



Technical Manual

DUO N Series

DUO Outdoor Models
DUO OU7 (9+9)
DUO OU7 (9+12)



REFRIGERANT
R410A

HEAT PUMP COOLING ONLY

TM DUO N A 0 GB

SEPTEMBER - 2005

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.

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*Due to constant improvements please note that the data on this service manual can be modified with out notice.

**Photos are not contractual

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REFRIGERANT	R410A
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INDOOR	ALPHA 9	ALPHA 12	WNG 9	WNG 12
	AME 20	AME 30	NXE 20	NXE 30
	WAF 9	WAF 12	FLO 9	FLO 12

1. INTRODUCTION

1.1 General

The DUO multi split R410A outdoor unit series, comprise the following ST (cooling only) and RC (heat pump) models:

- **Cooling Only** OU7 (9+9) ST, OU7 (9+12) ST, OU7 (12+12) ST
- **Heat Pump** OU7 (9+9) RC, OU7 (9+12) RC, OU7 (12+12) RC

1.2 Main Features

- R410A refrigerant
- Built in Deicing Controller.
- High COP
- Outdoor coil with hydrophilic louver fins for RC units.
- Metal sheets protected by anti - corrosion paint work allowing long life resistance.
- Compressor mounted in a soundproofed compartment
- Easy installation and service.

1.3 Tubing Connections

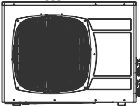
Flare type interconnecting tubing to be produced on site.

For further details please refer to APPENDIX A on this manual, and to the relevant indoor service Manual,

1.4 Inbox Documentation

Each indoor unit is supplied with its own installation and operation manuals, an additional instillation guide is provided in the DUO outdoor package.

1.5 Matching Table

OUTDOOR UNITS			INDOOR UNITS			
						
	MODEL	REFRIGERANT	WNG9	WNG12	ALPHA 9	ALPHA 12
	DUO 9+9 ST/RC	R410A	√		√	
	DUO 9+12 ST/RC	R410A	√	√	√	√
	DUO 12+12 ST/RC	R410A		√		√

2. PRODUCT DATA SHEET

Model Indoor Unit				WNG 9+9		
Model Outdoor Unit				OU7-0909		
Installation Method				Wall Mounted		
Characteristics			Units	Cooling		Heating
Capacity ⁽¹⁾			Btu/hr	19520		18315
			kW	5.72		5.37
Power Input ⁽¹⁾			kW	1.9		1.79
COP ⁽¹⁾			W/W	3.0		3.0
Power Supply			V/Ph/Hz	230/1/50+/-10%		
Rated Current			A	7.7		7.3
Starting Current			A	37.4		
Circuit Breaker Rating			A	16		
INDOOR	Fan Type & Quantity			Crossflow*1		
	Airflow ⁽²⁾	H/M/L	m³/hr	450	380	330
	External Static Pressure	Min-Max	Pa	N/A		
	Sound Power Level ⁽³⁾	H/M/L	dB (A)	44	46	49
	Sound Pressure Level ⁽⁴⁾	H/M/L	dB (A)	28	31	35
	Moisture Removal		L/hr	2*0.9		
	Condensate Drain Tube I.D.		mm	16		
	Dimensions	W/H/D	mm	810*190*285		
	Weight		kg	11		
	Package Dimensions	W/H/D	mm	945*395*655		
	Units per Pallet		Units	32		
	Stacking Height		Units	8		
OUTDOOR	Refrigerant Control			Capillary tube		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial*1		
	Fan Speeds	H/L	RPM	850		
	Airflow	H/L	m³/hr	1520		1100
	Sound Power Level	H/L	dB (A)	66.8		
	Sound Pressure Level ⁽⁴⁾	H/L	dB (A)	59		
	Dimensions	W/H/D	mm	900*680*340		
	Weight		kg	72		
	Package Dimensions	W/H/D	mm	985*730*406		
	Packaged Weight		kg	74		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R410A		
	Refrigerant Charge ST/ RC outdoor		gr	750+750 / 730+730		
	Connections Between Units	Liquid Line	In	2*6.35(1/4")		
		Suction Line	In	2*9.53(3/8")		
		Max. Tubing Length	m	15		
Max. Height Difference		m	7			
Operation Control Type				LC D REMOTE CONTROL		
Heating Elements			kW	NO		
Others						

1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.

(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.

PRODUCT DATA SHEET

Model Indoor Unit				WNG 9+12		
Model Outdoor Unit				OU7-0912		
Installation Method				Wall Mounted		
Characteristics			Units	Cooling		Heating
Capacity ⁽¹⁾			Btu/hr	20230		20910
			kW	5.93		6.13
Power Input ⁽¹⁾			kW	2.07		1.97
COP ⁽¹⁾			W/W	2.86		3.1
Power Supply			V/Ph/Hz	230/1/50		
Rated Current			A	9		8.7
Starting Current			A	43		
Circuit Breaker Rating			A	16		
INDOOR	Fan Type & Quantity			Crossflow*1		
	Airflow ⁽²⁾		H/M/L	m³/hr	450+635	380+550 330+450
	External Static Pressure		Min-Max	Pa	N/A	
	Sound Power Level ⁽³⁾		H/M/L	dB (A)	44+49	46+53 49+56
	Sound Pressure Level ⁽⁴⁾		H/M/L	dB (A)	28+35	31+39 35+43
	Moisture Removal		L/hr	0.9+1.3		
	Condensate Drain Tube I.D.		mm	16		
	Dimensions		W/H/D	mm	810*190*285	
	Weight		kg	11+11.5		
	Package Dimensions		W/H/D	mm	945*395*655	
	Units per Pallet		Units	32		
	Stacking Height		Units	8		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial*1		
	Fan Speeds		H/L	RPM	850	
	Airflow		H/L	m³/hr	1520	1100
	Sound Power Level		H/L	dB (A)	66.8	
	Sound Pressure Level ⁽⁴⁾		H/L	dB (A)	59	
	Dimensions		W/H/D	mm	900*680*340	
	Weight		kg	74		
	Package Dimensions		W/H/D	mm	985*730*406	
	Packaged Weight		kg	76		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R410A		
	Refrigerant Charge ST/ RC outdoor			gr	830+670 / 830+670	
	Connections Between Units	Liquid Line		In	2*6.35(1/4")	
		Suction Line		In	2*9.53(3/8")	
Max. Tubing Length		m	15			
Max. Height Difference		m	7			
Operation Control Type			LCD REMOTE CONTROL			
Heating Elements			kW	NO		
Others						

1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.

(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.

Model Indoor Unit				Alpha 9+9			
Model Outdoor Unit				OU7-0909			
Installation Method				Wall Mounted			
Characteristics			Units	Cooling		Heating	
Capacity ⁽¹⁾			Btu/hr	17400		18425	
			kW	5.1		5.4	
Power Input ⁽¹⁾			kW	1.84		1.86	
COP ⁽¹⁾			W/W	2.8		2.9	
Power Supply			V/Ph/Hz	230/1/50			
Rated Current			A	7.6		7.7	
Starting Current			A	37.4			
Circuit Breaker Rating			A	16			
INDOOR	Fan Type & Quantity			Crossflow*1			
	Airflow ⁽²⁾		H/M/L	m³/hr	450		
	External Static Pressure		Min-Max	Pa	N/A		
	Sound Power Level ⁽³⁾		H/M/L	dB (A)	52		
	Sound Pressure Level ⁽⁴⁾		H/M/L	dB (A)	40		
	Moisture Removal			L/hr	2*0.9		
	Condensate Drain Tube I.D.			mm	16		
	Dimensions		W/H/D	mm	680*250*180		
	Weight			kg	7		
	Package Dimensions		W/H/D	mm	770*325*265		
	Units per Pallet			Units	36		
	Stacking Height			Units	9		
OUTDOOR	Refrigerant Control				Capillary tube		
	Compressor Type, Model				Rotary		
	Fan Type & Quantity				Axial*1		
	Fan Speeds		H/L	RPM	850		
	Airflow		H/L	m³/hr	1520	1100	
	Sound Power Level		H/L	dB (A)	66.8		
	Sound Pressure Level ⁽⁴⁾		H/L	dB (A)	59		
	Dimensions		W/H/D	mm	900*680*340		
	Weight			kg	72		
	Package Dimensions		W/H/D	mm	985*730*406		
	Packaged Weight			kg	74		
	Units per Pallet			Units	6		
	Stacking Height			Units	2		
	Refrigerant Type				R410A		
	Refrigerant Charge ST/ RC outdoor			gr	750+750 / 730+730		
	Connections Between Units	Liquid Line		ln	2*6.35(1/4")		
		Suction Line		ln	2*9.53(3/8")		
		Max. Tubing Length		m	15		
		Max. Height Difference		m	7		
Operation Control Type				LC D REMOTE CONTROL			
Heating Elements			kW	NO			
Others							

1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.

(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.

PRODUCT DATA SHEET

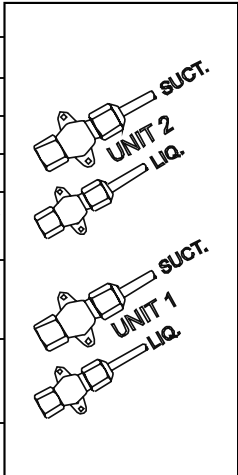
Model Indoor Unit				ALPHA 9+12		
Model Outdoor Unit				OU7-0912		
Installation Method				Wall Mounted		
Characteristics			Units	Cooling		Heating
Capacity ⁽¹⁾			Btu/hr	19815		21020
			kW	5.81		6.16
Power Input ⁽¹⁾			kW	2.06		2.09
COP ⁽¹⁾			W/W	2.82		2.94
Power Supply			V/Ph/Hz	230/1/50+/-10%		
Rated Current			A	9		9.2
Starting Current			A	43		
Circuit Breaker Rating			A	16		
INDOOR	Fan Type & Quantity			Crossflow *1		
	Airflow ⁽²⁾		H/M/L	m³/hr	600+450	450+350
	External Static Pressure		Min-Max	Pa	N/A	
	Sound Power Level ⁽³⁾		H/M/L	dB (A)	54+52	47+47
	Sound Pressure Level ⁽⁴⁾		H/M/L	dB (A)	42+40	36+36
	Moisture Removal		L/hr	0.9+1.3		
	Condensate Drain Tube I.D.		mm	16		
	Dimensions		W/H/D	mm	680*250*180/840*250*180	
	Weight		kg	7+8		
	Package Dimensions		W/H/D	mm	930*325*265/770*325*265	
	Units per Pallet		Units	36		
	Stacking Height		Units	9		
OUTDOOR	Refrigerant Control			Capillary		
	Compressor Type, Model			Rotary		
	Fan Type & Quantity			Axial*1		
	Fan Speeds		H/L	RPM	850	
	Airflow		H/L	m³/hr	1520	1100
	Sound Power Level		H/L	dB (A)	66.8	
	Sound Pressure Level ⁽⁴⁾		H/L	dB (A)	59	
	Dimensions		W/H/D	mm	900*680*340	
	Weight		kg	74		
	Package Dimensions		W/H/D	mm	985*730*406	
	Packaged Weight		kg	76		
	Units per Pallet		Units	6		
	Stacking Height		Units	2		
	Refrigerant Type			R410A		
	Refrigerant Charge ST/ RC outdoor			gr	830+670 / 830+670	
	Connections Between Units	Liquid Line		In	2*6.35(1/4")	
		Suction Line		In	2*9.53(3/8")	
		Max. Tubing Length		m	15	
		Max. Height Difference		m	7	
Operation Control Type				LCD REMOTE CONTROL		
Heating Elements			kW	NO		
Others						

- 1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
- 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.

2.1 Capacity & Additional Charge Table

2.1.1 DUO 9+9 RC Additional Refrigerant Charge Table (as show on unit).

2.1.2 DUO 9+9 ST Additional Refrigerant Charge Table (as show on unit).

CAPACITY AND ADDITIONAL CHARGE FOR VARIOUS APPLICATIONS					
INDOOR	UNIT 1	UNIT 2	UNIT 1	UNIT 2	
	ALPHA 9	ALPHA 9	WNG 9	WNG 9	
	AME 20	AME 20	NXE 20	NXE 20	
	WAF 9	WAF 9	FLO 9	FLO 9	
COOLING CAPACITY*	17400 Btu/h, 5100W		19520 Btu/h, 5720W		
ADDITIONAL CHARGE (gr)					
	7.5m-15m				
* For two units operating simultaneously. REFRIGERANT R410A					
Cat.No.433945/01					

2.1.3 DUO 9+12 RC Additional Refrigerant Charge Lable (as show on unit).

CAPACITY AND ADDITIONAL CHARGE FOR VARIOUS APPLICATIONS					
INDOOR		UNIT 1	UNIT 2	UNIT 1	UNIT 2
		ALPHA 12	ALPHA 9	WNG 12	WNG 9
		WAF 12	WAF 9	FLO 12	FLO 9
		MAE 30	MAE 20	NXE 30	NXE 20
COOLING CAPACITY*		19815 Btu/h, 5810W		20230 Btu/h, 5930W	
HEATING CAPACITY*		21020 Btu/h, 6160W		20910 Btu/h, 6130W	
ADDITIONAL CHARGE (gr)	Up to 7.5m	0	0	50	50
	7.5m-15m	50	50	100	100

* For two units operating simultaneously.

REFRIGERANT **R410A**

Cat.No.433944/01

2.1.4 DUO 9+12 ST Additional Refrigerant Charge Lable (as show on unit).

CAPACITY AND ADDITIONAL CHARGE FOR VARIOUS APPLICATIONS					
INDOOR		UNIT 1	UNIT 2	UNIT 1	UNIT 2
		ALPHA 12	ALPHA 9	WNG 12	WNG 9
		AME 30	AME 20	NXE 30	NXE 20
COOLING CAPACITY*		19815 Btu/h, 5810W		20230 Btu/h, 5930W	
ADDITIONAL CHARGE (gr)	Up to 7.5m	0	0	90	80
	7.5m-15m	100	100	190	180

* For two units operating simultaneously.

REFRIGERANT **R410A**

Cat.No.433946/01

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

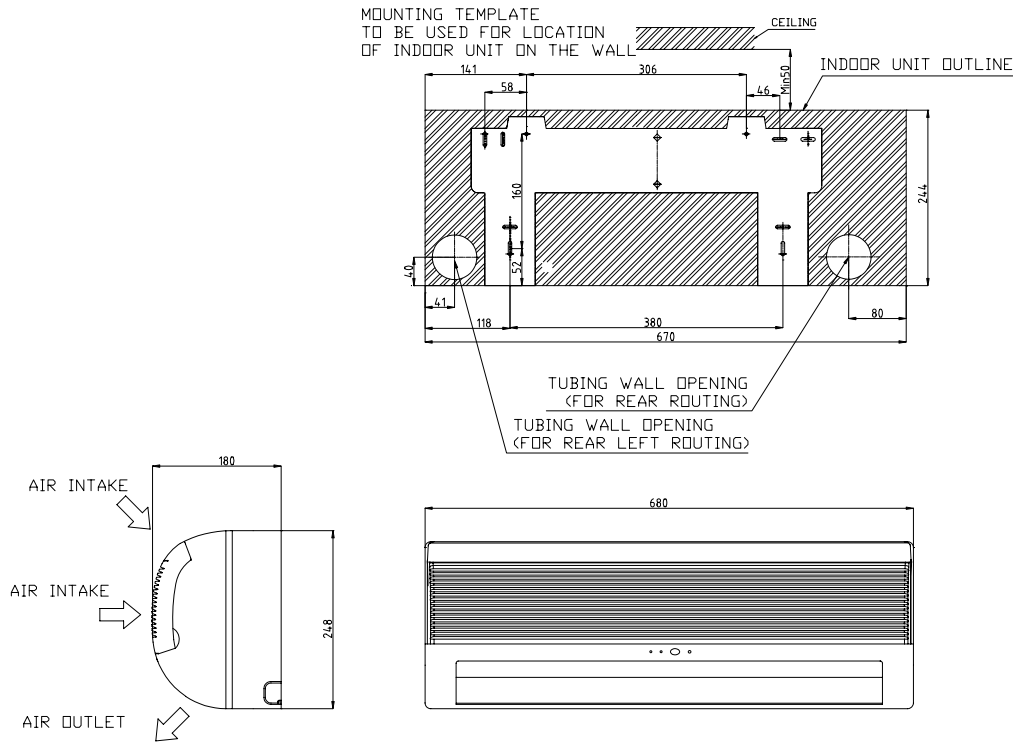
Outdoor: 7°C DB 6°C WB

3.1 Operating Limits

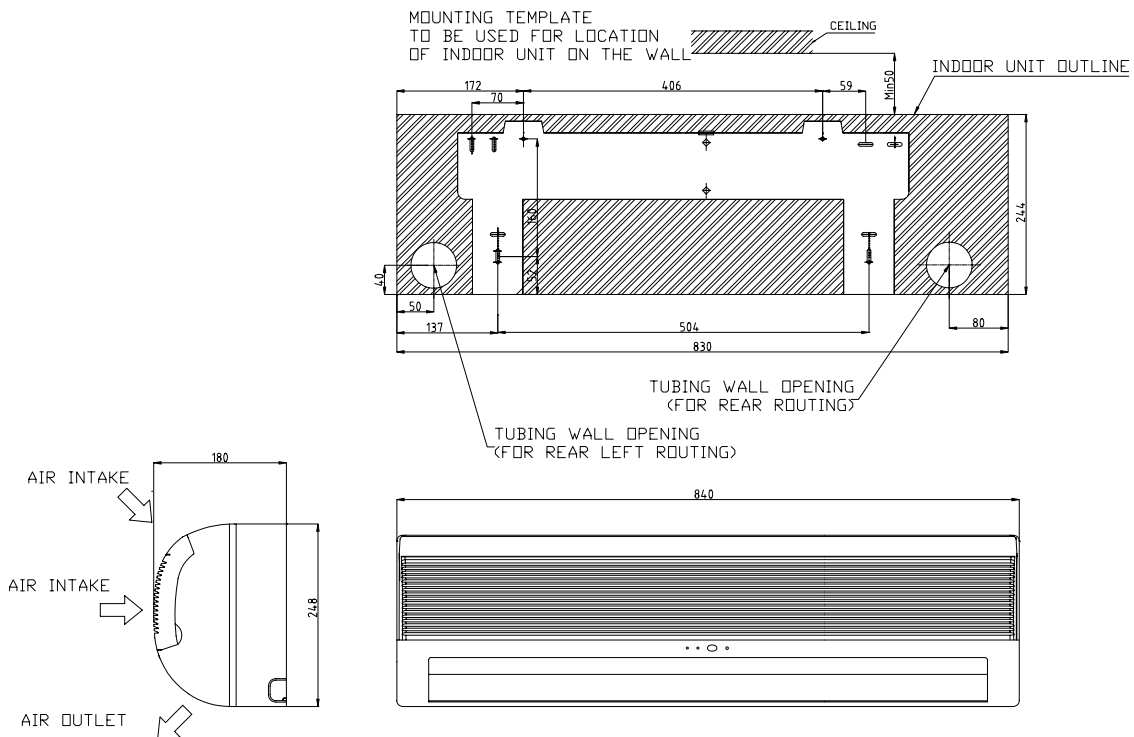
		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	21°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	20°C DB	-9°C DB -10°C WB
Voltage	1PH	198 – 264 V	
	3PH	360 – 440 V	

4. OUTLINE DIMENSIONS

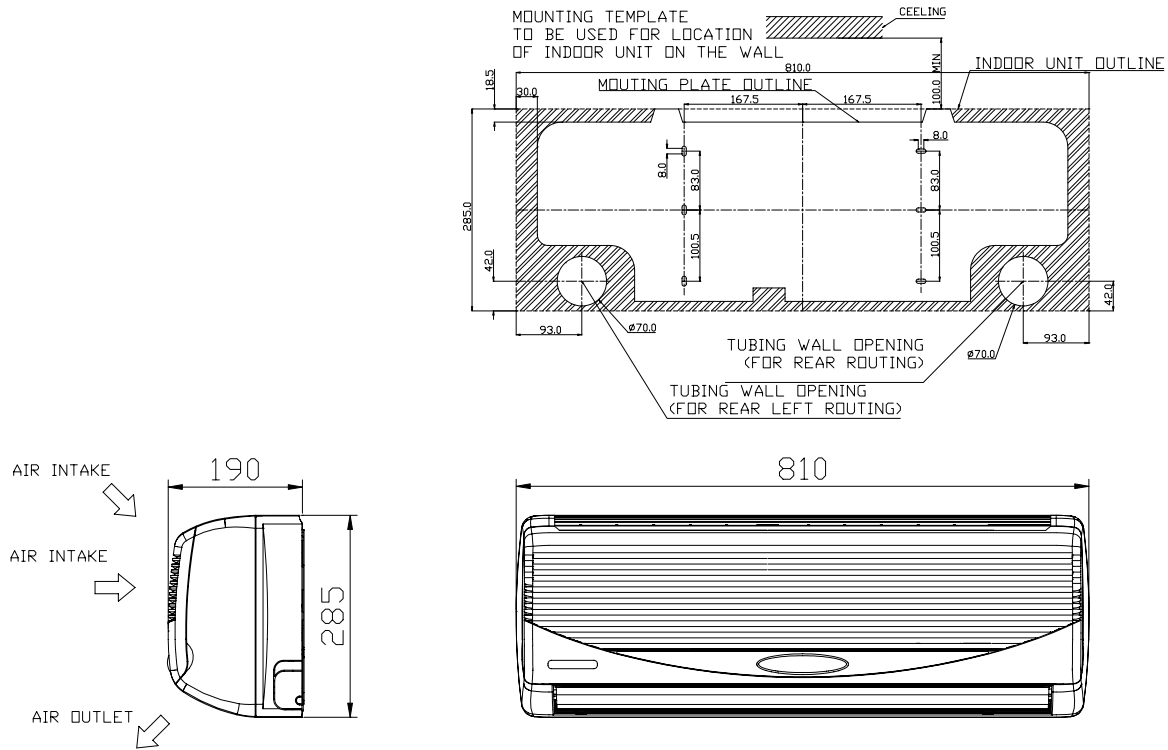
4.1 Indoor Unit: Alpha 9



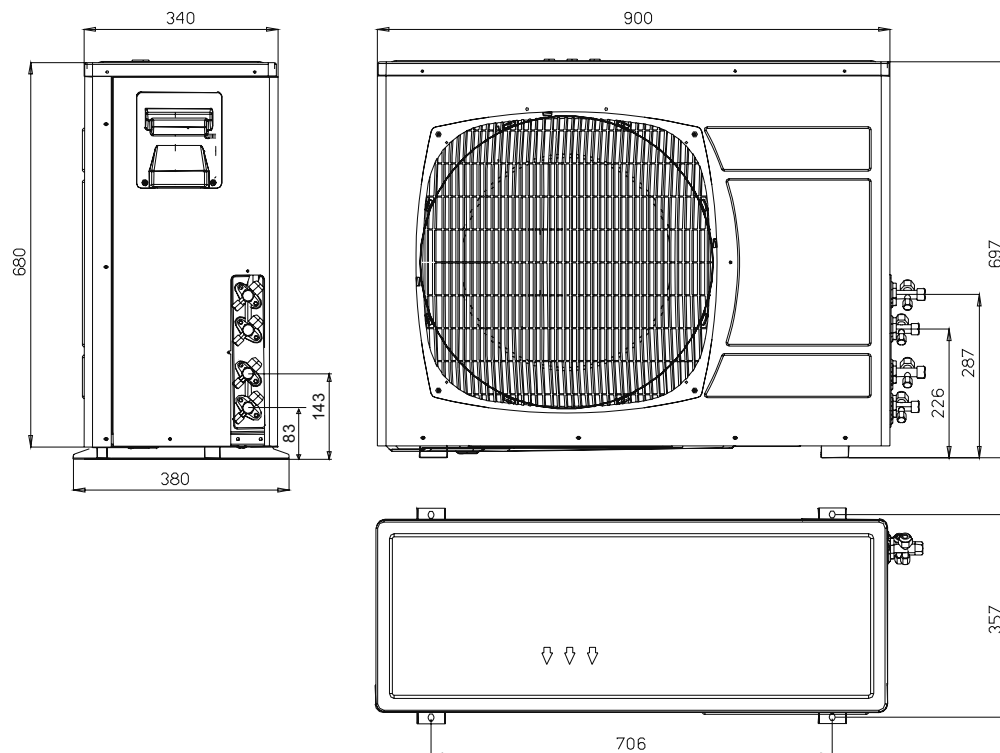
4.2 Indoor Unit: Alpha 12



4.3 Indoor Unit: WNG 9, 12



4.2 Outdoor Unit: DUO OU7



5. PERFORMANCE DATA

5.1 DUO ALPHA (9+9):Room A + Room B

5.1.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	5.38	5.57	5.70	5.83	5.92
	SC	3.65	3.81	3.96	4.06	4.13
	PI	1.30	1.31	1.31	1.31	1.32
20 ⁽¹⁾	TC	5.20	5.48	5.65	5.79	5.91
	SC	3.58	3.77	3.93	4.05	4.12
	PI	1.42	1.42	1.43	1.43	1.44
25	TC	4.92	5.31	5.59	5.75	5.90
	SC	3.49	3.70	3.90	4.02	4.09
	PI	1.53	1.54	1.55	1.56	1.57
30	TC	4.60	5.01	5.41	5.61	5.77
	SC	3.38	3.59	3.82	3.93	4.00
	PI	1.65	1.68	1.69	1.70	1.72
35	TC	4.26	4.62	5.10	5.36	5.61
	SC	3.21	3.44	3.73	3.84	3.91
	PI	1.78	1.81	1.84	1.85	1.86
40	TC	3.87	4.22	4.60	5.03	5.29
	SC	3.03	3.26	3.53	3.64	3.72
	PI	1.92	1.95	1.98	2.01	2.03
46	TC	3.36	3.68	4.04	4.47	4.81
	SC	2.79	2.99	3.22	3.33	3.40
	PI	2.10	2.13	2.18	2.21	2.23

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 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.12	1.49	3.00	1.58	2.88	1.66
-7	3.36	1.53	3.24	1.61	3.12	1.70
-2	3.56	1.54	3.45	1.64	3.33	1.73
2	4.34	1.62	4.16	1.72	3.98	1.82
6	5.56	1.74	5.40	1.86	5.21	1.98
10	6.05	1.84	5.89	1.96	5.72	2.10
15	6.53	1.92	6.37	2.06	6.21	2.19
20	6.89	1.97	6.72	2.14	6.53	2.31

* the above chart includes the weighted deicing influence.

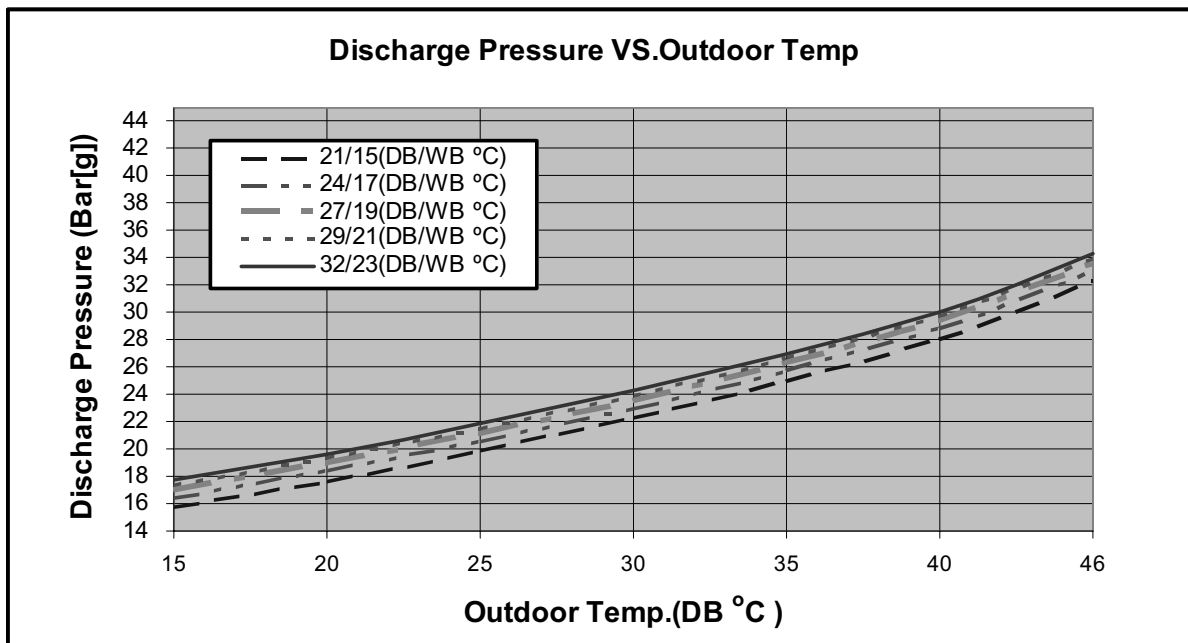
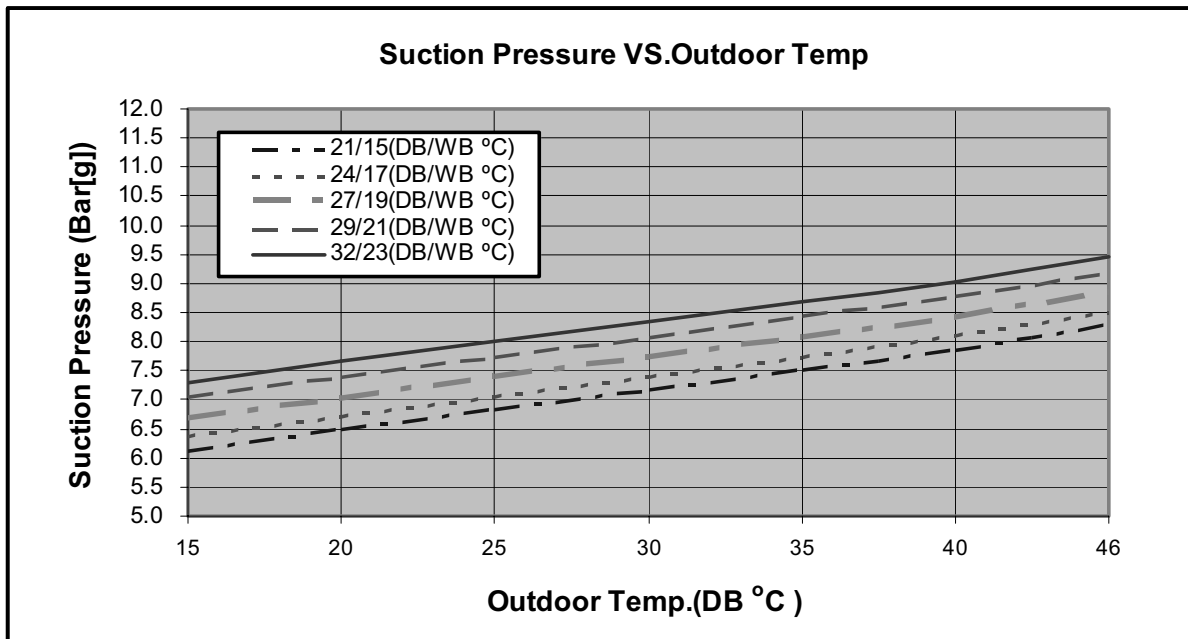
LEGEND

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

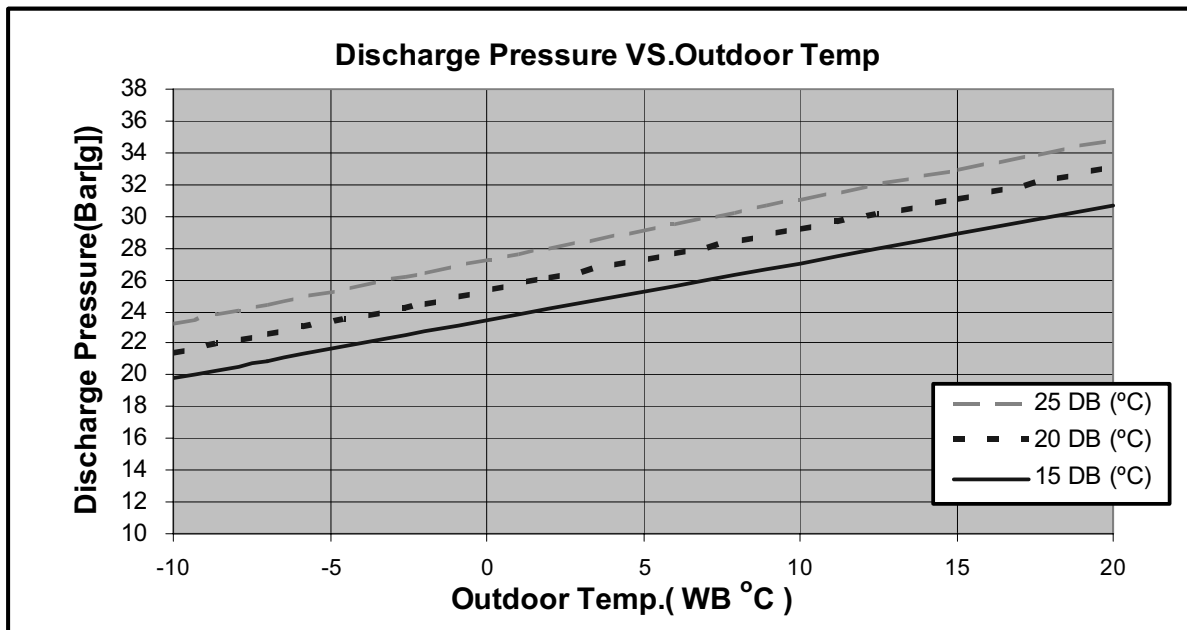
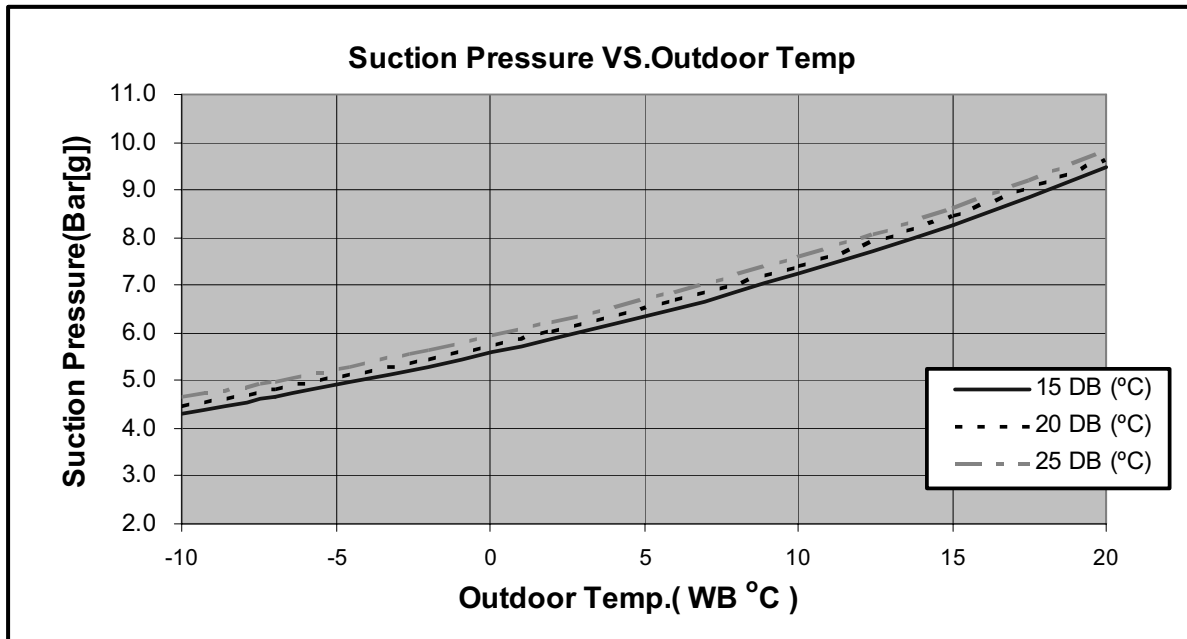
5.2 Pressure Curves.

5.2.1 ALPHA 9

5.2.2 Cooling.



5.2.3 Heating.



5.3 DUO ALPHA (9+12):Room A + Room B

5.3.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	6.12	6.34	6.49	6.65	6.75
	SC	4.10	4.28	4.45	4.56	4.64
	PI	1.46	1.46	1.47	1.47	1.48
20 ⁽¹⁾	TC	5.92	6.24	6.44	6.59	6.74
	SC	4.02	4.24	4.42	4.54	4.63
	PI	1.59	1.59	1.60	1.60	1.61
25	TC	5.61	6.05	6.36	6.56	6.72
	SC	3.92	4.16	4.39	4.51	4.59
	PI	1.71	1.73	1.74	1.75	1.76
30	TC	5.24	5.71	6.17	6.39	6.58
	SC	3.80	4.03	4.29	4.41	4.50
	PI	1.85	1.88	1.89	1.91	1.92
35	TC	4.85	5.27	5.81	6.10	6.39
	SC	3.61	3.87	4.19	4.31	4.40
	PI	1.99	2.03	2.06	2.08	2.09
40	TC	4.41	4.81	5.24	5.73	6.03
	SC	3.40	3.66	3.96	4.09	4.17
	PI	2.15	2.18	2.22	2.25	2.27
46	TC	3.83	4.19	4.60	5.09	5.48
	SC	3.13	3.36	3.61	3.74	3.82
	PI	2.35	2.38	2.44	2.47	2.50

LEGEND

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

5.3.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.56	1.67	3.42	1.78	3.29	1.87
-7	3.83	1.71	3.69	1.81	3.56	1.91
-2	4.07	1.73	3.93	1.84	3.79	1.94
2	4.95	1.82	4.74	1.93	4.54	2.05
6	6.34	1.95	6.16	2.09	5.94	2.22
10	6.90	2.06	6.71	2.20	6.53	2.36
15	7.45	2.15	7.27	2.32	7.08	2.47
20	7.85	2.22	7.67	2.40	7.45	2.59

* the above chart includes the weighted deicing influence.

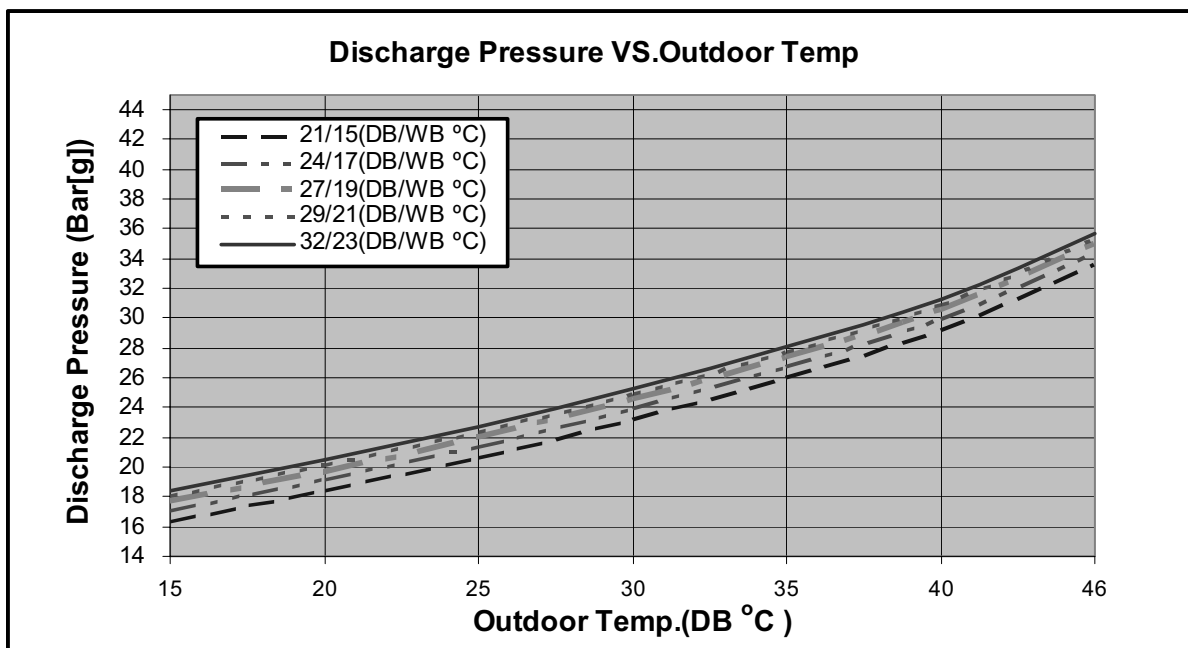
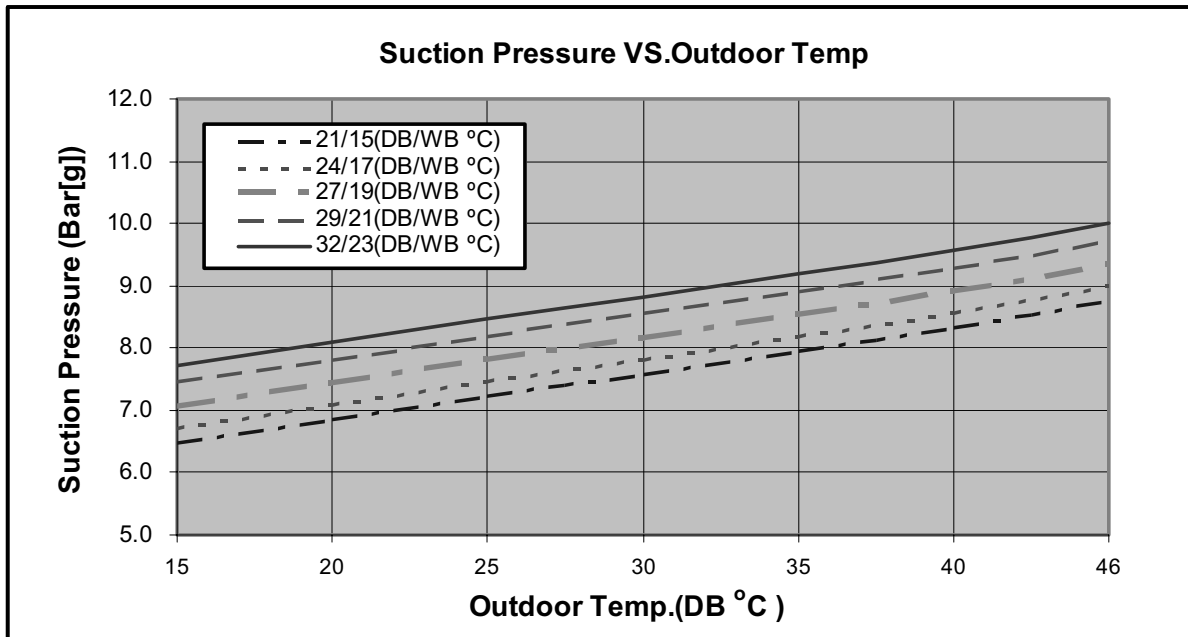
LEGEND

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

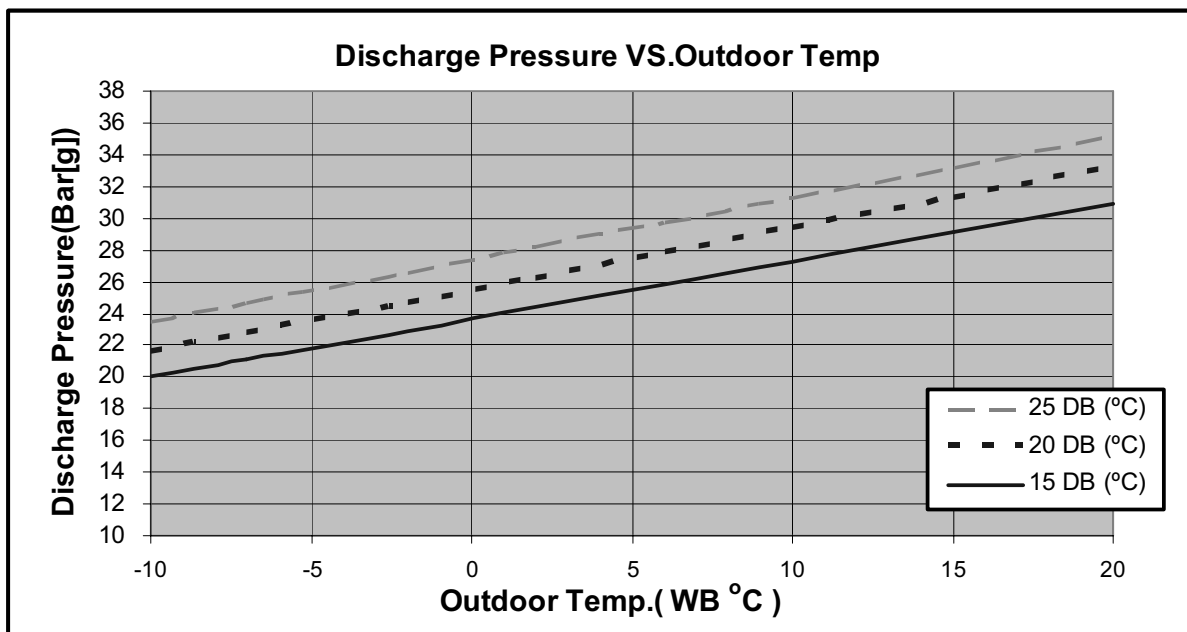
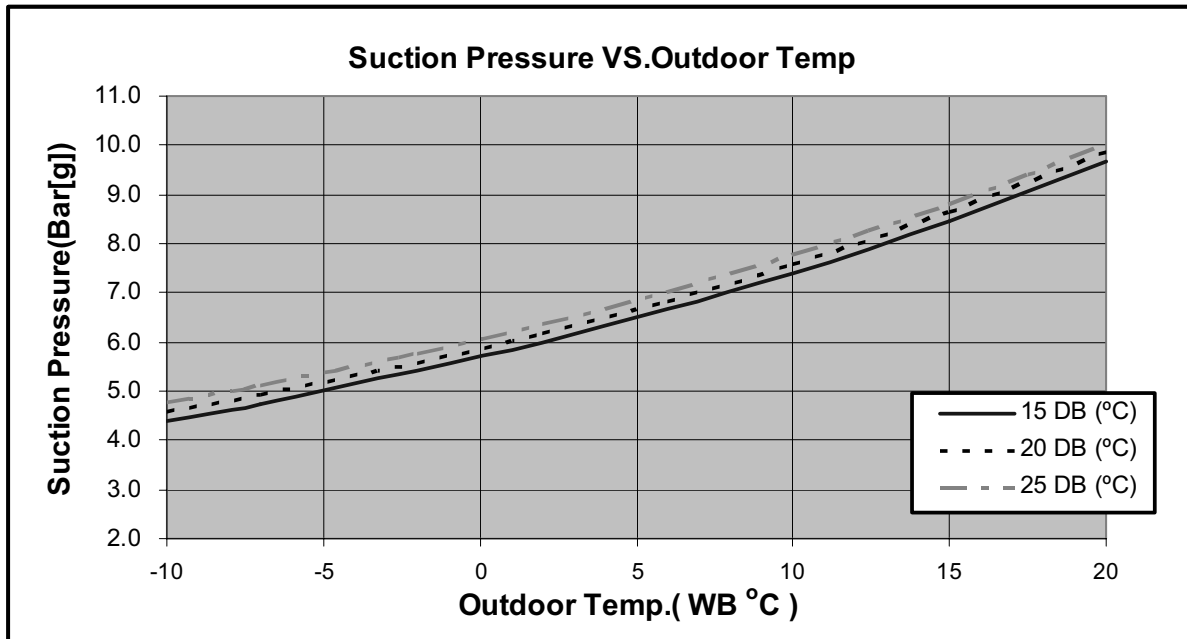
5.4 Pressure Curves.

5.4.1 ALPHA 9

5.4.2 Cooling.

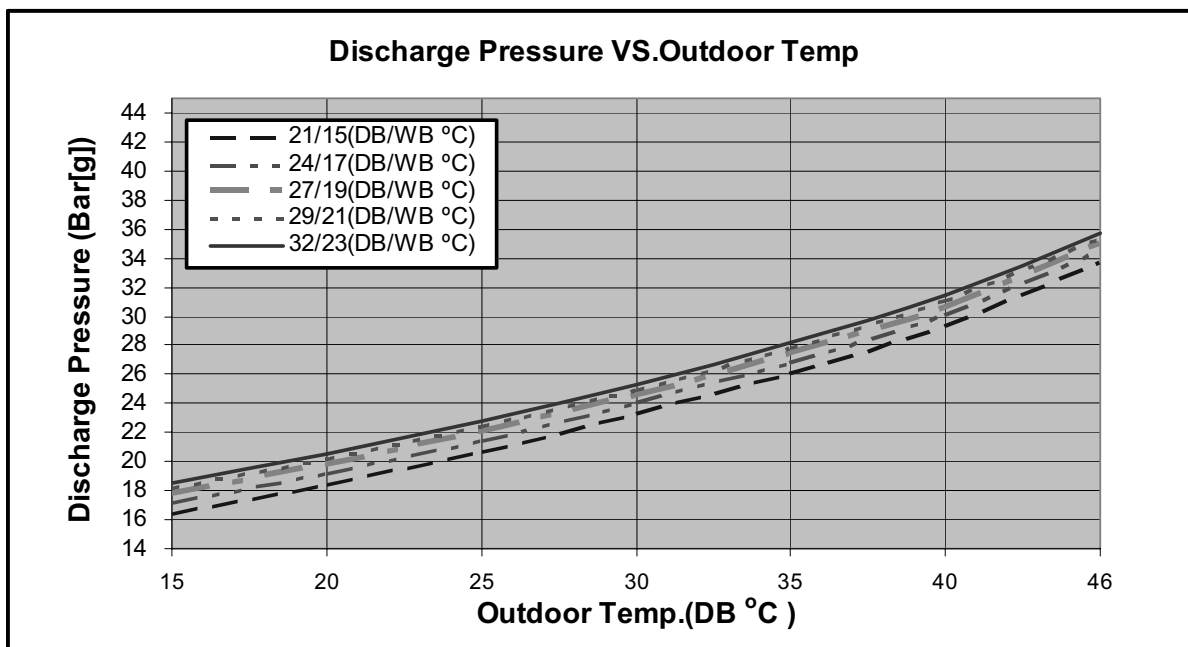
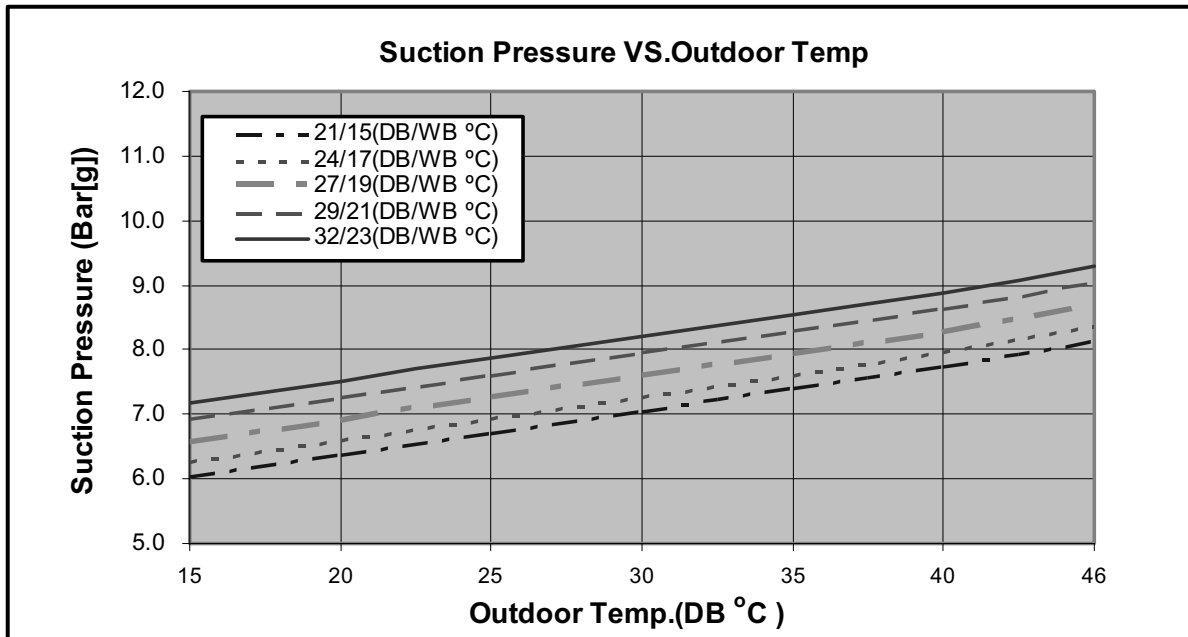


5.4.3 Heating.

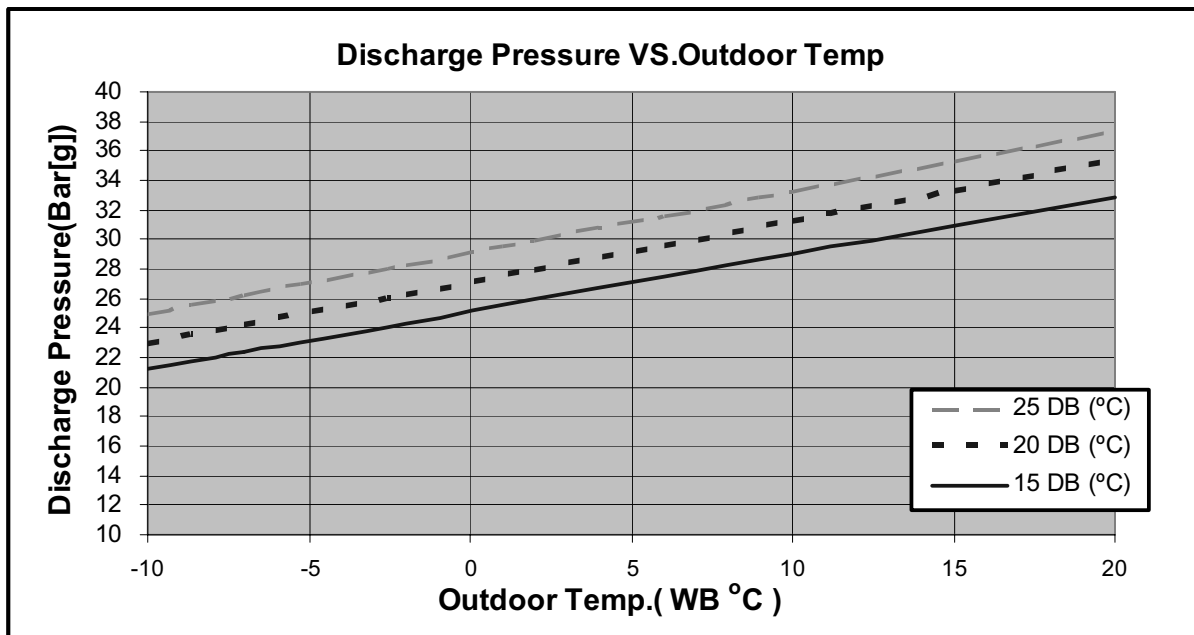
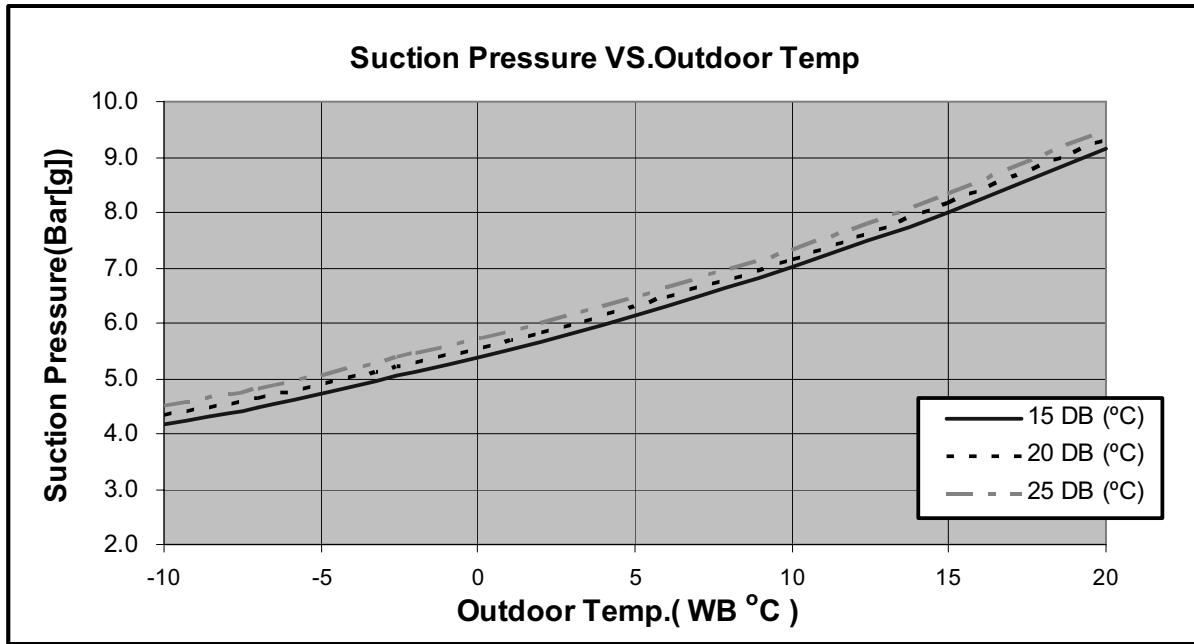


5.4.4 ALPHA 12

5.4.5 Cooling.



5.4.6 Heating.



5.5 DUO WNG (9+9):Room A + Room B

5.5.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	6.03	6.24	6.39	6.54	6.64
	SC	4.18	4.36	4.53	4.64	4.73
	PI	1.35	1.35	1.35	1.36	1.36
20 ⁽¹⁾	TC	5.83	6.15	6.34	6.49	6.63
	SC	4.10	4.32	4.50	4.63	4.72
	PI	1.46	1.47	1.47	1.48	1.48
25	TC	5.52	5.96	6.27	6.45	6.61
	SC	3.99	4.24	4.47	4.60	4.68
	PI	1.58	1.59	1.60	1.61	1.62
30	TC	5.16	5.62	6.07	6.29	6.47
	SC	3.87	4.11	4.37	4.50	4.58
	PI	1.70	1.73	1.74	1.76	1.77
35	TC	4.78	5.19	5.72	6.01	6.29
	SC	3.68	3.94	4.27	4.39	4.48
	PI	1.84	1.87	1.90	1.91	1.93
40	TC	4.35	4.73	5.16	5.64	5.93
	SC	3.47	3.73	4.04	4.17	4.25
	PI	1.98	2.01	2.05	2.07	2.09
46	TC	3.77	4.12	4.53	5.01	5.40
	SC	3.19	3.42	3.68	3.81	3.90
	PI	2.17	2.20	2.25	2.28	2.31

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

5.5.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.10	1.43	2.98	1.53	2.86	1.60
-7	3.34	1.47	3.22	1.55	3.10	1.63
-2	3.54	1.49	3.43	1.58	3.31	1.66
2	4.31	1.56	4.13	1.66	3.96	1.75
6	5.53	1.67	5.37	1.79	5.18	1.90
10	6.01	1.77	5.85	1.89	5.69	2.02
15	6.50	1.84	6.34	1.99	6.18	2.11
20	6.85	1.90	6.69	2.06	6.50	2.22

* the above chart includes the weighted deicing influence.

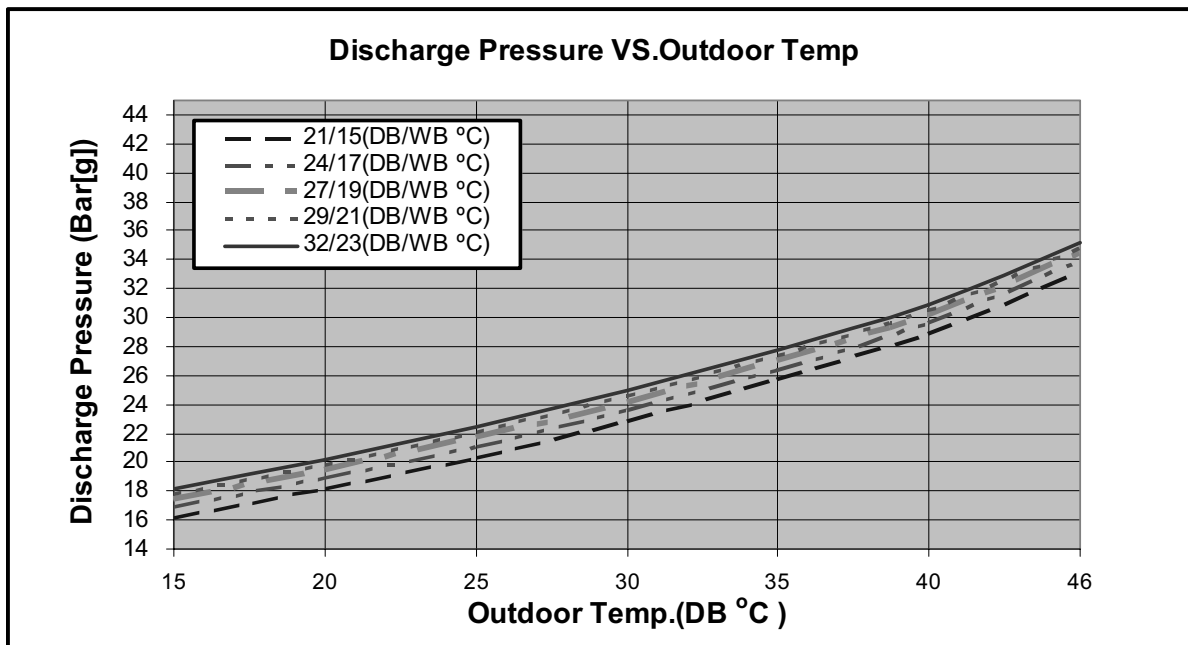
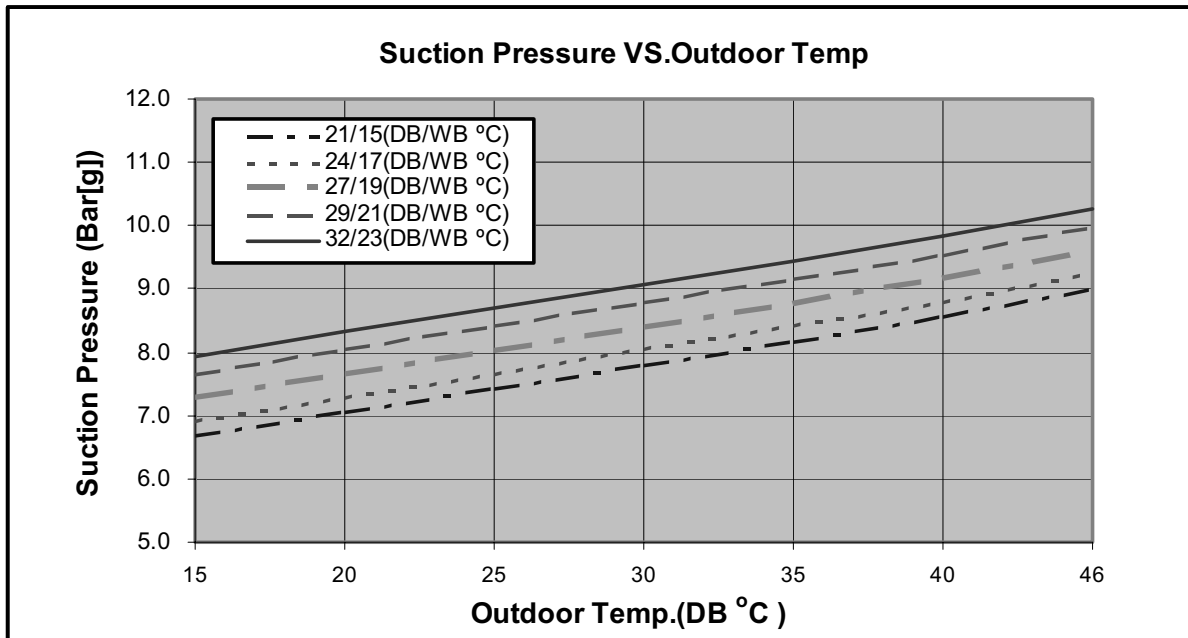
LEGEND

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

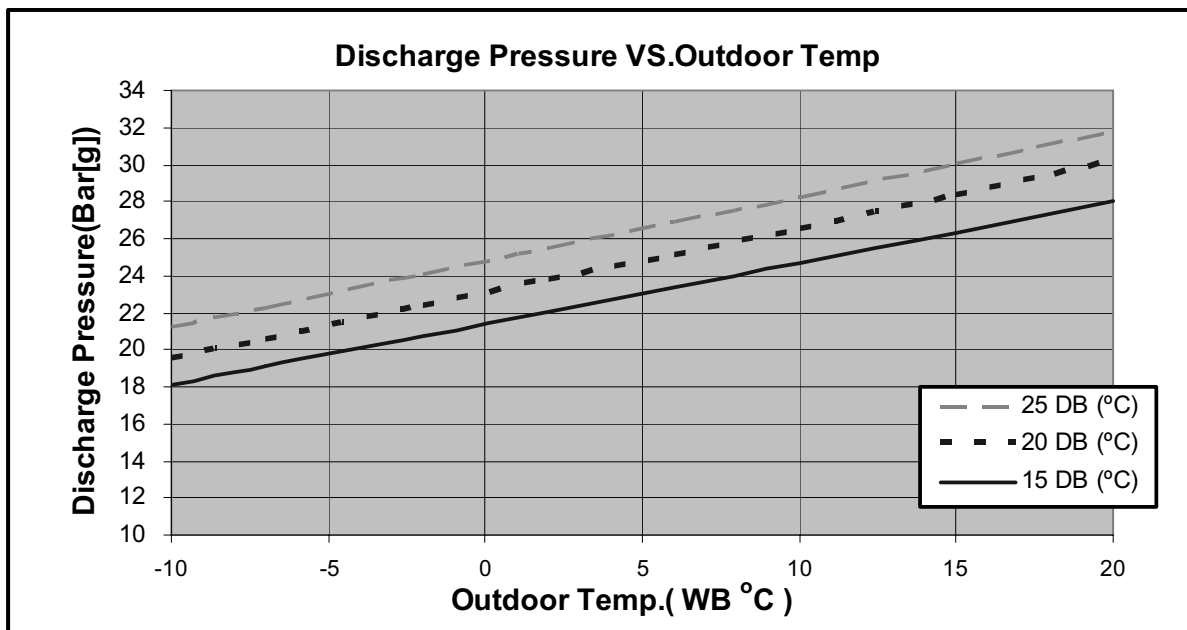
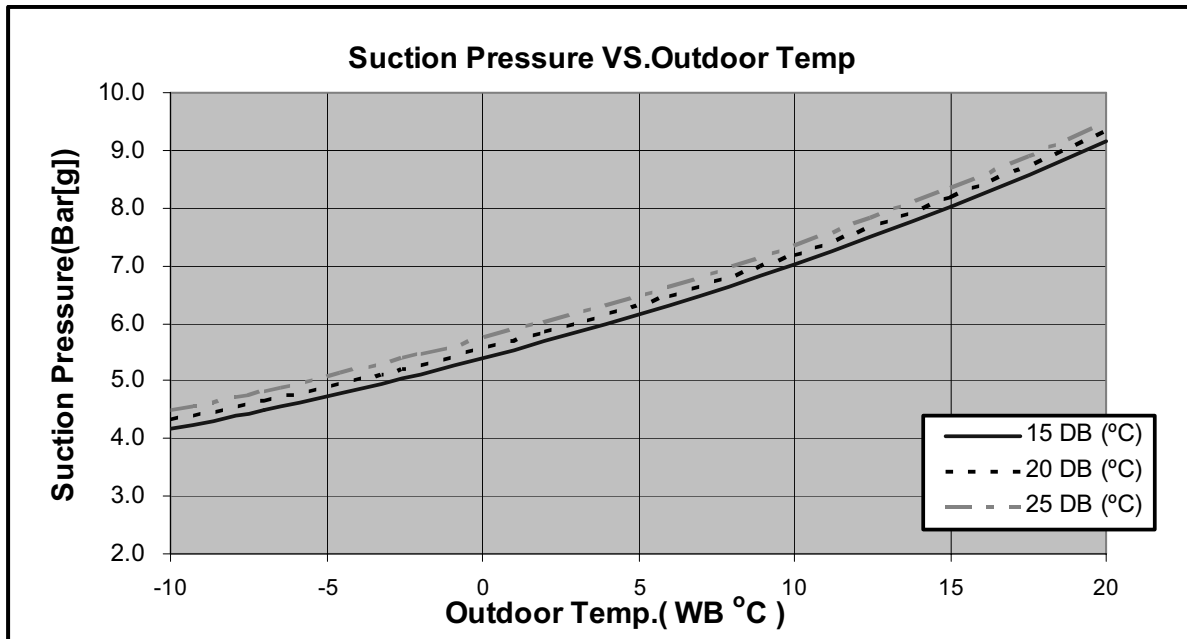
5.6 Pressure Curves.

5.6.1 WNG 9

5.6.2 Cooling.



5.6.3 Heating.



5.7 DUO WNG (9+12): Room A + Room B

5.7.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OU COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	6.25	6.47	6.63	6.78	6.89
	SC	4.58	4.78	4.97	5.09	5.18
	PI	1.47	1.47	1.47	1.48	1.48
20 ⁽¹⁾	TC	6.05	6.37	6.58	6.73	6.88
	SC	4.49	4.74	4.94	5.08	5.17
	PI	1.59	1.60	1.60	1.61	1.62
25	TC	5.72	6.18	6.50	6.69	6.85
	SC	4.38	4.64	4.90	5.04	5.13
	PI	1.72	1.73	1.75	1.76	1.77
30	TC	5.35	5.83	6.29	6.52	6.71
	SC	4.24	4.51	4.79	4.93	5.02
	PI	1.86	1.88	1.90	1.92	1.93
35	TC	4.95	5.38	5.93	6.23	6.52
	SC	4.03	4.32	4.68	4.82	4.91
	PI	2.00	2.04	2.07	2.09	2.10
40	TC	4.50	4.90	5.35	5.85	6.15
	SC	3.80	4.09	4.43	4.57	4.66
	PI	2.16	2.19	2.23	2.26	2.28
46	TC	3.91	4.27	4.70	5.19	5.59
	SC	3.50	3.75	4.04	4.18	4.27
	PI	2.36	2.40	2.45	2.49	2.51

LEGEND

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

5.7.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	3.54	1.58	3.41	1.68	3.27	1.76
-7	3.81	1.62	3.67	1.70	3.54	1.80
-2	4.05	1.64	3.91	1.73	3.78	1.83
2	4.92	1.71	4.72	1.82	4.52	1.93
6	6.31	1.84	6.13	1.97	5.92	2.09
10	6.87	1.94	6.68	2.08	6.50	2.22
15	7.42	2.03	7.23	2.19	7.05	2.32
20	7.82	2.09	7.63	2.27	7.42	2.44

* the above chart includes the weighted deicing influence.

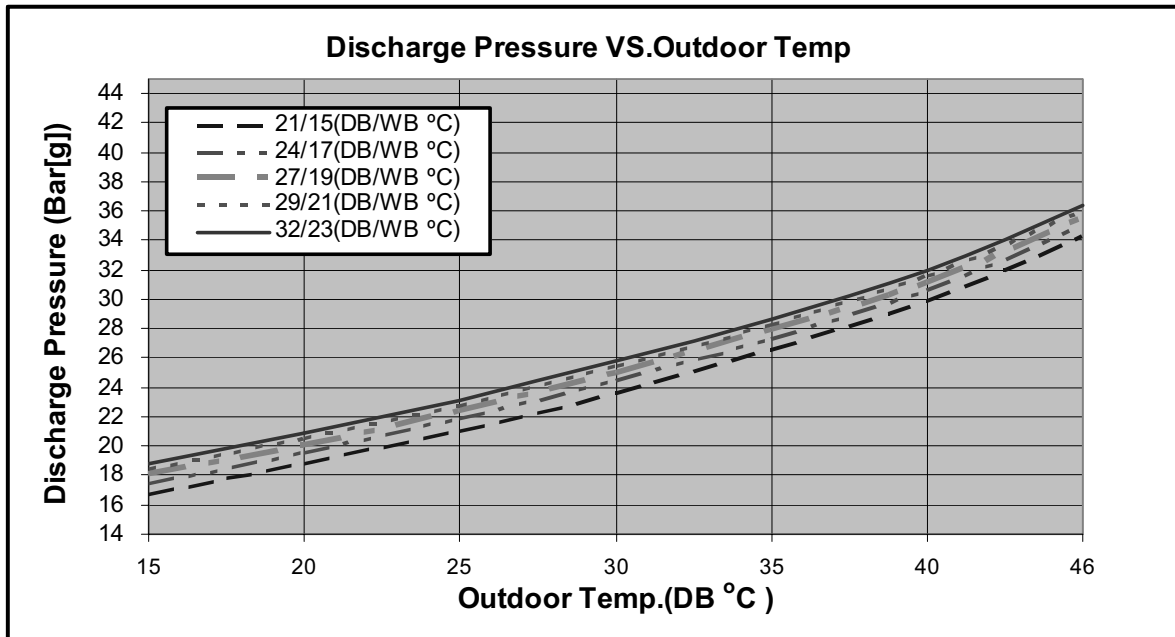
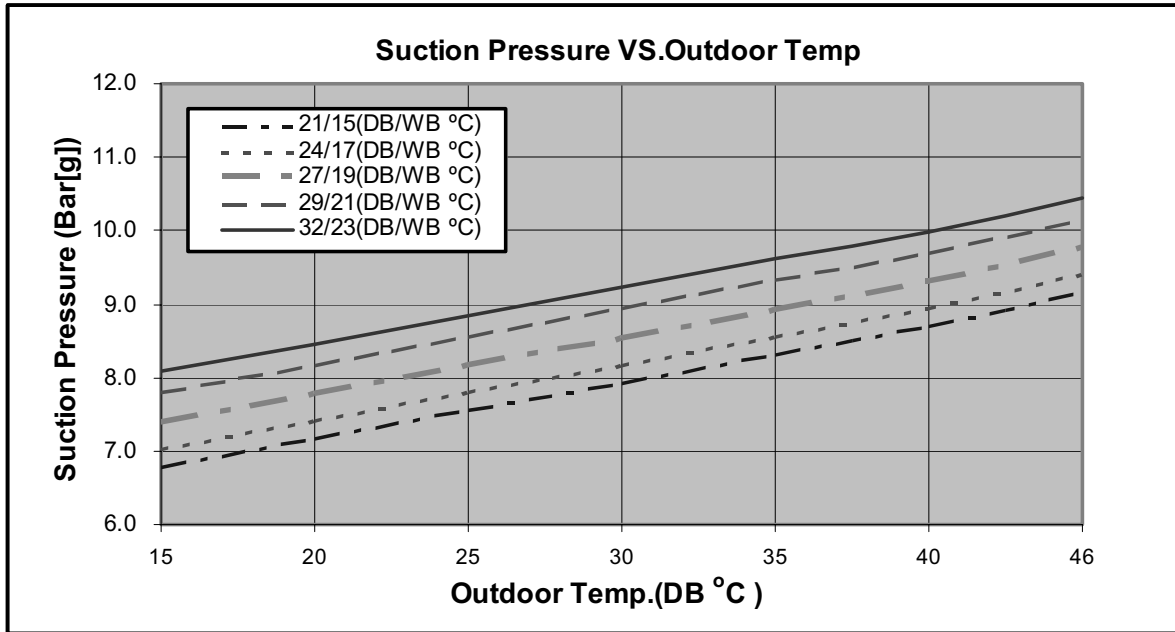
LEGEND

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

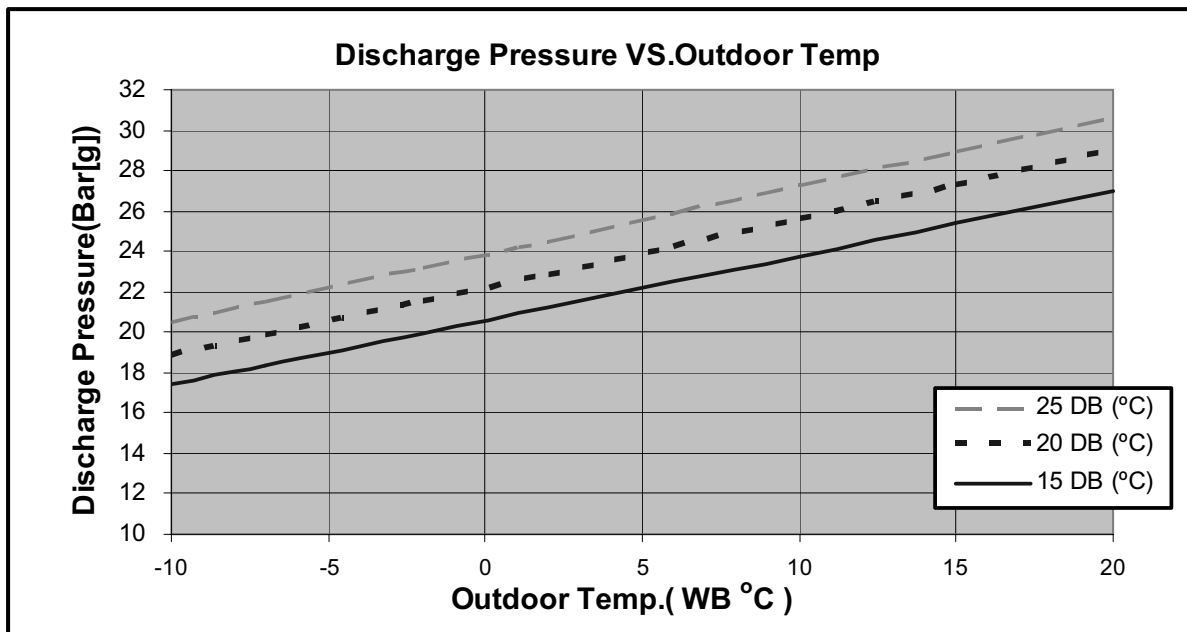
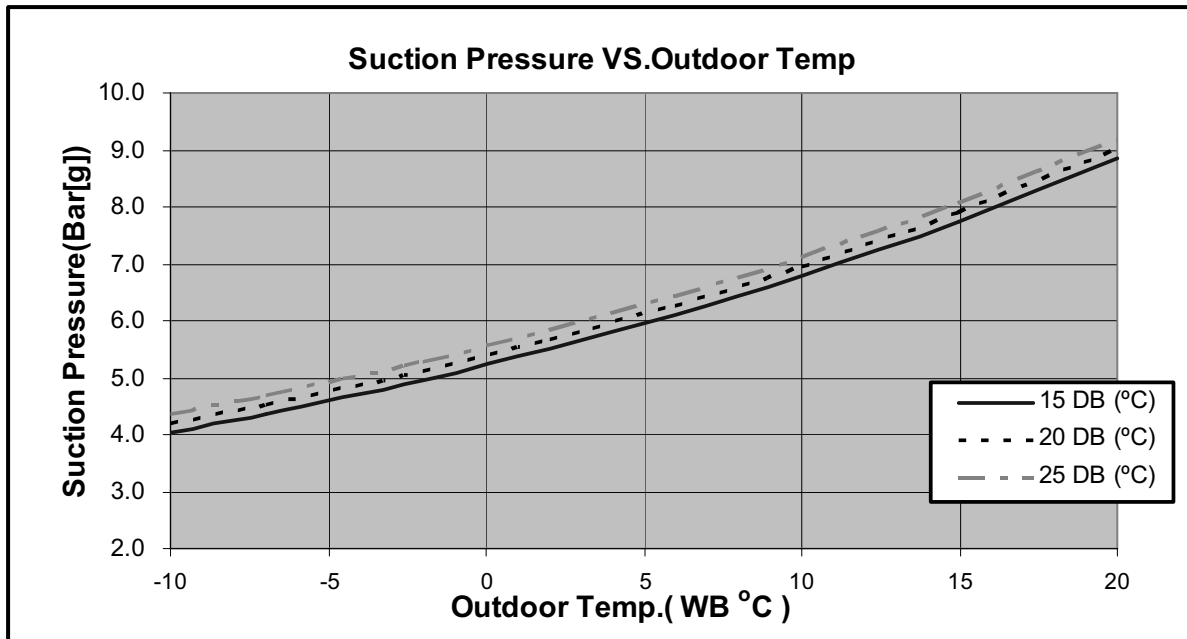
5.8 Pressure Curves.

5.8.1 WNG 9

5.8.2 Cooling.

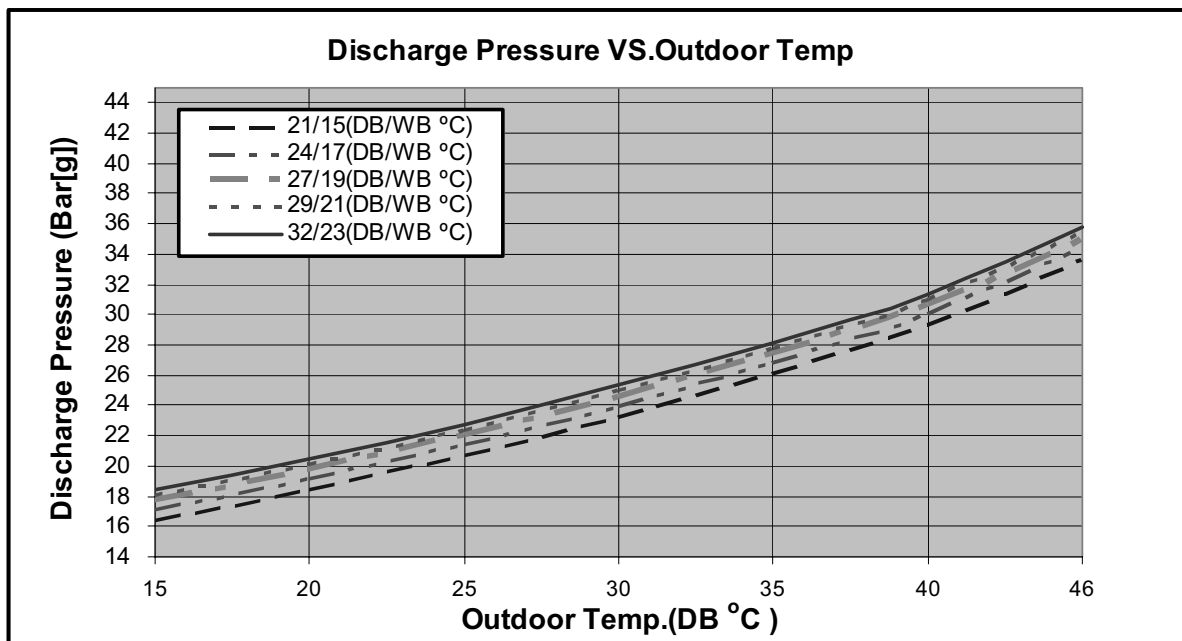
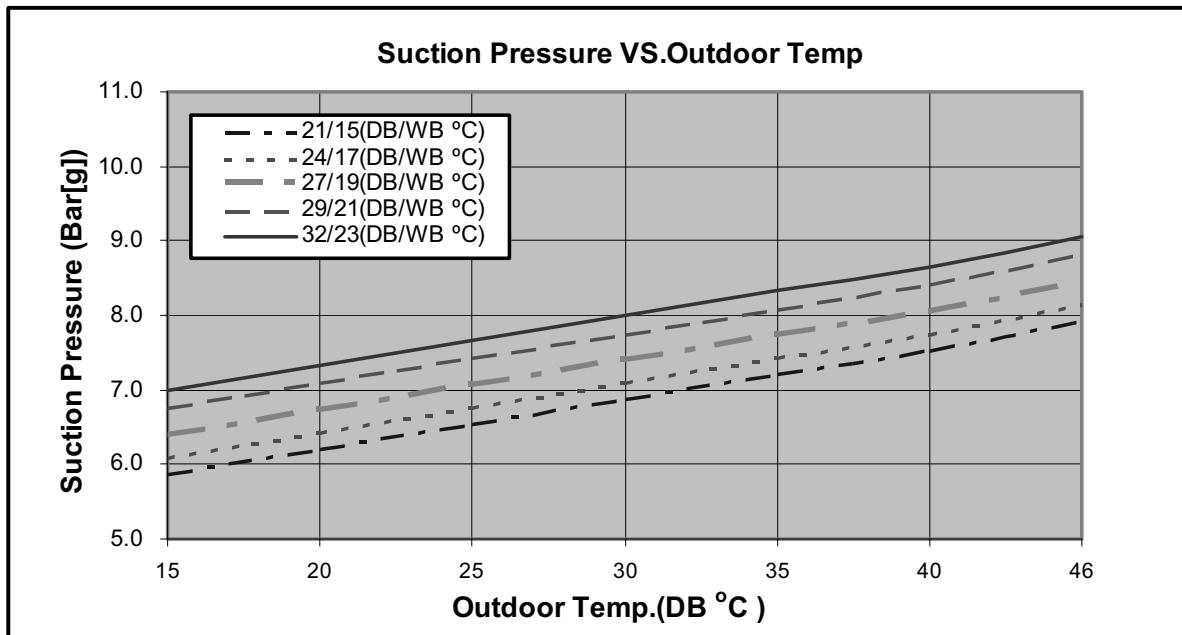


5.8.3 Heating.

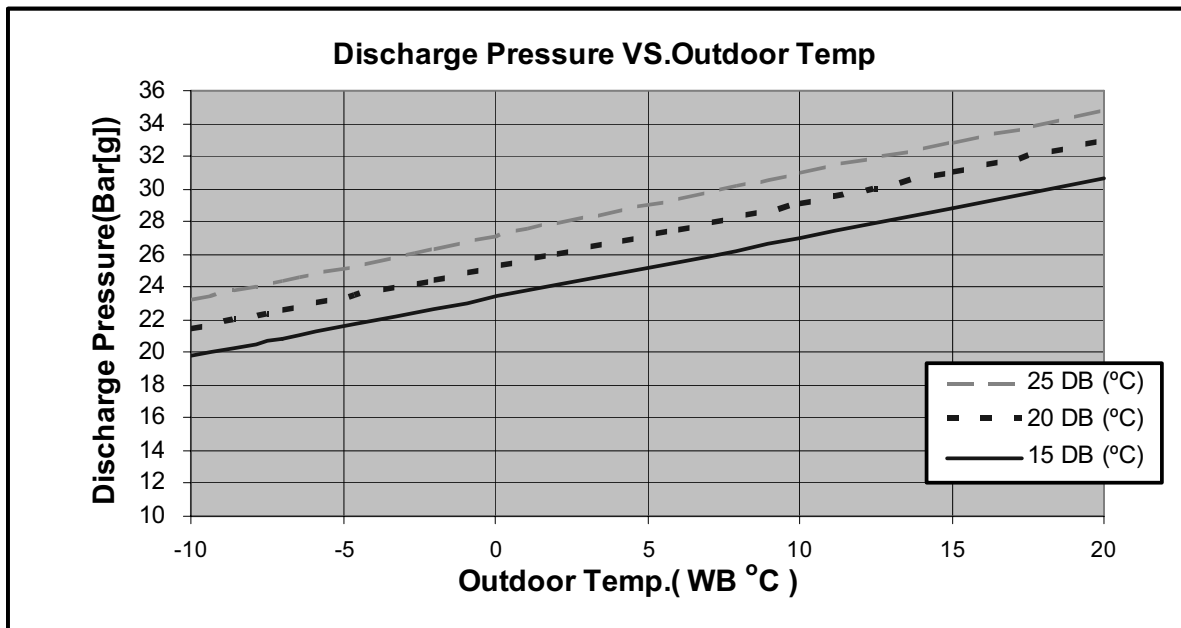
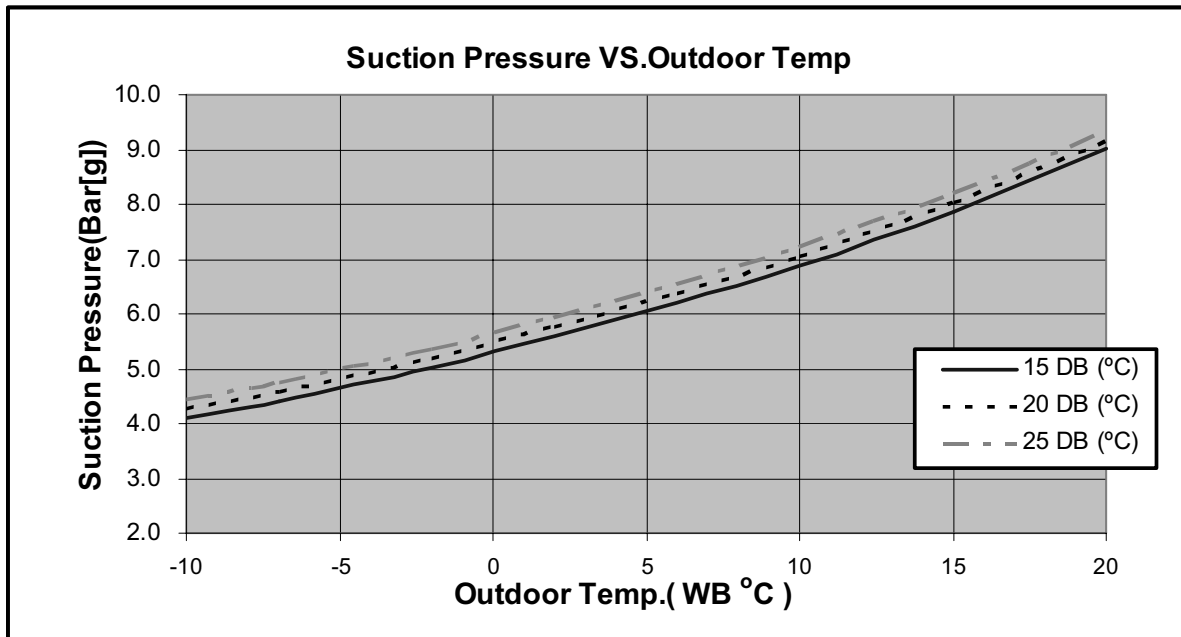


5.8.4 WNG 12

5.8.5 Cooling.



5.8.6 Heating.



5.9 Capacity Correction Factor Due to Tubing Length

5.9.1 DUO (9+9),(9+12)

5.9.2 Cooling

TOTAL TUBING LENGTH								
3m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	1	---	---	---	---	---

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

5.9.3 Heating

TOTAL TUBING LENGTH								
3m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.92	0.85	---	---	---	---	---

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

6. SOUND LEVEL CHARACTERISTICS

6.1 Outdoor Units

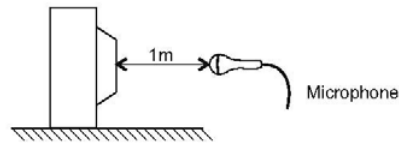
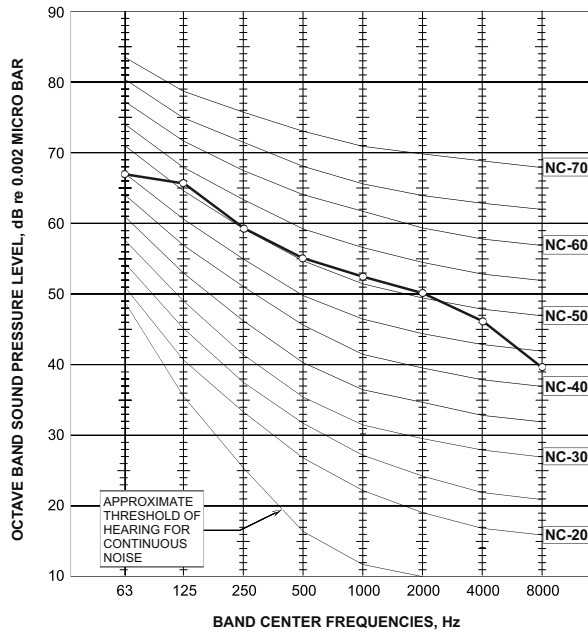


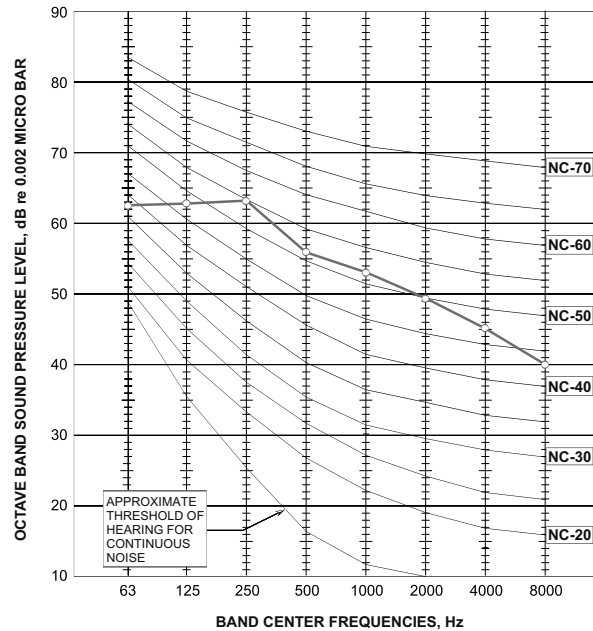
Fig.1
Microphone Distance from Unit

6.2 Sound Pressure Level Spectrum (Measured as Figure 1)

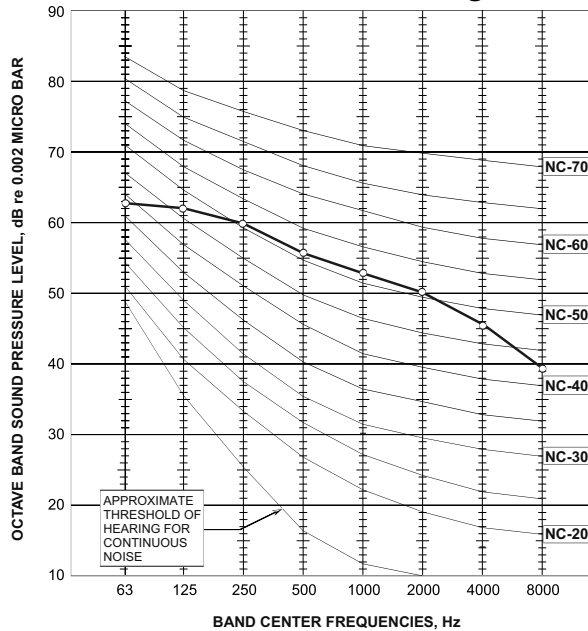
OU7- 0909 RC/ST Cooling



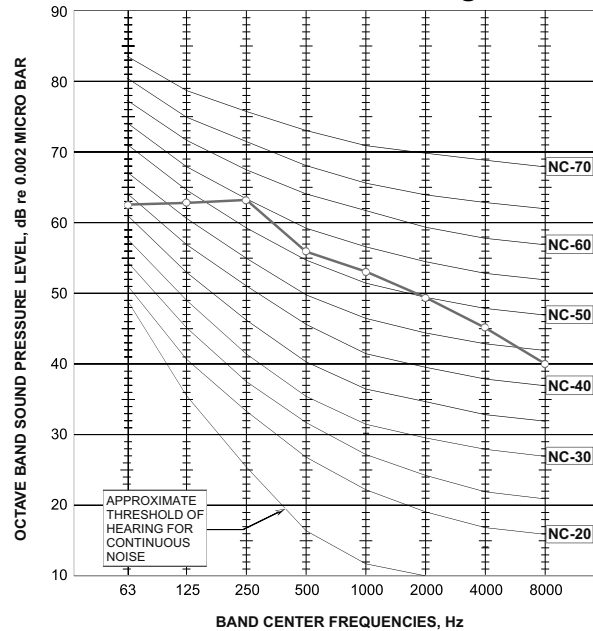
OU7-0909 RC/ST Heating



OU7-0912 RC/ST Cooling



OU7-0912 RC/ST Heating



7. ELECTRICAL DATA

7.1 DUO (9+9), (9+12)

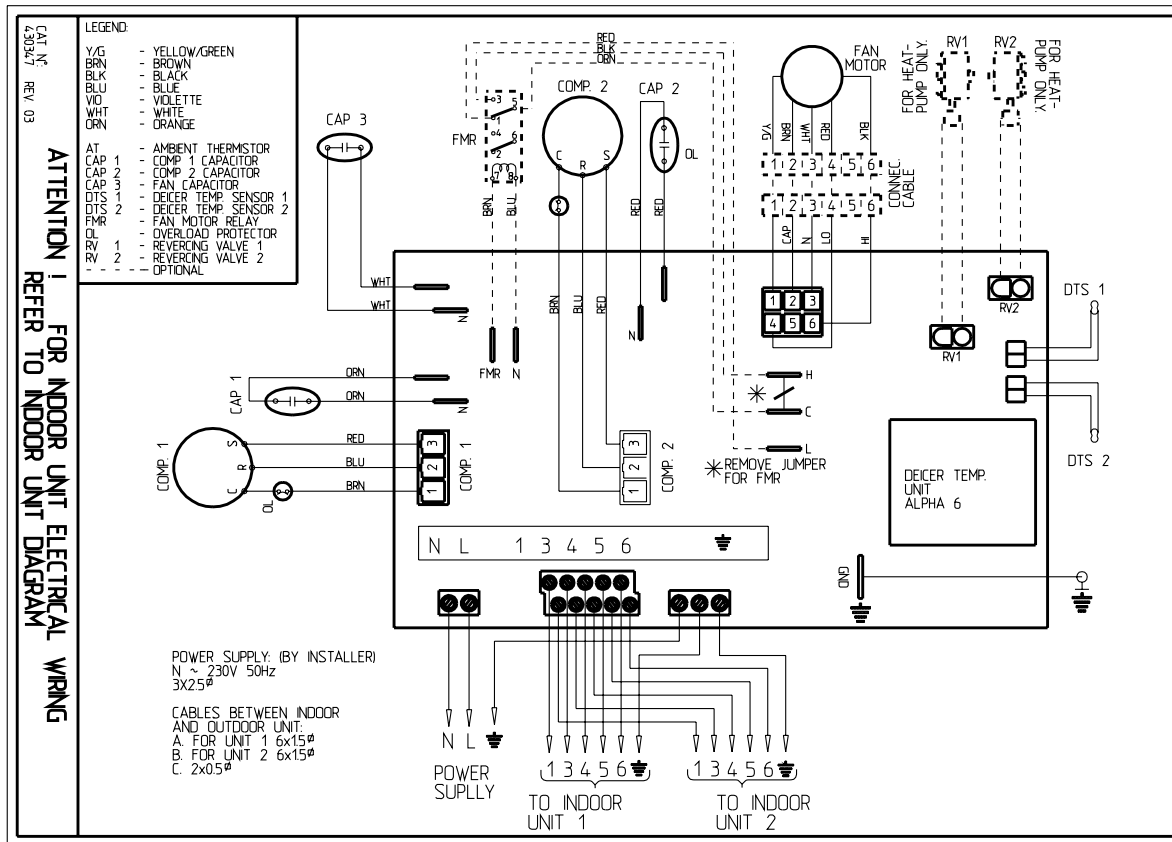
Power Supply	1 PH, 220-240 VAC, 50Hz
Connected to	Outdoor
Starting Current - 9/12	37.4/43
Circuit breaker	16 A
Power supply wiring - No. x cross section	3 X 2.5 mm ²
Interconnecting cable - No. x cross section	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

NOTE

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

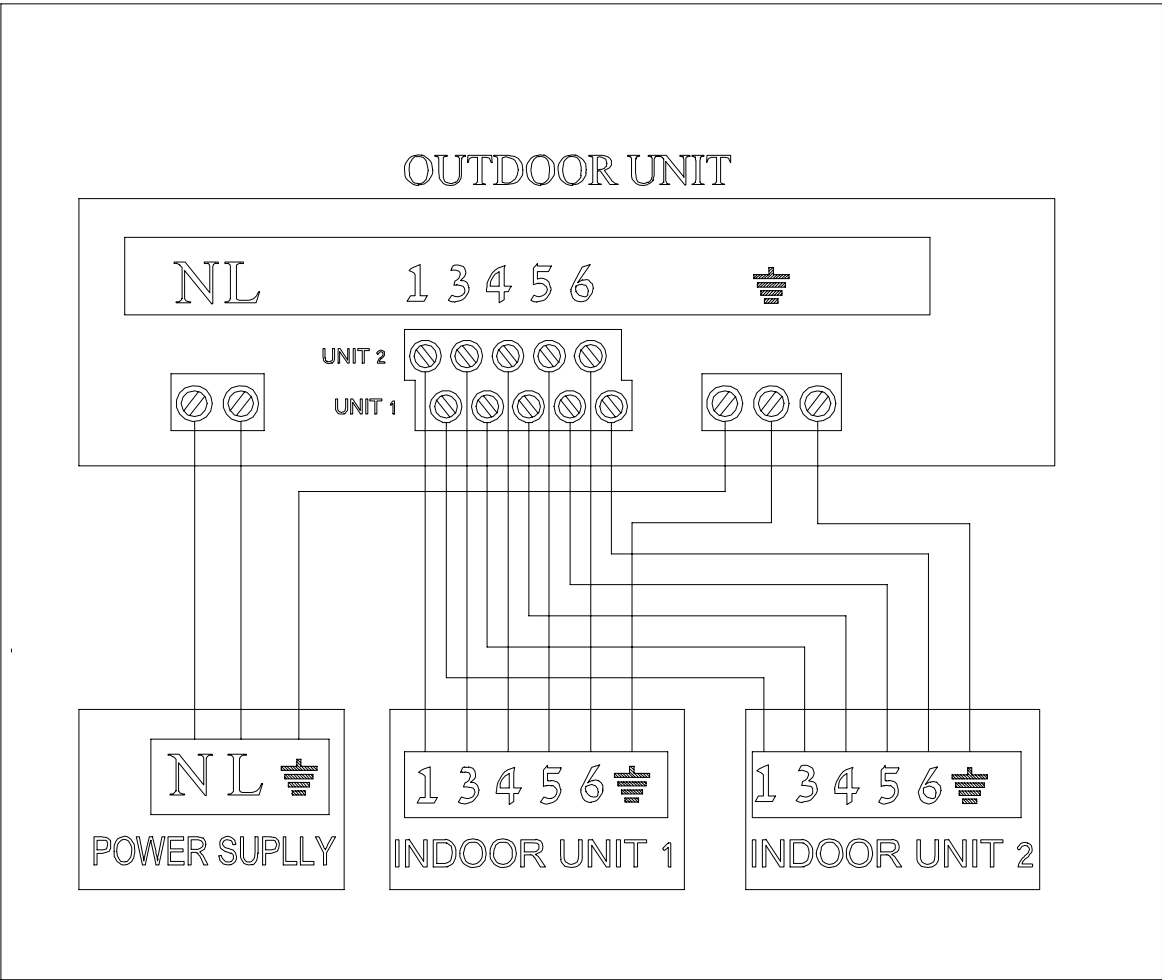
8. WIRING DIAGRAMS

8.1 DUO (9+9), (9+12)



9. ELECTRICAL CONNECTIONS

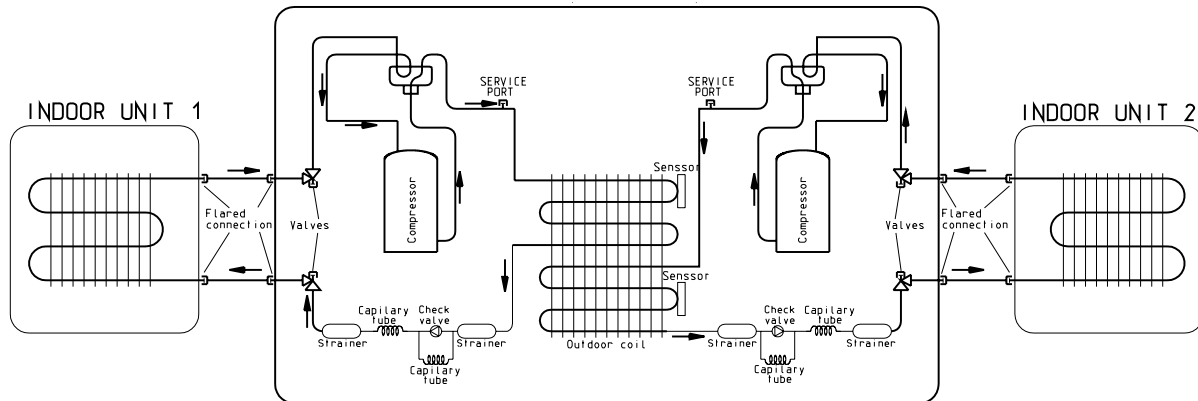
9.1 DUO (9+9), (9+12)



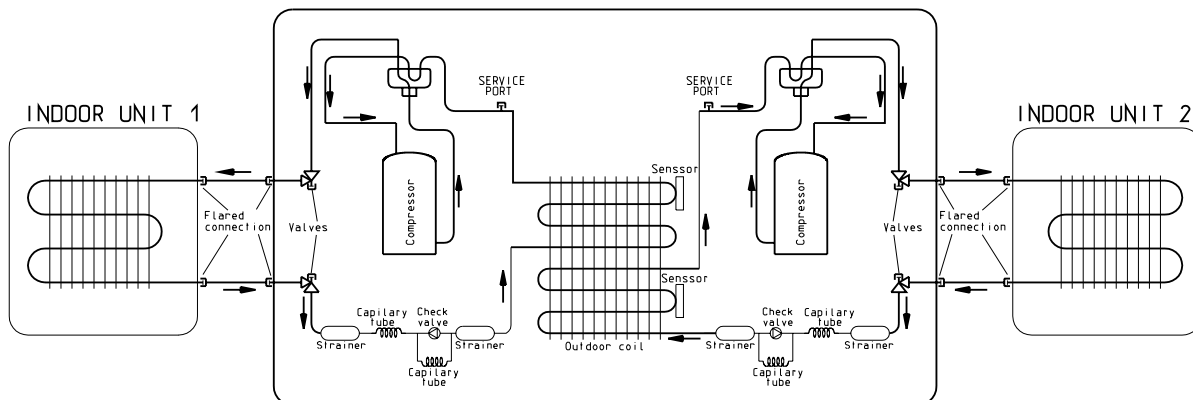
10. REFRIGERATION DIAGRAMS

10.1 DUO (9+9), (9+12)

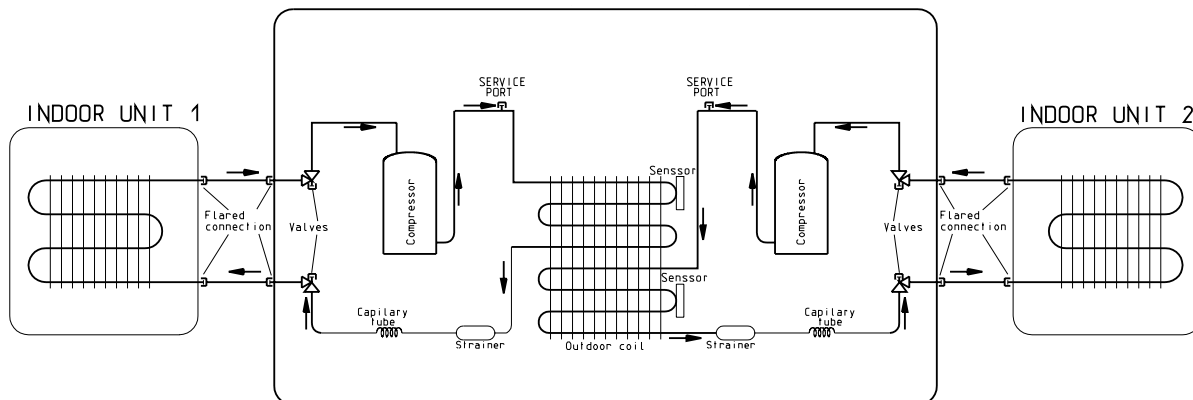
10.1.1 Cooling Mode



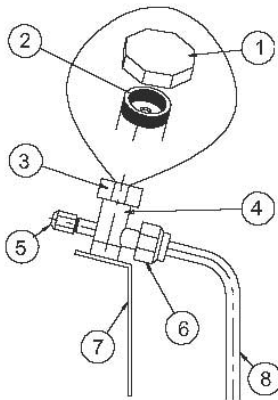
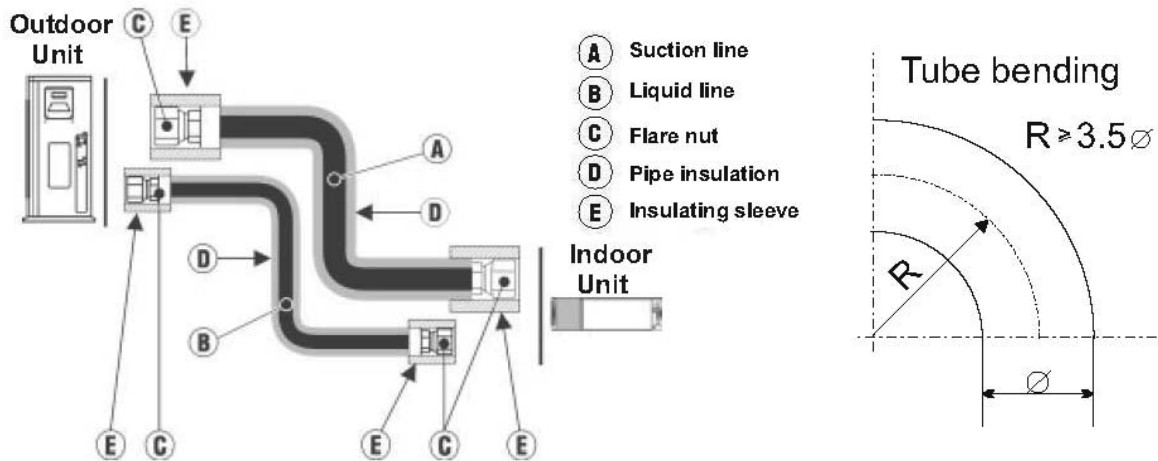
10.1.2 Heating Mode



10.1.3 Cooling Only



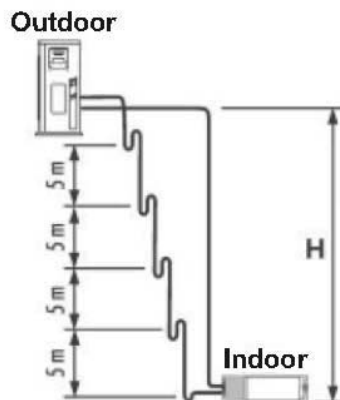
11. TUBING CONNECTIONS



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

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

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



12. CONTROL SYSTEM

12.1 General

The control and logic system is managed by the indoor PCB controller with regards to all functions and protections excluding Deicing. The DUO OU7 R410A is equipped with stand-alone internal deicer integrated on the outdoor PCB (TYPHOON - 4A 6.2).

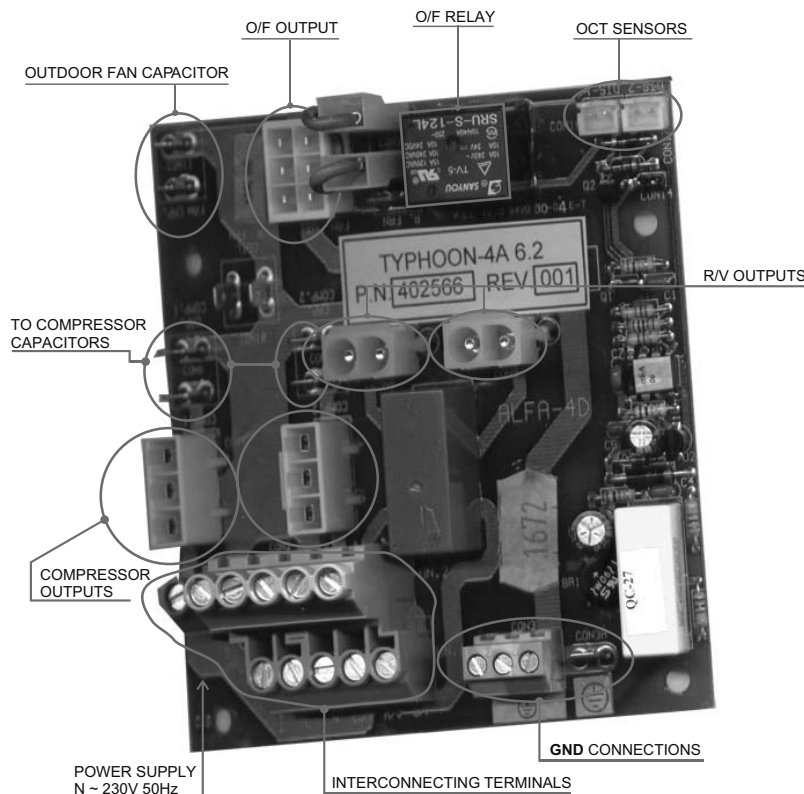
12.1.1 Deicing operation:

The outdoor coil temp ' is detected by 2 OCT sensors (outdoor coil temp') the deicing procedure will be activated if one of the sensors is sensing a temp' $\leq -6^{\circ}\text{C}$, and will stop when the outdoor coil will reach to 12°C or max 10 Min. once the deicing protection is activated it will include both units at the same time. Method of defrosting is by reversing the heat pump cycle to cooling mode, stopping the outdoor fan and keeping the comp' running, the unit will resume to its normal operation after the deicing procedure will be deactivated. Min deicing time is 2.5 Min.

12.1.2 Deicing intrval:

At first start up deicing will not be activated for the first 45 Min, and will go to STBY mode after every defrosting this timer will start a new cycle.

12.1.3 TYPHOON - 4A 6.2



NOTE :

For further information please refer to the relevant indoor unit service manual.

13. TROUBLESHOOTING

ELECTRICAL & CONTROL TROUBLESHOOTING

ATTENTION : check for broken or loose cable lugs first.

NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
1.	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
2.	The operating indicator (green led) does not light up.	The remote control batteries are discharged	-Replace batteries of the remote control
3.	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.
4.	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.
5.	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.
6.	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 correct replace capacitor or compressor. -If there is no voltage repair electrical wiring between indoor and outdoor units.
7.	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.
8.	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.

ATTENTION : check for broken or loose cable lugs first

NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
9.	Only indoor fan and compressor working.	Outdoor fan blocked.	- Remove obstructions.
10.	Only indoor fan working.	-Run capacitor of outdoor fan motor faulty. -Windings of outdoor fan are shorted.	- Replace capacitor. -Replace motor.
11.	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.
12.	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.
13.	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.
14.	Water accumulates and overflow from indoor unit section.	Drain tube or spout of drain pan clogged.	-Disassemble plastic drain tube from spout of indoor unit drain pan.
15.	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 throughly.
16.	Freeze-up of outdoor coil in heating mode, poor heating effect in room, indoor fan operates.	-Faulty outdoor thermistor. -Faulty control cable. -Outdoor unit air outlet is blocked.	-Replace thermistor. -Repair control cable. -Remove obstructions.

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