ELECTRA

Service Manual

WNG LED/LCD DCI Inverter Series

Indoor Units	Outdoor Units
WNG 50 DCI	DCI 50
WNG 60 DCI	DCI 60
WNG 72 DCI	DCI 72
	DCI 72 Z
WNG 80 DCI	DCI 80

REFRIGERANT

R410A

HEAT PUMP

APRIL 2007

LIST OF EFFECTIVE PAGES

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

Dates of issue for original and changed pages are:

Original ..... 0 .....September 2006

Total number of pages in this publication is 107 consisting of the following:

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1. INTRODUCTION

1.1 General

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

- **WNG50**
- **WNG60**
- **WNG72**
- **WNG80**

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

1.2 Main Features

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

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

1.3 Indoor Unit

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

Indoor Unit features:

Feature	WNG 50	WNG60	WNG72/80
Display	LCD or LED		LCD
Ionizer	YES		
ESF	YES		
Fresh air	YES	NO	
Indoor fan motor	Variable speed (PG)		
Horizontal motorized louver	YES		
Vertical motorized louver	YES		
Heating element	NO		
M2L Cable port	YES		
Dry contact	Presence detector or (jumper selected) power shedding		

1.4 Filtration

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

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

1.5 Ionizer (Optional)

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

1.6 Control

The microprocessor indoor controller, and an infrared remote control, supplied as standard, provides complete operating function and programming.
Remote controllers: RC-2/3/4/5/7, RC-4i-1, RCW, µBMS.
Networking system Airconet version 4.2 and up, MIU SW version H8 and up.

1.7 Outdoor Unit

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

Outdoor Unit Feature

Feature	DCI 50	DCI 60	DCI 72/72Z/80
Display	3 LED's		
Base Heater	Optional		
Outdoor Fan	Variable speed DC Inverter		
M2L cable Port	No		Yes
Night	No		Yes
STBY	No		Yes
Power Shedding	No		Yes
Alarm	No		Yes

1.8 Tubing Connections

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

1.9 Accessories

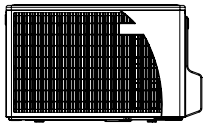
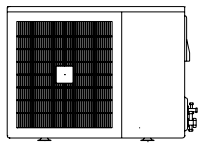
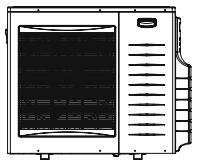
Item	Description
MIU (WNG)	MODBUS interface unit
RS485 Adapter	To be used as an interface with RCW or µBMS remote controllers
Base Heater	
M2L cable Port	

1.10 Inbox Documentation

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

1.11 Matching Table

1.11.1 R410A

OUTDOOR UNITS			INDOOR UNITS			
						
	MODEL	REFR"	WNG50 DCI	WNG60 DCI	WNG72 DCI	WNG80 DCI
	DCI 50	R410A	√			
	DCI 60	R410A		√		
	DCI 72 DCI 72Z	R410A			√	
	DCI 80	R410A				√

2. PRODUCT DATA SHEET

2.1 WNG50 DCI

Model Indoor Unit				**WNG 50**	
Model Outdoor Unit				**DCI 50**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	17060(5120-20470)	20470(5120-25930)
			kW	5.00(1.50-6.00)	6.00(1.50-7.60)
Power input (1)			kW	1.46(0.50-2.00)	1.66(0.45-2.20)
EER (Cooling) or COP(Heating) (1)			W/W	3.42	3.61
Energy efficiency class				A	A
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	6.6	7.5
Starting current			A	10.5	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Crossflow x 1	
	Fan speeds	H/M/L	RPM	1200/1050/900	
	Air flow (2)	H/M/L	m3/hr	850/760/620	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	55/51/47	
	Sound pressure level(4)	H/M/L	dB(A)	43/39/34	
	Moisture removal		l/hr	2	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1060x295x210	
	Weight		kg	15	
	Package dimensions	WxHxD	mm	1125x360x280	
	Packaged weight		kg	18	
	Units per pallet		units	16 units per pallet	
	Stacking height		units	8 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Scroll,Panasonic 5CS130XCC03	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H/L	RPM	920	
	Air flow	H/L	m3/hr	2160	
	Sound power level	H/L	dB(A)	63	
	Sound pressure level(4)	H/L	dB(A)	53	
	Dimensions	WxHxD	mm	795x610x290	
	Weight		kg	39	
	Package dimensions	WxHxD	mm	945x655x395	
	Packaged weight		kg	43	
	Units per pallet		Units	9 units per pallet	
	Stacking height		units	3 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	1.50/7.5	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.(mm)	1/4”(6.35)	
		Suction line	In.(mm)	1/2”(12.7)	
		Max.tubing length	m.	Max.30	
		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) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.2 WNG60 DCI

Model Indoor Unit				**WNG-60**	
Model Outdoor Unit				**DCI60**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	20470(5120-22860)	22180(5120-26950)
			kW	6.00(1.50-6.70)	6.50(1.80-7.90)
Power input (1)			kW	1.99(0.50-2.20)	1.90(0.45-2.30)
EER (Cooling) or COP(Heating) (1)			W/W	3.02	3.42
Energy efficiency class				B	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	8.9	8.6
Starting current			A	10.5	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Crossflow x 1	
	Fan speeds	H/M/L	RPM	1250/1100/1000	
	Air flow (2)	H/M/L	m3/hr	900/760/620	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	56/53/48	
	Sound pressure level(4)	H/M/L	dB(A)	45/40/34	
	Moisture removal		l/hr	2	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1060x295x210	
	Weight		kg	15	
	Package dimensions	WxHxD	mm	1125x360x280	
	Packaged weight		kg	18	
	Units per pallet		units	16 units per pallet	
	Stacking height		units	8 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Scroll,Panasonic 5CS130XCC03	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H/L	RPM	820	
	Air flow	H/L	m3/hr	2860	
	Sound power level	H/L	dB(A)	65	
	Sound pressure level(4)	H/L	dB(A)	55	
	Dimensions	WxHxD	mm	846x690x302	
	Weight		kg	46	
	Package dimensions	WxHxD	mm	990x770x430	
	Packaged weight		kg	50	
	Units per pallet		Units	9 units per pallet	
	Stacking height		units	3 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	1.65/7.5	
	Additional charge per 1 meter		g/m	No need	
	Connections between units	Liquid line	In.(mm)	1/4"(6.35)	
		Suction line	In.(mm)	1/2"(12.7)	
		Max.tubing length	m.	Max.30	
		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) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

2.3 WNG72 DCI

Model Indoor Unit				**WNG-DCI 72**	
Model Outdoor Unit				**GC-DCI 72**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	23188(5100~25575)	25916(5100~30000)
			kW	6.8(1.5-7.5)	7.6(1.5~8.8)
Power input (1)			kW	2.25(0.5-2.8)	2.35(0.45~3.0)
EER (Cooling) or COP(Heating) (1)			W/W	3.01	3.23
Energy efficiency class				B	C
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	9.8	10.3
Starting current			A	15	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Crossflow x 1	
	Fan speeds	H/M/L	RPM	1300/1150/1000	1350/1200/1050
	Air flow (2)	H/M/L	m3/hr	950/800/650	1000/850/700
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	60/54/47	
	Sound pressure level (4)	H/M/L	dB(A)	47/41/34	
	Moisture removal		l/hr	2.5	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1060x295x210	
	Weight		kg	15	
	Package dimensions	WxHxD	mm	1115x350x260	
	Packaged weight		kg	18	
	Units per pallet		units	16	
	Stacking height		units	8 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Two Rotary,Mitsubishi TNB220F	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H/L	RPM	850	
	Air flow	H/L	m3/hr	3600	
	Sound power level	H/L	dB(A)	66	
	Sound pressure level (4)	H/L	dB(A)	56	
	Dimensions	WxHxD	mm	950x835x412	
	Weight		kg	65.5	
	Package dimensions	WxHxD	mm	1080x910x477	
	Packaged weight		kg	73	
	Units per pallet		Units	2	
	Stacking height		units	2 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	2.4kg/30m	
	Additional charge per 1 meter		g/m	No Need	
	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 (Option)			kW		
Others					

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

2.4 WNG72Z DCI

Model Indoor Unit				WNG 72 DCI	
Model Outdoor Unit				DCI 72 Z R410A	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (4)			Btu/hr	23200(5120-25590)	24050(5120-30030)
			kW	6.80(1.50-7.50)	7.05(1.50-8.80)
Power input (4)			kW	2.25(0.5-2.8)	2.19(0.45-3.0)
EER (Cooling) or COP(Heating) (4)			W/W	3.01	3.23
Energy efficiency class				B	C
Power supply			V	220-240	
			Ph	Single	
			Hz	50	
Rated current			A	10.0	10.3
Power factor				0.97	0.97
Prated (IDU)			W	60	
Prated (IDU+ODU)			W	3000	
Starting current			A	15	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Crossflow x 1	
	Fan speeds	H/M/L	RPM	1350/1150/1000	
	Air flow (1)	H/M/L	m3/hr	960/800/670	
	External static pressure	Min	Pa	0	
	Sound power level (2)	H/M/L	dB(A)	60/56/51	
	Sound pressure level (3)	H/M/L	dB(A)	47/43/38	
	Moisture removal		l/hr	2.5	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1060x295x210	
	Net Weight		kg	15	
	Package dimensions	WxHxD	mm	1125x360x280	
	Packaged weight		kg	18	
	Units per pallet		units	16	
	Stacking height		units	8 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Two Rotary,Sanyo(Sheny) C-7RVN153H0W	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H	RPM	850	
	Air flow	H	m3/hr	3600	
	Sound power level	H	dB(A)	66	
	Sound pressure level (3)	H	dB(A)	56	
	Dimensions	WxHxD	mm	950x835x412	
	Net Weight		kg	64.5	
	Package dimensions	WxHxD	mm	1080x910x477	
	Packaged weight		kg	72	
	Units per pallet		Units	4	
	Stacking height		units	2 levels	
	Refrigerant type			R410A	
	Standard charge		kg(7.5m)	2.3kg	
	Additional charge			7.5m≤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.	30	
		Max.height difference	m.	15	
Operation control type				Remote control	
Heating elements(Option)			kW		
Others					

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

2.5 WNG80 DCI

Model Indoor Unit				**WNG- 80**	
Model Outdoor Unit				**DCI 80**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	26620(5100~30035)	29010 (5100~32420)
			kW	7.8 (1.50~8.8)	8.5 (1.5~9.5)
Power input (1)			kW	2.59 (0.50~3.1)	2.65 (0.5~3.2)
EER (Cooling) or COP(Heating) (1)			W/W	3.01	3.21
Energy efficiency class				B	C
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	11.3	11.5
Starting current			A	15	
Circuit breaker rating			A	20	
INDOOR	Fan type & quantity			Crossflow x 1	
	Fan speeds	H/M/L	RPM	1350/1150/1000	1350/1200/1050
	Air flow (2)	H/M/L	m3/hr	1250/1050/900	1250/1100/950
	External static pressure	Min-Max	Pa	N/A	
	Sound power level (3)	H/M/L	dB(A)	66/61/57	
	Sound pressure level(4)	H/M/L	dB(A)	51/48/44	
	Moisture removal		l/hr	3	
	Condensate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1200x340x236	
	Weight		kg	18.5	
	Package dimensions	WxHxD	mm	1305x430x325	
	Packaged weight		kg	24	
	Units per pallet		units	12 units per pallet	
	Stacking height		units	6 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type, model			Twin Rotary DC Inverter Mitsubishi TNB220F	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H/L	RPM	850	
	Air flow	H/L	m3/hr	3600	
	Sound power level (3)	H/L	dB(A)	66	
	Sound pressure level(4)	H/L	dB(A)	56	
	Dimensions	WxHxD	mm	950x412x835	
	Weight		kg	66	
	Package dimensions	WxHxD	mm	1080x477x910	
	Packaged weight		kg	73.5	
	Units per pallet		Units	2 units per pallet	
	Stacking height		units	3 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	2.75/30	
	Additional charge per 1 meter		g/m	No need	
	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) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

3. RATING CONDITIONS

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

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

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

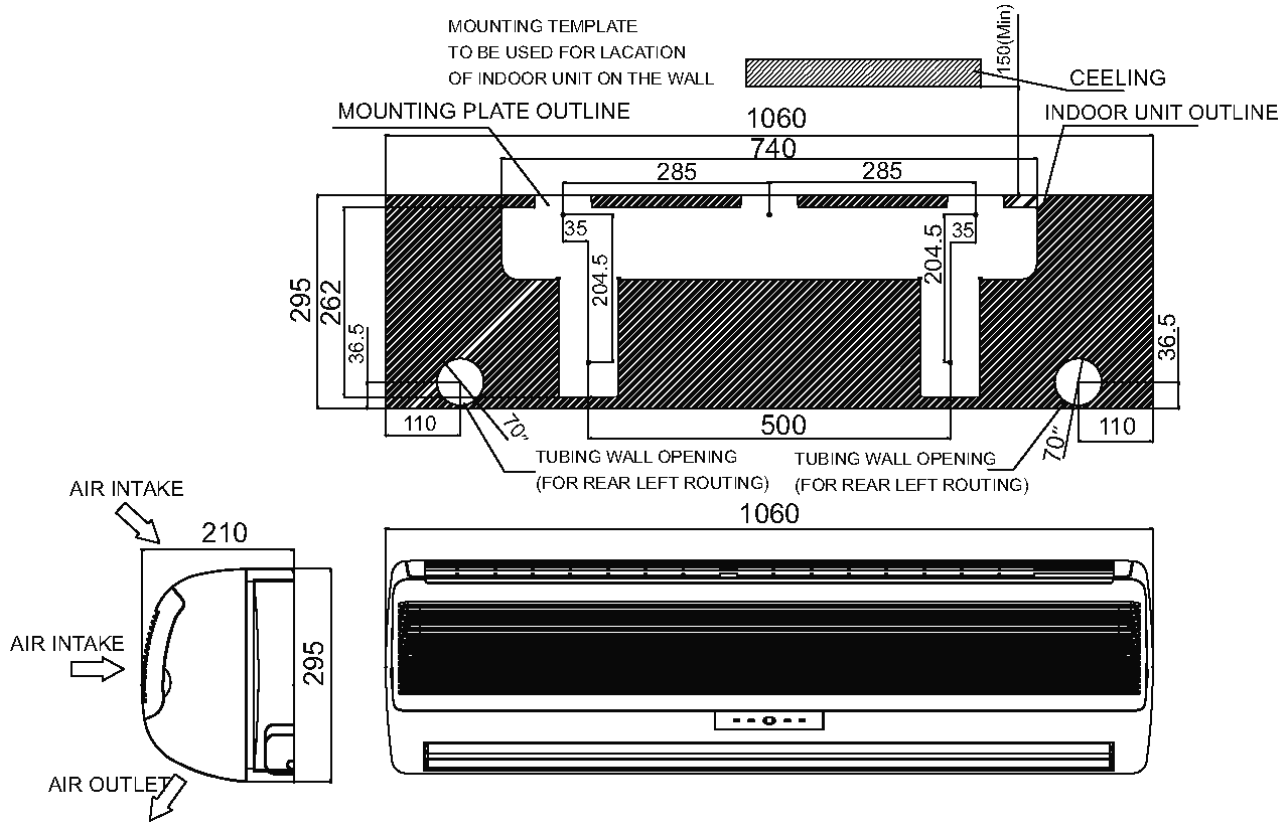
3.1 Operating Limits

3.1.1 R410A

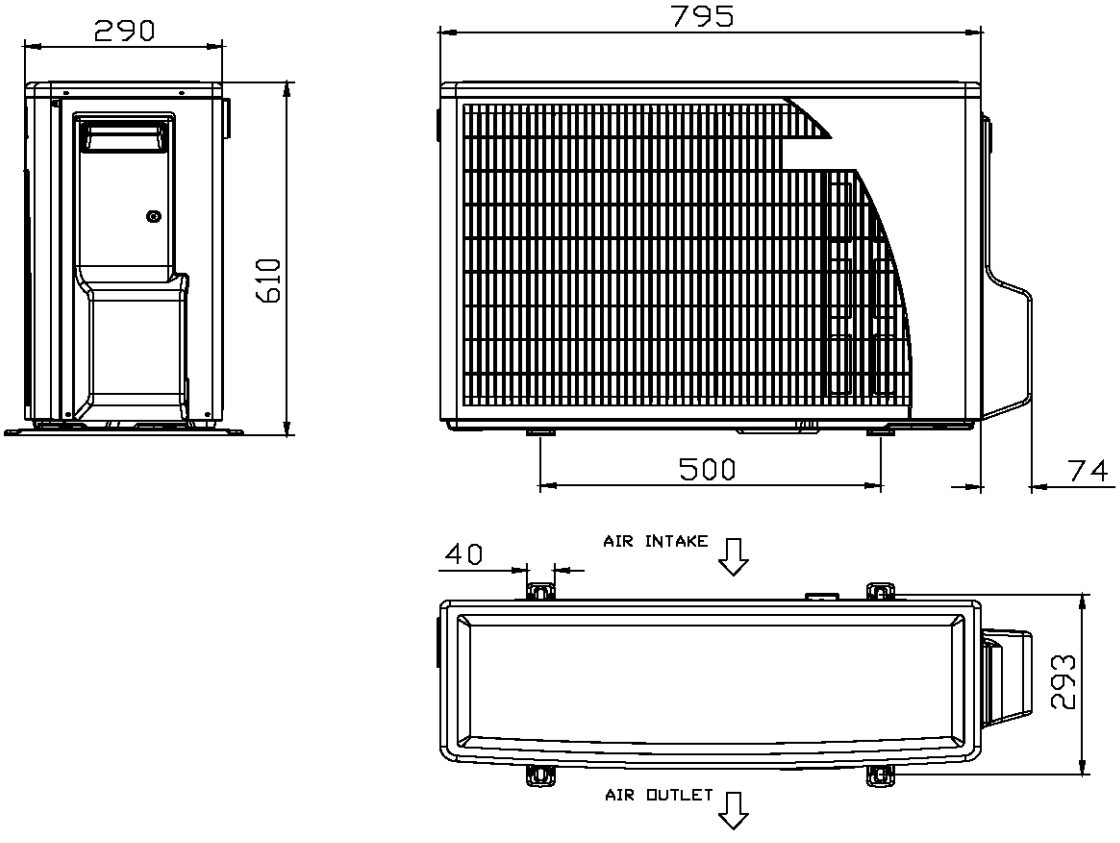
		Indoor	Outdoor
Cooling	**Upper limit**	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	-10°C DB
Heating	**Upper limit**	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-15°C DB -16°C WB
Voltage		198 – 264 V	

4. OUTLINE DIMENSIONS

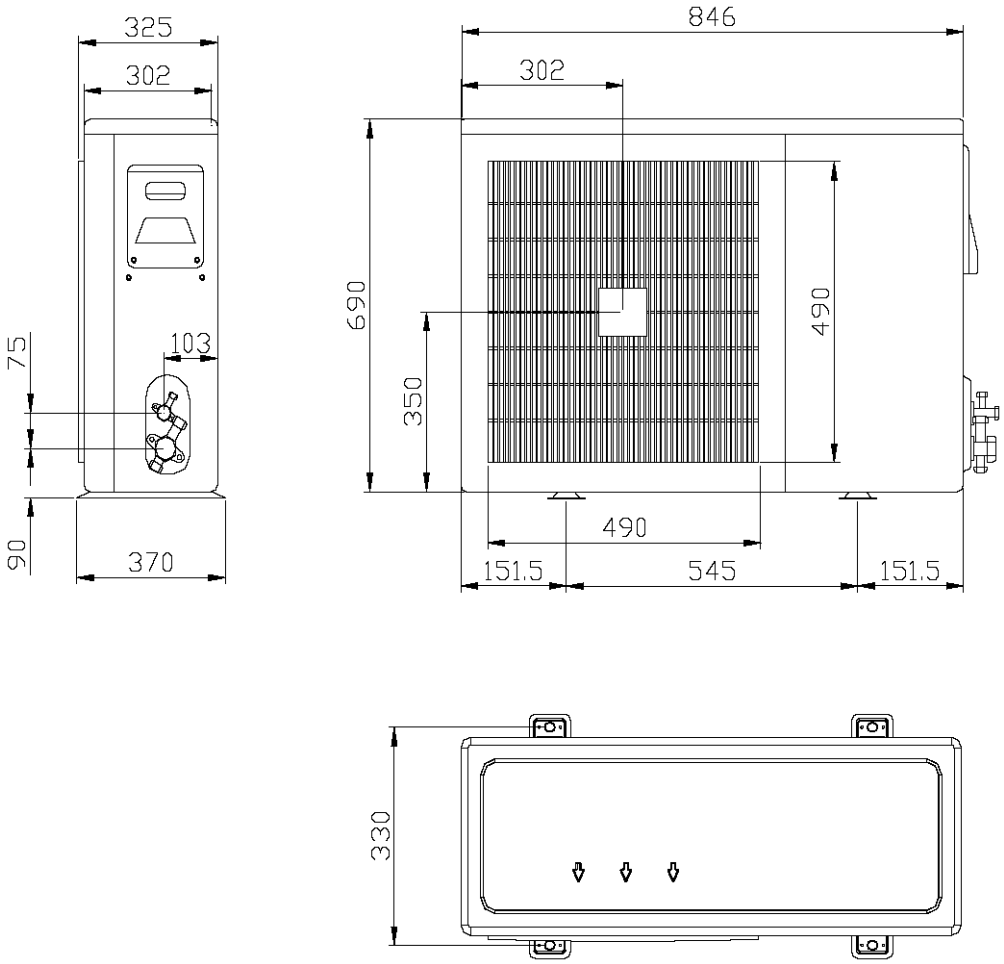
4.1 Indoor Unit: WNG 50/60/72 DCI



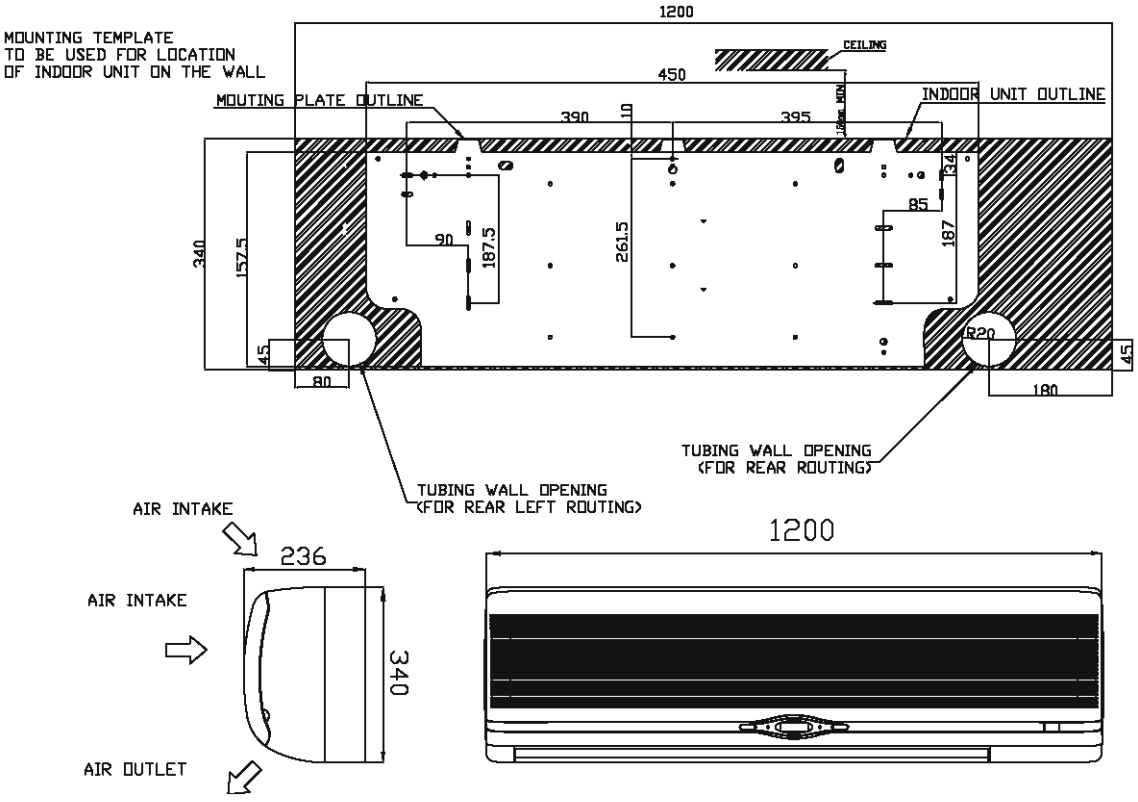
4.2 Outdoor Unit: DCI 50



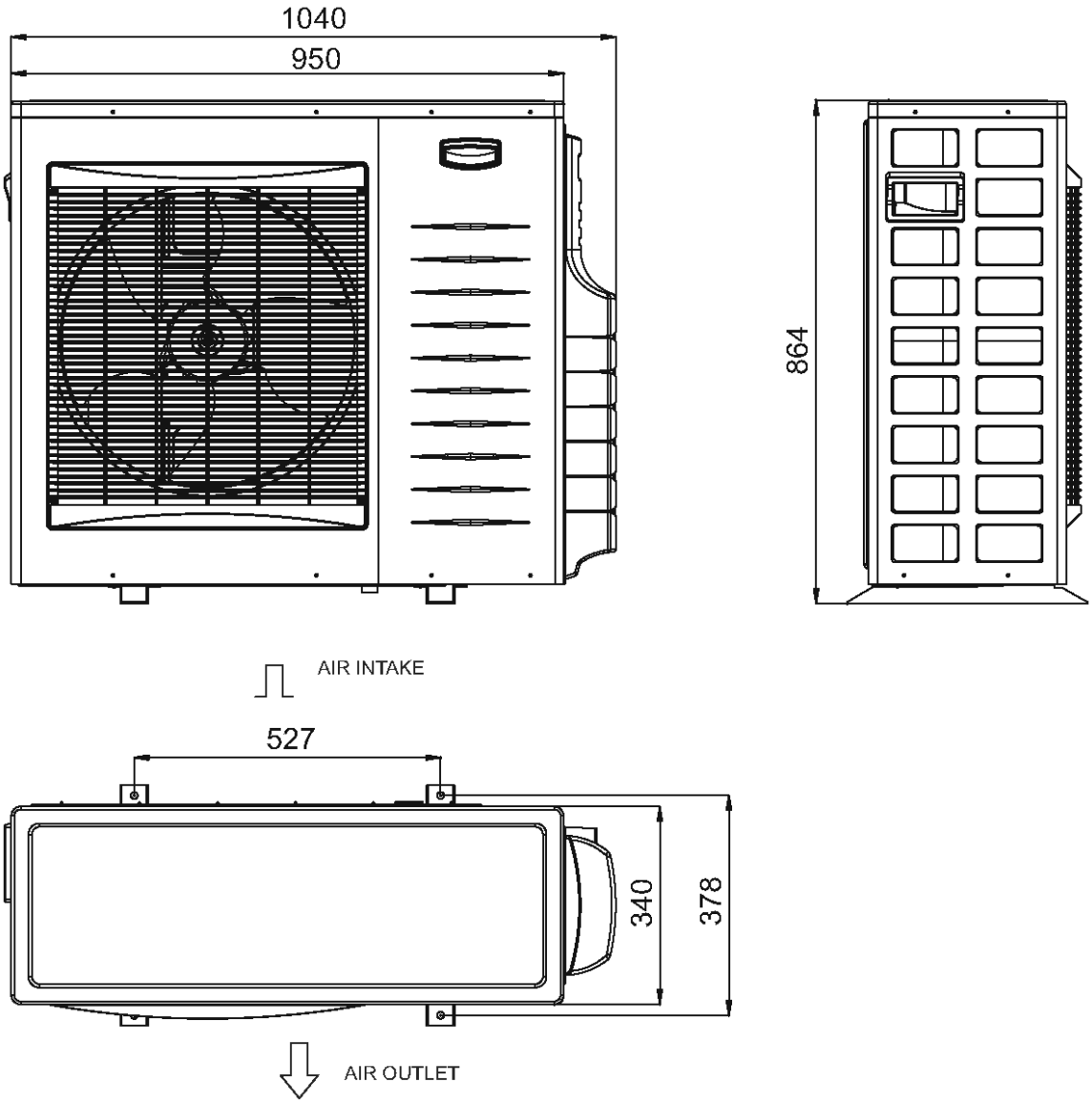
4.3 Outdoor Unit: DCI 60



4.4 Indoor Unit: WNG 80



4.5 Outdoor Unit: DCI 72 / 72 Z / 80



5. PERFORMANCE DATA

5.1 WNG50 DCI / DCI 50

5.1.1 Cooling Capacity (kW) - Run Mode

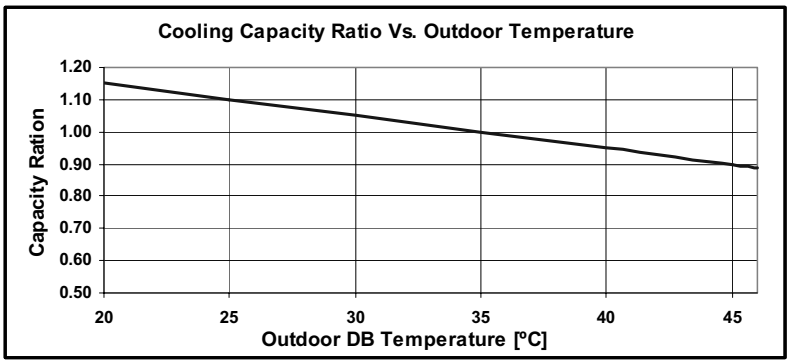
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C] 22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	4.93	5.22	5.51	5.80	6.09
	SC	4.10	4.16	4.22	4.28	4.34
	PI	1.10	1.13	1.15	1.18	1.20
30	TC	4.67	4.96	5.25	5.54	5.83
	SC	3.94	4.00	4.06	4.12	4.18
	PI	1.26	1.28	1.31	1.33	1.36
35	TC	4.42	4.71	**5.00**	5.29	5.58
	SC	3.78	3.84	**3.90**	3.96	4.02
	PI	1.41	1.44	**1.46**	1.48	1.51
40	TC	4.17	4.46	4.75	5.04	5.53
	SC	3.62	3.68	3.74	3.80	3.86
	PI	1.56	1.59	1.61	1.64	1.66
46	TC	3.86	4.15	4.44	4.73	5.02
	SC	3.43	3.49	3.55	3.61	3.67
	PI	1.75	1.77	1.80	1.82	1.85

LEGEND

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

5.1.2 Capacity Correction Factors



5.1.3 Heating Capacity (kW) - Run Mode)

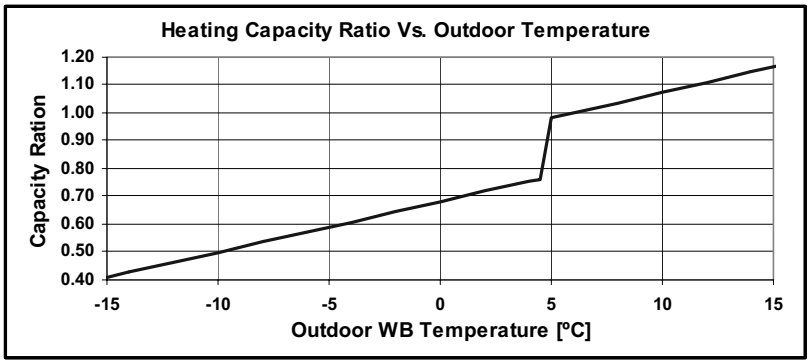
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	2.73	2.34	1.94
	PI	1.16	1.24	1.33
-10/-12	TC	3.60	3.21	2.82
	PI	1.31	1.40	1.48
-7/-8	TC	4.26	3.87	3.47
	PI	1.43	1.51	1.59
-1/-2	TC	4.59	4.19	3.80
	PI	1.48	1.57	1.65
2/1	TC	4.81	4.41	4.02
	PI	1.52	1.60	1.69
7/6	TC	6.39	**6.00**	5.61
	PI	1.58	**1.66**	1.74
10/9	TC	6.72	6.33	5.94
	PI	1.61	1.69	1.77
15/12	TC	7.06	6.66	6.27
	PI	1.64	1.72	1.80
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

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

5.1.4 Capacity Correction Factors



5.2 WNG60 DCI / DCI 60

5.2.1 Cooling Capacity (kW) - Run Mode

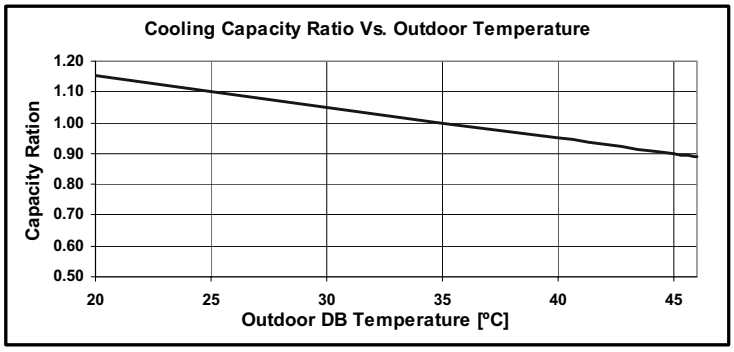
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C] 22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	5.91	6.26	6.61	6.95	7.30
	SC	4.64	4.71	4.78	4.85	4.92
	PI	1.50	1.54	1.57	1.61	1.64
30	TC	5.61	5.96	6.30	6.65	7.00
	SC	4.46	4.53	4.60	4.67	4.74
	PI	1.71	1.75	1.78	1.81	1.85
35	TC	5.30	5.65	**6.00**	6.35	6.70
	SC	4.28	4.35	**4.42**	4.49	4.56
	PI	1.92	1.96	**1.99**	2.02	2.06
40 (Protection Range)	TC	5.00	5.35	5.70	6.05	6.39
	SC	4.10	4.17	4.24	4.31	4.38
	PI	2.13	2.17	2.20	2.23	2.27
46 (Protection Range)	TC	4.64	4.99	5.33	5.68	6.03
	SC	3.88	3.95	4.02	4.09	4.16
	PI	2.38	2.42	2.45	2.48	2.52

LEGEND

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

5.2.2 Capacity Correction Factors



5.2.3 Heating Capacity (kW) - Run Mode

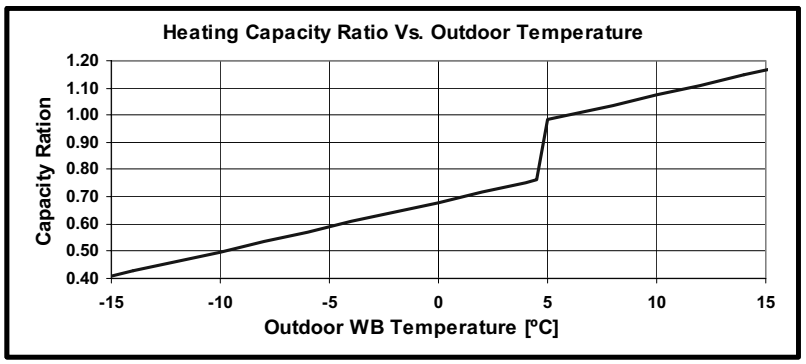
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	2.96	2.53	2.11
	PI	1.33	1.42	1.52
-10/-12	TC	3.90	3.48	3.05
	PI	1.50	1.60	1.69
-7/-8	TC	4.61	4.19	3.76
	PI	1.63	1.73	1.82
-1/-2	TC	4.97	4.54	4.12
	PI	1.70	1.79	1.82
2/1	TC	5.21	4.78	4.35
	PI	1.74	1.84	1.93
7/6	TC	6.93	**6.50**	6.07
	PI	1.81	**1.90**	2.00
10/9	TC	7.28	6.86	6.43
	PI	1.84	1.93	2.03
15/12	TC	7.64	7.22	6.79
	PI	1.87	1.97	2.06
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

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

5.2.4 Capacity Correction Factors



5.3 WNG72 DCI / DCI 72

5.3.1 Cooling Capacity (kW) - Run Mode

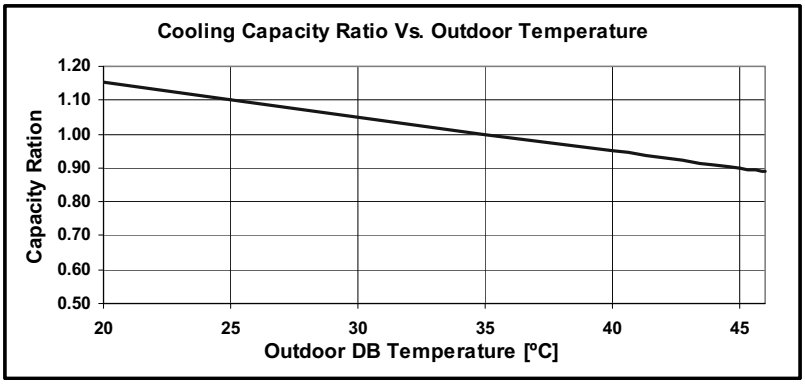
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C] 22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	6.70	7.09	7.49	7.88	8.28
	SC	5.04	5.12	5.19	5.27	5.34
	PI	1.70	1.74	1.78	1.82	1.85
30	TC	6.35	6.75	7.14	7.54	7.93
	SC	4.85	4.92	5.00	5.07	5.15
	PI	1.94	1.98	2.01	2.05	2.09
35	TC	6.01	6.41	**6.80**	7.19	7.59
	SC	4.65	4.73	**4.80**	4.87	4.95
	PI	2.17	2.21	**2.25**	2.29	2.33
40 (Protection Range)	TC	5.67	6.06	6.46	6.85	7.25
	SC	4.45	4.53	4.60	4.68	4.75
	PI	2.41	2.45	2.49	2.52	2.56
46 (Protection Range)	TC	5.26	5.65	6.04	6.44	6.83
	SC	4.22	4.29	4.37	4.44	4.52
	PI	2.69	2.73	2.77	2.81	2.85

LEGEND

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

5.3.2 Capacity Correction Factors



5.3.3 Heating Capacity (kW) - Run Mode

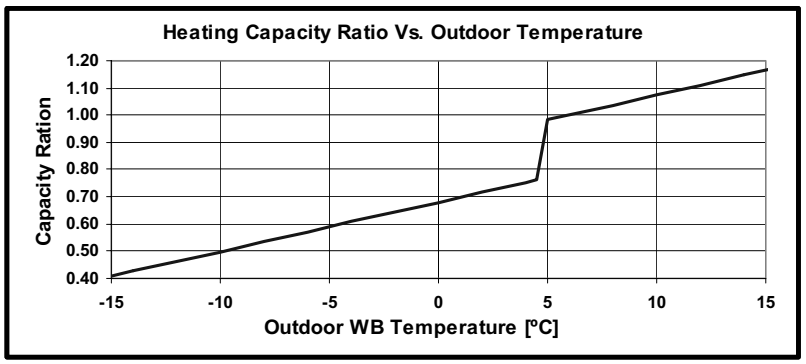
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	3.46	2.96	2.46
	PI	1.64	1.76	1.88
-10/-12	TC	4.57	4.07	3.57
	PI	1.86	1.98	2.09
-7/-8	TC	5.40	4.90	4.40
	PI	2.02	2.14	2.25
-1/-2	TC	5.81	5.31	4.81
	PI	2.10	2.22	2.33
2/1	TC	6.09	5.59	5.09
	PI	2.15	2.27	2.39
7/6	TC	8.10	**7.60**	7.10
	PI	2.23	**2.35**	2.47
10/9	TC	8.52	8.02	7.52
	PI	2.28	2.39	2.51
15/12	TC	8.94	8.44	7.94
	PI	2.32	2.44	2.55
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

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

5.3.4 Capacity Correction Factors



5.4 WNG72 DCI / DCI 72Z

5.4.1 Cooling Capacity (kW) - Run Mode

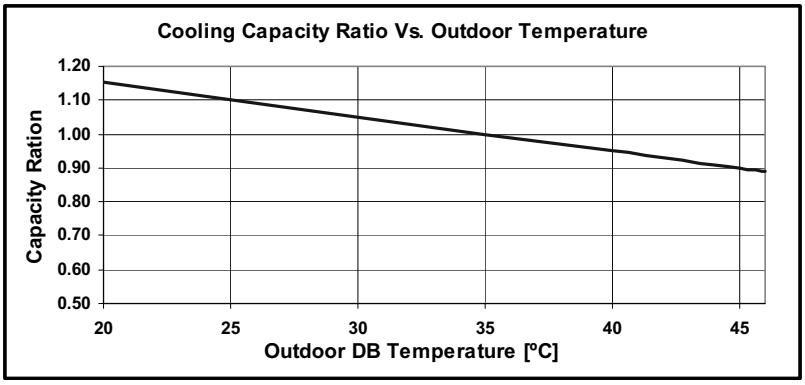
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C] 22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	6.70	7.09	7.49	7.88	8.28
	SC	5.04	5.12	5.19	5.27	5.34
	PI	1.70	1.74	1.78	1.82	1.85
30	TC	6.35	6.75	7.14	7.54	7.93
	SC	4.85	4.92	5.00	5.07	5.15
	PI	1.94	1.98	2.01	2.05	2.09
35	TC	6.01	6.41	**6.80**	7.19	7.59
	SC	4.65	4.73	**4.80**	4.87	4.95
	PI	2.17	2.21	**2.25**	2.29	2.33
40 (Protection Range)	TC	5.67	6.06	6.46	6.85	7.25
	SC	4.45	4.53	4.60	4.68	4.75
	PI	2.41	2.45	2.49	2.52	2.56
46 (Protection Range)	TC	5.26	5.65	6.04	6.44	6.83
	SC	4.22	4.29	4.37	4.44	4.52
	PI	2.69	2.73	2.77	2.81	2.85

LEGEND

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

5.4.2 Capacity Correction Factors



5.4.3 Heating Capacity (kW) - Run Mode

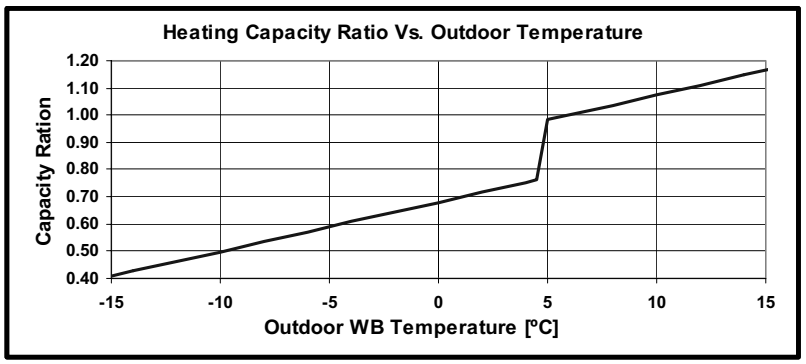
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	3.21	2.75	2.28
	PI	1.53	1.64	1.75
-10/-12	TC	4.23	3.77	3.31
	PI	1.73	1.84	1.95
-7/-8	TC	5.00	4.54	4.08
	PI	1.88	1.99	2.10
-1/-2	TC	5.39	4.93	4.47
	PI	1.96	2.07	2.17
2/1	TC	5.65	5.18	4.72
	PI	2.01	2.12	2.22
7/6	TC	7.51	**7.05**	6.59
	PI	2.08	**2.19**	2.30
10/9	TC	7.90	7.44	6.98
	PI	2.12	2.23	2.34
15/12	TC	8.28	7.83	7.37
	PI	2.16	2.27	2.38
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

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

5.4.4 Capacity Correction Factors



5.5 WNG80 DCI / DCI 80

5.5.1 Cooling Capacity (kW) - Run Mode

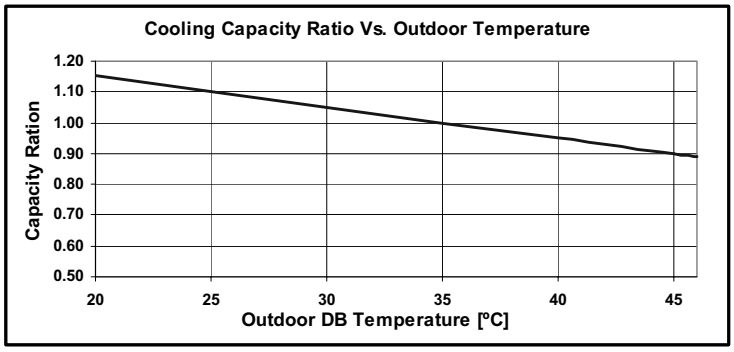
230[V] : Indoor Fan at High Speed.

OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	7.68	8.14	8.59	9.04	9.49
	SC	6.41	6.51	6.60	6.70	6.79
	PI	1.96	2.00	2.05	2.09	2.13
30	TC	7.29	7.74	8.19	8.65	9.10
	SC	6.16	6.25	6.35	6.45	6.54
	PI	2.23	2.27	2.32	2.36	2.41
35	TC	6.90	7.35	**7.80**	8.25	8.70
	SC	5.91	6.00	**6.10**	6.20	6.29
	PI	2.50	2.55	**2.59**	2.63	2.68
40 (Protection Range)	TC	6.50	6.95	7.41	7.86	8.31
	SC	5.66	5.75	5.85	5.95	6.04
	PI	2.77	2.82	2.86	2.91	2.95
46 (Protection Range)	TC	6.03	6.48	6.93	7.39	7.84
	SC	5.36	5.45	5.55	5.64	5.74
	PI	3.10	3.14	3.19	3.23	3.28

LEGEND

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

5.5.2 Capacity Correction Factors



5.5.3 Heating Capacity (kW) - Run Mode

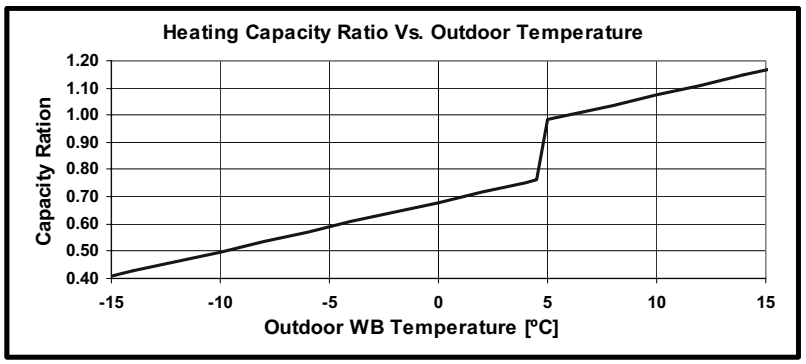
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	3.87	3.31	2.75
	PI	1.85	1.99	2.12
-10/-12	TC	5.11	4.55	3.99
	PI	2.09	2.23	2.36
-7/-8	TC	6.03	5.48	4.92
	PI	2.28	2.41	2.54
-1/-2	TC	6.50	5.94	5.38
	PI	2.37	2.50	2.63
2/1	TC	6.81	6.25	5.69
	PI	2.43	2.56	2.69
7/6	TC	9.06	**8.50**	7.94
	PI	2.52	**2.65**	2.78
10/9	TC	9.53	8.97	8.41
	PI	2.57	2.70	2.83
15/12	TC	10.00	9.44	8.88
	PI	2.61	2.75	2.88
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

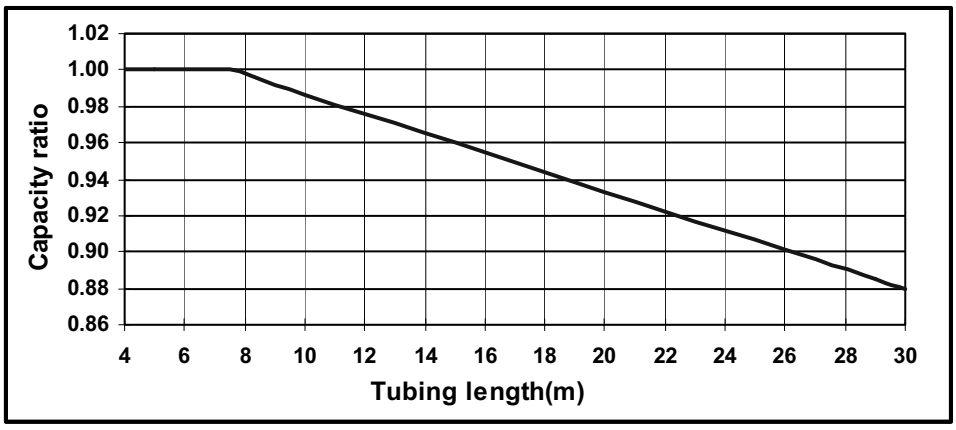
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

5.5.4 Capacity Correction Factors

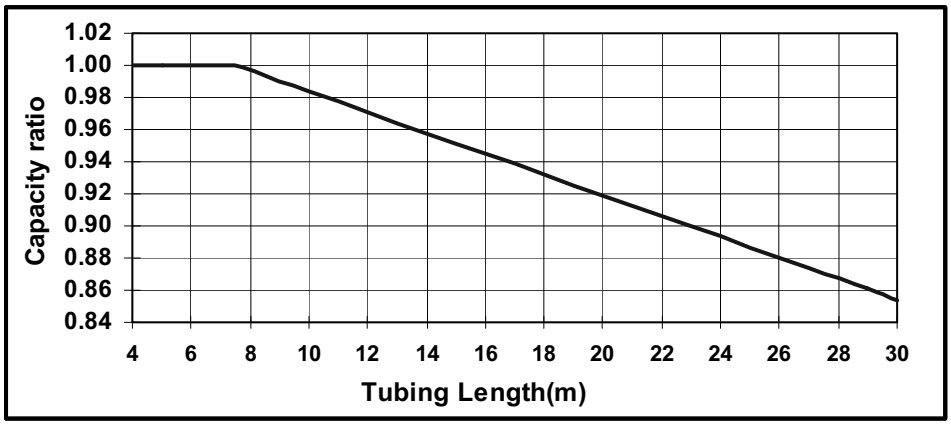


5.6 Capacity Correction Factor Due to Tubing Length

5.6.1 WNG 50/60/72/80 DCI: Cooling

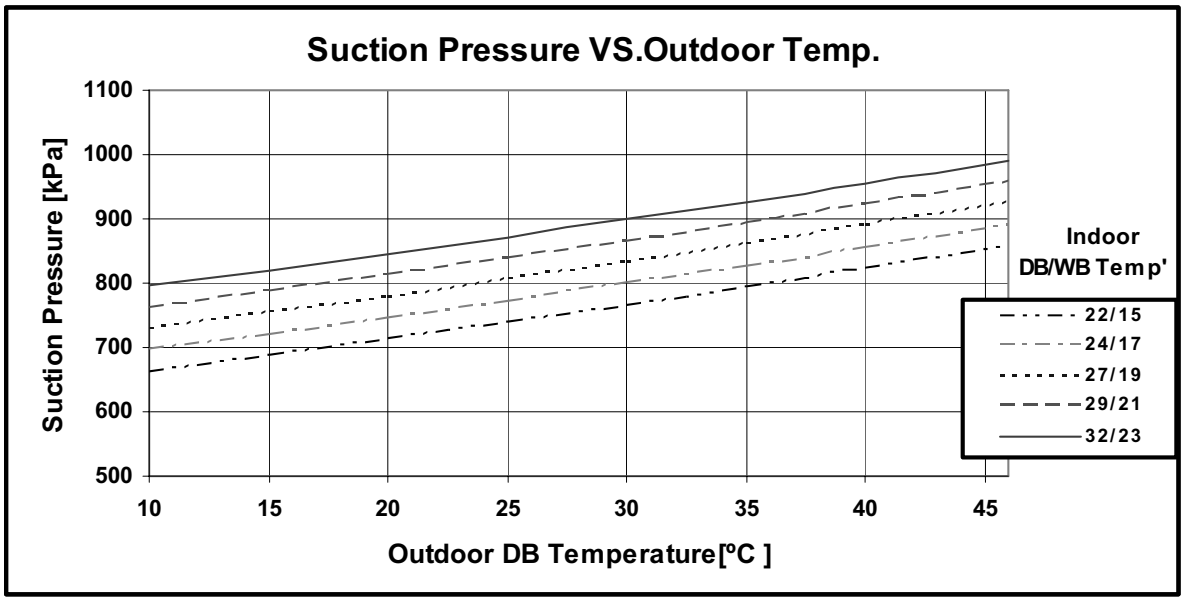


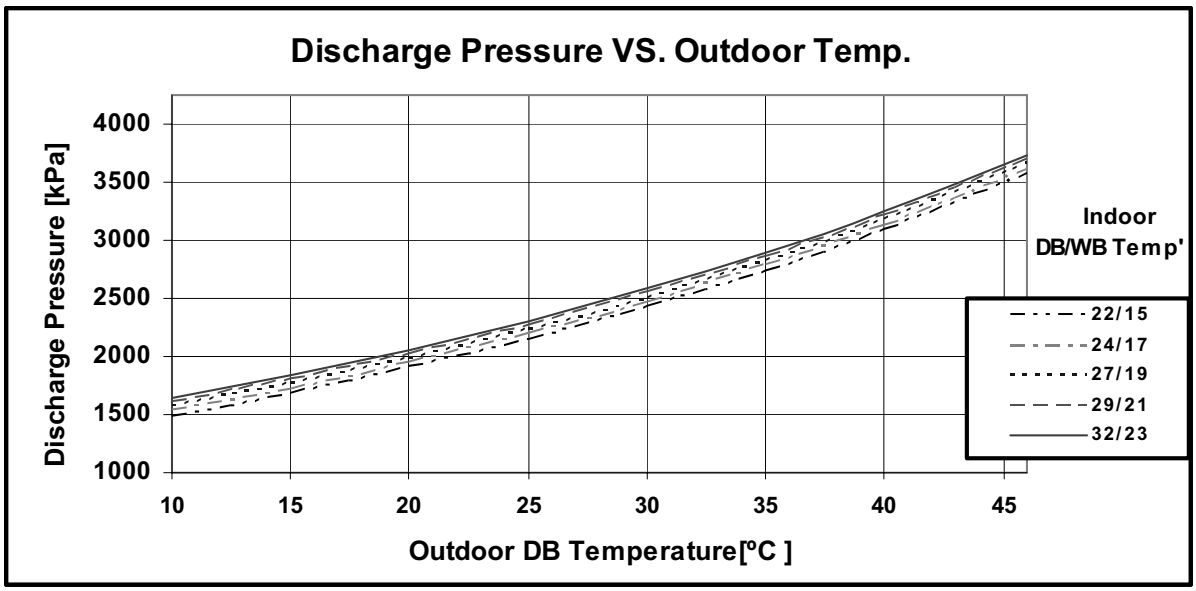
5.6.2 Heating



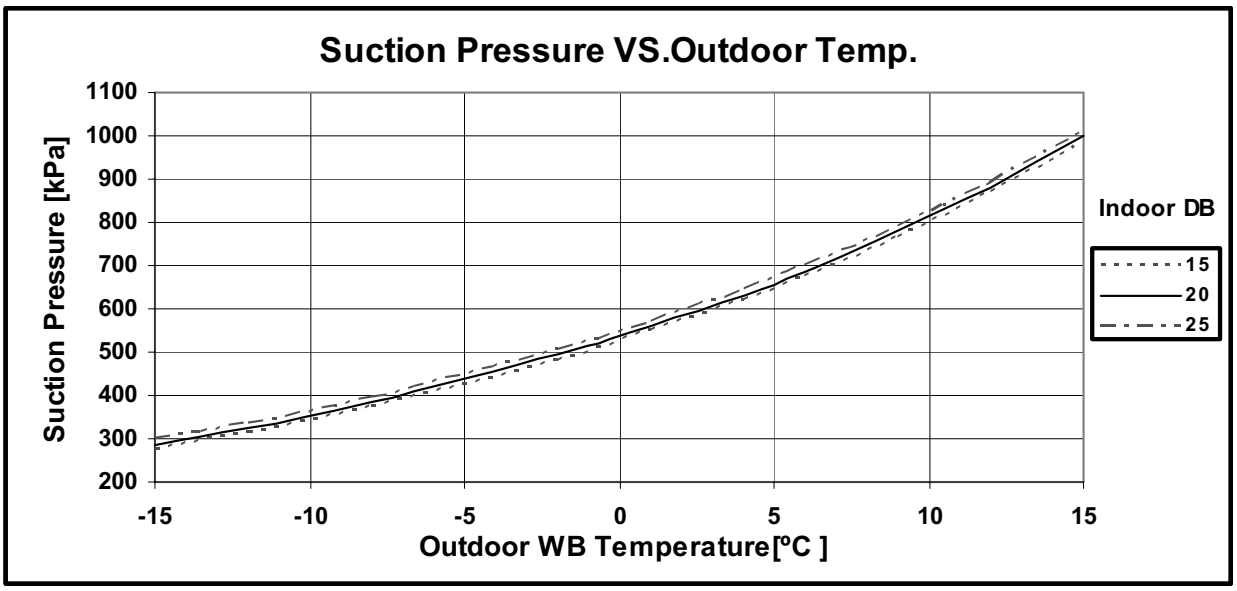
5.7 Pressure Curves

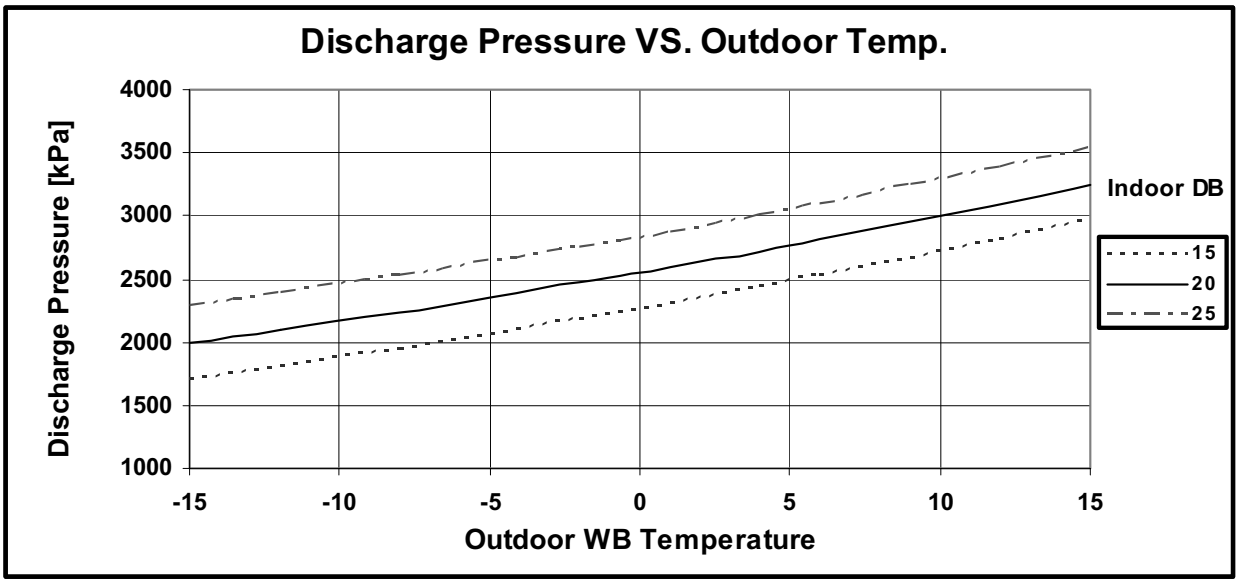
5.7.1. Model: WNG50 DCI / DCI 50 Cooling — Test Mode



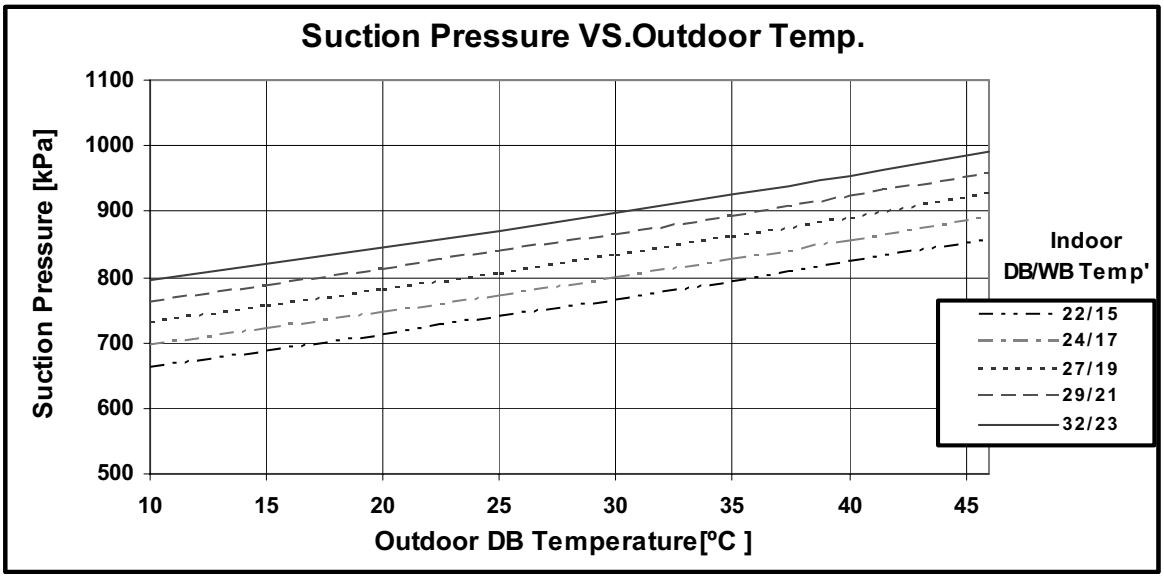


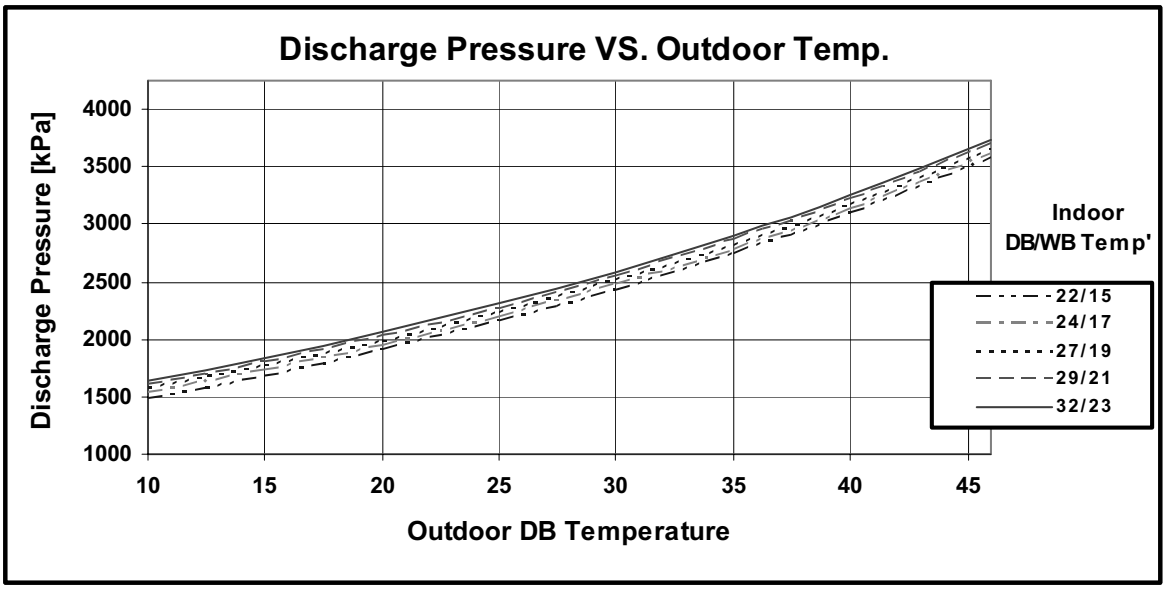
5.7.2. Heating — Test Mode



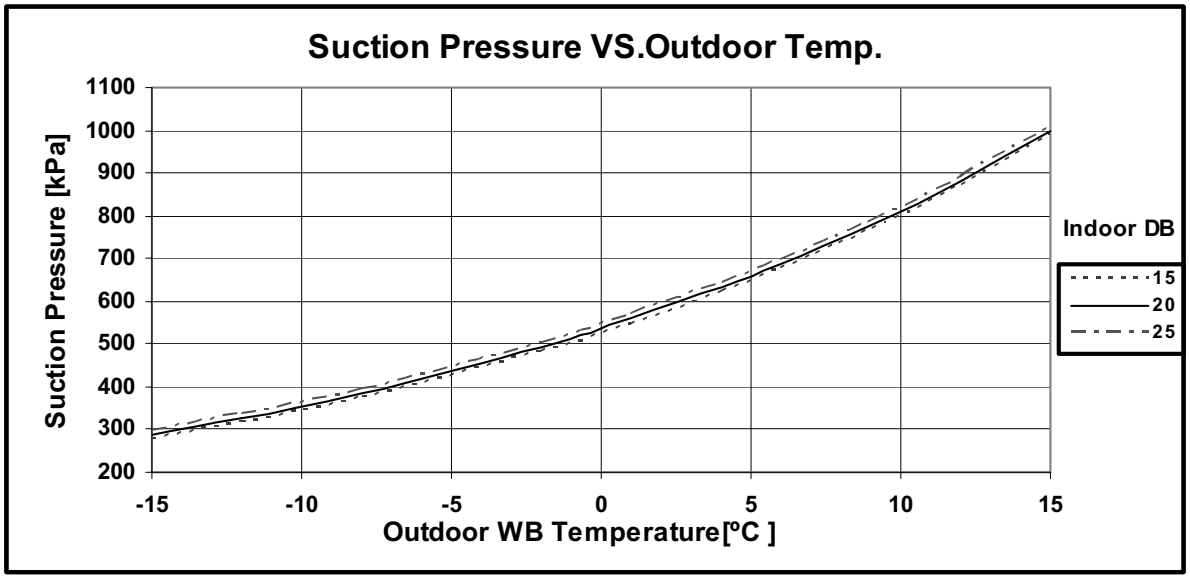


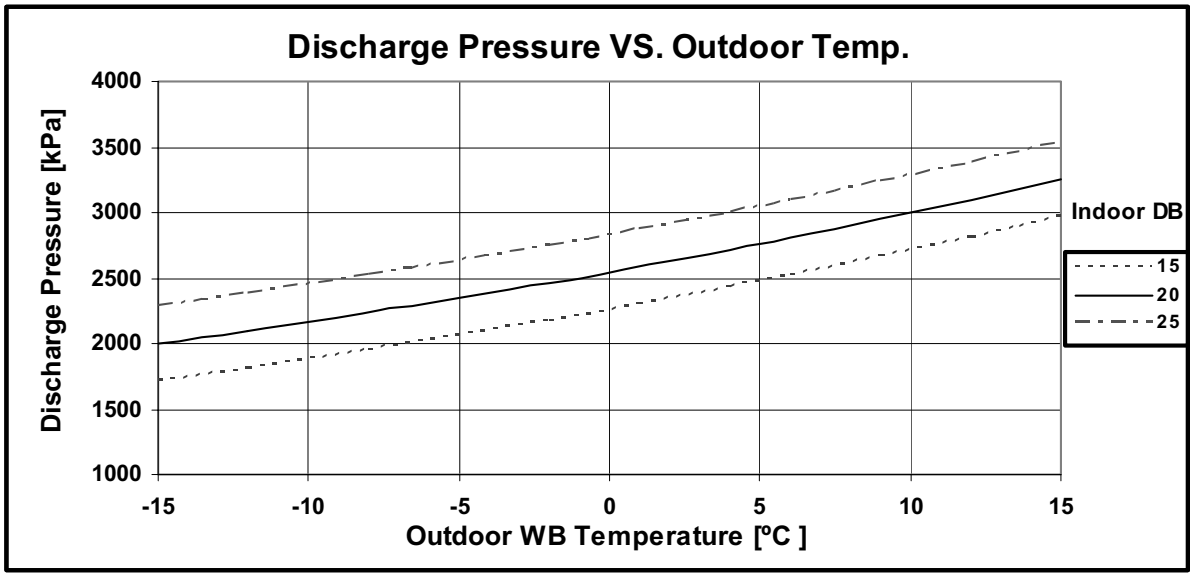
5.7.3 Model: WNG60 DCI / DCI 60 Cooling — Test Mode.



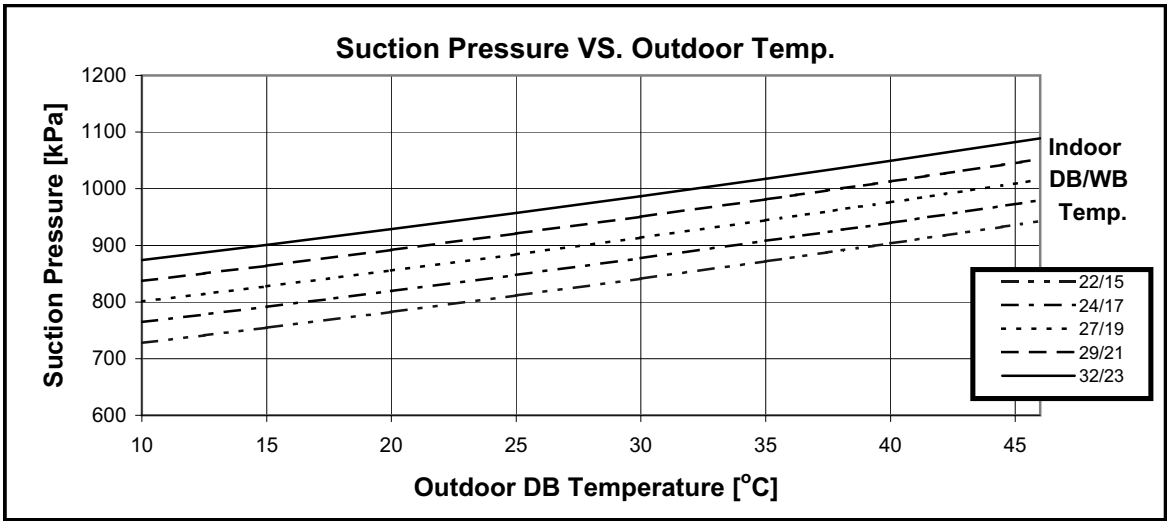


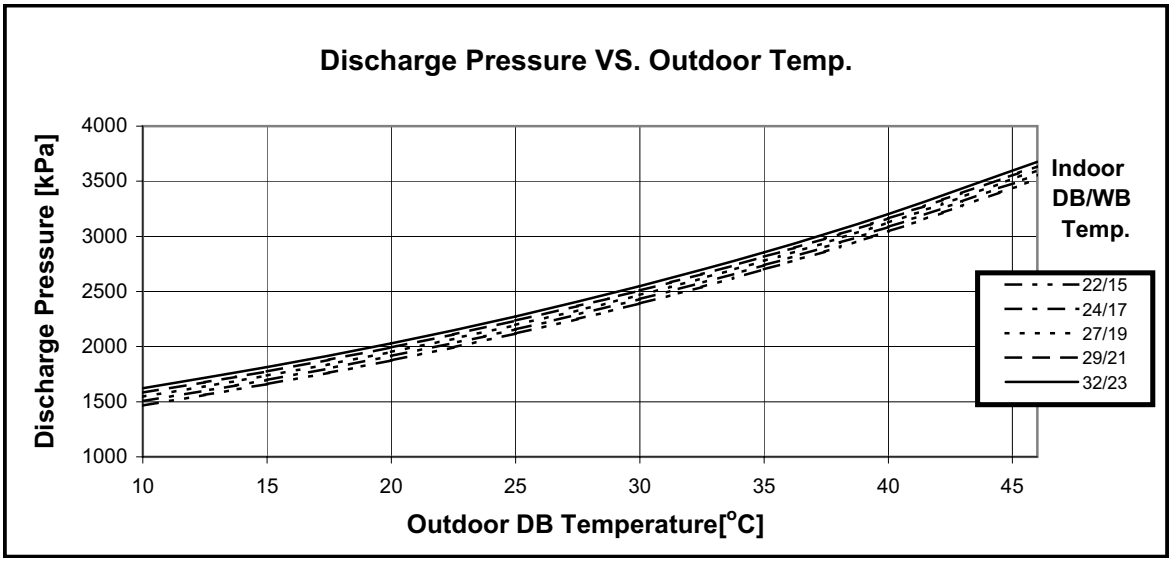
5.7.4 Heating — Test Mode



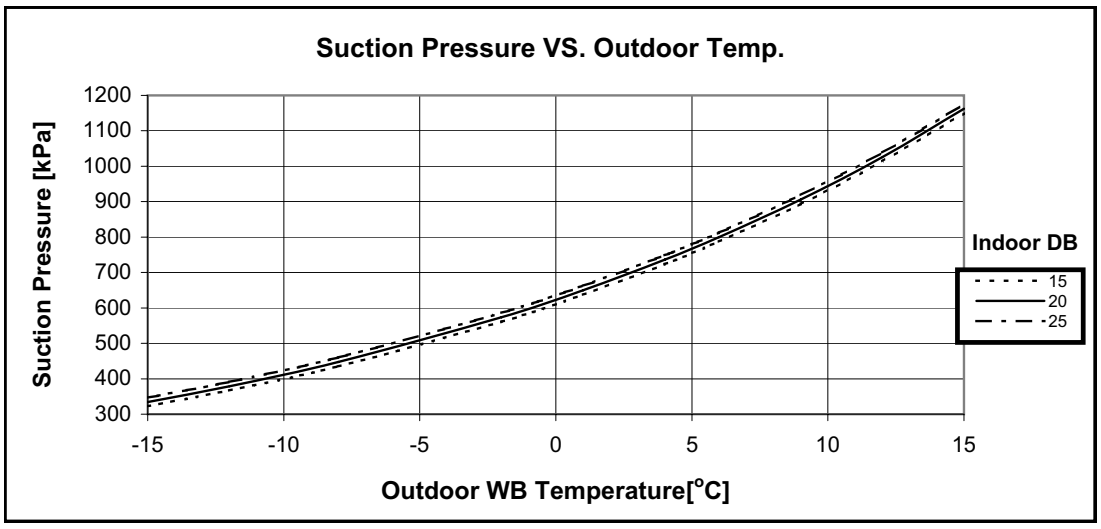


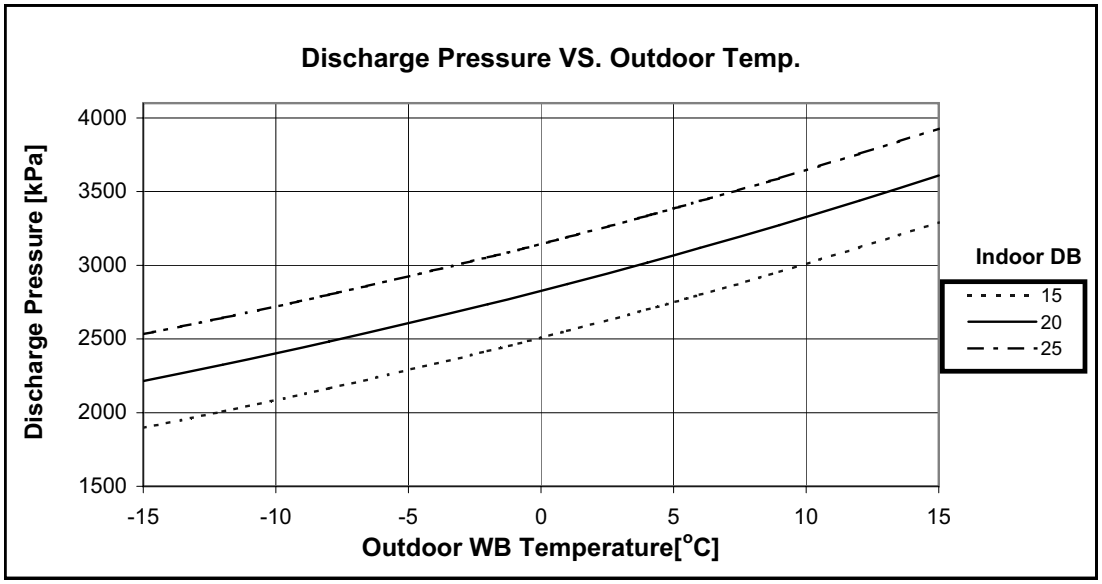
5.7.5 Model: WNG72 DCI / DCI 72 Cooling — Test Mode.



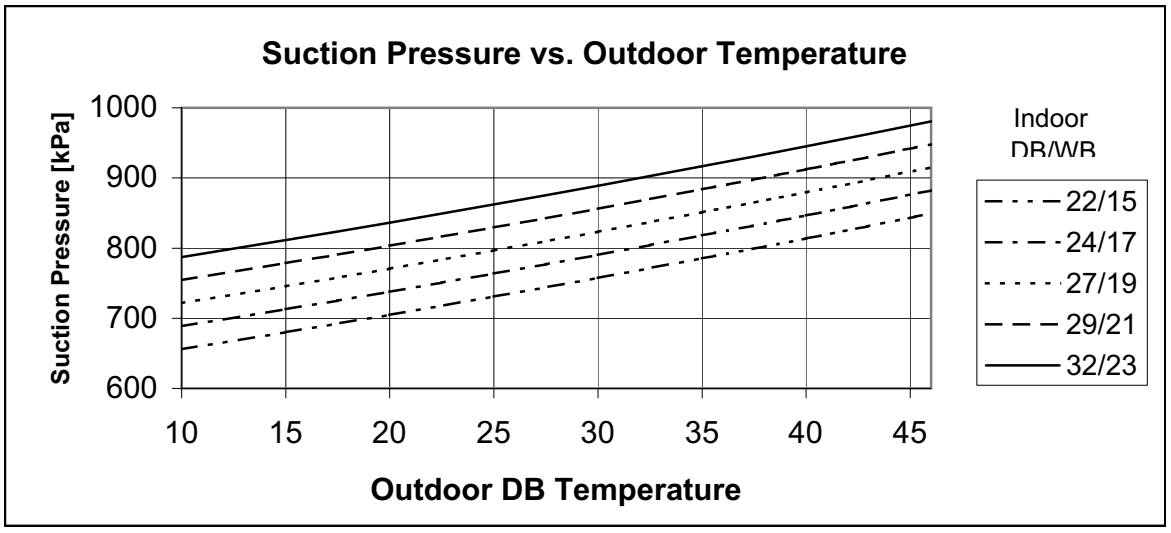


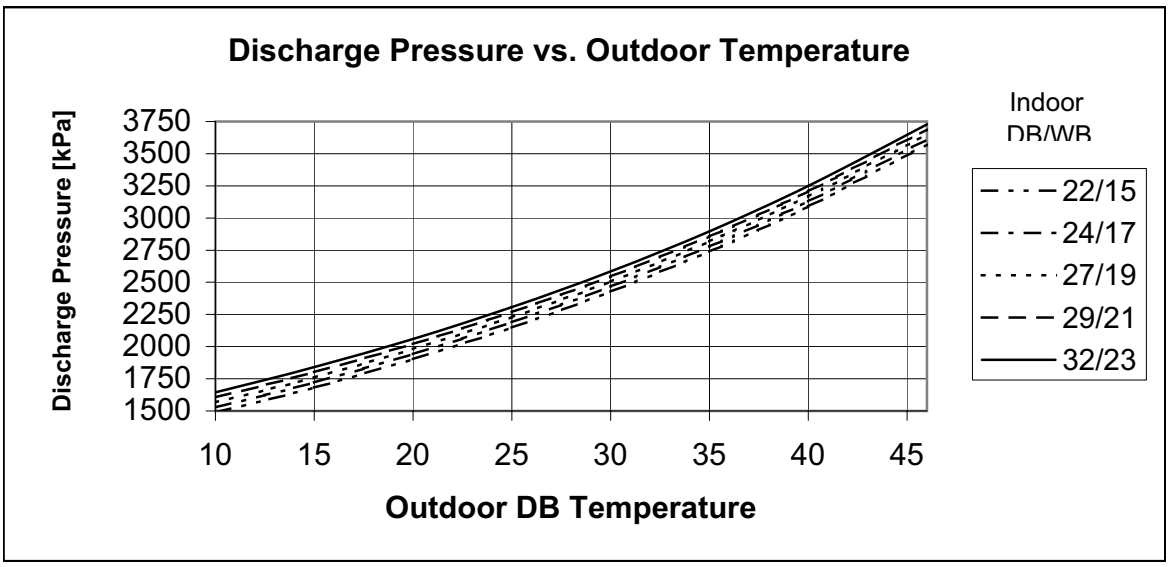
5.7.6 Heating — Test Mode



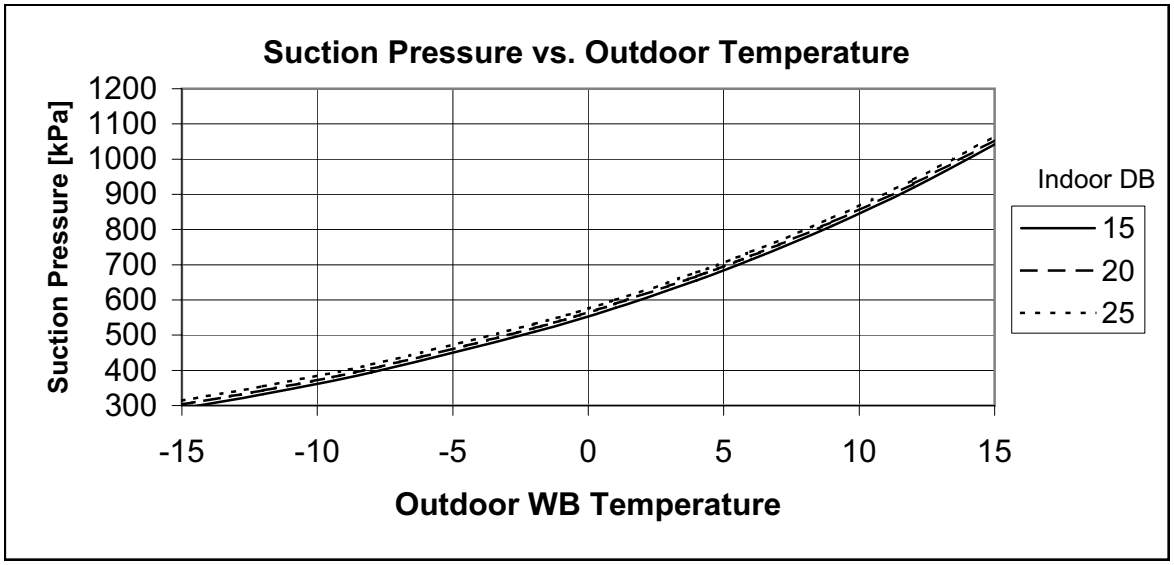


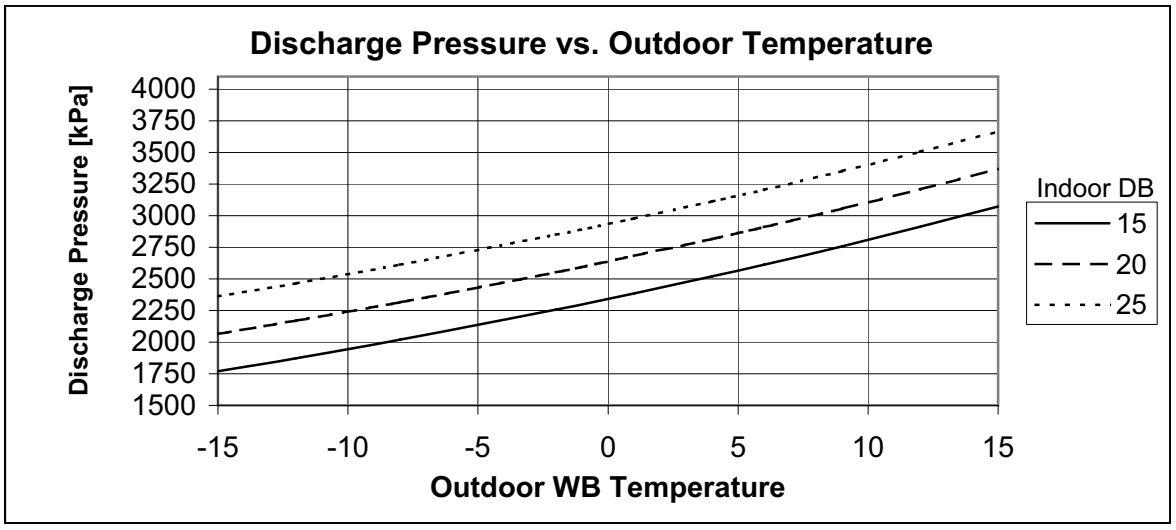
5.7.7 Model: WNG72 DCI / DCI 72Z Cooling — Test Mode.



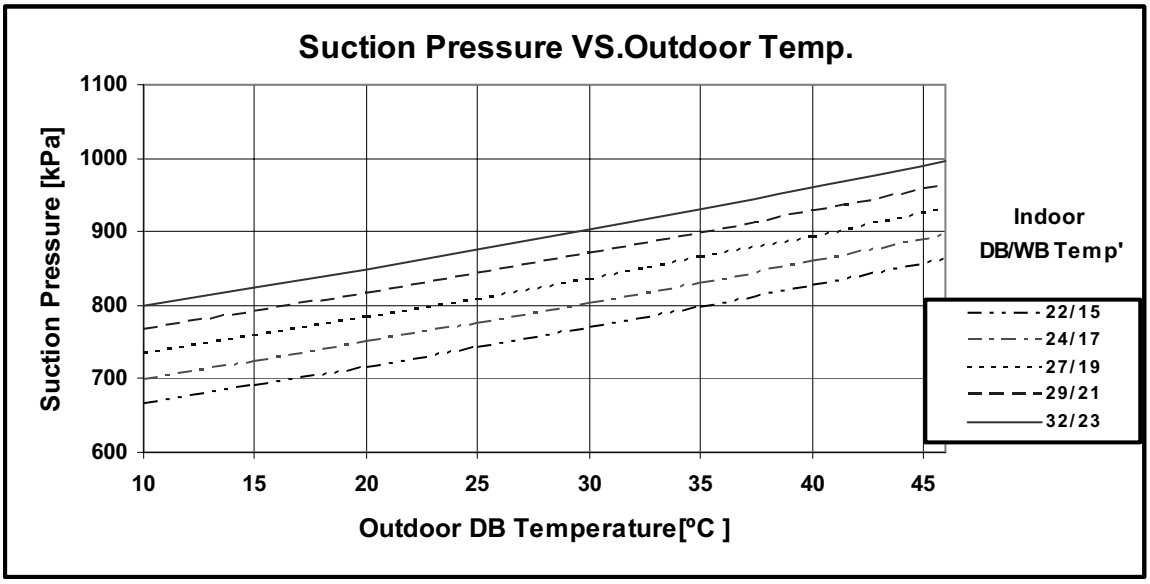


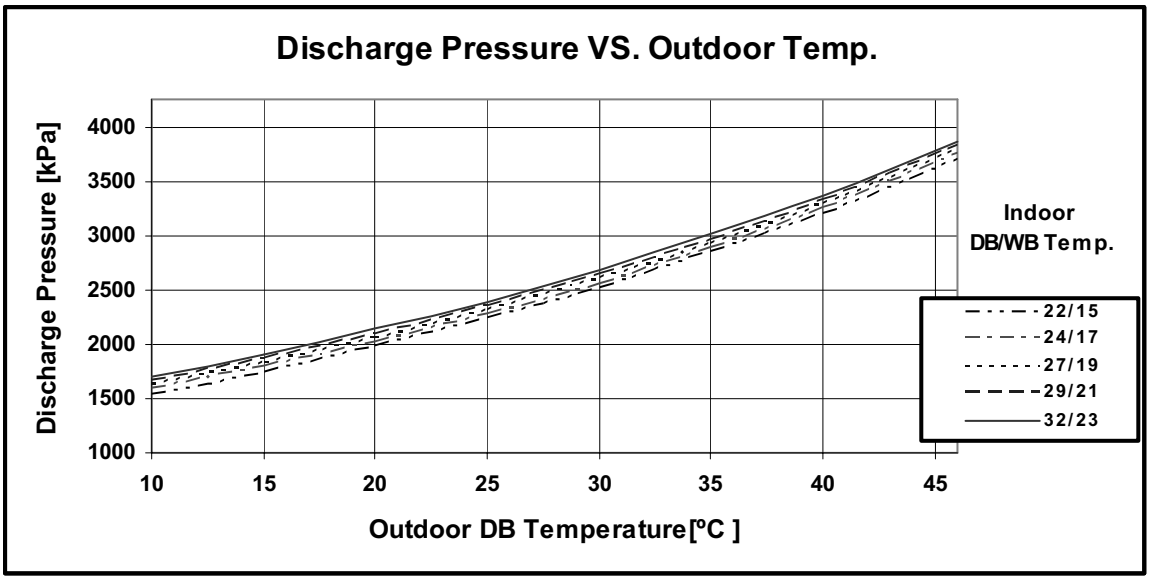
5.7.8 Heating — Test Mode



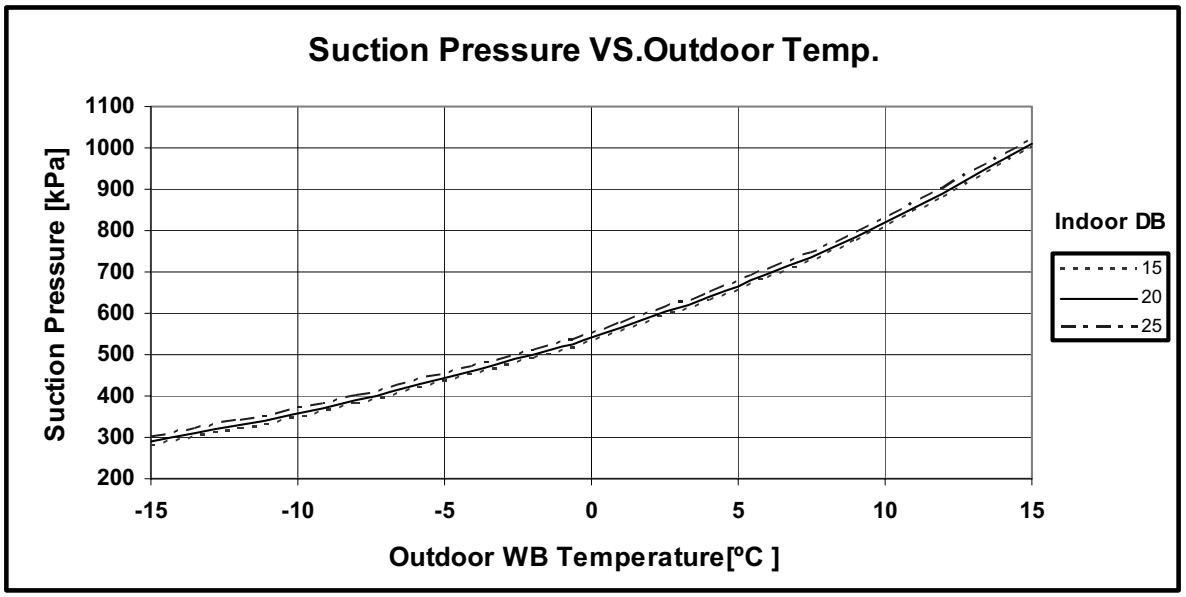


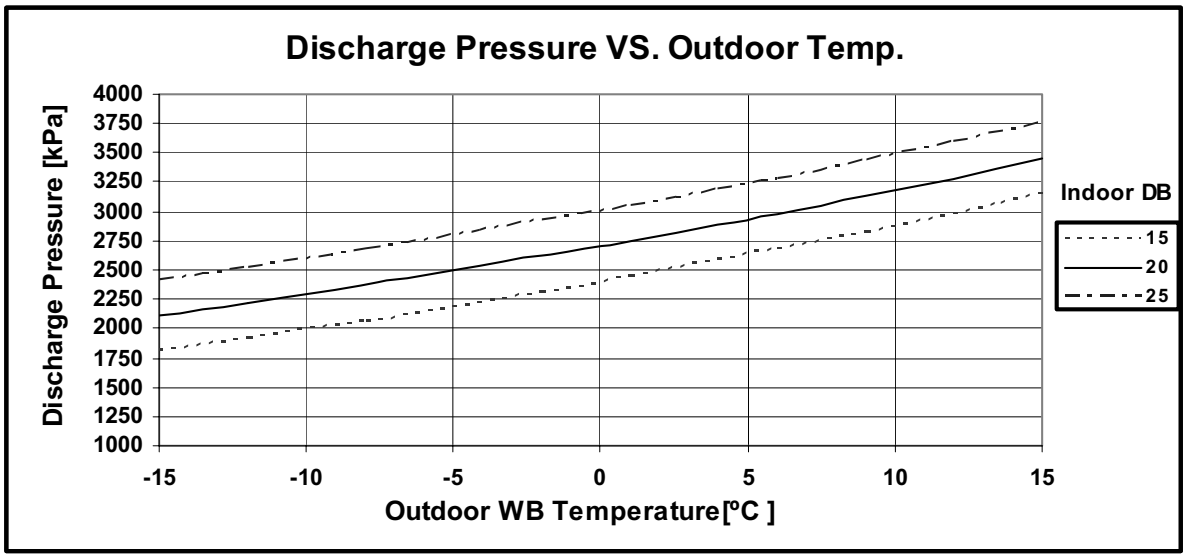
5.7.9 Model: WNG80 DCI / DCI 80 Cooling — Test Mode.





5.7.10 Heating — Test Mode





6. SOUND LEVEL CHARACTERISTICS

6.1 Sound Pressure Level

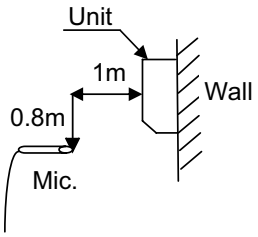
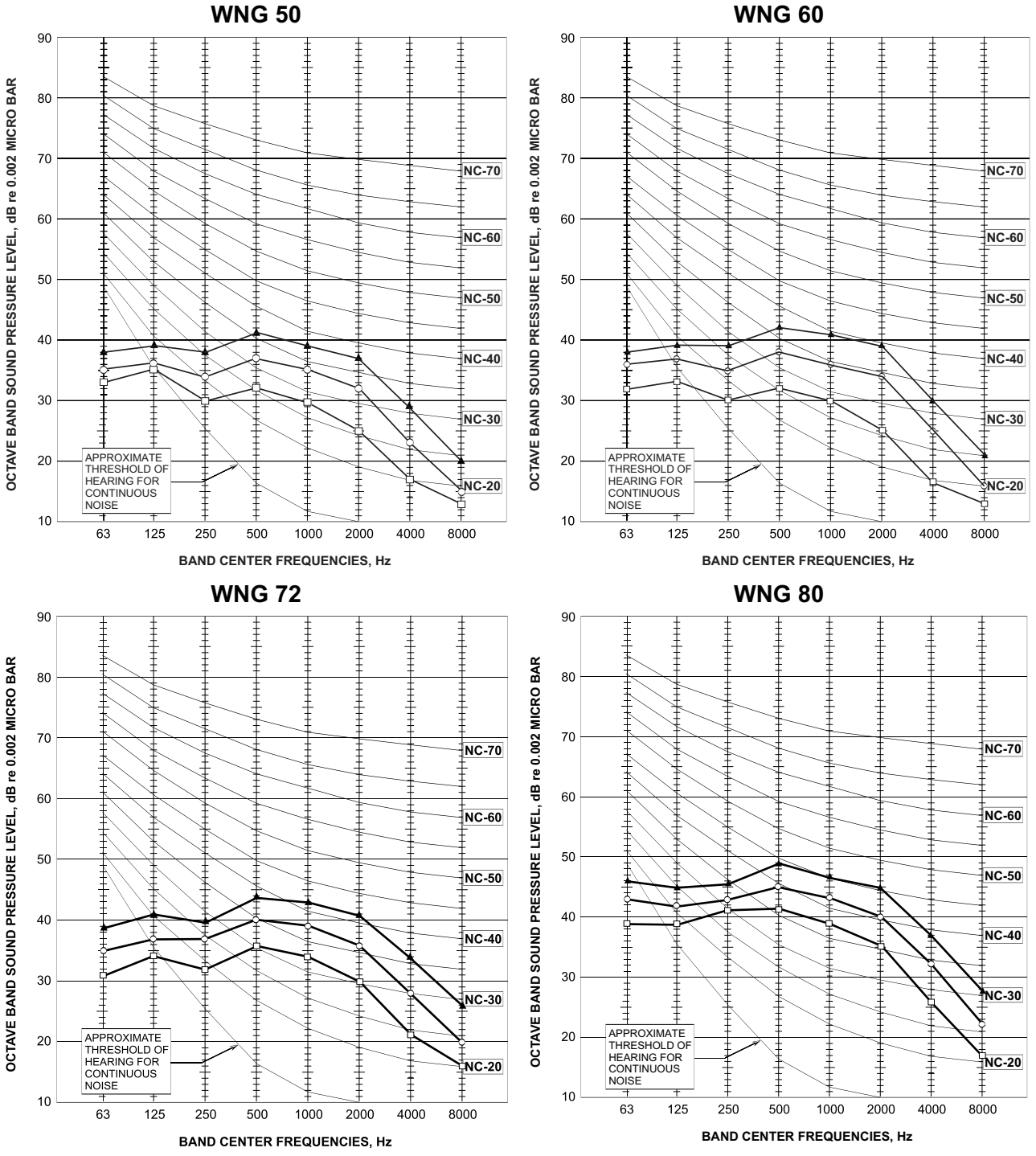


Figure 1

FAN SPEED	LINE
HI	▲
ME	○
LO	□

6.2 Sound Pressure Level Spectrum (Measured as Figure 1)



6.3 Outdoor units

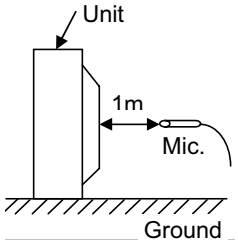
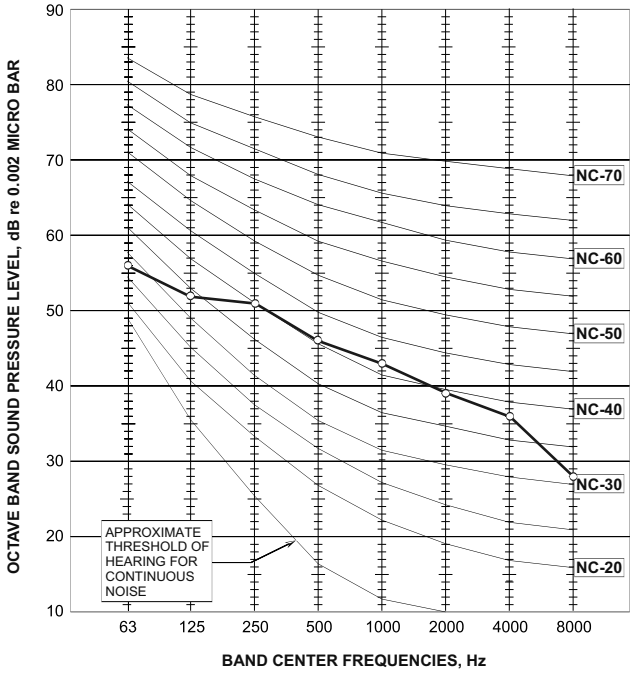


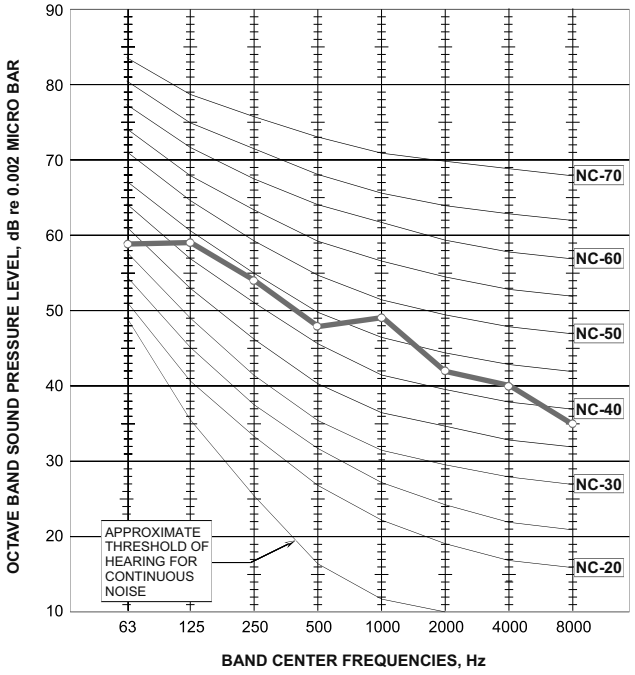
Figure 2

6.4 Sound Pressure Level Spectrum (Measured as Figure 2)

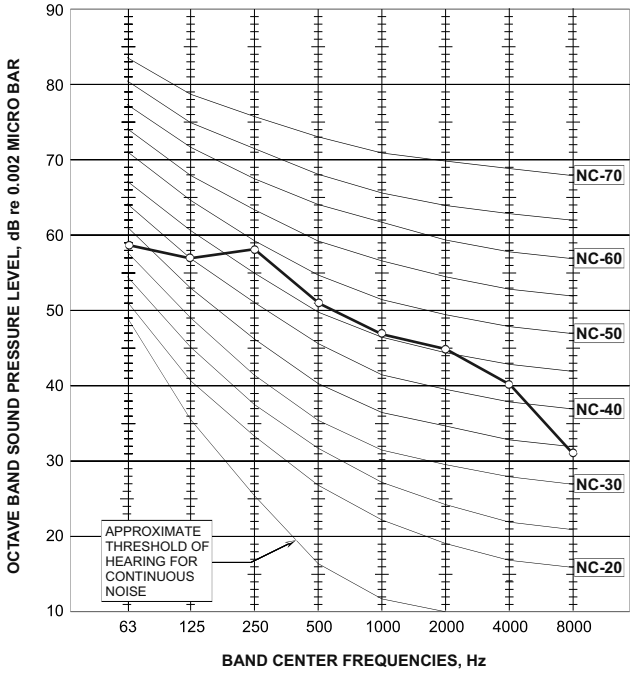
DCI 50 Cooling



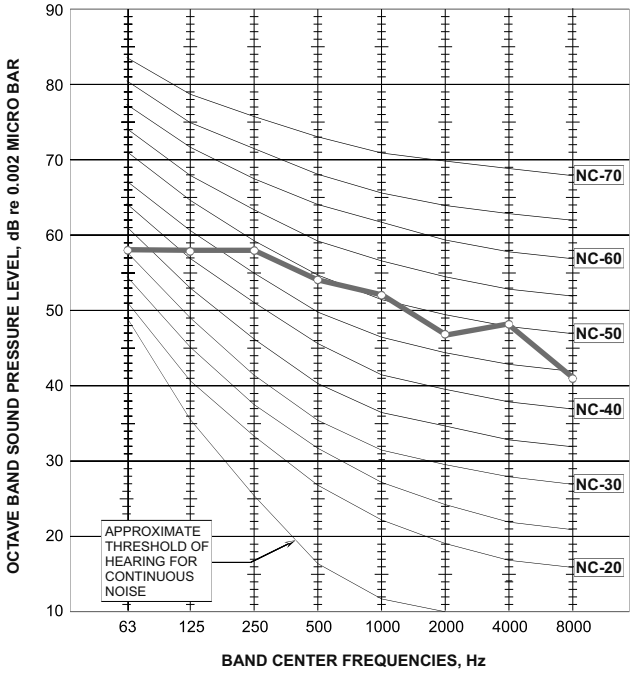
DCI 50 Heating



DCI 60 Cooling

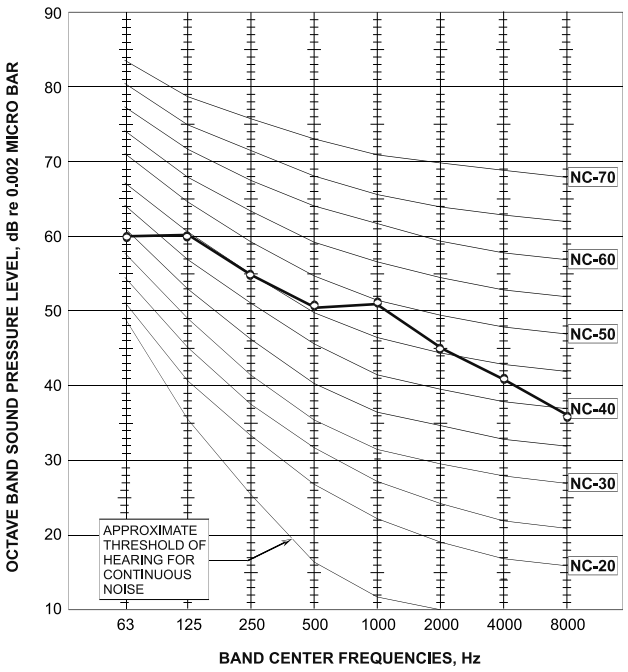


DCI 60 Heating

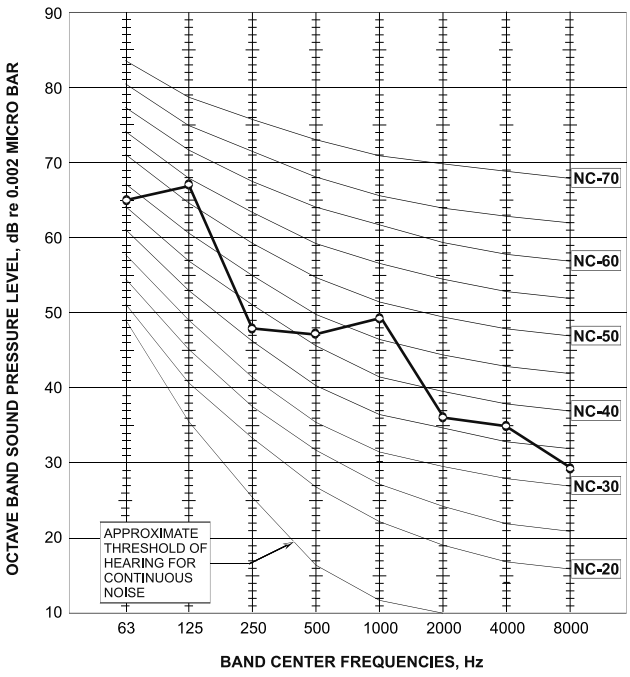


Sound Pressure Level Spectrum (Measured as Figure 2)

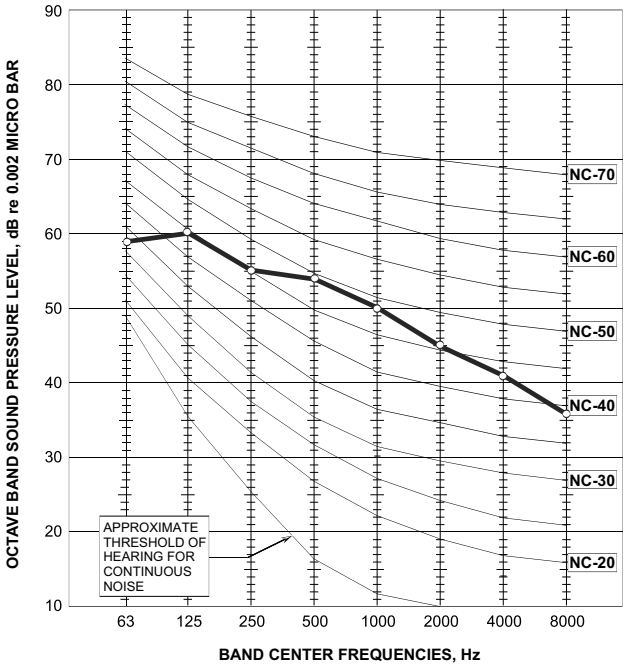
DCI 72Z Cooling



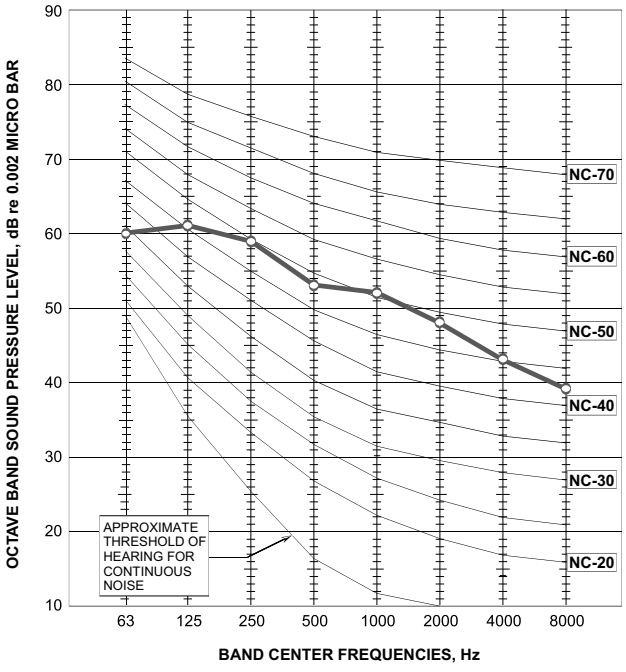
DCI 72Z Heating



DCI 72/80 Cooling



DCI 72/80 Heating



7. ELECTRICAL DATA

7.1 Single Phase Unit

Model	WNG50	WNG60	WNG72/80
Power Supply	1 PH ,220-240VAC ,50HZ		
Connected to	To indoor		To outdoor
Maximum Current	13.5A	15A	15.7A
Inrush Current \(a)	45 A		<35A
Starting Current\(b)	13.5 A	15A	15.7A
Circuit Breaker	20 A		
Power Supply	3 X 2.5 mm²		
Interconnecting cable	4 X 2.5 mm²		

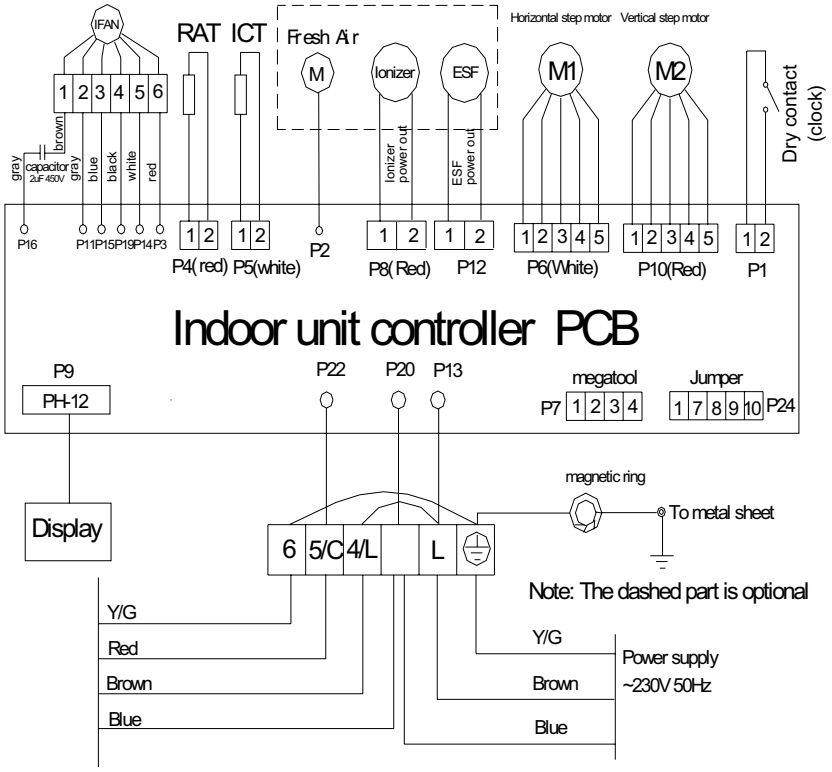
(a) Inrush current is the current when power is up (charging the DC capacitors at outdoor unit controller).
(b) Starting current is the current at compressor start up.

NOTE

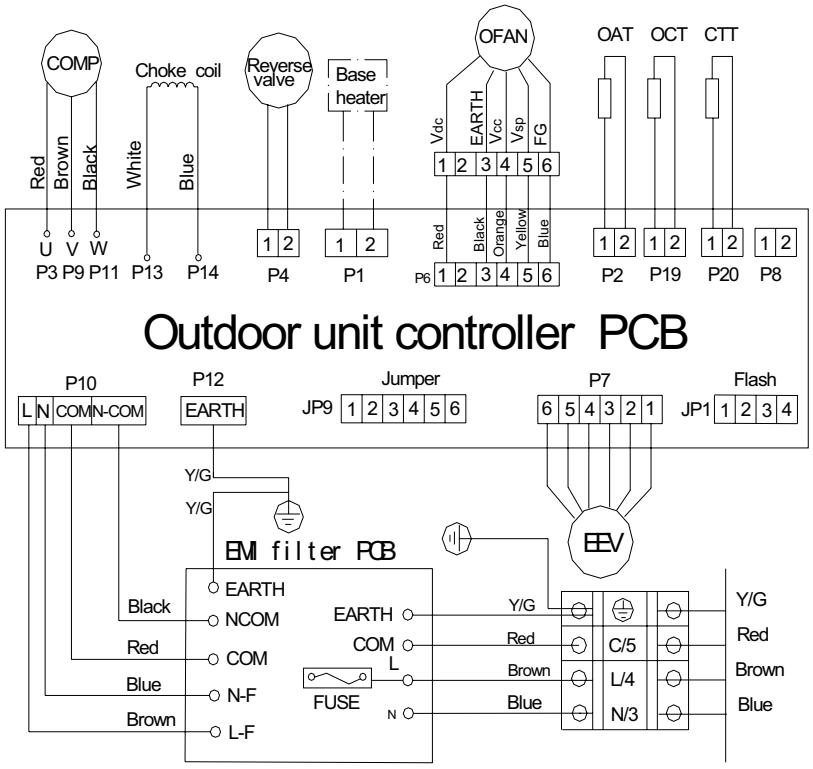
Power wiring cord should comply with local lows and electrical regulations requirements.

8. WIRING DIAGRAMS

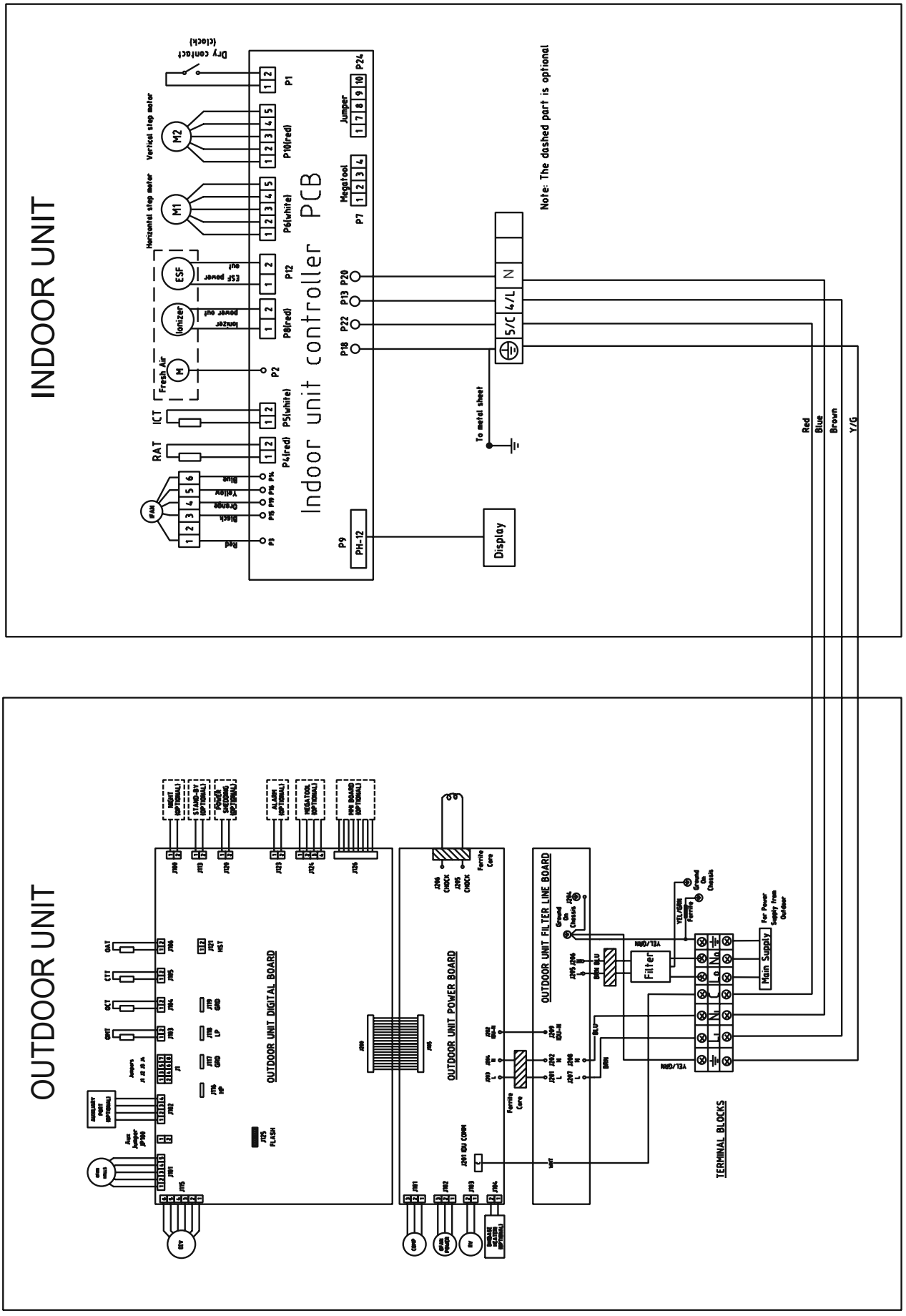
8.1 Indoor Unit: WNG 50_60 DCI



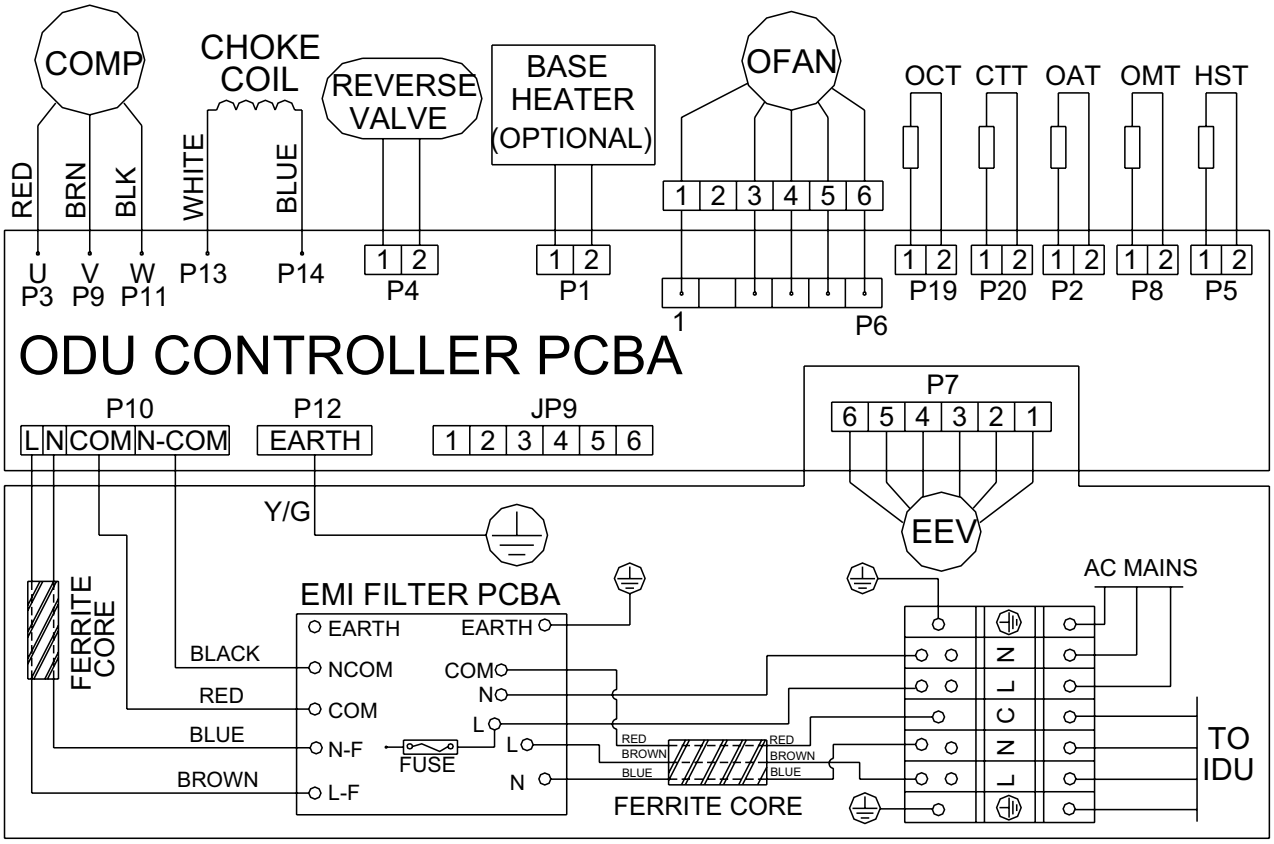
8.2 Outdoor Unit: DCI 50_60 DCI



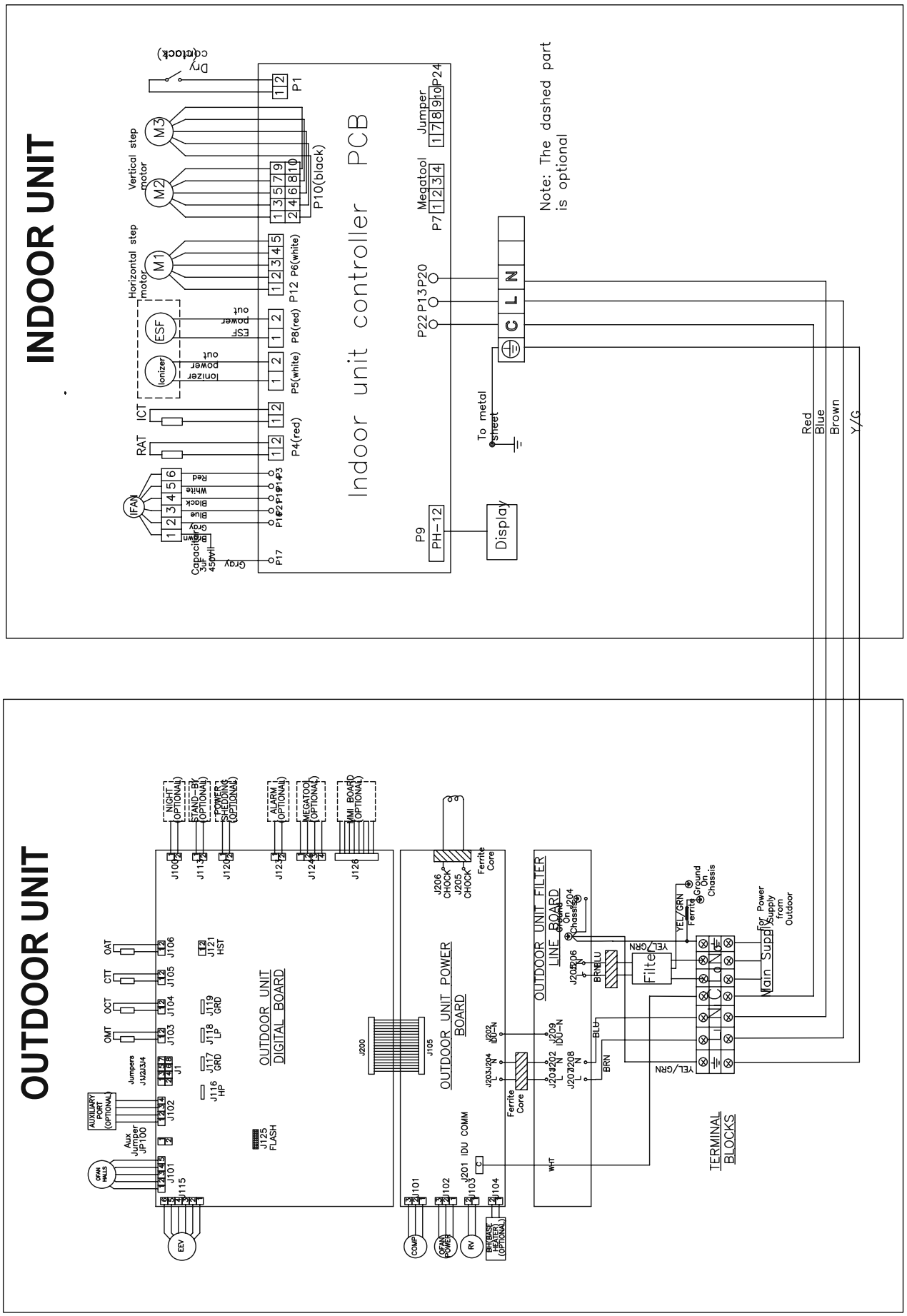
8.3 Indoor & Outdoor Units: WNG 72 DCI



8.4 Outdoor Units: DCI 72Z



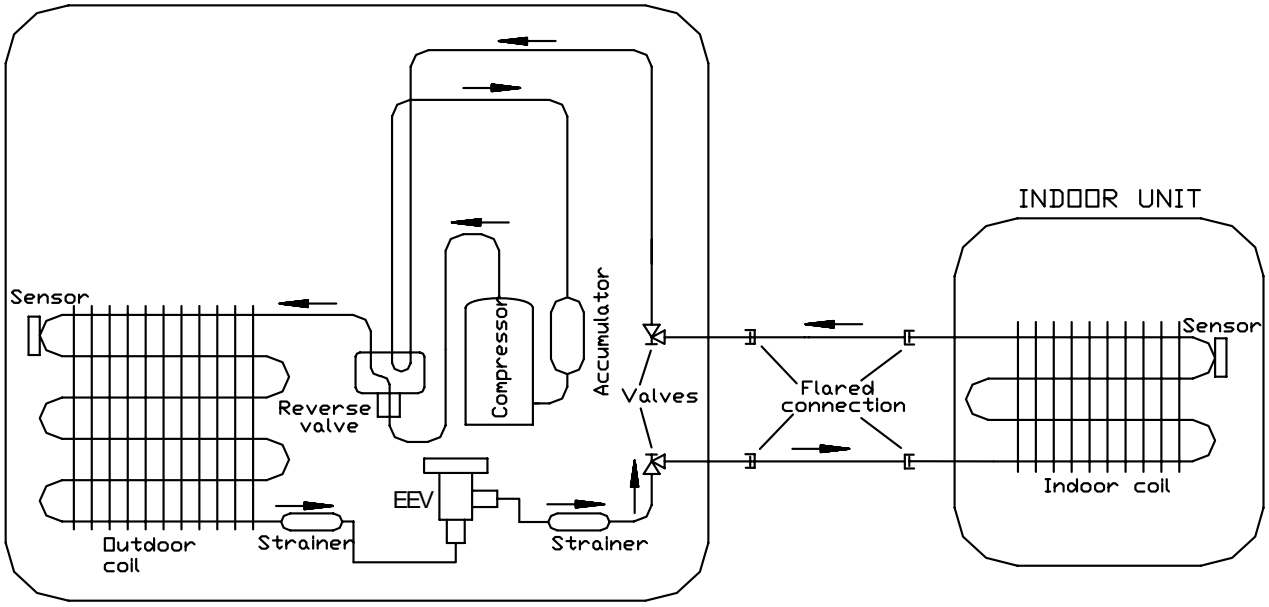
8.5 Indoor & Outdoor Units: WNG 80 DCI



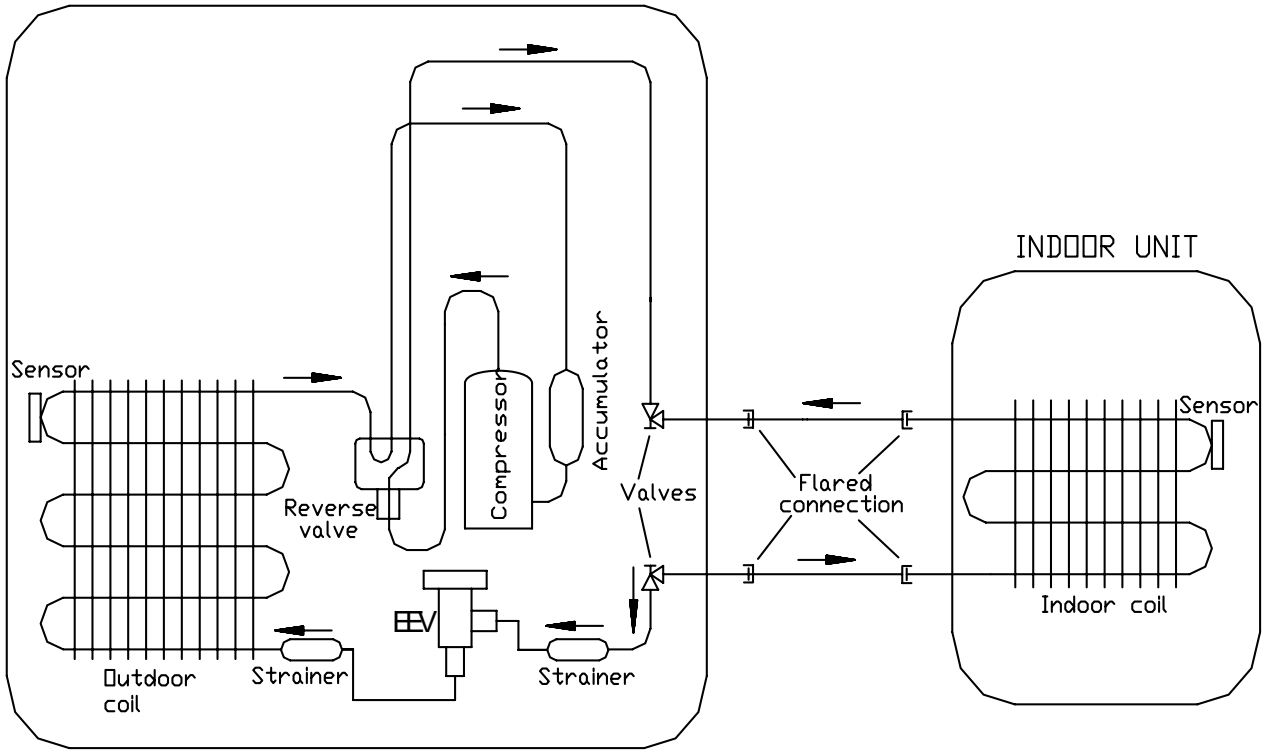
9. REFRIGERATION DIAGRAMS

9.1 Heat Pump Models

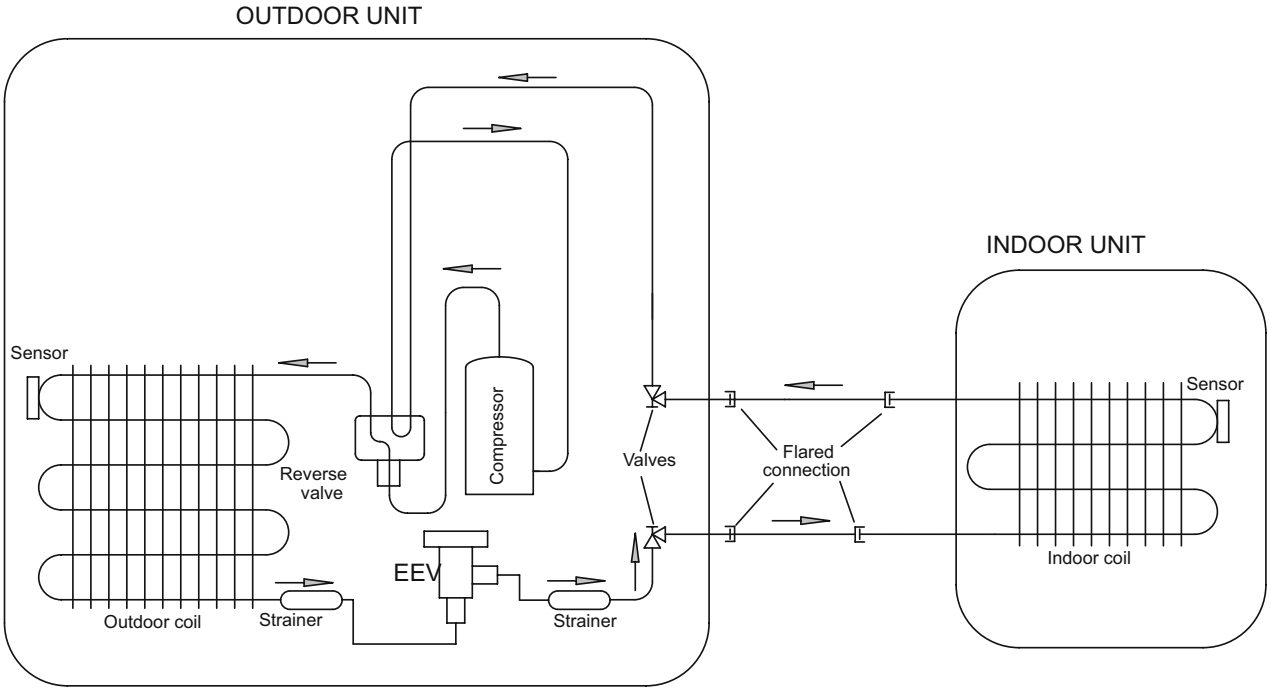
9.1.1 WNG 50_60 / DCI 50_60 Cooling Mode



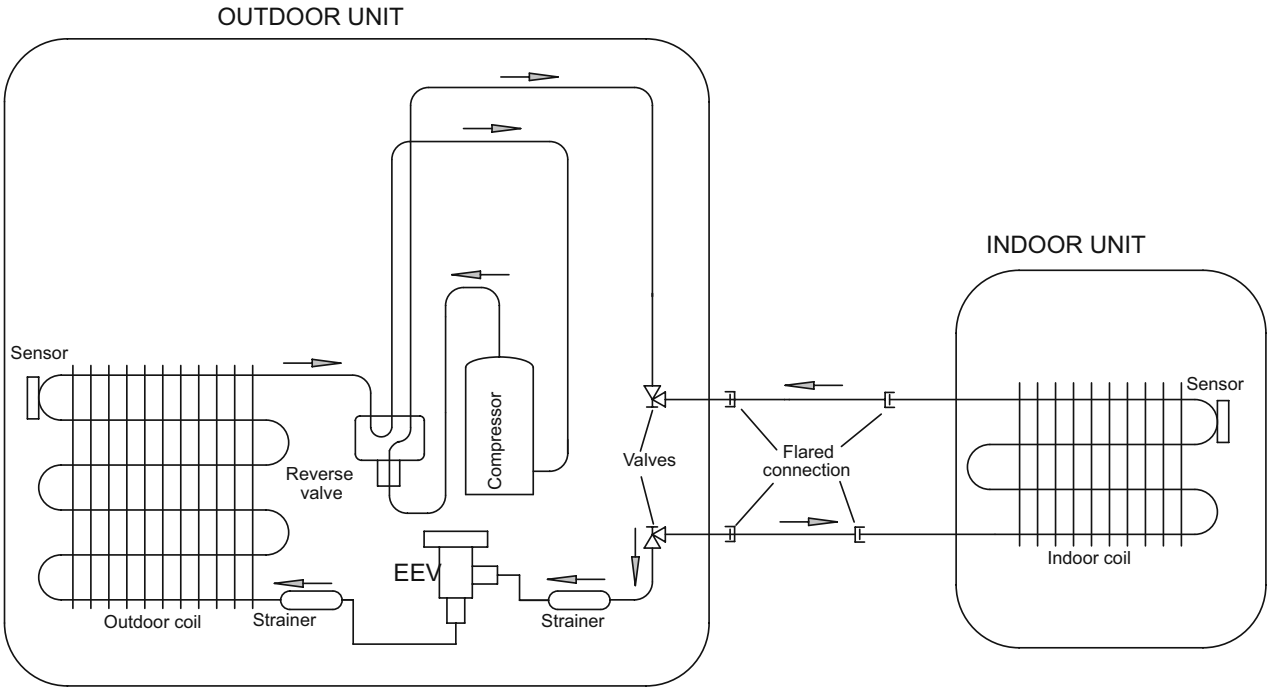
9.1.2 WNG 50_60 / DCI 50_60 Heating Mode



9.1.3 WNG 72/80, DCI 72/72 Z/80



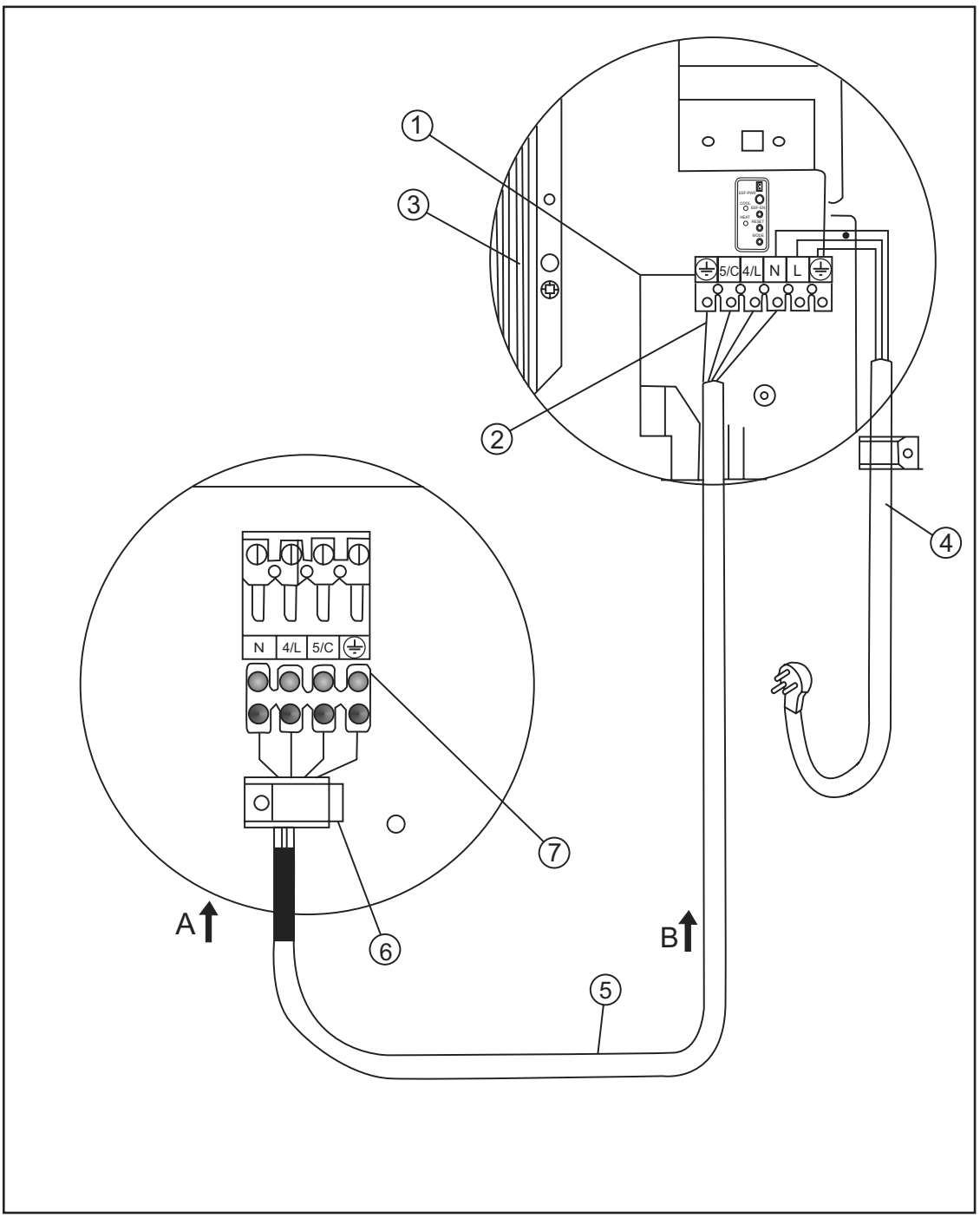
COOLING & DRY MODE



HEATING MODE

10. ELECTRICAL CONNECTIONS

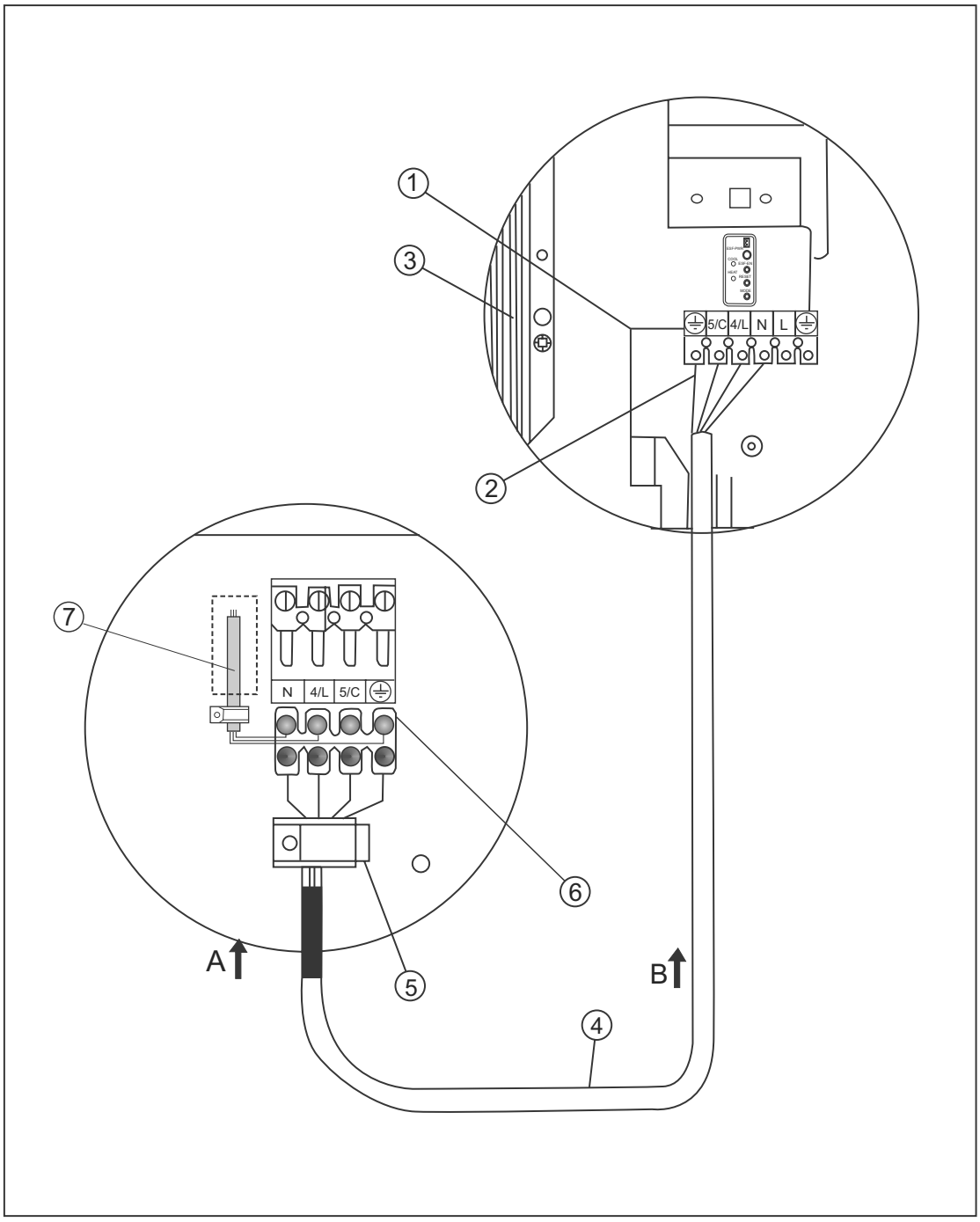
10.1 WNG 50, WNG 60 DCI



1. Indoor unit terminal
2. Ground wire.
3. Indoor coil.
4. Power cable in the indoor side.
5. Multiple wire cable.
6. Cable clamp.
7. Outdoor unit wire terminal.

A. OUTDOOR B. INDOOR

10.2 WNG 72, WNG 80 DCI

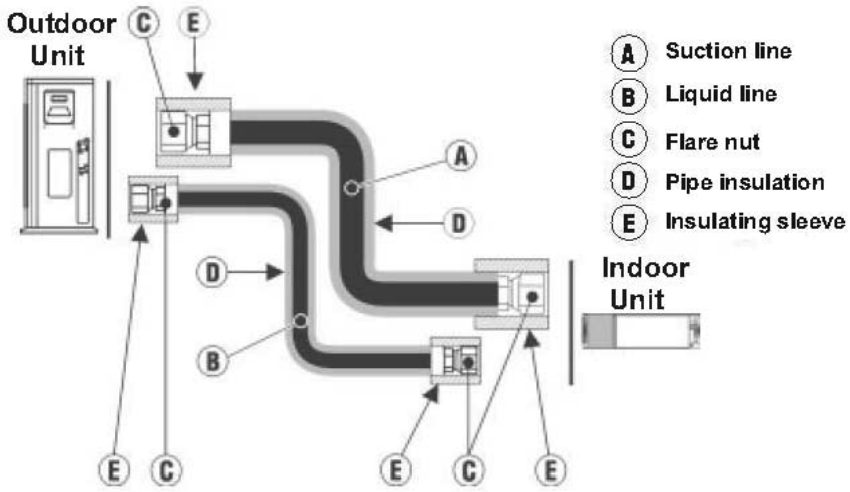


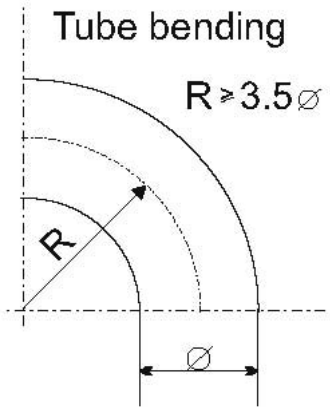
1. Indoor unit terminal
2. Ground wire.
3. Indoor coil.
4. Multiple wire cable.

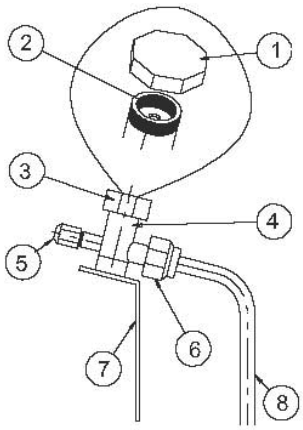
A. OUTDOOR B. INDOOR

5. Cable clamp.
6. Outdoor unit wire terminal.
7. Power cable in the outdoor side (only for outdoor unit power supply)

11. TUBING CONNECTIONS







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

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

12. CONTROL SYSTEM

12.1 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.

12.1.1 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 aparameter 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.

12.1.2 Compressor Frequency Control

12.1.2.1 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 LOADcalculation, 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	Maxium NLOAD Cooling	Maxium NLOAD Heating
Low	*MaxNLOADIF1C*	*MaxNLOADIF1H*
Medium	*MaxNLOADIF2C*	*MaxNLOADIF2H*
High	*MaxNLOADIF3C*	*MaxNLOADIF3H*
Turbo	*MaxNLOADIF4C*	*MaxNLOADIF4H*
Auto	*MaxNLOADIF5C*	*MaxNLOADIF5H*

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

12.1.3 Target Frequency Setting

12.1.3.1 Target Frequency Setting for DCI 50/60/72Z

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:

NLOAD	Target Frequency
127	*Maximum Frequency*
10<NLOAD<127	Interpolated value between minimum and maximum frequency
10	Minimum frequency
0	Compressor is stopped

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

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

12.1.3.2 Target Frequency Setting for DCI 72/80

The compressor Target Speed is calculated according to the following formula:

$$T\arg et\ Speed_{load} = \max\left[MinSpeed, MaxSpeed \cdot \frac{ODUNload}{127} \right]$$

MiniSpeed, MaxSpeed are defined as following:

When the unit is in the cool mode, $MiniSpeedC = 15Hz,\ MaxSpeed = 75Hz$

When the unit is in the heat mode, $MiniSpeedH = 20Hz,\ MaxSpeed = 95Hz$

ODU NLOAD is caculated according to the IDU NLoad:

$$ODU\ NLOAD = \min\left\{ \frac{3 * IDUNLOAD}{ODUCode}, 127 \right\}$$

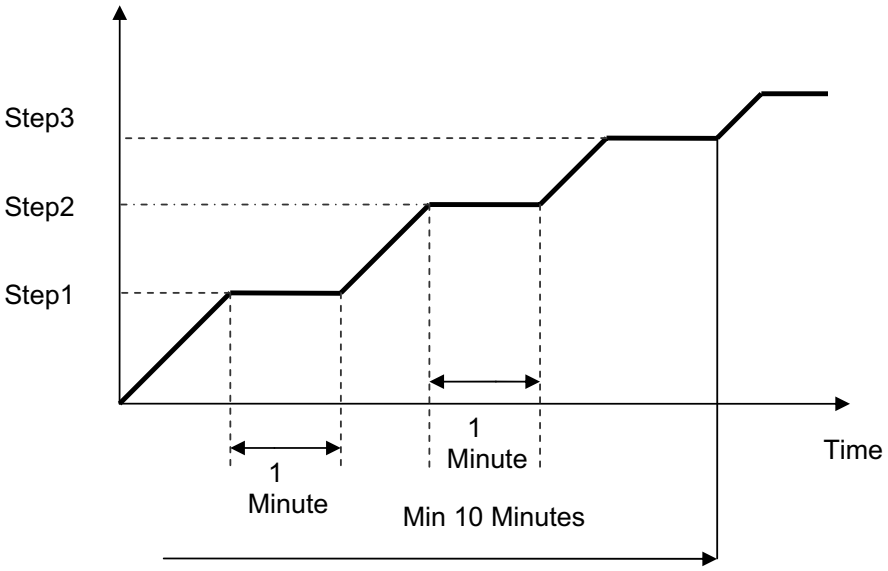
OAT	ODUCodeC	ODUCodeC	IDUNLOAD
≤-5	3	3	Refer to sect.112.1.2.1
≤-5	3.8	3	

12.1.4 Frequency Changes Control

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

12.1.5 Compressor Starting Control

12.1.5.1 Compressor starting control for DCI50/60/72Zzz



12.1.5.2 Compressor starting control for DCI72/80

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.

12.1.6 Minimum On and Off Time

3 minutes

12.1.7 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.

12.1.7.1 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 then 3 degrees.

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

12.1.8 Outdoor Fan Control

12.1.8.1 Outdoor Fan Control for DCI50/60

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.

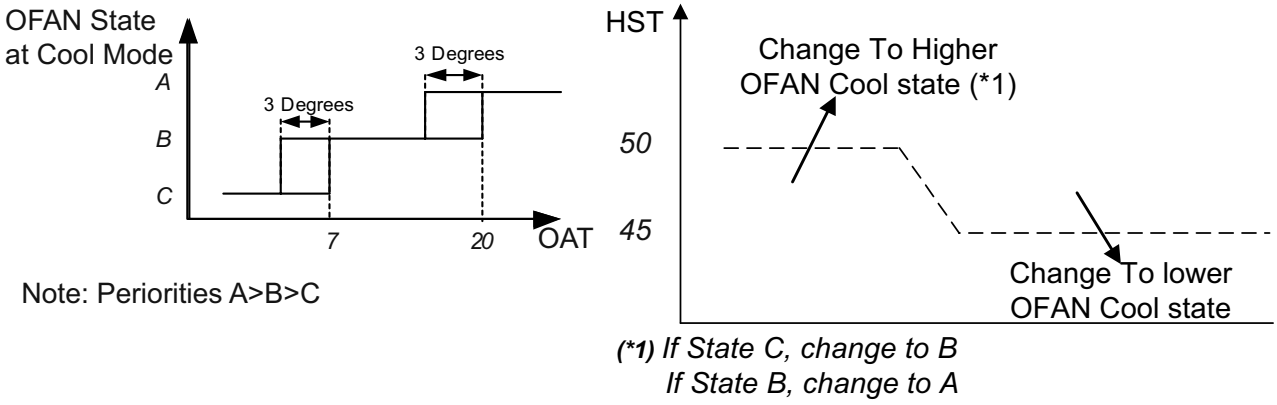
Outdoor fan speed is a function of compressor frequency and outdoor air temperature (OAT).

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

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.



Note: Periorities A>B>C

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

12.1.8.2 Outdoor Fan Control for DCI72/72Z/80

OFAN operates between any speed *OFMinRPM* to *OFMaxRPM*.

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

* For DCI 72Z, in heating mode the OFAN speed is related to OCT.

12.1.9 EEV (Electronic Expansion Vavle) Control

12.1.9.1 EEV Control for DCI50/60

EEV opening is defined as EEV = EEVOL + EEVCV

EEVOL is the initial EEV opening as a function of the compressor frequency, operation mode, unit model and capacity.

EEVCV is a correction value for the EEV opening that is based on the compressor temperature.

During the first 5 minutes of compressor operation EEVCV = 0.

Once the first 5 minutes are over, the correction value is calculated as follow: EEVCV(n) = EEVCV(n-1) + EEVCTT

EEVCTT 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.

12.1.9.2 EEV Control for DCI72/72Z/80

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

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

The EEV intial value(OL) is defined as follow:

EEV_{OL}= *EEVBaseOpenLoop* + *EEVOpenLoopCpctyCrct* + *EEVTubeCompnst*

Basic EEV open loop		Open Loop correction	EEV tube Length compensation
Mode	72/80	72/80	72/80
COOL	220	25	0
HEAT	170	30	0

*For DCI72Z

The initial EEV_{OL} is defined in accordance to the compressor frequency

EEV_{CV} is a correction value for the EEV opening that is based on the compressor temperature, During the first 6 minutes after SB the correction is not calculated. After that the correction value is updated every *30* seconds.

12.1.10 RV(Reversing Valve) Control

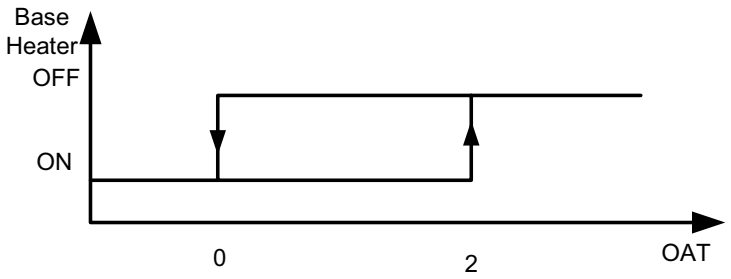
Reversing valve is on in heat mode.
Switching of RV state is done only after compressor is off for over 3 minutes.

12.1.11 Ioniser Control

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

12.1.12 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.

12.2 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 differencebetween actual room temperature and user set point temperature.

12.3 Cool Mode

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by PI control.
In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.
In AutoFan user setting, fan speed will be adjusted automatically according to the calculated NLOAD.

12.4 Heat Mode

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by PI control.
In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.
In AutoFan user setting, fan speed will be adjusted automatically according to the calculated NLOAD.

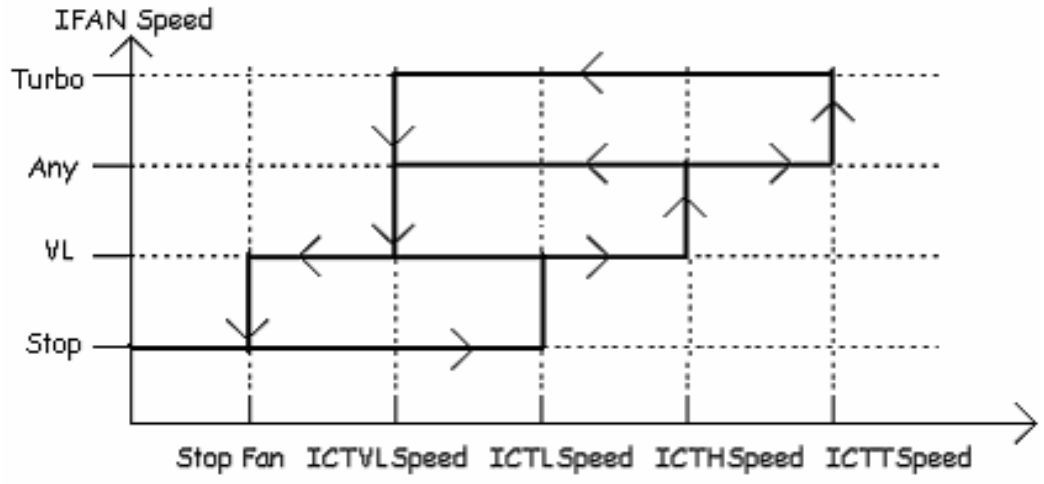
12.4.1 Temperature Compensation

In wall mounted, 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
Wall mounted	Compensation Disabled	Compensation Enabled
Cassette	Compensation Enabled	Compensation Disabled
Ducted	Compensation Enabled	Compensation Disabled
Floor/Ceiling	Compensation Disabled	Compensation Enabled

12.4.2 Indoor Fan Control in Heating Mode

Indoor fan speed depends on the indoor coil temperature:



12.5 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.

12.6 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.

12.7 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.

12.7.1 Indoor Coil Defrost Protection

ICT	ICT Trend				
	Fast Increasing	Increasing	No Change	Decreasing	Fast
ICT< *-2*	SC	SC	SC	SC	SC
-2 ≤ ICT<*0*	D1	D1	D2	D2	D2
0 ≤ ICT < *2*	SR	SR	D1	D2	D2
2 ≤ ICT< *4*	SR	SR	SR	D1	D2
4 ≤ ICT < *6*	Norm	Norm	SR	SR	D1
6 ≤ ICT ≤ *8*	Norm	Norm	Norm	SR	SR
ICT> *8*			Norm		

12.7.2 Indoor Coil Overheating Protection

12.7.2.1 Indoor Coil Overheating Protection For 50/60/72Z

ICT	ICT Trend				
	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
ICT >*62*	SC	SC	SC	SC	SC
60 ≤ ICT < *62*	D1	D1	D2	D2	D2
55≤ ICT <*60*	SR	SR	D1	D2	D2
52≤ ICT < *55*	SR	SR	SR	D1	D2
48≤ ICT < *52*	Norm	Norm	SR	SR	D1
45≤ ICT ≤ *48*	Norm	Norm	Norm	SR	SR
ICT <*45*			Norm		

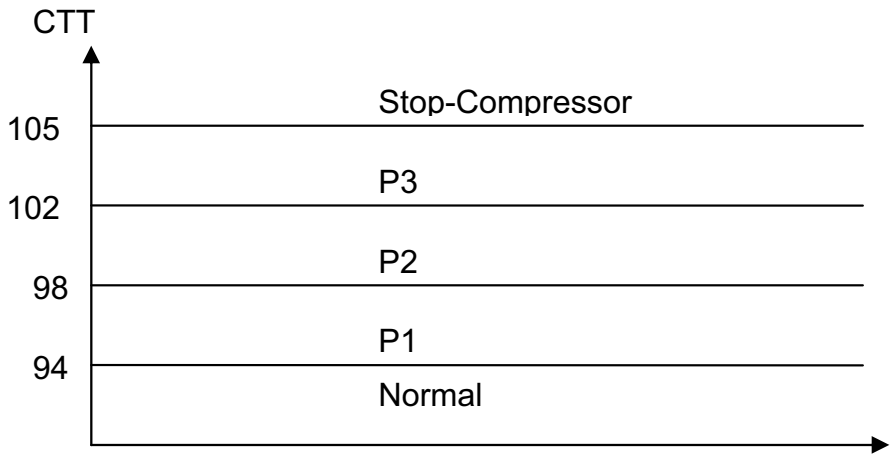
12.7.2.2 Indoor Coil Overheating Protection For 72/80

ICT	ICT Trend				
	<-2	**-2**	**-1,0,1**	**2**	**>2**
ICT >*62*	SC	SC	SC	SC	SC
60 ≤ ICT < *62*	D1	D1	D2	D2	D2
58≤ ICT <*60*	SR	SR	D1	D2	D2
56≤ ICT < *58*	SR	SR	SR	D1	D2
54≤ ICT < *56*	Norm	Norm	SR	SR	D1
52≤ ICT ≤ *54*	Norm	Norm	Norm	SR	SR
ICT <*52*	Norm				

12.7.3 Compressor Overheating Protection

12.7.3.1 Compressor Overheating Protection for DCI50/60/72Z

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

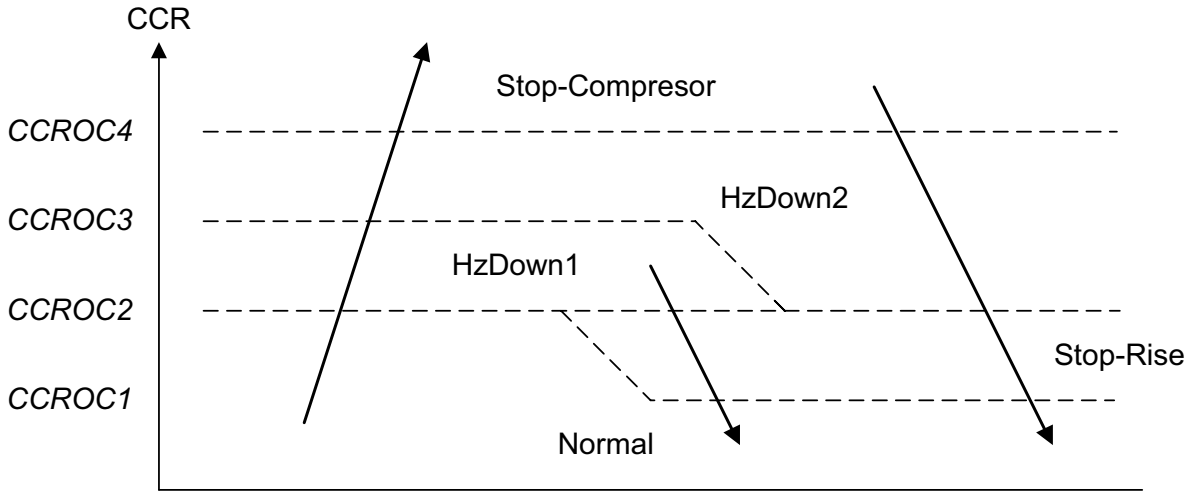


Control Status	Compressor Temperature Increases	Else
P1	Normal	Stop Rise
P2	HzDown 1	Stop Rise
P3	HzDown 2	HzDown 1
Stop Compressor	Stop Compressor	

12.7.3.2 Compressor Overheating Protection for DCI72/80

CTT		CTT Trend				
Cool	Heat	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
CTT >*105*	CTT >*105*	SC	SC	SC	SC	SC
100≤ CTT < *105*	*100*≤ CTT < *105*	D1	D1	D2	D2	D2
98≤CTT <*100*	*95*≤CTT <*100*	SR	SR	D1	D2	D2
93≤CTT < *100*	*85*≤CTT < *95*	SR	SR	SR	D1	D1
90≤CTT ≤ *93*	*80*≤CTT ≤ *85*	Norm	Norm	Norm	SR	SR
CTT <*90*	CTT <*80*	Norm				

12.7.4 Compressor Over Current Protection Only For DCI50/60/72Z



12.7.5 Heat Sink Overheating Protection

12.7.5.1 Heat Sink Overheating Protection For DCI50/60/72Z

HST	HST Trend				
	Fast Decreasing	Decreasing	No Change	Increasing	Fast Increasing
HST ≥ *90*	SC	SC	SC	SC	SC
85 ≤ HST < *90*	D1	D1	D2	D2	D2
82 ≤ HST < *85*	SR	SR	D1	D2	D2
80≤ HST< *82*	SR	SR	SR	D1	D1
78 ≤ HST ≤ *80*	Norm	Norm	Norm	SR	SR
HST < *78*	Norm				

12.7.5.2 Heat Sink Overheating Protection For DCI72/80

HST	Delta HST				
	<-2	**-2**	**-1,0,1**	**2**	**>2**
HST≥ *81*	SC	SC	SC	SC	SC
79 ≤ HST < *81*	D1	D1	D2	D2	D2
75 ≤ HST < *79*	SR	SR	D1	D2	D2
73≤ HST< *75*	SR	SR	SR	D1	D1
71 ≤ HST ≤ *73*	Norm	Norm	Norm	SR	SR
HST < *71*	Norm				

12.7.6 System Over Power Protection Only For DCI72/80

Power		Delta PWR				
		< -2000	***[-2000,0)***	***0***	***(0,2000]***	***> 2000***
PWR1	PWR2					
PWR ≥ *3500*	PWR ≥ *2900*	SC	SC	SC	SC	SC
3300≤PWR < *3500*	*2750*≤PWR < *2900*	D1	D1	D2	D2	D2
3100 ≤PWR < *3300*	*2600*≤PWR < *2750*	SR	SR	D1	D2	D2
3000≤PWR < *3100*	*2450*≤PWR < *2600*	SR	SR	SR	D1	D1
2950 ≤PWR ≤ *3000*	*2300* ≤PWR ≤ *2450*	Norm	Norm	Norm	SR	SR
PWR < *2950*	PWR < *2300*	Norm				

There are two sets of OVRPWR values, the selection of the values are set according to the state of the Power-Shed input.
Power-Shed input open Set values 1
Power-Shed input sort Set values 2

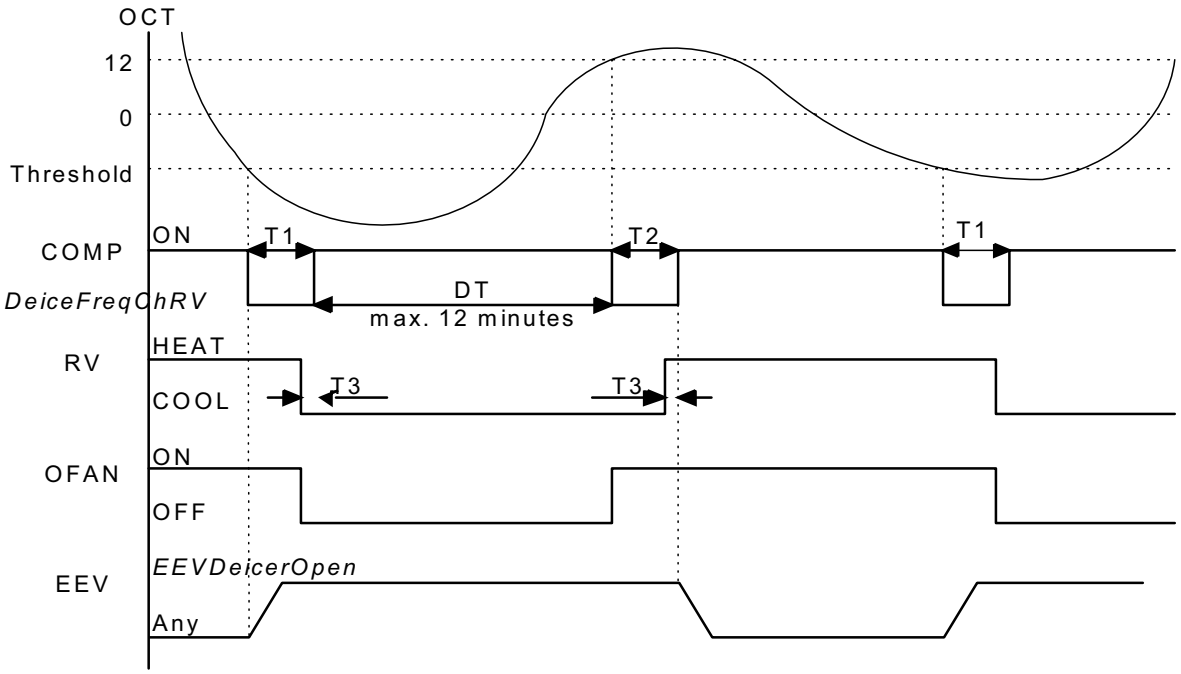
12.7.7 Outdoor Coil Deicing Protection

12.7.7.1 Outdoor coil Deicing Protection For DCI50/60/72Z

► **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 then former deicing time, the deicing interval time will be increased. If deicing time is longer then former deicing time, the deicing interval time will be decreased.

► Deicing Operation Procedure



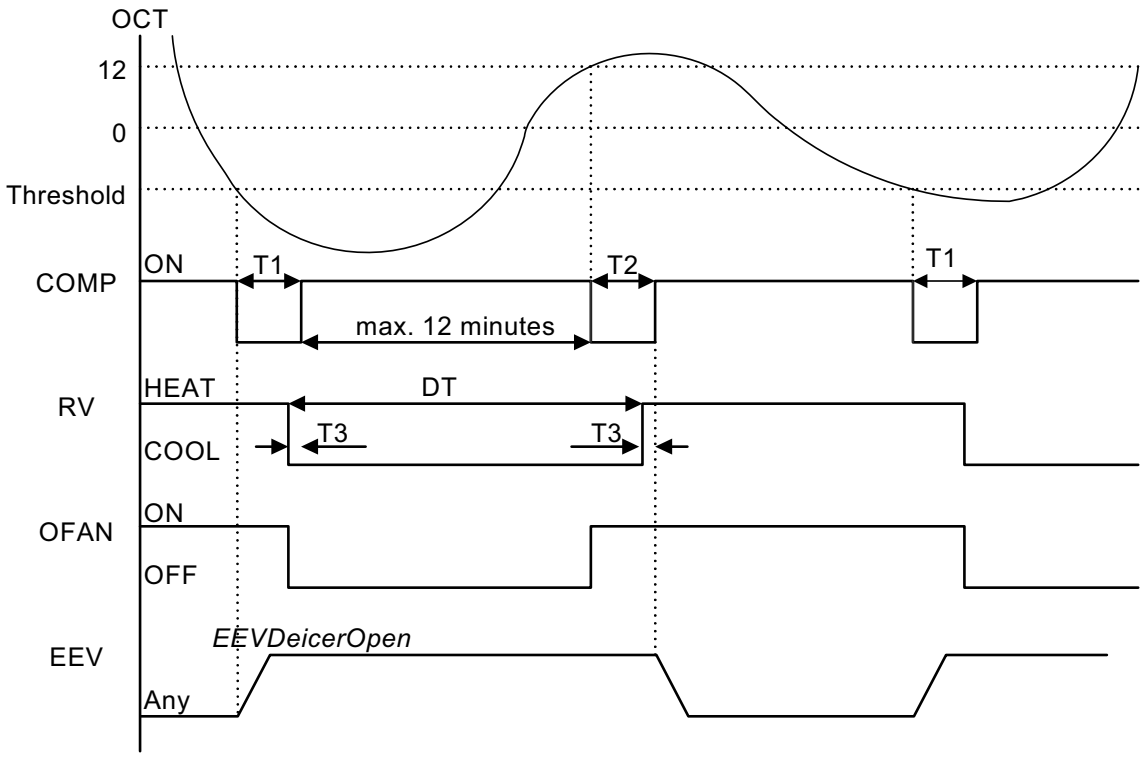
T1=60 secondes;T2=36 secondes;T3=6 secondes

12.7.7.2 Outdoor coil Deicing Protection For DCI72/80

► **Entering Deicing Conditions**

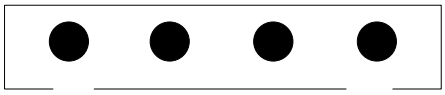
Deicing operation will start when either one of the following conditions exist:
Case 1: OCT < OAT – *8* AND TLD > *DI*
Case 2: OCT < OAT – 12 AND TLD > 30 minutes.
Case 3: OCT is Invalid AND TLD > *DI*
Case 4: Unit is just switched to STBY AND OCT < OAT – *8*
Case 5: NLOAD = 0 AND OCT < OAT - *8*
Case 6: OAT is invalid AND OCT< *8* AND TLD > *DI* AND Compressor ON Time > *15* minutes
All this condition will exist during 400 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 then former deicing time, the deicing interval time will be increased. If deicing time is longer then former deicing time, the deicing interval time will be decreased.

► **Deicing Operation Procedure**



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

12.7.8 Condensate Water Over Flow Protection



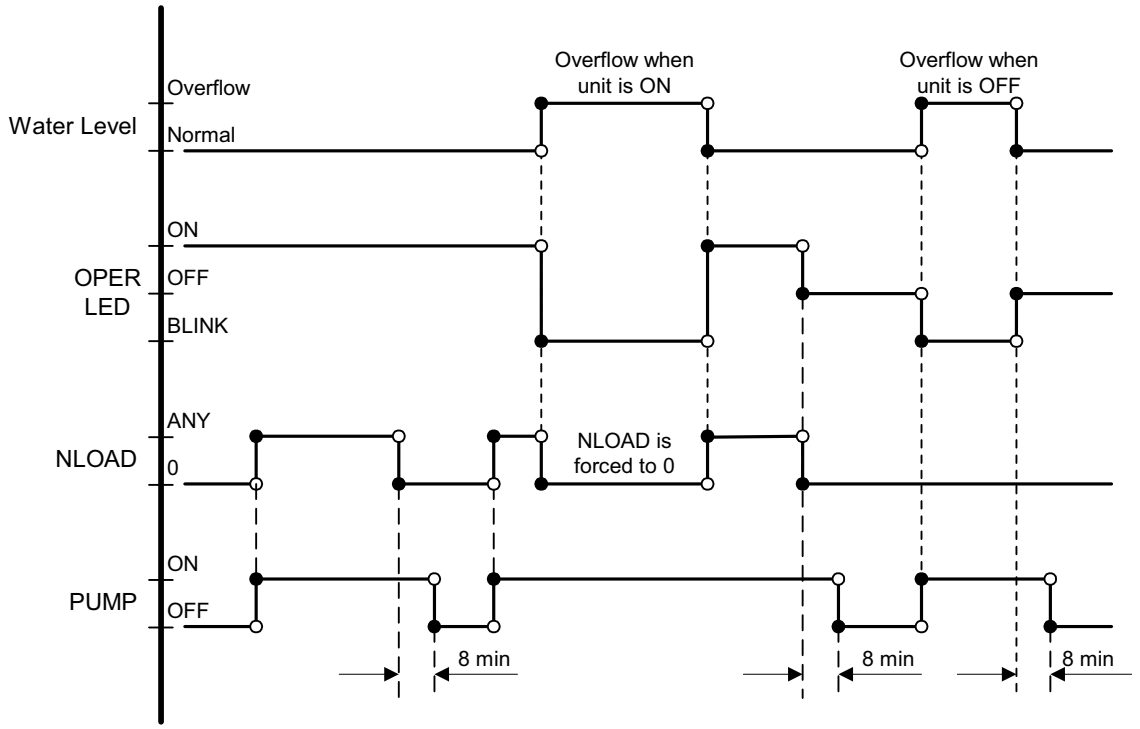
Each of the pins P1, P2, P3 can have two options:
1 – When it is shorted with P4
0 – When it is not shorted to P4

► **Water Level Protection-1 level**

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.



12.8 Indoor Unit Dry Contact

Indoor unit Dry contact has two alternative functions that are selected by J9.

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

12.9 Operating the Unit from Mode Button

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

12.10 On Unit Controls and Indicators

12.10.1 Indoor Unit controller Controls and Indicatiors 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 INDICATOR	1. Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands
OPERATION INDICATOR	1. Lights up during operation. 2. Blinks for 300 msec., to announce that a R/C infrared signal has been received and stored. 3. Blinks continuously during protections (according to the relevant spec section).
TIMER INDICATOR	Lights up during Timer and Sleep operation.
FILTER INDICATOR	Lights up when Air Filter needs to be cleaned.
COOLING INDICATOR	Lights up when system is switched to Cool Mode by using the Mode Switch on the unit.
HEATING INDICATOR	Lights up when system is switched Heat Mode by using the Mode Switch on the unit.
Mode SWITCH (COOL/HEAT/OFF)	Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB → … In long pressing system enters diagnostic mode.
RESET / FILTER SWITCH	For short pressing: When Filter LED is on - turn off the FILTER INDICATOR after a clean filter has been reinstalled. When Filter LED is off – enable/disable the buzzer announcer, if selected. In long pressing system enters set up mode (if in SB).

12.10.2 Outdoor Unit controller Indicatiors

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

12.11 Test Mode

12.11.1 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

12.11.2 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.

12.12 SW Parameters

12.12.1 Indoor Units SW Parameters

Model dependent parametes - KN

	A (KN-60)	B (KN-72)	C (KN-80)
Cap .Group	3	4	4
NomLoadC	81	61	67
NomLoadH	77	59	67
MaxNLOADIF1C	55	44	85
MaxNLOADIF2C	70	50	102
MaxNLOADIF3C	127	120	120
MaxNLOADIF4C	127	127	127
MaxNLOADIF5C	127	127	127
MinRTC	20	20	20
MaxNLOADRTC	127	127	127
MaxNLOADIF1H	127	127	127
MaxNLOADIF2H	127	127	127
MaxNLOADIF3H	127	127	127
MaxNLOADIF4H	127	127	127
MaxNLOADIF5H	127	127	127
MaxNLOADRTH	127	127	127
MaxRTH	27	27	27
MaxNLOADPSC	81	61	67
MaxNLOADPSH	77	59	67

Model dependent parameters - DNG

Unit	A (DNG50)	B (DNG60)	C (DNG72)	D (DNG80)
Cap .Group	3	3	4	4
NomLoadC	62	77	57	60
NomLoadH	74	80	55	63
ICTSTSpeed	22	22	22	22
ICTVLSpeed	28	28	28	28
ICTLSpeed	30	30	30	30
ICTHSpeed	32	32	32	32
ICTTSpeed	40	40	40	40
MaxNLOADIF1C	50	50	63	78
MaxNLOADIF2C	63	63	85	100
MaxNLOADIF3C	120	120	115	127
MaxNLOADIF4C	127	127	127	127
MaxNLOADIF5C	127	127	127	127
MinRTC	20	20	20	20
MaxNLOADRTC	127	127	127	127
MaxNLOADIF1H	127	127	127	127
MaxNLOADIF2H	127	127	127	127
MaxNLOADIF3H	127	127	127	127
MaxNLOADIF4H	127	127	127	127
MaxNLOADIF5H	127	127	127	127
MaxNLOADRTH	127	127	127	127
MaxRTH	27	27	27	27
MaxNLOADPSC	62	77	57	60
MaxNLOADPSH	74	80	55	63

Model dependent parameters - WNG

Parameter name	(WNG) Wall Mounted Models					
	25	35	50	60	72	80
NLOAD limits as a function of selected indoor fan speed						
MaxNLOADIF1C	40	40	45	50	53	68
MaxNLOADIF2C	53	53	62	85	75	90
MaxNLOADIF3C	120	120	120	120	105	120
MaxNLOADIF4C	127	127	127	127	127	127
MaxNLOADIF5C	127	127	127	127	127	127
Indoor Fan speeds						
IFVLOWC	700	700	700	800	850	850
IFLOWC	800	800	900	1000	1000	1000
IFMEDC	900	950	1050	1100	1150	1150
IFHIGHC	1050	1100	1200	1250	1350	1300
IFTURBOC	1150	1200	1250	1300	1400	1350
IFVLOWH	700	700	700	800	900	900
IFLOWH	800	850	900	950	1050	1050
IFMEDH	950	1000	1100	1150	1200	1200
IFHIGHH	1100	1150	1250	1250	1350	1300
IFTURBOH	1200	1250	1300	1300	1400	1350

Model dependent parameters - PXD

Unit	A (PXD50)	B (PXD60)	C (PXD72)	D (PXD80)
Cap .Group	3	3	4	4
NomLoadC	68	80	60	63
NomLoadH	77	82	60	67
MaxNLOADIF1C	40	50	127	127
MaxNLOADIF2C	60	85	127	127
MaxNLOADIF3C	90	127	127	127
MaxNLOADIF4C	90	127	127	127
MaxNLOADIF5C	90	127	127	127
MinRTC	20	20	20	20
MaxNLOADRTC	127	127	127	127
MaxNLOADIF1H	127	127	127	127
MaxNLOADIF2H	127	127	127	127
MaxNLOADIF3H	127	127	127	127
MaxNLOADIF4H	127	127	127	127
MaxNLOADIF5H	127	127	127	127
MaxNLOADRTH	127	127	127	127
MaxRTH	27	27	27	27
MaxNLOADPSC	68	80	60	63
MaxNLOADPSH	77	82	60	67

12.12.2 Outdoor Units SW Parameters:

Model dependent parameters for DCI50/60

#	Name	Single DCI-50	Single DCI 60
1	MinFreqC	20	20
2	MaxFreqC	85	95
3	MinFreqH	20	26
4	MaxFreqH	95	94
5	NormAccel	1	1
6	NormDecel	1	1
7	Step1Freq	60	60
8	Step2Freq	70	70
9	Step3Freq	90	90
10	OFVL	20	20
11	OFLOWC	60	55
12	OFMEDC	76	70
13	OFMAXC	92	79
14	OFLOWH	60	55
15	OFMEDH	83	70
16	OFMAXH	100	79
17	OFANTESTMODEC	92	83
18	OFANTESTMODEH	100	83
19	OFDelTestMode	28	28
20	CTTOH1	94	94
21	CTTOH2	98	98
22	CTTOH3	102	102
23	CTTOH4	105	105
24	CCROC1	10	11.4
25	CCROC2	10.5	11.8
26	CCROC3	10.8	12.2
27	CCROC4	11.2	12.6
28	DEICT1	60	60
29	DEICT2	36	36
30	DEICT3	6	6
31	ProtFreqLimit	60	60
32	EEVDecierOpen	100	180
33	OptimDeicFreq	90	90
34	EEVMinOperOpenC	50	80
35	EEVMaxOperOpenC	380	380
36	EEVMinOperOpenH	50	60
37	EEVMaxOperOpenH	380	300
38	EEVNormRate	33	33
39	EEVHighRate	12	12
40	EEVMaxOpen	500	500
41	OFLowFreqC	40	35
42	OFMedFreqC	70	55
43	OFLowFreqH	40	40
44	OFMedFreqH	86	60
45	HeaterDisableFlag	0	0
46	DeiceFreqChRV	0	0
47	OATRefC	35	35
48	SUCT Enable	0	0
49	HST Enable	1	1
50	OAT Enable	1	1
51	OATRefH	7	7
52	MinTargCTTC	30	30
53	MaxTargCTTC	95	90
54	MinTargCTTH	40	45
55	MaxTargCTTH	95	90
56	DST	8	8
57	DSTF	12	12
58	OATLimitC	28	28
59	OATLimit1H	6	6
60	OATLimit2H	15	15
61	MaxFreqAsOATC	64	85
62	MaxFreqAsOAT1H	85	80
63	MaxFreqAsOAT2H	60	60

Model dependent parameters for DCI72Z

No.	Name	Single DCI-72Z
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	13.3
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	24
30	OATLimit1H	6
31	OATLimit2H	15
32	MaxFreqAsOATC	60
33	MaxFreqAsOAT1H	85
34	MaxFreqAsOAT2H	75
35	NormAccel	1
36	NormDecel	1

Model dependent parameters for DCI72/80

Compressor Parameters	Value
MinOFFTime	3
MinOnTime	3
MaxCTT1	90
MaxCTT2	90
MinSpeedAsCTT1	26
MinSpeedAsCTT2	26
MaxSpeedC	75
MaxSpeedH	95
Step1RPS	40
Step2RPS	60
Step3RPS	75
NormAcc (sec/RPS)	1
NormDec (sec/RPS)	1
Down1(Sec/RPS)	12
Down2 (Sec/RPS)	7
DeiceAcc (Sec/RPS)	0.2
DeiceDec (Sec/RPS)	0.5

EEV Parameters	Value
NormEEVRate	30
EEVCompOFFOpen	200
EEVCompOFFTime	60
EEVMaxOpen	500
EEVMinOperOpenC	60
EEVMaxOperOpenC	500
EEVMinOperOpenH	70
EEVMaxOperOpenH	500
EEVMinOperOpenHInIDU	60
EEVMaxOperOpenHInIDU	140
EEVIDUOFFOpen	130
EEVMoveSteps	20
EEVTConstC	30
EEVTConstH	30
BlncTimTrnsStC	1
BlncTimStdyStC	1
BlncTimTrnsStH	1
BlncTimStdyStH	1
CompOffTimToTrnsSt	20

13. TROUBLESHOOTING

13.1 Troubleshooting for DCI50/60/72Z

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!!!

13.1.1 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 and follow the actions described.
7	Compressor stops during operation and Green LED remains on	Electronic control or power supply problem	Perform diagnostics and follow the actions described.
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 below, if not OK replace controller.

No	Symptom	Probable Cause	Corrective Action
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 , 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, and check if units is operating by EEPROM parameters.

13.1.2 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.

13.1.3 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

13.1.4 Indoor Unit Diagnostics

No	Problem	5	4	3	2	1
1	RT-1 is disconnected	0	0	0	0	1
2	RT-1 is shorted	0	0	0	1	0
3	RT-2 is disconnected	0	0	0	1	1
4	RT-2 is shorted	0	0	1	0	0
5	Reserved	0	0	1	0	1
7	Communication mismatch	0	0	1	1	1
8	No Communication	0	1	0	0	0
9	No Encoder	0	1	0	0	1
10	Reserved	0	1	0	1	0
11	Outdoor Unit Fault	0	1	0	1	1
…	Reserved					
17	Defrost protection	1	0	0	0	1
18	Deicing Protection	1	0	0	1	0
19	Outdoor Unit Protection	1	0	0	1	1
20	Indoor Coil HP Protection	1	0	1	0	0
21	Overflow Protection	1	0	1	0	1
22	Reserved					
24	EEPROM Not Updated	1	1	0	0	0
25	Bad EEPROM	1	1	0	0	1
26	Bad Communication	1	1	0	1	0
27	Using EEPROM data	1	1	0	1	1
28	Model A	1	1	1	0	0
29	Model B	1	1	1	0	1
30	Model C	1	1	1	1	0
31	Model D	1	1	1	1	1

13.1.4.1 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 EEPRRRROM parameters	
10	The power supply indicator (red led) doesn't light up.	There is no correct voltage between the line and neutral terminals on main P.C.B.	-If the voltage is low repair power supply. -If there is no voltage repair general wiring. -If there is correct voltage replace main or display P.C.B'S
11	TThe operating indicator (green led) does not light up	The remote control batteries are discharged	-Replace batteries of the remote control
12	The operating indicator (green led) does not light up when starting from unit..	Check main P.C.B and display P.C.B.	-Replace P.C.B if necessary.
13	The indoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main P.C.B	- If there is voltage replace capacitor or motor.

No.	Fault	Probable Cause	Corrective Action
14	The outdoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main P.C.B. There is voltage between outdoor fan terminals on the outdoor unit. There is no voltage between outdoor fan terminals on the outdoor unit.	- If there is no voltage replace main P.C.B - Replace capacitor or motor. - Check and repair electrical wiring between indoor and outdoor units.
15	The compressor does not start up.	Check voltage on compressor terminals on the outdoor unit. (with ampmeter) Check if there is correct voltage between compressor terminals on the outdoor unit.	-If no voltage replace main P.C.B. - If low voltage repair power supply. -If the voltage corrrect replace capacitor or compressor. -If there is no voltage repair electrical wiring between indoor and outdoor units.
16	The refrigeration system does not function correctly.	Check for leaks or restrictions, with ampmeter, pressure guage or surface thermometer.	- Repair refrigeration system and charge refrigerant if necessary.
17	No cooling or heating only indoor fan works.	Outdoor fan motor faulty or other fault caused, compresssor overload protection cut out.	-Replace P.C.B. - Outdoor fan blocked remove obstructions.
18	Only indoor fan and compressor working.	Outdoor fan blocked.	- Remove obstructions.
19	Only indoor fan working.	-Run capacitor of outdoor fan motor faulty. -Windings of outdoor fan are shorted.	- Replace capacitor. -Replace motor.

No.	Fault	Probable Cause	Corrective Action
20	No cooling or heating takes place, indoor and outdoor fans working.	- Overload safety device on compressor is cut out (low voltage or high temperature) - Compressor run capacitor faulty. - Compressor windings are shorted.	- Check for proper voltage, switch off power and try again after one hour. - Replace compressor capacitor. - Replace compressor.
21	No air supply at indoor unit, compressor operates.	-Indoor fan motor is blocked or turns slowly. -indoor fan run capacitor faulty. - motor windings are shorted.	- Check voltage,repair wiring if necessary. -Check fan wheel if it is tight enough on motor shaft,tighten if necessary. -Replace indoor fan motor.
22	Partial, limited air supply at indoor indoor unit.	Lack of refrigerant (will accompanied by whisteling noise) cause ice formation on indoor unit coil in cooling mode.	-Charge the unit after localizing leak.
23	Water accumulates and overflow from indoor unit section.	Drain tube or spout of drain pan clogged.	-Disasemble plastic drain tube from spout of indoor unit drain pan.
24	Water dripping from outdoor unit base. (in heating mode)	Water drain outlet is clogged.	-Open outdoor unit cover clean out water outlet ,clean the base inside througly.
25	Freeze-up of outdoor coil in heating mode, poor heating effect in room, indoor fan operates.	-Faulty outdoor thermistor. -Faulty control cable. - Outdoor temperature is too low (below -2°C) -Outdoor unit air outlet is blocked.	-Replace thermistor. - Repair control cable. - Shut unit off, outdoor temp. is below design conditions and cannot function properly. -Remove obstructions.

13.1.5 Outdoor Unit Diagnosits

No	Problem	5	4	3	2	1
1	OCT is disconnected	0	0	0	0	1
2	OCT is shorted	0	0	0	1	0
3	CTT is disconnected	0	0	0	1	1
4	CTT is shorted	0	0	1	0	0
5	HST is disconnected (when enabled)	0	0	1	0	1
6	HST is shorted (when enabled)	0	0	1	1	0
7	OAT is disconnected (when enabled)	0	0	1	1	1
8	OAT is shorted (when enabled)	0	1	0	0	0
9	TSUC is disconnected (when enabled)	0	1	0	0	1
10	TSUC is shorted (when enabled)	0	1	0	1	0
11	IPM Fault	0	1	0	1	1
12	Bad EEPROM	0	1	1	0	0
13	DC under voltage	0	1	1	0	1
14	DC over voltage	0	1	1	1	0
15	AC under voltage	0	1	1	1	1
16	Indoor / Outdoor unit Communication mismatch	1	0	0	0	0
17	No Communication	1	0	0	0	1
18	Reserved	1	0	0	1	0
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	OFAN locked	1	1	0	0	1
26	Compressor Lock	1	1	0	1	0
27	Bad Communication	1	1	0	1	1

13.1.5.1 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
8	Compressor Lock		Switch unit to STBY and restart
9	Bad Communication	Communication quality is low reliability	Check Indoor to Outdoor wiring and grounding

13.1.6 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

13.1.7 Simple procedures for checking the Main Parts

13.1.7.1 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).

13.1.7.2 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.

13.1.7.3 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

13.1.7.4 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).

13.1.7.5 Checking the Reverse Valve (RV).

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

13.1.7.6 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.

13.1.8 Precaution, Advise and Notice Items

13.1.8.1 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.

13.1.9 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.

13.1.10 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.

13.2 Troubleshooting for DCI72/80

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 1 Min. to discharge the system.

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

13.2.1 General System Failures and Corrective Actions

No	Symptom	Probable Cause	Corrective Action
1	Indoor unit power supply indicator (Red LED) does not light up.	No power supply	Check power supply. If OK, check display and display wiring. if OK, replace controller
2	Indoor unit does not respond to remote control message	Remote control message not reached the indoor unit	Check remote control batteries, if OK, check display and display wiring, if OK, replace display PCB. If still not OK replace controller
3	Indoor unit responds to remote control message but Operate indicator (Green LED) does not light up	Problem with display PCB	Replace display PCB. If still not OK replace controller
4	Indoor fan does not start (louvers are opened and Green LED is ON)	Unit in heat mode and coil is still not warm	Change to cool mode
		Outdoor unit is in opposite mode	Change operation mode
		Problem with controller 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.	Controller problem	Replace controller
6	Water leakage from indoor unit	Indoor unit drainage tube is blocked	Check and open drainage tube

No	Symptom	Probable Cause	Corrective Action
7	Outdoor unit display board and leds are off	No power supply	Check the connections and the wiring on the main terminal - Repair if needed.
		PFC Chock coil	Check the PFC Chock coil
		Burnt fuse	Check 20A fuse on the Filter
8	Compressor operates but no capacity	EEV problem	Check EEV
		Refrigerant leakage	Check refrigeration system
		Indoor coil block	Clean filters and/or remove block
		Outdoor coil block	Remove block and/or avoid air by-pass
9	Compressor is over heated and unit does not generate capacity	EEV problem	Check EEV
		Refrigerant leakage	Check refrigeration system)
		Indoor coil block	Clean filters and/or remove block
		Outdoor coil block	Remove block and/or avoid air by-pass
10	Compressor stops during operation	Electronic control	Check diagnostics
		Refrigerant leakage	Check refrigeration system
11	Unit is not operating	Communication problems	Check diagnostics
12	Compressor does not start	Electronics control problem or protection	
13	Unit works in wrong mode (cool instead of heat or heat instead of cool)	Electronics or RV problem	Check RV
14	All components are operating properly but no cooling or no heating	Refrigerant leak	Check refrigeration system
15	Compressor motor is generating noise and no suction occurs	Phase order to compressor is wrong	Check compressor phase order
16	Freezing of outdoor unit in heat mode and outdoor unit base is blocked with ice		Connect base heater
17	The unit stop suddenly during operation	EMC interference to the A/C unit	Check for EMC problems
18	Indoor unit(s) Indicator(s) leds may flicker		

No	Symptom	Probable Cause	Corrective Action
21	Other home appliances operation is faulty such as noise appears in the television picture, or the picture is distorted or static occurs in the radio sound	EMC interference by the A/C unit	Check for EMC problems
22	All others	Specific problems of indoor or outdoor units	Check diagnostics

13.2.2 Checking the refrigeration system

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

13.2.3 Diagnostics

13.2.3.1 Outdoor unit diagnostics

If any fault exists in the system, it will be shown according to tIf no fault exists in the system, no fault code will be displayed during normal operation mode, and the status led will be on while the compressor is enable.he following coding method.
Two LEDs display the system diagnostics on real time as follows:
STATUS LED is blinking 5 times in 5 seconds, and shut off for the next 5 seconds.
FAULT LED will blink during the same 5 seconds according to the following table:

No	Problem	5	4	3	2	1
1	OCT bad	0	0	0	0	1
2	CTT bad	0	0	0	1	0
3	HST bad	0	0	0	1	1
4	OAT bad	0	0	1	0	0
5	OMT bad	0	0	1	0	1
6	RGT bad	0	0	1	1	0
7	OFAN/Compressor Feedback Loss	0	0	1	1	1
8	OFAN- IPM fault	0	1	0	0	0
9	OFAN Lock	0	1	0	0	1
10	OFAN- Vospd exceeded	0	1	0	1	0
11	Compressor- IPM Fault	0	1	0	1	1
12	Compressor Lock	0	1	1	0	0
13	Compressor- Vospd exceeded	0	1	1	0	1
14	Compressor- Foldback	0	1	1	1	0
15	DC under voltage	0	1	1	1	1
16	DC over voltage	1	0	0	0	0
17	AC under voltage	1	0	0	0	1
18	No communication A	1	0	0	1	0
19	reserved	1	0	0	1	1
20	reserved	1	0	1	0	0
21	reserved	1	0	1	0	1
22	Compressor- Ilegal Speed	1	0	1	1	0
23	System Configuration Changed	1	0	1	1	1
24	System Configuration Problem	1	1	0	0	0
25	Heat sink Over Heating Fault/Protection	1	1	0	0	1
26	Deicing Protection	1	1	0	1	0
27	Compressor Over Heating Protection	1	1	0	1	1
28	System over power Protection	1	1	1	0	0
29	Bad EEPROM	1	1	1	0	1
30	Not Configured	1	1	1	1	0
31	Bad Communication	1	1	1	1	1

Notes:
1 - ON,0 - OFF

Whenever this table is updated, the installation test procedure, and the alarm output function should be updated.
Only one code is shown.
Order of priority is 1-32. Diagnostics is continuously ON as long as power is on.
Heat Sink Over Heating Protection, Compressor Over Heating Protection, and System Over Power Protection are declared only whenever in 'Stop-Compressor' status.
All faults, except the thermistor faults, will remain at least 10 seconds. This rule comes to serve the monitoring utilities, in a case the fault is released quickly it will be still shown under the monitoring utilities.
Thermistor faults are reported only when they are enabled.
When the outdoor unit is in fault (not protection), an in-fault signal is sent to the indoor. When all the outdoor unit faults are cleared, 'no-fault' signal is sent to the indoor.

13.2.3.2 Outdoor fault corrective actions

No	Fault Name	Probable Cause	Corrective Action
1	OCT bad	Thermistor not connected or damaged	Check Thermistor
2	CTT bad		
3	HST bad		
4	OAT bad		
5	TSUC bad		
6	RGT bad		
7	OFAN/Compressor Feedback Loss	OFAN halls or wires bad. Compressor wire cable bad or IPM bad or compressor bad	Check OFAN motor and compressor
8	OFAN - IPM fault	Over current / Over temperature of OFAN IPM	Check no obstruction to controller air opening Check OFAN motor Check motor type matches motor jumpers in controller
9	OFAN Lock	Fan does not rotate	Check OFAN motor
10	OFAN- Vospd exceeded	Exceeds speed high limit	Check motor type matches motor jumpers in controller Make necessary arrengments in unit installation location to avoid back wind Avoid EMC problems
11	Compressor- IPM Fault	Over current / Over temperature of compressor IPM	Check no obstruction to controller air opening Check Compressor
12	Compressor Lock	Compressor does not rotate	Check Compressor
13	Compressor- Vospd exceeded	Exceeds speed limit	Try again and replace controller if still have the problem
14	Compressor-Foldback	High pressure / Current reduces compressor speed	Check Compressor
15	DC under voltage	DC voltage is lower than limit	Replace controller
16	DC over voltage	DC voltage exceeds its high limit	Check if input voltage higher than limit (270VAC), if not and the problem presist, replace controller. If voltage is high, shut off the power and recommend the customer to fix the power supply
17	AC under voltage	AC input voltage is lower than limit	Check if input voltage lower than limit (170VAC), if not and the problem presist, replace controller. If voltage is low, recommend the customer to fix the power supply

No	Fault Name	Probable Cause	Corrective Action
18	No communication A	No signals in line A	Check communication
19	Compressor- Ilegal Speed	Exceeds speed low limit	See # 13
20	System Configuration Changed	Communication lines changed from last operation	No problem just an announcement
21	System Configuration Problem	Miss-match between the IDUs connected to port A,B,C or D, or the total capacity code of IDUs is higher than the ODU maximum capacity code	Change configuration if needed.
22	Heat sink Over Heating Fault/ Protection	Compressor stopped due to heatsink protection	Check that the airflow around the ODU is free and the fan is running free. Check fan motor (0)
23	Deicing Protection	During deicing procedure	No action required
24	Compressor Over Heating Protection	Compressor stopped due to over heat protection	Check if gas is missing in the system
25	System over power Protection	Compressor stopped due to over power protection	No action required
26	Bad EEPROM	EEPROM not operating	Power reset. (Replace Controller just in case you need EEPROM).
27	Not Configured	Cannot start the control	Power reset. Replace Controller if didn't help
28	Bad Communication	Bad communication lines	See # 18-21

13.2.4 Fault Code for Indoor unit

Pressing Mode button for long will activate diagnostic mode by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LED's.
Entering diagnostics in STBY mode allows only viewing of status (fault-display).
In diagnostic mode, system problems / information will be indicated by blinking of Heat & Cool LED's.
The coding method will be as follows:
Heat led will blink 5 times in 5 seconds, and then will be shut off for the next 5 seconds. Cool Led will blink during the same 5 seconds according to the following table:

No	Fault Name	5	4	3	2	1
1	RT-1 is disconnected	0	0	0	0	1
2	RT-1 is shorted	0	0	0	1	0
3	RT-2 is disconnected	0	0	0	1	1
4	RT-2 is shorted	0	0	1	0	0
…	Reserved	0	0	1	0	1
7	Communication mismatch	0	0	1	1	1
8	No Communication	0	1	0	0	0
9	No Encoder	0	1	0	0	1
10	Reserved	0	1	0	1	0
11	Outdoor Unit Fault	0	1	0	1	1
…	Reserved					
17	Defrost protection	1	0	0	0	1
18	Deicing Protection	1	0	0	1	0
19	Outdoor Unit Protection	1	0	0	1	1
20	Indoor Coil HP Protection	1	0	1	0	0
21	Overflow Protection	1	0	1	0	1
…	Reserved					
24	EEPROM Not Updated	1	1	0	0	0
25	Bad EEPROM	1	1	0	0	1
26	Bad Communication	1	1	0	1	0
27	Using EEPROM data	1	1	0	1	1
28	Model A	1	1	1	0	0
29	Model B	1	1	1	0	1
30	Model C	1	1	1	1	0
31	Model D	1	1	1	1	1

1 - ON, 0 - OFF

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

13.2.4.1 Indoor unit diagnostics and corrective actions

No.	Fault	Probable Cause	Corrective Action
1-4	Sensor failures	Sensors not connected or damaged	Check sensor connections or replace sensor
7	Communication mismatch	Indoor and Outdoor controllers are with different versions	Replace Indoor controller
8	No Communication	Communication or grounding wiring is not good	Check Indoor to Outdoor wiring and grounding
9	No Encoder	Indoor electronics or motor	Check motor wiring, if ok, replace motor, if still not ok, replace Indoor controller.
11	Outdoor Unit Fault	Outdoor controller problem	Switch to Outdoor diagnostics.
17-21	Protections	Indication	No action
24	EEPROM Not Updated	System is using ROM parameters and not EEPROM parameters	No action, unless special parameters are required for unit operation.
25	Bad EEPROM		No action, unless special parameters are required for unit operation.
26	Bad Communication	Communication quality is low reliability	Check Indoor to Outdoor wiring and grounding
27	Using EEPROM data	No problem	
28-31	IDU model		

13.2.5 Procedures for checking Main Parts

13.2.5.1 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).

13.2.5.2 Checking Main fuse

Check 20A fuse on the Filter Board - If burnt – check the compressor, fan or any other peripheral that can cause a short. In case of a problematic peripheral - replace it.
In case no problematic peripheral, check the resistance on the DC bank (B+ & B- on the Power board), if it is less than 30**Ω**, replace the controller. Otherwise replace the burnt fuse. In case of frequent burning fuse, replace the controller.

13.2.5.3 Checking PFC Chock coil

Check PFC chock connection – repair if needed.
Dis-connect the chock from the controller wire extensions, check if the 2 wires of the chock are shorted. If shorted (OK) check between each wire and the metal box. If shorted replace chock, if not (OK), open the controller top cover and check if the wire extensions are connected well and if shorted. If not shorted, replace wires, if shorted (OK) than might be a controller problem – replace controller.

13.2.5.4 Checking the Outdoor Fan Motor

Check FAN-Power and FAN-Halls connections - Repair if needed.
Rotate the fan slowly by hand. If the fan does not rotate easily, check whether something is obstructing the fan, or if the fan itself is coming into contact with the outer case, preventing it from rotating. Correct if necessary - otherwise, the fan motor bearings have seized. Replace the motor.
If the fan rotates easily, use a current probe ("Clamp") to assure AC current on each phase and it is less than 1A.
In case there is no current, check the resistance between the three poles. Assure the three coil resistances are almost the same.
The normal value should be between 10**Ω** to 20**Ω**.
Change to Stand-by or Power OFF and re-start - If the fault is still active - replace controller.

13.2.5.5 Checking the Compressor

Check Compressor connections - Repair if needed.
Use a current probe ("Clamp") to assure that there is an AC current on each phase – no more than 15A.
In case there is no current, check the resistance between the three poles. Assure the three coil resistances are almost the same (between 0.8**Ω** to 1.5**Ω**).
Change to Stand-by or Power OFF and re-start - If the fault is still "Active" - replace controller.

13.2.5.6 Checking the Reverse Valve (RV)

The RV has two parts, Solonoid and valve.
Solonoid - Running in heating mode, check the voltage between two pins of reverse valve connector, normal voltage is 230VAC. if no power supply to RV, Check RV operation with direct 230VAC power supply, if OK, replace outdoor controller.
Valve - if RV solonoid is OK (as above) but still no heating operation while compressor is On, replace the valve.

13.2.5.7 Checking the electrical expansion valve (EEV)

The EEV has two parts, drive and valve.
When Outdoor unit is powered on, EEV shall run and have click and vibration.
For assuring the problem is of the EEV parts, perform the installation test and if fails and no other indications in the diagnostics, than the problem is with the EEV (one or more).
Drive - a step motor; ringed on the valve. Check the drive voltage, should be12VDC.
Valve – if drive is OK (as above) but still the indoor unit perform no conditioning replace the valve (no need to take out the refrigerant, just pump down and shut off the main valves).

13.2.5.8 Checking the termistors

Check Thermistor connections and wiring - Repair if needed.
Check Thermistor resistance – between 0ºC and 40ºC should be between 35K**Ω** and 5K**Ω**.

13.2.5.9 Checking the communication

Change to Stand-by or Power OFF and re-start - If the fault is still "Active" check Indoor to Outdoor. Communication wiring and grounding connections (should be less than 2.0**Ω**) - Repair if needed.
If IDU failure – replace IDU controller that does not respond.
If ODU failure – replace ODU.

13.2.5.10 Checking for electromagnetic interferance (EMC problems)

EMC troubles to the A/C unit

Locations most susceptible to noise :

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

Trouble :

Either of the following trouble may occur:

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

Correction :

The fundamental concept is to make the system less susceptible to noise (insulate for noise or distance from the noise source):

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

13.2.5.11 EMC troubles to near by home appliances

Locations most susceptible to noise :

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

Trouble :

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

Correction

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

13.2.6 Precaution, Advise and Notice Items

13.2.6.1 High voltage in Outdoor unit controller

Whole controller, including the wires, 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.

13.2.6.2 Charged Capacitors

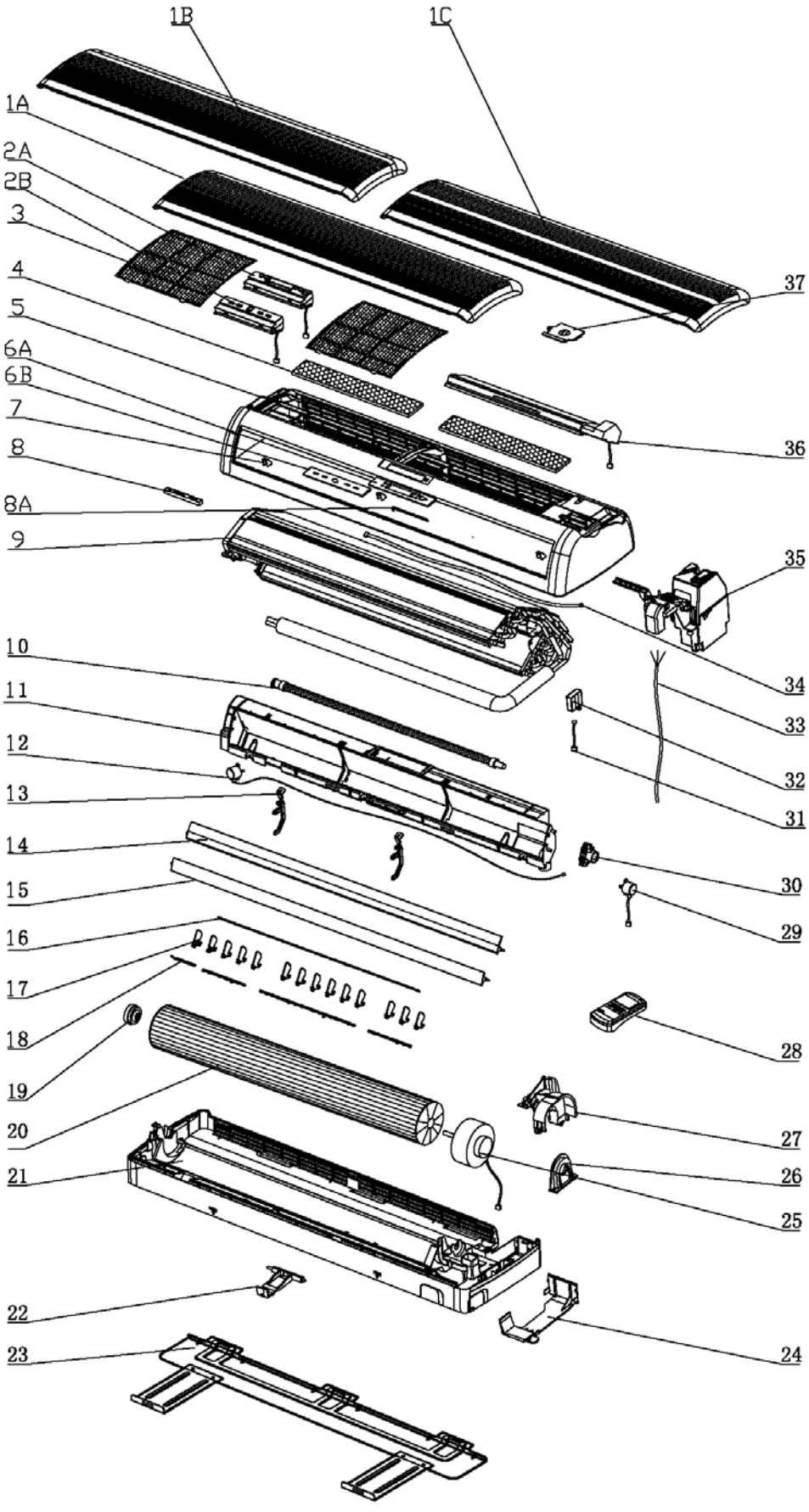
Three large-capacity electrolytic capacitors are used in the Outdoor unit controller. Therefore, charging voltage (380VDC) remains after power down. Discharging takes about one minute after turned off. Touching the Outdoor unit controller before discharging may cause an electrical shock. When open the Outdoor unit controller cover, don't touch the soldering pin by hand or by any conductive material.

13.2.6.3 Advise:

Open the Outdoor unit controller cover only after one minute from power off.
Measure the electrolytic capacitors voltage before farther checking controller.
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.

14. EXPLODED VIEWS AND SPARE PARTS LISTS

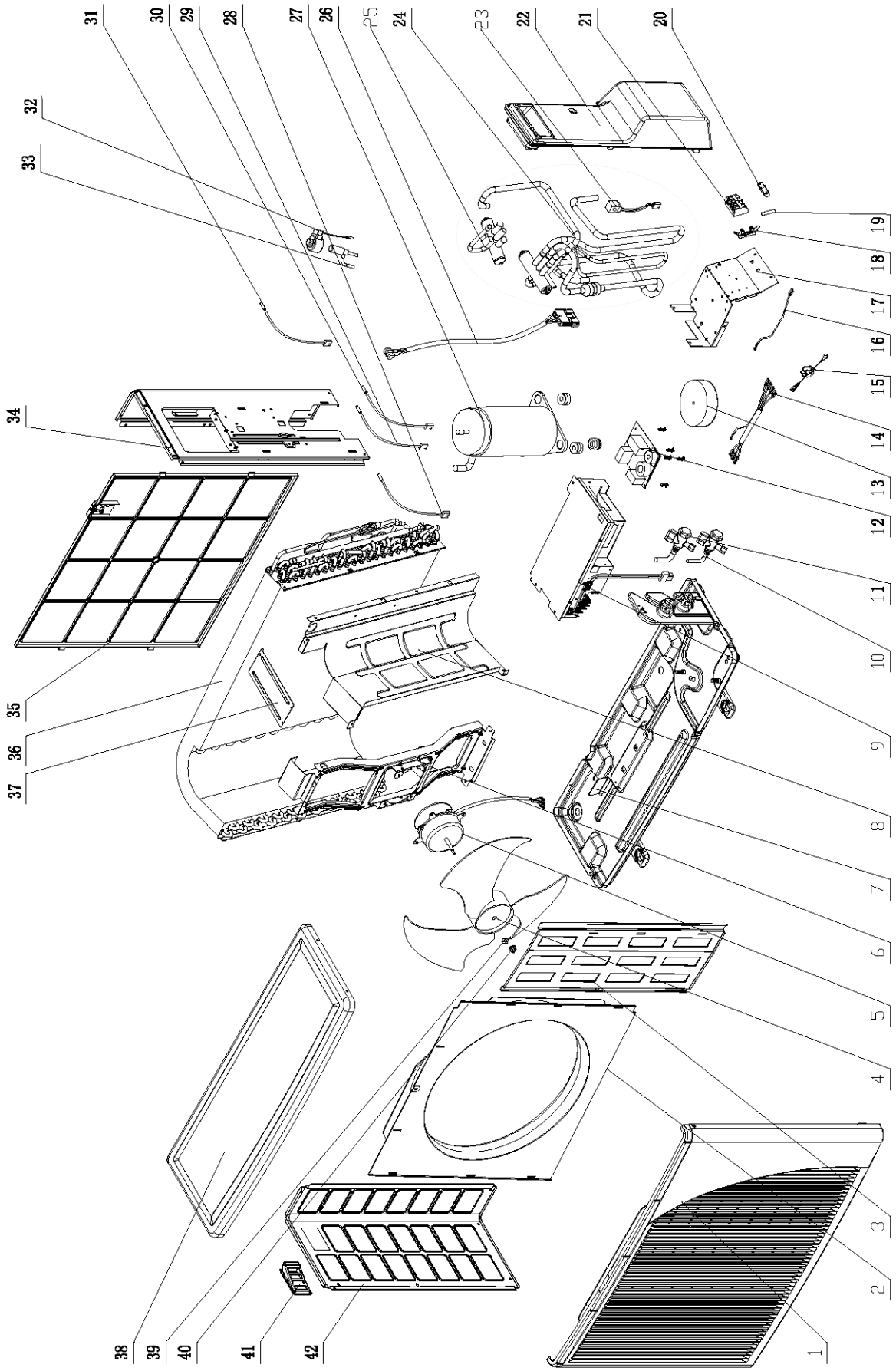
14.1 Indoor Unit: WNG 50 / WNG 60 DCI



14.2 Intdoor Unit: WNG 50/60 DCI

Item No.	Part No.	Description	Qty
1A	452917400	Grill A/WNG18	1
1B	452952800	Grill B/WNG18	1
1C	452952900	Grill C/WNG18	1
2A	453080400	Display Board Assy.906-257-00	1
3	452919800	Filter	2
4	4518113	Fiber Filter Assy. (Optional)	1
5	453054000	Frame assy./WNG18	1
6A	4526946	Display Lens Assy(LCD)	1
6B	4527144	Display Cover Assy	1
7	452919600	Screw cover	3
8	433133	IONIZER DISPLAY 906-191-07 (Optional)	1
8A	452919700	Cover/Ionizer (Optional)	1
9	453134600	Evaporator Assy.	1
10	4518664	Drain hose	1
11	452917300	Air outlet	1
12	453050200	STEP MOTOR A	1
13	452918700	Support/horizontal louver	2
14	452917500	Horizontal flap A	1
14	452917600	Horizontal flap B	1
16	452918500	Linkage A	1
	452918600	Linkage B	1
17	452930700	Vertical flap A	12
	452918200	Vertical flap B	2
18	452918300	Tie/vertical flap A	1
	452918400	Vertical flap stator B	2
	452953000	Vertical flap stator C	1
19	4518662	Bearing assy fan	1
20	453024900	Impeller fan	1
21	453053800	Base assy./WNG18	1
22	4518657	TUBE LOCK	1
23	452920100	Mount bracket/WNG-18 &#31;20&#31;	1
24	452919400	Joint/Unit housing	1
25	453024500	PG Motor	1
26	4518651	Cover Side Motor	1
27	452918800	Cover/motor	1
28	453042500	Remote controller/RC4-I-1 EHK P/N 974-710-00	1
29	453050300	STEP MOTOR B	1
30	453057900	Gear BOX ASSY	1
31	453109300	Wire UL100726AWG/Ionizer	1
32	433134	IONIZER POWER 906-191-01 (Optional)	1
33	4517022	Plug	1
34	4524967	IONIZER WIRE A (Optional)	1
35	453030600	Indoor DC Inverter Controller(ENGLISH)916-513-00	1
36	4524963	Electrostatic Filter (Optional)	1
37	452919500	Cover/terminal	1

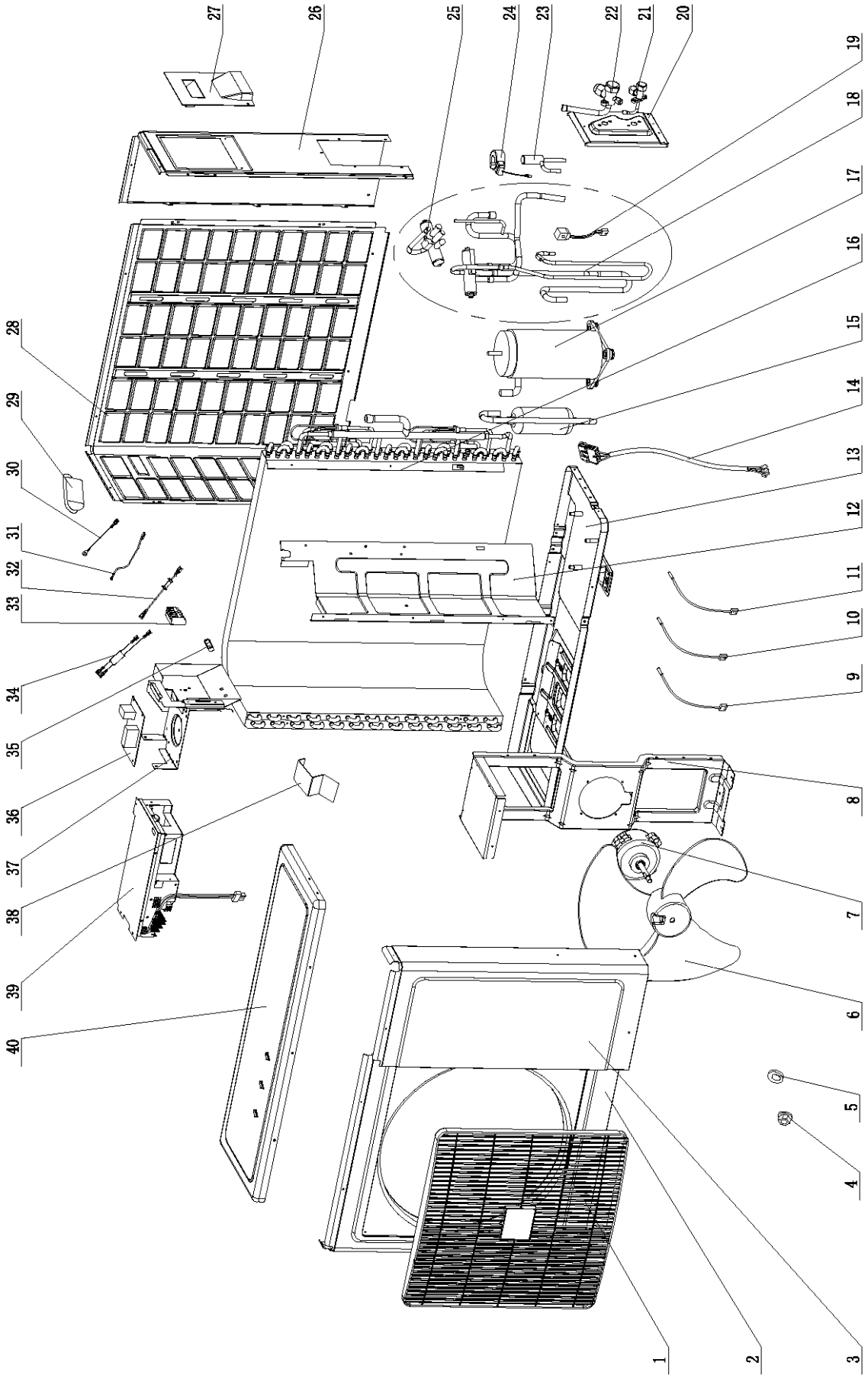
14.3 Outdoor Unit: ONG3-50 DCI



14.4 Outdoor Unit: ONG3-50 DCI

ItemNo.	Part No.	Description	Qty
1	433218	Front panel A	1
2	4526340	Air inlet ring-420	1
3	433223	Painting insulation plate	1
4	4526476	Axial fan OD=401	1
5	4526475	DC motor for DCI 50	1
6	4526457	Motor support	1
7	4527363	Base painting Assy.	1
8	4526459	Partition	1
9	4526203	Outdoor DC inverter controller (English)	1
10	4524595	Gas valve (R410A)	1
11	4524176	Liquid valve (R410A)	1
12	4526224	EMI fliter board 901-098-00	1
13	4526396	Chock Assy. 167-021-01	1
14	4526223	AC-IN connected wire	1
14	4526968	Earthing wire for DCI	1
16	4526222	Fuse connecting wire	1
17	4526300	Therminal sheet	1
18	4526220	Fuse stand JEF-511B(EHK P/N:140-038-00)	1
19	4526533	Fuse 65TS(20A,230)140-031-00	1
20	204107	Cable clip nylon	1
21	4519188	4 poles terminal block	1
22	433229	Value cover	1
23	4522509	4-Way valve coil	1
24	4527327	4-way valve welding Assy.	1
25	4518952	4-way valve	1
26	4526221	Compressor wire	1
27	4523446	DC Inverter compressor Assy. 5CS130XCC03	1
28	4526775	Compressor top thermistor(CTT)	1
29	4526774	Outside air thermistor(OAT)	1
30	4526776	Outside coil thermistor(OCT)	1
31	4526969	Suction coil thermistor(SUCT)	1
32	4526214	Electronic expansion valve ZDPF(L)-1.6C-01-RK forR410A	1
33	4526216	EEV COIL QA(L)12-HR-01A-RK	1
34	4519606	Right side panel	1
35	433228	Back side net	1
36	4526459	Condenser soldering assy	1
37	4526298	Bridge	1
38	4519614	Painting top cover	1
39	4526480	Gasket for axial fan	1
40	4519300	Nut M5 L	1
41	433225	Handle	1
42	4519607	Left side panel painting plate	1

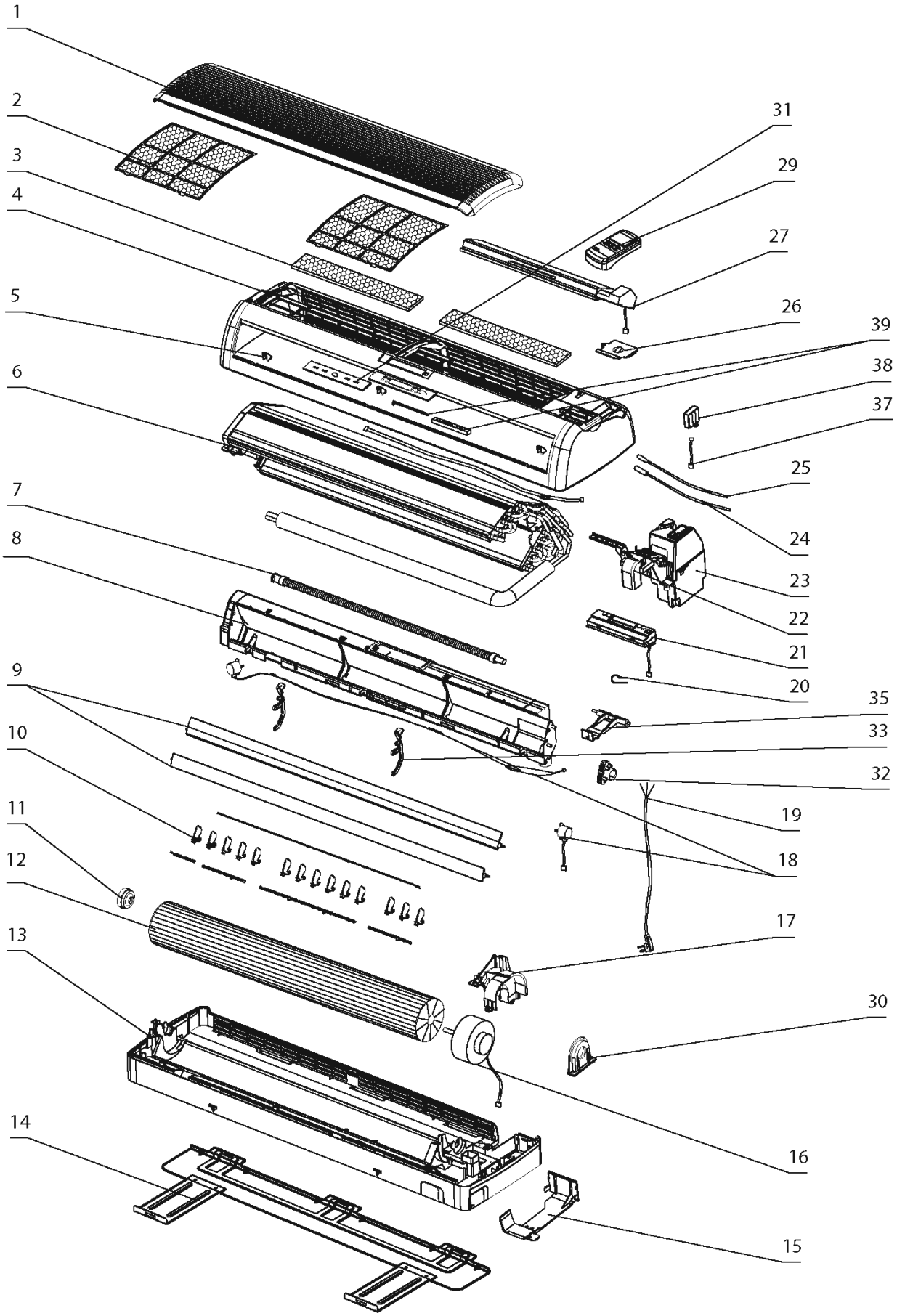
14.5 Outdoor Unit: DCI 60



14.6 Outdoor Unit: DCI 60

Item No.	Part No.	Description	Qty
1	4517144	FAN COVER PP+UV	1
2	452795700	PAINTED LEFT CABINET ASSY	1
3	4521642	Painted Right Cabinet and Isolation Assy.	1
4	4523141	M10 Hexagon locked nut M10	1
5	4526841	cusion for fan	1
6	4526510	FAN D=460mm (3 blade)	1
7	453026500	DC Motor SIC-71FW-F170-2	1
8	453036400	Motor Support	1
9	453238900	Sensor/OAT	1
10	4526775	Compressor top thermistor(CTT)	1
11	4526776	Outdoor coil thermistor(OCT)	1
12	453035800	Partition Plate	1
13	453036100	Base Plate Paint Assy.	1
14	4526221	Compressor wire	1
14	453041900	Liquid Accumulator	1
16	452882900	Condenser and distributor welding assy.	1
17	4523446	Scroll DC compressor assy. 5CS130XCC03	1
18	453034000	4-way Valve System Assy.	1
19	4522509	4-Way valve coil	1
20	4516766	PAINTED VALVE PLATE ASSY	1
21	4526301	High pressure stop valve R410a	1
22	4524595	1/2” Gas Valve for ONG R410A	1
23	4526214	Electronic expansion valve ZDPF(L)-1.6C-01-RK for R410A	1
24	4526216	EEV COIL QA(L)12-MD-02	1
25	4518952	4-W valve SHF-7H for R410A	1
26	4525938	PAINTED RIGHT-BACK CABINET ASSY	1
27	4523145	R.lifter	1
28	4517028	PAINTED LEFT-BACK GRILL	1
29	4516758	SMALL HANDLE	1
30	452841100	Earth wire	3
31	453238800	Ground Wire	1
32	453238700	Wire UL1007 16AWG/COM	1
33	4519188	4 poles terminal block	1
34	453238600	Wire 1014 16#/Power Input	1
35	204107	Cable clip Nylon	1
36	453048500	DCI 2.8kW EMI Filter Board 901-107-00	1
37	453052900	Therminal Plate Assy.	1
38	4526585	connect for motor backet	1
39	453030500	Outdoor DCI Controller/2.8kW(English) 906-105-00	1
40	4516788	PAINTED TOP COVER ASSY	1

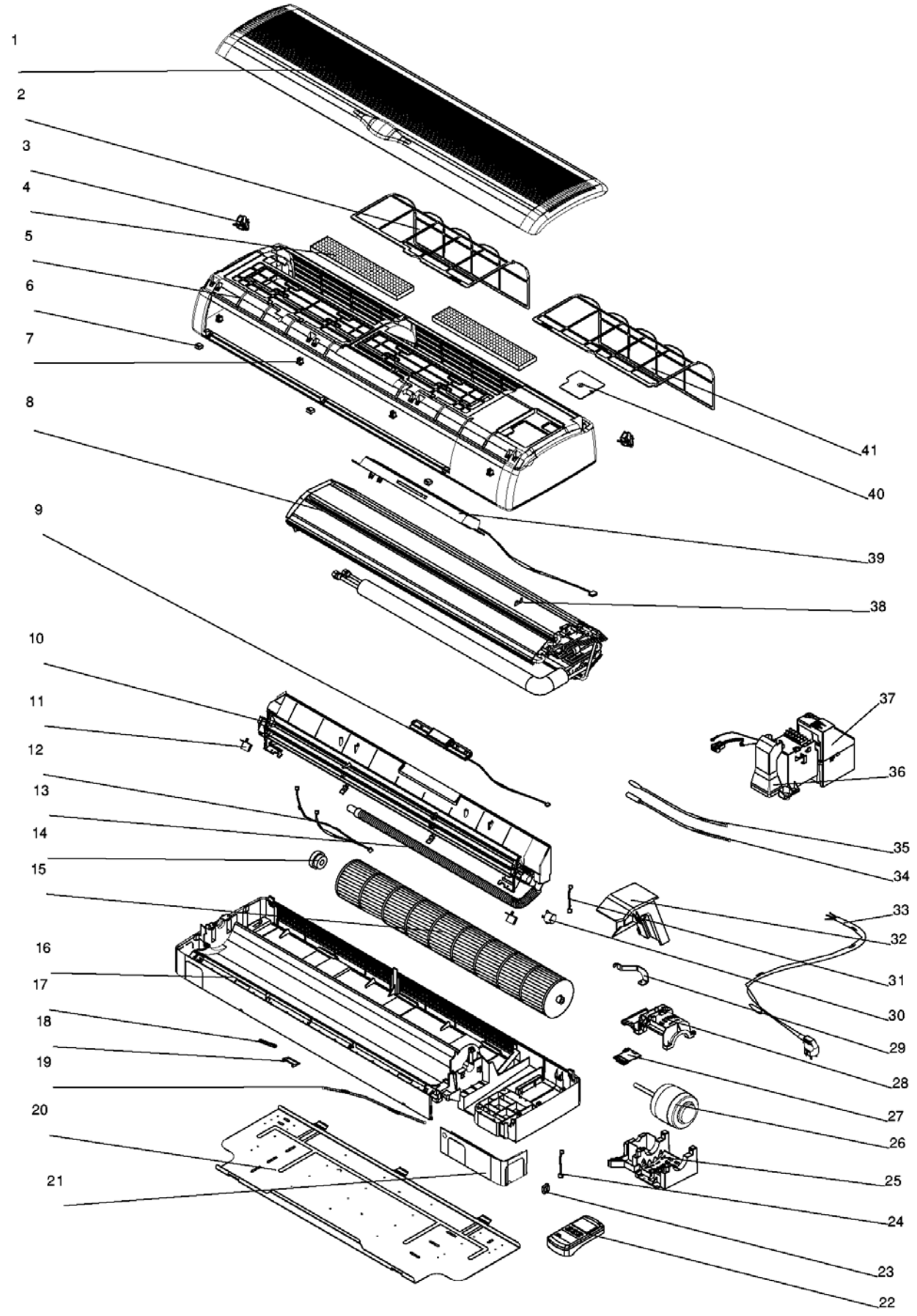
14.7 Indoor Unit: WNG 72 DCI



14.8 Indoor Unit: WNG72 DCI

Item No.	Part No.	Description	Qty.
1	452917400	Grille	1
2	452919800	Air Filter	1
3	4518113	Active Carrbon**(Cold Catalyst)** Filter	1
4	465720009	Frame Asy	1
5	452919600	Screw Cover	1
6	453260400	Evaporator Assy	1
7	4522754	Draining Hose	1
8	453053900	Air Outlet Assy	1
9	452917500	Flap	1
9	452917600	Flap	1
10	452930700	Vert. Louver	1
10	452918200	Vert. Louver	1
11	4518662	Bearing Assy	1
12	453024900	Cross Flow Fan	1
13	453053800	Base Assy	1
14	452920100	Installation Plate	1
14	452919400	Tube Bracket	1
16	453206800	Motor	1
17	452918800	Motor Cover	1
18	453050200	Step Motor	1
18	453050300	Step Motor	1
19		Power Wire	1
20	4519147	Cable locker	1
21	453080400	Display	1
22	452919100	Sensor	1
23	453207000	Control Box Assy	1
24	438082	Thermistor indoor coil	1
25	4519813	Thermistor **Room**	1
26	452919500	Terminal Cover	1
27	4524963	Electrostatic Filter**/Filter Frame** (Optional)	1
29	453042500	Remote control	1
30	4518651	Motor Side Cover	1
31	4526946	LCD Display Lens Assy	1
32	453057900	Gear Box Assy	1
33	452918700	Louver Support	1
35	4518657	Tube Lock	1
37	4524967	Ionizer Cable (Optional)	1
38	433134	Ionizer Power(Optional)	1
39	433133	Ionizer Cover/Ionizer Unit(Optional)	1

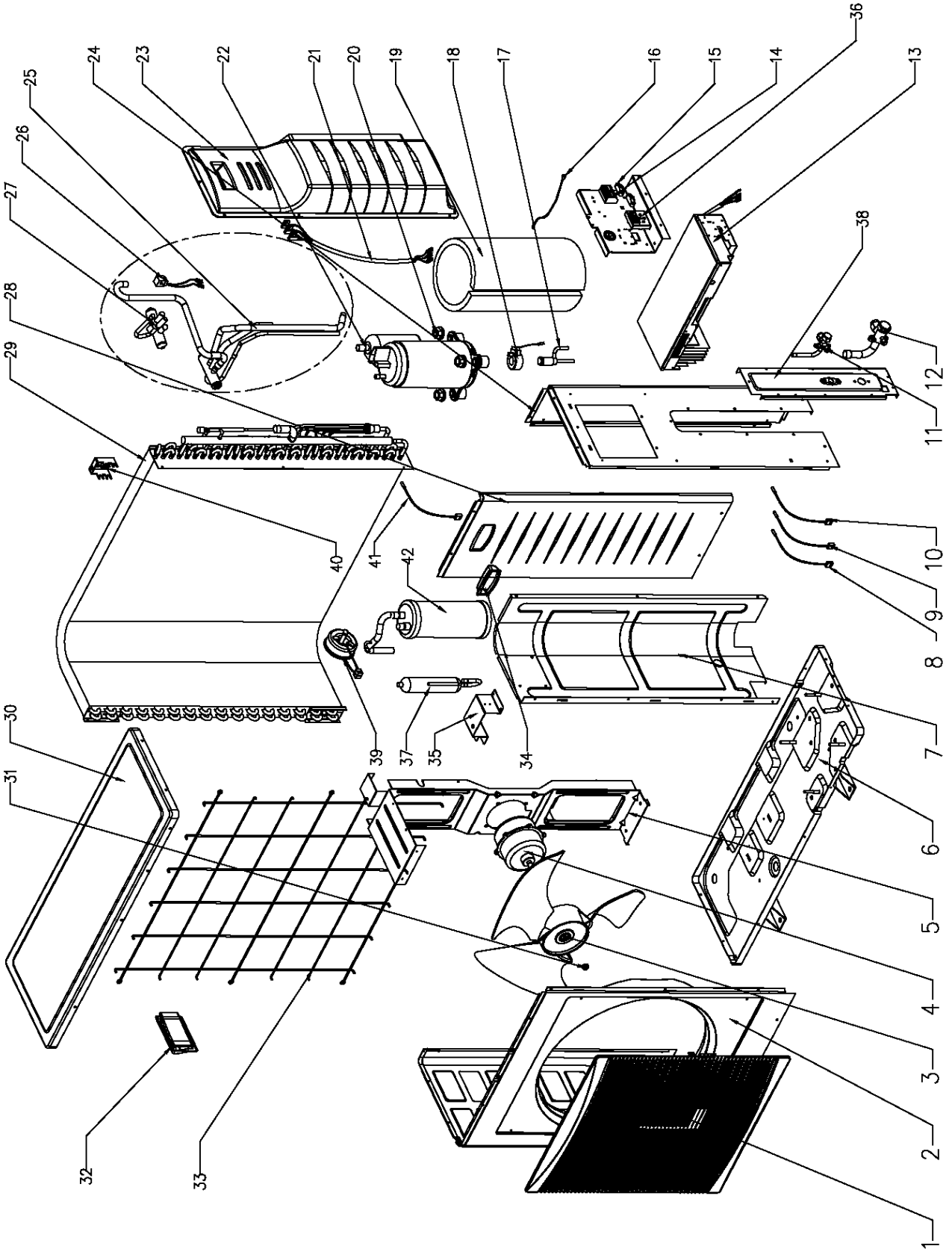
14.9 Indoor Unit: WNG 80 DCI



14.10 Indoor Unit: WNG 80 DCI

Item No.	Part No.	Description	Qty
1	4525902	GRILLE ASSY	1
2	4523299	FILTER	1
3	4523303	SHAFT LOCKER	2
4	4518113	AIR FILTER ASSY	1
5	4525610	FRAME ASSY	1
6	4523301	SCREW COVER	3
7	4523302	FIX LOCKER	4
8	462350007	EVAPORATOR ASSY WNG80 R410A	1
9	4525112	DISPLAY ASSY. 901-255-30	1
10	4525612	AIR OUTLET ASSY	1
11	4524962	TEP MOTOR B	2
12	4524965	STEP MOTOR WIRE A	1
13	4518664	DRAIN HOSE	1
14	4516204	BEARING ASSY.,FAN	1
14	4524954	CROSS FAN	1
16	4525611	REAR PANEL ASSY	1
17	433133	IONIZER DISPLAY	1
18	4523306	IONIZER COVER(NO IONIZER)	1
	4523307	IONIZER WIRE COVER(WITH IONIZER)	1
19	4524967	IONIZER WIRE A	1
20	4523372	WNG-30 INSTALLATION PLATE	1
21	4523309	TUBE OUTLET	1
22	4525111	REMOTE CONTROL BOX 974-700-00	1
23	433134	IONIZER POWER	1
24	453109300	IONIZER CABLE B	1
25	4523311	MOTOR HOUSING	1
26	4524953	FAN MOTOR	1
27	4523313	MOTOR WATER BREAKER	1
28	4523312	MOTOR COVER	1
29	4524661	FIX PLATE	1
30	4524961	STEP MOTOR A	1
31	4524966	STEP MOTOR WIRE B	1
32	4523308	WATER BREAKER COVER	1
33	4525113	POWER CORD CABLE(optional)	1
34	438082	THERMISTOR INDOOR COIL BACK	1
35	4519813	THERMISTOR ROOM BLACK	1
36	4525831	WIRE TUBE	1
37	453161200	CONTROL BOX 916-514-00	1
38	4516263	SENSOR BASE	1
39	4524963	ESF (optional)	1
40	4523304	WIRING COVER	1
41	4523300	FILTER R	1

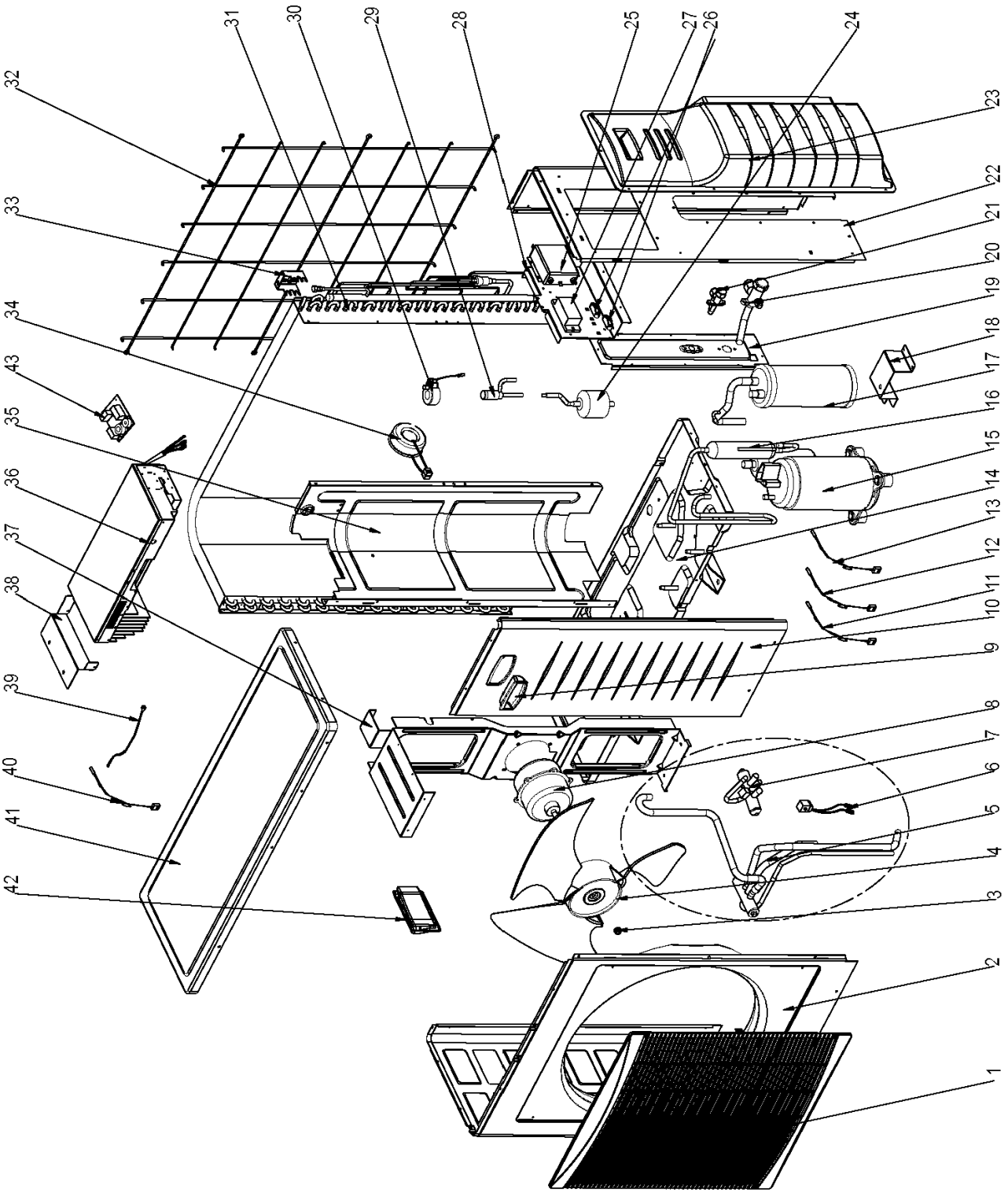
14.11 Outdoor Unit: DCI 72/80



14.12 Outdoor Unit: DCI 72/80

Item No.	Part No.	Description	Qty
1	465100000	Outlet Grille	1
2	4523652	Painted Left Cabinet Assy.	1
3	452960400	Outdoor Fan	1
4	466130001	Motor	1
5	452888500	Motor Support	1
6	452809900	Base Plate Painting Assy.	1
7	452809700	Partition Plate	1
8	4526774	Outdoor air thermistor(OAT)	1
9	452966200	Compressor Top Thermistor(CTT)	1
10	452677601	Outdoor Coil Thermistor(OCT)	1
11	4526514	Hight press valve(R410A)	1
12	4526513	Low Press Valve R410A	1
13	453170000	Controller/DCI80	1
14	467420003	Terminal Block	1
14	204107	Cable clip Nylon	2
16	4526968	Earthing wire with magnetic ring	1
17	4526214	Electronic expansion valve	1
18	4526216	EEV Coil	1
19	452963000	Insulation PVC/Compressor	1
20	4510677	Comp. screw	1
21	452956600	Compressor Cable	1
22	452803300	Compressor Assy. TNB220FLBM1	1
23	4522602	Valve Cover	1
24	4523654	Painted Right Back Cabinet Assy.	1
25	461600002	4-Way Valve Assy.	1
26	452956700	4-way Valve Coil	1
27	4526522	Four-Way Valve R410A	1
28	4523653	Painted Right Cabinet Assy.	1
29	462300002	Condenser Assy.	1
30	4523657	Painted Top Cover Assy.	1
31	4523758	Nut M8 left	1
32	4522600	Left Handle	1
33	453175500	Guard Net Painting Assy.	1
34	4522601	Right Handle	1
35	453256100	Support Assy./Gas-Liquid Separator	1
36	467300005	Display Board Assy Optional	1
37	452783600	Oil Separator Assy.	1
38	4526080	Valve plate paint assy	1
39	453256000	Choke Assy.	1
40	453083800	OAT Support/OAT	1
41	452956500	Suction Thermistor(SUCT)	1
42	452783200	Liquid-gas Separator	1

14.13 Outdoor Unit: DCI 72 Z



14.13 Outdoor Unit: DCI 72 Z

No.	Item	Description	Quan.
1	465100000	Grill/ DCI Trio	1
2	4523652	PAINTED LEFT CABINET ASSY	1
3	4523758	Nut M8 left	1
4	452960400	Outdoor Fan	1
5	461600023	4-Way Valve Assy.	1
6	4522509	4-way Valve Coil	1
7	4526522	FOUR-WAY VALVE R410A	1
8	466130002R	DC Motor 70W 8P	1
9	4522601	Right Handle	1
10	4523653	PAINTED RIGHT CABINET ASSY	1
11	4526775	Compressor Top Thermistor(CTT)	1
12	452956500	OMT Thermistor(OMT)	1
13	452677601	Outdoor Coil Thermistor(OCT)	1
14	452809900	Base Plate Painting Assy.	1
15	460080000R	Compressor Assy./ C-7RVN153H0W SANYO ShenYang)	1
16	452783600	Oil Separator Assy.	1
17	452783200	Liquid-gas Separator	1
18	453256100	Support Painting Support Assy./Gas-Liquid Separator	1
19	4526080	Valve plate paint assy	1
20	4526513	LOW PRESS VALVE (R410A)	1
21	4526514	Hight press valve(R410A)	1
22	4523654	PAINTED RIGHT BACK CABINET ASSY	1
23	4522602	Valve Cover	1
24	4518950	Filter Drier BFK-053S	1
26	204107	Cable clip Nylon	2
27	467420003	7 Poles Terminal Block	1
28	464280001	Terminal Plate/ DCI 72Z	1
29	4526215	Electronic expansion valve ZDPF(L)-1.6C-01-RK for R410A	1
30	4526216	EEV COIL QA(L)12-MD-02	1
31	462300002	Condenser Assy.	1
32	453175500	Guard Net Painting Assy.	1
33	453083800	Support/OAT	1
34	4526396	Choke Assy.167-021-01	1
35	464730006	Partition Plate Assy./DCI 72Z	1
36	467300082R	Controller/Outdoor Unit DCI 3.0KW(English) 906A-361-00	1
37	452888500	Motor Support	1
38	464250044	Connect Plate/Controller DCI 72Z	1
39	452841100	Earth wire	3
39	4516540	Earth wire	2
40	453238900	Sensor/OAT	1
41	4523657	PAINTED TOP COVER ASSY	1
42	4522600	Left Handle	1
43	467300114R	DCI 3.0KW EMI Fillter Board 901A-574-00	1

APPENDIX A

INSTALLATION AND OPERATION MANUAL

- ► **INSTALLATION & OPERATING MANUAL WNG 50/60 DCI**
- ► **INSTALLATION & OPERATING MANUAL WNG 72/80 DCI**

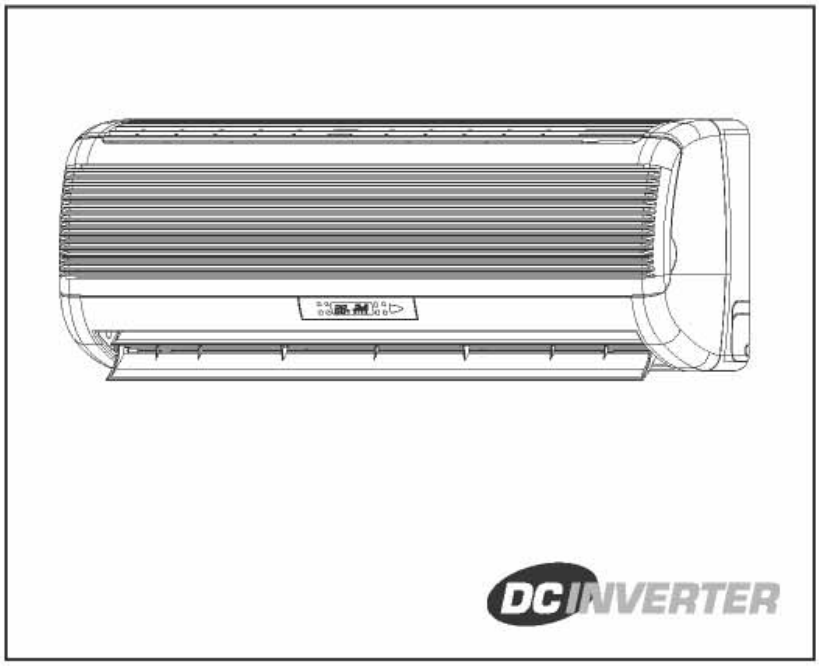
CLIMATISEUR SPLIT MURAL — FRANÇAIS

AIR CONDITIONER SPLIT WALL MOUNTED — ENGLISH

KLIMAGERAET IN SPLIT BAUWEISE — DEUTSCH

CLIMATIZADOR SPLIT MURAL — ESPAÑOL

CONDIZIONATORE D'ARIA A PARETE SPLIT — ITALIANO



MANUEL D'UTILISATION ET DE PROGRAMMATION

PROGRAMMING AND OPERATING MANUAL

BEDIENUNGS UND PROGRAMMIERUNGS HANDBUCH

MANUAL DE UTILíZACION Y DE PROGRAMMACION

MANUALE DI UTILIZZO E DI PROGRAMMAZIONE

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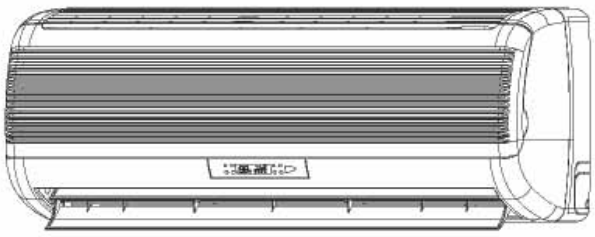
*PLEASE READ THESE INSTRUCTIONS **BEFORE** OPERATING THE AIR CONDITIONER*

INTRODUCTION

Dear customer:
The DC Inverter air conditioner you have purchased is one of the most advanced units of its kind. The DC Inverter air conditioner is a variable capacity air conditioner which uses high efficiency DC motors for the compressor and the outdoor fan. Unlike other models, it can adjust its capacity according to the user setting and the environmental condition, thus saving up to 30% of the seasonal power consumption, while keeping maximum comfort level. This modern unit is also equipped with an ionizer (optional) and an Electrostatic filter (optional) to maximize your indoor air quality.
Detailed instruction as to the DC Inverter air conditioner (including Single & Multi Split type) functions and way of operation are provided in the following pages.

This Split Air Conditioner is designed for versatile application:

- Cooling.
- Dehumidifying.
- Heating.
- Air Filtration.
- Ventilation



OPERATING TEMPERATURE RANGE:

-15℃ ~ 46℃

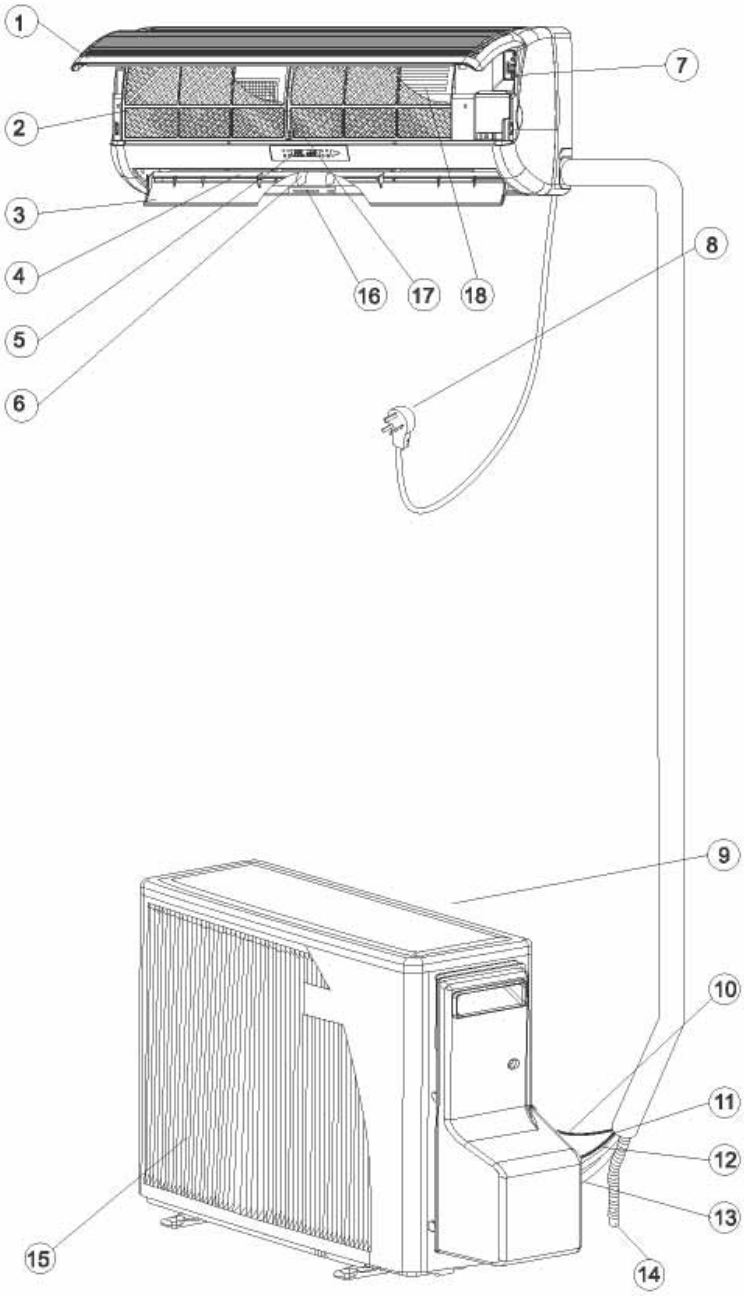
IMPORTANT NOTICE:

- *This air conditioner must be grounded to protect against electrical shock.*
- *Installation of the air conditioner must be performed by an experienced air conditioning installer, observing good refrigeration practice.*
- *Electrical connections and power cord replacement should only be made by authorized electricians and in accordance with electrical regulations and local codes. The appliance must be positioned so that the plug is accessible.*
- *Failure to comply with the manufacturer's installation and operation instructions could affect the performance of the air conditioner and the validity of the warranty.*

Test Mode

Test Mode is set only for performance testing purposes, and not for user operation.
Test mode can be initiated by either one of the following conditions:
1) Operating the unit with the following remote control settings and temperature conditions:
Cool Mode, SPT=16℃ and RAT=27±1℃,
OAT=35±1℃ for 30 minutes;
Heat Mode, SPT=30℃ and RAT=20±1℃,
OAT=7±1℃ for 30 minutes.
2) Entering Diagnostics with Cool/SPT=16℃ or Heat/SPT=30℃.

SYSTEM DESCRIPTION



1. Air intake grille
2. Air filter
3. Supply air flap (louver)
4. Air outlet
5. Unit's indicators
6. Horizontal Air flow Deflecting louvers
7. On unit operation
8. Power cord ※
9. Outdoor unit air intake
10. Power cable
11. Fresh-air controls wire (optional)
12. Liquid tube
13. Suction tube
14. Drain hose
15. Outdoor unit air outlet
16. Ionizer (optional)
17. Air purifying filter
18. Electrostatic filter (optional)

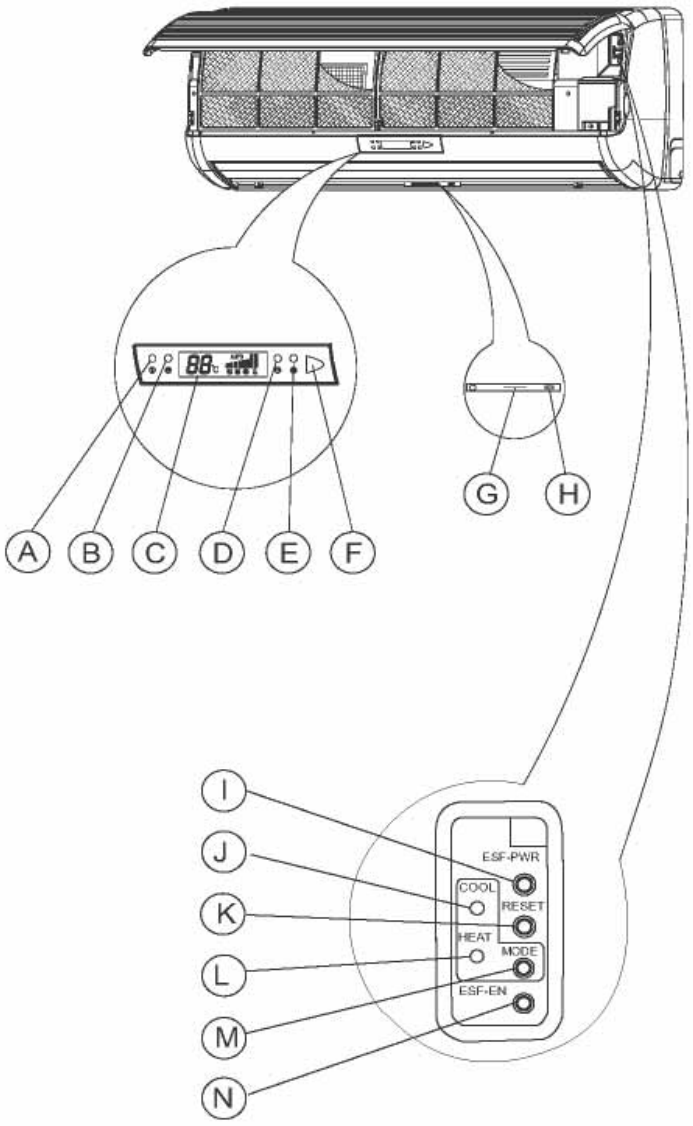
※ Not connected in multi split applications

MODES OF OPERATION, FUNCTIONS AND FEATURES

COOL	Cools, dehumidifies and filters the room air. Maintains desired room temperature.
HEAT	Heats and filters the room air. Maintains the desired room temperature.
AUTO	Automatically select between cool and heat operation modes, according to the requested room temperature and the actual room conditions.
DRY	Dehumidifies and softly cools the room In DRY Mode, the air conditioner operates at an increased dehumidifying power. This function is recommended to be used when temperature is rather low but the humidity is high.
FAN	Recirculates and filters the room air. Maintains constant air movement in the room.
AUTO FAN	The air conditioner automatically selects the FAN speed in accordance to the requested room temperature and the actual room temperature. During the first 30 minutes of unit operation after being turned ON, the unit operates at high fan speed to maximize the cooling/heating effect. As the room air approaches to the desired temperature, the fan switches to a lower speed for quieter operation.
HOT KEEP	In HEATING, when unit is started, the indoor fan will not be turned on until the indoor coil reaches adequate temperature. This HOT KEEP feature prevents uncomfortable cold air drafts.
I FEEL	Switches the temperature sensing point to the place where the remote control (optional) is located.(Generally the temperature sensor is located behind the intake grille of the air conditioner).This function is designed to provide a personalized environment by transmitting the temperature control command from the location next to you. The communication between the Remote Control and the unit is done by infra-red signal. Therefore, in using this function, the Remote Control should always be aimed, without obstructions, at the air conditioner.
TIMER	Real time control and display, automatically turns the air conditioner ON and OFF according to the time of day setting, ensuring comfort conditions before returning home, without wasting electricity. It turns the air conditioner off automatically when sleeping.
SLEEP	Designed to create comfortable sleeping conditions. When in COOLING mode, the temperature rises one degree centigrade after each consecutive hour, up to three hours, from the start of the mode. The temperature rise prevents the feeling of over-cooling while sleeping (when your body is at rest). In HEATING mode the reverse occurs; the air conditioner lowers its temperature one degree every hour, up to three hours, from the start of the mode. When in SLEEP mode, the air conditioner will be automatically turned off after operated for seven hours. The result is a more comfortable and invigorating sleep, which leaves you feeling fresh and energetic in the morning.
AUTO FLAP	The air flap (louvers) is automatically positioned for the most suitable blow-out angle, when COOL, HEAT, DRY or FAN modes are selected. When the air conditioner is turned off, the flap will close automatically for an aesthetic appearance.

VERTICAL AIR SWING	Automatic swing of supply air in vertical direction. The flap moves automatically in upward and downward direction to spread the conditioned air evenly throughout the room.
AIR DIRECTION POSITIONING	Automatic swing of Horizontal air flow in Horizontal direction. The flap move automatically in right and left direction to spread the conditioned air evenly throughout the room.
ROOM TEMPERATURE	Measures and displays room temperature.
FILTER INDICATION	Filter indicator on the indoor unit display is turned on when the filter requires cleaning. After cleaning and reinstalling the filter, It should be reset.
BUZZER	A soft buzzer will sound from the indoor unit display to indicate that a command sent by the remote control has been accepted and stored in the unit's memory. This feature may be easily cancelled by the user from the display panel.
ON UNIT OPERATION	The air conditioner can be turned ON for COOLING or HEATING or be turned OFF directly by "MODE" key without the use of the remote control.
3-MIN DELAYED RUN	The compressor is protected by a three-minute delayed restart.
MEMORY	The microprocessor retains the last data entry whether or not the unit is plugged in. Therefore, when the unit restarts after a power failure, it will resume operating in the same mode as before the power was disrupted.
LOCK	Freezes the last operation setting on the remote control. When LOCK is activated, the remote control will not be able to control the air-conditioner.
ILLUMINATED KEYPAD AND LCD DISPLAY (optional)	By pressing any button in dark environment, the keypad and the LCD display will be illuminated.
ELECTROSTATIC FILTER (optional)	They are capable of capturing small particles down to 0.1 microns, Such as atmospheric and house hold dust, coal dust, insecticide dust, mites, pollen, pet dander, tobacco smoke particles, cooking smoke and grease, mold fungi, bacteria, viruses and more.
IONIZER (optional)	Ionizer makes the air more fresh and more comfortable. Slide switch (H) to the ON position to activate the ionizer. The blue light indicator (G) on the unit will light up indicating the ionizer in operation. To cancel the operation set slide switch to OFF position. **Important Notice:** When the air-conditioner is turned OFF or if the indoor fan stops operation, the IONIZER stops automatically.

ON-UNIT INDICATORS AND CONTROLS



A. Stand-by Operation indicator
Lights up in red when connected to power.

B. ESF/ Ionizer/Fresh air indicator
Lights up during the ESF or Ionizer or Fresh air operation. (optional)

C. LCD operation display

D. Timer indicator
Lights up during timer and sleep operation.

E. Filter indicator
Lights up when air filter requires cleaning.

F. Signal receiver
Receive signals from the remote control.

G. Ionizer indicator
Lights up during ionizer operation

H. Ionizer on/off switch
Used to switch the ionizer on/off.

I. Electrostatic filter operation button
Used to switch the Electrostatic filter on or off

J. Cooling indicator
Lights up only when Mode (M) is pressed.

K. Reset button
- Press to turn off the filter indicator and to reset the filter function, after the cleaned filter has been reinstalled.
- Press to cancel the buzzer announcer.

L. Heating indicator
Lights up only when Mode (M) is pressed.

M. Unit mode button
Used to switch the unit off or to turn it on for cooling or heating without the remote control.

N. Electrostatic filter safety button
Turn off the Electrostatic filter when you open the grille.

If the air-conditioner can not be operated by the Remote Control unit, it can be turned on for cooling or heating, or completely turned off, by pressing MODE button (M) on the air-conditioner. The MODE button will change the operating status of the unit between - COOLING - HEATING -STAND BY positions. Every time MODE button (M) is pressed, (J) or (L) will light up respectively, to indicate in which mode the air-conditioner operates.

PROTECTION MODES

Your air conditioner includes several automatic protection modes which enables you to use it virtually at any time and in any season, regardless of the outdoor temperature. Some of the protection modes are listed below:

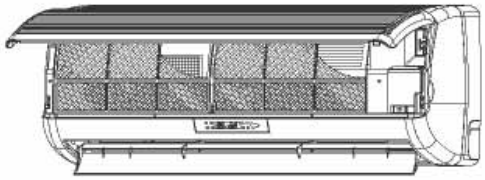
Mode	Operation conditions	Protection from	Controlled remedy
Cooling	Low outdoor temperature	Indoor coil Freezes up	Stops outdoor fan and compressor when approaching freezing conditions Resumes operation automatically Operating indicator (A) blinks.
	High outdoor temperature	Outdoor coil overheating	Stops compressor when approaching overheating conditions. Resumes operation automatically. Operating indicator (A) blinks.
Heating	Low outdoor temperature	Outdoor coil ice build up	Reverses operation from heating to cooling for short periods to de-ice outdoor coil. Operating indicator (A) blinks.
	High Indoor or outdoor temperature	Indoor coil overheating	Stops outdoor fan and compressor when approaching high indoor coil temperature. Resumes operation automatically. Operating indicator (A) blinks.

Note: When switching the unit to OFF after heating operation, the unit may perform outdoor coil deicing operation. In such a case, the compressor will continue to run for some time after the unit has switched to OFF, and the indoor unit louvers are closed. This feature is a part of the normal unit operation.

CARE AND MAINTENANCE

Before performing any maintenance procedure, make sure to disconnect the air conditioner from the power.

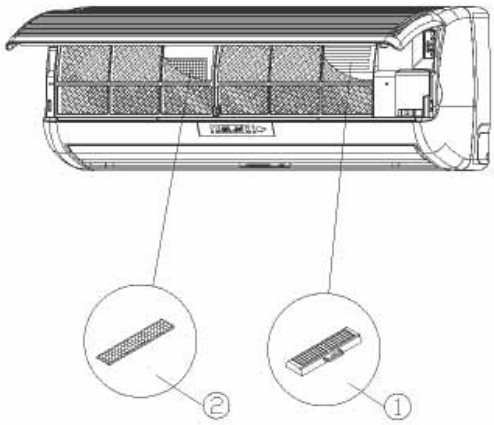
CLEANING THE AIR FILTER



● Your air conditioner is provided with a filter cleaning indicator. When the filter indicator (E) lights up, the filters should be removed for cleaning.
● To remove the air filters, lift up the panel, push the air filters up slightly to unlock them, pull out the filters. Clean the filters by washing in warm soapy water and dry thoroughly, align and fit the filters in place, close the panel by pushing it in the center to lock it in place.
● Reset button (K) to turn off filter indicator (E).

CLEANING THE ELECTROSTATIC FILTER

The electronic filter should be removed from the unit and cleaning once three month. The procedure is shown as following:



1 open the front panel
2 push the hook on the filter and pull out the electrostatic filter (Fig ①)
3 wash the filter with the warm soapy water and dry thoroughly
4 push the electrostatic filter into the right position
5 close the front panel
Note: the above procedure is used for cleaning the electrostatic filter.

PURIFICATION FILTER REPLACEMENT

The air purifying filter should be removed from the unit and replaced once a year, shown as following:
1 pulling out the filter. (Fig ②)
2 replacing and securing the filter in its frame.
3 sliding the filter back in its place.
Note: The above procedure is used for replacing the active carbon filter (when supplied).
DO NOT OPERATE THE UNIT WITHOUT FILTERS!

CLEANING THE AIR CONDITIONER

● Wipe the unit with a soft dry cloth or clean it using a vacuum cleaner
● Do not use hot water or volatile materials which could damage the surface of the air conditioner.

AT THE BEGINNING OF THE SEASON

● Make sure there are no obstacles blocking the flow of inlet or outlet air, in both indoor and outdoor units.
● Make sure the power is properly connected.

PROTECT THE ELECTRONIC SYSTEM

● Indoor unit and remote control must be at least 1 meter away from a TV, radio or any other home electronic appliance.
● Protect the inner unit from direct sun or lighting.

OPERATING TIPS

- Set a suitable room temperature; excessively low room temperature is not good for your health and wastes electricity. Avoid frequent setting of the temperature.

- During cooling, avoid direct sun. Keep curtains and blinds closed. Close doors and windows to keep the cool air in the room.

- Avoid generating heat or using of heating appliances while the air conditioner in cooling mode.

- Make sure that the air flap is positioned properly: horizontal flow in cooling and downward vertical flow for heating.

- Keep the room temperature uniform by adjusting the left/right vertical air blades.

- Position the air flap and the left/right air blades in such a manner as to prevent your body from being exposed directly to air drafts.

- During prolonged operation, ventilate the room occasionally by opening a window from time to time.

- In a power failure, the microprocessor memory is retained. When restarted, operation will be resumed in the last mode of operation. However, if the timer was used, the unit will be turned off by the timer only if the remote control is aimed at the unit. Otherwise the power failure will cause the timer data to be erased from the microprocessor memory.

- After turning on, allow more than 3 minutes for cooling, heating or dry operation to start.

- When COOL or DRY modes are used, make sure that the room's relative humidity is below 78% If the unit is used for a prolonged period of time in high humidity, moisture may form on the air outlet and drip down.

- Remote control signals may not be received if the indoor unit controls cover is exposed to direct sunlight or strong light. In such a case, block the sunlight or dim the lighting.

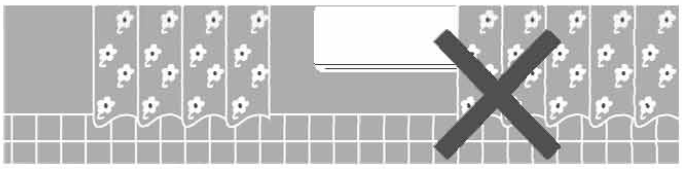
- The remote control is operative in a range of 8 meters. If you are out of range, the remote control may have difficulties in transmitting signals.

PRECAUTIONS

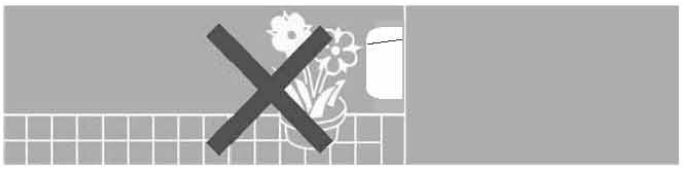
● Use the proper electrical fuse.
Do not pull out the power cord unless the unit is turned off.

● Do not start or stop operation by disconnecting the power cord.

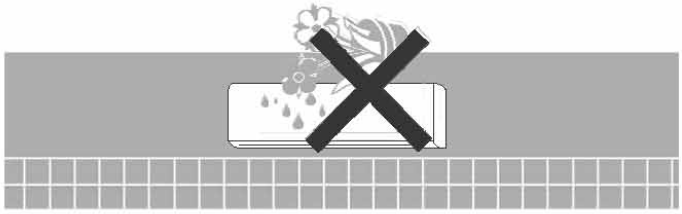
● Do not obstruct or block the air inlet or air outlet of the air conditioner.



● Do not insert any objects in the air outlet of the indoor or outdoor units.



● Do not splash water on air conditioner.



IF NOISE IS HEARD
There may be hissing sound during operation or just after shut down. This is caused by the refrigerant that is circulating inside the unit

There may be a cracking sound at starting and stopping of the unit's operation. This is caused by heat expansion or contraction of plastics.

BEFORE CALLING FOR SERVICE

Before calling for service, please check the following common malfunctions and correct as needed.

Problem	Cause	Remedy
● Unit does not operate. Stand-by indicator does not light up.	❑ Unit not connected to power ❑ Power failure	■ Plug in the power cord ■ Check main fuse
● Unit does not operate. Stand-by indicator lights.	❑ Remote control malfunctions	■ Check remote control batteries. ■ Try to operate from a closer distance. ■ Start from on-unit controls.
	❑ The remote control is locked.	■ Unlock the remote control.
● Unit does not respond properly to remote control command.	❑ IR signal does not reach unit.	■ Check for obstruction between unit and remote control, Clear if needed.
	❑ Distance between remote control and unit too large or aimed at from improper angle.	■ Get closer to unit.
	❑ IR receiver on-unit exposed to strong light source.	■ Dim lights, fluorescents especially
● Air does not blow out from indoor unit.	❑ De-icing protection mode is activated.	■ Normal operation in HEATING mode.
● COOLING, DRY or HEATING does not start immediately.	❑ 3-min. Compressor delayed start	■ Normal operation for these modes.
● Unit functions but does not perform sufficiently.	❑ Improper temperature setting.	■ Reset temperature.
	❑ Unit capacity insufficient for load or room size.	■ Consult your dealer
● Filter indicator lights up	❑ Air Filter needs cleaning	■ Clean filter, reinstall and reset indicator

EXCEPTION FOR MULTI-SPLIT TYPE

In multi split applications where more than a single indoor unit is connected to the same outdoor unit, it may happen that the requested operation mode can not be operated.
The reason for that is that the system is currently operating in a different mode.
The system operation mode can be either cooling or heating and is set by the outdoor unit controls, based on indoor and outdoor unit settings.
The rules for the mode settings may be different from one application to another.
In most applications the system operation mode will not be changed as long as there is an operating indoor unit requesting the active mode. The operation mode in such application will be set by the first indoor unit that is turned ON from Stand By.

The following table shows the indoor unit operation modes that can be operated per active system mode:

		System Active Mode	
		Cooling	Heating
Requested indoor unit operation mode	Cooling	v	X
	Heating	X	v
	Dry	v	X
	Auto Cool/Heat	v (cooling only)	v (heating only)
	Ventilation	v	X

(v - enabled indoor unit operation mode, X - disabled indoor unit operation mode)

Indoor unit operation when the requested mode is disabled is as following:
- Louver opens;
- Green (OPER) LED blinks once in two seconds;
- Indoor fan is forced off;

REMOTE CONTROL ENGLISH

PROGRAMMING AND OPERATING MANUAL

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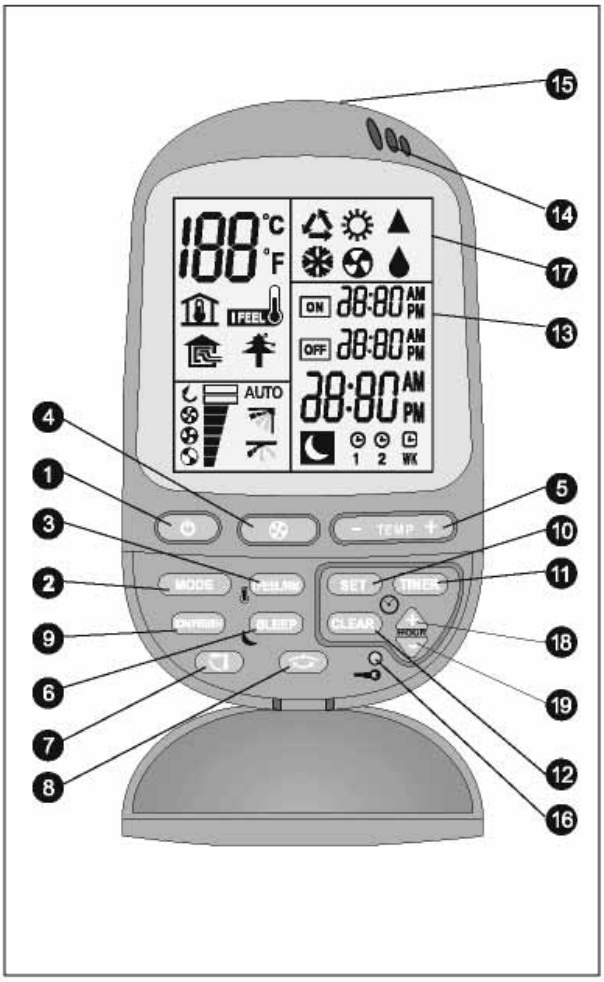
REMOTE CONTROL



1. START / STOP button
2. Operation mode selection button
   AUTO
   COOLING
   HEATING
   FAN
   DRY
3. I FEEL temperature sensing and
   Room temperature display button
4. FAN SPEED control button
5. Set point temperature UP and DOWN button
6. SLEEP button
7. Vertical swing button
8. Horizontal swing button
9. Ionizer & E.S.F and Fresh-Air button
10. TIME SET button
11. TIMER button
12. Clear button
13. LCD operation display
14. RM sensor
15. Infrared signal transmitter
16. LOCK Button
17. Transmission sign
18. TIMER UP button
19. TIMER DOWN button

OPERATION PROCEDURE

TURNING ON THE AIR CONDITIONER

Press the START/STOP button (1) to turn on the air conditioner. After connecting to the power supply, The indicator (A) on the air conditioner light up, indicating that the air conditioner is in the standby status. Please note that LCD operation display (13) will always show the last mode of operation and the previous function used. If you want to change the control settings, proceed according to the following instructions. Otherwise, the air conditioner will start and operate in the same mode and functions prior to being turned off.

VENTILATING OPERATION

Select the ventilating mode by pressing MODE button (2). Switch to the desired fan speed by pressing FAN speed button (4).

COOLING OPERATION

Select the COOLING mode by pressing MODE button (2). Switch to the desired FAN SPEED or to AUTO FAN by pressing button (4). Select suitable temperature setting. By selecting the COOLING mode, the air flap will move automatically to horizontal air delivery position, optimal for cooling.

COOLING OPERATION WITH AUTO FAN MODE

This operation starts with the highest air flow in order to quickly lower the room temperature. It will then automatically switch to the low air flow to quietly maintain the selected temperature.

HEATING OPERATION

Select the HEATING mode by pressing MODE button (2). Switch to the desired FAN SPEED or to AUTO FAN by pressing FAN button (4). Select suitable temperature setting. By selecting the HEATING mode, the air flap will move automatically to vertical air delivery position, optimal for heating. The HOT KEEP function is provided. The fan will be turned off when the indoor coil temperature is not sufficiently hot to prevent uncomfortable cold air drafts. In some models the HOT KEEP function is operating in AUTO FAN mode only.

HEATING OPERATION WITH AUTO FAN MODE

This operation starts with the highest air flow in order to quickly raise the room temperature. It will then automatically switch to a lower air flow to quietly maintain the selected temperature.

AUTO COOLING/HEATING OPERATION

Select the AUTO mode by pressing MODE button (2). Switch to the desired FAN SPEED or to AUTO FAN by pressing button (4). Select suitable temperature setting. The air flap will automatically move to either horizontal air delivery for cooling or to vertical air delivery for heating. At start, the air conditioner will select its mode of operation according to the room temperature and the temperature setting.

DRY OPERATION

Select the DRY mode by pressing MODE button (2). Select the suitable temperature setting. While in DRY mode, the air conditioner will operate at low fan speed, regardless of the fan setting on the LCD operation display. Fan might terminate operation from time to time to prevent from over cooling. By selecting the mode, the air flap will move automatically to optimal horizontal air delivery position.

SELECTING THE TEMPERATURE

Press TEMP button (5) to change the temperature setting in the LCD operation display(13).The temperature setting is shown in degrees centigrade.

I FEEL/ROOM TEMP FUNCTION OPERATION

Press button (3) to activate the I FEEL function. Thermometer sign will appear on the LCD operation display (13). Select suitable temperature setting. Make sure that the remote control unit is aimed at the air conditioner, with the I FEEL sensor (14) in front. Prevent the I FEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the Wrong temperature data, thereby disturbing the performance of the I FEEL function.
By pressing on ROOM temperature, the measured room temperature and the room temperature sign will be displayed.
To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM temperature button (3).
- Change of MODE button (2)

Note: Room temperature range is between 6℃ and 36℃in 1℃ increments. Display should show "HI" or "LO" to represent temperature that is above 36℃ or below 6℃.

SLEEP FUNCTION

Press the SLEEP button (6) to select the SLEEP function.
The sleep icon light while the sleep OFF time icon and the time which is 7 hours after current time blink as default. The default setting can be changed from 3 hr. to 12 hr. by pressing up and down buttons HOUR+(11) and HOUR-(12) respectively. (The sleep timer will display the default time or the setting time plus the current time initially in the display).
For example: current time is 23:00 and the sleep mode is set, the sleep mode OFF time will be 6:00. If the sleep off time is set to 10 hr, the sleep mode OFF time will be 9:00. All other timers will temporarily be suspended during the activation of the sleep timer.
The other timers will resume operation at the end of the SLEEP time.
To cancel the SLEEP function press one of the following:

- START/STOP button (1)
- SLEEP button (6)

NOTE: In some models the SLEEP icon lights only and the OFF time is set for seven hours as default.

TIMER OPERATION

There are four timers that can be selected on the remote control. Two daily timers (designated as T1,T2),and two optional weekend timers (designated as WKTI,WKT2).Each timer can be selected by pressing TIMER button (11).To set each timer use time adjust up and down buttons Hour+(18) and Hour-(19) respectively. SET button (10) to enable the timer and/or CLEAR button (12) to disable the timer.

Indicator (E)on the air conditioner will light up during timer operation.

NOTE: After a power, failure the timer operation is cancelled, timer indicator (E)on the air conditioner will blink, the unit will be automatically turned to stand-by mode and indicator (A) lights. To resume the timer operation, follow the instructions below.

A. DAILY TIMER

The daily timers T1 and T2 can be set for ON and OFF separately for two different time periods. Once the timer is set it will resume operation when initiated.

B. WEEKEND TIMER (OPTIONAL)

The weekend timers WKT1 and WKT2 can be set for ON and OFF separately
for two different time periods for two days only.
It will be effective on the day of setting and on the day after only.
At 24:00 on the second day, the WK timer will not be effective anymore and the daily timer will resume its effectiveness.

WkT1-effective on the setting day

WKT2-effective one day after the setting day.

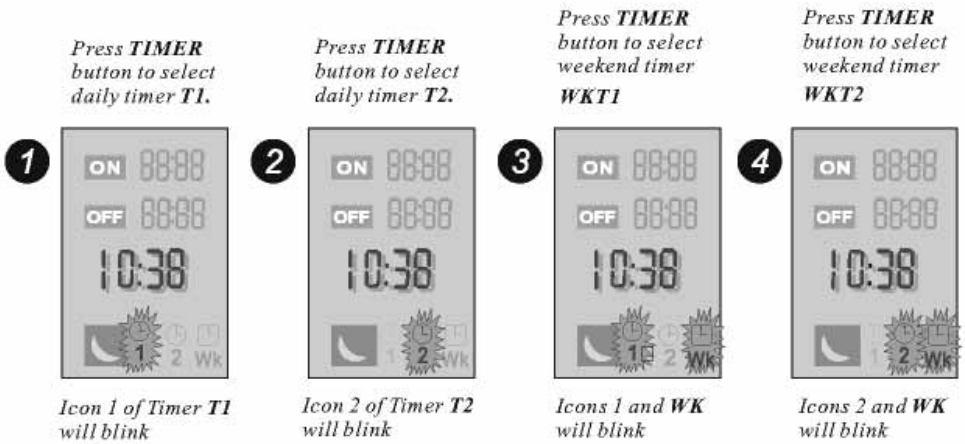
NOTE:

1.During the weekend timer operation, the daily timers will be disabled.

2.The WK timers must be reactivated before every weekend.

C. SELECTING A TIMER

Press the TIMER button (11) to select a timer. Each time the TIMER button (11) is pressed, one of the four following timer icons will appear on the LCD display.



TIMER OPERATING MODES

SETTING THE ON TIMER

Undertake the following steps after selecting a timer-T1,T2 or WKT1,WKT2,to set a timer for the start time of operation.

EXAMPLE:
Turning the air conditioner ON at 10:30.

1. *Press the SET. button.*

The ON icon & ON time digits will blink

2. *Set the hours and minutes.*

1.Set the ON time at 10:30
2.Press the (HOUR+) up button to advance the time, and press the (HOUR-)down button to retract.

3. *Press the SET button*

1.The ON time is activated at 10:30(the time ON icon will light)
2.Time OFF icon & OFF time digits will blink.

4. *Press the CLEAR button.*

Timer OFF is cleared.

SETTING THE OFF TIMER

Undertake the following steps after selecting a timer-T1,T2 or WKT1,WKT2,to set a timer for the stop time of operation.

EXAMPLE:
Turning the air conditioner OFF at 18:30.

1. *Press the SET. button.*

The ON icon & ON time digits will blink.

2. *Press the CLEAR button.*

1.The ON time is cleared.
2. OFF time icon & OFF time digits will blink.

3. *Set the hours and minutes.*

1.Set the OFF time at 18:30
2.Press the (HOUR+) up button to advance the time, and press the (HOUR-)down button to retract.

4. *Press the SET button*

OFF time is activated at 18:30 (the (timer OFF icon will light)

NOTES:
1.The default setting for the timers are 7:00 and 18:00 for ON and OFF, respectively.
2.The timer mode will display always the last ON and OFF settings on the LCD display

SETTING THE ON AND OFF TIMERS

Undertake the following steps after selecting a timer-T1,T2 or WKT1,WKT2,to set a timer for the start and stop time of operation.

EXAMPLE: Turning the air conditioner ON at 10:30.and OFF at 18:30.

Press the SET. button.	*Set the hours and minutes.*	*Press the SET button*	*Set the hours and minutes.*	*Press the SET button.*
				
The ON icon & ON time digits will blink	*1.Set the ON time at 10:30 2.Press the (HOUR+) up button to advance the time, and press the (HOUR-) down button retract.*	*1.The ON time is activated at 10:30(the time ON icon will light) 2.Timer OFF icon & OFF time digits will blink.*	*1. Set the OFF time at 18:30 2.Press the (HOUR+) up button to advance the time, and press the (HOUR-) down button retract.*	*OFF time is activated at 18:30 (the timer OFF icon will light)*

TO CHANGE THE TIME SETTING

EXAMPLE: To change the ON time setting from 10:30 to 9:20 (while preserving the OFF time setting)

Press the TIMER button. until the selected timer icon blinks.	*Press the SET button to enter edit mode*	*Change the setting time to 9:20 by pressing on HOUR-.*	*Press the SET button to save the new setting.*	*Press the SET button to confirm the previous timer OFF setting*
				
Note that the corresponding formerly set timer digits will display without blinking.	*ON icon & ON time digits blink*	*ON icon & ON time digits blink*	*ON icon & ON time digits light while OFF icon & OFF time digits blink.*	*ON & OFF icons and time digits of the consequent timer light*

TO CANCEL THE TIMER SETTING FOR A PARTICULAR TIMER

To cancel the ON time while keeping the OFF time setting.

Press TIMER button to select a timer.

The selected timer icon blinks & the corre spending previous timer ON, OFF settings light.

Press SET. button.

ON icon & ON time digits blink.

Press CLEAR button.

ON time is cleared, OFF icon & OFF time digits blink.

Press SET button

Confirm the new setting.

TO CANCEL THE ON & OFF TIME SETTIINGS

*Press **TIMER** button to select a timer.*

The selected timer icon blinks & the corre spending previous time ON, OFF settings light.

*Press **CLEAR** button.*

All settings of the selected timer are cleared.

NOTES:

1.The default settings for the timers are 7:00 and 18:00,for ON and OFF respectively.

2.The timer mode will always display the last ON and OFF settings on the LCD display.

3.Pressing CLEAR button (12) for 5 seconds will cancel all timer settings and clear timer display.

AIR FLOW VELOCITY AND DIRECTION ADJUSTMENT

Press button (7) to activate the supply air flap to auto swing;
Press button (8) to activate the Horizontal Air Flow to auto swing.
Press the two button again, you will cancel auto swing function.
To change the AIR FLOW velocity, press the ✻ button.
Each time the button is pressed, the fan speed is changed in sequence:
(Lo) → (Med) → (Hi) → (Strong) → (AUTO).

To change the AIR FLOW blowing direction vertically, press the button.
Each time the button is pressed, the mode of the HORIZONTAL VANE is changed in sequence:
Auto→Swing→Auto
To change the AIR FLOW blowing direction horizontally, press the button.
Each time the button is pressed, the mode of the VERTICAL VANE is changed in sequence:
Auto→Swing→Auto
1) Strong fan will only operation cooling & heating mode
2) Strong fan option is selectable via switch

TURNING OFF THE AIR CONDITIONER

Press Start /Stop button(1) to turn off the air conditioner. Indicator (A) on the air conditioner will be turned red. Indicating that the air conditioner is in Stand-by mode and ready to accept any new command from the remote control. The remote control LCD will display the clock time. The last operation set-up will kept for the next operation.

Ionizer / Fresh Air operation.(optional)
Pressing the Ionizer / Fresh air key will cycle in the following manner:
Fresh air (continual) & Ionizer→Fresh air (continual)→Ionizer→off
Fresh air option is selectable via switch
The function will be kept when mode is switch over
(E.S.F works together with Ionizer.)

CURRENT CLOCK TIME SET

Clock setting is performed when batteries are inserted. The remote control displays the setting and the clock display will blink0:00 or 12:00 AM (AM sign will blink, too) till a new time is set.
For clock setting, use buttons (18) and (19) for setting the hours and minutes, respectively, and then press timer SET button (10).The clock setting can be also performed by pressing timer SET button (10) for 5 seconds.
The clock display will blink, for new setting follow the steps described above.

LOCK FUNCTION

By pressing LOCK button (16),the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button (16) again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign (17) will be on.

DC INVERTER

INSTALLATION INSTRUCTIONS	ENGLISH
INSTRUCTIONS D'INSTALLATION	FRANÇAIS
INSTALLATION SANLEITUNG	DEUTSCH
INSTRUCCIONES DE INSTALACION	ESPAÑOL
ISTRUZIONE PER L'INSTALLAZIONE	ITALIANO

INSTALLATION INSTRUCTIONS

ENGLISH

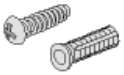
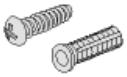
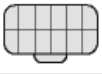
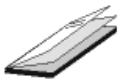
1. ACCESSORIES SUPPLIED WITH THE AIR CONDITIONER
2. LOCATION OF INDOOR AND OUTDOOR UNIT
3. INSTALLATION/SERVICE TOOLS (ONLY FOR R410A PRODUCT)
4. INSTALLATION OF THE INDOOR UNIT
5. CONDENSATE HOSE CONNECTION
6. ELECTRICAL CONNECTION BETWEEN INDOOR AND OUTDOOR UNIT
7. REFRIGERANT TUBING
8. FINAL TASKS

The appliance shall not be installed in the laundry.

NOTE: This manual is for single split applications.
For multi split applications please use installation manual supplied within outdoor unit package.

INSTALLATION INSTRUCTIONS
FOR DCI SPLIT WALL MOUNTED AIR CONDITIONER

1 ACCESSORIES SUPPLIED WITH THE AIR CONDITIONER

Shape	Name	Qty	Used for
	*Mounting plate*	1	*Wall mounting of the indoor unit*
	*Remote control with batteries*	1	*Operation of unit*
	*Remote control bracket*	1	*Wall mounting of the remote control*
	*Screws washer dowels*	4	*Wall mounting of indoor unit*
	*Screws dowels*	2	*Wall mounting of remote control bracket*
	*Outdoor unit drain connector*	1	*Outdoor unit water drain*
	*Mounting pads*	4	*Padding of outdoor unit bottom support*
	*Cable ties*	4	*Securing wires in the indoor and outdoor unit*
	*Power input cable (Optional)*	1	*Connecting indoor unit power*
	*Cable terminals*	1	*Securing of grounding wire in the indoor and outdoor unit*
	*Air purifying filter (Optional)*	2	*Cleaning the air*
	• *Remote control operation* • *Unit operation* • *Installation manual*	3	*Users and installers reference*

Indoor Unit's Accessories Only for One Unit.

2 LOCATION OF INDOOR AND OUTDOOR UNIT

Select the location considering the following:

INDOOR UNIT

1. Choose a location which will provide good air circulation.
2. Do not install the unit near a heat source or where it will be exposed to direct sunlight.
3. The location must allow convenient electrical wiring. drainage and tubing connections as shown in fig 3.
4. The appliance must be positioned so that the plug is accessible.
5. Installation site should provide an easy passage to outdoors.
6. The unit must be mounted on a strong wall that will withstand the generated vibrations.
7. Install the mounting plate as shown in fig 5.
8. Install the remote control bracket as shown in fig 4.

OUTDOOR UNIT

1. The location must allow easy servicing and provide good air circulation as shown in fig 5.
2. The unit may be suspended from a wall by a bracket (Optional) or located in a free standing position on the floor (preferably slightly elevated).
3. If the unit is suspended, ensure that the bracket is firmly connected and the wall is strong enough to withstand vibrations.
4. Unit location should not disturb neighbors with noise or exhaust air stream.
5. Place the mounting pads under the unit legs.
6. Refer to figure 5 for allowed installation distances.
7. When the unit is installed on a wall, install the drain connector hose and drain plug as shown in fig 1 and fig 2.

Fig.1
1.Bottom of outdoor unit
2.Drain connector

Fig 1

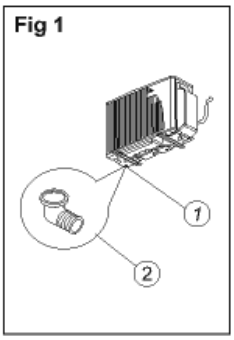
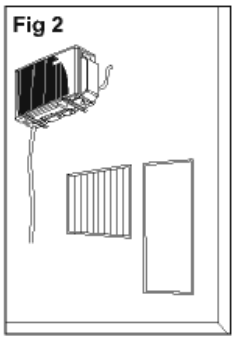


Fig.2
Drain installation Example

Fig 2



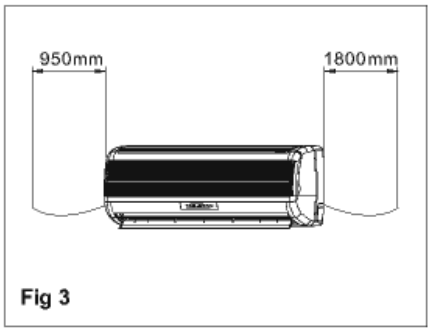
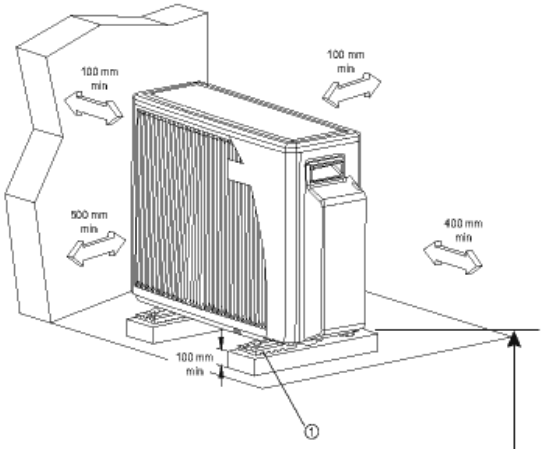


Fig 3



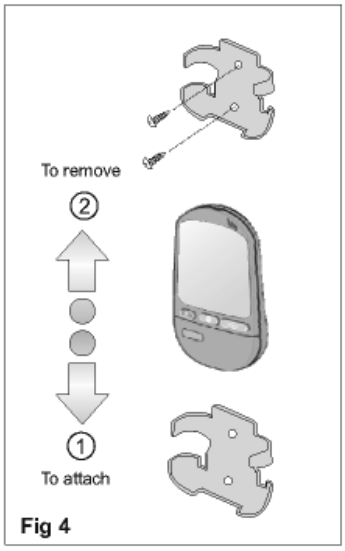


Fig 4

Height = 7m max
Without siphon
Height = 10m max
Fit a siphon on the
gas line every 3m.

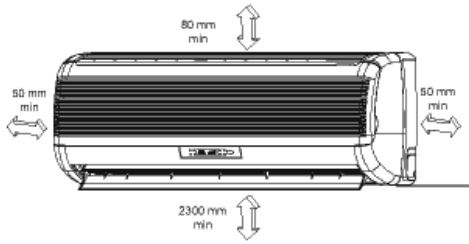


Fig 5

NOTE:
- Distance between indoor and outdoor units should be ⩽30m.
- The indoor unit may be installed above or below the outdoor unit. Height difference between indoor and outdoor units should be ⩽ 10m.
- No additional charge is required.

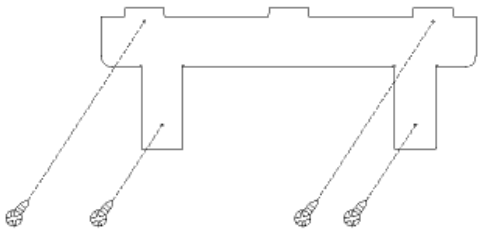


Fig.5
1. Mounting pads (×4)

3

INSTALLATION/SERVICE TOOLS (ONLY FOR R410A PRODUCT)

CAUTION

New Refrigerant Air Conditioner Installation

THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.
R410A refrigerant is apt to be affected by impurities such as water, oxidizing membrane, and oils because the working pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22. Accompanied with the adoption of the new refrigerant, the refrigeration machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigeration machine oil does not enter into the new type refrigerant R410A air conditioner circuit.
To prevent mixing of refrigerant or refrigerating machine oil, the sizes of connecting sections of charging port on main unit and installation tools are different from those used for the conventional refrigerant units. Accordingly, special tools are required for the new refrigerant (R410A) units. For connecting pipes, use new and clean piping materials with high pressure fittings made for R410A only, so that water and/or dust does not enter. Moreover, do not use the existing piping because there are some problems with pressure fittings and possible impurities in existing piping.

Changes in the product and components
In air conditioners using R410A, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)
- In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

New tools for R410A

New tools for R410A	Applicable to R22 model		Changes
Gauge manifold	×		As the working pressure is high, it is impossible to measure the working pressure using conventional gauges. In order to prevent any other refrigerant from being charged, the port diameters have been changed.
Charge hose	×		In order to increase pressure resisting strength, hose materials and port sizes have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.
Electronic balance for refrigerant charging	O		As working pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal dia. 1/2, 5/8)	×		The size of opposing flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)	O		By increasing the clamp bar's receiving hole size, strength of spring in the tool has been improved.
Gauge for projection adjustment	–		Used when flare is made by using conventional flare tool.
Vacuum pump adapter	O		Connected to conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back into the charge hose. The charge hose connecting part has two ports -- one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector	×		Exclusive for HFC refrigerant.

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U.S's ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" requires 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

4 INSTALLATION OF THE INDOOR UNIT

Installation of the indoor unit only with one unit for the sample.

INSTALLATION OF THE MOUNTING PLATE

Figure 6 shows the location of the mounting plate relative to the unit size.

1. Locate the mounting plate on the wall in a horizontal position.
2. Mark the position of the four mounting holes on the wall and drill four holes to accommodate the dowels.
3. Mount the mounting plate on to the wall by the four screws. Ensure screws are tightened properly.

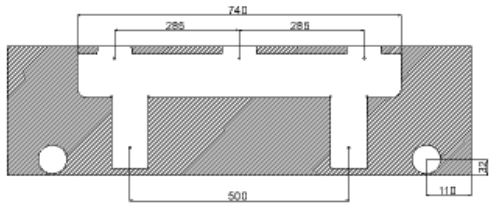


Fig 6 (Unit: mm)

REFRIGERATION TUBE ROUTING

1. There are five possible routes for installing the refrigeration tube as shown in fig 7.
2. For route (6), cut the bottom notch in the rear.
3. For routes (4) or (7), cut the side notches in the rear and in the front panel.

Fig.7
1.Front
2.Rear
3.Righthand rear outlet
4.Lefthand outlet
5.Lefthand rear outlet
6.Bottom outlet
7.Righthand outlet

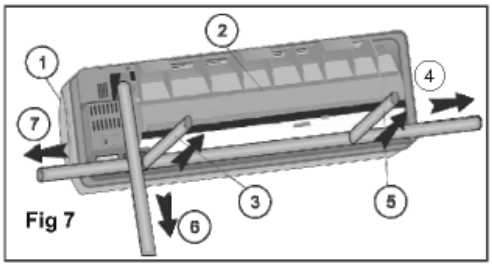


Fig 7

PENETRATION OF WALL FOR TUBING

1. Mark the location of the hole on either side of the mounting plate as shown, in fig6 and drill it at a 5° downward angle, as shown in fig8.
2. The hole is drilled at an angle, to prevent condensed or rain water from penetrating back into the room.
3. Trim the hole in the wall with a Φ70mm commercial plastic tube.

Fig.8
A. OUTDOOR SIDE
B. INDOOR SIDE
1. Drill 70mm
2. Wall

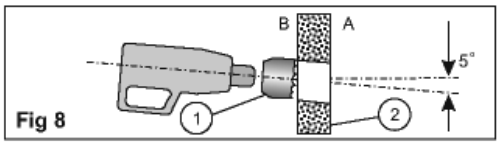


Fig 8

SUSPENDING AND RELEASING THE UNIT FROM THE MOUNTING PLATE

1. Make sure that the refrigerant tubes, electric cables and condensate water hose are well insulated with closed cell rubber based insulating tubes (6mm thickness), are wrapped together with UV stabilized nonadhesive plastic tape, and are passed through the hole in the wall.
2. Hang the indoor unit on the two hooks that are located near the top edge of the mounting plate as shown in fig 9 and fig 10.
3. Press the lower part of the indoor unit against the mounting plate until the catches snap into the slots and lock the indoor unit to the mounting plate.
4. Check the installation by pulling the unit towards you.
5. To release the unit from the mounting plate, lift up the unit and then pull the unit towards you, to ensure that the hooks are locked.

Fig.9
1.Indoor unit
2.Snap catches
3.Top hooks
4.Bottom hooks

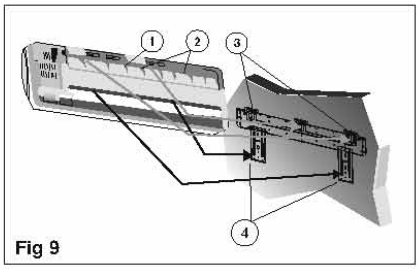


Fig 9

Fig.10
1.Mounting plate
2.Lower hook

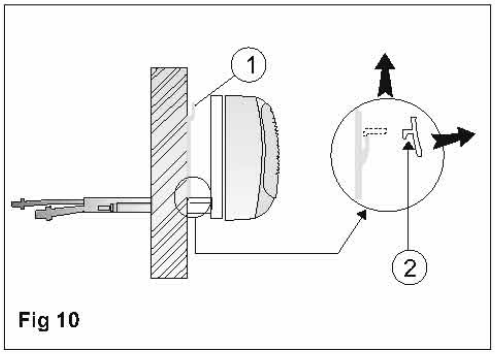


Fig 10

5 CONDENSATE HOSE CONNECTION

1. Attach the condensate drain hose to the corrugated hose in the rear groove of the indoor unit.
2. Wrap the drain hose together with the refrigerant tubes and electrical cables.
3. Ensure that the condensate drain hose is at all points installed in a downward slope manner.

Fig.11
1.Drain hose
2.Clamp
3.Downward slope

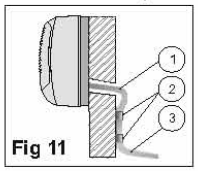


Fig 11

Fig.12
1.Trap
2.U-bend
3.End immersed in water

4. When installing the drain hose avoid traps and U-bends. The end of the drain hose should not be immersed in water.

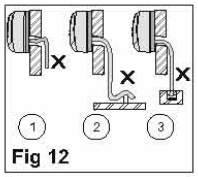


Fig 12

Fig.13
1.Electric cable
2.Refrigerant tubing
3.Condensate drain hose
4.UV stabilized nonadhesive plastic tape

5. For a lefthand outlet, lay the drain hose on the bottom of the indoor unit rear groove.

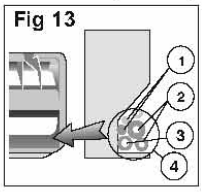


Fig 13

Fig.14
1.Vent
2.Downward drain
3.Water drain hose

6. When the installation location requires long horizontal sections, a vent must be provided at the top of the hose to prevent overflow of the unit drain pan.

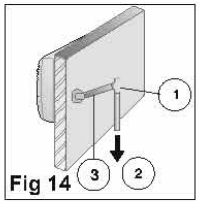


Fig 14

6 ELECTRICAL CONNECTION BETWEEN INDOOR AND OUTDOOR UNIT

ELECTRICAL REQUIREMENTS

Electrical wiring and connections should be made by qualified electricians and in accordance with local electrical codes and regulation. The air conditioner units must be grounded.
The air conditioner unit must be connected to an adequate power outlet from a separate branch circuit protected by a time delay circuit breaker, as specified on unit's nameplate.
Voltage should not vary beyond ±10% of the rated voltage.

1. Connect the power supply cable to the indoor unit of WNG.

2. To connect the indoor unit to the outdoor unit use the following electrical cables.

Electrical connections:

Power input cable: 3 wires × 2.5 mm²

Cable between
Indoor and outdoor units: 4 wires × 2.5 mm²

3. Prepare the cable ends for the power input and for the cables between outdoor and indoor units as shown in figure 16a and 16b respectively.
4. Connect the cable ends to the terminals of the indoor and outdoor units, as shown in fig 17.
5. Secure the multiple wire power cable with the cable clamps.

• **Power input cable**

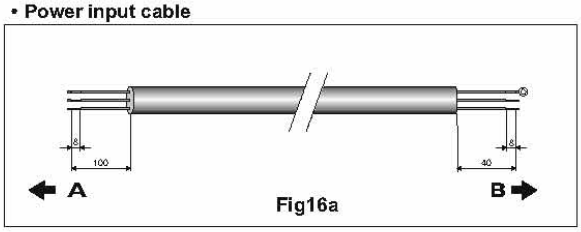


Fig16a

• **Cable between indoor and outdoor units**

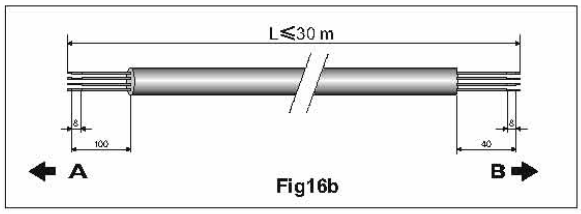


Fig16b

Fig.16 A. OUTDOOR B. INDOOR

Fig.15
1. Terminal 2. Cover 3. Cable clamp

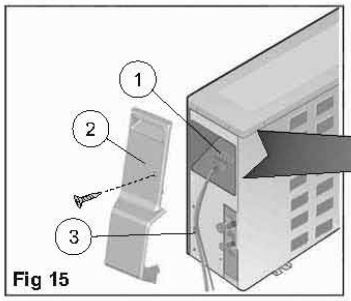


Fig 15

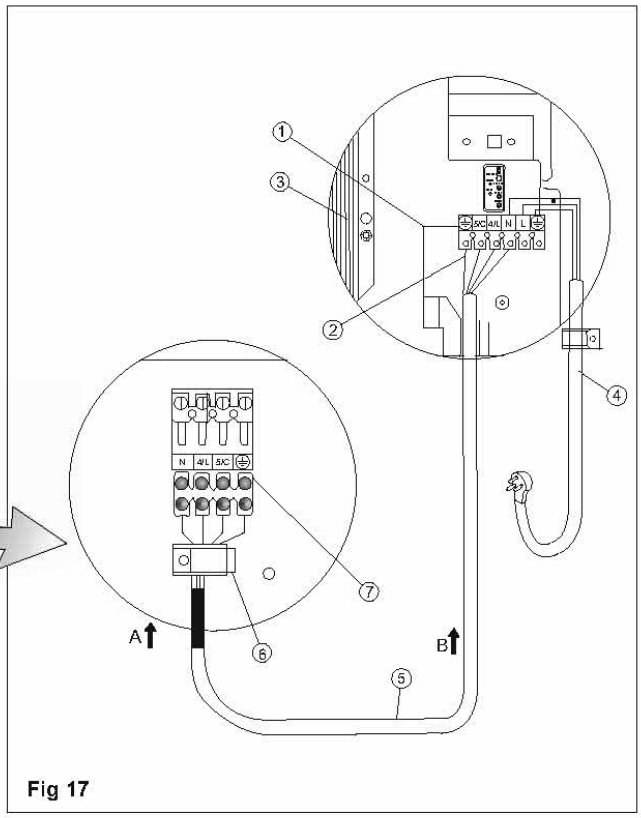


Fig 17

NOTES:

1. The wire color code can be selected by the installer.

Fig.17

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

7 REFRIGERANT TUBING

CONNECT THE INDOOR TO THE OUTDOOR UNIT
The indoor unit contains a small quantity of nitrogen. Do not unscrew the nuts from the unit until you are ready to connect the tubing. The outdoor unit is supplied with sufficient refrigerant charge (R410A). Refer to outdoor unit nameplate.

To prevent crushing, bend tubes using a bending tool.

NOTE: Use refrigeration R410A type copper tubing only.

1. Open the valve cover.
2. Use tubing diameter that corresponds to the tubing diameter of the indoor and outdoor units. Note that the liquid and suction tubes have different diameters. (See tube size, torque tightening table.)
3. Place flares nuts on tube ends before preparing them with a flaring tool. Use the flare nuts that are mounted on the supplied outdoor and indoor units.
4. Connect the all ends of the tubing to the indoor and outdoor units. Notice the sign. All ends should correspond one by one.
5. Insulate each tube separately, and their unions, with at least 13 mm thick of insulation. Wrap the refrigerant tubing, drain hose and electric cables together with a vinyl tape (UV protected).

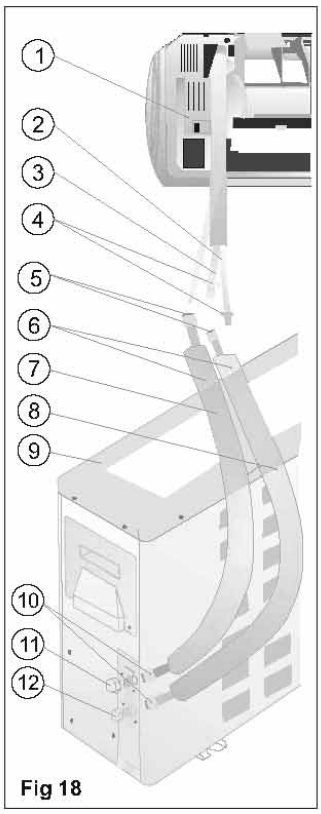


Fig 18

Caution!
When unscrewing the valve caps, do not stand in front of them or the spindles at any time, as the system is under pressure.

Fig.18
1.INDOOR UNIT
2.Liquid tube (small dia.)
3.Suction tube (large dia.)
4.Plugs
5.Flare nuts
6.Tubing between units
7.Suction tube
8.Liquid tube
9.OUTDOOR UNIT
10.Flare nuts
11.Suction valve (larger)
12.Liquid valve (small)

Tightening torques of unions and valve caps:

TUBE SIZE	TORQUE
Liquid line 1/4"	15-20 N.M.
Suction line 3/8"	30-35 N.M.
Suction line 1/2"	50-54 N.M.
Suction line 5/8"	75-78 N.M.

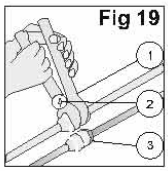


Fig 19

Fig.19
1.Wrench
2.Torque wrench
3.Union


Fig 20

Fig.20
To prevent refrigerant leakage, coat the flared surface with refrigeration oil

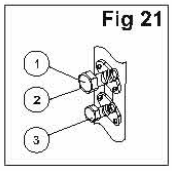


Fig 21

Fig.21
1.Suction valve
2.Service port
3.Liquid valve

EVACUATION OF THE REFRIGERATION TUBES AND THE INDOOR UNIT

After connecting the unions of the indoor and outdoor units, purge the air from the tubes and indoor unit as follows:

1. Connect the charging hoses with a push pin to the low side of the charging set and the service port of the suction valve. Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the center hose of the charging set to a vacuum pump.
3. Turn on the power switch of the vacuum pump, turn off the high side switch and make sure that the needle in the gauge moves from 0 MPa (0cm Hg) to -0.1 MPa (-76cm Hg). Let the pump run for fifteen minutes.
4. Close the valve of the low side of the charging set and turn off the vacuum pump. Note that the needle in the gauge should not move after approximately five minutes.
5. Not any problem for five minutes, turn on the power switch of the vacuum pump and open the valve of the low side of the charging set.
6. Disconnect the charging hose from the vacuum pump and from the service ports of the suction valve.
7. Tighten the service port caps of suction valve.
8. Redo 1 to 7 for other indoor units.
9. Remove the valve caps from all valves, and open them using a hexagonal Allen wrench.
10. Remount valve caps onto all of the valves.
11. Check for gas leaks from all the connecting position. Test with electronic leak detector or with a sponge immersed for soapy water for bubbles.

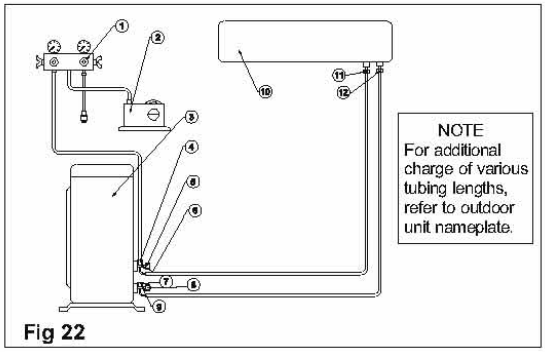


Fig 22

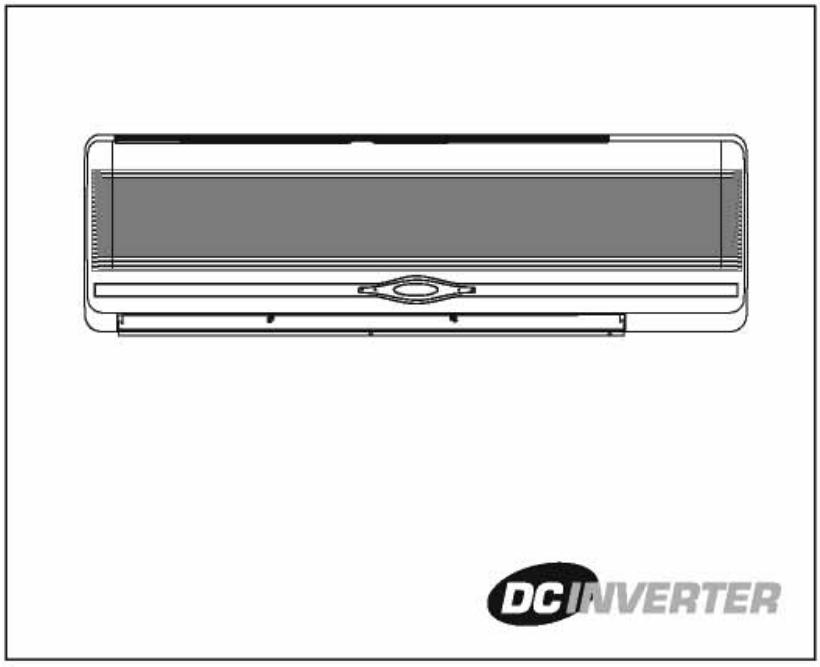
Fig.22
1. Charging set
2. Vacuum pump
3. OUTDOOR UNIT
4. Service valve
5. Cap
6. Suction valve
*7. Service valve**
8. Cap
9. Liquid valve
10. INDOOR UNIT
11. Suction flare connection
12. Liquid flare connection

**In some models only*

8 FINAL TASKS

1. Check all valve caps and ensure that they had tightened properly. Close the valve cover.
2. Fill gaps on the wall between hole sides and tubing with sealer.
3. Attach wiring and tubing to the wall with clamps where necessary.
4. Operate the unit for no less than 5 minutes at heating or cooling mode.
5. Explain filter removal, cleaning and installation.
6. Operate the air conditioner together with the customer and explain all functions.
7. Give the operating and installation manuals to the customer.

AIR CONDITIONER SPLIT WALL MOUNTED **ENGLISH**



PROGRAMMING AND OPERATING MANUAL

CONTENTS

INTRODUCTION	1
SYSTEM DESCRIPTION	2
MODES OF OPERATION, FUNCTIONS AND FEATURES	3
ON-UNIT INDICATORS AND CONTROLS	5
● On-unit Operation	5
PROTECTION MODES	6
CARE AND MAINTENANCE	7
OPERATING TIPS	8
PRECAUTIONS	9
BEFORE CALLING FOR SERVICE	10

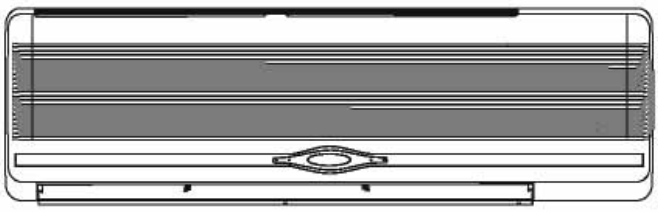
*PLEASE READ THESE INSTRUCTIONS **BEFORE** OPERATING THE AIR CONDITIONER*

INTRODUCTION

Dear customer:
The DC Inverter air conditioner you have purchased is one of the most advanced units of its kind. The DC Inverter air conditioner is a variable capacity air conditioner which uses high efficiency DC motors for the compressor and the outdoor fan. Unlike other models, it can adjust its capacity according to the user setting and the environmental condition, thus saving up to 30% of the seasonal power consumption, while keeping maximum comfort level. This modern unit is also equipped with an ionizer (optional) and an Electrostatic filter (optional) to maximize your indoor air quality.
Detailed instruction as to the DC Inverter air conditioner (including Single & Multi Split type) functions and way of operation are provided in the following pages.

This Split Air Conditioner is designed for versatile application:

	● Cooling.
	● Dehumidifying.
	● Heating.
	● Air Filtration.
	● Ventilation



OPERATING TEMPERATURE RANGE:

-15℃ ~ 46℃

IMPORTANT NOTICE:

● *This air conditioner must be grounded to protect against electrical shock.*

● *Installation of the air conditioner must be performed by an experienced air conditioning installer, observing good refrigeration practice.*

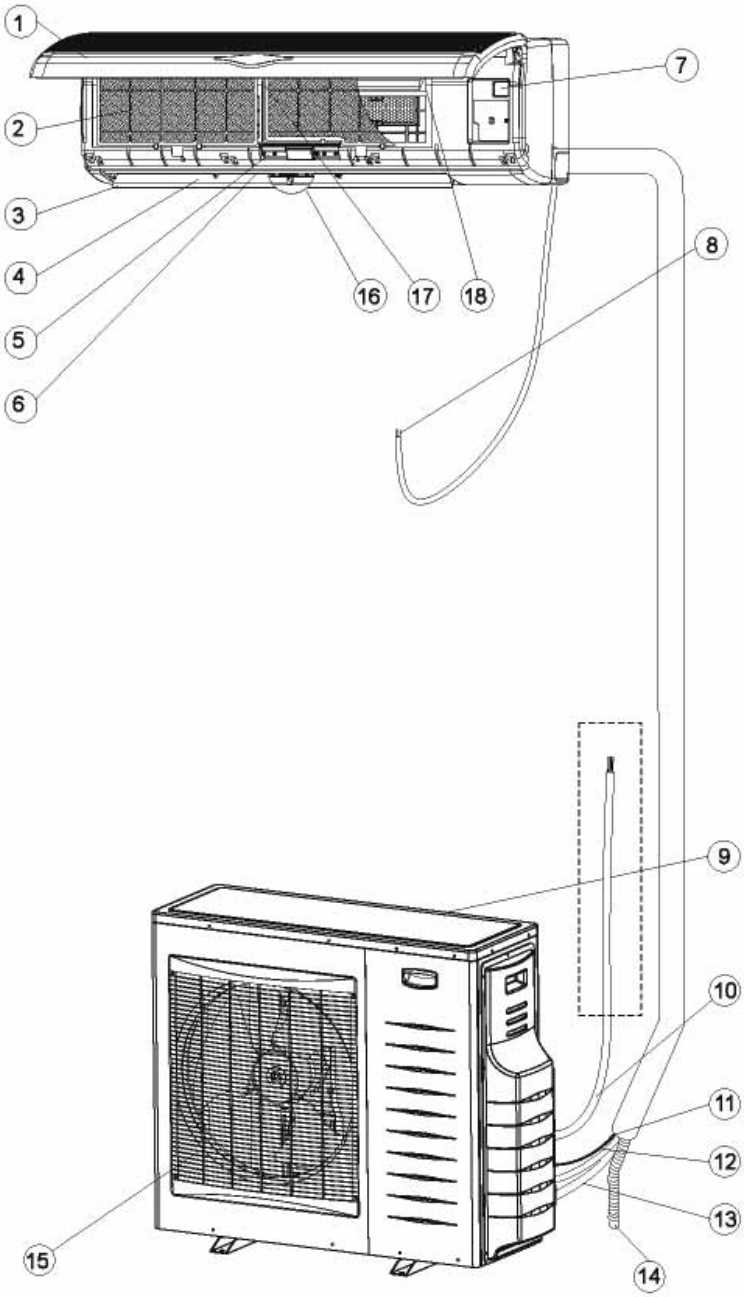
● *Electrical connections and power cord replacement should only be made by authorized electricians and in accordance with electrical regulations and local codes. The appliance must be positioned so that the plug is accessible.*

● *Failure to comply with the manufacturer's installation and operation instructions could affect the performance of the air conditioner and the validity of the warranty.*

Test Mode

Test Mode is set only for performance testing purposes, and not for user operation.
Test mode can be initiated by either one of the following conditions:
1) Operating the unit with the following remote control settings and temperature conditions:
Cool Mode, SPT=16℃ and RAT=27±1℃,
OAT=35±1℃ for 30 minutes;
Heat Mode, SPT=30℃ and RAT=20±1℃,
OAT=7±1℃ for 30 minutes.
2) Entering Diagnostics with Cool/SPT=16℃ or Heat/SPT=30℃.

SYSTEM DESCRIPTION



1. Air intake grille
2. Air filter
3. Supply air flap (louver)
4. Air outlet
5. Unit's indicators
6. Horizontal Air flow
   Deflecting louvers
7. On unit operation
8. Power cord ※
9. Outdoor unit air intake
10. Power Cord.
    (Only for Outdoor Unit
    Power Supply)
11. Power Cable.
12. Liquid tube
13. Suction tube
14. Drain hose
15. Outdoor unit air outlet
16. Ionizer (optional)
17. Air purifying filter
18. Electrostatic filter (optional)

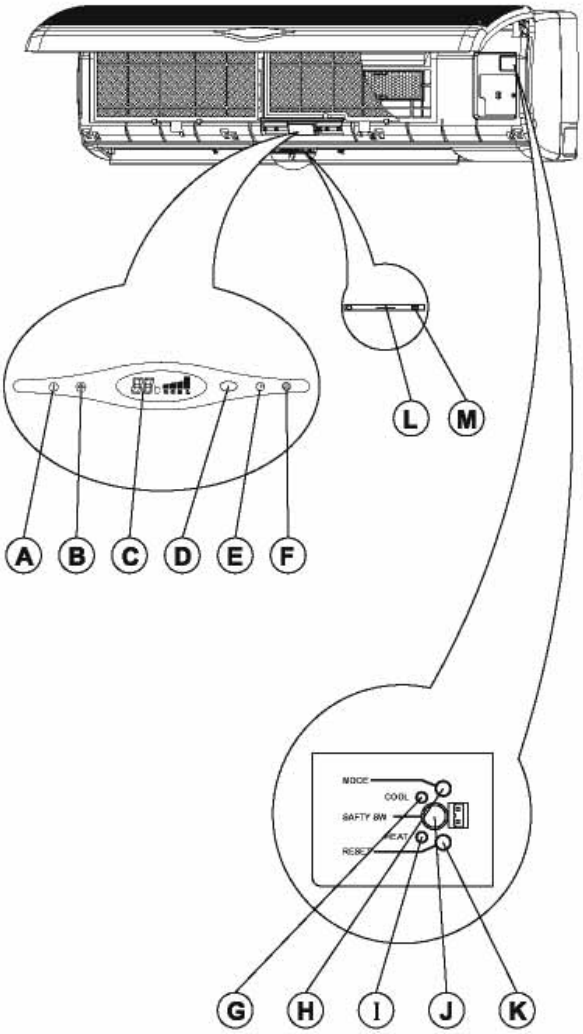
※ Not connected in multi split applications

MODES OF OPERATION, FUNCTIONS AND FEATURES

COOL	Cools, dehumidifies and filters the room air. Maintains desired room temperature.
HEAT	Heats and filters the room air. Maintains the desired room temperature.
AUTO	Automatically select between cool and heat operation modes, according to the requested room temperature and the actual room conditions.
DRY	Dehumidifies and softly cools the room In DRY Mode, the air conditioner operates at an increased dehumidifying power. This function is recommended to be used when temperature is rather low but the humidity is high.
FAN	Recirculates and filters the room air. Maintains constant air movement in the room.
AUTO FAN	The air conditioner automatically selects the FAN speed in accordance to the requested room temperature and the actual room temperature. During the first 30 minutes of unit operation after being turned ON, the unit operates at high fan speed to maximize the cooling/heating effect. As the room air approaches to the desired temperature, the fan switches to a lower speed for quieter operation.
HOT KEEP	In HEATING, when unit is started, the indoor fan will not be turned on until the indoor coil reaches adequate temperature. This HOT KEEP feature prevents uncomfortable cold air drafts.
I FEEL	Switches the temperature sensing point to the place where the remote control (optional) is located.(Generally the temperature sensor is located behind the intake grille of the air conditioner).This function is designed to provide a personalized environment by transmitting the temperature control command from the location next to you. The communication between the Remote Control and the unit is done by infra-red signal. Therefore, in using this function, the Remote Control should always be aimed, without obstructions, at the air conditioner.
TIMER	Real time control and display, automatically turns the air conditioner ON and OFF according to the time of day setting, ensuring comfort conditions before returning home, without wasting electricity. It turns the air conditioner off automatically when sleeping.
SLEEP	Designed to create comfortable sleeping conditions. When in COOLING mode, the temperature rises one degree centigrade after each consecutive hour, up to three hours, from the start of the mode. The temperature rise prevents the feeling of over-cooling while sleeping (when your body is at rest). In HEATING mode the reverse occurs; the air conditioner lowers its temperature one degree every hour, up to three hours, from the start of the mode. When in SLEEP mode, the air conditioner will be automatically turned off after operated for eight hours. The result is a more comfortable and invigorating sleep, which leaves you feeling fresh and energetic in the morning.
AUTO FLAP	The air flap (louvers) is automatically positioned for the most suitable blow-out angle, when COOL, HEAT, DRY or FAN modes are selected. When the air conditioner is turned off, the flap will close automatically for an aesthetic appearance.

VERTICAL AIR SWING	Automatic swing of supply air in vertical direction. The flap moves automatically in upward and downward direction to spread the conditioned air evenly throughout the room.
AIR DIRECTION POSITIONING	Automatic swing of Horizontal air flow in Horizontal direction. The flap move automatically in right and left direction to spread the conditioned air evenly throughout the room.
ROOM TEMPERATURE	Measures and displays room temperature.
FILTER INDICATION	Filter indicator on the indoor unit display is turned on when the filter requires cleaning. After cleaning and reinstalling the filter, It should be reset.
BUZZER	A soft buzzer will sound from the indoor unit display to indicate that a command sent by the remote control has been accepted and stored in the unit's memory. This feature may be easily cancelled by the user from the display panel.
ON UNIT OPERATION	The air conditioner can be turned ON for COOLING or HEATING or be turned OFF directly by "MODE" key without the use of the remote control.
3-MIN DELAYED RUN	The compressor is protected by a three-minute delayed restart.
MEMORY	The microprocessor retains the last data entry whether or not the unit is plugged in. Therefore, when the unit restarts after a power failure, it will resume operating in the same mode as before the power was disrupted.
LOCK	Freezes the last operation setting on the remote control. When LOCK is activated, the remote control will not be able to control the air-conditioner.
ILLUMINATED KEYPAD AND LCD DISPLAY (optional)	By pressing any button in dark environment, the keypad and the LCD display will be illuminated.
ELECTROSTATIC FILTER (optional)	They are capable of capturing small particles down to 0.1 microns, Such as atmospheric and house hold dust, coal dust, insecticide dust, mites, pollen, pet dander, tobacco smoke particles, cooking smoke and grease, mold fungi, bacteria, viruses and more.
IONIZER (optional)	Ionizer makes the air more fresh and more comfortable. Slide switch (H) to the ON position to activate the ionizer. The blue light indicator (G) on the unit will light up indicating the ionizer in operation. To cancel the operation set slide switch to OFF position. **Important Notice:** When the air-conditioner is turned OFF or if the indoor fan stops operation, the IONIZER stops automatically.

ON-UNIT INDICATORS AND CONTROLS



A. Stand-by/Operation indicator
Lights up in red when connected to power.
Lights up in green during operation.

B. ESF/Ionizer indicator
Lights up when the E.S.F or Ionizer operation.

C. LCD operation display

D. Signal receiver
Receiver signals from the remote control.

E. Timer indicator
Lights up during timer and sleep operation.

F. Filter indicator
Lights up when air filter requires cleaning.

G. Cooling indicator
Lights up only when mode (H) is pressed.

H. Unit mode button
Used to switch the unit off or turn it on for cooling or heating without the remote control.

I. Heating indicator
Lights up when mode (H) is pressed.

J. Electrostatic filter safety button
Turn off the Electrostatic filter when you open the grill.

K. Reset button
- *Press to turn off the filter indicator and to reset the filter function, after the cleaned filter has been reinstalled.*
- *Press to cancel the buzzer announcer.*

L. Ionizer indicator
Lights up during the ionizer is open.

M. Ionizer on/off
Used to switch the ionizer on or off.

ON- UNIT OPERATION
If the air-conditioner cannot be operated by the Remote Control unit, it can be turned on for cooling or heating, or completely turned off, by pressing MODE button (H) on the air-conditioner. The MODE button will change the operating status of the unit between- COOLING-HEATING-STAND-BY positions, every time it is pressed, Indicators (G), (I) or (A) will light up respecitively, to indicate in which mode the air-conditioner operates.

PROTECTION MODES

Your air conditioner includes several automatic protection modes which enables you to use it virtually at any time and in any season, regardless of the outdoor temperature. Some of the protection modes are listed below:

Mode	Operation conditions	Protection from	Controlled remedy
Cooling	Low outdoor temperature	Indoor coil Freezes up	Stops outdoor fan and compressor when approaching freezing conditions Resumes operation automatically Operating indicator (A) blinks.
	High outdoor temperature	Outdoor coil overheating	Stops compressor when approaching overheating conditions. Resumes operation automatically. Operating indicator (A) blinks.
Heating	Low outdoor temperature	Outdoor coil ice build up	Reverses operation from heating to cooling for short periods to de-ice outdoor coil. Operating indicator (A) blinks.
	High Indoor or outdoor temperature	Indoor coil overheating	Stops outdoor fan and compressor when approaching high indoor coil temperature. Resumes operation automatically. Operating indicator (A) blinks.

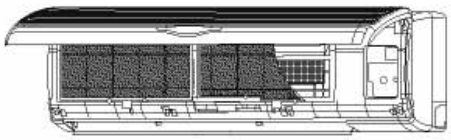
Note: When switching the unit to OFF after heating operation, the unit may perform outdoor coil deicing operation. In such a case, the compressor will continue to run for some time after the unit has switched to OFF, and the indoor unit louvers are closed. This feature is a part of the normal unit operation.

CARE AND MAINTENANCE

Before performing any maintenance procedure, make sure to disconnect the air conditioner from the power.

CLEANING THE AIR FILTER

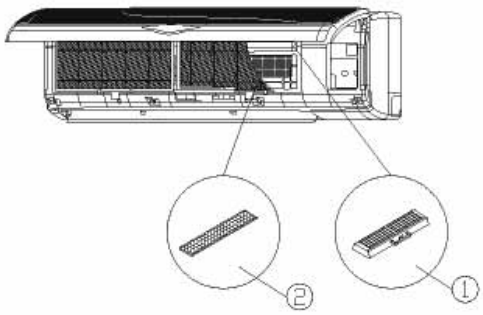
- Your air conditioner is provided with a filter cleaning indicator. When the filter indicator (F) lights up, the filters should be removed for cleaning.
- To remove the air filters, lift up the panel, push the air filters up slightly to unlock them, pull out the filters. Clean the filters by washing in warm soapy water and dry thoroughly, align and fit the filters in place, close the panel by pushing it in the center to lock it in place.
- Reset button (K) to turn off filter indicator (F).



CLEANING THE ELECTROSTATIC FILTER

The electronic filter should be removed from the unit and cleaning once three month. The procedure is shown as following:

1 open the front panel
2 push the hook on the filter and pull out the electrostatic filter (Fig ①)
3 wash the filter with the warm soapy water and dry thoroughly
4 push the electrostatic filter into the right position
5 close the front panel
Note: the above procedure is used for cleaning the electrostatic filter.



PURIFICATION FILTER REPLACEMENT

The air purifying filter should be removed from the unit and replaced once a year, shown as following:

1 pulling out the filter. (Fig ②)
2 replacing and securing the filter in its frame.
3 sliding the filter back in its place.
Note: The above procedure is used for replacing the active carbon filter (when supplied).
DO NOT OPERATE THE UNIT WITHOUT FILTERS!

CLEANING THE AIR CONDITIONER

- Wipe the unit with a soft dry cloth or clean it using a vacuum cleaner
- Do not use hot water or volatile materials which could damage the surface of the air conditioner.

AT THE BEGINNING OF THE SEASON

- Make sure there are no obstacles blocking the flow of inlet or outlet air, in both indoor and outdoor units.
- Make sure the power is properly connected.

PROTECT THE ELECTRONIC SYSTEM

- Indoor unit and remote control must be at least 1 meter away from a TV, radio or any other home electronic appliance.
- Protect the inner unit from direct sun or lighting.

OPERATING TIPS

● Set a suitable room temperature; excessively low room temperature is not good for your health and wastes electricity. Avoid frequent setting of the temperature.

● During cooling, avoid direct sun. Keep curtains and blinds closed. Close doors and windows to keep the cool air in the room.

● Avoid generating heat or using of heating appliances while the air conditioner in cooling mode.

● Make sure that the air flap is positioned properly: horizontal flow in cooling and downward vertical flow for heating.

● Keep the room temperature uniform by adjusting the left/right vertical air blades.

● Position the air flap and the left/right air blades in such a manner as to prevent your body from being exposed directly to air drafts.

● During prolonged operation, ventilate the room occasionally by opening a window from time to time.

● In a power failure, the microprocessor memory is retained. When restarted, operation will be resumed in the last mode of operation. However, if the timer was used, the unit will be turned off by the timer only if the remote control is aimed at the unit. Otherwise the power failure will cause the timer data to be erased from the microprocessor memory.

● After turning on, allow more than 3 minutes for cooling, heating or dry operation to start.

● When COOL or DRY modes are used, make sure that the room's relative humidity is below 78% If the unit is used for a prolonged period of time in high humidity, moisture may form on the air outlet and drip down.

● Remote control signals may not be received if the indoor unit controls cover is exposed to direct sunlight or strong light. In such a case, block the sunlight or dim the lighting.

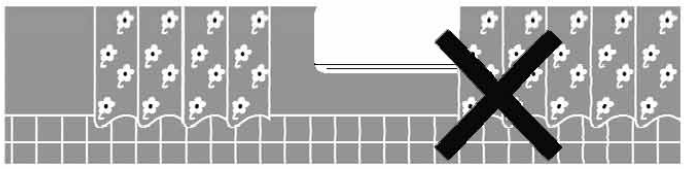
● The remote control is operative in a range of 8 meters. If you are out of range, the remote control may have difficulties in transmitting signals.

PRECAUTIONS

● Use the proper electrical fuse.
Do not pull out the power cord unless the unit is turned off.

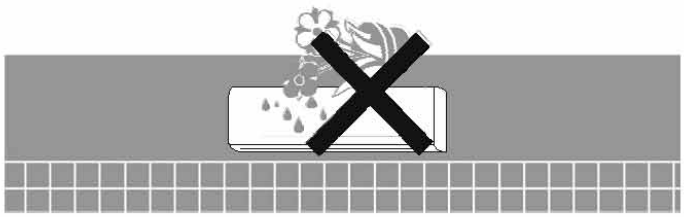
● Do not start or stop operation by disconnecting the power cord.

● Do not obstruct or block the air inlet or air outlet of the air conditioner.



● Do not insert any objects in the air outlet of the indoor or outdoor units.

● Do not splash water on air conditioner.



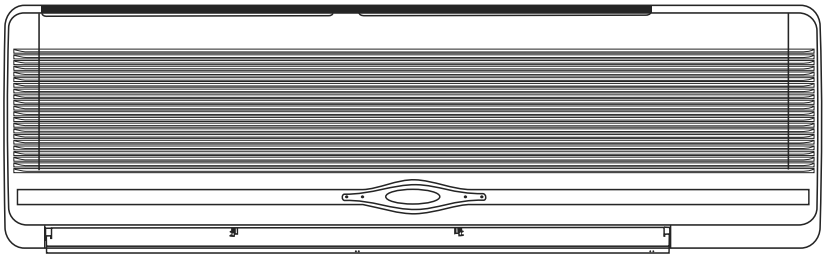
IF NOISE IS HEARD
There may be hissing sound during operation or just after shut down. This is caused by the refrigerant that is circulating inside the unit

There may be a cracking sound at starting and stopping of the unit's operation. This is caused by heat expansion or contraction of plastics.

BEFORE CALLING FOR SERVICE

Before calling for service, please check the following common malfunctions and correct as needed.

Problem	Cause	Remedy
● Unit does not operate. Stand-by indicator does not light up.	❑ Unit not connected to power ❑ Power failure	■ Plug in the power cord ■ Check main fuse
● Unit does not operate. Stand-by indicator lights.	❑ Remote control malfunctions	■ Check remote control batteries. ■ Try to operate from a closer distance. ■ Start from on-unit controls.
	❑ The remote control is locked.	■ Unlock the remote control.
● Unit does not respond properly to remote control command.	❑ IR signal does not reach unit.	■ Check for obstruction between unit and remote control, Clear if needed.
	❑ Distance between remote control and unit too large or aimed at from improper angle.	■ Get closer to unit.
	❑ IR receiver on-unit exposed to strong light source.	■ Dim lights, fluorescents especially
● Air does not blow out from indoor unit.	❑ De-icing protection mode is activated.	■ Normal operation in HEATING mode.
● COOLING, DRY or HEATING does not start Immediately.	❑ 3-min. Compressor delayed start	■ Normal operation for these modes.
● Unit functions but does not perform sufficiently.	❑ Improper temperature setting.	■ Reset temperature.
	❑ Unit capacity insufficient for load or room size.	■ Consult your dealer
● Filter indicator lights up	❑ Air Filter needs cleaning	■ Clean filter, reinstall and reset indicator



DC INVERTER

INSTALLATION INSTRUCTIONS

ENGLISH

INSTALLATION INSTRUCTIONS

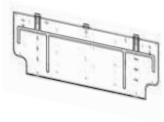
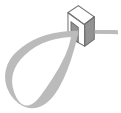
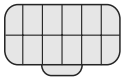
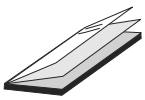
ENGLISH

1. ACCESSORIES SUPPLIED WITH THE AIR CONDITIONER
2. LOCATION OF INDOOR AND OUTDOOR UNIT
3. INSTALLATION/SERVICE TOOLS (ONLY FOR R410A PRODUCT)
4. INSTALLATION OF THE INDOOR UNIT
5. CONDENSATE HOSE CONNECTION
6. ELECTRICAL CONNECTION BETWEEN INDOOR AND OUTDOOR UNIT
7. REFRIGERANT TUBING
8. FINAL TASKS

The appliance shall not be installed in the laundry.

INSTALLATION INSTRUCTIONS
FOR DCI SPLIT WALL MOUNTED AIR CONDITIONER

1 ACCESSORIES SUPPLIED WITH THE AIR CONDITIONER

Shape	Name	Qty	Used for
	*Mounting plate*	1	*Wall mounting of the indoor unit*
	*Remote control with batteries*	1	*Operation of unit*
	*Remote control bracket*	1	*Wall mounting of the remote control*
	*Screws washer dowels*	4	*Wall mounting of indoor unit*
	*Screws dowels*	2	*Wall mounting of remote control bracket*
	*Outdoor unit drain connector*	1	*Outdoor unit water drain*
	*Mounting pads*	4	*Padding of outdoor unit bottom support*
	*Cable ties*	4	*Securing wires in the indoor and outdoor unit*
	*Power input cable (Optional)*	1	*Connecting indoor unit power*
	*Cable terminals*	1	*Securing of grounding wire in the indoor and outdoor unit*
	*Air purifying filter (Optional)*	2	*Cleaning the air*
	• *Remote control operation* • *Unit operation* • *Installation manual*	3	*Users and installers reference*

Indoor Unit's Accessories Only for One Unit.

2 LOCATION OF INDOOR AND OUTDOOR UNIT

Select the location considering the following:

INDOOR UNIT

1. Choose a location which will provide good air circulation.
2. Do not install the unit near a heat source or where it will be exposed to direct sunlight.
3. The location must allow convenient electrical wiring. drainage and tubing connections as shown in fig 3.
4. The appliance must be positioned so that the plug is accessible.
5. Installation site should provide an easy passage to outdoors.
6. The unit must be mounted on a strong wall that will withstand the generated vibrations.
7. Install the mounting plate as shown in fig 5.
8. Install the remote control bracket as shown in fig 4.

OUTDOOR UNIT

1. The location must allow easy servicing and provide good air circulation as shown in fig 5.
2. The unit may be suspended from a wall by a bracket (Optional) or located in a free standing position on the floor (preferably slightly elevated).
3. If the unit is suspended, ensure that the bracket is firmly connected and the wall is strong enough to withstand vibrations.
4. Unit location should not disturb neighbors with noise or exhaust air stream.
5. Place the mounting pads under the unit legs.
6. Refer to figure 5 for allowed installation distances.
7. When the unit is installed on a wall, install the drain connector hose and drain plug as shown in fig 1 and fig 2.

Fig.1
1.Bottom of outdoor unit
2.Drain connector

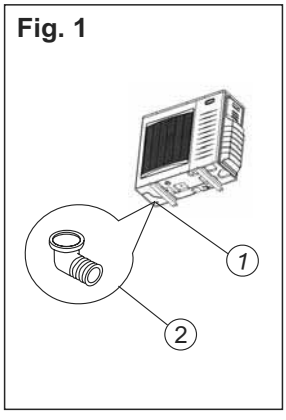
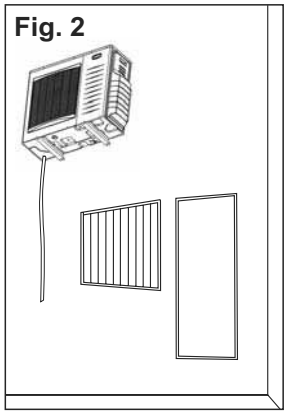


Fig.2
Drain installation Example



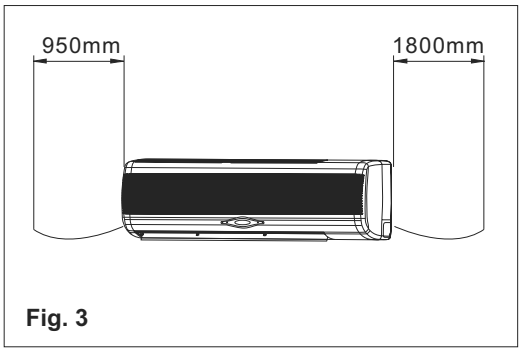


Fig. 3

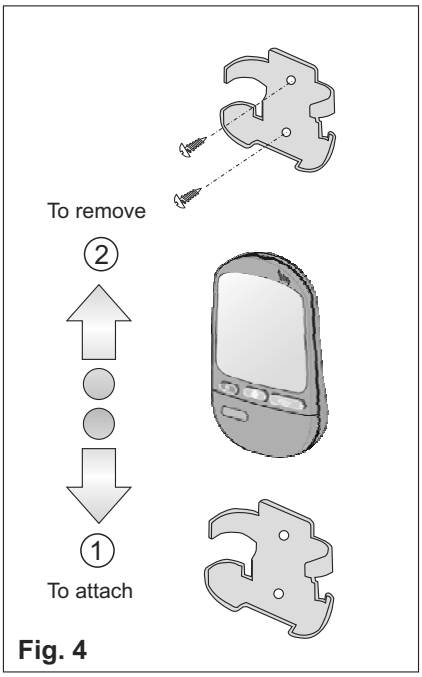


Fig. 4

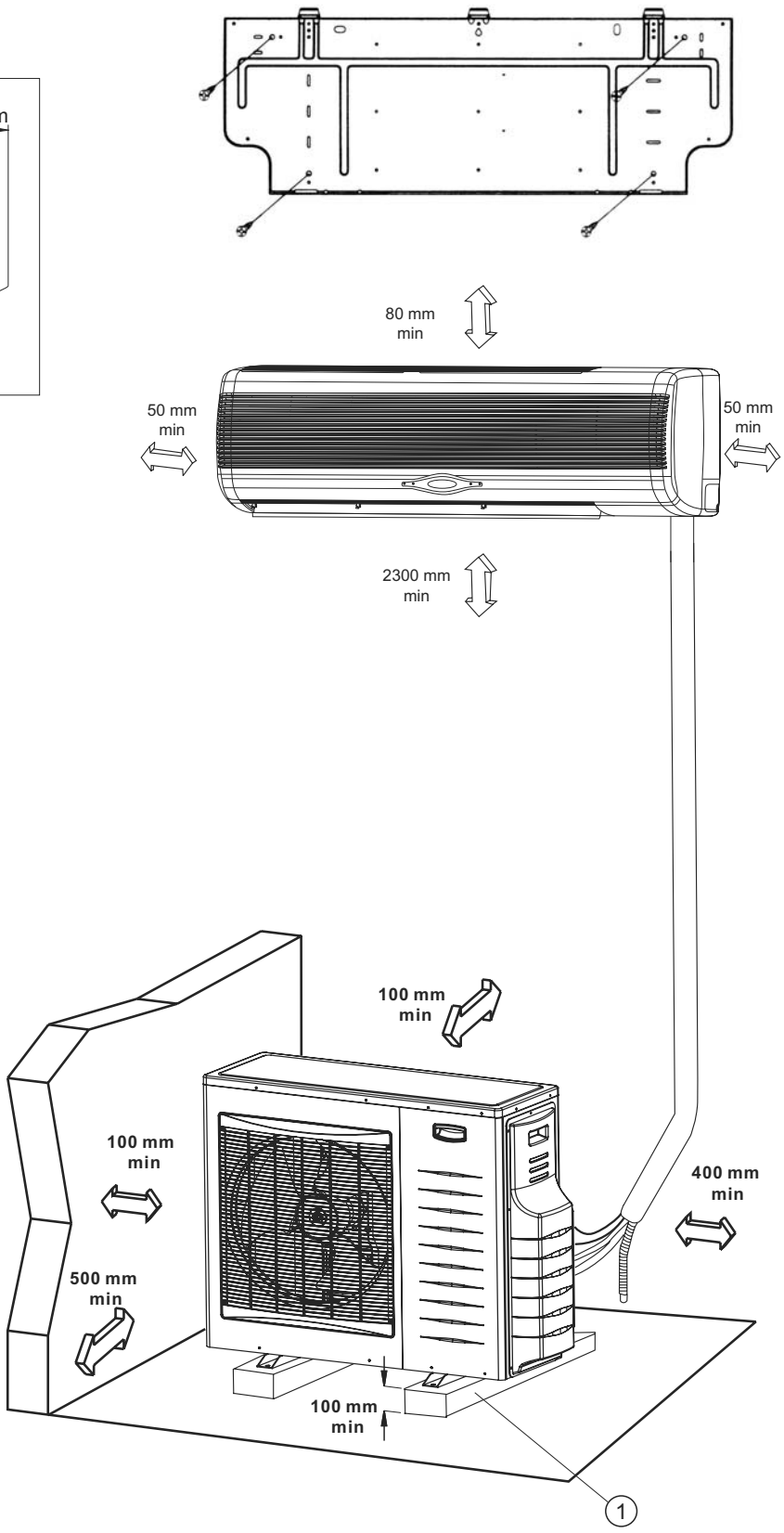


Fig. 5

NOTE:

- Distance between indoor and outdoor units should be ⩽30m.
- Height difference between indoor and outdoor units should be ⩽15m.
- No additional charge is required.

Fig.5
1. Mounting pads (×4)

3

INSTALLATION/SERVICE TOOLS (ONLY FOR R410A PRODUCT)

CAUTION

New Refrigerant Air Conditioner Installation

THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.
R410A refrigerant is apt to be affected by impurities such as water, oxidizing membrane, and oils because the working pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22. Accompanied with the adoption of the new refrigerant, the refrigeration machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigeration machine oil does not enter into the new type refrigerant R410A air conditioner circuit.
To prevent mixing of refrigerant or refrigerating machine oil, the sizes of connecting sections of charging port on main unit and installation tools are different from those used for the conventional refrigerant units. Accordingly, special tools are required for the new refrigerant (R410A) units. For connecting pipes, use new and clean piping materials with high pressure fittings made for R410A only, so that water and/or dust does not enter. Moreover, do not use the existing piping because there are some problems with pressure fittings and possible impurities in existing piping.

Changes in the product and components
In air conditioners using R410A, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)
- In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

New tools for R410A

New tools for R410A	Applicable to R22 model		Changes
Gauge manifold	×		As the working pressure is high, it is impossible to measure the working pressure using conventional gauges. In order to prevent any other refrigerant from being charged, the port diameters have been changed.
Charge hose	×		In order to increase pressure resisting strength, hose materials and port sizes have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.
Electronic balance for refrigerant charging	○		As working pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal dia. 1/2, 5/8)	×		The size of opposing flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)	○		By increasing the clamp bar's receiving hole size, strength of spring in the tool has been improved.
Gauge for projection adjustment	–		Used when flare is made by using conventional flare tool.
Vacuum pump adapter	○		Connected to conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back into the charge hose. The charge hose connecting part has two ports -- one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector	×		Exclusive for HFC refrigerant.

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U.S's ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" requires 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

4 INSTALLATION OF THE INDOOR UNIT

REMOVAL AND INSTALLATION OF THE FRONT PANEL

1. Open the front panel.
2. Open the terminal cover.
3. After installation of the wires, replace the terminal cover and close the grille.

Fig.6
1. Lift the grille
2. Screw
3. Terminal

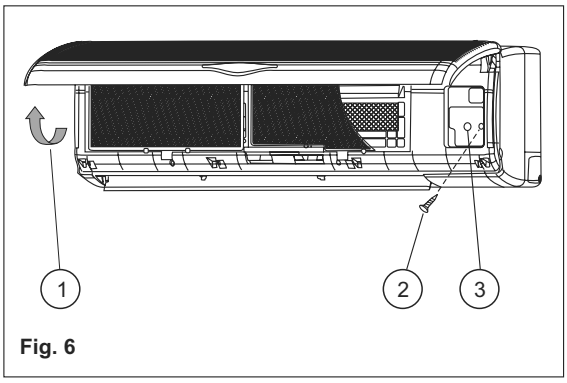


Fig. 6

REFRIGERATION TUBE ROUTING

1. There are five possible routes for installing the refrigeration tube as shown.
2. For route (6), cut the bottom notch in the rear.
3. For routes (5) or (7), cut the side notches in the rear and in the front panel.

Fig. 7
1. Front
2. Rear
3. Rear outlet
4. Lefthand outlet
5. Lefthand raw outlet
6. Bottom outlet
7. Righthand outlet

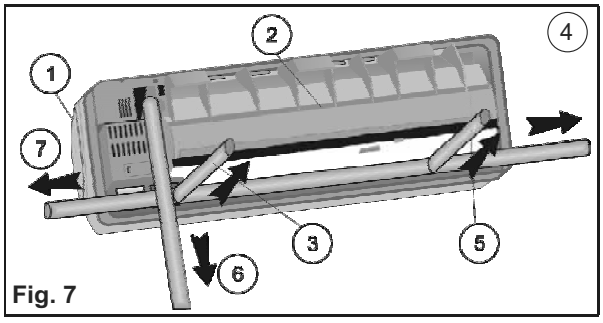


Fig. 7

INSTALLATION OF THE MOUNTING PLATE

1. Figure 9 shows the location of the mounting plate relative to the unit size. Refer to one of the drawings, according to your unit length (marked in square).
2. Locate the mounting plate as shown on the wall in a horizontal position, using a spirit level.
3. Mark the position of the four mounting holes on the wall and drill four holes to accommodate the dowels.
4. Mount the mounting plate on to the wall by the four screws. Ensure screws are tightened properly.

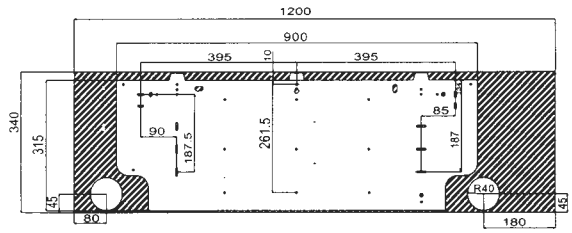


Fig. 8

PENETRATION OF WALL FOR TUBING

1. Mark the location of the hole on either side of the mounting plate as shown. and drill it at a 5 downward angle, as shown.
2. The hole is drilled at an angle, to prevent condensed or rain water from penetrating back into the room.
3. Trim the hole in the wall with a ϕ70 mm commercial plastic tube.

Fig. 9
A. OUTDOOR SIDE
B. INDOOR SIDE
1.Drill 70 mm
2.Wall

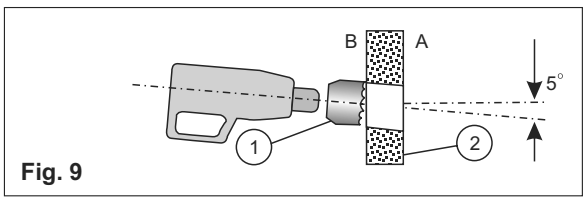


Fig. 9

SUSPENDING AND RELEASING THE UNIT FROM THE MOUNTING PLATE

1. Make sure that the refrigerant tubes, electric cables and condensate water hose are well insulated with closed cell rubber based insulating tubes (6mm thickness), are wrapped together with UV stabilized nonadhesive plastic tape, and are passed through the hole in the wall.
2. Hang the indoor unit on the two hooks that are located near the top edge of the mounting plate as shown in fig. 10 and fig. 11.
3. Press the lower part of the indoor unit against the mounting plate until the catches snap into the slots and lock the indoor unit to the mounting plate.
4. Check the installation by pulling the unit towards you.
5. To release the unit from the mounting plate, lift up the unit and then pull the unit towards you, to ensure that the hooks are locked.

Fig.10
1.Indoor unit
2.Snap catches
3.Top hooks
4.Bottom hooks

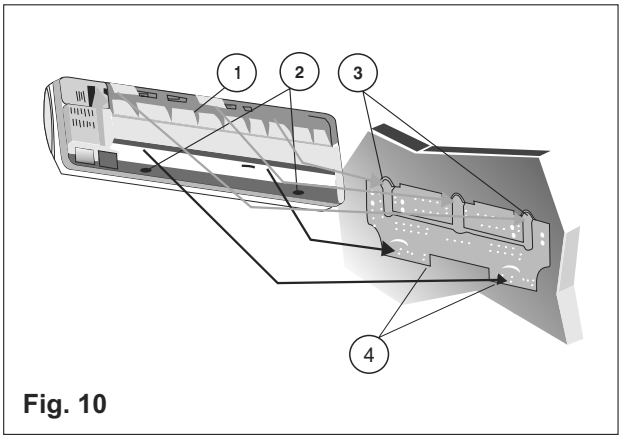


Fig. 10

Fig.11
1.Mounting plate
2.Lower hook

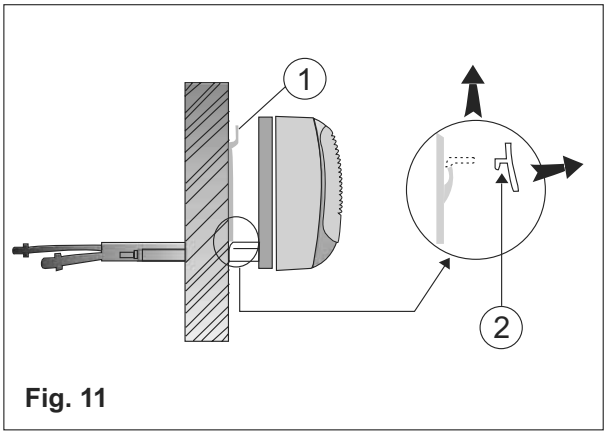


Fig. 11

5 CONDENSATE HOSE CONNECTION

1. Attach the condensate drain hose to the corrugated hose in the rear groove of the indoor unit.
2. Wrap the drain hose together with the refrigerant tubes and electrical cables.
3. Ensure that the condensate drain hose is at all points installed in a downward slope manner.

Fig.12
1.Drain hose
2.Clamp
3.Downward slope

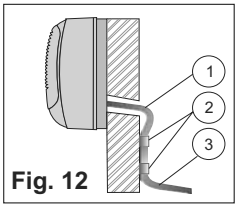


Fig. 12

Fig.13
1.Trap
2.U-bend
3.End immersed in water

4. When installing the drain hose avoid traps and U-bends. The end of the drain hose should not be immersed in water.

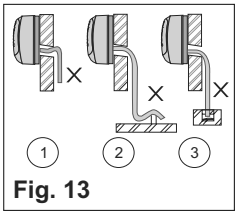


Fig. 13

Fig.14
1.Electric cable
2.Refrigerant tubing
3.Condensate drain hose
4.UV stabilized nonadhesive plastic tape

5. For a lefthand outlet, lay the drain hose on the bottom of the indoor unit rear groove.

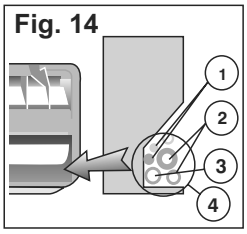


Fig. 14

Fig.15
1.Vent
2.Downward drain
3.Water drain hose

6.When the installation location requires long horizontal sections, a vent must be provided at the top of the hose to prevent overflow of the unit drain pan.

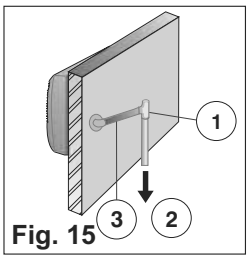


Fig. 15

7.Upon completing the installation, test the water drain by pouring at least two liters of water into the unit drain pan. Check that the water drains off.

6 ELECTRICAL CONNECTION BETWEEN INDOOR AND OUTDOOR UNIT

ELECTRICAL REQUIREMENTS

Electrical wiring and connections should be made by qualified electricians and in accordance with local electrical codes and regulation. The air conditioner units must be grounded.
The air conditioner unit must be connected to an adequate power outlet from a separate branch circuit protected by a time delay circuit breaker, as specified on unit's nameplate.
Voltage should not vary beyond ±10% of the rated voltage.

1. Connect the power supply cable to the indoor unit of WNG.

2. To connect the indoor unit to the outdoor unit use the following electrical cables.

Electrical connections:

Power input cable: 3 wires × 2.5 mm²

Cable between
Indoor and outdoor units: 4 wires × 2.5 mm²

3. Prepare the cable ends for the power input and for the cables between outdoor and indoor units as shown in figure 17a and 17b respectively.
4. Connect the cable ends to the terminals of the indoor and outdoor units, as shown in fig. 18.
5. Secure the multiple wire power cable with the cable clamps.

Fig.16
1. Terminal 2. Cover 3. Cable clamp

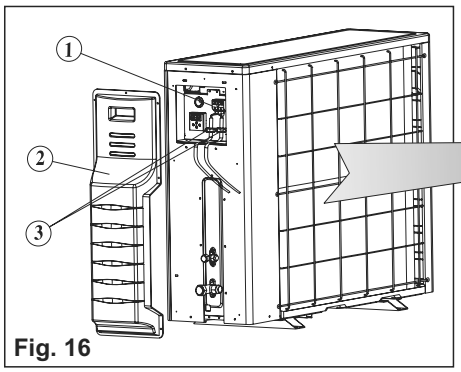


Fig. 16

NOTES:

1. The wire color code can be selected by the installer.

• **Power input cable**

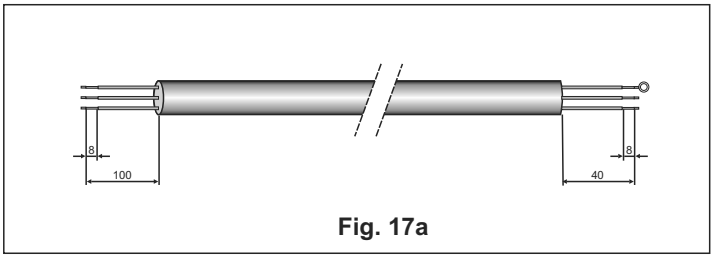


Fig. 17a

• **Cable between indoor and outdoor units**

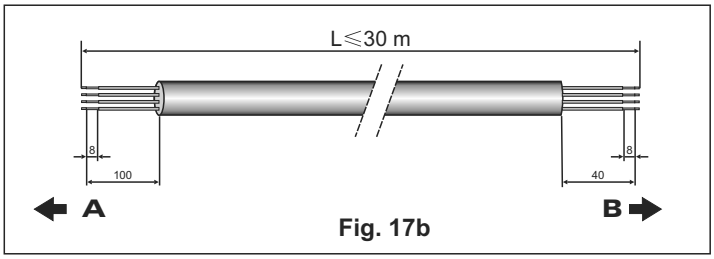


Fig. 17b

Fig.17 A. OUTDOOR B. INDOOR

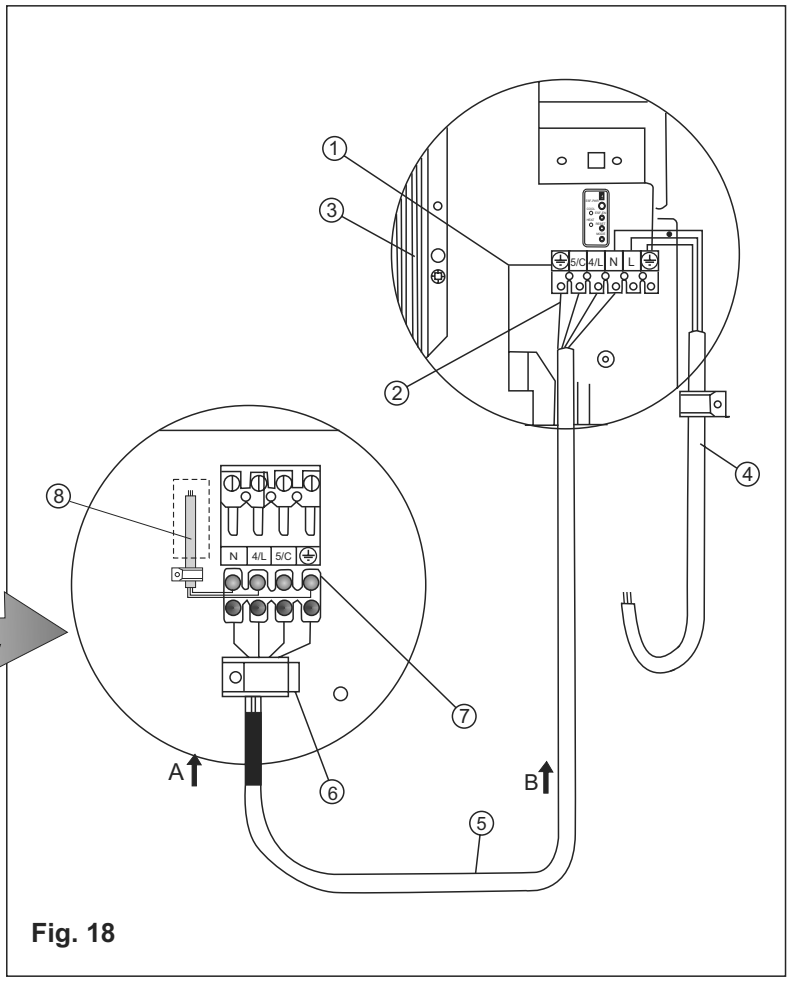


Fig. 18

Fig.18
1. Indoor unit terminal
2. Ground wire.
3. Indoor coil.
4. Power cable in the indoor side.
5. Multiple wire cable.
6. Cable clamp.
7. Outdoor unit wire terminal.
8. Power cable in the outdoor side (only for outdoor unit power supply)
A. OUTDOOR B. INDOOR

7 REFRIGERANT TUBING

CONNECT THE INDOOR TO THE OUTDOOR UNIT
The indoor unit contains a small quantity of nitrogen. Do not unscrew the nuts from the unit until you are ready to connect the tubing. The outdoor unit is supplied with sufficient refrigerant charge (R410A). Refer to outdoor unit nameplate.

To prevent crushing, bend tubes using a bending tool.

NOTE: Use refrigeration R410A type copper tubing only.

1. Open the valve cover.
2. Use tubing diameter that corresponds to the tubing diameter of the indoor and outdoor units. Note that the liquid and suction tubes have different diameters. (See tube size, torque tightening table.)
3. Place flares nuts on tube ends before preparing them with a flaring tool. Use the flare nuts that are mounted on the supplied outdoor and indoor units.
4. Connect the all ends of the tubing to the indoor and outdoor units. Notice the sign. All ends should correspond one by one.
5. Insulate each tube separately, and their unions, with at least 13 mm thick of insulation. Wrap the refrigerant tubing, drain hose and electric cables together with a vinyl tape (UV protected).

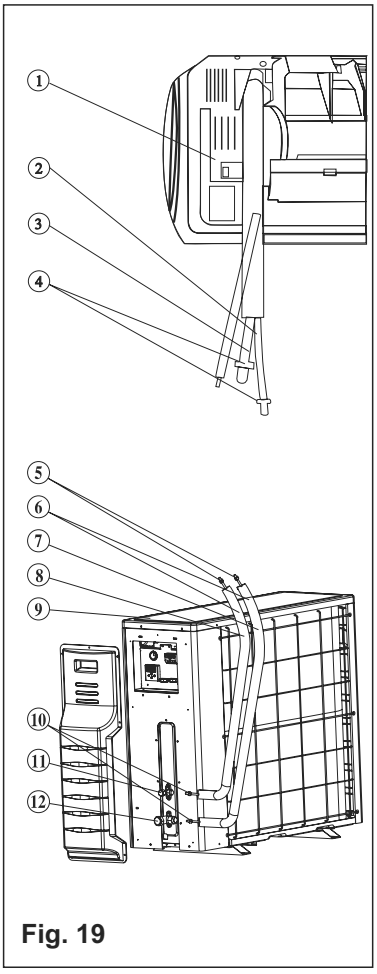


Fig. 19

Caution!
When unscrewing the valve caps, do not stand in front of them or the spindles at any time, as the system is under pressure.

Fig. 19
1.INDOOR UNIT
2.Liquid tube (small dia.)
3.Suction tube (large dia.)
4.Plugs
5.Flare nuts
6.Tubing between units
7.Suction tube
8.Liquid tube
9.OUTDOOR UNIT
10.Flare nuts
11.Liquid valve (small)
12.Suction valve (larger)

Tightening torques of unions and valve caps:

TUBE SIZE	TORQUE
Liquid line 3/8"	30-35 N.M.
Suction line 1/2"	50-54 N.M.
Suction line 5/8"	75-78 N.M.
Suction line 3/4"	80-100 N.M.

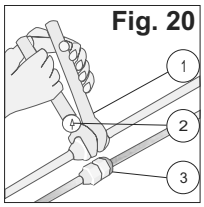


Fig.20
1.Wrench
2.Torque wrench
3.Union

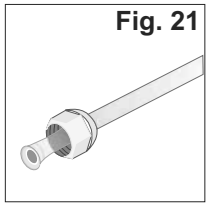


Fig. 21
To prevent refrigerant leakage, coat the flared surface with refrigeration oil

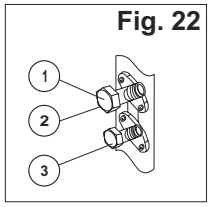
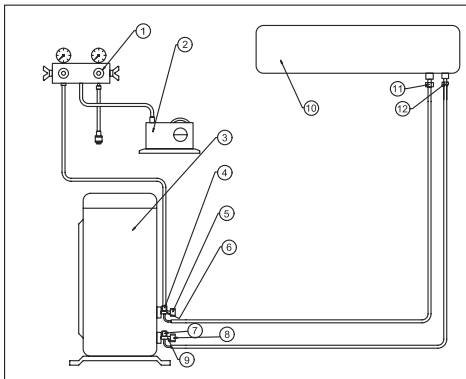


Fig. 22
1.Suction valve
2.Service port
3.Liquid valve

EVACUATION OF THE REFRIGERATION TUBES AND THE INDOOR UNIT

After connecting the unions of the indoor and outdoor units, purge the air from the tubes and indoor unit as follows:

1. Connect the charging hoses with a push pin to the low side of the charging set and the service port of the suction valve. Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the center hose of the charging set to a vacuum pump.
3. Turn on the power switch of the vacuum pump, turn off the high side switch and make sure that the needle in the gauge moves from 0 MPa (0cm Hg) to -0.1 MPa (-76cm Hg). Let the pump run for fifteen minutes.
4. Close the valve of the low side of the charging set and turn off the vacuum pump. Note that the needle in the gauge should not move after approximately five minutes.
5. Not any problem for five minutes, turn on the power switch of the vacuum pump and open the valve of the low side of the charging set.
6. Disconnect the charging hose from the vacuum pump and from the service ports of the suction valve.
7. Tighten the service port caps of suction valve.
8. Redo 1 to 7 for other indoor units.
9. Remove the valve caps from all valves, and open them using a hexagonal Allen wrench.
10. Remount valve caps onto all of the valves.
11. Check for gas leaks from all the connecting position. Test with electronic leak detector or with a sponge immersed for soapy water for bubbles.



NOTE
For additional charge of various tubing lengths, refer to outdoor unit nameplate.

Fig. 23

Fig. 23
1. Charging set
2. Vacuum pump
3. OUTDOOR UNIT
4. Service valve
5. Cap
6. Suction valve
*7. Service valve**
8. Cap
9. Liquid valve
10. INDOOR UNIT
11. Suction flare connection
12. Liquid flare connection
**In some models only*

8 FINAL TASKS

1. Check all valve caps and ensure that they had tightened properly. Close the valve cover.
2. Fill gaps on the wall between hole sides and tubing with sealer.
3. Attach wiring and tubing to the wall with clamps where necessary.
4. Operate the unit for no less than 5 minutes at heating or cooling mode.
5. Explain filter removal, cleaning and installation.
6. Operate the air conditioner together with the customer and explain all functions.
7. Give the operating and installation manuals to the customer.
8. An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring