Airwell

Service Manual

HDD / HED DCI Series

Indoor Units		Outdoor Units
AWSI-HDD018-H11	*AWSI-HED018-H11*	*AWAU-YDD018-H11*
AWSI-HDD024-H11	*AWSI-HED024-H11*	*AWAU-YDD024-H11*

SM HDDHED 2-A.1 GB

REFRIGERANT | NOVEMBER – 2010 | Version: 1

R410A | HEAT PUMP

LIST OF EFFECTIVE PAGES

Note: Changes in the pages are indicated by a “Revision#” in the footer of each effected page (when none indicates no changes in the relevant page). All pages in the following list represent effected/ non effected pages divided by chapters.

Dates of issue for original and changed pages are:

Original ..... 0 ..... August 2009

Total number of pages in this publication is **111** consisting of the following:

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*Due to constant improvements please note that the data on this service manual can be modified with out notice.
**Photos are not contractual

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1. INTRODUCTION

1.1 General

HDD/HED series is a monosplit DCI inverter air conditioner designed for residential buildings.

The **ODU YDD018/024** product is a DC inverter outdoor with high technology. By using DC compressor sine wave torque control technology, this product provides more comfort and economical operating.

The **IDU HDD/HED018/024** is a high-wall mounted type indoor with modern apperance.

1.2 Main Features

The unit benefits from the most advanced technological innovations, namely:

- DC inverter technology.
- R410A models.
- Microprocessor control and indoor LED display.
- High COP,Energy efficiency class A in cooling/heating mode.
- Torque control for compressor running in lower Freqency but with low vibration and little sound.
- Max allowing tubing distance of 15m.
- Up to 5 m vertical high between indoor and outdoor units.
- Cooling operation at outdoor temperature up to 48ºC.
- Heating operation at outdoor temperature down to -15ºC.
- Easy installation and service.
- Sleep mode from remote control to save energy.
- ON/OFF timer and clock display.
- Vertical auto swing with motorized flap (any position stop).
- Intelligent Deicing.
- Memory from power failure.
- Rapid cooling/heating.
- I-Feel function.
- Cold air prevention in heating.
- Clean function (Blow dry).
- Self diagnosic (Error indications) for ease of maintenance.

1.3 Indoor Unit

The indoor unit is wall mounted, and can be easily fitted to many types of residential locations. It includes:

- LED display
- Variable speed with PG motor
- Motorized flap
- High efficiency filtration to ensure a best Air Quality : Advanced filtering Combine mechanical, Photo-catalytic + Bi-anti bacterial and observe bad gaseous and smokes.

1.4 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, provide complete operating function and programming.

Remote control RC 8:

- ► Compact and economically design, it offers excellent user comfort.
- ► Combining modern design with high technology, the RC8 remote control offers powerful functions of real considering of user comfort and energy saving of air-conditioner.

For detail of functions, please refer to **Appendix**

1.5 Outdoor Unit

The outdoor units can be installed as floor or wall mounted units by using a wall supporting bracket. The metal sheets are protected by anti- corrosion paint work allowing long life resistance. All outdoor units are pre-charged. For further information please refer to the Product Data Sheet, Chapter 2.
It includes :

- Compressor mounted in a soundproofed compartment :
- Axial fan.
- Outdoor coil with hydrophilic louver fins for RC units.
- Outlet air fan grill.
- Interconnecting wiring terminal block.

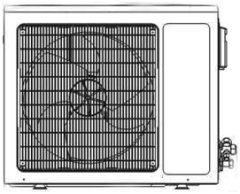
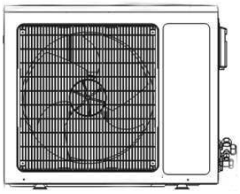
1.6 Tubing Connections

Flare type interconnecting tubing to be produced on site.
For further details please refer to the Installation Manual.

1.7 Inbox Documentation

Each unit is supplied with its own installation, operation and remote control manuals.

1.8 Matching Table

OUTDOOR UNITS		INDOOR UNITS	
		AWSI-HDD018-H11	AWSI-HDD024-H11
		AWSI-HED018-H11	AWSI-HED024-H11
			
	AWAU-YDD018-H11	√	
	AWAU-YDD024-H11		√

2. PRODUCT DATA SHEET

2.1 HDD018 / HED018 // YDD 018

Model Indoor Unit					**HDD/HED018**	
Model Outdoor Unit					**YDD 018**	
Installation Method of Pipe					Flared	
Characteristics				Units	Cooling	Heating
Capacity (4)				kW	5.30(1.05-6.50)	5.80(1.00-7.10)
Power input (4)				kW	1.60(0.36-2.50)	1.60(0.35-2.60)
EER (Cooling) or COP(Heating) (4)				W/W	3.31	3.62
Energy efficiency class					A	A
Power supply				V	220-240	
				Ph	1	
				Hz	50	
Rated current				A	7.2	7.2
Power factor					0.97	0.97
Prated (IDU+ODU)				W	2600	
Starting current				A		
Circuit breaker rating				A	25A	
INDOOR	Fan type & quantity				Crossflow x 1	
	Fan speeds	Cooling	SH/H/M/L	RPM	1350/1100/950/800	
		Heating	SH/H/M/L	RPM	1400/1200/1050/900	
	Air flow (1)		SH/H/M/L	m3/hr	800/680/560/460	
	External static pressure		Min	Pa	0	
	Sound power level (2)		SH/H/M/L	dB(A)	55/50/47/39	
	Sound pressure level (3)		SH/H/M/L	dB(A)	45/40/37/29	
	Moisture removal			l/hr	3	
	Condenstate drain tube I.D			mm	16	
	Dimensions		WxHxD	mm	865x305x215	
	Net Weight			kg	12	
	Package dimensions		WxHxD	mm	945x380x295	
	Packaged weight			kg	16	
OUTDOOR	Refrigerant control				Capillary	
	Compressor type,model				Sanyo Twin Rotary,C-6RZ146H1A	
	Fan type & quantity				Propeller(direct) x 1	
	Fan speeds		H	RPM	690	
	Air flow		H	m3/hr	2700	
	Sound power level		H	dB(A)	64	
	Sound pressure level (3)		H	dB(A)	54	
	Dimensions		WxHxD	mm	955x700x424	
	Net Weight			kg	52	
	Package dimensions		WxHxD	mm	1030x735x460	
	Packaged weight			kg	57	
	Refrigerant type				R410A	
	Standard charge			kg(5m)	1.25	
	Additional charge				20g/m(5m<L<20m)	
	Connections between units	Liquid line		In.(mm)	1/4"(6.35)	
		Suction line		In.(mm)	1/2"(12.7)	
		Max.tubing length		m.	20	
		Max.height difference		m.	Max. 5	
Operation control type					Remote control	

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.2 HDD024 / HED024 // YDD 024

Model Indoor Unit					**HDD/HED024**	
Model Outdoor Unit					**YDD 024**	
Installation Method of Pipe					Flared	
Characteristics				Units	Cooling	Heating
Capacity (4)				kW	6.45(1.40-7.00)	6.70(1.20-8.00)
Power input (4)				kW	2.00(0.35-2.60)	1.85(0.35-2.70)
EER (Cooling) or COP(Heating) (4)				W/W	3.22	3.62
Energy efficiency class					A	A
Power supply				V	220-240	
				Ph	1	
				Hz	50	
Rated current				A	9.0	8.3
Power factor					0.97	0.97
Prated (IDU+ODU)				W	2700	
Starting current				A		
Circuit breaker rating				A	25	
INDOOR	Fan type & quantity				Crossflow x 1	
	Fan speeds	Cooling	SH/H/M/L	RPM	1350/1150/1000/850	
		Heating	SH/H/M/L	RPM	1350/1150/1000/900	
	Air flow (1)		SH/H/M/L	m3/hr	1000/800/700/550	
	External static pressure		Min	Pa	0	
	Sound power level (2)		SH/H/M/L	dB(A)	58/54/49/44	
	Sound pressure level (3)		SH/H/M/L	dB(A)	48/44/39/34	
	Moisture removal			l/hr	4	
	Condenstate drain tube I.D			mm	16	
	Dimensions		WxHxD	mm	1008x319x221	
	Net Weight			kg	15	
	Package dimensions		WxHxD	mm	1073x395x313	
	Packaged weight			kg	20	
OUTDOOR	Refrigerant control				EEV	
	Compressor type,model				Sanyo Twin Rotary,C-6RZ146H1A	
	Fan type & quantity				Propeller(direct) x 1	
	Fan speeds		H	RPM	690	
	Air flow		H	m3/hr	2900	
	Sound power level		H	dB(A)	66	
	Sound pressure level (3)		H	dB(A)	56	
	Dimensions		WxHxD	mm	955x700x396	
	Net Weight			kg	55	
	Package dimensions		WxHxD	mm	1030x735x460	
	Packaged weight			kg	60	
	Refrigerant type				R410A	
	Scharg			kg(5m)	1.7	
	Additional charge				20g/m(5m<L<20m)	
	Connections between units	Liquid line		In.(mm)	1/4"(6.35)	
		Suction line		In.(mm)	1/2"(12.7)	
		Max.tubing length		m.	Max. 20	
		Max.height difference		m.	Max. 5	
Operation control type					Remote control	

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

3. RATING CONDITIONS

Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units).

Cooling:
Indoor: 27°C DB 19°C WB
Outdoor: 35 °C DB

Heating:
Indoor: 20°C DB
Outdoor: 7°C DB 6°C WB

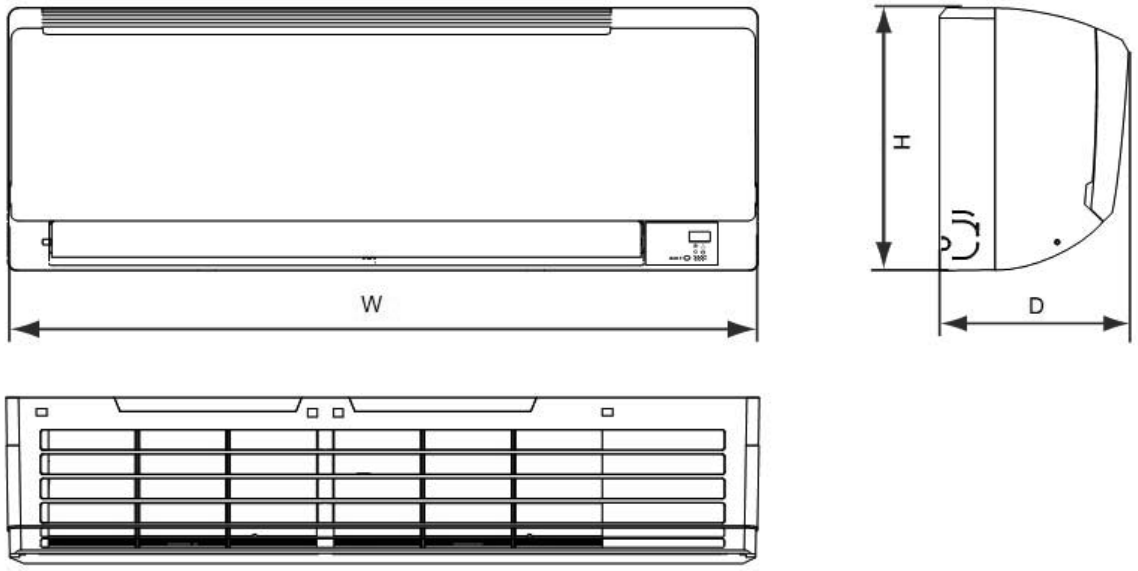
3.1 Operating Limits

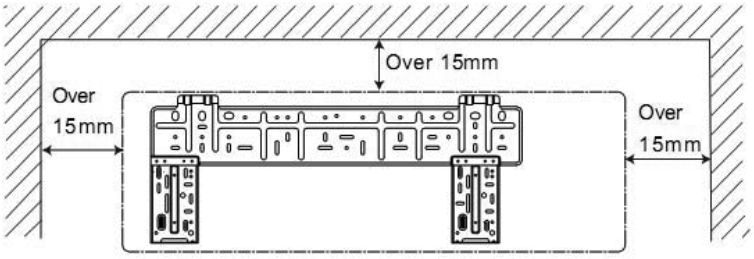
3.1.1 R410A

		Indoor	Outdoor
Cooling	**Upper limit**	32°C DB 23°C WB	48°C DB
	Lower limit	21°C DB 15°C WB	10°C DB
Heating	**Upper limit**	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-15°C DB -16°C WB
Voltage		1-PH 50Hz / 198 – 264 V	

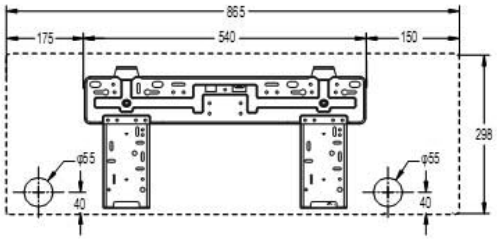
4. OUTLINE DIMENSIONS

4.1 Indoor Unit: HDD018, HDD024, HED018, HED024

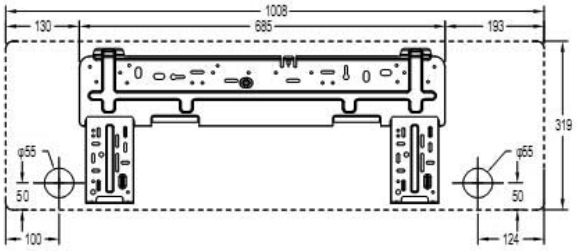




18K Wall Mounting Frame

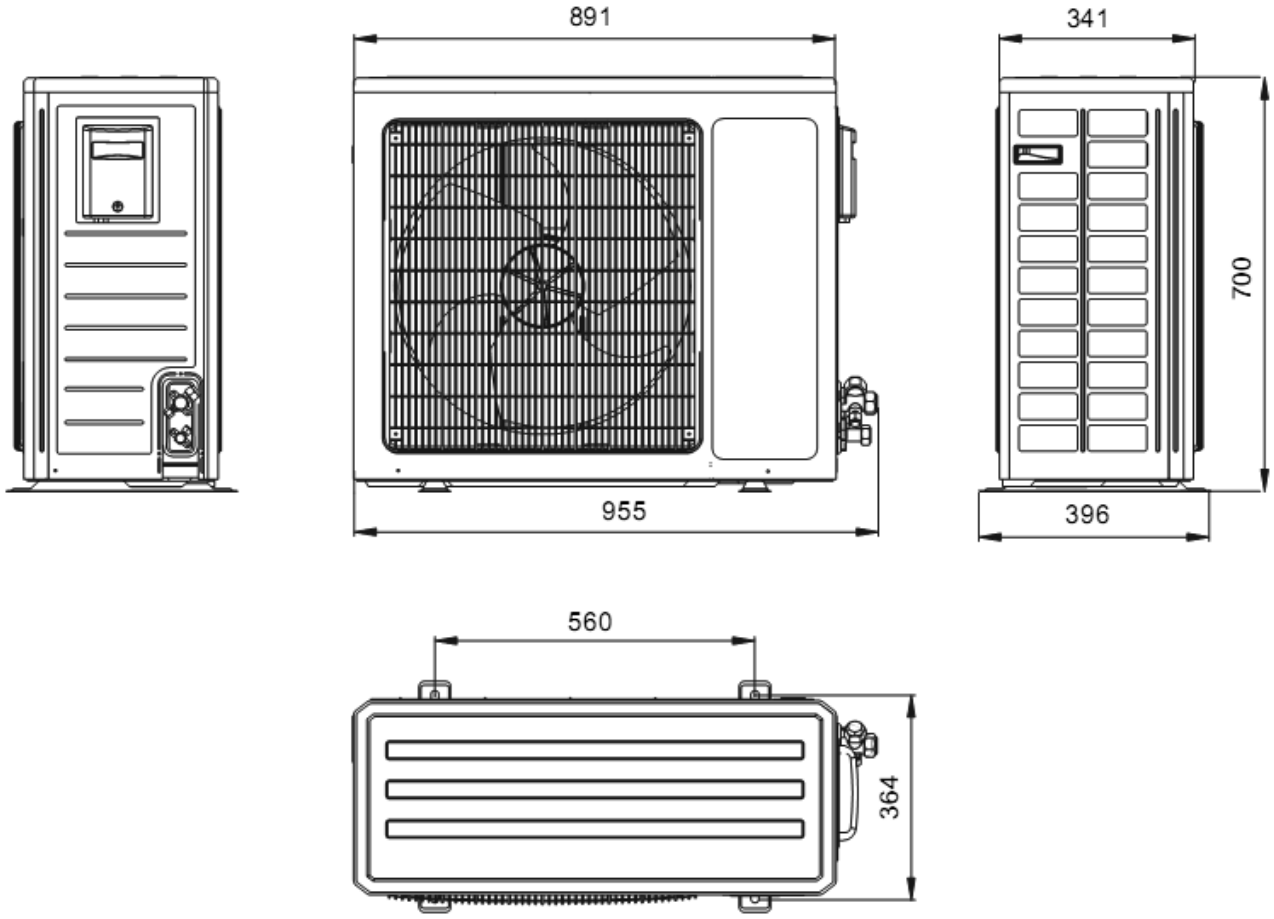


24K Wall Mounting Frame



Model	W(mm)	H(mm)	D(mm)
18K	865	305	215
24K	1008	319	221

4.2 Outdoor Units: YDD018, YDD024



5. PERFORMANCE DATA

5.1 HDD018, HED018

5.1.1 Cooling Capacity (kW) – Run Mode

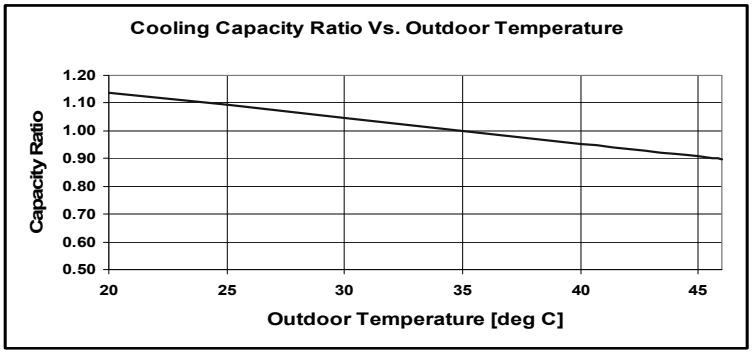
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	5.17	5.50	5.84	6.18	6.52
	SC	3.67	3.74	3.82	3.89	3.97
	PI	1.19	1.22	1.24	1.26	1.28
30	TC	4.92	5.25	5.59	5.93	6.27
	SC	3.58	3.65	3.73	3.80	3.88
	PI	1.33	1.36	1.38	1.40	1.42
35	TC	4.67	5.01	**5.34**	5.68	6.02
	SC	3.48	3.56	**3.63**	3.71	3.78
	PI	1.47	1.50	**1.52**	1.54	1.56
40	TC	4.42	4.76	5.10	5.43	5.77
	SC	3.39	3.47	3.54	3.62	3.69
	PI	1.61	1.63	1.66	1.68	1.70
46	TC	4.12	4.46	4.80	5.14	5.47
	SC	3.28	3.36	3.43	3.50	3.58
	PI	1.78	1.80	1.83	1.85	1.87

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.1.2 Capacity Correction Factors



5.1.3 Heating Capacity (kW) - Run Mode

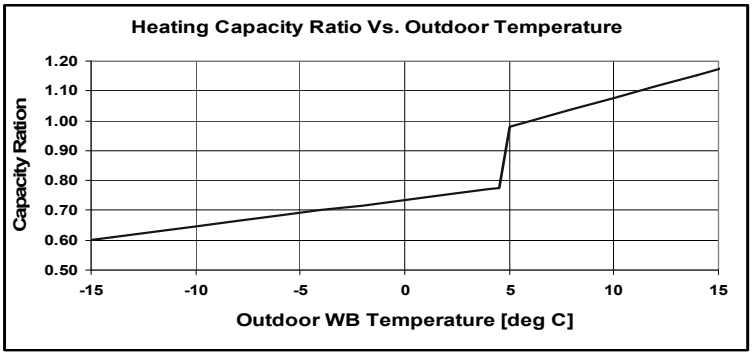
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	3.62	3.37	3.11
	PI	1.00	1.10	1.20
-10/-12	TC	4.03	3.78	3.52
	PI	1.21	1.31	1.41
-7/-8	TC	4.34	4.08	3.83
	PI	1.36	1.46	1.56
-1/-2	TC	4.49	4.24	3.98
	PI	1.44	1.54	1.64
2/1	TC	4.59	4.34	4.09
	PI	1.49	1.59	1.69
7/6	TC	5.94	**5.69**	5.43
	PI	1.57	**1.67**	1.77
10/9	TC	6.27	6.01	5.76
	PI	1.66	1.76	1.86
15/12	TC	6.59	6.34	6.09
	PI	1.75	1.85	1.96
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

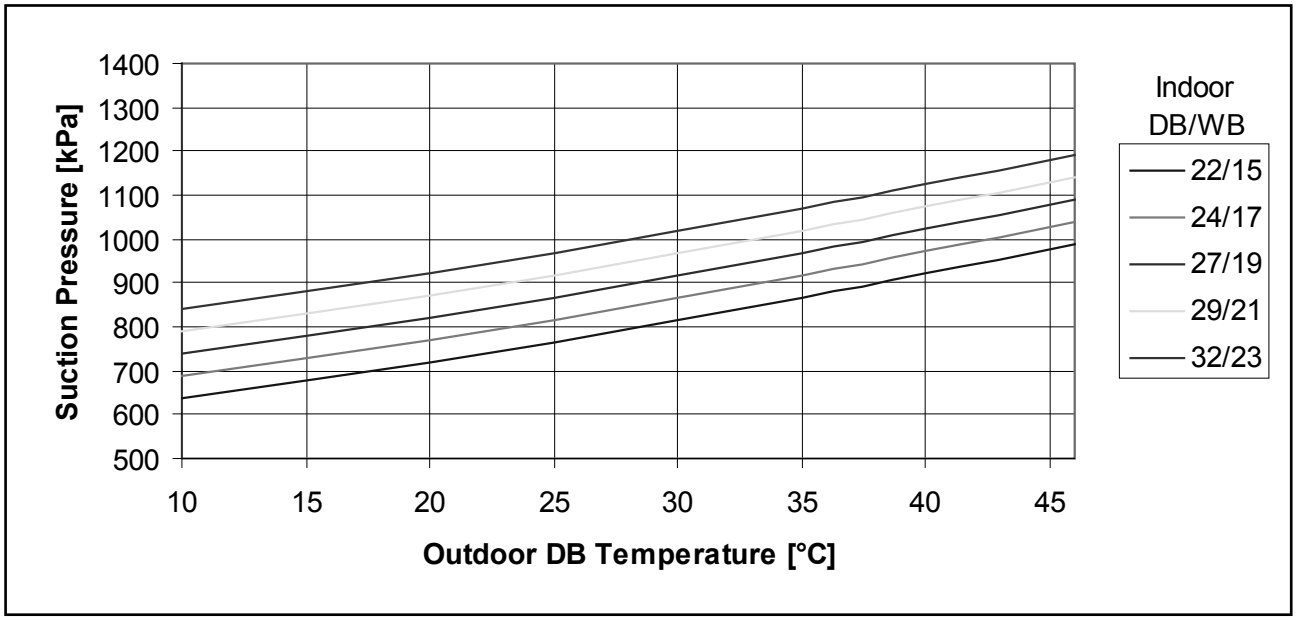
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

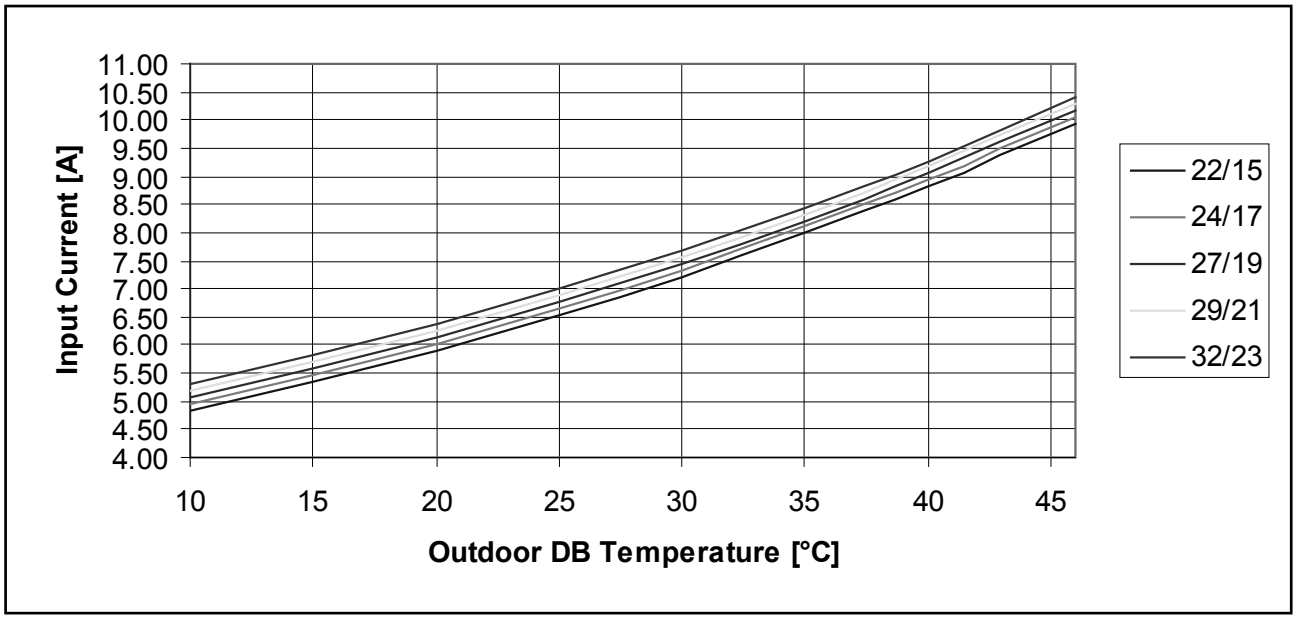
5.1.4 Capacity Correction Factors



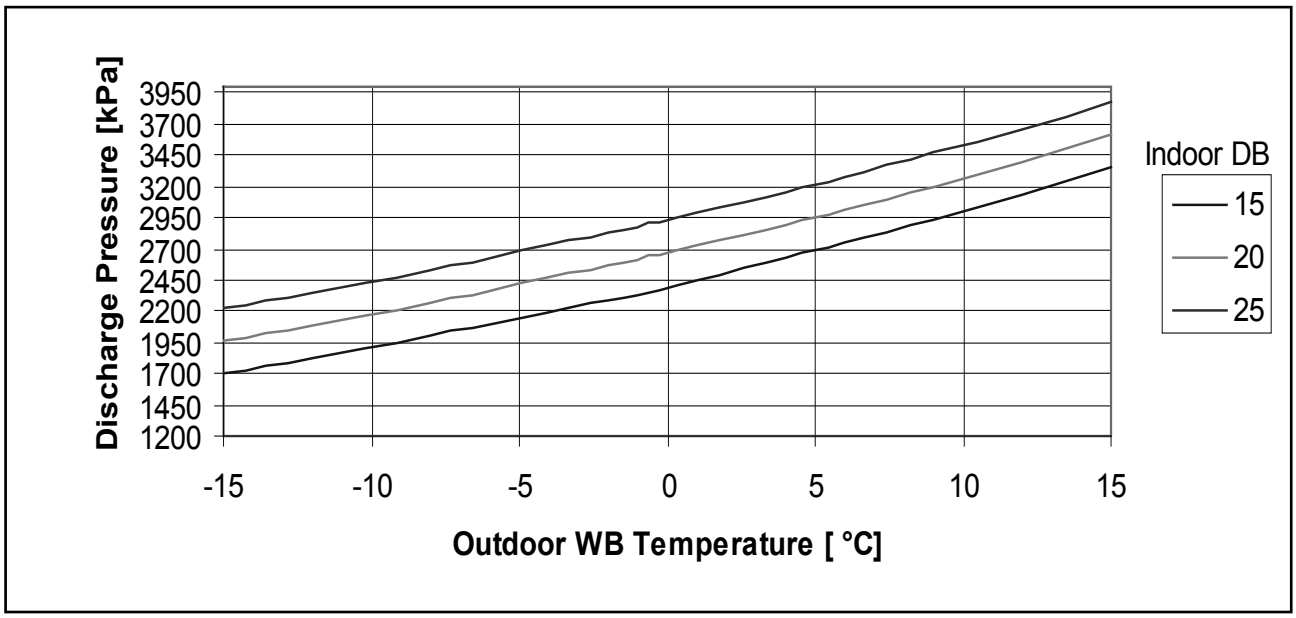
5.1.5 Model: HDD018, HED018

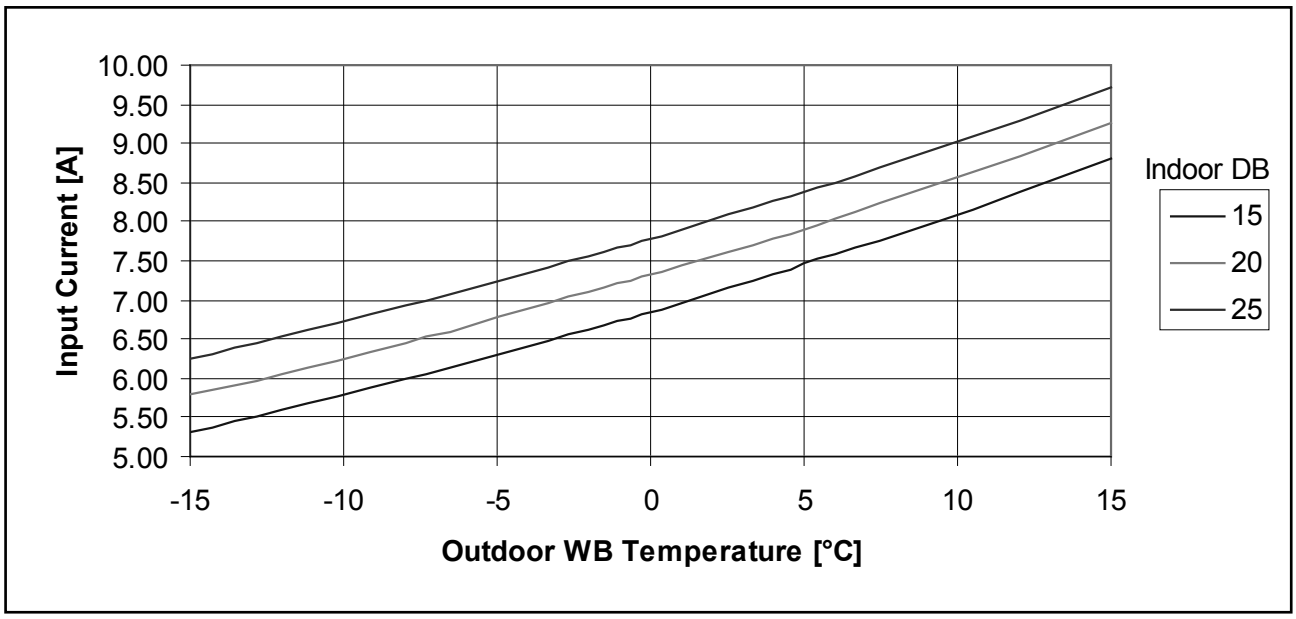
5.1.5.1 Cooling





5.1.5.2 Heating





5.2 HDD024, HED024

5.2.1 Cooling Capacity (kW) - Run Mode

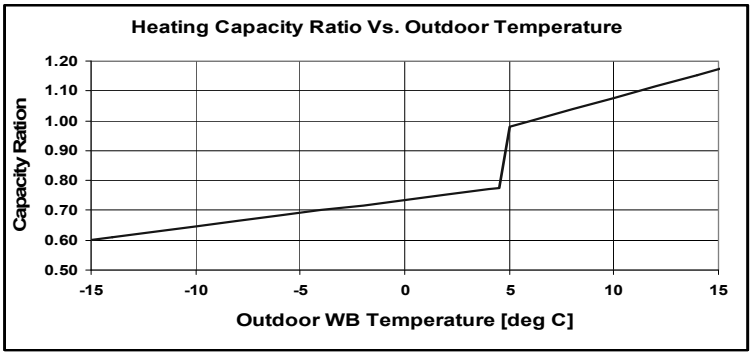
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	6.04	6.44	6.83	7.23	7.62
	SC	4.29	4.38	4.47	4.56	4.64
	PI	1.60	1.63	1.66	1.70	1.73
30	TC	5.75	6.15	6.54	6.94	7.33
	SC	4.18	4.27	4.36	4.45	4.53
	PI	1.79	1.82	1.85	1.88	1.91
35	TC	5.46	5.86	**6.25**	6.65	7.04
	SC	4.08	4.16	**4.25**	4.34	4.43
	PI	1.98	2.01	**2.04**	2.07	2.10
40	TC	5.17	5.57	5.96	6.36	6.75
	SC	3.97	4.05	4.14	4.23	4.32
	PI	2.17	2.20	2.23	2.26	2.29
46	TC	4.82	5.22	5.61	6.01	6.40
	SC	3.84	3.92	4.01	4.10	4.19
	PI	2.39	2.42	2.45	2.48	2.51

LEGEND

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.2.2 Capacity Correction Factors



5.2.3 Heating Capacity (kW) - Run Mode

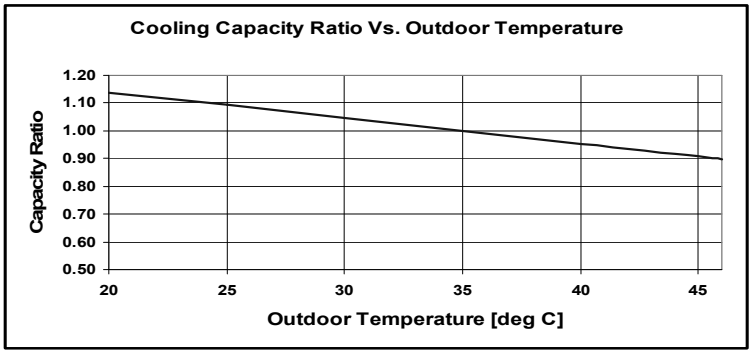
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	4.21	3.92	3.62
	PI	1.15	1.27	1.39
-10/-12	TC	4.69	4.40	4.10
	PI	1.39	1.51	1.63
-7/-8	TC	5.05	4.75	4.46
	PI	1.57	1.69	1.80
-1/-2	TC	5.23	4.93	4.64
	PI	1.66	1.77	1.89
2/1	TC	5.35	5.05	4.76
	PI	1.72	1.83	1.95
7/6	TC	6.92	**6.62**	6.33
	PI	1.81	**1.92**	2.04
10/9	TC	7.30	7.00	6.71
	PI	1.91	2.03	2.15
15/12	TC	7.68	7.38	7.09
	PI	2.02	2.14	2.26
15-24	TC	85 - 105 % of nominal		
(Protection Range)	PI	80 - 120 % of nominal		

LEGEND

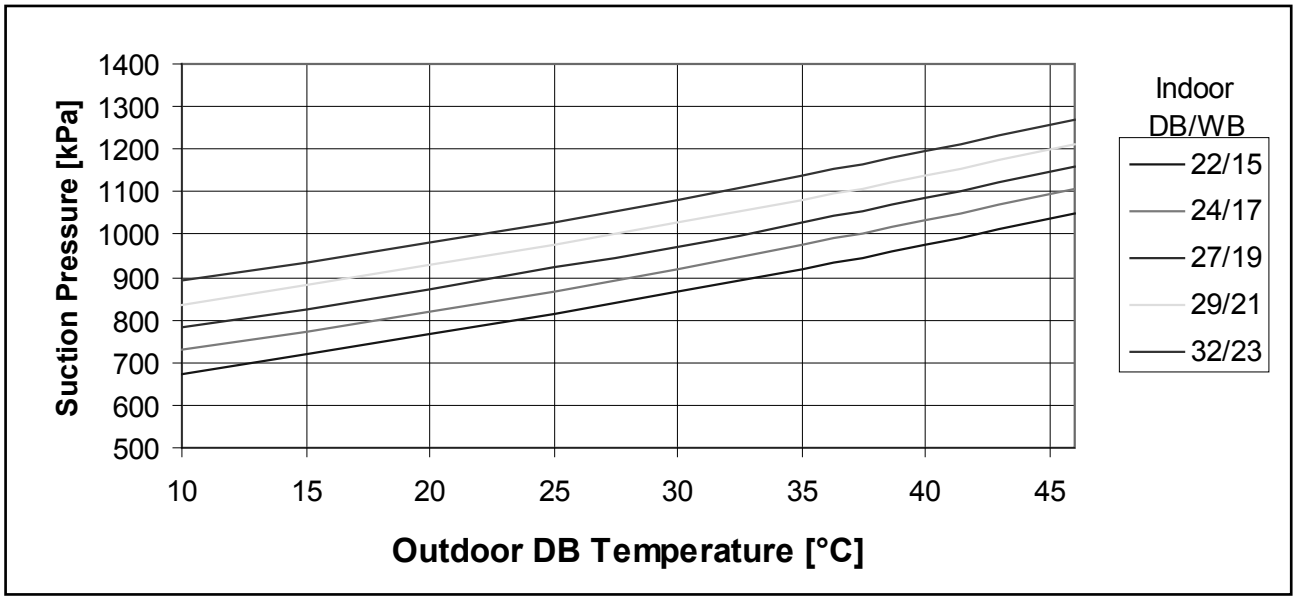
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

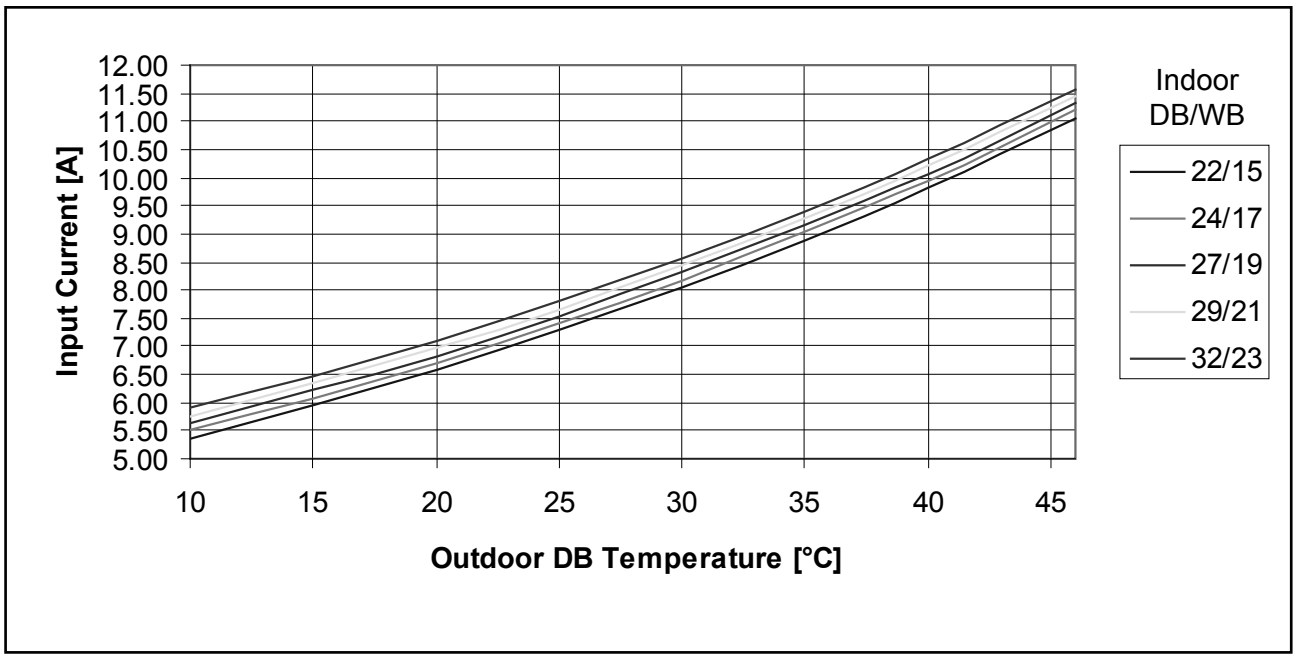
5.2.4 Capacity Correction Factors



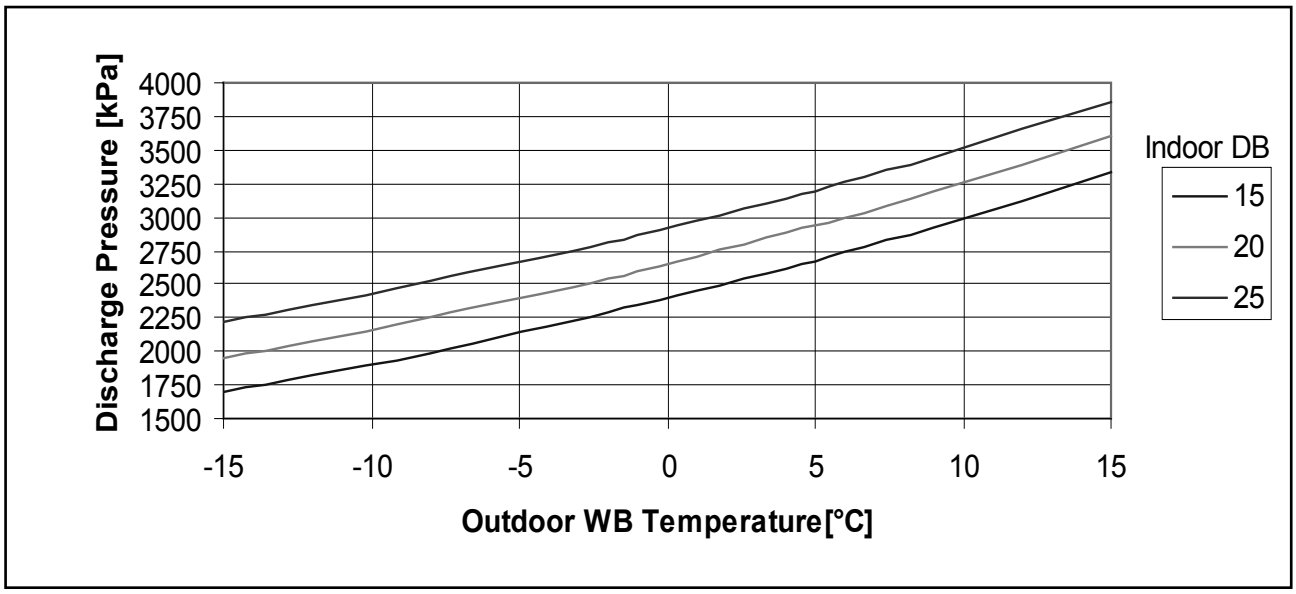
5.2.5 Model: HDD024, HED024

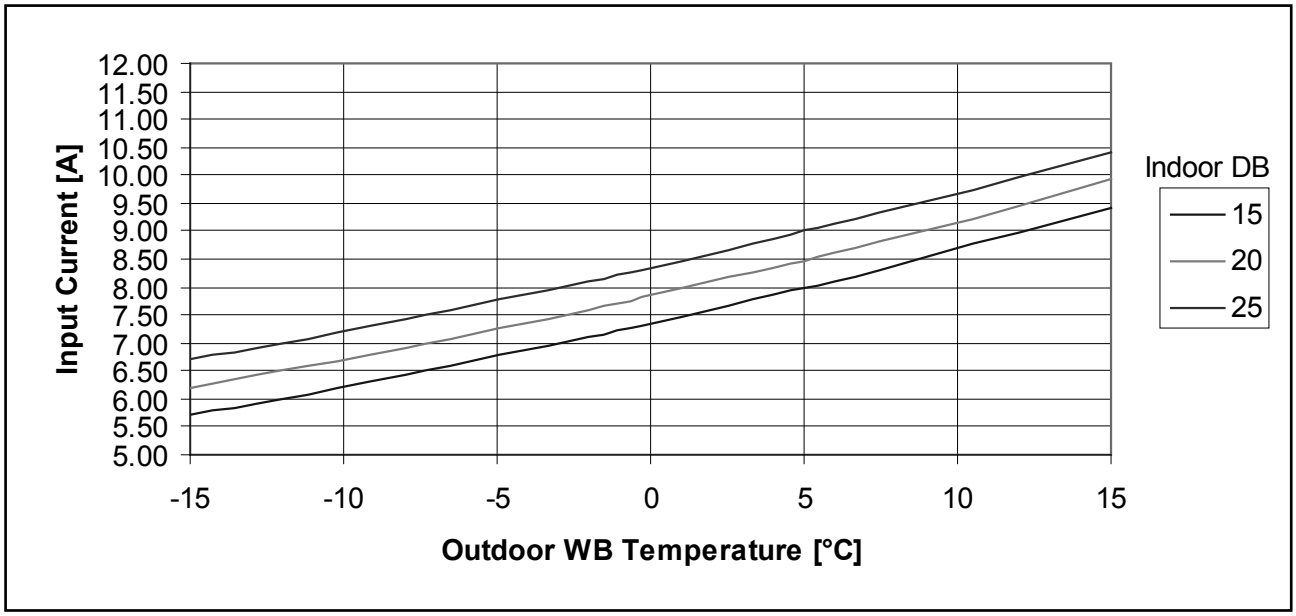
5.2.5.1 Cooling





5.2.5.2 Heating





6. SOUND LEVEL CHARACTERISTICS

6.1 Sound Pressure Level

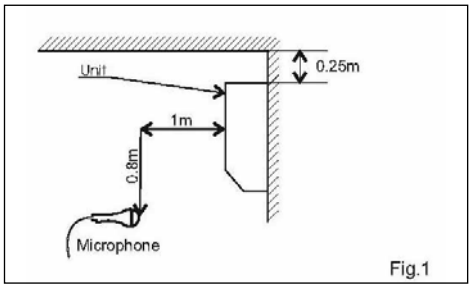
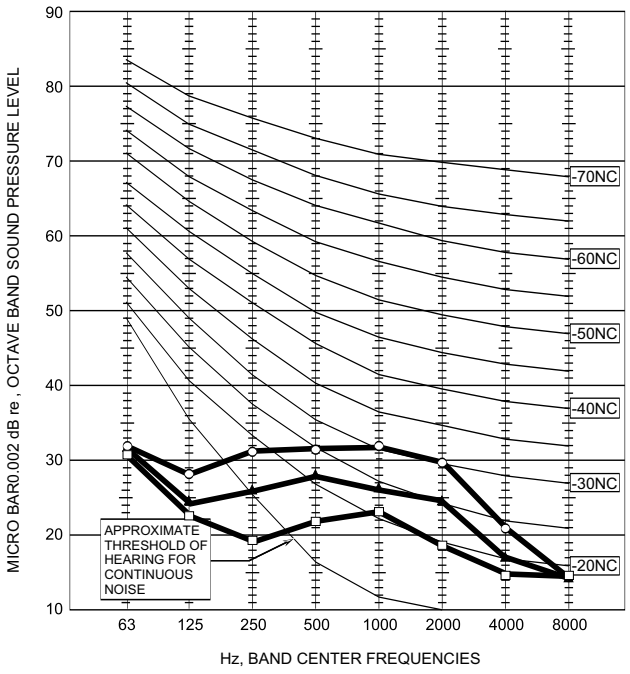


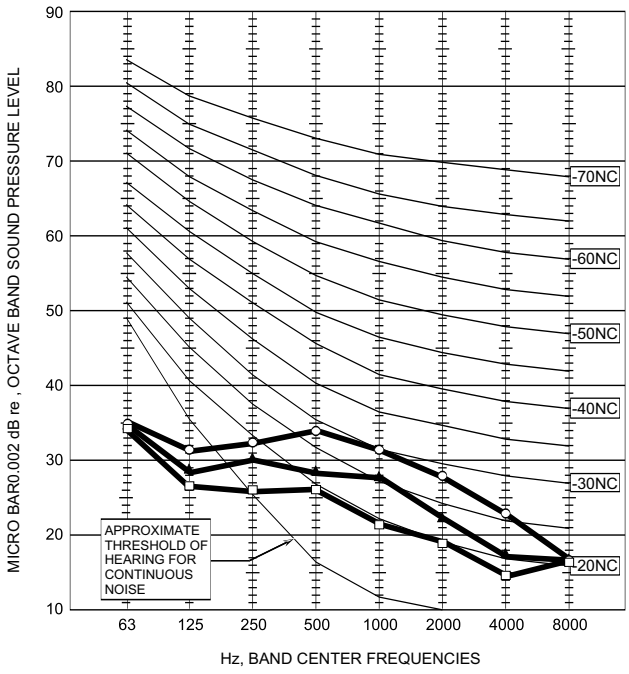
Figure 1. Wall Mounted

6.2 Sound Pressure Level Spectrum (Measured as Figure 1)

HDD018 / HED018



HDD024 / HED024



6.3 Outdoor units

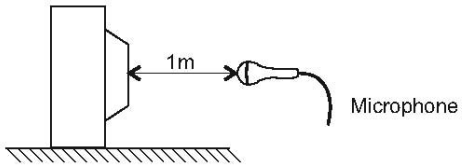
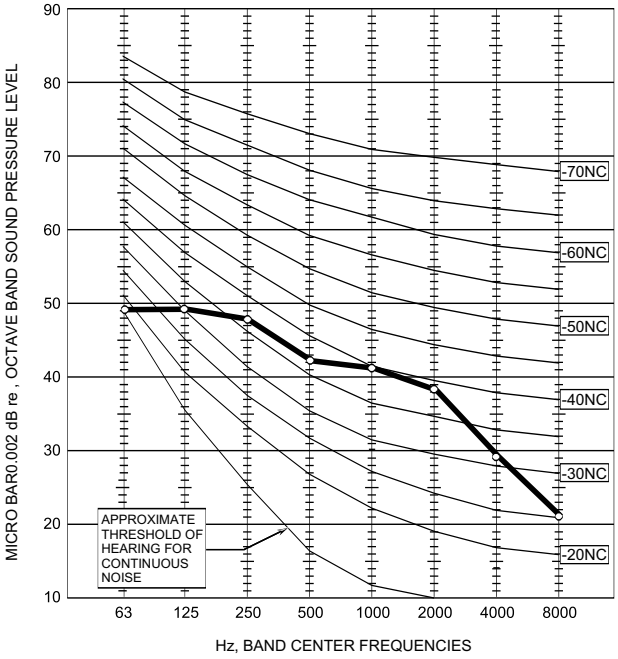


Fig.2

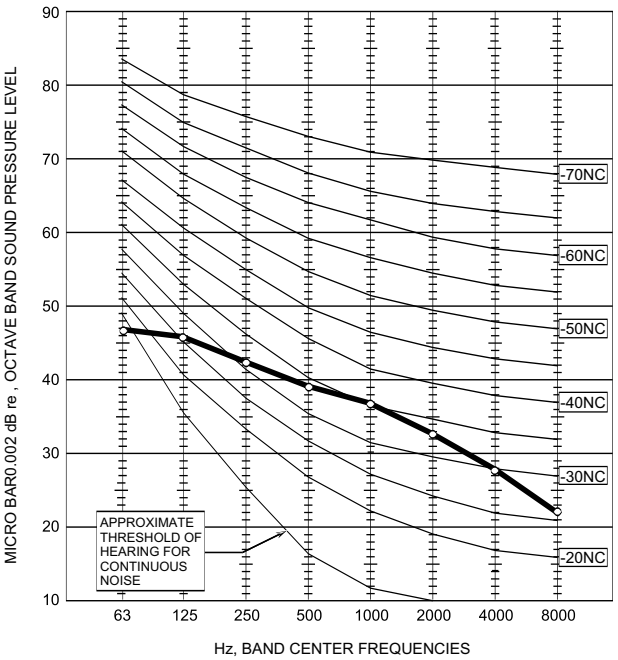
Microphone Distance from Unit

6.4 Sound Pressure Level Spectrum (Measured as Figure 2)

YDD018/YDD024 Cooling



YDD018/YDD024 Heating



7. ELECTRICAL DATA

7.1 Single Phase Units

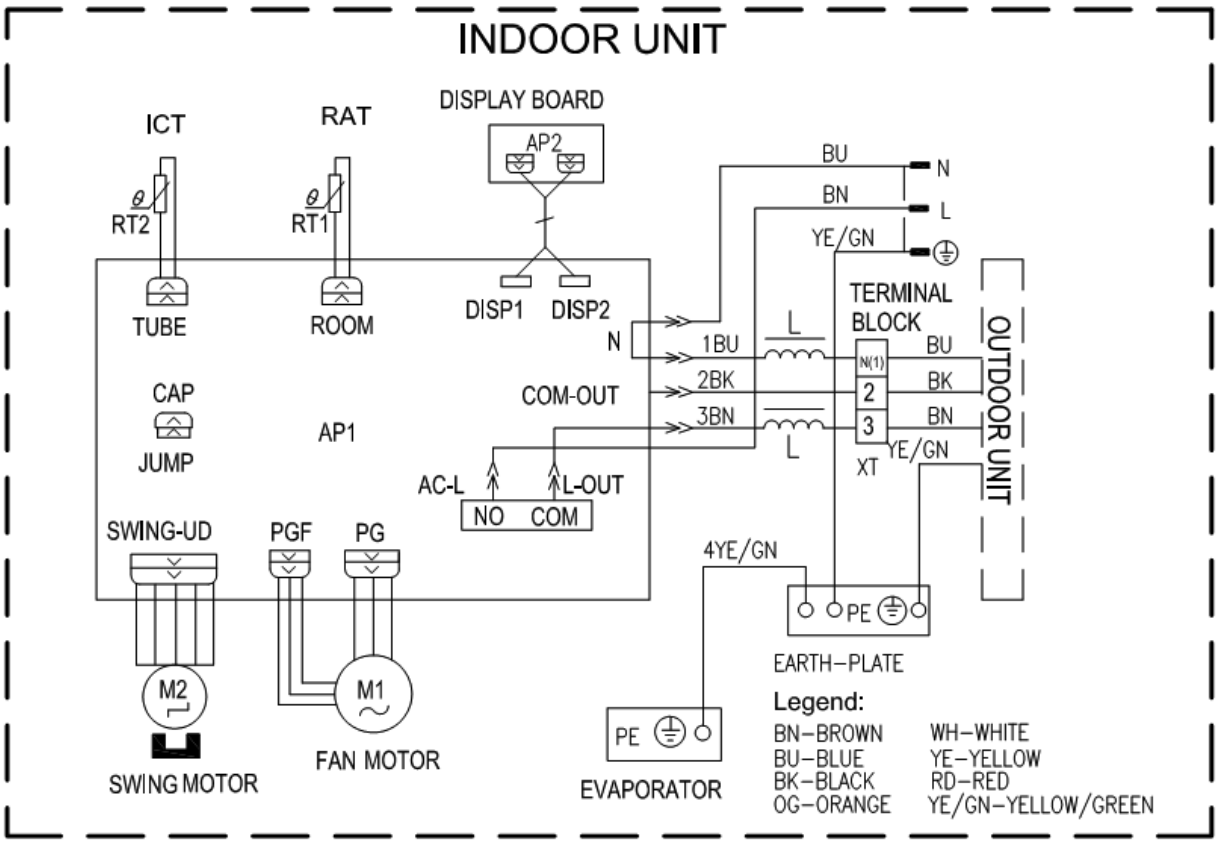
MODEL	YDD018	YDD024
Power Supply	To indoor	
	1PH / 220-240V / 50Hz	
Max Current, A	**12.0**	**13.8**
Circuit Breaker,A	**25.0**	**25.0**
Power Supply Wiring No. X Cross Section mm^2	**3x2.5 mm^2**	**3x2.5 mm^2**
Interconnecting Cable RC Model No. X Cross Section mm^2	**4x2.5 mm^2**	**4x2.5 mm^2**

NOTE

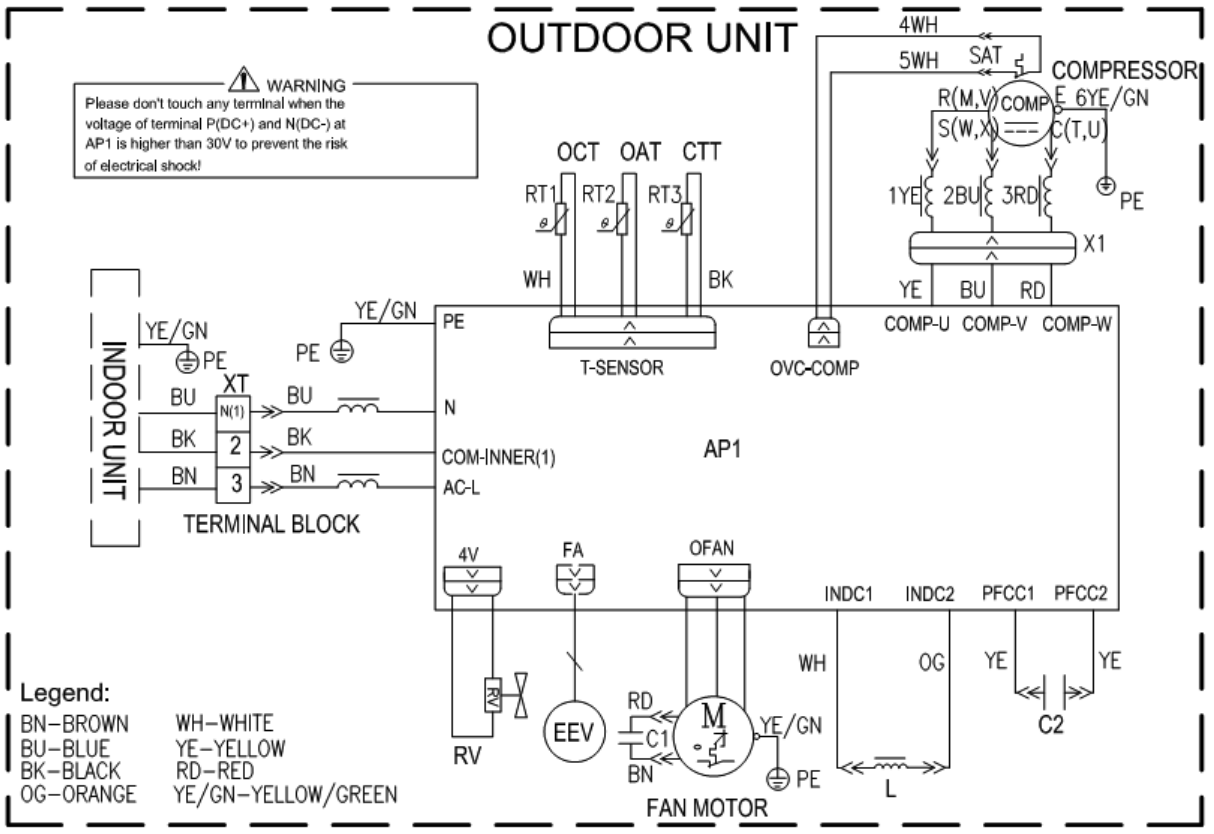
Power wiring cord should comply with local lows and electrical regulations requirements.

8. WIRING DIAGRAMS

8.1 Indoor Units: HDD018, HDD024, HED018, HED024

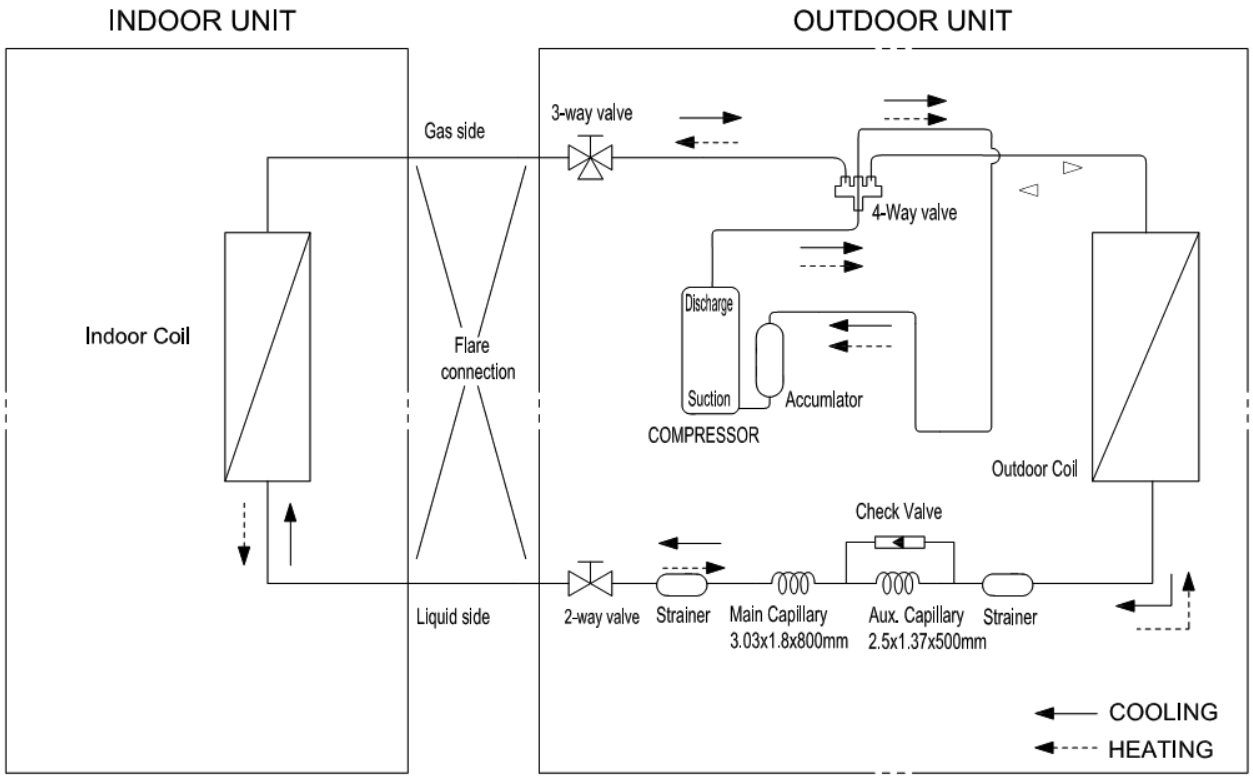


8.2 Outdoor Units: YDD018, YDD024

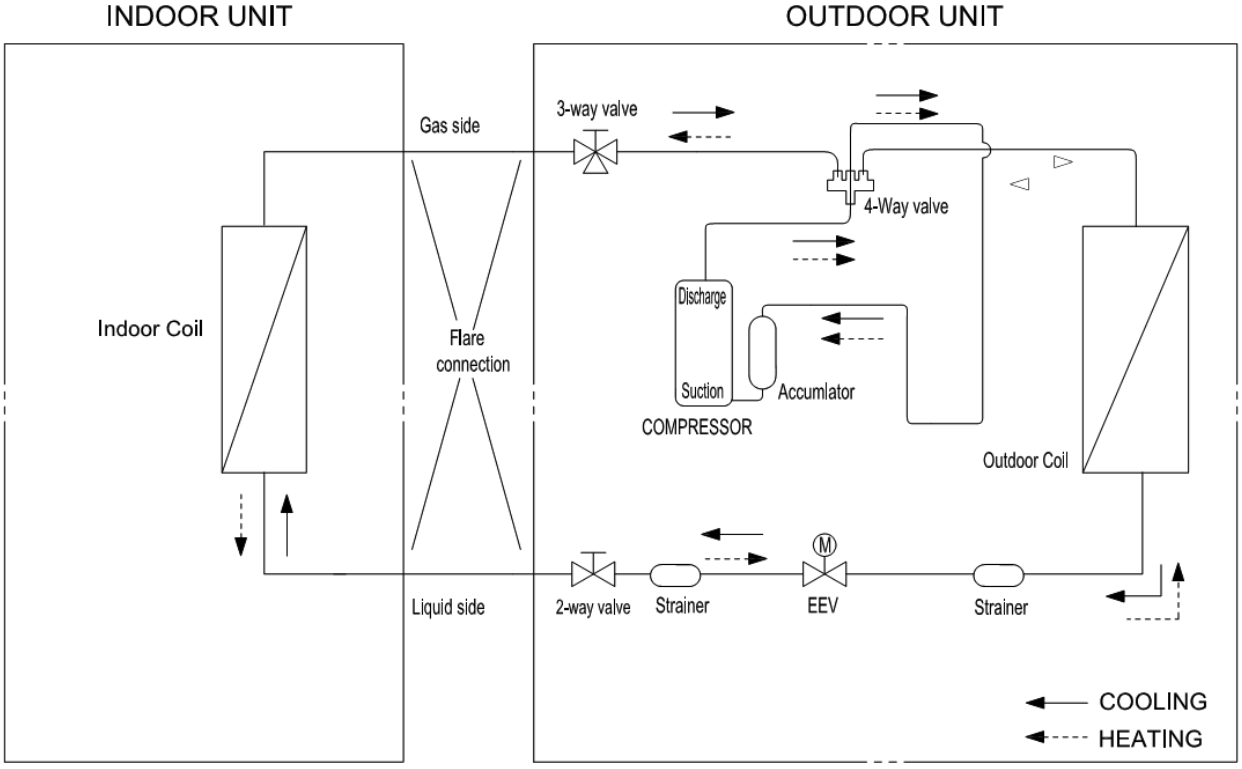


9. REFRIGERATION DIAGRAMS

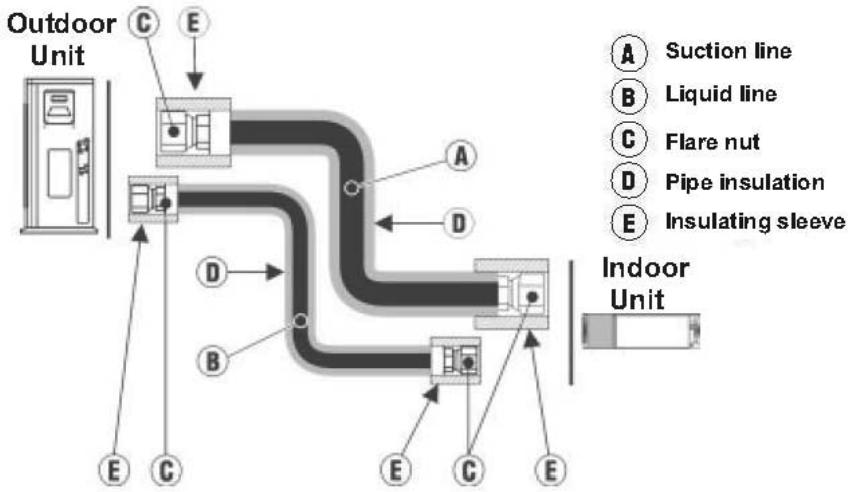
9.1 HDD018 / HED018 // YDD018

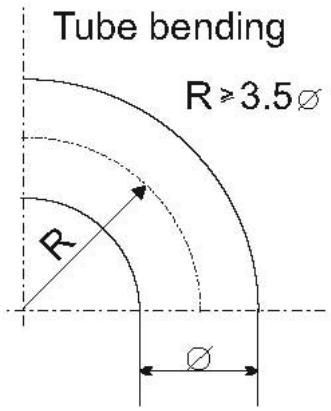


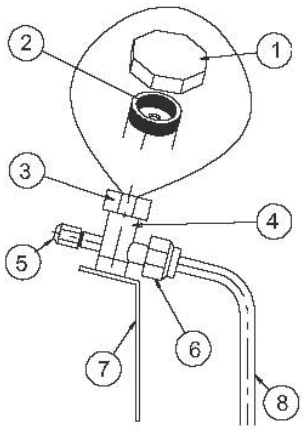
9.2 HDD024 / HED024 // YDD024



10. TUBING CONNECTIONS







TUBE (Inch) / TORQUE (Nm)	1/4"	3/8"	1/2"	5/8"	3/4"
Flare Nuts	11-13	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

1. Valve Protection Cap-end
2. Refrigerant Valve Port (use Allen wrench to open/close)
3. Valve Protection Cap
4. Refrigerant Valve
5. Service Port Cap
6. Flare Nut
7. Unit Back Side
8. Copper Tube

When the outdoor unit is installed above the indoor unit an oil trap is required every 5m along the suction line at the lowest point of the riser .
In case the indoor unit is installed above the outdoor, no trap is required.

11 CONTROL SYSTEM

11.1 Electronic Control

11.1.1 Abbreviations

Abbreviation	Definition
A/C	Air Condition
BMS	Building Management System
PWR	System Power
CTT	Compressor Top Temperature sensor
DCI	DC Inverter
EEV	Electronic Expansion Valve
HE	Heating Element
HMI	Human Machine Interface
HST	Heat Sink Temperature sensor
Hz	Hertz (1/sec) – electrical frequency
ICT	Indoor Coil Temperature (RT2) sensor
IDU	Indoor Unit
MCU	Micro Controller Unit
OAT	Outdoor Air Temperature sensor
OCT	ODU Coil Temperature sensor
ODU	Outdoor Unit
OFAN	Outdoor Fan
PFC	Power Factor Corrector
RAC	Residential A/C
RAT	Room Air Temperature sensor
RC	Reverse Cycle (Heat Pump)
RCT	Remote Control Temperature sensor
RGT	Return Gas Temperature sensor
RPS	Rounds per second (mechanical speed)
RV	Reverse Valve
SB,STBY	Stand By
SUCT	Compressor Suction Temperature sensor
S/W	Software
TBD	To Be Defined
TMR	Timer

11.1.2 System Operation Concept

The control function is divided between indoor and outdoor unit controllers. Outdoor unit is the system 'Master', requesting the indoor unit for cooling/heating capacity supply. The indoor unit is the system 'Slave' and it must supply the required capacity unless it enters into a protection mode avoiding it from supplying the requested capacity.

Target frequency is transferred via indoor to outdoor communication, and the caculation is based on room temperature and set point temperature.

11.1.3 Compressor Frequency Control

The Compressor Frequency Control is based on the PI scheme.
When starting the compressor, or when conditions are varied due to the change of the room condition, the frequency must be initialized according to the **ΔD** value of the indoor unit and the **Q** value of the indoor unit.
Q value: Indoor unit output determined from indoor unit capacity, air flow rate and other factors.

1. P control

Calculate **ΔD** value in each sampling time (20 seconds), and adjust the frequency according to its difference from the frequency previously calculated.

2. I control

If the operating frequency is not change more than a certain fixed time, adjust the frequency up and down according to the **ΔD** value.
Obtaining the fixed **ΔD** value

When the **ΔD** value is small- decrease the frequency
When the **ΔD** value is large- increase the frequency

3. Frequency management when other controls are functioning

When frequency is drooping;
Frequency management is carried out only when the frequency droops.
For limiting lower limit
Frequency management is carried out only when the frequency rises.

4. Maximum and minimum limits of frequency by PI control

The frequency upper and lower limits are set depending on indoor unit.
When low noise commands come from the indoor unit or when outdoor unit low noise or quiet commands come from indoor unit, the upper limit frequency must be lowered than the usual setting.
(see ***11.1.2.1***)

11.1.3.1 Frequancy range

The compressor frequency limitation is set by the following table

Mode	Minimum Frequency(MinFreq)		Maximum Frequency(MaxFreq)
	18	24	See following table
Cooling	*12*	*12*	
Heating	*12*	*12*	

The maximum allowed frequency is extracted from the following:

Mode	Night Mode	Maximum Frequency(MaxFreq)	
		18	24
Cooling	ON	*80*	*80*
	OFF	*90*	*90*
Heating	ON	*90*	*90*
	OFF	*120*	*120*

11.1.3.2 Frequency Changes Control

Frequency change rate is 1 Hz/sec.

11.1.3.3 Minimum On and Off Time

Prohibit to turn ON the compressor for 3 minutes after turning it off.(except during deicing protection)

11.1.4 Indoor Fan Control

8 Indoor fan speeds are determined for each model. 4 speeds for COOL modes and 4 speeds for HEAT mode.

Unit Model	Mode	Turbo(Super high)	High	Medium	Low
18	Cooling	1350	1100	950	800
	Heating	1400	1200	1050	920
24	Cooling	1350	1150	1000	850
	Heating	1350	1150	1000	850

In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.

In AutoFan user setting, fan speed will be adjusted automatically according to the difference between actual room temperature(RAT) and user set point temperature(SPT).

Indoor Fan speed		High	Medium	Low
RAT-SPT	Cooling	>=2	(0,2)	<=0
	Heating	<=1	(1,3)	>=3

In DRY mode, the automatic fan speed is forced to be low.

11.1.4.1 Turbo Speed

In COOL and HEAT mode (not available in AUTO, DRY, FAN mode), press the Turbo button, the super high fan speed is selected on Remote control and the indoor fan rotates at super high speed.

11.1.5 Outdoor Fan Control

11.1.5.1 OFAN Speed Type

The outdoor fan motor is a one speed AC motor and controllered by the relay on outdoor controller.

11.1.5.2 General rules

1. The OFAN is ON when compressor ON during cooling,dring and heating mode.
2. When the unit is off by remote control, in safety stops and stop after reaching to the temperature point, the outdoor fan stops.
3. Outdoor fan OFF will delay 30sec when compressor is OFF during cooling and heating mode.
4. OFAN operating in deicing protection will follow ***(12.11.5.2)***

11.1.6 Refrigerant control

11.1.6.1 Capiliary is used in model 18

11.1.6.2 EEV is used in model 24

1. EEV operation after power-on: When power on, EEV will open 240steps and then move back with 540steps. This position will be recognized as 0. Then EEV will open to 480 steps and be ready for system operating.
2. EEV openloop depends on OAT,RAT,SPT and compressor frequency after compressor starts to operate.
3. Target CTT control will be performed after compressor operates for 5min.
4. The EEV opening will be updated every 5s.

11.1.7 Reversing Valve (RV) Control

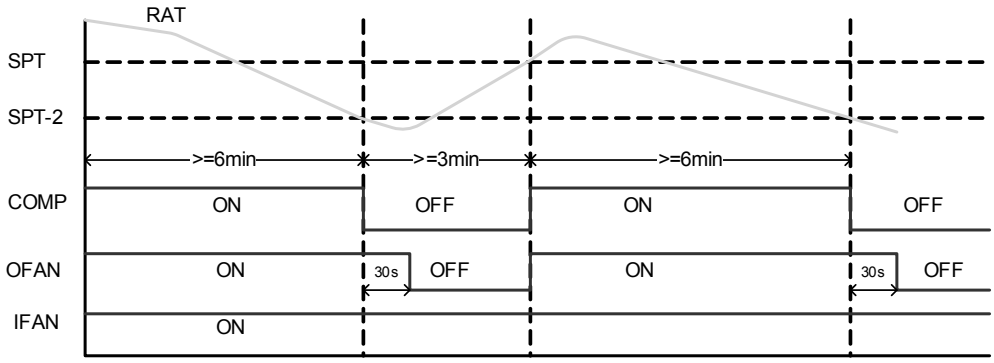
Reversing valve is on in heat mode.
Switching of RV state is done only after compressor is off for over 2 minutes.

11.2 Fan Mode

In this mode, the indoor fan may run at high,medium,low and automatic speed. The compressor, outdoor fan and 4-way valve will be OFF.
In this mode, the range of setting temperature is 16~30 °C

11.3 Cool Mode

If RAT≥SPT-0.5, the unit starts cooling operation. In this case, the compressor and outdoor fan will operate and the indoor fan will run at the setting speed.
If RAT≤SPT-2, the compressor will stop operation and the outdoor fan will delay 30 seconds to stop. While the indoor fan will run at the setting speed.
If SPT-2 < RAT < SPT, the unit will maintain the previous status.

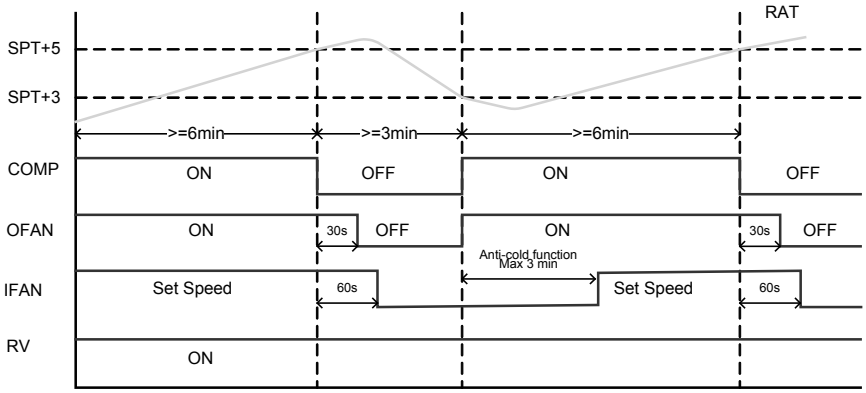


11.3.1 Indoor Fan operation under Cool Mode

When SPT-RAT<0, if indoor fan motor operates at high speed, the fan motor will operate at medium speed. The medium speed or low speed will be maintained; (this condition should be executed when compressor starts up); this function will be excluded in the super high speed; When (RAT-SPT) ≥1 , the fan will return to the setting fan speed.
In AutoFan user setting, fan speed will be adjusted automatically according to the SPT and RAT, rerfer to 12.1.4

11.4 Heat Mode

If RAT≤SPT+3.5, the unit will operate in heating mode. The compressor, outdoor fan and 4-way valve will operate and the indoor fan will delay 3min to start at the latest
If SPT+3≤RAT≤SPT+5,the unit will maintain the previous status.
If RAT≥SPT+5, the compressor will stop, the outdoor fan will delay 30s to stop and the indoor fan will blow for 60s at the setting speed. During this period, the fan speed can't be switched.



11.4.1 Temperature Compensation

3 degrees are reduced from room temperature reading (except when in I-Feel mode), to compensate for temperature difference between high and low areas in the heated room, and for coil heat radiation on room thermistor.

11.4.2 Indoor Fan Control in Heat Mode

Indoor fan speed depends on the indoor coil temperature

Anti-cold air function
When starting the heating mode, anti-cold air function will be activated and indoor fan can run at low

speed or stop running. This function will terminate after the unit runs for 3min or the ICT reaches 42 degree.

Residual heat blowing function

During heating, when the stopping condition for the compressor is reached, the compressor and the outdoor fan motor stop running while the louver moves to position L. The indoor fan will stop after running for 60s at setting speed.

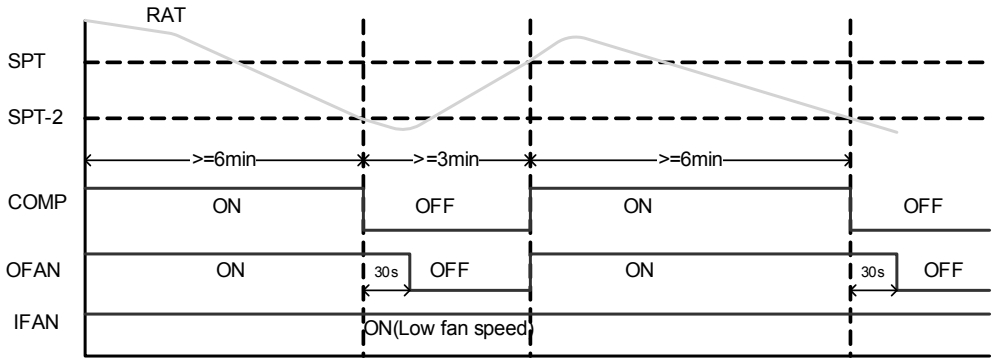
11.5 Auto Cool/Heat Mode

In AUTO mode, the system selects the running mode (COOL/HEAT/FAN) automatically according to the room temperature. The display shows the actual running mode and setting temperature. There will be 30s delay for mode conversion.

1. When RAT≥25 °C, the cooling mode is selected.
2. When RAT≤22 °C, the unit runs in heating mode
3. When 22 °C <RAT< 25 °C, upon initial startup, the unit will enter auto mode and run in automatic fan mode. If the other mode changes into auto mode, the previous running mode will remain.

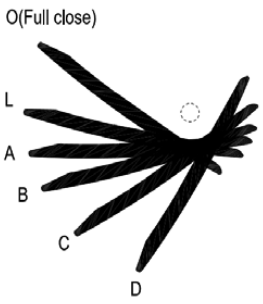
11.6 Dry Mode

If RAT>SPT, the unit starts drying operation. Indoor fan, outdoor fan and compressor will operate and the indoor fan will run at low speed.
If SPT-2≤RAT≤SPT, the unit will keep running in the original mode.
If RAT<SPT-2, the compressor will stop running and the outdoor fan will delay 30 seconds to stop. While the indoor fan will run at low speed.
In this mode, the Reverse Valve will be OFF and the temperature setting range is 16°C~30°C.



11.7 Louver Control

After power on, the up and down swing louver will automatically open and then close completely.
In heating mode, if the swing function is not set, the up and down louver will rotate to maximum in clockwise direction. Then it will rotate to position D. Under other states, the upper and lower air deflector will rotate to level L.
If the swing function is set when starting the unit, the louver will swing between Position L and D. there are 7 states for louver: in position L, A, B, C, D, and swing between L and D, stop in any place between Position L and position D. When the unit is turned off, the air deflector will stay in position 0.



The swing is available only when the swing function is set and the indoor fan is running.
The louver swing can also be set between L and B, between A and C, between B and D.

11.8 Clean function

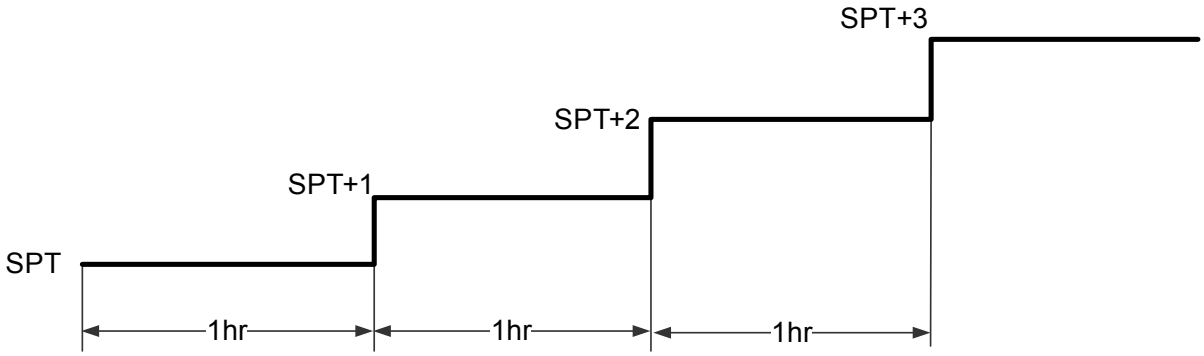
Clean function enables dring the indoor coil after Cool or Dry mode to avoid mould.

Press CLEAN button in Cool or Dry mode, and the will be shown on remote control.
Under clean function, the indoor fan will continue operation for 10 min at low speed after the unit is turned OFF.

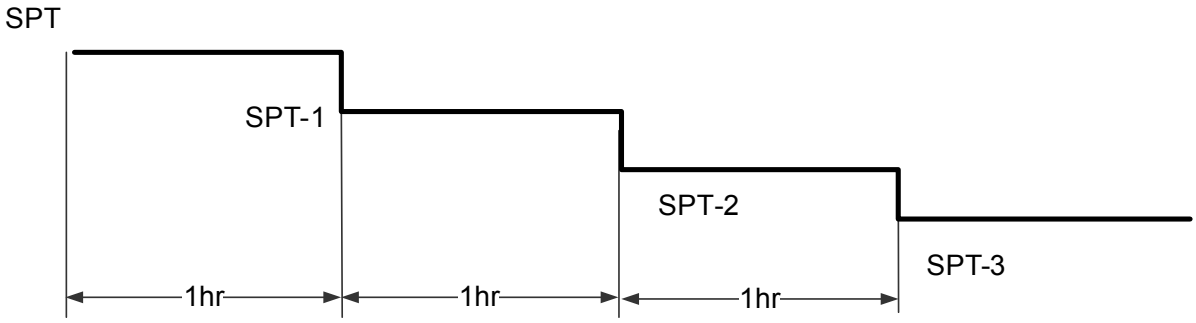
Clean function is defaulted as OFF after unit is Power ON.
Clean function is not available in Auto, Fan or Heat mode.

11.9 Sleep function

Pressing SLEEP button will enable the Sleep function. will be shown on remote control.
Sleep function in Cool and Dry mode:
The SPT will be adjusted according to following chart.



Sleep function in Heat mode:
The SPT will be adjusted according to following chart.



Press either Sleep button or ON/OFF button can cancel the Sleep function.
Sleep function will not be available in Auto mode or Fan mode.

11.10 I-Feel function

I-Feel function maintains the room temperature by comparing the RCT on remote control.

Pressing IFEEL button will enable the I-Feel function. will be shown on remote control.
Under I-Feel funtion, remote control sends I-Feel data every 10 min to IDU controller. If the IDU controller does not received I-Feel data after 11 min. I-Feel function will be interrupted and then the AC will work according to RAT on the IDU.
I-Feel function can not be remembered after power failure.

11.11 Protections

There are 4 protection codes.
Normal (Norm) – unit operate normally.
Stop Rise (SR) – compressor frequency can not be raised but does not have to be decreased.
HzDown – Compressor frequency is reduced by 2Hz/s (For 9k/12k, temperature protection is 4Hz/60s)
Stop Compressor (SC) – Compressor is stopped.

11.11.1 Indoor Coil Defrost Protection

Conditions for Start Controlling
Judge the controlling start with the ICT (Indoor Coil Temperature) after 2 sec from operation start.

During cooling operation, the signals being sent from the indoor unit allow the operating frequency limitation and then prevent freezing of the indoor heat exchanger.

Compressor frequency will be decreased or stop increasing if ICT<6C
Compressor will stop when ICT <= -1C for continuous 3 mins.

If the unit stops as such protection for 6 times, it can not resume running automatically and display malfunction, it can resume by pressing ON/OFF.

11.11.2 Indoor Coil over Heating Protection

Conditions for Start Controlling
Judge the controlling start with the ICT after 2 sec from operation start.

During heating operation, the signals being sent from the indoor unit allow the operating frequency limitation and prevent abnormal high pressure.

Compressor will stop when ICT/OCT reaches 62 °C

If the unit stops as such protection for 6 times, it can not resume running automatically and display malfunction, it can resume by pressing ON/OFF.

11.11.3 Compressor over Heating Protection

The Discharging temperature is used as the compressor's internal temperature. If the discharge temperature rises above a certain level, the operating frequency upper limit is set to keep this temperature from going up further.

Compressor will stop when CTT reaches 115C

If the unit stops as such protection for 6 times, it can not resume running automatically and display malfunction, it can resume by pressing ON/OFF.

11.11.4 Compressor over Current Protection

Detect an input current by the CT during the compressor is running, and set the frequency upper limit from such input current. In case of heat pump model, this control is the upper limit control function of the frequency which takes priority of the lower limit of four way valve activating compensation.
Detail

Compressor frequency will be decreased or stop increasing when AC current>=12.0A
Compressor will stop when AC current >= 17.0A for continious 2.5s
If the unit stops as such protection for 6 times, it can not resume running automatically and display malfunction, it can resume by pressing ON/OFF.

11.11.5 Outdoor Coil Deicing Protection

This protection is for Heat Pump Only
This protection is carried out by the cooling cycle (reverse cycle). The defrosting time or outdoor heat exchanger temperature must be more than its setting values when finishing the deicing protection.
In the deicing protection, IFAN is forced OFF.

11.11.5.1 Deicing Starting Conditions

The starting conditions must be made with the outdoor air temperature (OAT) and outdoor coil temperature (OCT). Under the conditions that the system is in heating operation, 6 minutes after the compressor is started and more than 44 minutes of accumulated time pass since the start of the operation or ending the defrosting.

Deicing interval time is changed as a function of deicing time. If deicing time is shorter than former deicing time, the deicing interval time will be increased. If deicing time is longer than former deicing time, the deicing interval time will be decreased.

11.11.5.2 Deicing Protection Procedure

5. Start to defrost: Compressor stops and starts up 55S later
6. Start to defrost: Outdoor fan will stop after compressor stops for 50S.
7. Defrosting finish: Compressor stops and starts up 55S later.
8. Defrosting finish: Outdoor fan will start up when the compressor is stopping.

11.11.5.3 Exiting Deicing

The deicing operation can exit when any of the conditions below is satisfied:
1. OCT>=12C
2. OAT<-5C, and OCT>=6C lasts for more than 80s
3. The continuous running time of deicing reaches to 8min.

11.11.6 Drop off voltage

During compressor operation, the system will stop and malfunction of drop off voltage if voltage downward fluctuates rapidly, and it will re-start up automatically 3min later.

11.11.7 Communication malfunction

If the unit does not receive correct signal from Indoor unit for 3min continuously, the unit will stop as communication malfunction protection; if communication malfunction resume and compressor has stopped for 3min, the unit will resume running.

11.11.8 IPM module protection

When the compressor starts, if there is over current or control voltage low for IPM module as some abnormal results, IPM will detect module protection signal as the unit is on. Once the module protective signal is detected, stop the unit with module protection immediately. If the module protection is resumed and compressor has stopped for 3min, the unit will be allowed to operate.
If the module protection continuously occurs for 3 times, it should not be resumed automatically, and you should press the ON/OFF button to resume.

11.11.9 Module overheating protection

If the module temperature is higher than 100C, the unit will stop. If module temperature is lower than 100C, and compressor has stopped for 3min, the unit will resume operating.
If the unit stops as module overheating protection for 6 times, it can not resume running automatically and display malfunction, it can resume by pressing ON/OFF.

11.11.10 Compressor overload protection

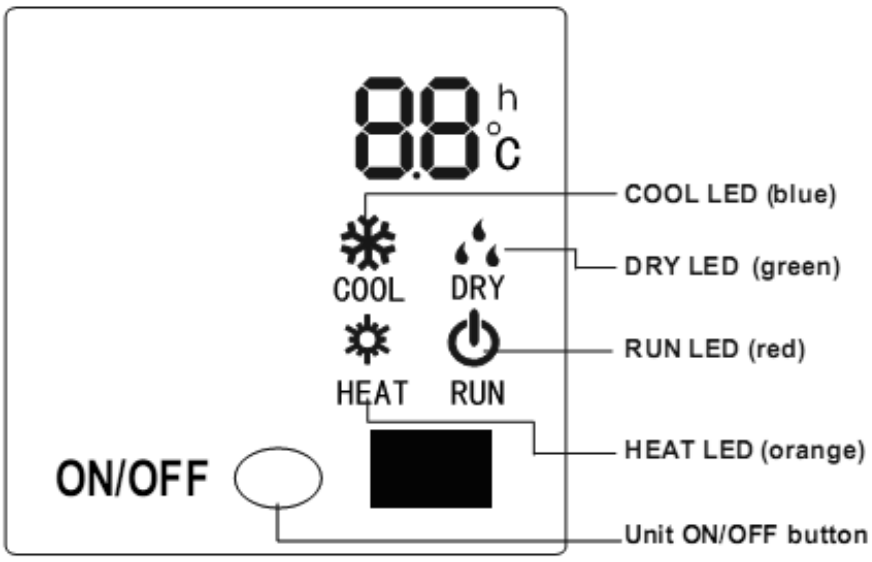
If the compressor OLP is opened for 3S continuously, the system will stop as protection
If the OLP is resumed and compressor has stopped for 3min, the unit will be allowed to operate.
If the unit stops as compressor overload protection occurred for 3 times continuously, it can not resume running automatically and display malfunction, it can resume by pressing ON/OFF, and the times of compressor overload protection will be cleared after the compressor has run for 30min.

11.12 Operating the Unit from the ON/OFF Button

The ON/OFF button allows to operate the unit in AUTO mode, the microcomputer will monitor the room temperature and select the (COOL, HEAT, FAN) mode automatically, and temperature/Fan speed settings can not be changed.

11.13 Indoor Unit Controllers and Indicators

The following is schematic drawing for the display:



RUN INDICATOR	1. Lights up when the Air Conditioner is connected to power and the mode is STBY. 2. When the unit is turned on remotely, the RUN LED goes out while the current setting running mode is displayed
COOL INDICATOR DRY INDICATOR HEAT INDICATOR	1. Lights up during specified operation mode (COOL/DRY/HEAT).
2* 7 segments display	1. In normal situation, the setting temperature is displayed. 2. Shows outdoor temperature or indoor temperature when receiving the corresponding demand from controller. It resumes displaying setting temperature 5s later 3. Shows H1 during deicing in heating mode. 4. Shows the alarm code whenever there is an alarm.(Refer to Diagonostic part)
Unit ON/OFF Button	**For Model 18/24** Single pressing : Unit will swich between Auto mode and STBY. System will select the COOL/HEAT/FAN mode automatically and temperature/Fan speed settings can not be changed.

11.14 Test Mode

11.14.1 Entering Test Mode

Test mode(Mode of testing capacity) can be achieved through special remote control settings as following table depends on models:

Model	Mode (Shown on display)	Settings of Remote control		Operation of Remote control	Display (2*7 segments)
		Cooling	Heating		
18/22	Setting frequecy to XY Hz	Timer OFF= (10+X)(hrs) SPT=20+Y Setting frequency=10*X+Y		Press “Sleep” button 4 times in 3 secs.	Show XY (Frequency) *1

Remark: *1 – 2*7 segments display can only show lower 2 digits of number.

Example of frequency setting on 18/24
To set the frequency=105Hz, following settings should be done.
105=10*10+5 (here the X=10, Y=5)
Settings on remote control:
Timer Off =10+X=20
SPT=20+Y=25
Press **“Sleep”** button 4 times in 3 secs and compressor will operate with 105Hz. Display will show “05”

11.14.2 Unit Operation in Test Mode

Compressor frequency will be set in the following ways:

Model		18	22
P0(Minimum capacity)	Cooling	15Hz	15Hz
	Heating	15Hz	15Hz
P1(Norminal capacity)	Cooling	83Hz	83Hz
	Heating	66Hz	75Hz
P2(Maximum capacity)	Cooling	100Hz	100Hz
	Heating	96Hz	96Hz
P3(Medium capacity)	Cooling	34Hz	36Hz
	Heating	33Hz	37Hz

IFAN speed can be adjusted during test mode.

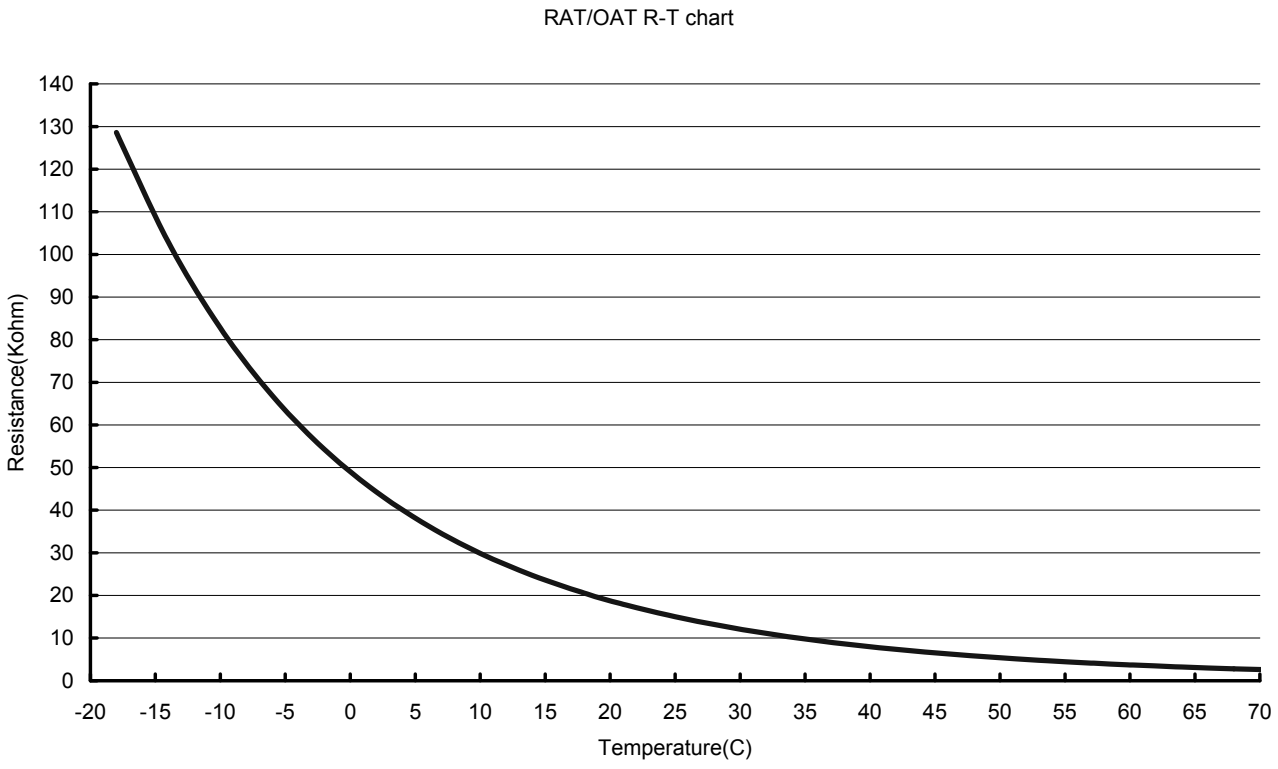
11.15 Forced Mode (Compulsory operating function)

Entering into forced mode :
After the unit is powered for 5mins, press the light button on remote controller for 3 times in 3s successively to enter into Freon recovery mode. Fo will be displayed. When Freon recovery mode operated for 25mins, all loads will operate in cooling mode. (The setting fan speed is high fan speed and the setting temperature is 16C)

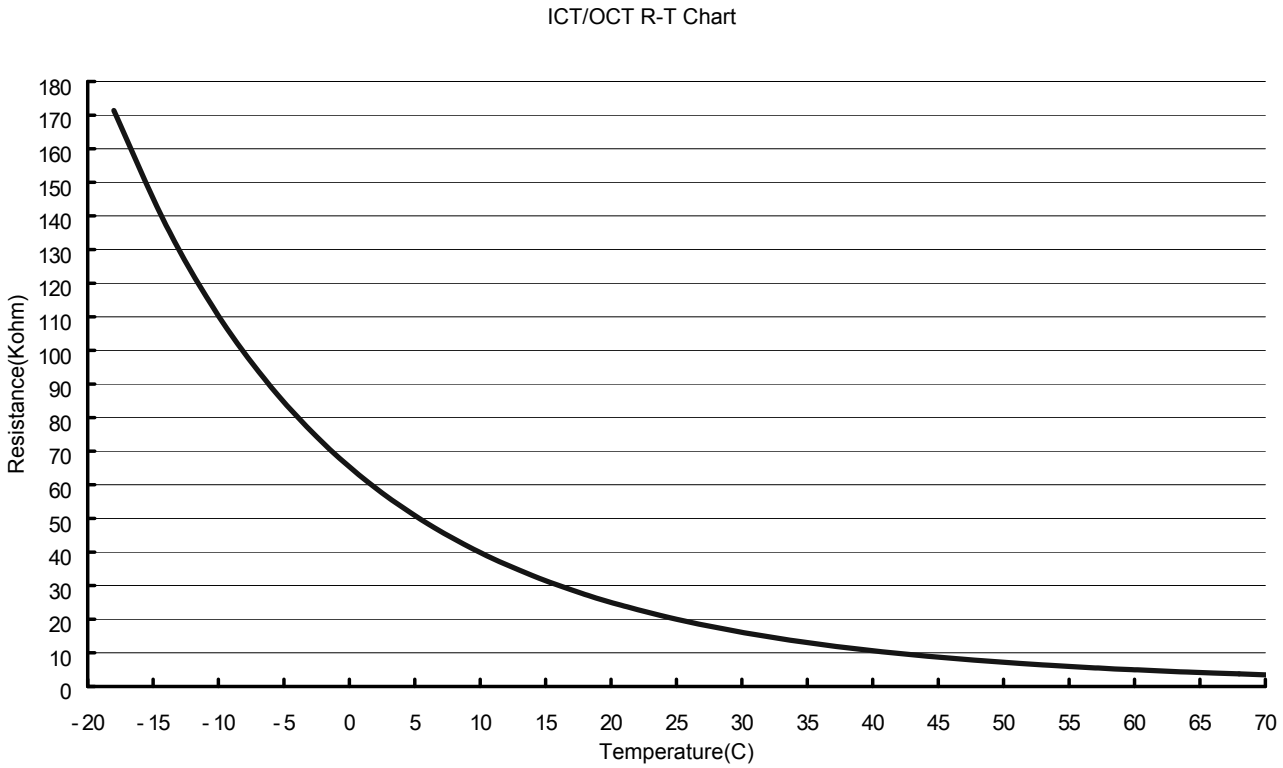
Exiting forced mode:
Any signal from remote controller or button will exit the forced mode, and then the unit will operate at the current setting command.
Forced mode will also be exited after operating for 25mins and then the unit will be turned off.

11.16 Characteristics of sensor

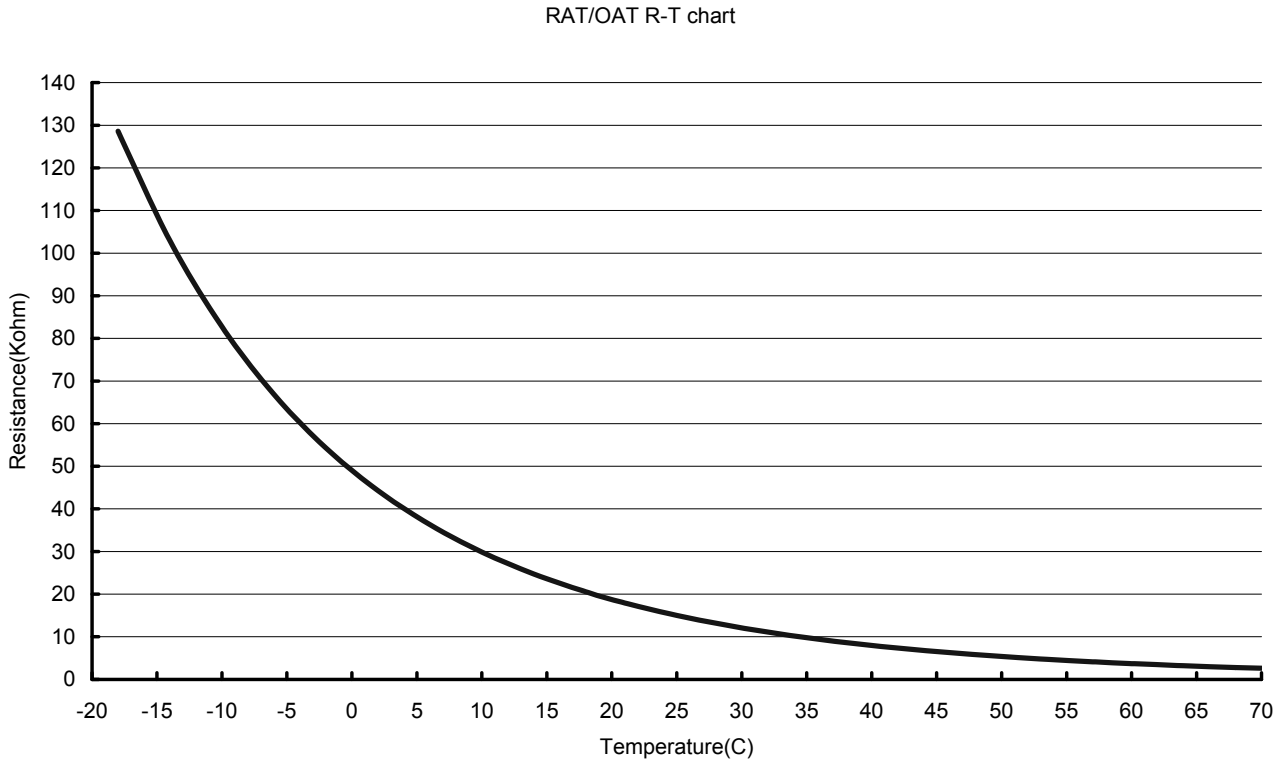
11.16.1 RAT / OAT



11.16.2 ICT / OCT



11.16.3 CTT



12 TROUBLESHOOTING

12.1 ELECTRICAL & CONTROL TROUBLESHOOTING

12.1.1 Precautions before Performing Inspection or Repair

Be cautious during installation and maintenance. Do operation following the regulations to avoid electric shock and casualty or even death due to drop from high attitude.

* **Static maintenance** is the maintenance during de-energization of the air conditioner.
For static maintenance, make sure that the unit is de-energized and the plug is disconnected.

***Dynamic maintenance** is the maintenance during energization of the unit. Before dynamic maintenance, check the electricity and ensure that there is ground wire on the site. Check if there is electricity on the housing and connection copper pipe of the air conditioner with voltage tester. After ensure insulation place and the safety, the maintenance can be performed.

Take sufficient care to avoid directly touching any of the circuit parts without first turning off the power. At time such as when the circuit board is to be replaced, place the circuit board assembly in a vertical position. Normally,diagnose troubles according to the trouble diagnosis procedure as described below.(Refer to the check points in servicing written on the wiring diagrams attached to the indoor/outdoor units.)

Precautions when inspecting the control section of the outdoor unit:
A large-capacity electrolytic capacitor is used in the outdoor unit controller (inverter).Therefore,if the power supply is turned off, charge(charging voltage DC280V to 380V)remains and discharging takes a lot of time. After turning off the power source,if touching the charging section before discharging, an electrical shock may be caused.
The outdoor unit can not be started up until the unit is de-energized for 20min.

12.1.2 Confirmation

12.1.2.1 Confirmation of Power Supply Confirm that the power breaker operates(ON) normally;

12.1.2.2 Confirmation of Power Voltage Confirm that power voltage is AC220~240V +/-10%. If power voltage is not in this range, the unit may not operate normally.

12.1.3 Judgment by Indoor/Outdoor Unit Diagnostics

If the malfunction still exists 4min later after stop of unit due to compressor protection, error code will be directly displayed though indoor display. In other situations, error code can be displayed by pressing LIGHT button 6 times within 4s.

Indoor indicators		Outdoor indicators				Failure	Possible Reasons/Corrective actions
2* 7 segments	LEDs (RUN,COOL,HEAT)	D40	D41	D42	D43		
E1	RUN OFF 3s and blink once	□				HP Switch protection	1. Refrigerant was superabundant 2. Poor heat exchange (including blockage and bad radiating environment) 3. Too high ambient temperature
E2	RUN OFF 3s and blink 2 times	■	□	■	□	Indoor coil defrost protection	1. Poor air-return in indoor unit 2. Fan speed is abnormal 3. Evaporator is dirty.
E4	RUN OFF 3s and blink 4 times	■	□	■		Compressor over Heating Protection	1. EEV connectgion problem or damage 2. Refrigerant leakage 3. Poor heat exchange

Indoor indicators		Outdoor indicators				Failure	Possible Reasons/Corrective actions
2* 7 segments	LEDs (RUN,COOL,HEAT)	D40	D41	D42	D43		
E5	RUN OFF 3s and blink 5 times	□	■		□	AC over current protection	1. Supply voltage is unstable 2. Supply voltage is too low and load is too high
E6	RUN OFF 3s and blink 6 times	□	□	□		Communication malfunction	1. Wiring mistakes 2. IDU or ODU PCB problem
E8	RUN OFF 3S and blink 8 times	■	□	■	■	Indoor coil/Outdoor coil over heating protection	1. Too high ambient temperature 2. Poor heat exchange (including blockage and bad radiating environment)
U8	RUN OFF 3S and blink 17 times					Zero-crossing protection (IDU)	1. IFAN motor damaged 2. Zero-cossing cuitcuit damaged on IDU PCB
H6	RUN OFF 3S and blink 11 times					No feedback of indoor motor	1. IFAN motor damaged 2. IFAN motor blocked 3. IDU PCB problem
C5	RUN OFF 3S and blink 15 times					Malfunction protection of jumper cap	Poor connection of the jumper on indoor PCB.
F1	COOL OFF 3S and blink once					RAT failure	1. Senor was broken or damaged 2. PCB temperature detection cuircuit has problem
F2	COOL OFF 3S and blink twice					ICT failure	
F3	COOL OFF 3S and blink 3 times	□	□		■	OAT failure	
F4	COOL OFF 3S and blink 4 times	□	□		□	OCT failure	
F5	COOL OFF 3S and blink 5 times	□	□			CTT failure	
F6	COOL OFF 3S and blink for 6 times	■	□			HZ down due to overload	1. Too high ambient temperature 2. Poor heat exchange (including blockage and bad radiating environment)
F8	COOL OFF 3S and blink 8 times	■	■	□	■	Hz down due to over current	1. Power supply voltage is too low 2. Higher system pressure and overload
F9	COOL OFF 3S and blink 9 times	■	■	□	□	Hz down due to CTT over heating	1. Overload or temperature is too high 2. Insufficient refrigerant 3. EEV Problem
PH	COOL OFF 3S and blink 11 times	□	■	□		DC over voltage	1. AC power supply is higher than 265V 2. Outdoor PCB circuit malfunction
U5	COOL OFF 3S and blink 13 times	□	■		■	AC Current detection problem	Outdoor PCB problem, replace the outdoor controller.
P5	COOL OFF 3S and blink 15 times	□		□	□	Compressor phase DC over current protection	1. Abnormal power input voltage. 2. Compressor wiring mistake. 3. Liquid and gas valve are not open. 4. EEV damaged or not proper working 5. Poor heat exchage. 6. Over charged system.
H1	HEAT OFF 3S and blink once					Deicing	Normal function during heating
H2	HEAT OFF 3S and blink twice					ESF protection	

Indoor indicators		Outdoor indicators				Failure	Possible Reasons/Corrective actions
2* 7 segments	LEDs (RUN,COOL,HEAT)	D40	D41	D42	D43		
H3	HEAT OFF 3S and blink 3 times	□			□	Compressor overload protection	1. Connection of compressor OLP is loosen (the resistance for this terminal should be less than 1ohm) 2. EEV connection problem or damaged/Capilliary problem 3. Refrigeratn leakage
H4	HEAT OFF 3S and blink 4 times	■	□	■	■	System is abnormal	1. Too high ambient temperature 2. Poor heat exchange (including blockage and bad radiating environment)
H5	HEAT OFF 3S and blink 5 times	□			□	IPM protection	1. Abnormal power input voltage. 2. Compressor wiring mistake. 3. Liquid and gas valve are not open. 4. EEV damaged or not proper working 5. Poor heat exchage. 6. Over charged system.
HC	HEAT OFF 3S and blink 6 times	□	■			PFC protection	1. PFC module assembly problem. 2. Poor heat exchange of Heatsink 3. PFC reactor problem. 4. Abnormal power voltage 5. PFC cuicuit problem on PCB
H7	HEAT OFF 3S and blink 7 times	□		■		Desynchronizing of compressor	1. Abnormal power input voltage. 2. Compressor wiring mistake. 3. Liquid and gas valve are not open. 4. EEV damaged or not proper working 5. Poor heat exchage. 6. Over charged system.
H0	HEAT OFF 3S and blink 10 times	■	□			HZ down due to Coil over heating protection	1. Too high ambient temperature 2. Poor heat exchange (including blockage and bad radiating environment)
Lc	HEAT OFF 3s and blink 11 times	□		□		Start-up failure	1. Compressor wiring mistake 2. Over charged system 3. System not balanced before compressor starting 4. Compressor problem
U1	HEAT OFF 3s and blink 13 times	□		■	□	Malfunction of phase current detection circuit for compressor	Phase current detection circuit for compressor has problem.
EE	HEAT OFF 3s and blink 15 times	□	□	□	■	EEPROM failure	Replace indoor controller
PU	HEAT OFF 3S and blink 17 times	□	■	□	■	Charging malfunction of capacitor	1. Reactor open 2. Charging relay or other components damaged on PCB.
P7	HEAT OFF 3s and blink 18 times	□	□	■		HST failure	Replace outdoor controller
P8	HEAT OFF 3s and blink 19 times	■	□		■	HST over heating protection	1. Insufficient grease on heatsink or poor connection of heatsink to PCB 2. Outdoor PCB problem.
U3	HEAT OFF 3s and blink 20 times	□	■	■	■	Malfunction of voltage dropping for DC BUS	Supply voltage is unstable

Indoor indicators		Outdoor indicators				Failure	Possible Reasons/Corrective actions
2* 7 segments	LEDs (RUN,COOL,HEAT)	D40	D41	D42	D43		
PL	HEAT OFF 3S and blink 21 times	□	■	■	□	DC under voltage	1. AC power supply voltage is less than 150VAC 2. Outdoor PCB circuit malfunction
EU		■	■	■		Stop rise/HZ down due to HST over heating protection	1. Insufficient grease on heatsink or poor connection of heatsink to PCB 2. Outdoor PCB problem.
U7		■	□		□	The RV is abnormal	1. Supply voltage is lower than AC175V 2. Wiring terminal of RV is loosen or broken 3. RV is damaged
U9		■	■		□	Zero-crossing protection (ODU)	Replace outdoor controller
FH		■	■	■	□	Stop rise/HZ down due to IDU defrosting protection	1. Poor air-return in indoor unit 2. Fan speed is abnormal 3. Evaporator is dirty.

12.1.4 Checking the refrigeration system

Checking system pressures and other thermodynamic measures should be done when system is in Test Mode (in Test mode, system operates in fixed settings). The performance curves given in this manual are given for unit performance in test mode when high indoor fan speed is selected.
Entering test mode please refer to section 11- Control system.

12.2 Simple procedures for checking the Main Parts

12.2.1 Checking Mains Voltage.

Confirm that the Mains voltage is between 198 and 264 VAC. If Mains voltage is out of this range, abnormal operation of the system is expected. If in range check the Power (Circuit) Breaker and look for broken or loosed cable lugs or wiring mistake(s).

12.2.2 Checking Power Input.

If Indoor unit power LED is unlighted, power down the system and check the fuse of the Indoor unit. If the fuse is OK replace the Indoor unit controller. If the fuse has blown, replace the fuse and power up again.
Checking Power Input procedure for the Outdoor unit is the same as with the Indoor unit.

12.2.3 Checking the Outdoor Fan Motor.

Check the voltage between two pins Hi and N of connector OFAN on controller, normal voltage is 220~240VAC.

12.2.4 Checking the Compressor.

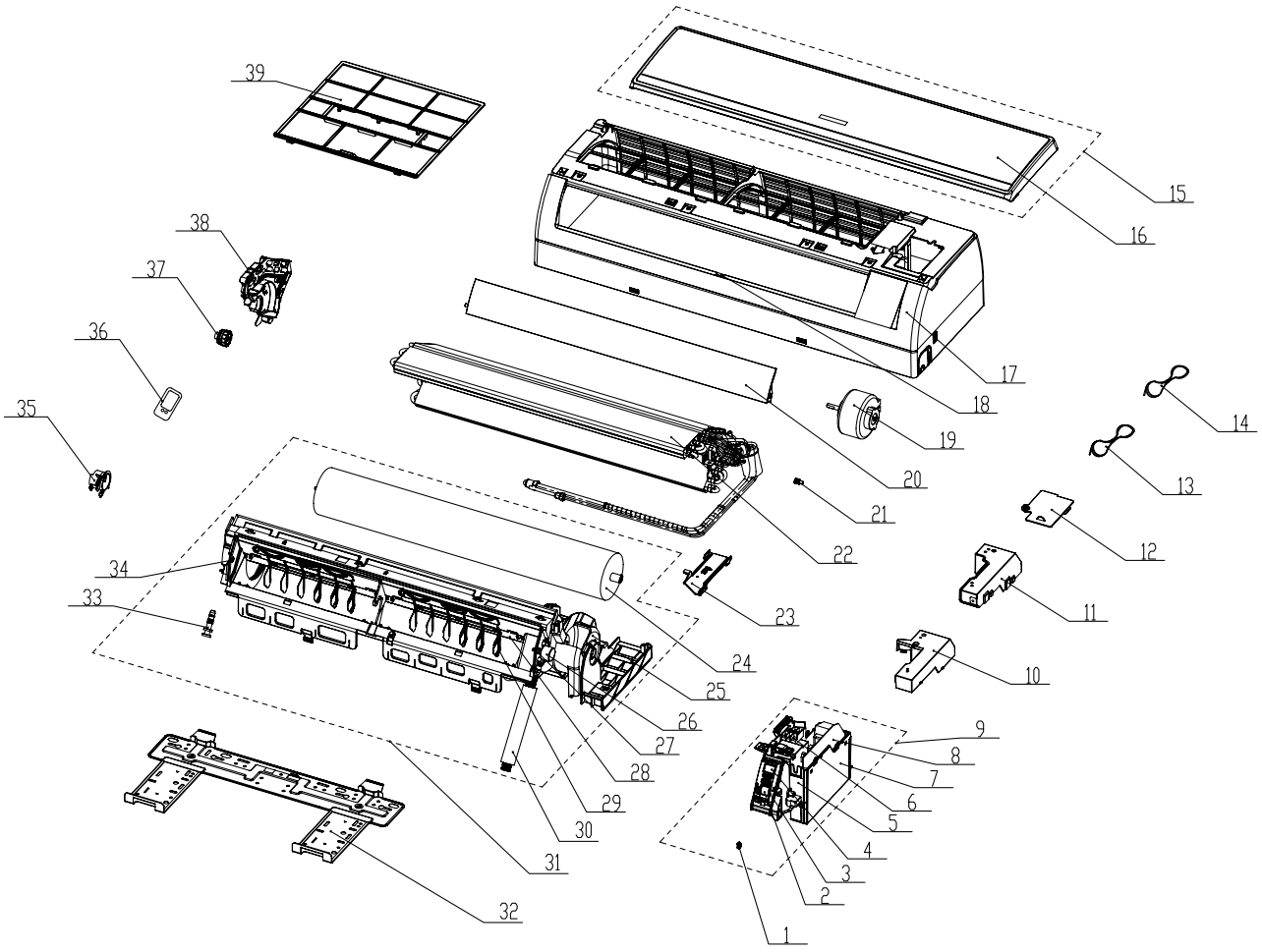
The compressor is brushless permanence magnetic DC motor. Three coil resistance is same. Check the resistance between three poles. The normal value should be ~ 0.45 Ohm (at 20^{O}C). Pay attention U,V, W are respective to connect to RED,YELLOW,BLUE wires ~ 0.54 Ohm (at 25^{O}C).

12.2.5 Checking the Reverse Valve (RV).

Running in heating mode, check the voltage between two pins of reverse valve connector, normal voltage is 220~240VAC.

13. EXPLODED VIEWS AND SPARE PARTS LISTS

13.1 Indoor Units: HDD018 / 024, HED018 / 024



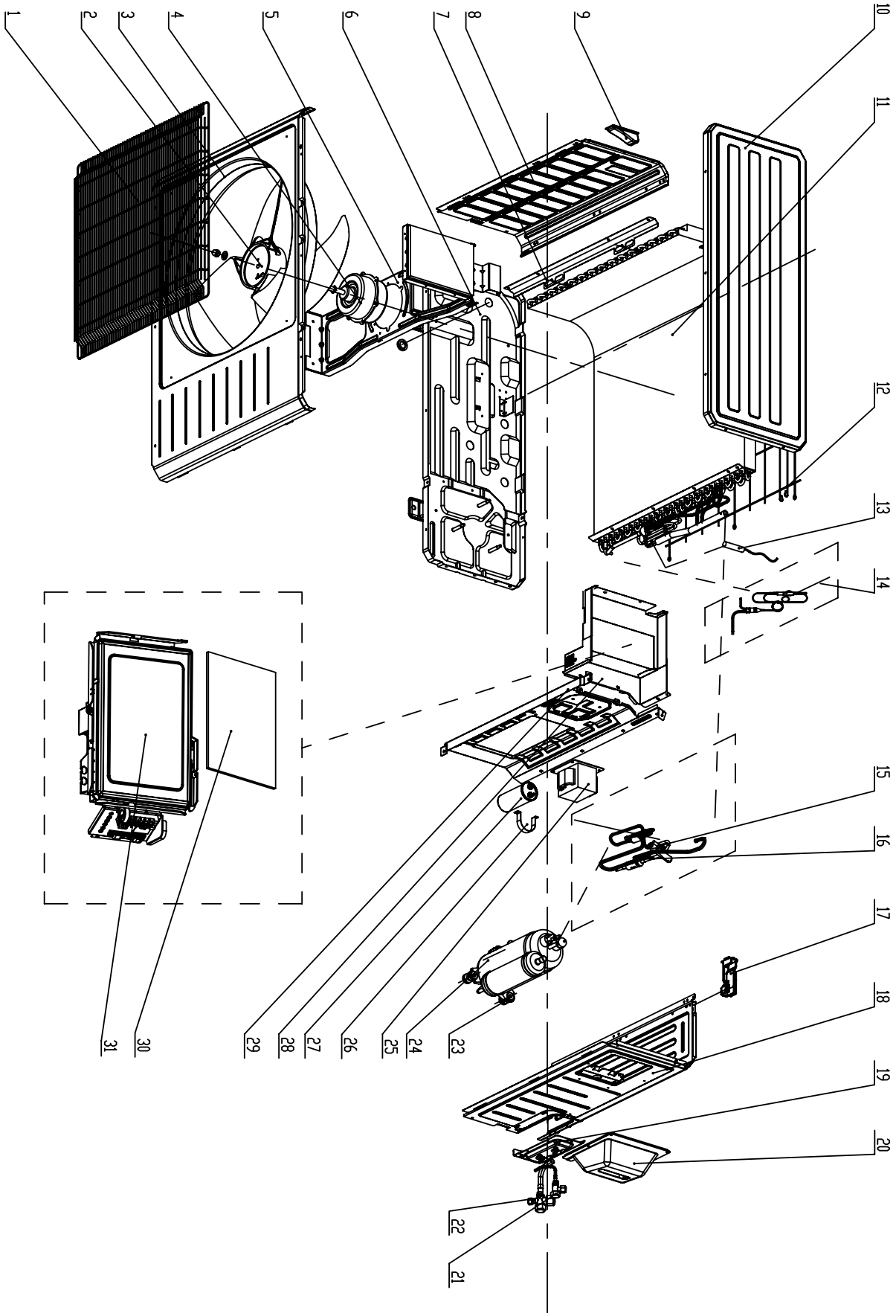
13.2 Intdoor Unit: HDD018, HED018

NO.	Part Code	Part Description	qty
1	4202300122	Jumper	1
2	22242083	Indicator shield cover	1
3	22242084	Indicator Light Cover	1
4	30568112	Display Board	1
5	20112103	Electric Box	1
6	4201026601	Terminal Board(three-bit)	1
7	01592087	Shield cover of Electric Box	1
8	30138505	Main Board	1
9	20202404	Electric Box Assy	1
10	20122123	Electric Box Cover	1
11	01592088	Shield Cover of Electric box Cover	1
12	20122142	Electric Box Cover2	1
13	4002048716	Power Cord	1
14	400205382	Connecting Cable	1
15	20012872	Front Panel Assy	1
16	20012808	Front Panel B3	1
17	20012873	Front Case Assy	1
18	242520041	Screw Cover	1
19	15012116	Motor	1
20	10512140	Guide Louver	1
21	10542008	Axile Bush (guide louver)	1
22	01002603	Evaporator Assy	1
23	26112164	Pipe Clamp	1
24	10352036	Cross Flow Fan	1
25	26112231	Motor Press Plate	1
26	15012086	Step Motor	1
27	10582070	Crank	1
28	26112232	Helicoid tongue	1
29	10512160	Air Louver	2
30	0523001407	Drainage hose	1
31	22202154	Rear Case assy	1
32	01252484	Wall Mounting Frame	1
33	76712012	Water Tray Glue Plug	1
34	10512037	Left Axile Bush	1
35	26152022	Bearing cushion rubber base	1
36	30510061	Remote control	1
37	76512051	O-Gasket sub-assy of Bearing	1
38	24212119	Evaporator Support	1
39	11122104	Filter Sub-Assy	2
	42020063	Sensor Insert	1
	390000453	Ambient Temperature Sensor	1
	49010104	Magnetic Ring	1
	400300848	Signal Wire	1
	390000632	Temperature Sensor	1

13.3 Intdoor Unit: HDD024, HED024

NO.	Part Code	Part Description	qty
1	4202300121	Jumper	1
2	22242083	Indicator shield cover	1
3	22242084	Indicator Light Cover	1
4	30568112	Display Board	1
5	20112103	Electric Box	1
6	4201026601	Terminal Board(three-bit)	1
7	01592087	Shield cover of Electric Box	1
8	30138513	Main Board	1
9	2020230204	Electric Box Assy	1
10	20122123	Electric Box Cover	1
11	01592088	Shield Cover of Electric box Cover	1
12	20112081	Electric Box cover 2	1
13	400203253	Power Wire	1
14	400205382	Connecting Cable	1
15	20012828	Front Panel Assy	1
16	20012809	Front Panel	1
17	20012845	Front Case Assy	1
18	24252016	Screw Cover	3
19	15012098	Fan Motor	1
20	10512138	Guide Louver	1
21	10542008	Axile Bush (guide louver)	1
22	01002269	Evaporator Assy	1
23	26112188	Pipe Clamp	1
24	10352030	Cross Flow Fan	1
25	26112184	Motor Press Plate	1
26	1521300101	Stepping Motor	1
27	10582070	Crank	1
28	26112229	Helicoid tongue	1
29	10512139	Air Louver	3
30	0523001405	Drainage hose	1
31	22202157	Rear Case assy	1
32	01252004	Wall Mounting Frame	1
33	76712012	Water Tray Glue Plug	1
34	10512037	Left Axile Bush	1
35	26152025	Ring of Bearing	1
36	30510061	Remote control	1
37	76512051	O-Gasket sub-assy of Bearing	1
38	24212103	Evaporator Support	1
39	11122091	Filter Sub-Assy	2
	390000591	Tube Sensor (20K black)	1
	42020063	Sensor Insert	1
	390000453	Ambient Temperature Sensor	1
	49010104	Magnetic Ring	1
	400300848	Signal Wire	1

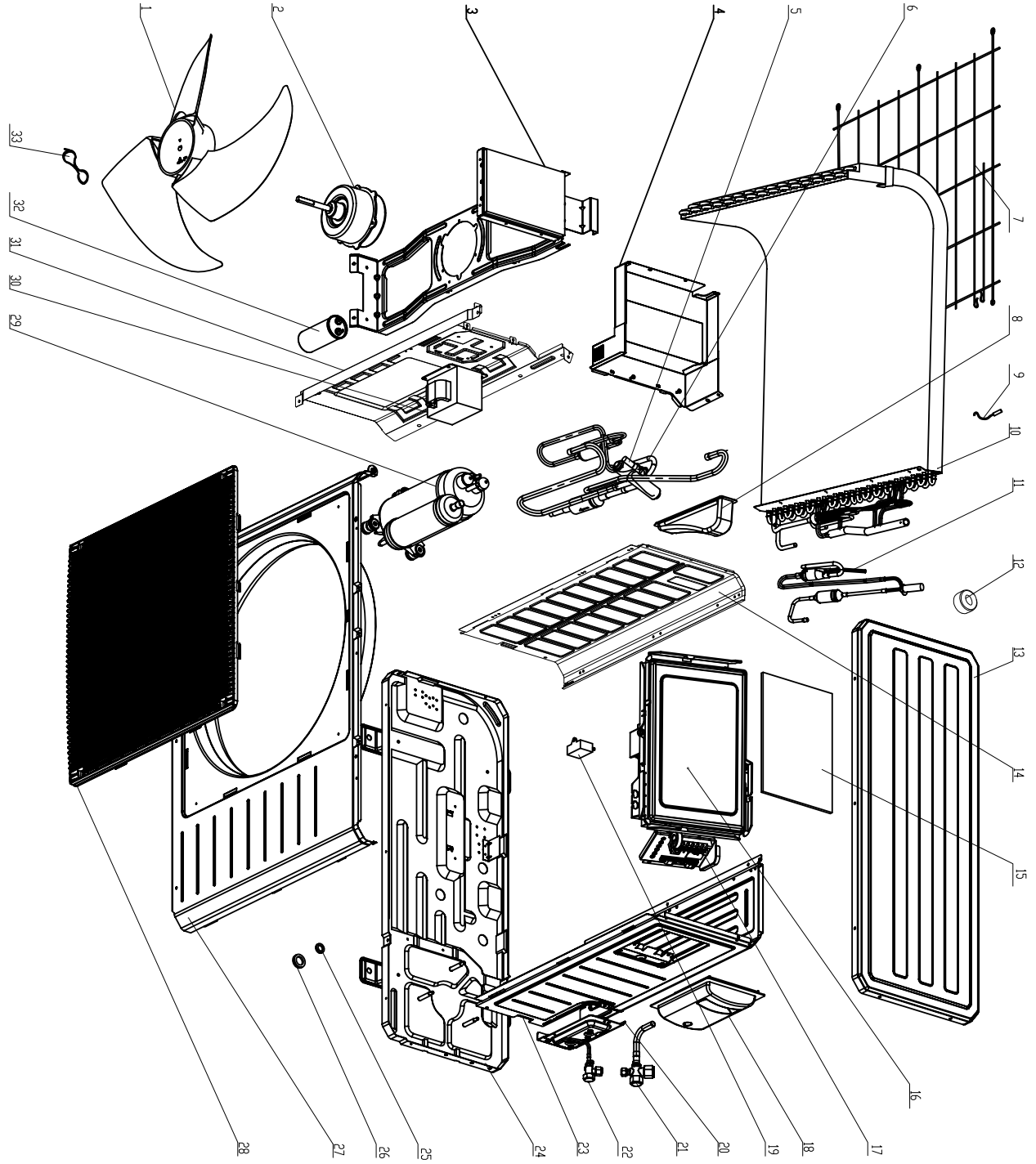
13.4 Outdoor Unit: YDD018



13.5 Outdoor Unit: YDD018

NO.	Part Code	Part Description	qty
1	22415002	Front grill	1
2	10335008	Axial Flow Fan	1
3	01535008P	Front Panel	1
4	1501506301	Fan Motor	1
5	01705020	Motor Support Sub-Assy	1
6	0120371401P	Chassis Sub-assy	1
7	none	Supporting board(condenser)	0
8	01305041P	Left Side Plate	1
9	26235401	Small Handle	1
10	01255005P	Top Cover	1
11	01113635	Condenser Assy	1
12	01473043	Rear Grill	1
13	3900030901	Temperature Sensor	1
14	03063168	Capillary Sub-Assy	1
15	4300040033	4-way Valve Fittings	1
16	0312324501	4-way Valve Assy	1
17	26115004	Wiring clamp	1
18	01305053P	Right Side Plate	1
19	01715010P	Valve support assy	1
20	26235254	Handle	1
21	07133204	Cut-off valve Sub-Assy	1
22	07133060	Cut-off valve Sub-Assy	1
23	76710236	Compressor Gasket	3
24	00103501	Compressor And Fittings C-6RZ146H1A	1
25	43130021	Reactor	1
26	01413098	Capacitor Clamp sub-assy	1
27	33000065	Capacitance CBB65 60uF/370v	1
28	01413148	Electric box (fireproofing)	1
29	01232902	Clapboard Sub-Assy	1
30	20113003	Insulating Plate of Electric box Cover	1
31	02603337	Electric Box Assy	1

13.6 Outdoor Unit: YDD024



13.7 Outdoor Unit: YDD024

NO.	Part Code	Part Description	qty
1	10335008	Axial Flow Fan	1
2	1501506301	Fan Motor	1
3	0170502001	Motor Support Sub-Assy	1
4	01413148	Electric box (fireproofing)	1
5	4300040033	4-way Valve Fittings	1
6	03123360	4-way Valve Assy	1
7	01473043	Rear Grill	1
8	26235401	Small Handle	1
9	3900030901	Temperature Sensor	1
10	01113609	Condenser Assy	1
11	07133206	Electronic Expansion Valve assy	1
12	4300876704	Electric expand valve fitting	1
13	01255005P	Top Cover	1
14	01305041P	Left Side Plate	1
15	20113003	Insulating Plate of Electric box Cover	1
16	0260306625	Electric Box Assy	1
17	42011113	Three-bit Terminal Board A	1
18	26235254	Handle	1
19	33010010	Capacitor CBB61 3.5kuF/450V	1
20	01715010P	Valve support assy	1
21	07133060	Cut-off valve Sub-Assy	1
22	07133058	Cut-off valve Sub-Assy	1
23	01305053P	Right Side Plate	1
24	0120371402P	Chassis Sub-assy	1
25	06123401	Drainage Connecter	1
26	06813401	Choke Plug	3
27	01535008P	Front Panel	1
28	22415002	Front grill	1
29	00103501	Compressor And Fittings C-6RZ146H1A	1
30	43130021	Reactor	1
31	01232902	Clapboard Sub-Assy	1
32	33000065	Capacitance CBB65 60uF/370v	1
33	none	Overload Protector	0

APPENDIX A

INSTALLATION AND OPERATION MANUAL

- ► **OPERATING MANUAL HDD/HED018-024**
- ► **INSTALLATION MANUAL HDD/HED018-024**