ELECTRA

Service Manual

TOP Series

Indoor Units	Outdoor Units
TOP 9	ONG3-9
TOP 12	ONG3-12

REFRIGERANT **R410A**

HEAT PUMP

COOLING ONLY

AUGUST – 2008

SM TOP 1-E.1 GB

CONTENT

LIST OF EFFECTIVE PAGES

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

Dates of issue for original and changed pages are:

Original ..... 0 ..... October 2006

Total number of pages in this publication is 83 consisting of the following:

Page No.	Revision No. #		Page No.	Revision No. #		Page No.	Revision No. #

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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 **TOP** split wall mounted range comprise the ST (cooling only) and RC (heat pump) models, as follows:

- **Cooling Only** TOP 9 ST, TOP 12 ST.
- **Heat Pump** TOP 9 RC, TOP 12 RC.

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

1.2 Main Features

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

- R410A models.
- Microprocessor control.
- Infrared remote control with liquid crystal display.
- Indoor centrifugal fan.
- High COP.
- Low indoor and outdoor noise levels.
- Easy installation and service.
- 4 way air discharge flow.
- Possibility of shutting one side of air discharge flow direction.
- The angle of two louvers can be adjusted.

1.3 Indoor Unit

The indoor unit is a 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 centrifugal fan.
- Coil with treated aluminum fins.
- Motorized flaps.
- Multi-speed motor with internal protection.
- Advanced electronic control box assembly.
- Interconnecting wiring terminal block.
- Mounting plate.

1.4 Filtration

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

1.5 Control

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

1.6 Outdoor Unit

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

1.7 Tubing Connections

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

1.8 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

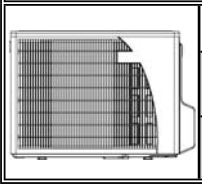
The RCW remote control, controls the unit either as an infrared remote control or as a wired controller. The wired controller can control up to 10 Indoor units with the same program settings and adjustments. For further detail splease refer to Optional Accessories (Chapter 15).

1.9 Inbox Documentation

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

1.10 Matching Table

1.10.1 R410A

OUTDOOR UNITS			INDOOR UNITS	
				
	MODEL	REFRIGER.	TOP 9	TOP 12
	ONG3-9 ST/RC	R410A	√	
	ONG3-12 ST/RC	R410A		√

2. PRODUCT DATA SHEET

2.1 TOP 9

Model Indoor Unit				**TOP 9**		
Model Outdoor Unit				**ONG3-9**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (4)			Btu/hr	8840	8840	9720
			kW	2.59	2.59	2.85
Power input (4)			kW	0.805	0.805	0.830
EER (Cooling) or COP(Heating) (4)			W/W	3.22	3.22	3.43
Energy efficiency class				A	A	B
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	3.6	3.6	3.7
Starting current			A	18.7		
Circuit breaker rating			A	10		
INDOOR	Fan type & quantity			Helicoid x 1		
	Fan speeds	H/M/L	RPM	520/490/450		
	Air flow (1)	H/M/L	m3/hr	390/360/330		
	External static pressure	Min-Max	Pa	0		
	Sound power level (2)	H/M/L	dB(A)	48/46/44		
	Sound pressure level (3)	H/M/L	dB(A)	35/33/31		
	Moisture removal		l/hr	1.2		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	570*570*160		
	Weight		kg	13.5		
	Package dimensions	WxHxD	mm	700*700*255		
	Packaged weight		kg	15.5		
	Units per pallet		units	16		
	Stacking height		units	8 levels		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type,model			Rotary,Hitachi ASG108CV-B7AT		
	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)	61	62	
	Sound pressure level (3)	H/L	dB(A)	51	53	
	Dimensions	WxHxD	mm	795x610x290		
	Weight		kg	34	35	
	Package dimensions	WxHxD	mm	945x655x395		
	Packaged weight		kg	38	39	
	Units per pallet		Units	9		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg(7.5m)	0.9kg		
	Additional charge		g	4m≤L≤10m: +0g; 10m≤L≤15m: +100g		
	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) Airflow in ducted units;at nominal external static pressure.
(2) Sound power in ducted units is measured at air discharge.
(3) Sound pressure level measured at 1-meter distance from unit.
(4) Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).

2.2 TOP 12

Model Indoor Unit				**TOP 12**		
Model Outdoor Unit				**ONG3-12**		
Installation Method of Pipe				Flared		
Characteristics			**Units**	**Cooling Only**	**Cooling**	**Heating**
Capacity (4)			Btu/hr	11257	11260	12590
			kW	3.30	3.30	3.69
Power input (4)			kW	1.09	1.09	1.210
EER (Cooling) or COP(Heating) (4)			W/W	3.03	3.03	3.05
Energy efficiency class				B	B	D
Power supply			V/Ph/Hz	220-240V/Single/50Hz		
Rated current			A	4.9	4.9	5.4
Starting current			A	25		
Circuit breaker rating			A	15		
INDOOR	Fan type & quantity			Helicoid x 1		
	Fan speeds	H/M/L	RPM	590/510/450		
	Air flow (1)	H/M/L	m3/hr	430/360/310		
	External static pressure	Min-Max	Pa	0		
	Sound power level (2)	H/M/L	dB(A)	51/47/44		
	Sound pressure level (3)	H/M/L	dB(A)	39/35/32		
	Moisture removal		l/hr	1.6		
	Condenstate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	570*570*160		
	Weight		kg	14		
	Package dimensions	WxHxD	mm	700*700*255		
	Packaged weight		kg	16		
	Units per pallet		units	16		
	Stacking height		units	8 levels		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type,model			Rotary,TOSHIBA 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 (3)	H/L	dB(A)	52	53	
	Dimensions	WxHxD	mm	795x610x290		
	Weight		kg	35	36	
	Package dimensions	WxHxD	mm	945x655x395		
	Packaged weight		kg	39	40	
	Units per pallet		Units	9		
	Stacking height		units	3 levels		
	Refrigerant type			R410A		
	Refrigerant chargless distance		kg(7.5m)	0.98kg		
	Additional charge		g	4m≤L≤10m: +0g; 10m≤L≤15m: +70g		
	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] Airflow in ducted units;at nominal external static pressure.
[2] Sound power in ducted units is measured at air discharge.
[3] Sound pressure level measured at 1-meter distance from unit.
[4] Rating conditions in accordance to ISO 5151 and ISO 13253 (for ducted units).

CONTENT

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

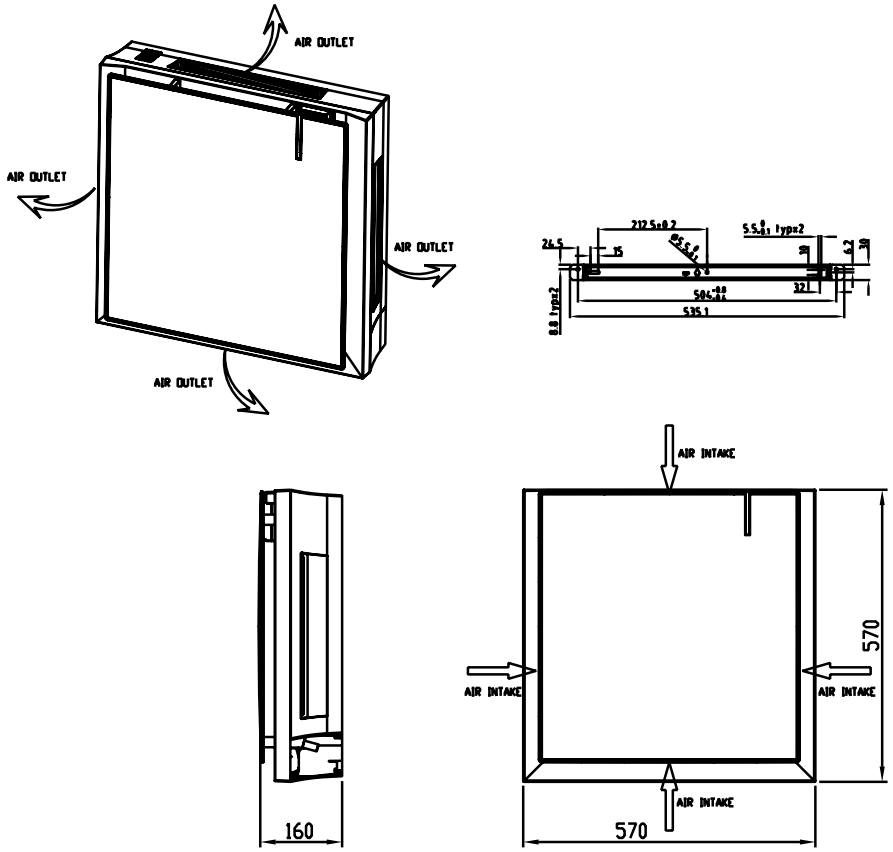
3.1 Operating Limits

3.1.1 R410A

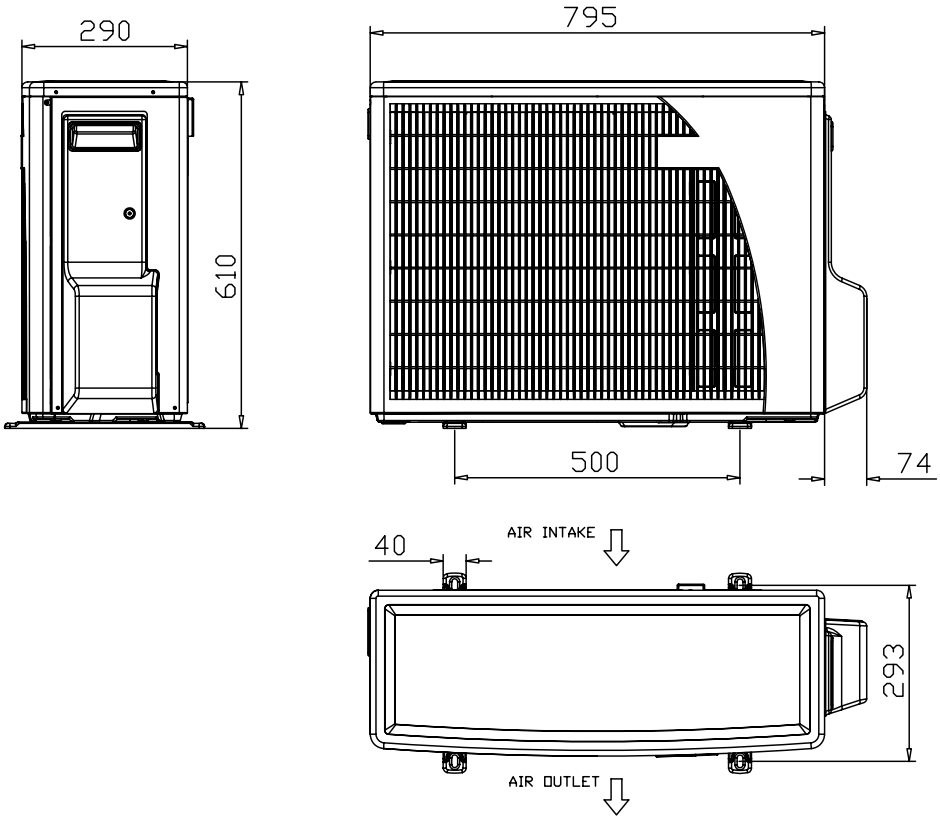
		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	10°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-9°C DB -10°C WB
Voltage	1PH	198 ÷ 264 V	

4. OUTLINE DIMENSIONS

4.1 Indoor Unit: TOP 9, TOP 12



4.2 Outdoor Unit: ONG3-9, ONG3-12



5. PERFORMANCE DATA & PRESSURE CURVES

5.1 TOP 9 / ONG3-9 R410A

5.1.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

Entering Air DB OD Coil(°C)	Data	Entering Air WB/DB ID Coil(°C)				
		15/21	17/24	19/27	21/29	23/32
15	TC	2.73	2.83	2.89	2.96	3.01
	SC	1.96	2.04	2.12	2.18	2.22
	PI	0.57	0.57	0.57	0.57	0.57
20	TC	2.64	2.78	2.87	2.94	3.00
	SC	1.92	2.02	2.11	2.17	2.21
	PI	0.62	0.62	0.62	0.62	0.62
25	TC	2.50	2.70	2.84	2.92	2.99
	SC	1.87	1.98	2.09	2.15	2.19
	PI	0.67	0.67	0.67	0.68	0.68
30	TC	2.34	2.54	2.75	2.85	2.93
	SC	1.81	1.93	2.05	2.11	2.15
	PI	0.72	0.73	0.73	0.74	0.75
35	TC	2.16	2.35	**2.59**	2.72	2.85
	SC	1.72	1.85	**2.00**	2.06	2.10
	PI	0.77	0.79	**0.80**	0.81	0.81
40	TC	1.97	2.14	2.34	2.56	2.85
	SC	1.62	1.75	1.89	1.95	1.99
	PI	0.84	0.85	0.86	0.87	0.88
46	TC	1.71	1.87	2.05	2.27	2.44
	SC	1.50	1.60	1.73	1.79	1.83
	PI	0.91	0.93	0.95	0.96	0.97

LEGEND

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

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

5.1.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	1.50	0.66	1.44	0.71	1.38	0.74
-7	1.61	0.68	1.55	0.72	1.50	0.76
-2	1.71	0.69	1.65	0.73	1.60	0.77
2	2.08	0.72	2.00	0.77	1.91	0.81
6	2.94	0.78	**2.85**	**0.83**	2.75	0.88
10	3.19	0.82	3.11	0.88	3.02	0.94
15	3.45	0.85	3.36	0.92	3.28	0.98
20	3.63	0.88	3.55	0.95	3.45	1.03

* 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
OD – 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	0.950	---	---	---	---	---

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

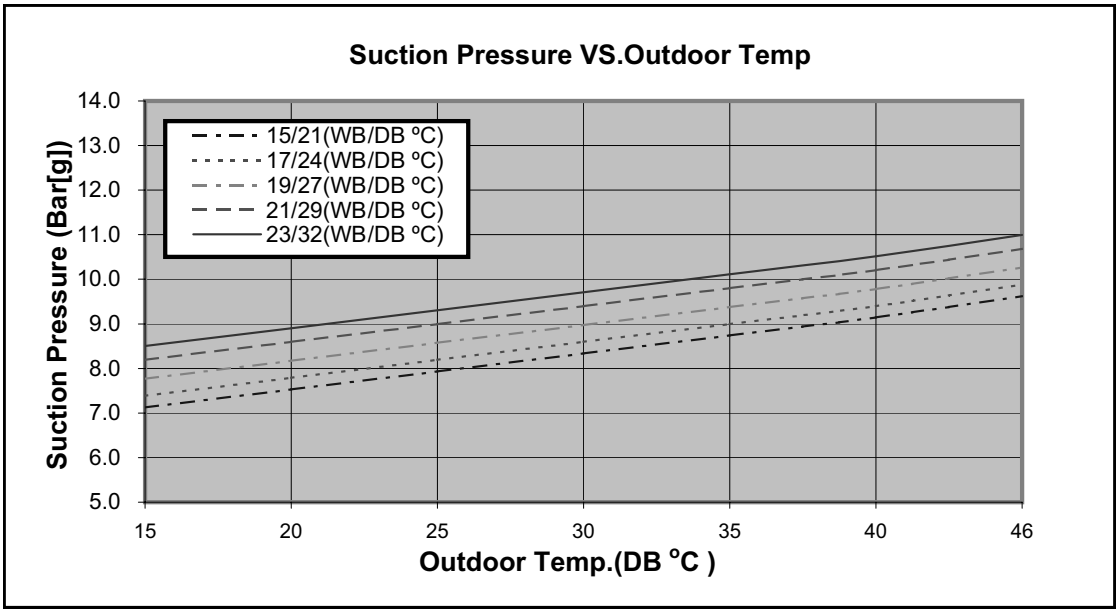
5.2.2 Heating

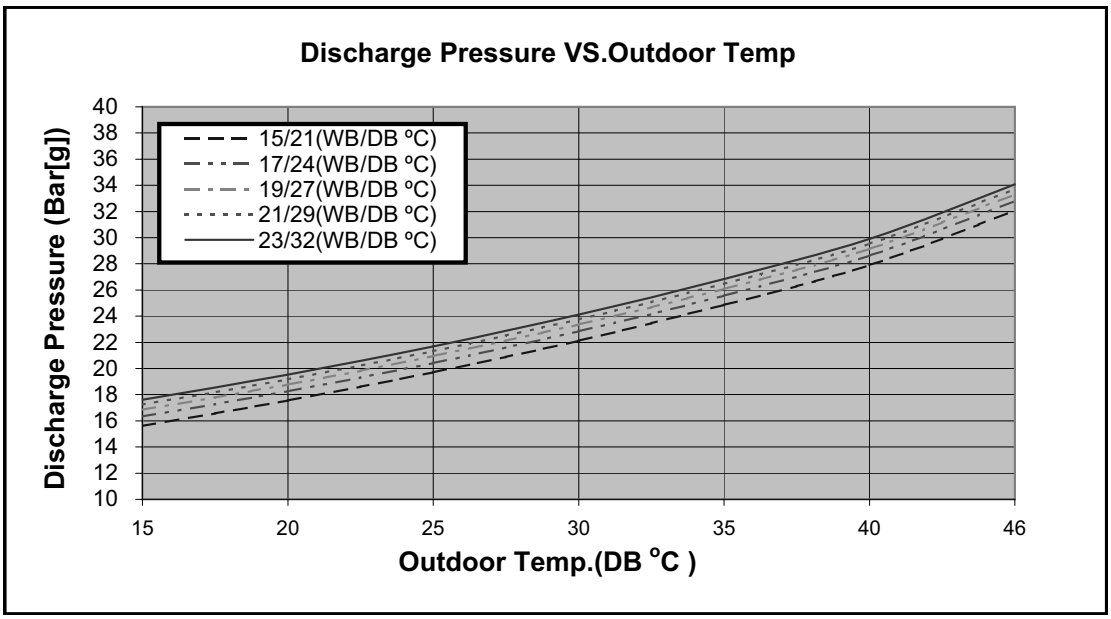
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.05	**1**	0.975	0.961	---	---	---	---	---

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

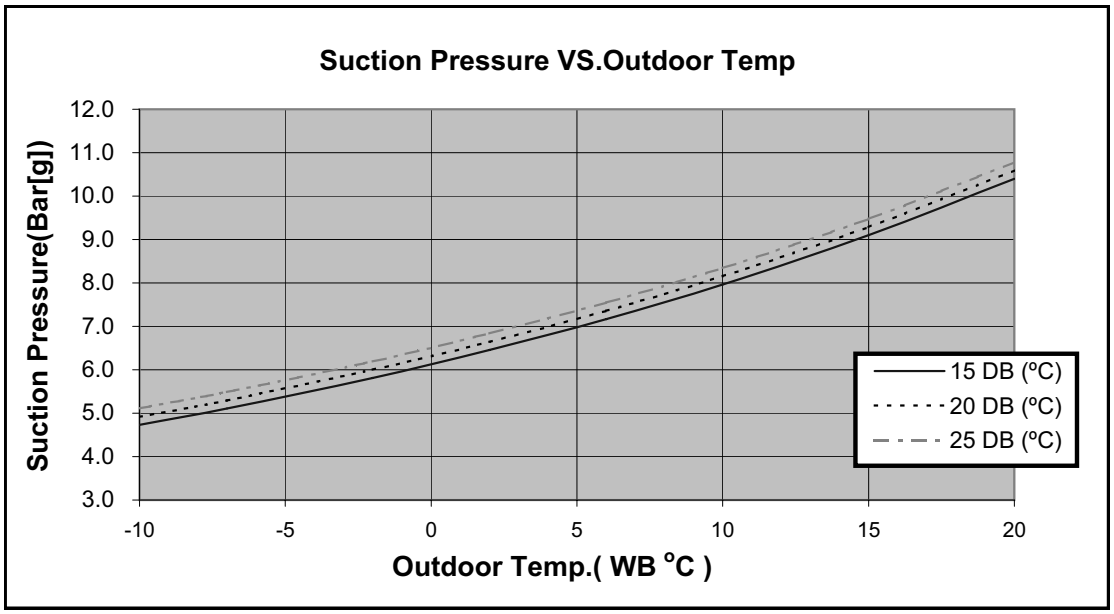
5.3 Pressure Curves.

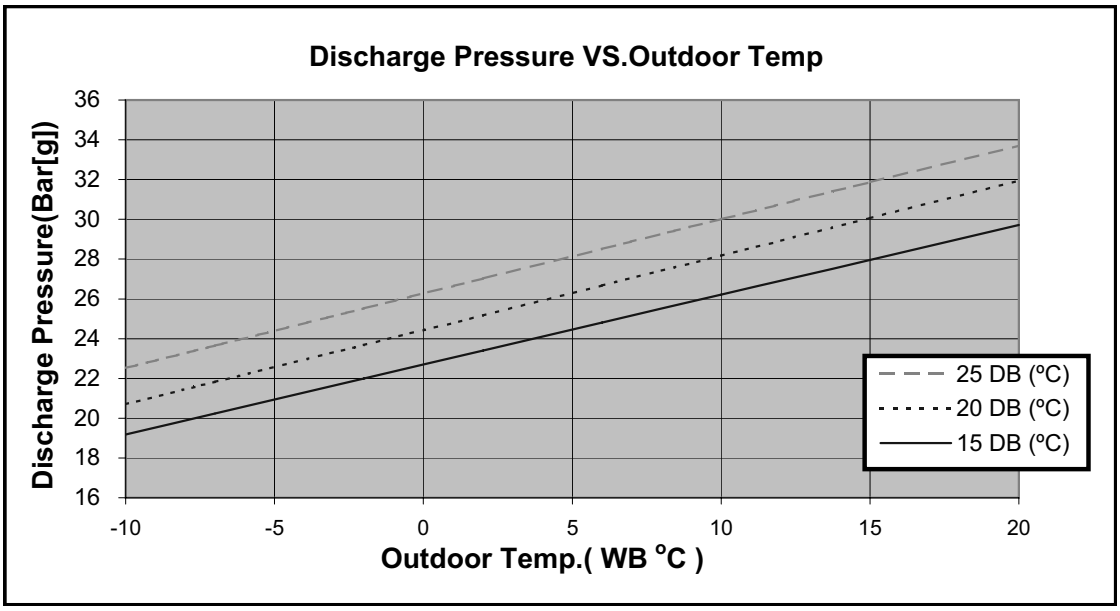
5.3.1 Cooling.





5.3.2 Heating.


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 (ºC)
20 DB (ºC)
25 DB (ºC)


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

5.4 TOP 12 / ONG3-12 R410A

5.4.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

Entering Air DB OD Coil(°C)	Data	Entering Air WB/DB ID Coil(°C)				
		15/21	17/24	19/27	21/29	23/32
15	TC	3.48	3.60	3.69	3.77	3.83
	SC	2.40	2.50	2.60	2.66	2.71
	PI	0.77	0.77	0.78	0.78	0.78
20	TC	3.37	3.55	3.66	3.75	3.83
	SC	2.35	2.48	2.58	2.66	2.71
	PI	0.84	0.84	0.84	0.85	0.85
25	TC	3.18	3.44	3.61	3.72	3.81
	SC	2.29	2.43	2.56	2.64	2.69
	PI	0.91	0.91	0.92	0.93	0.93
30	TC	2.98	3.24	3.50	3.63	3.73
	SC	2.22	2.36	2.51	2.58	2.63
	PI	0.98	0.99	1.00	1.01	1.02
35	TC	2.76	2.99	**3.30**	3.47	3.63
	SC	2.11	2.26	**2.45**	2.52	2.57
	PI	1.05	1.07	**1.09**	1.10	1.10
40	TC	2.51	2.73	2.98	3.26	3.42
	SC	1.99	2.14	2.32	2.39	2.44
	PI	1.14	1.16	1.18	1.19	1.20
46	TC	2.18	2.38	2.62	2.89	3.11
	SC	1.83	1.96	2.11	2.19	2.24
	PI	1.24	1.26	1.29	1.31	1.32

LEGEND

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

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

5.4.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING WB OD COIL(°C)	ENTERING AIR DB ID COIL(°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	1.94	0.97	1.86	1.03	1.79	1.08
-7	2.08	0.99	2.01	1.05	1.94	1.10
-2	2.21	1.00	2.14	1.06	2.07	1.13
2	2.69	1.05	2.58	1.12	2.47	1.19
6	3.80	1.13	**3.69**	**1.21**	3.56	1.29
10	4.13	1.19	4.02	1.28	3.91	1.36
15	4.46	1.25	4.35	1.34	4.24	1.43
20	4.70	1.28	4.59	1.39	4.46	1.50

* 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
OD – 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	0.948	---	---	---	---	---

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

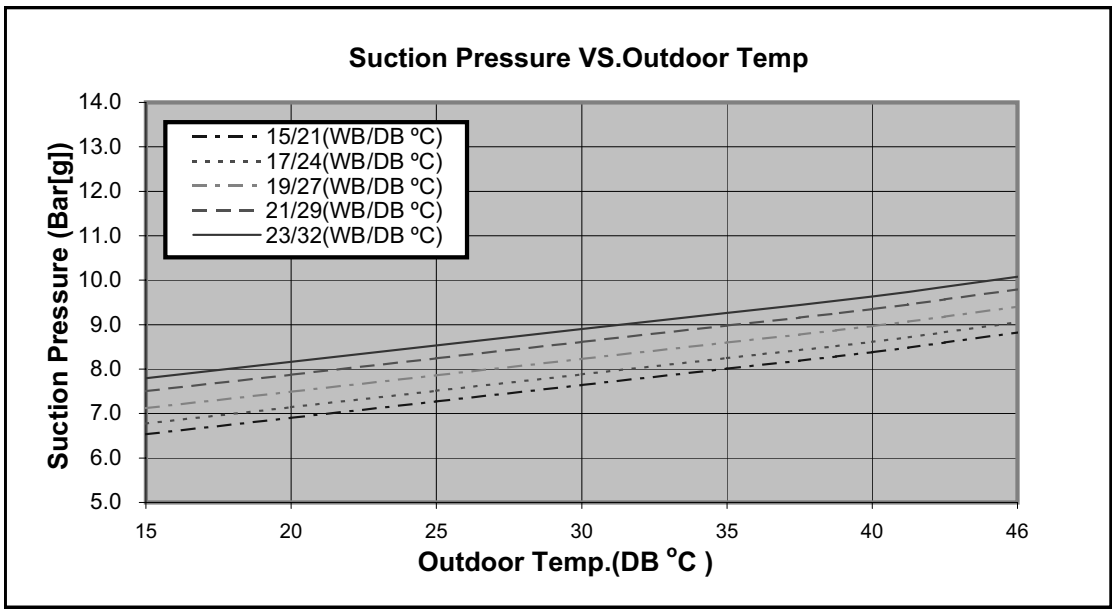
5.5.2 Heating

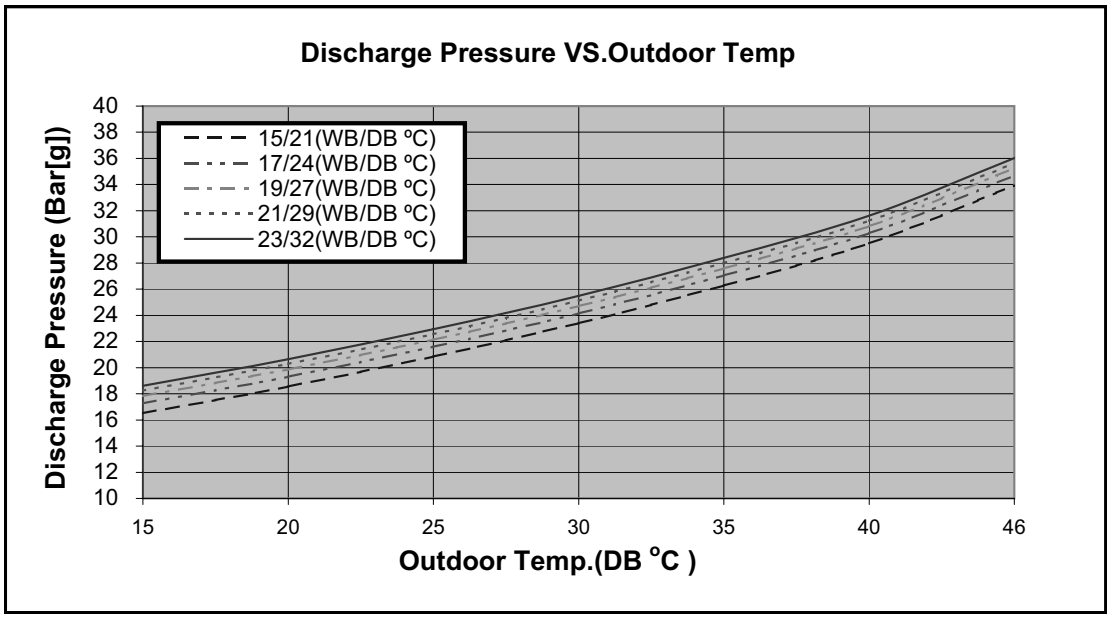
TOTAL TUBING LENGTH (One Way)								
3m	**7.5m**	10m	15m	20m	25m	30m	40m	50m
1.05	**1**	0.975	0.963	---	---	---	---	---

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

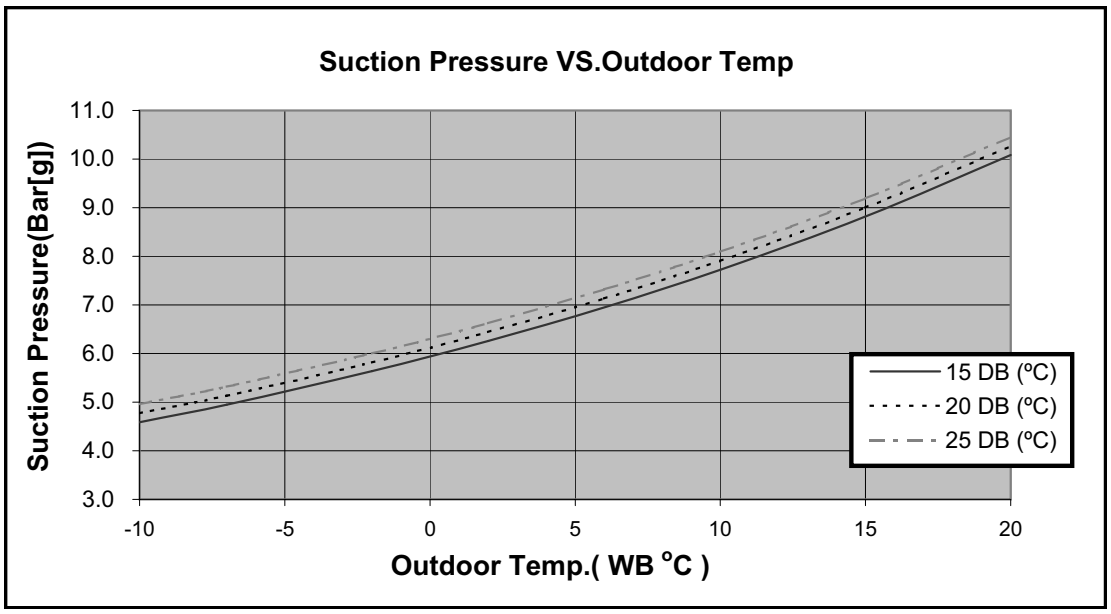
5.6 Pressure Curves.

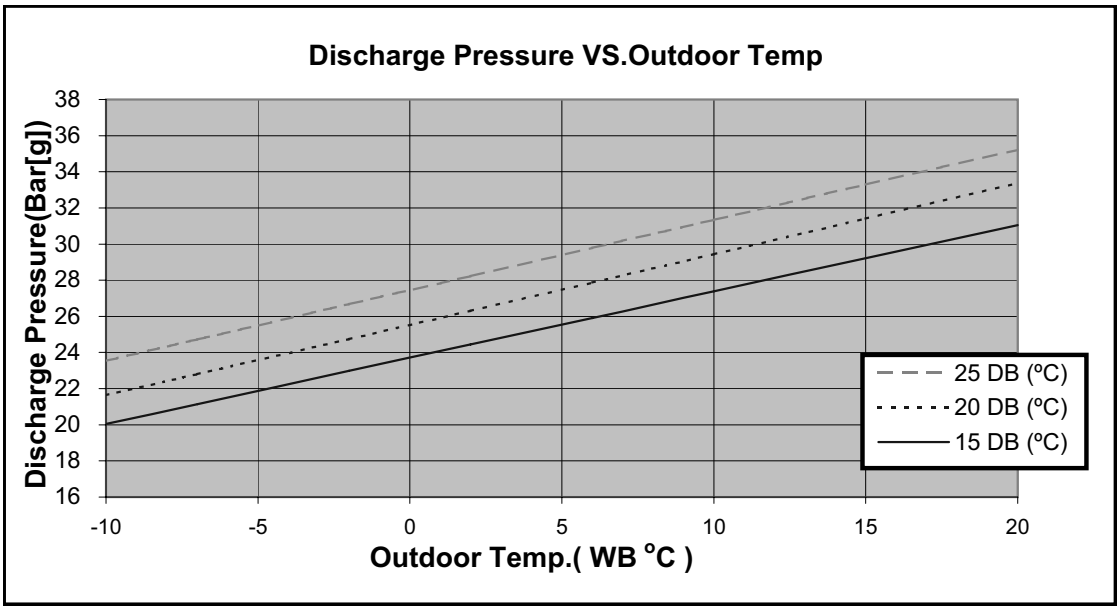
5.6.1 Cooling.





5.6.2 Heating.


Suction Pressure VS.Outdoor Temp
Suction Pressure(Bar[g])
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 (ºC)
20 DB (ºC)
25 DB (ºC)


Discharge Pressure VS.Outdoor Temp
Discharge Pressure(Bar[g])
38
36
34
32
30
28
26
24
22
20
18
16
-10
-5
0
5
10
15
20
Outdoor Temp.(WB °C)
25 DB (ºC)
20 DB (ºC)
15 DB (ºC)

6. SOUND LEVEL CHARACTERISTICS

6.1 Sound Pressure Level

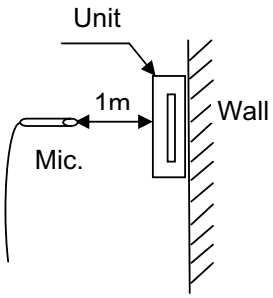
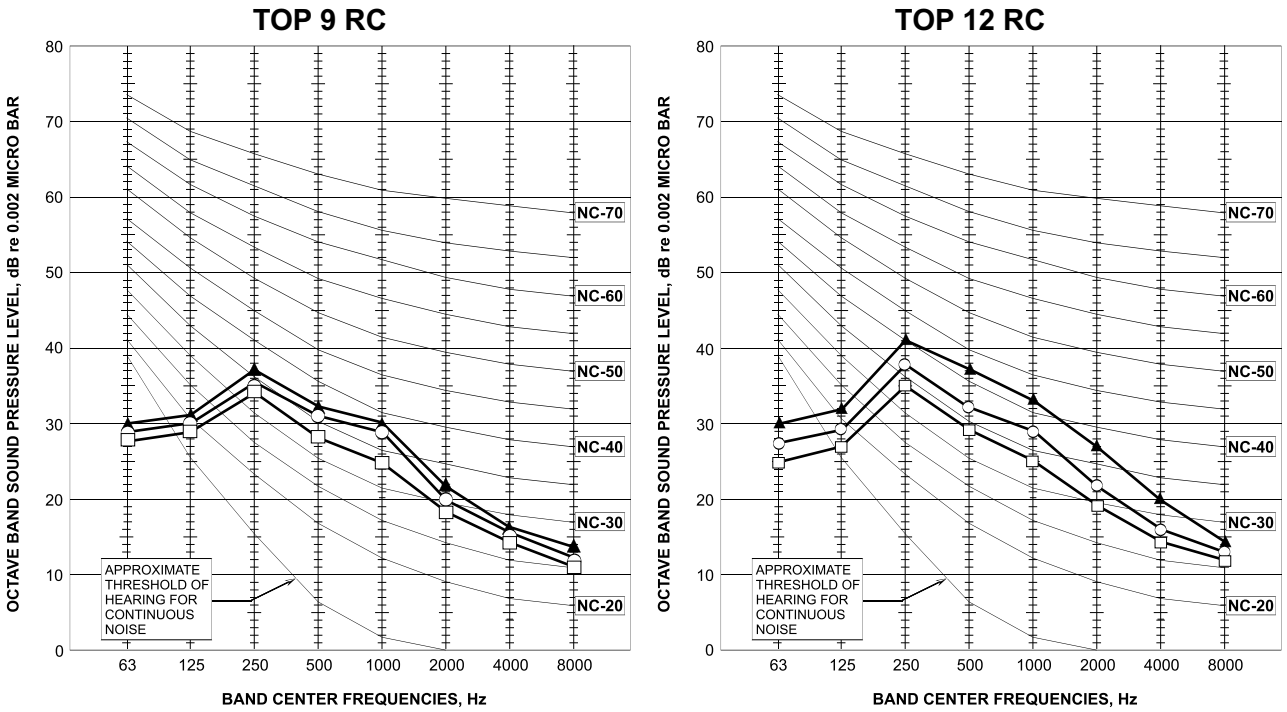


Figure 1

6.2 Sound Pressure Level Spectrum (Measured as Figure 1)



FAN SPEED	LINE
HI	
ME	
LO	

6.3 Outdoor units

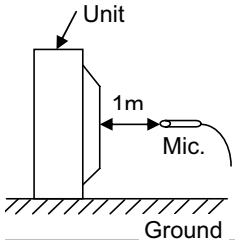
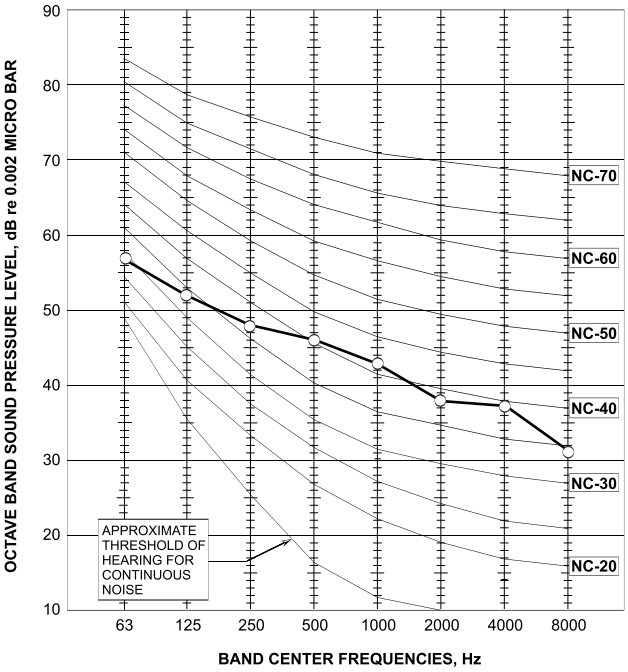


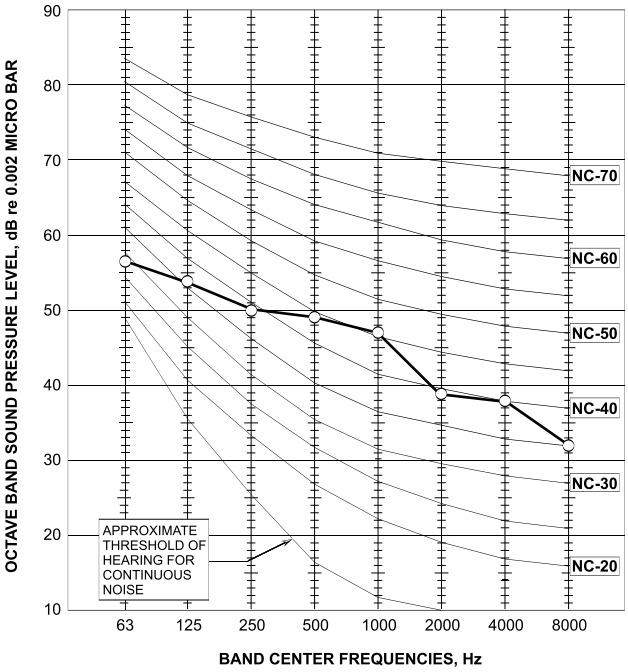
Figure 2

6.4 Sound Pressure Level Spectrum (Measured as Figure 2)

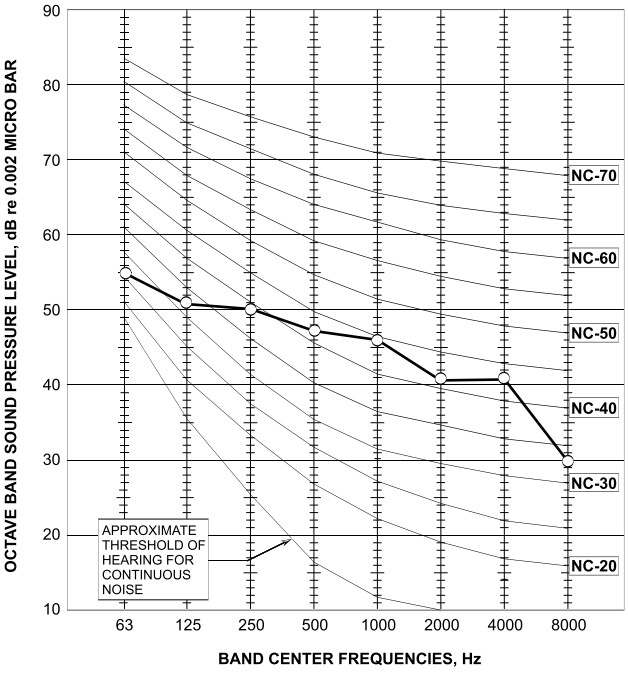
ONG3- 9 RC Cooling



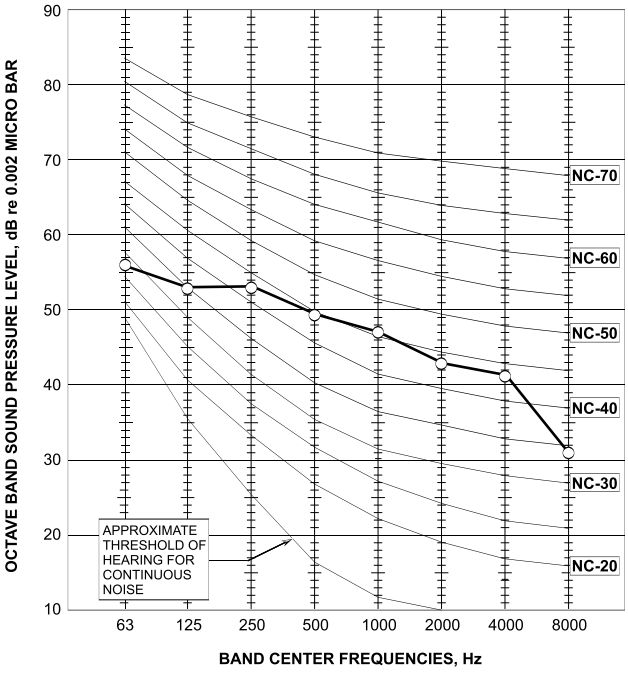
ONG3- 9 RC Heating



ONG3-12 RC Cooling



ONG3-12 RC Heating



7. ELECTRICAL DATA

7.1 Single Units

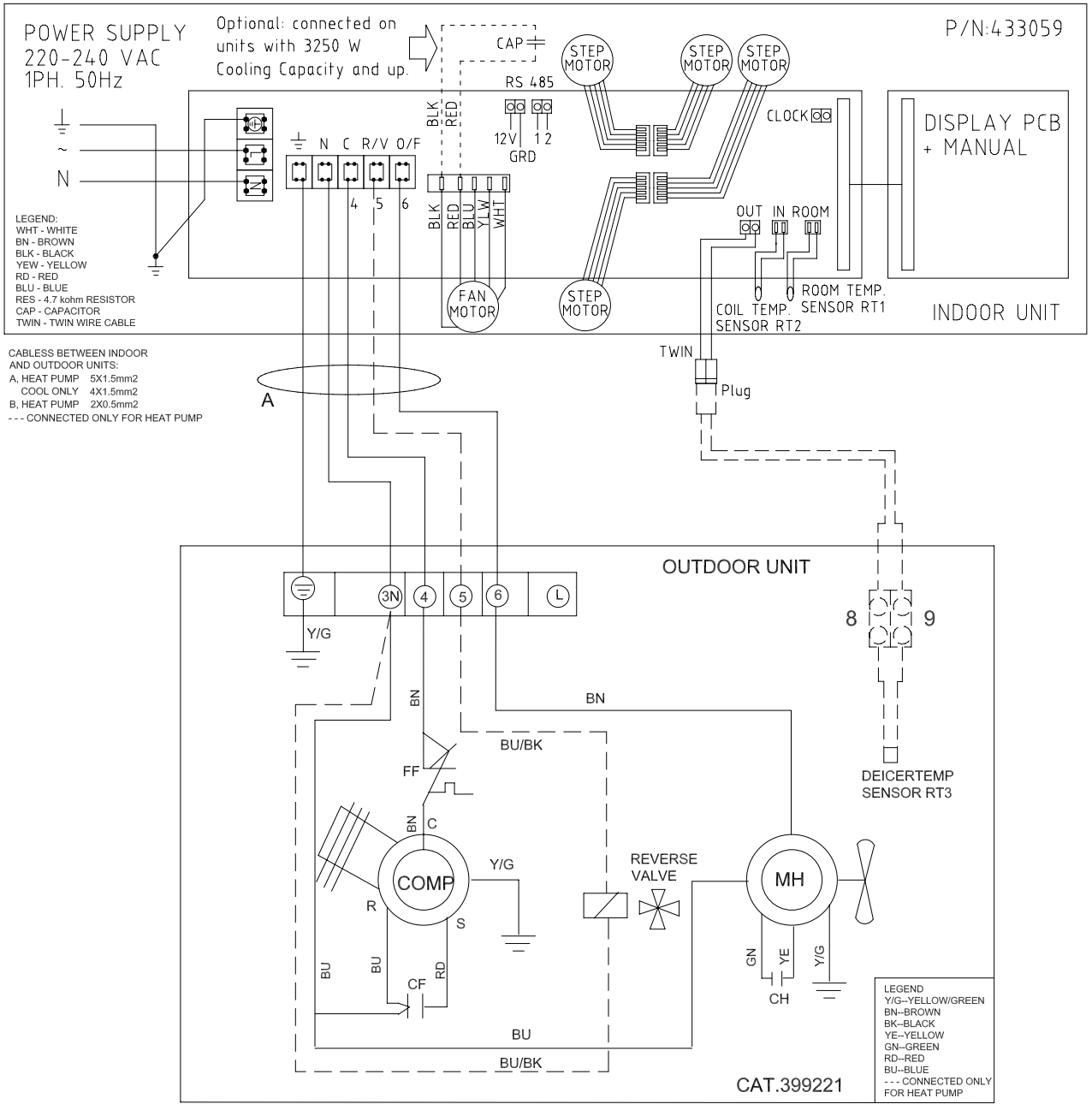
MODEL	TOP 9	TOP 12
Power Supply	To indoor	To indoor
	1PH-230V-50Hz	1PH-230V-50Hz
Max Current, (A)	5.8	7.7
Circuit Breaker,(A)	10.0	10.0
Power Supply Wiring. (No. x Cross Section mm^2)	3 x 1.5 mm^2	3 x 1.5 mm^2
Interconnecting Cable RC Model (No. x Cross Section mm^2)	5 x 1.5 mm^2 + 2 x 0.5 mm^2 (OCT sensor)	5 x 1.5 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	4 x 1.5 mm^2

NOTE

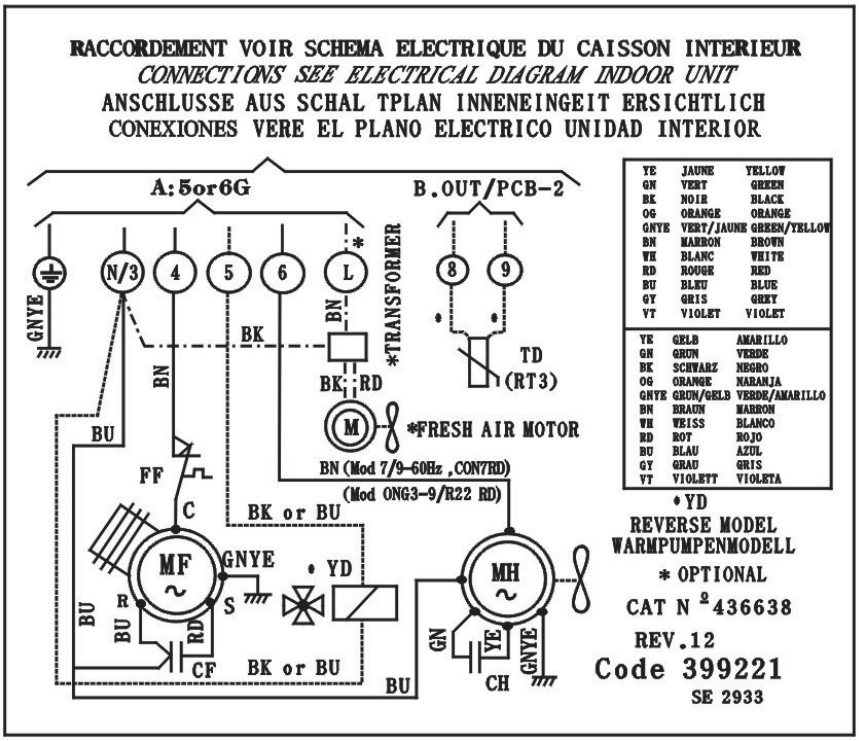
Power wiring cord should comply with local lows and electrical regulations requirements.

8. WIRING DIAGRAMS

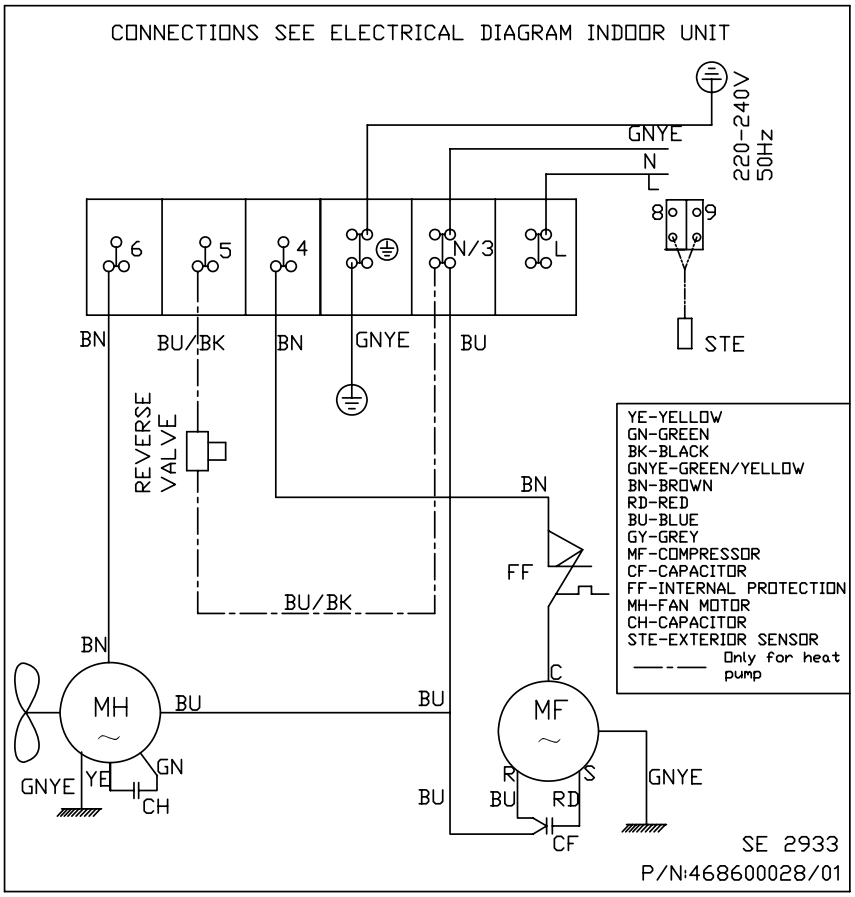
8.1 Indoor Unit: TOP 9, TOP 12



8.2 Outdoor Unit: ONG3-9 ST/RC, ONG3-12 ST/RC R410A (Power supply from indoor)



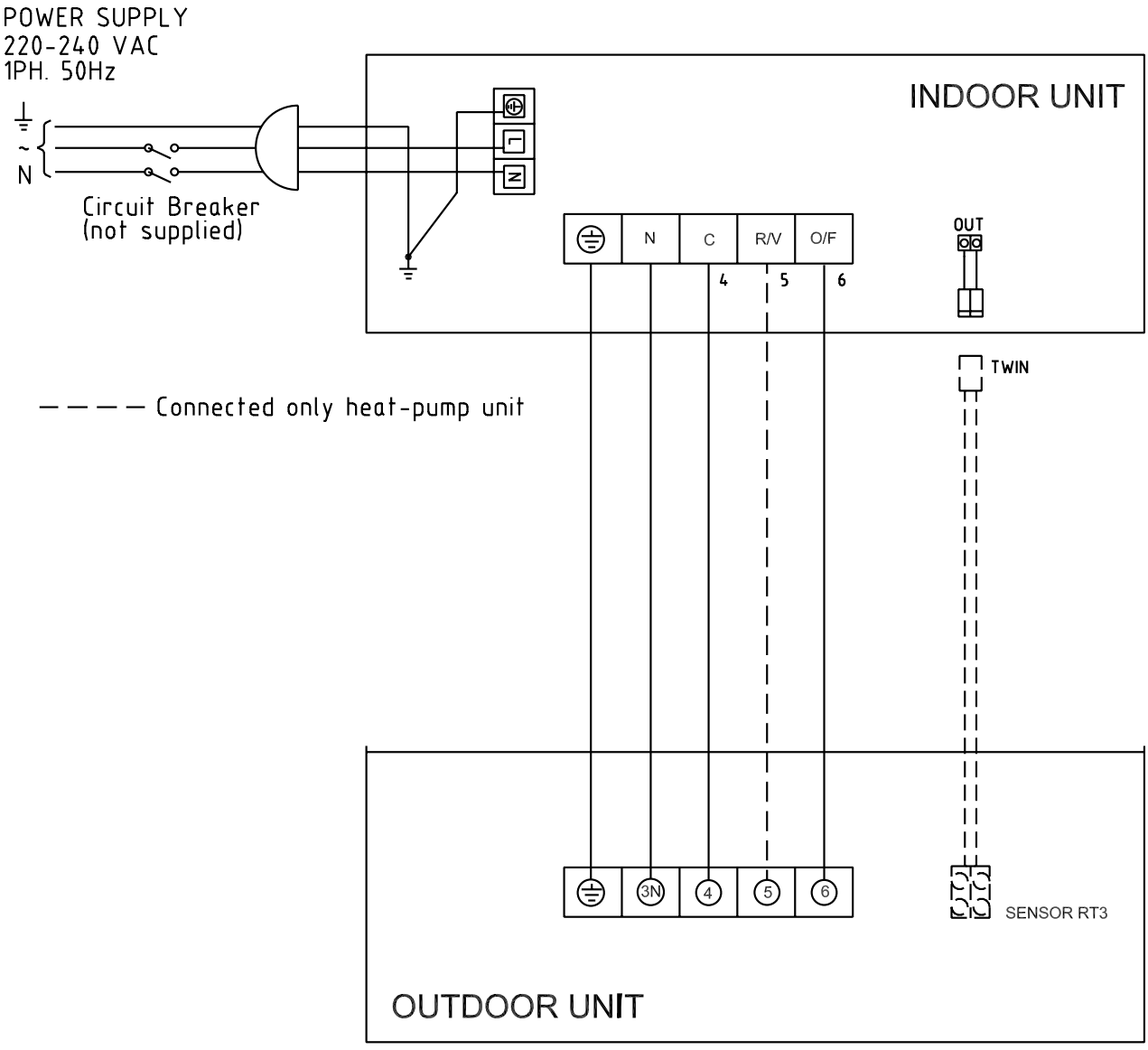
8.3 Outdoor Unit: ONG3-9 ST/ RC, ONG-3 12 ST/RC R410A (Power supply from outdoor)



CONTENT

9. ELECTRICAL CONNECTIONS

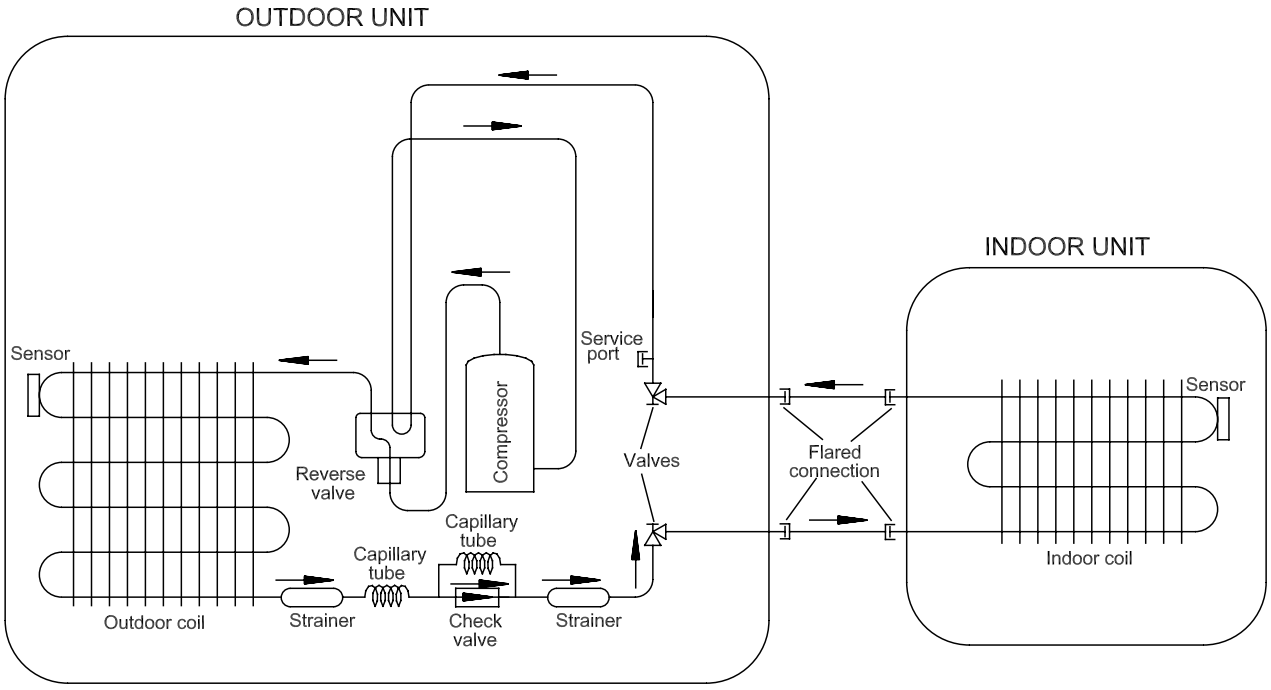
9.1 TOP 9/ONG3-9, TOP12/ONG3-12 R410A



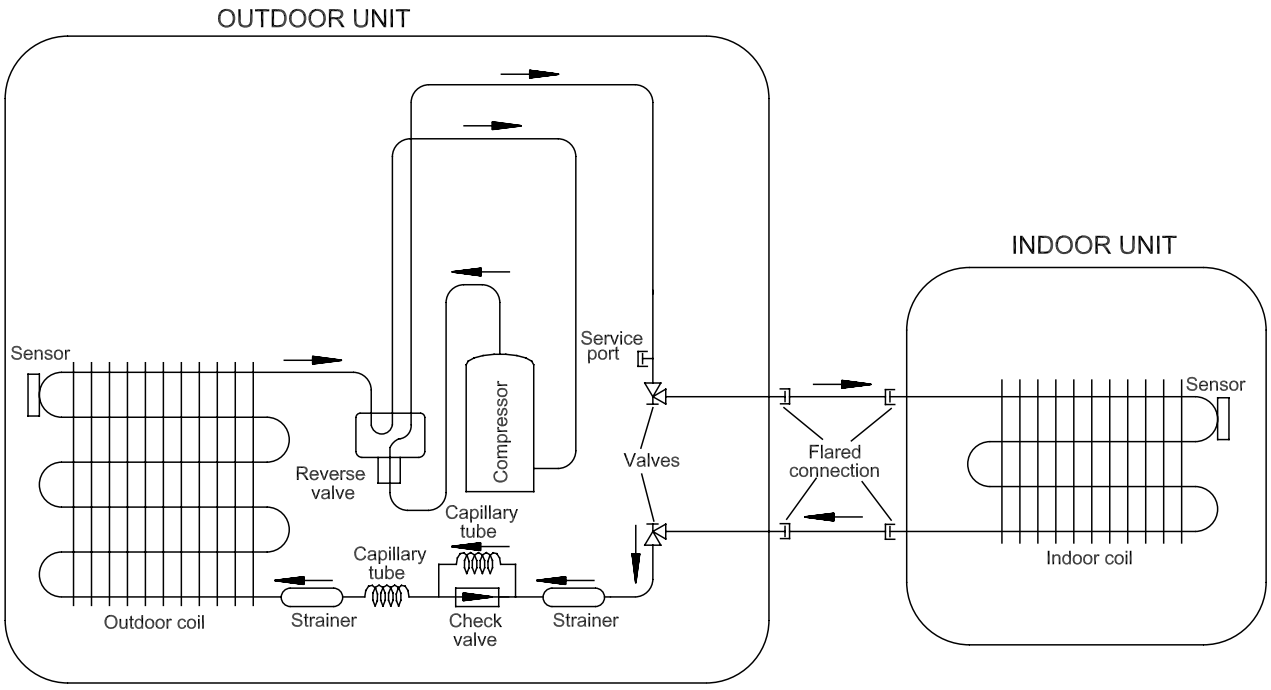
10. REFRIGERATION DIAGRAMS

10.1 Heat Pump Models

10.1.1 TOP 9, 12 R410A



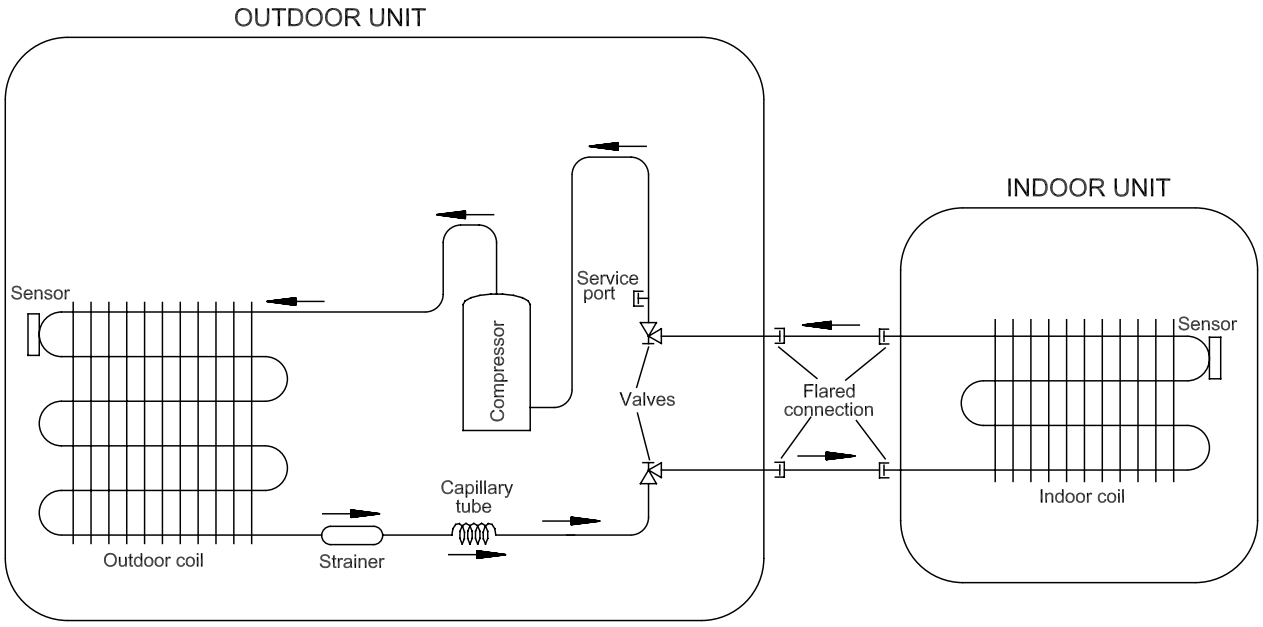
COOLING MODE



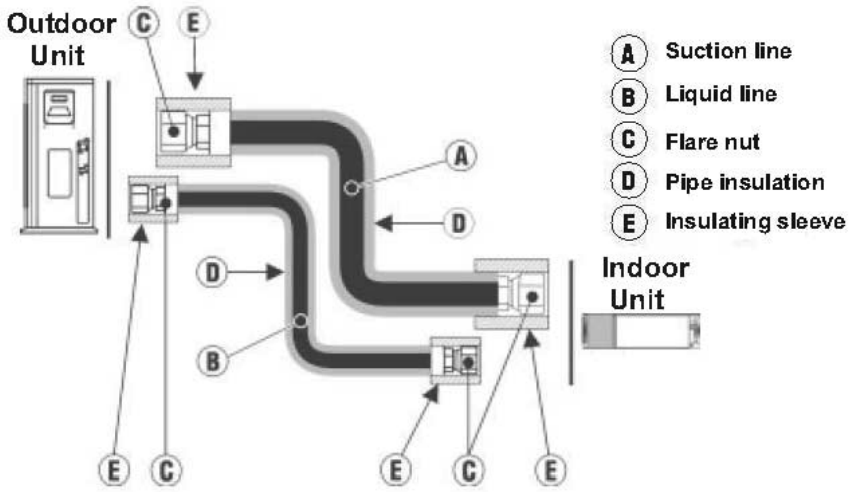
HEATING MODE

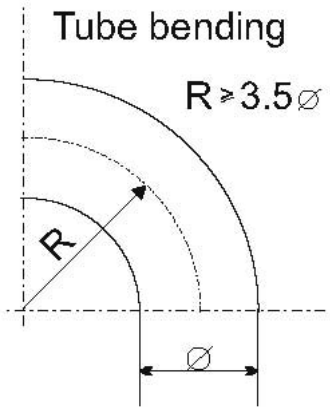
10.2 Cooling only Models

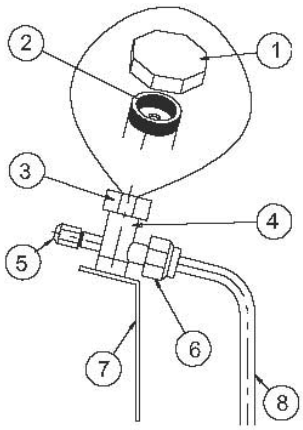
10.2.1 TOP 9, 12 R410A



11. TUBING CONNECTIONS



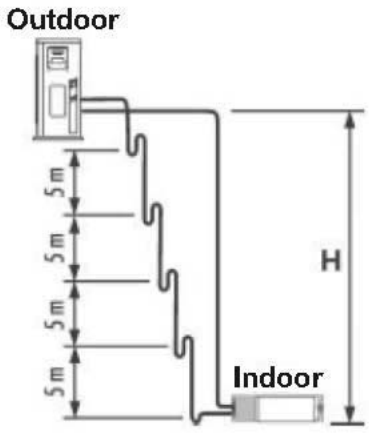




TUBE (Inch) / TORQUE (Nm)	1/4"	3/8"	1/2"	5/8"	3/4"
Flare Nuts	11-13	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

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. CONTROL SYSTEM

12.1 Electronic Control

12.1.1 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.

12.1.2 Jumpers Settings

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

12.2 Legend

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
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
ΔT	- The difference between SPT and RT. in Heat Mode:ΔT = SPT-RT in Cool/Dry/Fan Mode: ΔT = RT-SPT

12.4 General functions

12.4.1 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 or Auto Modes	3 min.
Fan, Dry, Overflow, Protection modes, or mode change	ignored

12.4.2 IFAN operation

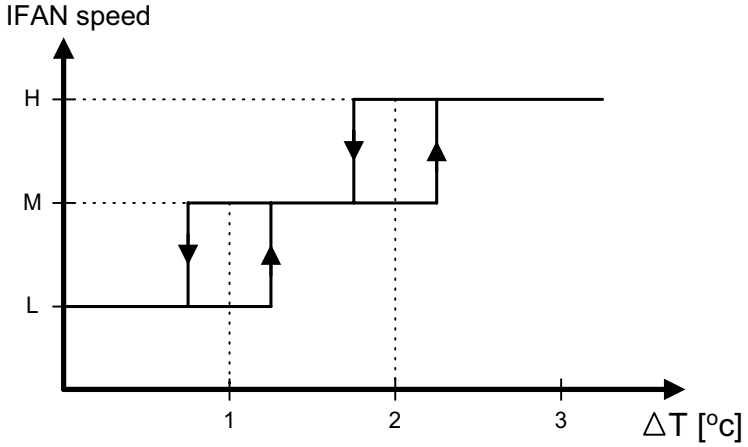
- Min time interval between IFAN speed change in AUTOFAN Mode, is 30 sec.
- Min time interval between IFAN speed change in H/M/L Mode is 1 sec.
- IFAN speed in Heat/Cool Autofan Mode is determined according to the following table:

ΔT	IFAN Speed
$\Delta T \geq 2$	HIGH
$2 \geq \Delta T \geq 1$	MED
$1 \geq \Delta T$	LOW

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

Note:

- In Heat Mode, the rules in section 4.0.3 have the higher priority.
- The table above can be represent by a hysteresis curve which will minimize the switching of the IFAN relay and will minimize the change in IFAN speed:



12.4.3 OFAN operation

- Min time interval between OFAN ON/OFF state change is 30 sec.
- In general, OFAN starts together with COMP.

12.4.4 HE operation

- Minimum Heaters ON or OFF time is 30 sec.
- Heaters can be activated only if IFAN is on.

12.4.5 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, Heat and Auto Modes.
- No reset after protection modes.

12.4.6 Thermistors operation

- Return air Temp. is detected by RAT (RT1) in normal Mode, or by RCT (R/C sensor) in I-FEEL Mode.
- Indoor Coil Temp. is detected by ICT (RT2).

12.4.6.1 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) -
   (i) This test is performed only once after a unit is switched from OFF/STBY to operation. At the first occurrence of 10 min continuous COMP operation, the current ICT & OCT are compared with those when the COMP was switched from OFF to ON 10 min before. If the ΔT is less than 3°c, the thermistor is regarded as defective.
   (ii) The ICT and OCT no-change error can be disabled together by connecting a4.7 kohm resistor (5%) to the OCT connector. These resistors are equivalent to a thermistor at 43+/-1°c and 48+/-1°c respectively.
   (iii) Connecting a 4.7k resistor to the ICT connector will disable the ICT no-change error only.

12.4.6.2 Cases for disabling thermistor short/disconnected detection

i. The detection of thermistor faults (a) and (b) above, are disabled when Deicer Protection is started. The detection will be enabled again only after (1) the deicing is completed, and (2) COMP has been restarted and operated for 30 sec.

ii. When all the following conditions are fulfilled:
   a. 4.7K Ohm resistor is connected on the OCT
   b. IFAN is OFF
   c. Compressor is ON
   d. ICT < -30 (disconnected)

   This condition come to detect and prevent IFAN operation in Deicer in multi spilt units.

12.4.6.3 Handling the thermistor faults in a COMP unit

i. ICT/OCT thermistor is disconnected or shorted -

The invalid thermistor temperature is replaced by 43°c, so that the unit can continue the normal operation. All protections related to that faulty thermistor will be disabled. For example, in case of any ICT fault, the ICT high pressure protection in Heat Mode and ICT defrost protection in Cool Mode will not operate anymore. The same is also applied to the OCT fault.

ii. RAT thermistor is disconnected or shorted –

The RAT will be derived from the ICT by using the equations :

Heat Mode: RAT=ICT/2.3
Cool Mode RAT=ICT*4

Notes:

- In case of any thermistor failure, the STBY LED will be blinking until the fault condition is corrected.
- User can use the system diagnostics function to find out the nature of the thermistor faults.

i. RAT thermistor is disconnected or shorted –

System will operate continuously in the last IFAN & WVL status when turned ON.

Notes:

- As in the COMP unit, the STBY LED will be blinking to indicate a thermistor fault. And, the user can use the system diagnostics function to find out the nature of the fault.

12.5 Cooling Mode - General

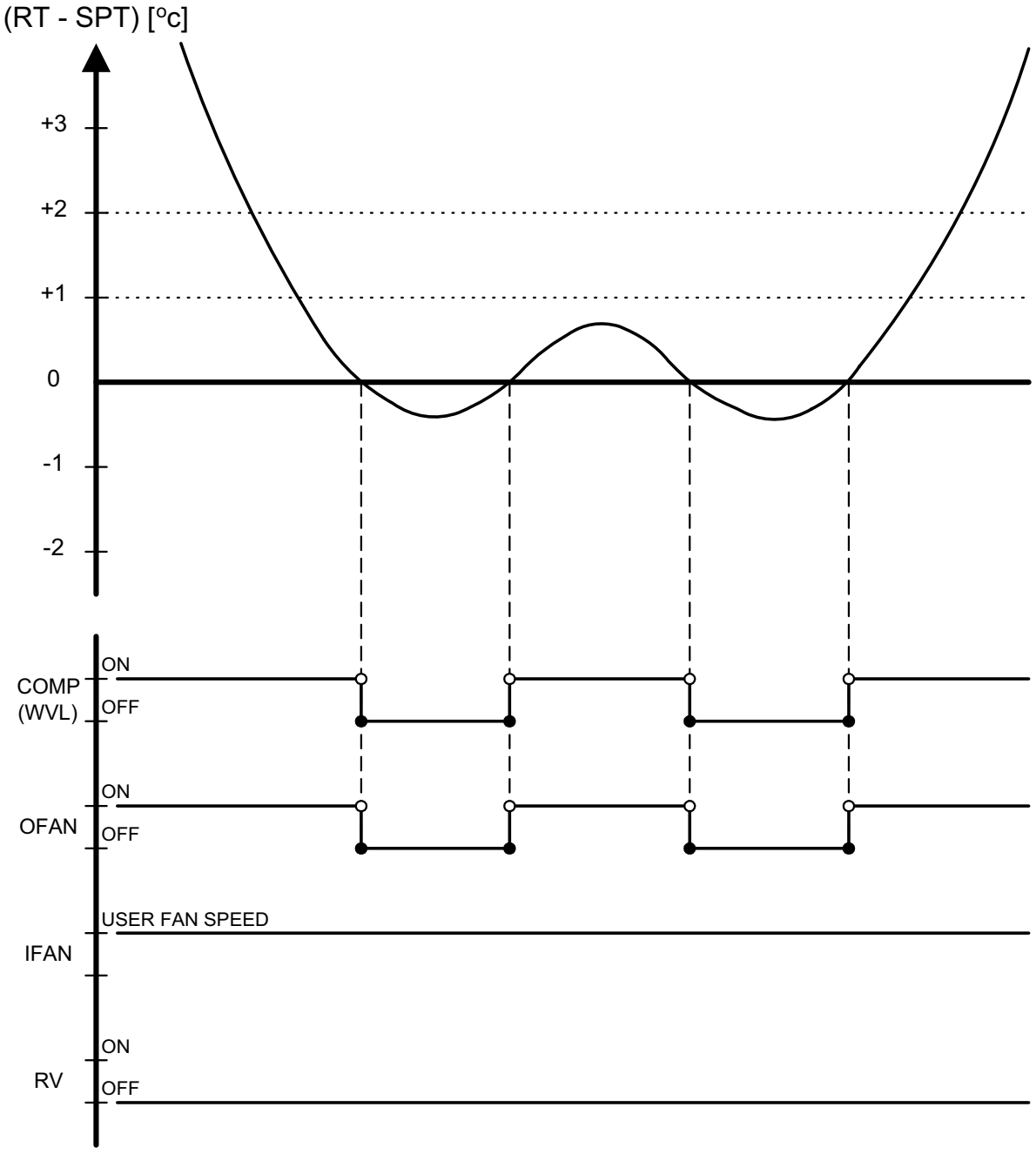
1) Room Temperature, RT, is detected by
   - RAT in normal operation, or
   - RCT (R/C sensor) in I-FEEL mode.
2) The resolution of RT is 1°c.
   - RT is activating COMP/WVL if (RT > SPT), and
   - RT is stopping COMP/WVL if (RT =< SPT).
3) Indoor Coil Temp is detected by ICT (RT2).
4) Outdoor Coil Temp is detected by OCT (RT3).
5) A WVL-RC/SH will work in Cooling Mode when
   - ICT < 16°c in general (see Sect 2.2.2 for details), and
   - Unit is not operating in Fan Mode.
6) OFAN OPERATIONS
   - OFAN starts together with COMP in general.

12.5.1 Cooling

Mode: Cool, Auto (at Cooling)
Temp: Selected desired temperature.
Fan: HIGH, MED, LOW
Timer: Any
I Feel: On or Off

Control function

Maintains room temp at desired level by comparing RT and SPT.



Note:

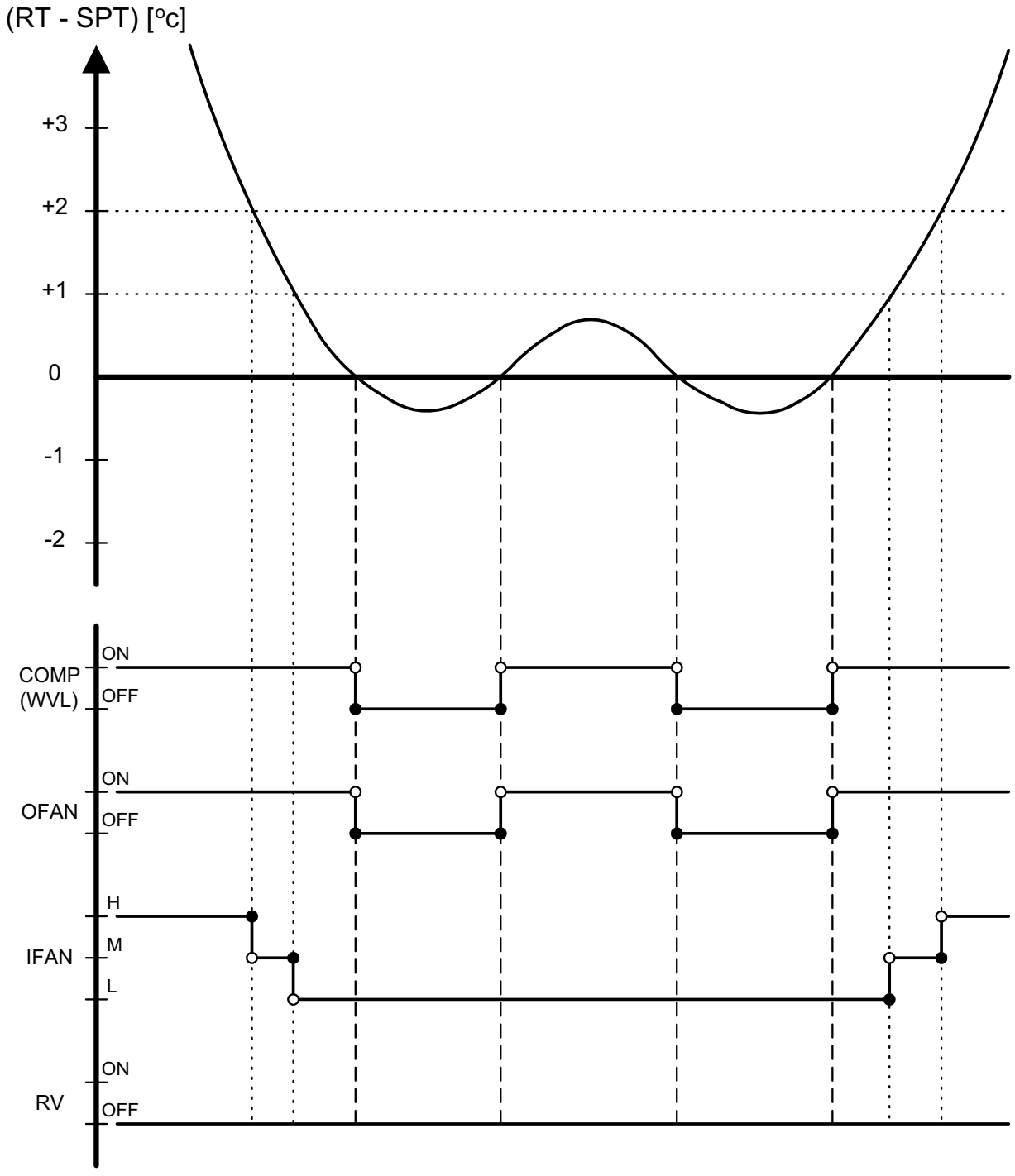
1) IFAN is always running at High, Medium or Low speed selected by user.
2) In IFEEL mode, the Room Temperature (RT) is the RCT from a R/C. Otherwise, the RT is the RAT from the Room Thermistor.

12.5.2 Cooling with Autofan

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

Control function

Maintains room temp at desired level and controls the IFAN speed for optimal comfort.



12.6 Heating Mode

12.6.1 Heating Mode - General

- In heating Mode, temp. compensation schedule will be activated for wall mounted units.

SPT [°c]	Add to SPT	
	I-FEEL ON	I-FEEL OFF
18 ≤ SPT ≤ 27	0 °c	+2 °c
27 < SPT ≤ 30	0 °c	+3 °c

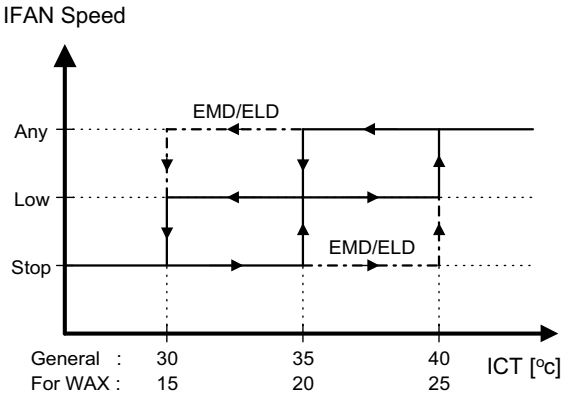
Notes :

- No compensation will be activated in Forced operation modes

12.6.2 IF operating rules

- As a general rule for **RC and SH groups**, when **COMP is ON**, excluding protection modes, IFAN will be switched ON if
- ICT > 35°c or

  at the IFTC 30 sec after the COMP is switched ON. In this case, the IFAN will be started at low speed.

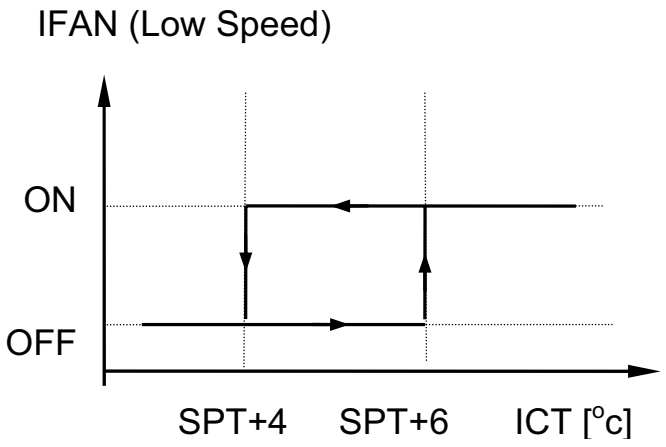


Notes :

1) In **SH or RC group**, if HE is set to OFF due to low ICT, IFAN will be switched to LOW and will be turned OFF after 30 sec.
2) An exception to this rule (4.0.3.a) is the Back-up mode for SH.

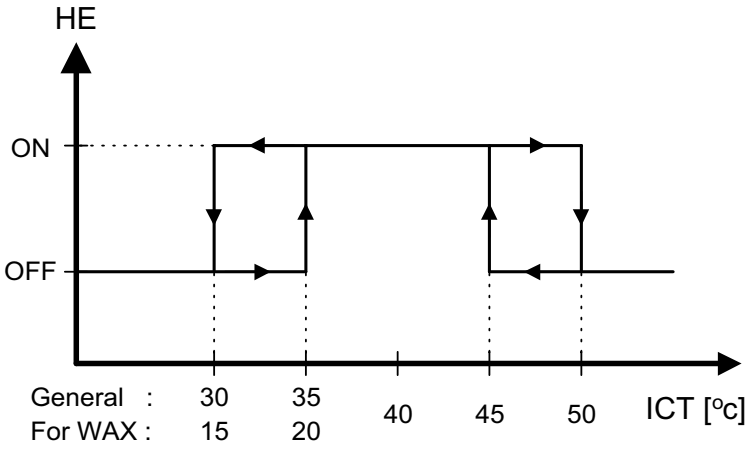
- In **RC and SH groups**, whenever **COMP & HE are both OFF**, excluding protection modes, IFAN operation will be according to the following:

In **other models** IFAN will operate in low speed for 30 sec and then stop. If COMP is OFF for more than 3 minutes and IFEEL Mode is inactive, IFAN will operate in low speed according to the following graph:



12.6.3 HE operation

- For **all Groups**, HE can be ON only when IFAN is ON.
- For **all Groups**, HE switches to OFF when ICT > 50 °c, and is activated again when ICT ≤ 45°c.
- In **SH or RC group**, HE operation is limited by the following graph:



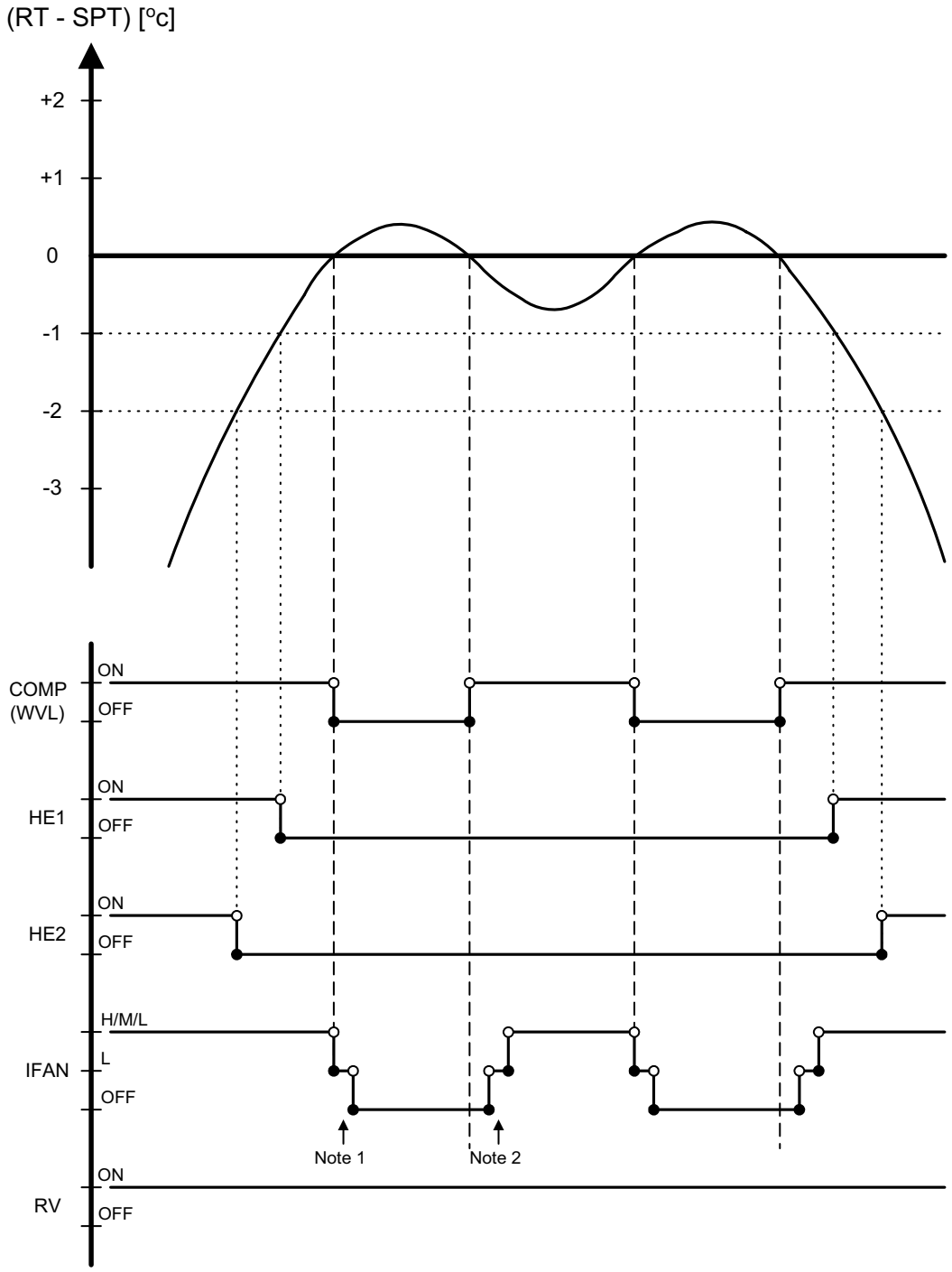
- Back-up mode for **SH group**

After COMP has been working for 5 minutes, HE & IFAN are activated even if the ICT is still below 35°c. This situation is called Back-up Mode. Both HE & IFAN will work in Back-up Mode until the ICT reaches 35°c. Then, the operation goes on in the usual mode .

12.6.4 Heating, RC or SH Group

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

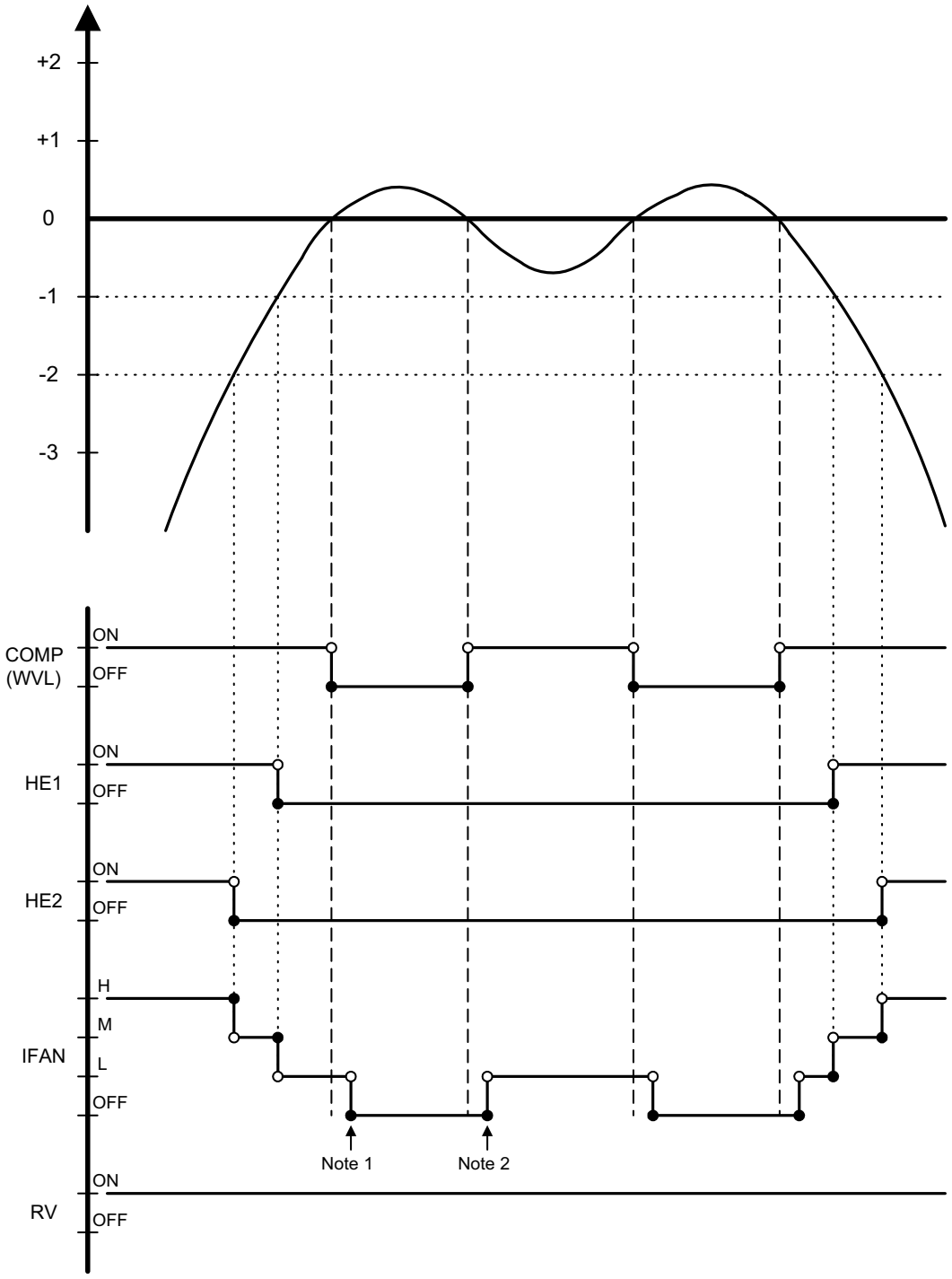
Control function
Maintains room temp. at desired level by comparing RAT or RCT to SPT.



12.6.5 Heating, RC or SH Group with Autofan

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

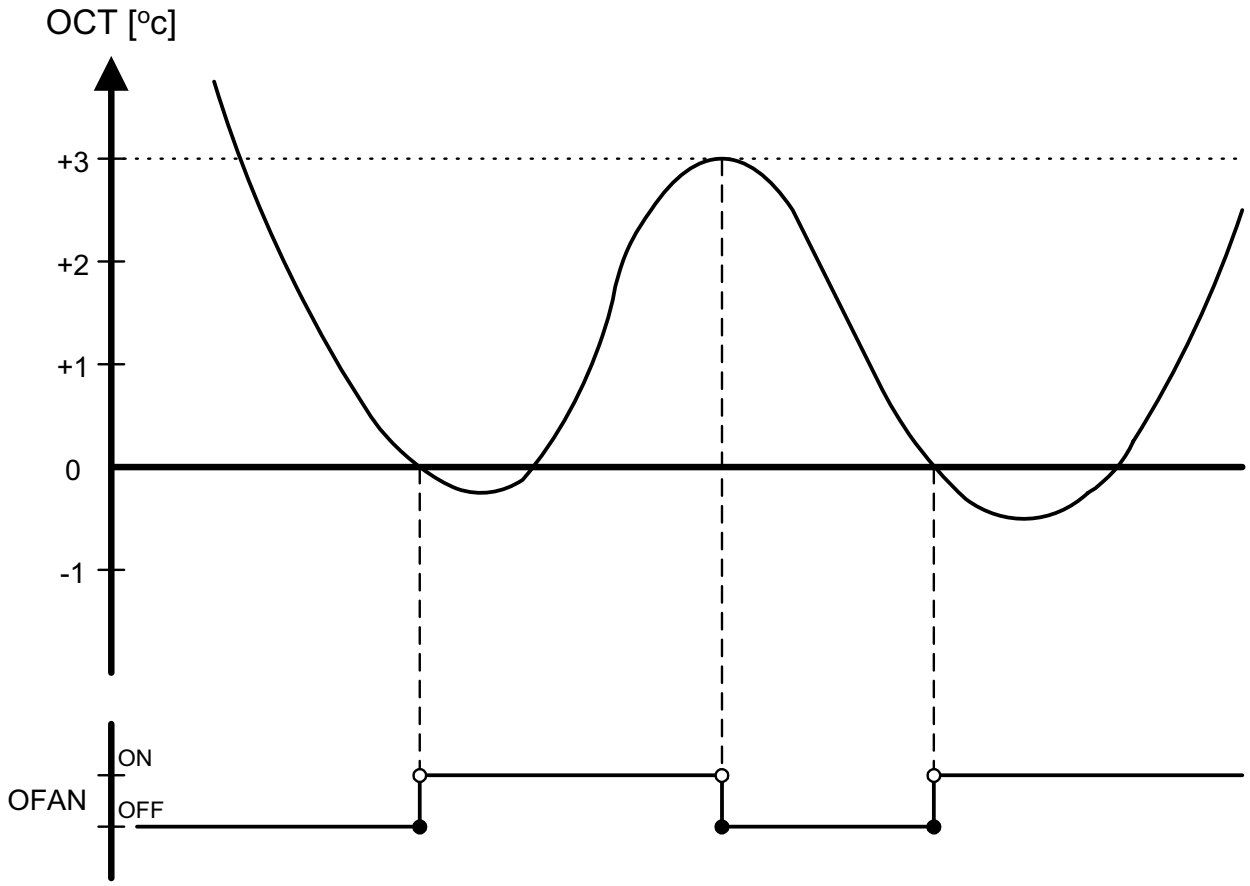
Control function
Maintains room temp at desired level by controlling COMP, IFAN and OFAN.



12.6.6 OFAN operation is controlled by the graph below when

1. (RAT ≥ SPT – 2°c), AND
2. (ICT ≥ 45°c), AND
3. (COMP is ON)

Otherwise, OFAN runs together with COMP.



12.7 Automatic Cooling or Heating

12.7.1 Automatic Cooling or Heating - General

- Switching-temperature between Cooling and Heating is SPT ± 3°c.

- Autofan in Automatic Cooling and Heating Mode will activate “Cooling with Autofan Mode” and “Heating with Autofan Mode” respectively.
- 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	T, min
Auto Cool to Auto Heat	3 min
Auto Heat to Auto Cool	4 min

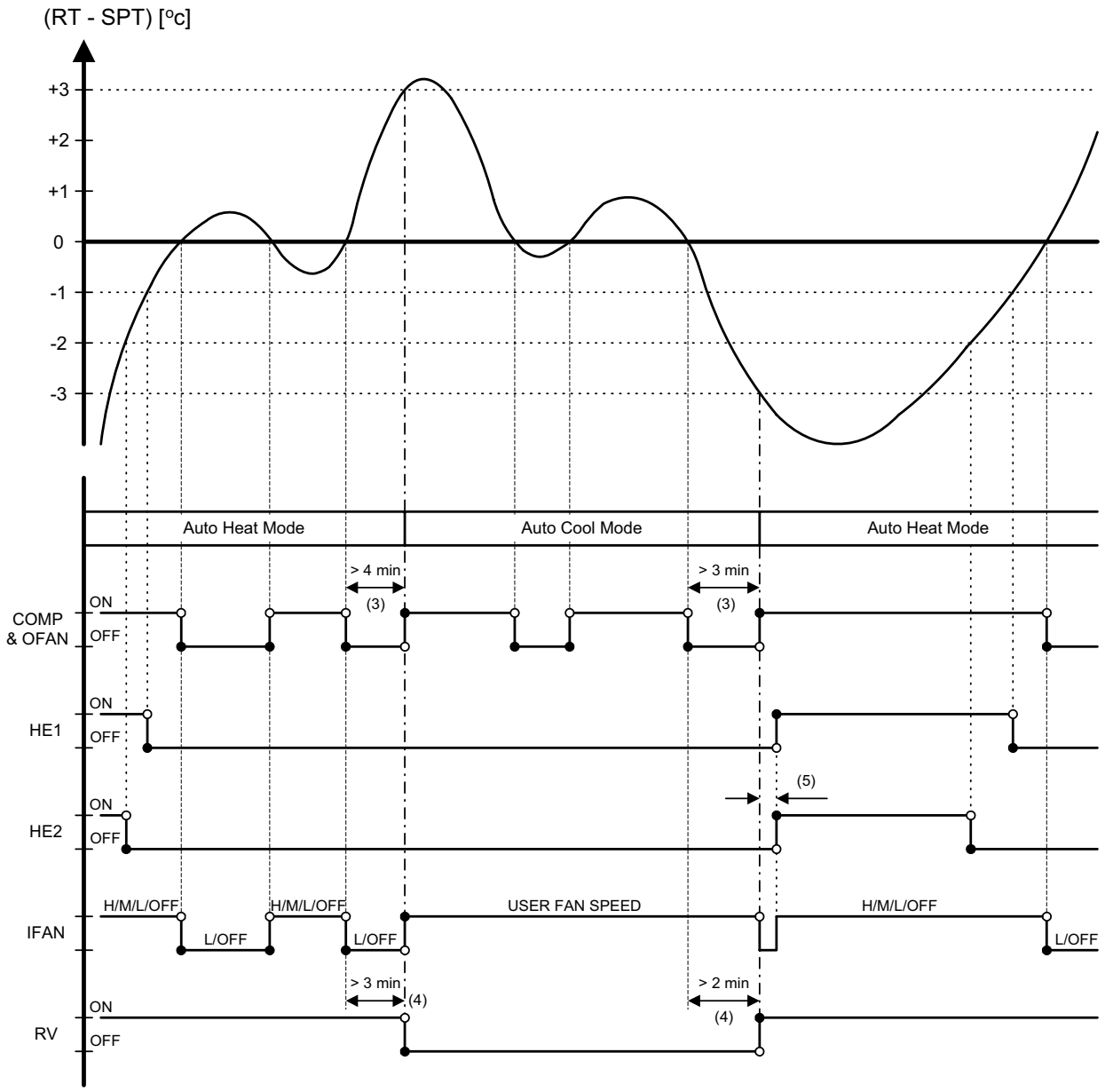
- When unit is changed form Cool/Dry mode to Auto Mode, the unit will continue to operate at (Auto) Cool Mode until the conditions for switching from Auto Cool to Auto Heat are satisfied.

  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.

12.7.2 Auto Cooling or Heating, RC or SH Groups

Mode: Auto
Temp: Selected desired temperature
Fan: Any
Timer: Any
I Feel: On or Off

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



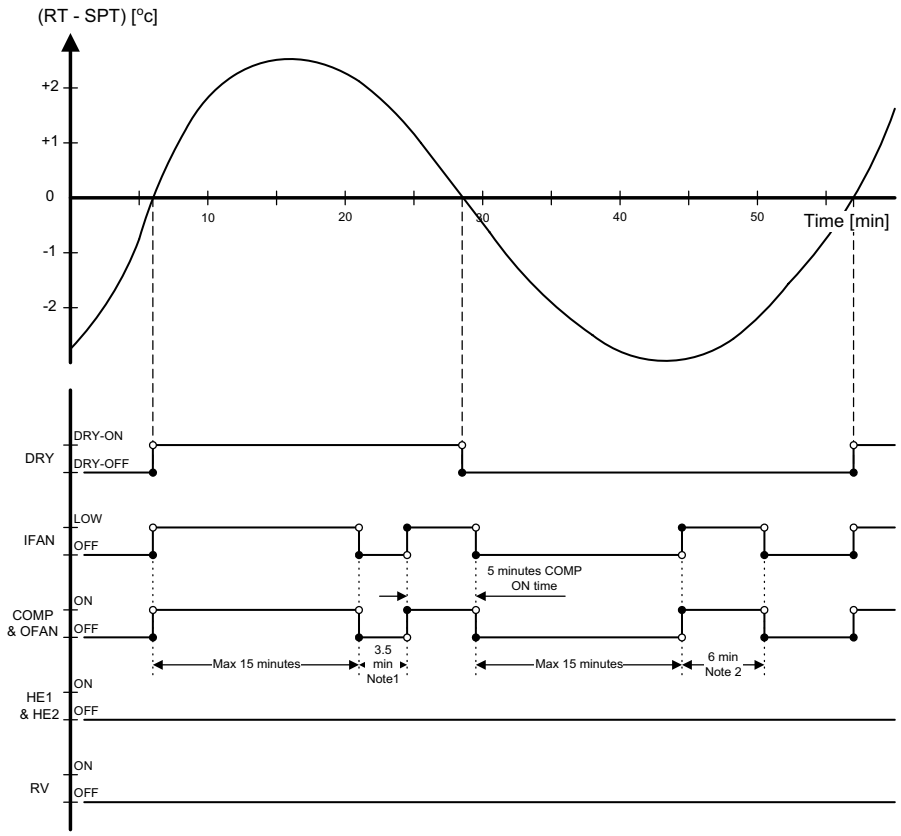
12.8 Dry Mode

12.8.1 Dry, ST or RC group

Mode: Dry
Temp: Selected desired temp
Fan: Low (automatically selected by software)
Timer: Any
I FEEL: Any

Control function

Reduce room humidity with minimum temp. fluctuations by operating in Cool Mode with low speed IFAN.



Notes :

- 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.
- 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.
- 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.
- In Dry Mode, IFAN is LOW when COMP is ON, and is OFF when COMP is OFF.

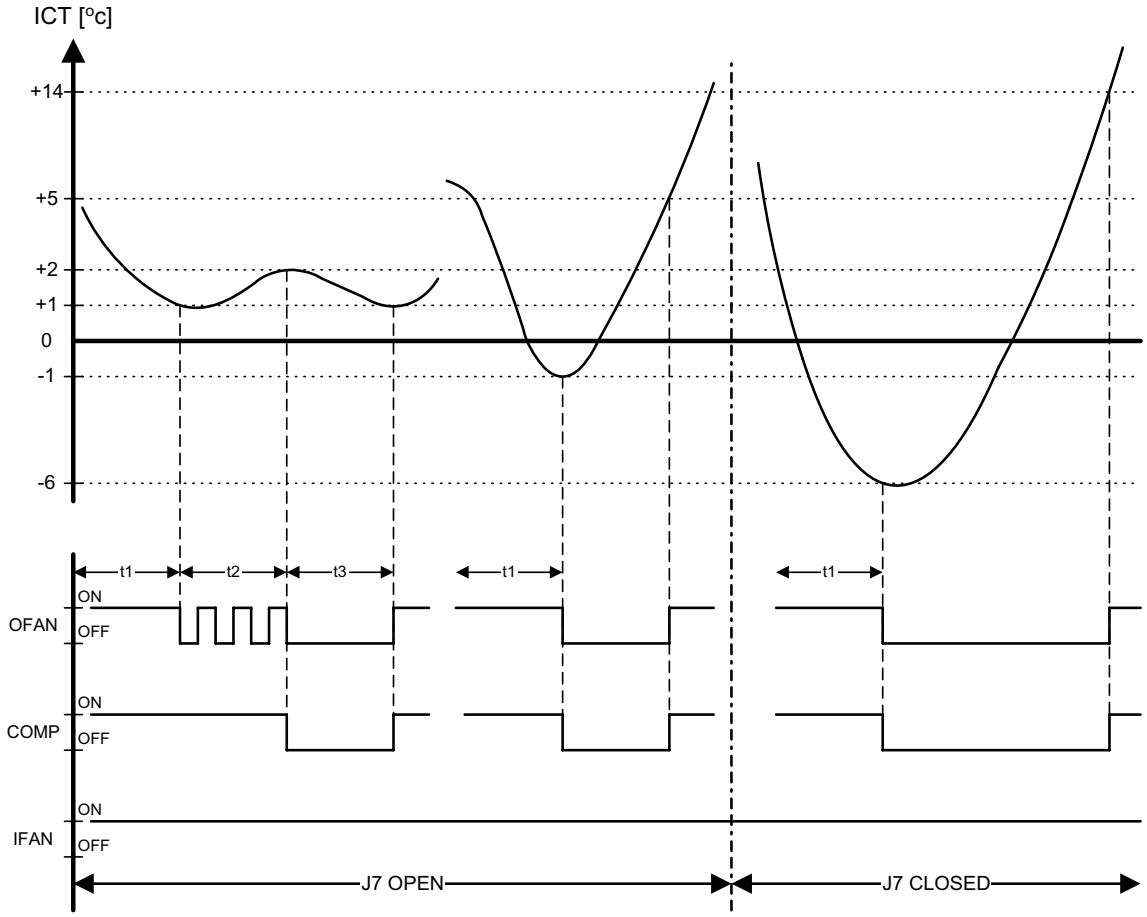
12.9 Protection

12.9.1 Cooling Mode Protections

Indoor Coil Defrost

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

Control 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

Notes:

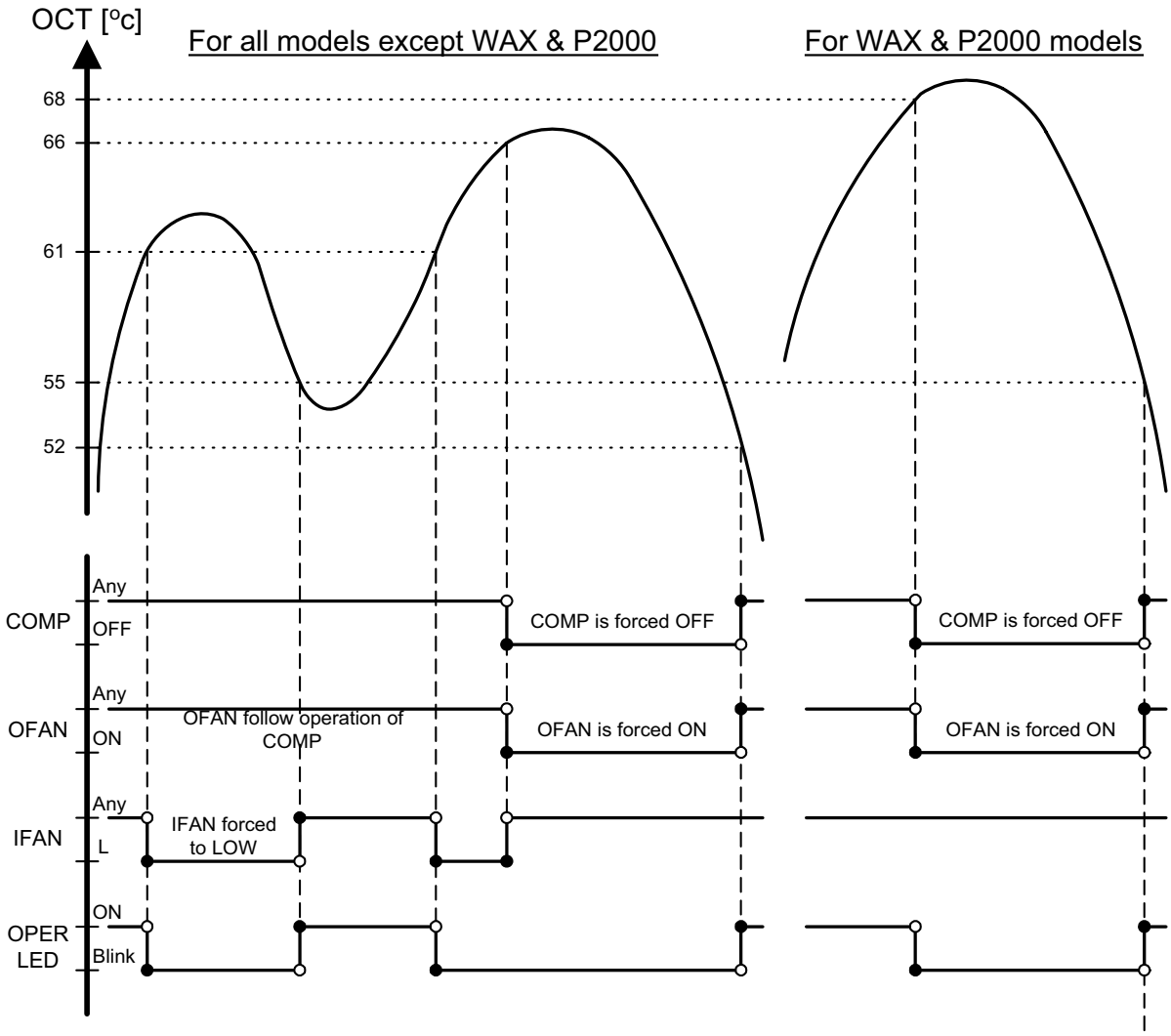
- When J7 is closed (connected), OFAN cycling is cancelled and the set temperature for COMP & OFAN cut-out and cut-in are changed. COMP & OFAN are forced OFF when ICT =< -6°c, and are kept OFF until ICT > 14°c.
- For WAX model, the defrost processes is simpler. When J7 is open, COMP & OFAN are forced OFF when ICT =< -1°c, and are kept OFF until ICT > 5°c. When J7 is closed, the WAX defrosting process is the same as that of the other models (R.H.S. of the graph above). In both cases, the ICT checking in t2 and t3 are not applied.

12.3.2 High Pressure Protection

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

Control Function

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



Note:

- 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.

12.9.3 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

Control function

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

Scope

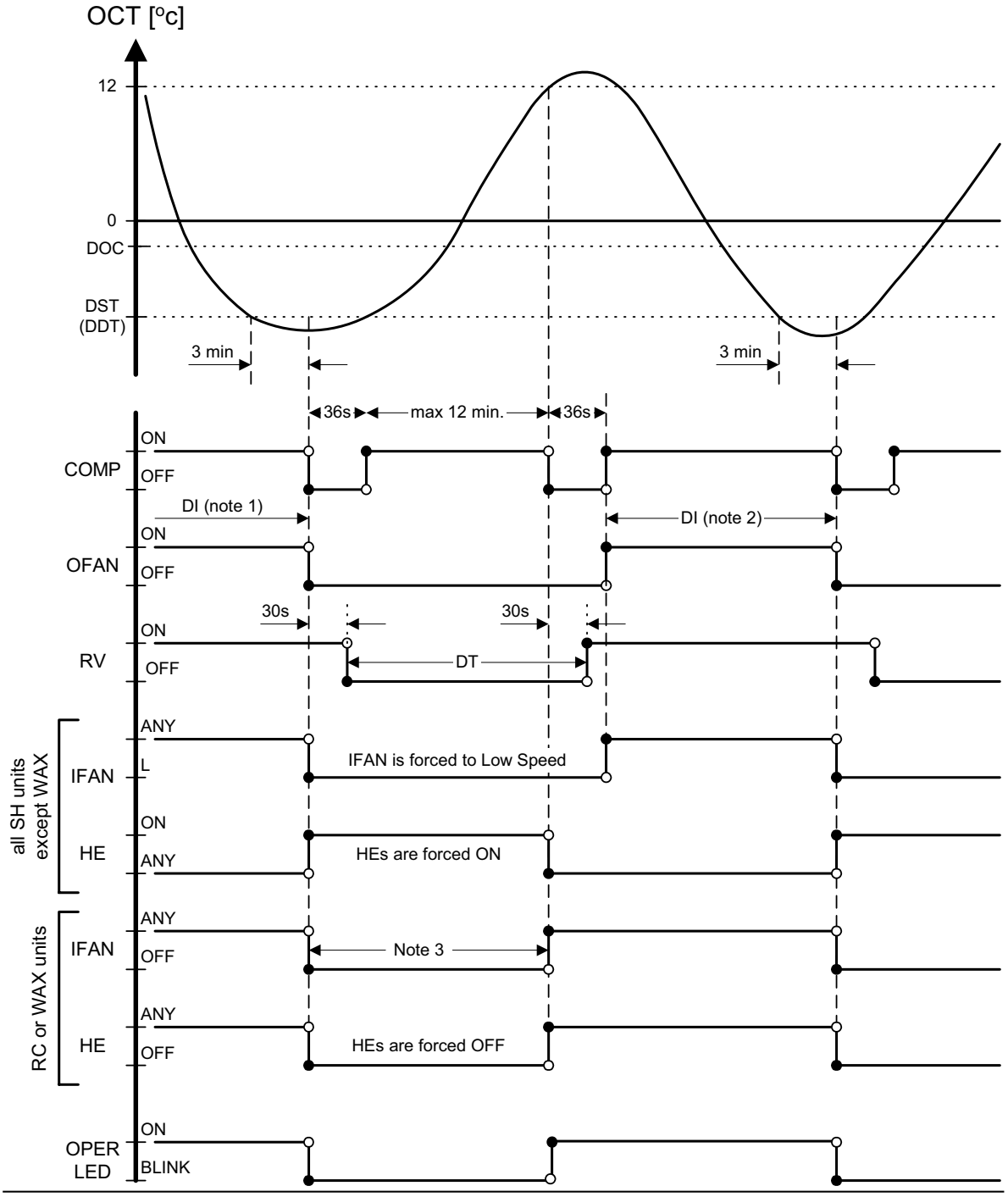
This new deicer is designed to operate at extreme temp conditions. The deicing cycle could be triggered from:

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

Both algorithms adjust the time between deicing cycles to optimize the A/C performance. The algorithm will automatically increase the time between deicing cycles and reduce the deicing cycle as needed.

The algorithm uses EEPROM data to operate.

Deicing procedure



Notes :

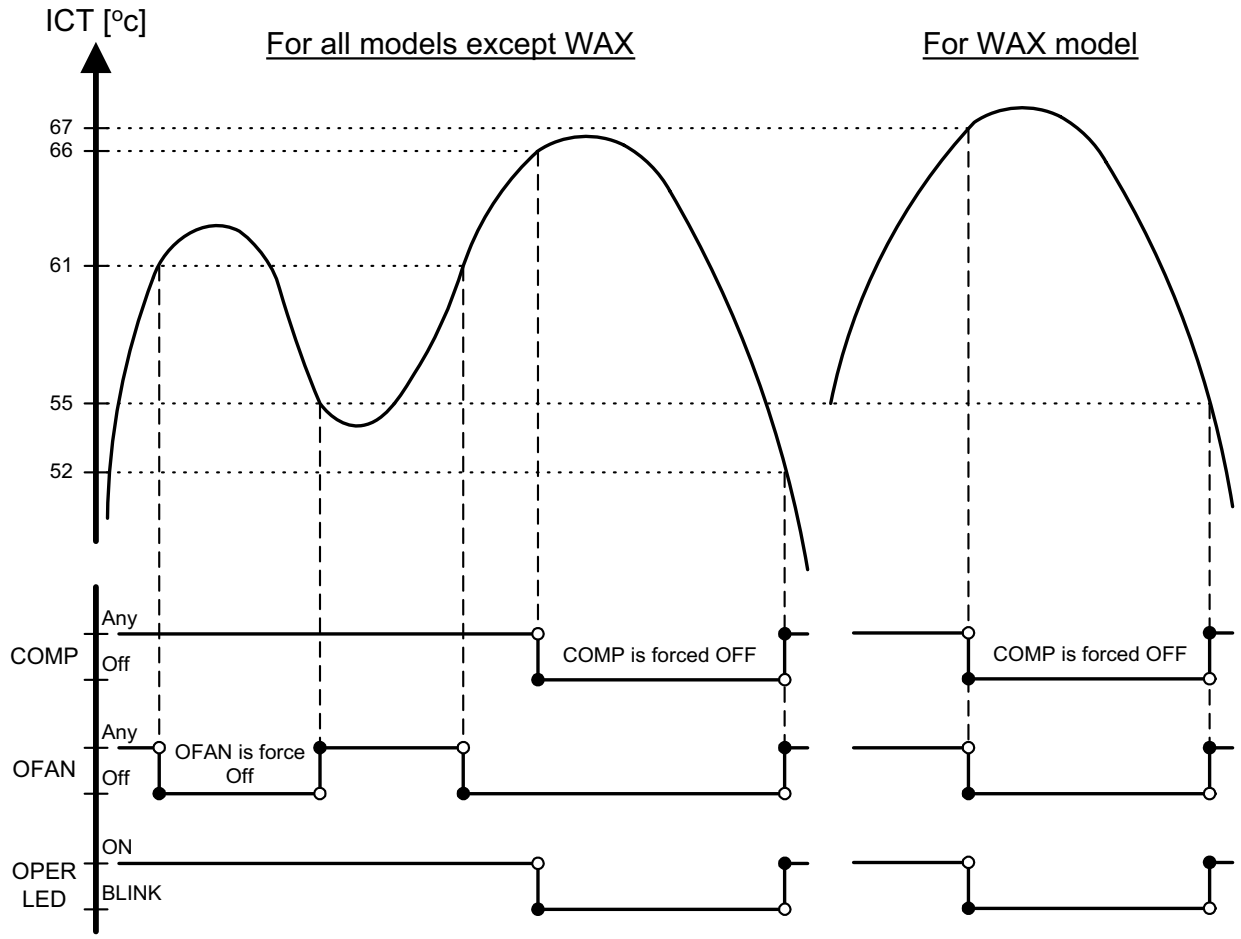
- At the first COMP activation after SB or OFF, if (OCT < 0ºc), then DI = 10 min, else DI = 40 min.
- In the following Deicing cycles, the time interval between two Deicing cycles activation is between 30 to 80 min (refer to the flow chart).
- For RC group, HEs are forced OFF. IFAN operation is as in Heat Mode, Sect 4.0.3.a, i.e. IFAN will be set to OFF when ICT<30ºc. For WAX, the IFAN is simply forced OFF.
- For SH group, HEs are forced ON and IFAN is forced to operate in Low speed, regardless of the ICT and difference between RAT & SPT.

12.9.4 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:

- IFAN, HE1 and HE2 will be activated according to the relevant Heating Mode Sect.
- 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.

12.10 Timer

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

Control 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 timersetting 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 and the Timer LED indicator is blinked to indicate the situation. The LED keeps blinking until the timer settings can be reloaded from a R/C message.

  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.

  - Set ON/OFF timer
  - Clear ON/OFF timer
  - R/C ON Timer is time-up
  - 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 a R/C with heat mode setting, the A/C will start in Cool Mode.

12.11 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 for : TOP, WMF, WMN, WNG models
Cooling	22°C
Heating	28°C

Note:

- While under the forced operation, the temperature compensation schedule.
- 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 Autofan Speed in forced operation.

12.12 Sleep Mode

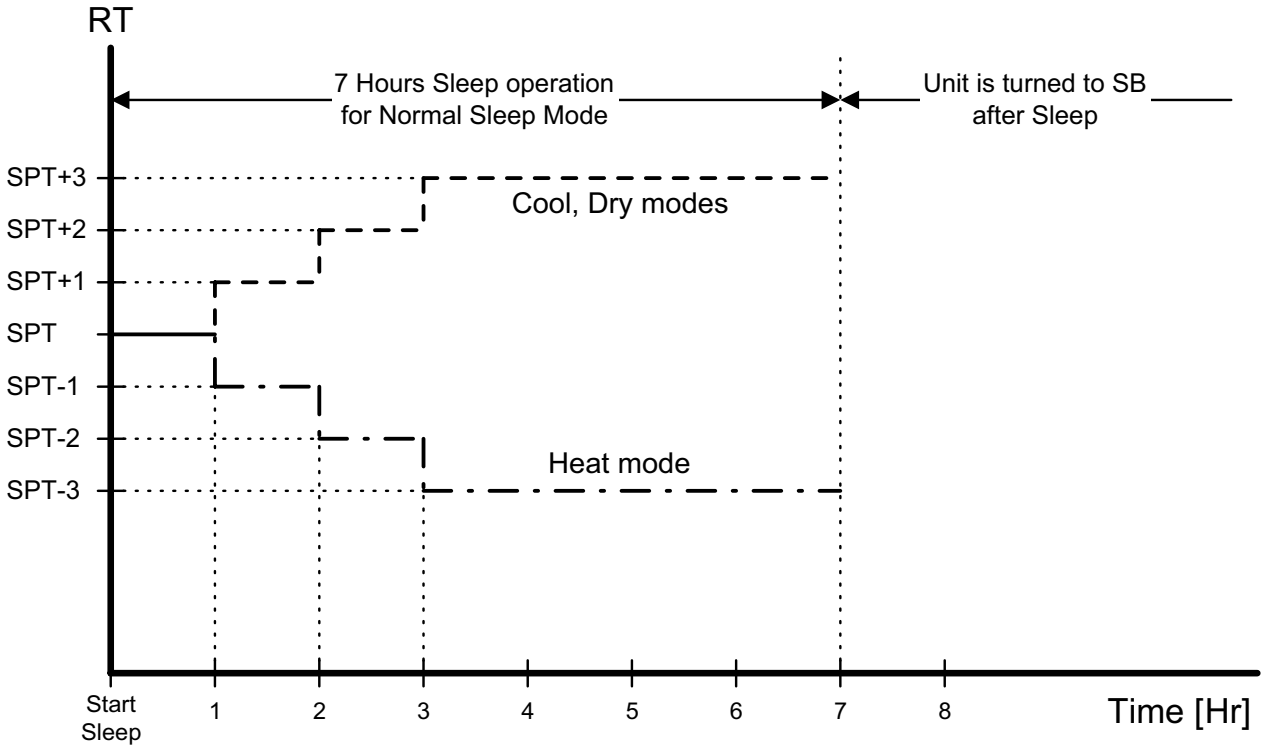
Mode: Any
Temp: Set – desired temperature selected
Fan: Any
Timer: Interact with Sleep Timer as described in sect 12.2
I Feel: On or Off

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.

12.12.1 Adjustment in Sleep Mode

1. in cool, auto cool or dry modes, the SPT adjustment is positive (from 0 to +3°c).
2. In heat or auto heat modes, the SPT adjustment is negative (from 0 to -3°c).
3. In other modes, there is no SPT adjustment.
4. 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.

12.12.2 Time adjustment in Sleep Mode

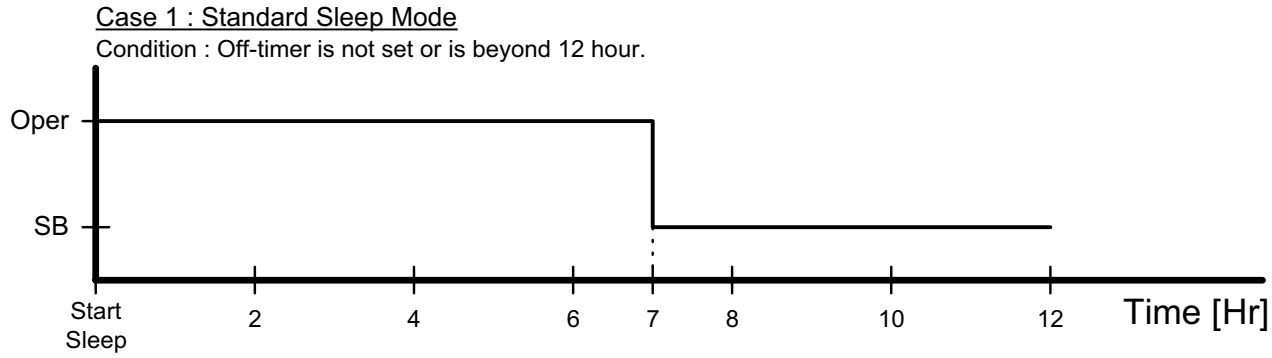
The user can make use of the Off-Timer to extend the Sleep Time from 7 hours to 12 hour (max). The operation of the new “Extended Sleep Mode” is illustrated by the graphs below.

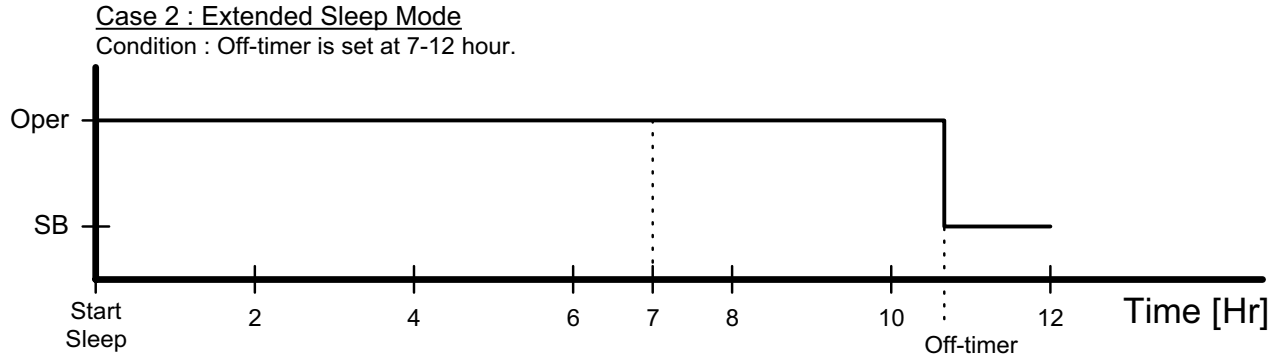
Case 1 is the Standard Sleep Mode, which is the only sleep mode in previous version of MCU. The A/C unit simply works for 7 hours, then goes to SB.

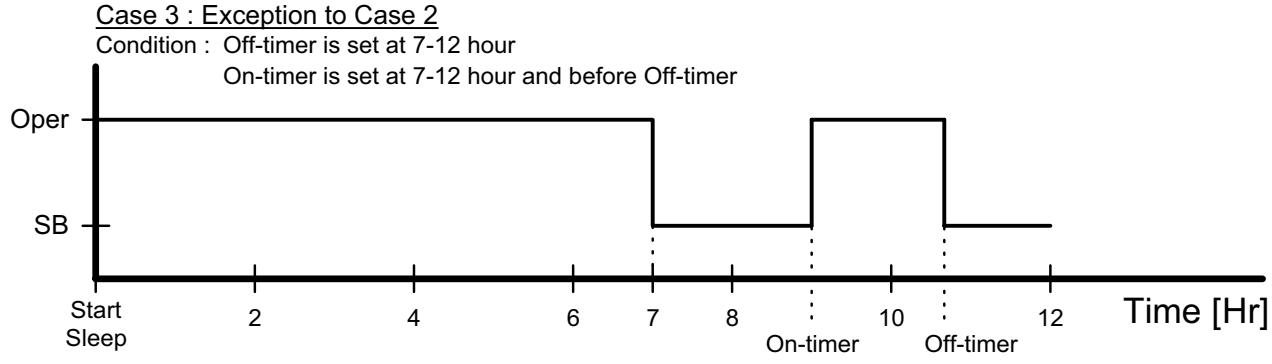
Case 2 is the new Extended Sleep Mode. If an active Off-Timer is set to turn off the A/C between 7-12 hour, relative to the starting of Sleep, the Sleep time is extended.

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.







12.13 Clogged Air Filter

Filter LED ON after 512 HR.

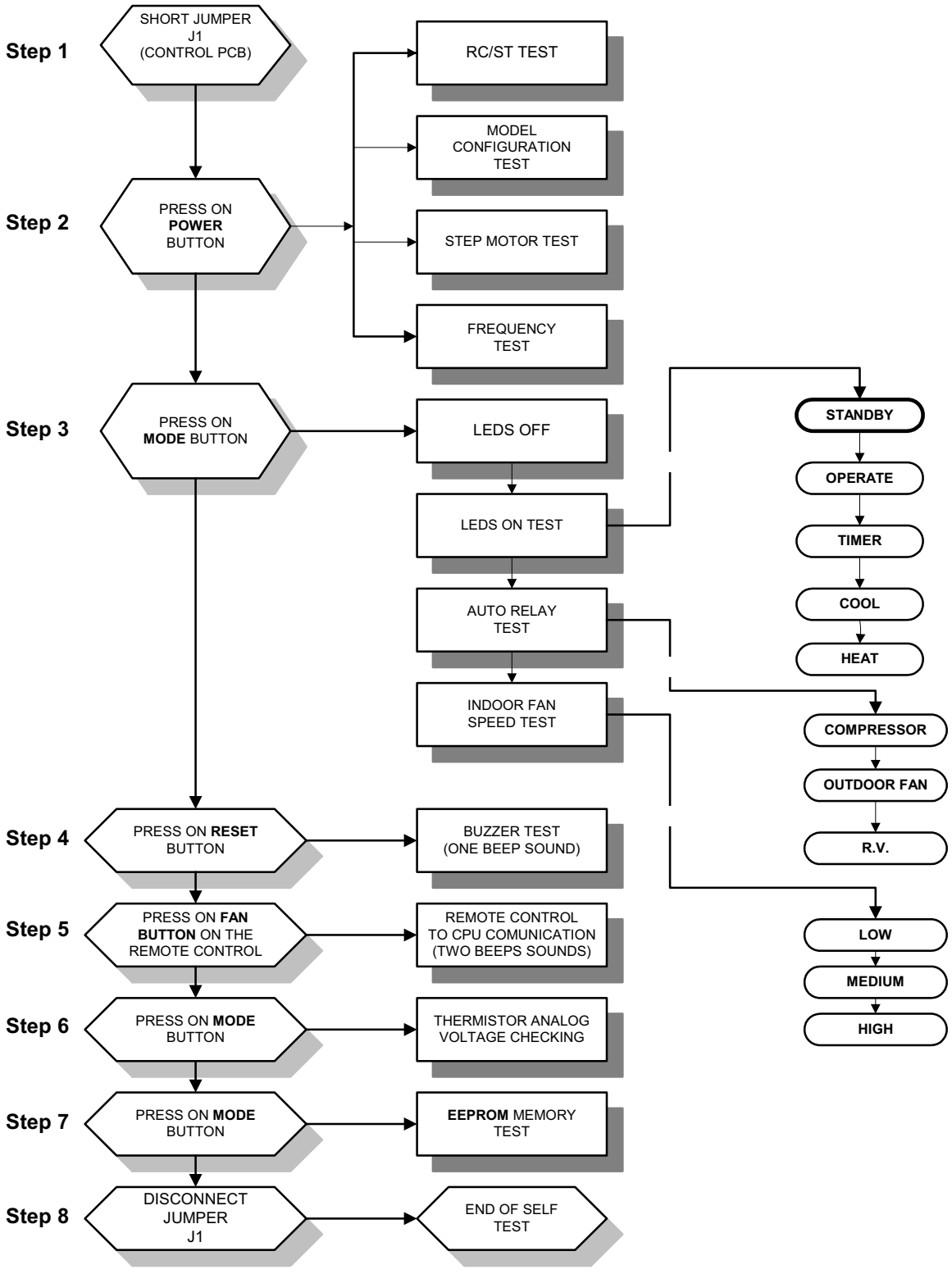
Filter LED is turned OFF, and the Filter Timer is restarted by pressing the reset button.

12.14 Controller Self-Test Procedure

12.14.1 By Shorting Test Jumper J1

SELF-TEST FLOW CHART

FOR CONTROLLER (VERSION 4V5 OR HIGHER)



12.14.2 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:

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

- Testing 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):

MODEL	COMP	OPERATE LED	TIMER LED	FILTER LED
WNG	ON	OFF	OFF	OFF
WMN1	ON	ON	OFF	ON
WMN4	OFF	OFF	ON	OFF
WMN2/WHX	OFF	ON	OFF	ON
WMN3	OFF	ON	ON	ON

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.

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

12.15 On Unit Indicators and Controls

STAND BY INDICATOR	Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands Blinks continuously in case of any thermistor failure.
OPERATION INDICATOR	Lights up during operation. Blinks for 300 ms, to announce that a R/C infrared signal has been received and stored. Blinks continuously during • OCT High Pressure Protection Mode • ICT High Pressure Protection Mode • Deicing in Heating Mode • Water Over Flow in ECC Model
TIMER INDICATOR	Lights up during Timer and Sleep operation.
FILTER INDICATOR	Lights up when Air Filter needs to be cleaned. Blinks during Water Over Flow in MBX/P2000 models.
COOLING INDICATOR	Lights up when system is switched to Cool Mode by using the Mode Switch on the unit. Show the thermistor status in Diagnostic Mode
HEATING INDICATOR	Lights up when system is switched Heat Mode by using the Mode Switch on the unit. Show the thermistor status in Diagnostic Mode.
MODE BUTTON (Cool, Heat, SB)	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 ➔ ... Press this button continuously for 5 sec or more to start the Diagnostic Mode.
RESET / FILTER BUTTON	When the Filter LED is ON, press to turn off the Filter LED after a clean filter has been reinstalled. When the Filter LED is OFF, use this button to enable/disable the buzzer announcer.

12.16 Clock Random Delay From 0 to 2.5 seconds

0 = Clock Switch Open
1 = Clock Switch close

The Clock is activate 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.

12.17 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	RT1 is disconnected	○	●	●	●	●
2	RT1 is shorted	○	●	●	●	○
3	(Reserved)	○	●	●	○	●
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	●	○	○	○	○

○ - 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 contain a Group ID, this ID will become the new Group ID of the ELCON unit.

13. TROUBLESHOOTING

13.1 Models: TOP 9/ONG3-9, TOP 12/ONG3-12

ELECTRICAL & CONTROL TROUBLESHOOTING

ATTENTION: check for broken or loose cable lugs first.

NO	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1.	The power supply indicator (red led) doesn't light up.	There is no correct voltage between the line and neutral terminals on main Assembly.	-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 Assemblies.
2.	The operating indicator (green led) does not light up.	The remote control batteries are discharged	-Replace batteries of the remote control.
3.	The operating indicator (green led) does not light up when starting from unit..	Check main P.C.B and display Assembly.	-Replace P.C.B if necessary.
4.	The indoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main Assembly.	- If there is voltage replace capacitor or motor.
5.	The outdoor fan does not function correctly.	Check the voltage between indoor fan terminals on the main Assembly.. 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 amperemeter). Check if there is correct voltage between compressor terminals on the outdoor unit.	-If no voltage replace main Assembly. - 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 amperemeter, pressure gauge or surface thermometer.	-Repair refrigeration system and charge refrigerant if necessary.
8.	No cooling or heating only indoor fan works.	Outdoor fan motor faulty or other fault caused, compresssor overload protection cut out.	-Replace Assembly. -Outdoor fan blocked remove obstructions.

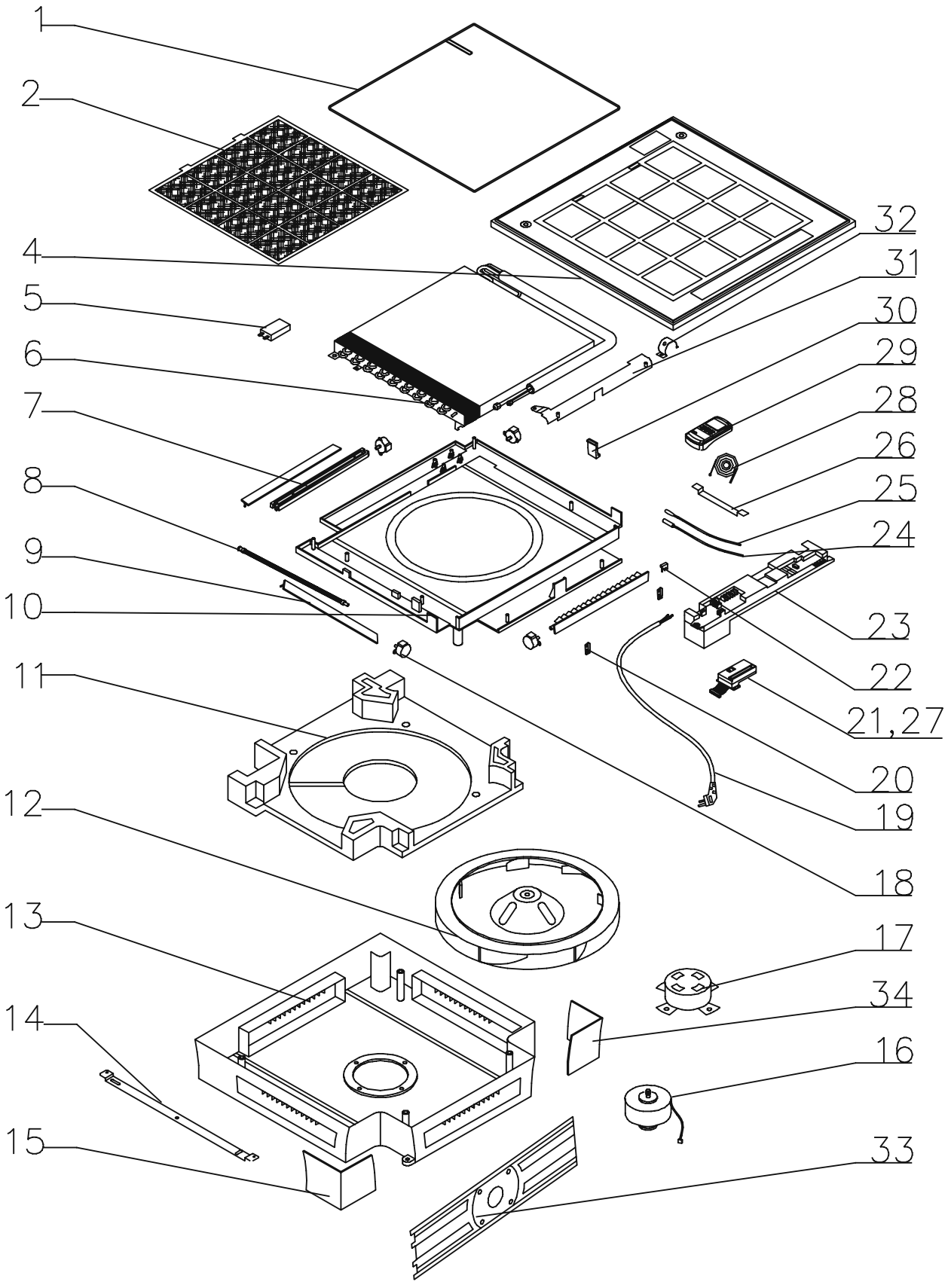
ATTENTION: check for broken or loose cable lugs first.

NO	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
9.	Only indoor fan and compressor working.	Outdoor fan blocked.	-Remove obstructions.
10.	Only indoor fan working.	-Run capacitor of outdoor fan motor faulty. -Windings of outdoor fan are shorted.	-Replace capacitor. -Replace motor.
11.	No cooling or heating takes place, indoor and outdoor fans working.	-Overload safety device on compressor is cut out (low voltage or high temperature) -Compressor run capacitor faulty. -Compressor windings are shorted.	-Check for proper voltage, switch off power and try again after one hour. -Replace compressor capacitor. -Replace compressor.
12.	No air supply at indoor unit, compressor operates.	-Indoor fan motor is blocked or turns slowly. -indoor fan run capacitor faulty. -motor windings are shorted.	-Check voltage, repair wiring if necessary. -Check fan wheel if it is tight enough on motor shaft, tighten if necessary. -Replace indoor fan motor.
13.	Partial, limited air supply at indoor 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 overflow from indoor unit section.	Drain tube or spout of drain pan clogged.	-Disassemble plastic drain tube from spout of indoor unit drain pan.
15.	Water dripping from outdoor unit base. (in heating mode)	Water drain outlet is clogged.	-Open outdoor unit cover clean out water outlet, clean the base inside throatily.
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 too low (below -10°C) -Outdoor unit air outlet is blocked.	-Replace thermistor. -Repair control cable. -Shut unit off, outdoor temp. is below design conditions and cannot function properly. -Remove obstructions.

14. EXPLODED VIEWS AND SPARE PARTS LISTS

14.1 R410A

14.1.1 Indoor Unit: TOP 9, TOP 12



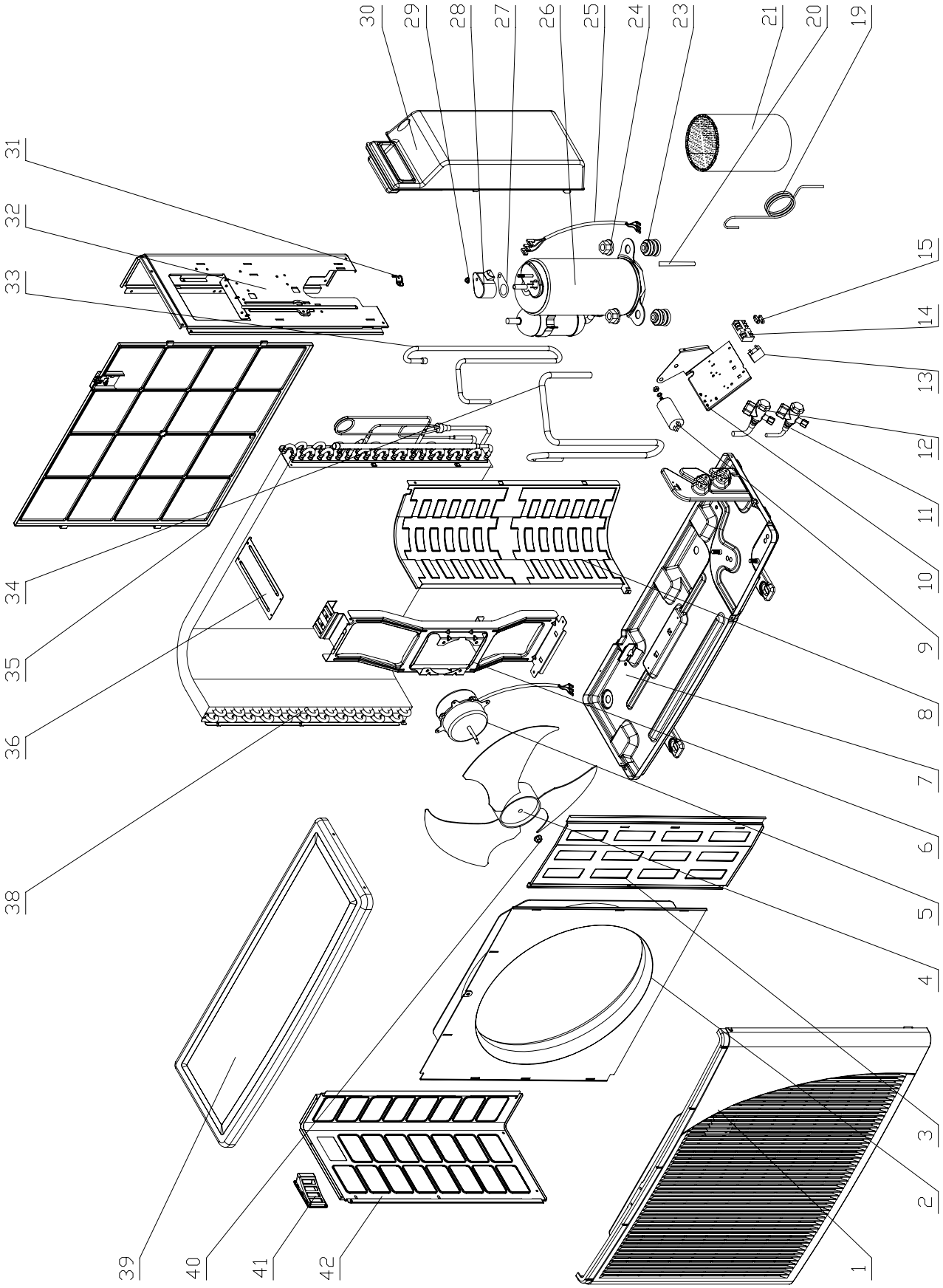
14.1.2 Indoor Unit: TOP 9

NO.	P/N	Description	Quan.
1	465720088	Front Panel Assy. (Electra)	1
	465720090	Front Panel Assy. (Airwell)	1
	465720091	Front Panel Assy. (Electra)	1
	465720092	Front Panel Assy. (Airwell)	1
	465720099	Front Panel Assy. (Elco)	1
2	433007	Air Filter	1
4	465020042	Front Frame / Silver	1
	465020028	Front Frame / White	1
6	470680007	Evaporator Assy	1
7	465800023	Air Outlet Frame Assy./Silver	4
	465800041	Air Outlet Frame Assy./White	4
8	437562	Draining Hose	1
9	465160006	Flap / Silver	4
	465160007	Flap / White	4
10	4518472	Coil Support Assy.	1
11	433040	UNIT BASE INS.	1
12	433011	Fan	1
13	465320009	Base / Silver	1
	465320010	Base / White	1
14	433031	Installation Plate	1
15	465340025	CORNER COVER LEFT / Silver	1
	465340029	CORNER COVER LEFT / White	1
16	433061R	Motor	1
17	433033	Motor Cover	1
18	433050	Step Motor	4
19	434879R	Power Wire	1
20	433020	Cable locker	2
21	467300089R	Display / Silver	1
	467300056R	Display / White	1
22	4516263	Sensor base	1
23	467300055R	Control Box Assy	1
24	438082	Thermistor indoor coil	1
25	4519813	Thermistor Room	1
26	433032	Wires Cover	1
27	433027	Display Connect wire	1
28	4520416	Defrost cable	1
29	436670R	Remote control / RC4	1
	436673R	Remote control / RC4	1
	433121R	Remote control / RC6	1
30	433008	LATCH	3
31	465320005	Tube Bracket	1
32	433034	Tube Lock	1
33	433030	BACK HOLDER	1
34	465340026	CORNER COVER RIGHT / Silver	1
	465340030	CORNER COVER RIGHT / White	1

14.1.3 Indoor Unit: TOP 12

NO.	P/N	Description	Quan.
1	465720088	Front Panel Assy. (Electra)	1
	465720090	Front Panel Assy. (Airwell)	1
	465720091	Front Panel Assy. (Electra)	1
	465720092	Front Panel Assy. (Airwell)	1
	465720099	Front Panel Assy. (Elco)	1
2	433007	Air Filter	1
4	465020042	Front Frame / Silver	1
	465020028	Front Frame / White	1
5	455000701	CAPACITOR	1
6	470680008	Evaporator Assy	1
7	465800023	Air Outlet Frame Assy./Silver	4
	465800041	Air Outlet Frame Assy./White	4
8	437562	Draining Hose	1
9	465160006	Flap / Silver	4
	465160007	Flap / White	4
10	4518472	Coil Support Assy.	1
11	433040	UNIT BASE INS.	1
12	433011	Fan	1
13	465320009	Base / Silver	1
	465320010	Base / White	1
14	433031	Installation Plate	1
15	465340025	CORNER COVER LEFT / Silver	1
	465340029	CORNER COVER LEFT / White	1
16	433062R	Motor	1
17	433033	Motor Cover	1
18	433050	Step Motor	4
19	434879R	Power Wire	1
	434353R	Power Wire	1
20	433020	Cable locker	2
21	467300089R	Display / Silver	1
	467300056R	Display / White	1
22	4516263	Sensor base	1
23	467300055R	Control Box Assy	1
24	438082	Thermistor indoor coil	1
25	4519813	Thermistor Room	1
26	433032	Wires Cover	1
27	433027	Display Connect wire	1
28	4520416	Defrost cable	1
29	436670R	Remote control / RC4	1
	436673R	Remote control / RC4	1
	433121R	Remote control / RC6	1
30	433008	LATCH	3
31	465320005	Tube Bracket	1
32	433034	Tube Lock	1
33	433030	BACK HOLDER	1
34	465340026	CORNER COVER RIGHT / Silver	1
	465340030	CORNER COVER RIGHT / White	1

14.1.4 Outdoor Unit ONG3-9 ST, ONG3-12 ST



14.1.5 Outdoor Unit ONG 9 ST

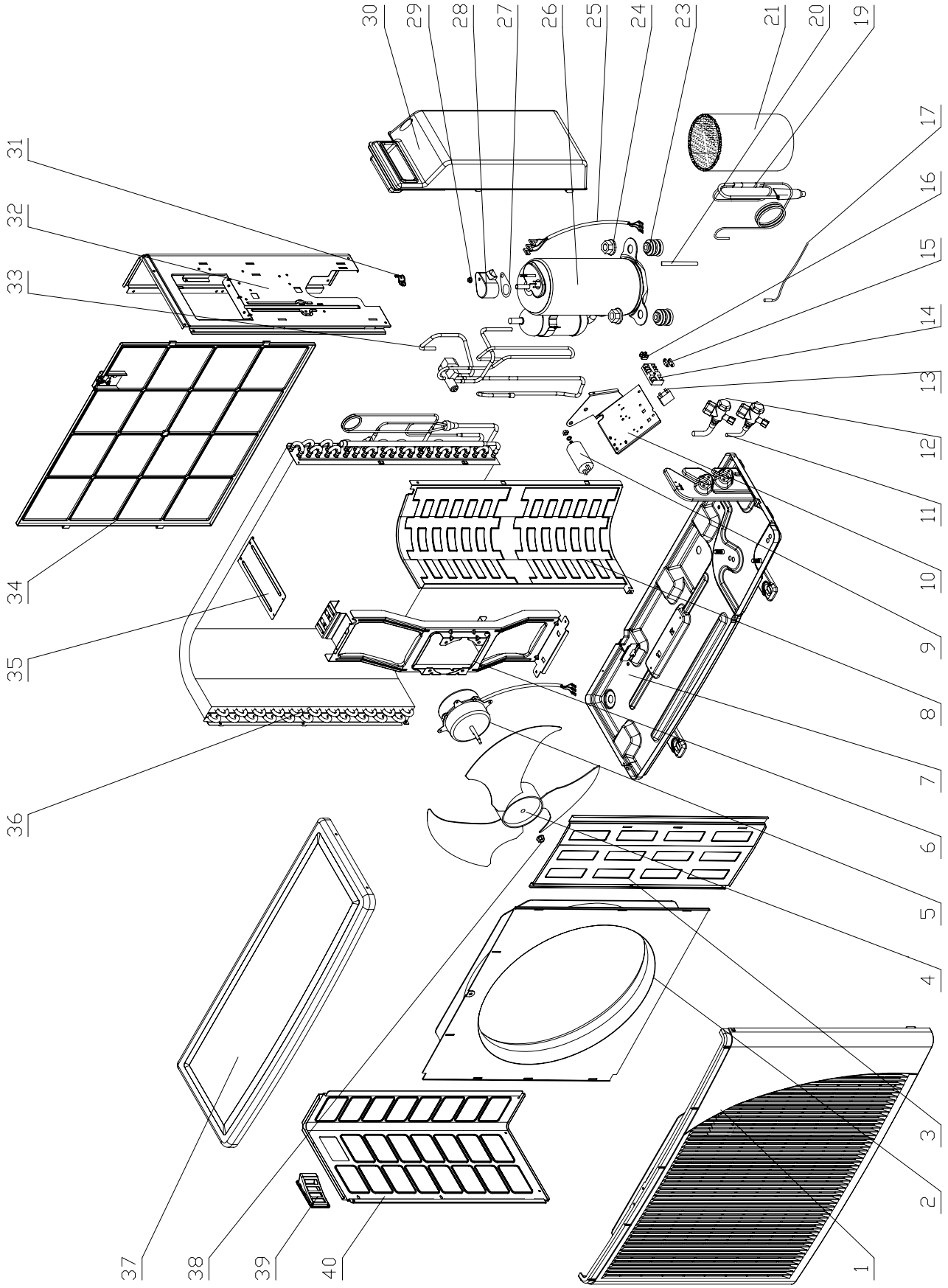
No.	Item No.	Description	Qty
1	433218	Front Panel A	1
1	433219	Front Panel A1	1
2	433221	Air Inlet Ring-420	1
3	433223	Painting Insulation Plate	1
4	4519251	Axial Fan OD=400	1
5	4519250	Fan Motor YDK30-6V	1
6	433215	Motor Support	1
6	4527203	Motor Support	1
7	4526747	Base Painting Assy.	1
8	433217	Partition Plate	1
9	455000503	Compressor Capacitor With Screw	1
10	4519611	Electric Panel Painting Plate	1
11	4524176	1/4 Liqiud Valve(R410A)	1
12	4524177	3/8 Gas Valve(R410A)	1
13	455000001	single patch Capacitor for fan	1
14	4514588	5 Poles terminal block	1
15	204107	Cable clip Nylon	1
19	4527281	Capillary Assy	1
20	4527362	Charge tube TP2 6.35x0.8	1
21	452799601	Compressor Jacket ONG3-9	1
24	4510677	Nut With Flange M8 -D=24	1
25	4527008	Wire assy	1
26	4524230	Compressor assy. GK113PAG	1
27	4516826	Rubber washer	1
28	4516825	Cover Terminal	1
29	4514089	Nut hex	1
30	433229	cover valve	1
31	433234	Clamp	1
32	4519606	Right side panel (painting plate)	1
33	4527279	Discharge Tube Assy 2 £¨9ST)	1
34	4527280	Suction Tube 1	1
35	433228	Back Side Net	1
36	433216	Bridge	1
38	4527155	condensor Soldering assy	1
39	4519614	Painting Top Cover	1
40	4519300	Nut M5 L	1
41	433225	Handle	1
42	4519607	Left Side Panel Painting Plate	1
230	4514091	Grommet	1

14.1.6 Outdoor Unit ONG3-12 ST

No.	Item No.	Description	Qty
1	433218	Front Panel A	1
1	433219	Front Panel A1	1
2	433221	Air Inlet Ring-420	1
3	433223	Painting Insulation Plate	1
4	4519251	Axial Fan OD=400	1
5	4519692	Fan Motor (810rpm)	1
6	433215	Motor Support	1
6	4527203	Motor Support	1
7	4519601	Base Painting Assy.	1
7	4526747	Base Painting Assy.	1
7	452772500	Base Plate Painting Assy.	1
8	433217	Partition Plate	1
9	4517993	Cap. 35uF/450V	1
9	455000504	Compressor Capacitor With Screw	1
10	4519611	Electric Panel Painting Plate	1
11	4524176	1/4 Liqiud Valve(R410A)	1
12	4524595	1/2 Gas Valve for ONG R410A	1
12	4524177	3/8 Gas Valve(R410A)	1
13	4517990	Cap. 2uF/450V	1
130	455000001	single patch Capacitor for fan	1
13	455000108	Double patch Capacitor for fan	1
14	4514588	5 Poles terminal block	1
15	204107	Cable clip Nylon	1
16	236179	2 Poles terminal block	1
17	4516637	Out sensor Black	1
18	4525210	Restrictor (031)	1
19	4524923	Capillary 2.6*1.6*800	1
19	4526848	Capillary Assy. (OD2.6xID1.6x1000)	1
20	4525650	Charge tube	1
20	4527362	Charge tube TP2 ¦?6.35x0.8	1
21	4519600	Compresssor Jacket	1
21	4527007	Comp. Jacket	1
21	4527058	Comp. Jacket	1
22	4519610	Compressor Isolation. Top Cover	1
23	4514091	Grommet	3
23	4516357	Rubber Cushion 1K15910311	3
24	4510677	Nut With Flange M8 -D=24	3
25	4519987	Wire assy	1
25	4527008	Wire assy	1
25	4519987	Wire assy	1
26	4524232	Compressor assy. GK151PAD	1
26	4526452	Comp. Assy GMCC PA145X2C-4FT	1
27	4516359	Terminal Packing 1K14720130	1
27	4516826	Rubber washer	1

No.	Item No.	Description	Qty
28	4516358	Terminal Cover 1K14720012	1
28	4516825	Cover Terminal	1
29	4514089	Nut hex	1
29	4516360	Terminal Nut 1K14300710	1
30	433229	Valve Cover	1
31	433234	Clamp	1
31	4518950	Filter Drier BFK-053S	1
32	4519606	Right side panel (painting plate)	1
33	4526790	Discharge Tube Assy.	1
42	4525081	Suction Tube 12.7*0.8*1090	1
34	4526791	Suction Tube Assy	1
35	433228	Back Side Net	1
36	433216	Bridge	1
37	433235	SPACER A 22*1	1
47	4525529	condensor Soldering assy	1
38	4526806	condensor Soldering assy	1
38	4526804	condensor Soldering assy	1
39	4519614	Painting Top Cover	1
40	4519300	Nut M5 L	1
41	433225	Handle	1
42	4519607	Left Side Panel Painting Plate	1
43	4525080	Discharge Tube 9.53*0.8*470	1

14.1.7 Outdoor Unit ONG3- 9 RC, ONG3-12 RC



14.1.8 Outdoor Unit ONG3-9 RC

No.	Item No.	Description	Qty
1	433218	Front Panel A	1
1	433219	Front Panel A1	1
2	433221	Air Inlet Ring-420	1
3	433223	Painting Insulation Plate	1
4	4519251	Axial Fan OD=400	1
5	4519250	Fan Motor YDK30-6V	1
6	4527203	Motor Support	1
7	4526747	Base Painting Assy.	1
8	433217	Partition Plate	1
9	455000503	Compressor Capacitor With Screw	1
10	4519611	Electric Panel Painting Plate	1
11	4524176	1/4 Liqiud Valve(R410A)	1
12	4524177	3/8 Gas Valve(R410A)	1
13	455000108	Double patch Capacitor for fan	1
14	4514588	5 Poles terminal block	1
15	204107	Cable clip Nylon	1
16	236179	2 Poles terminal block	1
17	4516637	Out sensor Black	1
18	4527444	Restrictor (029)	1
19	4527127	Capillary Assy	1
20	4527362	Charge tube TP2 6.35x0.8	1
21	452799601	Compressor Jacket ONG3-9	1
23	4514091	Grommet	1
24	4510677	Nut With Flange M8 -D=24	1
25	4527008	Wire assy	1
26	4524230	Compressor assy. GK113PAG	1
27	4516826	Rubber washer	1
28	4516825	Cover Terminal	1
29	4514089	Nut hex	1
30	433229	cover valve	1
31	433234	Clamp	1
32	4519606	Right side panel (painting plate)	1
33	4527135	4-Way Valve & Tube Assy	1
34	433228	Back Side Net	1
35	433216	Bridge	1
36	4527155	condensor Soldering assy	1
37	4519614	Painting Top Cover	1
38	4519300	Nut M5 L	1
39	433225	Handle	1
40	4519607	Left Side Panel Painting Plate	1

14.1.9 Outdoor Unit ONG3-12 RC

No.	Item No.	Description	Qty
1	433218	Front Panel A	1
1	433219	Front Panel A1	1
2	433221	Air Inlet Ring-420	1
3	433223	Painting Insulation Plate	1
4	4519251	Axial Fan OD=400	1
5	4519692	Fan Motor (810rpm)	1
5	4526591	Motor YYK30Z-6	1
6	4527203	Motor Support	1
7	452772500	Base Plate Painting Assy.	1
7	4526747	Base Painting Assy.	1
8	433217	Partition Plate	1
9	455000504	Compressor Capacitor With Screw	1
9	455000502	Compressor Capacitor 35uF With Screw	1
10	4519611	Electric Panel Painting Plate	1
11	4524176	1/4 Liqiud Valve(R410A)	1
12	4524177	3/8 Gas Valve(R410A)	1
13	455000108	Double patch Capacitor for fan	1
13	455000000	single patch Capacitor for fan	1
14	4514588	5 Poles terminal block	1
15	204107	Cable clip Nylon	1
16	236179	2 Poles terminal block	1
17	4516637	Out sensor Black	1
19	4526847	Valve-Capillary Assy	1
19	4526617	one way valve soldering	1
20	4527362	Charge tube TP2	1
21	4527058	Comp. Jacket	1
21	452799600	Compressor Jacket ONG3-7	1
23	4516357	Rubber Cushion 1K15910311	3
23	4514091	Grommet	3
24	4510677	Nut With Flange M8 -D=24	3
25	4519987	Wire assy	1
25	4527375	Compressor Wire	1
26	4526452	Comp. Assy GMCC PA145X2C-4FT	1
26	4526578	Compressor Assy. LG GK086P	1
26	4526601	Compressor LG GK086P	1
27	4516359	Terminal Packing 1K14720130	1
27	4514088	Gasket	1
28	4516358	Terminal Cover 1K14720012	1
28	4516824	Cover Terminal	1
29	4516360	Terminal Nut 1K14300710	1
29	4514089	Nut hex	1
30	433229	Valve Cover	1

No.	Item No.	Description	Qty
31	433234	Clamp	1
32	4519606	Right side panel (painting plate)	1
33	4526745	4-way Valve Welding Assy.	1
33	4526604	4-way Valve Welding Assy.	1
34	4527308	PCB Support	1
35	4526748	Low-Temp. Controller	1
36	433228	Back Side Net	1
37	433216	Bridge	1
38	4526804	condensor Soldering assy	1
38	4526605	condensor Soldering assy	1
39	4519614	Painting Top Cover	1
40	4519300	Nut M5 L	1
41	433225	Handle	1
42	4519607	Left Side Panel Painting Plate	1
43	4516114	2-W Valve coil	1

15. OPTIONAL ACCESSORIES

15.1 RCW Wall Mounted Remote Control

15.1.1 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),

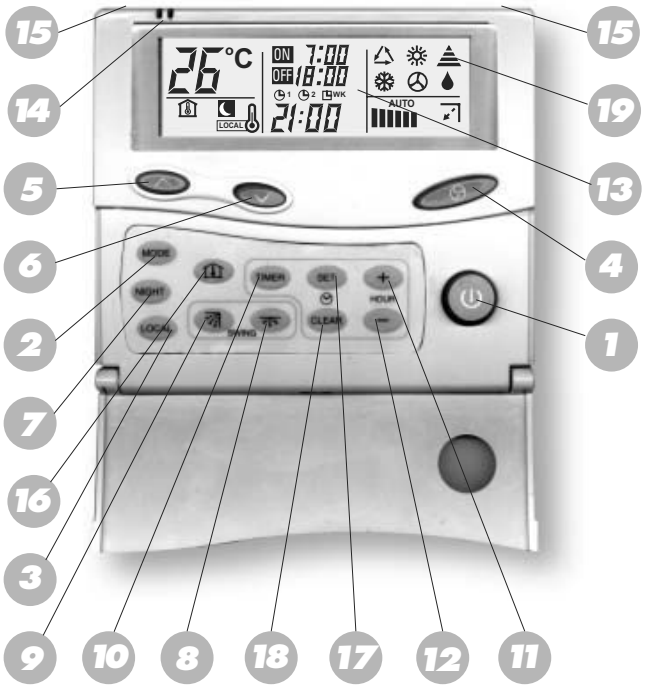
The max wiring length between the controller to the last indoor unit is 300m. for application on WNG LED indoor units an additional interface PCB is needed.

Ordering code no':

RCW – 436195
WNG 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



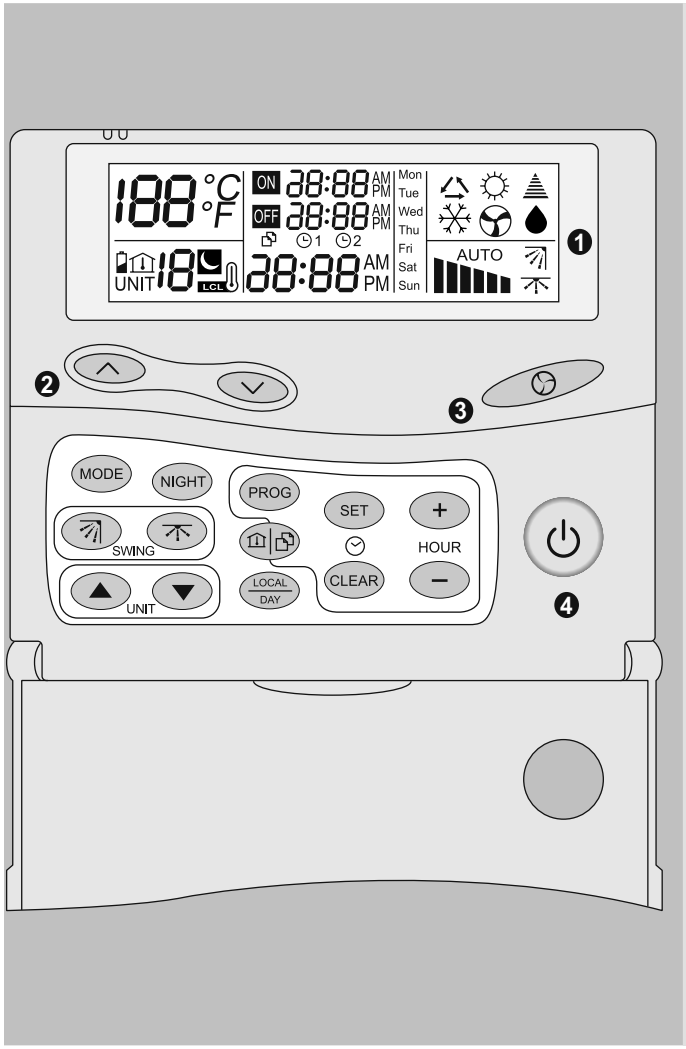
15.2 RCW2 Wall Mounted Remote Cntrol

15.2.1 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 WNG LED indoor units an additional interface PCB is needed.

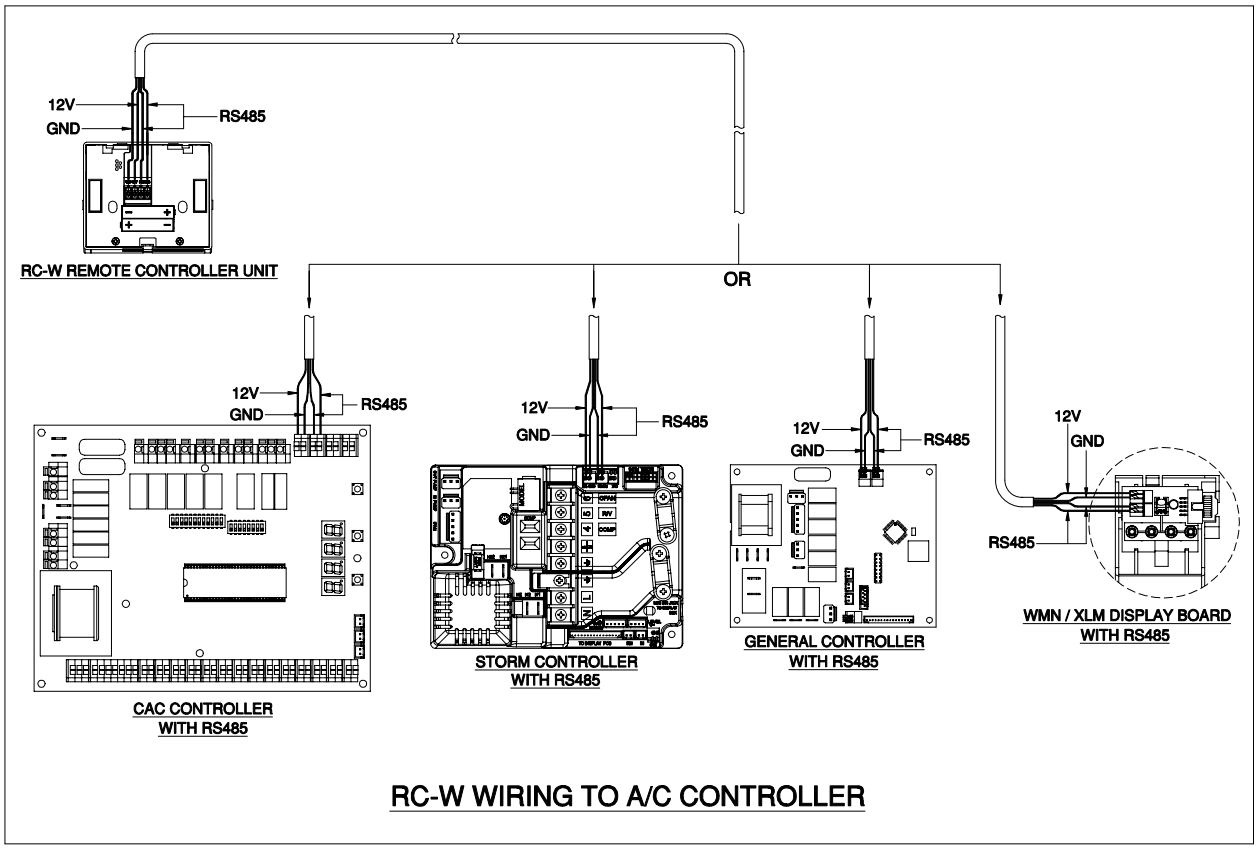
Ordering code no':

RCW2 – SP000000081
WNG add' PCB - SP000000290



❶ Display screen.
❷ Keys for raising and lowering the set temperature.
❸ Ventilation mode selection :
Low speed.
Medium speed.
High speed.
AUTO : Automatic speed selection.
❹ 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.

15.3 RCW/RCW2 Wiring Connections as Shown on Kit



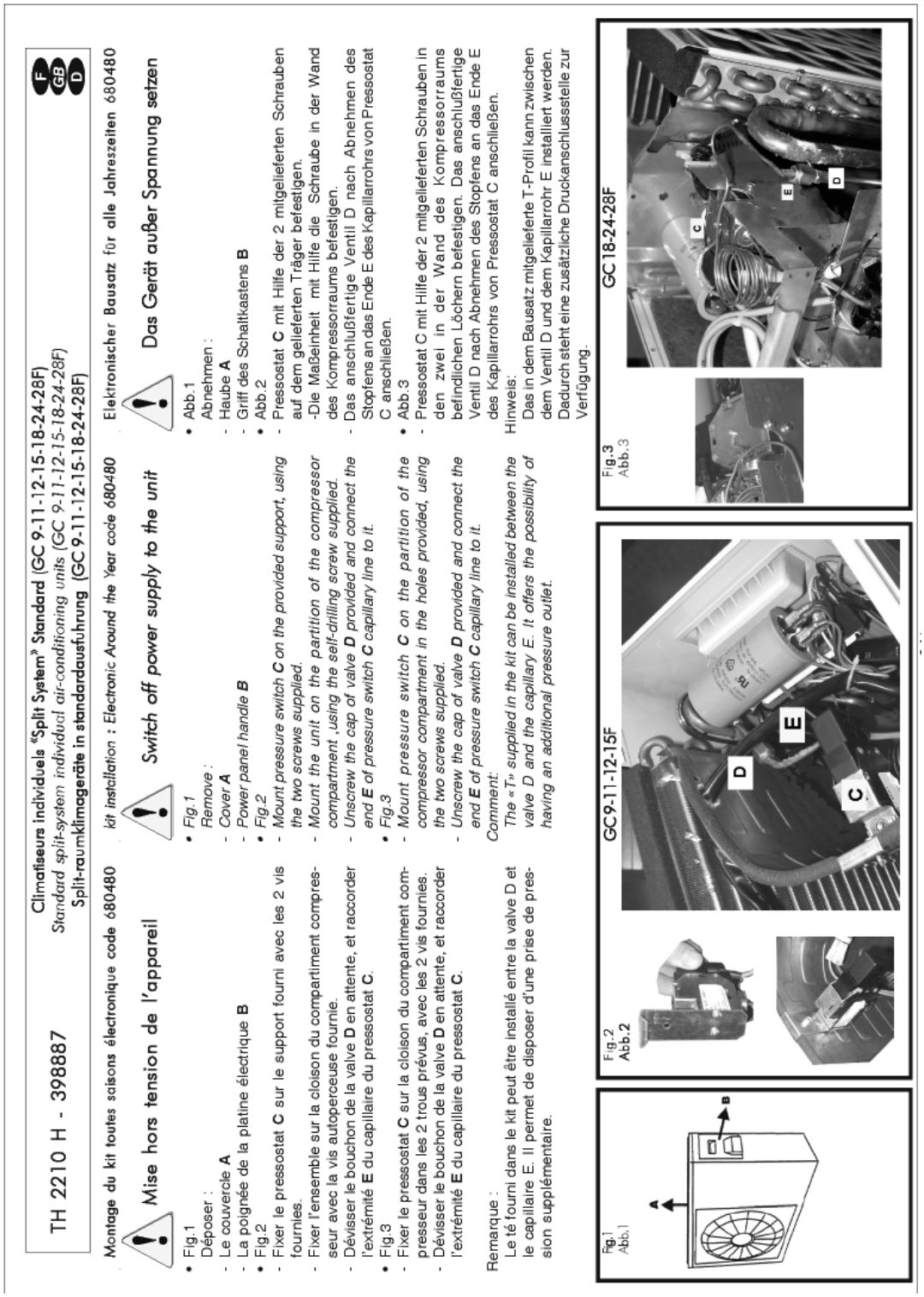
RC-W WIRING TO A/C CONTROLLER

15.4 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 :



TH 2210 H - 398887

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)

F GB D

Montage du kit toutes saisons électronique code 680480

Mise hors tension de l'appareil

- Fig.1
  Déposer :
  - Le couvercle **A**
  - La poignée de la platine électrique **B**
- Fig.2
- Fixer le pressostat **C** sur le support fourni avec les 2 vis fournies.
- Fixer l'ensemble sur la cloison du compartiment compresseur avec la vis autoperceuse fournie.
- Dévisser le bouchon de la valve **D** en attente, et raccorder l'extrémité **E** du capillaire du pressostat **C**.
- Fig.3
- Fixer le pressostat **C** sur la cloison du compartiment compresseur dans les 2 trous prévus, avec les 2 vis fournies.
- Dévisser le bouchon de la valve **D** en attente, et raccorder l'extrémité **E** du capillaire du pressostat **C**.

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.

kit installation : Electronic Around the Year code 680480

Switch off power supply to the unit

- *Fig.1*
  Remove :
  - *Cover* **A**
  - *Power panel handle* **B**
- *Fig.2*
- *Mount pressure switch* **C** *on the provided support, using the two screws supplied.*
- *Mount the unit on the partition of the compressor compartment ,using the self-drilling screw supplied.*
- *Unscrew the cap of valve* **D** *provided and connect the end* **E** *of pressure switch* **C** *capillary line to it.*
- *Fig.3*
- *Mount pressure switch* **C** *on the partition of the compressor compartment in the holes provided, using the two screws supplied.*
- *Unscrew the cap of valve* **D** *provided and connect the end* **E** *of pressure switch* **C** *capillary line to it.*

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.

Elektronischer Bausatz für alle Jahreszeiten 680480

Das Gerät außer Spannung setzen

- Abb.1
  Abnehmen :
  - Haube **A**
  - Griff des Schaltkastens **B**
- Abb.2
- Pressostat **C** mit Hilfe der 2 mitgelieferten Schrauben auf dem gelieferten Träger befestigen.
- -Die Maßeinheit mit Hilfe die Schraube in der Wand des Kompressorraums befestigen.
- Das anschlußfertige Ventil D nach Abnehmen des Stopfens an das Ende E des Kapillarrohrs von Pressostat C anschließen.
- Abb.3
- Pressostat C mit Hilfe der 2 mitgelieferten Schrauben in den zwei in der Wand des Kompressorraums befindlichen Löchern befestigen. Das anschlußfertige Ventil D nach Abnehmen des Stopfens an das Ende E des Kapillarrohrs von Pressostat C anschließen.

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.

Fig.1 Abb.1

Fig.2 Abb.2

GC9-11-12-15F

Fig.3 Abb.3

GC18-24-28F

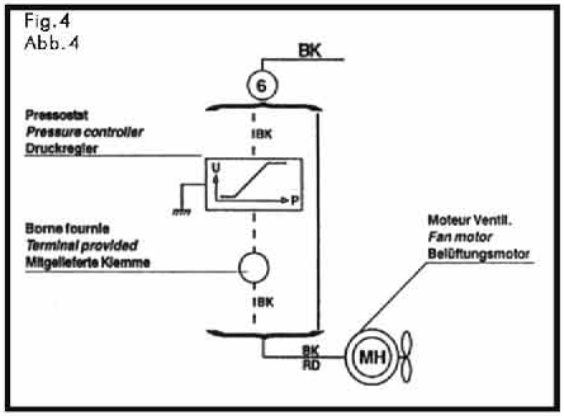
Climatiseurs individuels "Split System" Standard (GC 9-11-12-15-18-24-28F)
Standard split-system individual air-conditioning units (GC 9-11-12-15-18-24-28F)
Split-raumklimageräte in standardausfuhrung (GC 9-11-12-15-18-24-28F)

- 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 m âle-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 posostin 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

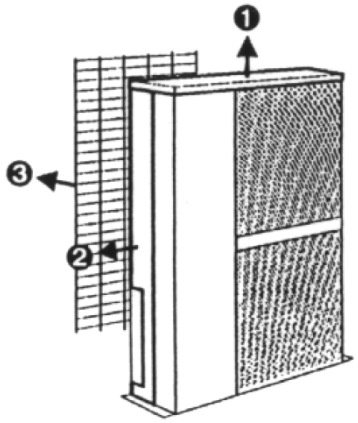
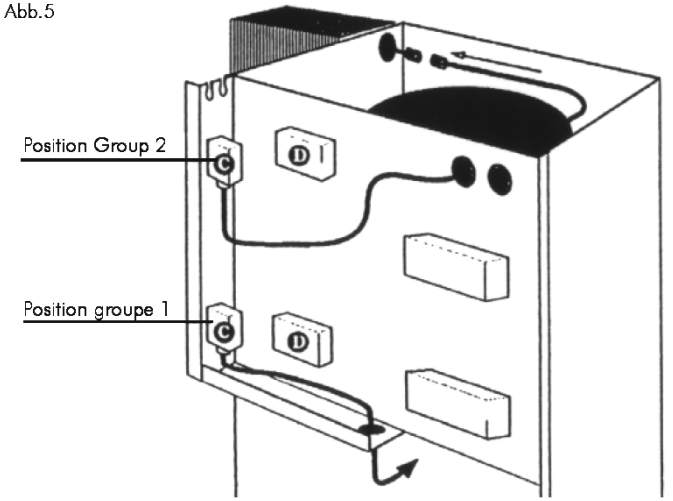


Fig.5
Abb.5



• 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 Massenlitze anschließen.

Fig.6
Abb.6

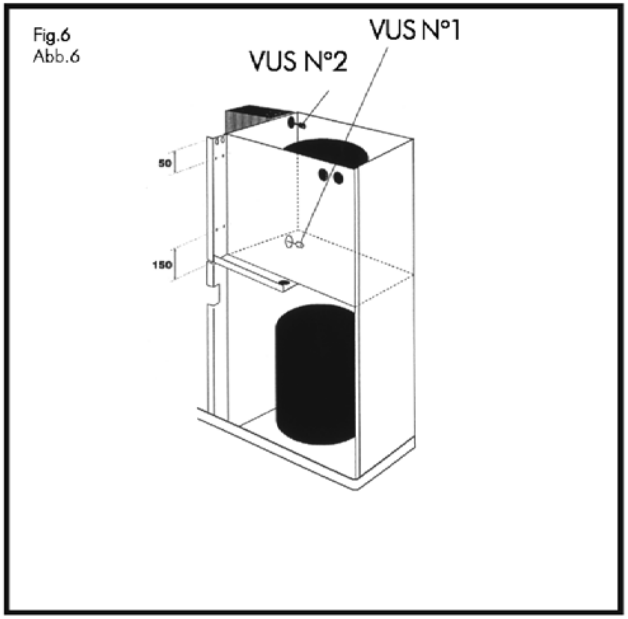
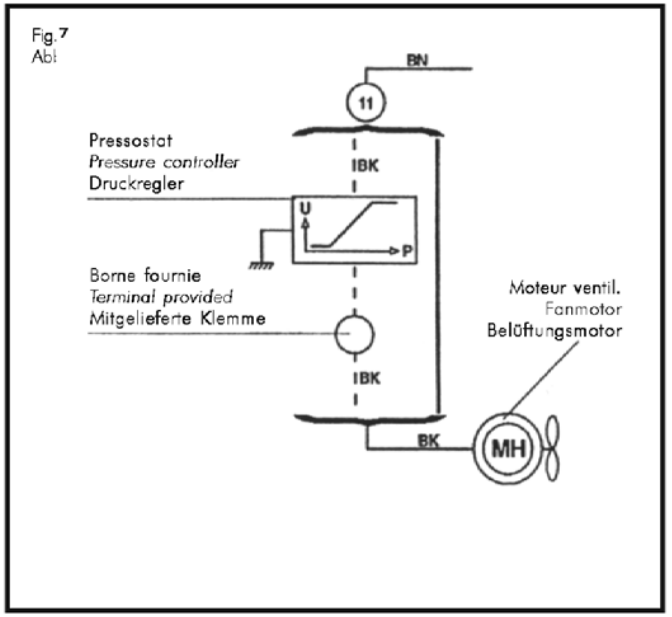


Fig.7
Abb



- 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.

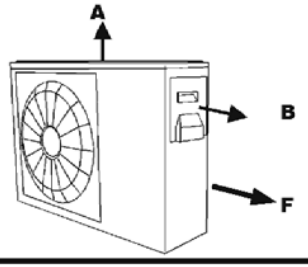
Raccordements électriques. Sur le bornier de raccordement .

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 2eme fil noir (marqué 1) du pressostat à la borne 6 du bornier de raccordement précedemment 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.

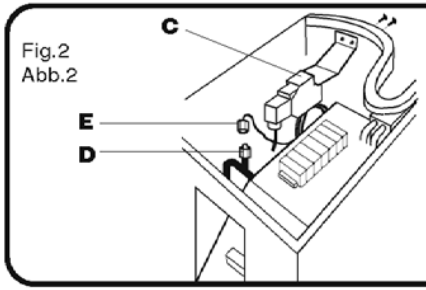
Electrical connections. On the terminal board.

Disconnect the black wire (motor) from terminal 6 on the terminal board and connect it to the connector with the wire N°2coming 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 vave.
Replace panel F, cover A and hatch B.

Fig.2
Abb.2



EINBAUSATZ ELEKTRONISCHE VERFLÜSSIGER-DRUCKREGELUNG (680488).

Einbau.
Am Verflüssigerteil 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 Nr.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.

APPENDIX A

INSTALLATION AND OPERATION MANUAL

- ► **OPERATION MANUAL TOP 9/ONG3-9, TOP 12/ONG3-12**
- ► **INSTALLATION MANUAL TOP 9/ONG3-9, TOP 12/ONG3-12**

CONTENT