

*Airwell*

# Service Manual

## ECO DESIGN HJD DCI Series

Indoor Units	Outdoor Units
AWSI-HJD009-N11	AWAU-YBDE009-H11
AWSI-HJD012-N11	AWAU-YBDE012-H11
AWSI-HJD018-N11	AWAU-YBDE018-H11
AWSI-HJD024-N11	AWAU-YBDE024-H11
AWSI-HJD030-N11	AWAU-YBDE030-H11



**REFRIGERANT**

**R410A**

**HEAT PUMP**

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## 1. INTRODUCTION

### 1.1 General

The new **HJD DCI INVERTER** split wall mounted range has expanded, comprising the following RC (heat pump) models:

- **HJD 9 DCI**
- **HJD 12 DCI**
- **HJD 18 DCI**
- **HJD 24 DCI**
- **HJD 30 DCI**

The indoor **HJD DCI** units are available as LED display types, featuring esthetic design, compact dimensions, and low noise operation.

### 1.2 Main Features

The **HJD DCI** series benefits from the most advanced technological innovations, namely:

- DC inverter technology.
- R410A.
- High COP.
- Lego concept.
- Pre-Charged units up to the max' allowing tubing distance.
- Networking system connectivity.
- A dry contact for clock or power shedding functions (configurable).
- Base heater connection.
- Cooling operation at outdoor temperature down to -10°C.
- Heating operation at outdoor temperature down to -15°C.
- Supports Indoor Air Quality features, such as – Ionizer and Active Electrostatic Filter.
- Indoor large diameter cross flow fan, allowing low noise level operation.
- Bended indoor coil with treated aluminum fins and coating for improved efficiency.
- Easy access to the interconnecting tubing and wiring connections, so that removing the front grill or casing is not necessary.
- Refrigerant pipes can be connected to the indoor unit from 5 different optional directions.
- Water condensate tray is equipped with two optional drain connections
- Automatic treated air sweep.
- Low indoor and outdoor noise levels.
- Easy installation and service.

### 1.3 Indoor Unit

The indoor unit is wall mounted, and can be easily fitted to many types of residential and commercial applications.

New design is available in LED version.

#### Indoor Unit features:

Feature	HJD009	HJD012	HJD018	HJD024	HJD030
Display	LED				LCD
Ionizer	Optional				No
ESF	Optional				No
Fresh air	Optional				No
Indoor fan motor	PG	PG	PG	DC	AC
Horizontal motorizes louver	Yes				
Vertical motorized louver	Optional				Yes
Heating element	No				
M2L Cable port	Yes				
Dry contact	Presence detector or (jumper selected) power shedding				

### 1.4 Filtration

The **HJD DCI INV** series presents several types of air filters:

- Easily accessible, and re-usable pre-filters (mesh)
- Pre-charged electrostatic filter (disposable)
- Active carbon filter (disposable)
- ESF. Active Electro Static re-usable filter (optional)

### 1.5 Ionizer (Optional)

A special design Ionizer protected by unique patents integrated into the indoor unit, generating negative ions to the room providing comfort and upgraded indoor air quality.

### 1.6 Control

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

Remote controllers: RC-2/3/4/5/7, RC-4i-1, RC-7i-1, RCW, µBMS.

Networking system Airconet version 4.2 and up, MIU SW version H8 and up.

For further details please refer to the Operational Manual.

## 1.7 Outdoor Unit

The **HJD DC INV** outdoor units can be installed as floor or wall mounted units by using a wall supporting bracket. The metal sheets are protected from 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.

Outdoor Unit Feature

Feature	YBDE009 DCI	YBDE012 DCI	YBDE018	YBDE024	YBDE030
Display	3 LED's		HMI		3 LED's
Base Heater	Optional				
Outdoor Fan	DC	DC	Triac	Triac	DC

## 1.8 Tubing Connections

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

## 1.9 Accessories






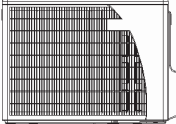
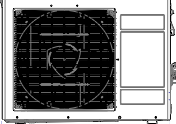
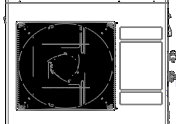
Item	Description
MIU	MODBUS interface unit
RS485 Adapter	To be used as an interface with RCW or $\mu$ BMS remote controllers
Base Heater	
M2L cable Port	

## 1.10 Inbox Documentation

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

### 1.11 Matching Table

#### 1.11.1 R410A

OUTDOORS UNITS			INDOOR UNITS				
							
	MODEL	REFR"	HJD009	HJD012	HJD018	HJD024	HJD030
	YBDE009 DCI	R410A	√				
	YBDE012 DCI	R410A		√			
	YBDE018	R410A			√		
	YBDE024	R410A				√	
	YBDE030	R410A					√

## 2. PRODUCT DATA SHEET

### 2.1 HJD009 DCI

Model Indoor Unit		AWAU-HJD009-N11			
Model Outdoor Unit		AWAU-YBDE009-H11			
Installation Method of Pipe		Flared			
Characteristics	Units	Cooling	Heating Average		
Capacity <sup>(1)</sup>	kW	2,5 (1,4-3,6)	3,0 (1,5 -5,0)		
Pdesign	kW	2,5	2,5		
SEER /SCOP <sup>(2)</sup>	W/W	5,7	4,0		
Energy efficiency class		A+	A+		
Annual energy consumption	kWh	154	875		
Tbiv	°C	N/A	-7		
Tol	°C	N/A	-15		
Power supply	V/Ph/Hz	220-240V/Single/50Hz			
Circuit breaker rating	A	16			
INDOOR	Fan type & quantity		Cross flow fan x1		
	Fan speeds	H/M/L	RPM	1050/900/800	1050/900/800
	Air flow <sup>(3)</sup>	H/M/L	m3/hr	530/430/330	530/430/330
	External static pressure	Min-Max	Pa	0	
	Sound power level <sup>(4)</sup>	H/M/L	dB(A)	51/47/39	
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A)	39/34/26	
	Moisture removal		l/hr	1	
	Condensate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	810x285x210	
	Weight		kg	11,5	
	Package dimensions	WxHxD	mm	870x356x282	
	Packaged weight		kg	14	
	Units per pallet		units	28 units per pallet	
	Stacking height		units	7 levels	
OUTDOOR	Refrigerant control		EEV		
	Compressor type, model		Rotary DC Inverter		
	Fan type & quantity		Axial x 1		
	Fan speeds	H/L	RPM	830	
	Air flow	H/L	m3/hr	1780	
	Sound power level <sup>(4)</sup>	H/L	dB(A)	61	
	Sound pressure level <sup>(5)</sup>	H/L	dB(A)	51	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	38	
	Package dimensions	WxHxD	mm	970x650x394	
	Packaged weight		kg	42	
	Units per pallet		Units	9 units per pallet	
	Stacking height		units	3 levels	
	Refrigerant type		R410A		
Refrigerant charge (standard connecting tubing length)		kg(5m)	1,1		
Additional charge per 1 meter		gr / 1m	No need		
Connections between units	Liquid line	In.(mm)	1/4"(6.35)		
	Suction line	In.(mm)	3/8"(9.53)		
	Max.tubing length	m.	Max.20		
	Max.height difference	m.	Max.10		
Operation control type		Remote control			
Heating elements		kW			
Others					

(1) Rating conditions in accordance with EN 14825 and EN 14511 (for ducted units).

(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 HJD012 DCI

Model Indoor Unit		AWAU-HJD012-N11		
Model Outdoor Unit		AWAU-YBDE012-H11		
Installation Method of Pipe		Flared		
Characteristics		Units	Cooling	Heating Average
Capacity <sup>(1)</sup>		kW	3,5 (1,4-4,3)	4,0 (1,5 -5,8)
Pdesign		kW	3,5	3,5
SEER /SCOP <sup>(2)</sup>		W/W	5,61	4,0
Energy efficiency class			A+	A+
Annual energy consumption		kWh	218	1225
Tbiv		°C	N/A	-7
Tol		°C	N/A	-15
Power supply		V/Ph/Hz	220-240V/Single/50Hz	
Circuit breaker rating		A	16	
INDOOR	Fan type & quantity		Cross flow fan x1	
	Fan speeds	H/M/L	RPM	1100/950/800
	Air flow <sup>(3)</sup>	H/M/L	m3/hr	550/450/350
	External static pressure	Min-Max	Pa	0
	Sound power level <sup>(4)</sup>	H/M/L	dB(A)	52/47/39
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A)	40/34/26
	Moisture removal		l/hr	1,5
	Condensate drain tube I.D		mm	16
	Dimensions	WxHxD	mm	810x285x210
	Weight		kg	11,5
	Package dimensions	WxHxD	mm	870x356x282
	Packaged weight		kg	14
	Units per pallet		units	28 units per pallet
	Stacking height		units	7 levels
	OUTDOOR	Refrigerant control		EEV
Compressor type, model		Rotary DC Inverter		
Fan type & quantity		Axial x 1		
Fan speeds		H/L	RPM	830
Air flow		H/L	m3/hr	1780
Sound power level <sup>(4)</sup>		H/L	dB(A)	61
Sound pressure level <sup>(5)</sup>		H/L	dB(A)	51
Dimensions		WxHxD	mm	795x610x290
Weight			kg	38
Package dimensions		WxHxD	mm	970x650x394
Packaged weight			kg	42
Units per pallet			Units	9 units per pallet
Stacking height			units	3 levels
Refrigerant type				R410A
Refrigerant charge (standard connecting tubing length)			kg(5m)	1,2
Additional charge per 1 meter		gr / 1m	No need	
Connections between units	Liquid line	ln.(mm)	1/4"(6.35)	
	Suction line	ln.(mm)	3/8"(9.53)	
	Max.tubing length	m.	Max.20	
	Max.height difference	m.	Max.10	
Operation control type		Remote control		
Heating elements		kW		
Others				

(1) Rating conditions in accordance with EN 14825 and EN 14511 (for ducted units).

(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.



2.3 HJD018 DCI

Model Indoor Unit			AWSI-HJD018-N11	
Model Outdoor Unit			AWAU-YBDE018-H11	
Installation Method of Pipe			Flared	
Characteristics	Units	Cooling	Heating	
			Average	Warmer
P <sub>design</sub> <sup>(1)</sup>	kW	5.0	4.8	4.8
SEER / SCOP <sup>(1)</sup>	W/W	5.7	3.9	4.3
Energy efficiency class <sup>(1)</sup>		A+	A	A+
T <sub>biv</sub>	°C	N/A	-3	2
T <sub>ol</sub>	°C	N/A	-15	-15
Capacity Range <sup>(2)</sup> Nominal (Min.~Max.)	kW	5.0 (1.9~6.0)	5.6 (1.6~6.8)	
Power Input <sup>(2)</sup> Nominal (Min.~Max.)	W	1,350 (550~1,970)	1,650 (450~2,300)	
Rated Current <sup>(2)</sup> Nominal (Min.~Max.)	A	6.1 (2.5~8.8)	7.4 (2.5~10.3)	
Power supply	V/Ph/Hz	220-240V/Single/50Hz		
Circuit breaker rating	A	20		
INDOOR	Fan type & quantity		Cross flow x 1	
	Fan speeds	H/M/L	RPM 1200 / 1050 / 900	
	Air flow <sup>(3)</sup>	H/M/L	m <sup>3</sup> /hr 850 / 700 / 550	
	External static pressure	Min.-Max.	Pa 0	
	Sound power level <sup>(4)</sup>	H/M/L	dB(A) 58 / 51 / 47 / 43	
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A) 43 / 39 / 34 / 30	
	Moisture removal		l/hr 2.7	
	Condensate drain tube I.D		mm 16	
	Dimensions	WxHxD	mm 1060x295x221	
	Weight		kg 15	
	Package dimensions	WxHxD	mm 1125x360x295	
	Packaged weight		kg 18	
	Units per pallet		units 14 per pallet	
	Stacking height		units 7 levels	
OUTDOOR	Refrigerant control		EEV	
	Compressor type, model		Twin Rotary DC Inverter	
	Fan type & quantity		Axial x 1	
	Fan speeds		RPM 250-800(continuous)	
	Air flow	Max.	m <sup>3</sup> /hr 2,500	
	Sound power level <sup>(4)</sup>	Nom.	dB(A) 65	
	Sound pressure level <sup>(5)</sup>	Nom.	dB(A) 53	
	Dimensions	WxHxD	mm 900x700x340	
	Weight		kg 56	
	Package dimensions	WxHxD	mm 985x730x435	
	Packaged weight		kg 58.5	
	Units per pallet		Units 6 units per pallet	
	Stacking height		units 2 levels	
	Refrigerant type		R410A	
	Refrigerant charge (standard tubing length)		kg(7.5m) 1.55	
	Additional charge per 1m		gr/m 7.5m < 0gr < 30m < 30gr per 1m < 70m	
	Connections between units	Liquid line	ln.(mm)	1/4"(6.35)
Suction line		ln.(mm)	1/2"(12.7)	
Max.tubing length		m.	Max.30	
Max.height difference		m.	Max. 15	
Operation control type		Remote control		
Heating elements		kW	BH 70W - optional	

- (1) Rating conditions in accordance with EN14825-2012.
- (2) Rating conditions in accordance with EN14511-2011.
- (3) Airflow in ducted units at nominal external static pressure.
- (4) Sound power in ducted units is measured at air discharge (In duct).
- (5) Sound pressure level measured at 1.0 meter distance from unit.

## 2.4 HJD024 DCI

Model Indoor Unit		AWSI-HJD024-N11		
Model Outdoor Unit		AWAU-YBDE024-H11		
Installation Method of Pipe		Flared		
Characteristics	Units	Cooling	Heating	
			Average	Warmer
Pdesign <sup>(1)</sup>	kW	6.8	6.3	6.3
SEER / SCOP <sup>(1)</sup>	W/W	5.2	3.8	4.65
Energy efficiency class <sup>(1)</sup>		A	A	A++
Tbiv	°C	N/A	-3	2
Tol	°C	N/A	-15	-15
Capacity Range <sup>(2)</sup> Nominal (Min.~Max.)	kW	6.5 (1.6~7.2)	6.3 (1.6~7.6)	
Power Input <sup>(2)</sup> Nominal (Min.~Max.)	W	1,800 (550~2,200)	2,200 (450~2,400)	
Rated Current <sup>(2)</sup> Nominal (Min.~Max.)	A	8.0 (3.1~8.8)	9.9 (2.5~10.9)	
Power supply	V/Ph/Hz	220-240V/Single/50Hz		
Circuit breaker rating	A	20		
INDOOR	Fan type & quantity		Cross flow x 1	
	Fan speeds	H/M/L	RPM 1350 / 1150 / 1000	
	Air flow <sup>(3)</sup>	H/M/L	m <sup>3</sup> /hr 960 / 800 / 670	
	External static pressure	Min.-Max.	Pa 0	
	Sound power level <sup>(4)</sup>	H/M/L	dB(A) 60 / 56 / 51 / 47	
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A) 47 / 43 / 38 / 34	
	Moisture removal	l/hr	2.8	
	Condensate drain tube I.D	mm	16	
	Dimensions	WxHxD	mm 1060x295x221	
	Weight	kg	15	
	Package dimensions	WxHxD	mm 1125x360x295	
	Packaged weight	kg	18	
	Units per pallet	units	14 per pallet	
	Stacking height	units	7 levels	
OUTDOOR	Refrigerant control		EEV	
	Compressor type, model		Twin Rotary DC Inverter	
	Fan type & quantity		Axial x 1	
	Fan speeds		RPM 250-800(continuous)	
	Air flow	Max.	m <sup>3</sup> /hr 2,750	
	Sound power level <sup>(4)</sup>	Nom.	dB(A) 67	
	Sound pressure level <sup>(5)</sup>	Nom.	dB(A) 55	
	Dimensions	WxHxD	mm 900x700x340	
	Weight	kg	61	
	Package dimensions	WxHxD	mm 985x730x435	
	Packaged weight	kg	63.5	
	Units per pallet	Units	6 units per pallet	
	Stacking height	units	2 levels	
	Refrigerant type		R410A	
	Refrigerant charge (standard tubing length)		kg(7.5m) 1.55	
	Additional charge per 1m		gr/m 7.5m < 0gr < 30m < 30gr per 1m < 70m	
	Connections between units	Liquid line	ln.(mm)	3/8"(9.53)
Suction line		ln.(mm)	5/8"(15.9)	
Max.tubing length		m.	Max.30	
Max.height difference		m.	Max. 15	
Operation control type		Remote control		
Heating elements		kW	BH 70W - optional	

- (1) Rating conditions in accordance with EN14825-2012.
- (2) Rating conditions in accordance with EN14511-2011.
- (3) Airflow in ducted units at nominal external static pressure.
- (4) Sound power in ducted units is measured at air discharge (In duct).
- (5) Sound pressure level measured at 1.0 meter distance from unit.

## 2.5 HJD030 DCI

Model Indoor Unit		AWSI-HJD030-N11		
Model Outdoor Unit		AWAU-YBDE030-H11		
Installation Method of Pipe		Flared		
Characteristics	Units	Cooling	Heating	
			Average	Warmer
Pdesign <sup>(1)</sup>	kW	7.5	8.6	8.6
SEER / SCOP <sup>(1)</sup>	W/W	5.2	3.8	4.65
Energy efficiency class <sup>(1)</sup>		A	A	A++
Tbiv	°C	N/A	-3	2
Tol	°C	N/A	-15	-15
Capacity Range <sup>(2)</sup> Nominal (Min.~Max.)	kW	7.5 (2.0~9.0)	8.6 (2.0~9.5)	
Power Input <sup>(2)</sup> Nominal (Min.~Max.)	W	2,230 (550~3,100)	2,530 (550~3,100)	
Rated Current <sup>(2)</sup> Nominal (Min.~Max.)	A	8.2 (3.1~12.0)	10.7 (2.5~12.0)	
Power supply	V/Ph/Hz	220-240V/Single/50Hz		
Circuit breaker rating	A	20		
INDOOR	Fan type & quantity		Cross flow x 1	
	Fan speeds	H/M/L	RPM 1300 / 1050 / 910	
	Air flow <sup>(3)</sup>	H/M/L	m <sup>3</sup> /hr 1300 / 1100 / 950	
	External static pressure	Min.-Max.	Pa 0	
	Sound power level <sup>(4)</sup>	H/M/L	dB(A) 62 / 58 / 55	
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A) 54 / 50 / 47	
	Moisture removal	l/hr	3.2	
	Condensate drain tube I.D	mm	16	
	Dimensions	WxHxD	mm 1310x322x2401	
	Weight	kg	23	
	Package dimensions	WxHxD	mm 1420x440x380	
	Packaged weight	kg	26	
	Units per pallet	units	12 per pallet	
	Stacking height	units	6 levels	
OUTDOOR	Refrigerant control		EEV	
	Compressor type, model		Twin Rotary DC Inverter	
	Fan type & quantity		Axial x 1	
	Fan speeds		RPM 200-850(continuous)	
	Air flow	Max.	m <sup>3</sup> /hr 3,400	
	Sound power level <sup>(4)</sup>	Nom.	dB(A) 68	
	Sound pressure level <sup>(5)</sup>	Nom.	dB(A) 56	
	Dimensions	WxHxD	mm 900x860x340	
	Weight	kg	66	
	Package dimensions	WxHxD	mm 985x905x435	
	Packaged weight	kg	68.5	
	Units per pallet	Units	6 units per pallet	
	Stacking height	units	2 levels	
	Refrigerant type		R410A	
	Refrigerant charge (standard tubing length)		kg(7.5m) 1.55	
	Additional charge per 1m		gr/m 7.5m < 0gr < 30m < 30gr per 1m < 70m	
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)
Suction line		In.(mm)	5/8"(15.9)	
Max.tubing length		m.	Max.30	
Max.height difference		m.	Max. 15	
Operation control type		Remote control		
Heating elements		kW	BH 70W - optional	

- (1) Rating conditions in accordance with EN14825-2012.
- (2) Rating conditions in accordance with EN14511-2011.
- (3) Airflow in ducted units at nominal external static pressure.
- (4) Sound power in ducted units is measured at air discharge (In duct).
- (5) Sound pressure level measured at 1.0 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

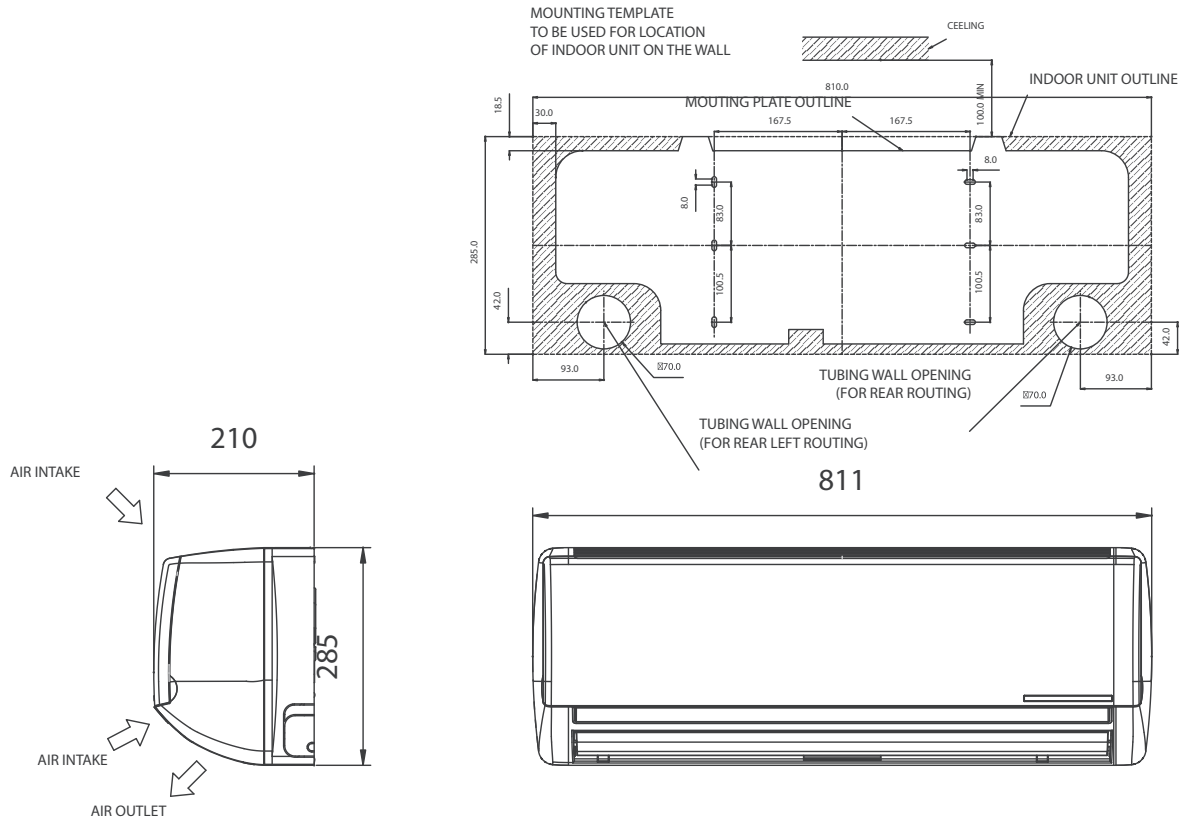
### 3.1 Operating Limits

#### 3.1.1 R410A

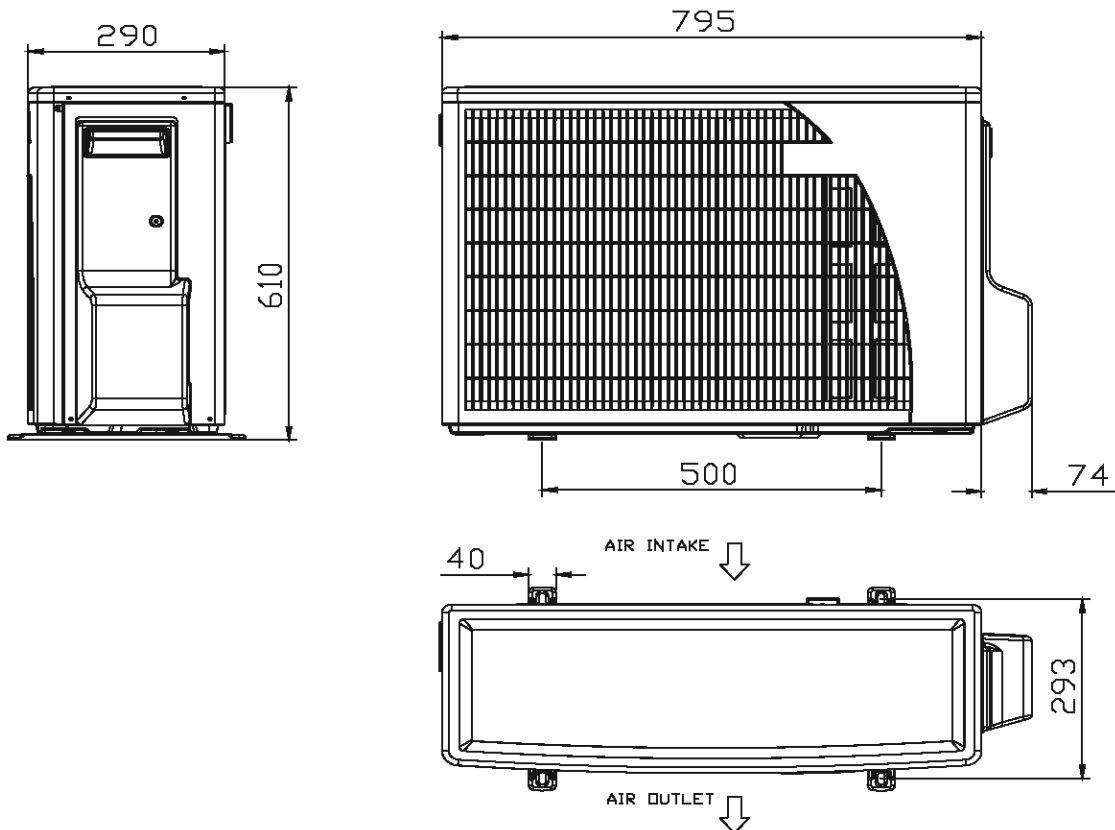
		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	-10°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-15°C DB -16°C WB
Voltage		198 – 264 V	

## 4. OUTLINE DIMENSIONS

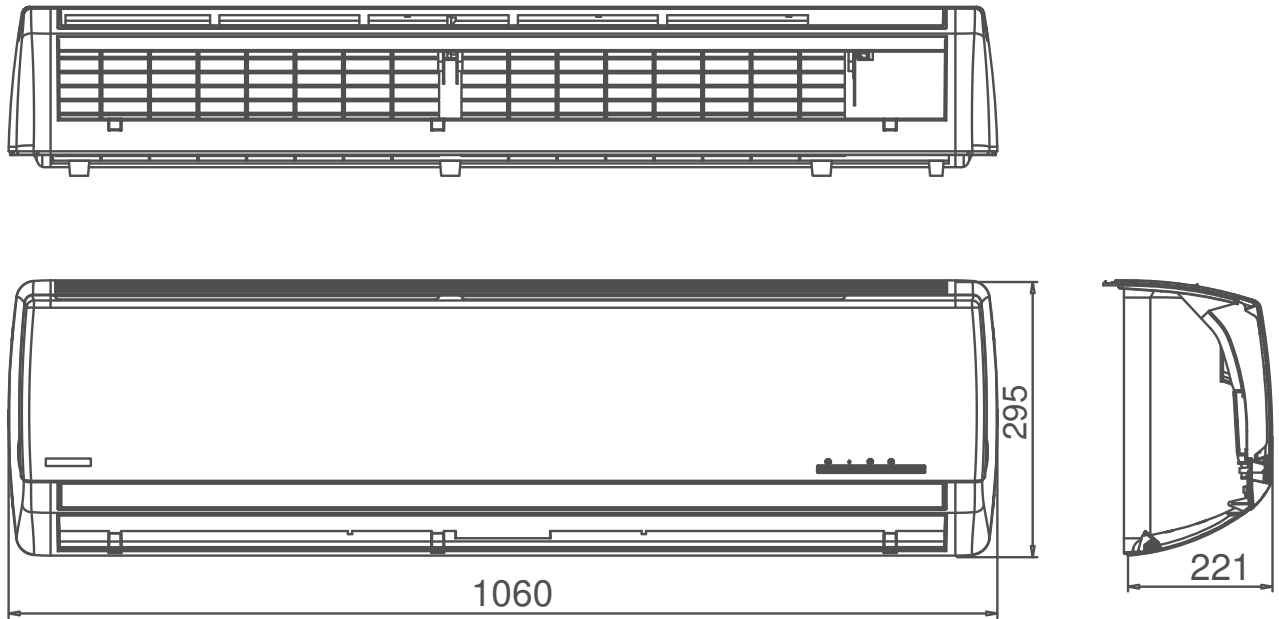
### 4.1 Indoor Unit: HJD009 / 012 DCI



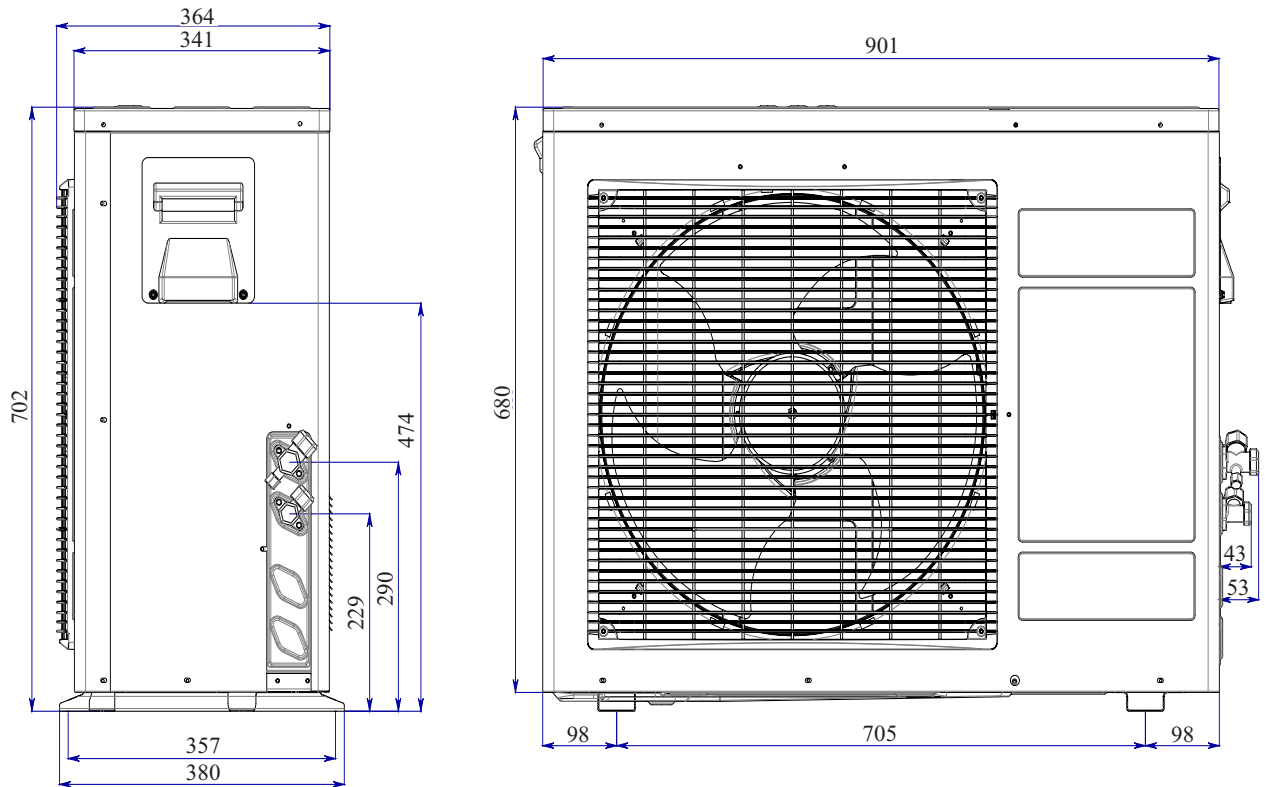
### 4.2 Outdoor Unit: YBDE009 / 012



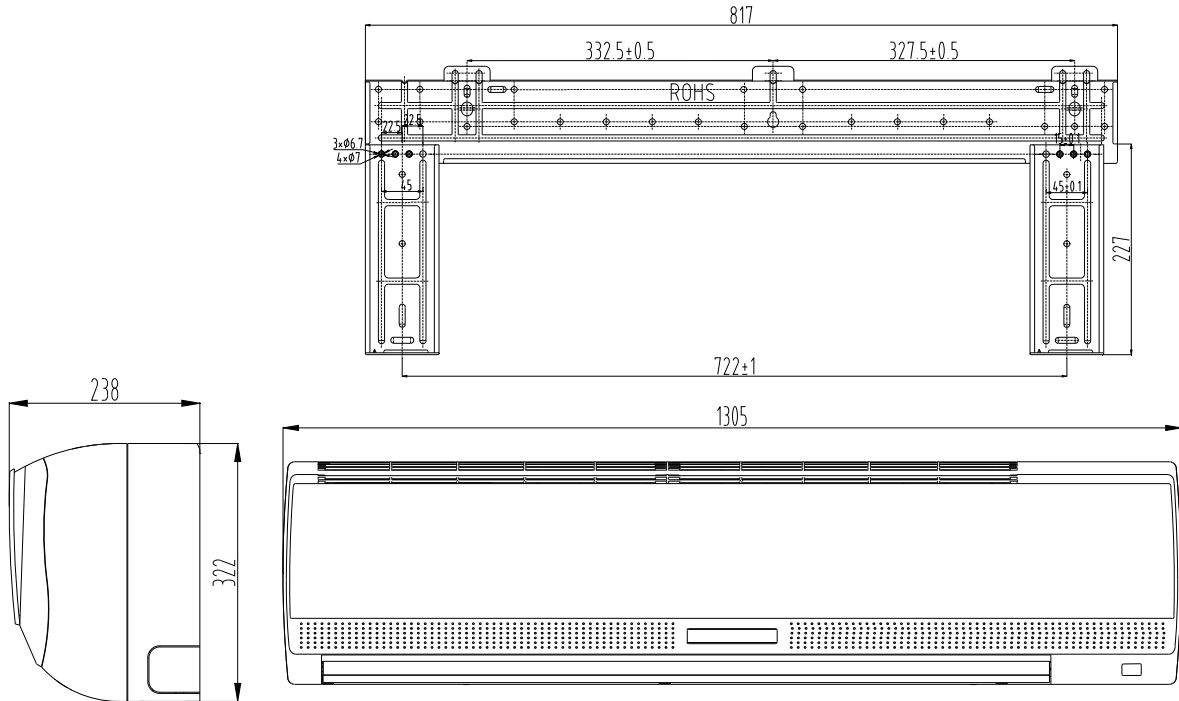
**4.3 Indoor Unit: HJD018 / 024**



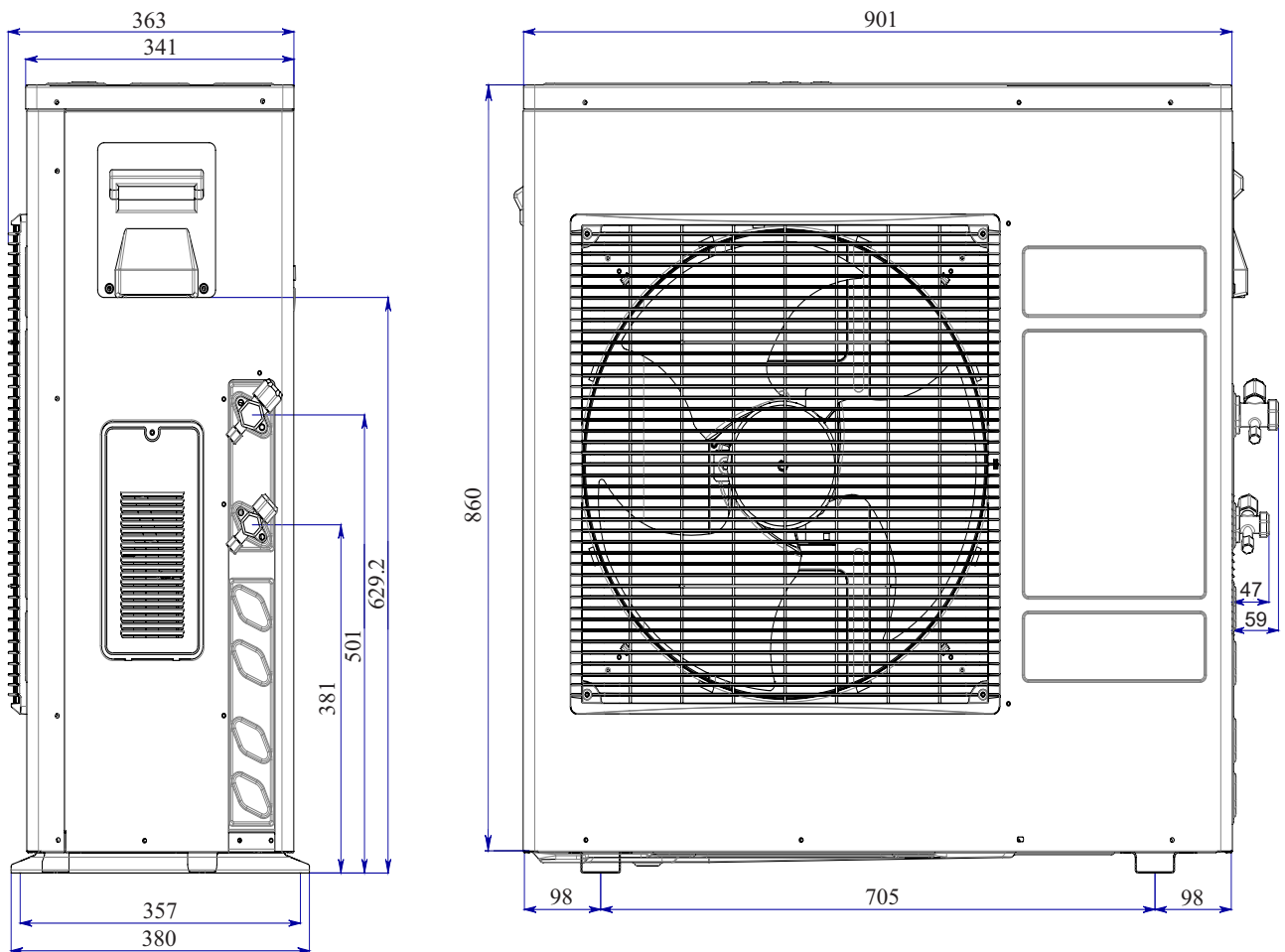
**4.4 Outdoor Unit: YBDE018 / 024**



**4.5 Indoor Unit: HJD030**



**4.6 Outdoor Unit: YBDE030**



## 5. PERFORMANCE DATA

### 5.1 HJD009 / YBDE009 DCI

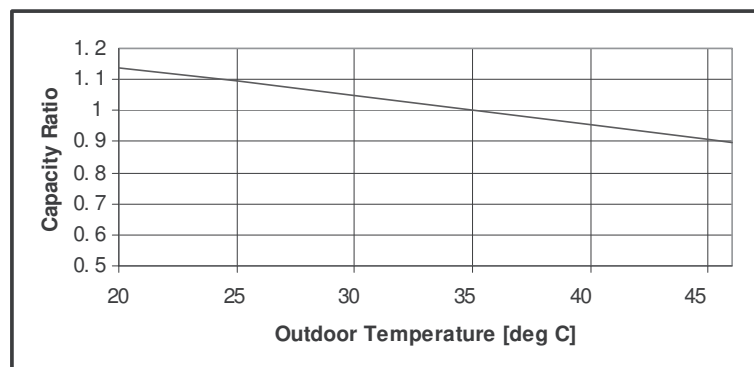
#### 5.1.1 Cooling Capacity (kW) - Run Mode

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	2.46	2.61	2.75	2.90	3.04
	SC	1.71	1.74	1.76	1.79	1.81
	PI	0.38	0.39	0.40	0.40	0.41
30	TC	2.34	2.48	2.63	2.77	2.92
	SC	1.65	1.67	1.70	1.72	1.75
	PI	0.43	0.44	0.45	0.46	0.46
35	TC	2.21	2.36	<b>2.50</b>	2.65	2.79
	SC	1.58	1.60	<b>1.63</b>	1.66	1.68
	PI	0.48	0.49	<b>0.50</b>	0.51	0.52
40	TC	2.08	2.23	2.37	2.52	2.66
	SC	1.51	1.54	1.56	1.59	1.61
	PI	0.54	0.54	0.55	0.56	0.77
46	TC	1.93	2.08	2.22	2.37	2.51
	SC	1.43	1.46	1.48	1.51	1.53
	PI	0.60	0.61	0.62	0.62	0.63

#### 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
- OU - Outdoor

#### 5.1.2 Capacity Correction Factors





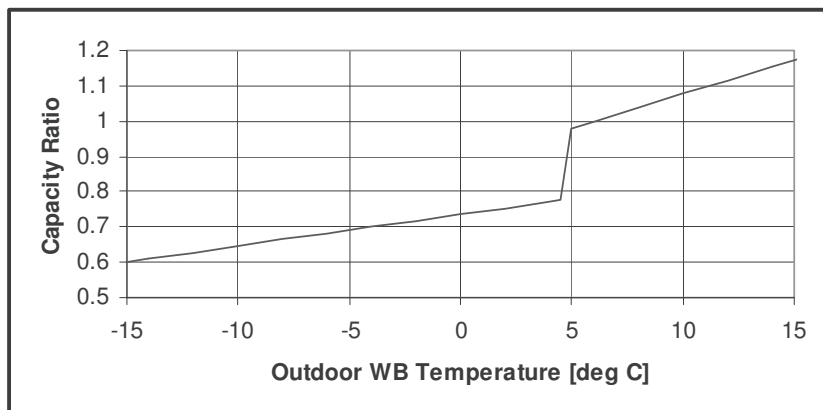
5.1.3 Heating Capacity (kW) - Run Mode)

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	1.37	1.17	0.97
	PI	0.42	0.45	0.48
-10/-12	TC	1.80	1.61	1.41
	PI	0.47	0.50	0.53
-7/-8	TC	2.13	1.93	1.74
	PI	0.52	0.55	0.58
-1/-2	TC	2.29	2.10	1.90
	PI	0.54	0.57	0.60
2/1	TC	2.40	2.21	2.01
	PI	0.55	0.58	0.61
7/6	TC	3.20	<b>3.00</b>	2.80
	PI	0.57	<b>0.60</b>	0.63
10/9	TC	3.36	3.17	2.97
	PI	0.58	0.61	0.64
15/12	TC	3.53	3.33	3.13
	PI	0.59	0.62	0.65
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

**LEGEND**

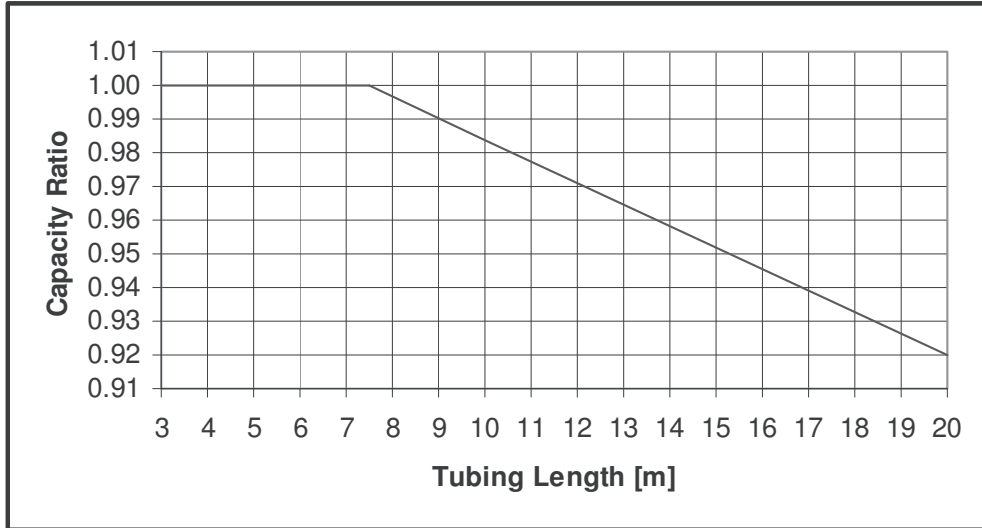
- TC – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OU - Outdoor

5.1.4 Capacity Correction Factors

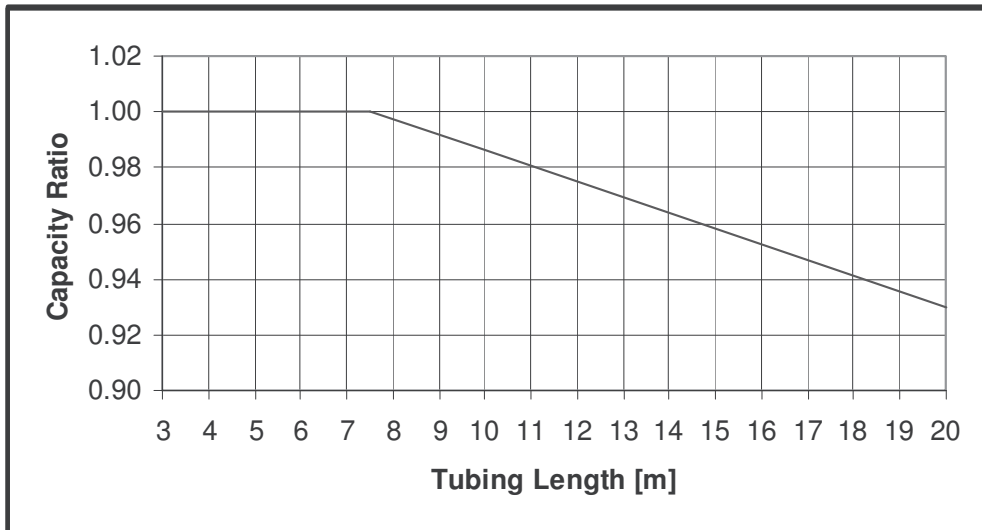


## 5.2 Capacity Correction Factor Due to Tubing Length

### 5.2.1 Cooling



### 5.2.2 Heating



### 5.3 HJD012 / YBDE012 DCI

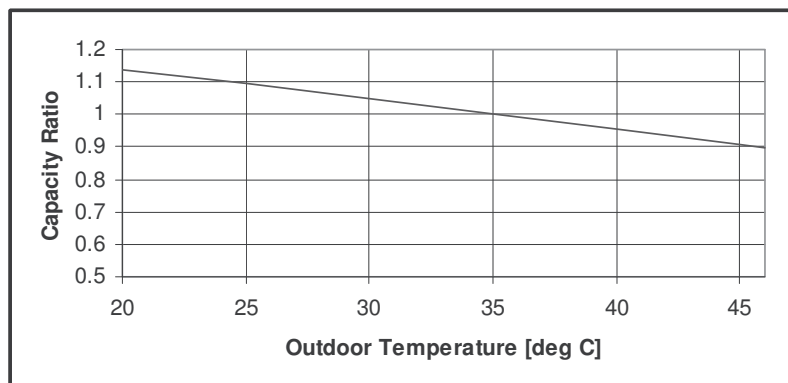
#### 5.3.1 Cooling Capacity (kW) - Run Mode

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
<b>-10 - 20</b> (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
<b>25</b>	TC	3.45	3.65	3.85	4.06	4.26
	SC	2.50	2.54	2.58	2.61	2.65
	PI	0.66	0.67	0.69	0.70	0.72
<b>30</b>	TC	3.27	3.47	3.68	3.88	4.08
	SC	2.40	2.44	2.48	2.51	2.55
	PI	0.75	0.76	0.78	0.79	0.81
<b>35</b>	TC	3.09	3.30	<b>3.50</b>	3.70	3.91
	SC	2.31	2.34	<b>2.38</b>	2.42	2.45
	PI	0.84	0.86	<b>0.87</b>	0.88	0.90
<b>40</b>	TC	2.92	3.12	3.32	3.53	3.73
	SC	2.21	2.25	2.28	2.32	2.36
	PI	0.93	0.95	0.96	0.98	0.99
<b>46</b>	TC	2.71	2.91	3.11	3.31	3.52
	SC	2.09	2.13	2.17	2.20	2.24
	PI	1.04	1.06	1.07	1.09	1.10

#### 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
- OU - Outdoor

#### 5.3.2 Capacity Correction Factors



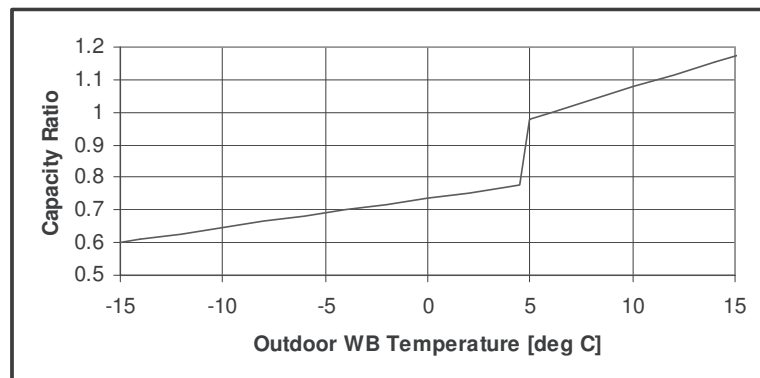
5.3.3 Heating Capacity (kW) - Run Mode

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	1.82	1.56	1.30
	PI	0.70	0.75	0.80
-10/-12	TC	2.40	2.14	1.88
	PI	0.79	0.84	0.89
-7/-8	TC	2.84	2.58	2.32
	PI	0.86	0.91	0.96
-1/-2	TC	3.06	2.80	2.53
	PI	0.89	0.94	0.99
2/1	TC	3.20	2.94	2.68
	PI	0.92	0.97	1.02
7/6	TC	4.26	<b>4.00</b>	3.74
	PI	0.95	<b>1.00</b>	1.05
10/9	TC	4.48	4.42	3.96
	PI	0.97	1.02	1.07
15/12	TC	4.70	4.44	4.18
	PI	0.99	1.04	1.09
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

**LEGEND**

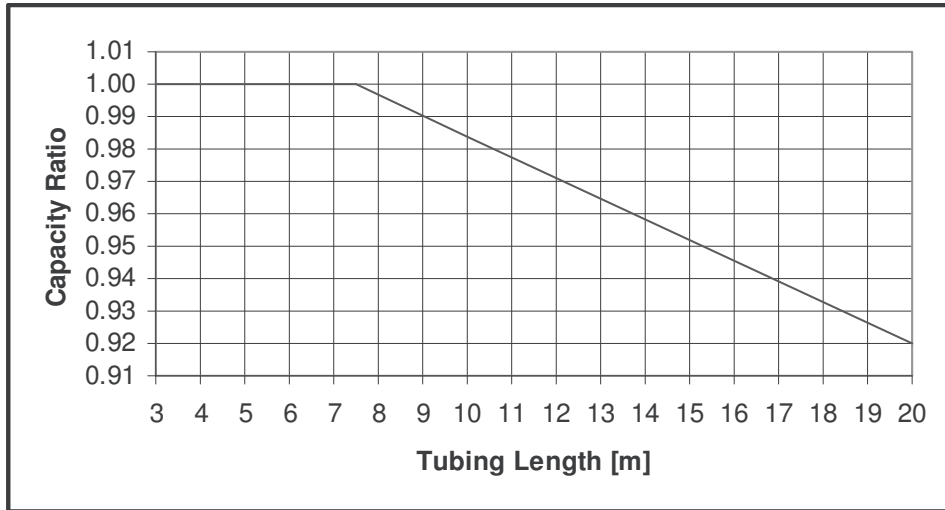
- TC – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OU - Outdoor

5.3.4 Capacity Correction Factors

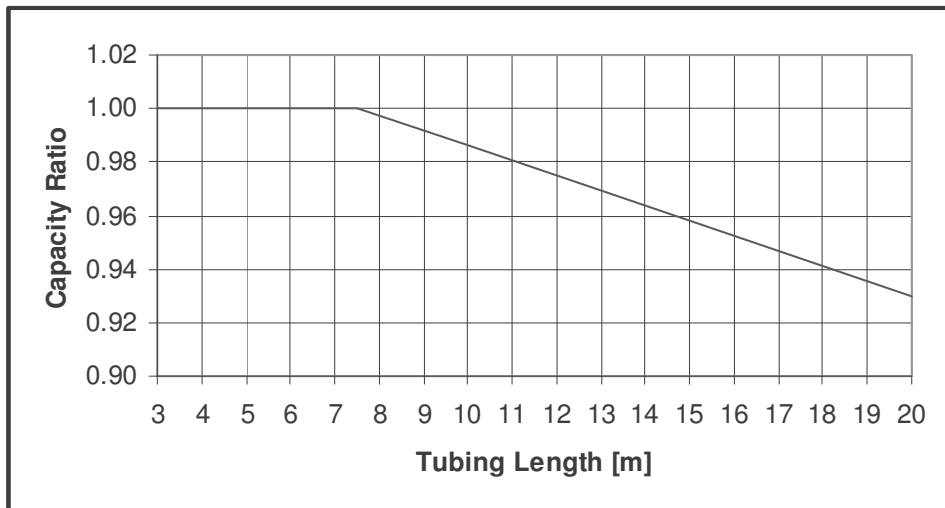


## 5.4 Capacity Correction Factor Due to Tubing Length

### 5.4.1 Cooling



### 5.4.2 Heating



5.5 HJD018 / YBDE018

5.5.1 Cooling Capacity (kW) - Run Mode

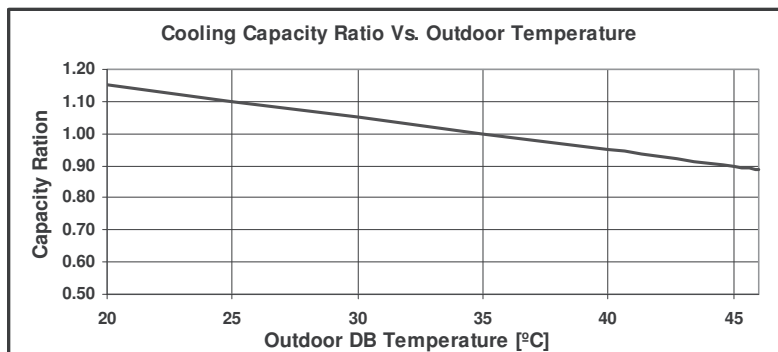
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [C0]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE				
		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	4.83	5.15	5.47	5.78	6.10
	SC	3.94	4.02	4.10	4.18	4.26
	PI	1.06	1.08	1.10	1.12	1.14
30	TC	4.60	4.92	5.23	5.55	5.86
	SC	3.84	3.92	4.00	4.08	4.16
	PI	1.19	1.21	1.23	1.25	1.27
35	TC	4.37	4.68	<b>5.00</b>	5.32	5.63
	SC	3.74	3.82	<b>3.90</b>	3.98	4.06
	PI	1.31	1.33	<b>1.35</b>	1.37	1.39
40	TC	4.14	4.45	4.77	5.08	5.40
	SC	3.64	3.72	3.80	3.88	3.96
	PI	1.43	1.45	1.47	1.49	1.51
46	TC	3.86	4.17	4.49	4.80	5.12
	SC	3.52	3.60	3.68	3.76	3.84
	PI	1.58	1.60	1.62	1.64	1.66

**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

5.5.2 Capacity Correction Factors



**5.5.3 Heating Capacity (kW) - Run Mode)**

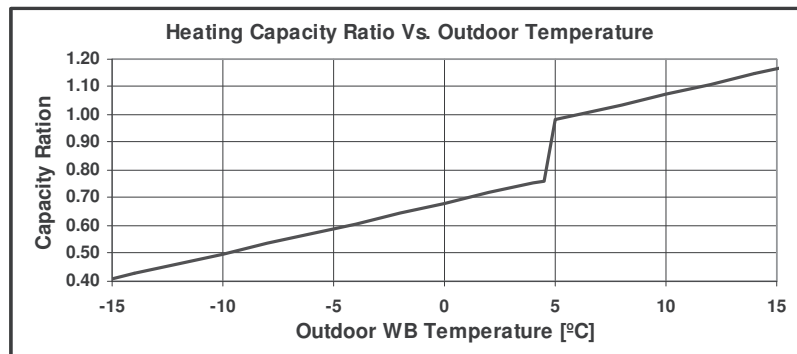
**230[V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	3.56	3.32	3.07
	PI	0.93	1.02	1.12
-10/-12	TC	3.97	3.72	3.47
	PI	1.12	1.22	1.31
-7/-8	TC	4.27	4.02	3.77
	PI	1.26	1.36	1.45
-1/-2	TC	4.42	4.17	3.92
	PI	1.34	1.43	1.53
2/1	TC	4.52	4.27	4.02
	PI	1.38	1.48	1.57
7/6	TC	5.85	<b>5.60</b>	5.35
	PI	1.46	<b>1.55</b>	1.64
10/9	TC	6.17	5.92	5.67
	PI	1.54	1.64	1.73
15/12	TC	6.49	6.25	6.00
	PI	1.63	1.72	1.82
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
- OD – Outdoor

**5.5.4 Capacity Correction Factors**



5.6 HJD024 / YBDE024

5.6.1 Cooling Capacity (kW) - Run Mode

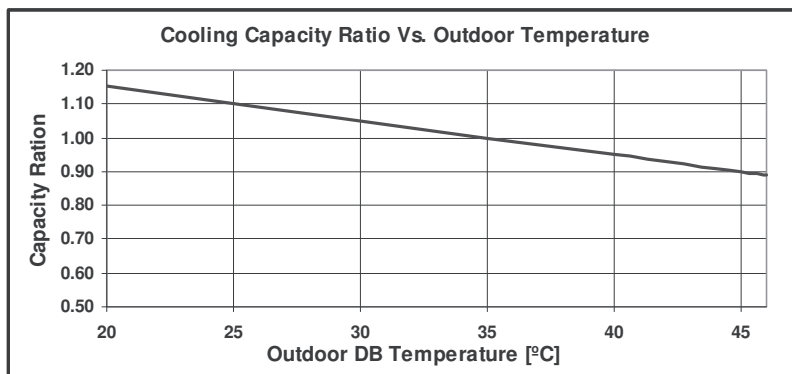
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [C0]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE				
		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	6.57	7.00	7.43	7.86	8.29
	SC	4.85	4.95	5.04	5.14	5.24
	PI	1.73	1.76	1.80	1.83	1.86
30	TC	6.26	6.69	7.12	7.55	7.98
	SC	4.72	4.82	4.92	5.02	5.12
	PI	1.93	1.96	2.00	2.03	2.06
35	TC	5.94	6.37	<b>6.80</b>	7.23	7.66
	SC	4.60	4.70	<b>4.80</b>	4.90	5.00
	PI	2.13	2.17	<b>2.20</b>	2.23	2.27
40	TC	5.62	6.05	6.48	6.91	7.34
	SC	4.48	4.58	4.68	4.78	4.88
	PI	2.34	2.37	2.40	2.44	2.47
46	TC	5.24	5.67	6.10	6.53	6.96
	SC	4.33	4.43	4.53	4.63	4.73
	PI	2.58	2.61	2.65	2.68	2.71

**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

5.6.2 Capacity Correction Factors





**5.6.3 Heating Capacity (kW) - Run Mode**

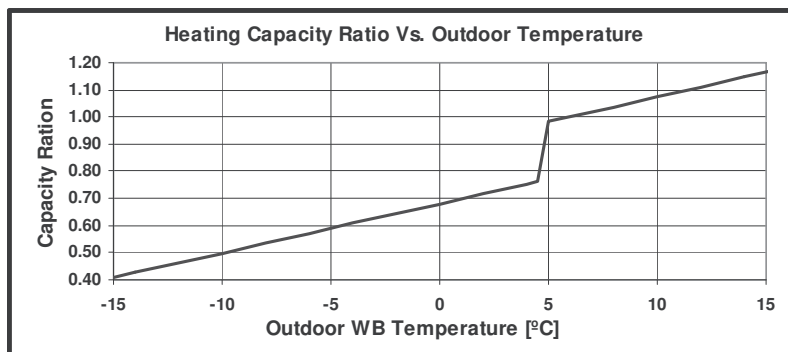
**230[V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	4.84	4.50	4.16
	PI	1.20	1.32	1.44
-10/-12	TC	5.38	5.05	4.71
	PI	1.45	1.57	1.69
-7/-8	TC	5.80	5.46	5.12
	PI	1.63	1.75	1.88
-1/-2	TC	6.00	5.66	5.32
	PI	1.72	1.85	1.97
2/1	TC	6.14	5.80	5.46
	PI	1.79	1.91	2.03
7/6	TC	7.94	<b>7.60</b>	7.26
	PI	1.88	<b>2.00</b>	2.12
10/9	TC	8.38	8.04	7.70
	PI	1.99	2.11	2.23
15/12	TC	8.81	8.48	8.14
	PI	2.10	2.22	2.35
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
- OD – Outdoor

**5.6.4 Capacity Correction Factors**



**5.7 HJD030 / YBDE030**

**5.7.1 Cooling Capacity (kW) - Run Mode**

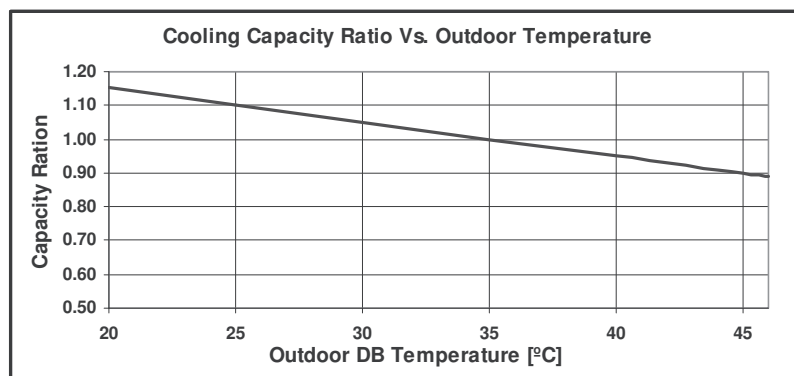
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [C0]		DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE				
			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	7.25	7.72	8.20	8.67	9.15	
	SC	5.35	5.46	5.57	5.68	5.79	
	PI	1.75	1.79	1.82	1.85	1.89	
30	TC	6.90	7.37	7.85	8.32	8.80	
	SC	5.22	5.33	5.44	5.54	5.65	
	PI	1.96	1.99	2.02	2.06	2.09	
35	TC	6.55	7.03	<b>7.50</b>	7.97	8.45	
	SC	5.08	5.19	<b>5.30</b>	5.41	5.52	
	PI	2.16	2.20	<b>2.23</b>	2.26	2.30	
40	TC	6.20	6.68	7.15	7.63	8.10	
	SC	4.95	5.06	5.16	5.27	5.38	
	PI	2.37	2.40	2.44	2.47	2.50	
46	TC	5.78	6.26	6.73	7.21	7.68	
	SC	4.78	4.89	5.00	5.11	5.22	
	PI	2.61	2.65	2.68	2.71	2.75	

**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

**5.7.1 Capacity Correction Factors**



**5.7.3 Heating Capacity (kW) - Run Mode**

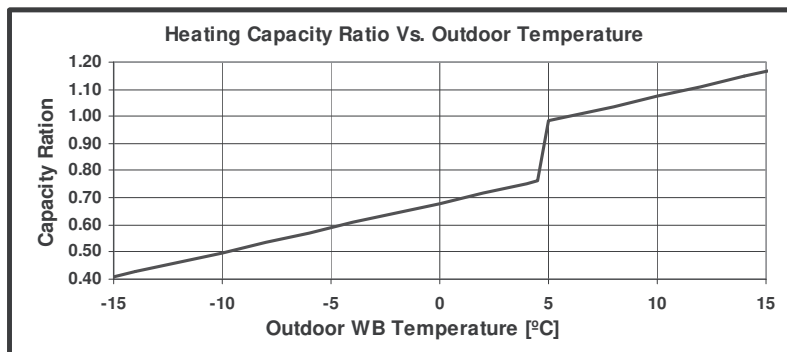
**230[V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	5.47	5.09	4.71
	PI	1.52	1.67	1.83
-10/-12	TC	6.09	5.71	5.33
	PI	1.83	1.98	2.14
-7/-8	TC	6.56	6.17	5.79
	PI	2.06	2.22	2.37
-1/-2	TC	6.79	6.41	6.02
	PI	2.18	2.34	2.49
2/1	TC	6.94	6.56	6.18
	PI	2.26	2.41	2.57
7/6	TC	8.98	<b>8.60</b>	8.22
	PI	2.38	<b>2.53</b>	2.68
10/9	TC	9.48	9.10	8.71
	PI	2.52	2.67	2.83
15/12	TC	9.97	9.59	9.21
	PI	2.66	2.81	2.97
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

**LEGEND**

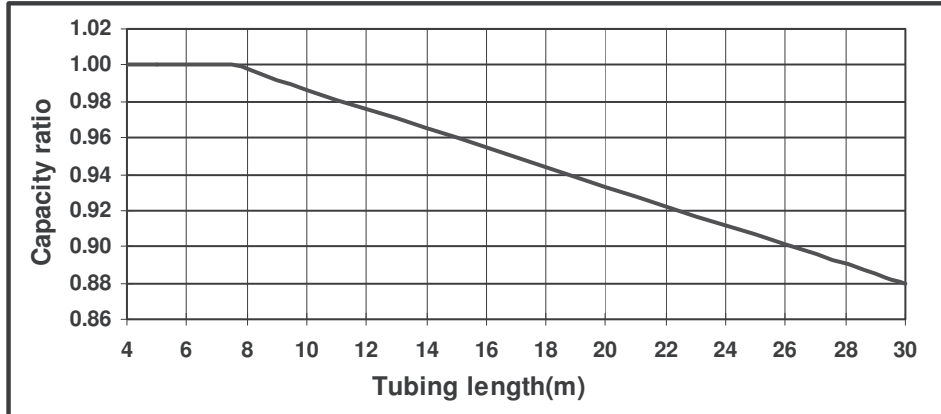
- TC – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

**5.7.4 Capacity Correction Factors**

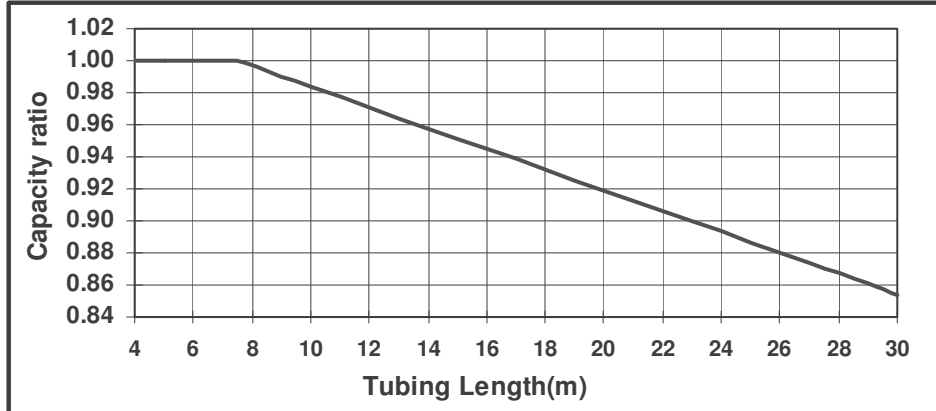


### 5.8 Capacity Correction Factor Due to Tubing Length

#### 5.8.1 Cooling

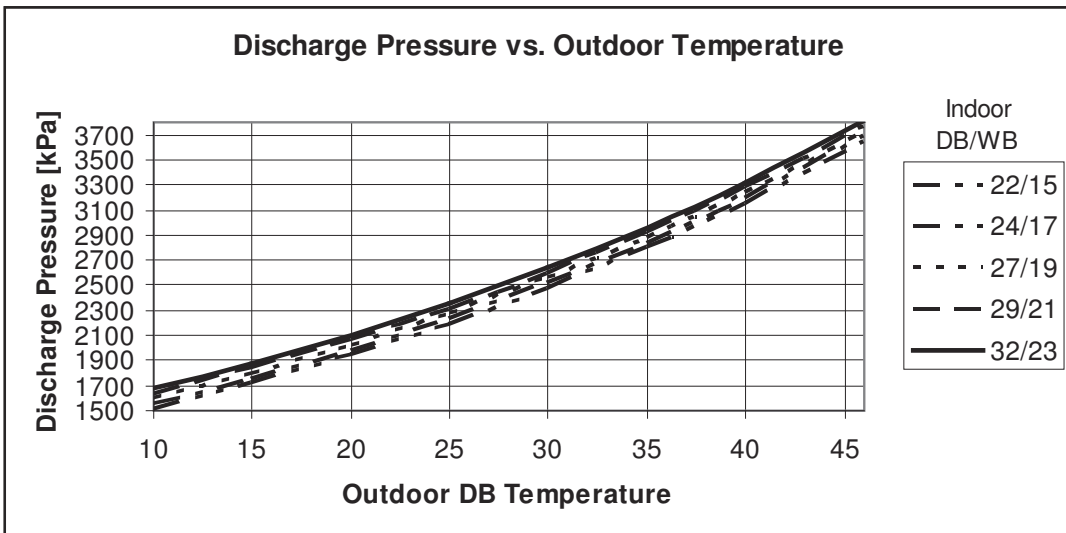
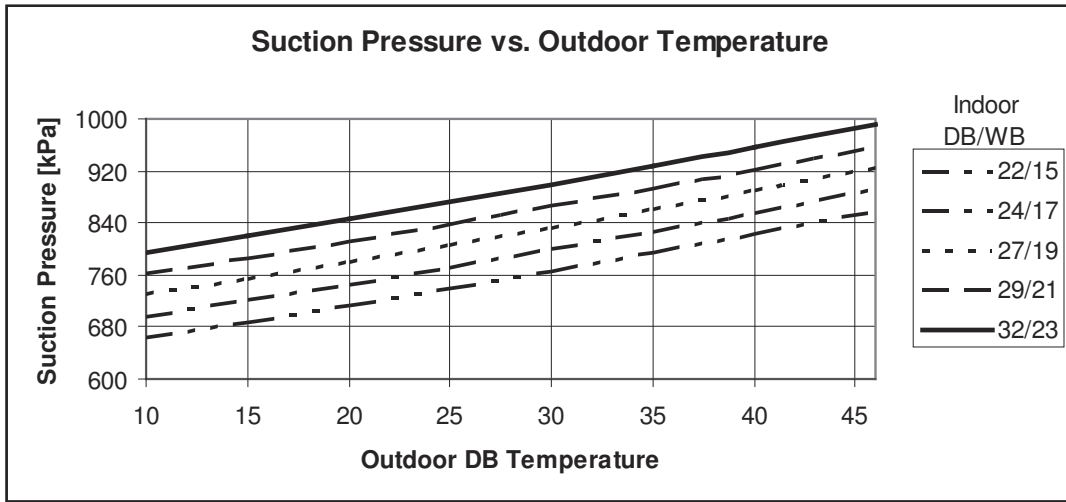


#### 5.8.2 Heating

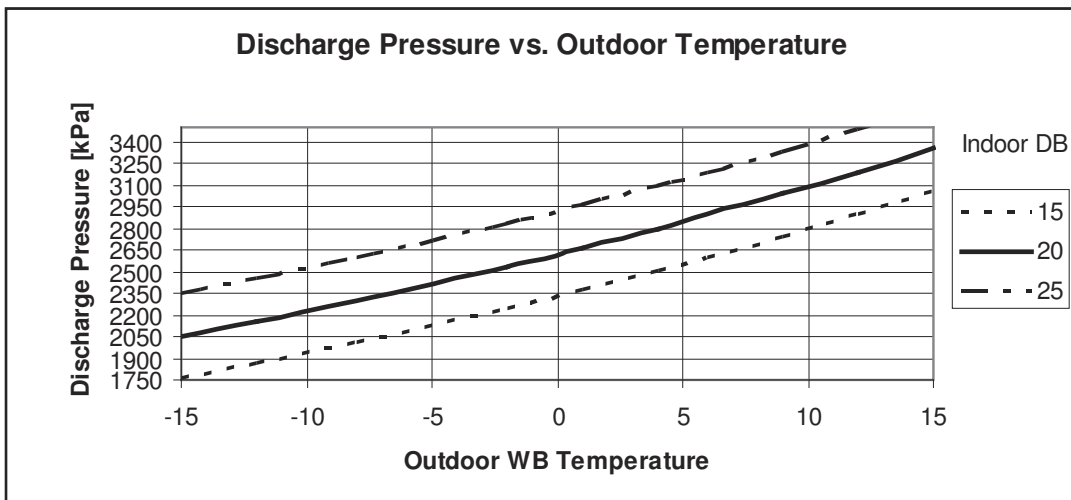
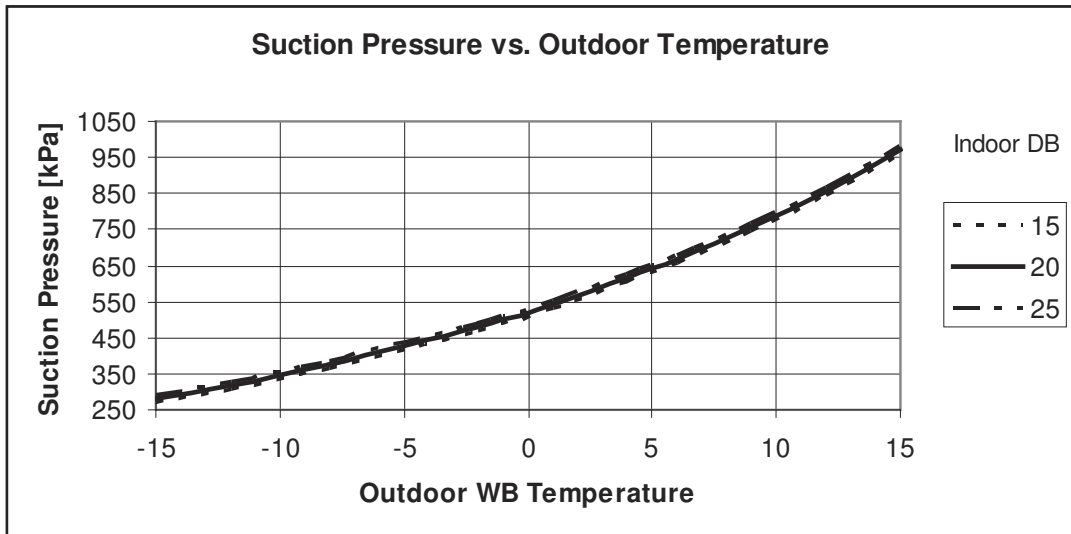


**5.9**  
**5.9.1**

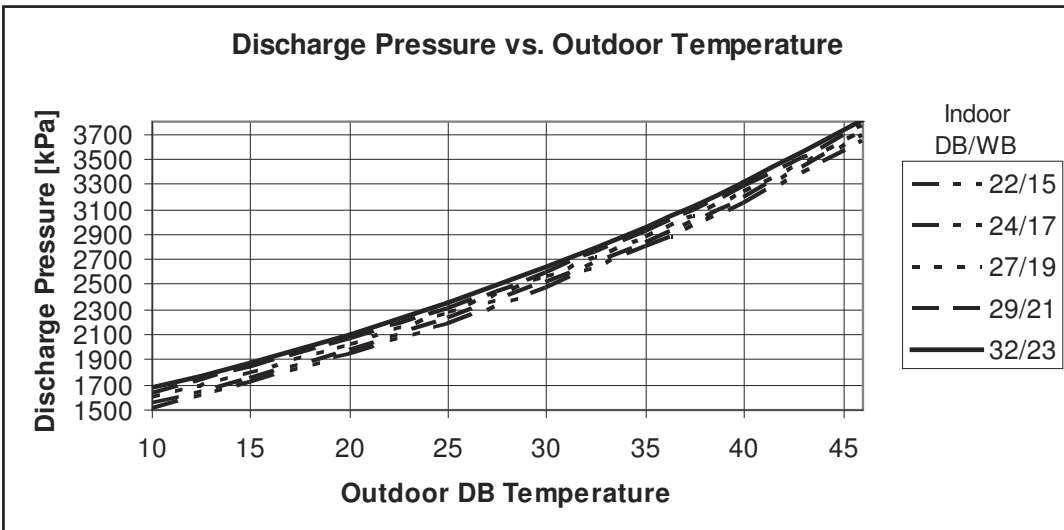
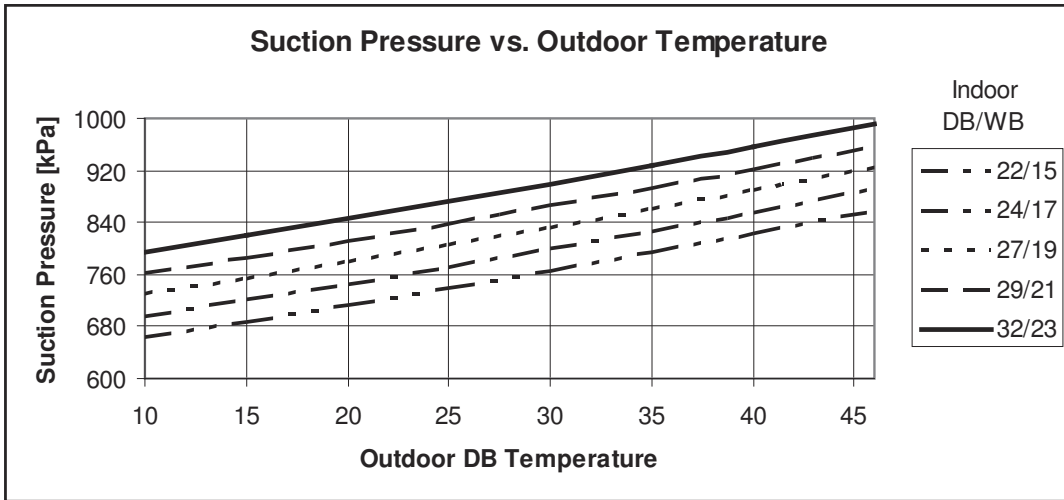
**Pressure Curves**  
**Model: HJD009 / YBDE009 DCI Cooling — Test Mode.**



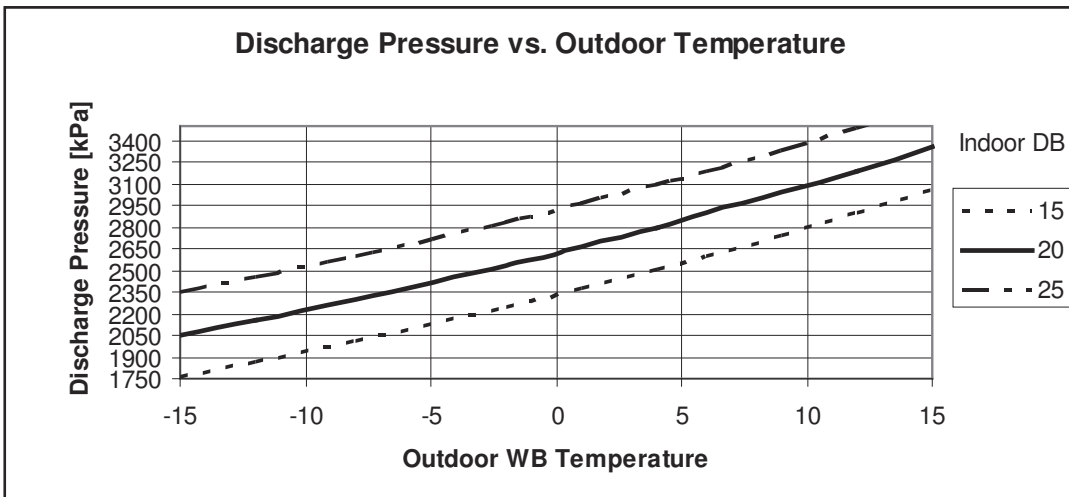
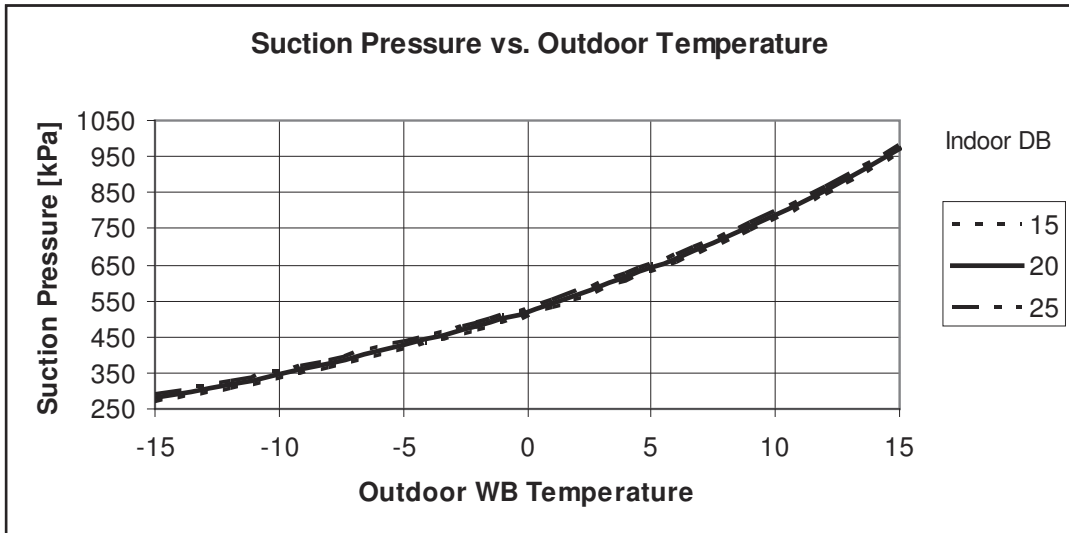
5.9.2 Heating — Test Mode



5.9.3 Model: HJD012 / YBDE012 DCI Cooling — Test Mode.

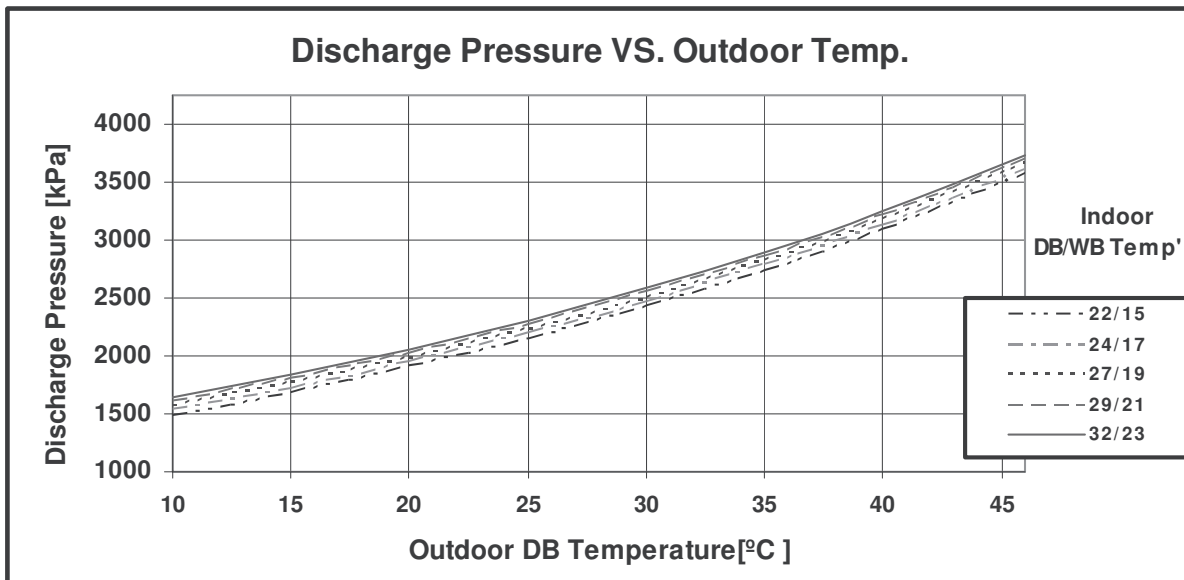
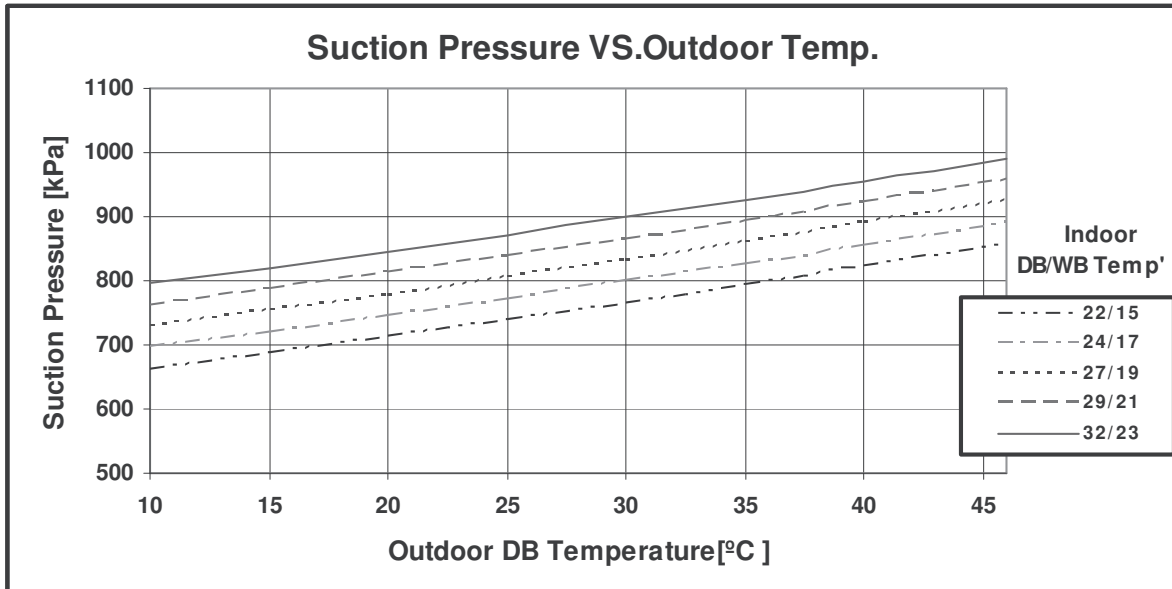


5.9.4 Heating — Test Mode

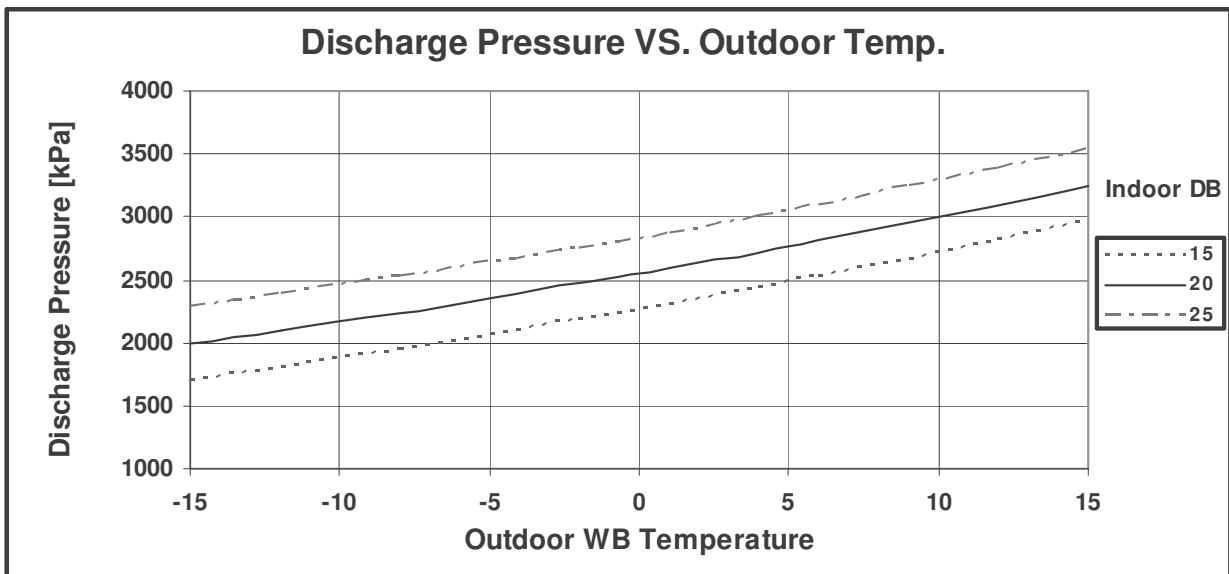
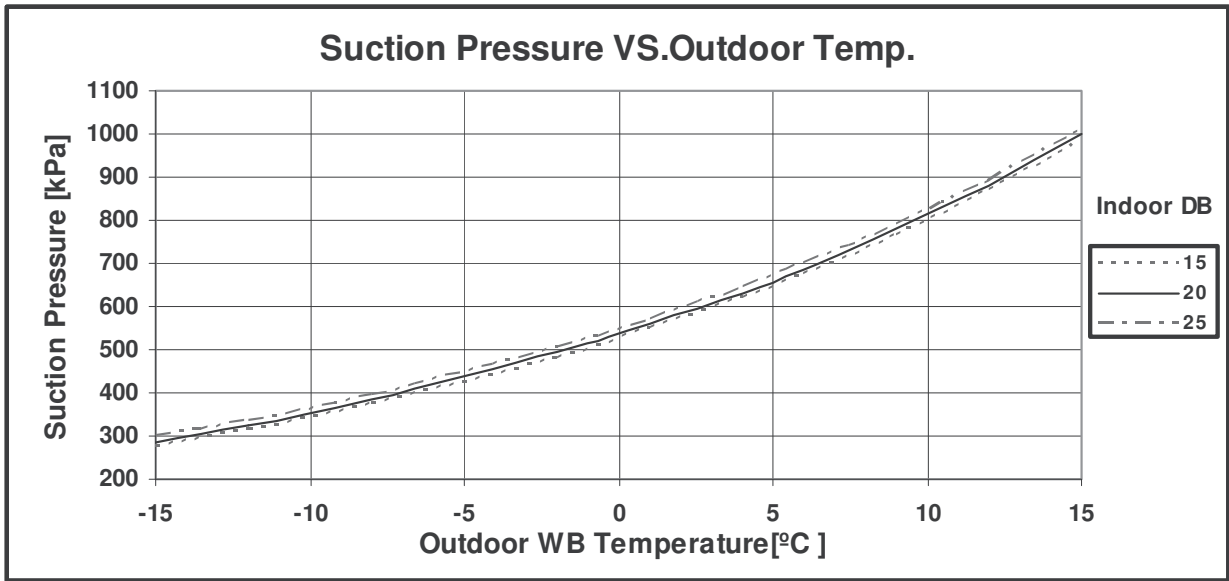




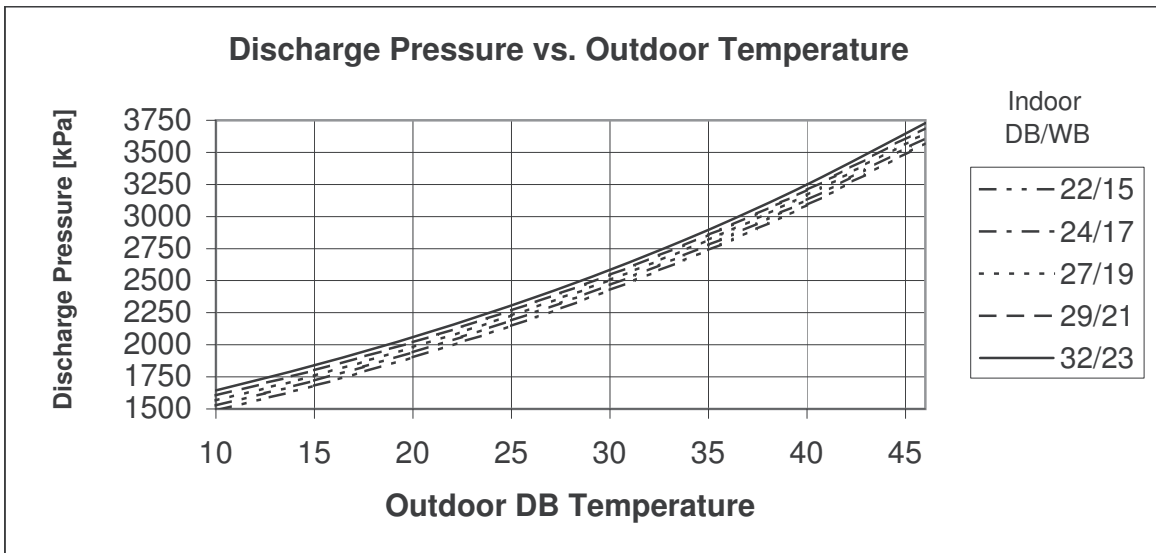
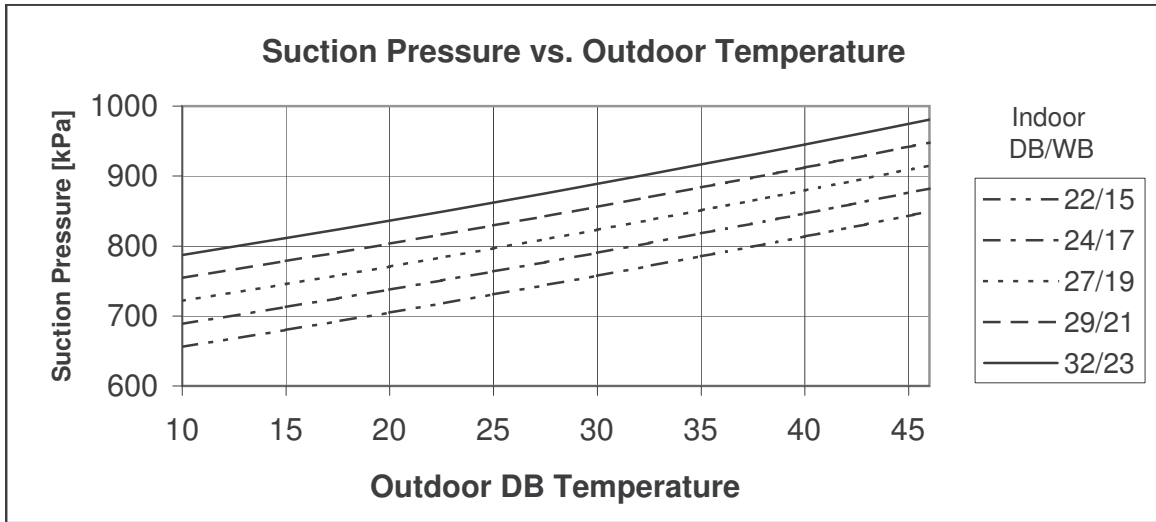
5.9.5 Model: HJD018 / YBDE018 Cooling — Test Mode



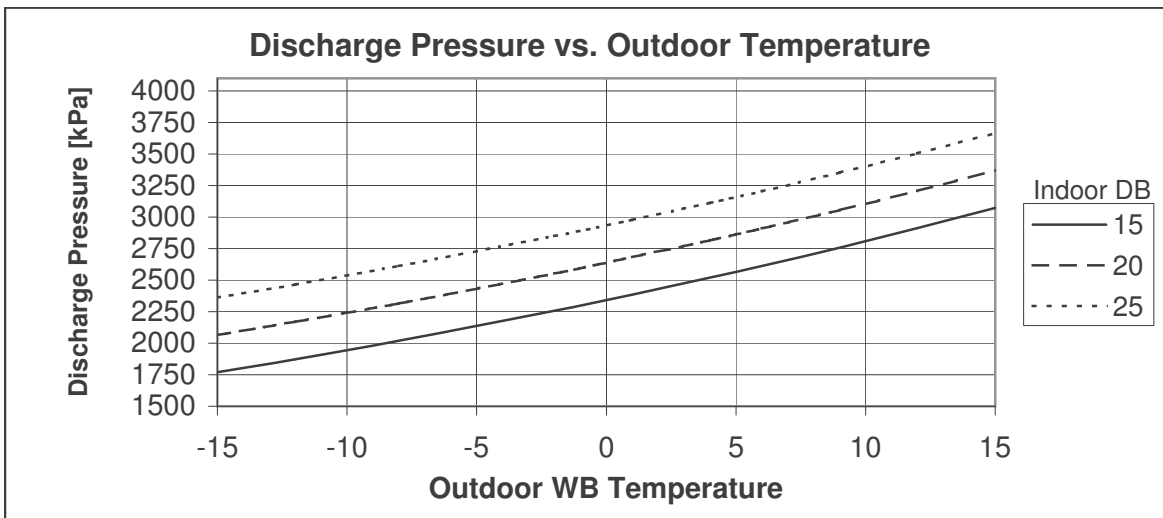
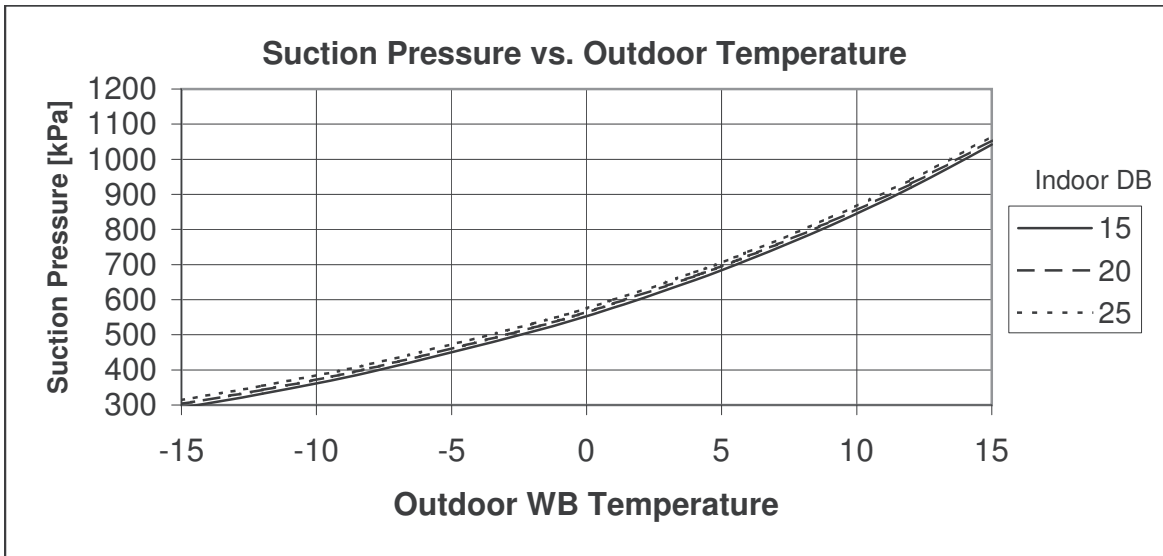
5.9.6 Heating — Test Mode



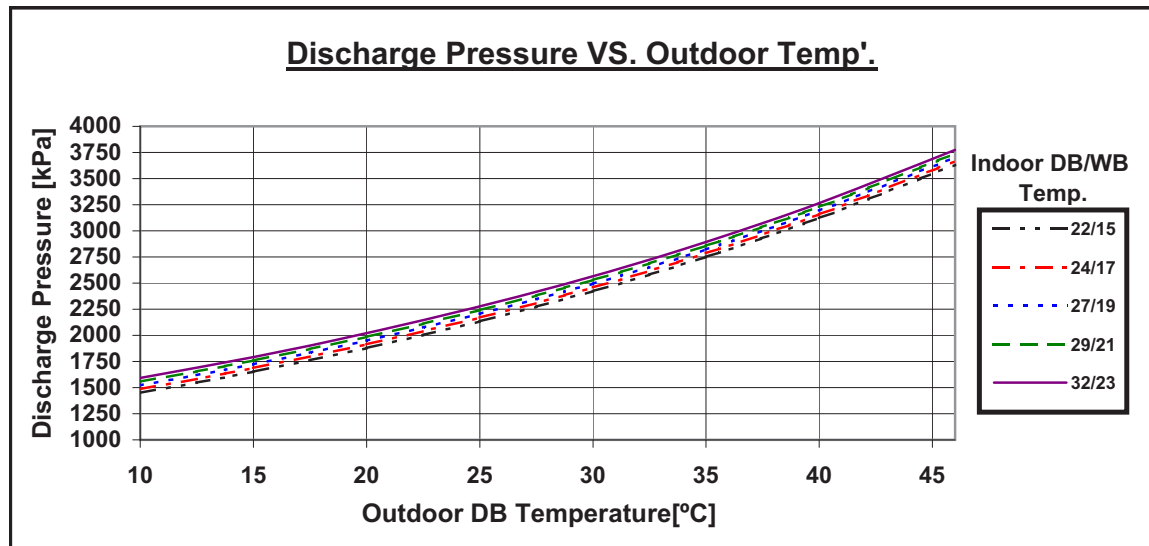
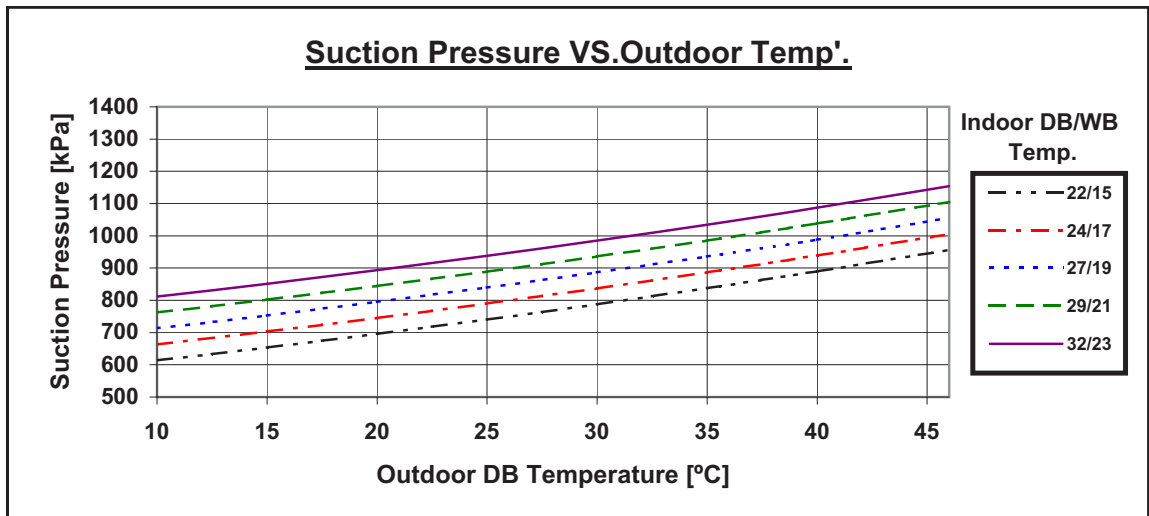
5.9.7 Model: HJD024 / YBDE024 Cooling — Test Mode.



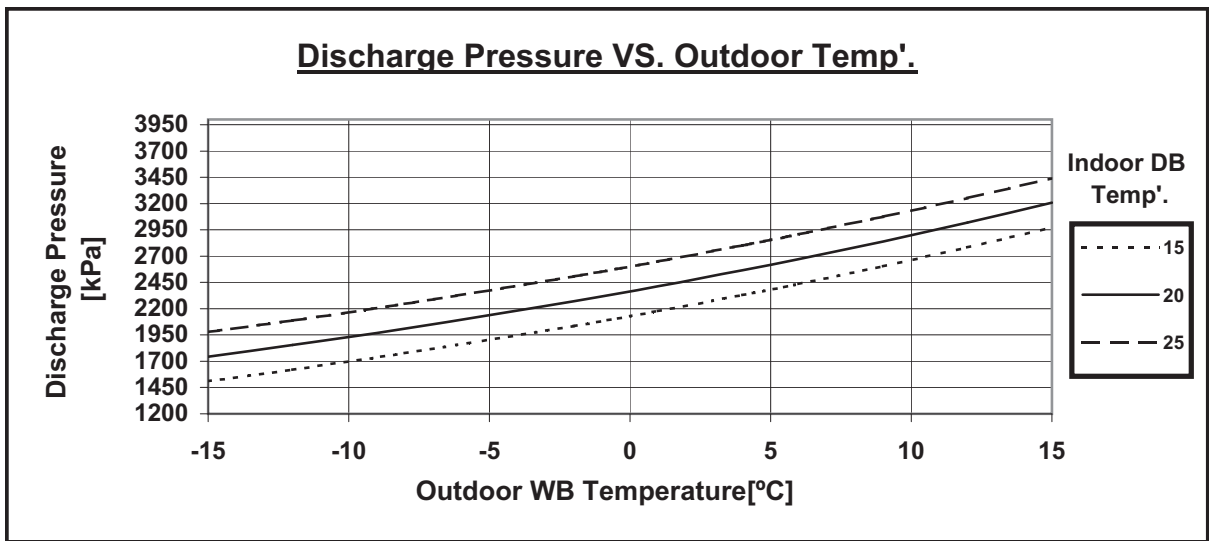
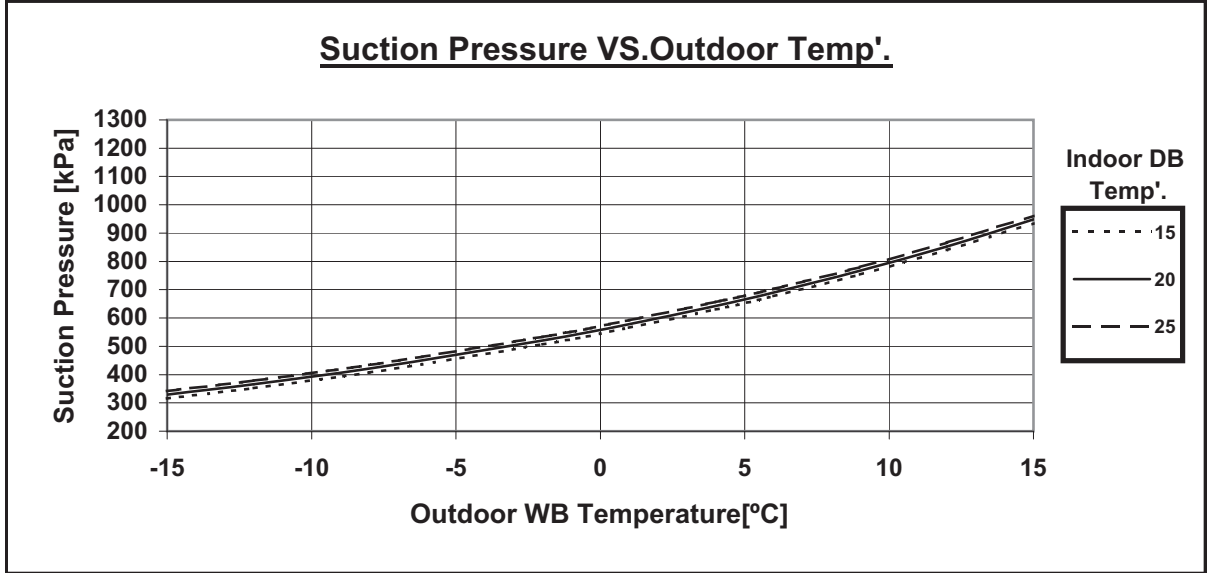
5.9.8 Heating — Test Mode



5.9.9 Model: HJD030 / YBDE030 Cooling ---- Test Mode



5.9.10 Heating — Test Mode



## 6. SOUND LEVEL CHARACTERISTICS

### 6.1.1 Indoor Units Test Scheme - HJD030

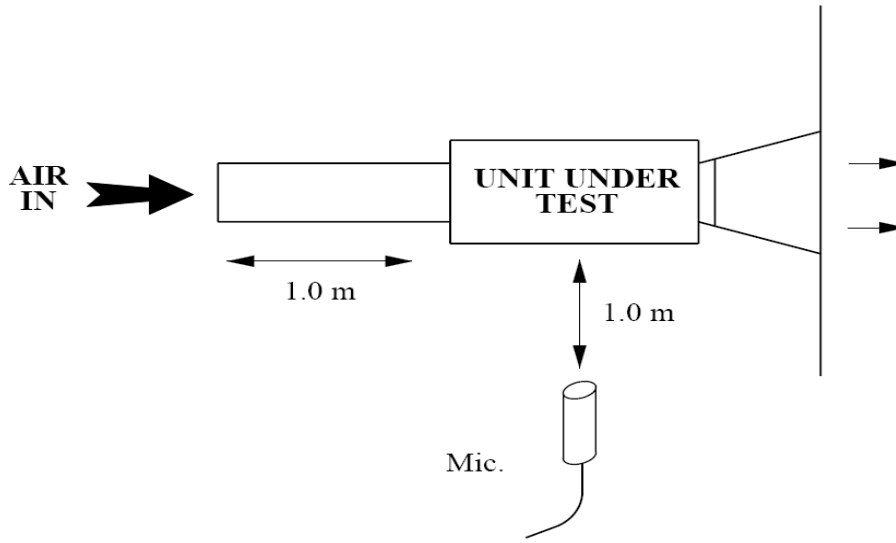
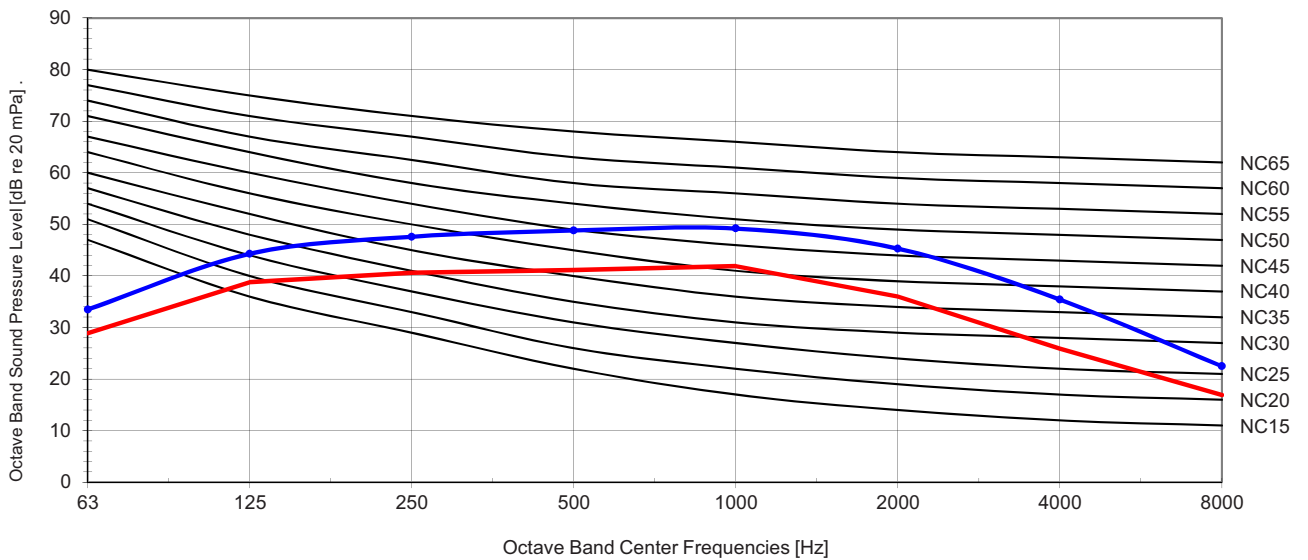


Figure 1

### 6.1.2 Sound Pressure Level Spectrum (Measured as Figure 1)



## 6.2 Outdoor Units

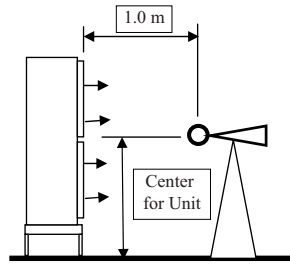
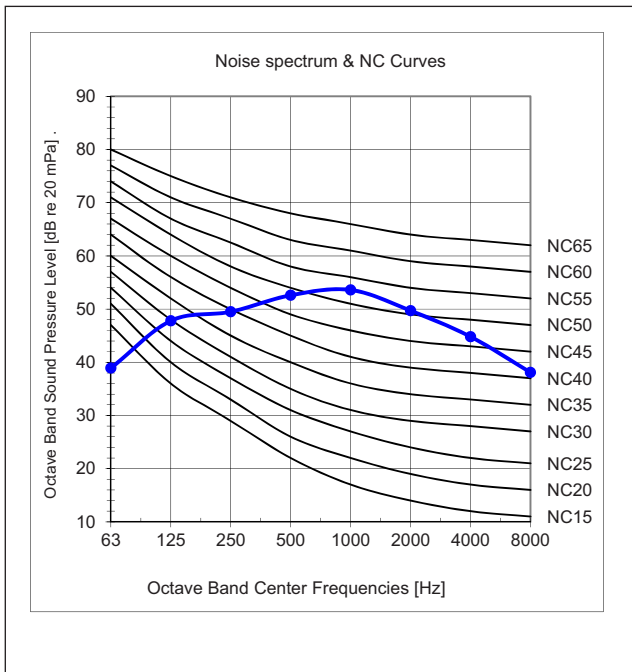


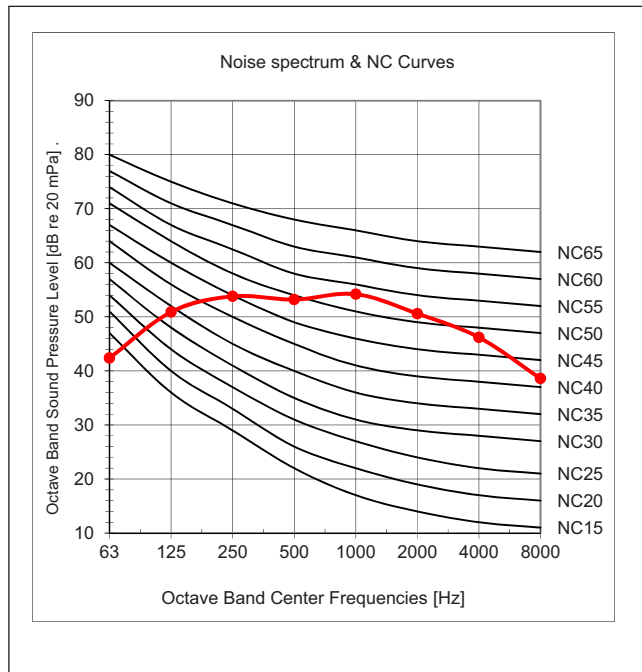
Figure 2

### 6.2.1 Sound Pressure Level Spectrum (Measured as Figure 2)

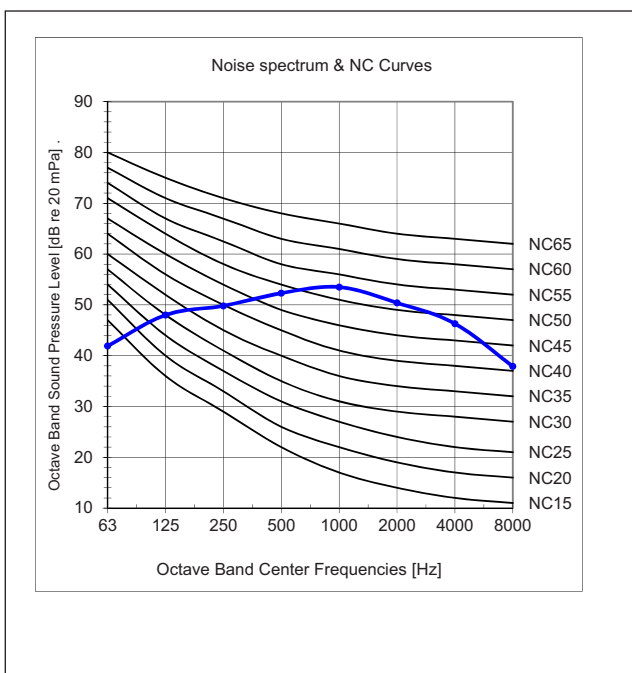
#### YBDE 018/024 - H11 Cooling



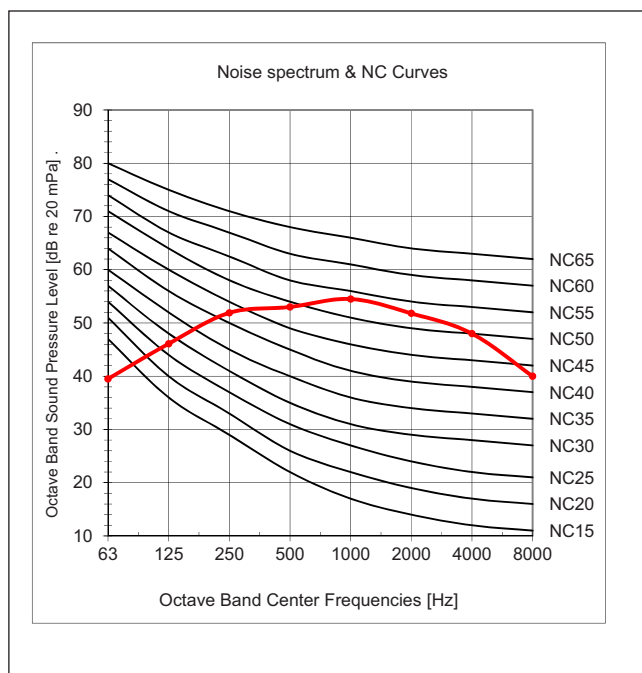
#### YBDE 018/024 - H11 Heating



#### YBD E030 - H11 Cooling



#### YBDE 030 - H11 Heating





## 7. ELECTRICAL DATA

### 7.1 Single Phase Unit

Model	HJD009 DCI	HJD012 DCI	HJD018 DCI	HJD024 DCI	HJD030 DCI
Power Supply	1 PH, 220-240VAC, 50HZ				
Connected to	To indoor			To outdoor	
Maximum Current	10A		15A		
Inrush Current \ (a)	35A		45A		
Starting Current \ (b)	10A		<15A		
Circuit Breaker	16A		20A		
Power Supply	3 X 1.5 mm <sup>2</sup>		3 X 2.5 mm <sup>2</sup>		
Interconnection Cable	4 X 1.5 mm <sup>2</sup>		4 X 2.5 mm <sup>2</sup>		

(a) Inrush current is the current when power is up (charging the DC capacitors at outdoor unit controller).

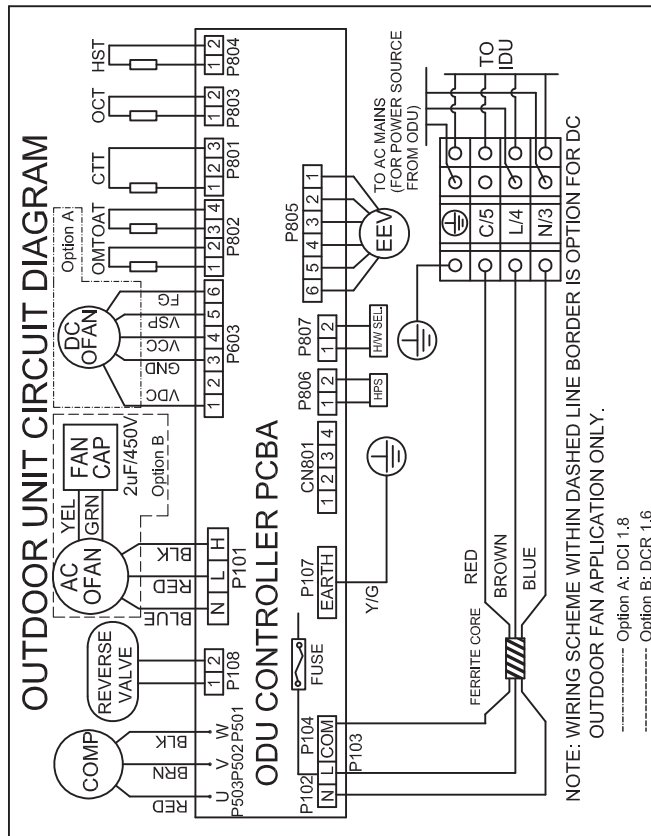
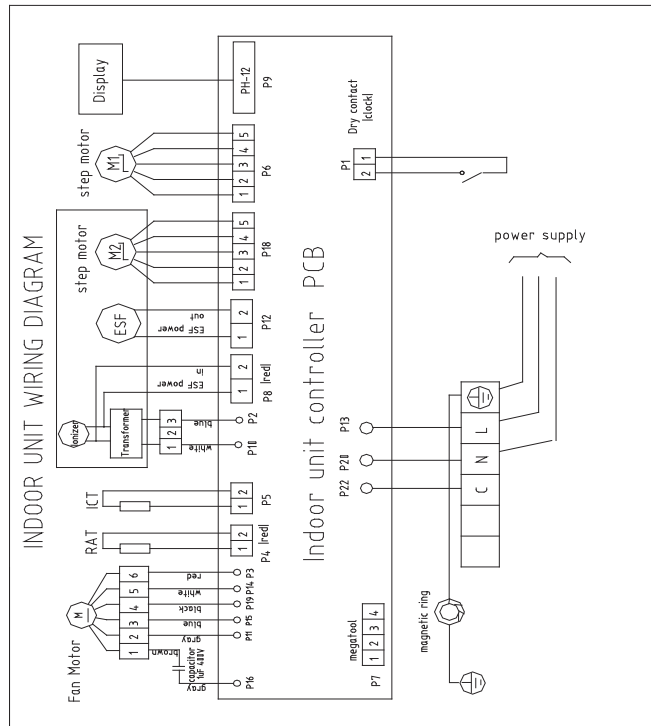
(b) Starting current is the current at compressor start up.

#### **NOTE**

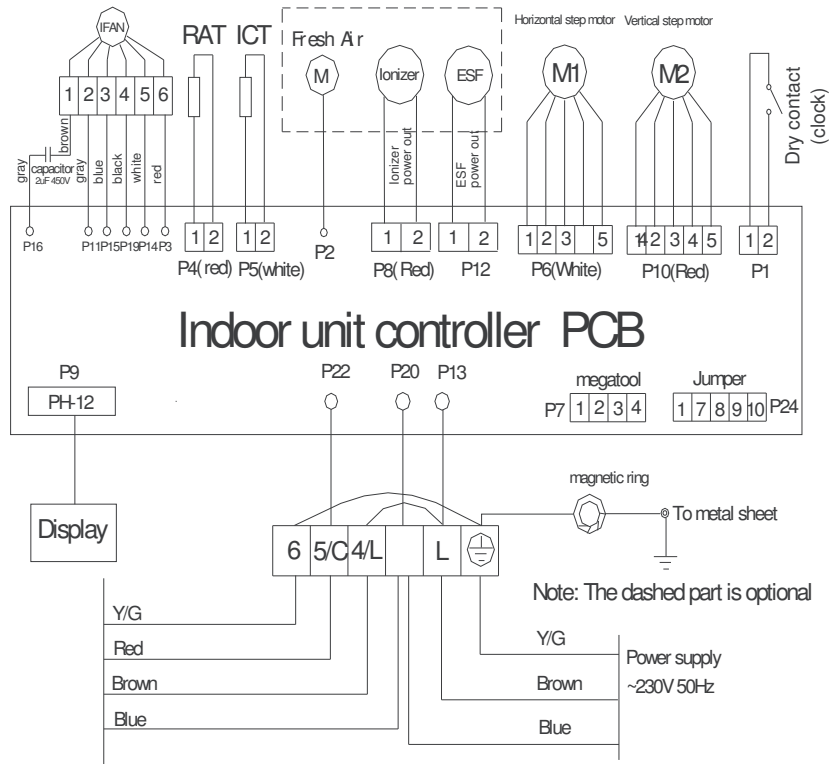
**Power wiring cord should comply with local laws and electrical regulations requirements.**

# 8. WIRING DIAGRAMS

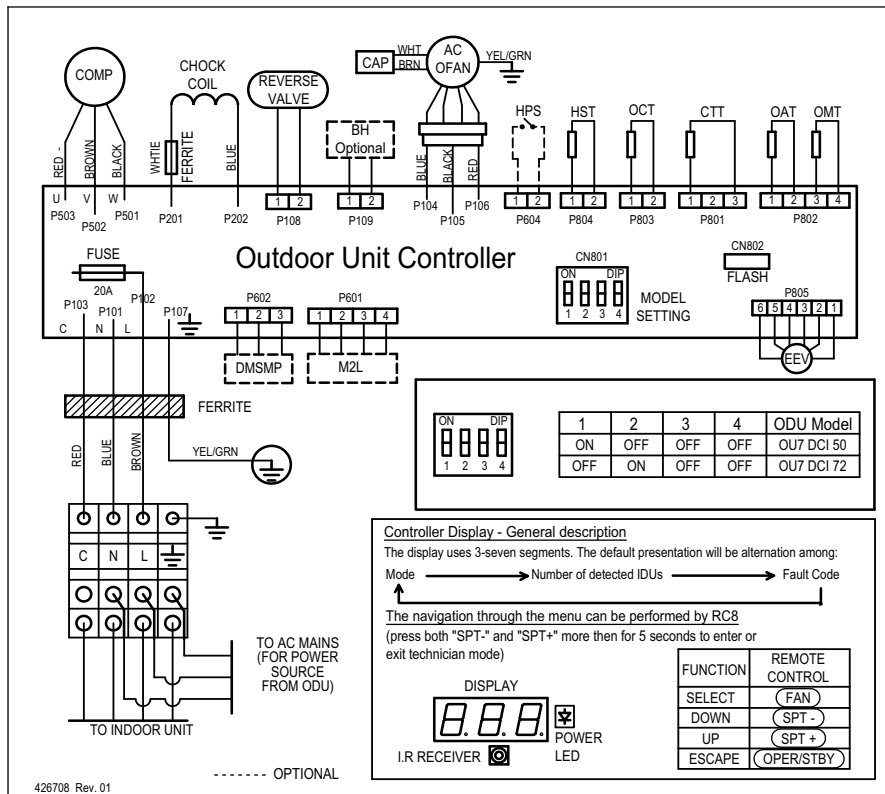
## 8.1 Indoor & Outdoor Units: HJD 009 / 012 YBDE 009/012 DCI



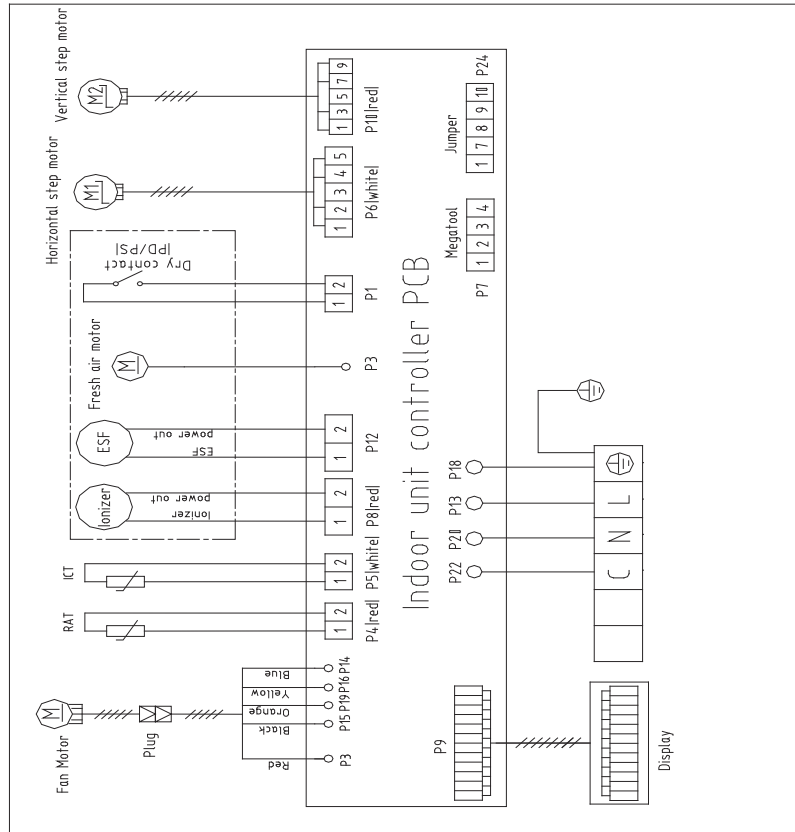
## 8.2 Indoor Unit: HJD 018



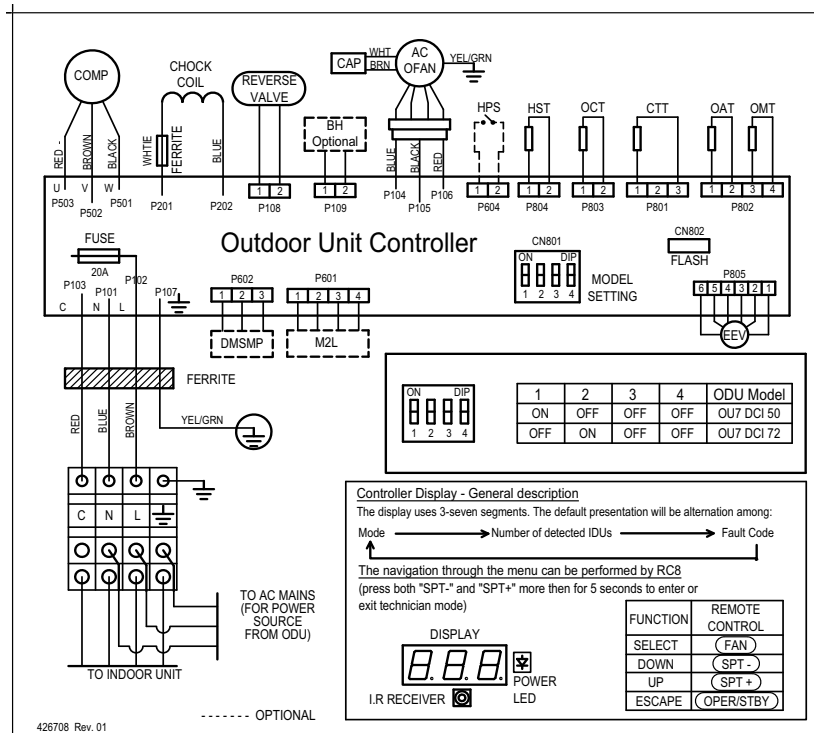
## 8.3 Outdoor Unit: YBDE018



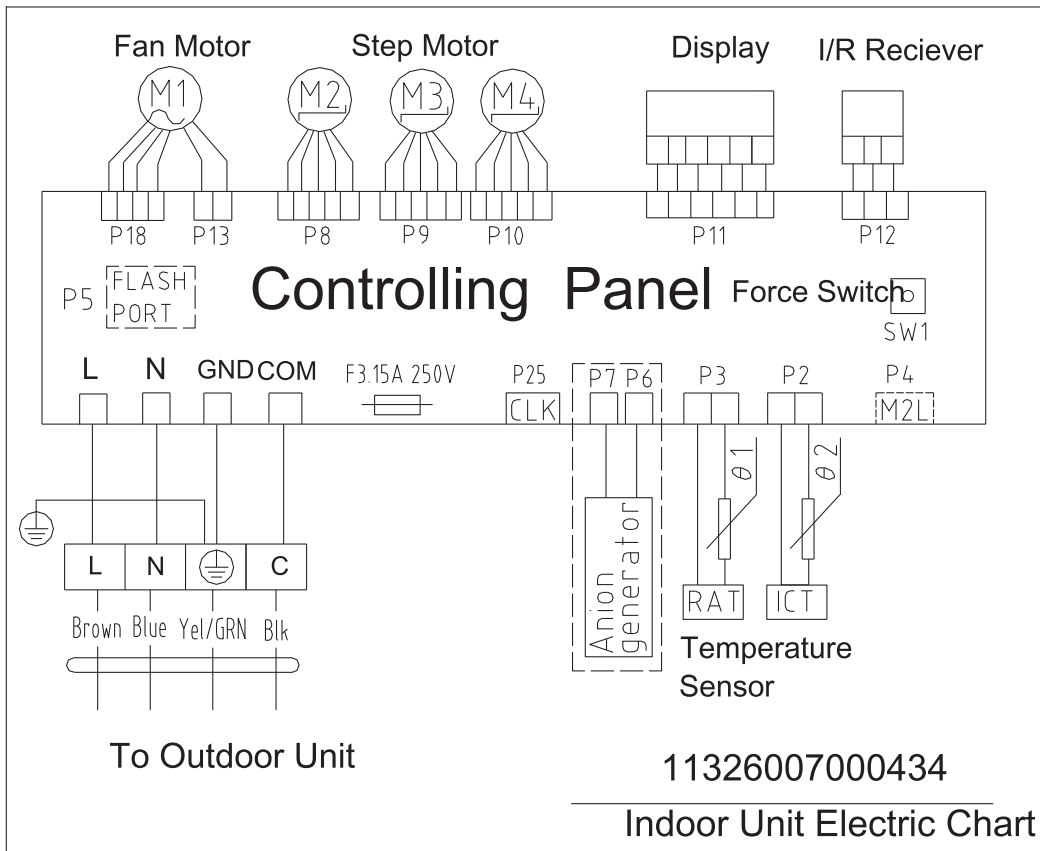
### 8.4 Indoor Unit: HJD024 DCI



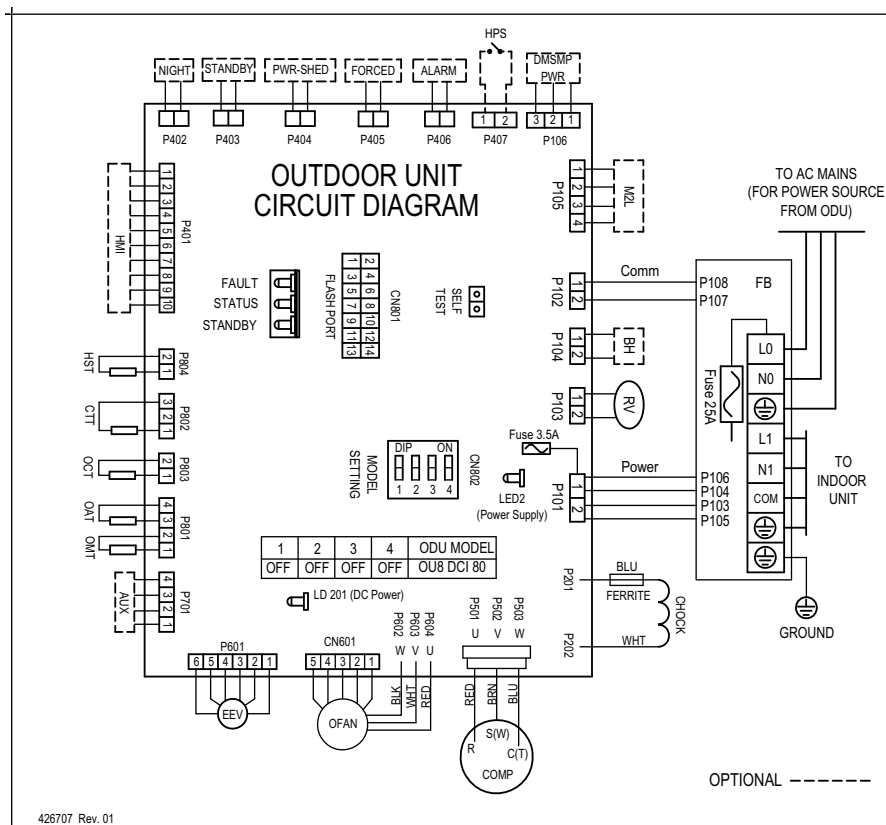
### 8.5 Outdoor Unit: YBDE024



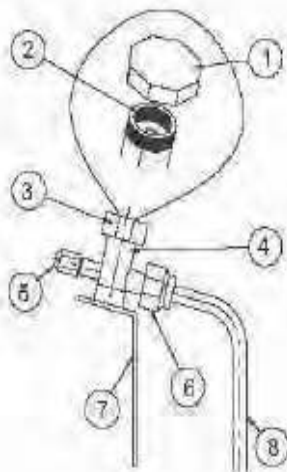
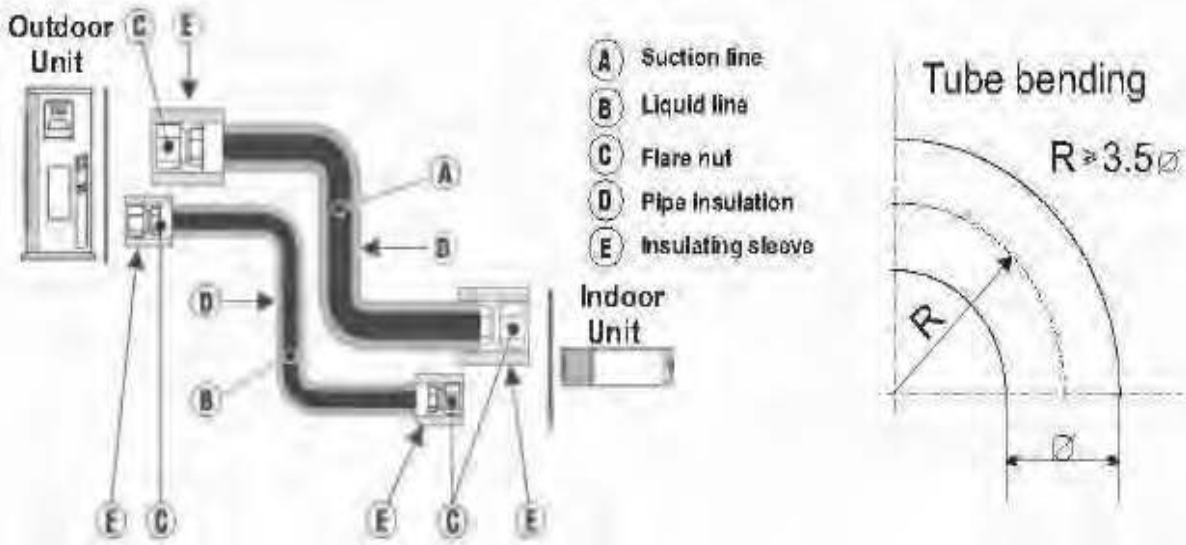
8.6 Indoor Unit: HJD030 DCI



8.7 Outdoor Unit: YBDE030 DCI



## 9. TUBING CONNECTIONS



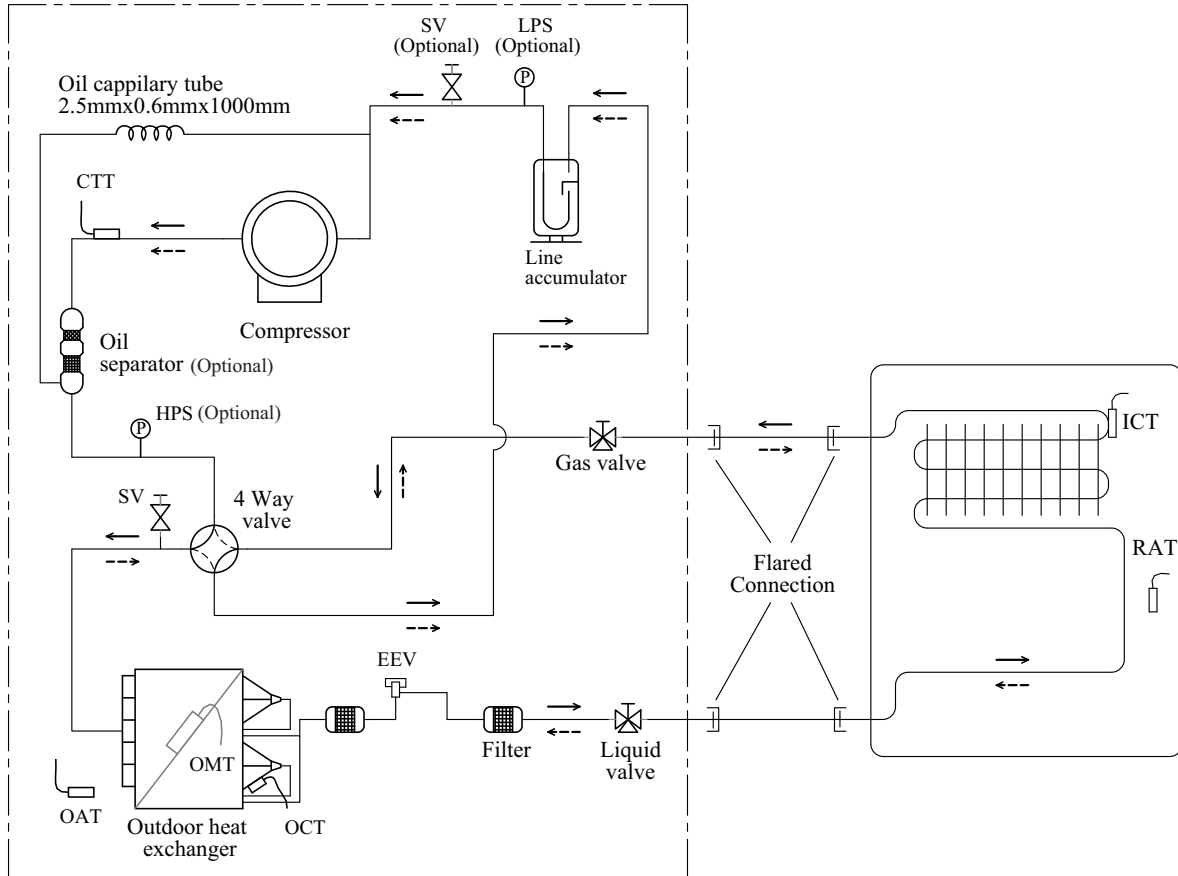
TUBE (Inch)	1/4"	3/8"	1/2"	5/8"	3/4"
<b>TORQUE (Nm)</b>					
<b>Flare Nuts</b>	15-18	40-45	60-65	70-75	80-85
<b>Valve Cap</b>	13-20	13-20	18-25	18-25	40-50
<b>Service Port Cap</b>	11-13	11-13	11-13	11-13	11-13

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.

**10. REFRIGERATION DIAGRAMS**

**10.1 Heat Pump Models**



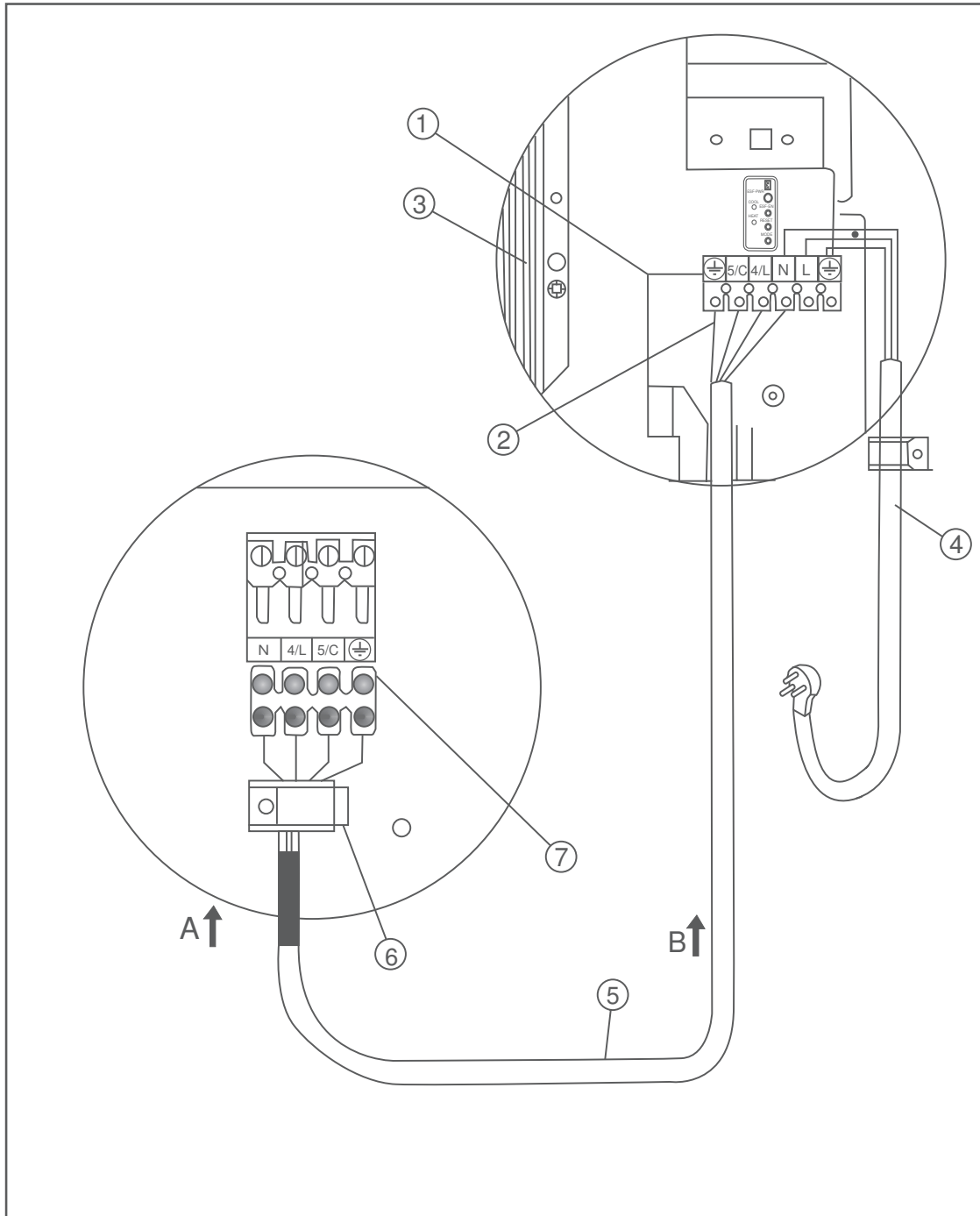
**OUTDOOR UNIT**

**INDOOR UNIT**

→ Refrigerant flow (Cooling)  
 --- Refrigerant flow (Heating)

**11. ELECTRICAL CONNECTIONS**

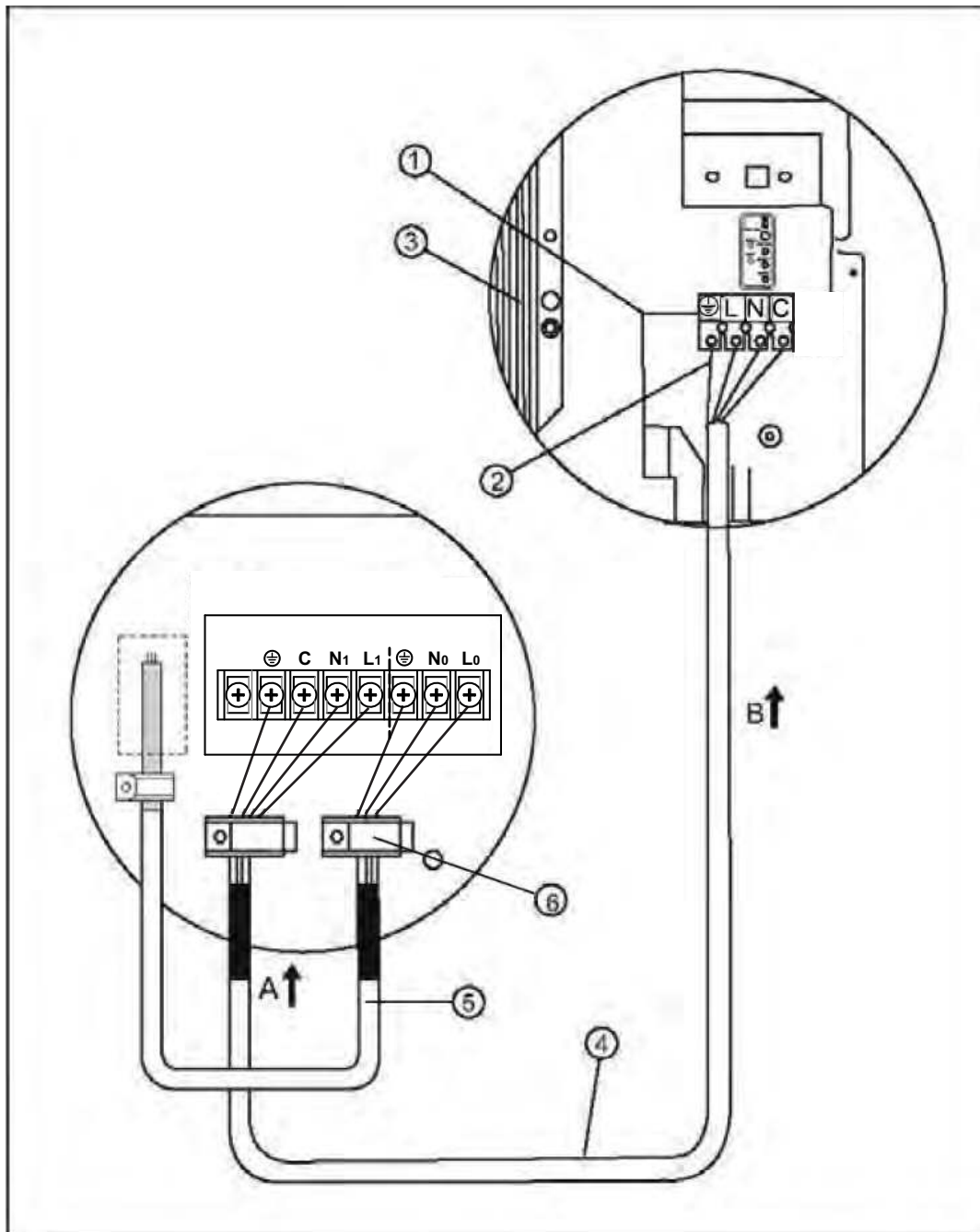
**11.1 HJD009, 012, 018, 024 DCI**



- |                                    |                                |
|------------------------------------|--------------------------------|
| 1. Indoor unit terminal            | 5. Multiple wire cable.        |
| 2. Ground wire.                    | 6. Cable clamp.                |
| 3. Indoor coil.                    | 7. Outdoor unit wire terminal. |
| 4. Power cable in the indoor side. | <b>A. OUTDOOR B. INDOOR</b>    |



## 11.2 HJD030 DCI



1. Indoor unit terminal

2. Ground wire.

3. Indoor coil.

4. Multiple wire cable.

5. Cable clamp.

6. Outdoor unit wire terminal.

7. Power cable in the outdoor side  
(only for outdoor unit power supply)

**A. OUTDOOR B. INDOOR**

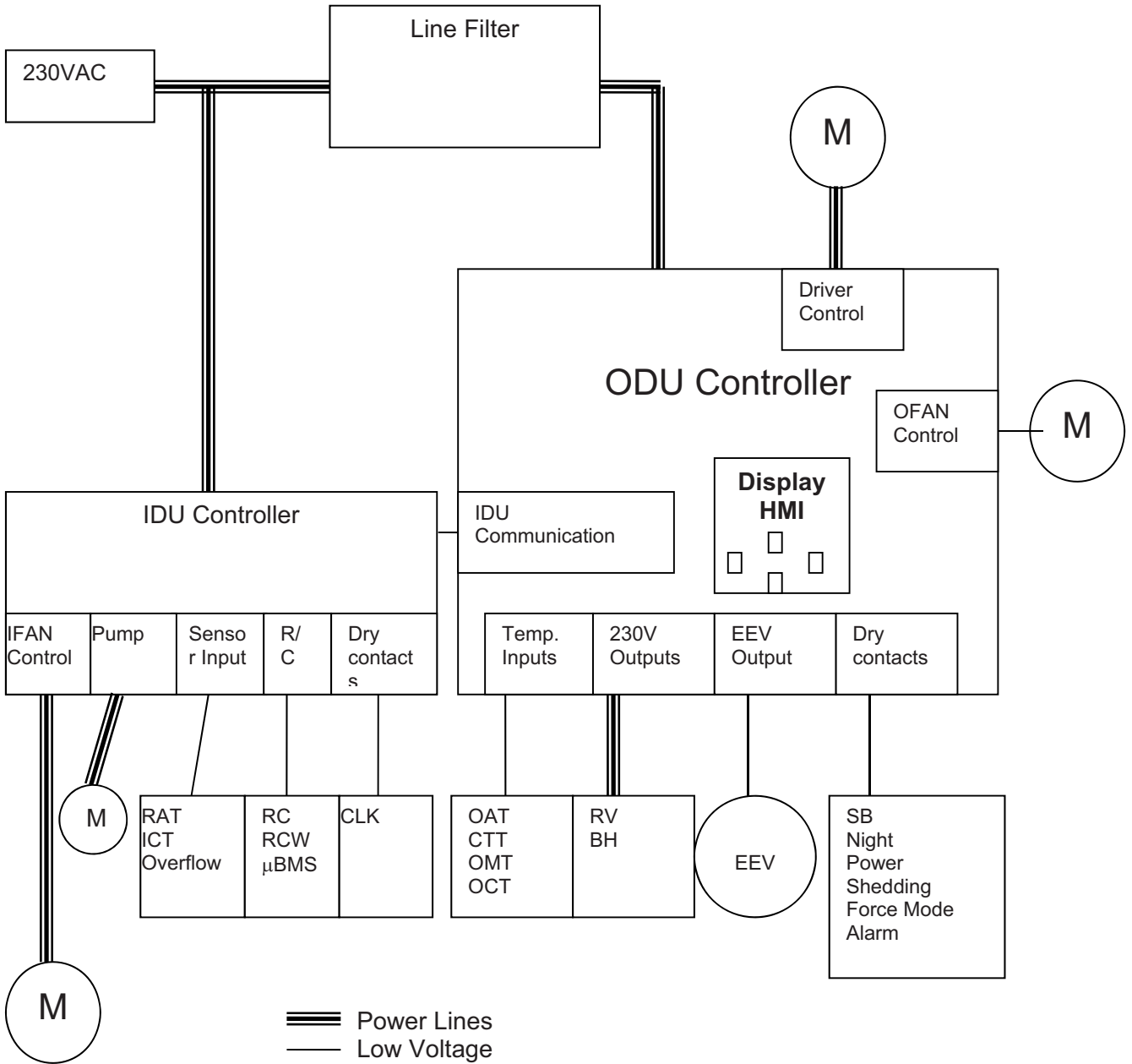
## 12. CONTROL SYSTEM

### 12.1 Abbreviations

Abbreviation	Definition
<b>A/C</b>	Air Conditioner
<b>BMS</b>	Building Management System
<b>CCR</b>	Compressor Current
<b>CCH</b>	Crankcase Heater
<b>COMP</b>	Compressor
<b>CTT</b>	Compressor Top Temperature sensor
<b>DCI</b>	DC Inverter
<b>DMSMP</b>	Dummy Multi Split multi Pipe – Control board
<b>E<sup>2</sup>PROM, EEP</b>	Erase Enable Programmable Read Only Memory
<b>EEV</b>	Electronic Expansion Valve
<b>HE</b>	Heating Element
<b>HMI</b>	Human Machine Interface
<b>HPS</b>	High Pressure Switch
<b>HST</b>	Heat Sink Temperature sensor
<b>Hz</b>	Hertz (1/sec) – electrical frequency
<b>ICT</b>	Indoor Coil Temperature (RT2) sensor
<b>IDU</b>	Indoor Unit
<b>IFAN</b>	Indoor Fan
<b>LPS</b>	Low Pressure Switch
<b>M2L / T-Tool</b>	Mega Tool (Monitoring SW)
<b>MCU</b>	Micro Controller Unit
<b>NA</b>	Not Applicable
<b>OAT</b>	Outdoor Air Temperature sensor
<b>OCT</b>	ODU Coil Temperature sensor
<b>OMT</b>	Outdoor middle coil temperature sensor
<b>ODU</b>	Outdoor Unit
<b>ODUC</b>	Outdoor Unit Control board
<b>OFAN</b>	Outdoor Fan
<b>PD</b>	Presence Detector
<b>PFC</b>	Power Factor Corrector
<b>RAC</b>	Residential A/C
<b>RAT</b>	Return (Room) Air Temperature sensor
<b>R/C</b>	Remote Control
<b>RC</b>	Reverse Cycle (Heat Pump)
<b>RGT</b>	Return Gas Temperature sensor
<b>RLT</b>	Return Liquid Temperature sensor
<b>RPS</b>	Rounds per second (mechanical speed)
<b>RV</b>	Reverse Valve
<b>SB,STBY</b>	Stand By
<b>SH</b>	Super-Heat
<b>SPT</b>	Set Point Temperature (In R/C)
<b>S/W</b>	Software
<b>TBD</b>	To Be Defined
<b>TEMP</b>	Temperature
<b>TMR</b>	Timer
<b>TPT</b>	Technician peripheral Test

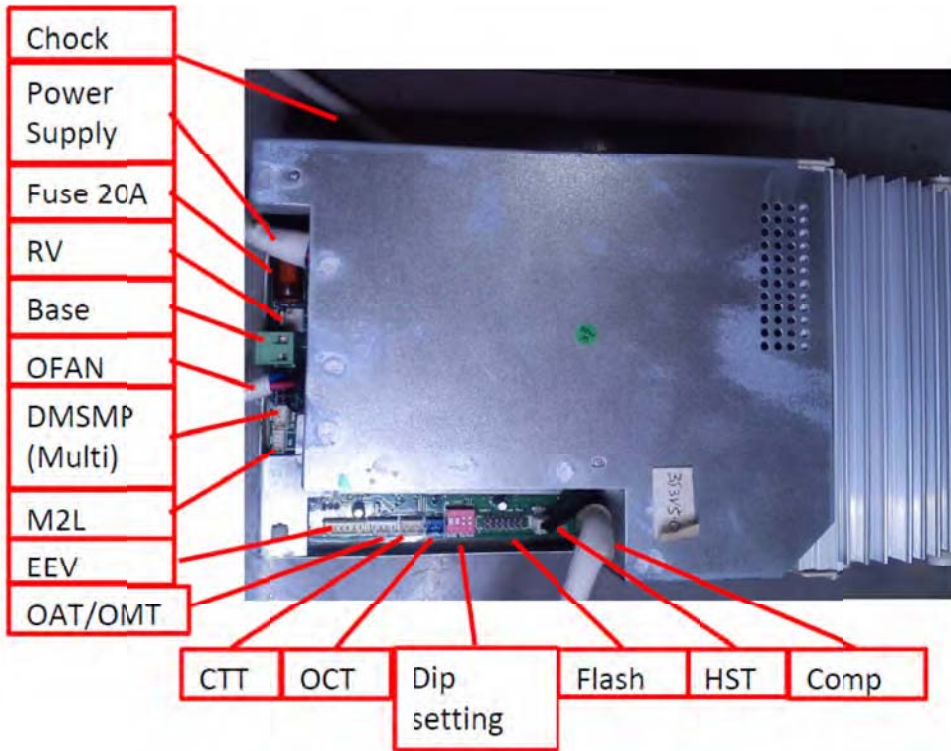
12.2 Product Overview

12.2.1 Block Diagram

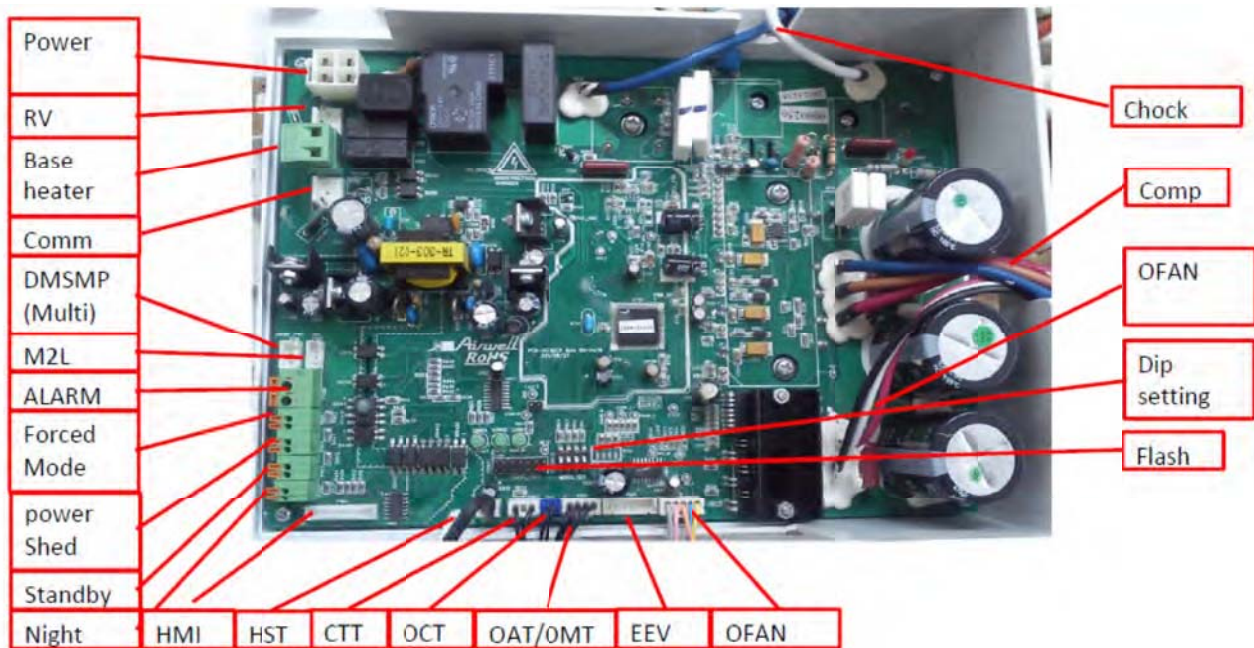


12.2.2 Controller overview

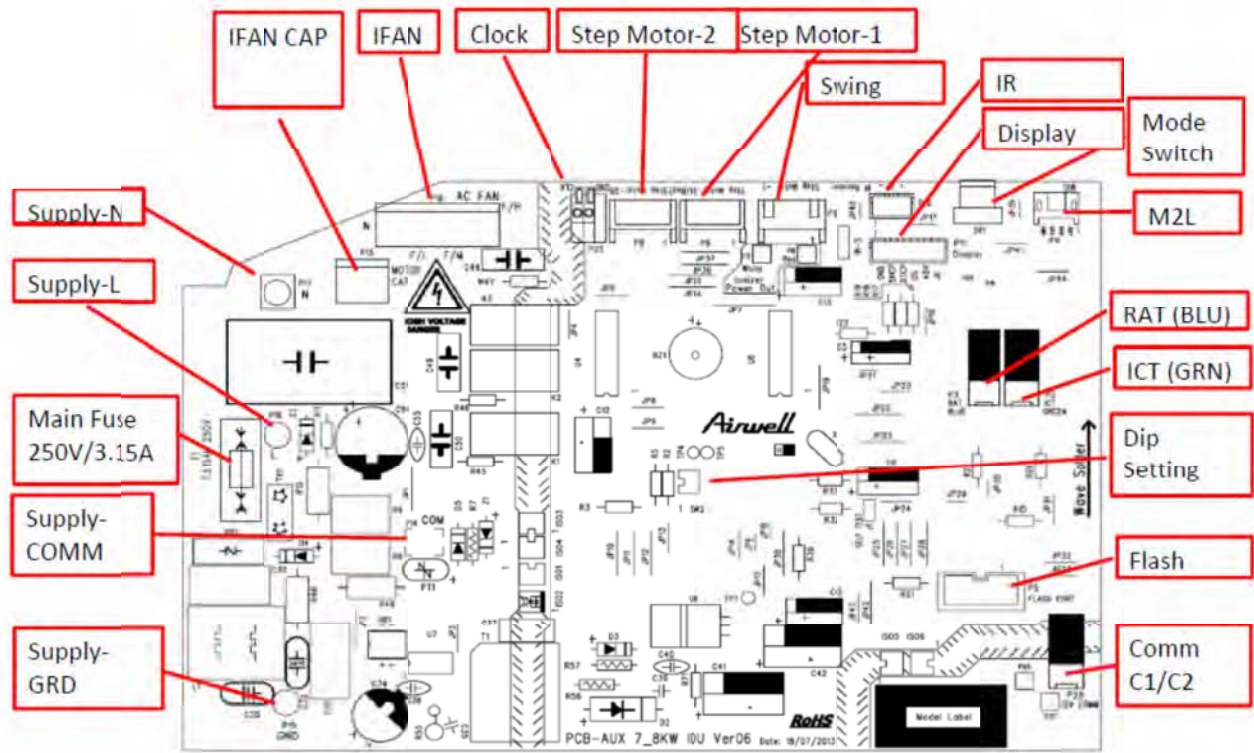
12.2.2.1 **Main Controller Outdoor Unit YBDE018/024**



12.2.2.2 **Main Controller Outdoor Unit YBDE030**



12.2.2.3 **Main Controller Indoor Unit HJD030**



### 12.2.3 Control Features

#### 12.2.3.1 Compressor

DC brush less and sensor less motor inverter driven compressor.

#### 12.2.3.2 Compressor Drive

DC inverter module to drive compressor.

#### 12.2.3.3 Outdoor Fan

YBDE 030: DC brush less motor(s) drive the outdoor unit fan.

YBDE 018/024: AC Triack motor(s) drive the outdoor unit fan.

#### 12.2.3.4 RV

Reverse Valve set the direction of refrigerant flow in the system, thus setting the operation mode for cooling or heating.

When the solenoid is powered, system will work in heat mode.

#### 12.2.3.5 EEV

Expansion valve operated by step motor which controls the size of the orifice.

#### 12.2.3.6 HMI

Consists of Four "7-Segments" + four push buttons for display, monitoring and setup features.

#### 12.2.3.7 Dry Contacts

Dry contacts are used to interface the system with an external building management system (BMS).

##### 12.2.3.7.1 ODU Dry Contacts (YBDE 030)

- **Night** input. Switches the system to night mode when closed. During night mode, the outdoor unit fan motor(s) and compressor speed will be reduced in order to reduce the system noise level.
- **SB** input. System will be turned to Stand-by when the contact is closed.
- **Power Shedding** input. Limits the maximum power consumption when closed.
- **Forced Mode** input. Force the mode to Cool or heat according HMI setup.
- **Alarm** output indicates a failure in the system.  
Alarm output will be activated when an ODU Faults/Protections occur. Alarm output will be OFF when the Fault/Protection is cleared.

##### 12.2.3.7.2 ODU Dry Contacts (YBDE 018/024)

- **Alarm** output indicates a failure in the system.  
Alarm output will be activated when an ODU Faults/Protections occur. Alarm output will be OFF when the Fault/Protection is cleared.

##### 12.2.3.7.3 IDU Dry Contacts

- Clock/Presence detector input.

12.2.3.8 **Temperature Sensors**

Action	CTT	OAT	OCT	OMT	HST	RGT	RLT	ICT	RAT
Compressor Speed Cool/Dry	P		P	P	P			P	+
Compressor Speed Heat	P	+(Multi)		P	P			P	+
OFAN Speed Cool	P		+	+	P				
OFAN Speed Heat			+	+	P				
EEV Cool	+	+		+		+(Multi)		+	+
EEV Heat	+	+	+				+(Multi)	+	+
Deicing		+	+						
Base Heater		+							
Indoor load (NLOAD)									+
IFAN Speed (Cool)									+
IFAN Speed (Heat)								+	+
Heating Element (Indoor)								+	

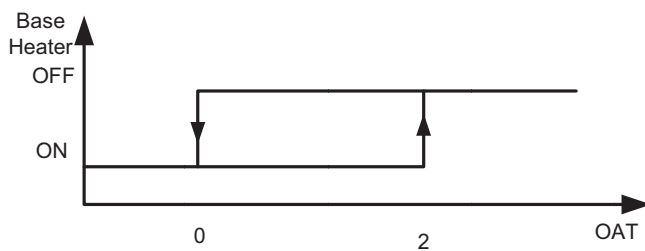
P – Sensor is acting only for protection.

+ - Sensor is active part of the control.

12.2.3.9 **Base Heater**

Heating element designed to melt any ice that is accumulated on the outdoor unit base during low heating operation.

The base heater will be working only when RV is “ON” according to the following graph:



When OAT is faulty the base heater will be “ON” continuously in HEAT mode.

## 12.3 General Operating Rules

### 12.3.1 Power up Sequence

After Power up A/C must perform some initialization procedures.

- Thermistors short/disconnect.
- Compressor Driver communication connected and error codes if any.
- Fans connected – check feedback.
- EEPROM power up parameters uploads.
- EEV initialization – zero process.
- ODU-IDU-DMSMP communication check.

### 12.3.2 Communication with Indoor Unit

#### 12.3.2.1 *Communication Failures Definition*

##### 12.3.2.1.1 'Bad Communication' fault

The system keeps a balance of a good/bad communication packet ratio. When the ratio becomes high the system enters 'Bad Communication' fault. The system recovers from that fault when the ratio becomes small again.

When in 'Bad Communication' fault, system continues its normal operation and fault code is shown in diagnostics.

##### 12.3.2.1.2 'No Communication' fault

If no legal transmission or no message received for 30 seconds, system enters 'No Communication' fault.

When in 'No Communication' fault, the fault code will be shown in diagnostics. In this case, the system will force the compressor to off.

The system will recover from 'No Communication' fault when counter is below 10 and legal message is received.

1. For the single split communication channel, whenever there is loose in the communication channel, the ODU unit will be forced to Idle mode.
2. For Multi split communication channel,

IDUs messages	Does DMSMP Message exist?	ODU report 'no-communication'	ODU force to Idle
All IDUs Loose comm.	No	Yes	Yes
All IDUs Loose comm.	Yes	No	Yes
			No.
Some IDUs loose comm.	Yes	No	The IDU channel Lost communication will be defined as inactive channel.

### 12.3.3 System Configuration Test

This test is continuously performed while the system is on:

#### 12.3.3.1 *Communication Channel Auto Detection (Single or Multi)*

System is continuously checking whether it is a single or multi system according to its 2 separate communication lines.



Case	Single split Channel	Multi Split Channel	Fault	Action
1 (Normal)	Detected	Not detected	No Fault	Continue to the next step
2 (Normal)	Not Detected	Detected	No Fault	Continue to the next step
3 (Abnormal)	Not Detected	Not Detected	'No Communication'	Present Fault under the HMI. Unit is forced to Idle mode.
4 (Abnormal)	Detected	Detected	'Mismatch between IDU and ODU models'	

12.3.3.2 **Model Plug & Indoor Capacity Test**

Test	How to check?	Error to report?	System Action (ODU Mode)
Jumper is inserted/DIP is configured	ODU model is 0 (zero).	"Missing ODU configuration"	Force to Idle mode.
Jumper/DIP is not defined in the software	ODU model is not defined	"Undefined ODU model"	Force to Idle mode
IDU-ODU capacity group mismatch	When ODU model is defined but the capacity group is not allowed.	"Mismatch between IDU and ODU models "	Force to Idle mode

The following combinations show the allowed and not allowed capacity group:

ODU Model	Communication channel	Is it allowed capacity group?				
		Indoor Capacity				
		0	1	2	3	4
AA (YBDE009 DCI)	Single	Yes	No	No	No	No
AB (YBDE012 DCI)	Single	No	Yes	No	No	No
AS (YBDE018 DCI)	Single	No	No	No	Yes	No
AT (YBDE024 DCI)	Single	No	No	No	No	Yes
AU (YBDE030 DCI)	Single	No	No	No	No	Yes

Capacity group	Capacity Code
Non Connected unit	0
0	1.0
1	1.5
2	1.7
3	2
4	3

12.3.4 Temperature Measurements

12.3.4.1 **Thermistors default value.**

Thermistor	Default value		System Reaction
	COOL	HEAT	
OCT	1°C	1°C	(1)
OAT	43°C	6°C	
CTT	43°C	43°C	
HST	75°C	75°C	
OMT	43°C	43°C	Replaced by OCT (1)
RGT	43°C	43°C	
RLT	43°C	43°C	
ICT	43°C	43°C	
RAT	SPT+4°C	SPT-4°C	

Notes:

- (1) Whenever both OCT and OMT are faulty the compressor will be forced to OFF.
- (2) Thermistor is defined as faulty (shorted/disconnected) if it's faulty for more than 10 seconds continuously. During this time, the system uses the last valid temperature

12.3.4.2 *The following thermistor faults are detected by the system:*

Thermistor	Thermistor is Disconnected	Thermistor is Shorted
OCT	Temp < -35 °C	Temp > 75 °C
OAT	Temp < -30 °C	Temp > 75 °C
CTT	Temp < -30 °C	Temp > 130 °C
HST	Temp < -30 °C	Temp > 125 °C
OMT	Temp < -30 °C	Temp > 75 °C
RGT	Temp < -30 °C	Temp > 75 °C
RLT	Temp < -30 °C	Temp > 75 °C
ICT	Temp < -30 °C	Temp > 75 °C
RAT	Temp < -30 °C	Temp > 75 °C

12.3.4.3 *System operation whenever a thermistor fault occurs*

#	Sensor	Single/Multi	Hydro/ Non Hydro	IDU Status	ODU Mode							Fault indication	System Operation
					Cool	Heat	Deicer	Idle	Technician/ Installation	ITU	TPT		
1.	OAT	Any	H/NH	Any	√	√	√	√		√	√	Yes	Normal
2.	OAT	Any	H/NH	Any					√			Yes	Stop Comp
3.	OCT	Any	H/NH	Any	√	√	√	√		√	√	Yes	Normal
4.	OCT	Any	H/NH	Any					√			Yes	Stop Comp
5.	CTT	Any	H/NH	Any	√	√	√	√	√		√	Yes	Stop Comp
6.	CTT	Any	H/NH	Any						√		Yes	Normal
7.	HST	Any	H/NH	Any	√	√	√	√	√	√	√	Yes	Stop Comp
8.	OMT	Any	H/NH	Any	√			√	√			Yes	Stop Comp
9.	OMT	Any	H/NH	Any		√	√			√	√	Yes	Normal
10.	RGT <sub>i</sub> /RLT <sub>i</sub>	Multi	NH	Inactive (Available)	√	√		√	√	√	√	Yes	Normal
11.	RGT <sub>i</sub> /RLT <sub>i</sub>	Multi	NH	Inactive (Unavailable)	√	√		√	√	√	√	No	Normal
12.	RGT <sub>i</sub>	Multi	NH	Active		√			√	√	√	Yes	Normal
13.	RLT <sub>i</sub>	Multi	NH	Active	√				√	√	√	Yes	Normal
14.	RGT <sub>i</sub> / RLT <sub>i</sub> /ICT <sub>i</sub>	Multi	NH	Any			√		√	√	√	Yes	Normal
15.	ICT	single	H/NH	NA	√	√		√	√			Yes	Stop Comp
16.	ICT	single	H/NH	NA			√			√	√	No	Normal
17.	LWT	single	H	NA	√	√	√	√	√			Yes	Stop Comp
18.	LWT	single	H	NA						√	√	Yes	Normal
19.	EWT	single	H	NA	√	√	√	√	√			Yes	Stop Comp
20.	EWT	single	H	NA						√	√	Yes	Normal
21.	IRT	single	H	NA	√	√		√	√			Yes	Stop Comp
22.	IRT	single	H	NA			√			√	√	No	Normal

## 12.4 Indoor Unit Control

### 12.4.1 Load calculation

LOAD is calculated according to the difference between actual room temperature and user set point temperature by PI control.

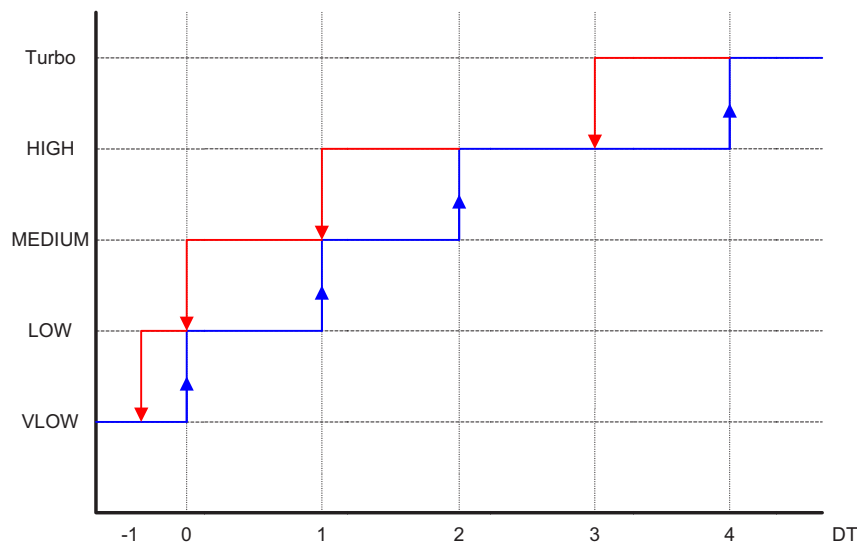
In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.

In AutoFan user setting, fan speed will be adjusted automatically according to the calculated LOAD.

### 12.4.2 Indoor Fan Control

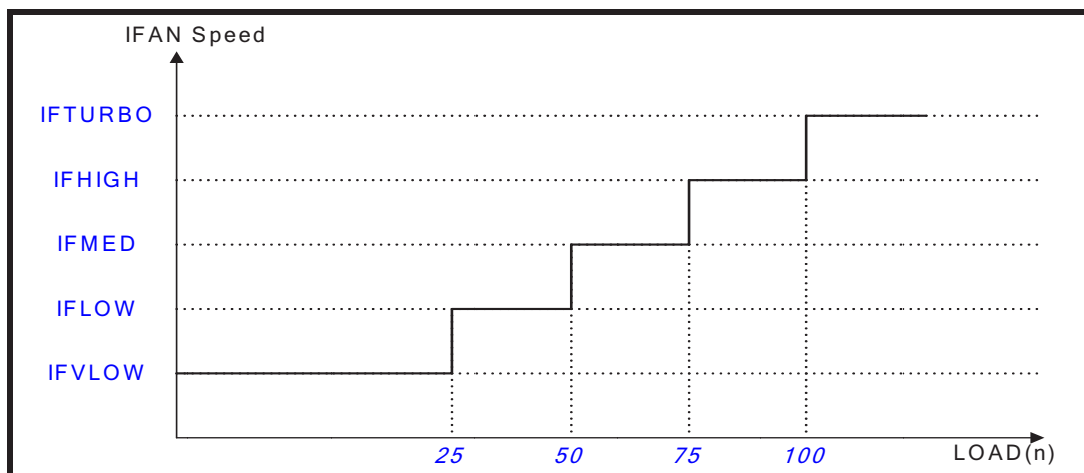
#### 12.4.2.1 Indoor fan control - FAN Mode

- When T/H/M/L speed is set by user, IFAN will work in constant requested speed.
- When Auto-Fan is set by user, IFAN speed will be set according to the following graph:



#### 12.4.2.2 Indoor fan control - Cool Mode

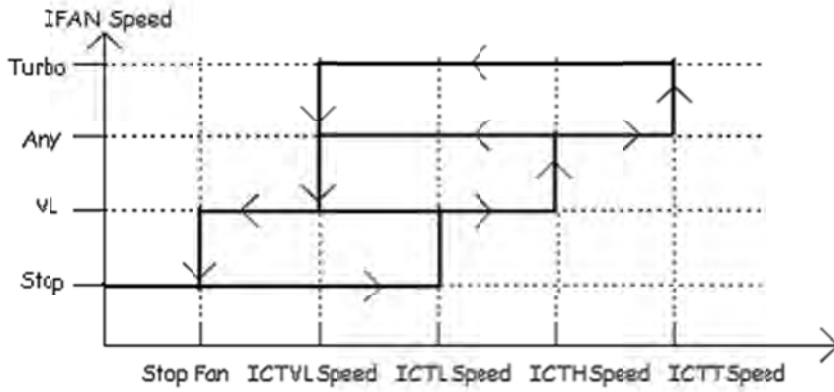
- When T/H/M/L speed is set by user, IFAN will work in constant requested speed.
- When Auto-Fan speed is set by user, IFAN speed will be set according to LOAD(n) as in the following graph:



12.4.2.3 Indoor fan control – Heat Mode

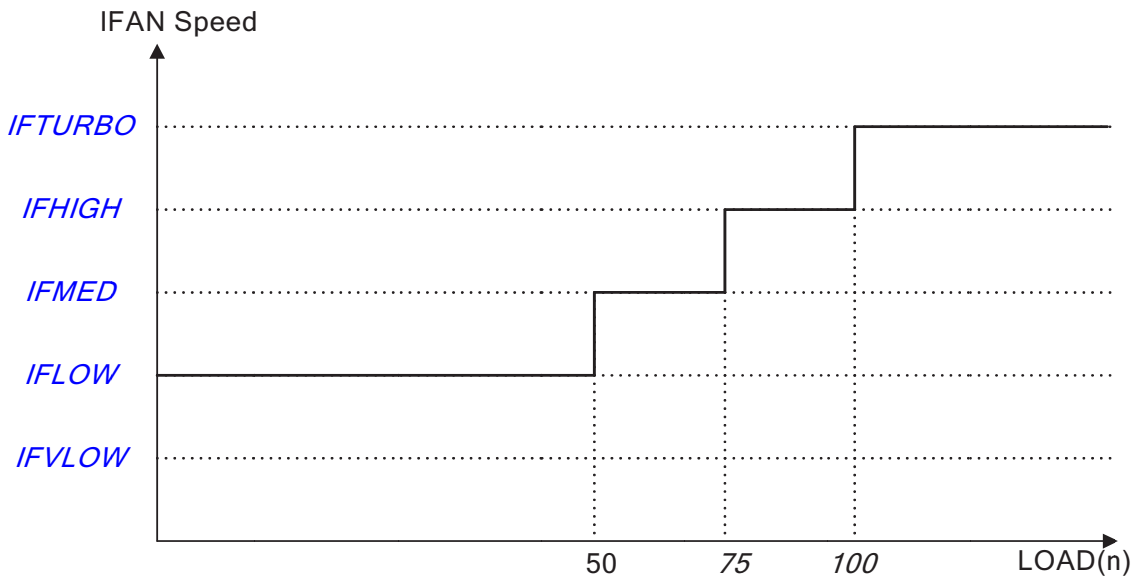
12.4.2.3.1 IFAN Operation in set speed

When in heat mode, including protections and except Deicing, IFAN will be working according to the graph below.



12.4.2.3.2 IFAN Operation in Auto Fan Mode

IFAN speed will be set automatically according to Load<sub>(n)</sub> by the following graph:



### 12.4.3 Cooling Mode

#### 12.4.3.1 *Cooling Mode – General*

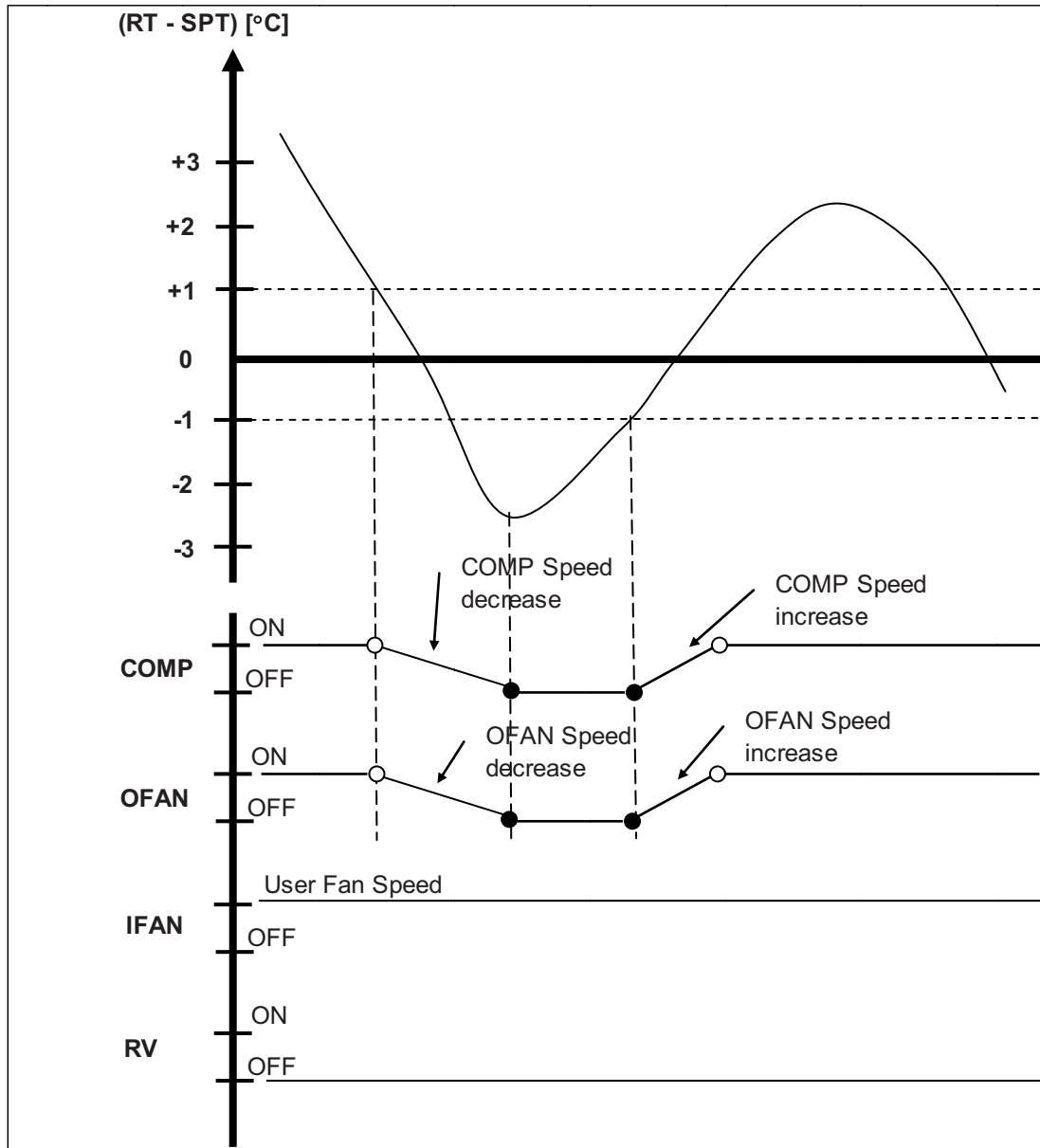
- a. Mode Definition
  - Mode: COOL, AUTO (at Cooling)
  - Temp: Selected desired temperature.
  - Fan: LOW, MED, HIGH, TURBO, AUTO.
  - Timer: Any
  - I-FEEL: ON or OFF
- b. Room Temperature, RT, is detected by:
  - RAT in normal operation, or
  - RCT (R/C sensor) in I-FEEL mode.
- c. Indoor Coil Temp is detected by ICT.

#### 12.4.3.2 *Control Functions*

- a. **COMP** Operation
  - In general – the operation is set by the NLOAD calculation in indoor unit side.
  - Other rules are according to section 12.5.2.
- b. **OFAN** Operation
  - In normal operation OFAN operates together with the COMP.
  - Other rules are according to section 12.5.4.
- c. **IFAN** Operation
  - IFAN will operate in ANY speed regardless the ICT or COMP state.
  - IFAN speed will be determined according to user selection or AUTO-FAN logic (see para. 12.4.2.2)
- d. **RV** is OFF during COOL mode.
- e. **HEATERS** are OFF during COOL mode.
- f. **Pump** operates in any mode.

12.4.3.3 *Sequence Diagrams*

Maintaining room temp at desired level by comparing RT and SPT with user defined IFAN speed.



## 12.4.4 Heating Mode

### 12.4.4.1 Heating - General

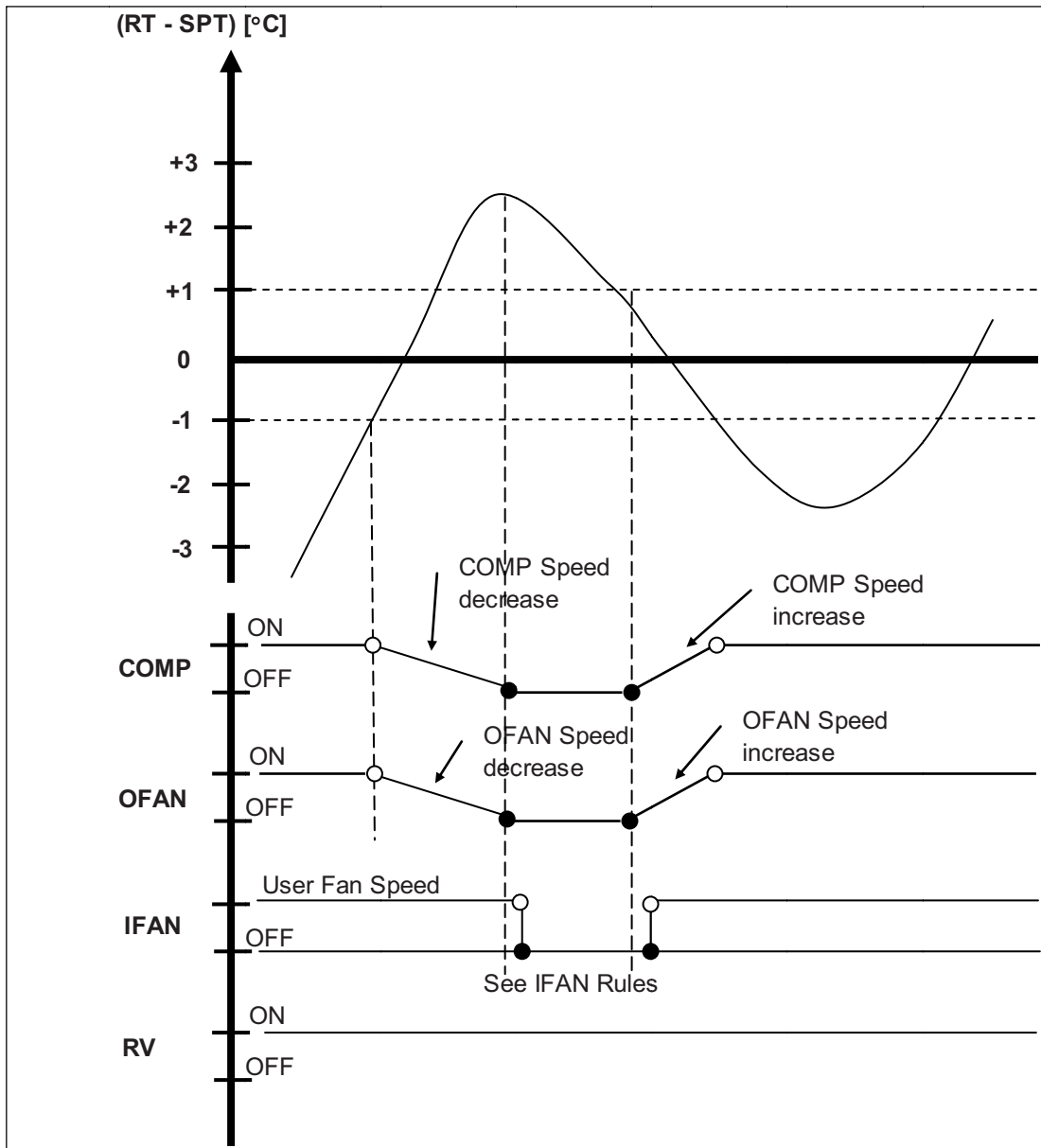
- a. Mode Definition
  - Mode: HEAT, AUTO (at heating)
  - Temp: Selected desired temperature
  - Fan: LOW, MED, HIGH, TURBO, AUTO.
  - Timer: Any
  - I-FEEL: ON or OFF
- b. Room Temperature, RT, is detected by:
  - RAT in normal operation, or
  - RCT (R/C sensor) in I-FEEL mode.
- c. Indoor Coil Temp is detected by ICT.

### 12.4.4.2 Control Functions

- a. **COMP** Operation
  - In general – the operation is set by the NLOAD calculation in indoor unit side.
  - Other rules are according to section 12.5.2.
- b. **OFAN** Operation
  - In normal operation OFAN operates together with the COMP.
  - Other rules are according to section 12.5.4.
- c. **IFAN** operation:
  - IFAN will operate according to heat mode rules. See section 12.4.2.3.
- d. **RV** is ON during HEAT mode.
- e. **Heaters** – See section 12.4.9.
- f. **Pump** is OFF during heat mode.

12.4.4.3 **Sequence Diagram**

Maintains room temp. at desired level by comparing RAT or RCT to SPT.



12.4.4.4 **Temperature Compensation**

A compensation value of 2-4 degrees is 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.

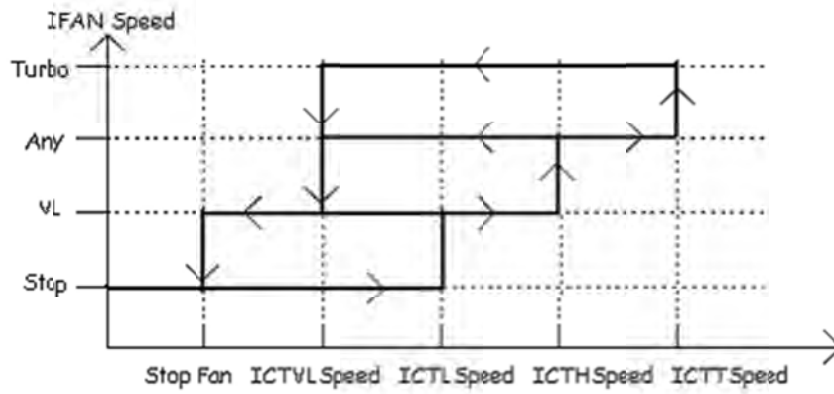
The temperature compensation can be enabled/disabled by closing/opening J2 on the indoor unit controller.

No compensation will be activated in Forced operation modes.



12.4.4.5 **Indoor Fan Control in Heat Mode**

When in heat mode, including protections and except Deicing, and when the conditions in the table below are fulfilled, IFAN will be working according to the graph below.



**12.4.5 Automatic Cooling or Heating**

**12.4.5.1 Automatic Cooling or Heating - General**

- a. Mode Definition

Mode: AUTO

Temp: Selected desired temperature

Fan: Any

Timer: Any

I-FEEL: ON or OFF

**12.4.5.2 Control Functions**

- a. Switching-temperature between Cooling and Heating is  $SPT \pm 3^{\circ}C$ .
- b. When the AUTO Mode is started with  $SPT \pm 0^{\circ}C$ , the unit will not select Auto Heat or Auto Cool mode immediately. Instead, the unit will be in a temporary FAN Mode with IFAN operating at low speed. The proper Auto Heat mode or Auto Cool will be started whenever the RT reaches  $SPT-1^{\circ}C$  or  $SPT+1^{\circ}C$  respectively.
- c. Mode change between Auto Heat & Auto Cool Modes is possible only after the COMP has been OFF during the last T minutes.

Mode Change	Time, T
Auto Cool to Auto Heat	3 min
Auto Heat to Auto Cool	4 min

- d. When unit is changed form Cool/Dry Mode to Auto Mode, the unit will continue to operate in (Auto) Cool Mode until the conditions for switching from Auto Cool to Auto Heat are satisfied.
- e. When unit is changed from Heat Mode to Auto Mode, the unit will continue to operate in (Auto) Heat Mode until the conditions for switching from Auto Heat to Auto Cool are satisfied.

## 12.4.6 Dry Mode

### 12.4.6.1 **DRY - General**

#### a. Mode Definition

Mode: DRY

Temp: Selected desired temperature

Fan: LOW (automatically selected by software)

Timer: Any

I-FEEL: ON or OFF

### 12.4.6.2 **Control function**

#### a. COMP Operation

In general – the operation is set by the NLOAD calculation in indoor unit side.

Other rules are according to section 12.5.2.

#### b. OFAN Operation

In normal operation OFAN operates together with the COMP.

Other rules are according to section 12.5.4.

#### c. IFAN Operation

LOW only.

#### d. RV

RV is in OFF state during DRY mode.

#### e. HEATERS

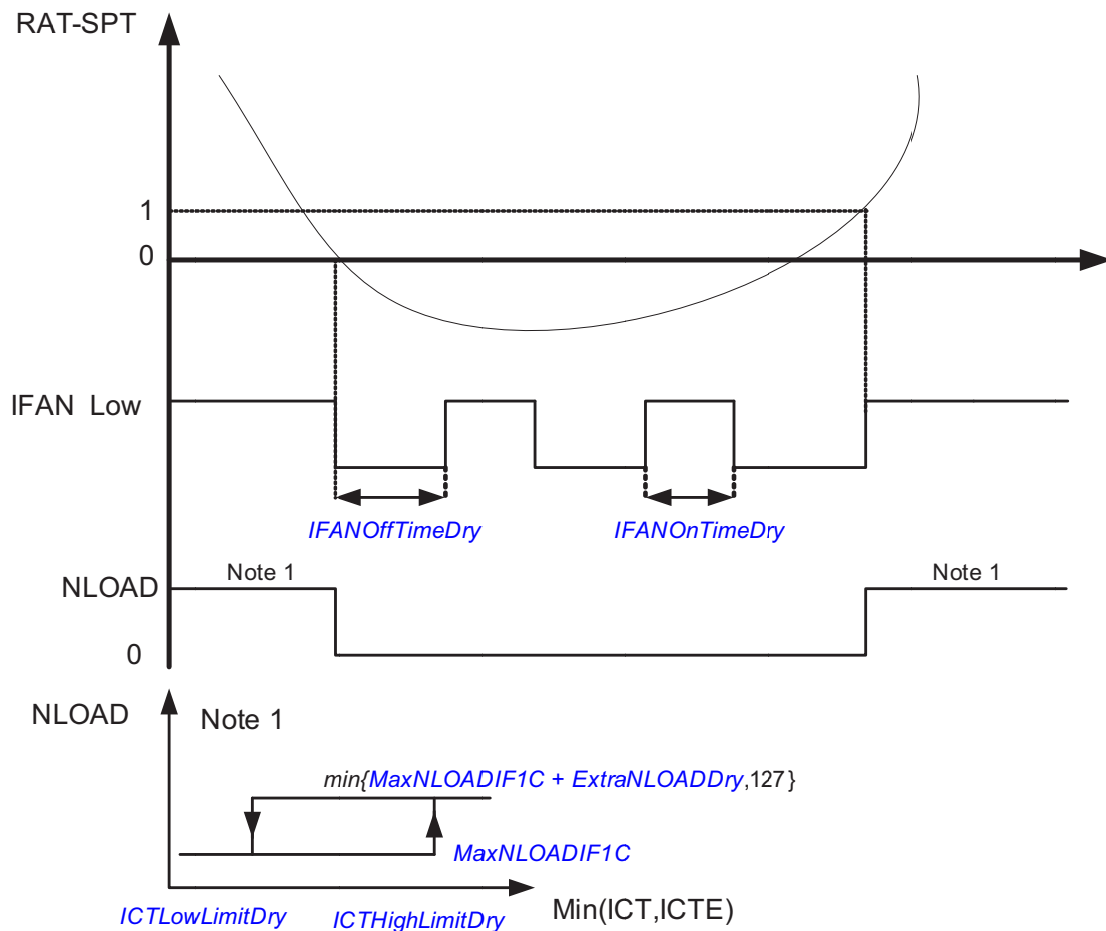
HEATERS are in OFF state during DRY mode.

#### f. Pump

Pump operates in cool/dry mode.

### 12.4.6.3 **Sequence Diagrams**

Reduce room humidity with minimum temp. fluctuations by operating in Cool Mode with LOW speed IFAN.



## 12.4.7 Sleep Mode

### 12.4.7.1 Sleep Mode - General

#### a. Mode Definition

Mode: Any

Temp: Selected desired temperature

IFan: Any

Timer: See below

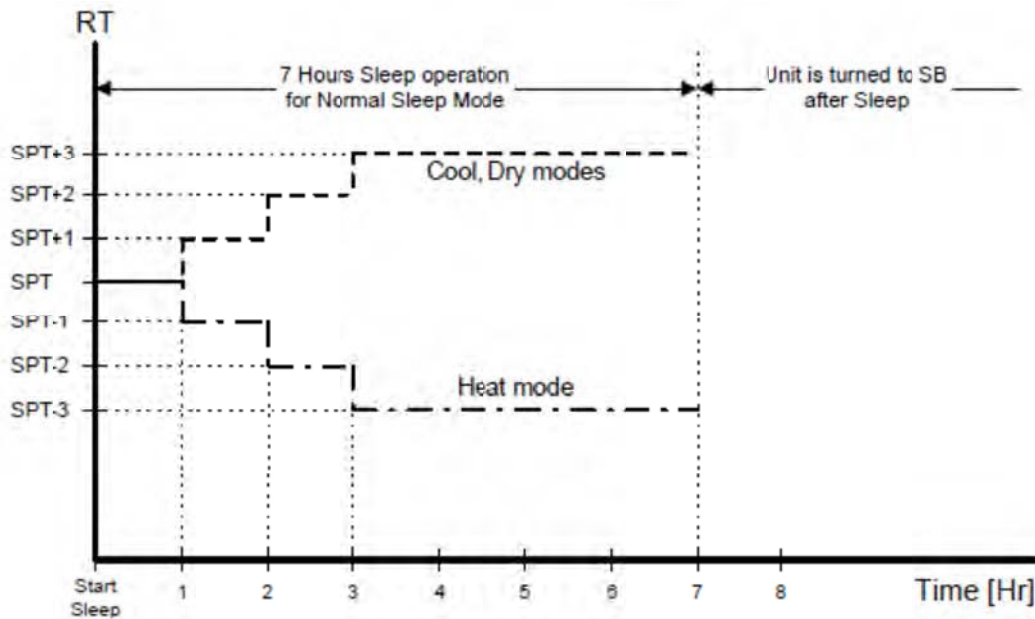
I-FEEL: ON or OFF

### 12.4.7.2 Control function

- The Sleep mode is activated by using the SLEEP button on the R/C. In Sleep Mode, the unit will automatically adjust the SPT to turn up/down the room temperature (RT) gradually to provide maximum comfort for the sleeping user.
- Sleep is treated as TIMER function. Therefore, the TIMER LED is activated similar to TIMER function.
- In COOL, AUTO COOL or DRY modes, the SPT adjustment is positive (from 0 to +3oC).

- In HEAT or AUTO HEAT modes, the SPT adjustment is negative (from 0 to -3oC).
- In other modes, there is no SPT adjustment.
- The SPT adjustment is cancelled when the Sleep mode is cancelled.
- If OFF-timer is active, the unit may go to SB before or after 7 hours of sleep operation.

12.4.7.3 **Sequence Diagrams**



12.4.8 **Forced Operation**

Forced operation is set by the mode button on the Display Board and allows to start, stop and operate in Cooling or Heating, in pre-set temperature according to the following table:

Forced operation Mode	Pre-set Temperature
Cooling	20 <sup>o</sup> C
Heating	28 <sup>o</sup> C

**NOTES**

- While under the forced operation, the temperature compensation is disabled.
- The IFAN is always set to Autofan Speed in forced operation.

12.4.9 **Indoor Units Operation when Indoor Unit Mode is Different than Outdoor Unit Mode**

- Open louvers according to user selection.
- Indoor fan is forced to OFF.

12.4.10 Indoor Unit Dry Contact

Status	Function	Contact = Open	Contact = Short
J9 = Open	Clock	See below	See below
J9 = Short	Presence Detector Connection	No action – normal operation	Forced to STBY

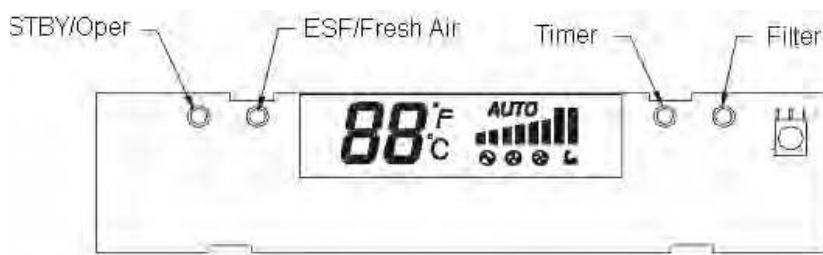
The Clock is activated according to the following table:

A/C STATE (before clock is changed)	CLOCK STATE (before clock is changed)	CLOCK ACTION (clock is changed)	A/C NEW STATE (after clock is changed)
ON	1	0	OFF
ON	0	1	ON
OFF	0	1	ON
OFF	1	0	OFF

12.4.11 On Unit Controls and Indicators (Ducted Indoor units)

<b>STAND BY INDICATOR</b>	Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands
<b>PERATION INDICATOR</b>	Lights up during operation. Blinks for 300 msec to announce that a R/C infrared signal has been received and stored. Blinks continuously during protections (according to the relevant spec section).
<b>TIMER INDICATOR</b>	Lights up during Timer and Sleep operation.
<b>FILTER INDICATOR</b>	Lights up after fix period of operation to indicate that filter needs to be cleaned.
<b>COOLING INDICATOR</b>	Lights up when system is switched to Cool Mode by using the Mode Switch <u>on the unit.</u>
<b>HEATING INDICATOR</b>	Lights up when system is switched Heat Mode by using the Mode Switch <u>on the unit.</u>
<b>Mode SWITCH (COOL/HEAT/OFF)</b>	Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB → ... In long pressing system enters diagnostic mode.

12.4.1 On Unit Controls and Indicators (HJD 009/012/018/024 LCD Display)



	STBY	Cool	Heat	Auto	Fan	Dry
88	OFF	SPT(1*)	SPT(1*)	SPT(1*)	SPT(1*)	SPT(1*)
C	OFF(2*)	ON(2*)	ON(2*)	ON(2*)	ON(2*)	ON(2*)
F	OFF(2*)	OFF(2*)	OFF(2*)	OFF(2*)	OFF(2*)	OFF(2*)
(Low)	OFF	User setting IFAN speed	User setting IFAN speed	User setting IFAN speed	User setting IFAN speed	User setting IFAN speed
(Med)	OFF					
(High)	OFF					
(Turbo)	OFF					
AUTO	OFF					
(Auto)						
Backlight(red)	OFF	OFF	ON(3*)	ON(3*)	ON(3*)	OFF
Backlight(green)	OFF	ON(3*)	OFF	ON(3*)	ON(3*)	ON(3*)

12.4.2 On Unit Controls and Indicators (HJD 030 LCD Display)



OPERATION INDICATOR	<ol style="list-style-type: none"> <li>Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands</li> <li>Blinks continuously during protections (according to the relevant spec section).</li> <li>Blinks for 300 ms, to announce that R/C infrared signal has been received and stored.</li> </ol>
7-segments (x2)	<ol style="list-style-type: none"> <li>Shows user SPT 16-32.</li> <li>Show error code during diagnostics mode</li> </ol>
TIMER INDICATOR	Lights up during Timer operation.
SLEEP INDICATOR	Lights up during Sleep operation.
DRY INDICATOR	Lights up when system is in Dry Mode by using the R/C.
COOLING INDICATOR	Lights up when system is in Cool Mode by using the R/C or the Mode Switch <u>on the unit</u> .
HEATING INDICATOR	Lights up when system is in Heat Mode by using the R/C or the Mode Switch <u>on the unit</u> .
Mode SWITCH (COOL/HEAT/OFF)	Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB → ... In long pressing system enters diagnostic mode.

12.4.3 Outdoor Unit Controllers and Indicators

12.4.3.1 The user display uses three 7 segments.

12.4.3.2 The user interface concept is Tree menus.

12.4.3.3 The navigation through the menu can be performed by either the key pad or RC8 remote controller (through infra red receiver).

Command Type	Function	Keypad	Remote controller	RC8 sketch:
Up or Down command	Scrolling among options (up and down).	Up or Down key button.	<b>Up:</b> Set Point '+' <b>Down:</b> Set Point '-'	

<b>Selection command</b>	Go down one level in the menu or select an option.	Select button	FAN mode	
<b>Escaping command</b>	Go up one level in the menu	Escape button	Oper/STBY	
<p>Note: the buttons above are selected according to RC8 design (refer to RC8 specifications) for the technician convenient use.</p>				

1. The navigation type selection, remote controller or keypad, is set through software parameter: *HMIType=0* (keypad), *HMIType=1* (remote controller)
2. The following table summarizes the remote controller commands:

Command Type	Pressed Button	Values on the IR protocol						
		SPT	Oper	FAN	Sleep	Horizontal Louver	I-FEEL	Other bits
Up	'+'	30	0	0	0	0	0	0
Down	'-'	16	0	0	0	0	0	0
Escape	Oper	Don't care	1	0	0	0	0	0
Enter	FAN	Don't care	0	01	0	0	0	0
Reserved	Sleep	Don't care	0	0	1	0	0	0
Reserved	Horizontal Louver	Don't care	0	0	0	1	0	0
Reserved	I-FEEL	Don't care	0	0	0	0	1	0
-	Other	20	0	0	0	0	0	0

Notes:

1. The zeros stated above must be checked in order to judge for proper message.
2. Proper checksum has to be performed according to the RC7 specifications.

3. For any remote controller command, the most right 'dot' will blink for 1 second in order to acknowledge the command is received.

**12.4.3.4 Active selection or status will be indicated by blinking the display.**

**12.4.4 Keys functionality**

- o Scrolling will be done whenever the button is pressed.
- o When scrolling alpha values, if the scroll button is held in, the selection will change at the rate of one step per second.
- o The display will not roll over during selection (for example stop/Ode/Dia/Stp/Par/stop)



**Fault Code:**

No	Problem	5	4	3	2	1
1	OCT is shorted/disconnected	0	0	0	0	1
2	CTT is shorted/disconnected	0	0	0	1	0
3	HST is shorted/disconnected	0	0	0	1	1
4	OAT is shorted/disconnected	0	0	1	0	0
5	OMT is shorted/disconnected	0	0	1	0	1
6	RGT is shorted/disconnected	0	0	1	1	0
7	RLT is shorted/disconnected	0	0	1	1	1
8	High Pressure Protection (for water Hydro units)	0	1	0	0	0
9	Reserved (for 4-5-6 HP)	0	1	0	0	1
10	Reserved (for 4-5-6 HP)	0	1	0	1	0
11	a) Compressor IPM Fault b) IPM Driver Pin c) Compressor Current Sensor Fault	0	1	0	1	1
12	No Water Flow (For Hydro Units only)	0	1	1	0	0
13	Reserved	0	1	1	0	1
14	a) DC under voltage b) DC over voltage	0	1	1	1	0
15	a) AC under voltage b) AC over Voltage c) Zero Crossing detection	0	1	1	1	1
16	a) Mismatch between IDU & ODU models b) Missing ODU configuration c) Undefined ODU Model d) HW Type and ODU model mismatch	1	0	0	0	0
17	No Communication	1	0	0	0	1
18	System Over Power	1	0	0	1	0
19	PFC Current sensor	1	0	0	1	1
20	Heat sink Over Heating	1	0	1	0	0
21	Deicing	1	0	1	0	1
22	Compressor Over Heating	1	0	1	1	0
23	Compressor Over Current	1	0	1	1	1
24	No OFAN Feedback	1	1	0	0	0
25	a) OFAN IPM fault b) OFAN IPM Driver Pin	1	1	0	0	1
26	Compressor Lock	1	1	0	1	0
27	Indoor Coil defrost	1	1	0	1	1
28	Reserved	1	1	1	0	0
29	Indoor Sensor Fault (for water Hydro units and DX)	1	1	1	0	1
30	a) Outdoor Coil Overheating b) Indoor Coil Overheating	1	1	1	1	0
31	Operation conditions exceeded	1	1	1	1	1

## **12.5 Run Mode**

Run mode is the default operation mode of the system. This is the standard operation mode that is active in field application (at customer site).

System can go from run mode to other operation modes through keyboard or serial ports.

### **12.5.1 Mode Setting**

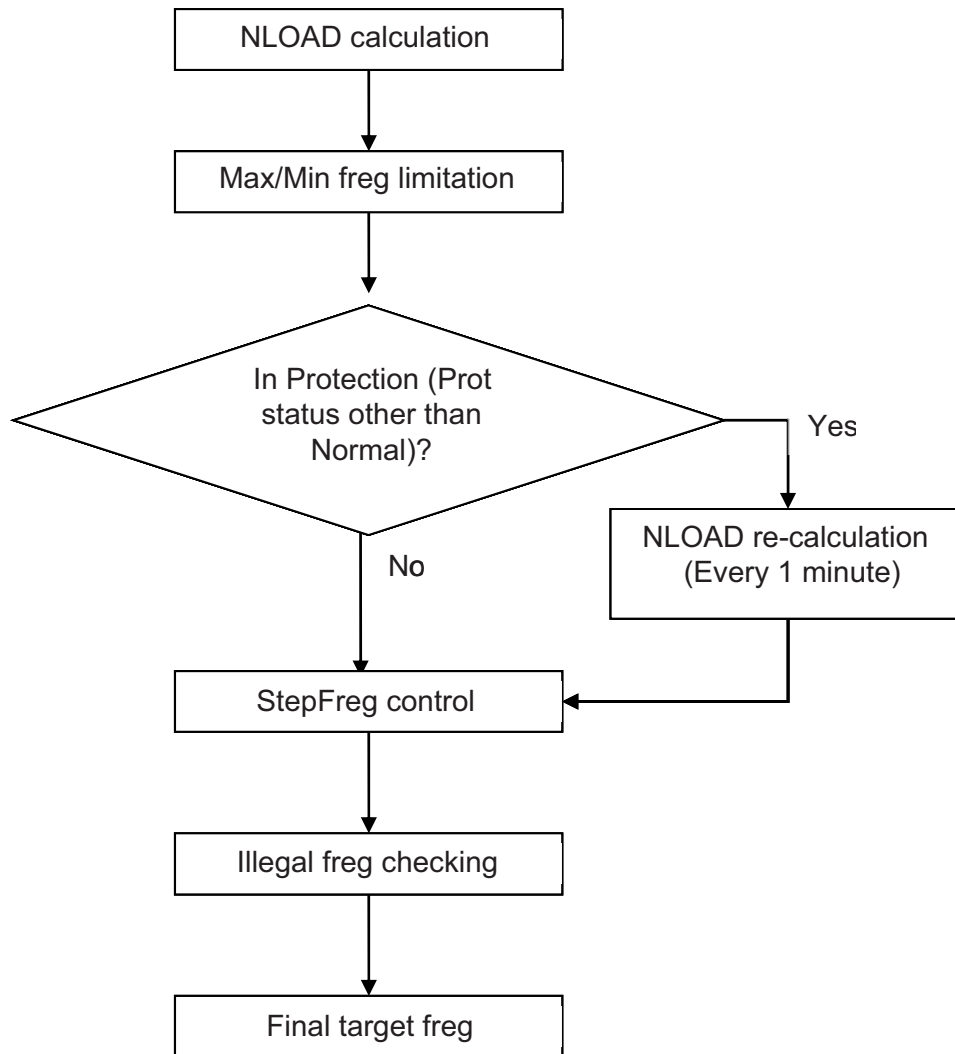
Thermal mode defines the ODU operation mode. There are three possible operation modes:

1. STBY – Standby mode
2. COOL - the unit operate at cooling cycle
3. HEAT - the unit operates at heat pump cycle (deicer will be treated as sub-mode of heat mode in the thermal Mode setting).

The last mode will be stored in the EEPROM, and it will be restored on system power up, where the default value is STBY.

## 12.5.2 Compressor Speed Control

The following diagram describes the sequence of the Target Frequency calculations:



### 12.5.2.1 Compressor Min On/Off time

Compressor minimum ON and OFF time is 3 minutes except during protections.

### 12.5.2.2 Compressor Startup

When started, compressor speed reaches certain level (usually 30÷40 RPS) and will not go below that during the first 5 minutes except when compressor is forced OFF.

### 12.5.2.3 Compressor start up fail

If the compressor does not succeed to complete the startup procedure, it retries the startup procedure every 10 seconds and up to 3 minutes than it will report a compressor lock or unusual behavior.

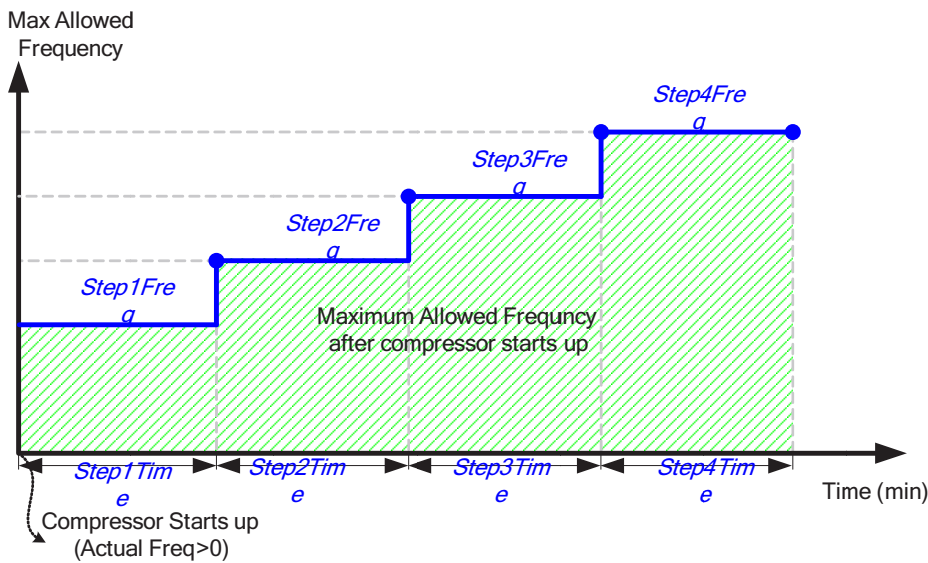
### 12.5.2.4 Compressor operation while OFAN Error

In case an OFAN error occurred for 10 continues seconds and the compressor is on, the compressor will be set to OFF until OFAN error will recover.

### 12.5.2.5 Speed Change Limitations

Acceleration and deceleration will be 1 RPS/sec.

12.5.2.6 **Speed Step Limitations**



12.5.2.7 **Illegal frequencies**

Illegal Frequencies are values that the unit is not allowed to be working at. The frequencies and values within tolerance of  $\pm 2$  Hz are not allowed.

12.5.2.8 **Compressor shutdown Cases**

#	Shutdown Reason
1	Single: ODU NLOAD=0 (or IDU protections)
2	Single: IDU change to STBY.
3	Multi: All IDUs become inactive.
4	Deicing (both when going from heat to cool and from cool to heat)
5	ODU Protections
6	Sensor faults
7	HPS protection
8	LPS protection
9	OFAN-ERR (Up and Down)
10	PFC TRIP
11	Water Overflow

12.5.2.9 **Compressor target frequency**

During normal operation (excluding protections) the compressor target frequency is set according to the ODU NLOAD number received from the indoor unit.

ODU NLOAD	Target Frequency [Hz]
0	0
$0 < \text{ODU NLOAD} \leq \text{MinFreq}$	MinFreq
$> \text{MinFreq}$	Linear relation between Min and Max freq.

**12.5.3 EEV Control**

**12.5.3.1 EEV General Rules**

The EEV is controlled to keep the optimal system performance at all times. It is done by means of discharge superheat temperature and optimum compressor temperature control.

The target EEV value is the sum of open loop value (OL) and a result of the accumulative correction values (CV).

$$EEV_i = EEV_{OLi} + \sum EEV_{CVi}$$

**12.5.3.2 EEV initialization procedure**

After power up, the EEVs perform initialization procedure while it closed completely and reopened to predefined position.

**12.5.3.3 Balance time**

During the first 5 minutes after SB the correction is not calculated. After that the correction value is updated every *EEV<sub>CVTConst</sub>* seconds.

**12.5.3.4 Operation Range**

The EEV operation range is defined according to the operation mode as following:

Comp Status	ODU Mode	EEV
On	COOL	From <i>EEV<sub>MinOperOpenC</sub></i> to <i>EEV<sub>MaxOperOpenC</sub></i>
On	HEAT	From <i>EEV<sub>MinOperOpenH</sub></i> to <i>EEV<sub>MaxOperOpenH</sub></i>
On/Off	De-ice	<i>EEV<sub>DeiceOpenSingle</sub></i>
OFF	Cool/Heat/Idle	400

**12.5.3.5 EEV initial value determination (EEV<sub>OLi</sub>)**

The EEV initial value (open loop) is determined according to the operation mode, the actual compressor speed and indoor/outdoor conditions.

**12.5.3.6 EEV correction definition (EEV<sub>CVi</sub>)**

The following table describes the closed loop control type (EEV correction):

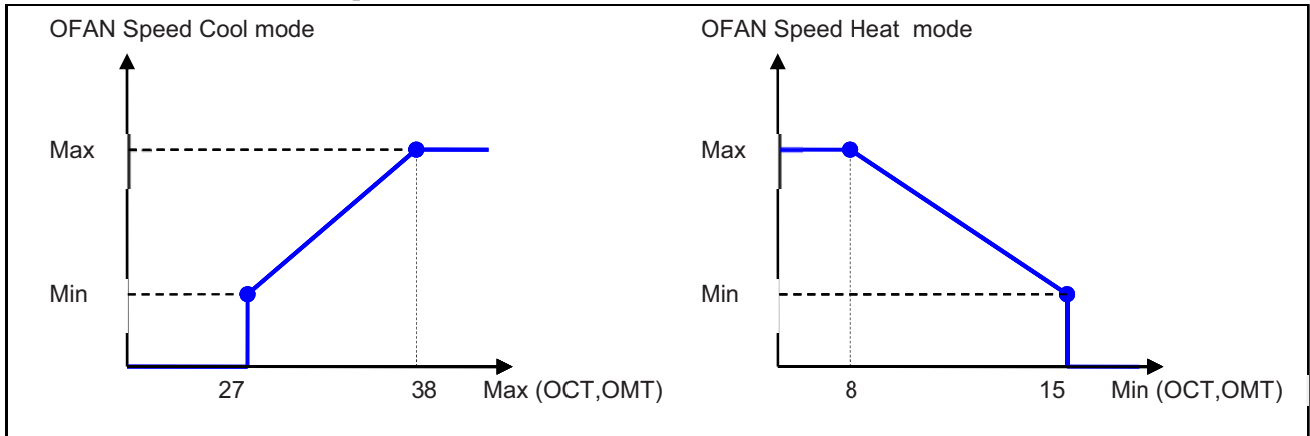
Mode	Main EEV
Cool	<ul style="list-style-type: none"> <li>• Target CTT</li> <li>• Discharge super heat protection</li> <li>• CTT Protection</li> </ul>
Heat	<ul style="list-style-type: none"> <li>• Target CTT</li> <li>• Discharge super heat protection</li> <li>• CTT Protection</li> <li>• Sub-cooling (SC) protection</li> </ul>

## 12.5.4 Outdoor Fan Speed Control

### 12.5.4.1 General Rules

The OFAN operation keeps the outdoor heat exchanger temperature within predefined values by increasing or reducing the OFAN speed.

Note - Whenever the OFAN speed is abnormal, the OMT and OCT sensors need to be checked.



### 12.5.4.2 Night mode

During night mode, the OFAN and the compressor will be limited to lower speeds.

### 12.5.4.3 Behavior when there is a failure in OFAN

Whenever OFAN fault occurs the compressor will be stopped immediately.

### 12.5.4.4 Protection Behavior

OFAN will enter protection speed according to CTT / HST / OMT protection level. Whenever one of these protections is entered, OFAN will also speed up/down (Cool/heat) accordingly.

## 12.6 Thermodynamic Protections

### 12.6.1 ODU Protections

#### 12.6.1.1 Protection types

There are 2 types of protections: Thermodynamic protections and Cut-Off protections:

Thermodynamic protections	Cut-Off protection
Compressor AC over current	Low Pressure Switch
Compressor DC over current / Driver Overload	High Pressure Switch
Heat Sink Overheating	Overflow
Indoor coil overheating	Exceeding Operation Conditions
Outdoor coil overheating	Abnormal Behaviour
Compressor overheat protection	
Indoor coil defrost	

#### 12.6.1.2 Protection status

Thermodynamic protections are based on reducing compressor frequency when needed. The following represent the possible protection status and their actions.

Protection Status	General Description
Normal	No protection
Hz Up	Compressor freq is allowed to increase slowly
Stop Rise	Compressor frequency is not allowed to rise
Hz Down1	Compressor frequency is reduced
Hz Down2	Compressor frequency is reduced
Stop compressor	Compressor is stopped

Each protection has protection status. The following are the possible protection statuses:

Protection Status	Active in?			
	Cool\Heat	Deicer	Technician/ Installation	ITU
Normal	√	√	√	√
Hz Up	√	x	x	x
Stop Rise	√	x	x	x
Hz Down1	√	x	x	x
Hz Down2	√	x	x	x
Stop compressor	√	√	√	√

Operation logic of all thermodynamic protections is the same. The controlled input (CTT, HST, ACC, DCC/OVPWR, OMT, ICT) is controlled by changing the protection level using the fuzzy logic algorithm according the input level and the change rate.

The following table summarizes the basic levels of each protection:

Protection level	Compressor Overheat	Heat Sink Overheat	AC Overcurrent	DC Overcurrent/ Overpower	Outdoor Coil Overheat	Indoor Coil Overheat	Indoor Coil Freeze
SC	CTTOH5	HSTOH5	CCROC3	DCROC3/ OVRPWR3	OMTOH5	ICTOH5	ICTDEF5
D2	CTTOH4	HSTOH4	-	-	OMTOH4	ICTOH4	ICTDEF4
D1	CTTOH3	HSTOH3	CCROC2	DCROC2/ OVRPWR2	OMTOH3	ICTOH3	ICTDEF3
SR	CTTOH2	HSTOH2	CCROC1	DCROC1/ OVRPWR1	OMTOH2	ICTOH2	ICTDEF2
HzUp	CTTOH1	HSTOH1	CCROC0	DCROC0/ OVRPWR0	OMTOH1	ICTOH1	ICTDEF1
Normal	CTTOH0	HSTOH1	-	-	OMTOH0	ICTOH0	ICTDEF0

### 12.6.1.3 Total Protection Level Definition

The total protection level is defined by the higher level of protection received.

## 12.6.2 Deicing

### 12.6.2.1 Deicing Starting Conditions

Deicing operation will start when either one of the following conditions exist:

Case 1: OCT is 8 degree lower then the ambient temp and the minimum time from the last deicer is passed

Case 2: OCT is 12 degree lower then the ambient temp and 30 minutes from the last deicer wa passed.

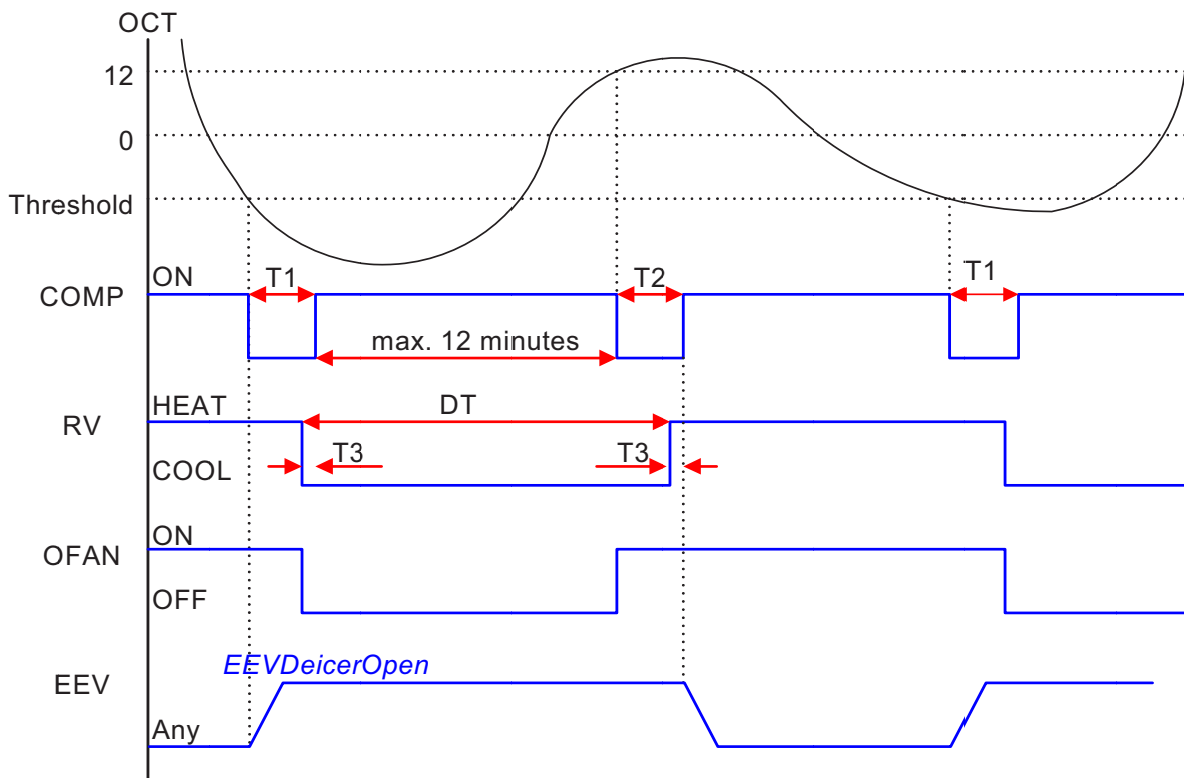
Deicing interval time when compressor is first started in heat mode, is 10 minutes if OCT < -2, and is 40 minutes in other cases.

Deicing interval time is changed (increased/ decreased in 10 minutes steps) as a function of deicing time.

In case one of the thermistors is bad the deicer will initiate in predefined intervals

Deicer may accure also when the unit switch to stanby and the OCT is 8 degree lower then ambient temperature

### 12.6.2.2 Deicing Protection Procedure



T1 = T2 = 36 seconds, T3 = 6 seconds



### 12.6.3 High/Low Pressure Protection

Whenever high or low pressure occurs in the system which extend beyond the system pre-defined limits, the high and low pressure switches turn on (short) and stop the compressor until these limits are redrawn.

Fault code error 8 (HPS) or 9 (LPS) will be shown until the compressor will resume operation.

## 12.7 Technician Test Mode

This test is aimed for the technicians to check the system under a preset compressor and outdoor fan values while the expansion valves will function according to the normal running mode.

### 12.7.1 Entering technician mode

- This mode is entered through the outdoor unit using the HMI (refer to user interface section).
- It can be selected either for cool or heat.
- Technician test is not possible to enter during deicer.

### 12.7.2 Technician mode procedure

- All the connected indoor units will enter technician test at high indoor fan speed.
- The outdoor unit will be working normally (according to the run mode control logic) except for the following changes:
  - The dry contact inputs will be ignored.
  - Protections will be operative for stop compressor.
  - The compressor and the outdoor fan will be working in target preset values according to the number and size of IDUs.

### 12.7.3 Exiting technician mode

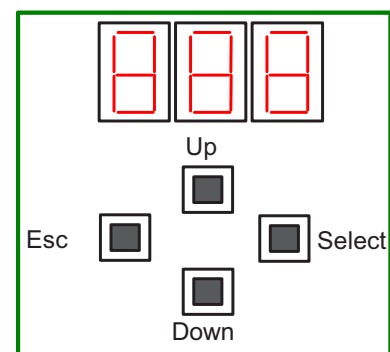
Technician mode will be exited either when:

- Escaping by the HMI (exiting the ttC or ttH menus)
- 60 minutes are passed from entering

## 12.8 User Interface

### 12.8.1 User interface description

- The user interface uses three 7-segment displays, and 4 keys.
- Keys, The 4 keys are:
  - Scroll - used to scroll between options (up and down)
  - Select - use to select an option
  - Escape - Will go up one level in the menu
- The user interface concept is Tree menus.
- Active selection or status will be indicated by a dot



at the right side of the third digit.

### **12.8.2 Keys functionality**

- Scrolling will be done whenever the button is pressed.
- When scrolling alpha values, if the scroll button is held in, the selection will change at the rate of one step per second.
- When changing/scrolling numeric value, if the scroll button is held in, the selection will change at the rate of one step per second. After 2 seconds, if the button continues to be held in, the rate of change will increase to 10 steps per second.

The display will not roll over during selection (for example stop/Ode/Dia/Stp/Par/stop)

### 12.8.3 Menus

#### 12.8.3.1 Main Menu

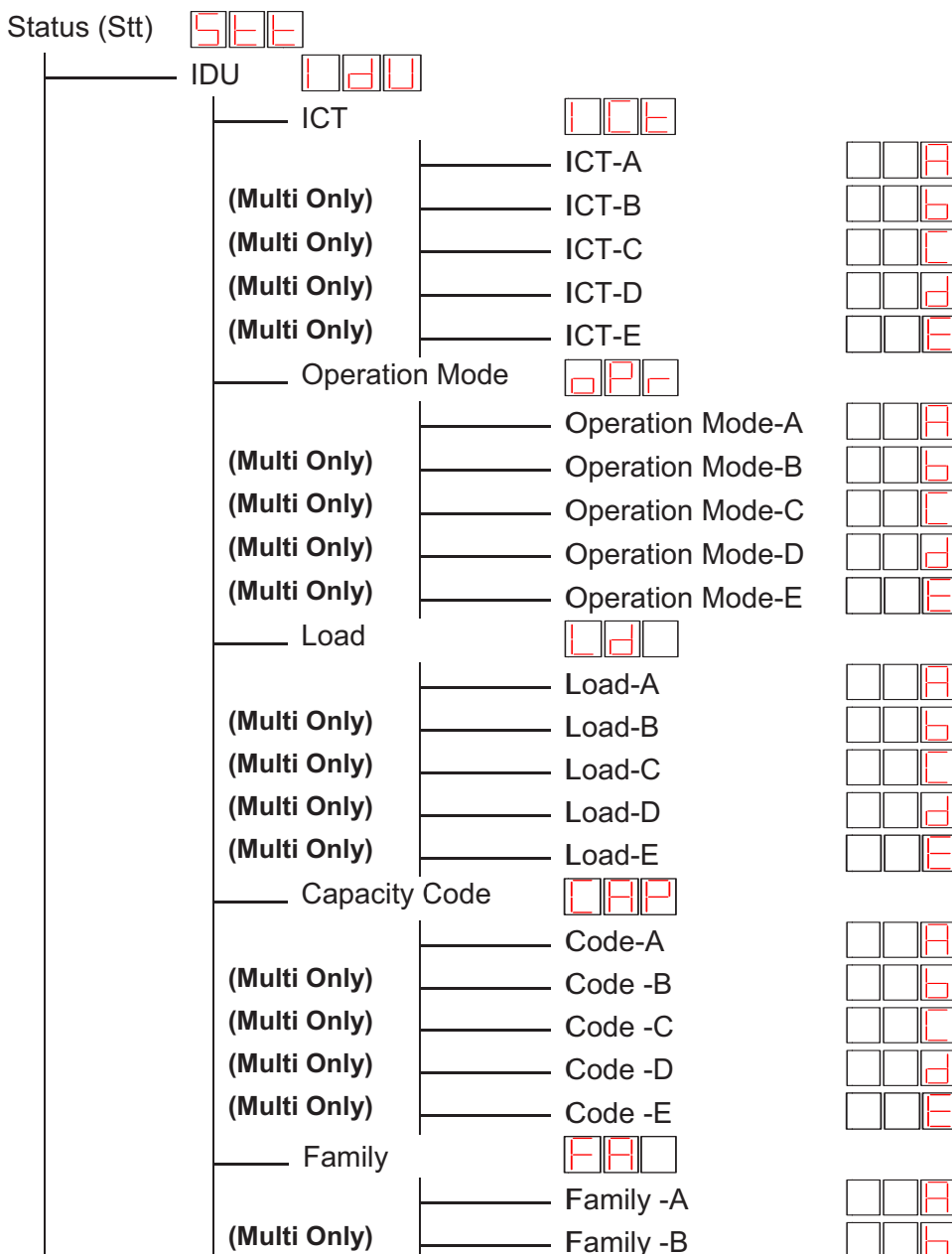
Mode (Cl/Ht/Sb)		□□□ H E □ S B □	
Technician Test (tt)		□ E E	
	_____	Technician Test Cool (PtC)	P □ C
	_____	Technician Test Heat (PtH)	P □ H
	_____	Charge Test Cool (CtC)	□ □ C
	_____	Charge Test Heat (CtH)	□ □ H
Installation Test (it)		□ E □ (Multi Only)	
	_____	Number of IDU`s	n   d
	_____	Begin test	b   G   n
	_____	Test Result	P   E
	_____	Matrix Table Test Result	E   G
	_____	Problem Correction	□   E
Diagnostics (dia)		□ □ □	
	_____	Outdoor Unit (oxx)	□ □ □
	_____	Indoor Unit A (axx)	A □ □
	_____	Indoor Unit B (bxx) (Multi Only)	B □ □
	_____	Indoor Unit C (Cxx) (Multi Only)	□ □ □
	_____	Indoor Unit D (dxx) (Multi Only)	d □ □
	_____	Indoor Unit E (Exx) (Multi Only)	E □ □
Set Up (Stp)		□ E □ (Multi Only)	
	_____	First IDU Wins (Idu)	1   d   u
	_____	IDU A is master (A-P)	A   □   P
	_____	IDU B is master (b-P)	b   □   P
	_____	IDU C is master (C-P)	□   □   P
	_____	IDU D is master (d-P)	d   □   P
	_____	IDU E is master (E-P)	E   □   P
Status (Stt)		□ E E	
	_____	IDU (Idu)	1   d   u
	_____	ODU (odu)	□   d   u
	_____	Timer (tr)	E   □   □

#### Notes:

- The default presentation will be the mode of the unit (Cl/Ht/Sb).

- In diagnostics menu, xx means failure code. Only the last active (operative) failure code will be shown, if there is no active failure a “-“sign will be shown (the faults Numbers are the one shown in the single split table).
- Technician Test mode is exited after 60 minutes from entry.
- All the menus, except technician menus- Status, Technician Test and their sub menus, are automatically exited to the main menu after 1 continuous minute out of any press.
- When Technician test cool or heat menu is selected, it will blink constantly until this menu is escaped.
- Pressing select and escape buttons together when in RST for more than 5 seconds will restore only the parameters of the factory settings. Acknowledge for restored parameters will be indicated by blinking RST for 3 seconds.

12.8.3.2 Status (Sub Menu)



(Multi Only)	Family -C	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="C"/>
(Multi Only)	Family -D	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="D"/>
(Multi Only)	Family -E	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="E"/>
Model	<input type="text" value="d"/> <input type="text" value="L"/> <input type="text" value=""/>	
(Multi Only)	Model -A	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="A"/>
(Multi Only)	Model -B	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="B"/>
(Multi Only)	Model -C	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="C"/>
(Multi Only)	Model -D	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="D"/>
(Multi Only)	Model -E	<input type="text" value=""/> <input type="text" value=""/> <input type="text" value="E"/>
ODU	<input type="text" value="o"/> <input type="text" value="d"/> <input type="text" value="U"/>	
Operation Mode	<input type="text" value="o"/> <input type="text" value="P"/> <input type="text" value="r"/>	
OFAN Up	<input type="text" value="O"/> <input type="text" value="F"/> <input type="text" value="u"/>	
OFAN Down	<input type="text" value="O"/> <input type="text" value="F"/> <input type="text" value="d"/>	
RV	<input type="text" value="R"/> <input type="text" value="V"/> <input type="text" value=""/>	
Speed	<input type="text" value="S"/> <input type="text" value="P"/> <input type="text" value="d"/>	
CTT	<input type="text" value="C"/> <input type="text" value="T"/> <input type="text" value="t"/>	
OMT	<input type="text" value="O"/> <input type="text" value="M"/> <input type="text" value="t"/>	
OCT	<input type="text" value="O"/> <input type="text" value="C"/> <input type="text" value="t"/>	
HST	<input type="text" value="H"/> <input type="text" value="S"/> <input type="text" value="t"/>	
OAT	<input type="text" value="O"/> <input type="text" value="A"/> <input type="text" value="t"/>	
RGT-A	<input type="text" value="r"/> <input type="text" value="g"/> <input type="text" value="A"/> (Multi Only)	
RGT-B	<input type="text" value="r"/> <input type="text" value="g"/> <input type="text" value="B"/> (Multi Only)	
RGT-C	<input type="text" value="r"/> <input type="text" value="g"/> <input type="text" value="C"/> (Multi Only)	
RGT-D	<input type="text" value="r"/> <input type="text" value="g"/> <input type="text" value="D"/> (Multi Only)	
RGT-E	<input type="text" value="r"/> <input type="text" value="g"/> <input type="text" value="E"/> (Multi Only)	
RLT-A	<input type="text" value="r"/> <input type="text" value="l"/> <input type="text" value="A"/> (Multi Only)	
RLT-B	<input type="text" value="r"/> <input type="text" value="l"/> <input type="text" value="B"/> (Multi Only)	
RLT-C	<input type="text" value="r"/> <input type="text" value="l"/> <input type="text" value="C"/> (Multi Only)	
RLT-D	<input type="text" value="r"/> <input type="text" value="l"/> <input type="text" value="D"/> (Multi Only)	
RLT-E	<input type="text" value="r"/> <input type="text" value="l"/> <input type="text" value="E"/> (Multi Only)	
EEV A	<input type="text" value="E"/> <input type="text" value="E"/> <input type="text" value="A"/>	
EEV B	<input type="text" value="E"/> <input type="text" value="E"/> <input type="text" value="B"/> (Multi Only)	
EEV C	<input type="text" value="E"/> <input type="text" value="E"/> <input type="text" value="C"/> (Multi Only)	
EEV D	<input type="text" value="E"/> <input type="text" value="E"/> <input type="text" value="D"/> (Multi Only)	
EEV E	<input type="text" value="E"/> <input type="text" value="E"/> <input type="text" value="E"/> (Multi Only)	
Power (System)	<input type="text" value="P"/> <input type="text" value="r"/> <input type="text" value=""/>	
AC Current	<input type="text" value="A"/> <input type="text" value="C"/> <input type="text" value=""/>	
DC Current	<input type="text" value="d"/> <input type="text" value="C"/> <input type="text" value=""/>	
ODU Model	<input type="text" value="o"/> <input type="text" value="d"/> <input type="text" value=""/>	
SW version	<input type="text" value="S"/> <input type="text" value="O"/> <input type="text" value="F"/>	
Timer	<input type="text" value="t"/> <input type="text" value="r"/> <input type="text" value=""/>	
Compressor Time	<input type="text" value="C"/> <input type="text" value="o"/> <input type="text" value="P"/>	

**Notes:**

- For the temperature display, when a thermistor is shorted or disconnected it shows FLT (FLt), when it is disabled it shows DIS (dis).
- It's possible to present a number between 999 and 99,999 by alternating between two numbers (each number is presented for 1 second). The two numbers format is "xx, yyy".
- Pressing select + escape together for 5 seconds will reset the counter to 0.
- The compressor time is measured in hours.

**12.9 Jumper/DIP-Switch Setting****12.9.1 Jumper/DIP-Switch Definition**

0 = Open (Disconnected)

1 = Close (Shorted)

**12.9.2 IDU Jumpers/DIP-Switch****12.9.2.1 *Self test Jumper/DIP – J1***

Position	Status	Description
0	Open (Disconnected)	Normal Operation (Default)
1	Close (Shorted)	Self Test enabled

Used for internal production line testing. For normal use must be set to OFF (0).

**12.9.2.2 *Compensation Jumper/DIP – J2***

Position	Status	Description
0	Open (Disconnected)	Compensation activated (Default)
1	Close (Shorted)	Compensation deactivated

Used for height compensation in heat mode

**12.9.2.3 *Family selection Jumper/DIP – J3, J4, J5, J6, J11***

Wired in controllers, no selection.

12.9.2.4 **Model selection Jumper/DIP – J7, J8**

Model	J7	J8
A	0	0
B	1	0
C	0	1
D	1	1

12.9.2.5 **Presence Detector/DIP – J9**

Position	Status	Description
0	Open (Disconnected)	Clock enabled (Default)
1	Close (Shorted)	Presence detector enabled

12.9.3 **ODU Jumpers**

12.9.3.1 **Self test Jumper/DIP – J1**

Position	Status	Description
0	Open (Disconnected)	Normal Operation (Default)
1	Close (Shorted)	Self Test enabled

Used for internal production line testing. For normal use must be set to OFF (0).

12.9.3.2 **ODU Model Selection Jumper/DIP – ODU0/1/2/3**

See below table.

12.9.4 **Dip-Switch Setting Table**

WNG / WNG18 / WNG72		J1	J7	J8	J9	J10
HJD009	3	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HJD012	3	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HJD018	8	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HJD024	8	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AUX 8kW		J2	J7			
HJD030	23	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
		OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

<u>ODU</u>		J1	J2	J3	J4
YBDE 018-H11 (OU7-22 DCI)	ON	■	■	□	□
	OFF	□	■	■	■
YBDE 024-H11 (OU7-30 DCI)	ON	□	■	■	□
	OFF	■	□	■	■
YBDE 030-H11 (OU8-35 DCI)	ON	□	□	□	□
	OFF	■	■	■	■
YBDE 009-H11	ON	■	■	□	■
	OFF	□	□	■	□
YBDE 012-H11	ON	□	□	■	■
	OFF	■	■	□	□

**12.9.5 Remote Control DIP Switch Settings**

SETTING SWITCH STATUS				DEFINITION	
SW. NO. 1	SW. NO. 2	SW. NO. 3	SW. NO. 4	RC3	RC4 / RC4i / RC7
OFF	OFF	--	--	RC - all modes of operation	
ON	OFF	--	--	ST - COOL, FAN, DRY modes active	
OFF	ON	--	--	HEAT COOL, FAN, DRY modes active	
ON	ON	--	--	Auto Mode, FAN modes active	
--	--	OFF	--	Temp. Display in °C degrees	Vertical swing only
--	--	ON	--	Temp. Display in °F degrees	Horizontal & vertical swing functions together
--	--	--	OFF	Timer & clock 12h am, pm	Disable LCD & key illumination
--	--	--	ON	Timer & clock 24h	Enable LCD & key illumination

Reset operation – Press all 4 buttons simultaneously for 5 sec.: “CLEAR“, “SET”, "HR+", "HR-".

DIP Switch Position: **OFF** = 0, **ON** = 1

**NOTE** - After setting the DIP switches perform reset operation.





## 12.10 System Parameters

### 12.10.1 General Parameters for All Models

Name	Default Value	Units
<i>MinOFFTime</i>	3	minute
<i>MinONTime</i>	3	minute
<i>Dlmin</i>	30	minute
<i>Dlmax</i>	120	minute
<i>TimeD</i>	1	minute
<i>DTmin</i>	2	minute
<i>DIT</i>	10	minute
<i>CTMRUP</i>	10	minute
<i>DIF</i>	30	minute
<i>TCT</i>	240	second
<i>DEICT1</i>	60	second
<i>DEICT2</i>	36	second
<i>DEICT3</i>	6	second
<i>DSTF</i>	12	°C
<i>OMTOH0</i>	50	°C
<i>OMTOH1</i>	53	°C
<i>OMTOH2</i>	56	°C
<i>OMTOH3</i>	59	°C
<i>OMTOH4</i>	61	°C
<i>OMTOH5</i>	63	°C

## 12.10.2 ODU Model Dependent Parameters

Parameter Name	AA YBDE009-H11	AB YBDE012-H11	AS YBDE018-H11	AT YBDE024-H11	AU YBDE030-H11	Range	Res.	Unit
MinFreqC	20	20	23	24	20	0-127	1	Hz
MaxFreqC	64	80	79	89	70	0-127	1	Hz
MinFreqH	20	20	23	24	20	0-127	1	Hz
MaxFreqH	80	90	80	89	75	0-127	1	Hz
DeicerFreq	90	90	65	80	80	0-127	1	Hz
Step1Freq	40	40	40	40	40	0-127	1	Hz
Step2Freq	55	55	65	65	55	0-127	1	Hz
Step3Freq	65	65	75	75	65	0-127	1	Hz
Step4Freq	75	75	95	95	85	0-127	1	Hz
Step1Time	3	3	3	3	3	0-7	1	Min
Step2Time	5	5	3	3	3	0-7	1	Min
Step3Time	1	1	1	1	1	0-7	1	Min
Step4Time	1	1	1	1	1	0-7	1	Min
NightRPS	-	-	NA	NA	NA	0-110	1	RPS
OFMinRPMC	20	20	27	27	20	0-130	1	*10RPM
OFMinRPMH	20	20	27	27	30	0-130	1	*10RPM
OFMaxRPMC	83	83	85	85	85	0-130	1	*10RPM
OFMaxRPMH	83	83	NA	NA	NA	0-130	1	*10RPM
NightRPM	60	60	85	75	60	0-130	1	*10RPM
OFNNoiseMaxRPMC	83	83	NA	NA	78	0-130	1	*10RPM
OFNNoiseMaxRPMH	83	83	NA	NA	NA	0-130	1	*10RPM
OCT_OFAN_Noise_Max	8	8	8	8	8	0-15	1	°C
OMT_OFAN_Noise_Max	38	38	38	38	35	27-42	1	°C
EEVMinOperOpenC	50	50	70	70	70	0 – 1023	1	step
EEVMaxOperOpenC	480	480	480	480	480	0 – 1023	1	step
EEVMinOperOpenH	50	50	70	70	80	0 – 1023	1	step
EEVMaxOperOpenH	480	480	480	480	480	0 – 1023	1	step
CTTOH0	78	78	78	78	78	0-120	1	°C
CTTOH1	85	85	85	85	85	0-120	1	°C
CTTOH2	90	90	90	90	90	0-120	1	°C
CTTOH3	95	95	95	95	95	0-120	1	°C
CTTOH4	100	100	100	100	100	0-120	1	°C
CTTOH5	105	105	105	105	105	0-120	1	°C
CCROC0	6.5	6.5	8.5	8.5	12	5-40	0.1	A
CCROC1	7.5	7.5	9.5	9.5	12.6	5-40	0.1	A
CCROC2	8.5	8.5	10.5	10.5	13.5	5-40	0.1	A
CCROC3	9.5	9.5	11.5	11.5	15.5	5-40	0.1	A
DCCOC0/ OVRPWR0	1450	1450	2350	2350	2950	5-40	0.1	A
DCCOC1/ OVRPWR1	1550	1550	2500	2500	3050	5-40	0.1	A
DCCOC2/ OVRPWR2	1650	1650	2650	2650	3200	5-40	0.1	A
DCCOC3/ OVRPWR3	1750	1750	2800	2800	3400	5-40	0.1	A
HSTOH0	65	65	65	65	59	0 – 110	1	°C

Parameter Name	AA YBDE009-H11	AB YBDE012-H11	AS YBDE018-H11	AT YBDE024-H11	AU YBDE030-H11	Range	Res.	Unit
HSTOH1	68	68	71	71	65	0 – 110	1	°C
HSTOH2	70	70	74	74	67	0 – 110	1	°C
HSTOH3	72	72	77	77	69	0 – 110	1	°C
HSTOH4	75	75	78	78	78	0 – 110	1	°C
HSTOH5	78	78	85	85	85	0 – 110	1	°C
ICTDef0	10	10	13	13	13	-23 – 8	1	°C
ICTDef1	8	8	10	10	10	-23 – 8	1	°C
ICTDef2	6	6	8	8	8	-23 – 8	1	°C
ICTDef3	4	4	6	6	6	-23 – 8	1	°C
ICTDef4	2	2	3	3	3	-23 – 8	1	°C
ICTDef5	0	0	0	0	0	-23 – 8	1	°C
ICTOH0	41	41	44	44	44	35– 66	1	°C
ICTOH1	45	45	50	50	50	35– 66	1	°C
ICTOH2	49	49	54	54	54	35– 66	1	°C
ICTOH3	53	53	58	58	58	35– 66	1	°C
ICTOH4	57	57	60	60	60	35– 66	1	°C
ICTOH5	61	61	61	61	61	35– 66	1	°C
OCTExitDeicer	12	12	10	10	10	12 - 28	1	°C
MaxDeicerTime	15	15	12	12	12	12 – 20	1	Min
EEVDecierOpenSingle	200	180	350	150	500	0 – 1023	1	Step
DeicerCoef	0.8	0.8	0.9	0.9	0.9	0.7 – 1	0.1	NA

### 12.10.3. IDU Model Dependent Parameters

Parameter Name	HJD009	HJD012	HJD018	HJD024	HJD030
Cap.Group	1	2	3	4	4
ICTSTSpeed	20	20	20	20	25
ICTVLSpeed	28	28	28	28	28
ICTLSpeed	30	30	30	30	30
ICTHSpeed	32	32	32	32	32
ICTTSpeed	40	40	40	30	40
MaxNLOADIF1C	40	40	45	44	127
MaxNLOADIF2C	53	53	62	105	127
MaxNLOADIF3C	120	120	120	127	127
MaxNLOADIF4C	127	127	127	127	127
MaxNLOADIF5C	127	127	127	127	127

12.11 7-Segment Legend

**Hindu-Arabic numerals**

0 1 2 3 4 5 6 7 8 9

**Latin alphabet**

A, a, @ B, b C, c D, d E, e F, f G, g H, h I, i J, j K, k L, l M, m N, n O, o  
 P, p Q, q R, r

S, s T, t U, u V, v W, w X, x Y, y Z, z

## 13. TROUBLESHOOTING

### 13.1 Precaution, Advise and Notice Items

#### 13.1.1 High voltage in Indoor and Outdoor unit electrical assembly

- Open the Outdoor unit controller assembly only after one minute from power off.
- Whole controller assembly, including the wires, connected to the Outdoor unit may have the potential hazard voltage when power is on.
- Touching the Outdoor unit controller assembly may cause an electrical shock.
- Do not touch the naked lead wire and don't insert finger, conductor or anything else into the controller when power is on.

#### 13.1.2 Charged Capacitors

- Large capacity electrolytic capacitors are used in the outdoor unit controller and driver.
- Charging voltage (380VDC) remains after power is down.
- Discharging takes about one minute after turned off.
- Touching the outdoor unit electrical assembly before discharging may cause an electrical shock.
- Measure the electrolytic capacitors voltage to be below 50VDC before further checking electrical assembly parts.

#### 13.1.3 Advisory Notes

- When open the Outdoor unit electrical assembly, don't touch the soldering pin by hand or by any conductive material.
- When connecting or disconnecting the connectors on the PCB, hold the whole housing, don't pull the wire.

#### **WARNING!!!**

- When Power Up – the outdoor and indoor unit electrical assemblies, including the wiring, are under HIGH VOLTAGE!!!
- Never open the outdoor or indoor units before turning off **ALL** Power sources!!!
- When turned off, the outdoor unit electrical assembly is still charged (400V)!!!
- DC capacitors are discharging for about 1 Minute after power is OFF.
- Touching the electrical before discharging may cause an electrical shock!!!
- **For safe handling of the electrical assembly please refer to section 13.1 above.**

### 13.2 General System Failures and Corrective Actions

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
<b>Indoor unit</b>			
1.	Indoor unit power supply indicator (Red LED) does not light up.	No Power supply	Check supply voltage to main terminals L and N with volt meter.
		Miss-wiring	Check all supply wiring to controller and terminals according to wiring diagram
		Loose connection	Check all power wiring connections
		Display and display cable	Check continuity of each wire of the display wires/pins with Ohm meter
		If still not OK	Check if fuse burnt
2.	Fuse burned in indoor unit controller	Short Circuit between wires	Check for any cuts or exposed supply wires or miss-wiring
		Failure of Indoor Unit Fan Motor	Check the motor and capacitor (13.5.14) Check for any cuts or exposed wires
		If still not OK	Replace fuse
3.	Indoor unit does not respond to remote control message	Remote control message not reached the indoor unit	Check remote control batteries Check continuity of each wire of the display wires/pins with Ohm meter
		If still not OK	Replace display box or indoor Electronic Assembly
4.	Indoor unit responds to remote control message but Operate indicator (Green LED) does not light up	Problem with display PCB	Replace display PCB.
		If still not OK	Replace indoor Electronic Assembly
5.	Indoor fan does not start (louvers are opened and Green LED is ON)	Unit in heat mode and coil is still not warm	Change to Cool or Fan mode
		Failure of Indoor Unit Fan Motor	Check the motor and capacitor (13.5.14) Check for any cuts or exposed wires
		Problem with controller or motor capacitor	Change to high speed and Check power supply to motor is higher than 220VAC
		If still not OK	Replace indoor Electronic Assembly
6.	Indoor fan works when unit is OFF, and indoor fan speed is not changed by remote control command.	Controller problem	Replace indoor Electronic Assembly
7.	Water leakage from indoor unit	Indoor unit drainage tube is blocked	Check and open drainage tube

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
8.	One indoor unit or more are operating in cool mode with no capacity, and the other units have water leaks/freezing problems	The communication wires of the indoor units are switched	Check and correct the communication wires connection
9.	One indoor or more are operating in heat mode with a limited capacity, and the coil on the other units are very hot.		
<b>Outdoor unit</b>			
10.	Outdoor unit display board and LEDs are off	No power supply	Check supply voltage to main terminals L and N with volt meter.
		Miss-wiring	Check all supply wiring to controller and terminals according to wiring diagram
		Loose connection	Check all power wiring connections
		Burnt fuse	Check fuse on the main board ( <i>Error! Reference source not found.</i> )
		If still not OK	Replace main board ( <b>14.1.13</b> )
11.	Compressor does not start operation	One or some components are not operating well	Check for any fault code shown on display board and act accordingly.
		Electronics control problem or protection	
		PFC Chock coil	Check the PFC Chock coil ( <b>13.5.5</b> )
		Driver failure	Check if fault code # is shown on display board. If so, fix the problem according to <b>13.5.4</b> or replace driver.
		If still not OK	Replace compressor.
12.	Cooling capacity is not sufficient	Unit size not match the load	Check if the size chosen for the complete room(s) load is enough or need bigger units
		Piping size not matching system	Check if piping is installed correctly and proper diameter size and total length is according to unit specifications
		Refrigerant leakage	Check refrigeration system ( <b>13.3</b> )
		Refrigerant over-charge	
		Refrigerant clog	Check and repair clogging specially near the EEV
		Electronics control problem or protection	Check for any fault code shown on display board and act accordingly.
		Compressor failure	Check if fault code # is shown on display board. If so, fix the problem according to <b>13.5.7</b> or replace driver
		Indoor coil block	Clean filters and/or remove block or air by-

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
			pass
		Indoor fan malfunction	Check the motor and capacitor (13.5.14)
		Outdoor coil block	Remove block and/or avoid air by-pass
		Outdoor fan malfunction	Check outdoor fan motors (13.5.6)
		EEV malfunction	Check EEV (13.5.9)
		Thermistor(s) malfunction	Check if any of fault codes #1-7 is shown on display board. Replace faulty thermistors (13.5.10)
13.	Heating capacity is not sufficient	Check all according to above cooling problem (12)	
		Reverse valve	Check reversing valve operation (13.5.8)
		Deicing not performed well (during low outdoors temperatures)	Check OCT and OAT thermistors fault codes (#1 and 4) Check OCT thermistor if connected well to pipe Check OAT thermistor if connected well Check the thermistors operation (13.5.10).
14.	Compressor is over heated	Electronic control	Check for any fault code shown on display board and act accordingly.
		EEV problem	Check EEV (13.5.9)
		Refrigerant leakage	Check refrigeration system (13.3)
		Indoor coil block	Clean filters and/or remove block
		Indoor fan malfunction	Check indoor fan motor and capacitor (13.5.14)
		Outdoor coil block	Remove block and/or avoid air by-pass
		Outdoor fan malfunction	Check outdoor fan motors (13.5.6)
Compressor malfunction	Check the compressor (13.5.7)		
15.	Compressor stops many times during operation	Check all according to above problem.	
		HP Switch	Check if HPS fault code (#8) is accruing frequently. If so, check the switch operation (13.5.12)
		LP Switch	Check if LPS fault code (#9) is accruing frequently. If so, check the switch operation (Error! Reference source not found.)
16.	Not all units are operating	Communication problems	Check the communication between outdoor and indoor units (Error! Reference source not found.)
17.	Unit is cooling while in heat mode	RV problem	Check RV operation (13.5.8)
		IDU-ODU communication	Check the communication between outdoor and indoor units (Error! Reference source not found.)
18.	Compressor is generating abnormal noise	Phase order to compressor is wrong	Check compressor phase order
		Compressor internal parts wearing	Replace compressor.
		Vibration	Check all piping connections Check compressor rubbers are fixed well



No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
			Check all screws on unit metal chassis are tightened Check that no piping is in contact with each other or with other parts.
19.	Freezing of outdoor unit coil in heat mode and outdoor unit base is blocked with ice	Hard conditions of low temperatures and high humidity	Check that no obstructions to outdoor unit coil air inlet.
			Check that all holes in bottom of outdoor unit base are open and clean from dirt.
			Check OCT and OAT thermistors
			Connect base heater
20.	The unit stop suddenly during operation	EMC interference to the A/C unit	Check for EMC problems ( <a href="#">13.5.15.1</a> )
21.	Indoor unit Indicator leds may flicker		
22.	Other home appliances operation is faulty such as noise appears in the television picture, or the picture is distorted or static occurs in the radio sound	EMC interference by the A/C unit	Check for EMC problems ( <a href="#">13.5.15.1</a> )
23.	All others	Specific problems of indoor or outdoor units	Check for any fault code shown on display board and act accordingly.

### 13.3 Checking the refrigeration system

Checking system pressures and other thermodynamic measures should be done when system is in technician Mode where the system operates as in fixed settings. The performance curves given in this manual are given for unit performance in Technician mode when high indoor fan speed is selected.

For entering technician mode check **Error! Reference source not found..**

### 13.4 Troubleshooting by Diagnostics Codes

#### 13.4.1 Fault codes Outdoor unit

If any fault exists in the system, its fault will be shown according to the following coding method.

The 5 last fault occurred in the system will be stored in the EEPROM.

If no fault exist in the system, no fault code will be displayed during normal operation mode. STATUS LED is blinking 5 times in 5 seconds, and shut off for the next 5 seconds.

FAULT LED will blink during the same 5 seconds according to the following table



The LED coding method is as follow:

No	Problem	AO	5	4	3	2	1
1	OCT is shorted/disconnected	Yes	0	0	0	0	1
2	CTT is shorted/disconnected	Yes	0	0	0	1	0
3	HST is shorted/disconnected	Yes	0	0	0	1	1
4	OAT is shorted/disconnected	Yes	0	0	1	0	0
5	OMT is shorted/disconnected	Yes	0	0	1	0	1
6	RGT is shorted/disconnected	Yes	0	0	1	1	0
7	RLT is shorted/disconnected	Yes	0	0	1	1	1
8	High pressure protection	Yes	0	1	0	0	0
9	Low pressure protection	Yes	0	1	0	0	1
10	No communication to Driver	Yes	0	1	0	1	0
11	<ul style="list-style-type: none"> <li>♦ Compressor IPM Fault</li> <li>♦ IPM Driver Pin</li> <li>♦ Compressor Current Sensor Fault</li> </ul>	Yes	0	1	0	1	1
12	No Water Flow (For Hydro Units only)	Yes	0	1	1	0	0
13	Refrigerant Leakage	No	0	1	1	0	1
14	<ul style="list-style-type: none"> <li>♦ DC over voltage</li> <li>♦ DC under voltage</li> </ul>	Yes	0	1	1	1	0
15	<ul style="list-style-type: none"> <li>♦ AC under voltage</li> <li>♦ AC over Voltage</li> <li>♦ Zero Crossing detection</li> </ul>	Yes	0	1	1	1	1
16	<ul style="list-style-type: none"> <li>♦ Mismatch between IDU &amp; ODU models</li> <li>♦ Missing ODU configuration</li> <li>♦ Undefined ODU Model</li> </ul>	Yes	1	0	0	0	0
17	No Communication	Yes	1	0	0	0	1
18	System Over Power	Yes	1	0	0	1	0
19	<ul style="list-style-type: none"> <li>♦ PFC Current sensor</li> <li>♦ Missing phase</li> <li>♦ Phase order mismatch</li> <li>♦ PFC Trip (Overload)</li> </ul>	Yes	1	0	0	1	1
20	Heat sink Over Heating	Yes	1	0	1	0	0
21	Deicing	No	1	0	1	0	1
22	Compressor Over Heating	Yes	1	0	1	1	0
23	Compressor Over Current	Yes	1	0	1	1	1
24	No OFAN Feedback (Both OFAN_UP or OFAN_DN)	Yes	1	1	0	0	0
25	<ul style="list-style-type: none"> <li>♦ OFAN IPM fault</li> <li>♦ OFAN IPM Driver Pin</li> </ul>	Yes	1	1	0	0	1
26	Compressor Lock	Yes	1	1	0	1	0
27	Indoor Coil defrost	Yes	1	1	0	1	1
28	Sweat protection	No	1	1	1	0	0
29	Indoor Sensor fault	Yes	1	1	1	0	1
30	<ul style="list-style-type: none"> <li>♦ Outdoor Coil Overheating</li> <li>♦ Indoor Coil Overheating</li> </ul>	Yes	1	1	1	1	0
31	Operation conditions are exceeded	Yes	1	1	1	1	1

1 - ON, 0 - OFF

Only one code is shown. Order of priority is lower to the higher number. Diagnostics is continuously ON as long power is on.

13.4.2 Outdoor unit diagnostics and corrective actions

No	Fault Name	Fault Description	Corrective Action
1	OCT short/disconnect	Thermistor not connected or damaged	Check Thermistor (13.5.10)
2	CTT short/disconnect		
3	HST short/disconnect		
4	OAT short/disconnect		
5	OMT short/disconnect		
6	RGT short/disconnect		
7	RLT short/disconnect		
8	High pressure protection	Compressor stopped due to high pressure protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant clog. Check the switch operation (13.5.12)
9	Low pressure protection	Compressor stopped due to low pressure protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak. Check the switch operation (Error! Reference source not found.)
10	No communication to Driver	Driver fault	Check power supply to driver Check driver communication (Error! Reference source not found.)
11	Compressor IPM Fault/ IPM Driver Pin/ Compressor Current Sensor Fault	Over current / IPM malfunction	Check no obstruction to electrical box and outdoor coil air inlet Check Compressor (13.5.7)
12	No Water Flow (For Hydro Units only)	NA	NA
13	Refrigerant Leakage	NA	NA
14	DC Under/over voltage	DC voltage exceeds its limit	Check if input voltage out of limit, if not and the problem persists, replace driver. If voltage is high/Low, shut off the power and recommend the customer to fix the power supply
15	AC under voltage/AC over Voltage/Zero Crossing	AC input voltage is lower/higher than limit	Check if input voltage is out of limit, if not and the problem persists, replace driver. If voltage is High/low, recommend the customer to fix the power supply
16	Mismatch between IDU & ODU models	Mismatch between IDU and ODU models	Indoor unit sizes are exceeding outdoor unit capacity, check indoor units model plugs. Either too high or too low capacity indoor units
	Missing ODU configuration Undefined ODU Model	ODU dip switches are not configured correctly	Check ODU dip switch setting if correct.
17	No Communication to IDU	IDU-ODU communication	Check communication between indoor and outdoor units (Error! Reference source not found.)
18	System Over Power	Protection – not available	-
19	PFC Current sensor	Driver fault	Replace Compressor Driver
	Missing phase	Installation incorrect	Check power supply lines
	Phase order mismatch		Switch between 2 supply lines

No	Fault Name	Fault Description	Corrective Action
	PFC Trip (Overload)	Protection of driver	Can occur during high current conditions. If problem persists, Check power supply to driver. Check driver communication ( <i>Error! Reference source not found.</i> ). Check no obstruction to electrical box and outdoor coil air inlet.
20	Heat sink Over Heating	Compressor stopped due to heat sink protection	Check that the airflow around the ODU is free and the fan is running free Check the screws connecting the driver to heat sink are tighten Check outdoor fan motors ( <b>13.5.6</b> )
21	Deicing	During deicing procedure	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak and thermodynamic operation ( <b>13.3</b> )
22	Compressor Over Heating	Compressor stopped due to over heat protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak and thermodynamic operation ( <b>13.3</b> )
23	Compressor Over Current	Compressor stopped due to over current protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak or clog and thermodynamic operation ( <b>13.3</b> )
24	No OFAN Feedback (Both OFAN_UP or OFAN_DN)	Outdoor fan(s) does not rotate	Check no obstruction to outdoor unit coil air path Check OFAN motor ( <b>13.5.6</b> )
25	OFAN IPM fault / OFAN IPM Driver Pin	Not available	-
26	Compressor Lock	Compressor does not rotate	Check Compressor ( <b>13.5.7</b> ) Check driver ( <b>13.5.4</b> )
27	Indoor Coil defrost	Indoor coil is freezing - protection	Normally no action is required If the problem persists for more than twice on each hour: Check refrigerant leakage – add refrigerant if required according pressure charts on section <i>Error! Reference source not found.</i> Check ICT sensor – replace if required Check IFAN motor and capacitor ( <b>13.5.14</b> )
28	Sweat protection	NA	NA
29	Indoor Sensor fault	Thermistor not connected or damaged	Check Thermistor ( <b>13.5.10</b> )
30	Outdoor/Indoor Coil Overheating	Compressor stopped due to over pressure protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant clog and thermodynamic operation ( <b>13.3</b> )
31	Operation conditions are	System is performing out	Check if indeed the conditions are

No	Fault Name	Fault Description	Corrective Action
	exceeded	of its outdoor condition limitations: Cooling: >46°C , <-11°C. Heating: >30°C , <-18°C. Indication only, no action.	exceeded. If not, check OAT thermistor, if OK, check no obstructions to outdoor air path.

### 13.4.3 Fault Code for Indoor unit

**Note:** Indoor unit diagnostics can be viewed by the outdoor unit display board ([13.4](#)). The below procedure is for viewing the indoor unit codes via the indoor unit led display.

Pressing Mode button for more than 5 seconds will activate diagnostic mode by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LED's.

When Indoor diagnostics is displayed, all four LED's (STBY, Operate, Filter, TMR) are on.

Entering diagnostics in STBY mode allows only viewing of status (fault-display).

In diagnostic mode, system problems / information will be indicated by blinking of Heat & Cool LED's.

The coding method will be as follows:

Heat led will blink 5 times in 5 seconds, and then will be shut off for the next 5 seconds. Cool Led will blink during the same 5 seconds according to the following table:

No	Fault Name	5	4	3	2	1
1	ICT is disconnected	0	0	0	0	1
2	ICT is shorted	0	0	0	1	0
3	RAT is disconnected	0	0	0	1	1
4	RAT is shorted	0	0	1	0	0
5	Reserved	0	0	1	0	1
6	ICTE Shorted/Disconneted	0	0	1	1	0
7	Undefined IDU Family/Model	0	0	1	1	1
8	No Communication	0	1	0	0	0
9	No Encoder	0	1	0	0	1
10	Reserved	0	1	0	1	0
11	Outdoor Unit Fault	0	1	0	1	1
...	Reserved					
17	Defrost protection	1	0	0	0	1
18	Deicing Protection	1	0	0	1	0
19	Outdoor Unit Protection	1	0	0	1	1
20	Indoor Coil HP Protection	1	0	1	0	0
21	Overflow Protection	1	0	1	0	1
...	Reserved					
24	EEPROM Not Updated	1	1	0	0	0
25	Bad EEPROM	1	1	0	0	1
26	Bad Communication	1	1	0	1	0
27	Using EEPROM data	1	1	0	1	1
28	Model A	1	1	1	0	0
29	Model B	1	1	1	0	1
30	Model C	1	1	1	1	0
31	Model D	1	1	1	1	1

1 - ON, 0 - OFF

Only one code is shown. Order of priority is lower to the higher number. Diagnostics is continuously ON as long power is on.

#### 13.4.4 Indoor unit diagnostics and corrective actions

No.	Fault	Probable Cause	Corrective Action
1-4,6	Sensor failures	Sensors not connected or damaged	Check Thermistor ( <a href="#">13.5.10</a> )
7	Undefined IDU Family/Model	IDU is not a valid model or family	IDU jumper configuration is not correct
8	No Communication	IDU-ODU communication	Check communication between indoor and outdoor units ( <a href="#">Error! Reference source not found.</a> )
9	No Encoder	Indoor electronics or motor	Check motor wiring, if ok, replace motor
		If still not ok	replace Indoor electronic assembly ( <a href="#">14.2.2</a> )
11	Outdoor Unit Fault	Outdoor controller problem	Check for any fault code shown on outdoor unit display board and act accordingly ( <a href="#">13.4</a> ).
17-18	Protections	Indication	No action

No.	Fault	Probable Cause	Corrective Action
19	Outdoor Unit Protection	Compressor stopped due to outdoor unit protection	Normally no action is required If the problem persists for more than twice on each hour, Check for any fault code shown on outdoor unit display board and act accordingly ( <b>13.4</b> ). Check the EEV ( <b>13.5.9</b> ) Check the Outdoor fans ( <b>13.5.6</b> ) Check the Indoor fan( <b>13.5.14</b> ) Check the compressor ( <b>13.5.7</b> ) Check the CTT thermistor ( <b>13.5.10</b> )
20	Indoor Coil HP Protection	Compressor stopped due to high pressure (heating) protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak and thermodynamic operation ( <b>13.3</b> ) Check the EEV ( <b>13.5.9</b> ) Check the Outdoor fans ( <b>13.5.6</b> ) Check the Indoor fan( <b>13.5.14</b> ) Check the compressor ( <b>13.5.7</b> ) Check the CTT thermistor ( <b>13.5.10</b> )
21	Overflow Protection	Compressor stopped due to water level overflow protection	Check the drainage tube for any clog.
24	EEPROM Not Updated	System is using ROM parameters and not EEPROM parameters	No action, unless special parameters are required for unit operation.
25	Bad EEPROM		No action, unless special parameters are required for unit operation.
26	Bad Communication	IDU-ODU communication	Check communication between indoor and outdoor units ( <i>Error! Reference source not found.</i> )
27	Using EEPROM data	No problem	
28	IDU model	Indoor unit model connected is shown: Model A - 4HP unit	No problem
29		Indoor unit model connected is shown: Model B - 5HP unit	
30		Indoor unit model connected is shown: Model C - 6HP unit	
31		Not applicable	

## 13.5 Procedures for checking Main Parts

### 13.5.1 Discharge DC Voltage



TURN OFF all power source switches

#### High voltage!!!

**Wait for DC voltage to be discharged before touching any part of the driver to avoid electric shock.**

**Check to ensure that DC voltage has reduced to below 50VDC, if not, keep waiting until it does.**

### 13.5.2 Checking Mains Voltage

Confirm that the Mains voltage is in range. 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 mistakes.

### 13.5.3 Checking Line Filter Board

- 1) Check for any burn signs on the filter board and its coils and relays, replace if any.
- 2) Check voltage at the inlet and outlet of the line filter. If no output voltage, replace line filter.
- 3) In case of burnt main fuse in line filter – replace both Line filter and driver.

Replacing line filter - ([14.1.16](#))

### 13.5.4 Checking Compressor Driver

#### 13.5.4.1. YBD018-024

In normal operation the 7-segments display is ON continuously. Even in that case, there can still be a Hardware problem that prevents the system to perform well or at all. If no other problem is found, replace the driver.

- ♦ Check power supply to driver connected well and no burn marks on wiring.
- ♦ PFC chock is connected well. Correct if needed.
- ♦ Check PFC Chock (13.5.5). Replace chock if needed.
- ♦ Check main fuse (20A). In case fuse is burnt, replace driver.

If all is well but still leds are OFF, Replace driver.

#### 13.5.4.2. YBD030

In normal operation the 7-segments display is ON continuously. Even in that case, there can still be a Hardware problem that prevents the system to perform well or at all. If no other problem is found, replace the driver.

- ♦ Check power supply to driver connected well and no burn marks on wiring.
- ♦ PFC chock is connected well. Correct if needed.
- ♦ Check PFC Chock (13.5.5). Replace chock if needed.
- ♦ Check line filter and main fuse (20A). In case fuse is burnt, replace both driver and filter.

If all is well but still leds are OFF, Replace driver.

### 13.5.5 Checking PFC Chock coil

- 1) Check PFC chock connections – repair if needed.
- 2) Visually check to see any burn marks on the wires – replace the chock(s) if needed.
- 3) Disconnect the chock from the driver and check if the 2 ending wires of each chock are shorted (continuity check) – if they are NOT shorted replace the chock(s), if they are shorted – check the driver ([13.5.4](#)).

Replacing PFC chock - ([14.1.17](#))



### 13.5.6 Checking Outdoor Fan Motor

#### 13.5.6.1 YBD018-024

Check motor capacitor.

Check voltage to motor, should be 230-130VAC. If voltage is not in range, replace the motor.

Check that OMT sensor reading is OK.

If motor is Ok, replace the controller.

#### 13.5.6.2 YBD030

Check fan connection wiring.

Rotate the fan slowly by hand, the fan should rotate easily, if not, replace the motor.

Check resistance between each phase, all should be about the same 0.8-1.5Ω.

Check that OMT sensor reading is OK.

If motor is Ok, replace the controller.

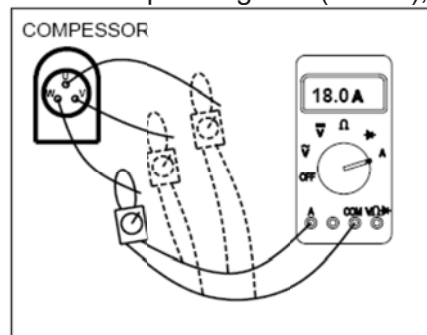
### 13.5.7 Checking Compressor

1) Check Compressor connections - Repair if needed.

2) Check the resistance between the three phases – all three coil resistances should be the same:

Unit	Resistance
YBD030	0.8 Ω
YBD018-024	0.9 Ω

3) Check the compressor current while operating to be the same on each wire - In case of abnormal current (no current or excessive current), the problem could be of driver or compressor – if driver is checked to be operating well ([13.5.4](#)), replace the compressor.



Check Compressor motor current

### 13.5.8 Checking Reverse Valve (RV)

The RV has two parts, Solenoid and valve.

1) Disconnect the RV connector from the main board and operate the unit in heating mode, check the voltage between two pins of reverse valve connector, normal voltage is 230VAC - if no power supply to RV, replace outdoor main board.

2) Check RV operation with direct 230VAC power supply. If RV solenoid is OK (but still no heating operation while compressor is ON), replace the RV valve from the refrigeration system. if not, replace the RV coil.

### 13.5.9 Checking Electrical Expansion Valve (EEV)

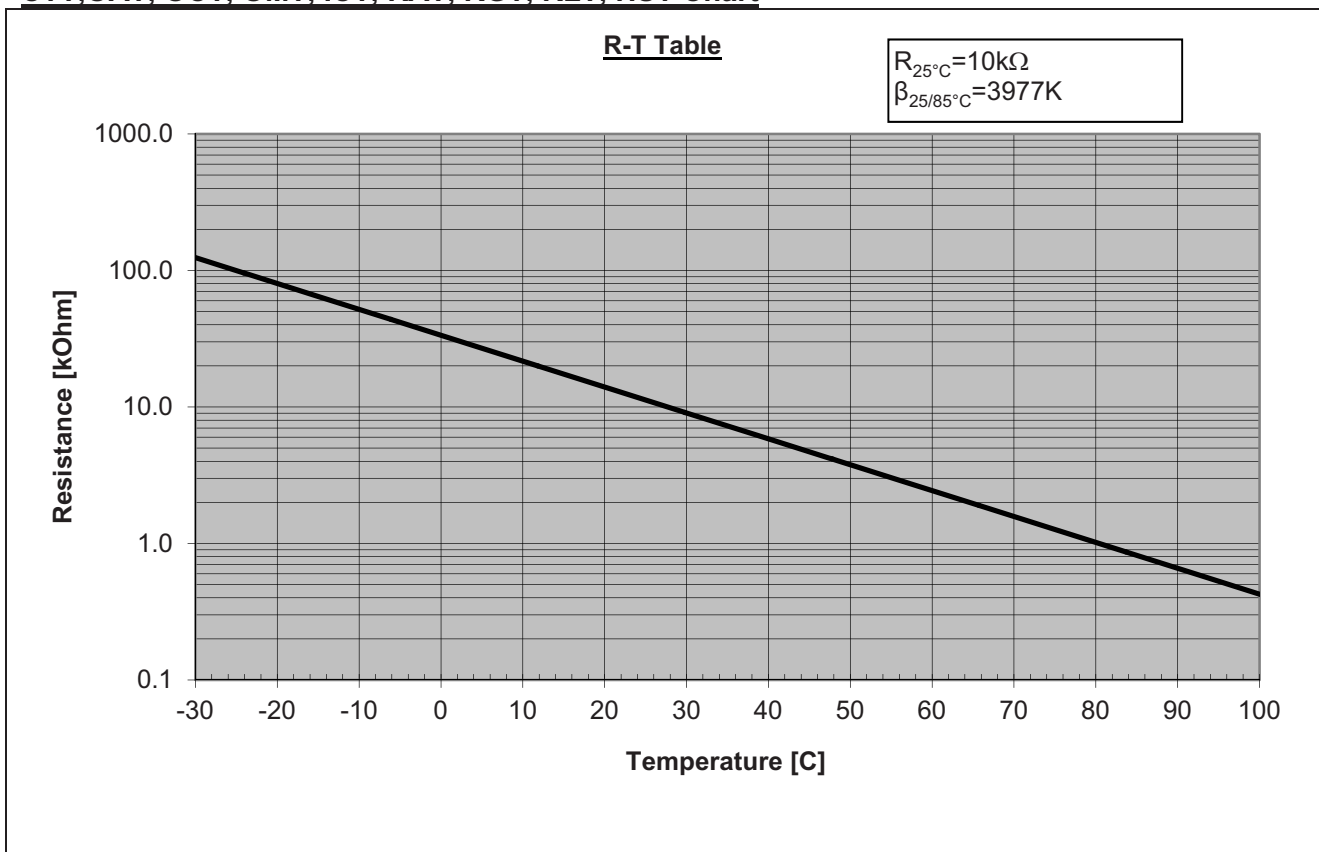
The EEV has two parts, step motor and valve. Use additional set of valve and coil to check the system.

- 1) Check the impedance in the coil wires to be as following:  
 Grey wire to each of the other wires – about  $100\Omega$   
 Other wires – each one to the others (except Grey) – about  $50\Omega$
- 2) When Outdoor unit is powered on, EEV shall have vibration and click sound. If not, replace the coil with the additional one and check again – turn OFF the unit and than turn it ON, vibration and click sound should be performed. If OK, the coil was damaged and require to be replaced.
- 3) Turn OFF the unit, insert a good coil onto an additional operating valve and turn the unit ON, vibration and click sound should be performed. If OK, replace EEV valve from the unit.
- 4) If both EEV coil and valve are still not operating, replace the ODU main board.

### 13.5.10 Checking Thermistors

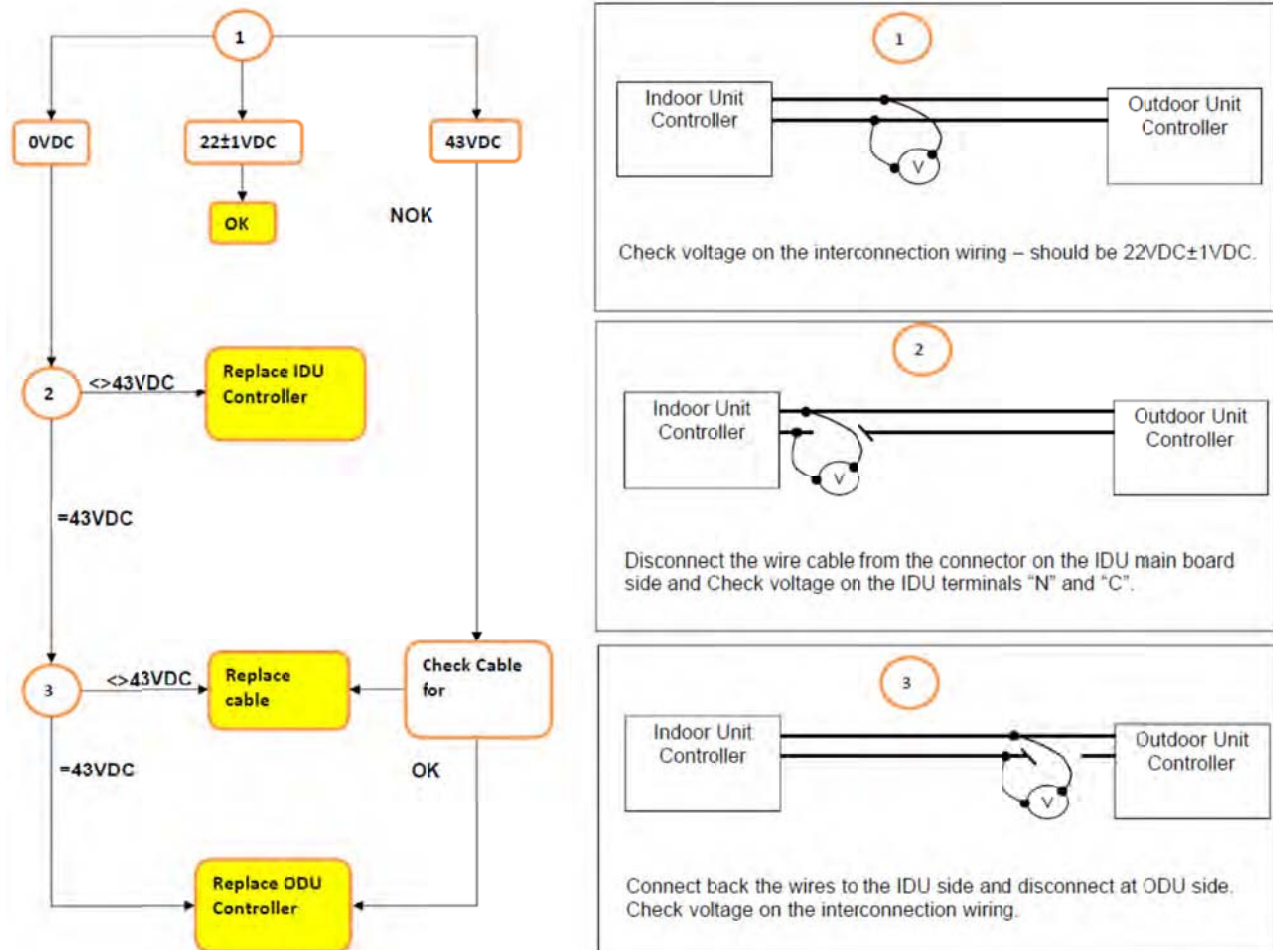
- 1) Check Thermistor connections and wiring - Replace if needed.
- 2) Check sensor visually - Replace if needed.
- 3) Check thermistor sensor attachment to pipe (or other parts), specially pay attention to the spring holding the sensor towards its sensing part – repair if needed.
- 4) Disconnect the connector from the main board and check Thermistor resistance – should be according the charts below for each sensor. If not in range of 10%, replace thermistor.
- 5) If thermistor resistance check is OK but reading is still wrong, replace main board.

#### **CTT,OAT, OCT, OMT, ICT, RAT, RGT, RLT, HST Chart**



### 13.5.11 Checking Indoor-Outdoor Unit Communications

- 1) Check voltage on the interconnection wiring – should be  $22\text{VDC} \pm 1\text{VDC}$ . If not:
- 2) Disconnect the wire cable from the connector on the IDU main board side and Check voltage on the IDU terminals "N" and "C" – should be  $43\text{VDC} \pm 1\text{VDC}$ . If not, replace IDU controller. If it is  $43\text{VDC}$ :
- 3) Connect back the wires to the IDU side and disconnect at ODU side. Check voltage on the interconnection wiring – should be  $43\text{VDC} \pm 1\text{VDC}$ . If not, replace wiring. If it is  $43\text{VDC}$  replace Outdoor unit controller.



### 13.5.12 Checking Indoor Unit Fuse on Controller

If the 3.15A fuse on the main Board is burnt check the fan or any other peripheral that can cause a short:

- 1) In case of a problematic peripheral - replace it.
- 2) In case no problematic peripheral replace the burnt fuse.
- 3) In case of frequent burning fuse, replace the controller.

### 13.5.13 Checking High Pressure Switch (HPS)

- 1) Disconnect HPS connector from the main board and check resistance between the 2 pins of the HPS connector – if shorted the HPS is OK, otherwise replace HPS.

### 13.5.14 Checking Indoor Unit Fan Motor

- 1) Check the motor wiring from the controller.
- 2) Check the motor capacitor for capacitance according to the capacitor name plate.
- 3) Check the resistance between each coil of the motor to be within normal range ( $30\text{--}300\Omega$ ).
- 4) Check resistance between each wire to ground to be above  $5\Omega$ .

### 13.5.15 Checking for electromagnetic interference (EMC problems)

#### 13.5.15.1 *EMC interference to the A/C unit*

**Locations most susceptible to interference**

- 1) Locations near broadcast stations where there are strong electromagnetic waves.
- 2) Locations near amateur radio (short wave) stations.
- 3) Locations near electronic sewing machines and arc-welding machines.

**Problem:**

- 1) The unit may stop suddenly during operation.
- 2) Indicator lamps may flicker

**Correction Actions:**

The fundamental concept is to make the system less susceptible to noise by Insulation for noise or distance from the noise source.

- 1) Use shielded wires.
- 2) Move unit away from the noise source.

#### 13.5.15.2 *EMC interference to near by home appliances*

**Locations most susceptible to interference:**

- 1) A television or radio is located near the A/C and A/C wiring.
- 2) The antenna cable for a television or radio is located close to the A/C and A/C wiring.
- 3) Locations where television and radio signals are weak.

**Problem:**

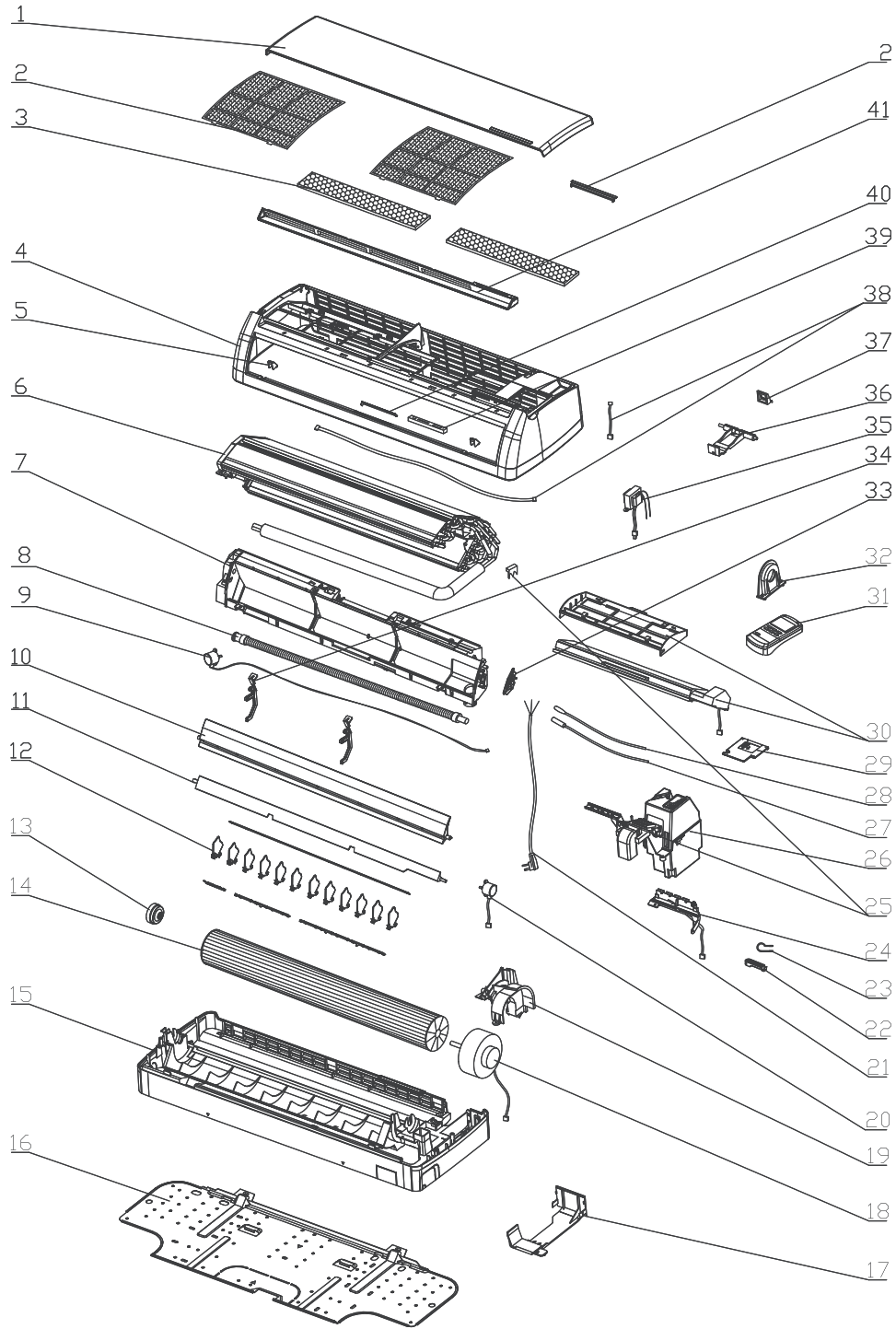
- 1) Noise appears in the television picture, or the picture is distorted.
- 2) Static occurs in the radio sound.

**Correction Actions:**

- 1) Select a separate power source.
- 2) Keep the A/C and A/C wiring at least 1 meter away from wireless devices and antenna cables.
- 3) Change the wireless device's antenna to a high sensitivity antenna.
- 4) Change the antenna cable to a BS coaxial cable.
- 5) Use a noise filter (for the wireless device).
- 6) Use a signal booster.

# 14. EXPLODED VIEW & SPARE PART LIST

## 14.1 Exploded view of indoor unit: HJD009/012 DCI



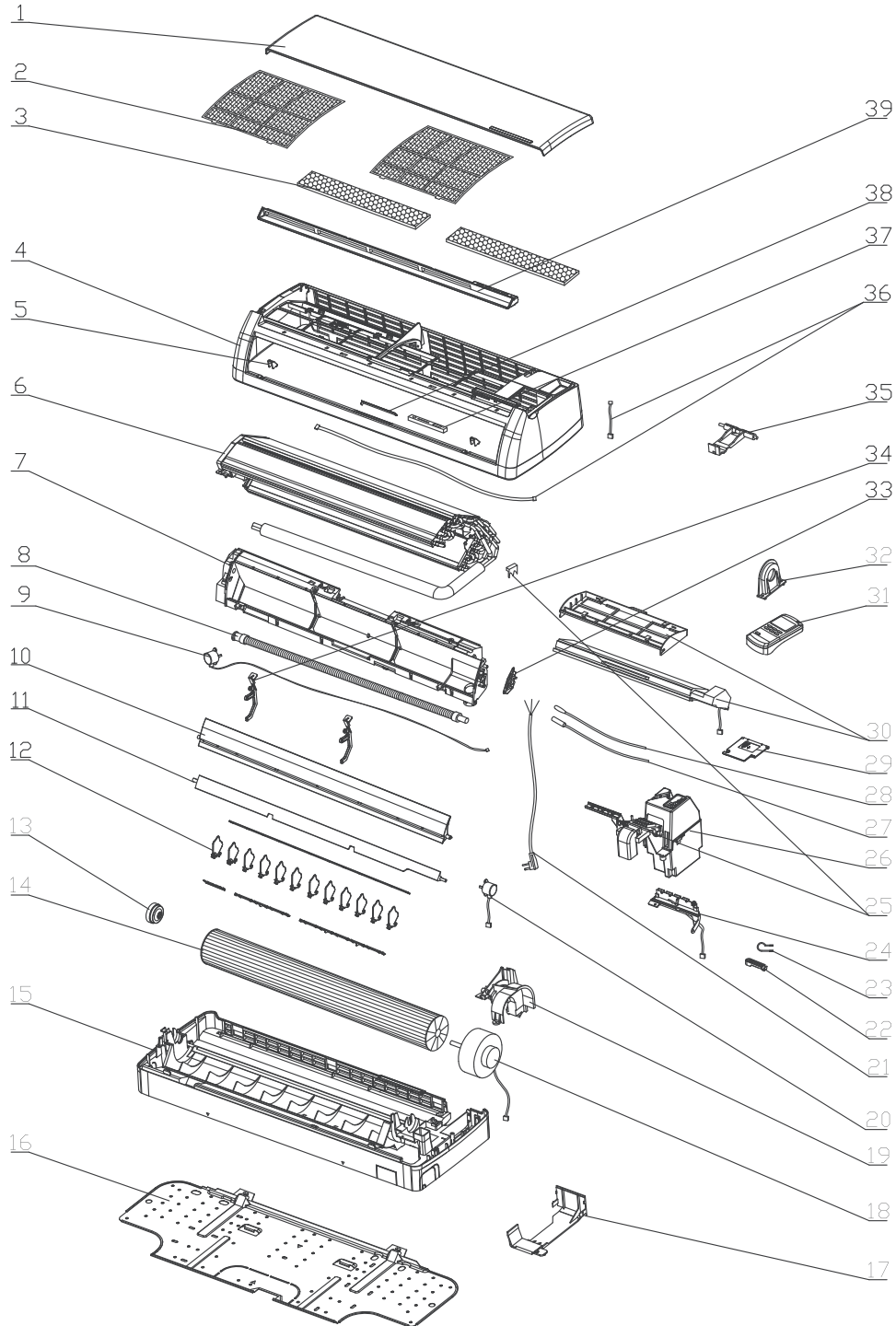
**14.2 Spare part list of indoor Unit: HJD009 DCI**

Item	PN	Description	Qty
1	465020275	Printed Grill A /Glossy/With New Function /LEX7/9/12/14/AIRWELL(RAL9003AW)	1
2	4518655	Air filter	2
3	470500011	Nanometer Photocatalysis Deodorant Filter Lex7-14	1
	470500014	Biological Sterilization Filter Lex7-14	1
4	465720387	Front Frame Assy./Glossy/LEX 25 35 DCI (VIESSMANN)	1
5	465340084	Screw Cover/Glossy/LEX 25 35 DCI (VIESSMANN)	2
6	4526389	R410A EVAPORATOR ASSY HPI DC WNG9/12	1
7	465800110	Air Outlet Frame Assy./Assemble New Ionizer Bi-polar/LEX 25 35 DCI (VIESSMANN)	1
8	465210017	Drain Pipe Delta7/9	1
9	452969500	Step Motor B	1
10	465160010	Horizontal Upper Flap /LEX25/35 DCI (Viessmann)	1
11	465160022	Lower Louver/Glossy/LEX 25 35 DCI (VIESSMANN)	1
12	465160013	Vertical Flap B /LEX25/35 DCI (Viessmann)	10
13	4518662	Bearing assy fan	1
14	4518661	Fan assy plastic D91	1
15	465700010	Unit Housing Assy./LEX 25 35 DCI (VIESSMANN)	1
16	4518670	WNG INSTALLATION PLATE	1
17	465360052	TUBE BRACKET(RAL9003AW)	1
18	4519864R	20W PG Motor	1
19	4518650	Motor Cover	1
20	452969400	Step Motor A	1
21	455013705R	Power Cord Without Plug/3G/1.5/2100	1
22	465320006	Wire Fixing Block /ABS	1
23	4519147	Power Cord Clip	1
24	467300079R	Display Board Assy./ LEX25/35DCI (With new function)	1
25	4518666	Nip Braket	1
26	467300147R	Indoor Controller/LEX25/35 DCI VIESSMANN/ EHK:916A512-04/(Ion+ESF+Vertical	1
27	467400053	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation ø6	1
28	467400024	Indoor Air Inlet Temperature Sensor	1
29	465340052	Terminal Cover / LEX25/35 DCI (Viessmann)	1
30	4518663	ELECTROSTATIC FLITER WNG-1	1
31	467240051	Remote Controller Assy. with Batteries.for Export RC08	1
32	4518651	Cover Side Motor	1
33	4518682	Gear BOX ASSY	1
34	464250069	Support/Horizontal Flap/ LEX25/35 DCI (Viessmann)	2
35	467450001	Transformer/Ionizer Bi-Polar	1
36	465320033	TUBE LOCK (RAL9003AW)	1
37	4518656	MOUNTING HOOK	2
38	467030086	Ionizer wire/bi-polar/UL 1007 26AWG/PH-2A*70*PH-2A/LEX 7-14	1
39	465360039	Support/Bi Polar Ionizer/LEX 7/9/12/18	1
40	467480009	Ionizer/Bi-Polar	1
41	464860140	Air Inlet Frame A Assy./LEX/AWSI-HJD009/012-N11/AIRWELL	1
42	465340044	Cover/Front Frame/ LEX 25/35 DCI (Viessmann)	1

**14.3 Spare part list of indoor Unit: HJD012 DCI**

Item	PN	Description	Qty
1	465020275	Printed Grill A /Glossy/With New Function /LEX7/9/12/14/AIRWELL(RAL9003AW)	1
2	4518655	Air filter	2
3	470500011	Nanometer Photocatalysis Deodorant Filter Lex7-14	1
	470500014	Biological Sterilization Filter Lex7-14	1
4	465720387	Front Frame Assy./Glossy/LEX 25 35 DCI (VIESSMANN)	1
5	465340084	Screw Cover/Glossy/LEX 25 35 DCI (VIESSMANN)	2
6	4526389	R410A EVAPORATOR ASSY HPI DC WNG9/12	1
7	465800110	Air Outlet Frame Assy./Assemble New Ionizer Bi-polar/LEX 25 35 DCI (VIESSMANN)	1
8	465210017	Drain Pipe Delta7/9	1
9	452969500	Step Motor B	1
10	465160010	Horizontal Upper Flap /LEX25/35 DCI (Viessmann)	1
11	465160022	Lower Louver/Glossy/LEX 25 35 DCI (VIESSMANN)	1
12	465160013	Vertical Flap B /LEX25/35 DCI (Viessmann)	10
13	4518662	Bearing assy fan	1
14	4518661	Fan assy plastic D91	1
15	465700010	Unit Housing Assy./LEX 25 35 DCI (VIESSMANN)	1
16	4518670	WNG INSTALLATION PLATE	1
17	465360052	TUBE BRACKET(RAL9003AW)	1
18	4519864R	20W PG Motor	1
19	4518650	Motor Cover	1
20	452969400	Step Motor A	1
21	455013705R	Power Cord Without Plug/3G/1.5/2100	1
22	465320006	Wire Fixing Block /ABS	1
23	4519147	Power Cord Clip	1
24	467300079R	Display Board Assy./ LEX25/35DCI (With new function)	1
25	4518666	Nip Braket	1
26	467300147R	Indoor Controller/LEX25/35 DCI VIESSMANN/ EHK:916A512-04/(Ion+ESF+Vertical)	1
27	467400053	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\phi$ 6	1
28	467400024	Indoor Air Inlet Temperature Sensor	1
29	465340052	Terminal Cover / LEX25/35 DCI (Viessmann)	1
30	4518663	ELECTROSTATIC FLITER WNG-1	1
31	467240051	Remote Controller Assy. with Batteries.for Export RC08	1
32	4518651	Cover Side Motor	1
33	4518682	Gear BOX ASSY	1
34	464250069	Support/Horizontal Flap/ LEX25/35 DCI (Viessmann)	2
35	467450001	Transformer/Ionizer Bi-Polar	1
36	465320033	TUBE LOCK (RAL9003AW)	1
37	4518656	MOUNTING HOOK	2
38	467030086	Ionizer wire/bi-polar/UL 1007 26AWG/PH-2A*70*PH-2A/LEX 7-14	1
39	465360039	Support/Bi Polar Ionizer/LEX 7/9/12/18	1
40	467480009	Ionizer/Bi-Polar	1
41	464860140	Air Inlet Frame A Assy./LEX/AWSI-HJD009/012-N11/AIRWELL	1
42	465340044	Cover/Front Frame/ LEX 25/35 DCI (Viessmann)	1

**14.4 Exploded view of indoor unit: HJD018 DCI**

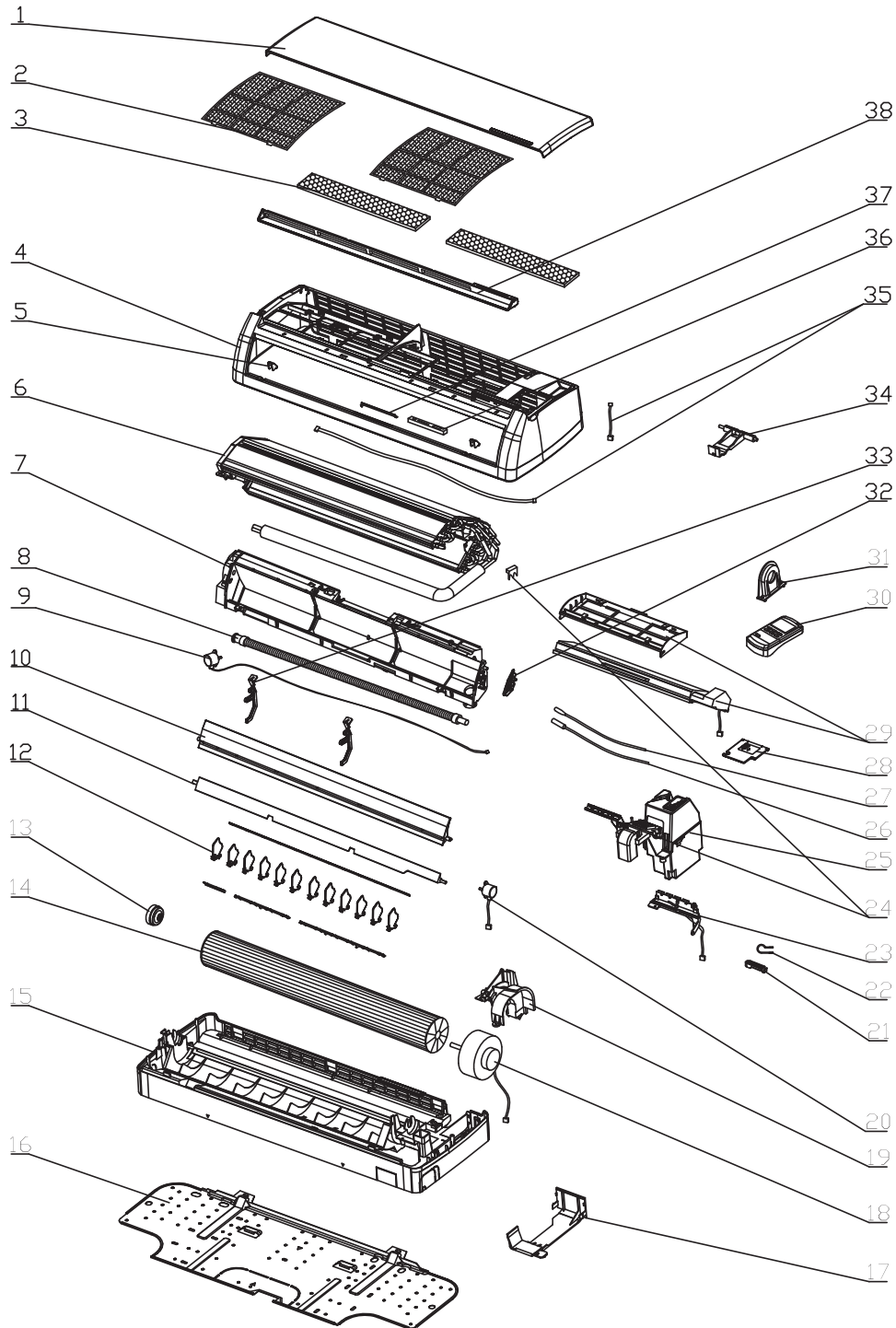




**14.5 Spare part list of indoor Unit: HJD018 DCI**

Item	PN	Description	Qty
1	465100078	Grill A/Lex-18 (RAL9003AW)	1
2	452919800	Filter	2
3	470500012	Nanometer Photocatalysis Deodorant Filter Lex18/24	1
	470500015	Biological Sterilization Filter Lex18/24	1
4	465720388	Front Frame Assy./Glossy/LEX 50 DCI (VIESSMANN)	1
5	465340085	Screw Cover/Glossy/LEX 50 DCI (VIESSMANN)	3
6	453134600	Evaporator Assy.	1
7	465120023	Air Outlet Frame/Assemble New Ionizer Bi-polar/LEX 50 DCI (VIESSMANN)	1
8	465210009	Drain Pipe for Europe / WNG18/24/30	1
9	453050300	STEP MOTOR B	1
10	465160023	Horizontal flap A/Glossy/LEX 50 DCI (VIESSMANN)	1
11	465160024	Horizontal flap B/Semi-Glossy/LEX 50 DCI (VIESSMANN)	1
12	465160016	Vertical Flap A /LEX50 DCI (Viessmann)	12
13	4518662	Bearing assy fan	1
14	453024900	Impeller fan	1
15	465700011	Unit Housing Assy./Glossy/LEX 50 DCI (VIESSMANN)	1
16	452920100	Mount bracket/WNG-18 (20)	1
17	465320017	Connect Plate/Unit housing/LEX 50 DCI (Viessmann)	1
18	453024500R	PG Motor	1
19	452918800	Cover/motor	1
20	453050200	STEP MOTOR A	1
21	455013707R	Power Cord Without Plug/3G/2.5/2100	1
22	452919200	Tie/connection Wire	1
23	453232000	Clip /Power cord	1
24	467300068R	Display Board /LEX DCI (With New Funtion)	1
25	452919100	Support/sensor	1
	4516263	SENSOR BASE	1
26	467300258R	Controller / DCI IDU HAD 18	1
27	467400053	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\phi 6$	1
28	467400025	Indoor Air Inlet Temperature Sensor	1
29	465340051	Terminal Cover / LEX50 DCI (Viessmann)	1
30	4524963	Electrostatic Filter	1
31	467240053	Remote Controller Assy. with Batteries.for Export RC08	1
32	4518651	Cover Side Motor	1
33	453057900	Gear BOX ASSY	1
34	464250070	Support/Horizontal Flap/ LEX50 DCI (Viessmann)	2
35	465320033	TUBE LOCK (RAL9003AW)	1
36	467030087	Ionizer wire/bi-polar/UL 1007 26AWG/PH-2Y*300*PH-2A/LEX 18	1
37	467480009	Ionizer/Bi-Polar	1
38	465360039	Support/Bi Polar Ionizer/LEX 7/9/12/18	1
39	464860143	Air Inlet Frame A Assy./LEX/AWSI-HJD018/024-N11/AIRWELL	1

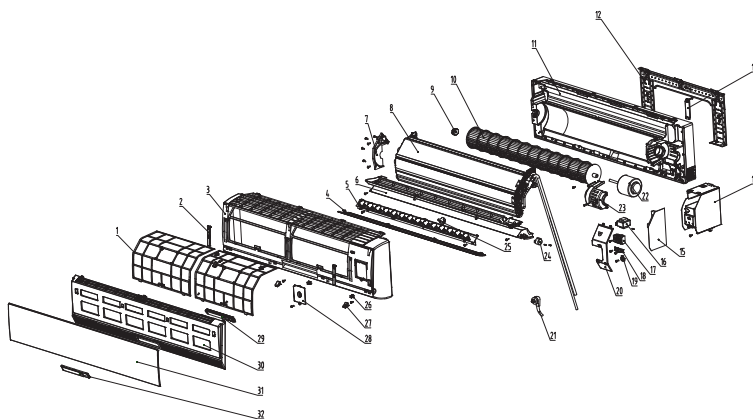
**14.6 Exploded view of indoor unit: HJD024 DCI**



## 14.7 Spare part list of indoor Unit: HJD024 DCI

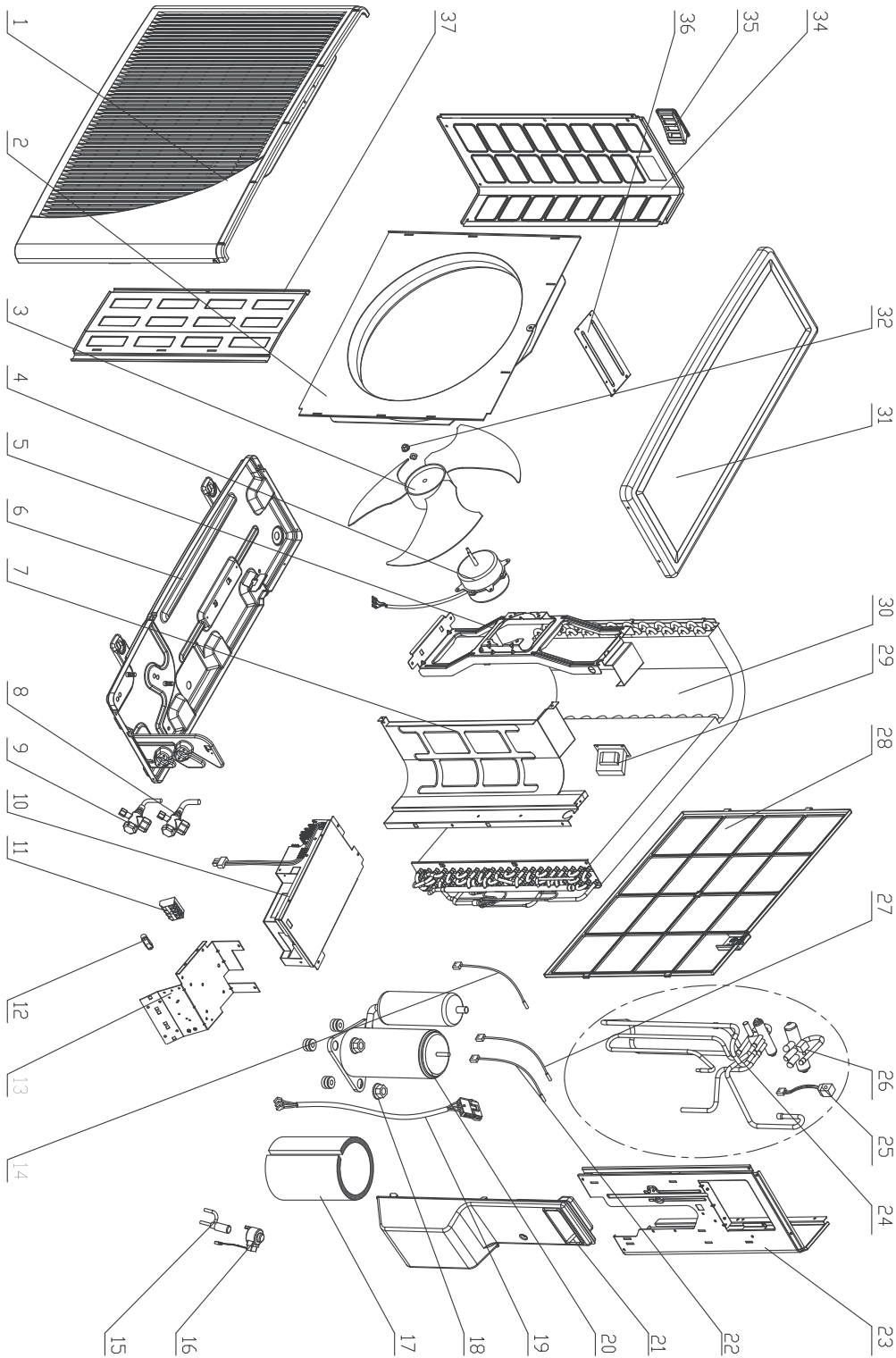
Item	PN	Description	Qty
1	465100078	Grill A/Lex-18 (RAL9003AW)	1
2	452919800	Filter	2
3	470500012	Nanometer Photocatalysis Deodorant Filter Lex18/24	1
	470500015	Biological Sterilization Filter Lex18/24	1
4	465720388	Front Frame Assy./Glossy/LEX 50 DCI (VIESSMANN)	1
5	465340085	Screw Cover/Glossy/LEX 50 DCI (VIESSMANN)	3
6	453260400	Evaporator Assy/WNG24	1
7	465120023	Air Outlet Frame/Assemble New Ionizer Bi-polar/LEX 50 DCI (VIESSMANN)	1
8	465210009	Drain Pipe for Europe / WNG18/24/30	1
9	453050300	STEP MOTOR B	1
10	465160023	Horizontal flap A/Glossy/LEX 50 DCI (VIESSMANN)	1
11	465160024	Horizontal flap B/Semi-Glossy/LEX 50 DCI (VIESSMANN)	1
12	465160016	Vertical Flap A /LEX50 DCI (Viessmann)	12
13	4518662	Bearing assy fan	1
14	453024900	Impeller fan	1
15	465700011	Unit Housing Assy./Glossy/LEX 50 DCI (VIESSMANN)	1
16	452920100	Mount bracket/WNG-18 (20)	1
17	465320017	Connect Plate/Unit housing/LEX 50 DCI (Viessmann)	1
18	453206800R	DC Motor 25W/(DR-8938-538D)	1
19	452918800	Cover/motor	1
20	453050200	STEP MOTOR A	1
21	452919200	Tie/connection Wire	1
22	453232000	Clip /Power cord	1
23	467300068R	Display Board /LEX DCI (With New Funtion)	1
24	452919100	Support/sensor	1
	4516263	SENSOR BASE	1
25	467300259R	Controller / DCI IDU HAD 24	1
26	467400053	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\phi$ 6	1
27	467400025	Indoor Air Inlet Temperature Sensor	1
28	465340051	Terminal Cover / LEX50 DCI (Viessmann)	1
29	4524963	Electrostatic Filter	1
30	467240053	Remote Controller Assy. with Batteries.for Export RC08	1
31	4518651	Cover Side Motor	1
32	453057900	Gear BOX ASSY	1
33	464250070	Support/Horizontal Flap/ LEX50 DCI (Viessmann)	2
34	465320033	TUBE LOCK (RAL9003AW)	1
35	467030087	Ionizer wire/bi-polar/UL 1007 26AWG/PH-2Y*300*PH-2A/LEX 18	1
36	467480009	Ionizer/Bi-Polar	1
37	465360039	Support/Bi Polar Ionizer/LEX 7/9/12/18	1
38	464860143	Air Inlet Frame A Assy./LEX/AWSI-HJD018/024-N11/AIRWELL	1

## 14.8 Spare part list of indoor Unit: HJD030 DCI



NO	component	Item Description	Revision	Uom	Qty
1	11320025000012 11320025000013	Filter assembly	01	EA	1
2	11320043000002	Bracing piece	01	EA	1
3	11320002000089	Medium frame	01	EA	1
4	11320005000126 11320005000127	Vertical airflow vanes	01	EA	1
5	11320017000093	Horizontal airflow vane assembly	01	EA	1
6	11220503000074	Air outlet frame assembly	01	EA	1
7	11320015000080	Left-hand propping holder for vaporizer	01	EA	1
8	11224003000459	Coil assemble	01	Tao	1
9	11220551000003	Bearing for through-flow fan	01	EA	1
10	11220513000003	Through-flow fan	01	EA	1
11	11220500000071	Chassis assembly	01	EA	1
12	11221500000025	Mount bracket	01	EA	1
13	11321010000016	Tube clip	01	EA	1
14-19	11222003001572	Controller Assembly	01	Tao	1
20	11321020000004	Control box cover	01	EA	1
21	None	Power cable	01	Tiao	0
22	11230003000064	Indoor fan motor	01	EA	1
23	11320052000007	Motor cover	01	EA	1
24	11230002000010	Vertical step motor	01	EA	1
25	11230002000004 11230002000005	Horizontal step motor	01	EA	1
26	11320106000004	Front panel fastener	01	EA	4
27	11320096000020	Screw cover	01	EA	3
28	11320076000028	Terminal board cover	01	EA	1
29	11222014000069	Display assembly	01	Tao	1
30	11320003000729	Front panel A	01	EA	1

14.9 Exploded view of outdoor Unit: YBDE009/012 DCI



**14.10 Spare part list of outdoor Unit: YBDE009 DCI**

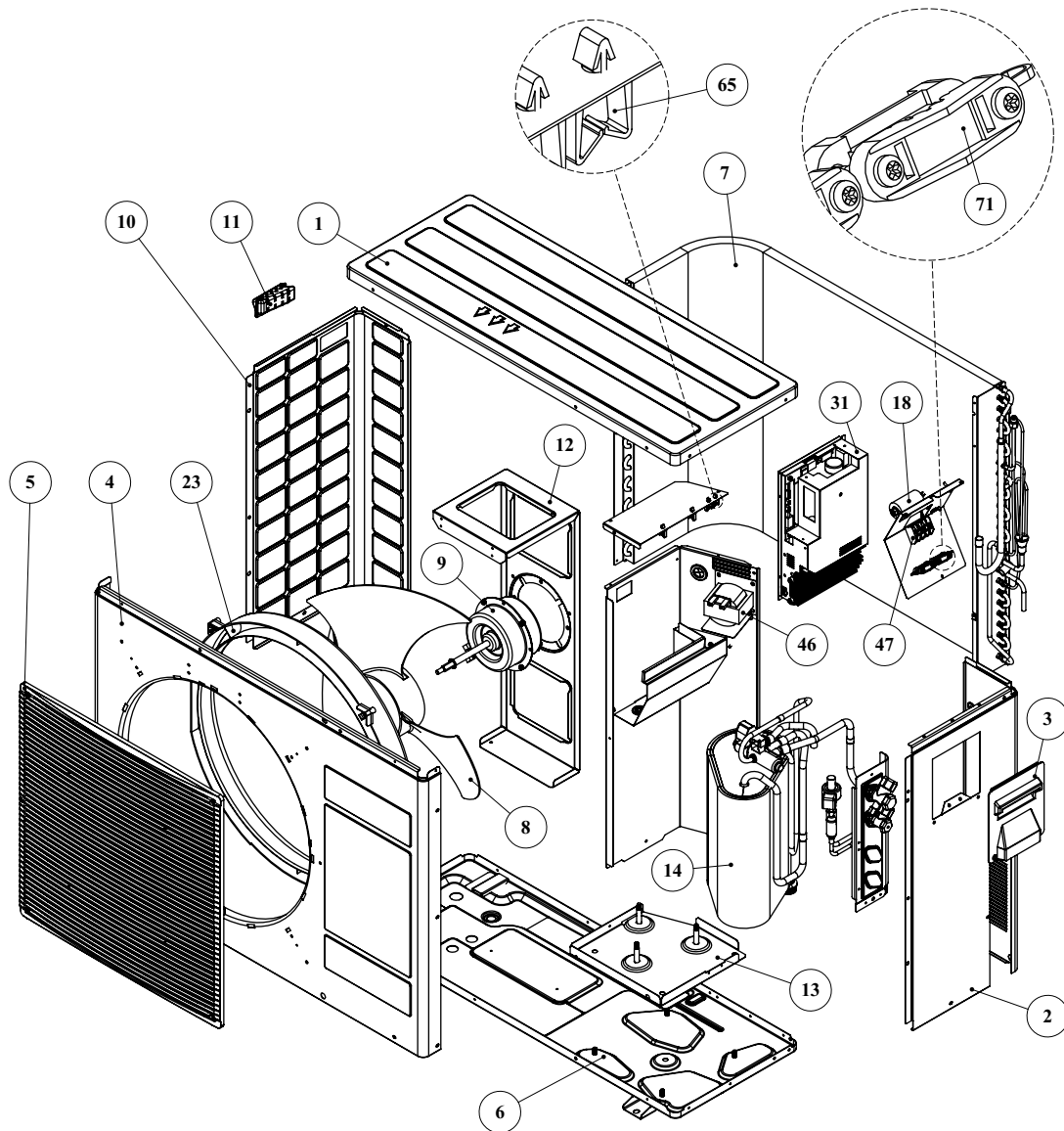
Item	PN	Description	Qty
1	433218	Front Panel A	1
2	4526340	Air inlet ring-420	1
3	4526476	Axial fan OD=401	1
4	4527092R	DC MOTOR for DCI 25/35	1
5	433215	Motor Support	1
6	4523059P1	Painting Base Assy.	1
7	452808800	Partition Assy.	1
8	461010004	Gas Valve 3/8" R410A	1
9	461000004	Liquid Valve 1/4" R410A	1
10	67300365R	Controller/DCI 1.8KW (SCM1243MF) BD	1
11	4519188	4 poles terminal block	1
12	204107	Cable clip Nylon	1
13	453012700	Electric Panel	1
14	467400200	CTT Compressor Top Temperature Sensor/10K/Resin-capsulation	1
15	4526827	Electronical expansion valve CAM-BD15 FKS-1	1
16	452682802	EEV coil CAM-MD12FKS-2 (White connector, 530mm)	1
17	469120004	Insulation 2 Felt+PVC/ Compressor DCI 25 35	1
18	4510677	Nut With Flange M8 -D=24 GB6187-86	3
19	4526221	Compressor wire	1
20	4526204	DC INVERTER Compressor Assy 5RS102XAB	1
21	465340080	Valve Cover/PP+UV 5VA/ONG3	1
22	467400056	OCT Outdoor Coil Temperature Sensor/10K/Copper-capsulation c6	1
23	433226P1	Right side panel /painting plate/DCI 25/35/ONG3	1
24	461600131	4-Way Valve Assy./DCI 25/35/ONG3	1
25	461030008	4-W valve coil /SHF(L)-4H/7H	1
26	461020006	4-W valve /DSF-4-R410A	1
27	467400040	Condenser Middle Temperature Sensor/OAT & OMT/DCR LC 25/35	1
28	433228	Back Side Net	1
29	467550014R	Choke/9A/3mH/DCR 1.6KW	1
30	4526368	Condensor Soldering assy	1
31	433231P1	Painting Top Cover/DCI 25/35/ONG3	1
32	4519300	Nut M5 L	1
33	433224P1	Left Side Panel/Painting Plate/DCI 25/35/ONG3	1
34	433225	Handle	1
35	4526298	Bridge	1
36	433223P5	Painting Insulation Plate	1

**14.11 Spare part list of outdoor Unit: YBDE012**

Item	PN	Description	Qty
1	433218	Front Panel A	1
2	4526340	Air inlet ring-420	1
3	4526476	Axial fan OD=401	1
4	4527092R	DC MOTOR for DCI 25/35	1
5	433215	Motor Support	1
6	4523059P1	Painting Base Assy.	1
7	452808800	Partition Assy.	1
8	461010004	Gas Valve 3/8" R410A	1
9	461000004	Liquid Valve 1/4" R410A	1
10	467300365R	Controller/DCI 1.8KW (SCM1243MF) BD	1
11	4519188	4 poles terminal block	1
12	204107	Cable clip Nylon	1
13	453012700	Electric Panel	1
14	467400200	CTT Compressor Top Temperature Sensor/10K/Resin-capsulation	1
15	4526827	Electronical expansion valve CAM-BD15 FKS-1	1
16	452682802	EEV coil CAM-MD12FKS-2 (White connector, 530mm)	1
17	469120004	Insulation 2 Felt+PVC/ Compressor DCI 25 35	1
18	4510677	Nut With Flange M8 -D=24 GB6187-86	3
19	4526221	Compressor wire	1
20	4526204	DC INVERTER Compressor Assy 5RS102XAB	1
21	465340080	Valve Cover/PP+UV 5VA/ONG3	1
22	467400056	OCT Outdoor Coil Temperature Sensor/10K/Copper-capsulation $\phi$ 6	1
23	433226P1	Right side panel /painting plate/DCI 25/35/ONG3	1
24	461600131	4-Way Valve Assy./DCI 25/35/ONG3	1
25	461030008	4-W valve coil /SHF(L)-4H/7H	1
26	461020006	4-W valve /DSF-4-R410A	1
27	467400040	Condenser Middle Temperature Sensor/OAT & OMT/DCR LC 25/35	1
28	433228	Back Side Net	1
29	467550014R	Choke/9A/3mH/DCR 1.6KW	1
30	4526368	Condensor Soldering assy	1
31	433231P1	Painting Top Cover/DCI 25/35/ONG3	1
32	4519300	Nut M5 L	1
33	433224P1	Left Side Panel/Painting Plate/DCI 25/35/ONG3	1
34	433225	Handle	1
35	4526298	Bridge	1
36	433223P5	Painting Insulation Plate	1

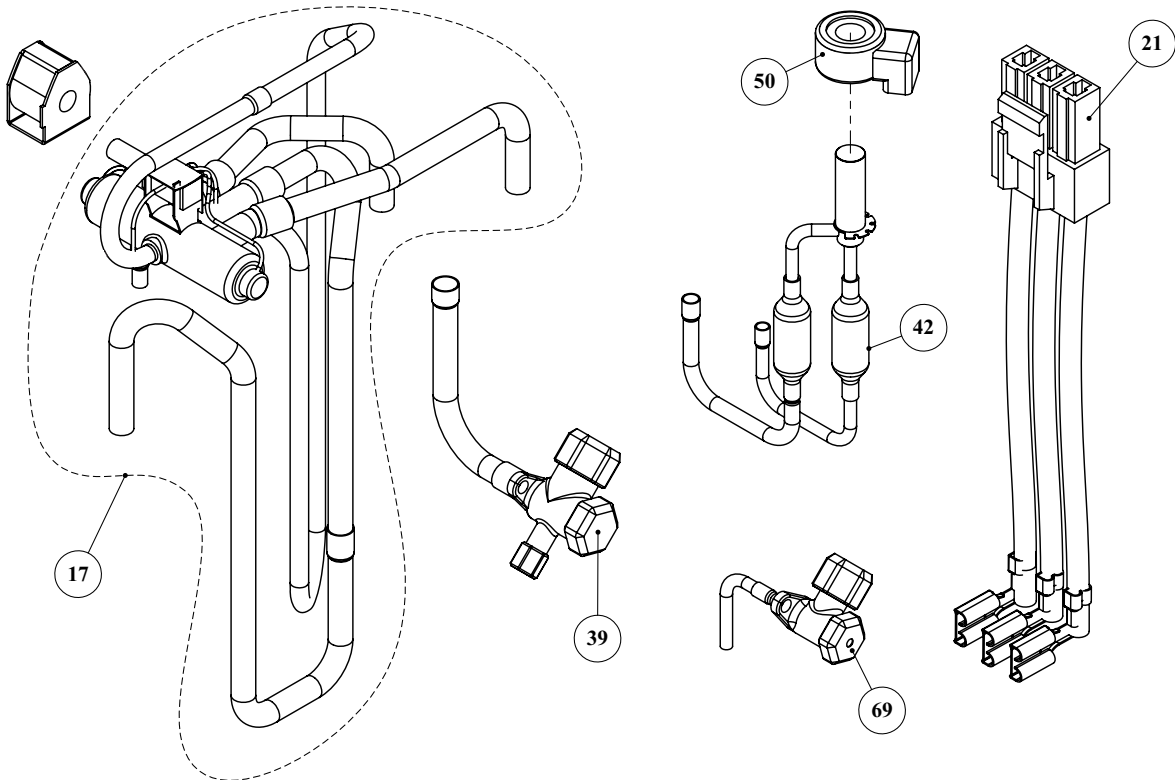
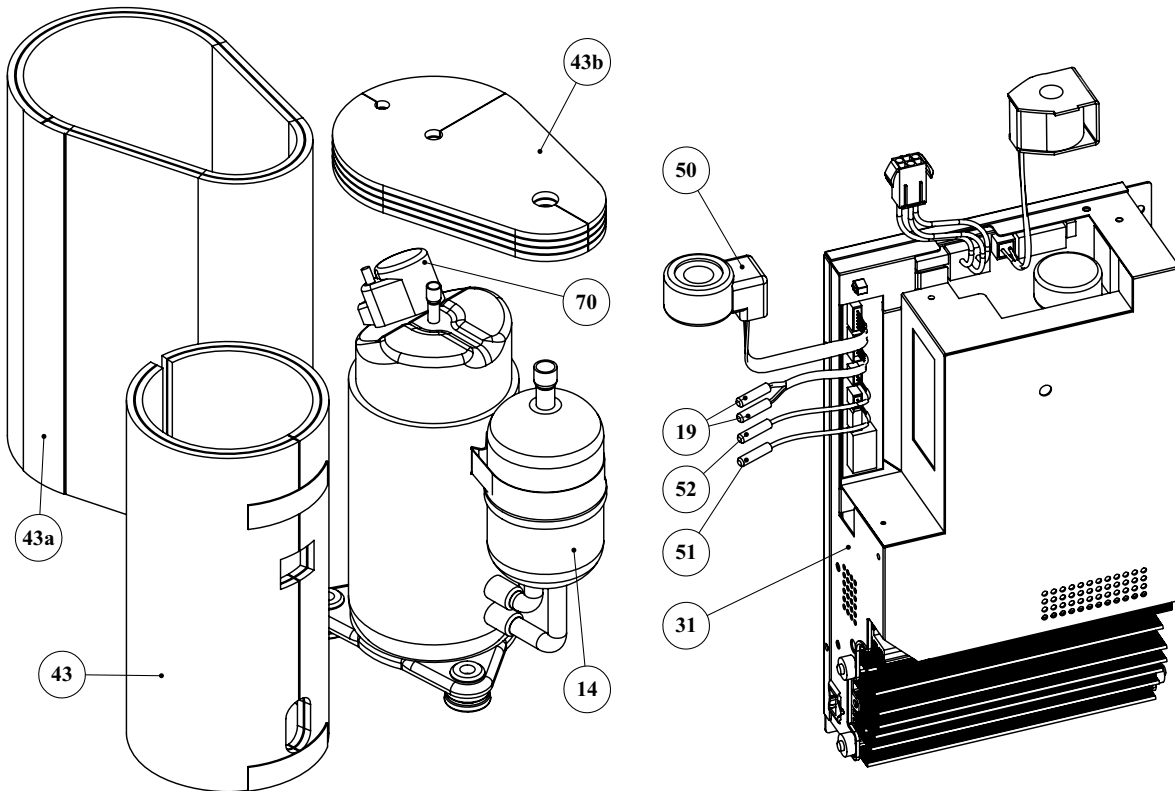
**14.12 Exploded view of outdoor Unit: YBDE 018-H11**

**14.12.1 General Assembly**





14.12.2 Parts Assembly

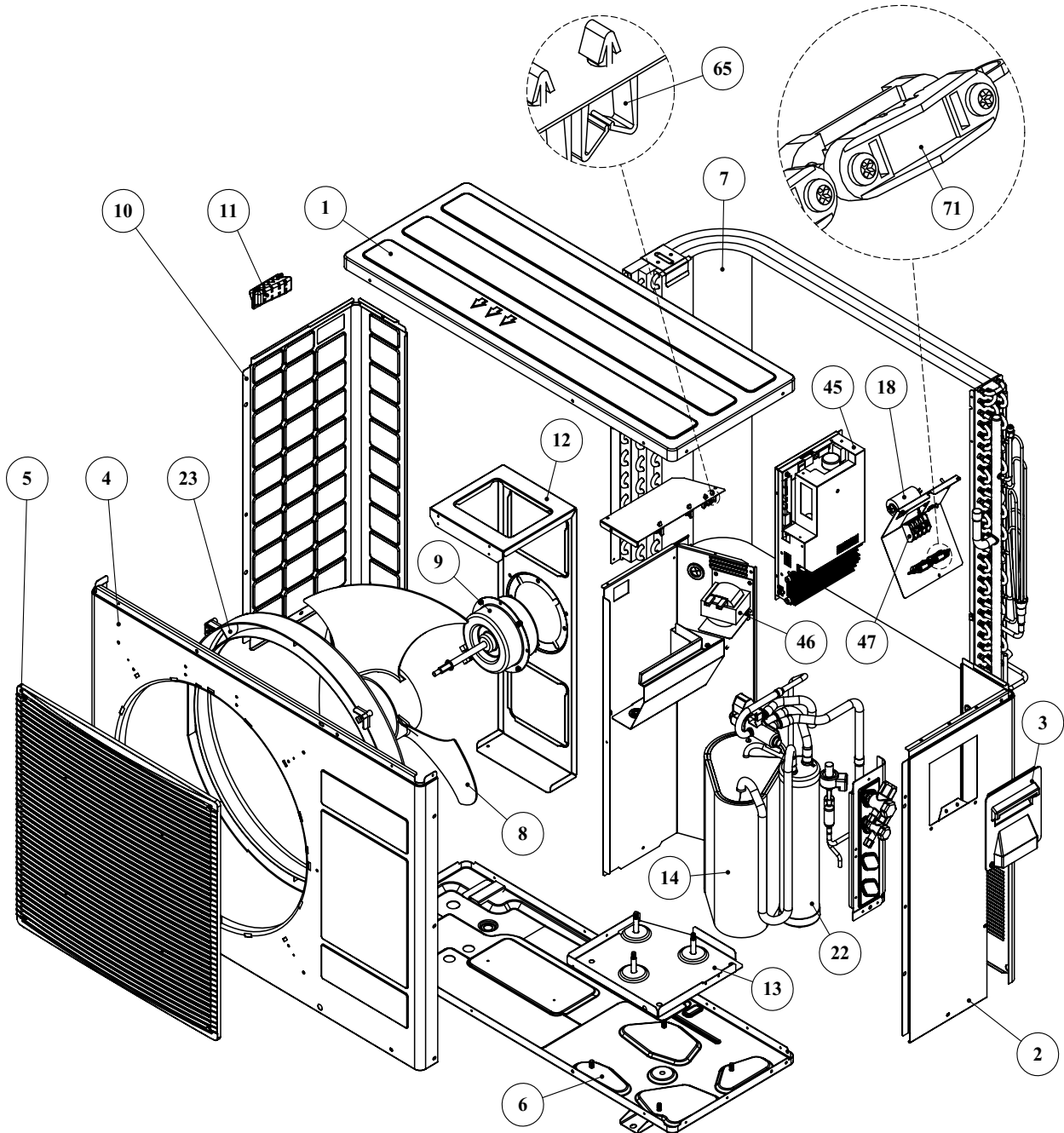


## 14.12.3 Spare Part List of outdoor Unit: YBDE 018-H11

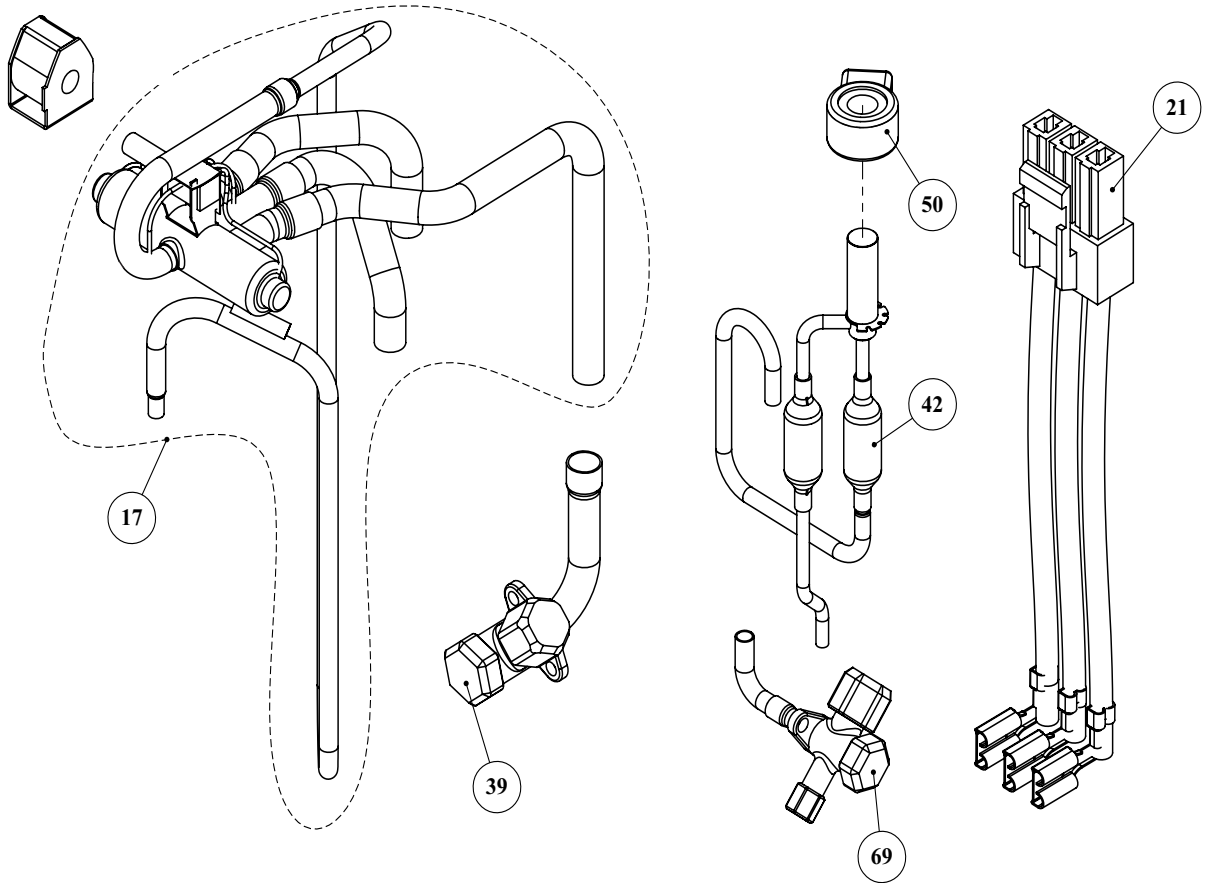
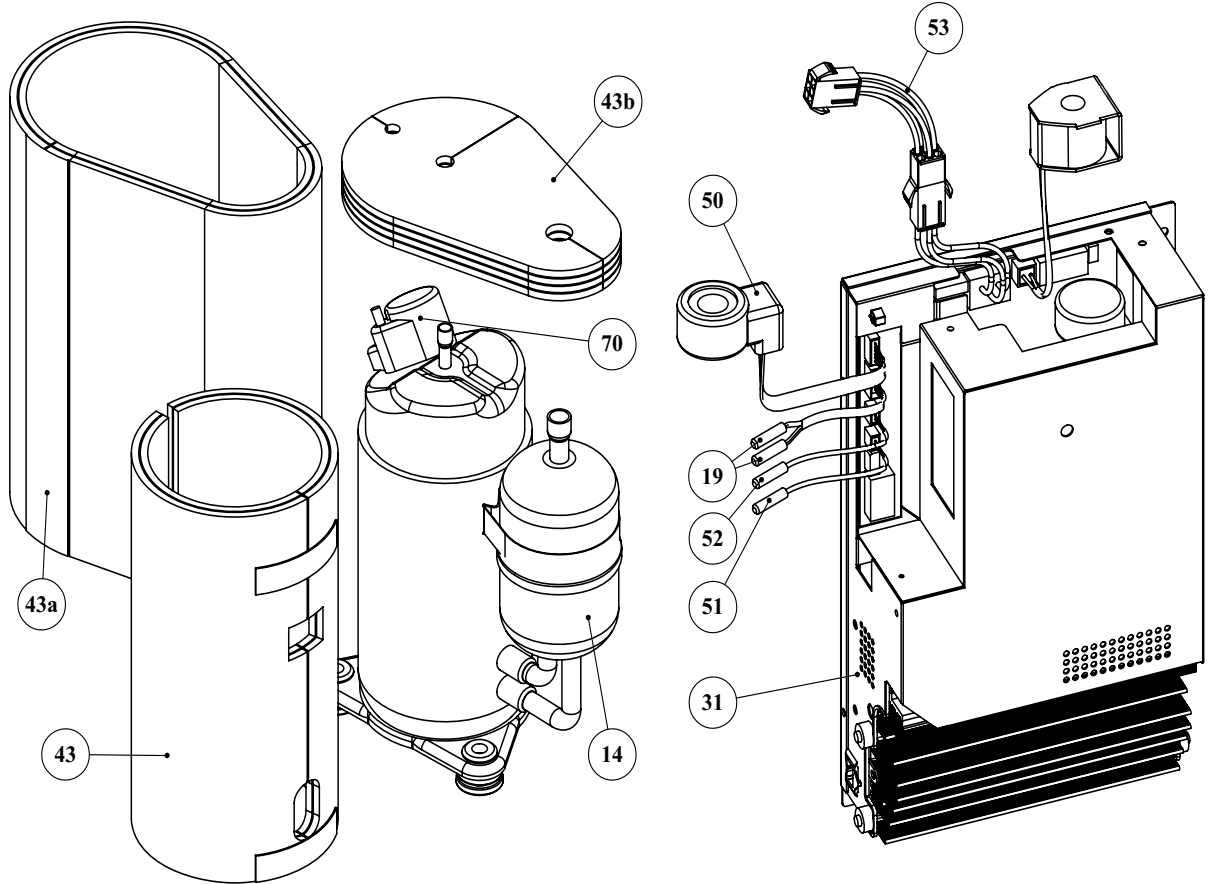
No.	PN	Description	Qty
71	253054	Supply Cord Clamp	2
9	416320	Motor 70W,2S,OU7 DCI	1
65	416910	Cable Holder	3
65	416910	Cable Holder	1
5	417000	OU Square Fan Guard	1
50	425713	EEV Coil (C) QA (Q) 12-YLT-07-RK	1
43	426630	Compressor Internal Insulation	1
43a	426631	Compressor External Insulation	1
43b	426632	Compressor Top Insulation OU7	1
13	426634	Compressor Base Plate OU7-22-30 DCI	1
2	426641	Side Panel OU7 DCI	1
7	426678	Coil OU7-22 DCI Eco Export As	1
17	426690	Tubing Assembly OU7-22 DCI	1
31	426705	Controller Assy OU7 DCI	1
21	426793	Compressor Wiring	1
46	426798	PFC Chock (1PH/DCI50)	1
70	426903	Terminal Cover Compressor GMCC	1
10	433281	Side Guard OU7-24	1
3	436357	Small Electrical Cover OU	1
11	436358	OU Leading Handle	1
1	437045	Upper Cover EL13 OU Large	1
12	439342	Motor Support OU7	1
4	439357	Front Cover OU7	1
23	4399281	Outlet Plastic Ring OU7/8/12	1
18	442007	Capacitor 6mF 450V/P2	1
8	4529604	Axial Fan D493*143	1
14	460170013R	Compressor DA150S1C-20FZ	1
19	467400040	OMT/OAT Thermistor with connector	1
51	467400078	OCT-Thermistor+CAP With Connector	1
52	467400200	CTT-Thermistor With Connector	1
47	467420025	Terminal Block 4P	1
69	474239	Liquid Valve Assembly OU12-50	1
39	455879	Service Valve 1/4"F	1
42	426662	EEV Assy OUI7-22 DCI	1
6	417200	Base Assembly	1

**14.13 Exploded View of outdoor Unit: YBDE 024-H11**

**14.13.1 General Assembly**



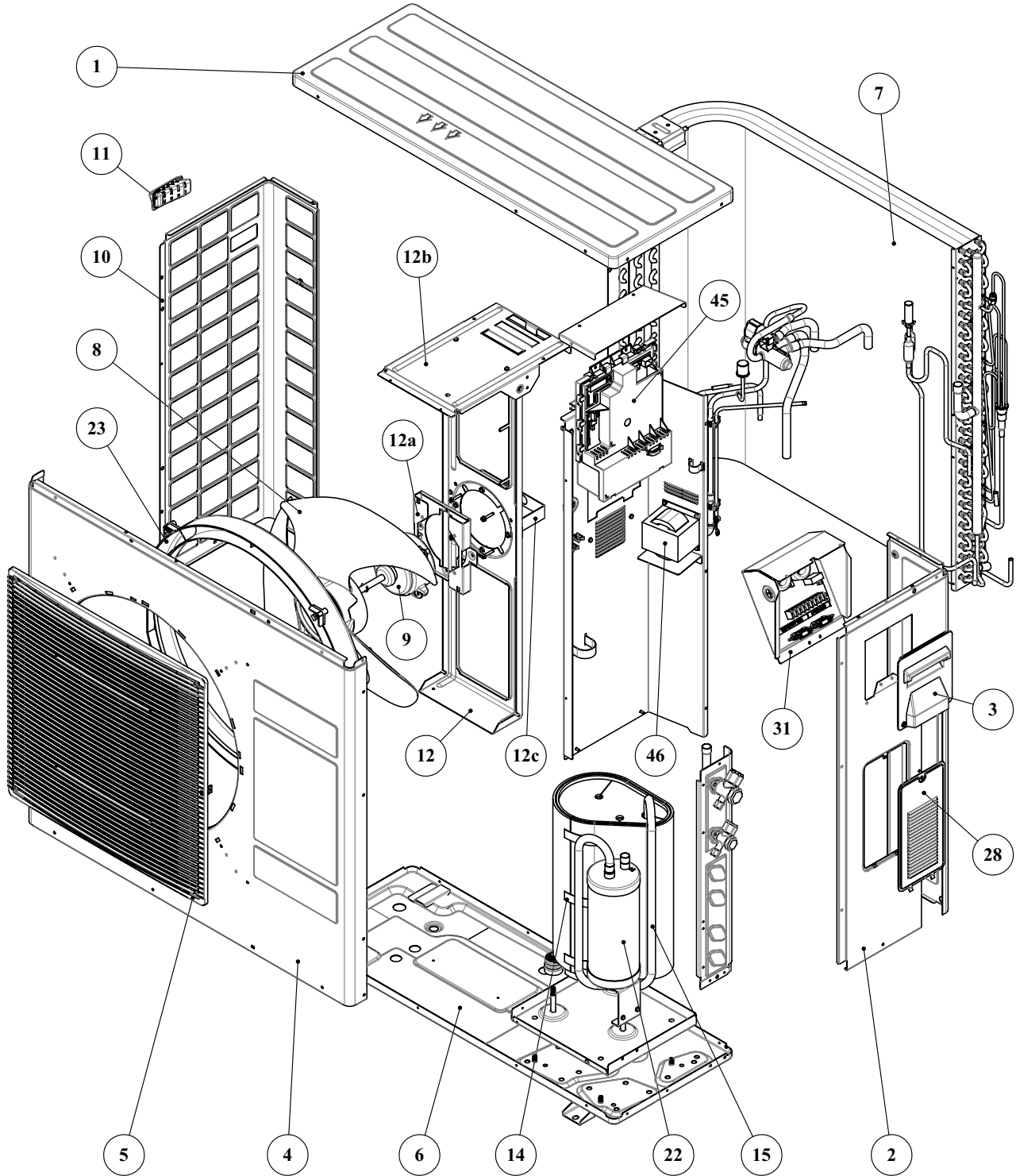
14.13.2 Parts Assembly



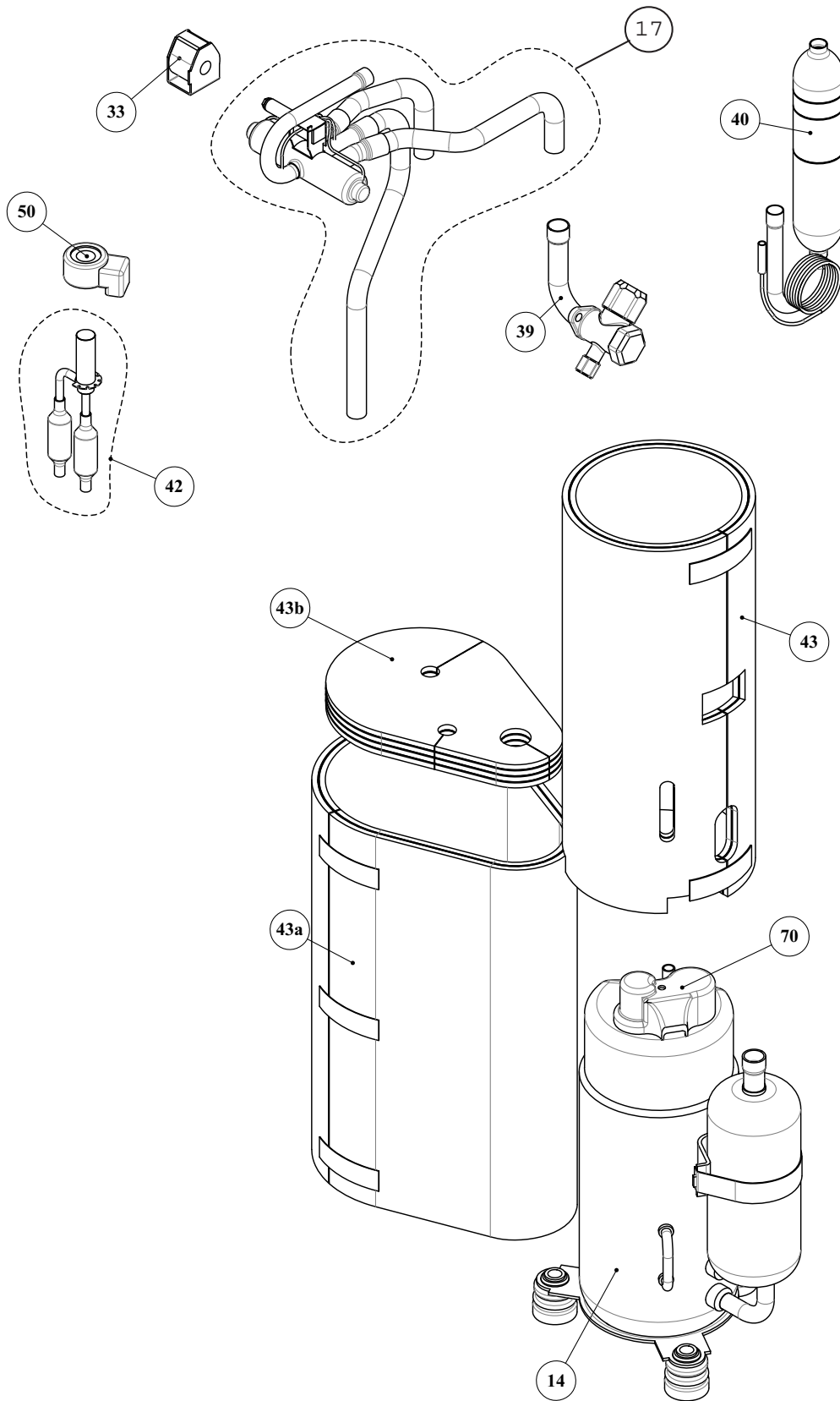
**14.13.3 Spare Part List of outdoor Unit: YBDE 024-H11**

No.	PN	Description	Qty
71	253054	Supply Cord Clamp	2
22	402283	Suction Accumulator 3"x5/8"	1
9	416320	Motor 70W,2S,OU7 DCI	1
65	416910	Cable Holder	3
65	416910	Cable Holder	1
5	417000	OU Square Fan Guard	1
50	425713	EEV Coil (C) QA (Q) 12-YLT-07-RK	1
43	426630	Compressor Internal Insulation	1
43a	426631	Compressor External Insulation	1
43b	426632	Compressor Top Insulation OU7	1
13	426634	Compressor Base Plate OU7-22-30 DCI	1
2	426641	Side Panel OU7 DCI	1
7	426686	Coil OU7-30 DCI Eco	1
17	426680	Tubing Assembly OU7-30 DCI	1
31	426705	Controller Assy OU7 DCI	1
21	426793	Compressor Wiring	1
53	426794	OU7 DCI Motor Wiring	1
46	426798	PFC Chock (1PH/DCI50)	1
70	426903	Terminal Cover Compressor GMCC	1
10	433281	Side Guard OU7-24	1
3	436357	Small Electrical Cover OU	1
11	436358	OU Leading Handle	1
1	437045	Upper Cover_EL13 OU Large	1
12	439342	Motor Support OU7	1
4	439357	Front Cover OU7	1
23	4399281	Outlet Plastic Ring OU7/8/12	1
18	442007	Capacitor 6mF 450V/P2	1
8	4529604	Axial Fan D493*143	1
14	460170013R	Compressor DA150S1C-20FZ	1
19	467400040	OMT/OAT Thermistor with connector	1
51	467400078	OCT-Thermistor+CAP With Connector	1
52	467400200	CTT-Thermistor With Connector	1
47	467420025	Terminal Block 4P	1
69	426589	Nipple 3/8" Assy OU8 DCI	1
39	455877	Service Valve 5/8"F 3 Way	1
42	426665	EEV Assy OU7-30 DCI	1
6	417200	Base Assembly	1

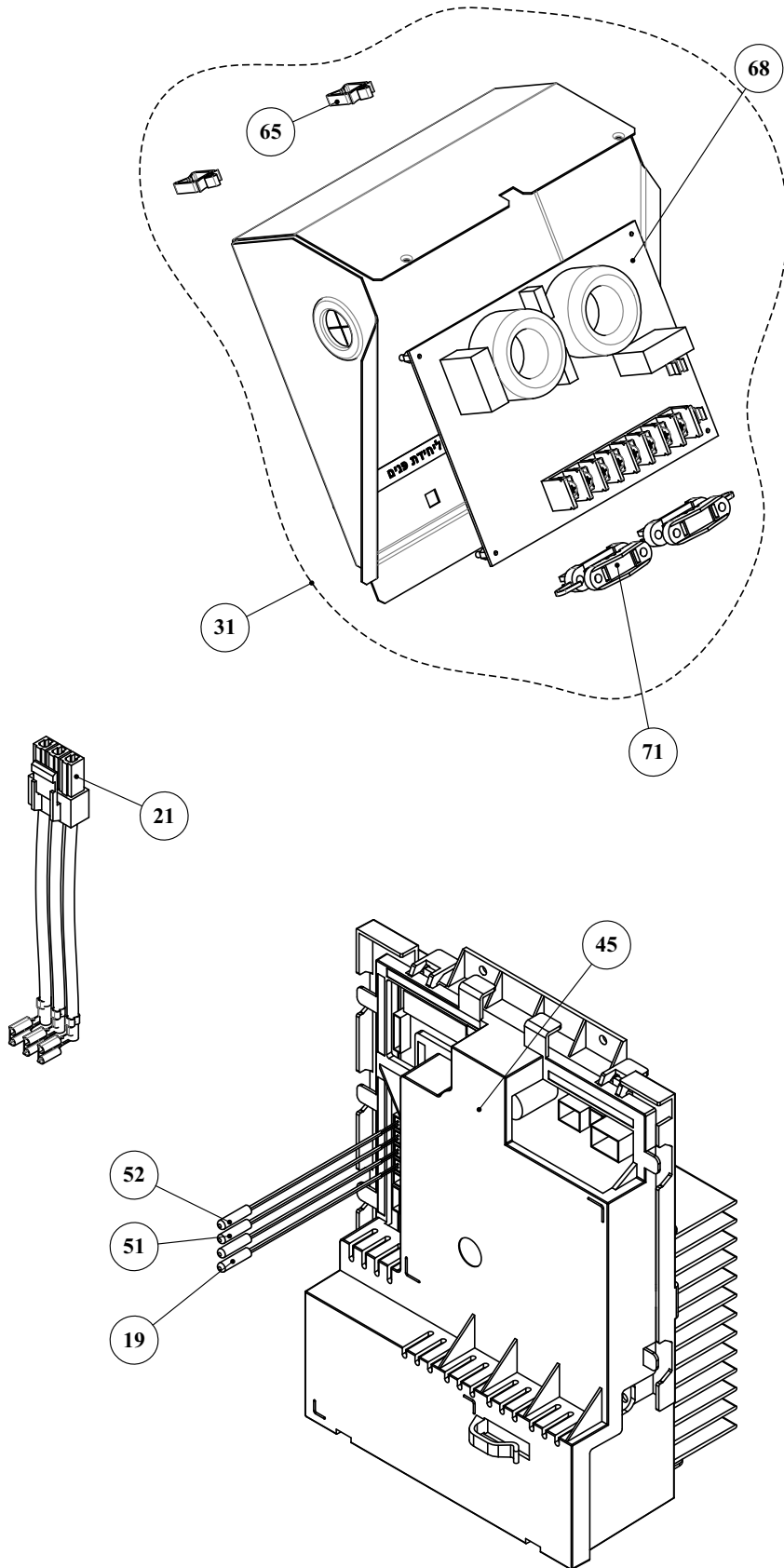
**14.14 Exploded View of outdoor Unit: OU8DCI**  
**14.14.1 General Assembly**



14.14.2 Parts Assembly



### 14.14.3 Parts Assembly





**14.14.4 Spare part list of outdoor Unit: OU8 DCI****14.14.4.1 855635 INV35 / OU0831DCA**

No.	PN	Description	QTY
1	440206	UPPER COVER OU8	1
2	402930	SIDE PANEL OU8-33	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439929	FRONT PANEL/COLLECTOR OU8-30	1
5	417000	OU SQUARE FAN GUARD	1
6	417200	NEW BASE ASSY OU10,12 4,6HP DC	1
7	438864	COIL OU8-25 HDR 3R R410A COP20	1
8	4529604	AXIAL FAN D493*143	1
9	416311	DC MOTOR 70W OU8 DCI	1
10	403996	SIDE GUARD OU8-33Z	1
11	436358	OU LEADING HANDLE	1
12	438937	Motor Support OU-8	1
12a	416276	Motor support adaptor OU8 DCI	1
12b	416248	MOTOR SUPPORT UPPER PANEL 3 ROWS	1
12c	438932	MOTOR SUPPORT BRACKET OU8 3 ROW	1
14	460080000R	COMPRESSOR C-7RZ233H1A	1
15	440510	Suction Tube OU8 Dci	1
17	440501	4 Way Valve Sub-Assembly Ou8 D	1
19	467400040	OMT/OAT THERMISTOR WITH CONNEC	1
21	414760	COMPRESSOR WIRING L800	1
22	452783200	SUCTION ACCUMULATOR 4"x5/8" 5L	1
23	4399281	OUTLET PLASTIC RING OU7/8/12	1
28	416270	Side cover OU8 DCI	1
31	426740	Filter board assy OU8 DCI 80	1
33	442520	RV COIL DUNAN	1
39	455877	VI - SERVICE VALVE 5/8F 3 WAY	1
40	460431	OIL SEPARATOR L210 R410A	1
42	440520	EEV Assembly OU8 DCI	1
43	414600	COMPRESSOR INSULATION DCI 4HP	1
43a	414601	COMPRESSOR 2nd INSULATION DCR	1
43b	414602	COMPRESSOR COVER INSULATION DC	1
45	426706	Controller assy OU8 DCI	1
46	426716	PFC Chock (DCI80)	1
50	425713	EEV Coil (C) QA(Q)12-YLT-07-RK	1
51	467400078	OCT-THERMISTOR+CAP WTH CONNECT	1
52	467400200	CTT-THERMISTOR WITH CONNECTOR	1
65	416910	CABLE HOLDER	7
68	467300185R	EMI Filter Board / DCI 80 CR	1
69	426589	Nippel 3/8 assy OU8 DCI 80	1
70	414903	COMPRESSOR SANYO DCI TERMINAL	1
71	253054	Supply cord clamp	2

**14.14.4.2 855540 INV35 / OU0830DCA**  
**855543 ELCO INV35 / OU0830DCA**  
**855547 AWAU-YBDE030-H11**

No.	PN	Description	QTY
1	440206	UPPER COVER OU8	1
2	402930	SIDE PANEL OU8-33	1
3	436357	SMALL ELECTRICAL COVER OU	1
4	439929	FRONT PANEL/COLLECTOR OU8-30	1
5	417000	OU SQUARE FAN GUARD	1
6	417200	NEW BASE ASSY OU10,12 4,6HP DC	1
7	441210	COIL OU8-28/28T R410 2R 7C COP	1
8	4529604	AXIAL FAN D493*143	1
9	416311	DC MOTOR 70W OU8 DCI	1
10	403996	SIDE GUARD OU8-33Z	1
11	436358	OU LEADING HANDLE	1
12	438937	Motor Support OU-8	1
12a	416276	Motor support adaptor OU8 DCI	1
12b	416226	MOTOR SUPPORT TOP OU12-DCI 4-5	1
12c	433707	MOTOR SUPPORT BRACKET OU8 2 RO	1
14	460080000R	COMPRESSOR C-7RZ233H1A	1
15	440510	Suction Tube OU8 Dci	1
17	440501	4_Way Valve Sub-Assembly Ou8 D	1
19	467400040	OMT/OAT THERMISTOR WITH CONNEC	1
21	414760	COMPRESSOR WIRING L800	1
22	452783200	SUCTION ACCUMULATOR 4"x5/8" 5L	1
23	4399281	OUTLET PLASTIC RING OU7/8/12	1
28	416270	Side cover OU8 DCI	1
31	426740	Filter board assy OU8 DCI 80	1
33	442520	RV COIL DUNAN	1
39	455877	VI - SERVICE VALVE 5/8F 3 WAY	1
40	460431	OIL SEPARATOR L210 R410A	1
42	440520	EEV Assembly OU8 DCI	1
43	414600	COMPRESSOR INSULATION DCI 4HP	1
43a	414601	COMPRESSOR 2nd INSULATION DCR	1
43b	414602	COMPRESSOR COVER INSULATION DC	1
45	426706	Controller assy OU8 DCI	1
46	426716	PFC Chock (DCI80)	1
50	425713	EEV Coil (C) QA(Q)12-YLT-07-RK	1
51	467400078	OCT-THERMISTOR+CAP WTH CONNECT	1
52	467400200	CTT-THERMISTOR WITH CONNECTOR	1
65	416910	CABLE HOLDER	7
68	467300185R	EMI Filter Board / DCI 80 CR	1
69	426589	Nippel 3/8 assy OU8 DCI 80	1
70	414903	COMPRESSOR SANYO DCI TERMINAL	1
71	253054	Supply cord clamp	2

# APPENDIX A

## INSTALLATION AND OPERATION MANUALS



**SERVICE MANUAL  
HJD DCI Series**