



## **Domestic Air Conditioner**

# **SERVICE MANUAL**

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### **Models**

HFU-09H03/R2(DB)

HFU-12H03/R2(DB)

### **● Features**

- International well-known compressor,economic and convenience.
- Novelty appearance,beautiful and generous.
- Anti-fungus filtration, multi-layer of fresh air.
- Powerful operation,adjust temperature quickly.
- CFC free refrigerant for environmental protection.

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## Features

### 1.comfortable:wide-angle airflow

The vertical dual-flap and horizontal wide-angle louvers ensure the cool(warm air reaches every corner of the room.

### 2.Quiet operation

Fan With Random-pitched Blades.

Random-pitched blades help reduce operating noise while maintaining a high airflow rate.

### 3Energy efficient

The design of inner-grooved copper tube greatly increases the refrigerant contact area and the efficiency of cooling/heating functions.

### 4.Convenience

Auto restart and washable panel:

The grille can be removed easily and washed when necessary.Any series have the function then even if the power falls when the unit is operating unit will automatically return to the operating settings in use before the power failure when power is restored.

### 5.Wide variety of functions

24-Hour Timer:

24-hour timer allows users to select the exact time they would like the air conditioner to turn on and to turn off.Timers on previous models operation based on the number of hours of desired operation.

### 6.Night-set models

When the air conditioner is operating on the timer-off circuit.The preset room temperature gradually rises(going down in heating)before the unit stops as shown below.Users can sleep comfortably without sudden change in temperature.

### 7.Program" dry"

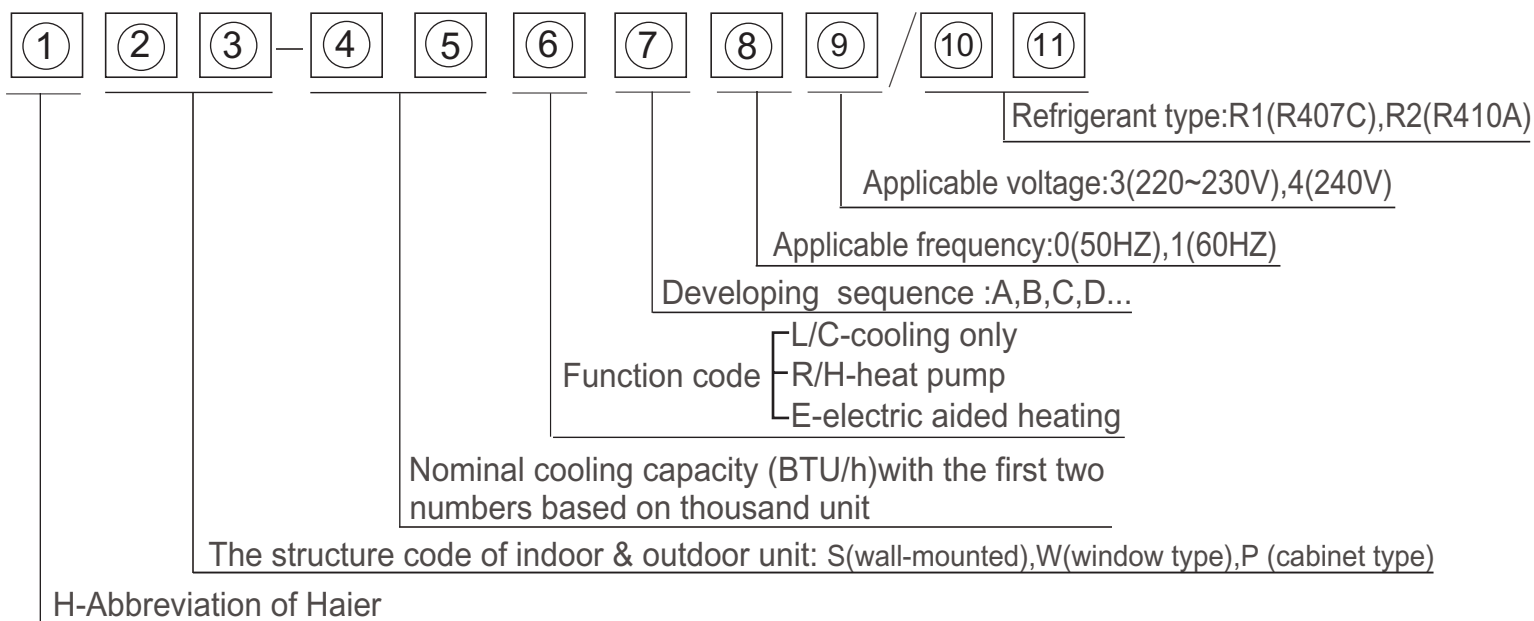
This function automatically reduces the level of humidity while maintaining the preset indoor temperature.

## Description of product model coding and series introduction

## Introductory Remarks

### A. Description of coding rules of unit model

Coding rules and descriptions are as follows:



### Examples:

H2SM-18HS03/R2,It represents wall-mounted split type heat pump air conditioner .The cooling capacity is 18000BTU/h,and the power supply is 220-230V/50Hz,"S" means the developing sequence,"2"means one by two,and"R2" means the refrigerant is R410A.

### B.Standard Situation/Conditions

No.	Operating condition	indoor air status		outdoor air status	
		DB°C	WB°C	DB°C	WB°C
1	Norminal cooling	27°C	19°C	35°C	24°C
2	Norminal heating	20°C	not control	7°C	6°C
3	Norminal electrical heating	---	---	---	---

# Specifications

## Model: HFU-09H03/R2(DB)

Cooling capacity(W)	2800	Heating capacity(W)	3150
Cooling coefficient(W/W)	3.46	Heating coefficient(W/W)	3.62
Cooling power input(W)	810	Heating power input(W)	870
Moiture removal(m <sup>3</sup> /h)	1.0X10 <sup>3</sup>	Frequency range(Hz)	50
Operating voltage range(V)	220-230 ~	Refrigerant type	R410A
Operating temp. range (°C)	-7-43	Air sending angle	60°
Variation of temp. adjust (°C)	+ 1	Fan type	indoor unit
			outdoor unit
Climate type:	T1	Class of electric shock	I
Indoor unit noise	40/36/31	Outdoor unit noise	48
Net dimensions mm (indoor unit)	720*205*630	Net dimensions mm (outdoor unit)	780*245*540
Packaging dimensions mm (indoor unit)	780*280*690	Packaging dimensions mm (outdoor unit)	930*340*620
Net/gross weight (kg) (indoor unit)	17/20	Net/gross weight (kg) (outdoor unit)	30/35
Max. mounting height difference(m)	10	Piling layers	indoor unit
			outdoor unit
Refrigerant charge(g) (R410A)	640	Current entering side (indoor/outdoor)	Indoor
Frequency of filter cleaning	Once/2 weeks	Compressor manufacturer	TOSHIBA
Compressor model	DA89X1C-20FZ	Compressor oil type	NMOCZE-Gles RB68EP or Equivalent
Compressor oil charge (cc)	270	Compressor protector type	B130-150-241E
Maxi. length of connecting pipe (m)	15	drain hose	length(mm)
Refrigerant recharged(Length of connecting pipe is more than 5 meter)	20g per meter		diametre(mm)
Cap. tube type muffle model:	TP <sub>2</sub> Y	Type of tube of evaporator and condenser	Internal treaded
Fan speed(H/M/L)(r/min) (indoor unit)	1000/900/800	Size of tube of evaporator and condenser(mm)	Dia. 7 / 7
Fan speed(r/min) (outdoor unit)	900	Appearance features of indoor unit	console type
Cut-off vavle(inch)	two-way	Appearance features of outdoor unit	Metal type
	three-way		
Max. operating pressure at warm side(Mpa)	4.15	Max. operating pressure at cool side(Mpa)	4.15

## Model: HFU-12H03/R2(DB)

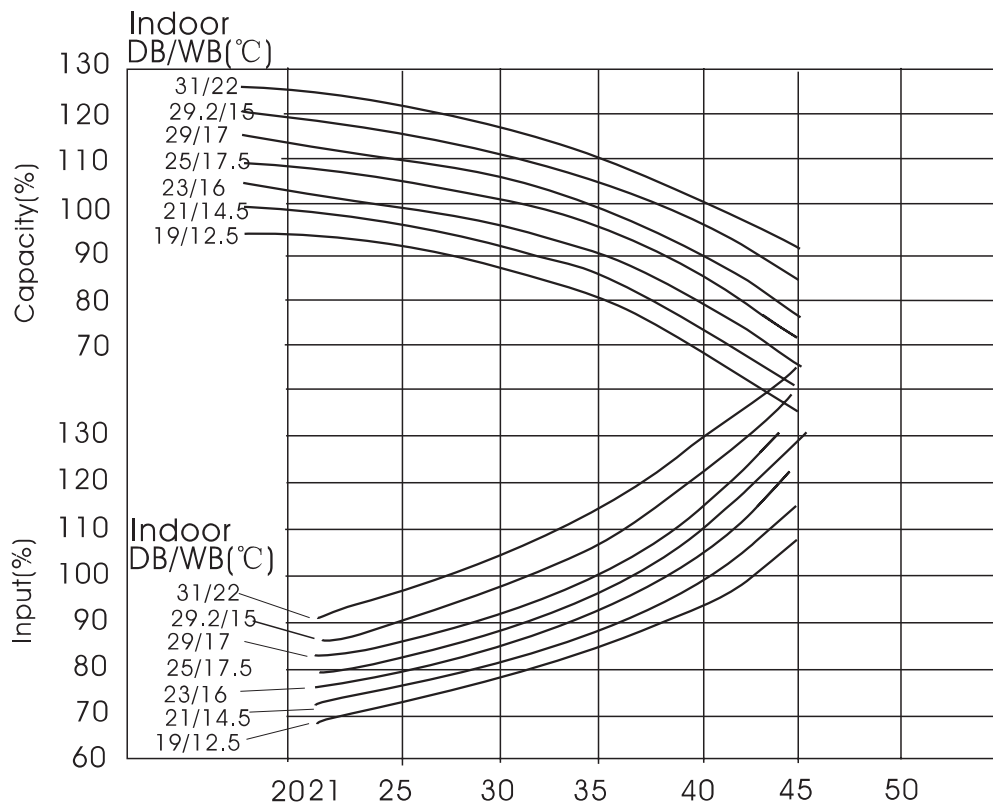
Cooling capacity(W)	3900	Heating capacity(W)	4100
Cooling coefficient(W/W)	3.51	Heating coefficient(W/W)	3.42
Cooling power input(W)	1110	Heating power input(W)	1200
Moiture removal(m <sup>3</sup> /h)	1.3X10 <sup>3</sup>	Frequency range(Hz)	50
Operating voltage range(V)	220-230 ~	Refrigerant type	R410A
Operating temp. range (°C)	-7-43	Air sending angle	60°
Variation of temp. adjust (°C)	+ 1	Fan type	indoor unit
			outdoor unit
Climate type:	T1	Class of electric shock	I
Indoor unit noise	41/37/31	Outdoor unit noise	53
Net dimensions mm (indoor unit)	720*205*630	Net dimensions mm (outdoor unit)	780*245*540
Packaging dimensions mm (indoor unit)	780*280*690	Packaging dimensions mm (outdoor unit)	930*340*620
Net/gross weight (kg) (indoor unit)	17/20	Net/gross weight (kg) (outdoor unit)	30/35
Max. mounting height difference(m)	15	Piling layers	indoor unit
			outdoor unit
Refrigerant charge(g) (R410A)	640	Current entering side (indoor/outdoor)	Indoor
Frequency of filter cleaning	Once/2 weeks	Compressor manufacturer	SANYOO
Compressor model	C-6RZ092H1A	Compressor oil type	FV-68S
Compressor oil charge (cc)	350	Compressor protector type	—————
Maxi. length of connecting pipe (m)	15	drain hose	length(mm)
Refrigerant recharged(Length of connecting pipe is more than 5 meter)	20g per meter		diametre(mm)
Cap. tube type muffle model:	TP <sub>2</sub> Y	Type of tube of evaporator and condenser	Internal treaded
Fan speed(H/M/L)(r/min) (indoor unit)	1000/900/800	Size of tube of evaporator and condenser(mm)	Dia. 7 / 7
Fan speed(r/min) (outdoor unit)	900	Appearance features of indoor unit	console type
Cut-off vavle(inch)	two-way	Appearance features of outdoor unit	Metal type
	three-way		
Max. operating pressure at warm side(Mpa)	4.15	Max. operating pressure at cool side(Mpa)	4.15



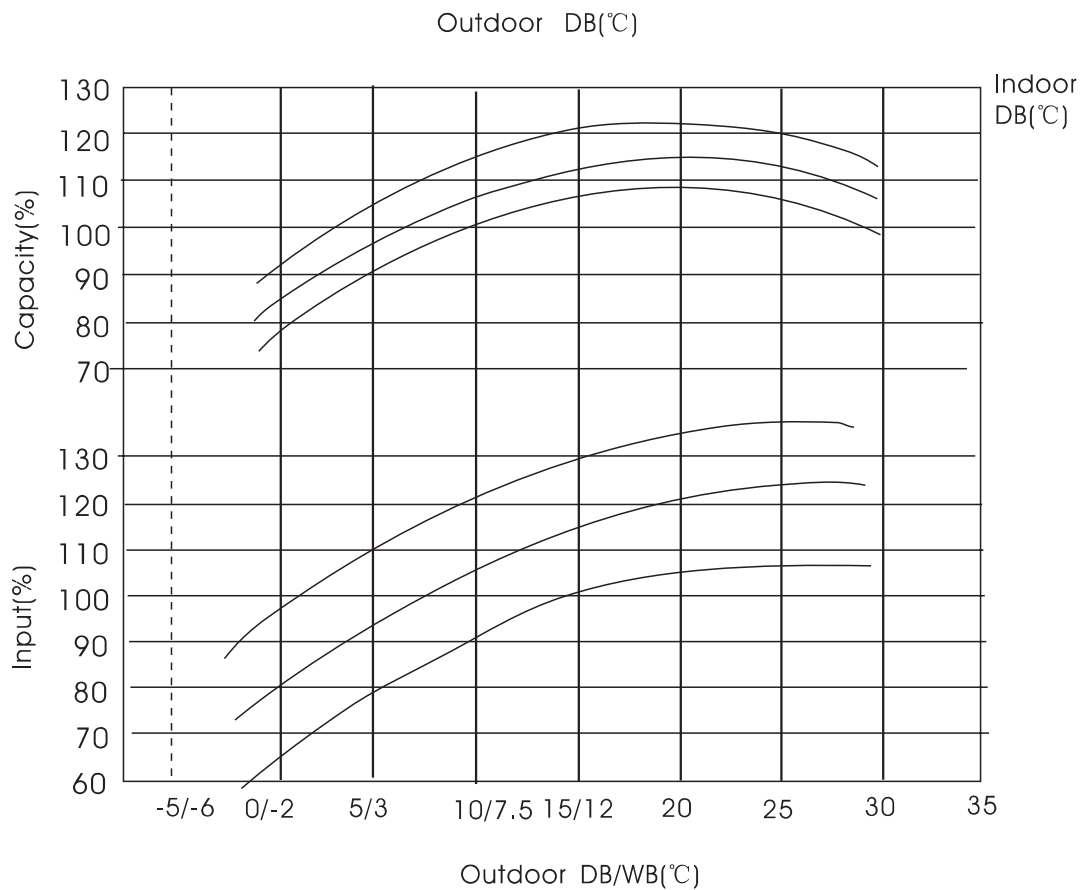
## Curves of performance

Curves of cooling capacity and heating capacity as a function of outdoor temperature(-7°C~43°C)

Cooling



Heating

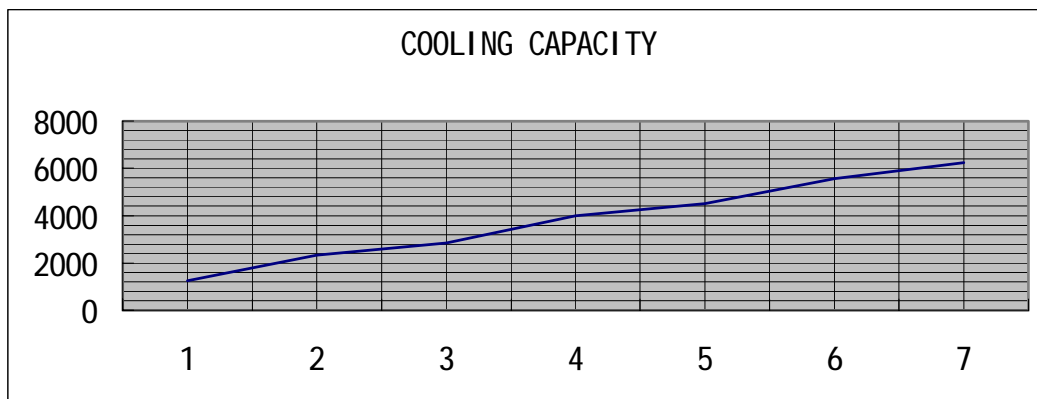


C-6RZ092H1A

CURVES OF CAPACITY AND POWER INPUT.

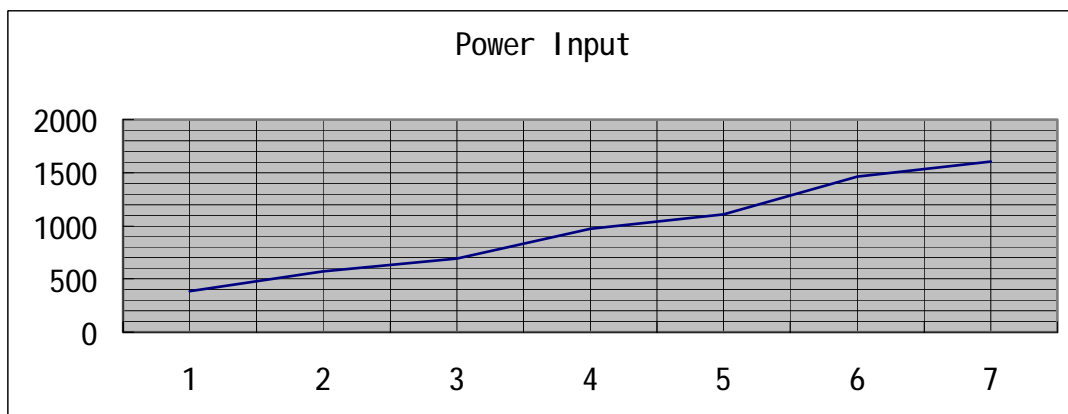
#### COOLING CAPACITY

Hz	30	50	60	80	90	110	120
Cooling	1244	2321	2833	3983	4502	5565	6246



#### Power Input

Hz	30	50	60	80	90	110	120
Power Input	387	570	691	973	1109	1465	1605

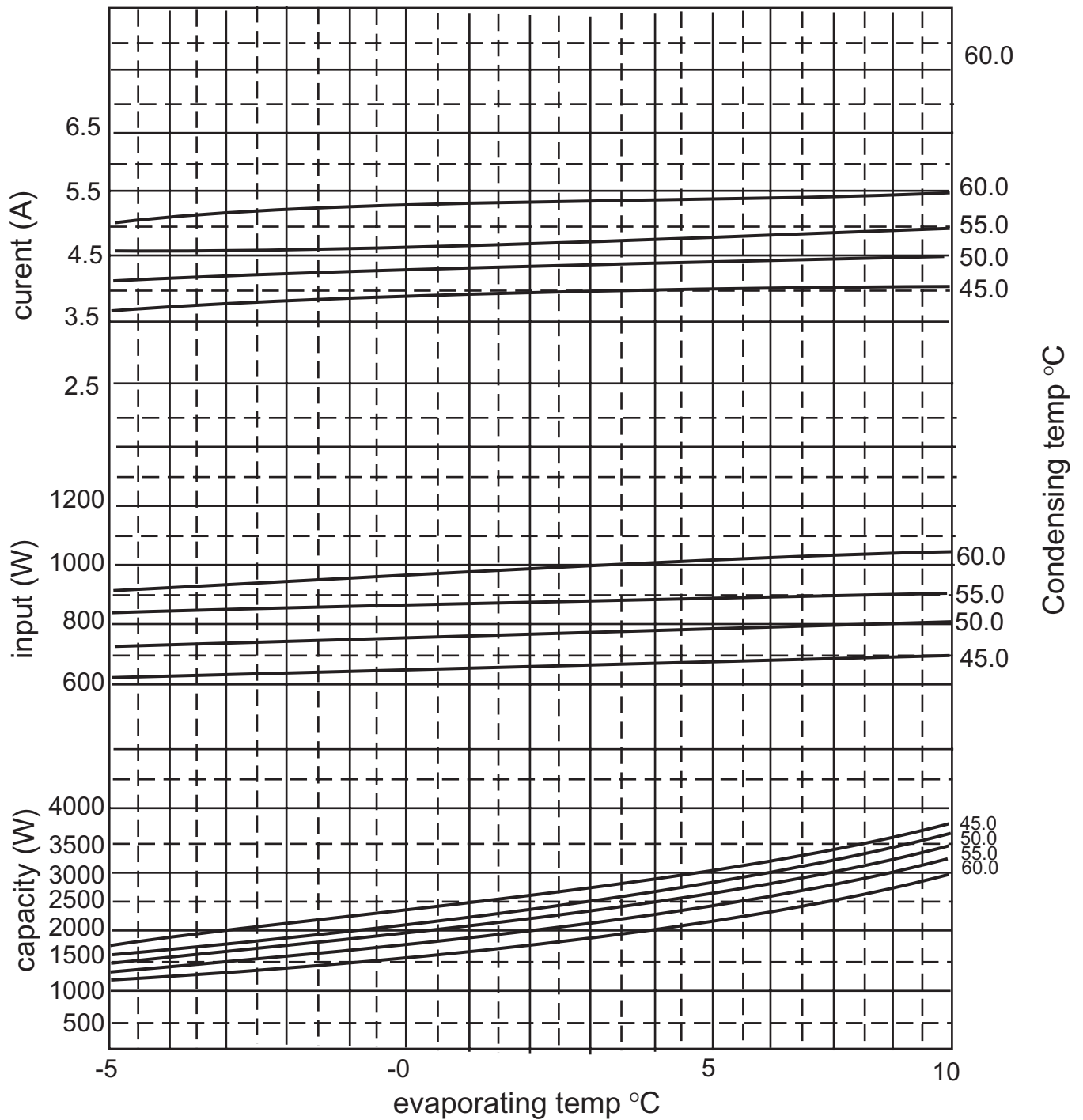


# Curves of compressor performance

Compressor: DA89X1C-20FZ

Model: HFU-09H03/R2(DB)

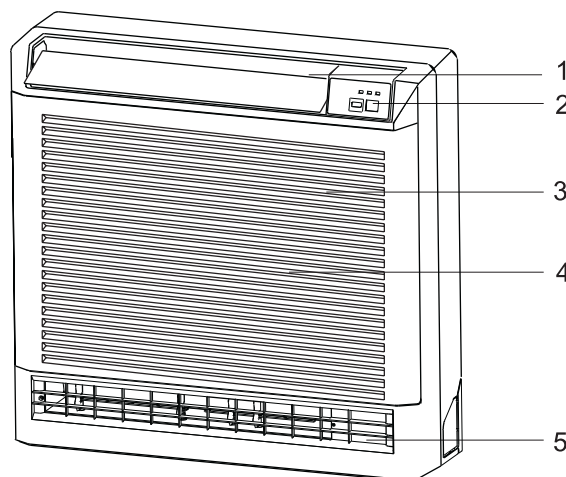
SUCTION GAS TEMP °C	35
UNDER COOL °C	8.3
Ambient temp °C	35



## Description, dimension and function of main components and accessories

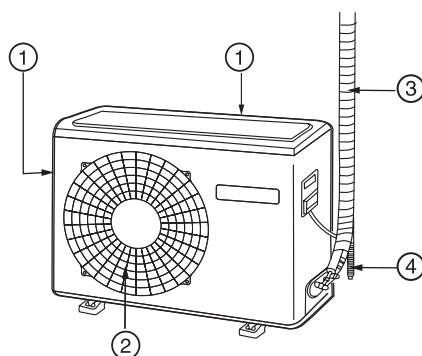
# Parts and Functions

Indoor unit



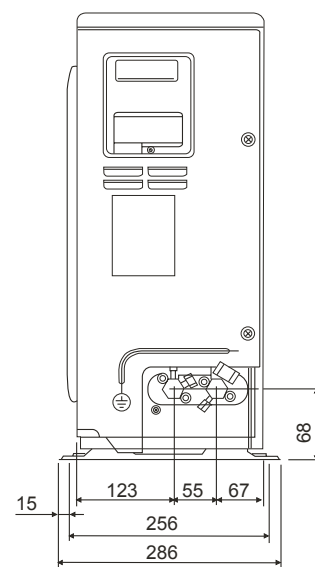
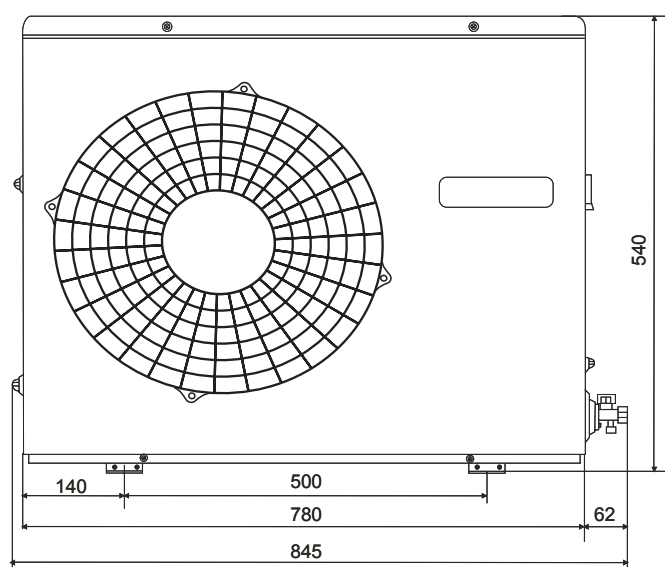
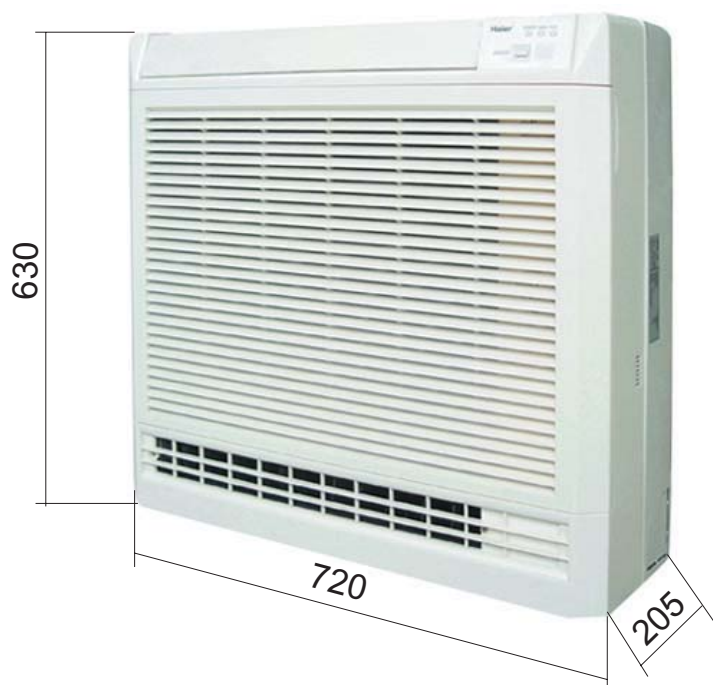
- 1.OUTLET
- 2.CONTROL PANEL
- 3.INLET
- 4.FILTER (inside)
- 5.OUTLET

Outdoor unit



- ① INLET
- ② OUTLET
- ③ CONNECTING PIPING AND ELECTRICAL WIRING
- ④ DRAIN HOSE

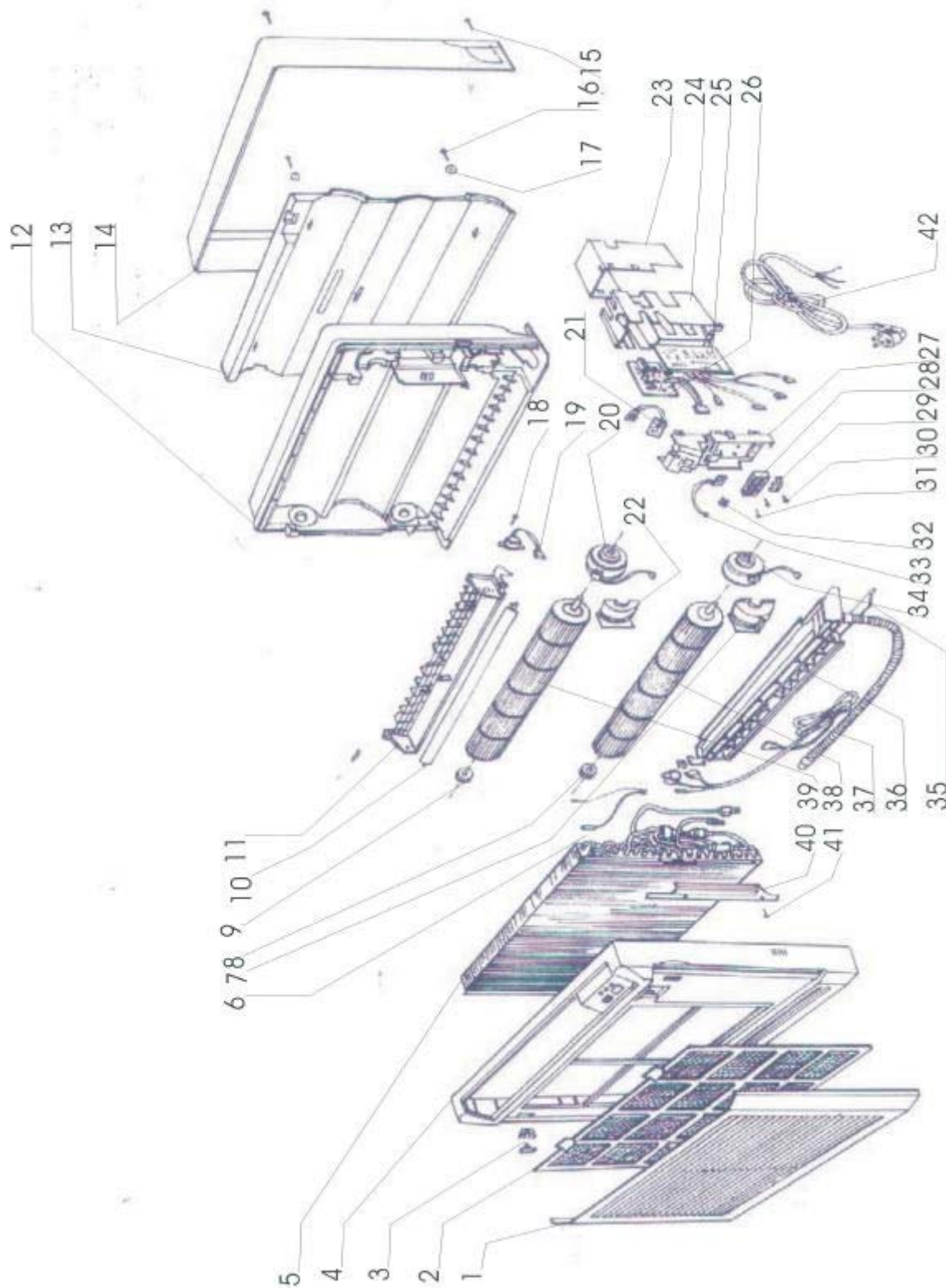
NET DIMENSIONS: Indoor unit for HFU-09H03/R2(DB) HFU-12H03/R2(DB)



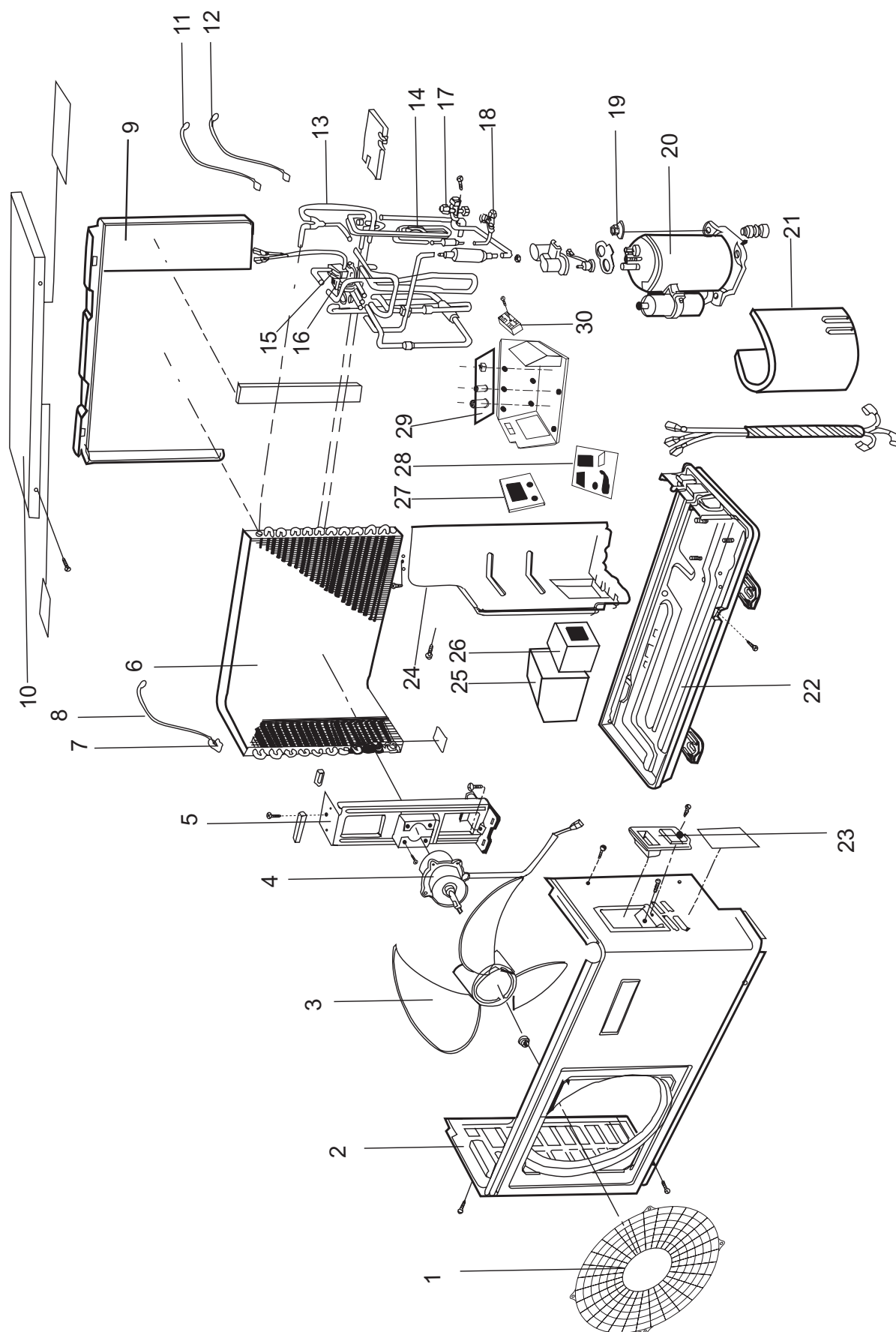
# Knock-down drawings



KNOCK-DOWN DRAWINGS FOR INDOOR UNIT



KNOCK-DOWN DRAWINGS FOR OUTDOOR UNIT



Model: HFU-09H03/R2 DB

NO. In exploded view	Name of part	Part specialized code	Model	QTY.	remark
1	Front grille	0010800954	HFU-09H03/R2 DB	1	indoor unit
2	Air purifying filter	0010201169	HFU-09H03/R2 DB	1	indoor unit
3	Button	0010201288	HFU-09H03/R2 DB	1	indoor unit
4	Front panel	0010800923	HFU-09H03/R2 DB	1	indoor unit
5	Heat exchanger	0010706830	HFU-09H03/R2 DB	1	indoor unit
6	Temperature sensor	001A3900059	HFU-09H03/R2 DB	1	indoor unit
7	DOWN Motor cover	0010800928	HFU-09H03/R2 DB	1	indoor unit
8	Bearing	0010201176	HFU-09H03/R2 DB	2	indoor unit
9	Bearing	0010201176	HFU-09H03/R2 DB	2	indoor unit
10	Flap	0010201191	HFU-09H03/R2 DB	1	indoor unit
11	Air outlet assy	0010800930	HFU-09H03/R2 DB	1	indoor unit
12	Bottom plate	0010800924	HFU-09H03/R2 DB	1	indoor unit
13	Plate cushion	0010800932	HFU-09H03/R2 DB	1	indoor unit
14	Back panel	0010100571	HFU-09H03/R2 DB	1	indoor unit
15	Screw	5002008	HFU-09H03/R2 DB	1	indoor unit
16	Screw	5002116	HFU-09H03/R2 DB	1	indoor unit
17	Screw washer	5401031	HFU-09H03/R2 DB	1	indoor unit
18	Screw	5002118	HFU-09H03/R2 DB	1	indoor unit
19	Swing motor	0010400935	HFU-09H03/R2 DB	1	indoor unit
20	Motor	0010400933	HFU-09H03/R2 DB	1	indoor unit
21	Display board	-----	HFU-09H03/R2 DB	1	indoor unit
22	UP Motor cover	0010800926	HFU-09H03/R2 DB	1	indoor unit
23	Control box shell	0010100572	HFU-09H03/R2 DB	1	indoor unit
24	Control box	0010201188	HFU-09H03/R2 DB	1	indoor unit
25	Main board	0010403628	HFU-09H03/R2 DB	1	indoor unit
26	Power board	-----	HFU-09H03/R2 DB	1	indoor unit
27	Service cover	0010201189	HFU-09H03/R2 DB	1	indoor unit
28	Terminal block	0010400931	HFU-09H03/R2 DB	1	indoor unit
29	Wiring clamp	0010201269	HFU-09H03/R2 DB	1	indoor unit
30	Screw	5002099	HFU-09H03/R2 DB	1	indoor unit
31	Screw	5002236	HFU-09H03/R2 DB	1	indoor unit
32	Hand switch	0010201275	HFU-09H03/R2 DB	1	indoor unit
33	Select board	-----	HFU-09H03/R2 DB	1	indoor unit
34	Motor	0010400934	HFU-09H03/R2 DB	1	indoor unit
35	Flap	0010201209	HFU-09H03/R2 DB	1	indoor unit
36	Drain pan assy	0010201208	HFU-09H03/R2 DB	1	indoor unit
37	Wires	0010400932	HFU-09H03/R2 DB	1	indoor unit
38	DOWN Below fan	0010201184	HFU-09H03/R2 DB	1	indoor unit
39	Up fan	0010201175	HFU-09H03/R2 DB	1	indoor unit
40	Cover panel	0010201281	HFU-09H03/R2 DB	1	indoor unit
41	Screw	5002236	HFU-09H03/R2 DB	1	indoor unit
42	Power wire	4200094	HFU-09H03/R2 DB	1	indoor unit
43	Remote controller	0010401605	HFU-09H03/R2 DB	1	indoor unit

Model: HFU-12H03/R2 DB

NO. In exploded view	Name of part	Part specialized code	Model	QTY.	remark
1	Front grille	0010800954	HFU-12H03/R2 DB	1.00	indoor unit
2	Air purifying filter	0010201169	HFU-12H03/R2 DB	1.00	indoor unit
3	Button	0010201288	HFU-12H03/R2 DB	1.00	indoor unit
4	Front panel	0010800923	HFU-12H03/R2 DB	1.00	indoor unit
5	Heat exchanger	0010706824	HFU-12H03/R2 DB	1.00	indoor unit
6	Temperature sensor	001A3900059	HFU-12H03/R2 DB	1.00	indoor unit
7	DOWN Motor cover	0010800928	HFU-12H03/R2 DB	1.00	indoor unit
8	Bearing	0010201176	HFU-12H03/R2 DB	2.00	indoor unit
9	Bearing	0010201176	HFU-12H03/R2 DB	2.00	indoor unit
10	Flap	0010201191	HFU-12H03/R2 DB	1.00	indoor unit
11	Air outlet assy	0010800930	HFU-12H03/R2 DB	1.00	indoor unit
12	Bottom plate	0010800924	HFU-12H03/R2 DB	1.00	indoor unit
13	Plate cushion	0010800932	HFU-12H03/R2 DB	1.00	indoor unit
14	Back panel	0010100571	HFU-12H03/R2 DB	1.00	indoor unit
15	Screw	5002008	HFU-12H03/R2 DB	1.00	indoor unit
16	Screw	5002116	HFU-12H03/R2 DB	1.00	indoor unit
17	Screw washer	5401031	HFU-12H03/R2 DB	1.00	indoor unit
18	Screw	5002118	HFU-12H03/R2 DB	1.00	indoor unit
19	Swing motor	0010400935	HFU-12H03/R2 DB	1.00	indoor unit
20	Motor	0010400933	HFU-12H03/R2 DB	1.00	indoor unit
21	Display board	-----	HFU-12H03/R2 DB	1.00	indoor unit
22	UP Motor cover	0010800926	HFU-12H03/R2 DB	1.00	indoor unit
23	Control box shell	0010100572	HFU-12H03/R2 DB	1.00	indoor unit
24	Control box	0010201188	HFU-12H03/R2 DB	1.00	indoor unit
25	Main board	0010403628	HFU-12H03/R2 DB	1.00	indoor unit
26	Power board	-----	HFU-12H03/R2 DB	1.00	indoor unit
27	Service cover	0010201189	HFU-12H03/R2 DB	1.00	indoor unit
28	Terminal block	0010400931	HFU-12H03/R2 DB	1.00	indoor unit
29	Wiring clamp	0010201269	HFU-12H03/R2 DB	1.00	indoor unit
30	Screw	5002099	HFU-12H03/R2 DB	1.00	indoor unit
31	Screw	5002236	HFU-12H03/R2 DB	1.00	indoor unit
32	Hand switch	0010201275	HFU-12H03/R2 DB	1.00	indoor unit
33	Select board	-----	HFU-12H03/R2 DB	1.00	indoor unit
34	Motor	0010400934	HFU-12H03/R2 DB	1.00	indoor unit
35	Flap	0010201209	HFU-12H03/R2 DB	1.00	indoor unit
36	Drain pan assy	0010201208	HFU-12H03/R2 DB	1.00	indoor unit
37	Wires	0010400932	HFU-12H03/R2 DB	1.00	indoor unit
38	DOWN Below fan	0010201184	HFU-12H03/R2 DB	1.00	indoor unit
39	Up fan	0010201175	HFU-12H03/R2 DB	1.00	indoor unit
40	Cover panel	0010201281	HFU-12H03/R2 DB	1.00	indoor unit
41	Screw	5002236	HFU-12H03/R2 DB	1.00	indoor unit
42	Power wire	4200094	HFU-12H03/R2 DB	1.00	indoor unit
43	Remote controller	0010401605	HFU-12H03/R2 DB	1.00	indoor unit

No. in explode d view	Spare parts number	Spare parts description in english	Model	QTY	Failure rate	The proportion of the spare part stock	remark
1	001A0100017	Front grille	HFU-09H03/R2(DB)	1			
2	001A1101009	Front panel	HFU-09H03/R2(DB)	1			
3	0010203662	Fan	HFU-09H03/R2(DB)	1			*
4	0010403487	Motor	HFU-09H03/R2(DB)	1			*
5	0010100419	Frame for motor	HFU-09H03/R2(DB)	1			
6	0010706498	Heat exchanger	HFU-09H03/R2(DB)	1			
7	001A5736055	Fixed clip forenviroment temp. sensor	HFU-09H03/R2(DB)	1			
8	001A3800082	Temperature sensor	HFU-09H03/R2(DB)	1			*
9	0010101388	Back panel	HFU-09H03/R2(DB)	1			
10	001A1101010	Top panel	HFU-09H03/R2(DB)	1			
11	001A3900056	Compressor temperature sensor	HFU-09H03/R2(DB)	1			*
12	001A3900055	Tube temperature sensor	HFU-09H03/R2(DB)	1			*
13	0010706509	Entering gas pipe	HFU-09H03/R2(DB)	1			
14	0010706497	Capillary Tube	HFU-09H03/R2(DB)	1			
15	0010403022	4-way valve coil	HFU-09H03/R2(DB)	1			*
16	0010704488	4-way valve	HFU-09H03/R2(DB)	1			
17	0010705988	Stop valve	HFU-09H03/R2(DB)	1			
18	0010705255	Stop valve	HFU-09H03/R2(DB)	1			
19	001A5102050	Flange Nut	HFU-09H03/R2(DB)	3			
20	0010706492	Compressor	HFU-09H03/R2(DB)	1			*
21	001A17621544	Cushion	HFU-09H03/R2(DB)	1			
22	001A1101014	Bottom plate	HFU-09H03/R2(DB)	1			
23	001A1436042	Service cover	HFU-09H03/R2(DB)	1			
24	0010804196	Separating plate	HFU-09H03/R2(DB)	1			
25	001A0100427	Reactor box	HFU-09H03/R2(DB)	1			
26	0010403365	Reactor	HFU-09H03/R2(DB)	1			*
27	0010403368	Power Module	HFU-09H03/R2(DB)	1			*
28	0010403521	PCB	HFU-09H03/R2(DB)	1			*
29	0010403520	Capacitor board	HFU-09H03/R2(DB)	1			*
30	001A4000105	Terminal Block	HFU-09H03/R2(DB)	1			

1,The failer rate and the proportion of the spare-part stock are regarded as the reference of the stock for spare-parts;The first time should be stocked accroded with the proportion of the spare-parts,and it should be adjusted with the actual quantity 3 months later.

2,easy-damaged;The spare-part which is often damaged and the customer must stock in the spare-parts warehouse,and should be marked with "\*\*\*"

3,possible damaged:The spare-part which is not often damaged like the easy damaged one and the customer may stock in the spare-part warehouse accord with the actual case,should be marked with " " .

4,not need provided :The spare-part which is seldom damaged or the maintenance man could not maitmains.The spare parts may be air freighted by the factory if they were damaged.The customer nees not stock in the spare-part warehouse,should be marked with " x " .

5,Above should be improved accord with the reply of the market half a year per time.

6.The spare parts price on net is FOB Qingdao term.

No. in exploded view	Spare parts number	Spare parts description in english	Model	QTY	Failure rate	The proportion of the spare part stock	remark
1	001A0100017	Front grille	HFU-12H03/R2(DB)	1			
2	001A1101009	Front panel	HFU-12H03/R2(DB)	1			
3	0010203662	Fan	HFU-12H03/R2(DB)	1			*
4	0010403508	Motor	HFU-12H03/R2(DB)	1			*
5	0010100419	Frame for motor	HFU-12H03/R2(DB)	1			
6	0010706505	Heat exchanger	HFU-12H03/R2(DB)	1			
7	001A5736055	Fixed clip forenviroment temp. sensor	HFU-12H03/R2(DB)	1			
8	001A3800082	Temperature sensor	HFU-12H03/R2(DB)	1			*
9	0010101388	Back panel	HFU-12H03/R2(DB)	1			
10	001A1101010	Top panel	HFU-12H03/R2(DB)	1			
11	001A3900056	Compressor temperature sensor	HFU-12H03/R2(DB)	1			*
12	001A3900055	Tube temperature sensor	HFU-12H03/R2(DB)	1			*
13	0010706502	Entering gas pipe	HFU-12H03/R2(DB)	1			
14	0010706504	Capillary Tube	HFU-12H03/R2(DB)	1			
15	001A2500076	4-way valve coil	HFU-12H03/R2(DB)	1			*
16	0010703501	4-way valve	HFU-12H03/R2(DB)	1			
17	0010705256	Stop valve	HFU-12H03/R2(DB)	1			
18	0010705255	Stop valve	HFU-12H03/R2(DB)	1			
19	001A5102050	Flange Nut	HFU-12H03/R2(DB)	3			
20	0010706499	Compressor	HFU-12H03/R2(DB)	1			*
21	001A17621544	Cushion	HFU-12H03/R2(DB)	1			
22	001A1101014	Bottom plate	HFU-12H03/R2(DB)	1			
23	001A1436042	Service cover	HFU-12H03/R2(DB)	1			
24	0010804196	Separating plate	HFU-12H03/R2(DB)	1			
25	001A0100427	Reactor box	HFU-12H03/R2(DB)	1			
26	0010403365	Reactor	HFU-12H03/R2(DB)	1			*
27	0010403368	Power Module	HFU-12H03/R2(DB)	1			*
28	0010403519	PCB	HFU-12H03/R2(DB)	1			*
29	0010403520	Capacitor board	HFU-12H03/R2(DB)	1			*
30	001A4000105	Terminal Block	HFU-12H03/R2(DB)	1			

1,The failer rate and the proportion of the spare-part stock are regarded as the reference of the stock for spare-parts;The first time should be stocked accroded with the proportion of the spare-parts,and it should be adjusted with the actual quantity 3 months later.

2,easy-damaged;The spare-part which is often damaged and the customer must stock in the spare-parts warehouse,and should be marked with"\*"

3,possible damaged:The spare-part which is not often damaged like the easy damaged one and the customer may stock in the spare-part warehouse accord with the actual case,should be marked with " " .

4,not need provided :The spare-part which is seldom damaged or the maintenance man could not maitmains.The spare parts may be air freighted by the factory if they were damaged.The customer nees not stock in the spare-part warehouse,should be marked with " x " .

5,Above should be improved accord with the reply of the market half a year per time.

6.The spare parts price on net is FOB Qingdao term.

# Brief introduction to electrical control function

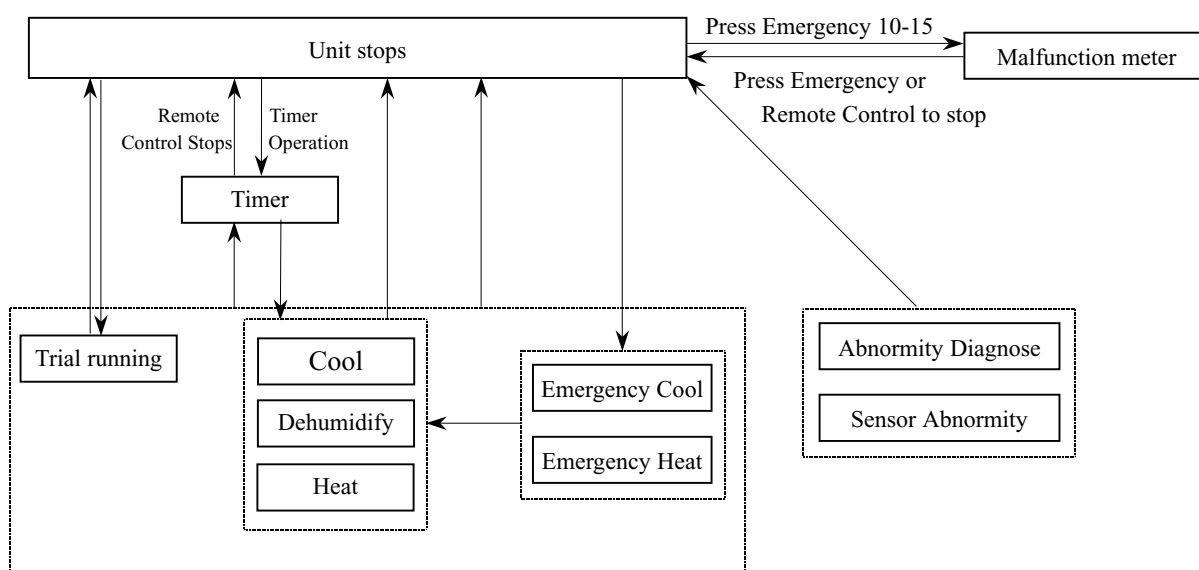
## 1. Introduction to electrical control function

Including brief introduction to air conditioners of series models and electrical control function as well as the technical information.

### 1.1 Brief introduction to electrical function

#### 1.1.1 Status conversion

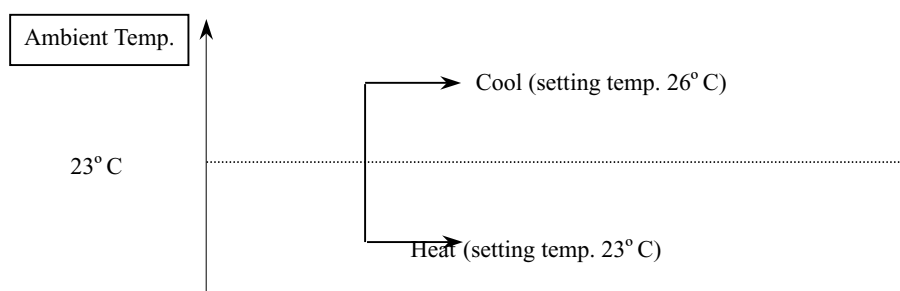
As the following figure:



#### 1.1.2 Automatic function (automatic running function is selected after pressing emergency button 0-5s)

##### 1.1.2.1 Status conversion under automatic running

As the following figure:



When running in the automatic emergency status, indoor unit can receive the remote controller' s signal to convert status.

##### 1.1.2.2 Air volume control under automatic running

Wind speed of indoor fan is automatically adjusted when automatic running, refer to air volume control under cool/heating running for details.

##### 1.1.2.3 Frequency control for compressor under automatic running

It is the same as the frequency control for compressor under cool/heating running.



### 1.1.2 Cooling running

#### 1.1.2.1 Air volume control under cooling running (Cool compensation temp. – 0.3<sup>3</sup> C)

When setting manual control, wind speed will run accord to the setting value during compressor running, and run in the speed of setting value minus 60rpm during compressor stopping.

When setting automatic wind speed, its velocity is related to temperature difference  $\Delta T$  ( | ambient temp. – compensation temp. – setting temp. ). See the following table for details:

Temperature difference (°C)	$\Delta T > 4.3$	$4.3 \geq \Delta T \geq 0.3$	$\Delta T < 0.3$
Wind speed	High	Middle	Low

#### 1.1.2.2 Compressor control under cooling running

##### 1.1.2.2.1 when running in normal status, control of compressor frequency:

Temperature difference (°C)	$\Delta T > 4.3$	$4.3 \geq \Delta T \geq 1.3$	$1.3 \geq \Delta T \geq -1$	$\Delta T < -1$
Maximum frequency (Hz)	High frequency	Mid. frequency	Low frequency	Compressor stop

##### 1.1.2.2.2 when running in cool mode, the setting air volume restricts frequency as follows:

Setting air volume	Maximum frequency (Hz)
Middle	90 Hz
Low	52 Hz

##### 1.1.2.2.3 when running in cool mode, the outdoor ambient temperature restricts frequency as follows: (only applying to the machine models with outdoor ambient temperature sensor).

Outdoor ambient temp. (°C)	Maximum frequency (Hz)
$\Delta T \geq 26$	No limitation
$\Delta T < 26$	60 Hz

### 1.1.3 Dehumidification running

#### 1.1.3.1 Air volume control under dehumidification running (Cool compensation temperature – 0.3<sup>3</sup> C)

Except for the first running that fan runs in low speed during compressor stopping, fan stops during compressor OFF.

When setting manual control, wind speed runs according to the following table during compressor running:

Temperature difference (°C)	$\Delta T \geq 0.3$	$\Delta T < 0.3$
Wind speed	Setting	Low

When setting automatic wind speed, its velocity is related to temperature difference (ambient temp. – setting temp.). See the following table for details:

Temperature difference (°C)	$\Delta T > 4.3$	$4.3 \geq \Delta T \geq 0.3$	$\Delta T < 0.3$
Wind speed	High	Middle	Low

## 1.1.3.2 Compressor control under dehumidification running

## 1.1.3.2.1 When running in normal status, control of compressor frequency:

Temperature difference (°C)	$\Delta T > 4.3$	$4.3 \geq \Delta T \geq 1.3$	$1.3 \geq \Delta T \geq -1$	$\Delta T < -1$
Maximum frequency (Hz)	High frequency	Mid. frequency	Low frequency	Compressor stop

## 1.1.3.2.2 When running in dehumidify mode, the setting air volume restricts frequency as follows:

Setting airflow	Maximum frequency (Hz)
Middle	90 Hz
Low	52 Hz

1.1.3.2.3 When running in dehumidify mode, the outdoor ambient temperature restricts frequency as follows:  
(only applying to the machine models with outdoor ambient temperature sensor).

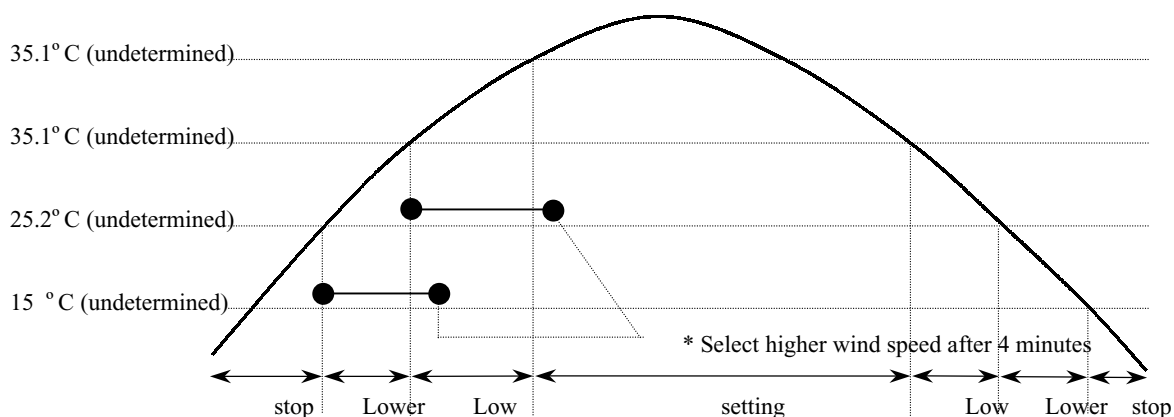
Outdoor ambient temp. (°C)	Maximum frequency (Hz)
$\Delta T \geq 26$	No limitation
$\Delta T < 26$	60 Hz

## 1.1.4 Heating running (heat compensation temp. 4.67° C)

## 1.1.4.1 Air volume control under heating running

When heating running starts, defrosting stops. When compressor restarts, it shall be warm start to prevent cold wind.

Thermal conversion temperature:



Note:

For different machine type, the “undetermined” parameters is also different, here only take this example for illustration.

“\*” Indicating that if unit maintains in this wind speed for more than 4 minutes, it then select higher speed.

When setting automatic wind speed, its velocity is related to the temperature difference (including compensation temperature), see the following table for details:

Temperature difference (°C)	$\Delta T > 4.3$	$4.3 \geq \Delta T \geq 0.3$	$\Delta T < 0.3$
Wind speed	High	Middle	Low

#### 1.1.4.2 Compressor control under heating running

##### 1.1.4.2.1 When running in normal status, control of compressor frequency:

Temperature difference (°C)	$\Delta T > 4.3$	$4.3 \geq \Delta T \geq 1.3$	$1.3 \geq \Delta T \geq -1$	$\Delta T < -1$
Maximum frequency (Hz)	High frequency	Mid. frequency	Low frequency	Compressor stops

1.1.4.1.2 When running in dehumidify mode, the outdoor ambient temperature restricts frequency as follows: (only applying to the machine models with outdoor ambient temperature sensor).

Outdoor ambient temp. (°C)	Maximum frequency (Hz)
$\Delta T \geq 15$	60 Hz
$\Delta T < 15$	No limitation

#### 1.1.5 Defrosting running

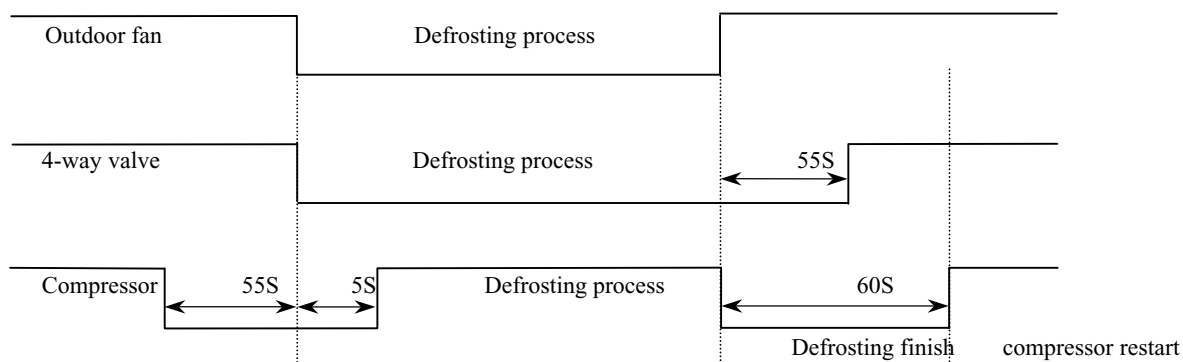
##### 1.1.5.1 Defrosting process

When defrosting during heating operation, frequency is not controlled according to the temperature difference, and the maximum heating frequency is displayed.

Compressor does not stop in the process of defrosting.

Defrosting beginning conditions: Heat mode, the first power on operation or the lasting time to the previous defrosting finishing is more than 47 minutes, and the outdoor ambient temperature is continuously found to be less than -4°C (model: 26, 28) or -5°C (model: 32, 36, 40) during compressor running, and then defrosting starts.

Defrosting process as following illustration:



##### 1.1.5.2 Air volume control during defrosting

20 seconds Low wind is firstly selected during defrosting, then indoor fan stops running.

#### 1.1.6 Special function

##### 1.1.6.1 Trial running

###### 1.1.6.1.1 Beginning conditions

Pressing emergency button 5-10 seconds and buzzer sounding twice, then starts.

#### 1.1.6.1.2 Running status

When in trial running, the display frequency of compressor is 58Hz, running mode is cool, compressor keeps on running for 30 minutes and will not be restricted by low-load protection (refer to protection function).

#### 1.1.6.1.3 Finishing conditions

Trial running will stop when remote control or emergency signal is received. After 30 minutes trial running, emergency running (automatic running) starts.

#### 1.1.6.2 Abnormity diagnose

When displaying abnormity, using indicator to express the previous error.

When having no error code record, show nothing.

The abnormity indicating mode will automatically disappeared 30 seconds later.

The remote controller only receives stopping signal and abnormity record indicating mode will finish according to the stopping signal of the switch or the remote controller.

##### 1.1.6.2.1 Beginning conditions

Pressing emergency switch 10-15 seconds, the buzzer sounds three times, and then start.

##### 1.1.6.2.2 Running status

The indicator displays the previous error code (see the error code list).

##### 1.1.6.2.3 Finishing condition

Finishing when remote control or emergency signal is received.

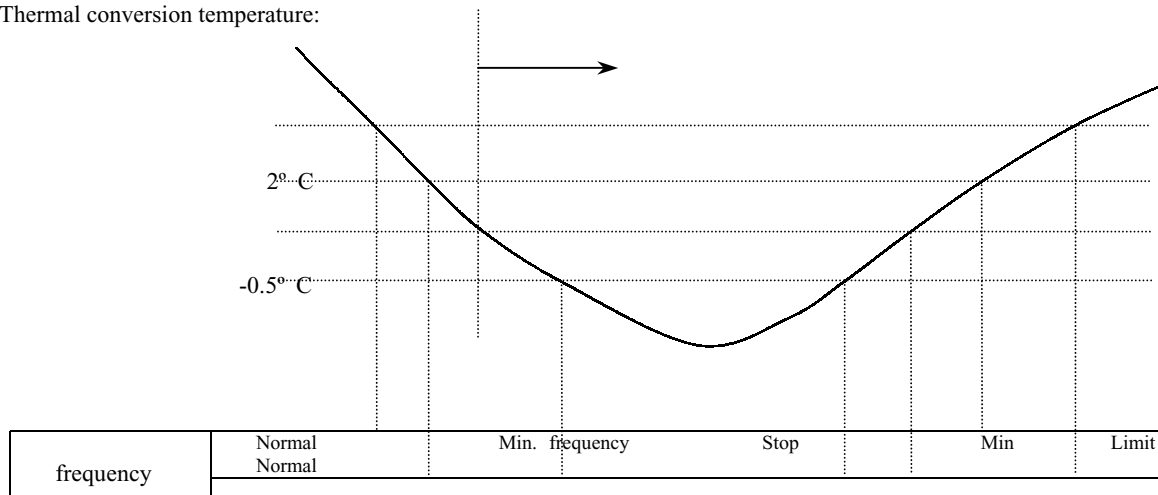
### 1.1.7 Protection function

#### 1.1.7.1 Low-load protection

During cooling running, if the indoor coil-pipe does not evaporate thoroughly and the temperature is too low, the compressor must be stopped for protection to prevent it from damaging due to the system “ liquid hitting” . See the following figure for action details:

Low-load protection control:

Thermal conversion temperature:



Indoor coil pipe temperature sensor type: R (25° C)=10KΩ

During cooling-dehumidification running, low-load protection is carried out according to indoor coil-pipe temperature; whereas, the displayed frequency is “ 58Hz” .

The minimum frequency is displayed when indoor coil- pipe temperature is lower than 2° C and coil-pipe temperature is above -0.5° C.

When thermal conversion temperature is lower than 0.5° C, selecting 3 minutes stand-by status.

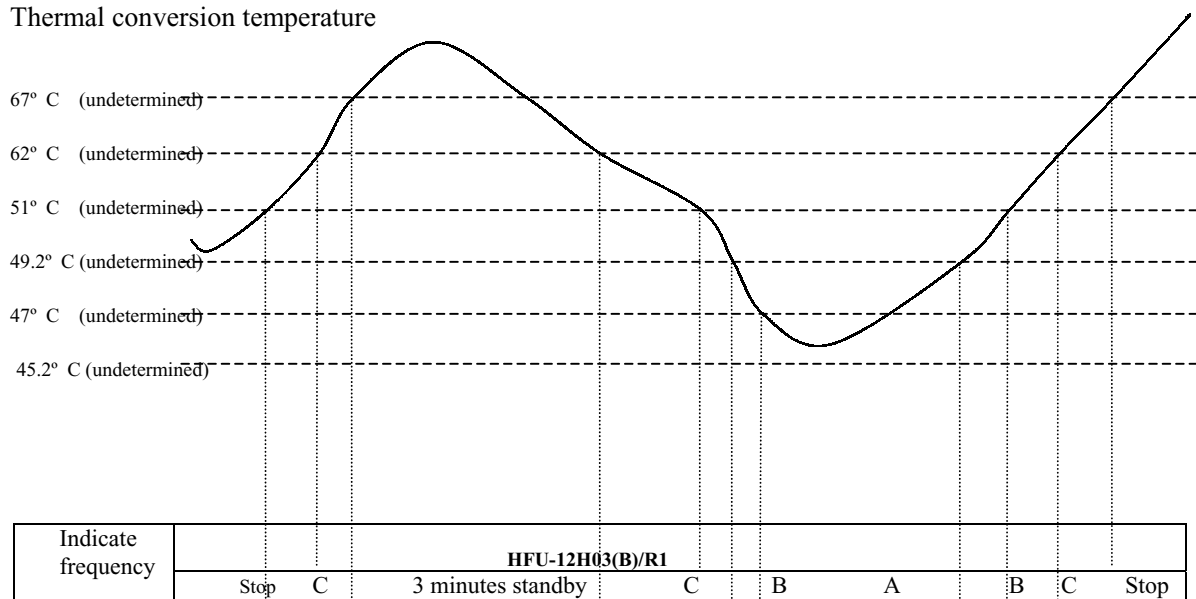
When indoor coil-pipe temperature is 2.1° C, the compressor restarts.

During trial running, the low-load protection control can be overlooked.

#### 1.1.7.2 High-load protection

During heating running, if the indoor coil-pipe temperature is too high, the compressor must be stopped for protection to prevent it from damaging due to the system overheating. See the following figure for details:

Thermal conversion temperature



Frequency A	Parameters 80Hz
Frequency B Frequency C	72Hz 50Hz
Frequency D	30Hz

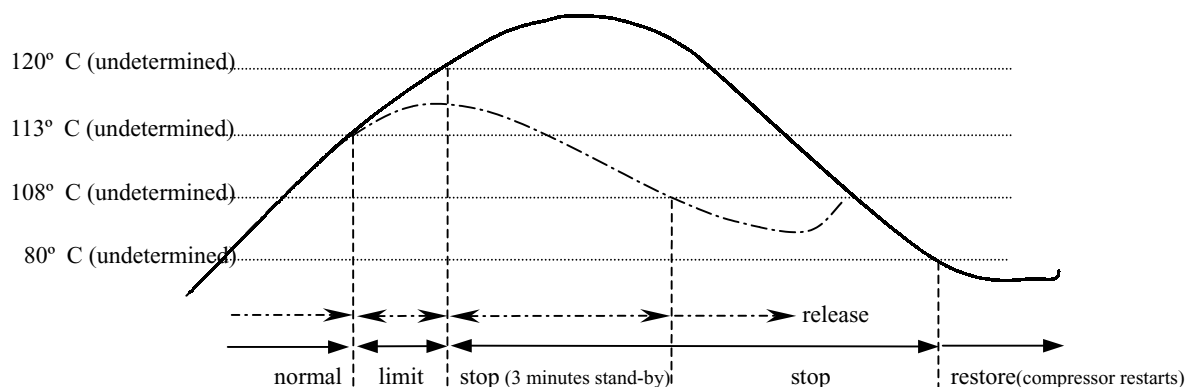
When high-load protection is limited to act twice within 30 minutes, it is high-load protection alarm.

When indoor coil pipe temperature is lower than 45° C, it comes back to normal control.

The frequency of high load protection is priority.

### 1.1.7.3 Compressor discharge temperature protection

When air conditioner is running, the discharge temperature need not to be detected within the first 10 minutes and starts to detect after 10 minutes. If the detected temperature is found too high, the compressor shall be protected from damaging by decreasing frequency or stopping, see the following figure for details:



If the compressor continuously stops twice within 30 minutes, the compressor discharge temperature protection alarms.

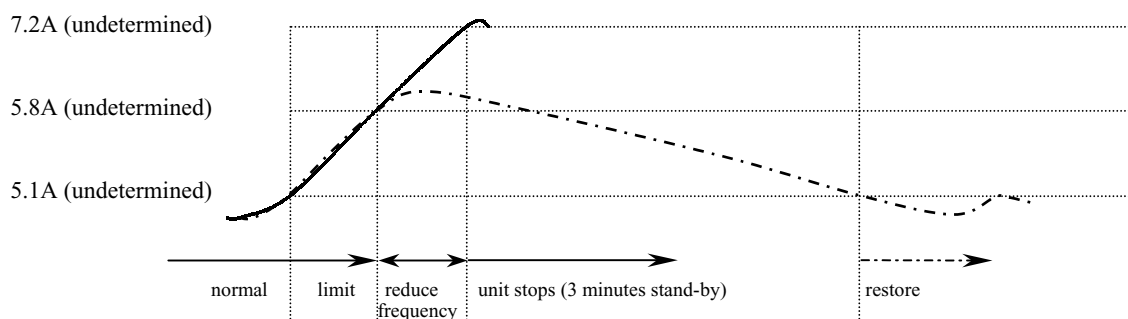
Note:

The undetermined data are for the example machine type, not for all types.

The dotted line indicates the descending curve of the discharge temperature after frequency is limited, and the real line indicates the continuous ascending curve of the discharge temperature after frequency is limited.

### 1.1.7.4 AC over-current protection

When compressor is running, overhigh current will appear if the system load is heavy. In order to reduce the current and protect the compressor, the frequency must be reduced or the compressor must be stopped, see the following for details:



If continuously appears twice within 30 minutes, AC over-current protection alarms.

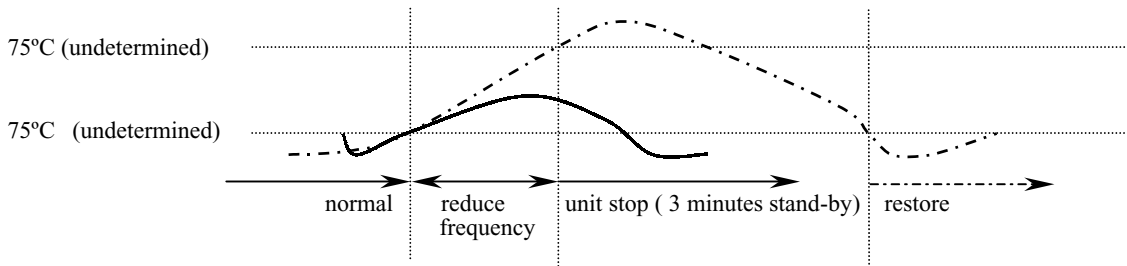
### 1.1.7.5 Over-current protection of the power module

When compressor is running, if “rotation obstacle” appears or the system pressure is too high, the power module will send “over-current signal of power module” to outdoor computer board to protect it from damaging and the unit stops

and alarms.

#### 1.1.7.6 Overhigh temperature protection of the outdoor computer board

If the temperature of the outdoor computer board is too high, the system will reduce the frequency or stop the compressor to protect other components on the computer board from damaging, see the following figure for details:



### 1.1.8 Abnormity confirmation alarm

#### 1.1.8.1 Indoor ambient temperature sensor abnormal

When in running, temperature above 126° C or below -31° C is abnormal.

When leaving the above ranges, operation resets automatically.

#### 1.1.8.2 Indoor coil pipe temperature sensor abnormal

When in running, temperature above 196° C or below -53° C is abnormal.

When leaving the above ranges, operation resets automatically.

If abnormality appears, the low-load protection shall be released.

#### 1.1.8.3 High-load protection

Within 30 minutes after upper limit of high-load acting, the high-load protection will alarm if the upper limit of high-load acts once more.

#### 1.1.8.4 Outdoor ambient temperature sensor abnormal

Displayed as thermistor abnormality mode respectively after outdoor unit received the abnormal error code signals of defrosting, discharge temperature, control board and outdoor thermistor.

Resetting operation automatically after outdoor unit received the signal of temperature sensor abnormality released.

If abnormality appears, the low-load protection shall be released.

#### 1.1.8.5 Control action of outdoor unit protection

Displaying abnormality confirmation mode since outdoor unit received the following error code:

Overhigh temperature protection of air discharge pipe, DC peak current, CT wiring disconnected, AC over-current, overhigh temperature protection of control board, low-voltage protection and compressor abnormal rotation.

#### 1.1.8.6 Transmission abnormality

According to the communication between indoor unit and outdoor unit, it is considered abnormal if outdoor unit cannot receive signals within 20 seconds after indoor unit' s sending. (Except for the first 2 minutes after power on).

It is regarded as transmission abnormality after outdoor unit receives the signal of transmission abnormality.  
Transmission abnormality is released by running stopping.

#### 1.1.8.7 EEPROM

When power on, EEPROM is abnormal if the control parameters and the checking total amount are not identical.  
EEPROM is considered abnormal since the outdoor received the abnormal signal of EEPROM.  
At the same time, remote control and emergency running are not accepted.  
It is only can be released by power blackout.

#### List of error code

Abnormity mode	Error display			Indoor	Outdoor	Automatic restore
	Power	Time	Running			
Abnormity of indoor thermistor	★	■	■	*		*
Abnormity of thermal conversion thermistor	★	□	□	*		*
Abnormity of defrosting thermistor	□	□	★		*	*
Abnormity of discharging thermistor	★	□	■		*	*
Abnormity of control board thermistor	□	■	★		*	*
Abnormity of module thermistor	□	★	□		*	*
Abnormity of outdoor thermistor	□	★	■		*	*
Transmission abnormity	■	■	★	*		
					*	
Compressor running abnormity	★	■	□		*	
Overhigh discharging temperature protection	■	★	■		*	
AC current protection	★	★	■		*	
DC current protection	★	★	□		*	
Insufficient current protection	■	★	□		*	
Outdoor control board temperature protection	■	★	★		*	
Module temperature rising protection	□	★	★		*	
High-load protection	★	★	★	*		
CT wiring disconnected protection	★	■	★		*	
EEPROM abnormity	★	□	★	*		
					*	
Note:	□: Lightening ★: Flashing ■: Blackout			* Indicating that this function is provided.		



**Parameter list of the main components**

No.	Name	Type	Unit	Indoor unit	Outdoor unit	Remarks
1	Optical coupler	TLP371	Piece	1	1	
2	Optical silicon controlled rectifier	TLP3526	Piece	1		
3	Rectifying bridge	S15VB60 (15A 600V)	Piece		2	
4	Rectifying bridge	SINB60	Piece	1		
5	Power module	TM-03	Piece		1	
6	Relay	G4A-1A DC12V (20)A	Piece	1	1	
7	Ceramic resonator	CST10.0MTW-TF01	Piece		1	
8	Receiver	HS0038A2M	Piece	1		

For the appeared abnormal phenomena, please refer to the following table for trouble analysis and troubleshooting:

List of error code:

Abnormity mode	Error display			Indoor	Outdoor	Automatic restore	Possible reason
	Po we r	Ti m er	Run ning				
Abnormity of indoor thermistor	★	■	■	*		*	1. Inserter does not contact well or control board is not good.
Abnormity of thermal conversion thermistor	★	□	□	*		*	1. Inserter does not contact well or control board is not good.
Abnormity of defrosting thermistor	□	□	★		*	*	1. Inserter does not contact well or control board is not good.
Abnormity of discharging thermistor	★	□	■		*	*	1. Inserter does not contact well or control board is not good.
Abnormity of control board thermistor	□	■	★		*	*	1. Inserter does not contact well or control board is not good.
Abnormity of module thermistor	□	★	□		*	*	1. Inserter does not contact well or control board is not good.
Abnormity of outdoor thermistor	□	★	■		*	*	1. Inserter does not contact well or control board is not good.
Transmission abnormality	■	■	★	*			1. There is great interference source around
					*		2. Incorrect wire connection or control board is not good.
Compressor running abnormality	★	■	□		*		1. Check if compressor shaft is seized. 2. Whether power module is damaged
Overhigh discharging temperature protection	■	★	■		*		1. Whether system gas is insufficient or charged gas is too much. 2. Whether system voltage is too high (above 242V) or too low (below 187V) 3. Whether capillary tube is blocked. 4. Whether sensors or control board components are abnormal. 5. Whether the indoor/outdoor ambient temperature is too high.
AC current protection	★	★	■		*		1. Whether system is charged too many gases. 2. Whether voltage is too low (below 187V). 3. Whether CT or control board component is abnormal.

It is regarded as transmission abnormality after outdoor unit receives the signal of transmission abnormality.  
Transmission abnormality is released by running stopping.

#### 1.1.8.7 EEPROM

When power on, EEPROM is abnormal if the control parameters and the checking total amount are not identical.  
EEPROM is considered abnormal since the outdoor received the abnormal signal of EEPROM.  
At the same time, remote control and emergency running are not accepted.  
It is only can be released by power blackout.

#### List of error code

Abnormality mode	Error display			Indoor	Outdoor	Automatic restore
	Power	Time	Running			
Abnormality of indoor thermistor	★	■	■	*		*
Abnormality of thermal conversion thermistor	★	□	□	*		*
Abnormality of defrosting thermistor	□	□	★		*	*
Abnormality of discharging thermistor	★	□	■		*	*
Abnormality of control board thermistor	□	■	★		*	*
Abnormality of module thermistor	□	★	□		*	*
Abnormality of outdoor thermistor	□	★	■		*	*
Transmission abnormality	■	■	★	*		
					*	
Compressor running abnormality	★	■	□		*	
Overhigh discharging temperature protection	■	★	■		*	
AC current protection	★	★	■		*	
DC current protection	★	★	□		*	
Insufficient current protection	■	★	□		*	
Outdoor control board temperature protection	■	★	★		*	
Module temperature rising protection	□	★	★		*	
High-load protection	★	★	★	*		
CT wiring disconnected protection	★	■	★		*	
EEPROM abnormality	★	□	★	*		
					*	
Fan motor abnormality	■	□	★	*		
Note:	□: Lightning ★: Flashing ■: Blackout			* Indicating that this function is provided.		

## OUTDOOR UNIT PART

### Chapter I: Indoor Unit and Main board for Outdoor Unit

#### Notice:

During operations under any mode, if short circuit, open circuit and other malfunctions of the temperature sensors are detected, the main engine should come to a halt immediately.

#### 1. Outdoor-board:

##### 1.1. Forced cooling operation switch:

Short circuit this switch before electrifying, data communication to indoor unit will be ignored:

Forced cooling will function, the 3-minute delay will be cancelled, and the following output will be ON simultaneously:

High wind volume (H) for outdoor fan motor;

Compressor operates at the frequency of 80Hz.

##### 1.2. Forced heating operation switch:

Short circuit this switch before electrifying, data communication to indoor unit will be ignored:

Forced heating will function, the 3-minute delay will be cancelled, and the following output will be ON simultaneously:

High wind volume (H) for outdoor fan motor;

Compressor operates at the frequency of 80Hz.

CPU checks all A/D ports

B When safeguarding action happens outdoors, the actions in A should be OFF, and other inputs are independent of the actions in A.

C LED output: Goes along even if safeguarding action happens outdoors; Cut this switch and go back to the original state. (The out-door safeguarding action will continue)

### Chapter II: Basic Functions

#### 3. Cooling mode

3.1. The four-way valve does not work (not electrified)

3.2. The discharge temperature sensor will not be tested within five minutes after the compressor is started

3.3. Outdoor fan motor control: The fan motor starts five seconds after the compressor starts, switching conditions for the two gears of wind volume are as follows:

T ambient temp. <21 , Low wind volume

T ambient temp. >21 , High wind

volume  
When the fan motor starts up, and the ambient temperature is at the return difference ( 2 ), it runs at the low wind volume.

3.4. Compressor control: Frequency range: 30HZ-----120HZ

T ambient temp. <16 , the maximum frequency is 65HZ

16 T ambient temp. 30 the maximum frequency is 90HZ

30 T ambient temp. 41 the maximum frequency is 110HZ

T ambient temp. 41 the maximum frequency is 85HZ

Actual temperature and frequency maybe adjusted through EEPROM

#### 4. Heating mode

4.1. The four-way valve is electrified 2 seconds after the compressor is electrified

4.2. Malfunctions of the discharge temperature sensor will not be tested within five minutes after the compressor is started

4.3. Outdoor fan motor control: The fan motor starts five seconds after the compressor starts, switching conditions for the two gears of wind volume are as follows:

T ambient temp.  $< 16$  , High wind volume  
T ambient temp.  $16$  , Low wind volume

When the fan motor starts up, and the ambient temperature is at the return difference (  $2$  ), it runs at the low wind volume.

4.4. Compressor control: Frequency range: 30HZ-----120HZ

T ambient temp.  $> 22$  , the maximum frequency is 70HZ

9 T ambient temp.  $22$  the maximum frequency is 90HZ

2 T ambient temp.  $9$  the maximum frequency is 100HZ

T ambient temp.  $< 2$  the maximum frequency is 110HZ

Actual temperature and frequency can be adjusted through EEPROM

#### 4.5. Conditions to enter into the defrosting stage:

##### A Conditions to enter into the defrosting stage

After the heating operation has begun, and the operation time of the compressor adds up to 45 minutes (The total operation time of the compressor will be reset to zero after defrosting or the operating mode switched into cooling), through examining the defrosting sensor TE (Examining the frosting status of the outdoor heat exchanger) and the ambient temperature sensor TA, if the following conditions are met continuously up to 5 minutes, then defrosting operation is entered:

$$\begin{aligned} & TE - C - TA \\ & \text{Of which } C - TA - 0 \quad C = 0.8 \\ & TA - 0 \quad C = 0.3 \end{aligned}$$

maybe adjusted through EEPROM

For places easy to frost, set as H; For places not easy to frost, set as L; It is set as M when leaving factory.

Temperature limit to enter into the defrosting stage -15 E C TA 2 E

##### B Time interval of defrosting

- While the calculated data of C TA fall within the range of -15 E C TA , the time interval between two defrosting operation is 45 minutes
- While the calculated data of C TA fall within the range of C TA -15 E, the time interval between two defrosting operation is 55 minutes C Defrosting operation
- When defrosting begins, the compressor and the outdoor fan motor stops, and the four-way valve turns OFF 50 seconds later.
- The compressor starts and stays at the frequency of 60HZ for 30 seconds, then operates towards the target frequency (Can be adjusted through EEPROM)
- The current safeguard and the compressor discharge safeguard and other means of safeguard remain valid while defrosting. If the compressor

halts during the defrosting stage, remain still for 30 seconds, then conducts defrosting operation if it is still within the defrosting stage, the compressor starts according to the demand of the startup of the defrosting compressor.

- Entering into the defrosting stage, it must be guaranteed that the minimum operation time of the compressor should amount at least to 2 minutes before exit defrosting.

**D. Conditions to exit the defrosting stage**

The defrosting operation will return to heating operation if any of the following conditions is met.

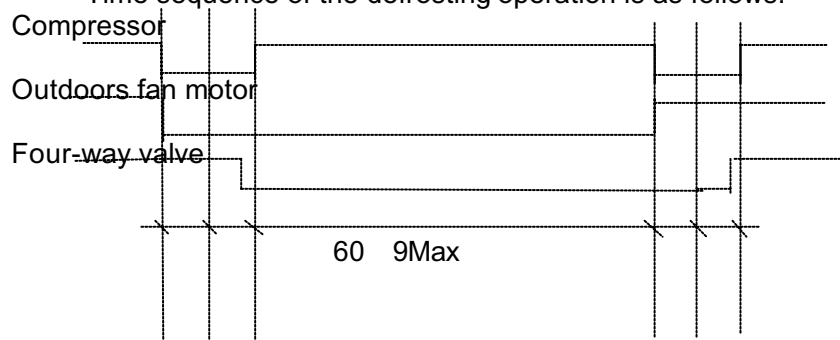
1 The temperature of the outdoor heat exchanger remains above 7 (Can be adjusted through EEPROM) for over 80 seconds continuously.

2 Keep defrosting operation for 9 minutes (Can be adjusted through EEPROM) continuously.

E After the condition to exit defrosting operation is met, work as follows.

The compressor stops, the outdoor fan motor stops 50 seconds later, the four-way valve turns on, the compressor starts according to the starting process.

Time sequence of the defrosting operation is as follows:



**5.Outdoor condensation temperature control while cooling:**

5.1.When the operation frequency  $F = 40\text{Hz}$ , if the temperature of the outdoor coiled pipe  $T_{\text{outdoor coil}} = 52$ , decrease the operation frequency of the compressor by  $2\text{Hz}$  then examine the temperature of the outdoor coiled pipe at 10-second intervals, if  $T_{\text{outdoor coil}} = 52$ , decrease the operation frequency further by  $2\text{Hz}$  until the frequency is the lowest;

During the frequency-decreasing operation, if  $47 \leq T_{\text{outdoor coil}} \leq 52$ , the compressor and the fan motor keep their original states;

the compressor runs at the normal operating frequency, and the outdoor fan motor returns to its original state,

5.2.When the operation frequency  $F = 40\text{Hz}$ , if the temperature of the outdoor coiled pipe  $T_{\text{outdoor coil}} = 57$ , decrease the operation frequency of the compressor by  $2\text{Hz}$  then examine the temperature of the outdoor coiled pipe at 10-second intervals, if  $T_{\text{outdoor coil}} = 57$ , decrease the operation frequency further by  $2\text{Hz}$  until the frequency is the lowest;

During the frequency-decreasing operation, if  $52 \leq T_{\text{outdoor coil}} \leq 57$ , the compressor and the fan motor keep their original states;

When  $T_{\text{outdoor coil}} = 51$ , the compressor runs at the normal operating frequency,

and the outdoor fan motor returns to its original state;

The above temperature points, frequency-decreasing step and time interval can all be adjusted through EEPROM

III. Anti over-loading operation while heating:

5.3. When the operation frequency  $F = 40\text{Hz}$ , if the temperature of the outdoor coiled pipe  $T_{\text{outdoor coil}} = 52$ , the outdoor fan motor performs forced high-speed operation and the operation frequency of the compressor should be decreased by 2Hz then examine the temperature of the outdoor coiled pipe at 10-second intervals, if  $T_{\text{outdoor coil}} = 52$ , decrease the operation frequency further by 2Hz until the frequency is the lowest;

During the frequency-decreasing operation, if  $47 \leq T_{\text{outdoor coil}} \leq 52$ , the compressor and the fan motor keep their original states;

When  $T_{\text{outdoor coil}} = 46$ , the compressor runs at the normal operating frequency, and the outdoor fan motor returns to its original state;

5.4. When the operation frequency  $F = 40\text{Hz}$ , if the temperature of the outdoor coiled pipe  $T_{\text{outdoor coil}} = 57$ , the outdoor fan motor performs forced high-speed operation and the operation frequency of the compressor should be decreased by 2Hz then examine the temperature of the outdoor coiled pipe at 10-second intervals, if  $T_{\text{outdoor coil}} = 57$ , decrease the operation frequency further by 2Hz until the frequency is the lowest;

During the frequency-decreasing operation, if  $52 \leq T_{\text{outdoor coil}} \leq 57$ , the compressor and the fan motor keep their original states

When  $T_{\text{outdoor coil}} = 51$ , the compressor runs at the normal operating frequency, and the outdoor fan motor returns to its original state;

The above temperature points, frequency-decreasing step and time interval can all be adjusted through EEPROM

6.. Compressor discharge safeguard:

5 minutes after the compressor starts, when the compressor temperature rises above  $105^\circ\text{C}$ , decrease the compressor frequency by 2Hz/stop for 10 seconds, until the compressor temperature falls below  $90^\circ\text{C}$ , the compressor returns to normal operation;

When the compressor temperature rises above  $115^\circ\text{C}$ , the compressor should stop at once, wait until the compressor temperature falls below  $90^\circ\text{C}$  and the waiting time period exceeds 3 minutes, the compressor returns to normal operation;

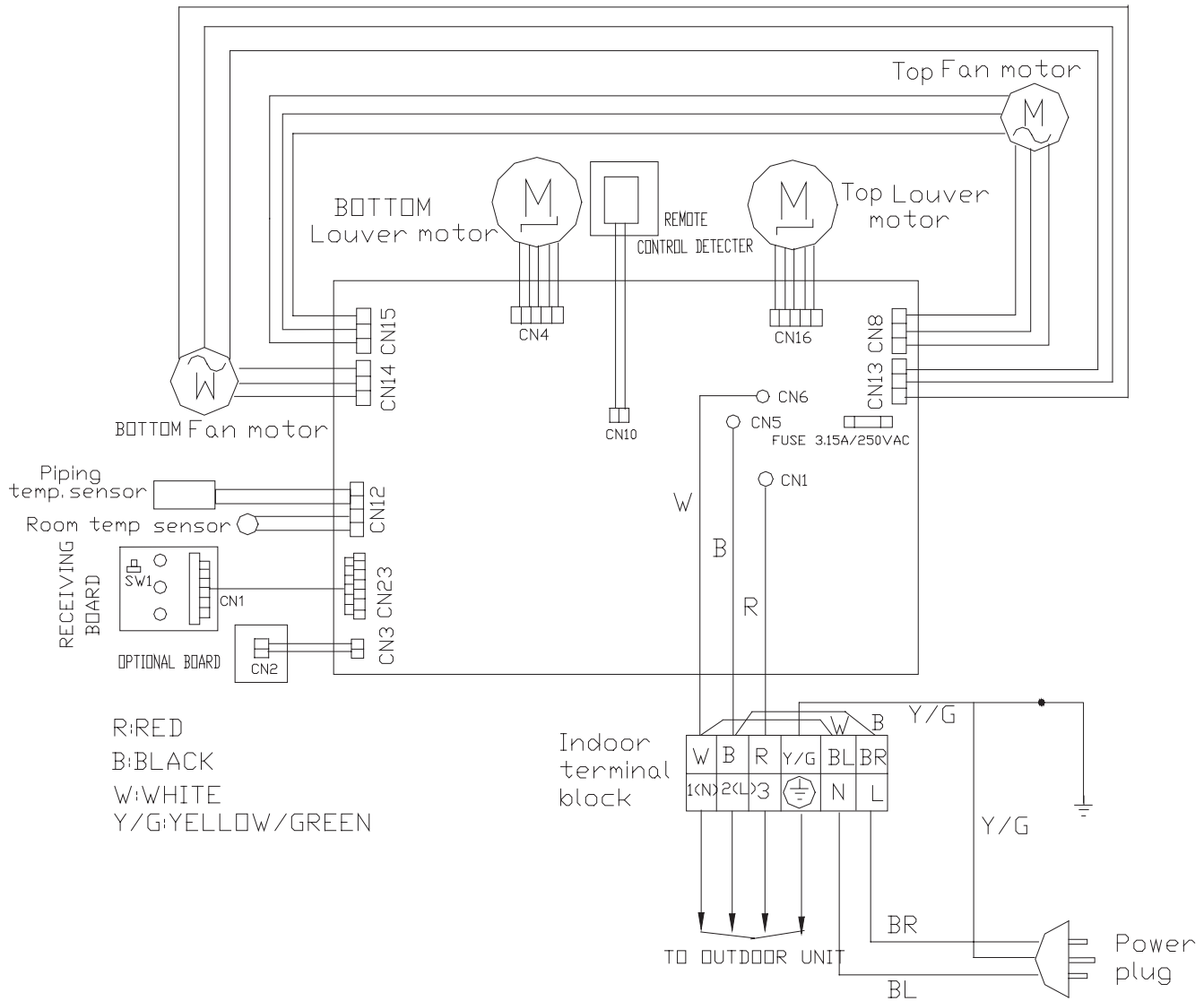
After the compressor restarts, if the compressor temperature rises above  $115^\circ\text{C}$  once more within 15 minutes, the compressor should stop at once and give an alarm.

The temperature points are stored in EEPROM

# WIRING DIAGRAM



# WIRING DIAGRAM FOR INDOOR UNIT

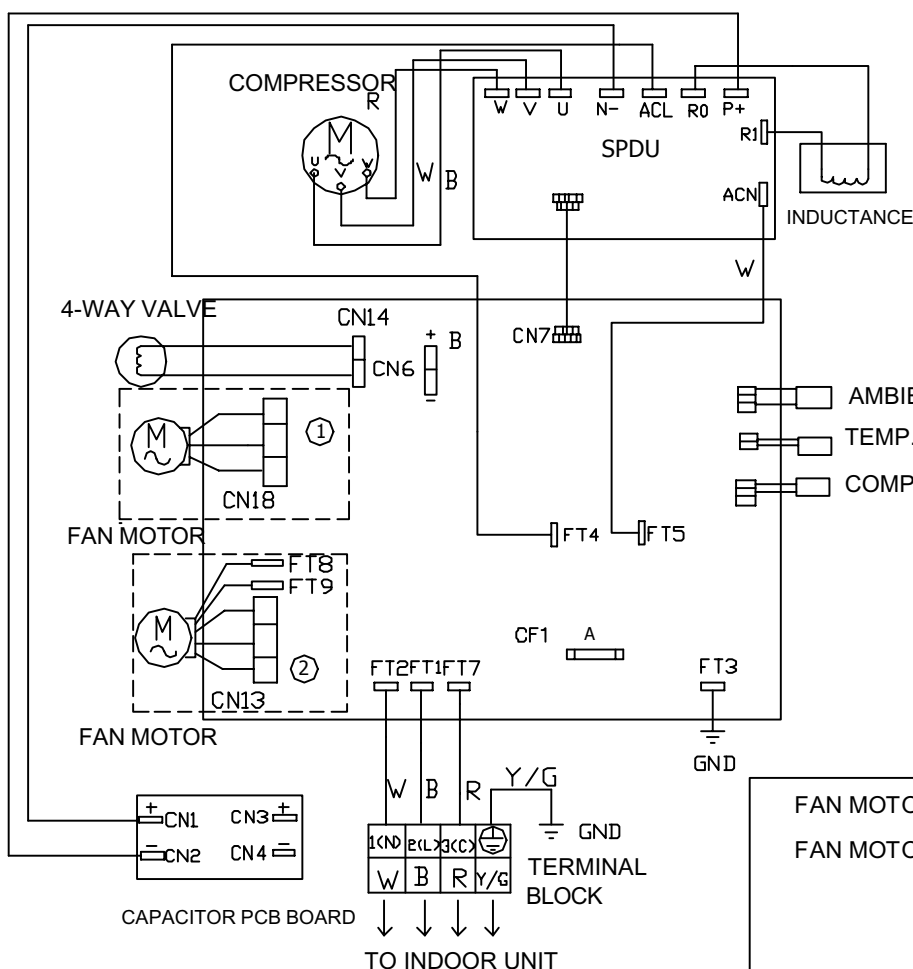


## NOTE:

WITHOUT REMOTE CONTROL FUNCTION,  
 WITHOUT THE PART IN DASHED FRAME.

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

# WIRING DIAGRAM OF OUTDOOR UNIT



## WARNING CAUTION

DON'T TOUCH CAPACITOR, EVEN AFTER PLUG-OFF ( DANGER OF ELECTRIC SHOCK)

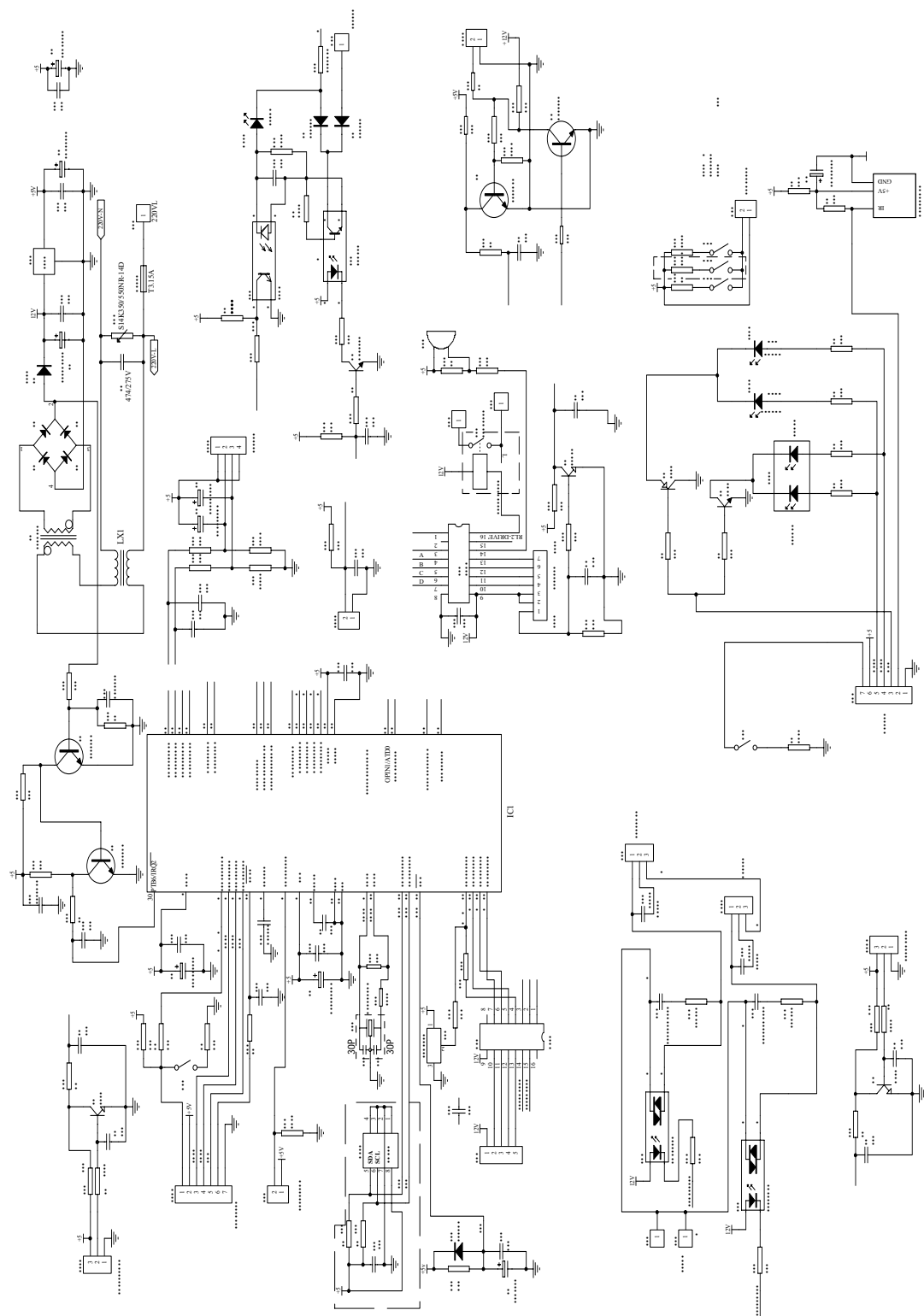
The capacitor retains high voltage even after the plug-off. For your safety, be sure to wait at least 5 minutes. after plug off and use a tester to confirm the voltage between connector CN1 and CN2 is less than DC 10V before start servicing.

AMBIENT TEMP.SENSOR  
TEMP.SENSOR OF HEAT  
COMP.TEMP.SENSOR

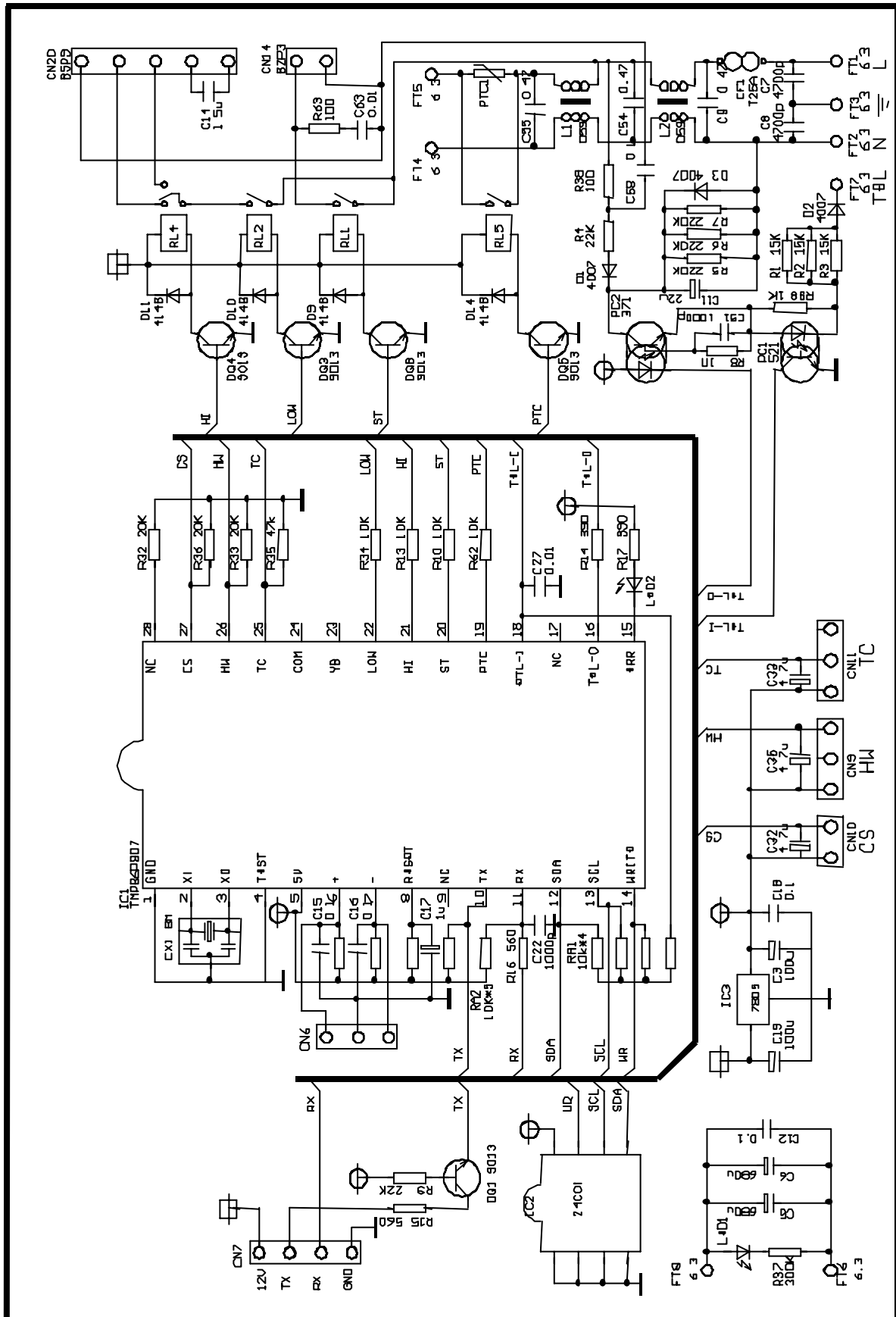
B BLACK  
R RED  
OR ORANGE  
BL BLUE  
W WHITE  
GR GRAY  
Y/G YELLOWGREEN

FAN MOTOR IS FOR"9000BTU"UNITS  
FAN MOTOR IS FOR"12000BTU"UNITS

# CIRCUIT DIAGRAM



OUTDOOR UNIT:



# **ABNORMITY DIAGNOSE**

## OUTDOOR UNIT PART

.LED output:




Twinkling times of LED	Possible cause of the malfunction
1	Outdoor temperature sensor abnormality
2	Outdoor defrosting sensor abnormality
3	Compressor discharge temperature abnormality
4	High compressor discharge temperature
5	Indoor-outdoor communication abnormality
6	Abnormal communication to IPDU module
7	E2PROM data abnormality
8	IPDU abnormality: Maximum revolving rate exceeded
9	IPDU abnormality: Vibration
10	IPDU abnormality: Displaced
11	IPDU abnormality: Speeding up abnormality
12	IPDU abnormality: G-TR short circuit
13	IPDU abnormality: Position-testing loop abnormality
14	IPDU abnormality: Current sensor abnormality
15	IPDU abnormality: Compressor locked
16	IPDU abnormality: Compressor damaged
17	IPDU abnormality: Case thermo action

# **TROUBLE SHOOTING**



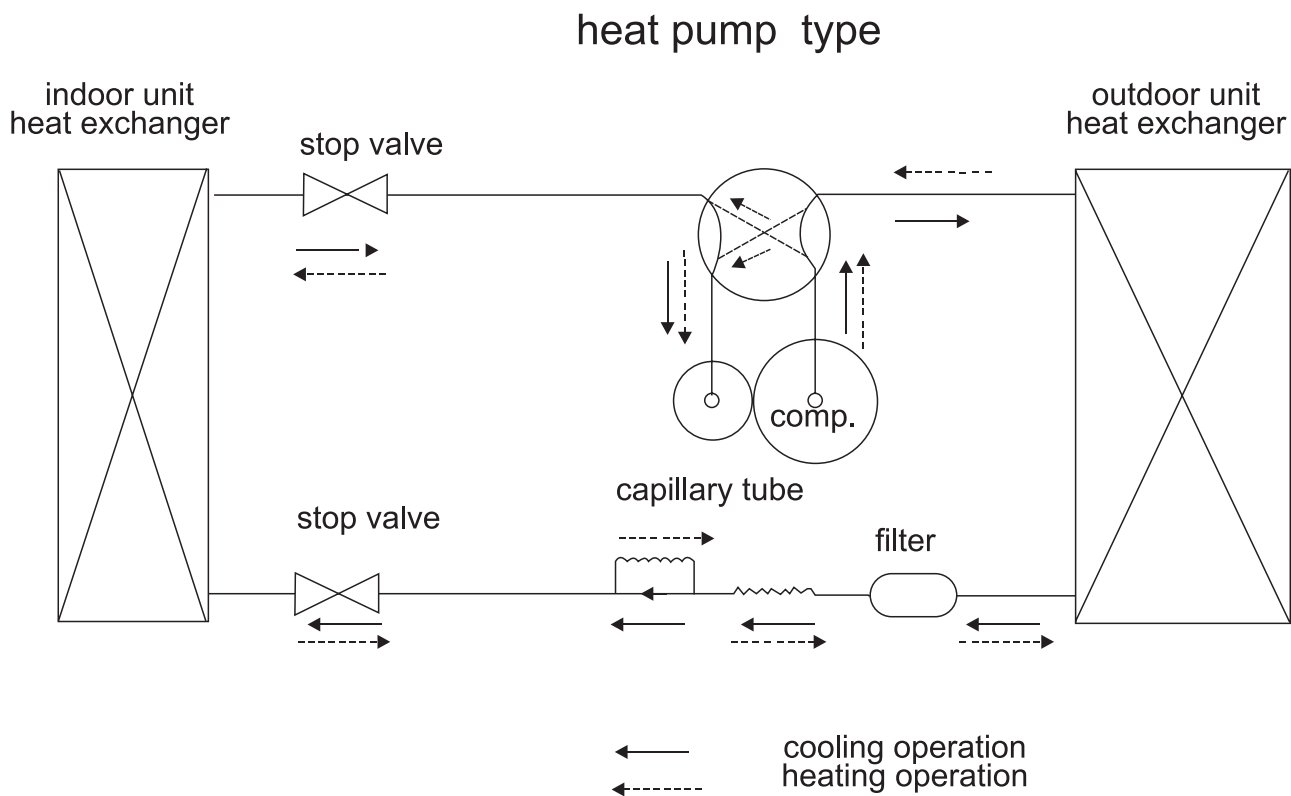
# Trouble shooting

Before asking for service, check the following first.

	Phenomenon	Cause or check points
Normal Performance inspection	<p>The system does not restart immediately.</p> 	<ul style="list-style-type: none"> <li>When unit is stopped, it won't restart immediately until 3 minutes have elapsed to protect the system.</li> <li>When the electric plug is pulled out and reinserted, the protection circuit will work for 3 minutes to protect the air conditioner.</li> </ul>
	<p>Noise is heard:</p> 	<ul style="list-style-type: none"> <li>During unit operation or at stop, a swishing or gurgling noise may be heard. At first 2-3 minutes after unit start, this noise is more noticeable. (This noise is generated by refrigerant flowing in the system.)</li> <li>During unit operation, a cracking noise may be heard. This noise is generated by the casing expanding or shrinking because of temperature changes.</li> <li>Should there be a big noise from air flow in unit operation, air filter may be too dirty.</li> </ul>
	<p>Smells are generated.</p>	<ul style="list-style-type: none"> <li>This is because the system circulates smells from the interior air such as the smell of furniture, cigarettes.</li> </ul>
	<p>Mist or steam are blown out.</p>	<ul style="list-style-type: none"> <li>During COOL or DRY operation, indoor unit may blow out mist. This is due to the sudden cooling of indoor air.</li> </ul>
Multiple check	<p>Does not work at all.</p>	<ul style="list-style-type: none"> <li>Is power plug inserted?</li> <li>Is there a power failure?</li> <li>Is fuse blown out?</li> </ul>
	<p>Poor cooling</p> 	<ul style="list-style-type: none"> <li>Is the air filter dirty? Normally it should be cleaned every 15 days.</li> <li>Are there any obstacles before inlet and outlet?</li> <li>Is temperature set correctly?</li> <li>Are there some doors or windows left open?</li> <li>Is there any direct sunlight through the window during the cooling operation?(Use curtain)</li> <li>Are there too much heat sources or too many people in the room during cooling operation?</li> </ul>

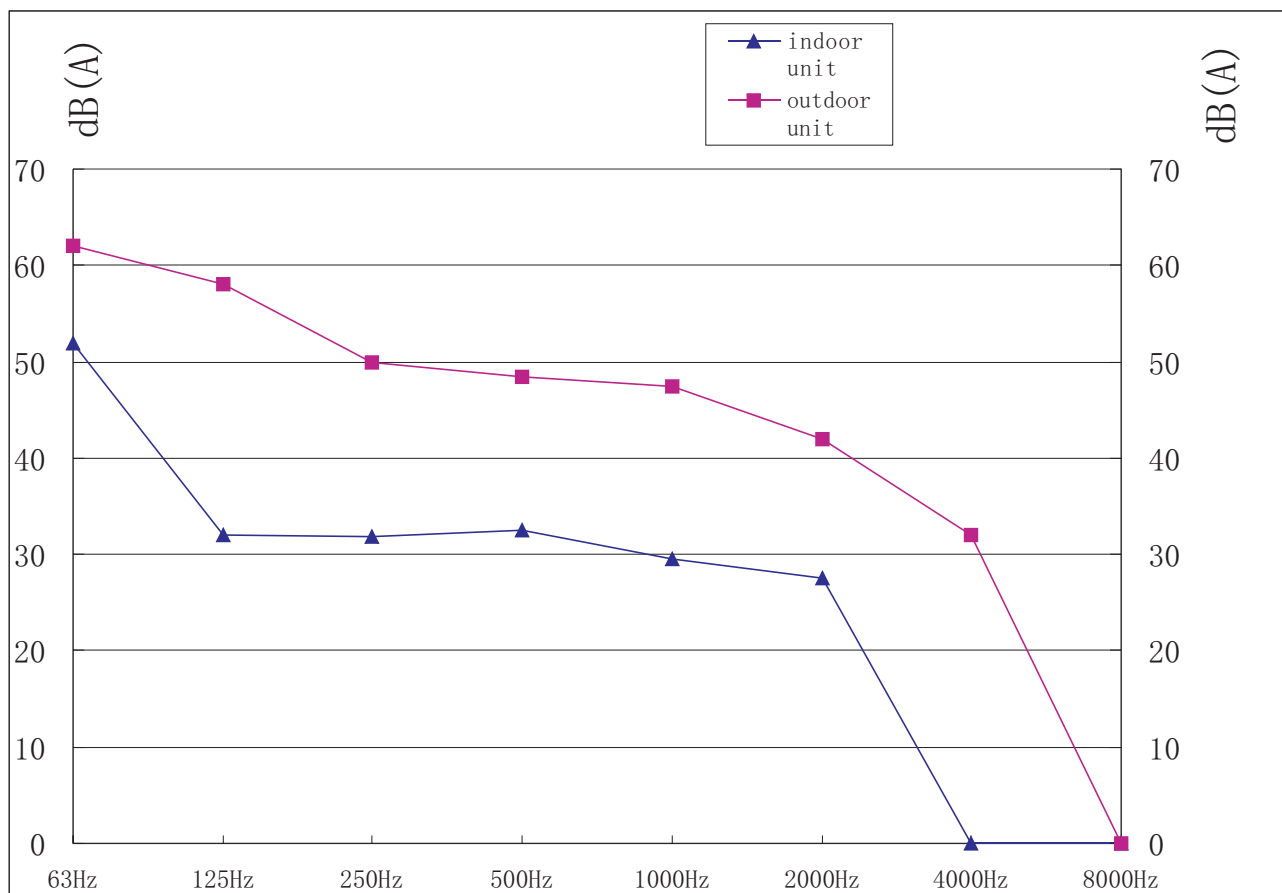
# REFRIGERATING-CYCLE DIAGRAM

## Refrigerating cycle diagram



# NOISE LEVEL TEST CHART & AIR VELOCITY DISTRIBUTION

### A、Noise level test chart



## B. Air velocity distribution

Fig 1  
Top View  
Flow Control Panel: Horiz.  
Louver: Center

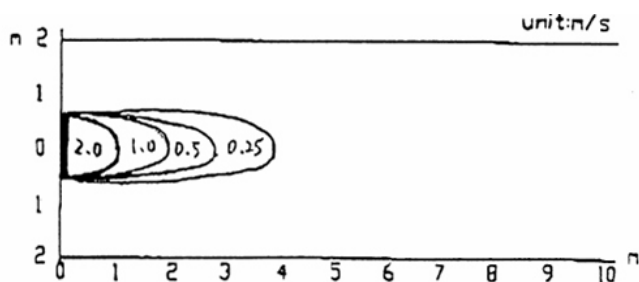


Fig 2  
Top View  
Flow Control Panel: Horiz.  
Louver: right & left

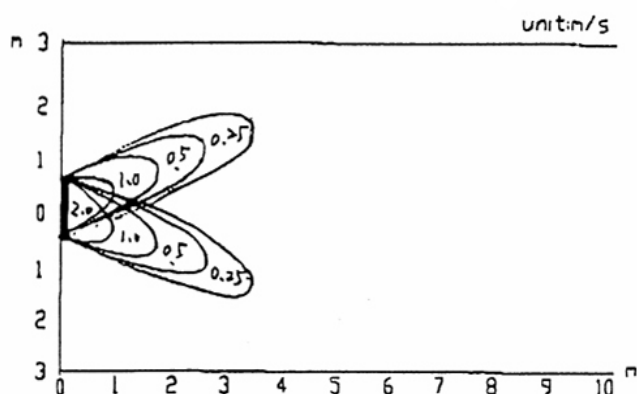


Fig 3  
Side View  
Flow Control Panel: Horiz.  
Louver: Center

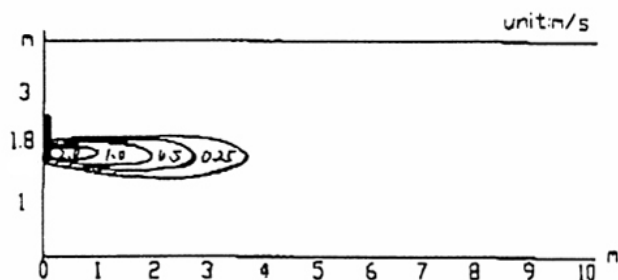
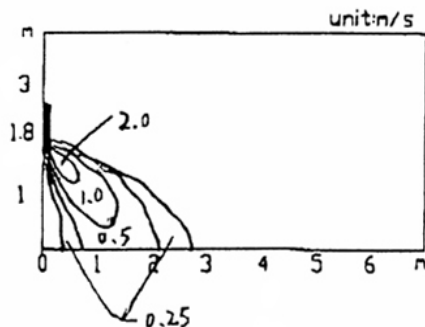


Fig 4  
Side View  
Flow Control Panel: Vert.  
Louver: Center



Condition  
Fan speed: high  
Operation mode: Fan  
Voltage : 230V  
50Hz mode

# Installation manual

## Installation Manual of Room Air Conditioner











### Tool necessary

- 1.Screw driver
- 2.Hacksaw
- 3.70mm dia. hole core drill
- 4.Spanner(dia.17,27mm)
- 5.Spanner(14,17,27mm)
- 6.Pipe cutter
- 7.Flaring tool
- 8.Knife
- 9.Nipper
- 10.Gas leakage detector  
or soap water
- 11.Measuring tape
- 12.Reamer
- 13.Refrigerant oil

### Standard accessories

Following parts shall be field supplied

Mark	Part name
Ⓐ	Adhesive tape
Ⓑ	Pipe clip
Ⓒ	Connecting hose
Ⓓ	Insulation material
Ⓔ	Putty
Ⓕ	Drain hose

No.	Shape and description	QTY
①	 Remote controller	1
②	 Drain hose	1
③	 Refrigerant oil	1
④	 Putty	1
⑤	 Wire clip	4
⑥	 Drain-elbow	1
⑦	 Self-tapping screw	3
⑧	 Rubber pad	4
⑨	 Wall hole cover	1
⑩	 dry battery #7	2

Note: There isn't connecting wire with this unit.

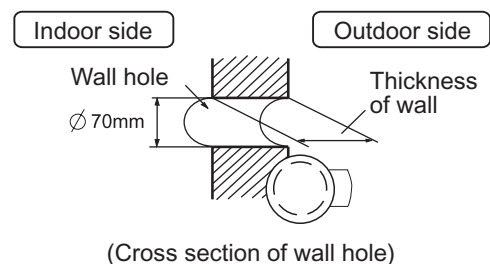
### Fixing of the unit

#### 1. Position of the wall hole

Wall hole should be decided according to installation place and piping direction.(refer to installation drawings).

#### 2. Making a wall hole

Drill a hole of 120x70mm dia. with a little slope towards outside.





## Installation Manual of Room Air Conditioner

### 3. Piping connection

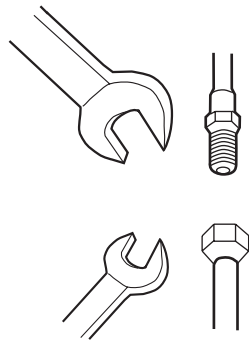
#### Connecting method

Apply refrigerant oil at half union and flare nut.

To bent a pipe, give the roundness as large as possible not to crash the pipe.

When connecting pipe, hold the pipe center to center then screw nut on by hand, refer to Fig.

Be careful not to let foreign matters, such as sands enter the pipe.



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

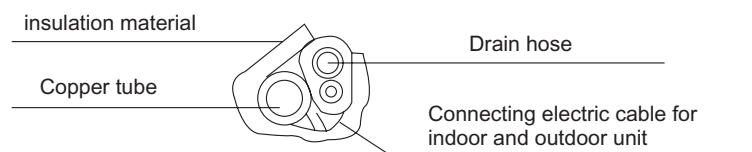
Pipe Diameter ( $\phi$ )	Fastening torque
Liquid side 6.35mm(1/4")	18N.m
Gas side 9.52mm(3/8")	42N.m
Gas side 12.7mm(1/2")	55N.m

#### Piping connection of the indoor unit

##### 1. Arrangement of piping and drainage pipe

Remove the cover before working.

Cut away, with a hammer or a saw, the lid for piping according to piping direction.



According to the piping method, connect the piping on indoor unit with union of connection pipe. Arrange the piping as per the wall hole and bind drain hose connecting electric cable and piping together with polyethylene tape.

Insert the bound piping connecting electric cable and drain hose through wall hole to connect with outdoor unit.

##### 2. Arrangement drain hose

Drain hose shall be placed in under place.

There should be a slope when arrange drain hose. Avoid up and down waves in drain hose.

If humidity is high, drain pipe(especially in room and indoor unit) must be covered with installation material.

# Installation Manual of Room Air Conditioner

3. Piping connection of the outdoor unit  
Connecting the connecting pipe and inlet and outlet liquid pipe according to the piping method

## Purging Method:

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

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

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

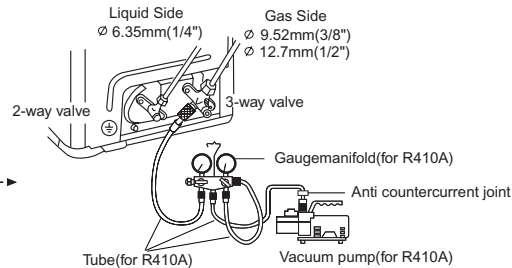
④ Open the valve rod for the 2-way valve to an angle of anticlockwise 90 degrees. After 6 seconds, close the 2-way valve and make the inspection of gas leakage.

⑤ No gas leakage? In case of gas leakage, tighten parts of pipe connection. If leakage stops, then proceed ⑥ steps.

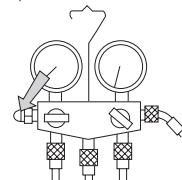
⑥ Detach the charge hose from the service port, open 2-way valve and 3-way. Turn the valve rod anticlockwise until hitting lightly.

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

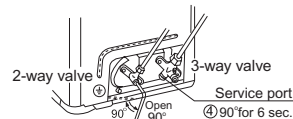
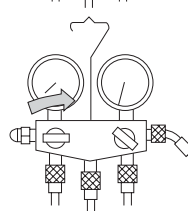
⑧ After attaching the each caps, check the gas leakage around the caps.



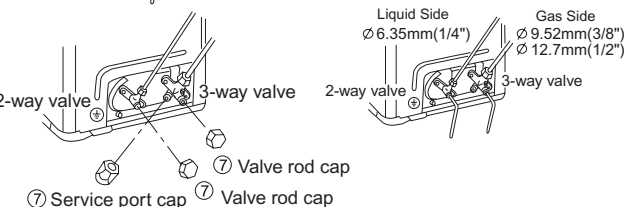
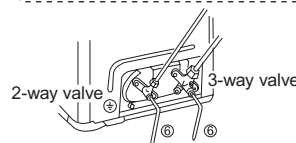
② Open



③ Close



If it does not stop gas leakage, discharge whole refrigerants from the service port. After flaring work again and vacuumize, fill up prescribed refrigerant from the gas cylinder



### CAUTION:

1.If the refrigerant of the air conditioner leaks, it is necessary to discharge all the refrigerant. Vacuumize first, then charge the liquid refrigerant into air conditioner according to the amount marked on the name plate.

2.Please do not let other cooling medium, except specified one (R410A), or air enter into the cooling circulation system. Otherwise, there will be abnormal high pressure in the system to make it crack and lead to personal injuries.

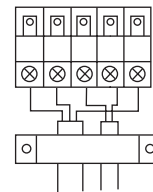
## Installation Manual of Room Air Conditioner

Note: When additional refrigerant is necessary, first purge air out of connecting pipe by external gas, then drive out the excessive refrigerant by purging method..

Brand new unit is charged 80g more refrigerant than spec. This is only for first installation to purge air in the indoor unit and connecting pipe.

When piping is longer than 5m, change additional refrigerant specified in this list.

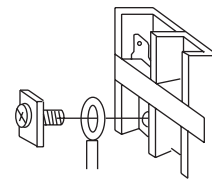
Pipe length	5m	10m	15m
Refrigerant charge(g)	—	90	180



### Electric wiring

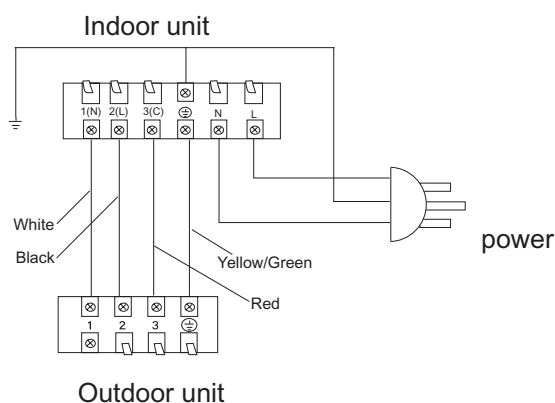
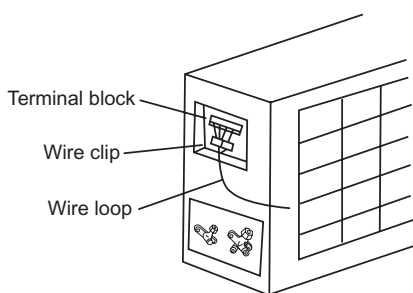
Note:

- Electric wiring must be done by qualified person.
- Use copper wire only.
- The parameter of the connecting cable is H05RN-F or H07RN-F  
HFU-09H03/R2(DB) :3G1.5mm<sup>2</sup>+1x0.75mm<sup>2</sup>  
HFU-12H03/R2(DB) :3G2.5mm<sup>2</sup>+1x0.75mm<sup>2</sup>



### Wiring of indoor unit

- Insert the cable from outside the wall hole where piping already exist.
- Pull it out from front.
- Loose terminal screw and insert cable end fully into terminal block, then tighten it
- Pull the cable gently to make sure it is tight.
- Replace cover after wiring.



### Wiring of outdoor unit

- Insert the cable from inside the wall hole where piping already exist.
- Pull it out from front.
- Loose terminal screw and insert cable end fully into terminal block, then tighten it
- Pull the cable gently to make sure it is tight.
- Replace cover after wiring.

Note:

- When connecting indoor and outdoor wire, check the number on indoor and outdoor terminal blocks. Terminals of same number and same color shall be connected by the same wire.
- Incorrect wiring may damage air conditioner's control or cause operation failure.

# Installation Manual of Room Air Conditioner

## Others

### 1. Power supply

Air conditioner must use an exclusive line(over 20A) and there is not power plug with this type, the type of power supply wire is HF05VV-3G2.5mm<sup>2</sup>.

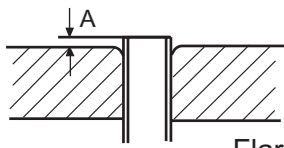
When installation air conditioner in a wet place, try to use a circuit breaker against current leakage.

For installation in other places, use circuit breaker as for as possible.

### 2. Piping cutting and flaring

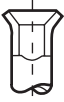
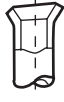
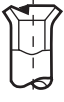
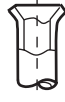
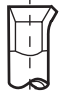

Be sure to carry out deburring after cutting with a pipe cutter.

Insert flaring tool to make a flare



Flare tooling die

	Pipe diameter $\phi$	Size A (mm)
Liquid side	6.35mm(1/4")	0.8~1.5
Gas side	9.52mm(3/8")	1.0~1.8
Gas side	12.7mm(1/2")	1.2~2.0

Correct	Incorrect					
						
	Lean	Damage of flare	Crack	Partial	Too outside	

## Installation inspection and test run:

Please operate unit according to this Manual

Items to be checked during test run. Please made a "✓" in "□"

- ☐ Are there any gas leakage?
- ☐ How is insulation at piping connection carried out?
- ☐ Are electric wires of indoor and outdoor unit firmly inserted into terminal block?
- ☐ Is electric wiring of indoor and outdoor securely fixed?
- ☐ Is drainage securely carried out?
- ☐ Is earth line(grounding) securely connected?
- ☐ Is power supply voltage abided by the code?
- ☐ Is there any noise?
- ☐ Is control display normal?
- ☐ Is cooling operation normal?
- ☐ Is room temp. regulator normal?

# **Sincere Forever**

**Haier Group**

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