



Service Manual

LEX Series

Indoor Units	Outdoor Units
LEX 7	ONG 7
LEX 9	ONG 9
LEX 12	ONG 12
LEX 14	ONG 14



REFRIGERANT	COOLING ONLY HEAT PUMP
R410A	

JANUARY - 2006

LIST OF EFFECTIVE PAGES

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**Photos are not contractual.

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1. INTRODUCTION

1.1 General

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

- **Cooling Only** LEX 7ST, LEX 9ST, LEX 12ST, LEX 14ST.
- **Heat Pump** LEX 7RC, LEX 9RC, LEX 12RC, LEX 14RC.

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

Display type models availability:

- **LED Type** LEX7, LEX9, LEX12, LEX14.

1.2 Main Features

The LEX 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 5 different optional directions.
- Automatic treated air sweep.
- Low indoor and outdoor noise levels.
- Easy installation and service.

1.3 Indoor Unit

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

It includes:

- Casing with air inlet and outlet grills.
- A large-diameter tangential fan.
- Bended coil with treated aluminum fins.
- Advanced electronic control box assembly
- Interconnecting wiring terminal block
- Mounting plate

1.4 Filtration

The LEX 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 Remote Control Manual, Appendix A.

1.7 Outdoor Unit

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

It includes :

- 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 LEX 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, APPENDIX A.S

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 °C 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.




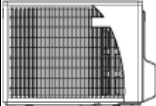
For further details please refer to Optional Accessories, Chapter 18.

1.10 Inbox Documentation

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

1.11 Matching Table

1.11.1 R410A

OUTDOOR UNITS			INDOOR UNITS									
												
MODEL	REFRIGER.	LEX7	LEX9	LEX12	LEX14	K9	K11	K15	PXD9	PXD12	PXD15	
	ONG7 ST	R410A	√									
	ONG9 ST	R410A		√			√			√		
	ONG12 ST	R410A			√			√			√	
	ONG14 ST	R410A				√			√		√	
	ONG7 RC	R410A	√									
	ONG9 RC	R410A		√			√			√*		
	ONG12 RC	R410A			√						√	
	ONG14 RC	R410A				√*						√

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

The above table lists outdoor units and LEX indoor units which can be matched together. In addition the listed outdoor units can be matched with other types of indoor units such as cassettes, floor/ceiling. For further information please refer to the relevant Service Manual.

2. PRODUCT DATA SHEET

2.1 LEX 7 R410A Specification

Model Indoor Unit		LEX-7				
Model Outdoor Unit		ONG-7				
Installation Method of Pipe		Flared				
Characteristics		Units	Cooling Only	Cooling	Heating	
Capacity ⁽⁴⁾		Btu/hr	7230	7230	7400	
		kW	2.12	2.12	2.17	
Power input ⁽⁴⁾		kW	0.63	0.63	0.595	
EER (Cooling) or COP(Heating) ⁽⁴⁾		W/W	3.37	3.37	3.65	
Energy efficiency class			A	A	A	
Power supply		V/Ph/Hz	220-240V/Single/50Hz			
Rated current		A	2.8	2.8	2.7	
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 ⁽¹⁾	H/M/L	m3/hr	380/320/280		
	External static pressure	Min-Max	Pa	0		
	Sound power level ⁽²⁾	H/M/L	dB(A)	45/41/39		
	Sound pressure level ⁽³⁾	H/M/L	dB(A)	30/27/25		
	Moisture removal		l/hr	0.7		
	Condensate drain tube I.D		mm	16		
	Dimensions	WxHxD	mm	810x210x285		
	Weight		kg	11		
	Package dimensions	WxHxD	mm	870x285x355		
	Packaged weight		kg	13.5		
	Units per pallet		units	36		
	Stacking height		units	9 levels		
OUTDOOR	Refrigerant control		Capillary tube (with 026 restrictor)			
	Compressor type,model		Rotary,Toshiba PA82X1C-4DZDE			
	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)	60	60	
	Sound pressure level ⁽³⁾	H/L	dB(A)	48	48	
	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	0.8kg/7.5m	0.85kg/7.5m		
Additional charge			4m≤L≤10m:+0g	4m≤L≤10m:+0g		
			10m≤L≤15m:+75g	10m≤L≤15m:+75g		
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 LEX 9 R410A Specification

Model Indoor Unit		LEX-9		
Model Outdoor Unit		ONG-9		
Installation Method of Pipe		Flared		
Characteristics		Units	Cooling Only	Cooling
Capacity ⁽⁴⁾		Btu/hr	9280	9890
		kW	2.72	2.90
Power input ⁽⁴⁾		kW	0.825	0.849
EER (Cooling) or COP(Heating) ⁽⁴⁾		W/W	3.30	3.42
Energy efficiency class			A	B
Power supply		V/Ph/Hz	220-240V/Single/50Hz	
Rated current		A	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	
	Air flow ⁽¹⁾	H/M/L	m3/hr	
	External static pressure	Min-Max	Pa	
	Sound power level ⁽²⁾	H/M/L	dB(A)	
	Sound pressure level ⁽³⁾	H/M/L	dB(A)	
	Moisture removal		l/hr	
	Condensate drain tube I.D		mm	
	Dimensions	WxHxD	mm	
	Weight		kg	
	Package dimensions	WxHxD	mm	
	Packaged weight		kg	
	Units per pallet		units	
	Stacking height		units	
OUTDOOR	Refrigerant control		Capillary tube (with 029 restrictor)	
	Compressor type,model		Rotary,Hitachi ASG108CV-B7AT	
	Fan type & quantity		Propeller(direct) x 1	
	Fan speeds	H/L	RPM	
	Air flow	H/L	m3/hr	
	Sound power level	H/L	61	62
	Sound pressure level ⁽³⁾	H/L	51	53
	Dimensions	WxHxD	mm	
	Weight		34	35
	Package dimensions	WxHxD	mm	
	Packaged weight		38	39
	Units per pallet		Units	
	Stacking height		units	
	Refrigerant type		R410A	
	Refrigerant charge(stabdard connecting tubing length)	kg(7.5mm)	1.03	
	Additional charge		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).

2.3 LEX 12 R410A Specification

Model Indoor Unit		LEX-12				
Model Outdoor Unit		ONG-12				
Installation Method of Pipe		Flared				
Characteristics		Units	Cooling Only	Cooling	Heating	
Capacity ⁽⁴⁾		Btu/hr	12210	12210	14160	
		kW	3.58	3.58	4.15	
Power input ⁽⁴⁾		kW	1.112	1.112	1.145	
EER (Cooling) or COP(Heating) ⁽⁴⁾		W/W	3.22	3.22	3.62	
Energy efficiency class			A	A	A	
Power supply		V/Ph/Hz	220-240V/Single/50Hz			
Rated current		A	5.0	5.0	5.2	
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 ⁽¹⁾		H/M/L	m3/hr		635/550/450
	External static pressure		Min-Max	Pa		0
	Sound power level ⁽²⁾		H/M/L	dB(A)		55/53/49
	Sound pressure level ⁽³⁾		H/M/L	dB(A)		43/39/35
	Moisture removal			l/hr		1.3
	Condensate drain tube I.D			mm		16
	Dimensions		WxHxD	mm		810x210x285
	Weight			kg		11.5
	Package dimensions		WxHxD	mm		870x285x355
	Packaged weight			kg		14
	Units per pallet			units		36
	Stacking height			units		9 levels
	OUTDOOR	Refrigerant control		Capillary tube		
Compressor type,model		Rotary,RN 145 VHSMT				
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	61	61		
Sound pressure level ⁽³⁾		H/L	51	51		
Dimensions		WxHxD	mm		795x290x610	
Weight			35	36		
Package dimensions		WxHxD	mm		945x395x655	
Packaged weight			39	40		
Units per pallet			Units		9	
Stacking height			units		3 levels	
Refrigerant type			R410A			
Refrigerant charge(standard connecting tubing length)		kg(7.5mm)	1.13			
Additional charge			4m≤L≤10m: +0g; 10m L≤15m: +50g			
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).

2.4 LEX 14 R410A Specification

Model Indoor Unit		LEX-14				
Model Outdoor Unit		ONG-14				
Installation Method of Pipe		Flared				
Characteristics		Units	Cooling Only	Cooling	Heating	
Capacity ⁽⁴⁾		Btu/hr	14400	14400	15010	
		kW	4.22	4.22	4.40	
Power input ⁽⁴⁾		kW	1.31	1.31	1.310	
EER (Cooling) or COP(Heating) ⁽⁴⁾		W/W	3.22	3.22	3.36	
Energy efficiency class			A	A	C	
Power supply		V/Ph/Hz	220-240V/Single/50Hz			
Rated current		A	5.9	5.9	5.9	
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 ⁽¹⁾		H/M/L	m ³ /hr	660/550/475	
	External static pressure		Min-Max	Pa	0	
	Sound power level ⁽²⁾		H/M/L	dB(A)	56/51/46	
	Sound pressure level ⁽³⁾		H/M/L	dB(A)	46/41/36	
	Moisture removal			l/hr	1.5	
	Condensate drain tube I.D			mm	16	
	Dimensions		WxHxD	mm	810x210x285	
	Weight			kg	11.5	
	Package dimensions		WxHxD	mm	870x285x355	
	Packaged weight			kg	14	
	Units per pallet			units	36	
	Stacking height			units	9 levels	
	OUTDOOR	Refrigerant control			Capillary tube	
		Compressor type,model			Rotary,Sanyo C-RV168H1AB	
Fan type & quantity			Propeller(direct) x 1			
Fan speeds		H/L	RPM	920		
Air flow		H/L	m ³ /hr	2160		
Sound power level		H/L	dB(A)	63	63	
Sound pressure level ⁽³⁾		H/L	dB(A)	53	53	
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	1.38kg/7.5m			
Additional charge			4m≤L≤10m: +0g 10m L≤15m: +120g			
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)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).

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

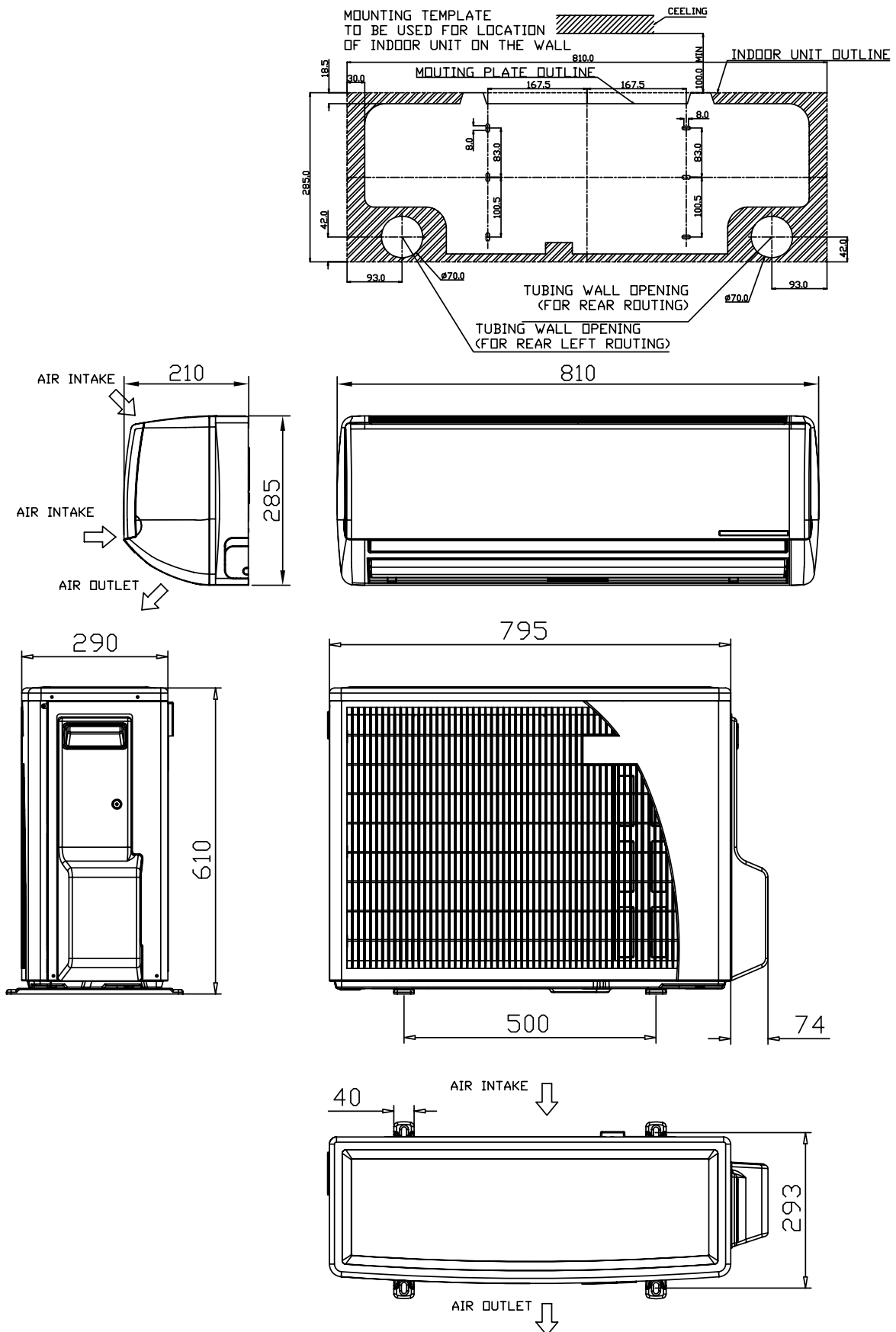
3.1 Operating Limits

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 LEX 7, 9, 12, 14 / ONG3 -7, 9, 12, 14



5. PERFORMANCE DATA & PRESSURE CURVES

5.1 LEX7 / ONG7 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 ⁽¹⁾	TC	2.23	2.31	2.37	2.42	2.46
	SC	1.59	1.65	1.72	1.76	1.79
	PI	0.45	0.45	0.45	0.45	0.45
20 ⁽¹⁾	TC	2.16	2.28	2.35	2.41	2.46
	SC	1.55	1.64	1.71	1.76	1.79
	PI	0.49	0.49	0.49	0.49	0.49
25	TC	2.05	2.21	2.32	2.39	2.45
	SC	1.52	1.61	1.70	1.74	1.78
	PI	0.52	0.53	0.53	0.53	0.54
30	TC	1.91	2.08	2.25	2.33	2.40
	SC	1.47	1.56	1.66	1.71	1.74
	PI	0.57	0.57	0.58	0.58	0.59
35	TC	1.77	1.92	2.12	2.23	2.33
	SC	1.40	1.50	1.62	1.67	1.70
	PI	0.61	0.62	0.63	0.63	0.64
40	TC	1.61	1.75	1.91	2.09	2.20
	SC	1.32	1.42	1.53	1.58	1.61
	PI	0.66	0.67	0.68	0.69	0.69
46	TC	1.40	1.53	1.68	1.86	2.00
	SC	1.21	1.30	1.40	1.45	1.48
	PI	0.72	0.73	0.75	0.76	0.77

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	1.13	0.48	1.09	0.51	1.04	0.53
-7	1.21	0.49	1.17	0.51	1.13	0.54
-2	1.29	0.49	1.25	0.52	1.20	0.55
2	1.57	0.52	1.51	0.55	1.44	0.58
6	2.21	0.56	2.15	0.60	2.07	0.63
10	2.41	0.59	2.34	0.63	2.28	0.67
15	2.60	0.61	2.54	0.66	2.47	0.70
20	2.74	0.63	2.68	0.68	2.60	0.74

* the above chart includes the weighted deicing influence.

LEGEND

- TH – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- 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	0.949	---	---	---	---	---

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

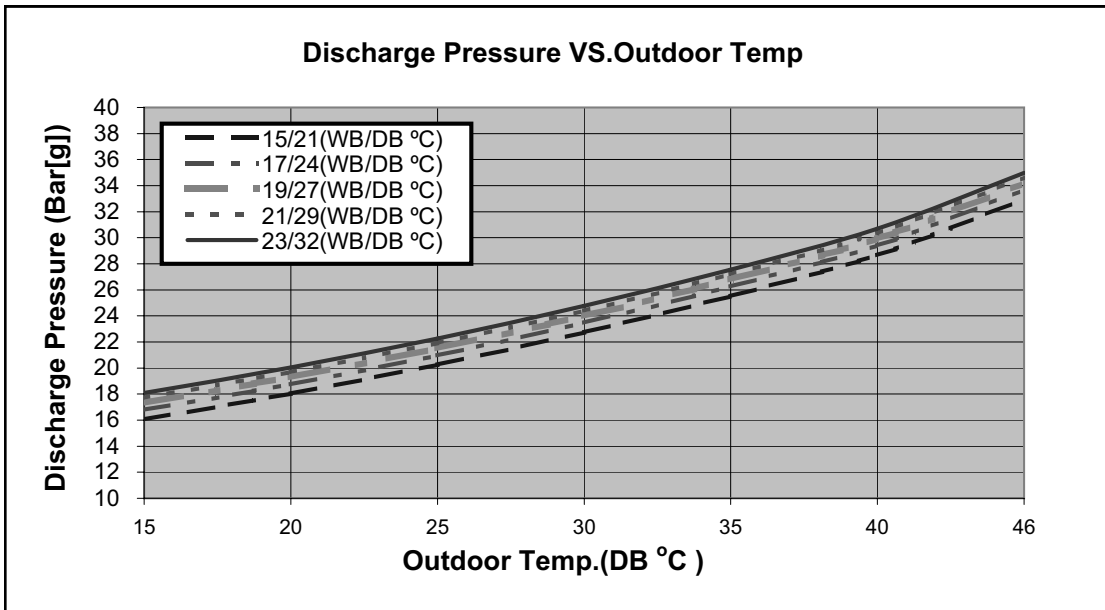
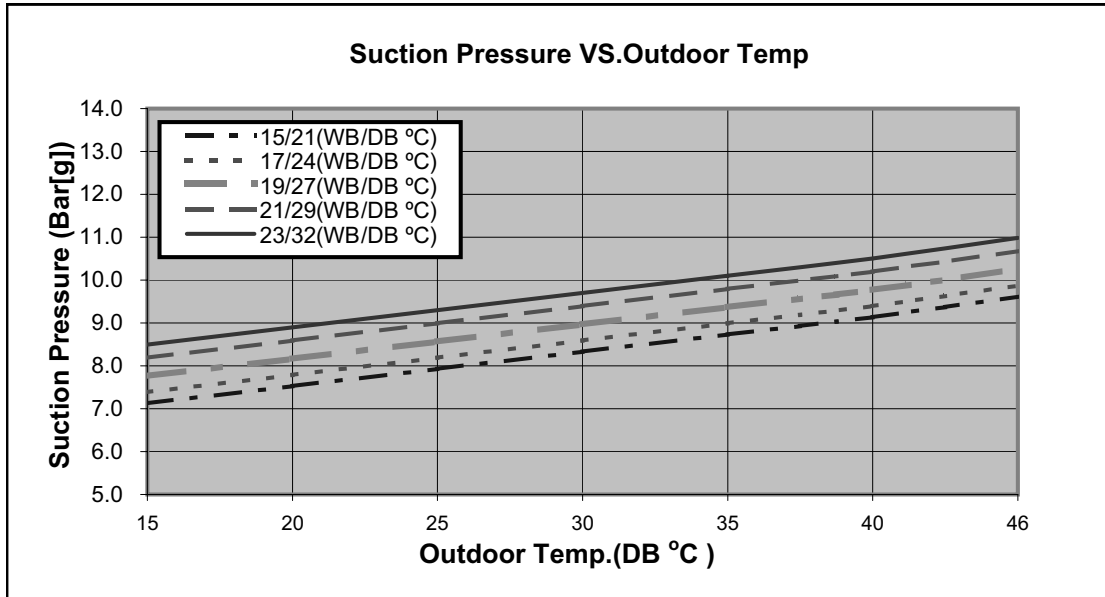
5.2.2 Heating

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

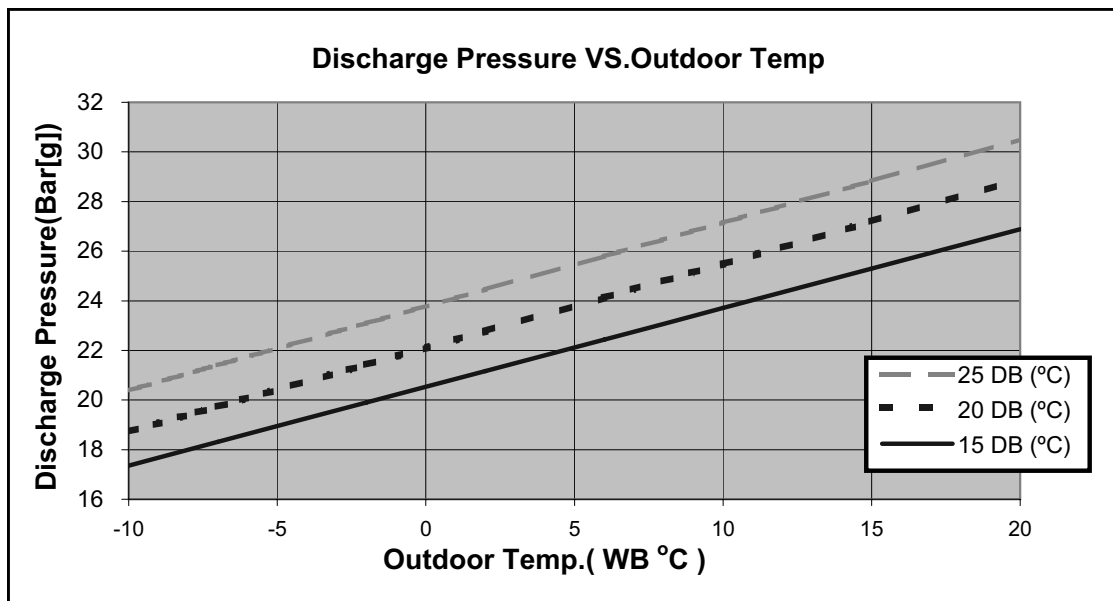
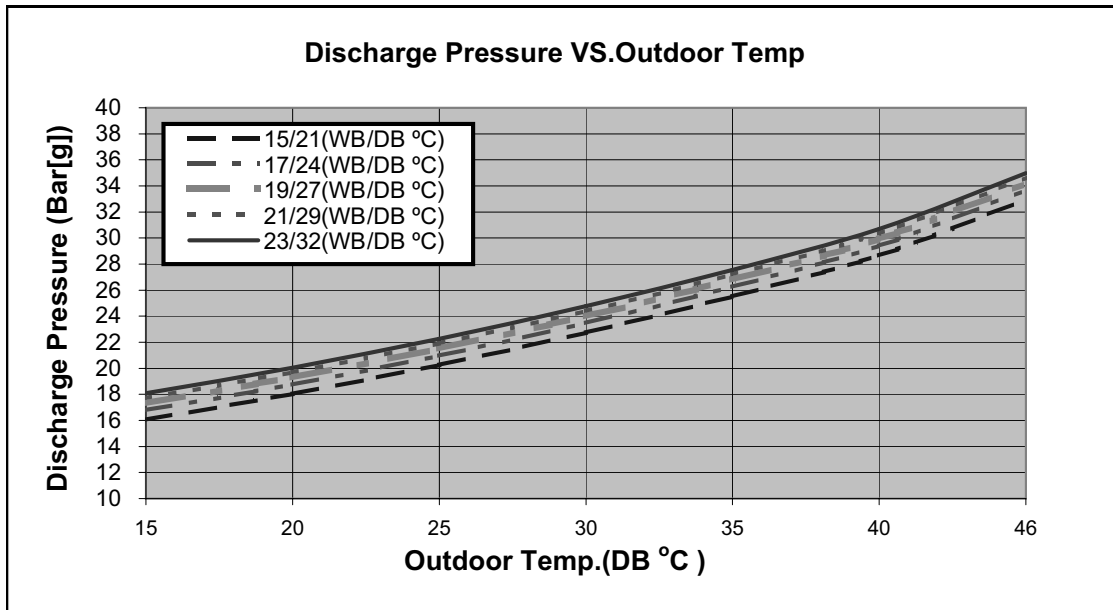
* Minimum recommended tubing length between indoor and outdoor units is 3m.

5.3 Pressure Curves.

5.3.1 Cooling.



5.3.2 Heating.



5.4 LEX9 / ONG9 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 ⁽¹⁾	TC	2.87	2.97	3.04	3.11	3.16
	SC	1.93	2.01	2.09	2.14	2.18
	PI	0.58	0.59	0.59	0.59	0.59
20 ⁽¹⁾	TC	2.77	2.92	3.02	3.09	3.15
	SC	1.89	1.99	2.08	2.14	2.18
	PI	0.64	0.64	0.64	0.64	0.64
25	TC	2.62	2.83	2.98	3.07	3.14
	SC	1.84	1.95	2.06	2.12	2.16
	PI	0.69	0.69	0.70	0.70	0.70
30	TC	2.45	2.67	2.89	2.99	3.08
	SC	1.78	1.90	2.02	2.08	2.11
	PI	0.74	0.75	0.76	0.76	0.77
35	TC	2.27	2.47	2.72	2.86	2.99
	SC	1.70	1.82	1.97	2.03	2.07
	PI	0.80	0.81	0.83	0.83	0.84
40	TC	2.07	2.25	2.45	2.68	2.82
	SC	1.60	1.72	1.86	1.92	1.96
	PI	0.86	0.87	0.89	0.90	0.91
46	TC	1.79	1.96	2.16	2.38	2.57
	SC	1.47	1.58	1.70	1.76	1.80
	PI	0.94	0.96	0.98	0.99	1.00

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	1.52	0.68	1.46	0.72	1.41	0.76
-7	1.64	0.70	1.58	0.73	1.52	0.77
-2	1.74	0.70	1.68	0.75	1.62	0.79
2	2.12	0.74	2.03	0.79	1.94	0.83
6	2.99	0.79	2.90	0.85	2.80	0.90
10	3.25	0.84	3.16	0.90	3.07	0.96
15	3.51	0.87	3.42	0.94	3.34	1.00
20	3.70	0.90	3.61	0.98	3.51	1.05

* the above chart includes the weighted deicing influence.

LEGEND

- TH – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- 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	0.950	---	---	---	---	---

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

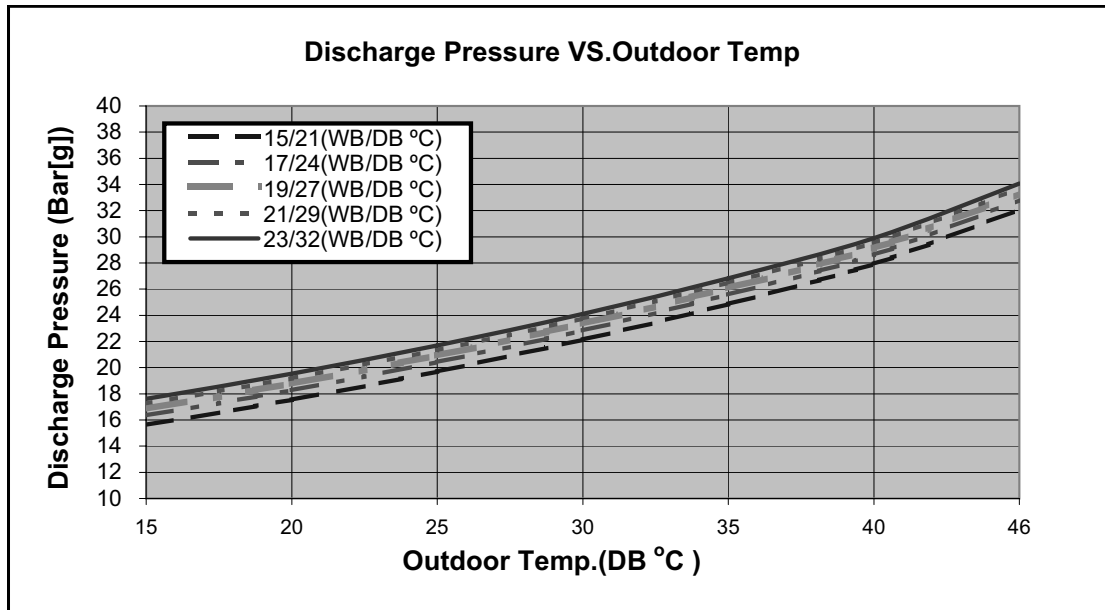
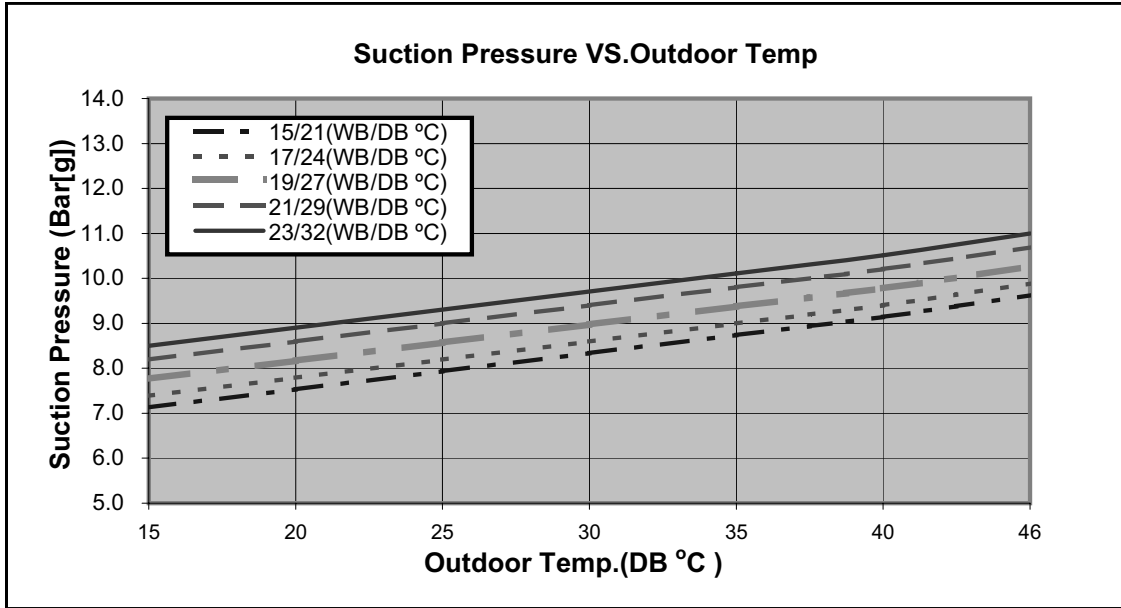
5.5.2 Heating

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

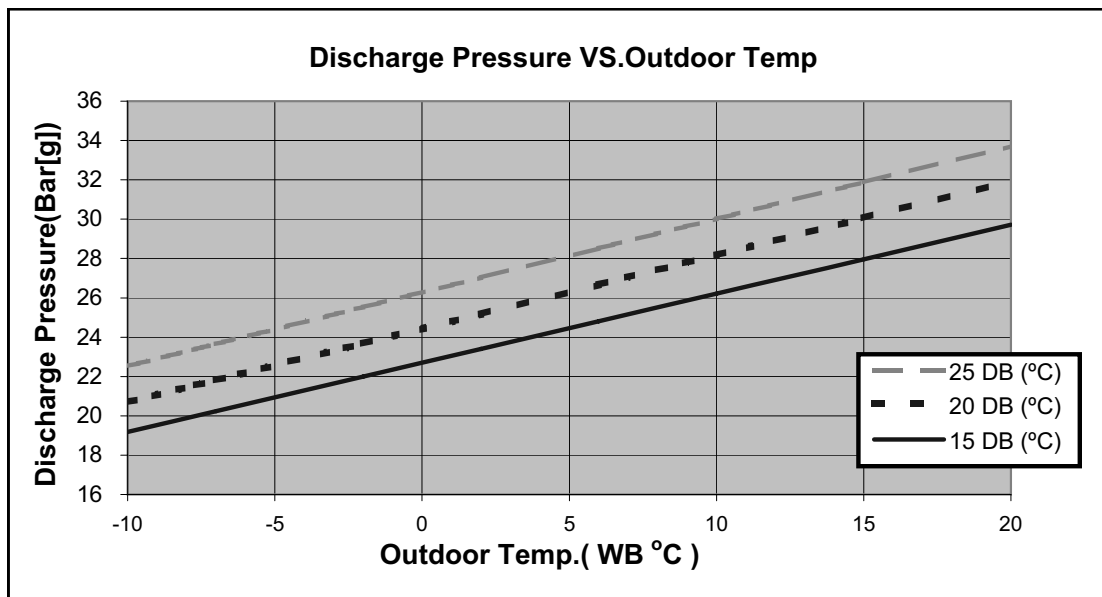
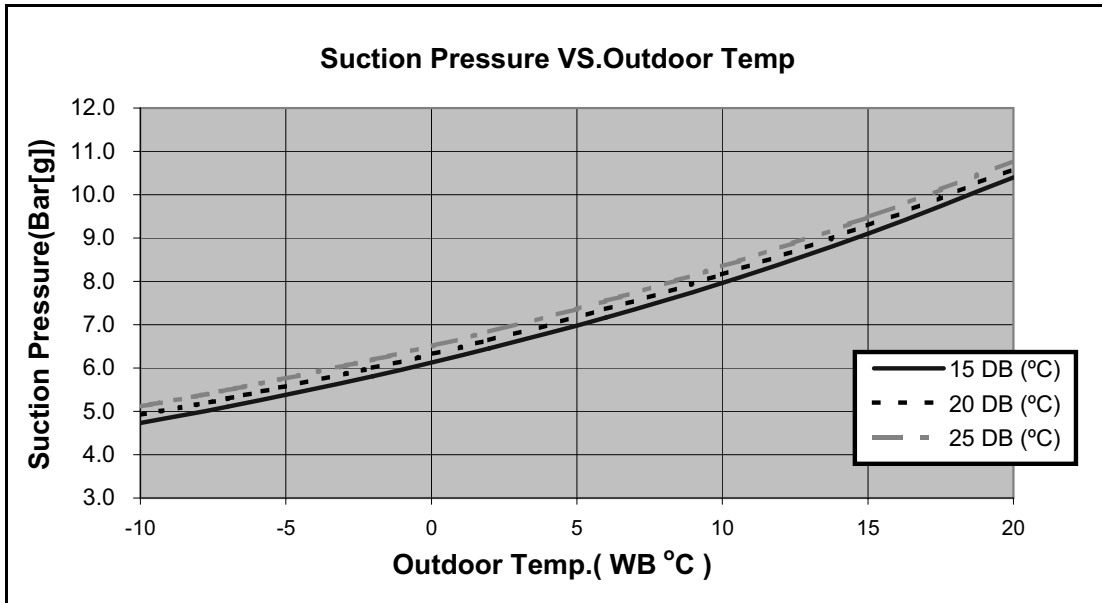
* Minimum recommended tubing length between indoor and outdoor units is 3m.

5.6 Pressure Curves.

5.6.1 Cooling.



5.6.2 Heating.



5.7 LEX12 / ONG12 R410A

5.7.1 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 ⁽¹⁾	TC	3.77	3.91	4.00	4.10	4.16
	SC	2.57	2.68	2.78	2.85	2.90
	PI	0.79	0.79	0.79	0.79	0.80
20 ⁽¹⁾	TC	3.65	3.85	3.97	4.06	4.15
	SC	2.51	2.65	2.76	2.84	2.89
	PI	0.86	0.86	0.86	0.87	0.87
25	TC	3.45	3.73	3.92	4.04	4.14
	SC	2.45	2.60	2.74	2.82	2.87
	PI	0.92	0.93	0.94	0.94	0.95
30	TC	3.23	3.52	3.80	3.93	4.05
	SC	2.37	2.52	2.68	2.76	2.81
	PI	1.00	1.01	1.02	1.03	1.04
35	TC	2.99	3.25	3.58	3.76	3.94
	SC	2.26	2.42	2.62	2.70	2.75
	PI	1.08	1.09	1.11	1.12	1.13
40	TC	2.72	2.96	3.23	3.53	3.71
	SC	2.13	2.29	2.48	2.56	2.61
	PI	1.16	1.18	1.20	1.21	1.23
46	TC	2.36	2.58	2.84	3.13	3.38
	SC	1.96	2.10	2.26	2.34	2.39
	PI	1.27	1.29	1.32	1.34	1.35

LEGEND

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

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

5.7.2 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	2.18	0.92	2.10	0.98	2.01	1.02
-7	2.34	0.94	2.26	0.99	2.18	1.04
-2	2.49	0.95	2.41	1.01	2.32	1.06
2	3.03	1.00	2.91	1.06	2.78	1.12
6	4.27	1.07	4.15	1.15	4.00	1.22
10	4.65	1.13	4.52	1.21	4.40	1.29
15	5.02	1.18	4.90	1.27	4.77	1.35
20	5.29	1.21	5.17	1.32	5.02	1.42

* the above chart includes the weighted deicing influence.

LEGEND

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

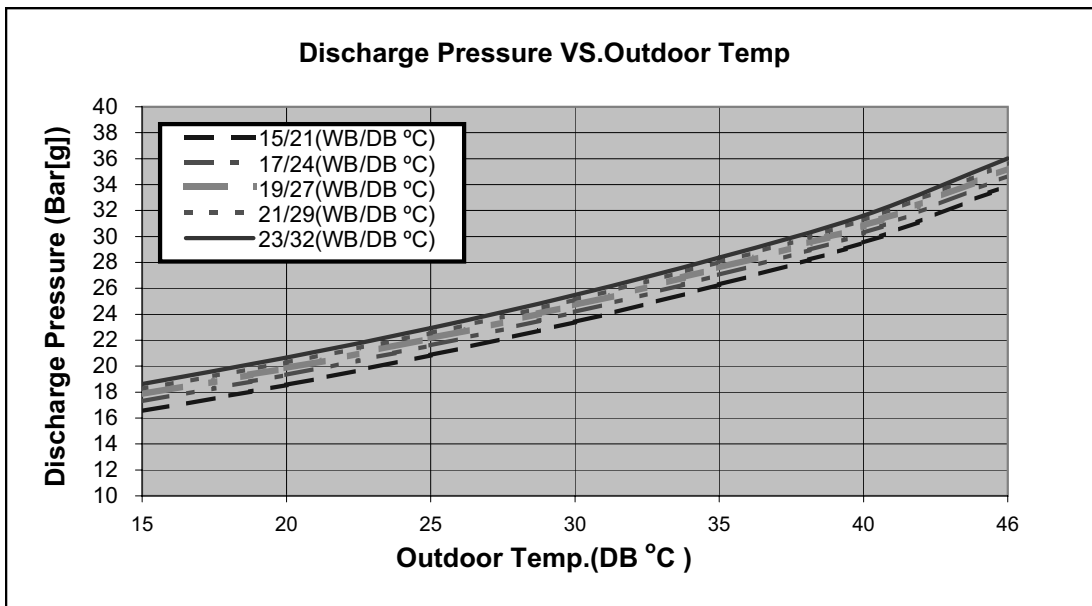
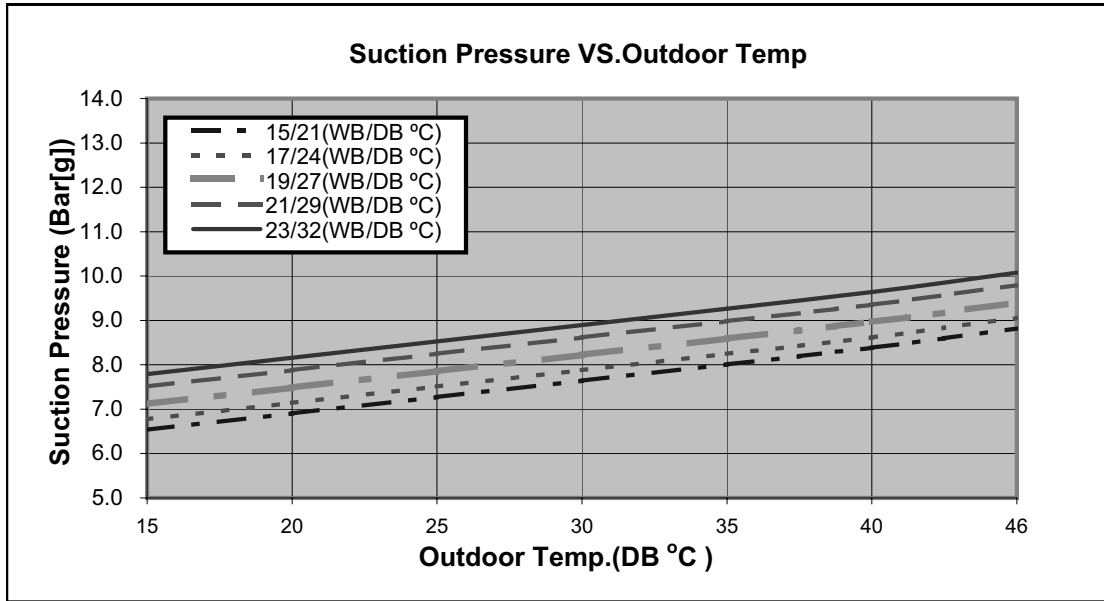
5.8.2 Heating

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

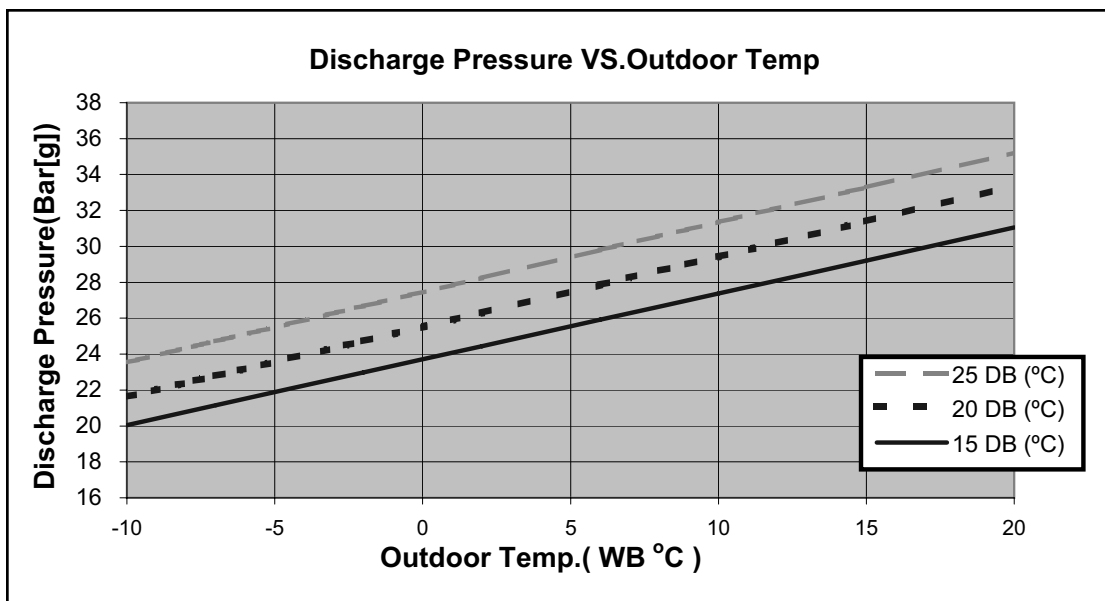
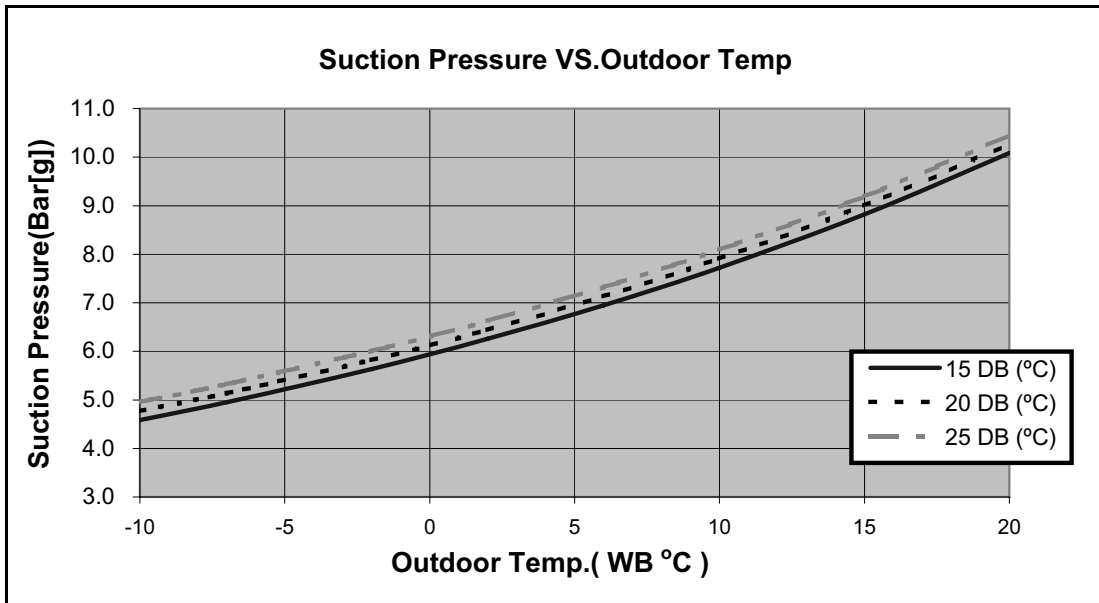
* Minimum recommended tubing length between indoor and outdoor units is 3m.

5.9 Pressure Curves.

5.9.1 Cooling.



5.9.2 Heating.



5.10 LEX14 / ONG14 R410A

5.10.1 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 ⁽¹⁾	TC	4.45	4.61	4.72	4.83	4.90
	SC	2.89	3.01	3.13	3.21	3.27
	PI	0.93	0.93	0.93	0.93	0.94
20 ⁽¹⁾	TC	4.30	4.54	4.68	4.79	4.89
	SC	2.83	2.98	3.11	3.20	3.26
	PI	1.01	1.01	1.02	1.02	1.02
25	TC	4.07	4.40	4.62	4.76	4.88
	SC	2.76	2.93	3.09	3.18	3.23
	PI	1.09	1.10	1.10	1.11	1.12
30	TC	3.81	4.15	4.48	4.64	4.78
	SC	2.67	2.84	3.02	3.11	3.17
	PI	1.18	1.19	1.20	1.21	1.22
35	TC	3.53	3.83	4.22	4.43	4.64
	SC	2.54	2.72	2.95	3.04	3.09
	PI	1.27	1.29	1.31	1.32	1.33
40	TC	3.21	3.49	3.81	4.16	4.38
	SC	2.39	2.58	2.79	2.88	2.94
	PI	1.37	1.39	1.41	1.43	1.44
46	TC	2.78	3.04	3.34	3.69	3.98
	SC	2.21	2.36	2.54	2.63	2.69
	PI	1.49	1.52	1.55	1.57	1.59

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).

5.10.2 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	2.31	0.90	2.22	0.96	2.13	1.01
-7	2.49	0.93	2.40	0.98	2.31	1.03
-2	2.64	0.94	2.55	1.00	2.46	1.05
2	3.21	0.98	3.08	1.05	2.95	1.11
6	4.53	1.06	4.40	1.13	4.25	1.20
10	4.93	1.12	4.80	1.19	4.66	1.28
15	5.32	1.16	5.19	1.26	5.06	1.33
20	5.61	1.20	5.48	1.30	5.32	1.40

* the above chart includes the weighted deicing influence.

LEGEND

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

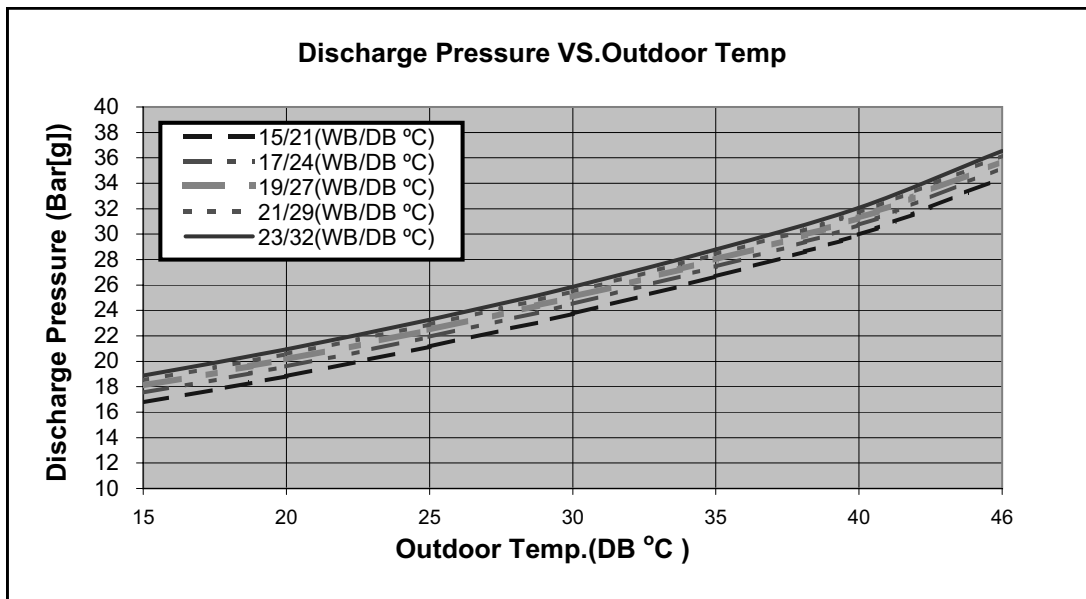
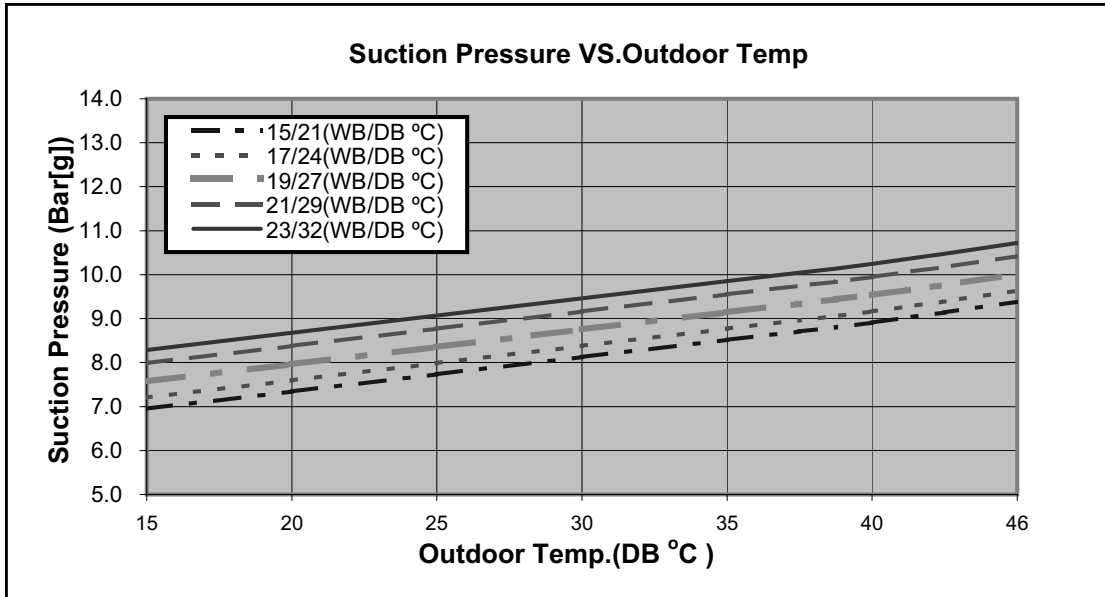
5.11.2 Heating

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

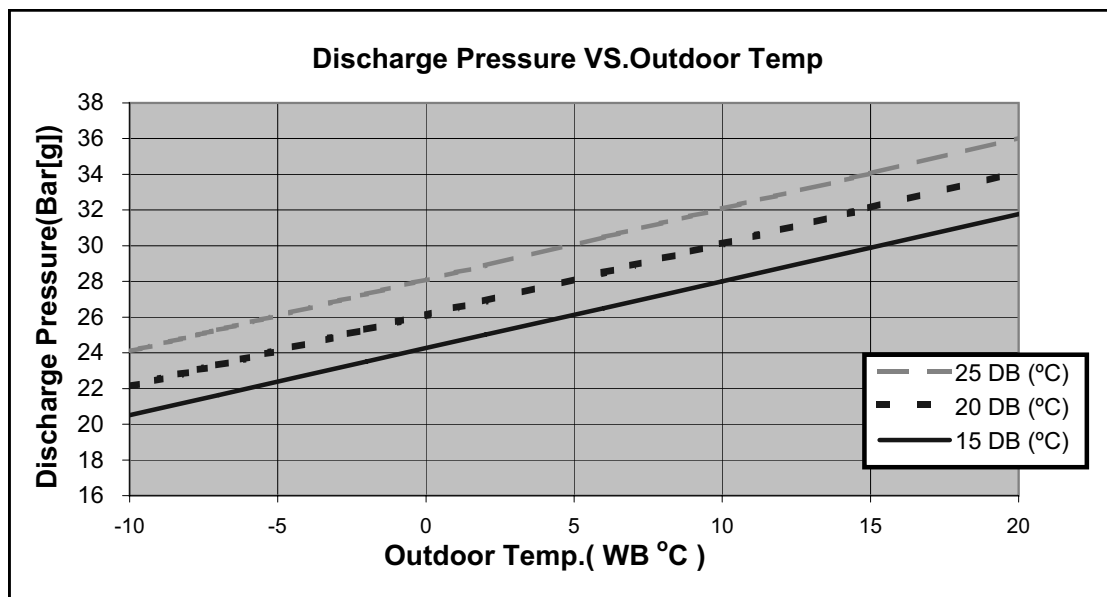
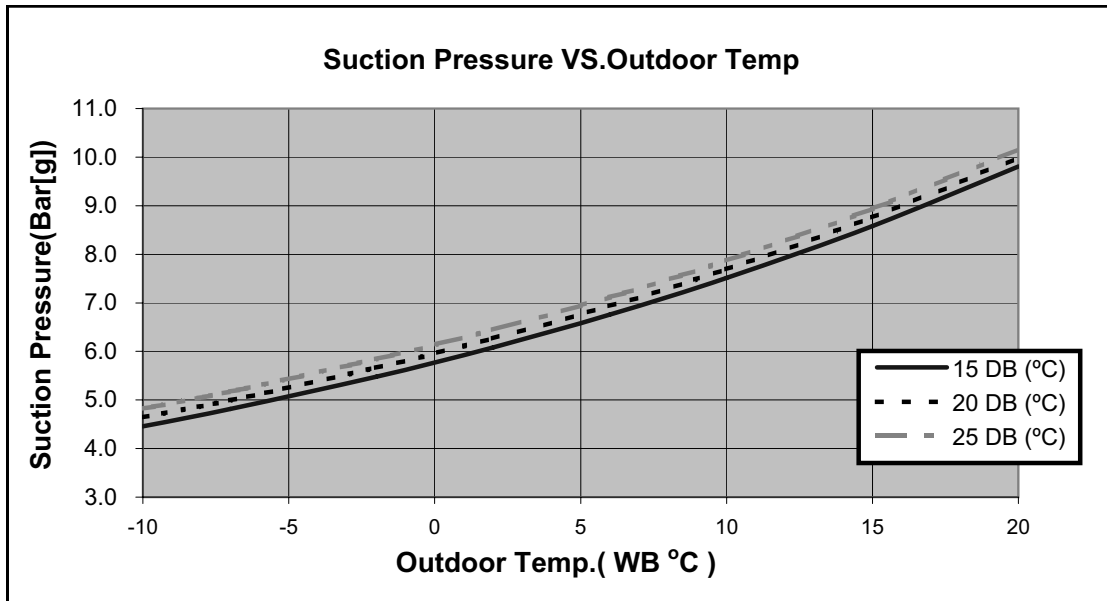
* Minimum recommended tubing length between indoor and outdoor units is 3m.

5.12 Pressure Curves.

5.12.1 Cooling.

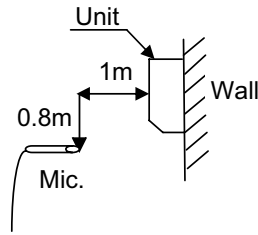


5.12.2 Heating.



6. SOUND LEVEL CHARACTERISTICS

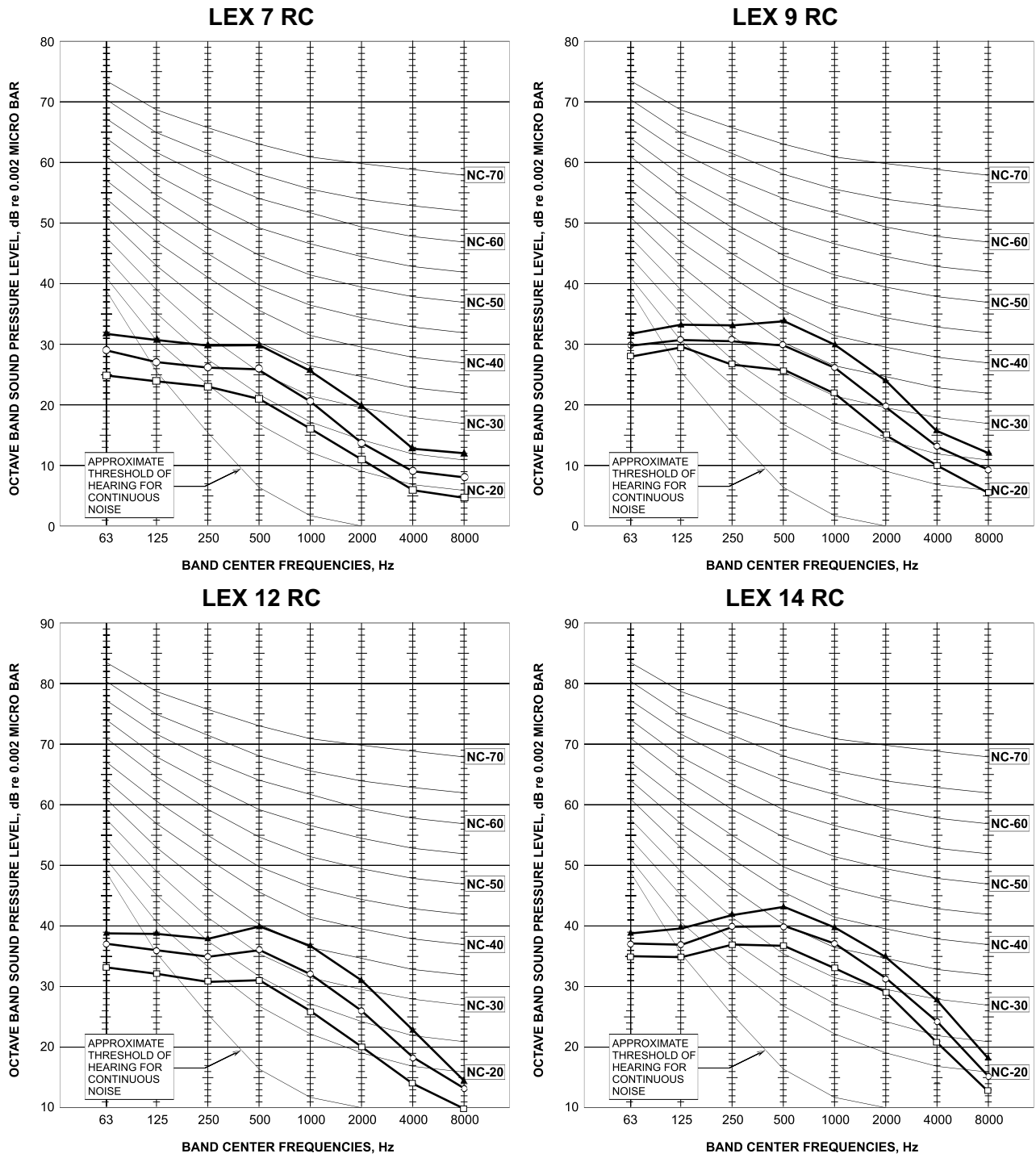
6.1 Sound Pressure Level



FAN SPEED	LINE
HI	▲
ME	○
LO	□

Figure 1

6.2 Sound Pressure Level Spectrum (Measured as Figure 1)



6.3 Outdoor units

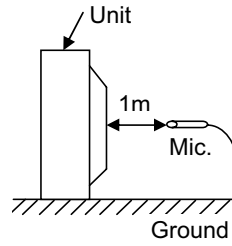
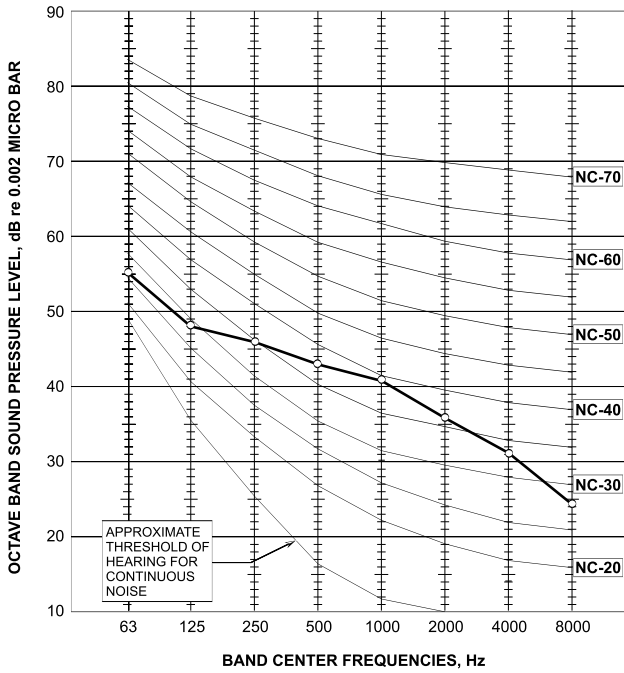


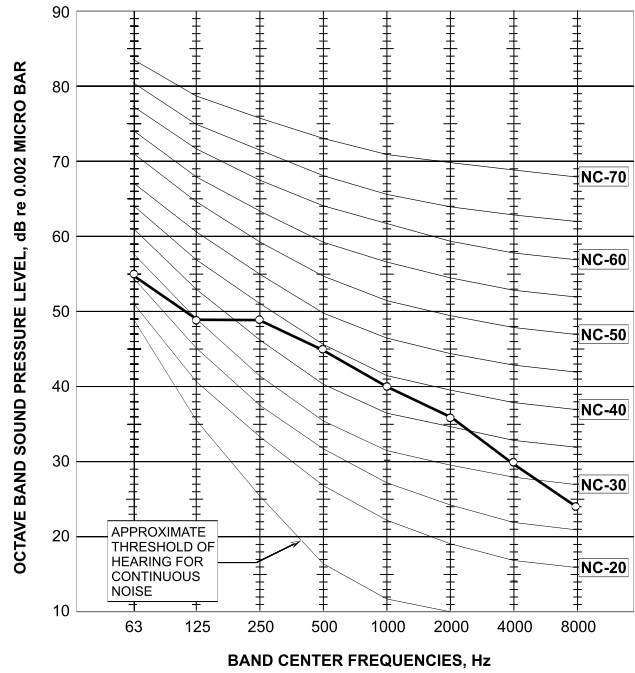
Figure 2

6.4 Sound Pressure Level Spectrum (Measured as Figure 2)

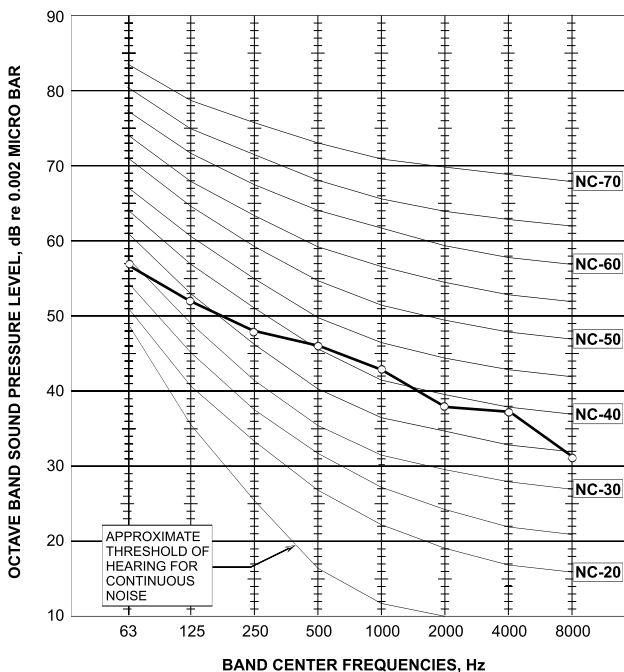
ONG 7 RC Cooling



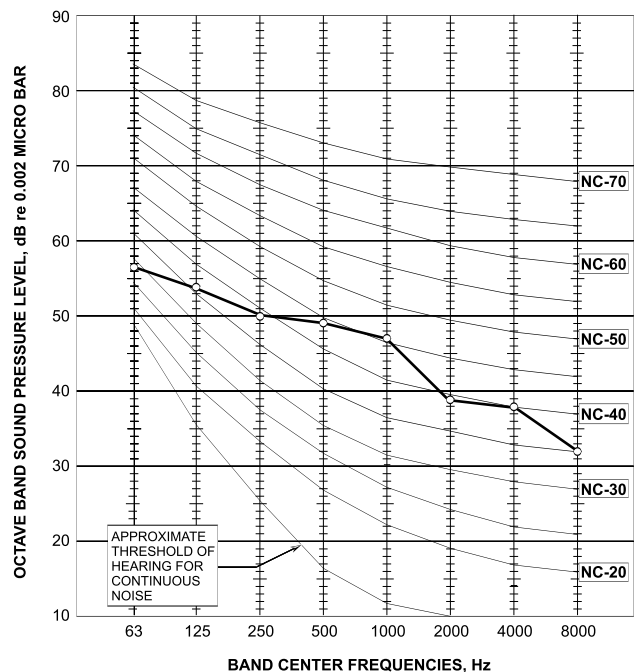
ONG 7 RC Heating



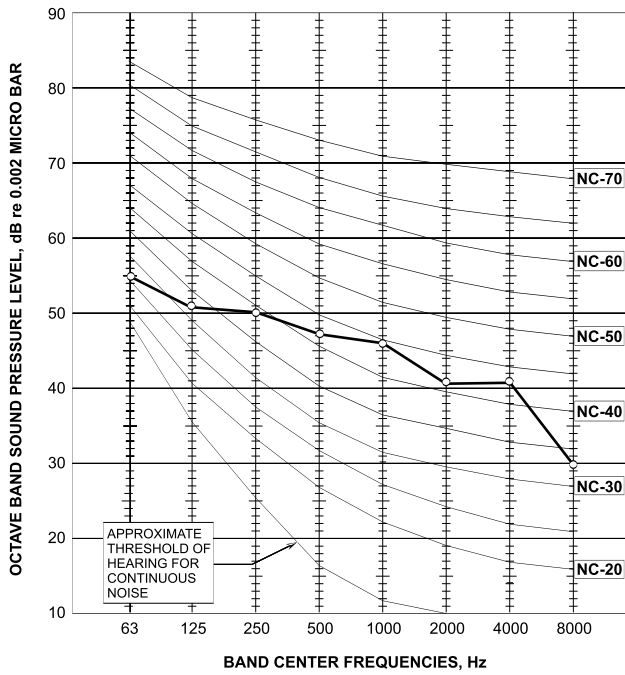
ONG 9 RC Cooling



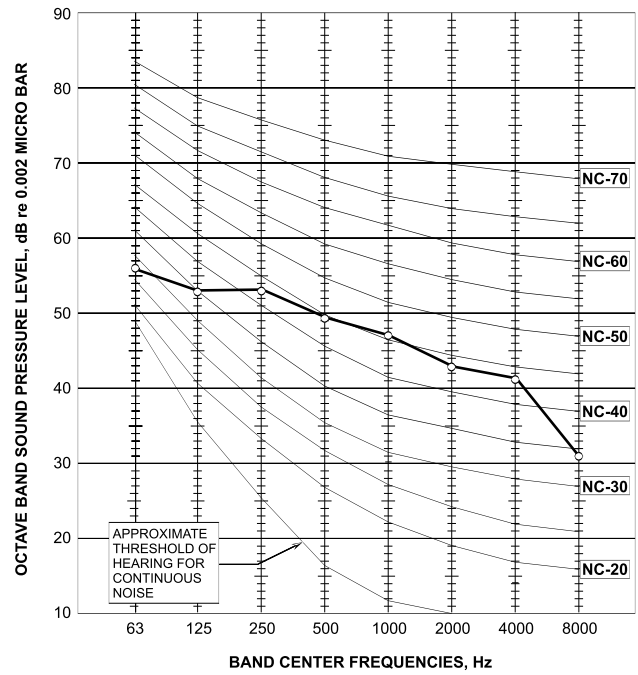
ONG 9 RC Heating



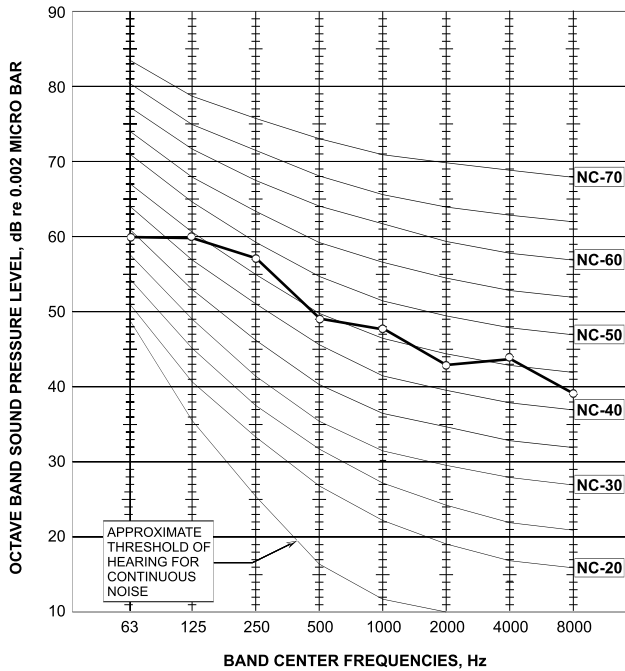
ONG 12 RC Cooling



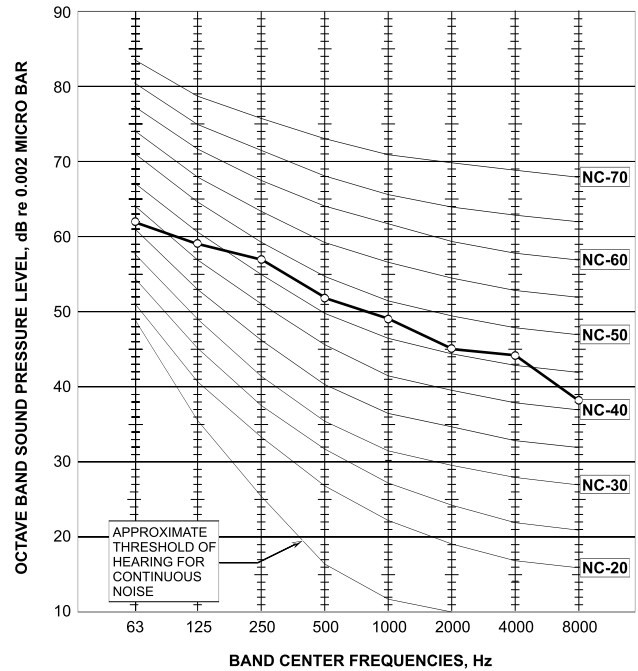
ONG 12 RC Heating



ONG 14 RC Cooling



ONG 14 RC Heating



7. ELECTRICAL DATA

7.1 Single Units

MODEL	LEX 7		LEX 9	
	To indoor	To outdoor	To indoor	To outdoor
Power Supply	1PH-230V-50Hz		1PH-230V-50Hz	
Max Current, (A)	4.3		6.0	
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 1.0 mm ² + 2 x 0.5 mm ² (OCT sensor)	6 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)	6 x 1.0 mm ² + 2 x 0.5 mm ² (OCT sensor)
Interconnecting Cable ST Model (No. x Cross Section mm ²)	4 x 1.0 mm ²	5 x 1.0 mm ²	4 x 1.0 mm ²	5 x 1.0 mm ²

MODEL	LEX 12		LEX 14	
	To indoor	To outdoor	To indoor	To outdoor
Power Supply	1PH-230V-50Hz		1PH-230V-50Hz	
Max Current, (A)	8.2		9.5	
Circuit Breaker,(A)	15.0		15.0	
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)	6 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)	6 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	5 x 1.5 mm ²	4 x 1.5 mm ²	5 x 1.5 mm ²

NOTE

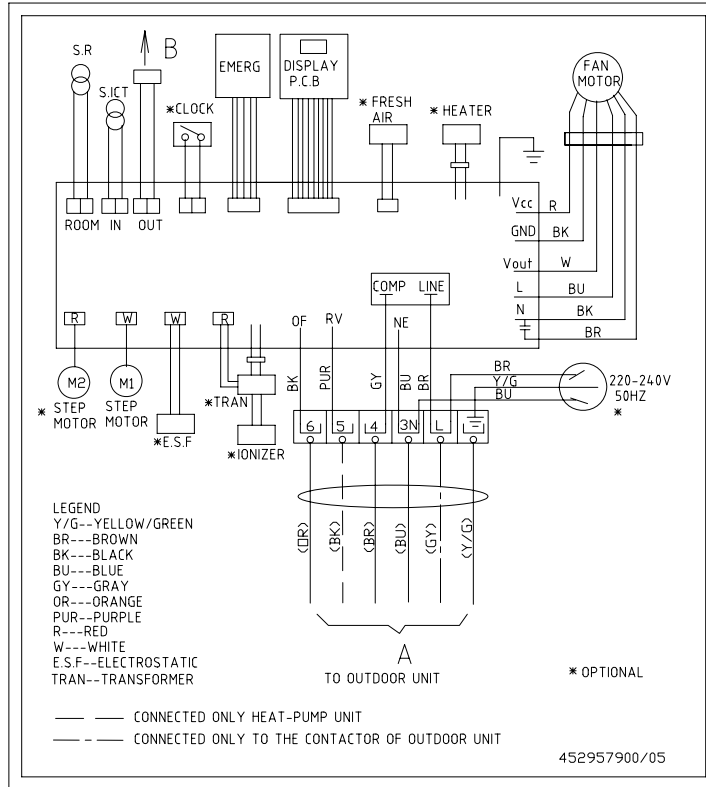
Power wiring cord should comply with local laws and electrical regulations requirements.

8. WIRING DIAGRAMS

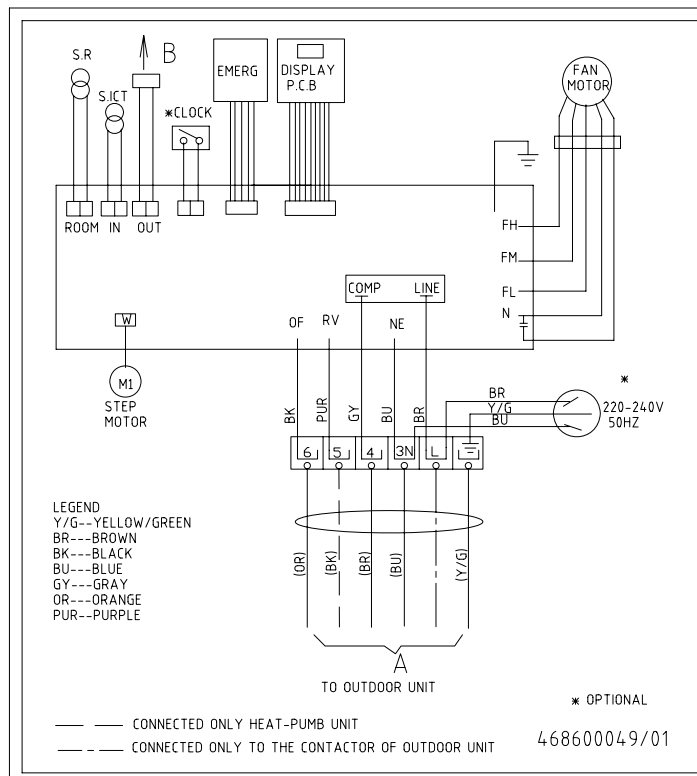
NOTE

Wiring diagram lables as shown on units.

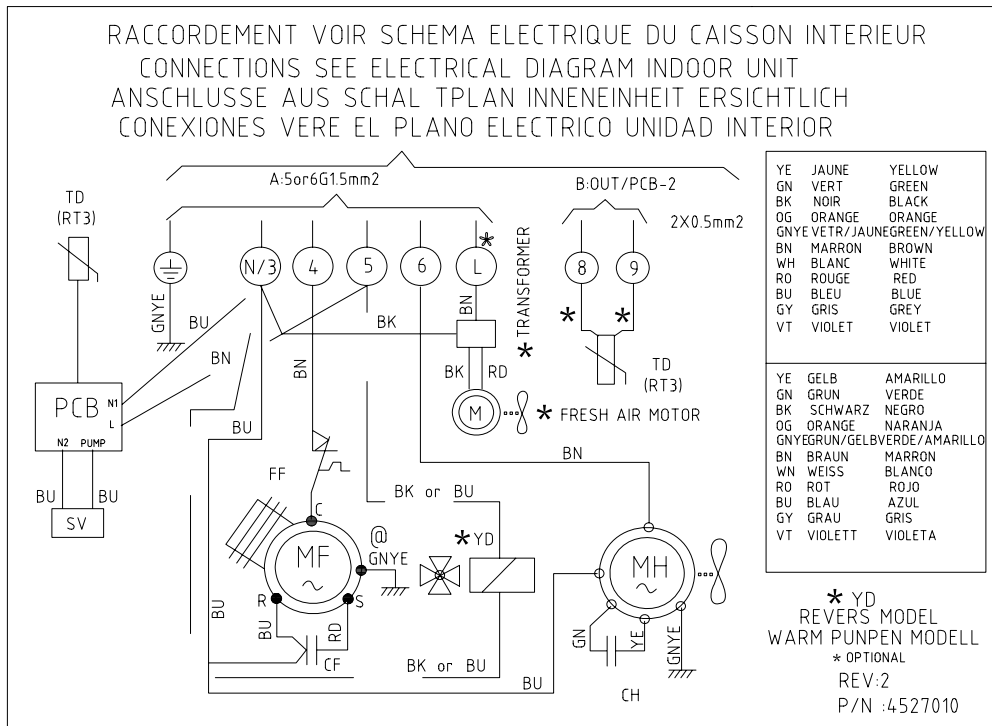
8.1 Indoor Unit: LEX 7,9,12,14 fully feature



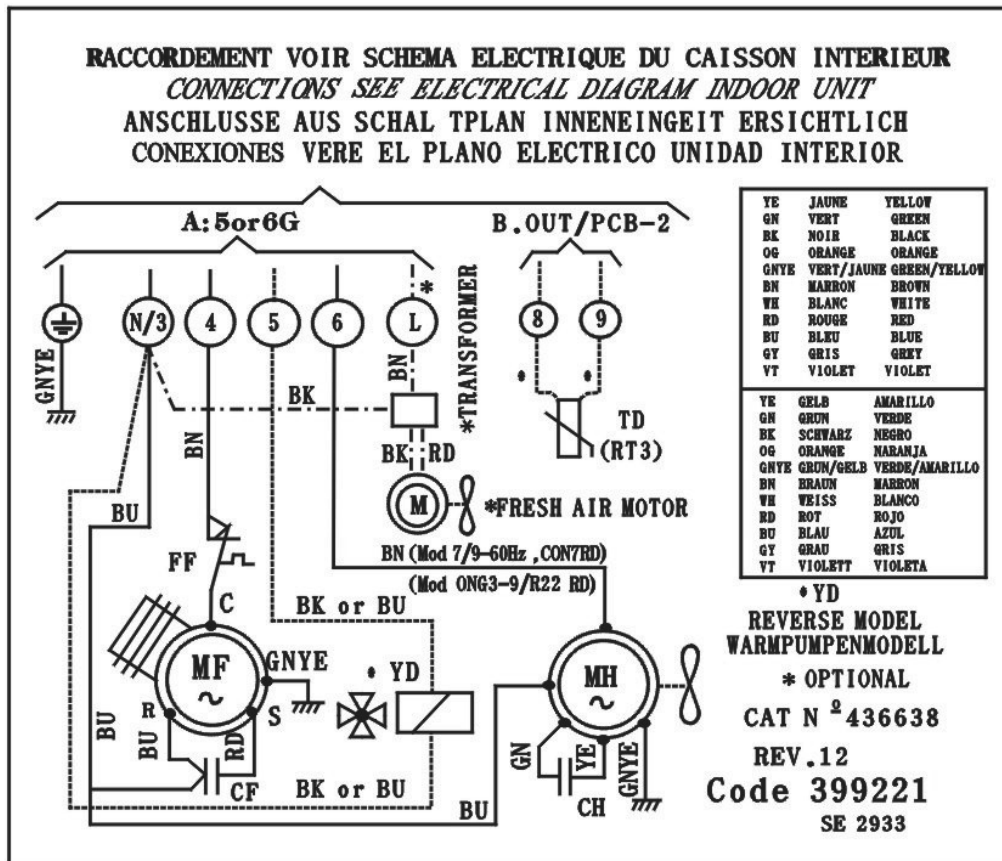
8.1.1 Indoor Unit: LEX 7,9,12,14 basic



8.2 Outdoor Unit: ONG7 RC R410A



8.3 Outdoor Unit: ONG7ST, 9ST/RC, 12ST/RC, 14ST/RC R410A

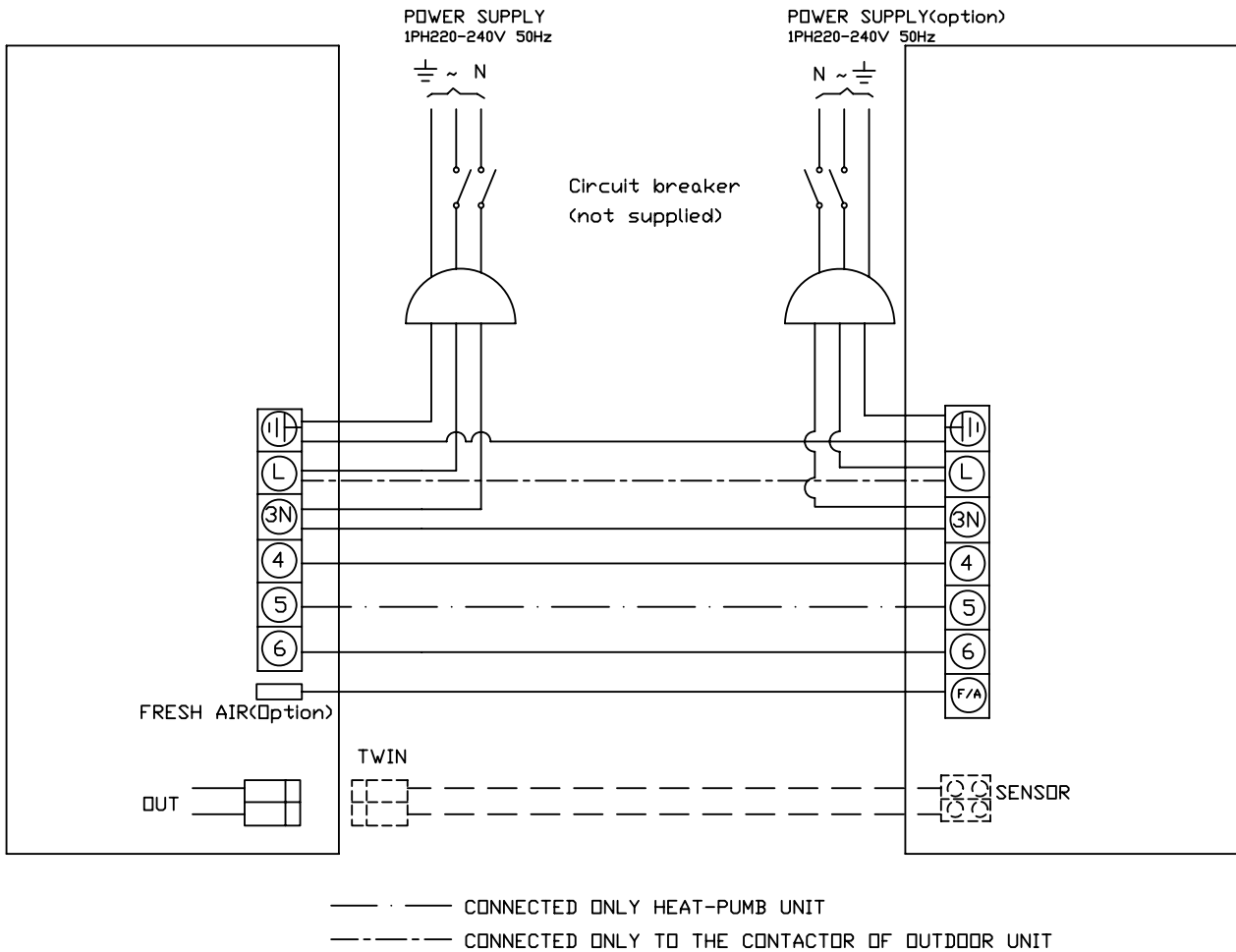


9. ELECTRICAL CONNECTIONS

9.1 LEX 7, 9, 12, 14 R410A

indoor unit

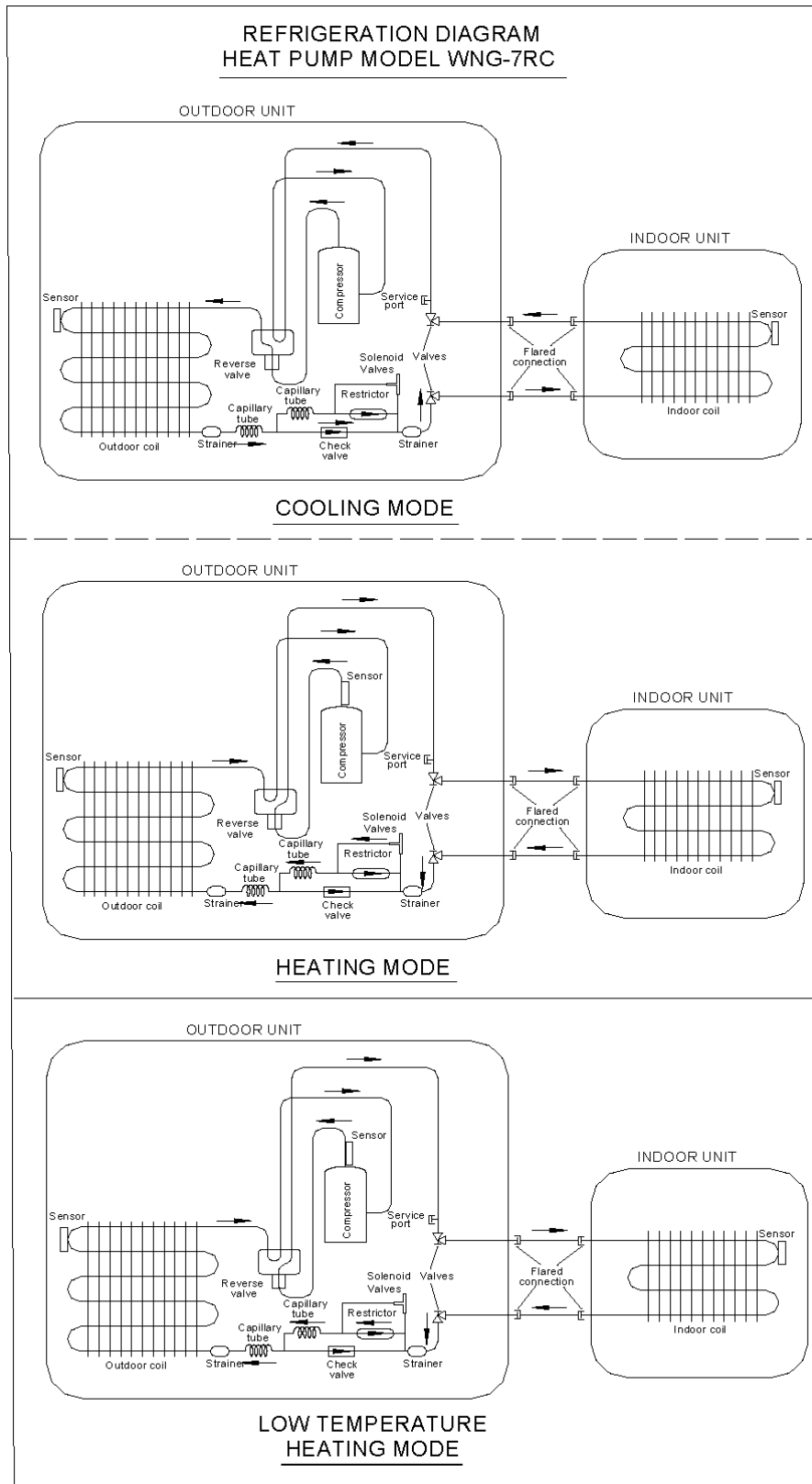
outdoor unit



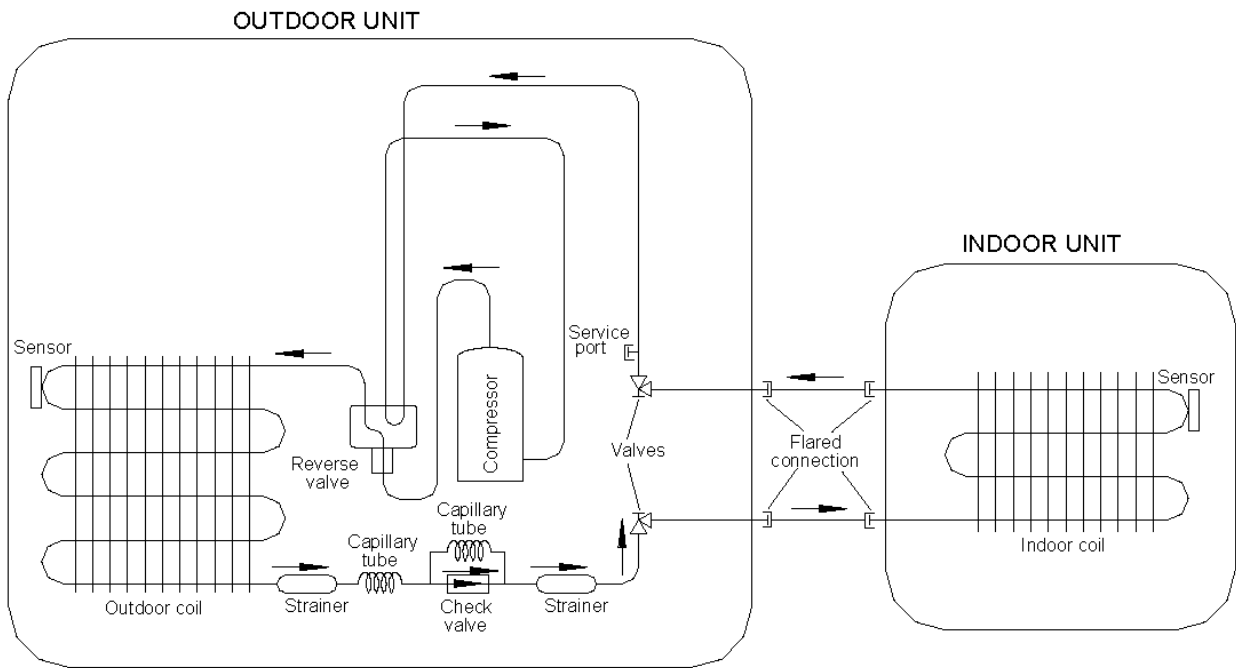
10. REFRIGERATION DIAGRAMS

10.1 Heat Pump Models

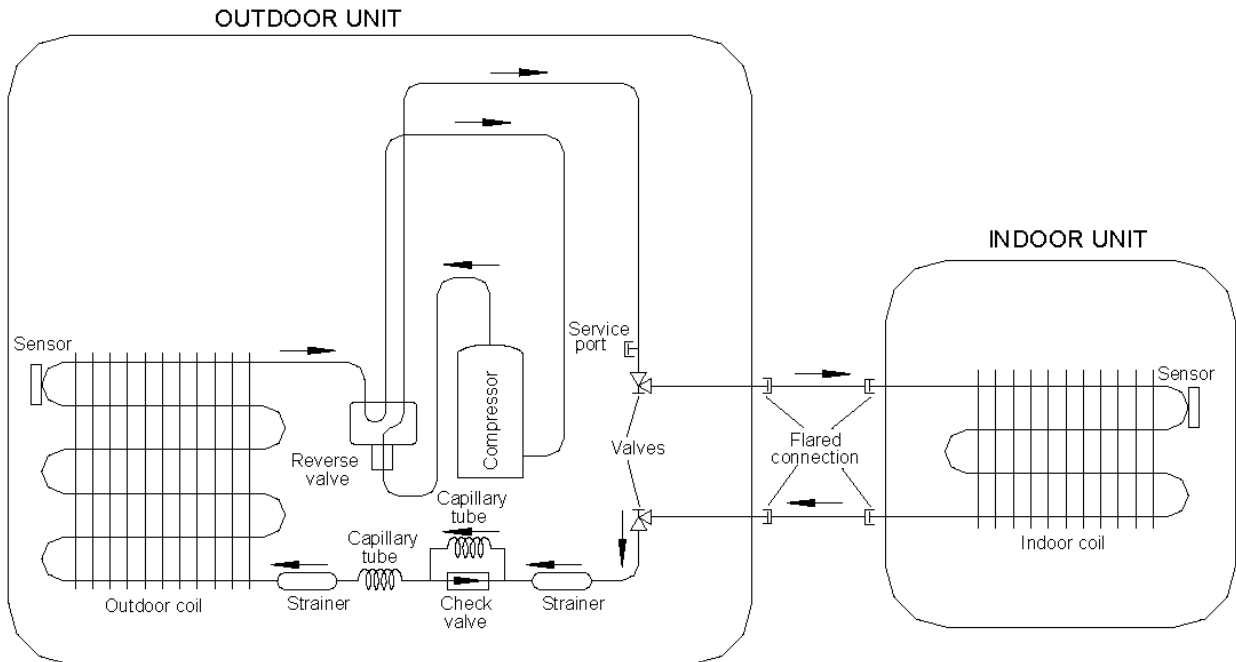
10.1.1 LEX 7 R410A



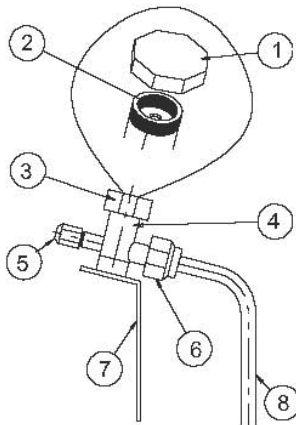
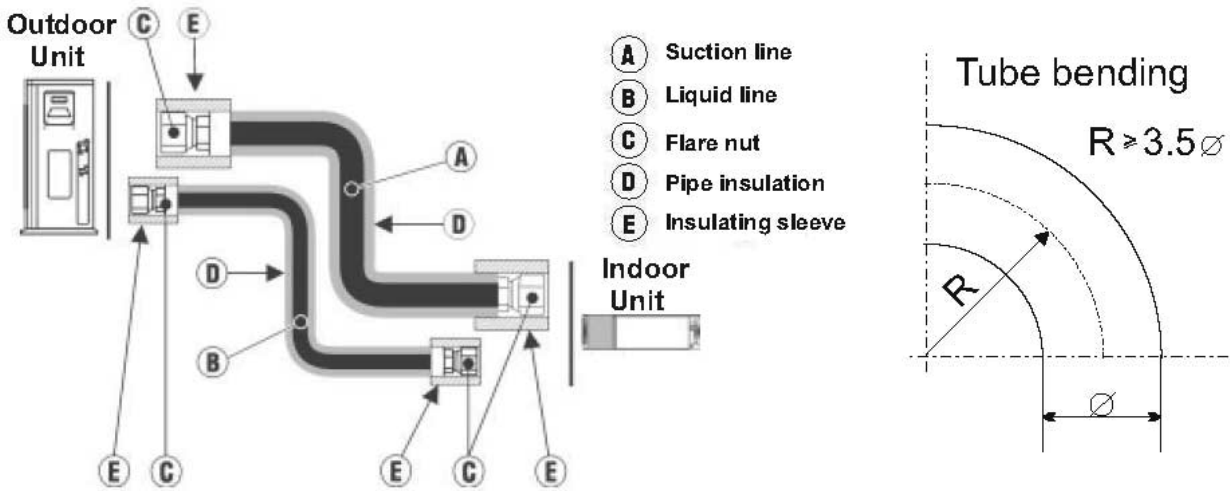
10.1.2 LEX 9, 12, 14 R410A



COOLING MODE



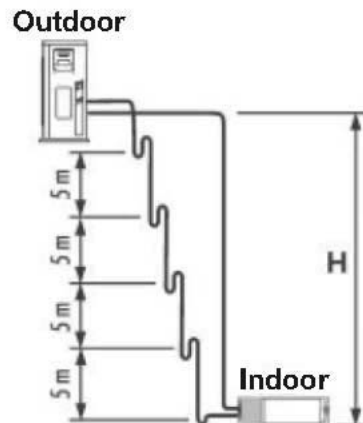
11. TUBING CONNECTIONS



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

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

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



12. CONTROL SYSTEM LEX 7-14 LED BASIC MODEL

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)
E ² PROM, 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: $\Delta T = SPT - RT$ in Cool/Dry/Fan Mode: $\Delta T = RT - SPT$

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

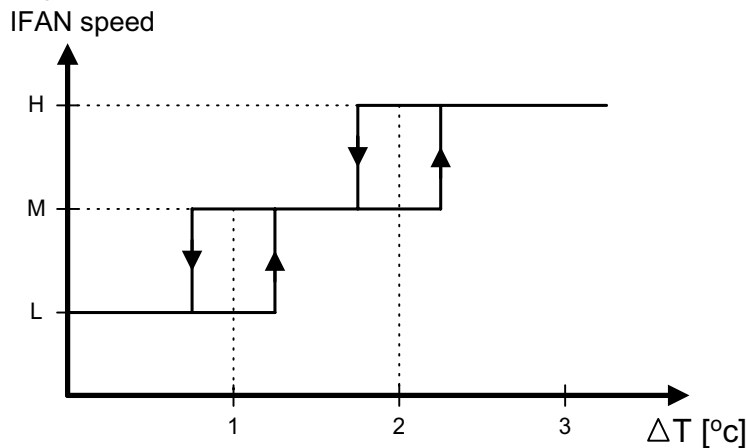
- Min time interval between IFAN speed change in AUTOFAN Mode, is 30 sec.
- Min time interval between IFAN speed change in H/M/L Mode is 1 sec.
- IFAN speed in Heat/Cool Autofan Mode is determined according to the following table:

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 a 4.7 kohm resistor (5%) to the OCT connector. These resistors are equivalent to a thermistor at $43\pm 1^{\circ}\text{C}$ and $48\pm 1^{\circ}\text{C}$ respectively.
 - (iii) Connecting a 4.7 k 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 split 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 :

$$\text{Heat Mode: } RAT = ICT / 2.3$$

$$\text{Cool Mode } RAT = ICT * 4$$

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 & WVW 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.

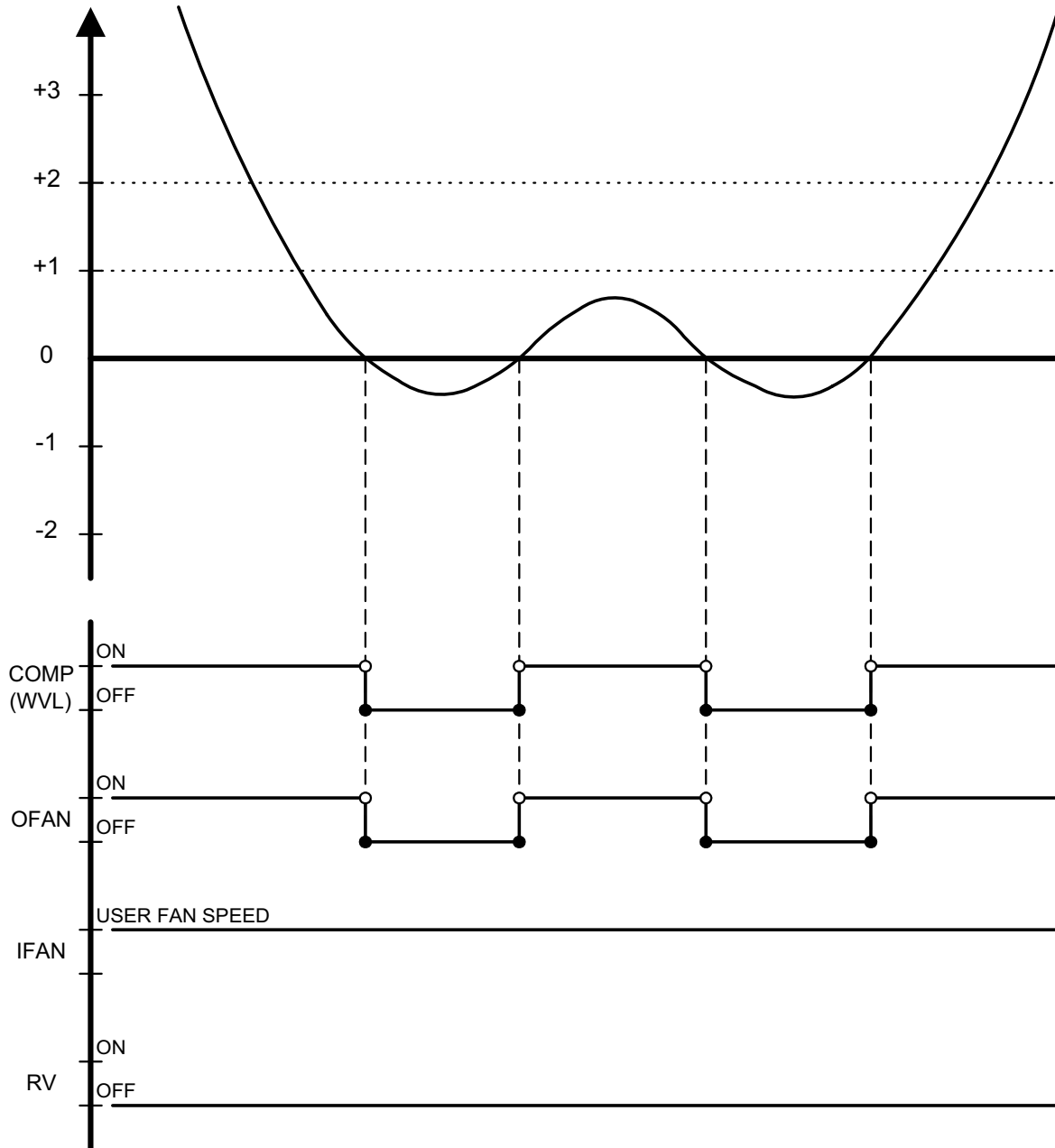
12.5.1 Cooling

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.

(RT - SPT) [°c]



Note:

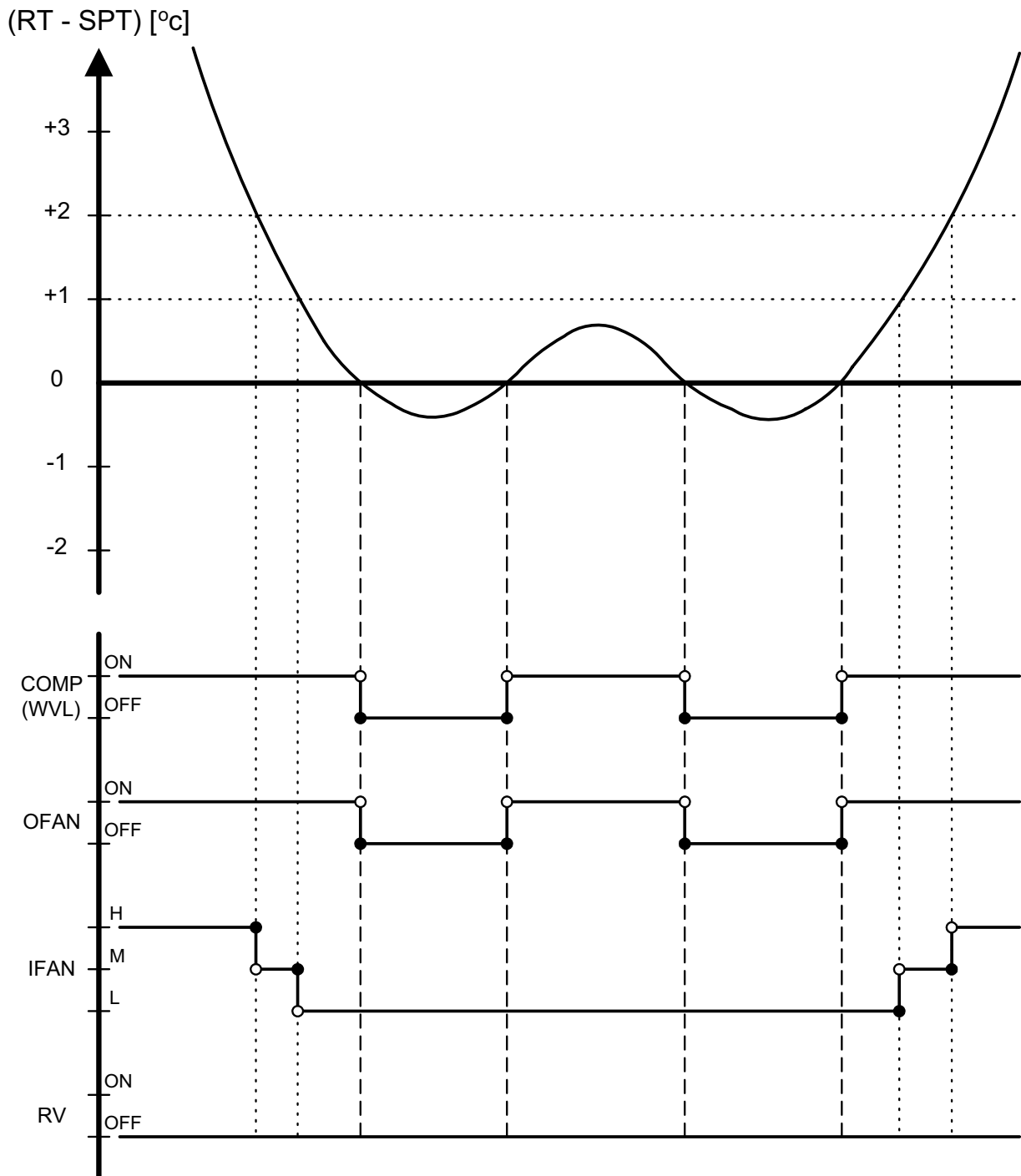
- 1) IFAN is always running at High, Medium or Low speed selected by user.
- 2) In IFEEL mode, the Room Temperature (RT) is the RCT from a R/C. Otherwise, the RT is the RAT from the Room Thermistor.

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.

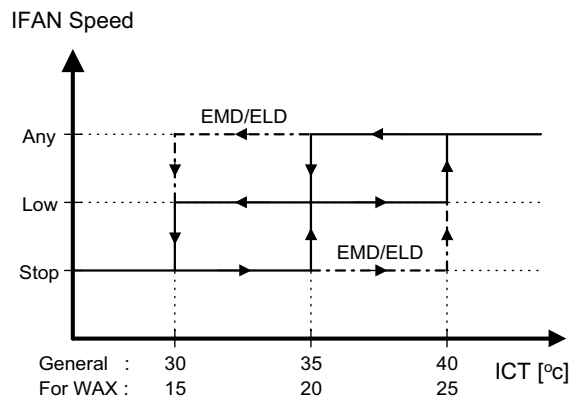
SPT [°C]	Add to SPT	
	I-FEEL ON	I-FEEL OFF
$18 \leq SPT \leq 27$	0 °C	+2 °C
$27 < SPT \leq 30$	0 °C	+3 °C

Notes :

- No compensation will be activated in Forced operation modes

12.6.2 IF operating rules

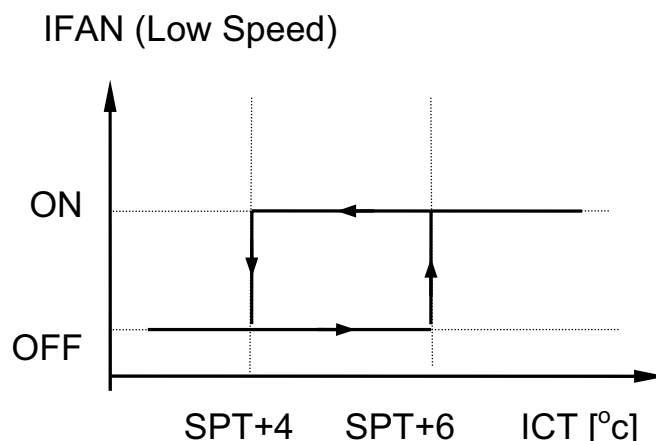
- As a general rule for **RC and SH groups**, when **COMP is ON**, excluding protection modes, IFAN will be switched ON if
- ICT > 35°C or
at the IFTC 30 sec after the COMP is switched ON. In this case, the IFAN will be started at low speed.



Notes :

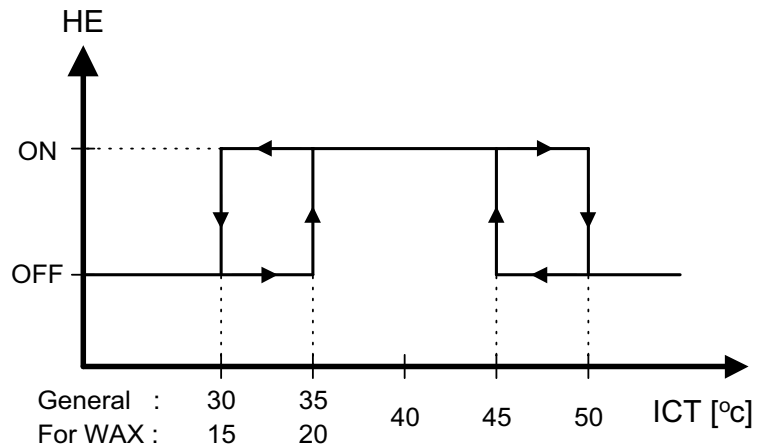
- In **SH or RC group**, if HE is set to OFF due to low ICT, IFAN will be switched to LOW and will be turned OFF after 30 sec.
- An exception to this rule (4.0.3.a) is the Back-up mode for SH.
- In **RC and SH groups**, whenever **COMP & HE are both OFF**, excluding protection modes, IFAN operation will 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 $ICT > 50\text{ }^{\circ}\text{C}$, and is activated again when $ICT \leq 45\text{ }^{\circ}\text{C}$.
- In **SH or RC group**, HE operation is limited by the following graph:



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

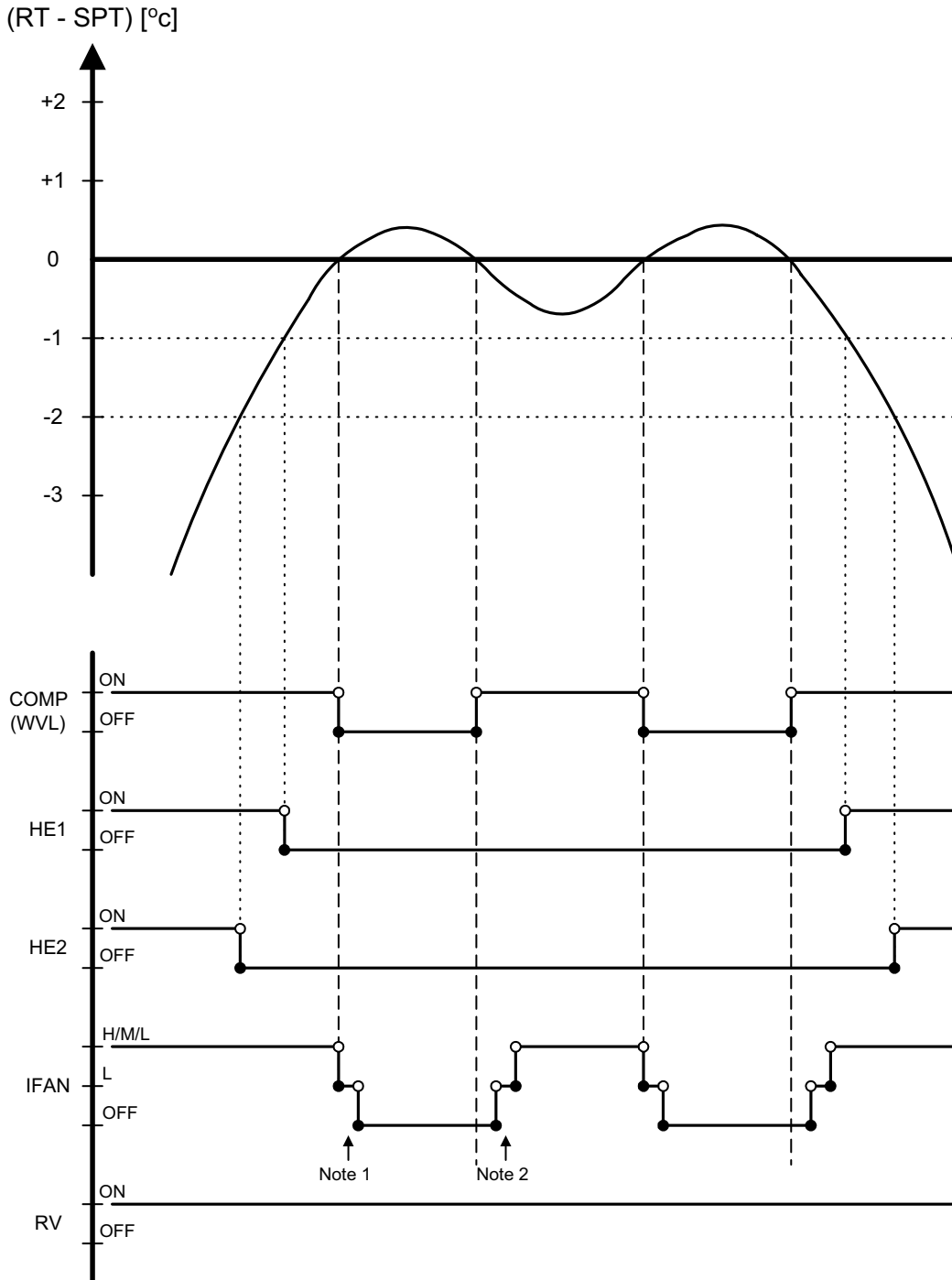
After COMP has been working for 5 minutes, HE & IFAN are activated even if the ICT is still below 35°C. This situation is called Back-up Mode. Both HE & IFAN will work in Back-up Mode until the ICT reaches 35°C. Then, the operation goes on in the usual mode .

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.



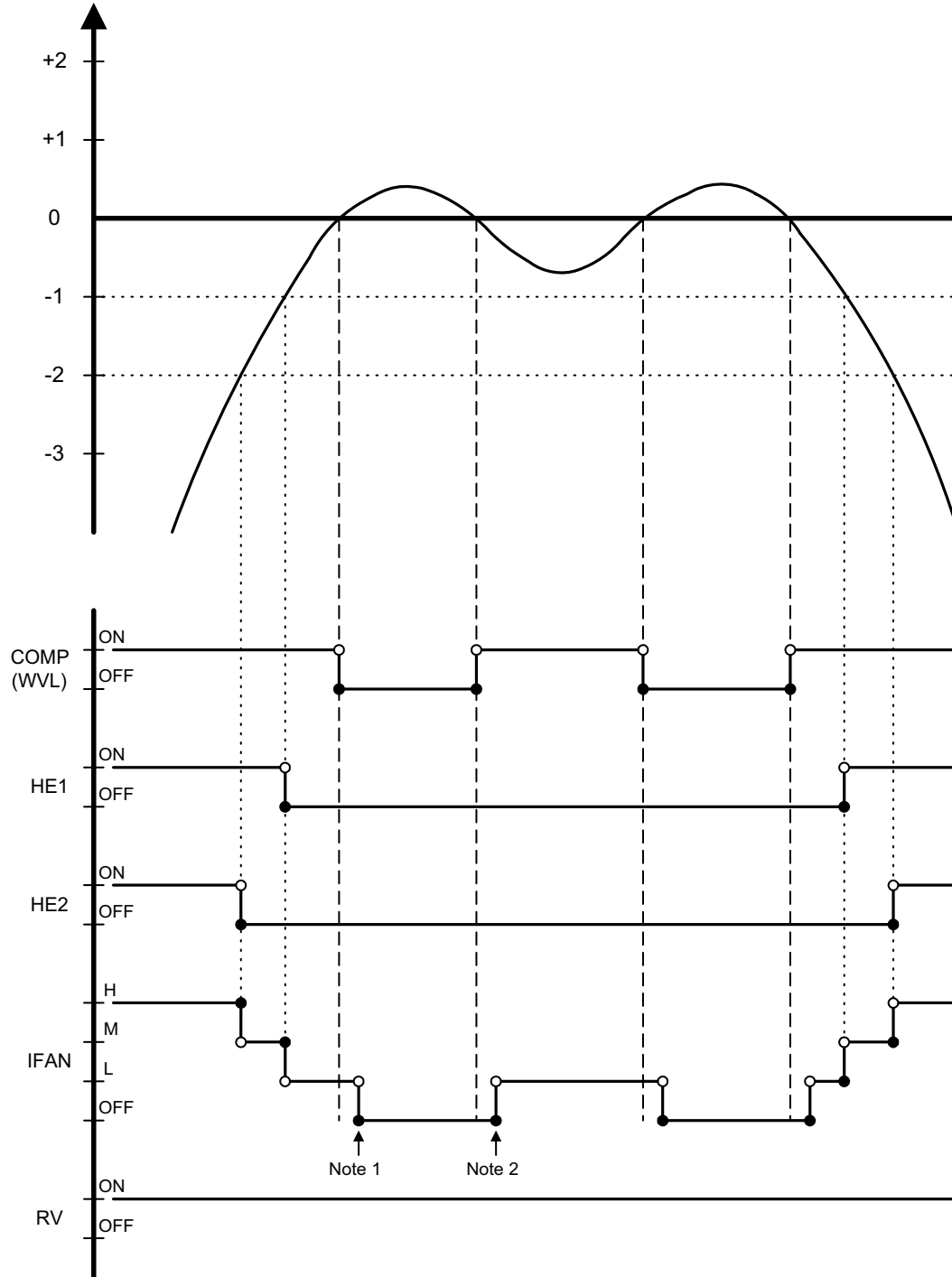
12.6.5 Heating, RC or SH Group with Autofan

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.

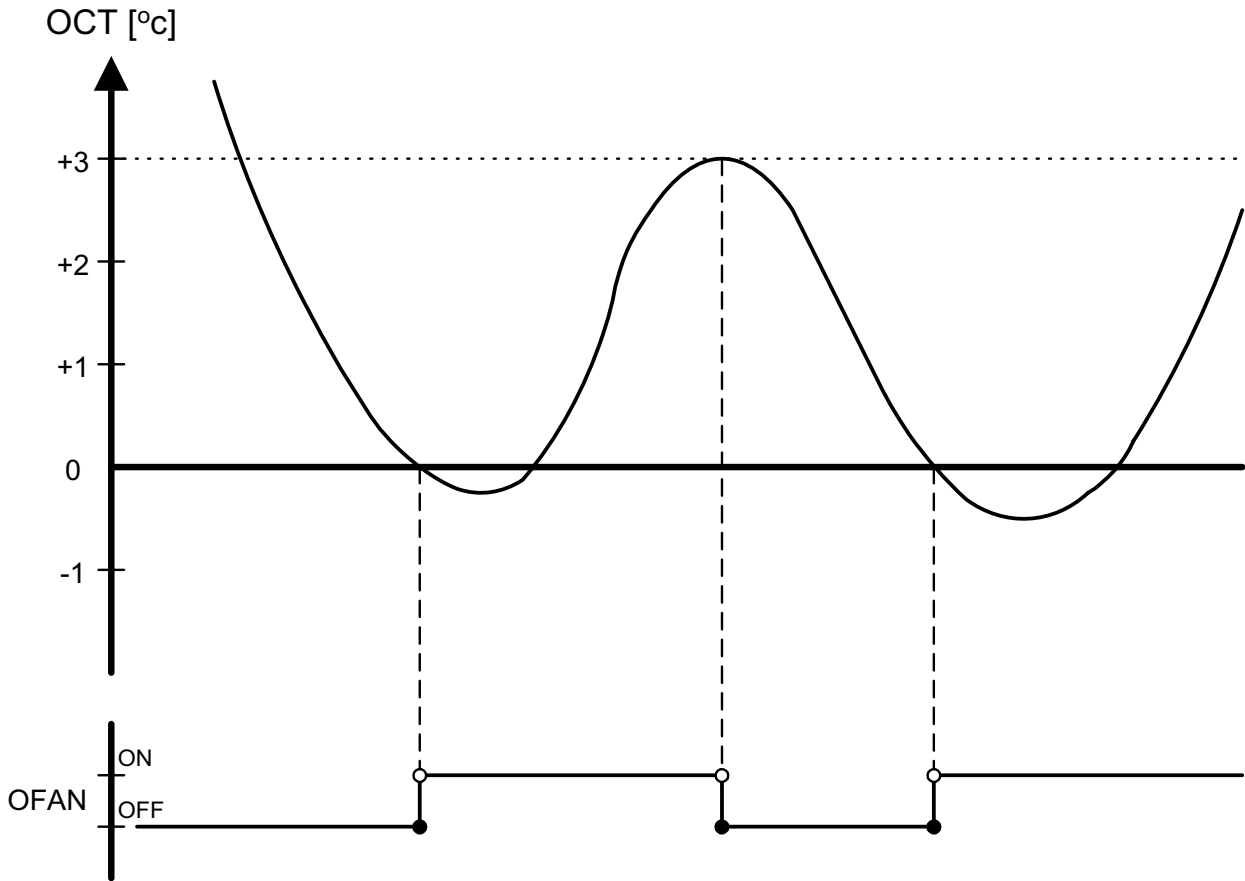
(RT - SPT) [°C]



12.6.6 OFAN operation is controlled by the graph below when

1. (RAT \geq SPT - 2°C), AND
2. (ICT \geq 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 $SPT \pm 3^{\circ}\text{C}$.
- 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 $SPT \pm 0^{\circ}\text{C}$, 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 $SPT-1^{\circ}\text{C}$ or $SPT+1^{\circ}\text{C}$ 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

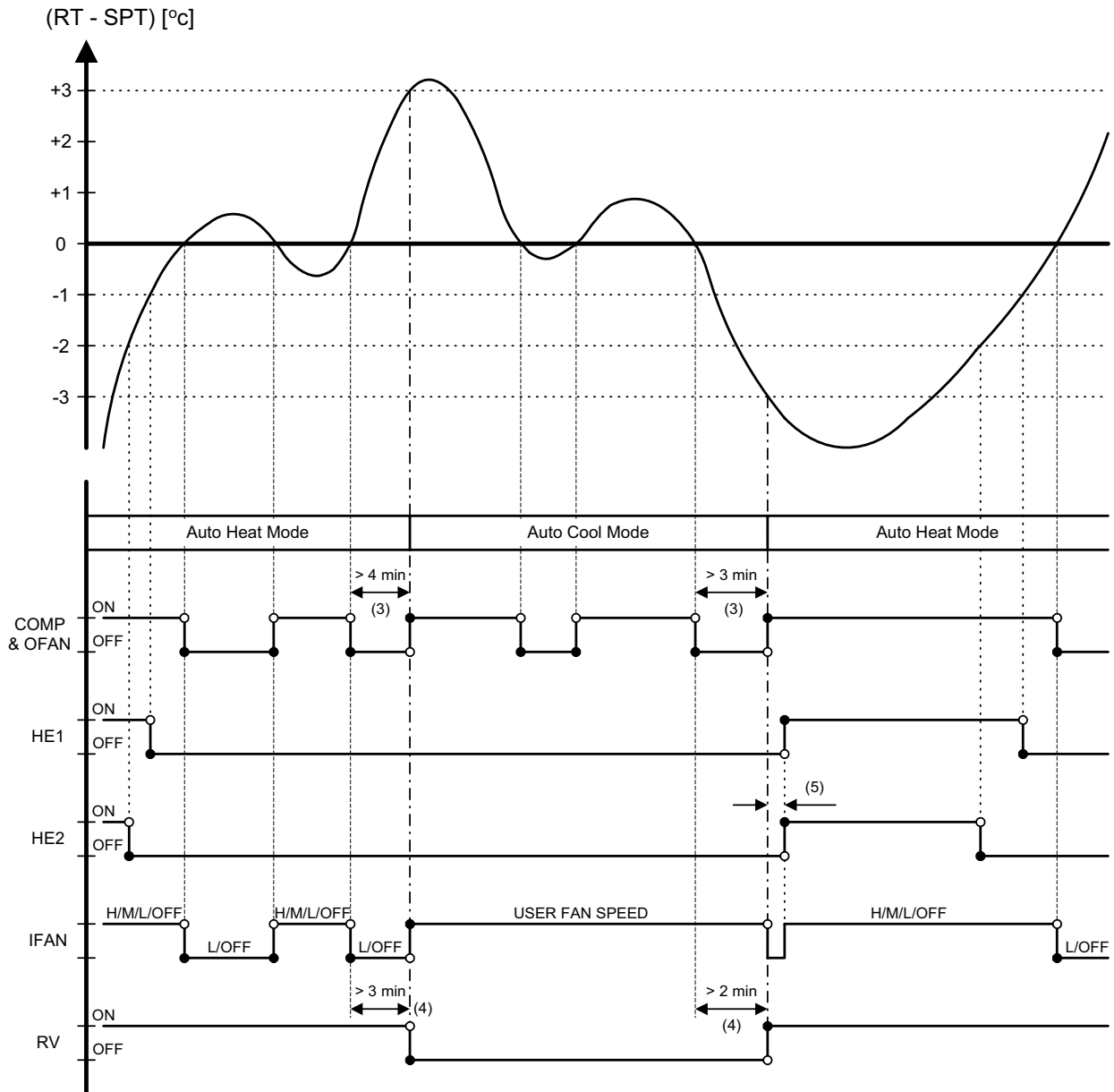
- When unit is changed from Cool/Dry mode to Auto Mode, the unit will continue to operate at (Auto) Cool Mode until the conditions for switching from Auto Cool to Auto Heat are satisfied. Similarly, when unit is changed from Heat Mode to Auto Mode, the unit will continue to operate at (Auto) Heat Mode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



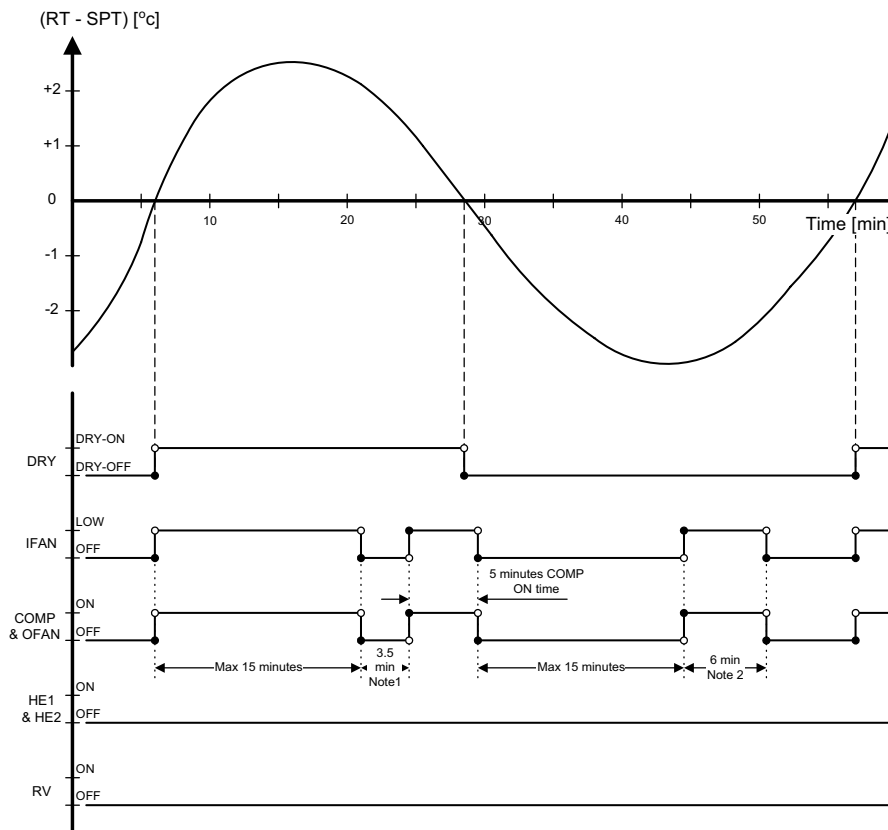
12.8 Dry Mode

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

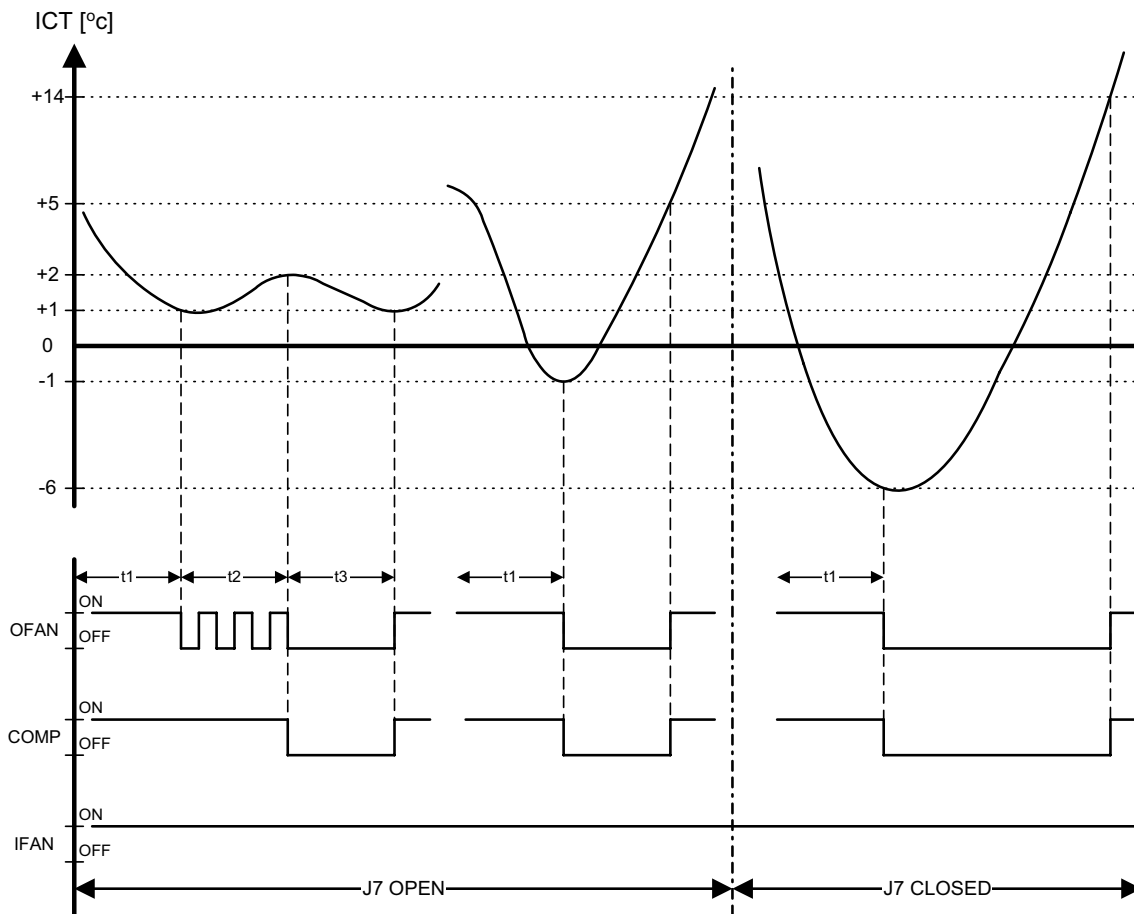
12.9.1 Cooling Mode Protections

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:

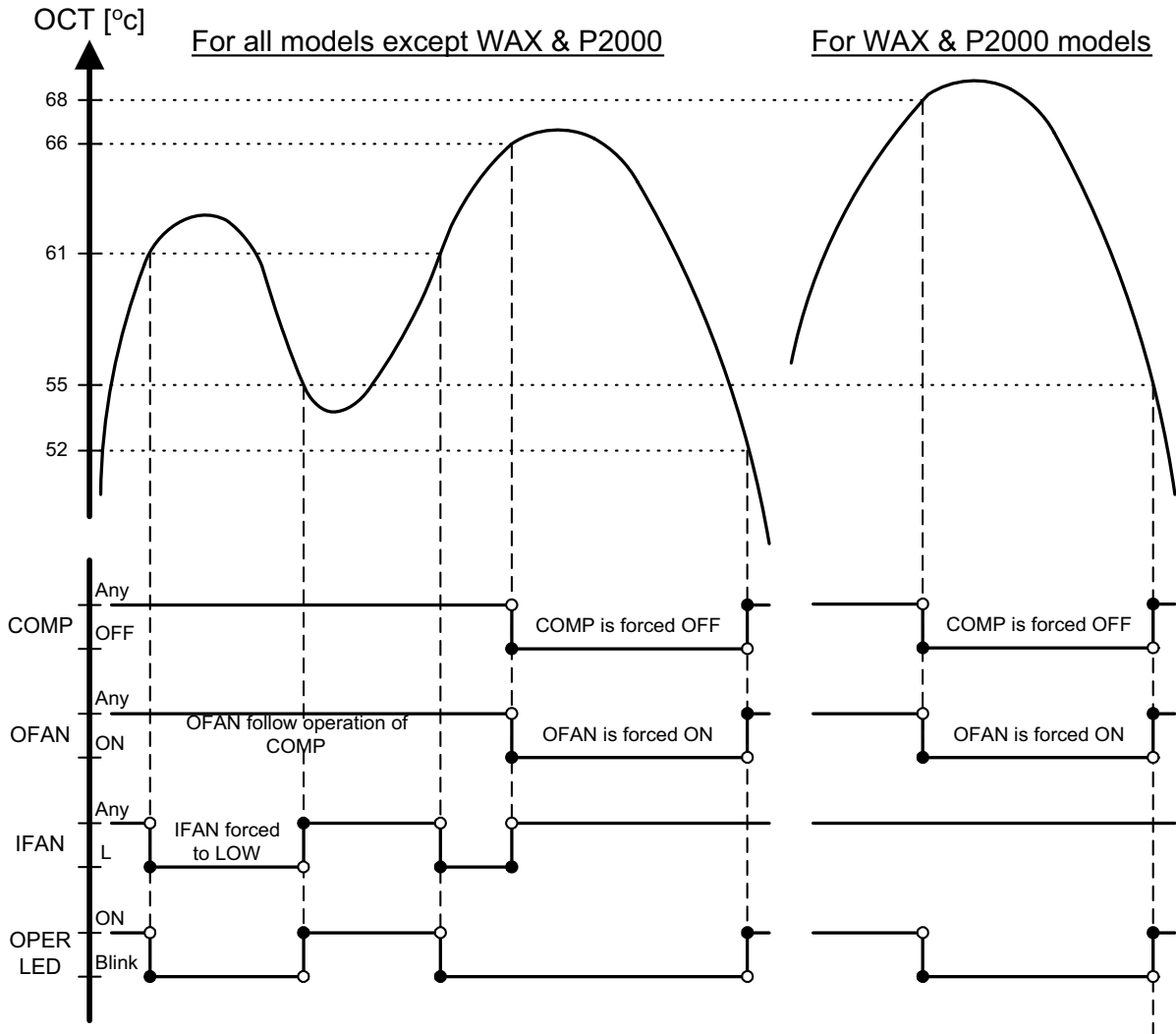
- When J7 is closed (connected), OFAN cycling is cancelled and the set temperature for COMP & OFAN cut-out and cut-in are changed. COMP & OFAN are forced OFF when $ICT \leq -6^{\circ}C$, and are kept OFF until $ICT > 14^{\circ}C$.
- For WAX model, the defrost processes is simpler. When J7 is open, COMP & OFAN are forced OFF when $ICT \leq -1^{\circ}C$, and are kept OFF until $ICT > 5^{\circ}C$. 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

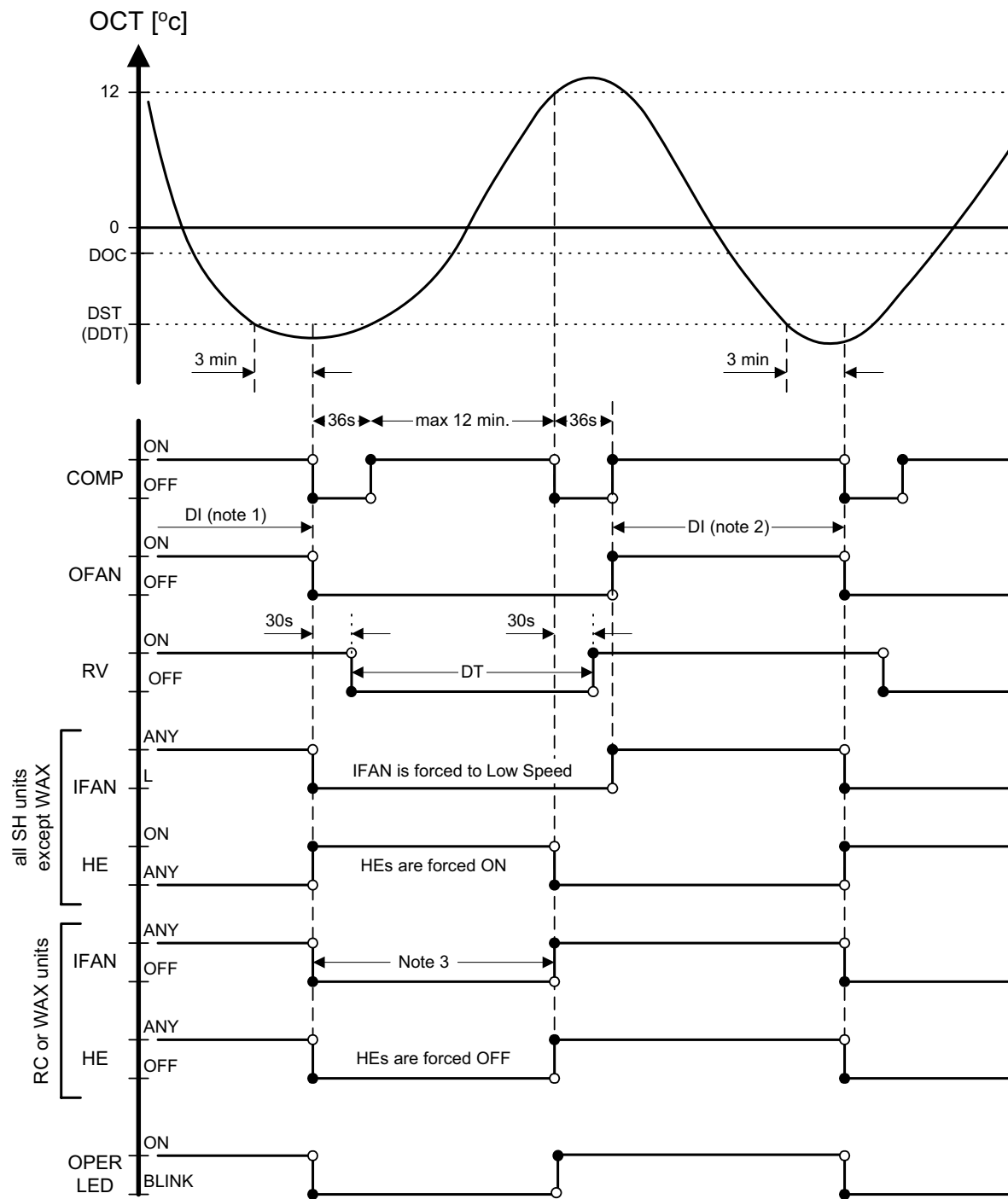
This new deicer is designed to operate at extreme temp conditions. The deicing cycle could be triggered from:

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 :

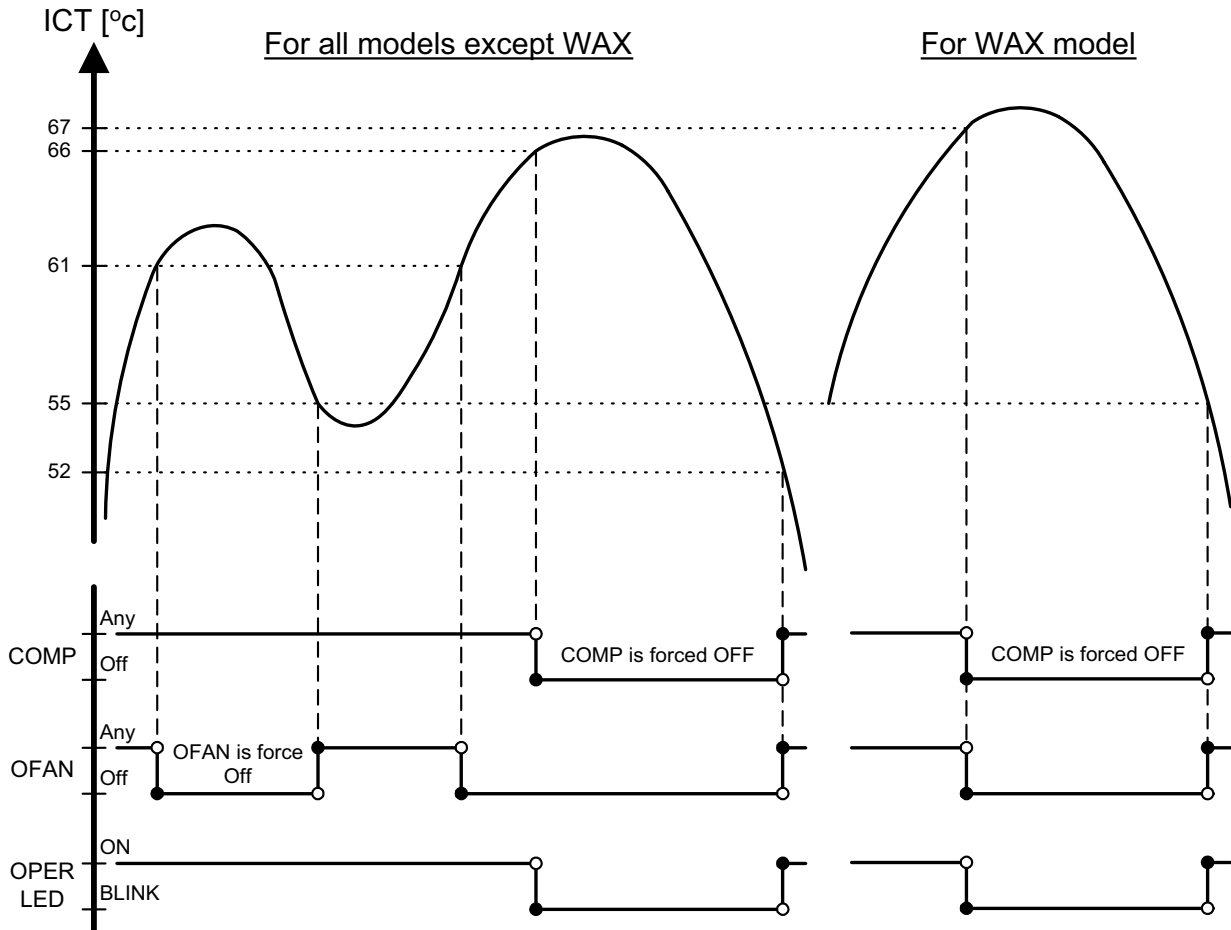
- At the first COMP activation after SB or OFF, if (OCT < 0°C), then DI = 10 min, else DI = 40 min.
- In the following Deicing cycles, the time interval between two Deicing cycles activation is between 30 to 80 min (refer to the flow chart).
- For RC group, HEs are forced OFF. IFAN operation is as in Heat Mode, Sect 4.0.3.a, i.e. IFAN will be set to OFF when ICT < 30°C. 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 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 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 : 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

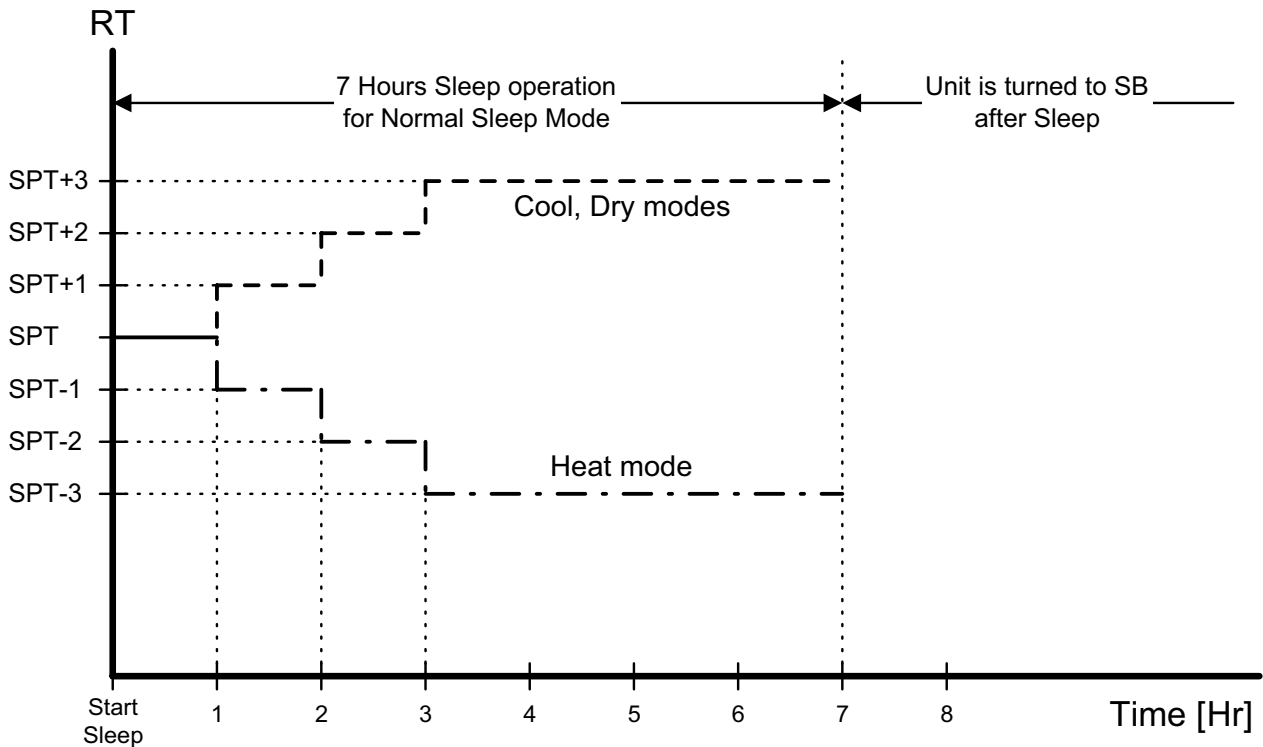
- Mode: Any
- Temp: Set – desired temperature selected
- Fan: Any
- Timer: Interact with Sleep Timer as described in sect 12.2
- I Feel: On or Off

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.

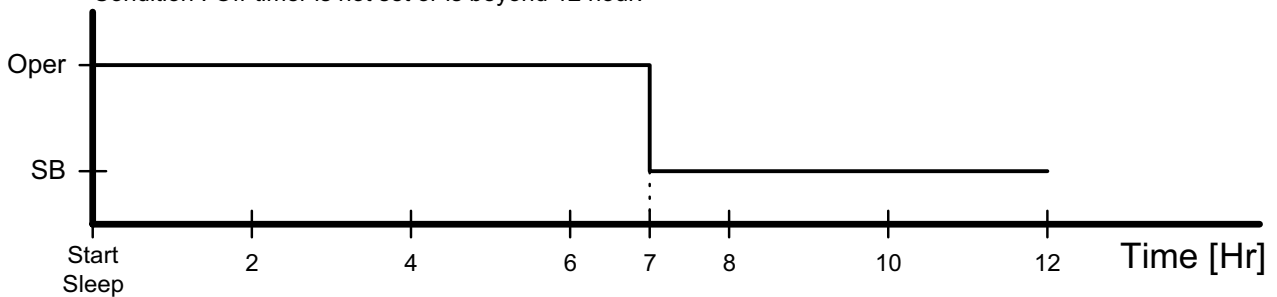
Case 2 is the new Extended Sleep Mode. If an active Off-Timer is set to turn off the A/C between 7-12 hour, relative to the starting of Sleep, the Sleep time is extended.

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.

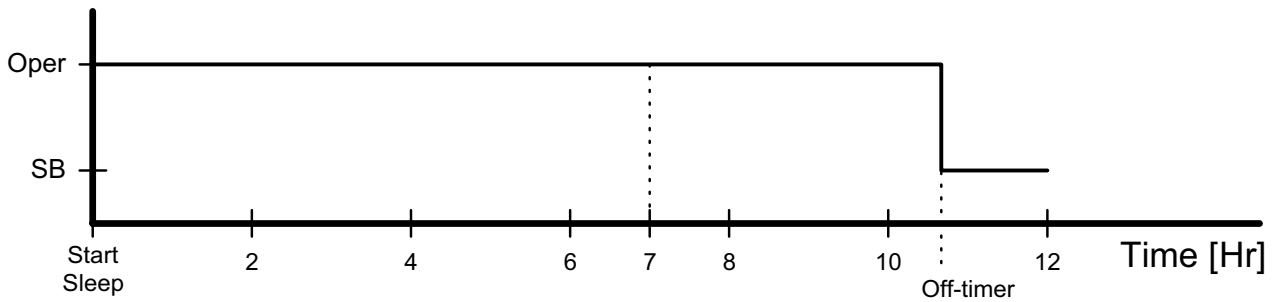
Case 1 : Standard Sleep Mode

Condition : Off-timer is not set or is beyond 12 hour.



Case 2 : Extended Sleep Mode

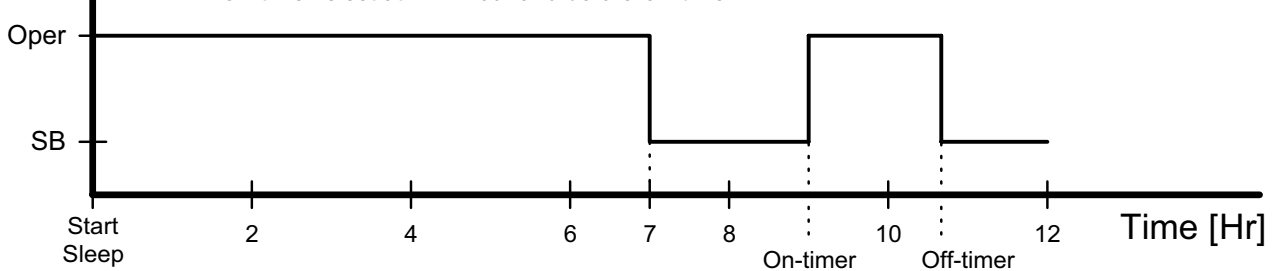
Condition : Off-timer is set at 7-12 hour.



Case 3 : Exception to Case 2

Condition : Off-timer is set at 7-12 hour

On-timer is set at 7-12 hour and before Off-timer



12.13 Clogged Air Filter

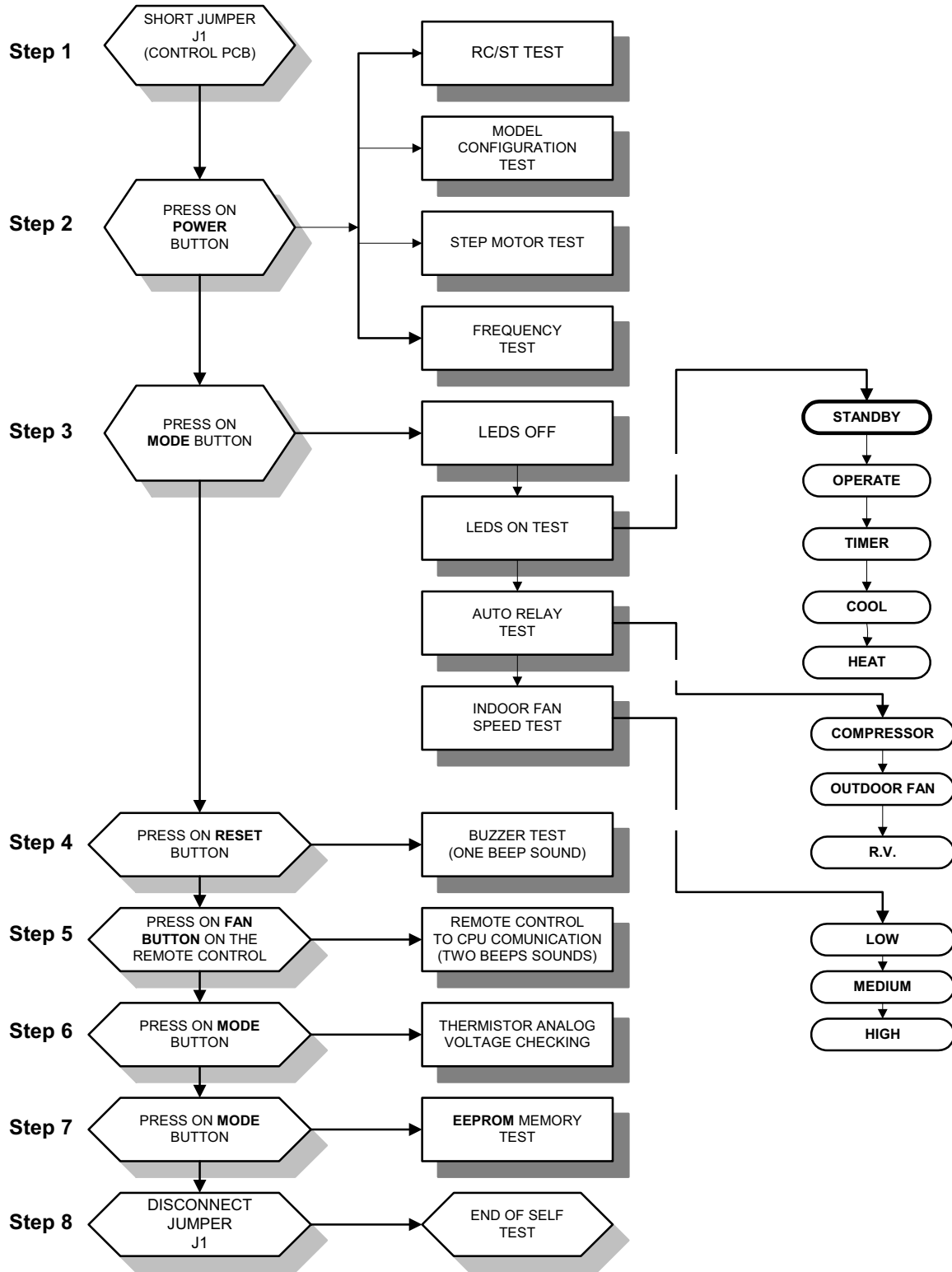
Filter LED ON after 512 HR.

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 °C, 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 <ul style="list-style-type: none"> • 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 <u>on the unit</u> . Show the thermistor status in Diagnostic Mode
HEATING INDICATOR	Lights up when system is switched Heat Mode by using the Mode Switch <u>on the unit</u> . 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 :

- Clock can be interrupted by :
 - R/C - POWER ON/OFF Push-button.
 - R/C - TIMER.
 - R/C - SLEEP.
 - A/C - MODE SWITCH.
- 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.

12B. CONTROL SYSTEM LEX 7-14 LED FULLY FEATURED

12B.1 General Functions

12B.1.1 Operation Modes

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

12B.1.2 Functions

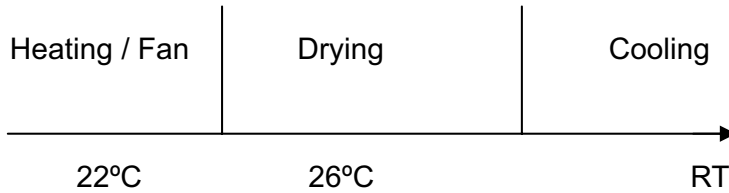
- I FEEL,
- Forced Mode,
- Protection - hot keep, Deicing, defrosting,
- Timer,
- Sleep,
- Fresh Air,
- Ionizer,
- E.S.F,

RCT: remote controller temperature

SPT: set point temperature

12B.2 Operation Modes

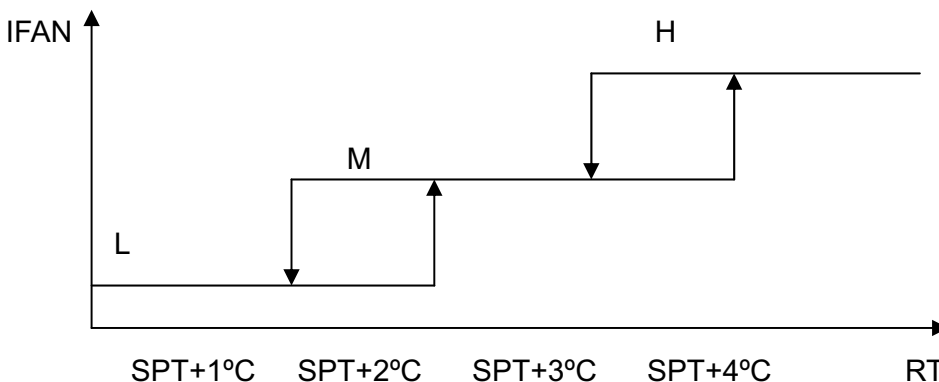
12B.2.1 Auto Mode Operation



- If $RT \geq 26^{\circ}\text{C}$ - A/C will go into Cooling Mode; Initial SPT is 25°C .
 - If $22^{\circ}\text{C} < RT < 26^{\circ}\text{C}$ - A/C go into Drying mode; Initial SPT is 24°C .
 - If $RT \leq 22^{\circ}\text{C}$ - A/C will go into Heating Mode; Initial SPT is 23°C .
 - For Cooling only, If $RT \leq 22^{\circ}\text{C}$ - A/C will go into Fan Mode; Initial SPT is 23°C .
-
- 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.2.2 Cooling Mode

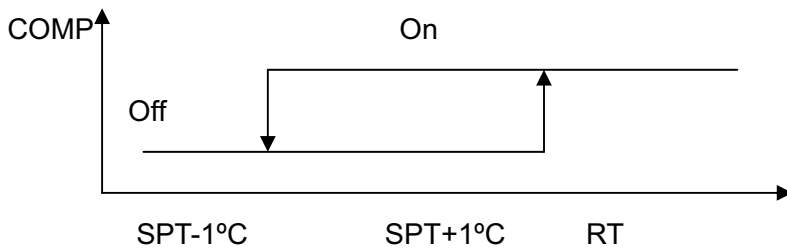
- SPT range: 16°C - 30°C . Initial: 24°C ;
- IFAN speed range: Auto, Low, Mid and High. Initial speed: Hi;
- Auto Fan



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.2.3 Comp' Operation

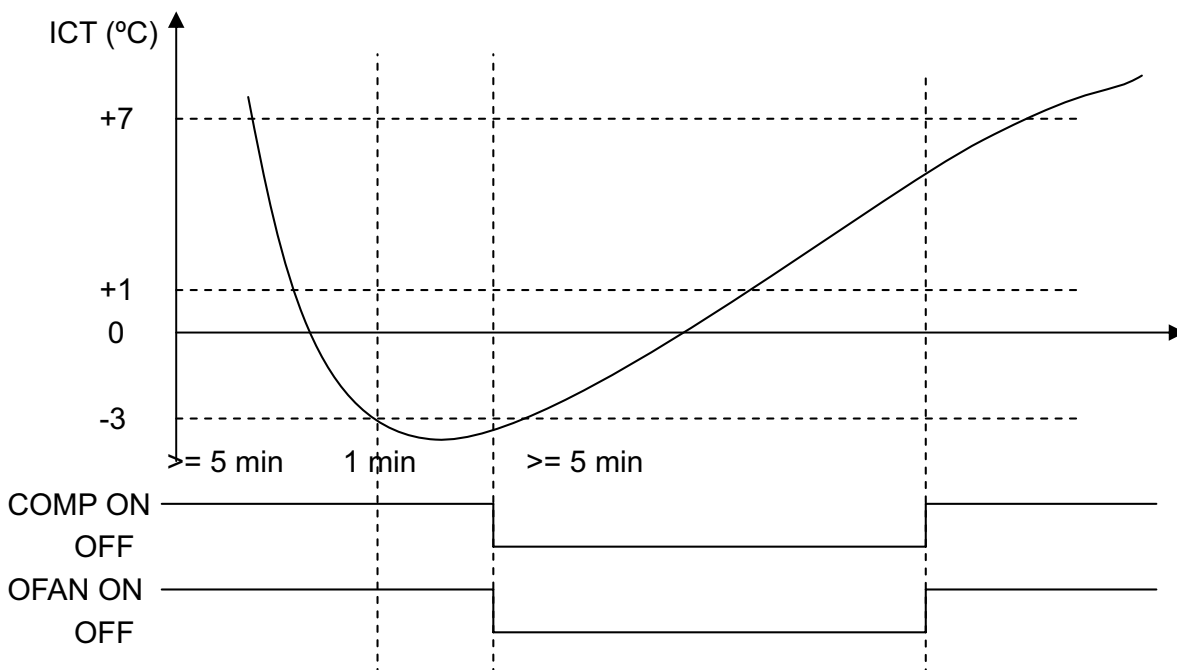


- If $RT \geq SPT+1^{\circ}C$, COMP and OFAN is activated;
- If $RT \leq SPT-1^{\circ}C$, COMP stop, OFAN will turn off after 5 seconds delay.

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

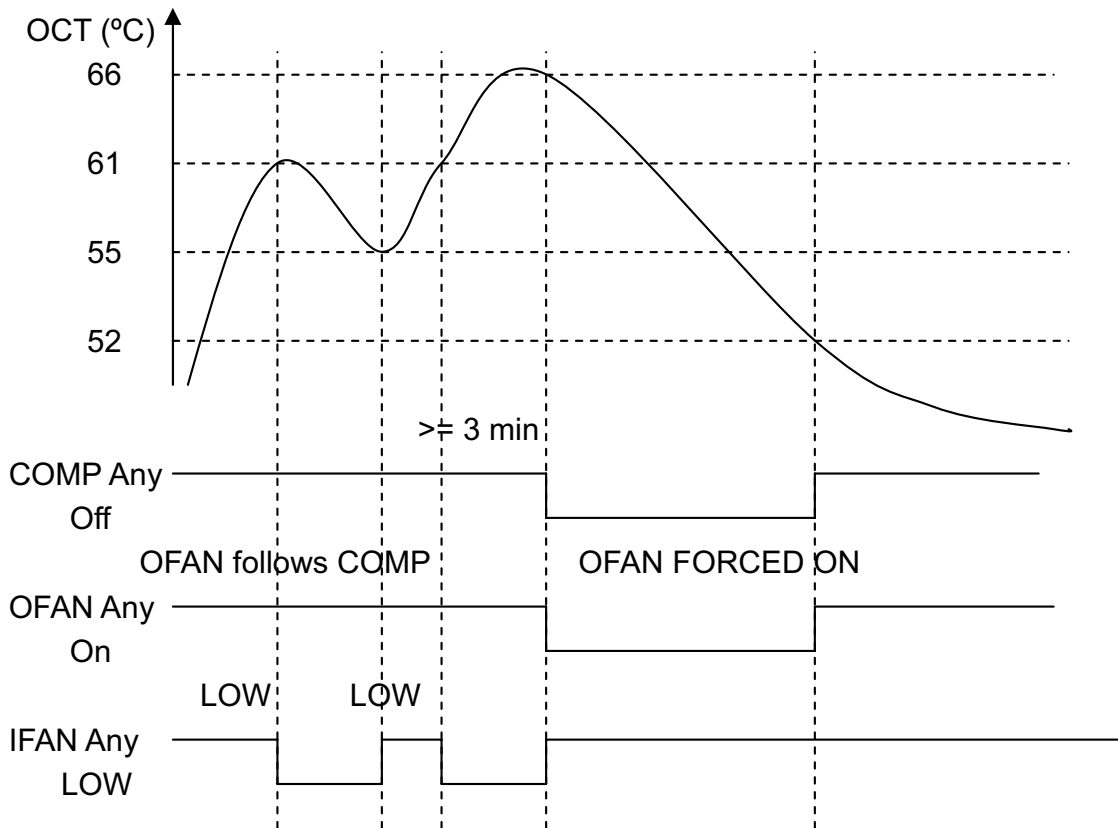
12B.2.4 Defrosting



- IFAN always run at the set speed.
- After COMP is on for 5 minutes, if $(ICT \leq -3^{\circ}C)$ during 1 minute, COMP and OFAN stop. If $(ICT > 7^{\circ}C)$, COMP and OFAN will resume to the normal operation.

Note: If ICT is invalid, defrosting protection cannot be activated

12B.2.5 High Pressure Protection (Excluding cooling only unit type)



- If (OCT $\geq 61^{\circ}\text{C}$), IFAN is forced to LOW. If (OCT $\leq 55^{\circ}\text{C}$), IFAN restore to normal.
- If (OCT $\geq 66^{\circ}\text{C}$), COMP stop and OFAN is forced on. If (OCT $\leq 52^{\circ}\text{C}$), COMP and OFAN will restore to normal operation.

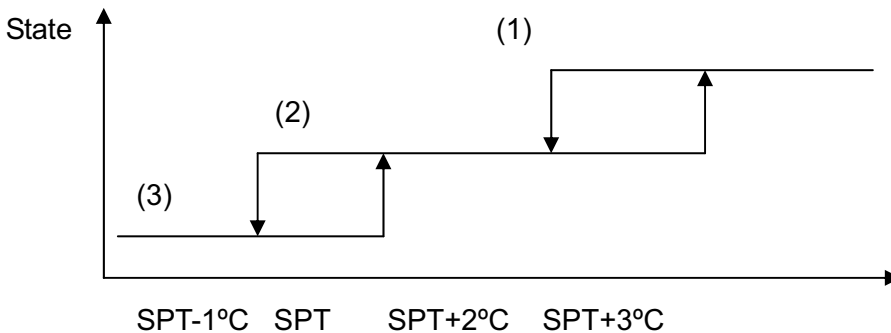
Note: If OCT is invalid, high pressure protection cannot be activated.

12B.2.6 Fan Mode

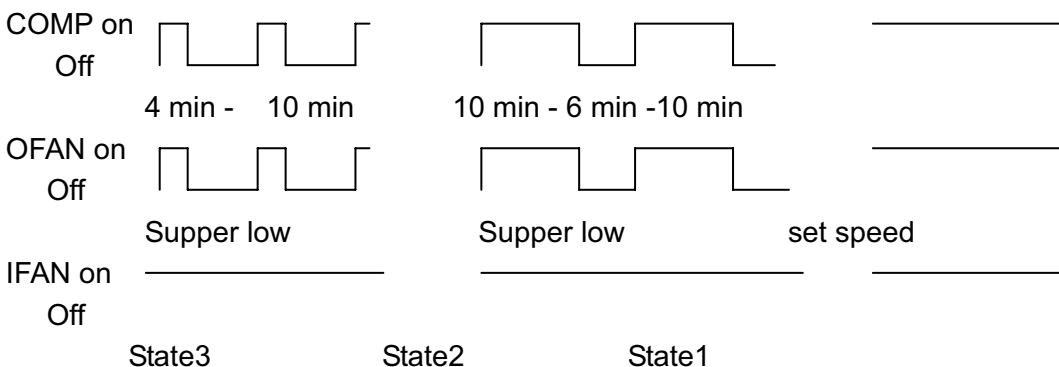
- S.P.T range: $16^{\circ}\text{C}\sim 30^{\circ}\text{C}$. Initial: 24°C ;
- IFAN speed range: Auto, Low, Mid and Hi. Initial speed: High;
- If IFAN is set to Auto Fan, the IFAN will run at Low speed;
- IFAN is always on, COMP, OFAN, AHEAT, RV are always off.

12B.2.7 Drying Mode

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



- If in state (1) - ($SPT - 1^{\circ}C < RT \leq SPT + 2^{\circ}C$), unit will go into state (2)
- If in state (1) or state (2), - ($RT \leq SPT - 1^{\circ}C$), unit will go into state (3)
- If in state (3), - ($SPT \leq RT < SPT + 3^{\circ}C$), unit will go into state (2)
- If in state (2) or state (3), - ($SPT + 3^{\circ}C \leq RT$), unit will go into state (1)



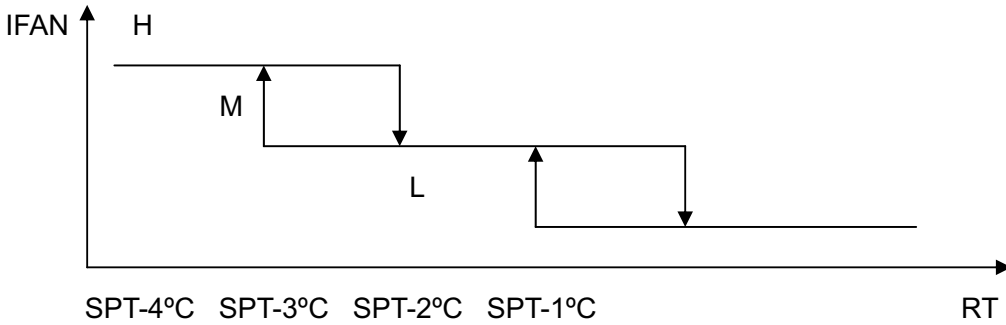
- State (1), COMP & OFAN are on, IFAN runs at the setting fan speed;
- State (2), COMP & OFAN are on for 10 minutes and off for 6 minutes, IFAN speed is always at Supper Low (Note: F/S type is Low);
- State (3), COMP & OFAN are on for 4 minutes and off for 10 minutes, IFAN speed is always at Supper Low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

Note:

1. If $RT \leq 14^{\circ}C$, 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.2.8 Heating Mode

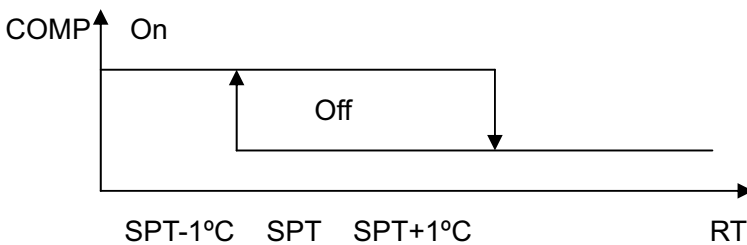
- SPT range: 16°C~30°C. Initial: 24°C;
- In wall mounted units the indoor RT compensation temp' value is - 3°C -> RT, (Excluding I FEEL Mode)
- IFAN speed range: Auto, Low, Mid and Hi. Initial speed: Low;
- Auto Fan



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.2.9 Comp' Operation



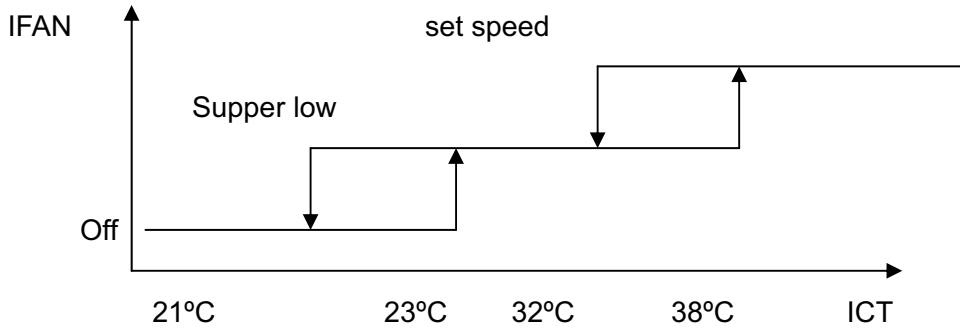
- If $RT \geq SPT+1^\circ C$, COMP stop, OFAN will turn off after a delay of 30 seconds.
- If $RT \leq SPT-1^\circ C$, COMP and OFAN will turn on,

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.

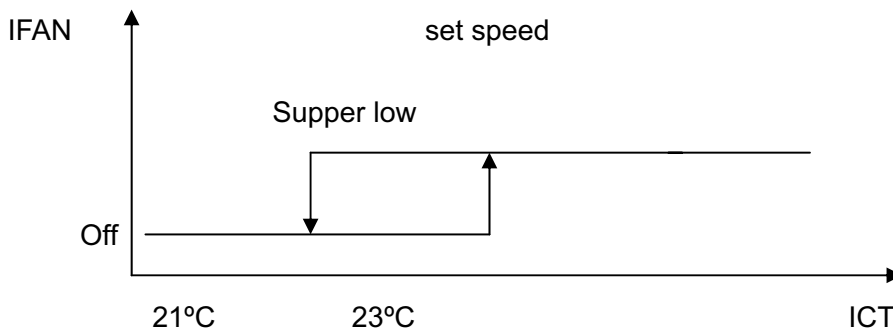
12B.2.10 Hot keep function

COMP on,

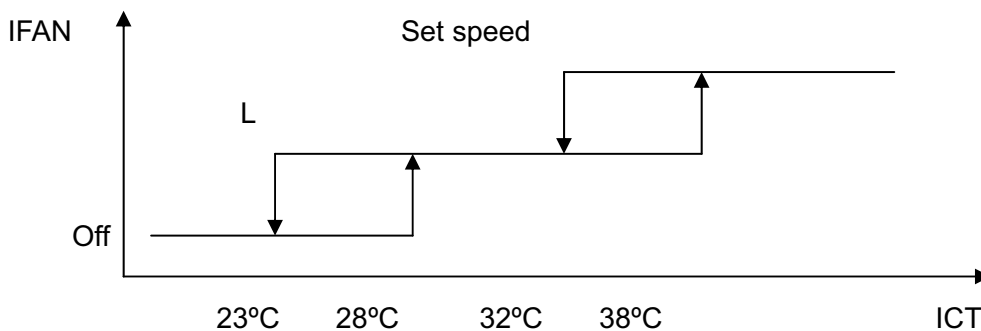


Note: If COMP is on for a period of 4 minutes or (ICT >= 38°C), IFAN is in set speed;

COMP off,



12B.2.11 For F/S

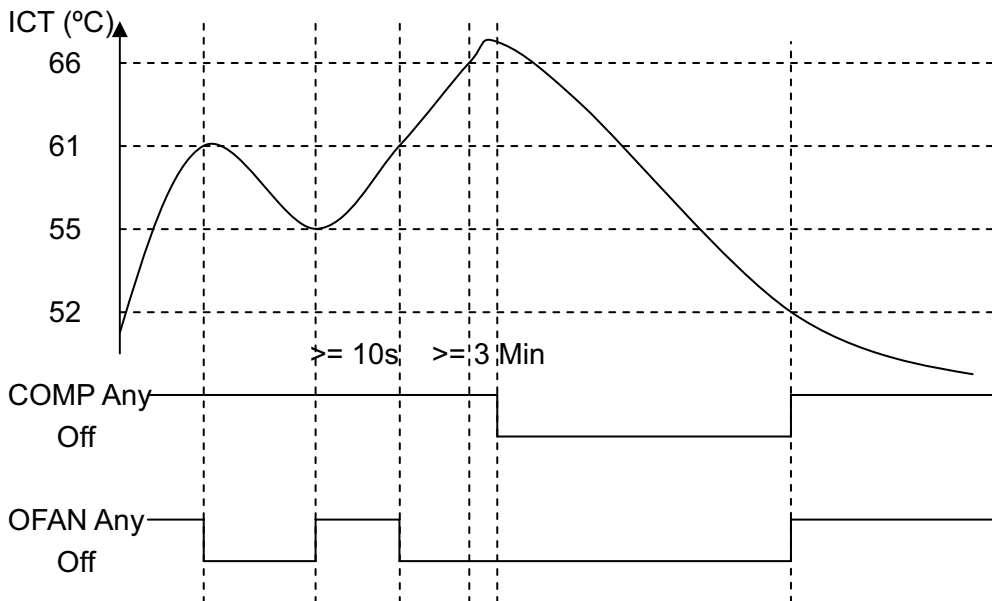


- If COMP turn on and (ICT >= 28°C), IFAN is Low;
- If COMP is on for a period of 4 minutes or (ICT >= 38°C), IFAN is in set speed;
- If COMP off, IFAN keep operating at Low speed for additional 30 seconds and stop.

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.2.12 High Pressure Protection



- If $ICT \geq 61^{\circ}\text{C}$, OFAN turn off. If $ICT \leq 55^{\circ}\text{C}$, OFAN turn on.
- If $(ICT \geq 66^{\circ}\text{C})$ for duration of 10 seconds, COMP turn off. If $ICT \leq 52^{\circ}\text{C}$, COMP turn on.

Note:

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

12B.2.13 Auxiliary Electric Heating

AHEAT will turn on, if all the following conditions are met:

- COMP is on for 60 seconds;
- $RT \leq 20^{\circ}\text{C}$;
- IFAN run at least at LOW speed;
- $RT \leq \text{SPT} - 2^{\circ}\text{C}$;
- $ICT \leq 50^{\circ}\text{C}$.

AHEAT will turn off, if one of the following conditions is filled:

- $RT > 21^{\circ}\text{C}$;
- COMP or IFAN stop;
- $RT \geq \text{SPT} - 1^{\circ}\text{C}$;
- $ICT \geq 55^{\circ}\text{C}$.

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.2.14 Deicing

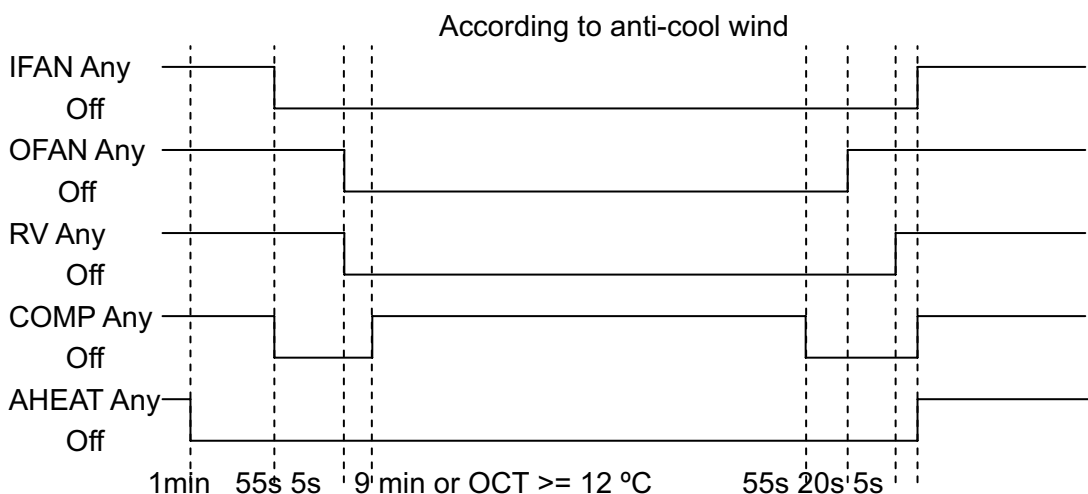
Deicing starts, if OCT $\leq -6^{\circ}\text{C}$ and meets with one of the following conditions:

- ICT $< 39^{\circ}\text{C}$, and IFAN is on for 20 minutes, and COMP is on for 5 minutes, and that ICT decrease 1°C per 6 minutes, occur 3 times;
- ICT $< 39^{\circ}\text{C}$, and (sum of COMP on ≥ 3 Hours), and COMP is on for 20 minutes;
- ICT – RT $< 19^{\circ}\text{C}$ (for F/S :ICT-RT $<16^{\circ}\text{C}$)keep for 5 minutes, and (sum of COMP on) > 45 minutes ,And COMP is on for 20 minutes;
- (4) ICT $\leq 35^{\circ}\text{C}$, 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 $< 39^{\circ}\text{C}$), and COMP keeps on for 30 minutes, and ICT is decreasing 1°C 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 $< -6^{\circ}\text{C}$) keeps for 4 min, (sum of COMP on) > 45 min.

13b.2.14.1 Deicing process:



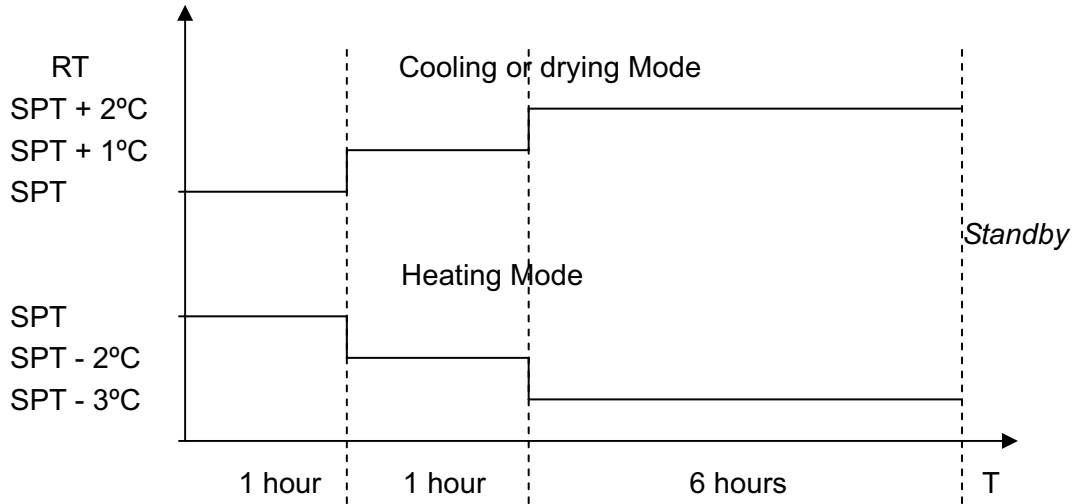
- At the beginning of Deicing, COMP, IFAN, OFAN stop, RV stops after 55 seconds, and then COMP will turn on after 5 seconds.
- Deicing ends if (OCT $\geq 12^{\circ}\text{C}$) or Deicing time is more than 9 minutes.
- Once deicing ends, IFAN operates according to anti-cool fan mode;
- Once deicing ends, 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.3 Other Functions

12B.3.1 Sleep Function



- After 8 hours, it will go into Standby.

Note:

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

12B.3.2 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 from 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.3.3 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.3.4 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.3.5 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.3.6 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.3.7 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
WNG	110	60--110	33--90	33--110

Swing angle: (L/R) this function used for WNG only.

Swing angle:

Left side: 0 - 70°

Right side: 0 - 60°

12B.3.8 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.3.9 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.3.10 Sound Indication

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

12B.3.11 Emergency Function

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

12B.3.12 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.3.13 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.3.14 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.3.15 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.3.16 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.3.17 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.3.18 5 Diagnostic

- If MCU detect that one of the sensors RT, ICT or, OCT is blow -40°C or over 85°C , 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.3.19 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 $25 \pm 2^{\circ}\text{C}$, the power and operating led will turn on;

If RT is not $25 \pm 2^{\circ}\text{C}$, operate led and timer led on; If ICT is not $25 \pm 2^{\circ}\text{C}$, timer and filter led will turn on.

12B.3.20 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

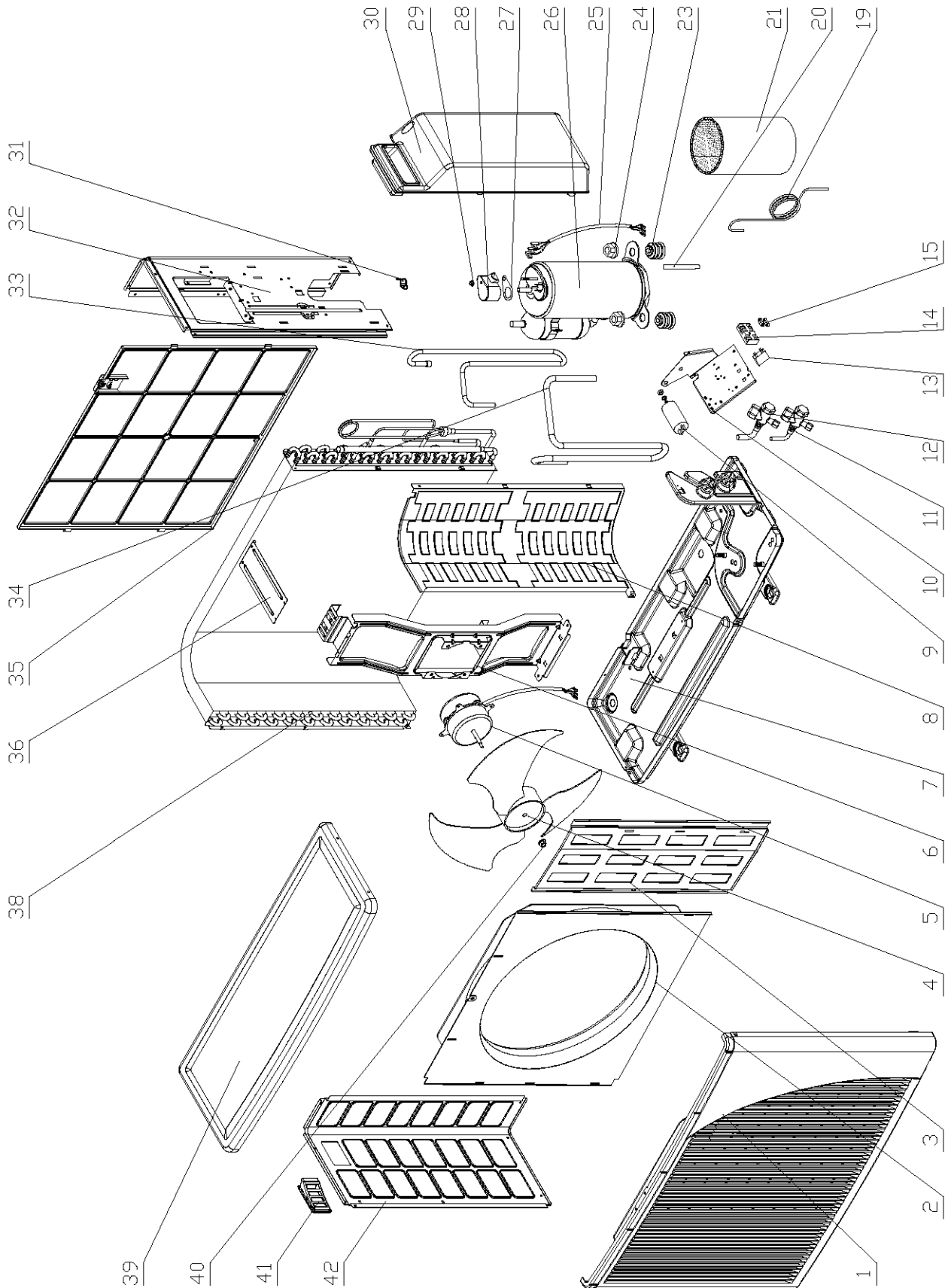
NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
1.	The stand-by indicator (red led) on the central control display panel doesn't light up.	There is no correct voltage between the line and neutral terminals on main P.C.B	-If the voltage is low repair power supply. -If there is no voltage repair general wiring. -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 outdoor 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.

14.1.2 Indoor Unit LEX 7, 9, 12, 14 LED

No.	PN	Description	Qty.
1	465800009	Grill A Assy./LEX7/9/12/14 AIRWELL .	1
	465800016	Grill A Assy./ Electra LEX 7/9/12/14	1
	465800020	Grill A Assy./ LEX7/9/12/14 Bosch	1
	465800021	Grill A Assy./ LEX7/9/12/14 Siemens	1
2	4518655	Air Filter	2
3	4519132	Active Carbon Static Fiber filter	1
	4519744	Low Temperature Catalyst Fiber Filter	1
4	465720059	Front Frame Assy./ LEX7/9/12/14	1
5	4526952	Screw Cover	2
6	4527173	EVAPORATOR ASSY WNG7/9 R410A	1
	4527336	Evaporator Assy WNG12 R410A	1
	453117000	Evaporator Assy./WNG14 R410A	1
	4518683	EVAPORATOR ASSY WNG7/9	1
	4519423	EVAPORATOR ASSY WNG12/14	1
7	4518664	Draining Hose(ordinary)	1
8	4527434	Air Outlet Assy	1
9	4518638	Upper Louver	1
9	4526953	Lower Louver	1
10	4518640	Vert. Louver A	2
	4518641	Vert. Louver B	10
11	4518662	Bearing assy fan	1
12	4518661	Fan assy plastic D91	1
13	465700000	Unit Housing Assy./LEX	1
14	4518670	WNG INSTALLATION PLATE	1
15	4518654	Tube Bracket	1
16	4519864R	Motor (LEX7/9/12/14 with new function)	1
	4519425R	Motor (LEX7 without new function)	1
	4518677	Motor (LEX9 without new function)	1
	4519427R	Motor (LEX12 without new function)	1
	4523706R	Motor (LEX14 without new function)	1
17	4518650	Motor Cover	1
18	452969400	Step Motor A	1
	452969500	Step Motor B	1
19	4521158R	Power cord cable (Euro.)	1
	4520278R	Power cord cable(Without plug)	1
20	4519147	Power Cord Clip	1
	465320006	Wire Fixing Block	1
21	467300080R	Display Board Assy./ LEX7/9/12/14(with new function)	1
22	4518666	Sensor Braket	1
23	467300063R	Controller/WNG Flat (LEX-7) HuaLian MCU With New Function	1
	467300064R	Controller/WNG Flat (LEX-9) HuaLian MCU With New Function	1
	467300065R	Controller/WNG Flat (LEX-12) HuaLian MCU With New Function	1
	467300066R	Controller/WNG Flat (LEX-14) HuaLian MCU With New Function	1
	467300086R	Controller/WNG Flat (LEX-12) HuaLian MCU With New Function R22	1
	467300087R	Controller/WNG Flat (LEX-14) HuaLian MCU With New Function R22	1
	467300053R	Controller/WNG Flat (LEX7/9/12/14) HuaLian MCU Without New Function	1
24	438082	Thermistor Indoor coil BLACK	1
25	4519813	Thermistor room	1
26	465340012	Terminal Cover	1
27	4518663	ELECTROSTATIC FLITER WNG-1	1
	4519338	FILTER FRAME(Optional)	1
28	4520416	Defrost cable EXPORT UNITS (For LEX7/9/12/14)	1
29	452760600R	RC-4 Remote controller(HL)	1
	4521197	remote controller RC3 (silver)	1
30	4518651	Cover Side Motor	1
31	none	none	
32	4518682	Gear BOX ASSY	1
33	4518646	Louver Support	2
34	4518868	Transformer For LEX7/9/12/14 (Optional)	1
35	4518657	Tube Lock	1
36	4518656	Mounting Hook	1
37	4519900	IONIZER CABLE A (Optional)	1
38	467430000	Power Supply Unit /Ionizer(Optional)	1
39	467480001	Ionizer/WNG NWNG SERIES(Optional)	1
	4526951	Ionizer Cover (Optional)	1
40	465800018	Air Inlet Frame A Assy.	1

14.1.3 Outdoor Unit ONG 7, 9, 12 ST



14.1.4 Outdoor Unit ONG 7 ST

Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433218	Front Panel A	1	1	05-Mar-04	Active
433221	Air Inlet Ring-420	1	2	05-Mar-04	Active
433223	Painting Insulation Plate	1	3	05-Mar-04	Active
4519251	Axial Fan OD=400	1	4	05-Mar-04	Active
4526591	Motor YYK30Z-6	1	5	05-Mar-04	Active
433215	Motor Support	1	6	05-Mar-04	12-Mar-04
4527203	Motor Support	1	6	12-Mar-04	Active
4519601	Base Painting Assy.	1	7	05-Mar-04	12-Mar-04
4526747	Base Painting Assy.	1	7	12-Mar-04	Active
433217	Partition Plate	1	8	05-Mar-04	Active
455000502	Compressor Capacitor 35uF With Screw	1	9	05-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	05-Mar-04	Active
4524176	1/4 Liquid Valve(R410A)	1	11	05-Mar-04	Active
4524177	3/8 Gas Valve(R410A)	1	12	05-Mar-04	Active
455000000	single patch Capacitor for fan	1	13	05-Mar-04	Active
4514588	5 Poles terminal block	1	14	05-Mar-04	Active
204107	Cable clip Nylon	1	15	05-Mar-04	Active
236179	2 Poles terminal block	1	16	05-Mar-04	11-Mar-04
4516637	Out sensor Black	1	17	05-Mar-04	11-Mar-04
4526614	Capillary	1	19	05-Mar-04	02-Sep-04
4526606	Capillary Assy.(ST)	1	19	02-Sep-04	Active
4525650	Charge tube	1	20	05-Mar-04	Active
4526608	Compressor Jacket	1	21	05-Mar-04	12-Mar-04
452799600	Compressor Jacket ONG3-7	1	21	12-Mar-04	Active
4519610	Compressor Isolation. Top Cover	1	22	05-Mar-04	11-Mar-04
4514091	Grommet	3	23	05-Mar-04	Active
4510677	Nut With Flange M8 -D=24	3	24	05-Mar-04	Active
4519987	Wire assy	1	25	05-Mar-04	12-Mar-04
4527008	Wire assy	1	25	12-Mar-04	Active
4526578	Compressor Assy. LG GK086P	1	26	05-Mar-04	Active
4514088	Gasket	1	27	05-Mar-04	Active
4516824	Cover Terminal	1	28	05-Mar-04	Active
4514089	Nut hex	1	29	05-Mar-04	Active
433229	cover valve	1	30	05-Mar-04	Active
433234	Clamp	1	31	05-Mar-04	Active
4518950	Filter Drier BFK-053S	1	31	05-Mar-04	11-Mar-04
4519606	Right side panel (painting plate)	1	32	05-Mar-04	Active
4527323	2 Discharge Pipe Assy. 2 (7ST)	1	33	11-Mar-04	Active
4526574	Suction Tubing 1 (7ST)	1	34	05-Mar-04	Active
433228	Back Side Net	1	35	05-Mar-04	Active
433216	Bridge	1	36	05-Mar-04	Active
433235	SPACER A 22*1	1	37	05-Mar-04	11-Mar-04
4526615	Condensor Soldering Assy	1	38	05-Mar-04	Active
4519614	Painting Top Cover	1	39	05-Mar-04	Active
4519300	Nut M5 L	1	40	05-Mar-04	Active
433225	Handle	1	41	05-Mar-04	Active
4519607	Left Side Panel Painting Plate	1	42	05-Mar-04	Active
4526573	Discharge Tubing	1	43	05-Mar-04	11-Mar-04

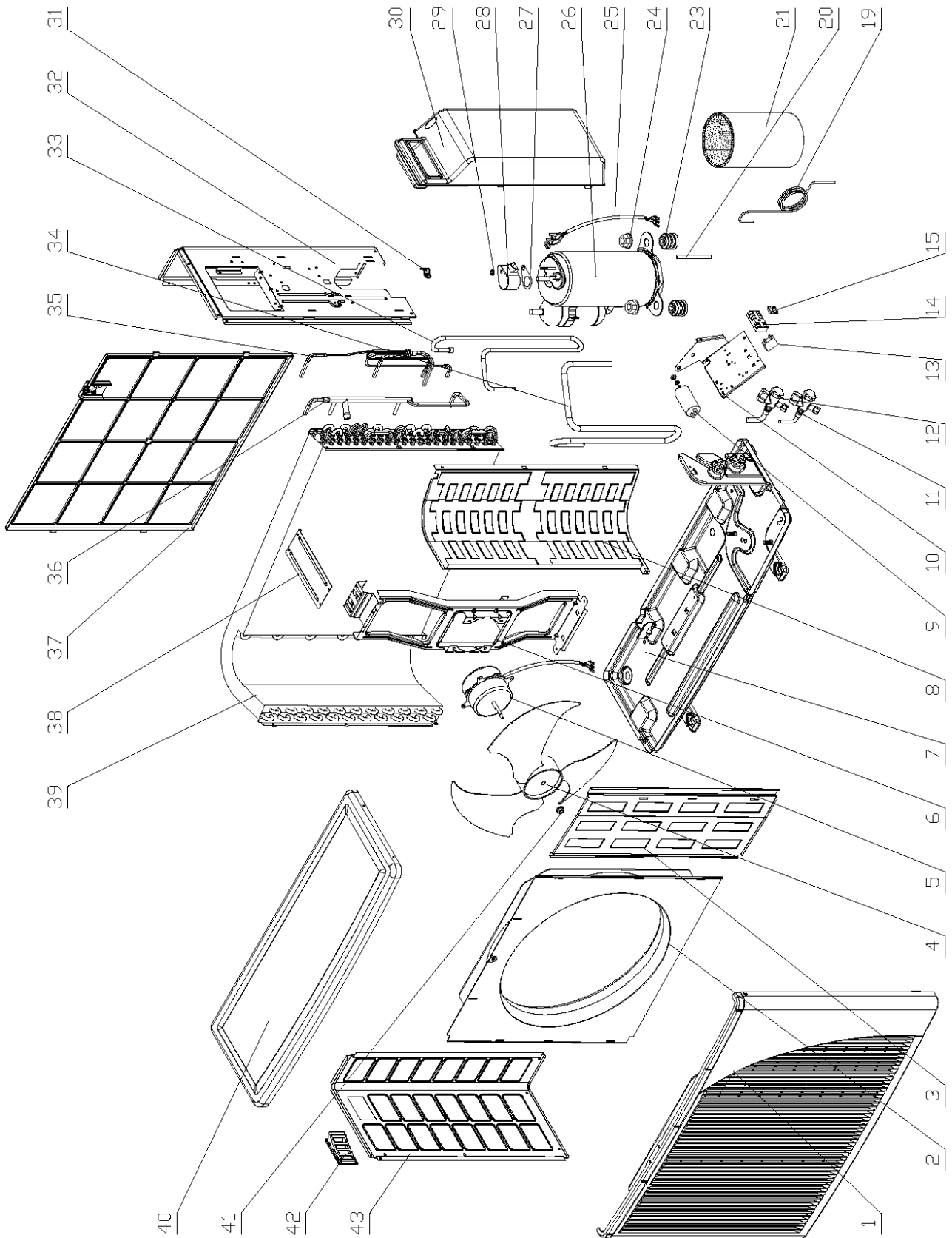
14.1.5 Outdoor Unit ONG 9 ST

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433218	Front Panel A	1	1	05-Mar-04	Active
433219	Front Panel A1	1	1	05-Mar-04	05-Mar-04
433221	Air Inlet Ring-420	1	2	05-Mar-04	Active
433223	Painting Insulation Plate	1	3	05-Mar-04	Active
4519251	Axial Fan OD=400	1	4	05-Mar-04	Active
4519250	Fan Motor YDK30-6V	1	5	05-Mar-04	Active
433215	Motor Support	1	6	05-Mar-04	05-Mar-04
4527203	Motor Support	1	6	05-Mar-04	Active
4526747	Base Painting Assy.	1	7	05-Mar-04	Active
433217	Partition Plate	1	8	05-Mar-04	Active
455000503	Compressor Capacitor With Screw	1	9	05-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	05-Mar-04	Active
4524176	1/4 Liquid Valve(R410A)	1	11	05-Mar-04	Active
4524177	3/8 Gas Valve(R410A)	1	12	05-Mar-04	Active
455000001	single patch Capacitor for fan	1	13	05-Mar-04	Active
4514588	5 Poles terminal block	1	14	05-Mar-04	Active
204107	Cable clip Nylon	1	15	05-Mar-04	Active
4527281	Capillary Assy	1	19	05-Mar-04	Active
4527362	Charge tube TP2 6.35x0.8	1	20	05-Mar-04	Active
452799601	Compressor Jacket ONG3-9	1	21	05-Mar-04	Active
4510677	Nut With Flange M8 -D=24	1	24	05-Mar-04	Active
4527008	Wire assy	1	25	05-Mar-04	Active
4524230	Compressor assy. GK113PAG	1	26	05-Mar-04	Active
4516826	Rubber washer	1	27	05-Mar-04	Active
4516825	Cover Terminal	1	28	05-Mar-04	Active
4514089	Nut hex	1	29	05-Mar-04	Active
433229	cover valve	1	30	05-Mar-04	Active
433234	Clamp	1	31	05-Mar-04	Active
4519606	Right side panel (painting plate)	1	32	05-Mar-04	Active
4527279	Discharge Tube Assy 2 £"9ST)	1	33	05-Mar-04	Active
4527280	Suction Tube 1	1	34	05-Mar-04	Active
433228	Back Side Net	1	35	05-Mar-04	Active
433216	Bridge	1	36	05-Mar-04	Active
4527155	condensor Soldering assy	1	38	05-Mar-04	Active
4519614	Painting Top Cover	1	39	05-Mar-04	Active
4519300	Nut M5 L	1	40	05-Mar-04	Active
433225	Handle	1	41	05-Mar-04	Active
4519607	Left Side Panel Painting Plate	1	42	05-Mar-04	Active
4514091	Grommet	1	230	05-Mar-04	Active

14.1.6 Outdoor Unit ONG 12 ST

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433218	Front Panel A	1	1	15-Nov-03	13-Jan-04
433219	Front Panel A1	1	1	13-Jan-04	Active
433221	Air Inlet Ring-420	1	2	15-Nov-03	Active
433223	Painting Insulation Plate	1	3	15-Nov-03	Active
4519251	Axial Fan OD=400	1	4	15-Nov-03	Active
4519692	Fan Motor (810rpm)	1	5	15-Nov-03	Active
433215	Motor Support	1	6	15-Nov-03	16-Feb-04
4527203	Motor Support	1	6	16-Feb-04	Active
4519601	Base Painting Assy.	1	7	15-Nov-03	15-Nov-03
4526747	Base Painting Assy.	1	7	15-Nov-03	16-Feb-04
452772500	Base Plate Painting Assy.	1	7	16-Feb-04	Active
433217	Partition Plate	1	8	15-Nov-03	Active
4517993	Cap. 35uF/450V	1	9	15-Nov-03	29-Dec-03
455000504	Compressor Capacitor With Screw	1	9	29-Dec-03	Active
4519611	Electric Panel Painting Plate	1	10	15-Nov-03	Active
4524176	1/4 Liquid Valve(R410A)	1	11	15-Nov-03	Active
4524595	1/2 Gas Valve for ONG R410A	1	12	15-Nov-03	13-Jan-04
4524177	3/8 Gas Valve(R410A)	1	12	13-Jan-04	Active
4517990	Cap. 2uF/450V	1	13	15-Nov-03	08-Jan-04
455000001	single patch Capacitor for fan	1	130	08-Jan-04	09-Feb-04
455000108	Double patch Capacitor for fan	1	13	09-Feb-04	Active
4514588	5 Poles terminal block	1	14	15-Nov-03	Active
204107	Cable clip Nylon	1	15	15-Nov-03	Active
236179	2 Poles terminal block	1	16	15-Nov-03	16-Feb-04
4516637	Out sensor Black	1	17	15-Nov-03	16-Feb-04
4525210	Restrictor (031)	1	18	15-Nov-03	13-Jan-04
4524923	Capillary 2.6*1.6*800	1	19	15-Nov-03	13-Jan-04
4526848	Capillary Assy. (OD2.6xID1.6x1000)	1	19	13-Jan-04	Active
4525650	Charge tube	1	20	15-Nov-03	13-Jan-04
4527362	Charge tube TP2 1?6.35x0.8	1	20	13-Jan-04	Active
4519600	Compressor Jacket	1	21	15-Nov-03	13-Jan-04
4527007	Comp. Jacket	1	21	13-Jan-04	16-Feb-04
4527058	Comp. Jacket	1	21	16-Feb-04	Active
4519610	Compressor Isolation. Top Cover	1	22	15-Nov-03	13-Jan-04
4514091	Grommet	3	23	15-Nov-03	15-Nov-03
4516357	Rubber Cushion 1K15910311	3	23	15-Nov-03	Active
4510677	Nut With Flange M8 -D=24	3	24	15-Nov-03	Active
4519987	Wire assy	1	25	15-Nov-03	13-Jan-04
4527008	Wire assy	1	25	13-Jan-04	16-Feb-04
4519987	Wire assy	1	25	16-Feb-04	Active
4524232	Compressor assy. GK151PAD	1	26	15-Nov-03	15-Nov-03
4526452	Comp. Assy GMCC PA145X2C-4FT	1	26	15-Nov-03	Active
4516359	Terminal Packing 1K14720130	1	27	15-Nov-03	Active
4516826	Rubber washer	1	27	15-Nov-03	15-Nov-03
4516358	Terminal Cover 1K14720012	1	28	15-Nov-03	Active
4516825	Cover Terminal	1	28	15-Nov-03	15-Nov-03
4514089	Nut hex	1	29	15-Nov-03	15-Nov-03
4516360	Terminal Nut 1K14300710	1	29	15-Nov-03	Active
433229	Valve Cover	1	30	15-Nov-03	Active
433234	Clamp	1	31	15-Nov-03	Active
4518950	Filter Drier BFK-053S	1	31	15-Nov-03	13-Jan-04
4519606	Right side panel (painting plate)	1	32	15-Nov-03	Active
4526790	Discharge Tube Assy.	1	33	15-Nov-03	Active
4525081	Suction Tube 12.7*0.8*1090	1	42	15-Nov-03	15-Nov-03
4526791	Suction Tube Assy	1	34	15-Nov-03	Active
433228	Back Side Net	1	35	15-Nov-03	Active
433216	Bridge	1	36	15-Nov-03	Active
433235	SPACER A 22*1	1	37	15-Nov-03	16-Feb-04
4525529	condensor Soldering assy	1	47	15-Nov-03	13-Jan-04
4526806	condensor Soldering assy	1	38	13-Jan-04	16-Feb-04
4526804	condensor Soldering assy	1	38	16-Feb-04	Active
4519614	Painting Top Cover	1	39	15-Nov-03	Active
4519300	Nut M5 L	1	40	15-Nov-03	Active
433225	Handle	1	41	15-Nov-03	Active
4519607	Left Side Panel Painting Plate	1	42	15-Nov-03	Active
4525080	Discharge Tube 9.53*0.8*470	1	43	15-Nov-03	15-Nov-03

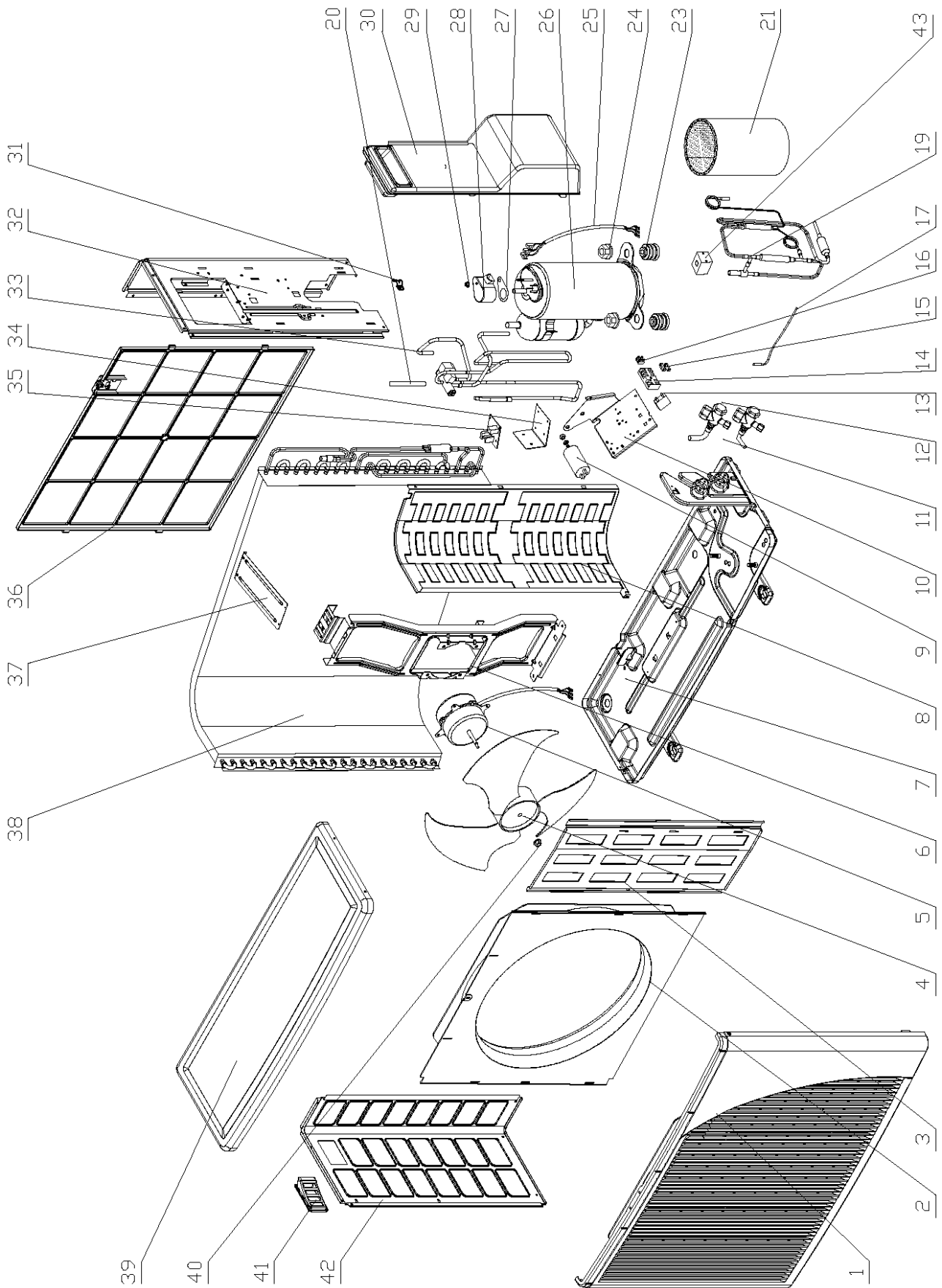
14.1.7 Outdoor Unit ONG 14 ST



14.1.8 Outdoor Unit ONG 14 ST

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433219	Front Panel A1	1	1	01-Mar-04	15-Mar-04
433218	Front Panel A	1	1	15-Mar-04	Active
433221	Air Inlet Ring-420	1	2	01-Mar-04	Active
433223	Painting Insulation Plate	1	3	01-Mar-04	Active
4519251	Axial Fan OD=400	1	4	01-Mar-04	Active
4520171	Fan Motor (910rpm)	1	5	01-Mar-04	Active
4527203	Motor Support	1	6	01-Mar-04	Active
4527255	Base Painting Assy.	1	7	01-Mar-04	Active
4527202	Partition Plate	1	8	01-Mar-04	Active
455000503	Compressor Capacitor With Screw	1	9	01-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	01-Mar-04	Active
4524176	1/4 Liquid Valve(R410A)	1	11	01-Mar-04	Active
4524595	1/2 Gas Valve for ONG R410A	1	12	01-Mar-04	Active
455000108	Double patch Capacitor for fan	1	13	01-Mar-04	Active
4514588	5 Poles terminal block	1	14	01-Mar-04	Active
204107	Cable clip Nylon	1	15	01-Mar-04	Active
236179	2 Poles terminal block	1	16	01-Mar-04	Active
4516637	Out sensor Black	1	17	01-Mar-04	Active
4526918	Valve & Capillary Assy	1	19	01-Mar-04	01-Mar-04
4526919	Capillary Assy ID1.6x600	1	19	01-Mar-04	Active
4527362	Charge tube TP2 1/8"6.35x0.8	1	20	01-Mar-04	Active
4527058	Comp. Jacket	1	21	01-Mar-04	Active
4527287	Grommet	3	23	01-Mar-04	Active
4510677	Nut With Flange M8 -D=24	3	24	01-Mar-04	Active
4519987	Wire assy	1	25	01-Mar-04	Active
4526453	Compressor Assy. RN165VHSMT	1	26	01-Mar-04	Active
4527289	Terminal Packing	1	27	01-Mar-04	Active
4527285	Terminal Cover SC01D024	1	28	01-Mar-04	Active
4527286	Terminal Nut	1	29	01-Mar-04	Active
433229	valve cover	1	30	01-Mar-04	Active
433234	Clamp	1	31	01-Mar-04	Active
4519606	Right side panel (painting plate)	1	32	01-Mar-04	Active
4526794	4-way Valve Welding Assy.	1	33	01-Mar-04	01-Mar-04
4526797	Discharge Tube Assy.	1	33	01-Mar-04	Active
4526798	ASuction Tube A	1	34	01-Mar-04	Active
4526911	Distribution Capillary Assy	1	35	01-Mar-04	Active
4526903	Collection tube Assy	1	36	01-Mar-04	Active
433228	Back Side Net	1	37	01-Mar-04	Active
433216	Bridge	1	38	01-Mar-04	Active
4526808	condensor assy	1	39	01-Mar-04	01-Mar-04
4526809	condensor assy	1	39	01-Mar-04	25-Aug-04
4526796	condensor Soldering assy	1	39	25-Aug-04	Active
4519614	Painting Top Cover	1	40	01-Mar-04	Active
4519300	Nut M5 L	1	41	01-Mar-04	Active
433225	Handle	1	42	01-Mar-04	Active
4519607	Left Side Panel Painting Plate	1	43	01-Mar-04	Active

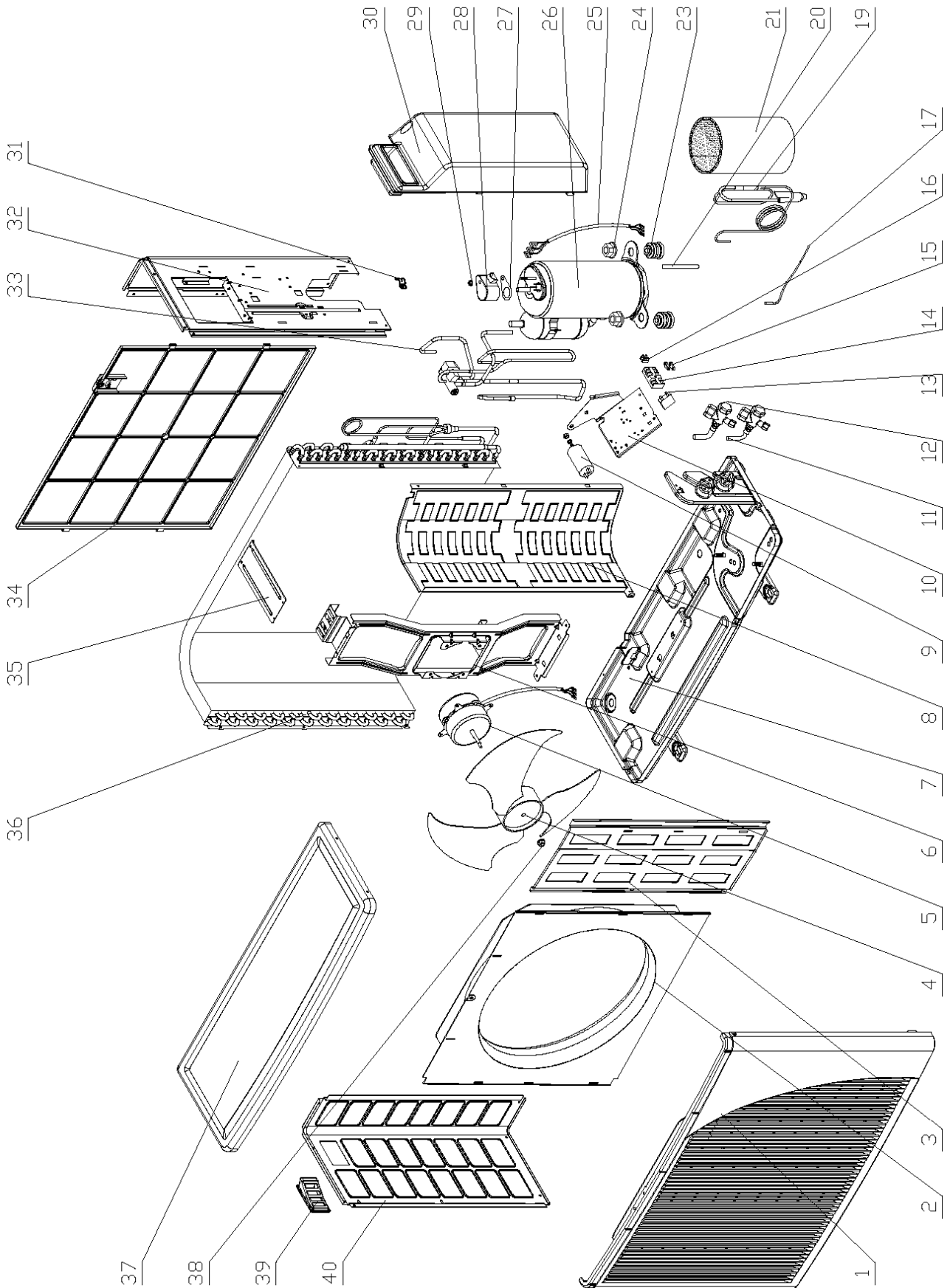
14.1.9 Outdoor Unit ONG 7 RC



14.1.10 Outdoor Unit ONG 7 RC

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433218	Front Panel A	1	1	05-Mar-04	Active
433219	Front Panel A1	1	1	05-Mar-04	05-Mar-04
433221	Air Inlet Ring-420	1	2	05-Mar-04	Active
433223	Painting Insulation Plate	1	3	05-Mar-04	Active
4519251	Axial Fan OD=400	1	4	05-Mar-04	Active
4519692	Fan Motor (810rpm)	1	5	05-Mar-04	12-Mar-04
4526591	Motor YYK30Z-6	1	5	12-Mar-04	Active
4527203	Motor Support	1	6	05-Mar-04	Active
452772500	Base Plate Painting Assy.	1	7	05-Mar-04	12-Mar-04
4526747	Base Painting Assy.	1	7	12-Mar-04	Active
433217	Partition Plate	1	8	05-Mar-04	Active
455000504	Compressor Capacitor With Screw	1	9	05-Mar-04	12-Mar-04
455000502	Compressor Capacitor 35uF With Screw	1	9	12-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	05-Mar-04	Active
4524176	??-§1/4 Liqjud Valve(R410A)	1	11	05-Mar-04	Active
4524177	3/8 Gas Valve(R410A)	1	12	05-Mar-04	Active
455000108	Double patch Capacitor for fan	1	13	05-Mar-04	12-Mar-04
455000000	single patch Capacitor for fan	1	13	12-Mar-04	Active
4514588	5 Poles terminal block	1	14	05-Mar-04	Active
204107	Cable clip Nylon	1	15	05-Mar-04	Active
236179	2 Poles terminal block	1	16	05-Mar-04	Active
4516637	Out sensor Black	1	17	05-Mar-04	Active
4526847	Valve-Capillary Assy	1	19	05-Mar-04	12-Mar-04
4526617	one way valve soldering	1	19	12-Mar-04	Active
4527362	Charge tube TP2 6.35x0.8	1	20	05-Mar-04	Active
4527058	Comp. Jacket	1	21	05-Mar-04	12-Mar-04
452799600	Compressor Jacket ONG3-7	1	21	12-Mar-04	Active
4516357	Rubber Cushion 1K15910311	3	23	05-Mar-04	12-Mar-04
4514091	Grommet	3	23	12-Mar-04	Active
4510677	Nut With Flange M8 -D=24	3	24	05-Mar-04	Active
4519987	Wire assy	1	25	05-Mar-04	12-Mar-04
4527375	Compressor Wire	1	25	12-Mar-04	Active
4526452	Comp. Assy GMCC PA145X2C-4FT	1	26	05-Mar-04	12-Mar-04
4526578	Compressor Assy. LG GK086P	1	26	12-Mar-04	Active
4526601	Compressor LG GK086P	1	26	12-Mar-04	12-Mar-04
4516359	Terminal Packing 1K14720130	1	27	05-Mar-04	12-Mar-04
4514088	Gasket	1	27	12-Mar-04	Active
4516358	Terminal Cover 1K14720012	1	28	05-Mar-04	12-Mar-04
4516824	Cover Terminal	1	28	12-Mar-04	Active
4516360	Terminal Nut 1K14300710	1	29	05-Mar-04	12-Mar-04
4514089	Nut hex	1	29	12-Mar-04	Active
433229	????	1	30	05-Mar-04	Active
433234	Clamp	1	31	05-Mar-04	Active
4519606	Right side panel (painting plate)	1	32	05-Mar-04	Active
4526745	4-way Valve Welding Assy.	1	33	05-Mar-04	12-Mar-04
4526604	4-way Valve Welding Assy.	1	33	12-Mar-04	Active
4527308	PCB Support	1	34	11-Mar-04	Active
4526748	Low-Temp. Controller	1	35	11-Mar-04	Active
433228	Back Side Net	1	36	05-Mar-04	Active
433216	Bridge	1	37	05-Mar-04	Active
4526804	condensor Soldering assy	1	38	05-Mar-04	12-Mar-04
4526605	condensor Soldering assy	1	38	12-Mar-04	Active
4519614	Painting Top Cover	1	39	05-Mar-04	Active
4519300	Nut M5 L	1	40	05-Mar-04	Active
433225	Handle	1	41	05-Mar-04	Active
4519607	Left Side Panel Painting Plate	1	42	05-Mar-04	Active
4516114	2-W Valve coil	1	43	11-Mar-04	Active

14.1.11 Outdoor Unit ONG 9,12 RC



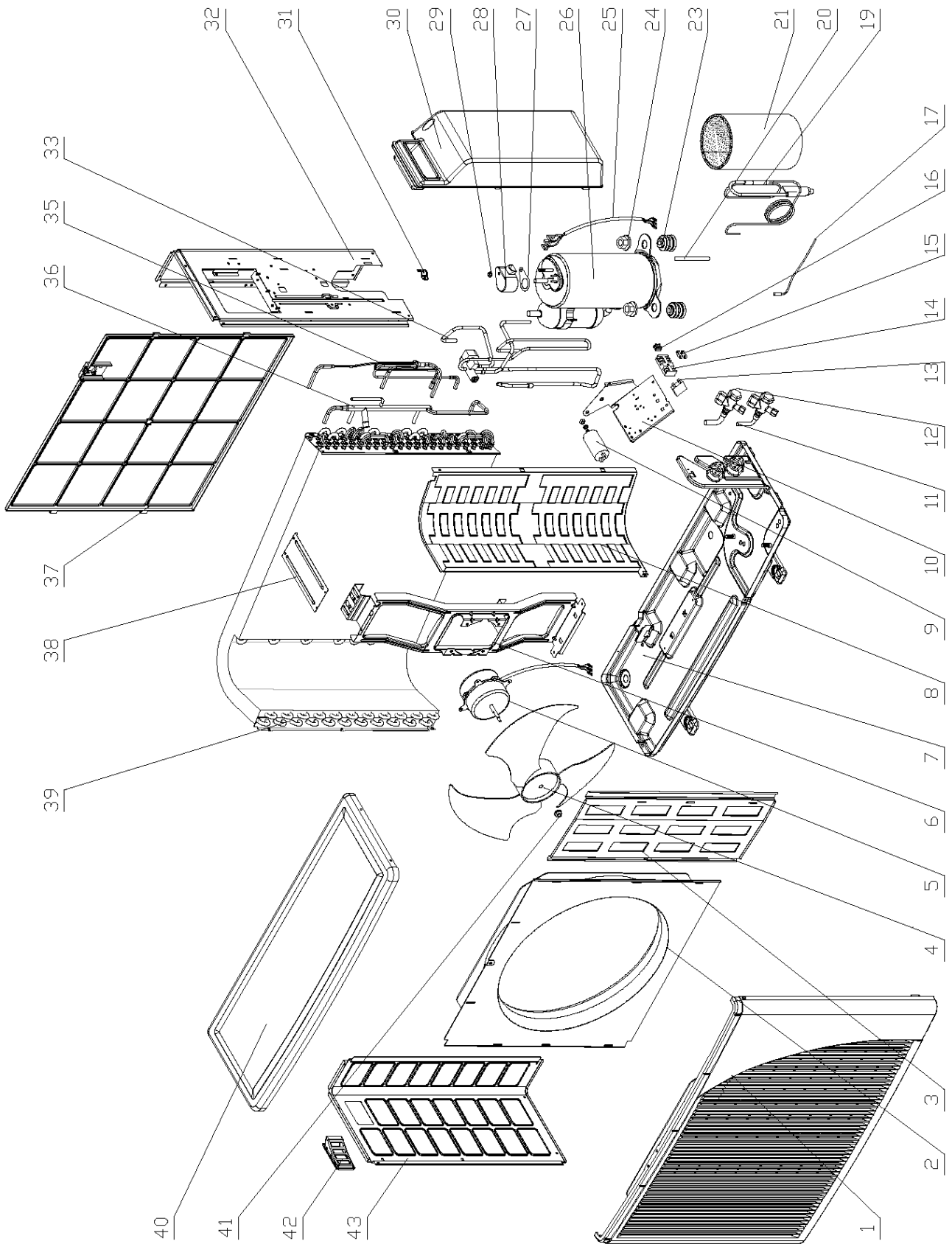
14.1.12 Outdoor Unit ONG 9 RC

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433218	Front Panel A	1	1	05-Mar-04	Active
433219	Front Panel A1	1	1	05-Mar-04	05-Mar-04
433221	Air Inlet Ring-420	1	2	05-Mar-04	Active
433223	Painting Insulation Plate	1	3	05-Mar-04	Active
4519251	Axial Fan OD=400	1	4	05-Mar-04	Active
4519250	Fan Motor YDK30-6V	1	5	05-Mar-04	Active
4527203	Motor Support	1	6	05-Mar-04	Active
4526747	Base Painting Assy.	1	7	05-Mar-04	Active
433217	Partition Plate	1	8	05-Mar-04	Active
455000503	Compressor Capacitor With Screw	1	9	05-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	05-Mar-04	Active
4524176	1/4 Liquid Valve(R410A)	1	11	05-Mar-04	Active
4524177	3/8 Gas Valve(R410A)	1	12	05-Mar-04	Active
455000108	Double patch Capacitor for fan	1	13	05-Mar-04	Active
4514588	5 Poles terminal block	1	14	05-Mar-04	Active
204107	Cable clip Nylon	1	15	05-Mar-04	Active
236179	2 Poles terminal block	1	16	05-Mar-04	Active
4516637	Out sensor Black	1	17	05-Mar-04	Active
4527444	Restrictor (029)	1	18	05-Mar-04	11-Mar-04
4527127	Capillary Assy	1	19	05-Mar-04	Active
4527362	Charge tube TP2 6.35x0.8	1	20	05-Mar-04	Active
452799601	Compressor Jacket ONG3-9	1	21	05-Mar-04	Active
4514091	Grommet	1	23	05-Mar-04	Active
4510677	Nut With Flange M8 -D=24	1	24	05-Mar-04	Active
4527008	Wire assy	1	25	05-Mar-04	Active
4524230	Compressor assy. GK113PAG	1	26	05-Mar-04	Active
4516826	Rubber washer	1	27	05-Mar-04	Active
4516825	Cover Terminal	1	28	05-Mar-04	Active
4514089	Nut hex	1	29	05-Mar-04	Active
433229	cover valve	1	30	05-Mar-04	Active
433234	Clamp	1	31	05-Mar-04	Active
4519606	Right side panel (painting plate)	1	32	05-Mar-04	Active
4527135	4-Way Valve & Tube Assy	1	33	05-Mar-04	Active
433228	Back Side Net	1	34	05-Mar-04	Active
433216	Bridge	1	35	05-Mar-04	Active
4527155	condensor Soldering assy	1	36	05-Mar-04	Active
4519614	Painting Top Cover	1	37	05-Mar-04	Active
4519300	Nut M5 L	1	38	05-Mar-04	Active
433225	Handle	1	39	05-Mar-04	Active
4519607	Left Side Panel Painting Plate	1	40	05-Mar-04	Active

14.1.13 Outdoor Unit ONG 12 RC

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433218	Front Panel A	1	1	05-Mar-04	Active
433219	Front Panel A1	1	1	05-Mar-04	05-Mar-04
433221	Air Inlet Ring-420	1	2	05-Mar-04	Active
433223	Painting Insulation Plate	1	3	05-Mar-04	Active
4519251	Axial Fan OD=400	1	4	05-Mar-04	Active
4519692	Fan Motor (810rpm)	1	5	05-Mar-04	12-Mar-04
4526591	Motor YYK30Z-6	1	5	12-Mar-04	Active
4527203	Motor Support	1	6	05-Mar-04	Active
452772500	Base Plate Painting Assy.	1	7	05-Mar-04	12-Mar-04
4526747	Base Painting Assy.	1	7	12-Mar-04	Active
433217	Partition Plate	1	8	05-Mar-04	Active
455000504	Compressor Capacitor With Screw	1	9	05-Mar-04	12-Mar-04
455000502	Compressor Capacitor 35uF With Screw	1	9	12-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	05-Mar-04	Active
4524176	1/4 Liquid Valve(R410A)	1	11	05-Mar-04	Active
4524177	3/8 Gas Valve(R410A)	1	12	05-Mar-04	Active
455000108	Double patch Capacitor for fan	1	13	05-Mar-04	12-Mar-04
455000000	single patch Capacitor for fan	1	13	12-Mar-04	Active
4514588	5 Poles terminal block	1	14	05-Mar-04	Active
204107	Cable clip Nylon	1	15	05-Mar-04	Active
236179	2 Poles terminal block	1	16	05-Mar-04	Active
4516637	Out sensor Black	1	17	05-Mar-04	Active
4526847	Valve-Capillary Assy	1	19	05-Mar-04	12-Mar-04
4526617	one way valve soldering	1	19	12-Mar-04	Active
4527362	Charge tube TP2	1	20	05-Mar-04	Active
4527058	Comp. Jacket	1	21	05-Mar-04	12-Mar-04
452799600	Compressor Jacket ONG3-7	1	21	12-Mar-04	Active
4516357	Rubber Cushion 1K15910311	3	23	05-Mar-04	12-Mar-04
4514091	Grommet	3	23	12-Mar-04	Active
4510677	Nut With Flange M8 -D=24	3	24	05-Mar-04	Active
4519987	Wire assy	1	25	05-Mar-04	12-Mar-04
4527375	Compressor Wire	1	25	12-Mar-04	Active
4526452	Comp. Assy GMCC PA145X2C-4FT	1	26	05-Mar-04	12-Mar-04
4526578	Compressor Assy. LG GK086P	1	26	12-Mar-04	Active
4526601	Compressor LG GK086P	1	26	12-Mar-04	12-Mar-04
4516359	Terminal Packing 1K14720130	1	27	05-Mar-04	12-Mar-04
4514088	Gasket	1	27	12-Mar-04	Active
4516358	Terminal Cover 1K14720012	1	28	05-Mar-04	12-Mar-04
4516824	Cover Terminal	1	28	12-Mar-04	Active
4516360	Terminal Nut 1K14300710	1	29	05-Mar-04	12-Mar-04
4514089	Nut hex	1	29	12-Mar-04	Active
433229	Valve Cover	1	30	05-Mar-04	Active
433234	Clamp	1	31	05-Mar-04	Active
4519606	Right side panel (painting plate)	1	32	05-Mar-04	Active
4526745	4-way Valve Welding Assy.	1	33	05-Mar-04	12-Mar-04
4526604	4-way Valve Welding Assy.	1	33	12-Mar-04	Active
4527308	PCB Support	1	34	11-Mar-04	Active
4526748	Low-Temp. Controller	1	35	11-Mar-04	Active
433228	Back Side Net	1	36	05-Mar-04	Active
433216	Bridge	1	37	05-Mar-04	Active
4526804	condensor Soldering assy	1	38	05-Mar-04	12-Mar-04
4526605	condensor Soldering assy	1	38	12-Mar-04	Active
4519614	Painting Top Cover	1	39	05-Mar-04	Active
4519300	Nut M5 L	1	40	05-Mar-04	Active
433225	Handle	1	41	05-Mar-04	Active
4519607	Left Side Panel Painting Plate	1	42	05-Mar-04	Active
4516114	2-W Valve coil	1	43	11-Mar-04	Active

14.1.14 Outdoor Unit ONG 14 RC



14.1.15 Outdoor Unit ONG 14 RC

Item Code	Item Desc	Quantity	Drawing Number	Effective From	Effective To
433219	Front Panel A1	1	1	23-Feb-04	15-Mar-04
433218	Front Panel A	1	1	15-Mar-04	Active
433221	Air Inlet Ring-420	1	2	23-Feb-04	Active
433223	Painting Insulation Plate	1	3	23-Feb-04	Active
4519251	Axial Fan OD=400	1	4	23-Feb-04	Active
4519692	Fan Motor (810rpm)	1	5	23-Feb-04	01-Mar-04
4520171	Fan Motor (910rpm)	1	5	01-Mar-04	Active
4527203	Motor Support	1	6	23-Feb-04	Active
452772500	Base Plate Painting Assy.	1	7	23-Feb-04	01-Mar-04
4527255	Base Painting Assy.	1	7	01-Mar-04	Active
433217	Partition Plate	1	8	23-Feb-04	01-Mar-04
4527202	Partition Plate	1	8	01-Mar-04	Active
455000504	Compressor Capacitor With Screw	1	9	23-Feb-04	01-Mar-04
455000503	Compressor Capacitor With Screw	1	9	01-Mar-04	Active
4519611	Electric Panel Painting Plate	1	10	23-Feb-04	Active
4524176	1/4 Liquid Valve(R410A)	1	11	23-Feb-04	Active
4524177	3/8 Gas Valve(R410A)	1	12	23-Feb-04	01-Mar-04
4524595	1/2 Gas Valve for ONG R410A	1	12	01-Mar-04	Active
455000108	Double patch Capacitor for fan	1	13	23-Feb-04	Active
4514588	5 Poles terminal block	1	14	23-Feb-04	Active
204107	Cable clip Nylon	1	15	23-Feb-04	Active
236179	2 Poles terminal block	1	16	23-Feb-04	Active
4516637	Out sensor Black	1	17	23-Feb-04	Active
4526847	Valve-Capillary Assy	1	19	23-Feb-04	01-Mar-04
4526918	Valve & Capillary Assy	1	19	01-Mar-04	Active
4527362	Charge tube TP2 1/8" x 0.8	1	20	23-Feb-04	Active
4527058	Comp. Jacket	1	21	23-Feb-04	Active
4516357	Rubber Cushion 1K15910311	3	23	23-Feb-04	01-Mar-04
4527287	Grommet	3	23	01-Mar-04	Active
4510677	Nut With Flange M8 -D=24	3	24	23-Feb-04	Active
4519987	Wire assy	1	25	23-Feb-04	Active
4526452	Comp. Assy GMCC PA145X2C-4FT	1	26	23-Feb-04	01-Mar-04
4526453	Compressor Assy. RN165VHSMT	1	26	01-Mar-04	Active
4516359	Terminal Packing 1K14720130	1	27	23-Feb-04	01-Mar-04
4527289	Terminal Packing	1	27	01-Mar-04	Active
4516358	Terminal Cover 1K14720012	1	28	23-Feb-04	01-Mar-04
4527285	Terminal Cover SC01D024	1	28	01-Mar-04	Active
4516360	Terminal Nut 1K14300710	1	29	23-Feb-04	01-Mar-04
4527286	Terminal Nut	1	29	01-Mar-04	Active
433229	valve cover	1	30	23-Feb-04	Active
433234	Clamp	1	31	23-Feb-04	Active
4519606	Right side panel (painting plate)	1	32	23-Feb-04	Active
4526745	4-way Valve Welding Assy.	1	33	23-Feb-04	01-Mar-04
4526794	4-way Valve Welding Assy.	1	33	01-Mar-04	Active
4526911	Distribution Capillary Assy	1	35	01-Mar-04	Active
4526903	Collection tube Assy	1	36	01-Mar-04	Active
433228	Back Side Net	1	37	23-Feb-04	Active
433216	Bridge	1	38	23-Feb-04	Active
4526804	condensor Soldering assy	1	38	23-Feb-04	01-Mar-04
4526808	condensor assy	1	39	01-Mar-04	25-Aug-04
4526793	condensor Soldering assy	1	39	25-Aug-04	Active
4519614	Painting Top Cover	1	40	23-Feb-04	Active
4519300	Nut M5 L	1	41	23-Feb-04	Active
433225	Handle	1	42	23-Feb-04	Active
4519607	Left Side Panel Painting Plate	1	43	23-Feb-04	Active

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 (wireless mode) or wired controller. the RCW can control up to 15 indoor units using the same settings (on its wired application),

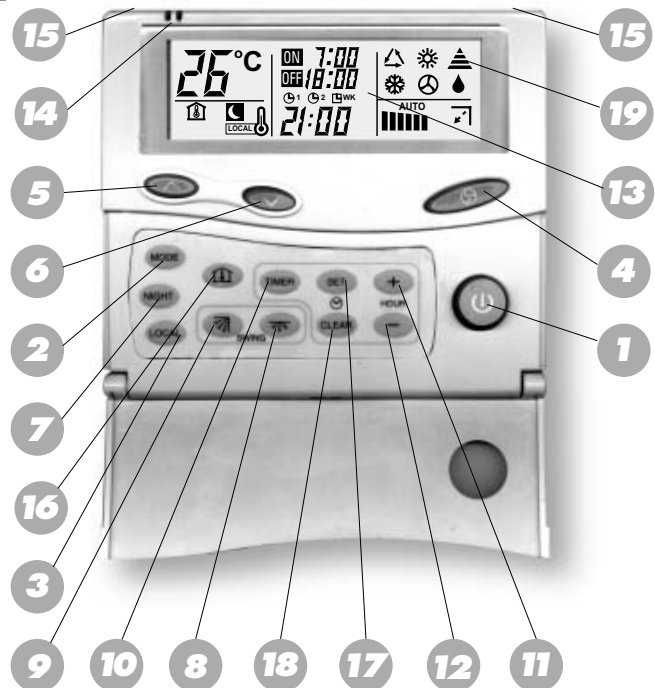
The max wiring length between the controller to the last indoor unit is 300m. for application on WNG LED indoor units an additional interface PCB is needed.

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



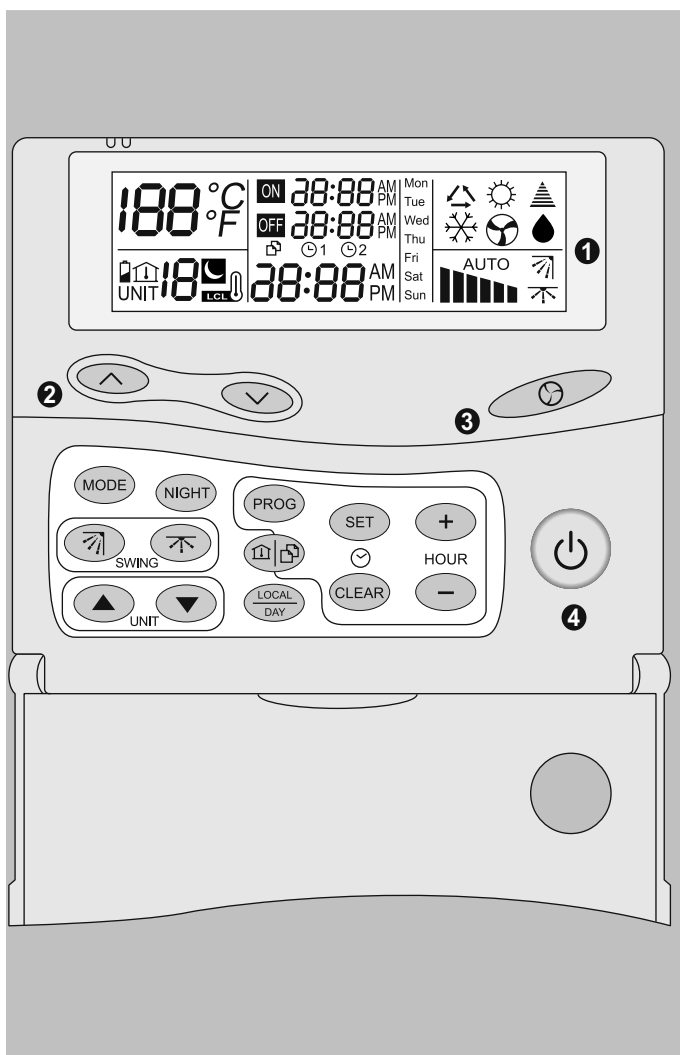
15.2 RCW2 Wall Mounted Remote Control

15.2.1 The RCW2 wall mounted remote controller is a wired controller that can provide affective controlling 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.

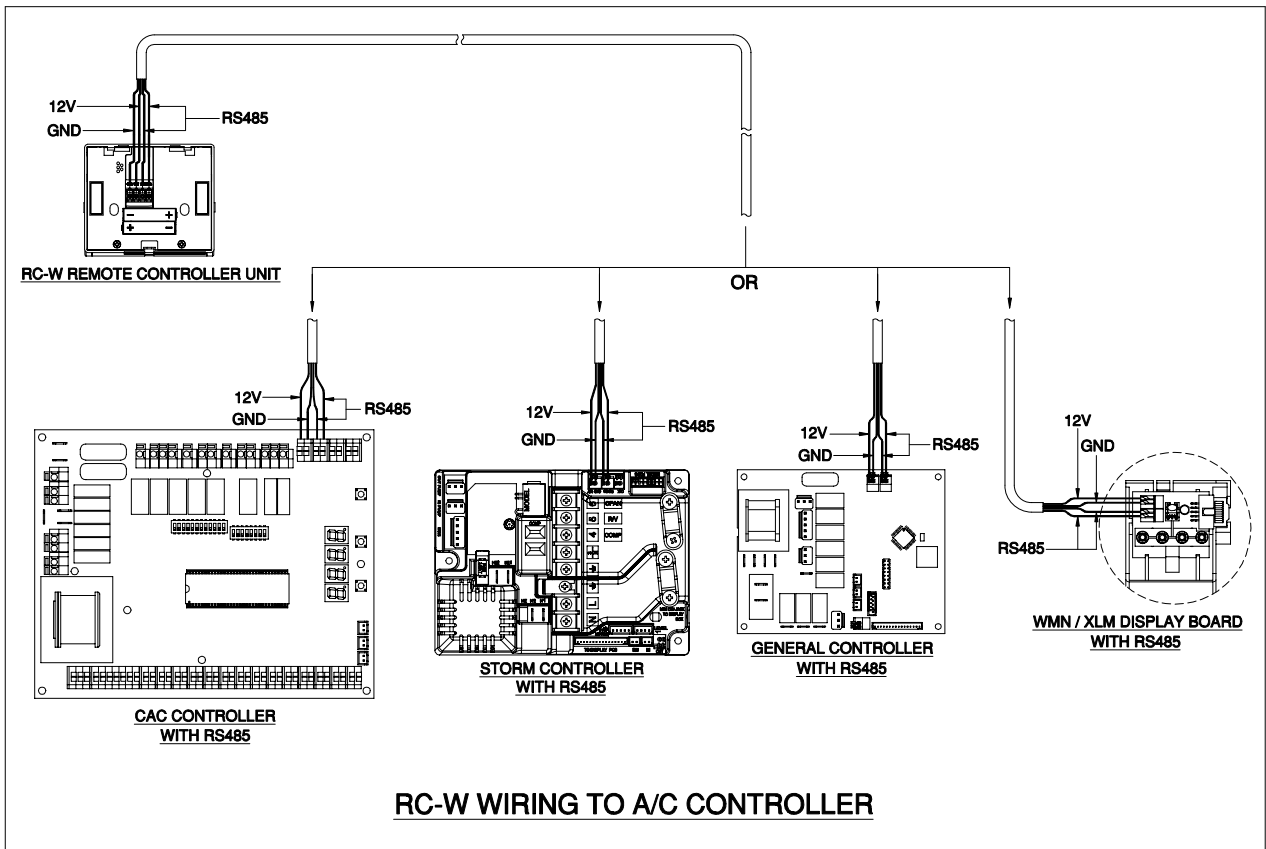
Ordering code no':

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) "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.
- (SWING) Louver : step by step or horizontal.
- (V) Louver : vertical.

15.3 RCW/RCW2 Wiring Connections as Shown on Kit



APPENDIX A

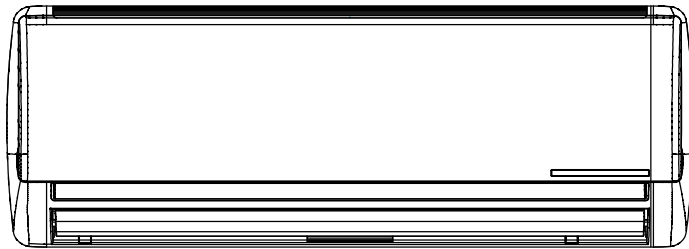
INSTALLATION AND OPERATION MANUAL

- ▶ OPERATION MANUAL LEX 7,9,12,14 LED
- ▶ INSTALLATION MANUAL LEX 7,9,12,14 LED

OPERATING MANUAL

ENGLISH

CONTENT



FEATURES AND FUNCTIONS ...	1
PRECAUTIONS	2
NAME OF EACH PART	3-4
OPERATION TIPS	5
CARE AND MAINTENANCE	6
TROUBLESHOOTING	7



**Thank you for
purchasing our
Room Air Conditioner.**

Before using your air-conditioner, please read this operating instruction carefully and keep it for future reference.

Part No. 468100078/01

FEATURES AND FUNCTIONS

VERTICAL AIR SWING

Automatic swing of supply air in vertical direction. The flap moves automatically in upward and downward direction to spread the conditioned air evenly throughout the room.

SLEEP TIME

When the SLEEP button is pressed during Heating mode, the air conditioner's thermostat setting is gradually lowered during the period of operation; during cooling mode, the thermostat setting is gradually raised during the period of operation. When the set time is reached, the unit automatically turns off.

ELECTROSTATIC FILTER(Optional)

They are capable of capturing small particles down to 0.1 microns, such as atmospheric and house hold dust, coal dust, insecticide dust, mites, pollen, pet dander, tobacco smoke particles, cooking smoke and grease, mold fungi, bacteria, viruses and more.

IONIZER(Optional)

IONIZER makes the air more fresh and more comfortable. Slide switch to the ON position to activate the ionizer. The blue light indicator on the unit will light up indicating the ionizer is on. To cancel the operation set slide switch to OFF position.

Important Notice: When the air-conditioner is turned OFF or if the indoor fan stops operation, the IONIZER stops automatically.

AIR DIRECTION POSITIONING (optional)

Automatic swing of Horizontal air flow in horizontal direction. The flap moves automatically in right and left direction to spread the conditioned air evenly throughout the room.

AUTO CHANGE OVER

The operation mode (cooling, dry, heating) is switched automatically to maintain the set temperature, and the set temperature is kept constant at all times.

WIRELESS REMOTE CONTROL UNIT

The Wireless Remote Control Unit allows convenient control of air conditioner operation.

OPERATING TEMPERATURE RANGE

		Indoor		Outdoor	
		DB[C°]	WB[C°]	DB[C°]	WB[C°]
Cooling	Upper Limit	32	23	46	NA
	Lower Limit	21	15	10	NA
Heating	Upper Limit	27	NA	24	18
	Lower Limit	10	NA	-9	-10

PRECAUTIONS



Danger

This sign warns of death or serious injury.

- Do not attempt to install this air conditioner by yourself.
- This unit contains no user-serviceable parts. Always consult authorized service personnel for repairs.
- When moving, consult authorized service personnel for disconnection and installation of the unit.
- Do not become excessively chilled by staying for lengthy periods in the direct cooling airflow.
- Do not insert fingers or objects into the outlet port or intake grilles.
- Do not start and stop air conditioner operation by disconnecting the power supply cord and so on.
- Take care not to damage the power supply cord.
- In the event of a malfunction (burning smell, etc.), immediately stop operation, disconnect the power supply plug, and consult authorized service personnel.
- If the power supply cord of this appliance is damaged, it should only be replaced by the authorized service personal, since special purpose tools and specified cord are required.



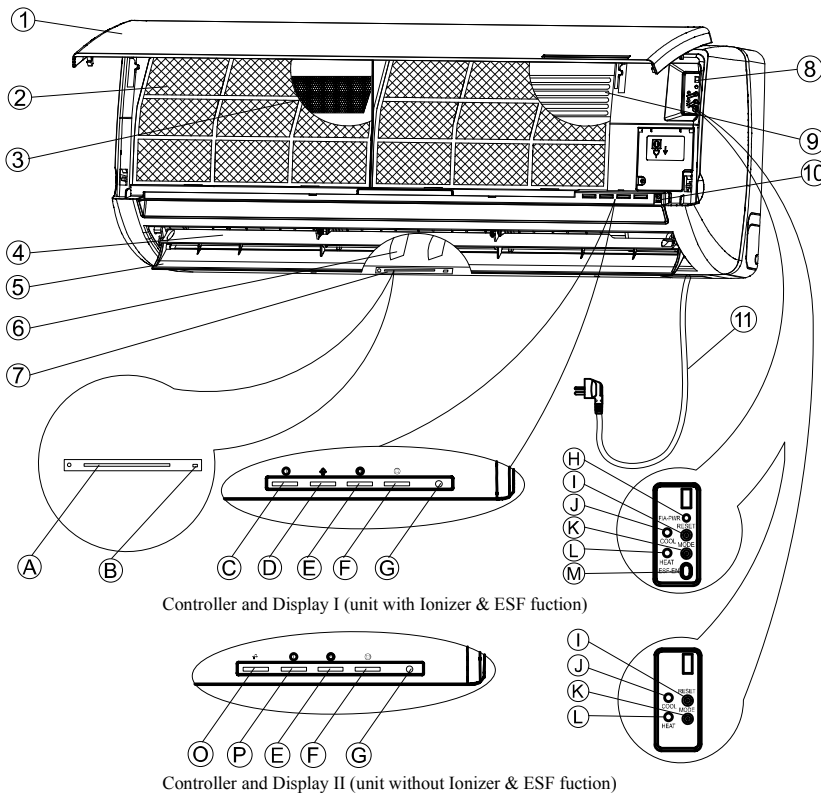
Caution

This sign warns of damage to property.

- Provide occasional ventilation during use.
- Do not direct air flow at fireplaces or heating apparatus.
- Do not climb on, or place objects on, the air conditioner.
- Do not hang objects from the indoor unit.
- Do not set flower vases or water containers on top of air conditioners.
- Do not expose the air conditioner directly to water.
- Do not pull power supply cord.
- Turn off power source when not using the unit for extended periods.
- Check the condition of the installation stand for damage.
- Do not place animals or plants in the direct path of the air flow.
- Do not drink the water drained from the air conditioner.
- Do not use in applications involving the storage of foods, plants or animals, precision equipment, or art works.
- Connection valves become hot during Heating; handle with care.
- Do not apply any heavy pressure to radiator fins.
- Operate only with air filters installed.
- Do not block or cover the intake grille and outlet port.
- Ensure that any electronic equipment is at least one metre away from either the indoor or outdoor units.
- Avoid installing the air conditioner near a fireplace or other heating apparatus.
- When installing the indoor and outdoor unit, take precautions to prevent access to infants.
- Do not use inflammable gases near the air conditioner.

NAME OF EACH PART

INDOOR UNIT



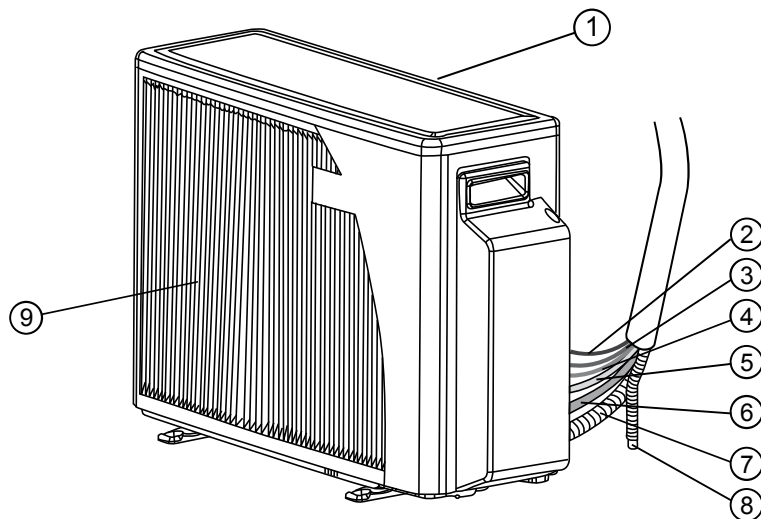
- ① Air intake grill
- ② Air filter
- ③ Air purifying filter
- ④ Air outlet
- ⑤ Supply air flap louver
- ⑥ horizontal Air flow
- ⑦ Ionizer(optional)
- ⑧ On unit operation
- ⑨ Electrostatic filter (optional)
- ⑩ Unit's indications
- ⑪ Power cord (optional)

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

- A. IONIZER INDICATOR
Lights up during ionizer on.
- B. IONIZER ON/OFF SWITCH
Used to switch the ionizer on/off.
- C. STAND-BY AND OPERATION INDICATOR
Lights up in red when connected to power.
Lights up in green during operation.
- D. IONIZER INDICATOR
Lights up during the Ionizer operation.
- E. TIMER INDICATOR
Lights up during timer and sleep operation.
- F. FILTER INDICATOR
Lights up when air filter requiers cleaning
- G. SIGNAL RECEIVER
Receive signals from the remote control.
- H. FRESH AIR OPERATION BUTTON
Used to switch the Fresh air on or off.
- I. RESET BUTTON
Press to turn off the filter indicator and to reset the filter function,after the cleaned filter has been reinstalled.
Press to cancel the buzzer announcer.
- J. COOLING INDICATOR
Lights up only when Mode(K) is pressd.
- K. UNIT MODE BUTTON
Used to switch the unit off or to run it on for cooling or heating without the remote control.
- L. HEATING INDICATOR
Lighrs up only when Mode(K) is pressed.
- M. ELECTROSTATIC FILTER SAFETY BUTTON
Turn off the Electrostatic filter when you open the grille.
- O. STAND-BY INDICATOR
Lights up in red when connected to power.
- P. OPERATION INDICATOR
Lights up in green during operation.

CARE AND MAINTENANCE

OUTDOOR UNIT



- ① Outdoor unit air intake
- ② Power cable
- ③ Control wire
- ④ Air-Fresh controls wire
- ⑤ Liquid line
- ⑥ Suction line
- ⑦ Air-Fresh hose (optional)
- ⑧ Drain hose.
- ⑨ Outdoor unit air outlet

OPERATION TIPS

- Set a suitable room temperature; excessively low room temperature is not good for your health and wastes electricity. Avoid frequent setting of the temperature.
- During cooling, avoid direct sun. Keep curtains and blinds closed. Close doors and windows to keep the cool air in the room.
- Avoid generating heat or using of heating appliances while the air conditioner in cooling mode.
- Make sure that the air flap is positioned properly: horizontal flow in cooling and downward vertical flow for heating.
- Keep the room temperature uniform by adjusting the left/right vertical air blades.
- Position the air flap and the left/right air blades in such a manner as to prevent your body from being exposed directly to air drafts.
- During prolonged operation, ventilate the room occasionally by opening a window from time to time.
- In a power failure, the microprocessor memory is retained. When restarted, operation will be resumed in the last mode of operation. However, if the timer was used, the unit will be turned off by the timer only if the remote control is aimed at the unit. Otherwise the power failure will cause the timer data to be erased from the microprocessor memory.
- After turning on, allow more than 3 minutes for cooling, heating or dry operation to start.
- When DRY mode is used, make sure that the room temperature is between 20°C and 27°C. When used out of this range, the unit may protect itself and become inoperative.
- When COOL or DRY modes are used, make sure that the room's relative humidity is below 78%. If the unit is used for a prolonged periods of time in high humidity, moisture may form on the air outlet and drip down.
- Remote control signals may not be received if the indoor unit controls cover is exposed to direct sunlight or strong light. In such a case, block the sunlight or dim the lighting.
- The remote control is operative in a range of 8 meters. If you are out of range, the remote control may have difficulties in transmitting signals.

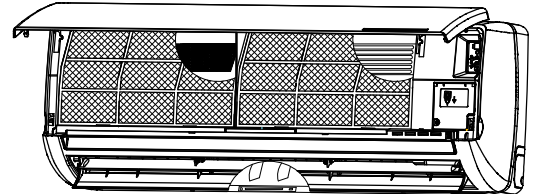
CARE AND MAINTENANCE

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

CLEANING THE AIR FILTER

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

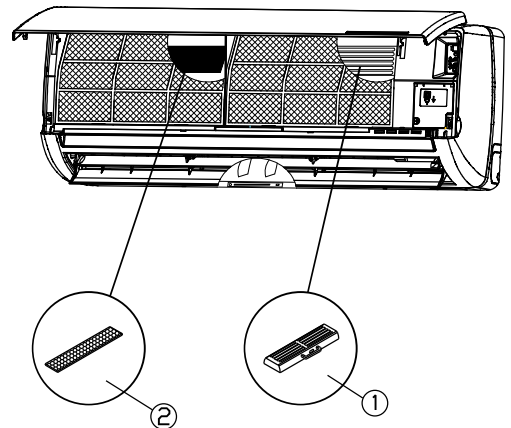
DO NOT OPERATE THE UNIT WITHOUT FILTERS!



CLEANING THE ELECTROSTATIC FILTER

- The electrostatic filter should be removed from the unit and cleaning once three month. The procedure is shown as following;
 1. Open the front panel
 2. Push the hook on the filter and pull out the electrostatic filter (Fig ①)
 3. Wash the filter with the warm soapy water and dry thoroughly
 4. Push the electrostatic filter into the right position
 5. Close the front panel

Note: the above procedure is used for cleaning the electrostatic filter.



PURIFICATION FILTER REPLACEMENT

- PURIFICATION FILTER REPLACEMENT

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

- 1 pulling out the filter. (Fig ②)
- 2 replacing the filter in its place.

CLEANING THE AIR CONDITIONER

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

AT THE BEGINNING OF THE SEASON

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

PROTECT THE ELECTRONIC SYSTEM

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

TROUBLESHOOTING

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

Problem	Cause	Remedy
<ul style="list-style-type: none"> Unit does not operate. Stand-by indicator does not light up 	<ul style="list-style-type: none"> Unit not connected to power Power failure 	<ul style="list-style-type: none"> Plug in the power cord Check main fuse
<ul style="list-style-type: none"> Unit does not operate. Stand-by indicator lights. 	<ul style="list-style-type: none"> Remote control malfunctions The remote control is locked 	<ul style="list-style-type: none"> Check remote control batteries Try to operate from a closer distance Start from on-unit controls Unlock the remote control
<ul style="list-style-type: none"> Unit does not respond properly to remote control command 	<ul style="list-style-type: none"> IR signal does not reach unit Distance between remote control and unit too large or aimed at from improper angle IR receiver on-unit exposed to strong light source 	<ul style="list-style-type: none"> Check for obstruction between unit and remote control. Clear if needed. Get closer to unit. Dim lights, fluorescents especially
<ul style="list-style-type: none"> Air does not blow out from indoor unit 	<ul style="list-style-type: none"> De-icing protection mode is activated Unit in AUTO FAN mode Over cooling in DRY 	<ul style="list-style-type: none"> Normal operation in HEATING mode Normal operation in DRY mode
<ul style="list-style-type: none"> COOLING, DRY or HEATING does not start immediately 	<ul style="list-style-type: none"> 3-min. Compressor delayed start 	<ul style="list-style-type: none"> Normal operation for these modes
<ul style="list-style-type: none"> Unit functions but does not perform sufficiently 	<ul style="list-style-type: none"> Improper temperature setting Unit capacity insufficient for load or room size 	<ul style="list-style-type: none"> Reset temperature Consult your dealer

ENGLISH

Required tools for Installation Works

- 1. Screw driver
2. Electric drill, hole core drill
3. Hexagonal wrench
4. Spanner
5. Pipe cutter
6. Reamer
7. Knife
8. Gas leak detector
9. Measuring tape
10. Thermometer
11. Megameter
12. Multimeter
13. Torque wrench
14. Vacuum pump
15. Gauge manifold
16. Vacuum pump
17. Gauge manifold
18. N • m (1.8 kgf.m)
19 • N • m (3.5 kgf.m)
20 • N • m (5.5 kgf.m)
21. Vacuum pump
22. Gauge manifold
23. Vacuum pump
24. Gauge manifold
25. Vacuum pump
26. Gauge manifold
27. Vacuum pump
28. Gauge manifold
29. Vacuum pump
30. Gauge manifold
31. Vacuum pump
32. Gauge manifold
33. Vacuum pump
34. Gauge manifold
35. Vacuum pump
36. Gauge manifold
37. Vacuum pump
38. Gauge manifold
39. Vacuum pump
40. Gauge manifold
41. Vacuum pump
42. Gauge manifold
43. Vacuum pump
44. Gauge manifold
45. Vacuum pump
46. Gauge manifold
47. Vacuum pump
48. Gauge manifold
49. Vacuum pump
50. Gauge manifold

SAFETY PRECAUTIONS

- Read the following "SAFETY PRECAUTIONS" carefully before installation.
Electrical work must be installed by a licensed electrician.
The caution items stated here must be followed because these important contents are related to safety.

WARNING This indication shows the possibility of causing death or serious injury.

The items to be followed are classified by the symbols:

Symbol with background white denotes item that is PROHIBITED from doing.

Carry out test running to confirm that no abnormally occurs after the installation. Then, explain to use the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

WARNING

- 1. Use qualified installer and follow careful instructions.
2. Install at a strong and firm location which is stable to withstand the set's weight.
3. For electrical work, follow the local national wiring standards, regulation and this installation instruction.
4. Use the specified cable and connection type for indoor/outdoor connection.
5. Wire routing must be properly arranged so that control board cover is not fixed perfectly.
6. When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle.
7. Do not damage or use unspecified power supply cord.
8. Do not modify the length of the power supply cord or use of the extension cord.
9. The equipment must be earthed.
10. Do not install the unit at place where leakage of flammable gas may occur.
11. Carry out drainage piping as mentioned in installation instructions.

ATTENTION

- 1. Selection of the installation location.
2. Power supply connection to the room air conditioner.
3. Power supply connection to the indoor unit air conditioner.
4. Installation work. It may need people to carry out the installation work.

NOTE

This manual is for single split applications. For multi split applications please use installation manual supplied within out door unit package.

INSTALLATION/SERVICE TOOLS (ONLY FOR R410A PRODUCT)

CAUTION

New Refrigerant Air Conditioner Installation
THIS AIR CONDITIONER ADOPTS THE NEW HCFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.
R410A refrigerant is apt to be affected by impurities such as water, oxidizing substances, and oils because the working pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22.

Table with 3 columns: New tools for R410A, Applicable to R22 model, Changes. Lists tools like Gauge manifold, Charge hose, Torque wrench, etc.

Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the US/AR specified rose color (AR color code: R410A 507).

Attached accessories.

Table listing accessories: No., Accessories part, Qty., Accessories part, Qty. Includes items like Power supply cord, Cable bracket, etc.

SELECT THE BEST LOCATION

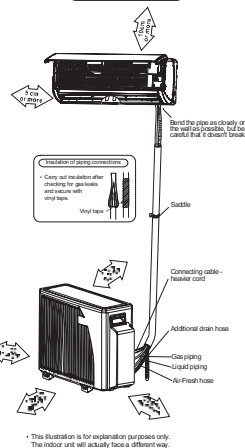
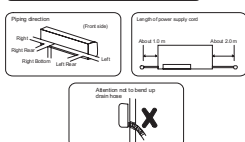
INDOOR UNIT

- There should not be any heat source or steam near the unit.
There should not be any obstacles blocking the air circulation.
A place where air circulation in the room is good.
A place where drainage can be easily done.
A place where noise prevention is taken into consideration.
Do not install the unit near the door way.
Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.

OUTDOOR UNIT

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condensers is not obstructed.
There should not be any animal or plants which could be affected by hot air discharged.
Do not place any obstacles which may cause a short circuit of the discharged air.
If piping length is over 10m, additional refrigerant should be added as shown in the outdoor unit table.

Indoor/Outdoor Unit Installation Diagram



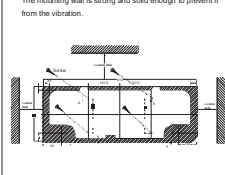
* This illustration is for explanation purposes only. The indoor unit will actually face a different way.

INDOOR UNIT

1 SELECT THE BEST LOCATION (Refer to "Select the best location" section)

2 HOW TO FIX INSTALLATION PLATE

The mounting wall is strong and solid enough to prevent it from the vibration.



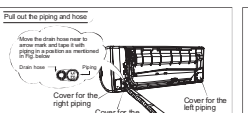
The edge of installation carton board should be at more than 50mm at right and left of the wall.

- 1. Locate the mounting plate on the wall in a horizontal position.
2. Mark the position of the four mounting holes on the wall and drill four holes to accommodate the dowels.
3. Mount the mounting plate on the wall by the four screws.
4. Mark the location of the piping hole on either side of the mounting plate as shown.
5. The piping hole is drilled at a 5° downward angle to prevent condensed or rain water from penetrating back into the room.
6. Trim the hole in the wall with a 47mm commercial plastic tube.

3 INDOOR UNIT INSTALLATION

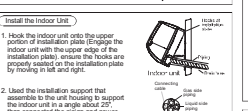
1.FOR THE RIGHT REAR PIPING

- Pull out the Indoor piping
Install the Indoor Unit
Secure the Indoor Unit



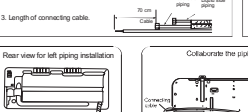
2.FOR THE RIGHT AND RIGHT BOTTOM PIPING

- Pull out the Indoor piping
Install the Indoor Unit
Install the connecting cable and pipe
Secure the Indoor Unit



3.FOR THE LEFT

- Collaborate the piping
Install the Indoor Unit
Secure the Indoor Unit



4 INSTALLATION OF AIR PURIFYING FILTERS

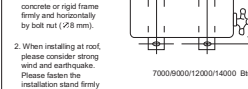
- 1. Open the grille.
2. Remove the air filters.
3. Put air purifying filter into place as shown in illustration at right.



1 SELECT THE BEST LOCATION (Refer to "Select the best location" section)

2 INSTALL THE OUTDOOR UNIT

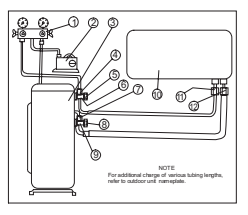
- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.
1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (φ8 mm).
2. When installing at roof, please consider strong wind and earthquake.
3. Do not release refrigerant during piping work.
4. Installation work. It may need people to carry out the installation work.



4 EVACUATION OF THE REFRIGERATION TUBES AND THE INDOOR UNIT

After connection the unions of the indoor and outdoor units, purge the air from the tubes and indoor units as follows.

- 1. Connect the charging hoses with a push pin to the low and high sides of the charging set and the service port of the indoor and liquid valves.
2. Connect the center hose of the charging set to a vacuum pump.
3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0MPa (0cm Hg) to 0.1 MPa (-760mm Hg).
4. Close the valves of both the low and high sides of the charging set and turn off the vacuum pump.
5. Disconnect the charging hose from the vacuum pump and from the service ports of the suction and liquid valves.
6. Tighten the service port caps on both valves.
7. Remove the valve caps on both valves, and open them using a hexagonal Allen wrench.
8. Return valve caps onto both of the valves.
9. Check for gas leaks from the four unions and from the valve caps.
10. Test with electronic leak detector or with a sponge immersed in soapy water for bubbles.

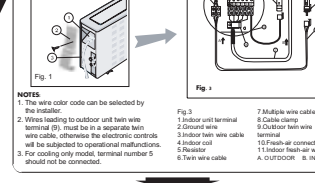


- 1. Charging set
2. Vacuum pump
3. OUTDOOR UNIT
4. Service valve
5. Cap
6. Suction valve
7. Service valve*
8. Cap
9. Liquid valve
10. INDOOR UNIT
11. Suction flare connection
12. Liquid flare connection
* In some models only

5 ELECTRICAL CONNECTIONS BETWEEN INDOOR AND OUTDOOR UNITS

1. To connect the indoor unit to the outdoor unit use the following electrical cables, protected for outdoor use.

- Multiple wire cable (20-240V, 50/60Hz)
Twin wire low voltage cable (When power supply in indoor)
Twin wire low voltage cable (When power supply in outdoor)
Multiple wire cable (20-240V, 50/60Hz)
Twin wire low voltage cable (When power supply in indoor)
Twin wire low voltage cable (When power supply in outdoor)
Shape a loop and connect the yellow/green ground wire to ground terminal screw of the indoor unit.
Prepare the bare wire cable end for connection as shown in Fig.2a.
Disconnect the resistor (R) from the indoor unit bare wire cable (3) and connect the bare wire cable (6) to the outdoor unit bare wire terminal (3).
Secure the multiple wire power cable with the cable caps.
Fasten the bare wire cable to the power cable with cable ties.



6 PIPE INSULATION

- 1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram.
2. If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLYFOAM with thickness 6 mm or above.

HOW TO TAKE OUT FRONT GRILLE

- 1. Set the vertical airflow direction lower to the horizontal position.
2. Slide down the three caps on the front grille as shown in the illustration at right, and then remove the three mounting screws.
3. Pull the lower section of the front grille towards you to remove the front grille.

DISPOSAL OF OUTDOOR UNIT DRAIN WATER

If a drain elbow is used, the unit should be placed on a stand which is taller than 3 cm.

CHECK THE DRAINAGE

- Open front panel and remove air filters.
Drainage checking can be carried out without removing the front grille.
Pour a glass of water into the drain tray/styrofoam.
Ensure that water flows out from drain hose of the indoor unit.

CHECK ITEMS

- Is there any gas leakage at flare nut connections?
Has the heat insulation been carried out at flare nut connection?
Is the connecting cable being fixed to terminal board firmly?
Is the connecting cable being clamped firmly?
Is the drainage ok?
Is the earth wire connection properly done?
Is the indoor unit properly hooked to the installation plate?
Is the power supply voltage complied with rated value?
Is there any abnormal sound?
Is the cooling operation normal?
Is the thermostat operation normal?
Is the remote control's LCD operation normal?

EVALUATION OF THE PERFORMANCE

Operate the unit at cooling operation mode for fifteen minutes or more. Measure the temperature of the intake and discharge air. Ensure the difference between the intake temperature and the discharge is more than 8°C.

