ELECTRA

Service Manual

PXD DCI Series

Indoor Units	Outdoor Units
PXD 25 DCI	DCI 25
PXD 35 DCI	DCI 35
PXD 50 DCI	DCI 50
PXD 60 DCI	DCI 60
PXD 72 DCI	DCI 72
	DCI 72Z
PXD 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:

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

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

Table of Contents

1. INTRODUCTION

1.1 General

The **PXD** split ceiling mounted range comprise RC (heat pump) models, as follows:

- **PXD 25**
- **PXD 35**
- **PXD 50**
- **PXD 60**
- **PXD 72**
- **PXD 80**

1.2 Main Features

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

- DC Inverter Technology R410A models.
- High COP.
- Low indoor and outdoor noise levels.
- Microprocessor control.
- Infrared remote control with LED.
- Easy access to the interconnecting tubing and wiring connections, main control panel can slide out for service .
- Automatic treated air sweep (by definition in NPR).
- Fresh Air & Distribution treated air to adjacent room.
- Indoor centrifugal fan.
- Easy installation and service.

1.3 Indoor Unit

The indoor unit is a floor/ ceiling mounted, and can be easily fitted to many types of residential and commercials applications.

It includes:

- Coil with hydrophilic aluminum fins.
- Motorized flaps (two step motors)
- Advanced electronic control box assembly (DCI storm)
- Mounting plate

1.4 Filtration

The PXD series presents several types assembly (DCI storm).

- Easily accessible, and re-usable pre-filters (mesh).

1.5 Control

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

1.6 Outdoor Unit

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

It includes :

- Compressor mounted in a soundproofed compartment :

  Single Rotary – for PXD25 DCI and PXD35 DCI.

  Scroll – for PXD50 DCI and PXD60 DCI.

  Twin Rotary – for PXD72 DCI and PXD80 DCI.

- Axial fan.
- Outdoor coil with hydrophilic louver fins for RC units.
- Outlet air fan grill.
- Service valves" flare" type connection.
- Interconnecting wiring terminal block.

1.7 Tubing Connections

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

1.8 Accessories

RCW Wall Mounted Remove Control

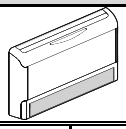
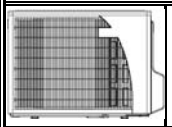
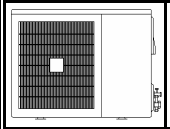
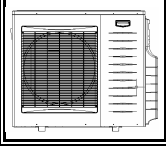
The RCW remote control is mounted on the wall, and controls the unit either as an infrared remote control or as a wired controller.The wired controller can control up to 10 indoor units with the same program settings and adjustment.
For further details please refer to the Technical Service Manual

1.9 Inbox Documentation

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

1.10 Matching Table

1.10.1 R410A

OUTDOOR UNITS			INDOOR UNITS					
								
MODEL		REFRIGER.	PXD 25	PXD 35	PXD 50	PXD 60	PXD 72	PXD 80
	DCI25/35/50	R410A	√	√	√			
	DCI 60	R410A				√		
	DCI 72	R410A					√	
	DCI 72Z							
	DCI 80	R410A						√

The above table lists outdoor units and PXD DCI indoor units which can be matched together.
In addition the listed outdoor units can be matched with other types of indoor units such as cassettes and wall mounted.
For further information please refer to the relevant Service Manual.

2. PRODUCT DATA SHEET

2.1 PXD 25 DCI R410A

Model Indoor Unit				**PXD 25 DCI**	
Model Outdoor Unit				**ONG-25 DCI**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	8530(4780~12280)	10920(5120~15350)
			kW	2.5(1.4-3.6)	3.2(1.5~4.5)
Power input (1)			kW	0.62(0.42-1.1)	0.93(0.4~1.6)
EER (Cooling) or COP(Heating) (1)			W/W	4.03	3.41
Energy efficiency class				A	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	2.7	4.1
Starting current			A	10.5	
Circuit breaker rating			A	35	
INDOOR	Fan type & quantity			Centrifugal x 2	
	Fan speeds	H/M/L	RPM	760/670/500	
	Air flow (2)	H/M/L	m3/hr	400/350/300	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	50/49/47	
	Sound pressure level (4)	H/M/L	dB(A)	39/37/35	
	Moisture removal		l/hr	1	
	Condenstate drain tube I.D		Mm	16	
	Dimensions	WxDxH	Mm	820*190*630	
	Weight		Kg	21	
	Package dimensions	WxDxH	Mm	890*280*710	
	Package weight		Kg	25	
	Units per pallet		Units	14units per pallet	
	Units stacking		Units	7 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Single Rotary,DC Inverter,Panasonic 5RS102XAB	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H/L	RPM	830	
	Air flow	H/L	m3/hr	1780	
	Sound power level	H/L	dB(A)	61	
	Sound pressure level (4)	H/L	dB(A)	51	
	Dimensions	WxDxH	Mm	795*290*610	
	Weight		Kg	38	
	Package dimensions	WxDxH	Mm	945*395*655	
	Packaged weight		Kg	42	
	Units per pallet		Units	9	
	Stacking height		Units	3 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	1.10kg/7.5m	
	Additional charge per 1 meter		g/m	No Need	
	Connections between units	Liquid line	In.(mm)	1/4"(6.35)	
		Suction line	In.(mm)	3/8"(9.53)	
		Max.tubing length	m.	Max.20	
		Max.height difference	m.	Max.10	
Operation control type				Remote control	
Heating elements (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.

2.2 PXD 35 DCI R410A

Model Indoor Unit				**PXD 35 DCI**	
Model Outdoor Unit				**ONG-DCI 35**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	11940(5120~15010)	14330(5120~17060)
			kW	3.5(1.5-4.4)	4.2(1.5~5.0)
Power input (1)			kW	0.98(0.46-1.3)	1.31(0.35~1.58)
EER (Cooling) or COP(Heating) (1)			W/W	3.57	3.21
Energy efficiency class				A	C
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	4.3	5.7
Starting current			A	10.5	
Circuit breaker rating			A	35	
INDOOR	Fan type & quantity			Centrifugal x 2	
	Fan speeds	H/M/L	RPM	830/760/500	
	Air flow (2)	H/M/L	m3/hr	450/400/300	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	56/53/51	
	Sound pressure level (4)	H/M/L	dB(A)	45/41/38	
	Moisture removal		l/hr	1.5	
	Condenstate drain tube I.D		Mm	16	
	Dimensions	WxDxH	Mm	820*190*630	
	Weight		Kg	22	
	Package dimensions	WxDxH	Mm	890*280*710	
	Package weight		kg	26	
	Units per pallet		units	14units per pallet	
	Units stacking		units	7 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Single Rotary,DC Inverte - Panasonic 5RS102XAB	
	Fan type & quantity			Propeller(direct) x 1	
	Fan speeds	H/L	RPM	830	
	Air flow	H/L	m3/hr	1780	
	Sound power level	H/L	dB(A)	62	
	Sound pressure level (4)	H/L	dB(A)	52	
	Dimensions	WxDxH	mm	795*290*610	
	Weight		kg	38.5	
	Package dimensions	WxDxH	mm	945*395*655	
	Packaged weight		kg	42.5	
	Units per pallet		Units	9	
	Stacking height		units	3 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	1.20kg/7.5m	
	Additional charge per 1 meter		g/m	No Need	
	Connections between units	Liquid line	In.(mm)	1/4"(6.35)	
		Suction line	In.(mm)	3/8"(9.53)	
		Max.tubing length	m.	Max.20	
		Max.height difference	m.	Max.10	
Operation control type				Remote control	
Heating elements (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.

2.3 PXD 50 DCI R410A

Model Indoor Unit				**PXD 50 DCI**	
Model Outdoor Unit				**ONG-DCI 50**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	17000(5120-20460)	20460(5120-24550)
			kW	5.0(1.5-6.0)	5.8(1.5~7.2)
Power input (1)			kW	1.65(0.5-2.1)	1.69(0.45-2.1)
EER (Cooling) or COP(Heating) (1)			W/W	3.03	3.43
Energy efficiency class				B	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	7.2	7.7
Starting current			A	10.5	
Circuit breaker rating			A	35	
INDOOR	Fan type & quantity			Centrifugal x 2	
	Fan speeds	H/M/L	RPM	1050/950/700	
	Air flow (2)	H/M/L	m3/hr	870/750/600	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	65/60/56	
	Sound pressure level (4)	H/M/L	dB(A)	51/48/45	
	Moisture removal		l/hr	2	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxDxH	mm	1200*190*630	
	Weight		kg	30	
	Package dimensions	WxDxH	mm	1270*280*710	
	Package weight		kg	35	
	Units per pallet		units	7units per pallet	
	Units stacking		units	7 levels	
OUTDOOR	Refrigerant control			EEV	
	Compressor type,model			Scroll compressor 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	WxDxH	mm	795*290*610	
	Weight		kg	39	
	Package dimensions	WxDxH	mm	945*395*655	
	Packaged weight		kg	43	
	Units per pallet		Units	9	
	Stacking height		units	3 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	1.50kg/7.5m	
	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 (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 PXD 60 DCI R410A

Model Indoor Unit				**PXD 60 DCI**	
Model Outdoor Unit				**DCI 60 R410A**	
Installation Method				Floor / Ceiling	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	19100(5120-21490)	21480(5120-25590)
			kW	5.60(1.5-6.3)	6.30(1.8~7.5)
Power input (1)			kW	1.86(0.5-2.15)	1.84(0.5-2.08)
EER (Cooling) or COP(Heating) (1)			W/W	3.01	3.42
Energy efficiency class				B	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	8.4	8.3
Starting current			A	10.5	
Circuit breaker rating			A	35	
INDOOR	Fan type & quantity			Centifugal x 2	
	Fan speeds	H/M/L	RPM	1100/1000/900	
	Air flow (2)	H/M/L	m3/hr	900/780/650	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	64/62/59	
	Sound pressure level (4)	H/M/L	dB(A)	53/51/48	
	Moisture removal		l/hr	2	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxDxH	mm	1200*190*630	
	Weight		kg	31	
	Package dimensions	WxDxH	mm	1270*280*710	
	Package weight		kg	35	
	Units per pallet		units	7units per pallet	
	Units stacking		units	7 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	WxDxH	mm	846x690x302	
	Weight		kg	46	
	Package dimensions	WxDxH	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. 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 PXD 72 DCI R410A

Model Indoor Unit				**PXD 72 DCI**	
Model Outdoor Unit				**DCI 72 R410A**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	23200(5120~25590)	25910(5110-30000)
			kW	6.80(1.50-7.60)	7.60(1.60~8.60)
Power input (1)			kW	2.25(0.50-2.68)	2.05(05~2.30)
EER (Cooling) or COP(Heating) (1)			W/W	3.02	3.61
Energy efficiency class				B	A
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	10.1	9.6
Starting current			A	15	
Circuit breaker rating			A	45	
INDOOR	Fan type & quantity			Centrifugal x 2	
	Fan speeds	H/M/L	RPM	1300/1200/1050	
	Air flow (2)	H/M/L	m3/hr	1020/930/760	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	67/64/60	
	Sound pressure level (4)	H/M/L	dB(A)	56/53/49	
	Moisture removal		l/hr	2.5	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1200x630x190	
	Weight		kg	32	
	Package dimensions	WxHxD	mm	1270x710x280	
	Packaged weight		kg	36	
	Units per pallet		units	7	
	Stacking height		units	7	
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	950*340*835	
	Weight		kg	65.5	
	Package dimensions	WxHxD	mm	1087x477x910	
	Packaged weight		kg	70	
	Units per pallet		Units	2	
	Stacking height		units	2 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	2.4/7.5	
	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.

2.6 PXD 80 DCI R410A

Model Indoor Unit				**PXD 80 DCI**	
Model Outdoor Unit				**DCI 80 R410A**	
Installation Method of Pipe				Flared	
Characteristics			**Units**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	25570(6820-32390)	30000(5110-35800)
			kW	7.5(1.6-8.6)	8.4(1.8-9.8)
Power input (1)			kW	2.49(0.5-3.1)	2.46(0.5-2.8)
EER (Cooling) or COP(Heating) (1)			W/W	3.01	3.41
Energy efficiency class				B	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz	
Rated current			A	11.3	11.0
Starting current			A	15	
Circuit breaker rating			A	45	
INDOOR	Fan type & quantity			Centrifugal x 2	
	Fan speeds	H/M/L	RPM	1300/1200/1050	
	Air flow (2)	H/M/L	m3/hr	1020/930/760	
	External static pressure	Min-Max	Pa	0	
	Sound power level (3)	H/M/L	dB(A)	67/64/60	
	Sound pressure level (4)	H/M/L	dB(A)	56/53/49	
	Moisture removal		l/hr	2.9	
	Condenstate drain tube I.D		mm	16	
	Dimensions	WxHxD	mm	1200x630x190	
	Weight		kg	32	
	Package dimensions	WxHxD	mm	1270x710x280	
	Packaged weight		kg	36	
	Units per pallet		units	7	
	Stacking height		units	7	
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	950*340*835	
	Weight		kg	66	
	Package dimensions	WxHxD	mm	1087x477x910	
	Packaged weight		kg	70	
	Units per pallet		Units	2	
	Stacking height		units	2 levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	2.75/7.5	
	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.

3. RATING CONDITIONS

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

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

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

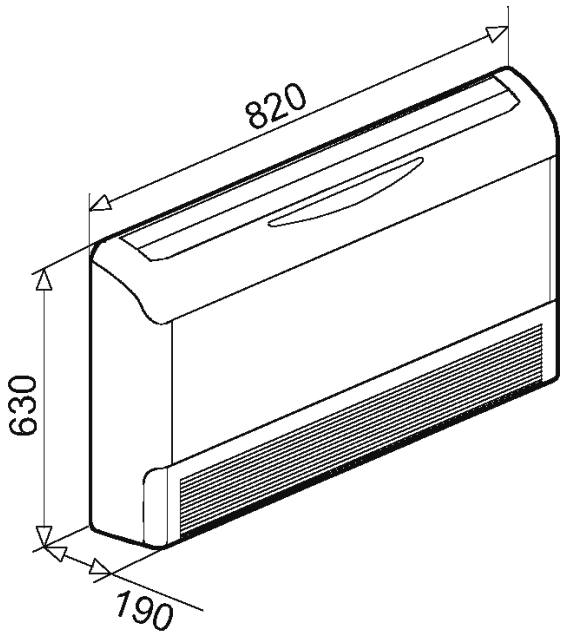
3.1 Operating Limits

R410A

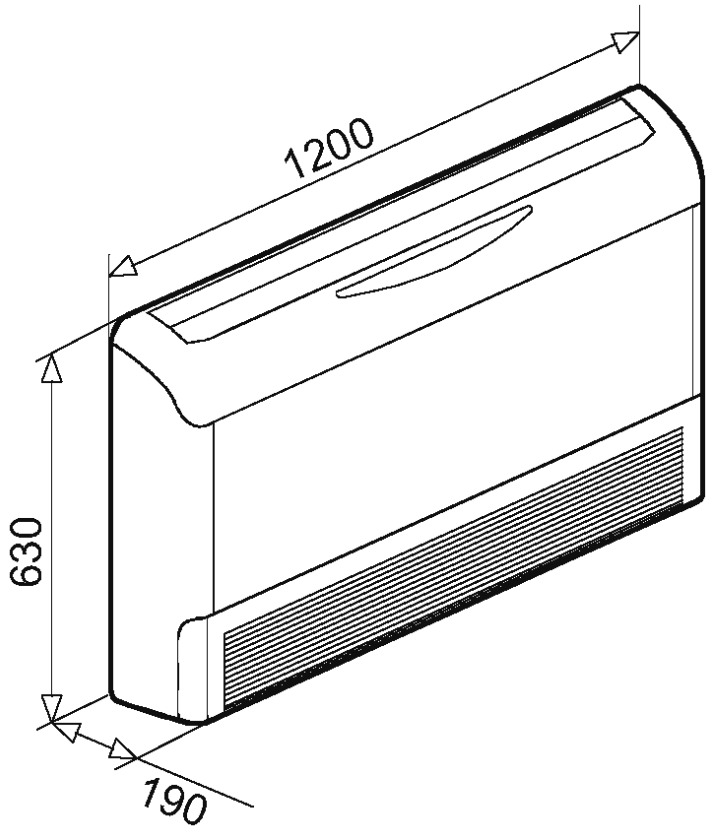
		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	-10°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-15°C DB -16°C WB
Voltage	1PH	198 – 264 V	
	3PH	N/A	

4. OUTLINE DIMENSIONS

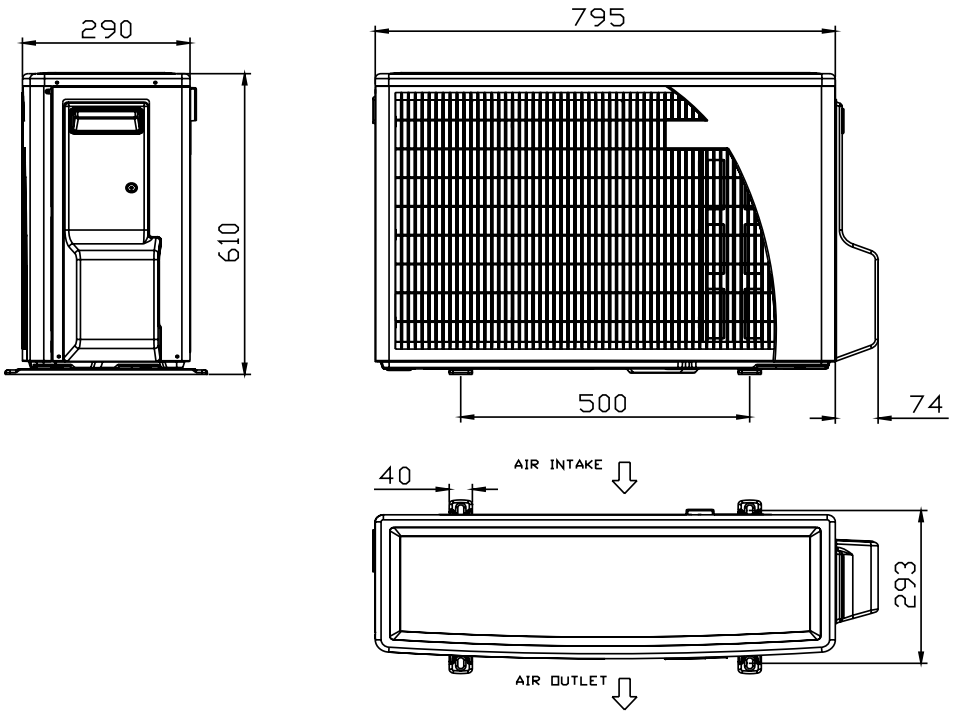
4.1 Indoor Unit: PXD 25, 35 DCI



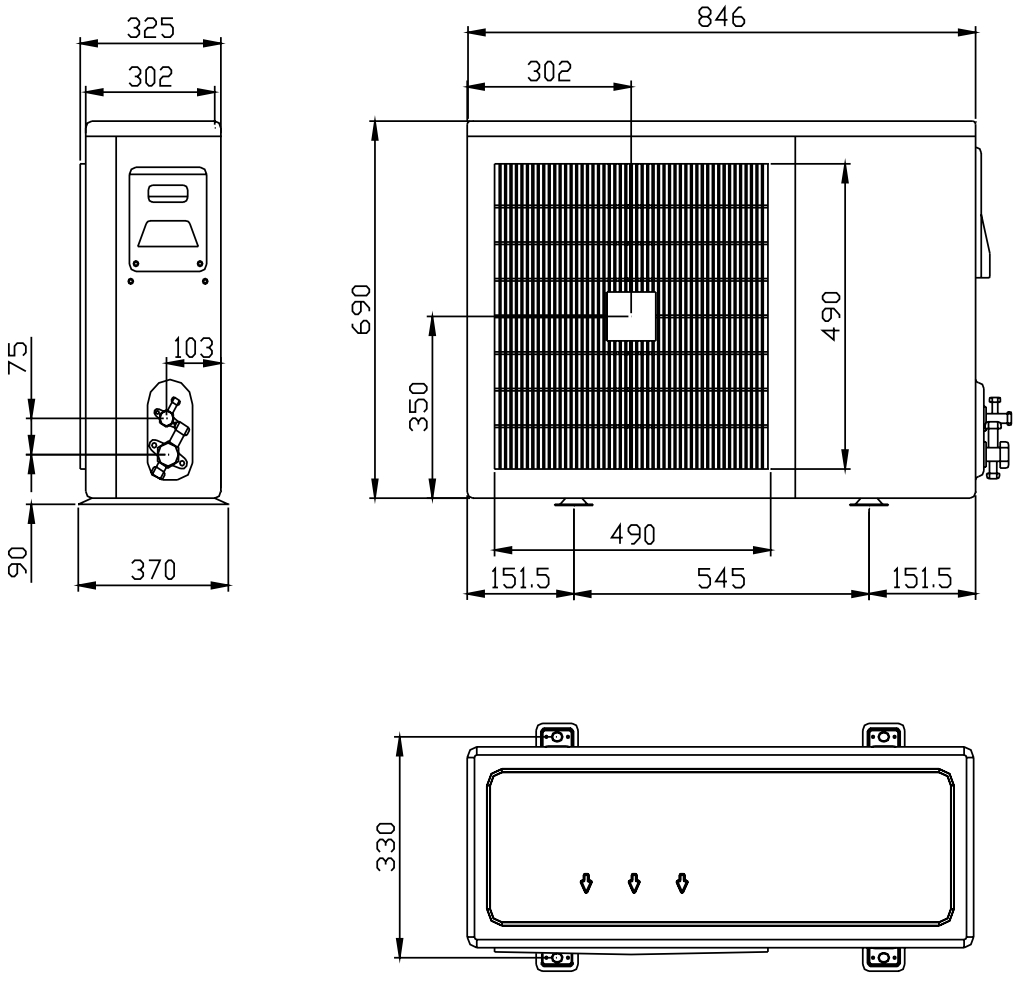
4.2 Indoor Unit: PXD 50, 60, 72, 80 DCI



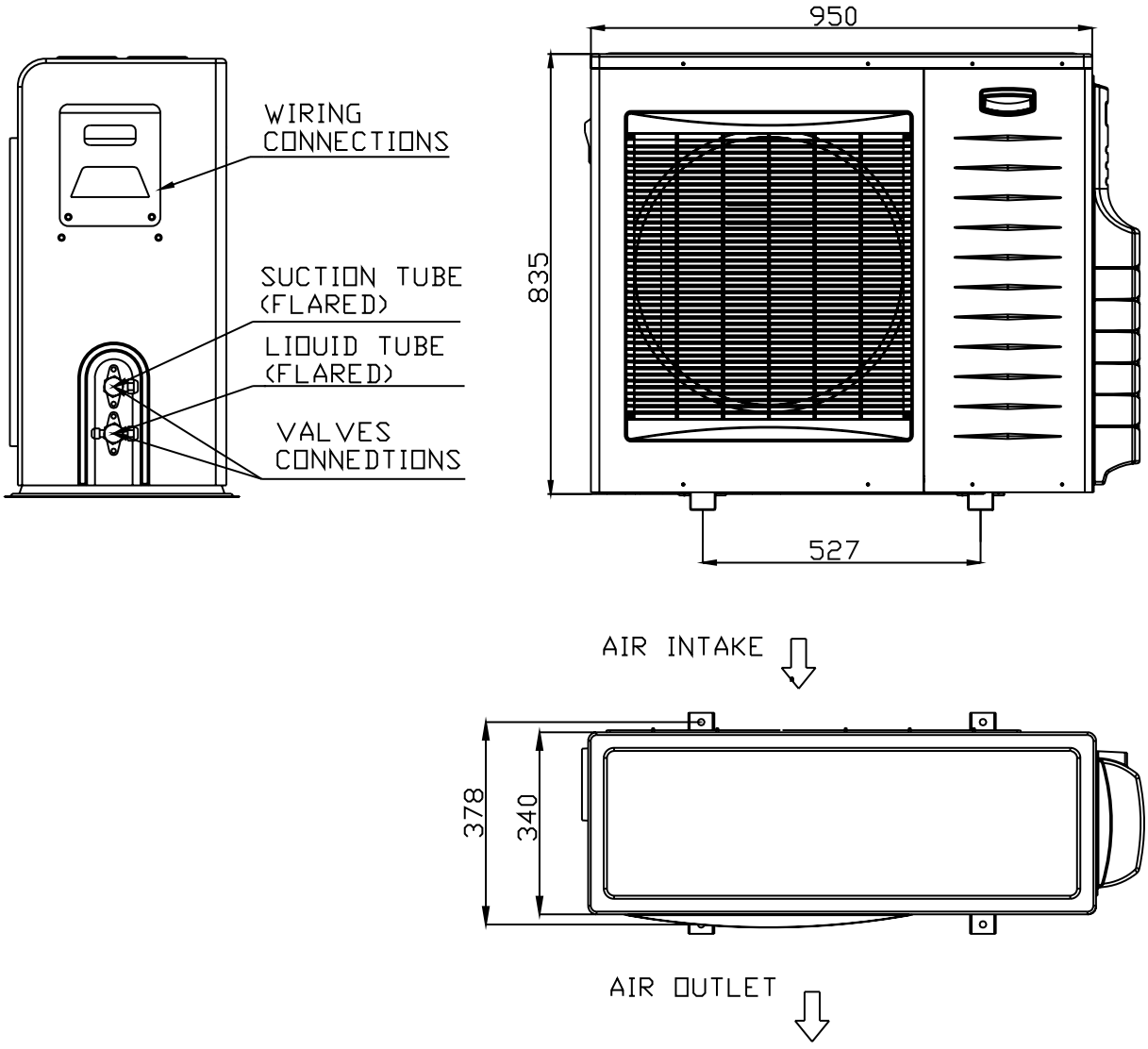
4.3 Outdoor Unit: DCI 50



4.4 Outdoor Unit: DCI 60



4.4 Outdoor Unit: DCI 72, DCI 72Z, DCI 80



5. PERFORMANCE DATA

5,1 PXD25 DCI / DCI 50

5.1.1 Cooling Capacity (kW) – Run Mode

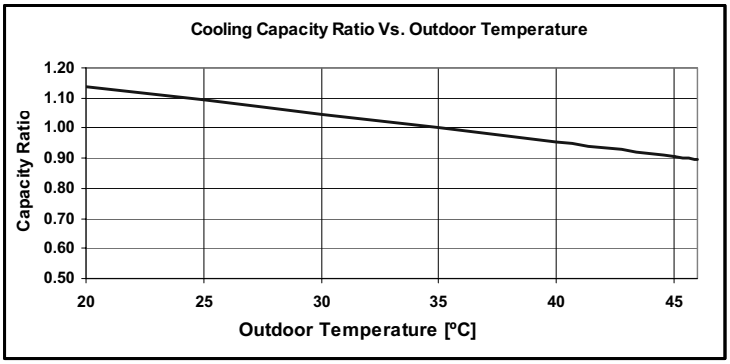
230[V] : Indoor Fan at High Speed.

OU COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	2.42	2.57	2.73	2.89	3.05
	SC	2.09	2.13	2.18	2.22	2.26
	PI	0.49	0.50	0.51	0.52	0.52
30	TC	2.30	2.46	2.62	2.77	2.93
	SC	2.04	2.08	2.12	2.17	2.21
	PI	0.54	0.55	0.56	0.57	0.58
35	TC	2.18	2.34	**2.50**	2.66	2.82
	SC	1.98	2.03	**2.07**	2.11	2.16
	PI	0.60	0.61	**0.62**	0.63	0.64
40	TC	2.07	2.23	2.38	2.54	2.70
	SC	1.93	1.97	2.02	2.06	2.10
	PI	0.66	0.67	0.68	0.69	0.70
46	TC	1.93	2.09	2.24	2.40	2.56
	SC	1.87	1.91	1.95	2.00	2.04
	PI	0.73	0.74	0.75	0.75	0.76

LEGEND

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

5.1.2 Capacity Correction Factors



5.1.3 Heating Capacity (kW) - Run Mode

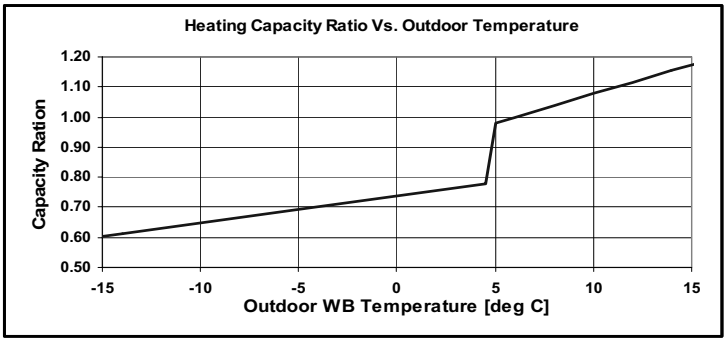
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OU COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	**TC**	2.04	1.89	1.75
	PI	0.56	0.61	0.67
-10/-12	**TC**	2.27	2.12	1.98
	PI	0.67	0.73	0.79
-7/-8	**TC**	2.44	2.30	2.16
	PI	0.76	0.82	0.87
-1/-2	**TC**	2.53	2.38	2.24
	PI	0.80	0.86	0.92
2/1	**TC**	2.58	2.44	2.30
	PI	0.83	0.89	0.94
7/6	**TC**	3.34	**3.20**	3.06
	PI	0.87	**0.93**	0.99
10/9	**TC**	3.53	3.38	3.24
	PI	0.93	0.98	1.04
15/12	**TC**	3.71	3.57	3.43
	PI	0.98	1.03	1.09
15-24 (Protection Range)	**TC**	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

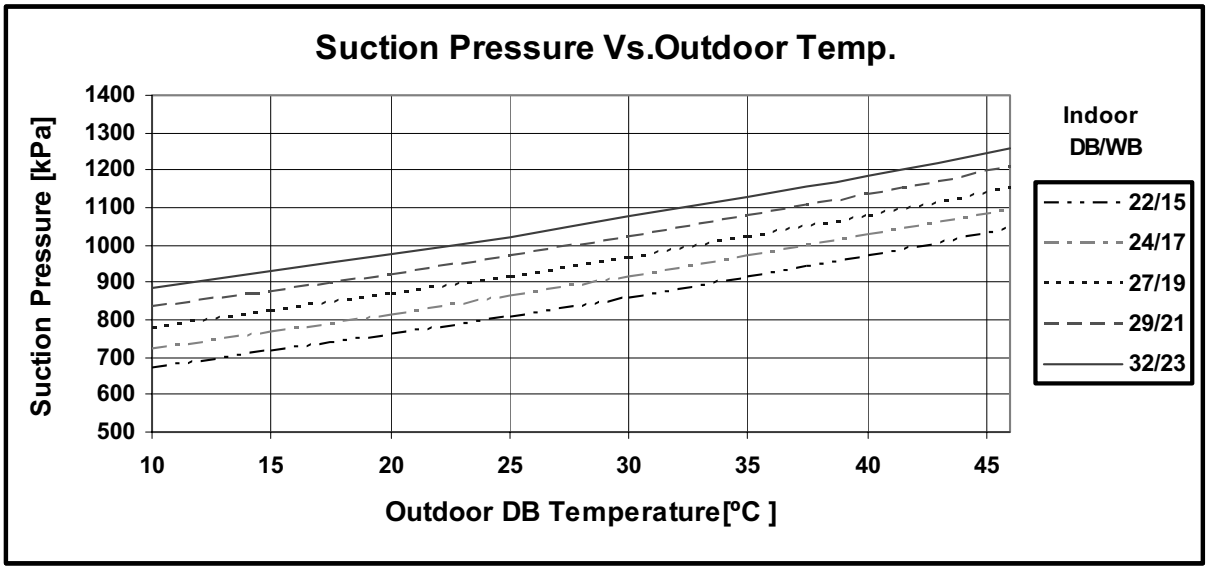
LEGEND

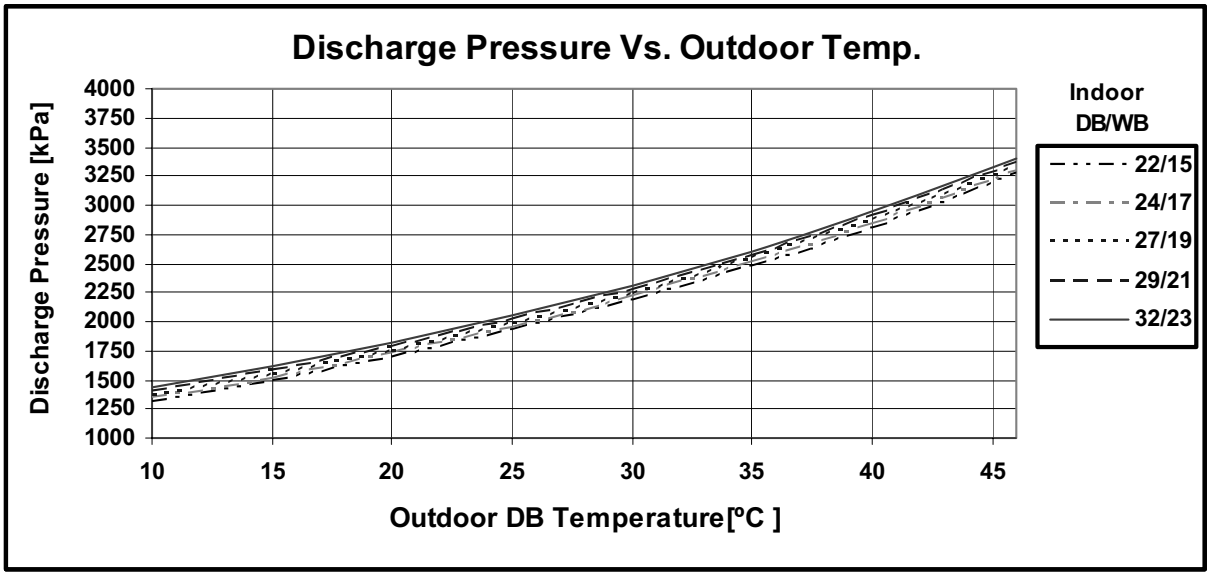
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.1.4 Capacity Correction Factors

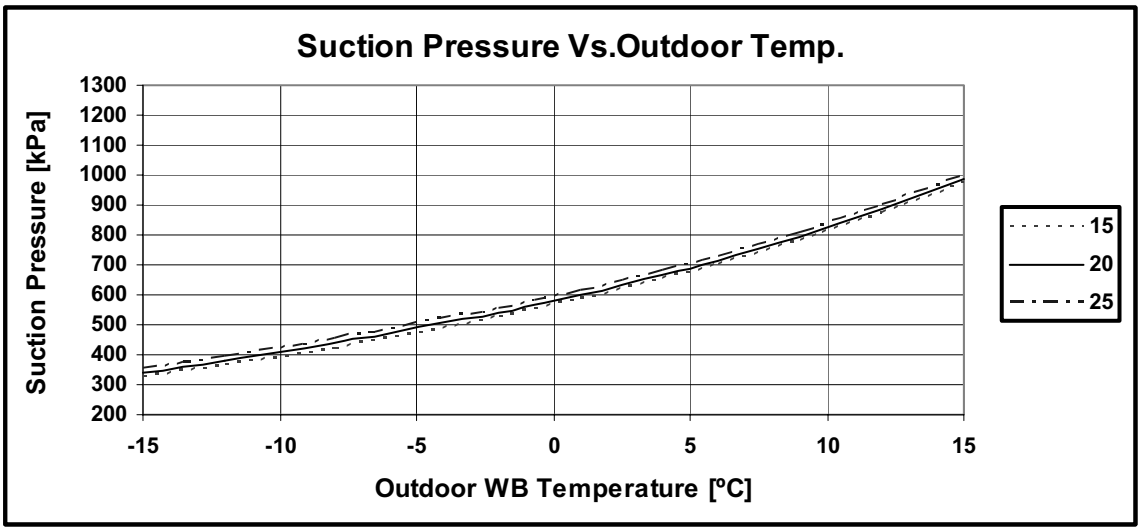


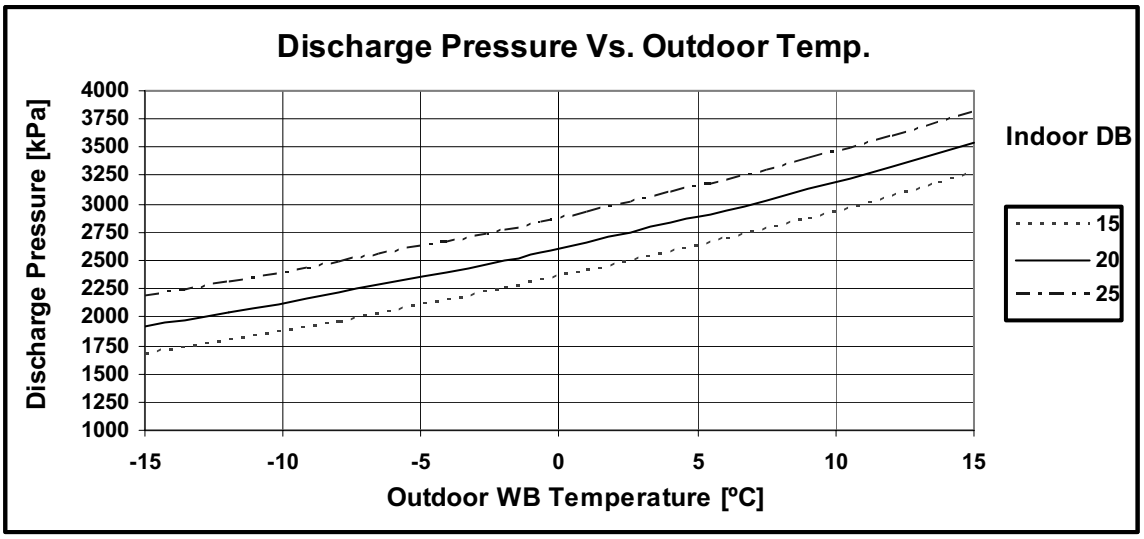
5.1.5 Model: PXD25 DCI / DCI 50 Cooling – Test Mode





5.1.6 Heating – Test Mode





5.2 PXD35 DCI / DCI 50

5.2.1 Cooling Capacity (kW) - Run Mode

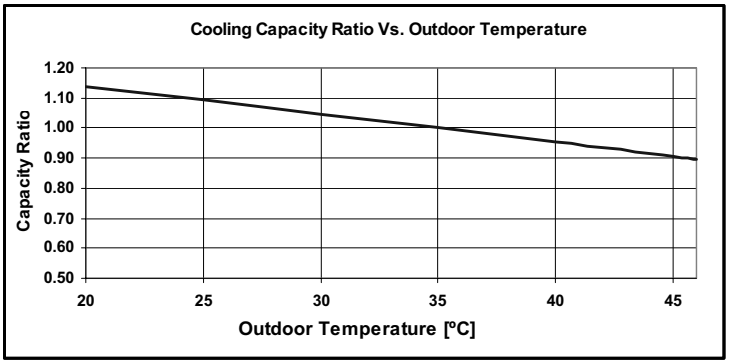
230[V] : Indoor Fan at High Speed.

OU COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
		22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	3.38	3.60	3.83	4.05	4.27
	SC	2.65	2.70	2.75	2.81	2.86
	PI	0.77	0.78	0.80	0.81	0.83
30	TC	3.22	3.44	3.66	3.88	4.11
	SC	2.58	2.63	2.69	2.74	2.79
	PI	0.86	0.88	0.89	0.90	0.92
35	TC	3.06	3.28	**3.50**	3.72	3.94
	SC	2.51	2.57	**2.62**	2.67	2.73
	PI	0.95	0.97	**0.98**	0.99	1.01
40	TC	2.89	3.12	3.34	3.56	3.78
	SC	2.45	2.50	2.55	2.61	2.66
	PI	1.04	1.06	1.07	1.08	1.10
46	TC	2.70	2.92	3.14	3.36	3.58
	SC	2.37	2.42	2.47	2.53	2.58
	PI	1.15	1.16	1.18	1.19	1.21

LEGEND

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

5.2.2 Capacity Correction Factor



5.2.3 Heating Capacity (kW) - Run Mode

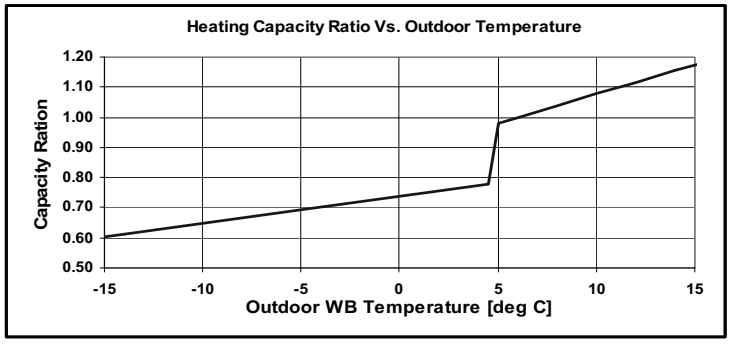
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OU COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	2.67	2.49	2.30
	PI	0.79	0.87	0.95
-10/-12	TC	2.98	2.79	2.60
	PI	0.95	1.03	1.11
-7/-8	TC	3.20	3.02	2.83
	PI	1.07	1.15	1.23
-1/-2	TC	3.32	3.13	2.94
	PI	1.13	1.21	1.29
2/1	TC	3.39	3.20	3.02
	PI	1.17	1.25	1.33
7/6	TC	4.39	**4.20**	4.01
	PI	1.23	**1.31**	1.39
10/9	TC	4.63	4.44	4.26
	PI	1.30	1.38	1.46
15/12	TC	4.87	4.68	4.50
	PI	1.38	1.46	1.54
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

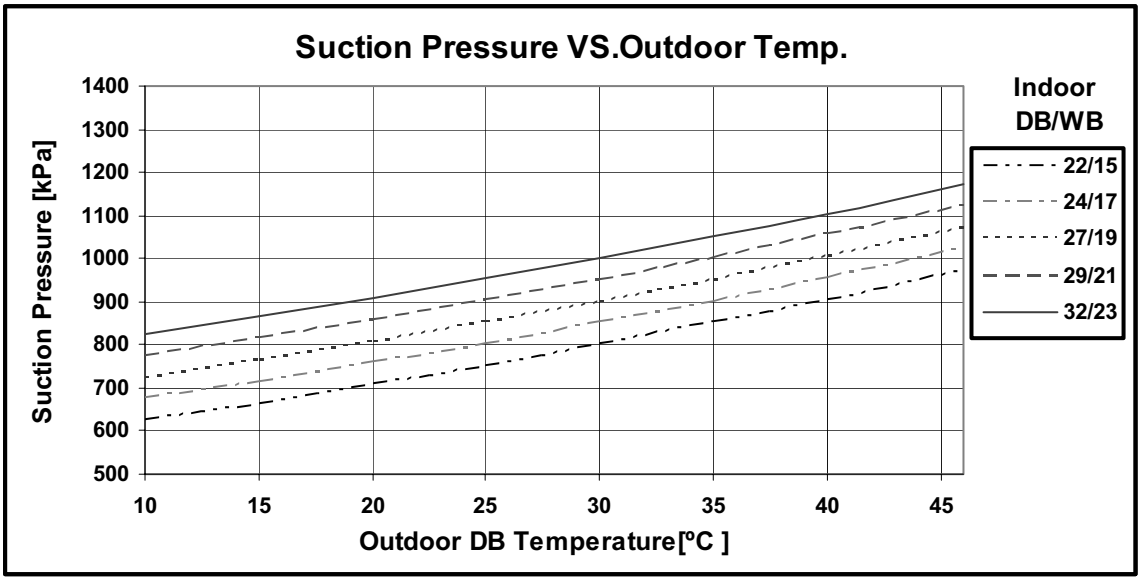
LEGEND

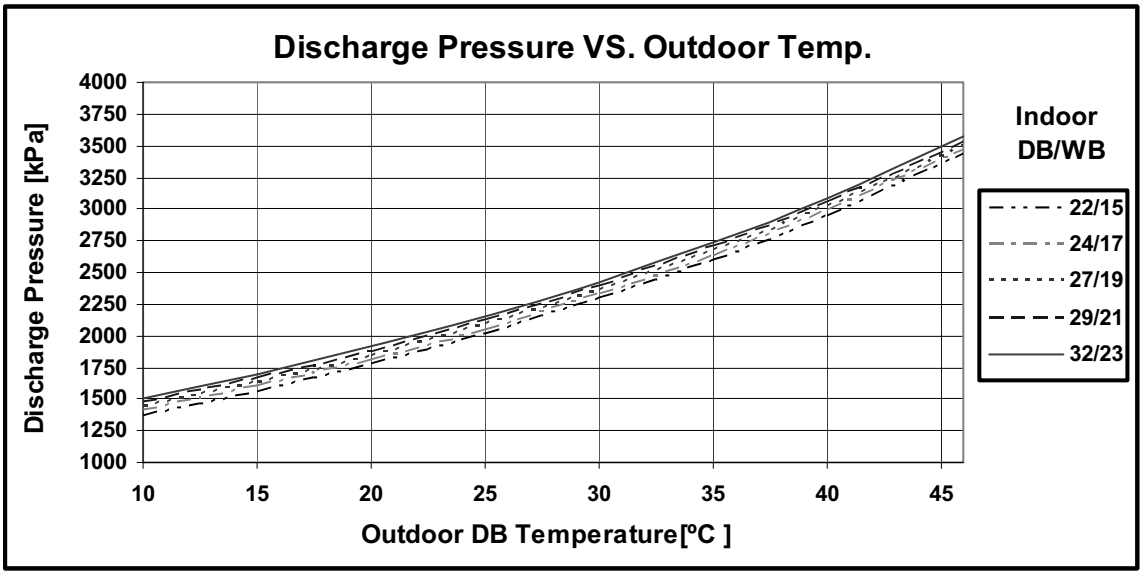
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.2.4 Capacity Correction Factors

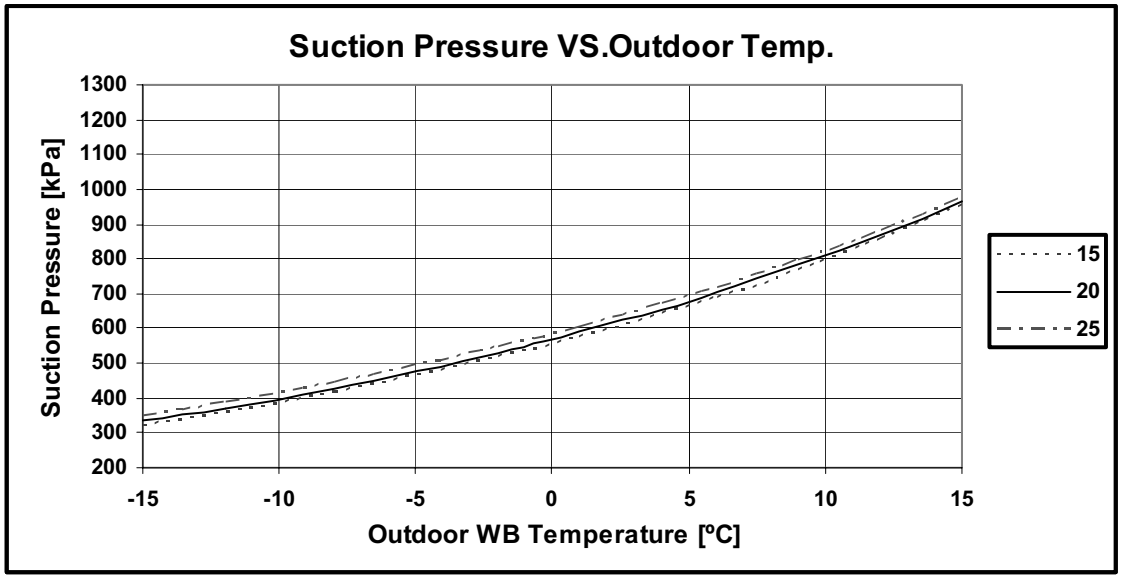


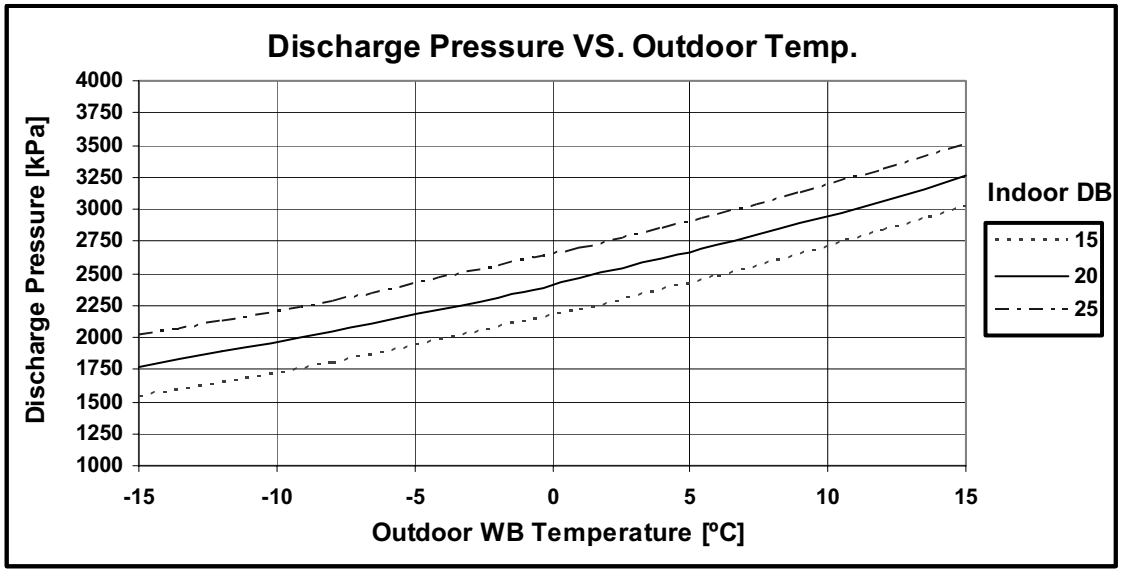
5.2.5 Model: PXD35 DCI / DCI 50 Cooling – Test Mode





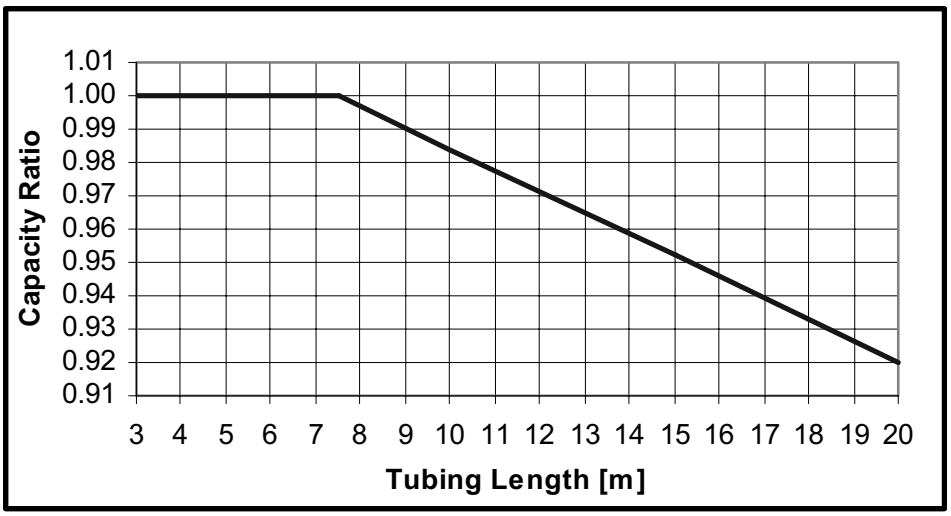
5.2.6 Heating – Test Mode



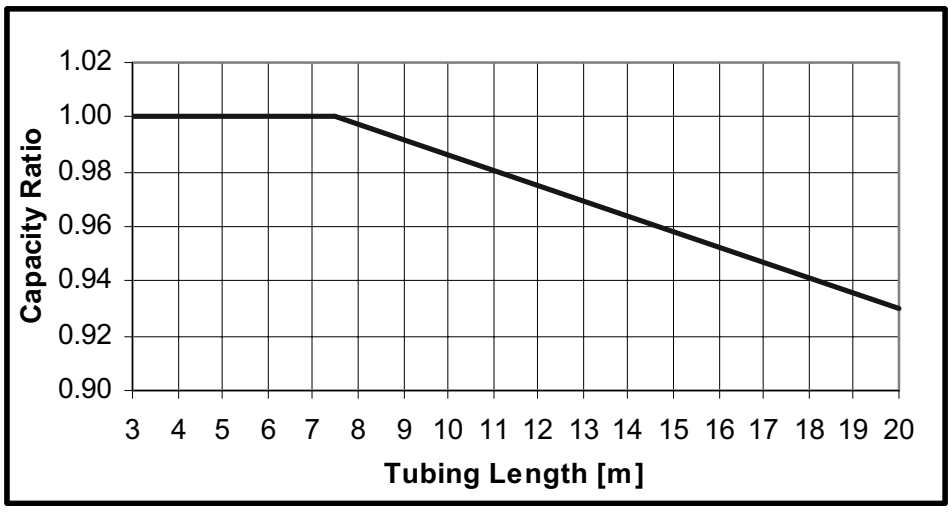


5.3 Capacity Correction Factor Due to Tubing Length

5.3.1 PXD 25/35 DCI / DCI 50 :Cooling



5.3.2 Heating



5.4 PXD50 DCI / DCI 50

5.4.1 Cooling Capacity (kW) - Run Mode

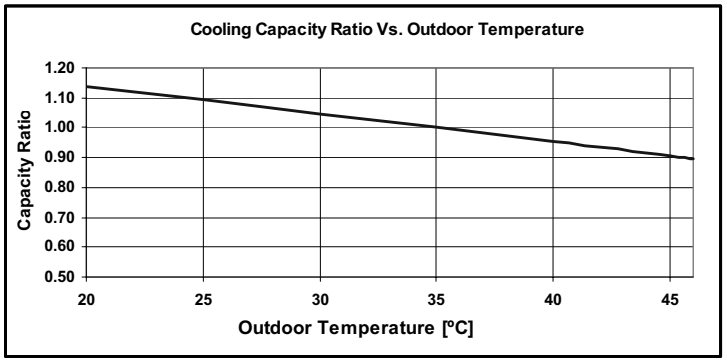
230[V] : Indoor Fan at High Speed.

OU 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	3.35	3.40	3.45	3.50	3.55
	PI	1.25	1.28	1.30	1.33	1.36
30	TC	4.67	4.96	5.25	5.54	5.83
	SC	3.22	3.27	3.32	3.37	3.42
	PI	1.42	1.45	1.48	1.50	1.53
35	TC	4.42	4.71	**5.00**	5.29	5.58
	SC	3.09	3.14	**3.19**	3.24	3.29
	PI	1.59	1.62	**1.65**	1.68	1.71
40	TC	4.17	4.46	4.75	5.04	5.33
	SC	2.96	3.01	3.06	3.11	3.16
	PI	1.77	1.80	1.82	1.85	1.88
46	TC	3.86	4.15	4.44	4.73	5.02
	SC	2.80	2.85	2.90	2.95	3.00
	PI	1.98	2.00	2.03	2.06	2.09

LEGEND

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

5.4.2 Capacity Correction Factors



5.4.3 Heating Capacity (kW) - Run Mode

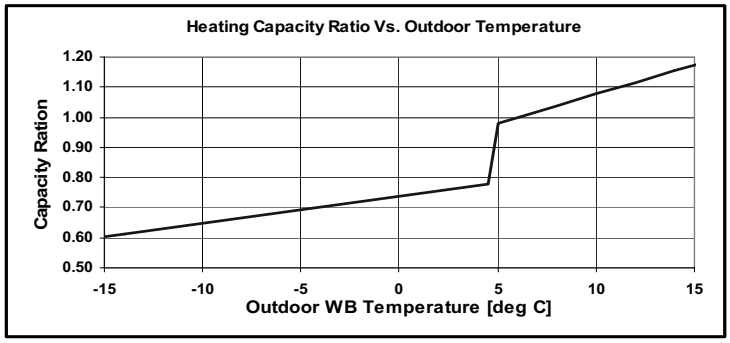
230[V] : Indoor Fan at High Speed.

OU COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	2.64	2.26	1.88
	PI	1.18	1.27	1.35
-10/-12	TC	3.48	3.10	2.72
	PI	1.34	1.42	1.50
-7/-8	TC	4.12	3.74	3.36
	PI	1.45	1.54	1.62
-1/-2	TC	4.43	4.05	3.67
	PI	1.51	1.59	1.68
2/1	TC	4.65	4.27	3.89
	PI	1.55	1.63	1.72
7/6	TC	6.18	**5.80**	5.42
	PI	1.61	**1.69**	1.77
10/9	TC	6.50	6.12	5.74
	PI	1.64	1.72	1.81
15/12	TC	6.82	6.44	6.06
	PI	1.67	1.75	1.84
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

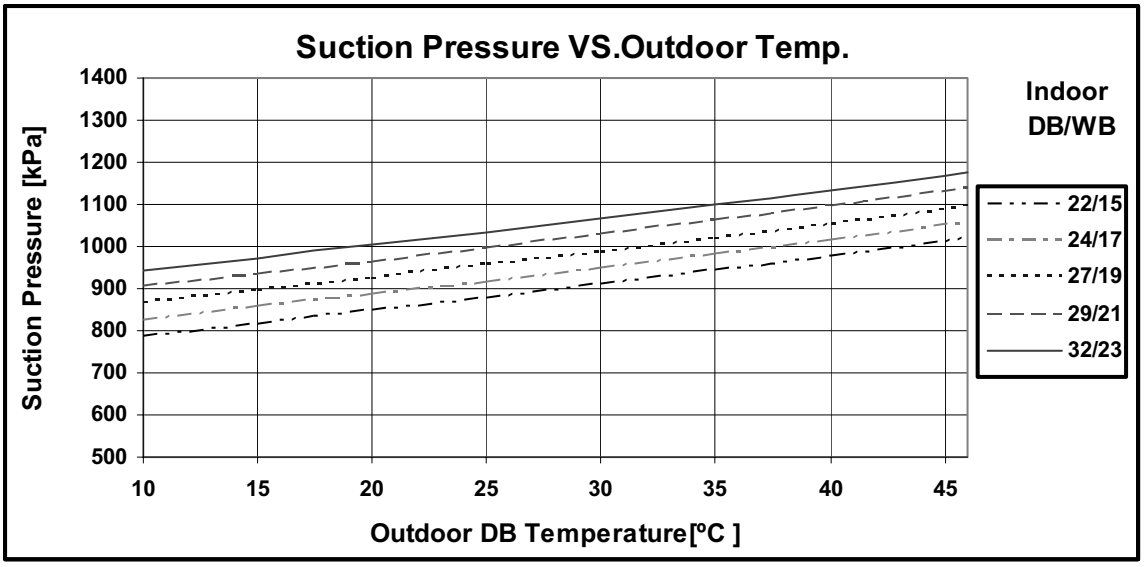
LEGEND

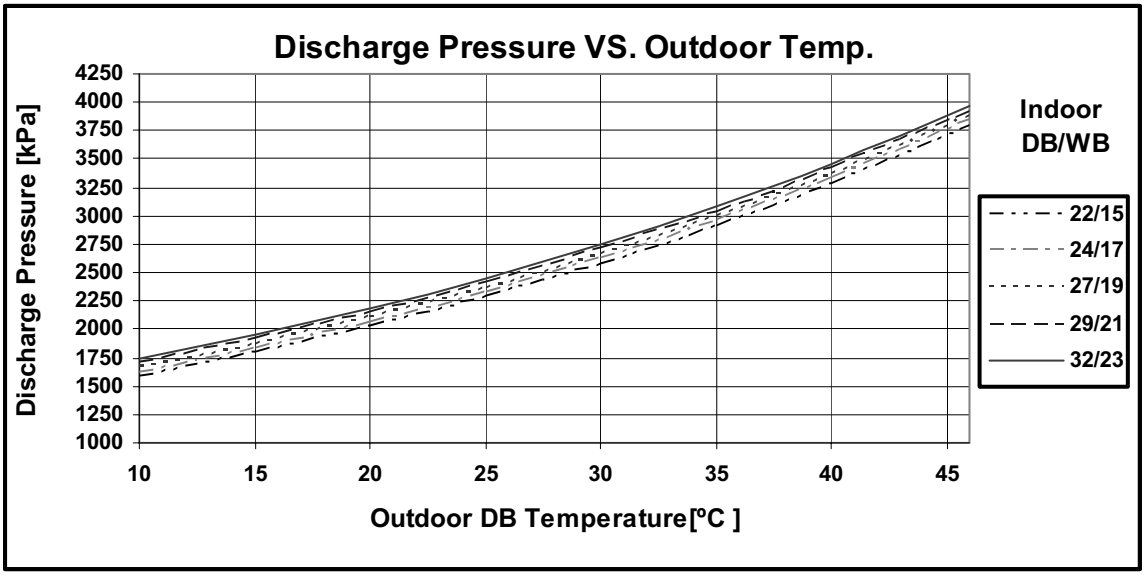
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.4.4 Capacity Correction Factors

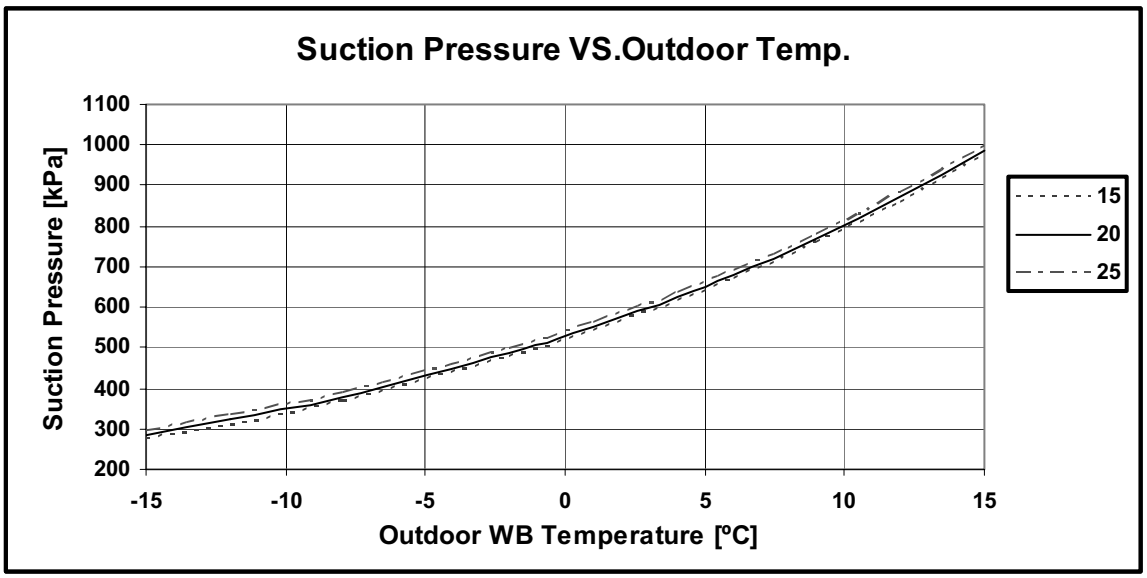


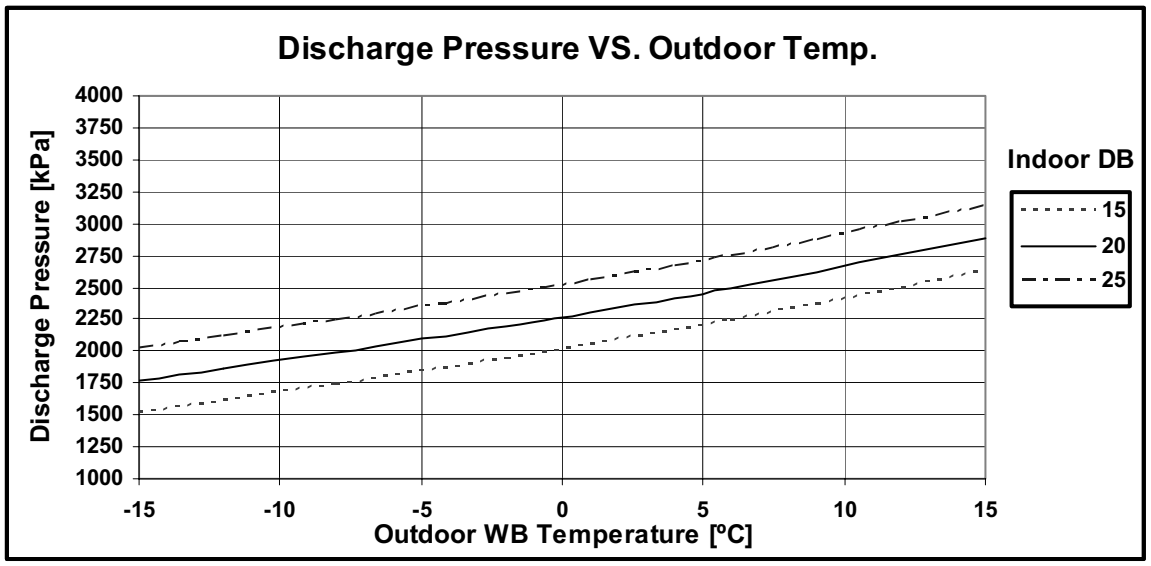
5.4.5 Model: PXD50 DCI / DCI 50 Cooling – Test Mode





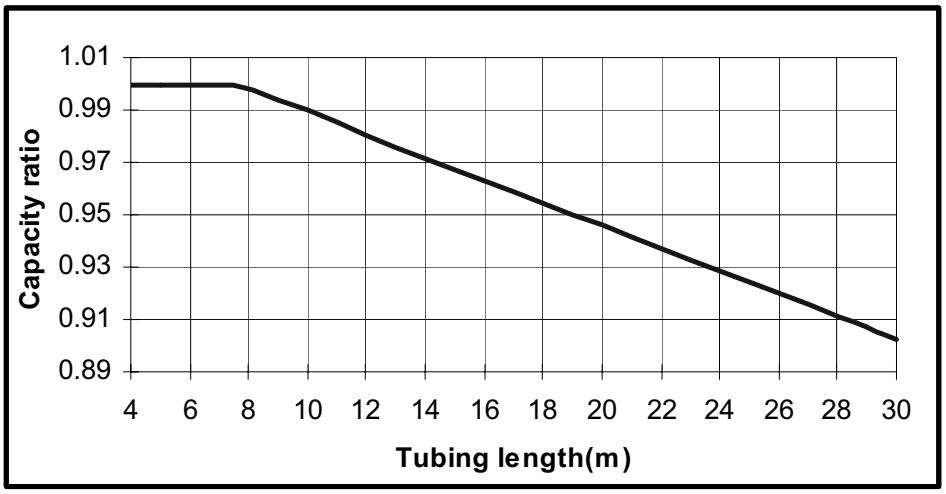
5.4.6 Heating – Test Mode



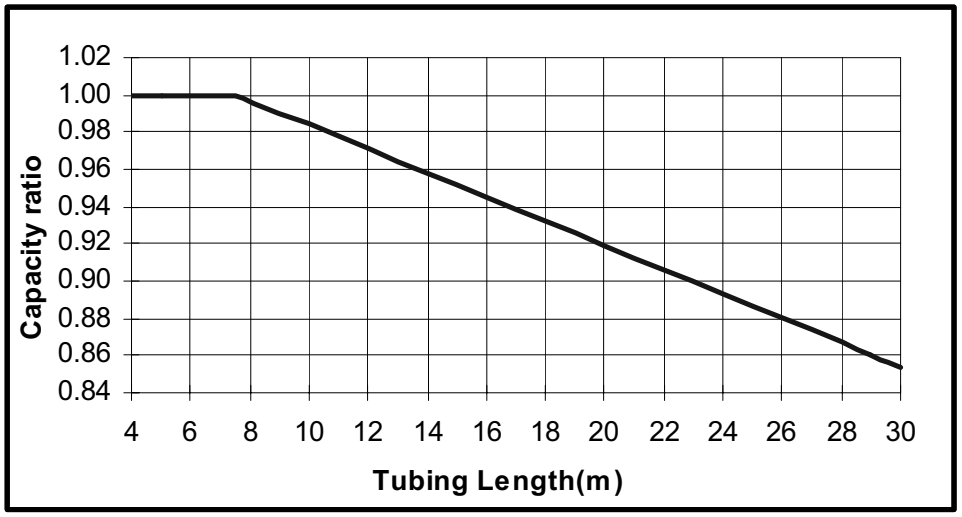


5.5 Capacity Correction Factor Due to Tubing Length

5.5.1 PXD 50 DCI :Cooling



5.5.2 Heating



5.6 PXD60 DCI / DCI 60

5.6.1 Cooling Capacity (kW) - Run Mode

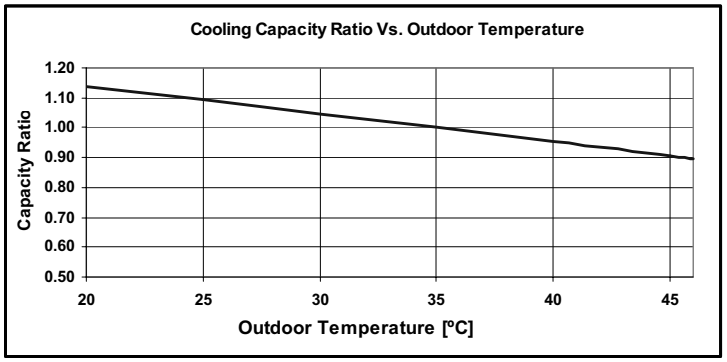
230[V] : Indoor Fan at High Speed.

OU 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	5.52	5.84	6.17	6.49	6.82
	SC	4.48	4.54	4.61	4.68	4.74
	PI	1.41	1.44	1.47	1.50	1.53
30	TC	5.23	5.56	5.88	6.21	6.53
	SC	4.30	4.37	4.43	4.50	4.57
	PI	1.60	1.63	1.66	1.70	1.73
35	TC	4.95	5.28	**5.60**	5.92	6.25
	SC	4.13	4.19	**4.26**	4.33	4.39
	PI	1.80	1.83	**1.86**	1.89	1.92
40	TC	4.67	4.99	5.32	5.64	5.97
	SC	3.95	4.02	4.09	4.15	4.22
	PI	1.99	2.02	2.06	2.09	2.12
46	TC	4.33	4.65	4.98	5.30	5.63
	SC	3.74	3.81	3.88	3.94	4.01
	PI	2.23	2.26	2.29	2.32	2.35

LEGEND

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

5.6.2 Capacity Correction Factors



5.6.3 Heating Capacity (kW) - Run Mode

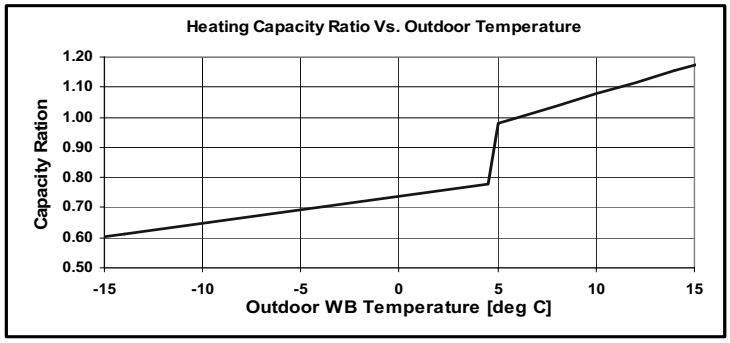
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OU COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	2.87	2.45	2.04
	PI	1.29	1.38	1.47
-10/-12	TC	3.78	3.37	2.96
	PI	1.45	1.55	1.64
-7/-8	TC	4.47	4.06	3.65
	PI	1.58	1.67	1.76
-1/-2	TC	4.82	4.40	3.99
	PI	1.64	1.74	1.83
2/1	TC	5.05	4.63	4.22
	PI	1.69	1.78	1.87
7/6	TC	6.71	**6.30**	5.89
	PI	1.75	**1.84**	1.93
10/9	TC	7.06	6.65	6.24
	PI	1.78	1.87	1.97
15/12	TC	7.41	7.00	6.58
	PI	1.82	1.91	2.00
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

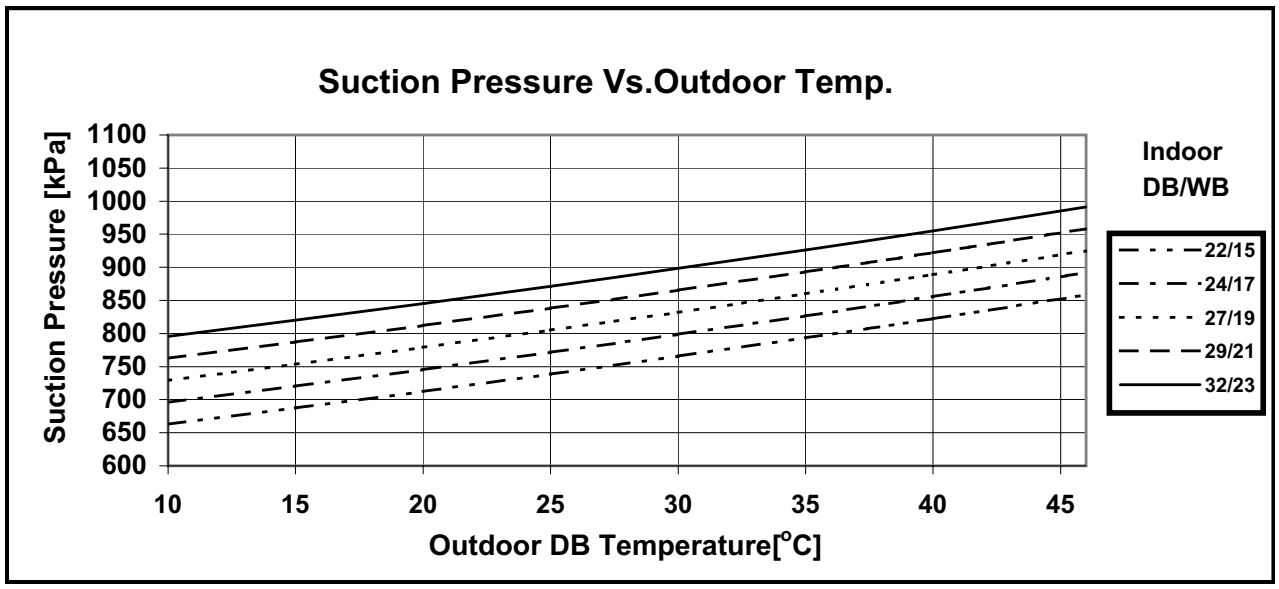
LEGEND

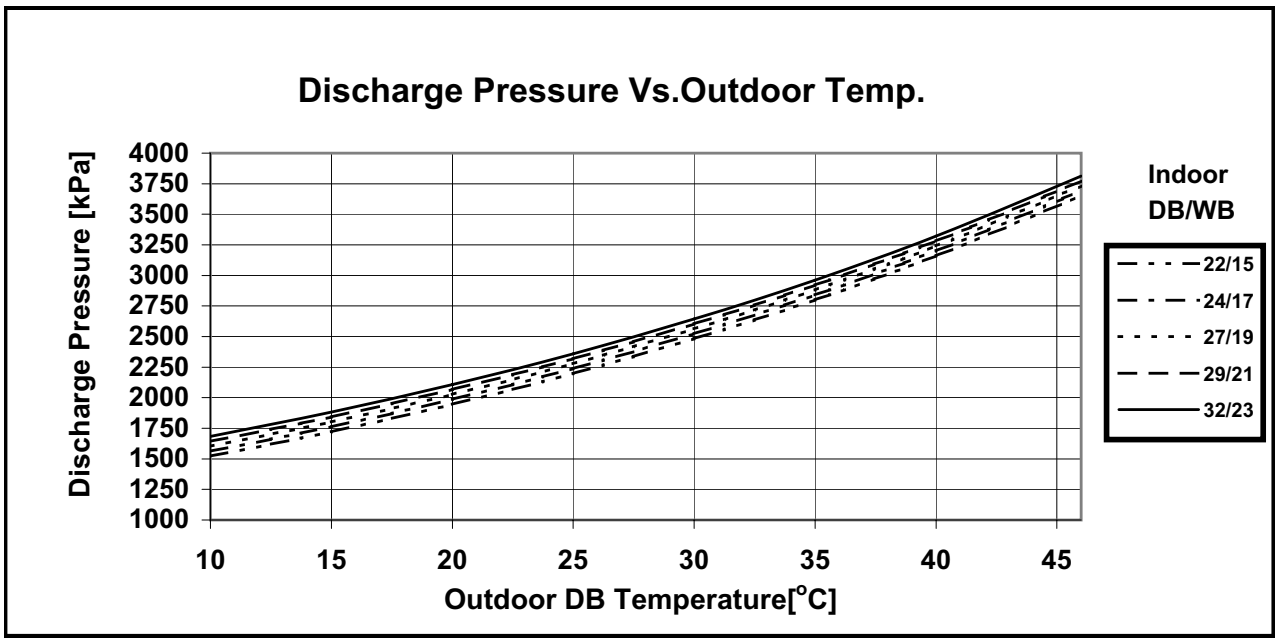
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.6.4 Capacity Correction Factors

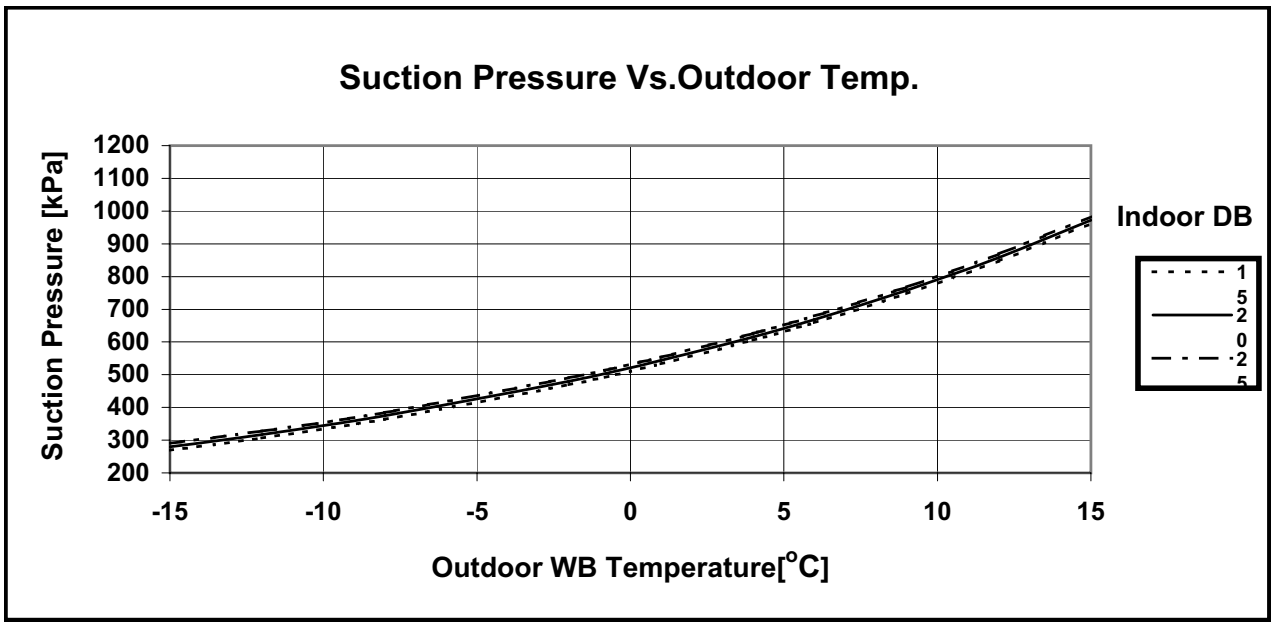


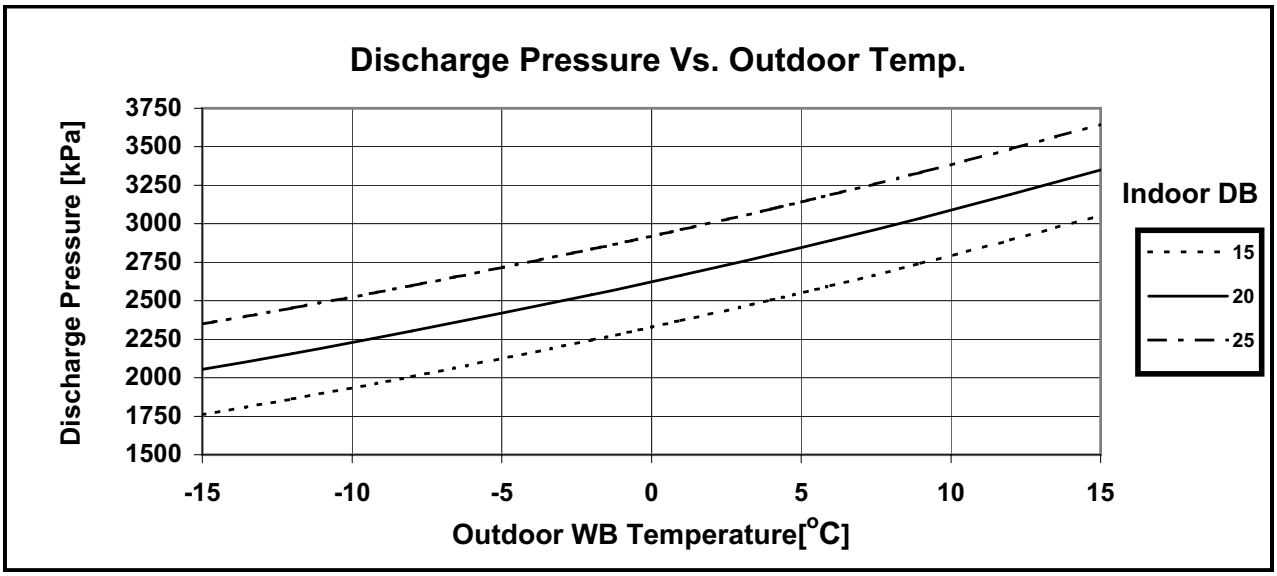
5.6.5 Model: PXD60 DCI / DCI 60 Cooling – Test Mode





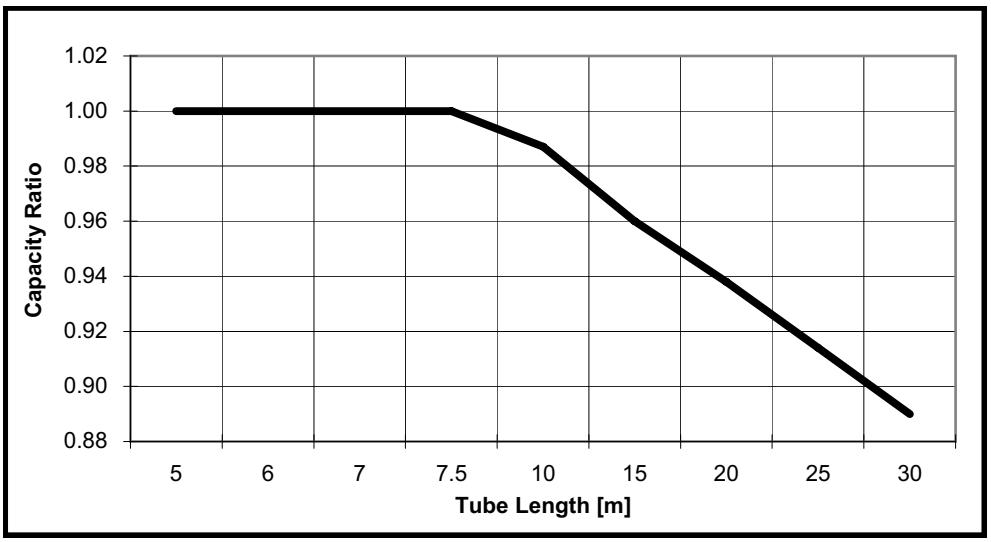
5.6.6 Heating – Test Mode



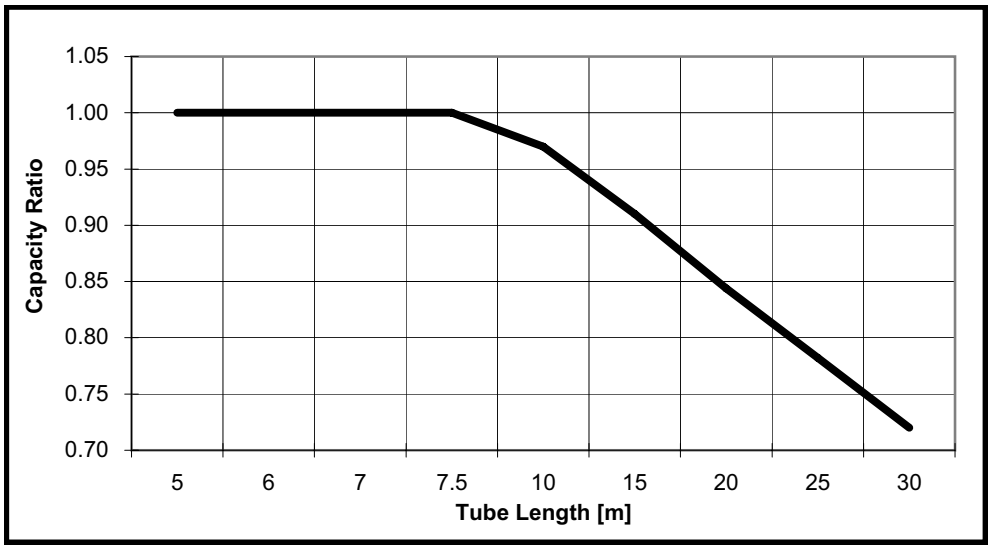


5.7 Capacity Correction Factor Due to Tubing Length

5.7.1 PXD60 DCI / DCI 60 :Cooling



5.7.2 Heating



5.8 PXD72 DCI / DCI 72, DCI 72Z

5.8.1 Cooling Capacity (kW) - Run Mode

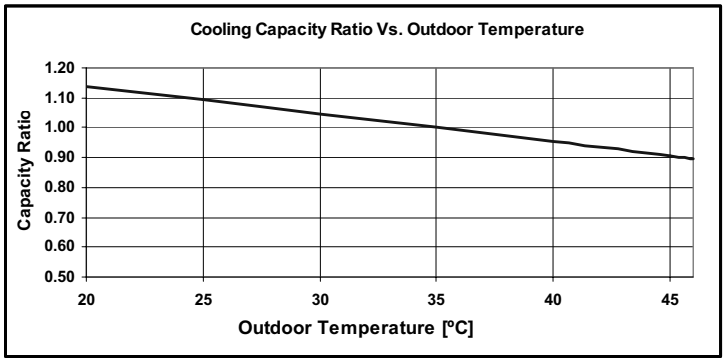
230[V] : Indoor Fan at High Speed.

OU 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	5.36	5.44	5.52	5.60	5.68
	PI	1.70	1.74	1.78	1.82	1.85
30	TC	6.35	6.75	7.14	7.54	7.93
	SC	5.15	5.23	5.31	5.39	5.47
	PI	1.94	1.98	2.01	2.05	2.09
35	TC	6.01	6.41	**6.80**	7.19	7.59
	SC	4.94	5.02	**5.10**	5.18	5.26
	PI	2.17	2.21	**2.25**	2.29	2.33
40	TC	5.67	6.06	6.46	6.85	7.25
	SC	4.73	4.81	4.89	4.97	5.05
	PI	2.41	2.45	2.49	2.52	2.56
46	TC	5.26	5.65	6.04	6.44	6.83
	SC	4.48	4.56	4.64	4.72	4.80
	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
OU – Outdoor

5.8.2 Capacity Correction Factors



5.8.3 Heating Capacity (kW) - Run Mode

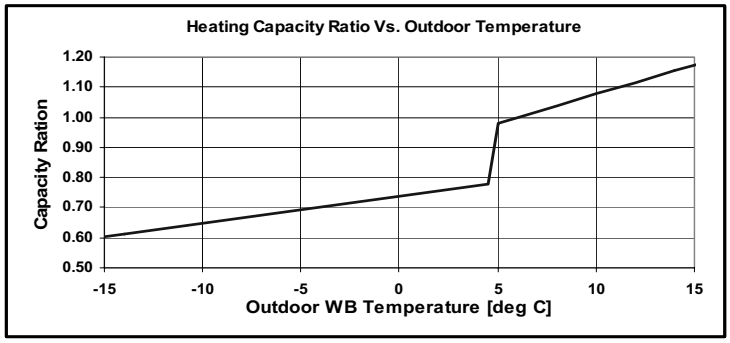
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OU COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	3.46	2.96	2.46
	PI	1.48	1.58	1.69
-10/-12	TC	4.57	4.07	3.57
	PI	1.67	1.77	1.88
-7/-8	TC	5.40	4.90	4.40
	PI	1.81	1.92	2.02
-1/-2	TC	5.81	5.31	4.81
	PI	1.88	1.99	2.10
2/1	TC	6.09	5.59	5.09
	PI	1.93	2.04	2.14
7/6	TC	8.10	**7.60**	7.10
	PI	2.00	**2.11**	2.22
10/9	TC	8.52	8.02	7.52
	PI	2.04	2.15	2.25
15/12	TC	8.94	8.44	7.94
	PI	2.08	2.19	2.29
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

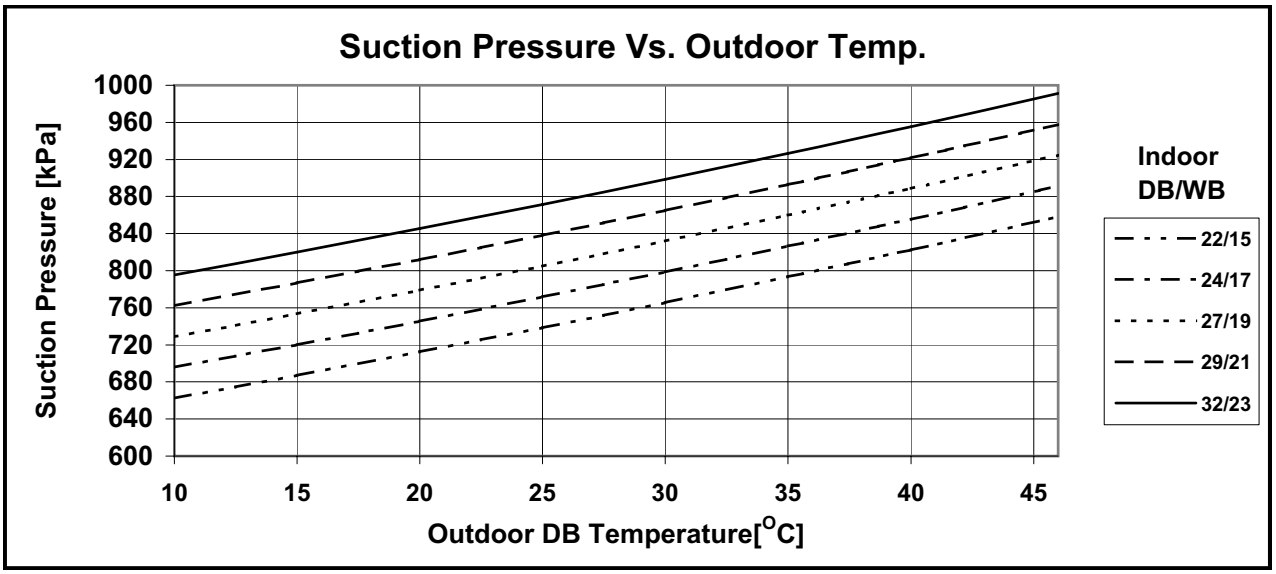
LEGEND

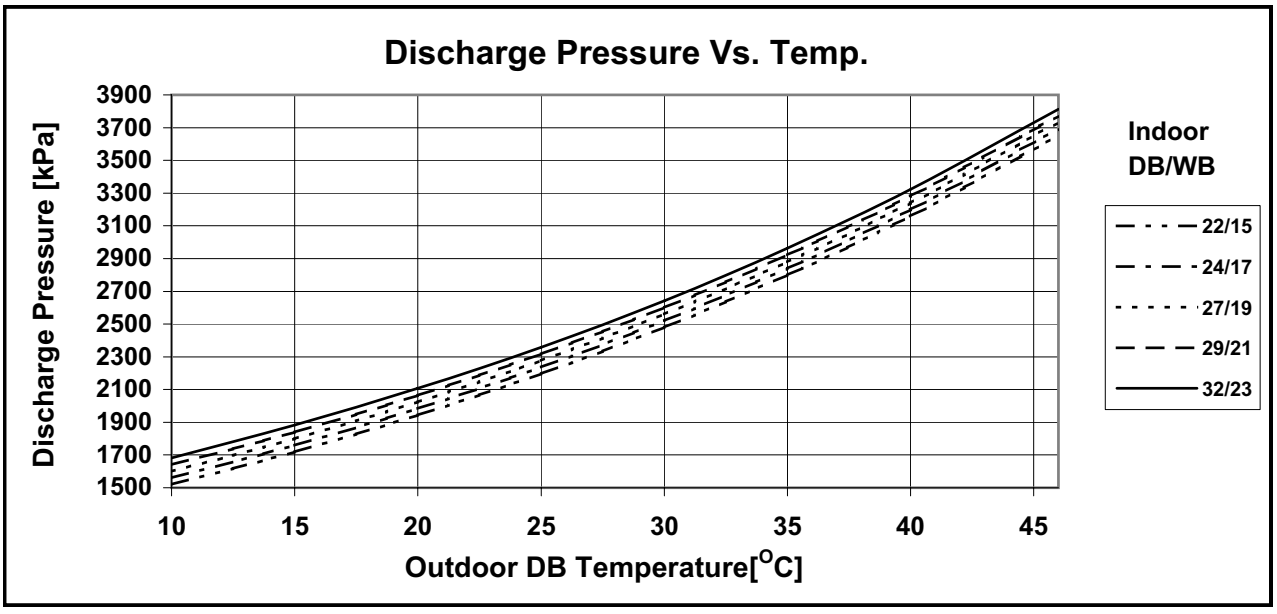
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.8.4 Capacity Correction Factors

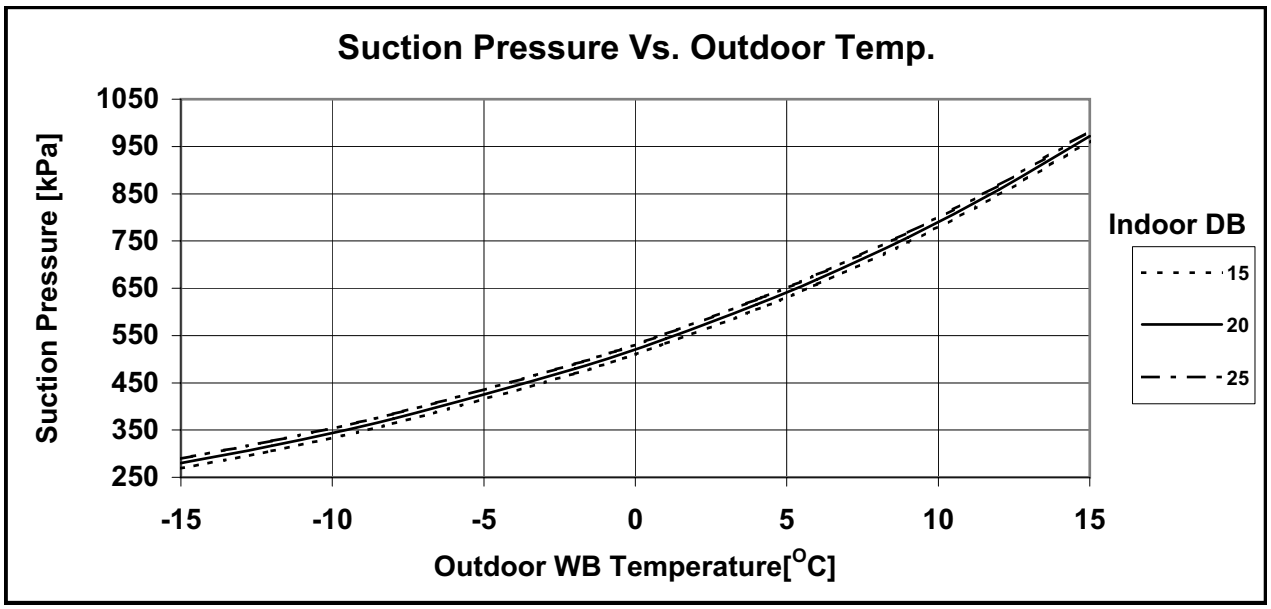


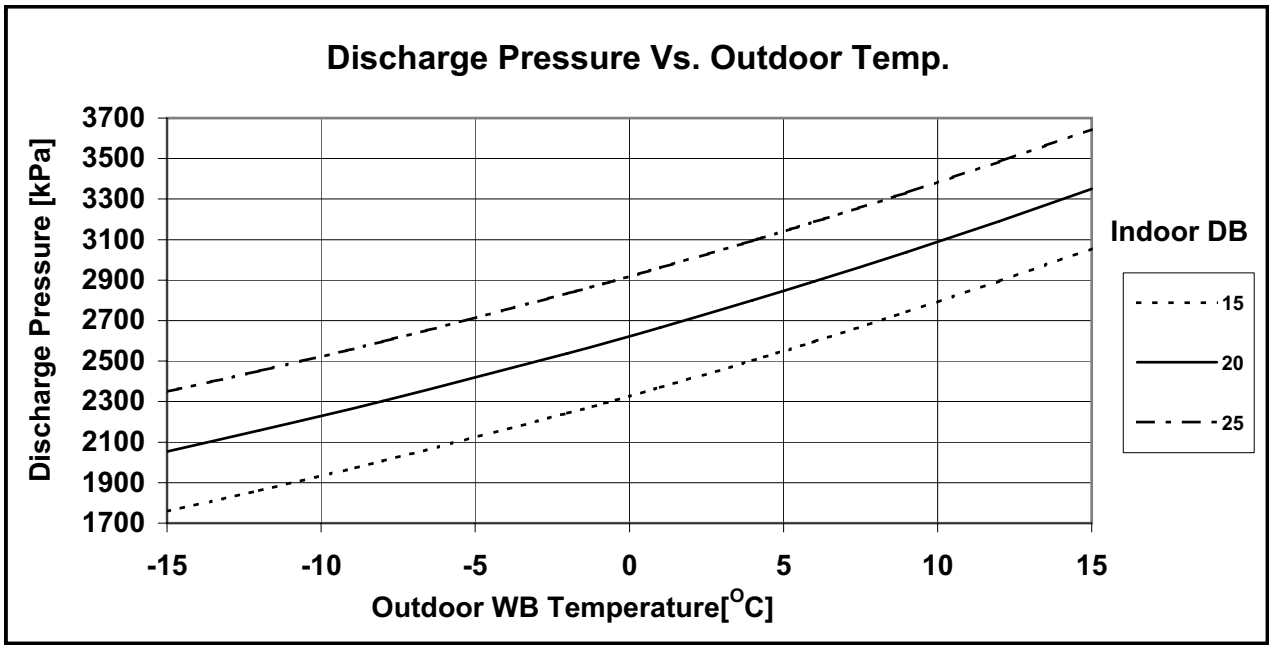
5.8.5 Model: PXD72 DCI / DCI 72, DCI 72Z Cooling – Test Mode





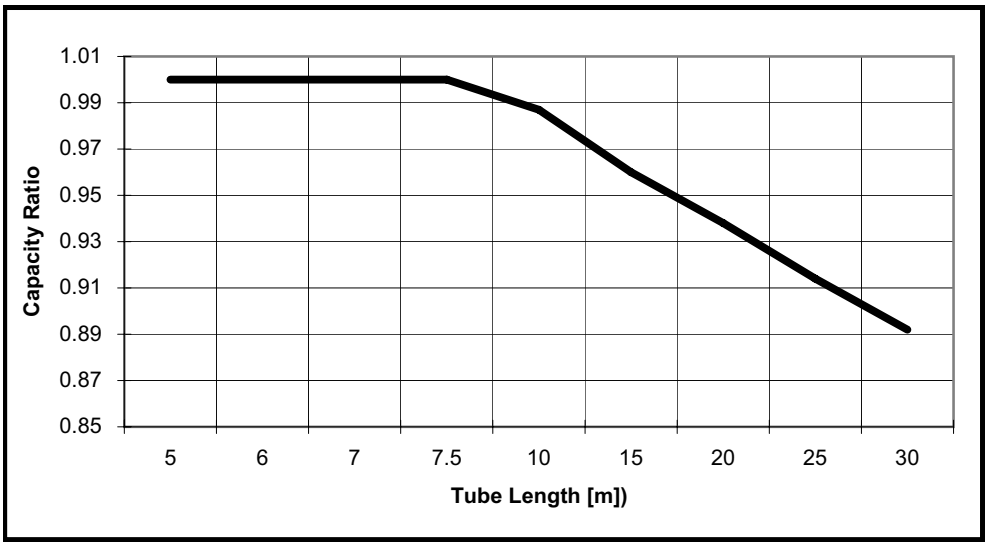
5.8.6 Heating – Test Mode



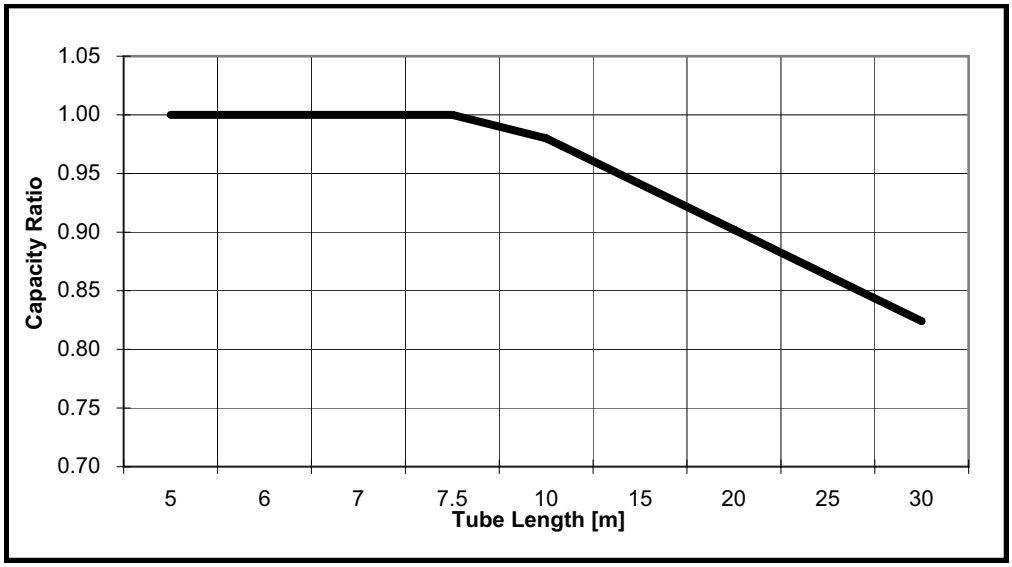


5.9 Capacity Correction Factor Due to Tubing Length

5.9.1 PXD72 DCI / DCI 72, DCI 72Z :Cooling



5.9.2 Heating



5.10 PXD80 DCI / DCI 80

5.10.1 Cooling Capacity (kW) - Run Mode

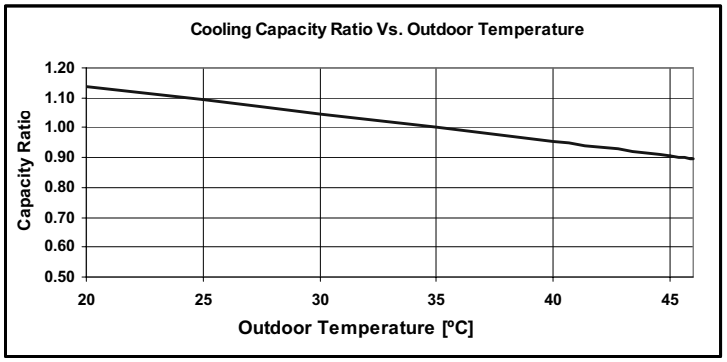
230[V] : Indoor Fan at High Speed.

OU 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	7.39	7.82	8.26	8.69	9.13
	SC	5.72	5.80	5.88	5.97	6.05
	PI	1.88	1.92	1.97	2.01	2.05
30	TC	7.01	7.44	7.88	8.31	8.75
	SC	5.49	5.58	5.66	5.75	5.83
	PI	2.14	2.19	2.23	2.27	2.31
35	TC	6.63	7.07	**7.50**	7.94	8.37
	SC	5.27	5.35	**5.44**	5.52	5.61
	PI	2.41	2.45	**2.49**	2.53	2.57
40	TC	6.25	6.69	7.12	7.56	7.99
	SC	5.05	5.13	5.22	5.30	5.39
	PI	2.67	2.71	2.75	2.79	2.84
46	TC	5.80	6.23	6.67	7.10	7.54
	SC	4.78	4.86	4.95	5.03	5.12
	PI	2.98	3.02	3.07	3.11	3.15

LEGEND

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

5.10.2 Capacity Correction Factors



5.10.3 Heating Capacity (kW) - Run Mode

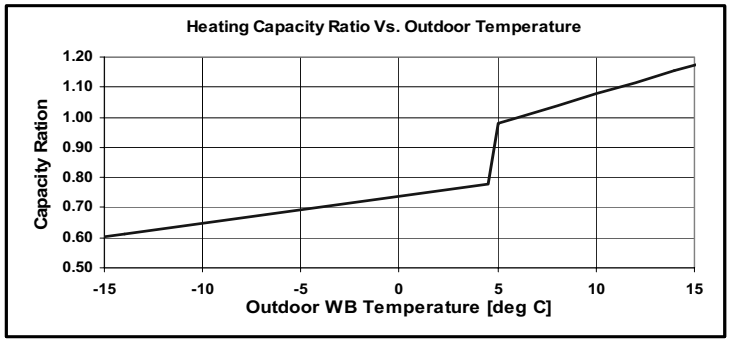
230[V] : Indoor Fan at High Speed.

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OU COIL ENTERING AIR DB/WB TEMPERATURE [°C]	**DATA**	**15**	**20**	**25**
-15/-16	TC	3.96	3.39	2.82
	PI	1.78	1.91	2.04
-10/-12	TC	5.23	4.66	4.09
	PI	2.02	2.14	2.27
-7/-8	TC	6.18	5.61	5.04
	PI	2.19	2.32	2.44
-1/-2	TC	6.65	6.08	5.51
	PI	2.28	2.40	2.53
2/1	TC	6.97	6.40	5.83
	PI	2.34	2.46	2.59
7/6	TC	9.27	**8.70**	8.13
	PI	2.42	**2.55**	2.68
10/9	TC	9.75	9.18	8.61
	PI	2.47	2.60	2.72
15/12	TC	10.23	9.66	9.09
	PI	2.52	2.64	2.77
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

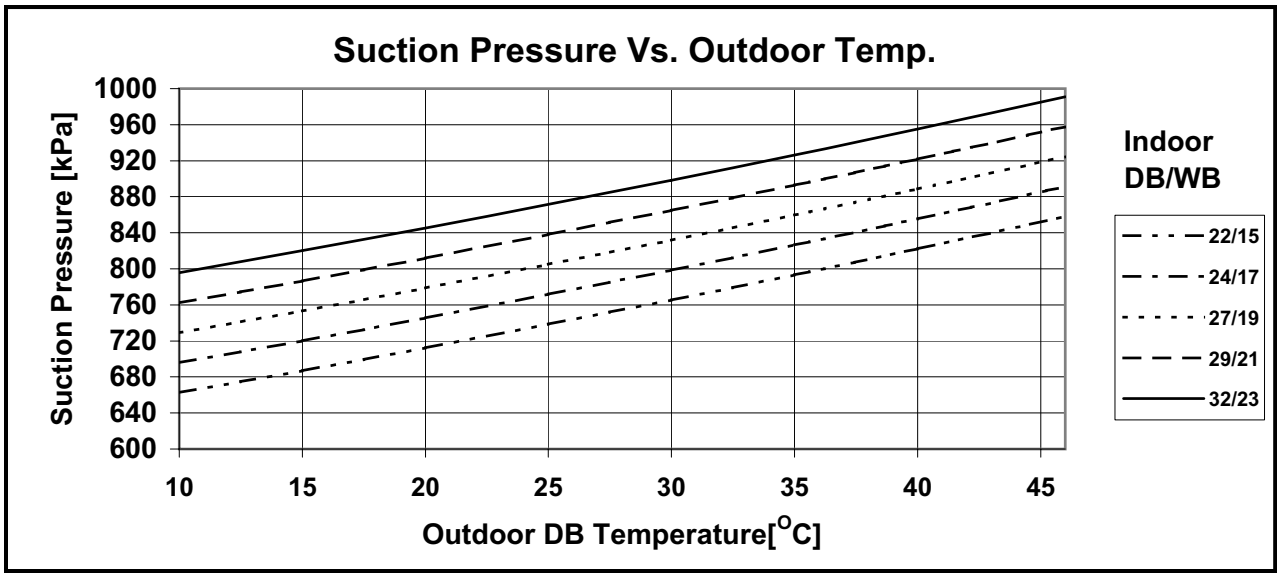
LEGEND

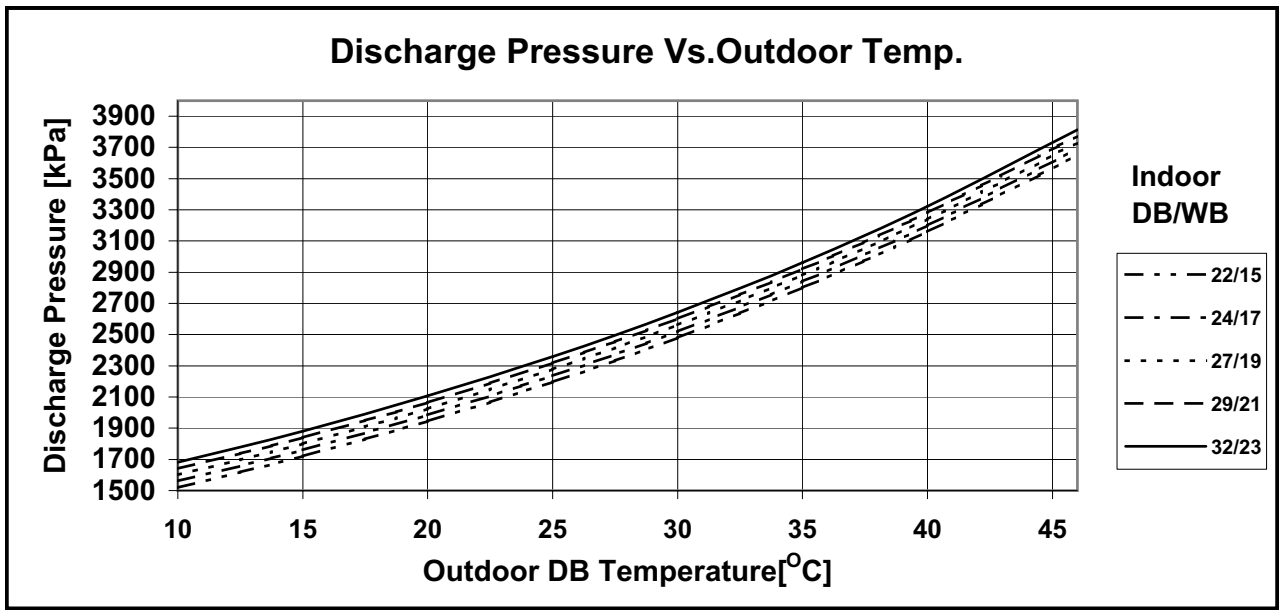
TC – Total Heating Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OU – Outdoor

5.10.4 Capacity Correction Factors

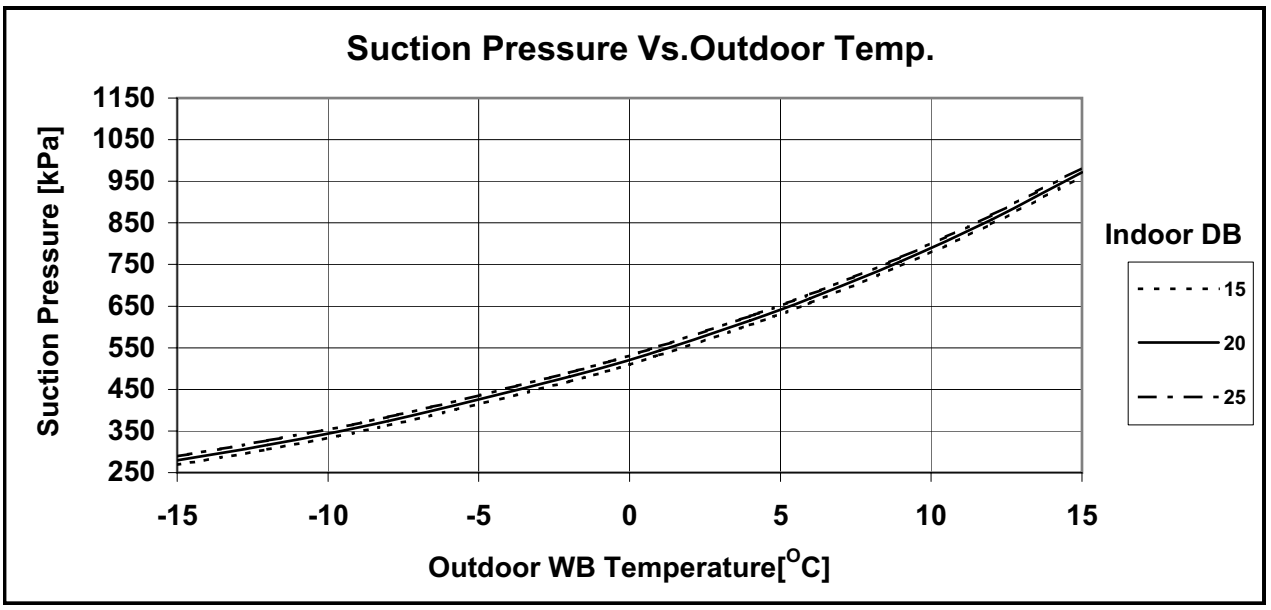


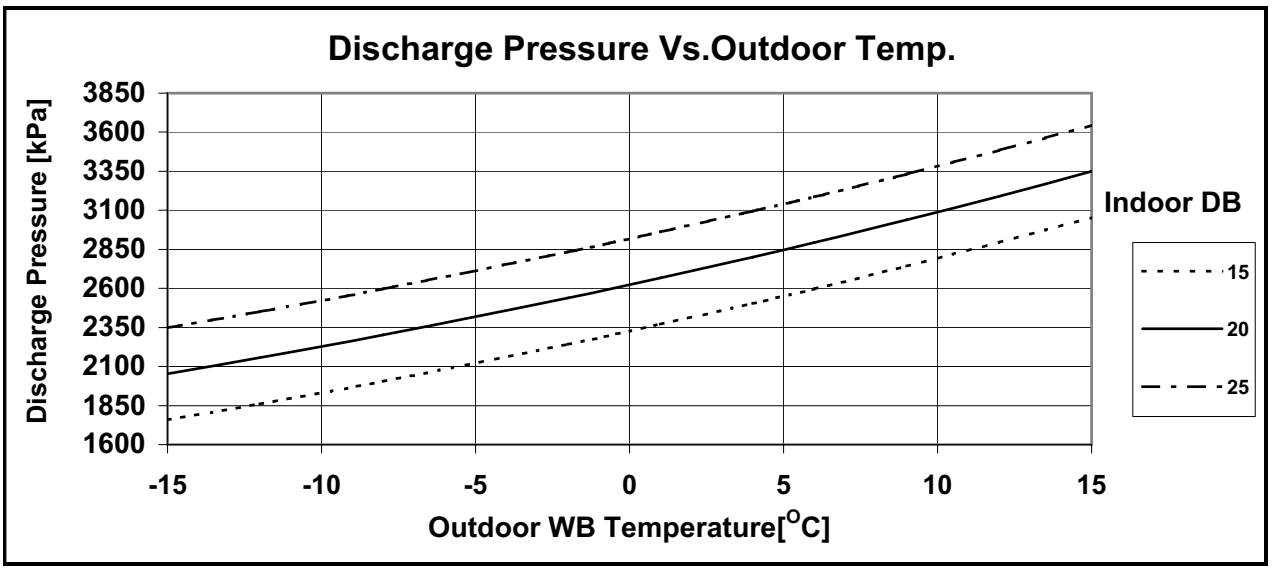
5.10.5 Model: PXD80 DCI / DCI 80 Cooling – Test Mode





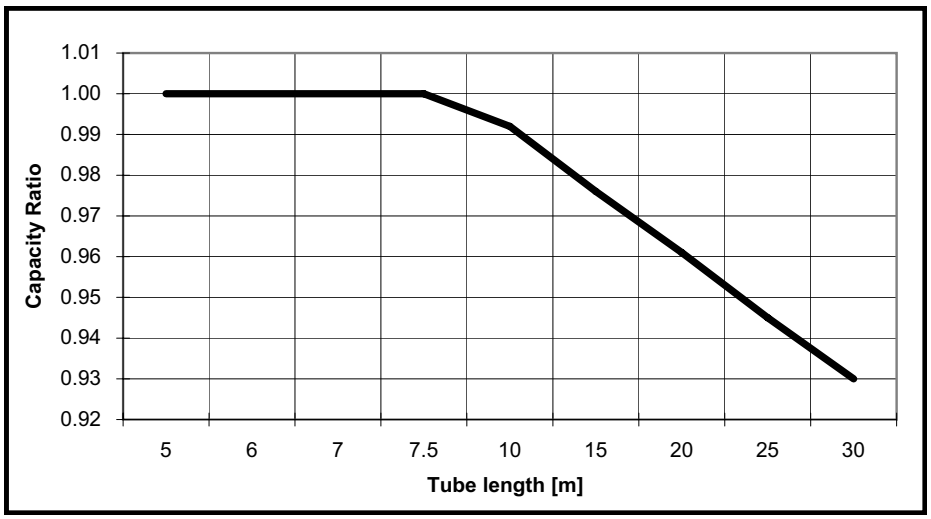
5.10.6 Heating – Test Mode



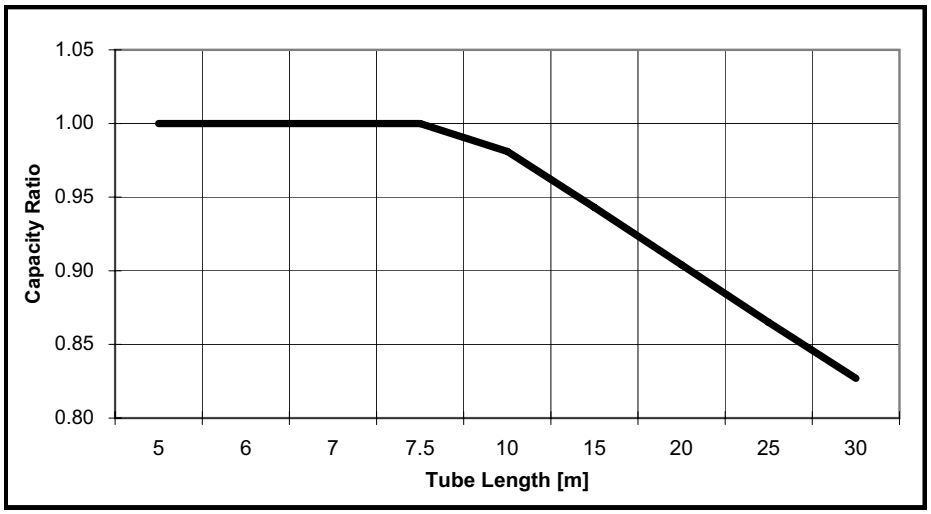


5.11 Capacity Correction Factor Due to Tubing Length

5.11.1 PXD80 DCI / DCI 80 :Cooling



5.11.2 Heating



6. SOUND LEVEL CHARACTERISTICS

6.1 Sound Pressure Level

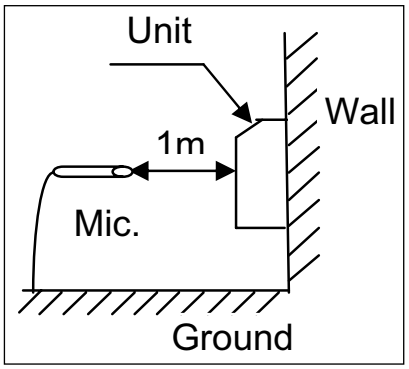
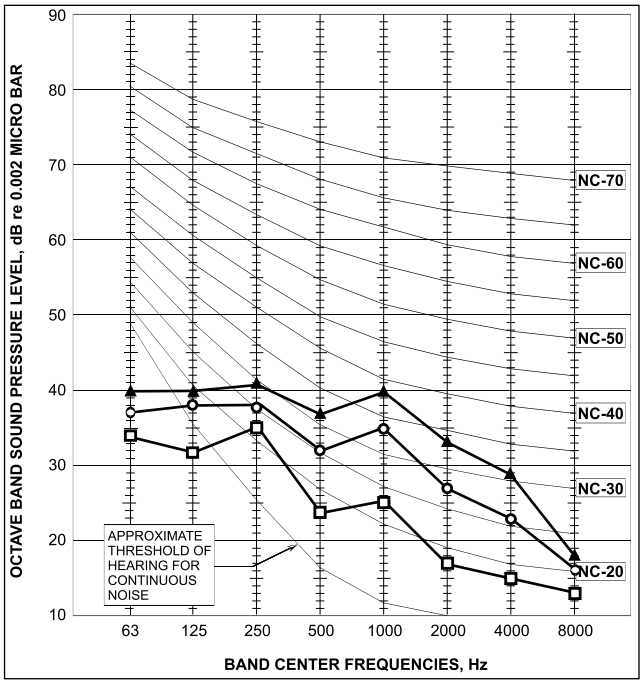


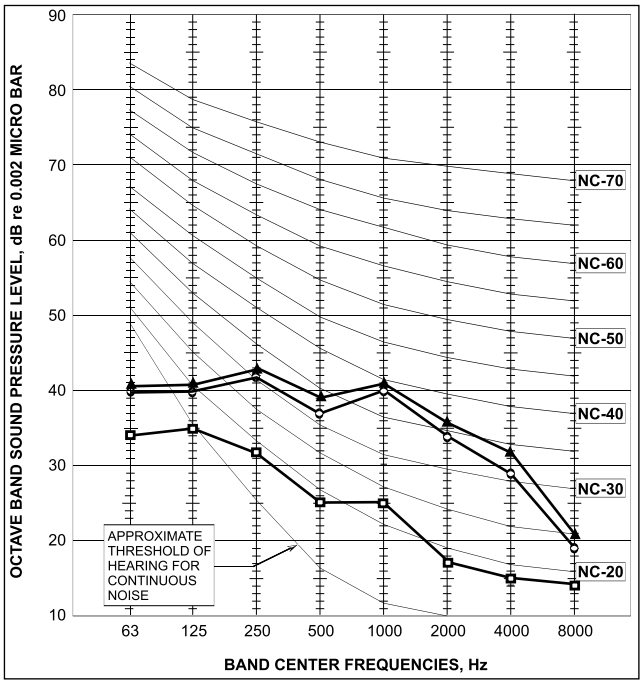
Figure 1

6.2 Soud Pressure Level Spectrum (Measured as Figure 1)

PXD 25

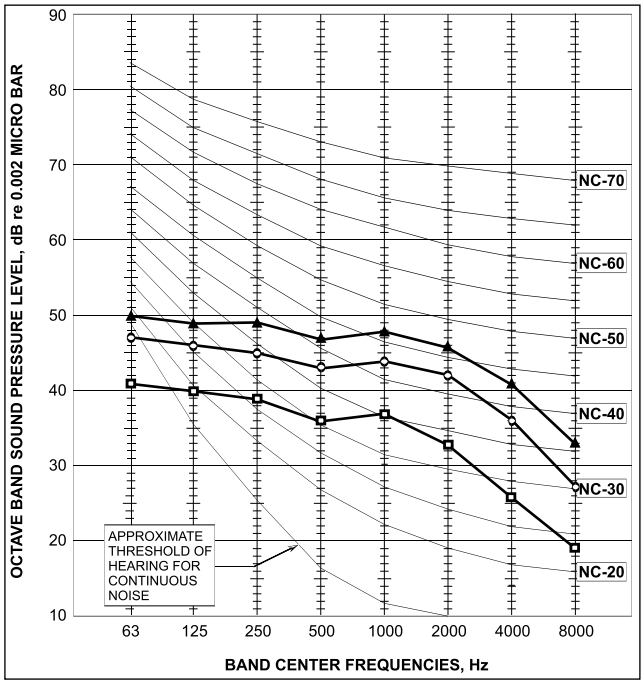


PXD 35

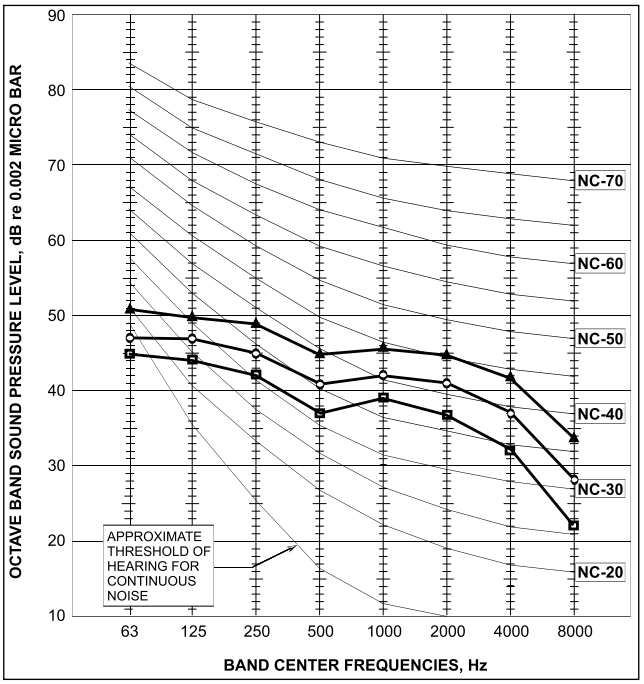


FAN SPEED	LINE
HI	▲
ME	○
LO	□

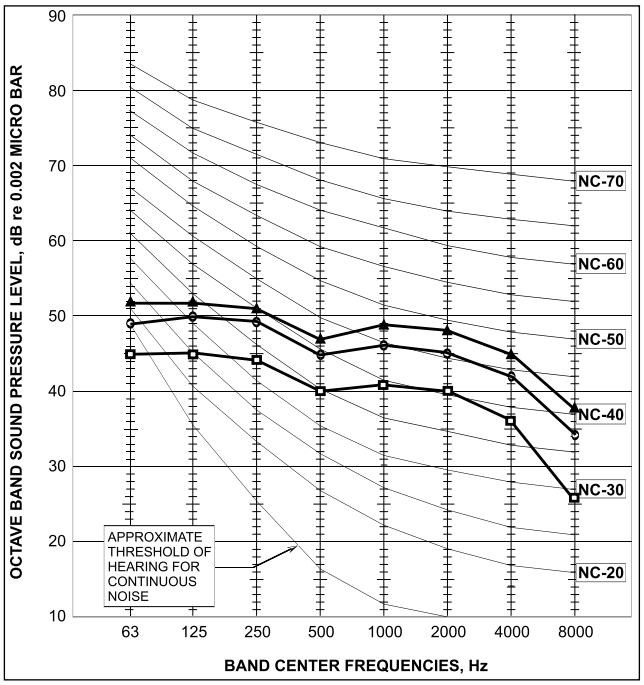
PXD 50



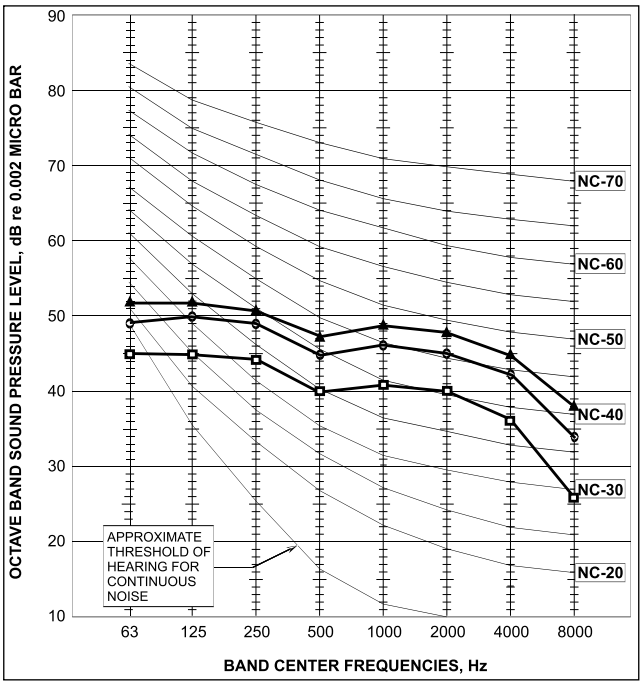
PXD 60



PXD 72



PXD 80



FAN SPEED	LINE
HI	▲
ME	○
LO	□

6.3 Outdoor units

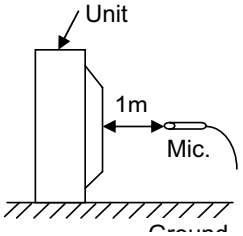
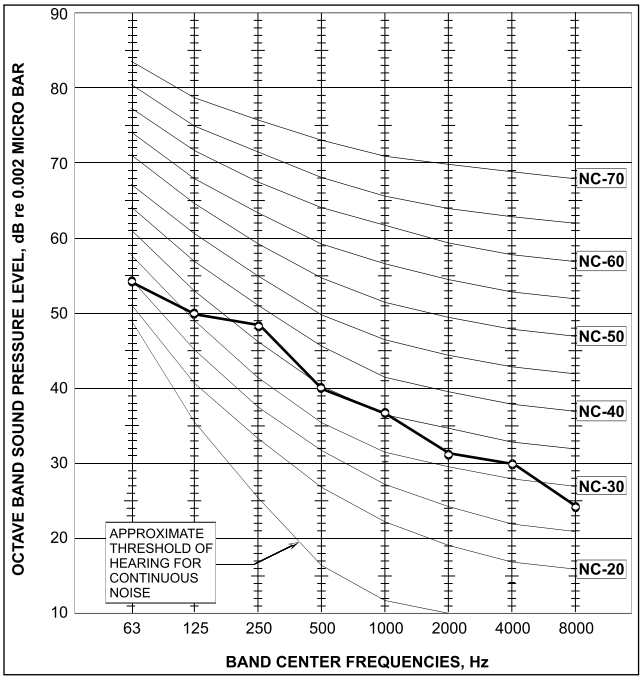


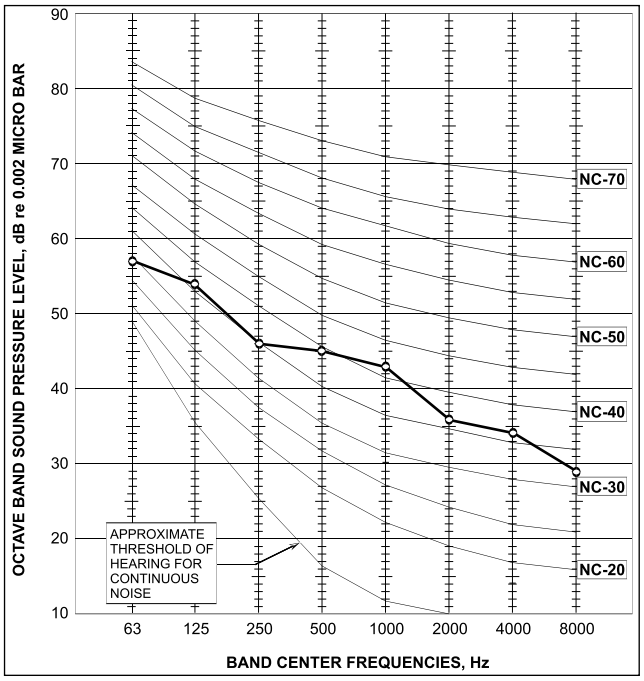
Figure 2

6.4 Sound Pressure Level Spectrum (Measured as Figure 2)

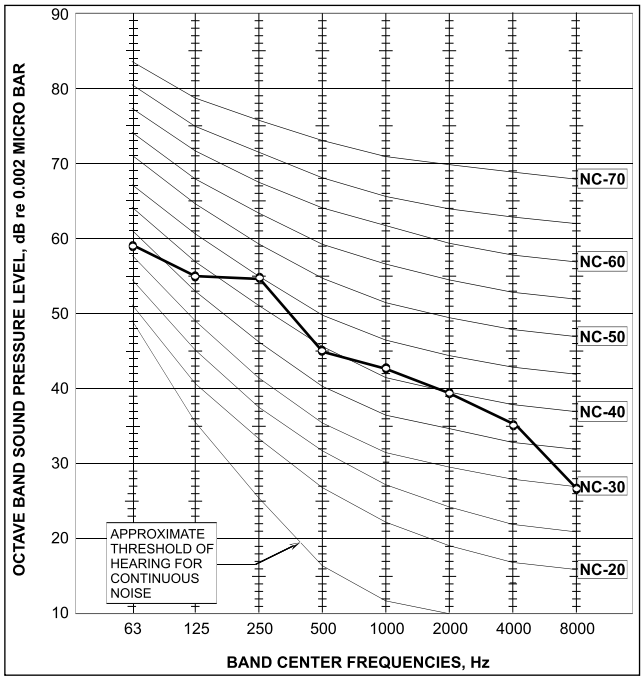
DCI 25 Cooling



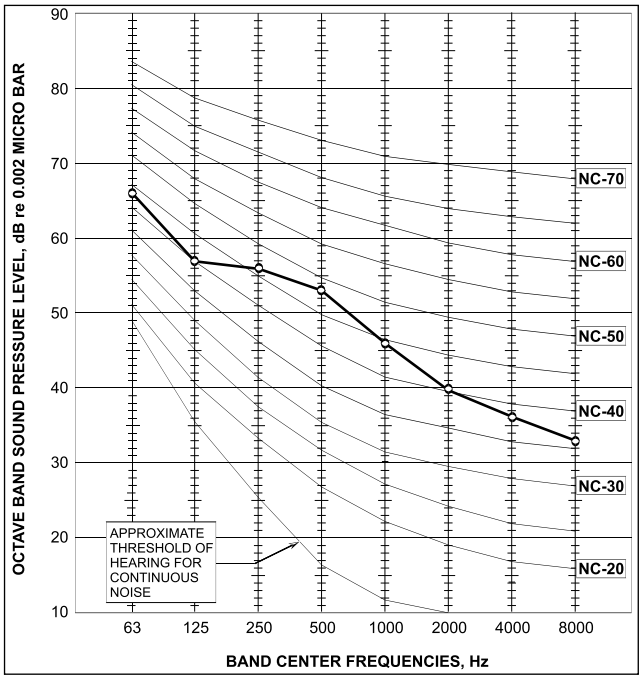
DCI 25 Heating



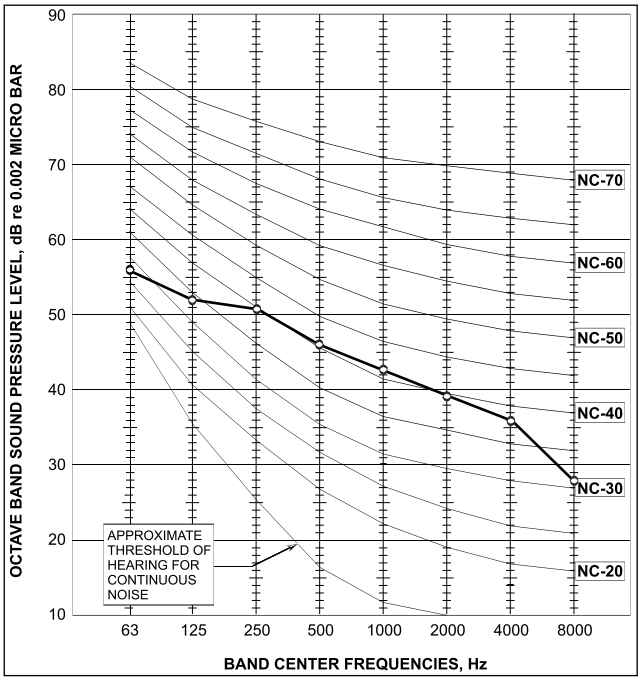
DCI 35 Cooling



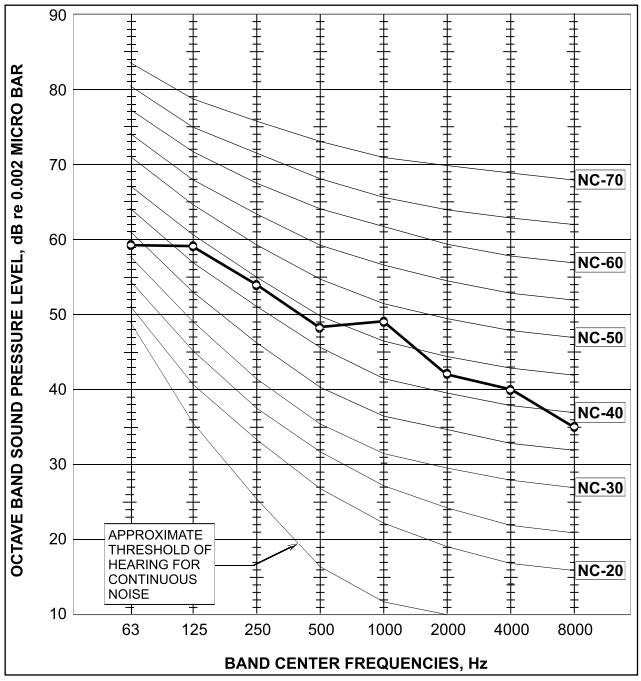
DCI 35 Heating



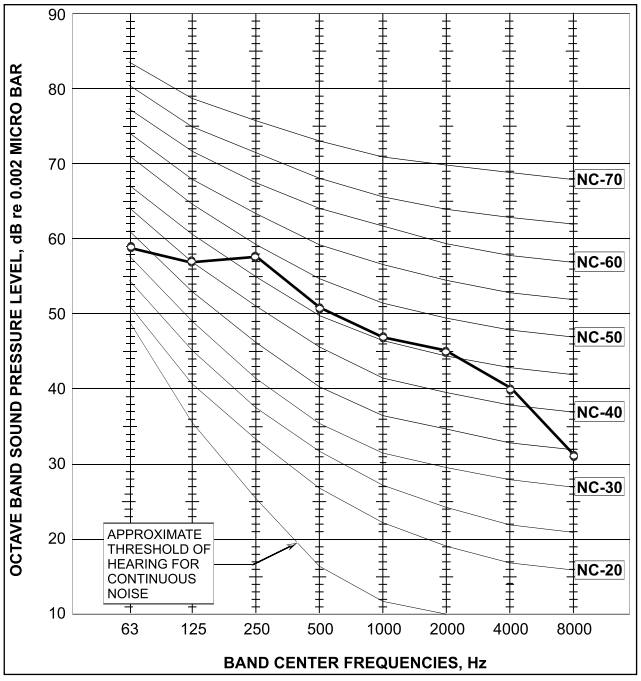
DCI 50 Cooling



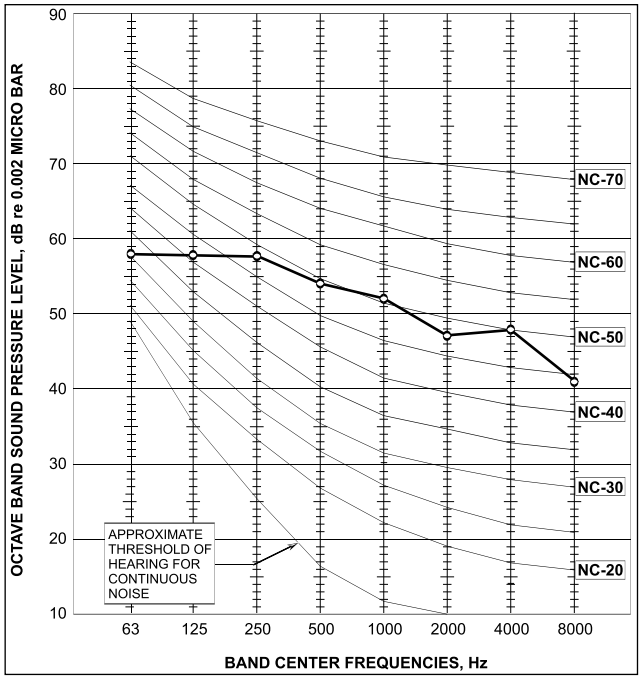
DCI 50 Heating



DCI 60 Cooling

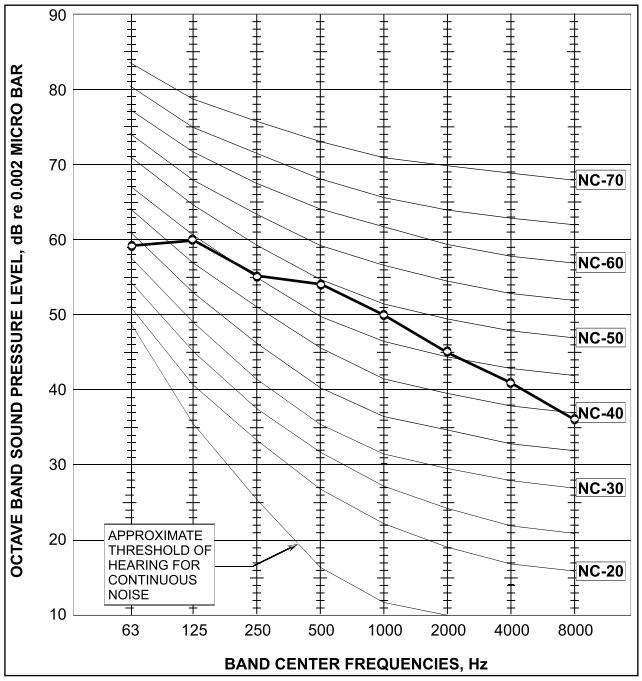


DCI 60 Heating

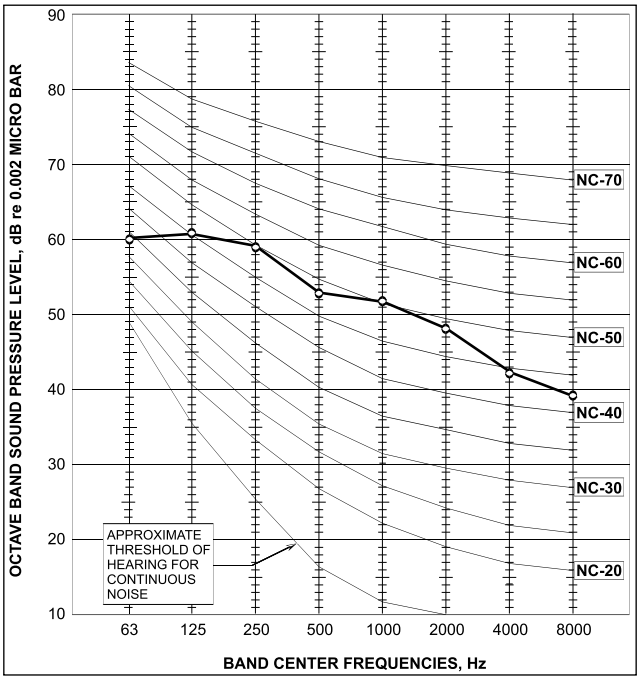


FAN SPEED	LINE
HI	▲
ME	○
LO	□

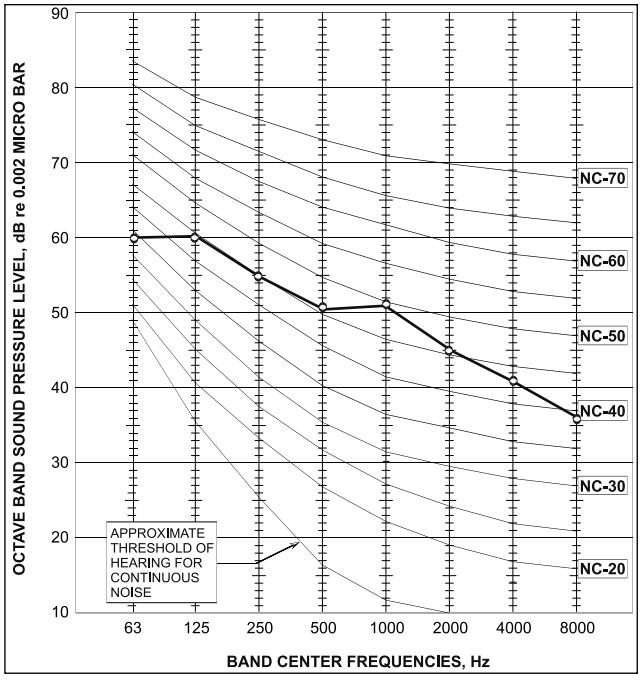
DCI 72 Cooling



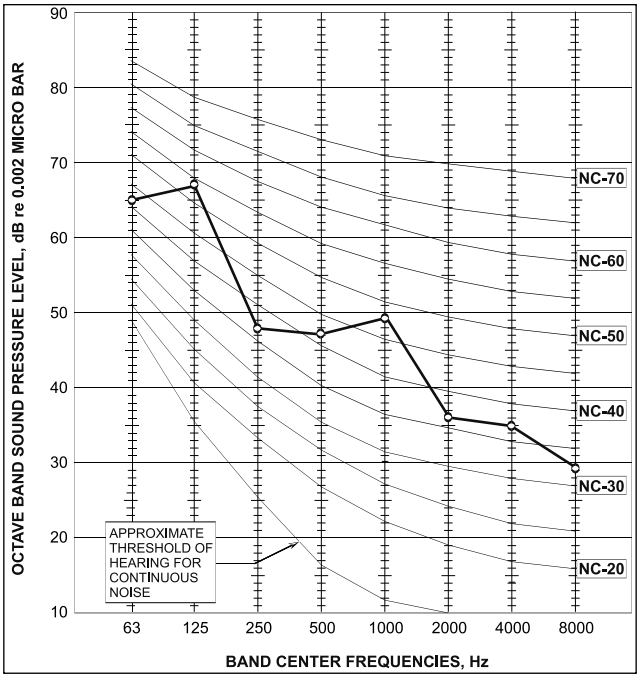
DCI 72 Heating



DCI 72Z Cooling

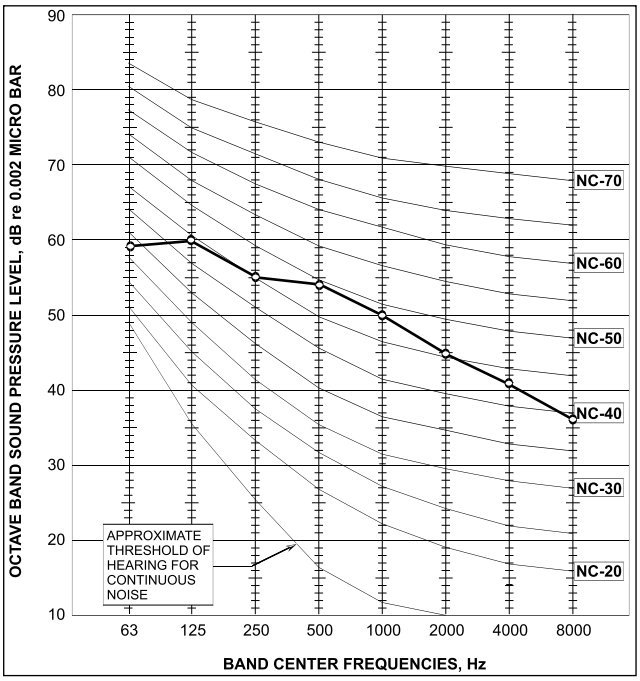


DCI 72Z Heating

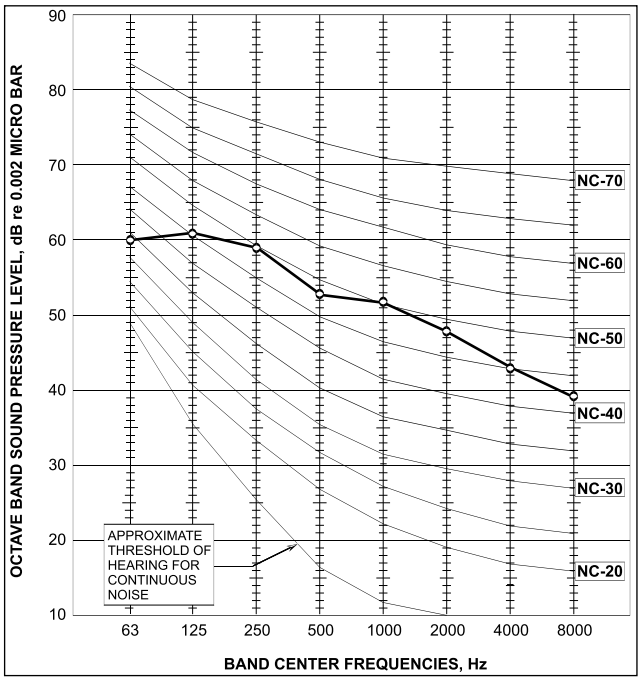


FAN SPEED	LINE
HI	▲
ME	○
LO	□

DCI 80 Cooling



DCI 80 Heating



FAN SPEED	LINE
HI	▲
ME	○
LO	□

7. ELECTRICAL DATA

7.1 Single Phase Units

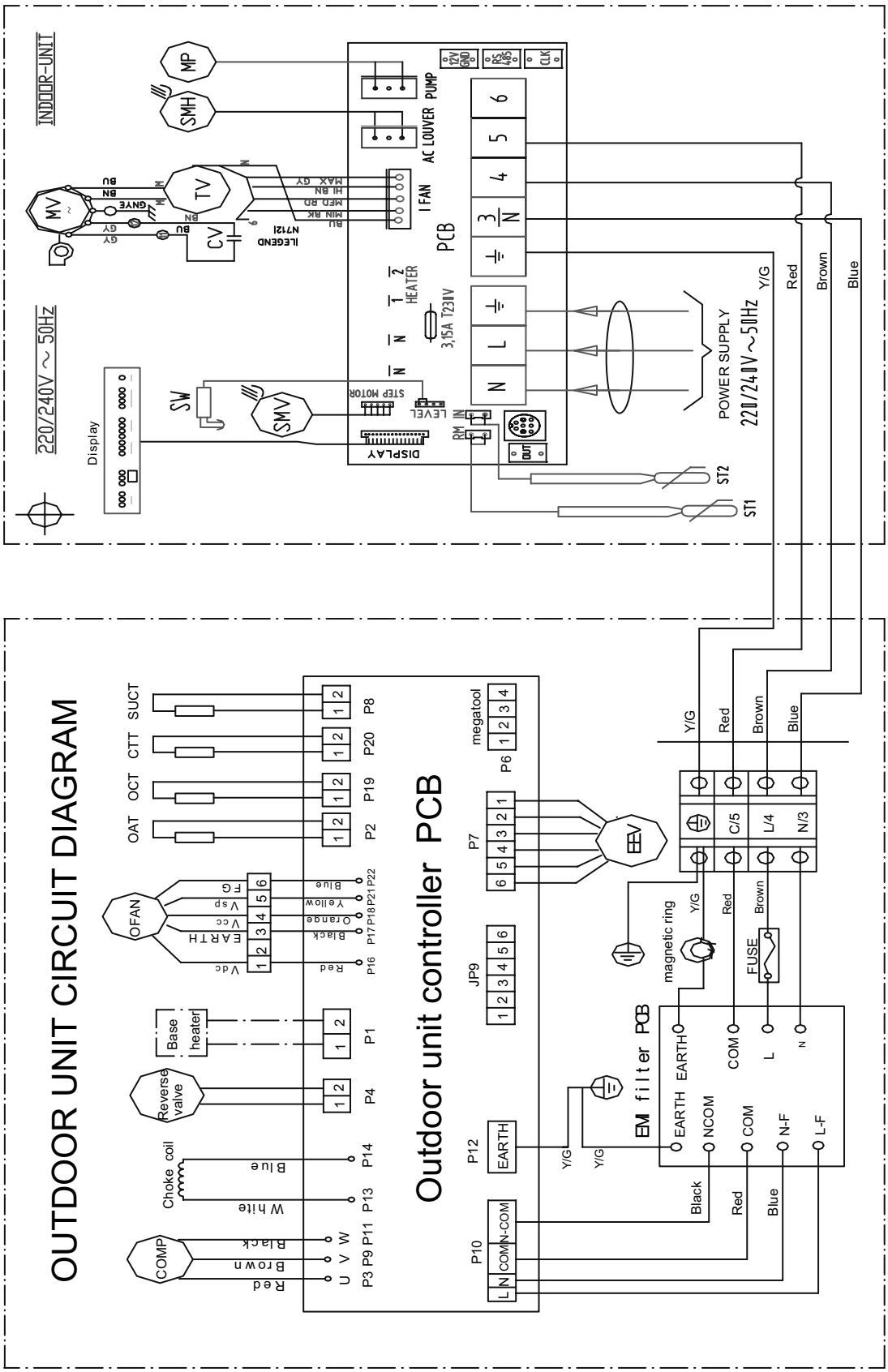
MODEL	PXD 25 DCI	PXD 35 DCI	PXD 50 DCI	PXD 60 DCI	PXD 72 DCI	PXD 80 DCI
Power Supply	To indoor 1PH-230V-50Hz	To indoor 1PH-230V-50Hz	To indoor 1PH-230V-50Hz	To indoor 1PH-230V-50Hz	To outdoor 1PH-230V-50Hz	To outdoor 1PH-230V-50Hz
Max Current, A	10	10	12	13	14	15
Inrush Current A	35	35	35	35	45	45
Starting Current A	10.5	10.5	10.5	10.5	10.5	10.5
Circuit Breaker A	16	16	20	20	20	20
Power Supply Wiring No.X Cross Section mm^2	3 x 1.5 mm^2	3 x 1.5 mm^2	3 x 2.5 mm^2	3 x 2.5 mm^2	3 x 2.5 mm^2	3 x 2.5 mm^2
Interconnecting Cable No.X Cross Section mm^2	4 x 1.5 mm^2	4 x 1.5 mm^2	4 x 2.5 mm^2	4 x 2.5 mm^2	4 x 2.5 mm^2	4 x 2.5 mm^2

NOTE

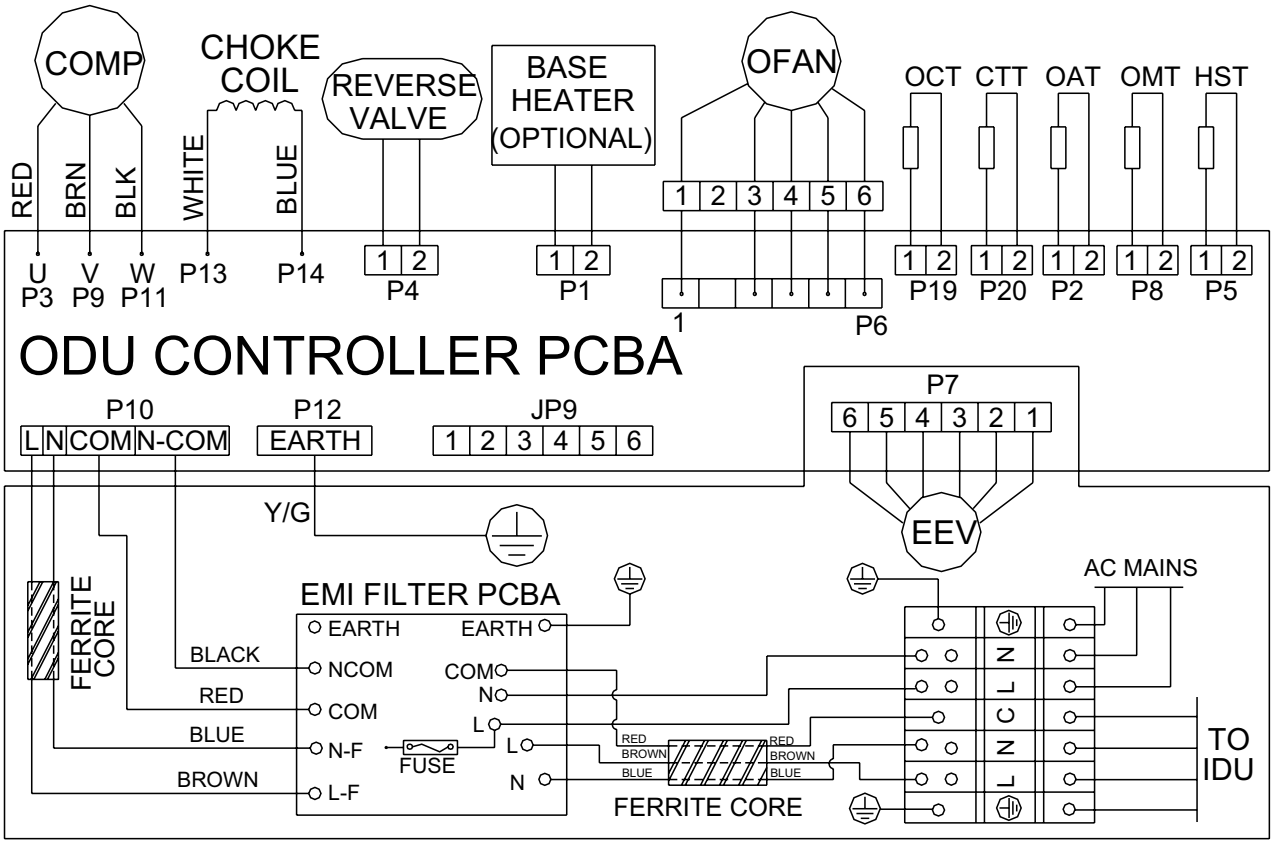
Power wiring cord should comply with local lows and electrical regulations requirements.

8. WIRING DIAGRAMS

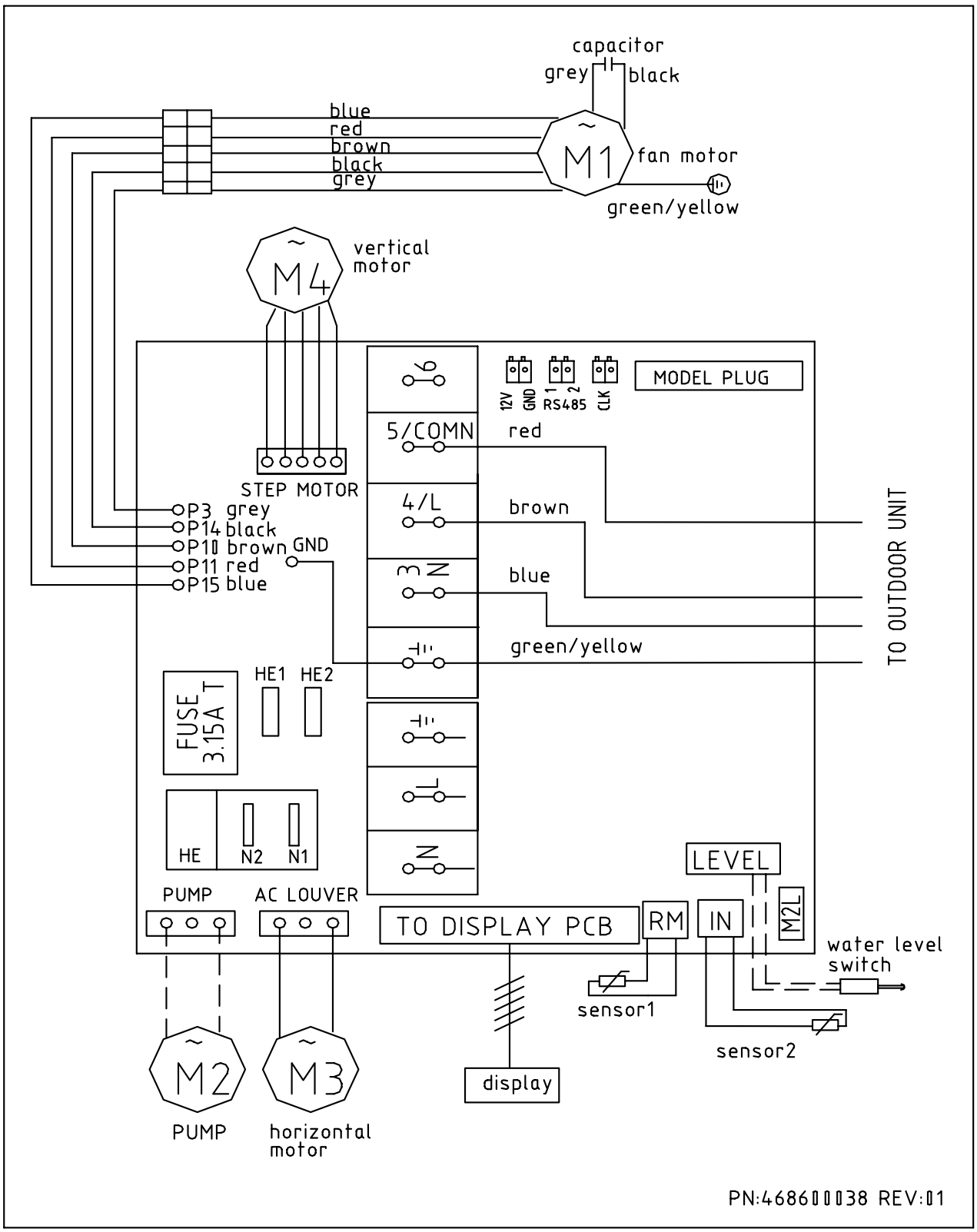
8.1 PXD 25, 35, 50, 60 DCI / DCI 50, 60



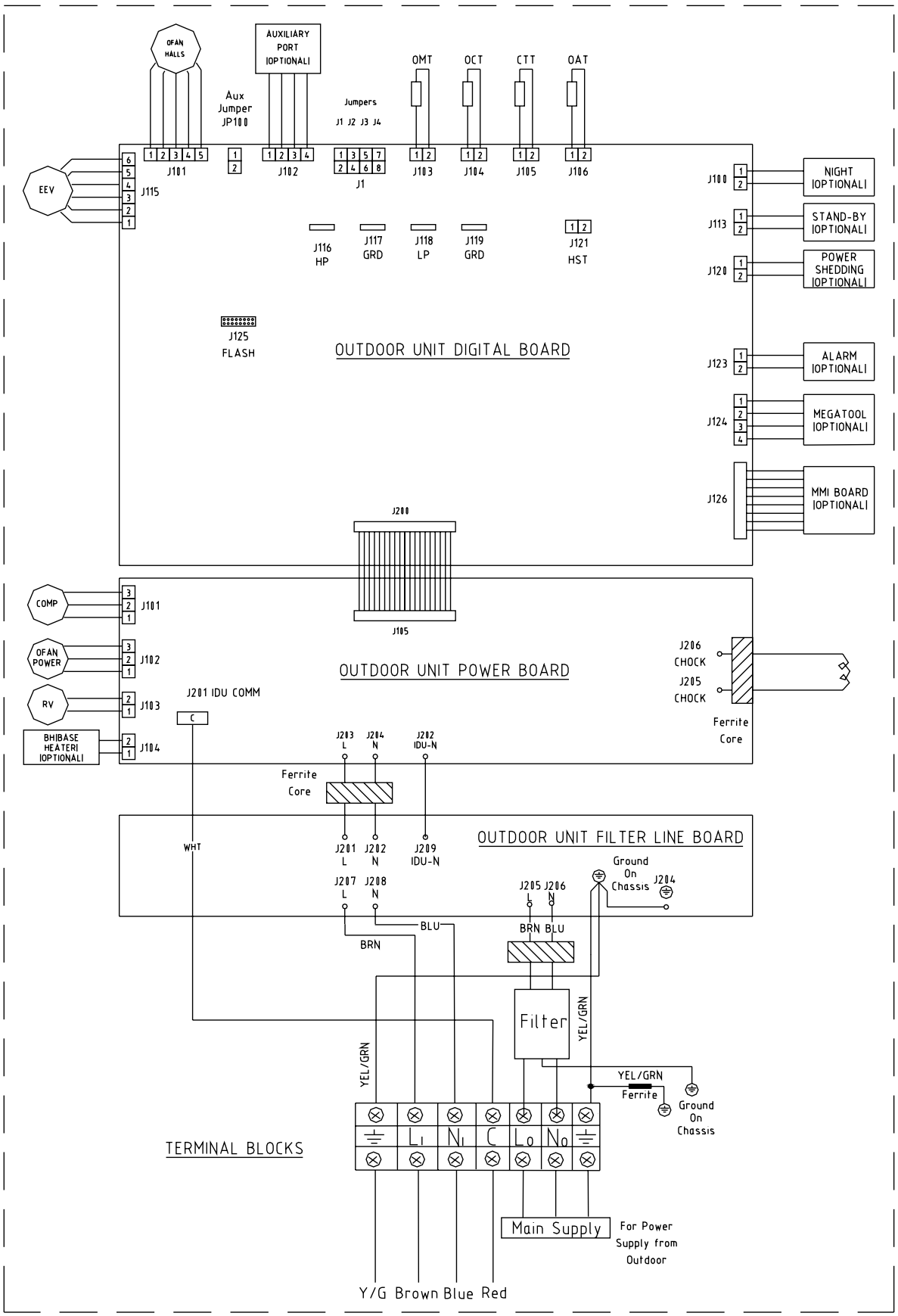
8.2 PXD72 DCI / DCI 72Z



8.3 PXD 72, 80 DCI



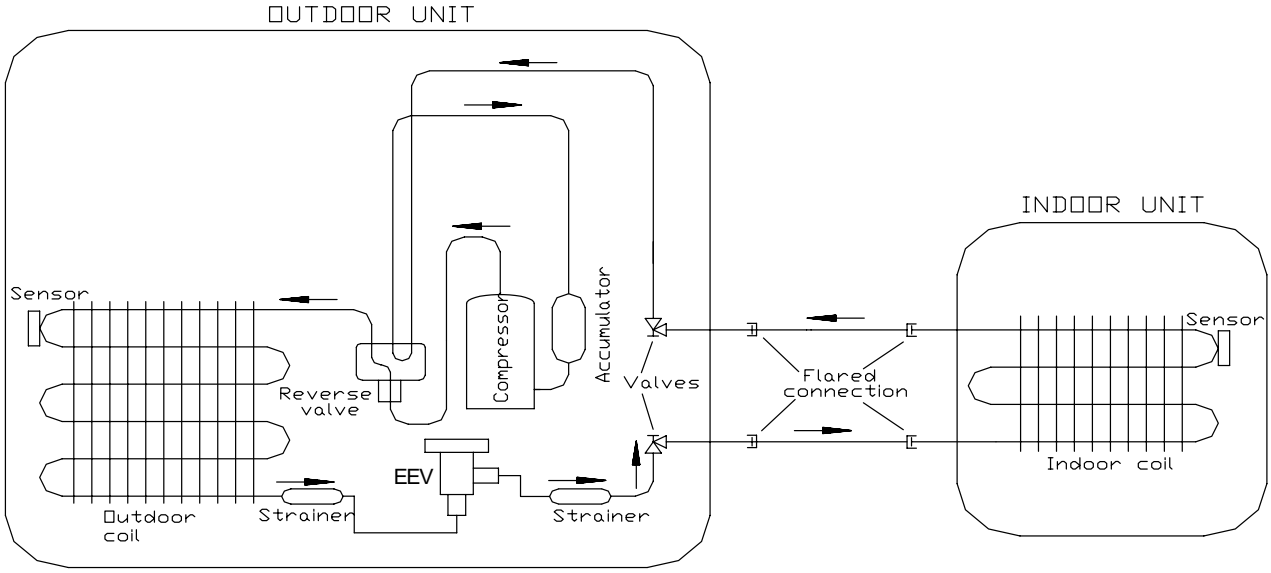
8.4 DCI 72, DCI 80



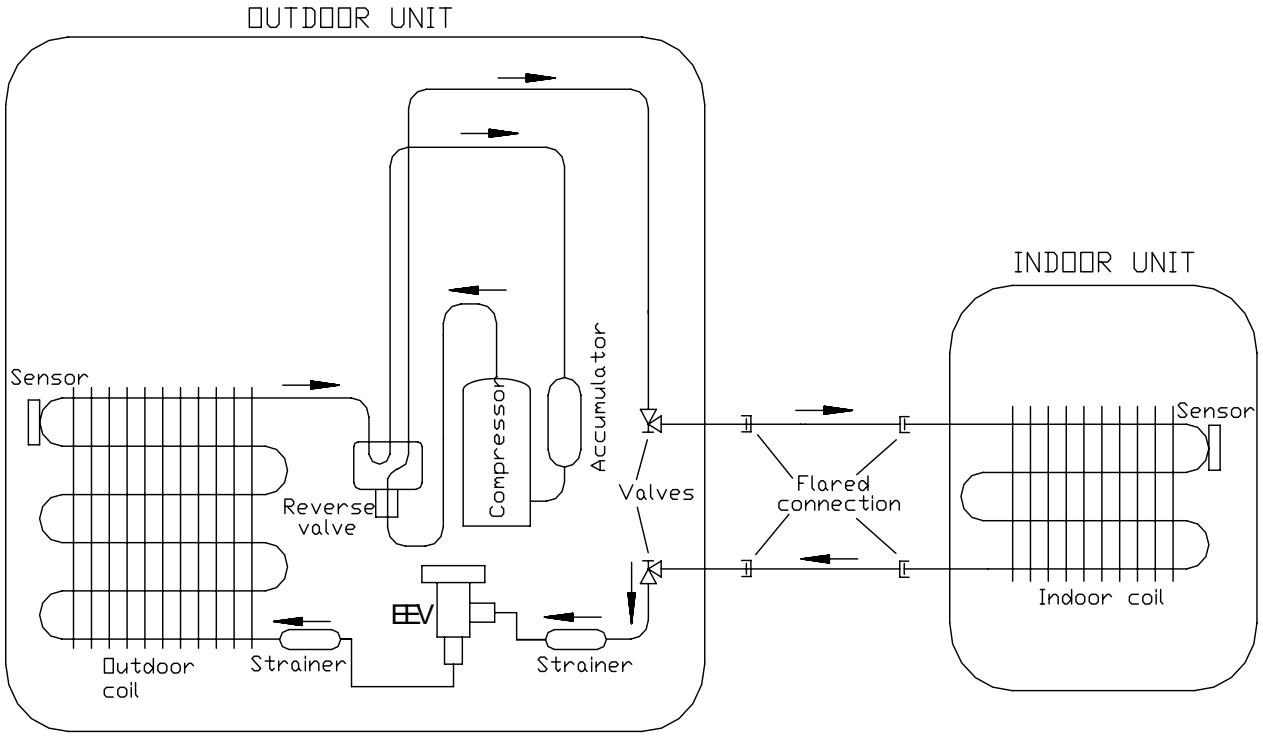
9. REFRIGERATION DIAGRAMS

9.1 PXD 25, 35, 50, 60, 72, 80 DCI

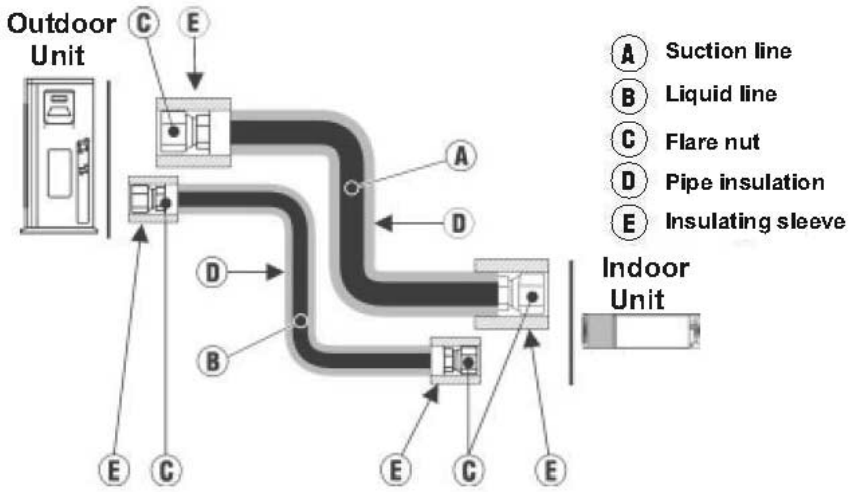
Cooling Mode

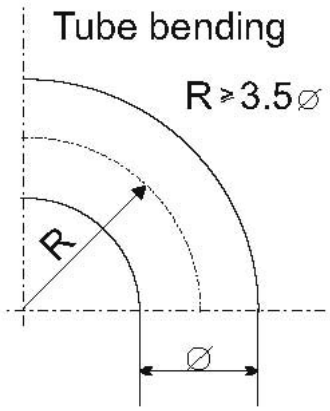


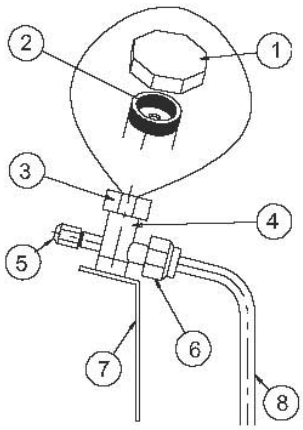
Heating Mode



10. TUBING CONNECTIONS



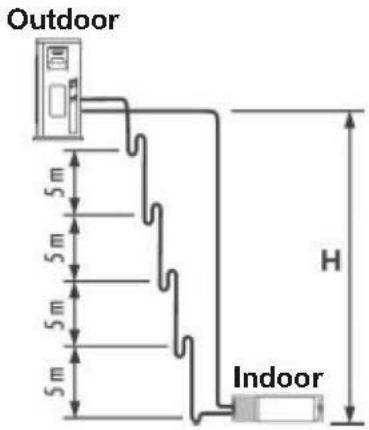




TUBE (Inch) / TORQUE (Nm)	1/4"	3/8"	1/2"	5/8"	3/4"
Flare Nuts	11-13	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

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

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



11. TROUBLESHOOTING

11.1 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!!!

11.1.1 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.

11.1.2 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.

11.1.3 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

11.1.4 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

11.1.4.1 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.

11.1.5 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

11.1.5.1 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

11.1.6 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

11.1.7 Simple procedures for checking the Main Parts

11.1.7.1 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).

11.1.7.2 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.

11.1.7.3 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

11.1.7.4 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).

11.1.7.5 Checking the Reverse Valve (RV).

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

11.1.7.6 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.

11.1.8 Precaution, Advise and Notice Items

11.1.8.1 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.

11.1.9 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.

11.1.10 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.

11.2 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!!!

11.2.1 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

11.2.2 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.

11.2.3 Diagnostics

11.2.3.1 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.

11.2.3.2 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

11.2.4 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.

11.2.4.1 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		

11.2.5 Procedures for checking Main Parts

11.2.5.1 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).

11.2.5.2 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.

11.2.5.3 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.

11.2.5.4 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.

11.2.5.5 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.

11.2.5.6 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.

11.2.5.7 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).

11.2.5.8 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**.

11.2.5.9 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.

11.2.5.10 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.

11.2.5.11 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.

11.2.6 Precaution, Advise and Notice Items

11.2.6.1 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.

11.2.6.2 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.

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

11.2.6.3 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.