Light Commercial Air Conditioner

R410A Inverter

Service Manual

2022.10

Contents

Part 1 General Information

1. Model Names of Indoor/Outdoor Units

1.1 R410A (capacity multiplied by 1000Btu/h)

Type	Function	18k	24k	30k	36k	48k	55k
4-way cassette	cooling and heating	√	×	×	×	×	×
8-way cassette	cooling and heating	√	√	√	√	√	√
Duct	cooling and heating	√	√	√	√	√	√
Ceiling & floor	cooling and heating	√	√	√	√	√	√

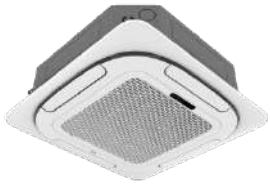
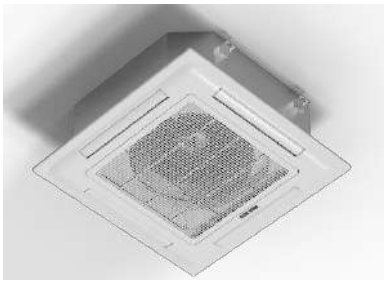
1.2 Outdoor Units

Model of outdoor unit and corresponding indoor unit

Universal Outdoor unit	Compressor type	Compressor Brand	Matched indoor units
TCC-18HA/DVO(02)	Rotary DC Inverter	GMCC	TCC-18CHRA/DV(Q4)(02)
			TCC-18CHRA/DV(02)
			TCC-18ZHRA/DV(02)
			TCC-18D2HRA/DV(02)
TCC-24HA/DVO(02)	Rotary DC Inverter	GMCC	TCC-24CHRA/DVI(02)
			TCC-24ZHRA/DVI(02)
			TCC-24D2HRA/DVI(02)
TCC-30HA/DVO(02)	Rotary DC Inverter	HIGHLY	TCC-30CHRA/DVI(02)
			TCC-30ZHRA/DVI(02)
			TCC-30D2HRA/DVI(02)
TCC-36HA/DVO(02)	Rotary DC Inverter	SANYO	TCC-36CHRA/DV(02)
			TCC-36ZHRA/DV(02)
			TCC-36D2HRA/DV(02)
TCC-48HA/DV7O(02)	Rotary DC Inverter	SANYO	TCC-48CHRA/DV7(02)
			TCC-48ZHRA/DV7(02)
			TCC-48D2HRA/DV7(02)
TCC-60HA/DV7O(02)	Rotary DC Inverter	HIGHLY	TCC-60CHRA/DV7(02)
			TCC-60ZHRA/DV7(02)
			TCC-60D2HRA/DV7(02)

2. External Appearance

2.1 Indoor Units

<table>
<tr><td>Duct
  </td><td>Ceiling & Floor
  </td></tr>
<tr><td>8‐way Cassette 360° Round Air Flow Cassette
   </td><td>4‐way Compact Cassette
  </td></tr>
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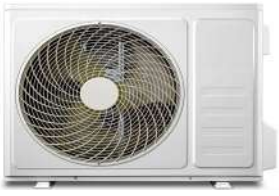
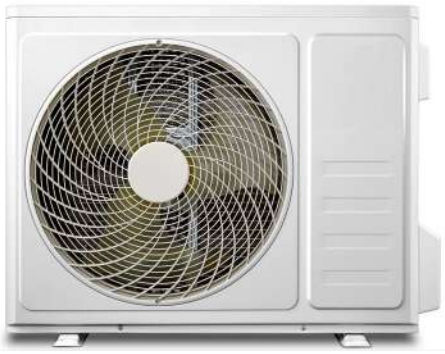
2.2 Outdoor Units



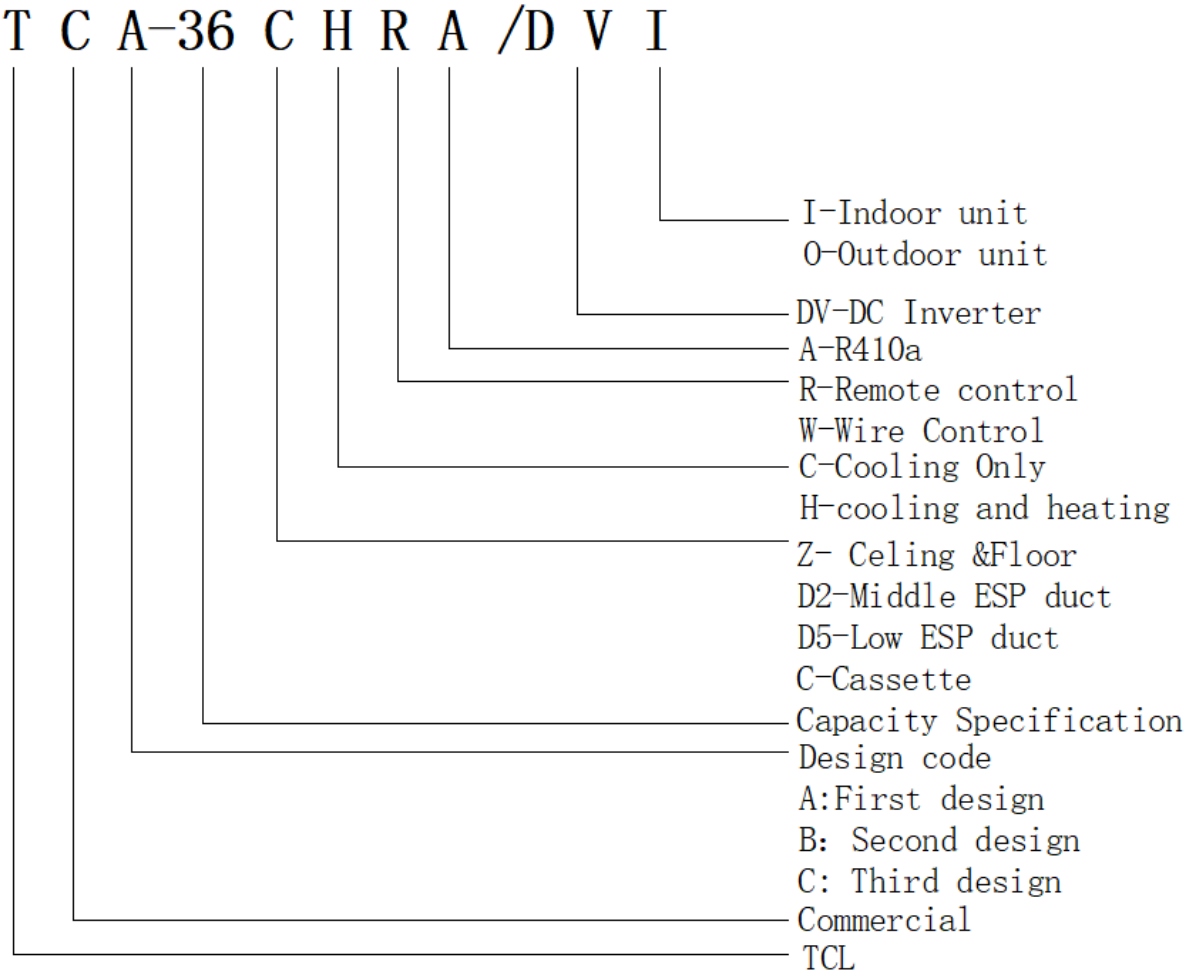
18k , 24K

30k，36，48k



60k

3. Nomenclature



Part 2 Indoor Units

1. Cassette

1.1 Specifications

Model name	Cassette Unit	TCC-18CHRA/DV(Q4)(02)	TCC-18CHRA/DV(02)	TCC-24CHRA/DV(02)	TCC-30CHRA/DV(02)
model		TCC-18CHRA/DV(Q4)(02)	TCC-18CHRA/DV(02)	TCC-24CHRA/DV(02)	TCC-30CHRA/DV(02)
Indoor unit		TCC-18CHRA/DVI(Q4)(02)	TCC-18CHRA/DVI(02)	TCC-24CHRA/DVI(02)	TCC-30CHRA/DVI(02)
Outdoor unit		TCC-18HA/DVO(02)	TCC-18HA/DVO(02)	TCC-24HA/DVO(02)	TCC-30HA/DVO(02)
Type		heating pump	heating pump	heating pump	heating pump
Control type		remote controller	remote controller	remote controller	remote controller
cooling capacity	btu/h	18000(6200~18600)	18000(6200~18600)	24000(8550~25400)	30000(10600~31400)
heating capacity	btu/h	19500(6800~20400)	19500(6800~20400)	26000(6800~27200)	32000(11450~34100)
cooling capacity	W	5270(1820~5460)	5270(1820~5460)	7030(2500~7450)	8800(3100-9200)
heating capacity	W	5700(2000~5985)	5700(2000~5980)	7600(2660~7980)	9370(3350-10000)
EER	W/W	2.80	2.80	2.80	3.20
COP	W/W	3.00	3.20	3.20	3.40
Moisture removal	Liters/h	1.20	1.20	2.00	2.60
Indoor sound power(H/M/L)	dB(A)	45/42/41	39/38/27	44/41/37	49/47/44
Outdoor sound pressure	dB(A)	57	57	53	57
Electrical Data					
Power supply		Indoor：220-240V~/50Hz/1P Outdoor：220-240V~/50Hz/1P			
Power supply side		Indoor	Indoor	Indoor	Indoor
Voltage Range	V	198~264	198~264	198~264	198~264
Cooling Operating current	A	9.2(2.3~10.4)	9.2(2.3~10.4)	11.5(4.5~12)	12.6(4.5~15.1)
Heating Operating current	A	10(2.5~11.4)	10(2.5~11.4)	10.8(4.8-13)	12.6(4.5-13.8)
Cooling Power consumption	W	2150(500~2275)	2100(500~2275)	2510(980~2620)	2750(990~3310)
Heating Power consumption	W	2080(550~2490)	1650(550~2490)	2375(1050~2840)	2755(990~3010)
Max. powerconsump	W	2650	2650	3500	3900
Max.current	A	12	12	15	17
Refrigerating System					
Indoor coil	Number of row	2	1	2	2
	Fin spacing	1.6mm	1.4mm	1.4mm	1.4mm
	Fin material	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin
	Tube outside diameter	φ7mm	φ7mm	φ7mm	φ7mm
	Tube material	Innergroover tube type	Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width	1370×210×25.4mm	2050*210*12.7mm	2050×210×25.4mm	2050×210×25.4mm
Indoor fan motor	Brand	Lifeng	LiFeng	LiFeng	LiFeng
	Model	YSK30-6E1	YDK95-21Q-6P	SJ56H	YDK56-6-6
	Output	30W	21W	56W	56W
	Capacitor	2μF	3μF	3.5μF	3.5μF
	Speed (Hi/Me/Lo)	900/800/700rpm	480/400/350/290rpm	640/550/470/370rpm	720/580/500/420rpm
Outdoor coil	Number of row	1	1	2	2

	Fin spacing		1.4mm	1.4mm	1.4m	1.4mm
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter		φ9.52mm	φ9.52mm	φ9.52mm	φ9.52mm
	Tube material		Innergroover tube	Innergroover tube	Innergroover tube	Innergroover tube
	Coil length x height x width		775×567x19.05mm	775×567x19.05mm	775×567×38.1mm	767×660×38.1mm
Outdoor fan motor	Brand		LiFeng	LiFeng	LiFeng	Broad-ocean
	Model		RD(AL)N33HE10	RD(AL)N33HE10	RD(AL)N33HE10	GZSDJ-16
	Output		33W	33W	33W	54W
	Capacitor		/	/	/	3.5μF
	Speed (Hi/Me/Lo)		1000rpm	1000rpm	1000rpm	910rpm
Refrigerant type/Charge			R410A/1.0kg	R410A/1.0kg	R410A/1.7kg	R410A/1.9kg
Compressor	Type		Rotary	Rotary	Rotary	Rotary
	Model		KSN140D33UFZ3	KSN140D33UFZ3	KSN140D33UFZ3	GTD226UKPA8LT6C
	MFG		GMCC	GMCC	GMCC	HIGHLY
Indoor air circulation Cooling/heating		m^3/h	675	1000	1300	1600
Indoor fan type			centrifugal fan	centrifugal fan	centrifugal fan	centrifugal fan
Outdoor fan type			Propeller fan	Propeller fan	Propeller fan	Propeller fan
Outdoor air circulation		m3/h	3000	3000	3000	3600
Connections			3×1.0mm²	3×1.0mm²	3×1.0mm²	3×1.0mm²
Connecting Wiring	Core x Size		3×2.5mm²	3×2.5mm²	3×2.5mm²	3×2.5mm²
Expansion device			Capillary	Capillary	Capillary	Capillary
Connecting Pipe φ	Gas	Inches	1/2"	1/2"	1/2"	5/8"
		mm	12.7	12.7	12.7	15.88
	Liquid	Inches	1/4"	1/4"	1/4"	3/8"
		mm	6.35	6.35	6.35	9.52
Others						
Application area		m²	20~35	20~35	27~45	33~58
Max. refrigerant pipe length			30m	30m	30m	30m
Max. difference in level			15m	15m	15m	15m
Operation temperature range			16-31℃	16-31℃	16-31℃	16-31℃
Ambient temperature range	Outdoor		Cooling:5~48℃ Heating:-15~24℃	Cooling:5~48℃ Heating:-15~24℃	Cooling:5~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃
	Indoor		Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃
Net dimensions (W x H x D)	Indoor		580x580x255mm	840×840×245mm	840×840×245mm	840×840×245mm
	Outdoor		780×288×590mm	780×288×590mm	780×288×590mm	845×330×699mm
	Panel		650x650x30mm	950x950x45mm	950x950x45mm	950x950x45mm
Net weight	Indoor		19kg	21.5kg	23kg	24kg
	Outdoor		28kg	28kg	31kg	43kg
	Panel		2.5kg	6kg	6kg	6kg
Packing dimensions (W x H x D)	Indoor		725x725x300mm	935×935×305mm	935×935×305mm	935×935×305mm
	Outdoor		890×385×648mm	890×385×648mm	890×385×628mm	960×430×732mm
	Panel		700×700×80	1035x1035x90	1035x1035x90	1035x1035x80
Gross weight	Indoor		21kg	25.5kg	28kg	29kg
	Outdoor		30kg	30kg	33kg	46kg
	Panel		4.5kg	9kg	9kg	9kg

Model name	Cassette Unit	TCC-36CHRA/DV(02)	TCC-48CHRA/DV7(02)	TCC-60CHRA/DV7(02)
model		**TCC-36CHRA/DV(02)**	**TCC-48CHRA/DV7(02)**	**TCC-60CHRA/DV7(02)**
Indoor unit		**TCC-36CHRA/DVI(02)**	**TCC-48CHRA/DVI(02)**	**TCC-60CHRA/DVI(02)**
Outdoor unit		**TCC-36HA/DVO(02)**	**TCC-48HA/DV7O(02)**	**TCC-60HA/DV7O(02)**
Type		heating pump	heating pump	heating pump
Control type		remote controller	remote controller	remote controller
cooling capacity	btu/h	36000(12550~37500)	48000(16700~50150)	55000(19100~57300)
heating capacity	btu/h	39400(13800~41300)	52500(18400~54950)	58000(20300~63800)
cooling capacity	W	10550(3680~11000)	14060(4900~14700)	16120(5600~16800)
heating capacity	W	11550(4050~12100)	15400(5400~16100)	17000(5950~18700)
EER	W/W	3.00	2.80	3.00
COP	W/W	3.20	3.20	3.20
Moisture removal	Liters/h	3.40	4.80	5.50
Indoor sound power(H/M/L)	dB(A)	49/47/44	51/48/45	51/48/45
Outdoor sound pressure	dB(A)	56	57	58
Electrical Data				
Power supply		Indoor：220-240V~/50Hz/1P Outdoor：220-240V~/50Hz/1P	Indoor：220-240V~/50Hz/1P Outdoor：380-415V~/50Hz/3P	
Power supply side		Indoor	Outdoor	Outdoor
Voltage Range	V	198~264	342~456	342~456
Cooling Operating current	A	16.0(5.5~16.1)	7.6(2.6~8.8)	8.2(3.0~9.4)
Heating Operating current	A	16.5(5.5~16.1)	7.3(2.8~8.6)	8.1(3.2~9.4)
Cooling Power consumption	W	3500(1200~3730)	5020(1530~5770)	5370(1770~6180)
Heating Power consumption	W	3600(1200~3750)	4810(1650~5690)	5310(1880~6180)
Max. powerconsump	W	3900	6000	6400
Max.current	A	17	9	10
Refrigerating System				
Indoor coil	Number of row	2	3	3
	Fin spacing	1.4mm	1.4mm	1.4mm
	Fin material	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin
	Tube outside diameter	φ7mm	φ7mm	φ7mm
	Tube material	Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width	2050×210×25.4mm	2050×252×38.1mm	2050×252×38.1mm
Indoor fan motor	Brand	LiFeng	LiFeng	LiFeng
	Model	YDK56-6-6	SJ100E	SJ100E
	Output	56W	100W	100W
	Capacitor	3.5μF	4.5μF	4.5μF
	Speed (Hi/Me/Lo)	720/580/500/420rpm	820/730/610/510rpm	820/730/610/510rpm
Outdoor coil	Number of row	2	2	2
	Fin spacing	1.4mm	1.4mm	1.5mm
	Fin material	Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter	φ7mm	φ9.52mm	7mm
	Tube material	Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width	994×756×36.4mm	992×762×38.1mm	1112×798×36.4mm
Outdoor fan motor	Brand	Broad-ocean	Broad-ocean	Broad-ocean
	Model	ZW511B500037	ZW511B500077	ZW511D000017
	Output	85W	85W	200W

	Capacitor		/	/	/
	Speed (Hi/Me/Lo)		850rpm	930rpm	700rpm
Refrigerant type/Charge			R410A/2.05kg	R410A/2.98kg	R410A/2.8kg
Compressor	Type		Rotary	Rotary	Rotary
	Model		C-6RZ210H1EBF	C-7RZ320H3CCF	GTH420SKPC8DQ
	MFG		SANYO	SANYO	HIGHLY
Indoor air circulation Cooling/heating			1600m^3/h	2000m^3/h	2000m^3/h
Indoor fan type			centrifugal fan	centrifugal fan	centrifugal fan
Outdoor fan type			Propeller fan	Propeller fan	Propeller fan
Outdoor air circulation			3600m^3/h	5000m^3/h	5600m^3/h
Connections			3×1.0mm²	3×1.0mm²	3×1.0mm²
Connecting Wiring	Core x Size		3×2.5mm²	5×1.0mm²	5×1.0mm²
Expansion device			Capillary	Capillary	Capillary
Connecting Pipe φ	Gas	Inches	5/8"	5/8"	5/8"
		mm	15.88	15.88	15.88
	Liquid	Inches	3/8"	3/8"	3/8"
		mm	9.52	9.52	9.52
Others					
Application area		m²	39~71	50~95	55~105
Max. refrigerant pipe length		m	30	50	50
Max. difference in level		m	15	30	30
Operation temperature range		℃	16-31	16-31	16-31
Ambient temperature range	Outdoor	℃	Cooling:-10~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃
	Indoor	℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃
Net dimensions (W x H x D)	Indoor	mm	840×840×245	840×840×290	840×840×290
	Outdoor	mm	910×360×805	910×360×805	1010×410×850
	Panel	mm	950x950x45	950x950x45	950x950x45
Net weight	Indoor	kg	24	30	30
	Outdoor	kg	47	65	75
	Panel	kg	6	6	6
Packing dimensions (W x H x D)	Indoor	mm	935×935×305	935×935×350	935×935×350
	Outdoor	mm	1022x480x860	1022x480x860	1135x530x970
	Panel	mm	1035x1035x90	1035x1035x90	1035x1035x90
Gross weight	Indoor	kg	28	35	36
	Outdoor	kg	51	70	83
	Panel	kg	9	9	9

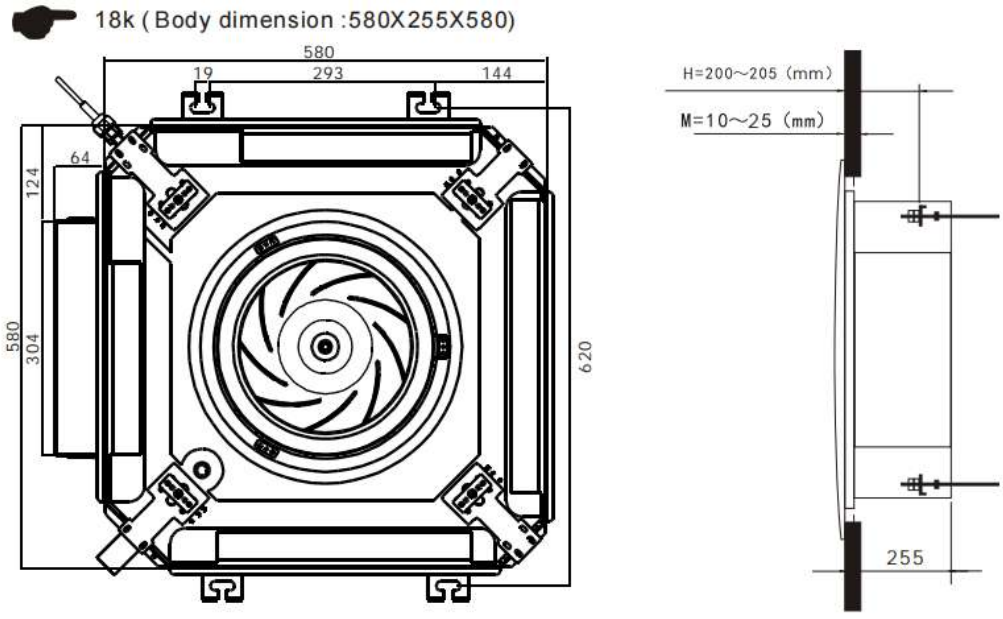
Notes:

1. Nominal cooling capacities are based on the following conditions:
Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB; Equivalent ref. piping: 7.5m (horizontal)
2. Nominal heating capacities are based on the following conditions:
Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB; Equivalent ref. piping: 7.5m (horizontal)
3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

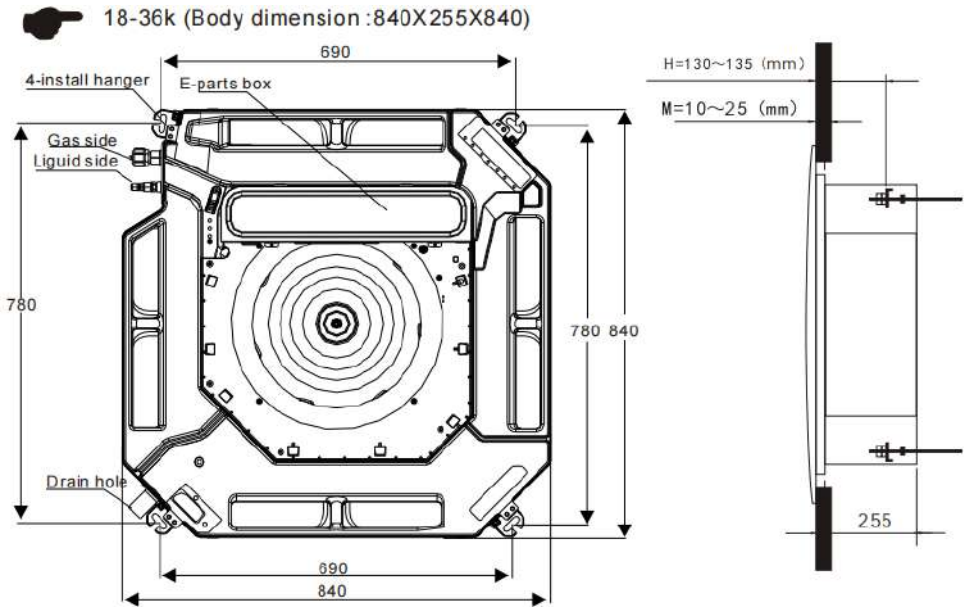
Remark: The above design and specification are subject to change without prior notice for product improvement.

1.2 Dimensions

Q4 4-way cassette

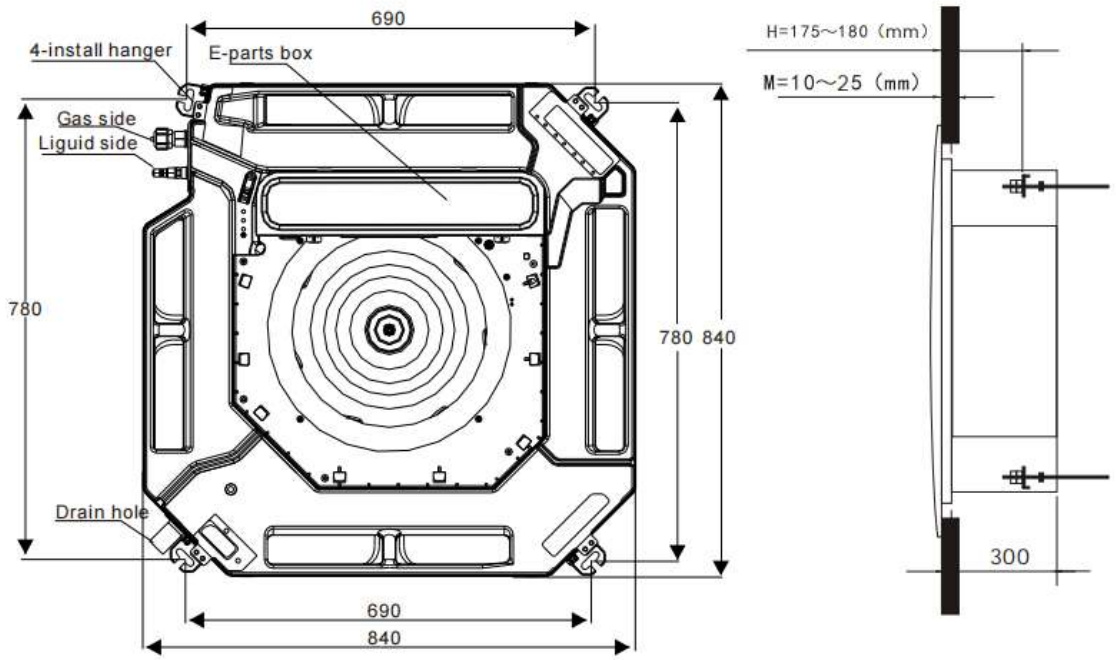


Q8 8-way cassette

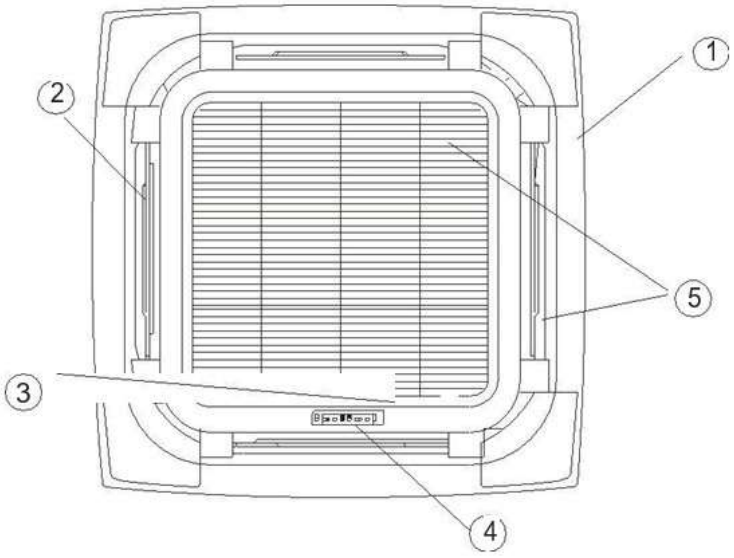


Q8 8-way cassette

48/60k (Body dimension : 840X300X840)



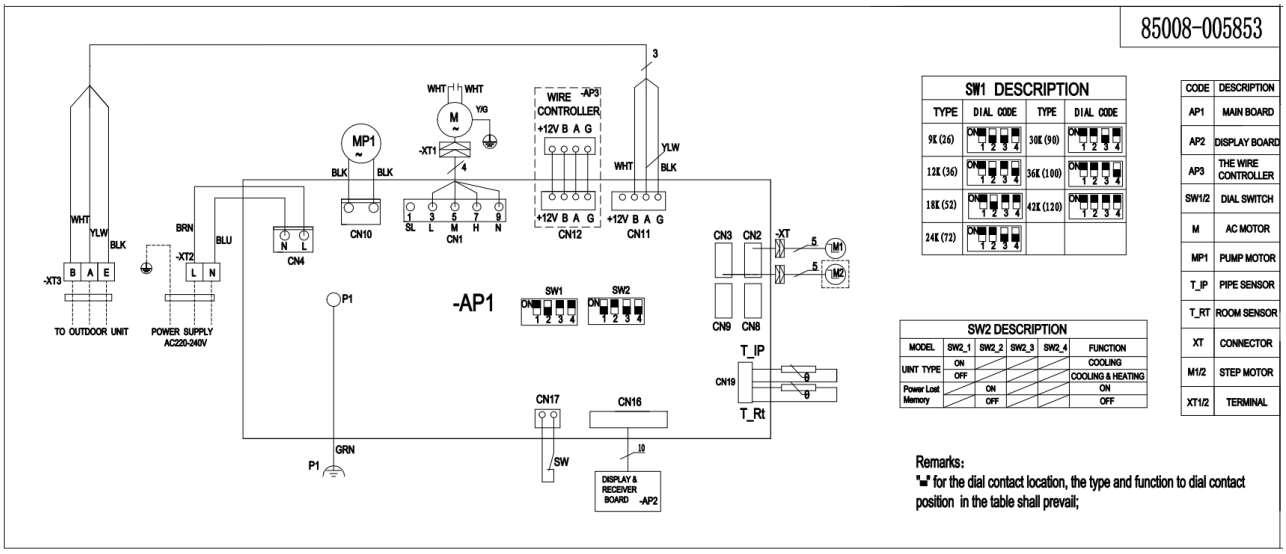
CONSTITUTION OF PANEL



1. PANEL 2.AIR FLOW LOUVER 3. INFRARED SIGNAL RECEIVER 4. DISPLAY PANEL 5.AIR—IN GRILL

1.3 Wiring Diagram

Q4 Cassette Unit
TCC-18CHRA/DV(Q4)(02)



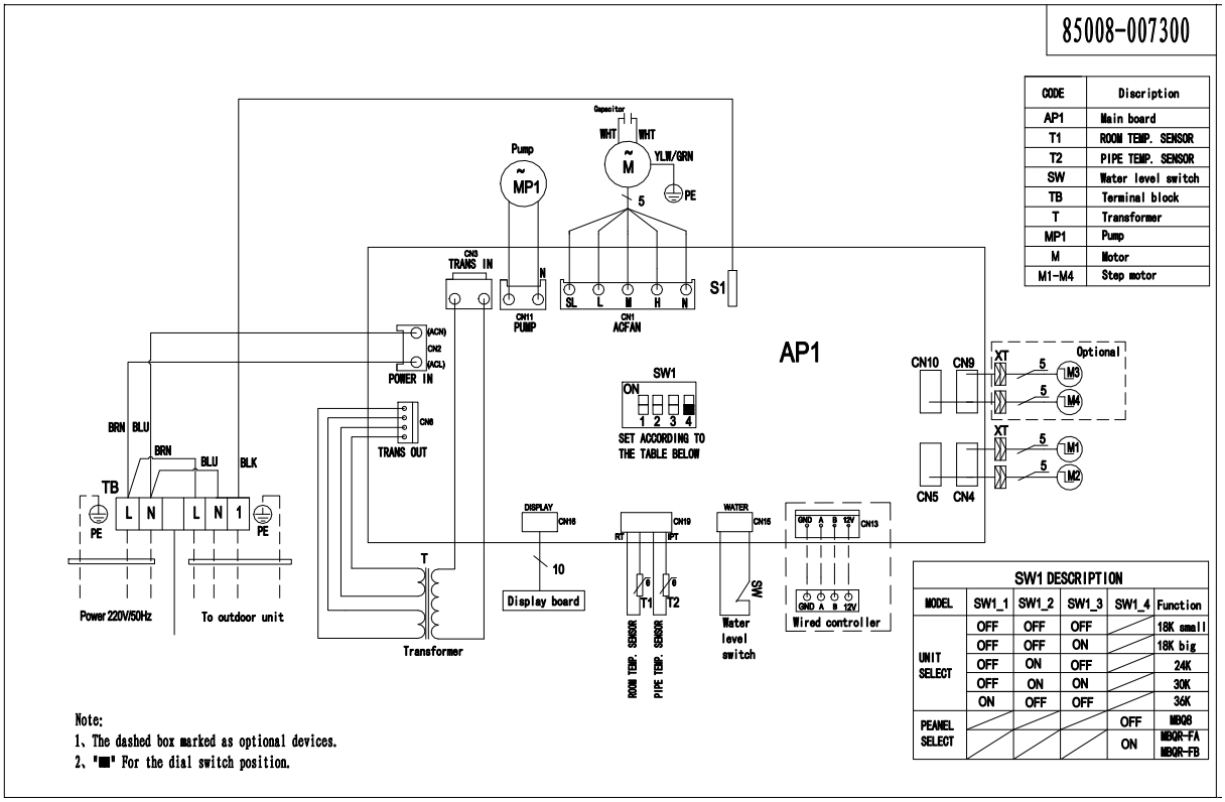
CODE	DESCRIPTION
AP1	MAIN BOARD
AP2	DISPLAY BOARD
AP3	THE WIRE CONTROLLER
SW1/2	DIAL SWITCH
M	AC MOTOR
MP1	PUMP MOTOR
T_IP	PIPE SENSOR
T_RT	ROOM SENSOR
XT	CONNECTOR
M1/2	STEP MOTOR
XT1/2	TERMINAL

TYPE	DIAL CODE	TYPE	DIAL CODE
9K(26)		30K(90)	
12K(36)		36K(100)	
18K(52)		42K(120)	
24K(72)			

MODEL	SW2_1	SW2_2	SW2_3	SW2_4	FUNCTION
UINT TYPE	ON				COOLING
	OFF				COOLING & HEATING
Power Lost Memory		ON			ON
		OFF			OFF

Q8 Cassette Unit

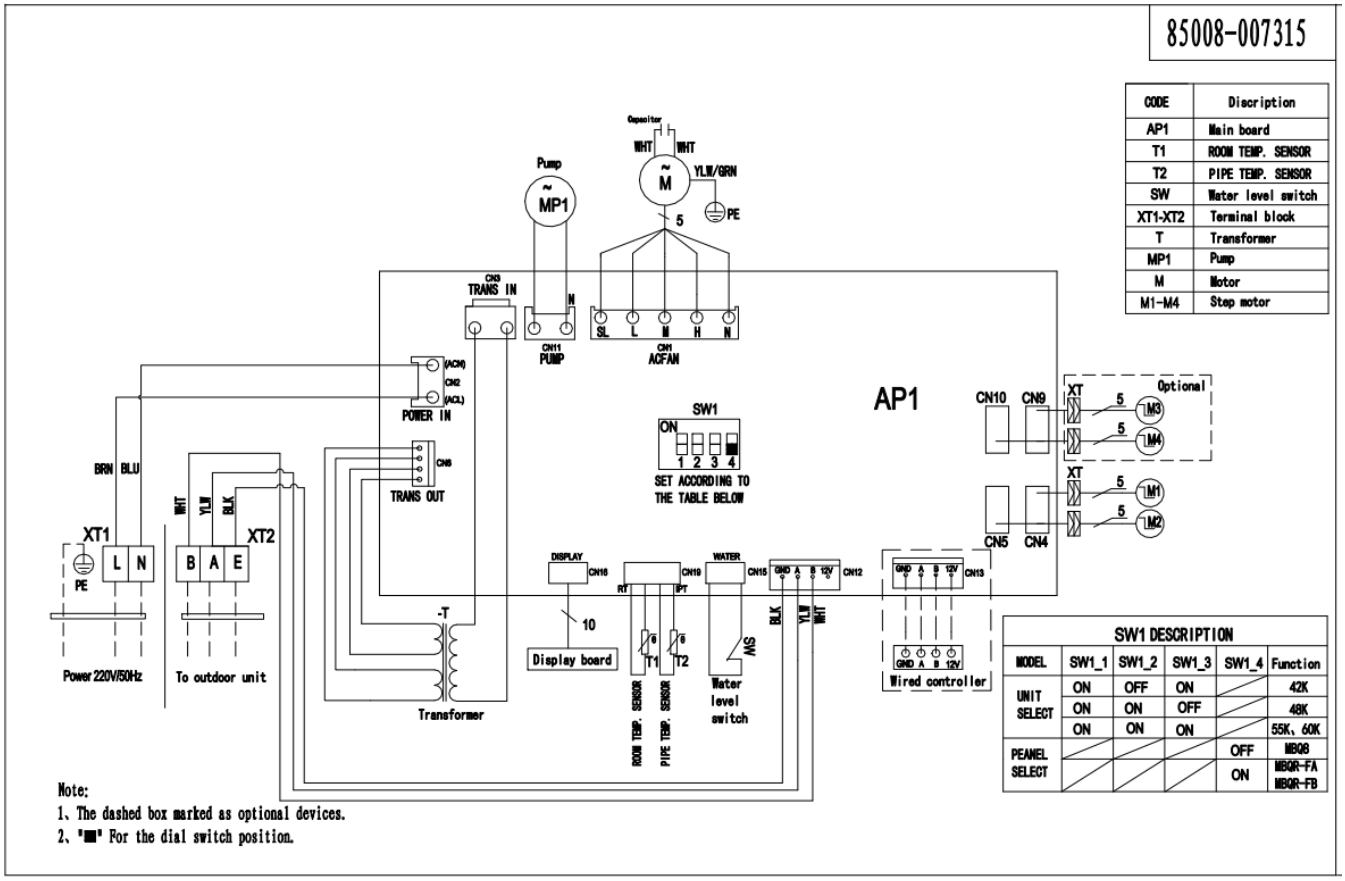
18K~36K Cassette Unit



CODE	Discription
AP1	Main board
T1	ROOM TEMP. SENSOR
T2	PIPE TEMP. SENSOR
SW	Water level switch
TB	Terminal block
T	Transformer
MP1	Pump
M	Motor
M1-M4	Step motor

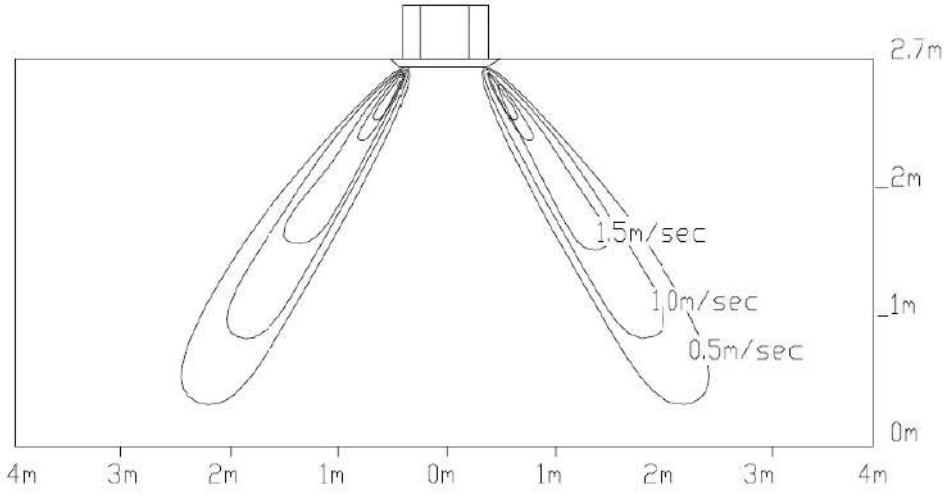
MODEL	SW1_1	SW1_2	SW1_3	SW1_4	Function
UNIT SELECT	OFF	OFF	OFF		18K small
	OFF	OFF	ON		18K big
	OFF	ON	OFF		24K
	OFF	ON	ON		30K
	ON	OFF	OFF		36K
PEANEL SELECT				OFF	MBQ8
				ON	MBQR-FA MBQR-FB

48/60K Cassette Unit

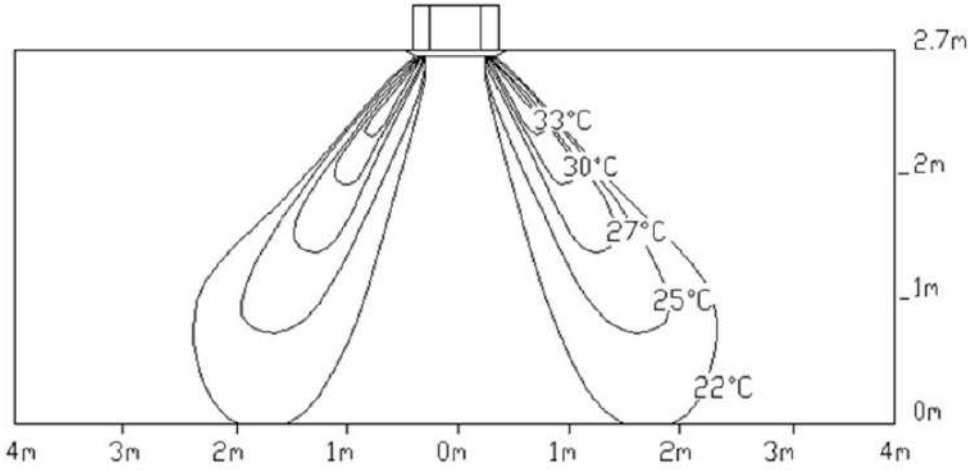


1.4 Air Velocity and Temperature Distributions

Airflow velocity

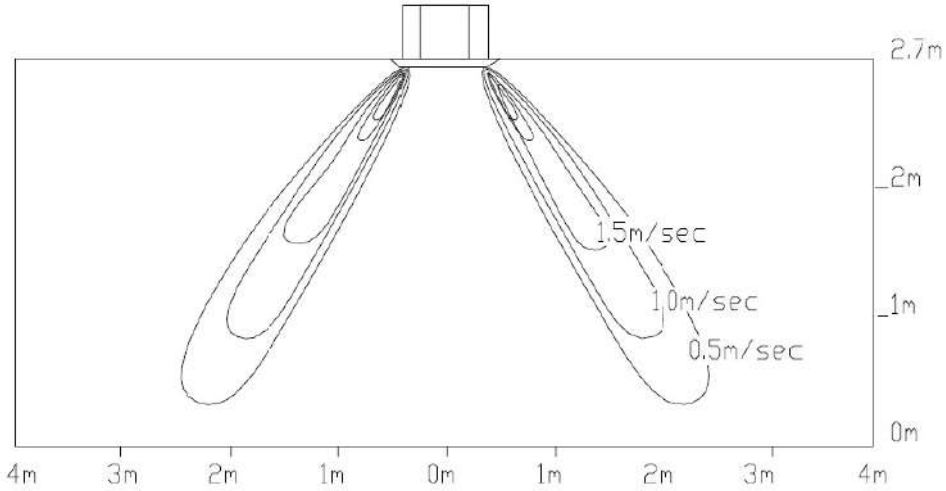


Temperature

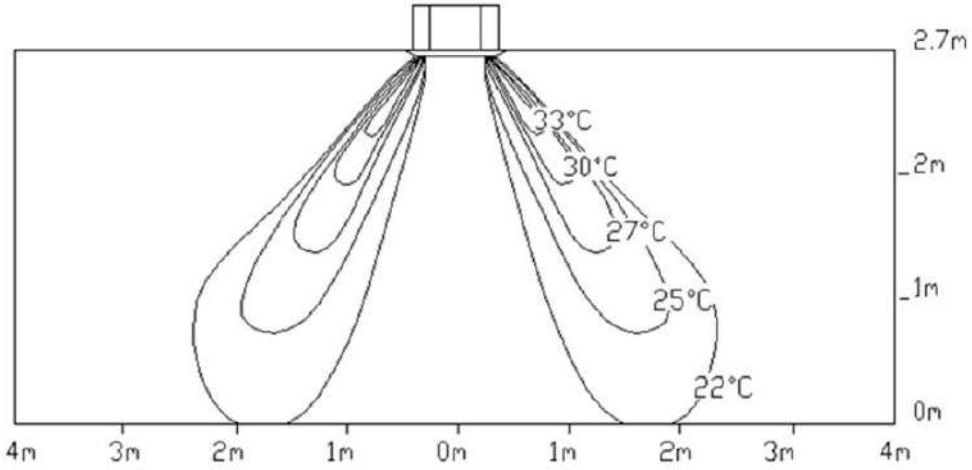


1.5 Air Velocity and Temperature Distributions

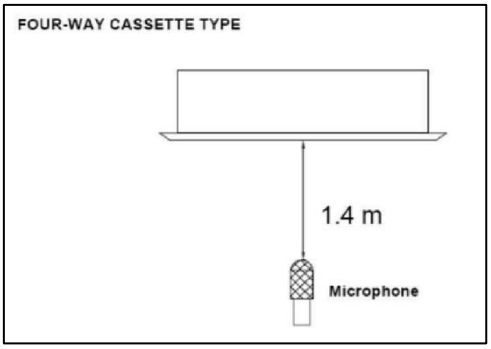
Airflow velocity

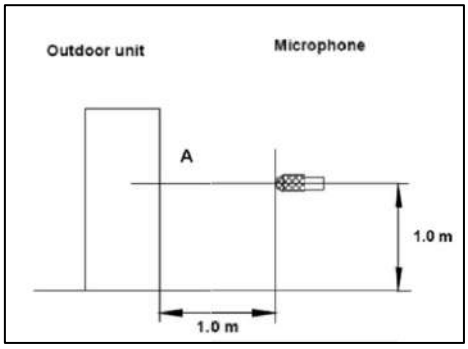


Temperature



1.7 Sound Levels





Model	Noise level dB(A)			
	Indoor unit			Outdoor unit
	H	M	L	
TCC-18CHRA/DVI(Q4)(02)	45	42	41	57
TCC-18CHRA/DVI(02)	39	38	27	57
TCC-24CHRA/DVI(02)	44	41	37	53
TCC-30CHRA/DVI(02)	49	47	44	57
TCC-36CHRA/DVI(02)	49	47	44	56
TCC-48CHRA/DVI(02)	51	48	45	57
TCC-60CHRA/DVI(02)	51	48	45	58

2. Duct Type

2.1 Specifications

Model name	Cassette Unit		TCC-18D2HRA/DV(02)	TCC-24D2HRA/DV(02)	TCC-30D2HRA/DV(02)
model			**TCC-18D2HRA/DV(02)**	**TCC-24D2HRA/DV(02)**	**TCC-30D2HRA/DV(02)**
Indoor unit			**TCC-18D2HRA/DVI(02)**	**TCC-24D2HRA/DVI(02)**	**TCC-30D2HRA/DVI(02)**
Outdoor unit			**TCC-18HA/DVO(02)**	**TCC-24HA/DVO(02)**	**TCC-30HA/DVO(02)**
Type			heating pump	heating pump	heating pump
Control type			remote controller	remote controller	remote controller
cooling capacity		btu/h	18000(6200~18600)	24000(8550~25400)	30000(10600~31400)
heating capacity		btu/h	19500(6800~20400)	26000(6800~27200)	32000(11450~34100)
cooling capacity		W	5270(1820~5460)	7030(2500~7450)	8800(3100-9200)
heating capacity		W	5700(2000~5980)	7600(2660~7980)	9370(3350-10000)
EER		W/W	2.80	2.80	3.20
COP		W/W	3.20	3.20	3.40
Moisture removal		Liters/h	1.20	2.00	2.60
Indoor sound power(H/M/L)		dB(A)	38/36/35	40/39/36	46/44/40
Outdoor sound pressure		dB(A)	57	53	57
Electrical Data					
Power supply			Indoor：220-240V~/50Hz/1P Outdoor：220-240V~/50Hz/1P		
Power supply side			Indoor	Indoor	Indoor
Voltage Range		V	198~264	198~264	198~264
Cooling Operating current		A	9.6(2.3~10.4)	11.5(4.5~12)	12.6(4.5~15.1)
Heating Operating current		A	10(2.5~11.4)	10.8(4.8-13)	12.6(4.5-13.8)
Cooling Power consumption		W	2250(500~2275)	2510(980~2620)	2750(990~3310)
Heating Power consumption		W	1900(550~2490)	2375(1050~2840)	2755(990~3010)
Max. Power consumption		W	2650	3500	3900
Max.current		A	12	15	17
Refrigerating System					
Indoor coil	Number of row		3	3	3
	Fin spacing		1.4mm	1.4mm	1.4mm
	Fin material		Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin
	Tube outside diameter		φ7mm	φ7mm	φ7mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		734×252×38.1mm	734×252×38.1mm	734×252×38.1mm
Indoor fan motor	Brand		Match-well	Match-well	Match-well
	Model		YSK68-4P-5	YSK68-4P-5	YSK74-4P-5
	Output		68W	68W	74W

	Capacitor		3.5μF	3.5μF	5μF
	Speed (Hi/Me/Lo)		1150/1020/750/640rpm	1150/1020/750/640rpm	1070/910/630/560rpm
Outdoor coil	Number of row		1	2	2
	Fin spacing		1.4mm	1.4mm	1.4mm
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter		φ9.52mm	φ9.52mm	φ9.52mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		775×567x19.05mm	775×567×38.1mm	767×660×38.1mm
Outdoor fan motor	Brand		LiFeng	LiFeng	Broad-ocean
	Model		RD(AL)N33HE10	RD(AL)N33HE10	GZSDJ-16
	Output		33W	33W	54W
	Capacitor		/	/	3.5μF
	Speed (Hi/Me/Lo)		1000rpm	1000rpm	910rpm
Refrigerant type/Charge			R410A/1.0kg	R410A/1.7kg	R410A/1.9kg
Compressor	Type		Rotary	Rotary	Rotary
	Model		KSN140D33UFZ3	KSN140D33UFZ3	GTD226UKPA8LT6C
	MFG		GMCC	GMCC	HIGHLY
Indoor air circulation Cooling/heating			850m^3/h	1100m^3/h	1500m^3/h
Indoor fan type			centrifugal fan	centrifugal fan	centrifugal fan
Outdoor fan type			Propeller fan	Propeller fan	Propeller fan
Outdoor air circulation			3000m^3/h	3000m^3/h	3600m^3/h
External Static Pressure(Rated)			25Pa	25Pa	37Pa
External Static Pressure(Range)			0~70Pa	0~70Pa	0~80Pa
Connections			3×1.0mm²	3×1.0mm²	3×1.0mm²
Connecting Wiring	Core x Size		3×2.5mm²	3×2.5mm²	3×2.5mm²
Expansion device			Capillary	Capillary	Capillary
Connecting Pipe φ	Gas	Inches	1/2"	1/2"	5/8"
		mm	12.7	12.7	15.88
	Liquid	Inches	1/4"	1/4"	3/8"
		mm	6.35	6.35	9.52
Others					
Application area			20~35m²	27~45m²	33~58m²
Max. refrigerant pipe length			30m	30m	30m
Max. difference in level			15m	15m	15m
Operation temperature range		℃	16-31	16-31	16-31
Ambient temperature range	Outdoor	℃	Cooling:5~48℃ Heating:-15~24℃	Cooling:5~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃
	Indoor	℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃
Net dimensions (W x H x D)	Indoor	mm	920×210×570	920×210×570	920×270×570
	Outdoor	mm	780×288×590	780×288×590	845×330×699
Net weight	Indoor	kg	21.5	22	26

	Outdoor	kg	28	31	43
Packing dimensions (W x H x D)	Indoor	mm	1120x281x690	1120x281x690	1120×341×690
	Outdoor	mm	890×385×648	890×385×648	960×430×732
Gross weight	Indoor	kg	26.5	27	31
	Outdoor	kg	30	33	46

Model name	**Cassette Unit**		**TCC-36D2HRA/DV(02)**	**TCC-48D2HRA/DV7(02)**	**TCC-60D2HRA/DV7(02)**
model			**TCC-36D2HRA/DV(02)**	**TCC-48D2HRA/DV7(02)**	**TCC-60D2HRA/DV7(02)**
Indoor unit			**TCC-36D2HRA/DVI(02)**	**TCC-48D2HRA/DVI(02)**	**TCC-60D2HRA/DVI(02)**
Outdoor unit			**TCC-36HA/DVO(02)**	**TCC-48HA/DV7O(02)**	**TCC-60HA/DV7O(02)**
Type			heating pump	heating pump	heating pump
Control type			remote controller	remote controller	remote controller
cooling capacity		btu/h	36000(12550~37500)	48000(16700~50150)	55000(19100~57300)
heating capacity		btu/h	39400(13800~41300)	52500(18400~54950)	58000(20300~63800)
cooling capacity		W	10550(3680~11000)	14060(4900~14700)	16120(5600~16800)
heating capacity		W	11550(4050~12100)	15400(5400~16100)	17000(5950~18700)
EER		W/W	3.00	2.80	3.00
COP		W/W	3.20	3.20	3.20
Moisture removal		Liters/h	3.40	4.80	5.50
Indoor sound power(H/M/L)		dB(A)	47/44/40	49/45/42	49/45/42
Outdoor sound pressure		dB(A)	56	57	58
Electrical Data					
Power supply			Indoor：220-240V~/50Hz/1P Outdoor：220-240V~/50Hz/1P	Indoor：220-240V~/50Hz/1P Outdoor：380-415V~/50Hz/3P	
Power supply side			Indoor	Outdoor	Outdoor
Voltage Range		V	198~264	342~456	342~456
Cooling Operating current		A	16.0(5.5~16.1)	7.6(2.6~8.8)	8.2(3.0~9.4)
Heating Operating current		A	16.5(5.5~16.1)	7.3(2.8~8.6)	8.1(3.2~9.4)
Cooling Power consumption		W	3500(1200~3730)	5020(1530~5770)	5370(1770~6180)
Heating Power consumption		W	3600(1200~3750)	4810(1650~5690)	5310(1880~6180)
Max. Power consumption		W	4000	6000	6400
Max.current		A	17	9	10
Refrigerating System					
Indoor coil	Number of row		3	4	4
	Fin spacing		1.4mm	1.4mm	1.4mm
	Fin material		Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin
	Tube outside diameter		φ7mm	φ7mm	φ7mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		948×336×38.1mm	1030×378×50.8mm	1030×378×50.8mm
Indoor fan motor	Brand		Match-well	Match-well	Match-well

	Model		YSK140-4P-5	YSK180-4P-5	YSK180-4P-5
	Output		140W	180W	180W
	Capacitor		10μF	10μF	10μF
	Speed (Hi/Me/Lo)		1000/940/760/650rpm	1025/895/750/660rpm	1025/895/750/660rpm
Outdoor coil	Number of row		2	2	2
	Fin spacing		1.4mm	1.4mm	1.5mm
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter		φ7mm	φ9.52mm	7mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		994×756×36.4mm	992×762×38.1mm	1112×798×36.4mm
Outdoor fan motor	Brand		Broad-ocean	Broad-ocean	Broad-ocean
	Model		ZW511B500037	ZW511B500077	ZW511D000017
	Output		85W	85W	200W
	Capacitor		/	/	/
	Speed (Hi/Me/Lo)		850rpm	930rpm	700rpm
Refrigerant type/Charge			R410A/2.05kg	R410A/2.98kg	R410A/2.8kg
Compressor	Type		Rotary	Rotary	Rotary
	Model		C-6RZ210H1EBF	C-7RZ320H3CCF	GTH420SKPC8DQ
	MFG		SANYO	SANYO	HIGHLY
Indoor air circulation Cooling/heating		m^3/h	1500	2200	2200
Indoor fan type			centrifugal fan	centrifugal fan	centrifugal fan
Outdoor fan type			Propeller fan	Propeller fan	Propeller fan
Outdoor air circulation		m3/h	3600	5000	5600
External Static Pressure(Rated)		Pa	37	50	50
External Static Pressure(Range)		Pa	0~80	0~120	0~120
Connections			3×1.0mm²	3×1.0mm²	3×1.0mm²
Connecting Wiring	Core x Size		3×2.5mm²	5×1.0mm²	5×1.0mm²
Expansion device			Capillary	Capillary	Capillary
Connecting Pipe φ	Gas	Inches	5/8"	5/8"	5/8"
		mm	15.88	15.88	15.88
	Liquid	Inches	3/8"	3/8"	3/8"
		mm	9.52	9.52	9.52
Others					
Application area		m²	39~71	50~95	55~105
Max. refrigerant pipe length		m	30	50	50
Max. difference in level		m	15	30	30
Operation temperature range		℃	16-31	16-31	16-31
Ambient temperature range	Outdoor	℃	Cooling:-10~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃
	Indoor	℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃
Net dimensions	Indoor	mm	1140×270×710	1200×800×300	1200×800×300

(W x H x D)	Outdoor	mm	910×360×805	910×360×805	1010×410×850
Net weight	Indoor	kg	37	44	44
	Outdoor	kg	47	65	75
Packing dimensions (W x H x D)	Indoor	mm	1341×341×830	1400x920x371	1400x920x371
	Outdoor	mm	1022x480x860	1022x480x860	1135x530x970
Gross weight	Indoor	kg	41	50	51
	Outdoor	kg	51	70	83

Notes:

1. Nominal cooling capacities are based on the following conditions:

Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB; Equivalent ref. piping: 7.5m (horizontal)

2. Nominal heating capacities are based on the following conditions:

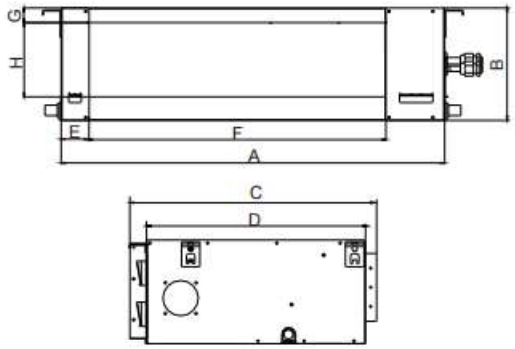
Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB; Equivalent ref. piping: 7.5m (horizontal)

3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

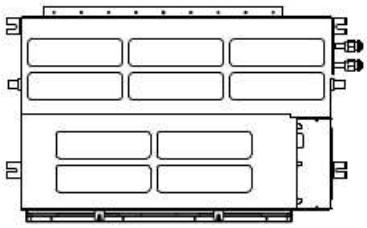
Remark: The above design and specification are subject to change without prior notice for product improvement.

Dimensions

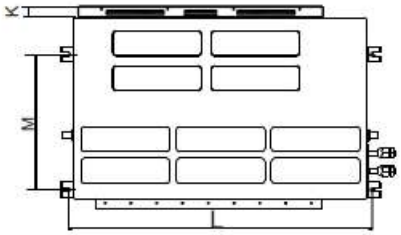
The positioning of celling hole, indoor unit and hanging screw bolts.



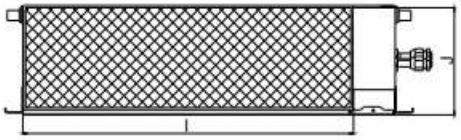
Position size of descensional ventilation opening.



Size of mounted hook



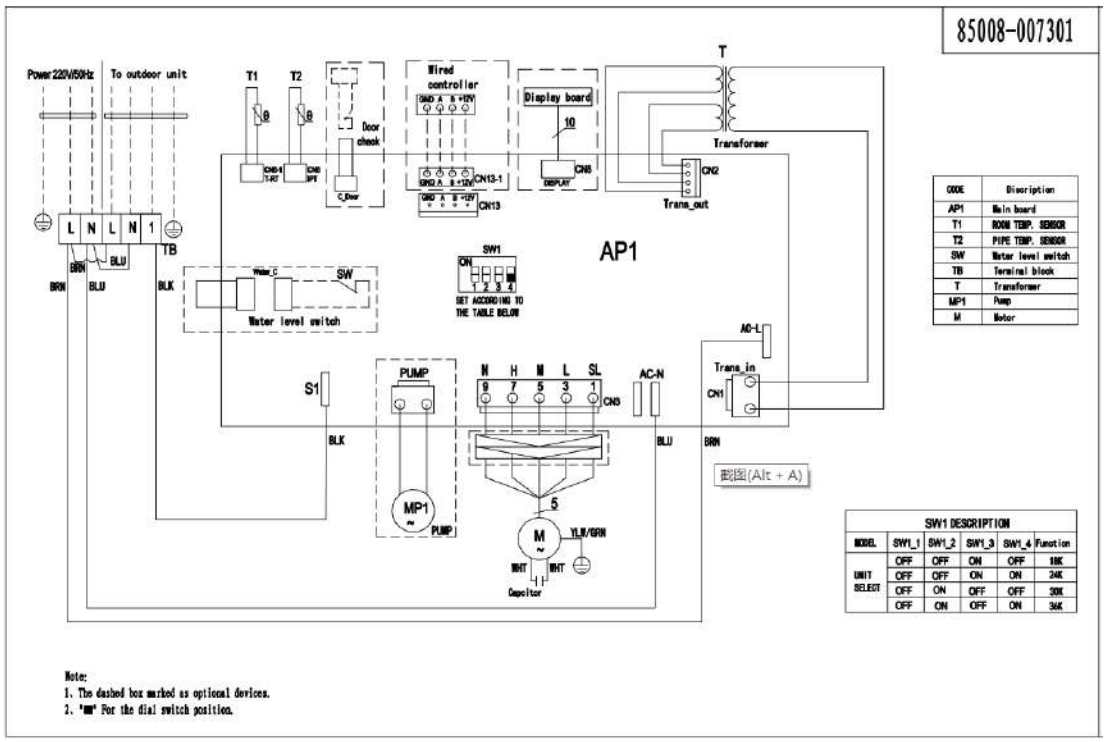
Air inlet size



	Outline dimension				Air outlet opening size				Air return opening size			Size of mounted lug	
	A	B	C	D	E	F	G	H	I	J	K	L	M
18/24K	920	210	635	570	65	713	35	119	815	197	36	958	427
30K	920	270	635	570	65	713	35	179	815	260	36	958	427
36K	1140	270	775	710	65	933	37	175	1034	260	36	1178	541
48/60K	1200	300	865	800	80	968	40	202	1091	288	36	1238	585

2.2 Wiring Diagrams

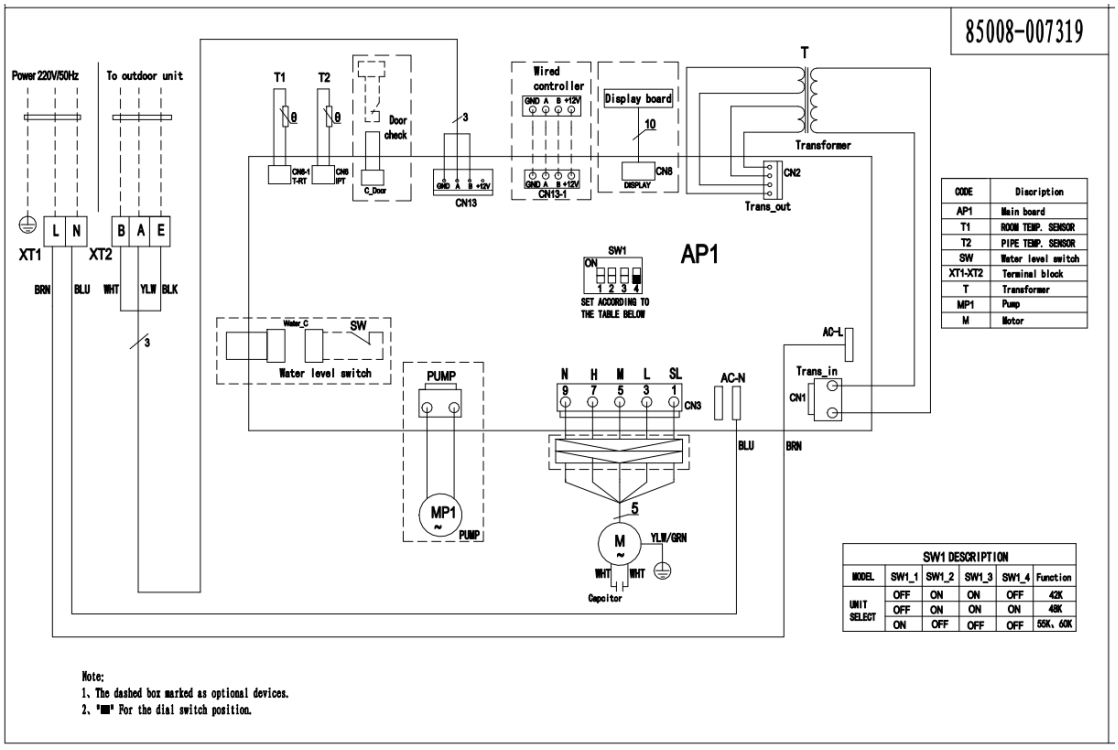
18K~36K



CODE	Discription
AP1	Main board
T1	ROOM TEMP. SENSOR
T2	PIPE TEMP. SENSOR
SW	Water level switch
TB	Terminal block
T	Transformer
MP1	Pump
M	Motor

SW1 DESCRIPTION					
MODEL	SW1_1	SW1_2	SW1_3	SW1_4	Function
UNIT SELECT	OFF	OFF	ON	OFF	18K
	OFF	OFF	ON	ON	24K
	OFF	ON	OFF	OFF	30K
	OFF	ON	OFF	ON	36K

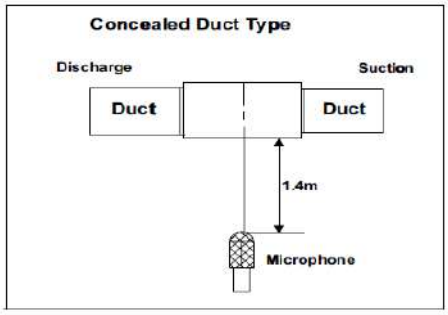
48K，60K

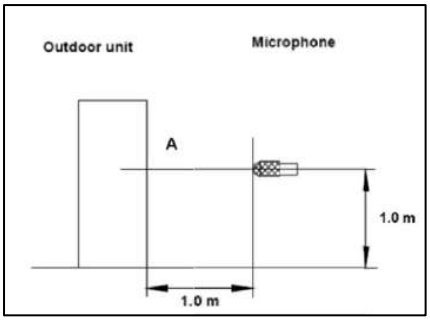


CODE	Discription
AP1	Main board
T1	ROOM TEMP. SENSOR
T2	PIPE TEMP. SENSOR
SW	Water level switch
XT1-XT2	Terminal block
T	Transformer
MP1	Pump
M	Motor

SW1 DESCRIPTION					
MODEL	SW1_1	SW1_2	SW1_3	SW1_4	Function
UNIT SELECT	OFF	ON	ON	OFF	42K
	OFF	ON	ON	ON	48K
	ON	OFF	OFF	OFF	55K、60K

2.3 Sound Levels





Model	Noise level dB(A)			
	Indoor unit			Outdoor unit
	H	M	L	
TCC-18D2HRA/DVI(02)	38	36	35	57
TCC-24D2HRA/DVI(02)	40	39	36	53
TCC-30D2HRA/DVI(02)	46	44	40	57
TCC-36D2HRA/DVI(02)	47	44	40	56
TCC-48D2HRA/DVI(02)	49	45	42	57
TCC-60D2HRA/DVI(02)	49	45	42	65

3. Ceiling & Floor

3.1 Specifications

Model name	Cassette Unit		TCC-18ZHRA/DV(02)	TCC-24ZHRA/DV(02)	TCC-30ZHRA/DV(02)
model			TCC-18ZHRA/DVI(02)	TCC-24ZHRA/DVI(02)	TCC-30ZHRA/DVI(02)
Indoor unit			TCC-18ZHRA/DVI(02)	TCC-24ZHRA/DVI(02)	TCC-30ZHRA/DVI(02)
Outdoor unit			TCC-18HA/DVO(02)	TCC-24HA/DVO(02)	TCC-30HA/DVO(02)
Type			heating pump	heating pump	heating pump
Control type			remote controller	remote controller	remote controller
cooling capacity		btu/h	18000(6200~18600)	24000(8550~25400)	30000(10600~31400)
heating capacity		btu/h	19500(6800~20400)	26000(6800~27200)	32000(11450~34100)
cooling capacity		W	5270(1820~5460)	7030(2500~7450)	8800(3100-9200)
heating capacity		W	5700(2000~5980)	7600(2660~7980)	9370(3350-10000)
EER		W/W	2.80	2.80	3.20
COP		W/W	3.20	3.20	3.40
Moisture removal		Liters/h	1.20	2.00	2.60
Indoor sound power(H/M/L)		dB(A)	43/40/39	49/43/40	53/50/48
Outdoor sound pressure		dB(A)	57	53	57
Electrical Data					
Power supply			Indoor：220-240V~/50Hz/1P Outdoor：220-240V~/50Hz/1P		
Power supply side			Indoor	Indoor	Indoor
Voltage Range		V	198~264	198~264	198~264
Cooling Operating current		A	9.2(2.3~10.4)	11.5(4.5~12)	12.6(4.5~15.1)
Heating Operating current		A	10(2.5~11.4)	10.8(4.8-13)	12.6(4.5-13.8)
Cooling Power consumption		W	2150(500~2275)	2510(980~2620)	2750(990~3310)
Heating Power consumption		W	1650(550~2490)	2375(1050~2840)	2755(990~3010)
Max. Power consumption		W	2650	3500	3900
Max.current		A	12	15	17
Refrigerating System					
Indoor coil	Number of row		2	2	2
	Fin spacing		1.5mm	1.5mm	1.5mm
	Fin material		Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin
	Tube outside diameter		φ7mm	φ7mm	φ7mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		795×294×25.4mm	795×294×25.4mm	940×294×25.4mm
Indoor fan motor	Brand		LiFeng	Broad-ocean/Lifeng	Broad-ocean
	Model		YSK36-4P	Y6S443B5136	Y6S443C0100
	Output		36W	55W	92W

	Capacitor		2.5μF	2.5μF	4.5μF
	Speed (Hi/Me/Lo)		985/940/850740rpm	1230/1150/1045/860rpm	1300/1230/1170/1040rpm
Outdoor coil	Number of row		1	2	2
	Fin spacing		1.4mm	1.4mm	1.4mm
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter		φ9.52mm	φ9.52mm	φ9.52mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		775×567x19.05mm	775×567×38.1mm	767×660×38.1mm
Outdoor fan motor	Brand		LiFeng	LiFeng	Broad-ocean
	Model		RD(AL)N33HE10	RD(AL)N33HE10	GZSDJ-16
	Output		33W	33W	54W
	Capacitor		/	/	3.5μF
	Speed (Hi/Me/Lo)		1000rpm	1000rpm	910rpm
Refrigerant type/Charge			R410A/1.0kg	R410A/1.7kg	R410A/1.9kg
Compressor	Type		Rotary	Rotary	Rotary
	Model		KSN140D33UFZ3	KSN140D33UFZ3	GTD226UKPA8LT6C
	MFG		GMCC	GMCC	HIGHLY
Indoor air circulation Cooling/heating		m^3/h	900	1200	1600
Indoor fan type			centrifugal fan	centrifugal fan	centrifugal fan
Outdoor fan type			Propeller fan	Propeller fan	Propeller fan
Outdoor air circulation		m3/h	3000	3000	3600
Connections			3×1.0mm²	3×1.0mm²	3×1.0mm²
Connecting Wiring	Core x Size		3×2.5mm²	3×2.5mm²	3×2.5mm²
Expansion device			Capillary	Capillary	Capillary
Connecting Pipe φ	Gas	Inches	1/2"	1/2"	5/8"
		mm	12.7	12.7	15.88
	Liquid	Inches	1/4"	1/4"	3/8"
		mm	6.35	6.35	9.52
Others					
Application area		m²	20~35	27~45	33~58
Max. refrigerant pipe length		m	30	30	30
Max. difference in level		m	15	15	15
Operation temperature range		℃	16-31	16-31	16-31
Ambient temperature range	Outdoor	℃	Cooling:5-48/Heating:-15-24	Cooling:5-48/Heating:-15-24	Cooling:-10-48/Heating:-15-24
	Indoor	℃	Cooling:17-32/Heating:0-30	Cooling:17-32/Heating:0-30	Cooling:17-32/Heating:0-30
Net dimensions (W x H x D)	Indoor	mm	1055x675x235	1055x675x235	1275×675×235
	Outdoor	mm	780×288×590	780×288×590	845×330×699
Net weight	Indoor	kg	24	24	28
	Outdoor	kg	28	31	43
Packing	Indoor	mm	1130x748x305	1130x748x305	1350x748x305

dimensions (W x H x D)	Outdoor	mm	890×385×628	890×385×628	960×430×732
Gross weight	Indoor	kg	29	29	34
	Outdoor	kg	30	33	46

Model name	**Cassette Unit**		**TCC-36ZHRA/DV(02)**	**TCC-48ZHRA/DV7(02)**	**TCC-60ZHRA/DV7(02)**
model			**TCC-36ZHRA/DVI(02)**	**TCC-48ZHRA/DV7(02)**	**TCC-60ZHRA/DV7(02)**
Indoor unit			**TCC-36ZHRA/DVI(02)**	**TCC-48ZHRA/DVI(02)**	**TCC-60ZHRA/DVI(02)**
Outdoor unit			**TCC-36HA/DVO(02)**	**TCC-48HA/DV7O(02)**	**TCC-60HA/DV7O(02)**
Type			heating pump	heating pump	heating pump
Control type			remote controller	remote controller	remote controller
cooling capacity		btu/h	36000(12550~37500)	48000(16700~50150)	55000(19100~57300)
heating capacity		btu/h	39400(13800~41300)	52500(18400~54950)	58000(20300~63800)
cooling capacity		W	10550(3680~11000)	14060(4900~14700)	16120(5600~16800)
heating capacity		W	11550(4050~12100)	15400(5400~16100)	17000(5950~18700)
EER		W/W	3.00	2.80	3.00
COP		W/W	3.20	3.20	3.20
Moisture removal		Liters/h	3.40	4.80	5.50
Indoor sound power(H/M/L)		dB(A)	53/50/48	52/49/47	52/49/47
Outdoor sound pressure		dB(A)	56	57	58
Electrical Data					
Power supply			Indoor：220-240V~/50Hz/1P Outdoor：220-240V~/50Hz/1P	Indoor：220-240V~/50Hz/1P Outdoor：380-415V~/50Hz/3P	
Power supply side			Indoor	Outdoor	Outdoor
Voltage Range		V	198~264	342~456	342~456
Cooling Operating current		A	16.0(5.5~16.1)	7.6(2.6~8.8)	8.2(3.0~9.4)
Heating Operating current		A	16.5(5.5~16.1)	7.3(2.8~8.6)	8.1(3.2~9.4)
Cooling Power consumption		W	3500(1200~3730)	5020(1530~5770)	5370(1770~6180)
Heating Power consumption		W	3600(1200~3750)	4810(1650~5690)	5310(1880~6180)
Max. Power consumption		W	3900	6000	6400
Max.current		A	17	9	10
Refrigerating System					
Indoor coil	Number of row		2	3	3
	Fin spacing		1.5mm	1.5mm	1.5mm
	Fin material		Hydrophilic & Louver Fin	Hydrophilic & Louver Fin	Hydrophilic & Louver Fin
	Tube outside diameter		φ7mm	φ7mm	φ7mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		940×294×25.4mm	1300×294×38.1mm	1300×294×38.1mm
Indoor fan motor	Brand		Broad-ocean	Broad-ocean	Broad-ocean
	Model		Y6S443C0100	Y6S443B5137	Y6S443B5137
	Output		92W	48W×2	48W×2

	Capacitor		4.5μF	3.5μF×2	3.5μF×2
	Speed (Hi/Me/Lo)		1300/1230/1170/1040rpm	1180/1130/1010/940rpm	1180/1130/1010/940rpm
Outdoor coil	Number of row		2	2	2
	Fin spacing		1.4mm	1.4mm	1.5mm
	Fin material		Louver or Corrugated Fin	Louver or Corrugated Fin	Louver or Corrugated Fin
	Tube outside diameter		φ7mm	φ9.52mm	φ7mm
	Tube material		Innergroover tube type	Innergroover tube type	Innergroover tube type
	Coil length x height x width		994×756×36.4mm	992×762×38.1mm	1112×798×36.4mm
Outdoor fan motor	Brand		Broad-ocean	Broad-ocean	Broad-ocean
	Model		ZW511B500037	ZW511B500077	ZW511D000017
	Output		85W	85W	200W
	Capacitor		/	/	/
	Speed (Hi/Me/Lo)		850rpm	930rpm	700rpm
Refrigerant type/Charge			R410A/2.05kg	R410A/2.98kg	R410A/2.8kg
Compressor	Type		Rotary	Rotary	Rotary
	Model		C-6RZ210H1EBF	C-7RZ320H3CCF	GTH420SKPC8DQ
	MFG		SANYO	SANYO	HIGHLY
Indoor air circulation Cooling/heating		m^3/h	1600	2000	2000
Indoor fan type			centrifugal fan	centrifugal fan	centrifugal fan
Outdoor fan type			Propeller fan	Propeller fan	Propeller fan
Outdoor air circulation		m3/h	3600	5000	5600
Connections			3×1.0mm²	3×1.0mm²	3×1.0mm²
Connecting Wiring	Core x Size		3×2.5mm²	5×1.0mm²	5×1.0mm²
Expansion device			Capillary	Capillary	Capillary
Connecting Pipe φ	Gas	Inches	5/8"	5/8"	5/8"
		mm	15.88	15.88	15.88
	Liquid	Inches	3/8"	3/8"	3/8"
		mm	9.52	9.52	9.52
Others					
Application area		m²	39~71	50~95	55~105
Max. refrigerant pipe length		m	30	50	50
Max. difference in level		m	15	30	30
Operation temperature range		℃	16-31	16-31	16-31
Ambient temperature range	Outdoor	℃	Cooling:-10~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃	Cooling:-10~48℃ Heating:-15~24℃
	Indoor	℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃	Cooling:17~32℃ Heating:0~30℃
Net dimensions (W x H x D)	Indoor	mm	1275×675×235	1635x675x235	1635x675x235
	Outdoor	mm	910×360×805	910×360×805	1010×410×850
Net weight	Indoor	kg	28	39	39
	Outdoor	kg	47	65	75
Packing dimensions	Indoor	mm	1350x748x305	1710x748x305	1710x748x305

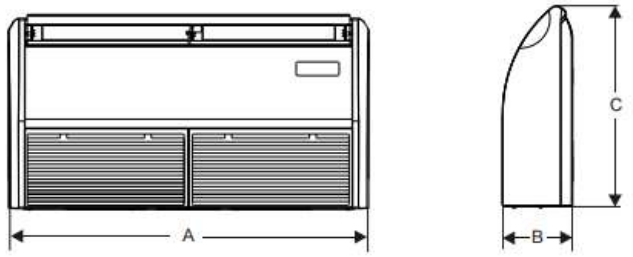
(W x H x D)	Outdoor	mm	1022x480x835	1022x480x835	1135x530x877
Gross weight	Indoor	kg	34	43	47
	Outdoor	kg	51	70	83

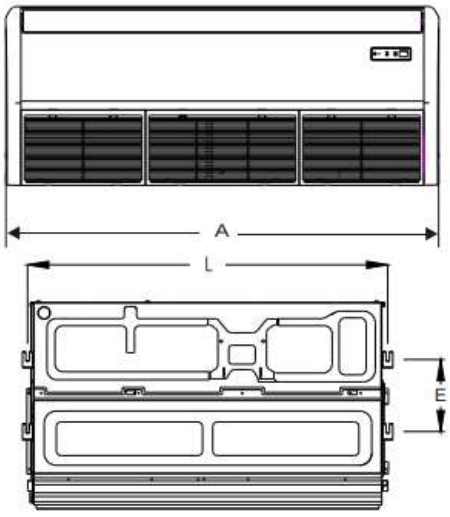
1. Nominal cooling capacities are based on the following conditions:
Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB; Equivalent ref. piping: 7.5m (horizontal)
2. Nominal heating capacities are based on the following conditions:
Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB; Equivalent ref. piping: 7.5m (horizontal)
3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

Remark: The above design and specification are subject to change without prior notice for product improvement.

3.2 Dimensions

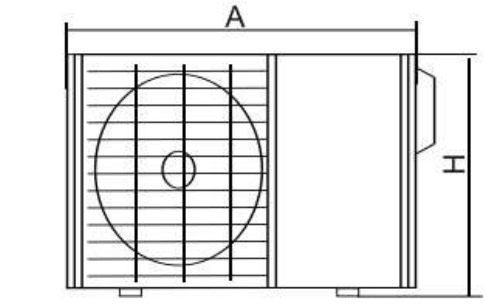
Indoor Unit

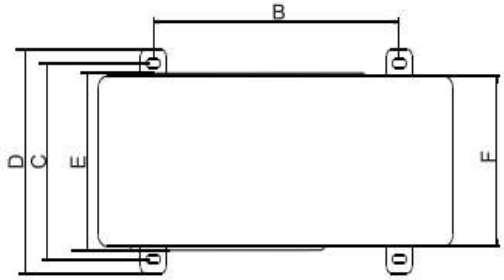




MODE	A	B	C	L	E
18K	1045	235	672	980	240
24K	1045	235	672	980	240
30K	1272	235	672	1200	240
36K	1272	235	672	1200	240
48K	1633	235	692	1560	240
60K	1633	235	692	1560	240

Outdoor Unit

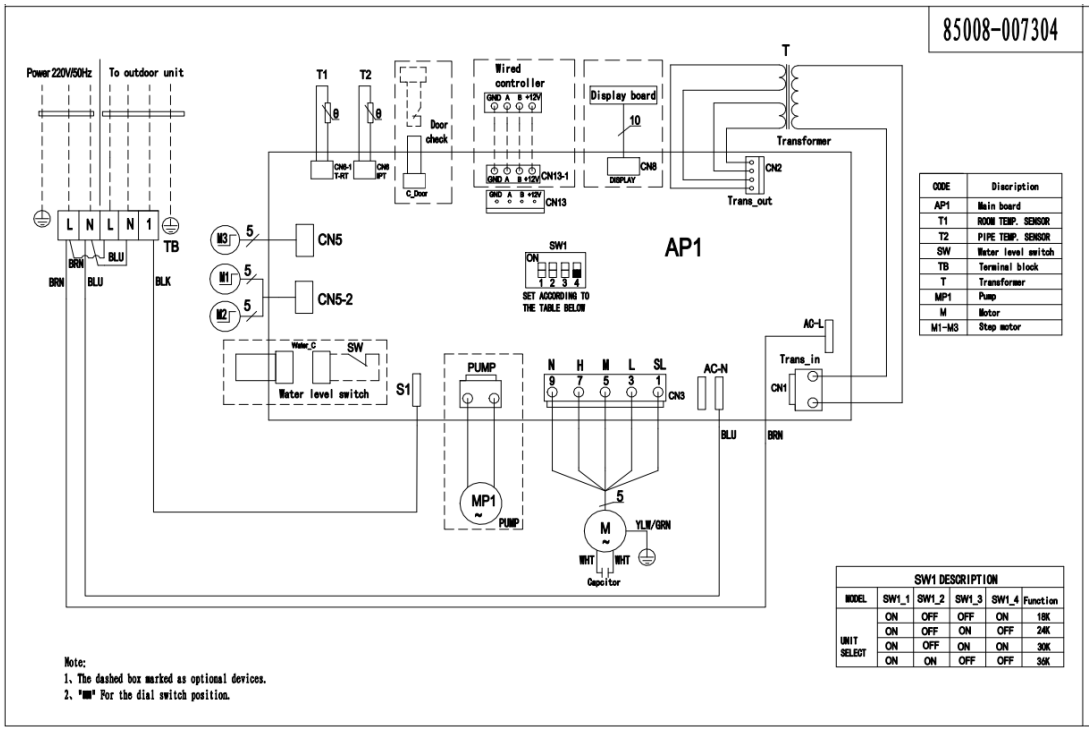




MODE	A	B	C	D	E	F	H
18K	780	516	314	350	321	307	605
24K	780	516	314	350	321	307	605
30K	845	574	348	375	358	342	700
36K	910	607	390	421	391	378	804
48K	910	607	390	421	391	378	804
60K	1010	660	462	494	462	436	858

3.3 Wiring Diagrams

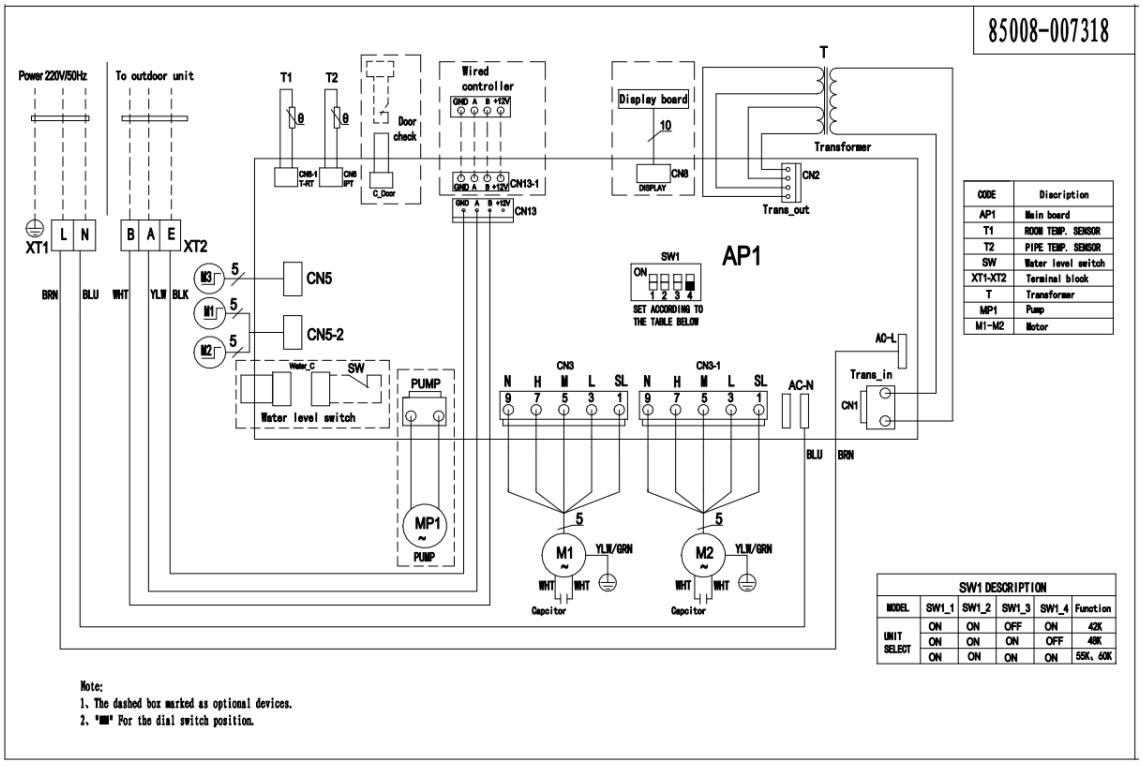
18K~36K



CODE	Discription
AP1	Main board
T1	ROOM TEMP. SENSOR
T2	PIPE TEMP. SENSOR
SW	Water level switch
TB	Terminal block
T	Transformer
MP1	Pump
M	Motor
M1-M3	Step motor

SW1 DESCRIPTION					
MODEL	SW1_1	SW1_2	SW1_3	SW1_4	Function
UNIT SELECT	ON	OFF	OFF	ON	18K
	ON	OFF	ON	OFF	24K
	ON	OFF	ON	ON	30K
	ON	ON	OFF	OFF	36K

48K，,60K

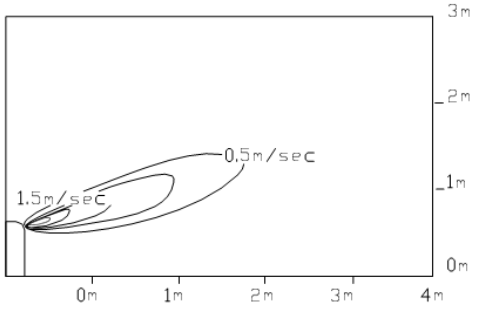


CODE	Discription
AP1	Main board
T1	ROOM TEMP. SENSOR
T2	PIPE TEMP. SENSOR
SW	Water level switch
XT1-XT2	Terminal block
T	Transformer
MP1	Pump
M1-M2	Motor

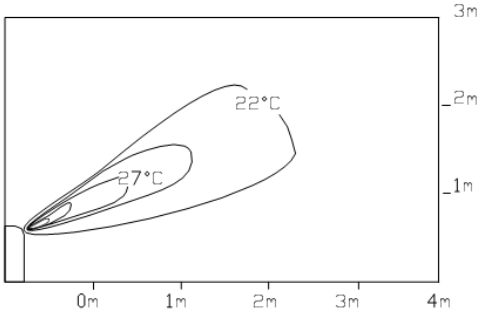
SW1 DESCRIPTION					
MODEL	SW1_1	SW1_2	SW1_3	SW1_4	Function
UNIT SELECT	ON	ON	OFF	ON	42K
	ON	ON	ON	OFF	48K
	ON	ON	ON	ON	55K、60K

3.4 Air Velocity and Temperature Distributions

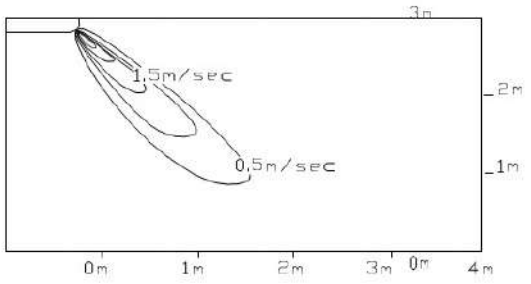
Airflow velocity



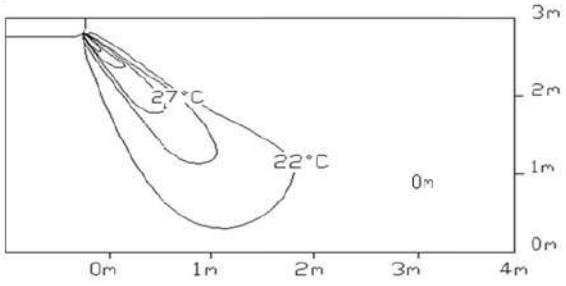
Temperature



Airflow velocity

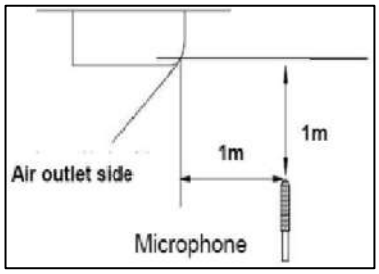


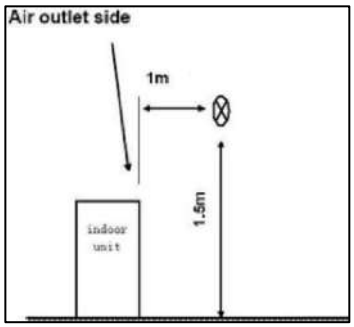
Temperature

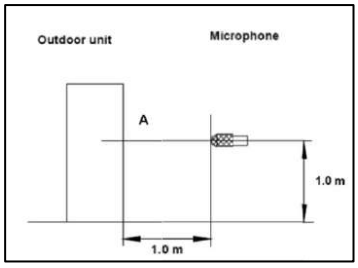


Discharge angle 60°(FLOOR)

3.5 Sound Levels







Model	Noise level dB(A)			
	Indoor unit			Outdoor unit
	H	M	L	
TCC-18ZHRA/DVI(02)	43	40	39	57
TCC-24ZHRA/DVI(02)	49	43	40	53
TCC-30ZHRA/DVI(02)	53	50	48	57
TCC-36ZHRA/DVI(02)	53	50	48	56
TCC-48ZHRA/DVI(02)	52	49	47	57
TCC-60ZHRA/DVI(02)	52	49	47	65

Part 3 Outdoor Units

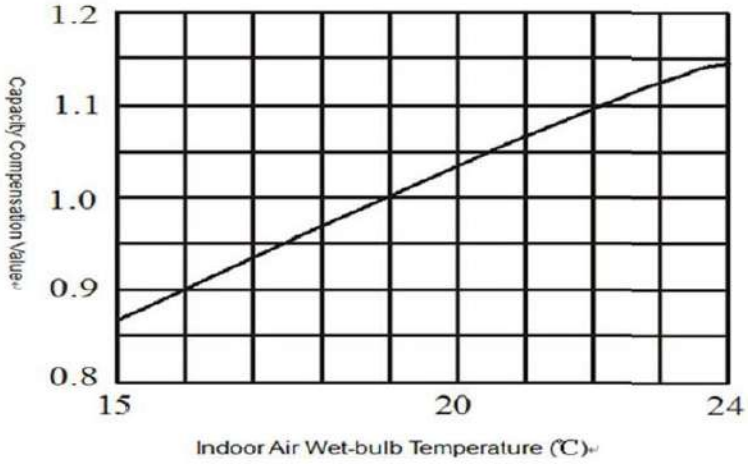
1 Correction Curve of Capacity performance

1.1Correction of Cooling Capacity

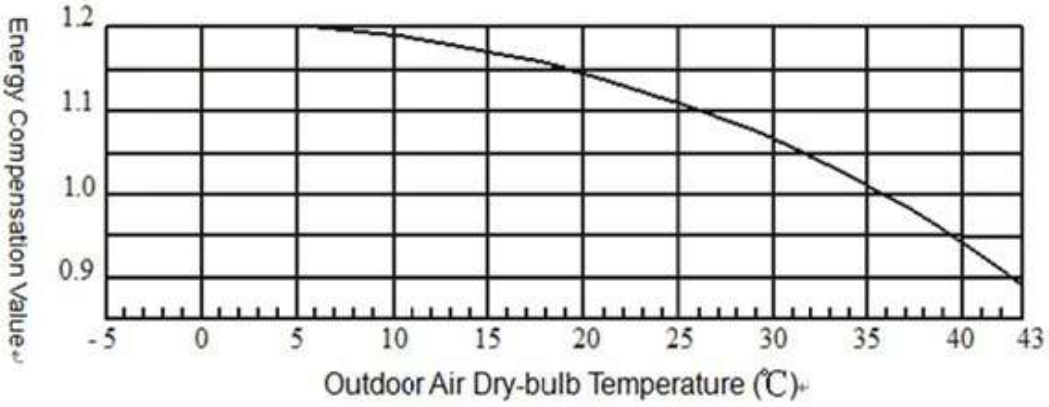
Valid Cooling Capacity = Rated Cooling Capacity × Correction Coefficient [(1)×(2)×(3)×(4)]

Notes: (1)×(2)×(3)×(4) refers to the correction coefficients for the following four figures.

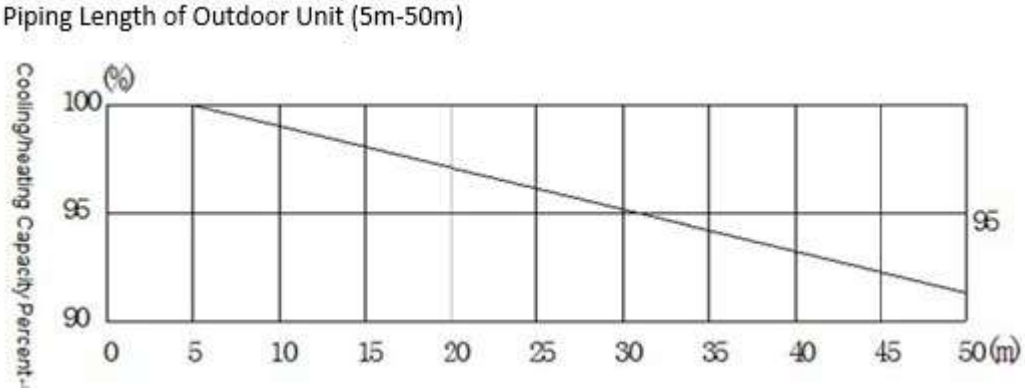
(1) Correction Coefficient of Indoor Wet - bulb Temperature



(2) Correction Coefficient of Outdoor Dry - bulb Temperature



(3) Correction Coefficient of Piping Length

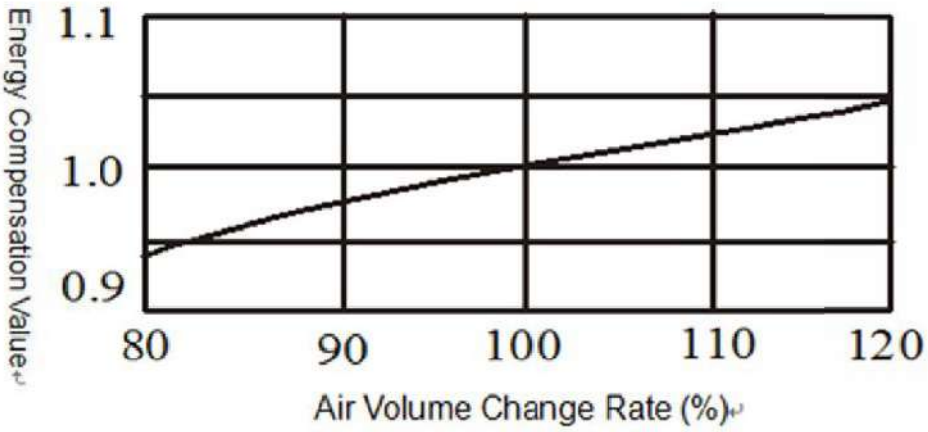


Precautions:

A. It is equally applicable whether or not the outdoor unit is abo e or below the indoorunit;

B. Refrigerant piping cannot exceed the calibrated range of the machine, otherwise do not follow the capacity attenuation curve in the said figure.

(4) Correction Coefficient of Air Volume Change Rate of Indoor Unit

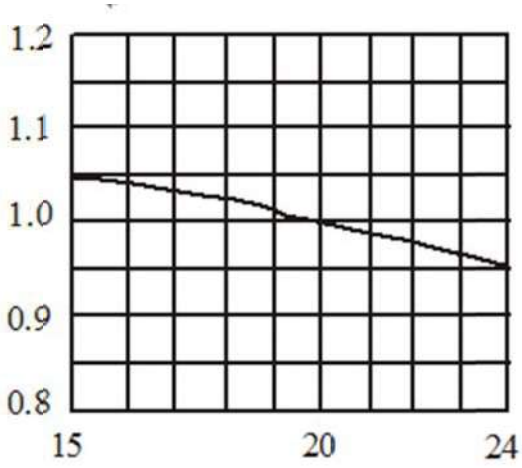


1.2Correction of Heating Capacity

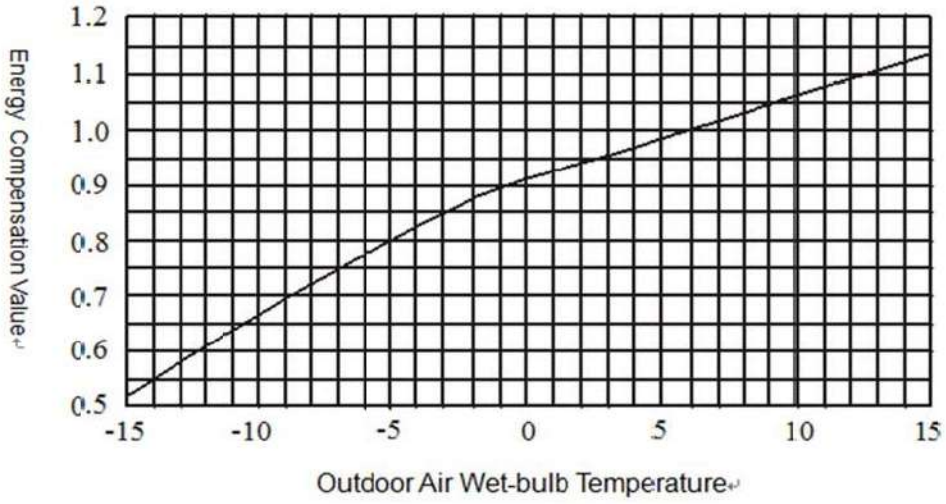
Valid Heating Capacity = Rated Heating Capacity × Correction Coefficient [(1)×(2)×(3)×(4)]

Notes: (1)×(2)×(3)×(4) refers to the correction coefficient of the following four figures.

Correction Coefficient of Indoor Dry - Bulb Temperature

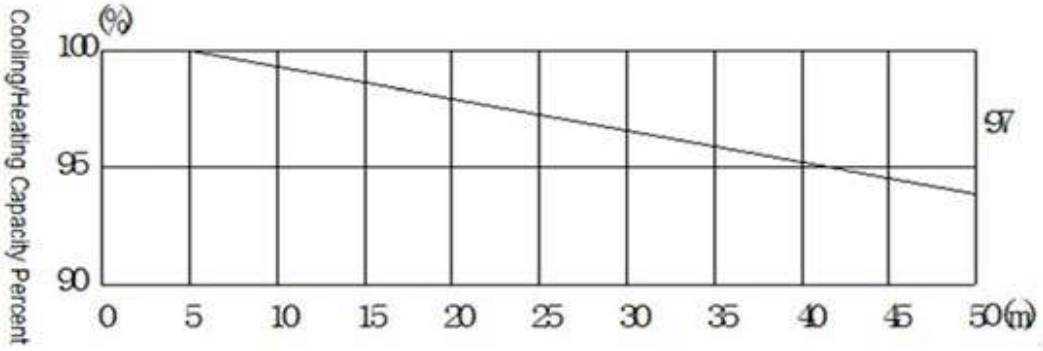


Correction Coefficient of Outdoor Wet - Bulb Temperature



Correction Coefficient of Piping Length

Piping Length of Outdoor Unit (5-50m)



Precautions:

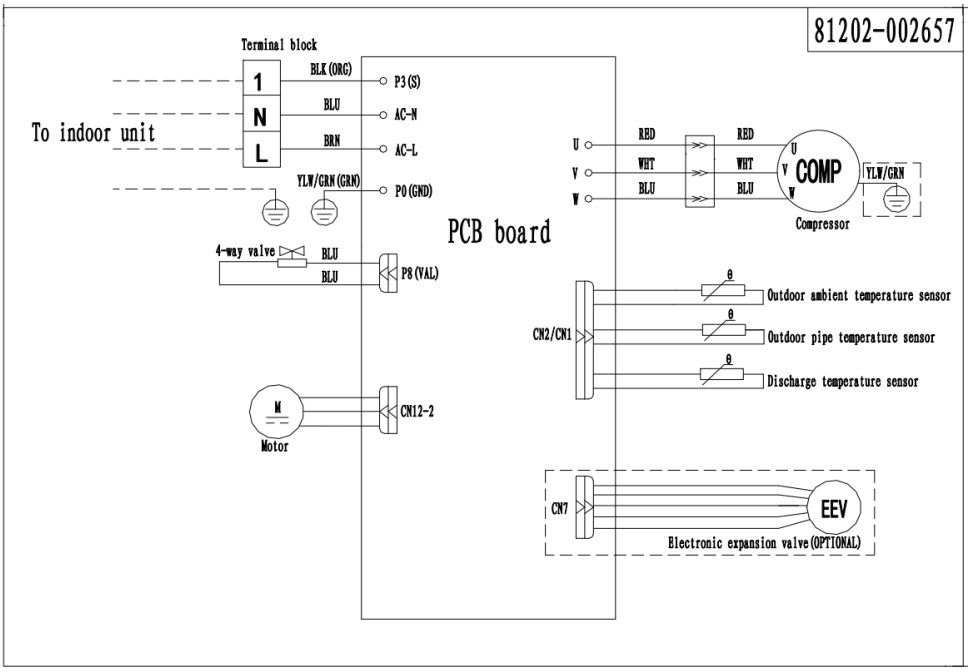
A. It is equally applicable whether or not the outdoor unit is abo e or below the indoorunit;

B. Refrigerant piping cannot exceed the calibrated range of the machine, otherwise do not follow the capacity attenuation curve in the said figure.

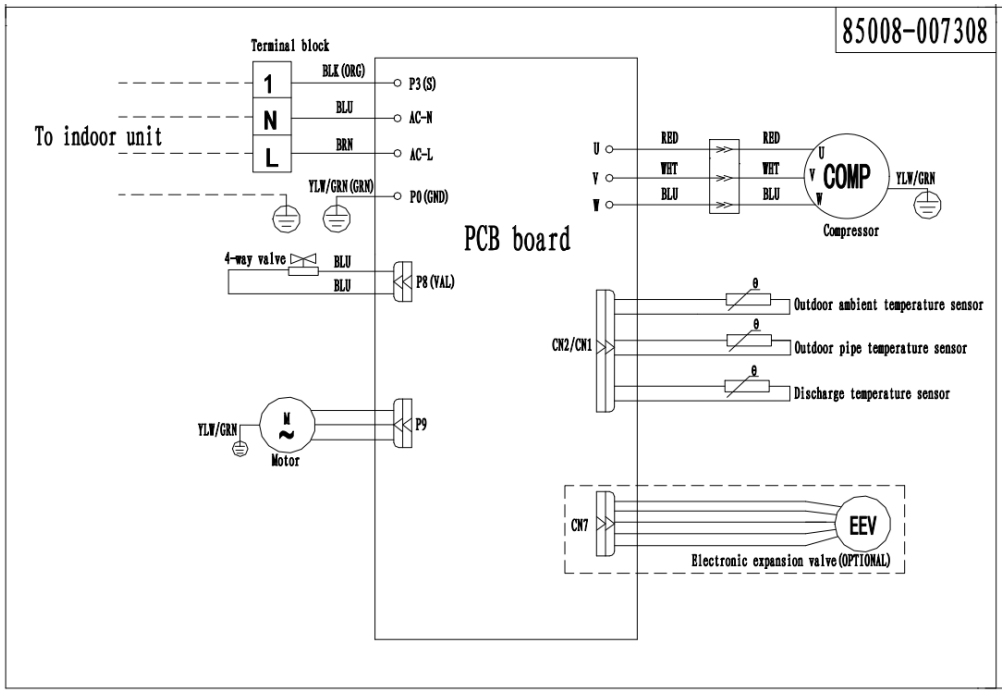
(5) Correction Coefficient of Air Volume Change Rate of Outdoor Unit

3 Wiring Diagrams

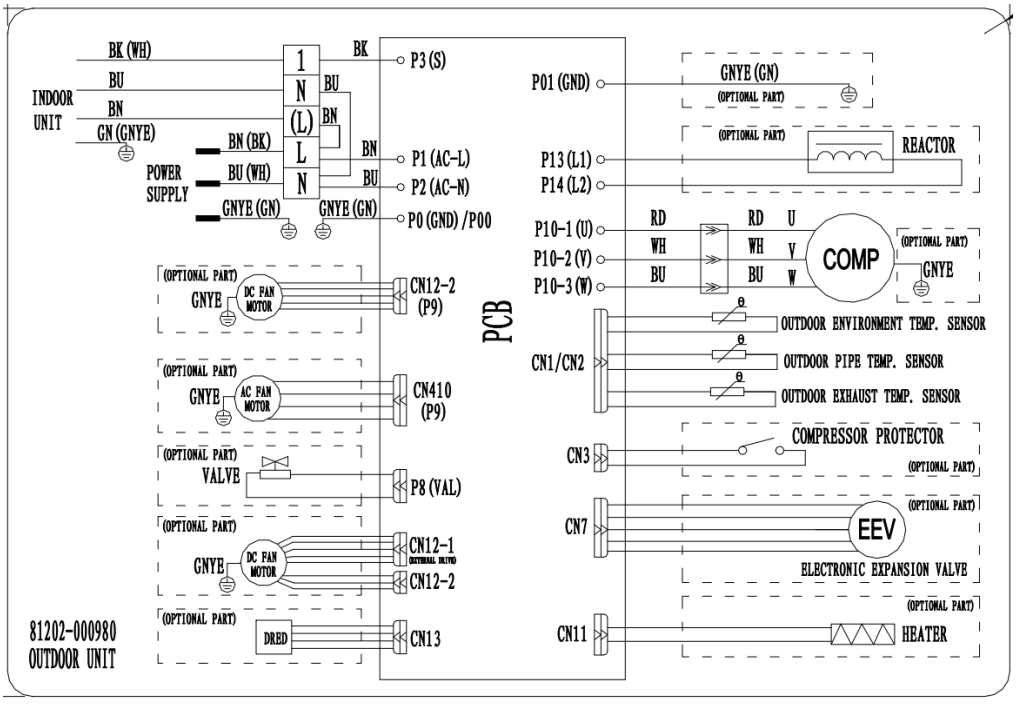
18K，24K



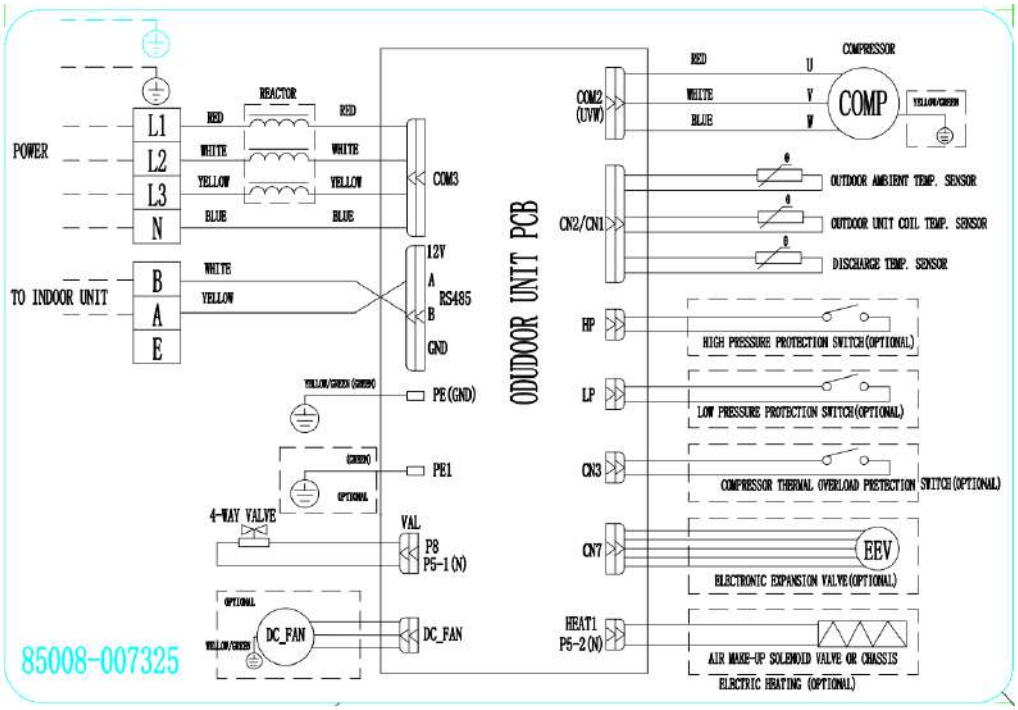
30K



36K


INDOOR UNIT
BK (WH)
BU
BN
GN (GNYE)
POWER SUPPLY
BN (BK)
BU (WH)
GNYE (GN)
1
N
(L)
L
N
P3 (S)
P1 (AC-L)
P2 (AC-N)
P0 (GND) /P00
PCB
P01 (GND)
GNYE (GN)
(OPTIONAL PART)
REACTOR
P13 (L1)
P14 (L2)
P10-1 (U)
P10-2 (V)
P10-3 (W)
RD
WH
BU
U
V
W
COMP
GNYE
CN1/CN2
OUTDOOR ENVIRONMENT TEMP. SENSOR
OUTDOOR PIPE TEMP. SENSOR
OUTDOOR EXHAUST TEMP. SENSOR
CN3
COMPRESSOR PROTECTOR
CN7
EEV
ELECTRONIC EXPANSION VALVE
CN11
HEATER
DC FAN MOTOR
CN12-2 (P9)
AC FAN MOTOR
CN410 (P9)
VALVE
P8 (VAL)
CN12-1
CN12-2
DRED
CN13
81202-000980
OUTDOOR UNIT

48K，60K


POWER
L1
L2
L3
N
REACTOR
RED
WHITE
YELLOW
BLUE
COM3
TO INDOOR UNIT
B
A
E
12V
A
RS485
B
GND
PE (GND)
PE1
4-WAY VALVE
VAL
P8
P5-1 (N)
DC_FAN
ODUDOOR UNIT PCB
COMPRESSOR
COM2 (UVW)
U
V
W
COMP
CN2/CN1
OUTDOOR AMBIENT TEMP. SENSOR
OUTDOOR UNIT COIL TEMP. SENSOR
DISCHARGE TEMP. SENSOR
HP
HIGH PRESSURE PROTECTION SWITCH(OPTIONAL)
LP
LOW PRESSURE PROTECTION SWITCH(OPTIONAL)
CN3
COMPRESSOR THERMAL OVERLOAD PRETECTION SWITCH(OPTIONAL)
CN7
EEV
ELECTRONIC EXPANSION VALVE(OPTIONAL)
HEAT1
P5-2 (N)
AIR MAKE-UP SOLENOID VALVE OR CHASSIS
ELECTRIC HEATING (OPTIONAL)
85008-007325

Part 4 Installation

1. Notes for Installation

Safety Precautions

Important!

Please read the safety of precautions carefully before installation and maintenance. The following contents are very important for installation and maintenance. Please follow the instructions bellow.

●The installation or maintenance must accord with the instructions.

●Comply with all national electrical codes and local electrical codes.

●Pay attention to the warnings and cautions in this manual.

●All installation and maintenance shall be performed by distributor or qualified person.

●All electric work must be performed by licensed technician according to local regulations and Instructions given in this manual.

●Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

Warnings

Electrical Safety Precautions.

1) Cut off the power supply of air conditioner before checking and maintenance.

2) The air conditioner must apply specialized circuit and prohibit share the same circuit with other appliances.

3) The air conditioner should be installed in suitable location and ensure the power plug is touchable.

4) Make sure each wiring terminal is connected firmly during installation and maintenance.

5) Have the unit adequately grounded. The grounding wire can't be used for other purposes.

6) Must apply protective accessories such as protective boards, cable-cross loop and wire clip.

7) The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.

8) The power cord and power connection wires can't be pressed by hard objects.

9) If power cord or connection wire is broken, it must be replaced by qualified person.

10) If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.

11) For the air conditioner without plug, an air switch must be installed in the circuit. The air switch

Should be all-pole parting and the contact parting distance should be more then 3mm.

12) Make sure all wires and pipes are connected properly and the valves are opened before energizing.

13) Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.

14) Replace the fuse with a new one of the same specification if it is burnt down, don't replace it

with a cooper wire or conducting wire.

15) If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precaution

1) Select the installation location according to the requirement of this manual. (See the requirements in installation part).

2) Handle unit transportation with care, the unit should not be carried by only one person if it is more than 20kg.

3) When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed, make sure the installation supporter is firm.

4) Ware safety belt if the height of working is above 2m.

5) Use equipped components or appointed components during installation.

6) Make sure no foreign objects are left in the unit after finishing installation.

2. Location Selection

2.1 Indoor Unit Location Selection

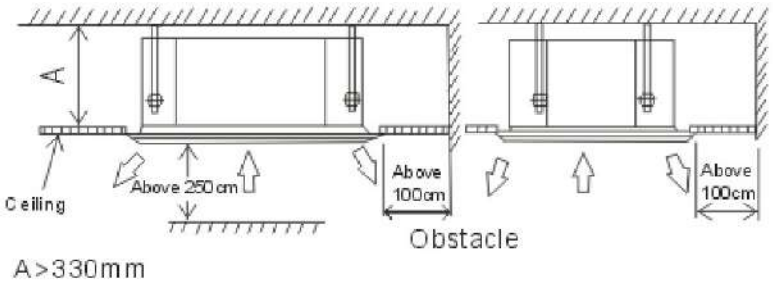
- The place shall easily support the indoor unit's weight.
- The place can ensure the indoor unit installation and inspection.
- The place can ensure the indoor unit horizontally installed.
- The place shall allow easy water drainage.
- The place shall easily connect with the outdoor unit.
- The place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

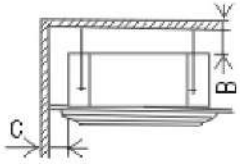
2.2 Outdoor Unit Location Selection

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

3. Installation Requirements of Casette

1) Service Space





Wall material	Flammable material	Fire-proof material or other nonflammable materials other than metal	Fire-proof structure
Up(B)	Above 5cm	Above 5cm	Above 5cm
Sides(C)	Above 100cm	Above 100cm	———

HEIGHT BETWEEN CEILING AND FLOOR

The installation height between ceiling and floor must be 2.7m~3.2m.

2) Ceiling hole and the hook installation

Preparation Work on the Ceiling

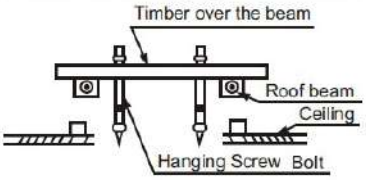
Installation method should be changed under the different construction structure. Please consult the professional for the detailed information. After opening a hole, the ceiling should be horizontal and strong to prevent vibration. Cut the beams at the hole and remove them. Reinforcing the beams that have been cut and the beams fixing the ceiling .

Installation of the hanging screw bolt.

Bolt with M10 whorl is to be used. The center distance between the bolts is decided by the size of the unit. Use the following method to install:

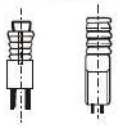
Wooden construction

Put the square timber over the roof beam, then install the hanging screw bolts.



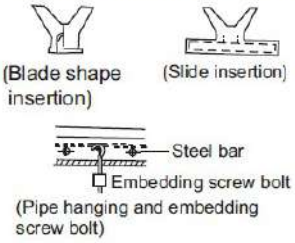
For finished concrete bricks

Install the hanging hook with expansible bolt into the concrete deep to 45~50mm to prevent loose.



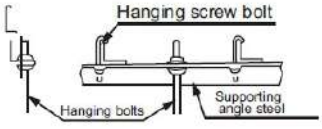
New Concrete Bricks

Inlaying or embedding the screw bolts.



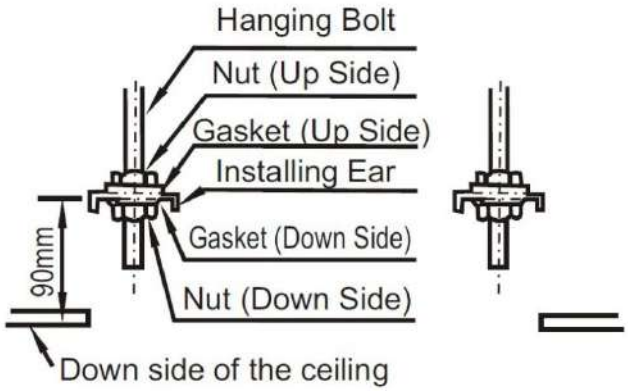
Steel roof beam structure

Install the supporting angle steel.

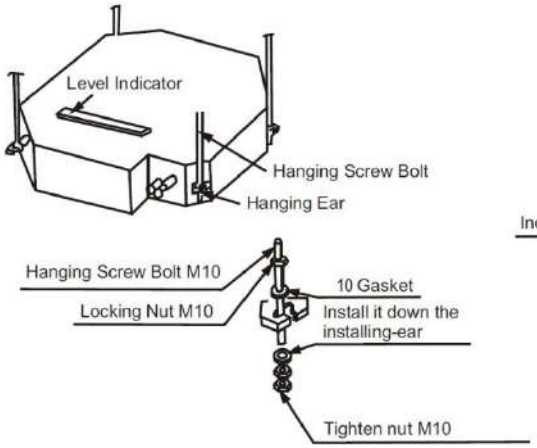


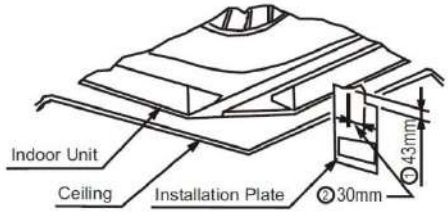
Overhanging the indoor unit

Adjust the gasket (down side) to 90mm over the ceiling.



Install the hanging bolt into T groove of the hanging tool. Overhang the indoor unit and ensure it is level using a level indicator.

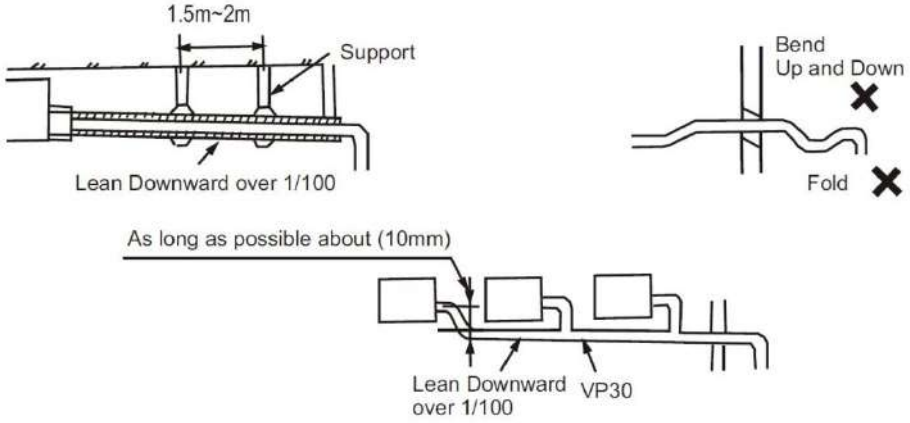




3）Drainage pipe installation

CAUTION

- The drain pipe of indoor unit must have the heat insulation, or it will condense dew, as well as the connections of the indoor unit.
- The declivity of the drain pipe downwards should be over 2/100, and no winding and bending.
- The total length of the drain pipe when pulled out transversely should not exceed 20m, when the pipe is over long, a prop stand must be installed every 1.5 to 2m to prevent winding.
- Refer to the following figures about the installation of the pipes.
- Do not impose any pressure on the connection part of the drainage pipe.



Drainage Pipe Material, Heat—insulating Material

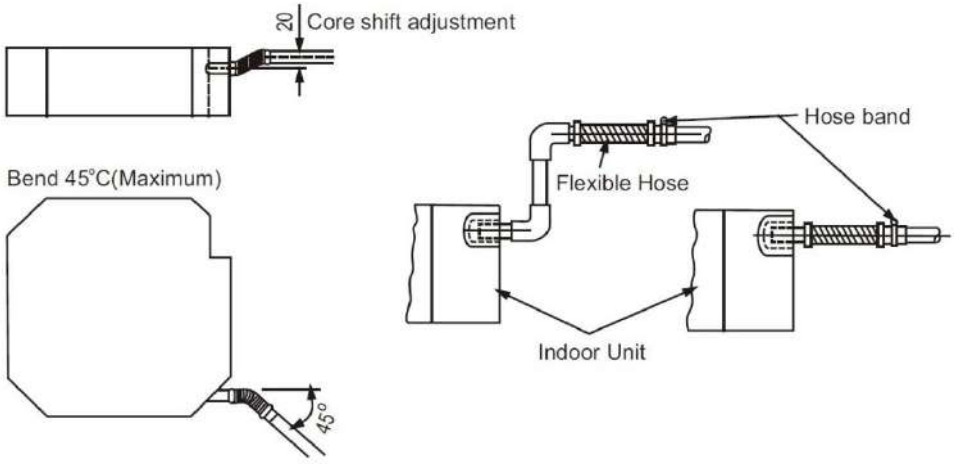
The listed material should be used:

Drainage Pipe Material	Polyvinyl chloride pipe (32mm outer diameter)
Heat Insulation Material	Foamed polyethylene insulation plate (10mm thickness)

Flexible Hose

Measure diameter of the hard pipe using cutting method, and adjust the joining angle.

- Pull out the flexible hose, do not over deform than illustrated below.
- Be sure to bind it with the attached hose horizontally.
- Please place the flexible hose horizontally.



Connection Procedure

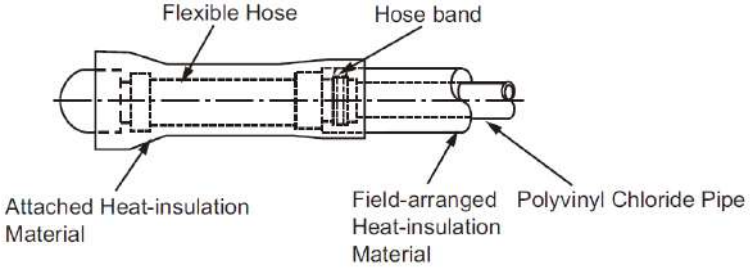
Connect the transparent pipe with the polyvinyl chloride pipe.

- Use polyvinyl chloride glue at the connection part of the drainage pipe, be sure no water leakage.

- Paste glue at the front 40mm of the polyvinyl chloride pipe, insert it into the transparent pipe.
- It needs 10 minutes for the glue to dry. Do not impose pressure on the connection during the drying period.

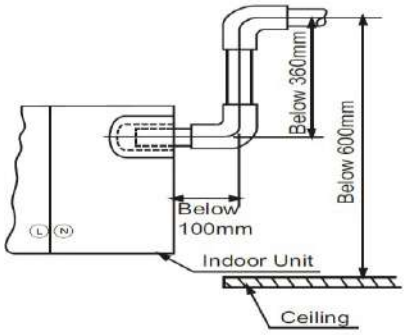
Heat Insulation

Wrap the flexible hose carefully with the attached heat insulation material from the start to the end (to indoor part)



Drainage Upward

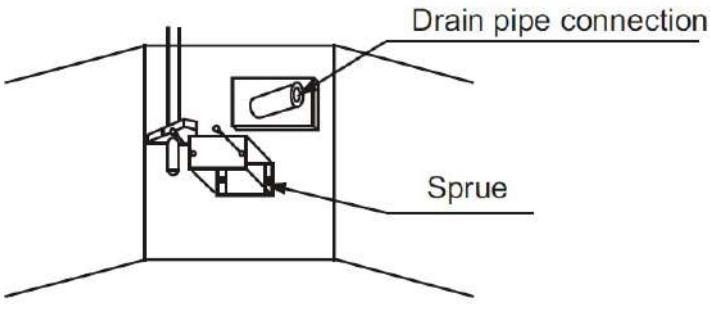
To make sure that the drainage pipe would not be slanted downward, lead it upward to a height 360mm maximum, then downward lead it.



Drainage Test

Check whether the drain pipe is unhindered before testing.

1) Stow water from sprue to check.
2) Stow 600cc water with pot or hose from sprue slowly, preventing touching the drain pump motor.
3) After the preparation work, disconnect the water level switch ,power 20 - 240VAC to of terminal board and the drain pump start up immediately.
4) After drain pump run 2 min., reset the water level pin, and then drain pump motor will stop after running 1 min..

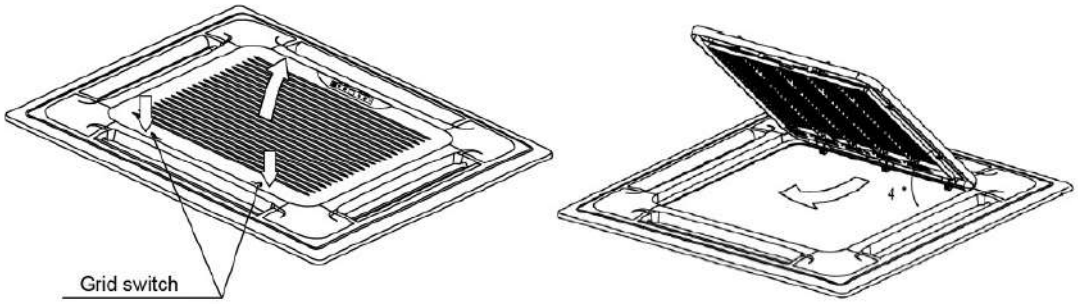


Motor Sound Test

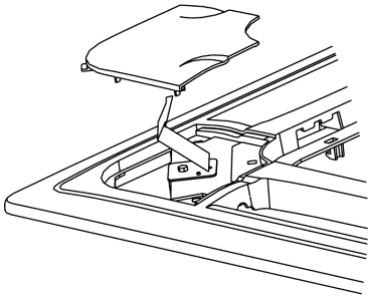
- The drainage test is doing during checking the drain pump motor running sound.
- Reset the water level switch connection to the original position after the drainage test.

4) Installation of panel

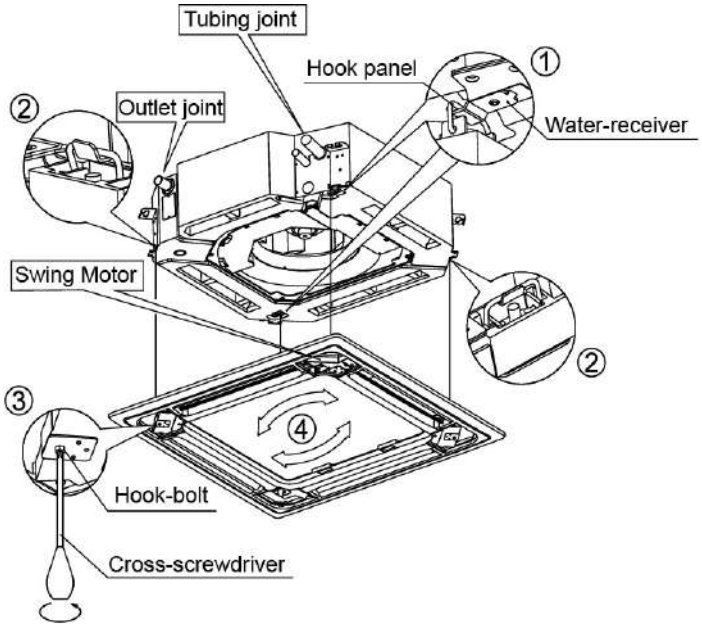
Remove the grille



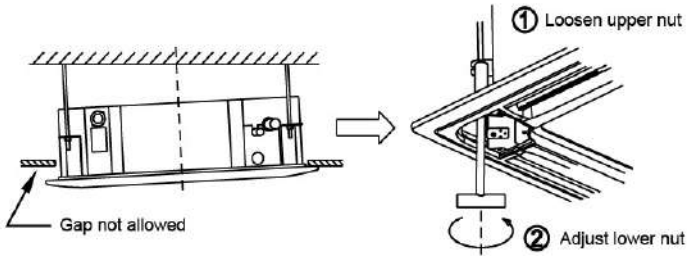
Remove the 4 corner covers.

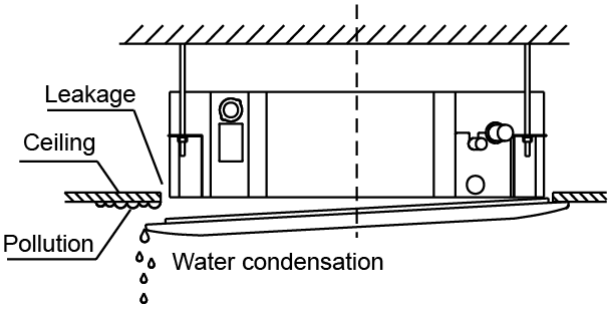


Hang the panel to the hooks on the main body. If the panel is with auto-lift grille, please watch the ropes lifting the grille, DO NOT make the ropes enwinded or blocked.

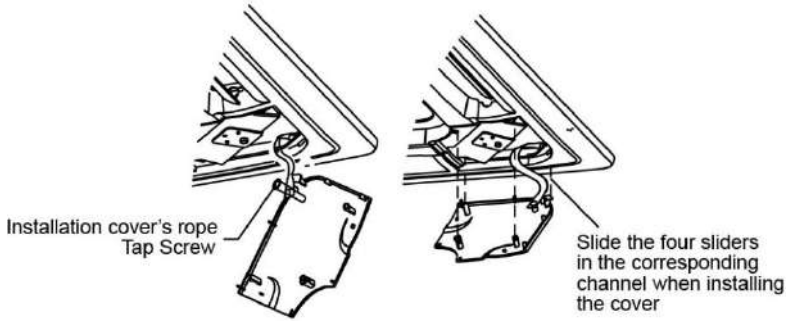


Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.





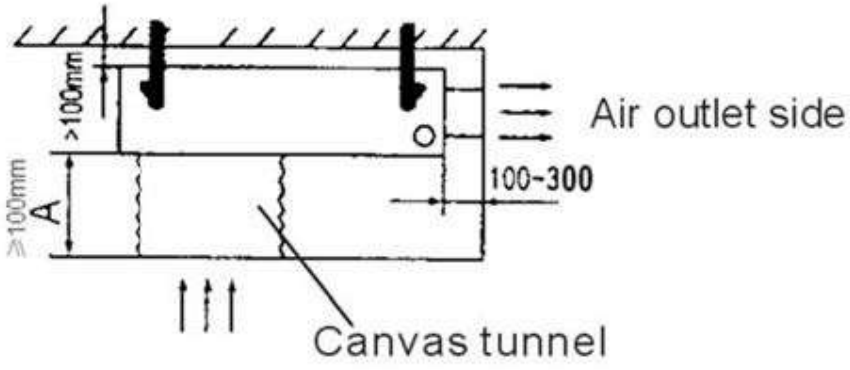
Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.
Install the 4 corner covers back.



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

4. Installation Requirements of Duct

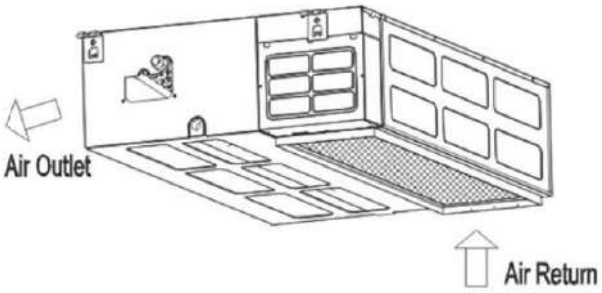
1) Service Space



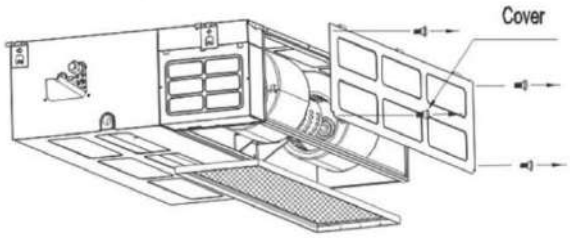
2) Choice of air return ways

This indoor unit is fitted with downward air return, which can be change to its backward counterpart if necessary. Please follow the steps below (1-3) to change it into the mode of air return backward (4).

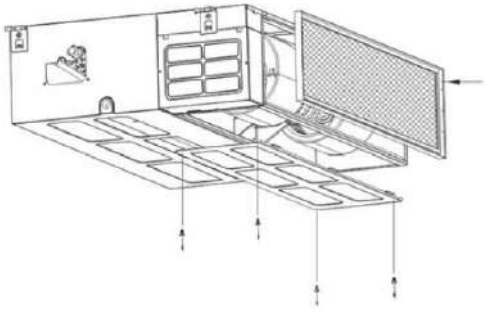
1. Air return downward



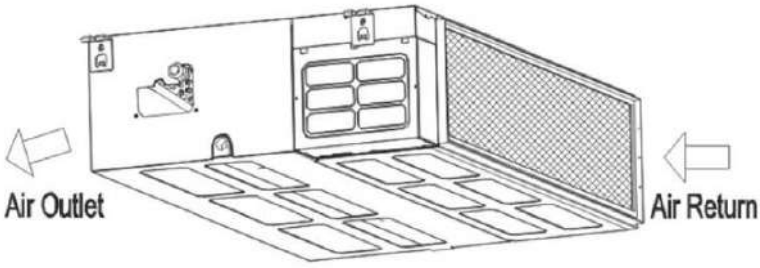
2. Loose the nut and dismantle flannel plate and filter; Loose the nut dismantle the back over.



3. Install the flannel plate and filter at the backside; Install the cover to the downside.



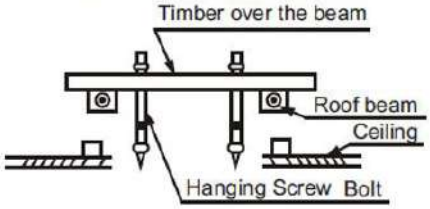
4. Air return backward.



3) Hanging &Installation of Indoor Unit

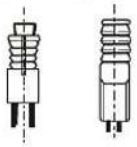
Wooden construction

Put the square timber over the roof beam, then install the hanging screw bolts.



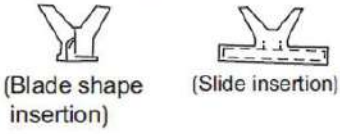
For finished concrete bricks

Install the hanging hook with expansible bolt into the concrete deep to 45~50mm to prevent loose.



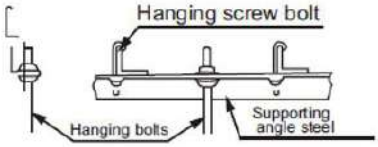
New Concrete Bricks

Inlaying or embedding the screw bolts.

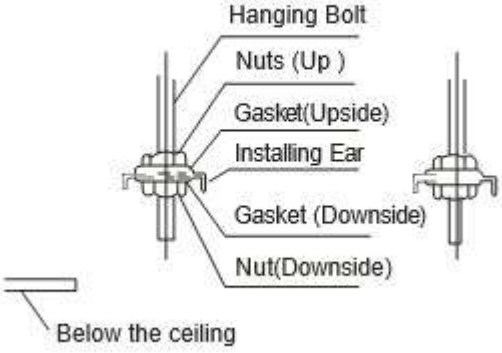


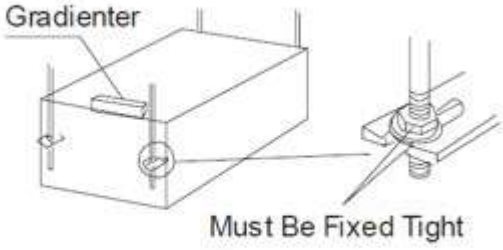
Steel roof beam structure

Install the supporting angle steel.



Adjust the nut position while the gap between gasket (downside) and ceiling should be confirmed according to actual situations.

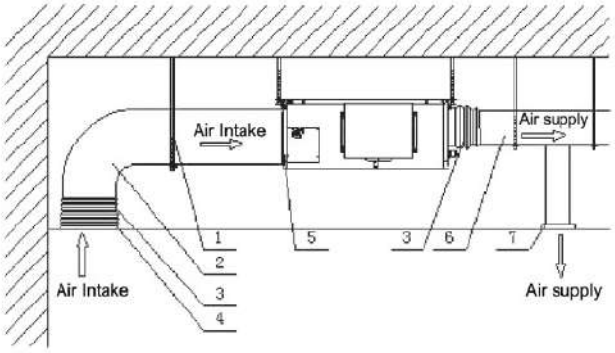




Hang the nut inside the U slot of the installation panel. To confirm level degree with gradienter. (Leaning downside toward non - draining side is prohibited)

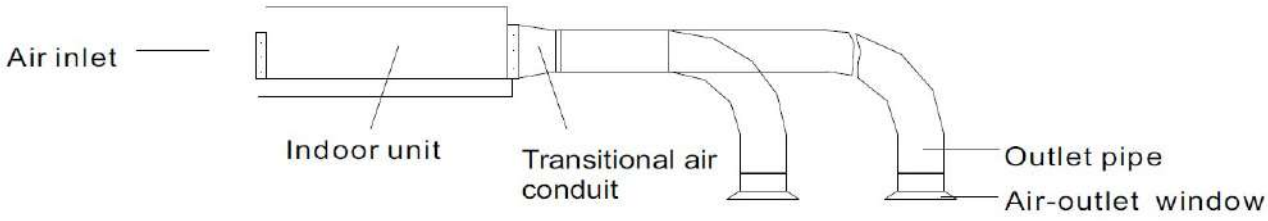
4) How to Mount Outlet Pipe

- Generally, we have two types of outlet pipe available, i.e. rectangular or round ones.
- Rectangular air conduit can be directly connected to air outlet of indoor unit by rivets. For outlet dimensions, see outline drawing of the unit.



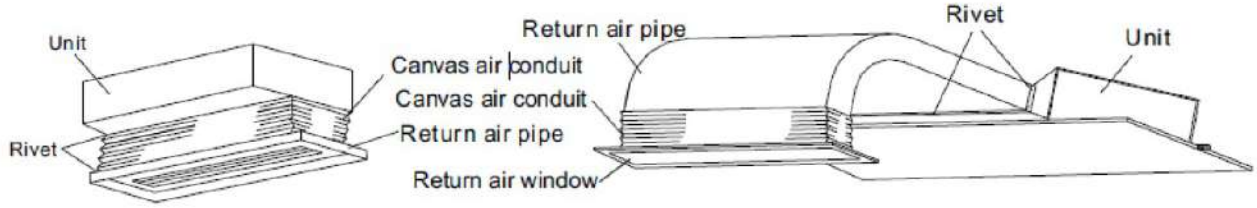
No.	Name	No.	Name
1	Hanger	5	Filter
2	Air Intake Pipe	6	Main Air Supply Pipe
3	Canvas Air Pipe	7	Air Supply Outlet
4	Air Intake		

- Round air conduit should be connected to a piece of transitional air conduit before it is connected to air outlet of indoor unit, the other end of it can be separately connected to air conduit window or connected to air conduit window after air flow diversion, and the total length should not be over 6m. As shown in figure below, air speeds at all air outlets should be set to basically consistent so as to meet the room air - conditioning requirements.



5) Installation Method for Return Air Pipe

- In case sidewise air intake is adopted, return air pipe should be fabricated and rivet - connected to return air orifice, and the other end of it should be connected to return air window.
- In case of underside air intake, purchase or fabricate a section of pleated canvas air conduit serving as transition joint for return air orifice and return air window. in this way, it can be freely adjusted according to height of indoor ceiling board; in addition, during operation of the unit , canvas air conduit may avoid vibration of ceiling board, as shown in figure below.

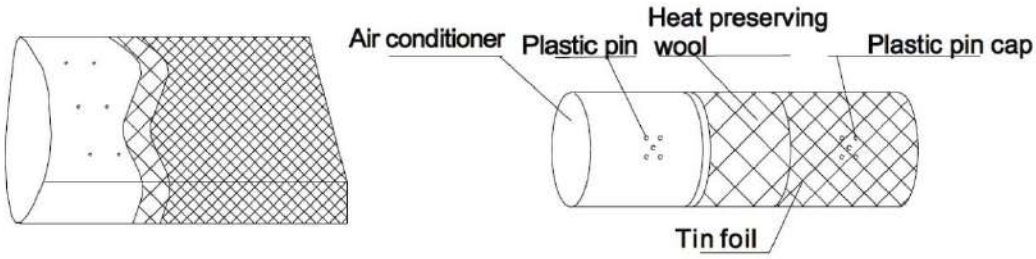


Installation mode for underside air intake

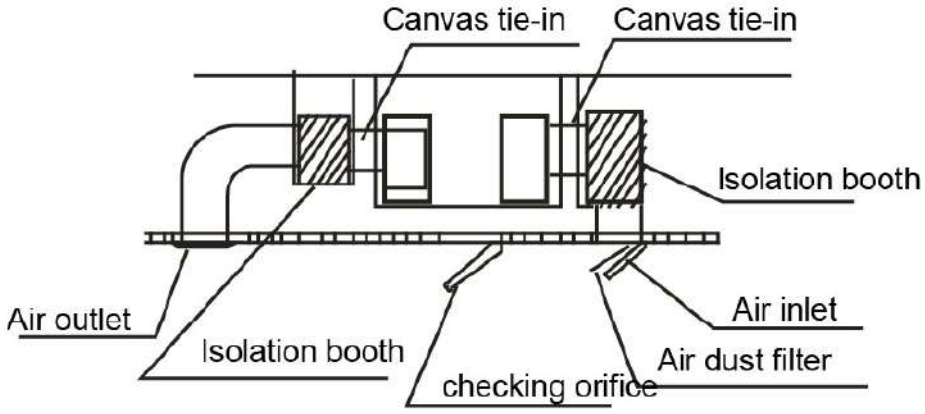
Installation mode for sidewise air intake

6) Tips for Installation of Return Air Pipe and Outlet Pipe

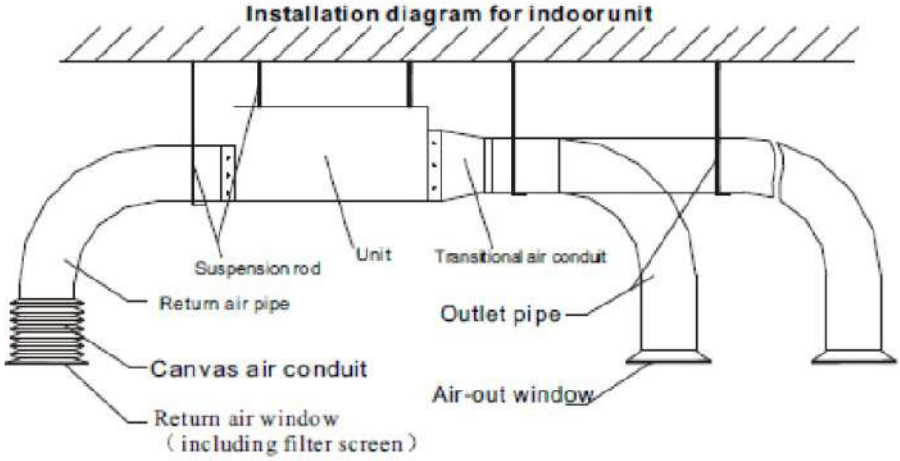
To minimize energy loss occurring in transmission process and condensed water during heating operation, return air pipe and outlet pipe shall be equipped with heat - insulating layer as shown in the figure.:



- Return air pipe and outlet pipe shall be fixed to floor precast slabs by iron stand; in addition, all ports of the air conduit should be tightly sealed by gasket cement, and it is advisable that the edge clearance of return air pipe shall be 150mm at least.
- Drain pipe for condensed water shall be installed with minimum gradient of 1 %, and the drain pipe shall be insulated with heat - preserving pipe casing as well.



Installation of the rectangular duct



Installation of the round duct

7) Installation of Drain Pipes

Warning:

Must install drainpipes according to the following figure, avoiding generating condensed water and leakage water.

a. Assemble the main body according to the Figure.

b. The opening of drainpipes can be installed on the leftside or the right side . Could remove the drain stopper and put it on the leftside or the right side.

c. For the best effect, should keep pipes as short as possible. Tilt the pipes to ensure the flow of fluid.

d. Make sure the drainpipes have admirable heat insulation.

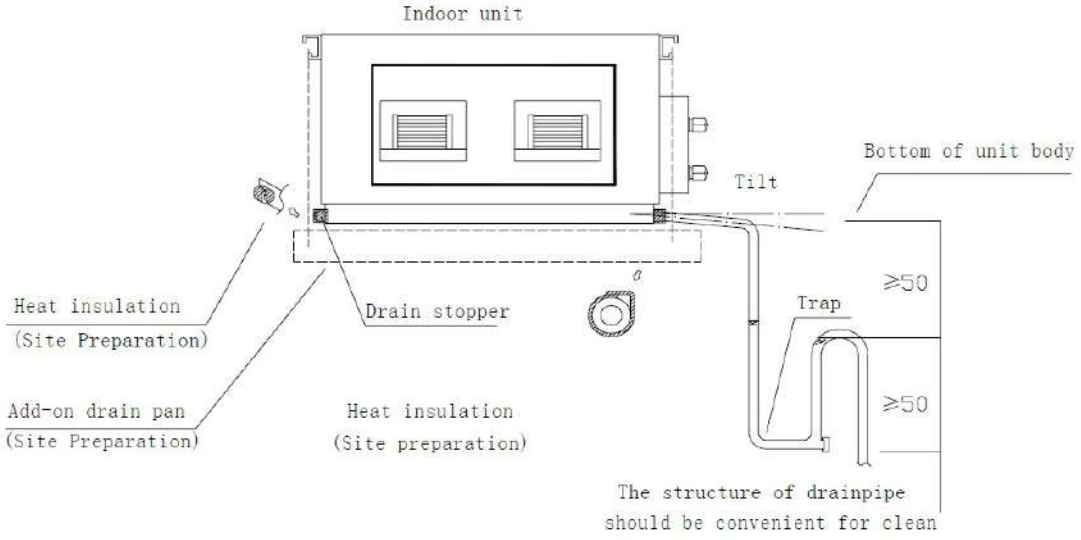
e. It is necessary to install a trap near the opening of the drainpipe, so that when the machine is working, the pressure in the inside of the machine is lower than atmospheric pressure. If there isn't an elbow, the water will splash and the pipe will produce a bad smell.

f. Keep straightness of drainpipes so as to remove dirt.

g. Seal the drainpipe on the other side of the machine, then wrap up the drainpipe in the heat - barrier materials.

h. Put water into the drain pan to test whether the water can be discharged swimmingly.

i. In humid conditions, please must use an add - on drain pan (commercially available) to cover the whole area of the indoor unit.



Unit: mm

Drainage Experiment

◆ Before the test, it is necessary to ensure the unblocking state of drain pipes, and check the sealing performance of various joints;

◆ The new room shall be subject to a drainage test before laying the ceiling;

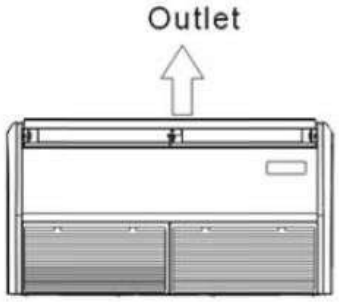
◆ Inject a certain amount of water from the air outlet to check the drainage condition.

Precautions: the insulated cotton is used for the heat preservation of drain pipe after making sure the unblocked drainage and no water leakage; otherwise, it may result in the generation of condensed water.

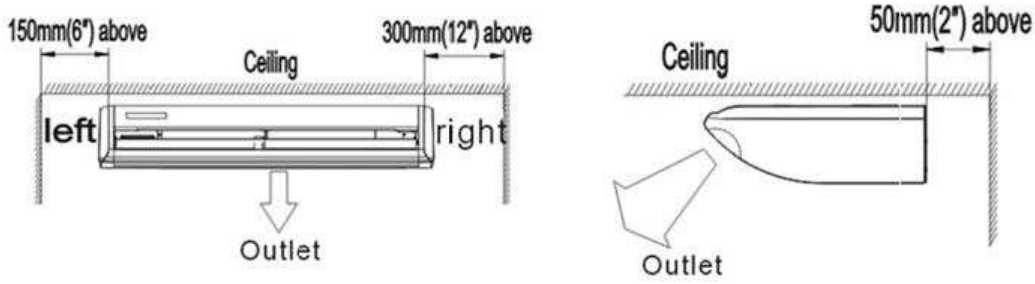
5. Installation Requirements of Ceiling& Floor

1) Installation Space

Floor console



Under ceiling

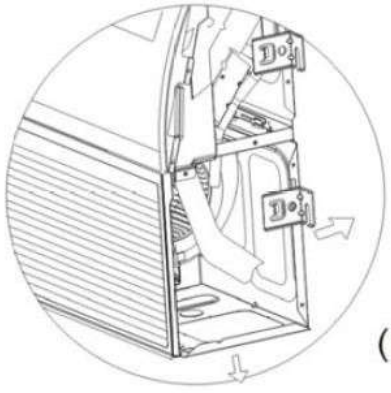


2) Floor console type

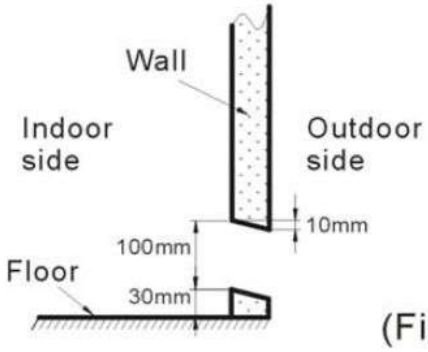
(1) Select the piping and drainage directions.

The piping and drain can be made in two directions as shown below (fig.1).

When the direction is selected, please drill a 100mm (4″)diameter hole on the wall ,and the hole must be tilted downward towards the outdoor for smooth water flow .When the pipe is out from the rear ,make a hole in figure ,at the position shown(fig.2).



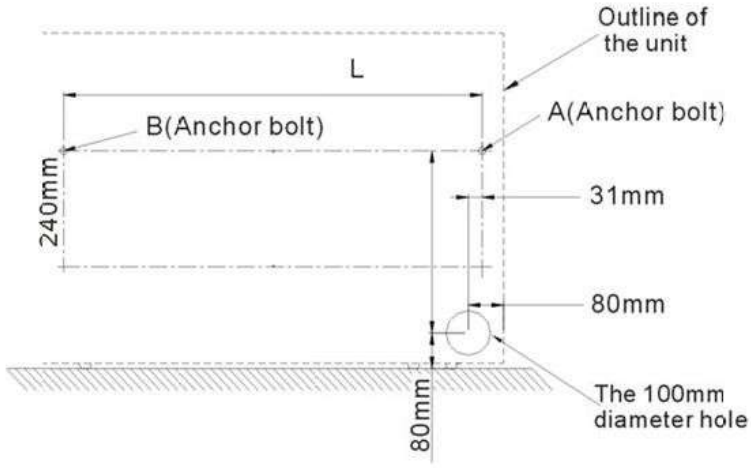
(Fig.1)



(Fig.2)

(2) Drilling holes for anchor bolts and installing the anchor blots(m10)

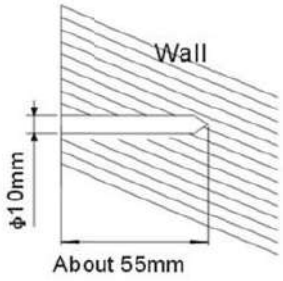
According to the position of the hole, install two expansible anchor bolts (A and B) at the position shown in the figure.



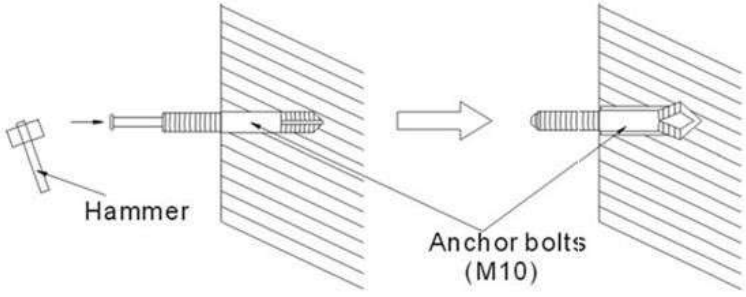
NOTE:

Cooling Capacity	18000 Btu/h	24000 Btu/h	36000 Btu/h	48000 Btu/h	60000 Btu/h
Dimension (L)	980mm	980mm	1200mm	1560m m	1560mm

With a concrete drill, drill two 10mm diameter holes at the position (A and B) on the wall.

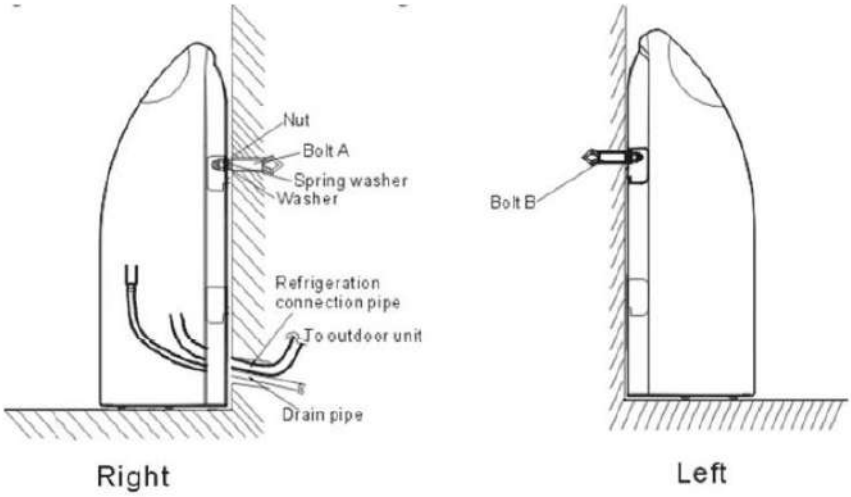


Insert the anchor bolts into the drilled holes, and drive the pins completely into the anchor bolts with a hammer.



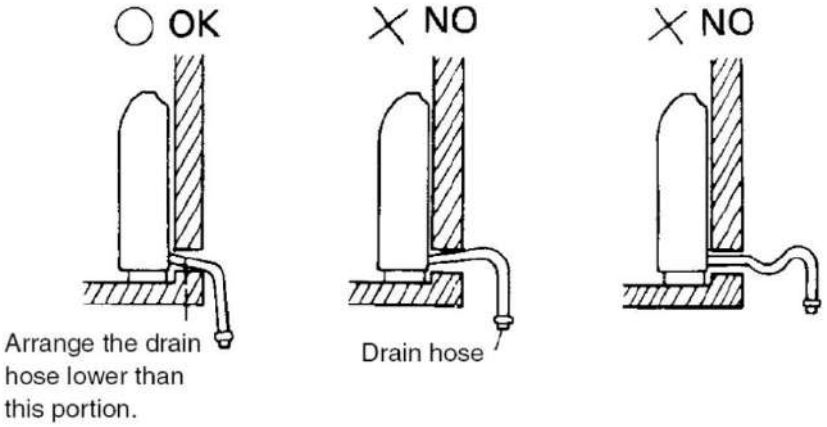
Install the unit to them with nuts, washers and spring washers

NOTE: The installation angle should not exceed 15 degrees.



CAUTION

Be sure to arrange the drain hose so that it is leveled lower than the drain hose connecting port of the indoor unit.

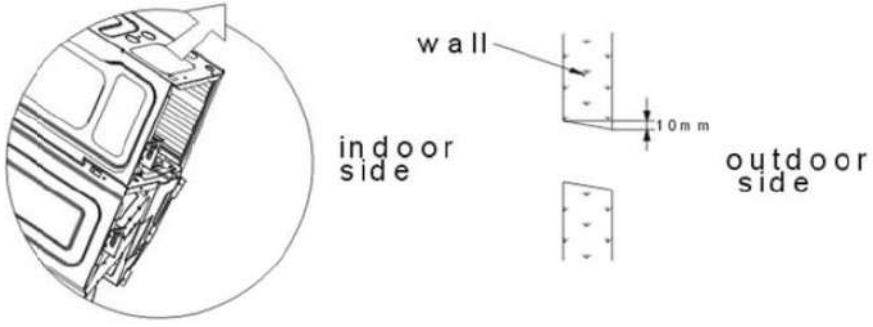


3) Under ceiling type

(1)Select piping and drain directions.

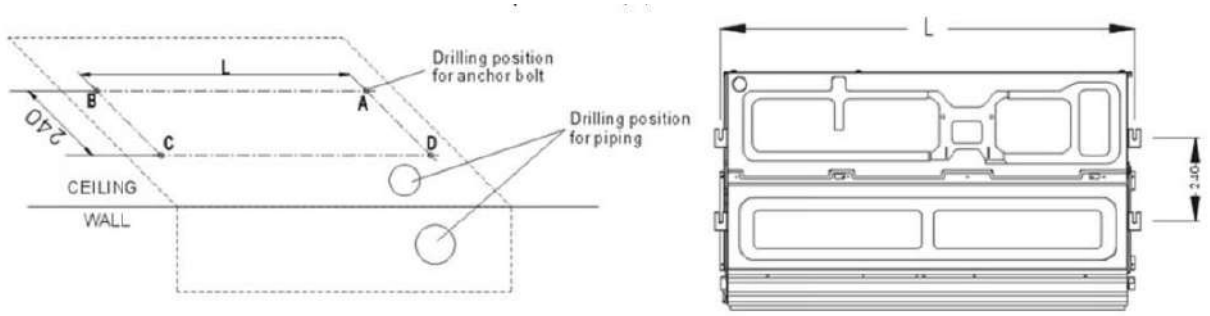
CAUTION: Install the drainage hose at the rear, it should not be installed on the top.

When the directions are selected, drill 80 mm (3 - 1/8") and 50 mm (2") or 150 mm (6") dia. hole on the wall so that the hole is tilted downward toward the outdoor for smooth water flow.



(2) Drilling holes for anchor bolts and installing the anchor blots (m10).

Please drill four holes for anchor bolts at the position A, B, C andD.



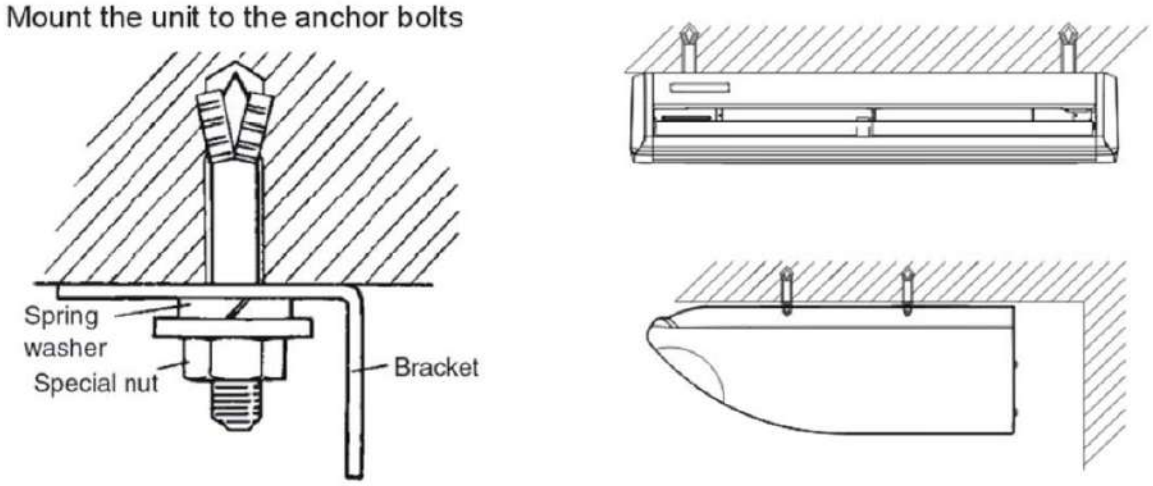
NOTE:

Cooling Capacity	18000 Btu/h	24000 Btu/h	36000 Btu/h	48000 Btu/h	60000 Btu/h
Dimension (L)	980mm	980mm	1200mm	1560m m	1560mm

4) Installing indoor unit

Now, securely tighten nuts to each bolt with washers and spring washers.

NOTE: The installation angle should not exceed 10 degrees.

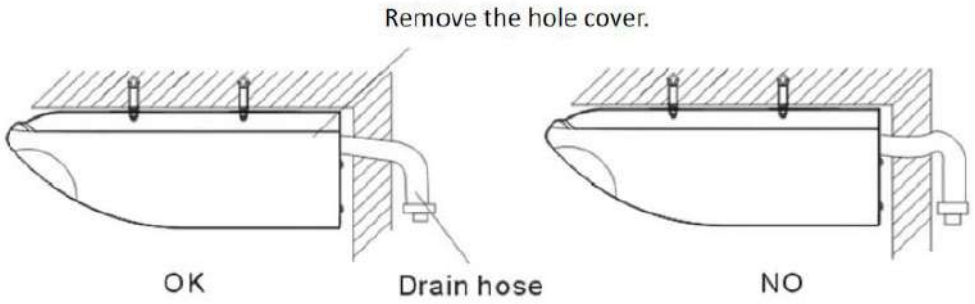


5) DRAINAGE PIPE CONNECTION

(1) Installing the drain hose

Insert the drain hose into the drain pan, then secure the drain hose with a nylon fastener(we have connected the drain hose to the drain pan in the factory,you just need connect the drain pipe.). Wrap the insulation (drain hose) around the drain hose connection.

Be sure to arrange the drain hose so that it is leveled lower than the drain hose connecting port of the indoor unit.



(2) Drainage test

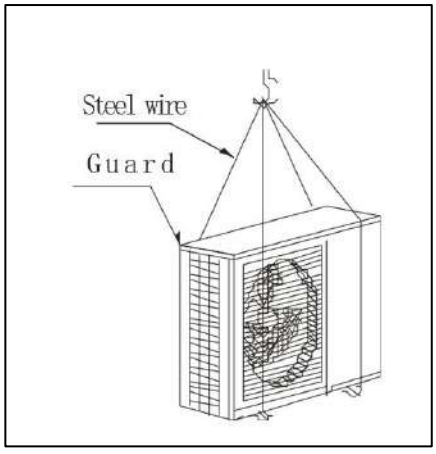
A. Check whether the drain pipe is unhindered and each joint is airproof.

B. Inject 2000ml water into the drain panto test whether the water flows smoothly.

6. Installation Requirements of Outdoor Unit

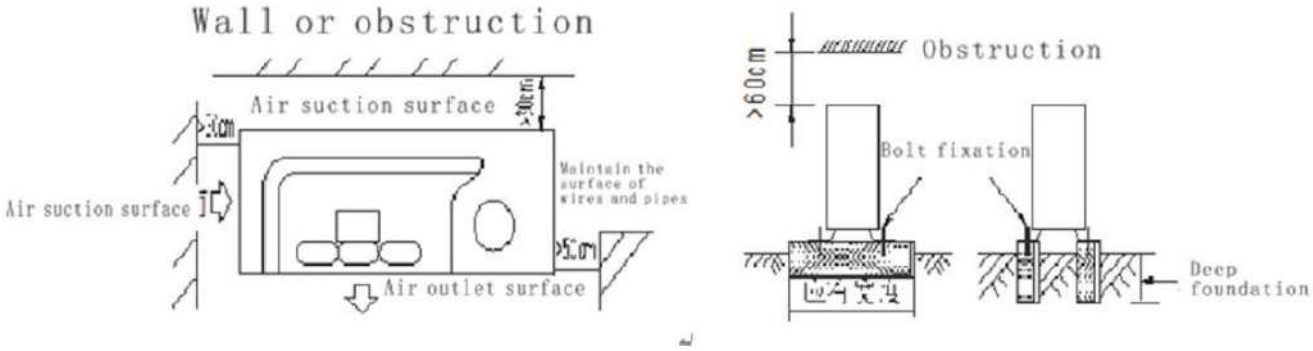
1) Hoisting and Transportation of Outdoor Unit

- Please use four wire ropes of at least Φ6mm to hoist the outdoor unit and pay attention to the gravity center position to avoid the slide and turnover of the outdoor unit, and forklift can also be used for the handling;
- Please add the guard plate at the contacting surface between wire rope and air conditioner to avoid the surface scratches and deformation of the outdoor unit;
- Please remove the backing plate for transportation after completing the hoisting operations, as shown in the following figures:

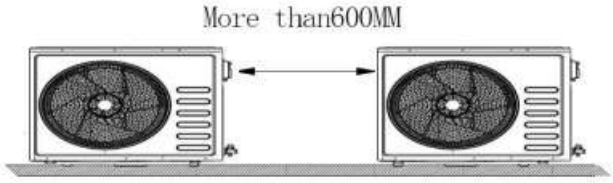


2) Installation Requirements of Outdoor Unit

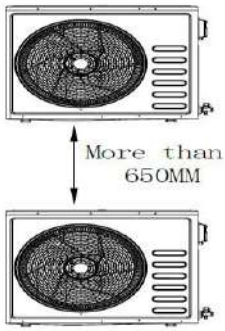
(1)Installation Space Requirements



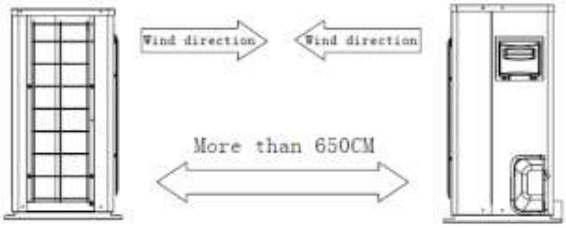
(2)Minimum Distance between Side Faces



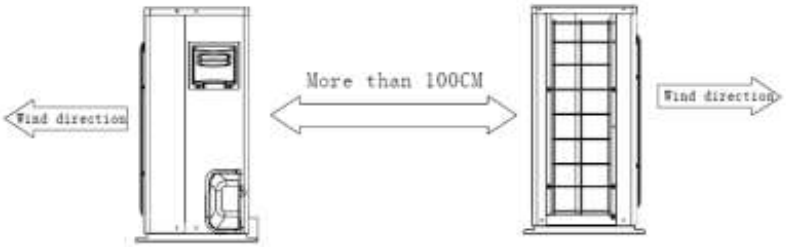
(3)Minimum Distance between Upper Side and Lower Side



(4) Minimum Distance for Relative Arrangement of Front Face in the Same Plane (Air Outlet Side):

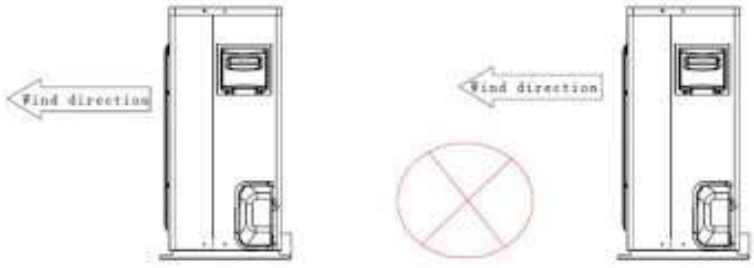


(5)Minimum Distance for Relative Arrangement of Back Face in the Same Plane (Air Return Side):



(6)Front/Rear Arrangement of Outdoor Units in the Same Plane (Air outlet in same direction, namely, the air outlet of the rear outdoor unit faces towards the air inlet of the front unit):

It is necessary to put an end to this installation mode! Because the return air of the front unit may seriously affect the exhaust air of the rear unit!



7. Design and Installation of Connecting Pipes

7.1 Pipe length and drop height shall comply with the scope required below.

Mode	18K	24K
Max pipe length	30m	30m
Max drop height	15m	20m
Standard piping length	5m	5m
The refrigerant shall be increased while the mounted pipe is more than the standard piping	22g/m	22g/m

Note: A return oil elbow must be equipped for each drop of 10m in the vertical height of refrigerant pipe!

Connection Mode

	Gas Side	Liquid Side
Outdoor Unit	Flare nut	Flare nut
Indoor Unit	Flare nut	Flare nut

7.2 Material and Size of the Pipes

Outdoor pipe dimension and installation modes (in sequence of cooling capacity)

Pipe material		Copper Pipe For Air Conditioner	
Model		18K	24K
Size(mm)	Liquid side	Φ6.35(1/4inch)	Φ6.35(1/4inch)
	Gas side	Φ12.7(1/2inch)	Φ12.7(1/2inch)

7.3 Precautions for Installation:

7.3.1 Installation

Confirm the model, name and specification to avoid the faulty installation.

7.3.2 Refrigerant Piping

A. The refrigerant piping must adopt the pipe diameter specified;

B. The refrigerant piping must be subject to insulation treatment;

C. It is necessary to inject the nitrogen of certain pressure into the refrigerant pipes before welding the pipes;

D. The indoor unit cannot be energized before the airtight test and vacuum pumping operation after completing the installation of refrigerant piping. If it has been energized, the airtight test and vacuum pumping operation must be carried out to the pipes at gas side and liquid side.

7.3.3 Airtight Test

The refrigerant piping must be subject to the air - tight test and the test pressure of R410A system is 40.0kgf/cm2.

7.3.4 Vacuum Pumping Operation/Evacuation

The evacuation of refrigerant piping must use the vacuum pump and it shall be simultaneously carried out from both gas side and liquid side.

7.3.5 Adding of Refrigerant

A. The adding amount of refrigerant for each outdoor unit for excessive standard piping length shall be determined according to the piping size and specification.

B. The data of refrigerant adding amount, piping length and height difference of indoor/outdoor units shall be recorded and properly stored for backup.

7.3.6 Electrical Wiring

A. The diameter of power capacitor cables and power cables shall be selected according to the design manual, and the diameter of air‐condition power cord shall be greater than the power cord of the common motor;
B. In order to prevent the misuse of the air conditioner, it is necessary to make sure of no staggering and winding of power cord with the connection line of the indoor unit (low‐voltage line);
C. The indoor unit shall be energized after the airtight test and the vacuum pumping operation (Evacuation).

7.3.7 Trial Run

The trial run cannot be performed unless the outdoor unit has been energized for over 12 hours.

7.4 Installation of Refrigerant Pipes

7.4.1 Selection of Refrigerant Copper Tubes

1) The refrigerant pipes must use the specified diameter;
2) The refrigerant pipes must be subject to the insulation treatment and the copper tube for R410A system must be subject to the oil‐removing treatment;
3) The withstand pressure copper tube: R410A:≥46kgf/cm^2;
4) The R410A system requires that the impurities in copper tube shall be < 30mg/10m.

7.4.2 Material Protection of Refrigerant Pipes

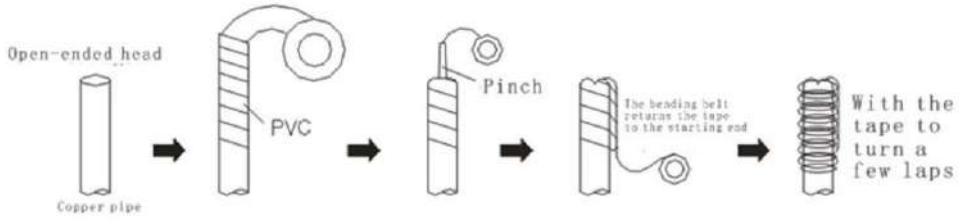
1) The end of each pipe must be wrapped and capped. The “tightening” is the most effective method. However, “binding” is the simple alternative method used for certain working area.

A. Tightening Method

Clamp and flatten the end of copper tube and then weld it.

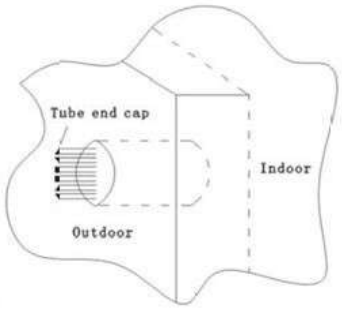
B. Binding Method

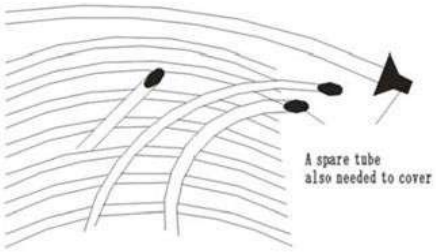
Wrap the copper tube with PVC tapes



C. Special attention shall be paid to the following operations:

- When passing the copper tube through the hole (the dirt may easily enter the pipe)



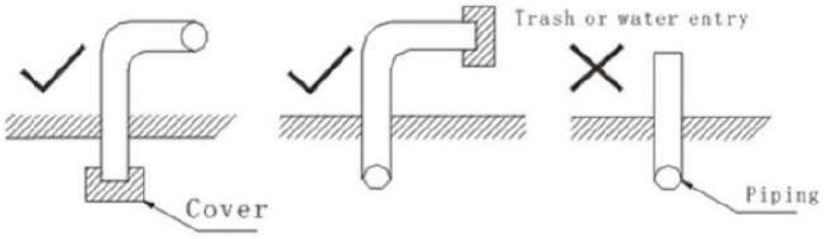


- When the copper tube gets into the outdoor area (the rain may easily enter the pipe, in particular, special attention shall be paid when the pipe is in a vertical state)

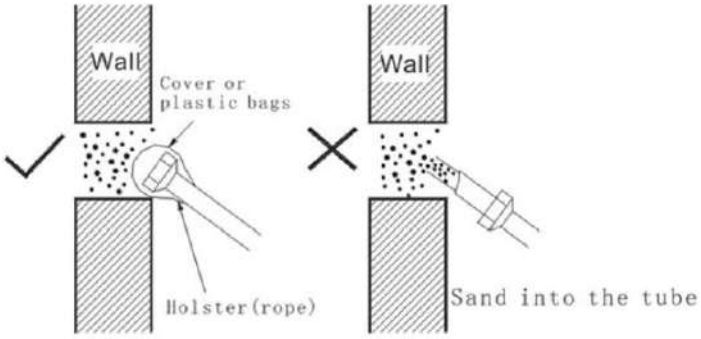
2) Precautions for Material Protection of Refrigerant Pipe

A. No waste or water vapor shall be entered into the pipes

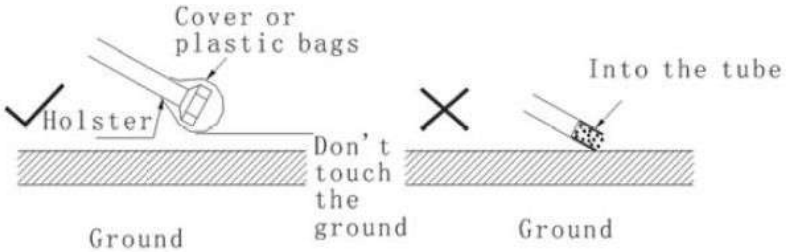
- Before completing the connection of pipes, the opening of the pipes shall be capped tightly;
- The opening of pipes shall be lateral or be downward;



B. The opening of the pipe must be blocked and capped while it passes through the wall.

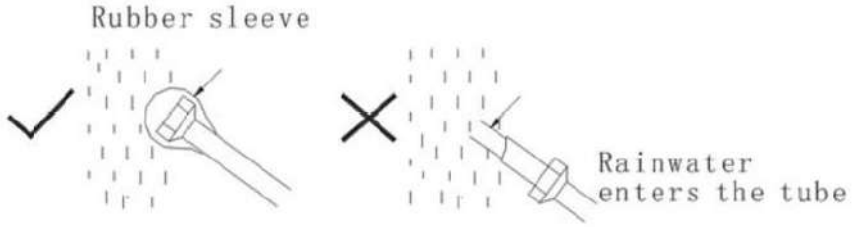


C. The pipe shall not be placed on the ground or rubbed against the ground.



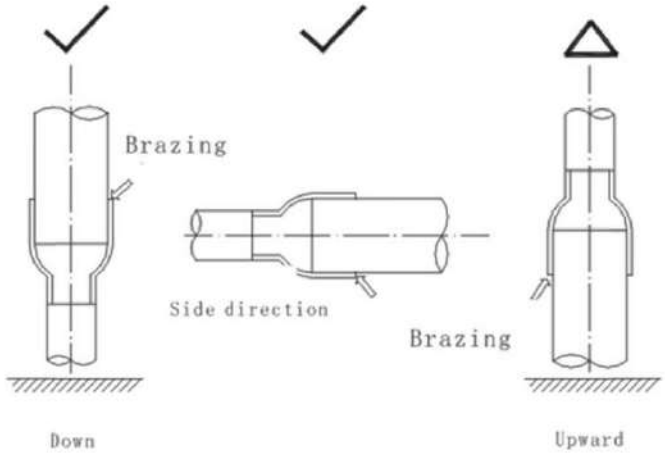
D. The pipe opening shall be upside down while removing the burr after cutting the pipe.

E. Remember that the pipe opening must be plugged while conducting the piping operations in rainy



7.4.3 Welding Operations

1) The welding operation shall be carried out in a downward or lateral state and the overhead welding operation shall be avoided.



2) The attention shall be paid to the assembly direction and angle of the liquid pipe and gas pipe openings to avoid the oil backflow or accumulation;
3) The alternative method for nitrogen injection is the standard operation method during the welding operation.

A. Preparation for fire prevention (to avoid the fire, conduct in clean area, prepare the fire - fighting equipment and water for emergency purpose);

B. Pay attention to the avoidance of scalds;

C. Pay attention to the gap between pipe and nipples (avoid the leakage);

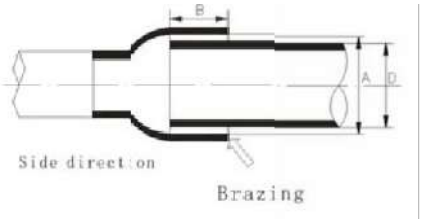
DC Confirm the support strength for pipes.

- The spacing criteria for supports of horizontal pipes(copper tube) are as follows:

Criteria(mm)	Below 20	25 - 40	50
Max. spacing(m)	1.0	1.5	2.9

- Minimum embedding depth and gap of copper tube nipples/fittings Unit mm

Type	Outer diameter D	Minimum embedding depth B	Gap A - D

	5＜D＜8	6	0.05 - 0.21
	8＜D＜12	7	
	11＜D＜16	8	0.05 - 0.27
	16＜D＜25	10	
	25＜D＜35	12	0.05 - 0.35
	35＜D＜45	14	

7.4.4 Flare Connection

1) The auxiliary connecting pipe must be annealed before the flaring operation;
2) The pipe shall be cut by pipe cutter (the large diameter pipe shall use the large cutter; when the diameter is so large that it cannot be cut by the pipe cutter, the metal saw shall be used, but attention shall be paid to that the saw dust cannot enter the pipeline);
3) The flaring tool shall be used and the size of flare opening shall remain as follows:

Do not forget to consider the pipe nut in the situation specified for processing of flare opening. Shape and Size of Flare Opening:

Dimension table (unit: mm)

Nominal size	Outer diameter D_0	A
F1/4	6.35	8.6 - 9.0
F3/8	9.52	12.6 - 13.0
F1/2	12.7	15.8 - 16.2
F5/8	15.88	19.0 - 19.4
F3/4	19.05	22 - 22.4

Attention shall be paid to that the bore diameter of pipe nut shall be increased by 1mm based on the dimension A; otherwise there is a possibility that the pipe nut cannot be assembled.

Pipe diameter “d”（mm）	6.4	9.5	12.7	15.9	19.1
R22 flare size “A”（mm）	8.8	12.8	16.2	19.4	23.7
R410A flare size “A”（mm）	9.1	13.2	16.6	19.7	24.0

Notes:

A. The flared side of R410A is deeper than that of R22;

B. The eccentricity between horn center and pipe center is set for 0.1mm or above;

C. There shall be no scar, crack and asperity at the horn position.

4) Apply the air - conditioning oil on the inner and outer surface of the flare (for facilitating the smooth pass of flare nut to prevent the distortion of the pipeline)
   A. Carefully remove the burrs;
   B. Use two wrenches to grab the pipe;
   C. The flare nut shall be mounted onto the pipe before the pipe expansion operation;
   D. The torque force shall be appropriate when using it to tighten the nut (standard torque ±10%)

Size	Torque	
	(kgf·m)	(N·cm)
1/4"(Φ6.4)	144 - 176	1440 - 1720
3/8"(Φ9.5)	133 - 407	3270 - 3990
1/2"(Φ12.7)	504 - 616	4950 - 6030
5/8"(Φ15.9)	630 - 770	6180 - 7540
3/4"(Φ19.0)	990 - 1210	9270 - 11860

7.4.5 Laying of Refrigerant Pipes

1) Laying of Refrigerant Pipes

The system shall be clear and a system sign shall be marked at some distance to avoid the improper connection.

2) Protection of Outdoor Refrigerant Pipes

In addition to the insulation layer, some outdoor refrigerant pipes shall be subject to the treatment against the expected damage. If the length of exposed outdoor refrigerant pipe is over one meter, the exposed pipe must be equipped with a pinch plate for protection.

3) Laying Principle of Refrigerant Pipes

A. It shall adopt the centralized arrangement, arrangement along the wall and the arrangement using the corridor.

B. After completing the laying, it shall be wrapped with the white wrapping tapes. All pipes shall be wrapped together according to the thickness of main pipeline on the basis of independent wrapping for individual pipes, and no sense of relaxation shall prevail for their wrapping tightness.

C. The connecting pipes and electric wires of indoor/outdoor units (power cords, control lines) shall be in principle arranged along the walls, turned reasonably, be smoothly vertical and horizontal, parallel to each other and bound together to try the best to avoid the overhead cross and blockage;

D. The installation of connecting pipes and electric wires of indoor/outdoor units (power cords, control lines) shall in principle try the best to reduce the length of the pipeline;

E. It is necessary to try the best to wrap all pipes and the joints cannot be exposed;

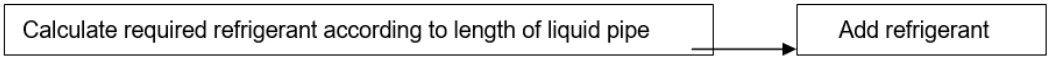
4) Precautions for Laying of Refrigerant Pipes

A. Pipe Inserting: add the system number on the pipe to avoid the wrong connection of pipes;

B. Confirm the support strength for pipes.

Note: A return oil elbow must be equipped for each drop of 10m in the vertical height of refrigerant pipe!

7.4.6 Adding of Refrigerant



1) Charging Step of Refrigerant

A. The completion condition of vacuum drying can be determined based on evacuation or vacuum - pumping operation;

B. Calculate the weight of added refrigerant. When the piping length is longer than the actual standard length for delivery:

(1) Valid length of pipe = pipe length + (elbow number× elbow equivalent length)

(2) Conversion of elbow equivalent length

Gas piping size	Φ12.7	Φ15.9	Φ19.0	Φ25.4	Φ28.6
90° elbow equivalent length	0.10	0.10	0.15	0.15	0.20

Calculation of Adding Amount of Refrigerant

Recharging Amount: R (Kg) = (L1 - L2)×A/m)

Where, L1— actual length of liquid pipe (m);

L2— actual standard length for delivery (m) (see the Recharging label of the outdoor unit)

A—The refrigerant to be added for pipe , see the following table.

Pipe specification	φ6.35	φ9.5	φ12.7
Add R410A for an increase of one meter(g/m)	20	54	110

A. Correctly measure the refrigerant using the scale and filler tank;

B. Connect the filler tank, instrument manifolds and maintenance valve of liquid pipe of outdoor unit (at high - pressure side) and charge the refrigerant in its liquid state. The air in the hose and manifold must be removed by the refrigerant before the recharging operation.

C. After completing the recharging operation, check whether there is refrigerant leakage at the flare positions of indoor/outdoor units;

D. Record the adding amount of refrigerant onto the refrigerant indicator nameplate of outdoor unit;

E. The recharged amount shall be measured by the electronic scale.

8. Heat Insulation Works

8.1 Insulation Materials and Thickness

8.1.1 Insulation Materials

The insulation materials shall use the materials that can withstand the temperature of pipes: the withstand pressure at high - pressure side shall not be less than 70℃ and at low - pressure side shall not be less than 120℃. (No such a requirement at the low - pressure side for single - cold unit)

For example: heat - pump type – heat - resisting polyethylene foam (over 120℃) Single - cold type – foaming polyethylene (over 100℃).

8.1.2 Thickness selection of insulation materials:

	Pipe diameter (mm)	Thickness of Insulation Materials
Refrigerant Pipe	Φ6.4 - Φ25.4	10mm
	Φ28.6 - Φ38.1	15mm
Drain Pipe	Inner diameter Φ20 - Φ32	10mm

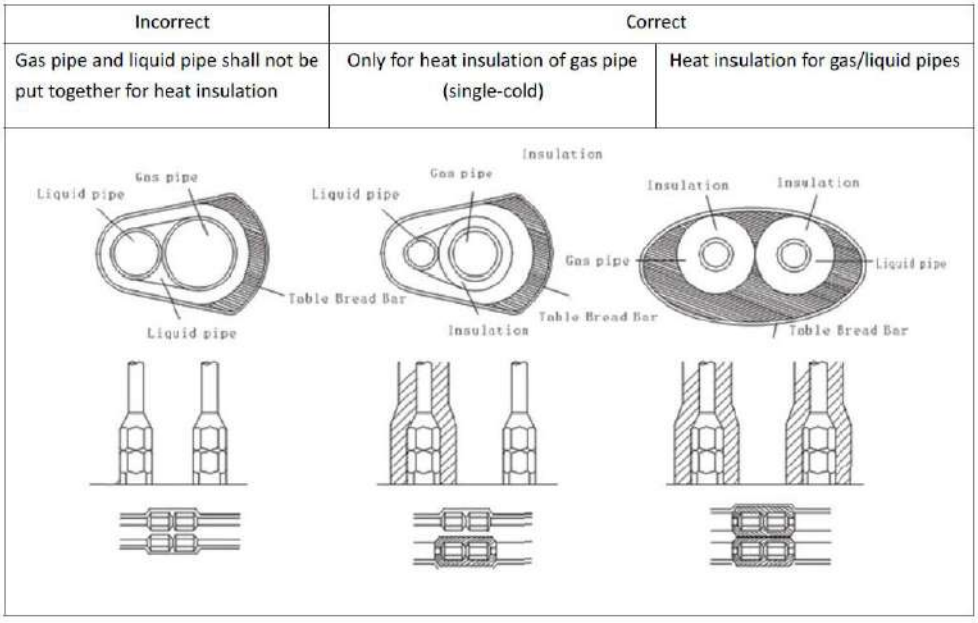
8.2 Heat Insulation of Refrigerant Pipes

8.2.1 Operation Sequence

1. The non - welded or non - connected positions shall be subject to the heat - insulation treatment prior to the laying of pipes;
2. The welding area, flared area or flange area shall be subject to the heat - insulation treatment after completing the leakage detection.

8.2.2 Heat Insulation of Non - welded or Non - connected Positions

In order to facilitate the construction, please use the heat insulation materials to deal with the pipes before their laying, and meanwhile, a certain length at two ends of the pipe shall be reserved not for the insulation treatment for purpose of welding and leakage detection after completing the laying of the pipe.

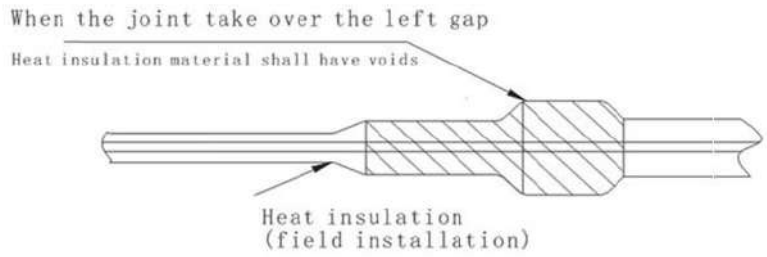


8.2.3 Heat Insulation of Welding Area, Flare Area or Flange Area

A. The heat insulation of welding area, flare area or flange area shall be carried out after completingthe leakage detection of pipes.

B. There shall be no gap b tween the junction position of attached insulation materials and the locally

prepared insulation materials.



8.2.4 Wrapping Treatment

The wrapping tapes shall be used for the wrapping treatment after completing the insulation treatment and no sense of relaxation shall prevail.

8.3 Heat Insulation of Drain Pipes

The heat insulation treatment of drain pipes shall be extended to the juncture (position), or it may cause the condensation at the position without heat insulation treatment.

8.4 Precautions

1) The welding area, flare area or flange area shall all be subject to the heat insulation treatment after they are qualified upon the airtight test;
2) The gas pipe and liquid pipe shall be subject to the heat insulation treatment and the juncture shall also be subject to the separate heat insulation treatment;
3) The piping juncture of indoor unit (pipe fitting, flare nut) shall be subject to the heat insulation treatment through the attached insulation materials.

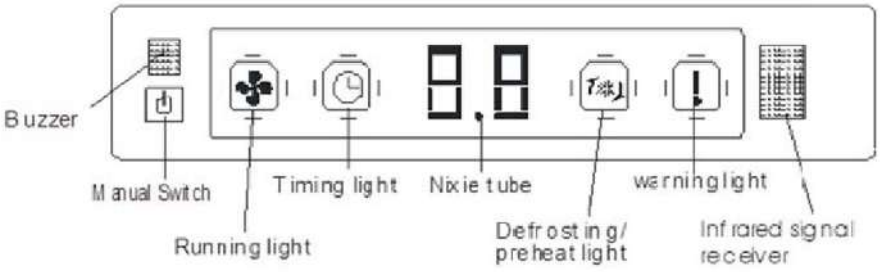
Part 5 Maintenance

1. Trouble display

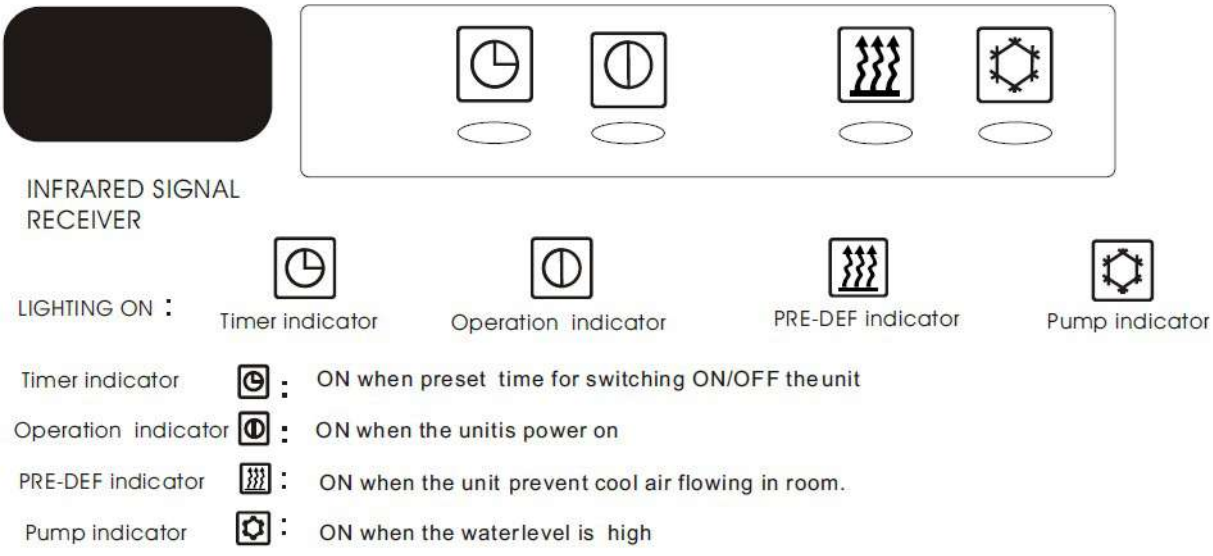
1.1 Trouble display of indoor display panel

Infrared signal receiver: receive the signal from the remote controller.
To make your remote controller operation more efficient, please let remote controller emittor aim at infrared signal receiver.
Buzzer: firstly power supplied or any of remote controller operations will make the buzzer sound once.
Some obstacles occurring in the system will be recognized by intelligent recognition system of unit, lighting on the DISPLAY PANEL flashing show the type of obstacles.

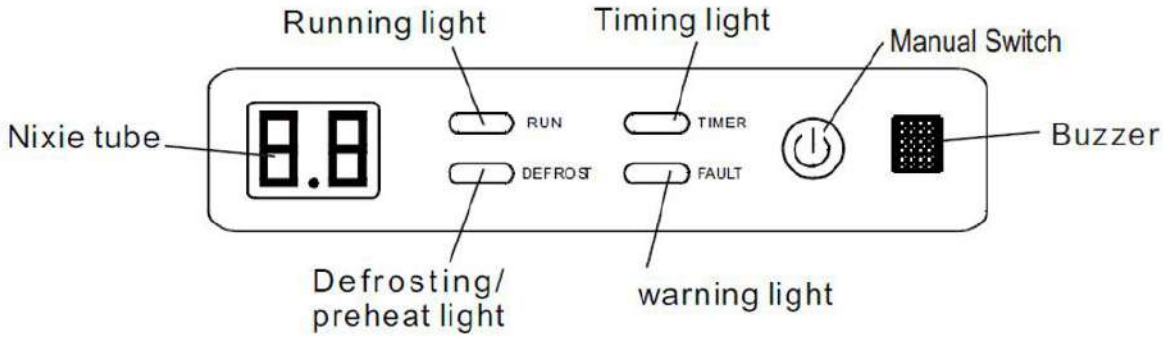
1) 8‐way cassette



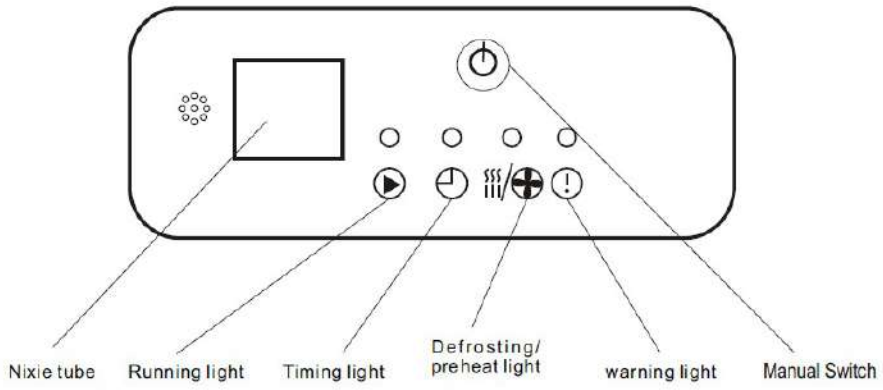
2) 4‐way cassette



3) Ceiling & Floor



4) Duct



Display function declaration:
LED light the state of running light
When powered‐on the first time, the running light twinkles, while the double‐8 does not lit.
When started‐up normally, the running light lights on, while the double‐8 shows the designed temperature.
When operated normally, the running light lights on, while the double‐8 shows the designed temperature. When closed down, both LED and double‐8 are gone out.
LED light the state of Timing light
When timing set, the timing light lights on, and the double‐8 flash shows the time setting within 5 seconds, then shows the designed temperature.
When without time setting, the timing light gone out, while the double‐8 back to the original state.
LED ligh the state of defrosting/preheat light
When in the state of defrost, oil return, cold‐wind proof, the defrosting/preheat light lights on, while the double‐8 shows the designed temperature. (One‐driven‐one does not show the oil return state).
When out of the state of defrost, oil return, cold‐wind proof, the defrosting/preheat light gone out, while the double‐8 shows the designed temperature. (One‐drive‐one does not show the oil return state).
LED light the state of warning light
When double‐8 shows E* or P*, the running lights gone out, while the warning light lights on.

1.2 Trouble display of outdoor unit

Display the faults through the digital tube of outdoor unit. The fault contents refer to the fault indication table of corresponding outdoor unit. (See the digital tube display information code during the fault protection)

1.3 Display of Fault Codes

Code	Description
E0	Communication fault between indoor and outdoor
E1	Indoor temperature sensor fault
E2	Indoor coil temperature sensor fault
E3	Outdoor coil temperature sensor fault
E4	System fault
E5	Unit wrong matching(with communication model)/Outdoor protection(without communication model)
E6	Indoor fan motor fault
E7	Outdoor temperature sensor fault
E8	Exhaust temperature sensor fault
E9	Inverter driver modular fault
EA	Current sensor fault
EC	Outdoor communication fault
Ed	Indoor EEPROM fault
EE	Outdoor EEPROM fault
EF	Outdoor fan motor fault
EH	Return temperature sensor fault
EP	Top-shell of compressor switch fault
EU	Voltage sensor fault
d3	Pump fault
P0	Modular protection
P1	Undervoltage/Overvoltage protection
P2	Overcurrent protection
P3	System fault
P4	Exhaust temperature overtemperature protection
P5	Anti-supercooling protection in cooling mode
P6	Anti-overheating protection in cooling mode
P7	Anti-overheating protection in heating mode
P8	Outdoor ambient temp. too high/too low protection
P9	Driver protection
PA	Mode conflict
H1	High pressure switch protection
H2	Low pressure switch protection
H6	Lack of refrigerant protection
HE	Power phase sequence protection
PH	Outdoor exhaust temperature sensor failure protection
PC	Outdoor coil temperature sensor failure protection

2. Fault Identification: Determine the fault type according to the symptom

The faults of AC system are generally classified into four categories:
AC system cannot be started;
AC system has a poor cooling effect;
The system can be started but it is usually subject to abnormal protective shutdown during the running;
Water leakage and noise problem of the indoor unit

Common Troubleshooting:

1) AC system cannot be started

(1) Check the wiring condition of power cables of indoor/outdoor units, and whether the communication cables of indoor/outdoor units are connected as required;

(2) Check the indicator light of remote receiver panel of indoor unit, digital tube display of outdoor unit, and check whether there is fault indication of indoor/outdoor units.

2) AC system has a poor cooling effect

(1) Whether the air volume of indoor uni。t is normal or not? If the air volume is significantly smaller or there is no wind from the indoor unit, it usually belongs to the following problems:

A. Return air mesh is too dirty;

B. Motor of the indoor unit failed (motor failed, capacitor capacity attenuated)

C. Electric control panel failed, causing no fan output.

(2) Whether the difference between outlet wind temperature of indoor unit and the return wind temperature of indoor unit is normal or not. The outlet wind temperature difference is 10﹣15° under normal cooling condition, and it is 18﹣25° under the normal heating condition.

If there is no problem for the said, it indicates there is no problem for the air conditioner.

The reasons resulted in the poor cooling effect include:

a. The design load for the air﹣conditioner is not enough;

b. Improper installation results in no wind from the air conditioner;

c. The return air design of air conditioner is unreasonable, resulting in an unreasonable air flow in the room and uneven room temperature;

If the AC cooling effect is indeed poor after the inspection, there may be the following reasons:

A. The running frequency of inverter compressor is wrong and its frequency is lower than the target frequency.

The factors restricting the running frequency of inverter compressor include:
The exhaust temperature of outdoor unit is too high, the voltage is too high or too low, the current is too big, and outdoor ambient temperature;

B. The refrigerant amount of the outdoor unit is too little or too much

Inspection and Treatment: it can be judged by testing the system temperature and pressure. The normal temperature and pressure of the system are as follows:

Measuring point	Normal Cooling	Normal heating	Max. cooling	Max. heating
Discharge temperature(℃)	85﹣90	70﹣80	＜115	＜110
Suction temperature (℃)	8﹣12	﹣3﹣3	﹣﹣	﹣﹣
Condenser Temperature (℃)	48﹣52	﹣1﹣1	<65	﹣﹣
Evaporator Temperature	7﹣9	42﹣50	﹣﹣	<60

(℃)				
Return gas superheated(℃)	5 - 10	5 - 10	- -	- -
Discharge pressure (MPa)	2.9-3.1	2.9-3.1	3.6-3.8	3.6-3.8
Suction pressure (MPa)	0.9-1.1	0.7-0.9	＜1.2	＜1.2

When the refrigerant amount is too little, its symptom is as follows: exhaust air and return air temperature is higher, LV pressure and HV pressure is lower;
When the refrigerant amount of outdoor unit is too much, its symptom is as follows: exhaust air and return air temperature is lower, LV pressure and HV pressure is higher;

C. Air Channeling of Compressor or Four－way Valve

Common phenomena: poor cooling effect, higher LV pressure and lower HV pressure
Distinction: when there is an air channeling in four - way valve, the noise of four - way valve is bigger, and the temperature difference is very big while testing one position and four positions of four - way valve, and there are many tested temperatures far beyond the normal temperature (normal temperature difference is 3°or so);

D. Poor Heat Exchange of Outdoor Unit (Installation space of outdoor unit is smaller and the condenser is too dirt)

Phenomena: higher exhaust air and return air temperature; higher LV pressure and HV pressure.

E. System is Blocked

Phenomena: higher exhaust air and return air temperature; lower LV pressure and higher HV pressure.

G. Throttle Member failed

The electronic expansion valve of outdoor unit cannot be opened.
There may be the following reasons: the electronic expansion valve or the coil is damaged, the electronic expansion valve assembly of electric control panel drive is damaged;

3) The system can be started for running but it is usually subject to abnormal protective shutdown during the running;

(1) Common Protection of AC System

General Protection: it is the protection function designed to protect the air conditioner (AC) from being damaged by the possible big current, high temperature and high voltage (delay protection three minutes after the start of compressor, phase sequence, phase - loss protection, low/high voltage protection, over - voltage and under - voltage protection of inverter compressor, exhaust air temperature protection, module protection, etc.);
Cooling and dehumidifying mode protection: evaporator anti - freeze protection and condenser high temperature protection.
Heating mode protection: evaporator high - temperature protection, cold wind resistance function, blowing residual heat function.

(2) Confirmation of Protection Types

Confirm the protection type through the display of indoor unit remote receiver panel indicator light and outdoor unit digital tube.
Firstly, it is necessary to determine whether it is the electrical control problem (element, electrical control panel) or the cooling system problem.
For example, there may be the following reasons for system display of high - voltage protection: high - voltage switch damaged (element problem), system high voltage is actually not high, but there are problems for circuit board after the test of circuit (circuit board of outdoor unit is failed), and there are cooling system problems (poor heat radiation effect, excessive refrigerant, etc.).

4) Water leakage and Noise Problem of Indoor Unit

Reasons for Water Leakage of Indoor Unit:

(1) Condensation of indoor unit;

Possible reasons: system refrigerant is insufficient, system is blocked, and shunt capillary pipe of indoor unit is blocked.

(2) Drain pipe is not connected or not subject to a heat insulation treatment;

(3) Drainage pump in the ceiling does not work;

(4) Low - temperature protection of evaporator failed.

Reasons for Big Noise of Indoor Unit:

(1) Fan or motor of indoor unit is poorly assembled;

(2) Fan volute of indoor unit is deformed;

(3) The design and installation of air outlet pipe or return air duct is unreasonable during the on - site installation of air duct unit.

3 Troubleshooting and Repair

3.1 Steps of Fault Repair

A. Collect fault phenomena

B. Judge whether it is a fault or reasonable protection function;

C. Fault identification: determine fault position according to fault display;

D. Test the damage condition of failed peripheral elements (sensor, display screen, pressure switch, level switch, etc.);

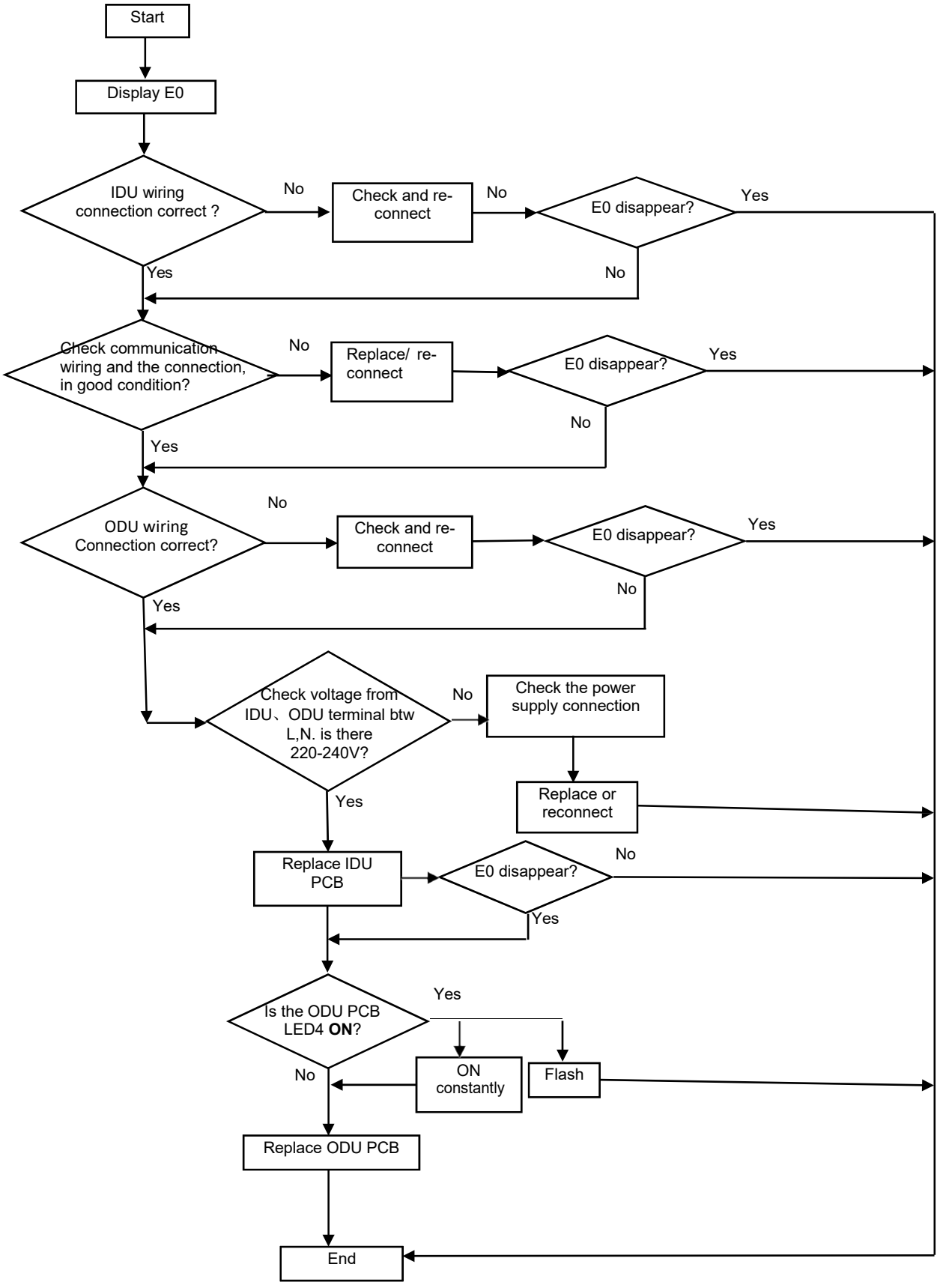
E. Replace the damaged parts;

F. Main control panel is damaged or not;

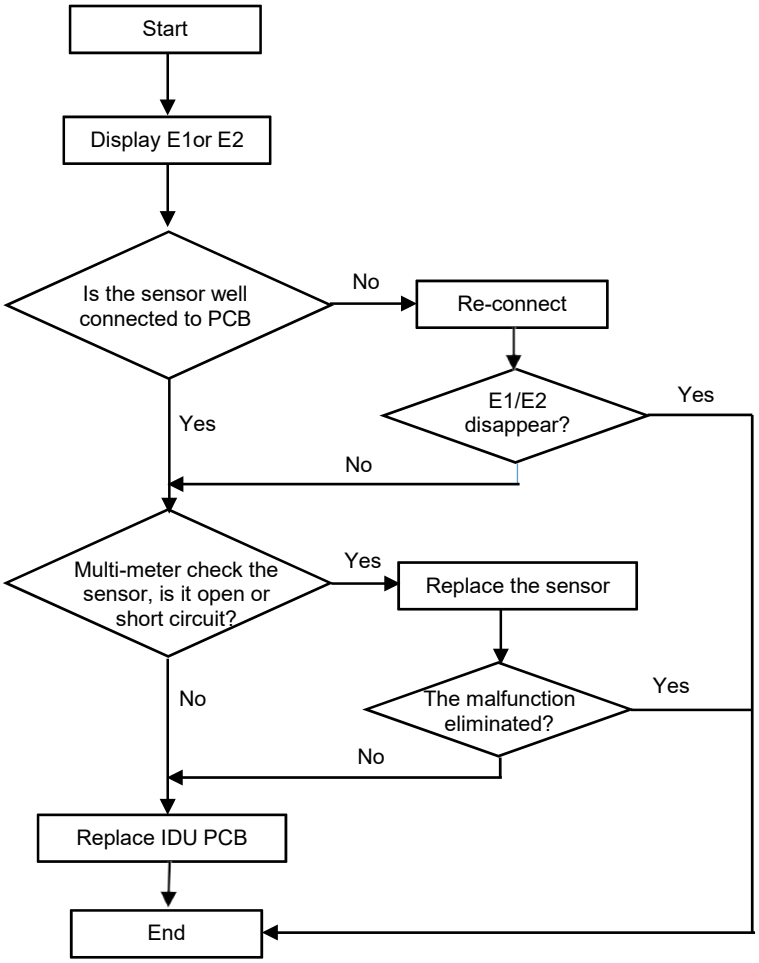
G. Replace the main control board.

3.2 Trouble Shooting

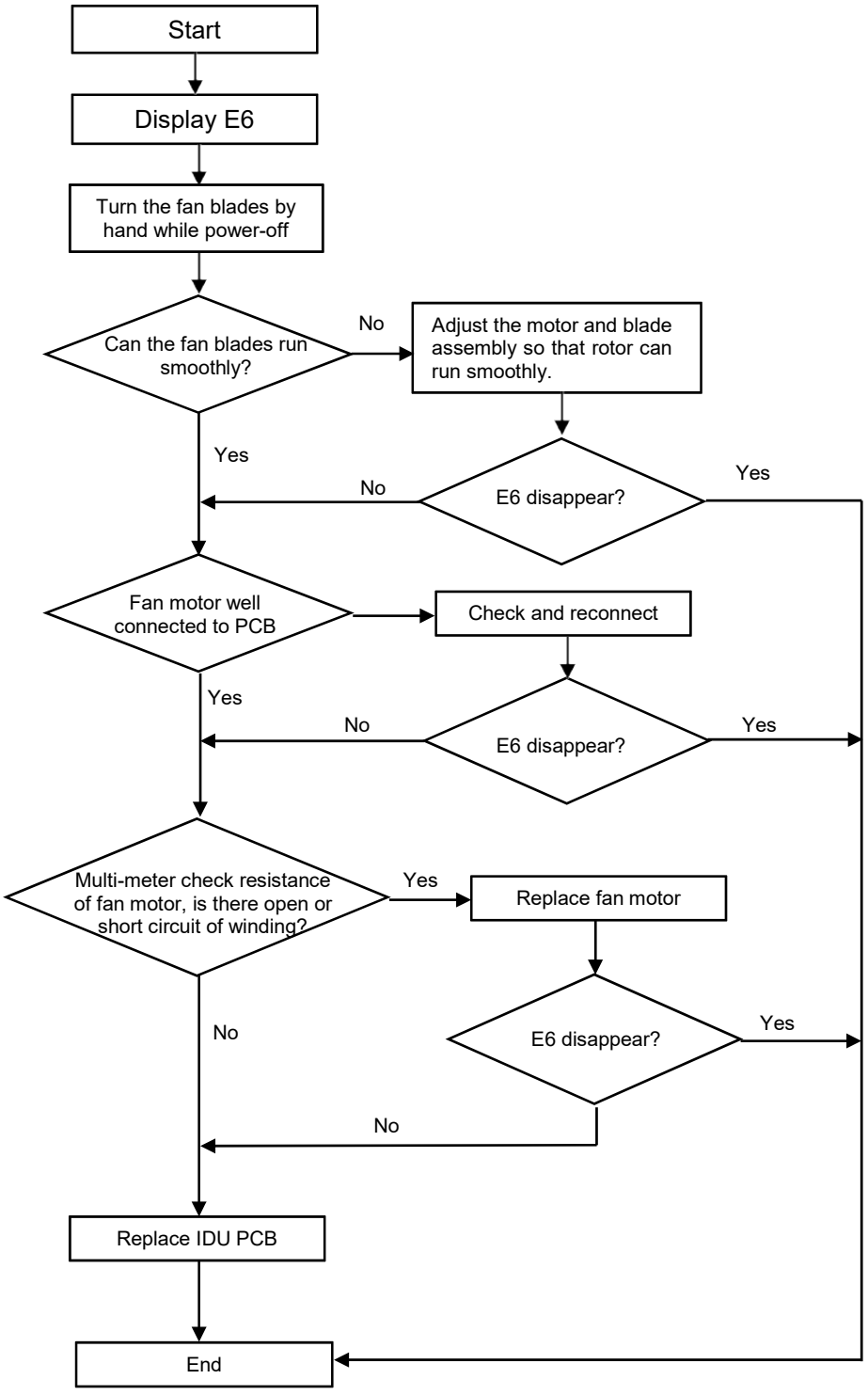
3.2.1 E0 ---IDU & ODU communication failure



3.2.2 E1, E2 ---IDU Room temperature sensor and/or coil temperature sensor failure.

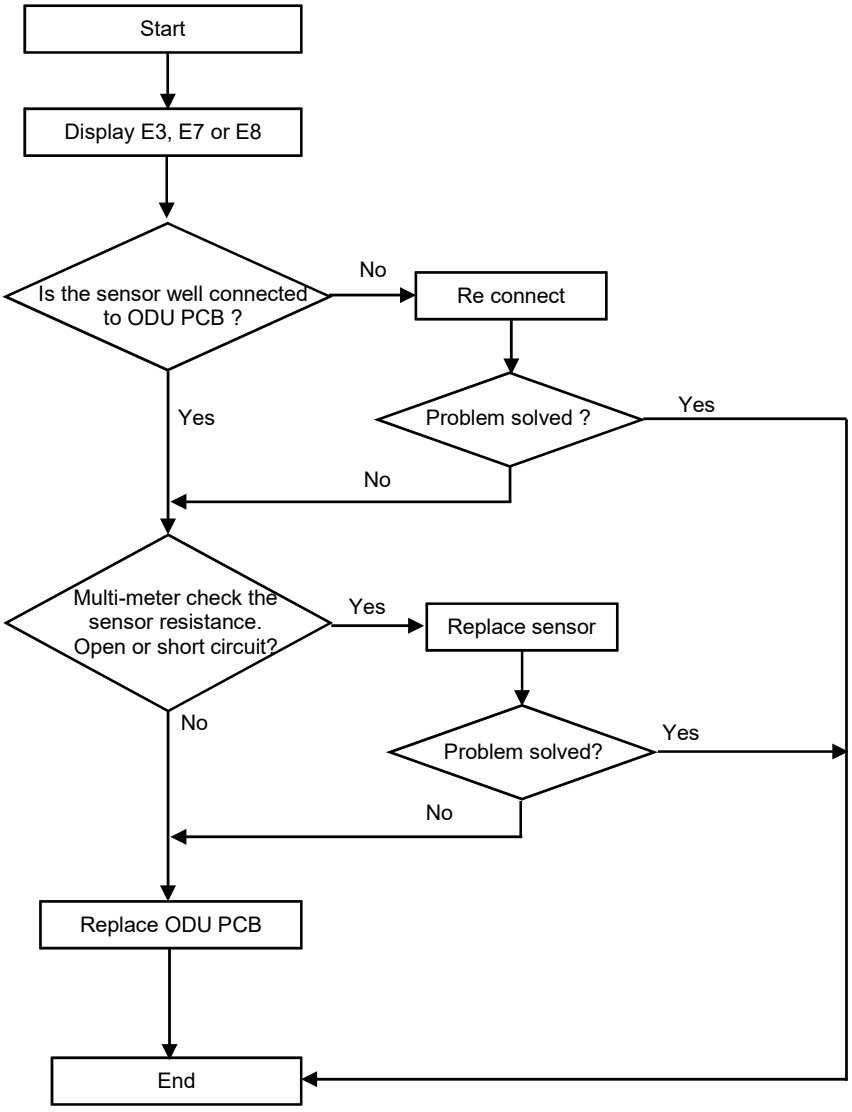


3.2.3 E6----IDU ventilation failure (PG and DC fan motor only)

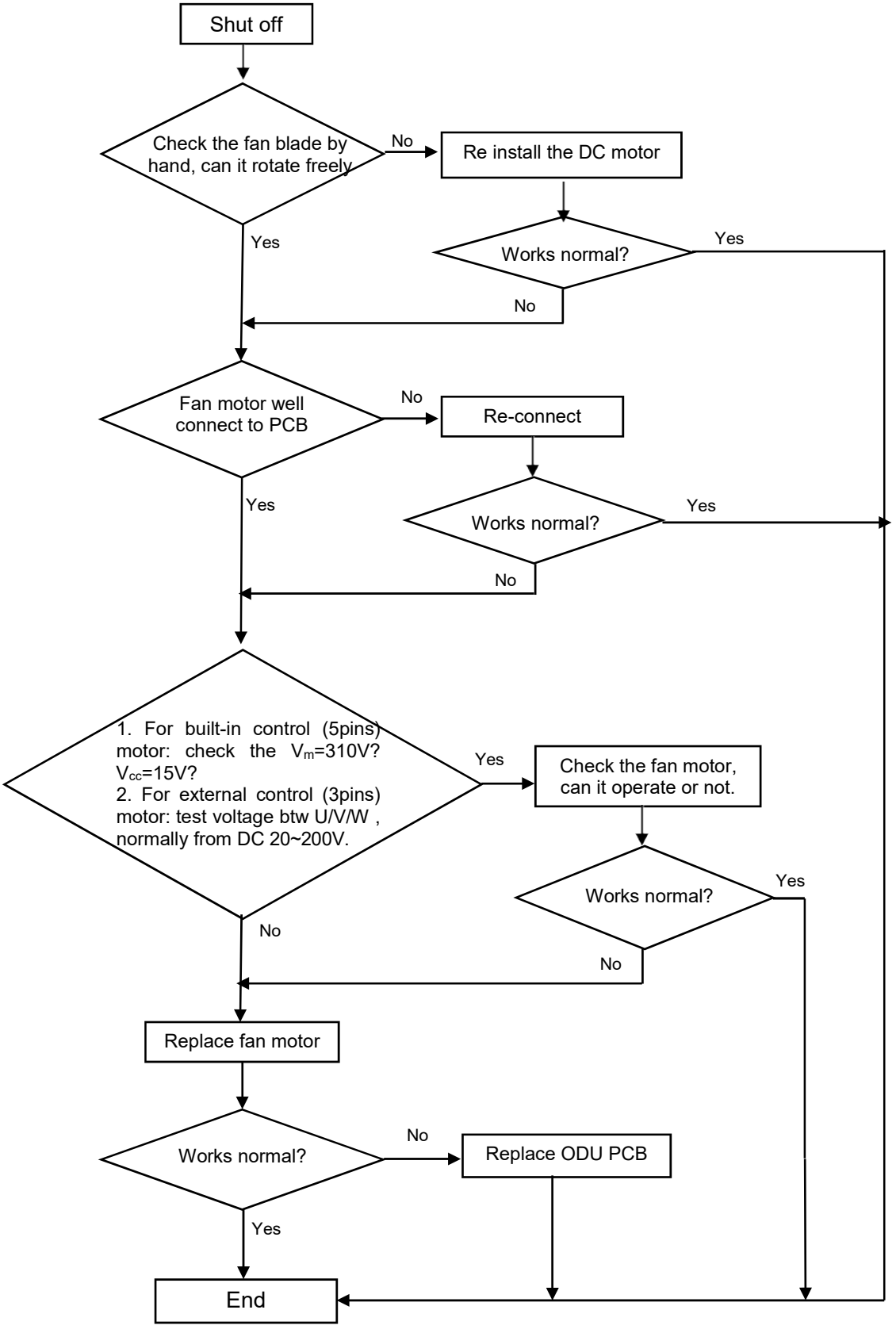


3.2.4 E3, E7 or E8----ODU Coil temperature sensor, Ambient temperature sensor or Discharge temperature sensor failure.

When any of the sensor resistance open or short circuit , unit will display failure code as E3/E7 or E8, IDU and ODU turns off. When the sensor resistance recovery, unit revert to be standby, customer can switch on the unit directly.

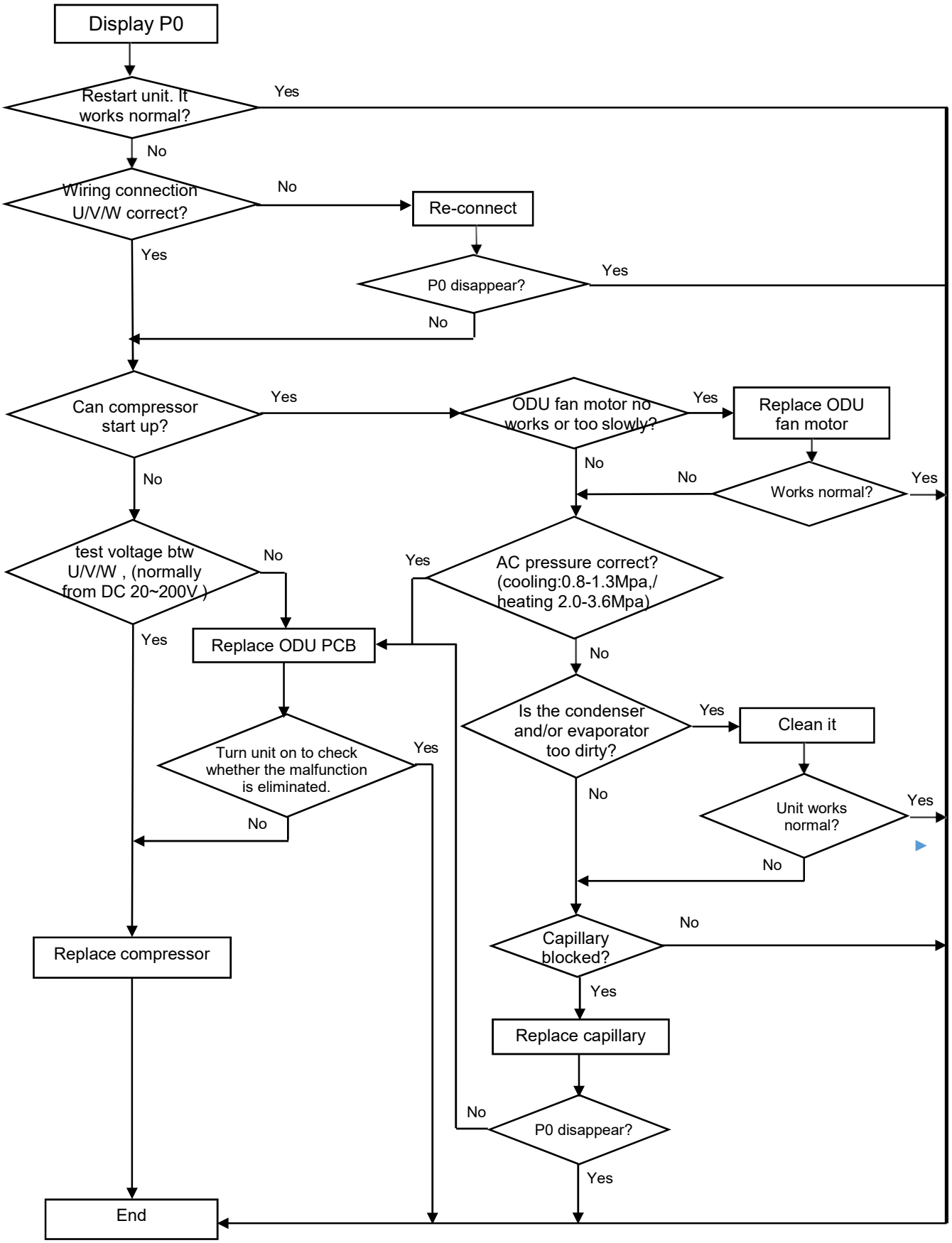


3.2.5 EF---ODU DC fan motor failure



3.2.6 P0---IPM protection

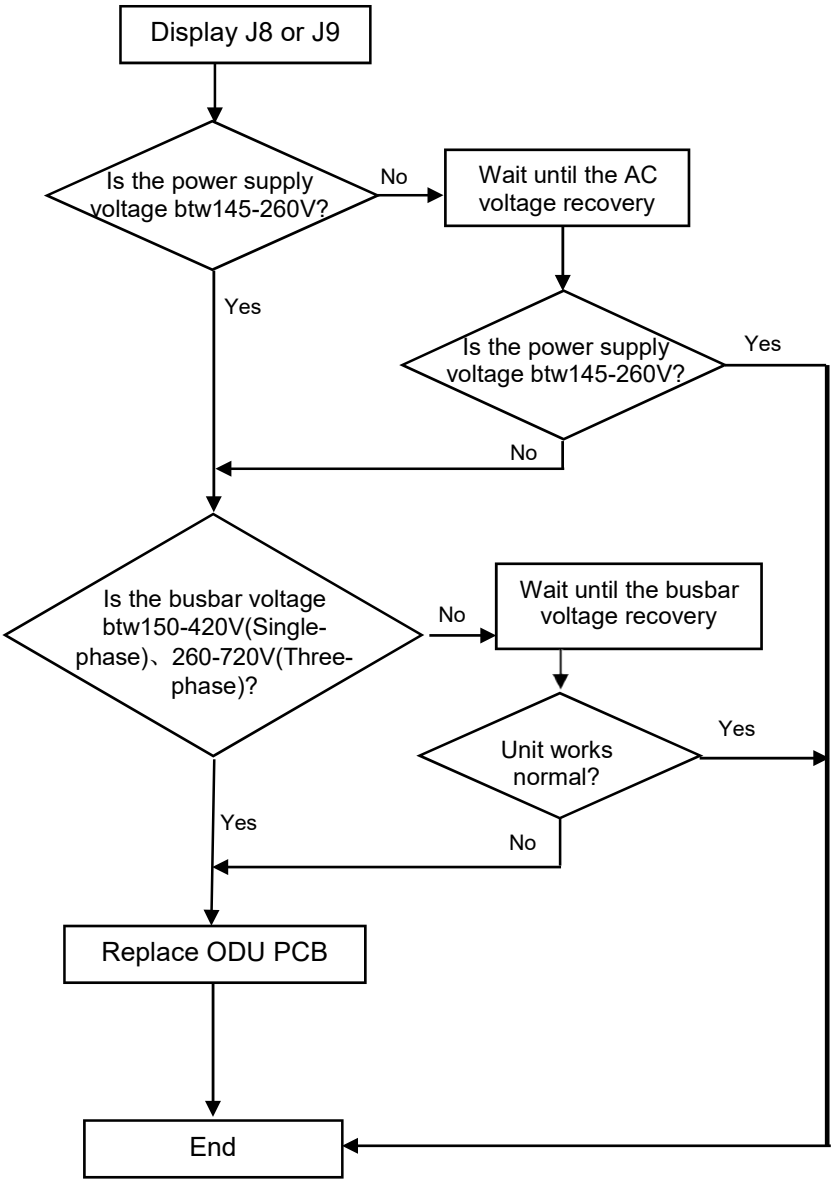
When overheat or overcurrent for IPM, AC unit will display P0 protection.



3.2.7 J8,J9--- Over / under voltage protection

1. Test voltage between L &N, When the power supply V＞AC260V or V＜AC150V, AC will display J8 or J9 protection, unit will recover back to previous status while V＞AC155V.

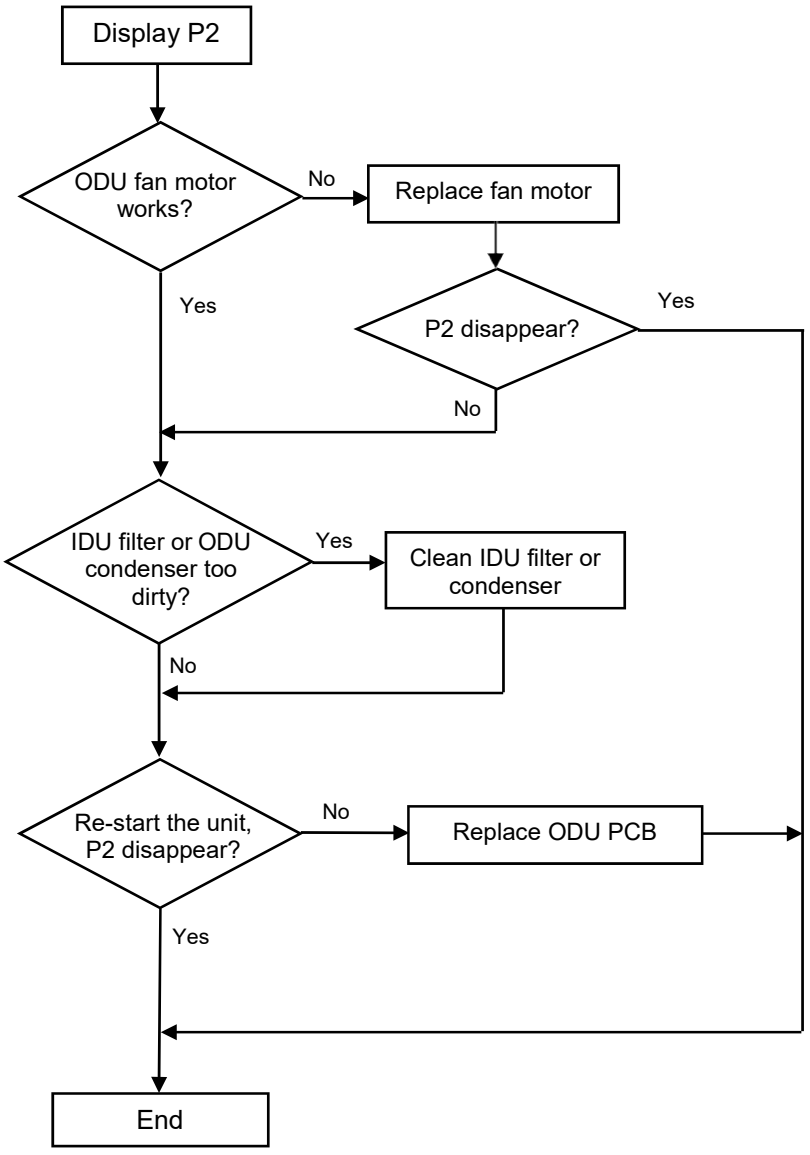
2. Test voltage on the big size electrolytic capacitor of ODU PCB, When DC busbar voltage V＞DC420V or V＜DC150V, unit will recover back to previous status while DC190V＜V＜DC410V



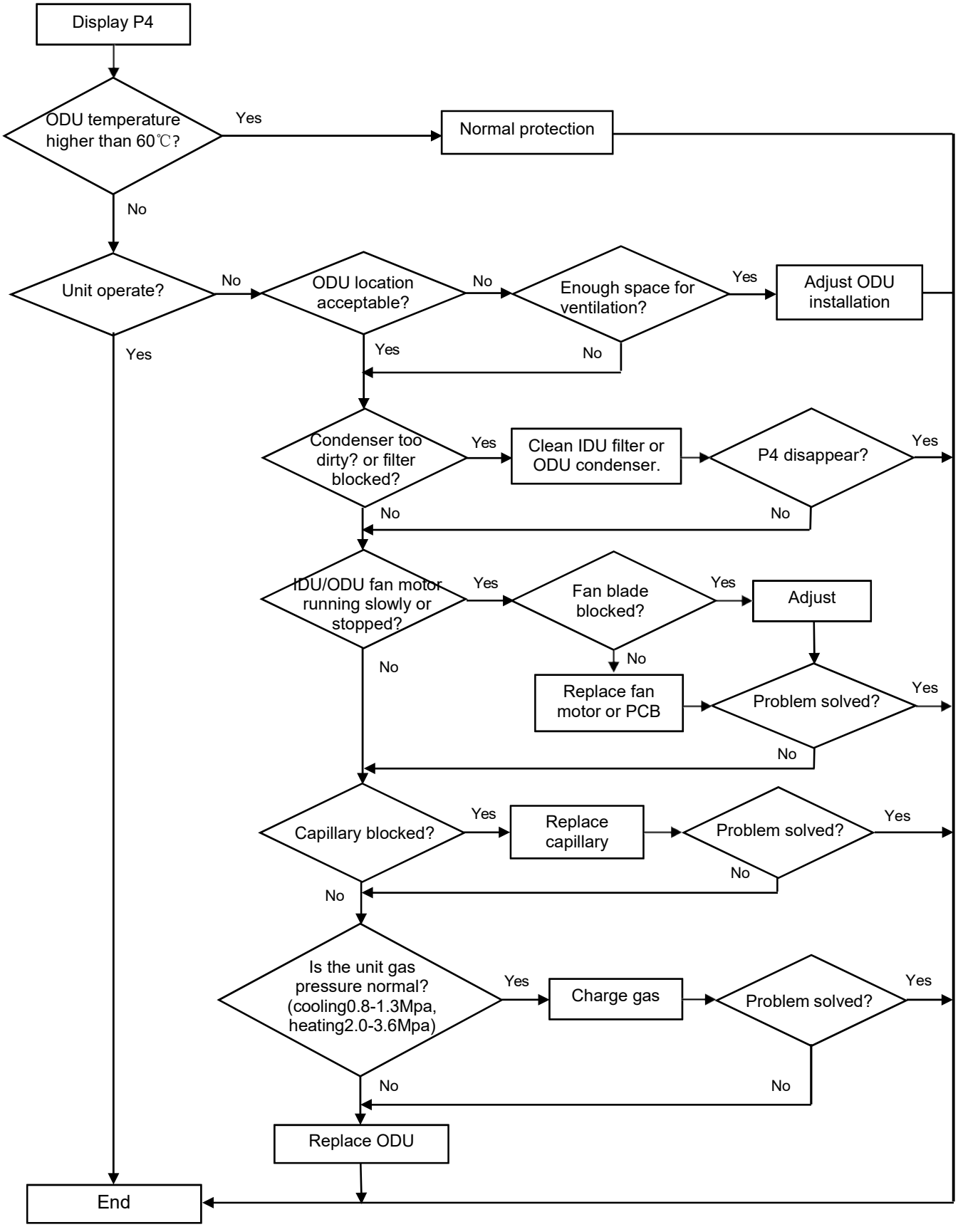
3.2.8 P2---Over Current protection

When the AC unit running current more than I_{max}, it will stop and display P2 protection.

Note: for different AC model, I_{max} has difference valve.

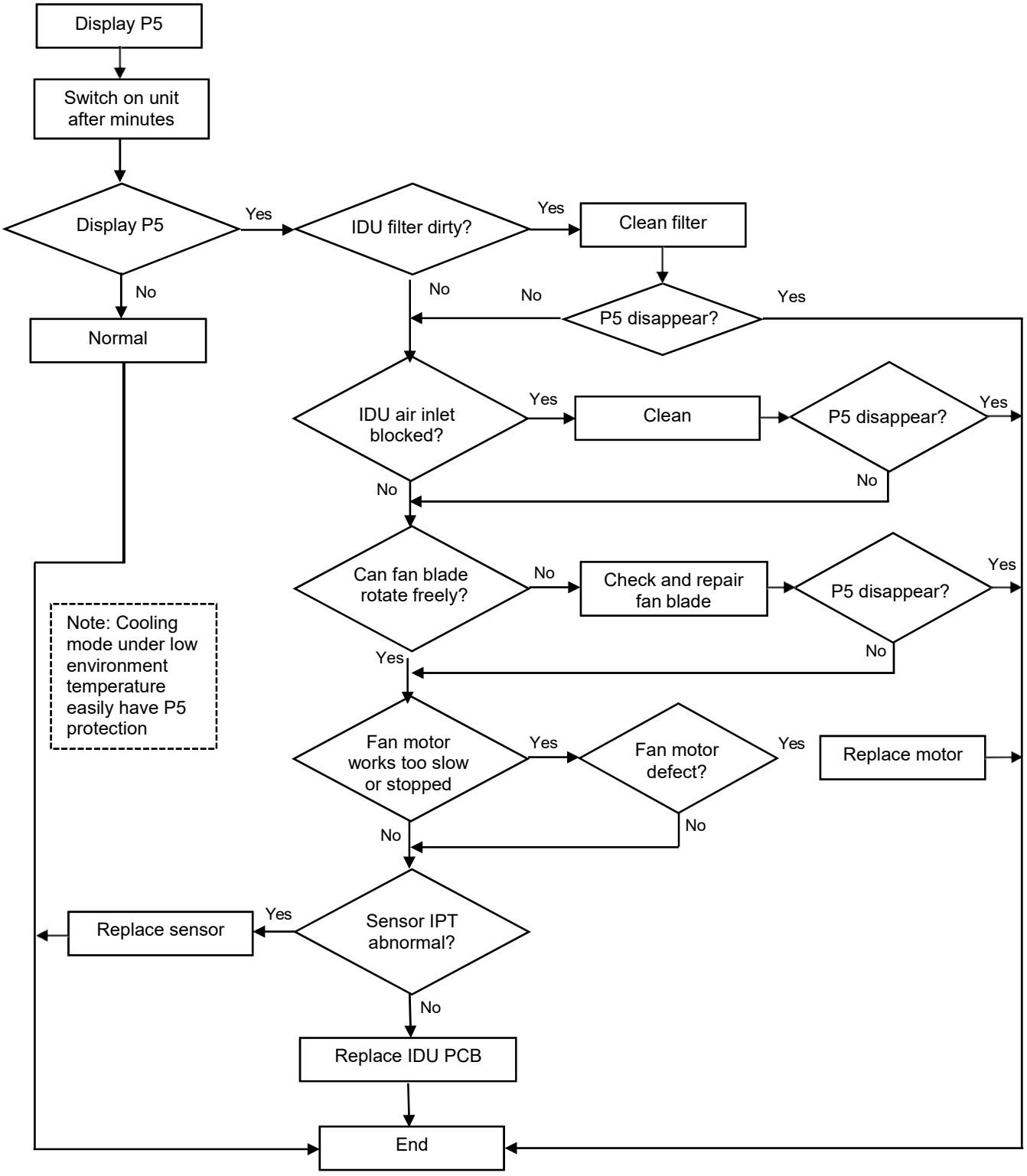


3.2.9 P4 ---ODU Discharge temperature overheating protection



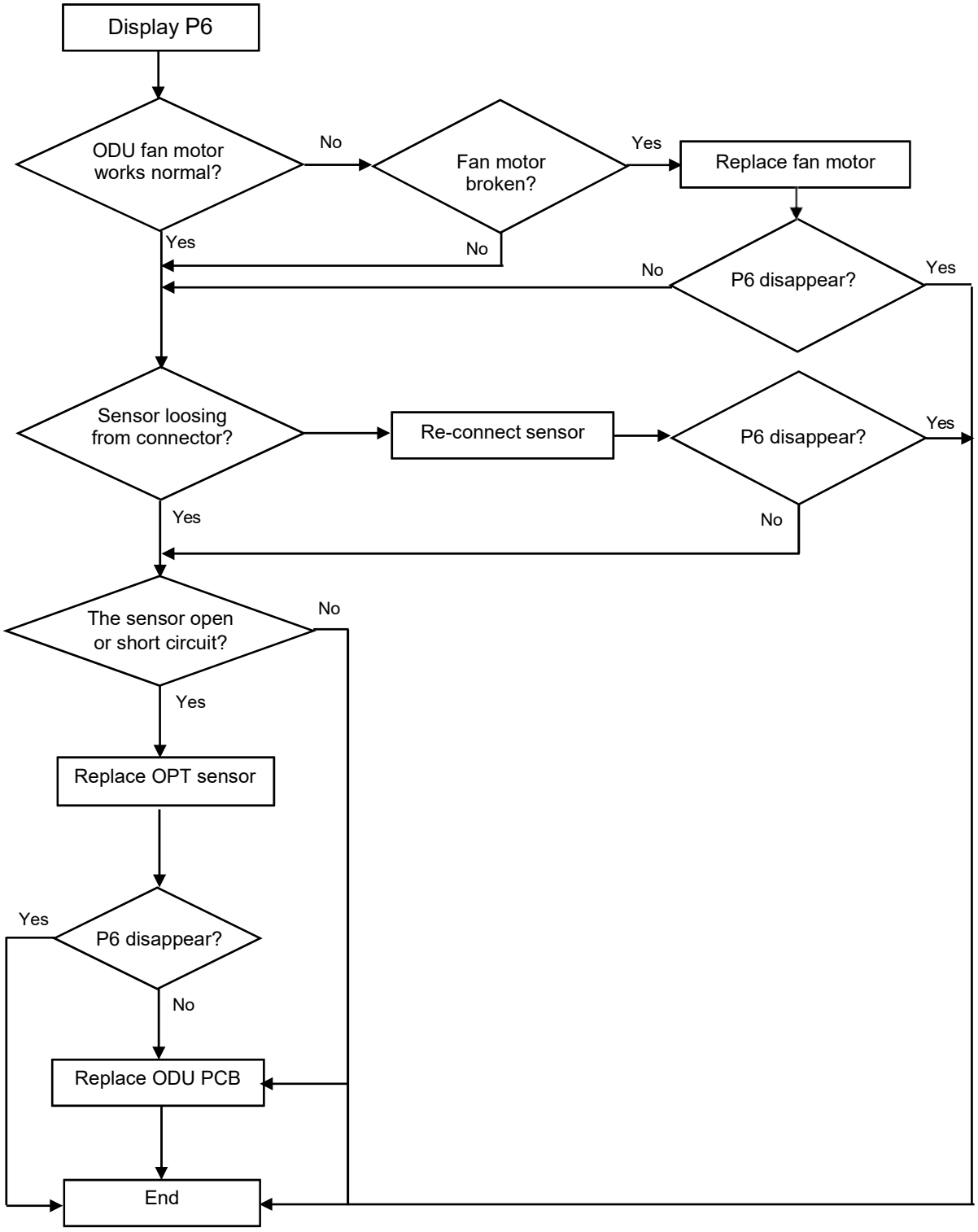
3.2.10 P5---Sub-cooling protection on Cooling/Dry mode

On Cooling or Dry mode, when IDU evaporator coil temperature **IPT＜1℃** continuously for 3 min after compressor start up for 6 min, CPU will switch off outdoor unit and show P5 failure code.



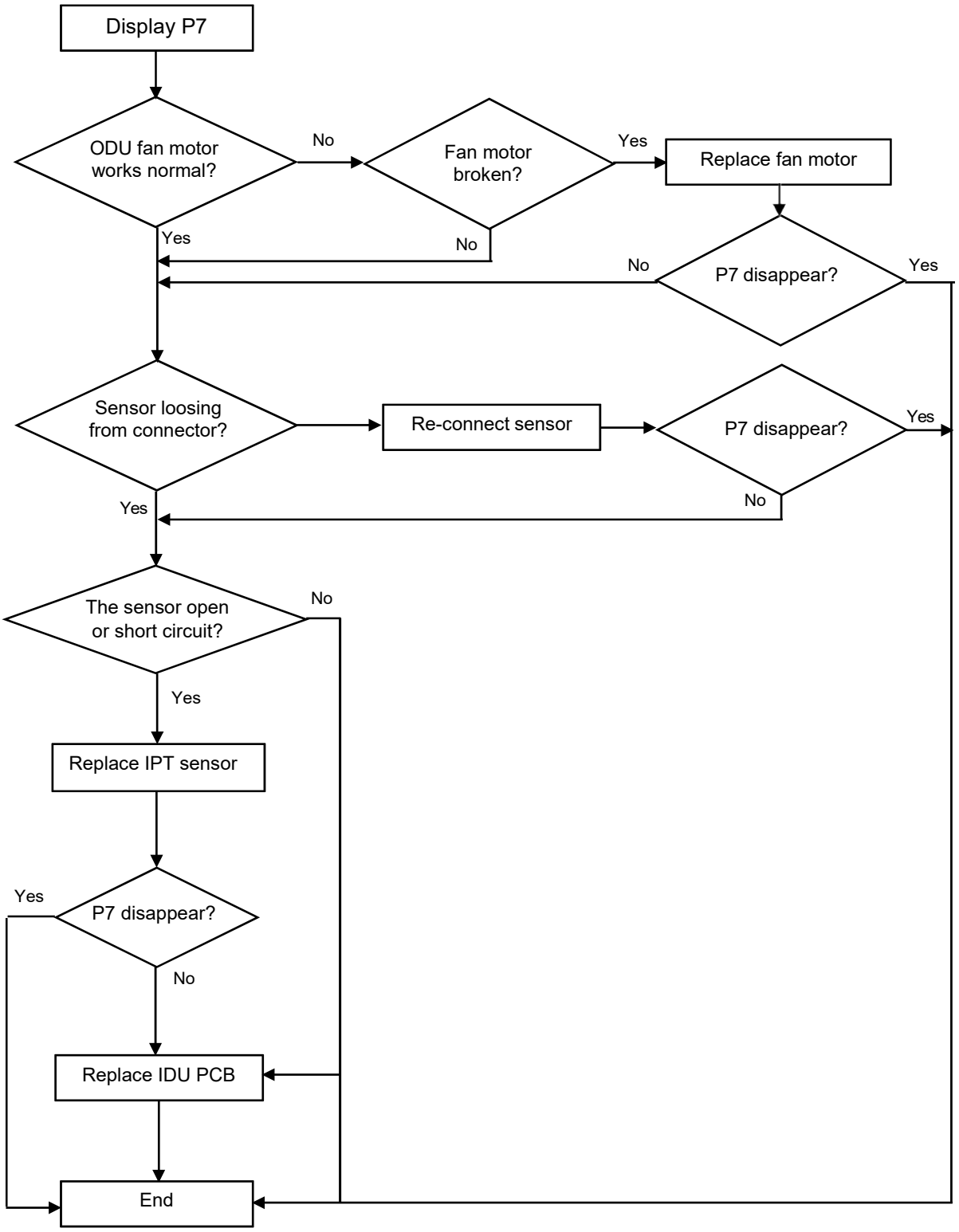
3.2.11 P6---Overheating protection on Cooling mode

On Cooling or Dry mode, when ODU condenser coil temperature OPT≥65℃（149℉）, MCU will switch off outdoor unit and show P6 failure code.



3.2.12 P7---Overheating protection on Cooling mode

On heating mode, when IDU evaporator coil temperature IPT≥64℃（147.2℉）, ODU PCB will switch off outdoor unit and show P7 failure code.



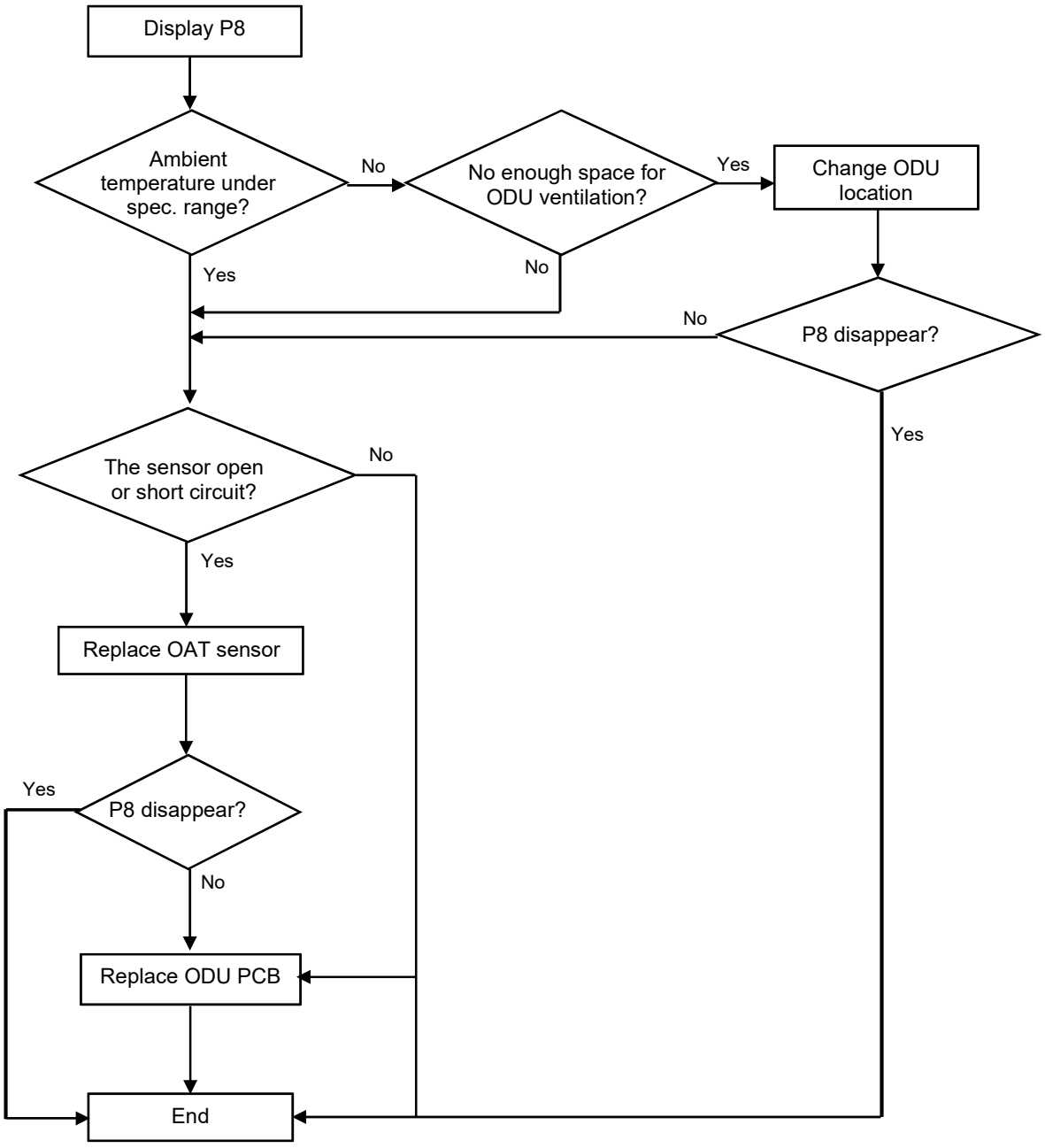
3.2.13 P8---Outdoor Overtemperature/Under-temperature protection

When environment temperature as below condition, the compressor will stop working, after 200s delay, the IDU will show P8 failure code.

(1). **On Cooling or Dry mode**: ODU ambient temperature: OAT＜-15℃(5℉) or OAT＞60℃(140℉);

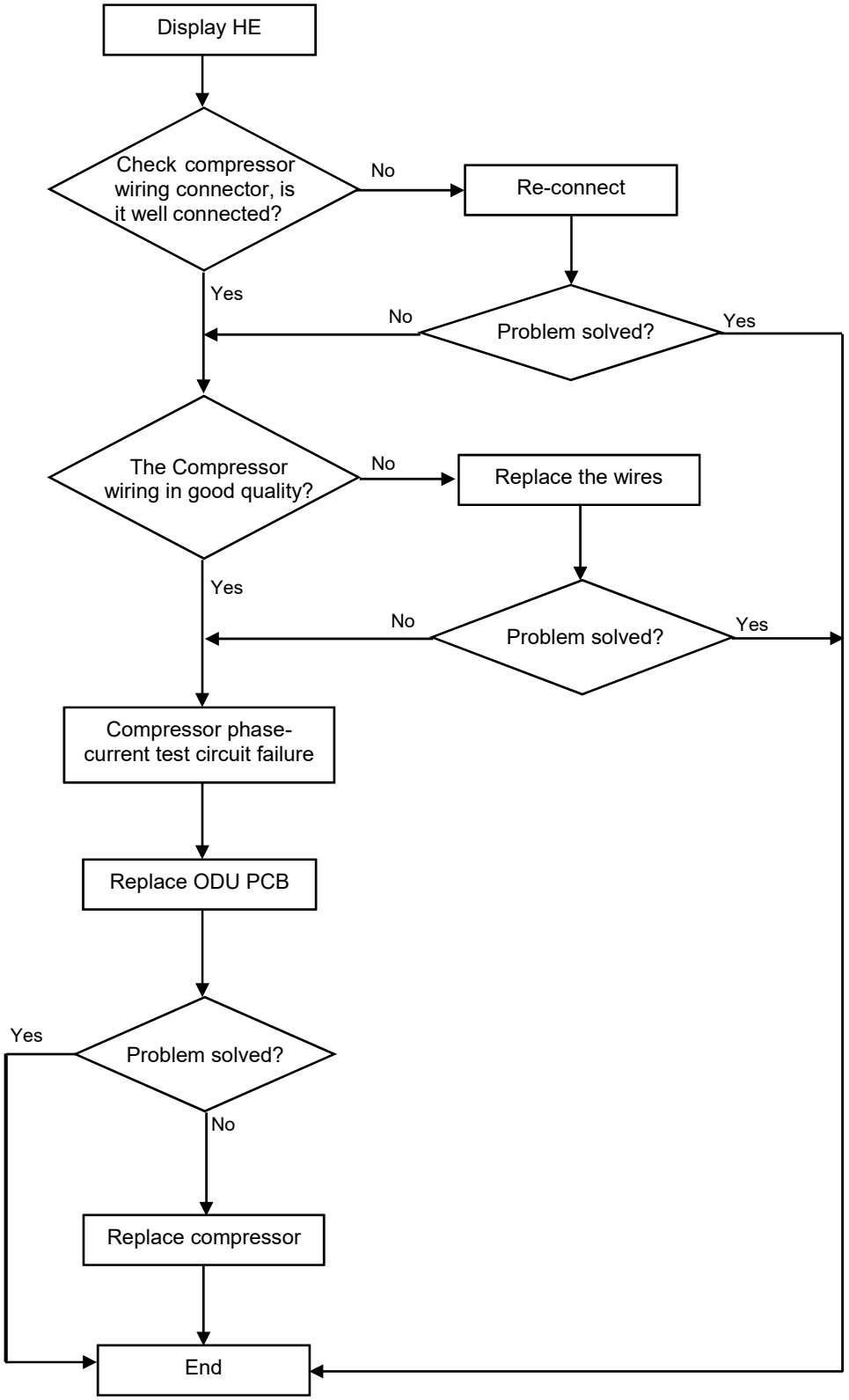
(2). **On Heating mode**:

OAT≥40℃(104℉)



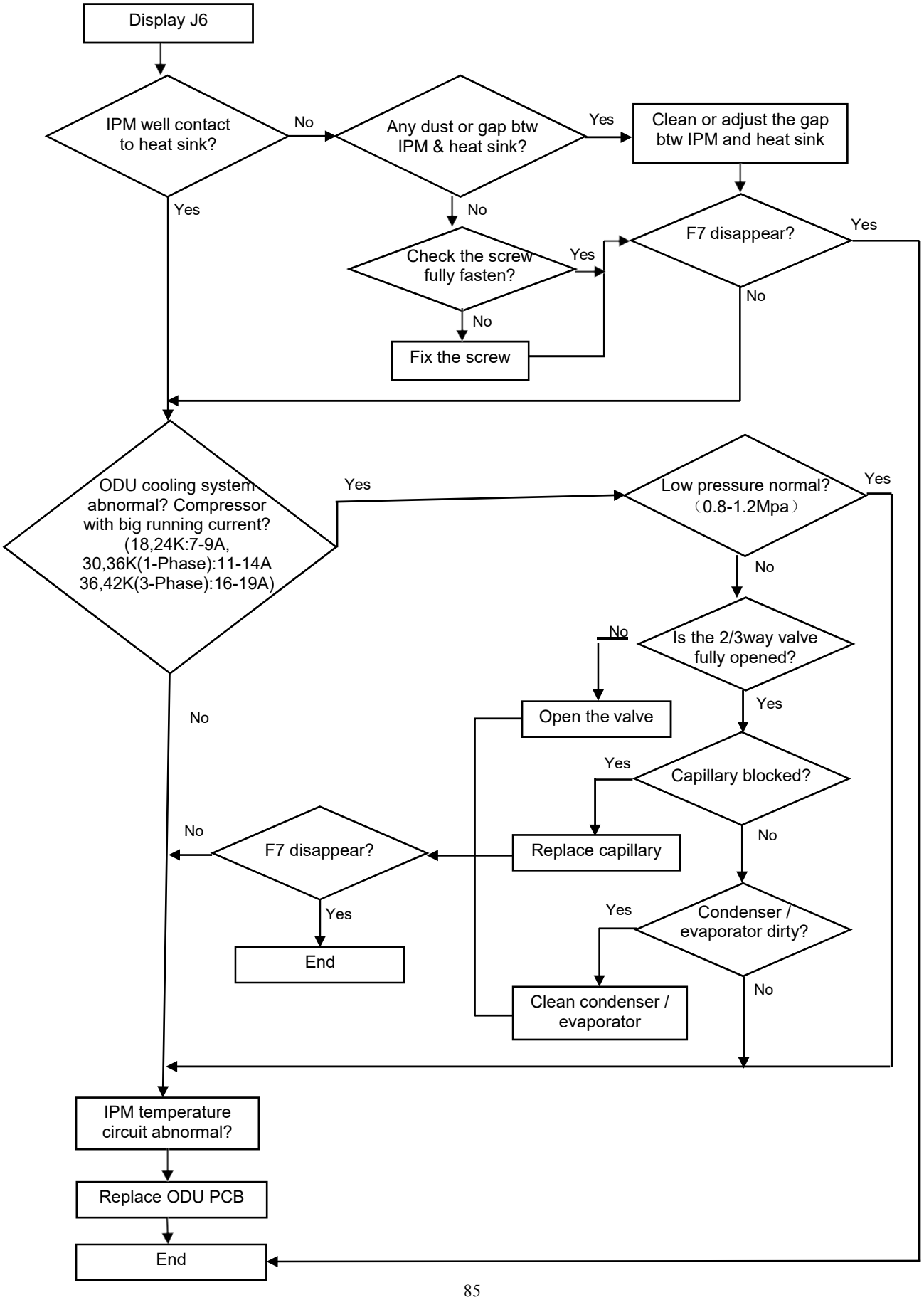
3.2.14 HE The Compressor Lack of phase / Anti-phase protection.

If ODU PCB can't test one, or even three phase of compressor current, it will show HE protection.



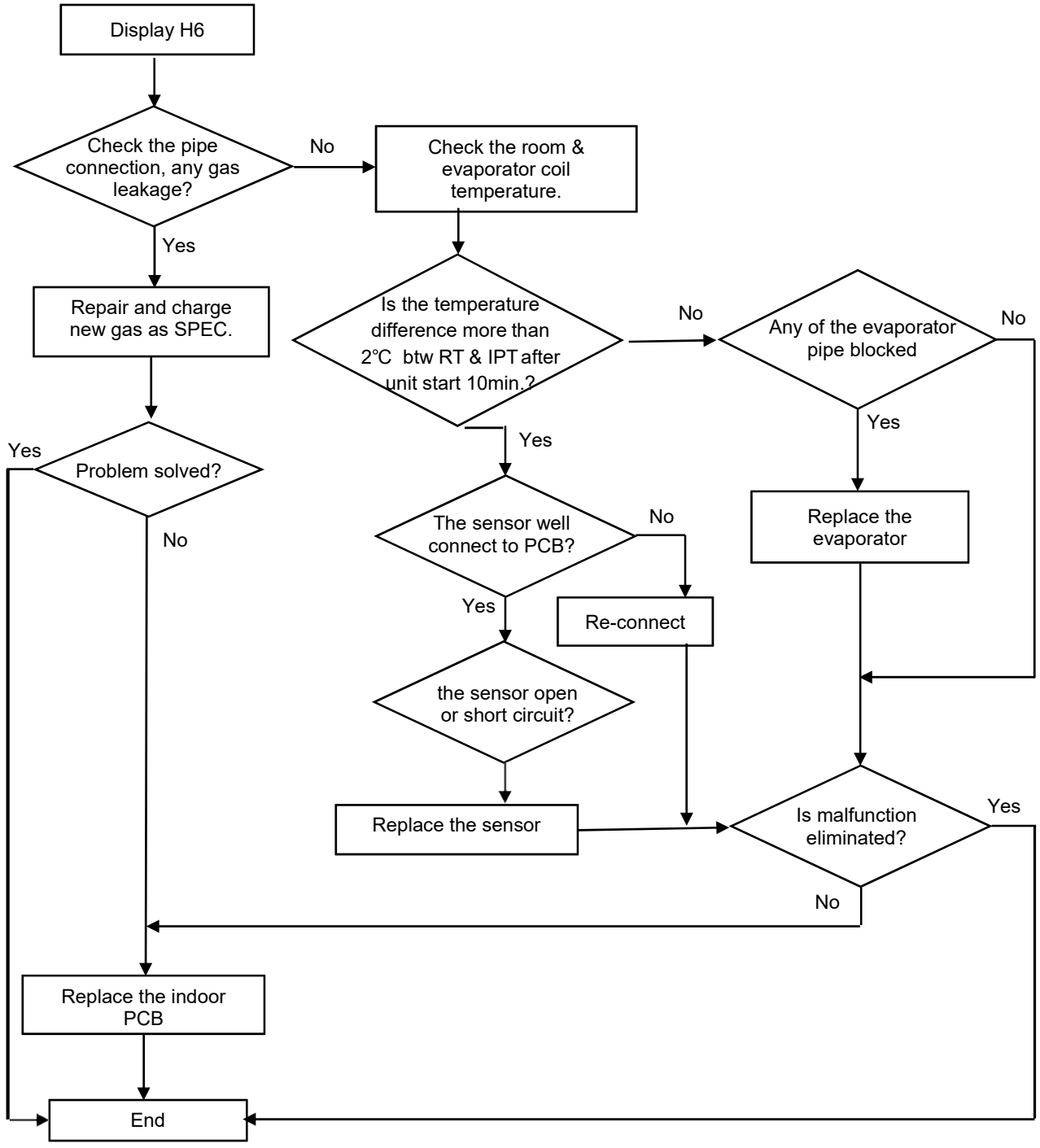
3.2.15 J6---Module temperature protection.

IPM overtemperature protection, when IPM temperature more than 95℃, it will show J6.



3.2.16 H6--- Gas leakage protection

After compressor works in high frequency for 9 min, if the temperature on IDU evaporator & ODU condenser has only a little variation comparing previous, but, the compressor discharge temperature on high level, then the unit will show H6 failure code.



4. System Maintenance

4.1 Maintenance of Indoor Unit

4.1.1 Clean the Dust Filter Screen

(1) The dust filter screen can eliminate the dust or other particles from the air, and if it is blocked, the effect of air - conditioner system will be significantly reduced;

(2) If the indoor unit is mounted in heavy dusty place, the times of cleaning the dust filter screen shall be increased;

(3) If the dirt is heavy and it is difficult to clean, please replace the dust filter screen;

(4) Replacement Method of Dust Filter Screen:

A. Take off the air intake grill according to the operation methods in the following table.

Model	Operation Sequence
Ducted Indoor Unit	a. Slide the clip of air intake panel along the arrow direction and open downward the air intake grill; b. Take out the dust filter screen at the bottom of air conditioner.

B. Detach the filter screen: press down the hook of dust filter screen and pull down to take out the filter screen.

C. Clean the filter screen.

The filter screen can be cleaned by vacuum cleaner or clean water. If the dirt is heavier, please use the soft brush and neutral detergent to clean and then spin the water and put it in cool place.

Notes: do not dry up the filter screen in direct sunlight or by fire; the filter screen of the embedded air conditioner shall be assembled before the installation and the fixation.

D. Re - mount the filter screen

E. Re - mount and close the air intake grill as per the reverse order of Step A and Step B.

4.1.2 Clean the air outlet and panel

(1) Wipe it with soft dry cloth;

(2) If it is difficult to remove the stain, please use the clean water or neutral detergent to clean it. Notes:

A. Do not clean it with gasoline, benzene, volatile agent, scouring powder and liquid pesticides; otherwise it will cause the discoloration or deformation;

B. Do not get the water into the indoor unit; otherwise, it may cause electric shock or fire;

C. Do not scrub it while cleaning the air deflector with water;

D.If the air conditioner is operated under the condition of no installation of filter screen, the dust accumulated in the air conditioner will cause the fault because the dust in the indoor air cannot be removed.

4.2 Maintenance of Outdoor Unit

1) Some edges of stamping parts and fins of condenser are sharp, any incorrect operation may lead to damage, and therefore, it must be careful while cleaning it.
2) The inside coils and other parts of outdoor unit shall be cleaned regularly. Please feel free to contact the commercial air conditioner dealers or local commercial air - conditioner after - sale service center.
3) It is necessary to regularly check the air outlet of outdoor unit to see whether they are blocked by dirt or soot;

4.3 System Maintenance prior to Seasonal Shutdown

1) Make the air conditioner in a blowing running state and keep it for about half a day to fully dry its inside;
2) Turn off the air conditioner via the ON/OFF of the remote controller and then power it off. If the power supply is not switched off, the machine will consume the electricity of several kilowatts or tens of kilowatts. Therefore, if it is powered off, it can save the power.
3) After the air conditioner has been used for several seasons, there will be accumulated debris of different degrees in it according to the different working conditions. For this reason, except the said common cleaning operations, it is recommended to carry out other inspection and maintenance, for example, the trained service personnel can be invited to clean the air filter and its housing.

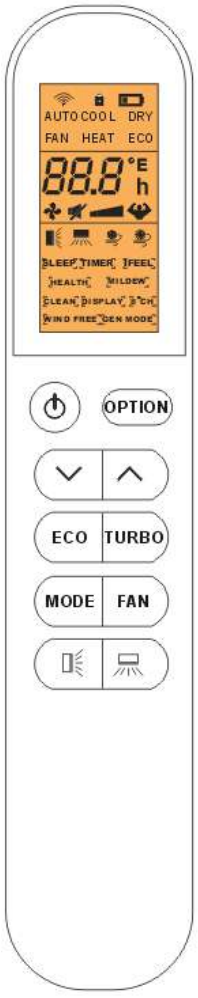
4.4 System Maintenance prior to Seasonal Startup

1) Check the following items:
2) Ensure that the air inlet and outlet of indoor and outdoor units are not blocked;
3) Ground wire is intact/ wiring is intact;
4) The trained service personnel can be invited to clean the air filter and its housing. The air filter must be mounted after the cleaning;
5) Power it on.

Part 5 Controller

1. Wireless remote controller

No.	Button	Function
1	⏻	To turn on or off the air conditioner .
2	OPTION	To activate or deactivate optional function (Check below table).
3	∨	To decrease temperature, time setting or choose the function.
4	∧	To increase temperature, time setting or choose the function.
5	ECO	To activate / deactivate the ECO function which enables the unit automatically to sets the operation to achieve energy savings.
6	TURBO	Press this button to activate/deactivate the Super function which enables the unit to reach the preset temperature in the shortest time.
7	MODE	To select the mode of operation(AUTO COOL DRY FAN HEAT)
8	FAN	To select the fan speed of auto/mute/low/mid low /mid /mid high/high/turbo , cycle as below: Flashing →
9		After power-on,the deflector is stoped by default.Press this key to activate the SWING futi on ,and the deflector start to swing up and down.Do ti again to deactivate this funtion. *NOTE: This fiuntion is unavailable on duct type machine*
10		



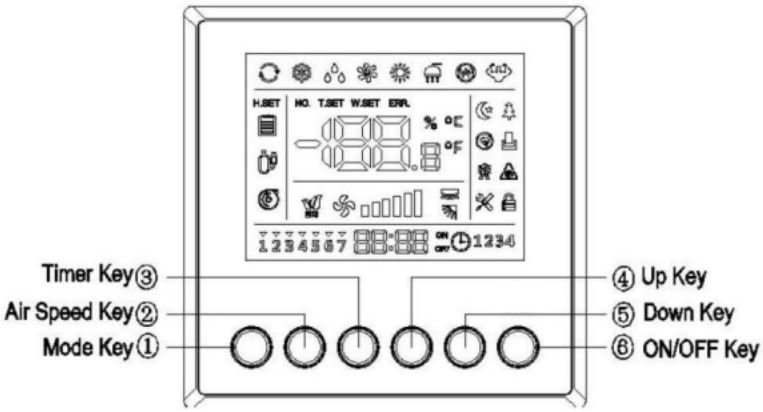
a. The outlooking and some function of remote control may vary according to the model.
b. The shape and position of buttons and indicators may vary according to the model, but their function is the same.
c. The unit confirms the correct reception of each press button with a beep.

Remote control DISPLAY Meaning of symbols on the liquid crystal display

No.	Symbols	Function
1		Signal indicator
2		Lock function indicator
3		Battery indicator
4	AUTO	Mode Auto function indicator
5	COOL	Mode Cooling indicator
6	DRY	Mode Dry indicator
7	FAN	Mode Fan indicator
8	HEAT	Mode Heating indicator
9	ECO	ECO function indicator
10	88.8 h TIMER	Timer indicator
11	88.8 °C	Temperature indicator
12		Fan speed indicator: auto/low/mid low /mid /mid high/high
13		Mute indicator
14		SUPER indicator
19	SLEEP TIMER IFEEL HEALTH MILDEW CLEAN DISPLAY GEN MODE	Optional functions indicator Notes: There is no HEALTH/WIND FREE/GEN MODE functions for current models, we express our apologies.

2. Wired remote controller

2.1
An Introduction to Wire Controller



Description of Icons or Symbols

	Sleep		Fresh		Door Card		Defrost
	Anti-freeze		Set		Child Lock		Economic
	Up/Down Swing		Left/Right Swing	°C	Degree centigrade	°F	Fahrenheit
	Electric	ERR.	Error		Water Level		Water Pump Sign
W.	Current Water Temperature	T.	Ambient Temperature	SET	Set Temperature		Compressor Sign
ON	Timer ON	OFF	Timer OFF				

Remark: If an icon goes on, it means “ON”; if such icon goes off, it means “OFF”.

Dial Setting

Definition	SW1-1	SW1-2	Description
Reserve	ON	-	/
	OFF	-	/
Reserve	-	ON	/
	-	OFF	/

2.2 Initial Power-on

1.1. It is necessary to initially power the wire controller on for self-check wherein all the icons or symbols go on for 3 seconds. During such period, all the key ad remote controller operations are invalid.

1.2. The wire controller is without the power-down memory function by default. If a user needs to use the power-down memory function, such user can see the detailed parameters corresponding to “P1” in Section 2.7.2 --- Parameter Setting.

2.3 Key Description

2.3.1 [ON/OFF] Key

2.3.1.1. Press the [ON/OFF] key once to start the controller; press the [ON/OFF] key once again to stop the controller.

2.3.1.2. Liquid Crystal Self-check:

Press the [ON/OFF] key to power the controller on for 5 seconds and then release such key; the controller enters self-check at the moment. The controller executes the liquid crystal self-check in the following sequence:

After the buzzer short sounds once, the following outputs successively motion (wherein the liquid crystal successively goes on from left to right and then go off.) After that, the controller exits from the self-check.

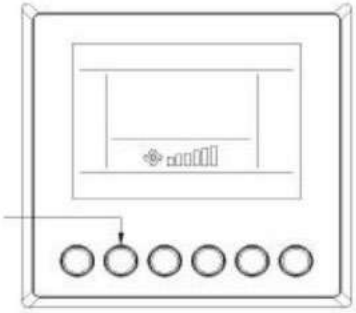
Notes: 1. The controller exits from the self-check status after it is powered off in the self-check status.

2. All the keys are invalid during the self-check.

2.3.2. [Mode] Key

Mode Switch

On the startup interface, press the [Mode] key once when the selected mode icon normally goes on and other icons go off. The switch sequence is as shown in the right picture.

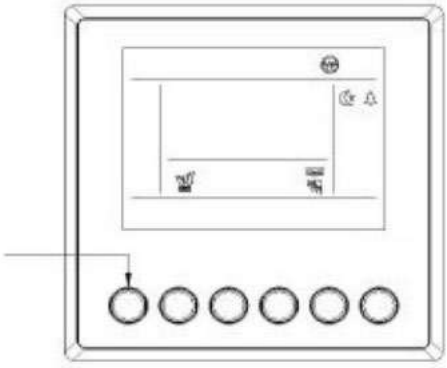


The refrigeration machine is without the “Heat” icon.

Automatic Mode: The controller with the power-down memory function can be powered on again after being powered down, re-judge the temperature and then re-execute the automatic mode; if the power-down memory function is not started, the controller will enter the standby mode.

2.3.2.1. Function Setting

On the startup interface, long press the [Mode] key for over 5 seconds to enter the function setting interface; short press the [Mode] key when the selected function icon twinkles with the frequency of 1Hz and other icons act as per the actual status (if the status is ON, the icons normally go on; otherwise, the icons go off.)



2.3.3. [▲]/[▼] Key

2.3.3.1 On the startup interface, press the [▲]/[▼] key once to set the temperature increase or decrease by 0.5℃ ;

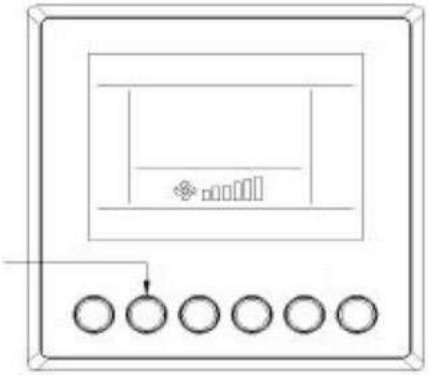
2.3.3.2 Forced Defrosting

On the startup interface, set the wire controller to be in the heating mode and at the temperature of 16℃, and then finish the following 6 keys of operations within 5 seconds:

“[▲]→[▼]→[▲]→[▼]→[▲]→[▼]”. At the moment, the system successfully enters the forced defrosting and then the buzzer long beeps once.

2.3.4 [Air Speed] Key

On the startup interface, press the [Air Speed] key once, the selected air speed icon normally goes on and other icons go off wherein the air speed switches in the cyclic sequence of low air speed → intermediate air speed → high air speed



- When the wire controller is initially powered on, its default air speed is low and the icon of low air speed is displayed.
- When the wire controller is at the time of automatic air, the air speed icon is successively displayed in the dynamic and cyclic sequence of low air speed—intermediate air speed—high air speed—low air speed.
- When the wire controller is at the time of automatic air, the air speed icon is successively displayed in the dynamic and cyclic sequence of low air speed—intermediate air speed—high air speed—idle—low air speed.
- If the air speed is of individual backup, the wire controller will display the last set air speed of the corresponding mode when it enters the same mode next time.

2.3.5 [Timer] Key

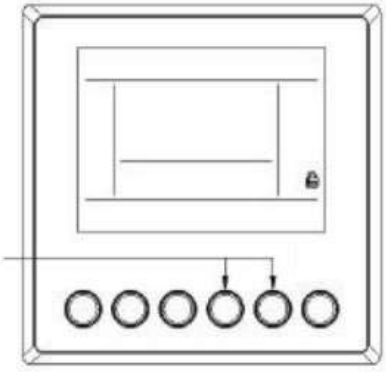
2.3.5.1 Continuously press the [Timer] key for over 5 seconds to enter the clock setting interface (See Chapter 2.5--- Clock Setting for details).

2.3.5.2 Press the [Timer] key once to enter the timer setting interface (See Chapter 6---Timer Setting for details).

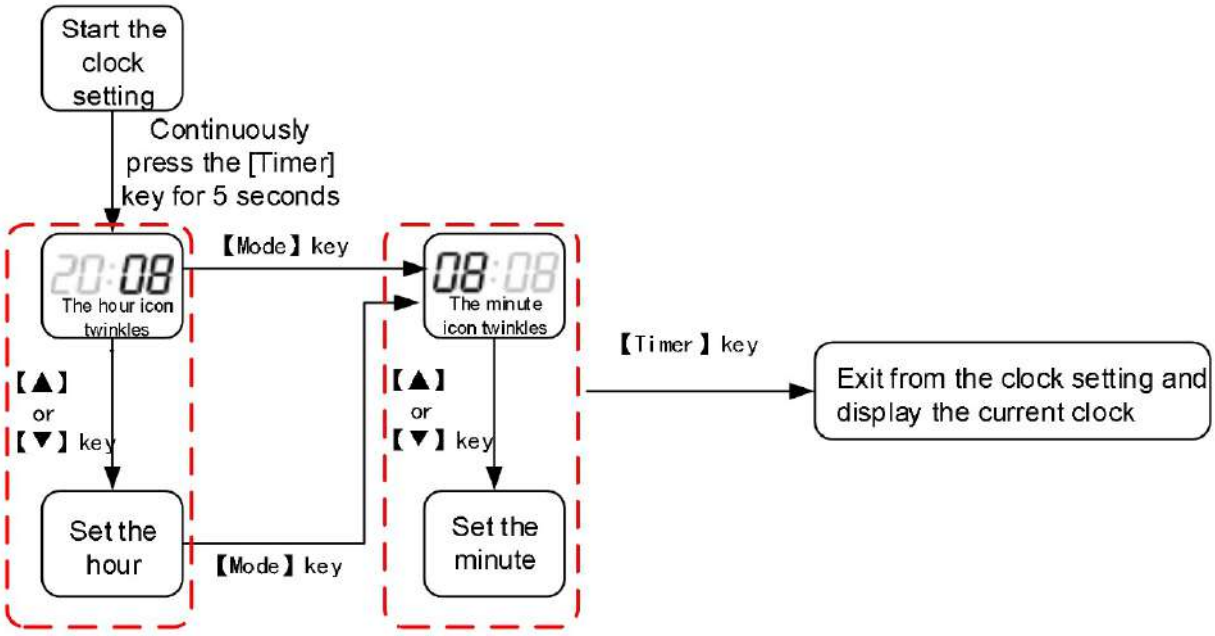
2.4. Auxiliary Functions

2.4.1. Child Lock

1. On the startup or shutdown interface, simultaneously press the [▲] and [▼] keys for over 5 seconds to enable the child lock when the child lock icon normally goes on.
2. When the child lock is valid, the operations of other keys are invalid but the icons twinkle with the frequency of 1Hz.

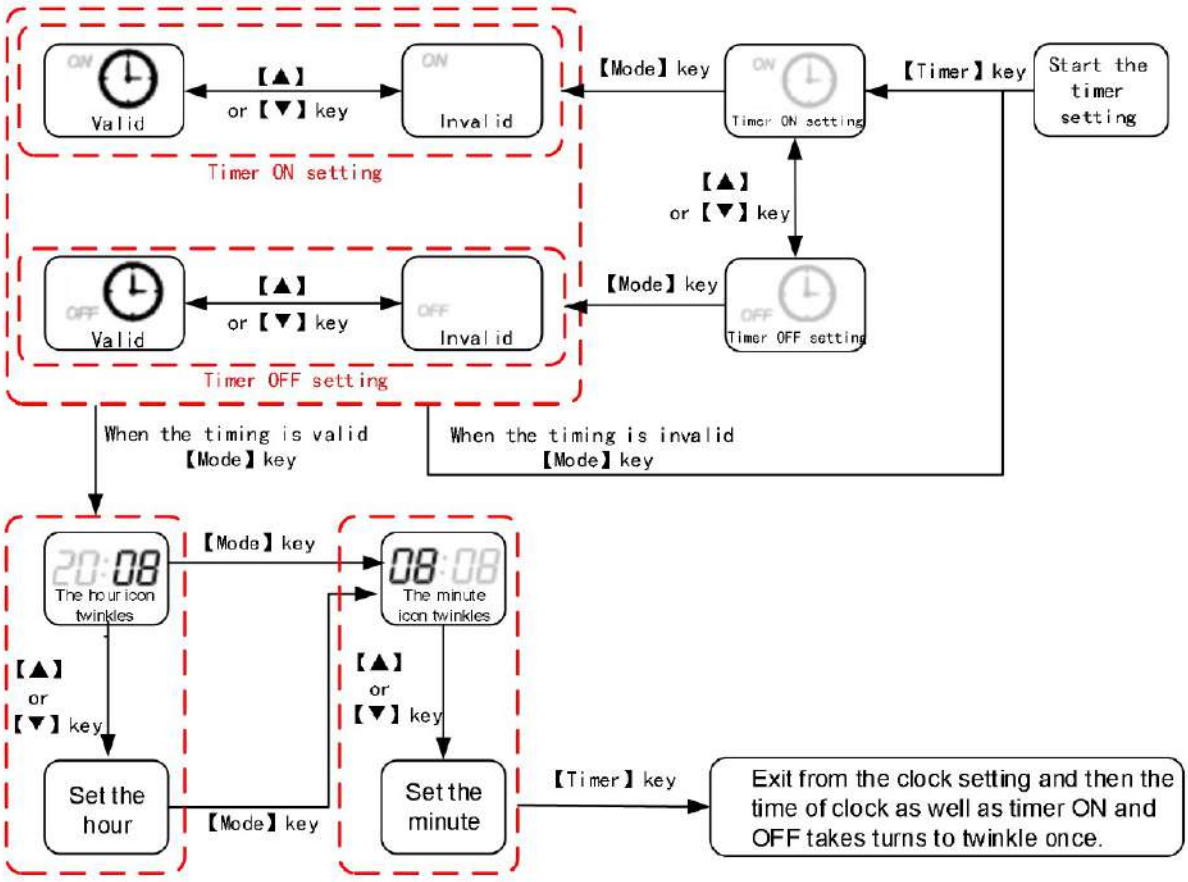


2.5. Clock Setting



Set the period by pressing the [Timer] key and then exit from the clock setting with such setting saved; Set the period by pressing the [ON/OFF] or [Mode] key and then exit from the clock setting with such setting not saved; Set the status and if there are no key operations for 15 consecutive seconds, exit from the clock setting with such setting not saved.

2.6. Timer Setting



Set the period by pressing the [Timer] key and then exit from the clock setting with such setting saved;
Set the period by pressing the [ON/OFF] or [Mode] key and then exit from the clock setting with such setting not saved;
Set the status and if there are no key operations for 15 consecutive seconds, exit from the clock setting with such setting not saved.

2.7 Parameter Query/Setting

2.7.1 Parameter Query

- Continuously press the "[Mode]+[▲]" combination keys for 5 seconds to automatically enter the parameter query interface when the "Time Area-Hour" icon twinkles and displays the "Parameter Code" and "Temperature Area" displays the current "Parameter Value" corresponding to such "Parameter Code".
- When the parameter code twinkles, press the [▲] or [▼] key to switch the parameter code.

Parameter Code	Area Display	Parameter Name	Query the Current Parameter		Query Range
			Value to Query	Area Display	
01	Time Area-Hour	Indoor ambient temperature	Current value	Temperature Area	-30~150
02	Time Area-Hour	Aperture of expansion valve of the indoor unit	Current value	Temperature Area	0~500
03	Time Area-Hour	Temperature at the inlet of evaporator of the indoor unit	Current value	Temperature Area	-30~150
04	Time Area-Hour	Temperature in the middle of evaporator of the indoor unit	Current value	Temperature Area	-30~150
05	Time Area-Hour	Temperature at the outlet of evaporator of the indoor unit	Current value	Temperature Area	-30~150
06	Time Area-Hour	Engineering number of the indoor unit	Current value	Temperature Area	/
07	Time Area-Hour	IP address of the indoor unit	Current value	Temperature Area	/
E1	Time Area-Hour	Historical Error 1	Err+**	Temperature Area	
E2	Time Area-Hour	Historical Error 2	Err+**	Temperature Area	
E3	Time Area-Hour	Historical Error 3	Err+**	Temperature Area	
E4	Time Area-Hour	Historical Error 4	Err+**	Temperature Area	
E5	Time Area-Hour	Historical Error 5	Err+**	Temperature Area	

2.7.2 Parameter Setting

- Continuously press the “[Mode]+[▼]” combination keys for 5 seconds to automatically enter the parameter setting interface when the “Time Area-Hour” icon twinkles and displays the “Parameter Code” and “Temperature Area” displays the current “Parameter Value” corresponding to such “Parameter Code”.
- When the parameter code twinkles, press the [▲] or [▼] key to switch the “Parameter Code”; press the [Mode] key to stopthe “Parameter Code” from twinkling and enters the “Parameter Value” changing interface when the “Parameter Value” twinkles.
- When the parameter value twinkles, press the [▲] or [▼] key to change the “Parameter Value”; press the [Mode] key to save the “Parameter Value” and return to the “Parameter Code” twinkling interface.

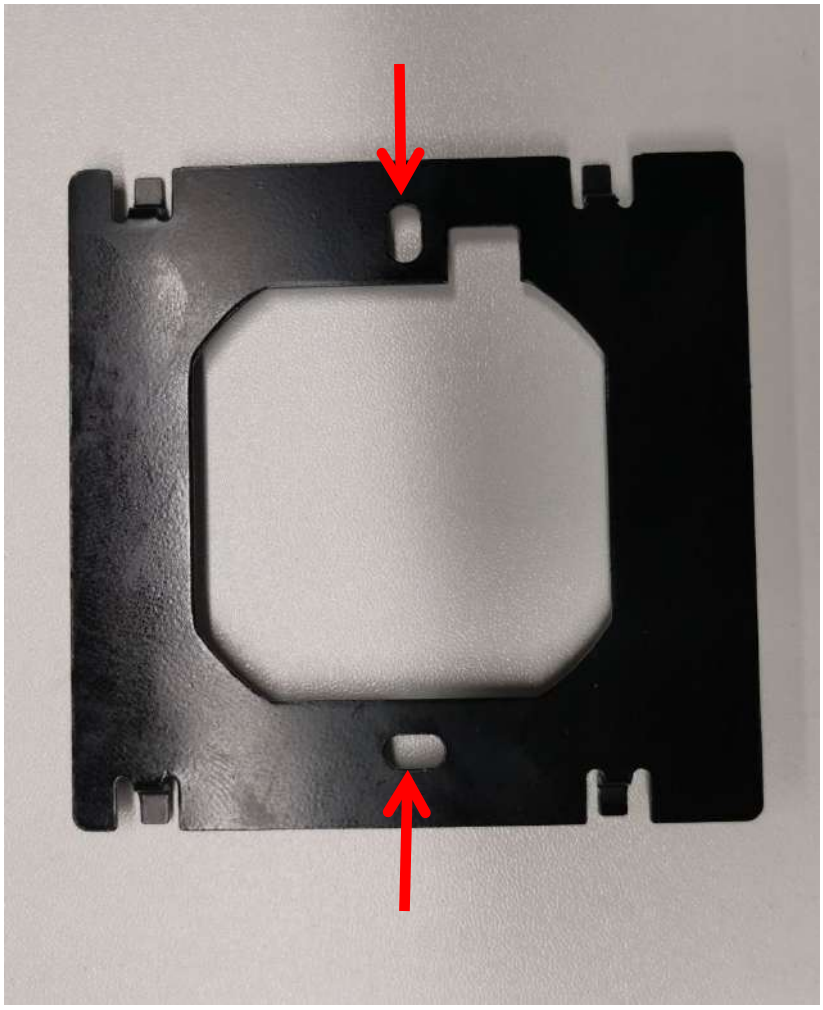
Parameter Code			Query the Current Parameter		Query Range
Parameter Code	Area Display	Parameter Name	Value to Query	Area Display	
P1	Time Area-Hour	The indoor unit corresponding to the wire controller is the indoor unit in the master mode	SL	Temperature Display Area	SL: From the indoor unit
P2	Time Area-Hour	Clearing Away the Master Indoor Unit from the Set	00	Temperature Display Area	00: No action
P3	Time Area-Hour	Address Setting of Two-wire Controller	01	Temperature Display Area	01: Upper computer of RS485 trunk
P5	Time Area-Hour	Power-down memory mode	Off	Temperature Display Area	On: Valid
			on		Off: Invalid
P6	Time Area-Hour	Temperature Unit Conversion	℃	Temperature Display Area	C: degree centigrade
			℉		
P7	Time Area-Hour	Selection of Ambient Temperature Sensing Bag	IL	Temperature Display Area	/
P8	Time Area-Hour	Modification Value of Return-air Temperature Sensing Bag	00	Temperature Display Area	-15℃~15℃
P9	Time Area-Hour	Modification Value of Return-air Temperature Sensing Bag	00	Temperature Display Area	-15℃~15℃
PF	Time Area-Hour	Thermal Aggregation Prevention	00	Temperature Display Area	00~60
PH	Time Area-Hour	Maximum Defrosting Duration	15	Temperature Display Area	00~20

2.8. 86J2 wire controller installation guideline

2.8.1 Open the wire controller packaging, check the model and the code at back surface.

2.8.2 Flip the wire controller, pull the installation board to separate from controller.

2.8.3 Pass the cable through the back panel and use 2 screws to fix it on the wall.



2.8.4 Connect the cable and the PCB board.

2.8.5 Align the front and installation board and press firmly.

Annexes

Annex 1 Analysis of Common Faults of Compressors

1. Compressor Fault Detection

(1) Short - circuit fault of compressor coil: with the multimeter, the resistance between terminal blocks or between terminal blocks and the ground is measured as 0 ohm under the condition that the compressor is in a cold state;

Specific fault symptom: power air switch is subject to the leakage of electricity and tripping when the compressor is started.

Reasons:

a. The air and moisture entered in the cooling system will lead to a poor insulation effect of the coils and it may cause the short circuit of compressor coil when it is operated in high temperature and pressure for a long time; b. The system power supply quality is poor, leading to under - voltage or over - voltage, phase failure and partial phase and even the short circuit of compressor coil;

c. The debris entered into the system will block the filter and reduce the circulating amount of the refrigerant, leading to insufficient running pressure and overheat running of the compressor and even the short circuit of compressor coil;

(2) open - circuit fault of compressor coil: With the multimeter, the resistance among terminal blocks is measured as ∞ ohms under the condition that the compressor is in a cold state.

Specific fault symptom:

a. The compressor is unable to start in case of any open circuit for either group of coils, and the current of other two groups of coils is big. After a long time, it will lead to the burning of compressor built - in protector or two groups of coils.

b. The compressor is unable to start in case of any open circuit of either two groups of coils, and the current of the residual group of coils is big, and after a long time, it will lead to the burning of compressor built - in protector or two groups of coils.

c. The compressor is unable to start in case of any open circuit of three groups of coils, and any group of coils has no current.

Reasons:

a. The air and moisture entered in the cooling system will lead to a poor insulation effect of the coils and it may cause the open circuit of compressor coil when it is operated in high temperature and pressure for a long time;

b. The system power supply quality is poor, leading to under - voltage or over - voltage, phase failure and partial phase and even the open circuit of compressor coil;

c. The debris entered into the system will block the filter and reduce the circulating amount of the refrigerant, leading to insufficient running pressure and overheat running of the compressor and even the open circuit of compressor coil;

(3) Stuck Fault of Compressor Motor: when the compressor bearing is rotated under the condition of insufficient lubrication or lack of lubricant, it will cause the abrasion and stuck of compressor bearing.

Specific fault symptom: it will cause the current protection or compressor built - in protection shortly after the start of the compressor,

Reasons:

a. The refrigerant leakage and the lubricant leakage occur in the cooling system, which has resulted in the reduction of the lubricant of the compressor;

b. The air and the moisture enter the system and they enable the lubricant and air - conditioning oil to begin

to acidify and heat to finally become the gelatinous substance and cause the stuck of compressor after the compressor has been operated in high temperature and high pressure for a long time;

c. In order to remove the residual acidified air - conditioning oil in the AC system, the carbon tetrachloride (CTC) or other cleaning liquid is now used widely to clean the piping system of air conditioner. The CTC left on the pipe wall is sometimes diluted by the refrigerant and air - conditioning oil. The diluted CTC is operated together with the refrigerant and AC oil in the high temperature and pressure for a long time to cause the acidification and heating of AC oil to finally become the gelatinous substance and cause the stuck of compressor.

(4) Compressor Liquid Strike Fault: the excessive liquid refrigerant that is not evaporated is sucked into the compressor to cause the wreck of compressor liquid strike scroll.

Specific fault symptom:

a. The compressor is unable to start, which leads to the current protection or compressor built - in protection (insertion);

b. After the wreck of compressor liquid strike scroll, the scroll fragments will fall on the motor coils to damage the insulation layer of the coil and cause the burning of coil;

c. The compressor can run, but it has no high or low pressure and has a small current.

Specific fault symptom: it causes the current protection or compressor built - in protection (insertion) shortly after the compressor is started.

Reasons:

a. The compressor is subject to a liquid strike due to excessive adding or charging of refrigerants in the cooling system;

b. During the cooling process of the system, the fan of indoor unit does not work or the capacitor capacitance decreases, fan speed is low, air duct is clogged and the filter screen and heat exchanger are dirt, which all possibly cause the incomplete evaporation of the refrigerant and even the liquid strike of the compressor;

c. During the heating process of the system, the fan of outdoor unit does not work or the capacitor capacitance decreases, fan speed is low, air duct is clogged and the heat exchanger is dirt, which all possibly cause the incomplete evaporation of the refrigerant and even the liquid strike of the compressor;

d. During the cooling process, the electronic expansion valve of indoor unit in the VRF system does not work and it is still in the normally open state. At this moment, the refrigerant is not evaporated to absorb the heat, causing the liquid strike of compressor.

2. Notes to Replacement of Compressor

For any compressor fault, it is necessary to analyze the lubricant of damaged compressor oil during the replacement and repair.

(1) The oil is very dark and turbid (see the following figure), and the moving parts in the compressor have undergone the serious wear.

a. it is necessary to replace the compressor;

b. It is also necessary to replace the low - pressure storage tank in the system and at this moment, some deteriorated lubricants of the system have been stored in this storage tank;

c. the high - pressure nitrogen is used to blow the waste oil of the whole cooling system to ensure the waste oil is removed thoroughly from the whole cooling system.

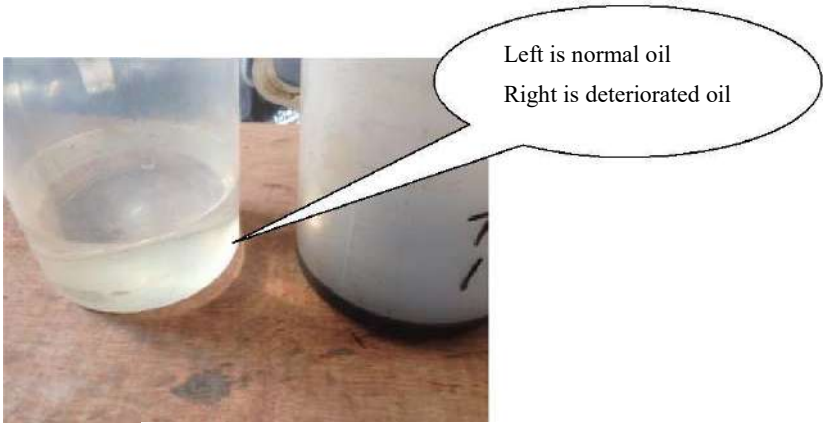
(2) The oil shows the dark red and it is not turbid (see the following figure) and the moving parts in the compressor have undergone the light wear.

a. it is necessary to replace the oil in the compressor;

b. It is also necessary to replace the low - pressure storage tank in the system and at this moment, some deteriorated lubricants of the system have been stored in this storage tank;

c. the high - pressure nitrogen is used to blow the waste oil of the whole cooling system to ensure the waste oil is removed thoroughly from the whole cooling system.

After completing the replacement of compressor, the strict evacuation and pressure holding operation shall be carried out to the cooling system and the refrigerant shall be filled as per the system requirements. After starting and operating the compressor for half an hour, it is necessary to test the performance parameters of system temperature, pressure, current, etc.



Annex 2 Faults Not Resulted from Air Conditioner

Due to the difference of installation, commissioning and actual operating environments, the air conditioner may present different running states. The following phenomena are not resulted from the abnormity of the compressor.

1. The system does not work

1) The system does not work immediately after pressing the ON/OFF button;

2) If the indicator light is ON, it presents the normal running state of the air conditioner. The symptom that it does not work immediately is incurred from the action of safety device of the system to prevent the overload;

3) The compressor of the air conditioner will automatically start its running three minutes later;

4) If the running indicator light and defrosting/preheating indicator light is ON, it indicates that you have chosen the heating mode. Because the compressor is unable to run at the very beginning, the under - temperature of indoor unit will result in the "anti - cold wind" protection.

2. White mist in indoor unit

1) Conduct the cooling operation under the condition that the indoor relative humidity is too high (or oily and dusty place);

2) If there is heavy dirt in the indoor unit, the room temperature will be uneven, and under such a condition, it is necessary to clean the inside of the indoor unit, which must be performed by the professional repairman.

3) The air conditioner is switched from defrosting operation into the heating operation;

4) The water from defrosting operation becomes the steam to discharge.

3. Noise of Air Conditioner

1) The air conditioner will give out the lower continuous "Hissing" sound when it is in its automatic operation, cooling, dehumidifying or heating operation. it is the flowing sound of refrigerants between indoor unit and outdoor unit;

2) In a short time after the running suspension or during the defrosting operation, the "hissing" sound can be heard. It is the sound given out by refrigerant when it stops or changes its flow;

3) When the air conditioner is in heating (including the heating in automation mode) or dehumidifying operations, the "rustle" sound can be heard, and it is the operating sound of the drainagepump.

4) When the air conditioner is running or stops running, the "creak" sound can be heard. It is the

expanding or contracting sound of plastic parts due to the change of temperature;

4. Dust blown from Indoor Unit

The dust in the indoor unit will be blown out when the unit is operated for the first time after it is left unused for a long time.

5. Odor Emitted from Indoor Unit

The odor absorbed from room, furniture or soot through the air return circulation of indoor unit is emitted during the running process of the air conditioner.

6. Cooling Mode Converted into Heating Mode

1) In order to prevent the frosting of heat exchanger of indoor unit, it will automatically be converted into the Blowing Mode and soon restored to Cooling Mode.

2) When the room temperature has dropped to the set temperature, the air conditioner will automatically shut down the compressor and enter the Blowing state; after the room temperature rises, the compressor will be restarted. The action of compressor in the heating mode is exactlyopposite;

3) In case of any conflict of operating modes in the same control system, the priority is given to the heating

mode, namely, the air conditioner system only performs the Blowing state under the cooling mode.

Annex 3 Parameter Table of Temperature Sensor

℃	K Ohm	℃	K Ohm	℃	K Ohm	℃	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413

3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

Unit: ℃---K		Discharge temperature sensor table					
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717

9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294	B(25/50)=3950K	
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045	R(90℃)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		