Technology leads Intelligent life

Technical & Service Manual

DC Inverter LCAC Europe R32

Version 11

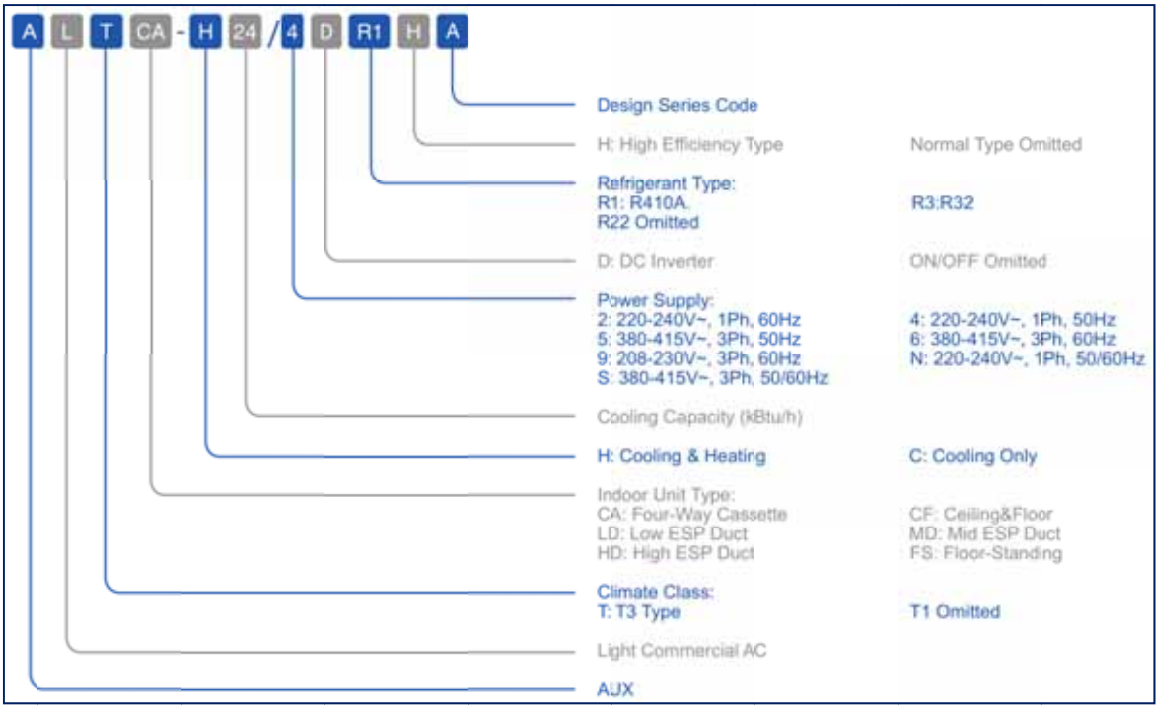
2022.11.22

Contents

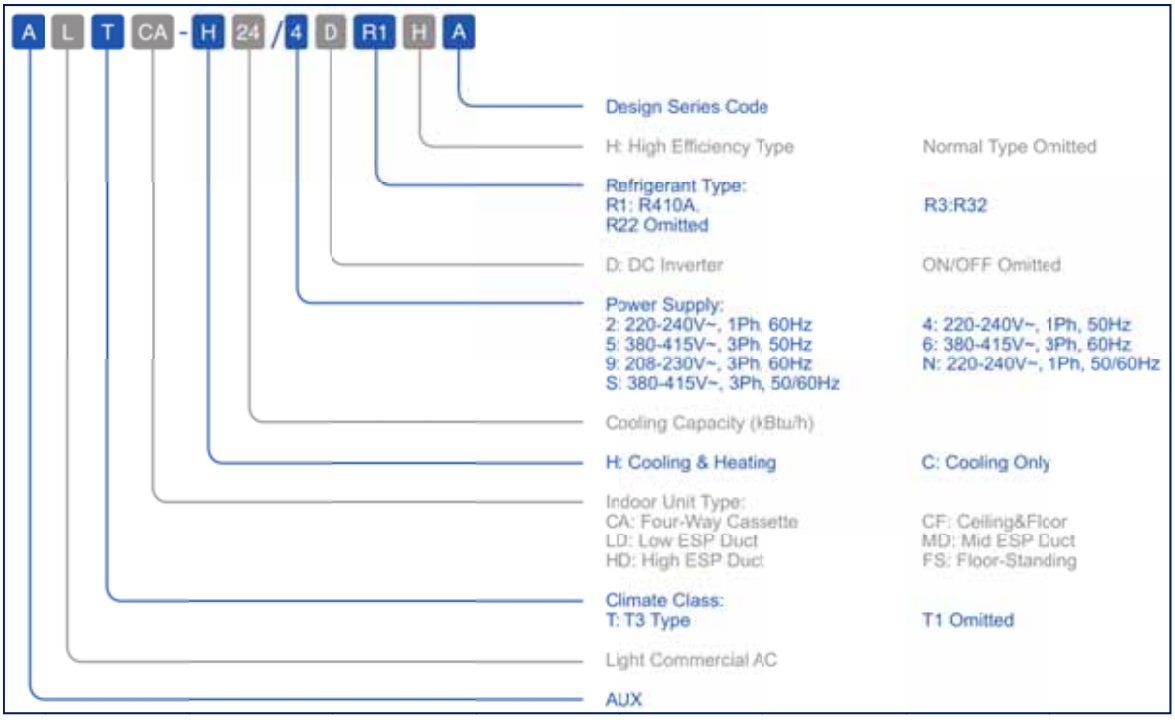
Part1 General Information

1. Nomenclature

Indoor Unit



Outdoor Unit：



2. Unit appearance

2.1 Cassette (Y type)

Type	Picture	Capacity Range / Mode	
Compact cassette		12 K Btu/h	ALCA-H12/NDR3HYA
			ALCA-H12/NDR3HY2A
		18 K Btu/h	ALCA-H18/NDR3HYA
			ALCA-H18/NDR3HY2A
Round-flowy cassette		24 K Btu/h	ALCA-H24/NDR3HYB
			ALCA-H24/NDR3HY2A
		36 K Btu/h	ALCA-H36/NDR3HYB
		42 K Btu/h	ALCA-H42/NDR3HYB
		48 K Btu/h	ALCA-H48/SDR3HYB
		60 K Btu/h	ALCA-H60/SDR3HYB

Capacity	12K/18K	24-60K
Standard Panel		
Optional Panel		/

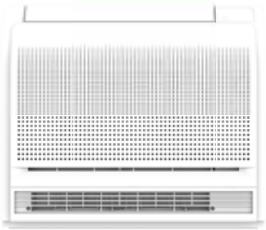
2.2 Ceiling Floor (F type)

Type	Picture	Capacity Range / Mode	
Ceiling Floor (F Type)		18 K Btu/h	ALCF-H18/NDR3HF
			ALCF-H18/NDR3HF2
		24 K Btu/h	ALCF-H24/NDR3HF
			ALCF-H24/NDR3HF2
		36 K Btu/h	ALCF-H36/NDR3HF
		42 K Btu/h	ALCF-H42/NDR3HF
		48 K Btu/h	ALCF-H48/SDR3HF
		60 K Btu/h	ALCF-H60/SDR3HF

2.3 Duct (M type)

Type	Picture	Capacity Range / Mode	
M DUCT		18 K Btu/h	ALMD-H18/NDR3HM2A
		18 K Btu/h	ALMD-H18/NDR3HA
			ALMD-H18/NDR3HM2
		24 K Btu/h	ALMD-H24/NDR3HA
			ALMD-H24NDR3HM2
		30 K Btu/h	ALMD-H30/NDR3HA
			ALMD-H30/NDR3HM2
		36 K Btu/h	ALMD-H36/NDR3HA
		42 K Btu/h	ALMD-H42/NDR3HA
		48 K Btu/h	ALMD-H48/SDR3HA
		60 K Btu/h	ALMD-H60/SDR3HA

2.4 Console

Picture	Capacity Range / Mode	
	12 K Btu/h	ALCO-H12/4R3A
	18 K Btu/h	ALCO-H18/4R3A

2.5 Outdoor Unit

Series	Capacity (K Btu/h)	Models	Photos
Outdoor unit	12	AL-H12/NDR3A(U)	
	12	AL-H12/NDR3HB2(U)	
	18	AL-H18/NDR3A(U)	
	18	AL-H18/NDR3HB2(U)	
	24	AL-H24/NDR3A(U)	

		AL-H24/NDR3HB2(U)	
	30	AL-H30/NDR3HB2(U)	
		AL-H30/NDR3A(U)	
	36	AL-H36/NDR3A(U)	
	42	AL-H42/NDR3A(U)	
	48	ALT-C48/4R1A(U)	

	60	AL-H60/SDR3A(U)	

Part2 Features

1. Outdoor Units

High Efficiency

Equipped with high efficiency DC Inverter compressor, adjustable fan motor and advanced 180° sine wave vector driver, the system can be higher than 6.1 in SEER and 4.0 in SCOP so as to meet the European and Australian new energy efficiency standards.

Reliability

Stable cooling under -15°C and heating under -15°C outdoor environment temperature.

180°Sine Wave Control

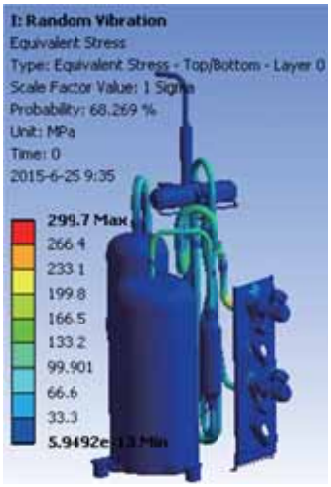
DC inverter compressor uses 180°sine wave vector control technique, make compressor motor operate smoothly and efficiency increases significantly.

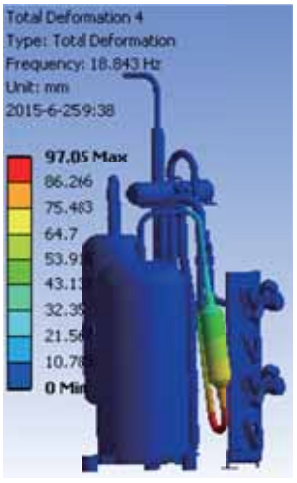
Optimized Pipeline Design

The design ensures the sub-cooling and enhances the cooling capacity by separating the refrigerant inlet and outlet.

Simulation Technology

Via analyzing piping stress distribution, piping amplitude and displacement in transportation and operation, the reliability has been improved greatly.





Electrical heater （Optional）

Heater code: 11330029000010 220V 50W

The electrical heater is used to melt ice on the chassis, make sure good heat exchange performance for condenser, powerful heating performance in very cold condition and create comfortable environment.

Heating only function（Optional）

Cooling & heating is standard，heating only is optional. Pls refer to Part9 2.2 Parameter setting.

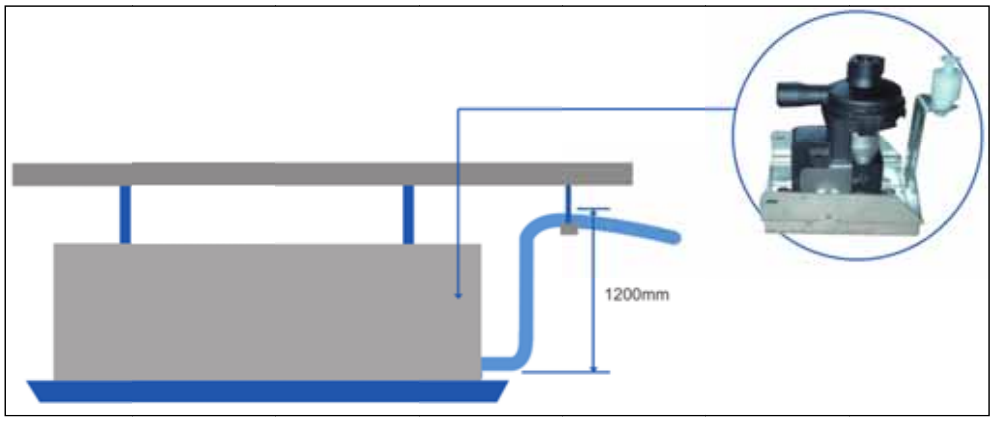
2. Cassette

2.1 Round-flow Cassette

Four-way cassette type A/C is installed under the ceiling, compared with Floor &Standing type A/C, it has following advantages: Ceiling installation combining with the decoration, makes the room more elegant; Flexible installation in anywhere in the ceiling and 4-direction blowing, makes you feel more comfortable.

Built-in Drain Pump

The built-in drain pump can lift condensing water up to 1200mm high from the drainage pan.



Fresh Air Intake

Fresh air makes indoor air healthy and comfortable.

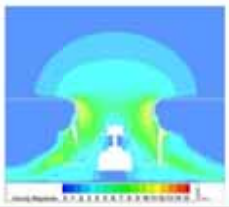
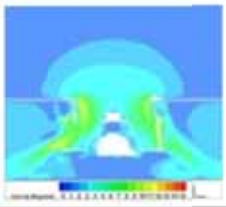
Optimized Electric Box

Better fire-proof and easy to maintenance.

2.2 Compact Y Cassette

2.2.1. Large air flow

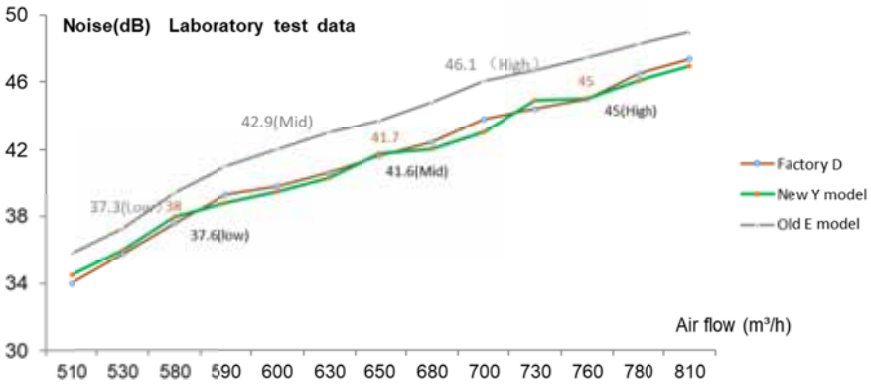
Optimized structure of air guide ring, Insertion depth design of guide ring through simulation technology, Ensure the large air flow, improve cooling & heating comfort

Compact cassette	New Y model	Old E model
Photos		
Simulation of air flow		
Indoor Air Flow (H/M/L) m^3/h	760/650/580	700/600/530

※ Above Air flow is rated data of R32 DC inverter series

2.2.2. Low Operation Noise

Optimize structure design of air guide ring, chassis and wind wheel to effectively reduce air volume noise and abnormal noise. The air volume is larger but the noise is lower



3. Ceiling Floor

3.1 Ceiling Floor F Type

3.1.1 Comfortable

Prevent gel

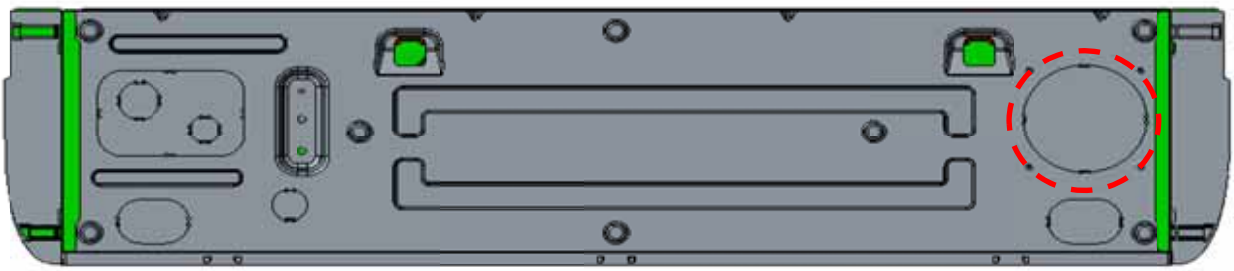
Unique air outlet insulation and wind guide bar arc design (Kangda effect), no condensation time from 4h to 6h, higher than the industry level.

Strong air supply

Super air supply distance, up to 14m, the air supply volume is higher than the industry level to meet the circulation air supply of the whole room.

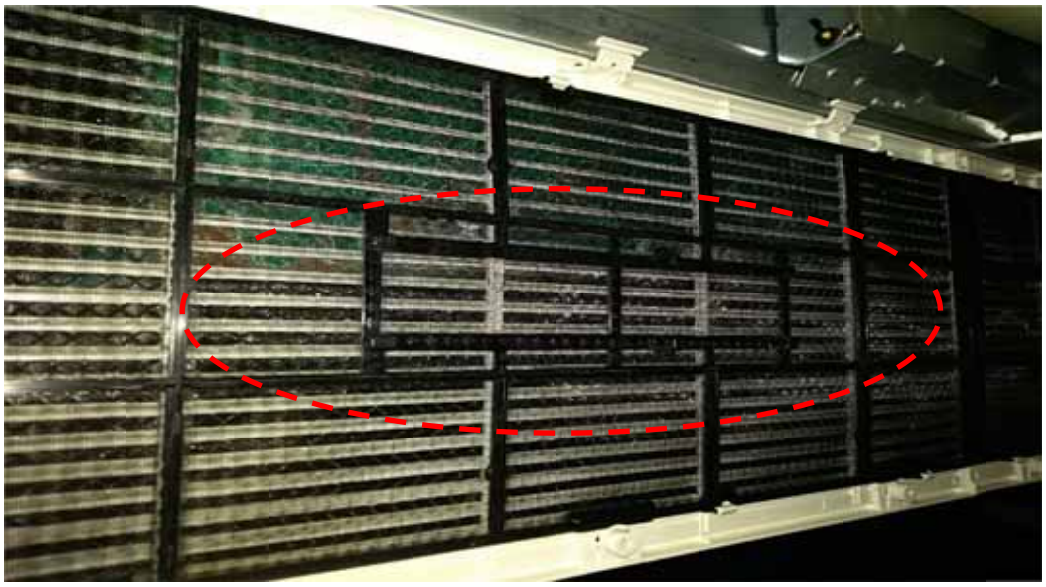
Bring fresh air

Fresh air inlet design can bring fresh air into the room to ensure fresh air in the room.



Degradation of formaldehyde

The filter screen can be equipped with a formaldehyde removal module to ensure fresh air in the room.



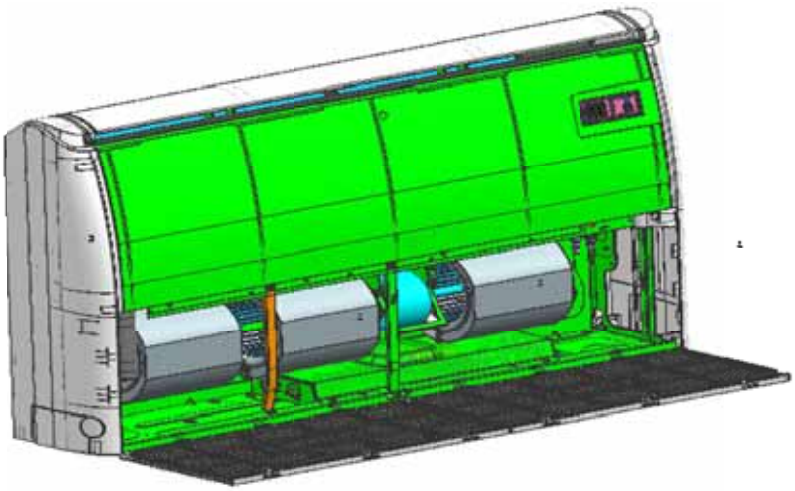
Low noise

High quality wind wheel/turbine selection, using simulation design, the lowest noise than the industry level.

3.1.2 Convenient and efficient

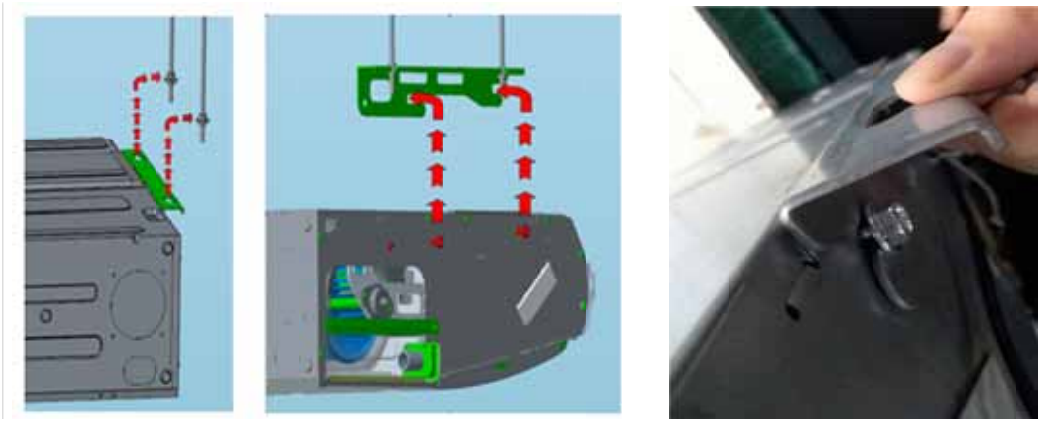
Easy unpick and wash

Return air grille, filter screen cover is removed and cleaned.



Easy Installation

Can be hoisted, can be mounted; Removable load-bearing rod can be installed flexibly, and the rod can be fine-tuned up and down to adjust the horizontal Angle of machine hoisting

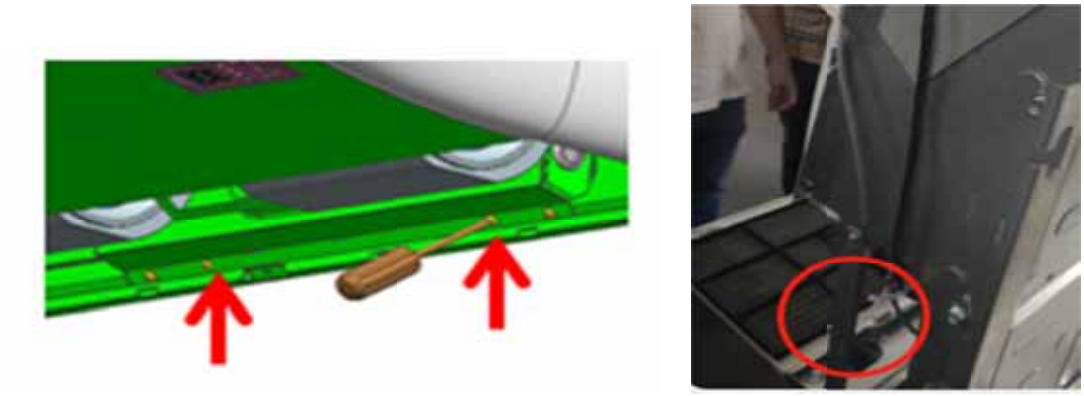


Easy drainage

The left and right water outlet design of the receiving tray is flexible to adapt to the installation site

Easy maintenance

Easy to repair, screw two screws, do not need to remove, left and right end cover 1 screw quickly remove, step motor 2 screws have been repaired, the bottom space is easy to repair



3.1.3 Stable and Reliable

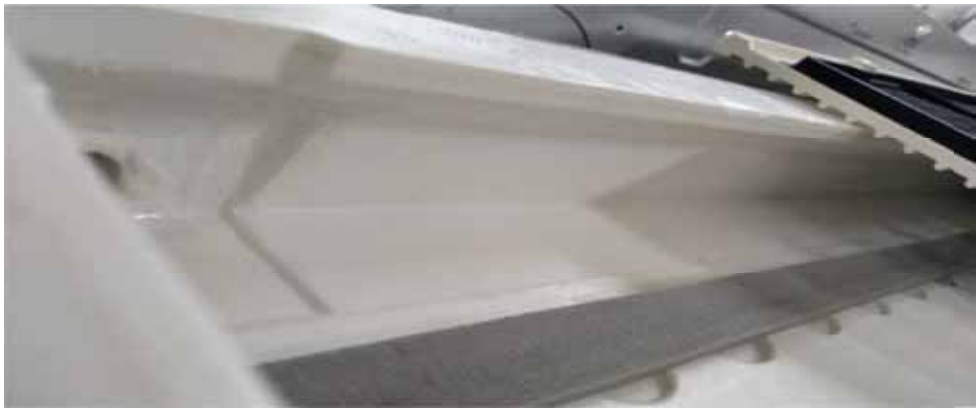
The face plate is elegant, the display board is beautiful

Matte white panel design, high-end elegant

Lamp board design beautiful, and good sealing, moisture proof, long reliable life

Strong catchment

Excellent water collection structure design, whether in lifting or upright installation can well collect condensed water to the water tray, avoid leakage



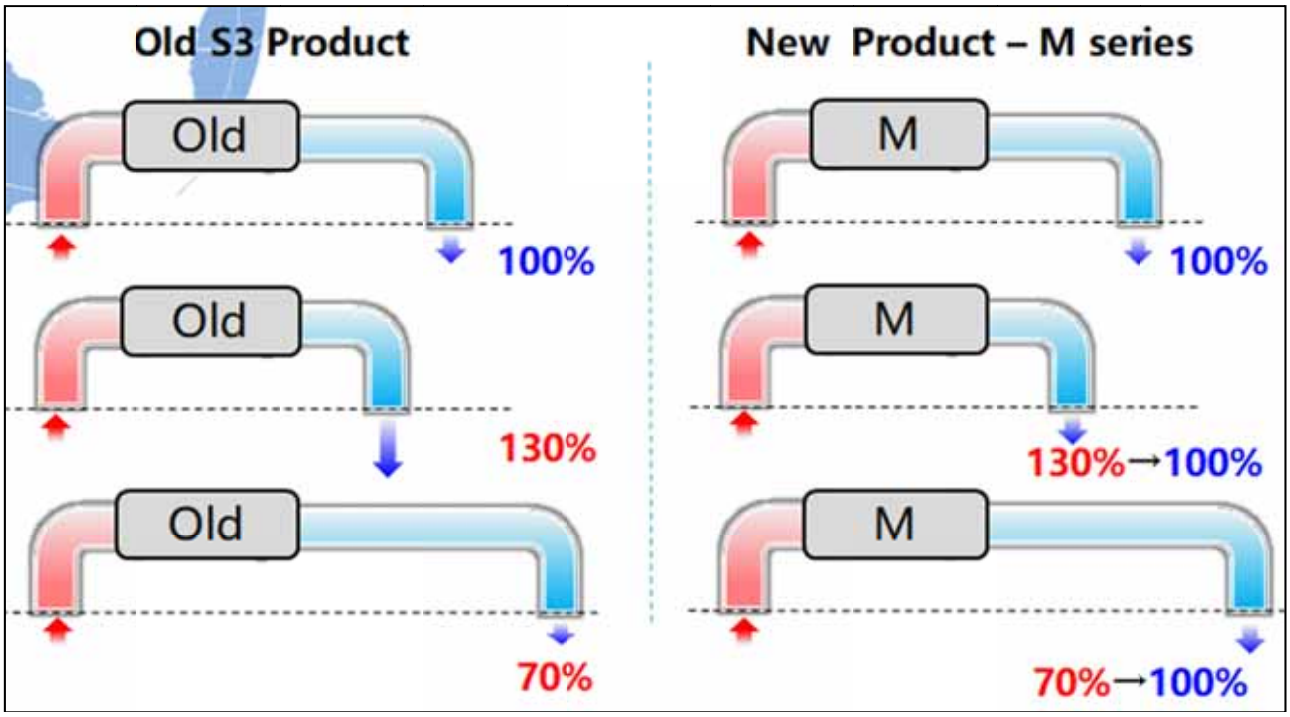
Safe and reliable

Strong and weak electric connection terminals are separated to ensure safe and reliable use of electricity

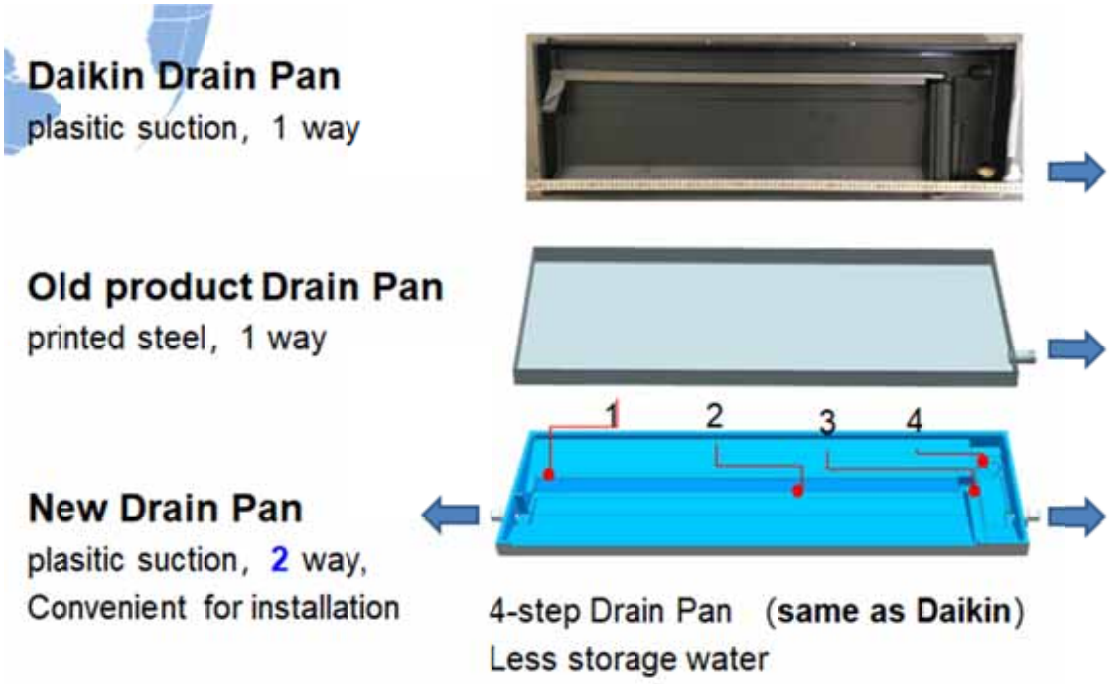
4. Duct

Constant Air Flow Volume

Under different ESP, the product supply Constant air flow volume for comfort.



Two-way drain pan



Independently designed bottom flange

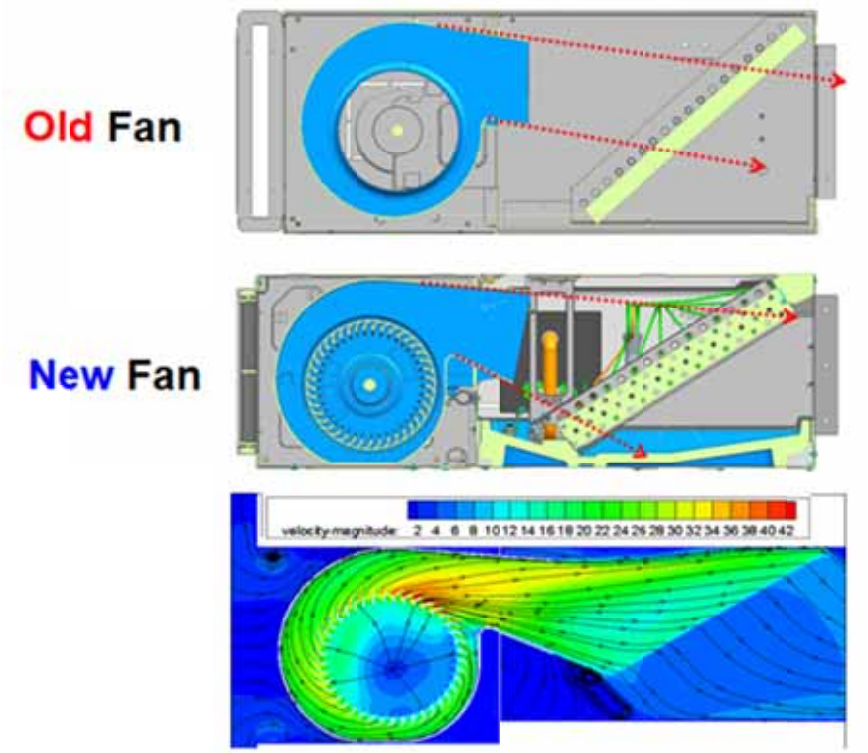
Independently designed bottom flange, the air duct will not be damaged in maintenance.

Easy for maintenance.

Easy disassembly filter

0 Screws, Easy disassembly, convenient for washing, W type highly efficient filter

Optimized Centrifugal Fan



Removable Control Box

5.Console

5.1 Strong heating capacity

Full DC inverter air source heat pump heater

It can easily cope with various harsh outdoor environment in winter and create a warm and healthy home for you

5.2 Approximate to Floor heating

The wind blows from the bottom, and the feet are warm; the wind blows from the top, it heats up quickly the temperature rise rate is faster than conventional floor heating. Bring comfortable heating enjoyment

5.3 Full DC inverter technology

Both indoor and outdoor units adopt full DC invrter technology, which is highly efficient and energy-saving

5.4 Continuous heating

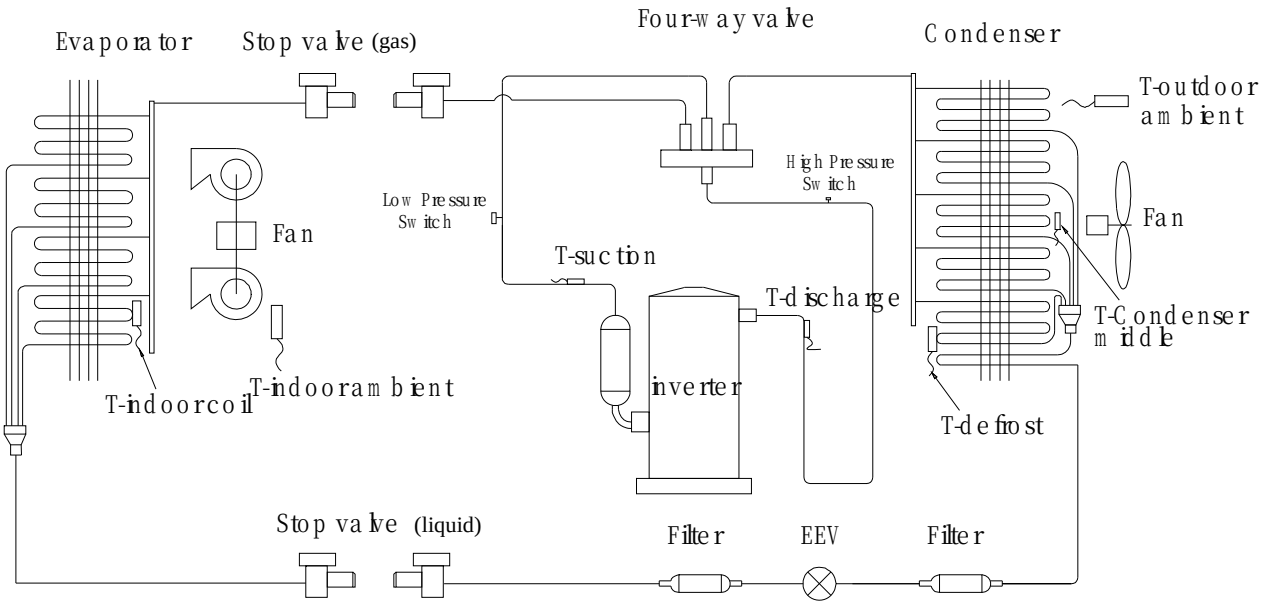
Under low temperature conditions, it can be continuously heated for a long time without defrosting, no obvious temperature fluctuations, and enjoy a comfortable heating.

5.5 Purify first

The console has a long-lasting air filter, making the air fresher and healthier, creating a healthy home for you.

Part3 Piping System

The compressor inhales the low-temperature and low-pressure refrigerant vapor from the evaporator, and vapor be turned into high-temperature and high-pressure gas then enters into condenser, the high-temperature and high-pressure refrigerant gas and outdoor air make heat exchange in the condenser, the compressed vapor is then cooled by heat exchange with the outside air, so that the vapor condenses to be a high-temperature and high-pressure fluid, and then through capillary throttling to cooled, low pressure, then the liquid enters into the evaporator and two-phase of gas and liquid refrigerant in the evaporator completely evaporate, thereby cooling the indoor air; from evaporator the vapor is inhaled into compressor again, so it runs continuously cycle to cycle, cooled air is continuous supplied to the air-conditioned area though duct by fan motor.

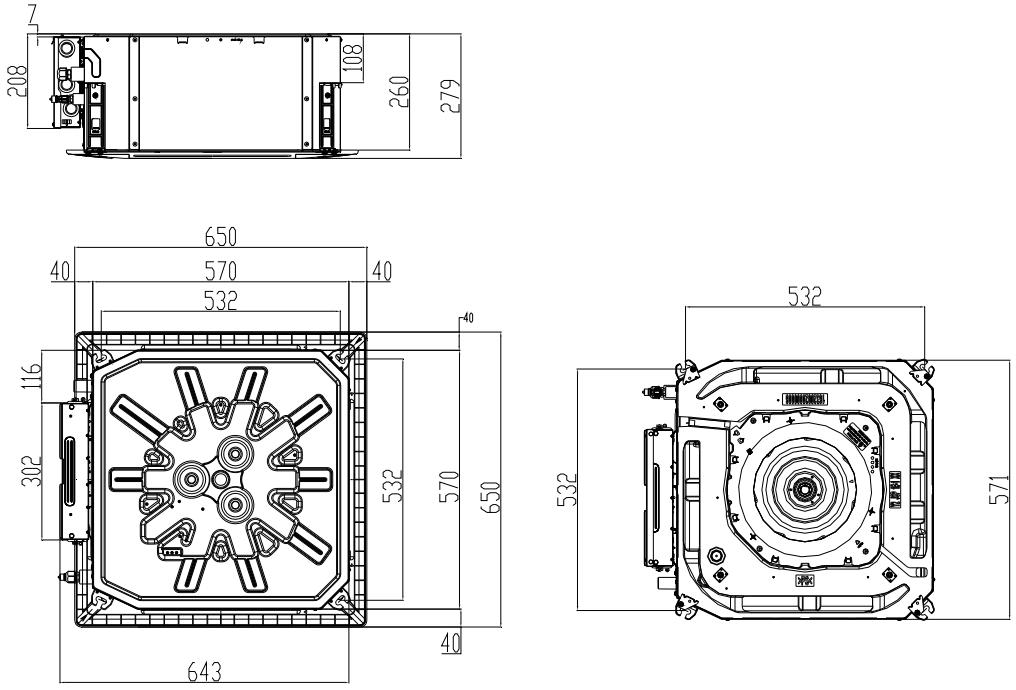


Part4 Dimension

1. Cassette

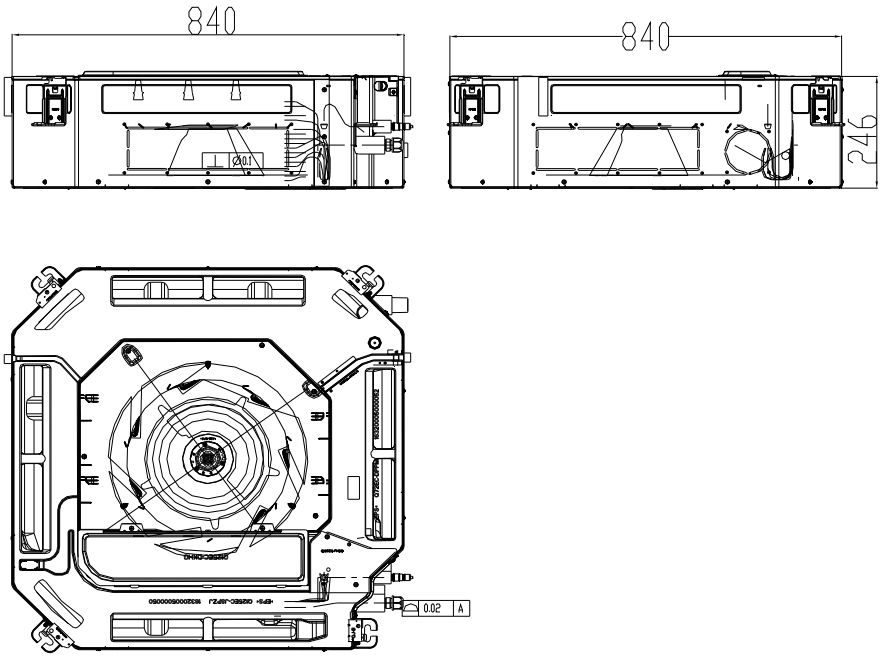
1.1 Compact cassette

ALCA-H12/NDR3HYA, ALCA-H12/NDR3HY2A, ALCA-H18/NDR3HYA, ALCA-H18/NDR3HY2A:

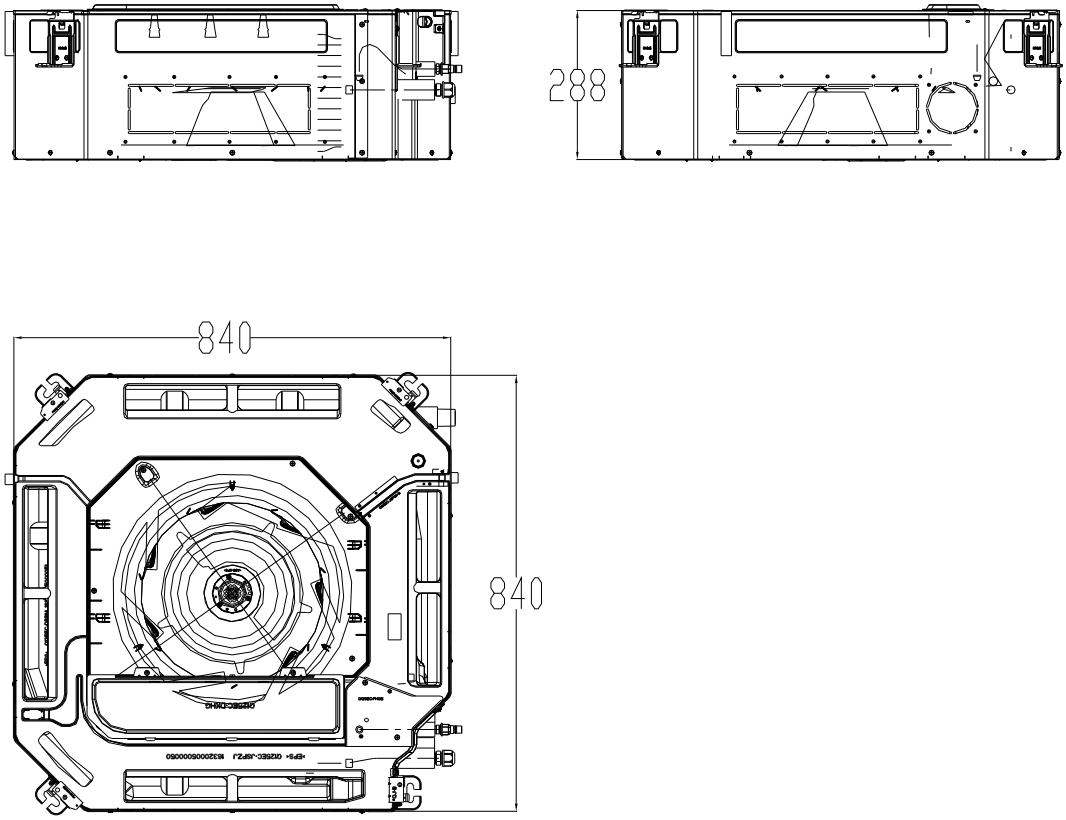


1.2 Round-flow cassette

ALCA-H24/NDR3HYB, ALCA-H24/NDR3HY2A:

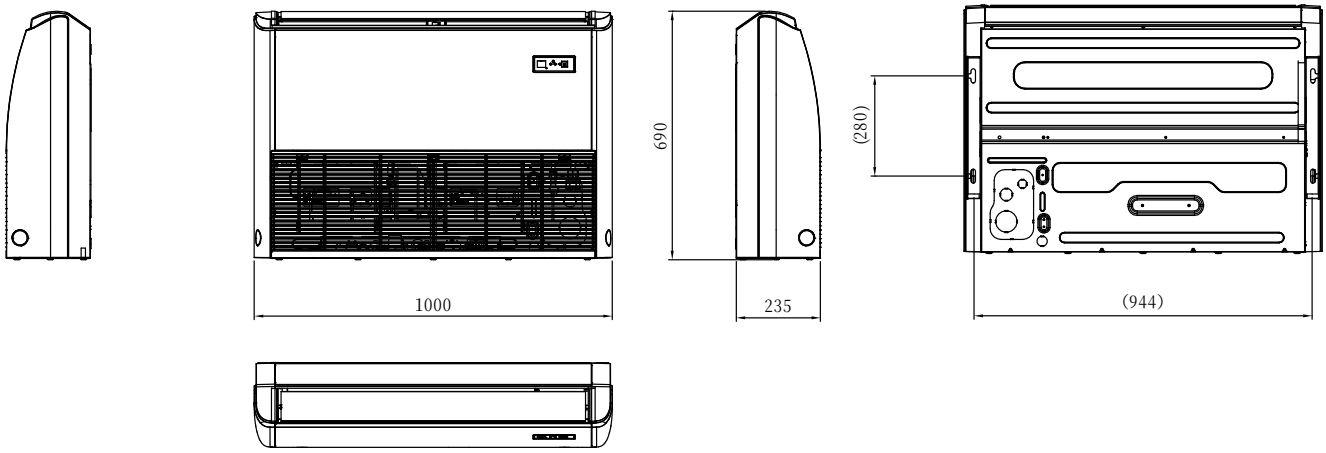


ALCA-H36/NDR3HYB, ALCA-H42/NDR3HYB, ALCA-H48/SDR3HYB, ALCA-H60/SDR3HYB:

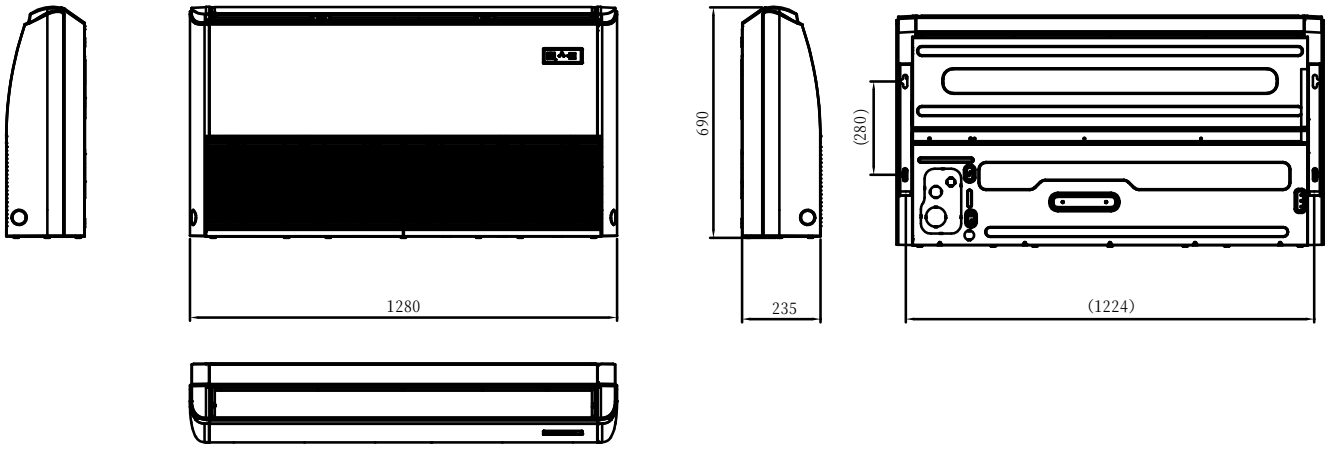


2. Ceiling Floor

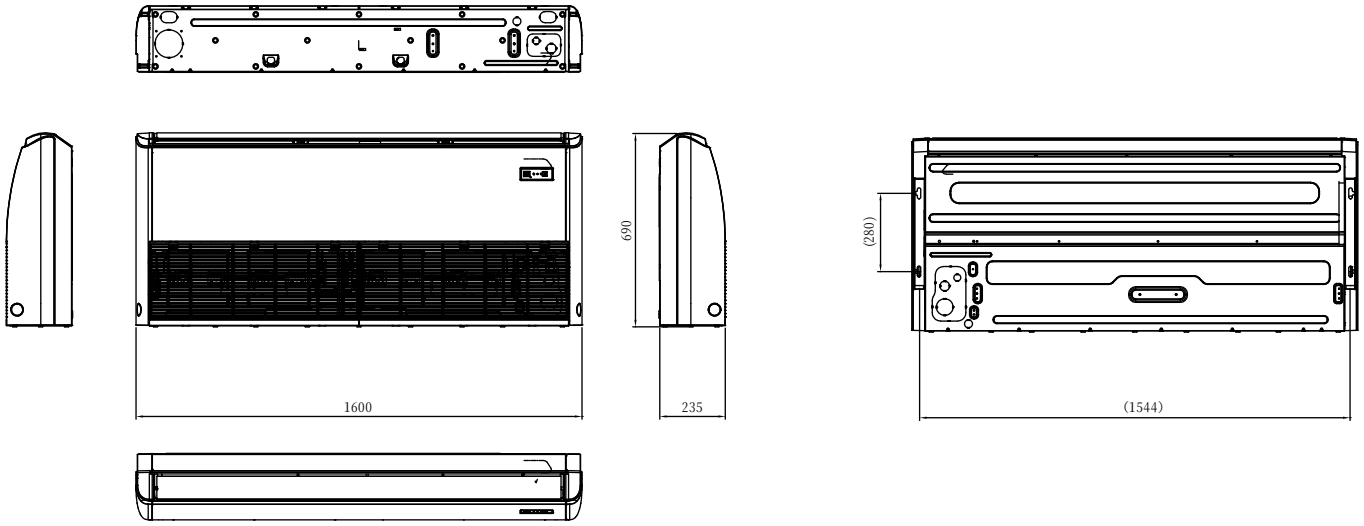
ALCF-H18/NDR3HF, ALCF-H18/NDR3HF2:



ALCF-H24/NDR3HF, ALCF-H24/NDR3HF2:

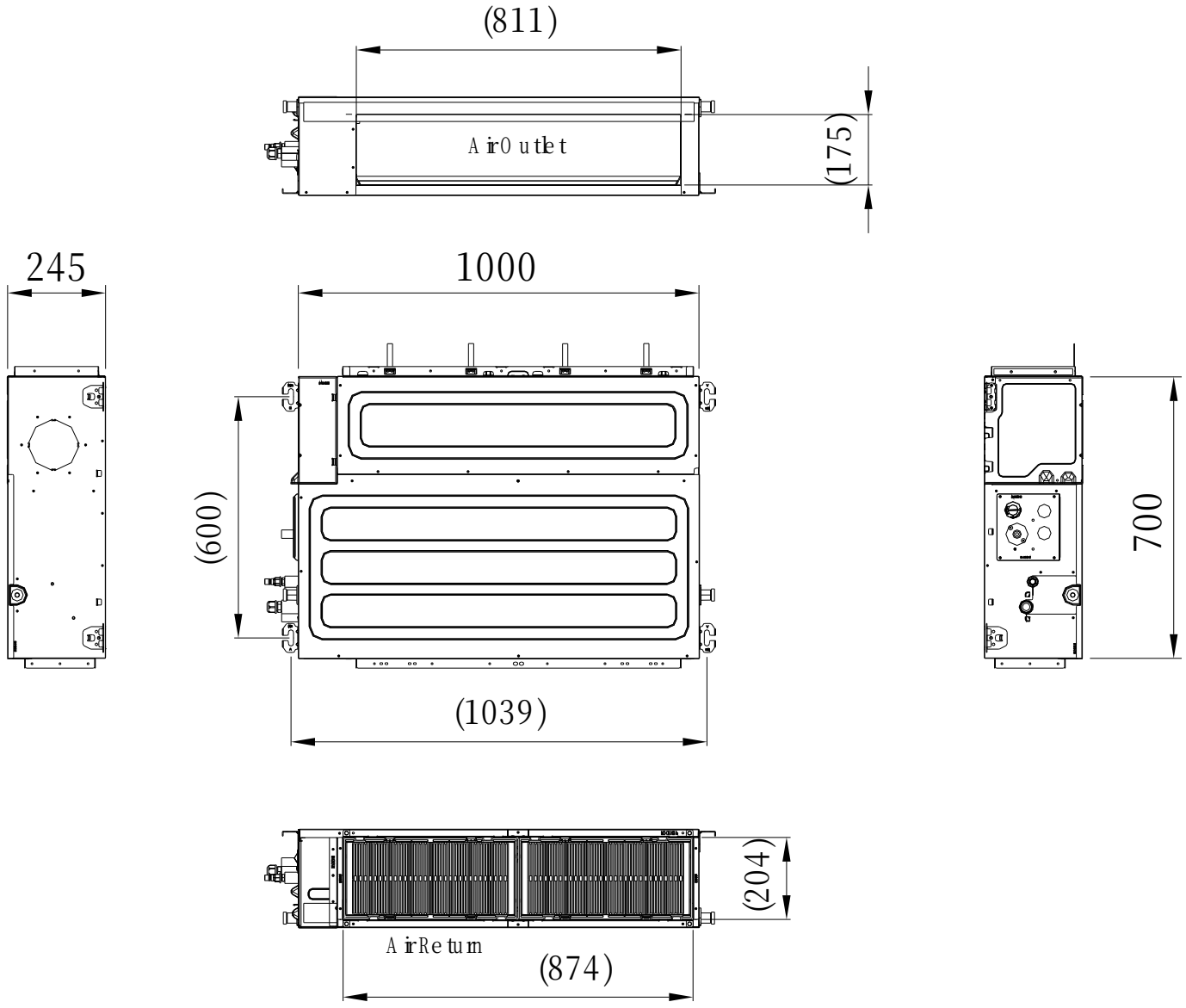


ALCF-H36/NDR3HF, ALCF-H42/NDR3HF, ALCF-H48/SDR3HF, ALCF-H60/SDR3HF:

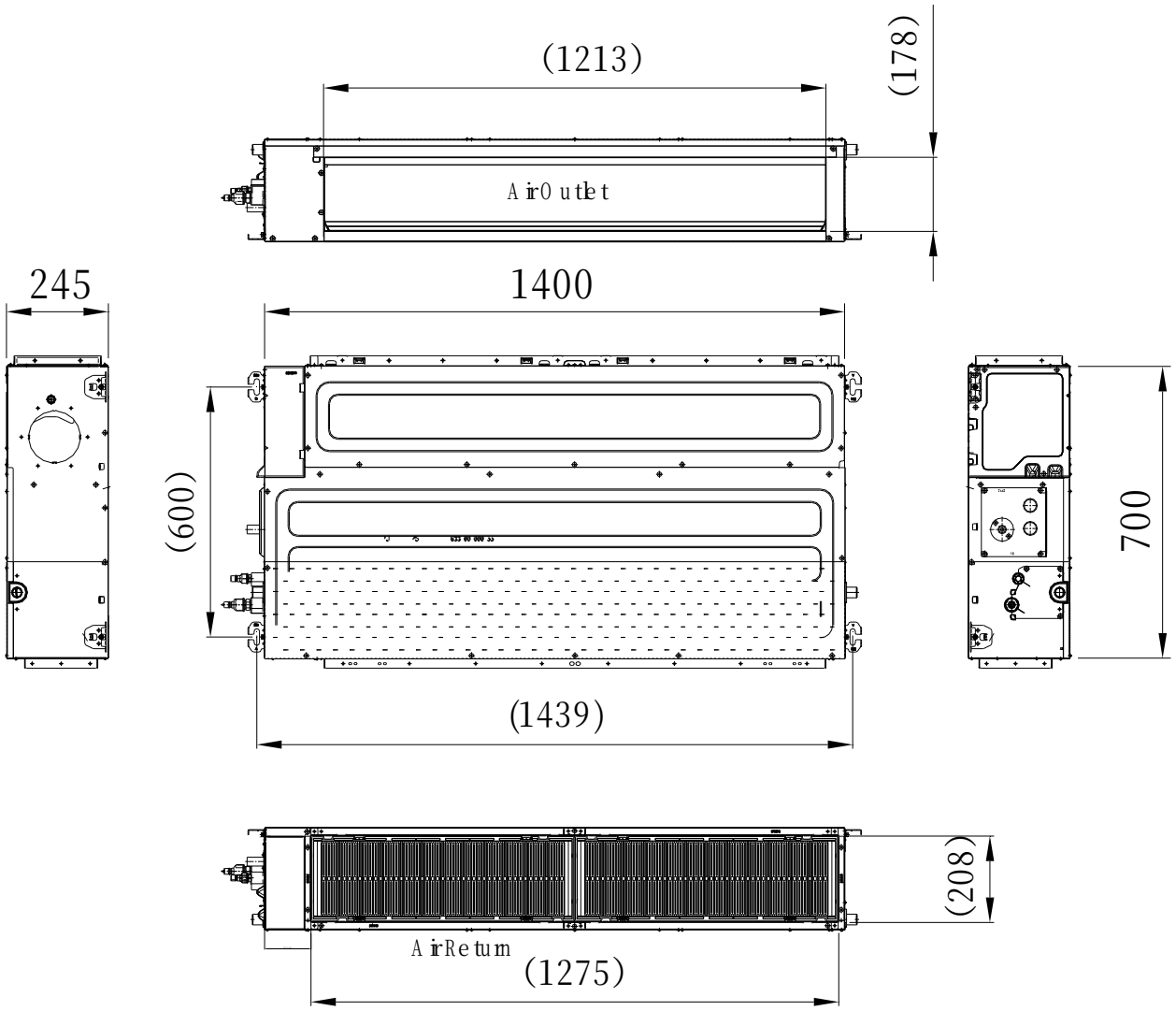


3. Duct

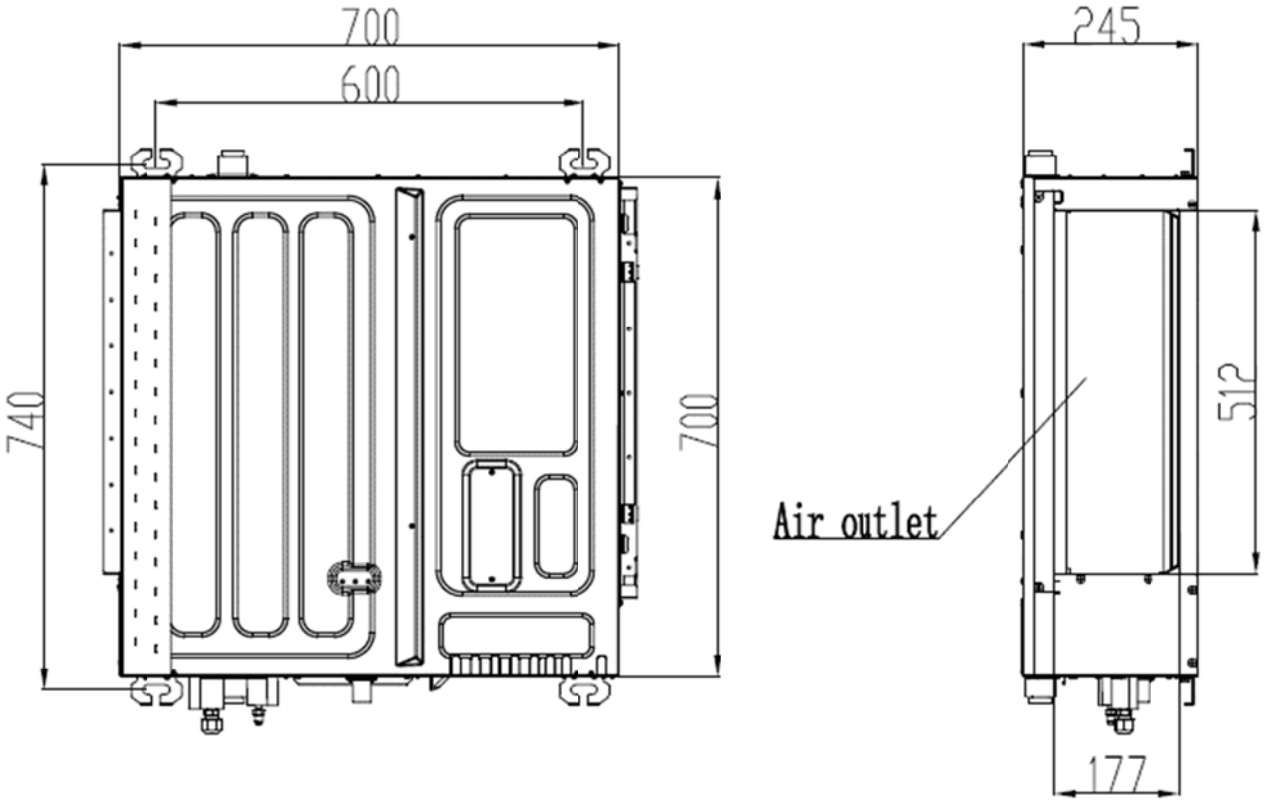
ALMD-H18/NDR3HA, ALMD-H18/NDR3HM2, ALMD-H24/NDR3HA, ALMD-H24NDR3HM2, ALMD-H30/NDR3HA, ALMD-H30/NDR3HM2:



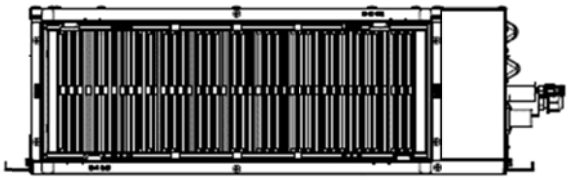
ALMD-H36/NDR3HA, ALMD-H42/NDR3HA, ALMD-H48/SDR3HA,
ALMD-H60/SDR3HA:



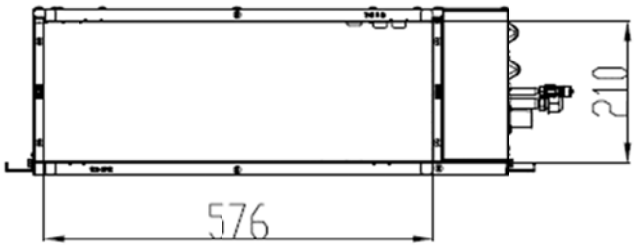
ALMD-H18/NDR3HM2A



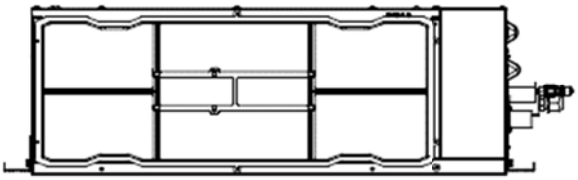
W-type filter



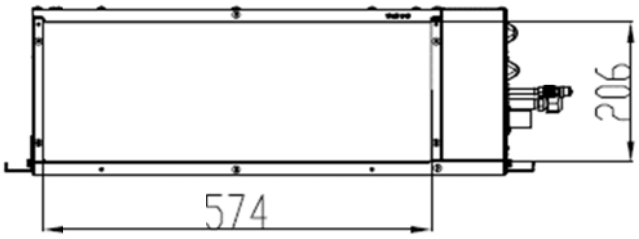
Air return (W-type filter)



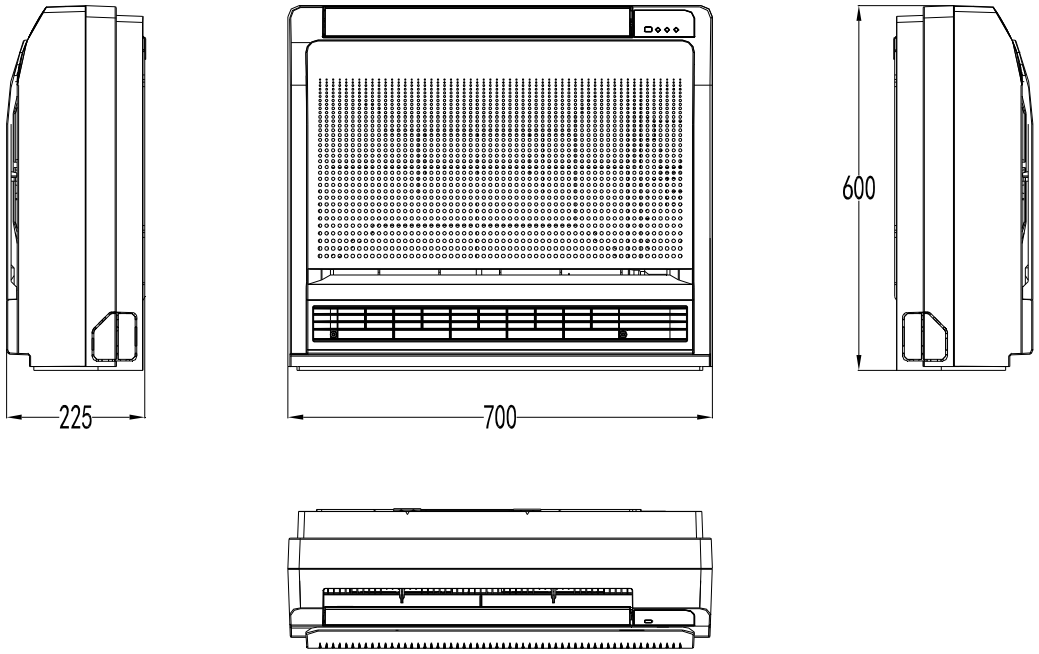
Nomal filter



Air return (Noaml filter)

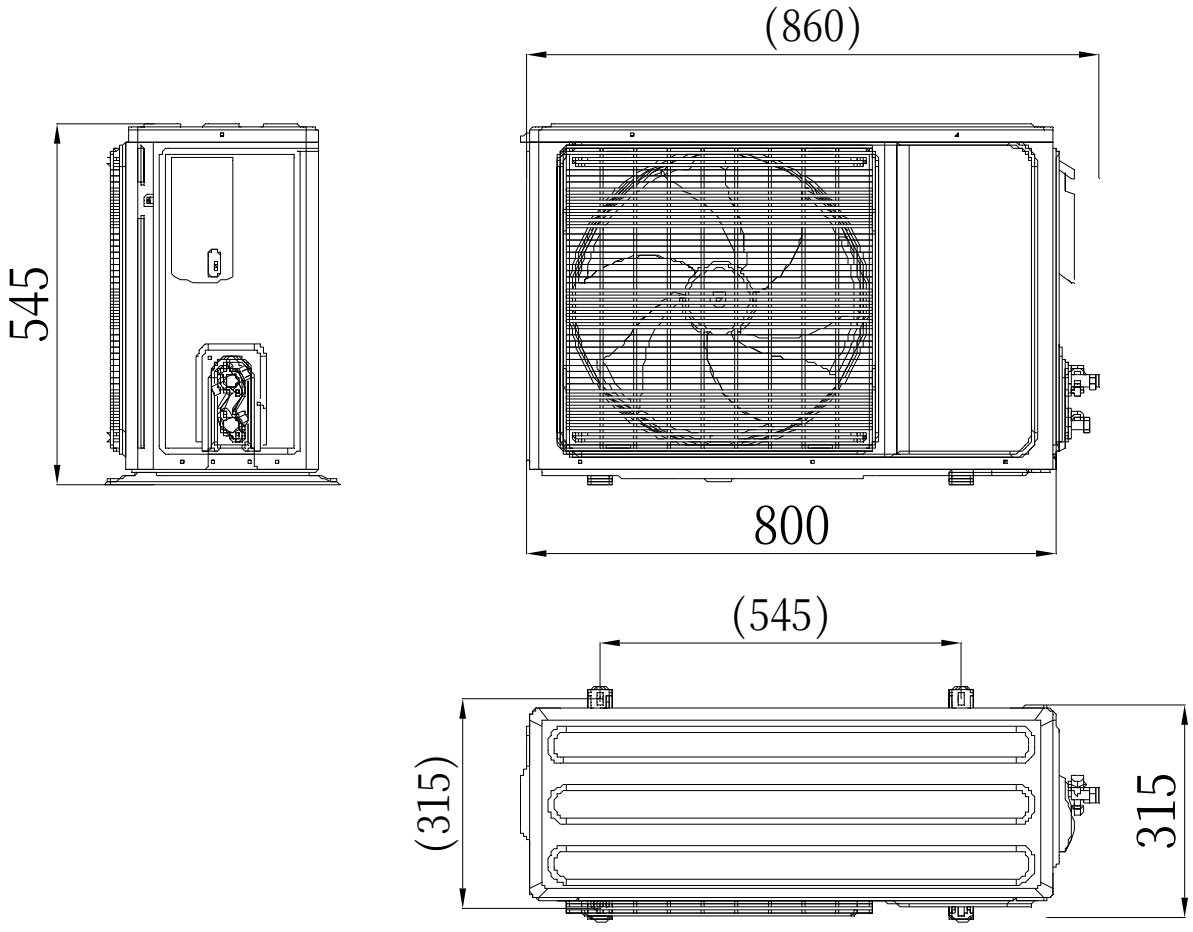


4. Console

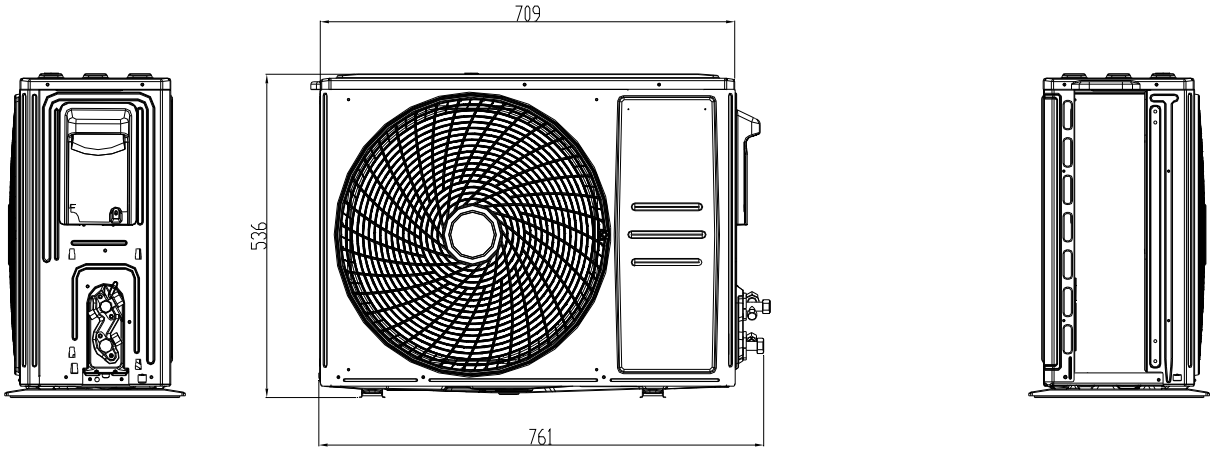


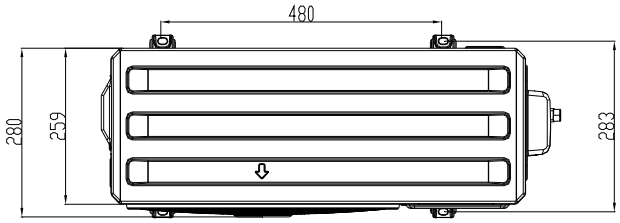
5. Outdoor Unit

5.1 AL-H12/NDR3A(U), AL-H18/NDR3A(U):

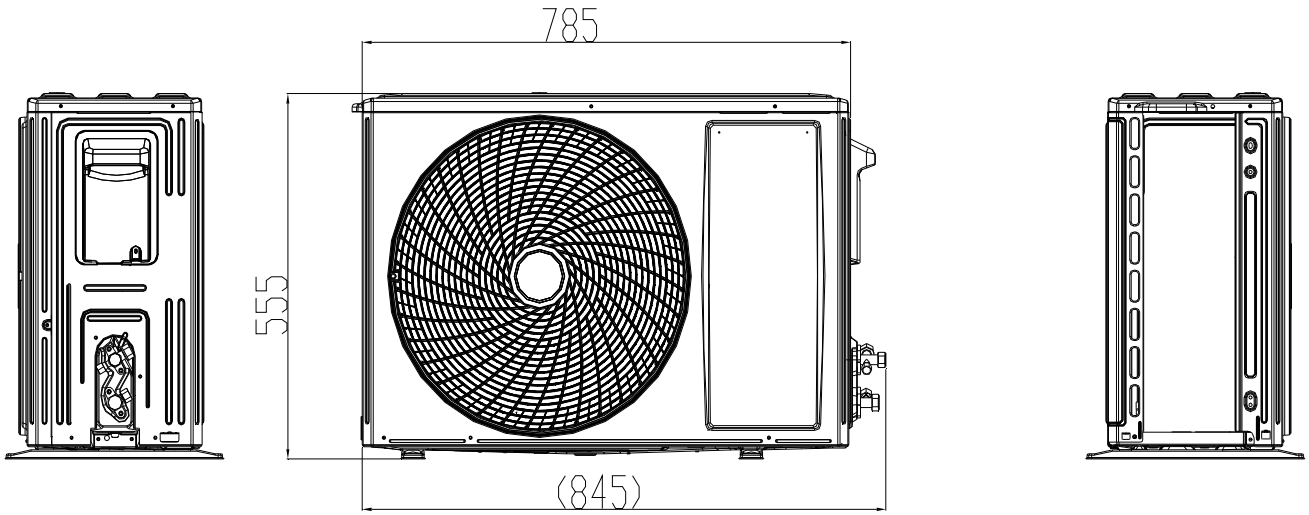


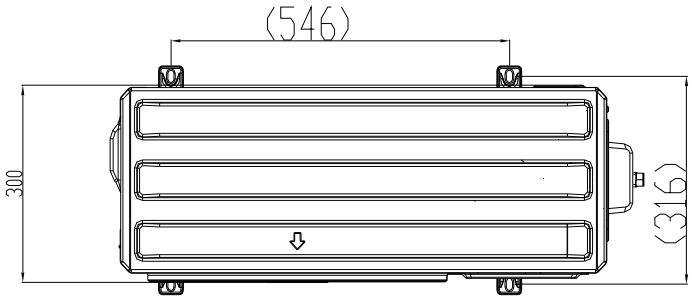
5.2 AL-H12/NDR3HB2(U)



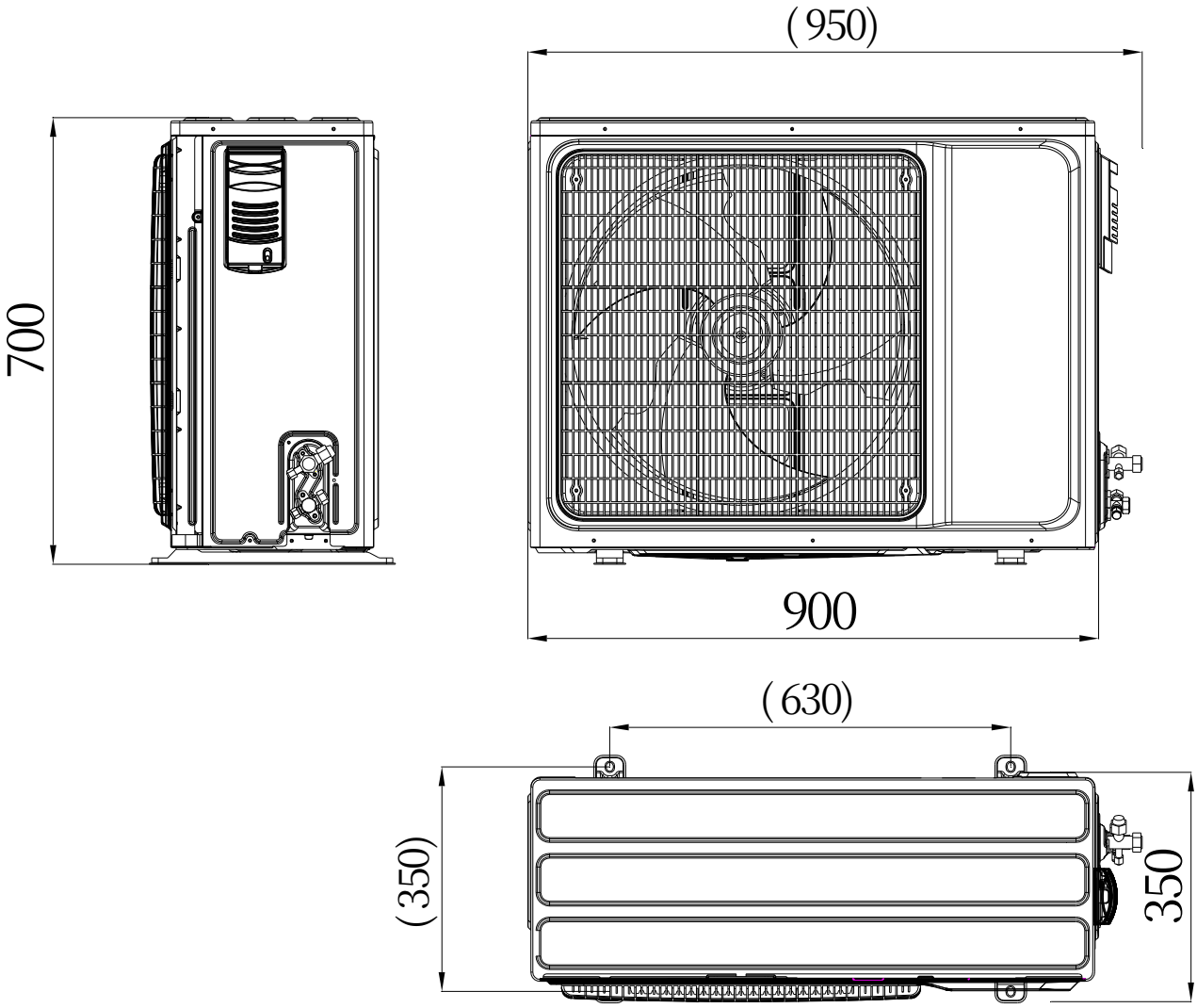


5.3 AL-H18/NDR3HB2(U)

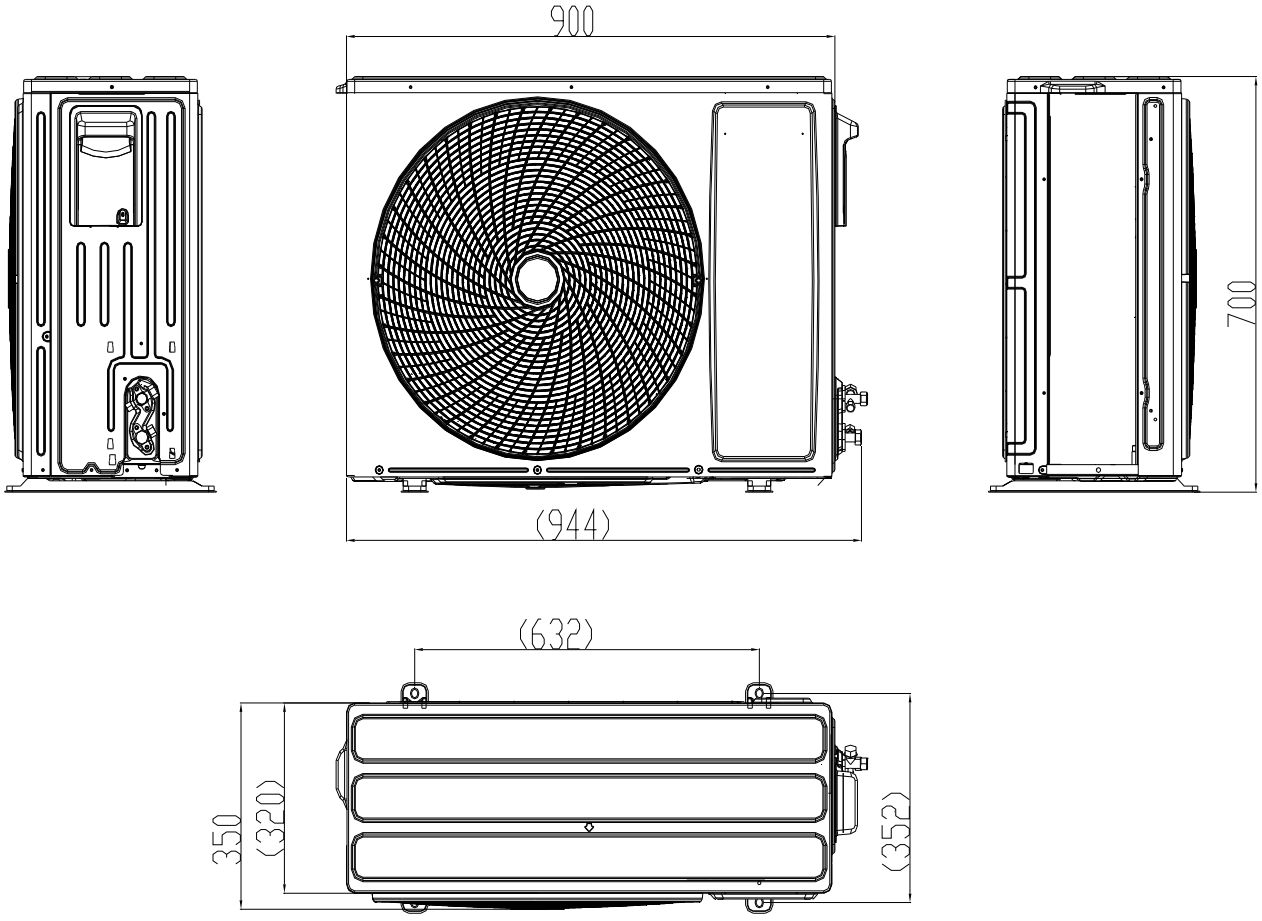




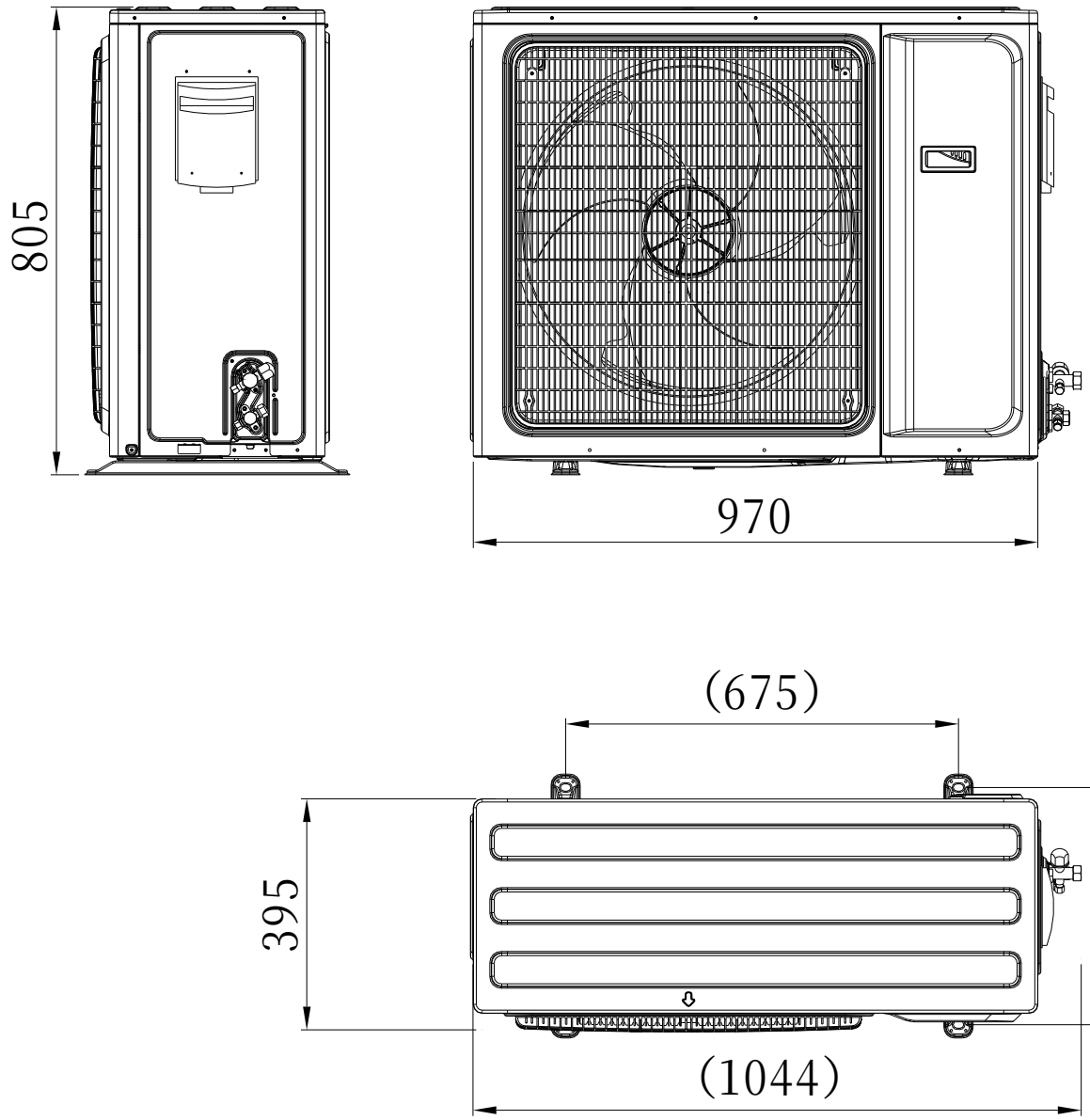
5.4 AL-H24/NDR3A(U)



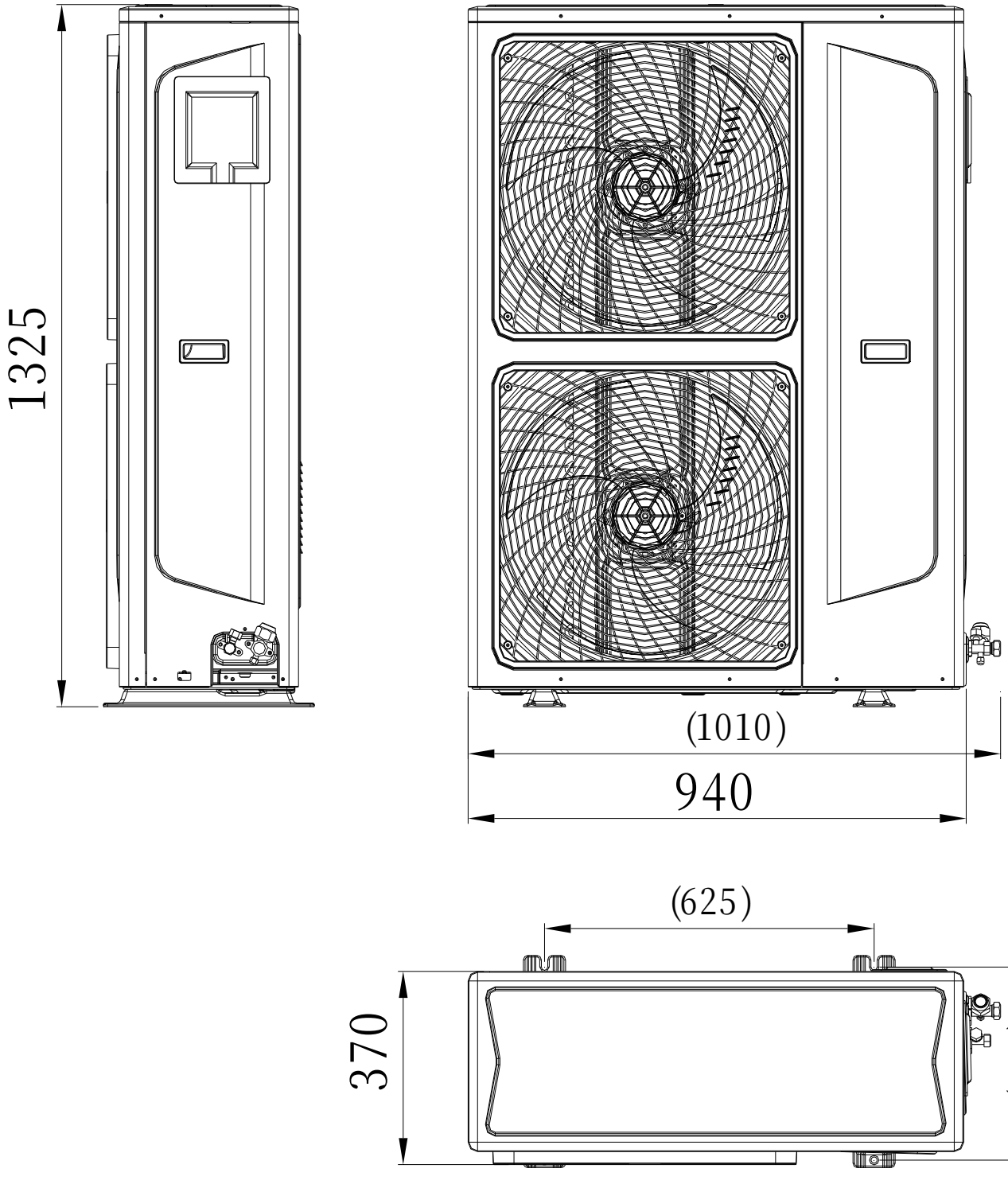
5.5 AL-H24/NDR3HB2(U), AL-H30/NDR3HB2(U)



5.6 AL-H30/NDR3A(U), AL-H36/NDR3A(U), AL-H42/NDR3A(U)



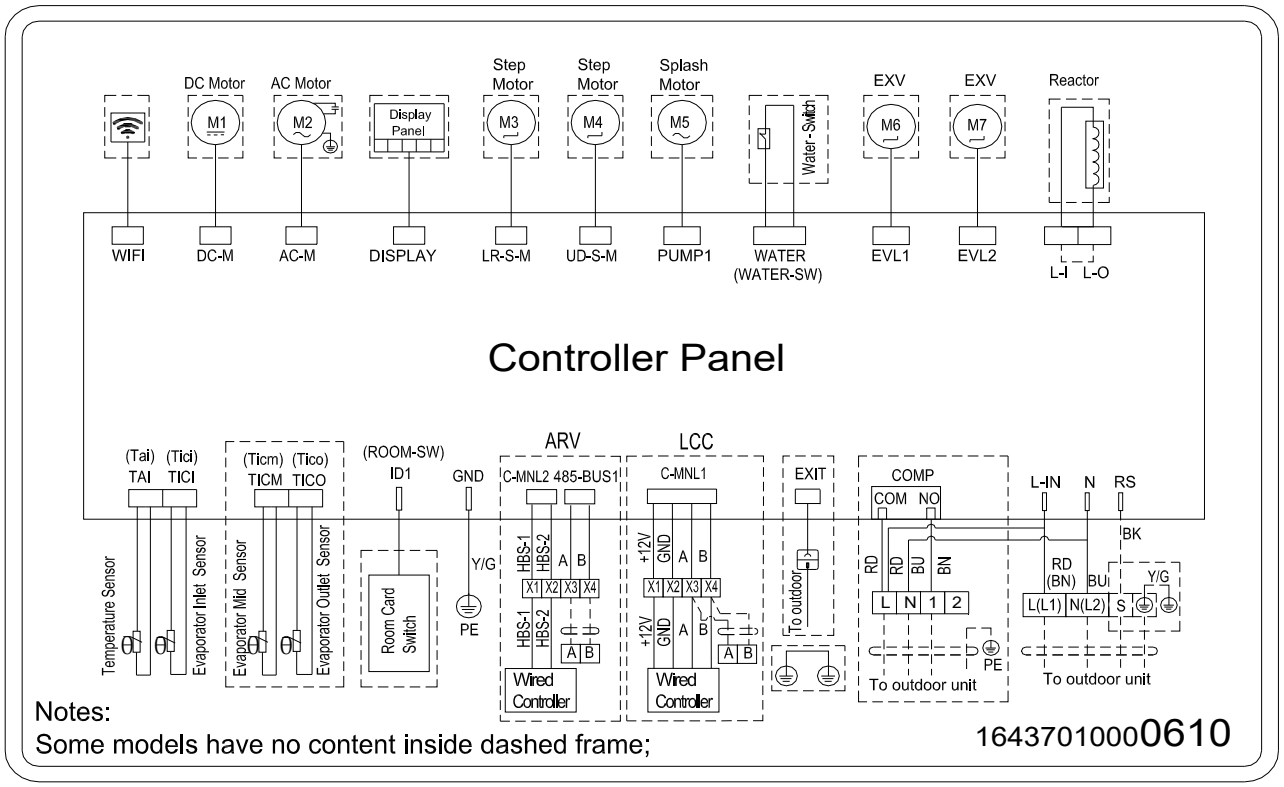
5.7 AL-H48/SDR3A(U), AL-H60/SDR3A(U)



Part5 Electrical Principle Diagram

1. Cassette

ALCA-H12/NDR3HYA, ALCA-H12/NDR3HY2A, ALCA-H18/NDR3HYA, ALCA-H18/NDR3HY2A, ALCA-H24/NDR3HYB, ALCA-H24/NDR3HY2A, ALCA-H36/NDR3HYB, ALCA-H42/NDR3HYB, ALCA-H48/SDR3HYB, ALCA-H60/SDR3HYB

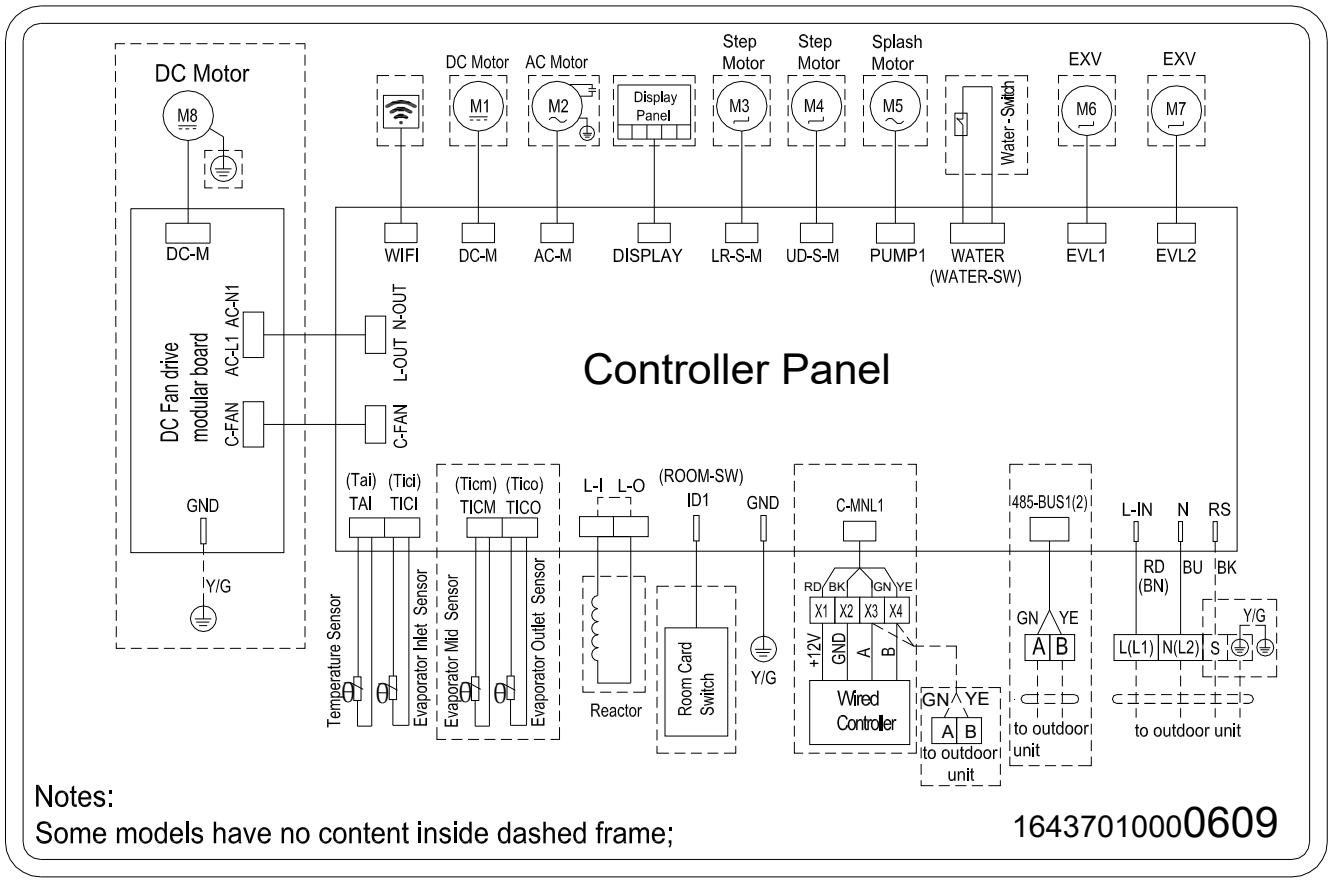


2. Ceiling Floor

ALCF-H18/NDR3HF, ALCF-H18/NDR3HF2, ALCF-H24/NDR3HF,

ALCF-H24/NDR3HF2, ALCF-H36/NDR3HF, ALCF-H42/NDR3HF,

ALCF-H48/SDR3HF, ALCF-H60/SDR3HF:



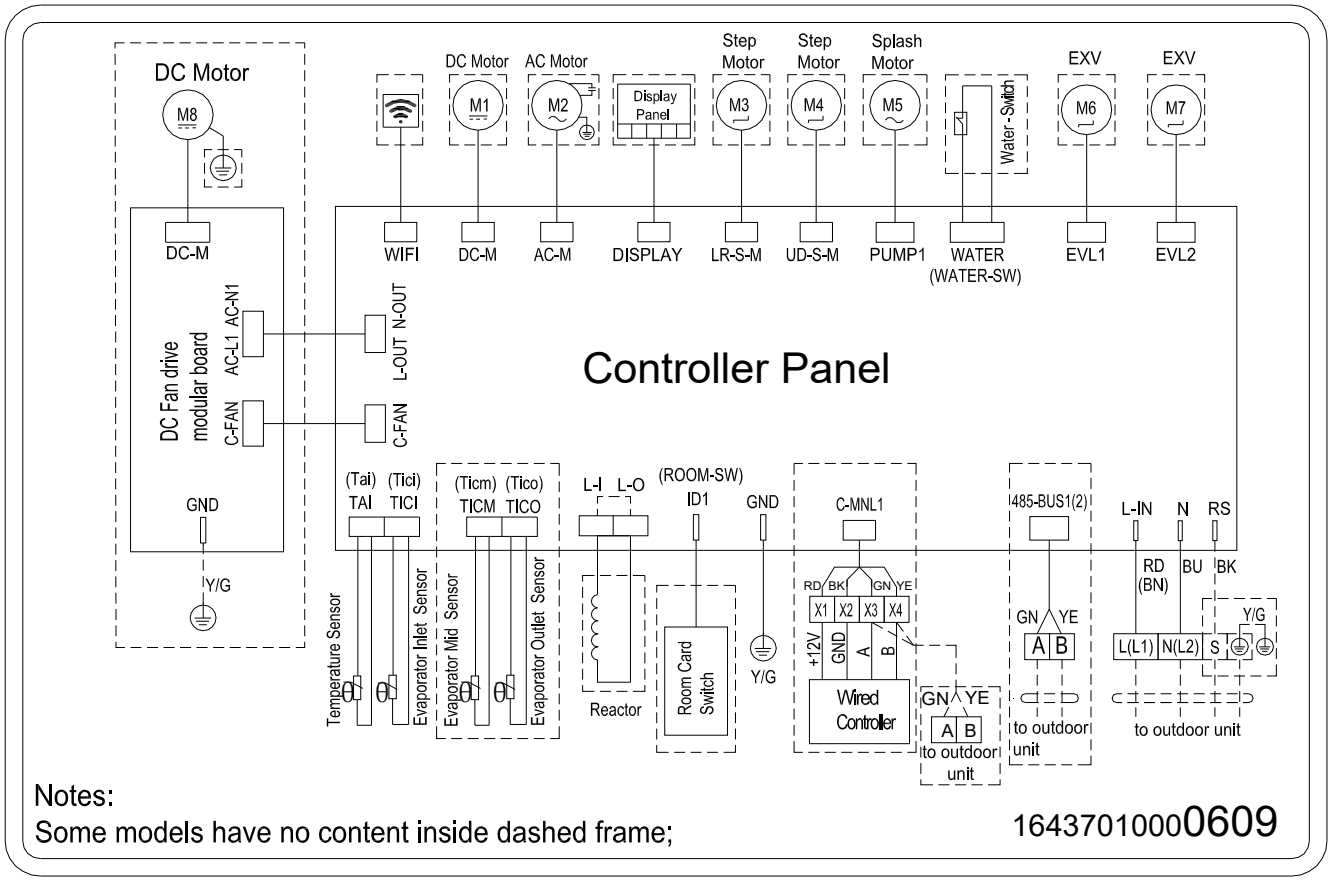
3. Duct

ALMD-H18/NDR3HA, ALMD-H18/NDR3HM2, ALMD-H18/NDR3HM2A , ALMD-H24/NDR3HA,

ALMD-H24NDR3HM2, ALMD-H30/NDR3HA, ALMD-H30/NDR3HM2,

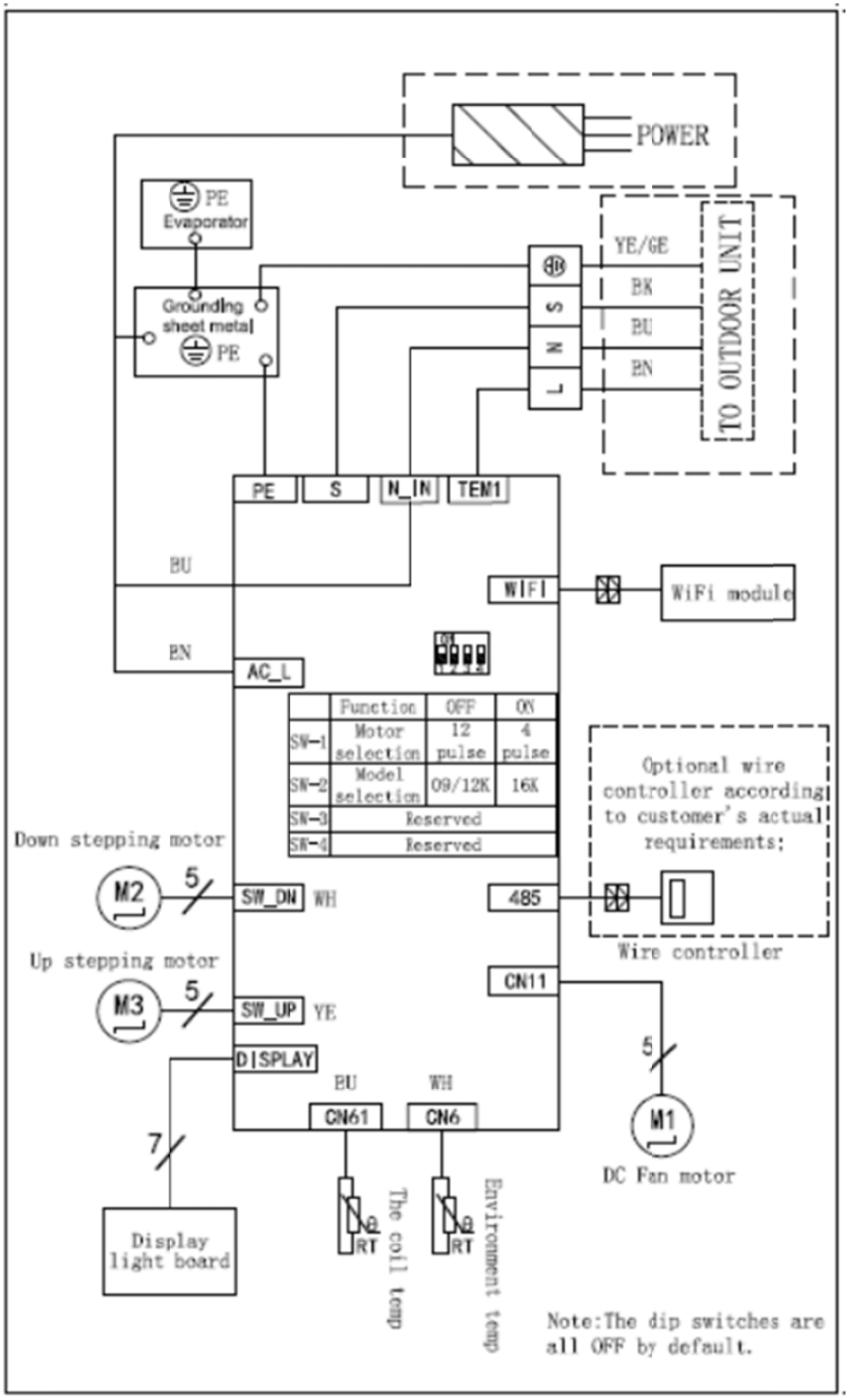
ALMD-H36/NDR3HA, ALMD-H42/NDR3HA, ALMD-H48/SDR3HA,

ALMD-H60/SDR3HA



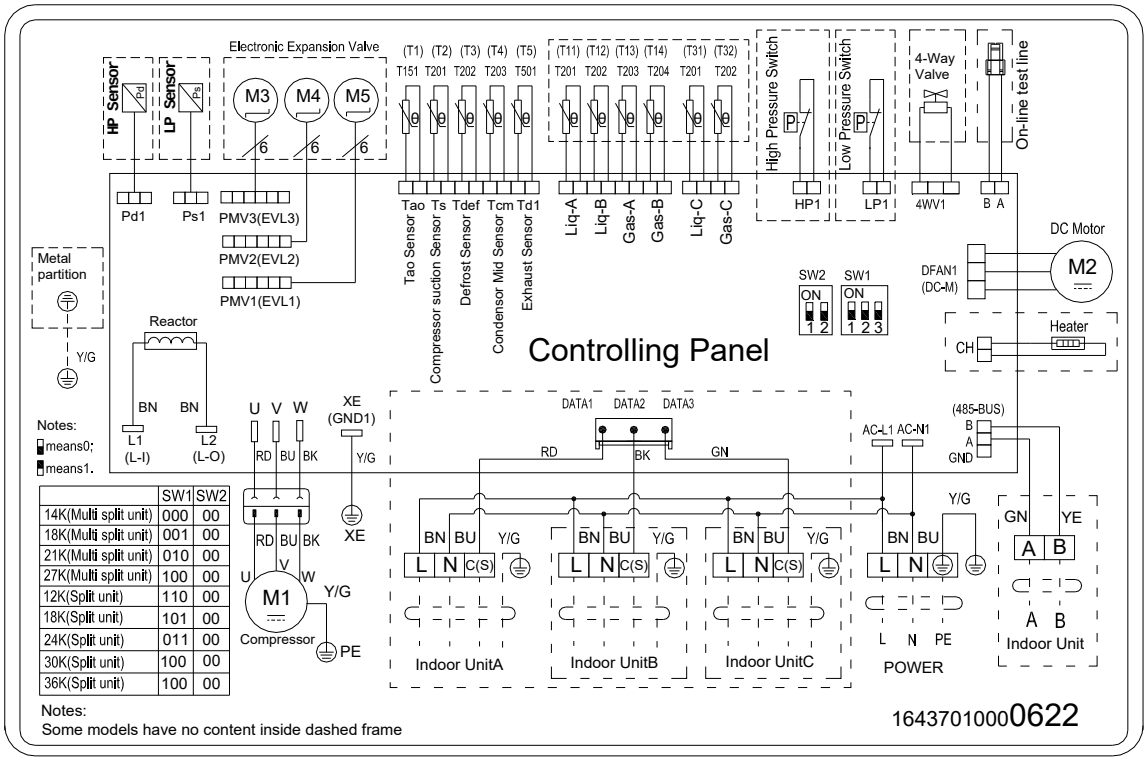
4. Console

ALCO-H12/4R3A、ALCO-H18/4R3A



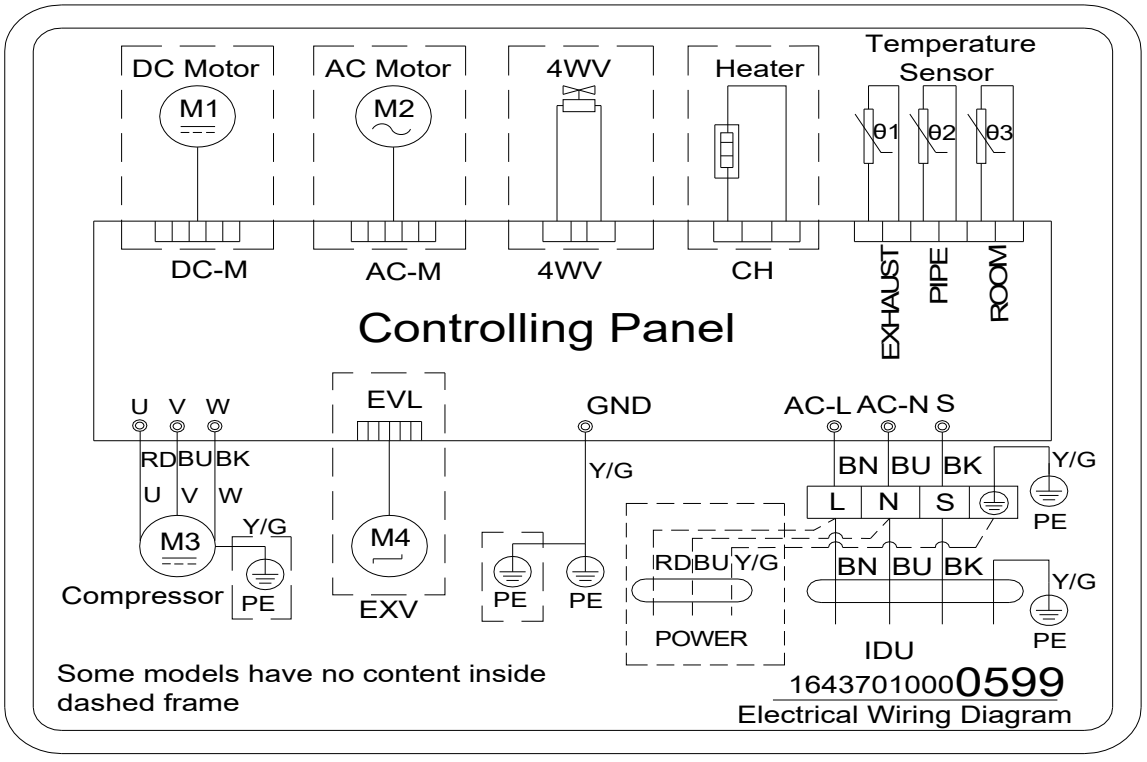
5. Outdoor Unit

AL-H12/NDR3A(U), AL-H18/NDR3A(U), AL-H24/NDR3A(U):

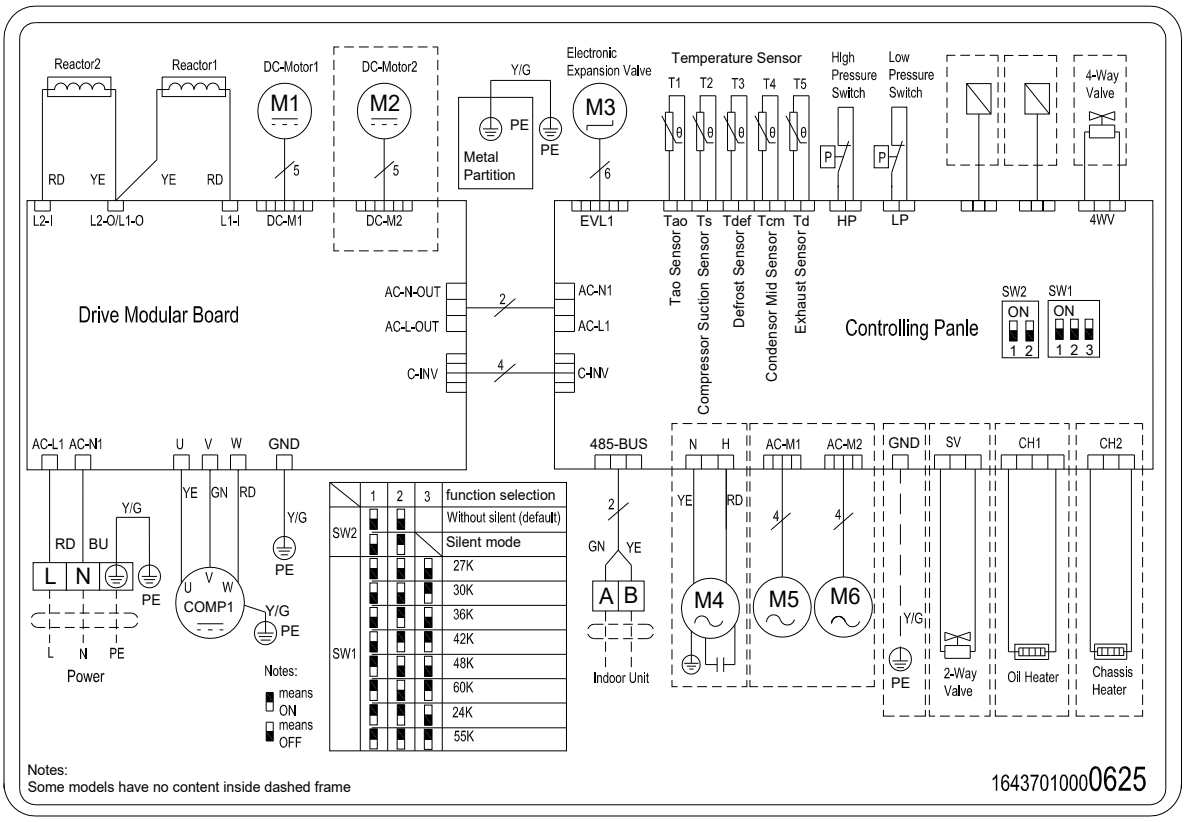


	SW1	SW2
14K(Multi split unit)	000	00
18K(Multi split unit)	001	00
21K(Multi split unit)	010	00
27K(Multi split unit)	100	00
12K(Split unit)	110	00
18K(Split unit)	101	00
24K(Split unit)	011	00
30K(Split unit)	100	00
36K(Split unit)	100	00

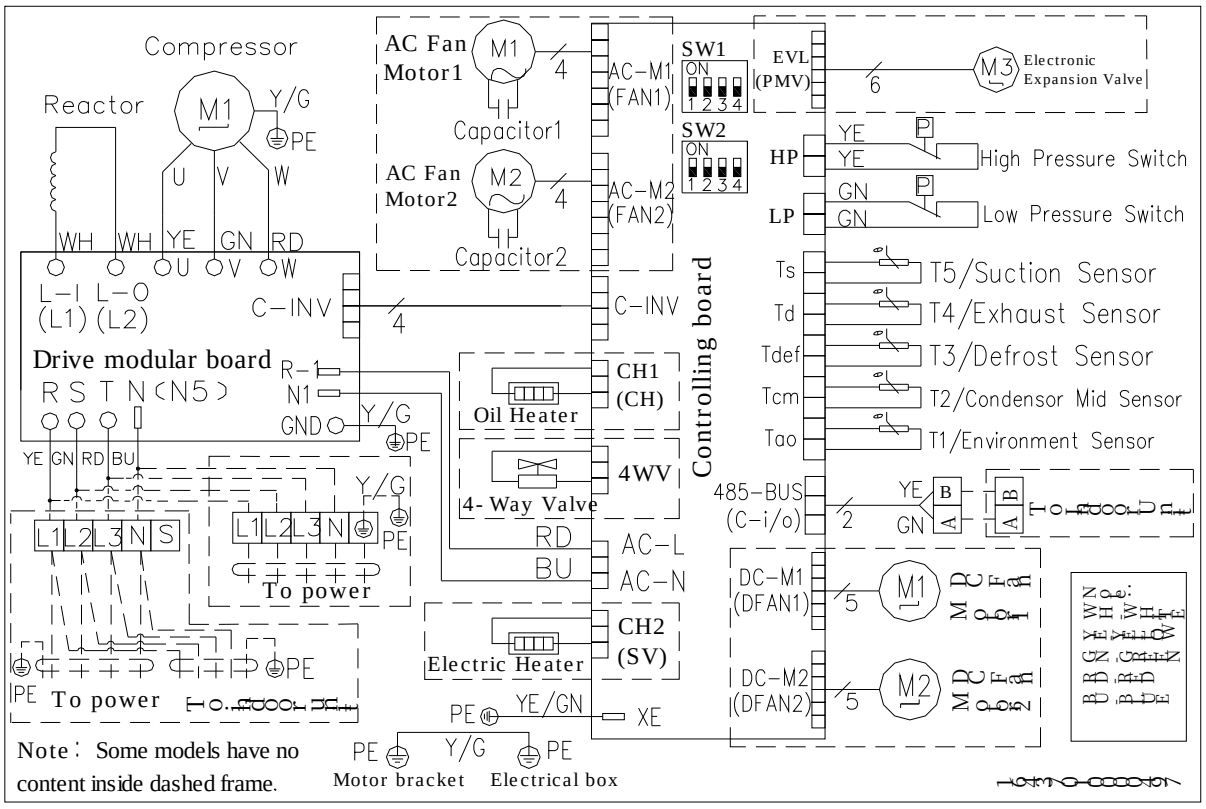
AL-H12/NDR3HB2(U), AL-H18/NDR3HB2(U), AL-H24/NDR3HB2(U), AL-H30/NDR3HB2(U)



AL-H30/NDR3A(U), AL-H36/NDR3A(U), AL-H42/NDR3A(U):



AL-H48/SDR3A(U), AL-H60/SDR3A(U):



Part6 Capacity Amendment

1. Operation range

Cooling capacity (K Btu/h)		12K	18K	24K	30K	36K	42K	48K	60K
Power supply		220-240V~/50Hz						380-415V~/50Hz	
Voltage		187~242V						342~456V	
Ambient temperature	Cooling	-15~52℃							
	Heating	-15~24℃							

2. Capacity amendment of different ambient temperature

2.1 Amendment coefficient of Cooling capacity under different indoor/outdoor DB/WB temperature K1

IDU temp.℃		Outdoor air inlet DB temperature℃										
DB	WB	-10	0	10	16	25	30	35	40	43	48	52
23	16	1.19	1.12	1.08	1.05	1	0.95	0.90	0.87	0.85	0.82	0.77
25	18	1.26	1.19	1.12	1.08	1.05	1	0.95	0.90	0.87	0.85	0.82
27	19	1.28	1.26	1.19	1.12	1.08	1.05	1	0.95	0.90	0.87	0.85
28	20	1.30	1.28	1.26	1.19	1.12	1.08	1.05	1	0.95	0.90	0.87
30	22	1.33	1.30	1.28	1.26	1.19	1.12	1.08	1.05	1	0.95	0.90
32	24	1.5	1.33	1.30	1.28	1.26	1.19	1.12	1.08	1.05	1	0.95

Actual cooling capacity calculation:

Actual cooling capacity=amendment coefficient of cooling capacity × nominal cooling capacity

——Rated cooling capacity could be found from【Part 4 Specification】

——Amendment coefficient of cooling capacity could be found from table above.

2.2 Amendment coefficient of Heating capacity under different indoor/outdoor DB/WB temperature K2

IDU temp.℃	Outdoor air inlet DB temperature℃								
DB	-15	-10	-5	0	7	10	15	20	24
16	0.93	0.97	1	1.06	1.08	1.1	1.14	1.2	1.25
18	0.87	0.93	0.97	1	1.06	1.08	1.1	1.14	1.2
20	0.8	0.87	0.93	0.97	1	1.06	1.08	1.1	1.14
22	0.71	0.8	0.87	0.93	0.97	1	1.06	1.08	1.1
24	0.62	0.71	0.8	0.87	0.93	0.97	1	1.06	1.08

Actual heating capacity calculation:

Actual heating capacity=amendment coefficient of heating capacity × nominal heating capacity

——Rated heating capacity could be found from【Part 4 Specification】

——amendment coefficient of heating capacity could be found from table above.

3. Long piping length

Cooling capacity (K Btu/h)		12K	18K	24K	30K	36K	42K	48K	60K
Connection Pipe(mm)	Liquid pipe	Φ6.35		Φ9.52				Φ9.52	
	Gas pipe	Φ12.7		Φ15.88				Φ19.05	
Max. piping length(m)		25	30	50		65			
Max. piping height(m)		10	20	25		30			
Max. Bend Qty		5		8		10			

Caution：

1. The standard Pipe length is 5m, if the pipe length is less than this then no additional charging is necessary. If the pipe length is more than this then you should charge more refrigerant into the system according to the above Charging Data

2. The thickness of the pipe is 0.6-1.0, bearing pressure is 4.2MPa;

3. If the connection pipe is too long, the cooling capacity and stability would be decreased. And the more bend quantity, the resistance in the piping system would be bigger, then the cooling and heating capacity would be decreased even lead to compressor broken. We suggest you to use the shortest connection pipe according to the pipe length parameter in this manual. If the height difference between outdoor and indoor unit is more than

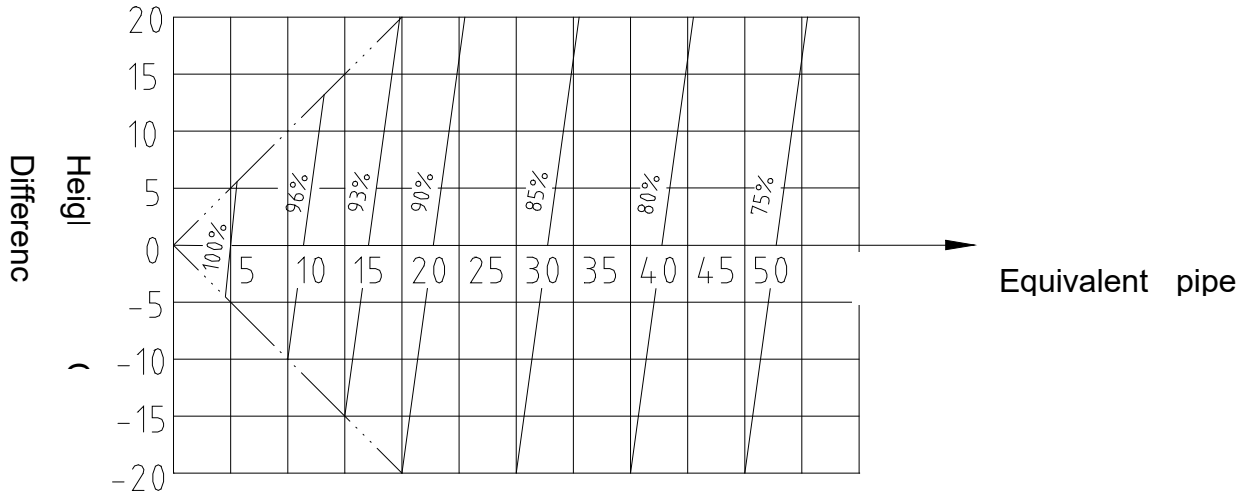
5m, an oil trap should be installed in the gas pipe for every 10 meters.

4. Capacity amendment of different piping length

4.1 Amendment coefficients

Amendment coefficients of heating and cooling capacity under different height drop **K3**

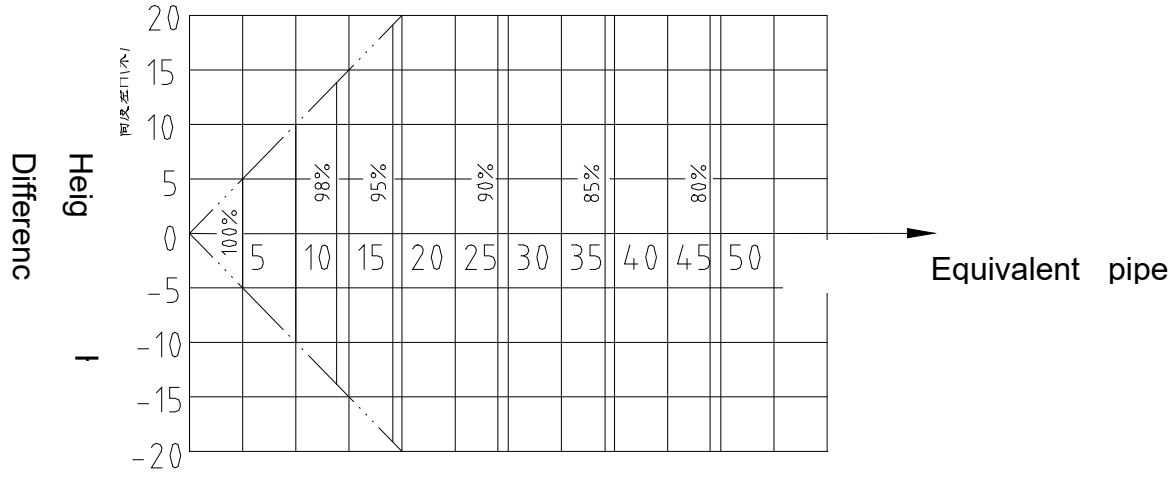
Different Cooling Capacity modified coefficients at different height:



Note:

H = Height of Outdoor Unit — Height of Indoor Unit

Different Heating Capacity modified coefficients at different height:



Note:

H = Height of Outdoor Unit — Height of Indoor Unit

4.2 Correction capability

Cooling capacity = Rated cooling capacity xK1xK3

Heating capacity = Rated heating capacity xK2xK3

5. Equivalent Pipe length conversion

Equivalent pipe length means converting pipe elbow to straight pipe length after considerate the pressure loss.

Bend and Oil Loop Conversion tablet

Type / Pipe Dia.(mm)	Bend（m）	Oil Loop(m)
6.35	0.10	0.7
9.52	0.18	1.3
12.70	0.20	1.5
15.88	0.25	2.0
19.05	0.35	2.4
22.02	0.40	3.0

Equivalent Pipe length L＝Actual Pipe length L+ Bend Qty× Equivalent pipe bend length+ Oil Loop Qty × Equivalent Oil Loop length

Sample:

ALCA-H42/5 Actual Pipe length is 25meters, Gas pipe diameter is 15.88mm. If there's 5 bends and 2 oil loops during the installation, then the equivalent pipe length should be:

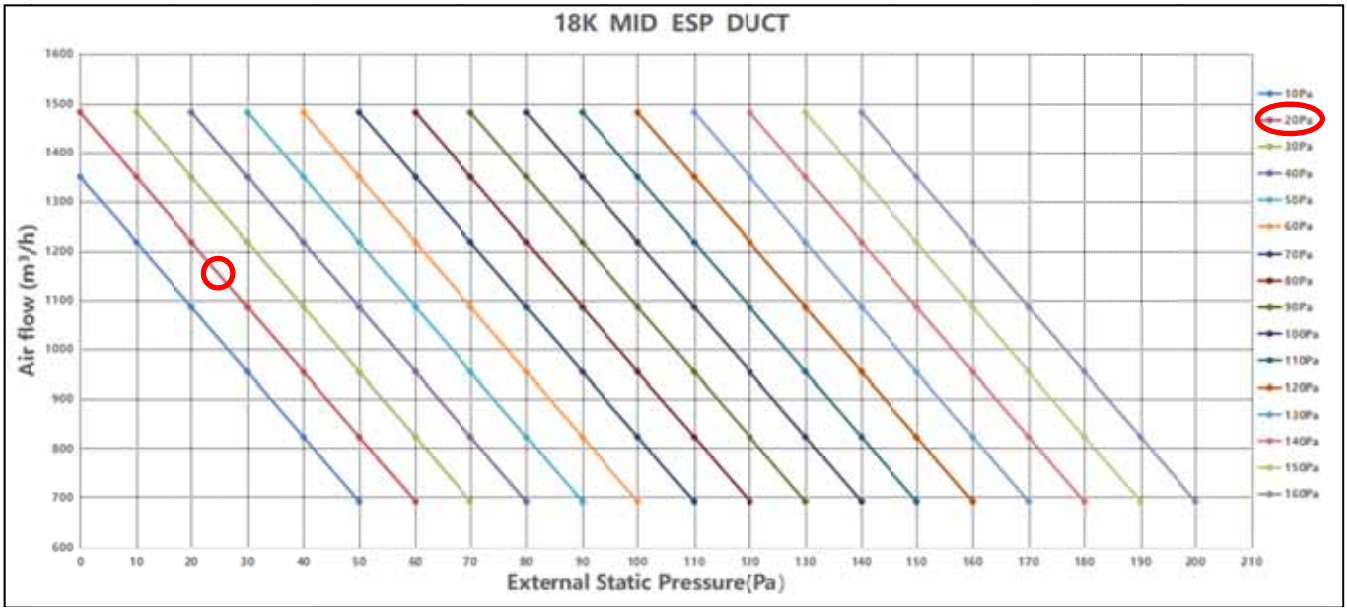
L=25+0.25×5+2.0×2=30.25(m)

Note:

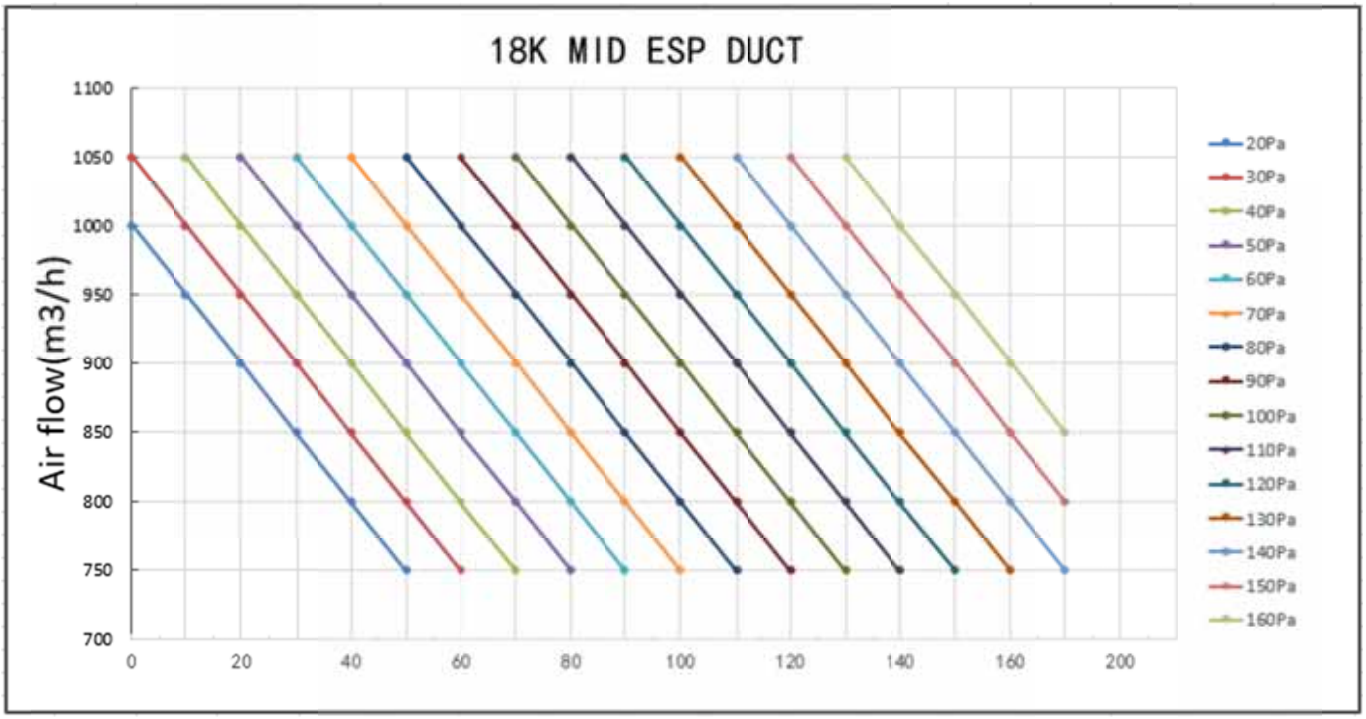
If there is relatively level difference of indoor and outdoor unit, S-shaped oil trap must be installed every 8~10m for vertical pipe.

Part7 Static pressure curve

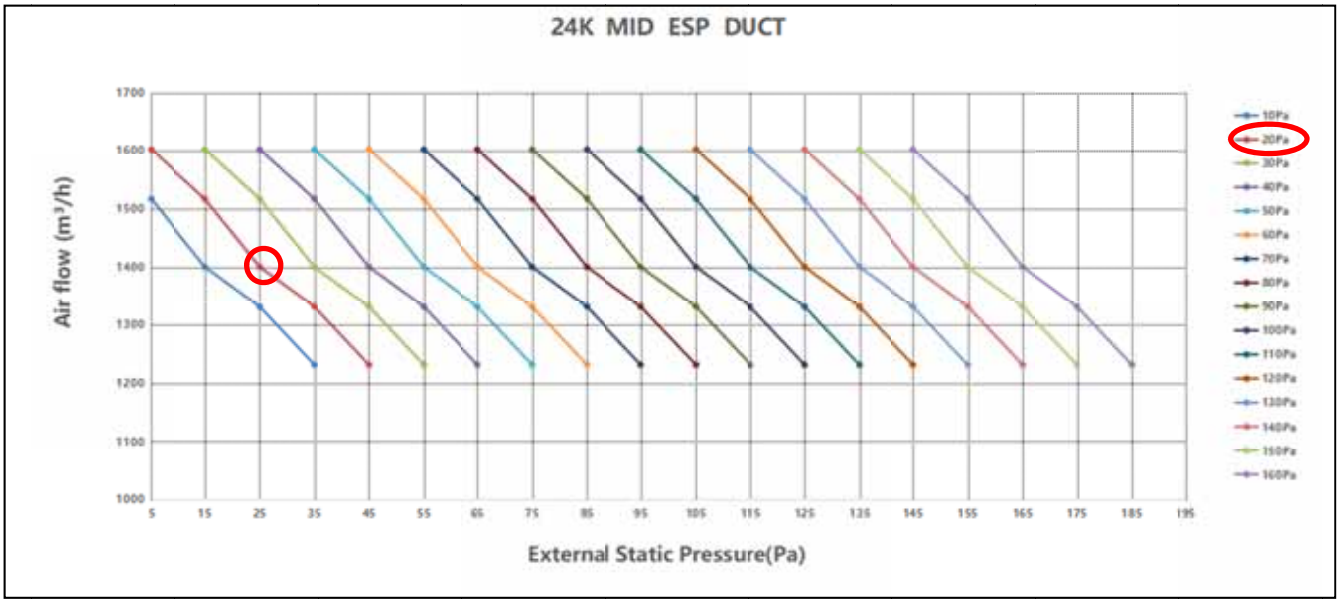
1. ALMD-H18/NDR3HA, ALMD-H18/NDR3HM2



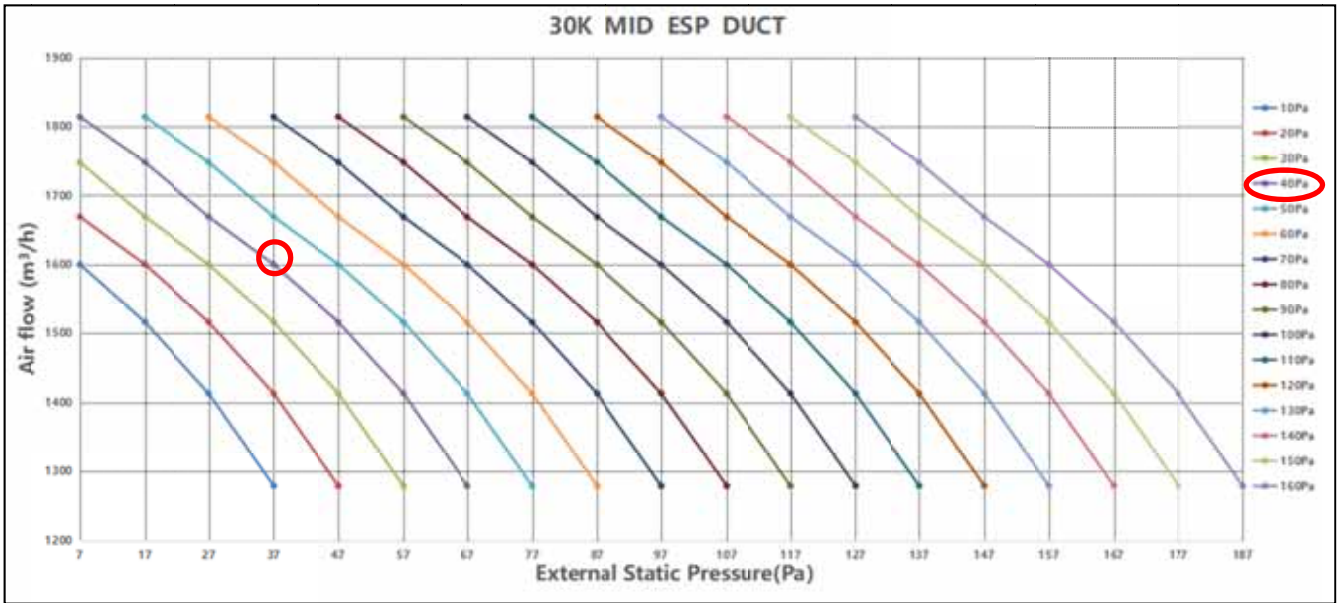
2. ALMD-H18/NDR3HM2A



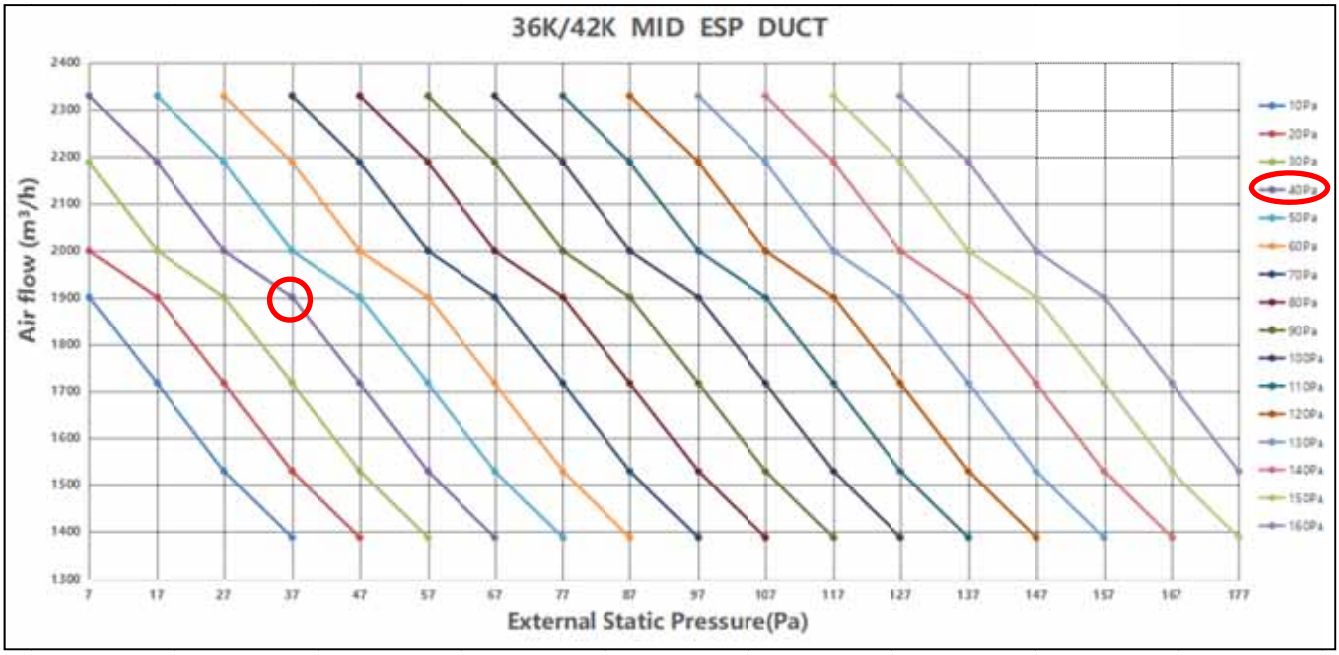
3. ALMD-H24/NDR3HA, ALMD-H24NDR3HM2



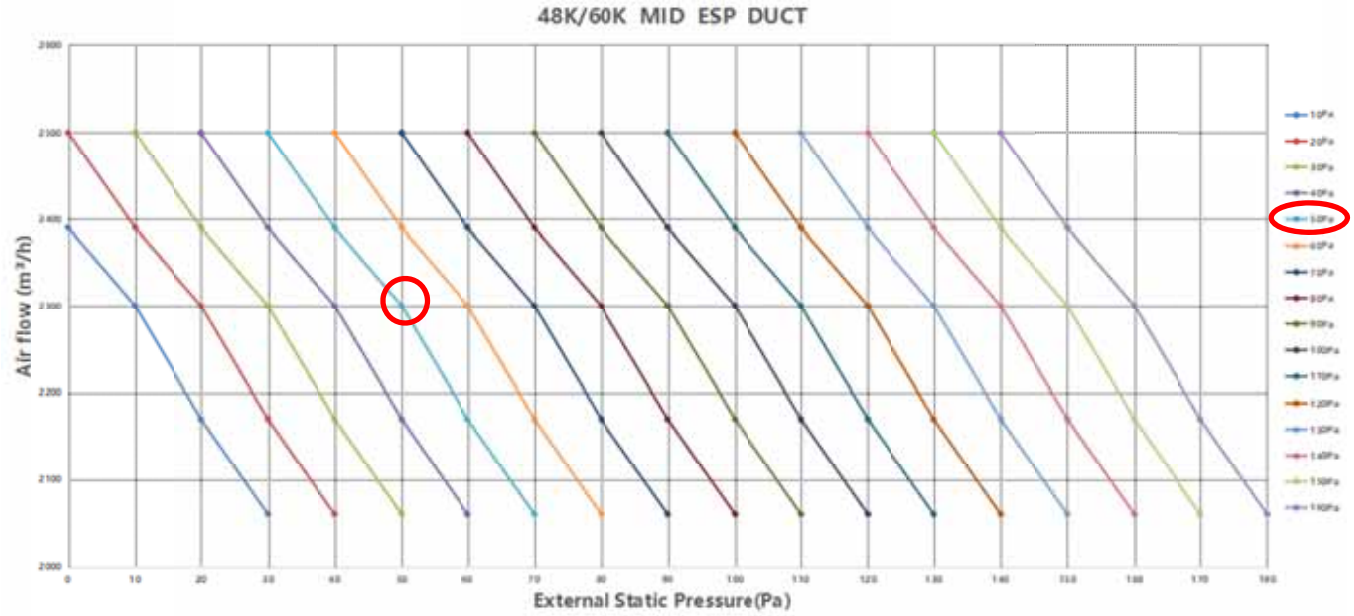
3. ALMD-H30/NDR3HA, ALMD-H30/NDR3HM2



4. ALMD-H36/NDR3HA, ALMD-H42/NDR3HA

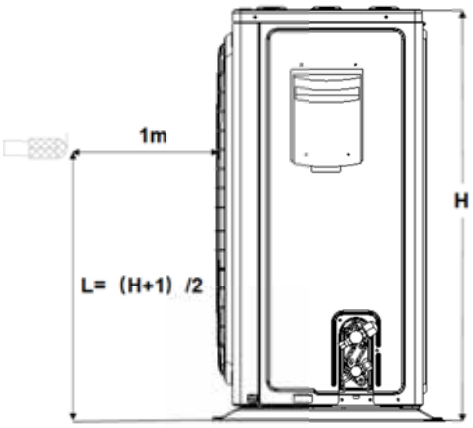


5. ALMD-H48/SDR3HA, ALMD-H60/SDR3HA



Part8 Sound level

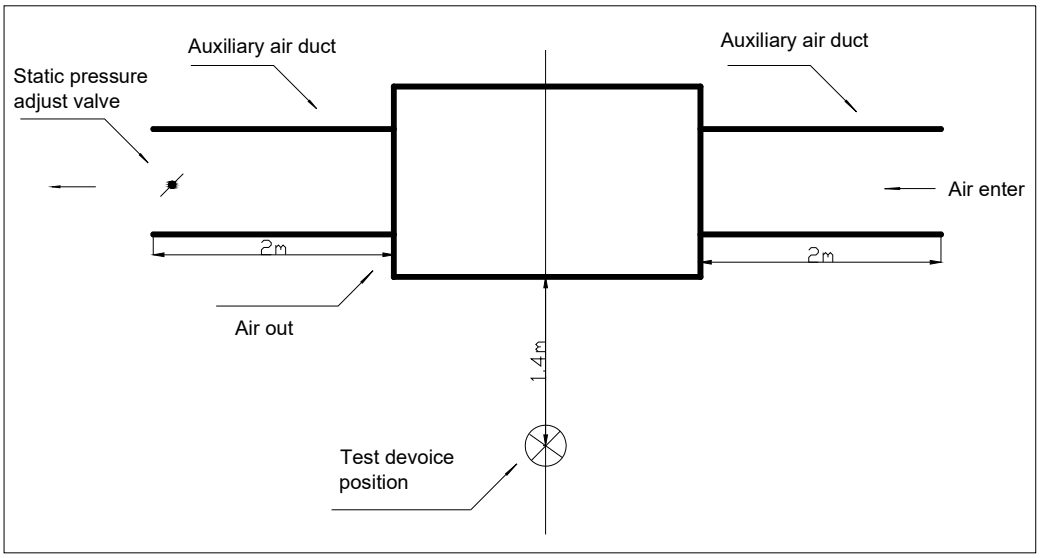
1. Outdoor unit



Test site：1m directly in front of the air outlet

Model	Sound pressure（dB（A））
AL-H12/NDR3A(U)	54
AL-H18/NDR3A(U)	55
AL-H24/NDR3A(U)	58
AL-H30/NDR3A(U)	57
AL-H36/NDR3A(U)	57
AL-H42/NDR3A(U)	57
AL-H48/SDR3A(U)	60
AL-H60/SDR3A(U)	80
AL-H12/NDR3HB2(U)	54
AL-H18/NDR3HB2(U)	55
AL-H24/NDR3HB2(U)	58
AL-H30/NDR3HB2(U)	58

2. Duct

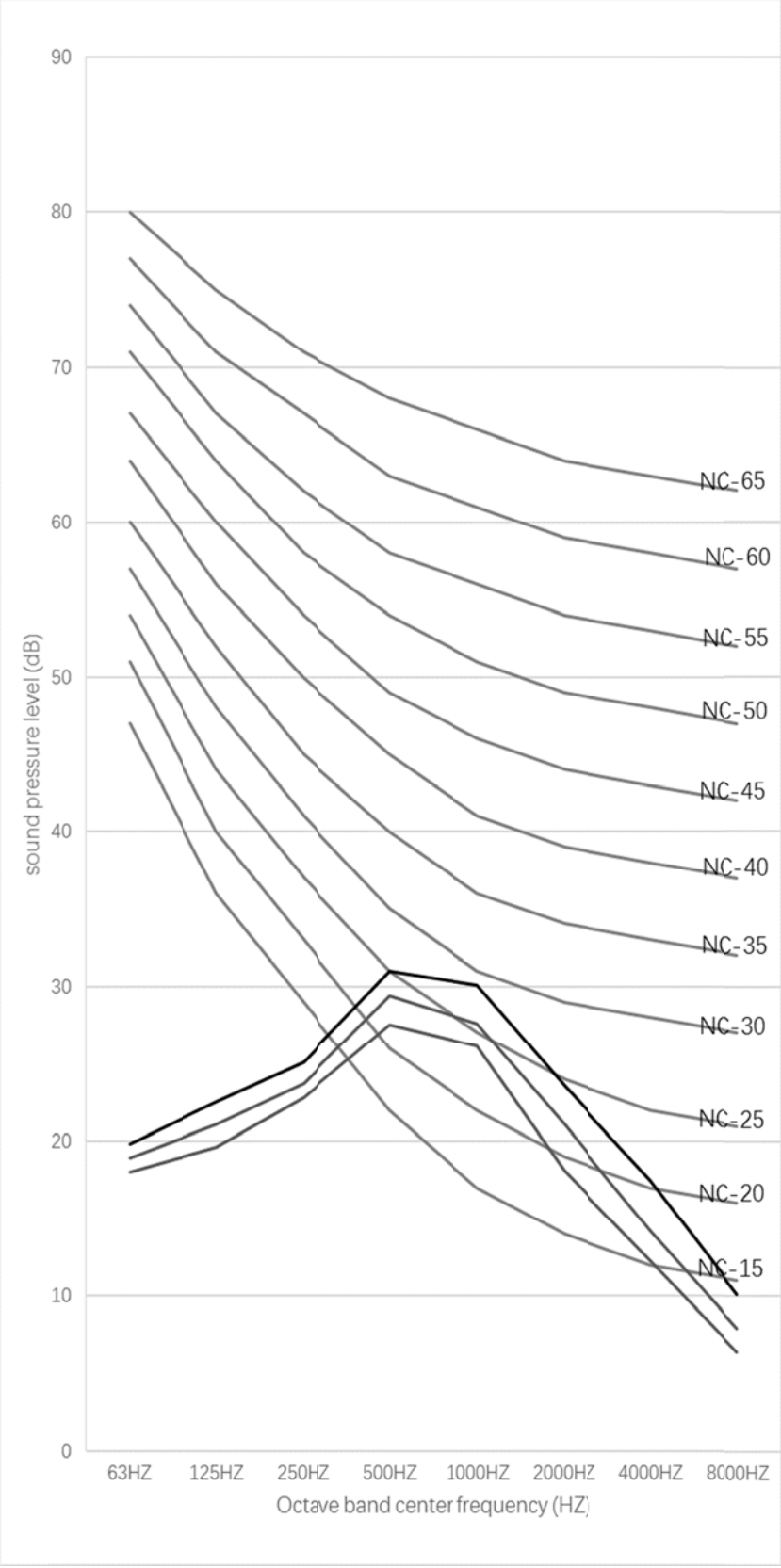


Test site：1.4m directly below the center of the duct

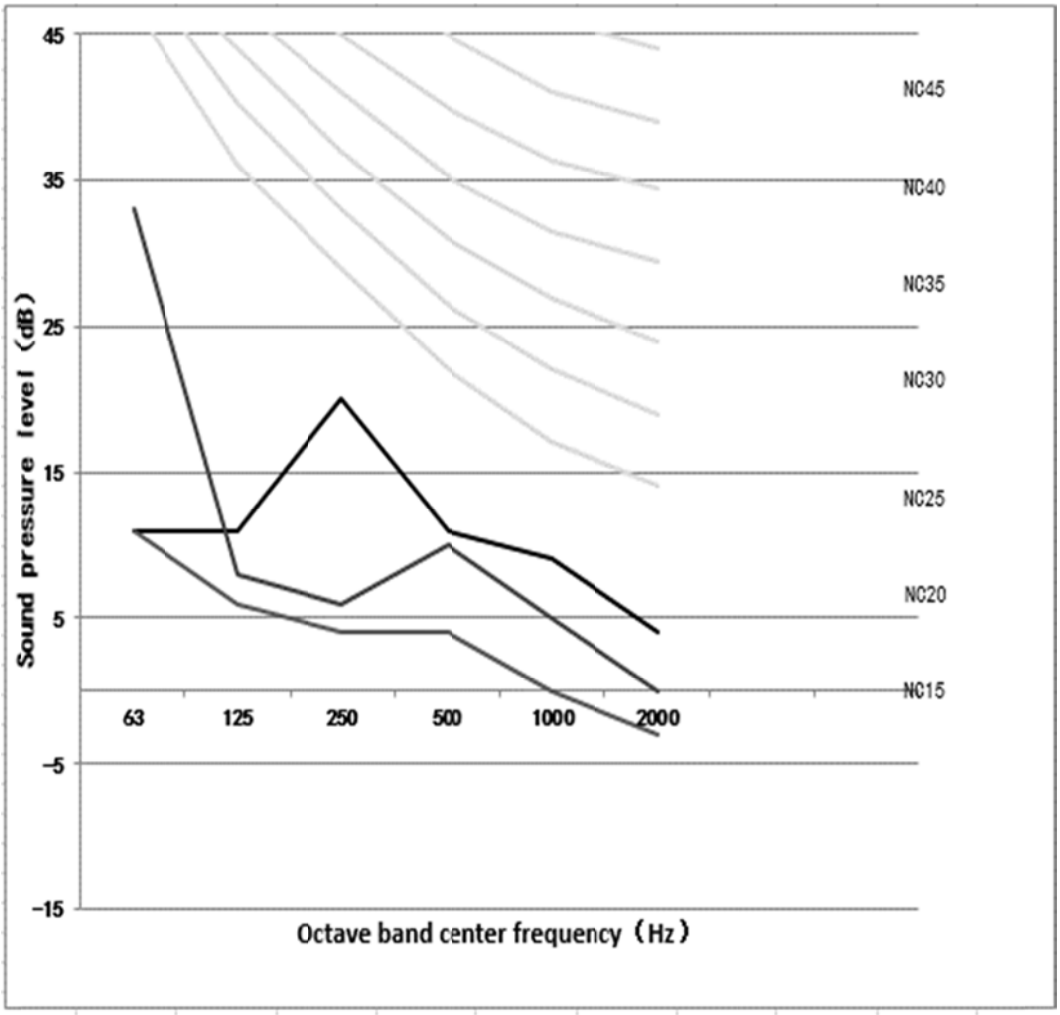
Series	Models	Noise level under three speeds of fan (dB(A))		
		H	M	L
M Series	ALMD-H18/NDR3HA	43	41	40
	ALMD-H18/NDR3HM2	41	39	38
	ALMD-H18/NDR3HM2A	44	41	37
	ALMD-H24/NDR3HA	44	41	39
	ALMD-H24NDR3HM2	43	41	39
	ALMD-H30/NDR3HA	46	44	41
	ALMD-H30/NDR3HM2	46	44	41
	ALMD-H36/NDR3HA	44	41	39
	ALMD-H42/NDR3HA	44	41	39
	ALMD-H48/SDR3HA	52	49	47
	ALMD-H60/SDR3HA	52	49	47

NC curves

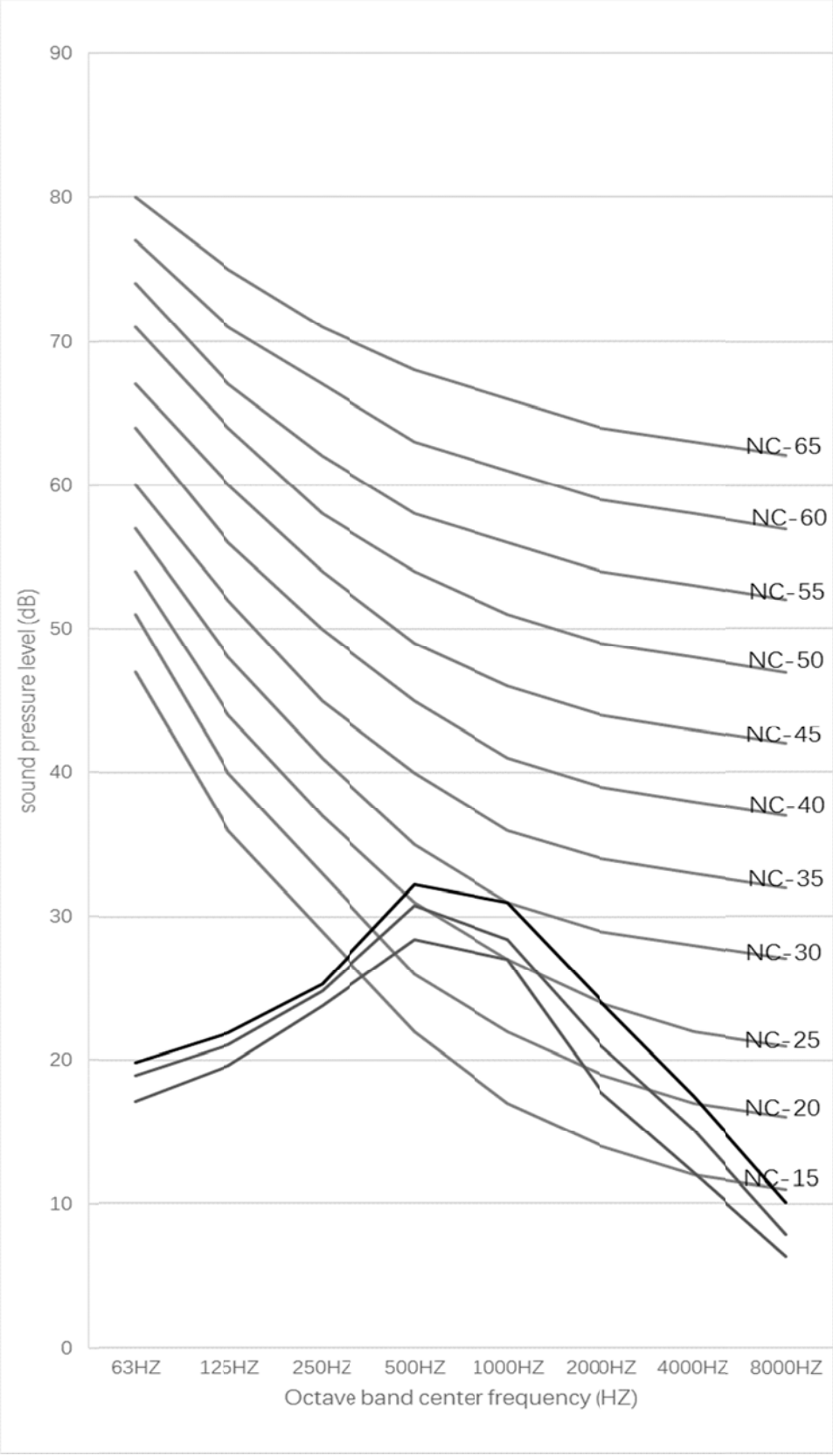
ALMD-H18/NDR3HM2



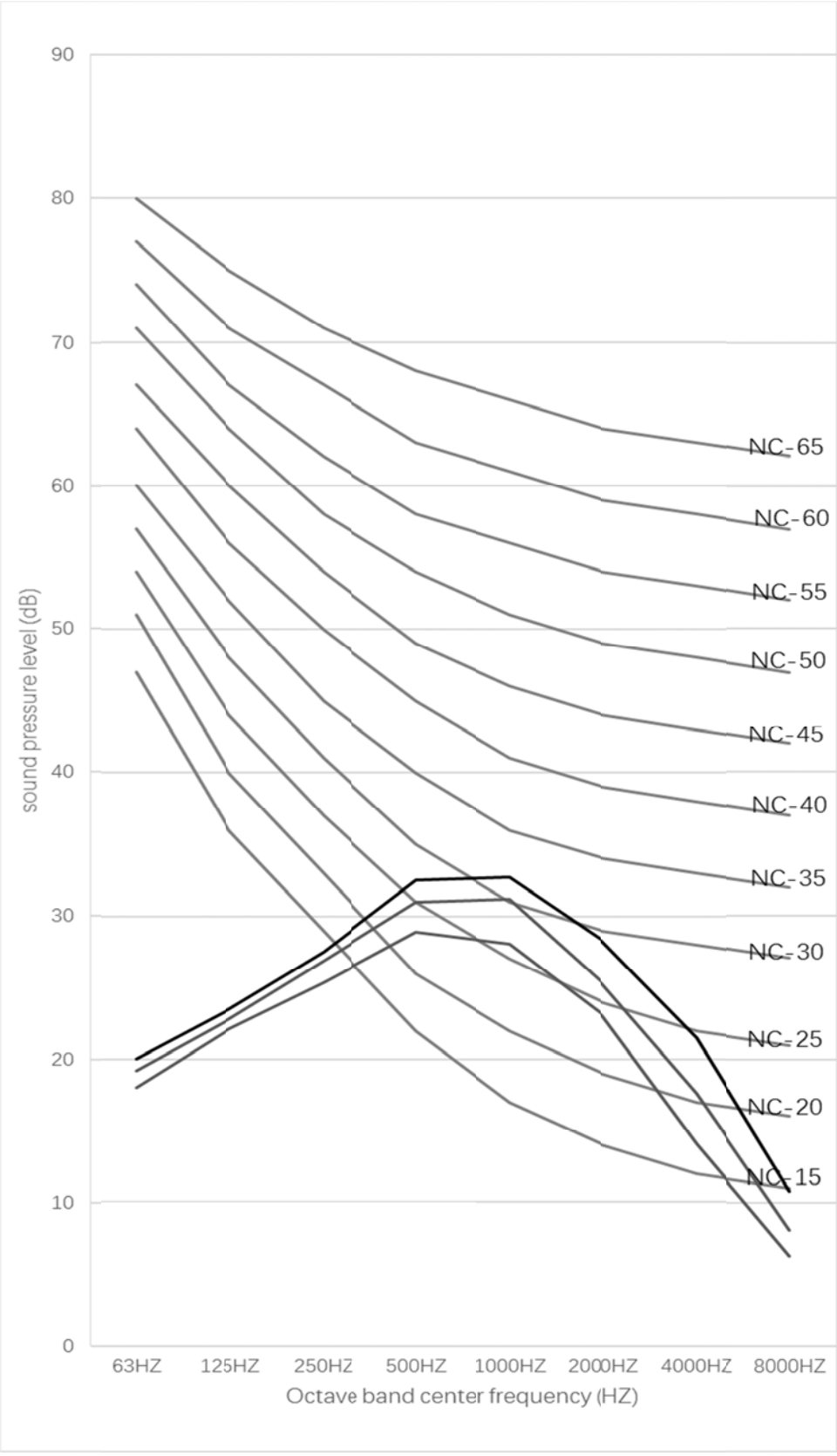
ALMD-H18/NDR3HM2A



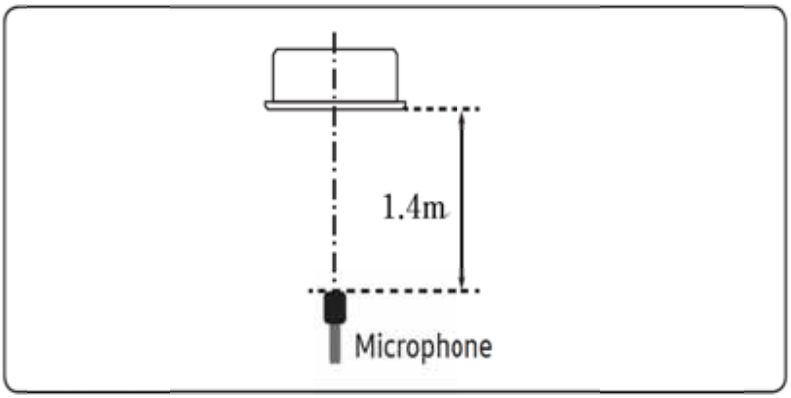
ALMD-H24/NDR3HM2



ALMD-H30/NDR3HM2



3. Cassette

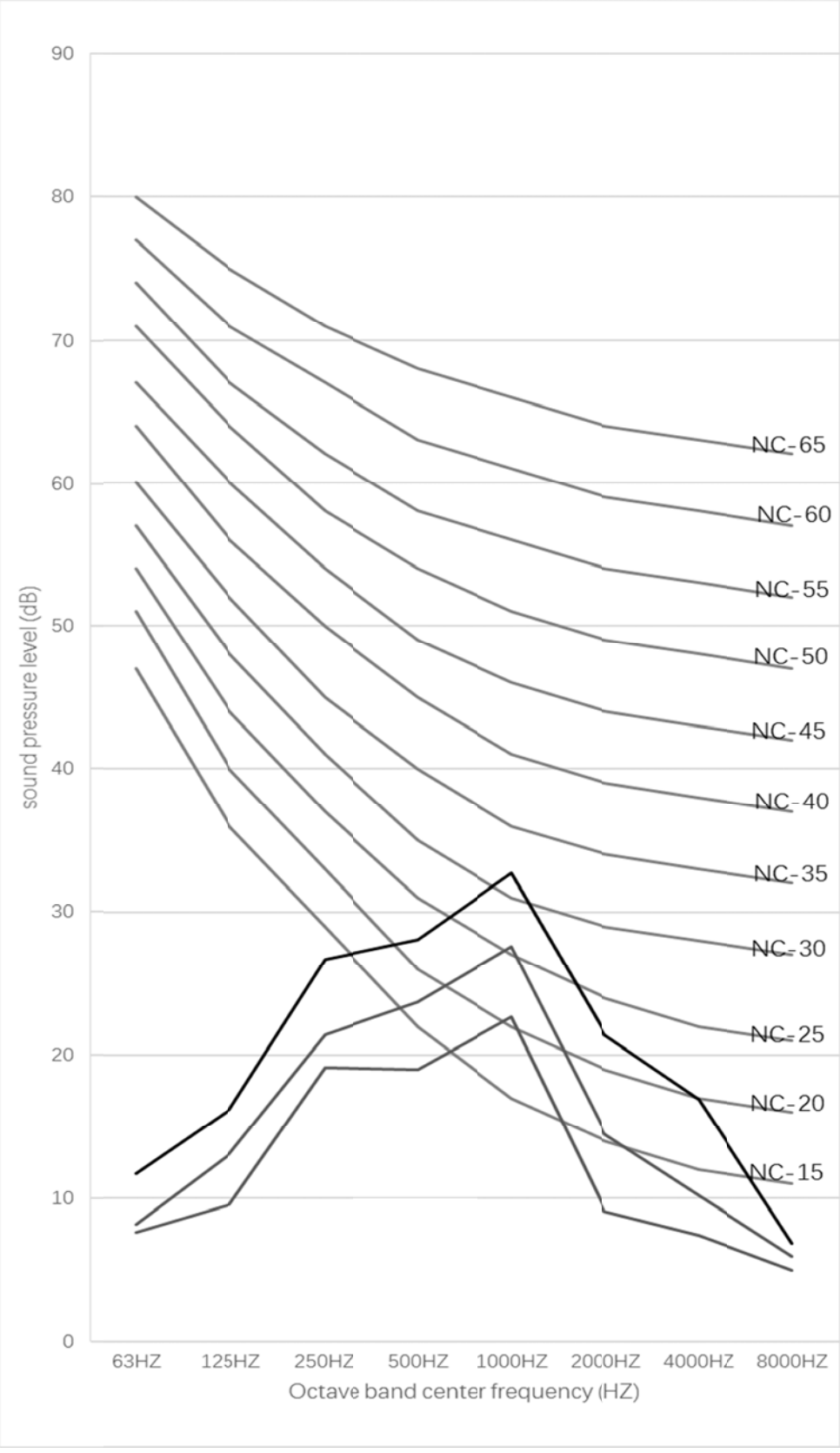


Test site：1.4m directly below the center of the duct

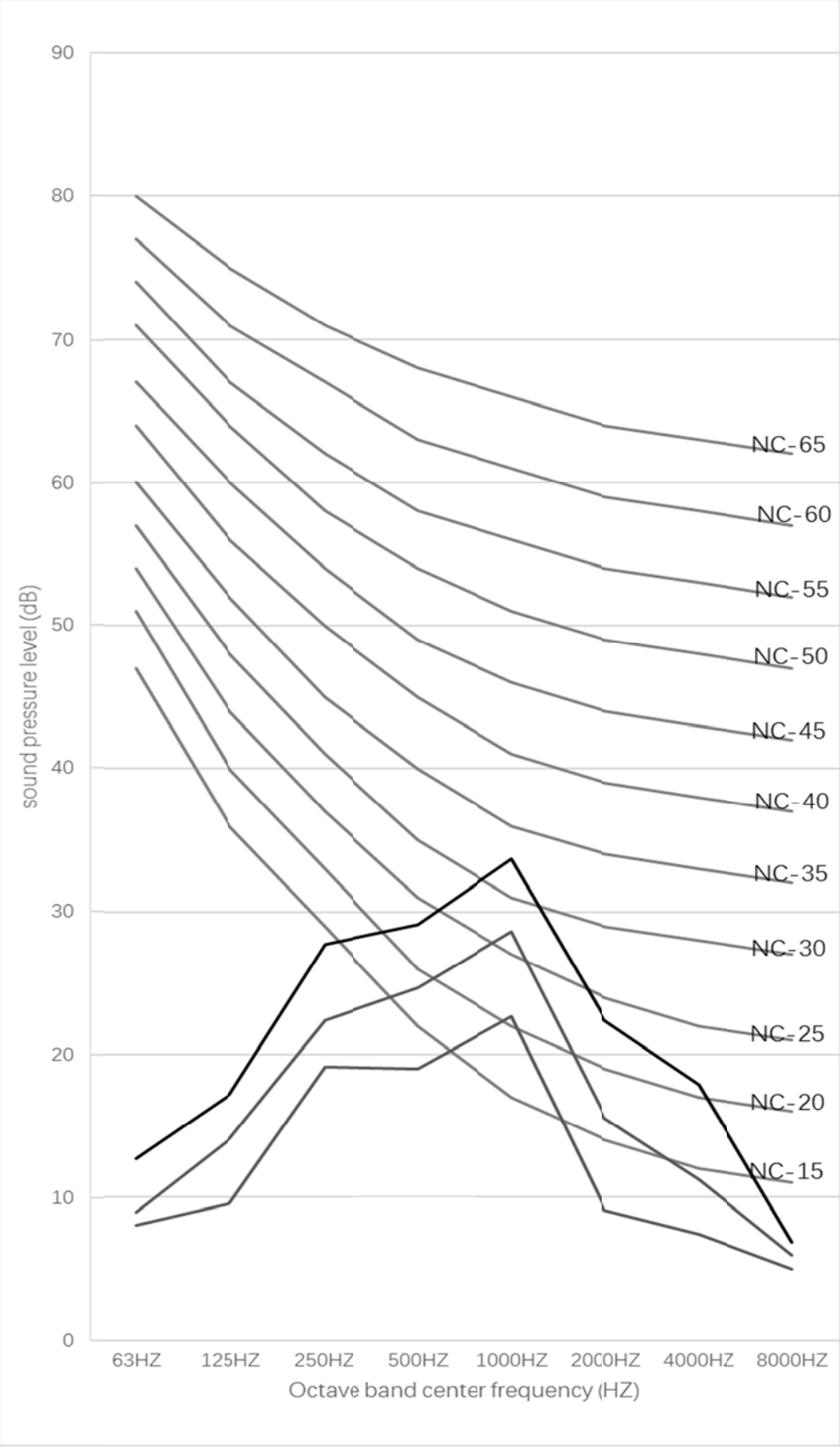
Series	Models	Noise level under three speeds of fan (dB(A))		
		H	M	L
Y Series	ALCA-H12/NDR3HAA	45	44	36
	ALCA-H12/NDR3HYA	44	40	37
	ALCA-H12/NDR3HY2A	42	38	35
	ALCA-H18/NDR3HAA	45	44	36
	ALCA-H18/NDR3HYA	45	41	38
	ALCA-H18/NDR3HY2A	44	41	38
	ALCA-H24/NDR3HYB	49	47	44
	ALCA-H24/NDR3HY2A	46.5	45	43
	ALCA-H36/NDR3HYB	52	50	48
	ALCA-H42/NDR3HYB	54	52	48
	ALCA-H48/SDR3HYB	54	52	48
	ALCA-H60/SDR3HYB	54	52	48

NC curves

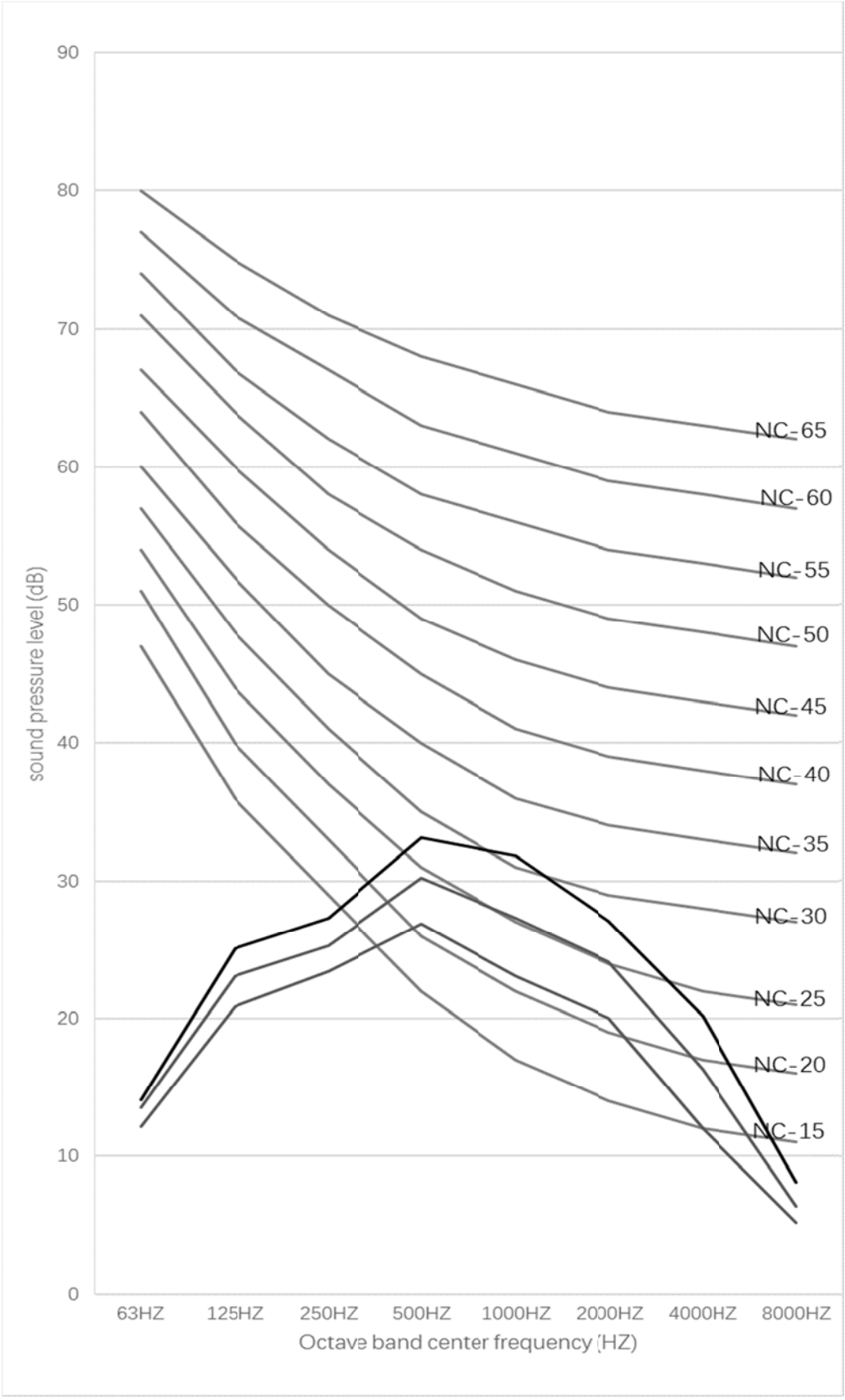
ALCA-H12/NDR3HY2A



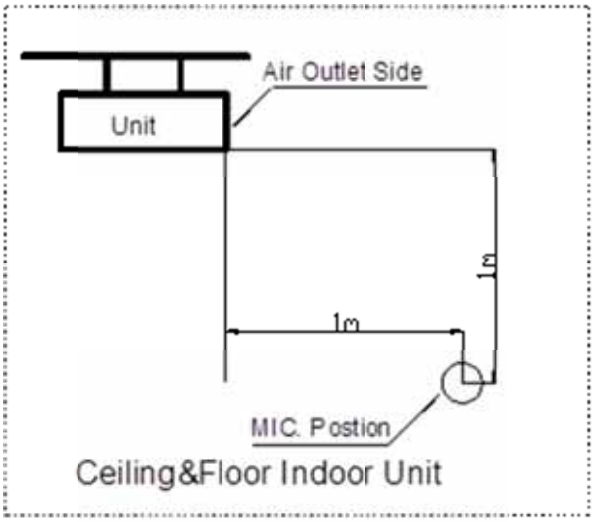
ALCA-H18/NDR3HY2A



ALCA-H24/NDR3HY2A



4. Ceiling Floor

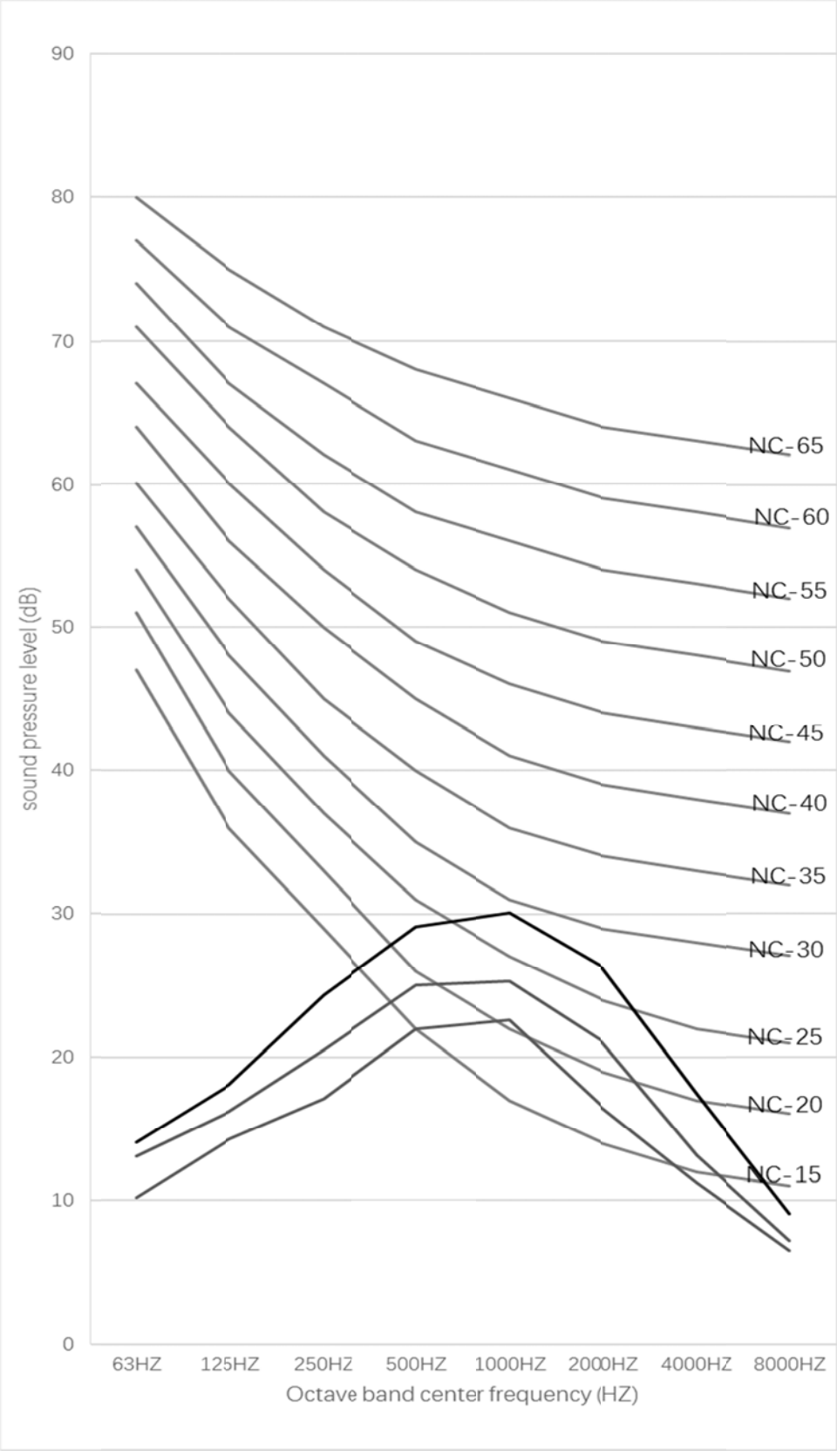


Test site：1m directly in front of the air outlet and 1m above the ground

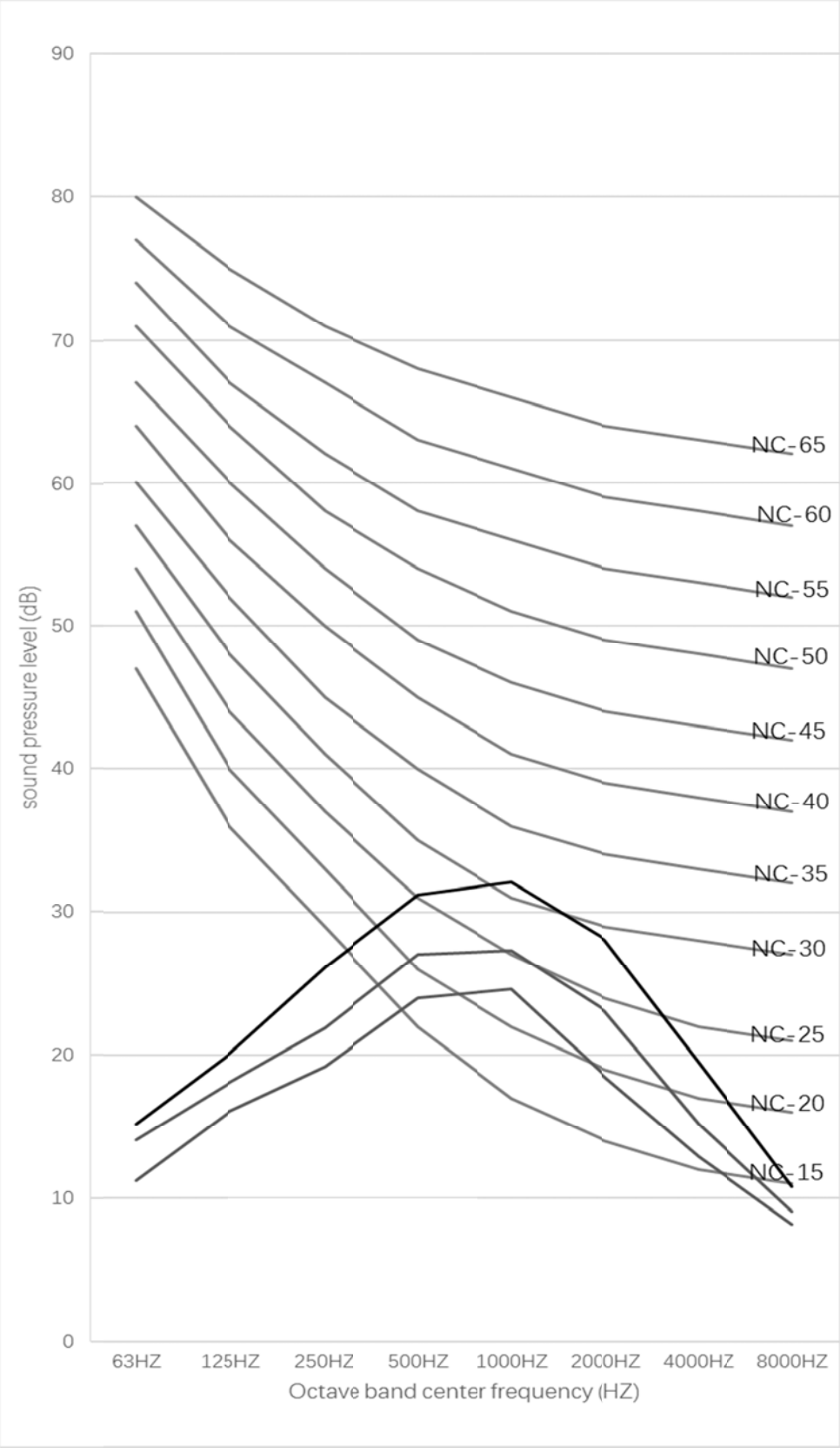
Series	Models	Noise level under three speeds of fan (dB(A))		
		H	M	L
F Series	ALCF-H18/NDR3HF	40	35	33
	ALCF-H18/NDR3HF2	40	35	33
	ALCF-H24/NDR3HF	42	38	35
	ALCF-H24/NDR3HF2	42	38	35
	ALCF-H36/NDR3HF	47	44	42
	ALCF-H42/NDR3HF	50	46	43
	ALCF-H48/SDR3HF	50	46	43
	ALCF-H60/SDR3HF	50	46	43

NC curves

ALCF-H18/NDR3HF2



ALCF-H24/NDR3HF2

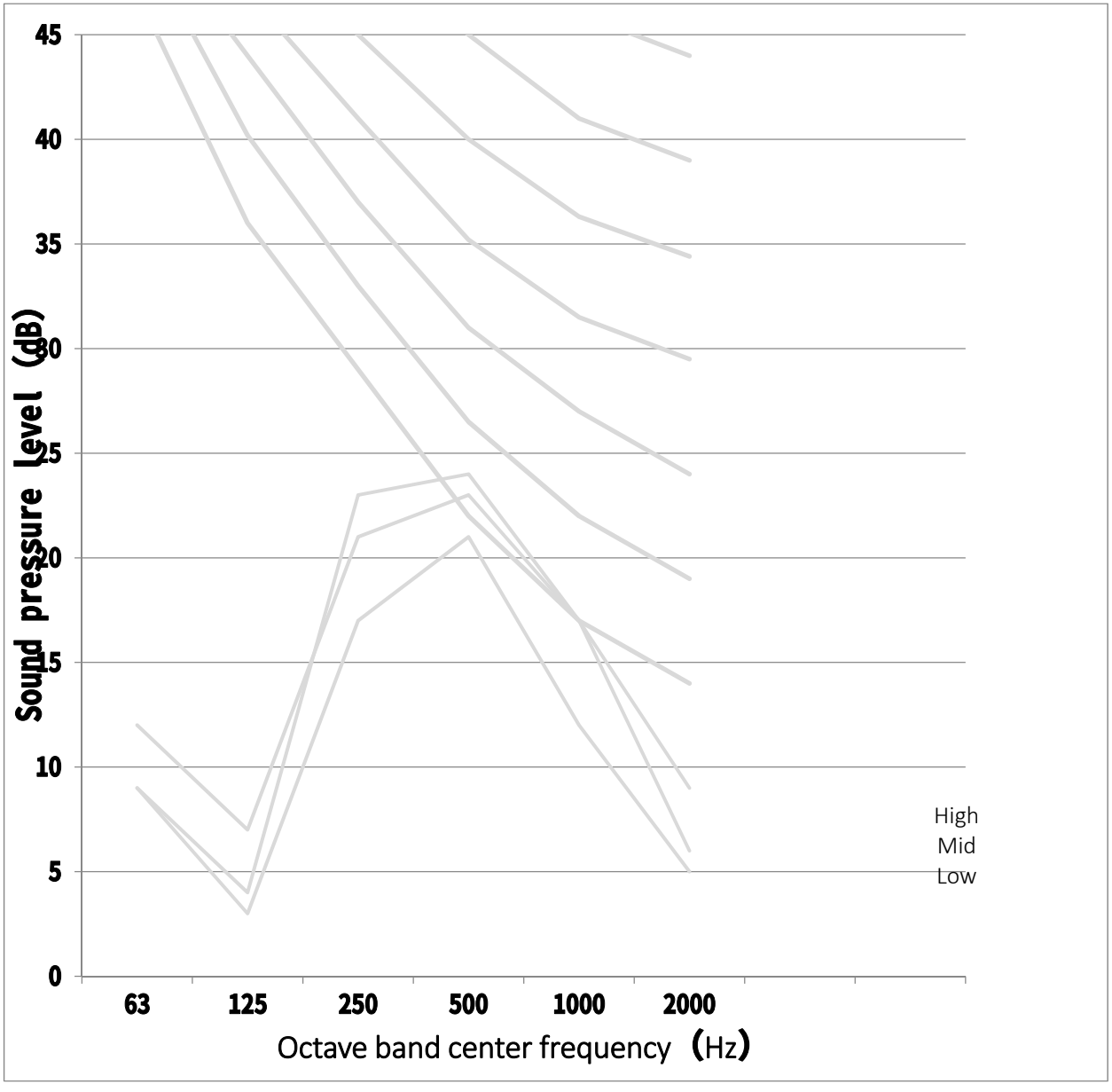


5. Console

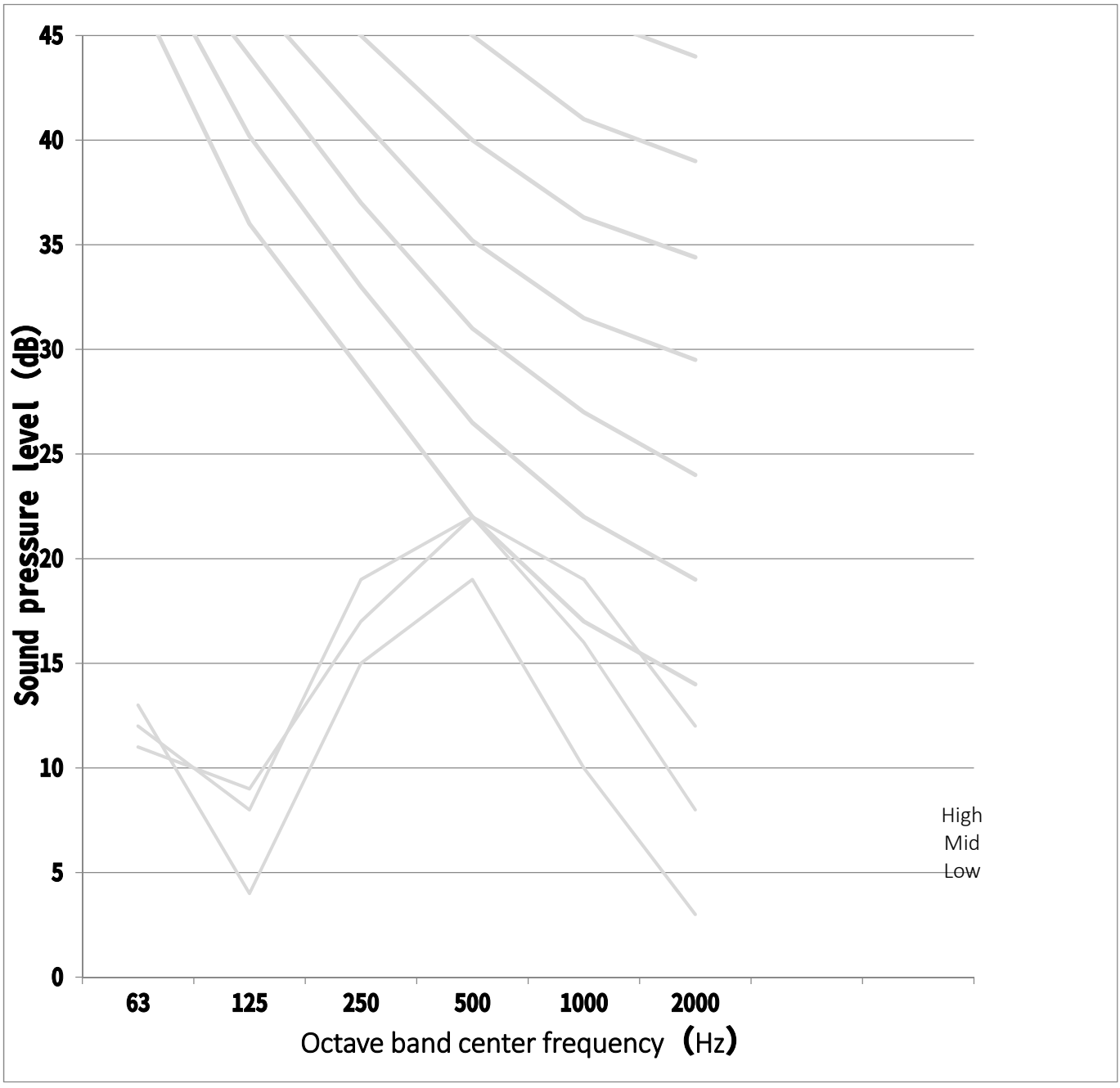
Models	Noise level under three speeds of fan (dB(A))		
	H	M	L
ALCO-H12/4R3A	42	39	36
ALCO-H18/4R3A	44	40	37

NC curves

1. ALCO-H12/4R3A

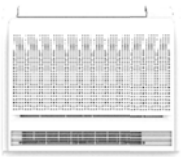


2. ALCO-H18/4R3A

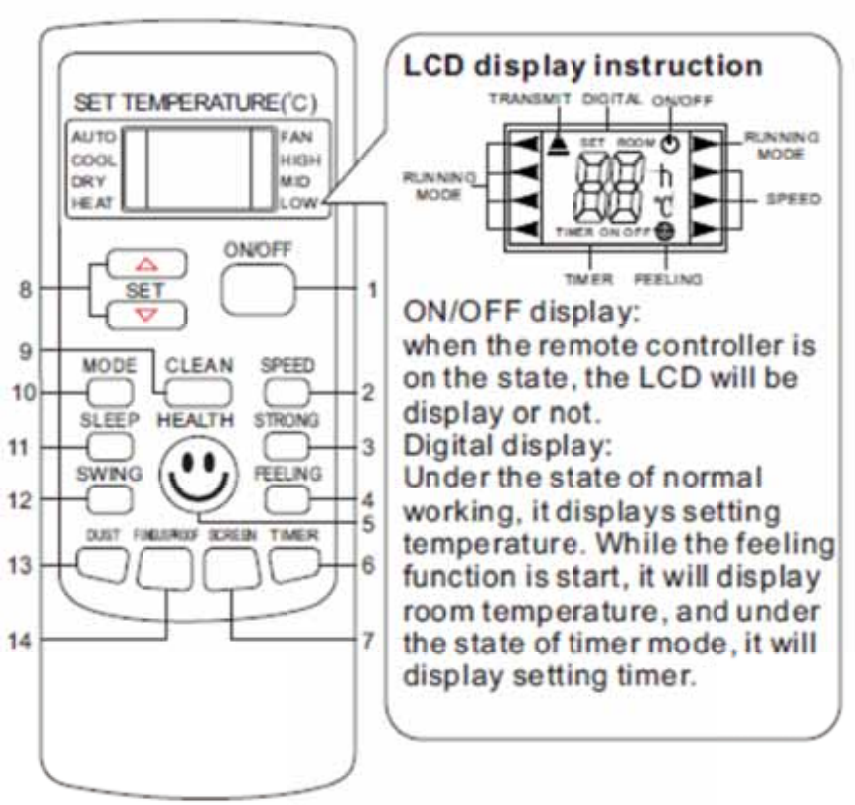


Part9 Controller

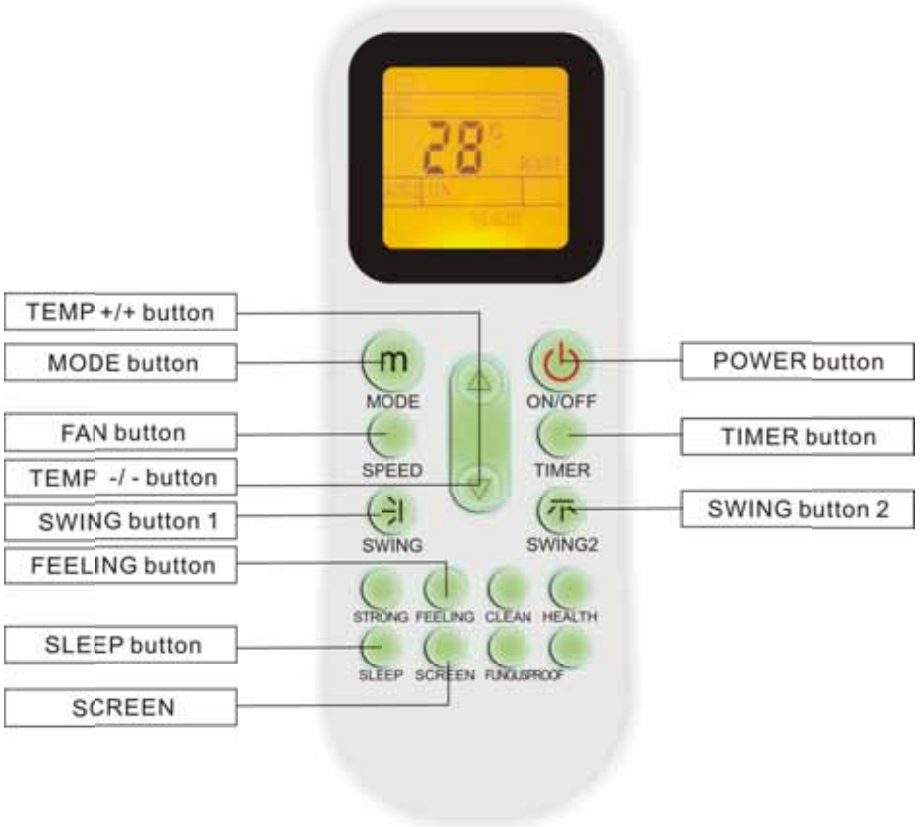
1. Controller

Series		Standard	Optional		
Cassette					
		YK-H	YK-K	XK-05	XK-06
Ceiling floor					
		XK-05	YK-H	YK-K	XK-06
Duct					
		YK-H	YK-K	XK-05	XK-06
Console					
		YK-L	YK-K	XK-05	XK-06

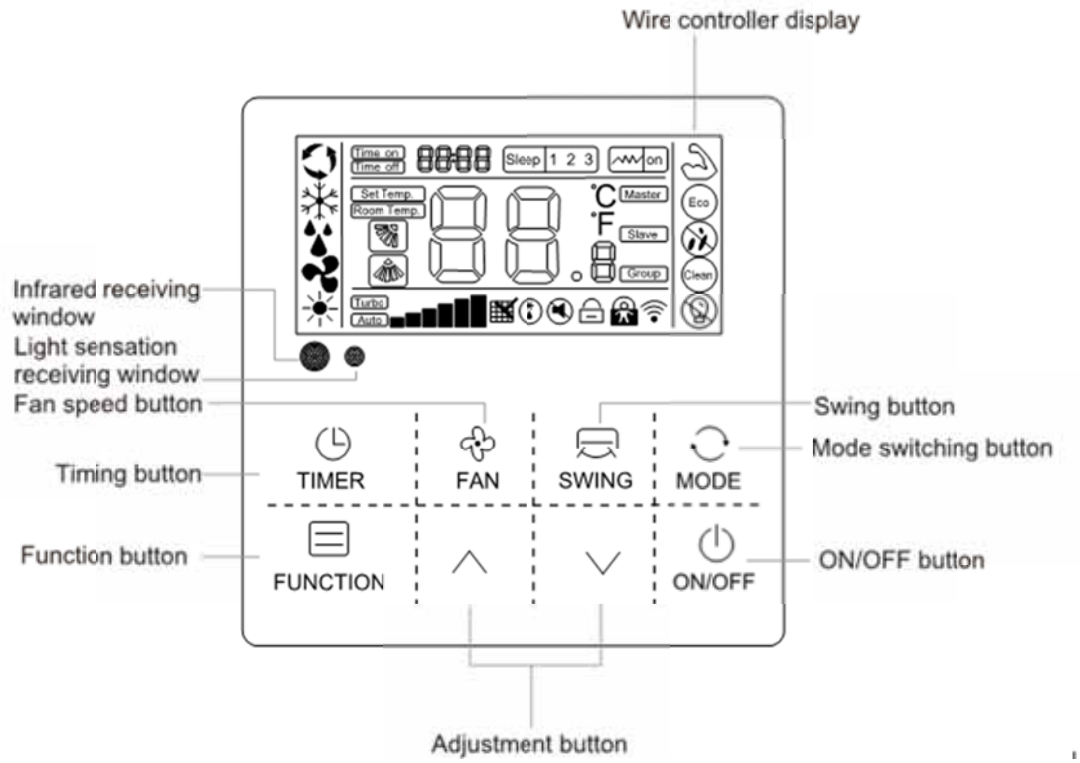
Remote Controller YK-H



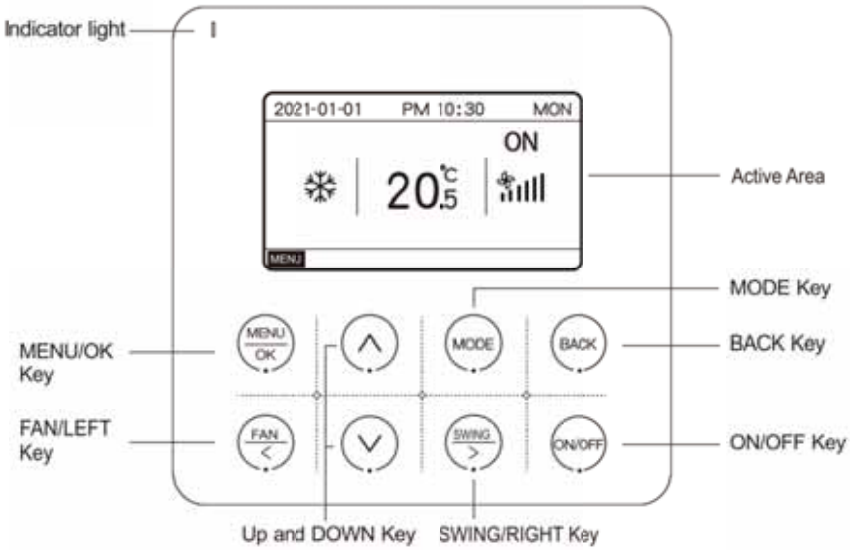
Remote Controller YK-L



Wired controller XK-05



Wired controller XK-06



Note : For details of all the above controllers, please refer to the corresponding controller manual.

2. Parameters Setting

Indoor unit's parameters can be set by remote controller (YK-L) and wired controller—For after-sales (In indoor side, After the new PCB was replaced, indoor parameters set is necessary).

2.1 Parameter Setting table (General parameter)

Model	【04】	【05】	【15】
	Model of IDU	Capacity of IDU	Selection of room sensor
ALMD-H18/NDR3HA	12	18	01
ALMD-H18/NDR3HM2	12	18	01
ALMD-H18/NDR3HM2A	12	18	01
ALMD-H24/NDR3HA	12	24	01
ALMD-H24NDR3HM2	12	24	01
ALMD-H30/NDR3HA	12	30	01
ALMD-H30/NDR3HM2	12	30	01
ALMD-H36/NDR3HA	12	36	01
ALMD-H42/NDR3HA	12	42	01
ALMD-H48/SDR3HA	12	48	01
ALMD-H60/SDR3HA	12	60	01
ALCA-H12/NDR3HYA	37	18	00
ALCA-H12/NDR3HY2A	37	18	00
ALCA-H18/NDR3HYA	37	18	01
ALCA-H18/NDR3HY2A	37	18	01
ALCA-H24/NDR3HYB	01	24	01
ALCA-H24/NDR3HY2A	01	24	01
ALCA-H36/NDR3HYB	01	36	01
ALCA-H42/NDR3HYB	01	42	01
ALCA-H48/SDR3HYB	01	48	01
ALCA-H60/SDR3HYB	01	48	01
ALCF-H18/NDR3HF	46	18	02
ALCF-H18/NDR3HF2	46	18	02
ALCF-H24/NDR3HF	46	24	02
ALCF-H24/NDR3HF2	46	24	02
ALCF-H36/NDR3HF	46	36	02
ALCF-H42/NDR3HF	46	48	02
ALCF-H48/SDR3HF	46	48	02
ALCF-H60/SDR3HF	46	60	02

Note:

【04】：Model of IDU

【05】：Capacity of IDU

【15】：Selection of air return temperature sensor; 00 – sensor in indoor unit, 01—Sensor in wired controller

2.2 Working mode parameter (Heating only function)

Under heating only mode, IDU cannot receive signal of other working mode besides “OFF” signal.

Once change the parameter, need to power on again to activate the function

Series No	Value	Meaning	Available mode
11	**0**	All mode	Cooling. Dehumidification. Swing. Heating. Auto
	1	No “Auto” mode	Cooling. Dehumidification. Swing. Heating
	2	Cooling	Cooling. Dehumidification. Swing
	3	Heating	Heating only

Note:

The duct type indoor unit produced before 2019.3 need to update program for IDU PCB so that achieve heating only.

2.3 Parameter Setting by YK-L

Enter the setting interface

① Make sure the remote controller is ***off***

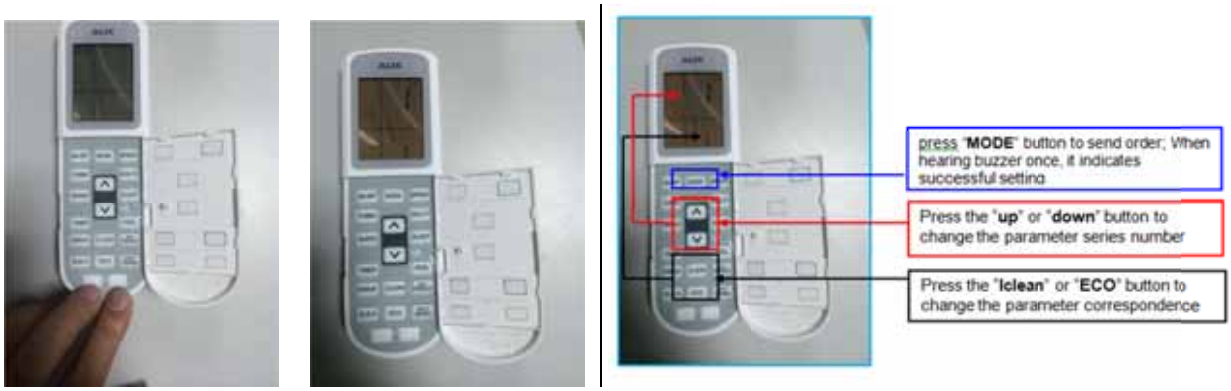
② Press the ***two white button*** at the down side simultaneously ***more than 10s*** to enter the address setting mode.

Parameter Setting

③ Press the **[∧]** or **[∨]** button to change the parameter series number

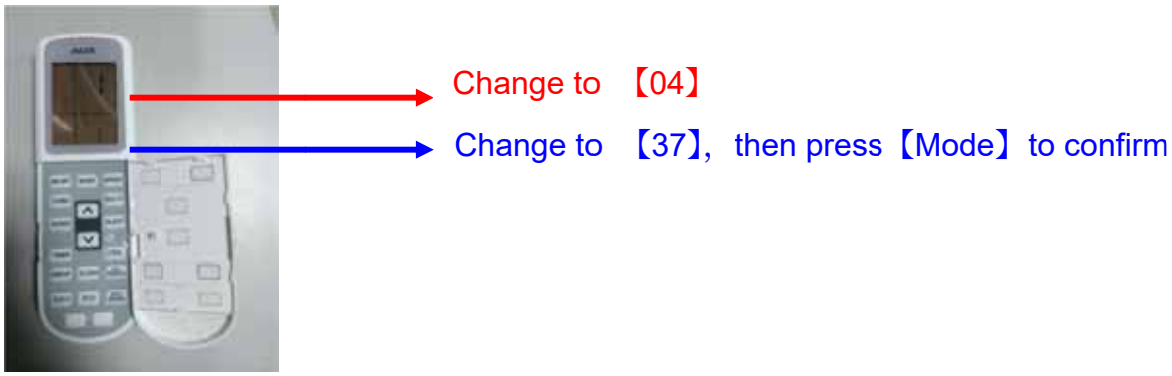
④ Press the **[IClean]** or **[ECO]** button to change the parameter correspondence

⑤ Press the **[MODE]** button to send order (Sent signal to display panels or receivers), Then can hearing buzzer once



For example:

If you changed a new PCB to 18K cassette indoor unit , then you should set the type of the unit , check the above【**Parameter Setting Items table**】--- Mode of IDU is 【04】, 18K cassette parameter is 【37】



2.4 Parameter Setting by XK-04/ XK-05

Parameter checking

Press the “FUNCTION” button for 5 seconds, enter into the parameter checking interface.

The wired controller’s address will be displayed in the temperature zone of LED screen (press “FUNCTON” button, the wired controller’s address will flash, the wired controller ‘s

address can be changed through press the “ ▲ ” or “ ▼ ” , then press “FUNCTION” button to

confirm);

In the timing setting zone: **HH** means series NO. **MM** means parameter value. After

Entering into IDU parameter checking , via pressing the “ ▲ ” or “ ▼ ” button ,you can check

the parameter value of series NO.【04】【05】【1】.

HH: means series NO.

MM: means parameter

2. Press “▲”or“▼ , change the parameter

1. Press **“FUNCTION”** for 5S, enter parameter checking

Parameter setting

Only in parameter checking model, press the “FUNCTION” button for 5 seconds,

Enter into parameter setting model.

The corresponding parameter valve “**MM”** begin to flash, changing it by pressing

The “ ▲ ” or “ ▼ ” button, after finished ,press the “FUNCTION” button to confirm. When finishing parameter setting, it will automatically go back to parameter checking model.

2. Press "∧"or"∨ , change the parameter value.

1. Only in checking model, Press **"FUNCTION"** for 5S, enter parameter checking model

For example:

If you want to change the PCB from cassette type to mid duct type for 42k unit , you should set the type of the unit , check the above【**Parameter Setting Items table**】--- Mode of IDU is 【04】, 42K cassette parameter is 【11】, 42K mid duct parameter is 【39】

【0411】change to 【0439】(step1)

③ Press **"FUNCTION"** for 5S again, enter parameter setting model;

② Press the"∧"or"∨"button to get "**04 11**"

① Press **"FUNCTION"** for 5S,enter parameter check model;

【0411】change to 【0439】（step2）

④ Press the“^”or“v”button to get **“04 39”**

⑤ After finishing setting , press **“FUNCTION”** to confirm

3. Room Card Function

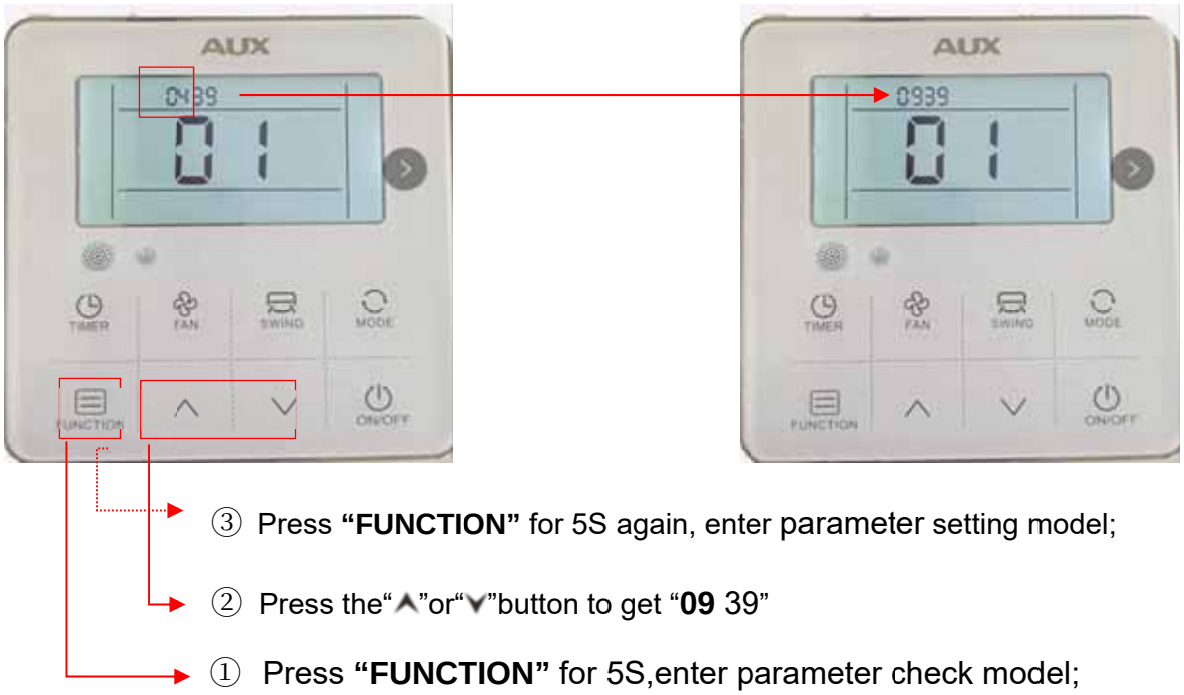
3.1 Function setting

Parameter setting	Model	Contact State	Operation model specification
0900	Normal (default)	/	Stand
0901	Room Card (optional)		the IDU Will be into standby mode, can be controlled by controller
			the IDU Will be into standby mode, can't be controlled by controller

※ How to set the room card function (Set method same as the above【Part 9 →2.2Parameter Setting by YK-L **or** 2.3 Parameter Setting by XK-04/XK-05 】

For example (XK-05)

Step 1

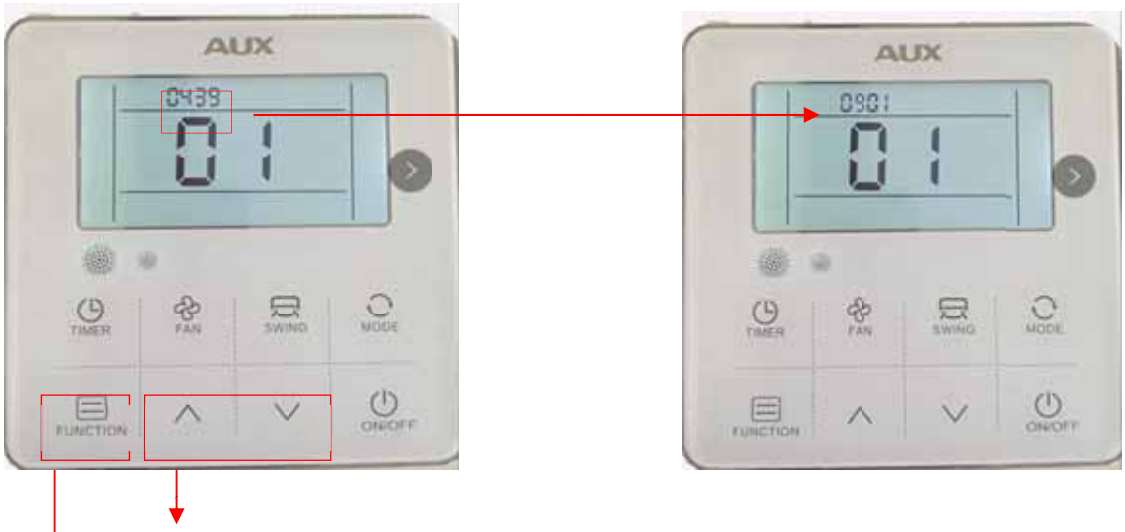


③ Press **"FUNCTION"** for 5S again, enter parameter setting model;

② Press the"∧"or"∨"button to get "**09** 39"

① Press **"FUNCTION"** for 5S,enter parameter check model;

Step 2



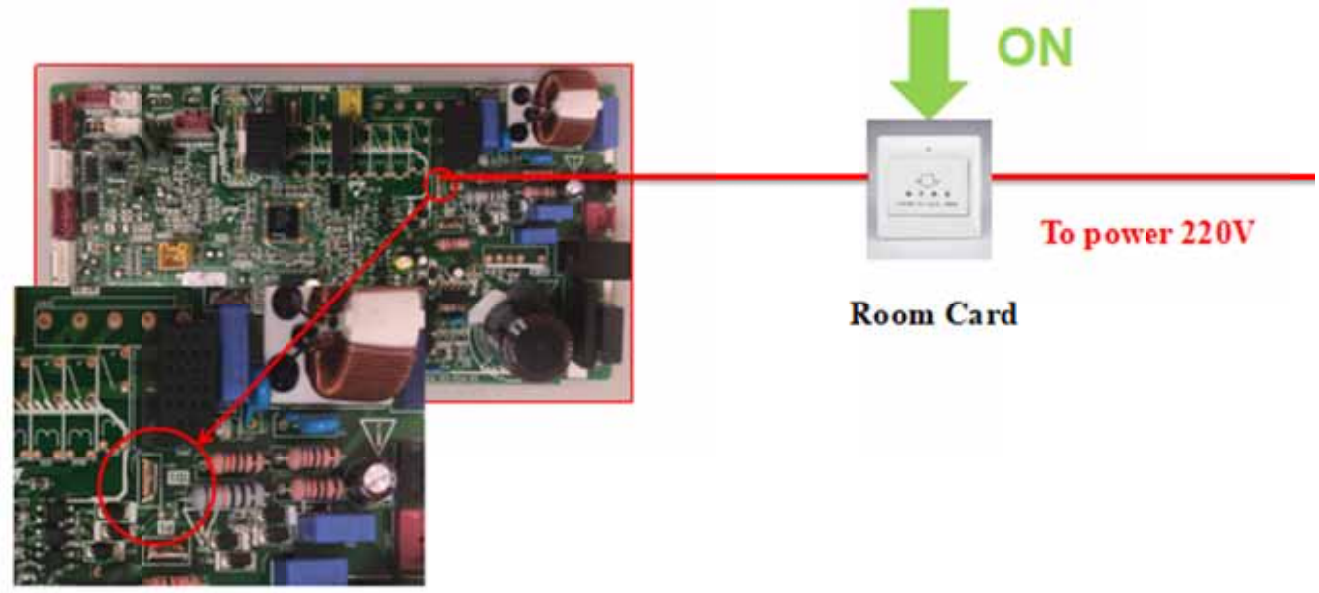
④ Press the“ ”or“ ”button to get **“09 01”**

⑤ after finishing setting , press **“FUNCTION”** to confirm

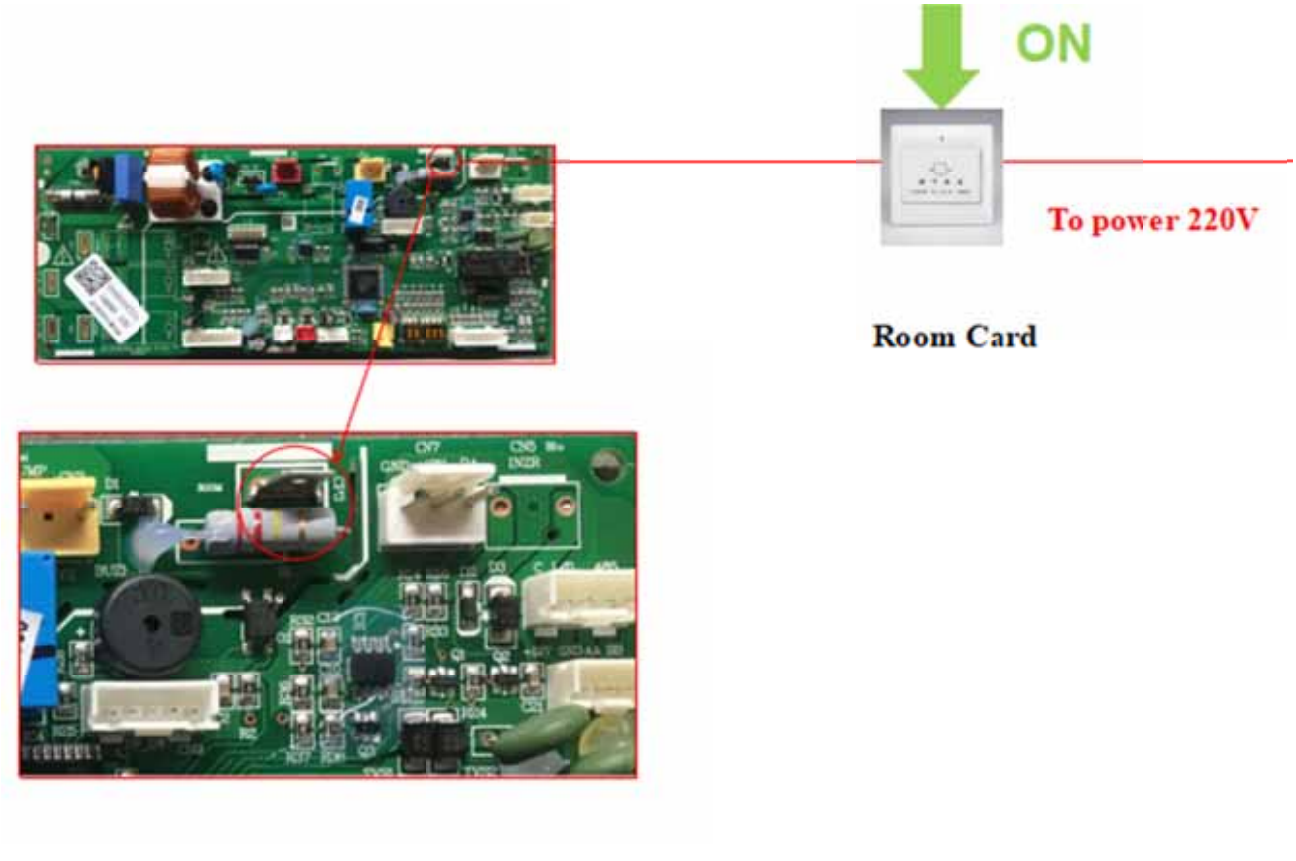
3.2 Wiring diagram

When the room card is inserted, the air conditioning can be controlled; when you leave the room, the AC will standby, can’t be controlled.

【DUCT TYPE】



【Cassette】and【ceiling& floor】



4. Wifi Module

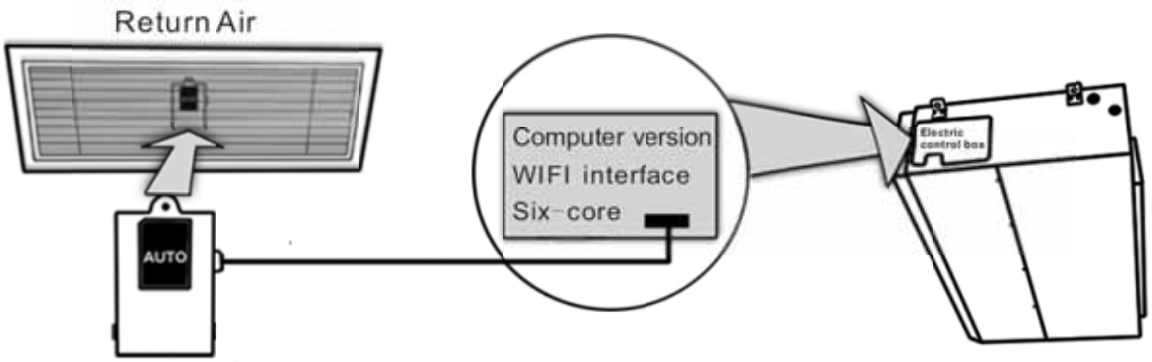
4.1 WiFi Module Configuration

① APP Download

Mobile terminal scans the following dimensional code to download APP, or search “AC Freedom” in APPSTORE and Google store

② Light Commercial WIFI Module Installation

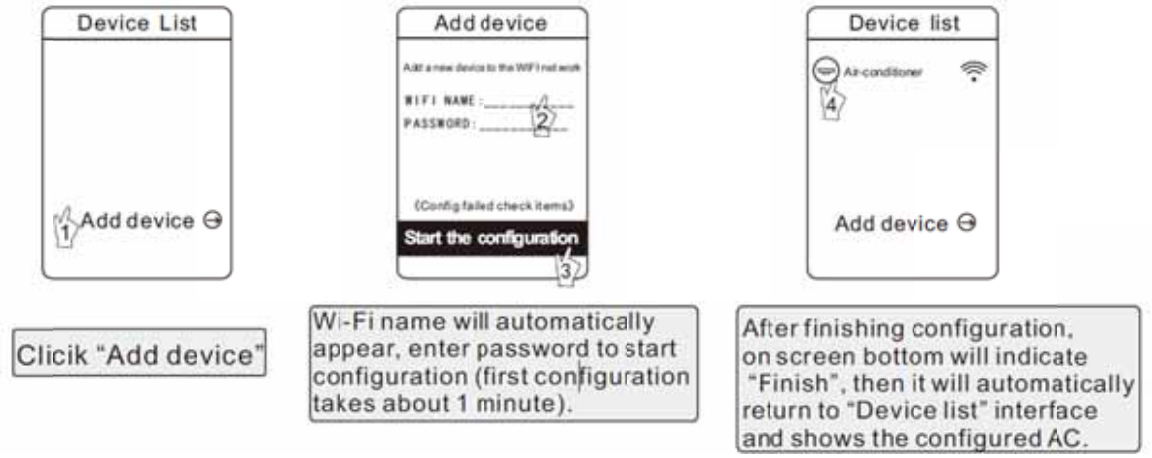
Connect the WIFI module communication wire to WIFI interfaces of main PCB, as shown below:



The WIFI module should be placed in the return air or some other place in WIFI area. (customers buy the wireless router)

③ APP Configuration

- Press "healthy" button 8 times consecutive, and buzzer even ring two sound then into the configuration
- Connect mobile terminals to WIFI, open APP “AC Freedom”, and then operate following the steps below:



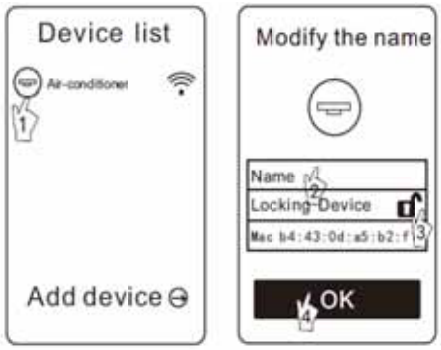
Note:

If the configuration fails or you change the password of wireless router, you need to reset the WIFI module to

reconnect: Turn on the power of the module, then repeat the steps above for APP configuration.

4.2 AC management

① Modify AC name and locking function



Note:
If you had locked AC equipment, you need to unlock before connecting other mobile terminal. If the mobile terminal locked AC was accidentally lost, you need to reset WIFI module first, and then use the new mobile terminal to connect (Reset step is same with 1.3 APP configuration).

② For other instructions, please refer to "HELP" in APP.

③ Remote-control device

Connect the wireless router to internet, then open the GPRS. It means the remote control device, voice control function only effective after connected to the Internet

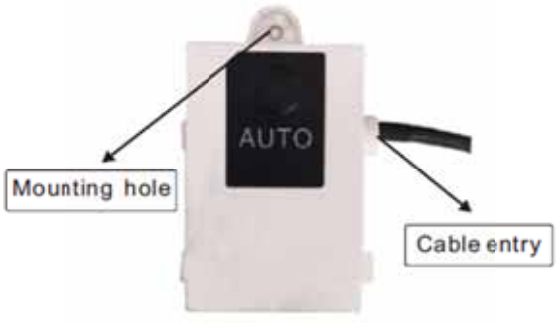
4.3 Trouble Shooting

If unable to properly configured or connect the WIFI box:

- Make sure the WIFI box for wiring is properly connected.
- Long press WIFI box 8 seconds to reconfigure the positive button. If the problem can't be solved, please contact after sales person.

4.4 Technical Parameters

- Working temperature：0~50℃；
- Working environment humidity：20~90%RH；
- Dimensions：78 X 52 X 15.5
- Configuration cable wire length：1500mm



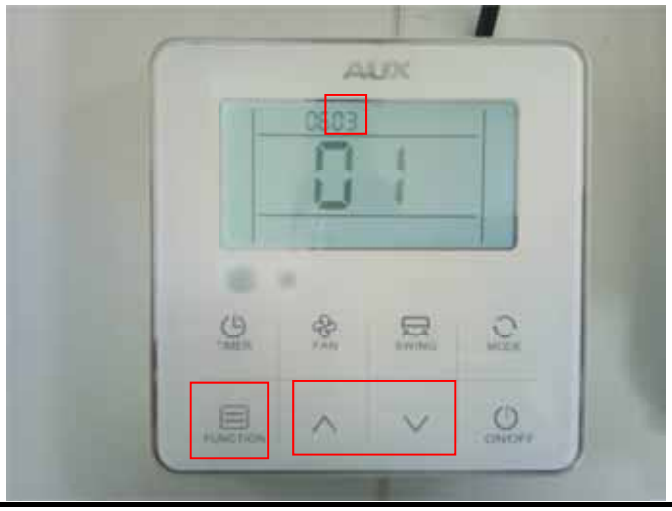
5. Static Pressure setting

5.1 Factory default

Capacity	Model	Default (Pa)	Parameters
18k/Btu	ALMD-H18/NDR3HA	25	0602
	ALMD-H18/NDR3HM2	25	0602
	ALMD-H18/NDR3HM2A	25	0602
24k/Btu	ALMD-H24/NDR3HA	25	0602
	ALMD-H24NDR3HM2	25	0602
30k/Btu	ALMD-H30/NDR3HA	37	0604
	ALMD-H30/NDR3HM2	37	0604
36k/Btu	ALMD-H36/NDR3HA	37	0604
42k/Btu	ALMD-H42/NDR3HA	37	0604
48k/Btu	ALMD-H48/SDR3HA	50	0605
60k/Btu	ALMD-H60/SDR3HA	50	0605

5.2 Static Pressure setting (30Pa-example) use XK-05

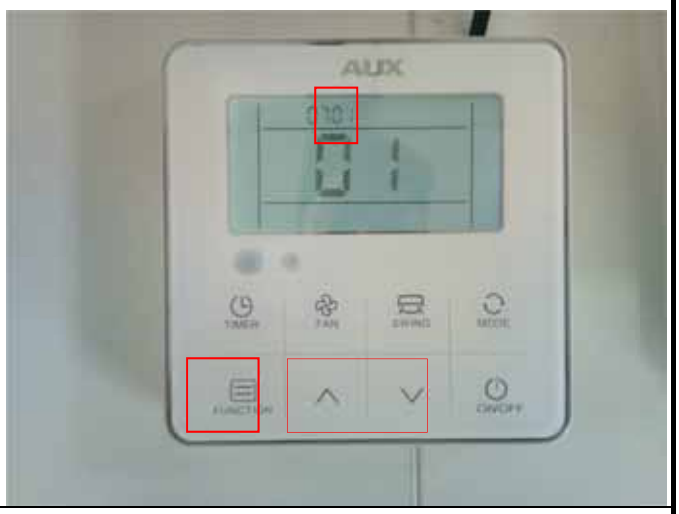
【Step 1】Feel free to touch a button and light up the screen, As shown in the right picture	

【Step 2】Press the "**FUNCTION**" button for 5s to enter the set interface, As shown in the following picture	
【Step 3】Press "△ ▽"button changing the first 2 numbers of "**01**XX" to "**06**XX", As shown in the following picture	
【Step 4】Press the "**FUNCTION**" button for 5S again to enter ESP set interface, the last 2 numbers of "06**01**" will be Twinkle ,then Press "△ ▽"button changing the last 2 numbers of "06**XX**" to set the ESP of IDU,As shown in the following picture,The"06**03**"means that ESP of IDU is **30 Pa**.	

ESP setting table									
ESP(Pa)	0	10	20	30	40	50	60	70	80
parameter values	0600	0601	0602	0603	0604	0605	0606	0607	0608
ESP(Pa)	90	100	110	120	130	140	150	160	
parameter values	0609	0610	0611	0612	0613	0614	0615	0616	

【**Step 5**】Press "**FUNCTION**" button to confirm, As shown in the picture

【**Step 6**】Press "△"button changing the first 2 numbers of "**06**XX" to "**07**XX", As shown in the picture

【**Step 7**】 Press the "**FUNCTION**" button for 5S again ，the last 2 numbers of "07**XX**" will be Twinkle ,then Press "△ ▽"button change "07XX" to "**0701**" Confirm the ESP of IDU,As shown in the picture,	
【Step 8】 Press "**FUNCTION**" button to confirm, finishing set ,As shown in the picture.	

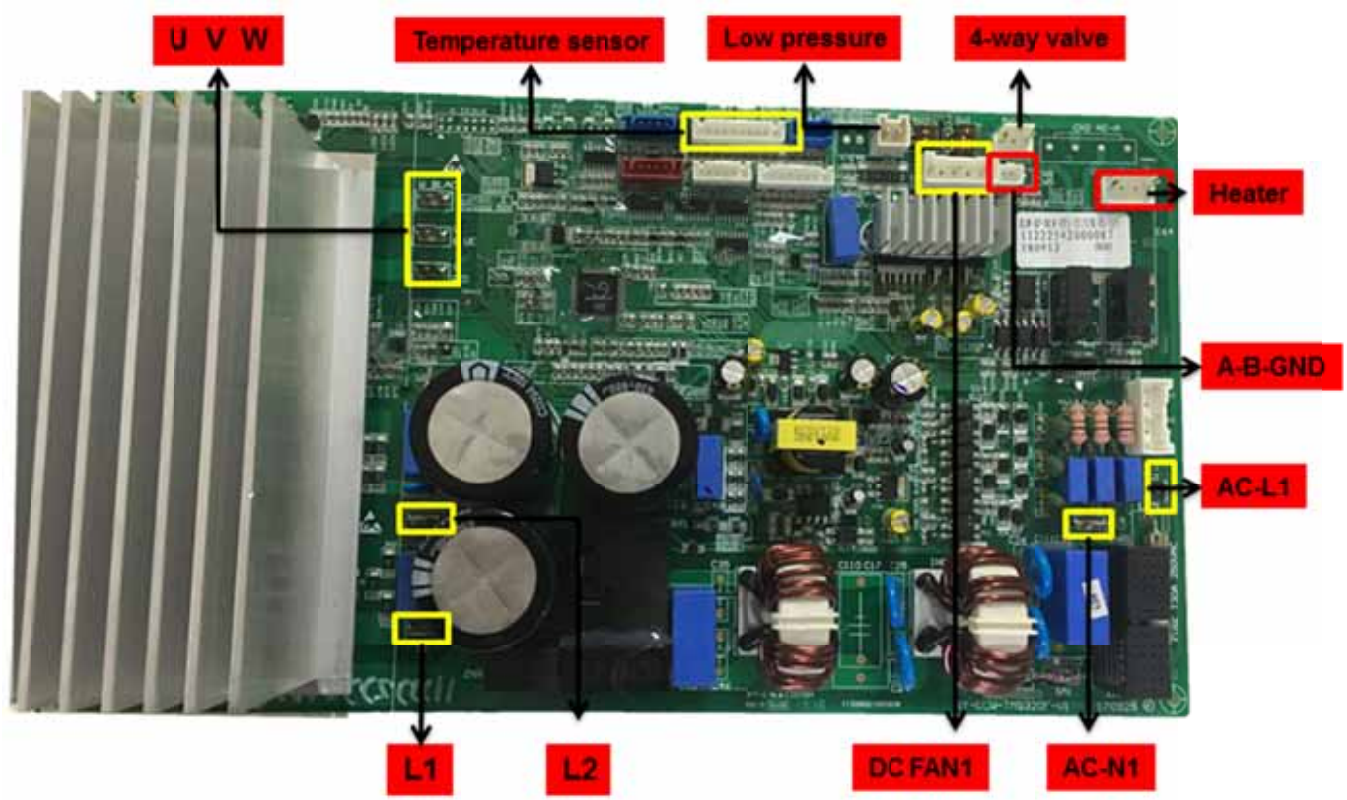
※ Use Remote controller(YK-L) and XK-04 Set method same as the above XK-05

Part10 PCB Instruction

1. Outdoor Unit PCB

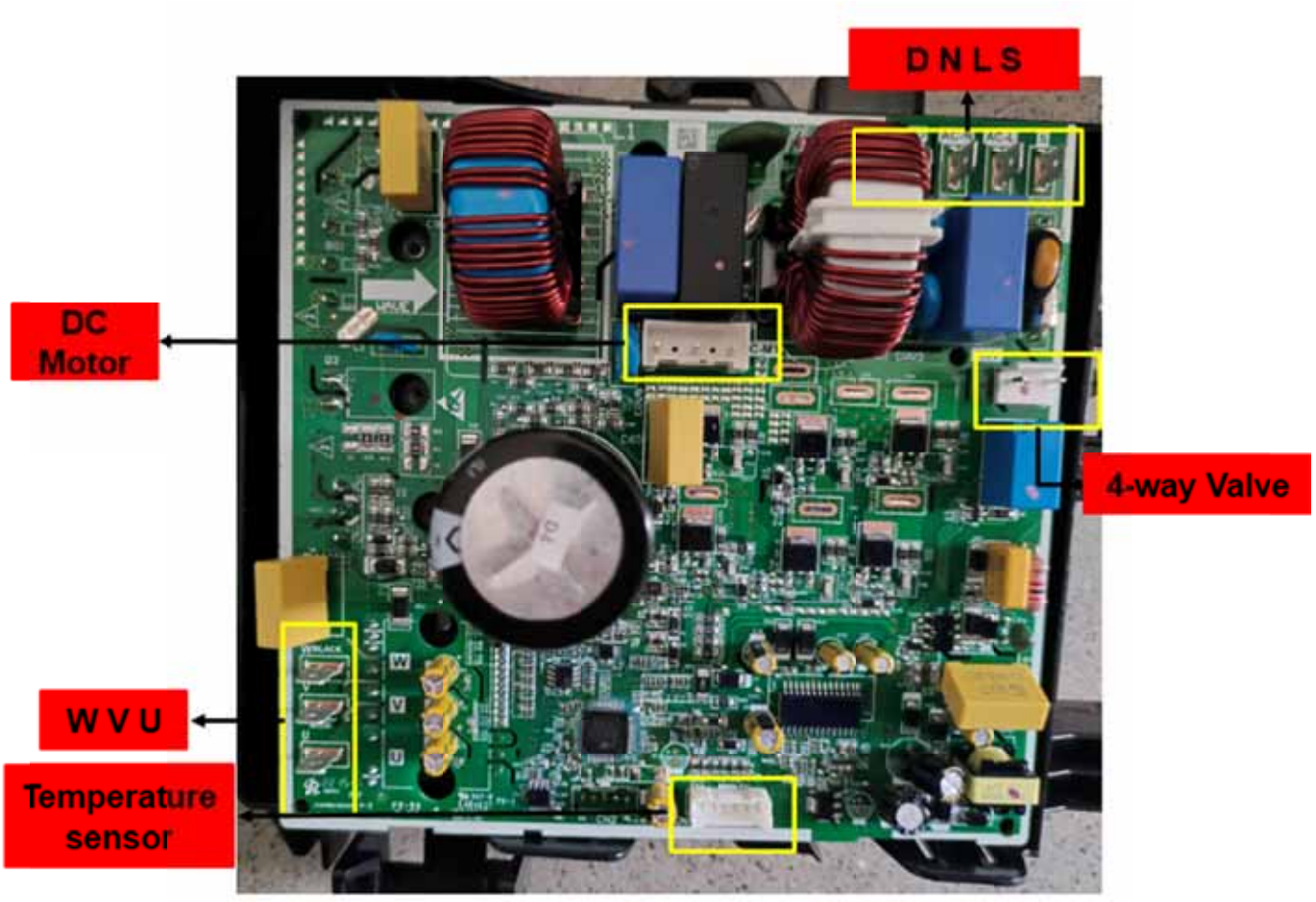
1.1 AL-H12/NDR3A(U),, AL-H18/NDR3A(U),, AL-H24/NDR3A(U),

Main PCB：



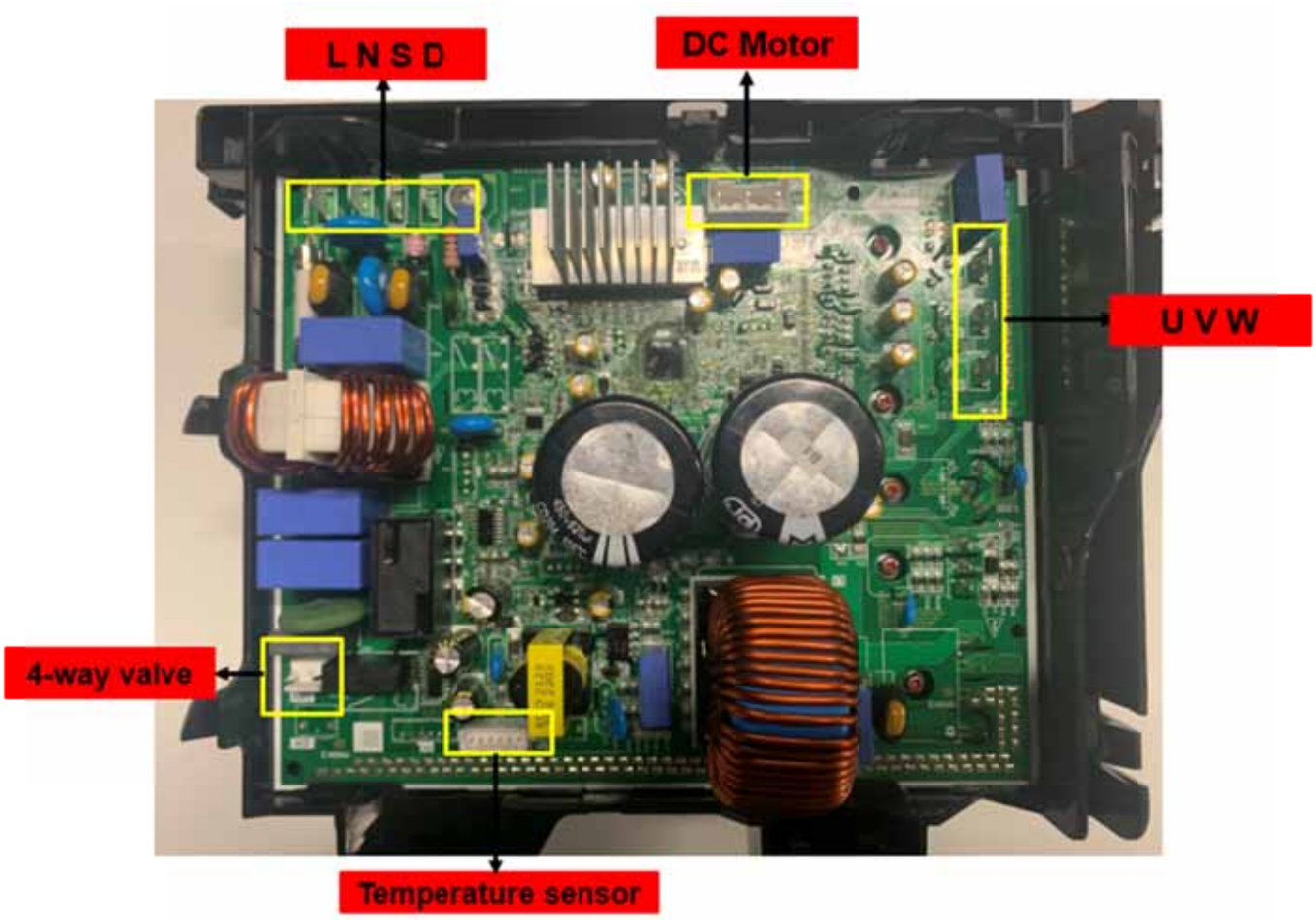
1.2 AL-H12/NDR3HB2(U)

Main PCB



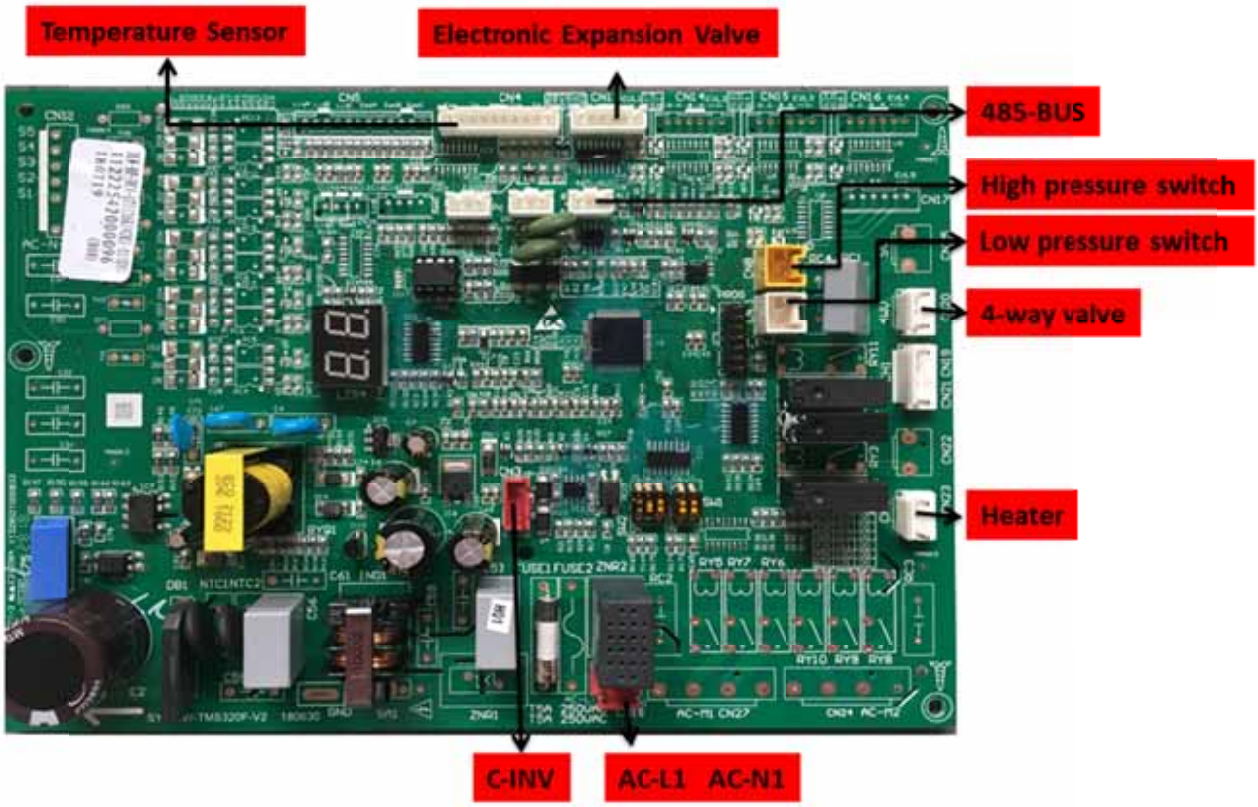
1.3 AL-H18/NDR3HB2(U), AL-H24NDR3HB2(U), AL-H30/NDR3HB2(U)

Main PCB

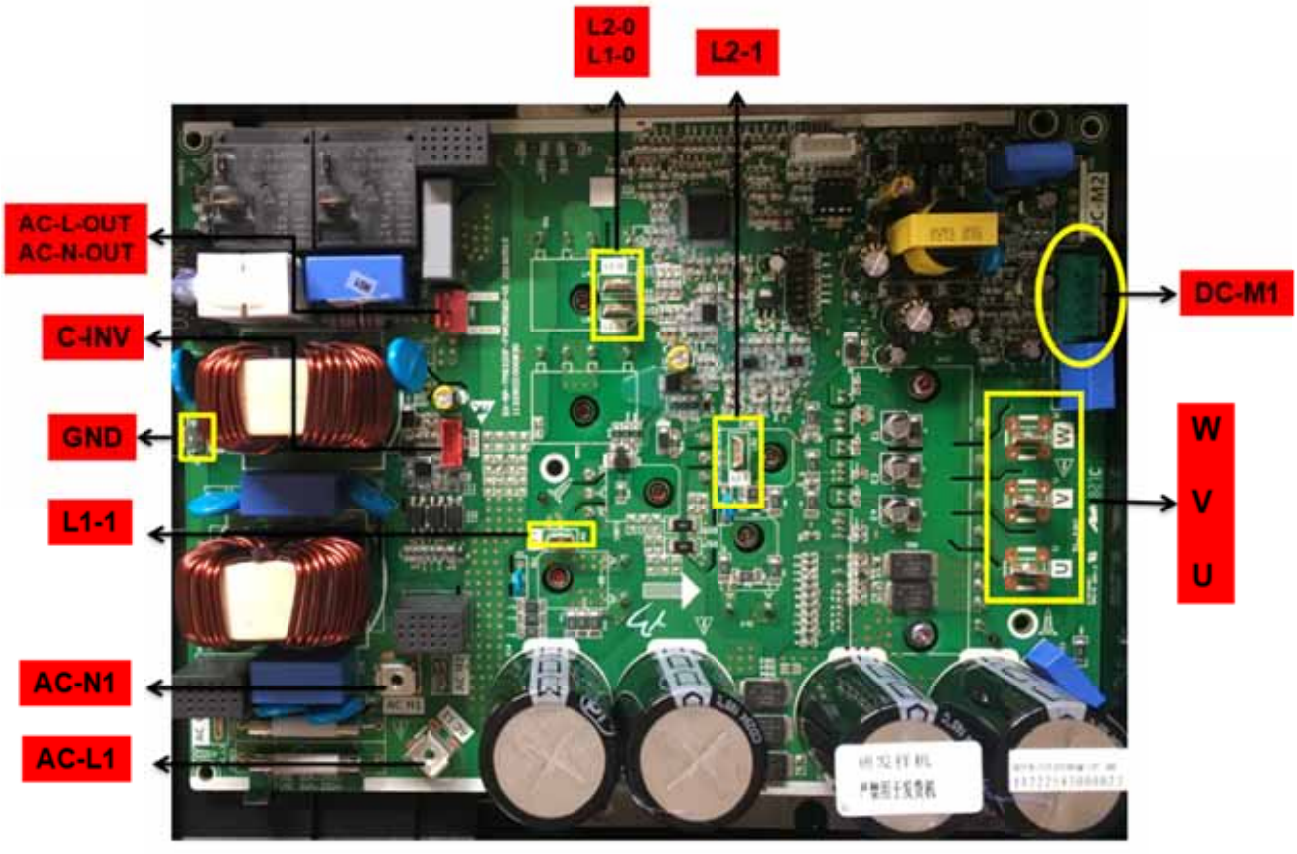


1.4 AL-H30/NDR3A(U), AL-H36/NDR3A(U), AL-H42/NDR3A(U)

Main PCB

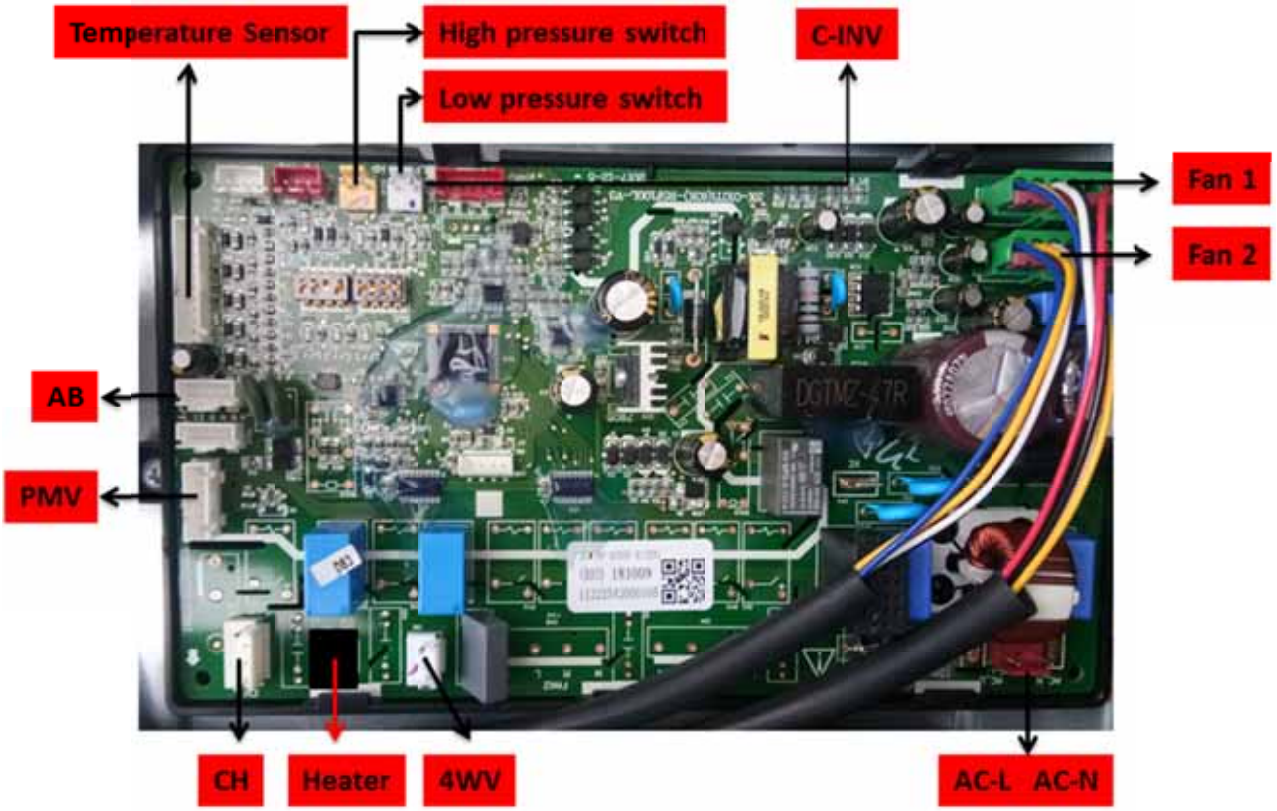


Drive Modular Board

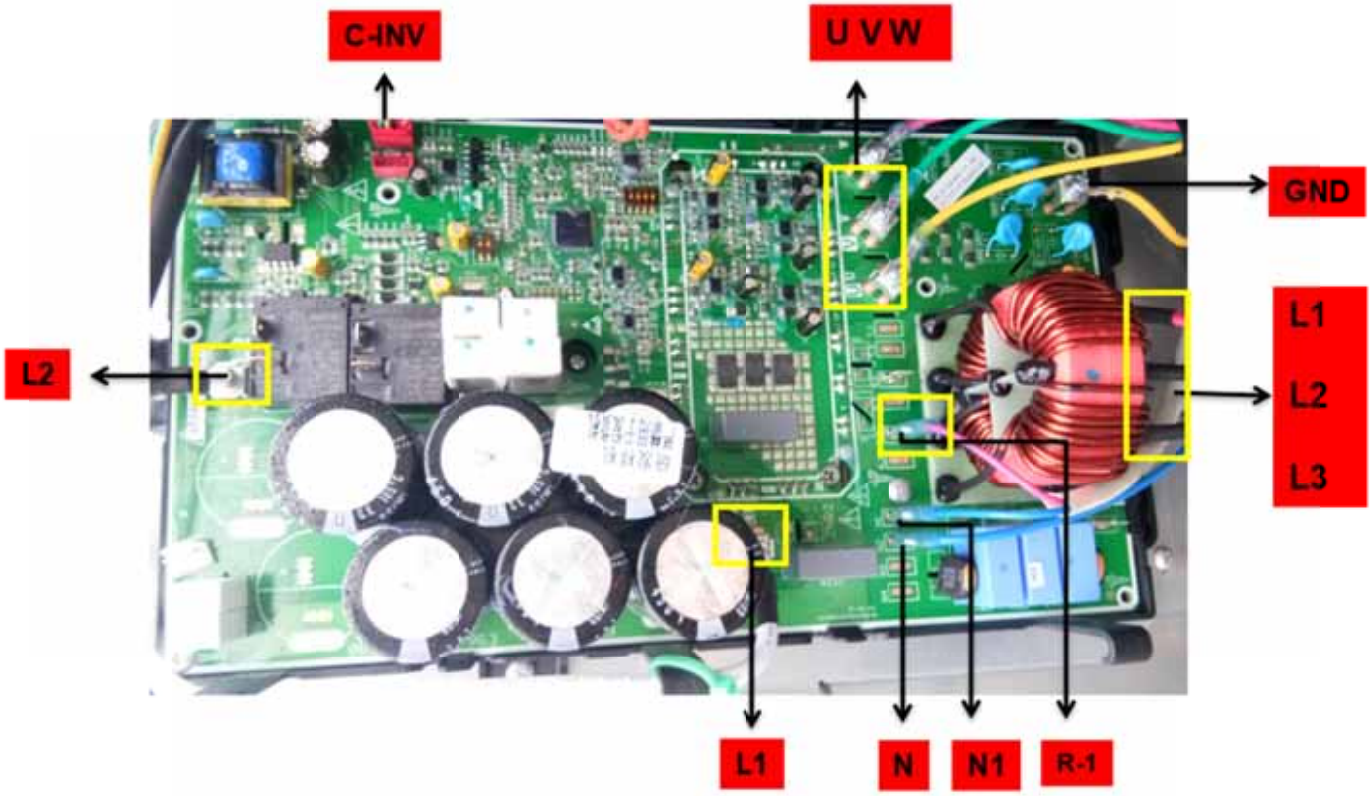


1.5 AL-H48/SDR3A(U), AL-H60/SDR3A(U)

Main PCB

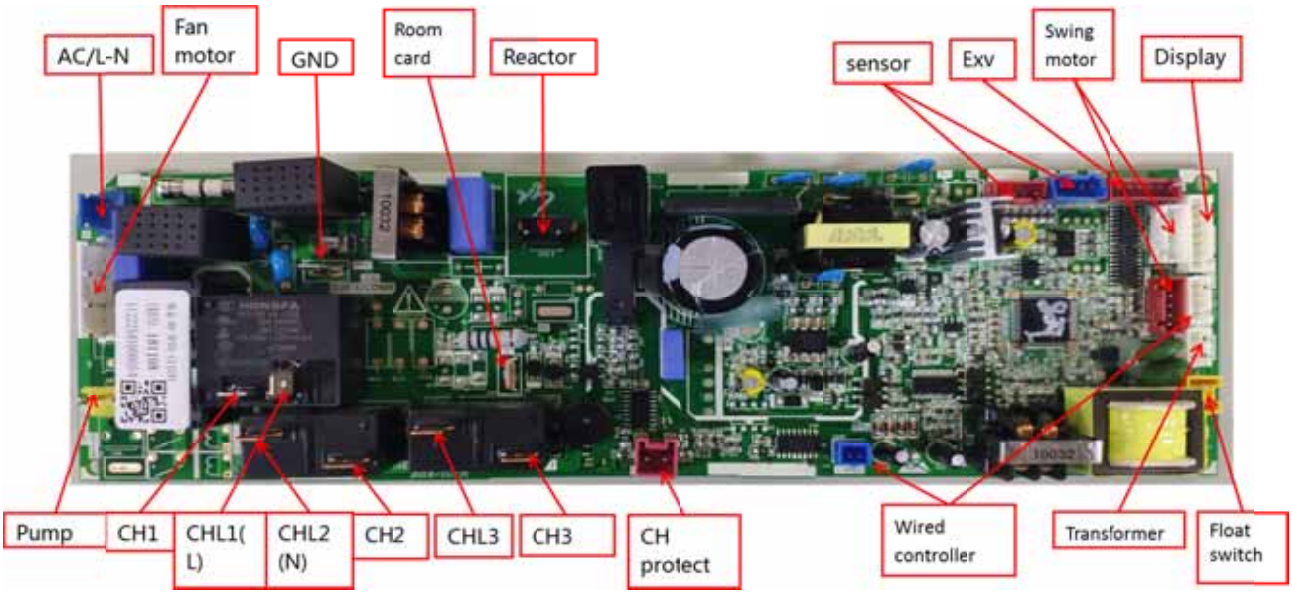


Drive Modular Board

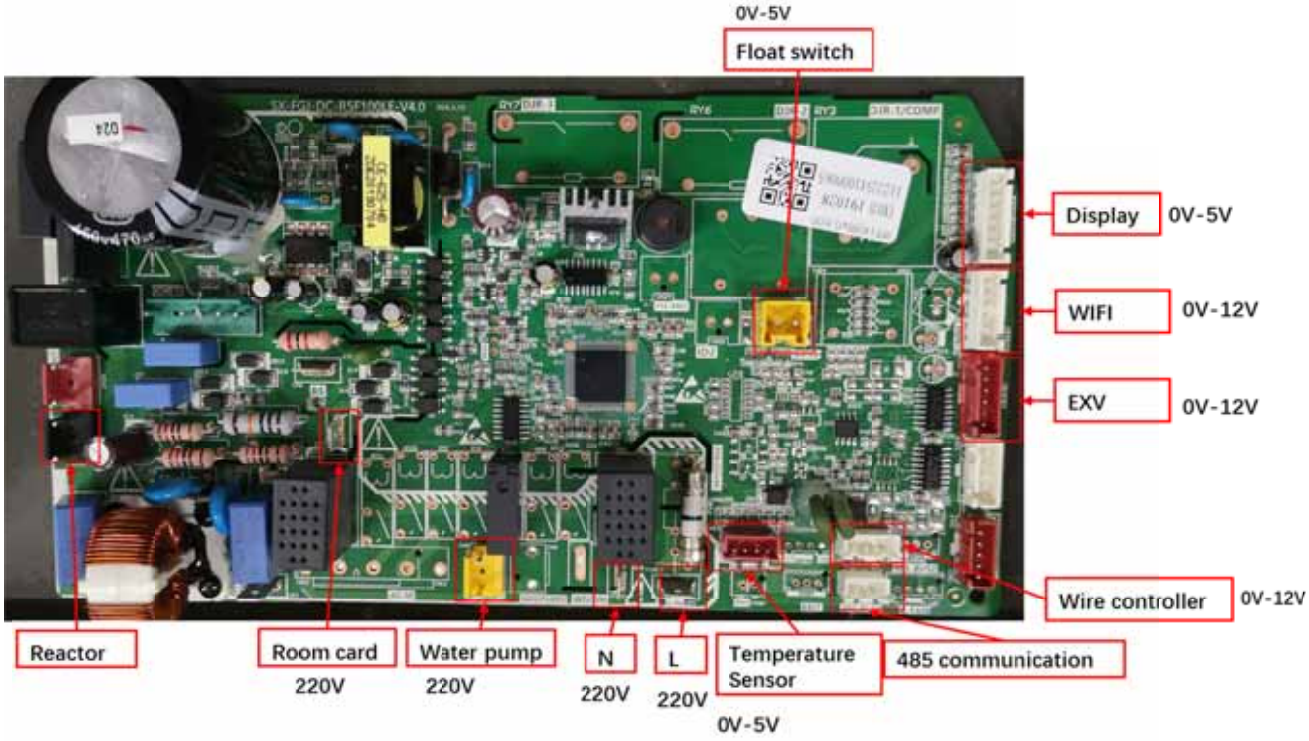


2. Indoor Unit PCB

2.1.Cassette (12~60K)

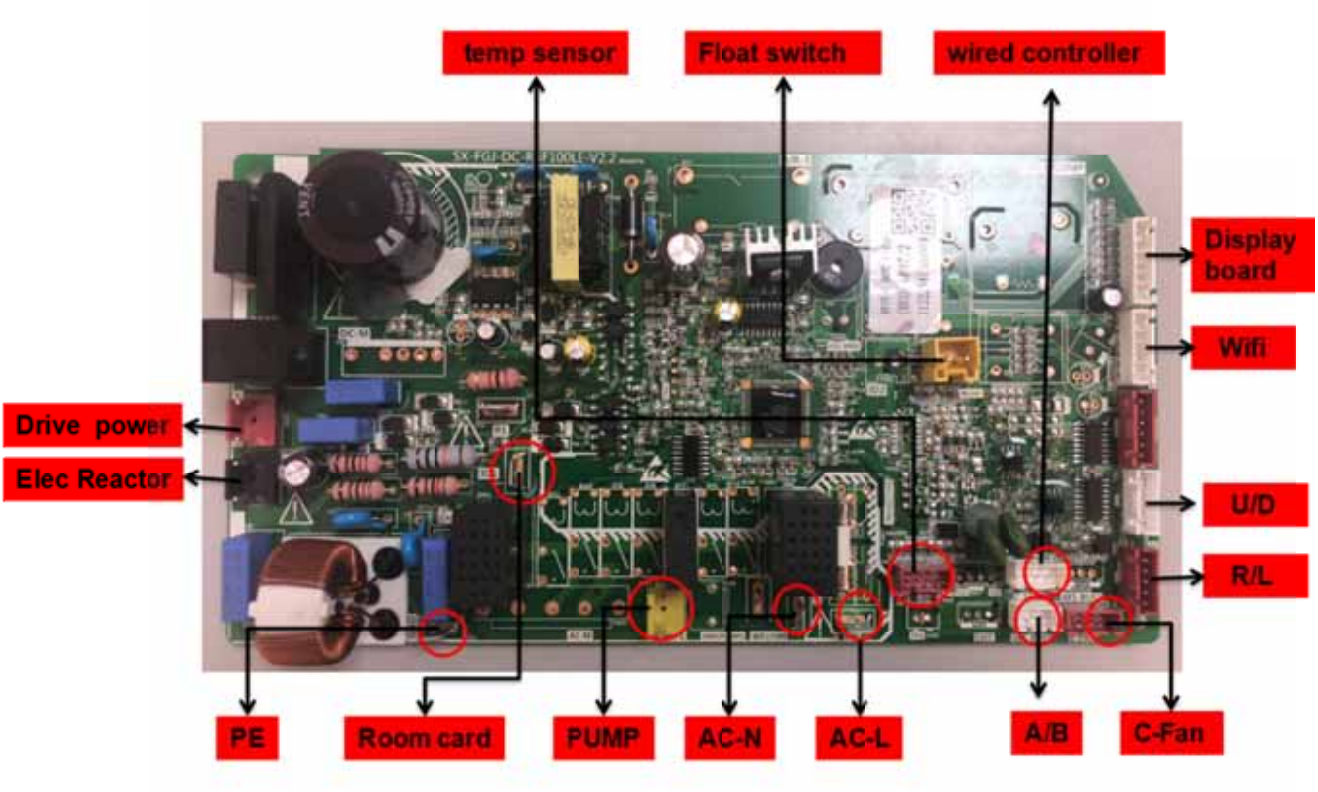


2.2.Ceiling & Floor (12~60K)

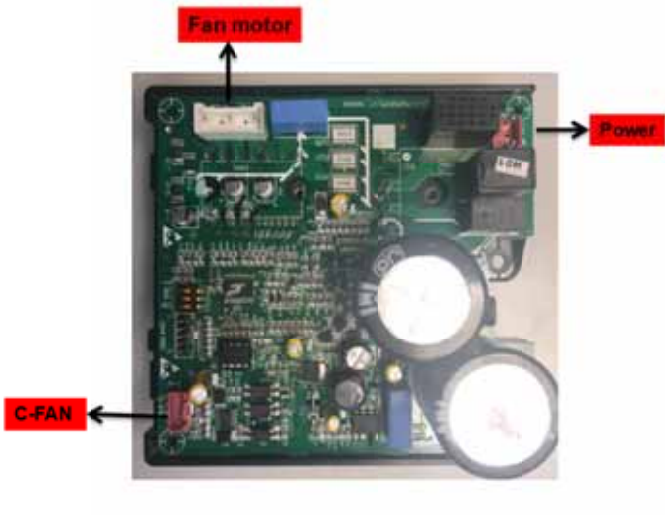


2.3 Duct (12K~60K)

Main PCB



ALMD-H18/NDR3HM2A



Driver Modular

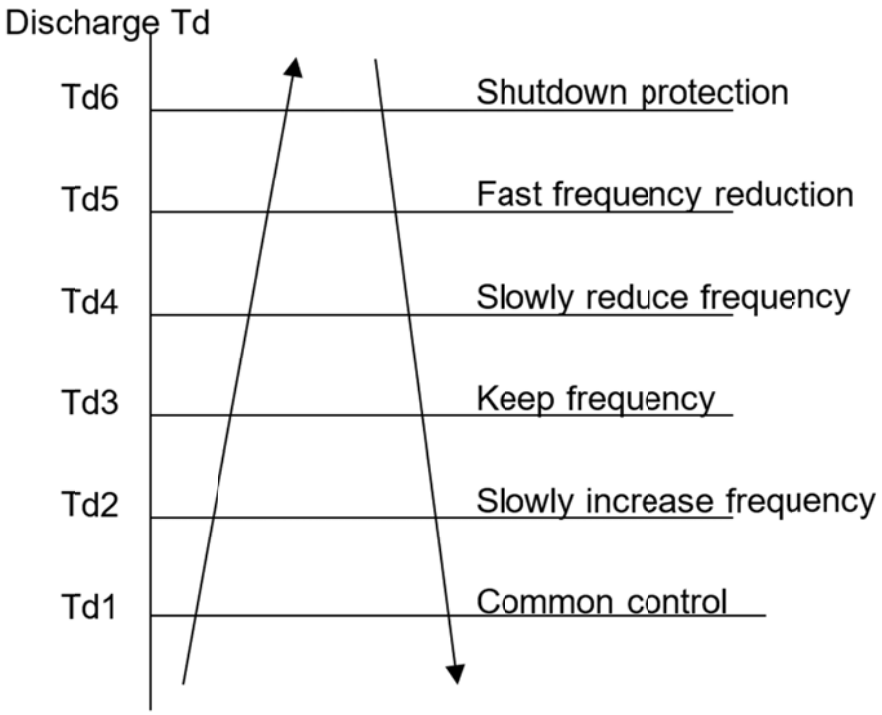
ALMD-H18/NDR3HM2A

2.4 Console

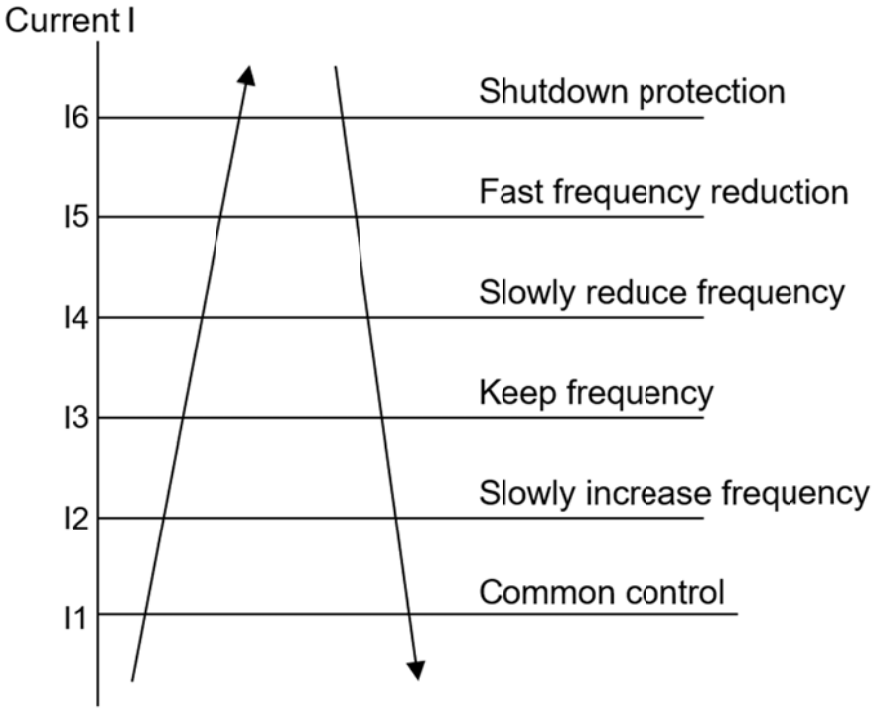
ALCO-H12/4R3A、ALCO-H18/4R3A

Part11 Protection

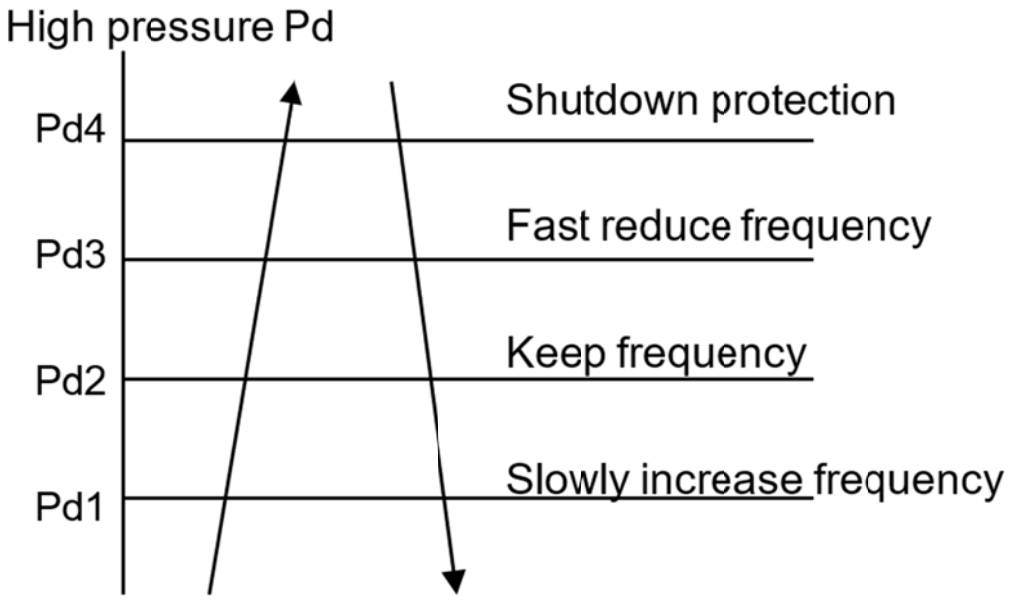
1. High Temperature Protection



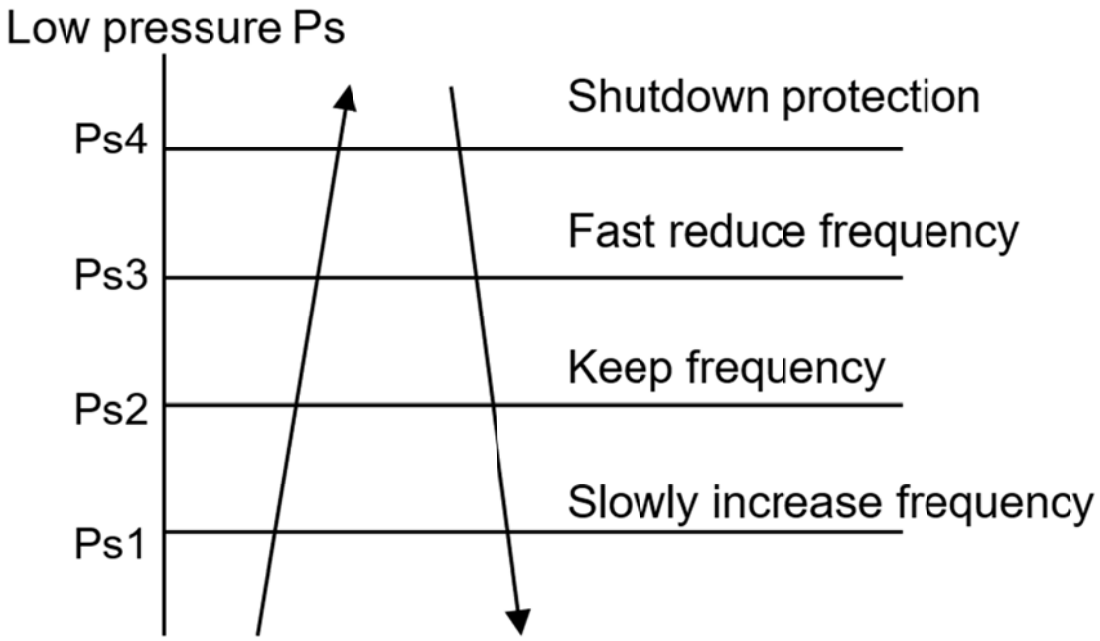
2. Over Current Protection



3. High Pressure Protection



4. Low Pressure Protection



Part12 Electric Characteristic

model	power supply		current		ODU fan motor input （kW）
	Hz	voltage	MCA	MOP	
AL-H12/NDR3A(U)	50/60	220-240	/	11	40
AL-H12/NDR3HB2(U)		220-240	/	9	35
AL-H18/NDR3A(U)		220-240	/	12	40
AL-H18/NDR3HB2(U)		220-240	/	12	40
ALMD-H18/NDR3HM2A		220-240	/	12A	40
AL-H24/NDR3A(U)		220-240	/	16	69
AL-H24/NDR3HB2(U)		220-240	/	16	65
AL-H30/NDR3A(U)		220-240	/	23.5	120
AL-H30/NDR3HB2(U)		220-240	/	16	65
AL-H36/NDR3A(U)		220-240	/	23.5	120
AL-H42/NDR3A(U)		220-240	/	24.9	120
AL-H48/SDR3A(U)		380-415	/	15	200
AL-H60/SDR3A(U)		380-415	/	15	200

Part13 Trouble Shooting

CA/ CF/ Duct /Co: Ceiling floor /Cassette/Duct/Console unit; WM: wall mounted unit

1. Failure code display

ERROR CODE	DESCRIPTION	Causes of possible failure
A1	Fault with the room temperature sensor on the Indoor unit	Damage of the room temperature sensor on the indoor unit
		Poor contact of the room temperature sensor on the indoor unit
		Damage of wiring of the room temperature sensor on the indoor unit
		Damage of the main PCB on the indoor unit
A2	Fault with the temperature sensor in the middle of indoor evaporator	Damage of the temperature sensor on the indoor unit
		Poor contact of the temperature sensor on the indoor unit
		Damage of wiring of the temperature sensor on the indoor unit
		Damage of the main PCB on the indoor unit
A3	Fault with the liquid pipe temperature sensor on the indoor unit	Damage of the liquid pipe temperature sensor on the indoor unit
		Poor contact of the liquid pipe temperature sensor on the indoor unit
		Damage of wiring of the liquid pipe temperature sensor on the indoor unit
		Damage of the main PCB on the indoor unit
A4	Fault with the gas pipe temperature sensor on the indoor unit	Damage of the gas pipe temperature sensor on the indoor unit
		Poor contact of the gas pipe temperature sensor on the indoor unit
		Damage of wiring of the gas pipe temperature sensor on the indoor unit
		Damage of the main PCB on the indoor unit
A5	Fault with the drainage	Float switch disconnected or poor wiring
		Error setting of model parameters
		Drain plug
		Damage of the pump
A6	Fault with the Fan motor of indoor unit	Low voltage
		Poor wiring
		Damage of the main PCB on the indoor unit
		Damage of the motor

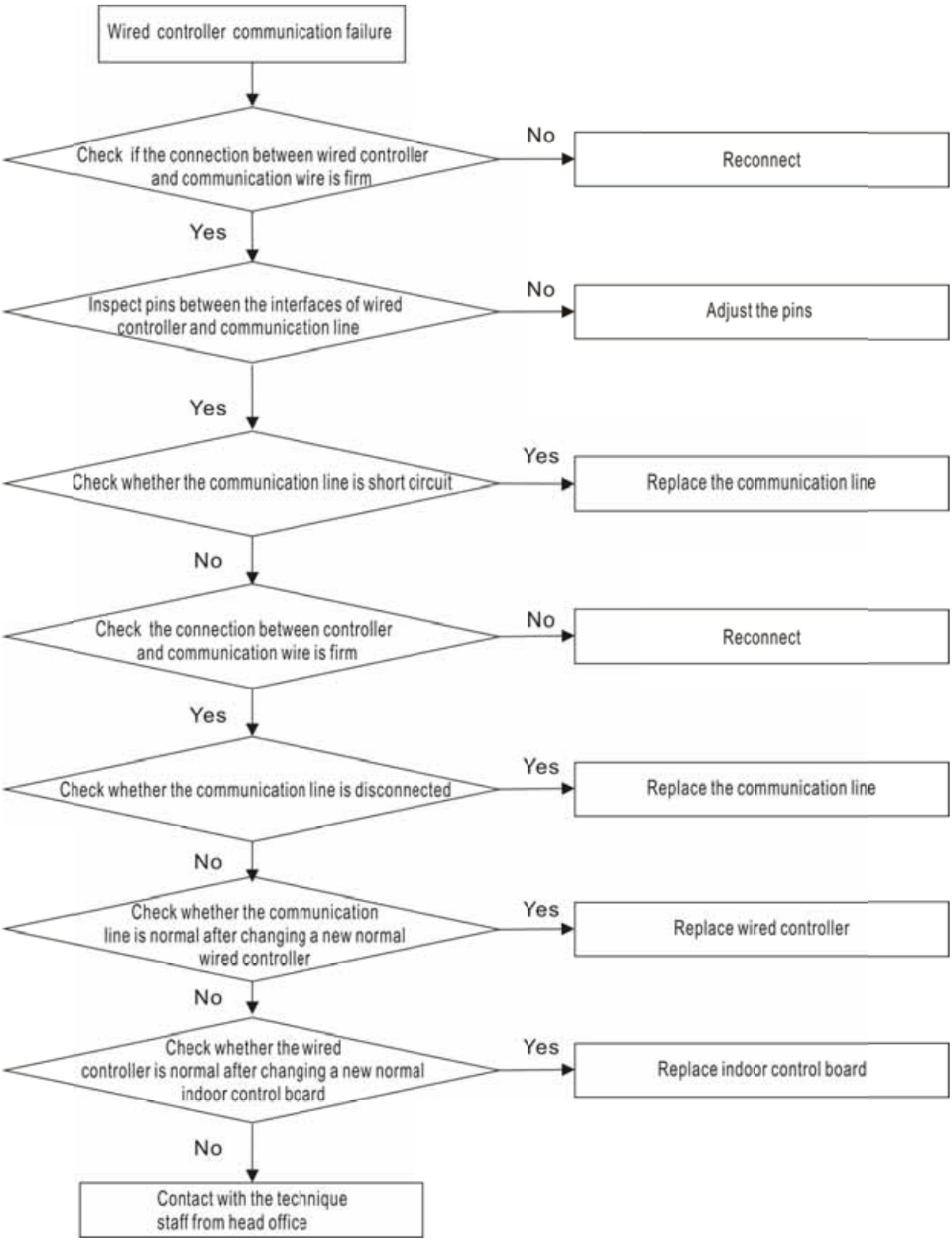
ERROR CODE	DESCRIPTION	Causes of possible failure
A8	Indoor unit EEPROM module failure	Indoor unit PCB is broken
		EEPROM module is broken.
A9	Communication error between the outdoor unit and the indoor unit	Damage of the main PCB on the indoor unit
		Damage of the main PCB on the outdoor unit
		Poor wiring
AA	Communication error between the wired controller and main PCB of the indoor unit	Poor wiring
		Damage of the wired controller
		Damage of the main PCB on the indoor unit
H1	Fault with the high-pressure switch	System pipeline blockage
		Damage of the pressure switch
H4	Fault with the low-pressure switch	Lack of the refrigerant
		Stop valve unopened
		Damage of the pressure switch
C1	Fault with the Environmental temperature sensor on the outdoor unit	Damage of the Environmental temperature sensor on the outdoor unit
		Poor contact of the Environmental temperature sensor on the outdoor unit
		Damage of wiring of the Environmental temperature sensor on the outdoor unit
		Damage of the main PCB on the outdoor unit
C2	Fault with the defrosting temperature sensor on the outdoor unit	Damage of the defrosting temperature sensor on the outdoor unit
		Poor contact of the defrosting temperature sensor on the outdoor unit
		Damage of wiring of the defrosting temperature sensor on the outdoor unit
		Damage of the main PCB on the outdoor unit
C3	Fault with the discharge temperature sensor	Damage of the discharge temperature sensor on the outdoor unit
		Poor contact of the discharge temperature sensor on the outdoor unit
		Damage of wiring of the discharge temperature sensor on the outdoor unit
		Damage of the main PCB on the outdoor unit
C6	Fault with the suction temperature Sensor	Damage of the suction temperature sensor on the outdoor unit
		Poor contact of the suction temperature sensor on the outdoor unit
		Damage of wiring of the suction temperature sensor on the outdoor unit
		Damage of the main PCB on the outdoor unit

ERROR CODE	DESCRIPTION	Causes of possible failure
C8	Fault with the temperature sensor in the mid of outdoor condenser	Damage of the temperature sensor on the outdoor unit
		Poor contact of the temperature sensor on the outdoor unit
		Damage of wiring of the temperature sensor on the outdoor unit
		Damage of the main PCB on the outdoor unit
J2	Communication error between the outdoor unit and the indoor unit	Damage of the main PCB on the indoor unit
		Damage of the main PCB on the outdoor unit
		Poor wiring
J3	Communication error between the driver PCB and main PCB of the outdoor unit	Damage of the driver PCB on the outdoor unit
		Damage of the main PCB on the outdoor unit
		Poor wiring
J7	Fault with the outdoor unit EPROM	Chip damage
E1	Fault of four-way valve	Damage of four-way valve
		Damage to coil of four-way valve
E3	Protection high temperature discharge	Lack of the refrigerant
		Stop valve unopened
		Damage of the main PCB on the outdoor unit
E8	Fault with anti-high temperature protection of indoor unit in heating model	Outdoor condenser viscera
		Indoor evaporator viscera
FH	Protection lower temperature discharge	Temperature sensor shedding
		Damage of the main PCB on the outdoor unit
31	Fault with the inverter module protection	Fault with the inverter module protection
32	Compressor drive hardware protection	Damage of the EE chip of driver board
33	Module software protection	Supply voltage below level let the current excessive
		Supply voltage exceed limit
		Outdoor fan stops or low speed
34	Compressor start failure	Compressor power line not connected
35	Fault with the over-electric current protection	Excessive running current of the unit
		Voltage drops abruptly in operation
36	Fault with the over-voltage or low voltage protection	Excessive input voltage
		Lower input voltage
37	Fault with the modular temperature sensor on the outdoor unit	Sensor damage of compressor IPM module

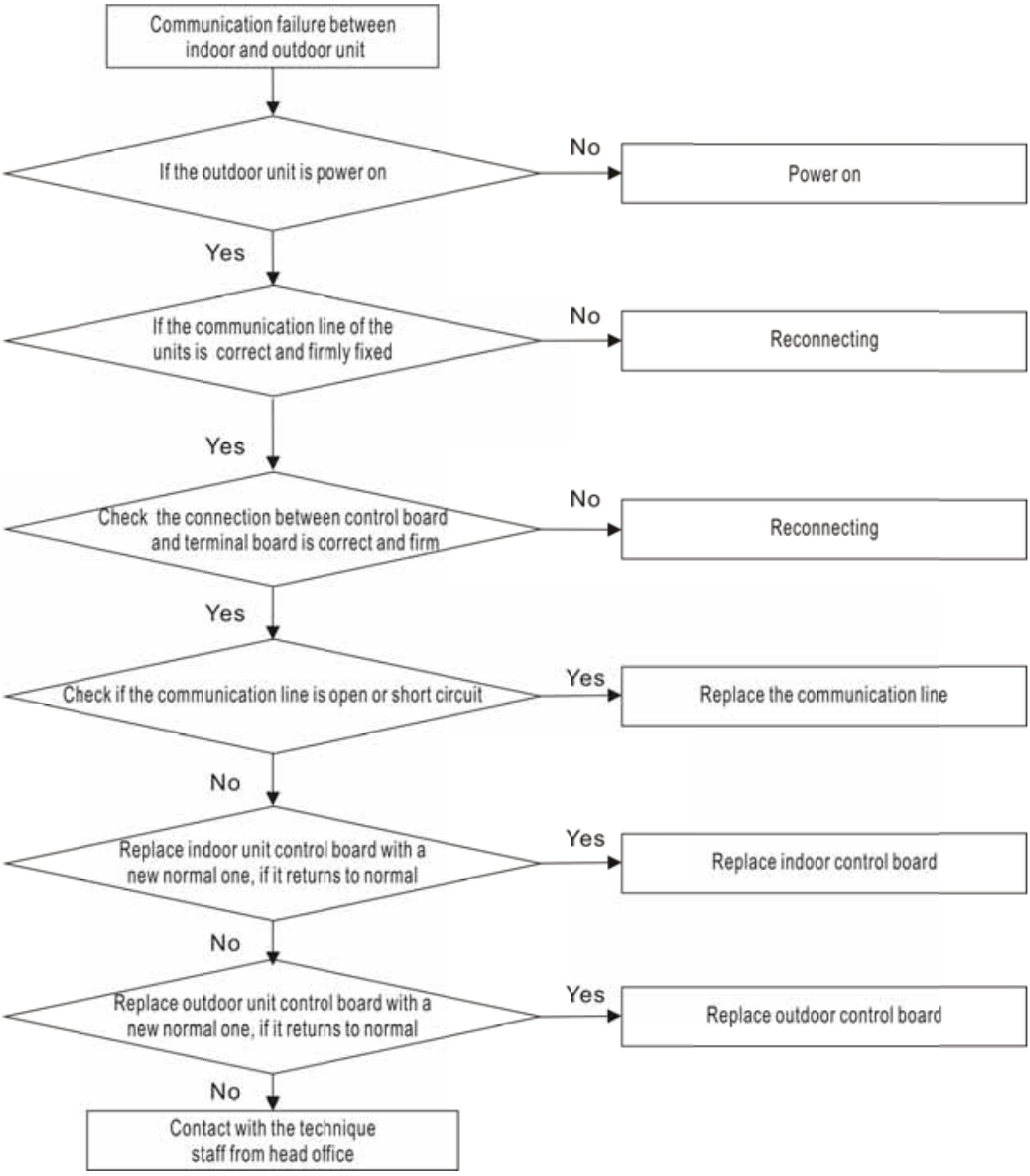
ERROR CODE	DESCRIPTION	Causes of possible failure
38	Fault with the Compressor Power supply Phase efficiency protection	Compressor power line not connected
39	Protection of compressor driving module for excessive temperature	Poor contact between compressor IPM module and radiator
3H	Fault with the Fan motor of outdoor unit	Damage of motor
3C	Overcurrent protection of outdoor DC motor	High speed of DC motor
3J	Overvoltage protection of outdoor DC motor	Low voltage output
3E	Compressor drive PFC software protection	Excessive running current of the unit
		Voltage drops abruptly in operation
3F	Compressor drive PFC hardware protection	Damage of the PFC circuit components
		Reactor damage
41	IPM protection for driving board of outdoor DC fan	Damage of IPM components of DC fan
99	Communication error between the driver PCB and main PCB of the indoor unit	Abnormal power supply of fan driving board
		Poor contact of the communication line of fan drive board
		Damage of fan driving board
9A	Temperature protection of indoor DC fan module B L5	Damage of fan driving board
9H	Failure of indoor DC fan start-up	Damage of fan motor
		High speed of DC motor
9C	Overcurrent protection of indoor DC motor	Excessive running current of fan motor
9J	Overvoltage and undervoltage protection of indoor DC motor	Excessive input voltage
		Lower input voltage
9E	IPM protection for driving board of indoor DC fan	Sensor damage of Dc motor IPM module
9F	EE protection for driving board of indoor DC fan	Damage of EE chip of Driver board

2. Failure analysis

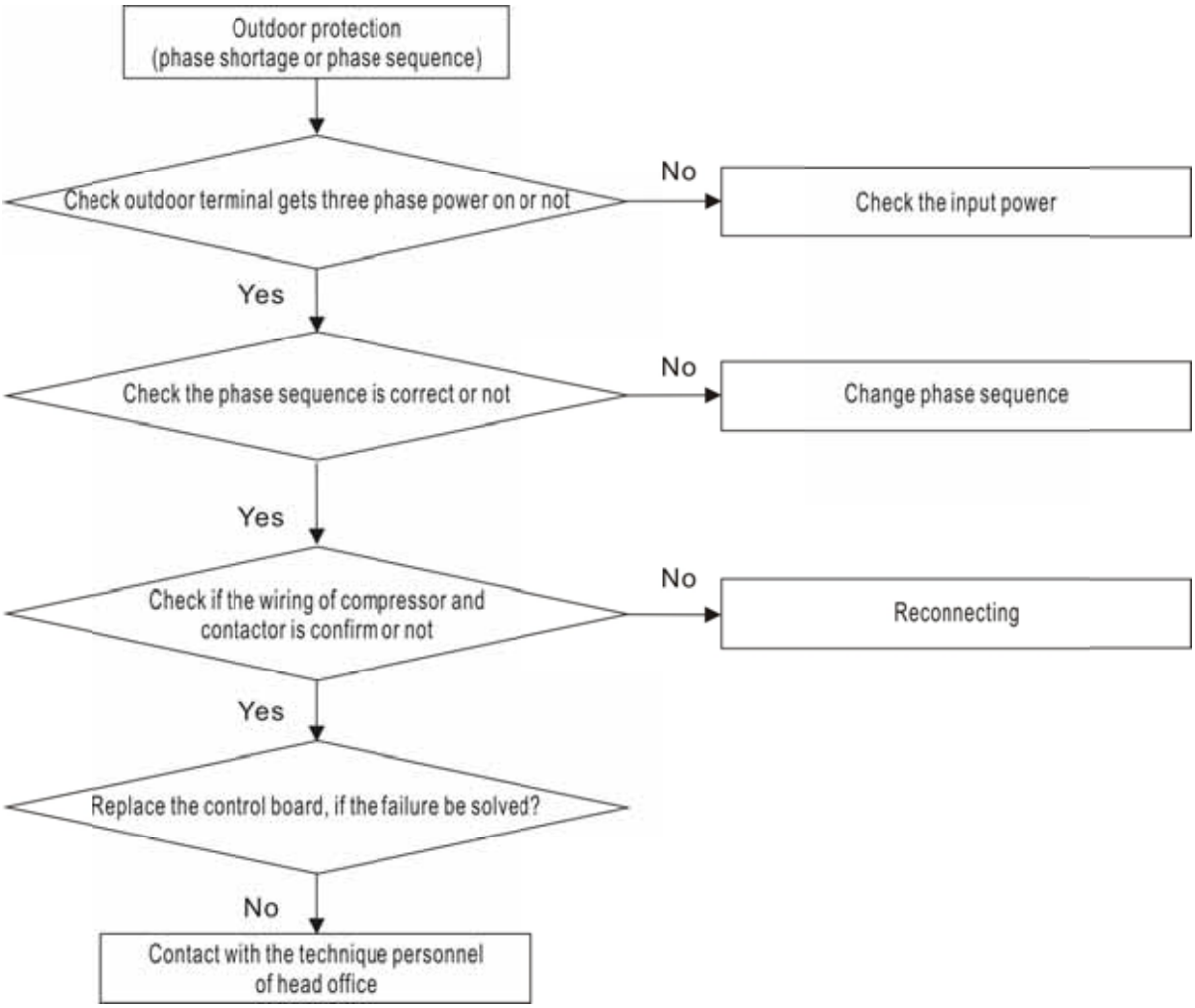
2.1【AA】Wired controller communication failure



2.2【A9】Communication failure between indoor and outdoor unit

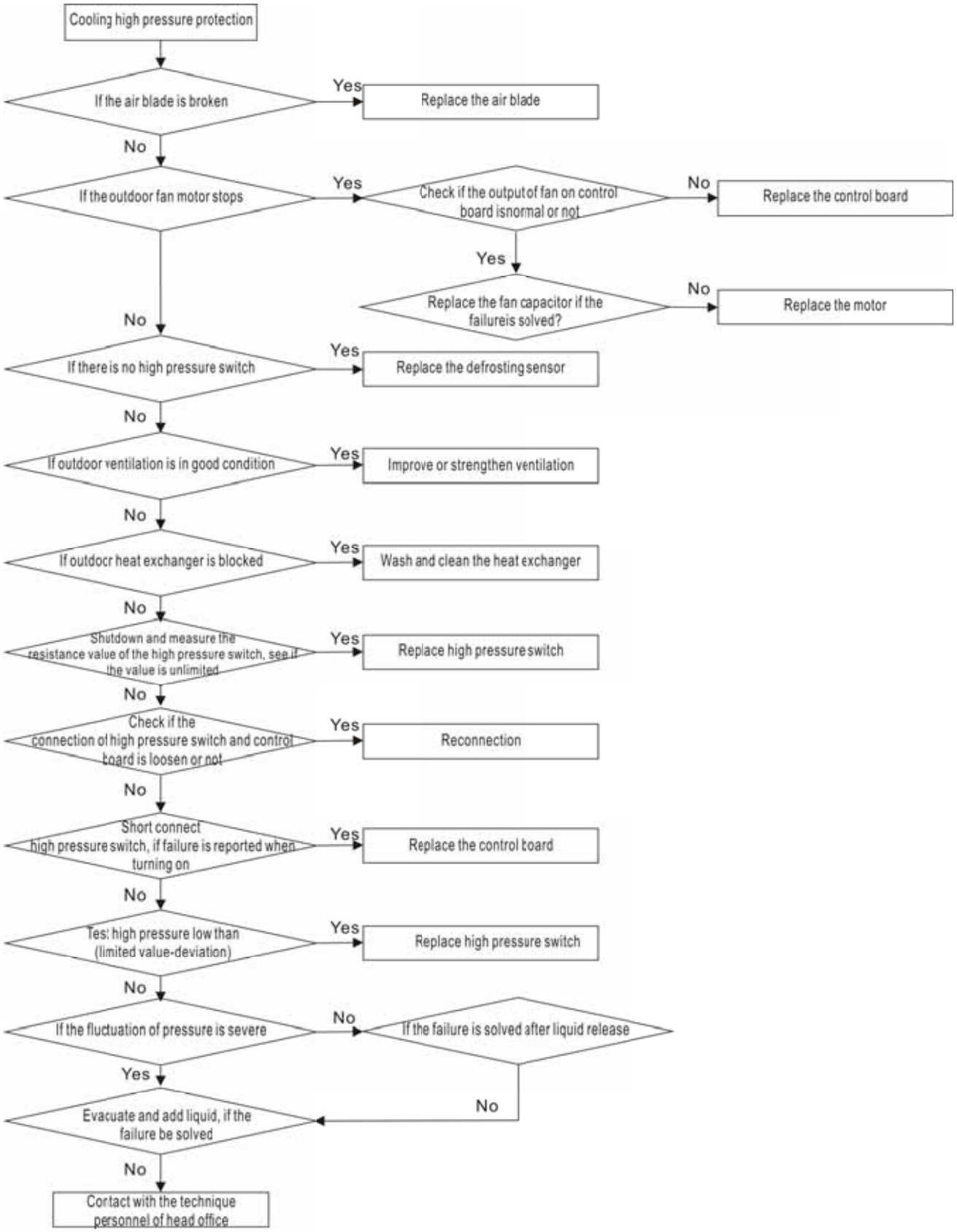


Outdoor protection (phase sequence)

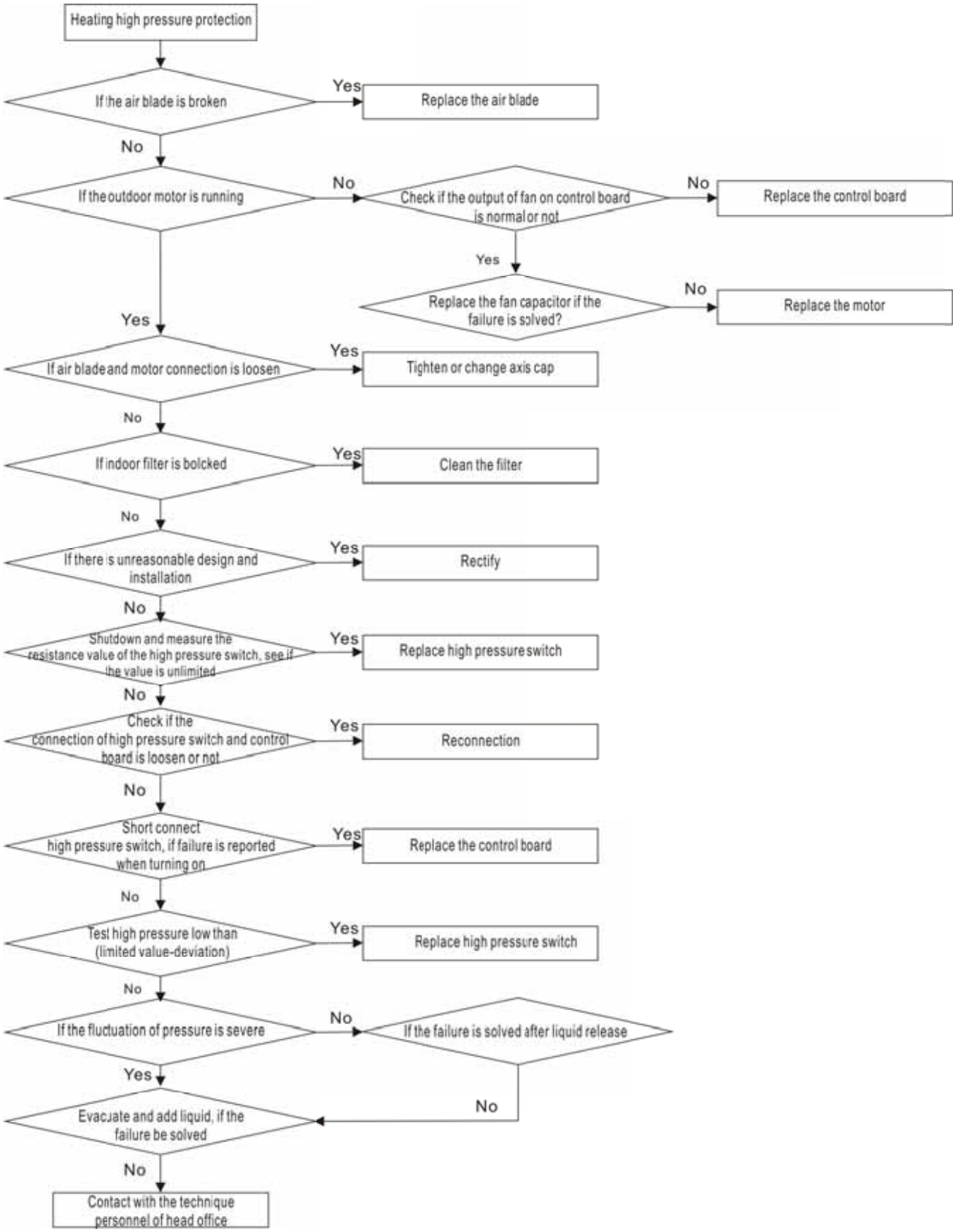


2.3【H1】high pressure protection

Cooling high pressure protection

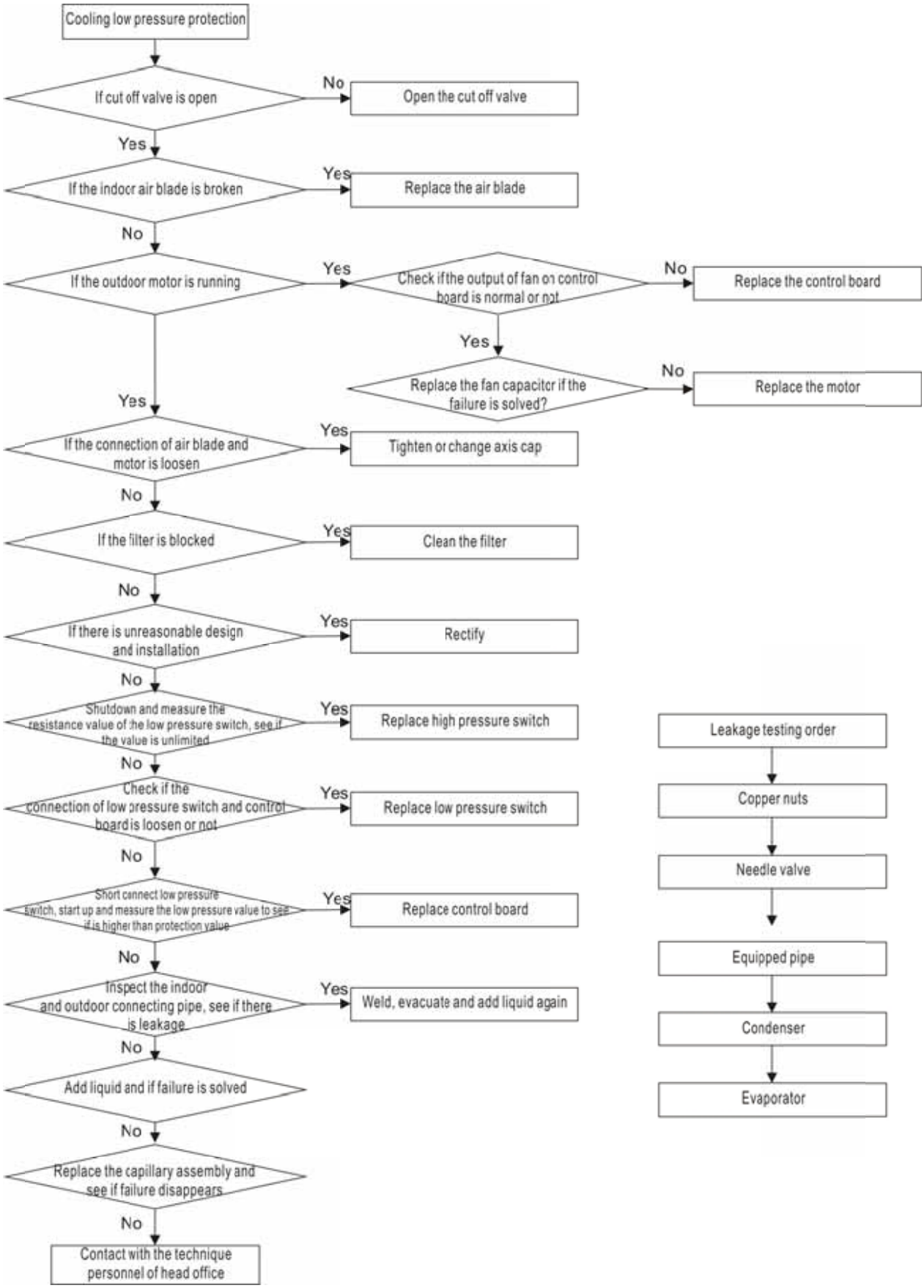


Heating high pressure protection



2.4【H4】low pressure protection

2.4.1Cooling low pressure protection

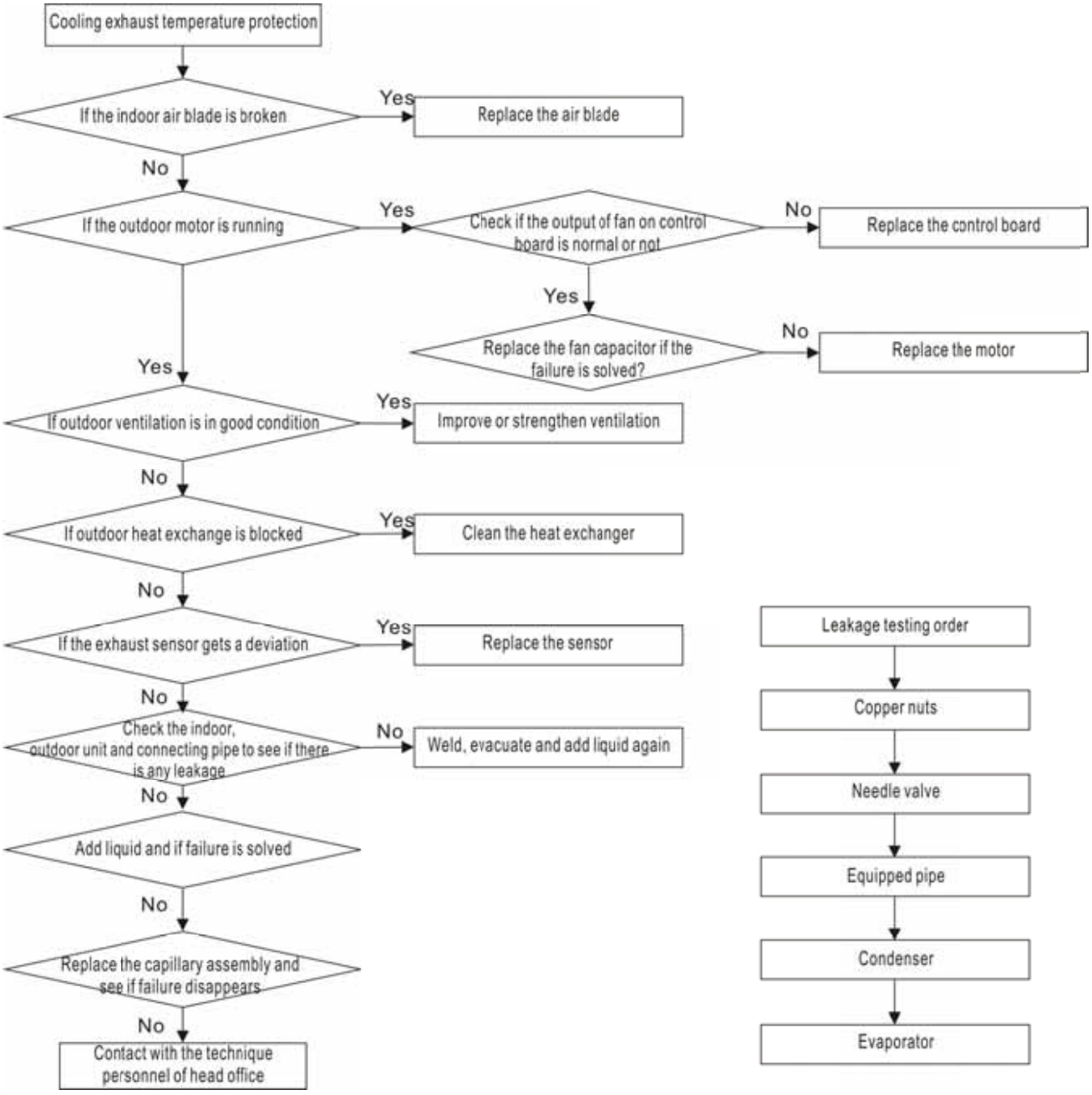


2.4.2Heating low pressure protection


Heating low pressure protection
If cut off valve is open
No
Open the cut off valve
Yes
If the indoor air blade is broken
Yes
Replace the air blade
No
If the outdoor motor is running
Yes
Check if the output of fan on control board is normal or not
No
Replace the control board
Yes
Replace the fan capacitor if the failure is solved?
No
Replace the motor
Yes
If outdoor ventilation is in good condition
Yes
Improve or strengthen ventilation
No
If outdcor heat exchange is blocked
Yes
Clean the heat exchanger
No
Shutdown and measure the resistance value of the low pressure switch, see if the value is unlimited
Yes
Replace low pressure switch
No
Check if the connection of low pressure switch and control board is loosen or not
No
Reconnect
Yes
Short connect low pressure switch, start up and measure the low pressure value to see if is higher than protection value
No
Replace control board
Yes
Inspect the indoor and outdoor connecting pipe, see if there is leakage
Yes
Weld, evacuate and add liquid again
No
Add liquid and if failure is solved
No
Heat the capillary assembly and see if failure disappears
No
Replace the capillary assembly and see if failure disappears
No
Contact with the technique personnel of head office
Leakage testing order
Copper nuts
Needle valve
Equipped pipe
Condenser
Evaporator

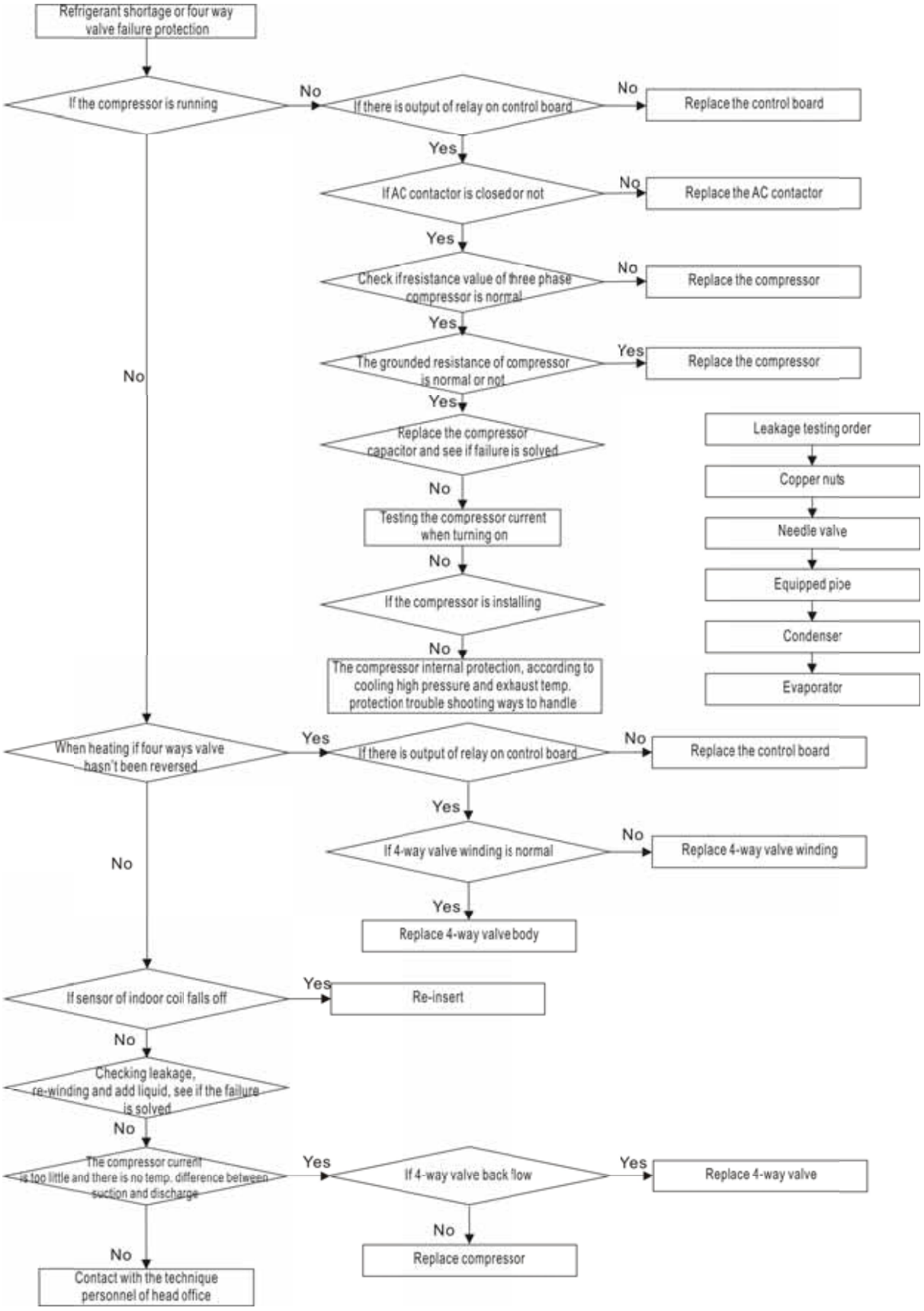
2.5【E3】High exhaust temperature protection

Cooling exhaust temperature protection

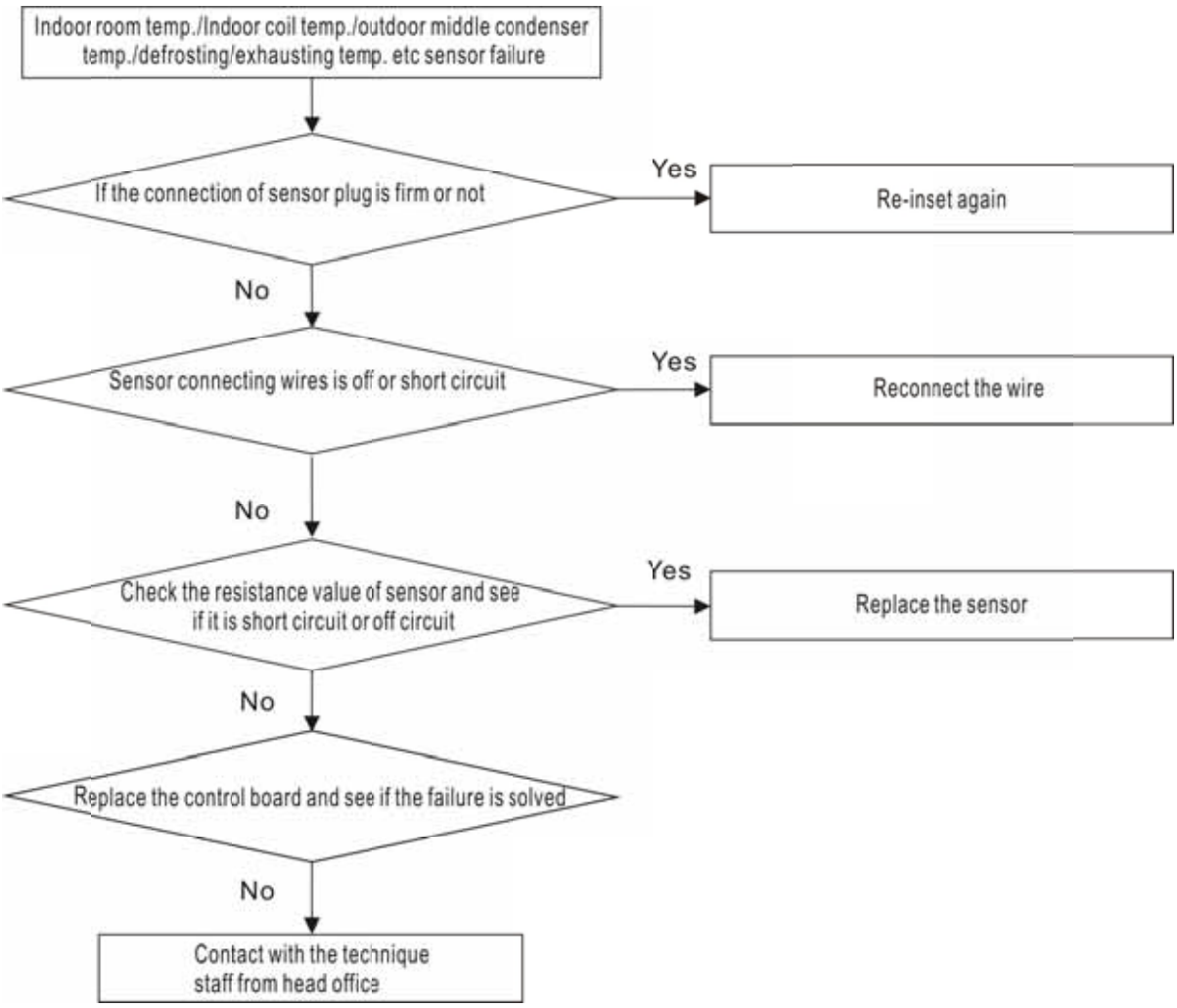


Heating exhaust temperature protection

2.6【E1】four way valve failure protection



2.7 Sensor failure protection



更新记录表

更新版本	更新人	更新内容
2020413 版	阳露	1.删除安装部分信息，以研发说明书为准 2.删除祥参部分，以 EXCEL 为准
2020415 版	张标	1.358 通讯 C5 座吊禁用，变更为 458 通讯 C5 座吊，A → B 2.运行范围，(-10~52,15~24) → (-15~52，-15~24)，
20200508 版	尹春梅	1.更新 F 新座吊外观图、电气原理图 2.增加 48K F 款座吊爆炸图、爆炸清单
20200828 版	尹春梅	1.增加 F 座吊 36k 相关内容 2.补全故障代码
2020.10.27 版	刘卓	1.增加 F 座吊 42/60K 相关内容 2.天花 E 款更改为天花 Y 款 3.区分新老座吊
20210201	阳露	更新 F 款座吊机爆炸图及清单，3D→二维图纸
20210530	阳露	新增 Y 款小天花 18K
20220413	王鹏程	对照最新型谱，更新如下： 1、删除已淘汰产品（已淘汰产品信息，如需查询，请在 pdm 已淘汰产品文件夹中找） 2、增噪音参数 3、增电气特性参数 4、增保护功能介绍
20220525	王晓熙	1、 增加 12K、18K、24K、30K 外机相关内容 2、 增加 12K、18K、24K Y 款天花相关内容 3、 增加 18K、24K、30K M 款风管相关内容 4、 增加 18K、24K F 款座吊相关内容 5、 增新品内机噪声频谱图
20221028	童彦洲	1、Add new indoor unit: Console
20221122	张亚雄	新增小 2P 风管相关内容