

# Airwell

# Service Manual

## CNE DC Inverter Series

Indoor Units	Outdoor Units
AWAU-CNE009-N11	AWAU-YBDE009-H11
AWAU-CNE012-N11	AWAU-YBDE012-H11
AWAU-CNE018-N11	AWAU-YBDE018-H11
AWAU-CNE024-N11	AWAU-YBDE024-H11



**REFRIGERANT**

**R410A**

**HEAT PUMP**

**Table of Contents**

1. INTRODUCTION ..... 1-1

2. PRODUCT DATA SHEET ..... 2-1

3. RATING CONDITIONS ..... 3-1

4. OUTLINE DIMENSIONS ..... 4-1

5. PERFORMANCE DATA & PRESSURE CURVES..... 5-1

6. SOUND LEVEL CHARACTERISTICS..... 6-1

7. ELECTRICAL DATA ..... 7-1

8. WIRING DIAGRAMS..... 8-1

9. REFRIGERATION DIAGRAMS ..... 9-1

10. TUBING CONNECTIONS ..... 10-1

11. CONTROL SYSTEM ..... 11-1

12. TROUBLESHOOTING ..... 12-1

13. EXPLODED VIEWS AND SPARE PARTS LISTS ..... 13-1

14. APPENDIX A..... 14-1

## 1. INTRODUCTION

### 1.1 General

The **CNE DCI Inverter Cassette** type split air conditioner range comprise RC (heat pump) models, as follows:

- **CNE 009**
- **CNE 012**
- **CNE 018**
- **CNE 024**

### 1.2 Main Features

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

- DC inverter technology.
- R410A refrigerant.
- High COP.
- Precharged refrigerant.
- Low Sound level for both Indoor and Outdoor.
- 60 x60 cm dimension designed for integration in suspended ceilings.
- DC Brushless fan motor.
- New grille, modern style with elegant lines in line with every interior decor , 2 panels optional available (hard ceiling / Suspended ceiling).
- Motorized air distribution fans.
- Very slim profile 219 mm at size 9-12, and 270 mm at size 18-24.
- Option of fresh air intake, and air distribution to adjacent room.
- Integrated condensate pump with a lift of 1 m Max.
- Connection to Multisplit outdoor units.
- Up to 30 m pipe length between indoor and outdoor units.
- Up to 15 m vertical high between indoor and outdoor units.
- Cooling operation at outdoor temperature down to -10°C.
- Heating operation at outdoor temperature down to -15°C.
- Built in overflow protection against the condensate water.
- Easy installation and service.
- Product can have the option of additional function of Ionizer and ESF.
- Fan speed can be adjusted by compensation on PCB according to different installation height (Field option).

### 1.3 Indoor Unit

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

It includes:

- Coil with hydrophilic aluminum fins.
- Motorized fans (two step motors).
- Advanced electronic control box assembly (DCI storm).
- Low sound level of the indoor fan.

### 1.4 Filtration

The **CNE** series presents several types of air filters:

- Easily accessible, and re-usable pre-filters.
- Easily Static Filter (Field Option).

### 1.5 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, providing complete operating function and programming. For further details please refer to the Operation Manual, Appendix A.

### 1.6 Outdoor Unit

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

It includes:

- Compressor mounted in a soundproofed compartment:

**Single Rotary – for YBDE 009 and YBDE 012.**

**Scroll – for YBDE 018 .**

**Twin Rotary – for YBDE 024.**

- Axial fan.
- Outdoor coil with hydrophilic louvers for RC units.
- Outlet air fan grill.
- Service valves” are” type connection.
- Interconnecting wiring terminal block.

### 1.7 Tubing Connections

Flare type interconnecting tubing to be produced on site.  
For further details please refer to the Installation Manual, Chapter 10.

### 1.8 Accessories





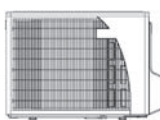
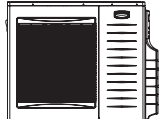
Remote Control.  
Panel 625x625 for gird ceiling.  
Panel 725x725 for hard ceiling.  
ESF & Ionizer kit.

### 1.9 Inbox Documentation

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

### 1.10 Matching Table

#### 1.10.1 R410A

OUTDOOR UNITS			INDOOR UNITS			
						
MODEL	REFRIGER.	CNE 009	CNE 012	CNE 018	CNE 024	
 YBDE 009/012/018	R410A	√	√	√		
 YBDE 024	R410A				√	

The above table lists outdoor units and PXD DCI indoor units which can be matched together. In addition the listed outdoor units can be matched with other types of indoor units such as cassettes and wall mounted.

For further information please refer to the relevant Service Manual.

## 2. PRODUCT DATA SHEET

### 2.1 CNE 009 DCI R410A

Model Indoor Unit		AWAU-CNE009-N11	
Model Outdoor Unit		AWAU-YBDE009-H11	
Installation Method of Pipe		Flared	
Characteristics		Units	Cooling
			Heating Average
Capacity <sup>(1)</sup>		kW	2,5 (1,5-3,6)
Pdesign		kW	2,5
SEER /SCOP <sup>(2)</sup>		W/W	5,7
Energy efficiency class			A+
Annual energy consumption		kWh	154
Tbiv		°C	N/A
Tol		°C	N/A
Power supply		V/Ph/Hz	220-240V/Single/50Hz
Circuit breaker rating		A	16
INDOOR	Fan type & quantity		Centrifugal x 1
	Fan speeds	H/M/L	RPM
	Air flow <sup>(3)</sup>	H/M/L	m3/hr
	External static pressure	Min-Max	Pa
	Sound power level <sup>(4)</sup>	H/M/L	dB(A)
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A)
	Moisture removal		l/hr
	Condensate drain tube I.D		mm
	Dimensions	WxHxD	mm
	Weight		kg
	Package dimensions	WxHxD	mm
	Packaged weight		kg
	Units per pallet		units
	Stacking height		units
OUTDOOR	Refrigerant control		EEV
	Compressor type, model		Rotary DC Inverter
	Fan type & quantity		Axial x 1
	Fan speeds	H/L	RPM
	Air flow	H/L	m3/hr
	Sound power level <sup>(4)</sup>	H/L	dB(A)
	Sound pressure level <sup>(5)</sup>	H/L	dB(A)
	Dimensions	WxHxD	mm
	Weight		kg
	Package dimensions	WxHxD	mm
	Packaged weight		kg
	Units per pallet		Units
	Stacking height		units
	Refrigerant type		R410A
	Refrigerant charge (standard connecting tubing length)		kg(5m)
	Additional charge per 1 meter		gr / 1m
Connections between units	Liquid line	ln.(mm)	
	Suction line	ln.(mm)	
	Max.tubing length	m.	
	Max.height difference	m.	
Operation control type		Remote control	
Heating elements		kW	
Others			

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

(2) Air ow 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 CNE 012 DCI R410A

Model Indoor Unit			AWAU-CNE012-N11		
Model Outdoor Unit			AWAU-YBDE012-H11		
Installation Method of Pipe			Flared		
Characteristics		Units	Cooling	Heating Average	
Capacity <sup>(1)</sup>		kW	3,5 (1,7-4,3)	4,2 (1,6 -5,5)	
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		Centrifugal x 1		
	Fan speeds	H/M/L	RPM	600/520/450	
	Air flow <sup>(3)</sup>	H/M/L	m3/hr	470/390/320	
	External static pressure	Min-Max	Pa	0	
	Sound power level <sup>(4)</sup>	H/M/L	dB(A)	51/-/-	
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A)	34/31/28	
	Moisture removal		l/hr	1,5	
	Condensate drain tube I.D		mm	20	
	Dimensions	WxHxD	mm	575X219X575	
	Weight		kg	12,9	
	Package dimensions	WxHxD	mm	681X297X681	
	Packaged weight		kg	16,2	
	Units per pallet		units	12 units per pallet	
	Stacking height		units	6 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	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 ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

(2) Air ow 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 CNE 018 DCI R410A

Model Indoor Unit		AWAU-CNE018-N11			
Model Outdoor Unit		AWAU-YBDE018-H11			
Installation Method of Pipe		Flared			
Characteristics		Units	Cooling	Heating Average	
Capacity <sup>(1)</sup>		kW	5,0 (1,5-5,8)	5,6 (1,3 -6,8)	
Pdesign		kW	5,0	4,6	
SEER /SCOP <sup>(2)</sup>		W/W	5,1	3,8	
Energy efficiency class			A	A	
Annual energy consumption		kWh	343	1695	
Tbiv		°C	N/A	-7	
Tol		°C	N/A	-15	
Power supply		V/Ph/Hz	220-240V/Single/50Hz		
Circuit breaker rating		A	20		
INDOOR	Fan type & quantity		Centrifugal x 1		
	Fan speeds	H/M/L	RPM	680/620/550	680/620/550
	Air flow <sup>(3)</sup>	H/M/L	m3/hr	620/560/500	620/560/500
	External static pressure	Min-Max	Pa	0	
	Sound power level <sup>(4)</sup>	H/M/L	dB(A)	55/-/-	
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A)	36/33/30	
	Moisture removal		l/hr	2	
	Condensate drain tube I.D		mm	20	
	Dimensions	WxHxD	mm	575X270X575	
	Weight		kg	15,2	
	Package dimensions	WxHxD	mm	681X348X681	
	Packaged weight		kg	18,7	
	Units per pallet		units	12 units per pallet	
	Stacking height		units	6 levels	
OUTDOOR	Refrigerant control		EEV		
	Compressor type, model		Rotary DC Inverter		
	Fan type & quantity		Axial x 1		
	Fan speeds	H/L	RPM	920	
	Air flow	H/L	m3/hr	2160	
	Sound power level <sup>(4)</sup>	H/L	dB(A)	63	
	Sound pressure level <sup>(5)</sup>	H/L	dB(A)	53	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	38	
	Package dimensions	WxHxD	mm	970x650x394	
	Packaged weight		kg	41	
	Units per pallet		Units	9 units per pallet	
	Stacking height		units	3 levels	
	Refrigerant type		R410A		
	Refrigerant charge (standard connecting tubing length)		kg(5m)	1,26	
	Additional charge per 1 meter		gr / 1m	No need	
Connections between units	Liquid line	ln.(mm)	1/4"(6,35)		
	Suction line	ln.(mm)	1/2"(12,7)		
	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 ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

(2) Air ow 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.



## 2.4 CNE 024 DCI R410A

Model Indoor Unit			AWAU-CNE024-N11	
Model Outdoor Unit			AWAU-YBDE024-H11	
Installation Method of Pipe			Flared	
<b>Characteristics</b>		<b>Units</b>	Cooling	Heating Average
Capacity <sup>(1)</sup>		kW	6,8 (1,5-8)	7,3 (1,5 -9)
Pdesign		kW	6,8	6,0
SEER /SCOP <sup>(2)</sup>		W/W	5,1	3,8
Energy efficiency class			A	A
Annual energy consumption		kWh	467	2211
Tbiv		°C	N/A	-7
Tol		°C	N/A	-15
Power supply		V/Ph/Hz	220-240V/Single/50Hz	
Circuit breaker rating		A	25	
INDOOR	Fan type & quantity		Centrifugal x 1	
	Fan speeds	H/M/L	RPM	750/700/650
	Air flow <sup>(3)</sup>	H/M/L	m3/hr	700/640/580
	External static pressure	Min-Max	Pa	0
	Sound power level <sup>(4)</sup>	H/M/L	dB(A)	60/-/-
	Sound pressure level <sup>(5)</sup>	H/M/L	dB(A)	40/38/36
	Moisture removal		l/hr	3
	Condensate drain tube I.D		mm	20
	Dimensions	WxHxD	mm	575X270X575
	Weight		kg	15,5
	Package dimensions	WxHxD	mm	681X348X681
	Packaged weight		kg	19
	Units per pallet		units	12 units 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		H/L	RPM	850
Air flow		H/L	m3/hr	3600
Sound power level <sup>(4)</sup>		H/L	dB(A)	69
Sound pressure level <sup>(5)</sup>		H/L	dB(A)	59
Dimensions		WxHxD	mm	950x864x340
Weight			kg	65,5
Package dimensions		WxHxD	mm	1140x510x930
Packaged weight			kg	73
Units per pallet			Units	4 units per pallet
Stacking height			units	2 levels
Refrigerant type				R410A
Refrigerant charge (standard connecting tubing length)			kg(5m)	2,3
Additional charge per 1 meter		gr / 1m	Length≤20m:+0g; 20m<Length≤30m:+300g	
Connections between units	Liquid line	In.(mm)	3/8"(9,53)	
	Suction line	In.(mm)	5/8"(15,88)	
	Max.tubing length	m.	Max.30	
	Max.height difference	m.	Max.15	
Operation control type			Remote control	
Heating elements		kW		
Others				

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN 14511.

(2) Air ow 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.

## 2.5 Optional accessory

Panel 625x625(Optional accessory)		For all the models
Dimensions (H x L x D)	mm	625x625x40
Weight	kg	2.2
Package Dimensions (H x L x D)	mm	700x700x103
Package Weight	kg	3.4
Units per pallet	units	20
Stacking height	units	10 levels

Panel 725x725(Optional accessory)		For all the models
Dimensions (H x L x D)	mm	725x725x40
Weight	kg	2.7
Package Dimensions (H x L x D)	mm	800x800x103
Package Weight	kg	4.2
Units per pallet	units	10
Stacking height	units	10 levels

### 3. RATING CONDITIONS

Standard conditions in accordance with ISO 5151, ISO 13253 (for ducted units) and EN 14511.

**Cooling:**

Indoor: 27°C DB 19°C WB

Outdoor: 35°C DB

**Heating:**

Indoor: 20°C DB Outdoor:

7°C DB 6°C WB

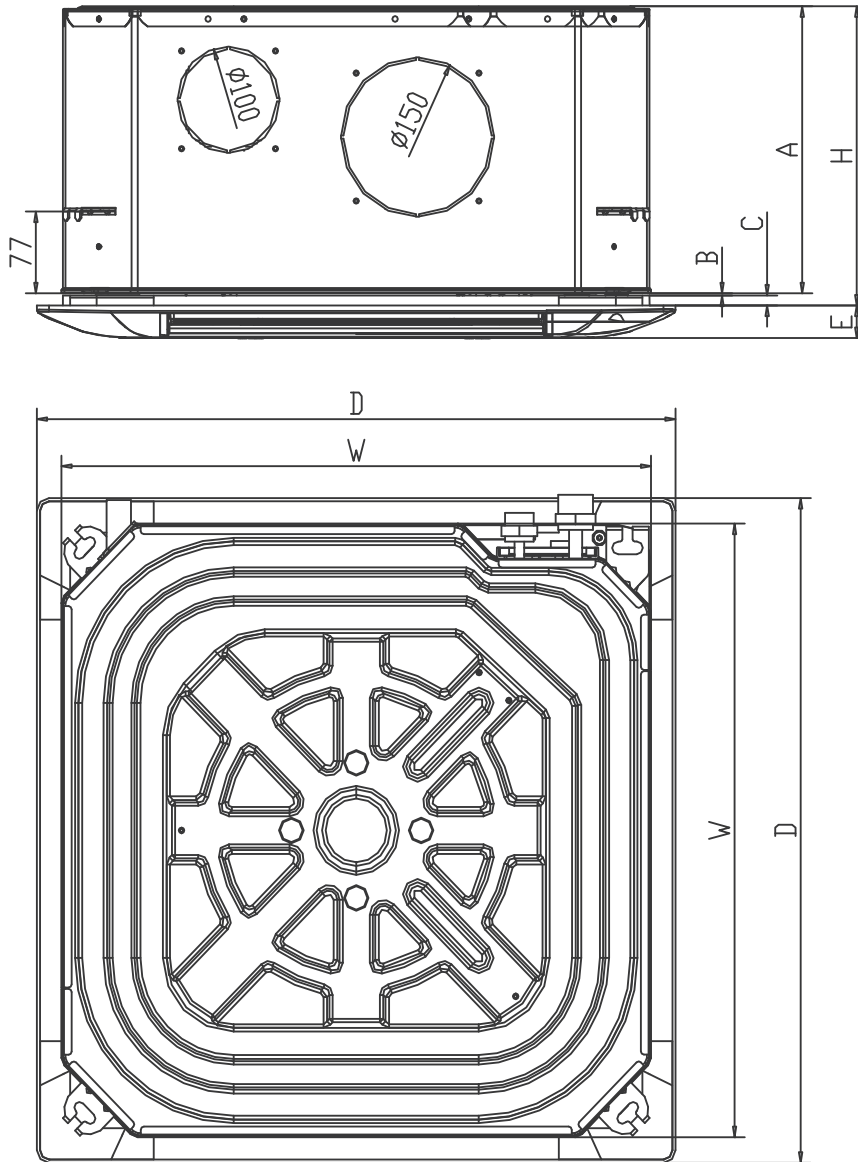
#### 3.1 Operating Limits

##### R410A DCI (Excluding Delta Units)

		Indoor	Outdoor
<b>Cooling</b>	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	-10°C DB
<b>Heating</b>	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-15°C DB -16°C WB
<b>Voltage</b>	1PH	198 – 264 V	
	3PH	N/A	

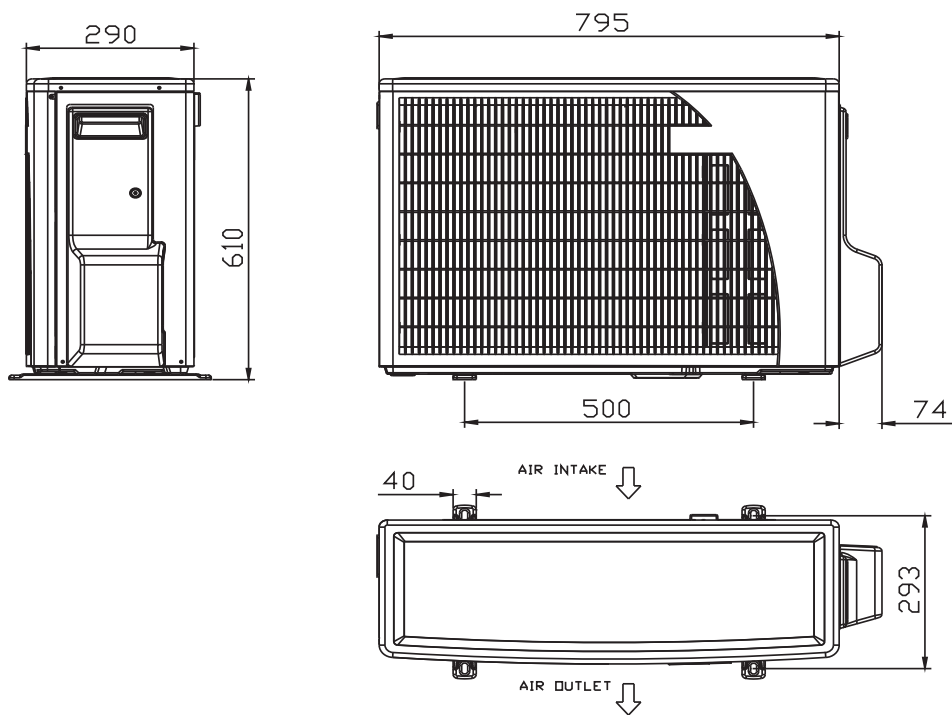
## 4. OUTLINE DIMENSIONS

### 4.1 Indoor Unit: CNE 009, 012, 018, 024 R410A DCI

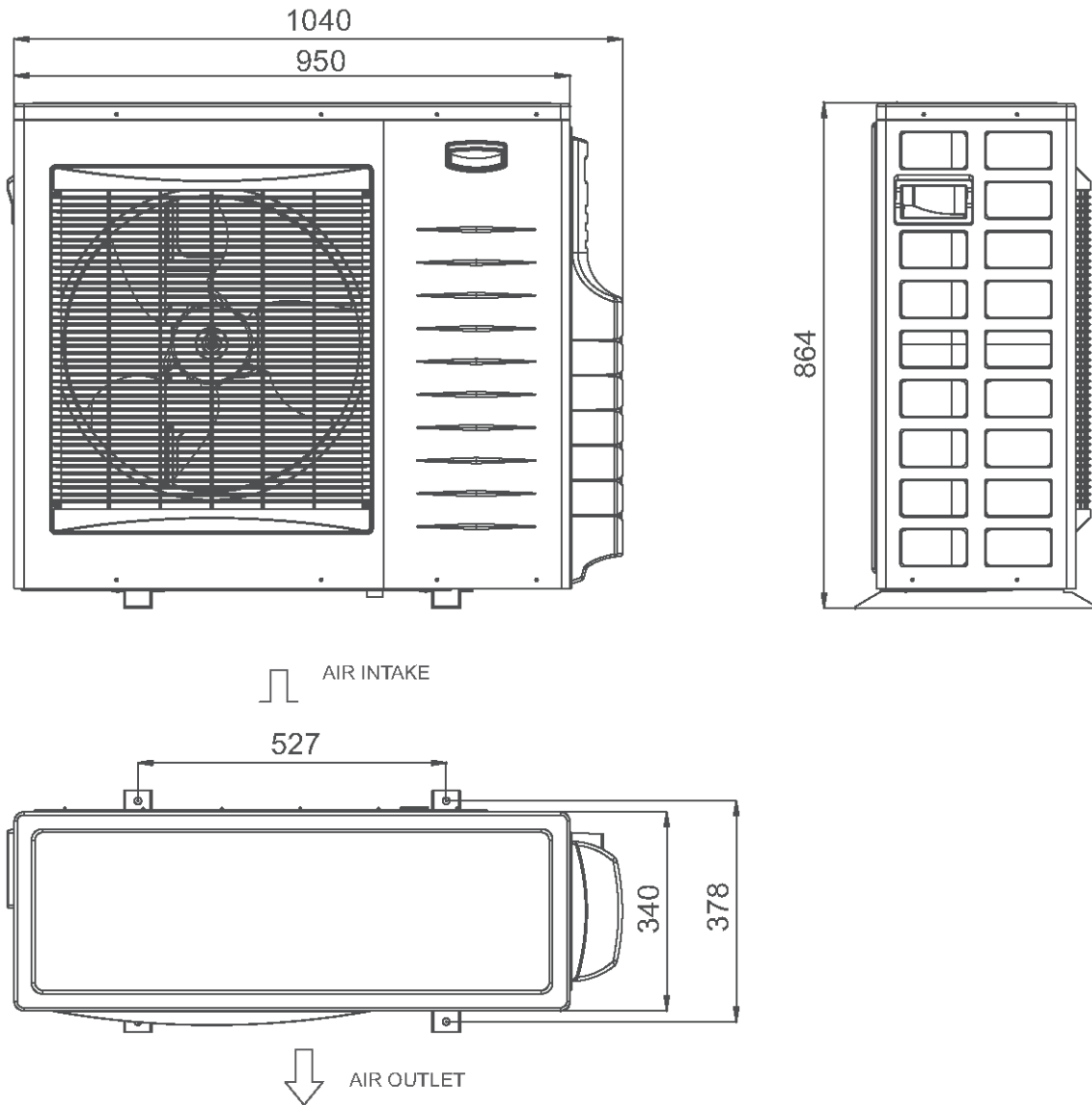


Unit Model	Main unit (A)	Insulation (B)	Front Step (C)	Front width (D)	Front height (E)	Unit Body Width (W)	Effective Height (H)
009/012	219	2	9	625/725	40	575	230
018/024	270	2	9	625/725	40	575	281

**4.2 Outdoor Unit: YBDE 009, 012, 018**



4.3 Outdoor Unit: YBDE 024



## 5. PERFORMANCE DATA

### 5.1 CNE 009 DCI

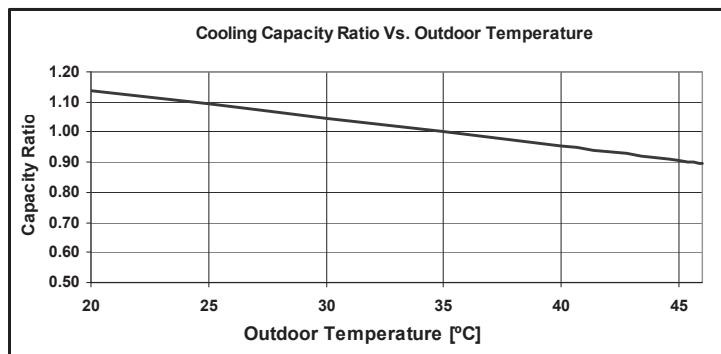
#### 5.1.1 Cooling Capacity (kW) – Run Mode [230V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [C°]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	2.42	2.57	2.73	2.89	3.05
	SC	1.72	1.75	1.79	1.82	1.86
	PI	0.46	0.47	0.48	0.49	0.50
30	TC	2.30	2.46	2.62	2.77	2.93
	SC	1.67	1.71	1.74	1.78	1.81
	PI	0.52	0.53	0.54	0.54	0.55
35	TC	2.18	2.34	2.50	2.66	2.82
	SC	1.63	1.66	1.70	1.74	1.77
	PI	0.57	0.58	0.59	0.60	0.61
40	TC	2.07	2.23	2.38	2.54	2.70
	SC	1.59	1.62	1.66	1.69	1.73
	PI	0.63	0.64	0.64	0.65	0.66
46	TC	1.93	2.09	2.24	2.40	2.56
	SC	1.53	1.57	1.60	1.64	1.67
	PI	0.69	0.70	0.71	0.72	0.73

#### 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



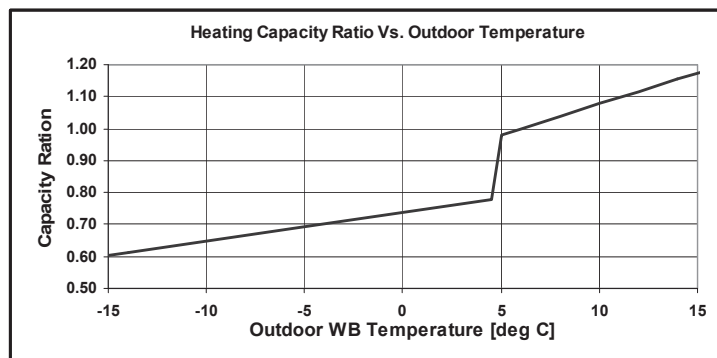
**5.1.3 Heating Capacity (kW) - Run Mode  
[230V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [C°]		
		15	20	25
-15/-16	TC	2.04	1.89	1.75
	PI	0.48	0.53	0.58
-10/-12	TC	2.27	2.12	1.98
	PI	0.58	0.63	0.68
-7/-8	TC	2.44	2.30	2.16
	PI	0.65	0.70	0.75
-1/-2	TC	2.53	2.38	2.24
	PI	0.69	0.74	0.79
2/1	TC	2.58	2.44	2.30
	PI	0.71	0.76	0.81
7/6	TC	3.34	3.20	3.06
	PI	0.75	0.80	0.85
10/9	TC	3.53	3.38	3.24
	PI	0.80	0.84	0.89
15/12	TC	3.71	3.57	3.43
	PI	0.84	0.89	0.94
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

**LEGEND**

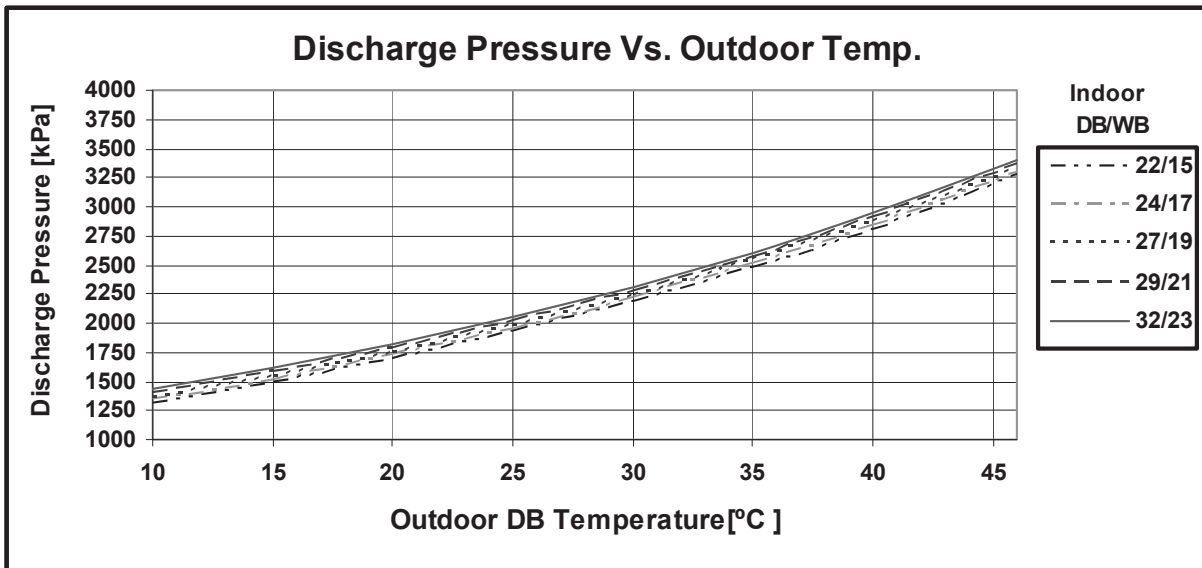
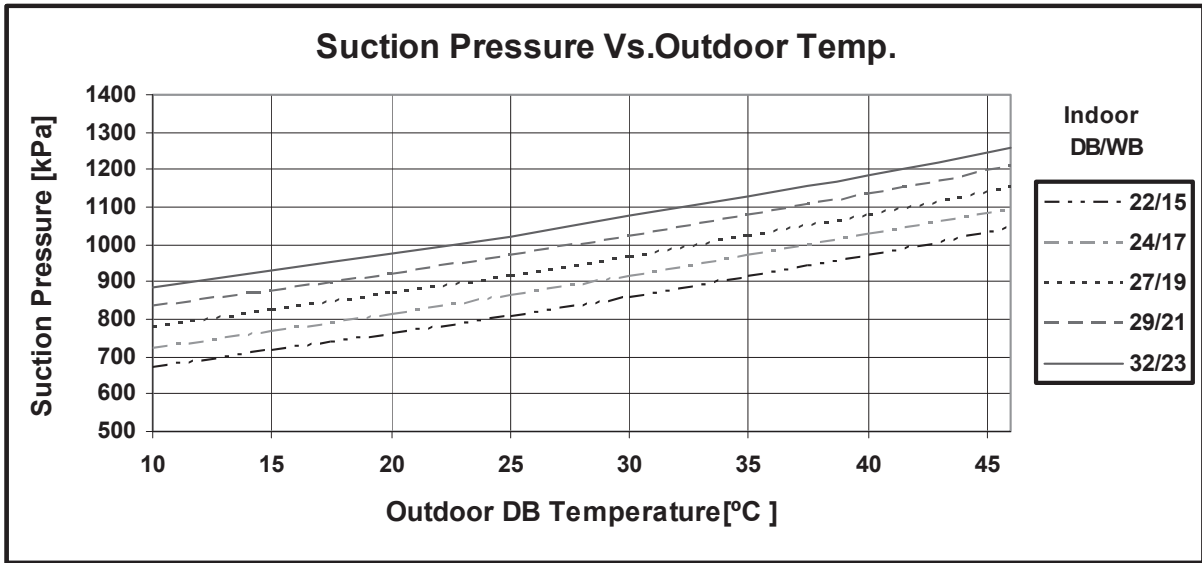
- TC – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OU – Outdoor

**5.1.4 Capacity Correction Factors**

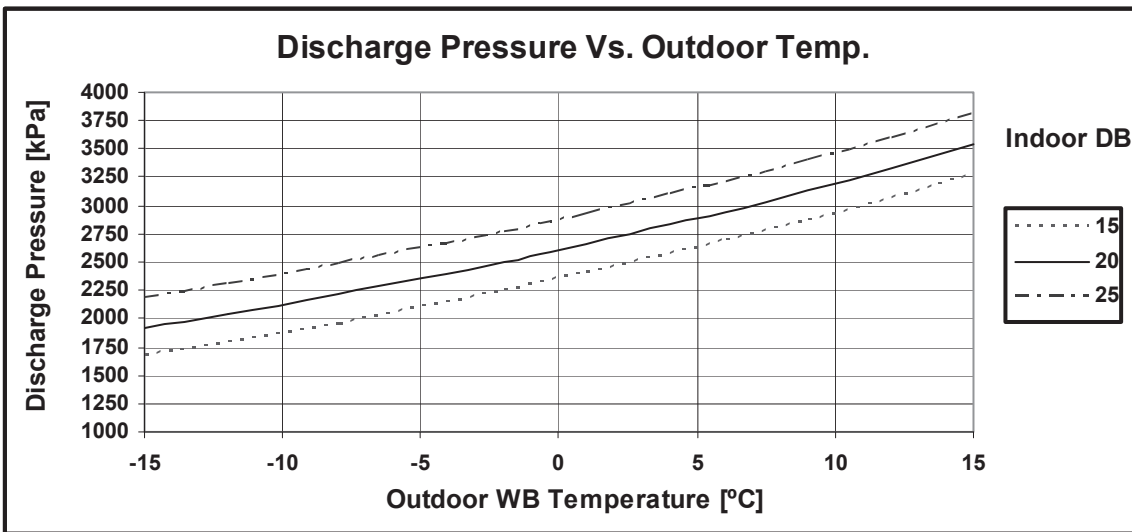
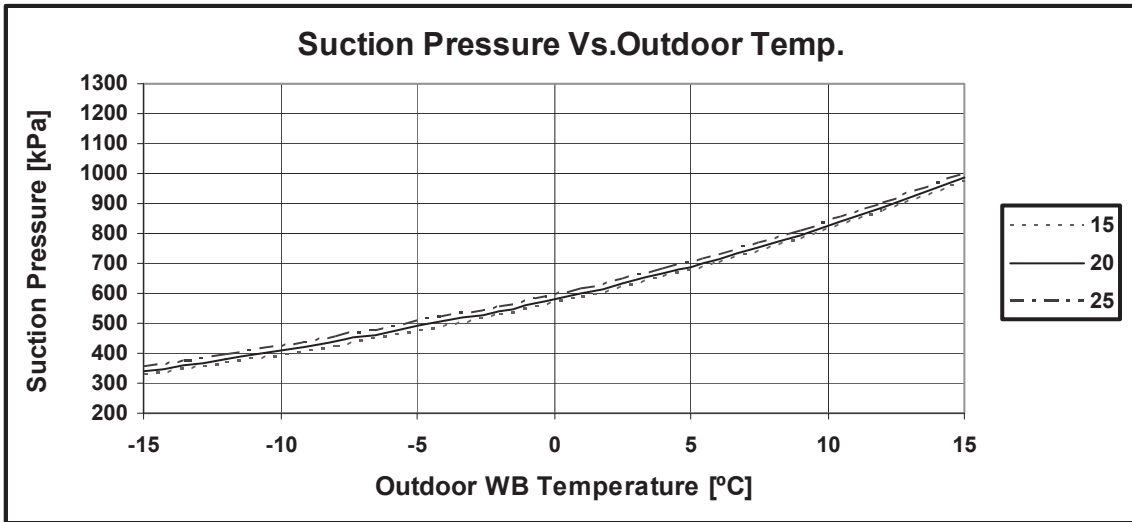




5.1.5 Model: CNE 009 DCI Cooling - Test Mode



5.1.6 Heating - Test Mode



5.2 CNE 012 DCI

5.2.1 Cooling Capacity (kW) - Run Mode

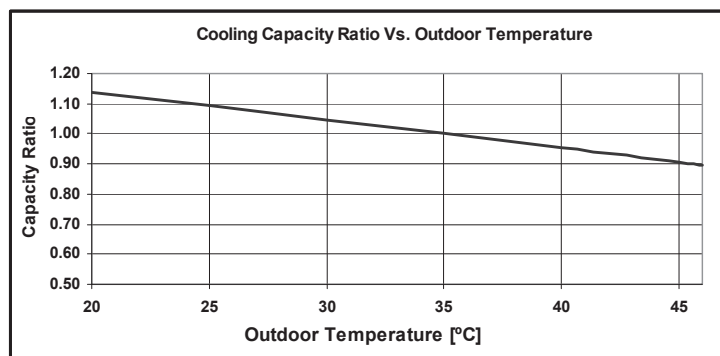
[230V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [C°]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	3.38	3.60	3.83	4.05	4.27
	SC	2.40	2.45	2.50	2.55	2.60
	PI	0.75	0.77	0.78	0.80	0.81
30	TC	3.22	3.44	3.66	3.88	4.11
	SC	2.34	2.39	2.44	2.49	2.54
	PI	0.84	0.86	0.87	0.89	0.90
35	TC	3.06	3.28	3.50	3.72	3.94
	SC	2.28	2.33	2.38	2.43	2.48
	PI	0.93	0.95	0.96	0.97	0.99
40	TC	2.89	3.12	3.34	3.56	3.78
	SC	2.22	2.27	2.32	2.37	2.42
	PI	1.02	1.03	1.05	1.06	1.08
46	TC	2.70	2.92	3.14	3.36	3.58
	SC	2.15	2.20	2.25	2.30	2.34
	PI	1.13	1.14	1.15	1.17	1.18

**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

5.2.2 Capacity Correction Factor



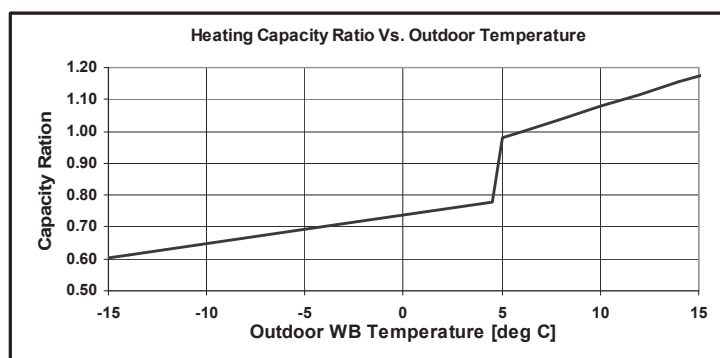
**5.2.3 Heating Capacity (kW) - Run Mode**  
**[230V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [C°]		
		15	20	25
-15/-16	TC	2.67	2.49	2.30
	PI	0.70	0.77	0.84
-10/-12	TC	2.98	2.79	2.60
	PI	0.84	0.91	0.98
-7/-8	TC	3.20	3.02	2.83
	PI	0.95	1.02	1.09
-1/-2	TC	3.32	3.13	2.94
	PI	1.00	1.07	1.14
2/1	TC	3.39	3.20	3.02
	PI	1.04	1.11	1.18
7/6	TC	4.39	4.20	4.01
	PI	1.09	1.16	1.23
10/9	TC	4.63	4.44	4.26
	PI	1.15	1.23	1.30
15/12	TC	4.87	4.68	4.50
	PI	1.22	1.29	1.36
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

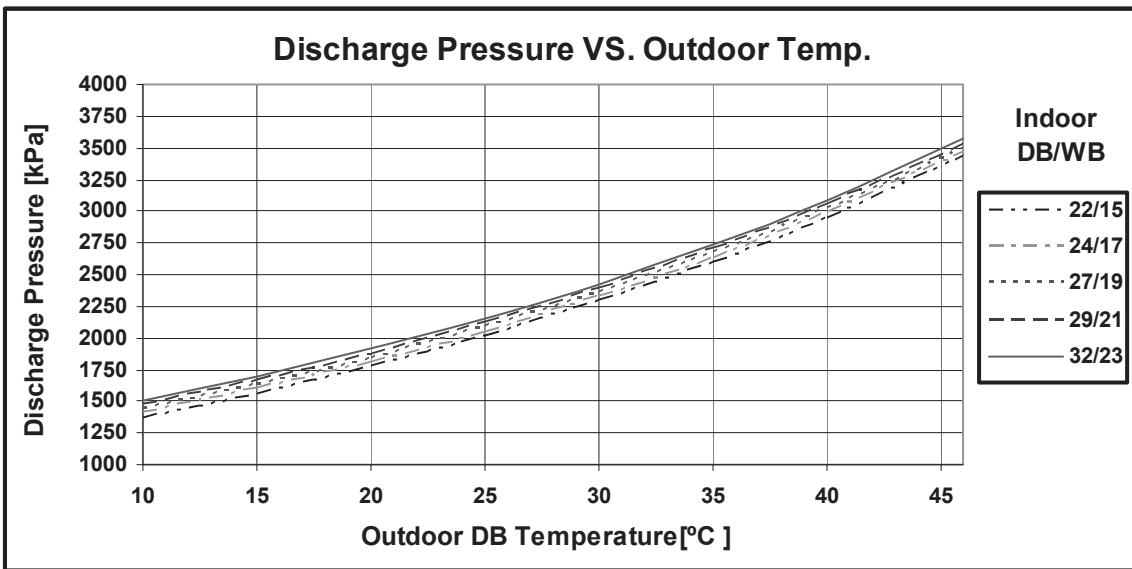
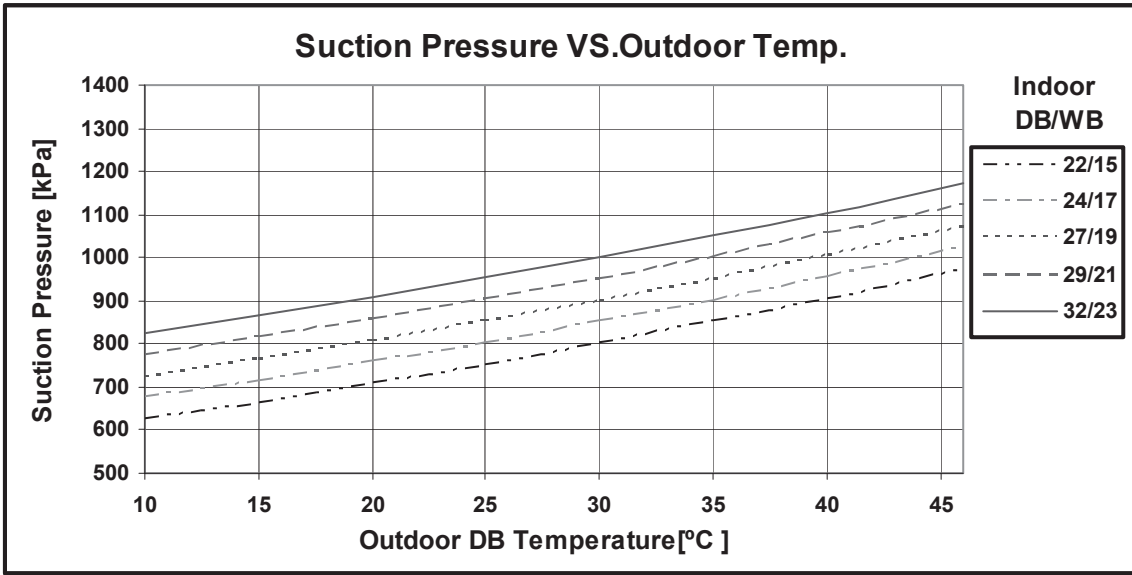
**LEGEND**

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

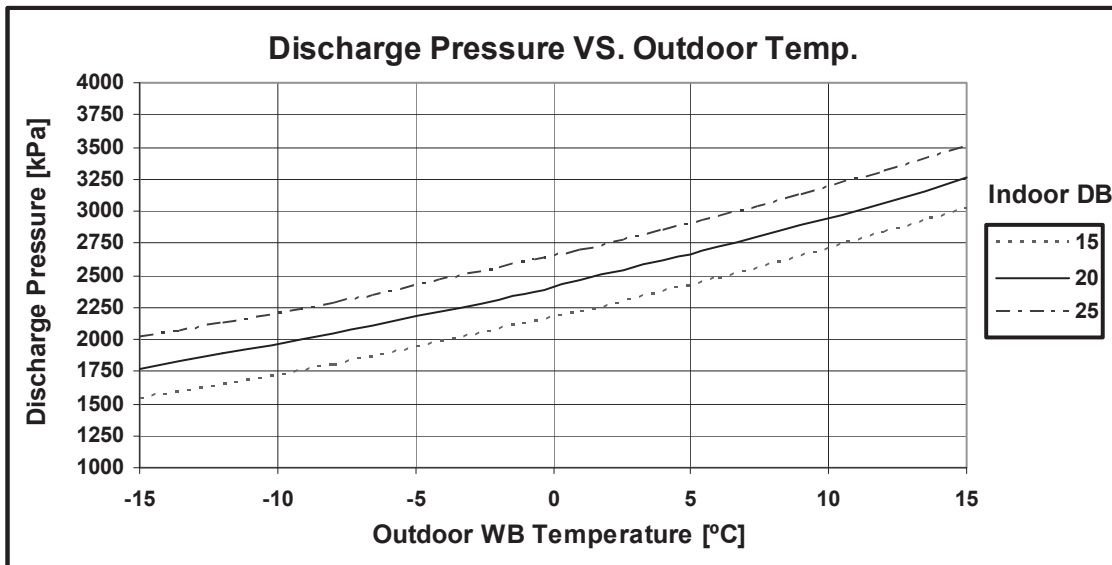
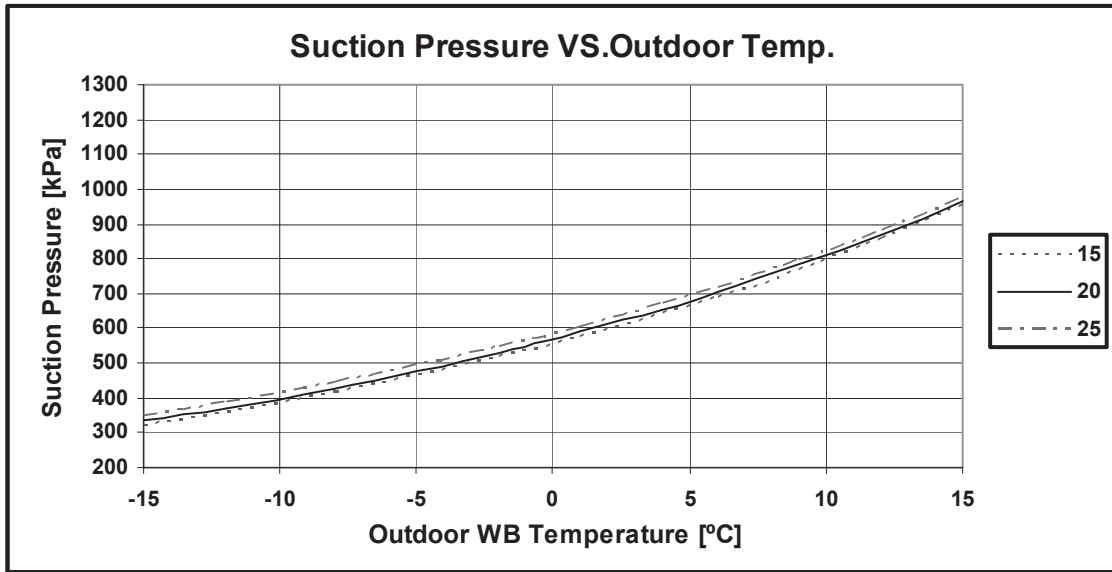
**5.2.4 Capacity Correction Factors**



5.2.5 Model: CNE 012 DCI Cooling - Test Mode



5.2.6 Heating - Test Mode



**5.3 CNE 018 DCI**

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

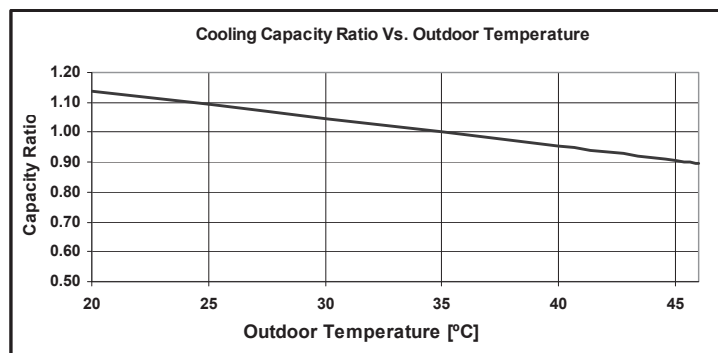
**[230V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [C°]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	4.83	5.15	5.47	5.78	6.10
	SC	3.43	3.50	3.57	3.64	3.71
	PI	1.23	1.25	1.27	1.30	1.32
30	TC	4.60	4.92	5.23	5.55	5.86
	SC	3.35	3.42	3.49	3.56	3.63
	PI	1.37	1.39	1.42	1.44	1.46
35	TC	4.37	4.68	5.00	5.32	5.63
	SC	3.26	3.33	3.40	3.47	3.54
	PI	1.51	1.54	1.56	1.58	1.61
40	TC	4.14	4.45	4.77	5.08	5.40
	SC	3.17	3.24	3.31	3.38	3.45
	PI	1.66	1.68	1.70	1.73	1.75
46	TC	3.86	4.17	4.49	4.80	5.12
	SC	3.07	3.14	3.21	3.28	3.35
	PI	1.83	1.85	1.88	1.90	1.92

**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**



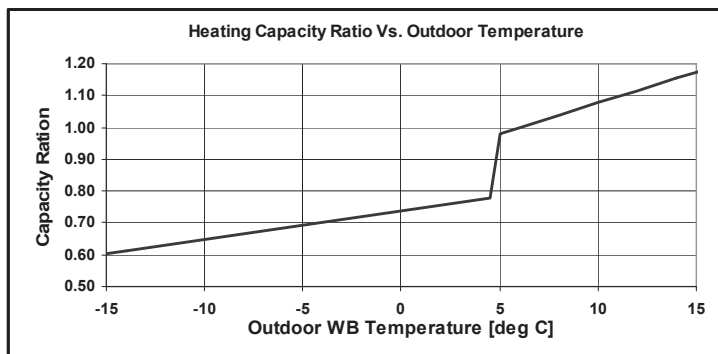
**5.3.3 Heating Capacity (kW) - Run Mode**  
**[230V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [C°]		
		15	20	25
-15/-16	TC	3.69	3.43	3.18
	PI	0.96	1.06	1.16
-10/-12	TC	4.11	3.85	3.59
	PI	1.16	1.26	1.35
-7/-8	TC	4.42	4.16	3.91
	PI	1.31	1.40	1.50
-1/-2	TC	4.58	4.32	4.06
	PI	1.38	1.48	1.57
2/1	TC	4.68	4.43	4.17
	PI	1.43	1.53	1.62
7/6	TC	6.06	5.80	5.54
	PI	1.50	1.60	1.70
10/9	TC	6.39	6.13	5.88
	PI	1.59	1.69	1.79
15/12	TC	6.73	6.47	6.21
	PI	1.68	1.78	1.88
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

**LEGEND**

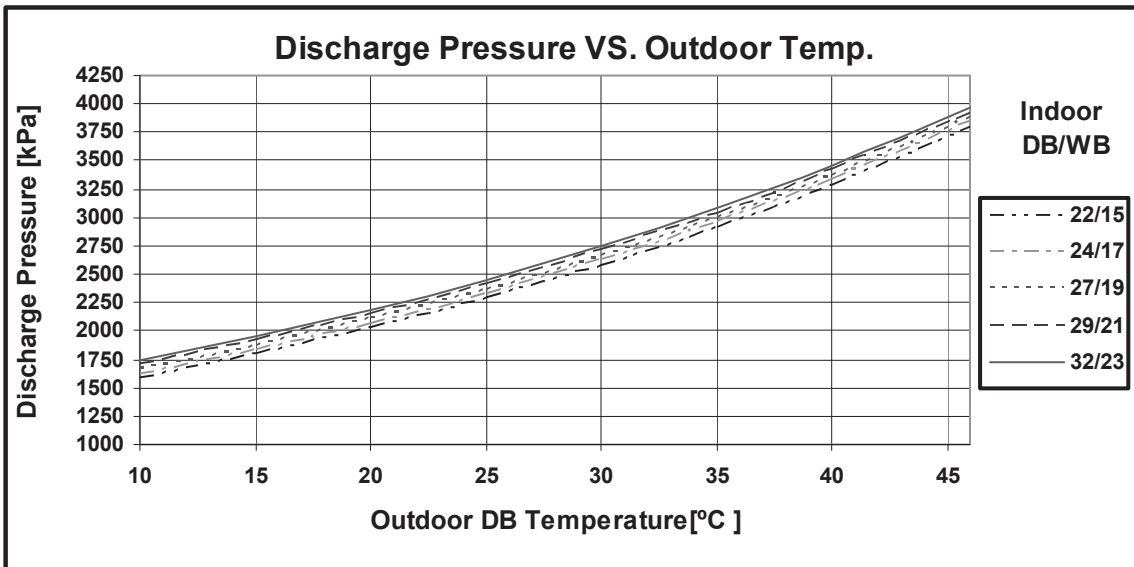
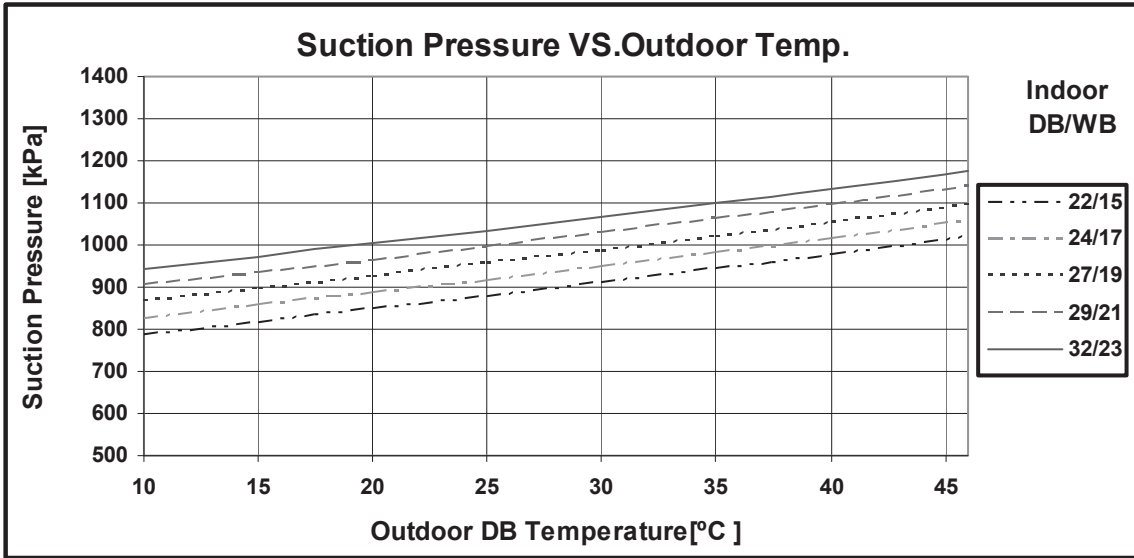
- TC – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OU – Outdoor

**5.3.4 Capacity Correction Factors**

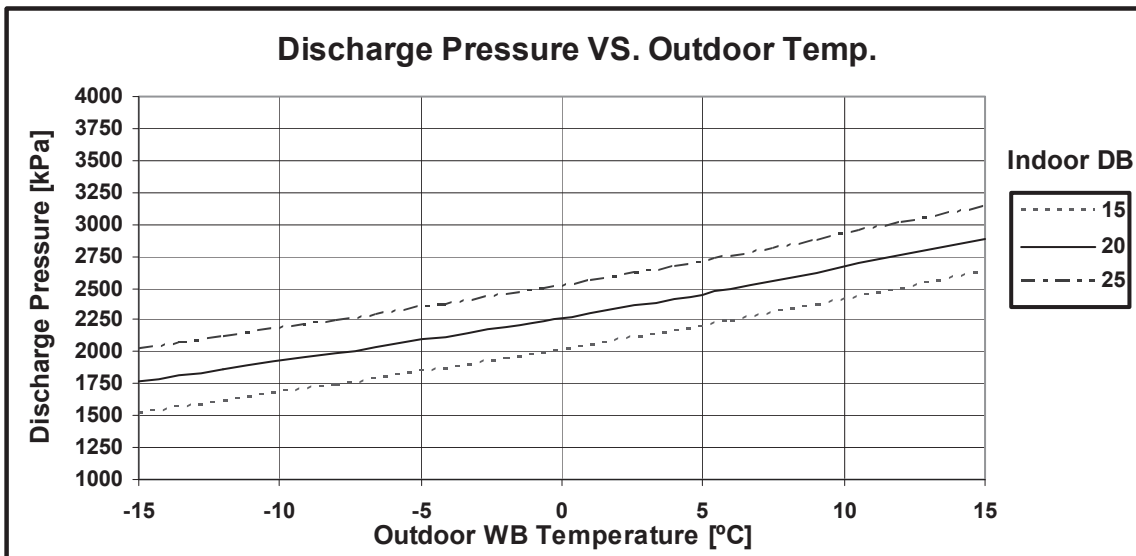
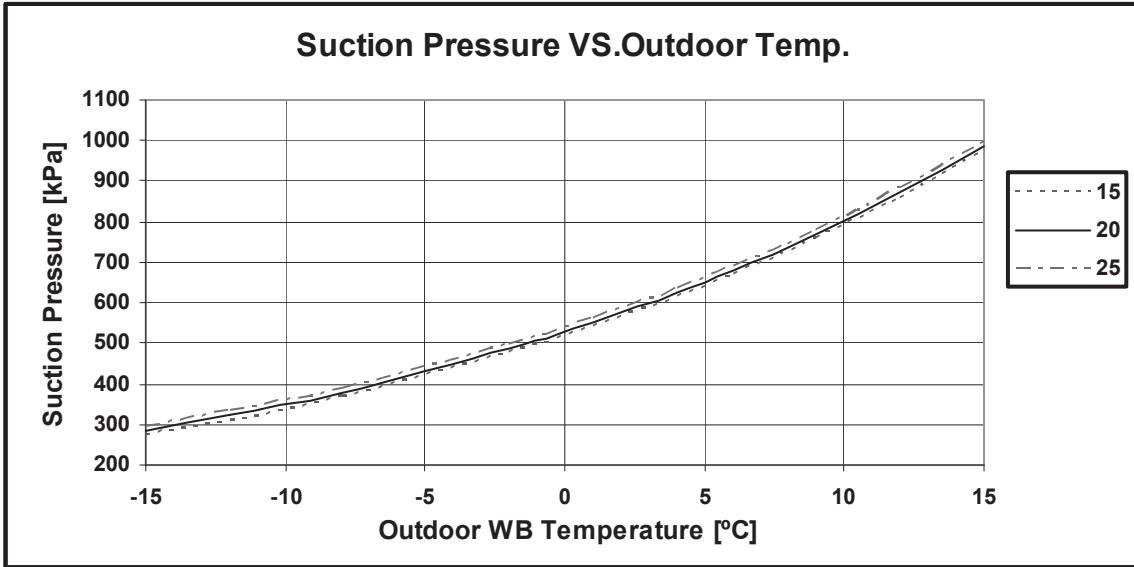




5.3.5 Model: CNE 018 DCI Cooling - Test Mode



5.3.6 Heating - Test Mode



**5.4 CNE 024 DCI**

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

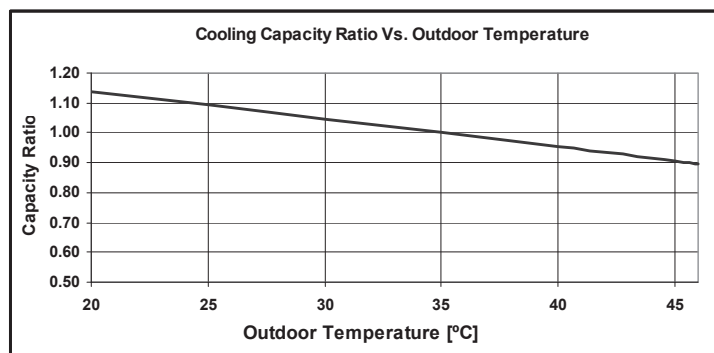
**[230V] : Indoor Fan at High Speed.**

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [C°]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	6.57	7.00	7.43	7.86	8.29
	SC	4.67	4.76	4.86	4.96	5.05
	PI	1.89	1.93	1.97	2.00	2.04
30	TC	6.26	6.69	7.12	7.55	7.98
	SC	4.55	4.65	4.74	4.84	4.93
	PI	2.12	2.15	2.19	2.22	2.26
35	TC	5.94	6.37	6.80	7.23	7.66
	SC	4.43	4.53	4.62	4.72	4.81
	PI	2.34	2.37	2.41	2.45	2.48
40	TC	5.62	6.05	6.48	6.91	7.34
	SC	4.32	4.41	4.51	4.60	4.70
	PI	2.56	2.60	2.63	2.67	2.70
46	TC	5.24	5.67	6.10	6.53	6.96
	SC	4.17	4.27	4.36	4.46	4.56
	PI	2.83	2.86	2.90	2.93	2.97

**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

**5.4.2 Capacity Correction Factors**



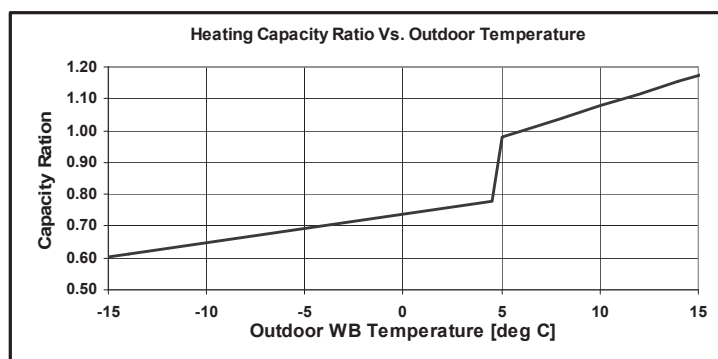
**5.4.3 Heating Capacity (kW) - Run Mode  
[230V] : Indoor Fan at High Speed**

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [C°]		
		15	20	25
-15/-16	TC	4.65	4.32	4.00
	PI	1.36	1.50	1.64
-10/-12	TC	5.17	4.85	4.52
	PI	1.64	1.78	1.92
-7/-8	TC	5.57	5.24	4.92
	PI	1.85	1.99	2.13
-1/-2	TC	5.76	5.44	5.11
	PI	1.96	2.10	2.23
2/1	TC	5.89	5.57	5.25
	PI	2.03	2.17	2.30
7/6	TC	7.62	7.30	6.98
	PI	2.13	2.27	2.41
10/9	TC	8.05	7.72	7.40
	PI	2.26	2.40	2.54
15/12	TC	8.47	8.14	7.82
	PI	2.39	2.52	2.66
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

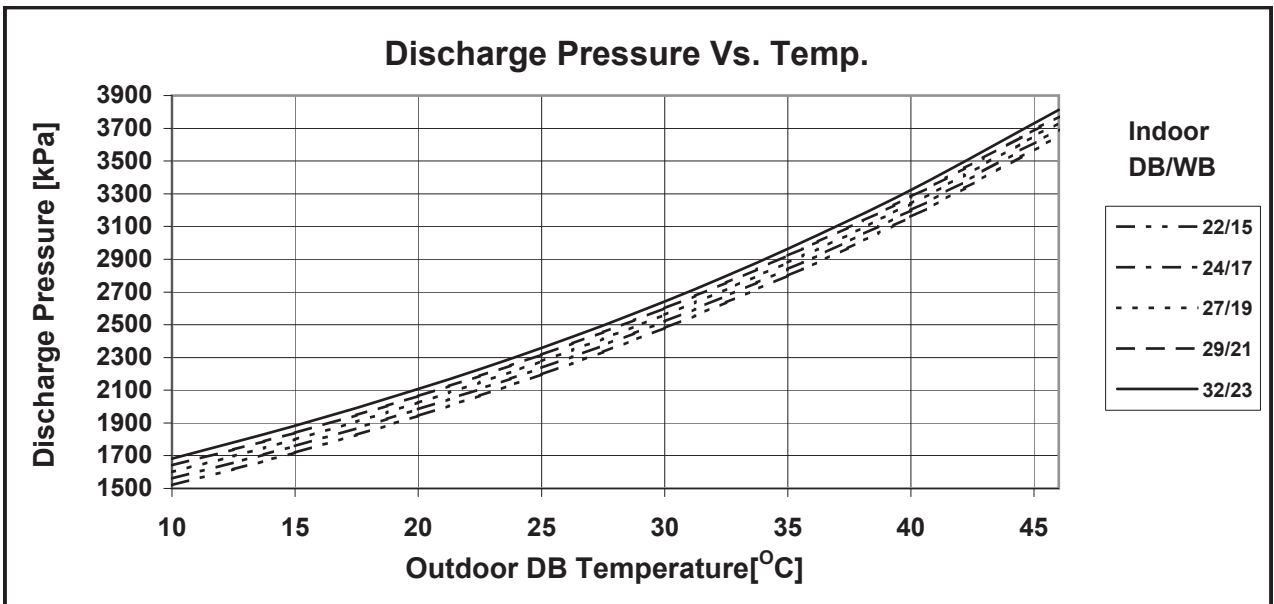
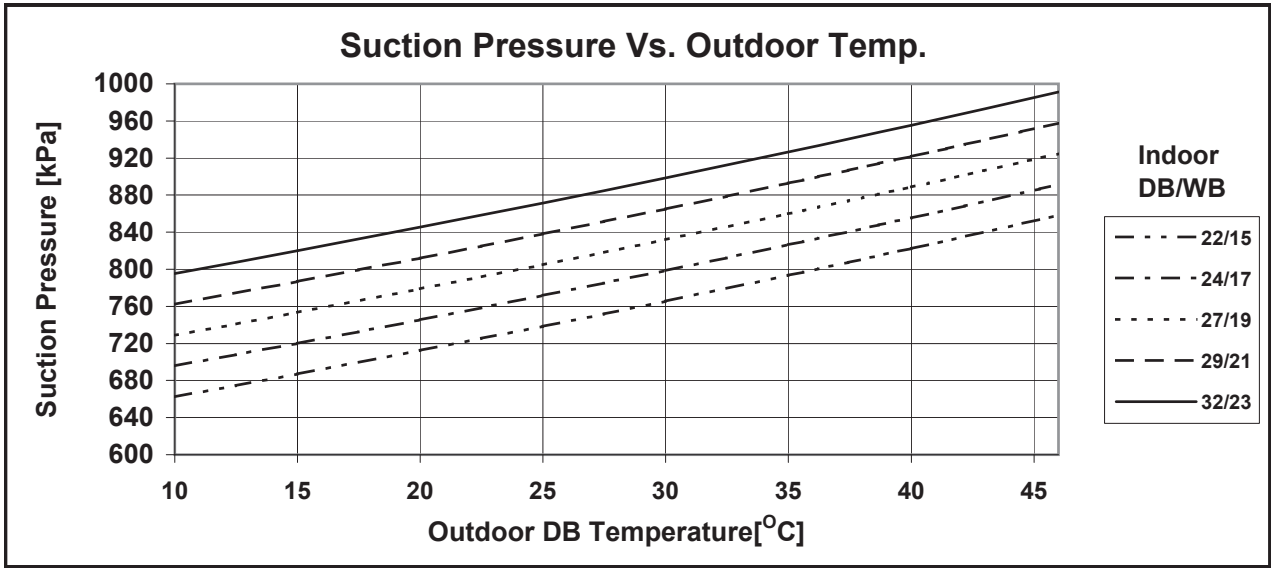
**LEGEND**

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

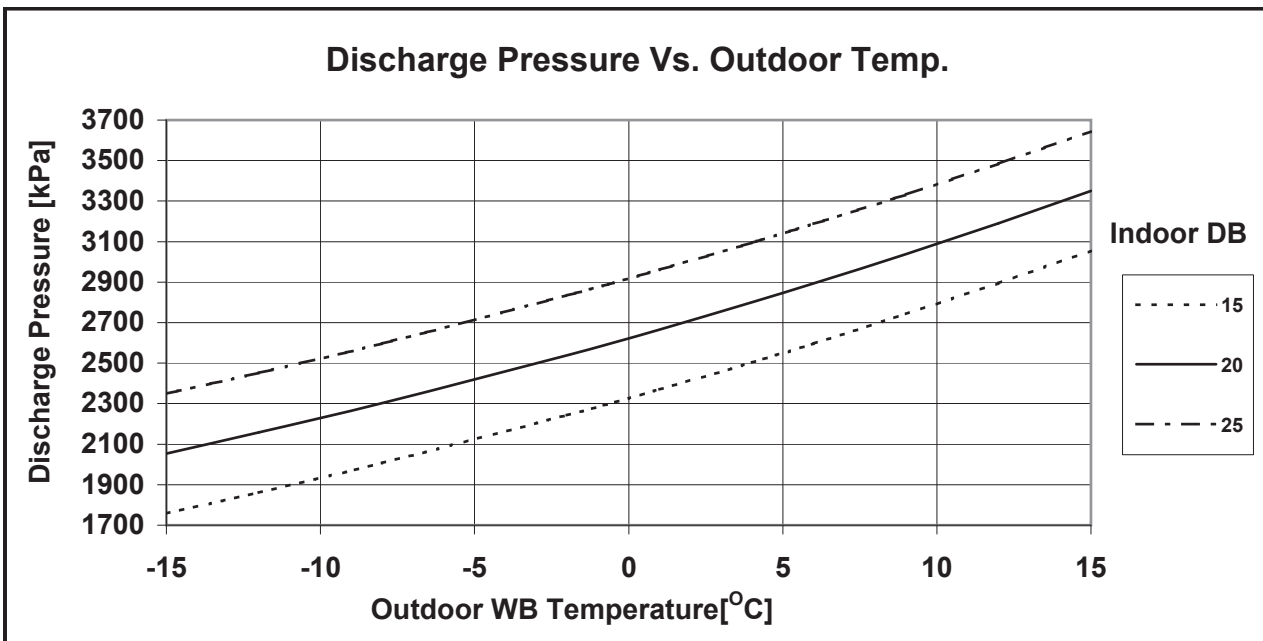
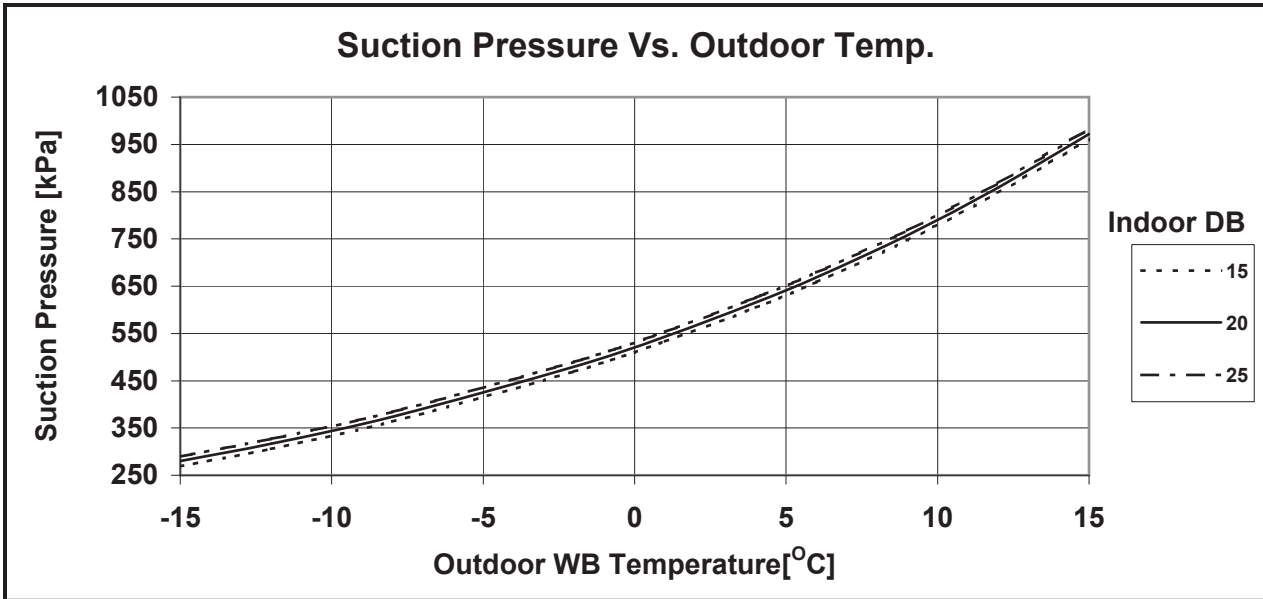
**5.4.4 Capacity Correction Factors**



5.4.5 Model: CNE 024 DCI Cooling – Test Mode



5.4.6 Heating – Test Mode



### 5.5 Capacity Correction Factor Due to Tubing Length

#### 5.5.1 Cooling

Model	TOTAL TUBING LENGTH								
	3m	7.5m	10m	15m	20m	25m	30m	40m	50m
	1.02	1	0.98	0.96	0.95	0.95	0.93	---	---

\* Minimum recommended tubing length between indoor and outdoor units is 3m.w

#### 5.5.2 Heating

Model	TOTAL TUBING LENGTH								
	3m	7.5m	10m	15m	20m	25m	30m	40m	50m
	1.02	1	0.98	0.96	0.95	0.95	0.93	---	---

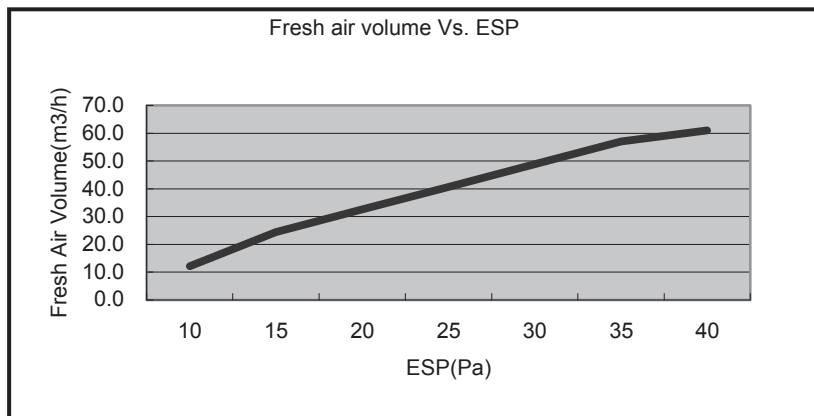
\* Minimum recommended tubing length between indoor and outdoor units is 3m.

### 5.6 Fresh air volume to the external static pressure (Field option)

Knock-down opening :φ100mm on the casing for the fresh duct

Fresh air control: by external booster fan

Select the fresh air volume according to required external static pressure.



### 5.7 Conditioned air supply to adjacent room (Field option)

(To be nished)

**6. SOUND LEVEL CHARACTERISTICS**

**PAGE UNDER WORK**



## 7. ELECTRICAL DATA

### 7.1 Single Phase Units

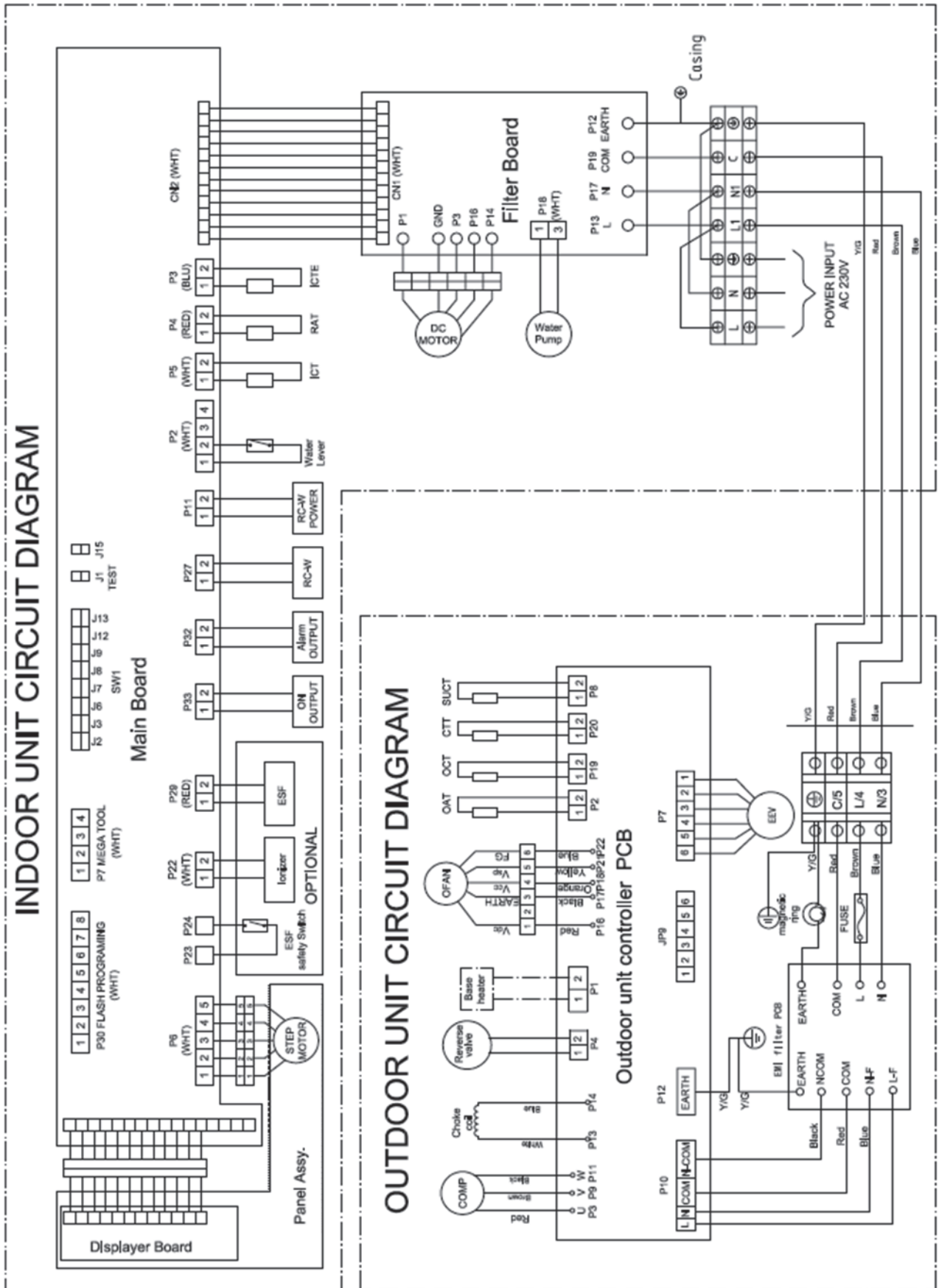
MODEL	CNE 009 DCI	CNE 012 DCI	CNE 018 DCI	CNE 024 DCI
Power Supply	To indoor	To indoor	To indoor	To outdoor
	1PH-230V-50Hz	1PH-230V-50Hz	1PH-230V-50Hz	1PH-230V-50Hz
Max Current, A	10	10	12	14
Inrush Current A	35	35	35	45
Starting Current A	10.5	10.5	10.5	10.5
Circuit Breaker A	16	16	20	20
Power Supply Wiring No.X Cross Section mm <sup>2</sup>	3 x 1.5 mm <sup>2</sup>	3 x 1.5 mm <sup>2</sup>	3 x 2.5 mm <sup>2</sup>	3 x 2.5 mm <sup>2</sup>
Interconnecting Cable No.X Cross Section mm <sup>2</sup>	4 x 1.5 mm <sup>2</sup>	4 x 1.5 mm <sup>2</sup>	4 x 2.5 mm <sup>2</sup>	4 x 2.5 mm <sup>2</sup>

#### NOTE

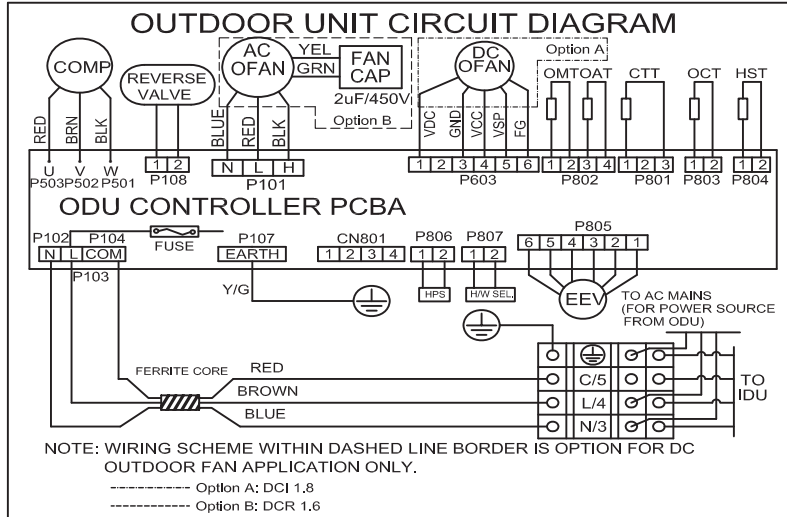
***Power wiring cord should comply with local laws and electrical regulations requirements.***

8. WIRING DIAGRAMS

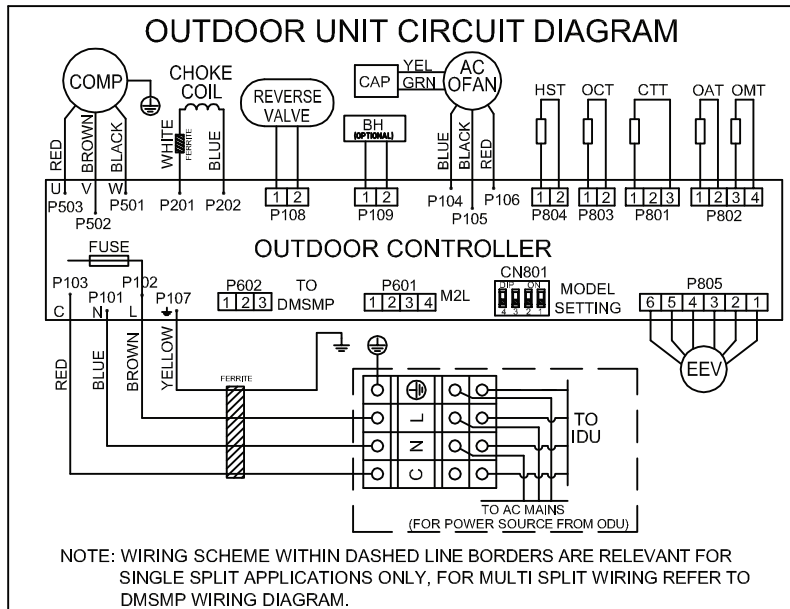
8.1 CNE 009, 012, 018, 024 DCI



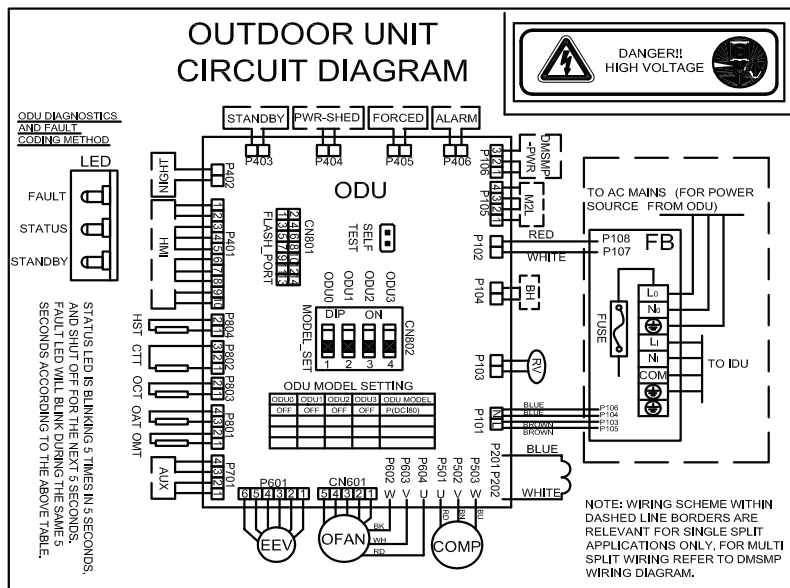
8.2 Outdoor Unit: YBDE 009, 018



Outdoor Unit: YBDE 018



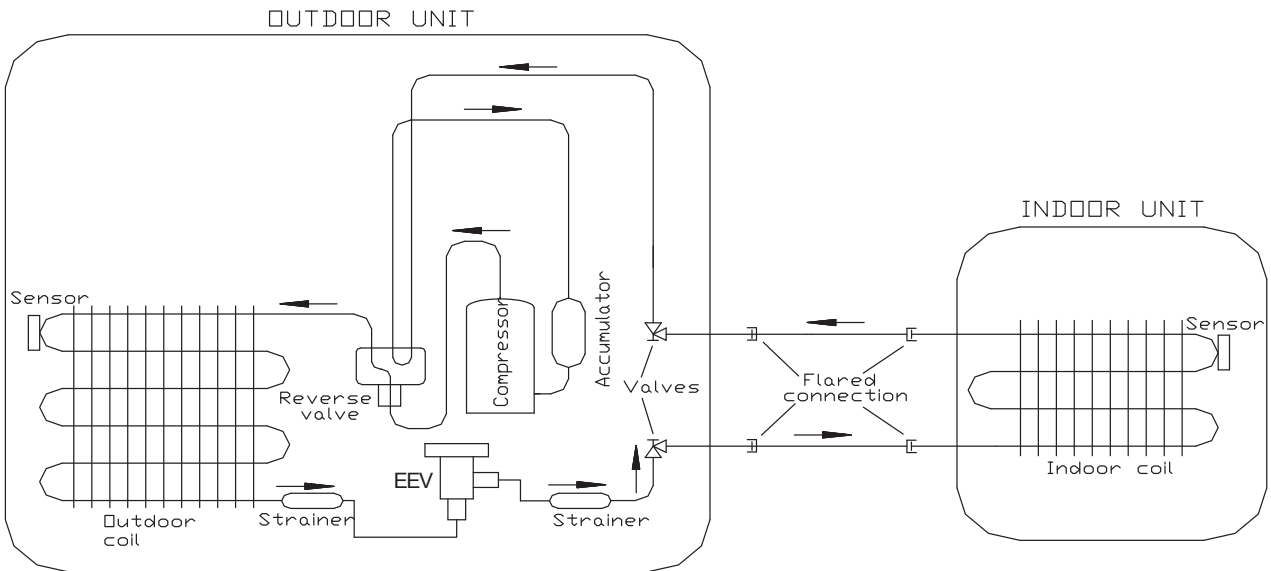
Outdoor Unit: YBDE 024



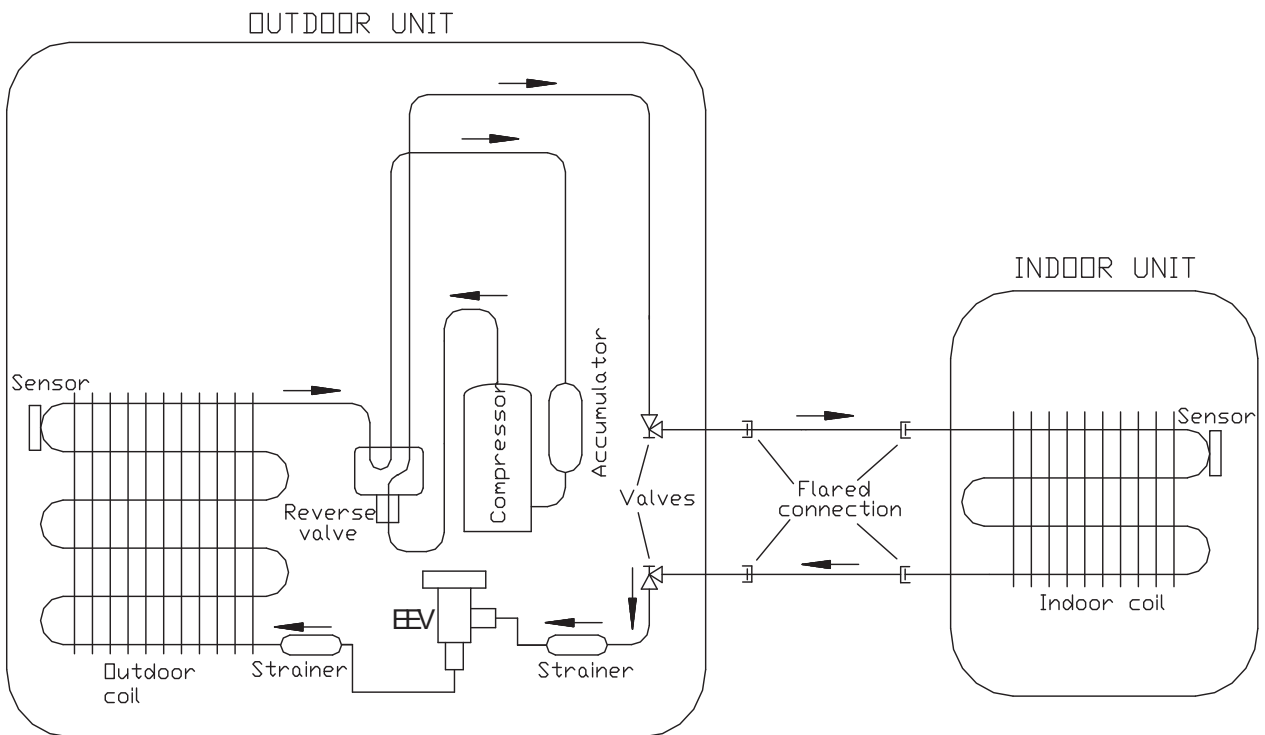
**9. REFRIGERATION DIAGRAMS**

**9.1 CNE 009, 012, 018, 024 DCI**

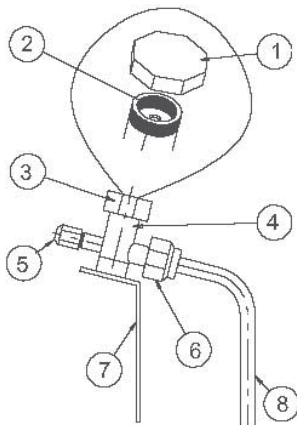
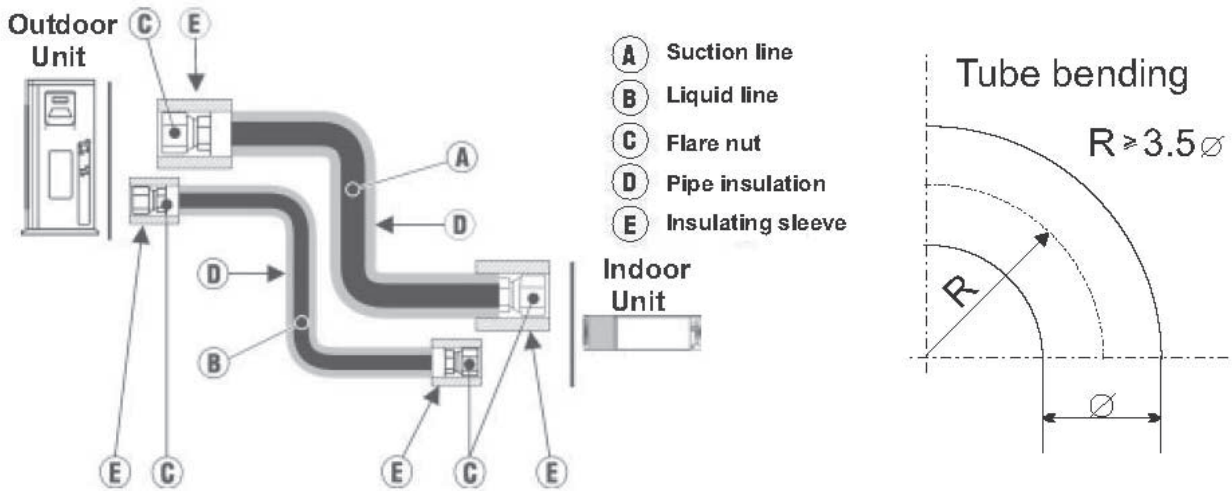
**Cooling Mode**



**Heating Mode**



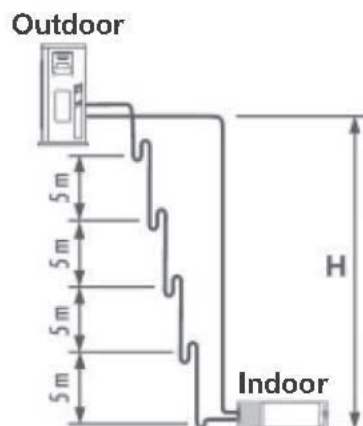
# 10. TUBING CONNECTIONS



TUBE (Inch)	1/4"	3/8"	1/2"	5/8"	3/4"
<b>TORQUE (Nm)</b>					
<b>Flare Nuts</b>	11-13	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.



## 11. CONTROL SYSTEM

### 11.1 General Functions and Operating Rules **The DCI software is fully parametric.**

All the model dependent parameters are shown in Blue color and with Italic style [*parameter*]. The parameters values are given in the last section of this control logic chapter of the service manual.

#### 11.1.1 System Operation Concept

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

The capacity request is transferred via indoor to outdoor communication, and is represented by a parameter called 'NLOAD'. NLOAD is an integer number with values between 0 and 127, and it represents the heat or cool load felt by the indoor unit.

#### 11.1.2 Compressor Frequency Control

##### 11.1.2.1 NLOAD setting

The NLOAD setting is done by the indoor unit controller, based on a PI control scheme.

The actual NLOAD to be sent to the outdoor unit controller is based on the preliminary LOAD calculation, the indoor fan speed, and the power shedding function. NLOAD limits as a function of indoor fan speed:

Indoor Fan Speed Maximum NLOAD Cooling Maximum NLOAD Heating

Indoor Fan Speed	Maximum NLOAD Cooling	Maximum NLOAD Heating
Low	<i>MaxNLOADIF1C</i>	<i>MaxNLOADIF1H</i>
Medium	<i>MaxNLOADIF2C</i>	<i>MaxNLOADIF2H</i>
High	<i>MaxNLOADIF3C</i>	<i>MaxNLOADIF3H</i>
Turbo	<i>MaxNLOADIF4C</i>	<i>MaxNLOADIF4H</i>
Auto	<i>MaxNLOADIF5C</i>	<i>MaxNLOADIF5H</i>

NLOAD limits as a function of power shedding:

Mode	Power Shedding OFF	Power Shedding ON
Cooling	No limit	Nominal Cooling
Heating	No limit	Nominal heating

#### 11.1.3 Target Frequency Setting

##### 11.1.3.1 Target Frequency Setting for YBDE 009/012/018/024

The compressor target frequency is a function of the NLOAD number sent from the indoor controller and the outdoor air temperature. Basic Target Frequency Setting:

Up to SW 35V12

NLOAD	Target Frequency [Hz]
<10	0
10	<i>MinFreqC</i> in cool OR <i>MinFreqH</i> in heat mode
11-126	NLOAD (as long it is in the allowed range, if not, the <i>MinFreqC</i> or <i>MaxFreqC</i> in cool mode OR <i>MinFreqH</i> or <i>MaxFreqH</i> in heat mode will be selected).
127	<i>MaxFreqC</i> in cool OR <i>MaxFreqH</i> in heat mode.

**SW 35V14 and above**

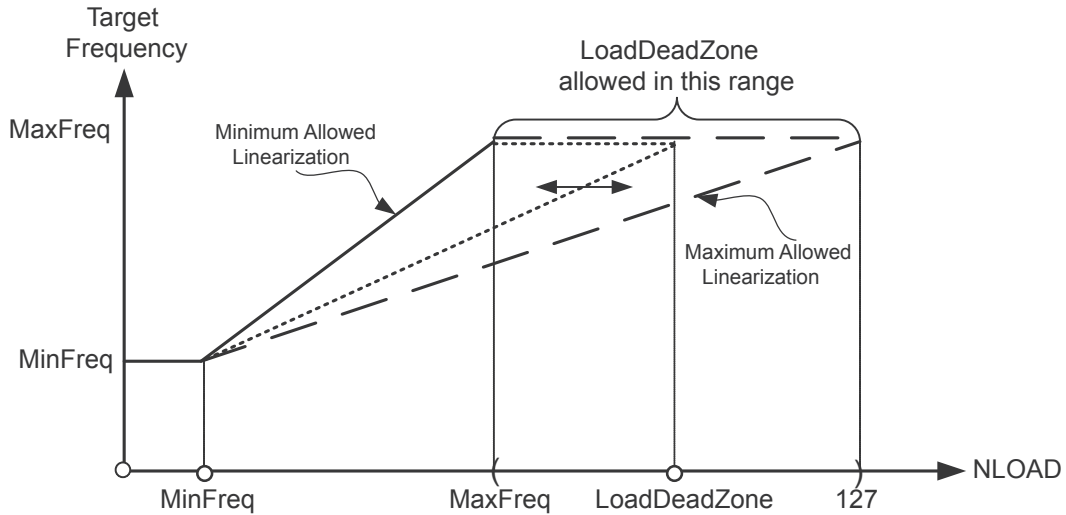
NLOAD	Target Frequency [Hz]
0	0
0 < NLOAD ≤ MinFreq	MinFreq
> MinFreq	$\frac{MaxFreq - MinFreq}{LoadDeadZone - MinFreq} \cdot \{min(NLOAD, LoadDeadZone) - MinFreq\} + MinFreq$

**Differences between Old and New ODU DCI/DCR software**

Unit	Current software	New software
DCI	35V12	35V14

**Comment:** there is no use for 35V13 software. This software is used in the past for Nordic countries. However, currently it's stopped completely from being used.

**Graphical Illustration:**



	Mode	During initial period (Start Phase)	After initial period (Run Phase)
MaxFreq	Cool	MaxFreqC	MaxFreqCRunPhase
	Heat	MaxFreqH	MaxFreqHRunPhase
MinFreq	Cool	MinFreqC	
	Heat	MinFreqH	
LoadDeadZone	Cool	LoadDeadZoneC	
	Heat	LoadDeadZoneH	

#	Name	A Single DCI 009	B Single DCI 012	C Single DCI 024	D Duo 50	E DCR 50	F Duo Delta38	G Trio Delta52	H DCR 50T
1	MinFreqC	30	33	20	20	20	38	20	20
2	MaxFreqC	64	80	85	97	77	93	100	77
3	MaxFreqCRunPhase	64	80	85	97	77	85	95	77
4	MinFreqH	30	35	20	26	26	38	25	26
5	MaxFreqH	81	93	95	106	79	100	100	79
6	MaxFreqHRunPhase	81	93	95	106	79	90	95	79
7	LoadDeadZoneC	90	95	95	97	90	93	127	90
8	LoadDeadZoneH	127	127	127	106	127	100	100	127

Target frequency limits as a function of outdoor air temperature (OAT):

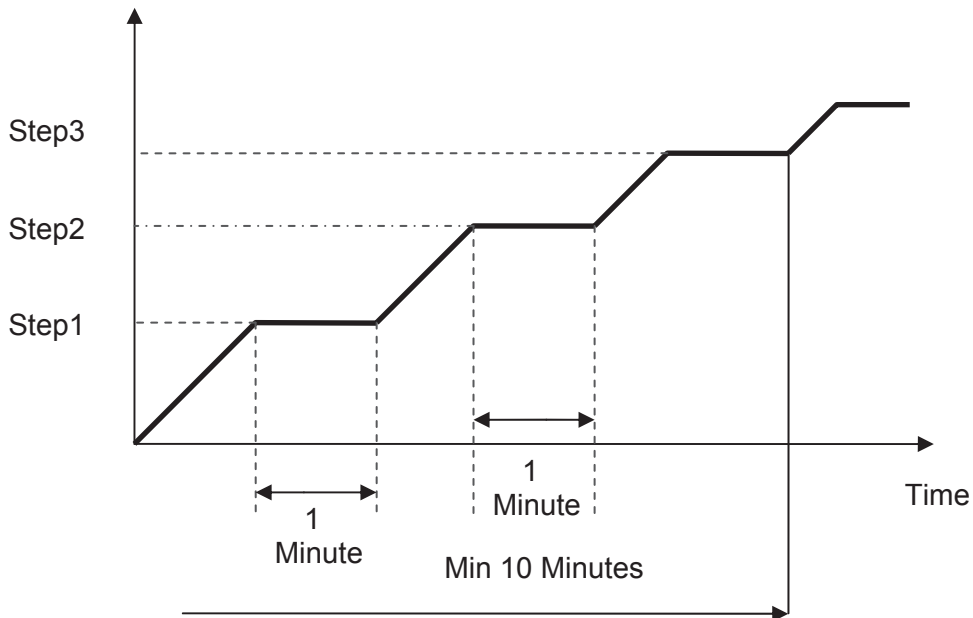
OAT Range	Cooling Mode limits	Heating Mode limits
OAT < 6	<i>MaxFreqAsOATC</i>	No limit
6 ≤ OAT < 15		<i>MaxFreqAsOAT1H</i>
15 ≤ OAT < 28		<i>MaxFreqAsOAT2H</i>
28 ≤ OAT	No limit	

**11.1.4 Frequency Changes Control**

When the unit is running normally , the compressor frequency change rate is 1 Hz/sec.

**11.1.5 Compressor Starting Control**

**11.1.5.1 Compressor starting control for DCI009/012/018**



**11.1.5.2 Compressor starting control for DCI024**

**Step 1**

Whenever the compressor starts up, after it has been off for more than 45 minutes, the compressor frequency cannot go below *Step1RPS* for 3 continuous minutes (*this rule comes to ensure oil return to the compressor*).

**Step 2**

The compressor speed cannot go above *Step2RPS* once after each compressor start up for 3 continuous minutes (*this rule comes to prevent oil exit from the compressor after its start up*).

**Step 3**

The speed cannot go higher than *Step3RPS* unless it was operating for more than 1 continuous minutes between *Step3RPS – 5* and *Step3RPS*.

After passing above *Step3RPS*, this rule is re-applied when passing below *Step3RPS-5*.



**11.1.6 Minimum On and Off Time**

3 minutes

**11.1.7 Indoor Fan Control**

8 Indoor fan speeds are determined for each model. 4 speeds for cool/dry/fan modes and 4 speeds for heat mode.

When user sets the indoor fan speed to a fixed speed (Low/ Medium/ High), unit will operate constantly at set speed.

When Auto Fan is selected, indoor unit controller can operate in all speeds. The actual speed is set according to the cool/heat load.

**11.1.7.1 Turbo Speed**

The Turbo speed is activated during the first 30 minutes of unit operation when auto fan speed is selected and under the following conditions:

Difference between set point and actual room temperature is bigger than 3 degrees.

Room temperature > 22 for cooling, or < 25 for heating.

**11.1.8 Outdoor Fan Control**

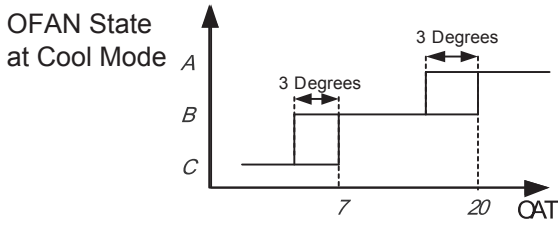
**11.1.8.1 Outdoor Fan Control for DCI009/012/018**

7 outdoor fan speeds are determined for each model. 3 speeds for cool and dry modes, and 3 speeds for heat mode, and a very low speed.

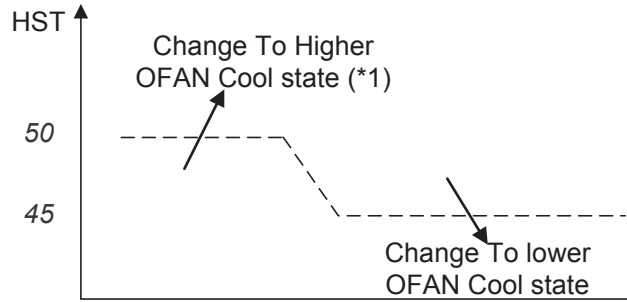
Outdoor fan speed is a function of compressor frequency and outdoor air temperature (OAT). 4 routines for fan control are determined. The control routine selection depends on operation mode, compressor speed, outdoor air temperature (OAT) and heat sink temperature (HST).

Routine	Conditions
<b>A</b>	Heating with OAT < 15°C or Cooling with OAT > 20°C, or Faulty OAT
<b>B</b>	Cooling with 20°C > OAT > 7°C
<b>C</b>	Cooling with 7°C > OAT
<b>D</b>	Heating with OAT > 15°C

Compressor Target Frequency	OFAN Speed			
	Routin A	Routin B	Routin C	Routin D
Freq=0	OFF	OFF	OFF	OFF
10 ≤ Freq < OFLowFreq	Low	Low	VL	Low
OFLowFreq ≤ Freq < OFMedFreq	Medium	Low	VL	Low
OFMedFreq ≤ Freq	High	Low	Low	Medium



Note: Periorities A>B>C



(\*1) If State C, change to B  
If State B, change to A

When compressor is switched to OFF and the heat sink temperature is above 55 degrees, the outdoor fan will remain ON in low speed for up to 3 minutes.

**11.1.8.2 Outdoor Fan Control for DCI024**

OFAN operates between *OFMinRPM* to *OFMaxRPM*.

Min time for speed change of OFAN *OFMinTimeReduce* (60 seconds).

There are 4 de ned speeds – High, Med, Low, and Very Low.

The actual OFAN speeds in cool mode are de ned according to the following table:

Freq	Outdoor air temperature (OAT)											
	-10	-5	0	5	10	15	20	25	30	35	40	46
0	0	0	0	0	0	0	0	0	0	0	0	0
15	80	100	120	130	220	340	460	580	600	730	730	730
25	130	140	160	190	250	380	600	610	670	730	740	750
35	160	180	210	250	330	470	730	730	730	730	780	800
45	205	230	260	320	440	600	730	730	730	730	800	850
55	250	280	310	390	550	730	730	730	730	730	800	850
65	275	315	355	470	640	730	730	730	730	730	800	850
75	300	350	400	550	730	730	730	730	730	730	800	850
85	325	395	445	630	730	730	730	730	730	730	800	850
95	350	440	490	710	730	730	730	730	730	730	800	850

The actual OFAN speeds in heat mode are de ned according to the following table

Freq	Outdoor air temperature (OAT)						
	-15	-7	0	7	14	21	24
0	0	0	0	0	0	0	0
15	850	850	750	750	500	350	300
25	850	850	750	750	520	370	320
35	850	850	750	750	540	390	340
45	850	850	750	750	560	410	360
55	850	850	750	750	580	430	380
65	850	850	750	750	600	450	400
75	850	850	750	750	620	470	420
85	850	850	750	750	640	490	440
95	850	850	750	750	650	500	450

The fan speed is also related to protections and OMT value.

### 11.1.9 EEV (Electronic Expansion Valve) Control

#### 11.1.9.1 EEV Control for DCI009/012/018

EEV opening is defined as  $EEV = EEV_{OL} + EEV_{CV}$

$EEV_{OL}$  is the initial EEV opening as a function of the compressor frequency, operation mode, unit model and capacity.

$EEV_{CV}$  is a correction value for the EEV opening that is based on the compressor temperature.

During the first 5 minutes of compressor operation  $EEV_{CV} = 0$ .

Once the first 5 minutes are over, the correction value is calculated as follow:  $EEV_{CV}(n) =$

$EEV_{CV}(n-1) + EEV_{CTT}$

$EEV_{CTT}$  is the correction based on the compressor temperature. A target compressor temperature is set depending on frequency and outdoor air temperature, and the actual compressor temperature is compared to the target temperature to set the required correction to the EEV opening.

#### 11.1.9.2 EEV Control for DCI024

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

$$EEV = EEV_{OL} + \sum EEV_{CV}$$

Initial EEV value is set according to compressor frequency and according to indoor and outdoor model

The corrective value is calculate every 30 sec the EEV corrective value is set to keep the discharged super heat temperature between 20° to 30° in cooling and 12° to 20° in heating.

**11.1.10 RV(Reversing Valve) Control**

Reversing valve is on in heat mode.

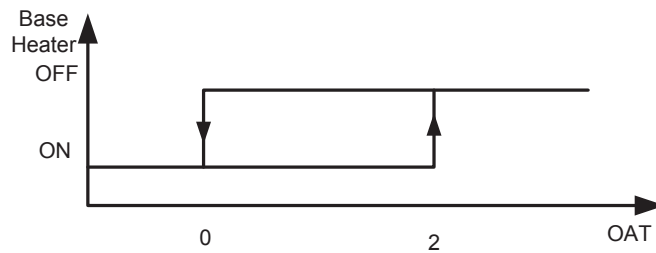
Switching of RV state is done only after compressor is off for over 3 minutes.

**11.1.10.1 Ioniser Control**

Ioniser is on when unit is on ,AND indoor fan is on ,AND Ioniser power switch (on grille) is on.

**11.1.10.2 Base Heater Control**

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.

**11.1.11 Fan Mode**

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

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

**11.1.12 Cool Mode**

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by **fuzzy** 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 NLOAD.

**11.1.13 Heat Mode**

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by **fuzzy** 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 NLOAD.

**11.1.11.1 Temperature Compensation**

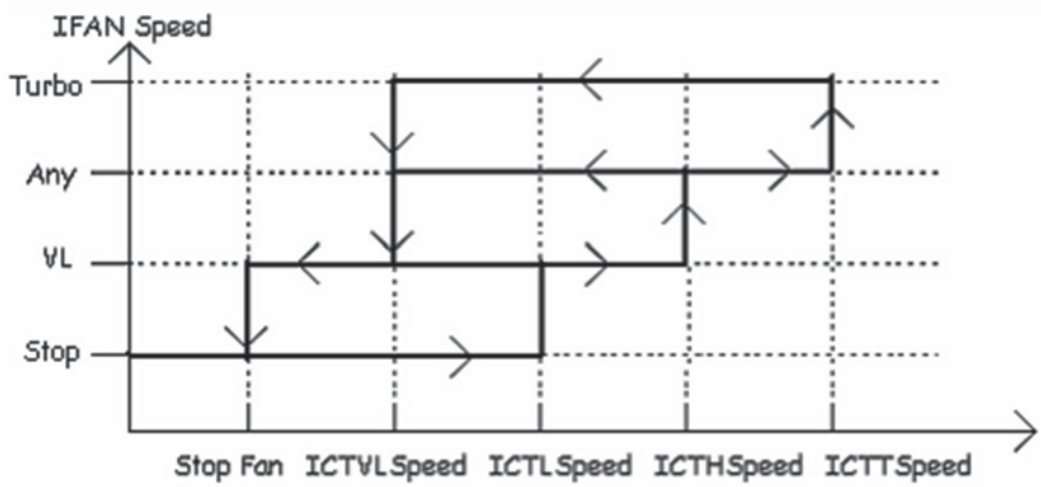
In ducted and cassette models, 3 degrees are reduced from room temperature reading (except when in I-Feel mode), to compensate for temperature difference between high and low areas in the heated room, and for coil heat radiation on room thermistor.

The temperature compensation can be enabled/disabled by shortening of J2 on the indoor unit Controller

Model	J2 Shorted	J2 Opened
Cassette	Compensation Enabled	Compensation Disabled
Ducted	Compensation Enabled	Compensation Disabled

**11.1.11.2 Indoor Fan Control in Heating Mode**

Indoor fan speed depends on the indoor coil temperature:



**11.1.14 Auto Cool/Heat Mode**

When in auto cool heat mode unit will automatically select between cool and heat mode according to the difference between actual room temperature and user set point temperature (.T). Unit will switch from cool to heat when compressor is off for 3 minutes, and .T < -3. Unit will switch from heat to cool when compressor is off for 5 minutes, and .T < -3.

**11.1.15 Dry Mode**

As long as room temperature is higher then the set point, indoor fan will work in low speed and compressor will work between 0 and MaxNLOADIF1C Hz. When the room temperature is lower than the set point, compressor will be switched OFF and indoor fan will cycle 3 minutes OFF, 1 minute ON.

**11.1.16 Protections**

- There are 5 protection codes.
- Normal (Norm) – unit operate normally.
- Stop Rise (SR) – compressor frequency can not be raised but does not have to be decreased.
- HzDown1 (D1) – Compressor frequency is reduced by 2 to 5 Hz per minute.
- HzDown2 (D2) – Compressor frequency is reduced by 5 to 10 Hz per minute.
- Stop Compressor (SC) – Compressor is stopped.

**11.1.16.1 Indoor Coil Defrost Protection — CNE**

Min(ICT,ICTE)	Trend				
	Fast Increasing	Increasing	No Change	Decreasing	Fast Decreasing
< -2	SC	SC	SC	SC	SC
[-2, 0)	D1	D1	D2	D2	D2
[0, 2)	SR	SR	D1	D2	D2
[2, 4)	SR	SR	SR	D1	D2
[4, 6)	Norm	Norm	SR	SR	D1
[6, 8]	Norm	Norm	Norm	SR	SR
> 8	Norm				

11.1.16.2 Indoor Coil Defrost Protection — CNE

ICT	Trend				
	Fast Increasing	Increasing	No Change	Decreasing	Fast Decreasing
< -2	SC	SC	SC	SC	SC
[-2, 0)	D1	D1	D2	D2	D2
[0, 2)	SR	SR	D1	D2	D2
[2, 4)	SR	SR	SR	D1	D2
[4, 6)	Norm	Norm	SR	SR	D1
[6, 8]	Norm	Norm	Norm	SR	SR
> 8	Norm				

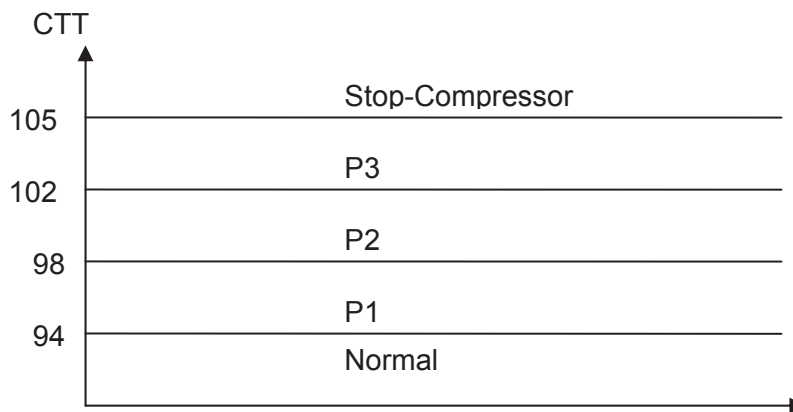
11.1.16.3 Indoor Coil Overheating Protection

ICT	ICT Trend				
	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
>62	SC	SC	SC	SC	SC
[60, 62)	D1	D1	D2	D2	D2
[55, 60)	SR	SR	D1	D2	D2
[52, 55)	SR	SR	SR	D1	D2
[48, 52)	Norm	Norm	SR	SR	D1
[45, 48)	Norm	Norm	Norm	SR	SR
I<45	Norm				

11.1.17 Compressor Overheating Protection

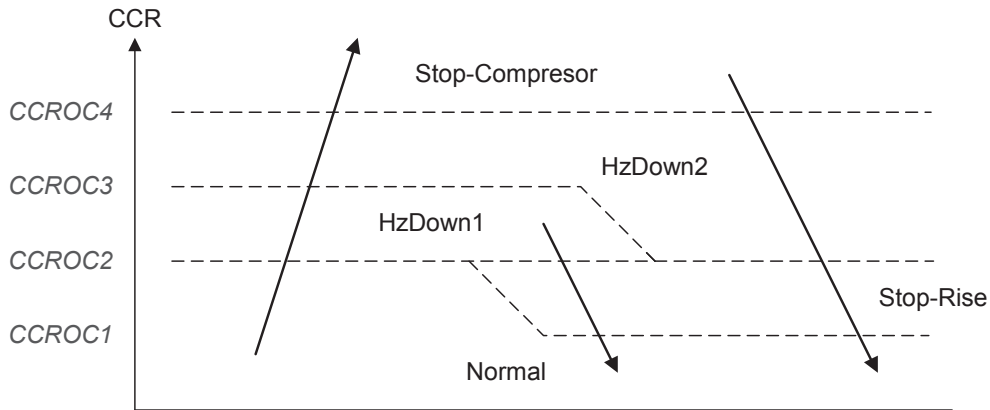
11.1.17.1 Compressor Overheating Protection for DCI009/012/018/024

Compressor temperature can be in one of 5 control zones (4 in protection, and 1 normal), according to the following chart.



Control Status	Compressor Temperature Increases	Else
P1	Normal	Stop Rise
P2	HzDown 1	Stop Rise
P3	HzDown 2	HzDown 1
Stop Compressor	Stop Compressor	

**11.1.17.2 Compressor Over Current Protection Only For DCI009/012/018/024**



**11.1.18 Heat Sink Overheating Protection**

**11.1.08.1 Heat Sink Overheating Protection For DCI009/012/018/024**

HST	HST Trend				
	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
≥ 90	SC	SC	SC	SC	SC
[85, 90)	D1	D1	D2	D2	D2
[82, 85)	SR	SR	D1	D2	D2
[80, 82)	SR	SR	SR	D1	D1
[78, 80)	Norm	Norm	Norm	SR	SR
< 78	Norm				

**11.1.19 Outdoor Coil Deicing Protection**

**11.1.19.1 Outdoor coil Deicing Protection For DCI009/012/018/024**

- Entering Deicing Conditions

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

- Case 1:  $OCT < OAT - 8$  AND  $TLD > DI$
- Case 2:  $OCT < OAT - 12$  AND  $TLD > 30$  minutes.
- Case 3: OCT is Invalid AND  $TLD > DI$
- Case 4: Unit is just switched to STBY AND  $OCT < OAT - 8$
- Case 5:  $NLOAD = 0$  AND  $OCT < OAT - 8$
- Case 6:  $OCT < -19$  AND  $TLD > 60$  minutes All

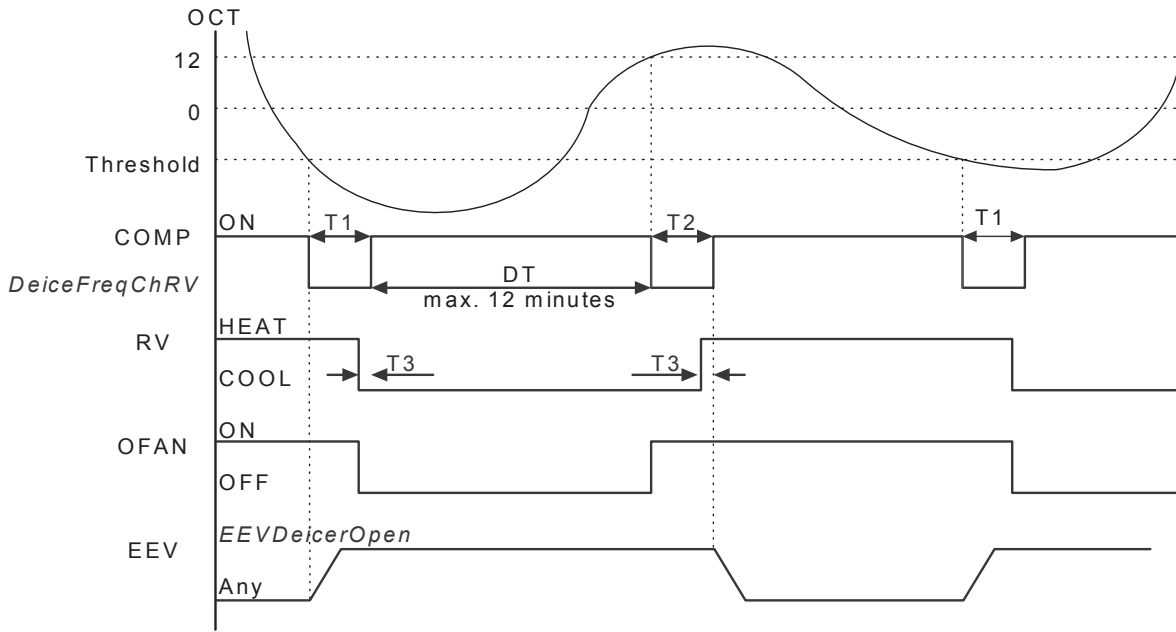
this condition will exist during 10 seconds  
 OCT – Outdoor Coil Temperature OAT –  
 Outdoor Air Temperature TLD – Time from  
 Last Deicing

DI – Deicing Interval (Time Interval Between Two Deicing)

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

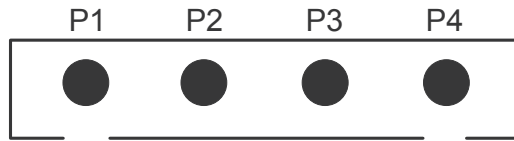
Deicing interval time is changed (increased/ decreased in 10 minutes steps) as a function of deicing time. If deicing time is shorter than former deicing time, the deicing interval time will be increased. If deicing time is longer than former deicing time, the deicing interval time will be decreased.

• Deicing Operation Procedure



T1=60 secondes;T2=36 secondes;T3=6 secondes  
 T1=50 secondes;T2=36 secondes;T3=6 secondes

**11.1.20 Condensate Water Over Flow Protection**



Level Connector Top View

Each of the pins P1, P2, P3 can have two options:  
 1 – When it is shorted with P4  
 0 – When it is not shorted to P4

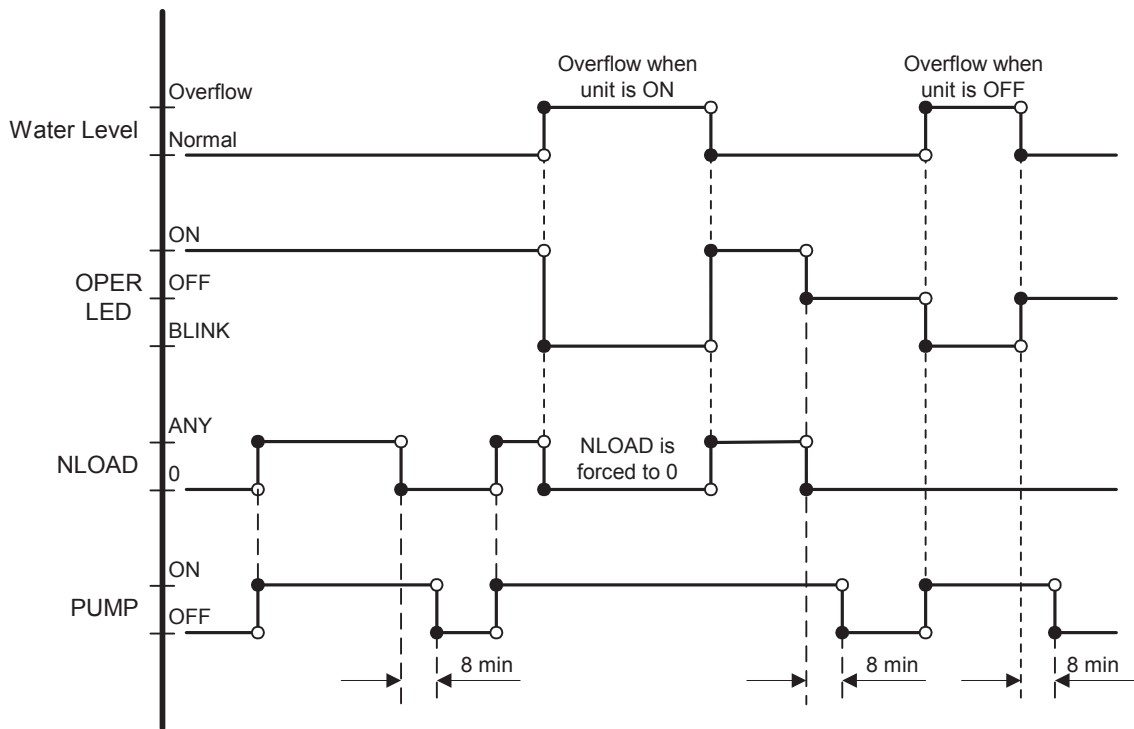
P1	P2	P3	Level
Don't care	Don't care	1	Normal
Don't care	Don't care	0	Overflow

- (\*) 1- Pin P1, P2, or P3 is connected to P4.
- 0- Pin P1, P2 or P3 is not connected to P4.

**For CNE unit:**

In case of vertical installation, change dipswitch 7 to OFF position to cancel Water Pump operation.





### 11.1.21 Operating the Unit from Mode Button (On display)

Forced operation 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°C
Heating	28°C

### 11.1.22 On Unit Controls and Indicators

#### 11.1.22.1 Indoor Unit controller Controls and Indicators for All Models Except for Floor/Ceiling model

During OFF, Fan, Cool, Heat, Dry, and Auto modes (for operation in other modes, see at the relevant spec paragraph):

STAND BY/OPERATION INDICATOR	<ul 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>Lights up during operations. Blinks when compressor is stopped as a result of a thermodynamic protection.</li> </ul>
ESF/INOIZER INDICATOR	<ul style="list-style-type: none"> <li>Lights up during ESF/ ionizer operation.</li> </ul>
TIMER INDICATOR	<ul style="list-style-type: none"> <li>Lights up during Timer and Sleep operation.</li> </ul>
FILTER INDICATOR	<ul style="list-style-type: none"> <li>Lights up when Air Filter needs to be cleaned.</li> </ul>
MODE/RESET BUTTON	<ul style="list-style-type: none"> <li>Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB → ...</li> <li>Press to turn off the filter indicator and to reset the filter function, after the cleaned filter has been reinstalled.</li> <li>In long pressing the system enters into diagnostic mode.</li> </ul>

**11.1.22.2 Outdoor Unit controller Indicators**

Unit has three LED's.

SB LED is ON when power is ON (230 VAC, even when no communication).

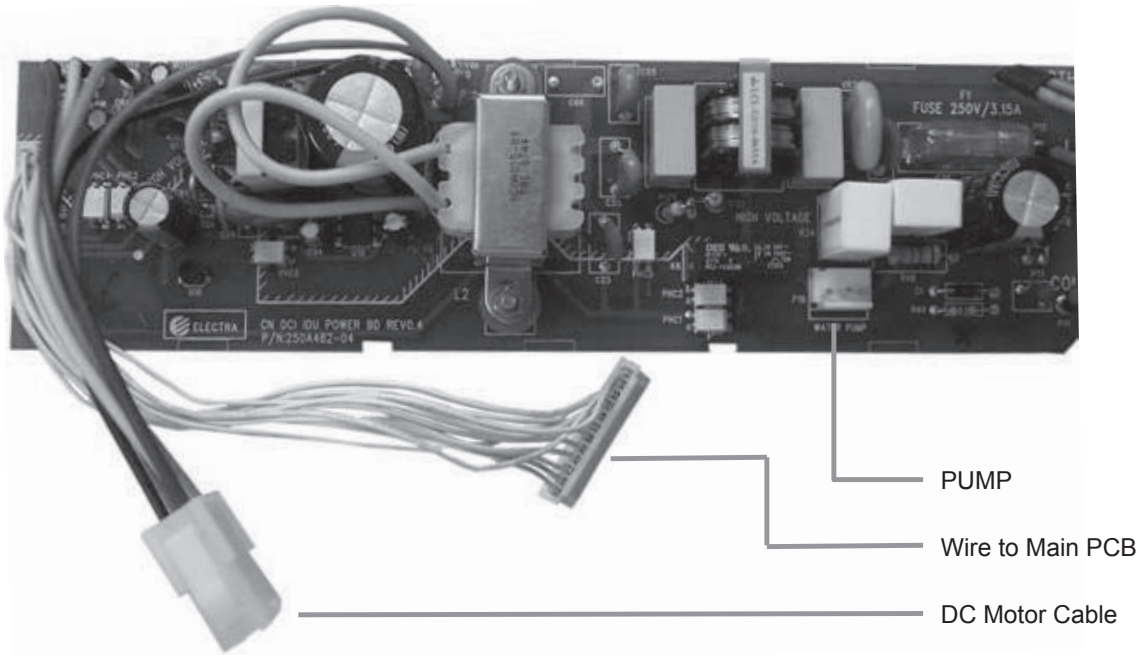
STATUS LED is ON when COMP is ON, and Blinks according to diagnostics mode de nitions when either fault or protection occurs.

FAULT LED Blinks according to diagnostics mode de nitions when either fault or protection occurs.

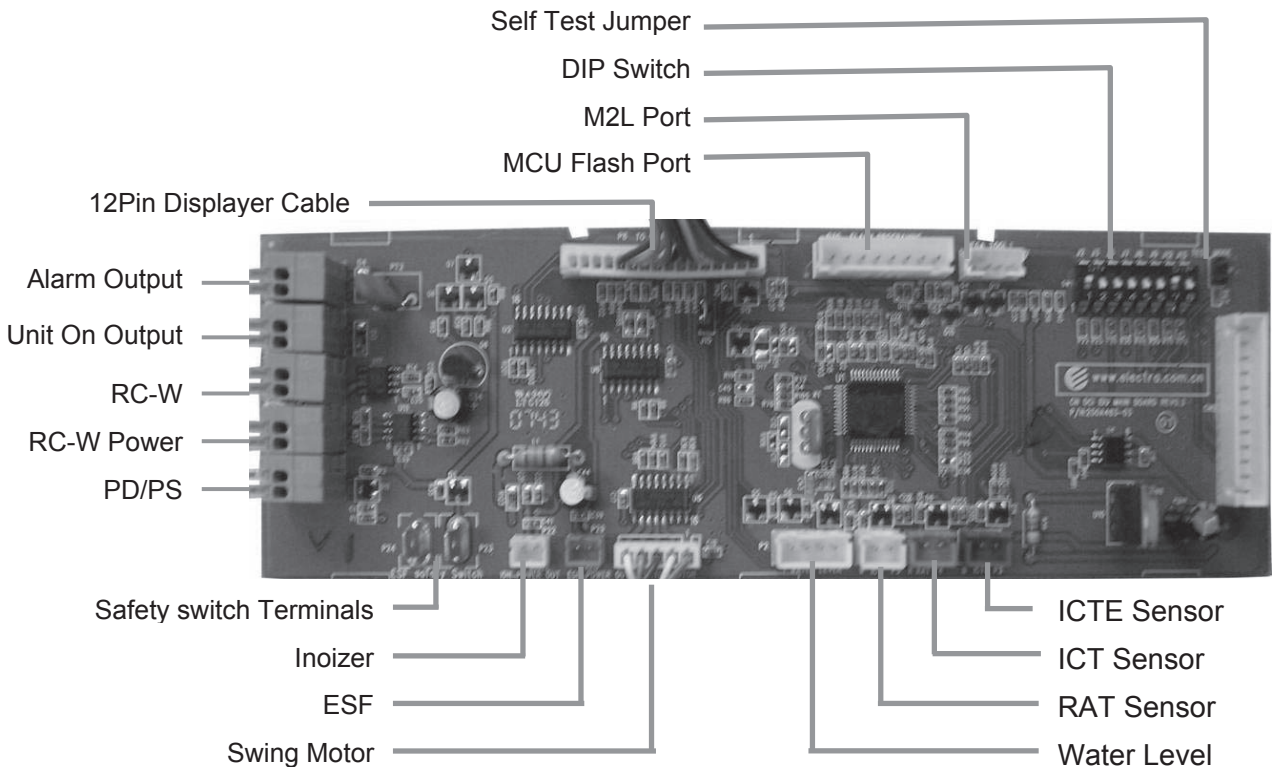
**11.1.23 DIP switch settings**

Indoor Unit Controller

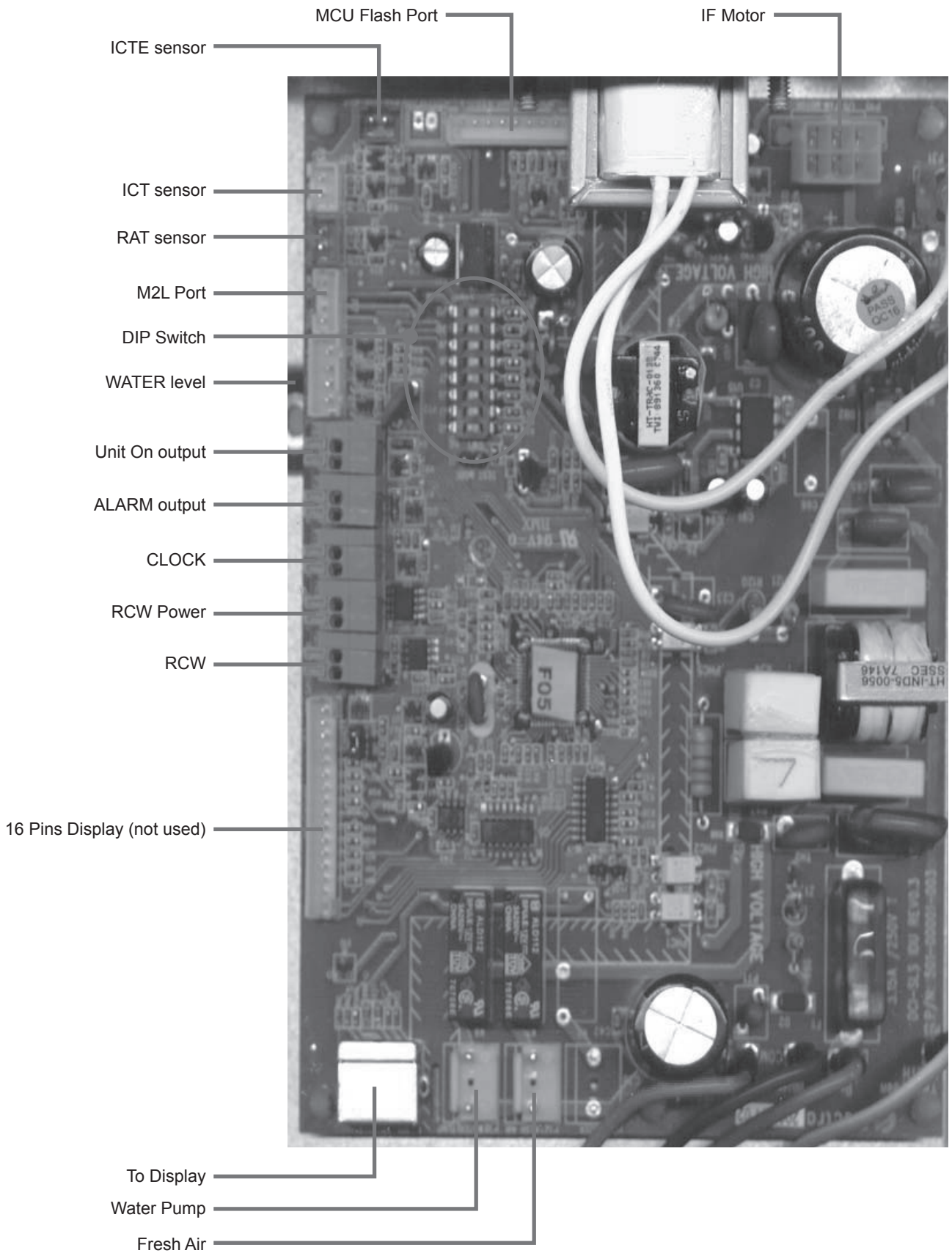
**11.1.23.1 Power PCB - CNE**



**11.1.23.2 Main PCB - CNE**



11.1.23.3 Main PCB - CNE



**11.1.24 Self Test Jumper(J1))**

- Jumper for production line only, never install jumper on site!

**11.1.25 DIP Switch and Jumper Settings • CNE - Dip**

switch default setting for each model

MODEL \ DIP	1	2	3	4	5	6	7	8
	J2	J3	J6	J7	J8	J9	J12	J13
2.5 KW	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
3.5 KW	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
5.0 KW	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
6.0 KW	ON	ON	OFF	ON	OFF	OFF	ON	OFF
7.0 KW	ON	ON	OFF	OFF	ON	OFF	ON	OFF

- CNE - Dip switch default setting for each model

MODEL \ DIP	1	2	3	4	5	6	7*	8**
	J2	J3	J5	J7	J8	J9	J10	J12
2.5 KW	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
3.5 KW	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
5.0 KW	ON	OFF	OFF	ON	ON	OFF	ON	OFF
6.0 KW	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
7.0 KW	ON	ON	OFF	ON	OFF	OFF	ON	OFF

\*Water pump and float switch setting

In case of vertical installation, change dipswitch 7 to OFF position to cancel their operation.

\*\*High external static pressure

There is an option of increasing the air flow if the ESP (external static pressure) is higher than planned. To increase the speed change dipswitch 8 to ON position.

**• Compensation setting (Factory setting)**

This setting activates the compensation to the return air temperature in heating mode. For indoor unit like cassette, the DIP switch J2 should be ON.

Compensation	J2
Activated(factory setting)	ON
Deactivated	OFF

**• Unit model setting (Factory setting)**

The unit model setting should be in accordance with the unit model on the nameplate. The unit operating parameters will be improper with wrong settings.

Unit model(Capacity)	J3	J6	J7	J8
2.5kW model	OFF	OFF	OFF	OFF
3.5kW model	OFF	OFF	ON	OFF
5.0kW model	ON	OFF	OFF	OFF
6.0kW model	ON	OFF	ON	OFF
7.0kW model	ON	OFF	OFF	ON

● **Presence Detector/Power Shedding Selection** Select the functions of dry contact PD/PS by setting the Dip switch J9

Selection	J9
Presence Detector	OFF
Power Shedding	ON

● **Installation of height compensation settings (By installer)**

The compensation settings according to installation height should be set by using the dip switch J12, J13 on the controller PCB

Installation Height	J12	J13	Installation height
H0	OFF	OFF	2.1-2.7m
H1(Factory setting)	ON	OFF	2.7-3.3m
H2	OFF	ON	>3.3m
H3	ON	ON	Reserved

Compensation data according to the installation height

Installation Height	Speed Compensation for Heating Mode		Speed Compensation for other Modes		Temperature compensation in heating mode	
	CNE	CNE	CNE	CNE	CNE	CNE
H0	-50	0	-50	0	4	2
H1	0	150	0	150	4	2
H2	100	150	100	150	6	2
H3	150	150	150	150	7	2

**IDU Diagnostic Table.**

- **Alarm Output**

The Alarm Output dry contact will be on (closed), when a predefined set faults occur.

The fault set is defined under diagnostics section.

The alarm output will be off (open), when the predefined fault is cleared.

The indoor alarm outputs are defined according to the following IDU Diagnostic Table:

No	Problem	AO	5	4	3	2	1
1	ICT is disconnected	Yes	0	0	0	0	1
2	ICT is shorted	Yes	0	0	0	1	0
3	RAT is disconnected	Yes	0	0	0	1	1
4	RAT is shorted	Yes	0	0	1	0	0
5	Reserved (for MSMP used as RGT fault)	No	0	0	1	0	1
*6	ICTE shorted/disconnected (when enabled)	Yes	0	0	1	1	0
7	Undefined IDU family/model	Yes	0	0	1	1	1
8	No Communication	Yes	0	1	0	0	0
9	No Encoder	No	0	1	0	0	1
10	Reserved	No	0	1	0	1	0
11	Outdoor Unit Fault	No	0	1	0	1	1
...	Reserved	No					
17	Defrost protection	No	1	0	0	0	1
18	Deicing Protection	No	1	0	0	1	0
19	Outdoor Unit Protection	No	1	0	0	1	1
20	Indoor Coil HP Protection	No	1	0	1	0	0
21	Overflow Protection	Yes	1	0	1	0	1
22	Reserved	No					
24	EEPROM Not Updated	No	1	1	0	0	0
25	Bad EEPROM	No	1	1	0	0	1
26	Bad Communication	No	1	1	0	1	0
27	Using EEPROM data	No	1	1	0	1	1
28	Model A	No	1	1	1	0	0
29	Model B	No	1	1	1	0	1
30	Model C	No	1	1	1	1	0
31	Model D	No	1	1	1	1	1

\* CNE Unit only



**ODU Diagnostic Table**

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

\*Alarm Output - is on SW 35V14 and above. There is no alarm on SW 35V12 and below/

● **Unit ON Output**

The 'On/Off status' dry contact will be on (closed), when the indoor mode is not STBY. If the indoor mode is STBY mode, the 'On/Off status' will be off (open).

● **PD/PS(Presence Detector/Power Shedding)**

	Function	Contact=open	Contact=short
J9=open	Presence Detector Connection	Last Mode	Force to STBY
J9=short	Power Shedding Function	No limit	Limit NLOAD

### 11.1.25 Outdoor Unit Controller

#### 11.1.25.1 Outdoor Unit Controller - Jumper setting

JP9 Jumper Layout

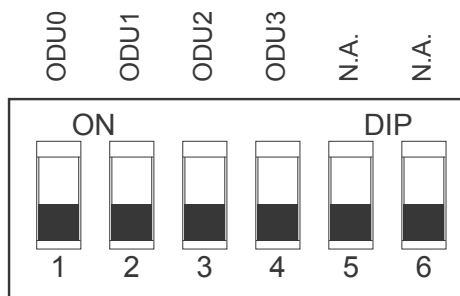
Reserved (PIN 9)	ODU3 (PIN 7)	ODU2 (PIN 5)	ODU1 (PIN 3)	ODU0 (PIN 1)
GND (PIN 10)	GND (PIN 8)	GND (PIN 6)	GND (PIN 4)	GND (PIN 2)

### 11.1.26 ODU Model Selection

ODU3	ODU2	ODU1	ODU0	ODU Model
OFF	OFF	OFF	ON	A (Single DCI 009)
OFF	OFF	ON	OFF	B (Single DCI 012)
OFF	OFF	ON (PIN3 & PIN4)	ON (PIN1 & PIN2)	C (Single DCI 018)
ON (PIN7 & PIN8)	ON (PIN5 & PIN6)	OFF	OFF	L (Single DCI 024)

### 11.1.27 Outdoor Unit Controller

#### 11.1.27.1 Outdoor Unit Controller - DIP Switch setting



ODU MODEL SETTING

ODU3	ODU2	ODU1	ODU0	ODU MODEL
OFF	OFF	OFF	ON	DCI 009
OFF	OFF	ON	OFF	DCI 012
OFF	OFF	ON	ON	DCI 018
ON	ON	OFF	OFF	DCI 024

## 11.2 Test Mode

### 11.2.1 Entering Test Mode

System can enter Test mode in two ways:

Automatically when the following conditions exists for 30 minutes continuously:

Mode = Cool, Set point = 16, Room temperature = 27(+1/-2), Outdoor temperature = 35(+2/-1)

Or

Mode = Heat, Set point = 30, Room temperature = 20±1, Outdoor temperature = 7±(+1/-2)

Manually when entering diagnostics with the following settings:

Mode = Cool, Set point = 16

Mode = Heat, Set point = 30



### 11.2.3 Unit Operation in Test Mode

In test mode, the unit will operate in fixed settings according to the indoor fan speed setting:

Indoor FAN Speed Setting	Unit Setting
Low	Minimum Capacity Setting
Turbo	Nominal Capacity Setting
Auto	Maximum Capacity Setting

During test mode, protections are disabled, except for stop compressor status.

## 11.3 Parameters

### 11.3.1 General Parameters for all models

#	Name	Values(Factory Setting)
1	<i>CVStep</i>	0
2	<i>Cool2Heat</i>	3
3	<i>Heat2Cool</i>	3
4	<i>ICTDef1</i>	8
5	<i>ICTDef2</i>	6
6	<i>ICTDef3</i>	4
7	<i>ICTDef4</i>	2
8	<i>ICTDef5</i>	0
9	<i>ICTDef6</i>	-2
10	<i>ICTDeltaDef1</i>	1
11	<i>ICTDeltaDef2</i>	-1
12	<i>ICTDeltaOH1</i>	-1
13	<i>ICTDeltaOH2</i>	1
14	<i>FLTRTime</i>	1023
15	<i>PITconst</i>	30
16	<i>STARTTIMETURBOH</i>	10
17	<i>IFANOffTimeDry</i>	3
18	<i>IFANOnTimeDry</i>	1
19	<i>ICTLowLimitDry</i>	10
20	<i>ICTHighLimitDry</i>	12
21	<i>ExtraNLOADDry</i>	20
22	<i>IFANMAXTimeH</i>	150
23	<i>IFANOffTimeH</i>	4
24	<i>IFANOnTimeH</i>	3
25	<i>IFANTimeHeat2STBY</i>	30
26	<i>MAXTURBOTIMEF</i>	30
27	<i>MAXTURBOTIMEC</i>	30
28	<i>MAXTURBOTIMEH</i>	30

## 11.3.2 Family Dependent Parameter

#	Name	CNE <sub>A</sub>	CNE <sub>B</sub>	CNE <sub>A</sub>	CNE <sub>B</sub>
1	<i>BasicCV1</i>	4	4	2	2
2	<i>BasicCV2</i>	4	4	2	2
3	<i>BasicCV3</i>	6	6	2	2
4	<i>BasicCV4</i>	7	7	2	2
5	<i>Max_Swg</i>	40	40	NA	NA
6	<i>Min_H_Angle</i>	5	5	NA	NA
7	<i>Max_H_Angle</i>	40	40	NA	NA
8	<i>Min_C_Angle</i>	5	5	NA	NA
9	<i>Max_C_Angle</i>	40	40	NA	NA
10	<i>MTR_Cls_Dir</i>	C	C	NA	NA
11	<i>MTR_Cls_Dir_V</i>	C	C	NA	NA
12	<i>Max_Angle_V</i>	NA	NA	NA	NA
13	<i>Min_Angle_V</i>	NA	NA	NA	NA
14	<i>Max_Swg_V</i>	NA	NA	NA	NA
15	<i>IFSPCHNA</i>	10	10	10	10
16	<i>IFSPCHND</i>	4	4	10	10
17	<i>IFSPCHAA</i>	6	6	6	6
18	<i>IFSPCHAD</i>	4	4	6	6
19	<i>IFSTARTSPEED</i>	670	670	670	670
20	<i>ICTSTSpeed</i>	25	25	25	25
21	<i>ICTVLSpeed</i>	28	28	28	28
22	<i>ICTLSpeed</i>	30	30	30	30
23	<i>ICTHSpeed</i>	32	32	32	32
24	<i>ICTTSpeed</i>	40	40	35	35
25	<i>NLOADHForcedValue</i>	60	60	60	60
26	<i>ICTOH1</i>	45	45	49	49
27	<i>ICTOH2</i>	48	48	51	51
28	<i>ICTOH3</i>	52	52	53	53
29	<i>ICTOH4</i>	55	55	55	55
30	<i>ICTOH5</i>	60	60	60	60
31	<i>ICTOH6</i>	62	62	62	62
32	<i>ICTEEnable</i>	1	1	0	0

11.3.3 Indoor Model Parameters:

Indoor Family	CNE <sub>A</sub>		CNE <sub>B</sub>		CNE <sub>A</sub>			CNE <sub>B</sub>
	A (CNE 009)	B (CNE 012)	A (CNE 018)	C (CNE 024)	A (CNE 009)	B (CNE 012)	C (CNE 018)	B (CNE 024)
Indoor Model								
Parameter	A (CNE 009)	B (CNE 012)	A (CNE 018)	C (CNE 024)	A (CNE 009)	B (CNE 012)	C (CNE 018)	B (CNE 024)
IFVLOWC	250	300	450	550	670	690	800	900
IFLOWC	450	450	550	650	740	730	860	980
IFMEDC	500	520	620	700	810	860	980	1050
IFHIGHC	550	600	680	750	920	980	1100	1200
IFTURBOC	650	700	800	1000	960	1060	1170	1280
IFVLOWH	250	300	450	550	670	690	800	900
IFLOWH	450	450	550	650	740	730	860	980
IFMEDH	520	550	620	700	810	860	980	1050
IFHIGHH	600	650	680	750	920	980	1100	1200
IFTURBOH	650	700	850	1000	960	1060	1220	1280
Cap .Group	0	1	3	4	0	1	3	4
NomLoadC	40	62	66	62	40	60	64	54
NomLoadH	52	67	67	57	57	70	73	57
MaxNLOADIF1C	47	42	55	50	127	127	127	127
MaxNLOADIF2C	70	60	78	70	127	127	127	127
MaxNLOADIF3C	127	127	127	127	127	127	127	127
MaxNLOADIF4C	127	127	127	127	127	127	127	127
MaxNLOADIF5C	127	127	127	127	127	127	127	127
IFAN_SPEED_COMP0_C	-50	-50	-50	-50	0	0	0	0
IFAN_SPEED_COMP1_C	0	0	0	0	150	150	150	150
IFAN_SPEED_COMP2_C	100	100	100	100	150	150	150	150
IFAN_SPEED_COMP3_C	150	150	150	150	150	150	150	150
IFAN_SPEED_COMP0_H	-50	-50	-50	-50	0	0	0	0
IFAN_SPEED_COMP1_H	0	0	0	0	150	150	150	150
IFAN_SPEED_COMP2_H	100	100	100	100	150	150	150	150
IFAN_SPEED_COMP3_H	150	150	150	150	150	150	150	150
ModelEnable	1	1	1	1	1	1	1	1

### 11.3.4 Outdoor Parameters

*General Parameters ( for every software):*

#	Name	Default Value
1	<i>MinOFFTime</i>	3
2	<i>MinONTime</i>	3
3	<i>OFSPCH</i>	4
4	<i>Down1</i>	3
5	<i>Down2</i>	10
6	<i>DImin</i>	30
7	<i>DImax</i>	120
8	<i>TimeD</i>	1
9	<i>DTmin</i>	2
10	<i>DTmax</i>	12
11	<i>DIT</i>	10
12	<i>CTMRUP</i>	15
13	<i>DIF</i>	30
14	<i>TCT</i>	10
15	<i>HSTOH1</i>	78
17	<i>HSTOH2</i>	80
18	<i>HSTOH3</i>	82
19	<i>HSTOH4</i>	85
20	<i>HSTOH5</i>	90
21	<i>HSTOHDelta1</i>	-1
22	<i>HSTOHDelta2</i>	1
23	<i>EEVCVTConst</i>	30
24	<i>BalanceTime</i>	5
25	<i>EEVInitOpen</i>	300

## 11.3.5 ODU Model Dependent Parameters ( 35V12 )

#	Outdoor Model Parameter	A	B	C
		Single CNE 009	Single CNE 012	Single CNE 018
1	MinFreqC	30	33	20
2	MaxFreqC	64	80	85
3	MinFreqH	30	35	20
4	MaxFreqH	81	93	95
5	NormAccel	1	1	1
6	NormDecel	1	1	1
7	Step1Freq	60	60	60
8	Step2Freq	70	70	70
9	Step3Freq	90	90	90
10	OFVL	20	20	20
11	OFLOWC	55	55	60
12	OFMEDC	70	70	76
13	OFMAXC	83	83	92
14	OFLOWH	55	55	60
15	OFMEDH	70	70	83
16	OFMAXH	83	83	100
17	OFANTESTMODEC	83	83	92
18	OFANTESTMODEH	83	83	100
19	OFDelTestMode	20	20	28
20	CTTOH1	94	94	94
21	CTTOH2	98	98	98
22	CTTOH3	102	102	102
23	CTTOH4	105	105	105
24	CCROC1	7.1	7.1	10
25	CCROC2	7.5	7.5	10.5
26	CCROC3	7.9	7.9	10.8
27	CCROC4	8.3	8.3	11.2
28	DEICT1	60	60	60
29	DEICT2	36	36	36
30	DEICT3	6	6	6
31	ProtFreqLimit	60	60	60
32	EEVDecierOpen	180	180	100
33	OptimDeicFreq	90	90	90
34	EEVMinOperOpenC	50	50	50
35	EEVMaxOperOpenC	380	380	380
36	EEVMinOperOpenH	50	50	50
37	EEVMaxOperOpenH	300	300	380
38	EEVNormRate	33	33	33
39	EEVHighRate	12	12	12
40	EEVMaxOpen	500	500	500
41	OFLowFreqC	45	45	40
42	OFMedFreqC	57	57	70
43	OFLowFreqH	45	45	40
44	OFMedFreqH	57	57	86
45	HeaterDisableFlag	0	0	0
46	DeiceFreqChRV	0	0	0
47	OATRefC	35	35	35
48	SUCT Enable	0	0	0
49	HST Enable	0	0	1
50	OAT Enable	1	1	1
51	OATRefH	7	7	7
52	MinTargCTTC	30	30	30
53	MaxTargCTTC	95	95	95
54	MinTargCTTH	40	40	40
55	MaxTargCTTH	95	95	95
56	DST	8	8	8
57	DSTF	12	12	12
58	OATLimitC	24	24	28
59	OATLimit1H	6	6	6
60	OATLimit2H	15	15	15
61	MaxFreqAsOATC	50	50	64
62	MaxFreqAsOAT1H	65	75	85
63	MaxFreqAsOAT2H	60	60	60

11.3.6 ODU Model Dependent Parameters ( 35V14 )

#	Outdoor Model Parameter	A Single DCI 006	B Single DCI 012	C Single DCI 018
1	MinFreqC	30	33	20
2	MaxFreqC	64	80	85
3	MaxFreqCRunPhase	64	80	85
4	MinFreqH	30	35	20
5	MaxFreqH	81	93	95
6	MaxFreqHRunPhase	81	93	95
7	LoadDeadZoneC	90	95	95
8	LoadDeadZoneH	127	127	127
9	NormAccel	1	1	1
10	NormDecel	1	1	1
11	Step1Freq	60	60	60
12	Step2Freq	70	70	70
13	Step3Freq	90	90	90
14	OFVL	20	20	20
15	OFLOWC	55	55	60
16	OFMEDC	70	70	76
17	OFMAXC	83	83	92
18	OFLOWH	55	55	60
19	OFMEDH	70	70	83
20	OFMAXH	83	83	100
21	OFANTESTMODEC	83	83	92
22	OFANTESTMODEH	83	83	100
23	OFDelTestMode	20	20	28
24	CTTOH1	94	94	94
25	CTTOH2	98	98	98
26	CTTOH3	102	102	102
27	CTTOH4	105	105	105
28	CCROC1	7.1	7.1	10
29	CCROC2	7.5	7.5	10.5
30	CCROC3	7.9	7.9	10.8
31	CCROC4	8.3	8.3	11.2
32	DEICT1	60	60	60
33	DEICT2	36	36	36
34	DEICT3	6	6	6
35	ProtFreqLimit	60	60	60
36	EEVDecierOpen	180	180	100
37	OptimDeicFreq	90	90	90
38	OCTExitDeicer	12	12	12
39	MaxDeicerTime	12	12	12
40	EEVMinOperOpenC	50	50	50
41	EEVMaxOperOpenC	380	380	380
42	EEVMinOperOpenH	50	50	50
43	EEVMaxOperOpenH	300	300	380
44	EEVNormRate	33	33	33
45	EEVHighRate	12	12	12
46	EEVMaxOpen	500	500	500
47	OFLowFreqC	45	45	40
48	OFMedFreqC	57	57	70
49	OFLowFreqH	45	45	40
50	OFMedFreqH	57	57	86
51	HeaterDisableFlag	0	0	0
52	DeiceFreqChRV	0	0	0
53	OATRefC	35	35	35
54	SUCT Enable	0	0	0
55	HST Enable	1	1	1
56	OAT Enable	1	1	1
57	OATRefH	7	7	7
58	MinTargCTTC	30	30	30
59	MaxTargCTTC	95	95	95
60	MinTargCTTH	40	40	40
61	MaxTargCTTH	95	95	95
62	DST	8	8	8
63	DSTF	12	12	12
64	OATLimitC	24	24	28
65	OATLimit1H	6	6	6
66	OATLimit2H	15	15	15
67	MaxFreqAsOATC	50	50	64
68	MaxFreqAsOAT1H	65	75	85
68	MaxFreqAsOAT2H	60	60	60
69	EnableExceedCond	0	0	0

## 11.3.7 ODU Model Dependent Parameters ( 36V1-S01 )

#	Parameter	Outdoor Model	L Single DCI 024
1	MinFreqC		15
2	MaxFreqC		70
3	MinFreqH		15
4	MaxFreqH		90
7	Step1Freq		35
8	Step2Freq		55
9	Step3Freq		90
10	OFMinRPM		8
11	OFMaxRPM		90
12	NightRPM		65
13	OFNNoiseMaxRPM		78
14	CTTOH1		90
15	CTTOH2		95
16	CTTOH3		100
17	CTTOH4		105
18	CCROC1		12.5
19	CCROC2		11.3
20	CCROC3		14.1
21	CCROC4		14.9
22	ProtFreqLimit		60
23	EEVMinOperOpenC		50
24	EEVMaxOperOpenC		480
25	EEVMinOperOpenH		50
26	EEVMaxOperOpenH		480
27	HeaterDisableFlag		0
28	HST Enable		1
29	OATLimitC		25
30	OATLimit1H		4
31	OATLimit2H		15
32	MaxFreqAsOATC		60
33	MaxFreqAsOAT1H		68
34	MaxFreqAsOAT2H		57
35	NormAccel		1
36	NormDecel		1
37	OCTExitDeicer		12
38	MaxDeicerTime		15

## 12. TROUBLESHOOTING

**WARNING!!!**

When Power Up – the whole outdoor unit controller, including the wiring, is under HIGH VOLTAGE!!!

Never open the Outdoor unit before turning off the Power!!!

When turned off, the system is still charged (400V)!!!

It takes about 3 Min. to discharge the system.

Touching the controller before discharging may cause an electrical shock!!!

**For safe handling of the controller please refer to section 12.6 below.**

### 12.1 General DCI Single Split System failures and Corrective Actions

No	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1	Power supply indicator (Red LED) does not light up.	No power supply	Check power supply. If power supply is OK, check display and display wiring. if OK, replace controller.
2	Unit does not respond to remote control message	Remote control message not reached the indoor unit	Check remote control batteries, if batteries are OK, check display and display wiring, if OK, replace display PCB. If still not OK replace controller.
3	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 controller.
4	Indoor fan does not start (louvers are opened and Green LED does light up)	Unit in heat mode and coil is still not warm.	Change to cool mode and check.
		Problem with PCB or capacitor	Change to high speed and Check power supply to motor is higher than 130VAC (for triack controlled motor) or higher than 220VAC for fixed speed motors, if OK replace capacitor, if not OK replace controller
5	Indoor fan works when unit is OFF, and indoor fan speed is not changed by remote control command.	PCB problem	Replace controller
6	Compressor does not start	Electronics control problem or protection	Perform diagnostics (See 12.3), and follow the actions described.
7	Compressor stops during operation and Green LED remains on	Electronic control or power supply problem	Perform diagnostics (See 12.3), and follow the actions described.



No	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
8	Compressor is on but outdoor fan does not work	Problem with outdoor electronics or outdoor fan	Check outdoor fan motor according to the procedure in section 12.5.3 , if not OK replace controller
9	Unit works in wrong mode (cool instead of heat or heat instead of cool)	Electronics or power connection to RV	Check RV power connections, if OK, Check RV operation with direct 230VAC power supply, if OK, Replace outdoor controller.
10	All components are operating properly but no cooling or no heating	Refrigerant leak	Check refrigeration system.
11	Compressor is over heated and unit does not generate capacity	EEV problem	Check EEV
12	Units goes into protections and compressor is stopped with no clear reason	Control problem or refrigeration system problem	Perform diagnostics (See 12.3), and follow the actions described.
13	Compressor motor is generating noise and no suction occurs	Phase order to compressor is wrong	Check compressor phase order.
14	Water leakage from indoor unit	Indoor unit drainage tube is blocked	Check and open drainage tube.
15	Freezing of outdoor unit in heat mode and outdoor unit base is blocked with ice		Connect base heater.
16	Unit operates with wrong fan speeds or wrong frequency	Wrong jumper settings	Perform diagnostics (See 12.3), and check if units is operating by EEPROM parameters.

## 12.2 Checking the refrigeration system

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

Entering test mode:

Set unit to Cool/16 degrees/High indoor fan speed, or Heat/30 degrees/High indoor fan speed, and enter diagnostics.

## 12.3 Judgment by Indoor/Outdoor Unit Diagnostics

Enter diagnostics mode - press for five seconds Mode button in any operation mode. Acknowledgment is by 3 short beeps and lights of COOL and HEAT LED's. Then, every short pressing of Mode button will scroll between Indoor and Outdoor unit diagnostic modes by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LED's.

During the Outdoor unit diagnostics all four Indoor LED's (STBY, Operate, Filter and Timer) are blinking. When Indoor diagnostics is displayed, all four LED's (STBY, Operate, Filter and Timer) are ON.

When system enters diagnostics mode, only one fault code is shown. Order of priority is from the lower to the higher number. Diagnostics is continuously ON as long as power is ON. The current system operation mode will not be changed.

If no fault occurred in the system, no fault code will be displayed during normal operation mode. The last fault code will be displayed even if the system has recovered from that fault. The last fault will be deleted from the EEPROM after the system has exit diagnostics mode.

In diagnostics mode, system fault / status will be indicated by blinking of Heat & Cool LEDs. 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 Indoor / Outdoor unit tables:

Note: 0 – OFF, 1-ON

### 12.3.1 Indoor Unit Diagnostics

- Alarm Output

The Alarm Output dry contact will be on (closed), when a predefined set faults occur.

The fault set is defined under diagnostics section.

The alarm output will be off (open), when the predefined fault is cleared.

The indoor alarm outputs are de

No	Problem	AO	5	4	3	2	1
1	ICT is disconnected	Yes	0	0	0	0	1
2	ICT is shorted	Yes	0	0	0	1	0
3	RAT is disconnected	Yes	0	0	0	1	1
4	RAT is shorted	Yes	0	0	1	0	0
5	Reserved (for MSMP used as RGT fault)	No	0	0	1	0	1
*6	ICTE shorted/disconnected (when enabled)	Yes	0	0	1	1	0
*7	Undefined IDU family/model	Yes	0	0	1	1	1
8	No Communication	Yes	0	1	0	0	0
9	No Encoder	No	0	1	0	0	1
10	Reserved	No	0	1	0	1	0
11	Outdoor Unit Fault	No	0	1	0	1	1
...	Reserved	No					
17	Defrost protection	No	1	0	0	0	1
18	Deicing Protection	No	1	0	0	1	0
19	Outdoor Unit Protection	No	1	0	0	1	1
20	Indoor Coil HP Protection	No	1	0	1	0	0
21	Overflow Protection	Yes	1	0	1	0	1
22	Reserved	No					
24	EEPROM Not Updated	No	1	1	0	0	0
25	Bad EEPROM	No	1	1	0	0	1
26	Bad Communication	No	1	1	0	1	0
27	Using EEPROM data	No	1	1	0	1	1

No	Problem	AO	5	4	3	2	1
28	Model A	No	1	1	1	0	0
29	Model B	No	1	1	1	0	1
30	Model C	No	1	1	1	1	0
31	Model D	No	1	1	1	1	1

\* CN / LSN Units only

### 12.3.2 Indoor Unit Diagnostics and Corrective Actions

No.	Fault	Probable Cause	Corrective Action
1	Sensor failures of all types		Check sensor connections or replace sensor
2	Communication mismatch	Indoor and Outdoor controllers are with different versions	Replace Indoor controller
3	No Communication	Communication or grounding wiring is not good.	Check Indoor to Outdoor wiring and grounding
4	No Encoder	Indoor electronics or motor	Check motor wiring, if ok, replace motor, if still not ok, replace Indoor controller.
5	Outdoor Unit Fault	Outdoor controller problem	Switch to Outdoor diagnostics.
6	EEPROM Not Updated	System is using ROM parameters and not EEPROM parameters	No action, unless special parameters are required for unit operation.
7	Bad EEPROM		No action, unless special parameters are required for unit operation.
8	Bad Communication	Communication quality is low reliability	Check Indoor to Outdoor wiring and grounding
9	Using EEPROM data	No problem. System is using EEPROM parameters	

### 12.3.3 Outdoor Unit Diagnostics

The outdoor alarm outputs are defined in the following way:

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

No	Problem	5	4	3	2	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

### 12.3.4 Outdoor Unit Diagnostics and Corrective Actions

No.	Fault	Probable Cause	Corrective Action
1	Sensors failures of all types		Check sensors connections or replace sensors.
2	IPM Fault	Electronics HW problem	Check all wiring and jumper settings, if OK, replace electronics.
3	Bad EEPROM		No action, unless special parameters are required for unit operation.
4	DC under/over Voltage	Electronics HW problem	Check outdoor unit power supply voltage
5	AC under Voltage		Check outdoor unit power supply voltage
6	Indoor / Outdoor unit Communication mismatch	Indoor and Outdoor controllers are with different versions	Replace Indoor controller
7	No Communication	Communication or grounding wiring is not good.	Check Indoor to Outdoor wiring and grounding

No.	Fault	Probable Cause	Corrective Action
8	Compressor Lock		Switch unit to STBY and restart If still not ok check compressor (12.5.4) If comp is ok replace OU controller If compressor is not ok replace compressor
9	Bad Communication	Communication quality is low reliability	Check Indoor to Outdoor wiring and grounding

## 12.4 Judgment by MegaTool

MegaTool is a special tool to monitor the system states.

Using MegaTool requires:

- A computer with RS232C port.
- A connection wire for MegaTool.
- A special MegaTool software.

Use MegaTool according to following procedure:

- Setup MegaTool software: copy the software to the computer.
- Connect RS232C port in computer with MegaTool port in Indoor/Outdoor unit controller by the connection wire.
- Run the software and choose the COM port, you can monitor the A/C system state in monitor tab.

## 12.5 Simple procedures for checking the Main Parts

### 12.5.1 Checking Mains Voltage.

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

### 12.5.2 Checking Power Input.

If Indoor unit power LED is unlighted, power down the system and check the fuse of the Indoor unit. If the fuse is OK replace the Indoor unit controller. If the fuse has blown, replace the fuse and power up again.

Checking Power Input procedure for the Outdoor unit is the same as with the Indoor unit.

### 12.5.3 Checking the Outdoor Fan Motor.

Enter Test Mode (where the OFAN speed is high)

Check the voltage between lead wires according to the normal value as following:

- Between red wire and black wire: 310VDC +/- 20V
- Between orange wire and black wire: 15VDC +/- 1V
- Between yellow wire and black wire: 2-6VDC

### 12.5.4 Checking the Compressor.

The compressor is brushless permanence magnetic DC motor. Three coil resistance is same. Check the resistance between three poles. The normal value should be below 0.5 ohm (TBD).

### 12.5.5 Checking the Reverse Valve (RV).

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

### 12.5.6 Checking the electrical expansion valve (EEV).

The EEV has two parts, drive part and valve. The drive part is a step motor; it is ringed on the valve. Check the drive voltage (12VDC). When Outdoor unit is power on, EEV shall run and have click and vibration.

## 12.6 Precaution, Advise and Notice Items

### 12.6.1 High voltage in Outdoor unit controller.

Whole controller, including the wires that are connected to the Outdoor unit controller may have the potential hazard voltage when power is on. Touching the Outdoor unit controller may cause an electrical shock.

**Advise:** Don't touch the naked lead wire and don't insert finger, conductor or anything else into the controller when power is on.

### 12.6.2 Charged Capacitors

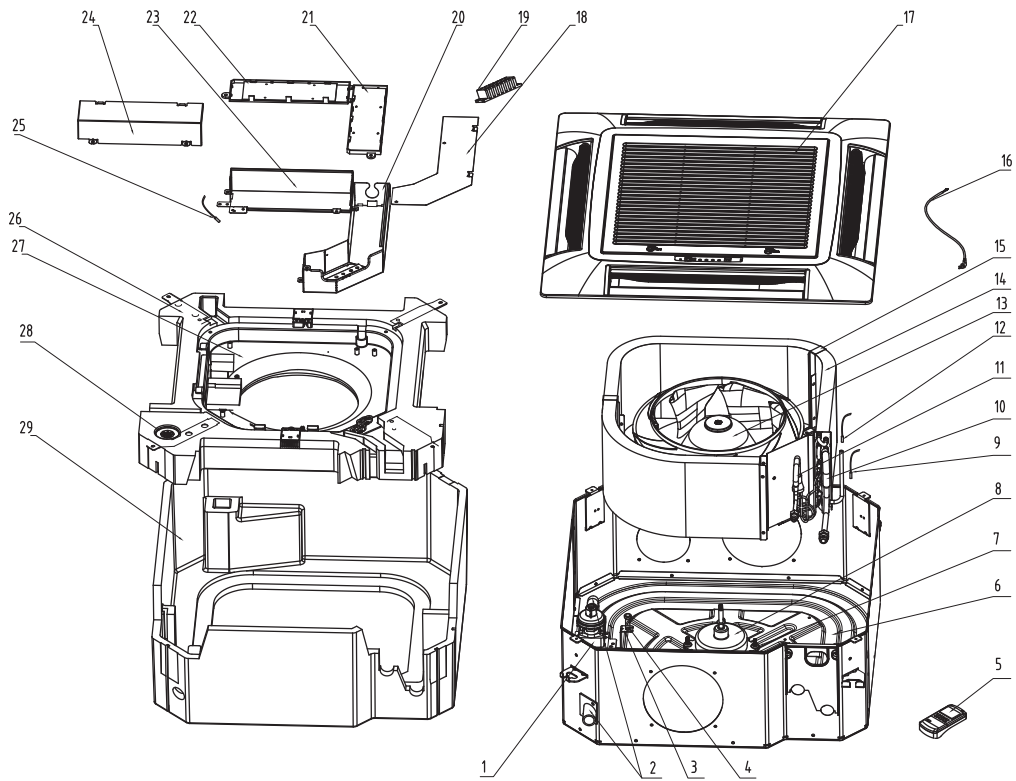
Three large-capacity electrolytic capacitors are used in the Outdoor unit controller. Therefore, charging voltage (380VDC) remains after power down. Discharging takes about four minutes after power is off. Touching the Outdoor unit controller before discharging may cause an electrical shock.

### 12.6.3 Additional advises

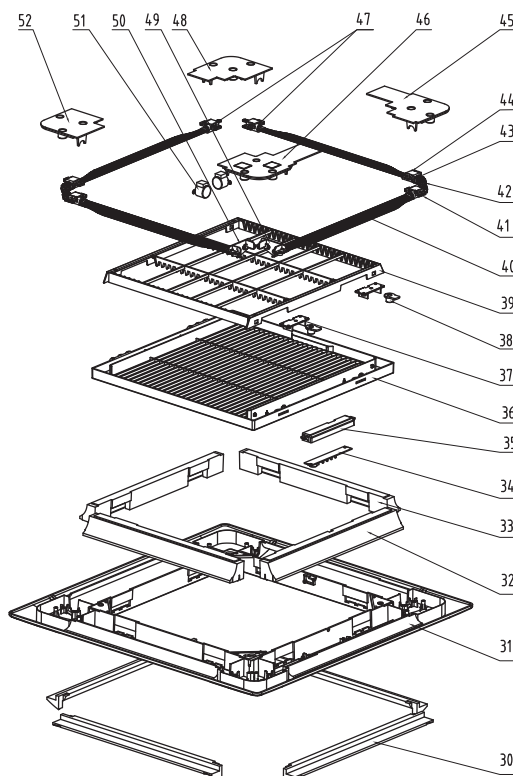
- When disassemble the controller or the front panel, turn off the power supply.
- When connecting or disconnecting the connectors on the PCB, hold the whole housing, don't pull the wire.
- There are sharp fringes and sting on shell. Use gloves when disassemble the A/C units.

**13. EXPLODED VIEWS AND SPARE PARTS LISTS**

**13.1 Indoor Unit: CNE 009, 012, 018, 024 DCI**



CNE 009 /012 /018 UNIT



CNE 009/012/018/024 Panel



## 13.2 Indoor Unit: CNE 009 DCI

Item	PN	Description	Qty
1	453192600	Pump CN	1
2	465800084	Drain Pipe Assy./CN.	1
3	464140133	Fixing Plate/Water-Level Switch/CNV22	1
4	453192700	Water-Level Switch	1
5	467240051	Remote Controller Assy. with Batteries.for Export RC08	1
6	464000020	Base Plate Assy./CN DCI	1
7	470100003	Cushion Rubber	3
8	466130010R	DC Motor 30w(SIC-72FV-F130-1)/CN	1
9	467400078	Condenser Coil Temperature Sensor(OCT) $\phi$ 6/XHP-2/Blue	1
10	463750122	Gas Pipe Assy./9.53	1
11	463750123	Liquid Pipe Assy. /6.35	1
12	467400069	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\phi$ 6	1
13	466010002	Centrifugal Fan (Low Height) CN60x60	1
14	462350078	Evaporator Assy./CN DCI 009/012 R410A	1
15	464250047	Fixing Plate/Evaporator (Low height)	2
16	455013705R	Power Cord Without Plug/3G/1.5/2100	1
17	464660033	Front Plate Assy. 625x625 /CN Airwell	1
	464660032	Front Plate Assy. 725x725 /CN Airwell	1
18	464750003	Cover/Controll Box 1	1
19	467420016	7 Poles Terminal Block	1
20	464750006	Controll Box1 Assy.	1
21	467300122R	Controller Board/ DCI CN (Power) IDU	1
22	467300121R	Controller Board/ DCI CN (Main) IDU	1
23	464750002	Controll Box 2/CN	1
24	464750004	Cover/Controll Box 2	1
25	467400024	( 320mm) Indoor Air Inlet Temperature Sensor	1
26	453191300	Drain pan Assy	1
27	465120005	Air Intake Panel/Low	1
28	453195100	Drain Jam	1
29	470250006	EPS/Air Housing (Low Height)	1
30	453191700	EPS 2 / Front Frame	1
	470250017	EPS /Air Outlet/Front Frame (725X725)	1
31	465020100	Front Frame (625x625) (Airwell)./CN	1
	465020105	Front Frame (725x725) (Airwell)./CN	1
32	470250004	EPS 3/Front Frame	1
33	453191600	EPS 1 / Front Frame	3
34	467300128R	Display Board/CN	1
35	465080003	Display Cover	1
36	453189500	Grille	1
37	465360021	Support/Grill Clasp	2
38	453189600	Grille Clasp	2
39	453189900	Filter Assy.	1
40	453189700	Horizontal Flap	4
41	465360028	Orienting Support/Lever	6
42	465800091	Linkage Assy./Flap/CN	2
43	465800089	Support 1/lever Assy/CN	4
44	465800090	Support 2/lever Assy./CN	4
45	453190600	Cover2 /Front Plate	1
46	465340022	Cover1 /Front Plate	1
47	453190200	Lever/Flap	2
48	465340040	Cover3 /Front Plate	1
49	465360032	Support/Step Moter 2	1
50	465360022	Support/Step Motor	1
51	433050	STEP MOTOR	2
52	465080002	Cover4 /Front Plate	1



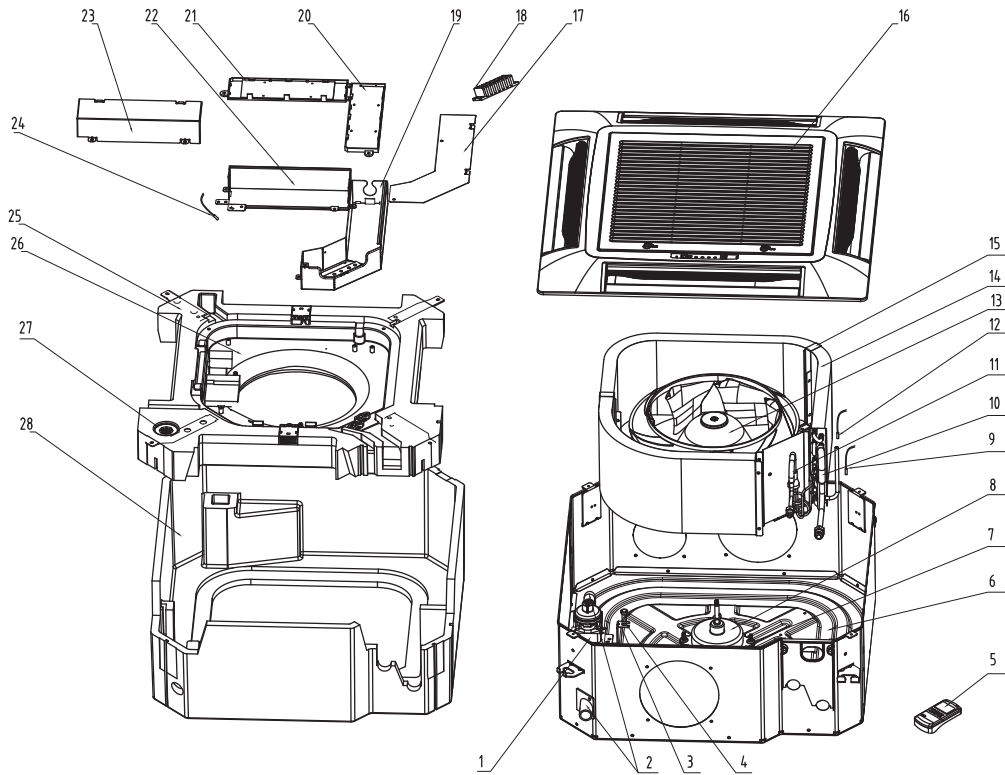
### 13.3 Indoor Unit: CNE 012 DCI

Item	PN	Description	Qty
1	453192600	Pump CN	1
2	465800084	Drain Pipe Assy./CN.	1
3	464140133	Fixing Plate/Water-Level Switch/CNV22	1
4	453192700	Water-Level Switch	1
5	467240051	Remote Controller Assy. with Batteries.for Export RC08	1
6	464000020	Base Plate Assy./CN DCI	1
7	470100003	Cushion Rubber	3
8	466130010R	DC Motor 30w(SIC-72FV-F130-1)/CN	1
9	467400078	Condenser Coil Temperature Sensor(OCT) $\phi$ 6/XHP-2/Blue	1
10	463750122	Gas Pipe Assy./9.53	1
11	463750123	Liquid Pipe Assy. /6.35	1
12	467400069	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\phi$ 6	1
13	466010002	Centrifugal Fan (Low Height) CN60x60	1
14	462350078	Evaporator Assy./CN DCI 009/012 R410A	1
15	464250047	Fixing Plate/Evaporator (Low height)	2
16	455013705R	Power Cord Without Plug/3G/1.5/2100	1
17	464660033	Front Plate Assy. 625x625 /CN Airwell	1
	464660032	Front Plate Assy. 725x725 /CN Airwell	1
18	464750003	Cover/Controll Box 1	1
19	467420016	7 Poles Terminal Block	1
20	464750006	Controll Box1 Assy.	1
21	467300122R	Controller Board/ DCI CN (Power) IDU	1
22	467300121R	Controller Board/ DCI CN (Main) IDU	1
23	464750002	Controll Box 2/CN	1
24	464750004	Cover/Controll Box 2	1
25	467400024	( 320mm) Indoor Air Inlet Temperature Sensor	1
26	453191300	Drain pan Assy	1
27	465120005	Air Intake Panel/Low	1
28	453195100	Drain Jam	1
29	470250006	EPS/Air Housing (Low Height)	1
30	453191700	EPS 2 / Front Frame	1
	470250017	EPS /Air Outlet/Front Frame ( 725X725 )	1
31	465020100	Front Frame ( 625x625) (Airwell)/CN	1
	465020105	Front Frame ( 725x725) (Airwell)/CN	1
32	470250004	EPS 3/Front Frame	1
33	453191600	EPS 1 / Front Frame	3
34	467300128R	Display Board/CN	1
35	465080003	Display Cover	1
36	453189500	Grille	1
37	465360021	Support/Grill Clasp	2
38	453189600	Grille Clasp	2
39	453189900	Filter Assy.	1
40	453189700	Horizontal Flap	4
41	465360028	Orienting Support/Lever	6
42	465800091	Linkage Assy./Flap/CN	2
43	465800089	Support 1/lever Assy/CN	4
44	465800090	Support 2/lever Assy./CN	4
45	453190600	Cover2 /Front Plate	1
46	465340022	Cover1 /Front Plate	1
47	453190200	Lever/Flap	2
48	465340040	Cover3 /Front Plate	1
49	465360032	Support/Step Moter 2	1
50	465360022	Support/Step Motor	1
51	433050	STEP MOTOR	2
52	465080002	Cover4 /Front Plate	1

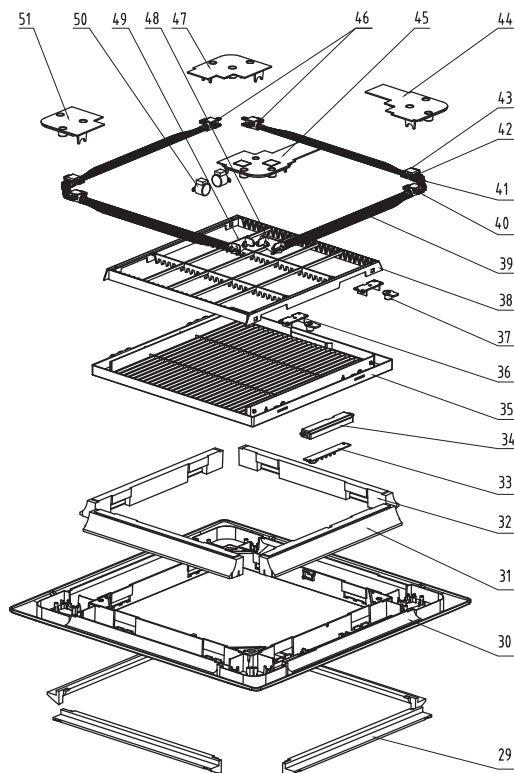
## 13.4 Indoor Unit: CNE 018 DCI

Item	PN	Description	Qty
1	453192600	Pump CN	1
2	465800084	Drain Pipe Assy./CN.	1
3	464140134	Fixing Plate/Water-Level Switch/CNV56	1
4	453192700	Water-Level Switch	1
5	467240051	Remote Controller Assy. with Batteries.for Export RC08	1
6	464000020	Base Plate Assy./CN DCI	1
7	470100003	Cushion Rubber	3
8	466130009R	DC Motor 67w(SIC-72FV-F167-1)/CN	1
9	467400078	Condenser Coil Temperature Sensor(OCT) $\varnothing$ 6/XHP-2/Blue	1
10	463750120	Gas Pipe Assy./12.7	1
11	463750124	Liquid Pipe Assy. /6.35	1
12	467400069	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\varnothing$ 6	1
13	453189300	Centrifugal Fan (High)CN60X60	1
14	462350077	Evaporator Assy./CN DCI 018 R410A	1
15	453188400	Fixing Plate/Evaporator (high)	2
16	455013707R	Power Cord Without Plug/3G/2.5/2100	1
17	464660033	Front Plate Assy. 625x625 /CN Airwell	1
	464660032	Front Plate Assy. 725x725 /CN Airwell	1
18	464750003	Cover/Controll Box 1	1
19	467420016	7 Poles Terminal Block	1
20	464750006	Controll Box1 Assy.	1
21	467300122R	Controller Board/ DCI CN (Power) IDU	1
22	467300121R	Controller Board/ DCI CN (Main) IDU	1
23	464750002	Controll Box 2/CN	1
24	464750004	Cover/Controll Box 2	1
25	467400024	( 320mm) Indoor Air Inlet Temperature Sensor	1
26	453191300	Drain pan Assy	1
27	453190900	Air Intake Panel (high)	1
28	453195100	Drain Jam	1
29	453191800	EPS/Air Housing (high)	1
30	453191700	EPS 2 / Front Frame	1
	470250017	EPS /Air Outlet/Front Frame ( 725X725)	1
31	465020100	Front Frame ( 625x625) (Airwell)./CN	1
	465020105	Front Frame ( 725x725) (Airwell)./CN	1
32	470250004	EPS 3/Front Frame	1
33	453191600	EPS 1 / Front Frame	3
34	467300128R	Display Board/CN	1
35	465080003	Display Cover	1
36	453189500	Grille	1
37	465360021	Support/Grill Clasp	2
38	453189600	Grille Clasp	2
39	453189900	Filter Assy.	1
40	453189700	Horizontal Flap	4
41	465360028	Orienting Support/Lever	6
42	465800091	Linkage Assy./Flap/CN	2
43	465800089	Support 1/lever Assy/CN	4
44	465800090	Support 2/lever Assy./CN	4
45	453190600	Cover2 /Front Plate	1
46	465340022	Cover1 /Front Plate	1
47	453190200	Lever/Flap	2
48	465340040	Cover3 /Front Plate	1
49	465360032	Support/Step Moter 2	1
50	465360022	Support/Step Motor	1
51	433050	STEP MOTOR	2
52	465080002	Cover4 /Front Plate	1

13.5 Indoor Unit: CNE 024 DCI



CNE 024 UNIT

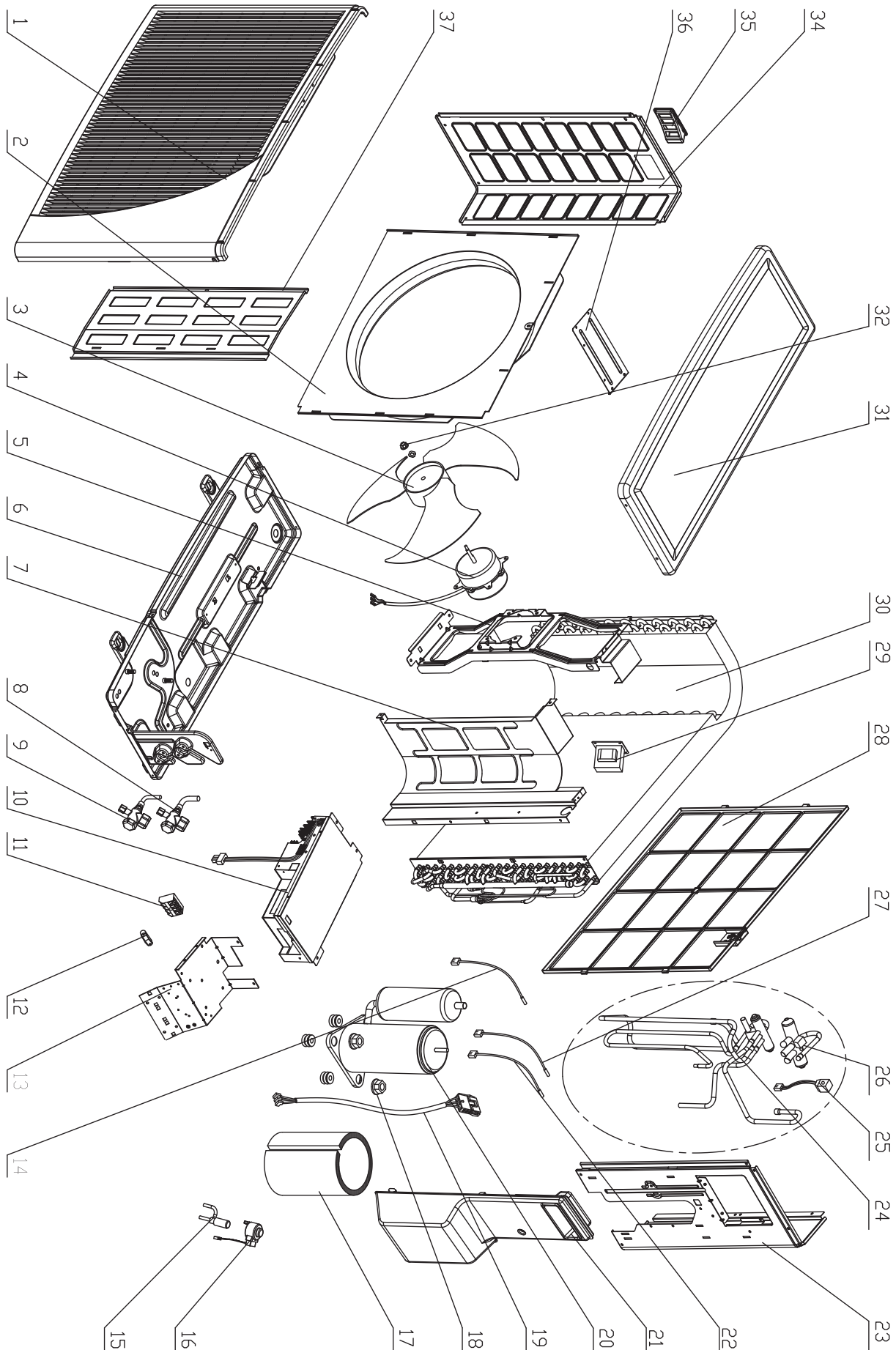


CNE 009/012/018/024 Panel

**13.6 Indoor Unit: CNE 024 DCI**

Item	PN	Description	Qty
1	453192600	Pump CN	1
2	465800084	Drain Pipe Assy./CN.	1
3	464140134	Fixing Plate/Water-Level Switch/CNV56	1
4	453192700	Water-Level Switch	1
5	467240051	Remote Controller Assy. with Batteries.for Export RC08	1
6	464000020	Base Plate Assy./CN DCI	1
7	470100003	Cushion Rubber	3
8	466130009R	DC Motor 67w(SIC-72FV-F167-1)/CN	1
9	467400078	Condenser Coil Temperature Sensor(OCT) $\varnothing$ 6/XHP-2/Blue	1
10	453194500	Gas Pipe Assy./15.88	1
11	453194200	Liquid Pipe Assy. /9.53	1
12	467400069	ICT Indoor Coil Temperature (RT2) sensor/10K/Copper-capsulation $\varnothing$ 6	1
13	453189300	Centrifugal Fan (High)CN60X60	1
14	462350079	Evaporator Assy./CN DCI 024 R410A	1
15	453188400	Fixing Plate/Evaporator (high)	2
16	464660033	Front Plate Assy. 625x625 /CN Airwell	1
	464660032	Front Plate Assy. 725x725 /CN Airwell	1
17	464750003	Cover/Controll Box 1	1
18	467420016	7 Poles Terminal Block	1
19	464750006	Controll Box1 Assy.	1
20	467300122R	Controller Board/ DCI CN (Power) IDU	1
21	467300121R	Controller Board/ DCI CN (Main) IDU	1
22	464750002	Controll Box 2/CN	1
23	464750004	Cover/Controll Box 2	1
24	467400024	( 320mm) Indoor Air Inlet Temperature Sensor	1
25	453191300	Drain pan Assy	1
26	453190900	Air Intake Panel (high)	1
27	453195100	Drain Jam	1
28	453191800	EPS/Air Housing (high)	1
29	453191700	EPS 2 / Front Frame	1
	470250017	EPS /Air Outlet/Front Frame ( 725X725)	1
30	465020100	Front Frame ( 625x625) (Airwell)./CN	1
	465020105	Front Frame ( 725x725) (Airwell)./CN	1
31	470250004	EPS 3/Front Frame	1
32	453191600	EPS 1 / Front Frame	3
33	467300128R	Display Board/CN	1
34	465080003	Display Cover	1
35	453189500	Grille	1
36	465360021	Support/Grill Clasp	2
37	453189600	Grille Clasp	2
38	453189900	Filter Assy.	1
39	453189700	Horizontal Flap	4
40	465360028	Orienting Support/Lever	6
41	465800091	Linkage Assy./Flap/CN	2
42	465800089	Support 1/lever Assy/CN	4
43	465800090	Support 2/lever Assy./CN	4
44	453190600	Cover2 /Front Plate	1
45	465340022	Cover1 /Front Plate	1
46	453190200	Lever/Flap	2
47	465340040	Cover3 /Front Plate	1
48	465360032	Support/Step Moter 2	1
49	465360022	Support/Step Motor	1
50	433050	STEP MOTOR	2
51	465080002	Cover4 /Front Plate	1

13.7 Outdoor Unit: YBDE 009, 012, 018 DCI



**13.8 Outdoor Unit: YBDE 009 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 009/012	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 009 012	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/YBDE	1
22	467400056	OCT Outdoor Coil Temperature Sensor/10K/Copper-capsulation $\phi$ 6	1
23	433226P1	Right side panel /painting plate/DCI 009/012/YBDE	1
24	461600131	4-Way Valve Assy./DCI 009/012/YBDE	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 009/012	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 009/012/YBDE	1
32	4519300	Nut M5 L	1
33	433224P1	Left Side Panel/Painting Plate/DCI 009/012/YBDE	1
34	433225	Handle	1
35	4526298	Bridge	1
36	433223P5	Painting Insulation Plate	1



**13.9 Outdoor Unit: YBDE 012 DCI**

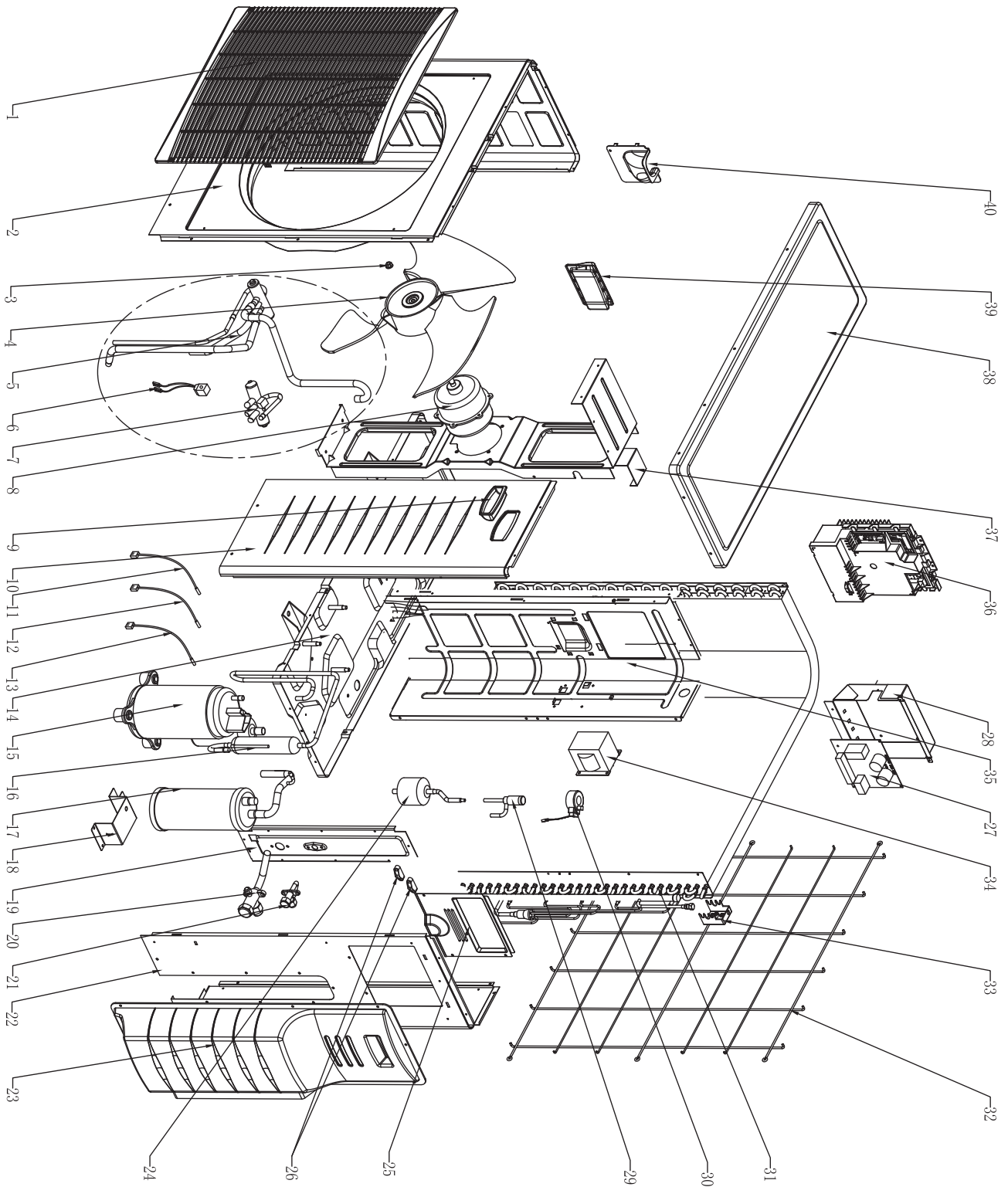
Item	PN	Description	Qty
1	433218	Front Panel A	1
2	4526340	Air inlet ring-420	1
3	4526476	Axial fan OD=401	1
4	4527092R	DC MOTOR for DCI 009/012	1
5	433215	Motor Support	1
6	4523059P1	Painting Base Assy.	1
7	452808800	Partition Assy.	1
8	461010004	Gas Valve 3/8" R410A	1
9	461000004	Liquid Valve 1/4" 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 009 012	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/YBDE	1
22	467400056	OCT Outdoor Coil Temperature Sensor/10K/Copper-capsulation $\phi$ 6	1
23	433226P1	Right side panel /painting plate/DCI 009/012/YBDE	1
24	461600131	4-Way Valve Assy./DCI 009/012/YBDE	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 009/012	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 009/012/YBDE	1
32	4519300	Nut M5 L	1
33	433224P1	Left Side Panel/Painting Plate/DCI 009/012/YBDE	1
34	433225	Handle	1
35	4526298	Bridge	1
36	433223P5	Painting Insulation Plate	1

**13.10 Outdoor Unit: YBDE 018 DCI**

Item	PN	Description	Qty
1	433218	Front Panel A	1
2	4526340	Air inlet ring-420	1
3	4519251	Axial Fan OD=400	1
4	466100034R	Metal Motor /DCR 50 Z	1
5	4527203	Motor Support	1
6	464000032P1	Base Painting Assy. /YBDE/DCI 024 R410A	1
7	464730012	Partition Plate Assy./DCR 50 Z	1
8	461010005	Gas Valve 1/2" R410A	1
9	461000004	Liquid Valve 1/4" R410A)	1
10	467300355R	Controller/DCRS 2.8KW Sine Wave (PS21997) Main BD	1
	467300372R	Controller/DCRS 2.8KW Sine Wave (PS21997) Main BD	1
11	467420025	4 Poles Terminal Block	1
12	204107	Cable clip Nylon	1
13	452823600	Terminal Plate Assy.	1
14	467400200	CTT Compressor Top Temperature Sensor/10K/Resin-capsulation	1
15	461040013	Electronic Expansion Valve DPF(Q)1.65C-63	1
16	461050014	EEV Coil QA(Q)12-HX-03	1
17	469120013	Insulation Felt+PVC/Compressor Panasonic 5RS132	1
18	4510677	Nut With Flange M8 -D=24 GB6187-86	3
19	467000001	Compressor Power Cord/DCR CR 009/012	1
20	460150020R	Compressor Assy./ Panasonic 5RS132ZAD21	1
21	465340080	Valve Cover/PP+UV 5VA/YBDE	1
22	467400056	OCT Outdoor Coil Temperature Sensor/10K/Copper-capsulation 6	1
23	433226P1	Right side panel /painting plate/DCI 009/012/YBDE	1
24	461600079	4-Way Valve Welding Assy./DCR 50 Z	1
25	461020004	4-W valve /SHF(L)-7H-34U	1
26	461020006	4-W valve /DSF-4-R410A	1
27	467400040	Condenser Middle Temperature Sensor/OAT & OMT/DCR LC 009/012	1
28	433228	Back Side Net	1
29	467550005R	Choke/ DCR 50 Z	1
30	462300127	Condenser Welding Assy./YBD 018	1
31	433231P1	Painting Top Cover/DCI 009/012/YBDE	1
32	4519300	Nut M5 L	1
33	433224P1	Left Side Panel/Painting Plate/DCI 009/012/YBDE	1
34	433225	Handle	1
35	4526298	Bridge	1
36	433223P5	Painting Insulation Plate	1



13.11 Outdoor Unit: YBDE 024 DCI



**13.12 Outdoor Unit: YBDE 024 DCI**

Item	PN	Description	Qty
1	465100000	Grill/ DCI Trio	1
2	4522593P1	Left front plate/Painting/YBD 024	1
3	4523758	Nut M8 left	1
4	452960400	Outdoor Axial Fan OD=493	1
5	461600055	4-Way Valve Assy./ DCI 80 CR	1
6	461030003	4-Way valve coil/DCI 80 CR	1
7	4526522	FOUR-WAY VALVE (English) R410A	1
8	466110008R	DC Resin Motor(SIC-71FW-F170-1A)/DCI 80 CR	1
9	4522601	Right Handle	1
10	4522594P1	Right front plate/Painting/YBD 024	1
11	467400200	CTT Compressor Top Temperature Sensor/10K/Resin-capsulation	1
12	467400040	Condenser Middle Temperature Sensor/OAT & OMT/DCR LC 009/012	1
13	467400038	ODU COIL MIDDLE TEMPERATURE SENSOR/CMV/VRF	1
14	452809800P1	Base Painting Assy. /YBD 024	1
15	460090007R	Compressor Assy./ C-7RZ233H1A (SANYO ShenYang)	1
16	452783600	Oil Separator Assy.	1
17	452783200	Liquid-gas Separator	1
18	452803100P1	Support Painting Support Assy./Gas-Liquid Separator	1
19	4526081P1	Valve plate paint assy./YBD 024	1
20	4526513	LOW PRESS VALVE (R410A)	1
21	4526514	Hight press valve(R410A)	1
22	464080007P1	Right-Rear Plate/Painting/YBD 024	1
23	465340082	Valve Cover/PP+UV 5VA/GC 30	1
24	4518950	Filter Drier BFK-053S	1
25	464250093	Protecting Plate /controller /DCI 80 CR	1
26	204107	Cable clip Nylon	1
27	467300185R	Filter Board / DCI 80 CR	1
28	464280003	Terminal Plate/ DCI 80 CR	1
29	461040013	Electronic Expansion Valve DPF(Q)1.65C-63	1
30	461050014	EEV Coil QA(Q)12-HX-03	1
31	462300105	Condenser Assy. /DCI80Z R410A	1
32	453174200P1	Guard Net Painting Assy./YBD 024	1
33	453083800	Support/OAT	1
34	467550002R	Choke / DCI 80 CR	1
35	464160023	Partition Plate/DCI 80 CR	1
36	467300184R	Controller / DCI 80 CR OUTDOOR BOX ASSY	1
	467300358R	Controller / DCI 80 CR OUTDOOR BOX ASSY	1
37	464200026	Motor Support/TRIO DCI/VISSMANN	1
38	4522597P1	PAINTED TOP COVER ASSY	1
39	4522600	Left Handle	1
40	465120013	Air Outlet Cover/DCI 80 CR R410a	1

# APPENDIX A

## INSTALLATION AND OPERATION MANUAL

- ▶ OPERATION MANUAL RC4
- ▶ OPERATION MANUAL CNE DCI
- ▶ INSTALLATION MANUAL CNE DCI

*Airwell*

**SERVICE MANUAL  
CNE DCI Series**