SERVICE MANUAL

CASSETTE、DUCT、CEILING&FLOOR

(R410A and R22)

SCOPE

This course is intended to support engineering staff that are installing, commissioning, servicing or maintaining AUX cassette、dust、ceiling&floor systems.

The system is available in 9000BTU ~ 52000BTU unit.

Cassette means built-in ceiling cassette split air conditioner unit.

Duct means low static press duct air conditioner unit.

Ceiling&Floor means ceiling&Floor air conditioner unit.

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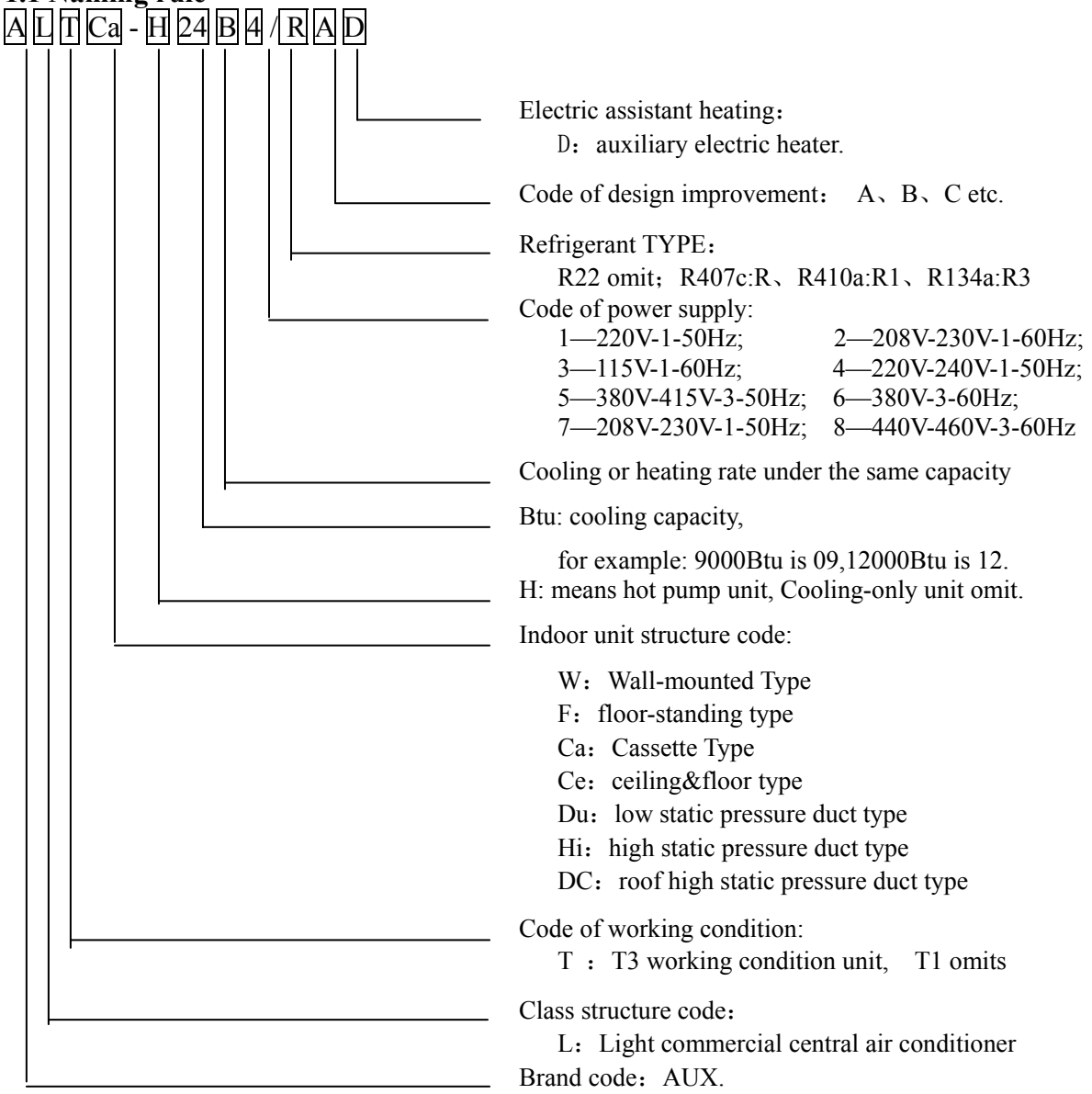
1 General description

1.1 Naming rule



Example:

ALCa-H24A5/R1：

T1 climate type and air output all-direction insert type heat pump room air conditioner, rating cold generation capacity A grade of 24000 Btu, i.e. 7000W, 220V-240V, 50Hz power supply and R410A refrigeration.

1.2 Indoor unit Features

1.2.1 Cassette

- **Innovative design of 6-segment heating exchanger**

Instead of old 4-segment type, the new innovative 6-segment heating exchanger enlarges the exchange area. The efficiency of heating exchanging increases 10%-15%. Furthermore, with a large air volume design, the machine can normally work at cooling mode in all the day and night without frost, even in Spring / Autumn.

- **Foam-plastic combination technology on the drip tray**

It was a long-term and difficult task to prevent the condensing water tray of cassette from fracture and leakage. These problems couldn't be solved perfectly by the old technical craft such as gelatinizing or plastic absorption, and the foam will possibly be broken while it is vibrated or long-term used.

Aux uses an innovative foam-PS combined technology on the water tray and the plastic surface thickness reaches 1mm. It can make the foam tray firmer and the surface stronger in order to avoid any leakage and fracture.

- **Fresh air intake design**

A special fresh air intake can lead outdoor fresh air into the indoor for better air quality, which keeps you enjoy the fresh air all the time.

- **Higher condensate lift through the inner pump**

A condensate pump is mounted inside of the cassette indoor unit. The condensate can be pumped up 750mm from the drip tray.

- **Hook design on the panel for the easier installation**

Following one of the AUX designing principles, DESIGNING FOR EASIER INSTALLATION, hooks are designed to assist installers to fix the panel on the unit. When installing the panel, just need to hang the four hooks on the unit and then tighten the screws. When maintaining the unit, just need to loosen the screws to take down the panel.

1.2.2 Ceiling & Floor

- **Air flow anto control**

To realize comfortable temperature in the room, warm air could be sent downwards to every corner of the room.

- **Quiet operating**

For a comfortable environment, we using line flow fan lowers noise by reducing fan speed, while air input is strong.

- **Flexible installation**

The indoor unit can be ceiling-mounted on the floor, saving more space. The big room or hall needs high capacity air conditioner.The cabinet type unit not only takes up space, but also doesn’t match with other furnitures. Now you have nothing to worry about.

- **Untrathin body design**

The unit is very thin, beautiful and elegant, saving space

- **Easy to overhang**

The indoor unit is light in design, making the whole unit easy to overhang. It has small unit body, easy to install in the common ceiling. thus making up the shortage of push-in type unit.

1.2.3 Duct

- **Saving space design**

Extrathin design, the whole thickness of indoor unit only 20cm Concealed installation combine indoor decoration perfectly, it almost not make you feel that air conditioner lied.

- **Outlet mounted freely**

Using duct connection, outlet mounted freely, let the outdoor fresh air easily come into to keep the indoor air pure.

- **Flexible and multiplicity**

According to the special situation to adopt the differ air reversing and water draining mode to meet the diverse decoration requiement.

- **High process condense pump**

According to special requirement to choose the 750mm condense pump which avoid the trouble of leakage, meanwhile draining water clearal.

- **Long refrigerant pipe**

The max. piping length reaches 50 meters.The max fall length reaches 15 meters.
It is more flexible and convenient to mount.

1.2.4 Outdoor unit

- **Universal outdoor unit**

The universal outdoor unit can work with different types indoor units in the same capacity for ducted,cassette,ceiling&floor.

- **Phase reverse protection**
- **Anti-freezing protection, over-heat protection**

Over-current protection and phase sequence protection High-pressure and low-pressure protection available

1.2.5 Controller

- **Indoor Unit On-Off control interface**

A control interface on each indoor unit PCB available realizes the outside additional on/off.

- **7-day timer interface**

A 7-day timer interface available on each indoor PCB to match with the weekly time for programming control.

- **Failure automatically display**
- **Wired controller,central controller interface available**
- **Auto changover**
- **Anti freezing**

1.3 Picture of unit

1.3.1 Indoor unit picture

Type	Appearance	Model	HP	Capacity (BTU/h)	
				Cooling	Heating
Cassette		ALCa-(H)09A4/R1	1.0	9000	9900
		ALCa-(H)12A4/R1	1.5	12000	13200
		ALCa-(H)18A4/R1	2.0	18000	20000
		ALCa-(H)09A4/C	1.0	9000	9900
		ALCa-(H)12A4/C	1.5	12000	13200
		ALCa-(H)18A4/C	2.0	18000	20000
		ALCa-(H)24B4/R1	3.0	24000	26000
		ALCa-(H)30A5/R1	3.5	30000	33000
		ALCa-(H)36A5/R1	4.0	36000	39000
		ALCa-(H)42A5/R1	5.0	42000	46000
		ALCa-(H)48A5/R1	5.5	48000	52000
		ALCa-(H)24B4/C	3.0	24000	26000
		ALCa-(H)30A4/C	3.5	30000	33000
		ALCa-(H)36A4/C	4.0	36000	39000
		ALCa-(H)36A5/C	4.0	36000	39000
		ALCa-(H)42A5/C	5.0	42000	46000
		ALCa-(H)48A5/C	5.5	48000	52000
Ceiling & Floor		ALCe-(H)09A4/C	1.0	9000	9900
		ALCe-(H)12A4/C	1.5	12000	13200
		ALCe-(H)18A4/C	2.0	18000	20000
		ALCe-(H)24B4/C	3.0	24000	26000
		ALCe-(H)30A4/C	3.5	30000	33000
		ALCe-(H)36A4/C	4.0	36000	39000
		ALCe-(H)36A5/C	4.0	36000	39000
		ALCe-(H)42A5/C	5.0	42000	46000
		ALCe-(H)48A5/C	5.5	48000	52000
		ALCe-(H)52A5/C	6.0	5200	56000
		ALCe-(H)09A4/R1	1.0	9000	9900
		ALCe-(H)12A4/R1	1.5	12000	13200
		ALCe-(H)18A4/R1	2.0	18000	20000
		ALCe-(H)24B4/R1	3.0	24000	26000
		ALCe-(H)30A5R1	3.5	30000	33000
		ALCe-(H)36A5/R1	4.0	36000	39000
		ALCe-(H)42A5/R1	5.0	42000	46000
		ALCe-(H)48A5/R1	5.5	48000	52000
		ALCe-(H)52A5/R1	6.0	5200	56000

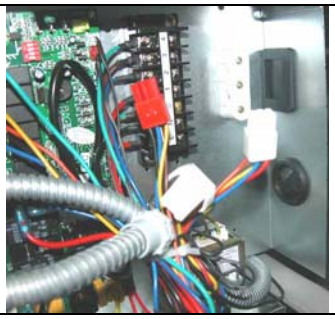
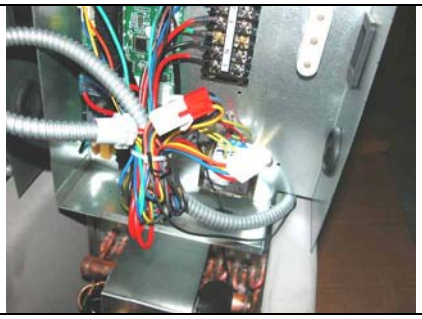
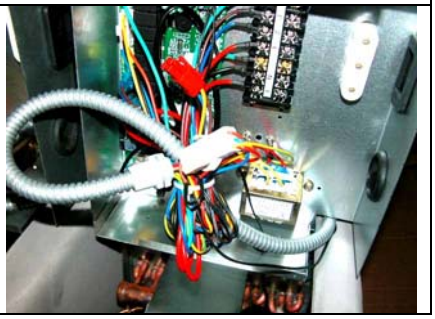
Type	Appearance	Model	HP	Capacity (BTU/h)	
				Cooling	Heating
Duct R22 (12Pa/ 30Pa)		ALDu-(H)09A4/SH	1.0	9000	9900
		ALDu-(H)12A4/SH	1.5	12000	13200
		ALDu-(H)18A4/SH	2.0	18000	20000
		ALDu-(H)24B4/SH	3.0	24000	26000
		ALDu-(H)30A4/SH	3.5	30000	33000
		ALDu-(H)36A4/SH	4.0	36000	39000
		ALDu-(H)36A5/SH	4.0	36000	39000
		ALDu-(H)42A5/SH	5.0	42000	46000
		ALDu-(H)48A5/SH	5.5	48000	52000
Duct R22 (50Pa/ 80Pa)		ALHi-(H)09A4/S	1.0	9000	9900
		ALHi-(H)12A4/S	1.5	12000	13200
		ALHi-(H)18A4/S	2.0	18000	20000
		ALHi-(H)24B4/S	3.0	24000	26000
		ALHi-(H)30A5/S	3.5	30000	33000
		ALHi-(H)36A5/S	4.0	36000	39000
		ALHi-(H)42A5/S	5.0	42000	46000
		ALHi-(H)48A5/S	5.5	48000	52000
		ALHi-(H)52A5/S	6.0	5200	56000
Duct R410A		ALDu-(H)09A4/R1	1.0	9000	9900
		ALDu-(H)12A4/R1	1.5	12000	13200
		ALDu-(H)18A4/R1	2.0	18000	20000
		ALDu-(H)24B4/R1	3.0	24000	26000
		ALDu-(H)30A5/R1	3.5	30000	33000
		ALDu-(H)36A5/R1	4.0	36000	39000
		ALDu-(H)42A5/R1	5.0	42000	46000
		ALDu-(H)48A5/R1	5.5	48000	52000
		ALDu-(H)52A5/R1	6.0	5200	56000

1.3.2 Controller unit picture

	Remote controller	Line controller(Optional)	Remark
Controller			**Cassette 、Ceiling&Floor unit Remote controller should be standard configuration and line controller should be optional;**
			Duct unit standard Configuration remotecontroller、Line controller

1.3.3 Static pressure choose for duct unit

Open the electric control box cover of unit, then can choose static pressure

	Red linker：low-end static	White linker：slap-up static
		

1.3.3 Outdoor unit picture

Type	Appearance	HP	Capacity (BTU/h)
Universal outdoor unit		1.0	9000
		1.5	12000
		2.0	18000(R22)
		2.0	18000(R410A)
		3.0	24000
		3.5	30000
		4.0	36000
		5.0	42000
		5.5	48000
		6.0	52000

2 Technical Data

2.1 Technical Data

2.1.1 Cassette (R410A)

Cassette (R410A) table 1

Type	Product type	ALCa-(H)09A4/R1	ALCa-(H)12A4/R1	ALCa-(H)18A4/R1	ALCa-(H)24B4/R1
	Indoor unit	ALCa-(H)09A4/R1	ALCa-(H)12A4/R1	ALCa-(H)18A4/R1	ALCa-(H)24B4/R1
	Outdoor unit	AL-(H)09A4/R1	AL-(H)12A4/R1	AL-(H)18A4/R1	AL-(H)24B4/R1
	Panel	MB04			MB06
Rated cooling capacity	kW	2.50	3.50	5.00	7.00
	BTU/H	9000	12000	18000	24000
Rated heating capacity	kW	2.75	3.80	5.50	7.70
	BTU/H	9900	13000	19000	26000
Power supply		1PH,220～240V,50Hz			
Rated power (kW)	cooling	0.90	1.23	1.80	2.57
	heating	0.89	1.14	1.75	2.32
Rated currency (A)	cooling	4.20	6.00	8.40	11.50
	heating	4.10	5.40	8.20	10.90
Refrigerant		R410A			
Indoor unit	Out dimensions W×D×H (mm)	570×570×255	570×570×255	570×570×255	835×835×240
	Page dimensions W×D×H (mm)	680×680×320	680×680×320	680×680×320	900×900×320
	Net weight (kg)	13(+1)	16(+1)	16 (+1)	25 (+2)
	Noise (dB(A))	38	39	42	45
	Air flow volume(m^3/h)	540	650	900	1300
	Exhaust pump head(mm)	700	700	700	1200
	Electrical Heating power (kW)	1.40	1.40	1.40	1.80
Panel	Out dimensions W×D×H (mm)	650×650×30	650×650×30	650×650×30	950×950×55
	Page dimensions W×D×H (mm)	740×740×145	740×740×145	740×740×145	1000×1000×100
	Net weight (kg)	3	3	3	5
Outdoor unit	Out dimensions W×D×H (mm)	760×260×540	760×260×540	800×300×590	800×300×690
	Page dimensions W×D×H (mm)	880×350×610	880×350×610	930×410×660	930×410×760
	Net weight (kg)	30(+1)	36(+2)	42(+1)	53(+1)
	Noise (dB(A))	46	47	52	56
Connection pattern		Bulge connection			

Cassette (R410A) table 2

Type	Product type		ALCa-(H)30A5/R1	ALCa-(H)36A5/R1	ALCa-(H)42A5/R1	ALCa-(H) 48A5/R1
	Indoor unit		ALCa-(H)30A5/R1	ALCa-(H)36A5/R1	ALCa-(H) 42A5/R1	ALCa-(H) 48A5/R1
	Outdoor unit		AL-(H)30A5/R1	AL-(H)36A5/R1	AL-(H) 42A5/R1	AL-(H) 48A5/R1
	Panel		MB06			
Rated cooling capacity		kW	8.50	10.00	12.00	14.00
		BTU/H	30000	36000	42000	48000
Rated heating capacity		kW	9.35	11.00	13.00	15.00
		BTU/H	32000	39000	44000	52000
Power supply			3PH,380～415V/3N,50Hz			
Rated power (kW)		cooling	3.08	3.60	4.62	5.10
		heating	3.03	3.55	4.71	5.20
Rated currency (A)		cooling	5.53	6.50	8.00	9.30
		heating	5.51	6.50	8.10	9.40
Refrigerant			R410A			
Indoor unit	Out dimensions W×D×H (mm)		835×835×240	835×835×240	835×835×280	835×835×280
	Page dimensions W×D×H (mm)		900×900×320	900×900×320	900×900×360	900×900×360
	Net weight (kg)		25(+3)	25(+3)	30(+3)	30(+3)
	Noise (dB(A))		48	48	50	50
	Air flow volume (m^3/h)		1300	1400	1800	1800
	Exhaust pump head (mm)		1200	1200	1200	1200
	Electrical Heating power (kW)		2.50	2.50	2.50	2.50
Panel	Out dimensions W×D×H (mm)		950×950×55	950×950×55	950×950×55	950×950×55
	Page dimensions W×D×H (mm)		1000×1000×100	1000×1000×100	1000×1000×100	1000×1000×100
	Net weight (kg)		5	5	5	5
Outdoor unit	Out dimensions W×D×H (mm)		903×354×857	903×354×857	950×350×940	945×340×1255
	Page dimensions W×D×H (mm)		1030×410×980	1030×410×980	1090×430×1060	1090×430×1370
	Net weight (kg)		78(+2)	78(+2)	92(+2)	98(+7)
	Noise (dB(A))		60	60	60	60
Connection pattern			Flared			

Note:

1. **No heating parameter of cooling-only unit, The parameter in parentheses of table is the parameter of electric heater type;**
2. **If any performance parameter modification, no otherwise notification is issued.**

2.1.2 Cassette (R22)

Cassette (R22) table 1

Type		Product type	ALCa-(H)09A4/C(D)	ALCa-(H)12A4/C(D)	ALCa-(H)18A4/C(D)	ALCa-(H)24B4/C(D)	ALCa-(H)30A4/C(D)
		Indoor unit	ALCa-(H)09A4/C(D)	ALCa-(H)12A4/C(D)	ALCa-(H)18A4/C(D)	ALCa-(H)24B4/C(D)	ALCa-(H)30A4/C(D)
		Outdoor unit	AL-(H)09A4/C	AL-(H)12A4/C	AL-(H)18A4/C	AL-(H)24B4/C	AL-(H)30A4/C
		Panel	MB04			MB06	
Rated cooling capacity		kW	2.50	3.50	5.00	7.00	8.50
		BTU/H	9000	12000	18000	24000	30000
Rated heating capacity		kW	2.75	3.80	5.50	7.70	9.35
		BTU/H	9900	13000	19000	26000	32000
Power supply			220V～240V/50Hz				
Rated power (kW)		cooling	0.90	1.23	1.75	2.45	3.25
		heating	0.89	1.14	1.80	2.35	3.13
Rated currency (A)		cooling	4.20	5.90	8.00	11.50	15.00
		heating	4.10	5.80	8.20	10.70	14.30
Refrigerant			R22				
Indoor unit	Out dimensions W×D×H (mm)		570×570×255	570×570×255	570×570×255	835×835×240	835×835×240
	Page dimensions W×D×H (mm)		680×680×320	680×680×320	680×680×320	900×900×320	900×900×320
	Net weight (kg)		13(+1)	16(+1)	16 (+1)	25 (+2)	30(+3)
	Noise (dB(A))		38	39	42	45	48
	Air flow volume(m^3/h)		540	650	900	1300	1300
	Exhaust pump head(mm)		700	700	700	1200	1200
	Electrical Heating power (kW)		1.40	1.40	1.40	1.80	2.50
Panel	Out dimensions W×D×H (mm)		650×650×30	650×650×30	650×650×30	950×950×55	950×950×55
	Page dimensions W×D×H (mm)		740×740×145	740×740×145	740×740×145	1000×1000×100	1000×1000×100
	Net weight (kg)		3	3	3	5	5
Outdoor unit	Out dimensions W×D×H (mm)		760×260×540	760×260×540	760×260×540	800×300×690	903×354×857
	Page dimensions W×D×H (mm)		880×350×610	880×350×610	880×350×610	930×410×760	1030×410×980
	Net weight (kg)		30(+1)	36(+2)	42(+1)	53(+1)	68(+2)
	Noise (dB(A))		46	47	52	56	60
Connection pattern			Bulge connection				

Note:

1. **No heating parameter of cooling-only unit, The parameter in parentheses of table is the parameter of electric heater type;**
2. **If any performance parameter modification, no otherwise notification is issued.**

Cassette (R22) table 2

Type	Product type		ALCa-(H)36A4/C(D)	ALCa-(H)36A5/C(D)	ALCa-(H)42A5/C(D)	ALCa-(H) 48A5/C(D)
	Indoor unit		ALCa-(H)36A4/C(D)	ALCa-(H)36A5/C(D)	ALCa-(H) 42A5/C(D)	ALCa-(H) 48A5/C(D)
	Outdoor unit		AL-(H)36A4/C	AL-(H)36A5/C	AL-(H) 42A5/C	AL-(H) 48A5/C
	Panel		MB06			
Rated cooling capacity		kW	10.00	10.00	12.00	14.00
		BTU/H	36000	36000	42000	48000
Rated heating capacity		kW	11.00	11.00	13.00	15.00
		BTU/H	39000	39000	44000	52000
Power supply			220V～240V/50Hz	380V～415V/3N/50Hz		
Rated power (kW)		cooling	3.72	3.62	4.40	5.00
		heating	3.60	3.68	4.50	5.10
Rated currency (A)		cooling	17.20	6.10	8.00	8.50
		heating	16.80	6.20	8.30	9.00
Refrigerant			R22			
Indoor unit	Out dimensions W×D×H (mm)		835×835×240	835×835×240	835×835×280	835×835×280
	Page dimensions W×D×H (mm)		900×900×320	900×900×320	900×900×360	900×900×360
	Net weight (kg)		25(+3)	25(+3)	30(+3)	30(+3)
	Noise (dB(A))		48	48	50	50
	Air flow volume (m^3/h)		1500	1500	1800	1800
	Exhaust pump head (mm)		1200	1200	1200	1200
	Electrical Heating power (kW)		2.50	2.50	2.50	2.50
Panel	Out dimensions W×D×H (mm)		950×950×55	950×950×55	950×950×55	950×950×55
	Page dimensions W×D×H (mm)		1000×1000×100	1000×1000×100	1000×1000×100	1000×1000×100
	Net weight (kg)		5	5	5	5
Outdoor unit	Out dimensions W×D×H (mm)		903×354×857	903×354×857	950×350×940	945×340×1255
	Page dimensions W×D×H (mm)		1030×410×980	1030×410×980	1090×430×1060	1090×430×1370
	Net weight (kg)		78(+2)	78(+2)	92(+2)	98(+7)
	Noise (dB(A))		60	60	60	60
Connection pattern			Bulge connection			

Note:

1. **No heating parameter of cooling-only unit, The parameter in parentheses of table is the parameter of electric heater type;**
2. **If any performance parameter modification, no otherwise notification is issued.**

2.1.3 Ceiling &Floor (R410a)

Ceiling &Floor (R410a) table 1

Type		Product type	ALCe-(H)09A4/R1	ALCe-(H)12A4/R1	ALCe-(H)18A4/R1	ALCe-(H)24B4/R1
		Indoor unit	ALCe-(H)09A4/R1	ALCe-(H)12A4/R1	ALCe-(H)18A4/R1	ALCe-(H)24B4/R1
		Outdoor unit	AL-(H)09A4/R1(Ce)	AL-(H)12A4/R1(Ce)	AL-(H)18A4/R1(Ce)	AL-(H)24B4/R1(Ce)
Rated cooling capacity		kW	2.50	3.50	5.00	7.00
		BTU/H	9000	12000	18000	24000
Rated heating capacity		kW	2.75	3.80	5.50	7.70
		BTU/H	9900	13000	19000	26000
Power supply			1PH,220～240V,50Hz			
Rated power (kW)		cooling	0.90	1.23	1.75	2.60
		heating	0.89	1.14	1.80	2.30
Rated currency (A)		cooling	4.20	5.90	8.40	12.10
		heating	4.10	5.80	8.20	10.80
Refrigerant			R410A			
Indoor unit	Out dimensions W×D×H (mm)		765×673×243	765×673×243	765×673×243	1148×673×243
	Page dimensions W×D×H (mm)		995×765×320	995×765×320	995×765×320	1375×765×320
	Net weight (kg)		25	25	25	40
	Noise (dB(A))		38	39	42	45
	Air flow volume(m^3/h)		540	650	900	1300
Outdoor unit	Out dimensions W×D×H (mm)		760×260×540	760×260×540	800×300×590	800×300×690
	Page dimensions W×D×H (mm)		880×350×610	880×350×610	930×410×660	930×410×760
	Net weight (kg)		30(+1)	36(+2)	42(+1)	53(+1)
	Noise (dB(A))		46	47	52	56
Connection pattern			Bulge connection			

Ceiling &Floor (R410a) table 2

Type		Product type	ALCe-(H)30A5/R1	ALCe-(H)36A5/R1	ALCe-(H)42A5/R1	ALCe-(H)48A5/R1	ALCe-(H)52A5/R1
		Indoor unit	ALCe-(H)30A5/ R1	ALCe-(H)36A5/ R1	ALCe-(H)42A5/ R1	ALCe-(H)48A5/ R1	ALCe-(H)52A5/ R1
		Outdoor unit	AL-(H)30A5/ R1(Ce)	AL-(H)36A5/ R1(Ce)	AL-(H)42A5/ R1(Ce)	AL-(H)48A5/ R1(Ce)	AL-(H)52A8/ R1(Ce)
Rated cooling capacity		kW	8.50	10.00	12.00	14.00	15.00
		BTU/H	30000	36000	42000	48000	52000
Rated heating capacity		kW	9.35	11.00	13.2	15.40	16.00
		BTU/H	32000	40000	46000	53000	56000
Power supply			380～415V/50Hz				
Rated power (kW)		cooling	3.08	3.65	4.75	4.85	6.05
		heating	3.03	3.45	4.70	4.90	6.15
Rated currency (A)		cooling	5.53	6.50	8.15	8.25	9.50
		heating	5.51	6.40	8.10	8.30	10.20
Refrigerant			R410A				
Indoor unit	Out dimensions W×D×H (mm)		1148×673×243	1148×673×243	1530×673×243	1530×673×243	1530×673×243
	Page dimensions W×D×H (mm)		1375×765×320	1375×765×320	1760×765×320	1760×765×320	1760×765×320
	Net weight (kg)		40	40	45	45	45
	Noise (dB(A))		45	48	50	50	50
	Air flow volume(m^3/h)		1400	1400	1800	1800	2000
Outdoor unit	Out dimensions W×D×H (mm)		903×354×857	903×354×857	950×350×940	945×340×1255	945×340×1255
	Page dimensions W×D×H (mm)		1030×410×980	1030×410×980	1090×430×1060	1090×430×1370	1090×430×1370
	Net weight (kg)		68(+2)	78+2)	92(+2)	98(+7)	98(+7)
	Noise (dB(A))		60	60	60	60	60
Connection pattern			Bulge connection				

2.1.4 Ceiling &Floor (R22)

Ceiling &Floor (R22) table 1

Type		Product type	ALCe-(H)09A4/C	ALCe-(H)12A4/C	ALCe-(H)18A4/C	ALCe-(H)24B4/C	ALCe-(H)30A4/C
		Indoor unit	ALCe-(H)09A4/C	ALCe-(H)12A4/C	ALCe(H)18A4/C	ALCe-(H)24B4/C	ALCe-(H)30A4/C
		Outdoor unit	AL-(H)09A4/C(Ce)	AL-(H)12A4/C(Ce)	AL-(H)18A4/C(Ce)	AL-(H)24B4/C(Ce)	AL-(H)30A4/C(Ce)
Rated cooling capacity		kW	2.50	3.50	5.00	7.00	8.50
		BTU/H	9000	12000	18000	24000	30000
Rated heating capacity		kW	2.75	3.80	5.50	7.70	9.35
		BTU/H	9900	13000	19000	26000	32000
Power supply			220V～240V/50Hz				
Rated power (kW)		cooling	0.90	1.23	1.90	2.45	3.16
		heating	0.89	1.14	1.70	2.20	3.13
Rated currency (A)		cooling	4.20	5.90	8.90	11.50	14.40
		heating	4.10	5.80	8.10	10.00	14.30
Refrigerant			R22				
Indoor unit		Out dimensions W×D×H (mm)	765×673×243	765×673×243	765×673×243	1148×673×243	1148×673×243
		Page dimensions W×D×H (mm)	995×765×320	995×765×320	995×765×320	1375×765×320	1375×765×320
		Net weight (kg)	25	25	25	40	40
		Noise (dB(A))	38	39	42	45	45
		Air flow volume(m^3/h)	540	650	850	1300	1300
Outdoor unit		Out dimensions W×D×H (mm)	760×260×540	760×260×540	760×260×540	800×300×690	903×354×857
		Page dimensions W×D×H (mm)	880×350×610	880×350×610	880×350×610	930×410×760	1030×410×980
		Net weight (kg)	30(+1)	37(+1)	42(+1)	53(+1)	68(+2)
		Noise (dB(A))	46	47	52	56	60
Connection pattern			Bulge connection				

Ceiling &Floor (R22) table 2

Type		Product type	ALCe-(H)36A4/C	ALCe-(H)36A5/C	ALCe-(H)42A5/C	ALCe-(H)48A5/C	ALCe-(H)52A5/C
		Indoor unit	ALCe-(H)36A4/C	ALCe-(H)36A5/C	ALCe-(H)42A5/C	ALCe-(H)48A5/C	ALCe-(H)52A5/C
		Outdoor unit	AL-(H)36A4/C(Ce)	AL-(H)36A5/C(Ce)	AL-(H)42A5/C(Ce)	AL-(H)48A5/C(Ce)	AL-(H)52A5/C(Ce)
Rated cooling capacity		kW	10.00	10.00	12.00	14.00	15.00
		BTU/H	36000	36000	42000	48000	52000
Rated heating capacity		kW	11.00	11.00	13.00	15.40	16.50
		BTU/H	4000	4000	46000	52000	56000
Power supply			3800V～415V/50Hz				
Rated power (kW)		cooling	3.72	3.65	4.60	4.80	5.85
		heating	3.60	3.85	4.50	4.85	5.85
Rated currency (A)		cooling	17.20	6.60	8.30	8.80	10.00
		heating	16.80	6.90	8.20	8.90	10.00
Refrigerant			R22				
Indoor unit	Out dimensions W×D×H (mm)		1148×673×243	1148×673×243	1530×673×243	1530×673×243	1530×673×243
	Page dimensions W×D×H (mm)		1375×765×320	1375×765×320	1760×765×320	1760×765×320	1760×765×320
	Net weight (kg)		40	40	45	45	45
	Noise (dB(A))		45	48	50	50	52
	Air flow volume(m^3/h)		1500	1600	1900	1900	2000
Outdoor unit	Out dimensions W×D×H (mm)		903×354×857	903×354×857	950×350×940	945×340×1255	945×340×1255
	Page dimensions W×D×H (mm)		1030×410×980	1030×410×980	1090×430×1060	1090×430×1370	1090×430×1370
	Net weight (kg)		78(+2)	78+2)	92(+2)	98(+7)	98(+7)
	Noise (dB(A))		60	60	60	60	62
Connection pattern			Bulge connection				

2.1.5 Duct (R410a)

Duct (R410a) table 1

Type		Product type	ALDu-(H)09A4/R1	ALDu-(H)12A4/R1	ALDu-(H)18A4/R1	ALDu-(H)24B4/R1
		Indoor unit	ALDu-(H)09A4/R1	ALDu-(H)12A4/R1	ALDu-(H)18A4/R1	ALDu-(H)24B4/R1
		Outdoor unit	AL-(H)09A4/R1(Du)	AL-(H)12A4/R1(Du)	AL-(H)18A4/R1(Du)	AL-(H)24B4/R1(Du)
Rated cooling capacity		kW	2.50	3.50	5.00	7.00
		BTU/H	9000	12000	18000	24000
Rated heating capacity		kW	2.75	3.80	5.50	7.70
		BTU/H	9900	13000	19000	26000
Power supply			1PH,220～240V,50Hz			
Rated power (kW)		cooling	0.90	1.23	1.95	2.60
		heating	0.89	1.14	1.90	2.50
Rated currency (A)		cooling	4.15	5.56	8.86	12.20
		heating	4.08	5.20	8.68	11.90
Refrigerant			R410A			
Indoor unit	Out dimensions W×D×H (mm)		830×528×240	830×528×240	890×785×290	890×785×290
	Page dimensions W×D×H (mm)		880×560×280	880×560×280	1050×820×320	1050×820×320
	Net weight (kg)		23	25	30	30
	Noise (dB(A))		38	39	42	43
	Static pressure(Pa)		12/30		50/80	
	Air flow volume(m^3/h)		500	630	950	1300
Outdoor unit	Out dimensions W×D×H (mm)		760×260×540	760×260×540	800×300×590	800×300×690
	Page dimensions W×D×H (mm)		880×350×610	880×350×610	930×410×660	930×410×760
	Net weight (kg)		30(+1)	36(+2)	42(+1)	53(+1)
	Noise (dB(A))		46	47	52	56
Connection pattern			Bulge connection			

Duct (R410a) table 2

Type		Product type	ALDu-(H)30A5/R1	ALDu-(H)36A5/R1	ALDu-(H)42A5/R1	ALDu-(H)48A5/R1	ALDu-(H)52A5/R1
		Indoor unit	ALDu-(H)30A5/ R1	ALDu-(H)36A5/ R1	ALDu-(H)42A5/ R1	ALDu-(H)48A5/ R1	ALDu-(H)52A5/ R1
		Outdoor unit	AL-(H)30A5/ R1(Du)	AL-(H)36A5/ R1(Du)	AL-(H)42A5/ R1(Du)	AL-(H)48A5/ R1(Du)	AL-(H)52A8/ R1(Du)
Rated cooling capacity		kW	8.50	10.00	12.00	14.00	15.00
		BTU/H	30000	36000	42000	48000	52000
Rated heating capacity		kW	9.00	11.00	13.20	15.40	15.00
		BTU/H	31000	40000	46000	52000	56000
Power supply			380～415V/50Hz				
Rated power (kW)		cooling	3.25	3.45	4.98	5.15	6.14
		heating	3.15	3.28	4.70	4.86	5.65
Rated currency (A)		cooling	5.84	6.41	8.57	8.78	10.40
		heating	5.81	6.11	8.11	8.40	9.64
Refrigerant			R410A				
Indoor unit		Out dimensions W×D×H (mm)	890×785×290	1250×785×290	1250×785×290	1250×785×290	1570×785×290
		Page dimensions W×D×H (mm)	1050×820×320	1410×820×320	1410×820×320	1410×820×320	1720×820×320
		Net weight (kg)	35	40	45	45	50
		Noise (dB(A))	45	48	50	50	50
		Static pressure(Pa)	50/80				
		Air flow volume(m^3/h)	1600	1600	2000	2000	2300
Outdoor unit		Out dimensions W×D×H (mm)	903×354×857	903×354×857	950×350×940	945×340×1255	945×340×1255
		Page dimensions W×D×H (mm)	1030×410×980	1030×410×980	1090×430×1060	1090×430×1370	1090×430×1370
		Net weight (kg)	68(+2)	78+2)	92(+2)	98(+7)	98(+7)
		Noise (dB(A))	60	60	60	60	60
Connection pattern			Bulge connection				

2.1.6 Duct (R22,low static pressure)

Duct (R22,low static pressure) table 1

Type		Product type	ALDu-(H)09A4/SH	ALDu-(H)12A4/SH	ALDu-(H)18A4/SH	ALDu-(H)24B4/SH	ALDu-(H)30A4/SH
		Indoor unit	ALDu-(H)09A4/SH	ALDu-(H)12A4/SH	ALDu(H)18A4/SH	ALDu-(H)24B4/SH	ALDu-(H)30A4/SH
		Outdoor unit	AL-(H)09A4/S(Du)	AL-(H)12A4/S(Du)	AL-(H)18A4/S(Du)	AL-(H)24B4/S(Du)	AL-(H)30A4/S(Du)
Rated cooling capacity		kW	2.50	3.50	5.00	7.00	8.50
		BTU/H	9000	12000	18000	24000	30000
Rated heating capacity		kW	2.75	3.80	5.50	7.70	9.35
		BTU/H	9900	13000	19000	26000	32000
Power supply			220V～240V/50Hz				
Rated power (kW)		cooling	0.90	1.23	1.75	2.45	3.25
		heating	0.89	1.14	1.70	2.35	3.13
Rated currency (A)		cooling	4.15	5.65	7.95	11.50	15.00
		heating	4.08	5.20	7.73	10.70	14.30
Refrigerant			R22				
Indoor unit		Out dimensions W×D×H (mm)	830×528×240	830×528×240	930×528×240	1355×528×240	1355×528×240
		Page dimensions W×D×H (mm)	880×560×280	880×560×280	980×560×280	1400×560×280	1400×560×280
		Net weight (kg)	23	25	29	41	41
		Noise (dB(A))	38	39	42	43	48
		Static pressure(Pa)	12/30				
		Air flow volume(m^3/h)	500	630	950	1300	1600
Outdoor unit		Out dimensions W×D×H (mm)	760×260×540	760×260×540	760×260×540	800×300×690	903×354×857
		Page dimensions W×D×H (mm)	880×350×610	880×350×610	880×350×610	930×410×760	1030×410×980
		Net weight (kg)	30(+1)	36(+2)	42(+1)	53(+1)	68(+2)
		Noise (dB(A))	46	47	52	56	60
Connection pattern			Bulge connection				

Duct (R22, low static pressure) table 2

Type		Product type	ALDu-(H)36A4/SH	ALDu-(H)36A5/SH	ALDu-(H)42A5/SH	ALDu-(H)48A5/SH	ALDu-(H)52A5/SH
		Indoor unit	ALDu-(H)36A4/SH	ALDu-(H)36A5/SH	ALDu-(H)42A5/SH	ALDu-(H)48A5/SH	ALDu-(H)52A5/SH
		Outdoor unit	AL-(H)36A4/S(Du)	AL-(H)36A5/S(Du)	AL-(H)42A5/S(Du)	AL-(H)48A5/S(Du)	AL-(H)52A5/S(Du)
Rated cooling capacity		kW	10.00	10.00	12.00	14.00	15.00
		BTU/H	36000	36000	42000	48000	52000
Rated heating capacity		kW	11.00	11.00	13.20	15.40	15.00
		BTU/H	40000	40000	46000	52000	56000
Power supply			3800V～415V/50Hz				
Rated power (kW)		cooling	3.62	3.59	4.40	4.90	5.50
		heating	3.55	3.65	4.45	4.80	5.60
Rated currency (A)		cooling	17.00	6.40	8.00	8.59	10.10
		heating	16.70	6.60	7.75	8.80	10.20
Refrigerant			R22				
Indoor unit	Out dimensions W×D×H (mm)		1555×528×240	1555×528×240	1555×528×240	1555×528×240	1555×528×240
	Page dimensions W×D×H (mm)		1600×560×280	1600×560×280	1600×560×280	1600×560×280	1600×560×280
	Net weight (kg)		50	50	50	50	50
	Noise (dB(A))		48	48	48	51	53
	Static pressure(Pa)		12/30				
	Air flow volume(m^3/h)		1600	1600	2000	2000	2000
Outdoor unit	Out dimensions W×D×H (mm)		903×354×857	903×354×857	950×350×940	945×340×1255	945×340×1255
	Page dimensions W×D×H (mm)		1030×410×980	1030×410×980	1090×430×1060	1090×430×1370	1090×430×1370
	Net weight (kg)		78(+2)	78(+2)	92(+2)	98(+7)	98(+7)
	Noise (dB(A))		60	60	60	60	60
Connection pattern			Bulge connection				

2.1.7 Duct (R22,high static pressure)

Duct (R22,high static pressure) table 1

Type		ProHict type	ALHi-(H)18A4/S	ALHi-(H)24B4/S	ALHi-(H)30A4/S
		Indoor unit	ALHi(H)18A4/S	ALHi-(H)24B4/S	ALHi-(H)30A4/S
		Outdoor unit	AL-(H)18A4/S(Hi)	AL-(H)24B4/S(Hi)	AL-(H)30A4/S(Hi)
Rated cooling capacity		kW	5.00	7.00	8.50
		BTU/H	18000	24000	30000
Rated heating capacity		kW	5.50	7.70	9.00
		BTU/H	19000	26000	32000
Power supply			220V～240V/50Hz		
Rated power (kW)		cooling	1.75	2.45	3.20
		heating	1.80	2.35	3.15
Rated currency (A)		cooling	8.00	11.50	15.02
		heating	8.20	10.70	14.99
Refrigerant			R22		
Indoor unit	Out dimensions W×D×H (mm)		890×785×290	890×785×290	890×785×290
	Page dimensions W×D×H (mm)		1050×820×320	1050×820×320	1050×820×320
	Net weight (kg)		35	35	35
	Noise (dB(A))		42	45	48
	Static pressure(Pa)		50/80		
	Air flow volume(m^3/h)		900	1300	1600
Outdoor unit	Out dimensions W×D×H (mm)		800×300×590	800×300×690	903×354×857
	Page dimensions W×D×H (mm)		930×410×660	930×410×760	1030×410×980
	Net weight (kg)		42(+1)	53(+1)	68(+2)
	Noise (dB(A))		52	56	60
Connection pattern			Bulge connection		

Duct (R22, high static pressure) table 2

Type		Product type	ALHi-(H)36A4/S	ALHi-(H)36A5/S	ALHi-(H)42A5/S	ALHi-(H)48A5/S	ALHi-(H)52A5/S
		Indoor unit	ALHi-(H)36A4/S	ALHi-(H)36A5/S	ALHi-(H)42A5/S	ALHi-(H)48A5/S	ALHi-(H)52A5/S
		Outdoor unit	AL-(H)36A4/S(Hi)	AL-(H)36A5/S(Hi)	AL-(H)42A5/S(Hi)	AL-(H)48A5/S(Hi)	AL-(H)52A5/S(Hi)
Rated cooling capacity		kW	10.00	10.00	12.00	14.00	15.00
		BTU/H	36000	36000	42000	48000	52000
Rated heating capacity		kW	11.00	11.00	13.00	15.00	16.40
		BTU/H	40000	40000	46000	52000	56000
Power supply			3800V～415V/50Hz				
Rated power (kW)		cooling	3.65	3.70	4.45	4.70	5.50
		heating	3.55	3.85	4.20	4.50	5.40
Rated currency (A)		cooling	17.13	6.76	7.70	8.25	9.50
		heating	16.90	6.87	7.50	8.00	9.20
Refrigerant			R22				
Indoor unit	Out dimensions W×D×H (mm)		1250×785×290	1250×785×290	1250×785×290	1250×785×290	1570×785×290
	Page dimensions W×D×H (mm)		1420×810×340	1420×810×340	1420×810×340	1420×810×340	1740×810×340
	Net weight (kg)		40	40	45	45	50
	Noise (dB(A))		48	48	50	50	50
	Static pressure(Pa)		50/80				
	Air flow volume(m^3/h)		1600	1600	2000	2000	2000
Outdoor unit	Out dimensions W×D×H (mm)		903×354×857	903×354×857	950×350×940	945×340×1255	945×340×1255
	Page dimensions W×D×H (mm)		1030×410×980	1030×410×980	1090×430×1060	1090×430×1370	1090×430×1370
	Net weight (kg)		78(+2)	78(+2)	92(+2)	98(+7)	98(+7)
	Noise (dB(A))		60	60	60	60	60
Connection pattern			Bulge connection				

2.2 Brief IntroHiction for T1、T2、T3 working condition

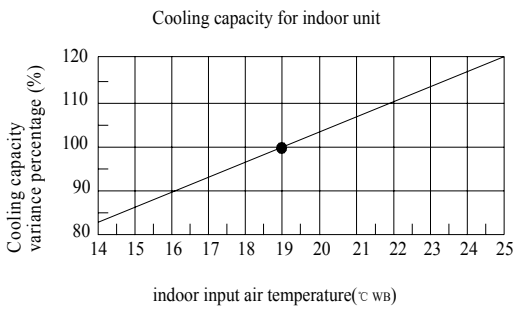
Type of Air Conditioner	Climate type		
	T1	T2	T3
Cooling Only	18 ℃~43℃	10℃~35℃	21℃~52℃
Heat pump	-7℃~43℃	-7℃~35℃	-7℃~52℃
Electricity Heating	~43℃	~35℃	~52℃

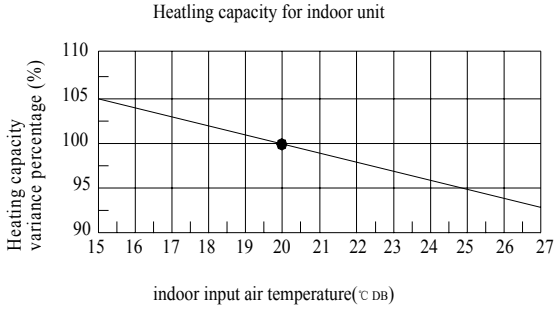
2.3 Operating Range of Air Conditioners

Working temperature range					
			Rated	Maximum	Minimum
Cooling	Indoor	DB℃	27	32	18
		WB℃	19	23	14
	outdoor	DB℃	35	43	10
		WB℃	24	26	6
Heating	Indoor	DB℃	20	27	15
		WB℃	14.5	--	--
	outdoor	DB℃	7	24	-15
		WB℃	6	18	--

2.4 Capacity performance

2.4.1 Capacity performance of indoor unit

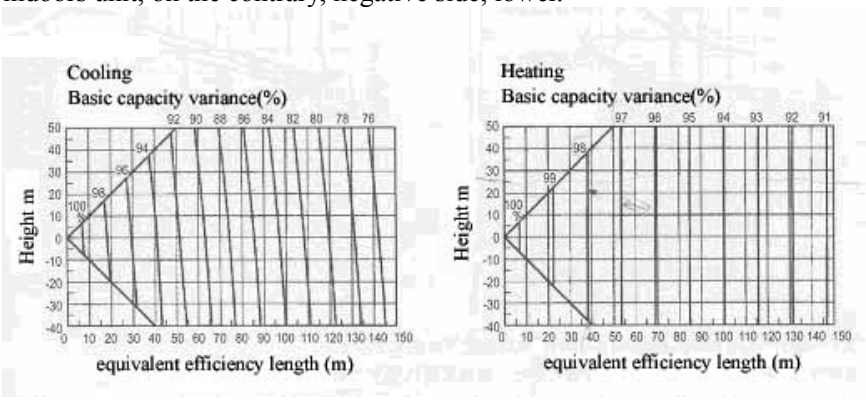




While connection pipe lengthened or larger height difference between indoor and outdoor unit, air conditioner' s capacity and reliability will reHice. So, the connection of air conditioner pipe should be based on the principle of "shortest route"

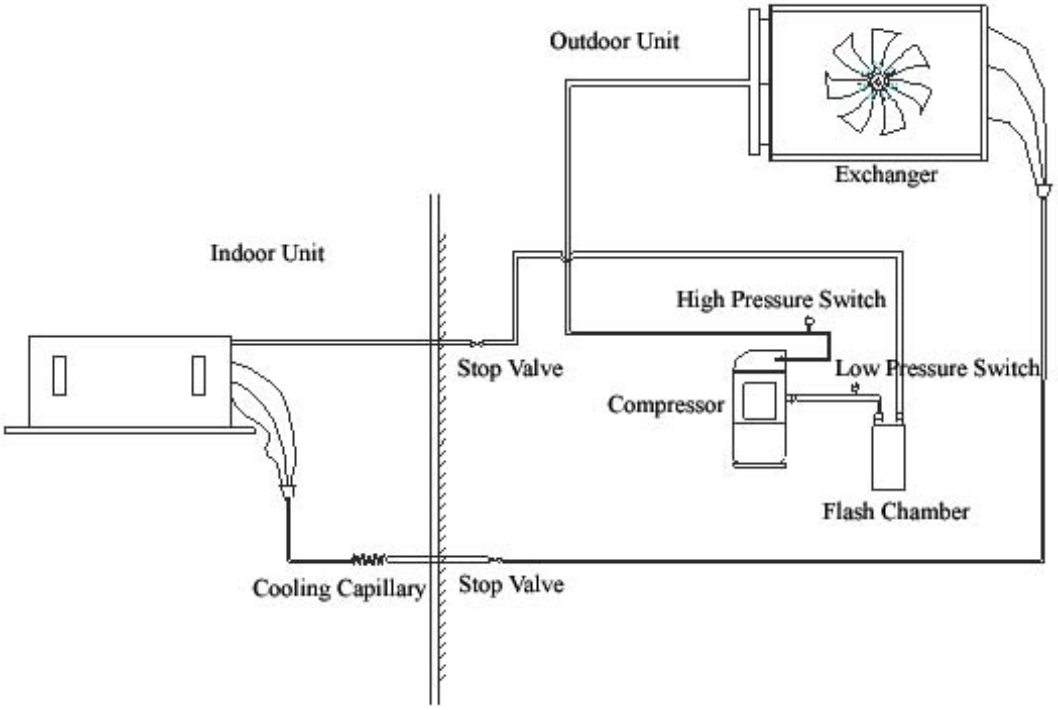
2.4.2 Mdify the performance table according to the magnitude of conHiit length and height difference.

The positive side of height difference represents that installation position of outdoor unit is higher than indoors unit, on the contrary, negative side, lower.

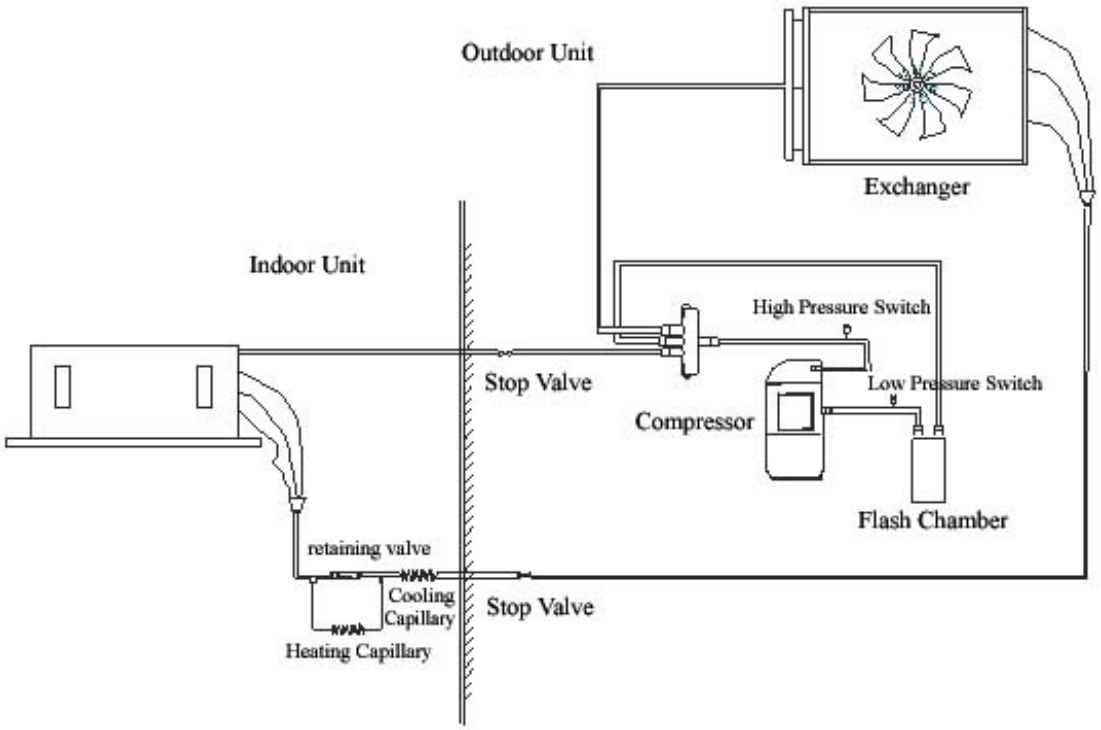


2.5 System principle drawing

2.5.1 Cooling-only Unit



2.5.2 Heating-pump Unit



Note:

The chematic philosophy drawing of cold generation is shown above, and detailed configuration should be based on physical unit.

3 Design manual

3.1 Selection principle

Please select the air conditioner with relative capacity according to application environment and room area of the air conditioner, and connection pipe length and height difference between indoor and outerdoor unit should be considered.

●Type and application area of air conditioner is listed as following:

Capacity（Btu）	9000	12000	18000	24000	36000	42000
Application area（m^2）	12～17	15～25	25～35	35～50	50～70	60～80

Table is not the sole factor; special application environment should be considered while select air conditioner, if not good hermetization or larger load of the room, such as supermarketm store, etc., should select the air conditioner unit with marger capacity.

3.2 Design of connecting pipe

3.2.1 Selection of connecting pipe

Value \ Type		9000BTU 12000BTU		18000BTU		24000BTU		30000BTU 36000BTU 42000BTU 48000BTU 52000BTU	
connecting pipe size (φmm)	Liquid side	6.35		6.35		9.52		9.52	
	Gas side	9.52		12.7		15.88		19.05	
Longest connecting pipe (m)	liquid side	6.35	7.94	6.35	7.94	9.52	9.52	9.52	12.7
	Gas side	9.52	12.7	12.7	15.88	15.88	19.05	19.05	22.2
	Longest pipe	10	25	15	25	20	30	25	50
Max. fall (m)		10		10		15		20	
Max. elbow number		5		6		8		10	

3.2.2 Equivalent length

Equivalent lengthmeans the conversion length that the pipe pressure loss was considered on the paerts of elbow. Etc.

Equivalent length:actual pipe length+elbow number×each equivalent length +oil trap number×equivalent length of each oil trap

Type / Pipe dia.	Elbow	Oil trap
9．52	0．18	1．3
12．70	0．20	1．5
15．88	0．25	2．0
19．05	0．35	2．4
22．02	0．40	3．0
25．40	0．45	3．4
28．58	0．50	3．7
31．80	0．55	4．0

●while calculation sample of equivalent length: Actual length of 5HP outdoor unit is 25 meters, diameter of air pipe 19.05mm, using 5 elbows and 2 oil traps, the equivalence length is:

25+0．35×5+2．4×2=31.5(m)

●aplication of equivalent length

1) While equivalent length beyond 90 % of maximum actual length (5HP 25meters), the diameter of air pipe should be increased one step. For example: while equivalent length beyond 25 meters, the diameter of air pipe should be 22.2mm from 19.05mm.
2) While didameter of air pipe increasing, the equivalent length should be calculated again. While calculation of performance fall as a result of pipe length based on diagram line, pipe length should be calculated based on effective equivalent length of the pipe.

●Example of effective equivalance calculation: While actual pipe length 5HP 25meters for 5HP outdoor unit is 25 meters, dismeter of ai pipe should be 19.05mm, using 5 elbows and 2 oil traps.

1) equivalent length:25+0．35×5+2．4×2=31.5(m)

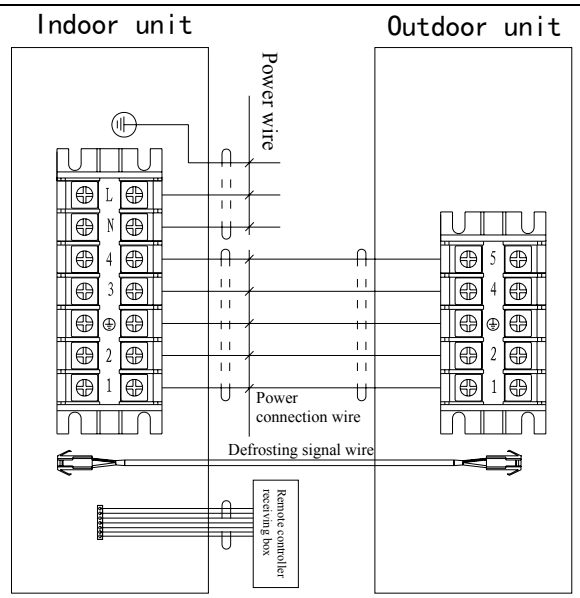
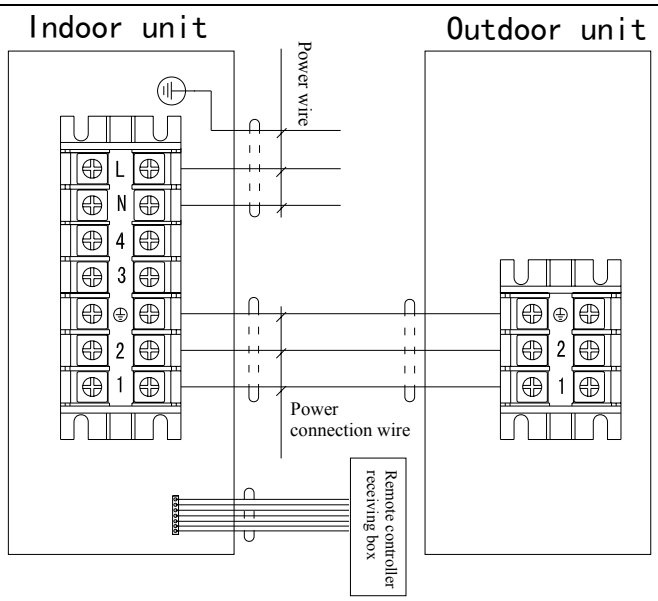
2) As a result of equivalent length beyond 25 meters, air pipe size of main pipe should be enlarged.
3) effective equivalent length:31.5×0．5=16.7(m)
4) So, while diameter of air pipe of main pipe enlarged, the perfprmance loss as a result of pipe length is equal to the effective length of 16.7 meters.

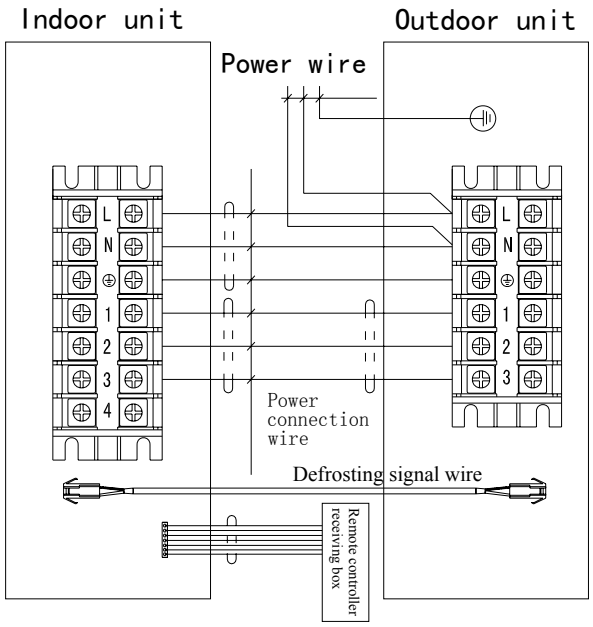
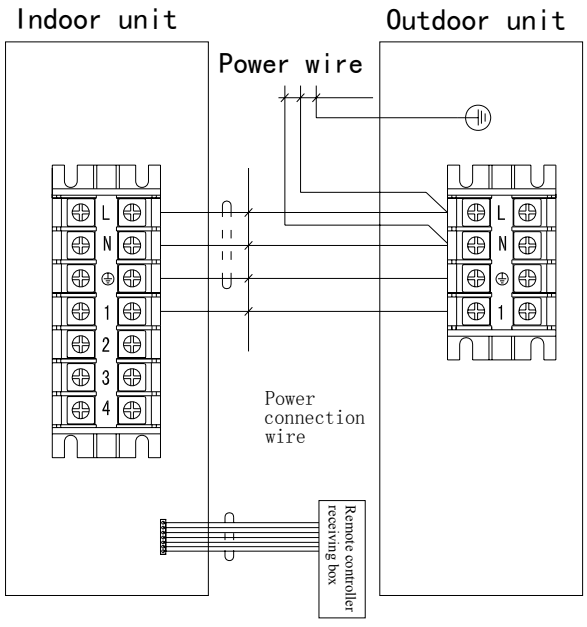
3.3 Design of distribution line

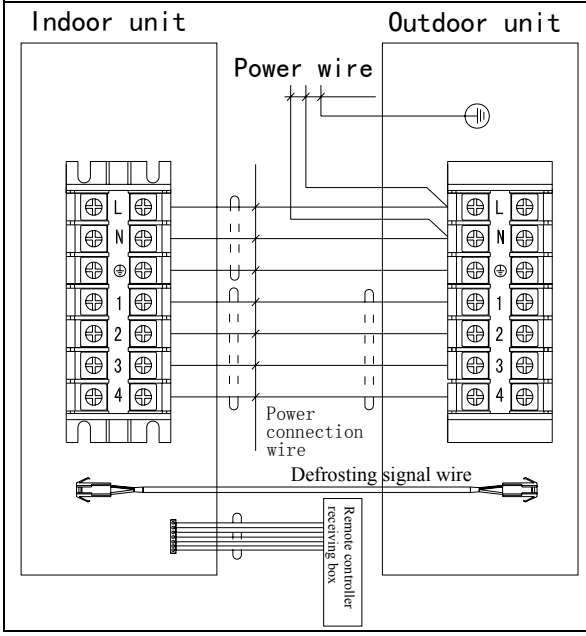
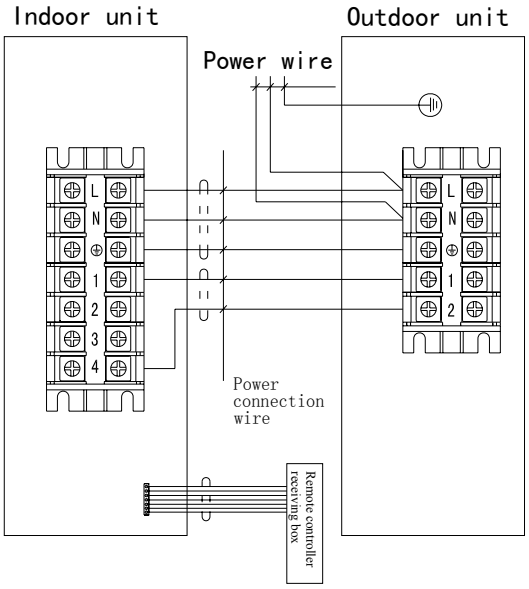
3.3.1 Distribution line of the unit

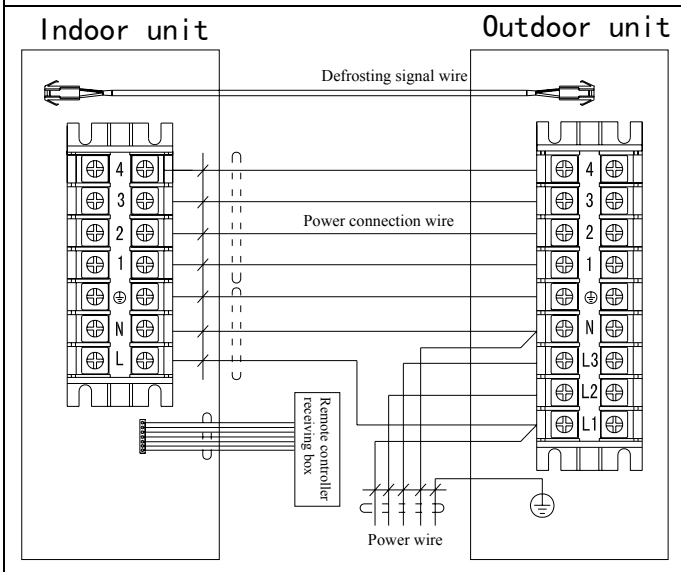
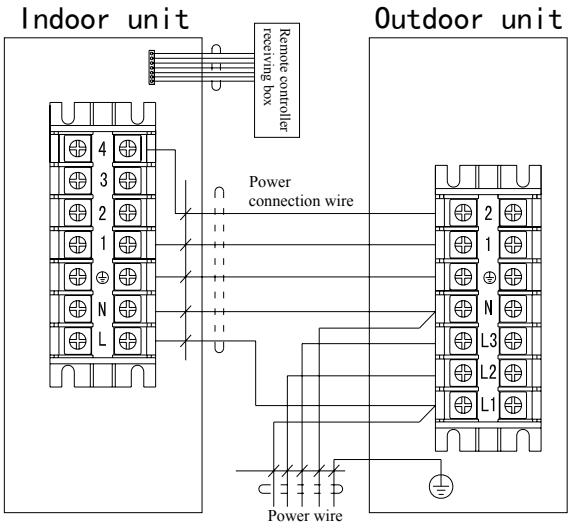
Type		Power supply	Power supply incoming pattern	Power supply line	Power supply connection line
Cooling-only	9000BTU	220V-240V~ 50Hz	Indoor unit incoming	$3\times1mm^2$	$3\times1mm^2$
	12000BTU			$3\times1.5mm^2$	$3\times1.5mm^2$
	18000BTU			$3\times2.5mm^2$	$3\times2.5mm^2$
	24000BTU		Outdoor unit incoming	$3\times4mm^2$	$4\times1mm^2$
	30000BTU				
	36000BTU				
	30000BTU	Outdoor unit 380V-415V 3N~50Hz Indoor unit 220V-240V~50Hz	Outdoor unit incoming	$5\times2.5mm^2$	$5\times1mm^2$
	36000BTU				
	42000BTU				
	48000BTU				
	52000BTU				
Heating pump	9000BTU	220V-240V~ 50Hz	Indoor unit incoming	$3\times1mm^2$	$5\times1mm^2$
	12000BTU			$3\times1.5mm^2$	$5\times1.5mm^2$
	18000BTU			$3\times2.5mm^2$	$5\times2.5mm^2$
	24000BTU		Outdoor unit incoming	$3\times4mm^2$	$3\times1mm^{2+}3\times1mm^2$
	30000BTU				
	36000BTU				
	30000BTU	Outdoor unit 380V-415V 3N~50Hz Indoor unit 220V-240V~50Hz	Outdoor unit incoming	$5\times2.5mm^2$	$3\times1mm^{2+}4\times1mm^2$
	36000BTU				
	42000BTU				
	48000BTU				
	52000BTU				
Heating pump + electric heating	9000BTU	220V-240V~ 50Hz	Indoor unit incoming	$3\times2.5mm^2$	$5\times1mm^2$
	12000BTU			$3\times2.5mm^2$	$5\times1.5mm^2$
	18000BTU			$3\times4mm^2$	$5\times2.5mm^2$
	24000BTU		Outdoor unit incoming	$3\times6mm^2$	$3\times4mm^{2+}3\times1mm^2$
	30000BTU				
	36000BTU				
	30000BTU	Outdoor unit 380V-415V 3N~50Hz Indoor unit 220V-240V~50Hz	Outdoor unit incoming	$5\times6mm^2$	$3\times2.5mm^{2+}4\times1mm^2$
	36000BTU				
	42000BTU				
	48000BTU				
	52000BTU				

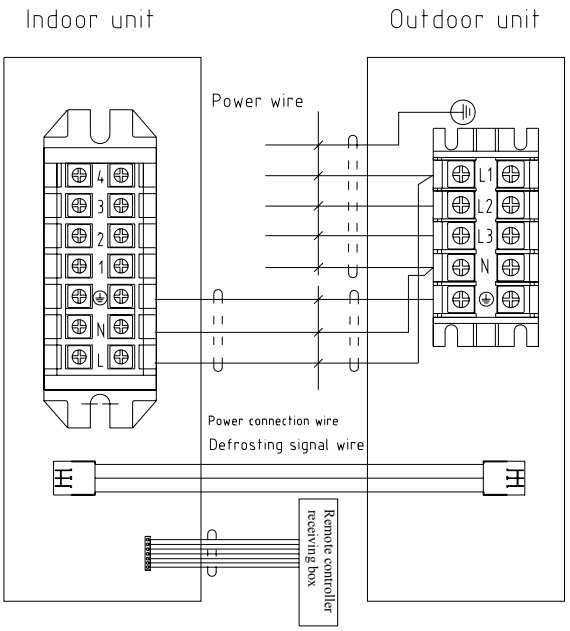
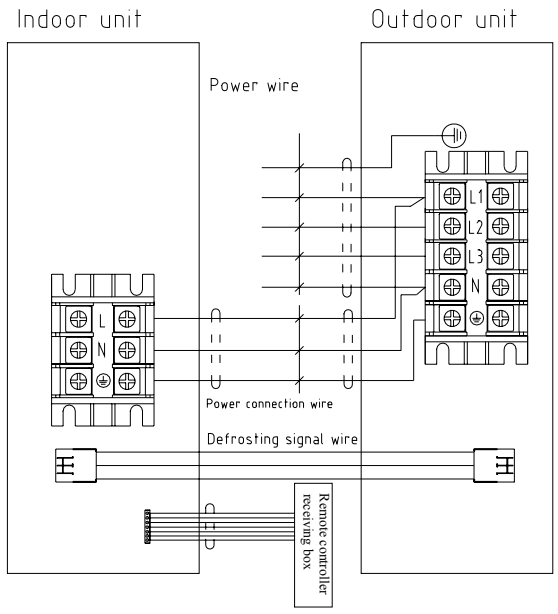
3.3.2 Schematic drawing of system distribution line:

Heating pump(R410A、R22) (220-240V)	Cooling-only(R410A、R22) (220-240V)
9000BTU、12000BTU、18000BTU	9000BTU、12000BTU、18000BTU
	

Heating pump (R410A、R22) (220-240V)	Cooling-only (R410A、R22) (220-240V)
24000BTU	24000BTU
	

Heating pump (R22) (220-240V)	Cooling-only (R22) (220-240V)
30000BTU、36000BTU	30000BTU、36000BTU
	

Heating pump (R22) (380-415V)	Cooling-only (R22) (380-415V)
36000BTU、42000BTU、48000BTU、52000BTU	36000BTU、42000BTU、48000BTU、52000BTU
	

Heating pump （R410A)(380-415V)	Cooling-only （R410A) (380-415V)
30000BTU、36000BTU、42000BTU、 48000BTU、52000BTU	30000BTU、36000BTU、42000BTU、 48000BTU、52000BTU
	

Note:

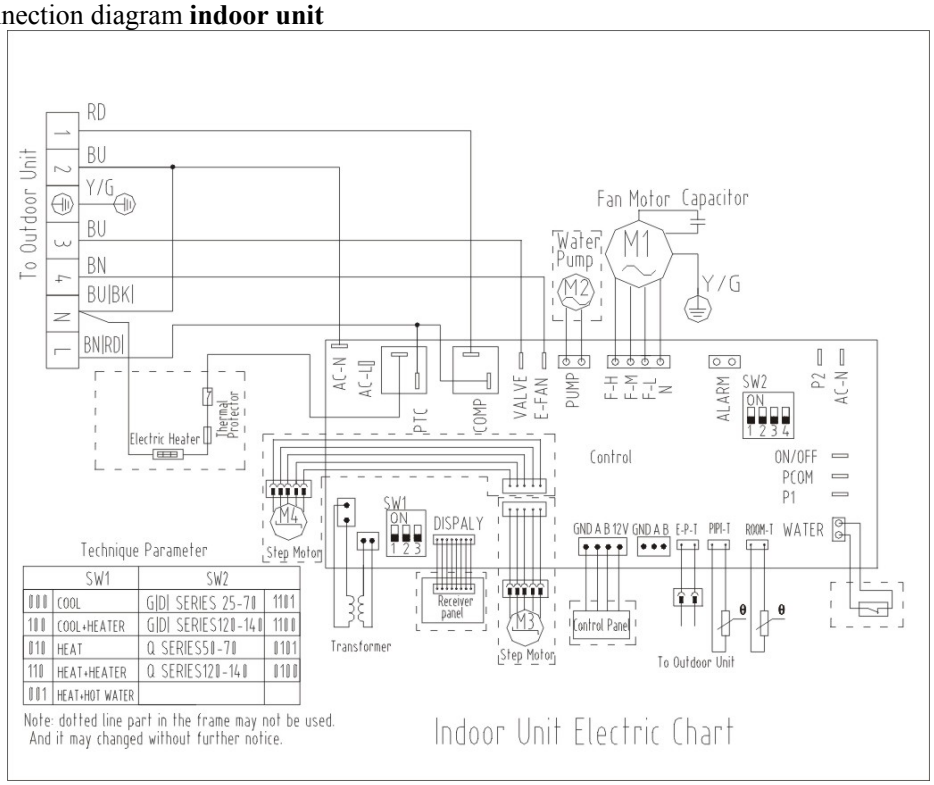
1. Unfreezing signal line RVVP 300/300V 70^{o} both ends joints ELR-02V.

2.It is recommended that adopt RVV jacket cable while power supply connection line not more than 10 meters;

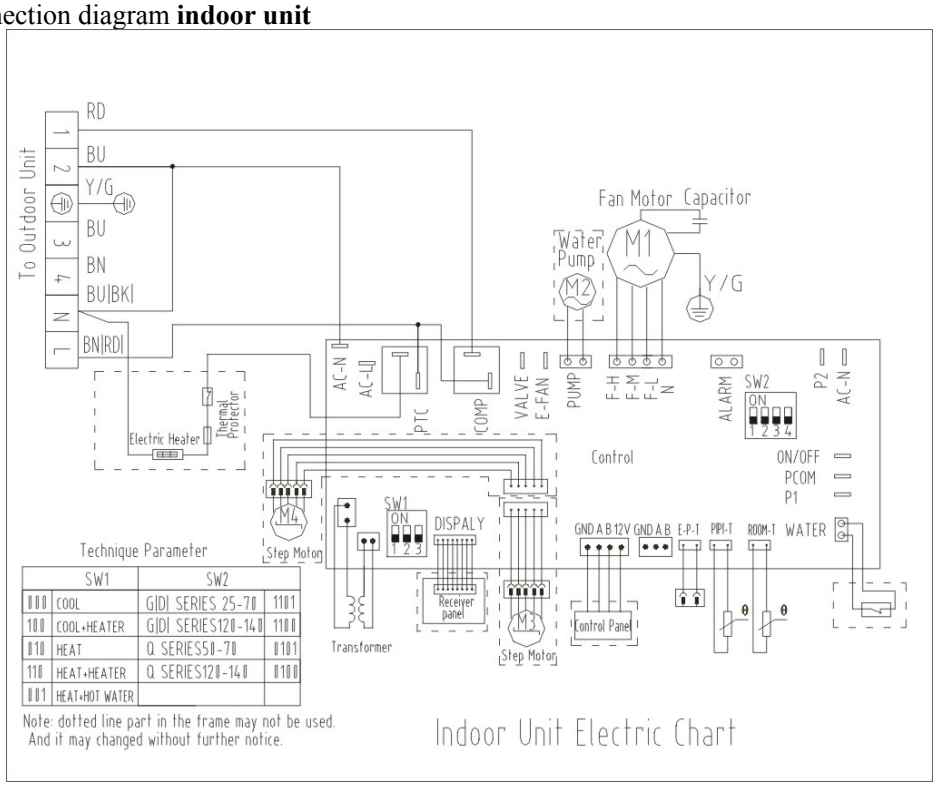
3.Adopt waterproof YZW rubber soft cable while supply connection line more than 10 meters; adopt oil-prevent RWY soft cable while bad oil contamination.

3.3.3 Schematic drawing of the system wiring

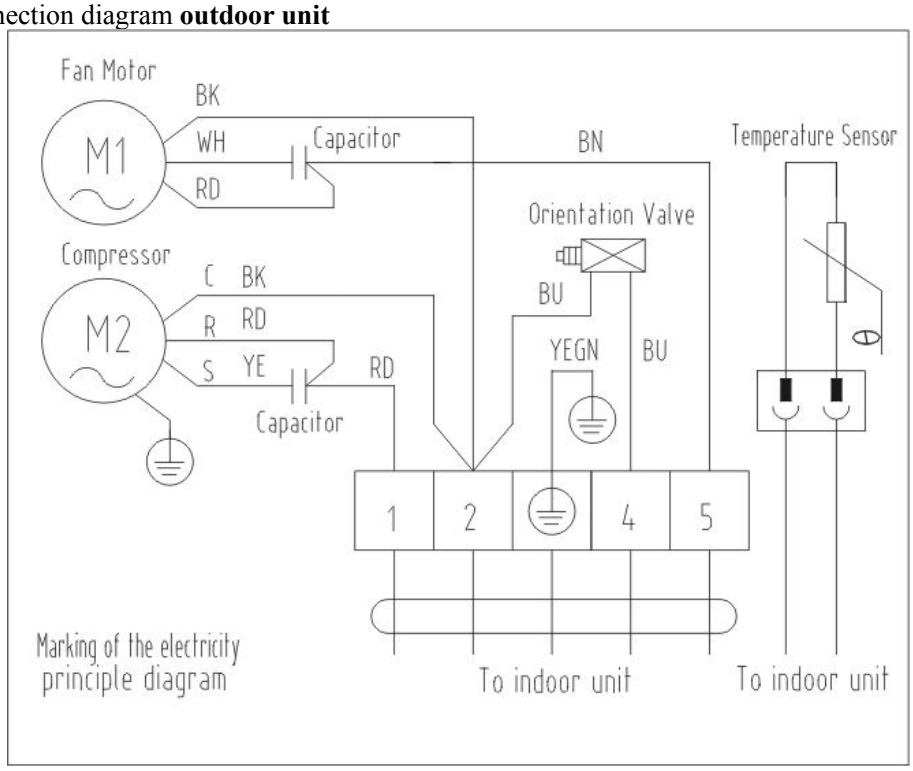
1. Heating pump:
   9000BTU、12000BTU、18000BTU(R410A、R22)
   Electric connection diagram **indoor unit**



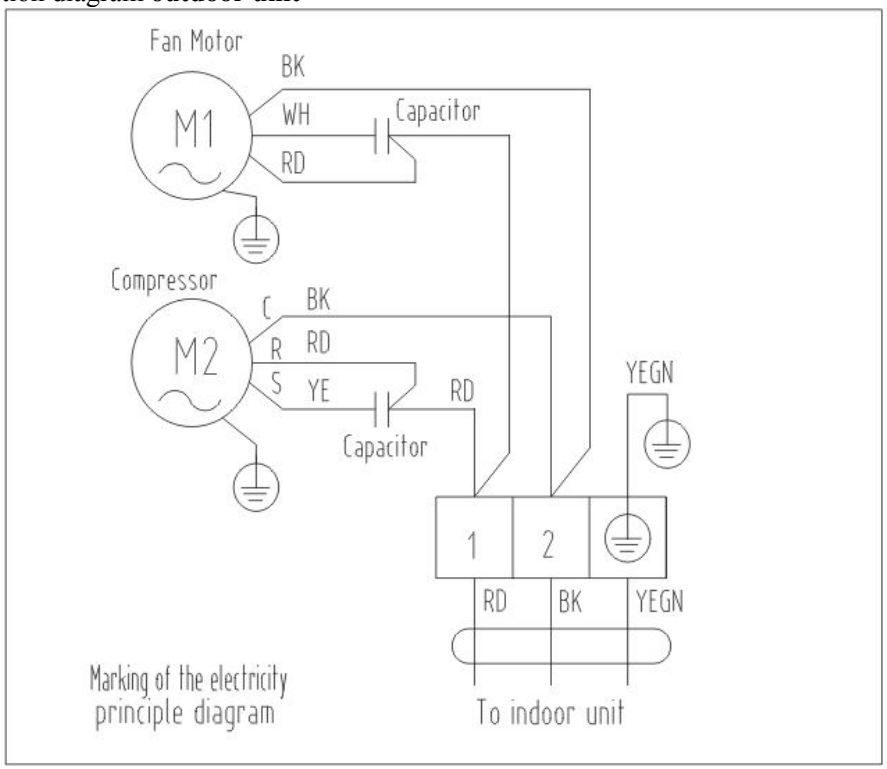
2. Cooling-only:
   9000BTU、12000BTU、18000BTU(R410A、R22)
   Electric connection diagram **indoor unit**



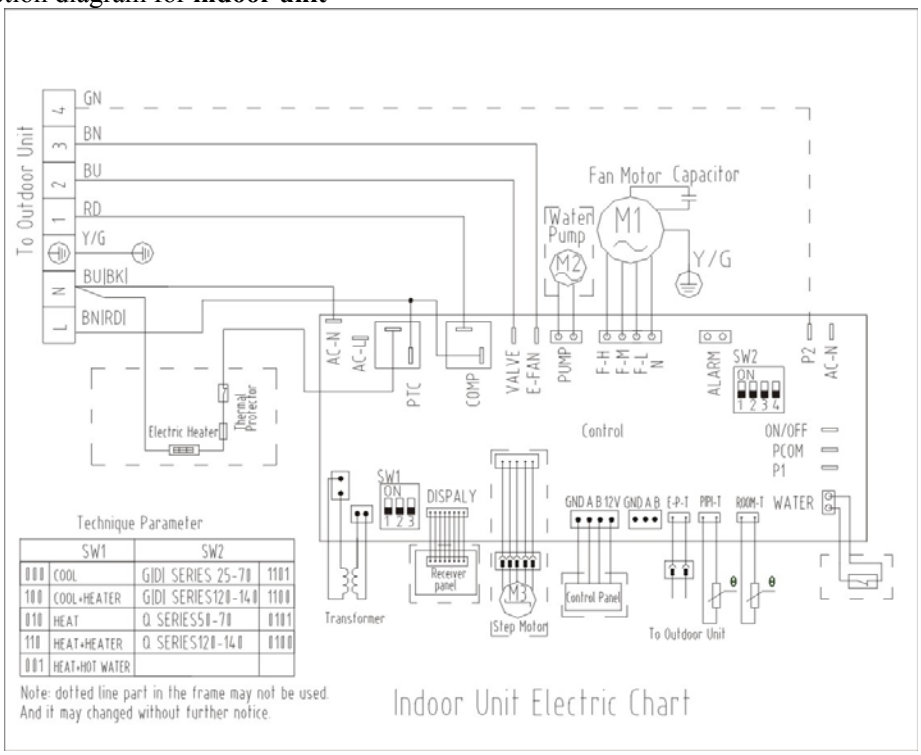
3. Heating pump:
9000BTU、12000BTU、18000BTU(R410A、R22)
Electric connection diagram **outdoor unit**



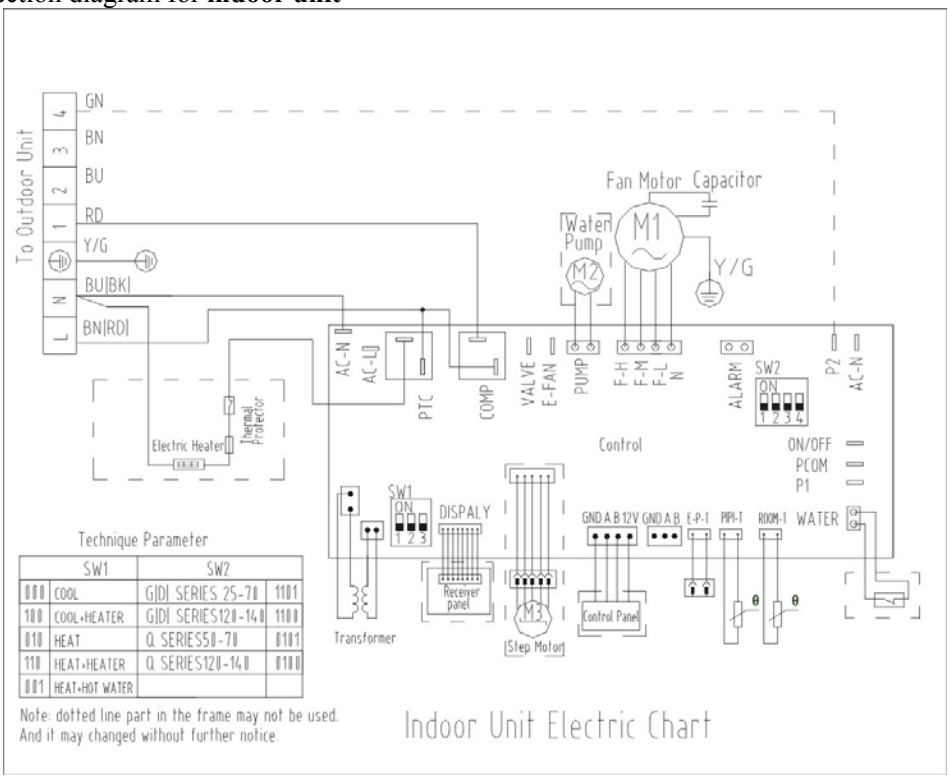
4. Cooling-only:
9000BTU、12000BTU、18000BTU(R410A、R22)
Electric connection diagram **outdoor unit**



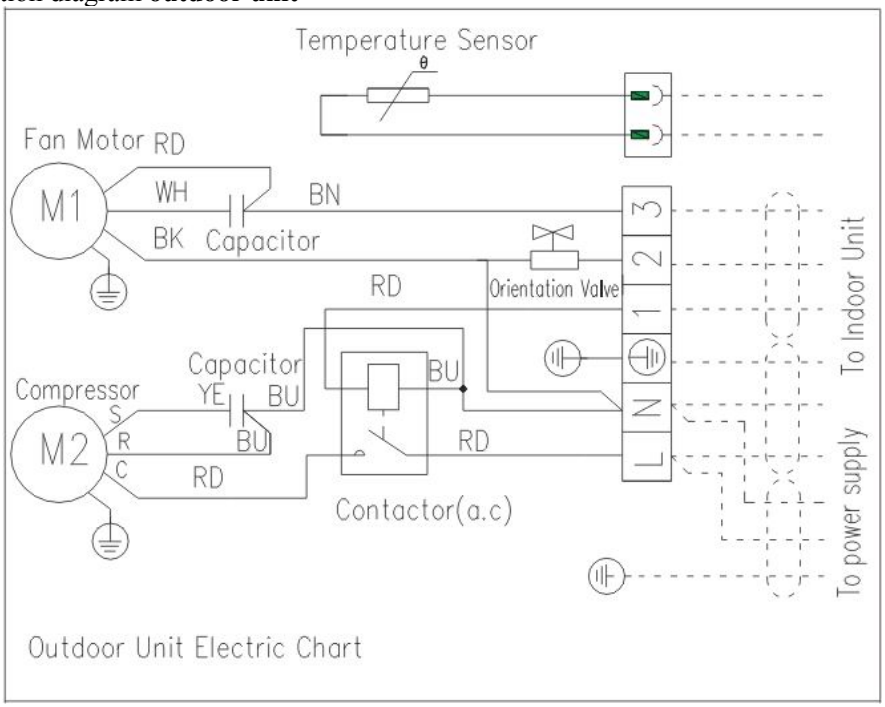
5. Heating pump:
24000BTU(R410A)
24000BTU、30000BTU、36000BTU、42000BTU、48000BTU、52000BTU(R22)
Electric connection diagram for **indoor unit**



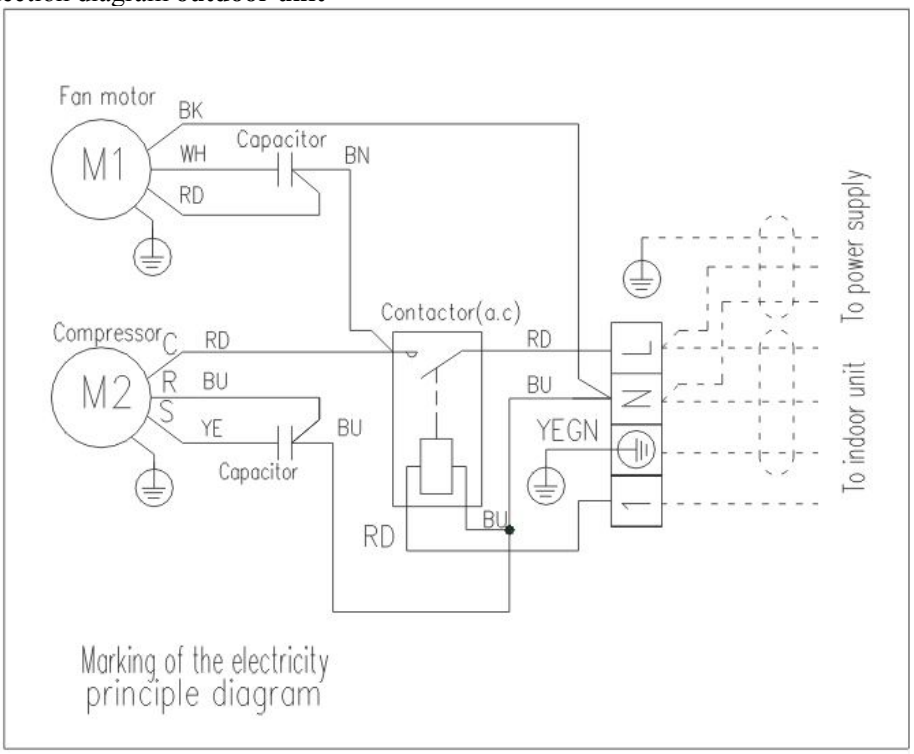
6. Cooling-only:
24000BTU(R410A)
24000BTU、30000BTU、36000BTU、42000BTU、48000BTU、52000BTU(R22)
Electric connection diagram for **indoor unit**



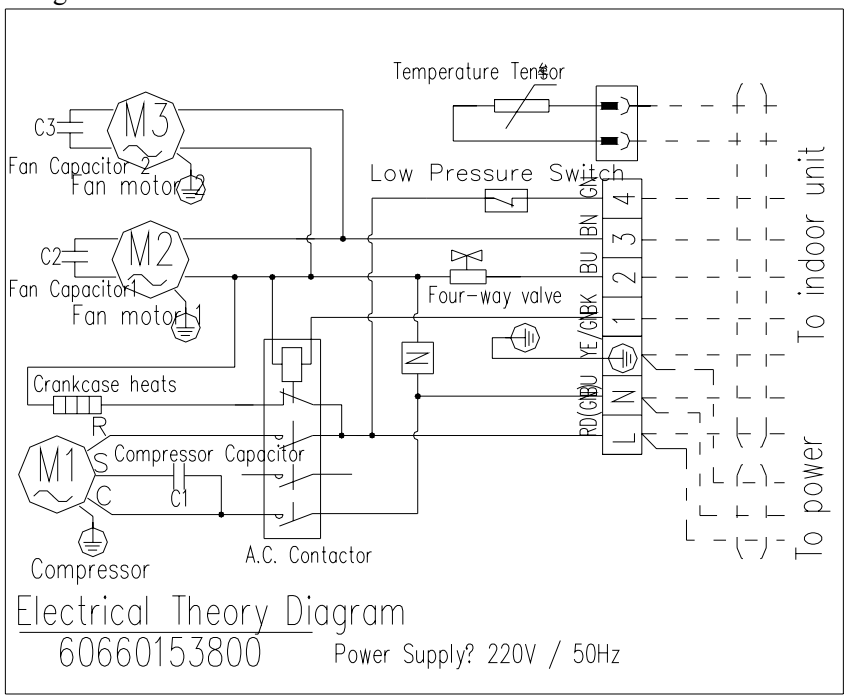
7. Heating pump:
24000BTU(R410A、R22)
Electric connection diagram **outdoor unit**



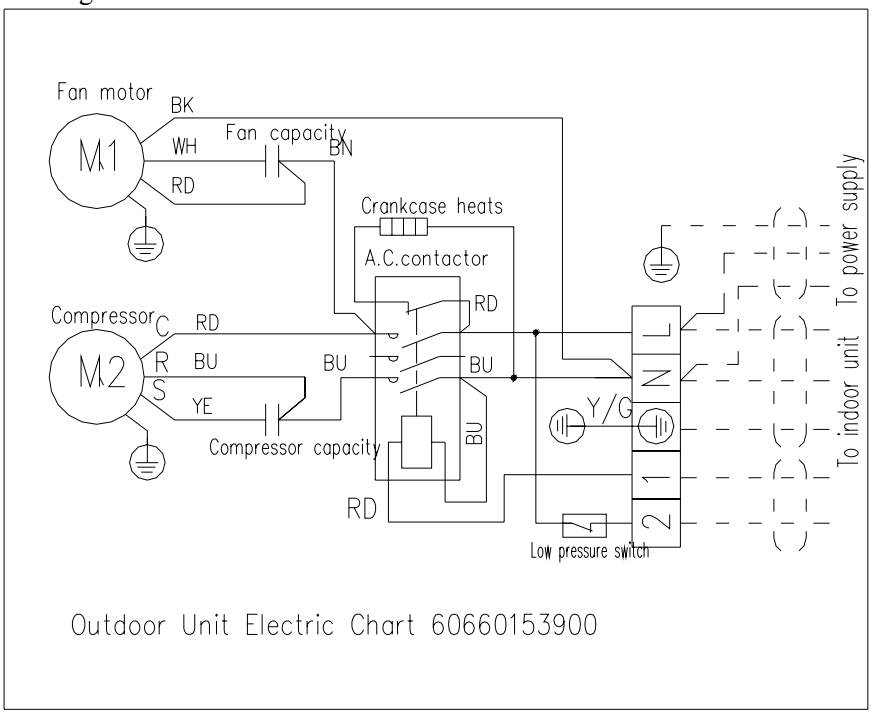
8. Cooling-only:
24000BTU(R410A、R22)
Electric connection diagram **outdoor unit**



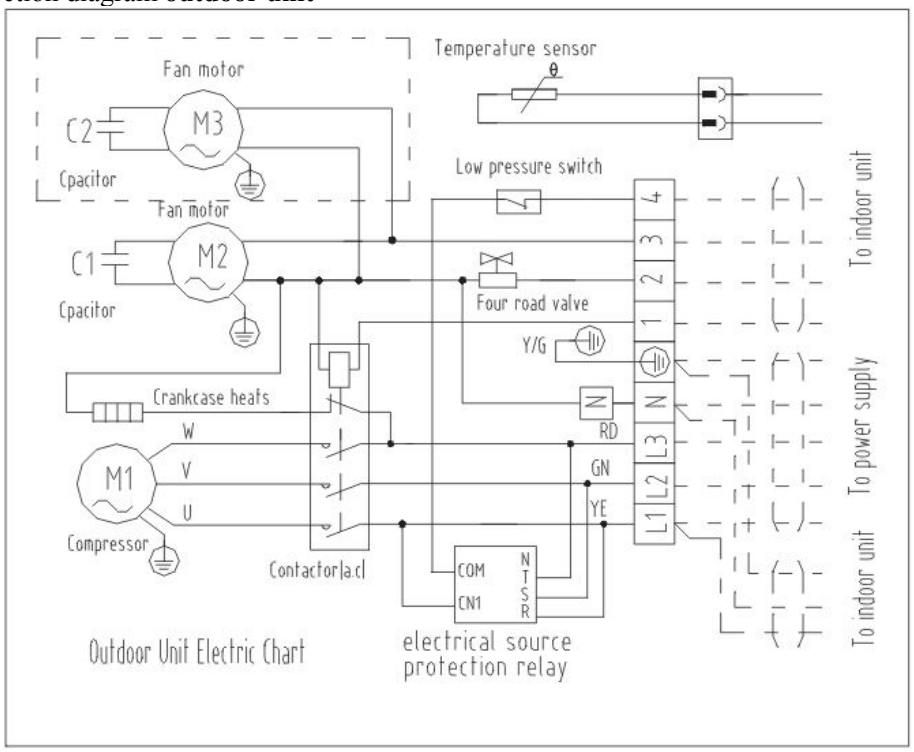
9. Heating pump:
30000BTU、36000BTU(R22)(220-240V)
Electric connection diagram **outdoor unit**



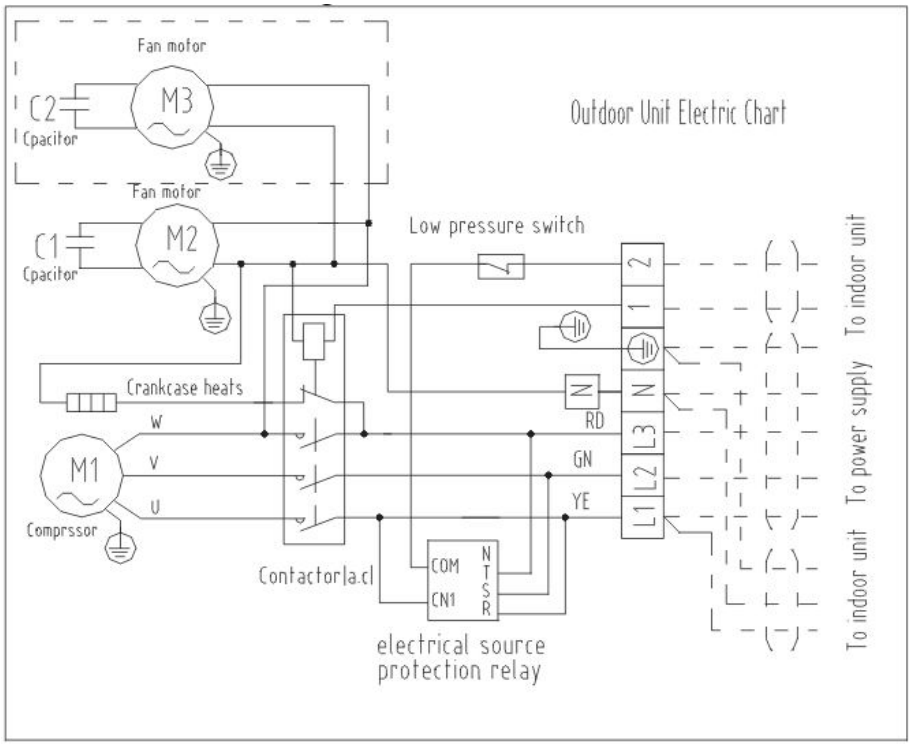
10. Cooling-only:
30000BTU、36000BTU(R22) (220-240V)
Electric connection diagram **outdoor unit**



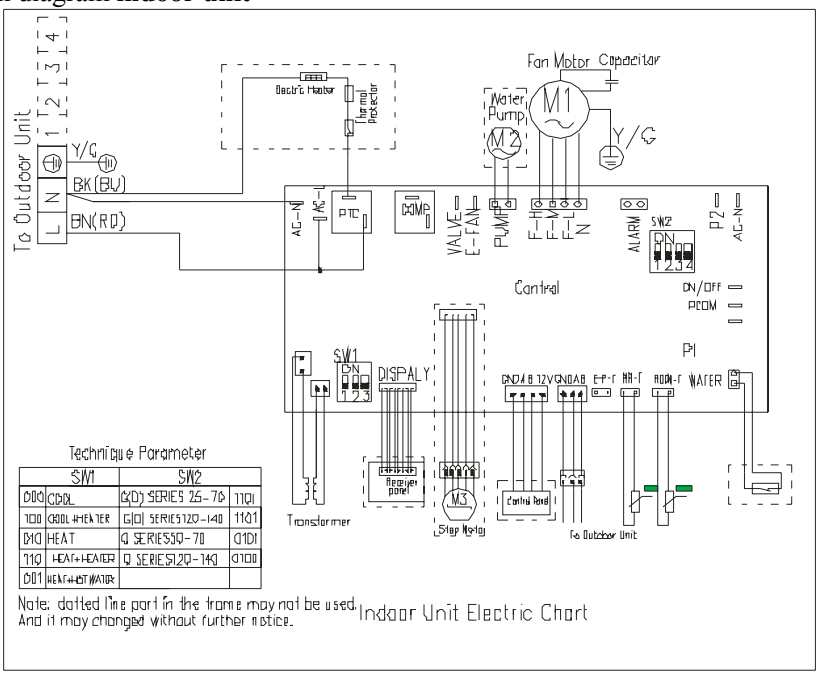
11. Heating pump:
36000BTU、42000BTU、48000BTU、52000BTU(R22) (380-415V)
Electric connection diagram **outdoor unit**



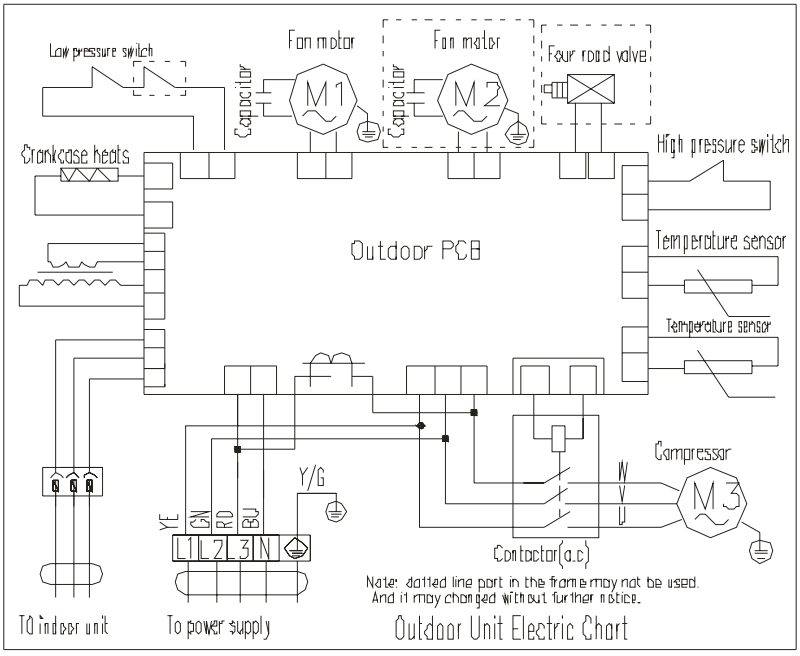
12. Cooling-only:
36000BTU、42000BTU、48000BTU、52000BTU(R22) (380-415V)
Electric connection diagram **outdoor unit**



13. Heating pump、Cooling-only:
30000BTU、36000BTU、42000BTU、48000BTU、52000BTU
Electric connection diagram **indoor unit**



14. Heating pump、Cooling-only:
30000BTU、36000BTU、42000BTU、48000BTU、52000BTU
Electric connection diagram **outdoor unit**



4 Installation

4.1 Before installation

4.1.1 Indoor unit

1. Select the position where provide enough space to intall and maintain
2. Select the position where support indoor unit weight.
3. Select the position where no obstruction and minimum affect by outer air
4. Select the position where no heat source or harmful contamination such as flue gas,open flame, etc below
5. Select the position where air flow supply can spread all over the room
6. Select the position where easy to install.

4.1.2 Outdoor unit

1. Select the position where provide enough space to intall and maintain
2. Select the position where no obstruction at air inlet and outlet and strong wind unreachable
3. Select the position where dry and ventilated.
4. Select the position where no affect of operation noise and exhaust on the neighbour.
5. Select the position where inflammable gas leakage
6. Select the position where easy to install.

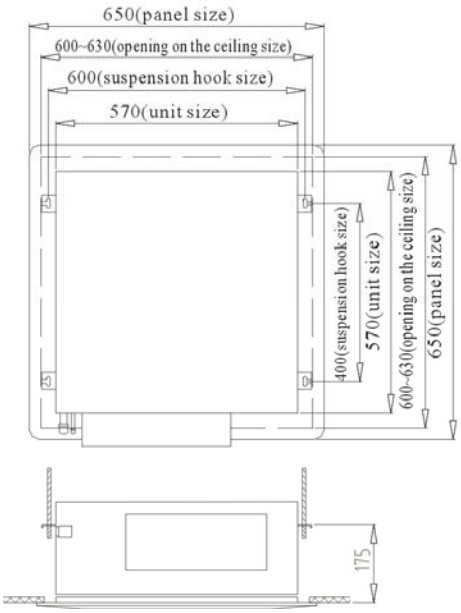
4.1.3 Preparation of appurtenance of installation

Before installation, please purchase the following parts and components by yourself:

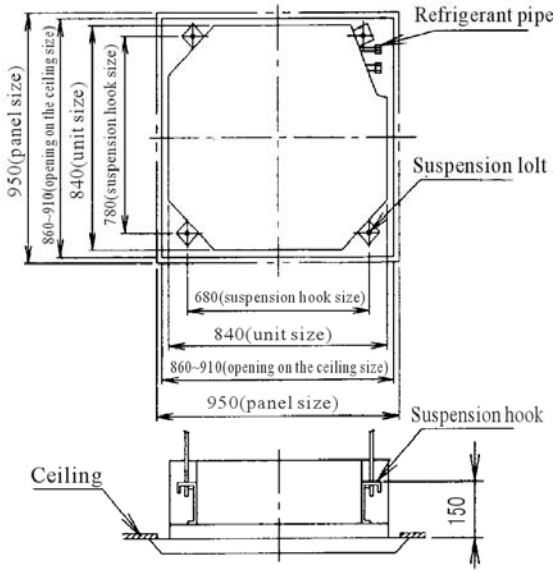
1. M10 or M12 hang bolt 4pieces
2. PVC drainage copper pipe
3. Connection copper pipe
4. Heat insulation material of connection copper pipe (PE transpired material, thickness more than 8mm)
5. Tie strap (big) 5 pieces, (small) 5 pieces
6. Power supply line, indoor and outdoor power supply connection line

4.2 Cassette indoor unit installation

4.2.1 Cassette indoor unit size

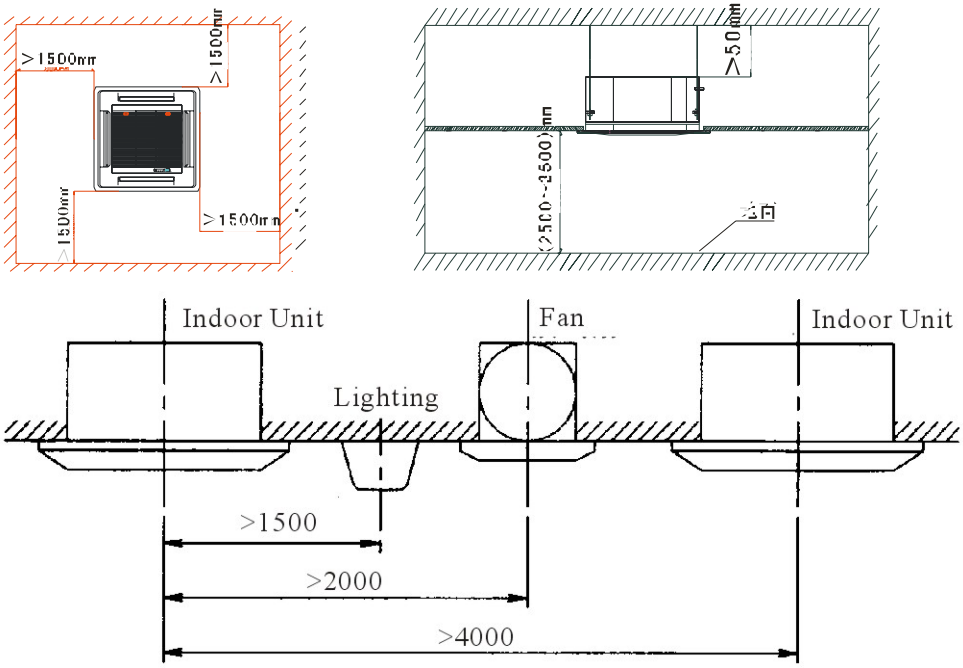


9000BTU、12000BTU
18000BTU



24000BTU、30000BTU
36000BTU、42000BTU
48000BTU、52000BTU

4.2.2 Reserve installation space for cassette inddor unit



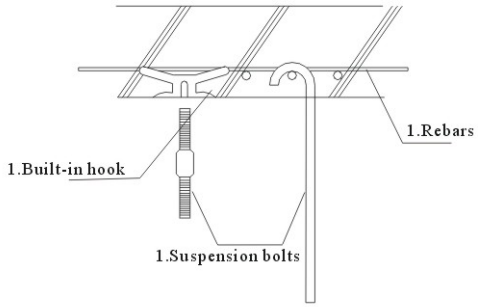
4.2.3 Cassette indoor unit installation

4.2.3.1 Select the suspension foundation：

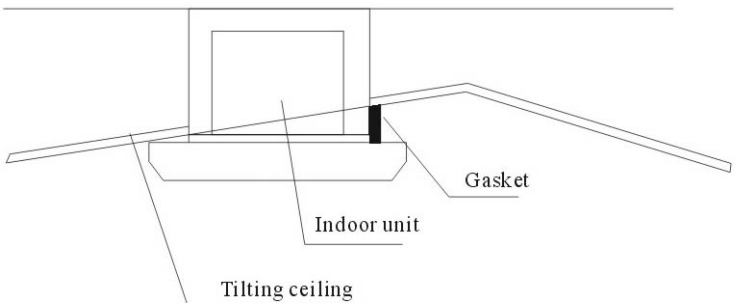
The suspension foundation must be firm and reliable, and can support the wooden frame and reinforced concrete structure that weigh more than 200kg. It is necessary to select the structure able to resist against certain vibration and keep firmness and supporting capacity, for a long time as the suspension foundation.

4.2.3.2 Fixing of suspension bolt：

Fix the suspension bolts in following methods or install the suspension bolts on iron bracket or wooden bracket.



4.2.3.3 If this unit body is installed on a tilting ceiling, a gasket should be installed between the ceiling and the air outlet panel, in order to ensure that this unit body is installed on a level surface.



4.2.3.4 The indoor unit hanging

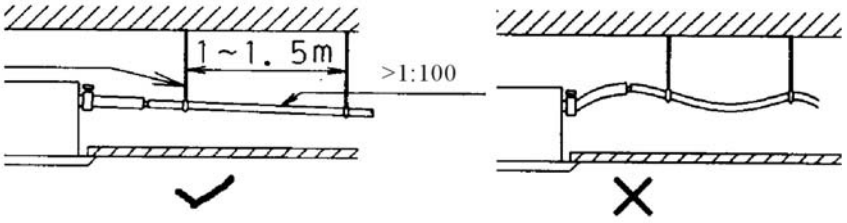
4.2.3.4.1 Adjust the hanger position on the hanging bolt to ensure the unit level in every direction.Keep the unit installed horizontally with the leveling instrument checking after its installation.

4.2.3.4.2 Screw down the nut and ensure the well contact among the hanger, the nut and the gasket.

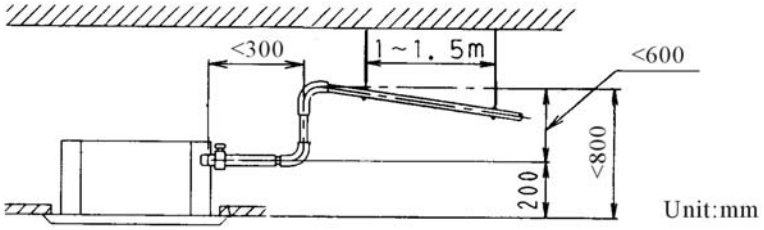
4.2.3.4.3 Keep no swaying for the unit after its installation.

4.2.3.5 Installation of drainage pipe：

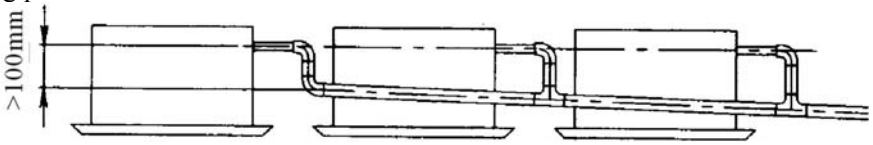
4.2.3.5.1 Heat preservation is necessary for the indoor unit drainage pipe or dew drops will accumulate on the pipe. The pipe root must be well preserved.There should be gradient between the pipe and the ground (1/50~1/100) without bending.



4.2.3.5.2 The water raise distance of the drain pump in the unit is 1,200M, but considering after turning off the unit, the condensing water converse fill may cause bobber switch sheltered closing the unit,please arrange the drainpipe as the following picture as possible.

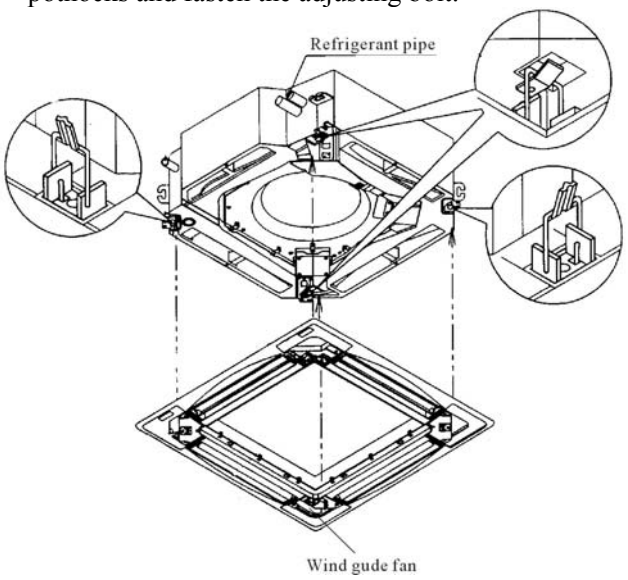


4.2.3.5.3. When install many units' drainpipe, Please install communal pipe 100mm under every unit's drainpipe as the following picture.



4.2.4 Panel installation:

4.2.4.1 As for MB06: Please refer to the following drawing: buckle the four pothocks in panel to the relative pothocks and fasten the adjusting bolt.



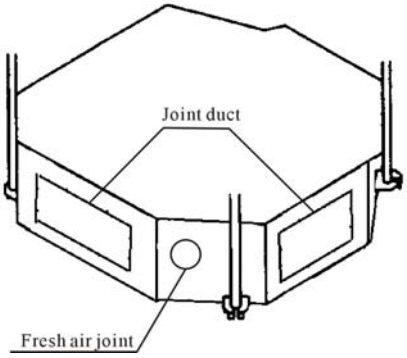
Note:

When installation, please make sure the position of wind guide electrical motor corresponding the indoor unit connection piping side.

4.2.4.2 As for MB04：Open panel air input grate, connect panel and main unit by four bolts in main unit.

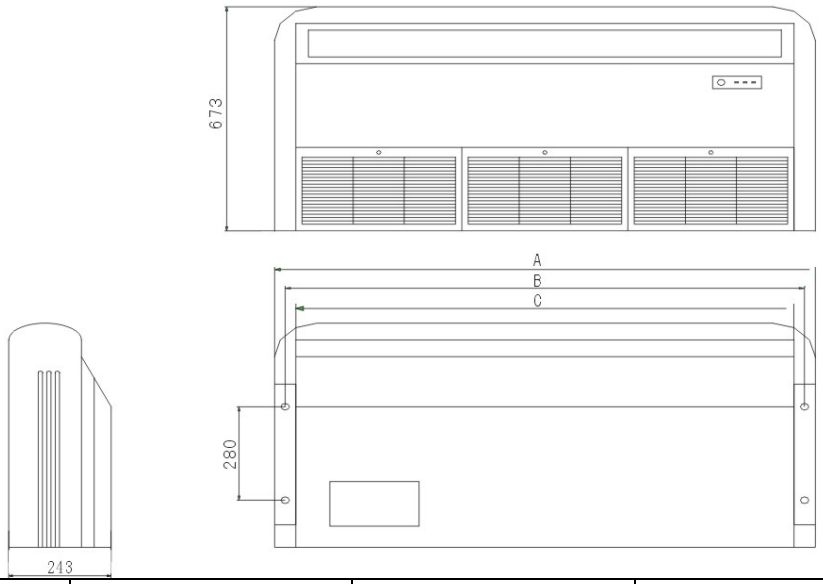
4.2.5 Fetch in fresh air and connet intake

In order to satisfy use requirement and use environment for various users, reserve a fresh air vent and four air Hict joints so as to fetch in fresh or receive air from unit.



4.3 Ceiling&Floor indoor unit installation

4.3.1 Ceiling&Floor indoor unit size



TYPE	A(mm)	B(mm)	C(mm)
9000BTU 12000BTU 18000BTU	950	805	765
24000BTU 30000BTU 36000BTU	1333	1188	1148
42000BTU 48000BTU 52000BTU	1715	1570	1530

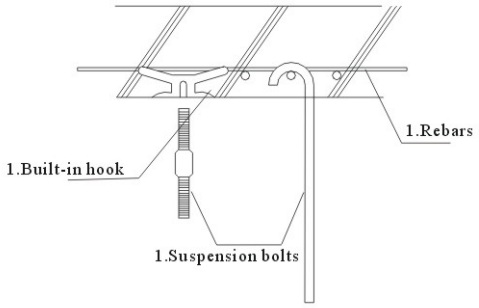
4.3.2 Ceiling&Floor indoor installation indoor unit

4.3.2.1 Select the suspension foundation：

The suspension foundation must be firm and reliable, and can support the wooden frame and reinforced concrete structure that weigh more than 200kg. It is necessary to select the structure able to resist against certain vibration and keep firmness and supporting capacity, for a long time as the suspension foundation.

4.3.2.2 Fixing of suspension bolt：

Fix the suspension bolts in following methods or install the suspension bolts on iron bracket or wooden bracket.



4.3.2.3 The indoor unit hanging

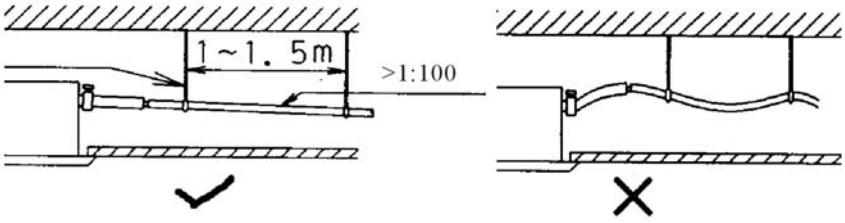
4.3.2.3.1 Adjust the hanger position on the hanging bolt to ensure the unit level in every direction.Keep the unit installed horizontally with the leveling instrument checking after its installation.

4.3.2.3.2 Screw down the nut and ensure the well contact among the hanger, the nut and the gasket.

4.3.2.3.3 Keep no swaying for the unit after its installation.

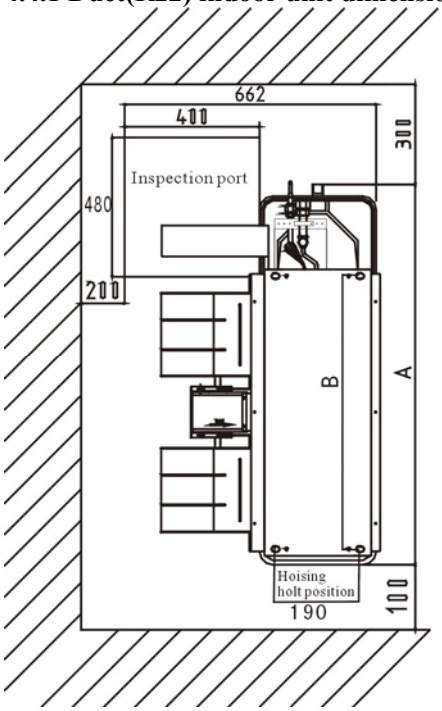
4.3.2.4 Installation of drainage pipe：

Heat preservation is necessary for the indoor unit drainage pipe or dew drops will accumulate on the pipe. The pipe root must be well preserved.There should be gradient between the pipe and the ground (1/50~1/100) without bending.



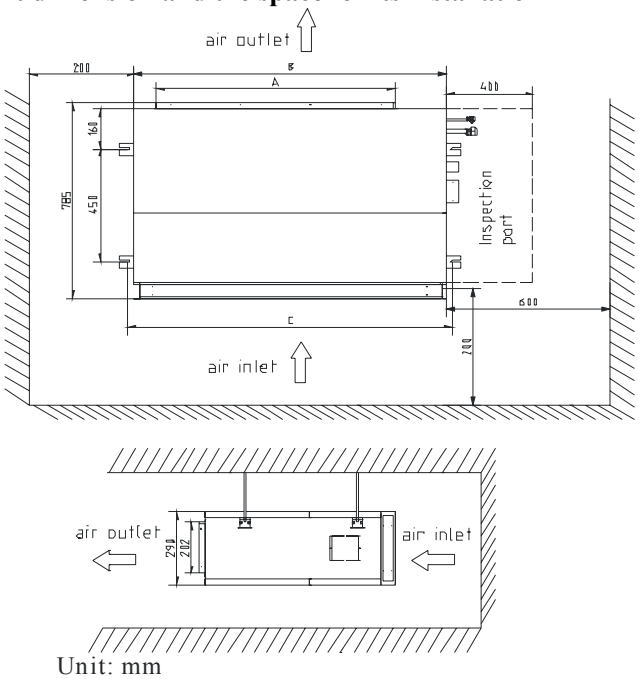
4.4 Duct indoor unit installation

4.4.1 Duct(R22) indoor unit dimension and the space for its installation



Model	A	B
ALDu-(H)09A4/SH(D)	855	615
ALDu-(H)12A4/SH(D)	855	615
ALDu-(H)18A4/SH(D)	955	715
ALDu-(H)24B4/SH(D)	1380	1140
ALDu-(H)36A5、42A5、48A5、52A5/SH(D)	1580	1340

4.4.2 Duct(R410A) indoor unit dimension and the space for its installation



Unit: mm

Type	A	B	C	D
ALDu-(H)18A4/R1 ALDu-(H)24B4/R1	590	890	860	940
ALDu-(H)36A5/R1 ALDu-(H)42A5/R1 ALDu-(H)48A5/R1	950	1250	1220	1300
ALDu-(H)52A5/R1	1270	1570	1540	1620

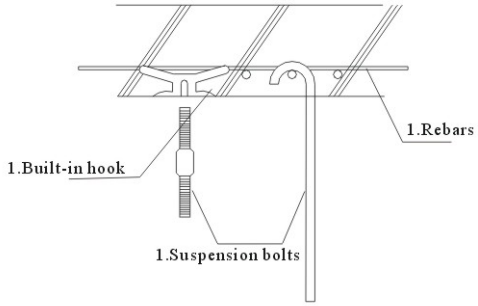
4.4.3 Duct indoor unit installation

4.4.3.1 Select the suspension foundation：

The suspension foundation must be firm and reliable, and can support the wooden frame and reinforced concrete structure that weigh more than 200kg. It is necessary to select the structure able to resist against certain vibration and keep firmness and supporting capacity, for a long time as the suspension foundation.

4.4.3.2 Fixing of suspension bolt：

Fix the suspension bolts in following methods or install the suspension bolts on iron bracket or wooden bracket.



4.4.3.3 The indoor unit hanging

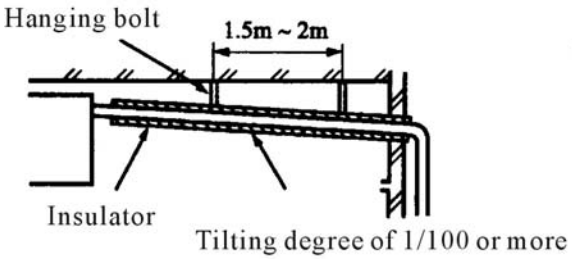
4.4.3.3.1 Adjust the hanger position on the hanging bolt to ensure the unit level in every direction.Keep the unit installed horizontally with the leveling instrument checking after its installation.

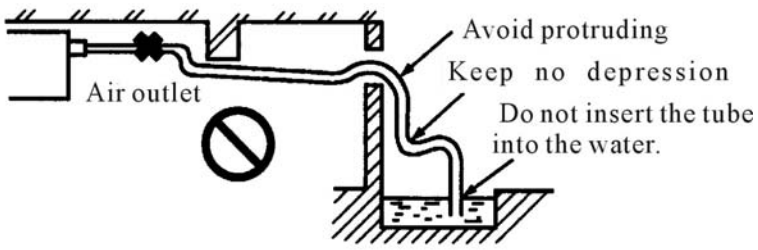
4.4.3.3.2 Screw down the nut and ensure the well contact among the hanger, the nut and the gasket.

4.4.3.3.3 Keep no swaying for the unit after its installation.

4.4.3.4 Installation of drainage pipe：

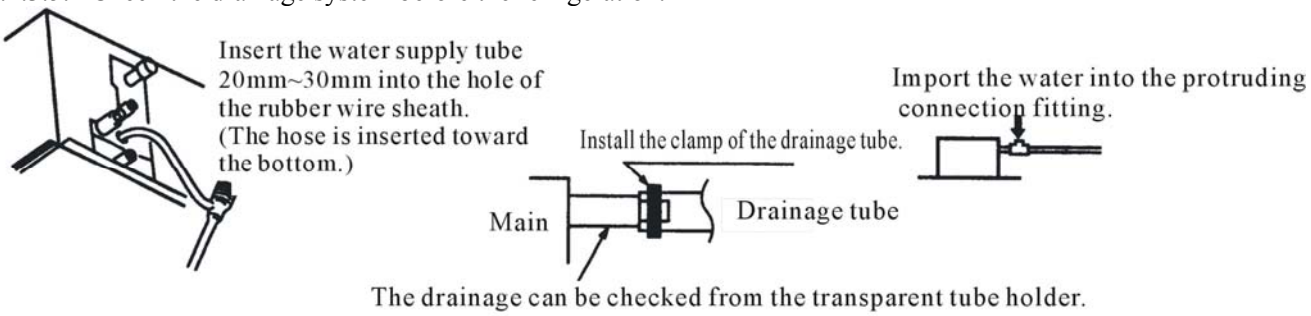
Heat preservation is necessary for the indoor unit drainage pipe or dew drops will accumulate on the pipe. The pipe root must be well preserved.There should be gradient between the pipe and the ground (1/50~1/100) without bending.





4.4.3.5 Process

4.4.3.5.1 Check the drainage system before the refrigeration.



Install a protruding connection fitting on the drainage tube to provide a water inlet before the electrical works finished. Then, check the connection if there is water leak from the Hict and ensure the water flowing successful though the drainage tube finally.

4.4.3.5.2 Suction and exhaust tube installation

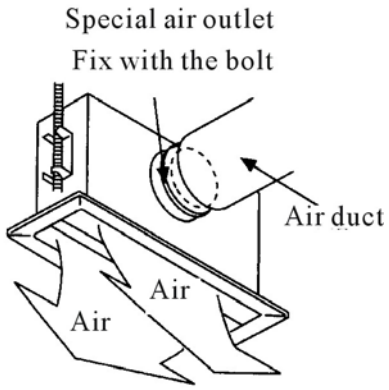
Please consult our after service staff for the selection and installation of the suction inlet, suction tube, air outlet, and the drainage tube. Calculate the outer static pressure and select the exhaust tube with the proper length and shape.

♦ Minimum the length of the Hict

♦ Minimum the number of the bends.

4.4.3.5.2 Notice in the installation of the suction and drainage tube

It is suggested that the air Hict with the fog prevention and acoustic absorption can be used (local purchase). The air Hict should be installed before the ceiling hanging and decoration and it should be heat insulated. The special air outlet should be installed at the place with the airflow properly distributed. A checking window should be kept on the suspended ceiling surface for the checking and maintenance in the future.



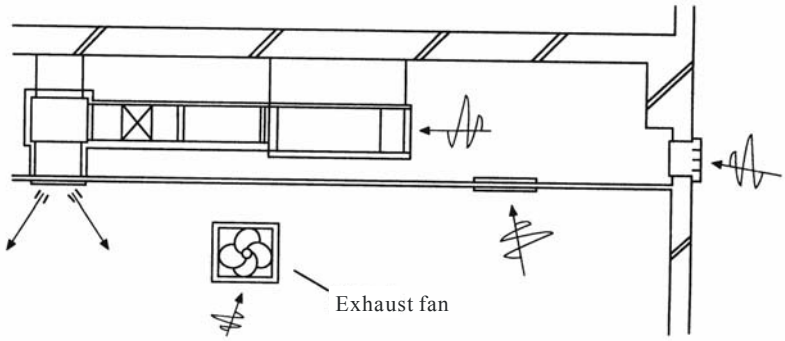
4.4.3.5.2 Examples for the installations with weakness

♦Take the hung ceiling inside as the air in Hict, which leads to the humidity rising Hie to the anomalistic air mass outside, the strong wind and the sunshine.

♦ Hie to the water dropping outside the air Hict, the humidity for the new building with concrete will also rise even if the hung ceiling inside is not taken as the air Hict. Thus, the unit should be heat insulated with the glass wool completely. (The glass wool should be bound with the iron gauze.)

♦ The compressor may be overloaded, if it is beyond the unit running limit (e.g. The indoor dry-bulb temperature is 35℃, and 24℃ for the wet-bulb).

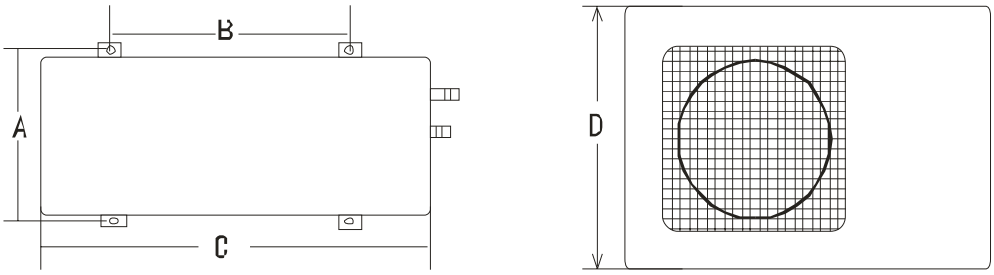
♦ With the influence from the capacity of the exhaust fan, the strong wind in the outside air Hict, and the wind direction, the draining water of the heat exchanger will spill if the unit amount of blast is beyond the limit, which will lead to the water leakage.



Example for the installation with weakness

4.5 Outdoor unit installation

4.5.1 Overall dimension of outdoor unit



Type	A	B	C	D
9000BTU 12000BTU 18000BTU(R22)	287	539	760	540
18000BTU(R410A)	326	540	800	590
24000BTU	326	540	800	690
30000BTU 36000BTU	354	606	903	857
42000BTU	390	580	950	940
48000BTU 52000BTU	376	585	945	1255

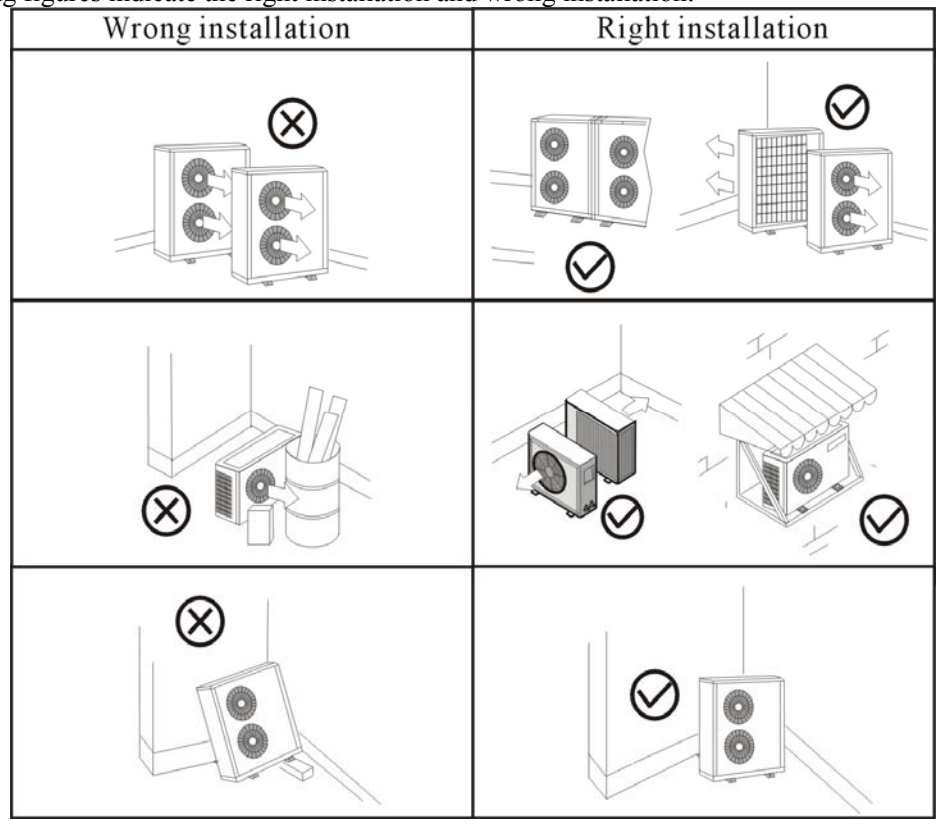
4.5.2 Select installation position of outdoor unit

Since there is a high condensing temperature (cooling) or low evaporation temperature (heating) will affect the operation of outdoor unit, in order to obtain best effects, the installation position of outdoor unit should be selected according to following principles:

A: The outdoor unit should be mounted in such a way that the air discharged by it will not return to it, Discharge shortcircuiting is prevented and there should be sufficient space around the unit for purpose of maintenance.

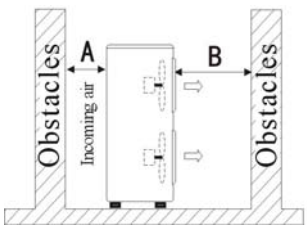
B: More than 5^{o} slope is strictly prohibited.

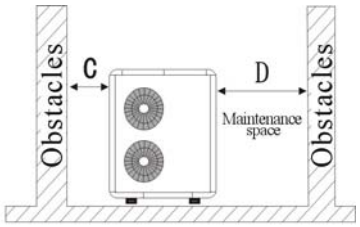
The following figures indicate the right installation and wrong installation:



4.5.3 Installation space of outdoor unit:

After the installation site is selected, the outdoor unit should be installed according to the following figure, in order to ensure the ventilation and maintenance of the outdoor unit. Please reserve the space according to the following figure：





A＞300mm　B＞1500mm　C＞300mm　D＞500mm

4.6 Connection piping installation

4.6.1 Choose the Connection piping

4.6.1.1 Three-principle for connection piping

	Main reason	Countermeasurement of prevent failure
Dry	●invasion of outside rain and constructin water ●invasion of condesating water in pipe	tubing process→purge→vacuum desiccation
Clean	●oxide form in pipe while welding ●invasioin of Hist, entrained matter	Nitrogen replacement→purge→tubing process
Airtightness	●incomplete welding ●flared pipe air leakage ●fringe leakage	Use proper material (copper pipe, welding rod) operation following strictly welding regulation →airtightness test Operation following strictly flared pipe regulation Operation following strictly interface regulation

4.4.1.2 Close cover of connection pipe

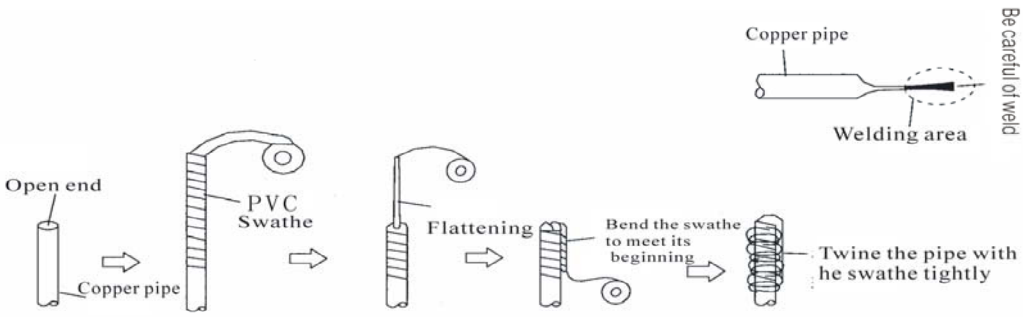
It is important of the binding of the refrigerant tube against the moisture and the Hist inleakage which is the potential risk in the future.

The end of each tube should be sealed by swathe. In fact, the "extrusion" is the most effective way for sealing, and the "binding" is just a simple replacement in certain conditions.

Area	Work cycle	Seal method
Outdoor	Over 3 monthes	Squeeze to shrunken
	Less than 3 monthes	Squeeze to shrunken or binding
Indoor	Free from it	Squeeze to shrunken or binding

①Squeeze to shrunken method：Squeeze the end of steel pipe and weld the gap.

②Binding method：Using PVC stap bind copper pipe ends



Note
1.Avoid the inleakage of the filth as the copper pipe passing the hole.
2.Avoid the inleakage of the rainwater as the copper pipe going to the outdoors.
3.Special attention should be paid while outdoor pipe is in perpendicular status).

4.4.1.3 Connection pipe purge

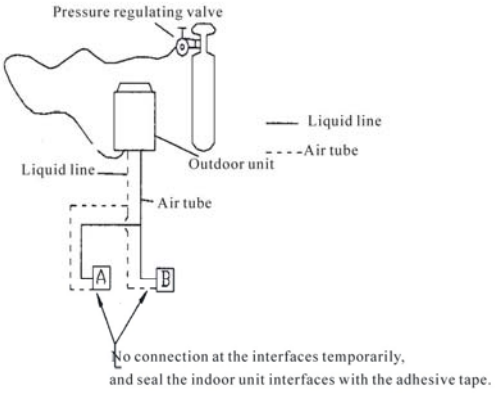
Pressurization gas purge is a way of removing dirty matters from the pipe.

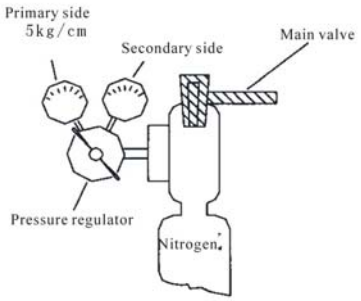
(Three main functions)

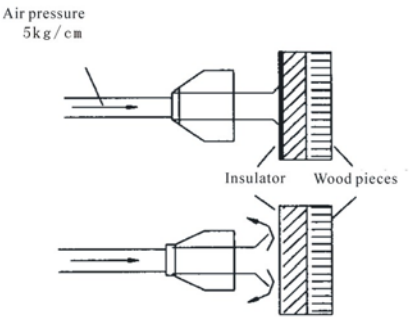
① While "nitrogen replace insufficient", remove the oxide bubble in copper pipe.

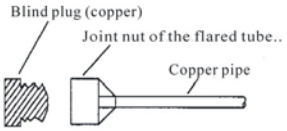
②while pipe enclosure not closed, remove foreigh matters and moisture.

③check pipe connection of indoor and outdoor unit (liquid pipe and gas pipe)









Example for the operations

①install the pressure adjust valve on nitrogen bottle.

* Used gas must be nitrogen (danger of condesation exists water if using freon or carbon dioxide,and danger of explosive exists if using oxide).

②connect the pressure adjust vavle and inlet at the side of outdoor unit liquid pipe by aeration pipe.

③Block all copper joints (including B joint) plug except a side of indoor unit by blind plug.

④open nitrogen valve and turn adjust adjust valve to 5kg / cm^2.

⑤check nitrogen whether get across the liquid pipe at the side of A indoor unit

(The interface at the side of indoor unit should be properly enveloped by adhersibe tape in case dirty matters into!)

⑥purge

★Using isolation material in the hand withstand pipe nozzle

↓

★While cannot withstand Hie to pressure increasing, fast replease isolation material. (First- purge).

↓

★Using isolation material withstand pipe nozzle(Second- purge).

↓

Check the pipe whether or not by way of putting a rug loosely in pipe nozzle while blow, sometime some moisture will occur, and at that time should desiccate thoroughly the pipe. Method:

(1) Blow the pipe by nitrogen (till moisture not exists any more)

(2) Execute entire vocuum desiccation operation (refer to chapter about tubing desiccation)

⑦close main nitrogen valve.

⑧repeat operation above-mentioned for indoor unit B.

⑨after liquid operation finish, execute blow operation of air pipe above-mentioned again.

4.4.1.4 Selection of connection pipe material

- ●use long and straight pipe or coil pipe as possible as you can (copper pipe with isolation material) to prevent frequent welding.
- ●all used pipes must satisfy the requirement listed in table as followed (size, material, thickness, etc.), And material is de-hydrogen-phosphorus-copper seamless pipe.
- ●if use coil copper pipe with adiabatic material, make the whole work easier.
- ●don't use copper pipe used for supply and drainage (Hie to not enough clean of the inner wall)

4.4.1.5 Expanded conncection piping

a) conncection piping must be annealed one time before expansion work.

b) Pipe cutter should be used while cut the pipe (as for large-caliber pipe, use large cutter; if pipe caliber too large to use cutter, use metallic saw, but should be care to prevent sawHist into pipe.)

c) Using flaring tool and the dimension of flared pipe section is as shown in following table:

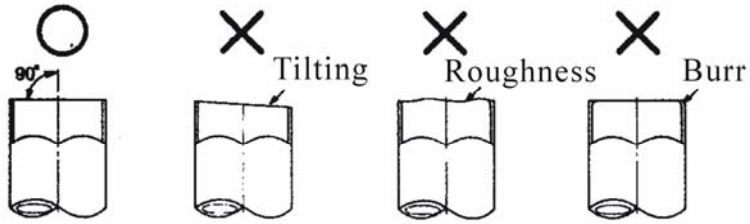
Piping size	Pipe outer dia.	Pipe expanded size A
3 / 8″	9．52	12．2～12．8
1 / 2″	12．7	15．6～16．2
5 / 8″	15．88	18．8～19．4
3 / 4″	19．05	23．1～23．7

d) When flaring nut is connected, some refrigerator oil should be applied on the flared pipe section
(on inside wall and outside wall), and screw the nut by 3~4 thread pitches before finally tightening it.

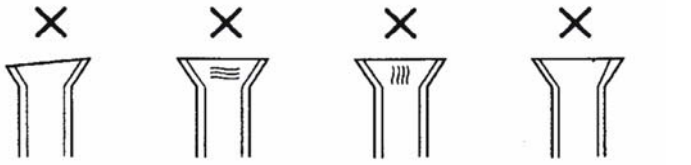
Emphasis:
①remove burr carefully.
②use two wrenches so as to hold the pipe.
⑧expanded nut should install pipe before expansion.
④use proper torque to fasten expanded nut.
fasten ±10% of standard torque of expanded nut.

Size	Torque	
	(kgf—cm)	(N—Cm)
1 / 4(Φ6.35)	144～176	1420—1720
3 / 8(Φ9.52)	333～407	3270～3990
1 / 2(Φ12.7)	504～616	4950～6030
5 / 8(Φ15.88)	630—770	6180～7540
3 / 4(Φ19.05)	990—1210	9270～11860

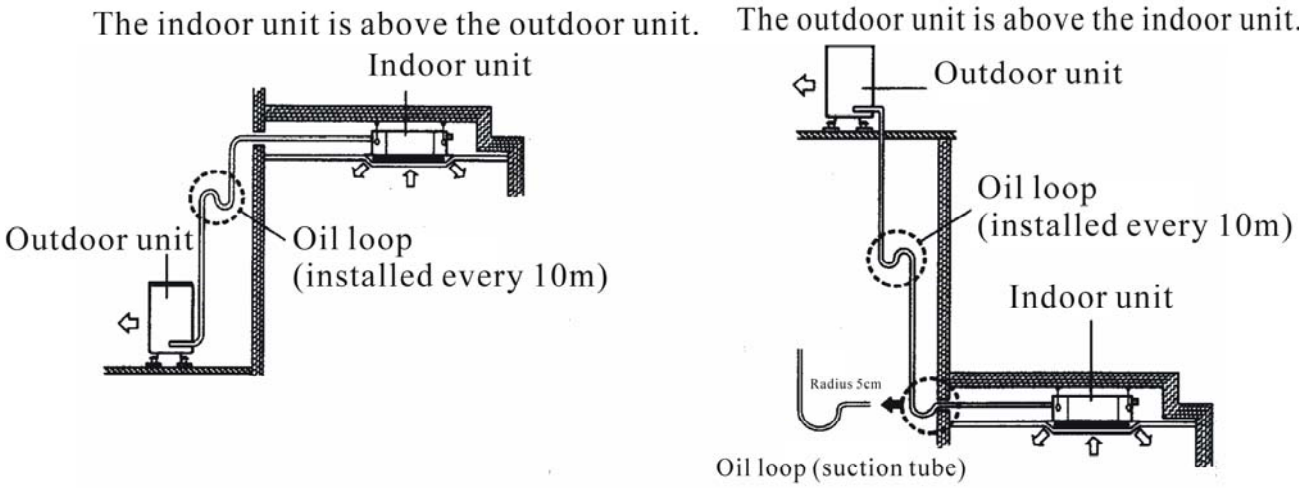
⑤check expansion surface whether damage or not.
●Necessary tools (pipe cutter, wrench knife, expansion, pipe frame)
●right and wrong cut are shown as followed:



●check expansion right or not.



4.4.1.6 Installation of oil trap
In order to facilitate oil return, may install oil trap on standpipe.
While height difference between indoor and outdoor unit beyond 8 meters, the distance between oil traps is 10cm subject to ben conHiit of the following drawing.



4.4.2 ConHiit heat preservation

4.4.2.1 ProceHire of heat preservation

condesating pipe work→heat preservation (except tubing joint)→airtightness test→heat preservation (except tubing joint)

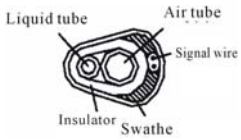
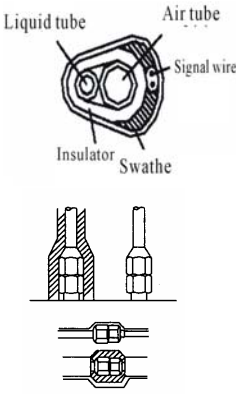
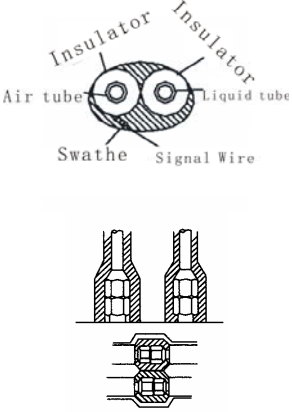
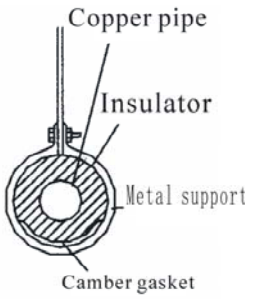
4.4.2.2 Material

Adiabatic material applied should withstand pipe heat quantity.

for example: heat pump; heat resistance transpired polythene (more than 120℃) single cold type: transpired polythene (more than 100℃)

4.4.2.3 Key points of heat preservation

Heat preservation area, for example welding area, expansion area or flange area, should be installed after airtightness test succeeds. Pay attention to unit type and necessary prerequisite because some air pipe and liquid pipe need be adiabatic.

Incorrect	Correct		
● Do not put the liquid tube and the air tube together.  ● The joints of the tubing should be also insulated completely,  	● Only is the air tube insulated. (cooling only style)  	● Both the air tube and liquid line are insulated.  	● Support 

Emphasis: ①thickness of heat preservation material should be 100mm.

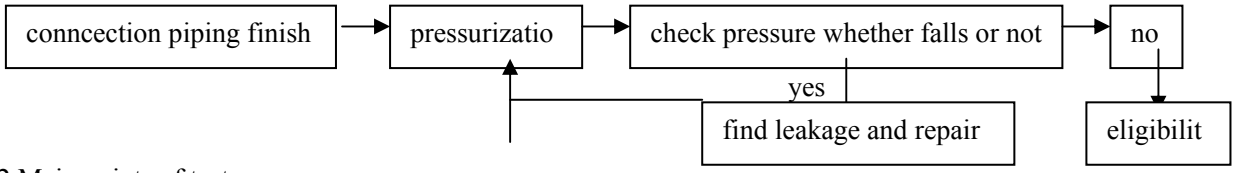
②The recommendation value (main pipe 1 inch, brach pipe half inch)should be increased in area with hot and wet environment.

③if user provides his standard, which should be attached.

④as for single cold type, if estimate that air conditioner possibly operate while ambient temperature not reach 10℃, liquid pipe should execute heat preservation.

4.4.3 Airtightness test

4.4.3.1 Work sequence



4.4.3.2 Main points of test

Pay attention to carry out the test subject to the following sequence.

a) Subject to various cold medium systems, air pipe and liquid pipe should be pressurized graHially.

- ●1st stage 3.0 kg / cm^2: Pressurize more than 3 minutes, →possibly find large leakage
- ●2nd stage15.0 kg / cm^2: Pressurize more than 3 minutes, →possibly find large leakage
- ●3rd stage 28.0 kg / cm^2: Pressurize more than 24 hours

Note

Even pressurize to 28.0kg / cm^2, small leakage cannot be found if time limited. Thus hold 24 hours and observe after pressurize.

NOTE: Pressure must not beyond 28.0kg / cm^2.

b) Observa pressure descends or not

- ●If no descends phenomenon, qualified.
- ●If descends, should find where leak air and refer to next page.

But, the temperature while pressurization and temperature while observation are different,every 1℃ change pressure 0.1, which should be modified. Modified value=(temperature while pressurization—temperature while observation)x0．1.

for example:

Pressure while pressurization 28 kg / cm^2,temperature 25℃.24 hours later, if pressure is 27．5 kg / cm^2 and temperature is 20℃, which should be judged to be qualified.

4.4.3.3 Check air leakage

Check 1(as described in last page, while find pressure falls in three-stage check)

①audition check: Find larger air leakage by ears;

②touch check: Put hand at pipe joint to feel leak or not;

③soap water check: Could find bubbles from air leakage.

Check 2 (want to find small leakage, or cannot find leakage while pressure falls under pressurization test)

①nitrogen to 3．0 kg / cm^2

②fluorin air (R22) to 5.0 kg / cm^2 (i.e. Admixture of nitrogen air and fluorin air)

③check by halogen lamp, alkyl gas (petroleum gas) detector, electric detector, etc.

④if cannot find, continue to pressurize to 28 kg / cm^2 and check again.

maximum pressure not more than 28 kg / cm^2

4.5 Fill of refrigerant

Refrigerant fill quantity of outdoor unit ex-factory is subject to 8m pipe length; while the length of conncection piping in the scope of 8m, no need to fill refrigerant additionally; while pipe length beyond 8mm, please add refrigerant subject to the following table:

Cold medium pipe	Air pipe	Liquid pipe	Additonal cold medium fill quantity
Standard of cold medium pipe	Φ9.52	Φ6.35	0.02Kg/m
	Φ12.7	Φ6.35	0.02 Kg/m
	Φ15.88	Φ9.52	0.05 Kg/m
	Φ19.05	Φ9.52	0.07 Kg/m

4.6 Commissioning

Points for attention of commissioning

- ●While operation in winter, power should be supplied ahead of 6 hours for first operation so that crankcase can preheat in advance.
- ●While operation in winter, commissioning can be executed again only after main power supply deenergization for 8 hours and then energization for 2.5 hours.

1)Switch on the power supply and turn on refrigerating mode.

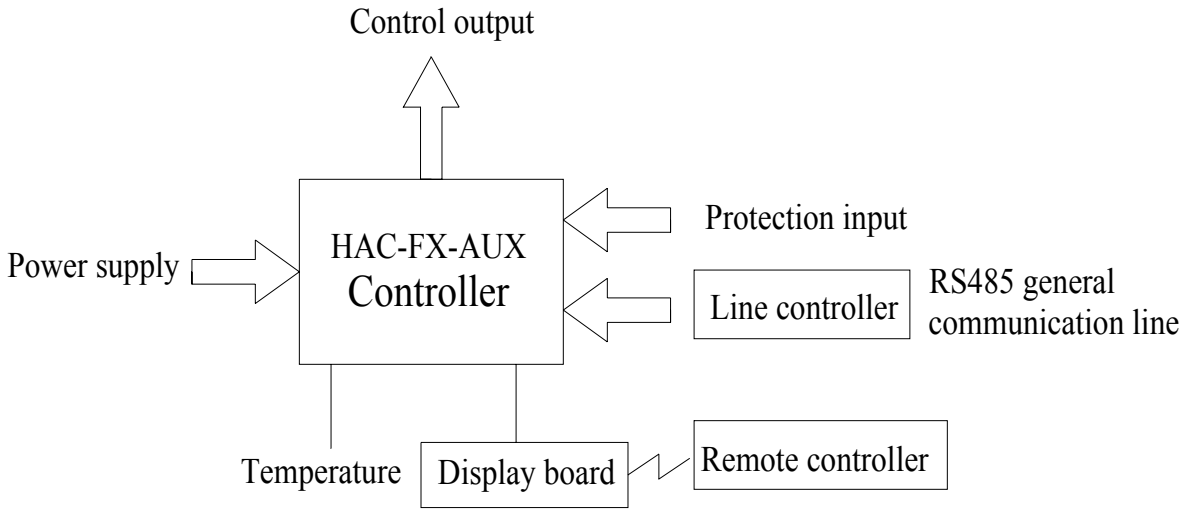
2)After compressor three-minute protection, observe inside of unit whether cold air blows in normal condition or not, and whether outer unit exists abnormal noise.
3)Switchover to “heaing” mode, observe inside of unit whether hot air blows in normal condition or not, and whether outer unit exists abnormal noise.
4)Set the mode to “Air-blast”(high speed air)mode,observe whether strong air blows from indoor.
5) Open “swing”mode and check whether baffle plate swing in normal condition or not.
6)Press remote control to check whether whole-set unit works in normal condition or not.
7) Switch mode into “cold generation” and operate 1 hour, and then observe whether drainage is normal or not.
8)After ensure unit operation in normal condition, press “ON/OFF” button to stop commissioning.

5. Control instruction of HAC-FX-AUX PC Board

This PCB is available in R22 refrigerant unit、The R410A refrigerant unit of the power supply is 1PH,220-240V,50Hz.

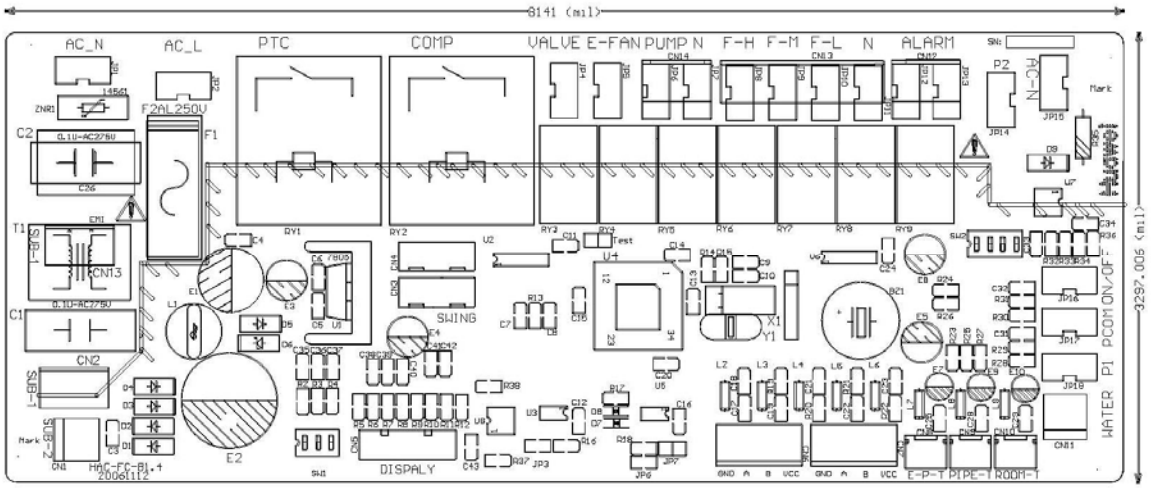
5.1 Composition and function

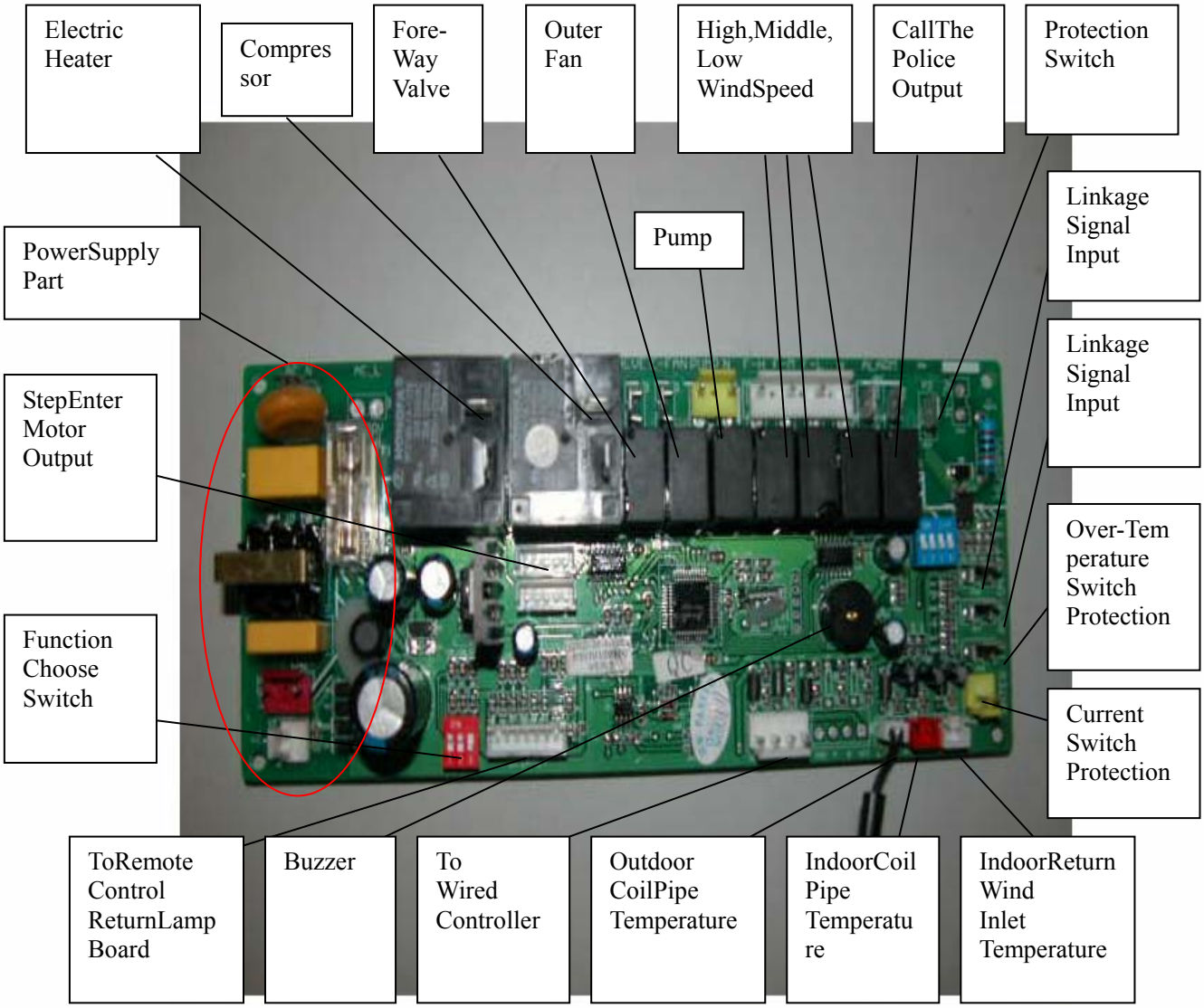
Controller of HAC-FX-AUX consists of main controller, display, remote controller, line controller and temperature sensor. Meanwhile, line controller and main controller should be connected by RS485 communication interface, and display and main controller should be connected by 7-core flat line. Structre frame drawing is as followed:



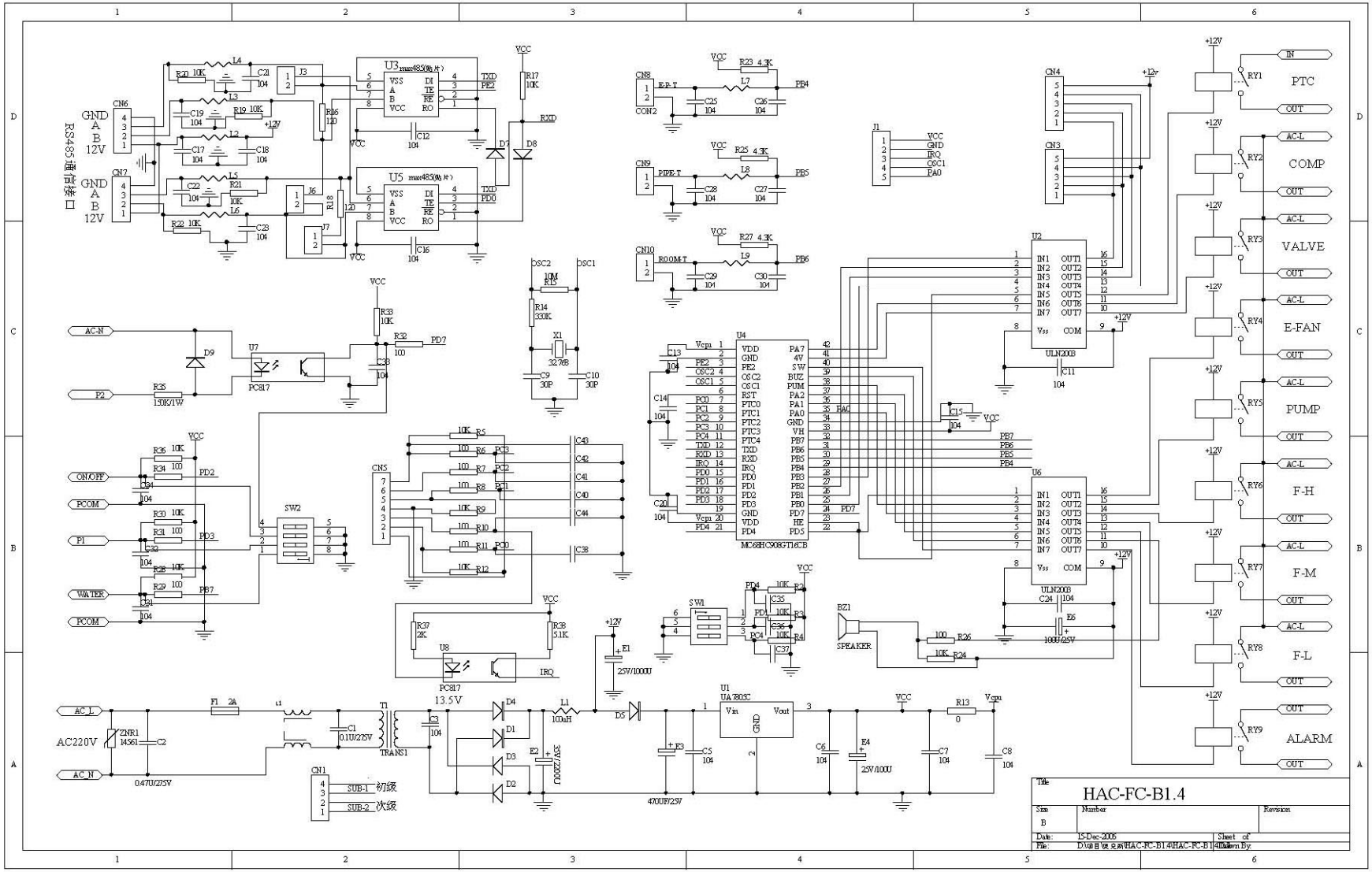
In this control system, control and check function are achieved by main controller, and outdoor section of controller includes compressor, outdoor cooling fan, four-way valve; indoor section includes indoor fan, swing increment motor and auxiliary electric heater. cassette unit is provided with control and water-lift pump function simultaneously, and inspection temperature objects of controller involves indoor return air temperature, indoor coil temperature and outdoot coil temperature. Additionally, controller also inspects the signals such as failure protection of indoor unit, indoor electric heater over temperature protection function, water level switch, etc.

5.1.1 Layout


AC_N
AC_L
PTC
COMP
VALVE E-FAN PUMP N
F-H F-M F-L N
ALARM
F2AL250V
SWING
DISPALY
WATER PI
E-P-T PIPE-T ROOM-T


Electric Heater
Compressor
Fore-Way Valve
Outer Fan
High,Middle, Low WindSpeed
CallThe Police Output
Protection Switch
Linkage Signal Input
Pump
PowerSupply Part
Linkage Signal Input
StepEnter Motor Output
Over-Temperature Switch Protection
Function Choose Switch
Current Switch Protection
ToRemote Control ReturnLamp Board
Buzzer
To Wired Controller
Outdoor CoilPipe Temperature
IndoorCoil Pipe Temperature
IndoorReturn Wind Inlet Temperature

5.1.2 PCB elements diagram



5.2 Composition of controller

5.2.1 Protection orifice input of main controller

★Heating over temperature protection switch, water level switch, telecontrol input checked by main controller are constant-close conact signals.

●Water level switch:

while water level in normal condition, switch closed; if water level out of normal scope, water level switch cuts off and enters protection status, atsame time alarms the output signal.

●Heating over temperature protection switch:

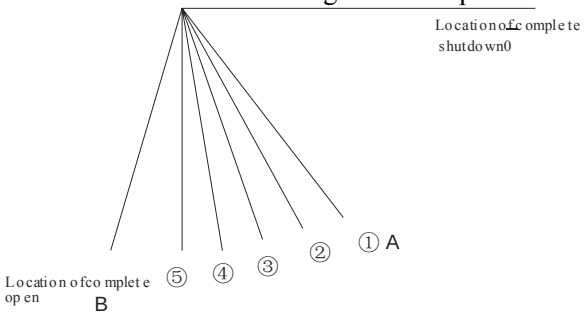
while over temperature protection switches off, controller enters protection status and alarms output signal at same time.

★Outdoor protection orifice checked by main controller adopts strong electric live line protection and enters protection status while protection switch off and, at same time alarms output signal.

★There is a red four-digital dial code switch that is used for shielding input signal in each protection orifice. Apply this function if cetain protection orifice disuses or non-shutdown overhauling.

5.2.3 Air Himper control of indoor unit

Air Himper motion of indoor unit should be executed by way of main controller driving two increment motors which motion is synchronized. Position schematic drawing of air damper is shown as following:



Air damper of indoor unit complete close position is 0^{o}. Meanwhile, air damper has 5 stable angle positions. While air damper in automatic swing status, air damper swing range from position1 to 5. swing range will be subject to parameter set value of 【SA12】、【SA13】、【SA15】、【HF08】

Model	A	B	SA15
Cassette	30	70	ON
Ceiling&Floor	3	11	OFF

5.3 Function set of controller

Function set is a blue three-digital dial code switch that can set 5 statuses, and set information refers to the following table:

Switch 1	Switch 2	Switch 3	Status	Function name	Description
OFF	OFF	OFF	000	Single cooling	Only provided with cooling, dehumidify and ventilation mode
ON	OFF	OFF	100	Single cooling +heat energy	Compressor cooling, hot water solenoid valve Heating or electric heater
OFF	ON	OFF	010	Heating pump	Cooling、Heating
ON	ON	OFF	110	Heating pump +electric heater	Cooling、Heating 、Electric heater
OFF	OFF	ON	001	Heating pump + heat energy	Cooling、Heating or hot water solenoid valve heating

5.4 Parameter set method

Controller is provided with many parameter sets, and line controller can inquire parameter contents.

The detailed operation of entering parameter set is:

Line controller: under shutdown status, press 【QUERY】and 【TIMER】for 5 seconds and hear “tick” sound from line controller, entering parameter set operation.

5.4.1 System function slection parameter

System function slection parameter has two opinions including “ON” and ”OFF” and change parameter status by pressing 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	ON	OFF
Air velocity status ofindoor fan	SA03	**ON**	Select three-velocity air	Select single-velocity air
Unfreezing pattern	SA04	**ON**	Compressor operation of runreezing	Compressor gap of runreezing
Mode conversion selection	SA07	**ON**	Converse mode under standby, operation status	Cannot converse mode under operation status
Selecton of combination timing/cycle timing	SA09	**0FF**	Cycle timing (cycle operation every 24 hours)	Combination timing (once effective in 24 hours)
Telecontrol switch	SA10	**ON**	Check telecontrol switch	Not heck telecontrol switch
Swing direction selection	SA11①	**ON**	Operation clockwise	Operation conterclockwise
Swing operation pattern	SA12②	**0FF**	Operation subject to angle pattern	Operation subject to on/off pattern

①【SA11】Parameter set is the relative parameter to CASSETTE UNIT operation.

②【SA12】Parameter set is the relative parameter to CASSETTE UNIT operation

5.4.2 Compensation parameter of temperature sensor

Compensation parameter of temperature sensor is regulated by way of【temperature▲】and【temperature▼】. Continue regulation while reaching maximum or minimum value, “- -” occurs indicating cancel status. Under candel status, temperature may not be installed, and the operation and protection relatively should be canceled.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. value	Cancel	Potential difference
Return vent temperature	PC01①	0℃	-9℃	9℃	- -①	1℃
Indoor coil temperature	PC02	0℃	-9℃	9℃	- -	1℃
Outdoor coil temperature sensor	PC05	0℃	-9℃	9℃	- -	1℃

① While temperature set of return vent in cancel status, select indoor temperature sensor on line controller.

5.4.3 System operation temperature parameter

System operation temperature parameter is temperature set parameter relative to operation and regulated by way of 【temperature▲】and【temperature▼】

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Adjustment
Return difference temperature	SP01①	1℃	5℃	1℃	X①	1℃
Return difference temperature in auto mode	SP02	5℃	10℃	3℃	X①	1℃
Inner pipe temperature condition while electric heater on	SP03	46℃	60℃	40℃	- -	1℃
Inner pipe temperature condition while electric heater off	SP04	50℃	60℃	40℃	- -	1℃
Parameter of anti-cooling air 1	SP05	25℃	35℃	20℃		1℃
Parameter of anti-cooling air 2	SP06	35℃	40℃	30℃		1℃
Blow after heat parameter1	SP07	28℃	35℃	20℃		1℃
Blow after heat parameter 2	SP08	35℃	40℃	30℃		1℃

① Some cannot be set into cancel, 【- -】cancel status will not occur in parameter adjustment.

5.4.4 System operation time parameter

System operation time parameter is time set parameter relative to operation and regulated by way of 【time▲】 and【time▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Hiration of sample temperature check	SC01	3 seconds	60 seconds	0 second	- -	1 second
Max. Swing angle of swing vane	SC02①	46	100	10	- -	1
Min. swing angle of swing vane	SC03②	10	50	0	- -	1
Compressor start delay time after outer fan start	SC04	5 seconds	60 seconds	1 second		1 second
Outer fan off time after compressor delay off	SC05	5 seconds	60 seconds	1 second		1 second
Back light source light on time	SC06	10 seconds	60 seconds	3 seconds	- -	1 second
LCD light on time period of parameter, failure inquiry, etc.	SC07③	10 seconds	30 seconds	3 seconds		1 second
Automatic mode judge interval time	SC08④	10 minutes	30minutes	00minute	- -	1minute

①【SC03】Parameter set is the relative parameter to CASSETTE UNIT operation.

②【SC08】Parameter set is the relative parameter to CASSETTE UNIT operation.

③【SC06】Set is cancel mode, back light souorce constant-light, if need close, press【reset/dark screen】

④【SC08】Set is cancel mode, no autom.

5.4.5 protection temperature parameter

protection temperature parameter is temperature set parameter relative to failure inspect judge and regulated by way of 【temperature▲】and【temperature▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Cold generation antifrost protection	EP01①	-2℃	10℃	-5℃	- -	1℃
Cold generation anti-overload protection	EP02②	60℃	80℃	51℃	- -	1℃
Heat generation over temperature protection	EP04②	66℃	80℃	45℃	- -	1℃

While ①、②、③【EP01】、【EP02】、【EP04】set is【- -】cancel mode , relative protection function cancel.

5.4.6 Protection time parameter

Protection time parameter is time set parameter relative to failure inspect judge and regulated by way of 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Compressor start for protection	EC01	3 minutes	10 minutes	1 minute		1 minute
Compressor operation satisfying time	EC02	3 minutes	10 minutes	1 minute		1 minute
Max. Time of anti-cooling air	EC03	15 seconds	120 seconds	0second	- -	1second
Max. Delay of blow after heat	EC04	15 seconds	120 seconds	0second	- -	1second
Protection inspection time of shielding outer unit	EC05	2 minutes	5 minutes	0 minute		1 minute
Hiration of protection condition	EC06	3 seconds	10 seconds	0second		1second
Switch off time of water lift pump	EC07①	30 seconds	60 seconds	1second		1 second

①【EC07】Parameter set is the relative parameter to CASSETTE UNIT operation.

5.4.7 Unfreezing parameter

Unfreezing parameter involves temperature and time parameter entering/exit unfreezing. Temperature parameter can be regulated by 【temperature▲】and【temperature▼】, and time parameter can be regulated by 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Outer pipe temperature condition entering unfreezing time	HF01①	3℃	10℃	-10℃	- -	1℃
Inner pipe-return air temperature difference condition entering unfreezing	HF02②	- -	10℃	4℃	- -	1℃
Outdoor coil temperature condition entering unfreezing	HF03③	-8℃	0℃	-10℃	- -	1℃
Outdoor coil temperature condition exit unfreezing	HF04④	16℃	20℃	5℃	- -	1℃
Compressor accumulation time of entering unfreezing	HF05	30 minutes	90 minutes	20 minutes		1minute
Max. Unfreezing time	HF06	8 minutes	20minutes	3 minutes		1minute
Each cycle operation velocity of increment motor	HF08⑤	20 seconds	50 seconds	10 seconds		1 second

①【HF01】Set is cancel, accumulation compressor operation time ignoring outer pipe temperature condition.

②【HF02】Set is cancel, unfreezing judge subject to 【HF03】 outer pipe temperature condition.

③【HF03】Set is cancel, unfreezing judge subject to 【HF03】 temperature difference between inner pipe temperature and vent temperature.

④【HF04】Set is cancel, unfreezing subject to 【HF06】condition and timing exit.

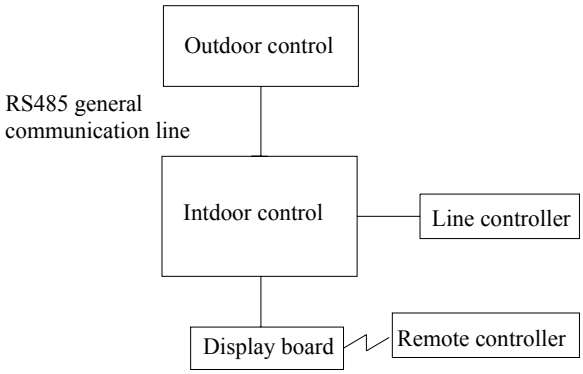
⑤【HF08】Parameter set is the relative parameter to CASSETTE UNIT operation.

6 Control instruction of HAC-F1X-AUX PC Board

This PCB is available in R410A refrigerant unit of the power supply is 3PH,380-415V,50Hz.

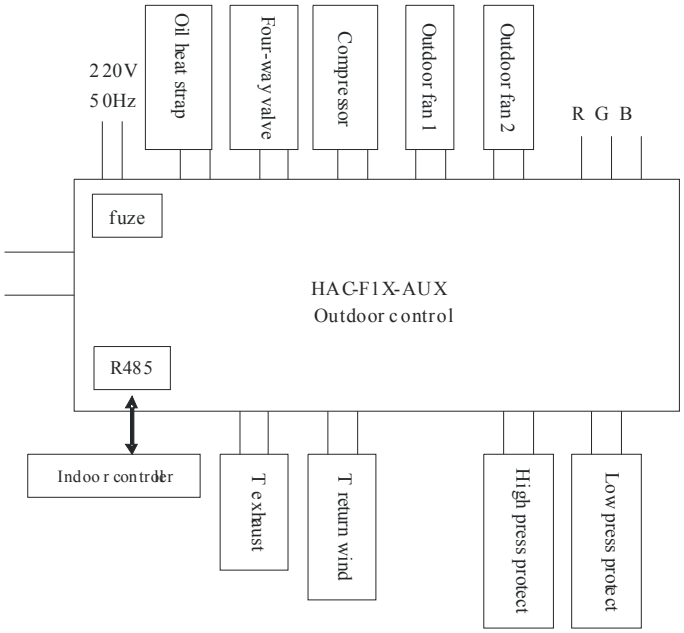
6.2 Composition and function

Controller of HAC-F1X-AUX consists of outdoor control 、indoor control, they should be connected by RS485 communication interface



In this control system, control and check function are achieved controller, and outdoor section of controller includes compressor, outdoor cooling fan, four-way valve, Oil heat strap; indoor section includes indoor fan, swing increment motor and auxiliary electric heater. cassette unit is provided with control and water-lift pump function simultaneously, and inspection temperature objects of controller involves indoor return air temperature, indoor coil temperature and outdoor coil temperature, compressor exhaust temperature . Additionally, controller also inspects the signals such as failure protection of indoor unit, indoor electric heater over temperature protection function, water level switch, outdoor high press protection,low press protection, current over protection, Phase is lose or phase sequence is reverse in three phase protection etc.

6.3 Outdoor control Composition



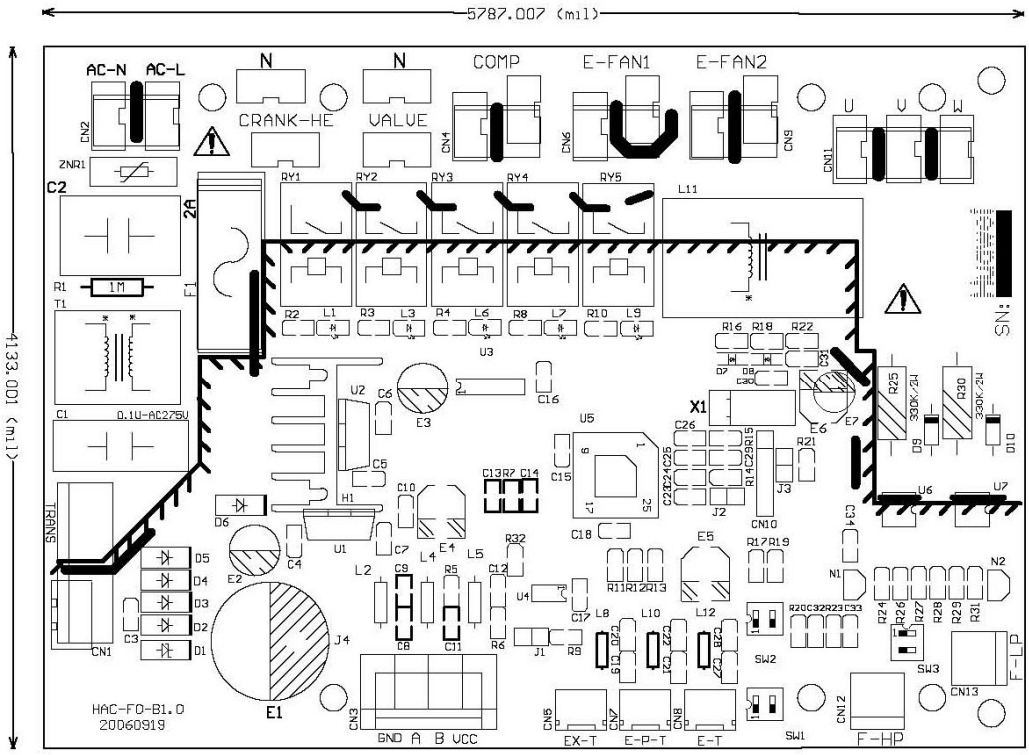
The outdoor controller control one compressor,two outdoor cooling fan, one four-way valve,one Oil heat strap. The outdoor controller inspection temperature objects outdoor coil temperature, compressor exhaust temperature.

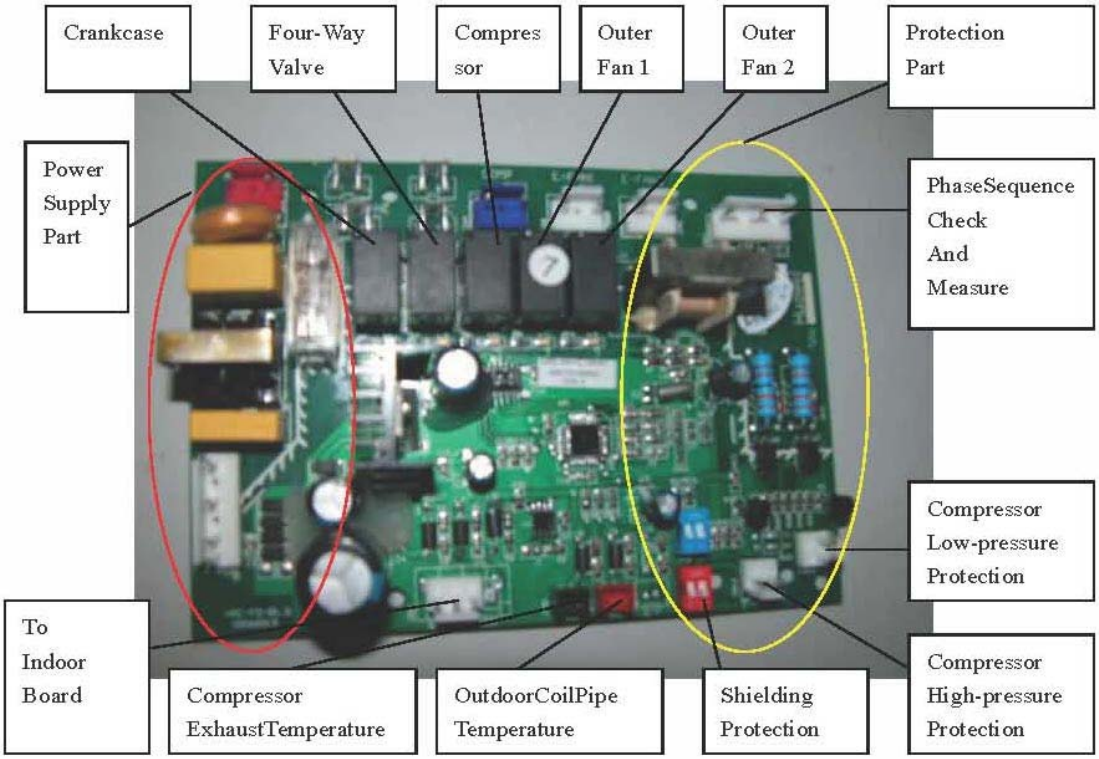
6.3.1 Setting screen safeguard switch

Outdoor control screen safeguard switch is a red two location thumbwheel switch, the setting information is as follows.

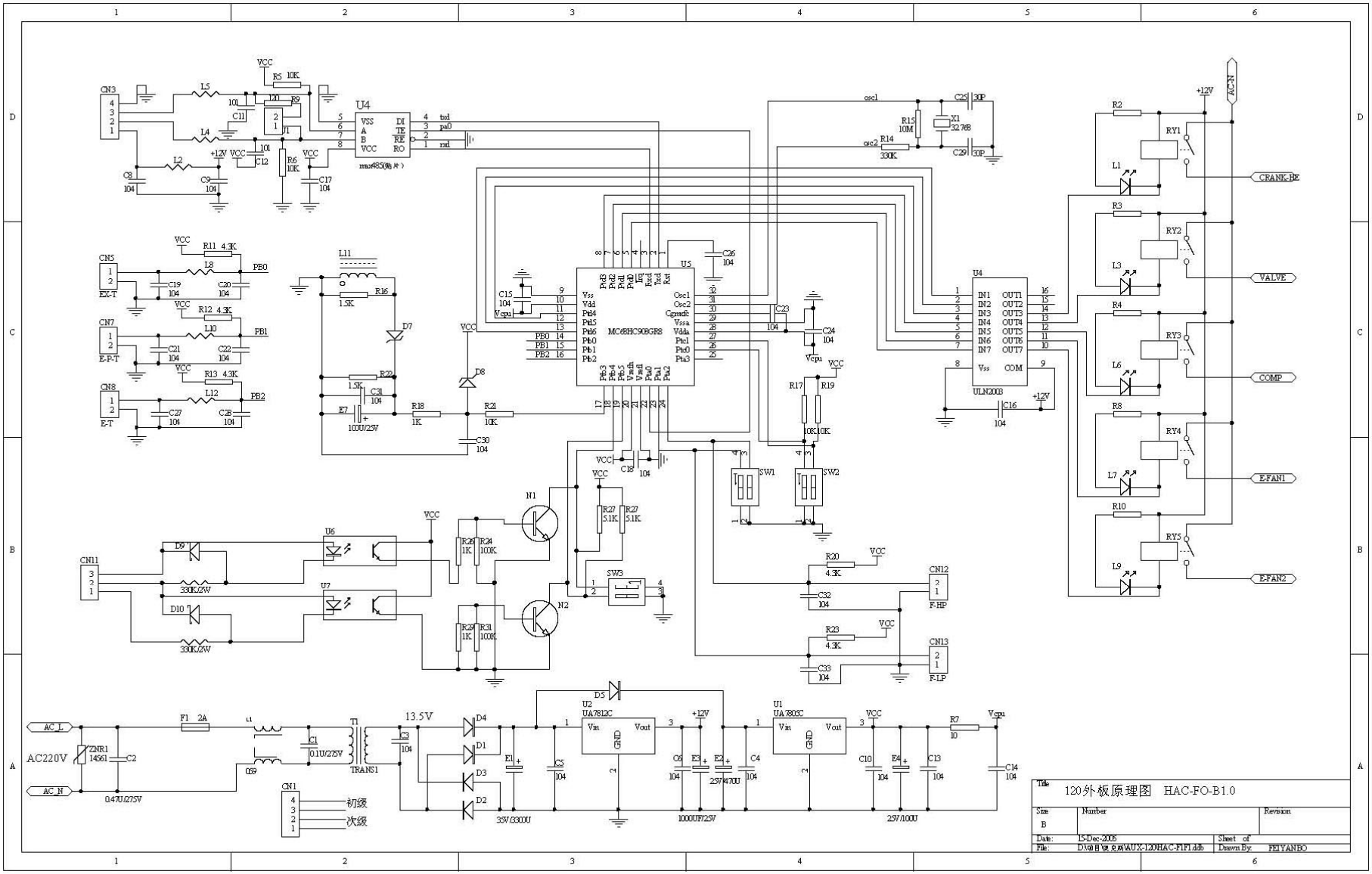
Switch estate	ON	OFF	Corresponding safeguard
on-off 1	Screen safeguard	safeguard	High press safeguard
on-off 2	screen safeguard	safeguard	Low press safeguard

6.3.2 Outdoor PCB Layout



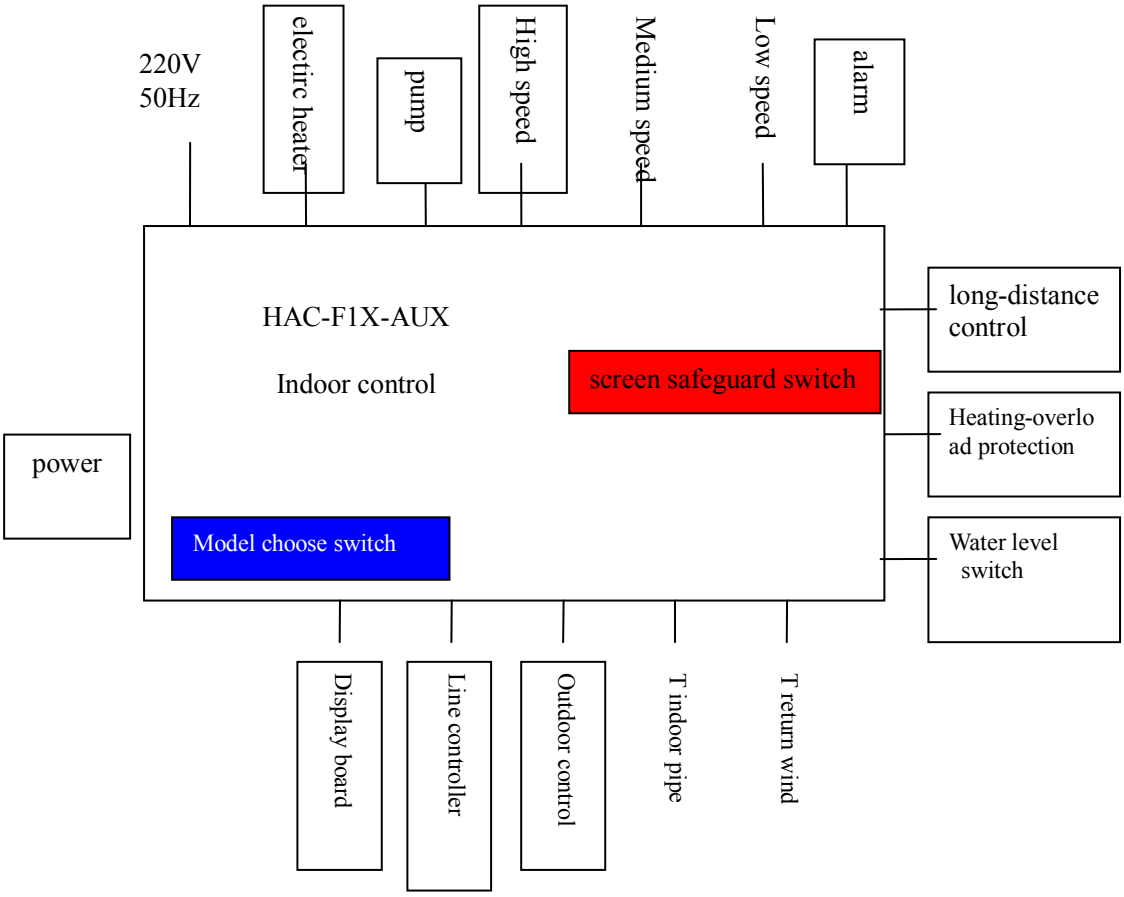


6.3.3 Outdoor PCB elements diagram



6.4 Indoor co ntrol Composition

The indoor controller inspection temperature objects of controller involves indoor return air temperature, indoor coil temperature and outdoor coil temperature, Control indoor fan and auxiliary electric heater.



6.4.1 Function set of indoor PCB

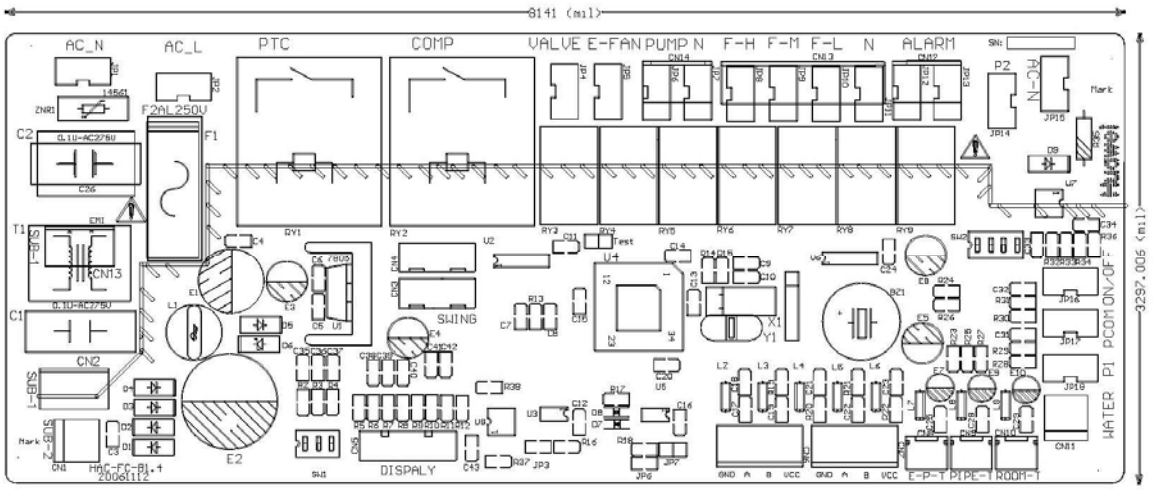
Indoor control function set is a blue three-digital dial code switch,the setting information is as follows.

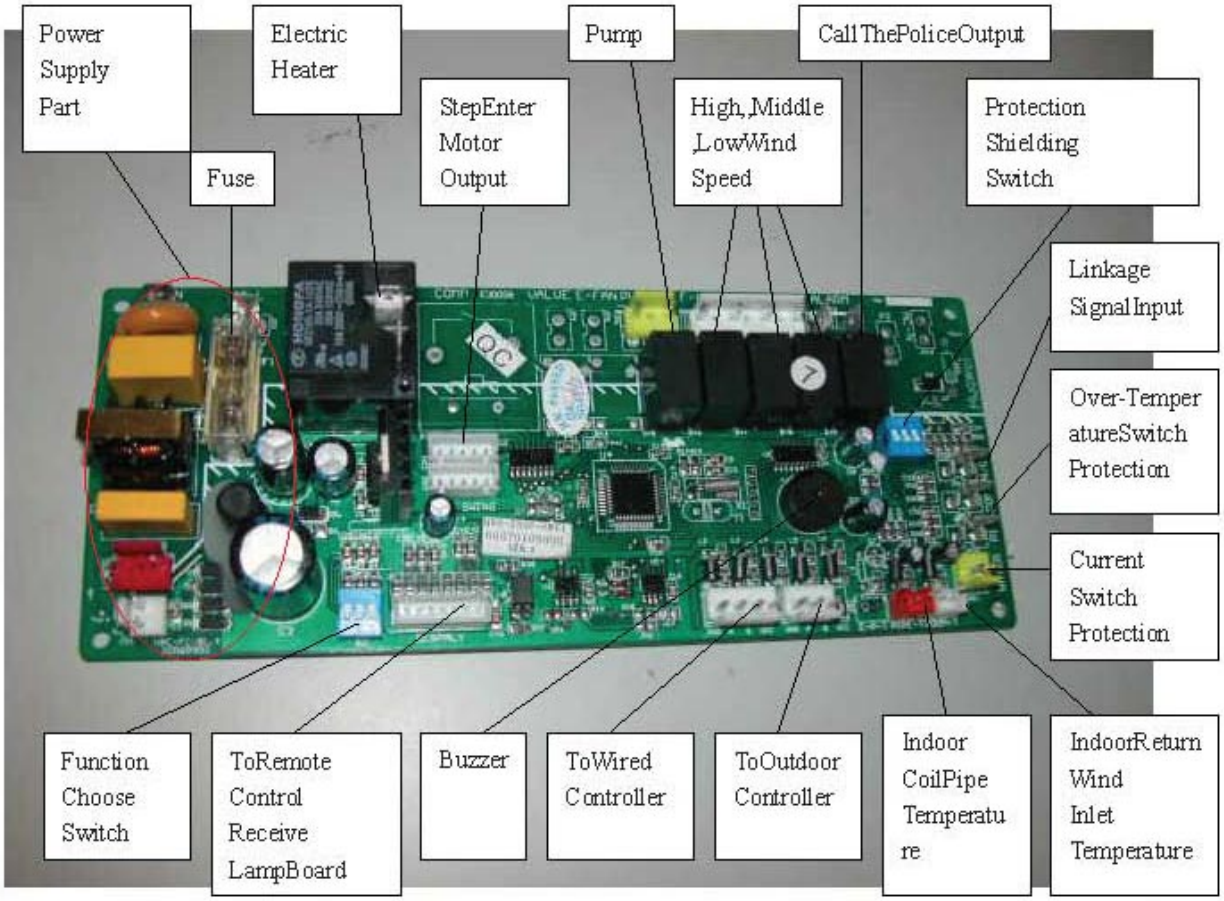
Switch 1	Switch 2	Switch 3	SA01	SA02	Function name	Remark
OFF	OFF	OFF	OFF	OFF	cooling only	Using line controller set the parameter SA01、SA02,default is heating pump
OFF	OFF	OFF	ON	ON	heating pump	

Indoor control screen safeguard switch is a red two location thumbwheel switch, the setting information is as follows.

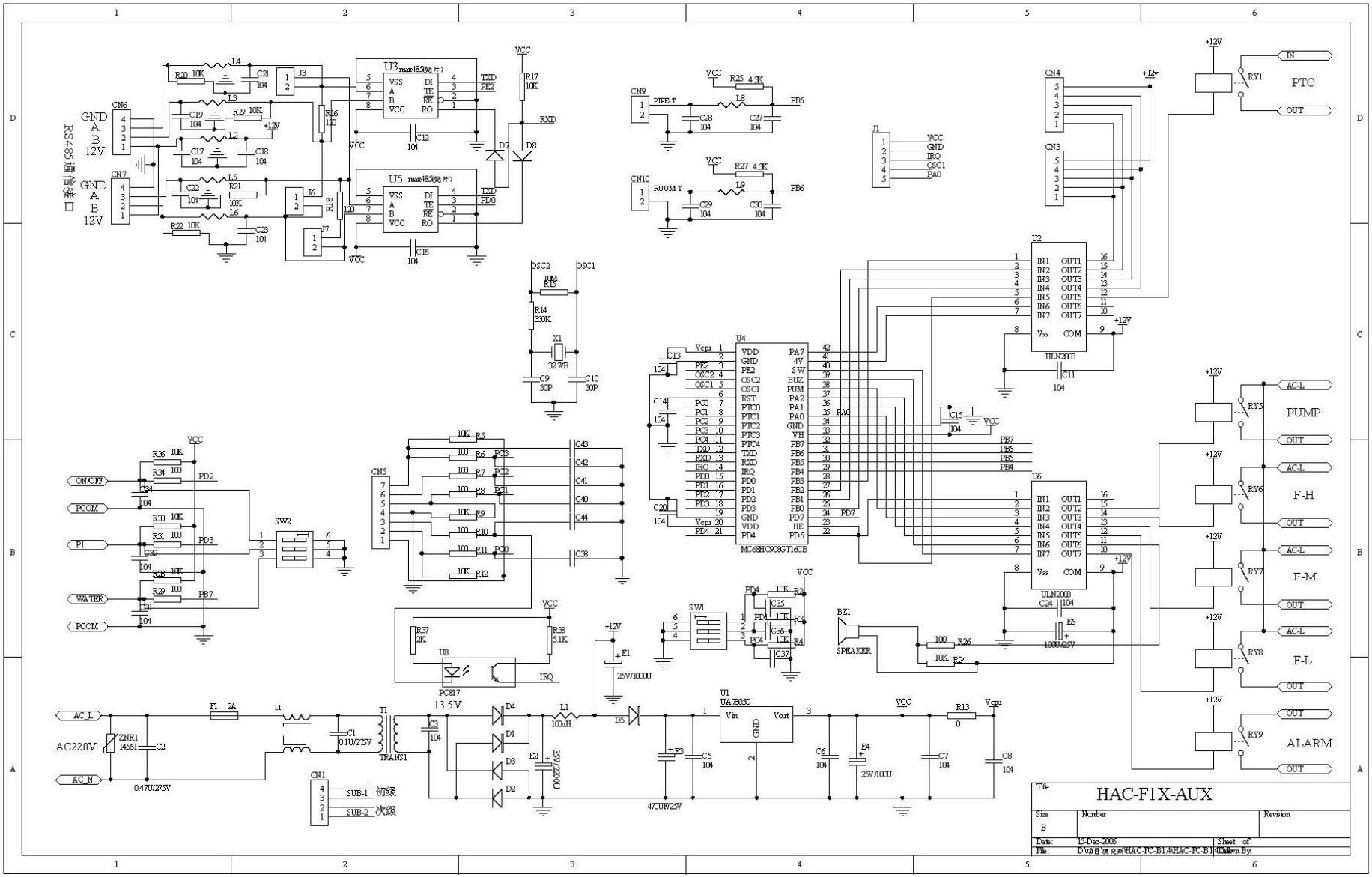
Switch estate	ON	OFF	Corresponding safeguard
Switch 1	Screen safeguard	safeguard	Water level switch
Switch 2	screen safeguard	safeguard	Heating-overload protection
Switch 3	screen safeguard	safeguard	long-distance control

6.4.2 Indoor PCB Layout



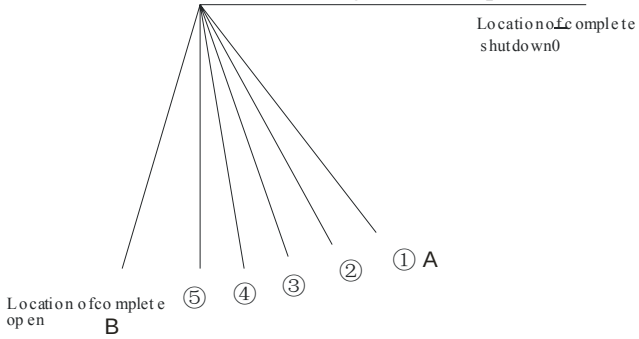


6.4.3 Indoor PCB elements diagram



6.4.4 Air Himper control of indoor unit

Air Himper motion of indoor unit should be executed by way of main controller driving two increment motors which motion is synchronized. Position schematic drawing of air damper is shown as following:



Air damper of indoor unit complete close position is 0^{o}. Meanwhile, air damper has 5 stable angle positions. While air damper in automatic swing status, air damper swing range from position1 to 5. swing range will be subject to parameter set value of 【SA12】、【SA13】、【SA15】、【HF08】

Model	A	B	SA15
Cassette	30	70	ON
Ceiling&Floor	3	11	OFF

6.5 Parameter set method

Controller is provided with many parameter sets, and line controller can inquire parameter contents.

The detailed operation of entering parameter set is:

English line controller: under shutdown status, press 【inquiry】for 5 seconds and hear “tick” sound from line controller, entering parameter set operation.

6.5.1 System function slection parameter

System function slection parameter has two opinions including “ON” and ”OFF” and change parameter status by pressing 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	ON	OFF
Function choose	SA01	**ON**	【SA01】=0FF,【SA02】= 0FF: cooling only 【SA01】=0N, 【SA02】= 0FF: cooling only+ electirc heater 【SA01】= 0FF，【SA02】=0N: heating pump 【SA01】=0N，【SA02】=0N: heating pump + electirc heater	
	SA02	**ON**		
Air velocity status ofindoor fan	SA03	**ON**	Select three-velocity air	Select single-velocity air
Unfreezing pattern	SA04	**ON**	Compressor operation of runreezing	Compressor gap of runreezing
Mode conversion selection	SA07	**ON**	Converse mode under standby, operation status	Cannot converse mode under operation status
Working state	SA08	**0FF**	Control incoming telegram，keeping running or OFF	Control incoming telegram，keeping OFF
Selecton of combination timing/cycle timing	SA09	**0FF**	Cycle timing (cycle operation every 24 hours)	Combination timing (once effective in 24 hours)
Telecontrol switch	SA10	**ON**	Check telecontrol switch	Not heck telecontrol switch
Swing direction selection	SA11①	**ON**	Operation clockwise	Operation conterclockwise
Swing operation pattern	SA12②	**0FF**	Operation subject to angle pattern	Operation subject to on/off pattern

①【SA11】Parameter set is the relative parameter to CASSETTE UNIT operation.

②【SA12】Parameter set is the relative parameter to CASSETTE UNIT operation

6.5.2Compensation parameter of temperature sensor

Compensation parameter of temperature sensor is regulated by way of 【temperature▲】and【temperature▼】. Continue regulation while reaching maximum or minimum value, "- -" occurs indicating cancel status. Under candel status, temperature may not be installed, and the operation and protection relatively should be canceled.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Return vent temperature	PC01①	0℃	-9℃	9℃	- -①	1℃
Indoor coil temperature	PC02	0℃	-9℃	9℃	- -	1℃
Outdoor coil temperature sensor	PC05	0℃	-9℃	9℃	- -	1℃
Exhaust temperature sensor	PC07	0℃	-9℃	9℃	- -	1℃

① While temperature set of return vent in cancel status, select indoor temperature sensor on line controller.

6.5.3 System operation temperature parameter

System operation temperature parameter is temperature set parameter relative to operation and regulated by way of 【temperature▲】and【temperature▼】

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Adjustment
Return difference temperature	SP01①	1℃	5℃	1℃	X①	1℃
Return difference temperature in auto mode	SP02	5℃	10℃	3℃	X①	1℃
Inner pipe temperature condition while electric heater on	SP03	46℃	60℃	40℃	- -	1℃
Inner pipe temperature condition while electric heater off	SP04	50℃	60℃	40℃	- -	1℃
Parameter of anti-cooling air 1	SP05	25℃	35℃	20℃		1℃
Parameter of anti-cooling air 2	SP06	35℃	40℃	30℃		1℃
Blow after heat parameter1	SP07	28℃	35℃	20℃		1℃
Blow after heat parameter 2	SP08	35℃	40℃	30℃		1℃

① Some cannot be set into cancel, 【- -】cancel status will not occur in parameter adjustment.

6.5.4 System operation time parameter

System operation time parameter is time set parameter relative to operation and regulated by way of 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Hiration of sample temperature check	SC01	3 seconds	60 seconds	0 second	- -	1 second
Max. Swing angle of swing vane	SC02①	46	100	10	- -	1
Min. swing angle of swing vane	SC03②	10	50	0	- -	1
Compressor start delay time after outer fan start	SC04	5 seconds	60 seconds	1 second		1 second
Outer fan off time after compressor delay off	SC05	5 seconds	60 seconds	1 second		1 second
Back light source light on time	SC06	10 seconds	60 seconds	3 seconds	- -	1 second
LCD light on time period of parameter, failure inquiry, etc.	SC07③	10 seconds	30 seconds	3 seconds		1 second
Automatic mode judge interval time	SC08④	10 minutes	30minutes	00minute	- -	1minute

①【SC03】Parameter set is the relative parameter to CASSETTE UNIT operation.
②【SC08】Parameter set is the relative parameter to CASSETTE UNIT operation.
③【SC06】set is cancel mode, back light souorce constant-light, if need close, press 【reset/dark screen】
④【SC08】set is cancel mode, no automatic mode.

6.5.5 Protection temperature parameter

Protection temperature parameter is temperature set parameter relative to failure inspect judge and regulated by way of 【temperature▲】and【temperature▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Cold generation antifrost protection	EP01①	-2℃	10℃	-5℃	- -	1℃
Cold generation anti-overload protection	EP02②	60℃	80℃	51℃	- -	1℃
Heat generation over temperature protection	EP04②	66℃	80℃	45℃	- -	1℃
Over current protection	EP06	16℃	50℃	1℃		1℃
Exhaust temperature protection(old)	EP08	20℃	50℃	-19℃		1℃
Exhaust temperature protection(new)		120℃	150℃	80℃		1℃

While ①、②、③【EP01】、【EP02】、【EP04】set is【- -】cancel mode , relative protection function cancel.

6.5.6 Protection time parameter

Protection time parameter is time set parameter relative to failure inspect judge and regulated by way of 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Compressor start for protection	EC01	3 minutes	10 minutes	1 minute		1 minute
Compressor operation satisfying time	EC02	3 minutes	10 minutes	1 minute		1 minute
Max. Time of anti-cooling air	EC03	15 seconds	120 seconds	0second	- -	1second
Max. Delay of blow after heat	EC04	15 seconds	120 seconds	0second	- -	1second
Protection inspection time of shielding outer unit	EC05	2 minutes	5 minutes	0 minute		1 minute
Hiration of protection condition	EC06	3 seconds	10 seconds	0second		1second
Switch off time of water lift pump	EC07①	30 seconds	60 seconds	1second		1 second

①【EC07】Parameter set is the relative parameter to CASSETTE UNIT operation.

6.5.7 Unfreezing parameter

Unfreezing parameter involves temperature and time parameter entering/exit unfreezing. Temperature parameter can be regulated by 【temperature▲】and【temperature▼】, and time parameter can be regulated by 【time▲】and【time▼】.

Parameter name	Unit No.	Ex-factory set	Min. value	Max. Value	Cancel	Potential difference
Outer pipe temperature condition entering unfreezing time	HF01①	3℃	10℃	-10℃	- -	1℃
Inner pipe-return air temperature difference condition entering unfreezing	HF02②	- -	10℃	4℃	- -	1℃
Outdoor coil temperature condition entering unfreezing	HF03③	-8℃	0℃	-10℃	- -	1℃
Outdoor coil temperature condition exit unfreezing	HF04④	16℃	20℃	5℃	- -	1℃
Compressor accumulation time of entering unfreezing	HF05	30 minutes	90 minutes	20 minutes		1minute
Max. Unfreezing time	HF06	8 minutes	20minutes	3 minutes		1minute
Each cycle operation velocity of increment motor	HF08⑤	20 seconds	50 seconds	10 seconds		1 second

①【HF01】Set is cancel, accumulation compressor operation time ignoring outer pipe temperature condition.

②【HF02】Set is cancel, unfreezing judge subject to 【HF03】 outer pipe temperature condition.
③【HF03】Set is cancel,unfreezing judge subject to 【HF03】 temperature difference between inner pipe temperature and vent temperature.
④【HF04】Set is cancel, unfreezing subject to 【HF06】condition and timing exit.
⑤【HF08】Parameter set is the relative parameter to air output all-direction card-unit operation.

7 Remote controller and Line controller

User control the air conditioner by way of remote controller or line controller, and remote controller and line controller could be used as a coordinate way:

7.1 Only line controller

Only one line controller is applied in system that executes the display of air conditioner operation status and the air conditioner operation, and the line controller should be connected with main controller by four-core communication line.

7.2 Only remote controller

Main controller connected with only one display board that receives control signal from remote control, and at same time display system operation status by light pipe.

7.3 Line controller + remote controller

If the configuration selected is provided with line controller of remote control receiver, use remote control to tele-control air conditioner operation at the same time of using line controller.

In addition, line controller and display board can be used simultaneously and no interference each other.

7.4 Display lamp board

7.4.1 Display board A

Display board A of controller is provided with function of displaying air conditioner operation status and receiving telecontrol signal. In addition, there is two function buttons on display board: under without remote control, make air conditioner automatic operation or force cold cold generation operation.

There is two function buttons on display board, which indicates that:

①Key SW1-AUTO

Under controller operation, press this key and controller will enter shutdown status at once; under controller shutdown, press this key, control will enter aotomatic mode operation at once.

②Key SW2-FORCED

Under any status of controller, press this key and Key SW1-AUTO simultaneity, controller will enter force cooling generation mode operation.

③Display function

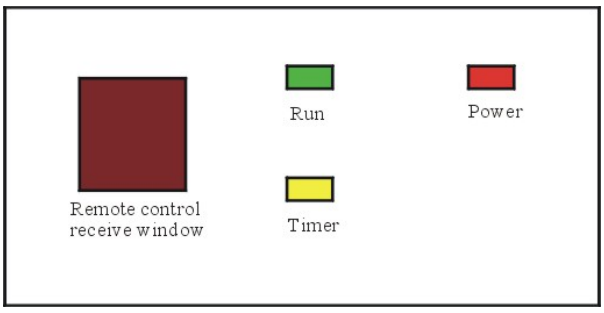
Display involves three different colors LBDs, which indicates that:

★Red indicator light: Light on indicates power supply on.

★Yellow indicator light: Light on indicates air conditioner operates under timing status or repose status.

★Green indicator light: Light on indicates air conditioner is in operation.

7.4.2 Display board B



Display function:

Display involves three different colors LBDs, which indicates that:

★Red indicator light: Light on indicates power supply on.

★Yellow indicator light: Light on indicates air conditioner operates under timing status or repose status.

★Green indicator light: Light on indicates air conditioner is in operation.

8 Control philosophy

8.1 Automatic mode

Entering aotomatic mode by some ways as followed: press line controller 【mode】for 2 seconds and enter; set into automatic mode by remote control; initial set temperature of automatic mode is 24℃, initial set air velocity is automatic air.

8.1.1 Judge and operation condition of automatic mode

While first entering automatic operation mode, select operation mode subject to the following conditions:

T return air temperature≥T set temperature-【SP01】 select cold generation operation mode

T return air temperature≤T set temperature+【SP01】 select hot generation operation mode

After entering automatic operation mode, with the change of indoor return air temperaturem operation mode can switch between cold and hot generation mode.

8.1.2 If system operates in cold generation currently, compressor off while reaching shutdown temperature;

A、After shutdown time≥3 minutes, meantime,if T return air temperature≤T set temperature +【SP02】, enter hot generation mode operation at once.

B、While shutdown time＞【SC08】set value,check temperature again, meanwhile, if T return air temperature≤T set temperature +3℃, enter hot generation mode operation, otherwise still in cold generation operation.

C、while reaching compressor shutdown temperature, compressor is off and indoor fan delay off.

8.1.3 If system operates in hot generation currently, compressor off while reaching shutdown temperature;

A、After shutdown time≥3 minutes, meanwhile, if T return air temperature≥T set temperature -【SP02】, enter cold generation mode operation at once.

B、While shutdown time＞【SC08】set value, check temperature again, meanwhile, if T return air temperature≥ T set temperature -3℃, enter cold generation mode operation, otherwise still in hot generation operation.

8.1.4 Failure protection under automatic mode

Failure protection under automatic mode is same to failure protection under cold/hot generation mode

8.2 Cooling mode

8.2.1 Entering cold generation mode by some ways as followed

press line controller【mode】for 2 seconds and enter; Set into a cold generation mode by remote control; under automatic mode, satisfying automatic cold generation condition and enter. initial set temperature of automatic mode is 27℃, initial set air velocity is automatic air.

8.2.2 Switch on flow for cold generation work

While controller executes switch on order of line controller or remote control, or reaching switch on at timing swith on time, or tele-distance control switch under off status, controller will switch on subject to the following flow:

A、Buzzer sound indicates switching on, at same time, operation iindicator lamp on line controller or remote control lights on.

B、Indoor fan starts and air damper opening and enters standby status;

C、While satisfying compressor start condition, i.e. $T_{return\ air}$≥T_{set}+【SP01】and compressor shutdown time ≥【EC01】, outdoor fan starts ahead of time; after outdoor fan starts 【SC04】, compressor starts, if one of conditions that dissatisfying for temperatyre and time conditions, keeps standby status.

8.2.3 Shutdown flow of cooling generation work

While controller executes shutdown order from line controller or remote control, or reaching shutdown in pointed time, or shutdown Hie to failure, or switch in off status of telecontrol switch, controller will shut down subject to the following flow:

A、compressor off;

B、outdoor fan delays 【SC05】time off;

C、outdoor fan delays 30 seconds off;

D、air damper off;

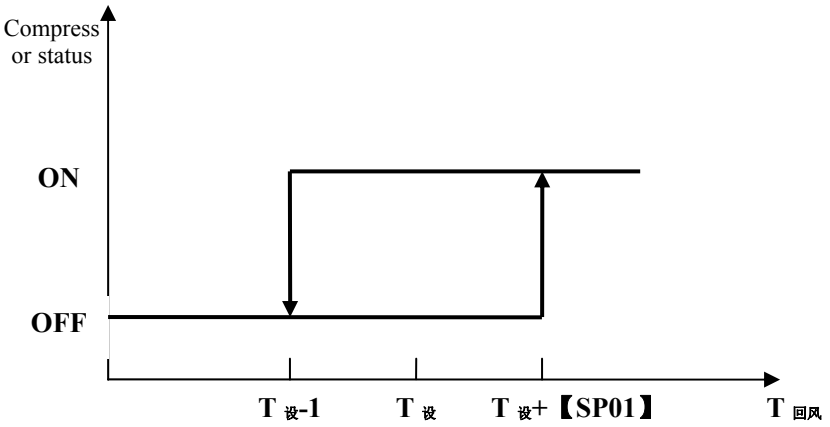
E、water lift pump 300 seconds off;

8.2.4 Cold generation temperature control process

Hiring cooling generation, indoor controller issues the orders to control compressor on/off via outdoor controller subject to return vent temperature and set temperature. Set range of controller temperature is 16℃--30℃.

While return vent temperature $T_{return\ air}$≥T_{set}+【SP01】and compressor satisfying start protection time ≥【EC01】, compressor switches on for cooling generation. If return air temperature falls and $T_{return\ air}$<$T_{set,}$ and compressor satisfying operation protection time ≥【EC02】, compressor is in shutdown status; while return vent temperature T_{set}+【SP01】≥$T_{return\ air}$>$T_{set,}$ compressor keeps unchaged status, which a set return diffefrence temperature

【SP01】to avoid compressor on/off frequently.



F4.1 Schematic Drawing of Compressor Operation under Cold Generation Mode

Examples is listed as followed to describe cold generation work condition of various set temperature points

Set temperatureT_{set}	Return difference temperature【SP01】	Compressor operation	Compressor holding	Compressor shutdown
20℃	1℃	$T_{return\ air}$≥21℃	19℃<$T_{return\ air}$<21℃	$T_{return\ air}$≤19℃
25℃	1℃	$T_{return\ air}$≥26℃	24℃<$T_{return\ air}$<26℃	$T_{return\ air}$≤24℃
30℃	1℃	$T_{return\ air}$≥31℃	29℃<$T_{return\ air}$<31℃	$T_{return\ air}$≤29℃
20℃	2℃	$T_{return\ air}$≥22℃	19℃<$T_{return\ air}$<22℃	$T_{return\ air}$≤19℃
25℃	2℃	$T_{return\ air}$≥27℃	24℃<$T_{return\ air}$<27℃	$T_{return\ air}$≤24℃
30℃	2℃	$T_{return\ air}$≥32℃	29℃<$T_{return\ air}$<32℃	$T_{return\ air}$≤29℃

8.2.5 Indoor fan operation rule while cooling generation work

A、Operation rule of automatic air velocity

While cooling generation, indoor fan will operate subject to set air velocity; meanwhile, automatic air velocity operation is determined subject to return vent temperature and set temperature. Table 4.4 determines operation rules of automatic air.

Temperature conditin	Automatic air velocity
T return air≥T set+3℃	Output high level air
T set+1℃≤T return air < T set+3℃	Output medium level air
T set-1℃<T return air < T set+1℃	Output low level air

After determination of automatic air velocity, judging again need 30 seconds operation at least in case indoor fan air velocity twittering.

B、Air velocity rules under failure protection

While failure protection occurs as shown followed under cooling generation, air velocity changes:

Failure reason	Failure code	Set or automatic high level air	Set or automatic medium level air	Set or automatic low level air
Anti-overload under cold generation	Po04	Low level air	Low level air	Low level air

After failure recovers to normal conditon, air velocity will recover to set air velocity accordingly.

8.2.6 Air damper motion rule under cooling generation mode

A、Indoor control board drives the increment motor to execute swing of the air damper. Air damper motion has 7 types modes: swing stop, automatic swing, air damper fixing position 1、2、3、4、5.

B、Air damper close

While controller executes shutdown order or just energizes, air damper will close subject to maximum angle so as to ensure complete close of air damper at any angle.

C、Air damper open

While controller executes switch on order, ai damper opens swiftly to pointed position.

D、Air damper automatic swing

While air damper switch over into automatic swing from other status, move to position1 firstly and then swing etween 1 to 5 with the swing cycle 22 seconds.

E、Anti-drop air damper

Hiring cooling generation or dehumidification, if air damper stay at position4 or 5 for a long time, after 1 hour blowing, air damper will switch over into position 1 horizontal air supply automatically to avoid drop.

F、Re-orientation of air damper

Affected by air velocity or machinery factor, air damper will raise incorrect status after long time swing, thus after contious 10 hours operation, air damper will close to complete-close position automatically and then operate again.

8.2.7 Operation rule of water lift pump

To provent indoor unit condesation water spillover and damage of indoor uint or indoor decoration, condesation water should be drained via water lift pump. Operation process of water lift pump is determined by water level status.

After outdoor compressor starts, water lift pump operates under cooling generation or dehunididfucation status. After compressor stop (or off), water lift pump motor operates for 300 seconds and stops. Under anti-freezing, pump should not stop, after exit anti-freezing, water lift pump will operate subject to mormal condition.

Hiring cooling generation or dehumidification, while water level sensor disconnects (water full) and disconnects continuously 【EC07】seconds, which is judged as water pump system failure, and drainage pump continue to operate, siwching off compressor, and displaying 【Po12】failure on line controller. After that failure is eliminated, unit operates in normal condition again (compressor here-minutes protection in priority). If failure is not eliminated 30 minutes later, water pump stops and unit enters shutdown status and failure code 【Po12】displays on the line controller.

Under first energization, after water lift pump operates for 180 seconds, judge water level sensor status.

8.2.8 Failure protection under cooling generation

Under cooling generation, at the same time of operation, controller will inspect failure condition possibly raised and execute relative treatment accordingly.

★Anti-freezing protection under cooling generation（failure code【Po03】）

Prerequisite entering anti-freezing protection under cooling generation:

① Compressor continuous operation time≥3 minutes;

② indoor coil temperature$T_{inner\ pipe}$<【EP01】and last 2 minutes.

After enter anti-freezing protection under cooling generation, 【Po03】failure code displays on line controller, and outer fan and compressor shut down for protection.

Exit condition for anti-freezing protection under cooling generation:

① indoor coil temperature$T_{inner\ pipe}$≥【EP01】+16℃. Failure code disappears;

② After satisfying shutdown protection time, compressor recovers to cooling generation.

★ Anti-overload protection under cooling generation（failure code【Po04】）

Insufficient cooling of outdoor unit will result in anti-overload protection under cooling generation. While outdoor coil temperature$T_{outer\ pipe}$≥【EP02】－5℃, indoor fan will force entering low air velocity operation; after that, While outdoor coil temperature$T_{outer\ pipe}$ $T_{外管}$≤【EP02】-10, inner fan will recover to set air velocity.

Prerequisite entering anti-overload protection under cooling generation:

① Compressor in operation;

② Outdoor coil temperature$T_{outer\ pipe}$≥【EP02】.

After enter anti-overload protection under cooling generation, compressor stops and indoor fan forces entering low velocity operation, and failure code 【Po04】dispalying on line controller, meanwhile, outdoor fan keeps operation to continue cooling till satisy exit protection condition.

① Outdoor coil temperature$T_{inner\ pipe}$≤【EP02】－10℃. Failure code disappears;
② After satisfying shutdown protection time, compressor recovers to cooling generation.

★Failure protection of temperature sensor（failure code 【Po01】、【Po06】、【Po07】）
①While temperature sensor of return vent damage, failure code【Po04】dispalys and compressor operates in limited time and continues operation 50 minutes and shutdown automatically. If pressing key of switch on, operates in limited time again.
②While temperature sensor of indoor coil damage, failure code【Po06】dispalys and compressor operates in limited time and continues operation 50 minutes and shutdown automatically. If pressing key of switch on, operates in limited time again, and cancel the function of anti-freezing protection under cooling generation and insufficient coolant of cooling generation.
③While temperature sensor of outdoor coil damage, failure code 【Po07】dispalys and cancels anti-overload protection under cooling generation

8.3 Dehumidification mode

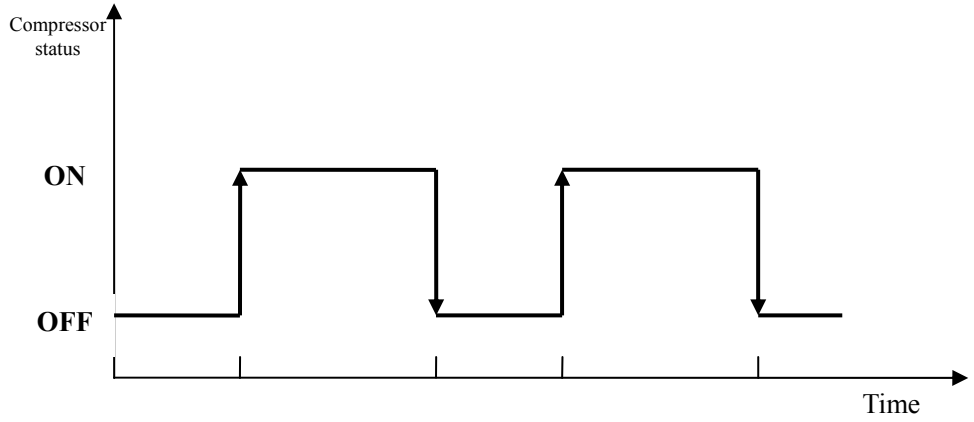
8.3.1 Pattern of entering dehumidification mode

Several ways of entering dehumidification mode as followed: press line controller【mode】for 2 seconds and set into dehumidification mode by remote control and enter; Or, enter under telecontrol switch off status.
Initial temperature of dehumidification mode is 22℃, and initial set air velocity is low-level air.

8.3.2 Work process of dehumidification mode

Under dehumidification mode, temperature set range of controller is 16℃--30℃. After entering dehumidification mode, comparing return air temperature and set temperature, unit is provided with 3 work modes:

★ While $T_{return\ air}>T_{set}+2℃$,compressor operates under cooling generation and indoor fan executes low-level operation.
★ While $T_{set}-2℃\le T_{return\ air}\le T_{set}+2℃$,compressor operates subject to the interval of opeation 6 minutes and stop 4 minutes, and indoor fan executes low-level operation.
★ While $T_{return\ air}<T_{set}-2℃$,compressor stops and indoor fan executes low-level operation.



F4.2 Schematic Drawing of Interval Dehumidification Operation

8.3.3 Failure protection under dehumidification mode

While operate in dehumidification mode, failure protection is same to cooling generation mode.

8.4 Ventilation mode

Several ways of entering ventilation mode as followed: press line controller 【mode】for 2 seconds and set into ventilation mode by remote control and enter; Or, enter under telecontrol switch off status.
Under ventilation mode, only indoor fan operates. Air velocity of indoor fan has only 3 modes including high-level, medium-level and low-level.

8.5 Heat generation mode

8.5.1 Pattern of entering heat generation mode

Several ways of entering heat generation mode as followed: press line controller 【mode】for 2 seconds and set into heat generation mode by remote control and enter; Or, enter after satisfying automatic heat generation

condition under automatic mode.
Initial temperature of heat generation mode is 20℃, and initial set air velocity is automatic air.

8.5.2 Switch on flow of heat generation

Several ways of entering heat generation mode as followed: press line controller【mode】for 2 seconds and set into heat generation mode by remote control and enter; Or, enter by way of telephone telecontrol; or enter under telecontrol switch off; enter after satisfying automatic heat generation condition under automatic mode.
Initial temperature of heat generation mode is 20℃.

8.5.3 Switch on flow of heat generation

①signle cooling+heat energy/electric heater（dial code100）

★ Indocator lamp from red to green, and green receiving indicator lamp lights on remote control display board lights on, and enter operation status.

★ Compearing set temperature and indoor return vent temperature, controller should satisfy heat generation switch on condition, and indoor fan starts.

★ After indoor fan starts 5 seconds, hot water solenoid valve or electric heater start.

② Hot pump type（dial switch code 010）

★ Operation indicator lamp lights and buzzer sounds on on line controller or telecontrol receiver, which indicates switch on;

★ Four-way diverting valve open and enter standby status;

★ If satisfying compressor start condition, i.e. Temperature conditon $T_{return\ air} \leq T_{set}$-【SP01】and compressor shutdown time ≥【EC01】, outdoor fan starts ahead of time; if one of conditions of temperature and time condition dissatisfy, keeps standby status continuously. After compressor starts, except failure occurs, otherwise shutdown must after operates 【EC02】time.

★ After outdoor fan starts 【SC04】time, compressor starts;

★ After compressor starts, start indoor fan subject to cooling air condition.

③ hot pump＋auxiliary electric heater type（dial switch code 110）

★Operation indicator lamp lights and buzzer sounds on on line controller or telecontrol receiver, which indicates switch on;

★ Four-way diverting valve open and enter standby status;

★ If satisfying compressor start condition, i.e. Temperature conditon $T_{return\ air} \leq T_{set}$-【SP01】and compressor shutdown time ≥【EC01】, outdoor fan starts ahead of time; if one of conditions of temperature and time condition dissatisfy, keeps standby status continuously. After compressor starts, except failure occurs, otherwise shutdown must after operates 【EC02】time.

★ After outdoor fan starts 【SC04】time, compressor starts;

★ After compressor starts, start indoor fan subject to cooling air condition.

★ After indoor fan starts and satisfying start condition of auxiliary electric heater, auxiliary heater starts.

④ Hot pump＋hot energy type（dial switch code 001）

★ Under hot pump mode, switch on subject to the following flow:

★Operation indicator lamp lights and buzzer sounds on on line controller or telecontrol receiver, which indicates switch on;

★Four-way diverting valve open and enter standby status;

★If satisfying compressor start condition, i.e. Temperature conditon $T_{return\ air} \leq T_{set}$-【SP01】and compressor shutdown time ≥【EC01】, outdoor fan starts ahead of time; if one of conditions of temperature and time condition dissatisfy, keeps standby status continuously. After compressor starts, except failure occurs, otherwise shutdown must after operates 【EC02】time.

★ After outdoor fan starts 【SC04】time, compressor starts;

★Under hot energy mode, switch on subject to the following flow.
After press “heat energy” in line contrller or “heat energy” in remote control, “hot water” indicator lamp in LCD of line controller lights on, heat generation sign【 】in LCD of line controller turns in to flicker. Compressor, outdoor fan, dour-way valve should shut down subject to shutdown flow and heat energy starts.

★Indocator lamp from red to green, and green receiving indicator lamp lights on remote control display board lights on, and enter operation status.

★Compearing set temperature and indoor return vent temperature, controller should satisfy heat generation switch on condition, and indoor fan starts.

★ After indoor fan starts 5 seconds, hot water solenoid valve or electric heater start.

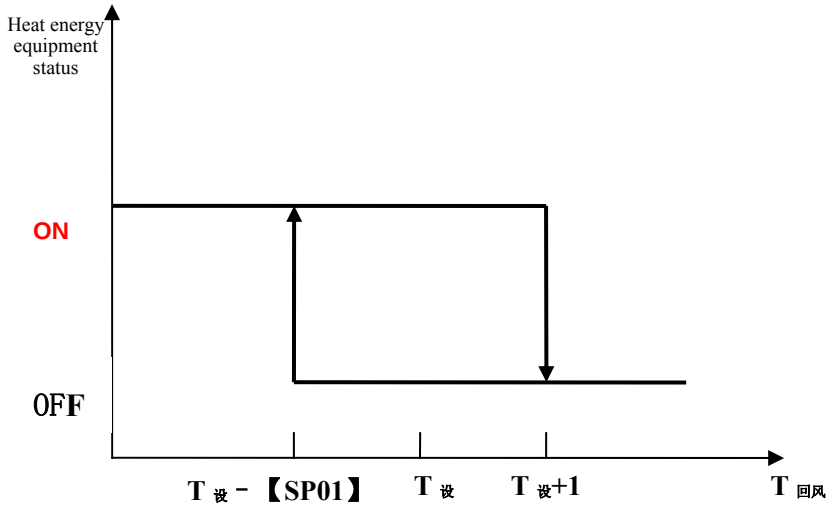
8.5.4 Shutdown flow of heat generation operation

While controller executes shutdown order from line controller or remote control, or reaching shutdown in pointed time, or shutdown Hie to failure, or switch in off status of telecontrol switch, controller will shut down subject to the following flow:

① Single cooling+heat energy/electric heater type（dial switch code100）
★Heat energy equipment or electric heater off.
★Indoor fan off subject to blow of after heat condition.
② Hot pump type（dial switch code 101）
★Compressor off.
★Four-way valve delay 30 seconds and close.
★Outdoor fan delay 【SC05】time and close.
★Indoor fan off subject to blow of after heat condition.
③ Hot pump＋auxiliary electric heater type（dial switch code 110）
★Electric heater off, compressor off after 5 deconds.
★Four-way valve delay 30 seconds and close.
★Outdoor fan delay 【SC05】time and close.
★Iindoor fan off subject to blow of after heat condition.
④ Hot pump＋heat energy type（dial switch code 001）
★Under hot pump mode, execute shutdown subject to the following flow:
★Compressor off.
★Outdoor fan delay 【SC05】time and close.
★Indoor fan off subject to blow of after heat condition.
★Four-way valve delay 60 seconds and close.
★Under hot energy mode, execute shutdown subject to the following flow:
★Heat energy equipment off.
★Indoor fan off subject to blow of after heat condition.

8.5.5 Temperature control process under heat generation

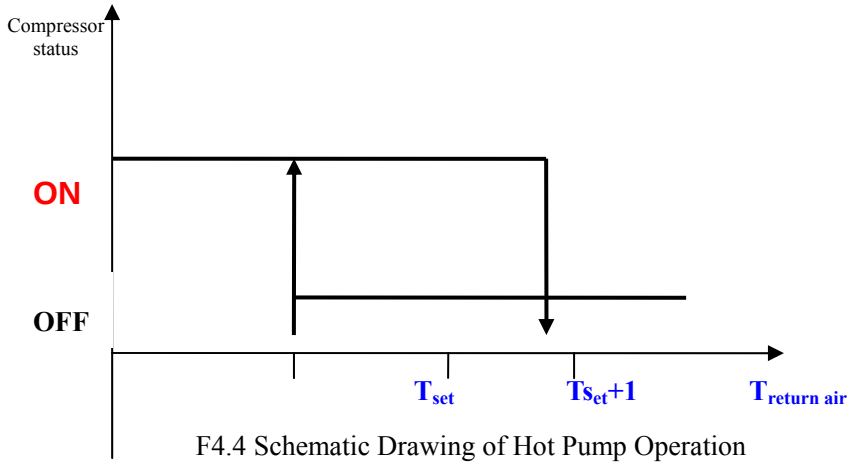
Hiring heat generation, indoor controller to control on/off of compressor of outdoor controller subject to return air temperature and set temperature, and temperature set range of line controller is 16℃--30℃.
★Single cold+heat energy/electric heater type（dial switch code 001）
While controller set is single cooling+ heat energy/electric heater type, and indoor temperature$T_{return\ air} \leq T_{set}$-【SP01】,electric heater starts for heat generation.if return vent temperature raises, $T_{return\ air} \geq T_{set}+1$℃,hot water solenoid valve or electric heater close and enter standby status. While return air temperature under T_{set}-【SP01】< $T_{return\ air} \leq T_{set}+1$℃, heat energy equipment keeps oringinal status, which can keep a set return difference temperature and avoid on/off frequently.



F4.3 Schematic Drawing of Single Cooling+Heat Energy Equipment Operation

★Hot pump type（dial switch code 010）
While controller set is **T_{set}–【SP0】** hot pump type, and indoor temperature$T_{return\ air} \leq T_{set}$-【SP01】,compressor starts and indoor fan starts subject to anti-cooling air condition. If return vent temperature raises, T_{return}

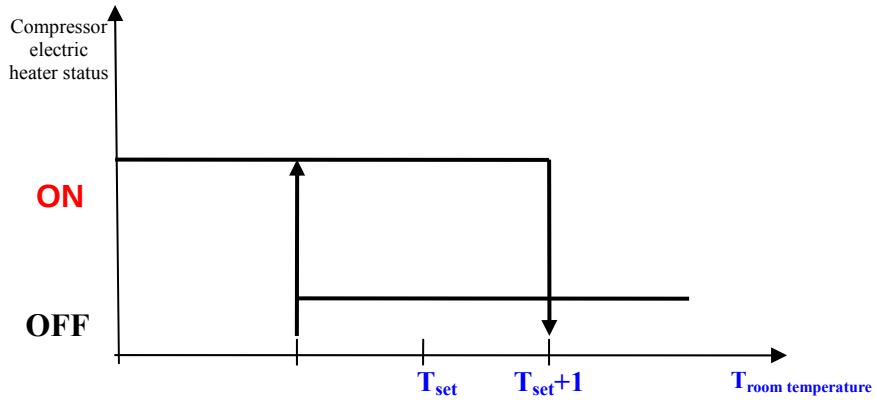
$_{air}$≥T_{set}+1℃, compressor close and indoor fan close subject to blowing after heat condition and enter standby status. While outdoor fan delay close for【SC05】time, and return air temperature under T_{set}-【SP01】< T_{return} $_{air}$≤T_{set}+1℃, heat energy equipment keeps oringinal status, which can keep a set return difference temperature and avoid on/off frequently.



F4.4 Schematic Drawing of Hot Pump Operation

★ Hot pump＋auxiliary electric heater type（dial switch code 110）

While controller set is hot pump＋auxiliary electric heater type, and indoor temperature$T_{return\ air}$≤T_{set}-【SP01】,compressor starts and indoor fan starts subject to anti-cooling air condition, and electric heater starts. If return vent temperature raises, $T_{return\ air}$≥T_{set}+1℃, compressor close and indoor fan close subject to blowing after heat condition and enter standby status. While outdoor fan delay close for【SC05】time, and return air temperature under T_{set}-【SP01】< $T_{return\ air}$≤T_{set}+1℃, heat energy equipment keeps oringinal status, which can keep a set return difference temperature and avoid on/off frequently.

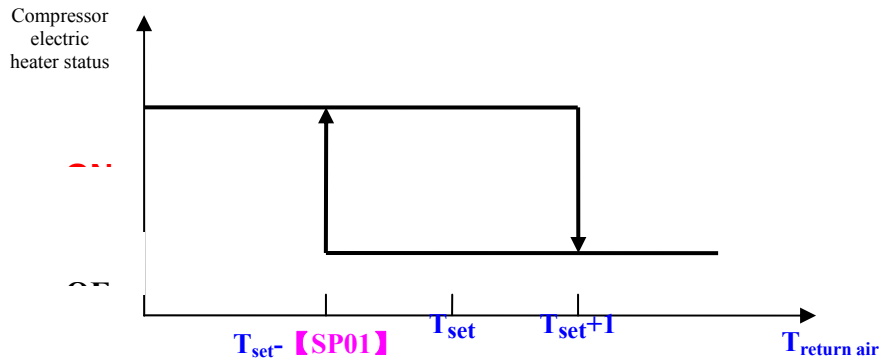


F4.5 Schematic Drawing of Hot Pump +Electric Heater Operation

★Hot pump＋heat energy type（dial switch code 001）

8.5.5.1 While controller set is hot pump type, and indoor temperature$T_{return\ air}$≤T_{set}-【SP01】,compressor starts and indoor fan starts subject to anti-cooling air condition. If return vent temperature raises, T_{return} $_{air}$≥T_{set}+1℃,compressor close and indoor fan close subject to blowing after heat condition and enter standby status. While outdoor fan delay close for【SC05】time, and return air temperature under T_{set}-【SP01】< T_{return} $_{air}$≤T_{set}+1℃, compressor keeps oringinal status, which can keep a set return difference temperature and avoid on/off frequently.

8.5.5.2 While controller set is hot energy type, and indoor temperature$T_{return\ air}$≤T_{set}-【SP01】, hot energy equipment starts. If return vent temperature raises, $T_{return\ air}$≥T_{set}+1℃, hot energy equipment close and indoor fan close subject to blowing after heat condition and enter standby status. While outdoor fan delay close for【SC05】time, and return air temperature under T_{set}-【SP01】< $T_{return\ air}$≤T_{set}+1℃, hot energy equipment keeps oringinal status, which can keep a set return difference temperature and avoid on/off frequently.



F4.6 Schematic Drawing of Hot Pump +Heat Energy Equipment Operation

Examples are given to describe heat generation work condition of various set temperature points in the table as followed:

Set temperatureT_{set}	Return difference temperature【SP01】	Compressor operation	Compressor holding	Compressor shutdown
20℃	1℃	$T_{return\ air}$≤19℃	19℃<$T_{return\ air}$<21℃	$T_{return\ air}$≥21℃
25℃	1℃	$T_{return\ air}$≤24℃	24℃<$T_{return\ air}$<26℃	$T_{return\ air}$≥26℃
30℃	1℃	$T_{return\ air}$≤29℃	29℃<$T_{return\ air}$<31℃	$T_{return\ air}$≥31℃
20℃	2℃	$T_{return\ air}$≤18℃	18℃<$T_{return\ air}$<21℃	$T_{return\ air}$≥21℃
25℃	2℃	$T_{return\ air}$≤23℃	23℃<$T_{return\ air}$<26℃	$T_{return\ air}$≥26℃
30℃	2℃	$T_{return\ air}$≤28℃	28℃<$T_{return\ air}$<31℃	$T_{return\ air}$≥31℃

8.5.6 Indoor fan operation rules under heat generation

① Operation rules for automatic air velocity

Under heat generation, indoor fan operates subject to set air velocity. Meanwhile, automatic air velocity operation is determined subject to return air temperature and set temperature. Table 4.7 determines of automatic air operation rule.

Temperature condition of return vent	Automatic air velocity
$T_{return\ air}$≤T_{set}-3℃	Output high level air
$T_{设}$-3℃≤$T_{return\ air}$≤T_{set}-1℃	Output medium level air
$T_{return\ air}$< T_{set}-1℃	Output low level air

After determineaiton of automatic air velocity, judge again at least 30 seconds to prevent indoor fan air velocity quivering.

② Indoor fan anti-cooling air under heat generation

While under hot generation mode, compressor starts performs anti-cooling air protection subject to indoor coil temperature. Maximum time of anti-cooling air is【EC03】second, and the detailed temperature condition is as followed:

Indoor coil temperature condition	Indoor air velocity	Line controller display
$T_{内盘}$≤【SP05】	Fan stop	Velocity flicker indicating anti-cooling air
【SP05】<$T_{内盘}$≤【SP06】	Output low-level air	Display set air velocity
$T_{内盘}$>【SP06】	Output set air	Display set air velocity

If the time of anti-cooling air beyond maximum time【EC03】of anti-cooling air, ignore indoor coil temperature and cancel function of anti-cooling air, and indoor fan will output subject to set air velocity.

③ Fan blowing after heat under heat generation

Under heat generation mode, after compressor shutdown, indoor fan performs blowing after heat operation

subject to indoor coil temperature Hie to a bit high indoor coil temperature. Maximum time of blowing after heat is 【EC04】second and the detailed temperature condition is as followed:

Indoor coil temperature condition	Indoor air velocity	Line controller display
$T_{内盘}$>【SP08】	Output set air	Display set air velocity
【SP08】≥$T_{内盘}$>【SP07】	Output low-level air	Display set air velocity
$T_{内盘}$≤【SP07】	Fan stop	No display of air velocity

If compressor shutdown beyond maximum blowing after heat time 【EC04】,even if indoor coil temperature still higher than minimum blowing after heat temperature, stop indoor fan operation.

④ Air velocity variance rule under failure protection status

Hiring heat generation, air velocity will change under the condition of indoor unit failure protection occurs as followed:

Failure reason	Failure code	Set or automatic high-level air	Set or automatic medium-level air	Set or automatic low-level air
Over high temperature under heat generation	Po11	High-level air	High-level air	High-level air

After failure recovers in normal condition, air velocity will recover to set air velocity accordingly.

8.5.7 Electric heater operation rule under heat generation

HAC-FX-AUX controller is provided with an electric heater and operates subject to the following rule under heat generation.（apply to heat pump＋auxiliary electric heater under heat generation mode）.

① Operation rule of electric heater

After satisfying all conditions as followed, electric heater put into execution:

★Switch on operation under heat generation;

★$T_{return\ air}$< T_{set}-2℃;

★$T_{inner\ pipe}$<【SP03】;

★ Compressor operates and indoor fan switches on more than 45S.

② Exit operation rule of electric heater

After electric operation, switch off if satisfying any rule in the following items:

★Mode conversion, serious failureor shutdown;

★$T_{return\ air}$≥T_{set}-1℃;

★$T_{inner\ pipe}$>【SP04】 ;

★Electric heater of over temperature protection switch disconnection.

★T_{pipe} sensor damage.

8.5.8 Failure protection under heat generation

Under heat generation, at the same time of operation, controller will inspect failure condition possibly raised and execute relative treatment accordingly.

① Anti-over temperature protection under heat generation（failure code【Po11】）

Entering process of anti-over temperature protection under heat generation

★If indoor coil temperature raising,$T_{inner\ pipe}$≥【SP04】and electric heater off:

After that if indoor coil temperature falls,$T_{inner\ pipe}$≤【SP04】-5℃, electric heater recovers normal operation.

★If indoor coil temperature raising,$T_{inner\ pip}$≥【SP04】+5℃, indoor air velocity will change subject to table 4.10accordingly.

★After that if indoor coil temperature falls, $T_{inner\ pipe}$ <【SP04】, indoor fan recovers normal operation.

★If indoor coil temperature still raising, while satisfying $T_{inner\ pipe}$≥【SP04】+8℃, puter air fan off; After that if if indoor coil temperature falls, $T_{inner\ pipe}$ and $T_{内管}$≤【SP04】+2℃, outdoor fan recovers normal operation.

★If iindoor coil temperature raising and satisfying the condition of $T_{inner\ pipe}$≥【EP04】drectly , enter anti-over temperature protection under heat generation.

After unit entering anti-over temperature protection under heat generation, failure code【Po11】displays and compressor shuts down, and indoor fan continues operation till indoor coil temperature satisfying $T_{inner\ pipe}$< 【SP04】and recovers normal condition, and failure code disappears.

② Failure protection of temperature sensor（failure code【Po01】、【Po06】、【Po07】）

★While return vent temperature sensor damage, failure code【Po11】displays and compressor operates in limited time, and shuts down automatically after continuous operation 50 minutes. If press the key of on/off, operate again in limited time.

★While indoor coil temperature sensor damage, failure code【Po06】displays and compressor operates in limited time, and shuts down automatically after continuous operation 50 minutes. If press the key of on/off, operate again in limited time, and cancel the functions such as anti-over temperature protection under heat generation, insufficient coolant of heat generation.

★While outdoor coil temperature sensor damage, failure code【Po067】displays, and cancel outdoor coil temperature condition judged by unfreezing. Unfreezing is judged subject to temperature difference between indoor coil temperature and return vent tenperature, or treats it subject to timing unfreezing.

8.6 Unfreezing operation

Hiring heat generation, outdoor unit will frost Hie to tool low temperature, which will affect heat generation work. HAC-FX-AUX controller designs many parameters for unfreezing and satisfying unfreezing work process under various conditions. HAC-FX-AUX controller is provided with particular unfreezing work mode, which will be as followed:

8.6.1 Entering condition of unfreezing

Based on the set of unfreezing parameter, several entering modes of unfreezing can be combined. While some prerequisites entering unfreezing operation are satisfied, the unit can enter unfreezing operation.

① Compressor Continuous Operation Hiration

Start to time while compressor starts operation time beyond set parameter value of compressor operation protection time. Meanwhile, if outer pipe temperature ≤【HF01】set value, start to time; if outer pipe temperature>【HF01】set value, clear away the timing.

②Indoor coil temperature condition（no outdoor coil sensor form）

The temperature condition entering unfreezing is determined subject to indoor coil temperature and return vent temperature. Permit entering unfreezing only after satisfying $T_{inner\ pipe}$-$T_{return\ air}$≤【HF02】. If 【HF02】set is cancel, cancel that judge condition, and unfreezing should operate subject to compressor accumulation operation time.

③Outdoor coil temperature condition（no outdoor coil sensor form）

The temperature condition entering unfreezing is determined subject to outdoor coil temperature and 【HF03】parameter. Permit entering unfreezing only after satisfying $T_{inner\ pipe}$≤【HF03】and compressor accumulation time 【HF05】set value and last 5 minutes. If 【HF03】set is cancel, cancel that judge condition, and unfreezing should operate subject to item 4.6.1.2.

Enter unfreezing after both 【HF02】and【HF03】 are canceled, and time condition satisfying 【HF05】.

note: 1、interval between wo unfreezing≥【HF05】
2、while off or controller deenergization, 【HF05】should be cleared.

8.6.2 Exit condition of unfreezing

After unit entering unfreezing, subject to compressor pressure variance, coil temperature variance and unfreezing operation time to judge whether exit unfreezing or not. Exit unfreezing only satisfy one of exit unfreezing.

① Temperature exit condition

While compressor performing unfreezing operaion, outdoor coil temperature raises and satisfies $T_{outer\ pipe}$≥【HF04】, that unit exits unfreezing operation.

② Time exit condition

【HF06】set the maximum unit unfreezing operation time, if unfreezing time beyond 【HF06】set time, exit unfreezing operation regardless outdoor coil satisfying 【HF04】set condition.

8.6.3 Unfreezing process

【SA04】parameter set two unfreezing process function moHiles. While 【SA04】set into ON, compressor will converse to unfreezing opration under non-shutdown condition; While【SA04】set into OFF, compressor shuts down firstly, and switch on for unfreezing after diversion of four-way dvering valve.

① Non-shutdown unfreezing process

【SA04】set into ON and satisfying entering unfreezing condition, compressor will not stop, and switch off electric heater if electric heater operation included, and then four-way diverting valve diverts and compressor turns into cooling generation operation status. 5 seconds later, outdoor fan switches off and another 5 seconds later indoor fan switches off.

After satisfying exit unfreezing condition, four-way valve is energized and compressor turns into heat generation operation status, and then outdoor fan switches on and indoor fan operates subject to anti-cooling air condition.

Hiring unfreezing, not inspect low-pressure pressur switch.

② Shutdown unfreezing process

【SA04】set into OFF and satisfying entering unfreezing condition, and switch off electric heater if electric heater operation included, and then compressor shuts down and 5 seconds outdoor fan stops, and four-way diverting valve deenergizes and diverts, and compressor starts again for unfreezing 30 seconds.

After satisfying exit unfreezing condition, compressor stops firstly, and four-way valve energizes and diverts 30 seconds. If satisfying temperature condition for compressor operation, outdoor fan and compressor start heat generation, and then indoor fan operates subject to anti-cooling air condition.

Hiring unfreezing, not inspect low-pressure pressur switch.

8.7 Timing operation

HAC-FX-AUX controller is provided wit hmany timing operation modes: timing on/off, combination and cycle timing. Timing time is set by way of line controller and remote control.

8.7.1 Timing ON

If set timing ON function, after controller time reaching set timing ON time, execute switch ON order. After timing switches on, the function of timing will cancel. If executes switch operation before not reaching timing ON time, the function of timing will cancel as well.

8.7.2 Timing OFF

If set timing OFF function, after controller reaching set timing OFF time, execute switch OFF order. After timing switches on, the function of timing will cancel. If executes switch operation before not reaching timing OFF time, the function of timing will cancel as well.

8.7.3 Combination timing

Combination is a kind of timing mode, which combines timing ON, and timinig OFF. While【SA09】is OFF, if select timing ON and timing OFF simultaneously, which means selecting combination timing mode.

Under this mode, after controller executes timing ON and timing OFF operation, timing function will be canceled.

8.7.4 Cycle timing

Cycle timing is also the combination of timing ON and timing OFF, which is not effective only once but 24 which means selecting cycle timing mode.

After set cycle timing, controller can operate in set time period everyday.

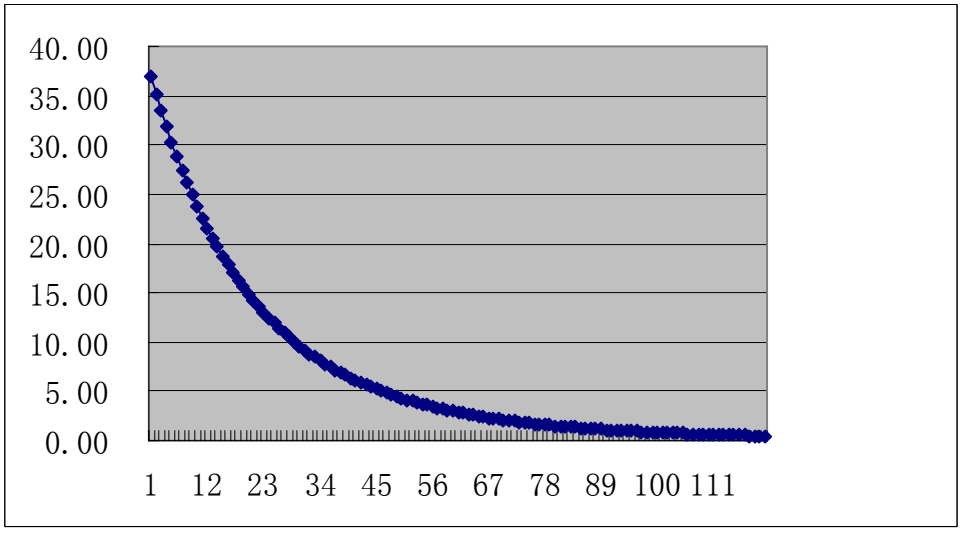
9 Sensor resistor value and graph

9.1 5K3470 sensor resistor value

R-T CONVERSION TABLE							
Part No. ：							
R25 ： 5.0 kΩ±1%							
B25/50：3470K±1%							
Tx(℃)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)	Tx(℃)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)
-20	35.90	36.99	38.11	17	6.787	6.877	6.967
-19	34.14	35.16	36.21	18	6.519	6.603	6.687
-18	32.48	33.43	34.41	19	6.264	6.342	6.420
-17	30.91	31.80	32.72	20	6.020	6.092	6.165
-16	29.43	30.26	31.11	21	5.786	5.854	5.921
-15	28.02	28.80	29.60	22	5.563	5.626	5.688
-14	26.69	27.42	28.17	23	5.350	5.408	5.466
-13	25.43	26.12	26.81	24	5.146	5.199	5.253
-12	24.24	24.88	25.53	25	4.950	5.000	5.050
-11	23.11	23.71	24.32	26	4.761	4.811	4.860
-10	22.04	22.60	23.17	27	4.580	4.630	4.679
-9	21.03	21.55	22.08	28	4.407	4.456	4.506
-8	20.07	20.56	21.05	29	4.242	4.291	4.340
-7	19.16	19.61	20.08	30	4.083	4.132	4.181
-6	18.29	18.72	19.15	31	3.932	3.980	4.029
-5	17.47	17.87	18.27	32	3.787	3.835	3.883
-4	16.69	17.06	17.44	33	3.648	3.695	3.743
-3	15.95	16.30	16.65	34	3.515	3.562	3.609
-2	15.25	15.57	15.90	35	3.387	3.434	3.481
-1	14.58	14.88	15.19	36	3.265	3.311	3.357
0	13.94	14.23	14.51	37	3.148	3.193	3.239
1	13.34	13.60	13.87	38	3.035	3.081	3.126
2	12.76	13.01	13.26	39	2.928	2.972	3.017
3	12.22	12.45	12.68	40	2.825	2.869	2.913
4	11.69	11.91	12.13	41	2.725	2.769	2.813
5	11.20	11.40	11.61	42	2.630	2.673	2.716
6	10.73	10.92	11.11	43	2.539	2.581	2.624
7	10.28	10.46	10.63	44	2.452	2.493	2.535
8	9.847	10.02	10.18	45	2.368	2.409	2.450
9	9.439	9.596	9.755	46	2.287	2.307	2.368
10	9.050	9.197	9.346	47	2.209	2.249	2.289
11	8.680	8.817	8.955	48	2.135	2.174	2.213
12	8.326	8.454	8.583	49	2.063	2.102	2.141
13	7.989	8.108	8.229	50	1.994	2.032	2.070
14	7.667	7.779	7.891	51	1.928	1.965	2.003
15	7.360	7.464	7.568	52	1.864	1.901	1.938
16	7.067	7.164	7.261	53	1.803	1.839	1.876

Tx(℃)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)	Tx(℃)	Rmin (KΩ)	Rnom (KΩ)	Rmax (KΩ)
54	1.744	1.780	1.816	81	0.758	0.779	0.802
55	1.687	1.722	1.785	82	0.736	0.758	0.780
56	1.633	1.667	1.702	83	0.715	0.737	0.758
57	1.580	1.614	1.648	84	0.695	0.716	0.737
58	1.530	1.563	1.597	85	0.676	0.696	0.717
59	1.481	1.514	1.547	86	0.657	0.677	0.698
60	1.434	1.466	1.499	87	0.639	0.658	0.679
61	1.389	1.421	1.452	88	0.621	0.641	0.660
62	1.346	1.376	1.408	89	0.604	0.623	0.643
63	1.304	1.334	1.365	90	0.588	0.606	0.625
64	1.263	1.293	1.323	91	0.572	0.590	0.609
65	1.224	1.254	1.283	92	0.556	0.574	0.592
66	1.187	1.215	1.245	93	0.541	0.559	0.577
67	1.152	1.179	1.207	94	0.527	0.544	0.562
68	1.116	1.143	1.171	95	0.513	0.530	0.547
69	1.082	1.109	1.137	96	0.499	0.516	0.533
70	1.049	1.076	1.103	97	0.486	0.502	0.519
71	1.018	1.044	1.071	98	0.473	0.489	0.505
72	0.9874	1.013	1.040	99	0.461	0.476	0.592
73	0.9582	0.9837	1.009	100	0.449	0.464	0.480
74	0.9300	0.9550	0.9806				
75	0.9027	0.9273	0.9524				
76	0.8764	0.9005	0.9252				
77	0.8509	0.8746	0.8988				
78	0.8264	0.8496	0.8734				
79	0.8026	0.8254	0.8488				
80	0.7797	0.8021	0.8250				

9.2 5K3470 sensor grahp

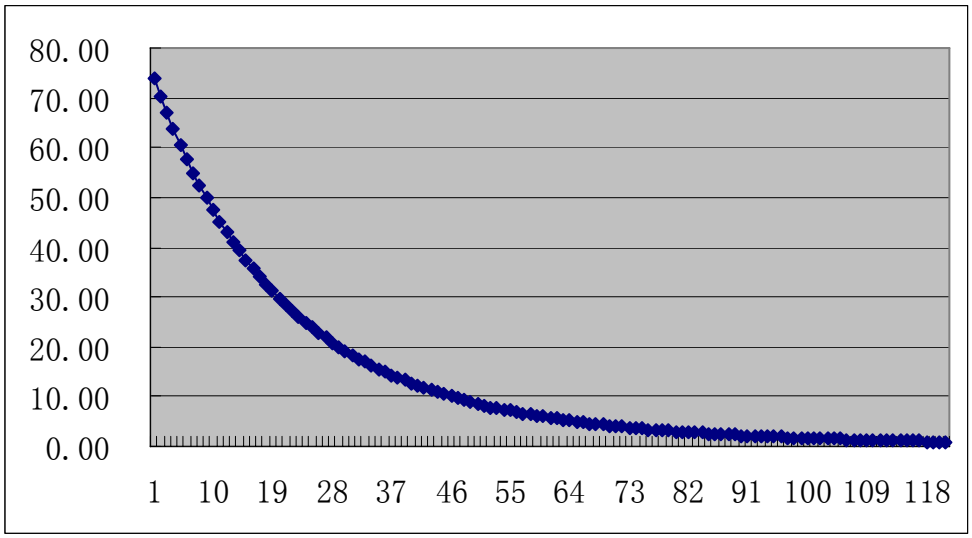


9.3 10K3470 sensor resistor value(exhaust temperature sensor)

R-T CONVERSION TABLE							
Part No. ：							
R25 ： 10.0 kΩ±1%							
B25/50：3470K±1%							
T (℃)	R MIN (KΩ)	R NOM (KΩ)	R MAX (KΩ)	T (℃)	R MIN (KΩ)	R NOM (KΩ)	R MAX (KΩ)
-20	71.79	73.98	76.23	17	13.58	13.75	13.93
-19	68.28	70.32	72.42	18	13.04	13.21	13.37
-18	64.96	66.87	68.83	19	12.53	12.68	12.84
-17	61.82	63.61	65.44	20	12.04	12.18	12.33
-16	58.85	60.52	62.23	21	11.58	11.71	11.84
-15	56.04	57.60	59.20	22	11.13	11.25	11.37
-14	53.38	54.84	56.34	23	10.70	10.82	10.93
-13	50.87	52.23	53.63	24	10.29	10.40	10.50
-12	48.48	49.76	51.02	25	9.900	10.00	10.10
-11	46.22	47.42	48.64	26	9.522	9.621	9.721
-10	44.08	45.20	46.34	27	9.160	9.259	9.359
-9	42.06	43.10	44.17	28	8.814	8.913	9.012
-8	40.13	41.11	42.11	29	8.483	8.581	8.680
-7	38.13	39.22	40.16	30	8.166	8.264	8.362
-6	36.58	37.43	38.31	31	7.863	7.690	8.056
-5	34.94	35.74	36.55	32	7.573	7.669	7.766
-4	33.38	34.12	34.89	33	7.295	7.391	7.487
-3	31.89	32.59	33.31	34	7.029	7.123	7.219
-2	30.49	31.14	31.81	35	6.774	6.868	6.962
-1	29.15	29.76	30.38	36	6.529	6.622	6.715
0	27.88	28.45	29.03	37	6.295	6.387	6.479
1	26.67	27.21	27.75	38	6.071	6.161	6.253
2	25.52	26.02	26.53	39	5.855	5.945	6.035
3	24.43	24.90	25.37	40	5.649	5.737	5.829
4	23.39	23.82	24.27	41	5.451	5.538	5.626
5	22.39	22.80	23.22	42	5.260	5.347	5.433
6	21.45	21.83	22.22	43	5.078	5.163	5.249
7	20.55	20.91	21.27	44	4.903	4.987	5.071
8	19.70	20.03	20.37	45	4.735	4.817	4.900
9	18.88	19.19	19.51	46	4.573	4.654	4.736
10	18.10	18.39	18.69	47	4.418	4.498	4.579
11	17.36	17.63	17.91	48	4.269	4.348	4.427
12	16.66	16.91	17.16	49	4.126	4.203	4.282
13	15.98	16.22	16.45	50	3.988	4.064	4.141
14	15.34	15.56	15.78	51	3.855	3.930	4.007
15	14.72	14.93	15.13	52	3.728	3.802	3.877
16	14.14	14.33	14.52	53	3.606	3.678	3.752

T (℃)	R MIN (KΩ)	R NOM (KΩ)	R MAX (KΩ)	T (℃)	R MIN (KΩ)	R NOM (KΩ)	R MAX (KΩ)
54	3.488	3.559	3.632	81	1.515	1.559	1.604
55	3.374	3.445	3.516	82	1.472	1.515	1.559
56	3.265	3.334	3.404	83	1.431	1.473	1.516
57	3.160	3.228	3.297	84	1.391	1.432	1.474
58	3.059	3.126	3.194	85	1.352	1.392	1.434
59	2.962	3.027	3.094	86	1.314	1.354	1.395
60	2.868	2.933	2.998	87	1.278	1.317	1.357
61	2.778	2.841	2.905	88	1.243	1.281	1.320
62	2.691	2.753	2.816	89	1.209	1.246	1.285
63	2.607	2.668	2.730	90	1.176	1.212	1.250
64	2.526	2.586	2.647	91	1.144	1.180	1.217
65	2.448	2.507	2.567	92	1.113	1.148	1.184
66	2.373	2.431	2.490	93	1.083	1.117	1.153
67	2.301	2.357	2.415	94	1.054	1.088	1.123
68	2.231	2.287	2.343	95	1.026	1.059	1.093
69	2.164	2.218	2.274	96	0.9979	1.031	1.065
70	2.099	2.152	2.207	97	0.9715	1.004	1.037
71	2.036	2.088	2.142	98	0.9460	0.9779	1.010
72	1.975	2.027	2.080	99	0.9212	0.9526	0.9849
73	1.917	1.967	2.019	100	0.8971	0.9279	0.9597
74	1.860	1.910	1.961				
75	1.806	1.855	1.904				
76	1.753	1.801	1.850				
77	1.702	1.749	1.797				
78	1.653	1.699	1.746				
79	1.606	1.651	1.697				
80	1.560	1.604	1.650				

9.4 10K3470 sensor grahp



9.5 Press switch

	Low press switch			High press switch		
	Default	Disconnection	Comeback	Default	Disconnection	Comeback
R22 refrigerant unit	closed circuit	0.05Mpa	0.15 Mpa	closed circuit	/	/
R410A refrigerant unit	closed circuit	0.10 Mpa	0.30 Mpa	closed circuit	4.20 Mpa	3.30 Mpa

10 System failure protection and code

Controller will judge various failures in system operation automatically and treats them accordingly subject to failure types. Failure protection can be classified two types subject to failure reason and treatment method: system recoverable protection and system serious failure protection.

10.1 Controller of HAC-FX-AUX

10.1.1 System recoverable prrotection

While air condition system recoverability occurs, whole system should adopt correlative protection measurement. After failure protected recovers to normal condition, system will recover to nomal condition.

Failure reason	Failure code	Enter condition	Protection measure	Recovery condition
$T_{return\ air}$ sensor damage	Po:01	Sensor short or cut	Timing operation	Repair or replace
Anti-freezing protection under cooling generation	Po:03	$T_{inner\ pipe}$＜【EP01】and last 2 minutes	Compressor off and recover operation after satisfying exit condition	$T_{inner\ pipe}$≥【EP01】+14℃
Anti-overload protection under cooling generation	Po:04	$T_{outer\ pipe}$＞【EP02】	Compressor off and recover operation after satisfying exit condition	$T_{outer\ pipe}$≤50℃
$T_{inner\ pipe}$ sensor damage	Po:06	Sensor short or cut	Cancel $T_{inner\ pipe}$ relative Protection function	Repair or replace
$T_{outer\ pipe}$ sensor damage	Po:07	Sensor short or cut	Cancel $T_{outer\ pipe}$ relative protection function	Repair or replace
Over temperature protection under heat genration	Po:11	$T_{inner\ pipe}$＞【EP04】	Stop compressor, outer fan. Inner fan force high velocity operation	After $T_{inner\ pipe}$≤【SP04】 Recover operation automatically
Recovery failure protection of water lift pump	Po:12	Water level off 【EC07】time	Stop compressor	Automatic reset after on/off normal

10.1.2 System serious failure protection

After system serious failure protection occurs, all units shut down and wair for inspection.

Failure reason	Failure code	Enter condition	Protection measure	Recovery condition
Communication failure	Eo:00	Abnormal communication	Line controller alarm	Communication line normal
Water lift pump failure	Eo:01	water level switch off【EC07】and more than 30 minutes	System shutdown	Press rest after on/off normal
Outer unit protection P2）	Eo:02	Outer unit protection switch off	System shutdown	Press rest after on/off normal
Electric heater over temperature（P1）	Eo:03	Over temperature switch off 【EC06】seconds	System shutdown	Press rest after on/off normal

10.1.3 Failure display of indicator lamp board

While failure occurs in unit, judge unit failure via three-indicator lamps ddisplay status, details showed as followed table (constant light-on of power lamp only after controller engerization):

Failure name	Failure code	Red （power）	Gree (Run)	Yellow （timing）
Air return sensor failure	Po:01	OFF	SHINE	SHINE
Anti-freezing under coolinggeneration	Po:03	SHINE	OFF	ON
Anti-overload under coolinggeneration	Po:04	OFF	SHINE	ON
Inner pipe sensor damage	Po:06	SHINE	ON	OFF
Outer pipe sensor damage	Po:07	SHINE	OFF	SHINE
Over temperature protection under heat generation	Po:11	SHINE	ON	ON
Recovery failure of water lift pump	Po:12	SHINE	ON	SHINE
Seriousness failure of water lift pump	Eo:01	SHINE	SHINE	SHINE
Outer unit protection swirch off (low pressure protection, phase reverse,phase lost)	Eo:02	OFF	ON	ON
Over temperature protection switch off	Eo:03	ON	SHINE	SHINE
Unit anti-cooling air		OFF	OFF	SHINE
Unit unfreezing		OFF	SHINE	OFF
Telecontrol wait signal		SHINE	OFF	OFF

10.2 Controller of HAC-F1X-AUX

10.2.1 System recoverable prrotection

While air condition system recoverability occurs, whole system should adopt correlative protection measurement. After failure protected recovers to normal condition, system will recover to nomal condition.

Failure name	Failure code	Red （power）	Gree (Run)	Yellow （timing）
T indoor pipe failure	**Pr：01**	SHINE	ON	OFF
T outdoor pipe failure	**Pr：02**	SHINE	OFF	SHINE
Anti-freezing under coolinggeneration	**Pr：03**	SHINE	OFF	ON
Anti-overload under coolinggeneration	**Pr：04**	OFF	SHINE	ON
T exhaust failure	**Pr：05**	SHINE	SHINE	OFF
T return wind failure	**Pr：06**	OFF	SHINE	SHINE
Heating-overload protection	**Pr：08**	SHINE	ON	ON
Water level switch protect	**Pr：11**	SHINE	ON	ON
Unit anti-cooling air		OFF	OFF	SHINE
Unit unfreezing		OFF	SHINE	OFF
Telecontrol wait signal		SHINE	OFF	OFF

10.2.2 System serious failure protection

After system serious failure protection occurs, all units shut down and wair for inspection.

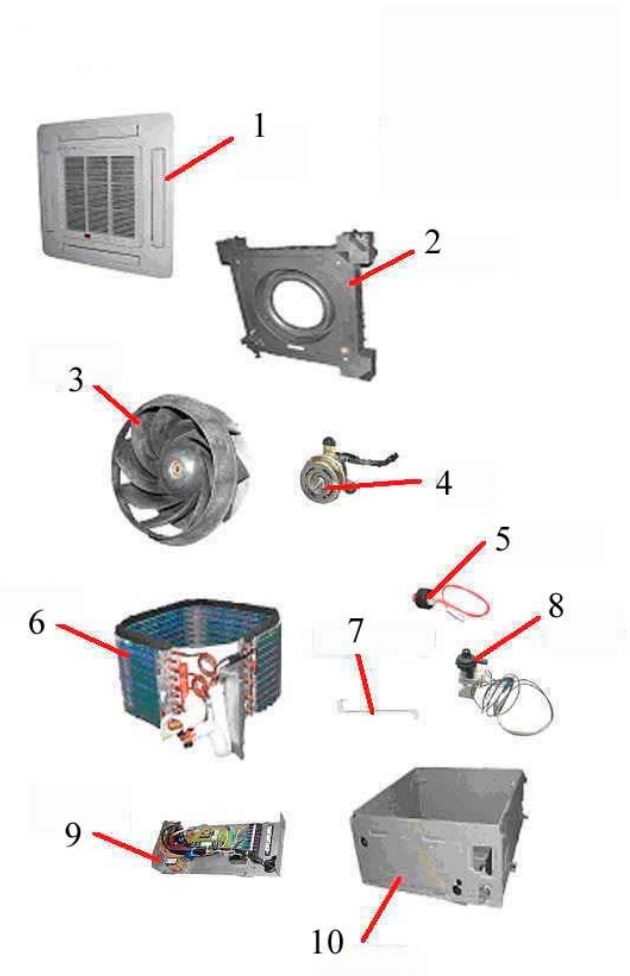
Failure name	Failure code	Red （power）	Gree (Run)	Yellow （timing）
High press protect	**Er：04**	ON	OFF	SHINE
Low press protect	**Er：05**	ON	SHINE	SHINE
T exhaust protect	**Er：06**	ON	SHINE	ON
Current over protect	**Er：07**	ON	ON	SHINE
No outdoor unit	**Er：08**	OFF	ON	ON
Water level switch graveness protect	**Er：11**	SHINE	SHINE	ON
Over temperature protection switch disconnection	**Er：12**	OFF	ON	SHINE
Communication trouble	**Eo：00**	Line controller alarm ,it will be unchained after the communication electric cir cuitis ok		
Phase is lose or phase sequence is Reverse in three phase protection	**Eo：03**	SHINE	SHINE	SHINE

11. Exploded chart

11.1 Csssette

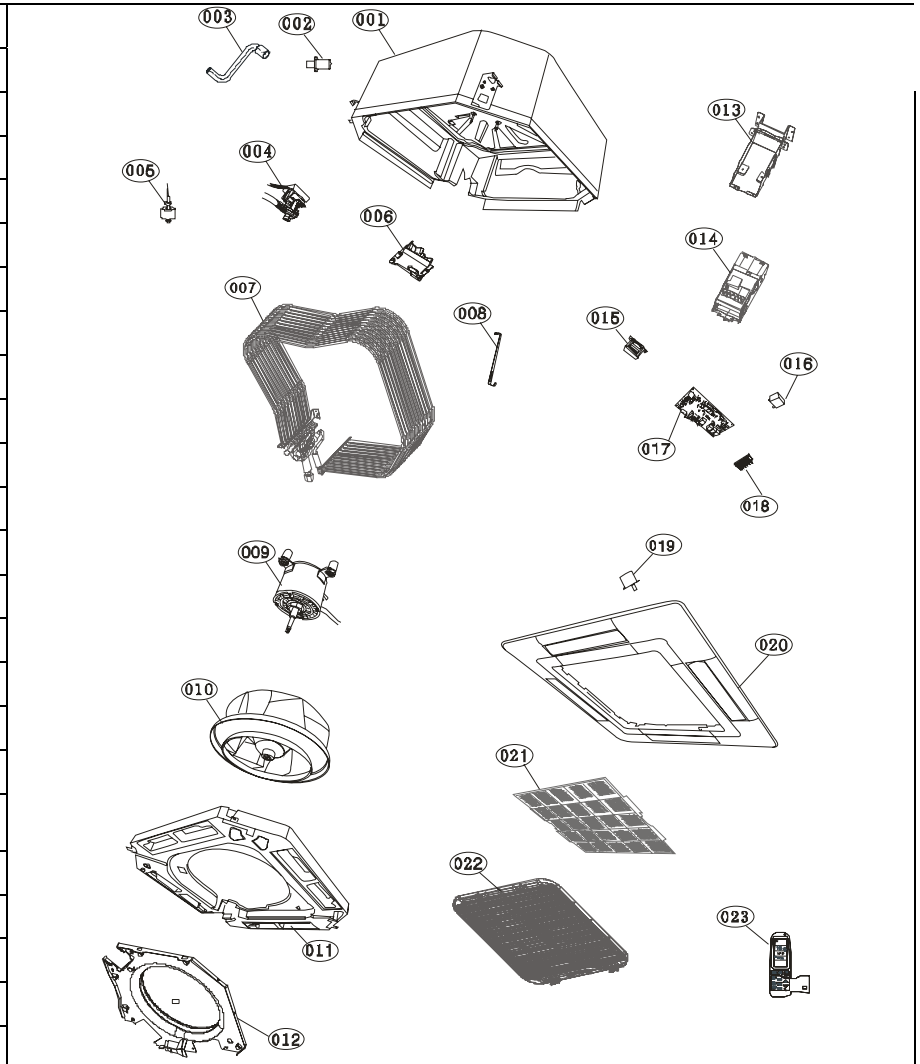
11.1.1 Csssette (9000BTU~12000BTU)

No.	Name	Number	material number
1	Panel	1	65964200270
2	Drain Tray Assembly	1	/
3	Fan Wheel	1	60120200200
4	Indoor motor	1	60020131300
5	Dobber switch	1	60050500400
6	Evaporator Assembly	1	63964106890
7	Evaporator Pothook	1	/
8	Drain pump	1	60040100100
9	Electrical Box Assembly	1	63964106220
10	Chassis Assembly	1	/



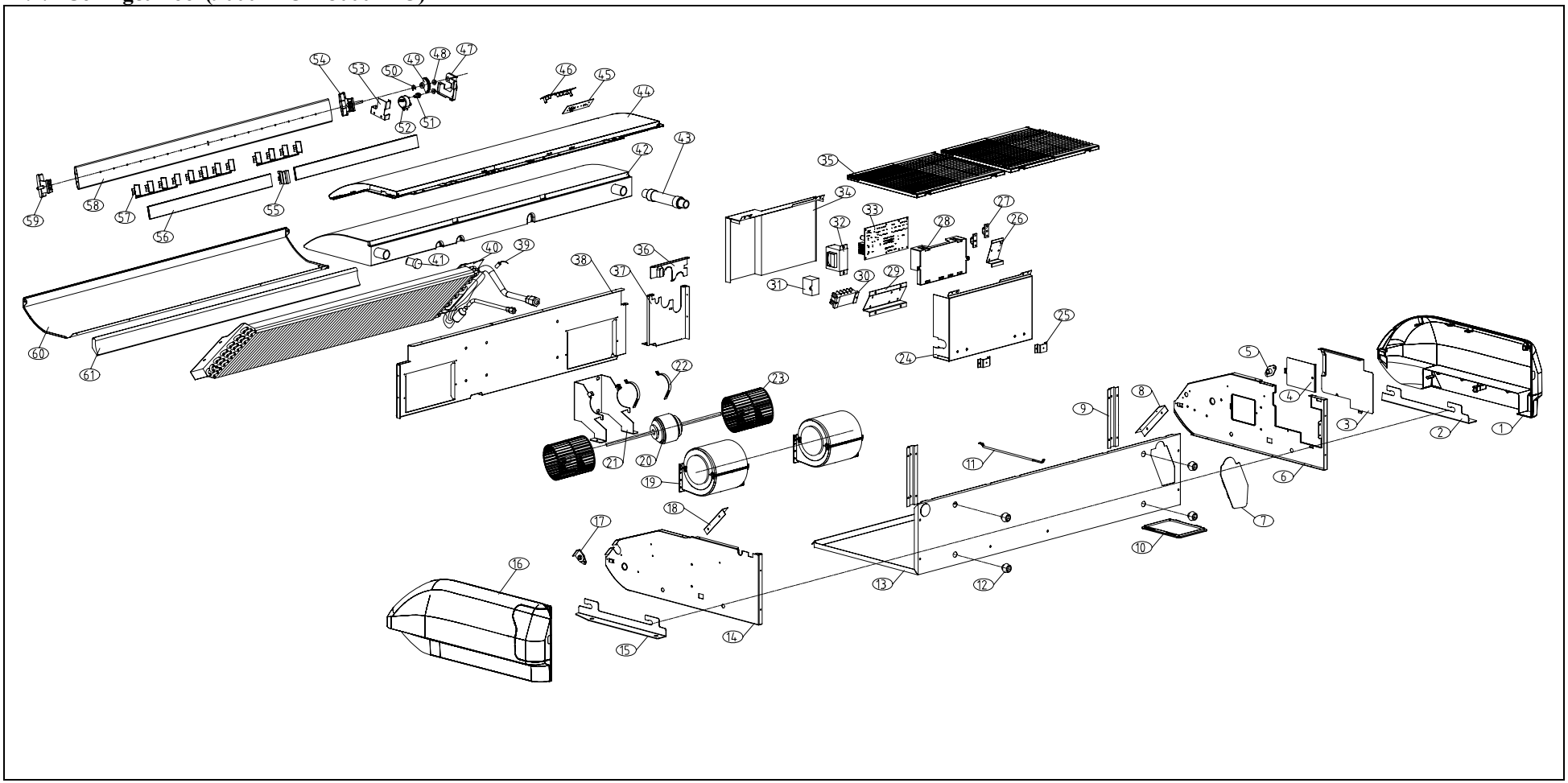
11.1.2 Csssette (24000BTU~48000BTU)

No.	Name	Number	material number	
			24000~36000BTU	42000~48000BTU
1	Chassis Assembly	1	63964105170	63964104770
2	Drain Connection Pipe	1	60460200700	
3	Drain Soft Pipe	1	60460200500	
4	Drain Pump	1	60040100500	
5	Dobber Switch	1	60050500400	
6	Tube Cover	1	60964105260	
7	Evaporator Assembly	1	63964105120	63964104720
8	Evaporator Pothook	1	60964105150	60964104750
9	Indoor motor	1	60020131400	60020119300
10	Fan Wheel	1	60120200400	60120200500
11	Drain Tray Assembly	1	63964104980	
12	Wind Guide Loop	1	60964105060	
13	Sheet Metal Electrical Box	1	60964104930	
14	Plastic Electrical Box	1	60964104940	
15	Transformer	1	60070500100	
16	Capacitor	1	60080900700	
17	Control Board	1	60070109100(R22, R410A 220-240V) 60070109900(R410A, 3PH, 380-415V)	
18	Terminal Board 7 Bit	1	60100204100	
19	Step Motor	1	60020300700	
20	Panel MB06 Frame	1	60964202170	
21	Panel MB06 filter	1	60964202490	
22	Panel MB06 Bar	1	60964202410	
23	Infrared Controler	1	60070302400	



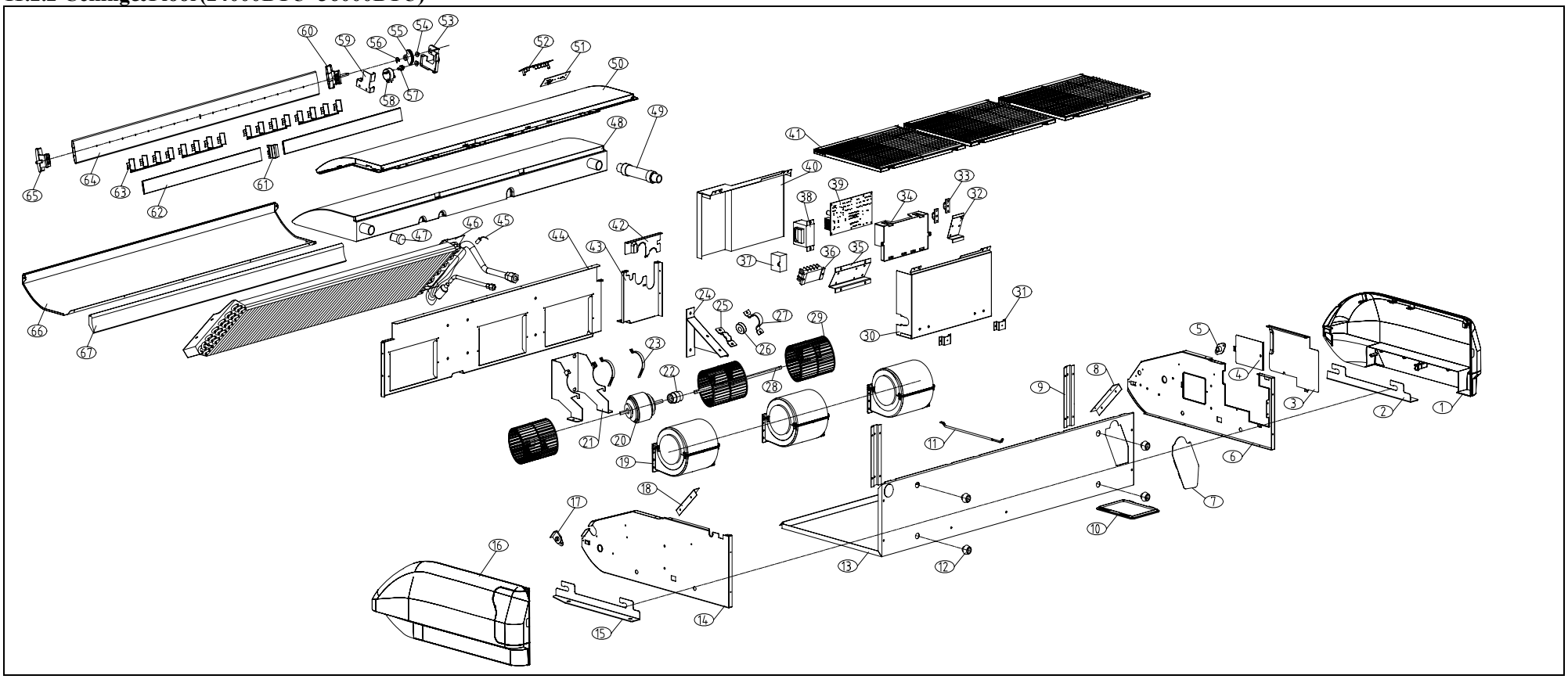
11.2 Ceiling&Floor

11.2.1 Ceiling&Floor(9000BTU~18000BTU)



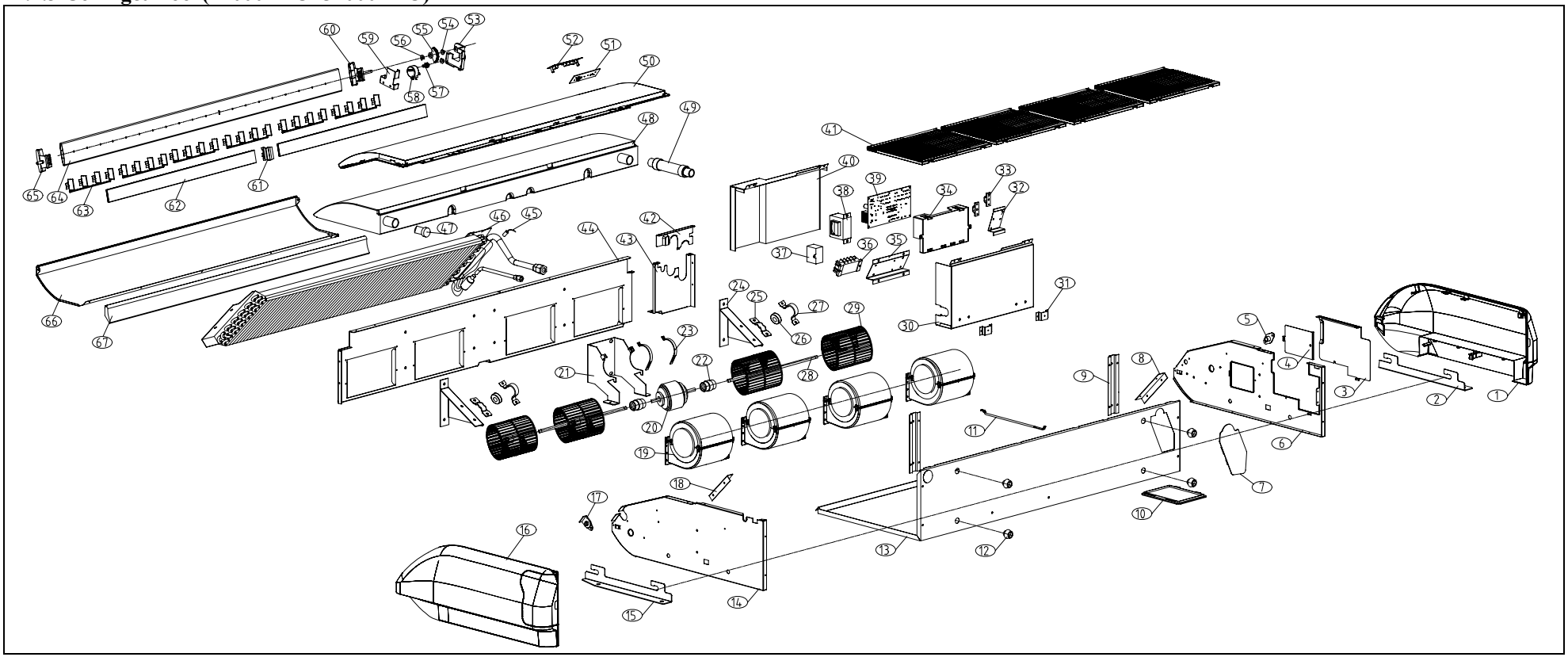
No.	Name	Number	material number		No.	Name	Number	material number
1	left panel	1			39	Sensor	1	60070601700/60070600800
2	left suspend plate	1			40	Evaporator assembly	1	
3	left cover 2	1			41	Rubber plug	1	
4	left cover 1	1			42	Draining tray assembly	1	
5	base of left-swing	1			43	Plastic water pipe	1	
6	left-hand board	1			44	Panel	1	
7	Pipe cover 1	1			45	Display board	1	60080801800
8	Fixture plate for Evaporator(left)	1			46	Display board cover	1	
9	Reinforced plate	2			47	Step motor cover	1	
10	Pipe cover 2	1			48	Bearing cover	2	
11	Support plate	1			49	gear wheel 1	1	
12	Rubber	4			50	Spring	1	
13	Casing base 1	1			51	gear wheel 2	1	
14	Right-hand board	1			52	step motor	1	60020301000
15	Right-suspend plate	1			53	Fixture for step motor	1	
16	Right panel	1			54	left Fixture for vane	1	
17	base of right-swing	1			55	middle Fixture for vane	1	
18	Fixture plate for Evaporator(Right)	1			56	Moving Vane 1	2	
19	Centrifugal fan	2	63110210100		57	Moving Vane 3	12	
20	Indoor Motor	1	60020129100		58	Moving Vane 2	1	
21	Motor fixture	1			59	right Fixture for vane	1	
22	Fan Hub	2			60	Casing base 2	1	
23	Centrifugal fan	2	63110210100		61	Air-outlet Rubber	1	
24	Electric box	1						
25	Fixture for Electric box	2						
26	Press string board	1						
27	Press string clip	2						
28	Electric control plate base	1						
29	Fixture for Terminal Block	1						
30	Terminal Block	1						
31	Capacitor	1						
32	Transformer	1						
33	PCB board	1	60070109100					
34	Electric box cover	1						
35	Air-inlet grill	2						
36	Valve base 2	1						
37	Valve base 1	1						
38	partition board	1						

11.2.2 Ceiling&Floor(24000BTU~36000BTU)



No.	Name	Number	material number	No.	Name	Number	material number
1	left panel	1	60965701010	37	Capacitor	1	
2	left suspend plate	1	60965701210	38	Transformer	1	
3	left cover 2	1		39	PCB board	1	60070109100(R22,R410A 220-240V) 60070109900(R410A,3PH,380-415V)
4	left cover 1	1		40	Electric box cover	1	60965702810
5	base of left-swing	1		41	Air-inlet grill	3	63965701510
6	left-hand board	1		42	Valve base 2	1	
7	Pipe cover 1	1		43	Valve base 1	1	
8	Fixture plate for Evaporator(left)	1		44	partition board	1	
9	Reinforced plate	2		45	Sensor	1	
10	Pipe cover 2	1		46	Evaporator assembly	1	63965705210
11	Support plate	1		47	Rubber plug	1	
12	Rubber	4		48	Draining tray assembly	1	
13	Casing base 1	1		49	Plastic water pipe	1	
14	Right-hand board	1		50	Panel	1	
15	Right-suspend plate	1	60965701310	51	Display board	1	60080801200
16	Right panel	1	60965701110	52	Display board cover	1	
17	base of right-swing	1		53	Step motor cover	1	
18	Fixture plate for Evaporator(Right)	1		54	Bearing cover	2	
19	Centrifugal fan	3	60965701910、60965702010	55	gear wheel 1	1	
20	Indoor Motor	1	60020126200	56	Spring	1	
21	Motor fixture	1	60965702410	57	gear wheel 2	1	
22	Connector	1	63965702210	58	step motor	1	60020301000
23	Fan Hub	2		59	Fixture for step motor	1	
24	Motor support	1	60965701610	60	left Fixture for vane	1	
25	Bearing base	1		61	middle Fixture for vane	1	
26	Bearing	1		62	Moving Vane 1	2	
27	Bearing top cover	1		63	Moving Vane 3	16	
28	Motor axes	1		64	Moving Vane 2	1	
29	Centrifugal fan	3	60965702110	65	right Fixture for vane	1	
30	Electric box	1	60965703010	66	Casing base 2	1	
31	Fixture for Electric box	2		67	Air-outlet Rubber	1	
32	Press string board	1					
33	Press string clip	2					
34	Electric control plate base	1					
35	Fixture for Terminal Block	1					
36	Terminal Block	1					

11.2.3 Ceiling&Floor(42000BTU~52000BTU)

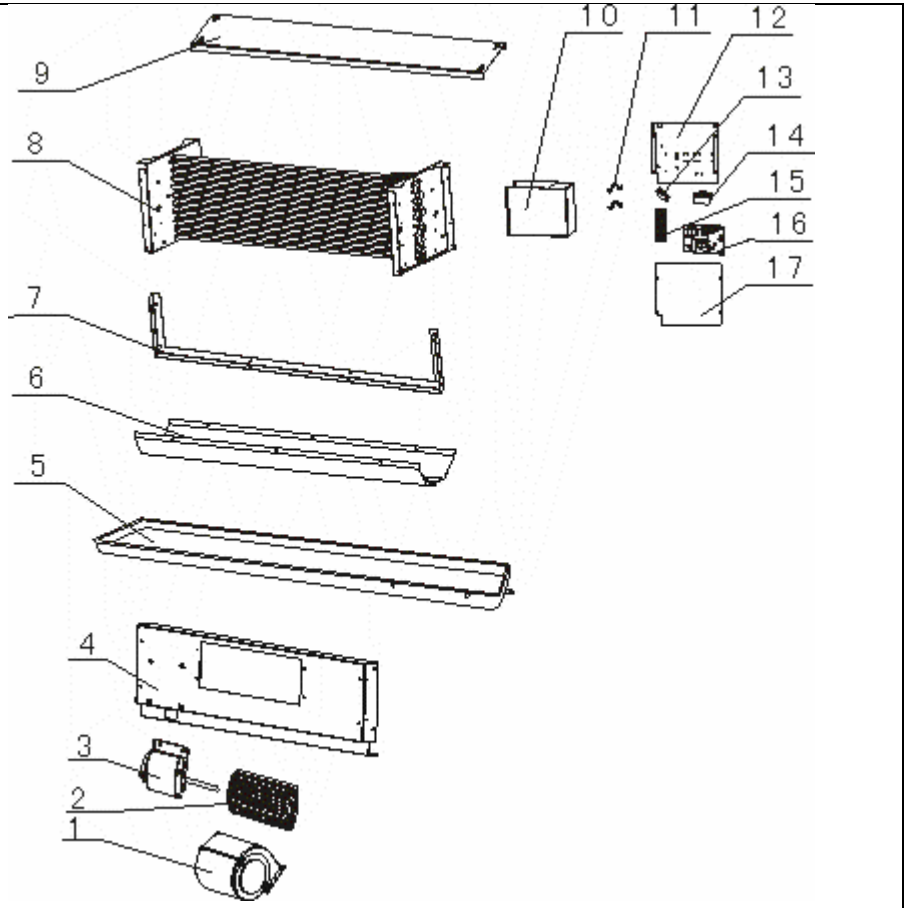


No.	Name	Number	material number		No.	Name	Number	material number
1	left panel	1	60965701010		35	Fixture for Terminal Block	1	
2	left suspend plate	1	60965701210		36	Terminal Block	1	
3	left cover 2	1			37	Capacitor	1	
4	left cover 1	1			38	Transformer	1	
5	base of left-swing	1			39	PCB board	1	60070109100(R22,R410A 220-240V) 60070109900(R410A,3PH,380-415V)
6	left-hand board	1			40	Electric box cover	1	60965702810
7	Pipe cover 1	1			41	Air-inlet grill	4	63965701510
8	Fixture plate for Evaporator(left)	1			42	Valve base 2	1	
9	Reinforced plate	2			43	Valve base 1	1	
10	Pipe cover 2	1			44	partition board	1	
11	Support plate	1			45	Sensor	1	
12	Rubber	4			46	Evaporator assembly	1	63965707610
13	Casing base 1	1			47	Rubber plug	1	
14	Right-hand board	1			48	Draining tray assembly	1	
15	Right-suspend plate	1	60965701310		49	Plastic water pipe	1	
16	Right panel	1	60965701110		50	Panel	1	
17	base of right-swing	1			51	Display board	1	60080801200
18	Fixture plate for Evaporator(Right)	1			52	Display board cover	1	
19	Centrifugal fan	4	60965701910、60965702010		53	Step motor cover	1	
20	Indoor Motor	1	60020126100		54	Bearing cover	2	
21	Motor fixture	1	60965702410		55	gear wheel 1	1	
22	Connector	1	63965702210		56	Spring	1	
23	Fan Hub	2			57	gear wheel 2	1	
24	Motor support	2	60965701610		58	step motor	1	60020301000
25	Bearing base	1			59	Fixture for step motor	1	
26	Bearing	1			60	left Fixture for vane	1	
27	Bearing top cover	1			61	middle Fixture for vane	1	
28	Motor axes	1			62	Moving Vane 1	2	
29	Centrifugal fan	4	60965702110		63	Moving Vane 3	24	
30	Electric box	1	60965703010		64	Moving Vane 2	1	
31	Fixture for Electric box	2			65	right Fixture for vane	1	
32	Press string board	1			66	Casing base 2	1	
33	Press string clip	2			67	Air-outlet Rubber	1	
34	Electric control plate base	1						

11.3 Duct

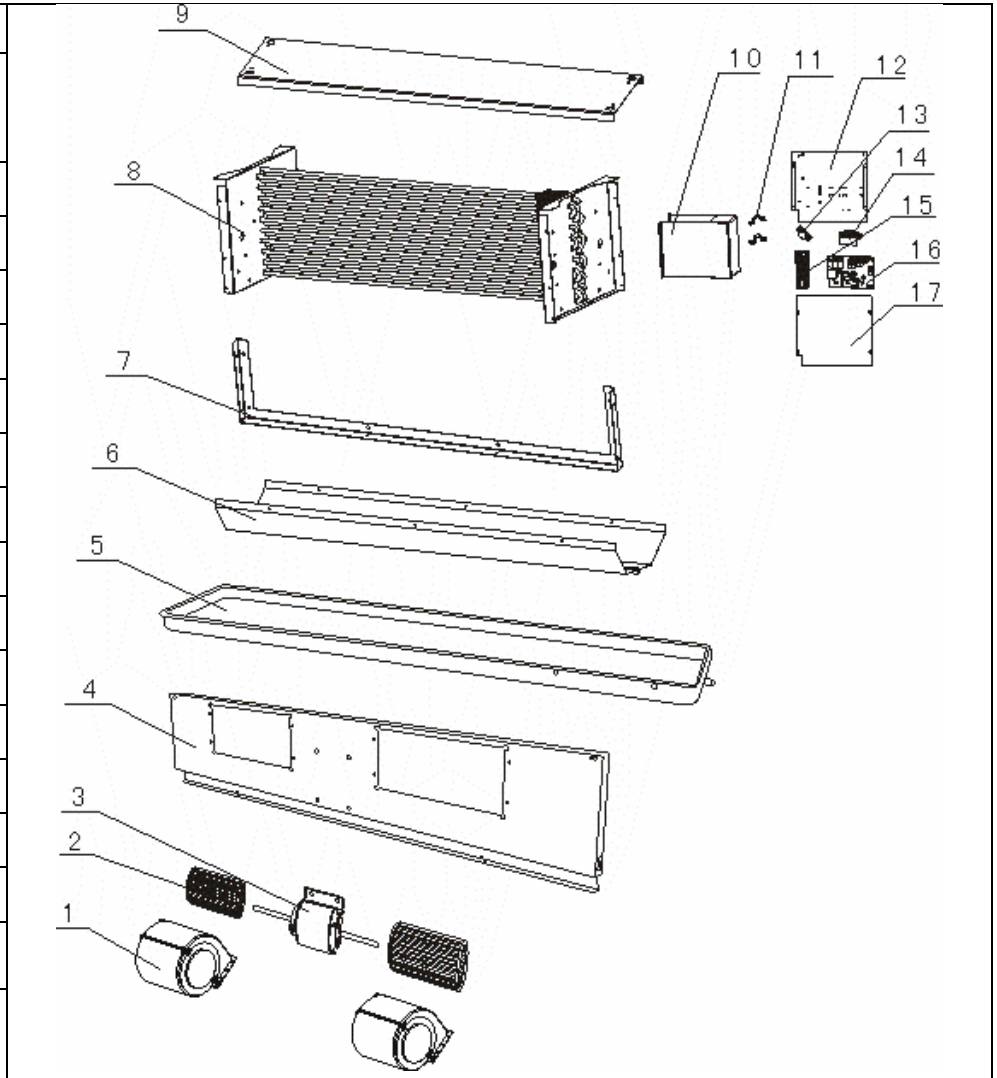
11.3.1 Duct(R22,9000BTU～12000BTU)

No.	Mame	Number	material number	
			9000BTU	12000BTU
1	Centrifugal fan	1	63110210100	
2				
3	Motor	1	60020127400	
4	Centrifugal fan fasten board	1	60960110856	
5	Drip tray	1	60450000200	
6	Chassis	1	60960110513	
7	Outlet flange	1	60960110738	
8	Evaporator assembly	1	63961513000	63961515100
9	Top cover board	1	60960110613	
10	Valve-panel	1	60961513150	
11	Pipe Clamp	2	60961517270	
12	Electric control box	1	60961513060	
13	String nip	1	60142300200/60142200200	
14	Transformer	1	60070500600	
15	Terminal board	1	60100202700	
16	PCB board	1	60070109100	
17	Electric control box cover	1	60961513070	



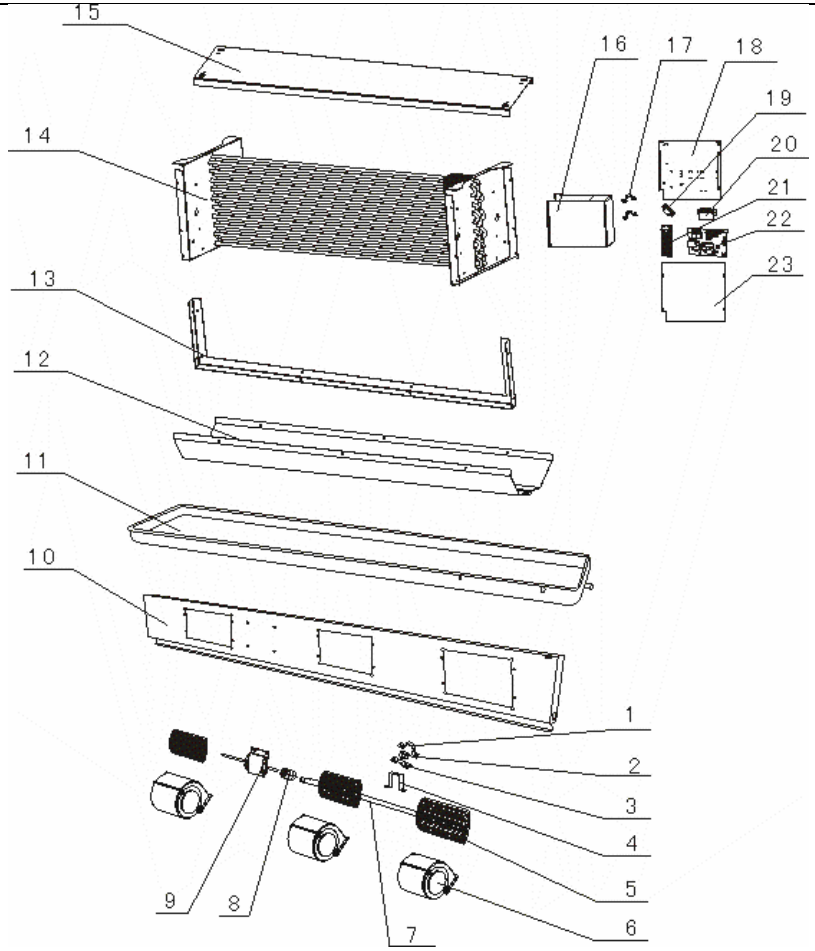
11.3.2 Duct (R22,18000BTU)

No.	Name	Number	material number
1	Centrifugal fan	1	63110210100
2			
3	Motor	1	60020127800
4	Centrifugal fan fasten board	1	60960110858
5	Drip tray	1	60450000400
6	Chassis	1	60960110515
7	Outlet flange	1	60960110740
8	Evaporator assembly	1	63961516100
9	Top cover board	1	60960110615
10	Valve-panel	1	60961513150
11	Pipe Clamp	1	60961517270
12	Electric control box	1	60961513060
13	String nip	1	60142300200/60142200200
14	Transformer	1	60070500600
15	Terminal board	1	60100202700
16	PCB board	1	60070109100
17	Electric control box cover	1	60961513070



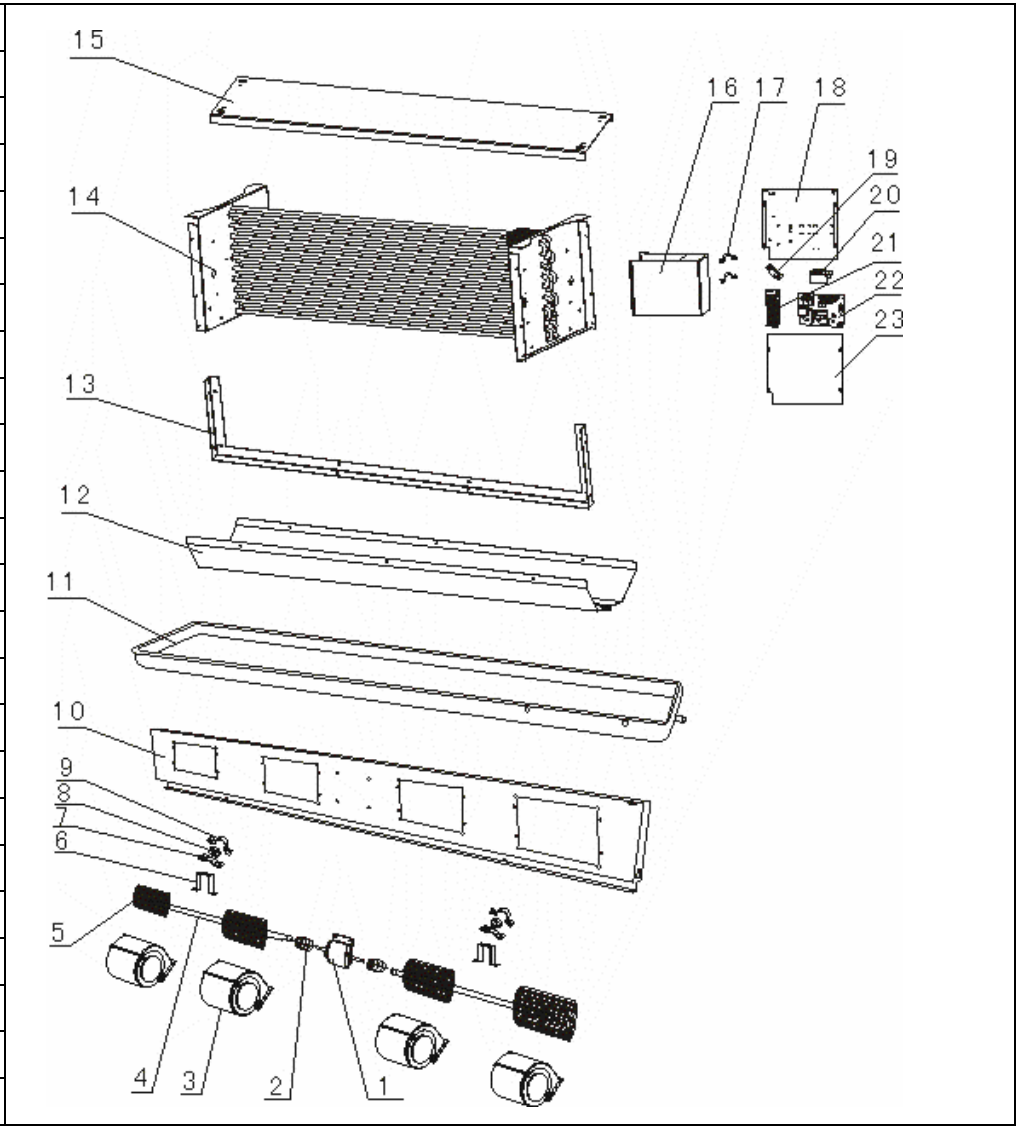
11.3.3 Duct (R22,24000BTU~36000BTU)

No.	Name	Number	material number
1	Pipe Clamp	1	60110500800
2	Axletree	1	08015180010
3	Pipe Clamp	1	60110500800
4	Bearing support	1	60960111239
5	Centrifugal fan	3	63110210100
6			
7	Motor axes	1	60110500300
8	Joint slack	1	60110500100
9	Motor	1	60020127500
10	Centrifugal fan fasten board	1	60960110862
11	Drip tray	1	60450000700
12	Chassis	1	60960110518
13	Outlet flange	1	60960110743
14	Evaporator assembly	1	63961517100
15	Top cover board	1	60960110618
16	Valve-panel	1	60961513150
17	Pipe Clamp	1	60961517270/60961517280
18	Electric control box	1	60961513060
19	String nip	1	60142300200/60142200200
20	Transformer	1	60070500600
21	Terminal board	1	60100202700
22	PCB board	1	60070109100
23	Electric control box cover	1	60961513070



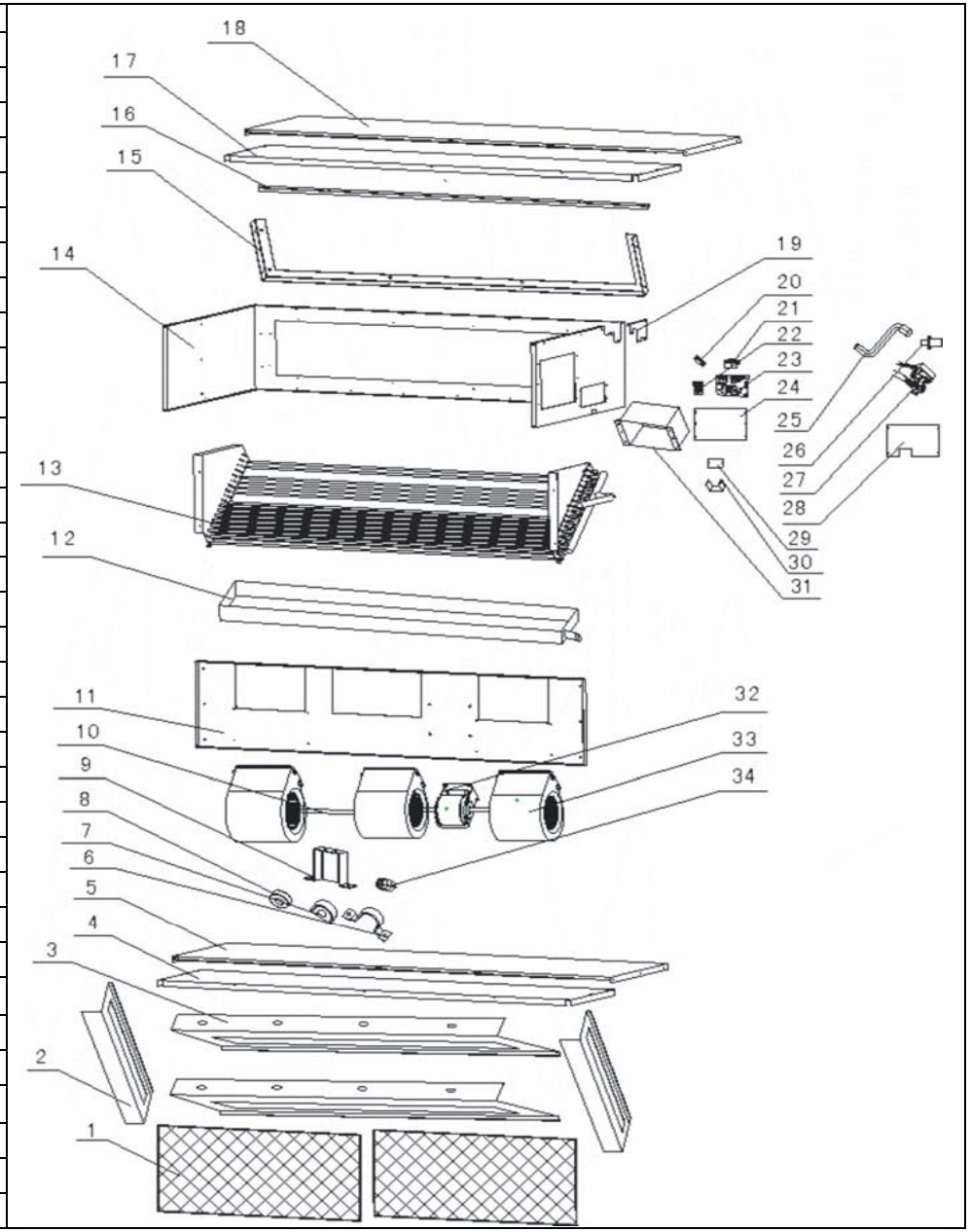
11.3.4 Duct (R22,42000BTU~48000BTU)

No.	Name	Number	material number
1	Motor	1	60020128000
2	Joint slack	2	60110500100
3	Centrifugal fan	4	63110210100
4	Motor axes	2	60110500300
5	Centrifugal fan	4	63110210100
6	Bearing support	2	60960111239
7	Pipe Clamp	1	60110500800
8	Axletree	2	08015180010
9	Pipe Clamp	1	60110500800
10	Centrifugal fan fasten board	1	60960110863
11	Drip tray	1	60450000900
12	Chassis	1	60960110520
13	Outlet flange	1	60960110745
14	Evaporator assembly	1	63961518100
15	Top cover board	1	60960110620
16	Valve-panel	1	60961513150
17	Pipe Clamp		60961517490/60961517270
18	Electric control box	1	60961513060
19	String nip	1	60142300200/60142200200
20	Transformer	1	60070500600
21	Terminal board	1	60100202700
22	PCB board	1	60070109100
23	Electric control box cover	1	60961513070



11.3.5 Duct (R410A,36000BTU~48000BTU)

No.	Name	Number	material number
1	Inhaler	2	60490112800
2	Inhaler assembly left&right	2	63964837110
3	Inhaler assembly up&down	2	63964837610
4	Air cover board	1	60964833210
5	Soleplate	1	60964833310
6	Pipe Clamp	1	60110500800
7	Axletree Rubber	1	60420202300
8	Axletree	1	08015180010
9	Bearing support	1	60964836110
10	Motor axes	1	60110500700
11	Centrifugal fan fasten board	1	60964834010
12	Drip tray	1	63964833010
13	Evaporator assembly	1	63964836510
14	round board	1	60964832910
15	Outlet flange A	1	60964828010
16	Outlet flange B	1	60964831310
17	Air cover board	1	60964833210
18	Top cover board	1	60964833910
19	Valve-panel	1	60964830310
20	String nip	1	60142300200
21	Transformer	1	60070500600
22	Terminal board	1	60100200700
23	PCB board	1	60070109900
24	Electric control box cover	1	60964838210
25	Draintube	1	60460200500
26	Drainpipe	1	60460200700
27	Drain pump	1	60040100500
28	Pump Valve-panel assembly	1	63964839210
29	Protection board B	1	60964838910
30	Protection board A	1	60964838810
31	Electric control box	1	60964838410
32	Motor	1	60020131800
33	Centrifugal fan	1/2	63110213000/63110213100
34	Joint slack	1	60110500900



11.3.6 Duct (R410A,52000BTU)

No.	Name	Number	material number
1	Inhaler	2	60490112800
2	Inhaler assembly left&right	2	63964837110
3	Inhaler assembly up&down	2	63964837610
4	Air cover board	1	60964833210
5	Soleplate	1	60964833310
6	Pipe Clamp	2	60110500800
7	Axletree Rubber	2	60420202300
8	Axletree	2	08015180010
9	Bearing support	2	60964836110
10	Motor axes	2	60110500700
11	Centrifugal fan fasten board	1	60964834010
12	Drip tray	1	63964833010
13	Evaporator assembly	1	63964836510
14	round board	1	60964832910
15	Outlet flange A	1	60964828010
16	Outlet flange B	1	60964831310
17	Air cover board	1	60964833210
18	Top cover board	1	60964833910
19	Valve-panel	1	60964830310
20	String nip	1	60142300200
21	Transformer	1	60070500600
22	Terminal board	1	60100200700
23	PCB board	1	60070109900
24	Electric control box cover	1	60964838210
25	Draintube	1	60460200500
26	Drainpipe	1	60460200700
27	Drain pump	1	60040100500
28	Pump Valve-panel assembly	1	63964839210
29	Protection board B	1	60964838910
30	Protection board A	1	60964838810
31	Electric control box	1	60964838410
32	Motor	1	60020131800
33	Centrifugal fan	2/2	63110213000/63110213100
34	Joint slack	2	60110500900