Haier

Cassette type

R32 Cooling Only Service Manual

SYJS.2023.A Edition: 2023-03

Haier

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1 . General Information

1.1 Line up

		Model	Appearance
Outdoor Unit		1U50S1TM1SA 1U71S1TT1SA	
		1U90S1LT1SA	
		1U105S1LN1SB	
		1U140S1LP1SB	
Indoor Unit 4-Way Cassette		AB50S1SR1FA AB71S1SR1FA AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA	

2 . Indoor Units-4-Way Cassette Type

2.1 Specification

Model name	FACTORY	ID	AB50S1SR1FA
		OD	1U50S1TM1SA
Power supply		V/Ph/Hz	1/220-240/50
Rated cooling	Capacity	KW	5.30
	Capacity	Btu/h*1000	18.00
	Input	W	1680
	Running current	A	7.38
	EER	/	3.15
Max. input consumption		W	2100
Max. current		A	13.83
Min. current		A	9.22
			YR-E17A/YL-HRS01
Operation Control		\	Wired/Remote
Indoor coil	Number of row		2
	Fin spacing	mm	1.4
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Coil l (L/H/W)	mm	670x670x147
	Number of circuit		7
Indoor fan motor	Brand-Manufacturer		Wolong/zhongshan broad-ocean
	Brand-Supplier		Wolong/zhongshan broad-ocean
	Model		WZD-A01030L-01AL ZW465B500025L
	Type		DC
	Input	W	37
	Output	W	30
	number of fan		1
	Speed (SH/H/M/L)	rpm	550/500/440/380
Indoor air flow (SH/H/M/L)		m^3/h	900/800/680/580
Sound power level (H/M/L)		dB(A)	—
Indoor noise level (H/M/L)		dB(A)	46/43/39/35
Panel Model			PB-950QB
External dimensions(W/D/H)			950/950/50
Shipping dimensions(W/D/H)		mm	1000/1000/110
Net/Shipping weight		KG	5.5/8.5
Indoor dimension	Unit (L/W/H)	(mm)	840/840/180
	Packing (L/W/H)	(mm)	978/978/247
Indoor weight	Net/Gross weight	(Kg)	20.5/26

Model name	FACTORY	ID	AB50S1SR1FA
		OD	1U50S1TM1SA
Outdoor coil	Number of row		2
	Fin spacing	mm	1.3
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ5
	Tube material		Inner grooved
	Coill (L/H/W)	mm	600x507x26
	Number of circuit		26
Compressor	Brand		RECHI
	Model		50X4C33M-5TME
	Type		Rotary
	Number of compressor		1
	Compressor oil charge	ml	370
Outdoor fan motor	Brand		zhongshan broad-ocean
	Model		Y5S613B512G
	Number of motor		1
	Input	W	84
	Output	W	35
	Capacitor	μF	3
	Type of fan		Axial Fan
	number of fan		1
	Number of fan blade	blade	3
	Speed	rpm	860
Outdoor air flow		m^3/h	2500
Outdoor noise level		dB(A)	53.00
Outdoor dimension	Unit (L/W/H)	mm	800/275/555
	Packing(L/W/H)	mm	902/375/607
Outdoor weight	Net	kg	36
	Gross	kg	38.5
Refrigerant	Type		R32
	Charge	g	730
	Additional weight	g/m	20
Refrigerant pipe	Liquid side	mm	6.35
	Gas side	mm	12.70
	Max. length	m	15.00
	Max. height	m	5.00
Operation temperature range		°C	16~30
Ambient temperature range		°C	18~43

Model name	FACTORY	ID	AB71S1SR1FA
		OD	1U71S1TT1SA
Power supply		V/Ph/Hz	1/220-240/50
Rated cooling	Capacity	KW	7.00
	Capacity	Btu/h*1000	24.00
	Input	W	2360
	Running current	A	10.36
	EER	/	2.97
Max. input consumption		W	2100
Max. current		A	19.10
Min. current		A	12.74
			YR-E17A/YL-HRS01
Operation Control		\	Wired/Remote
Indoor coil	Number of row		2
	Fin spacing	mm	1.4
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Coil l (L/H/W)	mm	670x670x147
	Number of circuit		8
Indoor fan motor	Brand-Manufacturer		Wolong/zhongshan broad-ocean
	Brand-Supplier		Wolong/zhongshan broad-ocean
	Model		WZD-A02060L-01AL ZW511A800075L
	Type		DC
	Input	W	73
	Output	W	60
	number of fan		1
	Speed (SH/H/M/L)	rpm	680/600/530/450
Indoor air flow (SH/H/M/L)		m^3/h	1200/1100/900/720
Sound power level (H/M/L)		dB(A)	—
Indoor noise level (H/M/L)		dB(A)	48/45/42/39
Panel Model			PB-950QB
External dimensions(W/D/H)			950/950/50
Shipping dimensions(W/D/H)		mm	1000/1000/110
Net/Shipping weight		KG	5.5/8.5
Indoor dimension	Unit (L/W/H)	(mm)	840/840/204
	Packing (L/W/H)	(mm)	978/978/269
Indoor weight	Net/Gross weight	(Kg)	22.5/27.5

Model name	FACTORY	ID	AB71S1SR1FA
		OD	1U71S1TT1SA
Outdoor coil	Number of row		1
	Fin spacing	mm	1.32
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Tube material		Inner grooved
	Coill (L/H/W)	mm	924×651×21.65
	Number of circuit		15
Compressor	Brand		HIGHLY
	Model		GSH264UV-C8DU
	Type		Rotary
	Number of compressor		1
	Compressor oil charge	ml	570
Outdoor fan motor	Brand		zhongshan broad-ocean/WOLONG
	Model		Y6S688B810
	Number of motor		1
	Input	W	180
	Output	W	85
	Capacitor	μF	5
	Type of fan		Axial Fan
	number of fan		1
	Number of fan blade	blade	3
	Speed	rpm	850/520
Outdoor air flow		m^3/h	3500
Outdoor noise level		dB(A)	54.00
Outdoor dimension	Unit (L/W/H)	mm	890/340/705
	Packing(L/W/H)	mm	1046/460/780
Outdoor weight	Net	kg	49.5
	Gross	kg	53
Refrigerant	Type		R32
	Charge	g	1030
	Additional weight	g/m	20
Refrigerant pipe	Liquid side	mm	6.35
	Gas side	mm	12.70
	Max. length	m	20.00
	Max. height	m	10.00
Operation temperature range		°C	16~30
Ambient temperature range		°C	18~43

Model name	FACTORY	ID	AB90S1SR1FA
		OD	1U90S1LT1SA
Power supply		V/Ph/Hz	1/220-240/50
Rated cooling	Capacity	KW	9.00
	Capacity	Btu/h*1000	30.70
	Input	W	2950
	Running current	A	10.80
	EER	/	3.66
Max. input consumption		W	2950
Max. current		A	19.43
Min. current		A	12.96
			YR-E17A/YL-HRS01
Operation Control		\	Wired/Remote
Indoor coil	Number of row		2
	Fin spacing	mm	1.4
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Coil l (L/H/W)	mm	670x670x210
	Number of circuit		10
Indoor fan motor	Brand-Manufacturer		Wolong/zhongshan broad-ocean
	Brand-Supplier		Wolong/zhongshan broad-ocean
	Model		WZD-A02100L-01AL ZW511B500084L
	Type		DC
	Input	W	124
	Output	W	100
	number of fan		1
	Speed (SH/H/M/L)	rpm	700/650/550/450
Indoor air flow (SH/H/M/L)		m^3/h	1720/1500/1250/850
Sound power level (H/M/L)		dB(A)	—
Indoor noise level (H/M/L)		dB(A)	52/49/46/42
Panel Model			PB-950QB
External dimensions(W/D/H)			950/950/50
Shipping dimensions(W/D/H)		mm	1000/1000/110
Net/Shipping weight		KG	5.5/8.5
Indoor dimension	Unit (L/W/H)	(mm)	840/840/246
	Packing (L/W/H)	(mm)	978/978/312
Indoor weight	Net/Gross weight	(Kg)	24/31

Model name	FACTORY	ID	AB90S1SR1FA
		OD	1U90S1LT1SA
Outdoor coil	Number of row		3
	Fin spacing	mm	1.45
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Tube material		Inner grooved
	Coill (L/H/W)	mm	940×714×39.9
	Number of circuit		45
Compressor	Brand		HIGHLY
	Model		ATH300UV-C8DU
	Type		Rotary
	Number of compressor		1
	Compressor oil charge	ml	740
Outdoor fan motor	Brand		zhongshan broad-ocean/WOLONG
	Model		Y6S688B810
	Number of motor		1
	Input	W	180
	Output	W	85
	Capacitor	μF	5
	Type of fan		Axial Fan
	number of fan		1
	Number of fan blade	blade	3
	Speed	rpm	850/520
Outdoor air flow		m^3/h	3500
Outdoor noise level		dB(A)	55.00
Outdoor dimension	Unit (L/W/H)	mm	920/372/760
	Packing(L/W/H)	mm	1085/487/843
Outdoor weight	Net	kg	63.5
	Gross	kg	67
Refrigerant	Type		R32
	Charge	g	1880
	Additional weight	g/m	45
Refrigerant pipe	Liquid side	mm	9.52
	Gas side	mm	15.88
	Max. length	m	20.00
	Max. height	m	10.00
Operation temperature range		°C	16~30
Ambient temperature range		°C	18~43

Model name	FACTORY	ID	AB105S1SR1FA
		OD	1U105S1LN1SB
Power supply		V/Ph/Hz	3/380-415/50
Rated cooling	Capacity	KW	10.50
	Capacity	Btu/h*1000	36.00
	Input	W	3900
	Running current	A	5.32
	EER	/	3.18
Max. input consumption		W	3900
Max. current		A	9.75
Min. current		A	6.50
			YR-E17A/YL-HRS01
Operation Control		\	Wired/Remote
Indoor coil	Number of row		2
	Fin spacing	mm	1.4
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Coil l (L/H/W)	mm	670x670x210
	Number of circuit		10
Indoor fan motor	Brand-Manufacturer		Wolong/zhongshan broad-ocean
	Brand-Supplier		Wolong/zhongshan broad-ocean
	Model		WZD-A02100L-01AL ZW511B500084L
	Type		DC
	Input	W	124
	Output	W	100
	number of fan		1
	Speed (SH/H/M/L)	rpm	780/690/620/550
Indoor air flow (SH/H/M/L)		m^3/h	1920/1750/1550/1300
Sound power level (H/M/L)		dB(A)	—
Indoor noise level (H/M/L)		dB(A)	53/50/47/43
Panel Model			PB-950QB
External dimensions(W/D/H)			950/950/50
Shipping dimensions(W/D/H)		mm	1000/1000/110
Net/Shipping weight		KG	5.5/8.5
Indoor dimension	Unit (L/W/H)	(mm)	840/840/246
	Packing (L/W/H)	(mm)	978/978/312
Indoor weight	Net/Gross weight	(Kg)	25/30.5

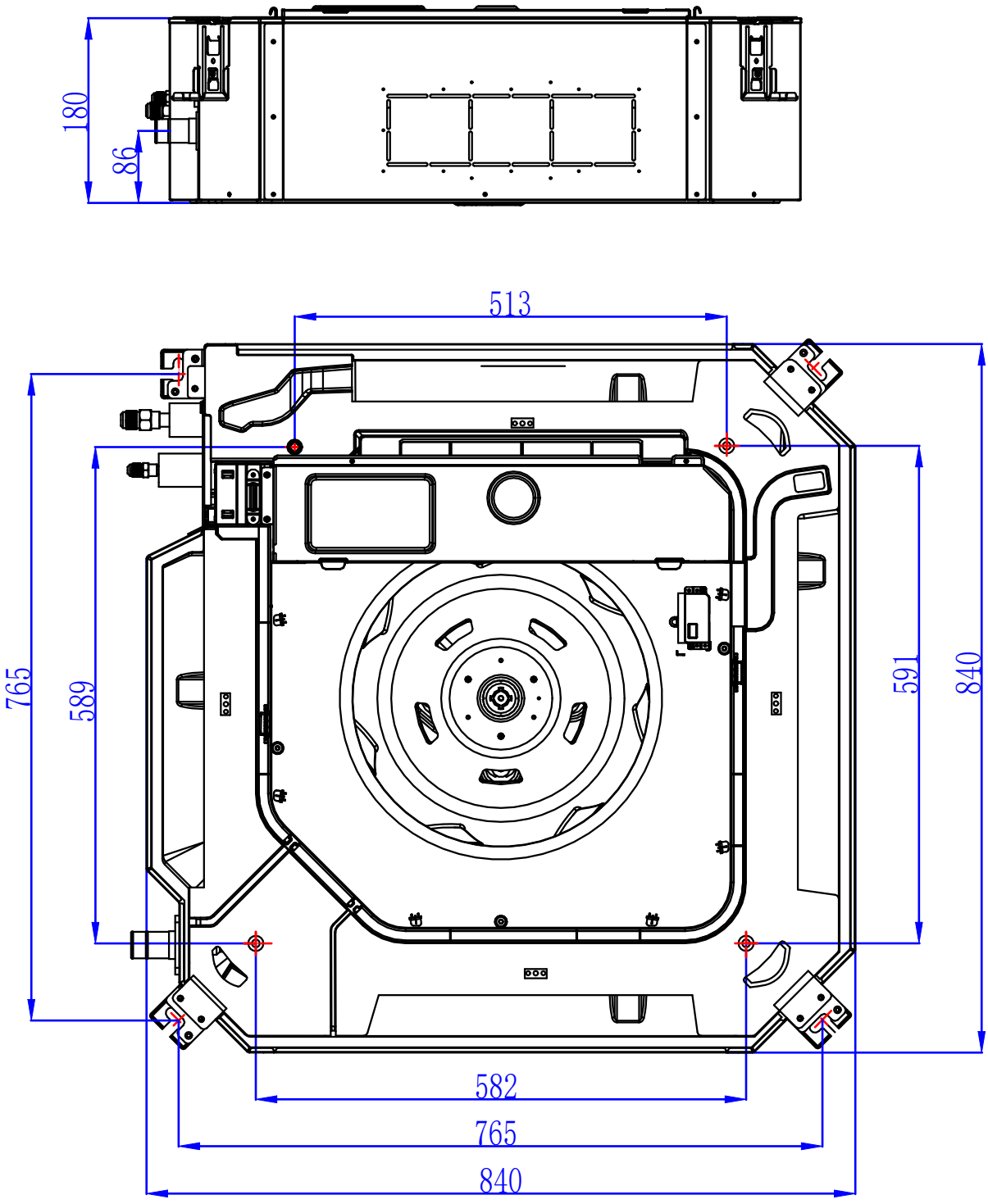
Model name	FACTORY	ID	AB105S1SR1FA
		OD	1U105S1LN1SB
Outdoor coil	Number of row		2
	Fin spacing	mm	1.45
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Tube material		Inner grooved
	Coill (L/H/W)	mm	1005×924×38.4
	Number of circuit		31
Compressor	Brand		HIGHLY
	Model		GTH380UC3C9EU
	Type		Rotary
	Number of compressor		1
	Compressor oil charge	ml	880
Outdoor fan motor	Brand		zhongshan broad-ocean
	Model		Y6S688B810
	Number of motor		1
	Input	W	180
	Output	W	85
	Capacitor	μF	5
	Type of fan		Axial Fan
	number of fan		1
	Number of fan blade	blade	3
	Speed	rpm	850/520
Outdoor air flow		m^3/h	5000
Outdoor noise level		dB(A)	59.00
Outdoor dimension	Unit (L/W/H)	mm	950/370/965
	Packing(L/W/H)	mm	1050/485/1095
Outdoor weight	Net	kg	74
	Gross	kg	85
Refrigerant	Type		R32
	Charge	g	2250
	Additional weight	g/m	45
Refrigerant pipe	Liquid side	mm	9.52
	Gas side	mm	15.88
	Max. length	m	30.00
	Max. height	m	15.00
Operation temperature range		°C	16~30
Ambient temperature range		°C	18~43

Model name	FACTORY	ID	AB140S1SR1FA
		OD	1U140S1LP1SB
Power supply		V/Ph/Hz	3/380-415/50
Rated cooling	Capacity	KW	14.10
	Capacity	Btu/h*1000	48.00
	Input	W	5300
	Running current	A	7.33
	EER	/	3.10
Max. input consumption		W	2100
Max. current		A	12.81
Min. current		A	8.54
			YR-E17A/YL-HRS01
Operation Control		\	Wired/Remote
Indoor coil	Number of row		2
	Fin spacing	mm	1.4
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Coil l (L/H/W)	mm	670x670x252
	Number of circuit		12
Indoor fan motor	Brand-Manufacturer		Wolong/zhongshan broad-ocean
	Brand-Supplier		Wolong/zhongshan broad-ocean
	Model		WZD-A02120L-01AL ZW511C500015L
	Type		DC
	Input	W	150
	Output	W	120
	number of fan		1
	Speed (SH/H/M/L)	rpm	800/750/650/550
Indoor air flow (SH/H/M/L)		m^3/h	2050/1950/1650/1480
Sound power level (H/M/L)		dB(A)	—
Indoor noise level (H/M/L)		dB(A)	54/51/48/44
Panel Model			PB-950QB
External dimensions(W/D/H)			950/950/50
Shipping dimensions(W/D/H)		mm	1000/1000/110
Net/Shipping weight		KG	5.5/8.5
Indoor dimension	Unit (L/W/H)	(mm)	840/840/288
	Packing (L/W/H)	(mm)	978/978/353
Indoor weight	Net/Gross weight	(Kg)	27/33

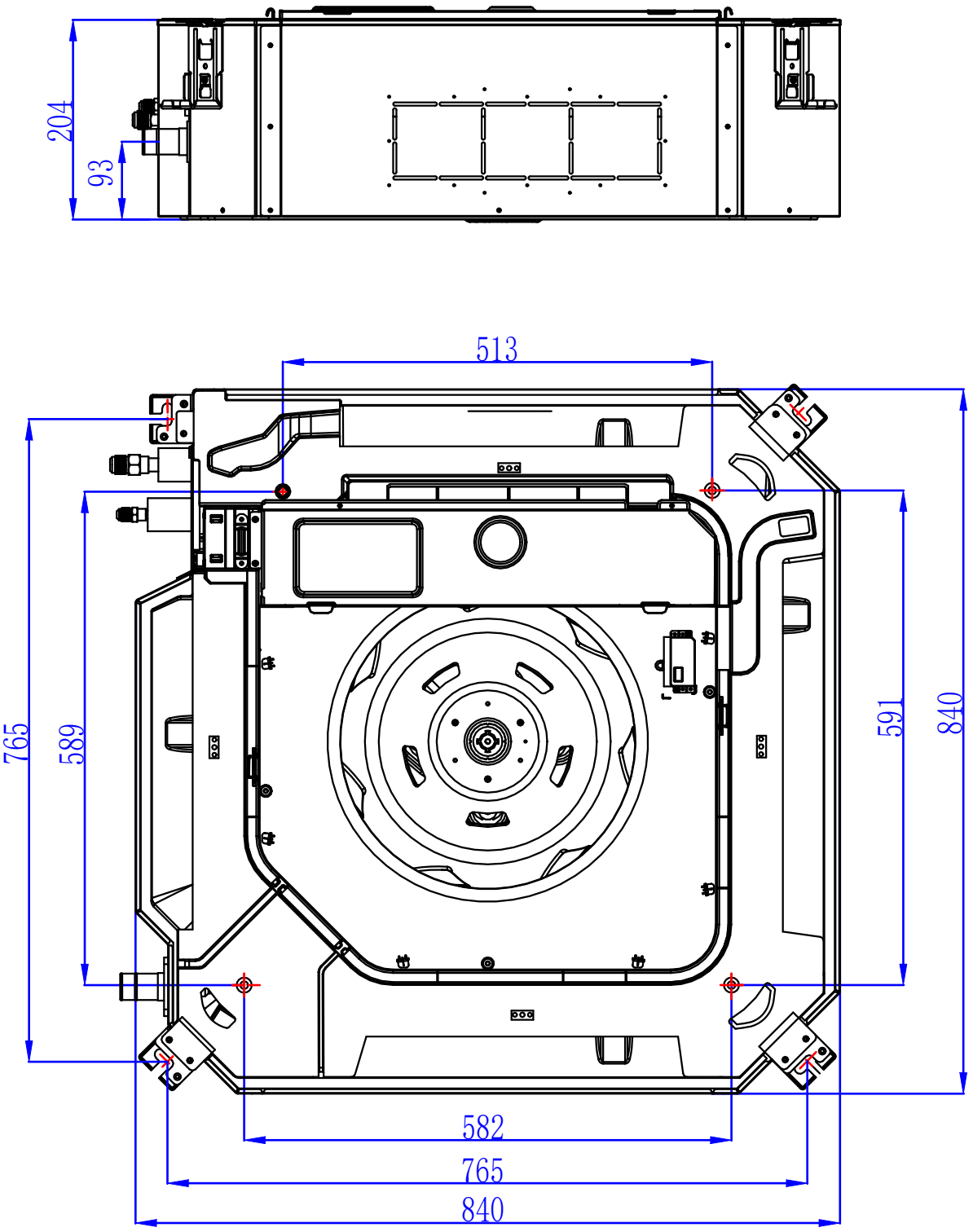
Model name	FACTORY	ID	AB140S1SR1FA
		OD	1U140S1LP1SB
Outdoor coil	Number of row		2
	Fin spacing	mm	1.45
	Fin material		Hydrophilic Aluminum
	Tube outside diameter	mm	Φ7
	Tube material		Inner grooved
	Coill (L/H/W)	mm	1302×1005×38.4
	Number of circuit		62
Compressor	Brand		HIGHLY
	Model		ATH550UC3C9EQC
	Type		Rotary
	Number of compressor		1
	Compressor oil charge	ml	1200
Outdoor fan motor	Brand		zhongshan broad-ocean/ TONGDELI/WOLONG/zhongshan broad-ocean
	Model		Y6S643D55G/ KFD-70/ YDK70-6F1/
	Number of motor		2
	Input	W	148
	Output	W	70
	Capacitor	μF	6+6
	Type of fan		Axial Fan
	number of fan		1
	Number of fan blade	blade	3
	Speed	rpm	820
Outdoor air flow		m^3/h	7000
Outdoor noise level		dB(A)	60.00
Outdoor dimension	Unit (L/W/H)	mm	950/370/1350
	Packing(L/W/H)	mm	1050/485/1500
Outdoor weight	Net	kg	91
	Gross	kg	105
Refrigerant	Type		R32
	Charge	g	2780
	Additional weight	g/m	45
Refrigerant pipe	Liquid side	mm	9.52
	Gas side	mm	15.88
	Max. length	m	50.00
	Max. height	m	20.00
Operation temperature range		°C	16~30
Ambient temperature range		°C	18~43

2.2 Dimension

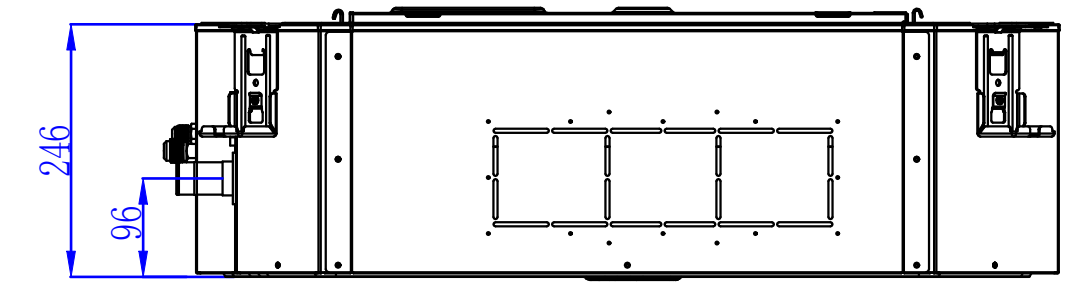
AB50S1SR1FA

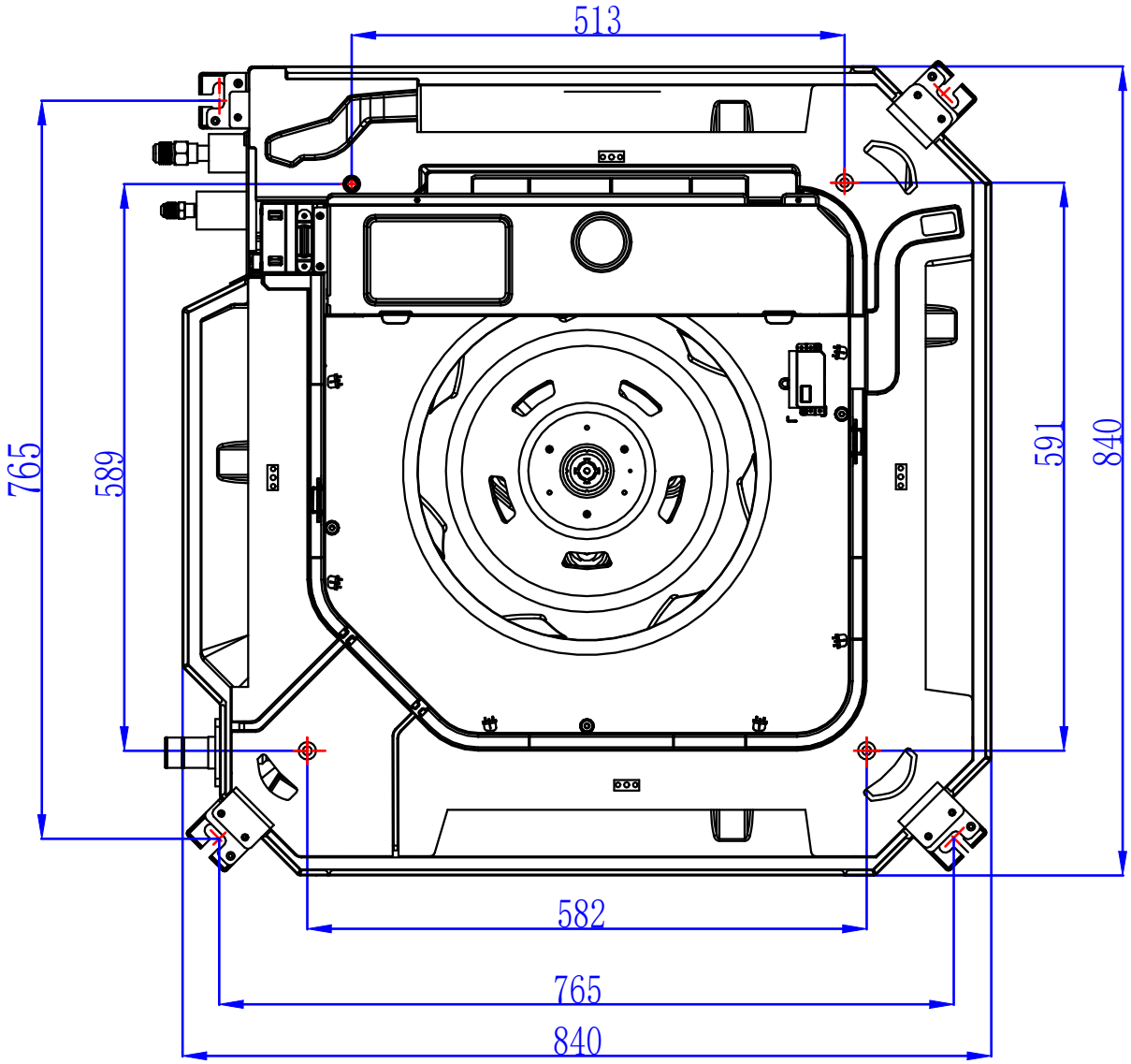


AB71S1SR1FA

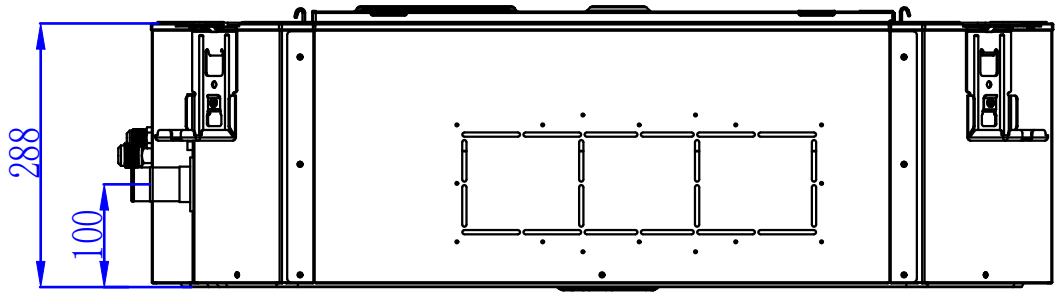


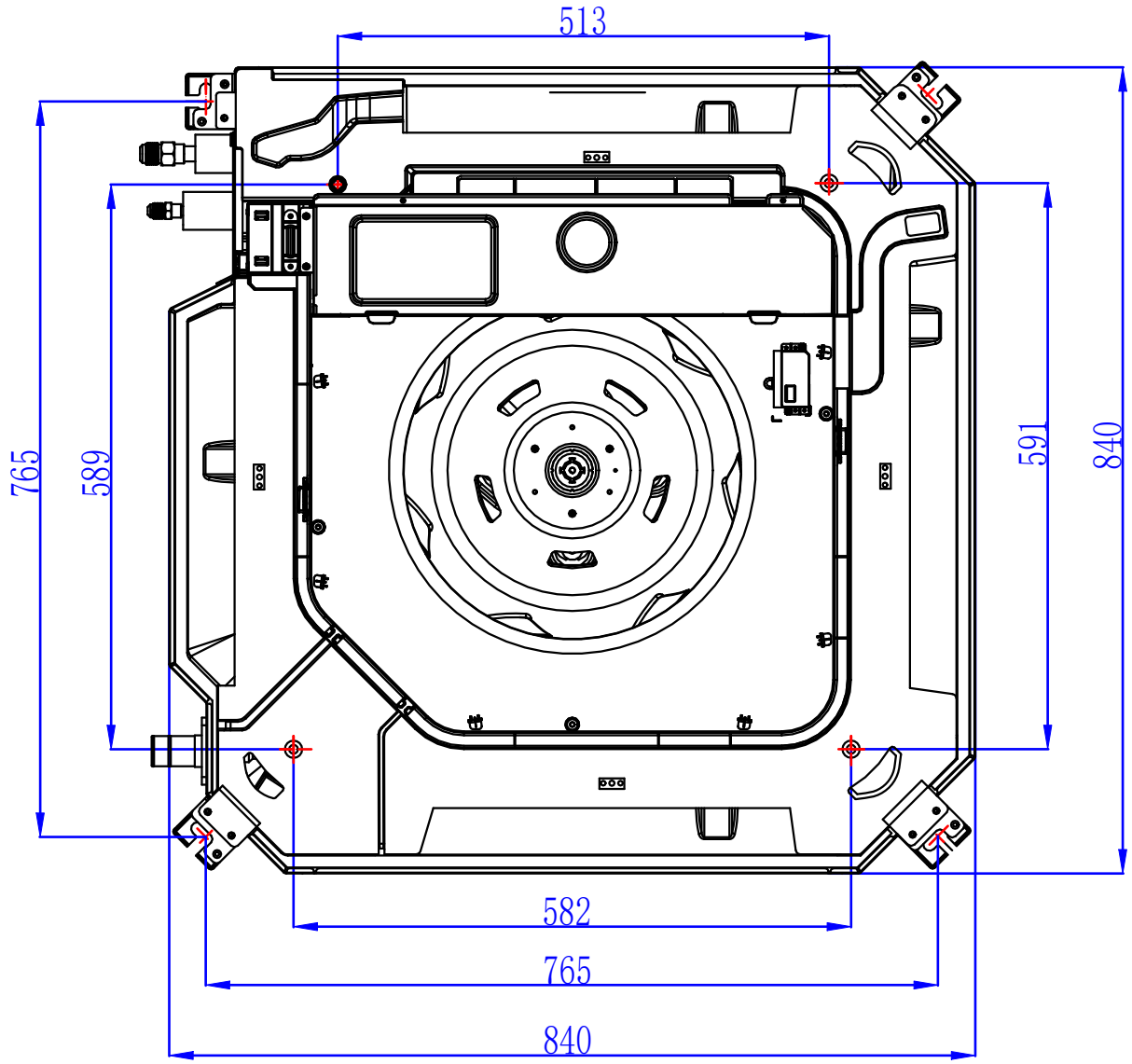
AB90S1SR1FA AB105S1SR1FA



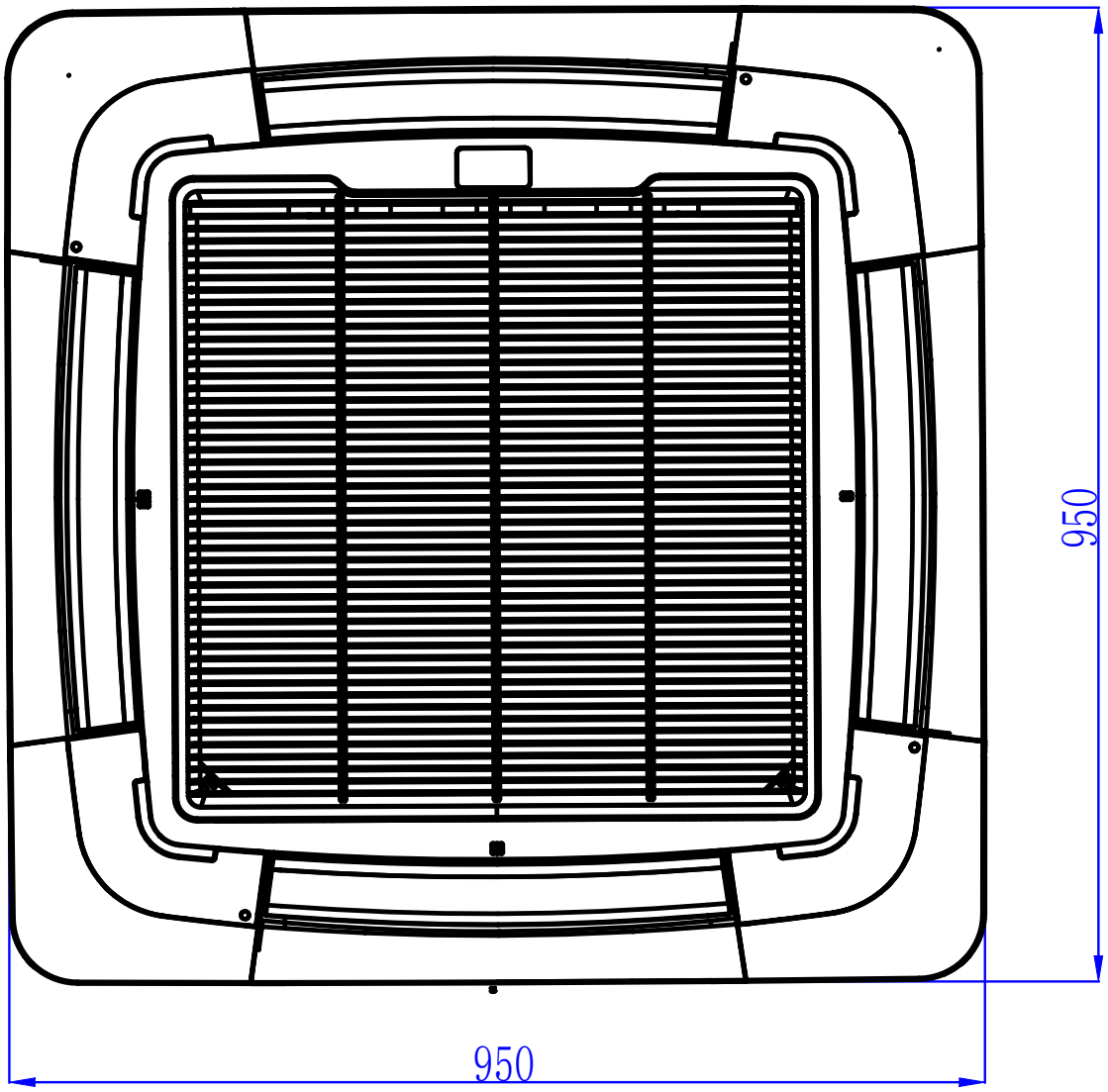


AB140S1SR1FA



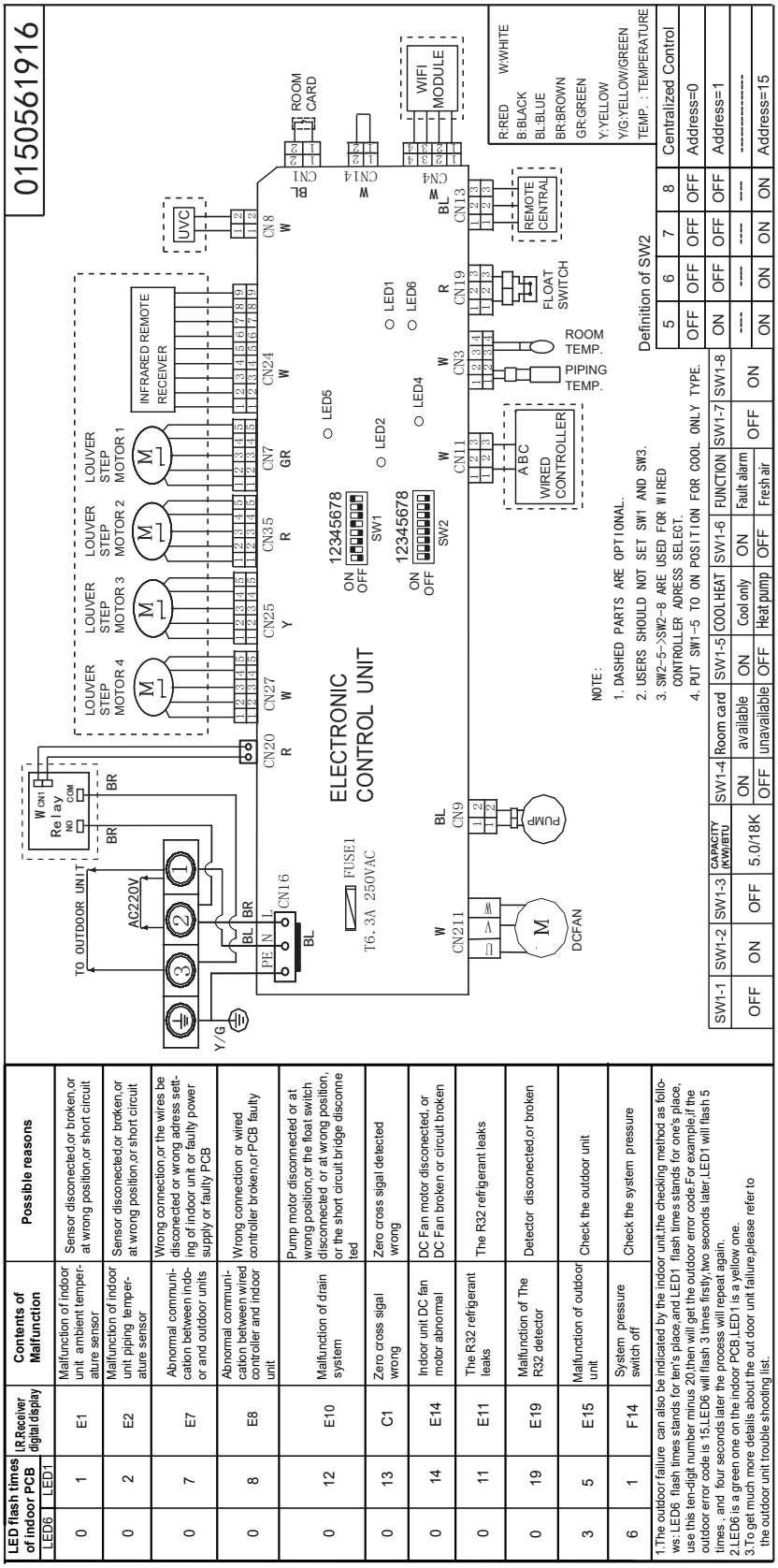


PB 950QB



2.3 Wiring Diagram

AB50S1SR1FA



LED flash times of indoor PCB		LR.Receiver digital display	Contents of Malfunction	Possible reasons
LED6	LED1			
0	1	E1	Malfunction of indoor unit ambient temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	2	E2	Malfunction of indoor unit piping temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	7	E7	Abnormal communication between indoor and outdoor units	Wrong connection,or the wires be disconected or wrong adress setting of indoor unit or faulty power supply or faulty PCB
0	8	E8	Abnormal communication between wired controller and indoor unit	Wrong connection or wired controller broken,or PCB faulty
0	12	E10	Malfunction of drain system	Pump motor disconnected or at wrong position,or the float switch disconnected or at wrong position, or the short circuit bridge disconnected
0	13	C1	Zero cross sigal wrong	Zero cross sigal detected wrong
0	14	E14	Indoor unit DC fan motor abnormal	DC Fan motor disconected, or DC Fan broken or circuit broken
0	11	E11	The R32 refrigerant leaks	The R32 refrigerant leaks
0	19	E19	Malfunction of The R32 detector	Detector disconected,or broken
3	5	E15	Malfunction of outdoor unit	Check the outdoor unit
6	1	F14	System pressure switch off	Check the system pressure

1.The outdoor failure can also be indicated by the indoor unit,the checking method as follows:LED6 flash times stands for ten's place,and LED1 flash times stands for one's place, use this ten-digit number minus 20,then will get the outdoor error code.For example,if the outdoor error code is 15,LED6 will flash 3 times firstly,two seconds later,LED1 will flash 5 times and four seconds later the process will repeat again.
2.LED6 is a green one on the indoor PCB,LED1 is a yellow one.
3.To get much more details about the out door unit failure,please refer to the outdoor unit trouble shooting list.

LED flash times of indoor PCB		I.R.Receiver digital display	Contents of Malfunction	Possible reasons
LED6	LED1			
0	1	E1	Malfunction of indoor unit ambient temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	2	E2	Malfunction of indoor unit piping temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	7	E7	Abnormal communication between indo-or and outdoor units	Wrong connection,or the wires be disconected or wrong adress setting of indoor unit or faulty power supply or faulty PCB
0	8	E8	Abnormal communication between wired controller and indoor unit	Wrong connection or wired controller broken,or PCB faulty
0	12	E10	Malfunction of drain system	Pump motor disconnected or at wrong position,or the float switch disconnected or at wrong position, or the short circuit bridge disconnected
0	13	C1	Zero cross sigal wrong	Zero cross sigal detected wrong
0	14	E14	Indoor unit DC fan motor abnormal	DC Fan motor disconected, or DC Fan broken or circuit broken
0	11	E11	The R32 refrigerant leaks	The R32 refrigerant leaks
0	19	E19	Malfunction of The R32 detector	Detector disconected,or broken
3	5	E15	Malfunction of outdoor unit	Check the outdoor unit
6	1	F14	System pressure switch off	Check the system pressure

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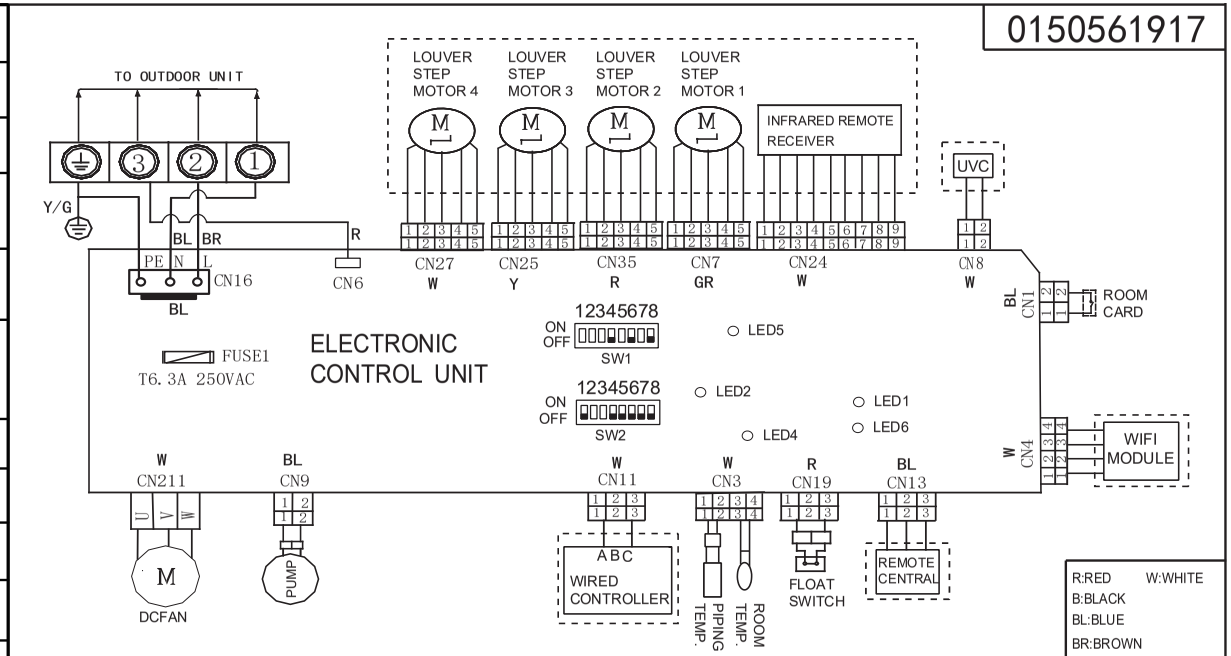


R:RED W:WHITE
B:BLACK
BL:BLUE
BR:BROWN
GR:GREEN
Y:YELLOW
Y/G:YELLOW/GREEN
TEMP. : TEMPERATURE

NOTE:
1. DASHED PARTS ARE OPTIONAL.
2. USERS SHOULD NOT SET SW1 AND SW2.
3. SW2-5->SW2-8 ARE USED FOR WIRED CONTROLLER ADRESS SELECT.
4. PUT SW1-5 TO ON POSITION FOR COOL ONLY TYPE.

SW1-1	SW1-2	SW1-3	SW1-7	SW2-2	SW2-3	CAPACITY (KW)/BTU
ON	ON	OFF	OFF	ON	OFF	7.1/24K
OFF	OFF	ON	OFF	OFF	ON	9.0/28K
ON	OFF	ON	OFF	OFF	ON	10.5/36K
OFF	ON	ON	OFF	ON	ON	12.5/42K
ON	ON	ON	OFF	ON	ON	14.0/48K
OFF	OFF	OFF	ON	ON	ON	16.0/60K

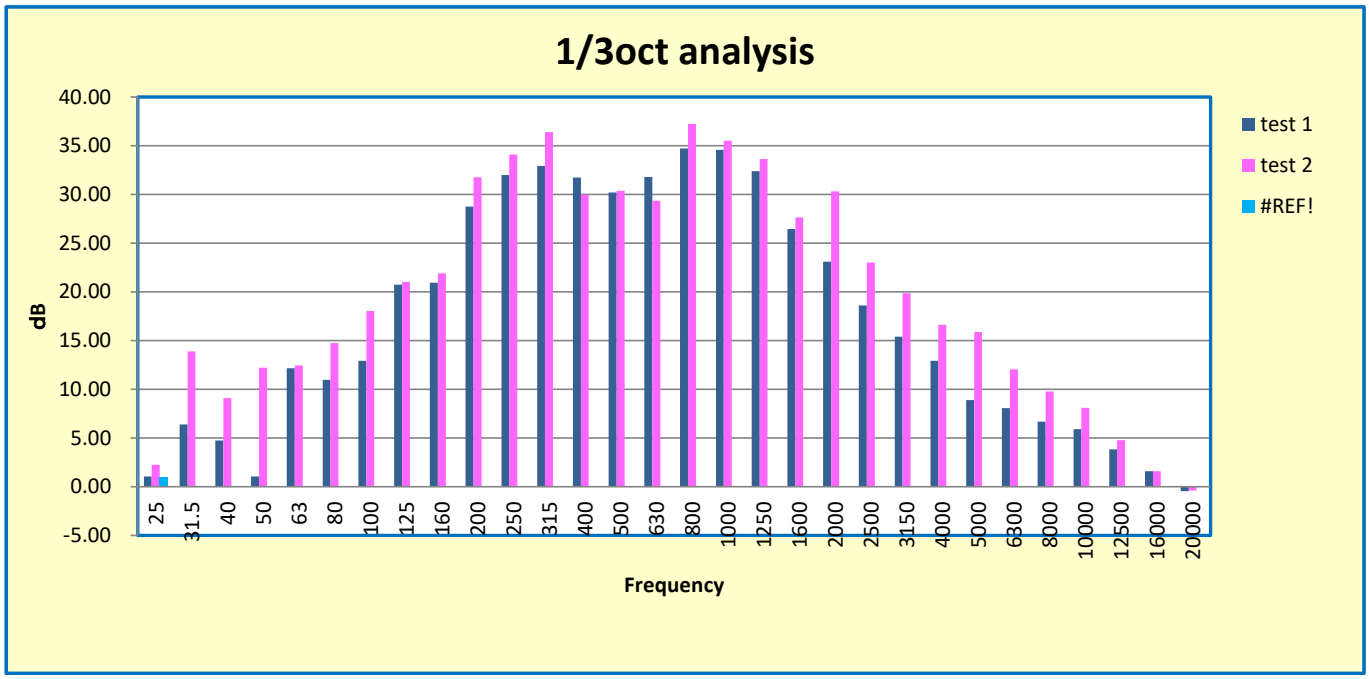
SW1-4	Room card	SW1-5	COOL HEAT	SW1-6	FUNCTION	SW1-8
ON	available	ON	Cool only	ON	Fault alarm	OFF
OFF	unavailable	OFF	Heat pump	OFF	Fresh air	

Definition of SW2

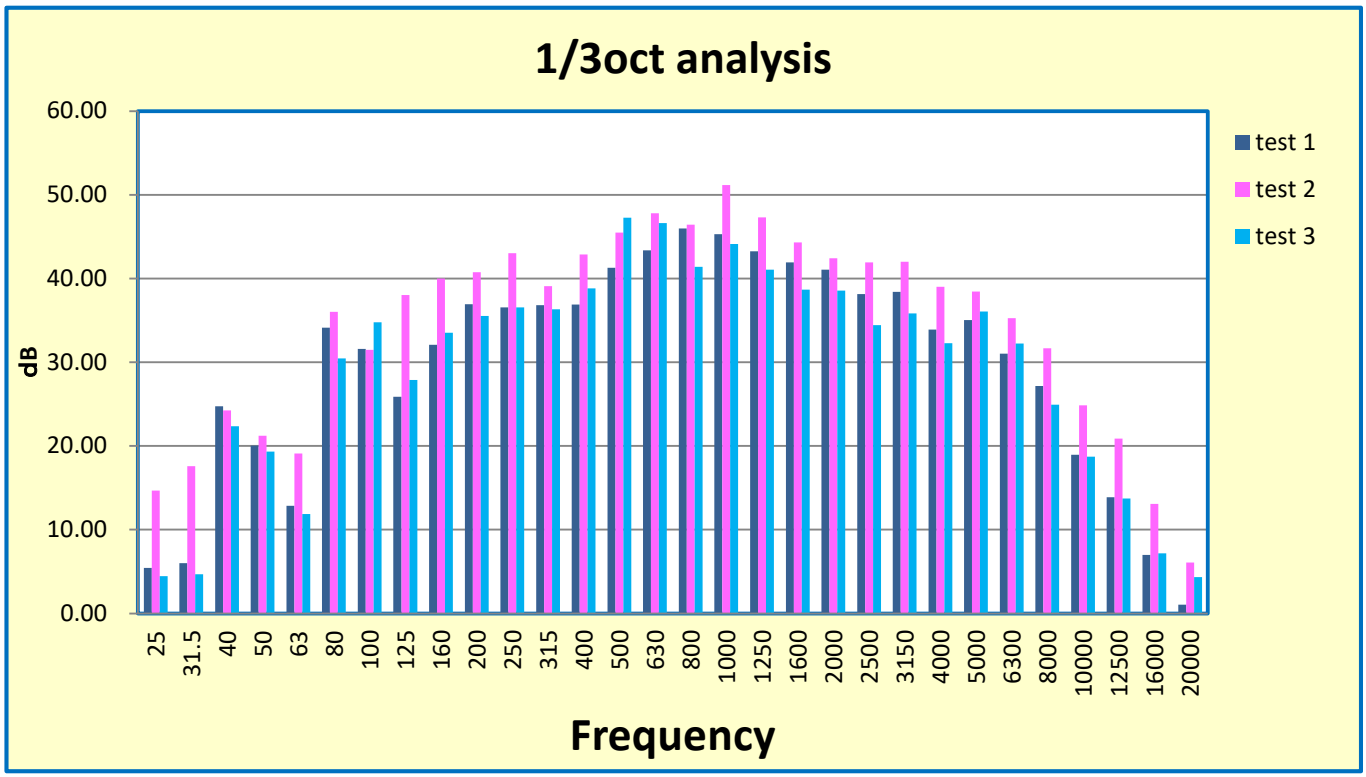
5	6	7	8	Centralized Control
OFF	OFF	OFF	OFF	Address=0
ON	OFF	OFF	OFF	Address=1
----	----	----	----	----------
ON	ON	ON	ON	Address=15

2.4 Sound Pressure level

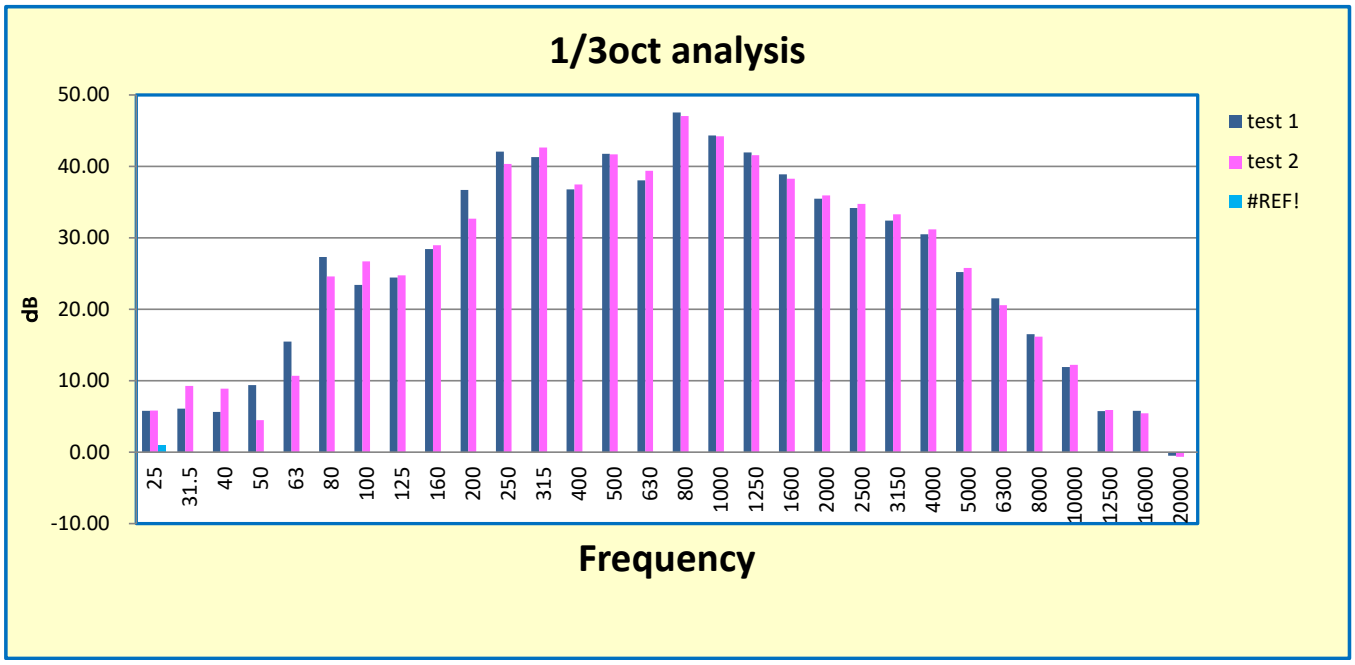
AB50S1SR1FA



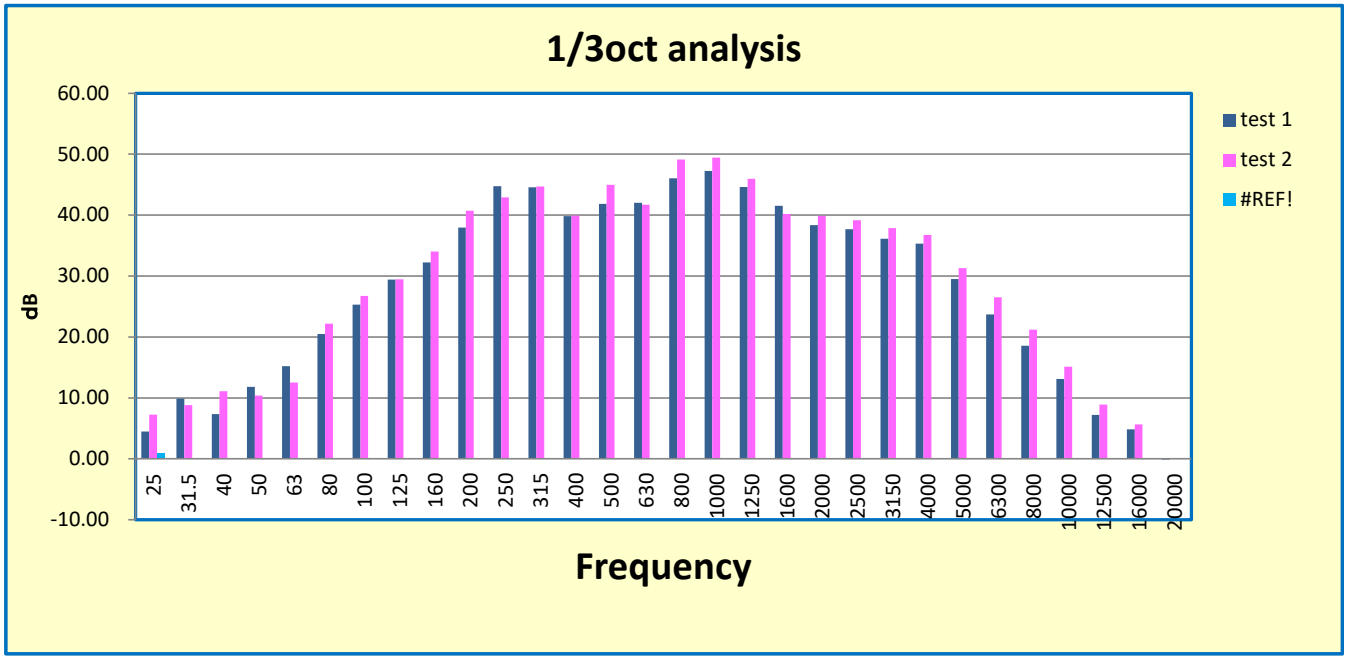
AB71S1SR1FA



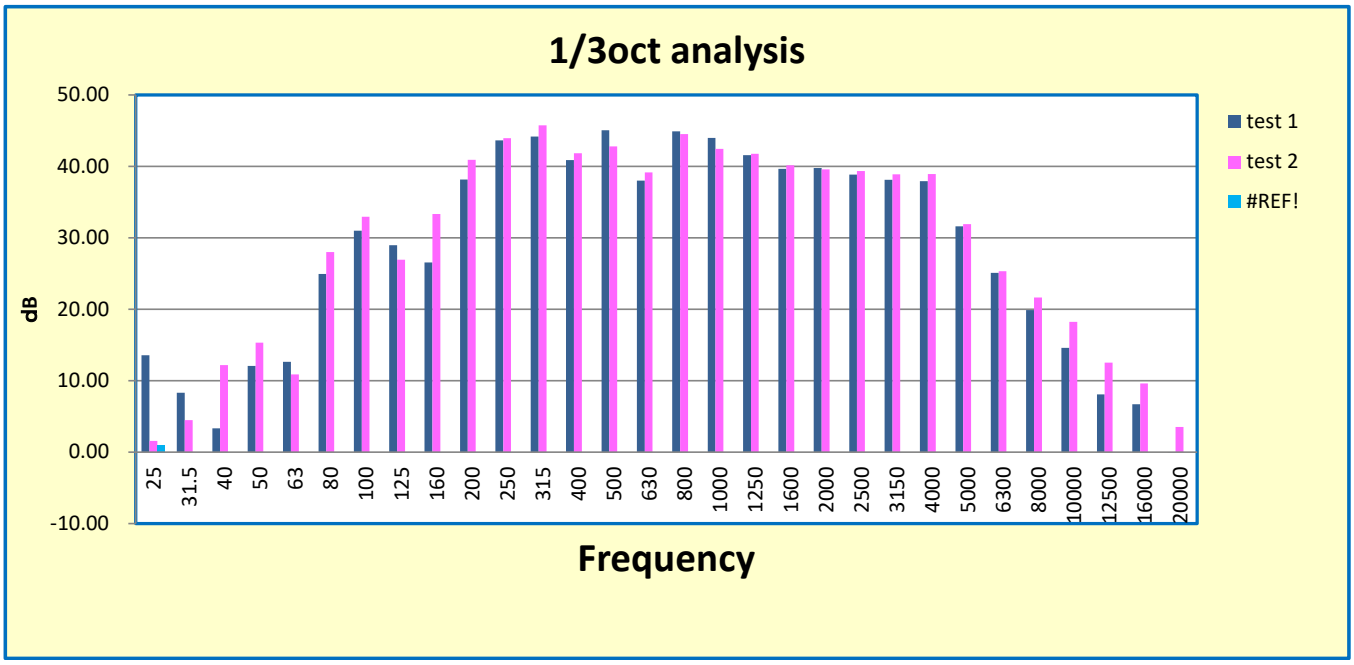
AB90S1SR1FA



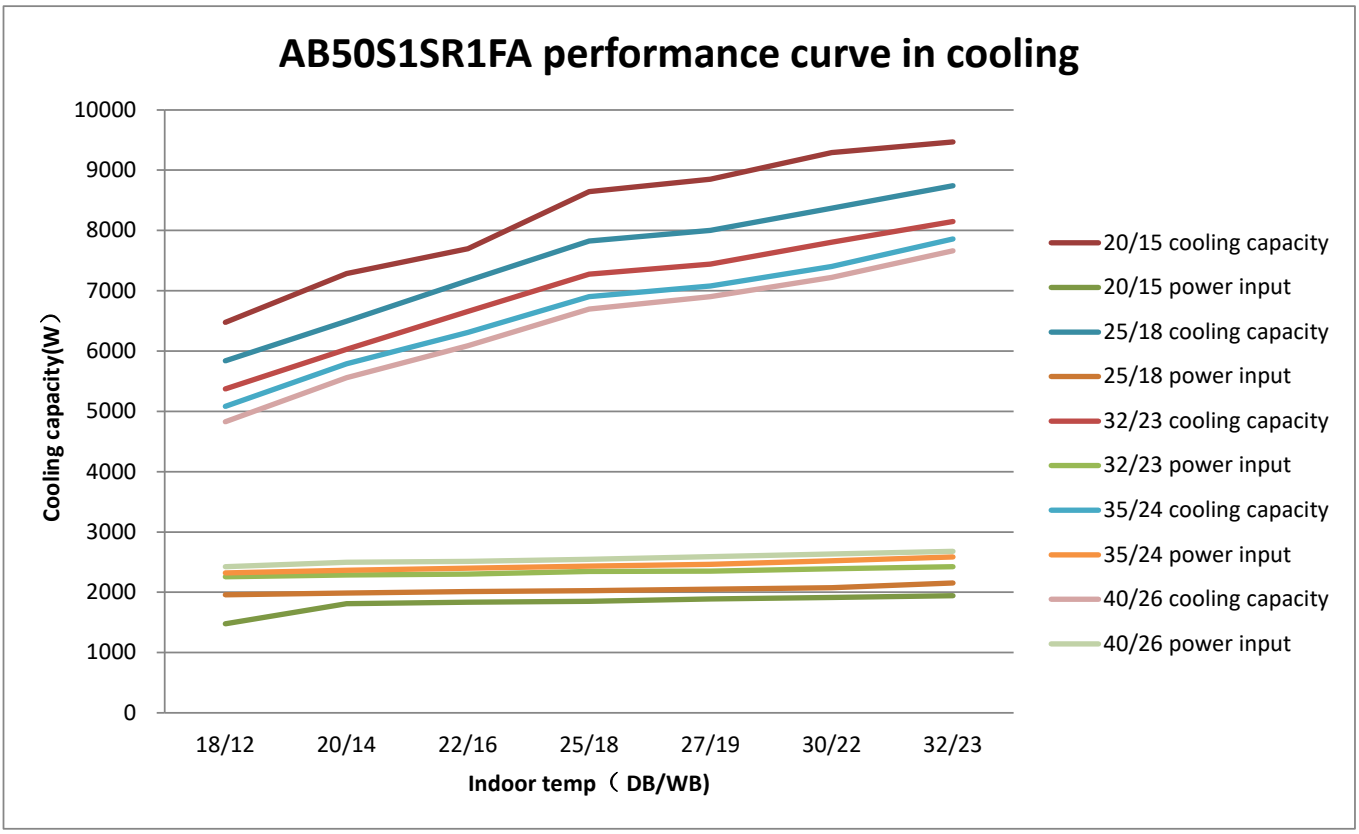
AB105S1SR1FA

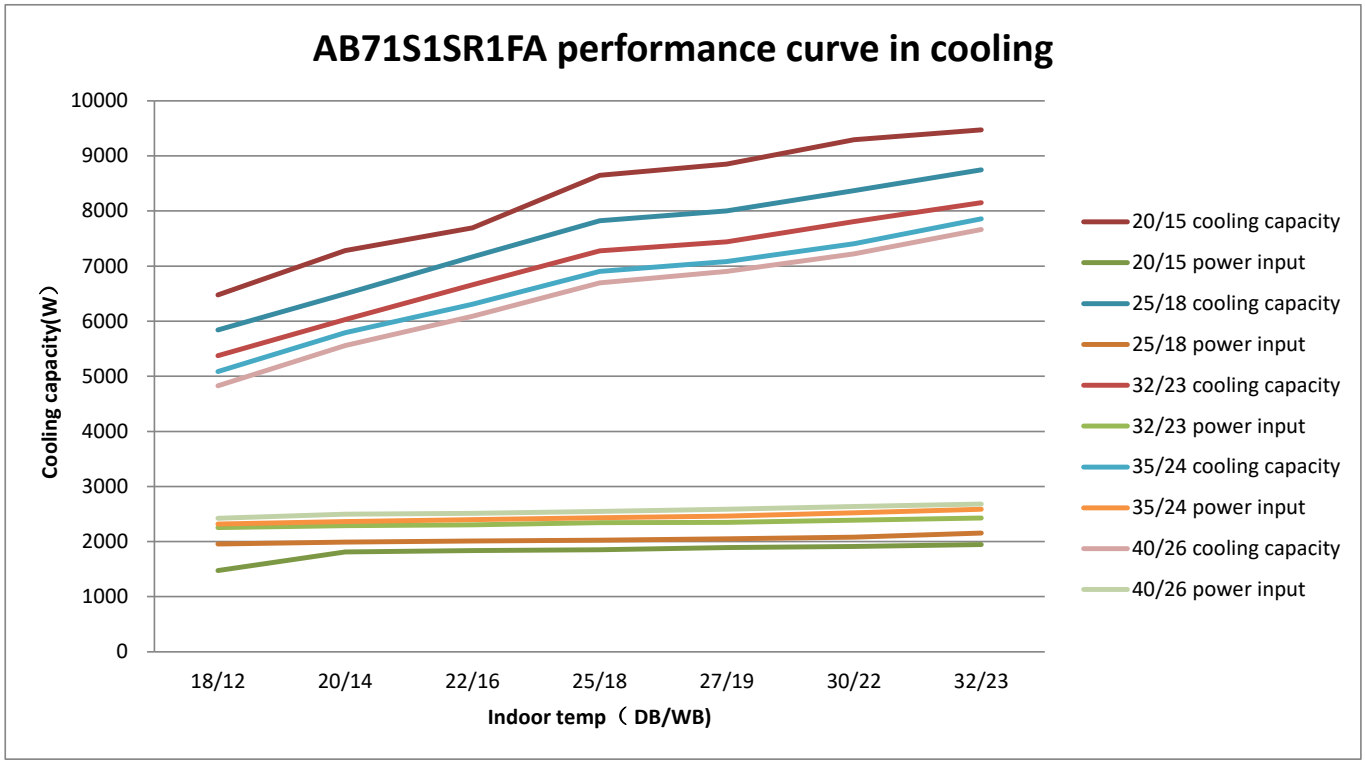


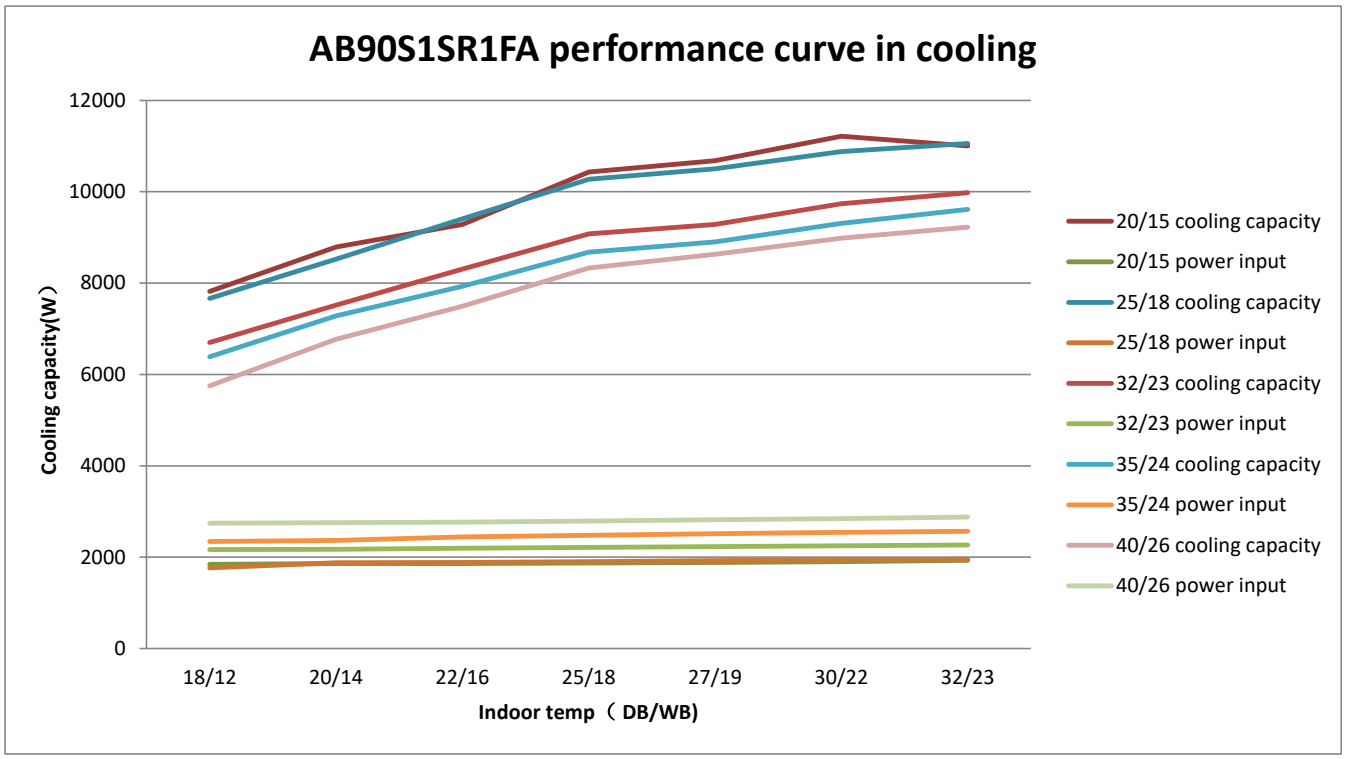
AB140S1SR1FA

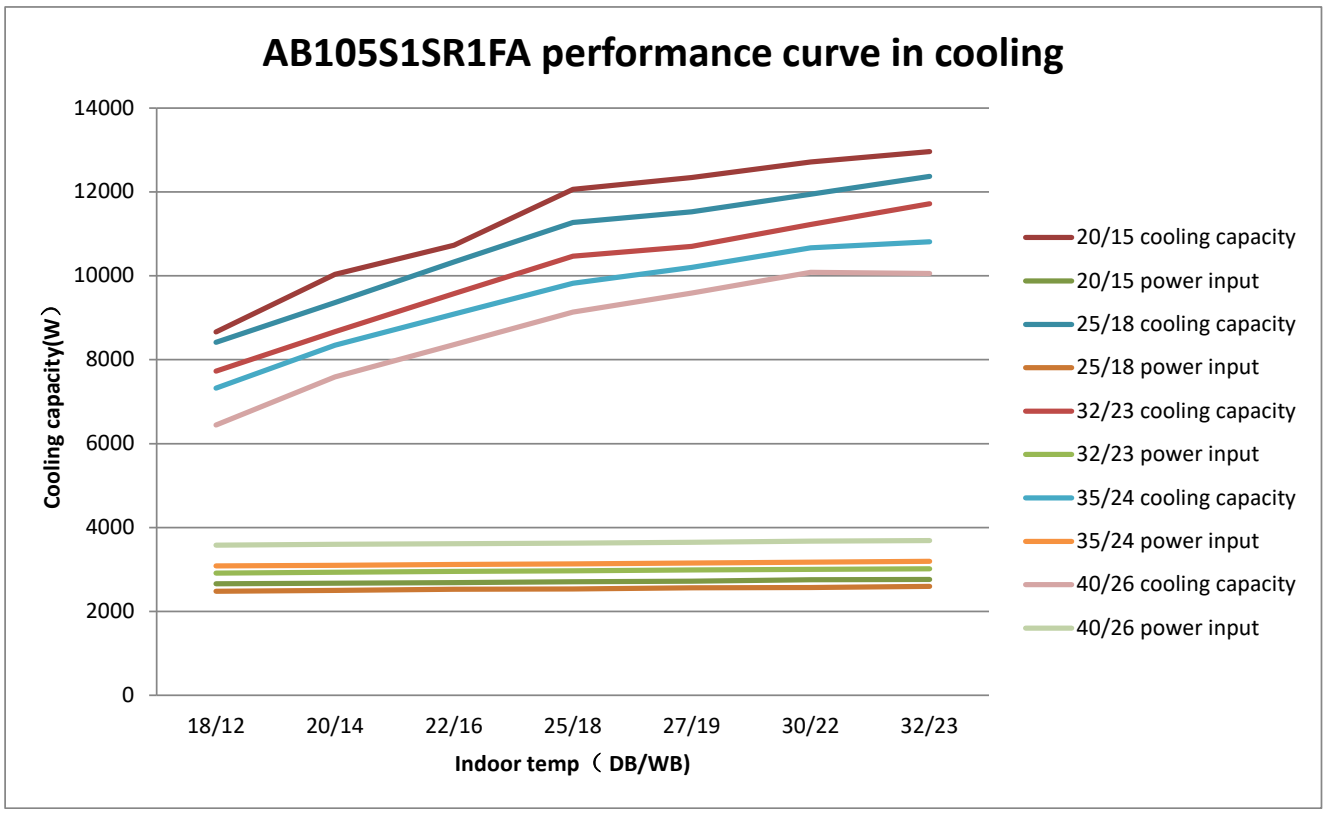


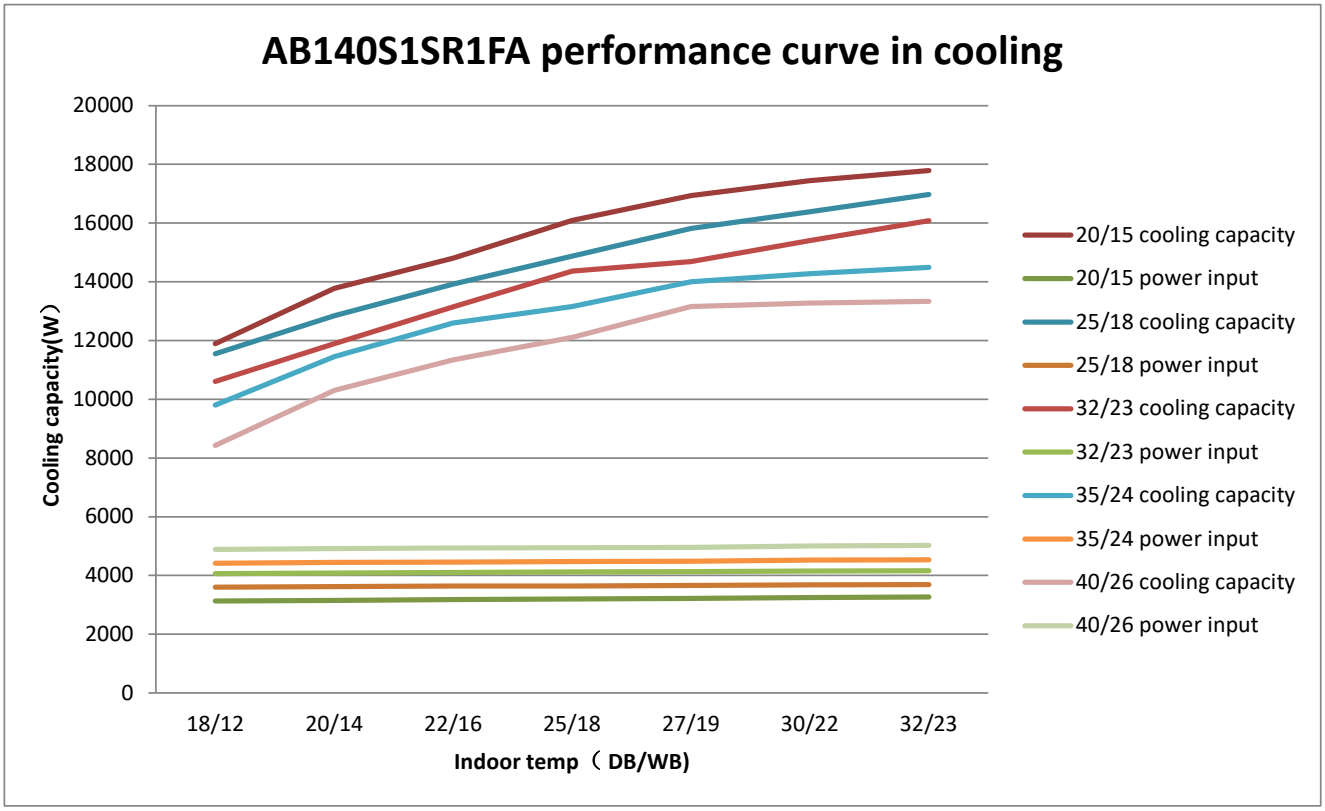
2.5 Performance curve






AB90S1SR1FA performance curve in cooling
12000
10000
8000
6000
4000
2000
0
Cooling capacity(W)
18/12
20/14
22/16
25/18
27/19
30/22
32/23
Indoor temp （DB/WB)
20/15 cooling capacity
20/15 power input
25/18 cooling capacity
25/18 power input
32/23 cooling capacity
32/23 power input
35/24 cooling capacity
35/24 power input
40/26 cooling capacity
40/26 power input


AB105S1SR1FA performance curve in cooling
14000
12000
10000
8000
6000
4000
2000
0
Cooling capacity(W)
18/12
20/14
22/16
25/18
27/19
30/22
32/23
Indoor temp （DB/WB)
20/15 cooling capacity
20/15 power input
25/18 cooling capacity
25/18 power input
32/23 cooling capacity
32/23 power input
35/24 cooling capacity
35/24 power input
40/26 cooling capacity
40/26 power input


AB140S1SR1FA performance curve in cooling
Cooling capacity(W)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
18/12
20/14
22/16
25/18
27/19
30/22
32/23
Indoor temp（DB/WB)
20/15 cooling capacity
20/15 power input
25/18 cooling capacity
25/18 power input
32/23 cooling capacity
32/23 power input
35/24 cooling capacity
35/24 power input
40/26 cooling capacity
40/26 power input

2.6 Installation

Installation Procedure

Indoor unit

❶ BEFORE INSTALLATION <Don't discard any accessories until comp>

- Determine the way to carry unit to installation place.
- Don't remove packing until unit reaches installation place.
- If unpacking is unkavoidable, protect unit properly.

❷ SELECTION OF INSTALLATION PLACE

(1) Installation place shall meet the following and agreed by customers:

- Place where proper air flow can be ensured.
- No block to air flow.
- Water drainage is smpoth.
- Place strong enough to support unit weight.
- Place where inclination is not evident on ceiling.
- Enough space for mainenance.
- Indoor and outdoor unit piping length is within limit. (Refer to Installation Manual for outdoor unit.)
- Indoor and outdoor unit, power cable, inter unit cable are at least 1 m away fromT.V. radop. This is helpful to avoid picture disturbance and noise. (Even if 1 m iskept, noise can still appear if radio wave is strong)

(2) Ceiling height

Indoor unit can be installed on ceiling of 2.5-3m in height. (Refer to Foeld setting and Installation Manual of ornament panel.)

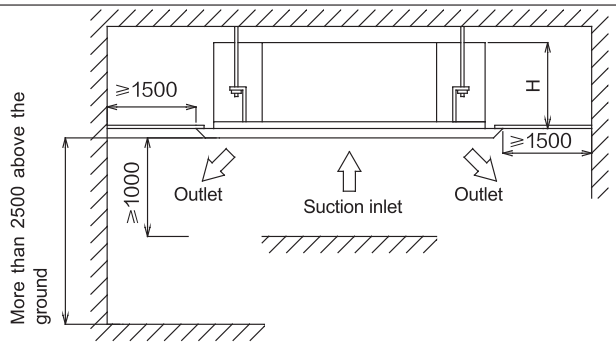
(3) Install suspending bolt.

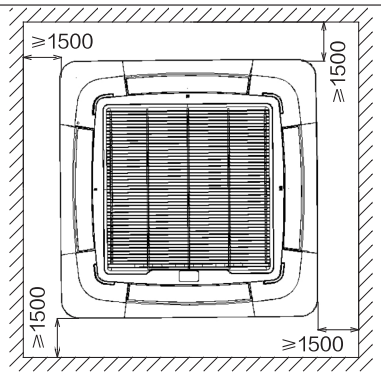
Check if the installation place is strong enough to hold weight. Take necessary measures in case it is not safe. (Distance between holes are marked on paper pattern. Refer to paper pattern for place need be reinforced)

(4) Selection of installation location of outdoor

With consent from the user, installation location shall:

- Be sufficient to bear weight of the units, with air circulation.
- Avoid direct radiation from heat sources or other heat sources.
- Facilitate the drainage of condensate. Holes in wall shall also facilitate drainage.
- Be such that noise and heat air will not disturb neighbors.
- Be free of heavy snow in winter.
- Allow air inlets and outlets to be free of barriers.
- Not allow air outlet to directly face strong airflow.
- Facilitate installation at four corners, with 1m space above the unit.
- Be convenient for maintenance and repair.
- For installation of multiple units, sufficient space shall be ensured to avoid short circuit.
- The air conditioner shall not be mounted on a non-dedicated metal frame (e.g. burglar mesh).
- When the outdoor unit is installed on a street side, its height shall not be less than 2.5m.



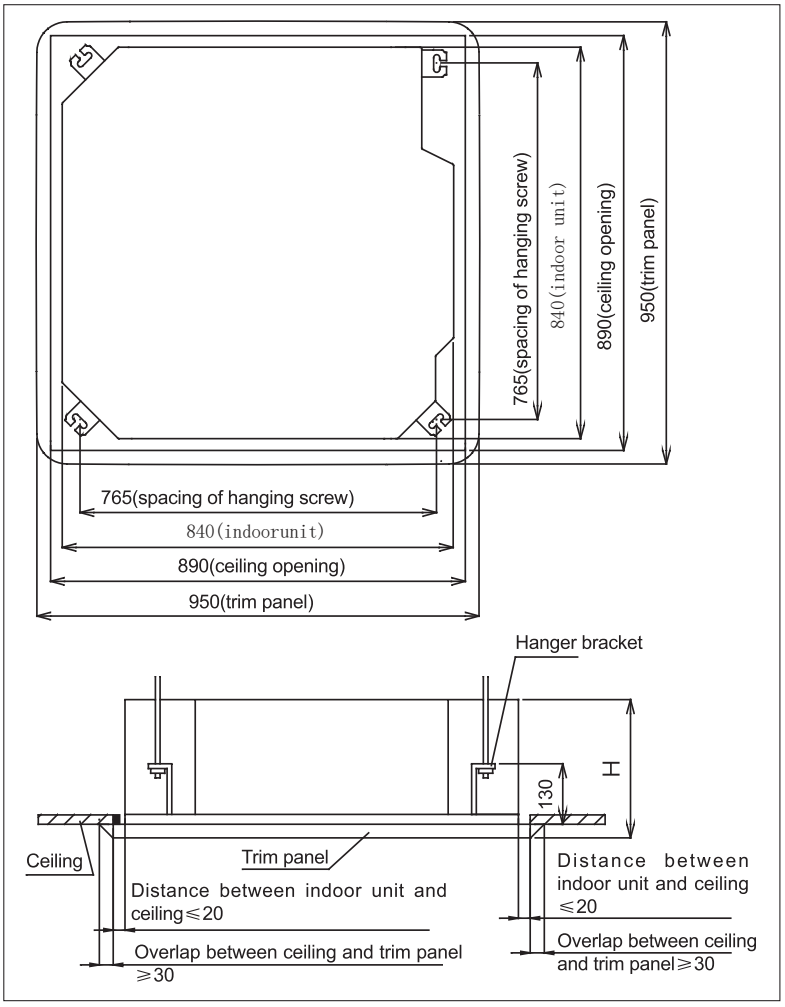


Space required for installation (unit: mm)

Model	H
AB50S1SR1FA	206
AB71S1SR1FA	227
AB90S1SR1FA AB105S1SR1FA	269
AB140S1SR1FA	311

❸ Preparation before installation

(1) Location relationships between ceiling opening and hanging screw



Model	H
AB50S1SR1FA	236
AB71S1SR1FA	257
AB90S1SR1FA AB105S1SR1FA	299
AB140S1SR1FA	341

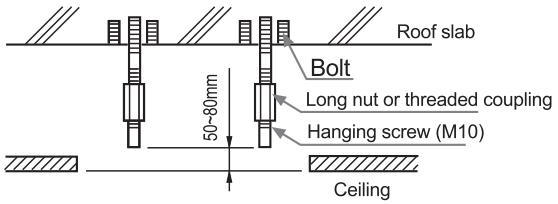
Note:
Overlap between the ceiling and decorative panel shall be 30mm or more. The distance between indoor unit and ceiling shall be 20mm or less. If it's more than 20mm, add ceiling materials at ■ or repair the ceiling.

(2) Complete all pipes (for refrigerants and drainage) and wires (for connection of indoor and outdoor units) to be connected to indoor unit before installation so that they can be connected to indoor unit immediately after installation.

(3) Install hanging screws

- To bearing the unit weight, use foundation bolts on existing ceilings, or embedded bolts, buried bolts or other parts that is provided on site on new ceilings. Before installation is continued, adjust the distance from ceiling.

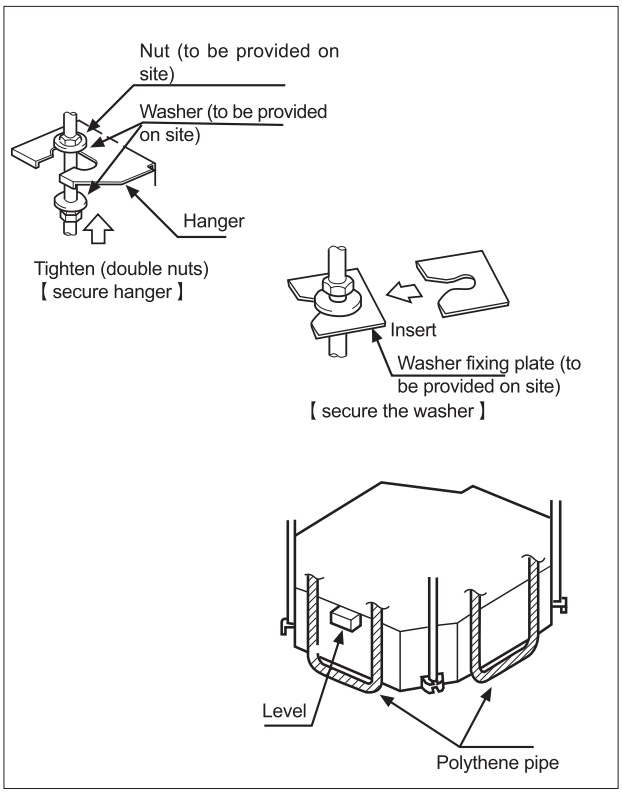
<Installation example>



Note: All the above parts are to be provided on installation sites.
Diameter of hanging screws is M10.

❹ Installation of indoor unit

Installation sequence on new ceiling: (1)➔(2)➔(3)➔(4)➔(5)➔(6)
Installation sequence on new ceiling: (1)➔(3)➔(4)➔ (5)



(1) Temporary installation of indoor unit
• Attach hangers to hanging screws, and make sure to use nuts and washers on both upper and lower ends of hangers so as to fix them firmly. A washer fixing plate (to be provided on site) can prevent the washer from dropping off.

<Work at ceilings>
(2) Adjust units to appropriate installation locations.
Refer to "(3)Preparation before installation."

(3) Correct levelness of air conditioner units.
• The indoor unit is equipped with a built-in drainage pump and a float switch. Correct levelness with a level or water-filled polyethylene pipe.

Note: if the unit inclines towards reverse direction of condensate flow, the float switch can not work normally and water leakage will be resulted.

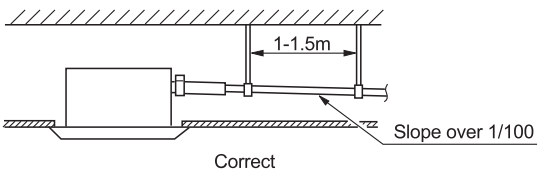
(4) Pull out the original fixing plate that prevents the washer from dropping off, and tighten nuts.

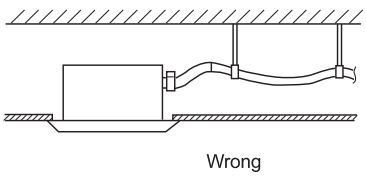
(5) Remove the installation cardboard.

❺ Installation of drain pipe

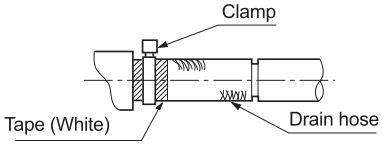
(1) Install drain pipe

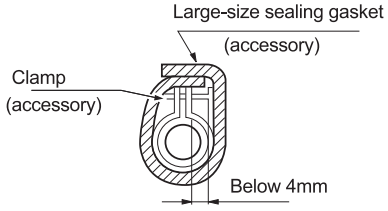
- Diameter of the drain pipe shall be greater than or equal to that of the connecting pipe. (PE pipe: size: 25mm; O.D.: 32mm)
- The drain pipe shall be short and have a downward slope of at least 1/100 to prevent pockets.
- If it is impossible to provide sufficient slope to the drain pipe, a drain lift pipe shall be installed.
- To avoid bending of the drain pipe, hangers shall be kept 1-1.5m away from each other.





Use a drain hose and clamp.
Insert the drain hose into the drainage outlet until it reaches the white tape. Then tighten the clamp.
For heat insulation, wind the drain hose with sealing gaskets. Provide heat insulation to indoor drain hose.

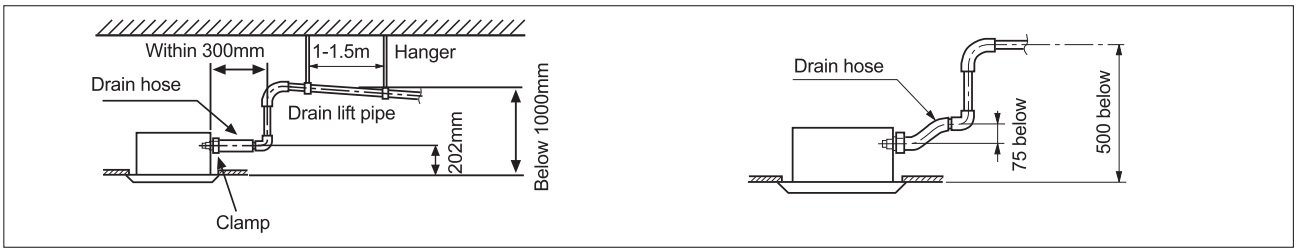




<Precautions for drain lift pipe>

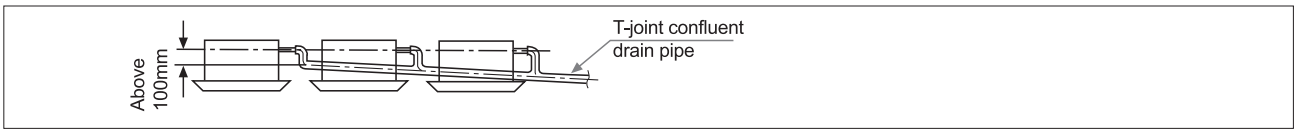
The drain lift pipe shall be installed as low as possible.

The drain lift pipe shall be perpendicular to the unit and not more than 300mm away from the unit



Note:

- The slope of accessory drain pipe shall be within 75mm so that the drainage outlet does not necessarily bear excessive external force.
- If multiple drain pipes join together, install them as follows.



The size of confluent drain pipe selected shall be suitable for operating capacity of the units.

(2) Check drainage is smooth after installation.

- Check drainage by filling in 1200cc water slowly from air outlet or inspection hole.

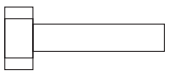
❻ Installation Instruction for Embedded Air-Conditioning Panel

1.Before installation

Warning

The trim panel shall be put on buffer materials when unpacked to prevent being scratched by hard objects.

Please confirm the following accessories delivered with the product:

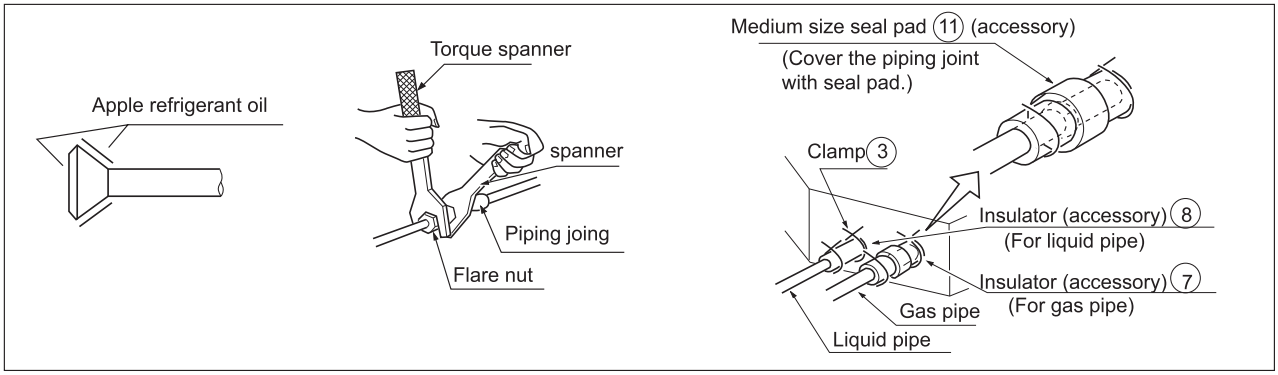


Bolt (M6*20) Qty:4

Connect and fix the power supply cable, indoor-outdoor connection cable as following:

❼ REFRIGERANT PIPING(As for outdoor piping, please refer to installation Manual of outdoor unit.)

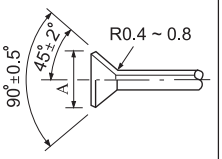
- Outdoor is precharged with refrigerant.
- Be sure to see the Fig.1, when connecting and removing piping from unit.
- For the size of the flare nut, please refer to Table 1.
- Apply refrigerant oil at both inside and outsid of lflare nut. Tighten it band tight 3-4 turns then tighten it.
- Use torque specified in Table 1. (Too much force may damage flare nut, causing gas leakage).
- Check piping joints for gas leakage. Insulate piping as shown in Fig. below.
- Cover joint of gas piping and insulator ⑦ with seal.



Pipe size

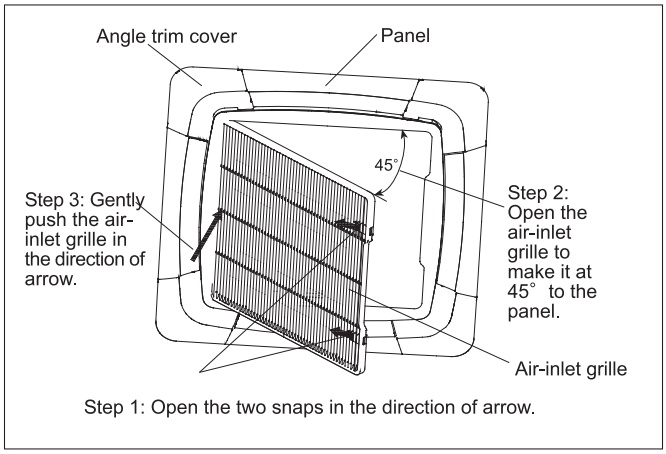
Model	Liquid side	Gas side
AB50S1SR1FA AB71S1SR1FA	Ø6.35mm	Ø12.7mm
AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA	Ø9.52mm	Ø15.88mm

Table 1

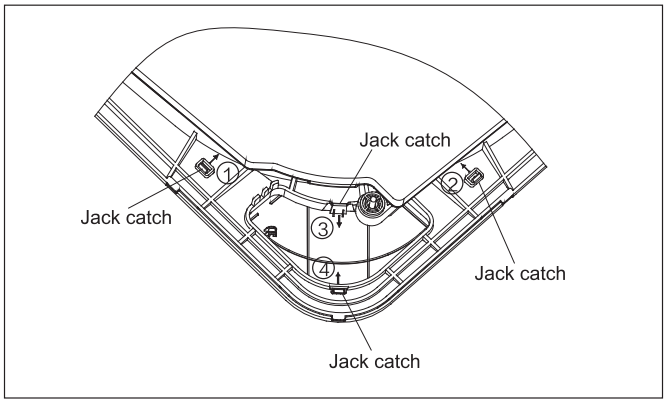
Pipe size	Tighten torque	A(mm)	Flare shape
Φ6.35	1420~1720N.cm (144~176kgf.cm)	8.3~8.7	
Φ9.52	3270~3990N.cm (333~407kgf.cm)	12.0~12.4	
Φ12.7	4950~6030N.cm (490~500kgf.cm)	12.4~16.6	
Φ15.88	6180~7540N.cm (630~770kgf.cm)	18.6~19.0	
Φ19.05	9720~11860 N.cm (990~1210 kgf.cm)	22.9~23.3	

❽ Panel installation

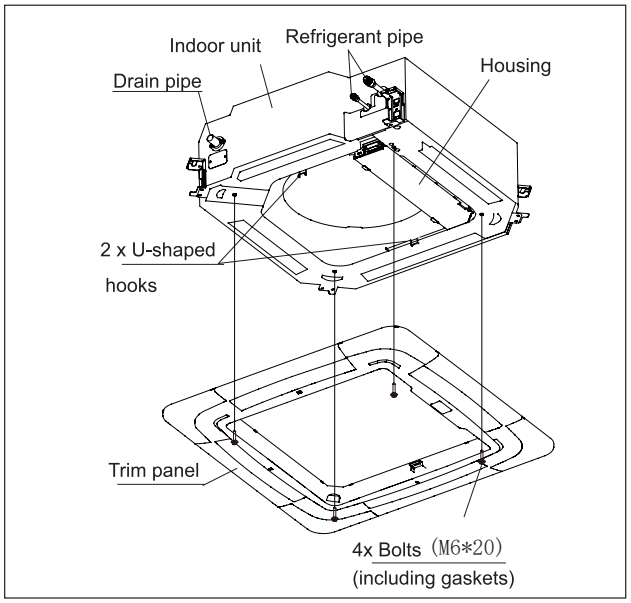
(1) Confirming the position of unit hanger
Please confirm the installation position of the hanger for indoor unit is about 130mm above the ceiling. For details, please refer to the Instructions for Installation and Maintenance of indoor unit.
(2) Removing the air-inlet grille
Open the air-inlet grille to make it at an angle of 45° to the trim panel. As shown in the following figure, please remove the air-inlet grille as per the operation requirements.



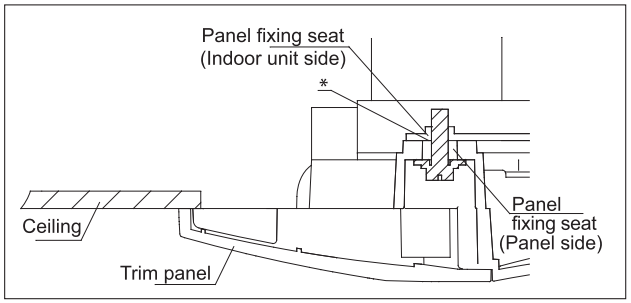
(3) Installing the panel
1) Please remove the four (4) angle trim panels. Removal method: Flip the jack catches of the angle trim panel in the order of ①②③④, as shown in the following figure. The flipping direction is indicated by the arrows. Then the angle trim panel can be removed.



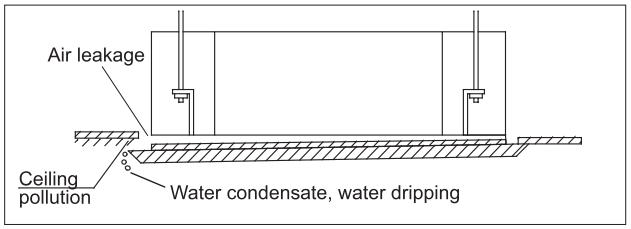
2) Pull out the two (2) U-shaped hooks on the indoor unit from below.
3)Adjust the panel direction to make the angle side engraved with"Pipe side" consistent with the refrigerant pipe of the indoor unit, and make the angle side engraved with "Drain side" consistent with the drain side of the indoor unit. Then hang the 2 hooks in the inner side of the panel on the 2 U-shaped hooks of the indoor unit.
4) Finally fix the panel on the indoor unit with the bolts (M5*25) and gaskets delivered with the unit.
Caution: Gaskets must be used for fixing, or else the panel would be easy to fall off.



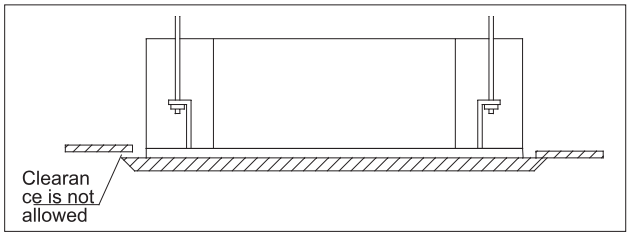
5) When tightening the four (4) bolts, please make sure there is no clearance between the panel fixing seat on the side of the indoor unit and the panel fixing seat on the side of the panel. That is to say: the bolts shall be fully tightened (see * in the figure). If there is a clearance, air leakage or water leakage is likely to occur.



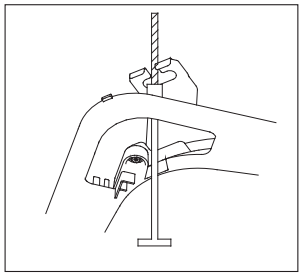
Caution:
• Improper tightening of bolts would lead to the faults shown in the following figure.



• After tightening the bolts, if there is a clearance between the ceiling and the trim panel, please readjust the height of the indoor unit.

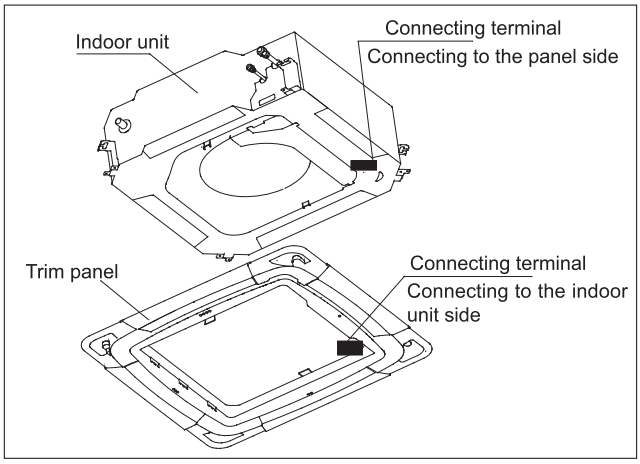


If the elevation level of the indoor unit and drain pipe are not affected, you can adjust the height of the indoor unit through the corner pore on the trim panel. Please keep the unit horizontal in the process of adjustment, or else water leakage is easy to occur.



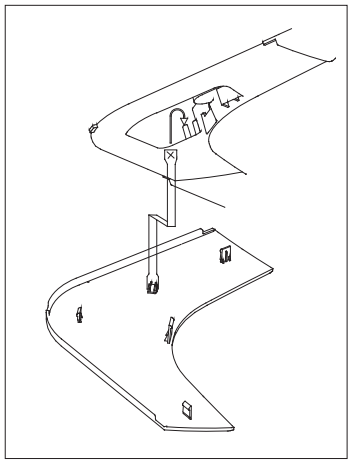
- Please do not swing the louver blade by hand, or else the blade mechanism would be damaged.

6) Connection of trim panel. Connect the black lead-out terminal of the panel to the black lead-out terminal of the indoor unit housing.



7) When the installation of panel is complete, please fix the four (4) angle trim panels.

- Hang and tighten the strap of the angle trim panel on the shackle of the trim panel, as shown in the figure.
- Fix the angle trim panel on the trim panel.



8) Installing the air-inlet grille.

Install the air-inlet grille with the steps opposite to that for removing.

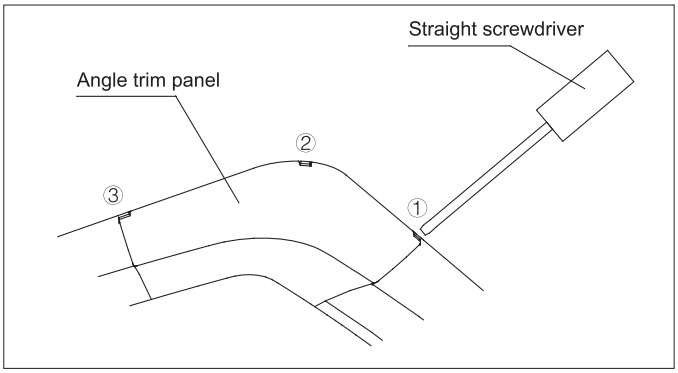
For reference

The method for removing angle trim panels when the installation of trim panel is complete:

1)Insert a straight screwdriver in the notch①. Gently turn the screwdriver downward, and slowly insert it in, and then move it up and down to make the angle fall off.

2)Make the angle ② and ③ fall off in the same way.

3)Take off the angle trim panel by hand.



Test Run

Check items

1. Indoor unit

- Is operation of each button on the remote control unit normal?
- Does each lamp light normally?
- Do not air flow direction louvers operate normally?
- Is the drain normal?

2. Outdoor unit

- Is there any abnormal noise and vibration during operation?
- Will noise, wind, or drain water from the unit disturb the neighbors?
- Is there any gas leakage?

Customer guidance

Explain the following to the customer in accordance with the operation manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote control unit operations.
(2) Air filter removal and cleaning, and how to use air louvers.
(3) Give the operation and installation manuals to the customer.

Test run

⚠ CAUTION

THIS UNIT WILL BE STARTED INSTANTLY WITHOUT "ON" OPERATION WHEN ELECTRIC POWER IS SUPPLIED.BE SURE TO EXECUTE "OFF" OPERATION BEFORE ELECTRIC POWER IS DISCONNECTED FOR SERVICING.

- This unit has a function of automatic restart system after recovering power stoppage.

1. Before starting test run (for Heat pump models)

Confirm whether the power source breaker (main switch) of the unit has been turned on for over 12 hrs to energize the crankcase heater in advance of operation.

2. Test run

Run the unit continuously for about 30 minutes, and check the following.

- Suction pressure at check joint of service valve for gas pipe.
- Discharge pressure at check joint on the compressor discharge pipe.
- Temperature difference between return air and supply air for indoor unit.

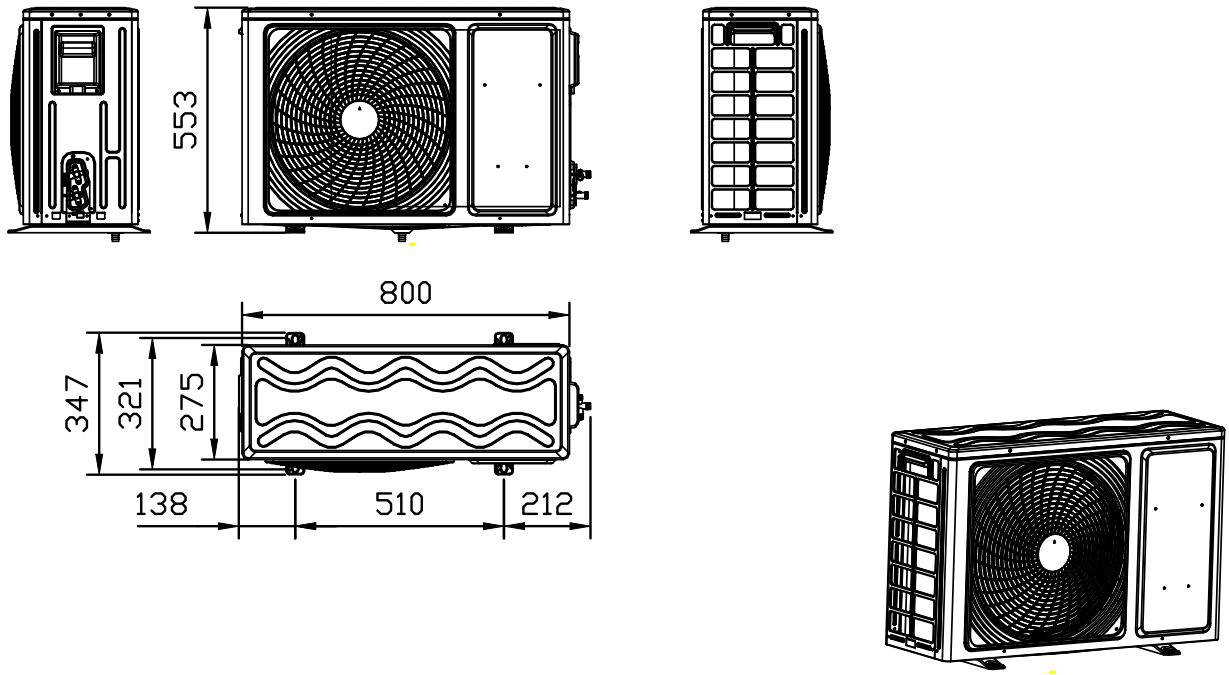
Move and scrap the air conditioning

- When moving, to disassemble and re-install the air conditioning, please contact your dealer for technical support.
- In the composition material of air conditioning, the content of lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers are not more than 0.1% (mass fraction) and cadmium is not more than 0.01% (mass fraction).
- Please recycle the refrigerant before scrapping, moving, setting and repairing the air conditioning; for the air conditioning scrapping, should be dealt with by the qualified enterprises.

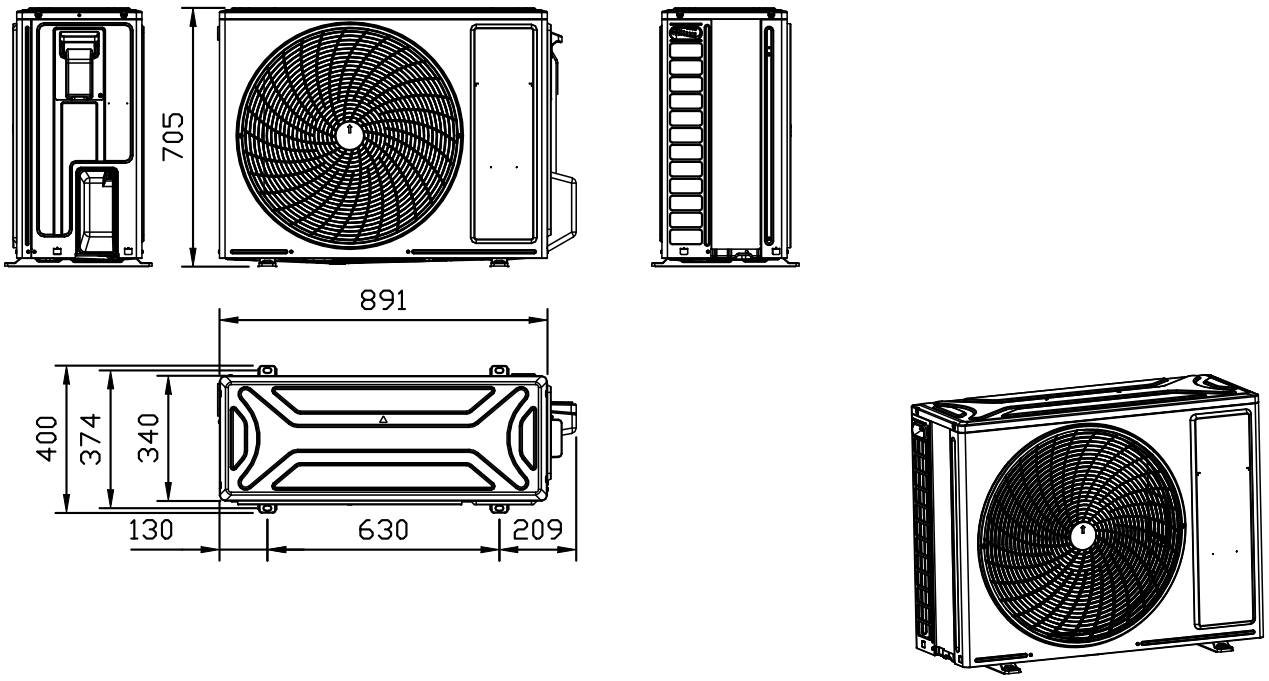
3 . Outdoor Units

3.1 Dimensional drawings

1U50S1TM1SA



1U71S1TT1SA



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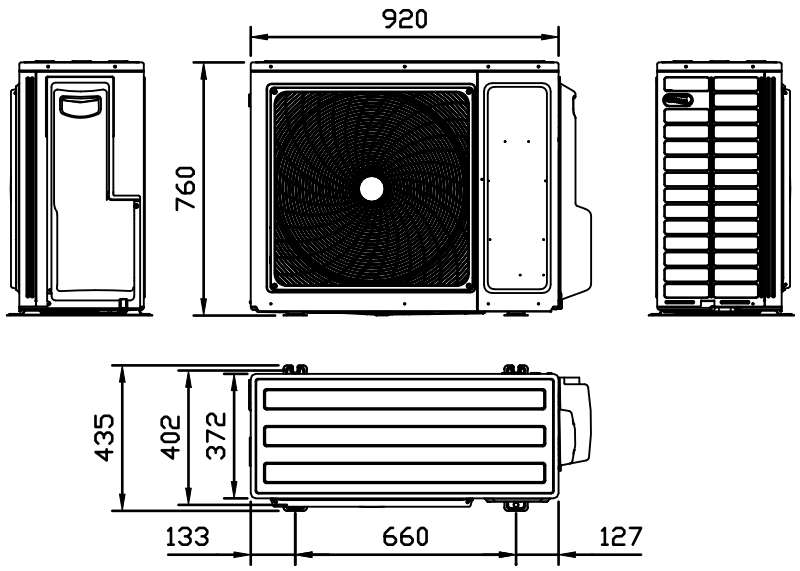
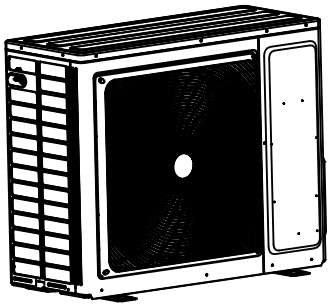
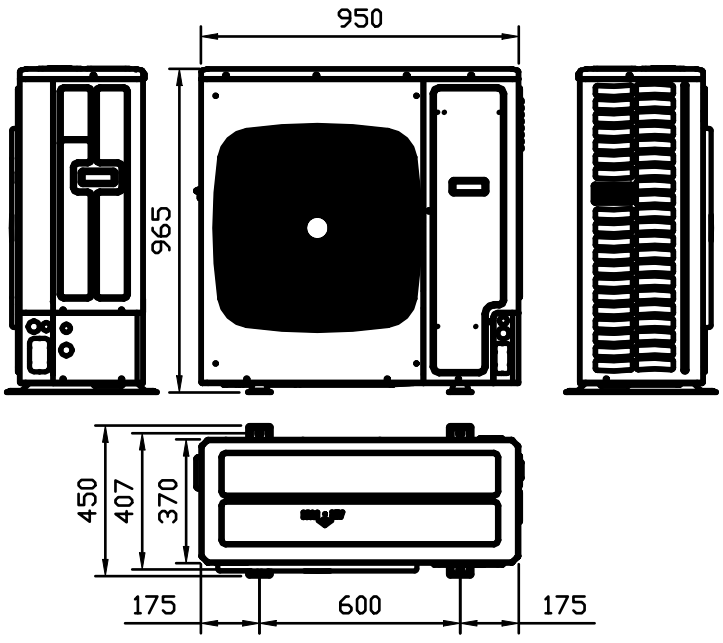
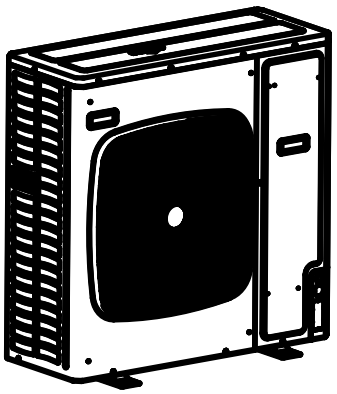


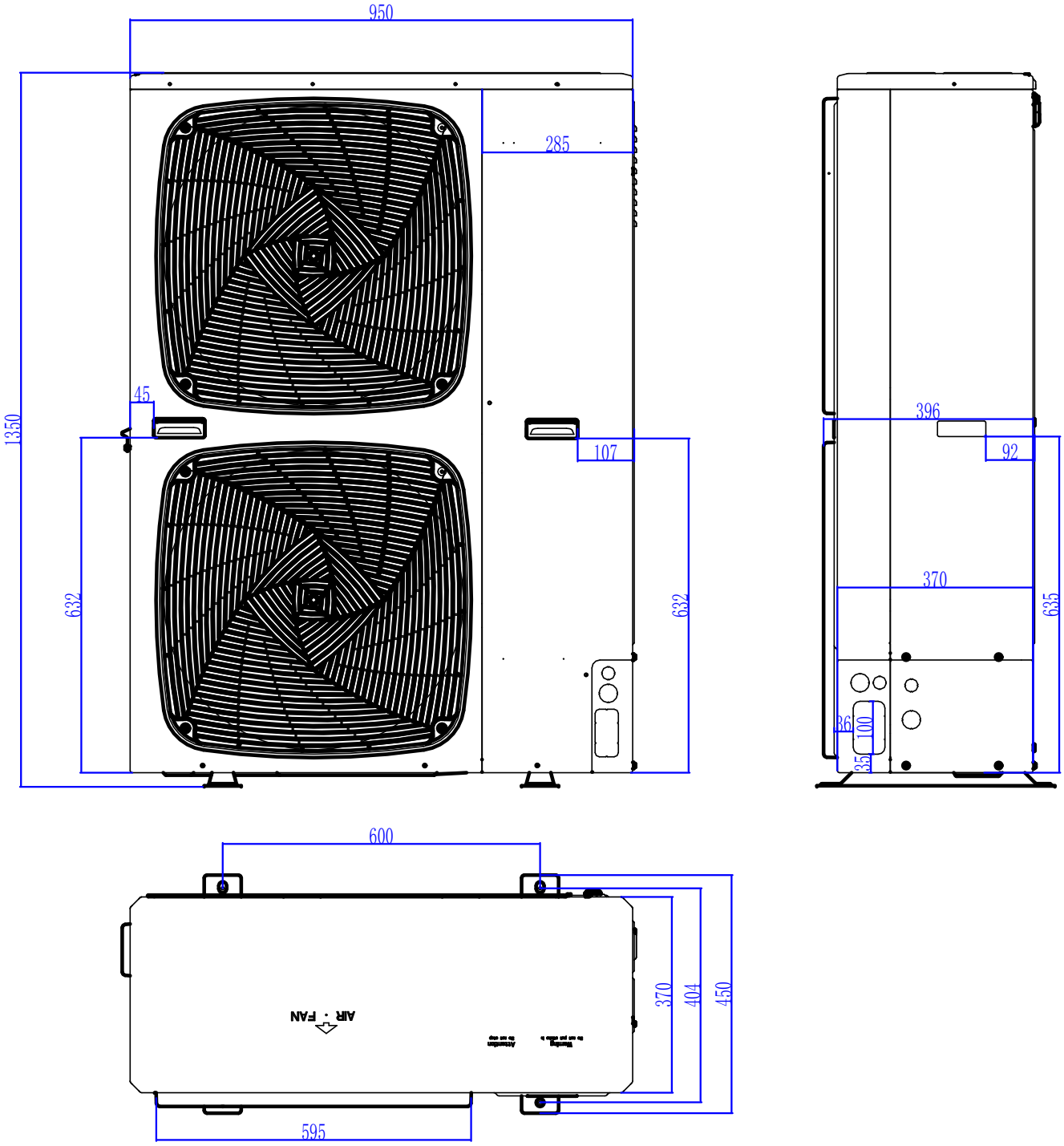


1U105S1LN1SB

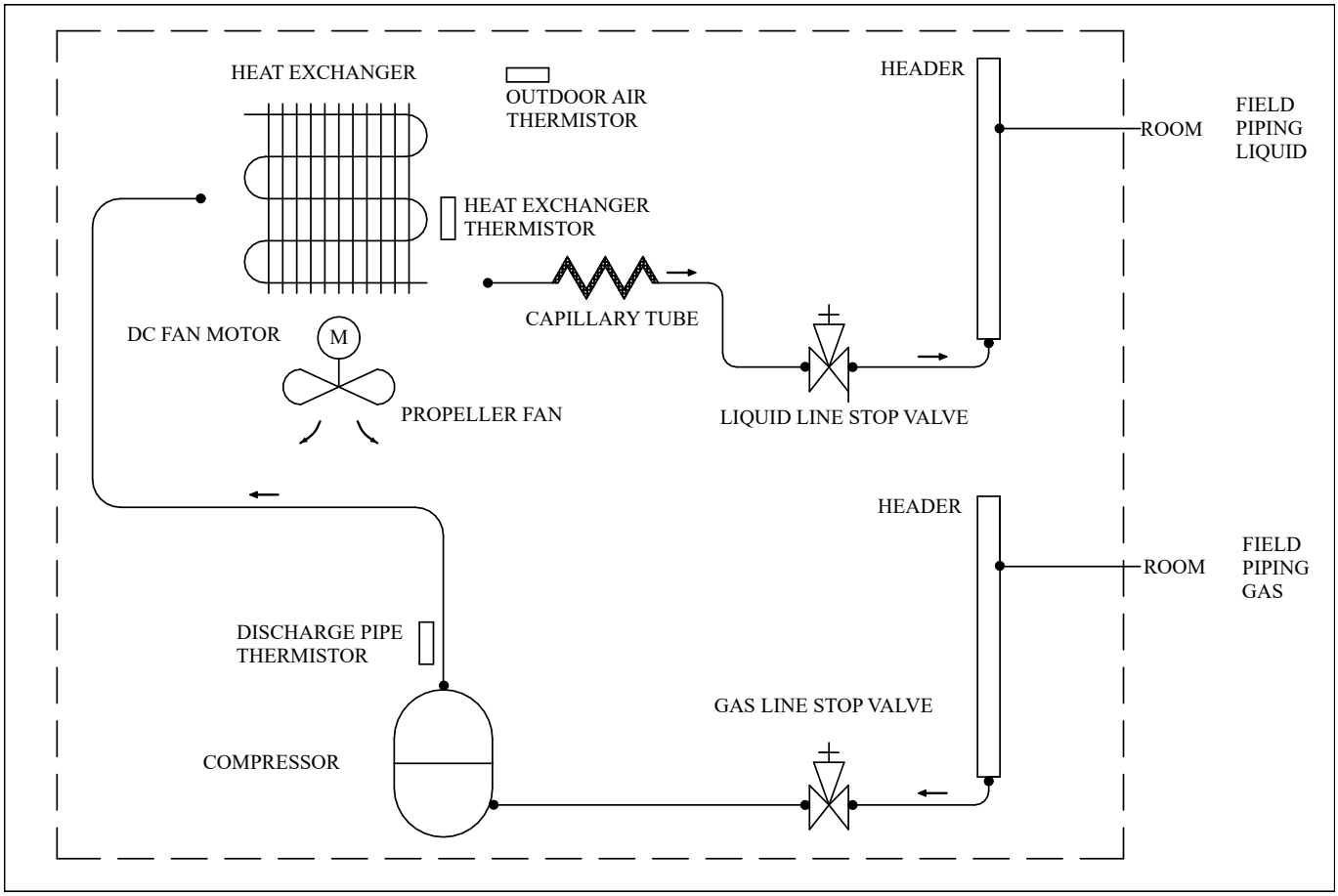




1U140S1LP1SB

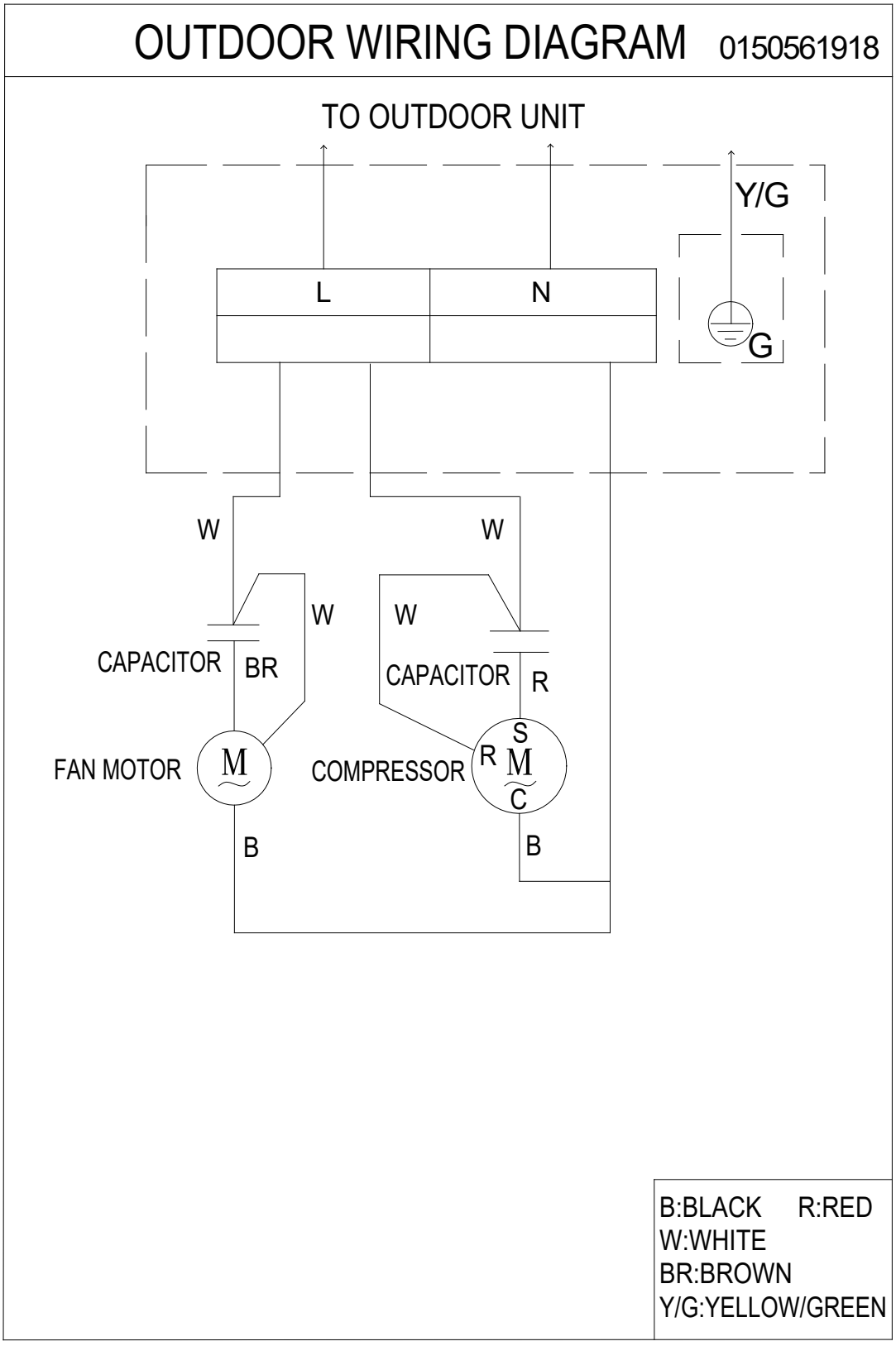


3.2 Piping diagram



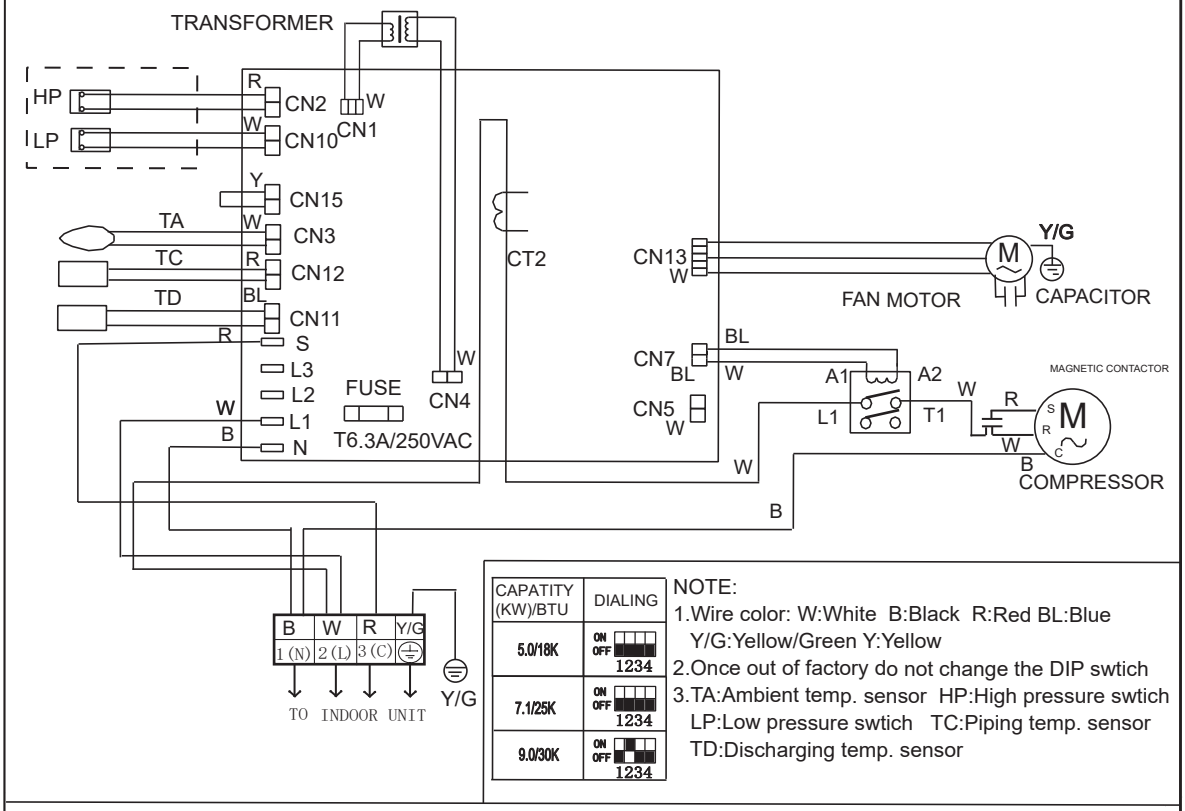
3.3 Wiring diagram

1U50S1TM1SA



1U71S1TT1SA 1U90S1LT1SA

CIRCUIT DIAGRAM OF OUTDOOR UNIT 0150560534



CAPATITY (KW)/BTU	DIALING
5.0/18K	ON OFF 1234
7.1/25K	ON OFF 1234
9.0/30K	ON OFF 1234

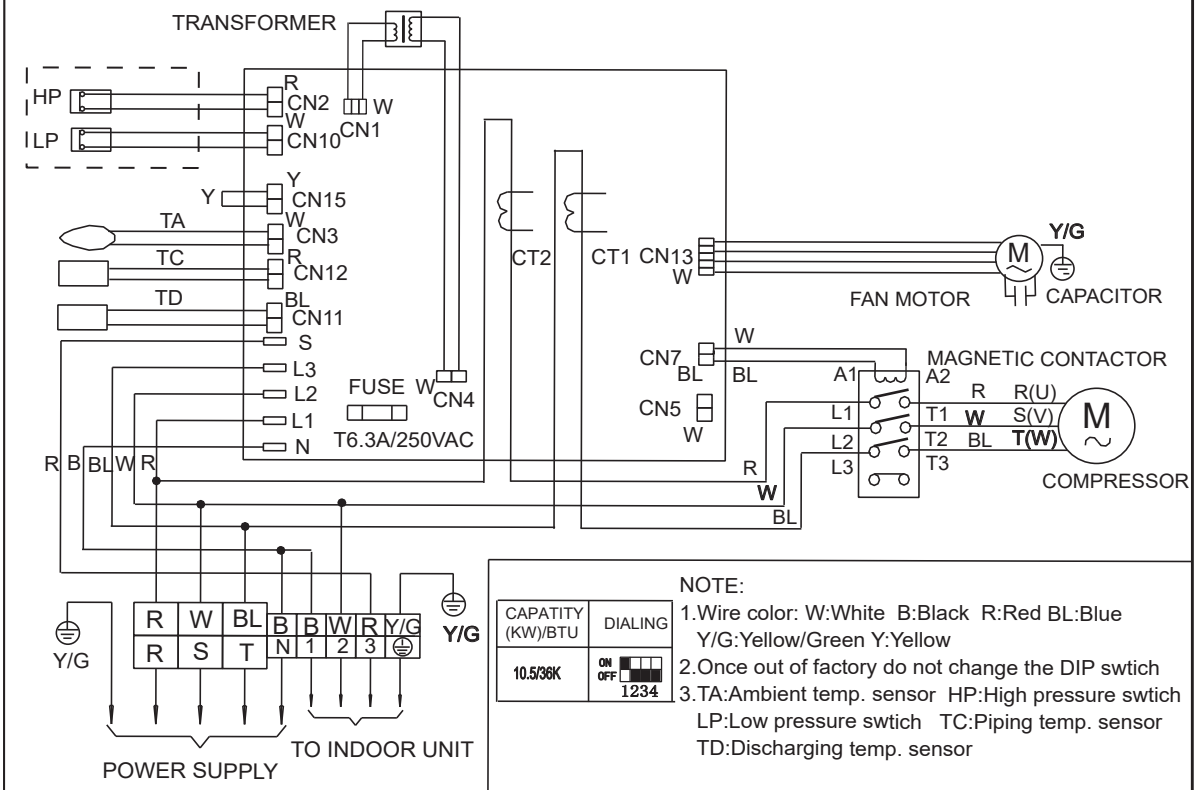
NOTE:
1.Wire color: W:White B:Black R:Red BL:Blue
Y/G:Yellow/Green Y:Yellow
2.Once out of factory do not change the DIP swtich
3.TA:Ambient temp. sensor HP:High pressure swtich
LP:Low pressure swtich TC:Piping temp. sensor
TD:Discharging temp. sensor

TROUBLE SHOOTING

Flash times of LED	Trouble Description	Analyze and diagnose	Remark
3	Outdoor ambient temp. sensor abnormal	Sensor broken down or short circuit	Resumable
11	Protection of discharging temp. too high or sensor abnormal	After compressor starts up,if TD is over120℃,10seconds later compressor stops	Resumable
5	Phase sequence abnormal	Power supply phase sequence wrong	Resumable
5	Compressor current pretection abnormal	Overcurrent/low current or current imbalance between two phase after compressor running	Non-Resumable
6	High pressure abnormal	High pressure switch acts abnormal.	Non-Resumable
7	High/Low voltage protection	Phase voltage too high or too low(over270V last 2 seconds; below 176V last 2 seconds)	Resumable
9	Abnormal communication between indoor and outdoor unit	Wrong connection or PCB faulty	Resumable
16	Low presure abnormal	Low pressure switch acts abnormal.	Non-Resumable
4	Outdoor defrosting temp. sensor abnormal	Sensor broken down or short circuit	Resumable
13	Outdoor EEPROM abnormal	Wrong EEPROM used	
14	Anti-freeze protection indication	System into Anti-freeze protection	Resumable

1U105S1LN1SB

CIRCUIT DIAGRAM OF OUTDOOR UNIT 0150560315



CAPATITY (KW)/BTU	DIALING
10.5/36K	ON OFF 1234

NOTE:

1.Wire color: W:White B:Black R:Red BL:Blue Y/G:Yellow/Green Y:Yellow

2.Once out of factory do not change the DIP swtich

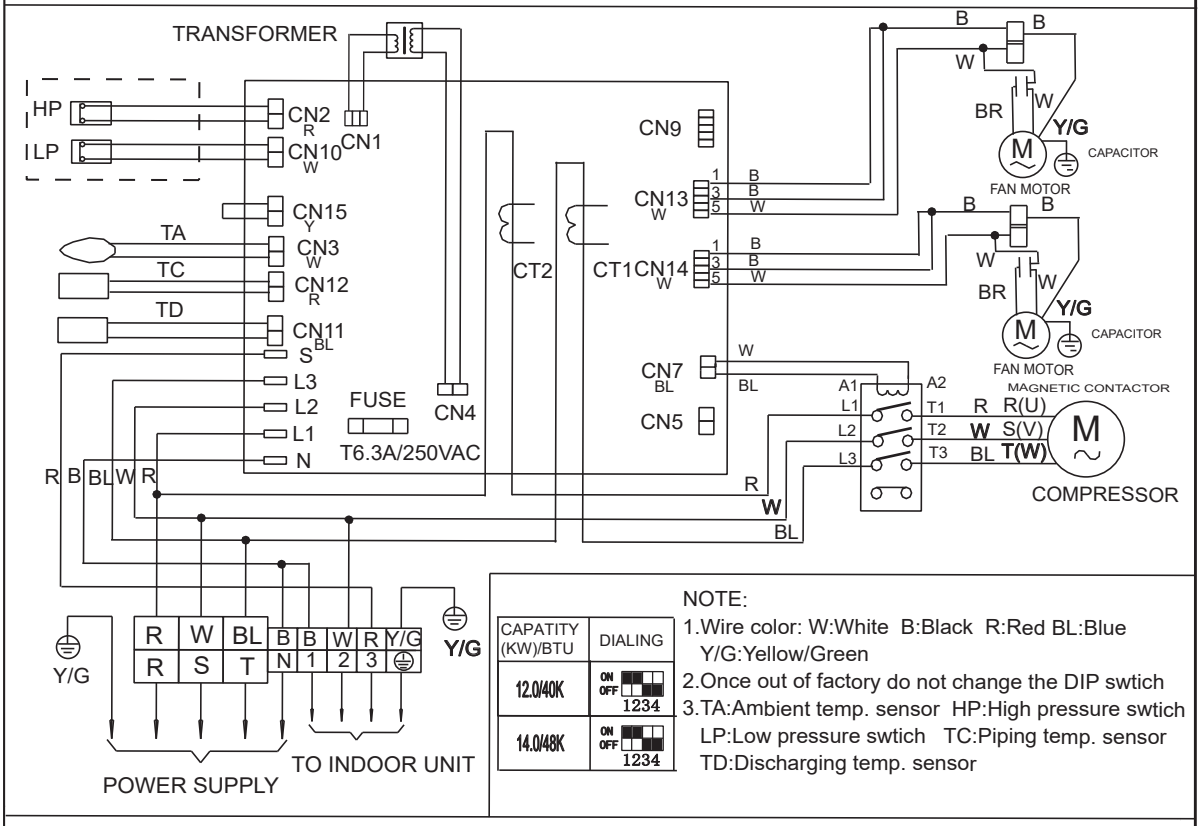
3.TA:Ambient temp. sensor HP:High pressure swtich LP:Low pressure swtich TC:Piping temp. sensor TD:Discharging temp. sensor

TROUBLE SHOOTING

Flash times of LED	Trouble Description	Analyze and diagnose	Remark
3	Outdoor ambient temp. sensor abnormal	Sensor broken down or short circuit	Resumable
11	Protection of discharging temp. too high or sensor abnormal	After compressor starts up,if TD is over120℃,10seconds later compressor stops	Resumable
5	Phase sequence abnormal	Power supply phase sequence wrong	Resumable
5	Compressor current pretection abnormal	Overcurrent/low current or current imbalance between two phase after compressor running	Non-Resumable
6	High pressure abnormal	High pressure switch acts abnormal.	Non-Resumable
7	High/Low voltage protection	Phase voltage too high or too low(over270V last 2 seconds; below 176V last 2 seconds)	Resumable
9	Abnormal communication between indoor and outdoor unit	Wrong connection or PCB faulty	Resumable
16	Low presure abnormal	Low pressure switch acts abnormal.	Non-Resumable
4	Outdoor defrosting temp. sensor abnormal	Sensor broken down or short circuit	Resumable
13	Outdoor EEPROM abnormal	Wrong EEPROM used	
14	Anti-freeze protection indication	System into Anti-freeze protection	Resumable

1U140S1LP1SB

CIRCUIT DIAGRAM OF OUTDOOR UNIT 0150560541



CAPATITY (KW)/BTU	DIALING
12.0/40K	ON OFF 1234
14.0/48K	ON OFF 1234

NOTE:
1.Wire color: W:White B:Black R:Red BL:Blue Y/G:Yellow/Green
2.Once out of factory do not change the DIP swtich
3.TA:Ambient temp. sensor HP:High pressure swtich LP:Low pressure swtich TC:Piping temp. sensor TD:Discharging temp. sensor

TROUBLE SHOOTING

Flash times of LED	Trouble Description	Analyze and diagnose	Remark
3	Outdoor ambient temp. sensor abnormal	Sensor broken down or short circuit	Resumable
11	Protection of discharging temp. too high or sensor abnormal	After compressor starts up,if TD is over120℃,10seconds later compressor stops	Resumable
5	Phase sequence abnormal	Power supply phase sequence wrong	Resumable
5	Compressor current pretection abnormal	Overcurrent/low current or current imbalance between two phase after compressor running	Non-Resumable
6	High pressure abnormal	High pressure switch acts abnormal.	Non-Resumable
7	High/Low voltage protection	Phase voltage too high or too low(over270V last 2 seconds; below 176V last 2 seconds)	Resumable
9	Abnormal communication between indoor and outdoor unit	Wrong connection or PCB faulty	Resumable
16	Low presure abnormal	Low pressure switch acts abnormal.	Non-Resumable
4	Outdoor defrosting temp. sensor abnormal	Sensor broken down or short circuit	Resumable
13	Outdoor EEPROM abnormal	Wrong EEPROM used	
14	Anti-freeze protection indication	System into Anti-freeze protection	Resumable

3.4 Installation

Safety Precautions

Carefully read the following information in order to operate the air conditioner correctly.

Below are listed three kinds of Safety Precautions and Suggestions.

⚠ **WARNING** Incorrect operations may result in severe consequences of death or serious injuries.

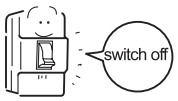
⚠ **CAUTION** Incorrect operations may result in injuries or machine damages; in some cases may cause serious consequences.

INSTRUCTIONS: These information can ensure the correct operation of the machine.

Symbols used in the illustrations

⃠ :Indicates an action that must be avoided.
:Indicates that important instructions must be followed.
:Indicates a part which must be grounded.
:Beware of electric shock (This symbol is displayed on the main unit label.)

After reading this handbook, hand it over to those who will be using the unit.
The user of the unit should keep this mamual at hand and make it available to those who will be performing repairs or relocating the unit. Also, make it available to the new user when the user changes hands.
Be sure to conform with the following important Safety Precautions.

⚠ WARNING	
• If any abnormal phenomena is found (e. g.smell of firing), please cut off the power supply immediately, and contact the dealer to find out the handling method. Open the window and well ventilated the room. In such case, to continue using the conditioner will damage the conditioner, and may cause electrical shock or fire hazard.  • After a long time use of air-conditioner the base should be checked for any damages. If the damaged base is not repaired, the unit may fall down and cause accidents. 	• Don't dismantle the outlet of the outdoor unit. The exposure of fan is very dangerous which may harm human beings.  • When need maintenance and repairment, call dealer to handle it. Incorrect maintenance and repairment may cause water leak, electrical shock and fire hazard. 

⚠ WARNING	
• No goods or nobody is permitted to placed on or stand on outdoor unit.The falling of goods and people may cause accidents.  • Don't operate the air-conditioner with damp hands.Otherwise it will be shocked.  • Only use explosion-proof fuse . May not use wire or any other materials replacing fuse, otherwise it may cause faults or fire accidents.  • Use discharge pipe correctly to ensure efficient discharge. Incorrect pipe use may cause water leaking. • Installed electrical-leaking circuit breaker. It easily cause electrical shock without circuit breaker.	• Air-conditioner can't be installed in the environment with inflammable gases because the inflammable gases near air-conditioner may cause fire hazard. Please let the dealer be responsible for installing the conditioner. Incorrect installation may cause water leak, electrical shock and fire hazard. • Call the dealer to take measures to prevent the refrigerant from leaking. If conditioner is installed in a small room, be sure to take every measure in order to prevent suffocation accident even in case of refrigerant leakage. • When conditioner is installed or reinstalled, the dealer should be responsible for them. Incorrect installation may cause water leaking, electrical shock and fire hazard. • Connect earthing wire. Earthing wire should not be connected to the gas pipe, water pipe, lightning rod or phone line, incorrect earthing may cause shock. Earthing

Safety Precautions

⚠ WARNING	
• Have the unit professionally installed. Improper installation by an unqualified person may result in water leak, electric shock, or fire. • Place the unit on a stable, level surface that withstands the weight of the unit to prevent the unit from tipping over or falling causing injury as a result. • Only use specified cables for wiring. Securely connect each cable, and make sure that the cables are not straining the terminals. Cables not connected securely and properly may generate heat and cause fire. • Take necessary safety measures against typhoons and earthquakes to prevent the unit from falling over. • Do not make any changes or modifications to the unit. In case of problems, consult the dealer. If repairs are not made properly, the unit may leak water and present a risk of electric shock, or it may produce smoke or cause fire.	• Be sure to carefully follow each step in this handbook when installing the unit. Improper installation may result in water leak, electric shock, fire or explosion. • Have all electrical work performed by a licensed electrician according to the local regulations and the instructions given in this manual. Secure a circuit designated exclusively to the unit. Improper installation or a lack of circuit capacity may cause the unit to malfunction or present a risk of electric shock, fire or explosion. • Securely attach the terminal cover(panel) on the unit. If installed improperly, dust and/or water may enter the unit and present a risk of electric shock, smoke or fire. • Only use refrigerant R32 as indicated on the unit when installing or relocating the unit. The use of any other refrigerant or an introduction of air into the unit circuit may cause the unit to run an abnormal cycle and abnormal cycle and cause the unit to burst.

⚠ WARNING	
• Do not touch the fins on the heat exchanger with bare hands, for they are sharp and dangerous. • In the event of a refrigerant gas leak, provide adequate ventilation to the room. If leaked refrigerant gas is exposed to a heat source, noxious gases, fire or explosion will be caused. • Do not try to defeat the safety features of the devices, and do not change the settings. Defeating the safety features on the unit such as the pressure switch and temperature switch or using parts other than the dealer or specialist may result in fire or explosion.	• When installing the unit in a small room, safeguard against hypoxia that results from leaked refrigerant reaching the threshold level. Consult the dealer for necessary measures to take. • When relocating the air conditioner, consult the dealer or a specialist. Improper installation may result in water leak, electric shock, fire or explosion. • After completing the service work, check for a refrigerant gas leak. If leaked gas refrigerant is exposed to a heat source such as fan heater,stove,and electric grill, noxious gases , fire or explosion. • Only use specified parts. Have the unit professionally installed. Improper installation may cause water leak, electric shock,smoke ,fire,explosion.

Safety Precautions

Precautions for Handling Units for Use with R32

⚠ Caution	
Do not use the existing refrigerant piping • The old refrigerant and refrigerator oil in the existing piping contain a large amount of chlorine, which will cause the refrigerator oil in the new unit to deteriorate. • R32 is a high-pressure refrigerant, and the use of the existing piping may result in bursting. Keep the inner and outer surfaces of the pipes clean and free of contaminants such as sulfur, oxides, dust/dirt shaving particles,oils,and moisture. • Contaminants inside the refrigerant piping will cause the refrigerant oil to deteriorate.	Use a vacuum pump with a reverse-flow check valve. • If other types of valves are used, the vacuum pump oil will flow back into the refrigerant cycle and cause the refrigerator oil to deteriorate. Do not use the following tools that have been used with the conventional refrigerants. Prepare tools that are for exclusive use with R32 . (Gauge manifold, charging hose, gas leak detector, reverse-flow check valve, refrigerant charge base,vacuum gauge, and refrigerant recovery equipment.) • If refrigerant and/or refrigerant oil left on these tools are mixed in with R32 , or if water is mixed with R32 , it will cause the refrigerant to deteriorate. • Since R32 does not contain chlorine, gas-leak detectors for conventional refrigerators will not work.

⚠ Caution	
Store the piping to be used during installation indoors, and keep both ends of the piping sealed until immediately before brazing.(keep elbows and other joints wrapped in plastic.) • If dust, dirt, or water enters the refrigerant cycle, it may cause the oil in the unit to deteriorate or may cause the compressor to malfunction. Use a small amount of ester oil, ether oil, or alkylbenzene to coat flares and flange connections. • A large amount of mineral oil will cause the refrigerating machine oil to deteriorate. Use liquid refrigerant to charge the system. • Charge the unit with gas refrigerant will cause the refrigerant in the cylinder to change its composition and will lead to a drop in performance	Do not use a charging cylinder. • The use of charging cylinder will change the composition of the refrigerant and lead to power loss. Exercise special care when handling the tools. • An introduction of foreign objects such as dust, dirt or water into the refrigerant cycle will cause the refrigerating machine oil to deteriorate. Only use R32 refrigerant. • The use of refrigerants containing chlorine(i.e. R22) will cause the refrigerant to deteriorate.

Before Installing the Unit

⚠ Caution	
Do not install the unit in a place where there is a possibility of flammable gas leak. • Leaked gas accumulated around the unit may start a fire. Do not use the unit to preserve food, animals, plants, artifacts, or for other special purposes. • The unit is not designed to provide adepuate conditions to preserve the quality of these items. Do not use the unit in an unusual environment • The use of the unit in the presence of a large amount of oil, steam, acid, alkaline solvents or special types of sprays may lead to a remarkable drop in performance and/or malfunction and presents a risk of electric shock, smoke, or fire. • The presence of organic solvents, corroded gas (such as ammonia,sulfur compounds,and acid may cause gas or water leak.)	When installing the unit in a hospital, take necessary measures against noise. • High-frequency medical equipment may interfere with the normal operation of the air conditioning unit or the air conditioning unit may interfere with the normal operation of the medical equipment Do not place the unit on or over things that may not get wet. • When humidity level exceeds 80% or when the drainage system is clogged, indoor units may drip water. • Installation of a centralized drainage system for the outdoor unit may also need to be considered to prevent water drips from the outdoor units.

Safety Precautions

Before Installing (Relocating) the Unit or Performing Electric Work

⚠ Caution	
Ground the unit. • Do not connect the grounding on the unit to gas pipes,water pipes, lightning rods, or the grounding terminals of telephones. Improper grounding presents a risk of electric shock, smoke, fire, or the noise caused by improper grounding may cause the unit to malfunction. Make sure the wires are not subject to tension. • If the wires are too taut, they may break or generate heat and/or smoke and cause fire. Install a explosion-proof breaker for current leakage at the power source to avoid the risk of the electric shock. • Without a breaker for current leakage will cause risks of electric shock, fire or explosion. • Do not use large-capacity fuses,steel wire,or copper wire. Damaging the unit ,fire,smoke or explosion will be caused otherwise.	Do not spray water on the air conditioners or immerse the air conditioners in water. • Water on the unit presents a risk of electric shock. Periodically check the platform on which is placed for damage to prevent the unit from falling. • If the unit is left on a damaged plarform, it may topple over, causing injury. When installing draining pipes, follow the instructions in the manual, and make sure that they properly drain water so as to avoid dew condensation. • If not installed properly, they may cause water leaks and damage the furnishings. Properly dispose of the packing materials. • Things such as nails may be included in the package. Dispose of them properly to prevent injury. • Plastic bags present a choking hazard to children. Tear up the plastic bags before disposing of them to prevent accidents.

Before the Test Run

⚠ Caution	
Do not operate switches with wet hands to avoid electric. Do not touch the refrigerant pipes with bare hands during and immediately after operation. • Depending on the state of the refrigerant in the system, certain parts of the unit such as the pipes and compressor may become very cold or hot and may subject the person to frost bites or burning. Do not operated the unit without panels and safety guards in their proper places. • They are there to keep the users from injury from accidentally touching rotating, high-tempreture or high-voltage parts.	Do not turn off the power immediately after stopping the unit. • Allow for at least five minutes before turning off the unit, otherwise the unit may leak water or experience other problems. Do not operate the unit without air filters. • Dust particles in the air may clog the system and cause malfunction.

Read Before Installation

Items to Be Checked

(1). Verify the type of refrigerant used by the unit to be serviced. Refrigerant Type: R32
(2). Check the symptom exhibited by the unit to be serviced. Look in this service handbook for symptoms relating to the refrigerant cycle.
(3). Be sure to carefully read the safety precautions at the beginning of this document.
(4). If there is a gas leak or if the remaining refrigerant is exposed to an open flame, a noxious gas hydrofluoric acid may form. Keep workplace well ventilated.

CAUTION

- Install new pipes immediately after removing old ones to keep moisture out of the refrigerant circuit.
- Chloride in some types of refrigerants such as R22 will cause the refrigerating machine oil to deteriorate.

Necessary Tools and Materials

Prepare the following tools and materials necessary for installing and servicing the unit.
Necessary tools for use with R32(Adaptability of tools that are for use with R22 and R410A.
1.To be used exclusively with R32(Not to be used if used with R22 or R410A

Tools/Materials	Use	Notes
Gauge Manifold	Evacuating,refrigerant charging	5.09MPa on the High-pressure side.
Charging Hose	Evacuating, refrigerant charging	Hose diameter larger than the concentional ones.
Refrigerant Recovery Equipment	Refrigerant recovery	
Refrigerant Cylinder	Refrigerant charging	Write down the refrigerant type. Pink in color at the top of the cylinder.
Refrigerant Cylinder Charging Port	Refrigerant charging	Hose diameter larger than the conventional ones.
Flare Nut	Connecting the unit to piping	Use Type-2 Flare nuts.

2. Tools and materials that may be used with R32 with some restrictions

Tools/Materials	Use	Notes
Gas leak detector	Detection of gas leaks	The ones for HFC type refrigerant may be used.
Vacuum Pump	Vacuum drying	May be used if a reverse flow check adaptor is attached.
Flare Tool	Flare machining of piping	Chages have been made in the flare machining dimension.Refer to the next page.
Refrigerant Recovery Equipment	Recovery of refrigerant	May be used if designed for use with R32 .

3. Tools and materials that are be used with R22 or R410A that can also be used with R32

Tools/Materials	Use	Notes
Vacuum Pump with a Check Valve	Vacuum drying	
Bender	Bending pipes	
Torque Wrench	Tightening flare nuts	Only Φ12.70 (1/2") and Φ 15.88(5/8") have a larger flare machining dimension.
Pipe Cutter	Cutting pipes	
Welder and Nitrogen Cylinder	Welding pipes	
Refrigerant Charging Meter	Refrigerant charging	
Vacuum Gauze	Checking vacuum degree	

4. Tool and materials that must not used with R32

Tools/Materials	Use	Notes
Charging Cylinder	Refrigerant Charging	Must not be used with R32 -type units.

Tools for R32 must be handled with special care, and keep moisture and dust from entering the cycle.

Read Before Installation

Piping Materials

Types of Copper Pipes (Reference)

Maximum Operation Pressure	Applicable Refrigerants
3.4MPa	R22
4.3 MPa	R32,R410A

- Use pipes that meet the local standards.

Piping Materials/Radial Thickness

Use pipes made of phosphorus deoxidized copper.
Since the operation pressure of the units that use R32 is higher than that of the units for use with R22, use pipes with at least the radial thickness specified in the chart below. (Pipes with a radial thickness of 0.7mm or less may not be used.)

Size(mm)	Size(inch)	Radial Thickness(mm)	Type
Φ6.35	1/4"	0.8t	Type-O pipes
Φ9.52	3/8"	0.8t	
Φ12.70	1/2"	0.8t	
Φ15.88	5/8"	1.0t	
Φ19.05	3/4"	1.0t	Type-1/2H or Hpipes

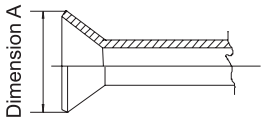
- Although it was possible to use type-O for pipes with a size of up to Φ 19.05(3/4") with conventional refrigerants, use type-1/2H pipes for units that use R32 .(Type-O pipes may be used if the pipe size is Φ19.05 and the radial thickness is 1.2t.)
- The table shows the standards in Japan. Using this table as a reference, choose pipes that meet the local standards.

Flare Machining (type-O and OL only)

The flare machining dimensions for units that use R32 is larger than those for units that use R22 in order to increase air tightness.

Flare Machining Dimension(mm)

External dimension of pipes	Size	Dimension A	
		R32	R22
Φ6.35	1/4"	9.1	9.0
Φ9.52	3/8"	13.2	13.0
Φ12.70	1/2"	16.6	16.2
Φ15.88	5/8"	19.7	19.4
Φ19.05	3/4"	24.0	23.3



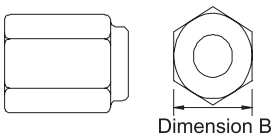
If a clutch type flare tool is used to machine flares on units that use R32, make the protruding part of the pipe between 1.0 and 1.5mm. Copper pipe gauge for adjusting the length of pipe protrusion is useful.

Flare Nut

Type-2 flare nuts instead of type-1 nuts are used to increase the strength. The size of some of the flare nuts have also been changed.

Flare nut dimension(mm)

External dimension of pipes	Size	Dimension B	
		R32 (Type2)	R22(Type1)
Φ6.35	1/4"	17.0	17.0
Φ9.52	3/8"	22.0	22.0
Φ12.70	1/2"	26.0	24.0
Φ15.88	5/8"	29.0	27.0
Φ19.05	3/4"	36.0	36.0

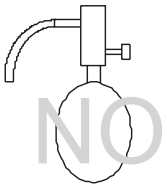


- The table shows the standards in Japan. Using this table as a reference, choose pipes that meet the local standards.

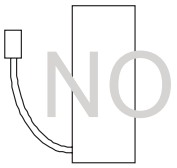
Read Before Installation

Air Tightness Test

No changes from the conventional method. Note that a refrigerant leakage detector for R22 or R410A cannot detect R32 leakage.



Halide torch



R22 or R407C leakage detector

Items to be strictly observed :

1. Pressurize the equipment with nitrogen up to the design pressure and then judge the equipment's air tightness, taking temperature variations into account.
2. When investigating leakage locations using a refrigerant, be sure to use R32 .
3. Ensure that R32 is in a liquid state when charging.

Reasons:

1. Use of oxygen as the pressurized gas may cause an explosion.
2. Charging with R32 gas will lead the composition of the remaining refrigerant in the cylinder to change and then this refrigerant can not be used.

Vacuuming

1. Vacuum pump with check valve

A vacuum pump with a check valve is required to prevent the vacuum pump oil from flowing back into the refrigerant circuit when the vacuum pump power is turned off (power failure). It is also possible to attach a check valve to the actual vacuum pump afterwards.

2. Standard degree of vacuum for the vacuum pump

Use a pump which reaches 65Pa or below after 5 minutes of operation.
In addition, be sure to use a vacuum pump that has been properly maintained and oiled using the specified oil. If the vacuum pump is not properly maintained, the degree of vacuum may be too low.

3. Required accuracy of the vacuum gauge

Use a vacuum gauge that can measure up to 650Pa. Do not use a general gauge manifold since it cannot measure a vacuum of 650Pa.

4. Evacuating time

Evacuate the equipment for 1 hour after 650Pa has been reached.
After envacuating, leave the equipment for 1 hour and make sure the that vacuum is not lost.

5. Operating procedure when the vacuum pump is stopped

In order to prevent a backflow of the vacuum pump oil, open the relief valve on the vacuum pump side or loosen the charge hose to drawn in air before stopping operation.The same operating procedure should be used when using a vacuum pump with a check valve.

Charging Refrigerant

R32 must be in a liquid state when charging.

Reasons:

R32 is a HFC refrigerant (boiling point = -52℃) and can roughly be handled in the same way as R410A; however, be sure to fill the refrigerant from the liquid side, for doing so from the gas side will somewhat change the composition of the refrigerant in the cylinder.

Note

- In the case of a cylinder with a syphon, liquid R32 is charged without turning the cylinder up side down. Check the type of cylinder before charging.

Remedies to be taken in case of a refrigerant leak

When refrigerant leaks, additional refrigerant may be charged. (Add the refrigerant from the liquid side)

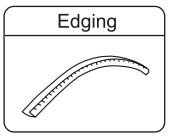
Characteristics of the Conventional and the New Refrigerants

- Because R32 is a simulated azeotropic refrigerant, it can be handled in almost the same mammer as a single refrigerant such as R22. Howerver, if the refrigerant is removed in the vapor phase, the composition of the refrigerant in the cylinder will somewhat change.
- Remove the refrigerant in the liquid phase. Additional refrigerant may be added in case of a refrigerant leak.

Installation Procedure

1. Accessories

"Edging" for protection of electrical wires from an opening edge.



2. Selecting installation site

2.1.General

WARNING

- Be sure to provide for adequate measures in order to prevent that the outdoor unit be used as a shelter bye small animals.
  Small animals making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.

Select an installation site where the following conditions are satisfied and that meets with your customer's approval.
- Places which are well-ventilated.
- Pllaces where the unit does not bother next-door neighbours.
- Safe places which can withstand the unit's weight and vibration and where the unit can be installed level.
- Places where there is no possibility of flammable gas or product leak.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Places where servicing space can be well ensured.
- Places where the indoor and outdoor units's piping and wiring lengths come within the allowable ranges.
- Places where water leaking from the unit cannot cause damage to the location (e.g. in case of a blocked drain pipe)
- Places where the rain can be avoided as much as possible.
- Do not install the unit in places often used as work place. In case of construction works (d.g.grinding works) where a lot of dust is created, the unit must be covered.
- Do not place any objects or equipment on top of the unit(top plate).

- Do not climb, sit or stand on top of the unit.
- Be sure that sufficient precautions are taken, in accordance with applicable legislation, in case of refrigerant leakage.

NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

- When installing the unit in a place exposed to strong wind, pay special attention to the following.
  Strong winds of 5 m/sec or more blowing against the outdoor unit's air outlet causes short circuit (suction of discharge air), and this may have the following consequences:
  - Deterioration of the operational capacity.
  - Frequent frost acceleration in heating operation.
  - Disruption of operation due to rise of high pressure.
  - When a strong wind blows continuously on the face of the unit, the fan can start rotating very fast until it breaks.
  Refer to the figures for installation of this unit in a place where the wind direction can be foreseen.
- Repare a water drainage channel around the foundation, to drain waste water from around the unit.
- If the water drainage of the unit is not easy, please build up the unit on a foundation of concrete blocks, etc.(the height of the foundation should be maximum 150mm).
- If you install the unit on a frame, please install a waterproof plate(field supplu) within 150mm of the underside of the unit in order to prevent the invasion of water from the lower direction.
  When installing the unitin a place frequently exposed to snow, pay special attention to elevate the foundation as high as possible.
- Make sure that the unit is installed level.

2.2.General

NOTICE

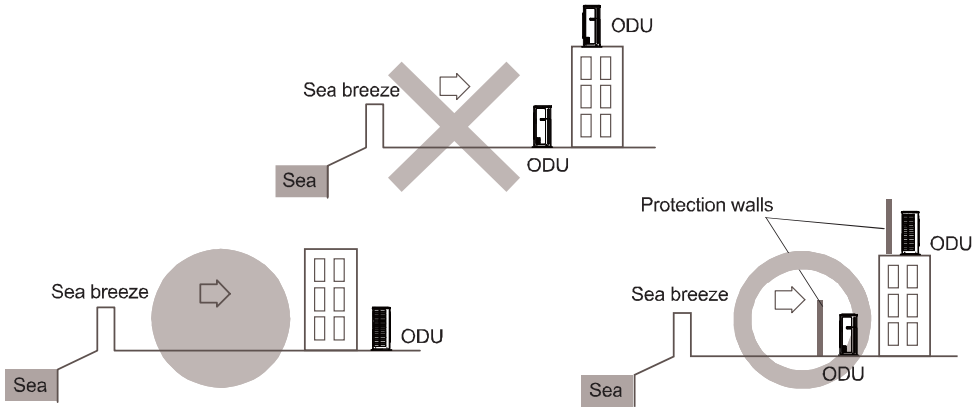
When operating the outdoor unit in a low outdoor amnient temperature, be sure to follow the instructions described below.

- To prevent exposure to wind, install the outdoor unit with its suction side facing the wall.
- Never install the outdoor unit at a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, install a baffle plate on the air discharge side of the outdoor unit.
  In heavy snowfall areas it is very important to select an installation site where the snow will not affect the unit and set the outlet side at a right angle to the direction of the wind.

Installation Procedure

2.3.General

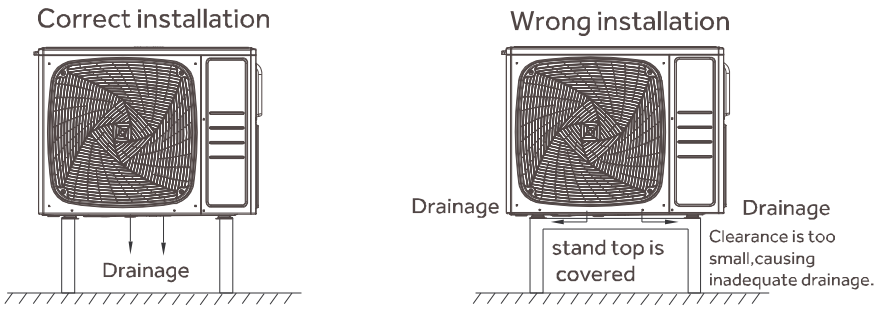
■ For seacoast applications, block the unit from direct exposure to sea breeze by installing the unit behind a structure (such as a building) or a protective wall that is 1.5 times higher than the unit, leaving 700 mm of space between the wall and unit for air circulation.Consult an installation expert about taking anti-corrosion measures, such as removing salinity on the heat exchanger and applying a rust inhibitor more frequently than once a year.

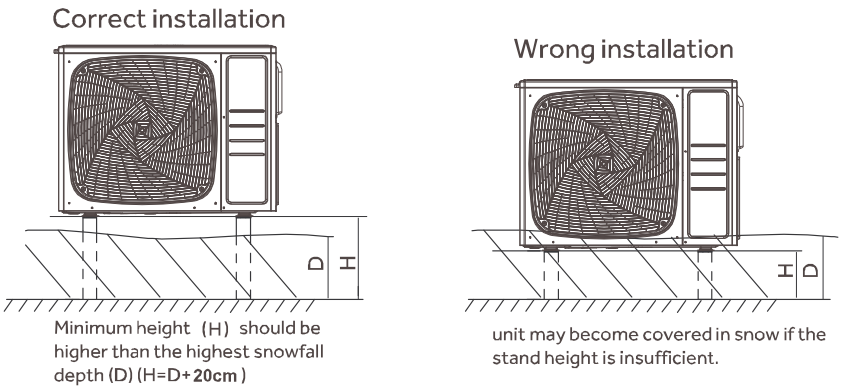


■ Set the unit on mounting brackets or pad. To avoid the adverse effects of snow, ice and defrosting issues, install the unit on heat pump risers to ensure a sufficient height from the ground. In all cases, refer to local code for correct riser height.

Make sure the outdoor unit is installed level and is stable.

Install snow protection hood as necessary.

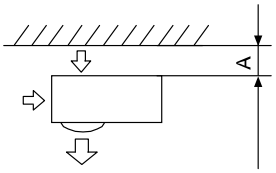




2.4.Selection of installation location of outdoor

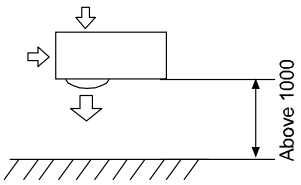
(1)Single-unit installation (unit: mm)

Back

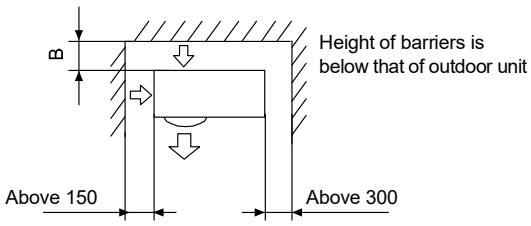


A	≥150
B	≥200
C	≥150
D	≥150
E	≥200
F	≥200
G	≥300
H	≥1500

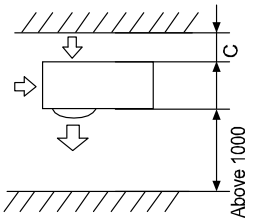
Front



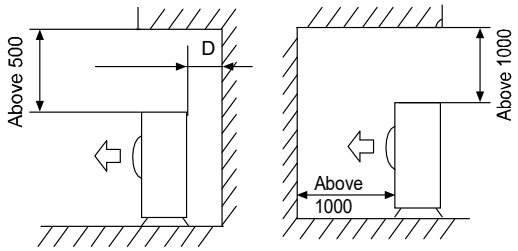
Back and side



Front and back



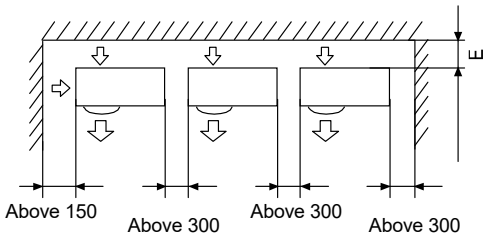
When barriers exist above the unit



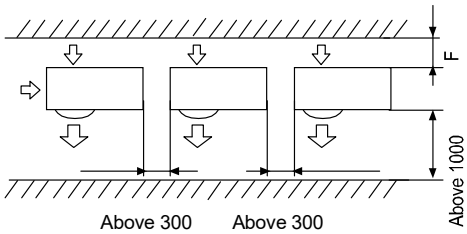
The top and two side surfaces must be exposed to open space, and barriers on at least one side of the front and back shall be lower than the outdoor unit.

(2) Multi-unit installation (unit: mm)

Back and side



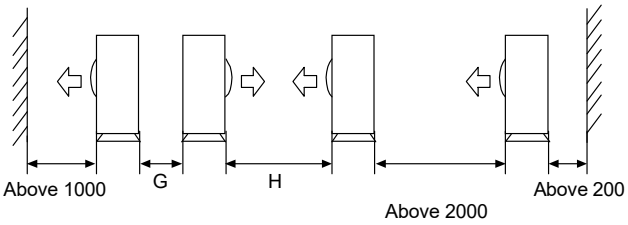
Front and back



Height of barriers is below that of outdoor unit

(3) Multi-unit installation in front and back (unit: mm)

Standard



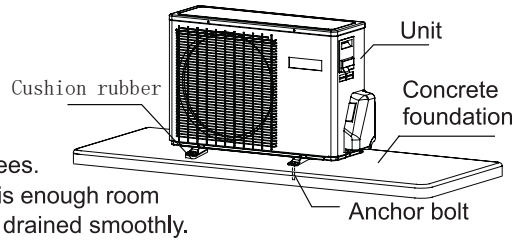
The top and two side surfaces must be exposed to open space, and barriers on at least one side of the front and back shall be lower than the outdoor unit.

- The installation service spaces shown in the illustrations are based on an air intake temperature of 35 °C(DB) for COOL operation. In regions where the air intake temperature regularly exceeds 35°C(DB), or if the heat load of outdoor units is expected to regularly exceed the maximum operating capacity, reserve a larger space than that indicated at the air intake side of units.
- Regarding the required air outlet space, position the units with consideration to the space required for the onsite refrigerant piping work as well. Consult your dealer if the work conditions do not match those in the drawings.

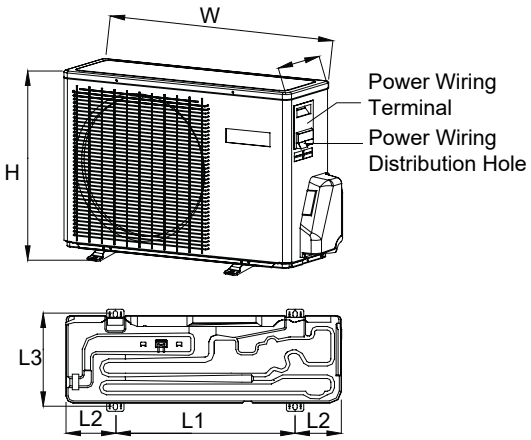
3. Installation of outdoor unit

Fix the unit on the foundation in a proper way according to the condition of the installation place, referring to the following information.

- Give enough room for the concrete foundation to fix by anchor bolts.
- Place the concrete foundation deep enough.
- Install the unit so that the angle of inclination must be less than 3 degrees.
- Forbidden to place the unit on the ground directly.Please confirm there is enough room near the drainage hole on bottom plate, which will ensure the water be drained smoothly.



4.Installation dimension(Unit:mm)

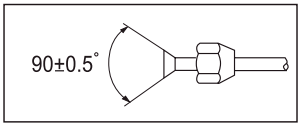


Outdoor Unit	W	D	H	L1	L2	L3
1U50S1TM1SA	800	275	553	510	130	321
1U71S1TT1SA	820	338	614	590	115	330
1U90S1LT1SA	920	372	765	661	128	402
1U105S1LN1SB	950	370	965	600	175	410
1U140S1LP1SB	950	370	1355	600	175	410

Installation Procedure

1. Piping size

1U50S1TM1SA 1U71S1TT1SA	Liquidpipe	Φ6.35×0.8mm
	Gaspige	Φ12.70×0.8mm
1U90S1LT1SA 1U105S1LN1SB 1U140S1LP1SB	Liquidpipe	Φ9.52×0.8mm
	Gaspige	Φ15.88×1.0mm

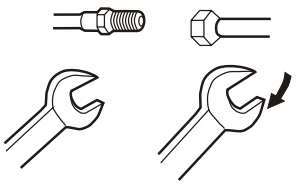


- Install the removed flare nuts to the pipes to be connected, then flare the pipes.

2. Connection of pipes

- To bend a pipe, give the roundness as large as possible not to crush the pipe , and the bending radius should be 30 to 40 mm or longer.
- Connecting the pipe of gas side first makes working easier.
- The connection pipe is specialized for R32.

Half union Flare nut



Spanner Torque wrench

Forced fastening without careful centering may damage the threads and cause a leakage of gas.

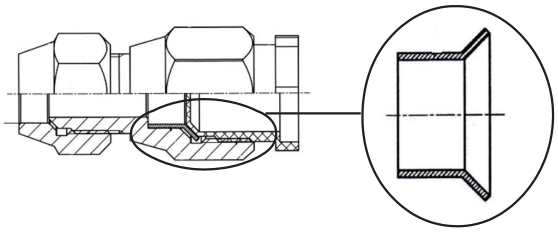
Pipe Diameter (ø)	Fastening torque
Liquid side6.35mm(1/4″)	18N.m
Liquid/Gas side9.52mm(3/8″)	42 N.m
Gas side12.70mm(1/2″)	55N.m
Gas side15.88mm(5/8″)	60 N.m

Be careful that matters, such as wastes of sands,water,, etc. shall not enter the pipe.

3.Install adapter

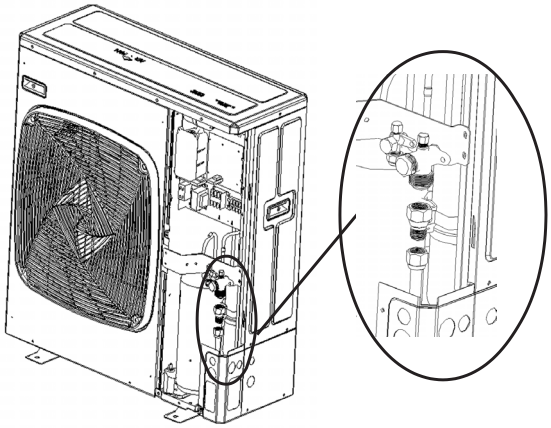
3.1.For 1U105S1LN1SB and 1U140S1LP1SB, the gas pipe shall be connected through the adapter, which shall be placed in the accessory bag of the indoor unit

3.2.The adapter is shown in the following figure.
Note that the trumpet-shaped copper connector contained in the nut shall not be lost. If it is lost, it will cause leakage



trumpet-shaped copper connector

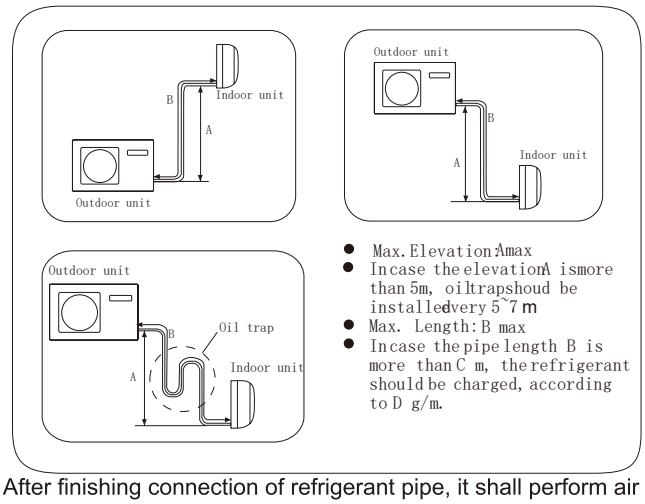
3.3.The installation of gas pipe is shown in the following figure



Installation Procedure

CAUTION

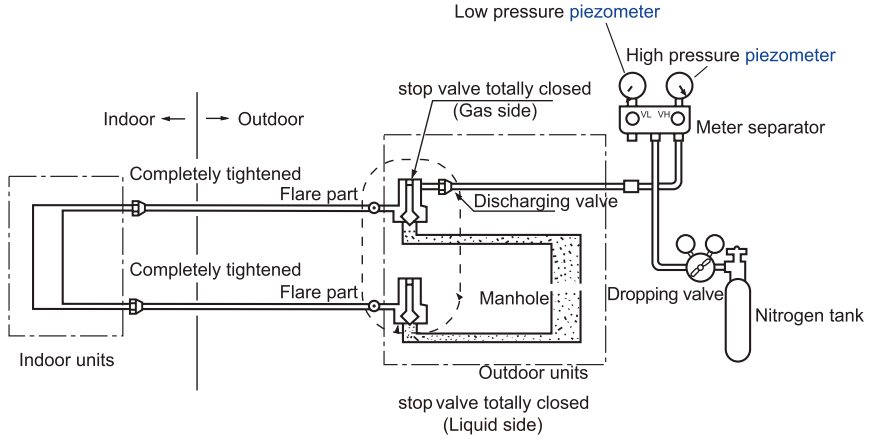
The standard pipe length is C m. If it is over C m, the function of the unit will be affected. If the pipe has to be lengthened, the refrigerant should be charged, according to D g/m. But the charge of refrigerant must be conducted by professional air conditioner engineer. Before adding additional refrigerant, perform air purging from the refrigerant pipes and indoor unit using a vacuum pump, then charge additional refrigerant.



Outdoor Unit	Amax	Bmax	C	D
1U50S1TM1SA	10	20	10	50g+(C-10)×20g
1U71S1TT1SA	10	20	10	50g+(C-10)×20g
1U90S1LT1SA	15	30	15	340g+(C-15)×45g
1U105S1LN1SB 1U140S1LP1SB	30	50	15	340g+(C-15)×45g

After finishing connection of refrigerant pipe, it shall perform air tightness test.

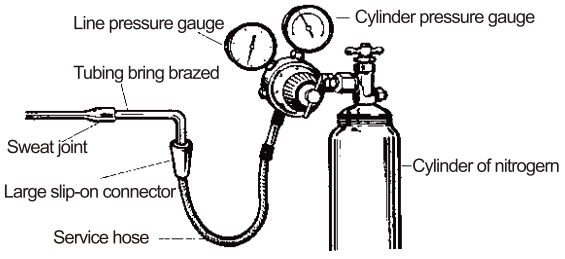
- The air tightness test adopts nitrogen tank to give pressure according to the pipe connection mode as the following figure shown.
- The gas and liquid valve are all in close state. In order to prevent the nitrogen entering the circulation system of outdoor unit, tighten the valve rod before giving pressure (both gas and liquid valve rods).



1) Pressurize for over 3 minutes at 0.3MPa (3.0 kg/cm^{2}g).

2) Pressurize for over 3 minutes at 1.5MPa (15 kg/cm^{2}g). A large leakage will be found.

3) Pressurize for about 24 hours at 3.0MPa (30 kg/cm^{2}g). A small leakage will be found.



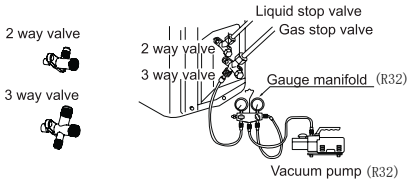
- Check if the pressure drops
  If the pressure does not drop, then pass.
  If the pressure drops, then please check the leaking point.
  When pressurizing for 24 hours, a variation of 1°C in the ambient temperature will cause a variation of 0.01MPa(0.1kg/cm^{2}g) in pressure. It shall be corrected during test.

- Checking the leaking point
  In 1) to 3) steps, if the pressure drops, check the leakage in each joint by listening, touching and using soap water etc. to identify the leaking point. After confirming the leaking point, welding it again or tighten the nut tightly again.

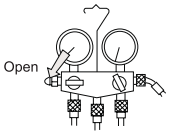
Installation Procedure

Piping vavuum method: to use vacuum pump

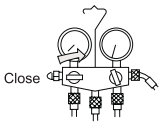
1. Detach the service port's cap of 3-way valve, the valve rod's cap for 2-way valve and 3-way valves, and connect the service port into the projection of charge hose (low) for gaugemanifold. Then connect the projection of charge hose (center) for gaugemanifold into vacuum pump.



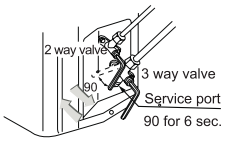
2. Open the handle at low in gaugemanifold, and operate vacuum pump. If the scale-moves of gause (low) reach vacuum condition in a moment, check the step 1 again.



3. Vacuumize for over 15min. And check the level gauge which should read -0.1MPa (-76 cm Hg) at low pressure side. After the completion of vacuumizing, close the handle 'Lo' in the vacuum pump. Check the condition of the scale and hold it for 1-2min. If the scale-moves back in spite of tightening, make flaring work again, then return to the beginning of the step 3.

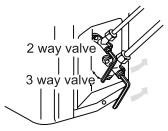


4. Open the valve rod for the 2-way valve to an angle of anticlockwise 90 degree. After 6 seconds, close the 2-way valve and make the inspection of gas leakge.

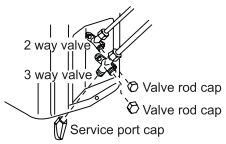


5. No gas leakage? In case of gas leakage, tighten parts of pipe connection. If leakage stops, then proceed the step 6. If it does not stop gas leakage, discharge whole refrigerants from the service port. After flaring work again and vacuumize, fill up prescribed refrigerant from the gas cylinder.

6. Detach the charge hose from the service port, open 2-way valve and 3-way. Turn the valve rod anticlockwise until hitting lightly.



7. To prevent the gas leakage, turn the service ports cap, the valve rodis cap for 2-way valve and 3-way's a little more than the point where the torque increases suddenly.



CAUTION:

If the refrigerant of the air conditioner leaks, it is necessary to make all the refrigerant out. Vacuumize first, then charge the liquid refrigerant into air conditioner according to the amount marked on the nameplate.

WARNING!
DANGER OF BODILY INJURY OR DEATH
• TURN OFF ELECTRIC POWER AT CIRCUIT BREAKER OR POWER SOURCE BEFORE MAKING ANY ELECTRIC CONNECTIONS. • GROUND CONNECTIONS MUST BE COMPLETED BEFORE MAKING LINE VOLTAGE CONNECTIONS.

Precautions for Electrical wiring

- Electrical wiring work should be conducted only by authorized personnel.
- Do not connect more than three wires to the terminal block. Always use round type crimped terminal lugs with insulated grip on the ends of the wires.
- Use copper conductor only.

Selection of size of power supply and interconnecting wires

Select wire sizes and circuit protection from table below. (This table shows 20 m length wires with less than 2% voltage drop.)

Installation Procedure

Item / Model	Outdoor Phase	Circuit breaker		Power source wire size (minimum) (mm^2)	Earth leakage breaker	
		Switch breaker (A)	Overcurrent protector rated capacity (A)		Switch breaker(A)	Leak current(mA)
1U50S1TM1SA 1U71S1TT1SA	1	25	20	4.0	25	30
1U90S1LT1SA	1	40	30	4.0	40	30
1U105S1LN1SB 1U140S1LP1SB	3	30	20	4.0	30	30

- If the supply cord is damaged, it must be replaced by the manufacturer or itsservice agent or a similar qualified person.
- If the fuse of control box is broken, please change it with the ceramic type of T 25A/250V.
- The wiring method should be in line with the local wiring standard.
- All the cables shall have got the European authentication certificate. During installation, when the connecting cables break off, it must be assured that the grouding wire is the last one to be broken off.
- The explosion-proof breaker of the air conditioner should be all-pole switch. The distance between its two contacts should not be no less than 3mm. Such means for disconnection must be incorporation in the fixed wiring.
- The distance between its two terminal blocks of indoor unit and outdoor unit should not be over 5m. If exceeded, the diameter of the wire should be enlarged according to the local wiring standard.
- A explosion-proof breaker must be installed.

Wiring procedure

1) Remove set screws on the side before taking off the front panel toward the direction.
2) Connect wires to the terminal block correctly and fix the wires with a wire clamp equipped nearby the terminal block.
3) Route the wires in a proper way and penetrate the wires through the opening for electrical wiring on the side panel.

WARNING:

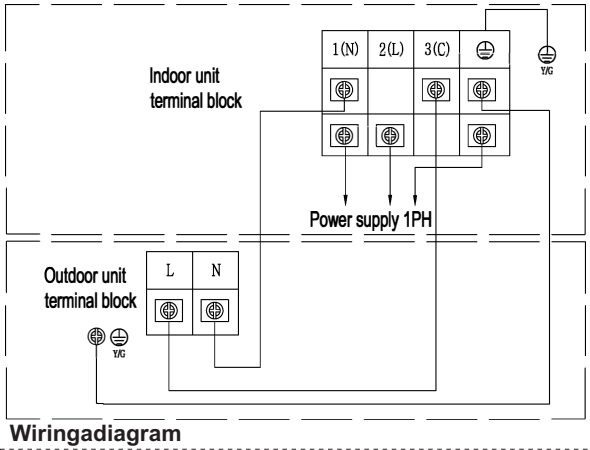
INTERCONNECTING WIRES MUST BE WIRED ACCORDING TO EQUIPMENT DAMAGE.

Model	1U50S1TM1SA 1U71S1TT1SA 1U90S1LT1SA 1U105S1LN1SB 1U140S1LP1SB
Connecting wiring	≥ 4G 2.5mm²
Power cable	≥ 3G 4.0mm²

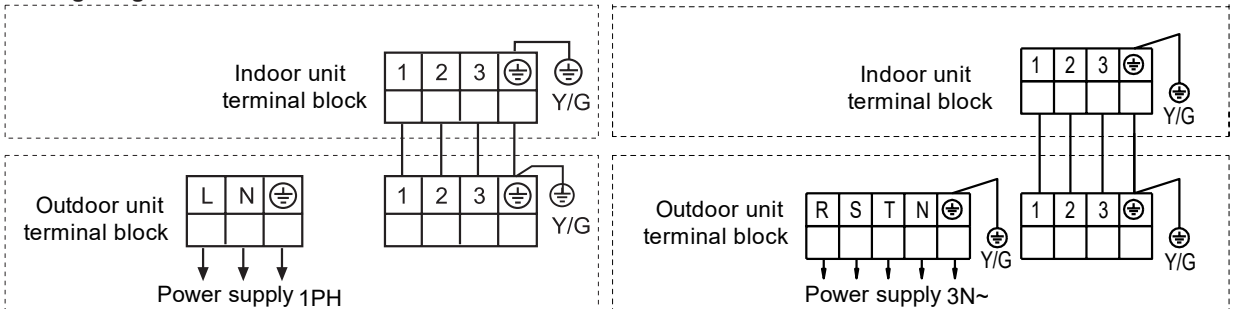
NOTE

Indoor and outdoor connection cable:
If communication cable length ≤40m, communication cable:H07RN-F 4G 2.5mm^2.
If 40m＜t he communication cable lenth ≤55m,all modles:H07RN-F 4G 4mm^2.
If 55m＜t he communication cable lenth ≤75m,all modles:H07RN-F 4G 6mm^2.
Communication line length is not allowed to exceed 75m.

Wiringadiagram **For 1U50S1TM1SA**



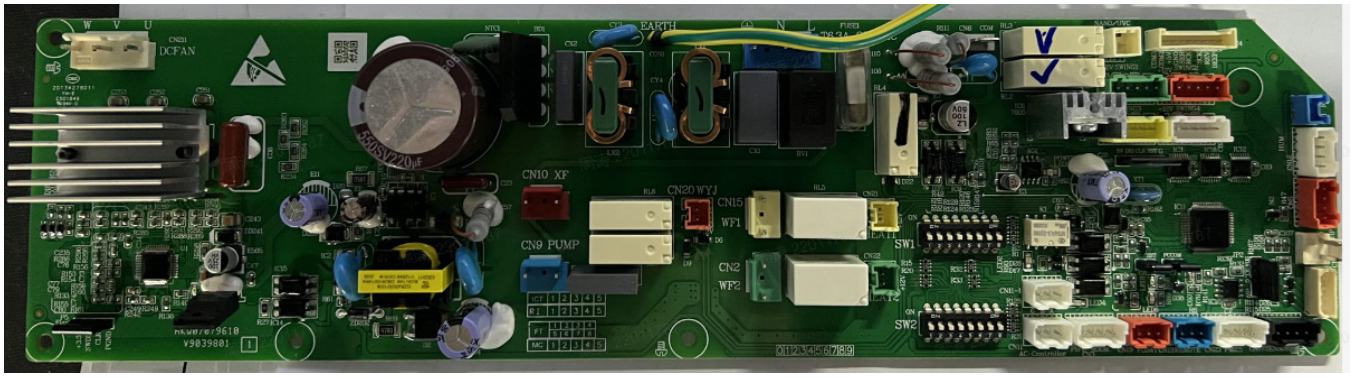
Wiringadiagram



4 . Electric Control and Troubleshooting

4.1 Indoor unit PCB Photo

AB50S1SR1FA AB71S1SR1FA AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA
PCB 0151800796



4.2 Indoor unit Dip Switch Setting

AB50S1SR1FA
PCB code 0151800796

SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8	Description
OFF	ON	OFF	---	---	---	---	---	Capacity: 5.0kw/18kBTU
---	---	---	OFF	---	---	---	---	Room Card Unavailable(Default)
---	---	---	ON	---	---	---	---	Room Card Available
---	---	---	---	OFF	---	---	---	Heat pump
---	---	---	---	ON	---	---	---	Cooling only
---	---	---	---	---	OFF	---	---	Fresh Air (Default)
---	---	---	---	---	ON	---	---	External Alarm Output
---	---	---	---	---	---	OFF	---	Reserved
---	---	---	---	---	---	---	ON	Reserved

PCB 0151800796 dip switch setting SW2

SW2-5	SW2-6	SW2-7	SW2-8	Address of centralized Control Indoor Unit
OFF	OFF	OFF	OFF	Address=0
ON	OFF	OFF	OFF	Address=1
---	---	---	---	----------
ON	ON	ON	ON	Address=15

Note:
1. Dashed paerts are option.
2. Users should not set SW1 and SW3.
3. SW2-5 ~ SW2-8 are used for wired controller address select.
4. Put SW1-5 to on position for cool only type.

AB71S1SR1FA AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA
PCB 0151800796

SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8	SW2-2	SW2-3	Description
ON	ON	OFF	---	---	---	OFF	---	ON	OFF	Capacity: 7.1kw/24kBTU
OFF	OFF	ON	---	---	---	OFF	---	OFF	ON	Capacity: 9.0kw/28kBTU
ON	OFF	ON	---	---	---	OFF	---	OFF	ON	Capacity: 10.5kw/36kBTU
OFF	ON	ON	---	---	---	OFF	---	ON	ON	Capacity: 12.5kw/42kBTU
ON	ON	ON	---	---	---	OFF	---	ON	ON	Capacity: 14.0kw/48kBTU
OFF	OFF	OFF	---	---	---	ON	---	ON	ON	Capacity: 16.0kw/60kBTU
---	---	---	OFF	---	---	---	---	---	---	Room Card Unavailable(Default)
---	---	---	ON	---	---	---	---	---	---	Room Card Available
---	---	---	---	OFF	---	---	---	---	---	Heat pump
---	---	---	---	ON	---	---	---	---	---	Cooling only
---	---	---	---	---	OFF	---	---	---	---	Fresh Air (Default)
---	---	---	---	---	ON	---	---	---	---	External Alarm Output
---	---	---	---	---	---	---	OFF	---	---	Reserved

PCB 0151800796 dip switch setting SW2

SW2-5	SW2-6	SW2-7	SW2-8	Address of centralized Control Indoor Unit
OFF	OFF	OFF	OFF	Address=0
ON	OFF	OFF	OFF	Address=1
---	---	---	---	----------
ON	ON	ON	ON	Address=15

Note:
1. Dashed paerts are option.
2. Users should not set SW1 and SW2.
3. SW2-5 ~ SW2-8 are used for wired controller address select.
4. Put SW1-5 to on position for cool only type.

4.3 Indoor unit Function

4.3.1 Sign Definition

Indoor					Outdoor				
Tai	Tc1	Tc2	Tm	Tao	Toci	Tc	Te	Ts	Td
Ambient Temp	Outlet Pipe Temp.	Inlet Pipe Temp	Mid Coil Temp	Ambient Temp	Thick Pipe of Heat Exchanger	Mid Condenser Temp.	Defrost Temp	Compressor Suction Temp.	Compressor Discharging Temp.
Tcomp1,2			Tset						
Temp. Compensation			Set Temp.						

4.3.2 Dry Operation

Tai ＜ 16°C, indoor unit stops running and sends stop-unit signal to outdoor.

Tai > Tset+2°C, indoor unit operates in the same way as cooling mode, and the automatic air is also controlled in accordance with cooling mode. The working mode sent to the outdoor unit is cooling.

Tset < Tai≤Tset +2°C, the operation mode sent from the indoor unit to the outdoor unit is dehumidification, turn on for 10 minutes and the indoor unit wind speed is low, turn off for 6 minutes to fix S-Code=0 and the indoor unit wind is stopped, and run alternately; Turn OFF for 6 minutes. When the indoor unit is faulty, the timing period remains unchanged for 10 minutes at a low speed and 6 minutes at a low speed.

Tai≤Tset, indoor motor runs at low speed and sends stop-unit signal to outdoor

4.3.3 Fan Operation

Indoor fan motor will run as the fan speed set on the remote controller or the wired controller and indoor unit will send the stop-unit signal to outdoor.

4.3.4 Auto Operation

A: If the unit enters Auto mode for the first time, the system will adjust the operation mode according to the room temp. and the set temp.

When Tai ≥ Tset, entering auto cooling mode;

When Tai ＜ Tset, entering auto heating mode.

B: Auto cooling mode is as the same as the cooling mode. After the thermostat is OFF for 15 minutes, if Tai+ 2+Tcomp2 ＜ Tset, the unit will enter auto heating mode, or the unit will still stay at auto cooling mode and stop when it reaches the set temperature; while the indoor motor will be at low speed.

C: Auto heating mode is as the same as the heating mode. After the thermostat is OFF for 15 minutes, if Tai≥Tset+1 +Tcomp1, the unit will enter auto cooling mode, or the unit will still stay at auto heating mode;

D: In this mode, the Sleep function is available, run as cooling sleep in cooling mode and as heating sleep in heating mode. Once sleep mode is set, the mode will not change after the unit stops for 15 minutes when it arrives Tset.

E: Mode conversion will be confirmed after compressor has stopped for 10 minutes.

4.3.5 Abnormal Operation

A: When outdoor modes from the request of indoor unit conflict, the one entering firstly will take priority.

B: After indoor receives the ON command from wired controller, it will firstly confirm the outdoor current operation mode. If they are the same modes, indoor unit will run as the request of remote controller. If they are different modes, the system will forbid to operate, and indoor will keep the OFF mode and send the “standby” signal to wired controller until outdoor stops or outdoor mode the requested mode of wired controller are the same, the unit will run as the requested mode of wired controller.

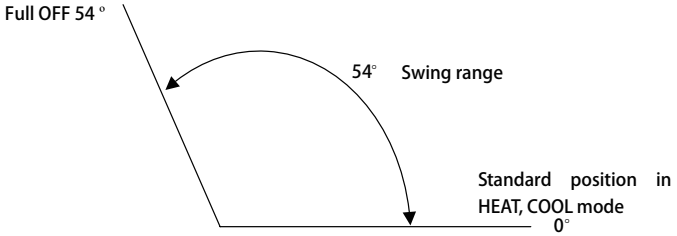
C: After indoor receives the ON command from remote controller, it will firstly confirm the outdoor current operation mode. If they are the same mode, indoor unit will run as the request of remote controller. If they are different modes, the system will forbid to operate, and indoor will keep the OFF mode. After setting on remote controller, if the buzzer sounds two times, that shows abnormal operation. Indoor will run until the outdoor mode and the requested mode of remote controller are the same.
D: In AUTO mode, when the indoor unit occurs abnormal operation, the indoor unit will keep OFF state, and the buzzer will not sound until the outdoor mode and the requested mode of indoor unit are the same.
F: COOL (included AUTO COOL), DRY, FAN are not abnormal mode.
G: HEAT and FAN are not abnormal mode.

4.3.6 Control for Discontinuous Operation

After the unit starts up in cooling/heating mode, in 30 seconds, the compressor run/stop will not be controlled by the room temp., but after changing the set temp., if compressor stop condition can be met, the system will stop compressor immediately.

4.3.7 Swing Motor Control

Indoor unit will control the swing motor according to the swing signal from the wired controller.



4.3.8 Static pressure gear setting

The cassette type can choose different wind speed according to the installation height, the factory setting standard installation height; The wired controller can set three levels of installation height, the standard installation height (2.7m), wind speed is strong/high/medium/low/small, in turn call 5/4/3/2/1 (level 1 static pressure gear);
High installation height (3.5m), wind speed is strong/high/medium/low/small, call 6/5/4/3/2 in turn (i.e. wind speed of each gear is raised one level in the standard gear wind speed, 2 level static pressure gear);
The highest installation height (4.2m), the wind speed is strong/high/medium/low/small, in turn call 7/6/5/4/3 (i.e., the wind speed of each gear is raised 2 levels in the standard speed, 3 levels of static pressure gear);
The fan speed is divided into 7 levels, which are adjusted according to the static pressure gear sent by the wired controller or remote controller.
Use the remote controller to set the static pressure mode: In supply air mode, select high air and press the health key 4+N continuously (4≥N≥1) to set to static pressure level N, and the reverberation of N+1 indicates successful setting.
Use the wire control mode: Click on the static press file on the wired controller interface.

4.3.9 Water Pump Control

A: Water pump will be electrified when indoor unit enters non-heating mode until indoor unit stops. 5 minutes later after indoor unit stops, water pump will stop.
B: In OFF state and in any mode, once float switch signal is measured, indoor unit will send OFF signal to outdoor and after 5 min if still float switch signal then send the failure code of drainage system to the wired controller, then the water pump will work until the float switch signal is cancelled. After water pump is forced to run for 5 minutes, indoor unit will be back to normal state.

4.3.10 Trial Operation

A: Enter condition

a: Wired control type: In OFF state of COOL or HEAT mode, press ON/OFF button for over 5 seconds to enter the cooling or heating trial operation;

b: Remote control type: In OFF state, keep pressing ON/OFF button until 5 seconds later, the buzzer sounds twice, then enter the cooling or heating trial operation;

B: Response in trial operation

a: Cooling trial operation: indoor sends S-CODE=SD to outdoor, indoor: at high speed, set temp: 16°C;

b: Heating trial operation: indoor sends S-CODE=SF to outdoor, indoor: at high speed, set temp: 30°C;

c: In this period, anti-freezed and overheat functions are invalid.

C: Quit condition

a: Receiving the signal of cancelling trial operation from wired controller or remote controller;

b: After trial operation has run for 20 minutes, it will quit trial operation automatically and enter the normal mode with the set temp.: 24°C.

4.3.11 Timer Operation

A: Wired control type: wired controller will control the unit ON/OFF;

B: Remote control type: indoor unit will confirm the unit ON or OFF according to the current clock and the timer clock set by remote controller. When setting timer function, the timer LED will be ON.

4.3.12 SLEEP Function

A: Wired control type unit is without sleep function;

B: Remote control type unit consists of cooling sleep and heating sleep, after the sleep is set, the unit will change mode; the sleep will begin to count.

a: In cooling/dry mode, after running for 1 hour, the set temp. will increase 1°C, another 1 hour later, the set temp. will increase 1°C again, then 6 hours (or set time-2) later , it will stop.

b: In heating mode, after running for 1 hour, the set temp. will reduce 2°C, another 1 hour later, the set temp. will reduce 2°C again, then 3 hours later, the set temp. will increase 1°C, and another 3 hours(or set time-5), it will stop.

c: When setting sleep function, indoor motor is forced at low speed.

4.3.13 Healthy Negative Ion Function

When receiving the healthy signal from the wired controller or remote controller, if fan motor is running, the negative ion will work;

If the fan motor stops, the negative ion generator will stop.

4.3.14 Auto-Restart Function

A: Wired control type:

YR-E17: Please refer to the DIP switch setting SW4: ON means auto-restart unavailable; OFF means auto-restart available(SW4=OFF is factory default setting)

B: Remote control type:

YR-HBS01:

In 5 seconds, press SLEEP button 10 times continuously, the buzzer will beep 4 times and enter auto-restart function. In 5 seconds, press SLEEP 10 times continuously, the buzzer will beep twice and quit auto-restart functioh

C: Memory information: ON/OFF state, mode, fan speed, set temp., health, swing position;

D: If the memory includes timer or sleep function, when being electrified again, timer and sleep will be cancelled;

E: If the memory includes auto mode, when the jumper shows cooling only type, auto mode will change to cooling mode.

4.3.15 Room Card Function

1)Room card function is invalid when the dip switch is off

If room card function invalid, indoor unit could be switched on/off by remote controller, wired controller, central controller and dry contact (When dry contact close the unit turns ON, when dry contact disconnect the unit turns OFF).

When the dry contact close, the unit will operate as per the state set by controller during the previous operation (EE memory separated), that will remember operating modes, fan speed, temperature setting, healthy mode, swing position etc. Timer and sleep mode will be canceled when the unit startup again.

When dry contact disconnect, indoor unit can be controlled by controller when turned off.

2)Room card function is valid when the dip switch is on

If room card function valid, the indoor unit will only runs when the room card connect first then switched ON by remote controller, wired controller or central controller. (The indoor unit stops when the room card disconnect, or switched OFF by remote controller, wired controller or central controller.)

When dry contact close, the indoor unit will be at stand-by state, indoor unit will be ON and run as per the controller setting state when it's switched on by wireless controller or power lost memory.

When dry contact disconnect, the indoor unit will shut down immediately and cannot be controlled by controller. connected, the unit can not be controlled.

4.3.16 Setting Method of Temperature Compensation Tcomp

A. Wired control type unit: this function is not available

B. Remote control type unit:

In cooling or heating mode, there is always with the temp. compensation.

In heating mode: In 24°C heating mode, press SLEEP(or SWING) button 7 times continuously within 5 seconds, indoor buzzer sounds twice, that shows temp. compensation works. Switch on the unit in heating mode by the remote controller, press TEMP button to set the set temp., so temperature compensation=the current set temp. - 24°C. For example, if the set temp. is 24°C, the temp. compensation is 0°C; if the set temp. is 25°C, the temp. compensation is 1°C. The max. compensation temp. is 6°C (the set temp. is 30°C). If you want to cancel it, set the temp. as 24°C.

In cooling mode: In 24°C cooling mode, press SLEEP(or SWING) button 7 times continuously within 5 seconds, indoor buzzer sounds twice, that shows temp. compensation works. Switch on the unit in heating mode by the remote controller, press TEMP button to set the set temp., so temperature compensation=24°C-the current set temp. For example, if the set temp is 24°C, the temp. compensation is 0°C; if the set temp. is 23°C, the temp. compensation is -1°C. The max. compensation temp is -8°C (the set temp is 16°C). If you want to cancel it, set the temp as 24°C.

So the temp. compensation range is +8°C~-6°C.

4.3.17 Anti-Freezed Protection

When compressor has run for over 5 minutes, to prevent indoor evaporator freezing (in cooling/dry mode), if indoor mid-coil temp is below -1 degree for over 5 minutes, indoor EEV will close, and compressor will stop. When indoor mid-coil temp is over about 10 degree, the unit will be normal.

4.3.18 Moving sensor (IFP):

Controller setting steps:

YL-HBS01:

(1) Press “IFP” button, display IFP AUTO , IFP function is set, and press “IFP” button again to cancel.
(2) Press “Follow/Evade” button, display that expresses following; press it again, display that expresses evading. Press it the third time to cancel.
(3) If follow/evade functions are set, air-out angle will change with position of people, so after setting these functions, Four-side Embedment icons in all sides, up-and-down SWING and left-and right SWING icons will disappear.

YR-E17A:

(1) Moving sensor function includes

- (Follow): Swing direction follows people
- (Evade): Swing direction evades people
- (Preception): If no person is perceived in half an hour (Time depends on the indoor unit or the setting of the moving sensor), the indoor unit will be off.

(2) Press MENU key, then will enter function circulation, use ▲ or ▼ key to switch between different functions. Switch to / / function, then press MENY key again, / / function will be turned on. If the function is turned on, / / icon will be displayed in the main interface.
In the state where the / / function is turned on, if you want to turn it off, please enter function circulation and switch to / / icon, then press MENU key, and the function will be turned off.

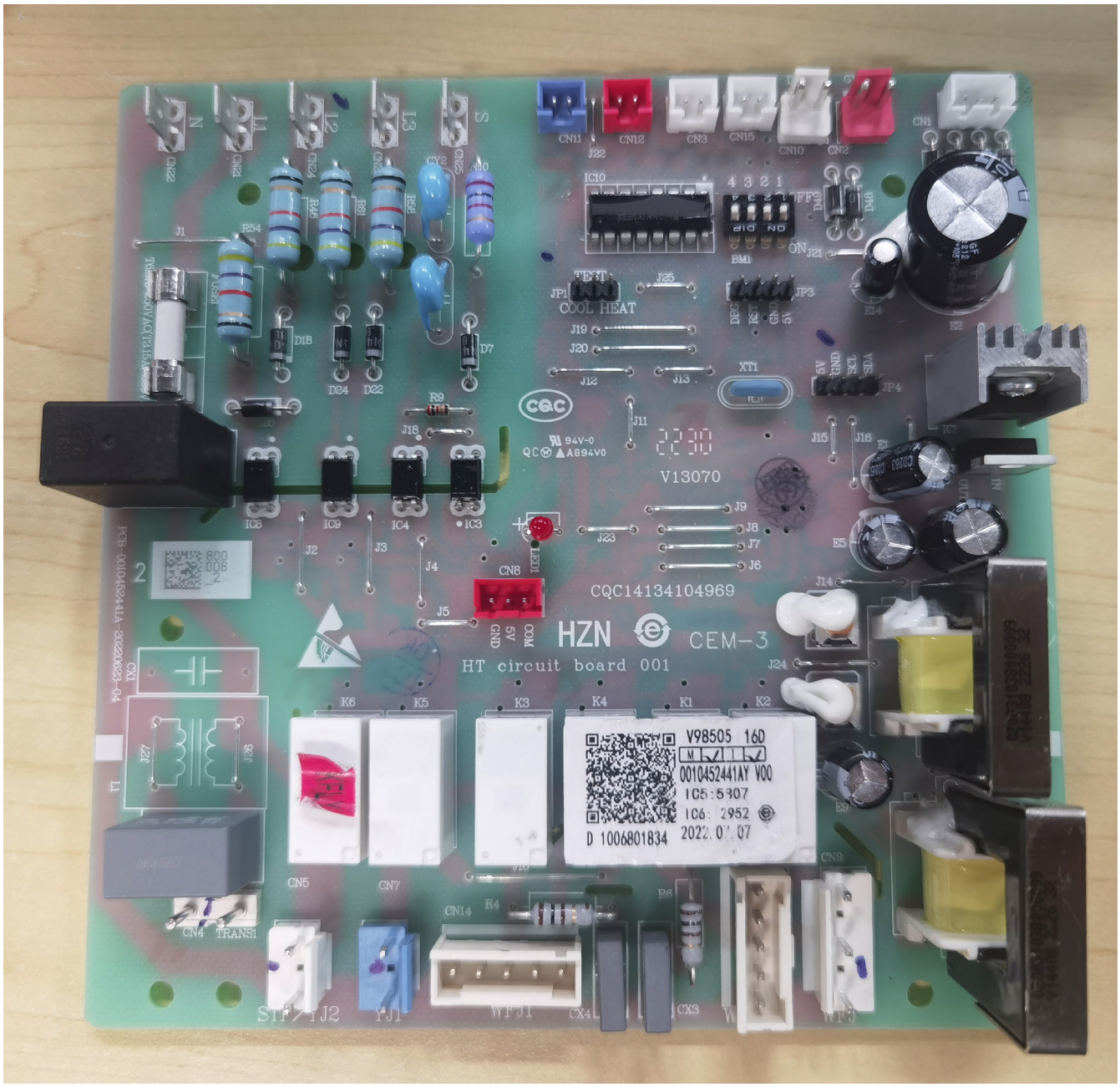
(3) When the / function is turned on, if you adjust swing angle, the / function will be turned off
(4) / / functions cannot be turned on at the same time. Only one function can exist at a time.

4.3.19 Fresh air

The fresh air outputs when there is a fresh air signal. When the unit turns on, the output of fresh air can be set in any mode and working condition (including defrosting), which controlled by the controller's fresh air signal, and when the unit turns off, the fresh air function is closed at the same time). The fresh air relay will close after receiving the fresh air signal until the fresh air signal stops or unit turns off.

4.4 Outdoor unit PCB Photo

1U50S1TM1SA 1U71S1TT1SA 1U90S1LT1SA 1U105S1LN1SB 1U140S1LP1SB
PCB 0010452441AY



4.5 Outdoor unit dip switch setting

1U50S1TM1SA 1U71S1TT1SA 1U90S1LT1SA 1U105S1LN1SB 1U140S1LP1SB
PCB 0010452441AY
Dip switch setting when out of factory

BM1-1	BM1-2	BM1-3	BM1-4	Description
OFF	OFF	OFF	OFF	Capacity:5.0kw/18kBTU
OFF	OFF	OFF	OFF	Capacity: 7.1kw/25kBTU
OFF	ON	OFF	OFF	Capacity: 9.0kw/30kBTU
ON	OFF	OFF	OFF	Capacity: 10.5kw/36kBTU
ON	ON	OFF	OFF	Capacity: 12.5kw/40kBTU
ON	ON	OFF	OFF	Capacity: 14.0kw/48kBTU

4.6 Diagnostic Code

AB50S1SR1FA

LED flash times of indoor PCB		I.R.Receiver digital display	Contents of Malfunction	Possible reasons
LED6	LED1			
0	1	E1	Malfunction of indoor unit ambient temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	2	E2	Malfunction of indoor unit piping temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	8	E8	Abnormal communication between wired controller and indoor unit	Wrong connection or wired controller broken,or PCB faulty
0	12	E10	Malfunction of drain system	Pump motor disconnected or at wrong position,or the float switch disconnected or at wrong position, or the short circuit bridge disconne ted
0	13	C1	Zero cross sigal wrong	Zero cross sigal detected wrong
0	14	E14	Indoor unit DC fan motor abnormal	DC Fan motor disconected, or DC Fan broken or circuit broken
0	11	E11	The R32 refrigerant leaks	The R32 refrigerant leaks
0	19	E19	Malfunction of The R32 detector	Detector disconected,or broken
6	1	F14	System pressure switch off	Check the system pressure

1.The outdoor failure can also be indicated by the indoor unit,the checking method as follows: LED6 flash times stands for ten's place,and LED1 flash times stands for one's place, use this ten-digit number minus 20,then will get the outdoor error code.For example,if the outdoor error code is 15,LED6 will flash 3 times firstly,two seconds later,LED1 will flash 5 times , and four seconds later the process will repeat again.
2.LED6 is a green one on the indoor PCB,LED1 is a yellow one.
3.To get much more details about the out door unit failure,please refer to the outdoor unit trouble shooting list.

AB71S1SR1FA AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA

LED flash times of indoor PCB		I.R.Receiver digital display	Contents of Malfunction	Possible reasons
LED6	LED1			
0	1	E1	Malfunction of indoor unit ambient temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	2	E2	Malfunction of indoor unit piping temperature sensor	Sensor disconected,or broken,or at wrong position,or short circuit
0	7	E7	Abnormal communication between indoor and outdoor units	Wrong connection,or the wires be disconected or wrong adress setting of indoor unit or faulty power supply or faulty PCB
0	8	E8	Abnormal communication between wired controller and indoor unit	Wrong connection or wired controller broken,or PCB faulty
0	12	E10	Malfunction of drain system	Pump motor disconnected or at wrong position,or the float switch disconnected or at wrong position, or the short circuit bridge disconnected
0	13	C1	Zero cross sigal wrong	Zero cross sigal detected wrong
0	14	E14	Indoor unit DC fan motor abnormal	DC Fan motor disconected, or DC Fan broken or circuit broken
0	11	E11	The R32 refrigerant leaks	The R32 refrigerant leaks
0	19	E19	Malfunction of The R32 detector	Detector disconected,or broken
3	5	E15	Malfunction of outdoor unit	Check the outdoor unit

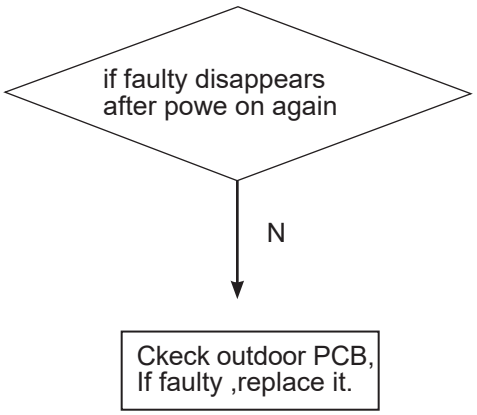
1.The outdoor failure can also be indicated by the indoor unit,the checking method as follows: LED6 flash times stands for ten's place,and LED1 flash times stands for one's place, use this ten-digit number minus 20,then will get the outdoor error code.For example,if the outdoor error code is 15,LED6 will flash 3 times firstly,two seconds later,LED1 will flash 5 times , and four seconds later the process will repeat again.
2.LED6 is a green one on the indoor PCB,LED1 is a yellow one.
3.To get much more details about the out door unit failure,please refer the outdoor unit trouble shooting list.

1U71S1TT1SA 1U90S1LT1SA 1U105S1LN1SB 1U140S1LP1SB

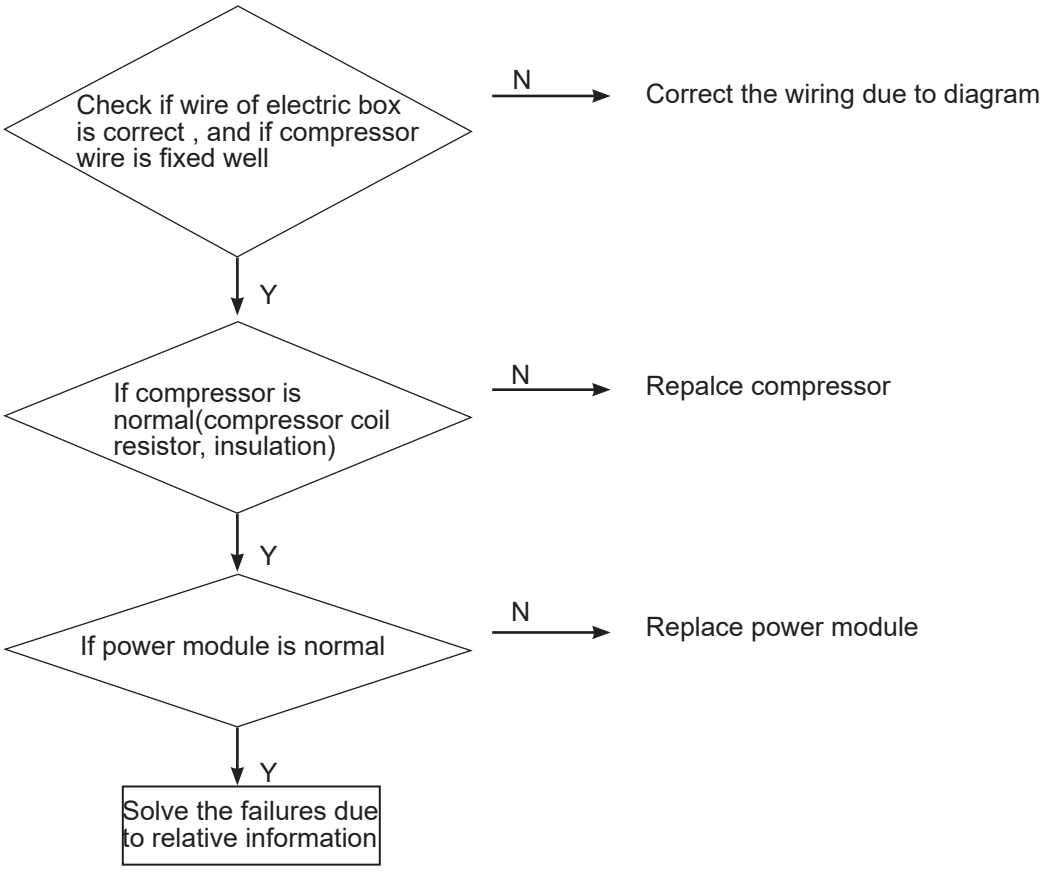
TROUBLE SHOOTING			
Flash times of LED	Trouble Description	Analyze and diagnose	Remark
3	Outdoor ambient temp. sensor abnormal	Sensor broken down or short circuit	Resumable
11	Protection of discharging temp. too high or sensor abnormal	After compressor starts up, if TD is over 120℃; 10 seconds later compressor stops	Resumable
5	Phase sequence abnormal	Power supply phase sequence wrong	Resumable
5	Compressor current protection abnormal	Over current/low current or current imbalance between two phase after compressor running	Non-Resumable
6	High pressure abnormal	High pressure switch acts abnormal.	Non-Resumable
7	High/Low voltage protection	Phase voltage too high or too low(over270V last 2 seconds; below 176V last 2 seconds)	Resumable
9	Abnormal communication between indoor and outdoor unit	Wrong connection or PCB faulty	Resumable
16	Low presure abnormal	Low pressure switch acts abnormal.	Non-Resumable
4	Outdoor defrosting temp. Sensor abnormal	Sensor broken down or short circuit	Resumable
13	Outdoor EEPROM Abnormal	Wrong EEPROM used	
14	Anti-freeze protection indication	System into Anti-freeze protection	Resumable

4.7 Trouble Shooting

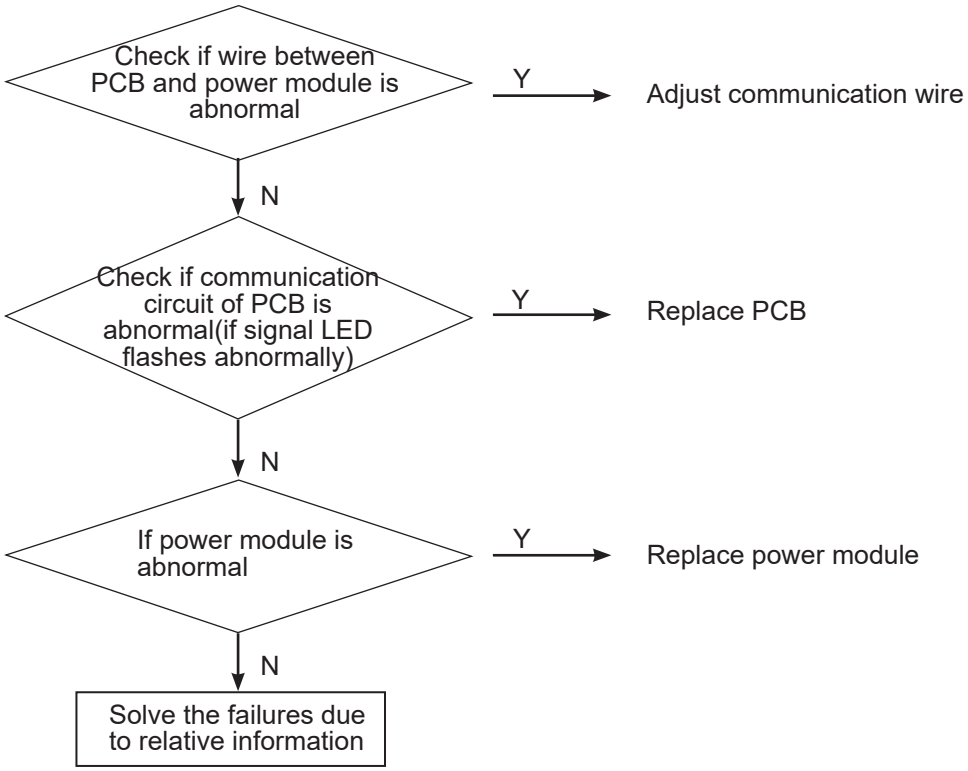
[1] Outdoor EEPROM Failure



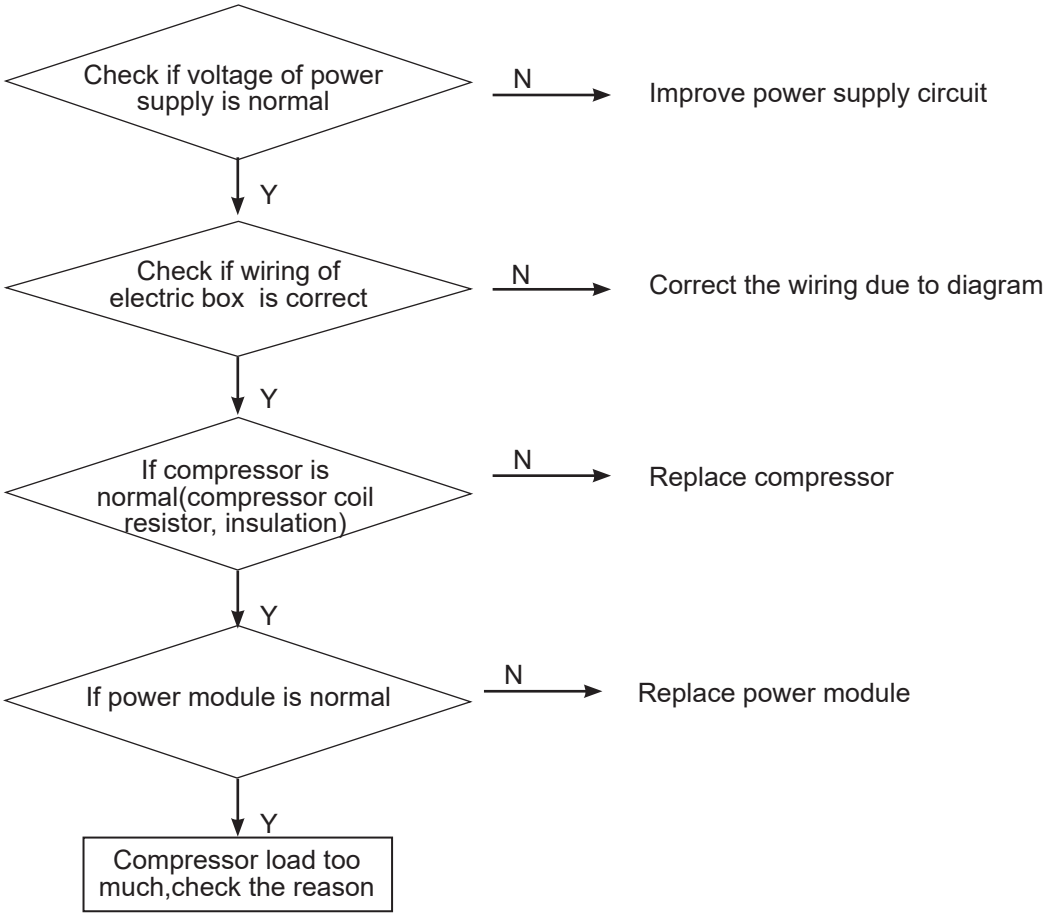
[2] IPM Over Current or Short Circuit



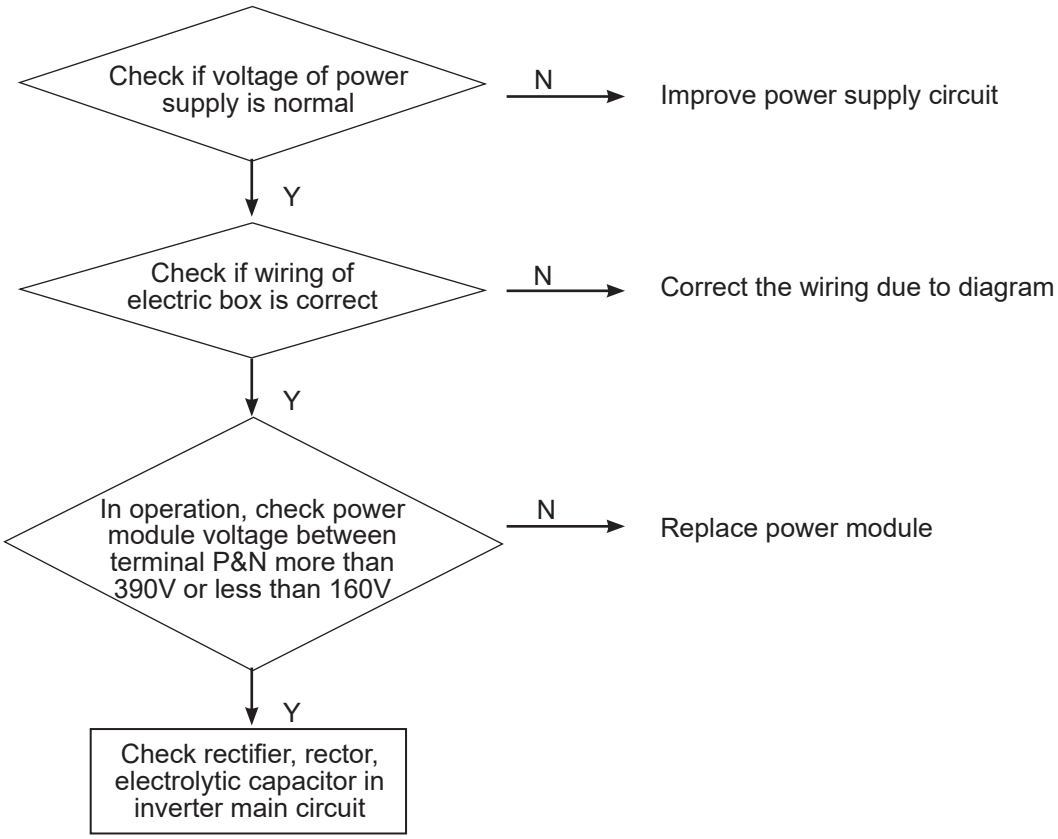
[4] Communication Failure Between Module Ans Ecu



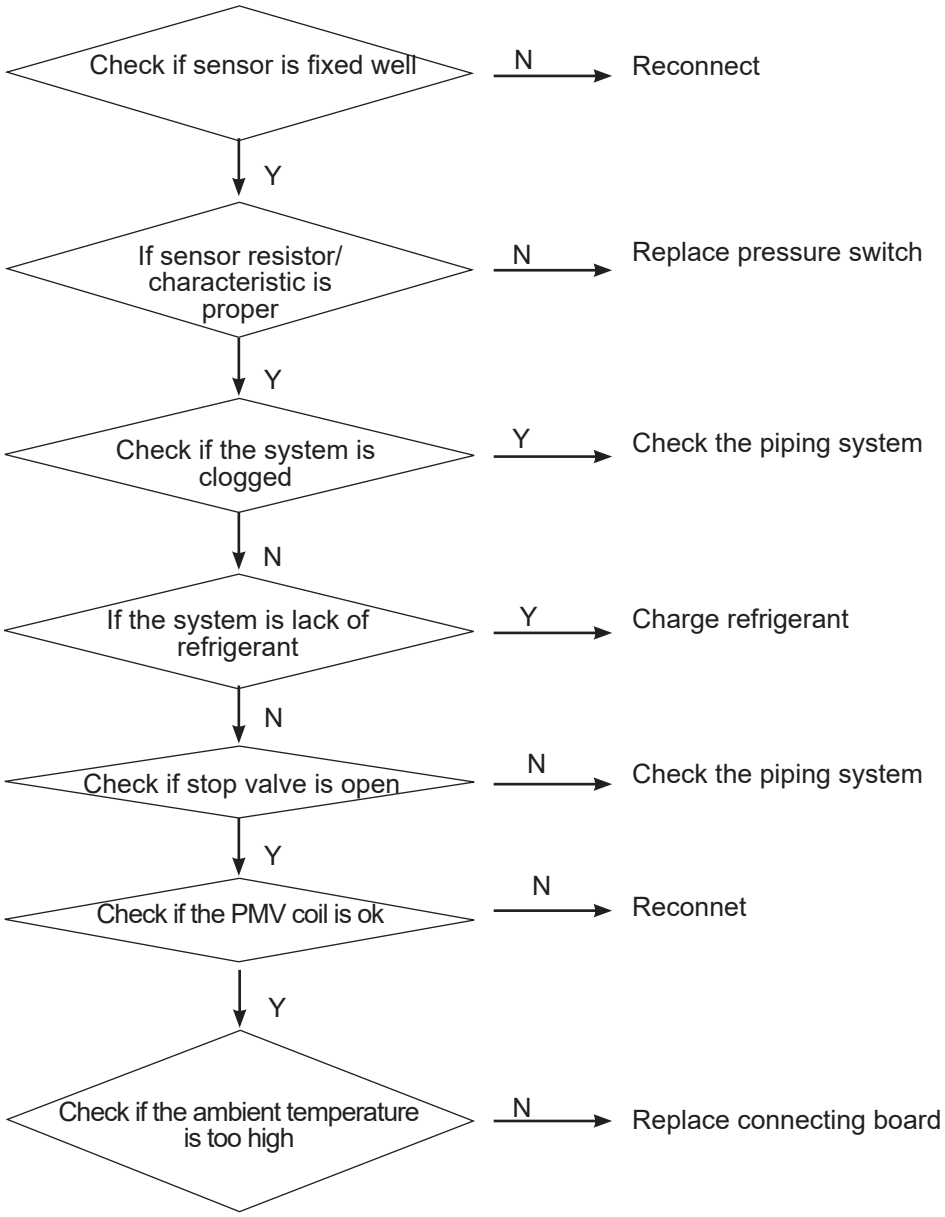
[5] Module Operated Overload



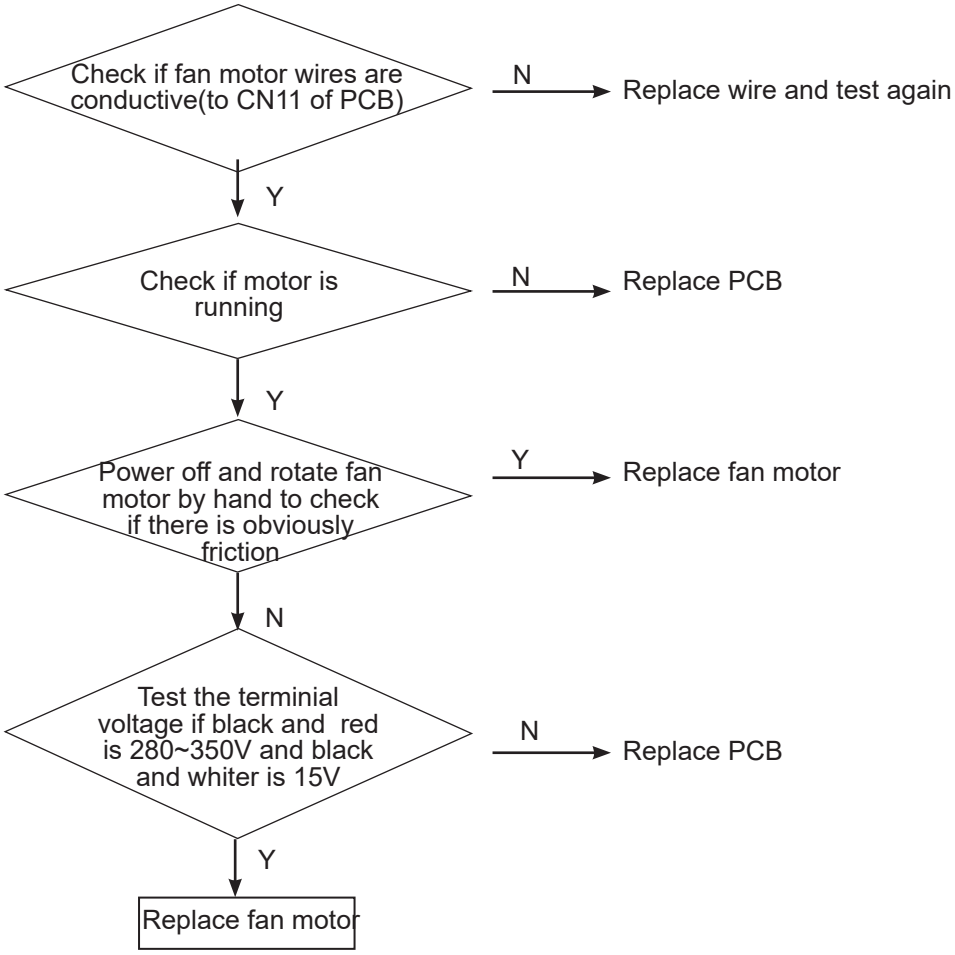
[6] Voltage too High or Low



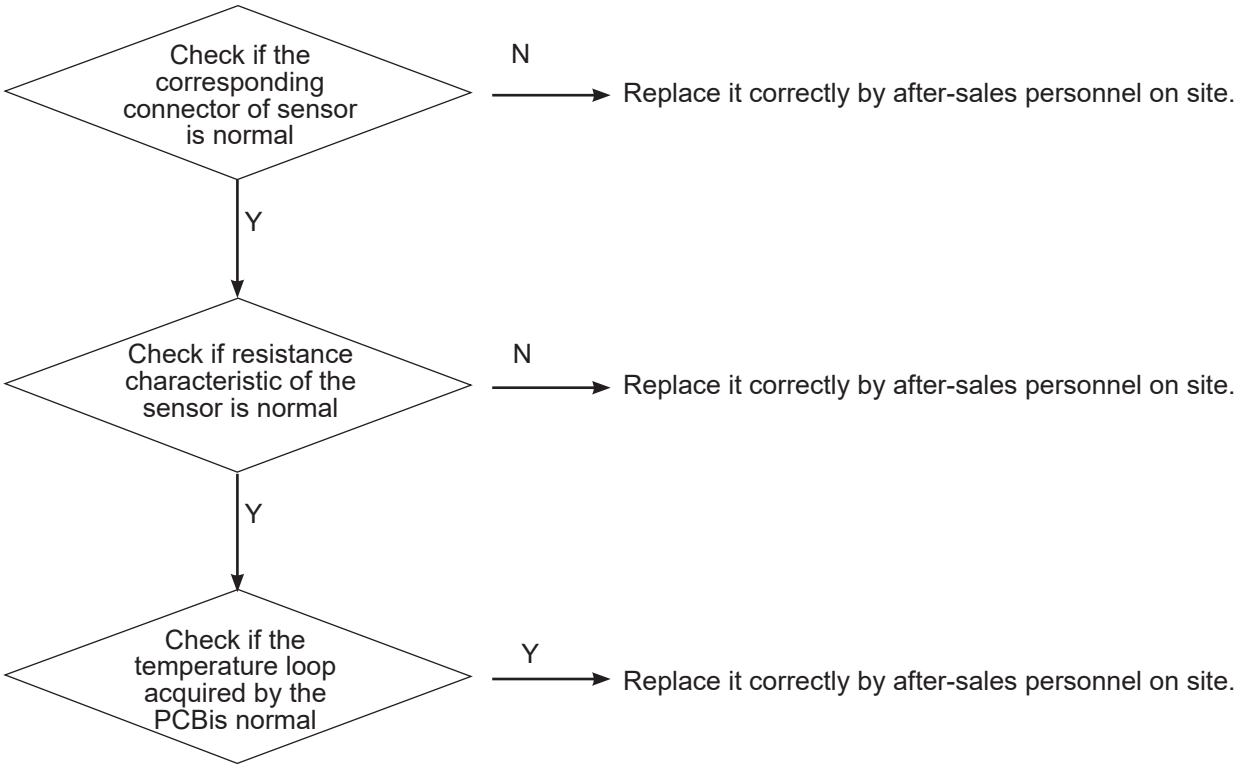
[8] Discharging Temperature Overheating



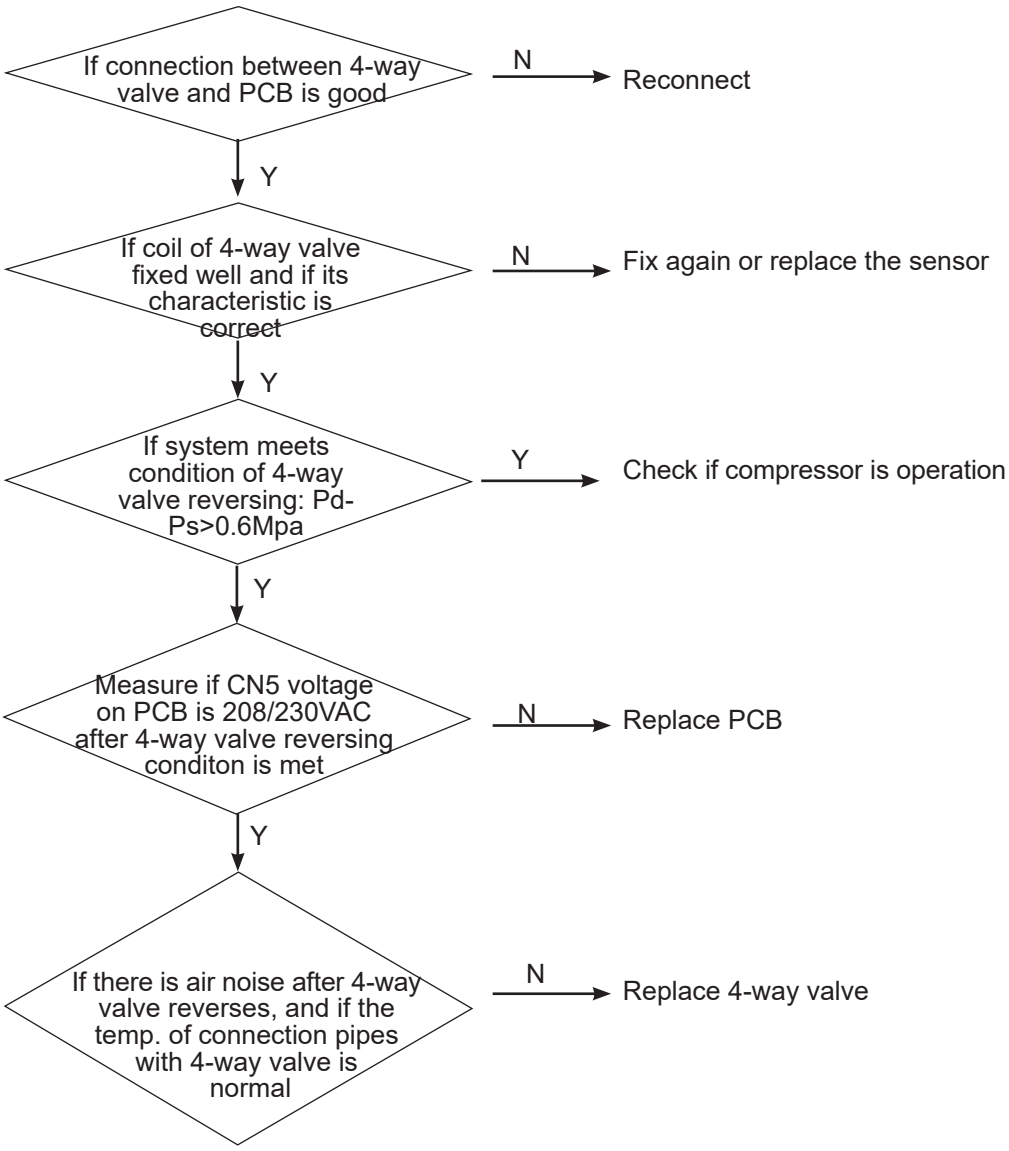
[9] DC Fan Motor Failure



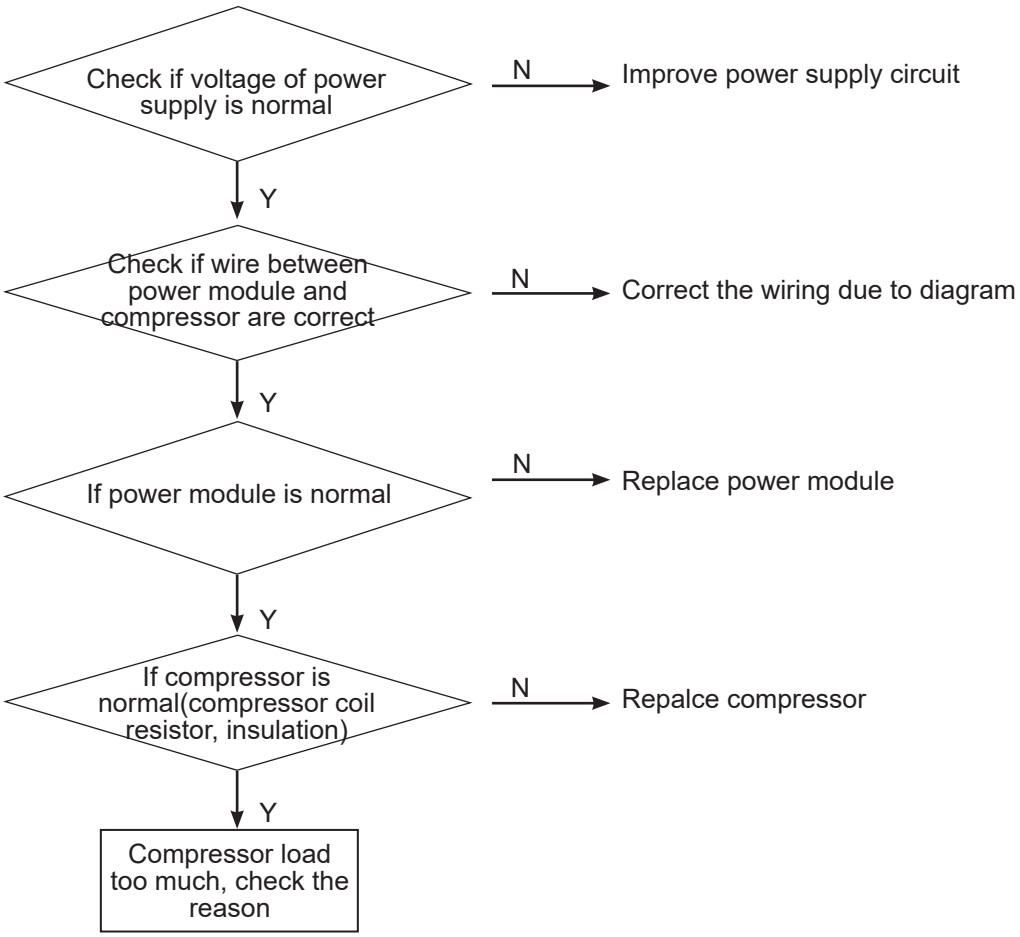
[10~13,28~36,38~41] Temperature Sensor Failure



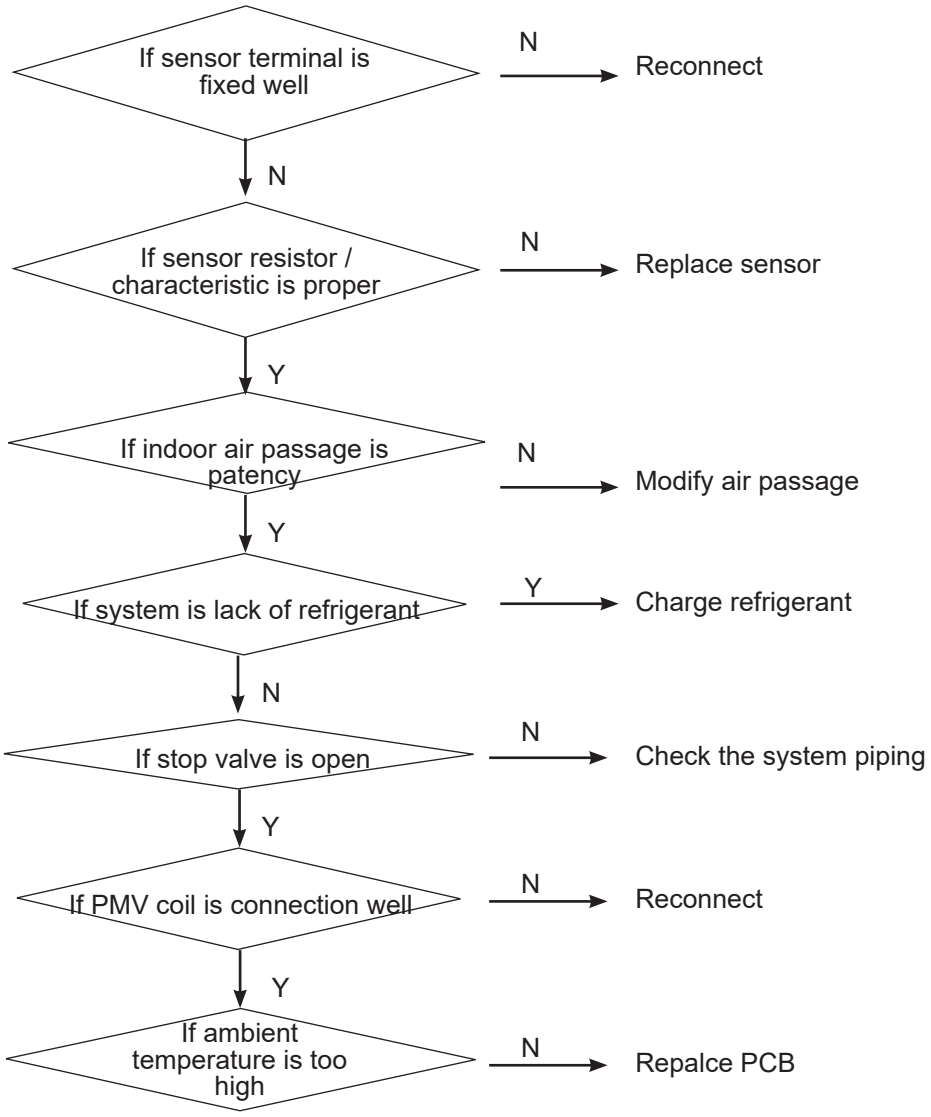
[17] 4-Way Valve Reversing Failure



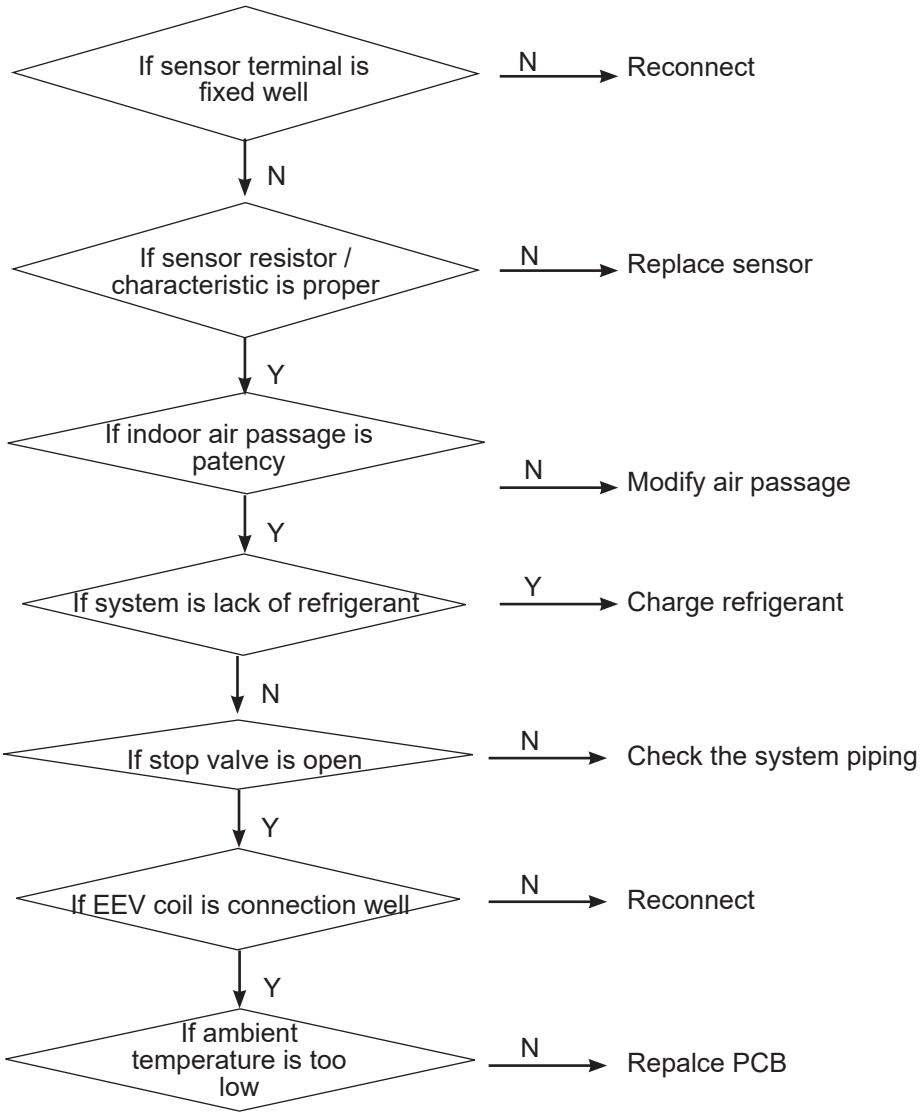
[18] Compressor Out Of Control Circuit



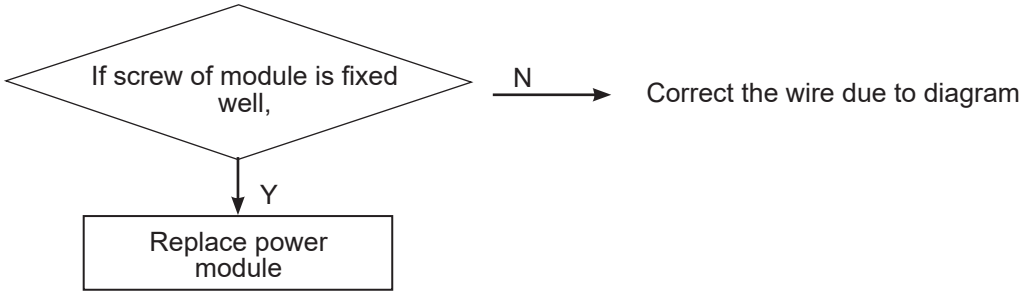
[20] Indoor Thermal Overload



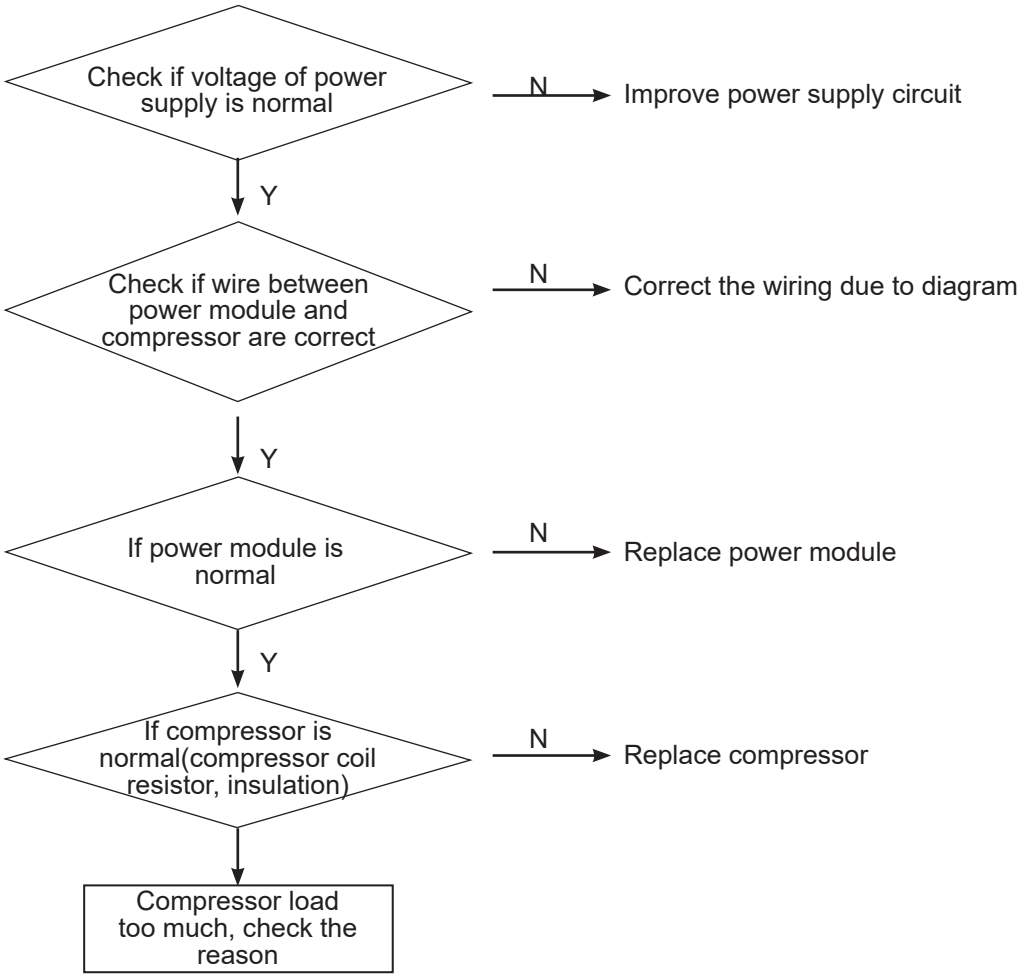
[21] Indoor Frosted



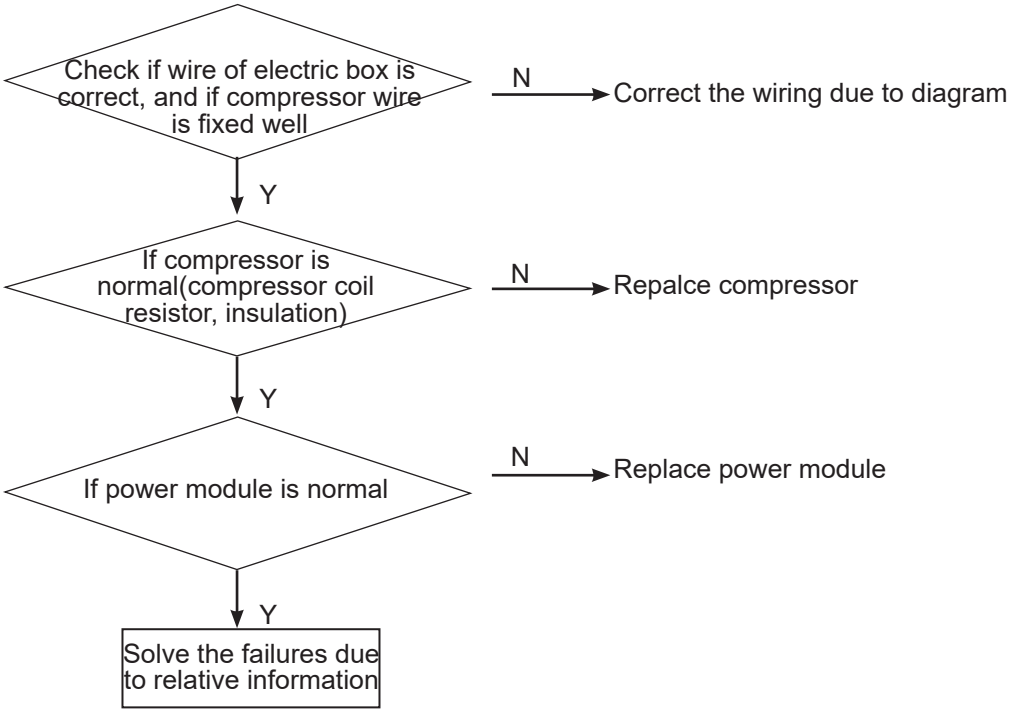
[23] Module Thermal Overload



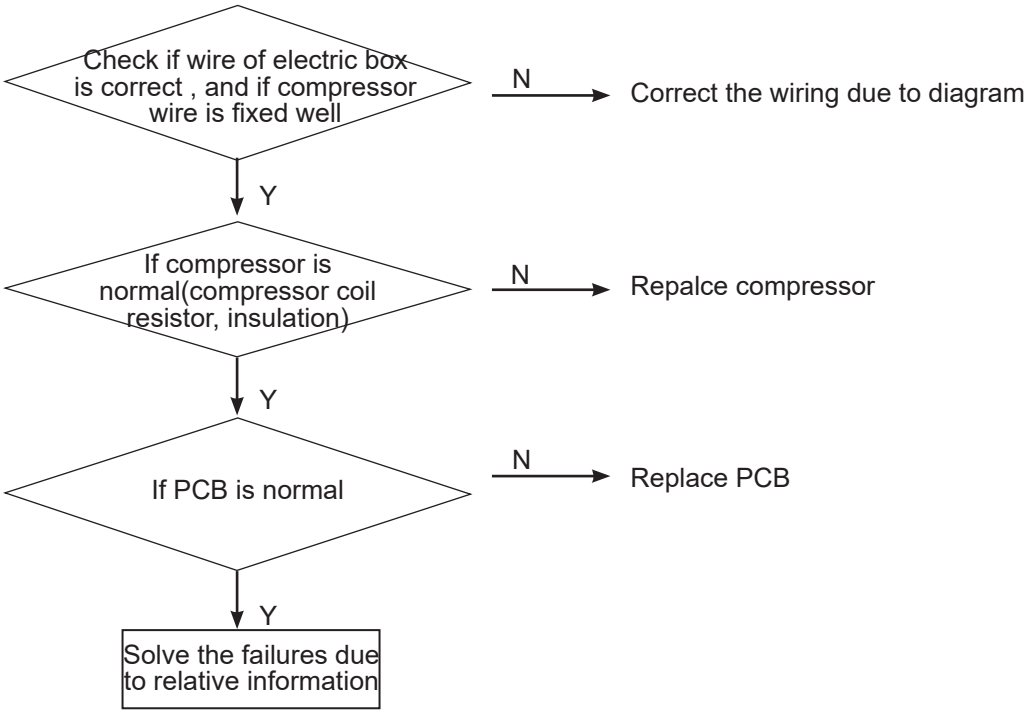
[24] Compressor Startup Failure



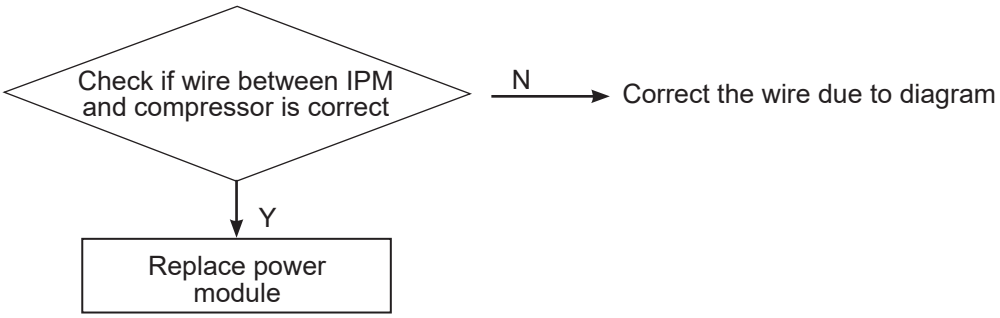
[25] Module Input Over-Current



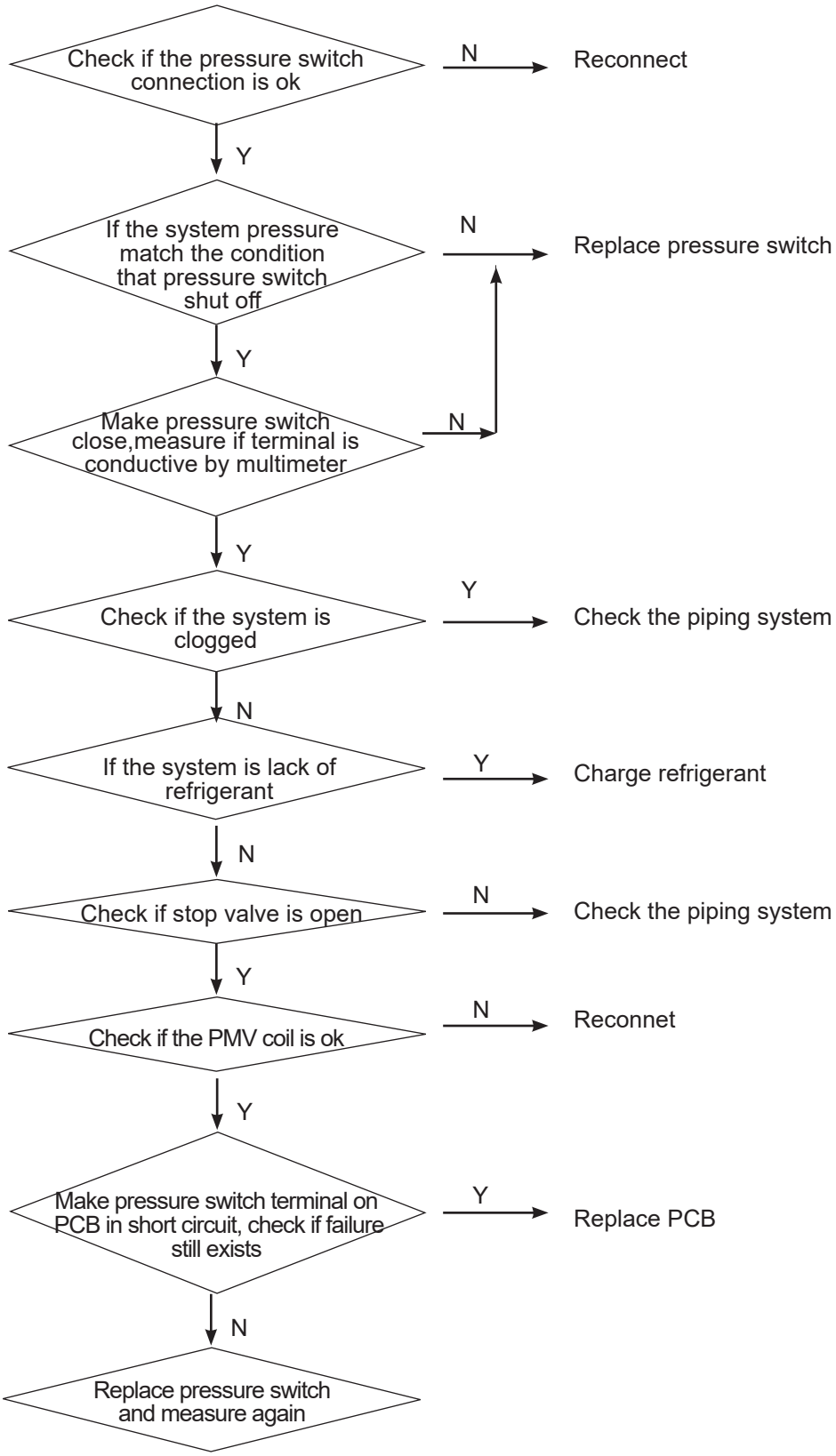
[26] MCU Reset



[27] Module Current Detect Circuit Failure



[42,43] High Or Low Pressure Switch Shut Off Failure



Appendix I Sensor Characteristic

Model	Function	Part Code	Characteristic
AB50S1SR1FA AB71S1SR1FA AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA	Indoor Ambient Temperature Sensor	0150402268	R25=23KΩ±2% B25/50=4200K±1%
1U50S1TM1SA 1U71S1TT1SA 1U90S1LT1SA 1U105S1LN1SB 1U140S1LP1SB	Outdoor Ambient Temp. Sensor	001A3900110	R25=5KΩ±3% B25/50=3450±3%
	Coil temp.sensor	0010451314	R25=5KΩ±3% B25/50=3450K±3%
	Discharging temp. sensor	0010450398	R80=50KΩ±3% B25/80= 4450K±3%

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R25=23KΩ±2%B25/50=4200K±1%							
T (°C)	Rnom (KΩ)	T (°C)	Rnom (KΩ)	T (°C)	Rnom (KΩ)	T(°C)	Rnom (KΩ)
-10	149.07	27	20.94	64	4.52	101	1.32
-9	140.35	28	20.00	65	4.36	102	1.28
-8	132.20	29	19.10	66	4.21	103	1.25
-7	124.59	30	18.24	67	4.05	104	1.21
-6	117.46	31	17.43	68	3.91	105	1.18
-5	110.79	32	16.66	69	3.77	106	1.14
-4	104.54	33	15.93	70	3.64	107	1.11
-3	98.69	34	15.24	71	3.51	108	1.08
-2	93.20	35	14.58	72	3.39	109	1.05
-1	88.06	36	13.95	73	3.28	110	1.02
0	83.23	37	13.35	74	3.16	111	0.99
1	78.70	38	12.79	75	3.06	112	0.96
2	74.45	39	12.25	76	2.95	113	0.93
3	70.46	40	11.73	77	2.85	114	0.91
4	66.70	41	11.24	78	2.76	115	0.88
5	63.18	42	10.78	79	2.66	116	0.86
6	59.86	43	10.33	80	2.58	117	0.84
7	56.74	44	9.91	81	2.49	118	0.81
8	53.80	45	9.51	82	2.41	119	0.79
9	51.03	46	9.12	83	2.33	120	0.77
10	48.42	47	8.76	84	2.26	121	0.75
11	45.97	48	8.41	85	2.18	122	0.73
12	43.65	49	8.07	86	2.11	123	0.71
13	41.46	50	7.75	87	2.05	124	0.69
14	39.40	51	7.45	88	1.98	125	0.67
15	37.46	52	7.16	89	1.92	126	0.66
16	35.62	53	6.88	90	1.86	127	0.64
17	33.89	54	6.62	91	1.80	128	0.62
18	32.25	55	6.36	92	1.74	129	0.61
19	30.70	56	6.12	93	1.69	130	0.59
20	29.23	57	5.89	94	1.64	131	0.58
21	27.84	58	5.67	95	1.59	132	0.56
22	26.53	59	5.46	96	1.54	133	0.55
23	25.29	60	5.25	97	1.49	134	0.53
24	24.11	61	5.06	98	1.45		
25	23.00	62	4.87	99	1.41		
26	21.94	63	4.70	100	1.36		

R25=5KΩ±3% B25/50=3450±3%							
T (°C)	Rnom (KΩ)	T (°C)	Rnom (KΩ)	T (°C)	Rnom (KΩ)	T(°C)	Rnom (KΩ)
-30	62.209	4	11.828	38	3.088	72	1.029
-29	58.887	5	11.324	39	2.981	73	0.999
-28	55.769	6	10.845	40	2.877	74	0.971
-27	52.841	7	10.388	41	2.778	75	0.943
-26	50.088	8	9.954	42	2.682	76	0.916
-25	47.499	9	9.54	43	2.591	77	0.89
-24	45.062	10	9.146	44	2.503	78	0.866
-23	42.768	11	8.77	45	2.418	79	0.841
-22	40.606	12	8.412	46	2.337	80	0.818
-21	38.568	13	8.07	47	2.259	81	0.795
-20	36.646	14	7.744	48	2.184	82	0.774
-19	34.833	15	7.433	49	2.112	83	0.752
-18	33.12	16	7.137	50	2.043	84	0.732
-17	31.503	17	6.854	51	1.976	85	0.712
-16	29.975	18	6.583	52	1.912	86	0.693
-15	28.531	19	6.325	53	1.851	87	0.674
-14	27.165	20	6.079	54	1.791	88	0.656
-13	25.873	21	5.843	55	1.734	89	0.639
-12	24.65	22	5.618	56	1.68	90	0.622
-11	23.493	23	5.403	57	1.627	91	0.605
-10	22.396	24	5.197	58	1.576	92	0.589
-9	21.358	25	5	59	1.527	93	0.574
-8	20.373	26	4.812	60	1.48	94	0.559
-7	19.44	27	4.632	61	1.434	95	0.544
-6	18.555	28	4.459	62	1.39	96	0.53
-5	17.716	29	4.294	63	1.348	97	0.517
-4	16.919	30	4.136	64	1.307	98	0.503
-3	16.163	31	3.985	65	1.268	99	0.49
-2	15.445	32	3.84	66	1.23	100	0.478
-1	14.763	33	3.701	67	1.193	101	0.466
0	14.115	34	3.568	68	1.158	102	0.454
1	13.499	35	3.44	69	1.124	103	0.443
2	12.914	36	3.318	70	1.091	104	0.432
3	12.357	37	3.201	71	1.059	105	0.421

R80=50KΦ±3% B25/80=4450K±3%					
T (°C)	Rnom (KΩ)	T (°C)	Rnom (KΩ)	T (°C)	Rnom (KΩ)
-30	11600	1	1775	32	366
-29	10860	2	1680	33	349.3
-28	10170	3	1590	34	333.5
-27	9529	4	1506	35	318.4
-26	8932	5	1426	36	304.1
-25	8375	6	1351	37	290.5
-24	7856	7	1280	38	277.6
-23	7372	8	1214	39	265.3
-22	6920	9	1151	40	253.6
-21	6498	10	1092	41	242.5
-20	6104	11	1036	42	232
-19	5736	12	983.2	43	221.9
-18	5392	13	933.4	44	212.3
-17	5071	14	886.4	45	203.2
-16	4770	15	841.9	46	194.5
-15	4488	16	800	47	186.3
-14	4225	17	760.8	48	178.4
-13	3978	18	722.8	49	170.9
-12	3747	19	687.3	50	163.7
-11	3531	20	653.8	51	155.9
-10	3328	21	622	52	150.4
-9	3138	22	592	53	144.2
-8	2960	23	553.6	54	138.3
-7	2793	24	536.6	55	132.7
-6	2636	25	511.1	56	127.3
-5	2489	26	486.9	57	122.1
-4	2351	27	464	58	117.2
-3	2221	28	442.3	59	112.5
-2	2099	29	421.7	60	108
-1	1984	30	402.1	61	103.8
0	1877	31	383.6	62	99.68

Appendix II Model With water pump list

Type	Model	With Pump
4-way cassette	AB50S1SR1FA AB71S1SR1FA AB90S1SR1FA AB105S1SR1FA AB140S1SR1FA	Yes

Haier Commercial Air Condition

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