Technical Manual

FLO N LCD Series

Indoor Units	Outdoor Units	
FLO 7 N	GC 7 N	ONG 7
FLO 9 N	GC 9 N	ONG 9
FLO 12 N	GC 12 N	ONG 12
FLO 14 N	GC 14 N	ONG 14
FLO18 N	GC 18 N	—
FLO 24 N	GC 24 N	OU7-24
WNG 25	GC 24	—
FLO 30 N	GC 30 N	OU8 30/33

REFRIGERANT	
R410A	HEAT PUMP

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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*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 new **FLO N** split wall mounted range comprise the RC (heatpump) models, as follows:

- **Heat Pump** FLO 7 NRC, FLO 9 NRC, FLO12 NRC, FLO 14 NRC, FLO 18 NRC, FLO 24 NRC, FLO 30 NRC

The indoor FLO N units are available as LCD display types, featuring esthetic design, compact dimensions, and low noise operation.

1.2 Main Features

The FLO N series benefits from the most advanced technological innovations, namely:

- R410A models
- Microprocessor control.
- Infrared remote control with liquid crystal display.
- Supports Indoor Air Quality features, such as – Ionizer, Active Electro-Static Filter, and Fresh Air.
- Indoor large diameter cross flow fan, allowing low noise level operation.
- Bended indoor coil with treated aluminum fins and coating for improved efficiency.
- High COP.
- Easy access to the interconnecting tubing and wiring connections, so that removing the front grill or casing is not necessary.
- Refrigerant pipes can be connected to the indoor unit from 6 different optional directions.
- The FLO 18/24/30 N are equipped with a flexible corrugated copper suction tube allowing easy bending by the installer without the necessity to use special equipment.
- Water condensate tray is equipped with two optional drain connections.
- Automatic treated air sweep.
- Low indoor and outdoor noise levels.
- Easy installation and service.

1.3 Indoor Unit

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

It includes:

- Casing with air inlet and outlet grills.
- A large-diameter tangential fan.
- Bended coil with treated aluminum fins.
- Motorized flaps (dual air sweeping for LCD type)
- Multi-speed motor with internal protection (P.G. motor for LCD type).
- Advanced electronic control box assembly
- Interconnecting wiring terminal block
- Mounting plate

1.4 Filtration

The FLO N series presents several types of air filters:

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

1.5 Ionizer (Optional)

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

1.6 Control

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

1.7 Outdoor Unit

All outdoor units are pre-charged. For further information please refer to the Product Data Sheet, Chapter 2.

It includes :

- Axial fan.
- Outdoor coil with hydrophilic louver fins for RC units.
- Outlet air fan grill.
- Service valves" flare" type connection.
- Interconnecting wiring terminal block.
- Fresh air motor for FLO N 7-14 (optional).

1.8 Tubing Connections

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

1.9 Accessories

ASK (All Season Kit):

For low ambient working conditions in cooling, an ASK can be installed inside the outdoor unit. This kit allows cooling operation down to outdoor temp of -10 ºC by gradually controlling the outdoor fan speed motor.

RCW Wall Mounted Remote Control

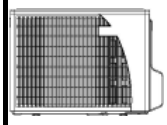
The RCW remote control is mounted on the wall, and controls the unit either as an infrared remote control or as a wired controller. The wired controller can control up to 10 Indoor units with the same program settings and adjustments.
For further details please refer to Optional Accessories, Chapter 14.

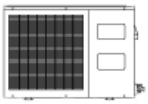
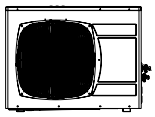
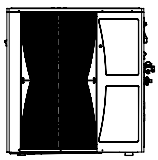
1.10 Inbox Documentation

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

1.11 Matching Table

1.11.1 R410A

OUTDOOR UNITS			INDOOR UNITS									
												
	MODEL	REFRIGER.	FLO7N	FLO9N	FLO12N	FLO14N	K9N	K11N	K15N	SX9N	SX12N	SX15
	ONG7 ST	R410A	√									
	ONG9 ST	R410A		√			√			√		
	ONG12 ST	R410A			√			√			√	
	ONG14 ST	R410A				√			√			√
	ONG7 RC	R410A	√									
	ONG9 RC	R410A		√			√			√*		
	ONG12 RC	R410A			√						√	
	ONG14 RC	R410A				√*						√

OUTDOOR UNITS			INDOOR UNITS										
													
	MODEL	REFt	FLO18N	FLO21N	FLO24N	FLO30N	_	K18N	KXL24	KXL30	SX18N	SX24N	SX30N
	GC18 ST	R410A	√					√			√		
	GC21 ST	R410A		√									
	GC24 ST	R410A			√				√			√	
	OU8 30 ST	R410A				√				√			√
	OU10 36 ST	R410A											
	GC18 RC	R410A	√					√			√		
	GC21 RC	R410A		√									
	GC24 RC	R410A			√								
	OU8 30 RC	R410A				√							
	OU10 36 RC	R410A											

√* - The outdoor unit of this combination cannot be matched to other indoor units.

2. PRODUCT DATA SHEET

2.1 R410A

Model Indoor Unit				**FLO 7 N**		
Model Outdoor Unit				GC 7 N (**ONG-7)**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity(1)			Btu/hr	7610	7610	7760
			kW	2.23	2.23	2.28
Power input (1)			kW	0.68	0.68	0.665
EER (Cooling) or COP(Heating)(1)			W/W	3.28	3.28	3.42
Energy efficiency class				A	A	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	3.0	3.0	2.9
Starting current			A	15		
Circuit breaker rating			A	10		
INDOOR	Fan type & quantity			Crossflow x 1		
	Fan speeds	H/M/L	RPM	860/760/660		
	Air flow(2)	H/M/L	m3/hr	380/320/280		
	External static pressure	Min-Max	Pa	0		
	Sound power level(3)	H/M/L	dB(A)	45/41/39		
	Sound pressure level(4)	H/M/L	dB(A)	30/27/25		
	Moisture removal		l/hr	0.7		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	810x190x285		
	Weight		kg	11		
	Package dimensions	WxHxD	mm	885x360x285		
	Packaged weight		kg	13.5		
	Units per pallet		units	32		
	Stacking height		units	8 levels		
OUTDOOR	Refrigerant control			Capillary tube (with 026 restrictor)		
	Compressor type,model			Rotary,LG GK086PAE		
	Fan type & quantity			Propeller(direct) x 1		
	Fan speeds	H/L	RPM	680		
	Air flow	H/L	m3/hr	1660		
	Sound power level	H/L	dB(A)	56	57	
	Sound pressure level(4)	H/L	dB(A)	46	47	
	Dimensions	WxHxD	mm	795x290x610		
	Weight		kg	31	32	
	Package dimensions	WxHxD	mm	945x395x655		
	Packaged weight		kg	35	36	
	Units per pallet		Units	9		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	0.77kg/7.5m	0.89kg/7.5m	
	Additional charge per 1 meter		g/m	15		
	Connections between units	Liquid line	In.(mm)	1/4"(6.35)		
		Suction line	In.(mm)	3/8"(9.53)		
		Max.tubing length	m.	Max.15		
		Max.height difference	m.	Max.7		
Operation control type				Remote control		
Heating elements (Option)			kW	0.3		
Others						

(1) Rating conditions in accordance with ISO 5151, 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.

Model Indoor Unit				**FLO 9 N**		
Model Outdoor Unit				**GC 9 N(ONG-9)**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	9280	9280	10240
			kW	2.72	2.72	3.0
Power input (1)			kW	0.825	0.825	0.850
EER (Cooling) or COP(Heating) (1)			W/W	3.30	3.30	3.53
Energy efficiency class				A	A	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	3.7	3.7	3.8
Starting current			A	18.7		
Circuit breaker rating			A	10		
INDOOR	Fan type & quantity			Crossflow x 1		
	Fan speeds	H/M/L	RPM	960/860/760		
	Air flow (2)	H/M/L	m3/hr	450/380/330		
	External static pressure	Min-Max	Pa	0		
	Sound power level (3)	H/M/L	dB(A)	49/46/44		
	Sound pressure level(4)	H/M/L	dB(A)	35/31/28		
	Moisture removal		l/hr	0.9		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	810x190x285		
	Weight		kg	11		
	Package dimensions	WxHxD	mm	885x285x360		
	Packaged weight		kg	13.5		
	Units per pallet		units	32		
	Stacking height		units	8 levels		
OUTDOOR	Refrigerant control			Capillary tube (with 029 restrictor)		
	Compressor type,model			Rotary,LG GK113PAG		
	Fan type & quantity			Propeller(direct) x 1		
	Fan speeds	H/L	RPM	780		
	Air flow	H/L	m3/hr	1780		
	Sound power level	H/L	dB(A)	58	60	
	Sound pressure level(4)	H/L	dB(A)	48	49	
	Dimensions	WxHxD	mm	795x290x610		
	Weight		kg	34	35	
	Package dimensions	WxHxD	mm	945x395x655		
	Packaged weight		kg	38	39	
	Units per pallet		Units	9		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	0.96kg/7.5m	1kg/7.5m	
	Additional charge per 1 meter		g/m	10		
	Connections between units	Liquid line	In.(mm)	1/4”(6.35)		
		Suction line	In.(mm)	3/8”(9.53)		
		Max.tubing length	m.	Max.15		
		Max.height difference	m.	Max.7		
Operation control type				Remote control		
Heating elements (Option)			kW	0.3		
Others						

(1) Rating conditions in accordance with ISO 5151, 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.

Model Indoor Unit				**FLO 12 N**		
Model Outdoor Unit				**GC 12 N (ONG-12)**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	12390	12390	13650
			kW	3.63	3.63	4.0
Power input (1)			kW	1.115	1.115	1.14
EER (Cooling) or COP(Heating)(1)			W/W	3.26	3.26	3.51
Energy efficiency class				A	A	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	5.0	5.0	5.1
Starting current			A	25		
Circuit breaker rating			A	15		
INDOOR	Fan type & quantity			Crossflow x 1		
	Fan speeds	H/M/L	RPM	1230/1080/930		
	Air flow(2)	H/M/L	m3/hr	635/550/450		
	External static pressure	Min-Max	Pa	0		
	Sound power level (3)	H/M/L	dB(A)	55/53/49		
	Sound pressure level(4)	H/M/L	dB(A)	43/39/35		
	Moisture removal		l/hr	1.3		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	810x190x285		
	Weight		kg	11.5		
	Package dimensions	WxHxD	mm	885x360x285		
	Packaged weight		kg	13.5		
	Units per pallet		units	32		
	Stacking height		units	8 levels		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type,model			Rotary,PA145X2C-4FT		
	Fan type & quantity			Propeller(direct) x 1		
	Fan speeds	H/L	RPM	810		
	Air flow	H/L	m3/hr	1850		
	Sound power level	H/L	dB(A)	62	64	
	Sound pressure level(4)	H/L	dB(A)	52	53	
	Dimensions	WxHxD	mm	795x290x610		
	Weight		kg	35	36	
	Package dimensions	WxHxD	mm	945x395x655		
	Packaged weight		kg	39	40	
	Units per pallet		Units	9		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	1.15kg/7.5m	1.15kg/7.5m	
	Additional charge per 1 meter		g/m	12		
	Connections between units	Liquid line	In.(mm)	1/4”(6.35)		
		Suction line	In.(mm)	3/8”(9.53)		
		Max.tubing length	m.	Max.15		
		Max.height difference	m.	Max.7		
Operation control type				Remote control		
Heating elements (Option)			kW	0.3		
Others						

(1) Rating conditions in accordance with ISO 5151, 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.

Model Indoor Unit				**FLO 14 N**		
Model Outdoor Unit				**GC14 N (ONG-14)**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	13650	13650	15290
			kW	4.0	4.0	4.48
Power input (1)			kW	1.33	1.33	1.395
EER (Cooling) or COP(Heating) (1)			W/W	3.01	3.01	3.21
Energy efficiency class				B	B	C
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	6.1	6.1	6.5
Starting current			A	30		
Circuit breaker rating			A	15		
INDOOR	Fan type & quantity			Crossflow x 1		
	Fan speeds	H/M/L	RPM	1280/1080/930		
	Air flow (2)	H/M/L	m3/hr	660/550/475		
	External static pressure	Min-Max	Pa	0		
	Sound power level (3)	H/M/L	dB(A)	56/51/46		
	Sound pressure level(4)	H/M/L	dB(A)	46/41/36		
	Moisture removal		l/hr	1.5		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	810x190x285		
	Weight		kg	11.5		
	Package dimensions	WxHxD	mm	885x360x285		
	Packaged weight		kg	14		
	Units per pallet		units	32		
	Stacking height		units	8 levels		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type,model			Rotary,RN165VHSMT		
	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	64	
	Sound pressure level(3)	H/L	dB(A)	53	54	
	Dimensions	WxHxD	mm	795x290x610		
	Weight		kg	41.5	42.2	
	Package dimensions	WxHxD	mm	945x395x655		
	Packaged weight		kg	45.5	46.5	
	Units per pallet		Units	9		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	1.34kg/7.5m		
	Additional charge per 1 meter		g/m	20		
	Connections between units	Liquid line	In.(mm)	1/4”(6.35)		
		Suction line	In.(mm)	1/2”(12.7)		
		Max.tubing length	m.	Max.15		
		Max.height difference	m.	Max.7		
Operation control type				Remote control		
Heating elements (Option)			kW	0.3		
Others						

(1) Rating conditions in accordance with ISO 5151, 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.

Model Indoor Unit				**FLO 18 N**		
Model Outdoor Unit				**GC 18 N**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	18250	18250	18420
			kW	5.35	5.35	5.40
Power input (1)			kW	1.66	1.66	1.56
EER (Cooling) or COP(Heating) (1)			W/W	3.22	3.22	3.46
Energy efficiency class				A	A	B
Power supply			V/Hz/Ph	220-240V/50Hz/Single		
Rated current			A	7.5	7.5	7.1
Starting current			A	43		
Circuit breaker rating			A	15		
INDOOR	Fan type & quantity			Cross flow*1		
	Fan speeds	H/M/L	RPM	1200/1100/1000		
	Air flow (2)	H/M/L	m3/hr	930/840/750		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	56-53-50		
	Sound pressure level(4)	H/M/L	dB(A)	43-40-37		
	Moisture removal		l/hr	1.8		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	1060x295x210		
	Weight		kg	14		
	Package dimensions	WxHxD	mm	1115x350x260		
	Packaged weight		kg	17		
	Units per pallet		units	16		
	Stacking height		units	8		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type,model			Rotary,TOSHIBA PA200X2CS-4KU1		
	Fan type & quantity			Propeller(direct) x 1		
	Fan speeds	H/L	RPM	815		
	Air flow	H/L	m3/hr	2480		
	Sound power level	H/L	dB(A)	68		
	Sound pressure level(4)	H/L	dB(A)	57		
	Dimensions	WxHxD	mm	846*302*690		
	Weight		kg	56		
	Package dimensions	WxHxD	mm	990*430*770		
	Packaged weight		kg	61		
	Units per pallet		Units	9		
	Stacking height		units	3		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	1.54kg/7.5m		
	Additional charge		g/m	4m≤Length≤10m 1540g 10m Length≤18m 1690g 18m Length≤25m 1900g		
	Connections between units	Liquid line	In.(mm)	1/4”(6.35)		
		Suction line	In.(mm)	1/2”(12.7)		
		Max.tubing length	m.	25		
		Max.height difference	m.	15		
Operation control type				Remote control		
Heating elements			kW			
Others				All season kit Factory option		

(1) Rating conditions in accordance with ISO 5151, 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.

Model Indoor Unit				**FLO** 24 **N**		
Model Outdoor Unit				**GC** 24 **N (OU7-24)**		
Installation method				WALL MOUNTED		
Characteristics			**Units**	**Cooling only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	23100	23100	24150
			kW	6.77	6.77	7.08
Power input (1)			kW	2.24	2.24	2.4
COP (1)			W/W	3.02	3.02	3.01
Energy efficiency class				B	B	D
Power supply			V/ Ph /Hz	230/50/1		
Rated current			A	9.3		10.2
Starting current			A	63		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			CROSS FLOW *1		
	Fan speeds	H/ M/ L	RPM	1300	1200	1100
	Air flow (2)	H/ M/ L	m³/hr	910	820	740
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/ M/ L	dB(A)	60	57	55
	Sound pressure level (4)	H/ M/ L	dB(A)	47	44	42
	Moisture removal		L/hr	2.3		
	Condensate drain tube I.D		mm	16		
	Dimensions	W/ H / D	mm	1060	295	210
	Weight		kg	15		
	Package dimensions	W/ H / D	mm	1125	360	280
	Packaged weight		kg	18		
	Units per pallet		Units	16		
	Stacking height		Units	8		
OUTDOOR	Refrigerant control			CAPILLARY TUBE		
	Compressor type, model			ROTARY		
	Fan type & quantity			AXIAL*1		
	Fan speeds	H / L	RPM	850		720
	Air flow	H / L	m³/hr	1520		1100
	Sound power level	H / L	dB(A)	67		62
	Sound pressure level (4)	H / L	dB(A)	58		54
	Dimensions	W/ H / D	mm	900	680	340
	Weight		kg	74		
	Package dimensions	W/ H / D	mm	985	730	406
	Packaged weight		kg	77		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg/m	2.035/12.5		
	Additional charge		g/m	12.5m<Add 350g<15m 15m<Add 1040g<20m		
	Connections between units	Liquid line	In.	3/8		
		Suction line	In.	5/8		
		Max. tubing length	m.	20		
		Max. height difference	m.	15		
Operation control type				LCD REMOTE CONTROL		
Heating elements			kW			
Others				All season kit Factory option		

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				**FLO** 24 **N**			
Model Outdoor Unit				**GC 24 N** T **(OU7-24 T)**			
Installation method				WALL MOUNTED			
Characteristics			**Units**	**Cooling only**	**Cooling**	**Heating**	
Capacity (1)			Btu/hr	23220	23220	25130	
			kW	6.81	6.81	7.37	
Power input (1)			kW	2.26	2.26	2.4	
COP (1)			W/W	3.01	3.01	3.07	
Energy efficiency class				B	B	D	
Power supply			V/ Ph /Hz	400/50/3N			
Rated current			A	4.1*3		4.4*3	
Starting current			A	55			
Circuit breaker rating			A	10*3			
INDOOR	Fan type & quantity			CROSS FLOW *1			
	Fan speeds	H/ M/ L	RPM	1300	1200	1100	
	Air flow (2)	H/ M/ L	m³/hr	990	930	840	
	External static pressure	Min-Max	Pa	N/A			
	Sound power level (3)	H/ M/ L	dB(A)	58	55	53	
	Sound pressure level (4)	H/ M/ L	dB(A)	45	42	40	
	Moisture removal		L/hr	2.3			
	Condensate drain tube I.D		mm	16			
	Dimensions	W/ H / D	mm	1060	295	210	
	Weight		kg	15			
	Package dimensions	W/ H / D	mm	1115	350	260	
	Packaged weight		kg	18			
	Units per pallet		Units	16			
	Stacking height		Units	8			
OUTDOOR	Refrigerant control			CAPILLARY TUBE			
	Compressor type, model			ROTARY			
	Fan type & quantity			AXIAL*1			
	Fan speeds	H / L	RPM	850		720	
	Air flow	H / L	m³/hr	1520		1100	
	Sound power level	H / L	dB(A)	67		62	
	Sound pressure level (4)	H / L	dB(A)	58		54	
	Dimensions	W/ H / D	mm	900	680	340	
	Weight		kg	74			
	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 chargless distance		kg/m	2.035/12.5			
	Additional charge		g/m	12.5m<Add 350g<15m 12.5m<Add 1040g<20m			
	Connections between units	Liquid line	In.	3/8			
		Suction line	In.	5/8			
		Max. tubing length	m.	20			
		Max. height difference	m.	15			
Operation control type				LCD REMOTE CONTROL			
Heating elements			kW				
Others				All season kit Factory option			

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				**FLO 30N**		
Model Outdoor Unit				GC30N(**OU830)**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	29550	29550	31800
			kW	8.66	8.66	9.33
Power input (1)			kW	3.08	3.08	3.27
EER (Cooling) or COP(Heating) (1)			W/W	2.81	2.81	2.85
Energy efficiency class				C	C	C
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	13.4	13.4	14.2
Starting current			A	75		
Circuit breaker rating			A	25		
INDOOR	Fan type & quantity			Cross flow x 1		
	Fan speeds	H/M/L	RPM	1300/1200/1000		
	Air flow (2)	H/M/L	m3/hr	1250/1040/830		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	64/59/53		
	Sound pressure level(4)	H/M/L	dB(A)	54/52/41		
	Moisture removal		l/hr	3.6		
	Condensate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	1200X340X236		
	Weight		kg	18.5		
	Package dimensions	WxHxD	mm	1305X430X325		
	Packaged weight		kg	25.5		
	Units per pallet		units	12		
	Stacking height		units	6 levels		
OUTDOOR	Refrigerant control			Capillary		
	Compressor type, model			SCROLL AQ036PAA		
	Fan type & quantity			Propeller(direct) x 1		
	Fan speeds	H/L	RPM	850		
	Air flow	H/L	m3/hr	3110		
	Sound power level	H/L	dB(A)	69		
	Sound pressure level(4)	H/L	dB(A)	62		
	Dimensions	WxHxD	mm	900X860X340		
	Weight		kg	78		
	Package dimensions	WxHxD	mm	903X907X435		
	Packaged weight		kg	82		
	Units per pallet		Units	6		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant charge less distance		kg/m	2.1kg / 7.5m		
	Additional charge		gr/m	30		
	Connections between units	Liquid line	In.(mm)	3/8”(9.53)		
		Suction line	In.(mm)	3/4”(19.05)		
		Max.tubing length	m.	30		
		Max.height difference	m.	10		
Operation control type				Remote control		
Heating elements			kW			

(1) Rating conditions in accordance with ISO 5151, 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.

Model Indoor Unit				**FLO 30N**		
Model Outdoor Unit				GC30NT(**OU830T)**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (1)			Btu/hr	29580	29580	31630
			kW	8.67	8.67	9.27
Power input (1)			kW	3.09	3.09	3.25
EER (Cooling) or COP(Heating) (1)			W/W	2.81	2.81	2.85
Energy efficiency class				C	C	C
Power supply			V/Ph/Hz	400V/3PH/50Hz		
Rated current			A	10.2	10.2	10.6
Starting current			A	35		
Circuit breaker rating			A	16		
INDOOR	Fan type & quantity			Cross flow x 1		
	Fan speeds	H/M/L	RPM	1300/1200/1000		
	Air flow (2)	H/M/L	m3/hr	1250/1040/830		
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/M/L	dB(A)	64/59/53		
	Sound pressure level(4)	H/M/L	dB(A)	54/52/41		
	Moisture removal		l/hr	3.6		
	Condensate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	1200X340X236		
	Weight		kg	18.5		
	Package dimensions	WxHxD	mm	1305X430X325		
	Packaged weight		kg	25.5		
	Units per pallet		units	12		
	Stacking height		units	6 levels		
OUTDOOR	Refrigerant control			Capillary		
	Compressor type, model			SCROLL AQ036YAA		
	Fan type & quantity			Propeller(direct) x 1		
	Fan speeds	H/L	RPM	850		
	Air flow	H/L	m3/hr	3110		
	Sound power level	H/L	dB(A)	69		
	Sound pressure level(4)	H/L	dB(A)	62		
	Dimensions	WxHxD	mm	900X860X340		
	Weight		kg	78		
	Package dimensions	WxHxD	mm	903X907X435		
	Packaged weight		kg	82		
	Units per pallet		Units	6		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant charge less distance		kg/m	2.13kg / 7.5m		
	Additional charge		gr/m	30		
	Connections between units	Liquid line	In.(mm)	3/8”(9.53)		
		Suction line	In.(mm)	3/4”(15.88)		
		Max.tubing length	m.	30		
		Max.height difference	m.	10		
Operation control type				Remote control		

(1) Rating conditions in accordance with ISO 5151, 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

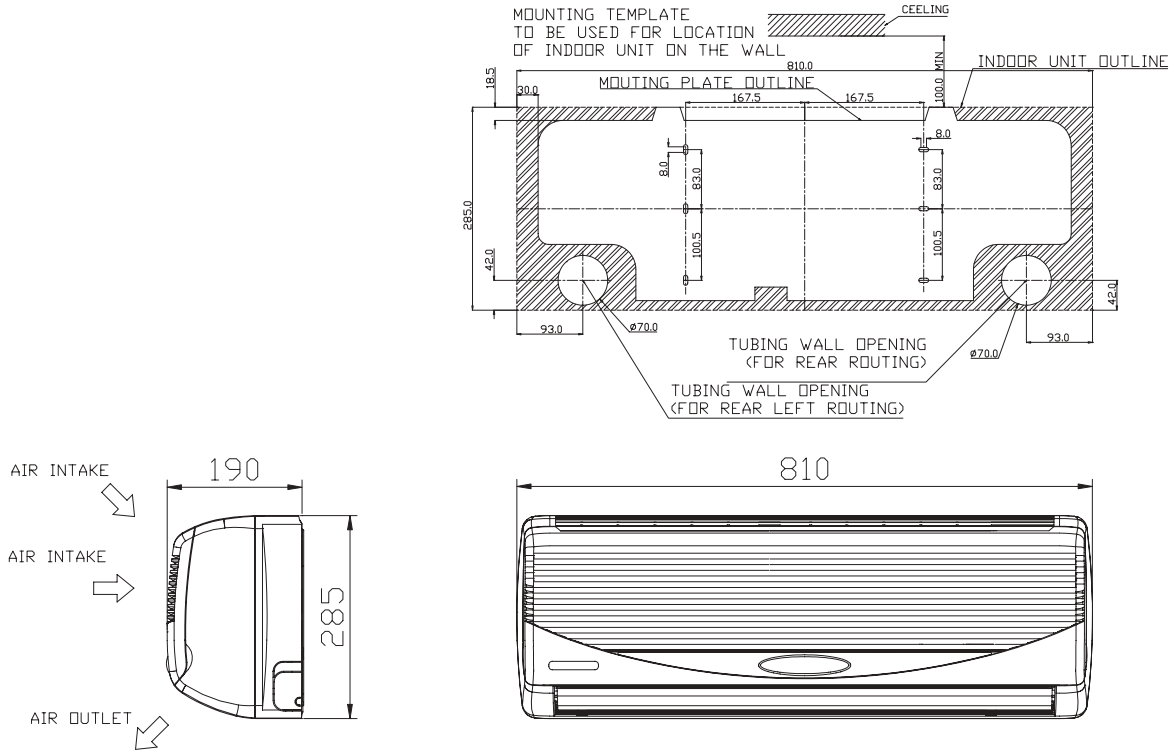
3.1 Operating Limits

3.1.1 R410A

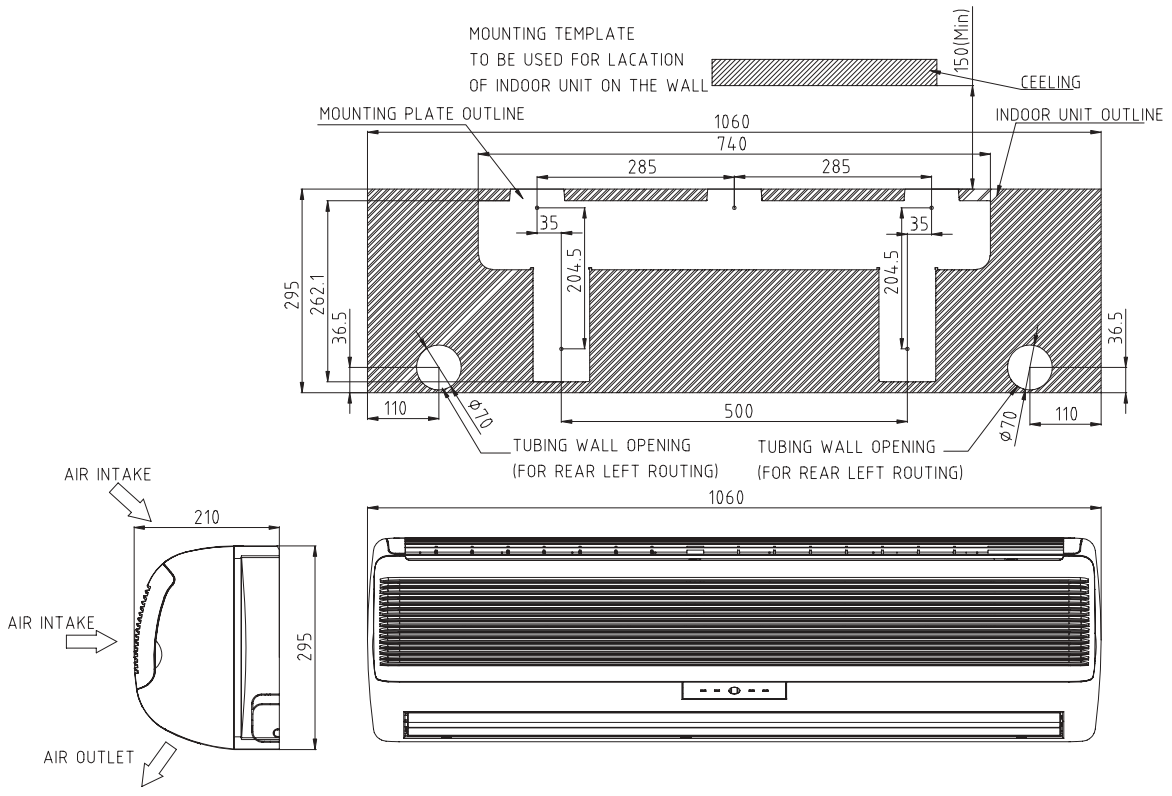
		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	10°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-9°C DB -10°C WB
Voltage	1PH	198 – 264 V	
	3PH	360 – 440 V	

4. OUTLINE DIMENSIONS

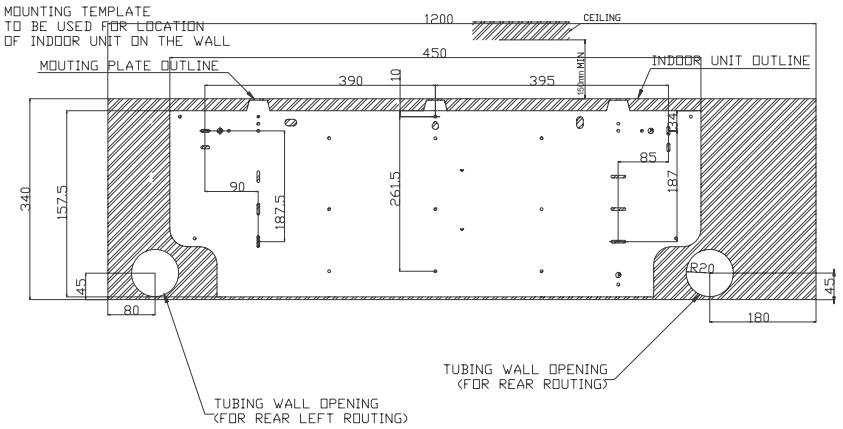
4.1 FLO N 7 , 9 , 12, 14

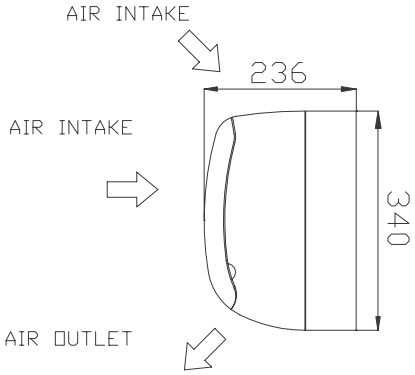


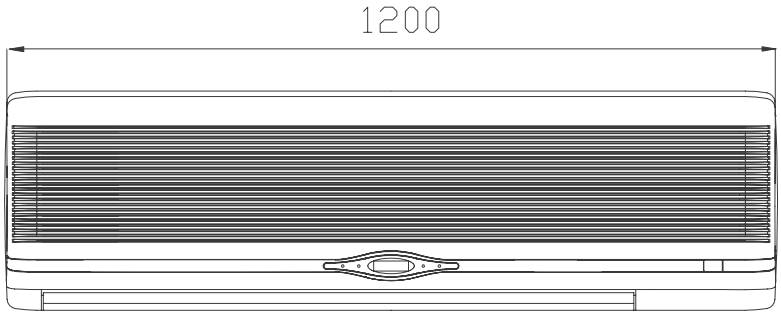
4.2 FLO N 18/24



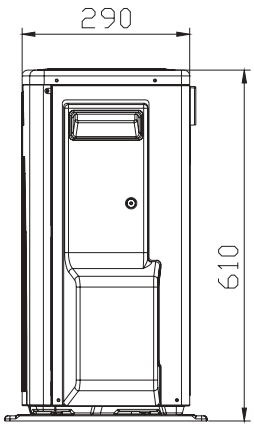
4.3 FLO N 30

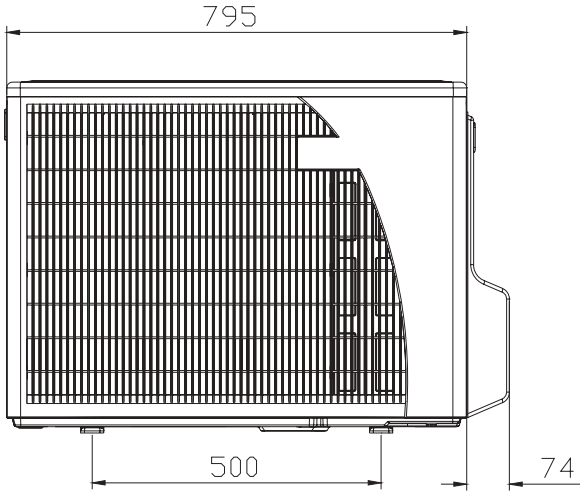


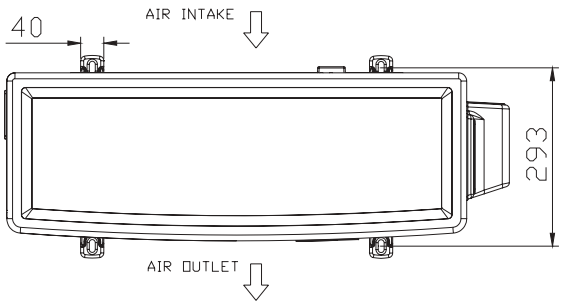




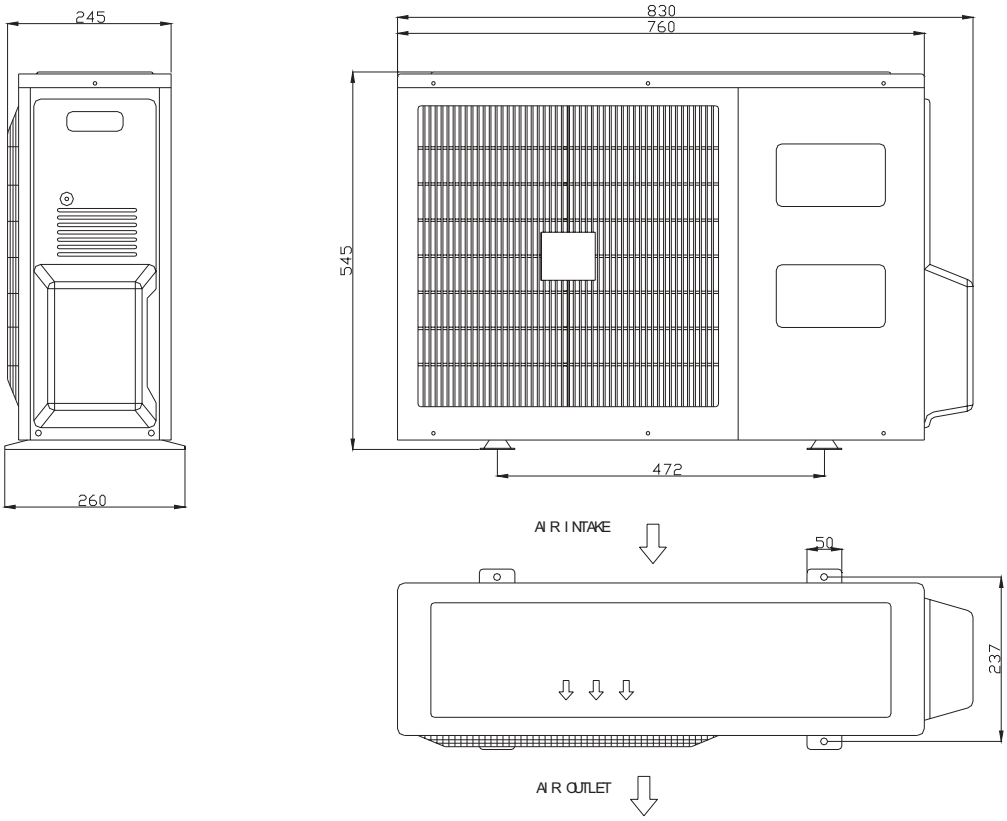
4.4 ONG 7, 9, 12, 14 RC



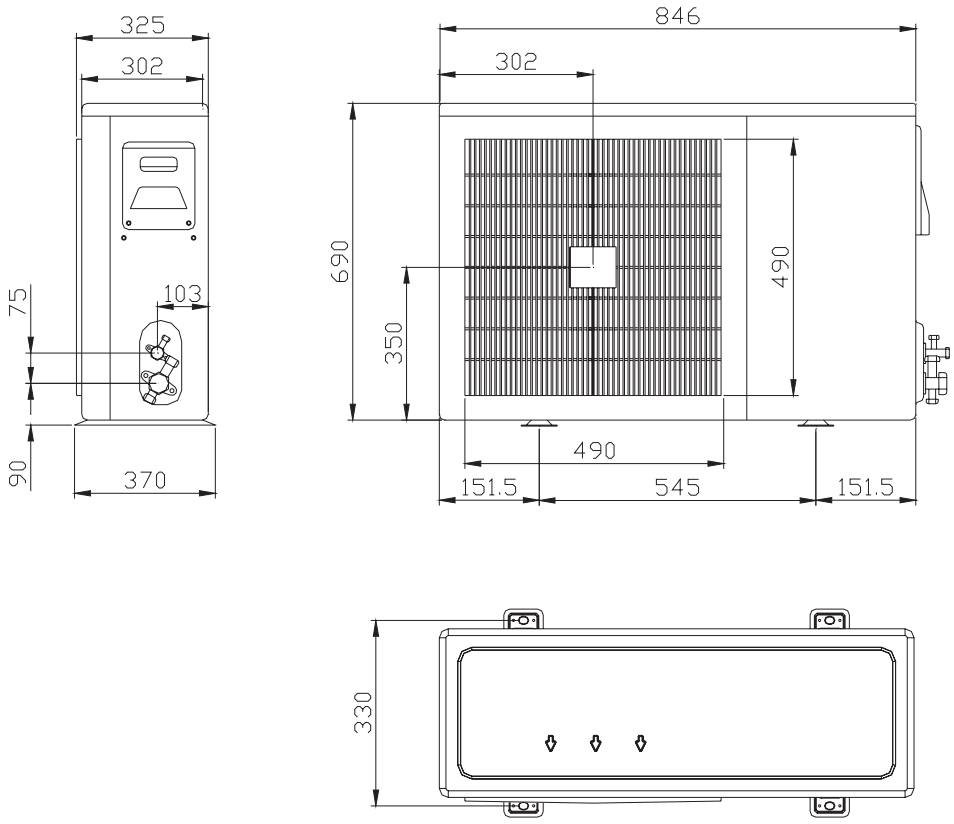




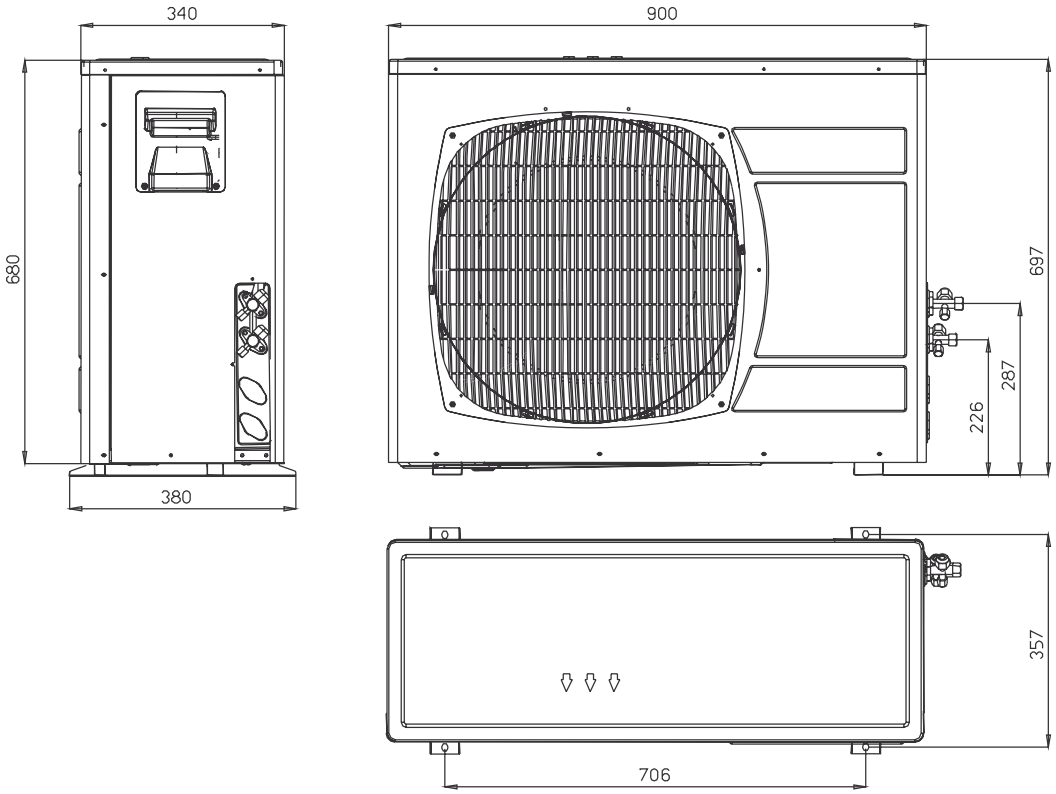
4.5 GCN 7, 9, 12, 14 RC



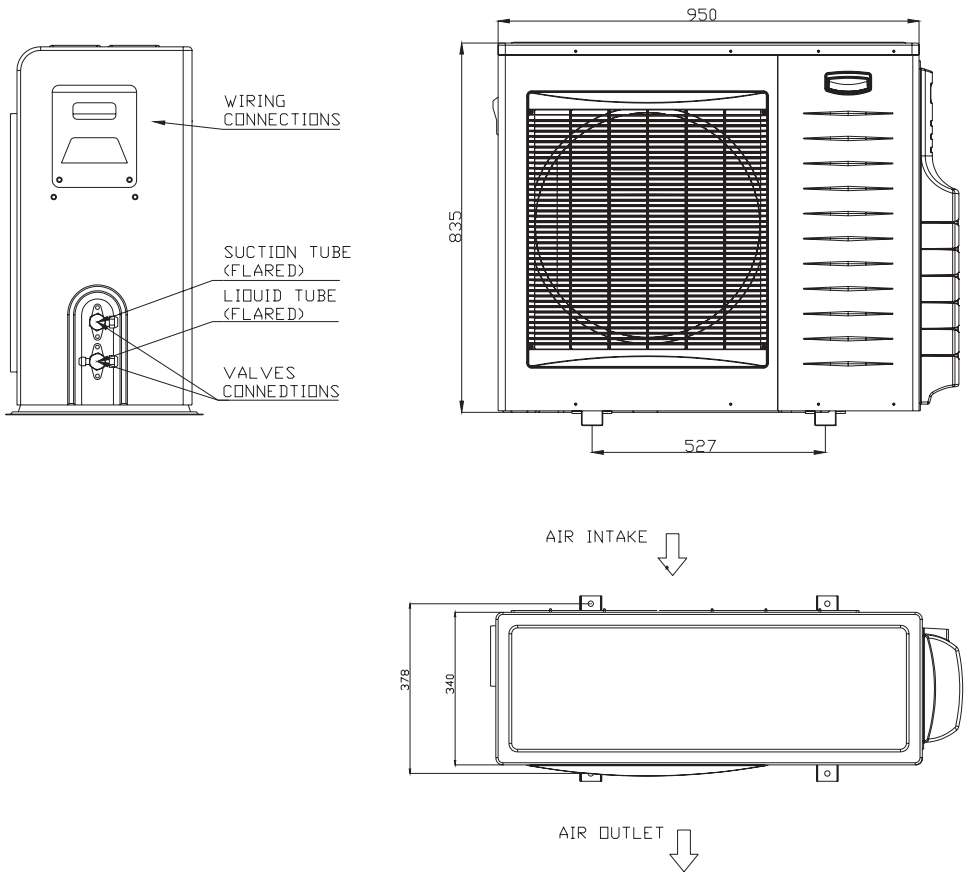
4.6 GC 18, 24 RC



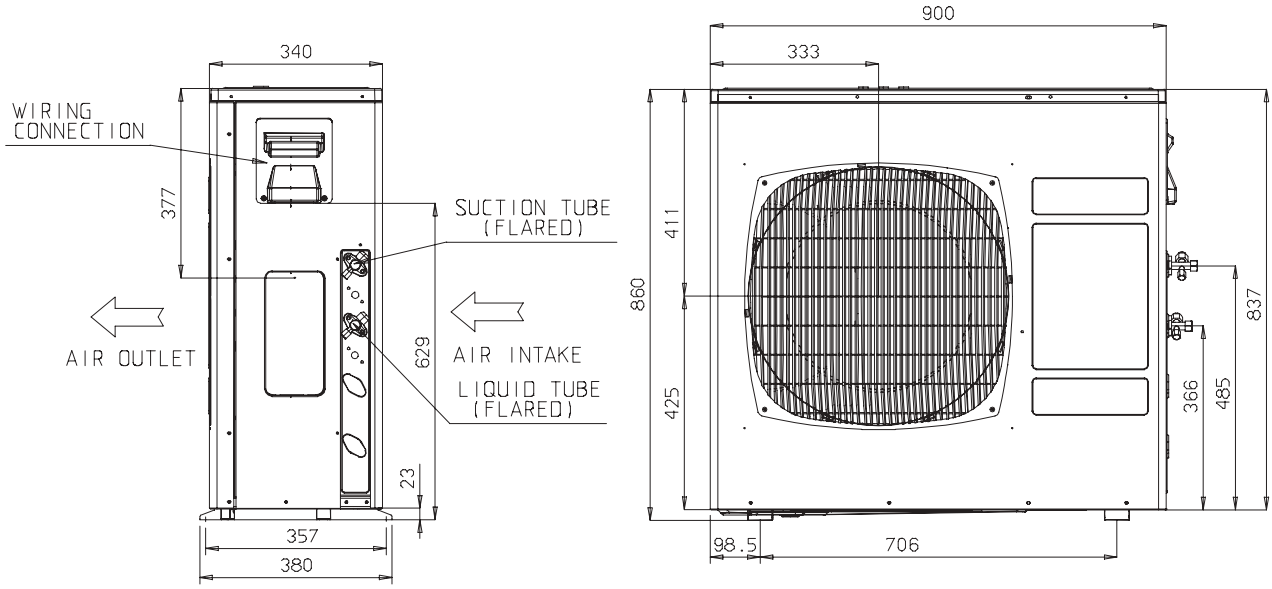
4.7 OU7-24 RC



4.8 GC 30 N RC



4.9 OU8-30 RC


340
WIRING
CONNECTION
377
SUCTION TUBE
(FLARED)
AIR OUTLET
AIR INTAKE
LIQUID TUBE
(FLARED)
629
23
357
380
900
333
860
411
425
837
366
485
98.5
706

5. PERFORMANCE DATA & PRESSURE CURVES

5.1 FLO 7 N R410A

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	2.35	2.43	2.49	2.55	2.59
	SC	1.66	1.74	1.80	1.85	1.88
	PI	0.48	0.48	0.48	0.49	0.49
20(1)	TC	2.27	2.40	2.47	2.53	2.57
	SC	1.63	1.72	1.79	1.84	1.88
	PI	0.52	0.53	0.53	0.53	0.53
25	TC	2.15	2.32	2.44	2.52	2.58
	SC	1.59	1.69	1.78	1.83	1.86
	PI	0.57	0.57	0.57	0.58	0.58
30	TC	2.01	2.19	2.37	2.45	2.52
	SC	1.54	1.64	1.74	1.79	1.83
	PI	0.61	0.62	0.62	0.63	0.64
35	TC	1.86	2.02	2.23	2.34	2.45
	SC	1.46	1.57	1.70	1.75	1.78
	PI	0.66	0.67	0.68	0.69	0.69
40	TC	1.69	1.84	2.01	2.20	2.31
	SC	1.38	1.49	1.61	1.66	1.69
	PI	0.71	0.72	0.73	0.74	0.75
46	TC	1.47	1.61	1.77	1.95	2.10
	SC	1.27	1.36	1.47	1.52	1.55
	PI	0.78	0.79	0.81	0.82	0.83

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.1.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	1.20	0.54	1.15	0.57	1.11	0.60
-7	1.29	0.55	1.24	0.58	1.20	0.61
-2	1.37	0.56	1.32	0.59	1.28	0.62
2	1.66	0.58	1.60	0.62	1.53	0.66
6	2.35	0.63	**2.28**	**0.67**	2.20	0.71
10	2.55	0.66	2.49	0.71	2.42	0.76
15	2.76	0.69	2.69	0.74	2.62	0.79
20	2.91	0.71	2.84	0.77	2.76	0.83

* the above chart includes the weighted deicing infleuence.

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 Capacity Correction Factor Due to Tubing Length

5.2.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.961	0.949	---	---	---	---	---

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

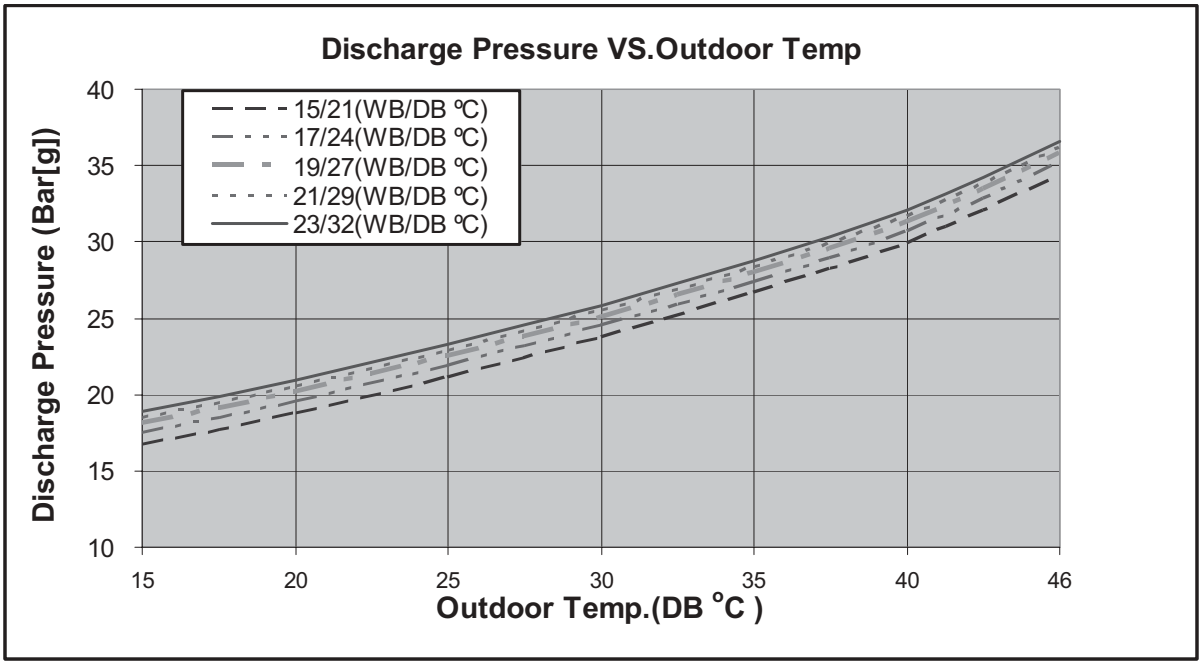
5.2.2 Heating

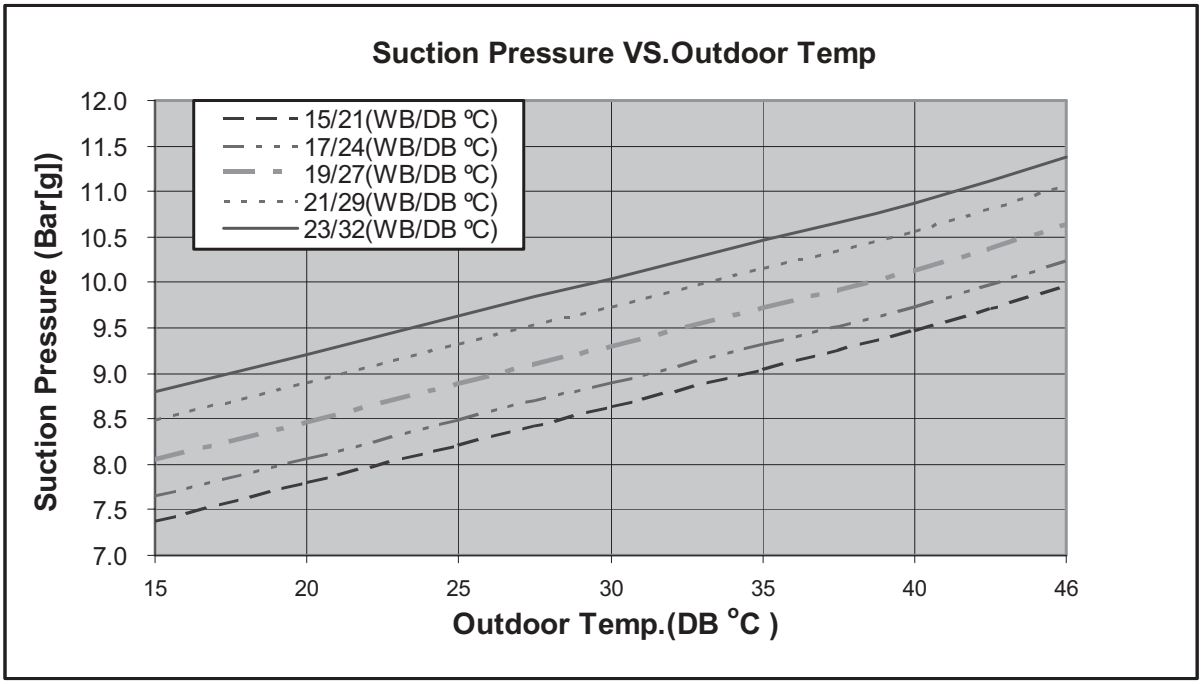
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.05	**1**	0.975	0.965	---	---	---	---	---

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

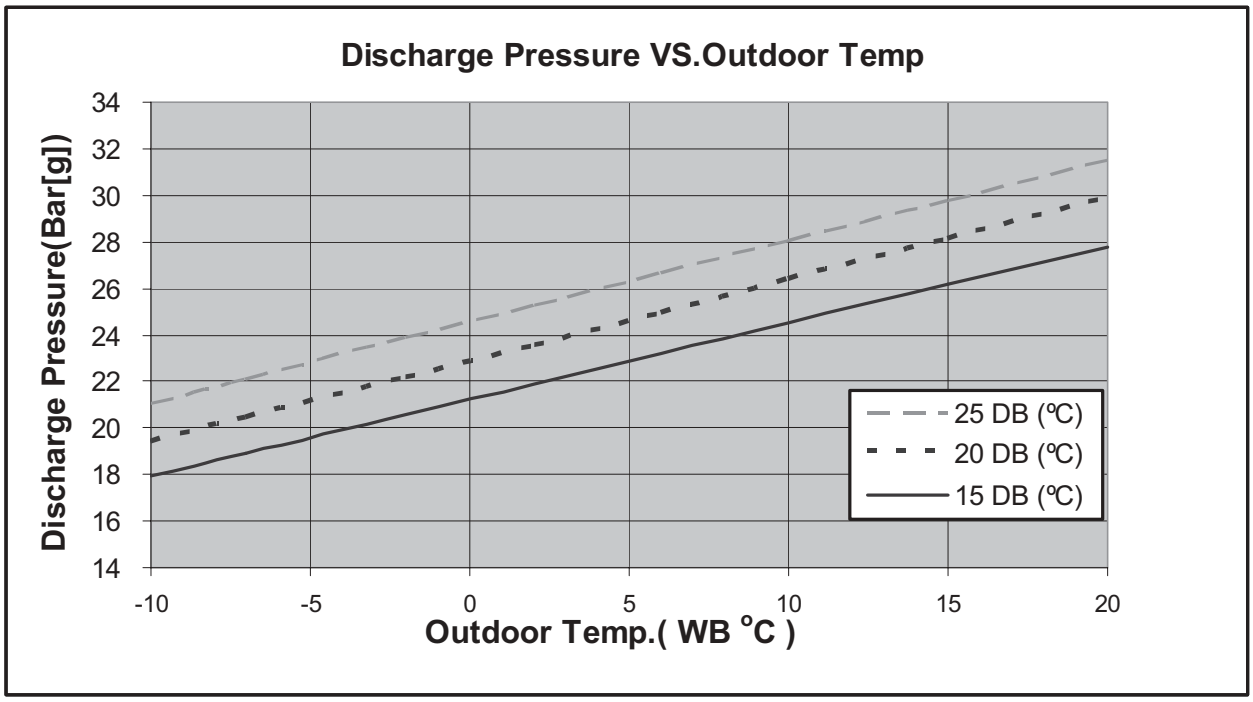
5.3 Pressure Curves.

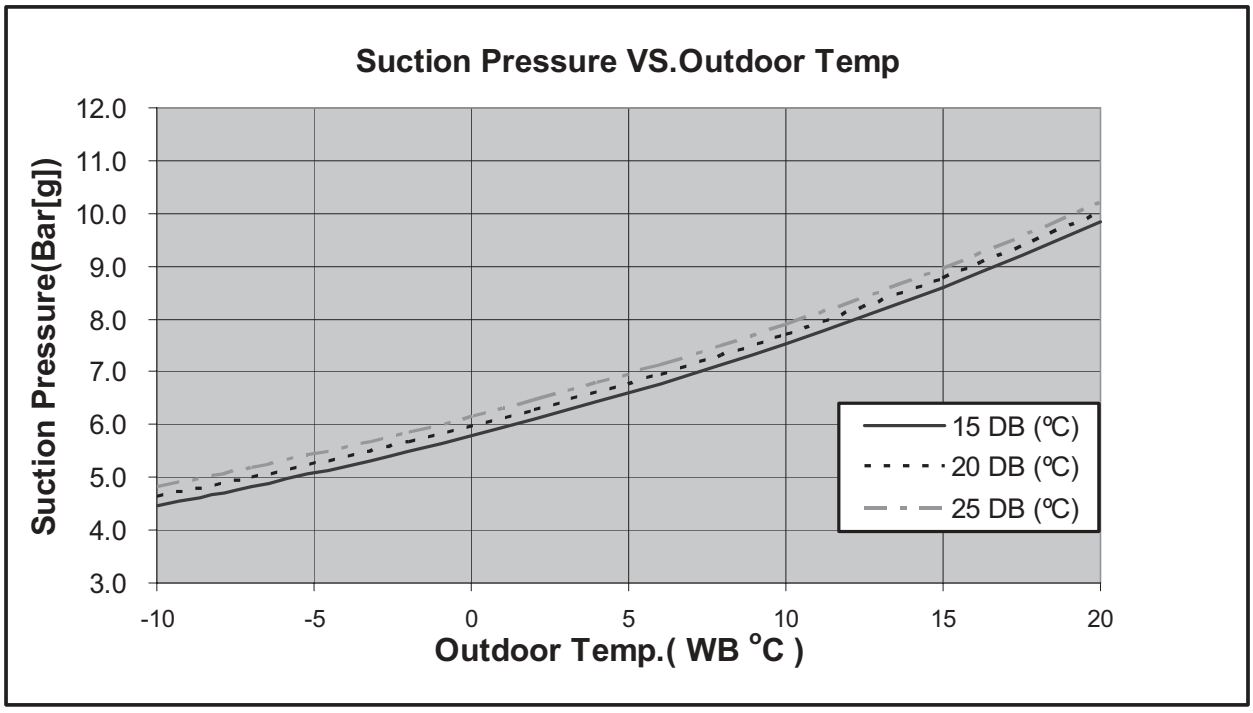
5.3.1 Cooling.





5.3.2 Heating.


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
34
32
30
28
26
24
22
20
18
16
14
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (°C)
20 DB (°C)
15 DB (°C)


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (°C)
20 DB (°C)
25 DB (°C)

5.4 FLO9N R410A

5.4.1 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	2.87	2.97	3.04	3.11	3.16
	SC	1.96	2.04	2.12	2.18	2.22
	PI	0.59	0.59	0.59	0.59	0.60
20(1)	TC	2.77	2.92	3.02	3.09	3.14
	SC	1.92	2.02	2.11	2.17	2.21
	PI	0.64	0.64	0.64	0.65	0.65
25	TC	2.62	2.83	2.98	3.07	3.14
	SC	1.87	1.98	2.09	2.15	2.19
	PI	0.69	0.70	0.70	0.70	0.71
30	TC	2.45	2.67	2.89	2.99	3.08
	SC	1.81	1.93	2.05	2.11	2.15
	PI	0.74	0.76	0.76	0.77	0.78
35	TC	2.27	2.47	2.72	2.86	2.99
	SC	1.72	1.85	2.00	2.06	2.10
	PI	0.80	0.82	0.83	0.84	0.84
40	TC	2.07	2.25	2.45	2.68	2.82
	SC	1.62	1.75	1.89	1.95	1.99
	PI	0.87	0.88	0.89	0.91	0.91
46	TC	1.79	1.96	2.16	2.38	2.57
	SC	1.50	1.60	1.73	1.79	1.83
	PI	0.95	0.96	0.98	1.00	1.01

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.4.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	1.58	0.68	1.52	0.72	1.46	0.76
-7	1.70	0.70	1.64	0.74	1.58	0.78
-2	1.80	0.71	1.74	0.75	1.68	0.79
2	2.19	0.74	2.10	0.79	2.01	0.83
6	3.09	0.79	**3.00**	**0.85**	2.90	0.90
10	3.36	0.84	3.27	0.90	3.18	0.96
15	3.63	0.88	3.54	0.94	3.45	1.00
20	3.83	0.90	3.74	0.98	3.63	1.05

* the above chart includes the weighted deicing infleuence.

LEGEND

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

5.5 Capacity Correction Factor Due to Tubing Length

5.5.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.961	0.950	---	---	---	---	---

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

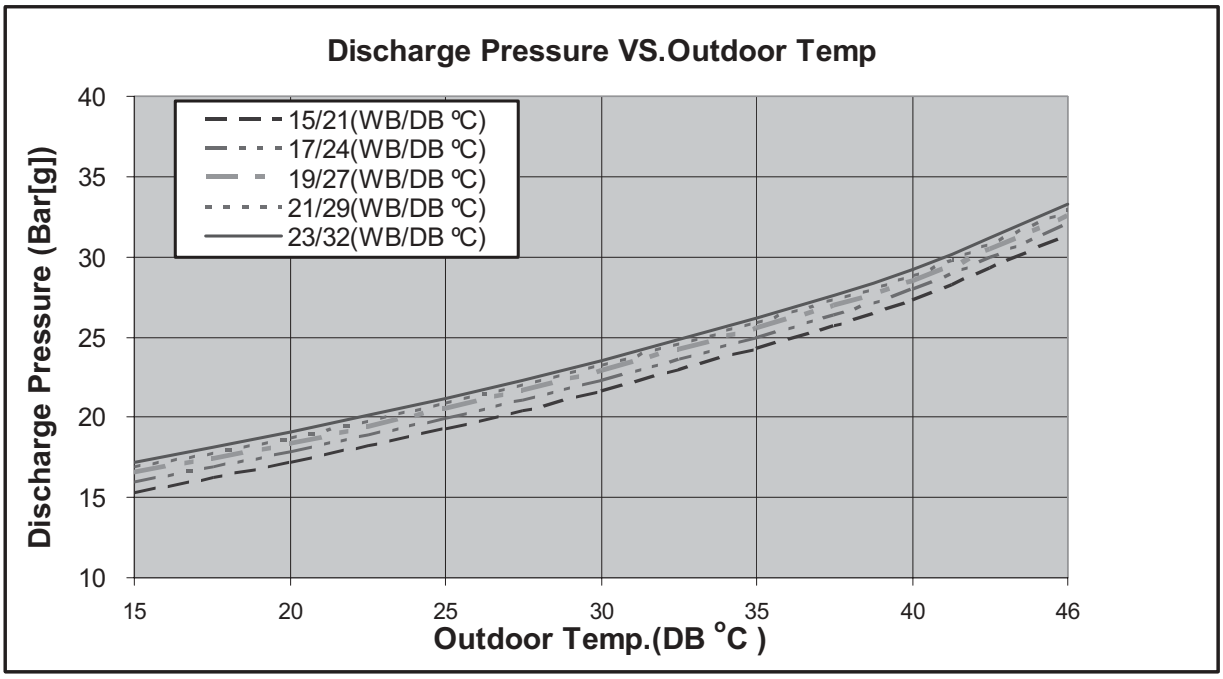
5.5.2 Heating

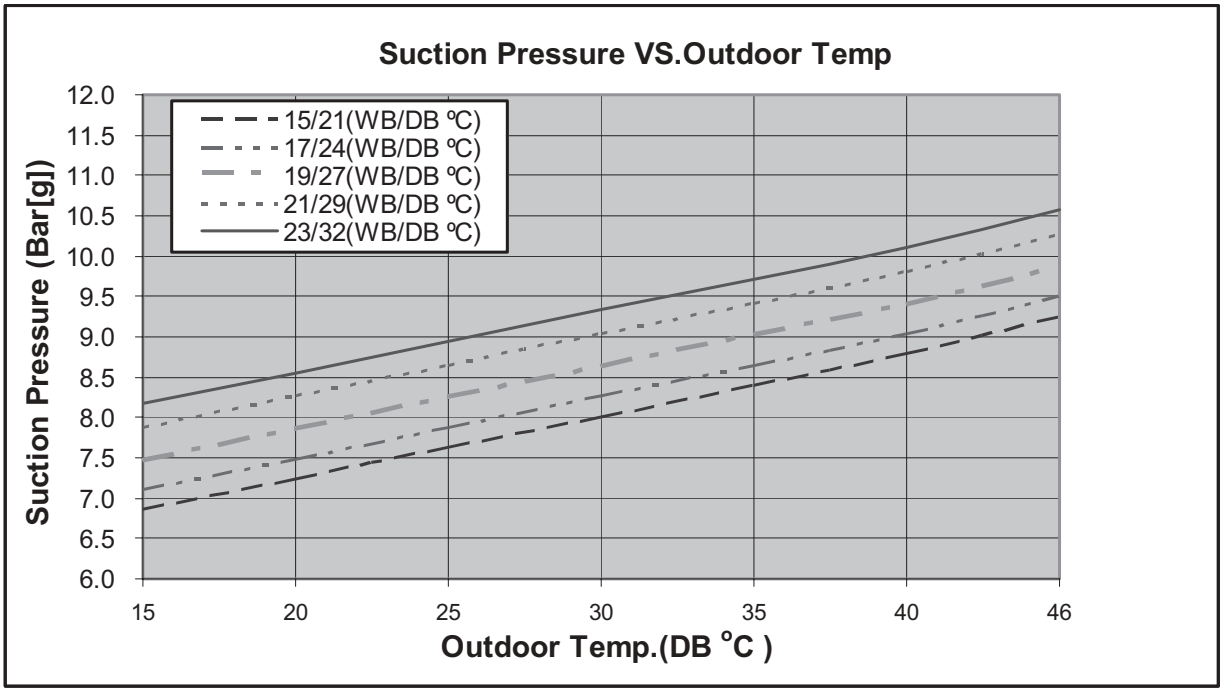
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.05	**1**	0.975	0.961	---	---	---	---	---

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

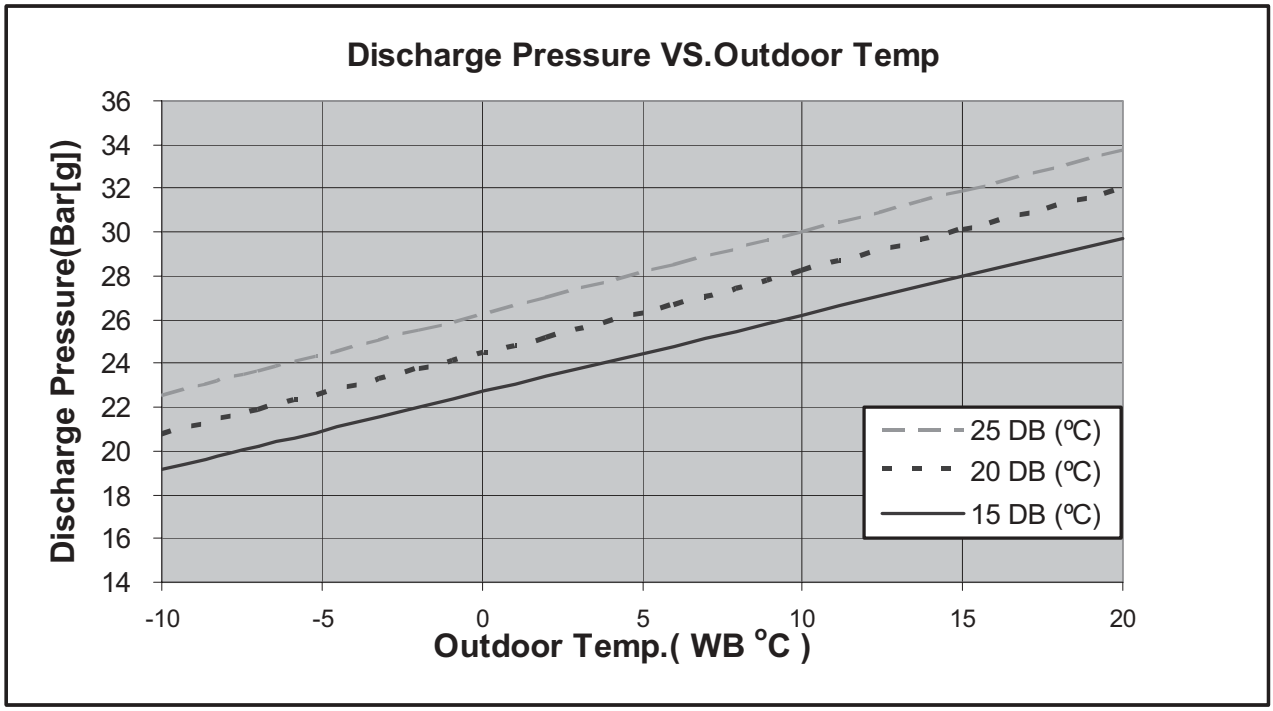
5.6 Pressure Curves.

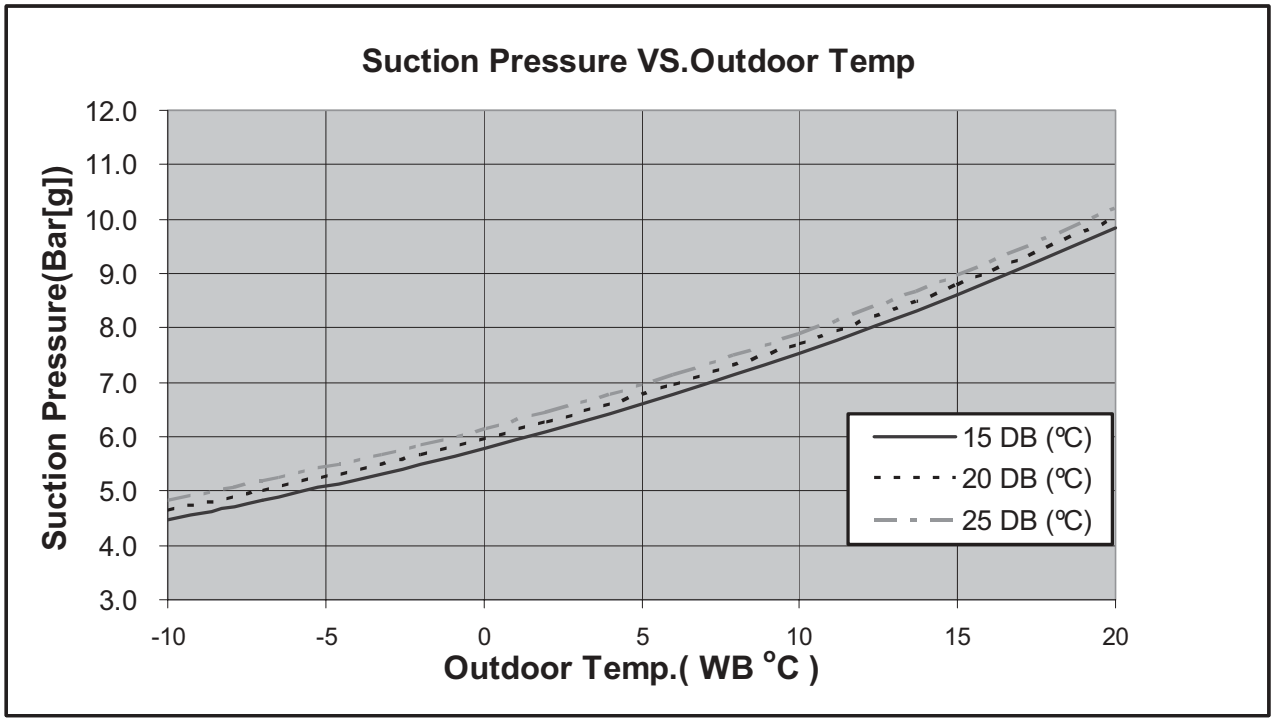
5.6.1 Cooling.





5.6.2 Heating.


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
36
34
32
30
28
26
24
22
20
18
16
14
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (℃)
20 DB (℃)
15 DB (℃)


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (℃)
20 DB (℃)
25 DB (℃)

5.7 FLO12N R410A

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	3.83	3.96	4.06	4.15	4.22
	SC	2.67	2.79	2.90	2.97	3.02
	PI	0.79	0.80	0.80	0.80	0.80
20(1)	TC	3.70	3.90	4.02	4.12	4.19
	SC	2.62	2.76	2.88	2.96	3.02
	PI	0.86	0.87	0.87	0.87	0.87
25	TC	3.50	3.78	3.98	4.10	4.20
	SC	2.55	2.71	2.86	2.94	2.99
	PI	0.93	0.94	0.94	0.95	0.96
30	TC	3.28	3.57	3.85	3.99	4.11
	SC	2.47	2.63	2.79	2.88	2.93
	PI	1.01	1.02	1.03	1.04	1.05
35	TC	3.03	3.29	3.63	3.81	3.99
	SC	2.35	2.52	2.73	2.81	2.86
	PI	1.08	1.10	1.12	1.13	1.13
40	TC	2.76	3.00	3.28	3.58	3.77
	SC	2.22	2.39	2.58	2.66	2.72
	PI	1.17	1.19	1.21	1.22	1.23
46	TC	2.39	2.62	2.88	3.18	3.42
	SC	2.04	2.19	2.35	2.44	2.49
	PI	1.28	1.30	1.33	1.35	1.36

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.7.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	2.10	0.91	2.02	0.97	1.94	1.02
-7	2.26	0.93	2.18	0.99	2.10	1.04
-2	2.40	0.95	2.32	1.00	2.24	1.06
2	2.92	0.99	2.80	1.05	2.68	1.12
6	4.12	1.07	**4.00**	**1.14**	3.86	1.21
10	4.48	1.13	5.00	1.20	4.24	1.29
15	4.84	1.17	4.72	1.27	4.60	1.35
20	5.10	1.21	4.98	1.31	4.84	1.41

* the above chart includes the weighted deicing infleuence.

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 Capacity Correction Factor Due to Tubing Length

5.8.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.961	0.948	---	---	---	---	---

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

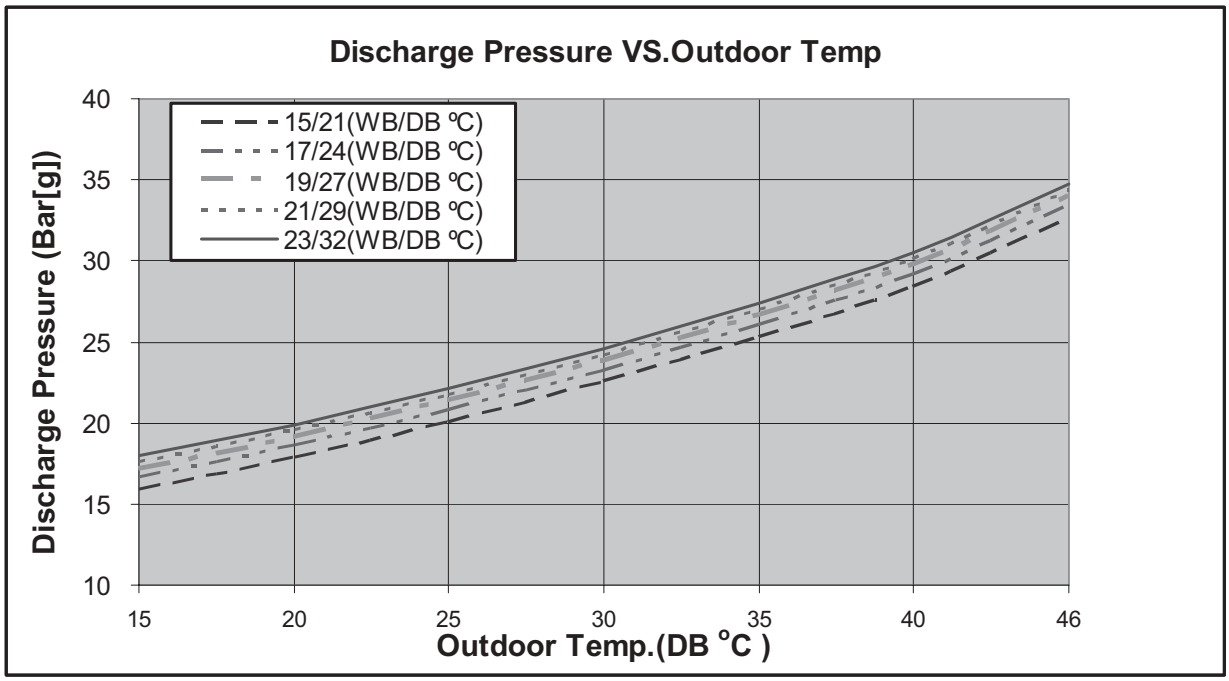
5.8.2 Heating

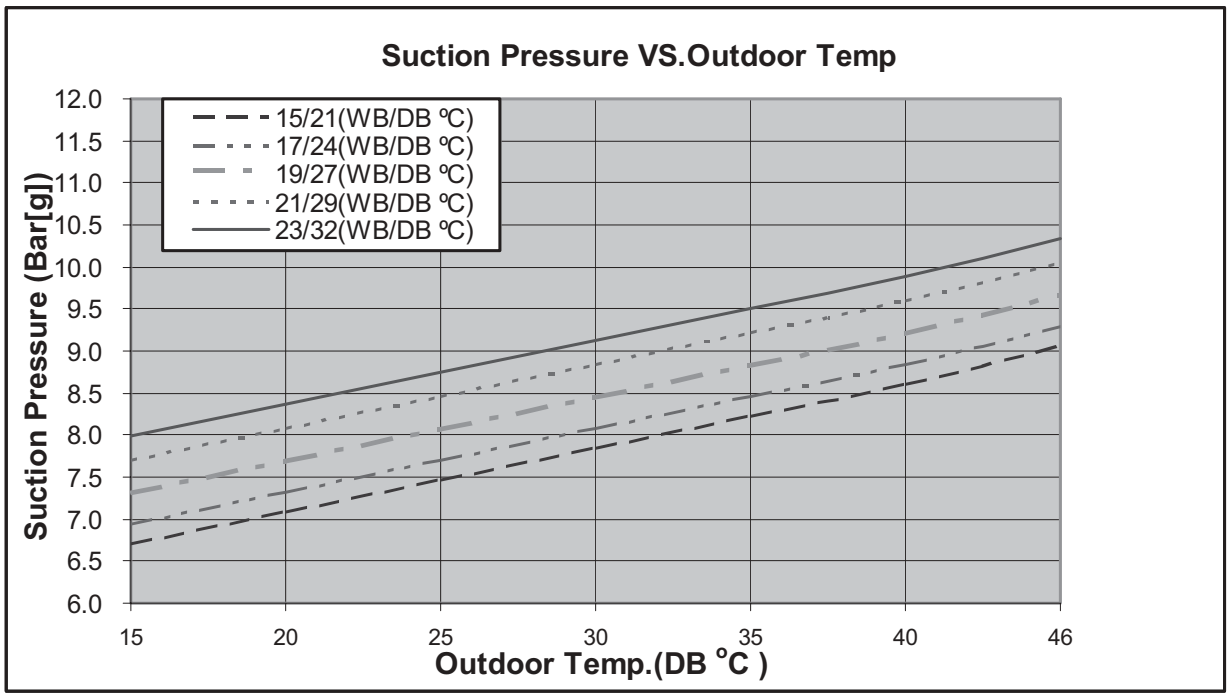
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.05	**1**	0.975	0.963	---	---	---	---	---

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

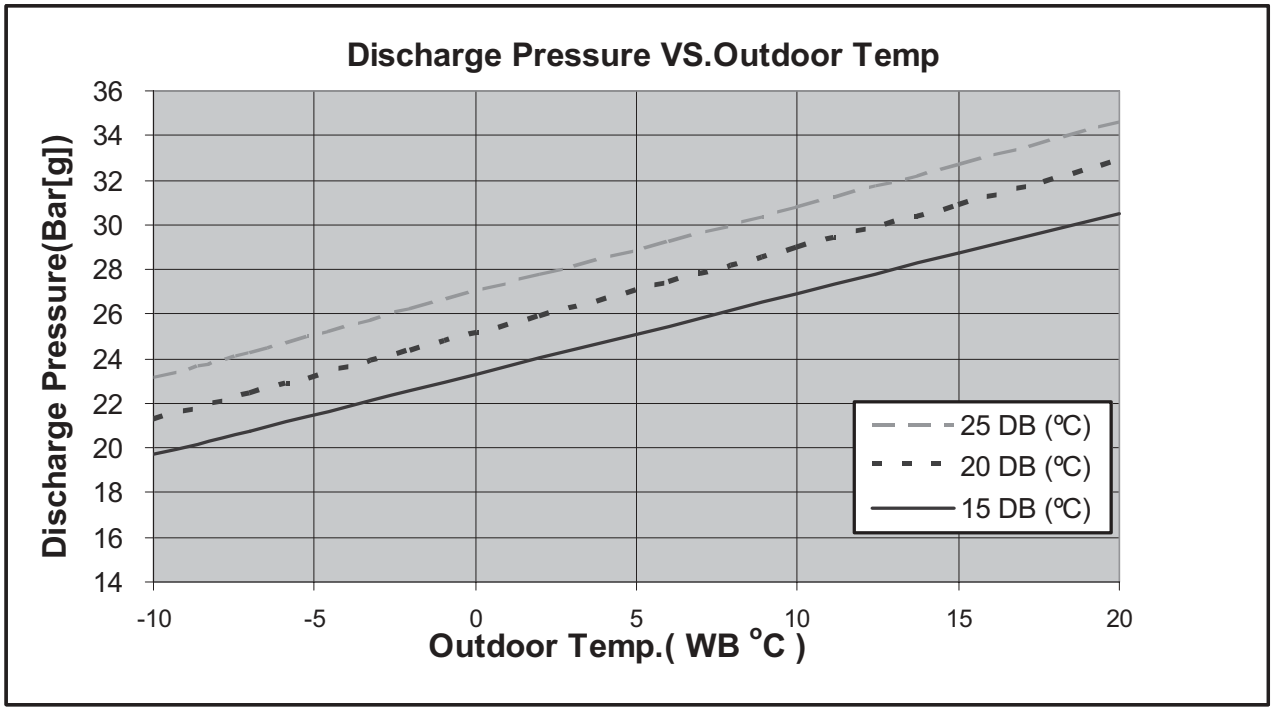
5.9 Pressure Curves.

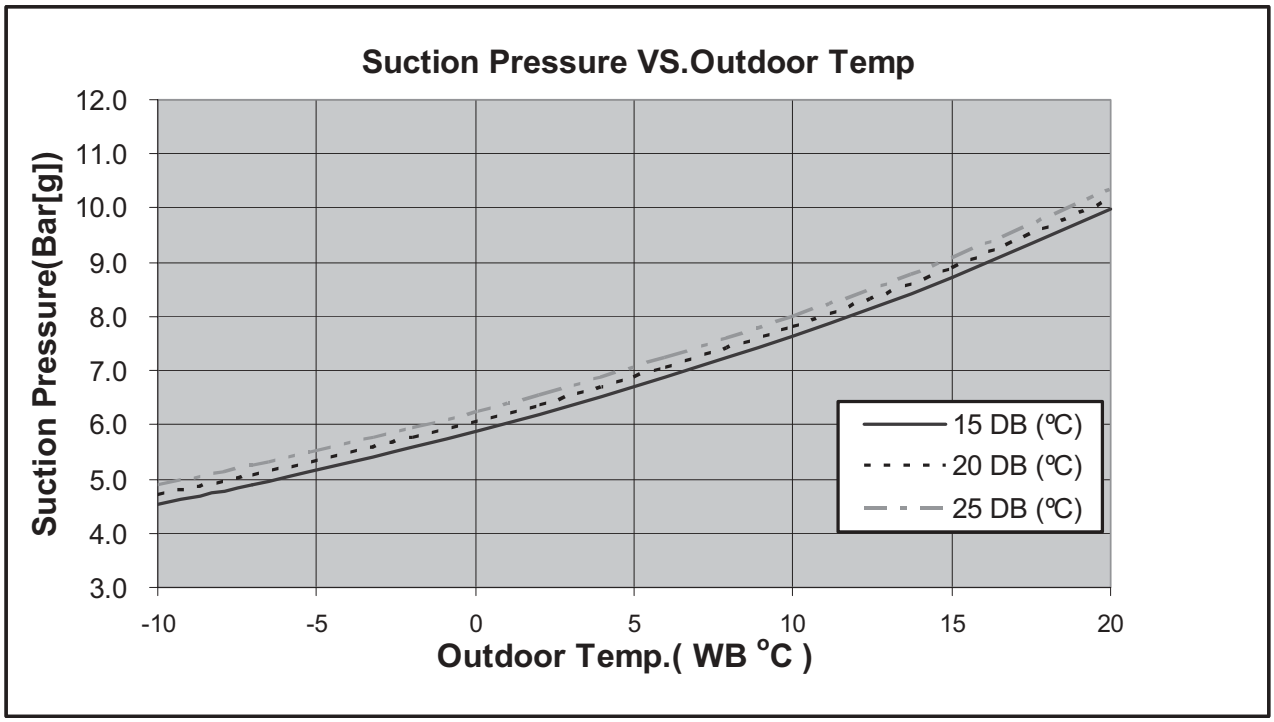
5.9.1 Cooling.





5.9.2 Heating.


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
36
34
32
30
28
26
24
22
20
18
16
14
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (℃)
20 DB (℃)
15 DB (℃)


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
15 DB (℃)
20 DB (℃)
25 DB (℃)

5.10 FLO 14 N R410A

5.10.1 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	4.22	4.37	4.47	4.58	4.65
	SC	2.80	2.92	3.03	3.11	3.17
	PI	0.94	0.94	0.95	0.95	0.95
20(1)	TC	4.08	4.30	4.44	4.54	4.62
	SC	2.75	2.89	3.02	3.10	3.16
	PI	1.02	1.03	1.03	1.04	1.04
25	TC	3.86	4.17	4.38	4.51	4.62
	SC	2.67	2.84	2.99	3.08	3.14
	PI	1.11	1.11	1.12	1.13	1.14
30	TC	3.61	3.93	4.25	4.40	4.53
	SC	2.59	2.75	2.93	3.01	3.07
	PI	1.19	1.21	1.22	1.23	1.24
35	TC	3.34	3.63	4.00	4.20	4.40
	SC	2.46	2.64	2.86	2.94	3.00
	PI	1.29	1.31	1.33	1.34	1.35
40	TC	3.04	3.31	3.61	3.95	4.15
	SC	2.32	2.50	2.71	2.79	2.85
	PI	1.39	1.41	1.43	1.45	1.47
46	TC	2.64	2.88	3.17	3.50	3.77
	SC	2.14	2.29	2.47	2.55	2.61
	PI	1.52	1.54	1.57	1.60	1.62

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.10.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	2.35	1.12	2.26	1.19	2.17	1.25
-7	2.53	1.15	2.44	1.21	2.35	1.28
-2	2.69	1.16	2.60	1.23	2.51	1.30
2	3.27	1.22	3.14	1.30	3.00	1.37
6	4.61	1.31	**4.48**	**1.40**	4.32	1.49
10	5.02	1.38	4.88	1.48	4.75	1.58
15	5.42	1.44	5.29	1.55	5.15	1.65
20	5.71	1.48	5.58	1.61	5.42	1.74

* the above chart includes the weighted deicing infleuence.

LEGEND

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

5.11 Capacity Correction Factor Due to Tubing Length

5.11.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.984	0.946	---	---	---	---	---

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

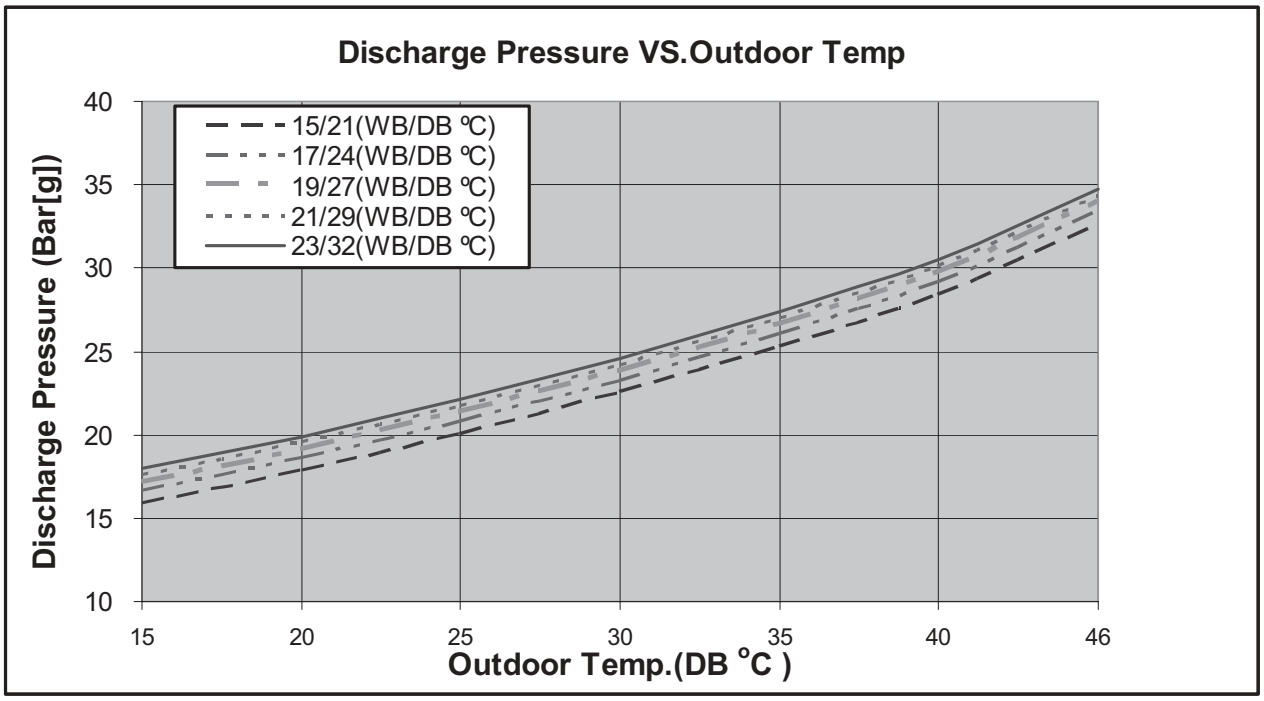
5.11.2 Heating

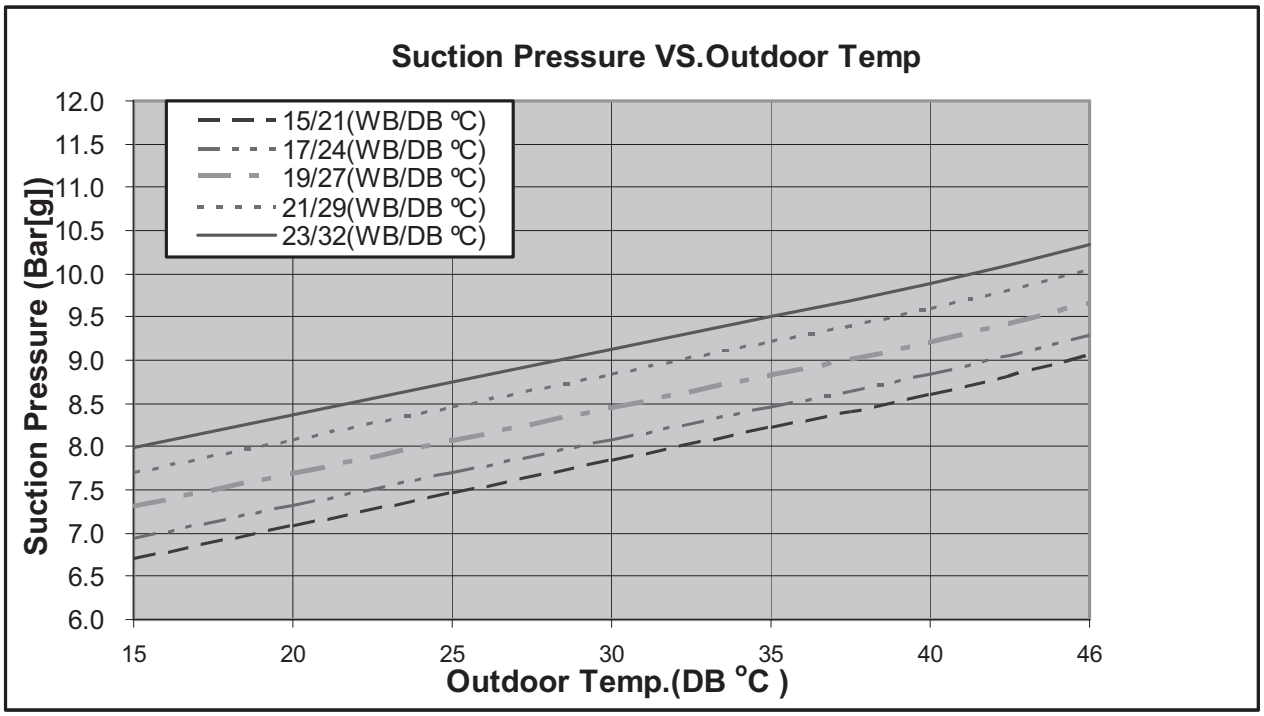
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.03	**1**	0.995	0.971	---	---	---	---	---

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

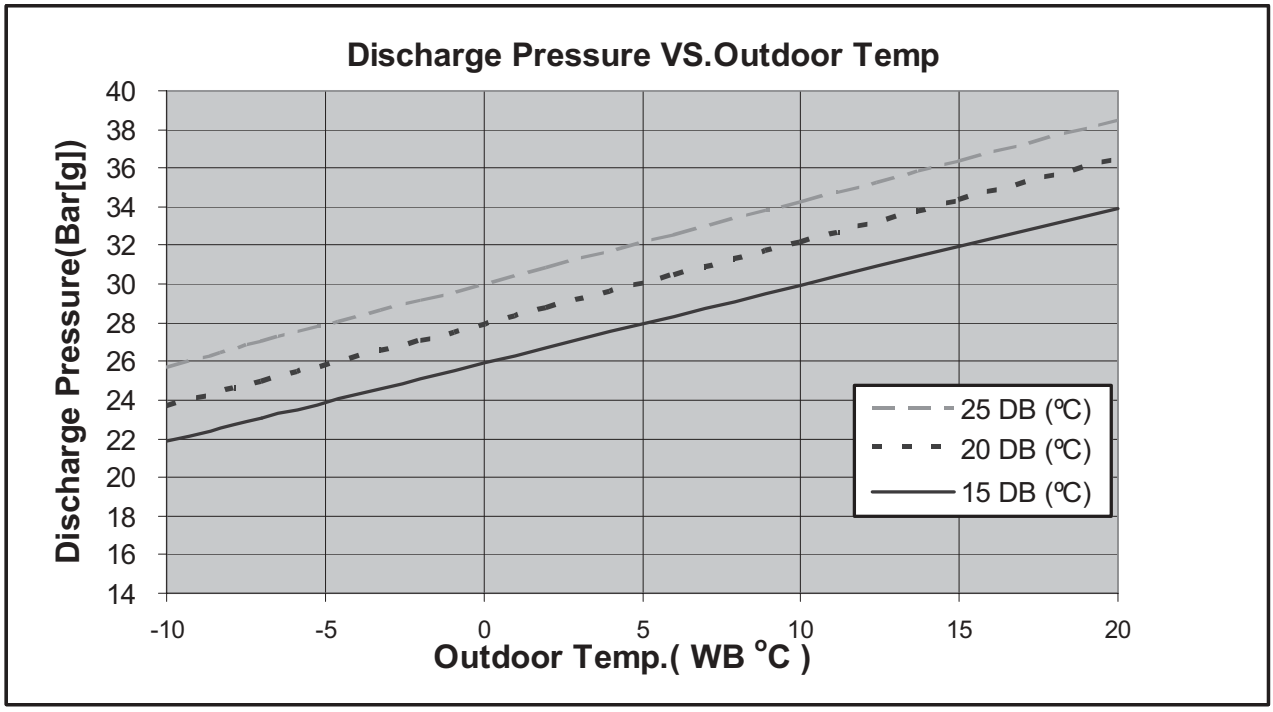
5.12 Pressure Curves.

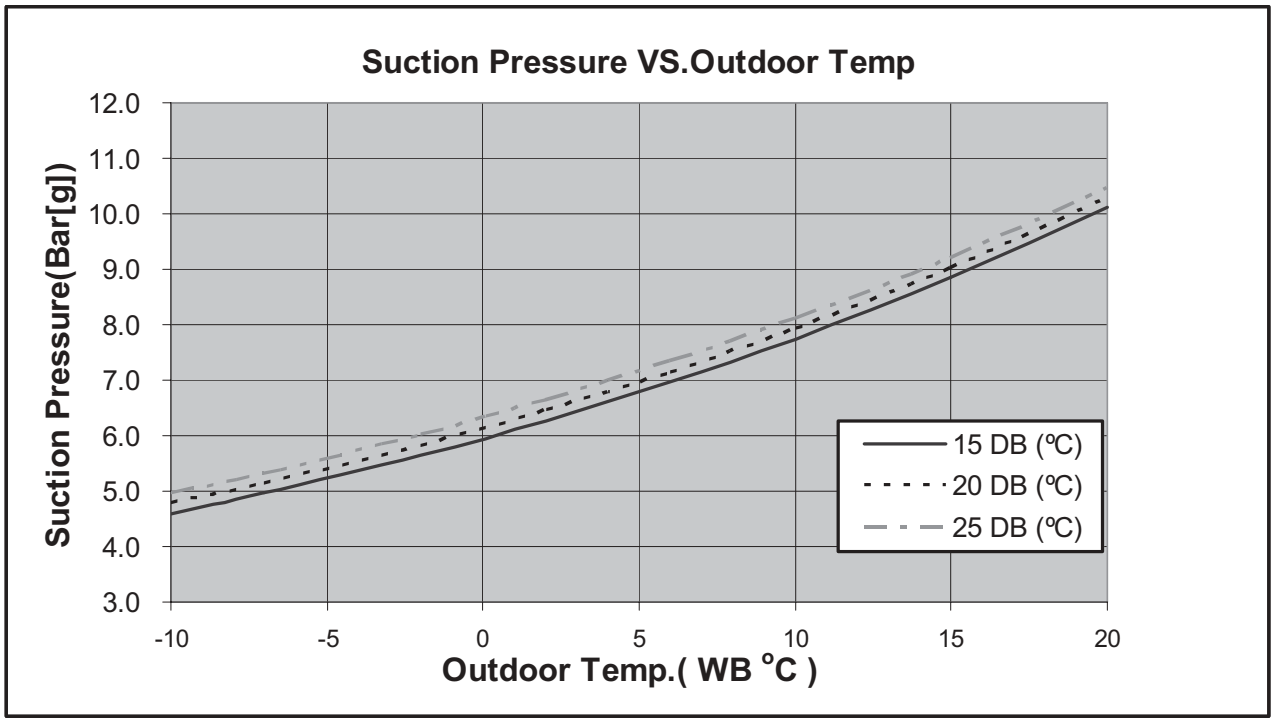
5.12.1 Cooling.





5.12.2 Heating.





5.13 FLO 18 N R410A

5.13.1 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	5.64	5.84	5.98	6.12	6.21
	SC	3.87	4.03	4.19	4.30	4.38
	PI	1.18	1.18	1.18	1.18	1.19
20(1)	TC	5.46	5.75	5.93	6.07	6.18
	SC	3.79	4.00	4.17	4.28	4.36
	PI	1.28	1.28	1.29	1.29	1.30
25	TC	5.16	5.57	5.86	6.04	6.18
	SC	3.69	3.92	4.13	4.25	4.33
	PI	1.38	1.39	1.40	1.41	1.42
30	TC	4.83	5.26	5.68	5.88	6.05
	SC	3.58	3.80	4.04	4.16	4.24
	PI	1.49	1.51	1.52	1.54	1.55
35	TC	4.47	4.85	5.35	5.62	5.88
	SC	3.40	3.65	3.95	4.06	4.14
	PI	1.61	1.63	1.66	1.67	1.68
40	TC	4.06	4.42	4.83	5.28	5.55
	SC	3.21	3.45	3.74	3.86	3.93
	PI	1.73	1.76	1.79	1.81	1.83
46	TC	3.53	3.86	4.24	4.68	5.05
	SC	2.95	3.16	3.41	3.53	3.60
	PI	1.89	1.92	1.97	1.99	2.02

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.13.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	2.84	1.25	2.73	1.33	2.62	1.40
-7	3.05	1.28	2.94	1.35	2.84	1.42
-2	3.24	1.29	3.13	1.37	3.02	1.45
2	3.94	1.36	3.78	1.44	3.62	1.53
6	5.56	1.46	**5.40**	**1.56**	5.21	1.66
10	6.05	1.54	5.89	1.65	5.72	1.76
15	6.53	1.61	6.37	1.73	6.21	1.84
20	6.89	1.65	6.72	1.79	6.53	1.93

* the above chart includes the weighted deicing infleuence.

LEGEND

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

5.14 Capacity Correction Factor Due to Tubing Length

5.14.1 Cooling

TOTAL TUBING LENGTH								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.99	0.975	0.965	0.950	---	---	---

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

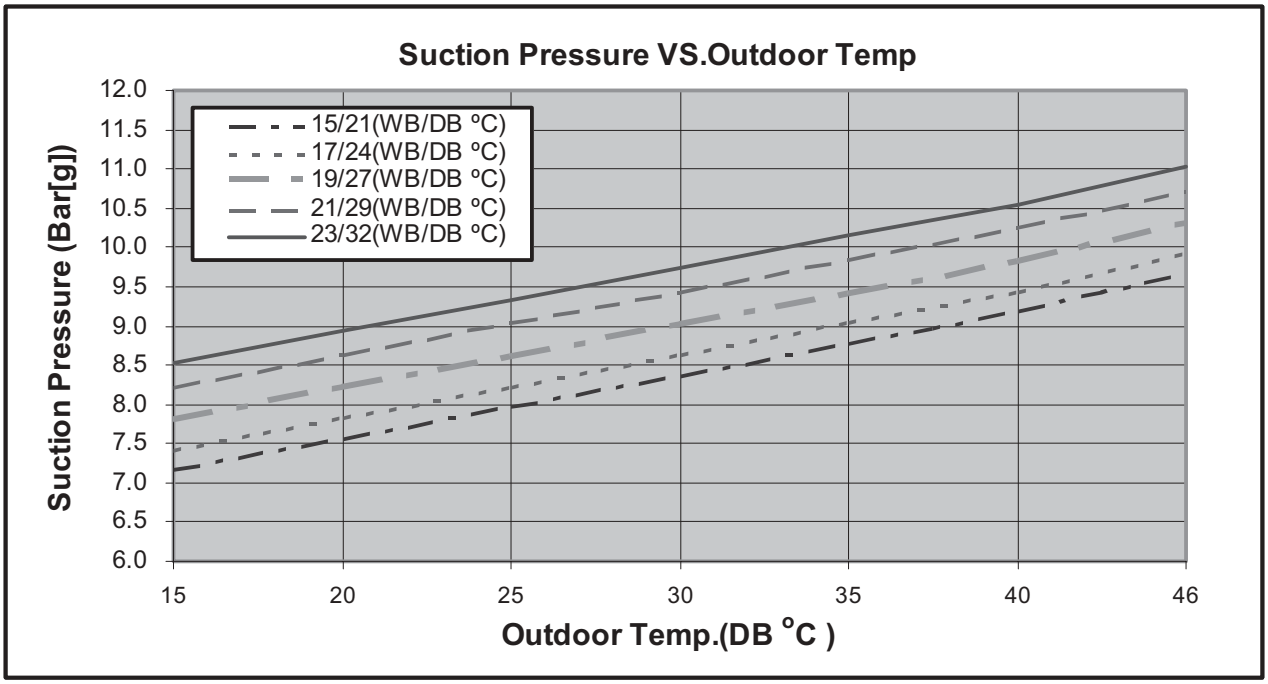
5.14.2 Heating

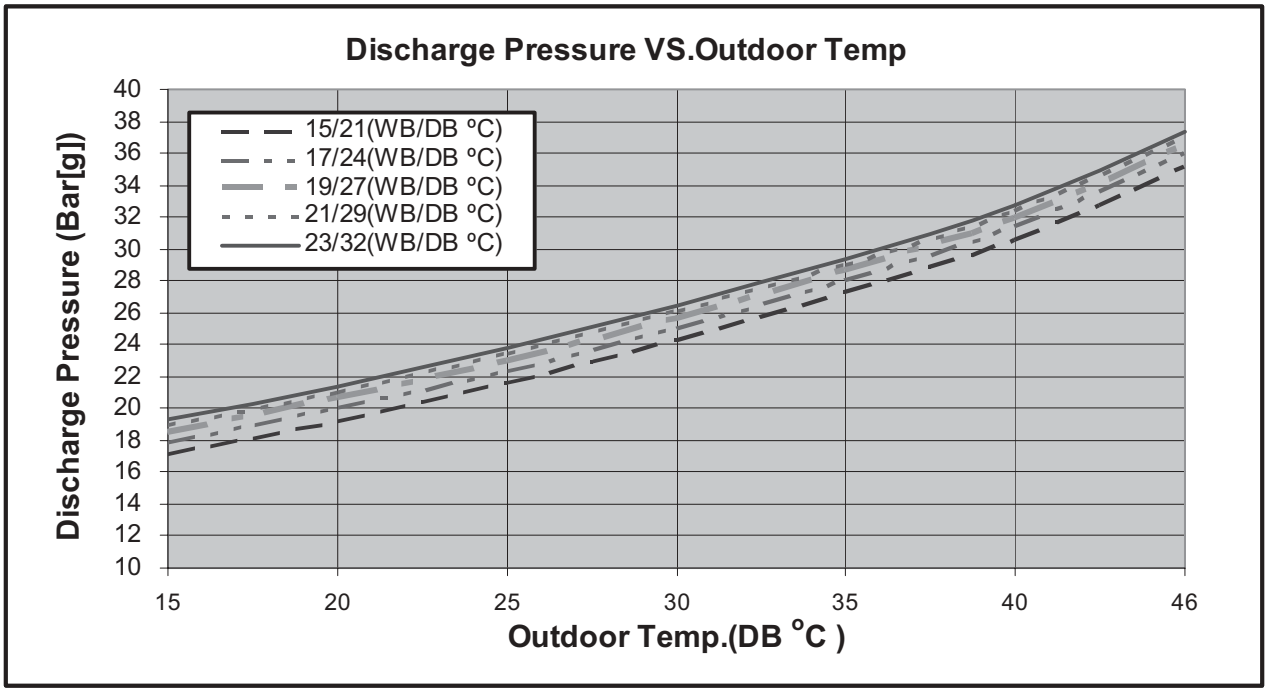
TOTAL TUBING LENGTH								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.05	**1**	1	0.993	0.988	0.978	---	---	---

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

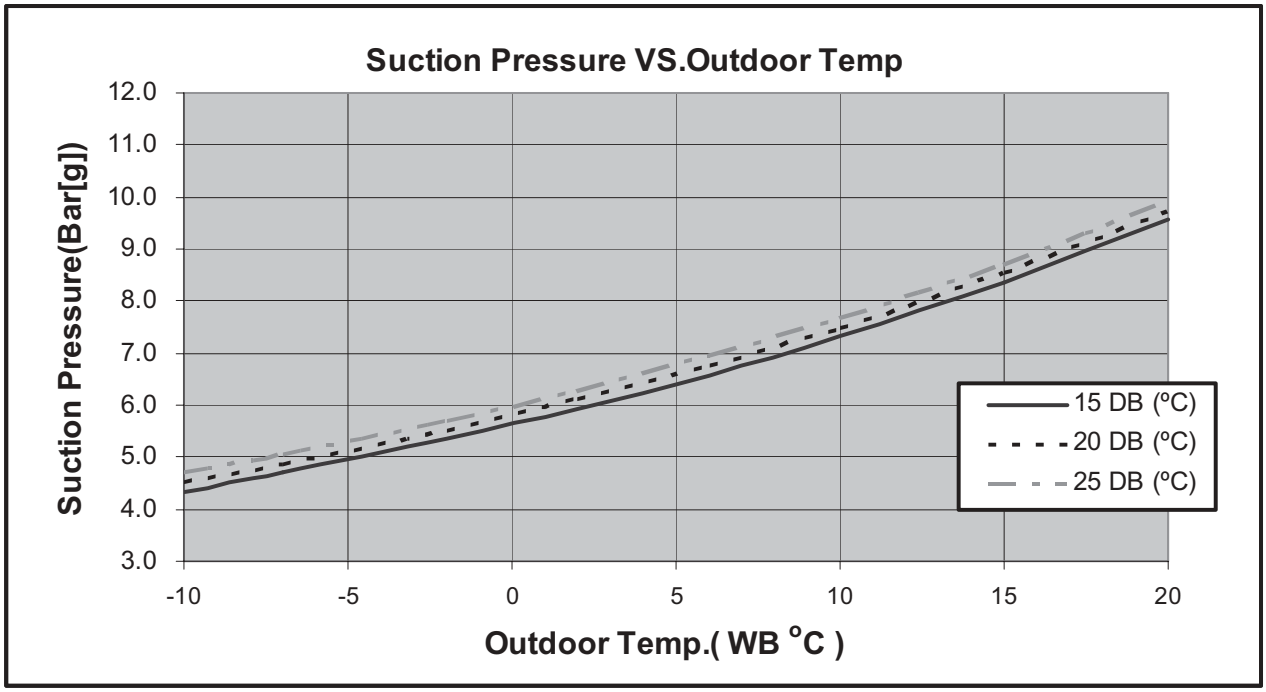
5.15 Pressure Curves.

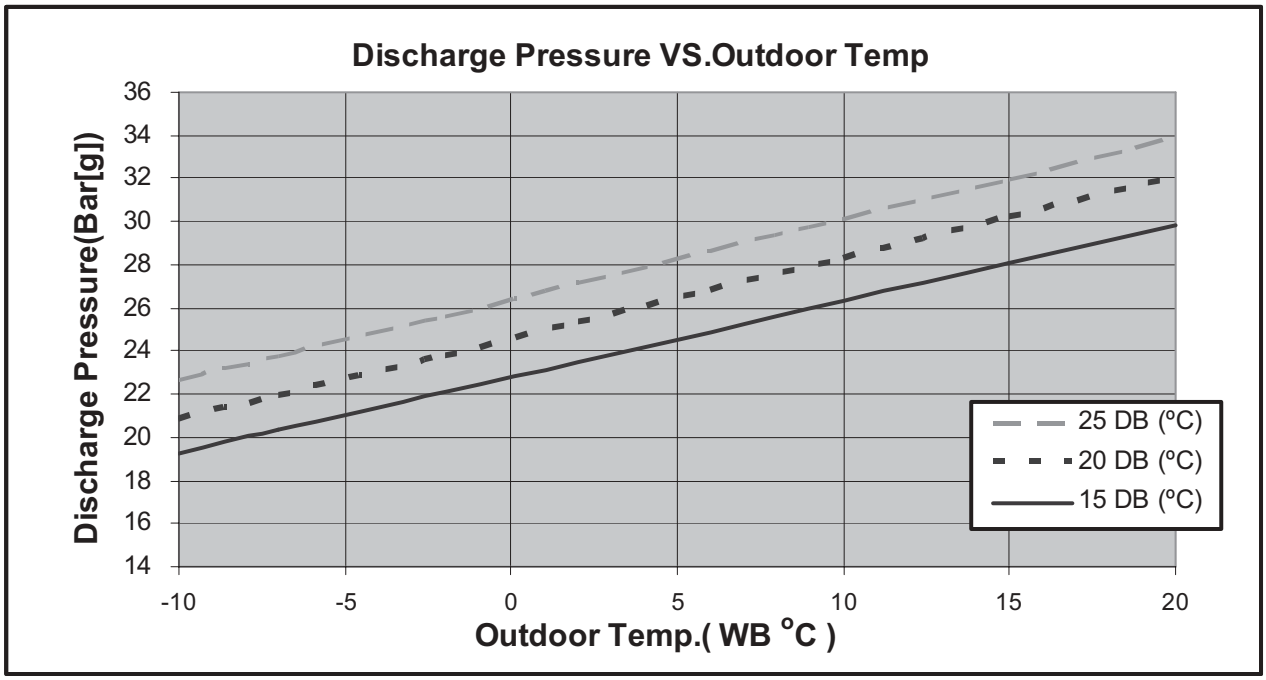
5.15.1 Cooling.





5.15.2 Heating.





5.16 FLO 24 N 1PH/3PH R410A

5.16.1 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	7.14	7.39	7.57	7.74	7.86
	SC	4.80	5.00	5.20	5.33	5.43
	PI	1.59	1.59	1.59	1.60	1.61
20(1)	TC	6.90	7.28	7.51	7.68	7.82
	SC	4.70	4.96	5.17	5.31	5.41
	PI	1.72	1.73	1.74	1.75	1.75
25	TC	6.53	7.05	7.42	7.64	7.83
	SC	4.58	4.86	5.13	5.28	5.37
	PI	1.86	1.88	1.89	1.90	1.91
30	TC	6.11	6.65	7.19	7.44	7.66
	SC	4.44	4.72	5.02	5.16	5.26
	PI	2.01	2.04	2.06	2.07	2.09
35	TC	5.66	6.14	6.77	7.11	7.45
	SC	4.22	4.52	4.90	5.04	5.14
	PI	2.17	2.20	2.24	2.26	2.27
40	TC	5.14	5.60	6.11	6.68	7.02
	SC	3.98	4.28	4.64	4.78	4.88
	PI	2.34	2.37	2.41	2.44	2.47
46	TC	4.46	4.88	5.37	5.93	6.39
	SC	3.66	3.93	4.23	4.37	4.47
	PI	2.55	2.59	2.65	2.69	2.72

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.16.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	4.09	1.92	3.93	2.04	3.78	6.34
-7	4.40	1.97	4.24	2.08	4.09	6.46
-2	4.67	1.99	4.52	2.11	4.36	6.58
2	5.69	2.09	5.45	2.22	5.22	6.94
6	7.29	2.24	**7.08**	**2.40**	6.83	7.52
10	7.93	2.37	7.72	2.53	7.50	7.99
15	8.57	2.47	8.35	2.66	8.14	8.35
20	9.03	2.54	8.81	2.76	8.57	8.78

* the above chart includes the weighted deicing infleuence.

LEGEND

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

5.17 Capacity Correction Factor Due to Tubing Length

5.17.1 Cooling

TOTAL TUBING LENGTH								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.980	0.970	0.960	---	---	---	---

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

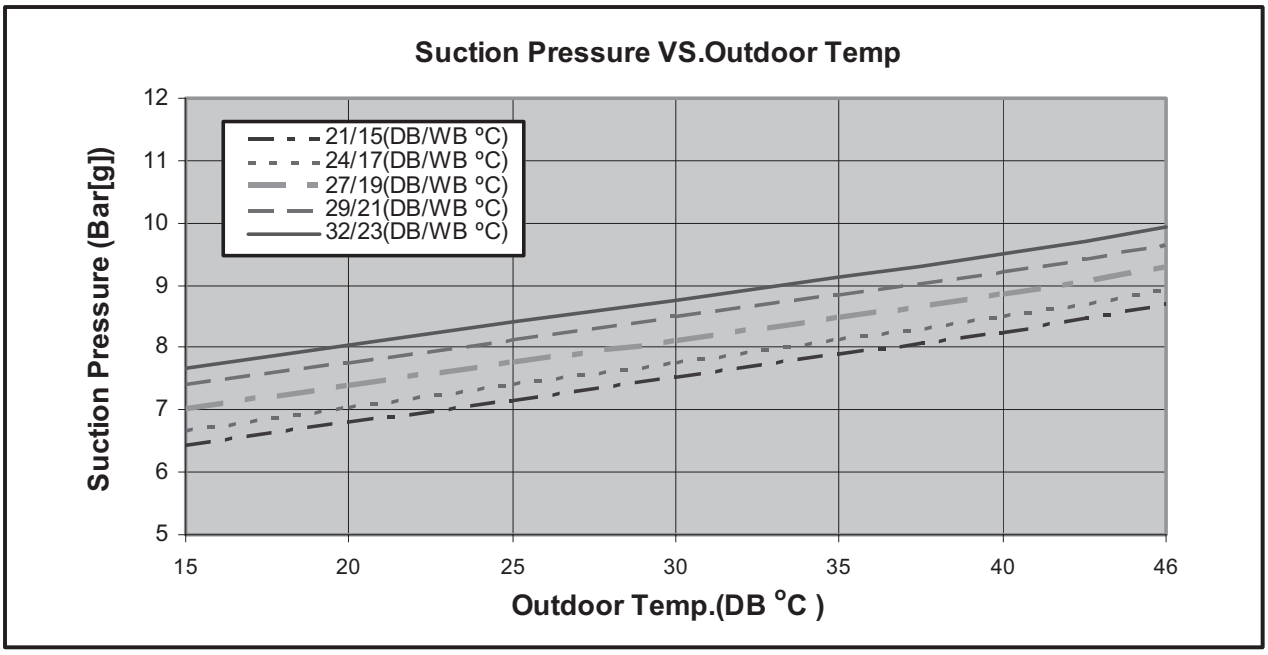
5.17.2 Heating

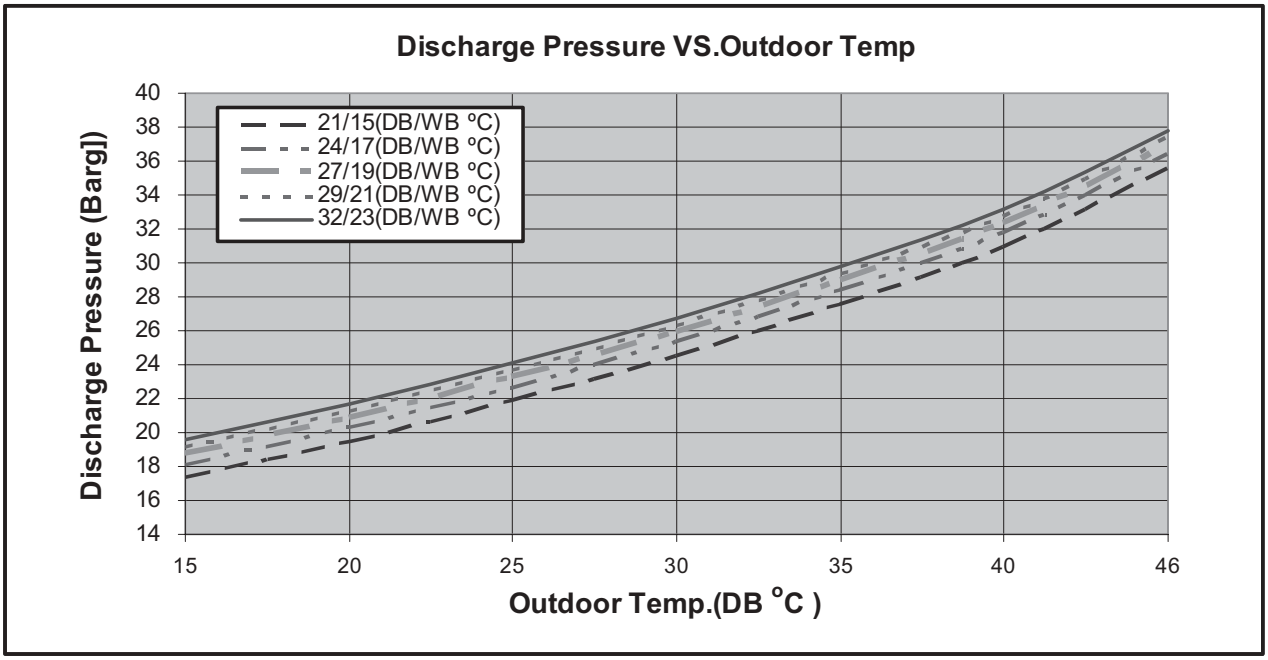
TOTAL TUBING LENGTH								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.990	0.990	0.980	---	---	---	---

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

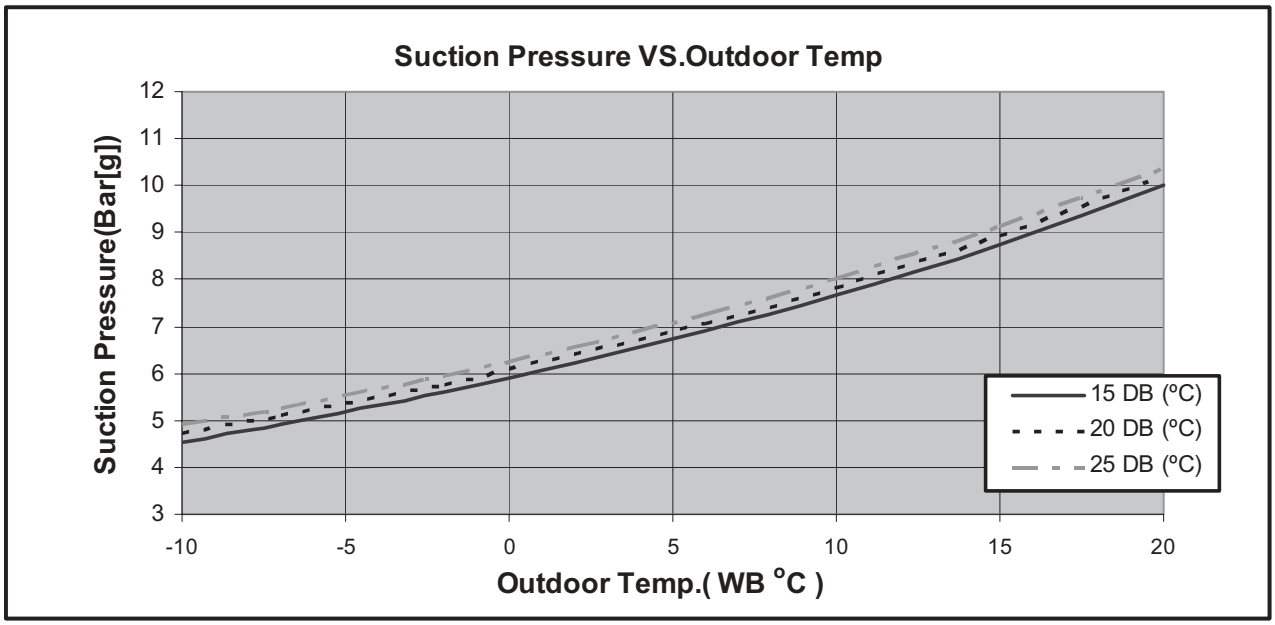
5.18 Pressure Curves.

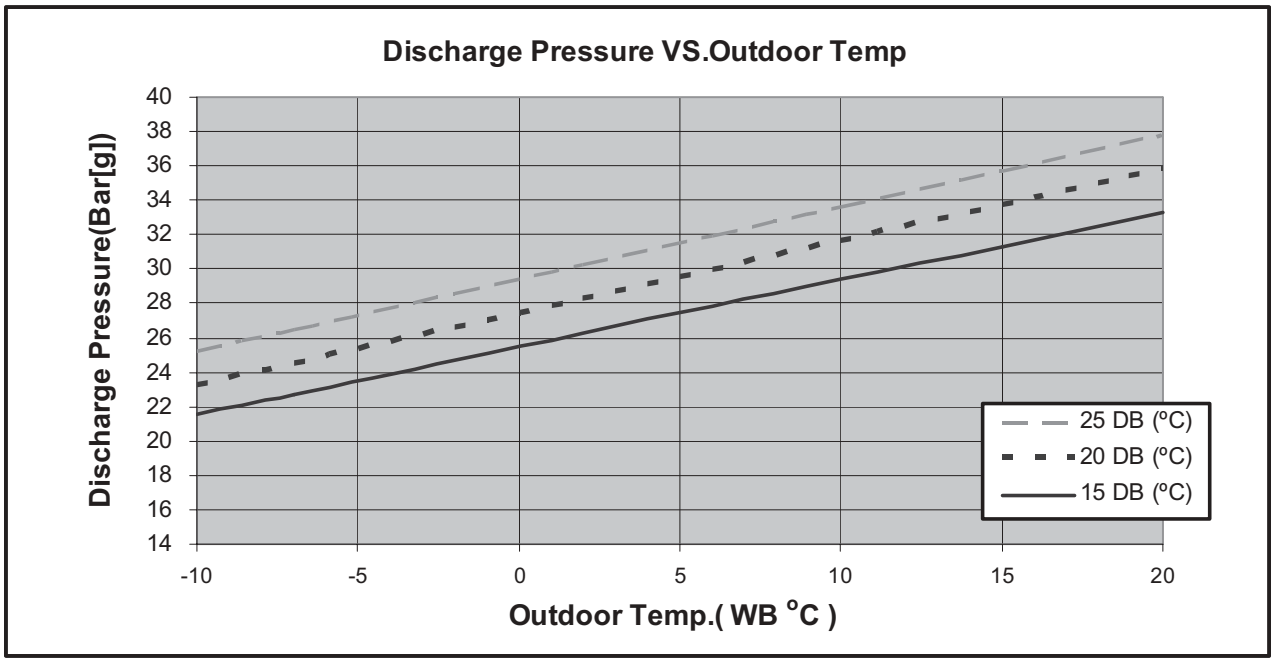
5.18.1 Cooling.





5.18.2 Heating.





5.19 FLO 30N 1PH R410A

5.19.1 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	9.13	9.45	9.68	9.91	10.06
	SC	5.88	6.13	6.37	6.53	6.65
	PI	2.18	2.19	2.19	2.20	2.21
20(1)	TC	8.83	9.31	9.60	9.83	10.00
	SC	5.76	6.07	6.33	6.51	6.63
	PI	2.37	2.38	2.39	2.40	2.40
25	TC	8.36	9.02	9.49	9.77	10.01
	SC	5.61	5.95	6.28	6.46	6.58
	PI	2.56	2.58	2.60	2.61	2.63
30	TC	7.81	8.51	9.19	9.52	9.80
	SC	5.43	5.78	6.14	6.32	6.44
	PI	2.76	2.80	2.83	2.85	2.88
35	TC	7.23	7.85	8.66	9.09	9.52
	SC	5.17	5.54	6.00	6.17	6.29
	PI	2.98	3.03	3.08	3.10	3.12
40	TC	6.58	7.16	7.81	8.54	8.98
	SC	4.87	5.24	5.68	5.86	5.98
	PI	3.22	3.26	3.32	3.36	3.39
46	TC	5.71	6.24	6.86	7.58	8.17
	SC	4.49	4.81	5.18	5.36	5.48
	PI	3.51	3.57	3.65	3.70	3.74

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 14).

5.19.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	5.24	2.38	5.04	2.54	4.84	2.67
-7	5.64	2.44	5.44	2.58	5.24	2.72
-2	5.99	2.47	5.79	2.62	5.59	2.77
2	7.29	2.59	6.99	2.76	6.69	2.92
6	9.35	2.79	**9.08**	**2.98**	8.76	3.16
10	10.17	2.94	9.90	3.14	9.62	3.36
15	10.99	3.07	10.71	3.31	10.44	3.52
20	11.58	3.16	11.30	3.43	10.99	3.70

* the above chart includes the weighted deicing infleuence.

LEGEND

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

5.20 Capacity Correction Factor Due to Tubing Length

5.20.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.980	0.970	0.960	0.950	0.940	---	---

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

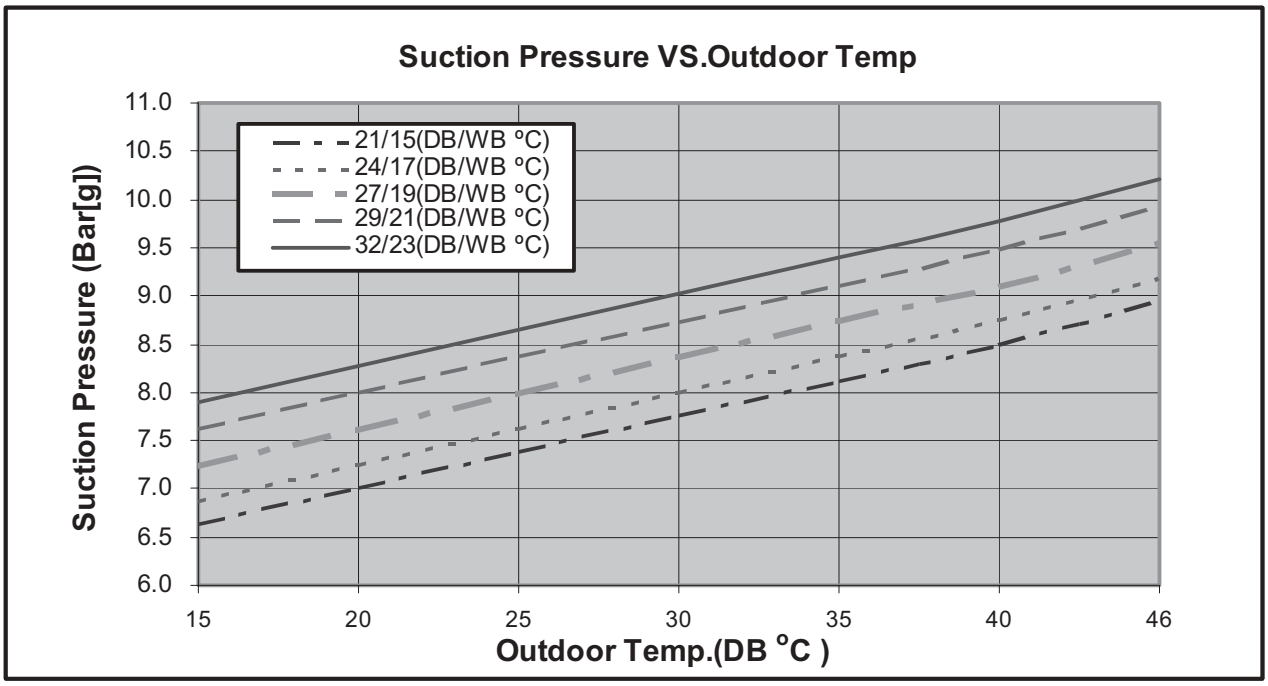
5.20.2 Heating

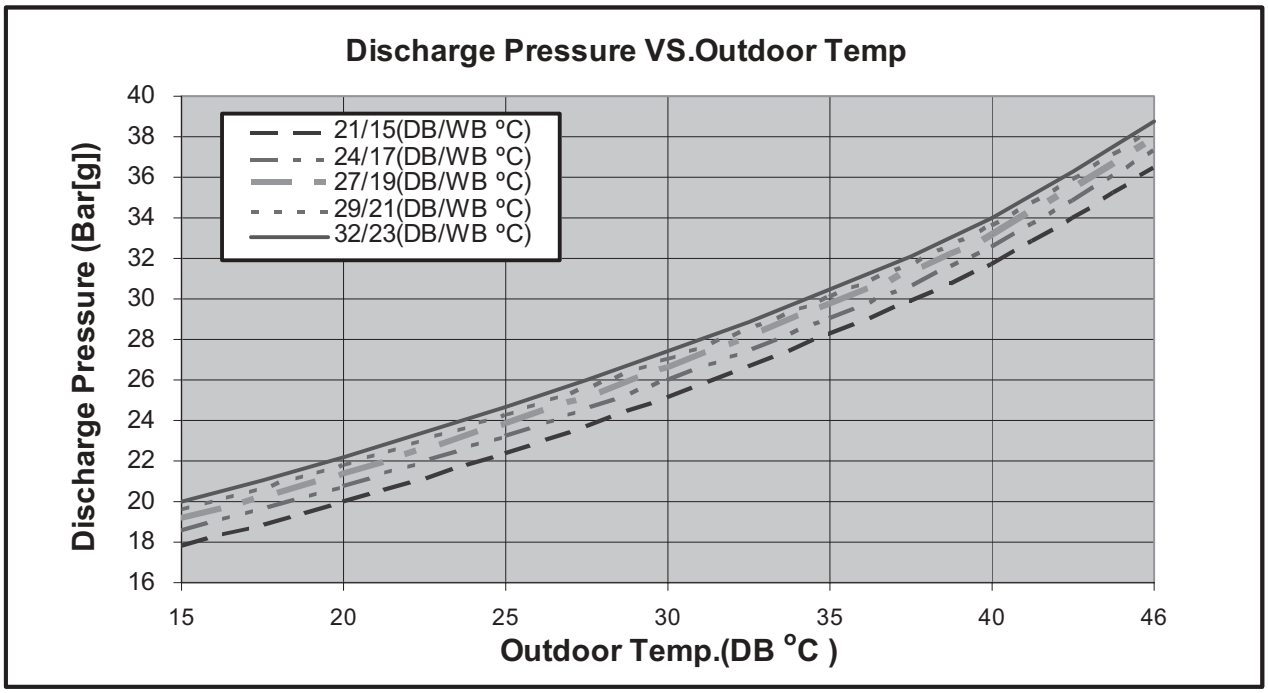
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.02	**1**	0.990	0.990	0.980	0.970	0.970	---	---

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

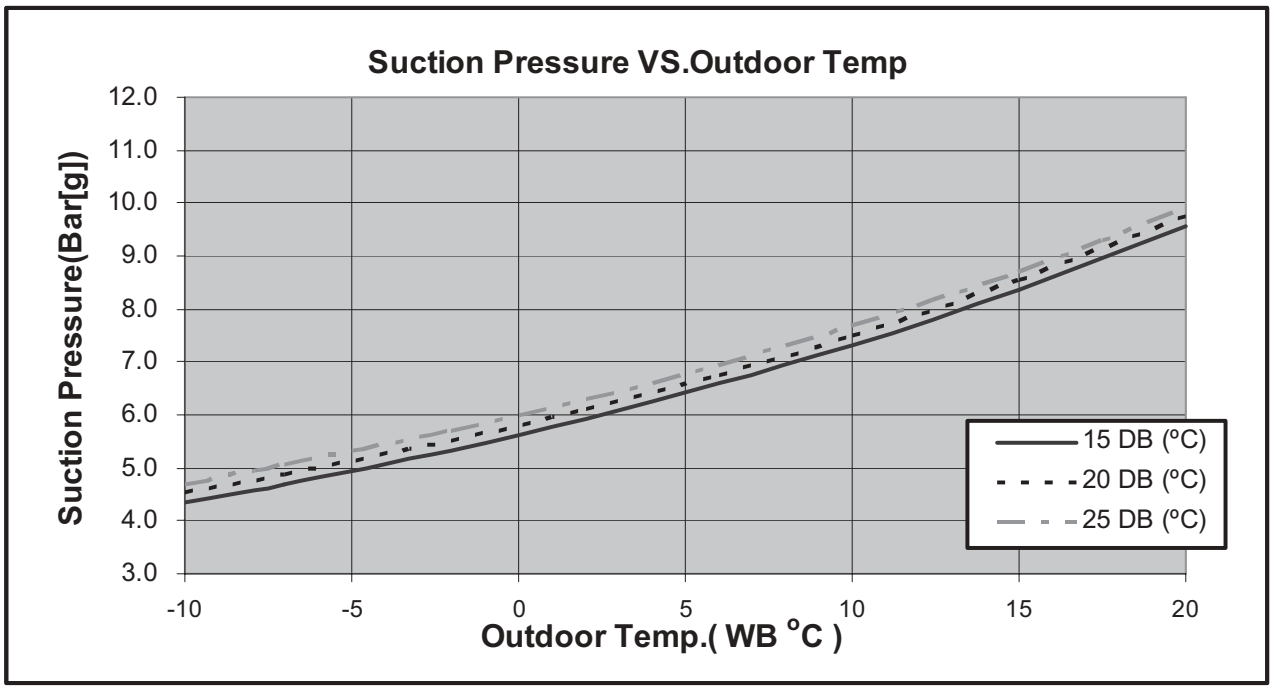
5.21 Pressure Curves.

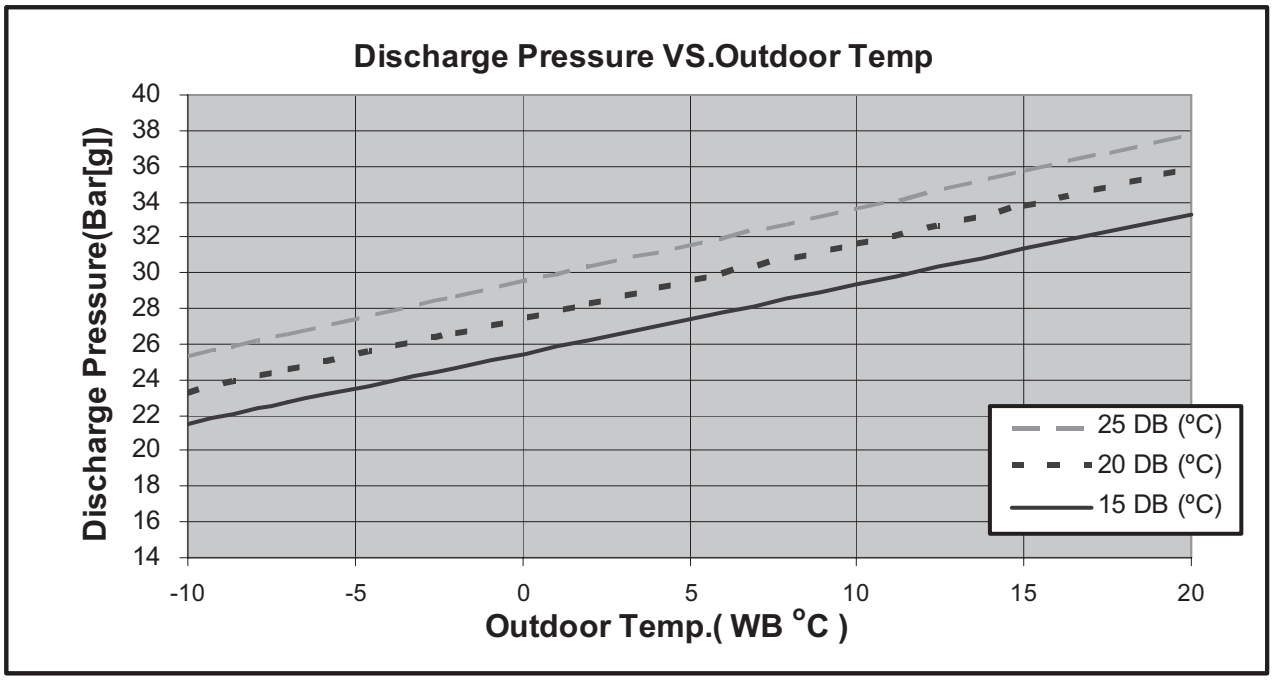
5.21.1 Cooling.





5.21.2 Heating.





5.22 FLO 30N 3PH R410A

5.22.1 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	9.14	9.46	9.69	9.92	10.07
	SC	6.13	6.39	6.64	6.81	6.93
	PI	2.19	2.20	2.20	2.20	2.22
20(1)	TC	8.84	9.32	9.61	9.84	10.01
	SC	6.01	6.33	6.60	6.79	6.91
	PI	2.38	2.39	2.39	2.41	2.41
25	TC	8.37	9.03	9.50	9.78	10.02
	SC	5.85	6.21	6.55	6.74	6.86
	PI	2.57	2.59	2.61	2.62	2.64
30	TC	7.82	8.52	9.20	9.53	9.81
	SC	5.67	6.03	6.41	6.60	6.72
	PI	2.77	2.81	2.84	2.86	2.89
35	TC	7.24	7.86	8.67	9.10	9.54
	SC	5.39	5.78	6.26	6.44	6.57
	PI	2.99	3.04	3.09	3.11	3.13
40	TC	6.59	7.17	7.82	8.55	8.99
	SC	5.08	5.47	5.92	6.11	6.23
	PI	3.23	3.28	3.33	3.37	3.41
46	TC	5.71	6.25	6.87	7.59	8.18
	SC	4.68	5.02	5.40	5.59	5.71
	PI	3.52	3.58	3.66	3.71	3.75

LEGEND

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

(1) Marked area is below standard operating limits. For operating in low ambient conditions, refer to Optional Accessories (Chapter 15).

5.24.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
ENTERING AIR WB OU COIL (°C)	TH	PI	TH	PI	TH	PI
-10	4.87	2.60	4.68	2.77	4.50	2.91
-7	5.24	2.67	5.05	2.81	4.87	2.96
-2	5.56	2.70	5.38	2.86	5.19	3.02
2	6.77	2.83	6.49	3.01	6.21	3.19
6	9.55	3.04	**9.27**	**3.25**	8.95	3.45
10	10.38	3.21	10.10	3.43	9.83	3.67
15	11.22	3.35	10.94	3.61	10.66	3.84
20	11.82	3.45	11.54	3.74	11.22	4.03

***** the above chart includes the weighted deicing infleuence.

LEGEND

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

5.25 Capacity Correction Factor Due to Tubing Length

5.25.1 Cooling

TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.12	**1**	0.979	0.943	0.940	0.931	0.913	---	---

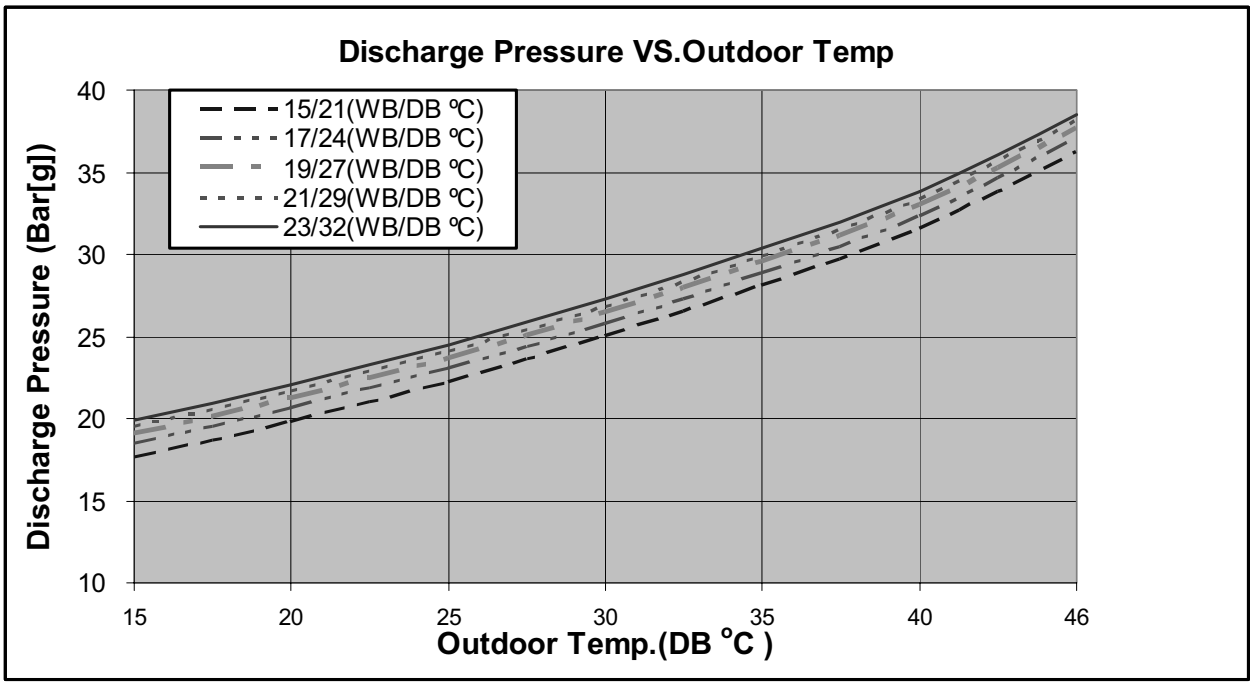
***** Minimum recommended tubing length between indoor and outdoor units is 3m.

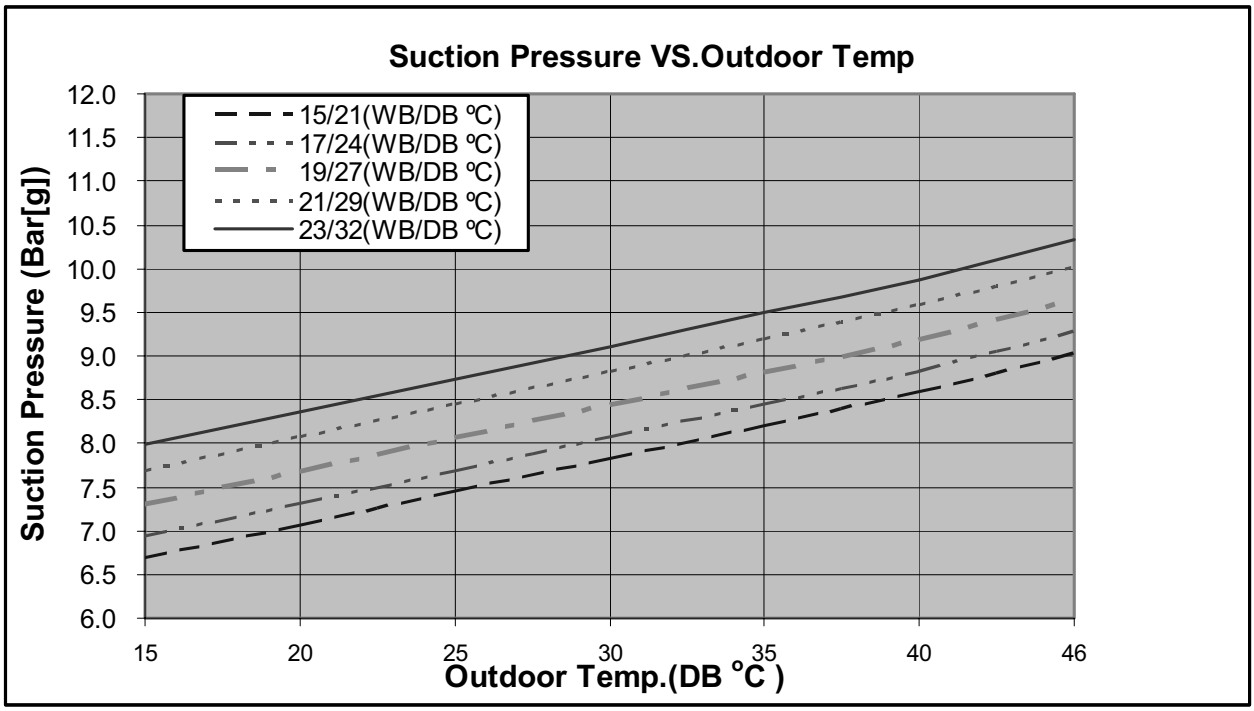
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.01	**1**	0.987	0.969	0.952	0.935	0.927	---	---

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

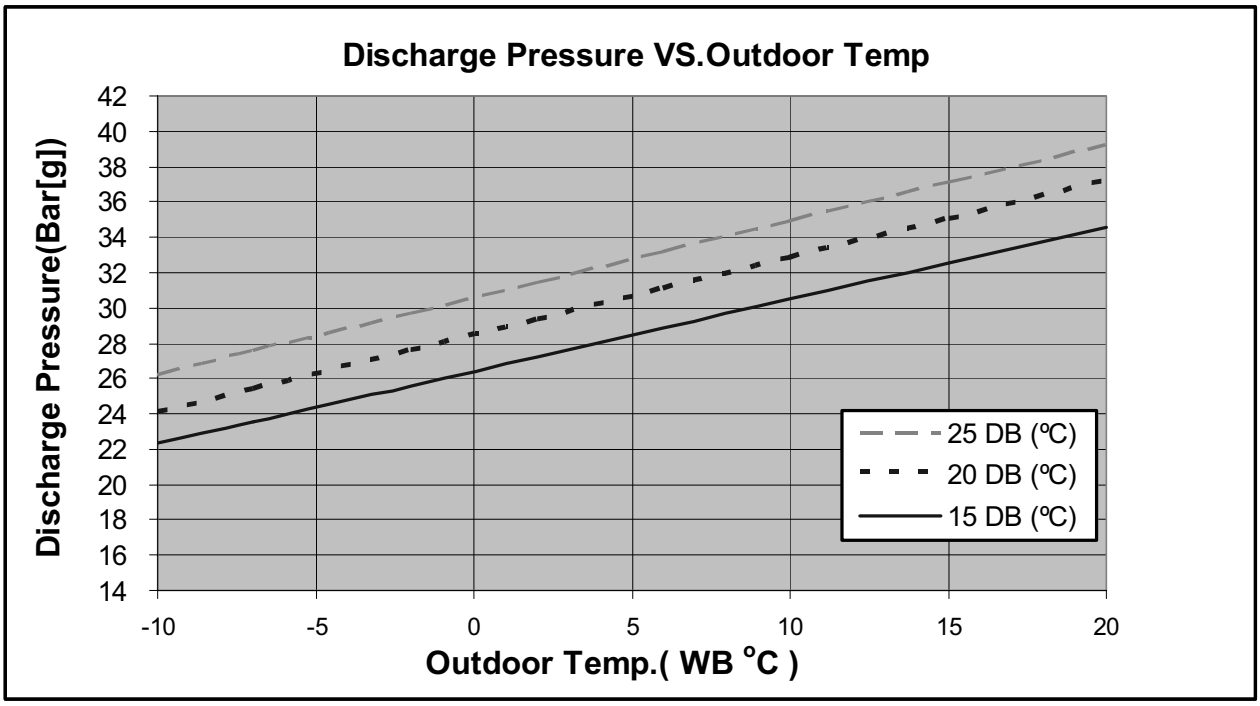
5.26 Pressure Curves.

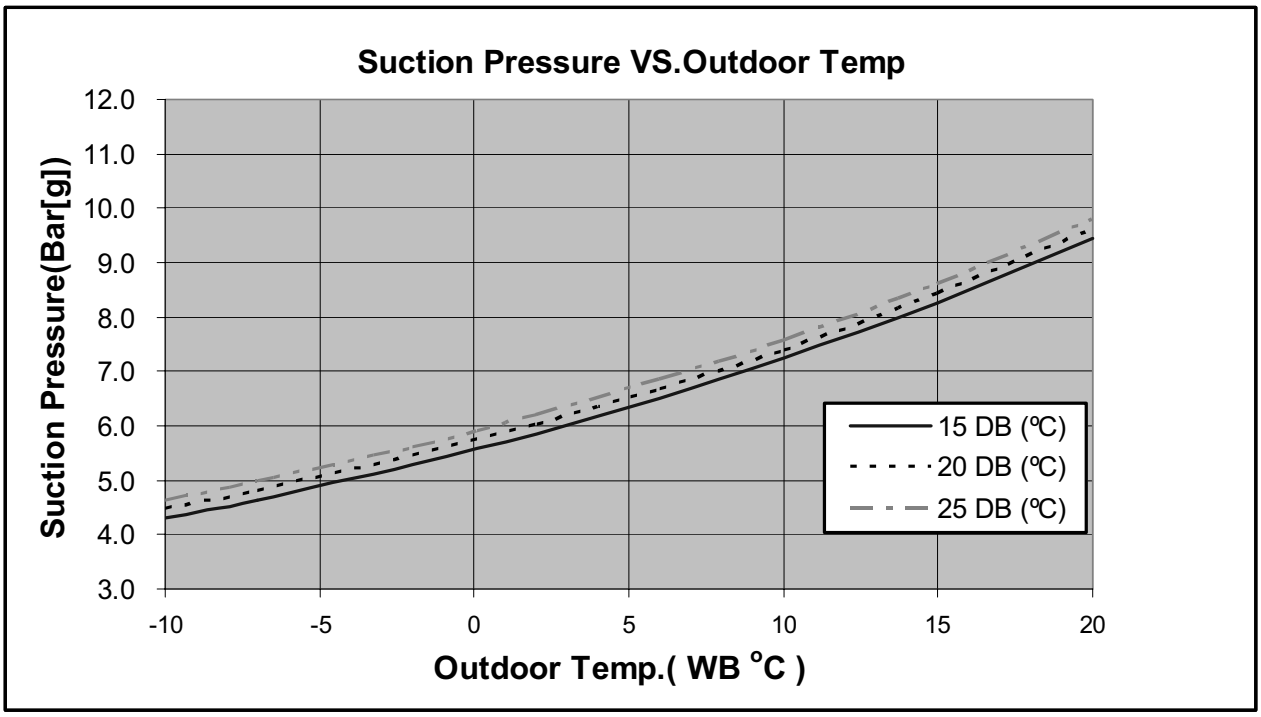
5.26.1 Cooling.





5.26.2 Heating.





6. SOUND LEVEL CHARACTERISTICS

6.1 Sound Pressure Level

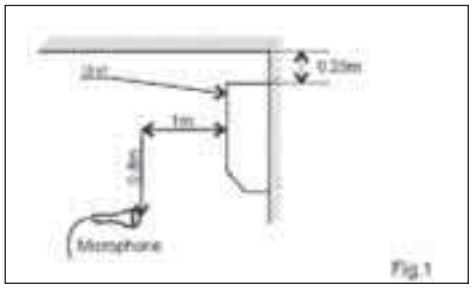


Figure 1. Wall Mounted

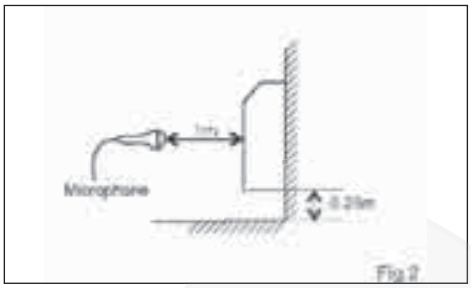


Figure 2. Floor Mounted

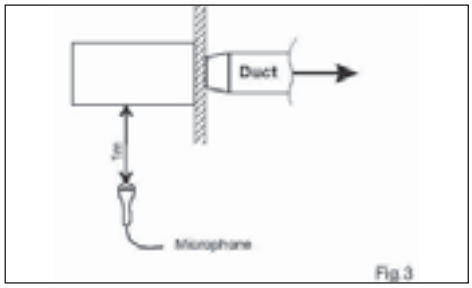


Figure 3. Ducted

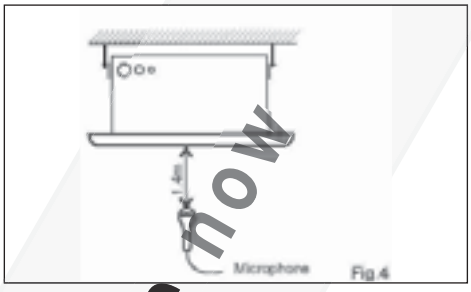
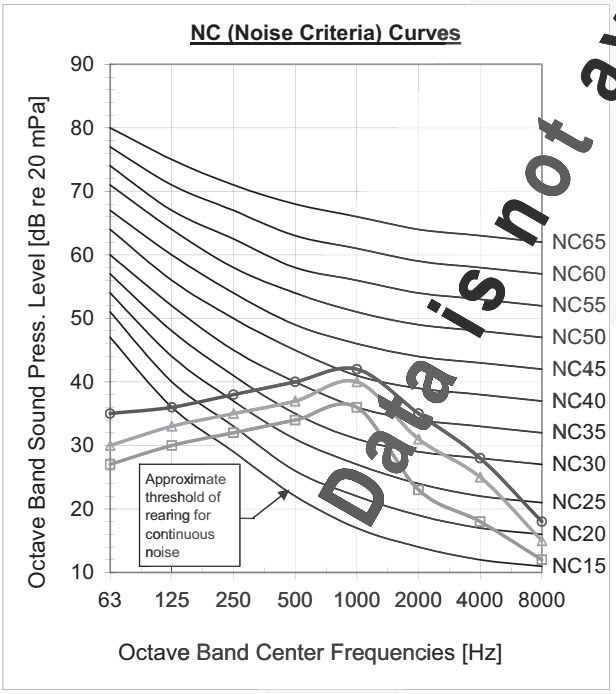


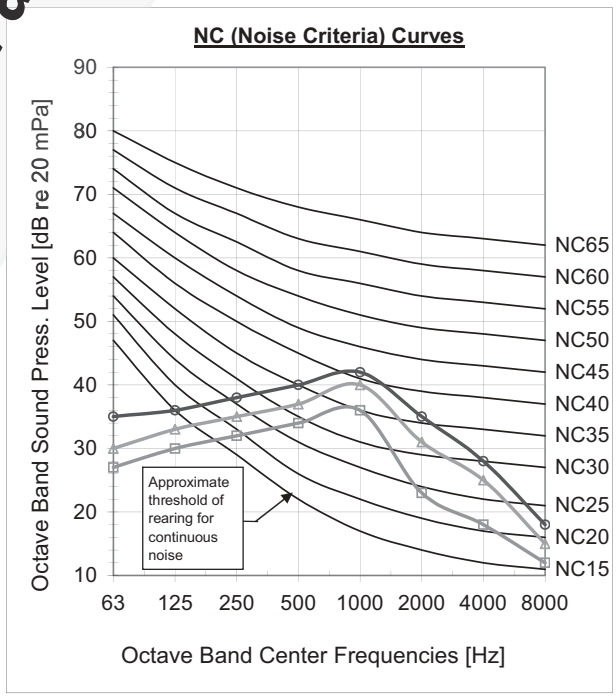
Figure 4. Cassette

6.2 Soud Pressure Level Spectrum (Measured as Figure 1)

FLO 7



FLO 9



FAN SPEED	LINE
HI	—○—
ME	—△—
LO	—□—

6.3 Outdoor units

MODEL		SPL dB(A)	SPW dB(A)
Indoor	Outdoor	Cooling/Heating	Cooling/Heating
FLO7	ONG-7	46/47	56/57
FLO9	ONG-9	48/49	58/60
FLO12	ONG-12	52/53	62/64
FLO14	ONG-14	53/54	63/64

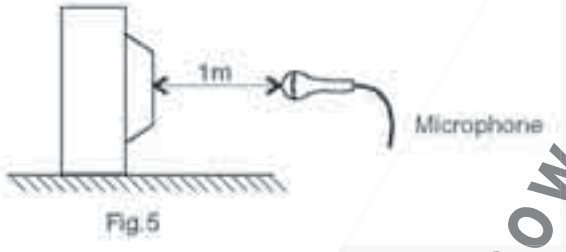
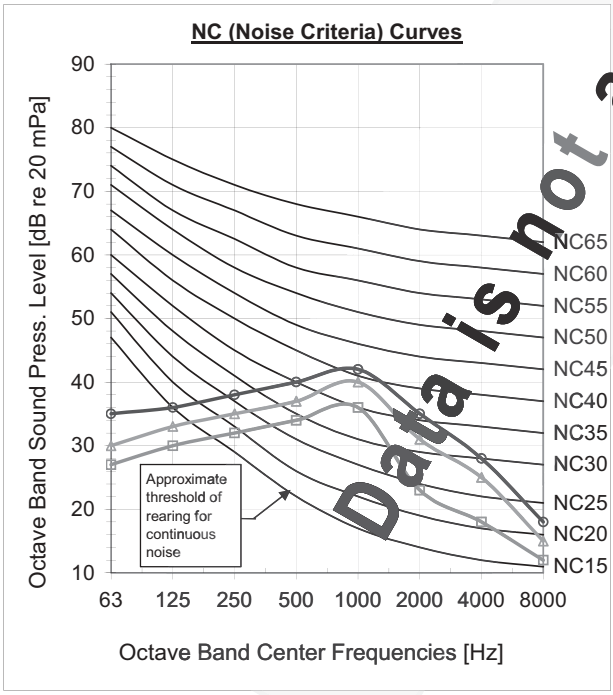


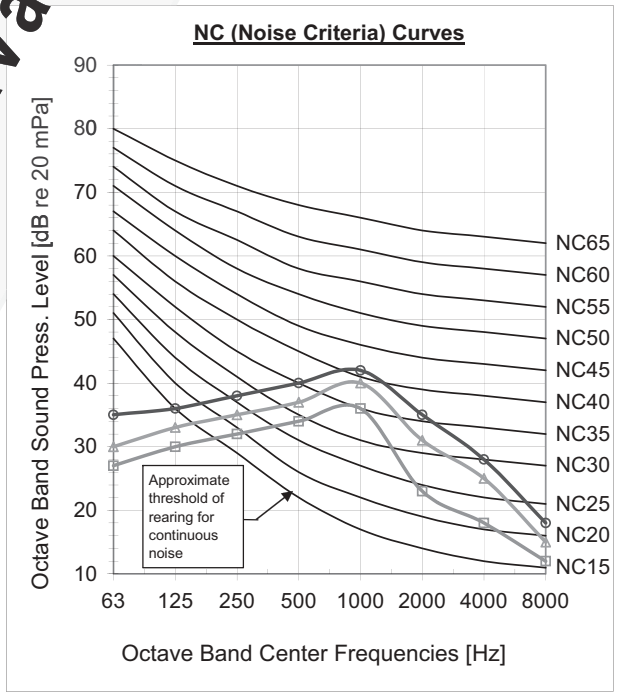
Figure 5. Microphone Distance from Unit

6.4 Sound Pressure Level Spectrum (Measured as Figure 5)

Cooling



Heating



MODEL	LINE
OU8-33	—○—
OU10-44	—△—
GC-18	—●—
GC-24	—□—

7. ELECTRICAL DATA

7.1 Single and Three Phase Units

MODEL	FLO 7 N LCD	FLO 9 N LCD	FLO 12 N LCD	FLO 14 N LCD
Power Supply	To indoor	To indoor	To indoor	To indoor
	1PH-230V-50Hz	1PH-230V-50Hz	1PH-230V-50Hz	1PH-230V-50Hz
Max Current, (A)	4.3	6.0	8.2	9.5
Circuit Breaker,(A)	10	10	15	15
Power Supply Wiring. (No. x Cross Section mm^2)	3x1.5 mm^2	3x1.5 mm^2	3x1.5 mm^2	3x1.5 mm^2
Interconnecting Cable RC Model (No. x Cross Section mm^2)	5 x 1.0 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	5 x 1.0 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	5 x 1.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	5 x 1.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)
Interconnecting Cable ST Model (No. x Cross Section mm^2)	4x1.0 mm^2	4x1.0 mm^2	4x1.5 mm^2	4x1.5 mm^2

MODEL	FLO 18 N LCD	FLO 24 N LCD	FLO 24 N LCD	FLO 24 N LCD
Power Supply	To indoor	To indoor(Option)	To Outdoor	To Outdoor
	1PH-230V-50Hz	1PH-230V-50Hz	1PH-230V-50Hz	3PH-400V-50Hz
Max Current, (A)	11.1	14	14	3x6
Circuit Breaker,(A)	15	20	20	3x10
Power Supply Wiring. (No. x Cross Section mm^2)	3 x 1.5 mm^2	3 x 2.5 mm^2	3 x 2.5 mm^2	5 x 1.5mm^2
Interconnecting Cable RC Model (No. x Cross Section mm^2)	5 x 1.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	5 x 2.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	6 x 2.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	6 x 2.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)
Interconnecting Cable ST Model (No. x Cross Section mm^2)	4 x 1.5 mm^2	4x2.5 mm^2 + 2x0.5 mm^2	5x2.5 mm^2 + 2x0.5 mm^2	5 x 2.5 mm^2 + 2 x 0.5mm^2 (OCT sensor)

MODEL	FLO 30 N LCD	FLO 30 N LCD
Power Supply	To Outdoor	To Outdoor
	1PH-230V-50Hz	3PH-400V-50Hz
Max Current, (A)	17	3x9.2
Circuit Breaker,(A)	25	16
Power Supply Wiring. (No. x Cross Section mm^2)	3 x 4mm^2	5 x 2.5mm^2
Interconnecting Cable RC Model (No. x Cross Section mm^2)	6x2.5 mm^2 + 2x0.5 mm^2 (OCT sensor)	6 x 1.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)
Interconnecting Cable ST Model (No. x Cross Section mm^2)	5 x 2.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	5 x 1.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)

NOTE

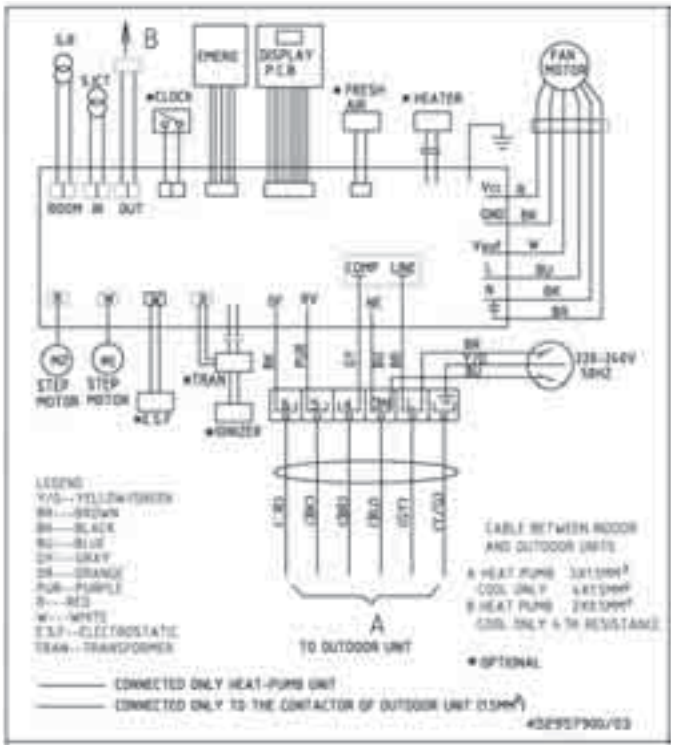
Power wiring cord should comply with local lows and electrical regulations requirements.

8. WIRING DIAGRAMS

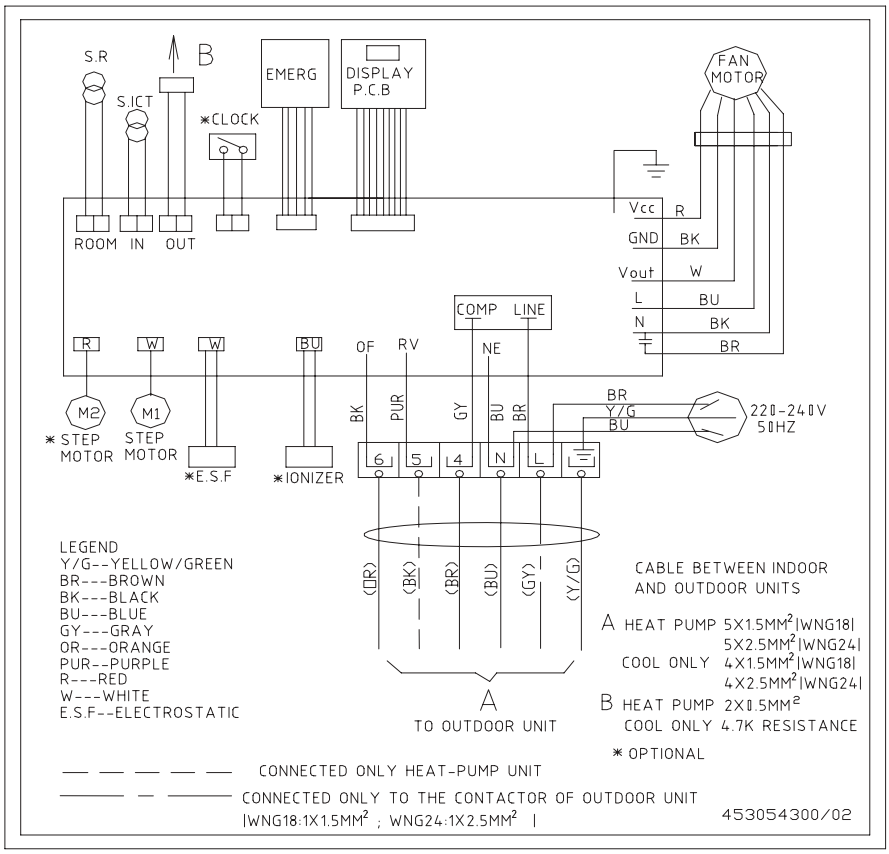
NOTE

Wiring diagram lables as shown on units.

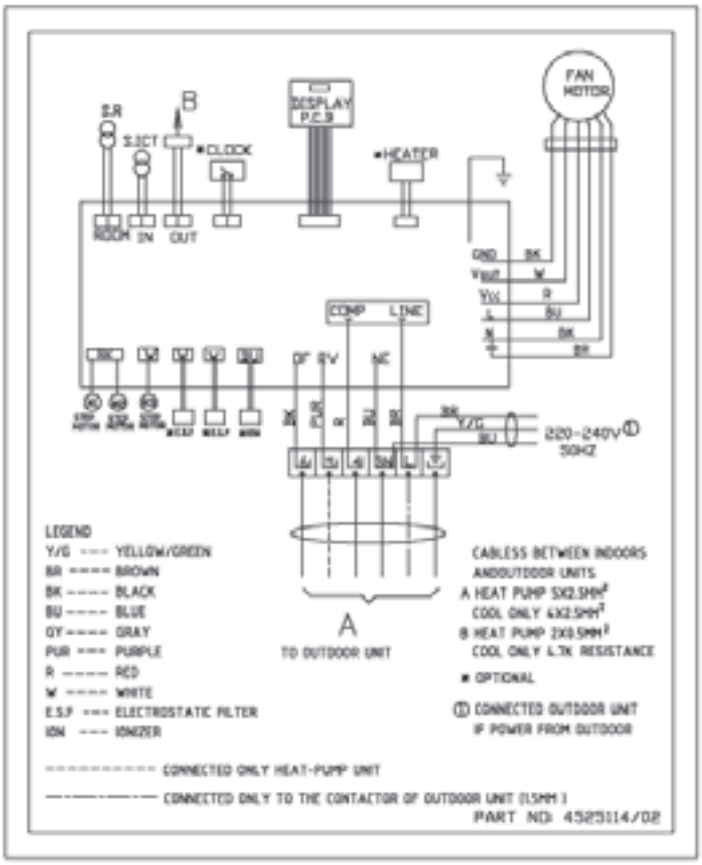
8.1 Indoor Unit FLO 7,9,12,14 N LCD



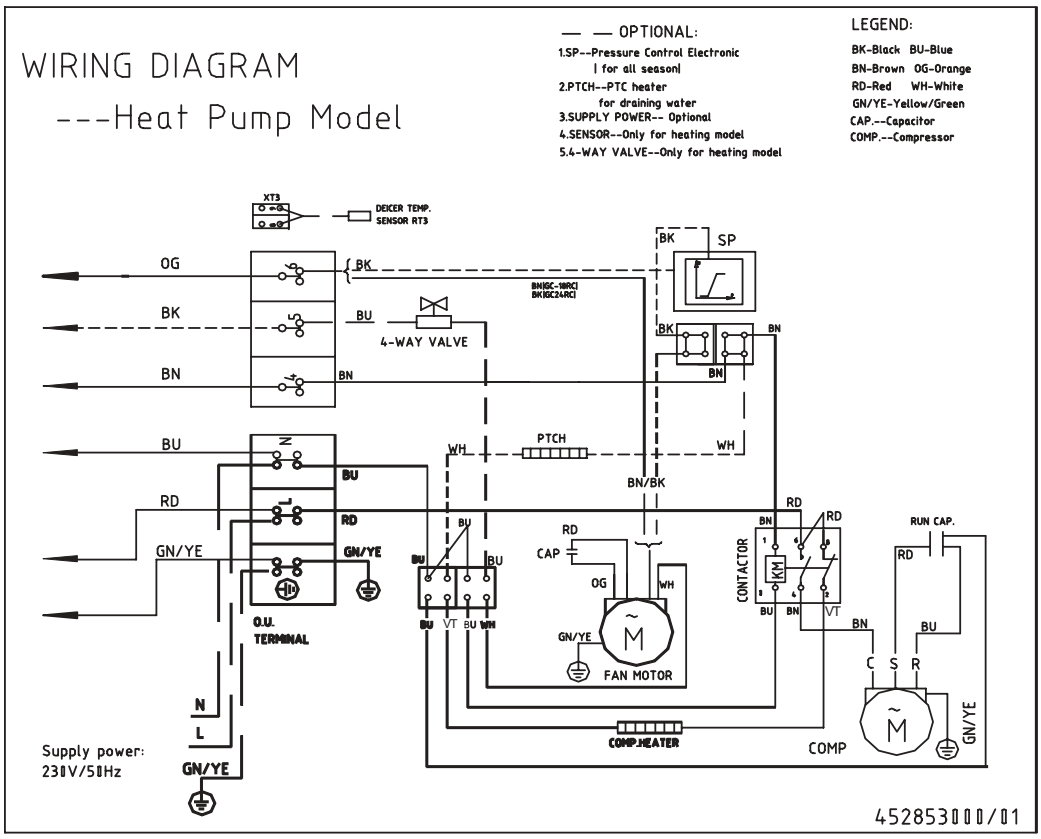
8.2 Indoor Unit FLO 18, 24 N LCD



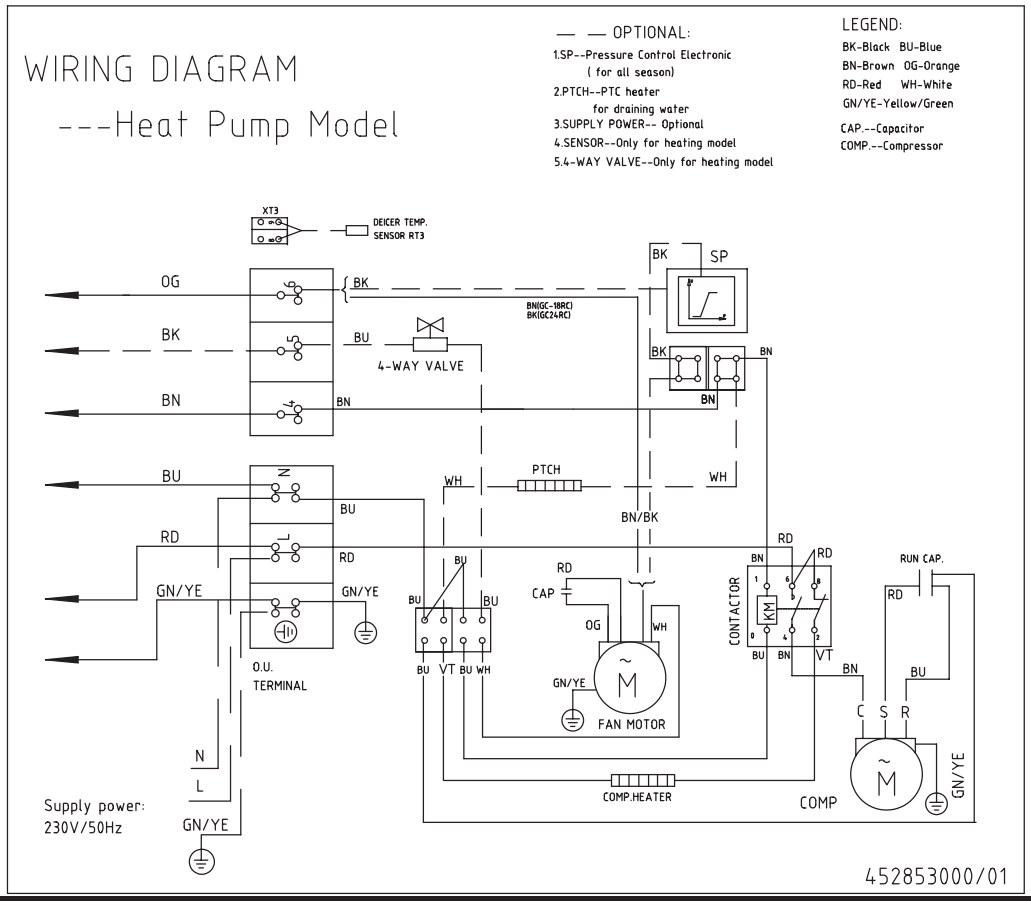
8.3 Indoor Unit FLO 30 N



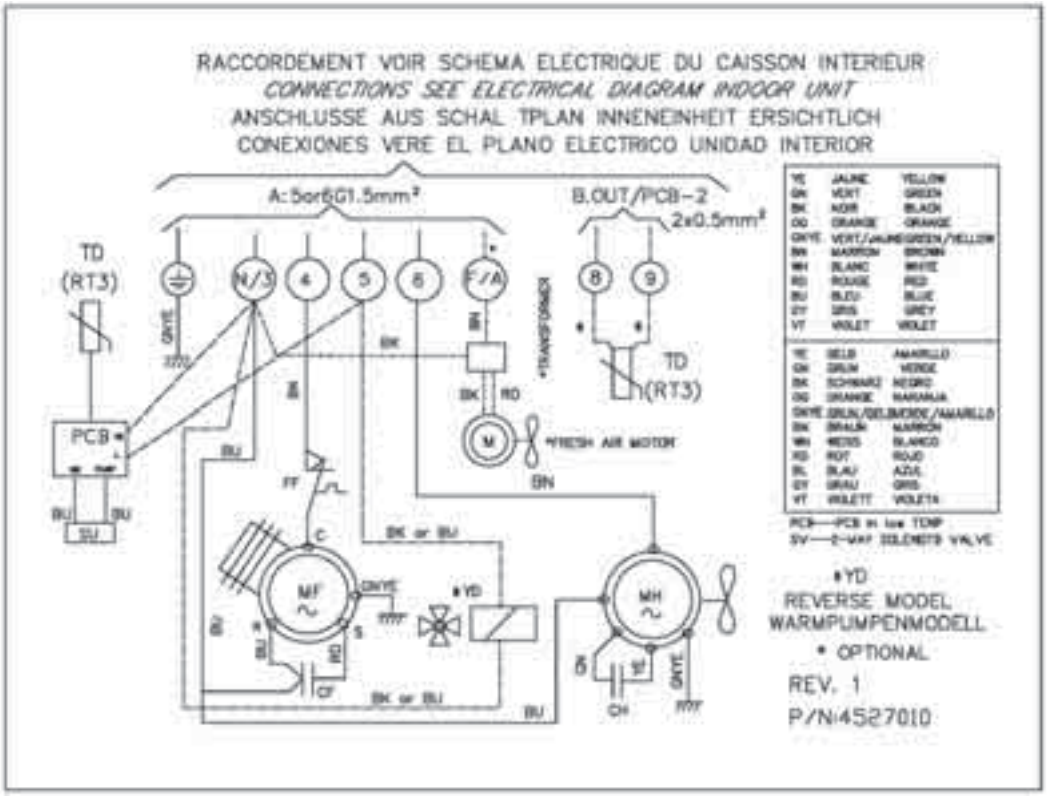
8.4 Outdoor Unit GC18 1PH R410A



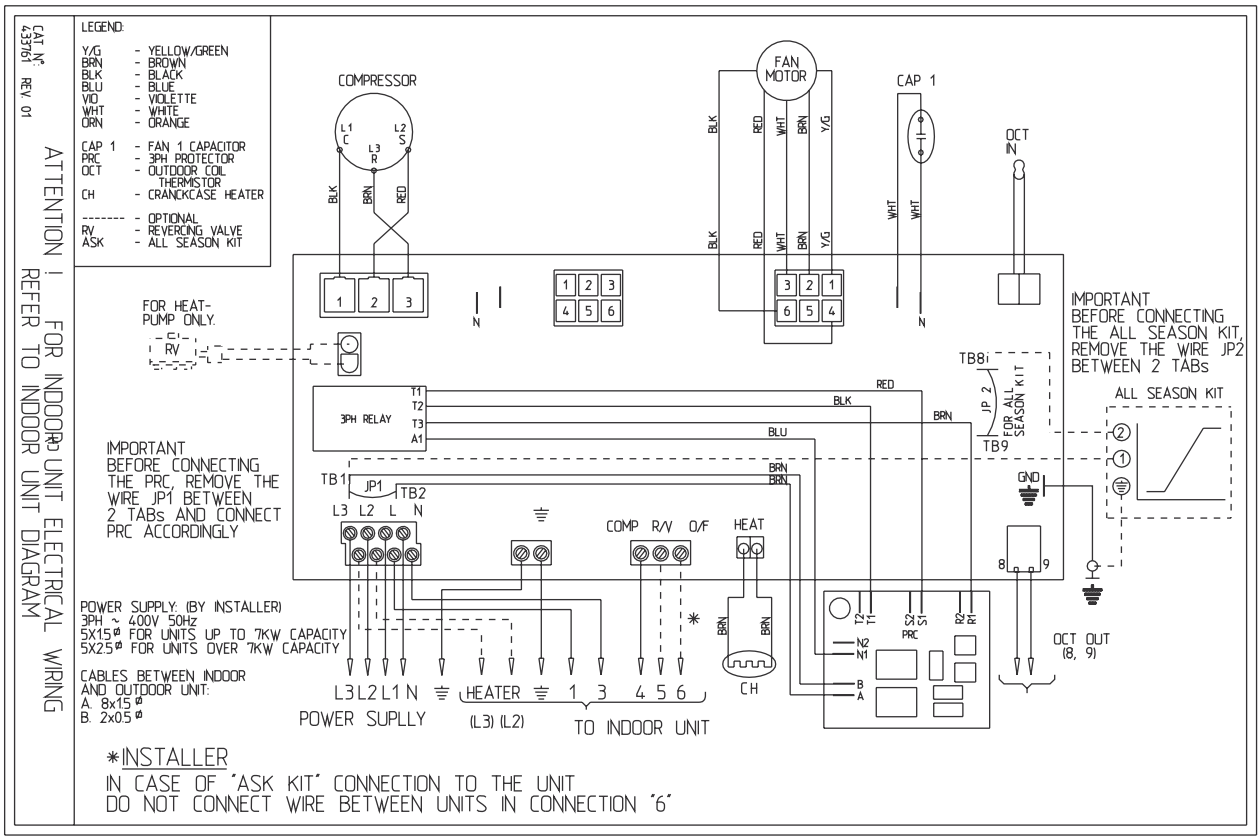
8.5 Outdoor Unit GC 24 1PH R410A



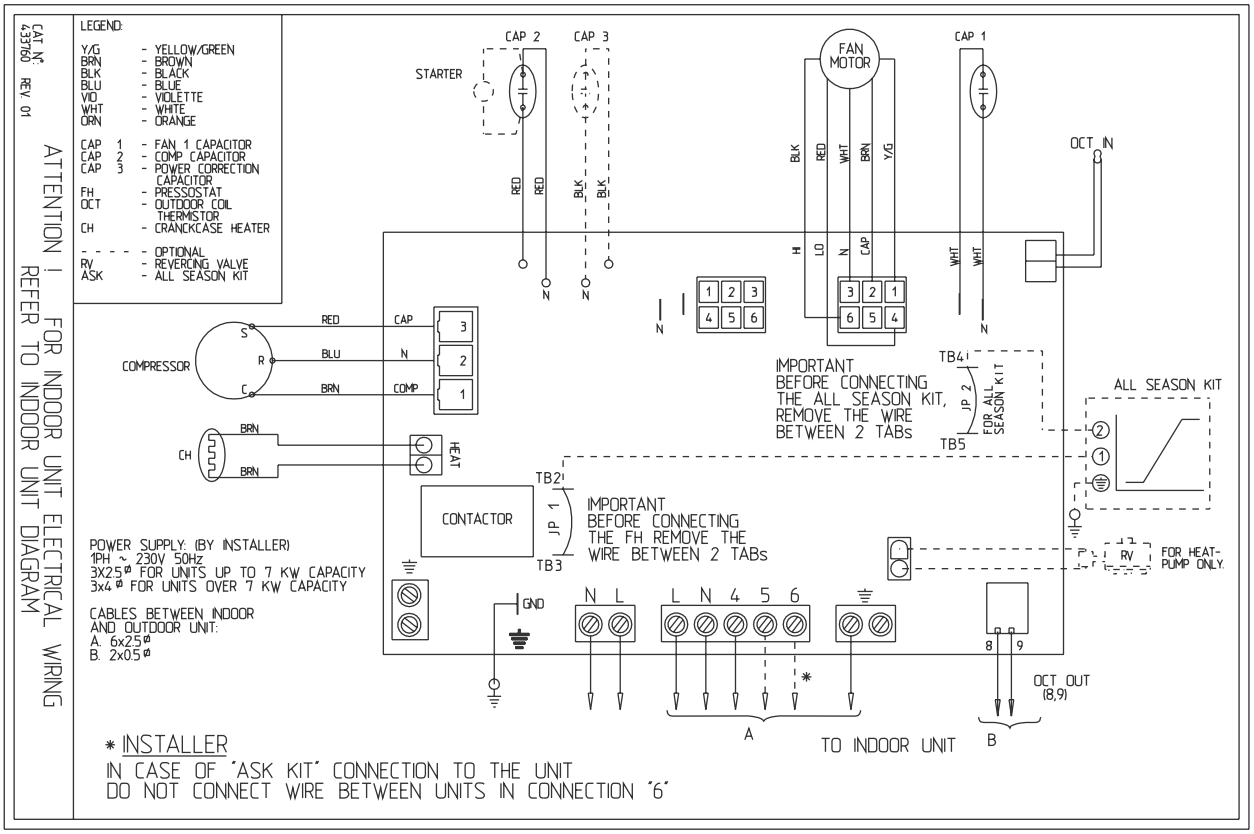
8.6 Outdoor Unit ONG7 1PH R410A



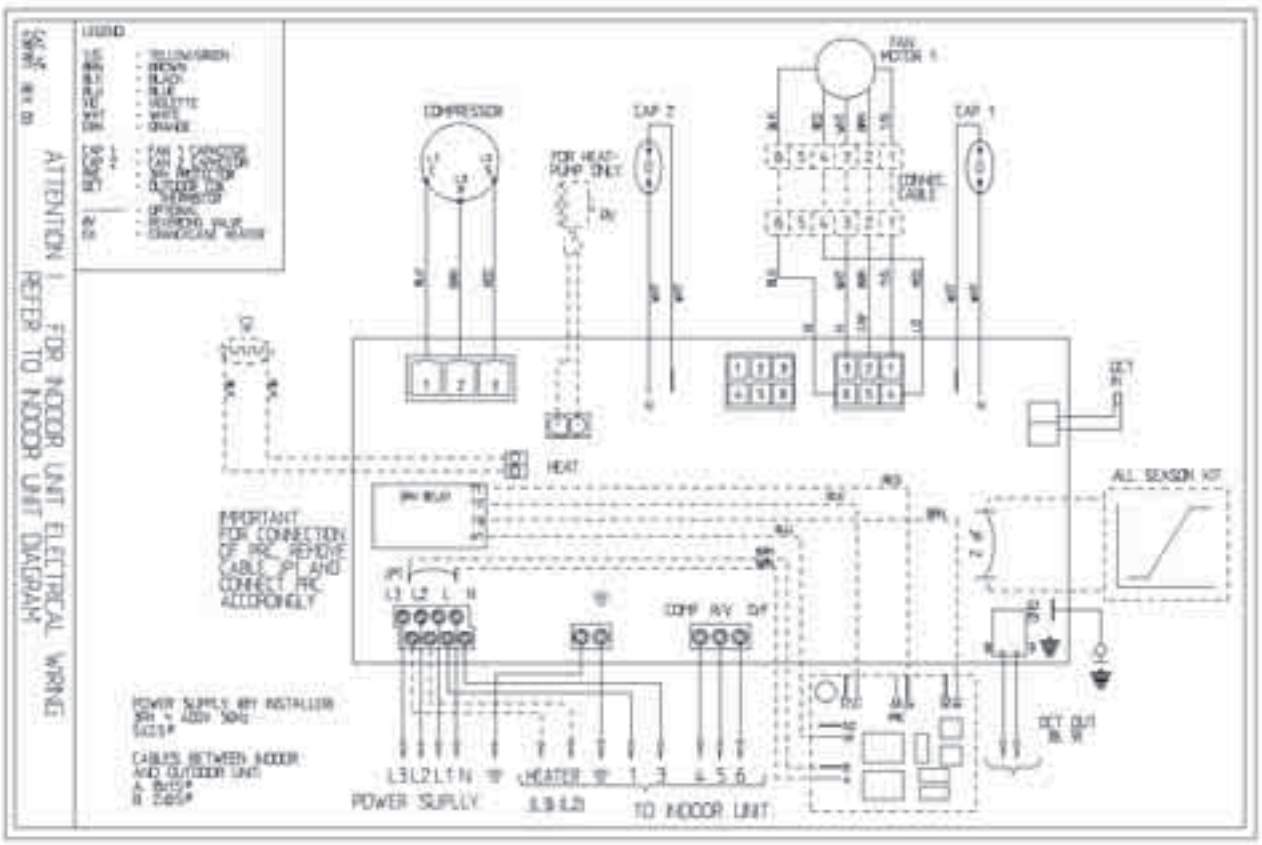
8.7 Outdoor Unit OU7-24/OU8-30 1PH R410A



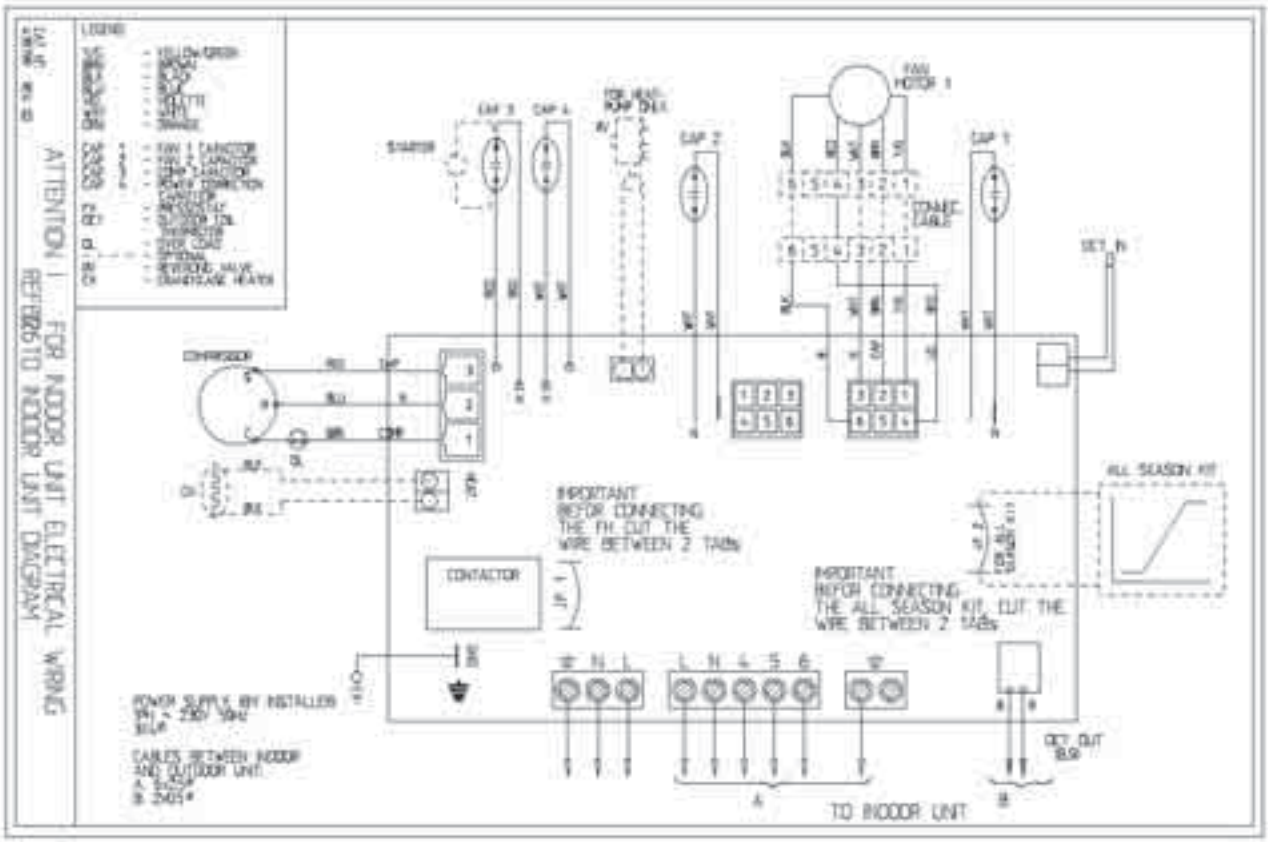
8.8 Outdoor Unit OU7-24/OU8-30 3PH R410A



8.9 Outdoor Unit OU8-33 1PH R410A

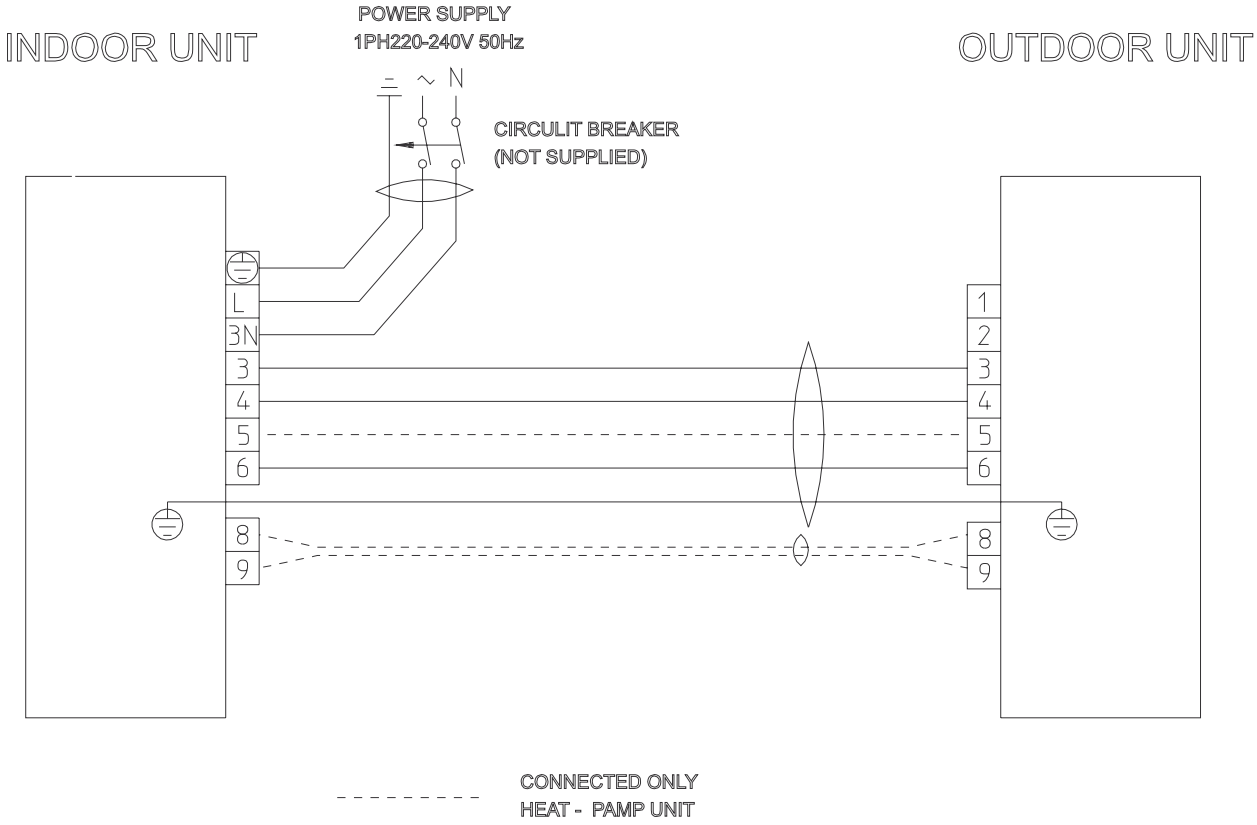


8.10 Outdoor Unit OU8-33 3PH R410A

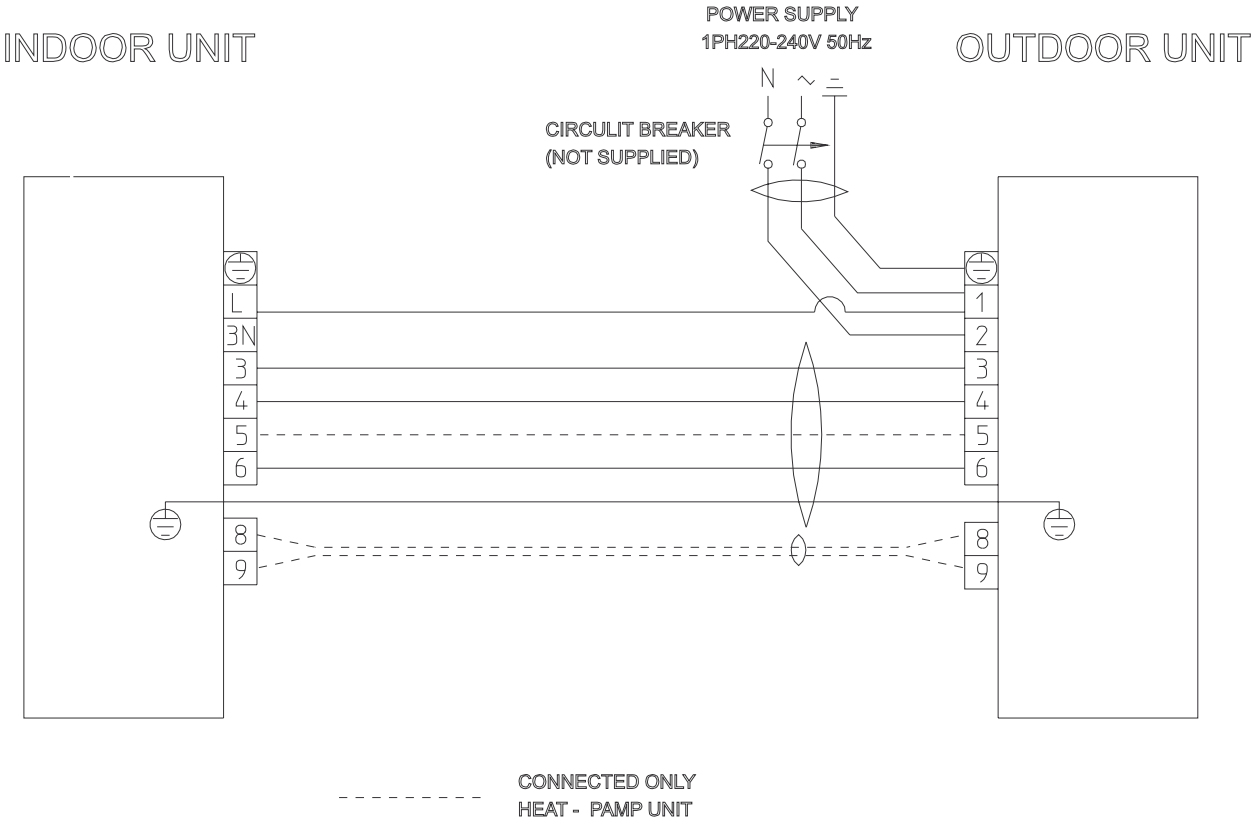


9. ELECTRICAL CONNECTIONS

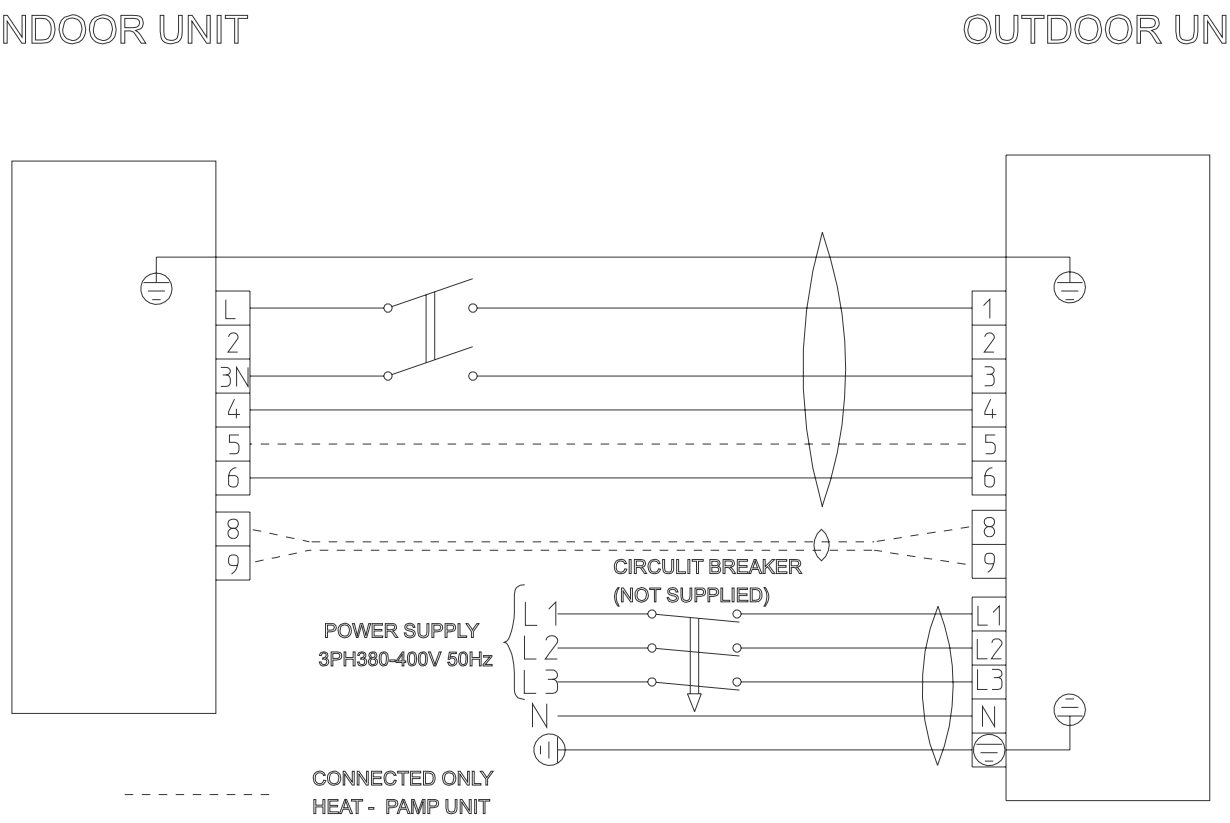
9.1 FLO N 7/9/12/14/18/24 1PH



9.2 FLO N - 24/30 1PH (power supply to outdoor unit)



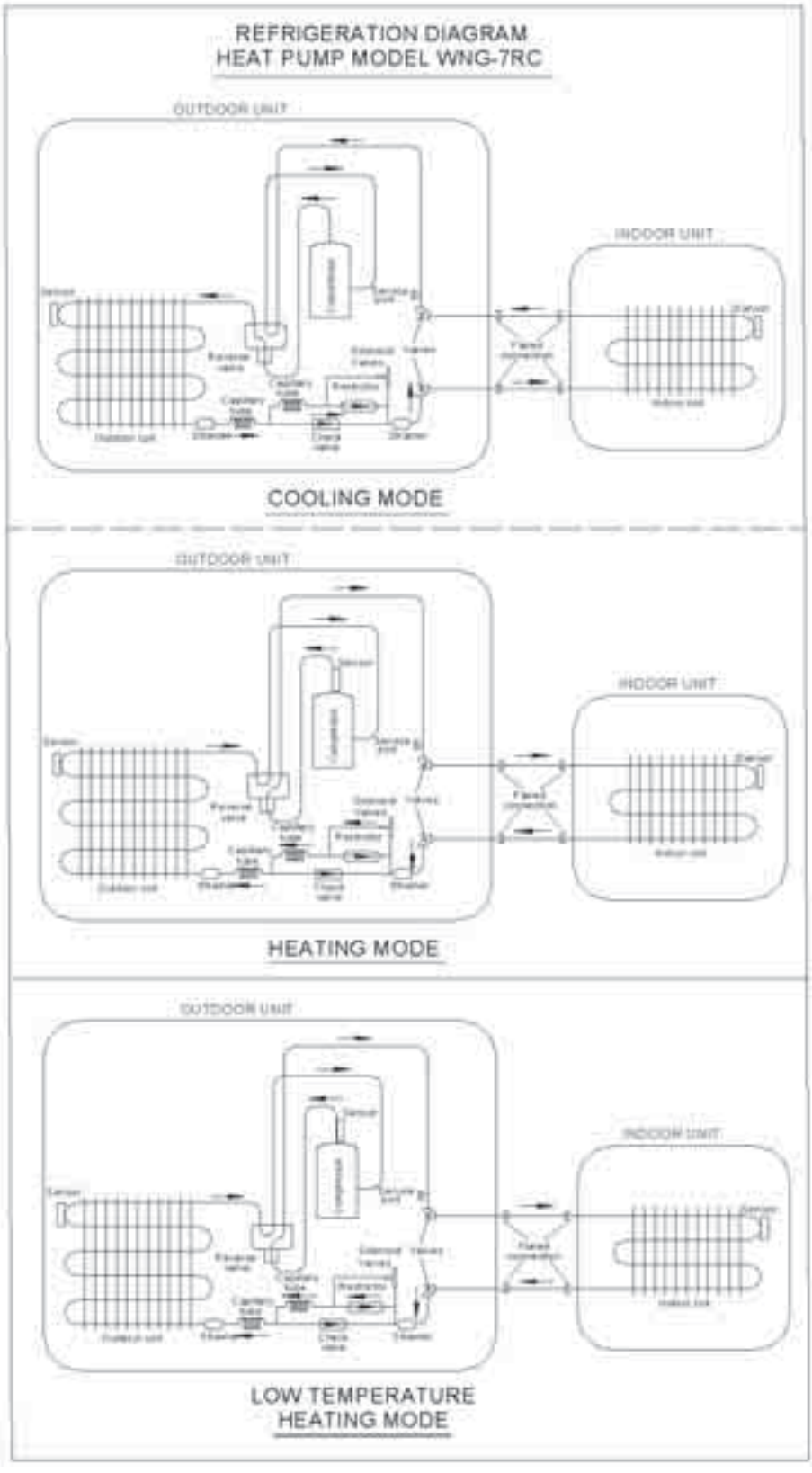
9.3 FLO - 30 N 3PH



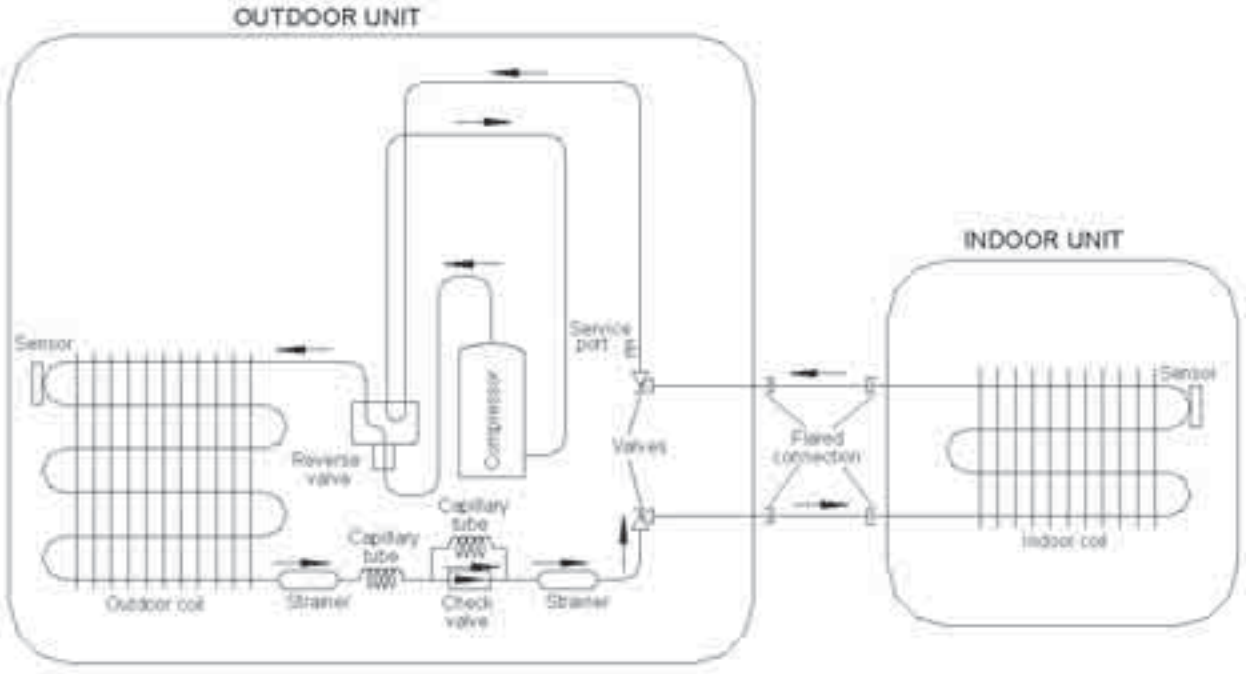
10. REFRIGERATION DIAGRAMS

10.1 Heat Pump Models

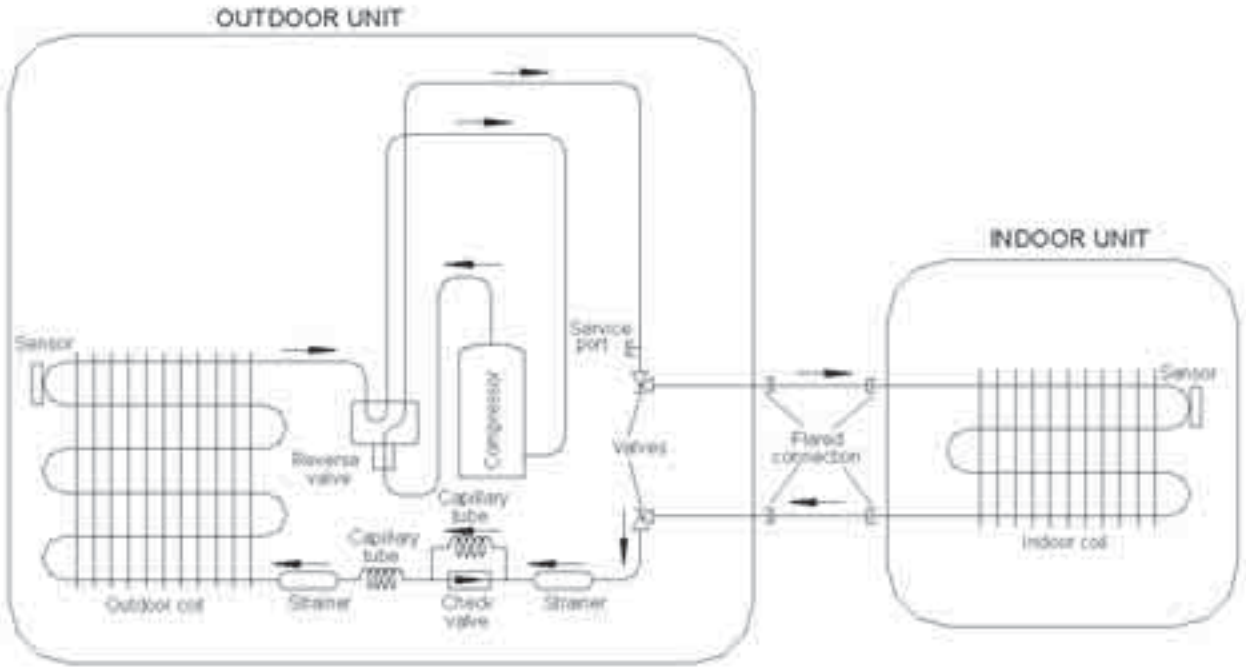
10.1.1 FLO 7 N



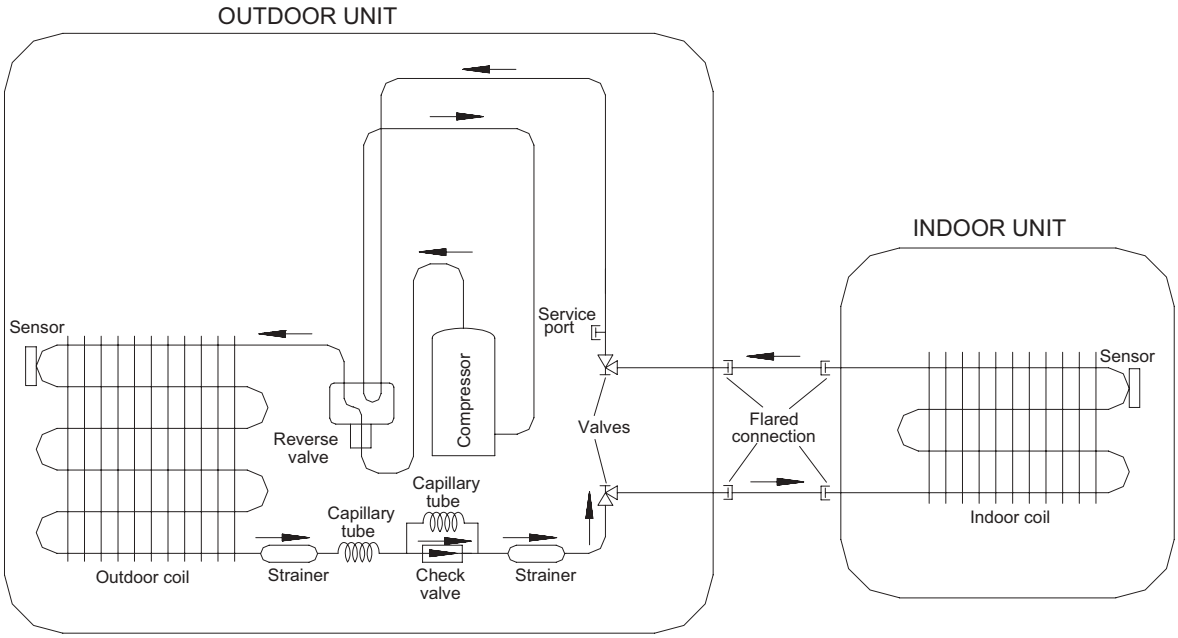
10.1.2 FLO 9/12/14 N R410A



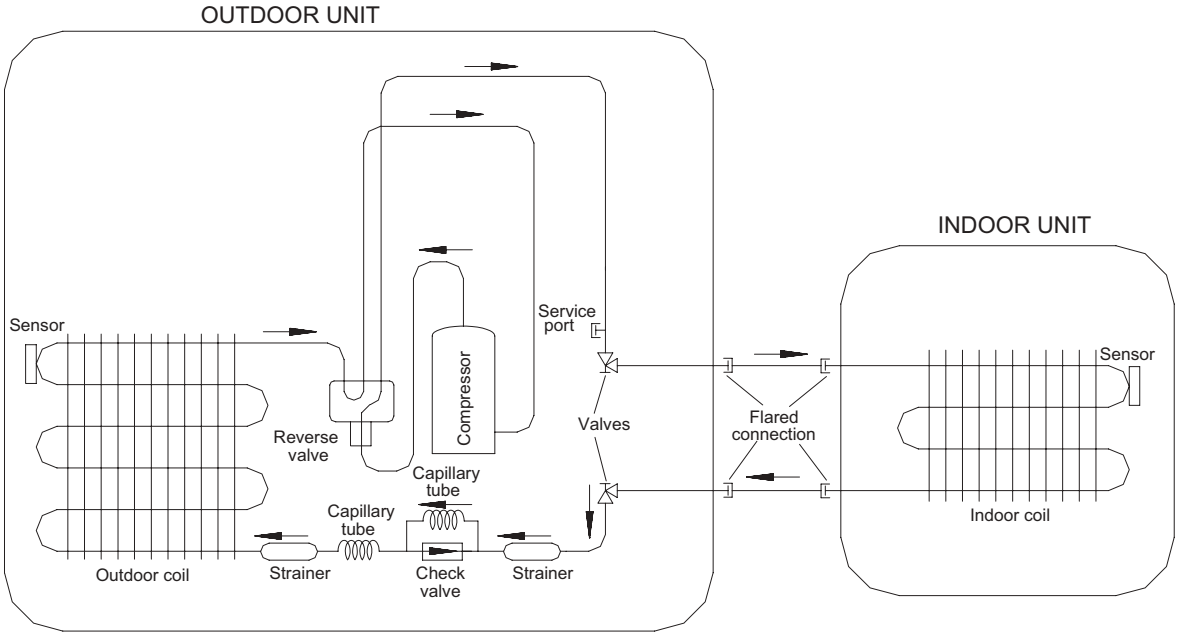
COOLING MODE



10.1.3 FLO 18 N R410A

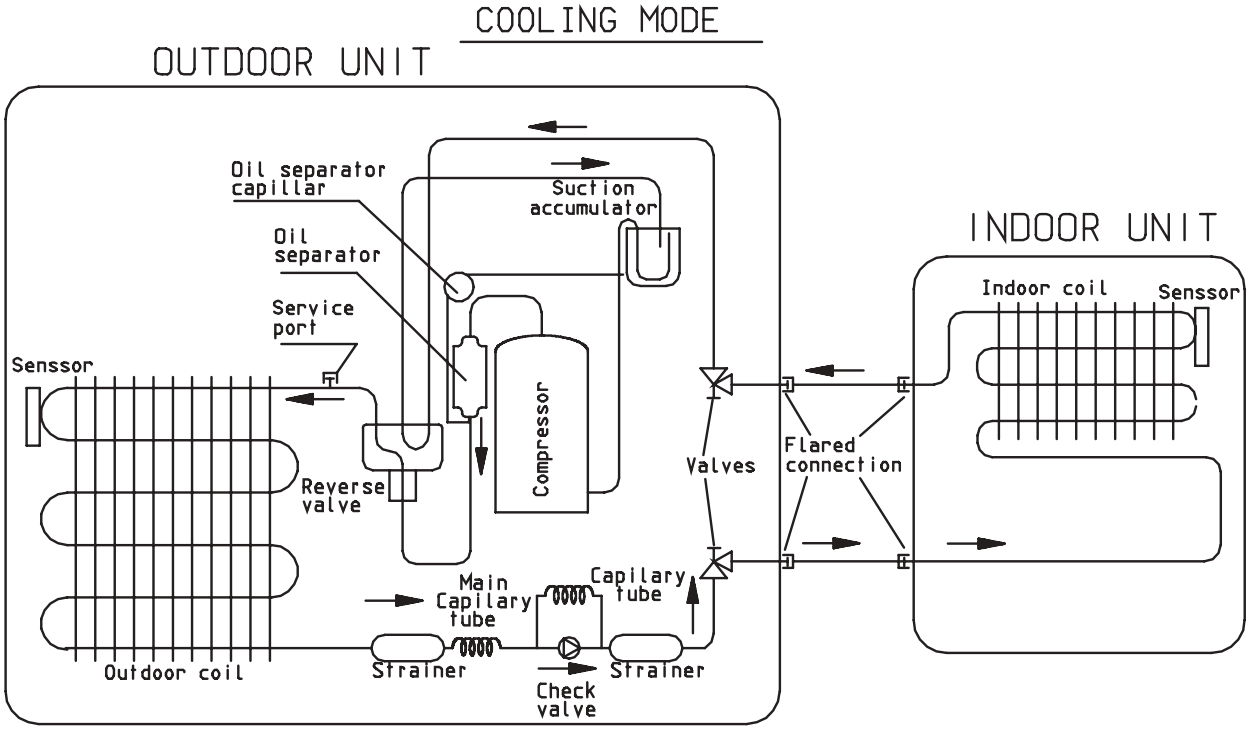


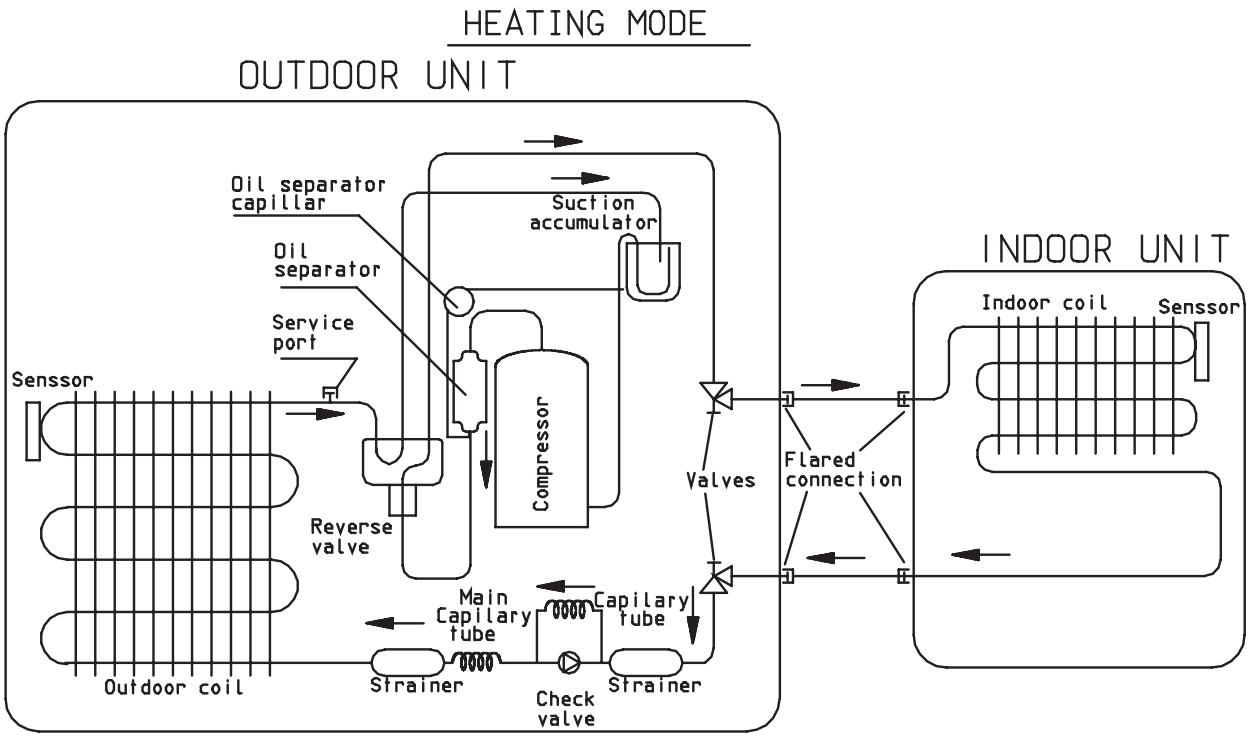
COOLING MODE



HEATING MODE

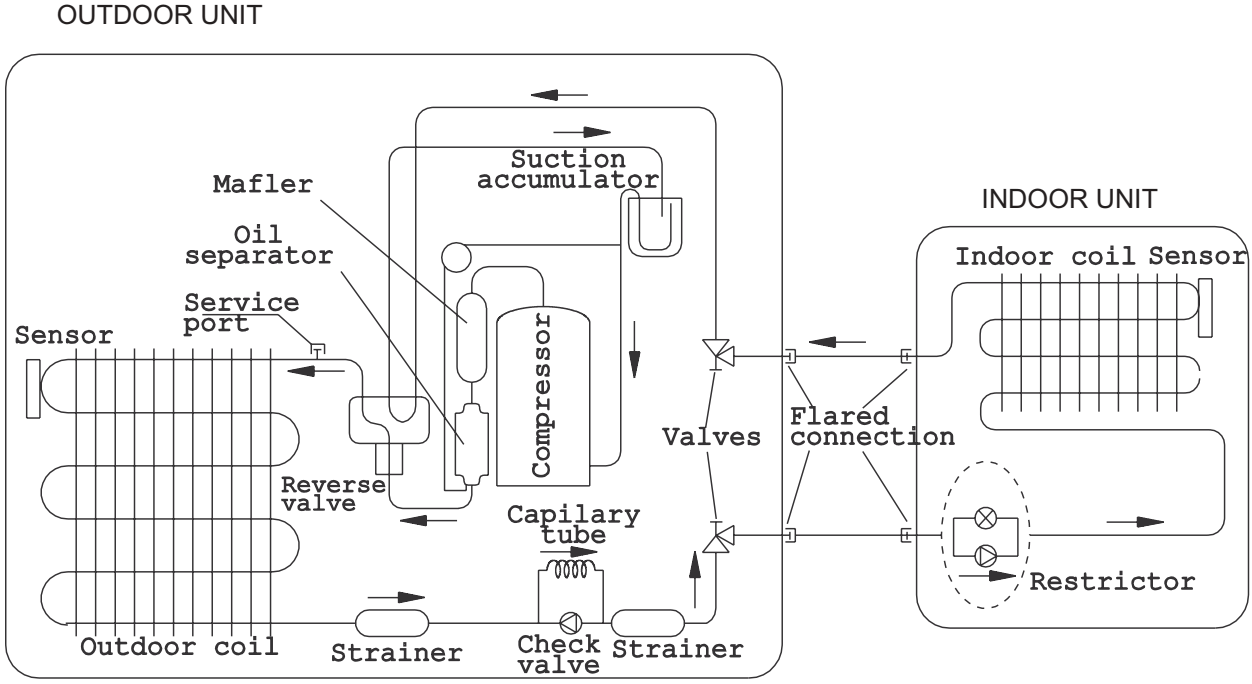
10.1.4 FLO 24 N R410A



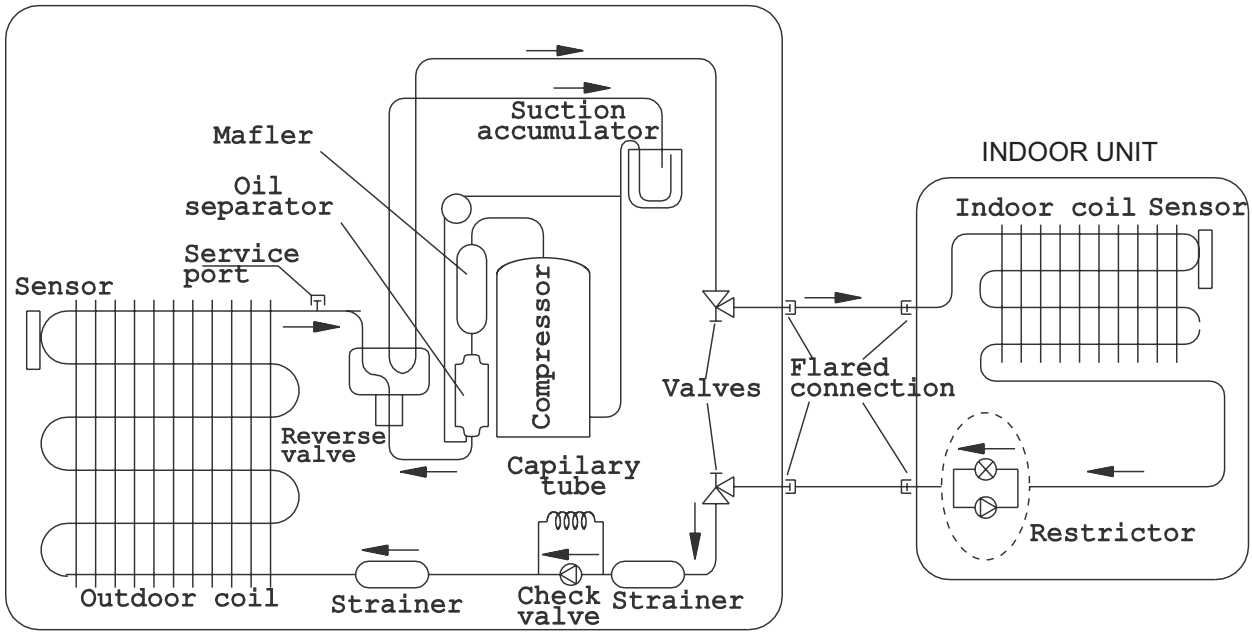


10.1.5 FLO 30 N OU8-30 R410A

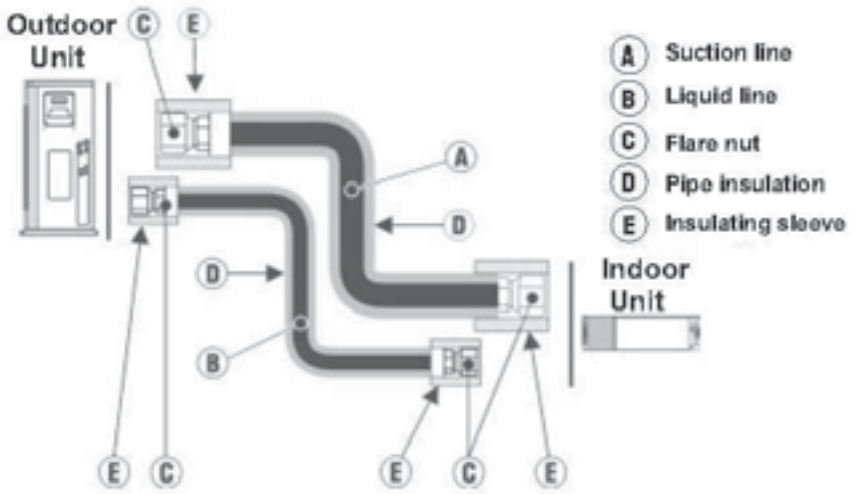
COOLING MODE

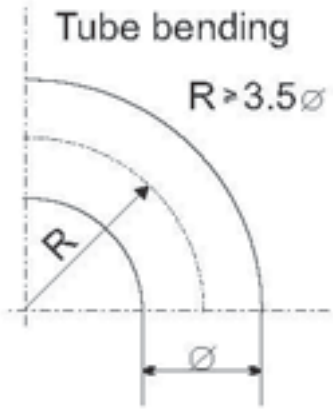


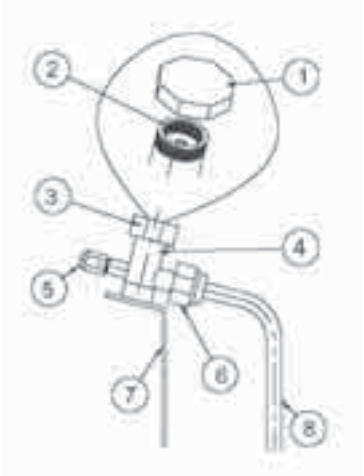
HEATING MODE



11. TUBING CONNECTIONS



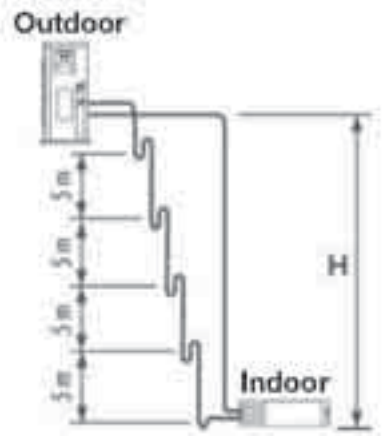




TUBE (Inch) / TORQUE (Nm)	1/4"	3/8"	1/2"	5/8"	3/4"
Flare Nuts	11-13	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

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

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.



12.A CONTROL SYSTEM FLO 30 N

12A.1. Electronic Control

12A.1.1. Introduction

The electronic control information is designed for service applications, and is common to the following groups of air-conditioners:

- **ST/ RC group** - Cooling only / cooling and heating by heat pump.
- **SH group** - Cooling and heating by heat pump and supplementary heater.
- **RH group** - Cooling, heating by heaters only.

12A.1.2. Jumpers Settings

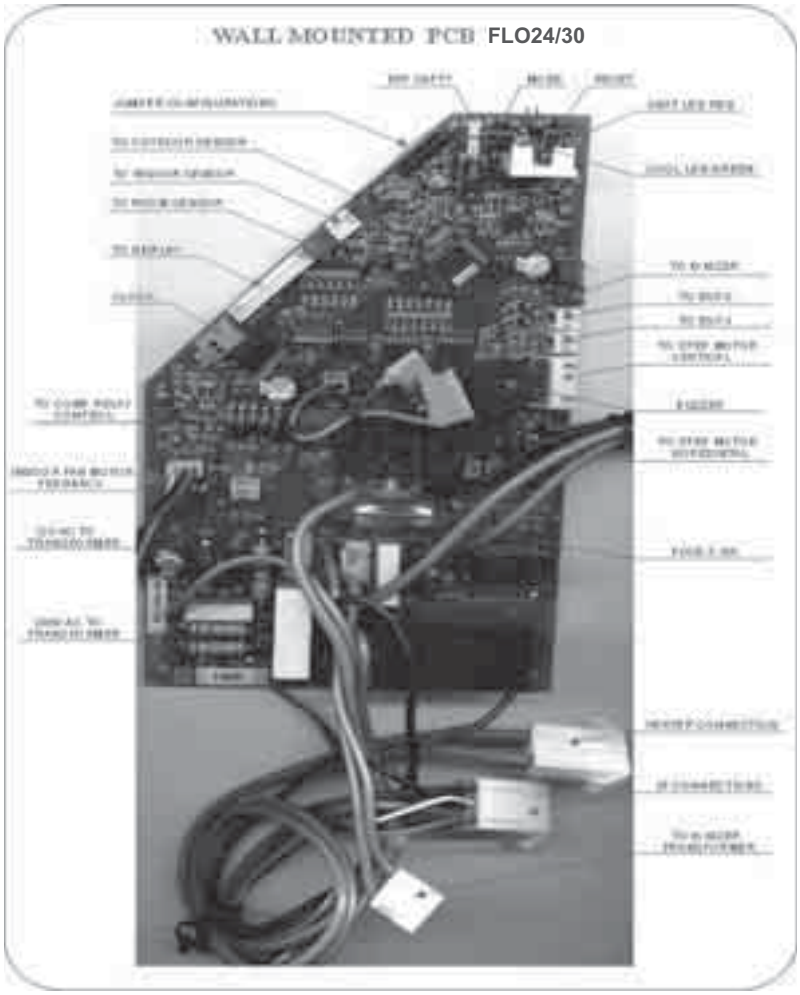
GROUP	**J6** Setting	**J2** Setting
ST / RC	Open	Open
SH	Closed	Open
RH	Closed	Closed

12A.2. Legend

12A.2.1. Abbreviations

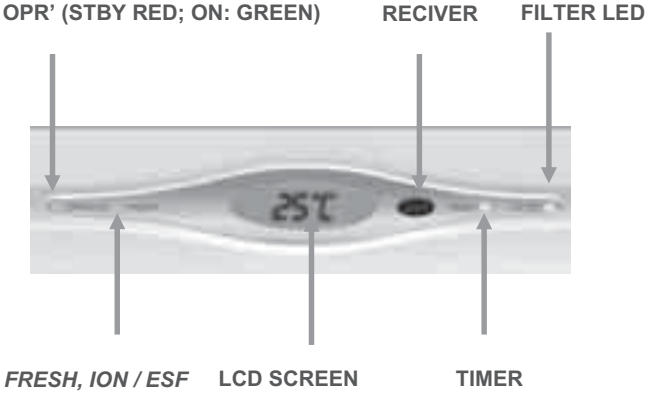
AC	**- Alternate Current**
A/C	- Air-Conditioner
ANY	- ON or OFF status
CLOCK	- ON/OFF Operation Input, (dry contact)
COMP	- Compressor
CPU	- Central Processing Unit
CTV	-Compensation Temperature Value
ELUM	- Extended Louver Upward Movement (Software Jumper)
E²PROM, EEP	- Erase Enable Programmable Read Only Memory
HE	- Heating Element
HPC	- High Pressure Control
H/W	- Hardware
ICP	- Indoor Condensation Pump
ICT	- Indoor Coil Temperature (RT2) sensor
IF, IFAN	- Indoor Fan
IR	- Infra Red
LEVEL1	- Normal Water Level
LEVEL2/3	- Medium/High Water Level
LEVEL4	- Overflow Level
Max	- Maximum
Min	- Minimum
min	- Minute (time)
NA	- Not Applicable
OCP	- Outdoor Condensation Pump
OCT	- Outdoor Coil Temperature (RT3) sensor
OF, OFAN	- Outdoor Fan
OPER	- Operate
Para.	- Paragraph
RAT	- Return Air Temperature (RT1) sensor
RC	- Reverse Cycle (Heat Pump)
R/C	- Remote Control
RCT	- Remote Control Temperature
RH	- Resistance Heater
RT	- Room Temperature (i.e. RCT in IFEEL mode, RAT otherwise)
RV	- Reversing Valve
SB, STBY	- Stand-By
Sec	- Second (time)
Sect	- Section
SH	- Supplementary Heater
SPT	- Set Point Temperature
ST	- Standard (a Model with Cooling Only)
S/W	- Software
TEMP	- Temperature
W/O	- Without
WVL	**- Water Valve**
∆T	**- The difference between SPT and RT.** **In Heat Mode: ∆T = SPT - RT** **In Cool/Dry/Fan Mode: ∆T = RT – SPT**

12A.3. Main PCB Controller

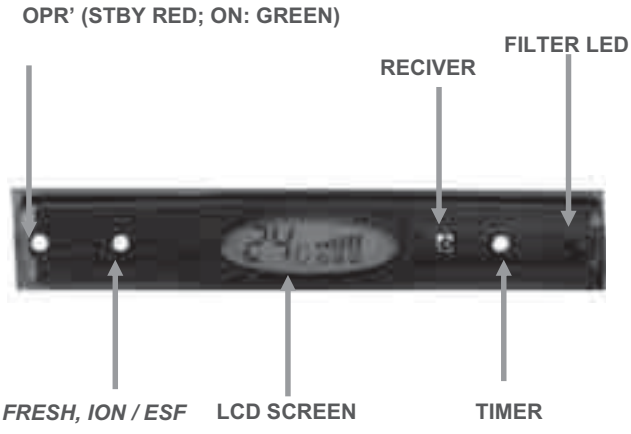


12A.3.1. Display Board

Display (LEXAN)



Display PCB Ass'y



12A.3.2. List of A/C Models

The model is divided by IFAN speed of PG motor.

Model	Type	IFAN Speed
FLO 30 N	**W**all Mounted	Low : 900 rpm
		Medial : 1050 rpm
		High : 1300 rpm
		Strong : 1350 rpm
WNG 25	Wall Mounted	Low : 750 rpm
		Medial : 900 rpm
		High : 1050 rpm
		Strong : 1100 rpm

Note:

1. In this specification, the IFAN speeds of WNG25 and WNG28 are not decided by the customer. It is only for reference.
2. The unit is only used in Wall mounted A/C.

12A.3.3. List of A/C Groups

The following table defines the different A/C groups, and the applicable operation modes for each group.

Operating Mode	ST	RH	RC	SH
Fan	Yes	Yes	Yes	Yes
Cool (3)	Yes	Yes	Yes	Yes
Heat (3)	No	Yes (1)	Yes	Yes (2)
Dry (3)	Yes	Yes	Yes	Yes
Auto Cool/Heat (3)	No	Yes (1)	Yes	Yes (2)

Notes:
1. Electric heaters do the heating.
2. Heating is done by Compressor (Heat Pump), and by electric heaters.

12A.4. General functions

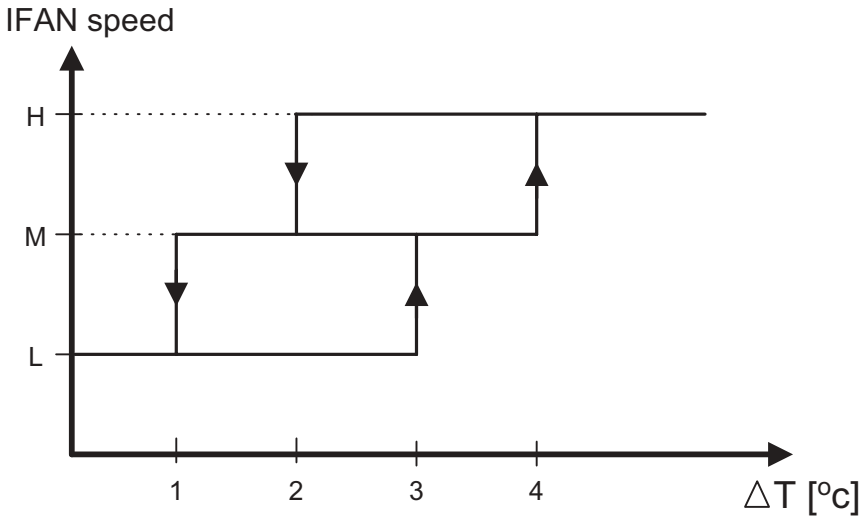
12A.4.1. COMP operation

- For each Mode including POWER OFF & SB, a Min time delay of 3 min before COMP restarting, excluding DEICING Mode.
- The Min operation time of COMP under different operating conditions is

Operation Mode	Min operation time of COMP
Heat, Cool, H.P protection or Auto Modes	3 min.
Fan, Dry, Overflow, Protection modes, or mode change	ignored

12A.4.2. IFAN operation

- Min time interval between IFAN speed changes in AUTOFAN Mode is 30 sec.
- Max time interval between IFAN speed changes in H/M/L Mode is 60 sec.
- Strong IFAN speed is only used in cool and heat mode and is controlled by R/C. Strong IFAN cannot be remembered by EEPROM.
- IFAN speed in Heat/Cool and Auto fan Mode is determined according to the following chart:



Where in Heat Mode: $\Delta T = SPT - RT$
in Cool Mode: $\Delta T = RT - SPT$

- IFAN uses PG motor and closed loop control.

12A.4.3. OFAN operation

- Min time interval between OFAN ON/OFF state changes is 30 s.

12A.4.4. HE operation

- Minimum Heaters ON or OFF time is 30 sec.
- Heaters can never be in operation while IFAN is OFF.
- In RH group, HE-1 will be activated only when COMP is not operating except in Dry Mode.

12A.1.5. Protections

- High-pressure protection is applicable to all operating modes.
- Deicing control is valid in Heat and Auto Heat Mode only.
- Defrosting control is valid in Dry, Cool and Auto Modes.
- No reset after protection modes.

12A.1.6. Thermistors operation

- Return air Temp is detected by RAT (RT1) in normal Mode, or by RCT (R/C sensor) in I-FEEL Mode.
- ICT (RT2) detects indoor Coil Temp.
- Outdoor Coil Temp is detected by OCT (RT3).
- Definition of thermistor faults:
  a. Thermistor is disconnected -

     The thermistor reading is below -30°c.

  b. Thermistor is shorted -

     The thermistor reading is over 75°c.

  c. Thermistor Temp reading doesn't change (irrelevant for RT1) -

12A.1.7. RV Fault (comp units only)

This test is performed every time the unit is switched from OFF/STBY to OPER in Heat mode or changes operation mode from COOL/DRY to HEAT (this applies also in AUTO COOL/HEAT mode).

If ICT is lower than 35^0C at the time of mode change, then at the first occurrence of 15 min continuous COMP operation, ICT is compared with ICT reading when the COMP was switched from OFF to ON 15 min before. RV fault is defined when ICT decreases in more than 5 ^{0}C.

In this case, the COMP will stop and the SB led will blink. This fault is reset after going to SB or mode change.

12A.1.8. Functional Mode Definitions

The following table summarized the models as they defined with accordance to the jumper's selection.

Model	J4	J5
FLO 3 N	0	0
RESERVE	1	1

12A.5. Cooling Mode

12A.5.1. Cooling Mode – General

- Room Temperature, RT, is detected by

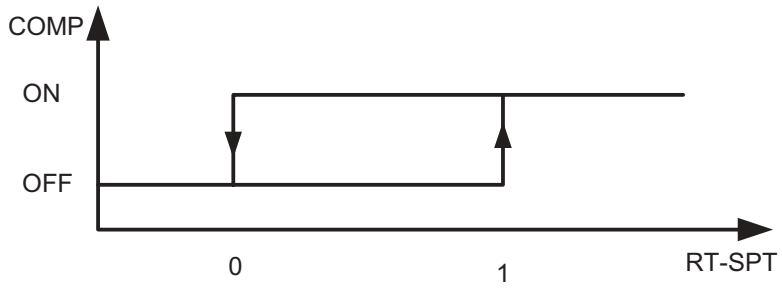
a) RAT in normal operation, or
b) RCT (R/C sensor) in I-FEEL mode.

- Indoor Coil Temp is detected by ICT (RT2).

- Outdoor Coil Temp is detected by OCT (RT3).

12A.5.2. Control Functions

- COMP Operation



- OFAN Operation

a. In normal operation, OFAN operates together with the COMP.

- IFAN Operation

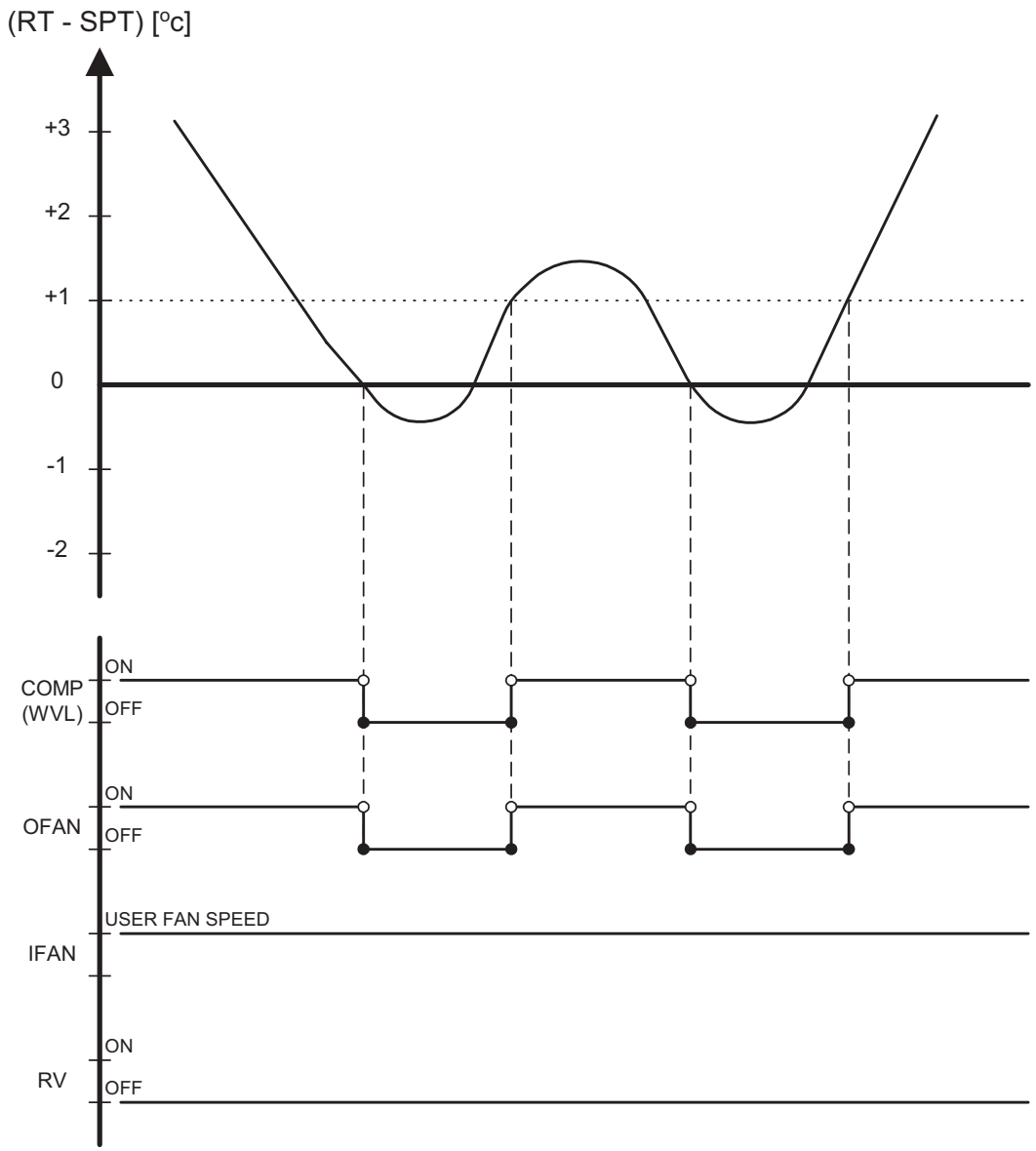
a. IFAN will operate in ANY speed regardless the ICT or COMP state.
b. IFAN speed will be determined according to user selection or AUTO-FAN logic.

- RV and HEATERS outputs

a. RV and HEATERS are in OFF state in cool mode.

12A.5.3. Sequence Diagrams

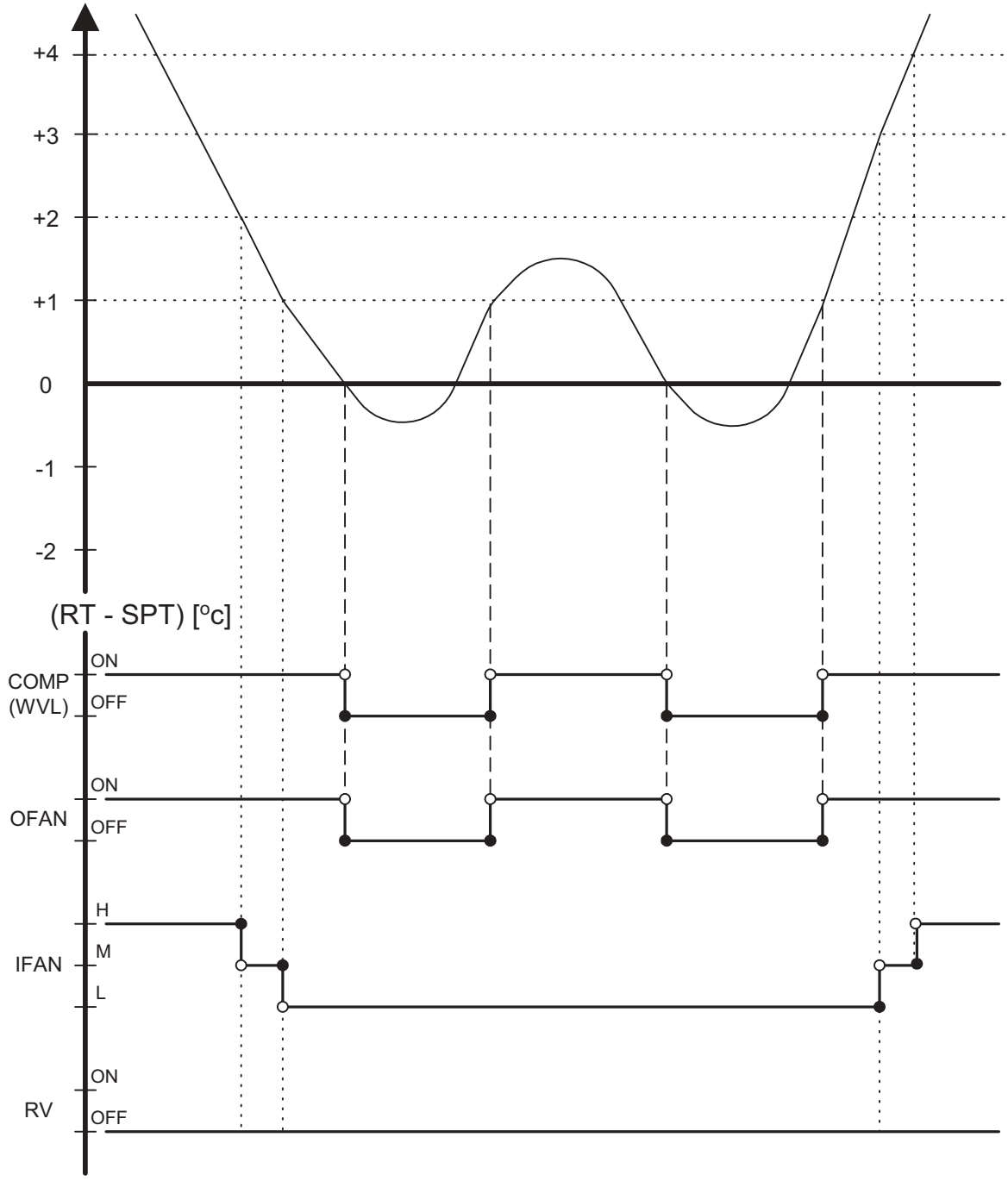
- Maintaining room temp at desired level by comparing RT and SPT with user defined IFAN speed.



Note:

1) IFAN is always running at High, Medium, Low or Strong speed selected by user.
2) In IFEEL mode, the Room Temperature (RT) is the RCT from a R/C. Otherwise, the RT is the RAT from the Room Thermistor.

- Maintaining room temp at desired level by comparing RT and SPT with AUTO-IFAN.



12A.6. Heating Mode

112A.6.1. Heating Mode - General

- **Compensation Procedure:**
  The compensation procedure comes to solve the problem of the temperature distribution by height during heat mode according to this procedure.
- When I feel is OFF during heat mode: RT= RAT – CTV.
  When I feel is ON during heat mode: RT= RCT.

- **CTV** is a compensation temperature value to be used from the following table (CTV table).
- **RCV** is a reference compensation value (relation between cells).
- **IOC** is a compensation value when IFAN is OFF.
- The values of RCV and IOC to be set in the following table are taken from the RCV and IOC table below depending on the model.

CTV table:

I / IFAN / ICT	OFF	LOW	MEDIUM	HIGH
40 > *ICT*	IIOC	RRCV+0	RRCV+0	RRCV+0
50 > *ICT* ≥ 40	IIOC	RRCV+0	RRCV+0	RRCV+0
ICT ≥ 50	IIOC+1	RRCV+1	RRCV+1	RRCV+1

-

RCV and IOC table

- The following table includes the RCV and IOC default values. These values are set as values in the above compensation table.

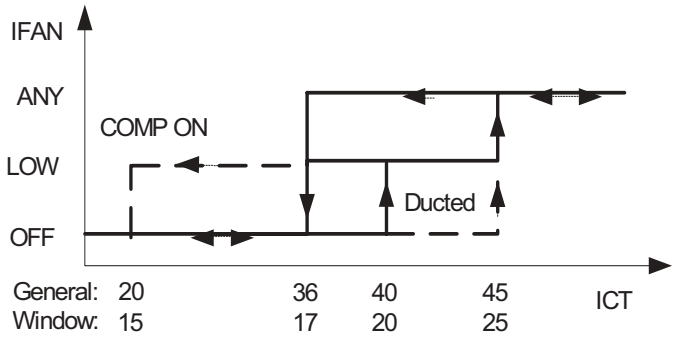
Model	RCV	IOC
FLO 30 N	+2 °C	+2 °C
WNG-28	+2 °C	+2 °C
WNG-25	+2 °C	+2 °C

No compensation will be activated in Forced operation modes.

12A.6.2. IFAN operation rules for RC and SH.

- As a general rule for **RC and SH groups,**

IFAN will be switched ON according to the following graph:



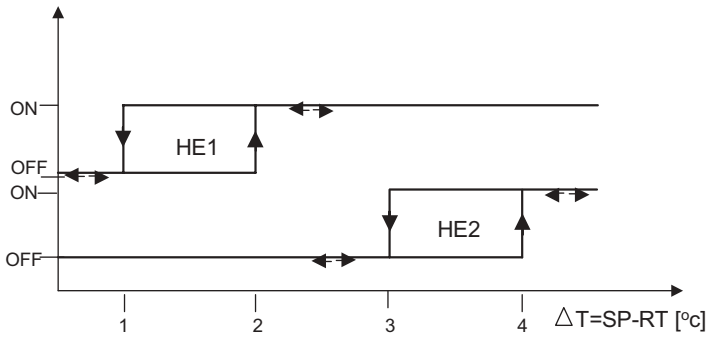
Note 1:
When ICT is faulty:
When the compressor switches from off to on (excluding deicing), IFAN will be on in ANY speed.
When the compressor switches from on to off, the IFAN will change to low speed for 30 seconds and then it will be off.

Note 2:
Once the compressor is ON, 6 min later, excluding protection modes, IFAN will be forced to Low until it reaches the ANY speed, and then IFAN will operate according to items and above. This rule can be re-performed only on the next compressor restart.

- In **SH or RC group**, IFAN will operate for min 30 sec , after HE's turned off, where in a case it has to be OFF, it will be forced to low speed.

12A.6.3. Heaters operation rules for RC and SH groups

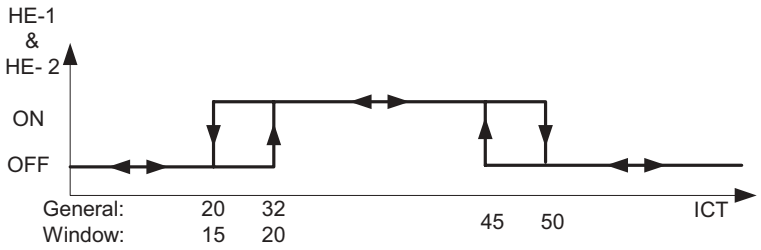
- For both **RC** and **SH groups**, Heaters versus ΔT is as the following:



- Operation rules for Heaters in **RC group**:

a. Heaters can be enabled only if IFAN is ON,.i.e IFAN is in higher precedence than the Heaters.

b. Heaters will operate according to ΔT **and** the following graph:

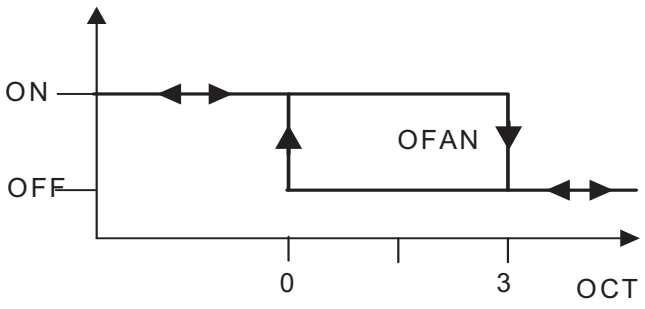


12A.6.4. OFAN Operation for RC and SH

- As a general rule for **RC and SH groups**, excluding protection modes, OFAN starts with the compressor.
- When OFAN is then ON it will operate according to the following conditions:

a) OFAN operates together with the compressor.

b) When $(RT \geq SPT - 2)$ *and* $ICT \geq 50$ the 4.7k Ohm resistor is not connected to the OCT, OFAN will operate according to the following curve:

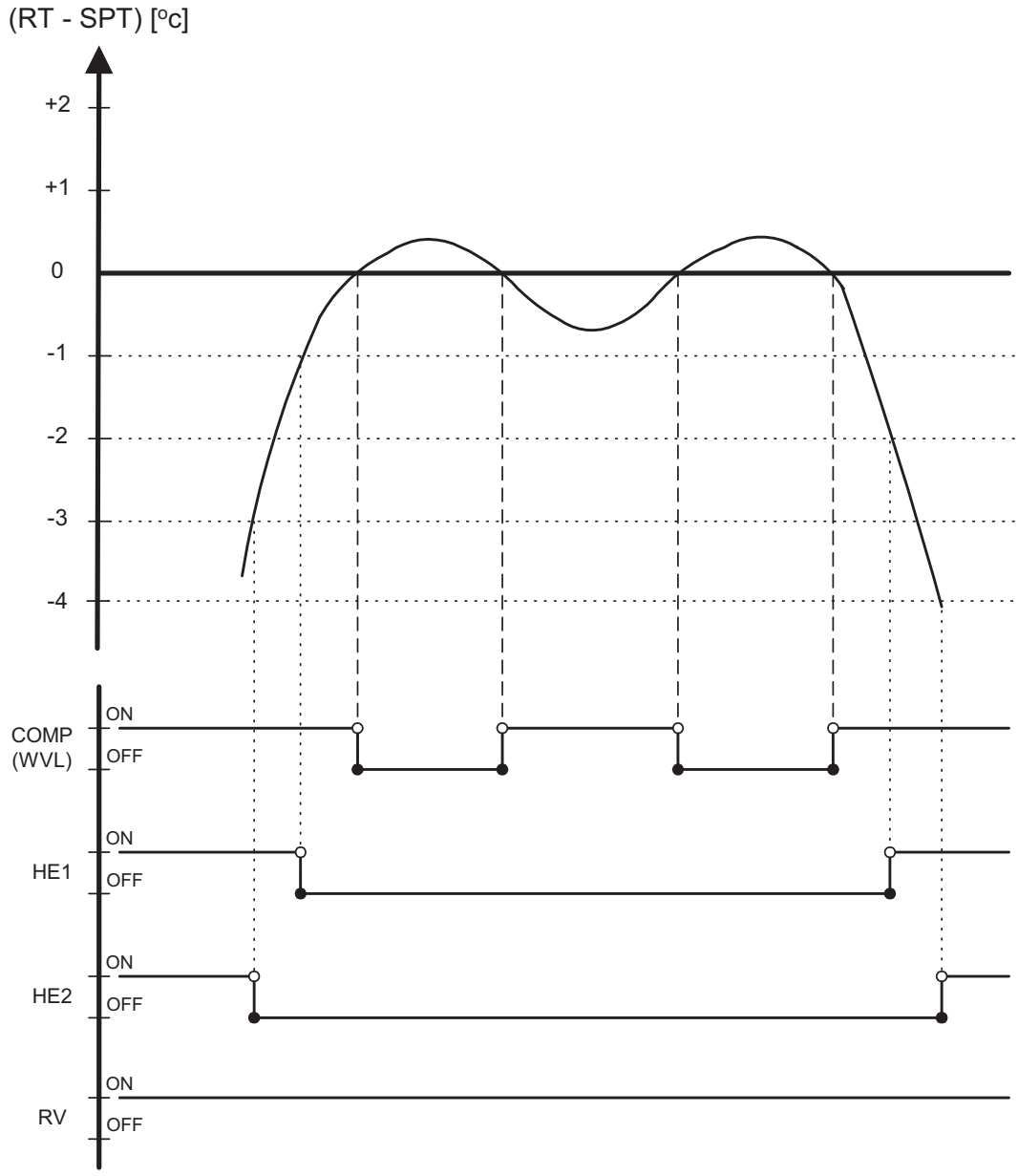


112A.6.5. Heating, RC or SH Group

Mode:	Heat, Auto (at heating)
Temp:	Selected desired temperature
Fan:	STRONG, HIGH, MED, LOW
Timer:	Any
I Feel:	On or Off

Sequence Diagram

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

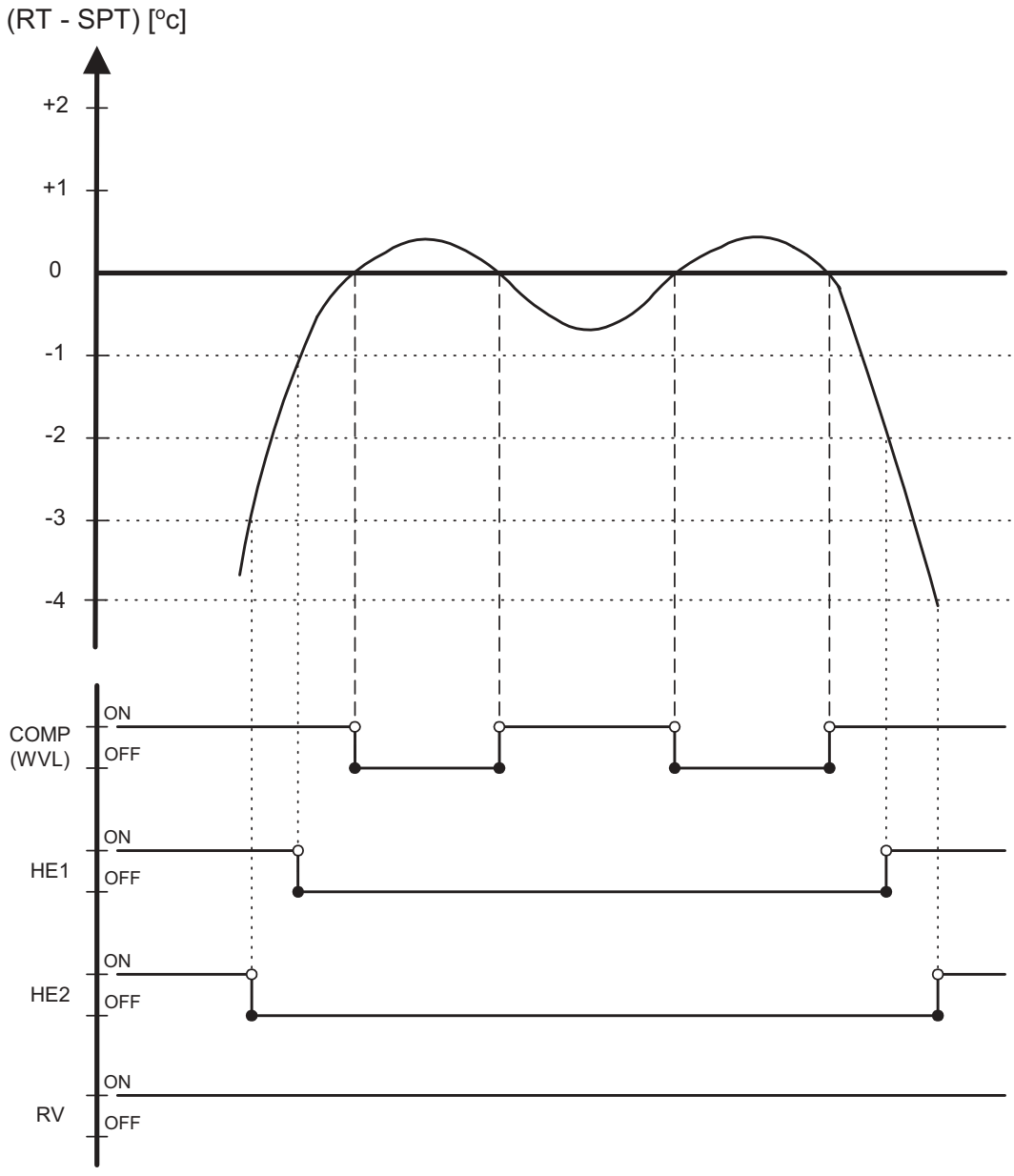


12A.6.6. Heating, RC or SH Group with Auto fan

Mode: Heat, Auto (at heating)
Temp: Selected desired temperature
Fan: Auto
Timer: Any
I Feel: On or Off

Sequence Diagram

Maintains room temp at desired level by controlling COMP, IFAN and OFAN.



12A.7. Automatic Cooling or Heating

12A.7.1. Automatic Cooling or Heating - General

- Mode Definition

Mode: Auto
Temp: Selected desired temperature
Fan: Any (except STRONG)
Timer: Any
I Feel: On or Off

- Switching-temperature between Cooling and Heating is SPT $\pm$ 3°c.

- When the Auto Mode is started with SPT +/-0°c, the unit will not select Auto Heat or Auto Cool mode immediately. Instead, the unit will be in a temporary Fan Mode with IFAN operating at low speed. The proper Auto Heat mode or Auto Cool will be started whenever the RT reaches SPT-1°c or SPT+1°c respectively.

- For RC & SH units, Mode change between Auto Heat & Auto Cool Modes is possible only after the COMP has been OFF during the last T minutes.

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

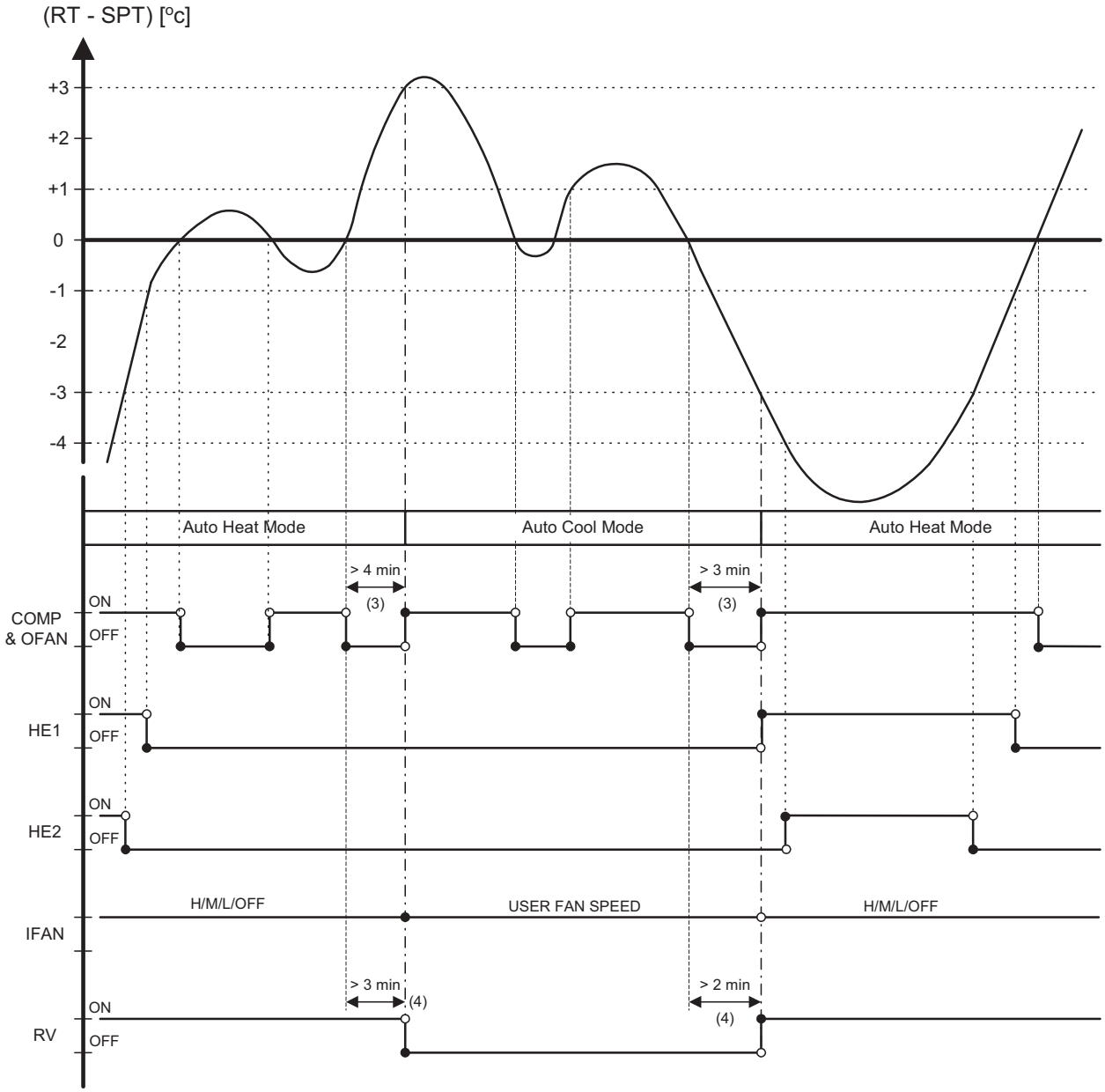
.

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

12A.7.2. Sequence Diagrams

- Auto Cooling or Heating, RC or SH Groups

Maintains room temp at desired level by selecting between cooling and heating modes.



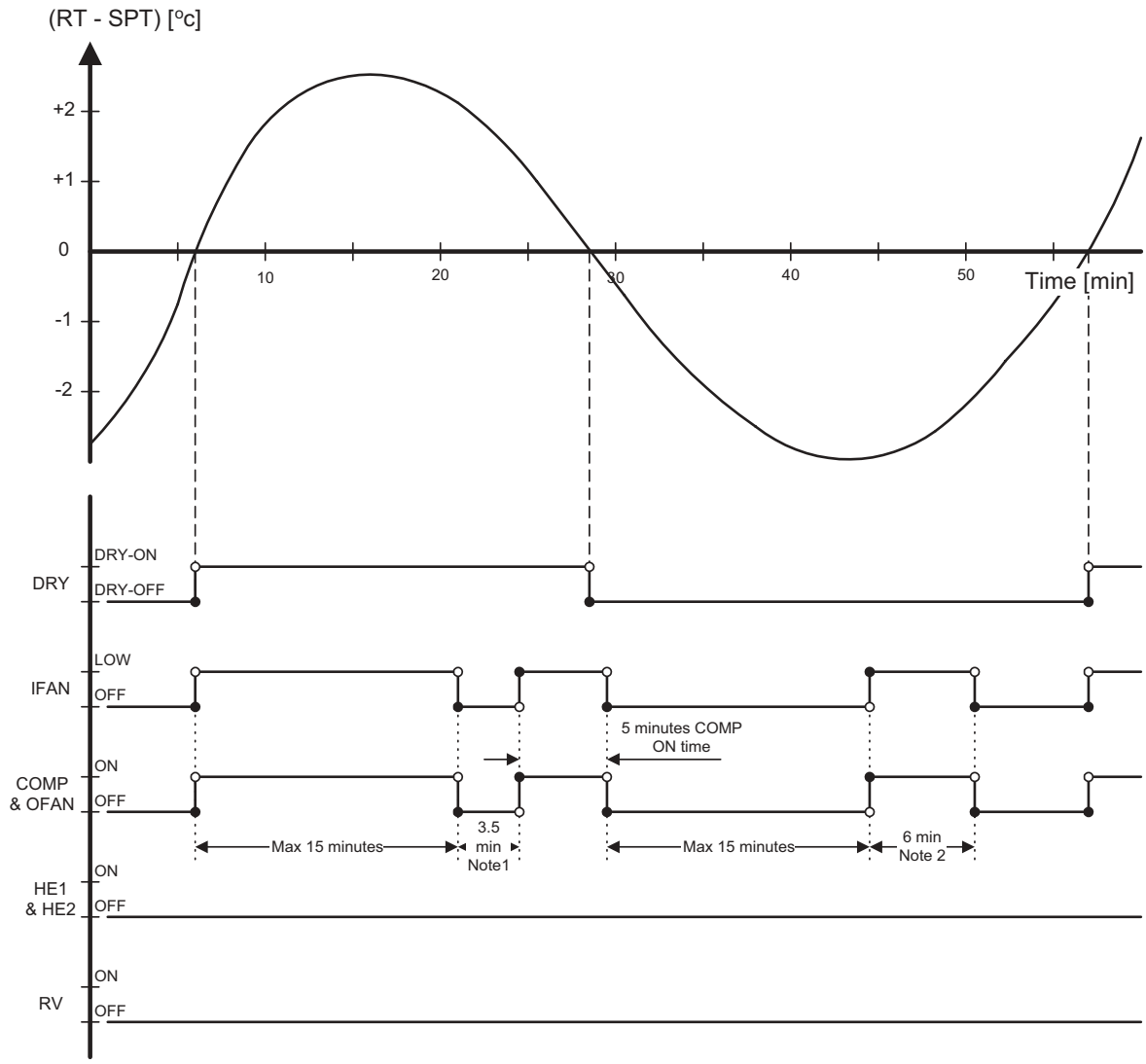
Notes:

1) Refer to Sect. **Error! Reference source not found.** for the details of IFAN operation.
2) Refer to Sect 0 for the minimum mode-change delay from COMP/HEs OFF.
3) HE2 is not used

12A.8. Dry Mode

- **Dry, ST or RC group with any group settings**

Mode: Dry
Temp: Selected desired temp
Fan: Low
Timer: Any
I FEEL: Any
Control function
Reduce room humidity with minimum temp 'fluctuations by operating in Cool Mode with low speed IFAN.



Notes:

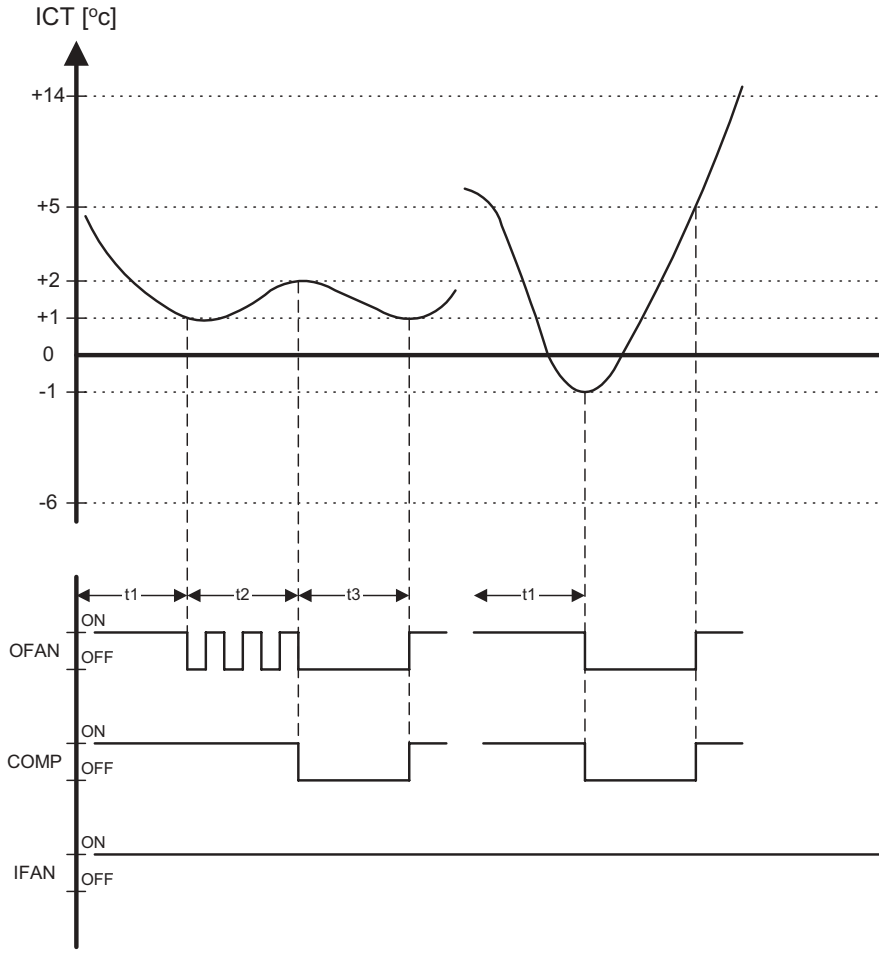
1. When Dry is ON, the COMP is forced OFF for 3.5 min (longer than the 3 min Min COMP-Off time) after every 15 min of continuous COMP operation.
2. When Dry is OFF, the COMP is forced ON for 6 min (longer than the 3 min Min COMP-On time) after every 15 min of continuous COMP OFF time.
3. When Dry is changed from ON to OFF or vice versa, the limits mentioned in (1) & (2) are ignored. The COMP operation is only controlled by the 3 min Min OFF time and 1 min Min ON time.
4. In Dry Mode, IFAN is LOW when COMP is ON, and is OFF when COMP is OFF.

12A.9. Protection

• Cooling Mode Protections

Indoor: Coil Defrost
Mode: Cooling, Dry, Auto
Temp: Selected desired temp.
Fan: Any
Timer: Any
I Feel: On or Off

Function: Protect the indoor coil from ice formation at low ambient temperature

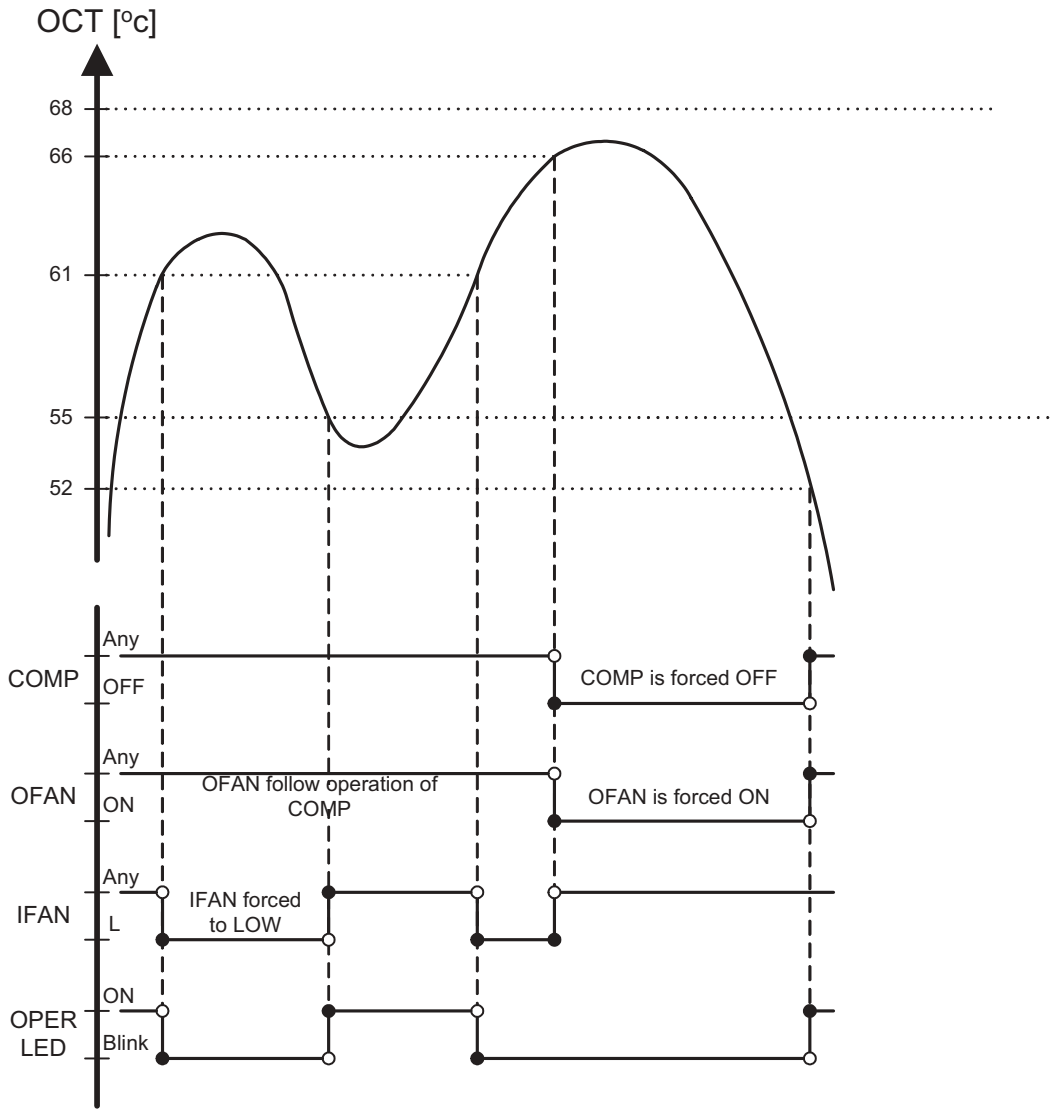


t1 = 5 min minimum for each COMP starting
t2 = OFAN cycling (alternate between ON and OFF every 30 sec) for 20 min maximum
t3 = COMP and OFAN stop for 10 min minimum

12A.9.1. High Pressure Protection

Mode: (Auto) Cooling or Dry
Temp: Selected desired temp.
Fan: Any
Timer: Any
I Feel: On or Off

Function:
To protect the COMP from the high-pressure built-up in the outdoor coil during normal cooling operation, by changing the IFAN speed and switching OFF COMP.



Note:

1. The ICT is also monitored during Cool and Dry mode, in case the RV control circuit is faulty. Whenever ICT reaches 70°c, which indicates a high pressure in the indoor coil, the COMP will be forced off automatically. The COMP can be turned on again only after the ICT is under 70°c again and after the 3 min COMP ON delay time. The OPER LED will not blink in this case.

12A.9.2. Heating Mode Protections

- Outdoor coil Deicing (excluding RH Group)

  Mode: Heating, Auto (at heating)
  Temp: Selected desired Temp
  Fan: Any
  Timer: Any
  I FEEL: Any

  Function:

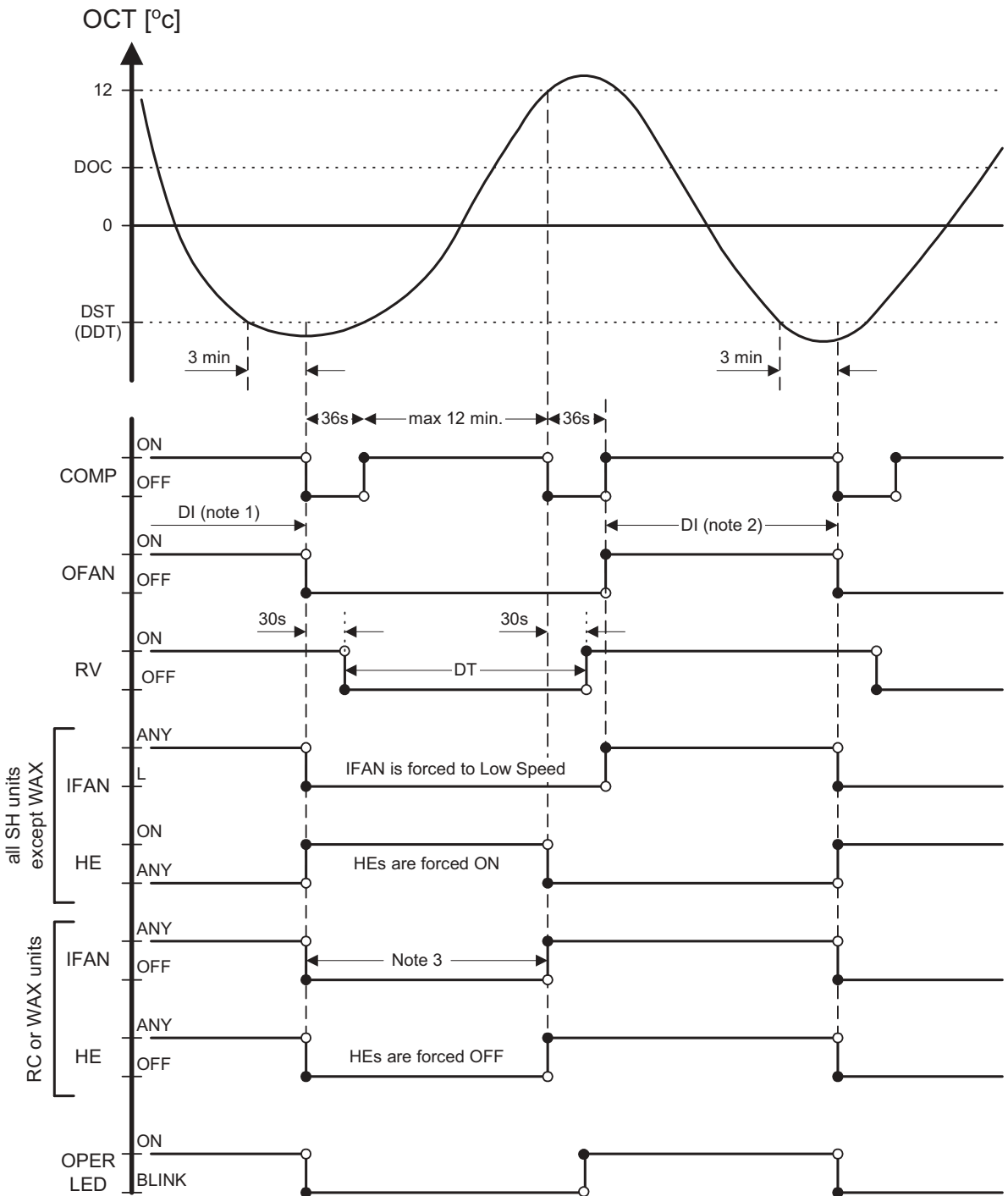
  Protects the Outdoor coil from ice formation by controlling COMP & RV operation.

  Scope

  This new deicer is designed to operate at extreme temp conditions. The deicing cycle could be triggered from:

  1. OCT temp' and time between two consecutive deicing cycles.
  2. Detection of ice forming by change of the OCT temp'.

- Deicing procedure



Notes:

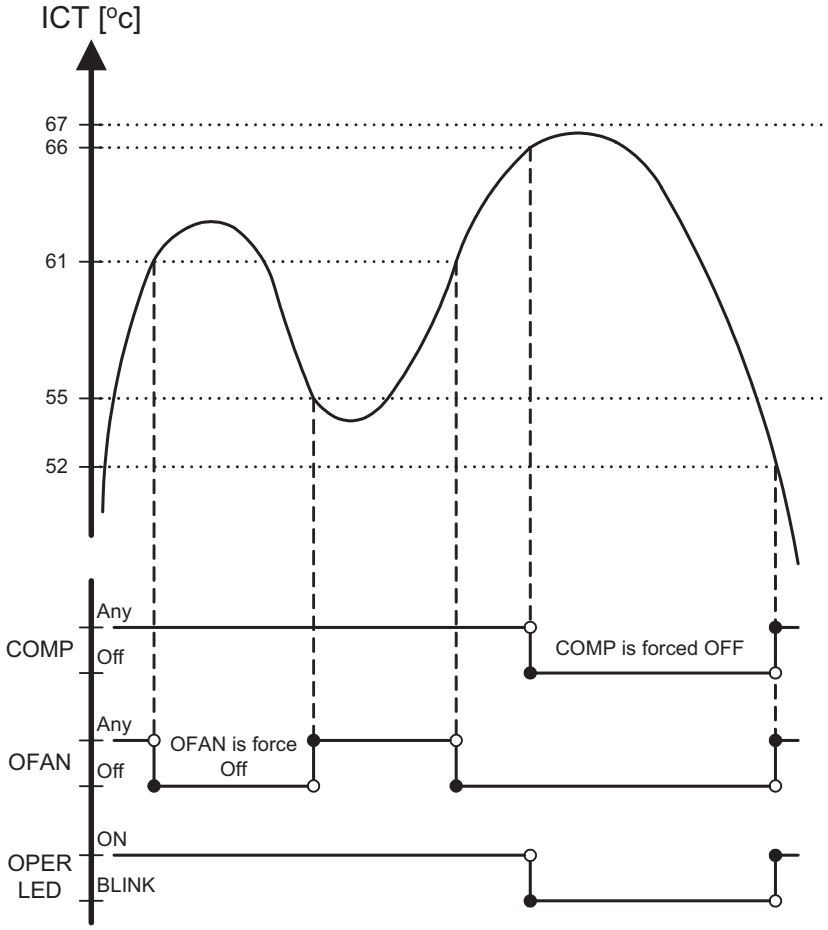
1. At the first COMP activation after SB or OFF, if (OCT < 0°c), then DI = 10 min, else DI = 40 min.
2. In the following Deicing cycles, the time interval between two Deicing cycles activation is between 30 to 80 min.
3. For RC group, IFAN is forced off,
4. For SH group, HEs are forced ON and IFAN is forced to operate in Low speed, regardless to the ICT and difference between RAT & SPT.
5. When jumper J7 is set, the DST value is -2°C.

12A.9.3. High pressure protection (excluding RH Group)

Mode: (Auto) Heating
Fan: Any
Timer: Any
I Feel: On or Off

Control Function

Protect the Compressor from high pressure by switching OFF the OFAN and COMP.



Notes:

1. IFAN, HE1 will be activated according to the relevant Heating Mode Sect.
2. In case of any malfunction in the relay control circuit, the OCT is also monitored during Heating mode. Whenever OCT reaches 70°c, which indicates a high pressure in the outdoor coil, the COMP will be forced off automatically. The COMP can be turned on again only after the 3 min COMP ON delay and the OCT is under 70°c. The OPER LED will not blink in this case.

12A.10. Timer

Mode:	Any
Temp.	Selected desired temp
Fan:	Any
Timer:	Timer On, Timer Off
I Feel:	On or Off

Function:

- Starts or stops the unit operation after pre-set time.

  If RC-1 is used, the timer setting will be (0.5 - 24 Hr) from the moment the timer is set. The minimum resolution is 30 minutes.

  If RC-2 or later version of remote controls is used, the timer setting will be (0:00 - 23:50) real time with 10 minutes resolution.

- After power failure, all pre-set timers are cleared. The system is forced to STBY mode. .

Note: If all timers are inactive, the system will not be forced OFF after the power failure. The last OPER/STBY status will be loaded from the EEP instead.

- When the A/C receives any valid message from a R/C, the current ON/OFF timer settings will be replaced by the new timer settings in the R/C message.

Note: The following timer related operations will not affect the A/C operating mode (Heat/Cool/Auto/Dry/Fan) setting.

a. Set ON/OFF timer
b. Clear ON/OFF timer
c. R/C ON Timer is time-up
d. R/C OFF Timer is time-up

E.g. When a STBY A/C unit (with Cool Mode setting in its EEP) is turned on by the ON-TIMER of an R/C with heat mode setting, the A/C will start in Cool Mode.

12A.11 Horizontal swing – Horizontal louvers

- When the power is ON, the Horizontal Louver will reset to left of A/C (0 °) and then stop.
- When the R/C signal of ON/OFF is received, the Horizontal louver will run to last position.
- When Horizontal swing mode is received from R/C. it will rotate to setting position.

Mode	Left Motor	Right Motor
1	0°	0°
2	22.5°	22.5°
3	45°	45°
4	67.5°	67.5°
5	90°	90°
6	0°	90°
7	0°⇔ 90	

- The Horizontal louvers are driven by two step motor.

12A.12. Forced operation

Forced operation allows units to start, stop and operate in Cooling or Heating in pre-set temperature according to the following table:

Forced operation mode	Pre-set Temp
Cooling	22°C
Heating	28°C

Note:

- While under the forced operation, the temperature compensation schedule is disabled.
- The forced operation is activated when the mode button on the Display Board is used to switch the unit to Cool or Heat mode.
- The IFAN is always set to Auto fan Speed in forced operation.
- The backlight will be ON when button is pressed.

12A.13. Sleep

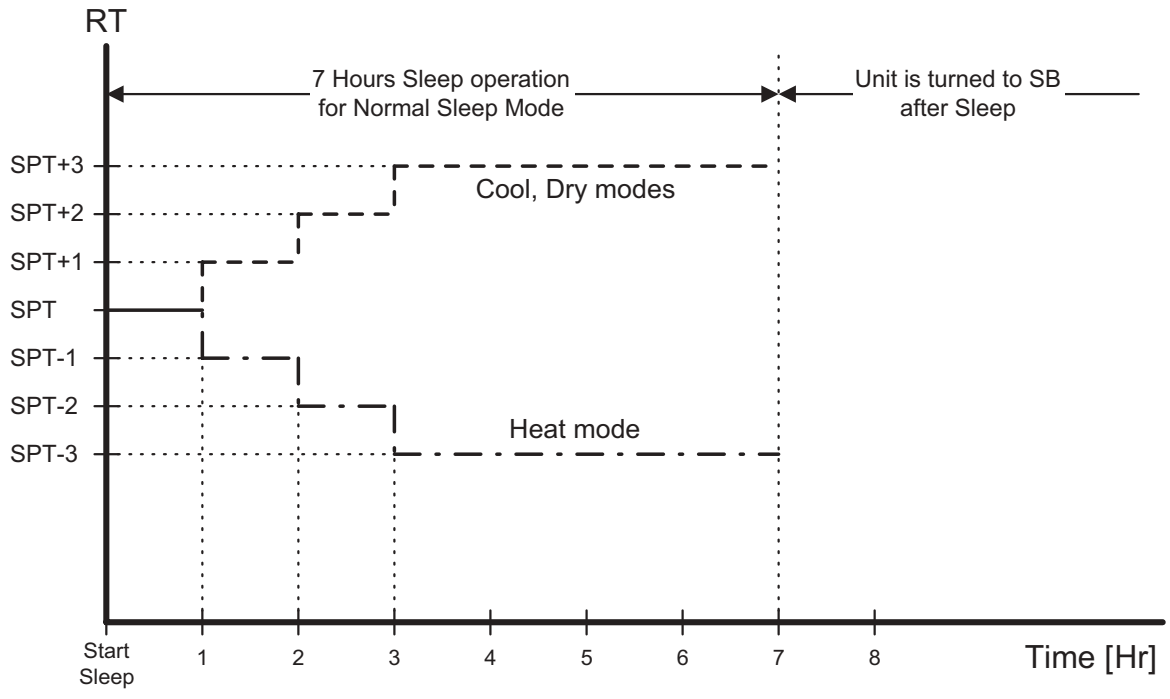
Mode: Any
Temp: Set – desired temperature selected
Fan: Any
Timer: Interact with Sleep Timer as described in sect 12.2
I Feel: On or Off

- The Sleep mode is activated by using the sleep button on the R/C. In Sleep Mode, the unit will automatically adjust the SPT to turn up/down the room temperature (RT) gradually to provide maximum comfort to the user in sleep.

- Sleep is treated as TIMER function. Therefore, the TIMER LED is activated similar to TIMER function.

12A.13.1. SPT adjustment in Sleep Mode

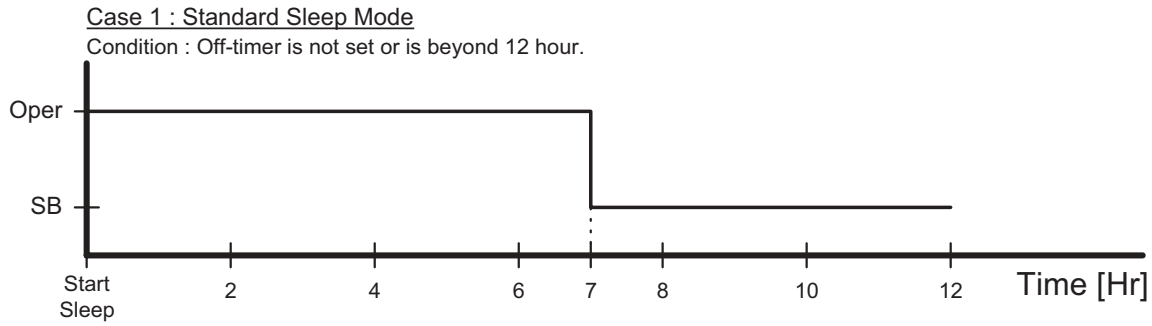
- In cool, auto cool or dry modes, the SPT adjustment is positive (from 0 to +3°c).
- In heat or auto heat modes, the SPT adjustment is negative (from 0 to -3°c).
- In other modes, there is no SPT adjustment.
- The SPT adjustment is cancelled when the Sleep mode is cancelled.

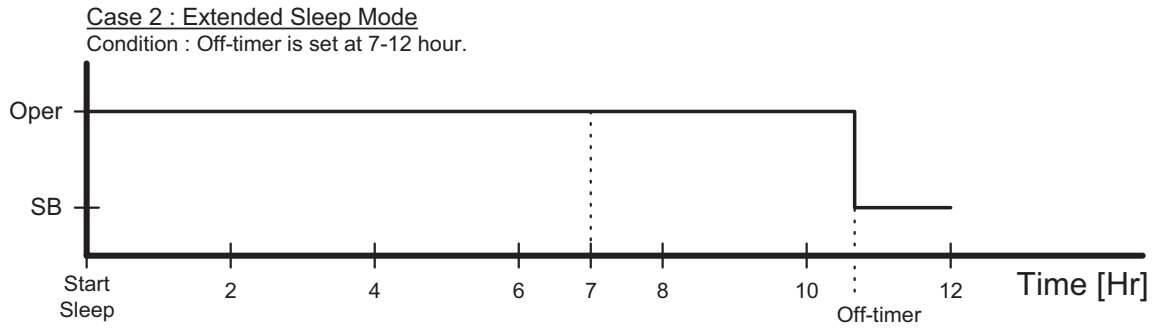


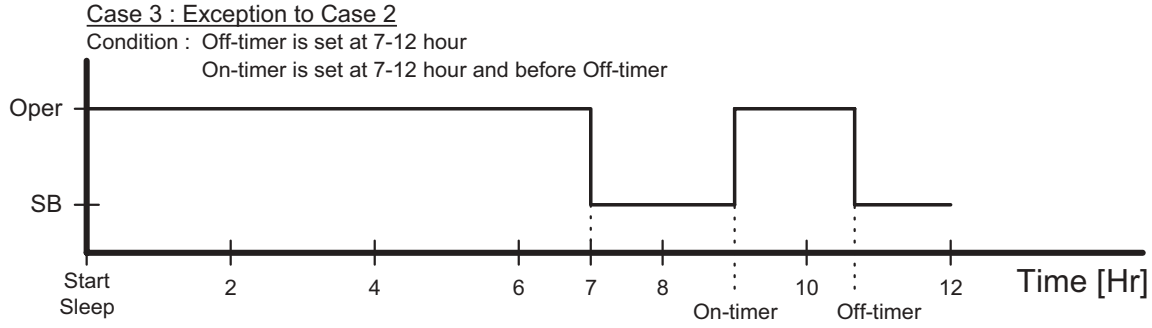
Note: If Off-timer is active, the unit may go to SB before or after 7 hours of sleep operation.

12A.13.2. Time adjustment in Sleep Mode

- In 10V4, the user can make use of the Off-Timer to extend the Sleep Time from 7 hours to 12 hour (max). The operation of the new “Extended Sleep Mode” is illustrated by the graphs below.
- Case 1 is the Standard Sleep Mode, which is the only sleep mode in previous version of MCU. The A/C unit simply works for 7 hours, then goes to SB.
- Case 2 is the new Extended Sleep Mode. If an active Off-Timer is set to turn off the A/C between 7-12 hour, relative to the starting of Sleep, the Sleep time is extended. And, instead of going to SB at the 7th hour, the A/C will work until reaching the Off-time.
- Case 3 is an exception to case 2. The Sleep Mode will not be extended to the Off-Time when the Off-Timer is preceded by an On-Timer, which is also between 7-12 hour.







12A.14. Clogged Air filter

- Filter LED ON after 512 HR
- Filter LED is turned OFF, and the Filter Timer is restarted by pressing the reset button.

12A.15. Ionizer

Ionizer output logic

Models: All
Operation mode: All

- ON condition:
  IFAN turn ON.
  Air Clean ON signal is received
- OFF condition:
  IFAN is OFF
  Air Clean OFF signal is received

12A.16. E.S.F – Electro Static Filter

12A.16.1. E.S.F output logic

- Models: All
- Operation mode: All
- E.S.F is ON when all the following condition are satisfied:
  a. IFAN turn ON.
  b. Air Clean ON signal is received.
  c. Safe switch is pressed

- E.S.F is OFF only if one of the following condition isn't satisfied :
  a. IFAN is OFF
  b. Air Clean OFF signal is received
  c. Safe switch is loosed.

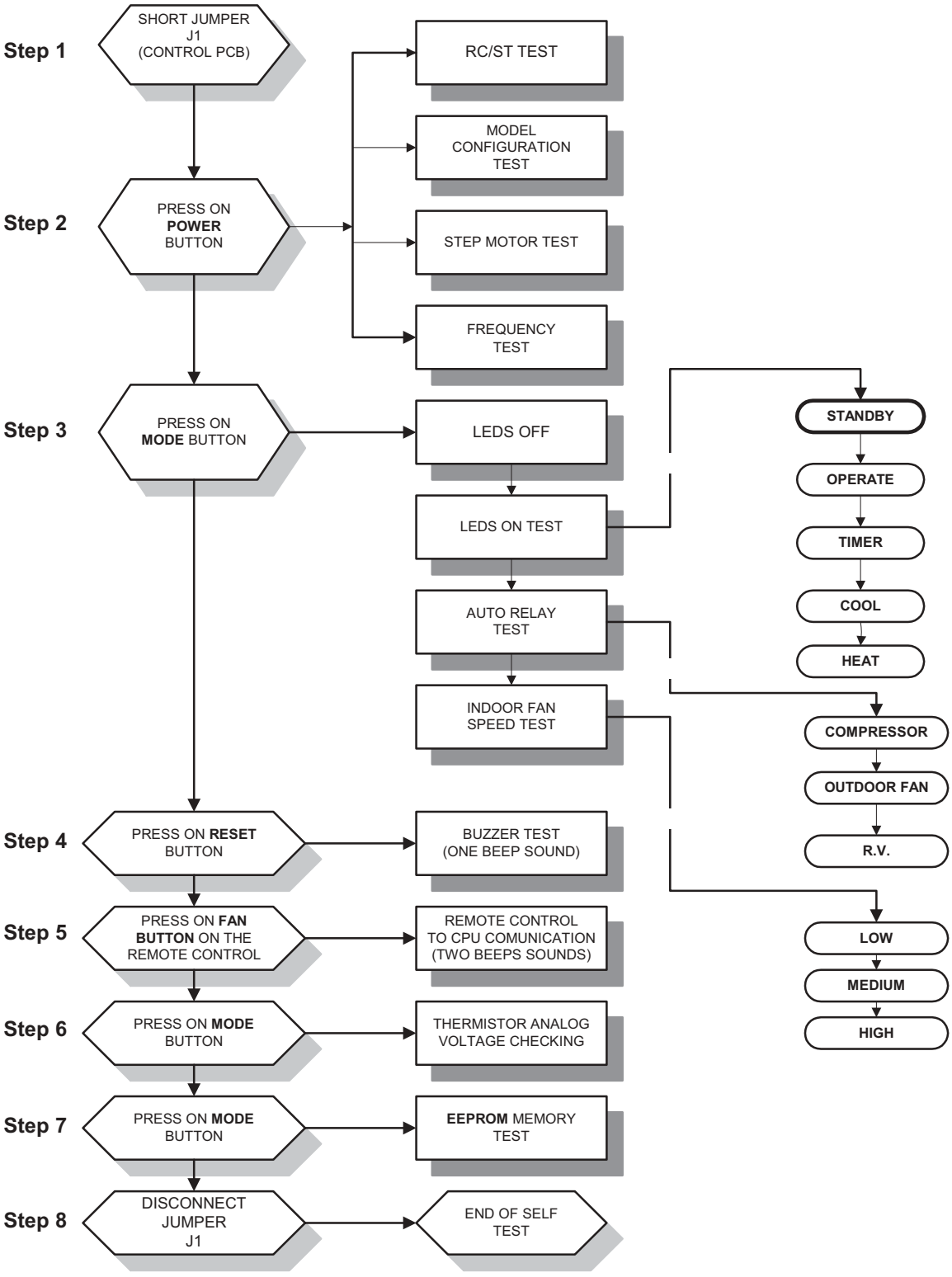
Note: That output logic will be active only if the E.S.F. Enable bit is 1 in the R/C message (default = 1) as described in Appendix A.

12A.17. Controller Self-Test Procedure

12A.17.1. By Shorting Test Jumper J1

SELF-TEST FLOW CHART

FOR CONTROLLER (VERSION 4V5 OR HIGHER)



12A.17.2. By Remote Control Settings:

a. **1: TURNING ON THE POWER.**

Turn ON the power, make sure that the unit is in operation.

b. **STEP 2 : ENABLE SELF-TEST MODE**

- Use the remote control to send the first settings to display / indoor unit HEAT mode, HIGH IFAN, set temperature to 16 ºC**,** no I-FEEL Sleep or any other timer settings are needed.
- Cover the IR transmitter components in the remote control so that it will not transmit the signals to the indoor unit display.
- Use the remote control to send the second settings to display / indoor unit COOL mode, LOW IFAN, no I-FEEL Sleep or any other timer settings.
- Uncover the remote control IR transmitter and change the temperature settings. If the display/indoor unit receive the settings properly the following steps will start:

c. **STEP 3: MODEL SETTING CONFIRMATION**

- The STAND-BY and COOL LEDS will indicate the operation mode as follows:

COOL LED	STAND-BY LED	OPERATION MODE
OFF	ON	ST
OFF	OFF	RC
ON	OFF	SH
ON	ON	RH

- Testi the Model configuration. Selected by the COMP, STAND-BY, TIMER LEDS and FILTER will indicate the model configuration as follows (the relevant line for this manual is highlighted):

FILTER LED	TIMER LED	OPERATE LED	COMP	MODEL
OFF	OFF	OFF	ON	FLO
ON	OFF	ON	ON	WMN1
OFF	ON	OFF	OFF	WMN 4
ON	OFF	ON	OFF	WMN 2/WHX
ON	ON	ON	OFF	WMN 3

In this term the step motor will turn to HOME POSITION.

d. **STEP 4 : AUTO LED WALK TEST.**

- All the LEDS will turn OFF.
- All the LEDS will turn ON for 1 second one by one in the following sequence:

  STAND-BY ⇨ OPERATE ⇨ TIMER ⇨ FILTER ⇨ COOL ⇨ HEAT.
- In PRX all the LEDS will turn ON for 1 second one by one in the following sequence : 18 °c ⇨ 20 °c ⇨ 22 °c ⇨ 24 °c ⇨ 26 °c ⇨ 28 °c ⇨ 30 °c ⇨ High IFAN ⇨ Auto IFAN ⇨ Med IFAN ⇨ Low IFAN ⇨ STAND-BY⇨ TIMER ⇨ FILTER ⇨COOL⇨ HEAT.

e. **STEP 5: AUTO REALY WALK TEST:**

- All relays will energize one by one in the following sequence:

COMPRESSOR ⇨ OUTDOOR FAN⇨R. V. ⇨ HEATER 1 ⇨ HEATER 2 ⇨ INDOOR WATER PUMP ⇨ SWING or OUTDOOR WATER PUMP ⇨ INDOOR FAN: LOW ⇨ MID ⇨ HIGH.

- When the relay walk test is completed, the next test will start automatically.

f. **STEP 6: FREQUENCY TESTING:**

- If the frequency measuring process fails the COOL LED will turn ON. In order to move to the next step, press ON/OFF button on the remote control.

g. **STEP 7: INPUT TEST.**

- The test purpose is to check the analog real time indicators (thermistors, LEVEL and clock) according to the table below.

LED Indicator	Condition for LED to be ON
STBY LED	Room thermistor ≠ 25°c
OPER LED	Indoor coil thermistor ≠ 25°c
TIMER LED	Outdoor coil thermistor ≠ 25°c
FILTER LED	Clock
COOL LED	LEVEL 2&3
HEAT LED	LEVEL 4

h. **STEP 8: TIMING RESET TEST (WATCH DOG).**

- The test purpose is to verify that the CPU rise time after power failure is between 1 to 3 sec, test results are indicated on the LEDS : STAND-BY,OPER, TIMER and FILTER turning ON one by one.
- The results of the test are coded as follows:

  Pass condition:

  1 sec - STAND-BY and OPER are turned ON

  2 sec - STAND-BY, OPER and TIMER are turned ON

Fail condition:

0 sec - STAND-BY is turned ON

3 sec - STAND-BY, OPER, TIMER and FILTER are turned ON

- When the timing reset test is completed, the next test will start automatically.

i. **STEP 9: MEMORY TEST (EEPROM)**

- The test purpose is to check if the memory is functioning correctly. The test result is reported by using the STAND-BY and FILTER LEDS:

LED Indicator	Condition for LED to be ON
STAND-BY LED	Test passed
FILTER LED	Test failed

AT THIS POINT THE SELF-TEST IS COMPLETED.

In order to terminate Self-Test mode the User can change the unit setting from COOL Mode, LOW FAN to COOL Mode, MED FAN or to wait without using the remote control for 60 sec.

12A.17.3. Values of Sensors Temperature VS. Voltage (DC)

Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)
-20	4.554	2	3.744	24	2.555	46	1.487
-19	4.529	3	3.695	25	2.5	47	1.447
-18	4.502	4	3.646	26	2.445	48	1.409
-17	4.475	5	3.595	27	2.391	49	1.371
-16	4.446	6	3.544	28	2.338	50	1.334
-15	4.417	7	3.492	29	2.284	51	1.298
-14	4.386	8	3.439	30	2.232	52	1.263
-13	4.354	9	3.386	31	2.18	53	1.228
-12	4.322	10	3.332	32	2.128	54	1.195
-11	4.287	11	3.278	33	2.077	55	1.162
-10	4.252	12	3.223	34	2.027	56	1.13
9	4.216	13	3.168	35	1.978	57	1.099
-8	4.178	14	3.113	36	1.929	58	1.069
-7	4.14	15	3.058	37	1.881	59	1.04
-6	4.1	16	3.002	38	1.834	60	1.011
-5	4.059	17	2.946	39	1.798	61	0.983
-4	4.017	18	2.89	40	1.742	62	0.956
-3	3.974	19	2.833	41	1.698	63	0.929
-2	3.93	20	2.777	42	1.654	64	0.904
-1	3.885	21	2.722	43	1.611	65	0.879
0	3.839	22	2.666	44	1.569	66	0.854
1	3.792	23	2.61	45	1.527	67	0.831

12A.18. On Unit Indicators and Controls.

STAND BY INDICATOR	1. Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands
OPERATION INDICATOR	1. Lights up during operation. 2. Blinks continuously during • OCT High Pressure Protection Mode • ICT High Pressure Protection Mode • Deicing in Heating Mode
TIMER INDICATOR	Lights up during Timer and Sleep operation.
FILTER INDICATOR	1. Lights up when Air Filter needs to be cleaned.
COOLING INDICATOR	1. Lights up when system is switched to Cool Mode by using the Mode Switch on the unit. 2. Show the thermistor status in Diagnostic Mode.
HEATING INDICATOR	1. Lights up when system is switched Heat Mode by using the Mode Switch on the unit. 2. Show the thermistor status in Diagnostic Mode.
MODE BUTTON (Cool, Heat, SB)	1. Use to cycle the operation mode of the A/C unit among COOL, HEAT and SB modes, without using the R/C. Every time this switch is pressed, the next operation mode is selected, in this order : SB ➔ Cool Mode ➔ Heat Mode ➔ SB ➔ ... The backlight will turn on and then off after 30 sec. 2. Press this button continuously for 5 sec or more to start the Diagnostic Mode.
RESET / FILTER BUTTON	1. When the Filter LED is ON, press to turn off the Filter LED after a clean filter has been installed. 2. When the Filter LED is OFF, use this button to enable/ disable the buzzer announcer.

12A.19. Clock Random Delay From 0 to 2.5 seconds

0 = Clock Switch Open
1 = Clock Switch close

The Clock is activating according to the following table:

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

Notes:

1. Clock can be interrupted by :
   - R/C - POWER ON/OFF Push-button.
   - R/C - TIMER.
   - R/C - SLEEP.
   - A/C - MODE SWITCH.
2. Any change in the CLOCK level during the first 6 sec after the system Reset is ignored.

12A.20. System diagnostics

Pressing Mode button for 5-10 seconds in SB or any other operation mode will activate diagnostic mode by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LEDs.

In diagnostic mode, system problems will be indicated by blinking of Heat & Cool LEDs.

The coding method will be as follow:

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	Problem	1	2	3	4	5
1	RT1 is disconnected	○	●	●	●	●
2	RT1 is shorted	○	●	●	●	○
3	RV Fault	○	●	●	○	●
4	RT2 is disconnected	●	○	●	●	●
5	RT2 is shorted	●	○	●	●	○
6	(Reserved)	●	○	●	○	●
7	RT2 temp reading doesn’t change	●	○	●	○	○
8	RT3 is disconnected	●	●	○	●	●
9	RT3 is shorted	●	●	○	●	○
10	(Reserved)	●	●	○	○	●
11	RT3 temp reading doesn’t change	●	●	○	○	○
12	RT2 & RT3 temp reading doesn’t change	●	○	○	○	○
13	PG motor no feedback error	●	●	●	●	●

○ - ON, ● - OFF

Notes:

1. If faults occur in more than one thermistor (except case number 12 on the table above), only one fault will be indicated according to the following order: RT3, RT2, RT1.

2. A/C will jump out to normal mode if sending a command by the R/C in the system diagnostics mode. If this command from the R/C contains a Group ID, this ID will become the new Group ID of the ELCON unit.

12A.21. Quick Run

Initiate the Quick Run Mode by using a R/C.

(i) Make sure that the correct A/C model has been selected by setting the jumpers J8, J3, J4 and J5 (if available), and the correct group has been selected by setting the jumpers J2 and J6. Jumper J1 must be disconnected.

(ii) Turn on the AC power to the unit and make sure that the unit is in operating mode.

(iii) Use a R/C to send the 1st setting to the ELCON unit
Heat/Fan Mode, High IFAN, SPT=16°c, no IFEEL, Sleep or any timer settings

(iv) Use a R/C to send the 2nd setting to the ELCON unit
Cool Mode, Auto IFAN, SPT=any, no IFEEL, Sleep or any timer settings.

(v) After the ELCON unit has received the two setting in the correct order, Quick Run Mode will be started immediately.

(vi) This special R/C initiated Quick Run Mode can be exit by changing the unit setting from Operating Mode to Stand-by Mode or resetting the unit.

Note: In (iii) and (iv), the 2nd setting must follow directly after the 1st setting. The timing is not important. For example, sending the 2nd setting 1 hour after the 1st setting is still acceptable. But if the two settings are separated by any other settings, such as Fan Mode or Dry Mode, the Quick Run Mode will not be started.

After entering Quick Run mode, the unit will be speed up by 52 times. For example, the compressor minimum off time will be speed up from 3 minutes to around 3 seconds; DI will be speed up from 10 or 40 minutes to 12 or 46 seconds…

12B. CONTROL SYSTEM WNG LCD TYPE

12B.1 General Functions

12B.1.1 Operation Modes

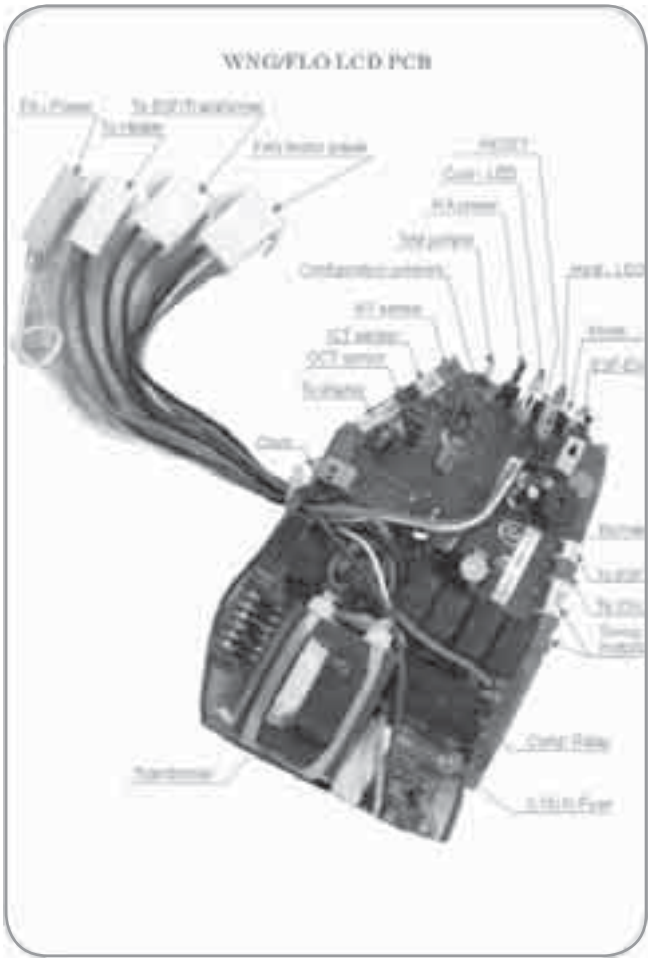
- Auto Mode
- Cooling Mode
- Drying Mode
- Fan Mode
- Heating Mode

12B.1.2 Functions

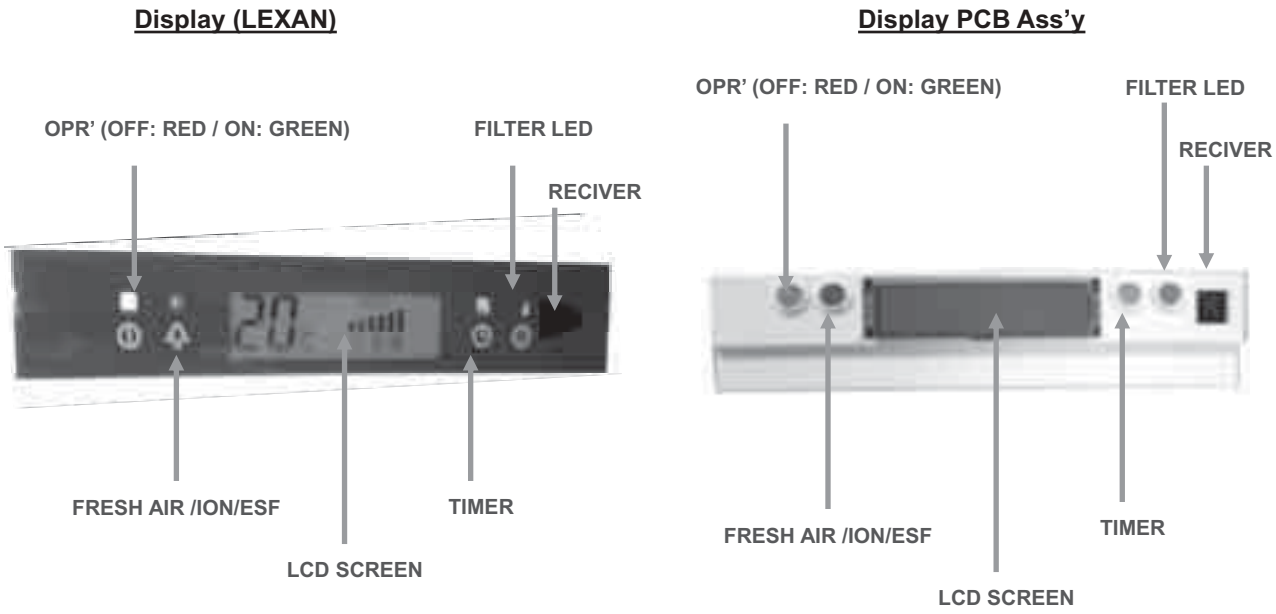
- I FEEL,
- Forced Mode,
- Protection - hot keep, Deicing, defrosting,
- Timer,
- Sleep,
- Fresh Air,
- Ionizer,
- E.S.F,

RCT: remote controller temperature
SPT: set point temperature

12B.2 Main PCB Controller

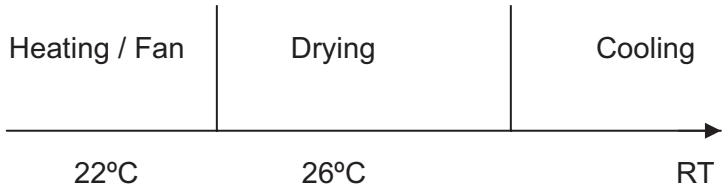


12B.2.1 LCD Display FLO 7-14 N



12B.3 Operation Modes

12B.3.1 Auto Mode Operation

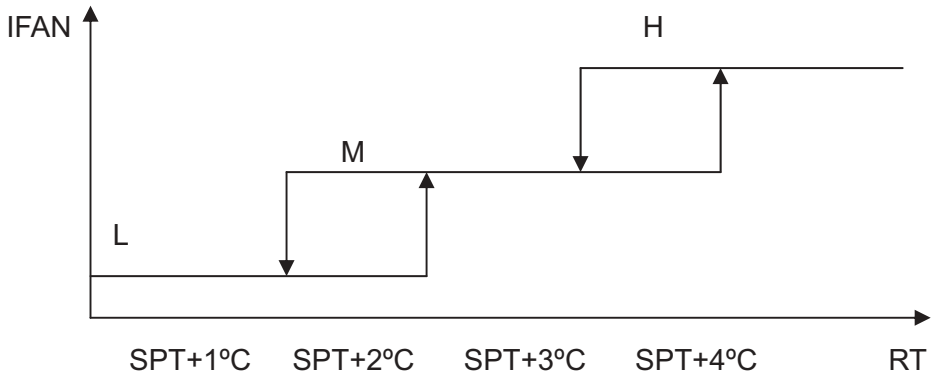


- If RT >= 26ºC - A/C will go into Cooling Mode; Initial SPT is 25ºC.
- If 22ºC < RT < 26ºC- A/C go into Drying mode; Initial SPT is 24ºC.
- If RT <= 22ºC - A/C will go into Heating Mode; Initial SPT is 23ºC.
- For Cooling only, If RT <= 22ºC - A/C will go into Fan Mode; Initial SPT is 23ºC.

- IFAN speed range: Auto, Low, Mid and Hi. Initial speed: Auto.
- SPT can be set by R/C command (heating, cooling, dry or fan mode).
- The Mode can not be changed.
- If RT is invalid, it will go into Drying mode state (2).

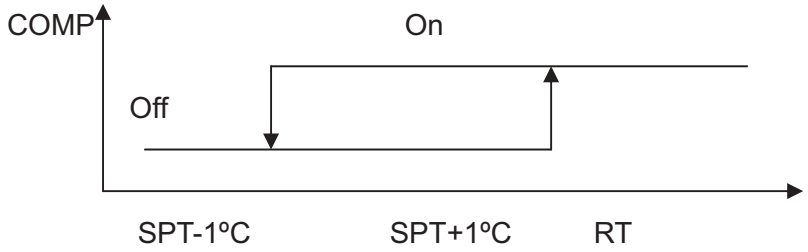
12B.3.2 Cooling Mode

- SPT range: 16ºC-30ºC. Initial: 24ºC;
- IFAN speed range: Auto, Low, Mid and High. Initial speed: Hi;
- Auto Fan



Note:
1. When fan speed changes from Low speed to High speed, there is 3 minutes delay to avoid the fan speed changing frequently. But not vice versa.
2. If RT is invalid and the fan speed is set to Auto, IFAN will operate at medium speed.

12B.3.3 Comp' Operation

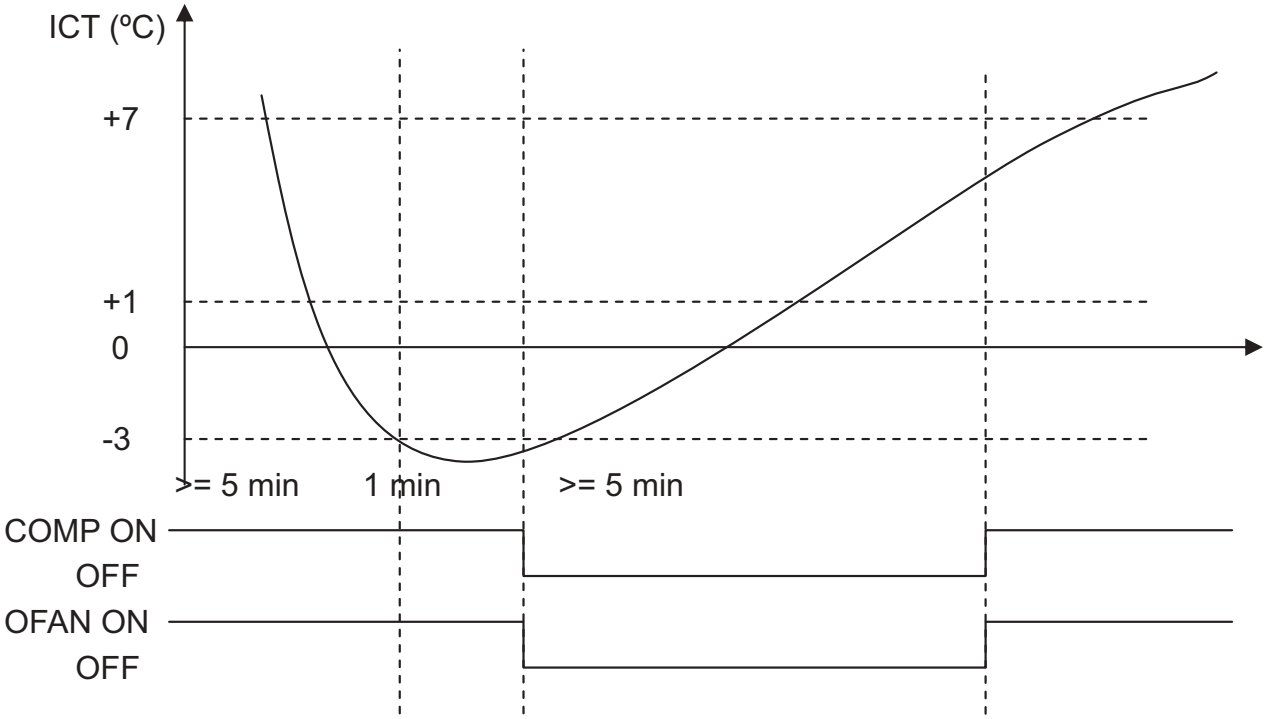


- If RT >= SPT+1ºC, COMP and OFAN is activated;
- If RT <= SPT-1ºC, COMP stop, OFAN will turn off after 5 seconds delay.

Note:
- COMP turns off have 3 min delay protection;
- COMP turn on have 5 min continues protection.
- OFAN will turn off 5 seconds after COMP stop, when turning the unit off or changing to heat mode.

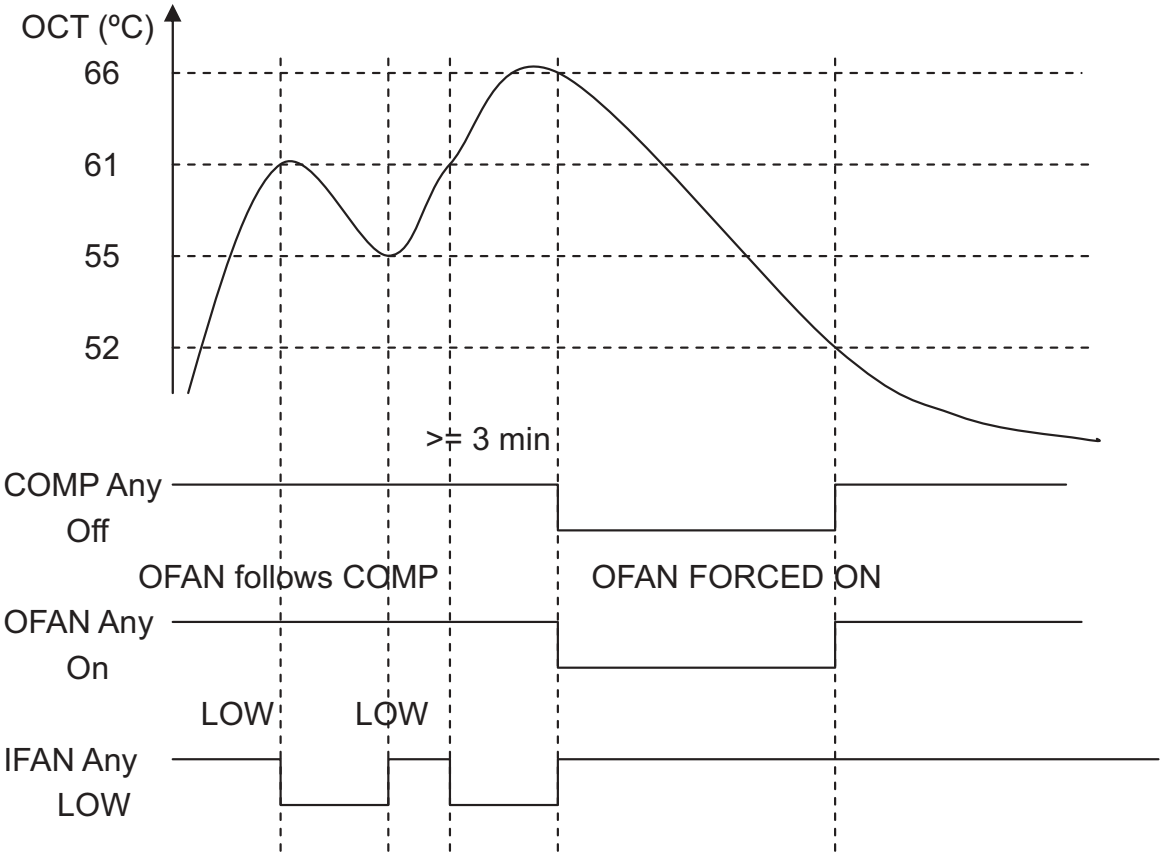
- RV & AHEAT closes.
- Louvers action rules see 3.7
- Sleep Function, see 3.1

12B.3.4 Defrosting



- IFAN always run at the set speed.
- After COMP is on for 5 minutes, if (ICT <= -3ºC) during 1 minute, COMP and OFAN stop. If (ICT > 7ºC), COMP and OFAN will resume to the normal operation.
  Note: If ICT is invalid, defrosting protection cannot be activated

12B.3.5 High Pressure Protection (Excluding cooling only unit type)



- If (OCT >= 61ºC), IFAN is forced to LOW. If (OCT <= 55ºC), IFAN restore to normal.
- If (OCT >= 66ºC), COMP stop and OFAN is forced on. If (OCT <= 52ºC), COMP and OFAN will restore to normal operation.

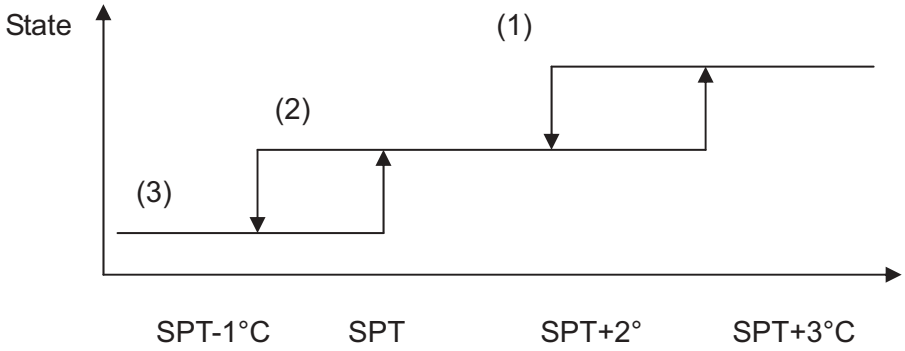
Note: If OCT is invalid, high pressure protection cannot be activated.

12B.3.6 Fan Mode

- S.P.T range: 16ºC~30ºC. Initial: 24ºC;
- IFAN speed range: Auto, Low, Mid and Hi. Initial speed: High;
- If IFAN is set to Auto Fan, the IFAN will run at Low speed;
- IFAN is always on, COMP, OFAN, AHEAT, RV are always off.

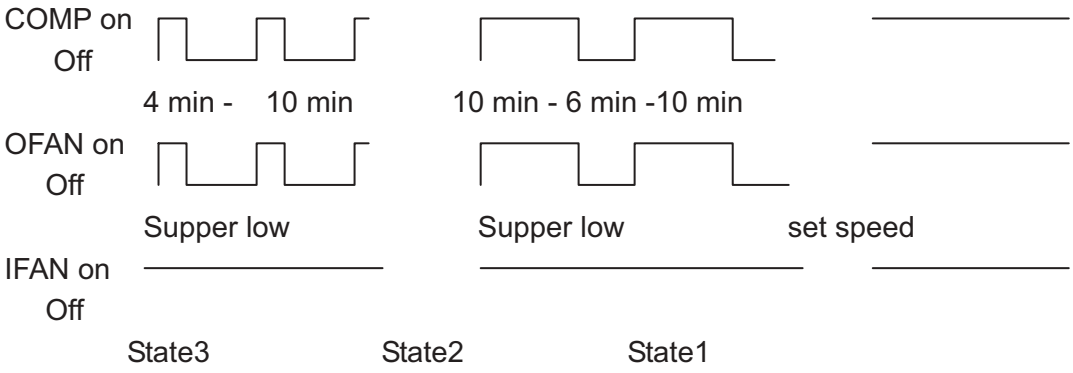
12B.3.7 Drying Mode

- SPT range: 16ºC~30ºC. Initial: 24ºC;
- IFAN speed range: Auto, Low, Mid and Hi. Initial speed: Low;
- IFAN speed can be changed only in state (1);



- If in state (1) - (SPT - 1ºC < RT <= SPT + 2ºC), unit will go into state (2)
- If in state (1) or state (2), - (RT <= SPT - 1ºC), unit will go into state (3)

- If in state (3), - (SPT <= RT < SPT + 3ºC), unit will go into state (2)
- If in state (2) or state (3), - (SPT + 3ºC <= RT), unit will go into state (1)

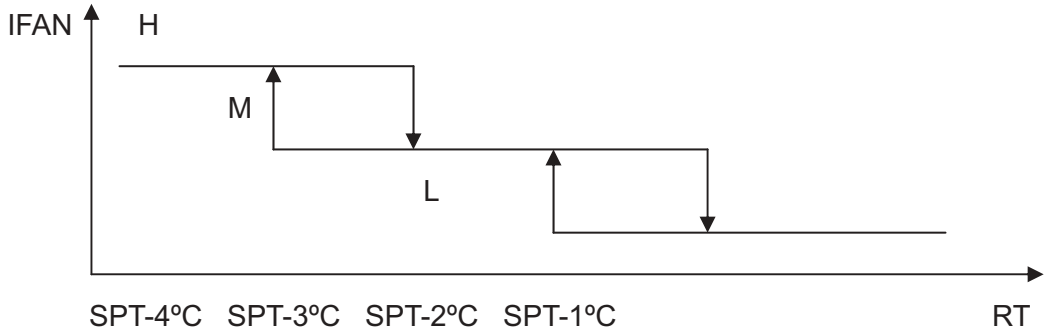


- State (1), COMP & OFAN are on, IFAN runs at the setting fan speed;
- State (2), COMP & OFAN are on for 10 minutes and off for 6 minutes, IFAN speed is always at Supper Low (Note: F/S type is Low);
- State (3), COMP & OFAN are on for 4 minutes and off for 10 minutes, IFAN speed is always at Supper Low (Note: F/S type is Low);

Note:
1. If RT <= 14ºC, Dry mode cannot be activated. COMP, OFAN, and IFAN are stopped.
2. OFAN will turn off 5 seconds after COMP stop, when turning the unit off or changing to heat mode.

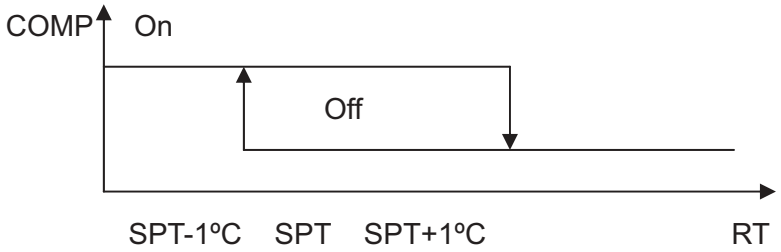
12B.3.8 Heating Mode

- SPT range: 16ºC~30ºC. Initial: 24ºC;
- In wall mounted units the indoor RT compensation temp' value is - 3ºC -> RT, (Excluding I FEEL Mode)
- IFAN speed range: Auto, Low, Mid and Hi. Initial speed: Low;
- Auto Fan



Note:
1. When IFAN speed changes from low speed to high, there is 3 minutes delay to avoid the fan speed changing frequently, But not vice versa.
2. If RT is invalid and the fan speed is set to Auto, IFAN will operate at the medium speed

12B.3.9 Comp' Operation

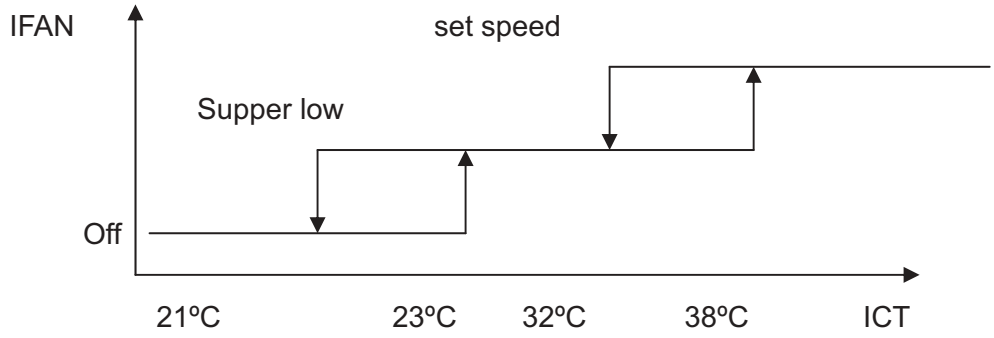


- If RT>=SPT+1ºC, COMP stop, OFAN will turn off after a delay of 30 seconds.
- If RT<=SPT-1ºC, COMP and OFAN will turn on,

Note:
1. COMP turns off have 3 min delay protection.
2. COMP turns on have 5 min protection.
3. OFAN will turn off 30 seconds after COMP stop, also when turning the unit off or changing to cooling, Dry or Fan mode.

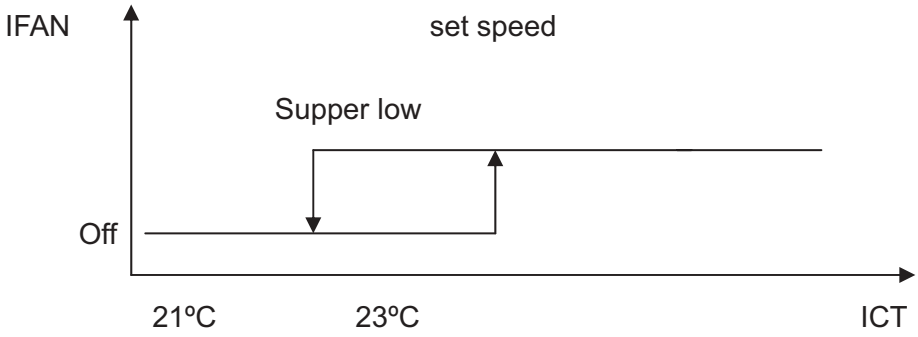
12B.3.10 Hot keep function

COMP on,

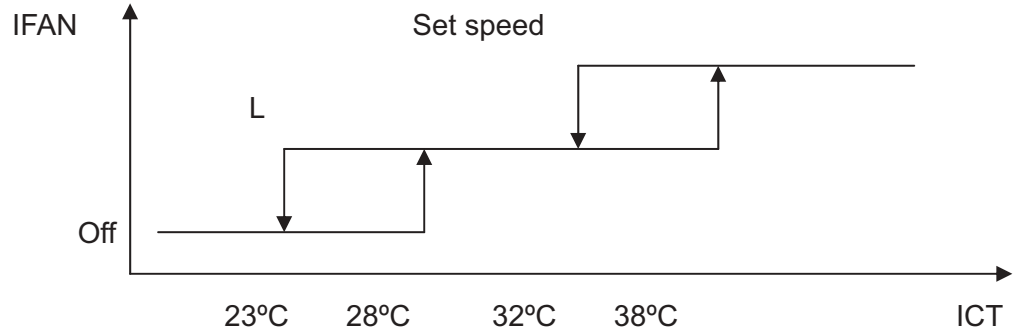


Note: If COMP is on for a period of 4 minutes or (ICT >= 38ºC), IFAN is in set speed;

COMP off,



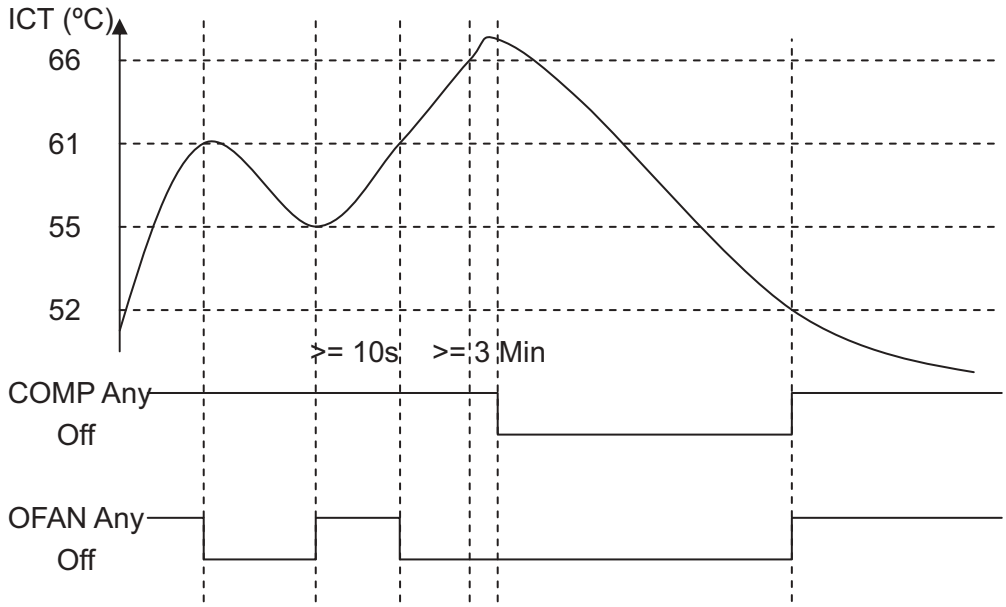
12B.3.11 For F/S



- If COMP turn on and (ICT >= 28ºC), IFAN is Low;
- If COMP is on for a period of 4 minutes or (ICT >= 38ºC), IFAN is in set speed;
- If COMP off, IFAN keep operating at Low speed for additional 30 seconds and stop.

Note:
When ICT is invalid, IFAN stop till COMP is on for 40 seconds, and then will turn on at the set speed. If COMP turns off, IFAN will be activated at super low speed for 30seconds then stop. (For F/S is Low speed).

12B.3.12 High Pressure Protection



- If ICT >= 61ºC, OFAN turn off. If ICT <= 55ºC, OFAN turn on.
- If (ICT >= 66ºC) for duration of 10 seconds, COMP turn off. If ICT <= 52ºC, COMP turn on.

Note:
If ICT is invalid, High Pressure protection cannot be activated.

12B.3.13 Auxiliary Electric Heating

AHEAT will turn on, if all the following conditions are met:
- COMP is on for 60 seconds;
- RT <= 20ºC;
- IFAN run at least at LOW speed;
- RT <= SPT – 2ºC;
- ICT <= 50ºC.

AHEAT will turn off, if one of the following conditions is filled:
- RT > 21ºC;
- COMP or IFAN stop;
- RT >= SPT - 1ºC;
- ICT >= 55ºC.

Note:
1. If ICT or RT is invalids, AHEAT will not be activated.
2. When the system turns off, if the AHEAT does not operate before, IFAN operates according to the hot keep condition, otherwise, IFAN should turn off after 30 seconds' at supper low fan speed (Note: F/S type in low speed) to blow off the remaining heat.

12B.3.14 Deicing

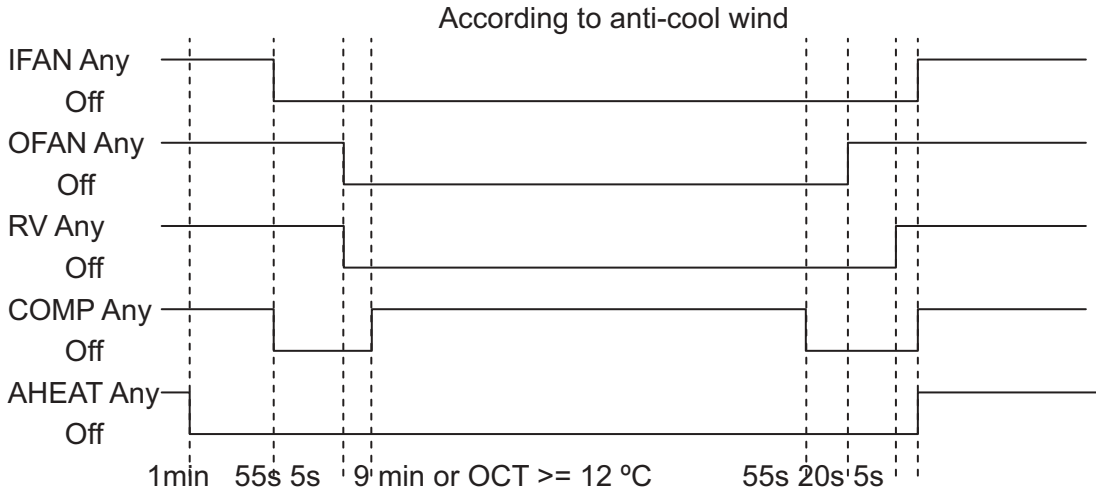
Deicing starts, if OCT <= -6ºC and meets with one of the following conditions:

- ICT < 39ºC, and IFAN is on for 20 minutes, and COMP is on for 5 minutes, and that ICT decrease 1ºC per 6 minutes, occur 3 times;
- ICT < 39ºC, and (sum of COMP on >= 3 Hours), and COMP is on for 20 minutes;
- ICT – RT < 19ºC (for F/S :ICT-RT<16ºC)keep for 5 minutes, and (sum of COMP on) > 45 minutes ,And COMP is on for 20 minutes;
- (4) ICT =< 35 ºC, and IFAN is on for 20 minutes, COMP is on for 5minutes,and sum of COMP on > 45 minutes.

Note:

- If OCT is invalid, and (ICT < 39ºC), and COMP keeps on for 30 minutes, and ICT is decreasing 1ºC per 6 minutes occur 3 times;
- If OCT and ICT are invalid; and if (sum of COMP on) >= 3 Hours;
- If ICT is invalid, and (OCT <-6ºC) keeps for 4 min, (sum of COMP on) > 45min.

12B.3.14.1 Deicing process:



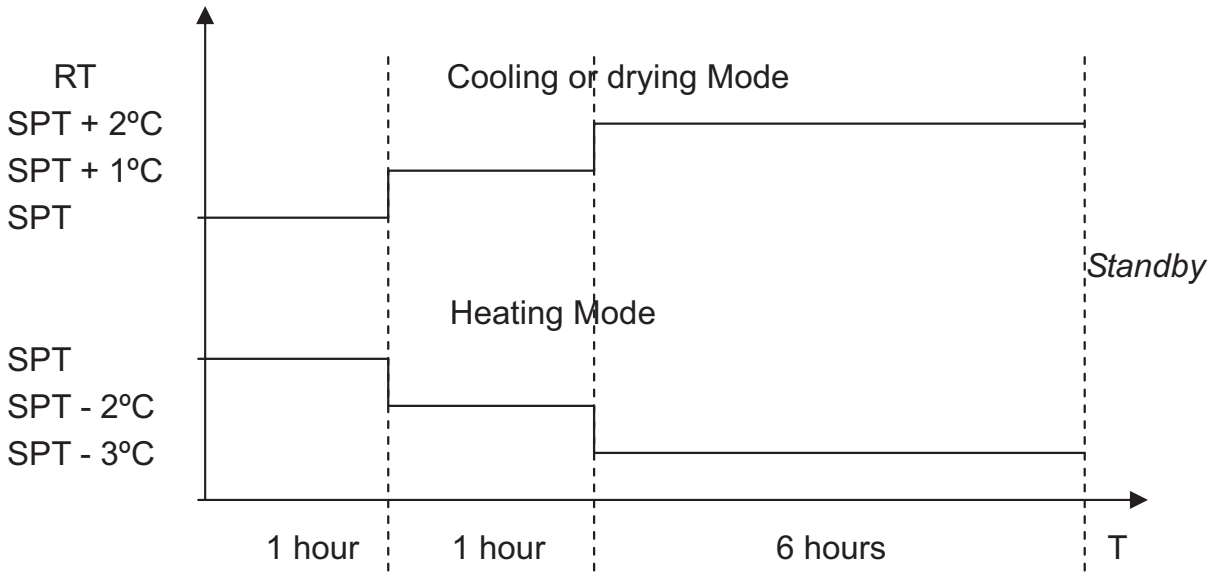
- At the beginning of Deicing, COMP, IFAN, OFAN stop, RV stops after 55 seconds, and then COMP will turn on after 5 seconds.
- Deicing ends if (OCT >= 12ºC) or Deicing time is more than 9 minutes.
- Once deicing ends, IFAN operates according to anti-cool fan mode;
- Once deicing ends, COMP stops for 20 seconds, OFAN will turn on. After 35 seconds, RV will turn on, 5 seconds later COMP resumes its operation;
- If AHEAT is operating when deicing conditions met, AHEAT will be turned off, and o deicing starts 1 minute later.
- After Deicing ends, if the conditions of AHEAT opening are met, AHEAT will turn on.

Note:

1. Deicing can’t end at the first 60 seconds once it was activated.
2. If OCT is invalid, Deicing ends after 5 minutes.

12B.4 Other Functions

12B.4.1 Sleep Function



- After 8 hours, it will go into Standby.

Note:
- During sleep mode, IFAN speed can be set by RC command.

12B.4.2 Timer Function

- Starts or stops the unit operation after preset time.
- After power failure, all preset timers are cleared, the system is forced to stand by mode and the Timer LED indicator is blinked to indicate the situation. The LED keeps blinking until the Timer setting can be reloaded form an R/C message.
- When the A/C receives any valid message from the R/C, Its current ON/OFF Timer settings will be replaced by the new timer setting in the R/C message.

Timer	Unit ON	Unit Off
Timer ON	ON	ON
Timer OFF	OFF	OFF
Timer ON before OFF	No action -> OFF	-> ON -> OFF
Timer OFF before ON	-> OFF -> ON	No action -> ON

12B.4.3 I FEEL

- The switchover between RCT by the remote controller and RT detected by the control board can be done by “I FEEL” function. After receiving the “I FEEL” command from the remote controller, MCU decide the operation mode of the air-conditioner by RCT detected by the remote controller.
- In I-Feel Mode, IF I-Feel data hasn’t been received from the R/C for more than 4 minutes, the I-Feel Mode would be suspended and the Room Temperature is replaced by the RT from the local sensor. As soon as new I-FEEL data is received from the R/C, the I-FEEL Mode will be resumed.

12B.4.4 E.S.F and Ionizer

- E.S.F and Ionizer will turn on when receiving a signal from the R/C. and IFAN on.

12B.4.5 Fresh- Air Function

- Fresh-Air has two ways: continuous and Auto.
- If the Fresh-Air signal from R/C is continuous, Fresh-Air is on till the signal is changed.
- If the Fresh-Air signal from R/C is Auto, Fresh Air will turn on for 20 minutes and then stop for 20 minutes, it continues doing cycle by cycle till the signal is changed.

12B.4.6 EEPROM

- The data stored in the EEPROM include:
- the setting parameters, such as: on/off status, temperature, fan speed, mode, louvers auto or fix, E.S.F , Ionizer, Fresh air, Timer status, Filter hour

12B.4.7 Louvers control

- Louvers is effective only if IFAN operates, but the remote controller can control its “ON” and “OFF” at any time after start up. When the air-conditioner is energized initially, the louvers is off, the following two modes can be controlled: (1) swing continuously; (2) cease any position in the swing range.

  For WNG, there are two step motors, the L/R louvers action rules are no different.

  Swing angle: (UP/DOWN)

A/C Model	Total angle	Travel at Auto Swing		Limit in User
	(Max_Swg)	Heat Mode	Other Mode	Position Mode
WMN1	119	60 - 104	74 - 119	60 - 119
WMN2	135	60 - 115	80 - 135	60 - 135
WMN	110	60 - 110	33 - 90	33 - 110

Swing angle: (L/R) this function used for FLO only.
Swing angle:
Left side: 0 - 70º
Right side: 0 - 60º

12B.4.8 Forced Mode

- When the air-conditioner is in standby, press the “SLEEP” button for 3 seconds till 5 beeps given by the buzzer, the forced cooling operation starts. COMP and OFAN turns on, COMP is restricted by 3 minutes delay protection. RV does not move, and IFAN run at high speed, and shut off automatically after 30 minutes running, the air-conditioner is in the normal mode of standby. If there is any control commands, the air-conditioner will operate according to the commands.

12B.4.9 Modes Switchover Instructions

- Switch-over between the modes must be under the condition of COMP 3 minutes protection and RV delay 2 minutes to shutdown after COMP off, when exit the heating mode.
- Switchover between Cooling and Drying mode, if COMP meets the operation conditions, COMP keeps running.

12B.4.10 Sound Indication

- The buzzer will beep twice when starts and a long sound when stops, one sound for receiving a command.

12B.4.11 Emergency Function

- The first press on the emergency key on the indoor control board, the unit enters to cooling mode (SPT: 22ºC; fan speed: Hi; Louver: Auto); the second time press on the emergency key, the unit enters to heating mode (SPT: 26ºC; fan speed: MID; Louver: Auto; AHEAT can operation). Press on the emergency key once again, the unit exits to STBY.

12B.4.12 Strong Function.

- Strong function will active once receiving a signal from R/C. IFAN run at supper high speed for 15 minutes, then restore to the set fan speed. When Strong signal from R/C is off, Strong function is canceled, IFAN operate at set speed.

Note: If COMP stops, strong function is canceled; IFAN will operate at set speed.

12B.4.13 On unit indicators and controls

- For WMN Standby led indicate Error message

Error indication	Standby led Blinks at 1Hz (● on ○ off)
RT	1 ●○○○○○●○
ICT	2 ●○●○○○○○●○●○
OCT	3 ●○●○●○○○○○●○●○●○
IFAN feedback	4 ●○●○●○●○○○○○●○●○●○●○

- During protection and Deicing operation LED blinks up.
- For WNG and F/S (use two-color LED)
- If unit is on, Operation LED light up, Standby LED turn off, During protection and Deicing operation LED blinks up, not to indicate an Error message.
- If unit is off, Standby LED light up, Operation LED turn off, indicate error message blinks up (see 3.13.1.1)

12B.4.14 Clogged air filter

- Filter LED will turn on after 512 operating h/r.
- Standby led indicate Error message Filter LED will turn OFF after Timer is restarted by pressing the RESET button.

12B.4.15 Protection

- When all relays meet their function requirements at the same time, there should be an interval of 0.5 second between every two relays. The action procedures are as follows:
  ON state:
  AHEAT → RV → OFAN —> COMP
  OFF state:
  AHEAT ← RV ← OFAN ← COMP

12B.4.16 Compressor delay protection

- At startup if the operation mode is not change, compressor will keep on running during the first 5 minutes, and it will delay for 3 minutes for a re-start once it was turned off.

- Compressor starts at 3 minutes delay unless:
- Power is on for the first time or power off lasts for 3 minutes, COMP has no 3 minutes delay protection;

12B.4.17 RV control

- In cooling or drying mode or fan mode, RV is off.
- In heating mode, RV will turns on.
- Switching between heating mode to other modes, or shutting off in heating mode, RV delays 2 minutes before turning off.

12B.4.18 Diagnostic

- If MCU detect that one of the sensors RT, ICT or, OCT is blow -40ºC or over 85ºC, the sensor is invalid and will be indicated (see 3.13).But the air-conditioner operates continuously.
- In Cooling or Heating mode, COMP turns on for 20 minutes and turns off for 5 minutes, it is continuously cycle by cycle. In Dry mode, COMP turns on for 10 minutes and turns off for 6 minutes.
- If RT is invalid, system runs at cycle by cycle mode.
- If OCT and ICT are invalid, system runs at cycle by cycle mode too.
- For cooling only unit's type, if ICT is wrong, system runs at cycle by cycle mode.

12B.4.19 Self-test

- When shorting the TEST jumper, the action will be per 1 second according to following:
- beep one -> Cool led on-> Cool led off, Heat led on-> Heat led off, power led on-> power led off ,running led on-> running led off, timer led on-> timer led off ,filter led on-> filter led off -> step motor (A and B) run to MAX angle -> IFAN in Mid speed-> COMP on -> Comp off ,OFAN on -> OFAN off , RV on -> Valve off ,E.S.F on -> E.S.F off, Fresh Air on -> Fresh Air off ,Ionizer on -> Ionizer off -> sensor test(see note1) -> step motor (A and B) run to MIN angle -> beep two then exit

Note:

If OCT is not 25 ± 2ºC, the power and operating led will turn on;
If RT is not 25 ±2ºC, operate led and timer led on; If ICT is not 25±2ºC, timer and filter led will turn on.

12B.4.20 Jumper Settings

- Self test (1)
- Model (4)
- IFAN speeds (PG MOTOR) (3)
- RC or ST (1)

Note:

0 = Open Jumper (disconnect jumper)
1 = Close Jumper (Jumper is connected)

13. TROUBLESHOOTING

NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
1.	The stand-by indicator (red led) on the central control display panel 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 operation indicator (green led) on the central control display panel does not light up.	The remote control batteries are discharged	-Replace batteries of the remote control.
3.	The operation 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 out door 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 ammeter) 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 ammeter. Pressure gauge or surface thermometer.	-Repair refrigeration system and charge refrigerant if necessary.

NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
8	No cooling or heating only indoor fan works.	Outdoor fan motor faulty or other fault caused, compressor overload protection cut out.	-Replace P.C.B. -Outdoor fan blocked remove obstructions.
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 fans working.	-Overload safety device on compressor is cut out (low voltage or high temperature). -Compressor runs 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.
13.	Partial, limited air supply at indoor unit.	Lack of refrigerant (will accompanied by whistling noise) cause ice formation on indoor unit coil in cooling mode.	-charge the unit after localizing leak.
14.	Water accumulates and over flow 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 thoroughly.
16.	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 below design conditions. -Outdoor unit air outlet is blocked.	-Replace thermistor. -Repair control cable. -Shut unit off, it cannot work properly. -Remove obstructions.
17.	Unit is in heat mode but operating in cooling.	-Faulty RV coil. -RV coil is ok valve is stuck position.	-Replace RV coil. -Replace the reversing valve.

14. OPTIONAL ACCESSORIES

14.1 RCW Wall Mounted Remote Control

14.1.1 The RCW wall mounted remote control can be fitted to a large range and models, It can be used as IR (wirless mode) or wired controler.the RCW can control up to15 indoor units using the same settings (on its wired aplication),

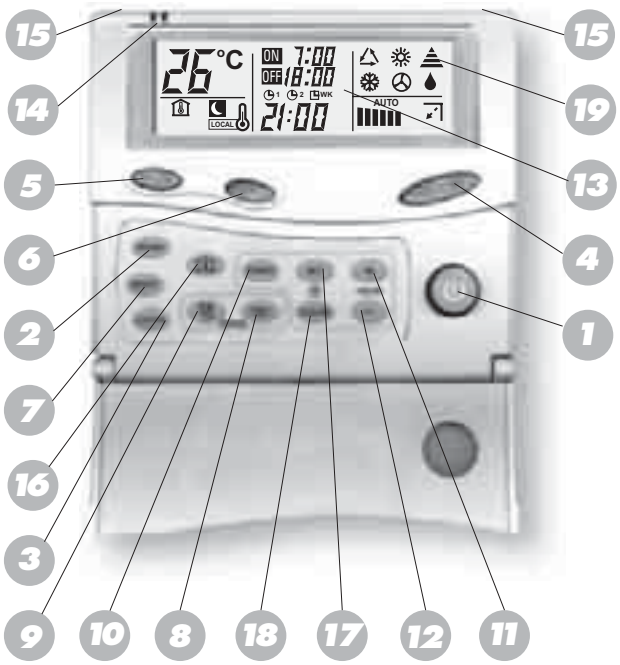
The max wiring length between the controller to the last indoor unit is 300m. for application on FLO LED indoor units an additional interface PCB is needed.

Ordering code no':

RCW – 436195
FLO add PCB - SP000000290.

REMOTE CONTROL

1. START / STOP button
2. Operation mode selection button COOLING, HEATING, AUTO COOL / HEAT, DRY, FAN.
3. LOCAL temperature sensing button
4. FAN SPEED and AUTO FAN button
5. Room temperature UP button
6. Room temperature DOWN Button
7. NIGHT button
8. Airflow direction MANUAL positioning control button
9. Airflow direction AUTO-CONTROL button
10. TIMER button
11. TIMER UP button
12. TIMER DOWN button
13. LCD operation display
14. LOCAL sensor
15. Infrared signal transmitter
16. ROOM temperature button
17. TIMER SET button
18. TIMER CLEAR button
19. Transmission sign



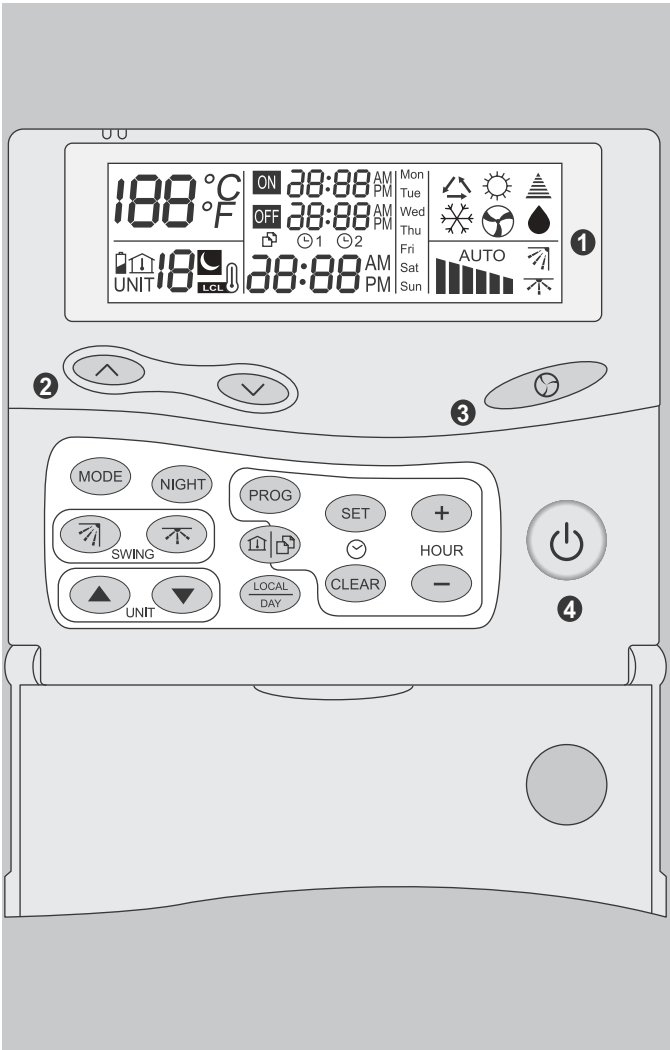
14.2 RCW2 Wall Mounted Remote Cntrol

14.2.1 The RCW2 wall mounted remote controler is a wired controler that can provide affective controling management up to 15 different settings and temp' zones.

The RCW2 can be connected up to a max' of 32 units,allowing a max wiring length of 1000m. for application on FLO LED indoor units an additional interface PCB is needed.

Ordering code no':

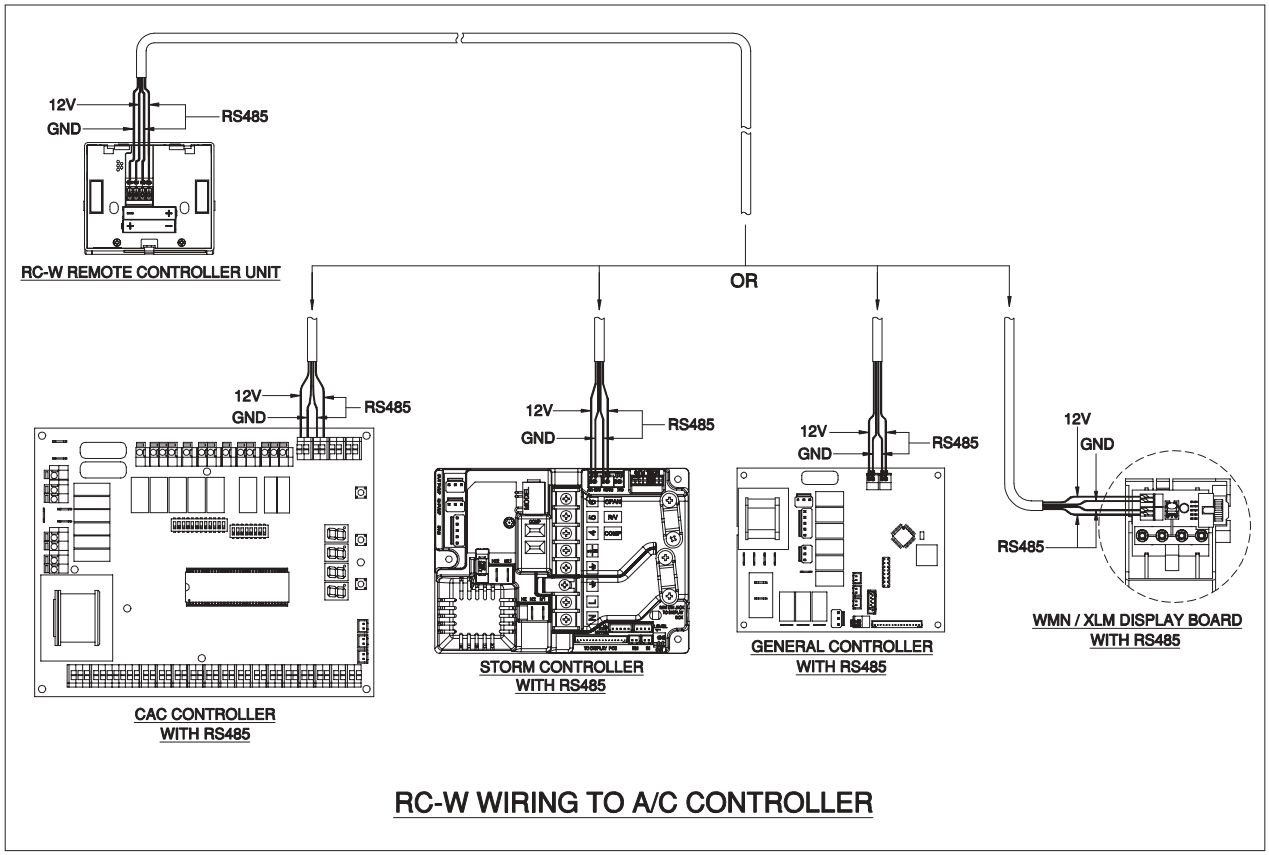
RCW2 – SP000000081
FLO add' PCB - SP000000290



1. Display screen.
2. Keys for raising and lowering the set temperature.
3. Ventilation mode selection :
   - Low speed.
   - Medium speed.
   - High speed.
   - AUTO : Automatic speed selection.
4. ON / Standby.

SET Accessing the time setting mode.
\+ Advancing the time setting.
– Retarding the time setting.
CLEAR Clearing memory of programmed time settings in programming mode.
LOCAL DAY Day of the week selection key or sending "I feel" local temperature setting.
PROG Programming mode key.
"Copy" key, enabling zone parameters to be duplicated for other zones.
MODE Operating mode selection.
NIGHT Day /Night key.
Current zone setting: zone above.
Current zone setting: zone below.
Louver : step by step or horizontal.
Louver : vertical.

14.3 RCW/RCW2 Wiring Connections as Shown on Kit



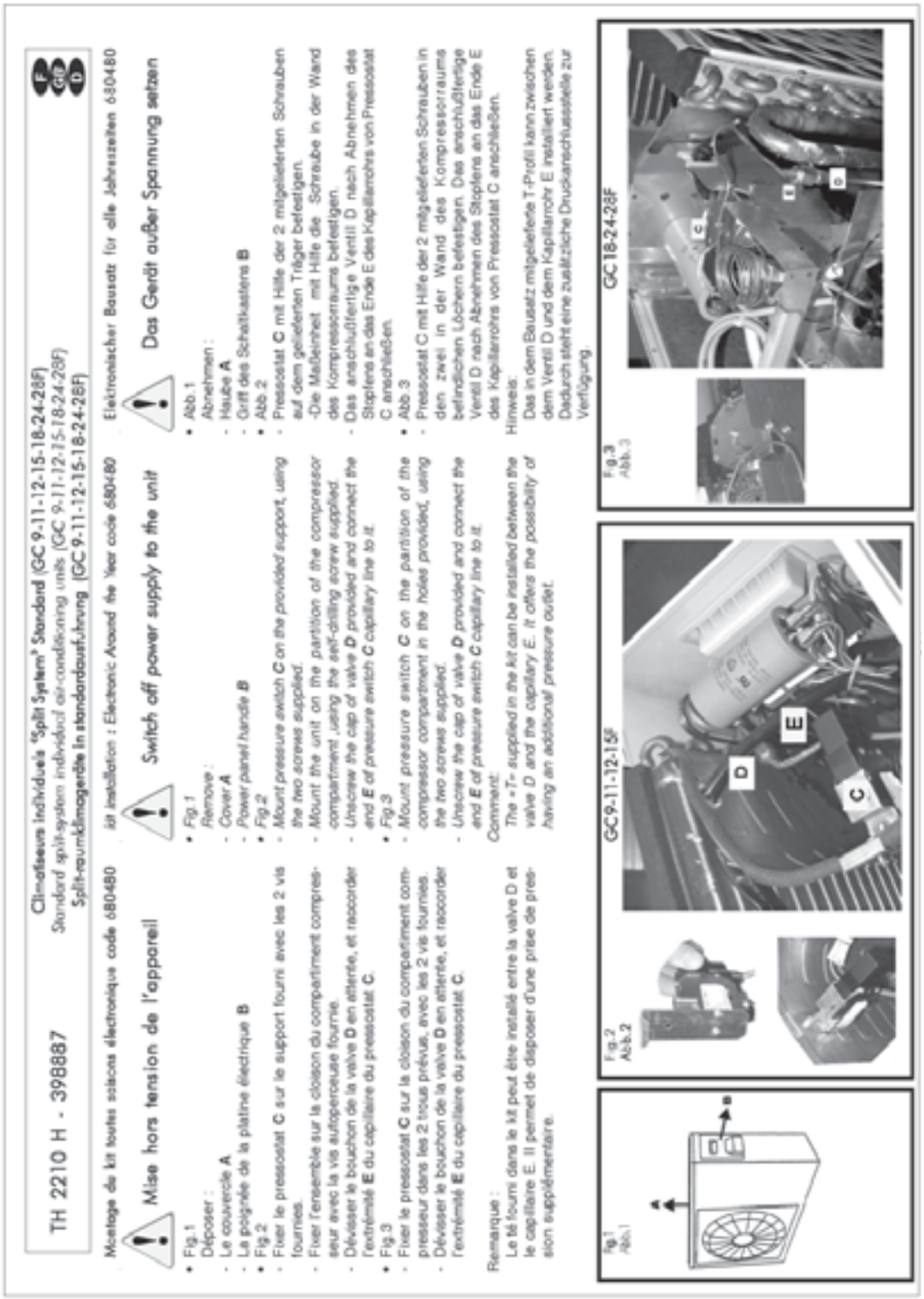
RC-W WIRING TO A/C CONTROLLER

14.4 A.S.K (All Season Kit)

The A.S.K is a pressure regulator to be installed on site in case the working conditions are below the standard operating range of the unit in cooling mode.
The ASK allows working in cooling at low temp' up to -10 ºC for rooms with high internal gains.

For units up to 7.2 KW kit code no' – 7ACFH0077
For units up to 12 KW kit code no' – 7ACFH0078

Documentation as shown on kits :



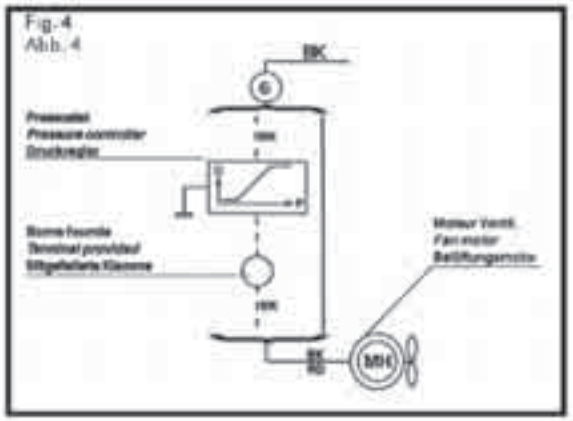
Climatiseurs individuels "Split System" Standard (GC 9-11-12-15-18-24-28F)
Standard split-system individual air-conditioning units (GC 9-11-12-15-18-24-28F)
Split-raumklimageräte in standardausführung (GC 9-11-12-15-18-24-28F)

• Fig.4
Raccordement électrique
- Déconnecter le fil du moteur de ventilation de la borne **6**.
- Raccorder le fil noir du pressostat sur la borne **6** libéré précédemment.
- Raccorder l'autre fil noir du pressostat sur le fil du moteur ventilation déconnecté précédemment à l'aide du connecteur mâle-mâle fourni.
- Raccorder la tresse de masse.
- Remonter les éléments démontés précédemment.

• *Fig.4*
Electrical connections
- *Disconnect the wire of fan motor on terminal **6**.*
- *Connect a black wire of the pressure controller with terminal **6** previously made available.*
- *Connect the other black wire of the pressure controler with the wire of the fan motor previously disconnected by means of the provided male-male connector.*
- *Connect the grounding braid.*
- *Re-assemble the previously removed element.*

• Abb.4
Elektrische Anschüsse
- Den Draht des Belüftungsmotors der Klemme 6.
- Eine schwarzen Draht des Druckreglers mit der vorher freigelegten Klemme 6 verbinden.
- Den anderen Draht des Druckreglers mit Hilfe des mitgelieferten Steckverbinders mit dem vorher abgeklemmten schwarzen Draht des Belüftungsmotors verbinden. Die Massenlitze anschließen.
- Die vorher demontieren Elemente wieder montieren.

Fig.4
Abb.4



MS 1040F (N°de produit fini : 7SP091012A) - MS 1400F (N°de produit fini : 7SP091014A / 7SP091015A)
MS 1040F (End product part numbers : 7SP091012A) - MS 1400F (End product part numbers : 7SP091014A / 7SP091015A)
MS 1040F (Teilenummern der enderzeugnisse : 7SP091012A) - MS 1400F (Teilenummern der enderzeugnisse : 7SP091014A / 7SP091015A)

F GB D

Montage du kit toutes saisons électronique code 680480

Mise hors tension de l'appareil

- Fig. 4
  Déposer :
  - Le panneau de dessus rep. 1
  - Le panneau avant rep. 2
  - La grille avant rep. 3

- Fig. 5
  Fixer le thermostat C sur la platine électrique
  - en position Haute pour le groupe 2
  - en position Basse pour le groupe 1

kit installation : Electronic Around the Year code 680480

Switch off power supply to the unit

- *Fig. 4*
  Remove :
  - *Top panel labeled 1*
  - *Front panel labeled 2*
  - *Front grille labeled 3*

- *Fig. 5*
  Fix thermostat C o nthe electric panel
  - *in position High for group 2*
  - *in posastin Low for group 1*

Elektronischer Bausatz für alle Jahreszeiten 680480

Das Gerät außer Spannung setzen

- Abb.4
  Abnehmen :
  - Das obere Panel Kennz. 1
  - Das Frontpanel Kennz. 2
  - Das vordere Gitter Kennz. 3

- Abb.5
  Das Thermostat C auf der Stromplatine befestigen
  - in oberer Position für die Gruppe 2
  - in unterer Position für die Gruppe 1

Fig.4
Abb.4

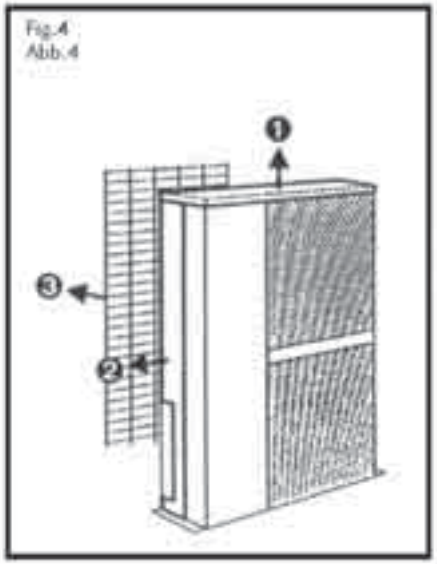
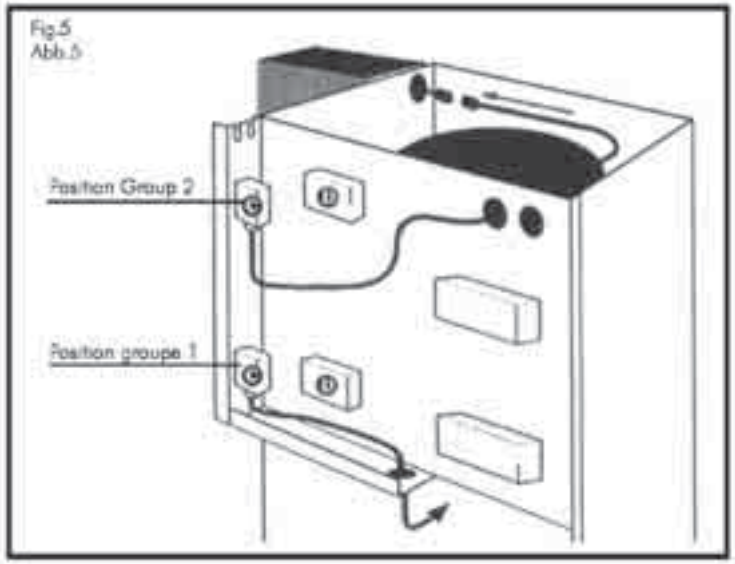


Fig.5
Abb.5



• Fig. 6
- Raccorder l'extrémité des capillaires des pressostat **C** sur les **VUS** correspondantes.

Remarque :
Le té fourni dans le kit peut être installé entre la valve et le capillaire. Il permet de disposer d'une prise de pression supplémentaire.

• Fig. 7
Raccordement électriques
- Déconnecter le fil Noir du moteur de ventilation de la borne **11** (Bornier rep **D** fig 5) du groupe 1 ou 2, concerné par le montage du kit.
- Raccorder un fil Noir du pressostat sur la borne **11** libéré précédemment.
- Raccorder l'autre fil Noir du pressostat sur le fil Noir du moteur déconnecté précédemment à l'aide du connecteur mâle-mâle fourni.
- Raccorder la tresse de masse.

• *Fig. 6*
- *Connect the end of the capillaries of pressure controller **C** with the corresponding **VUS**.*

Comment:
The «T» supplied in the kit can be installed between the valve and the capillary: it offers the possibility of having an additional pressure outlet.

• *Fig. 7*
Electric connections
- *Disconnect the Black wire of fanmotor on terminal **11** (terminal block labeled **D** fig.5) of group 1 or 2 according to the group concerned.*
- *Connect a Black wire of the pressure controller with terminal **11** previously made available.*
- *Connect the other Black wire of the pressure controller with the Black wire of the fanmotor previously disconnected by means of the provided male-male connector.*
- *Connect the grounding braid.*

• Abb.6
- Das Ende der Kapillarrohre der Druckregler C an den entsprechenden VUS anschließnen.

Hinweis:
Das in dem Bausatz mitgelieferte T-Profil kann zwischen dem Ventil und dem Kapillarrohr installiert werden. Dadurch steht eine zusätzliche Druckanschlussstelle zur Verfügung.

• Abb.7
Stromanschluß
- Den Schwarzen Draht des Belüftungsmotors der Klemme 11 (Klemme Kennz. D abb 5) der von der Montage des Bausatzes betroffenen Gruppe 1 oder 2 abklemmen.
- Einen Schwarzen Draht des Druckreglers mit der vorher freigelegten Klemme 11 verbinden.
- Den anderen Schwarzen Draht des Druckreglers mit Hilfe des mitgelieferten Steckverbinders mit dem vorher abgeklemmten Schwarzen Draht des Belüftungsmotors verbinden.
- Die Masselitze anschließen.

Fig.6
Abb.6

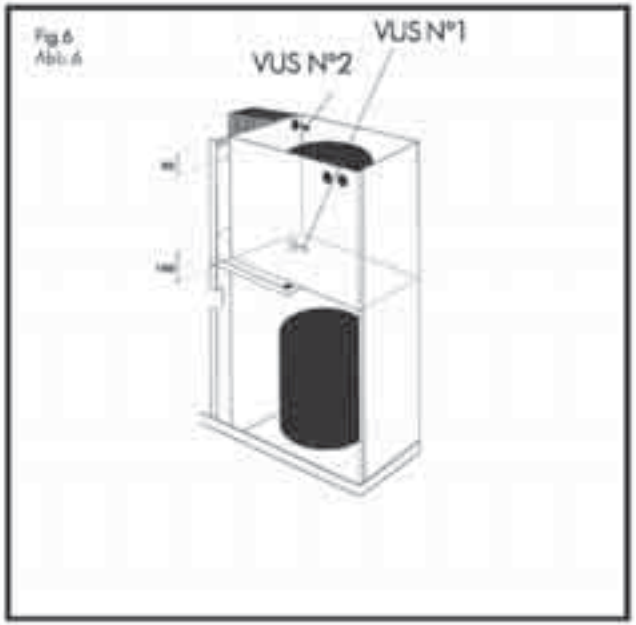
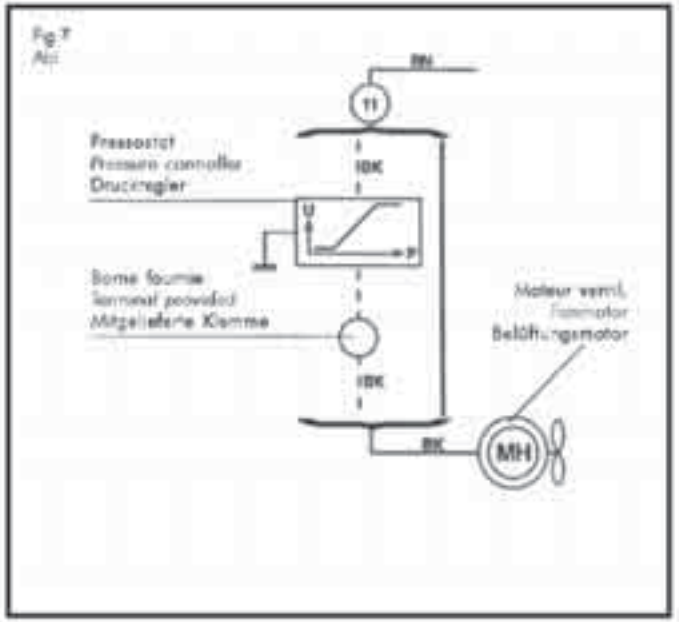


Fig.7
Abb.7



- Remonter les éléments démontés précédemment.
- *Re-assemble the previously removed elements.*
- Die vorher demontierten Elemente wieder montieren.

GROUPE DE CONDENSATION (GC 30 F)
CONDENSER UNIT (GC 30F)
VERFLÜSSIGEREINHEIT (GC 30F)

KIT TOUTES SAISONS ELECTRONIQUES (680488)

Montage du kit.
Groupe de condensation GC 30 F (Fig.1).
Déposer :
- Le couvercle A.
- La trappe de raccordement électrique B.
- Le panneau de côté F.

Fixer le pressostat C sur la cloison du compartiment compresseur dans les 2 trous prévus, avec les 2 vis fournies. (Fig.2)

Dévisser le bouchon de la valve D en attente, et raccorder l'extrémité E du capillaire du pressostat C. (Fig.3)
Remarque :
Le té fourni dans le kit peut être installé entre la valve D et le capillaire E. Il permet de disposer d'une prise de pression supplémentaire.

Raccordements électriques. Sur le bornier de raccordement :

Déconnecter le fil noir (moteur) de la borne 6 du bornier de raccordement et le raccorder au connecteur avec le fil 2 du câble du pressostat.
Raccorder le 2ème fil noir (marqué 1) du pressostat à la borne 6 du bornier de raccordement précédemment libérée.

Vérifier l'absence de fuite au niveau de la valve.

Remonter le panneau F, le couvercle A et la trappe B.

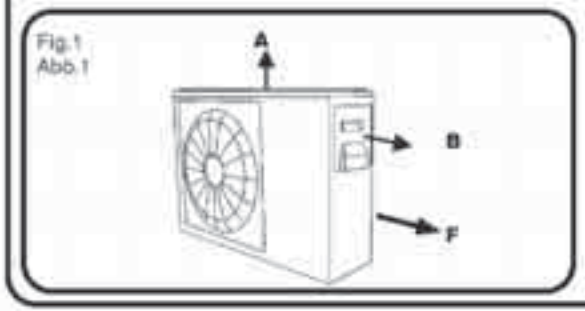


Fig.1
Abb.1

YEAR-ROUND SYSTEM ELECTRONIC KIT (680488)

Installation of the kit.
GC 30 F Condenser unit (Fig.1)
Remove :
- Cover A.
- Electrical connection hatch B
- Side panel F

Mount pressure switch C on the partition of the compressor compartment in the two holes provided, using the two screws supplied (Fig.2).

Unscrew the cap of valve D provided and connect the end E of pressure switch C capillary line to it (Fig.3).
Comment:
The «T» supplied in the kit can be installed between the valve D and the capillary E. It offers the possibility of having an additional pressure outlet.

Electrical connections. On the terminal board:

Disconnect the black wire (motor) from terminal 6 on the terminal board and connect it to the connector with the wire N°2 coming from the pressure switch.

Connect the second black wire (mark 1) of the pressure switch to terminal 6 on the terminal board that is now free.

Check that there is no leak in the valve.
Replace panel F, cover A and hatch B.

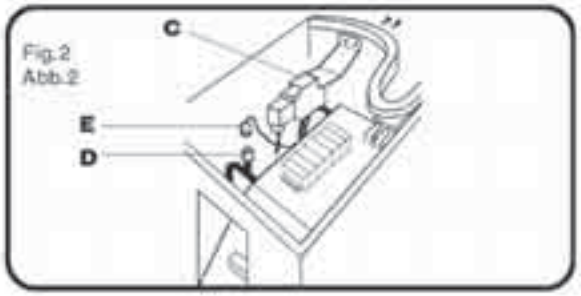


Fig.2
Abb.2

EINBAUSATZ ELEKTRONISCHE VERFLÜSSIGER-DRUCKREGELUNG (680488)

Einbau.
Am Verflüssigertel GC 30 F (Fig.1) folgende Teile abnehmen:
- Haube A.
- Elektroanschlußklappe B.
- Seitenpanel F.

Pressostat C mit Hilfe der 2 mitgelieferten Schrauben in den zwei in der Wand des Kompressorraums befindlichen Löchern befestigen. (Fig.2)

Das anschlußfertige Ventil D nach Abnehmen des Stopfens an das Ende E des Kapillarrohrs von Pressostat C anschließen. (Fig.3)
Hinweis:
Das in dem Bausatz mitgelieferte T-Profil kann zwischen dem Ventil D und dem Kapillarrohr E installiert werden. Dadurch steht eine zusätzliche Druckanschlußstelle zur Verfügung.

Elektrische Anschlüsse. An der Anschlußklemmleiste:

Das schwarze Kabel (Motor) von Klemme 6 der Anschlußklemmleiste abklemmen und an die Steckverbindung des von dem Pressostat kommenden №2 Kabels anschließen.

Das 2. schwarze Kabel (1) des Pressostat an die zuvor freigewordene Klemme 6 der Anschlußklemmleiste anschließen.

Prüfen, daß an dem Ventil keine Leckage auftritt.
Seitenpanel F, Haube A und Klappe B wieder montieren.

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