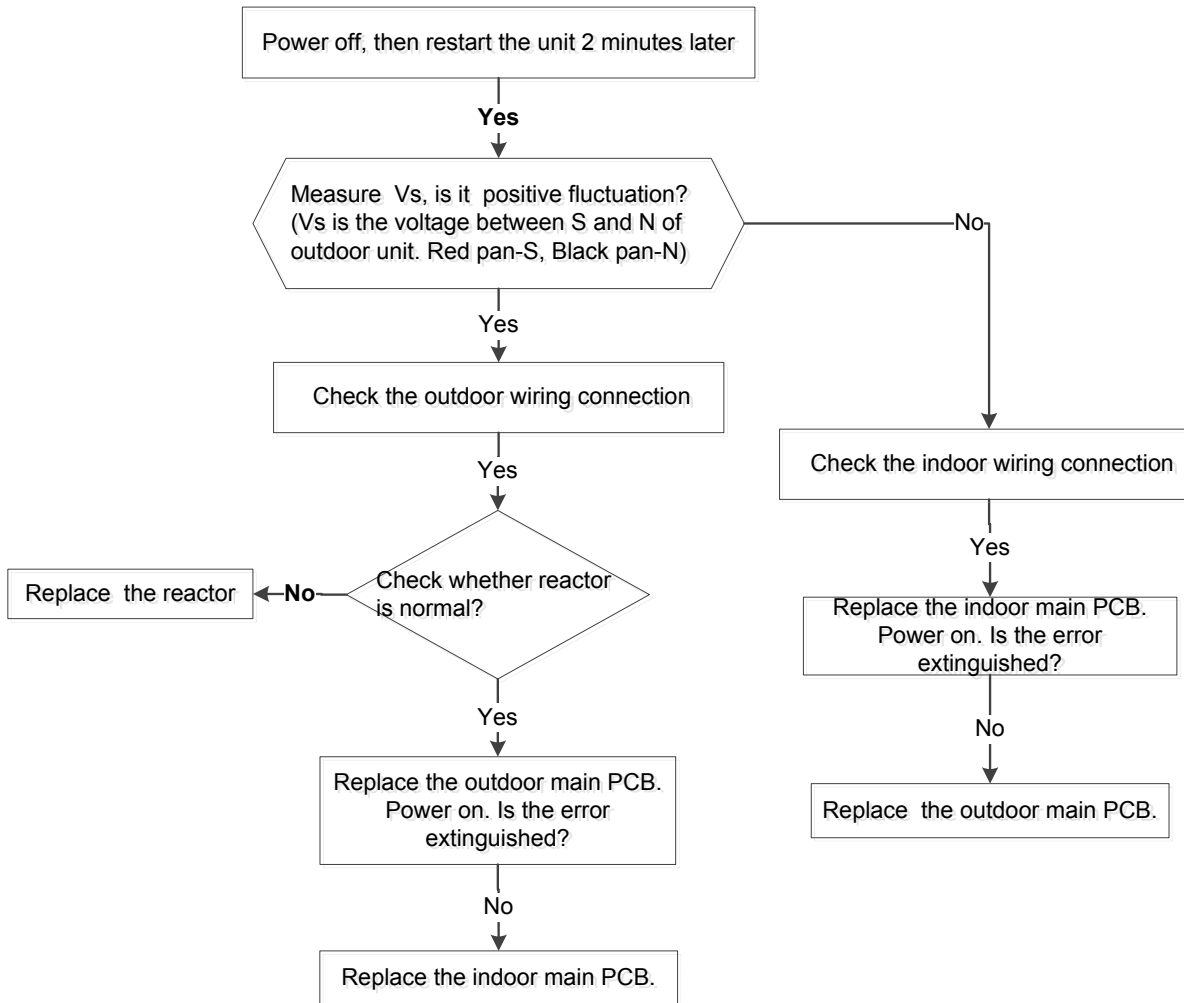


2.4.4.2. E0 malfunction

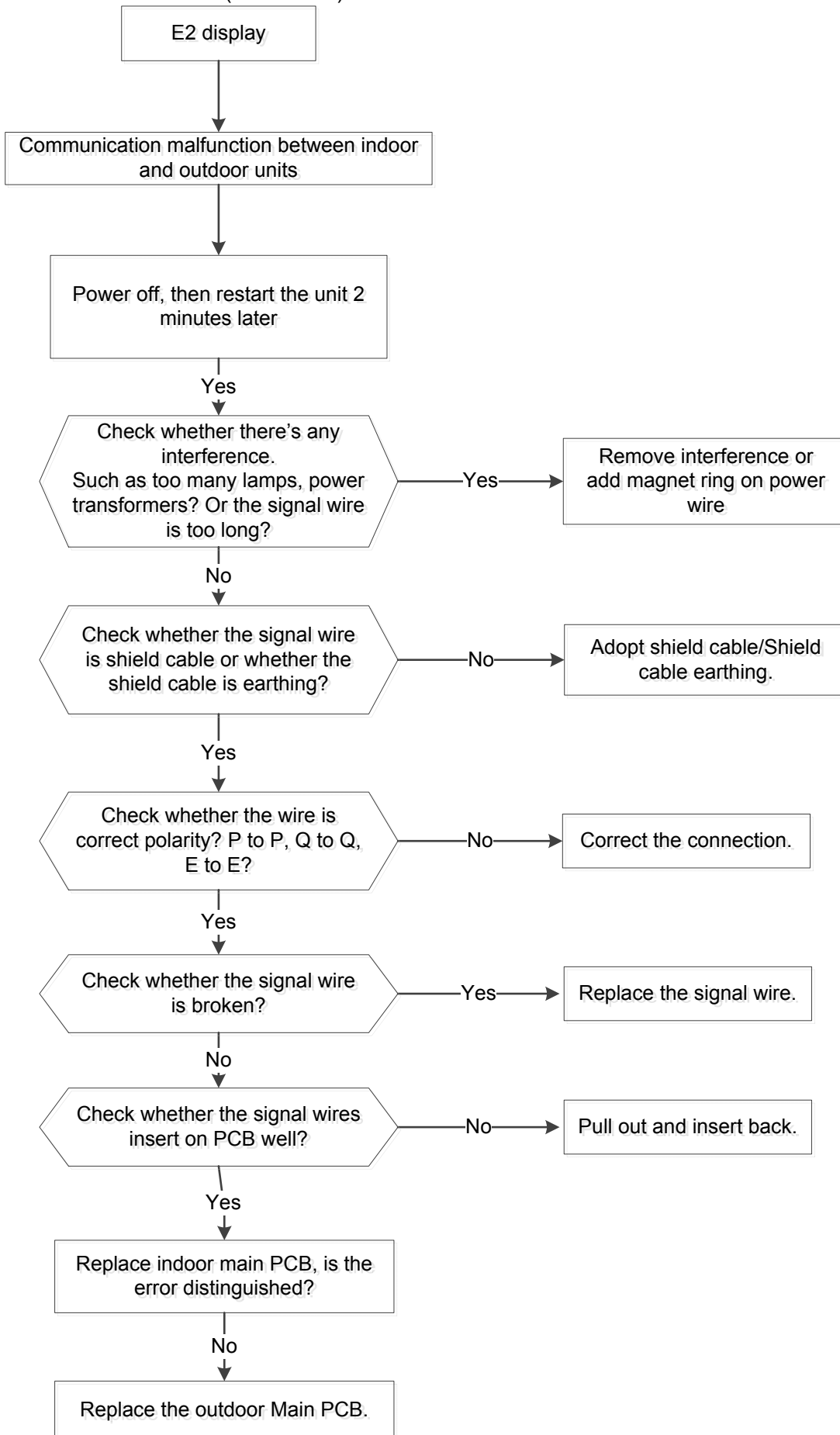


EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

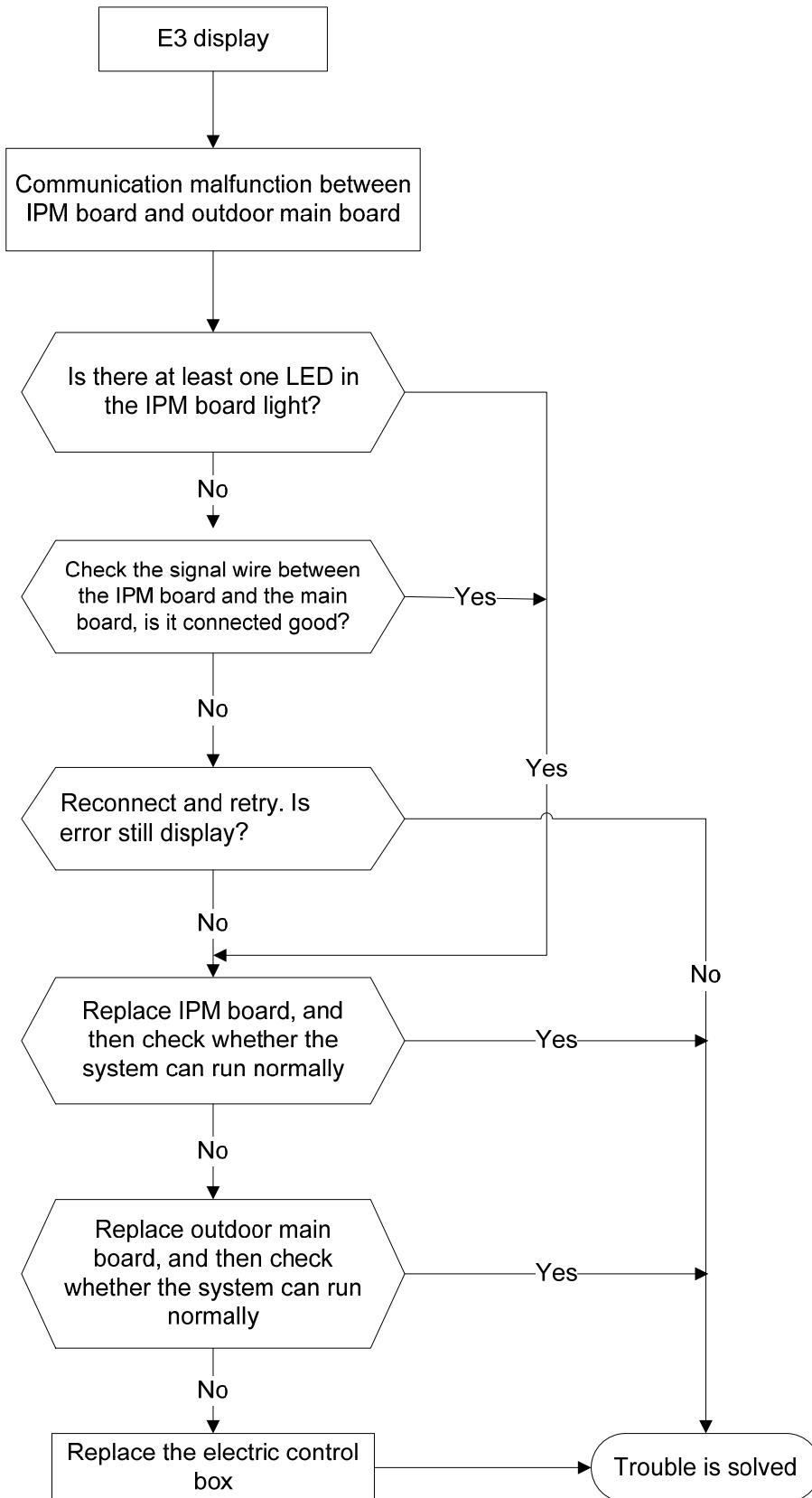
2.4.4.3. E2 malfunction(Only for 12k)



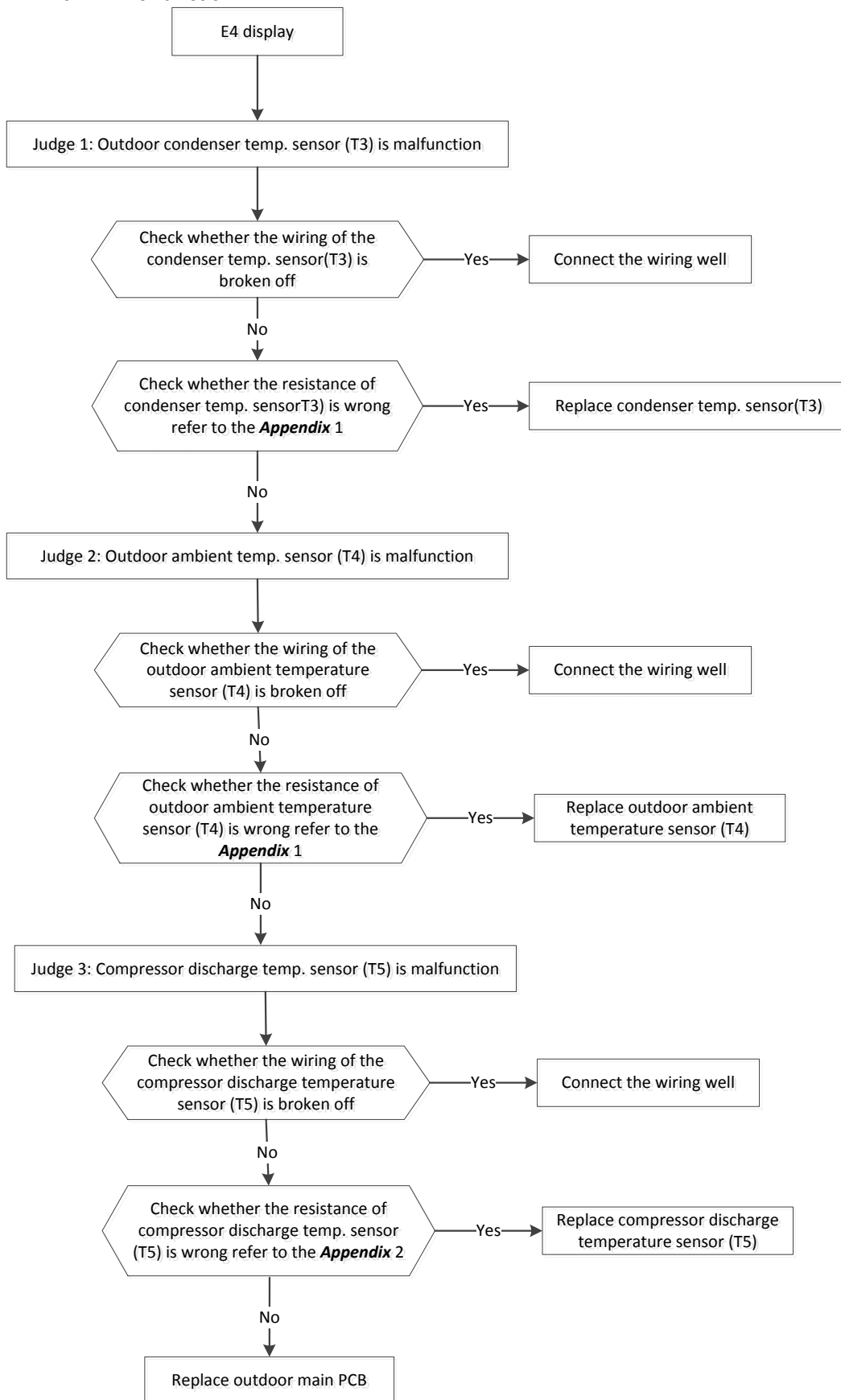
2.4.4.4. E2 malfunction(For 18-60k)



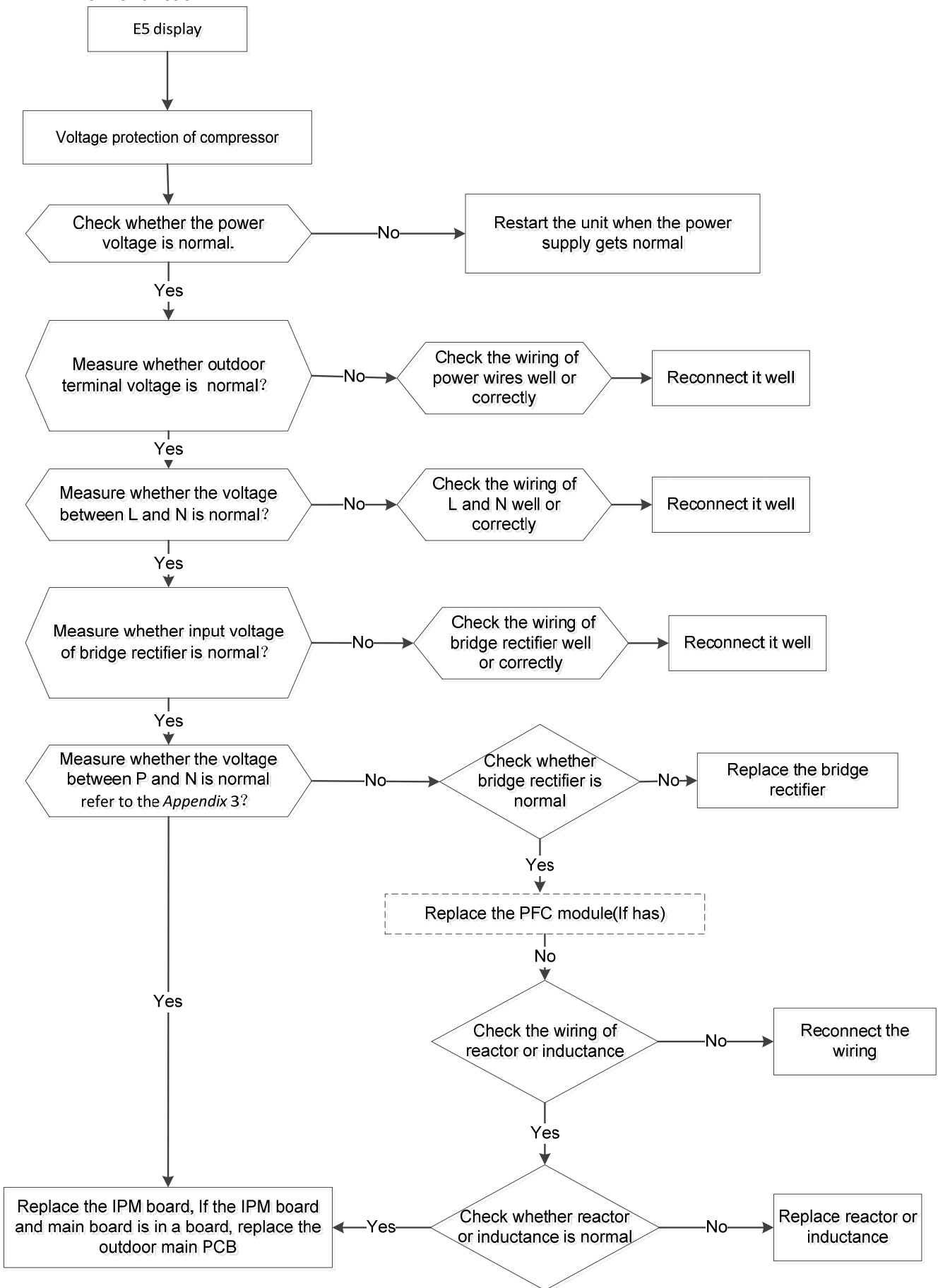
2.4.4.5. E3 malfunction



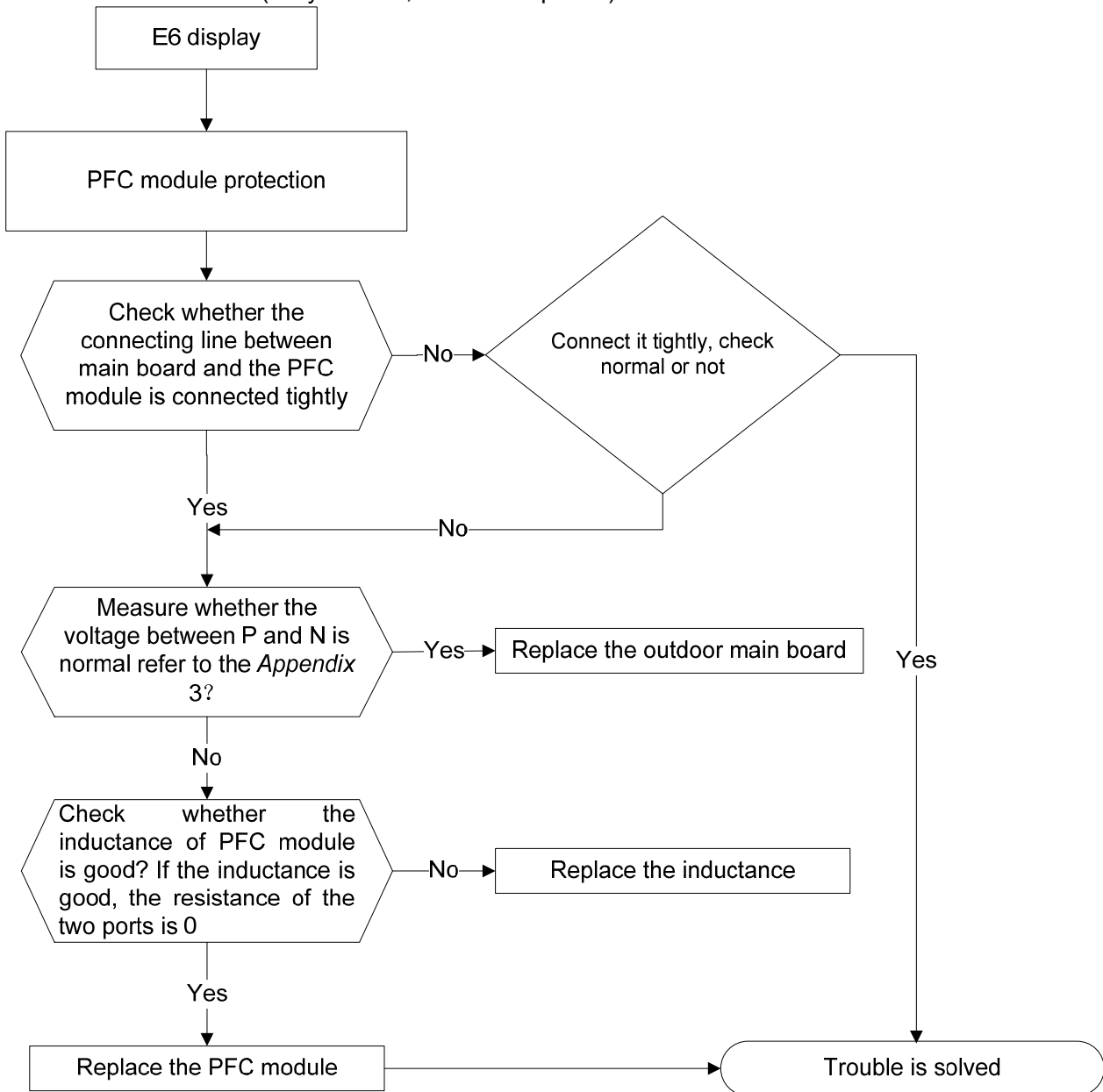
2.4.4.6. E4 malfunction



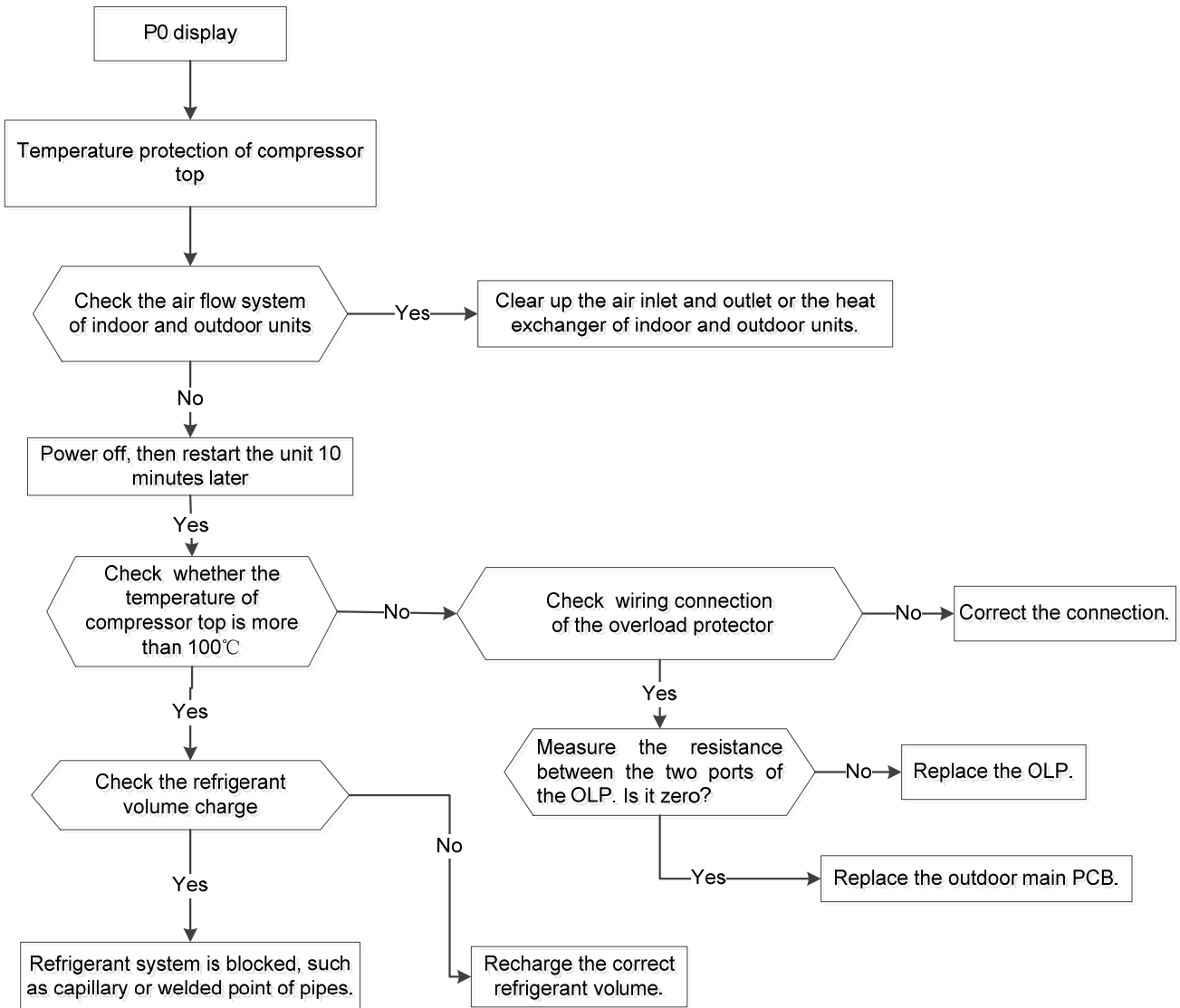
2.4.4.7. E5 malfunction



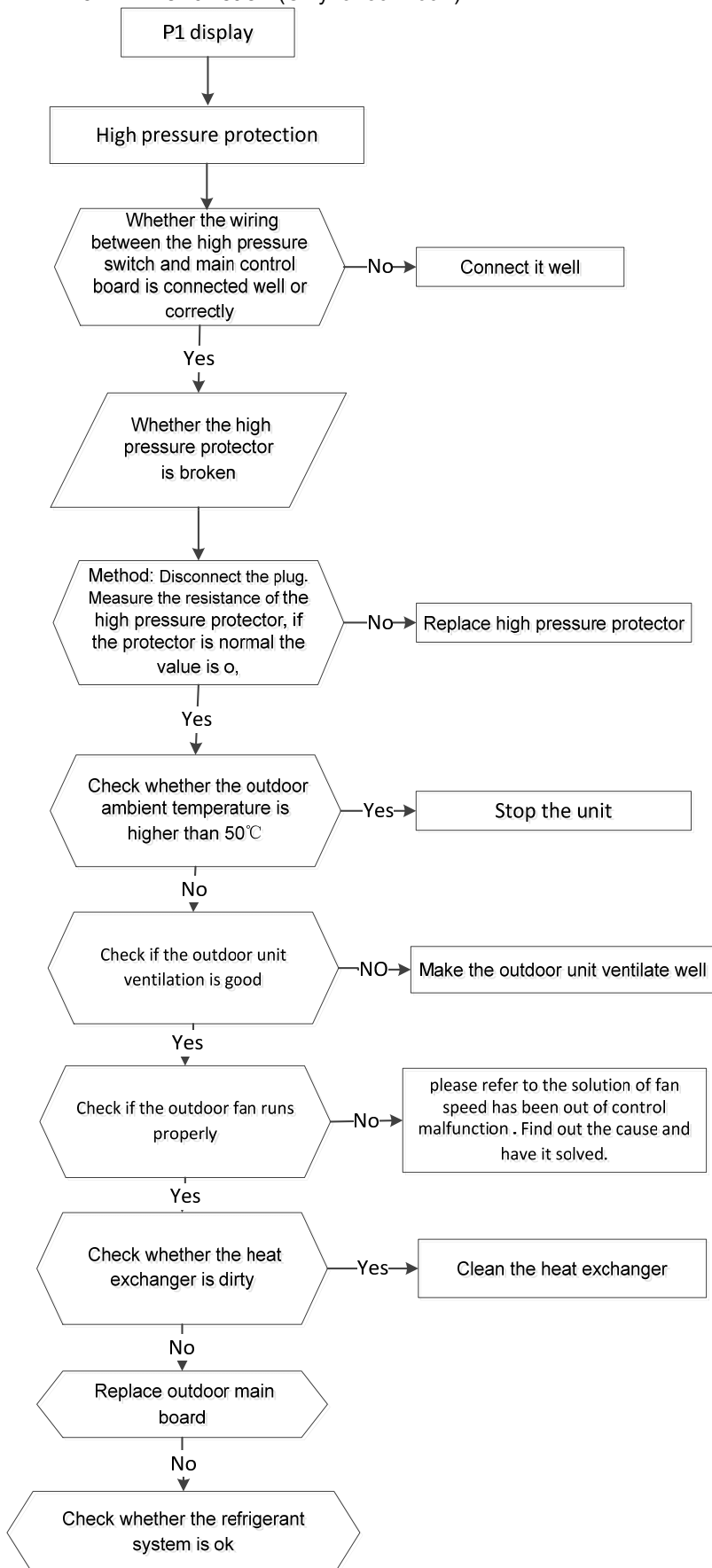
2.4.4.8. E6 malfunction (Only for 36K, 48K with 1 phase)



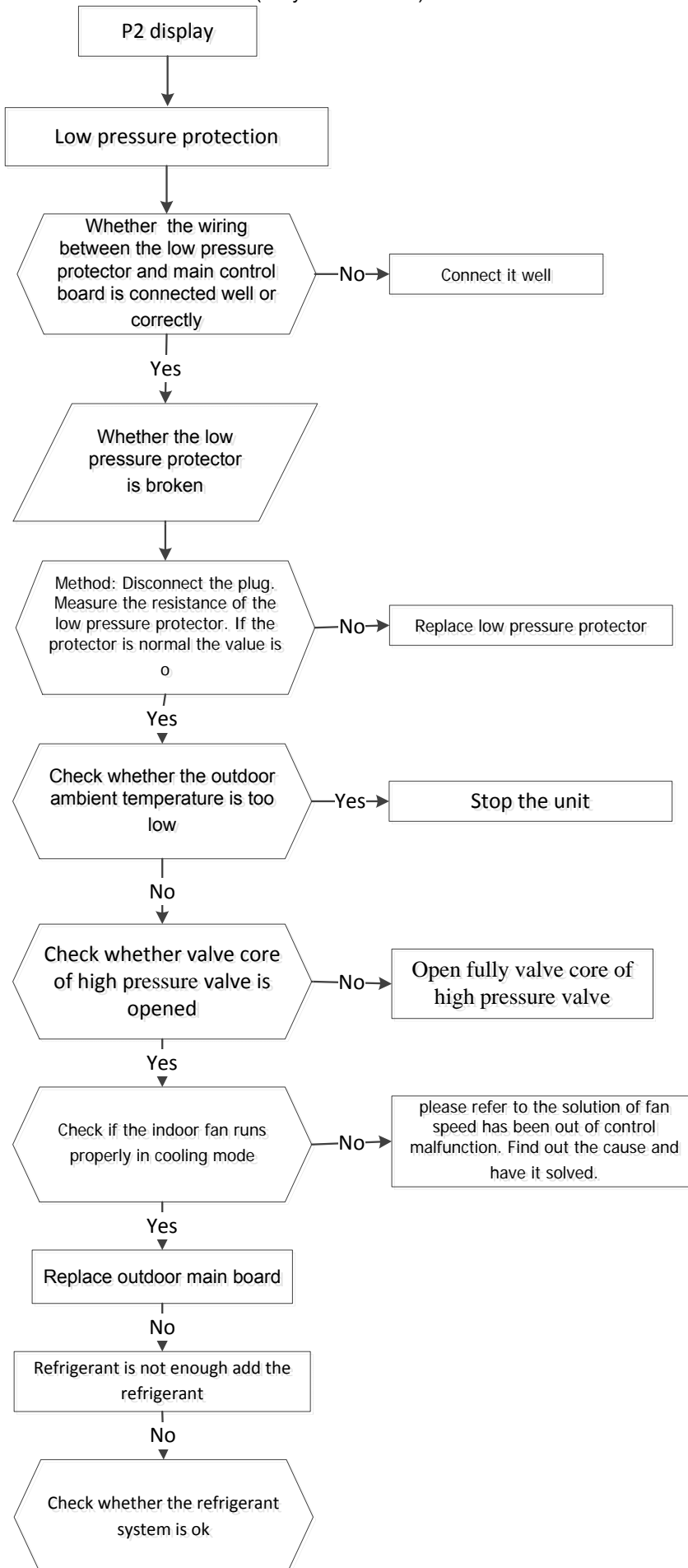
2.4.4.9. P0 malfunction



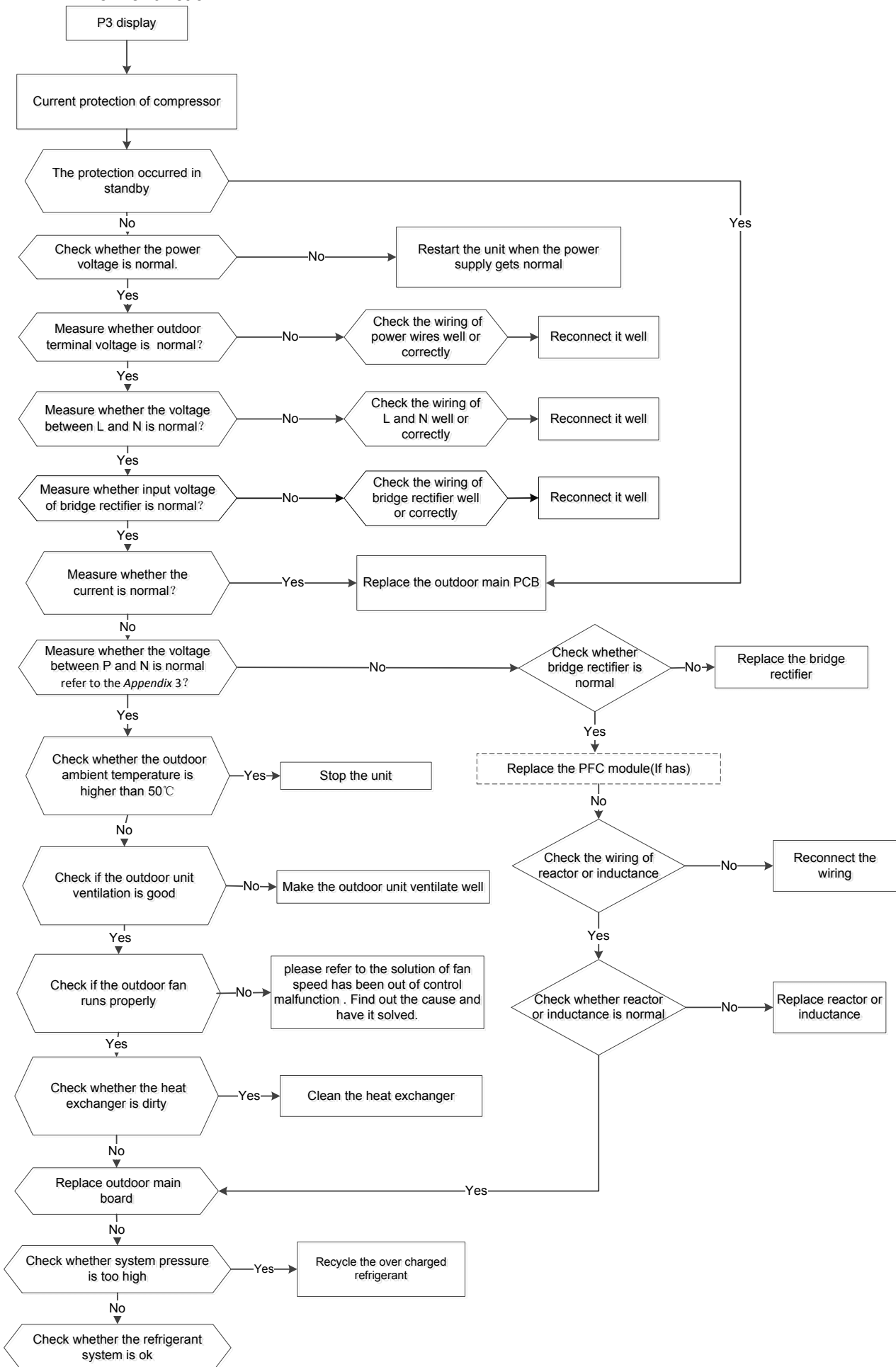
2.4.4.10. P1 malfunction (Only for 30K~60K)



2.4.4.11. P2 malfunction (Only for 30K~60K)

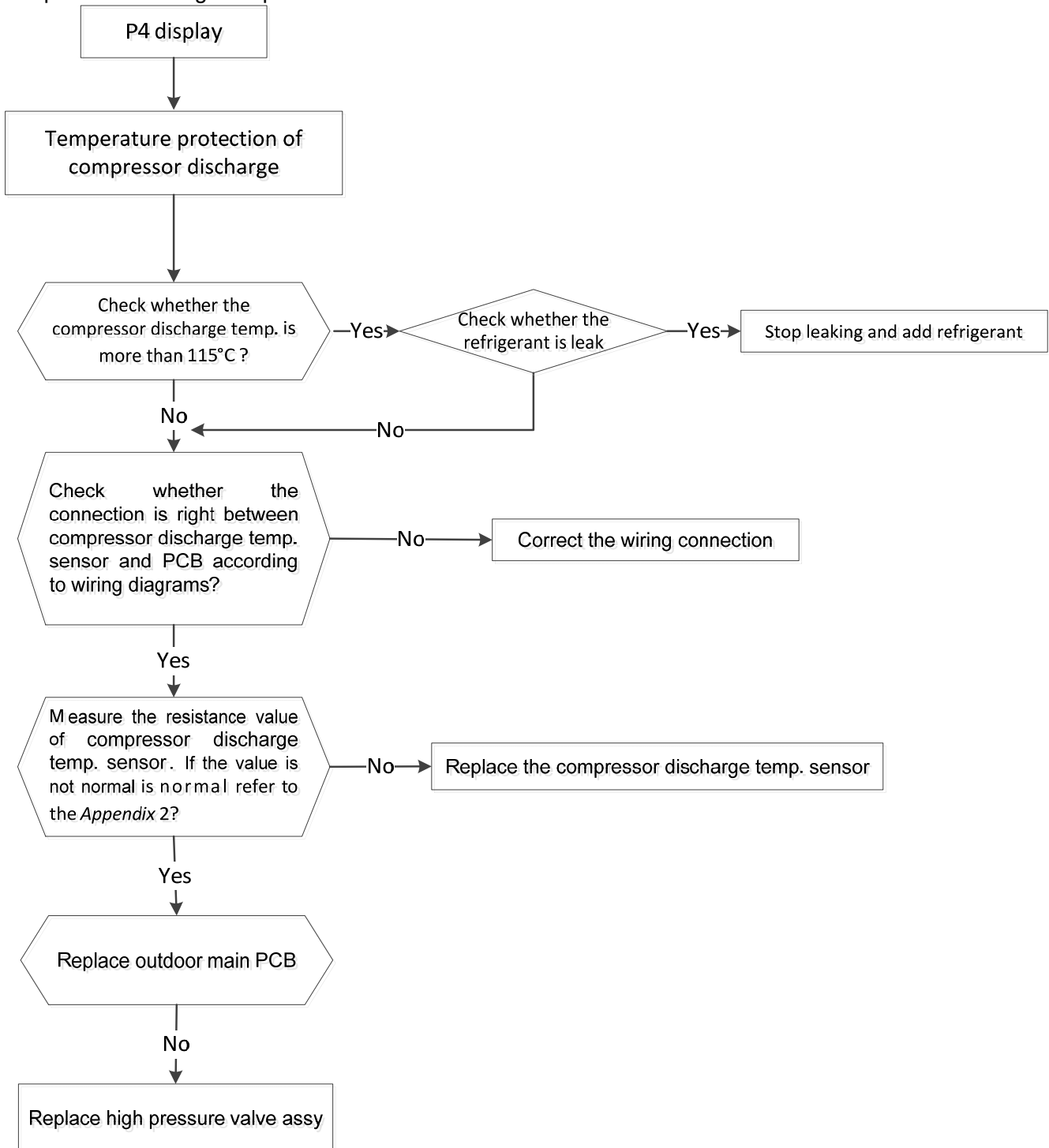


2.4.4.12. P3 malfunction



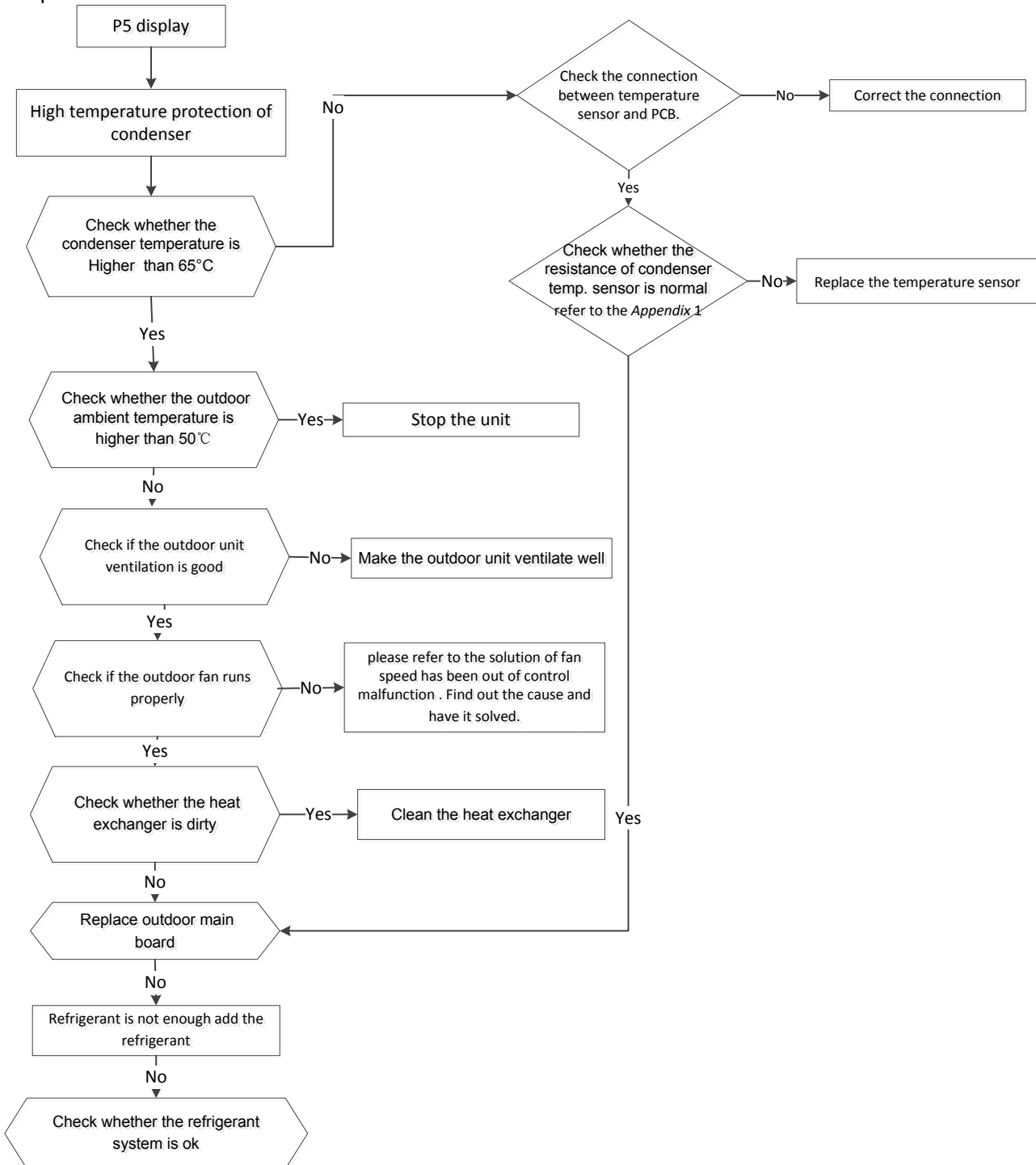
2.4.4.13. P4 malfunction

When compressor discharge temperature is higher than 115°C, the unit will stop, and unit runs again when compressor discharge temperature is lower than 90°C.



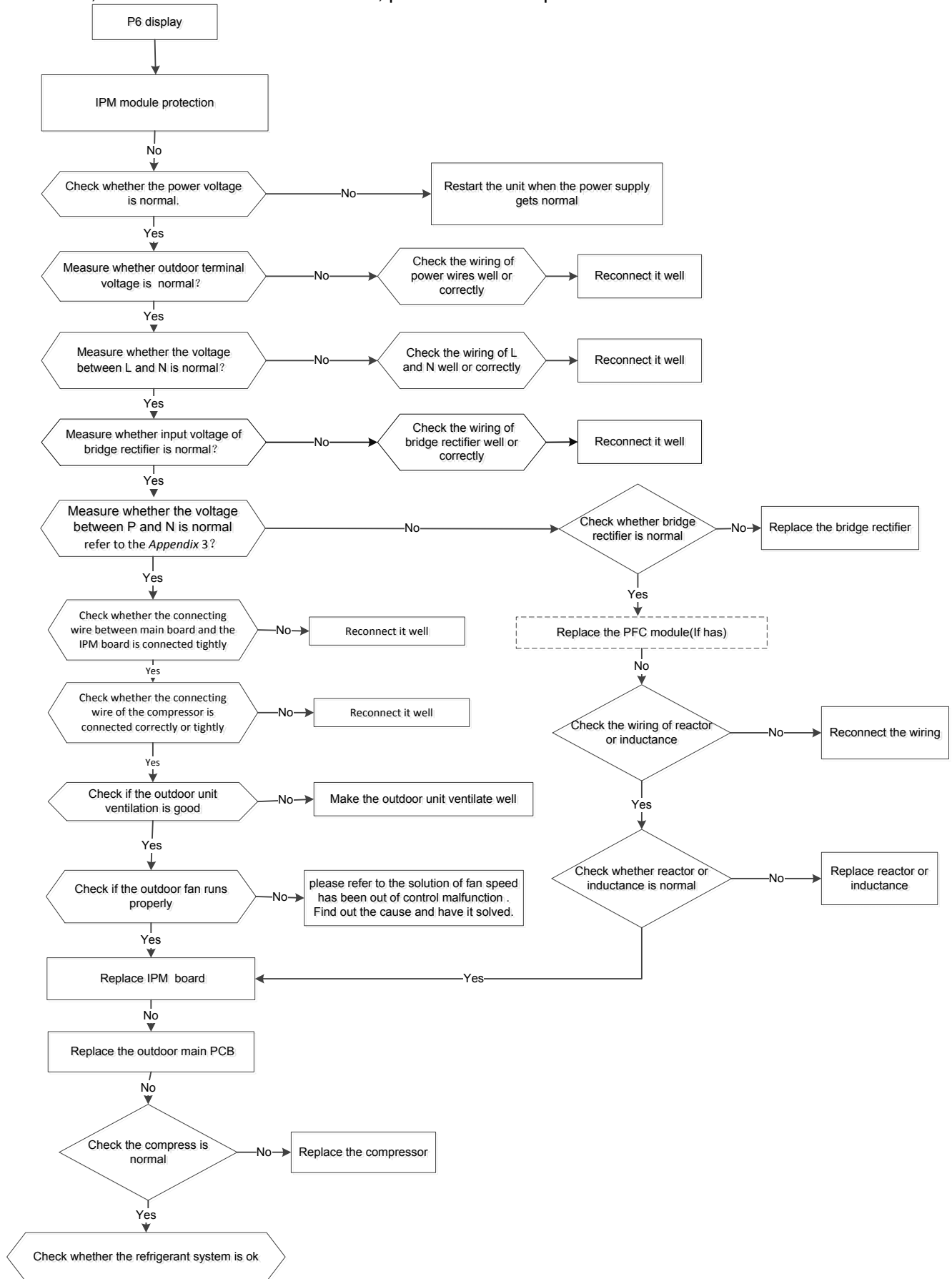
2.4.4.14. P5 malfunction

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

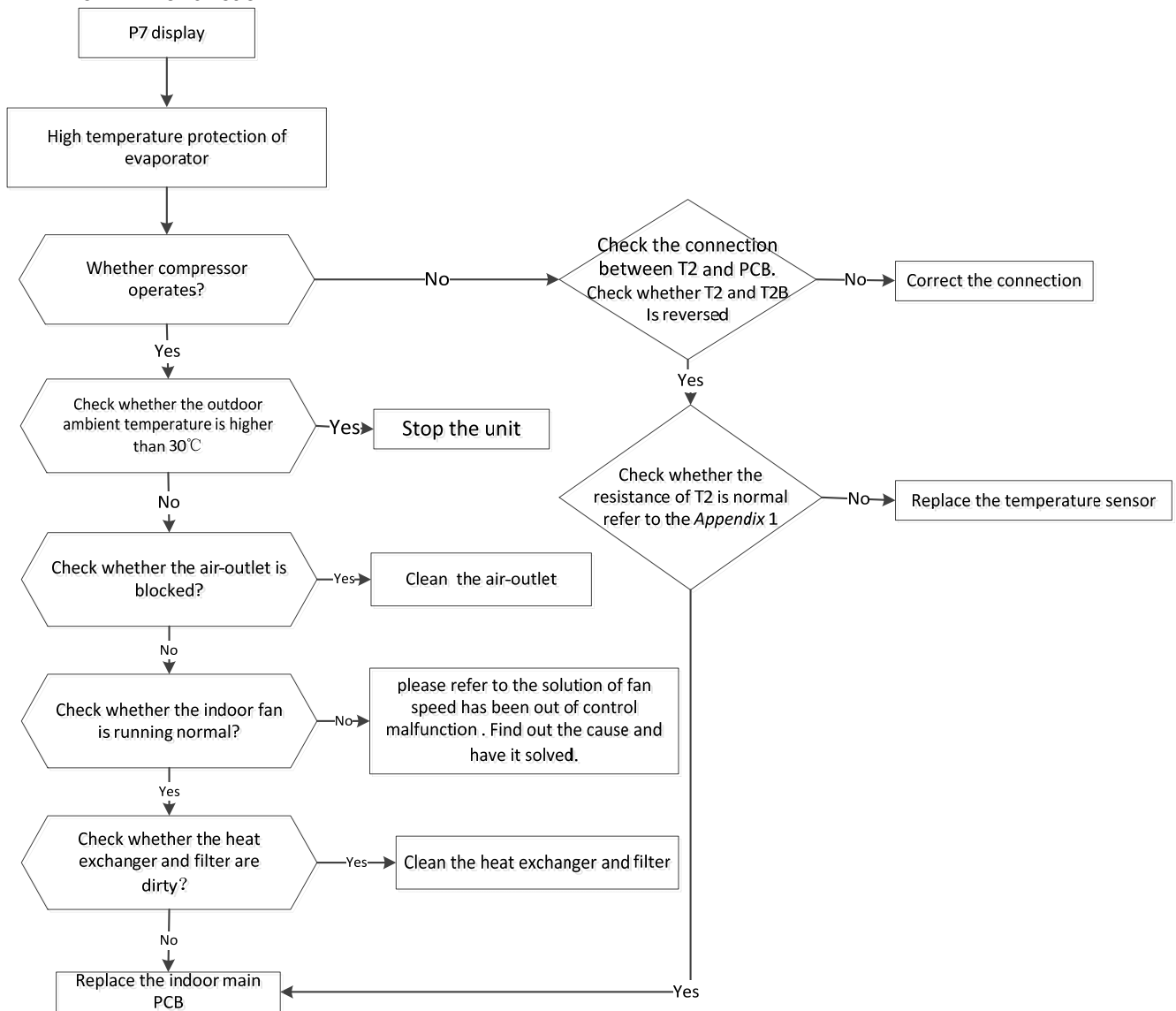


2.4.4.15. P6 malfunction

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



2.4.4.16. P7 malfunction



Appendix 1 Temperature Sensor Resistance Value Table (°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

Unit: °C---K				Discharge temp. sensor table			
-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		

Appendix 3

Normal voltage of P and N			
208-240V(1-phase,3-phase)		380-420V(3-phase)	
In standby			
around 310VDC		around 530VDC	
In operation			
With passive PFC module	With partial active PFC module	With fully active PFC module	/
>200VDC	>310VDC	>370VDC	>450VDC