

Airwell

Service Manual

DC Inverter 10.0 / 12.5 / 14.0 kW

Outdoor Units	Indoor Units
OU12 4HP DCI	DNG 100
	EMD 100
OU12 5HP DCI	DNG 125
	EMD 125
OU12 6HP DCI	CD 140



REFRIGERANT

R410A

HEAT PUMP

JUNE 2008

LIST OF EFFECTIVE PAGES

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1. INTRODUCTION

1.1 General

The new **4-5-6HP DC INVERTER** ducted split unit range comprises the following RC (heat pump) models:

- **DNG 100 / 125**
- **EMD 100 / 125**
- **CD 140**

Remote control compatibility

The units are compatible with remote controls RC3, RC4, RCW1, RCW2, RC7.

Inverter description

Unlike standard units (fix RPM) that are selected according to their nominal capacity to overcome the maximum required load, DC Inverter units can be selected to a smaller nominal capacity range unit.

It made possible due to the ability of inverters to reach a much higher capacity level (indicated as Maximum Capacity) which is around 115-130% of the nominal capacity.

1.2 Main Features

High Technology

- Sine wave DC Compressor drive.
- DC-BL-SL (DC Brush-Less Sensor less) Inverter Compressor.
- DC-BL Inverter Outdoor Fan.
- Fuzzy Logic Adaptive Control.

System Features

- Variable cooling and heating capacity from 30% to 115% (of rated capacity).
- High COP "A-B" class energy rating (Most units).
- Low noise levels.
- Pre-charged system up to 30m.
- Tubing up to 70m length / 30m height difference.
- Networking connectivity.
- Current limitation setting for circuit breaker size reduction (if required).
- Dry contact inputs:
 - ♦ Standby.
 - ♦ Night mode (for silent operation in cooling).
 - ♦ Power Shedding (to control maximum power consumption).
- Dry contact output:
 - ♦ Alarm
 - ♦ Base Heater
 - ♦ Crank Case Heater
- HMI Display consists of 7-segments shows system diagnostics and setup.
- Monitoring software (PC port for high level service).

- Cooling operation at outdoor temperature down to -10°C.
- Heating operation at outdoor temperature down to -15°C.
- Up to 100Pa (4-5HP) and 200Pa (6HP) External static pressure.

1.3 Indoor Unit

The **DNG DCI** indoor unit is a low silhouette ducted unit, and can be easily fitted to many type of residential and commercial applications.

- Low silhouette units 300 mm height.
- High technology plastic fan and fan housing.
- Drain pool at bottom of unit with internal downward slope.
- Over-flow switch, stops compressor operation in case of a blocked drainage.
- Bended coil hydrophilic coated aluminum fins.
- 3-speed fan motor and an extra speed in case a higher external static pressure required.
- Tubing connections at the back of the unit to allow easy outlet to both sides of the unit.
- Easy installation and service access.
- Infrared remote control with liquid display unit (LCD).
- **Field options:**
 - (1) External water pump.
 - (2) Airconet connection.
 - (3) Plenum kit for connection of flexible duct hoses at air outlet.

1.4 Filtration

- The unit is equipped with pre filters.
- Easy and versatile access, rear or bottom, can be easily adjusted by the installer.

1.5 Control

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

1.6 Outdoor Unit

The **DCI** 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.

- Compressor mounted in a soundproofed compartment.
- Improved 3-blades axial fans for noise reduction.
- Outdoor coil with hydrophilic fins optimized for operation with R410A refrigerant.
- Fan grill air outlet.
- Service valves" flare" type connection.

- Service ports for high/ low pressure measurement.
- Interconnecting wiring terminal blocks.

1.7 Tubing Connections

Flare type-interconnecting tubing to be produced on site.

Units can be installed with 70-meter pipe length and 30 meter height difference without oil traps.

For further details, please refer to the Installation Manual, Chapter 17.

1.8 Accessories

No.	Item
1.	RCW Wall Mounted Remote Control
2.	RCW2 (µBMS) Wall Mounted Remote Control
3.	Base Heater
4.	Crank case Heater
5.	Room thermostat

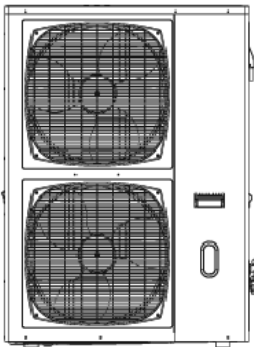

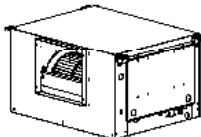

For further details, please refer the Optional Accessories, Chapter 16.

1.9 Inbox Documentation

Each unit includes its own installation and operation manuals.

1.10 Matching Table

1.10.1 R410A

	OUTDOOR UNITS	INDOOR UNITS				
						
	MODEL	DNG100 DCI	DNG125 DCI	EMD100 DCI	EMD125 DCI	CD140 DCI
	DCI 4HP	✓		✓		
	DCI 5HP		✓		✓	
	DCI 6HP					✓

2. PRODUCT DATA SHEET

2.1 DNG 100 DCI / OU12 4HP DCI

Model Indoor Unit				DNG 100 DCI	
Model Outdoor Unit				OU12 4HP DCI	
Installation Method				DUCTED	
Characteristics			Units	Cooling	Heating
Capacity - Nominal (Minimum ~ Maximum) ⁽¹⁾			Btu/hr	34100(10900+39200)	38200(9200 + 42650)
			kW	10.0(3.8 + 11.5)	11.2(2.6 + 12.5)
Power input - Nominal (Minimum ~ Maximum) ⁽¹⁾			kW	3.125(1.400 + 4.400)	3.390(1.000 + 4.450)
EER (Cooling) or COP(Heating) ⁽¹⁾			W/W	3.2	3.3
Energy Efficiency Class				"A"	"C"
Power supply			V/Ph/Hz	230 / 1 / 50	
Rated current (Nominal)			A	14.0	15.2
Starting current			A	10	
Circuit breaker rating			A	25	
INDOOR	Fan type & quantity			Centrifugal x 1	
	Fan speeds	H/M/L	RPM	890 / 800 / 670	
	Air flow ⁽²⁾	H/M/L	m3/hr	2170 / 1880 / 1440	
	External static pressure	Min-Max	Pa	20 -100	
	Sound power level ⁽³⁾	H/M/L	dB(A)	71 / 67 / 62	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	52 / 49 / 47	
	Moisture removal (Nominal)		l/hr	3.3	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	854/297/816	
	Weight		kg	33	
	Package dimensions	WxHxD	mm	1010/342/917	
	Packaged weight		kg	38	
	Units per pallet		units	6	
	Stacking height		units	6	
	OUTDOOR	Refrigerant control			Electronic Expansion Valve
Compressor type, model			Scroll		
Motor type			DCBL Inverter		
Fan type & quantity			Axial 2 x 493 Ømm		
Fan speeds		H/L	RPM	900 – 100 (Continuous)	
Airflow		Max	m3/hr	5.200	
Sound power level ⁽³⁾		Nom C/H	dB(A)	67 / 69	
Sound pressure level ⁽⁴⁾		Nom C/H	dB(A)	56 / 57	
Dimensions		WxHxD	mm	900 / 1255 / 340	
Weight		kg	110		
Package dimensions		WxHxD	mm	985 / 1395 / 435	
Packaged weight		kg	120		
Units per pallet		Units	1		
Stacking height		units	1		
Refrigerant type			R410A		
Refrigerant charge(standard connecting tubing length)		Kg(m)	2.9 / 30		
Additional charge per 1 meter		g/m	38		
Connections between units		Liquid line	In.(mm)	3/8" (9.52)	
		Suction line	In.(mm)	5/8" (15.875)	
		Max.Tubing Length	m.	70	
	Max.Height Difference	m.	30		
Operation control type				LCD Remote control	
Heating elements			kW	—	
Others					

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

(2) Airflow in ducted units; at nominal external static pressure.

(3) Sound power in ducted units is measured at air discharge.

(4) Sound pressure level measured at 1.0 meter distance from unit.

2.2 DNG 125 DCI / OU12 5HP DCI

Model Indoor Unit				DNG 125 DCI	
Model Outdoor Unit				OU12 5HP DCI	
Installation Method				Ducted	
Characteristics			Units	Cooling	Heating
Capacity - Nominal (Minimum ~ Maximum) ⁽¹⁾			Btu/hr	42650(16050+47750)	47750(15000+54600)
			kW	12.5 (4.7 ÷ 14.0)	14.0 (4.4 ÷ 16.0)
Power input - Nominal (Minimum ~ Maximum) ⁽¹⁾			kW	4.170 (1.500 ÷ 5.700)	4.300 (1.100 ÷ 5.500)
EER (Cooling) or COP(Heating) ⁽¹⁾			W/W	3.0	3.25
Energy efficiency class				"B"	"C"
Power supply			V/Ph/Hz	230 / 1 / 50	
Rated current (Nominal)			A	19.7	19.0
Starting current			A	10	
Circuit breaker rating			A	32	
INDOOR	Fan type & quantity			Centrifugal x 1	
	Fan speeds	H/M/L	RPM	935 / 855 / 760	
	Air flow ⁽²⁾	H/M/L	m3/hr	2160 / 1950 / 1620	
	External static pressure	Min-Max	Pa	30-100	
	Sound power level ⁽³⁾	H/M/L	dB(A)	71 / 67 / 62	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	52 / 49 / 47	
	Moisture removal (Nominal)		l/hr	4.6	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	854 / 297 / 816	
	Weight		kg	33	
	Package dimensions	WxHxD	mm	1010 / 342 / 917	
	Packaged weight		kg	38	
	Units per pallet		units	6	
	Stacking height		units	6	
OUTDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			Scroll	
	Motor type			DCBL Inverter	
	Fan type & quantity			Axial 2 x 493 Ømm	
	Fan speeds	H/L	RPM	900 – 100 (Continuous)	
	Air flow	H/L	m3/hr	5,700	
	Sound power level ⁽³⁾	Nom C/H	dB(A)	69 / 70	
	Sound pressure level ⁽⁴⁾	Nom C/H	dB(A)	56 / 58	
	Dimensions	WxHxD	mm	900 / 1255 / 340	
	Weight		kg	110	
	Package dimensions	WxHxD	mm	985 / 1395 / 435	
	Packaged weight		kg	120	
	Units per pallet		Units	1	
	Stacking height		units	1	
	Refrigerant type			R410A	
	Refrigerant charge(standard connecting tubing length)		Kg(m)	3.1 / 30	
	Additional charge per 1 meter		g/m	38	
	Connections between units	Liquid line	In.(mm)	3/8" (9.52)	
		Suction line	In.(mm)	3/4" (19.0)	
		Max.Tubing Length	m.	70	
		Max.Height Difference	m.	30	
Operation control type				LCD Remote control	
Heating elements			kW		
Others					

- (1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units).
 (2) Airflow in ducted units; at nominal external static pressure.
 (3) Sound power in ducted units is measured at air discharge.
 (4) Sound pressure level measured at 1.0 meter distance from unit.

2.3 EMD 100 DCI / OU12 4HP DCI

Model Indoor Unit				EMD 100 DCI	
Model Outdoor Unit				OU12 4HP DCI	
Installation Method				DUCTED	
Characteristics			Units	Cooling	Heating
Capacity - Nominal (Minimum ~ Maximum) ⁽¹⁾			Btu/hr	34,100 (10,250-40,950)	39,250 (12,000-42,650)
			kW	10.0 (3.0-12.0)	11.5(3.5-12.5)
Power input - Nominal (Minimum ~ Maximum) ⁽¹⁾			kW	3.05 (1.30-4.20)	3.10 (1.10-3.60)
EER (Cooling) or COP(Heating) ⁽¹⁾			W/W	3.30	3.70
Energy efficiency class				"A"	"A"
Power supply			V/Ph/Hz	230 / 1 / 50	
Rated current (Nominal)			A	14.0	14.2
Starting current			A	10	
Circuit breaker rating			A	25	
INDOOR	Fan type & quantity			Centrifugal x 1	
	Fan speeds	H/M/L	RPM	1060 / 1000 / 840	
	Air flow ⁽²⁾	H/M/L	m3/hr	1980 / 1820 / 1390	
	External static pressure	Min-Max	Pa	20-100	
	Sound power level ⁽³⁾	H/M/L	dB(A)	73 / 71 / 65	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	52 / 50 / 45	
	Moisture removal (Nominal)		l/hr	3.1	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	790X400X600	
	Weight		kg	36	
	Package dimensions	WxHxD	mm	825X425X610	
	Packaged weight		kg	38	
	Units per pallet		units	8	
	Stacking height		units	4	
OUTDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			Scroll	
	Motor type			DCBL Inverter	
	Fan type & quantity			Axial 2 x 493 Ømm	
	Fan speeds	H/L	RPM	900 – 100 (Continuous)	
	Airflow	Max	m3/hr	5,200	
	Sound power level ⁽³⁾	Nom C/H	dB(A)	67 / 69	
	Sound pressure level ⁽⁴⁾	Nom C/H	dB(A)	56 / 57	
	Dimensions	WxHxD	mm	900X1255X340	
	Weight		kg	110	
	Package dimensions	WxHxD	mm	985X1395X435	
	Packaged weight		kg	120	
	Units per pallet		Units	1	
	Stacking height		units	1	
	Refrigerant type			R410A	
	Refrigerant charge(standard connecting tubing length)		Kg(m)	2.9 / 30	
	Additional charge per 1 meter		g/m	38	
	Connections between units	Liquid line	In.(mm)	3/8" (9.52)	
		Suction line	In.(mm)	5/8" (15.875)	
		Max.tubing length	m.	70	
		Max.height difference	m.	30	
Operation control type				LCD Remote control	
Heating elements			kW	—	
Others					

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

(2) Airflow in ducted units; at nominal external static pressure.

(3) Sound power in ducted units is measured at air discharge.

(4) Sound pressure level measured at 1.0 meter distance from unit.

2.4 EMD 125 DCI / OU12 5HP DCI

Model Indoor Unit				EMD 125 DCI	
Model Outdoor Unit				OU12 5HP DCI	
Installation Method				DUCTED	
Characteristics			Units	Cooling	Heating
Capacity - Nominal (Minimum ~ Maximum) ⁽¹⁾			Btu/hr	42,650 (11,940-47,770)	47,770 (12,280-54,590)
			kW	12.5 (3.5-14.0)	14.0 (3.6-16.0)
Power input - Nominal (Minimum ~ Maximum) ⁽¹⁾			kW	4.1 (1.65-5.5)	4.1 (1.1-5.2)
EER (Cooling) or COP(Heating) ⁽¹⁾			W/W	3.05	3.4
Energy efficiency class				B	B
Power supply			V/Ph/Hz	230 / 1 / 50	
Rated current			A	18.8	18.6
Starting current			A	10	
Circuit breaker rating			A	32	
INDOOR	Fan type & quantity			Centrifugal x 1	
	Fan speeds	H/M/L	RPM	930 / 830 / 740	
	Air flow ⁽²⁾	H/M/L	m3/hr	2500 / 2100 / 1600	
	External static pressure	Min-Max	Pa	20-100	
	Sound power level ⁽³⁾	H/M/L	dB(A)	72 / 68 / 64	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	54 / 51 / 45	
	Moisture removal (Nominal)		l/hr	3.8	
	Condensate drain tube I.D		mm	19	
	Dimensions	WxHxD	mm	1150X400X700	
	Weight		kg	46	
	Package dimensions	WxHxD	mm	1195X440X730	
	Packaged weight		kg	50	
	Units per pallet		units	8	
	Stacking height		units	4	
OUTDOOR	Refrigerant control			Electronic Expansion Valve	
	Compressor type, model			Scroll	
	Motor type			DCBL Inverter	
	Fan type & quantity			Axial 2 x 493 Ømm	
	Fan speeds	H/L	RPM	900 – 100 (Continuous)	
	Air flow	Max	m3/hr	5,700	
	Sound power level ⁽³⁾	Nom C/H	dB(A)	69 / 70	
	Sound pressure level ⁽⁴⁾	Nom C/H	dB(A)	56 / 58	
	Dimensions	WxHxD	mm	900X1255X340	
	Weight		kg	110	
	Package dimensions	WxHxD	mm	985X1395X435	
	Packaged weight		kg	120	
	Units per pallet		Units	1	
	Stacking height		units	1	
	Refrigerant type			R410A	
	Refrigerant charge(standard connecting tubing length)		Kg(m)	3.3 / 30	
	Additional charge per 1 meter		g/m	38	
	Connections between units	Liquid line	ln.(mm)	3/8" (9.52)	
		Suction line	ln.(mm)	3/4" (19.0)	
		Max.tubing length	m.	70	
		Max.height difference	m.	30	
Operation control type				LCD Remote control	
Heating elements			kW	—	
Others					

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

(2) Airflow in ducted units; at nominal external static pressure.

(3) Sound power in ducted units is measured at air discharge.

(4) Sound pressure level measured at 1.0 meter distance from unit.

2.5 CD 140 DCI / OU12 6HP DCI

Model Indoor Unit				CD 140 DCI			
Model Outdoor Unit				OU12 6HP DCI			
Installation Method				DUCTED			
Characteristics			Units	Cooling		Heating	
Capacity - Nominal (Minimum ~ Maximum) ⁽¹⁾			Btu/hr	47,770 (15,700 - 56,300)		54,600 (12,600 – 63,100)	
			kW	14.0 (4.6 – 16.5)		16.0 (3.7 – 18.5)	
Power Input - Nominal (Minimum ~ Maximum) ⁽¹⁾			W	4,200 (1,500 - 6,000)		4,400 (1,200 - 5,500)	
COP ⁽¹⁾			W/W	3.3		3.6	
Energy Efficiency Class			-	A		A	
Power Supply			V/Ph/Hz	220-240/1/50			
Rated Current (Nominal)			A	21.6		20.3	
Starting Current			A	<10			
Circuit Breaker Rating			A	32			
INDOOR	Fan Type & Quantity			CENTRIFUGAL x2			
	Fan Speed		H/M/L	RPM	1,160	1,120	1,000
	Airflow ⁽²⁾		H/M/L	m³/hr	3,300	2,900	2,000
	External Static Pressure		Min-Nom-Max	Pa	80-140-200		
	Sound Power Level ⁽³⁾		H/M/L	dB (A)	73	71	66
	Sound Pressure Level ⁽⁴⁾		H/M/L	dB (A)	58	55	50
	Moisture Removal (Nominal)		L/hr	4.0			
	Condensate Drain Tube I.D.		mm	19			
	Dimensions		W/H/D	mm	1350	400	640
	Weight		kg	75			
	Package Dimensions		W/H/D	mm	1510	440	785
	Packaged Weight		kg	82			
	Units per Pallet		Units	5			
	Stacking Height		Units	5			
OUTDOOR	Refrigerant Control			Electronic Expansion Valve			
	Compressor Type, Model			Twin-Rotary			
	Motor type			DCBL Inverter			
	Fan Type & Quantity			Axial 2x 493Φmm			
	Fan Speed			RPM	900-100 (continuous)		
	Airflow		Max	m³/hr	5,700		
	Sound Power Level		Nom	dB (A)	68	70	
	Sound Pressure Level ⁽⁴⁾		Nom	dB (A)	56	58	
	Dimensions		W/H/D	mm	900	1255	340
	Weight		kg	110			
	Package Dimensions		W/H/D	mm	985	1395	435
	Packaged Weight		kg	120			
	Units per Pallet		Units	1			
	Stacking Height		Units	1			
	Refrigerant Type			R410A			
	Refrigerant Chargeless Distance			kg/m	3.8 / 30		
	Additional Charge Per 1 Meter			g/m	80		
	Connections Between Units	Liquid Line		In	3/8"		
		Suction Line		In	3/4"		
		Max. Tubing Length		m	70		
		Max. Height Difference		m	30		
Operation Control Type			LCD Remote Control				
Heating Elements			kW	BH 70W - optional			
Others							

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

(2) Airflow in ducted units; at nominal external static pressure.

(3) Sound power in ducted units is measured at air discharge.

(4) Sound pressure level measured at 1.0 meter distance from unit.

3. RATING CONDITIONS

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

Cooling:

Indoor: 27°C DB 19°C WB

Outdoor: 35 °C DB

Heating:

Indoor: 20°C DB

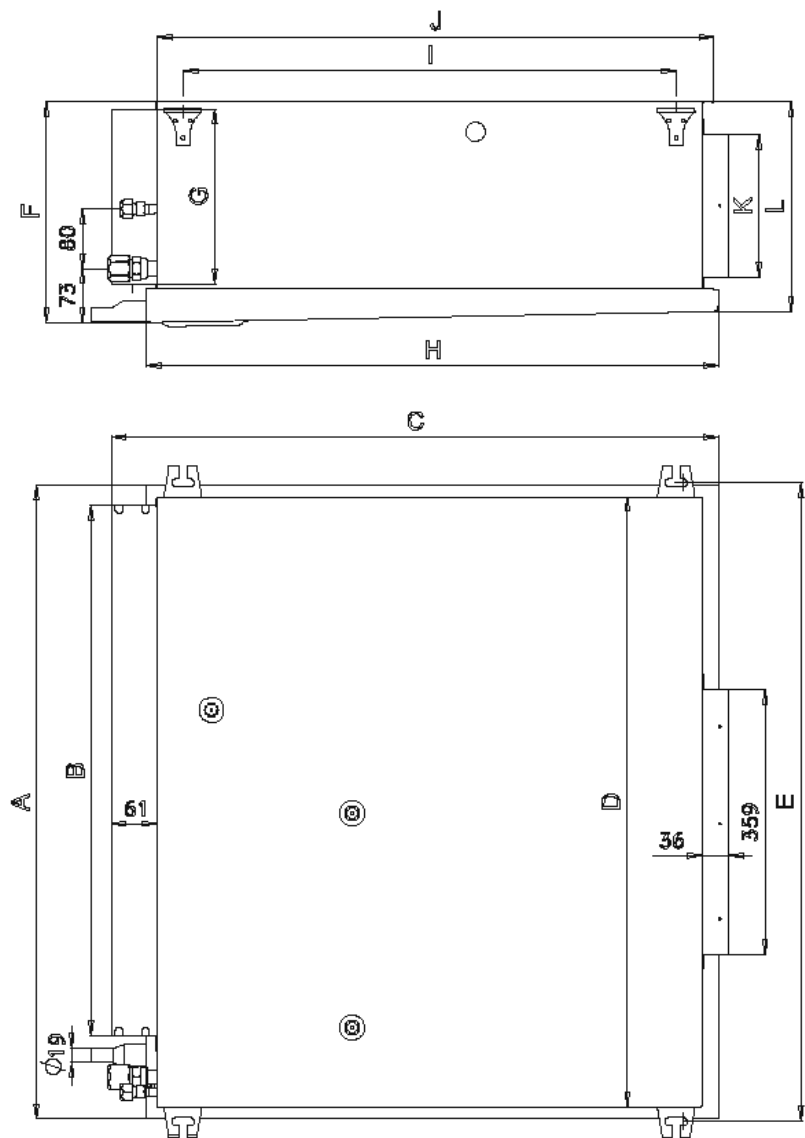
Outdoor: 7°C DB 6°C WB

3.1 Operating Limits

		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	-10°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	10°C DB	-15°C DB -16°C WB
Voltage	1PH	198 – 253V	

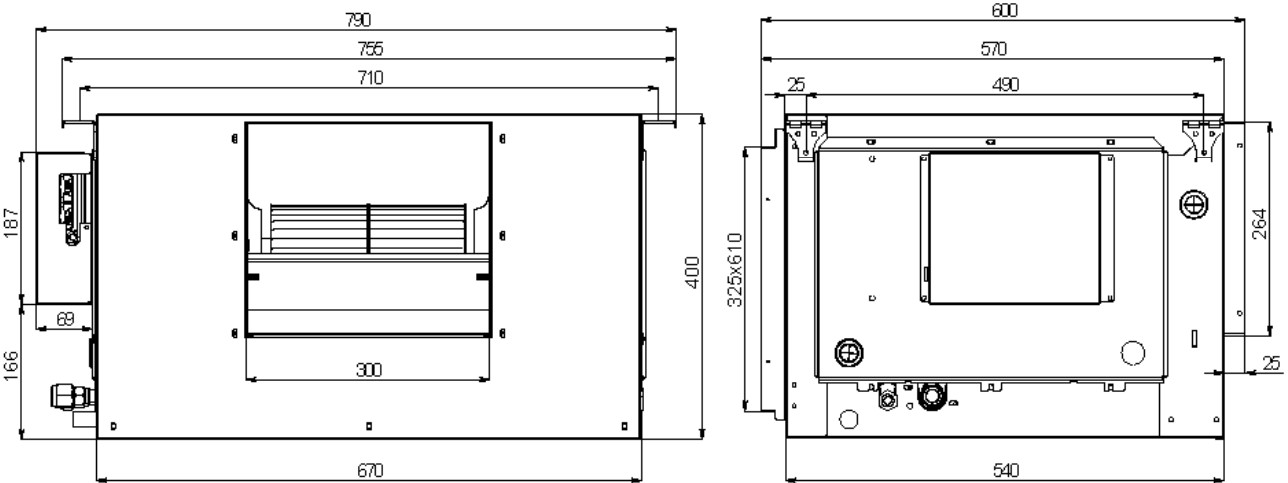
4. OUTLINE DIMENSIONS

4.1 Indoor Unit: DNG 100, 125 DCI

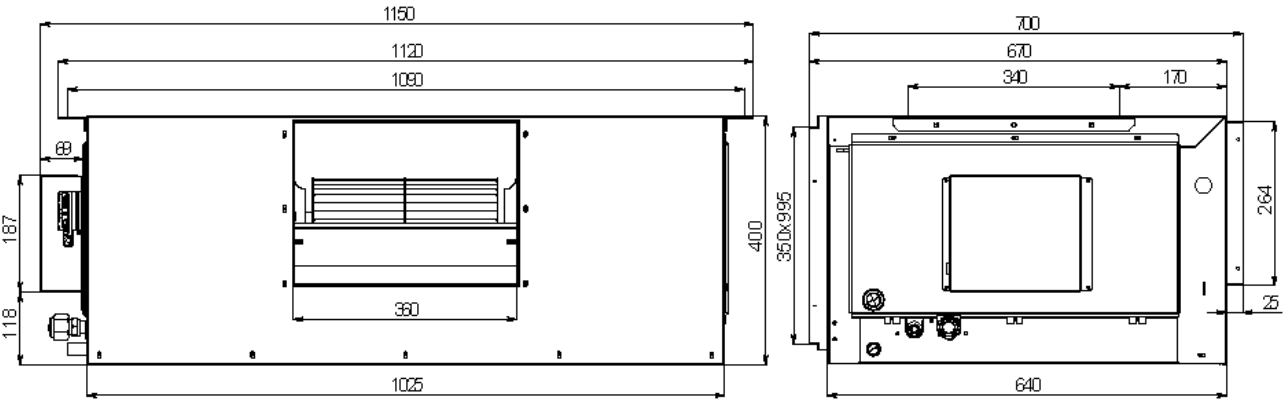


Model	A	B	C	D	E	F	G	H	I	J	K	L
DNG 100, 125	854	715	815	822	861	297	235	770	663	749	193	282

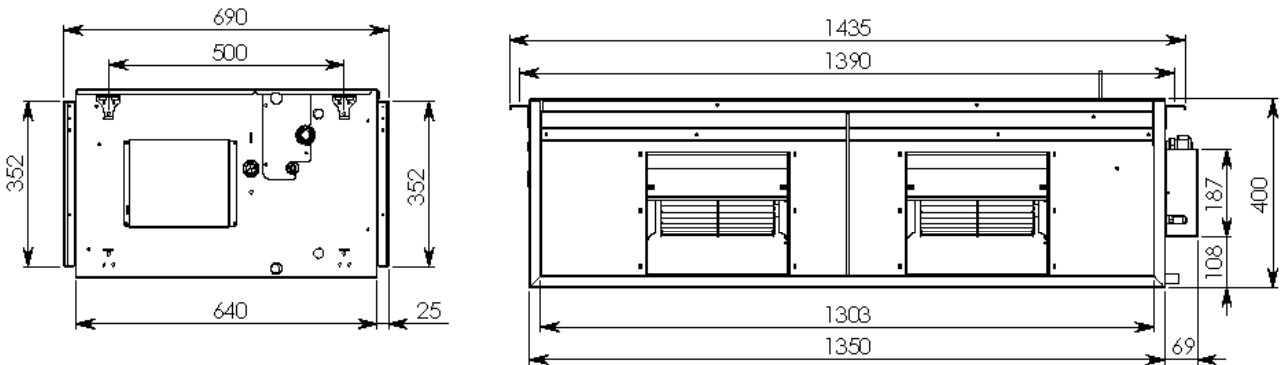
4.2 Indoor Unit: EMD 100 DCI

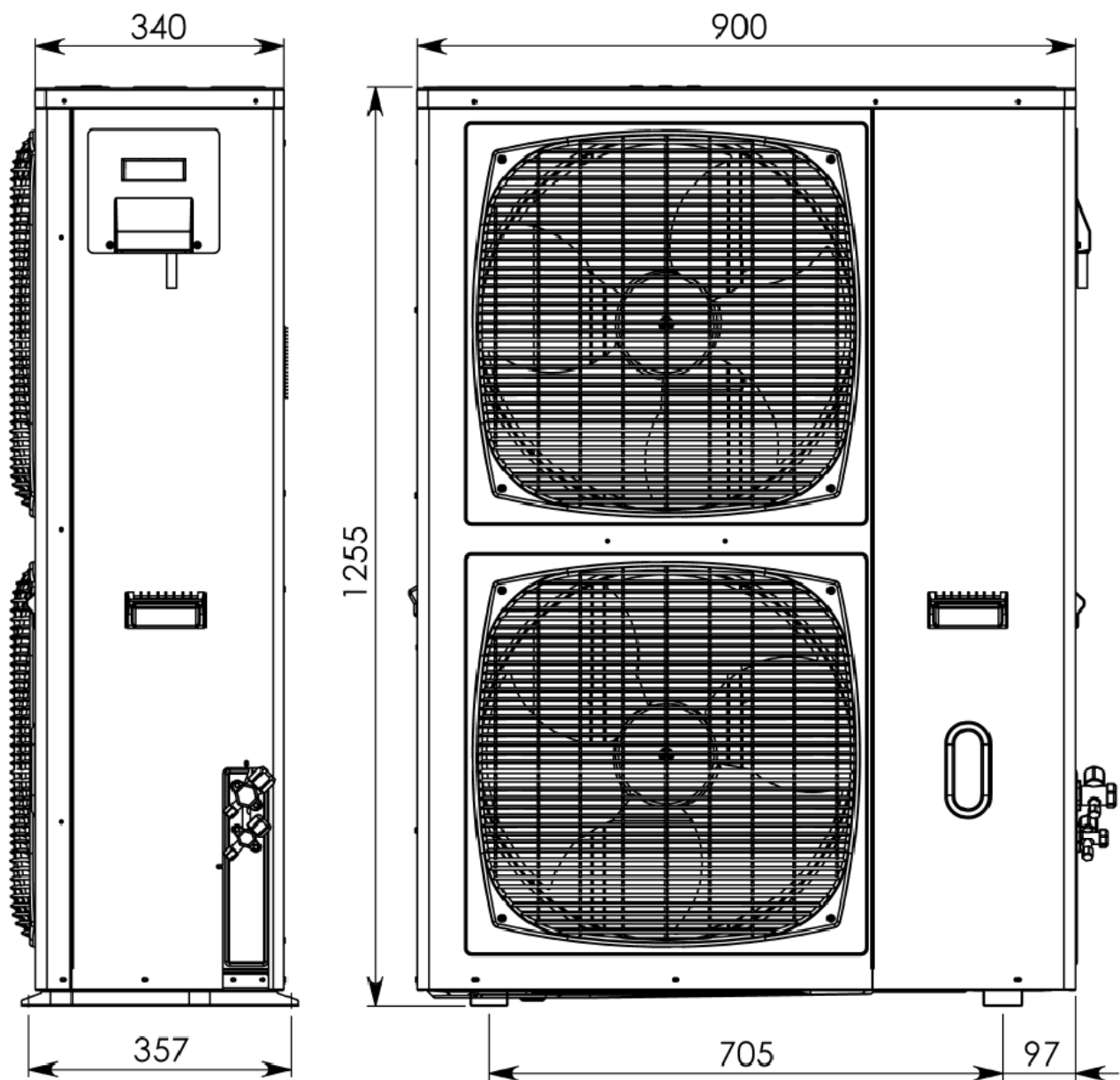


4.3 Indoor Unit: EMD 125 DCI



t4.4 Indoor Unit: CD 140 DCI



4.4 Outdoor Unit: DCI 100 / 125 / 140(OU12 DCI 4-5-6HP)

5. PERFORMANCE DATA & PRESSURE CURVES

5.1 DNG100 DCI

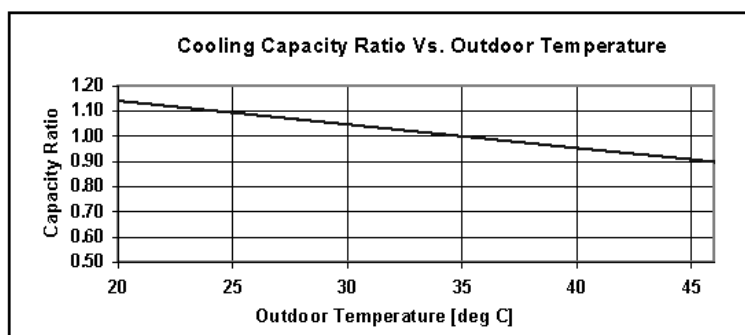
5.1.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	22/15	24/17	27/19	29/21	32/23
-10 – 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	9.67	10.30	10.93	11.56	12.19
	SC	7.67	7.83	7.99	8.14	8.30
	PI	2.46	2.50	2.55	2.60	2.64
30	TC	9.20	9.83	10.47	11.10	11.73
	SC	7.48	7.64	7.79	7.95	8.11
	PI	2.74	2.79	2.84	2.88	2.93
35	TC	8.74	9.37	10.00	10.63	11.26
	SC	7.29	7.44	7.60	7.76	7.91
	PI	3.03	3.08	3.13	3.17	3.22
40	TC	8.27	8.90	9.54	10.17	10.80
	SC	7.09	7.25	7.41	7.56	7.72
	PI	3.32	3.37	3.41	3.46	3.51
46	TC	7.71	8.35	8.98	9.61	10.24
	SC	6.86	7.02	7.17	7.33	7.49
	PI	3.66	3.71	3.76	3.80	3.85

LEGEND

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

5.1.2 Capacity Correction Factors (Cooling)



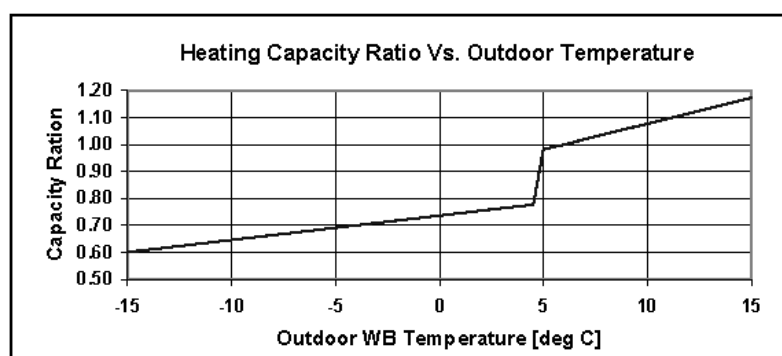
5.1.3 Heating Capacity

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	7.13	6.63	6.13
	PI	2.03	2.24	2.45
-10/-12	TC	7.94	7.44	6.94
	PI	2.45	2.66	2.87
-7/-8	TC	8.54	8.04	7.54
	PI	2.77	2.97	3.18
-1/-2	TC	8.84	8.34	7.85
	PI	2.92	3.13	3.34
2/1	TC	9.04	8.55	8.05
	PI	3.03	3.23	3.44
7/6	TC	11.70	11.20	10.70
	PI	3.18	3.39	3.60
10/9	TC	12.34	11.85	11.35
	PI	3.37	3.58	3.79
15/12	TC	12.99	12.49	11.99
	PI	3.56	3.77	3.98
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

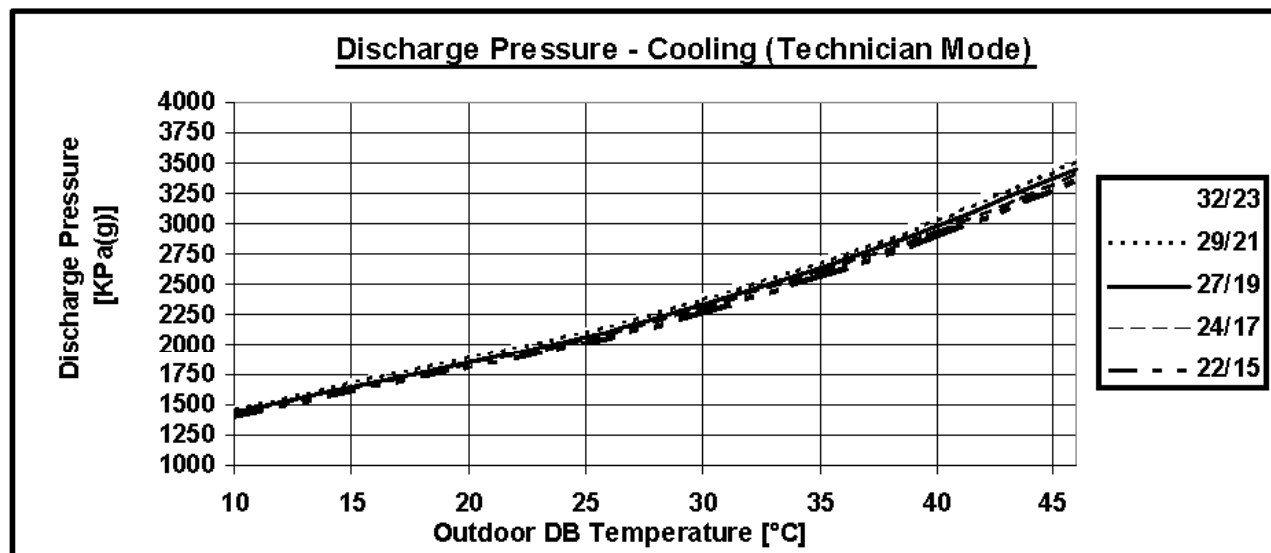
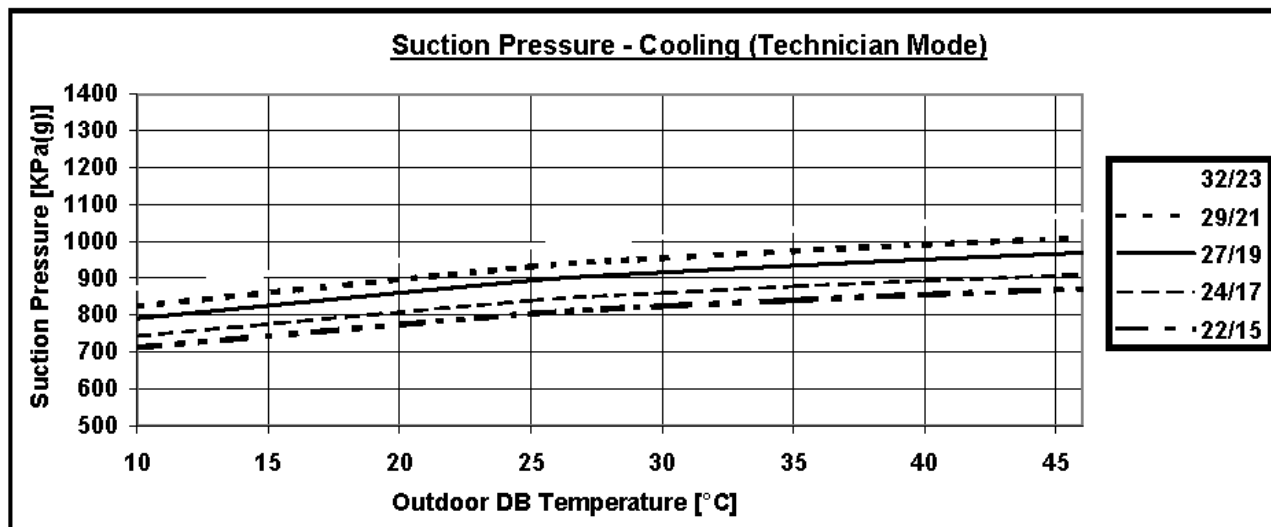
- TH – Total Heating Capacity, kW
 PI – Power Input, kW
 WB – Wet Bulb Temp., (°C)
 DB – Dry Bulb Temp., (°C)
 ID – Indoor
 OD – Outdoor

5.1.4 Capacity Correction Factors (Heating)

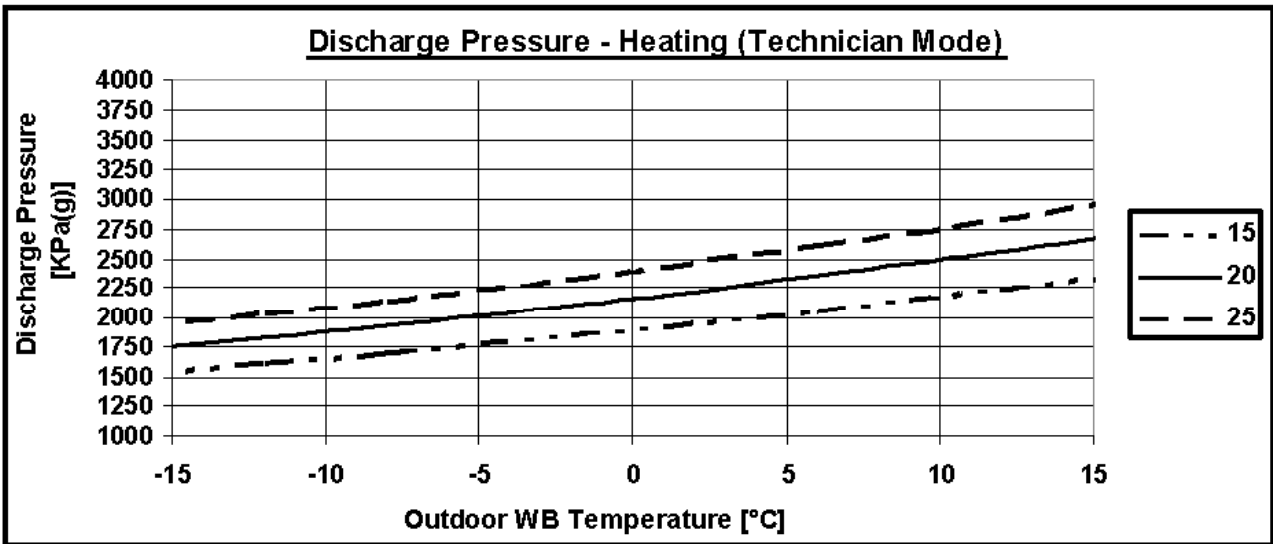
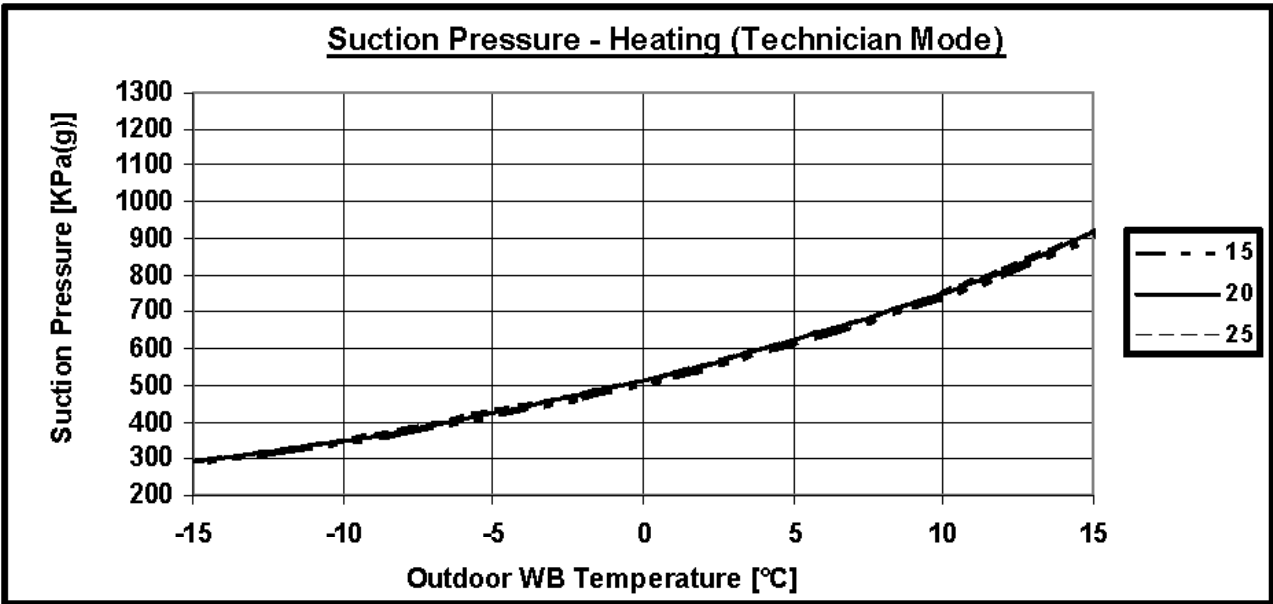


5.1.5 Pressure Curves (Cooling – Technician Mode)

5.1.5.1 Cooling



5.1.5.2 Heating



5.2 DNG125 DCI

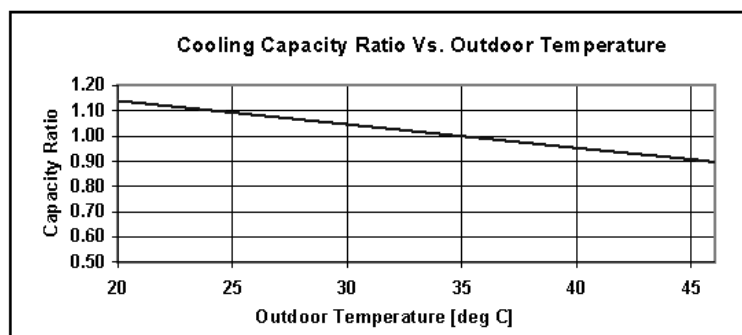
5.2.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	22/15	24/17	27/19	29/21	32/23
-10 – 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	12.08	12.87	13.66	14.45	15.24
	SC	9.59	9.79	9.98	10.18	10.38
	PI	3.28	3.34	3.40	3.47	3.53
30	TC	11.50	12.29	13.08	13.87	14.66
	SC	9.35	9.55	9.74	9.94	10.13
	PI	3.66	3.72	3.79	3.85	3.91
35	TC	10.92	11.71	12.50	13.29	14.08
	SC	9.11	9.30	9.50	9.70	9.89
	PI	4.04	4.11	4.17	4.23	4.30
40	TC	10.34	11.13	11.92	12.71	13.50
	SC	8.87	9.06	9.26	9.45	9.65
	PI	4.43	4.49	4.55	4.62	4.68
46	TC	9.64	10.43	11.22	12.01	12.80
	SC	8.58	8.77	8.97	9.16	9.36
	PI	4.89	4.95	5.01	5.08	5.14

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

5.2.2 Capacity Correction Factors (Cooling)



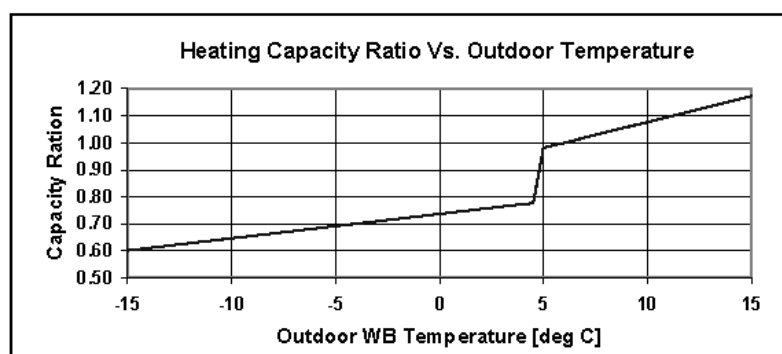
5.2.3 Heating Capacity

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	8.91	8.20	7.67
	PI	2.58	2.84	3.11
-10/-12	TC	9.92	9.30	8.67
	PI	3.11	3.37	3.64
-7/-8	TC	10.68	10.05	9.43
	PI	3.51	3.77	4.03
-1/-2	TC	11.05	10.43	9.81
	PI	3.71	3.97	4.23
2/1	TC	11.31	10.68	10.06
	PI	3.84	4.10	4.36
7/6	TC	14.62	14.00	13.38
	PI	4.04	4.30	4.56
10/9	TC	15.43	14.81	14.18
	PI	4.28	4.54	4.80
15/12	TC	16.24	15.61	14.99
	PI	4.52	4.78	5.04
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

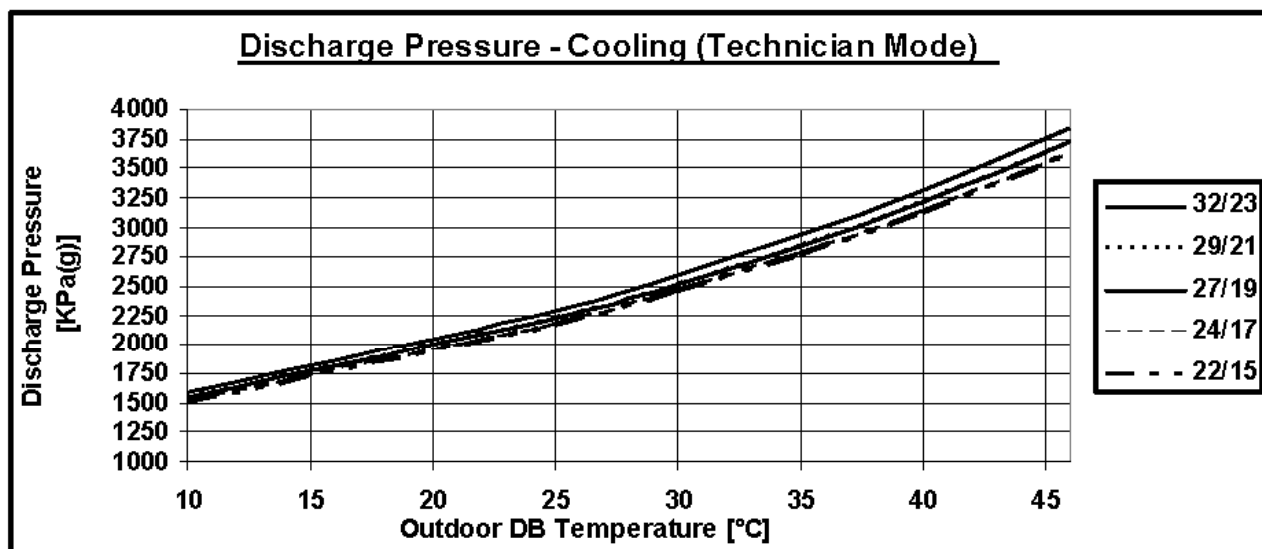
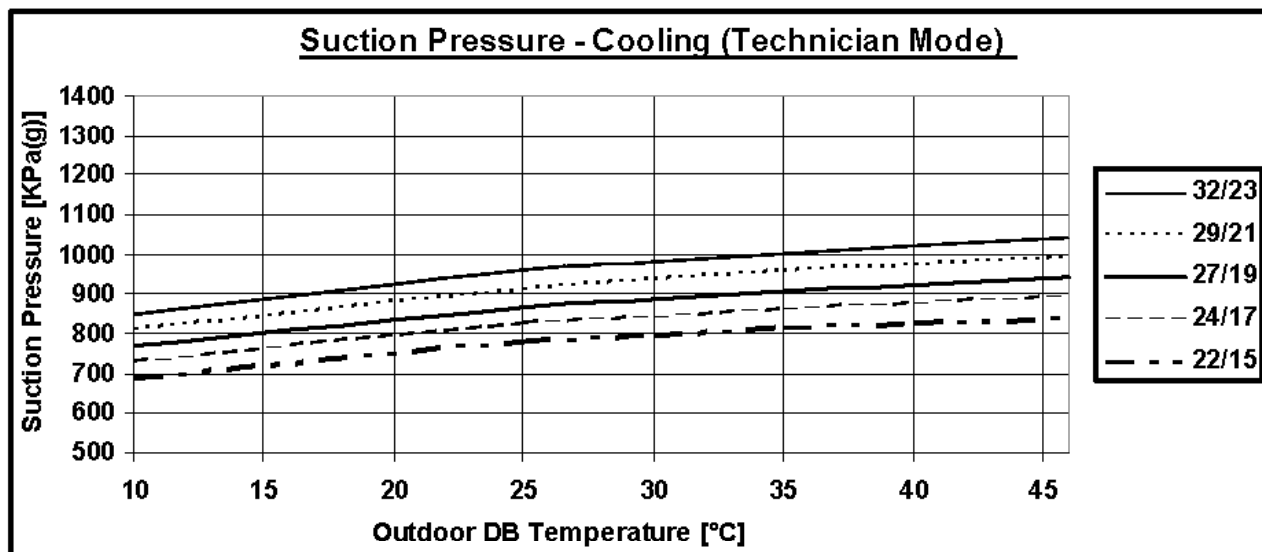
- TH – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

5.2.4 Capacity Correction Factors (Heating)

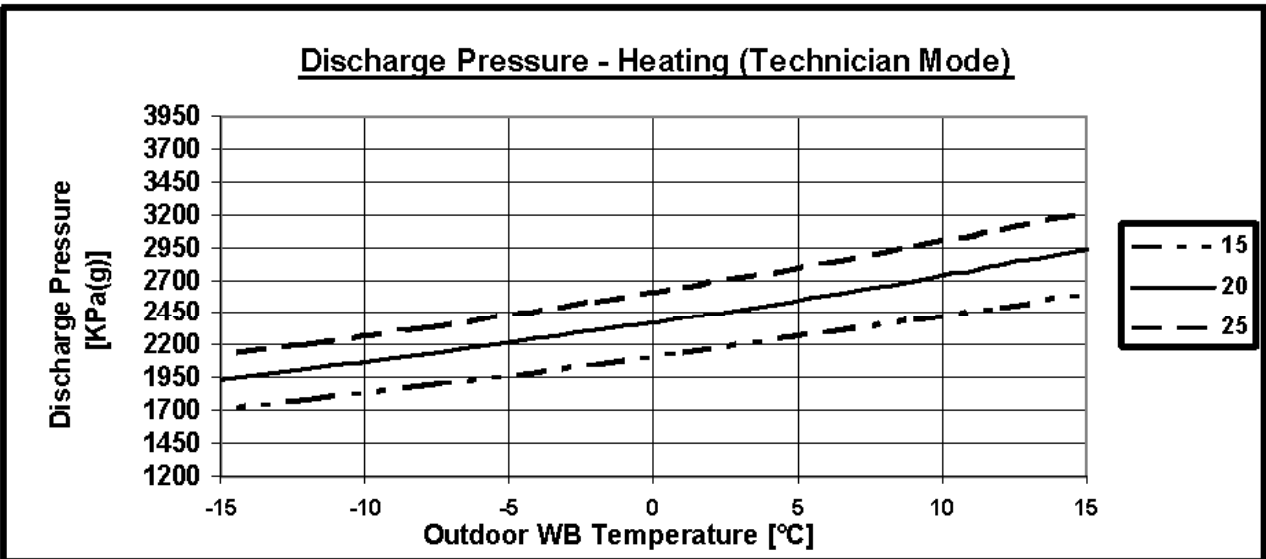
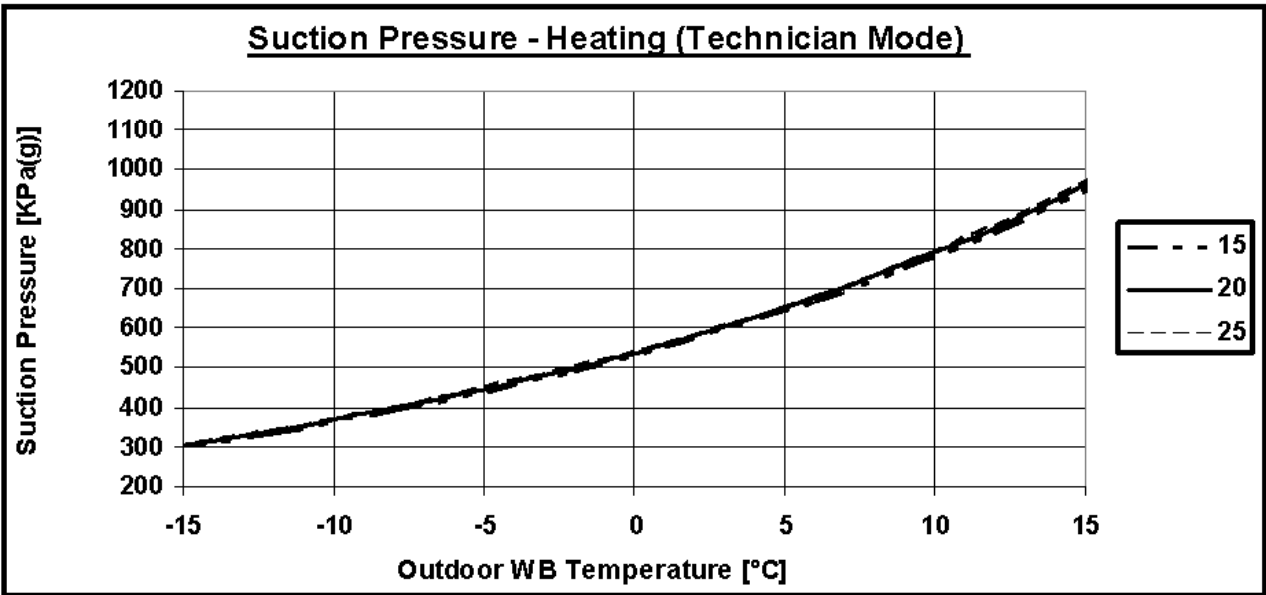


5.2.5 Pressure Curves (Cooling – Technician Mode)

5.2.5.1 Cooling



5.2.5.2 Heating



5.3 EMD100 DCI

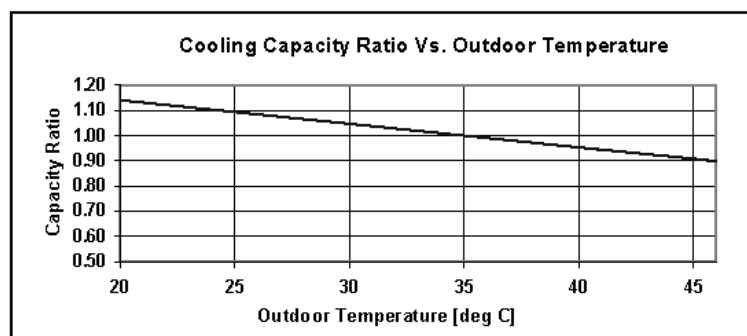
5.3.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	22/15	24/17	27/19	29/21	32/23
-10 – 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	9.67	10.30	10.93	11.56	12.19
	SC	7.96	8.12	8.28	8.44	8.61
	PI	2.40	2.44	2.49	2.53	2.58
30	TC	9.20	9.83	10.47	11.10	11.73
	SC	7.76	7.92	8.08	8.24	8.41
	PI	2.68	2.72	2.77	2.82	2.86
35	TC	8.74	9.37	10.00	10.63	11.26
	SC	7.56	7.72	7.88	8.04	8.20
	PI	2.96	3.00	3.05	3.10	3.14
40	TC	8.27	8.90	9.54	10.17	10.80
	SC	7.35	7.52	7.68	7.84	8.00
	PI	3.24	3.28	3.33	3.38	3.42
46	TC	7.71	8.35	8.98	9.61	10.24
	SC	7.11	7.28	7.44	7.60	7.76
	PI	3.58	3.62	3.67	3.71	3.76

LEGEND

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

5.3.2 Capacity Correction Factors (Cooling)



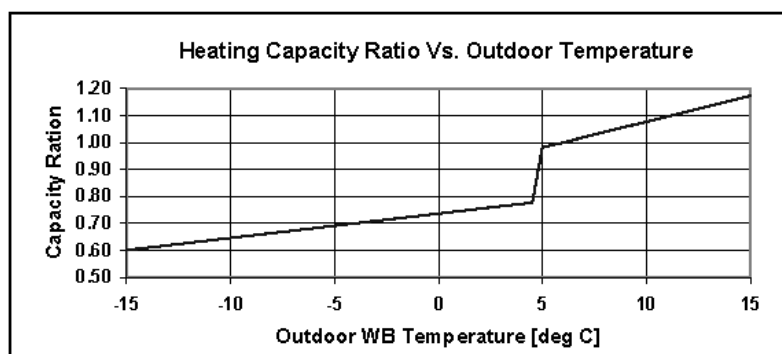
5.3.3 Heating Capacity

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	7.32	6.81	6.30
	PI	1.86	2.05	2.24
-10/-12	TC	8.15	7.64	7.12
	PI	2.24	2.43	2.62
-7/-8	TC	8.77	8.26	7.75
	PI	2.53	2.72	2.91
-1/-2	TC	9.08	8.57	8.06
	PI	2.67	2.86	3.05
2/1	TC	9.29	8.77	8.26
	PI	2.77	2.96	3.15
7/6	TC	12.01	11.50	10.99
	PI	2.91	3.10	3.29
10/9	TC	12.67	12.16	11.65
	PI	3.08	3.27	3.46
15/12	TC	13.34	12.82	12.31
	PI	3.26	3.45	3.64
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

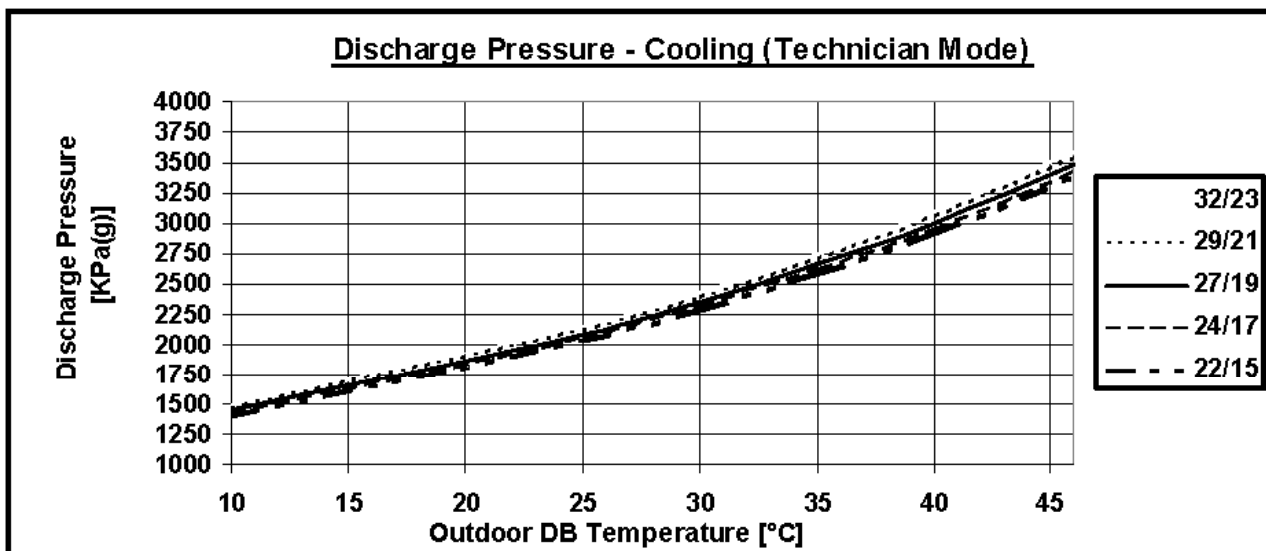
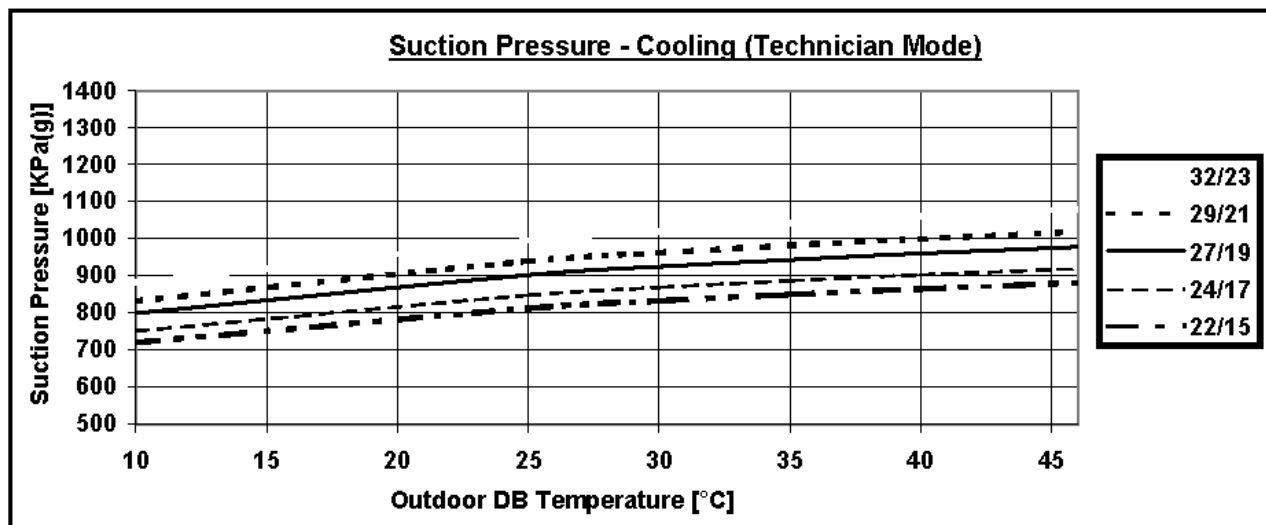
- TH – Total Heating Capacity, kW
 PI – Power Input, kW
 WB – Wet Bulb Temp., (°C)
 DB – Dry Bulb Temp., (°C)
 ID – Indoor
 OD – Outdoor

5.3.4 Capacity Correction Factors (Heating)

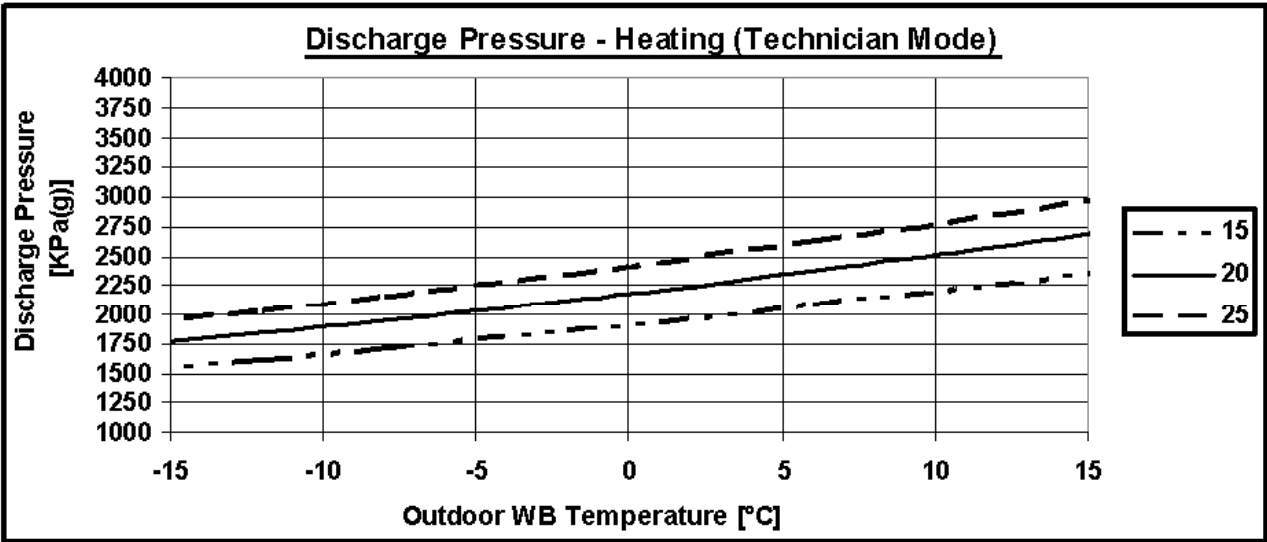
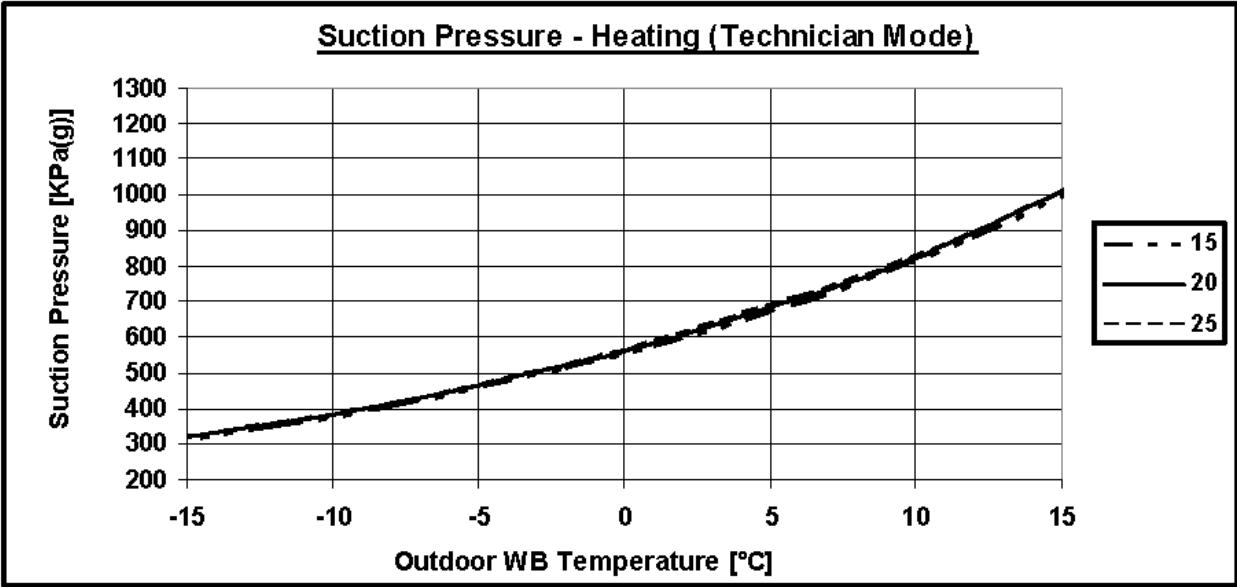


5.3.5 Pressure Curves (Cooling – Technician Mode)

5.3.5.1 Cooling



5.3.5.2 Heating



5.4 EMD125 DCI

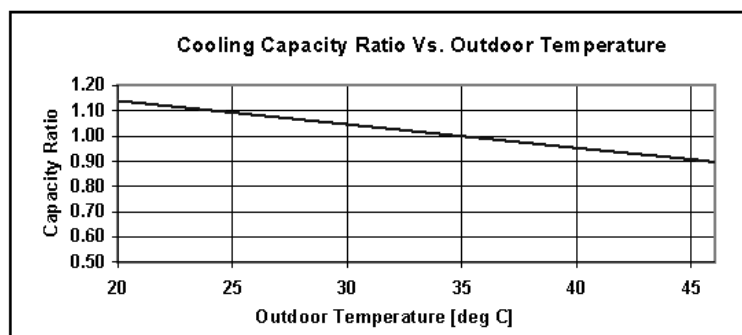
5.4.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	22/15	24/17	27/19	29/21	32/23
-10 – 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	12.08	12.87	13.66	14.45	15.24
	SC	9.87	10.07	10.27	10.47	10.68
	PI	3.22	3.28	3.35	3.41	3.47
30	TC	11.50	12.29	13.08	13.87	14.66
	SC	9.62	9.82	10.02	10.23	10.43
	PI	3.60	3.66	3.72	3.78	3.85
35	TC	10.92	11.71	12.50	13.29	14.08
	SC	9.37	9.57	9.78	9.98	10.18
	PI	3.98	4.04	4.10	4.16	4.22
40	TC	10.34	11.13	11.92	12.71	13.50
	SC	9.12	9.32	9.53	9.73	9.93
	PI	4.35	4.42	4.48	4.54	4.60
46	TC	9.64	10.43	11.22	12.01	12.80
	SC	8.82	9.03	9.23	9.43	9.63
	PI	4.71	4.87	4.93	4.99	5.05

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

5.4.2 Capacity Correction Factors (Cooling)



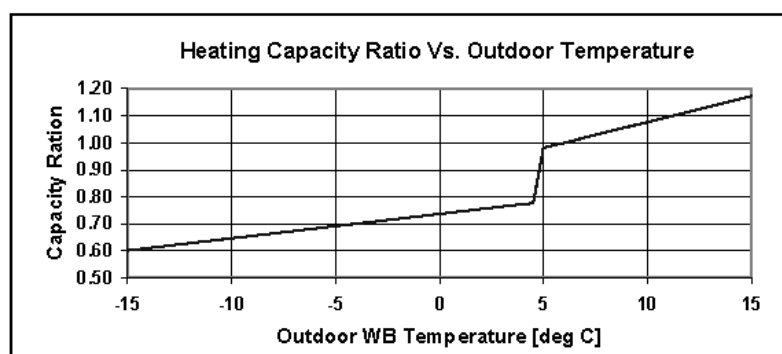
5.4.3 Heating Capacity

OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	ID COIL ENTERING AIR DB TEMPERATURE [°C]		
		15	20	25
-15/-16	TC	8.91	8.29	7.67
	PI	2.47	2.72	2.97
-10/-12	TC	9.92	9.30	8.67
	PI	2.97	3.22	3.47
-7/-8	TC	10.68	10.05	9.43
	PI	3.35	3.60	3.85
-1/-2	TC	11.05	10.43	9.81
	PI	3.54	3.79	4.04
2/1	TC	11.31	10.68	10.06
	PI	3.67	3.92	4.17
7/6	TC	14.62	14.00	13.38
	PI	3.86	4.11	4.36
10/9	TC	15.43	14.81	14.18
	PI	4.09	4.34	4.59
15/12	TC	16.24	15.61	14.99
	PI	4.32	4.57	4.82
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

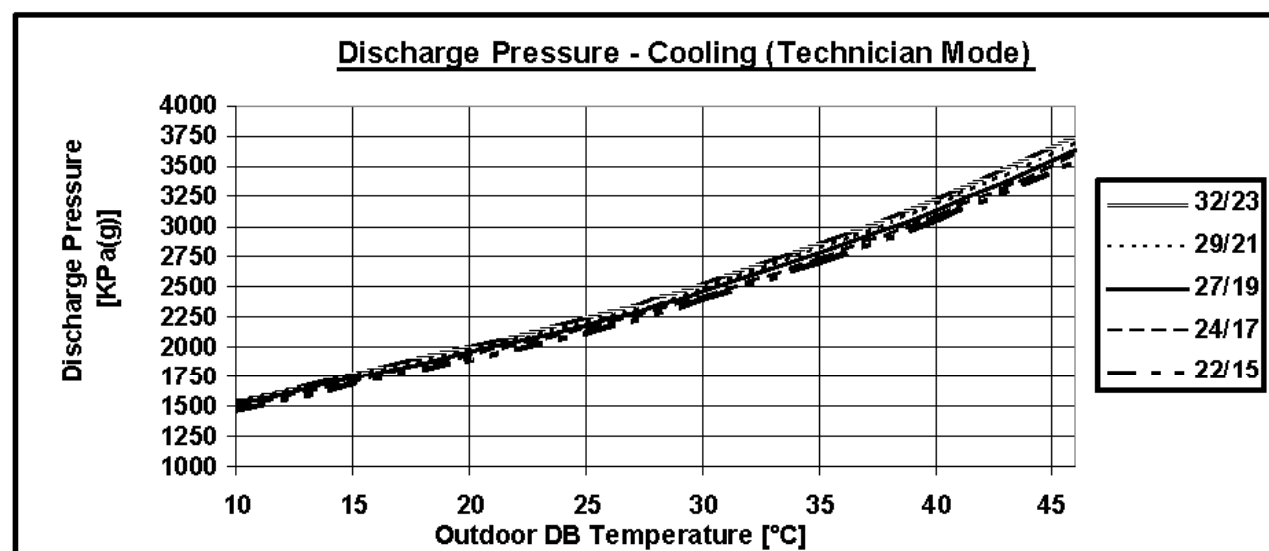
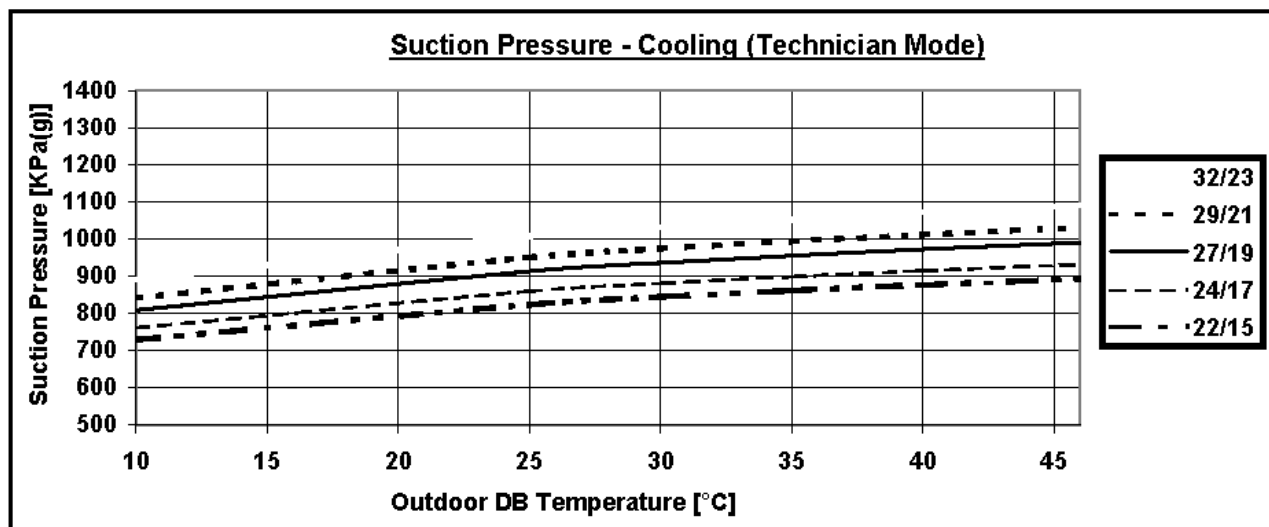
- TH – Total Heating Capacity, kW
 PI – Power Input, kW
 WB – Wet Bulb Temp., (°C)
 DB – Dry Bulb Temp., (°C)
 ID – Indoor
 OD – Outdoor

5.4.4 Capacity Correction Factors (Heating)

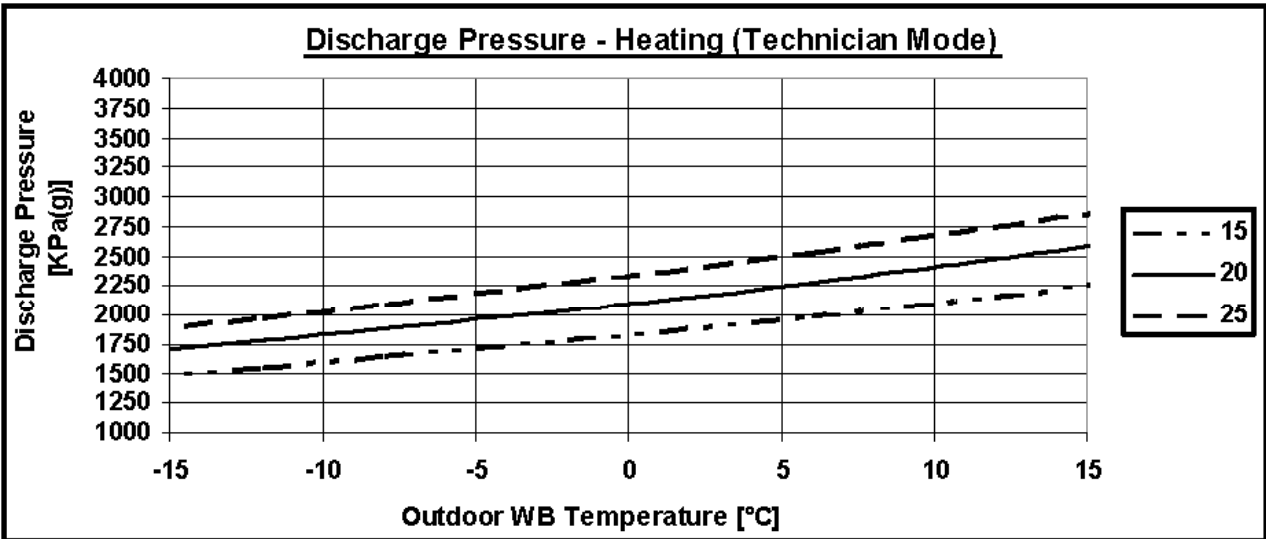
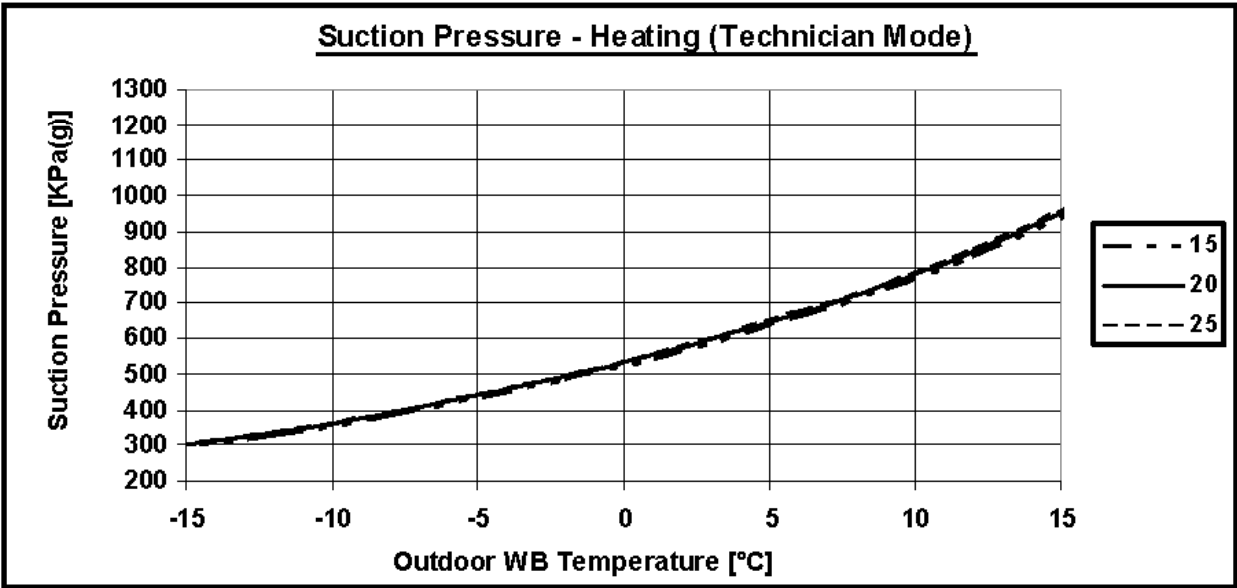


5.4.5 Pressure Curves (Cooling – Technician Mode)

5.4.5.1 Cooling



5.4.5.2 Heating



5.5 CD 140 DCI

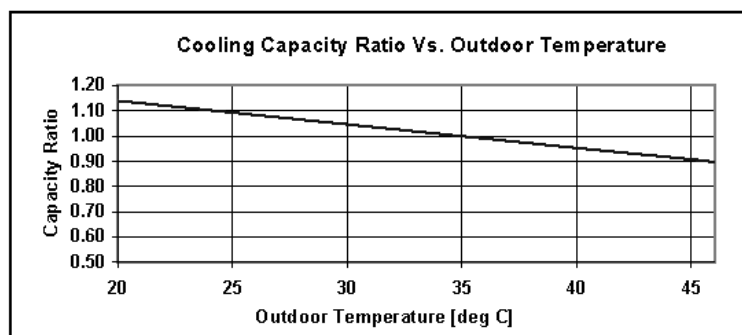
5.5.1 Cooling Capacity (kW)

		ID COIL ENTERING AIR DB/WB TEMPERATURE [°C]				
OD COIL ENTERING AIR DB TEMPERATURE [°C]	DATA	22/15	24/17	27/19	29/21	32/23
-10 - 20 (protection range)	TC	80 - 110 % of nominal				
	SC	80 - 105 % of nominal				
	PI	25 - 50 % of nominal				
25	TC	13.53	14.42	15.30	16.19	17.07
	SC	11.31	11.54	11.77	12.00	12.23
	PI	3.30	3.36	3.43	3.49	3.55
30	TC	12.88	13.77	14.65	15.54	16.42
	SC	11.02	11.25	11.49	11.72	11.95
	PI	3.69	3.75	3.81	3.88	3.94
35	TC	12.23	13.12	14.00	14.88	15.77
	SC	10.74	10.97	11.20	11.43	11.66
	PI	4.07	4.14	4.20	4.26	4.33
40	TC	11.58	12.46	13.35	14.23	15.12
	SC	10.45	10.68	10.91	11.15	11.38
	PI	4.46	4.52	4.59	4.65	4.71
46	TC	10.80	11.68	12.57	13.45	14.34
	SC	10.11	10.34	10.57	10.80	11.03
	PI	4.92	4.99	5.05	5.11	5.18

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

5.5.2 Capacity Correction Factors (Cooling)



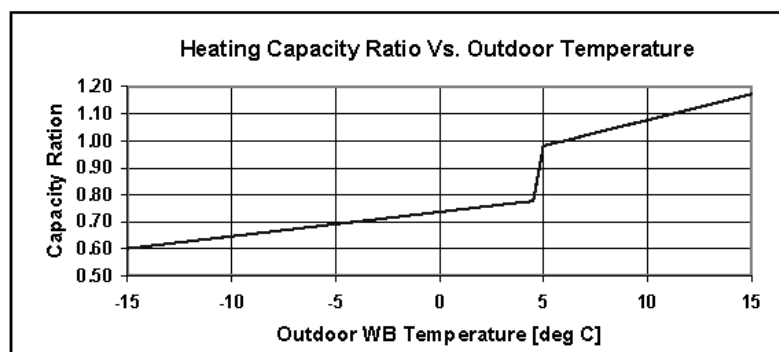
5.5.3 Heating Capacity

		ID COIL ENTERING AIR DB TEMPERATURE [°C]		
OD COIL ENTERING AIR DB/WB TEMPERATURE [°C]	DATA	15	20	25
-15/-16	TC	10.18	9.47	8.76
	PI	2.64	2.91	3.18
-10/-12	TC	11.34	10.62	9.91
	PI	3.18	3.45	3.72
-7/-8	TC	12.20	11.49	10.78
	PI	3.59	3.86	4.13
-1/-2	TC	12.63	11.92	11.21
	PI	3.79	4.06	4.33
2/1	TC	12.92	12.21	11.50
	PI	3.93	4.20	4.47
7/6	TC	16.71	16.00	15.29
	PI	4.13	4.40	4.67
10/9	TC	17.63	16.92	16.21
	PI	4.38	4.65	4.92
15/12	TC	18.56	17.84	17.13
	PI	4.63	4.89	5.16
15-24 (Protection Range)	TC	85 - 105 % of nominal		
	PI	80 - 120 % of nominal		

LEGEND

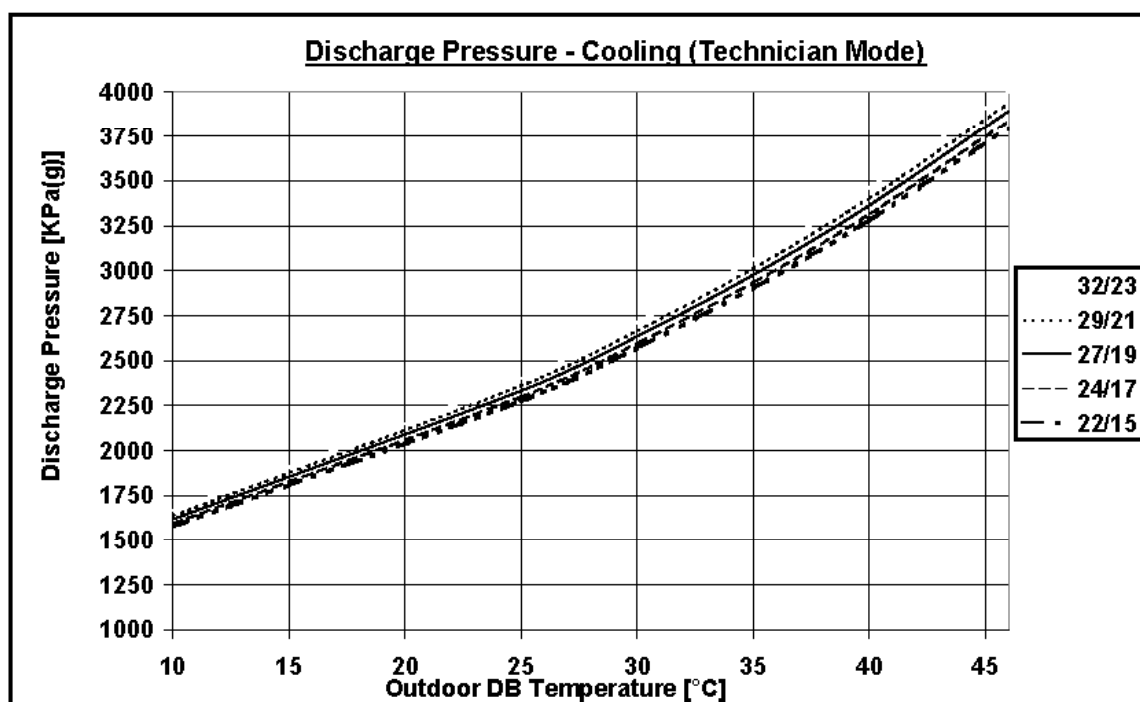
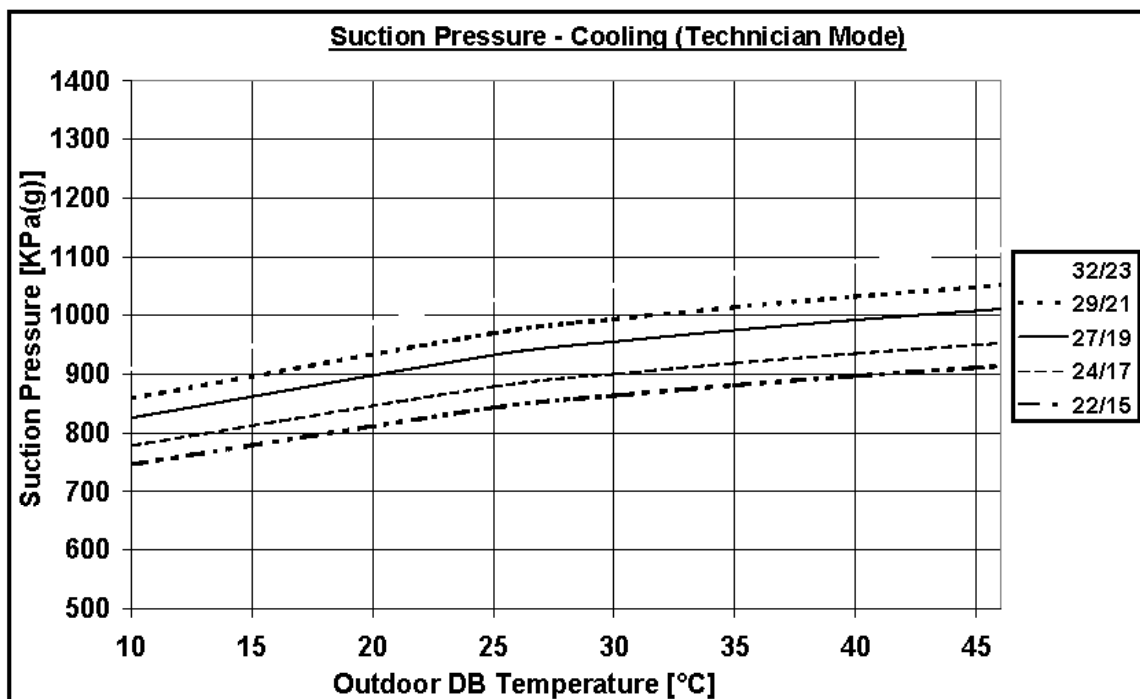
- TH – Total Heating Capacity, kW
- PI – Power Input, kW
- WB – Wet Bulb Temp., (°C)
- DB – Dry Bulb Temp., (°C)
- ID – Indoor
- OD – Outdoor

5.5.4 Capacity Correction Factors (Heating)

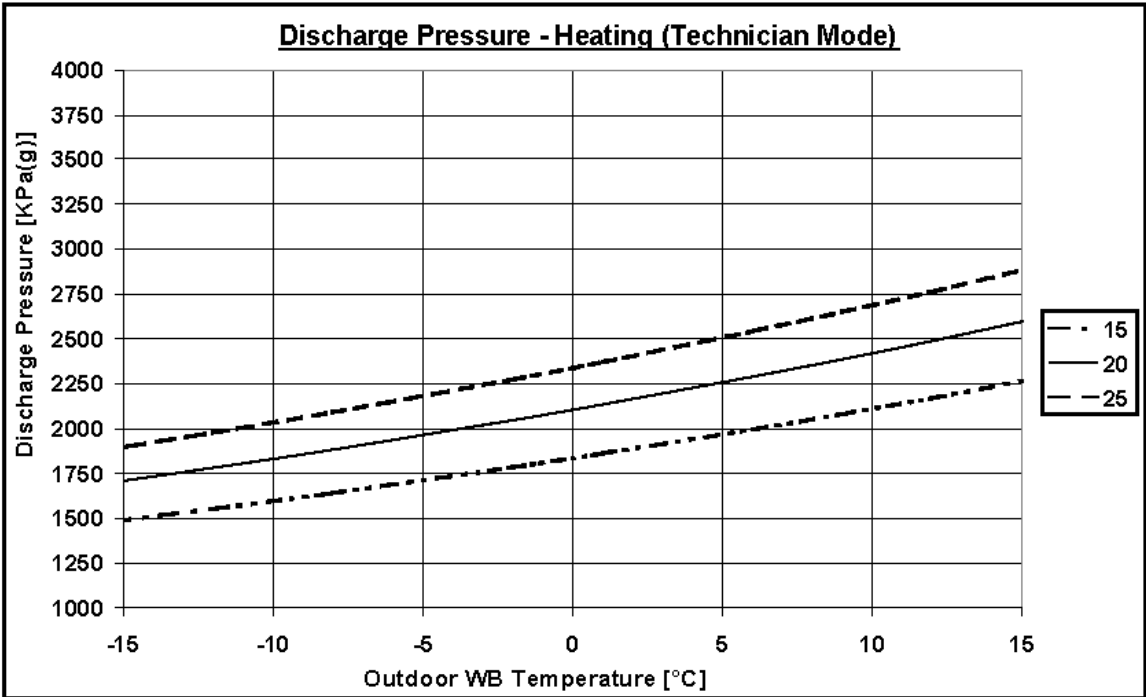
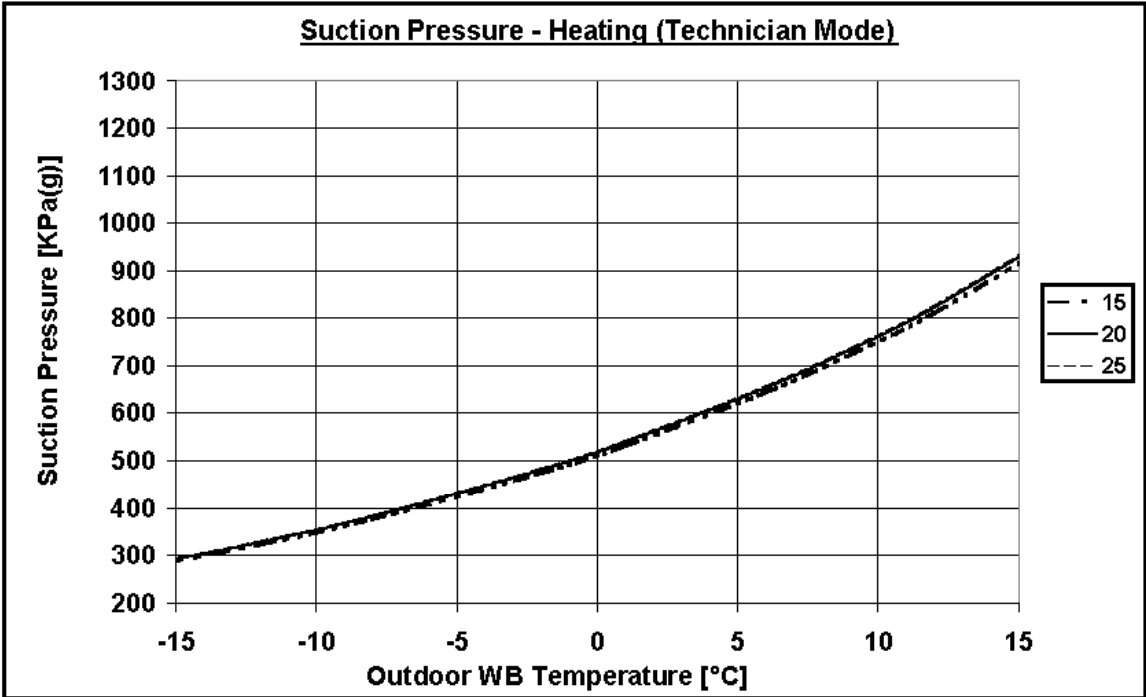


5.5.5 Pressure Curves (Cooling – Technician Mode)

5.5.5.1 Cooling

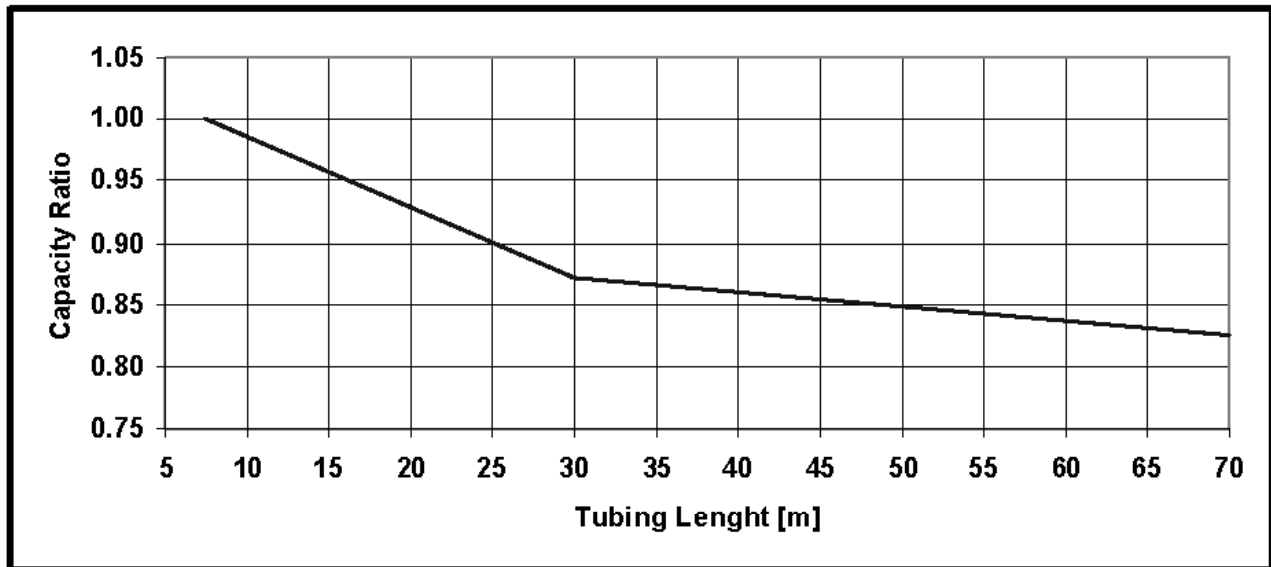


5.5.5.2 Heating

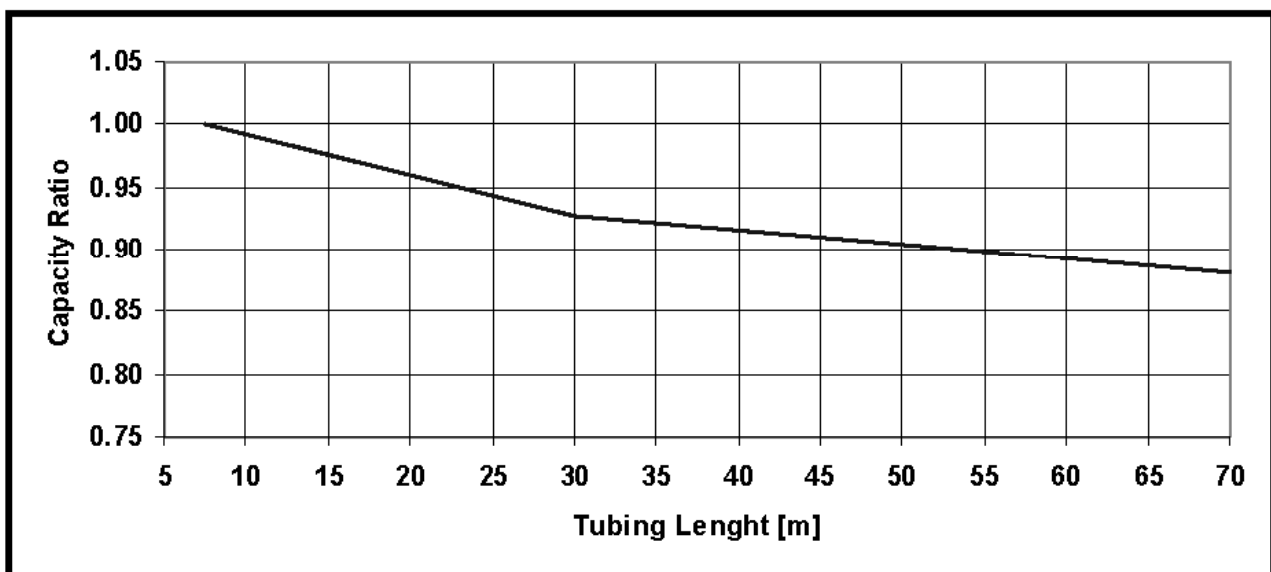


5.6 Capacity Correction Factor for Tubing Length

5.6.1 Cooling

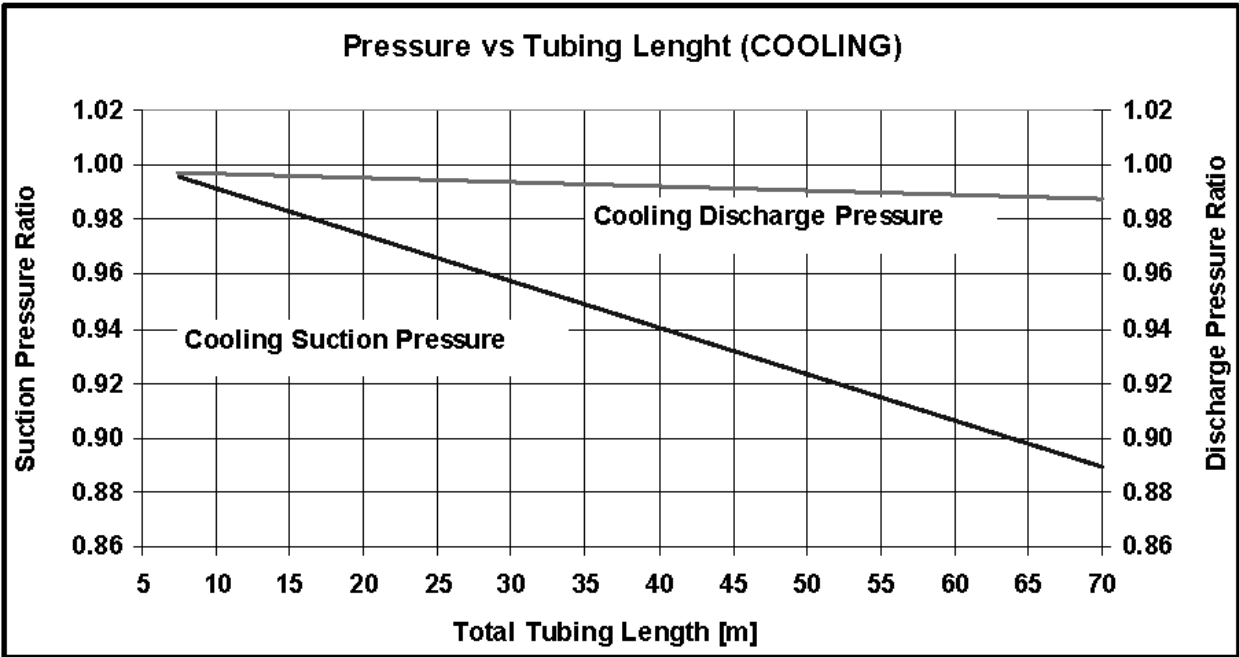


5.6.2 Heating

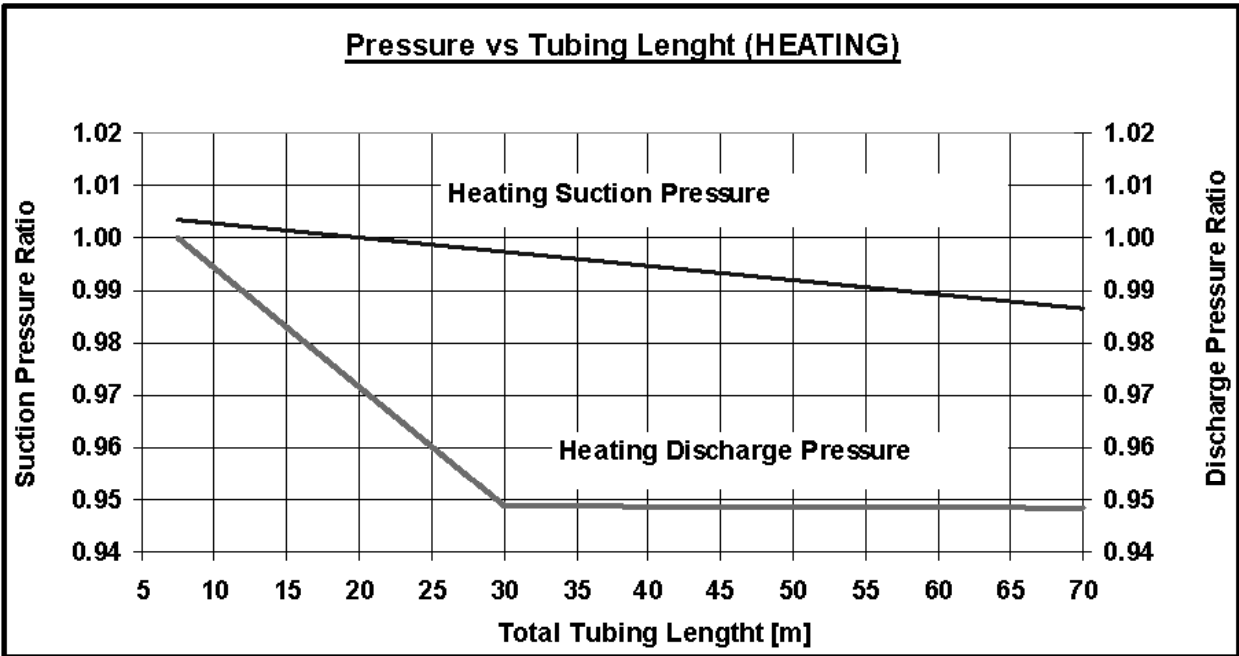


5.7 Pressure Correction Factor for Tubing Length

5.7.1 Cooling



5.7.2 Heating



5.8 Calculation Example

Outdoor Unit	OU12 5HP DCI
Indoor Unit	DNG 125 DCI
Operation Mode	Cooling Mode
Conditions Indoor	22°CDB/15°WB
Conditions Outdoor	30°CDB
Tubing length	50m

Cooling Capacity calculation:

Total Cooling Capacity (TC) [KW] = Capacity in conditions table x F_T

Cooling Capacity in table [KW]	Tubing Length Factor (F_T)	Corrected Capacity [KW]
11.5	0.85	TC = 11.5x0.85=9.775

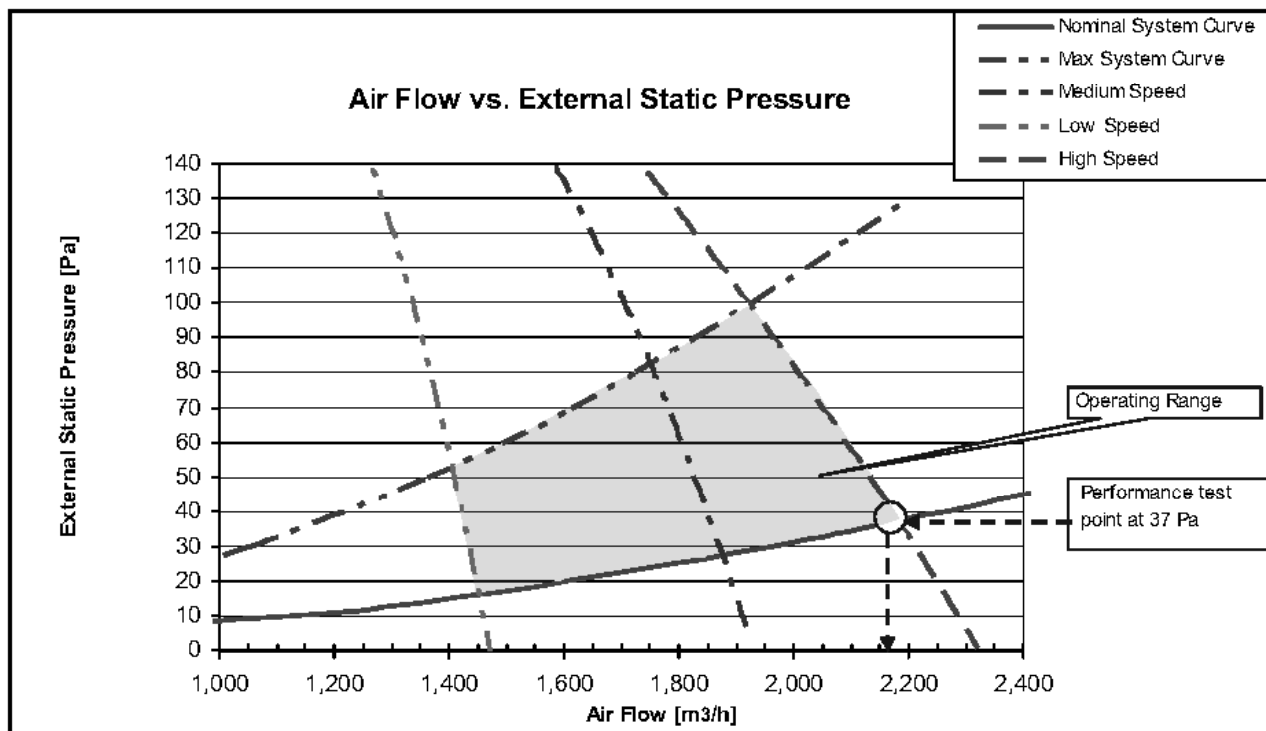
Cooling Pressure calculation:

Pressure [KPa(g)] = Nominal Pressure (at 7.5m) x F_T

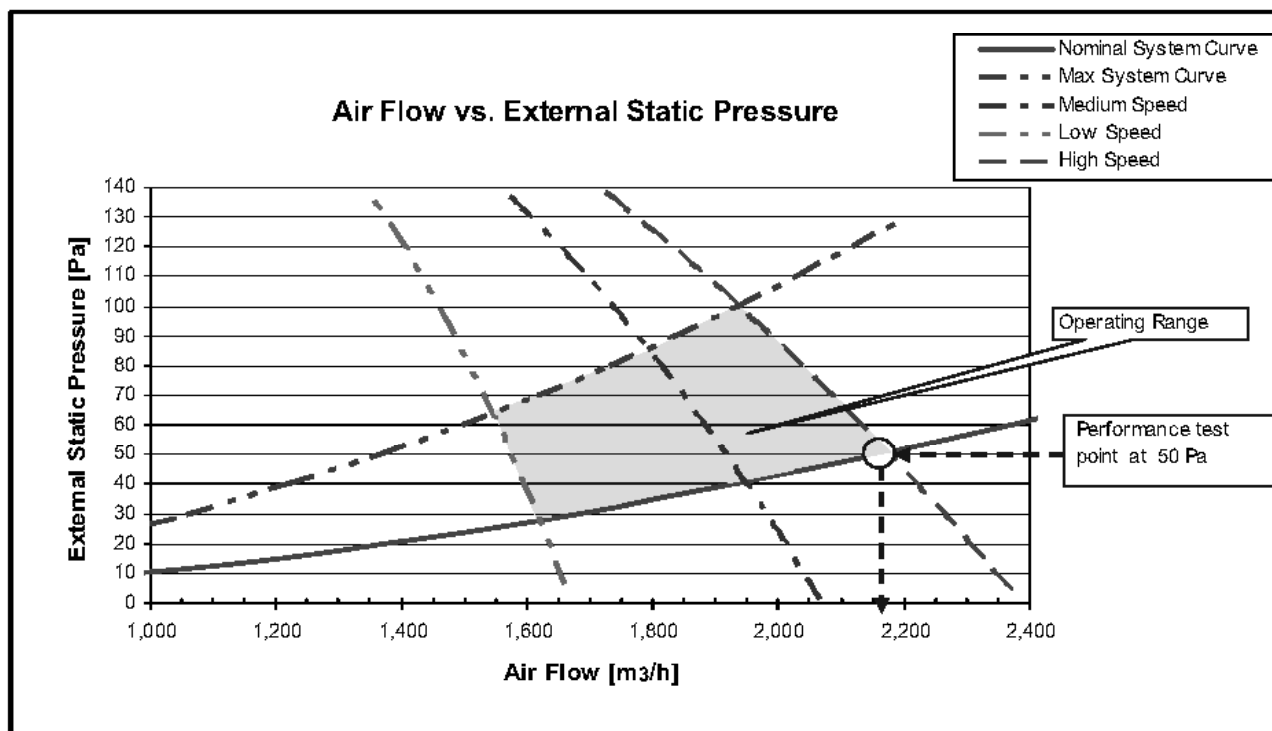
Nominal Pressure [KPa(g)]		Tubing Length Factor (F_T)	Corrected Pressure [KPa(g)]
Discharge	2500	0.99	Pd= 2500 x 0.99 = 2475
Suction	800	0.925	Ps= 800 x 0.925 = 740

6. AIRFLOW CURVES

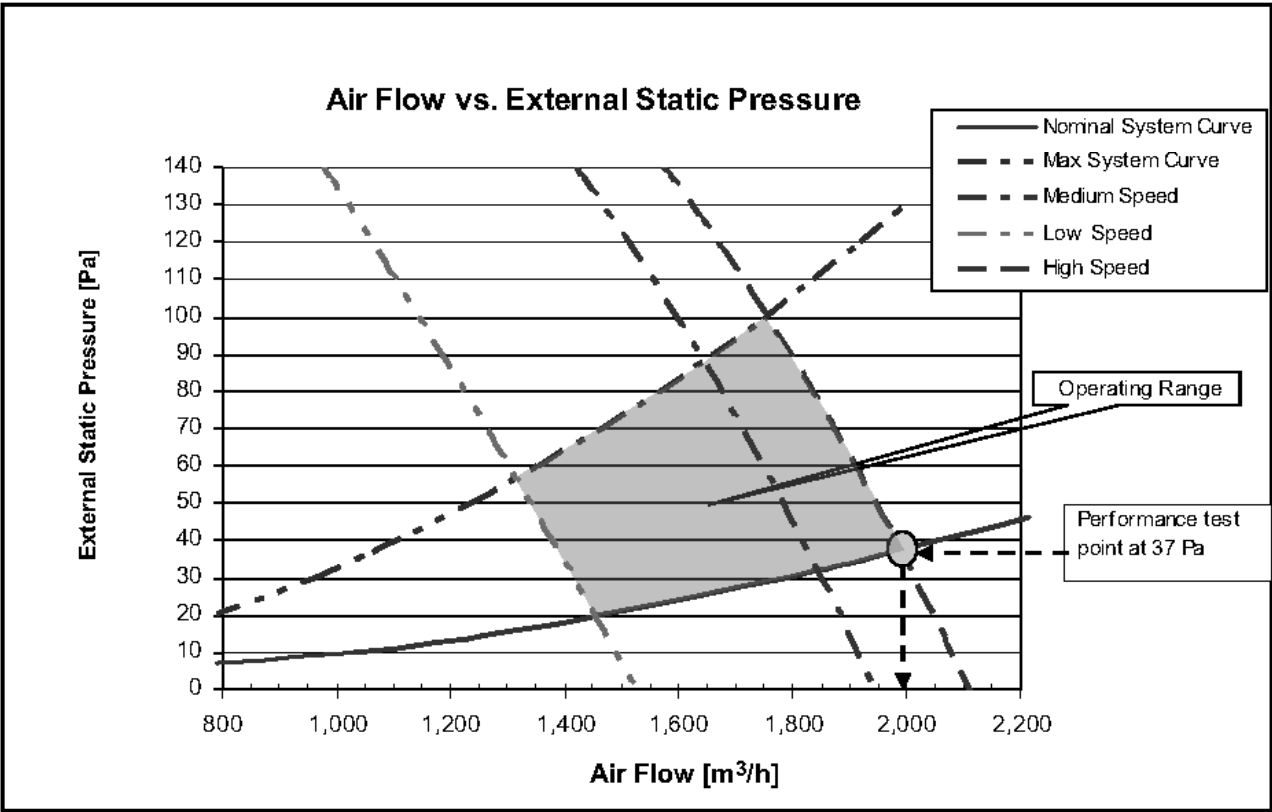
6.1 Model: DNG 100 DCI



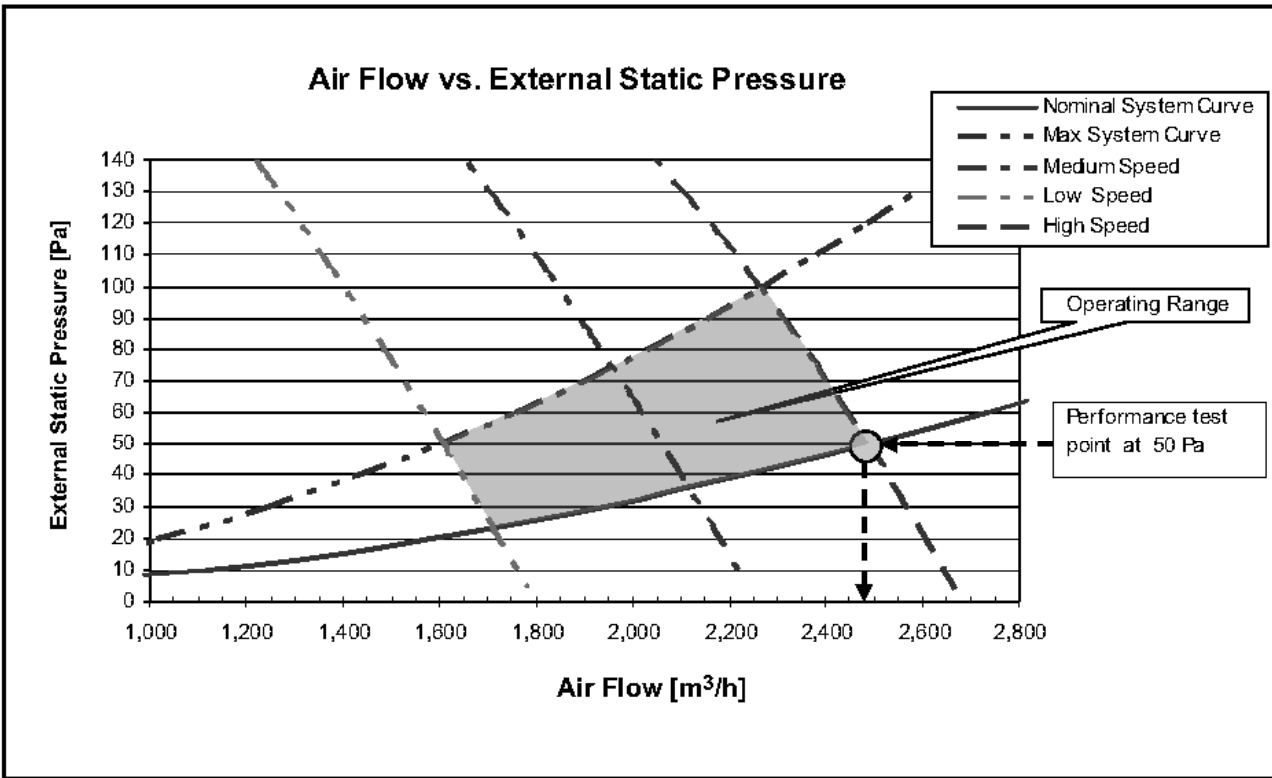
6.2 Model: DNG 125 DCI



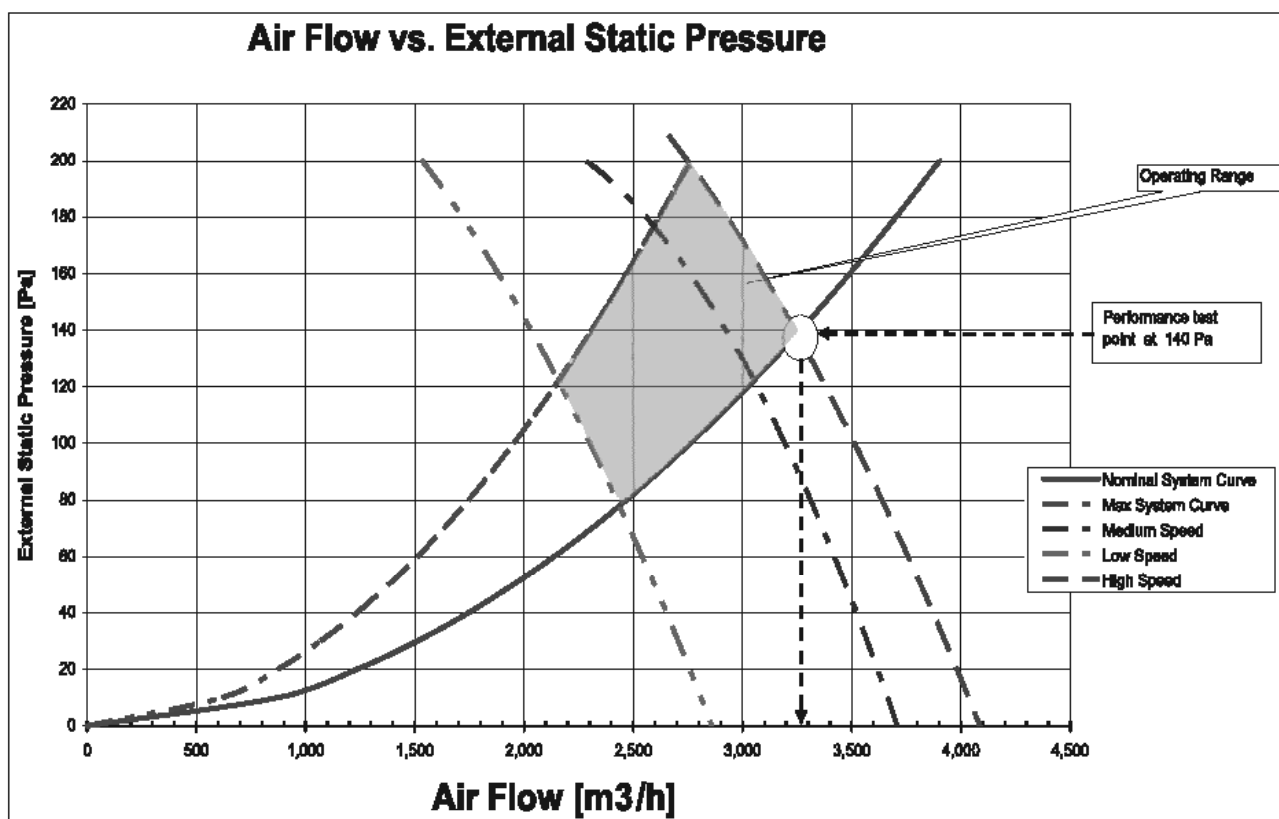
6.3 Model: EMD 100 DCI



6.4 Model: EMD 125 DCI



6.5 Model: CD 140 DCI



6.6 DNG / EMD / CD UNITS RANGE AIR FLOW CORRECTION FACTORS

(at nominal rating conditions — Test mode).

		Air Flow Rate [% of nominal]				
		60%	70%	80%	90%	100%
Cooling	TC	0.88	0.91	0.94	0.97	1
	SC	0.78	0.84	0.89	0.95	1
	PI	0.95	0.97	0.98	0.99	1
Heating	PI	1.07	1.05	1.03	1.02	1
	TC	0.90	0.92	0.95	0.97	1

* Permissible Air flow Rate - according to model Air Flow Curves

7. SOUND LEVEL CHARACTERISTICS

7.1 Indoor Units Test Scheme

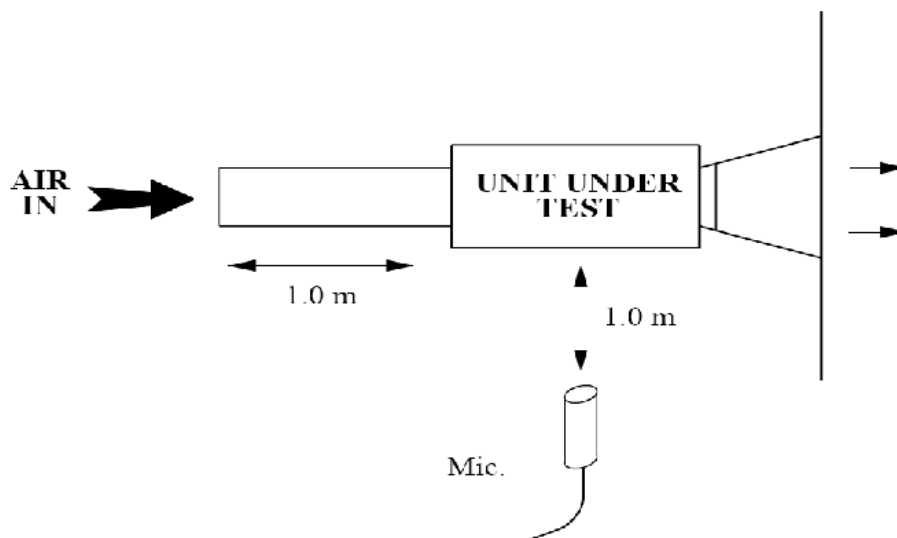
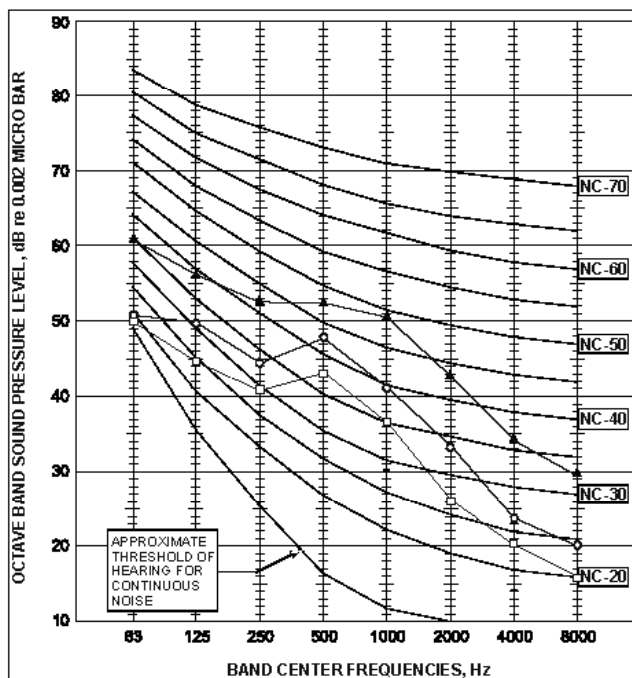


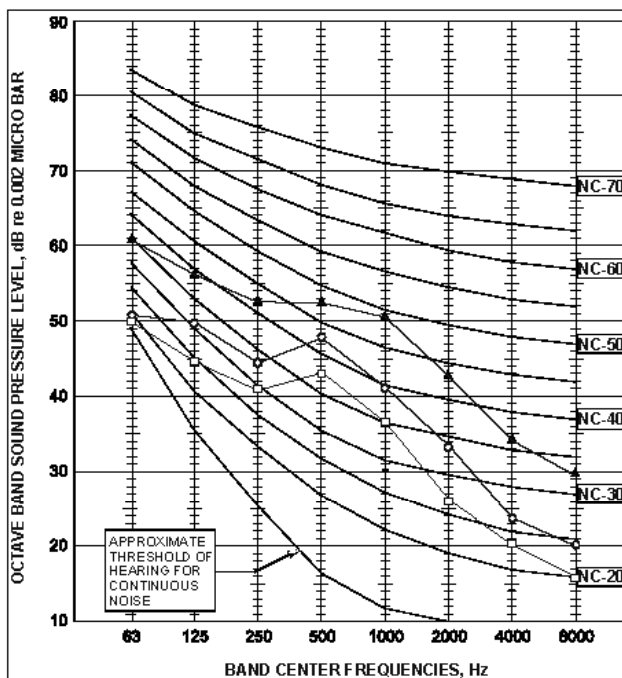
Figure 1

7.2 Sound Pressure Level Spectrum (Measured as Figure 1)

DNG 100

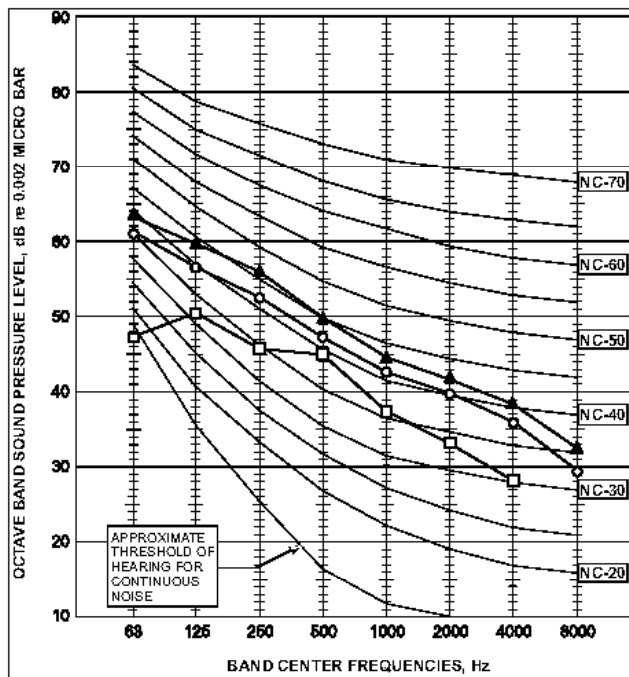


DNG 125

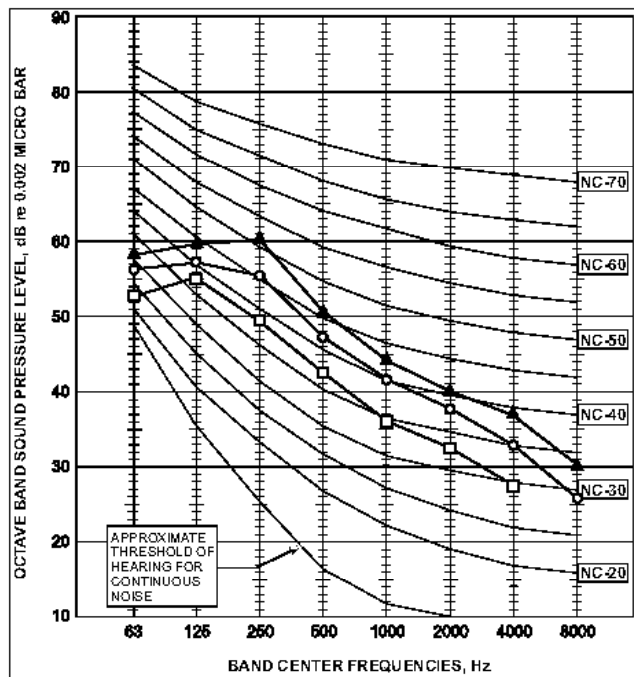


FAN SPEED	LINE
HI	—▲—
ME	—○—
LO	—□—

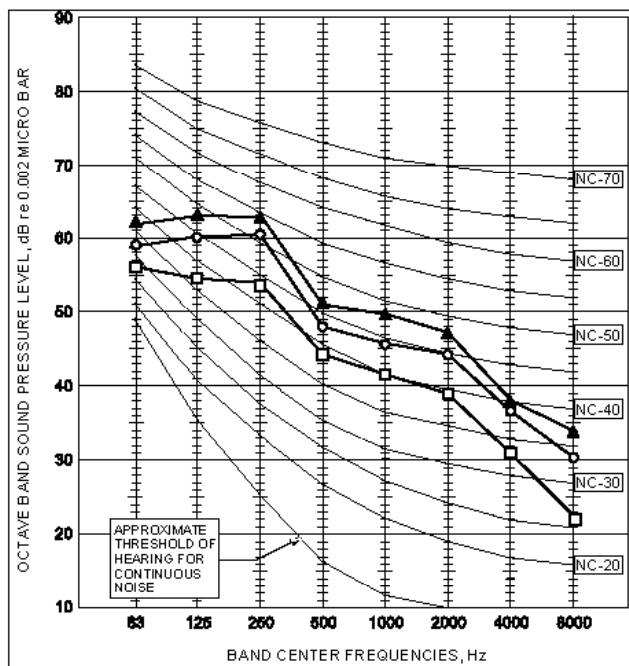
EMD 100



EMD 125



CD 140



FAN SPEED	LINE
HI	—▲—
ME	—○—
LO	—□—

7.3 Outdoor Units

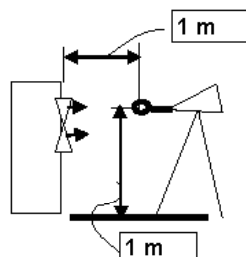
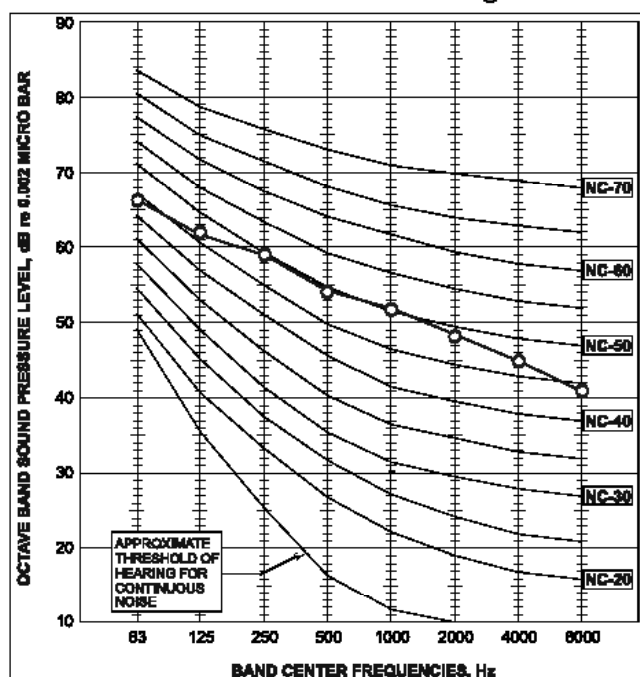


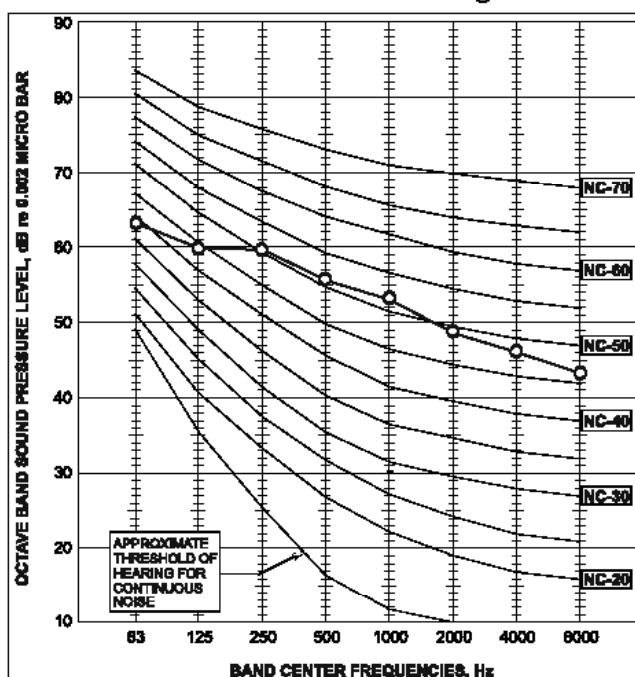
Figure 2

7.4 Sound Pressure Level Spectrum (Measured as Figure 2)

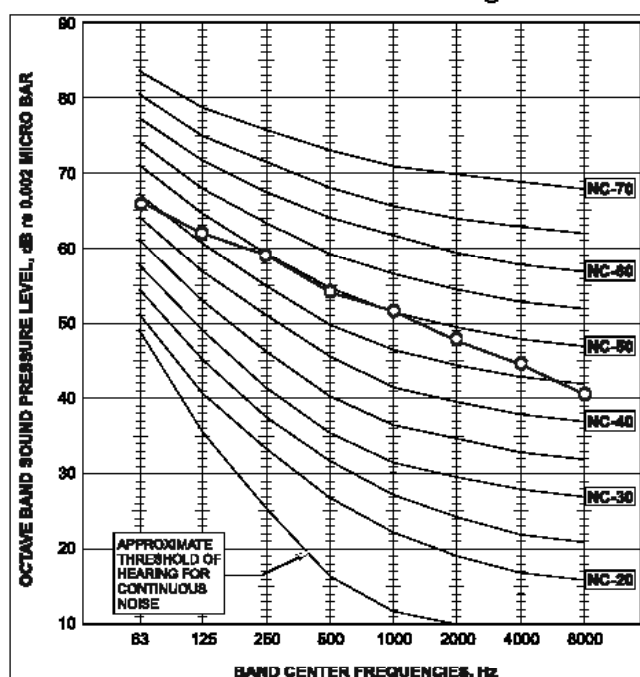
OU12 4HP DCI Cooling



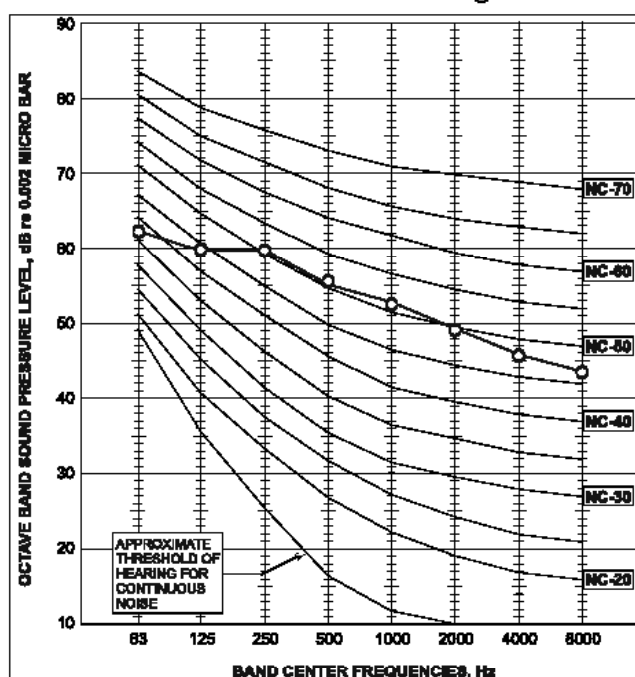
OU12 4HP DCI Heating



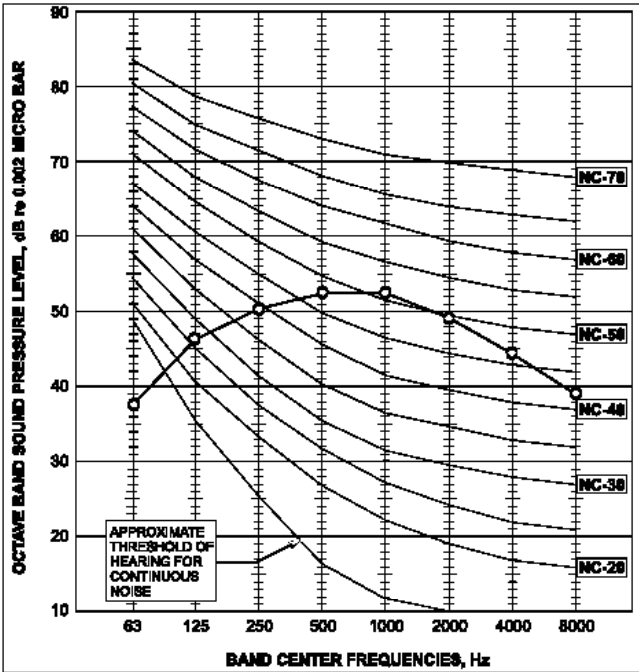
OU12 5HP DCI Cooling



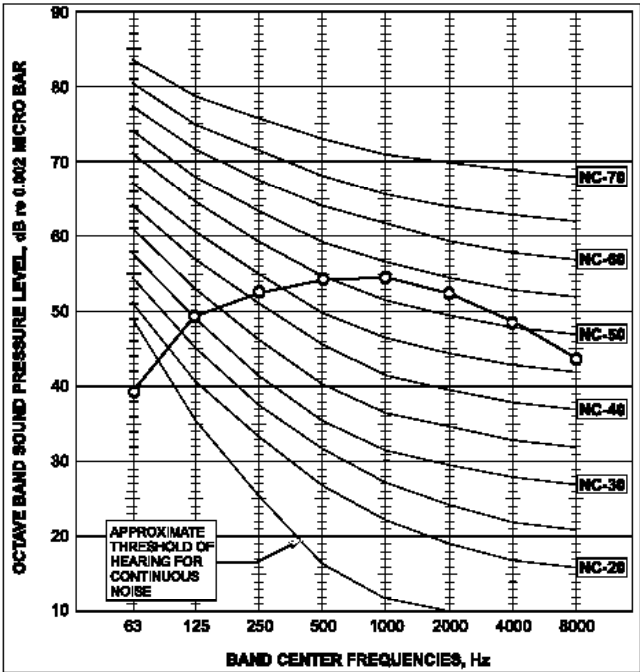
OU12 5HP DCI Heating



OU12 6HP DCI Cooling



OU12 6HP DCI Heating



8. ELECTRICAL DATA

8.1 Single Phase Units

MODEL	OU12 4PH DCI		OU12 5-6PH DCI	
Power Supply	1PH – 230V – 50 Hz			
Connected to ^(a)	Outdoor	Indoor	Outdoor	Indoor
Max Current	23A	5A	28A	5A
Inrush Current ^(c)	30A			
Starting Current ^(d)	10A			
Circuit Breaker	25A	10A	32A	10A
Power Supply Wiring No. X Cross Section	3 X 4.0 mm ²	3 X 1.5 mm ²	3 X 6.0 mm ²	3 X 1.5 mm ²
Interconnecting Cable No. X Cross Section ^(b)	3 X 1.5 mm ² + 2 X 0.75 mm ² (Communications)	2 X 0.75 mm ² (Communications)	3 X 1.5 mm ² + 2 X 0.75 mm ² (Communications)	2 X 0.75 mm ² (Communications)

(a) Power supply can be connected in both ways:

- ❖ To outdoor unit to supply both outdoor and indoor unit.
- ❖ To outdoor unit and to Indoor unit separately.

(b) Communication wires must be separated from the power wires and should be shielded type, earth connected at both ends.

(c) Inrush current is the current when power is up (charging the DC capacitors at outdoor unit controller).

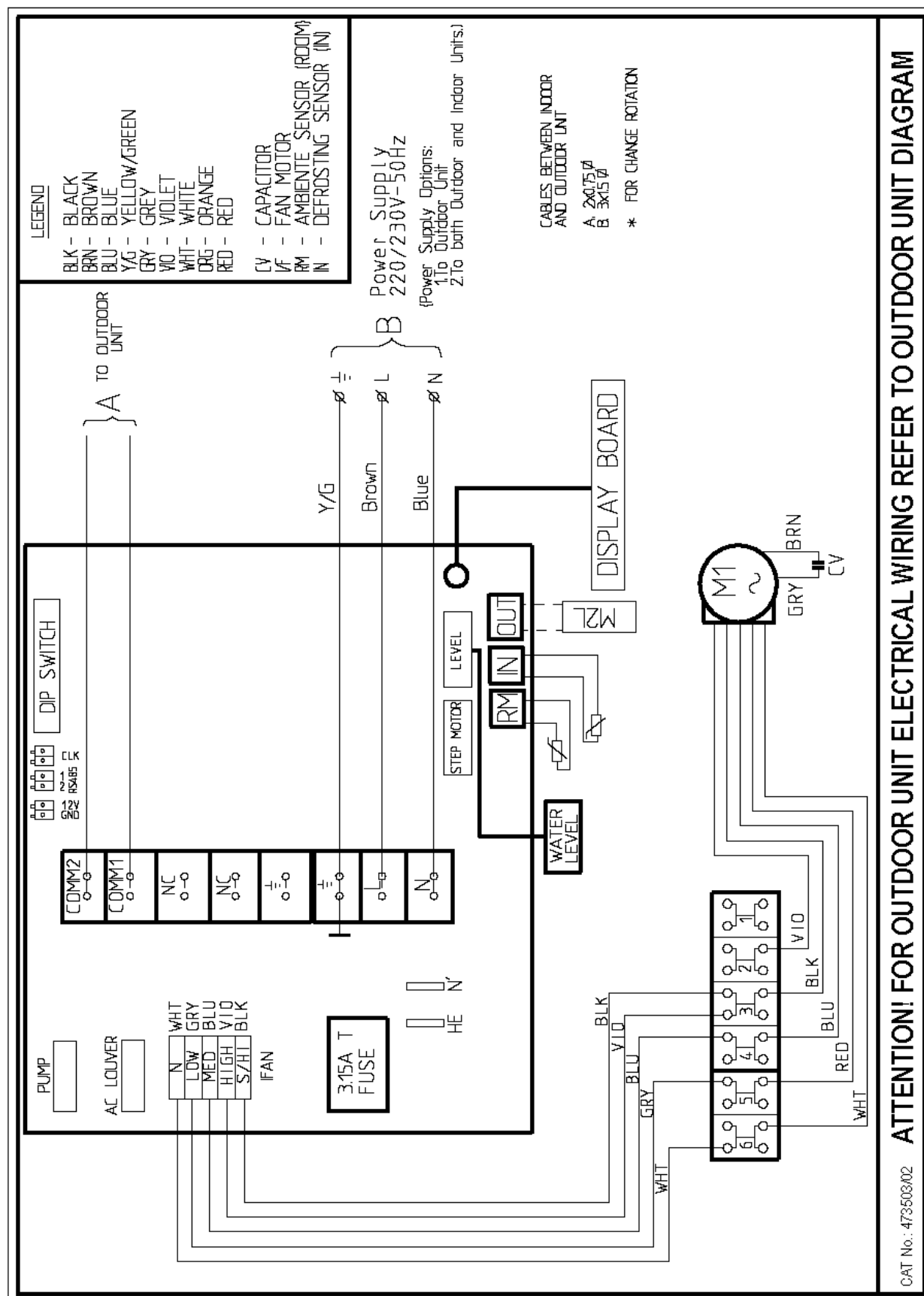
(d) Starting current is the current peak when starting the compressor.

NOTE:

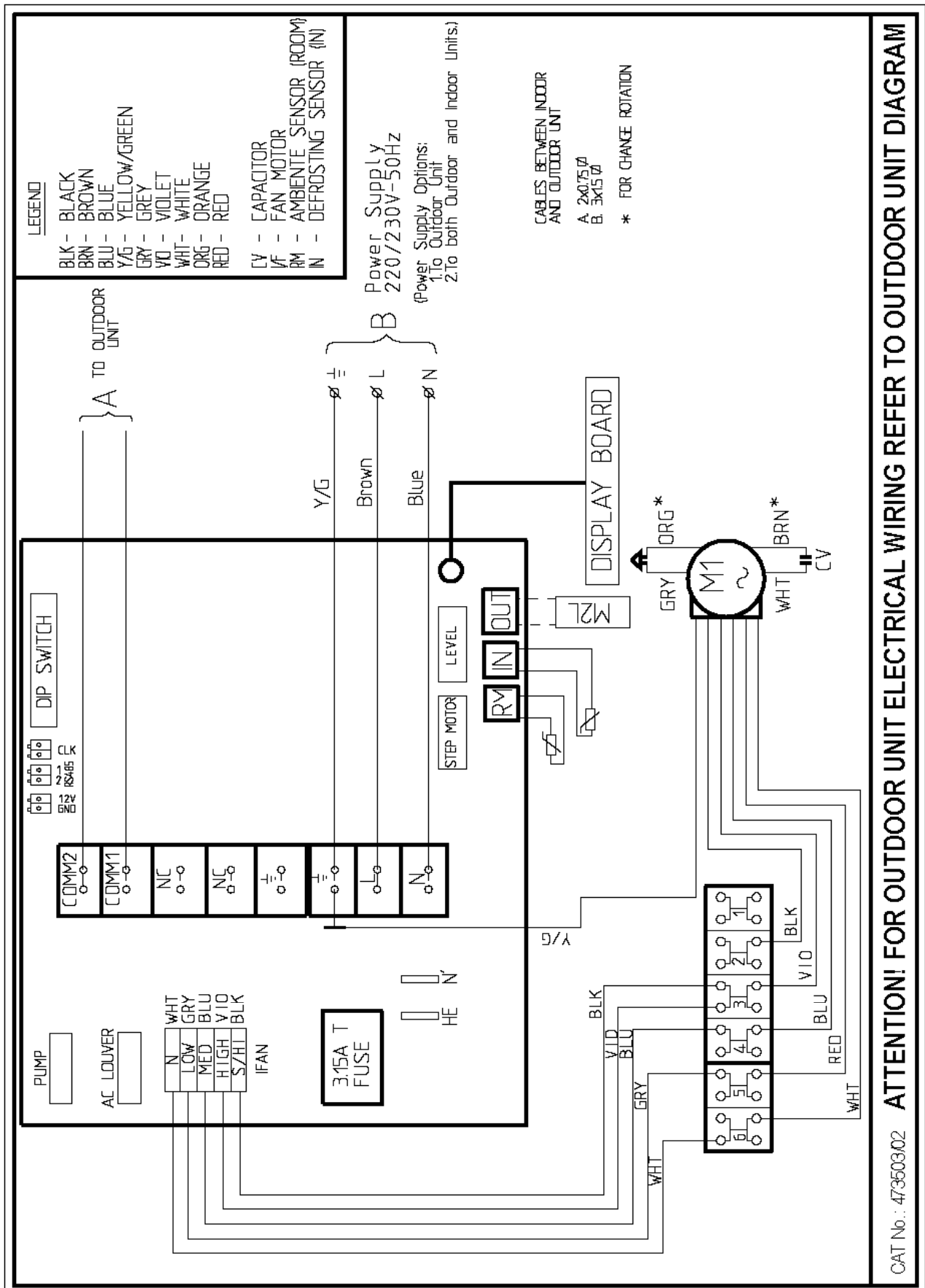
Power wiring cord should comply with local laws and electrical regulations requirements.

9. WIRING DIAGRAMS

9.1 Indoor Unit: DNG 100, 125 DCI

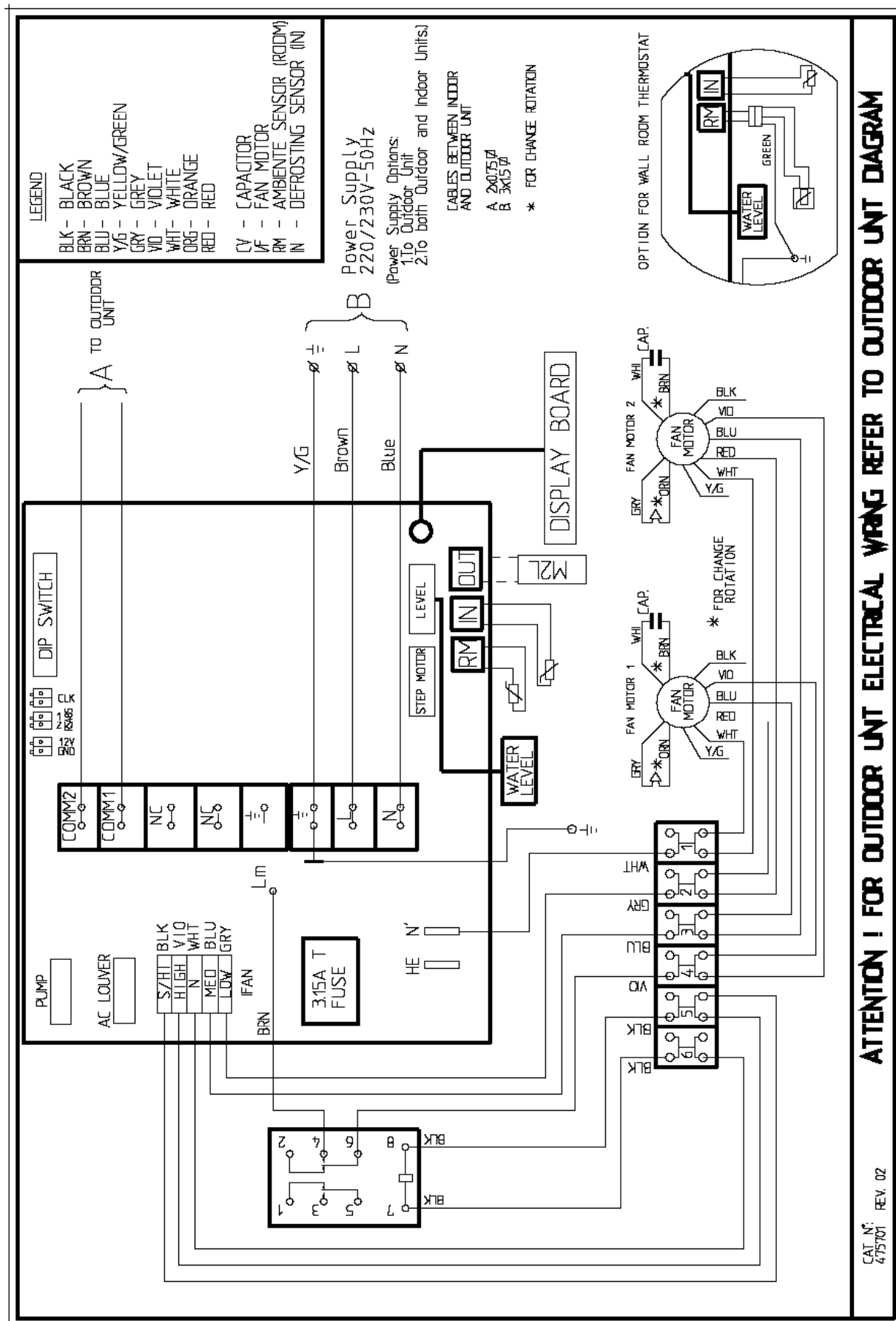


9.2 Indoor Unit: EMD 100, 125 DCI

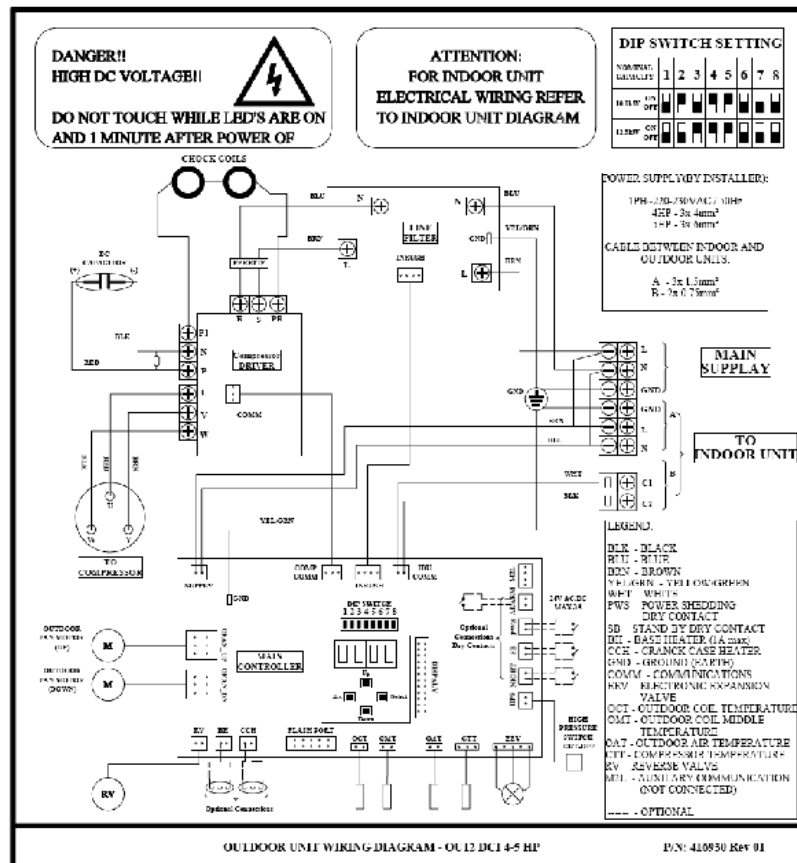


CAT No.: 473503/02 **ATTENTION! FOR OUTDOOR UNIT ELECTRICAL WIRING REFER TO OUTDOOR UNIT DIAGRAM**

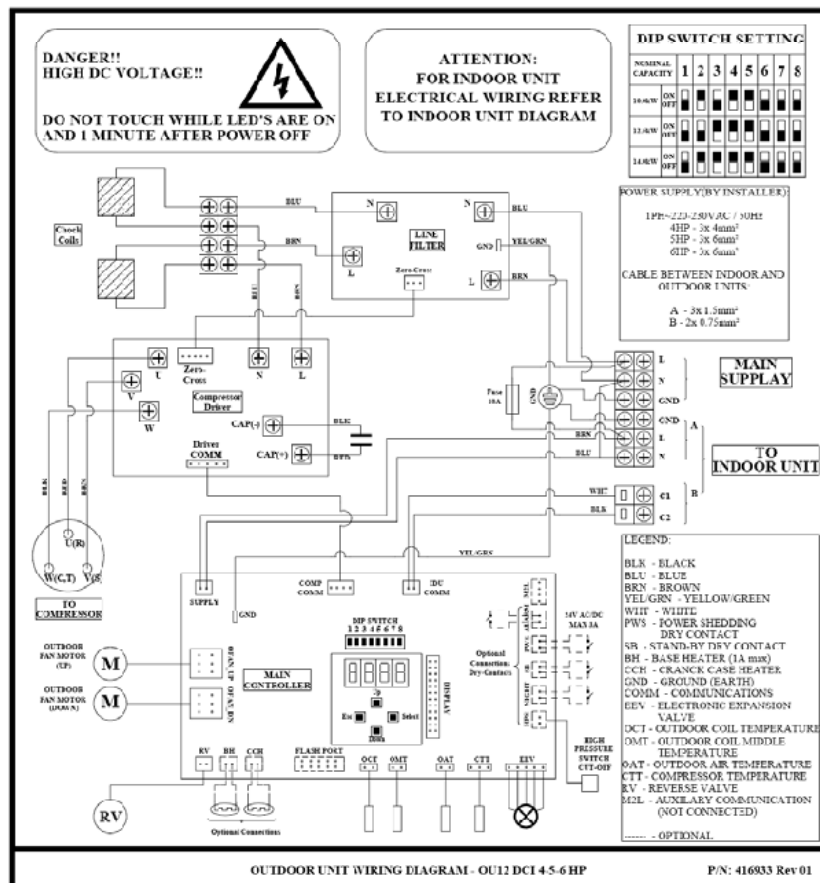
9.3 Indoor Units: CD 140 DCI

CAT. N°:
475701 REV. 02

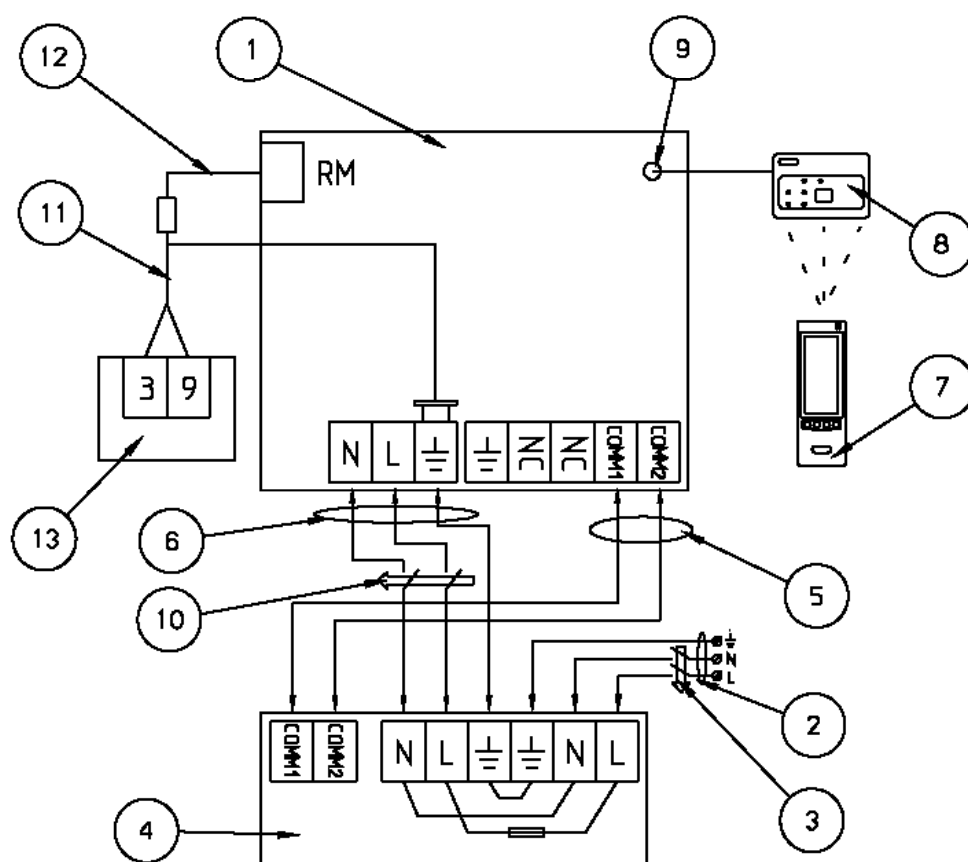
9.4 Outdoor Units: OU12 4-5HP DCI



9.5 Outdoor Units: OU12 6HP DCI



9.6 1PH UNITS POWER SUPPLY TO OUTDOOR (10.0, 12.5 Kw units)



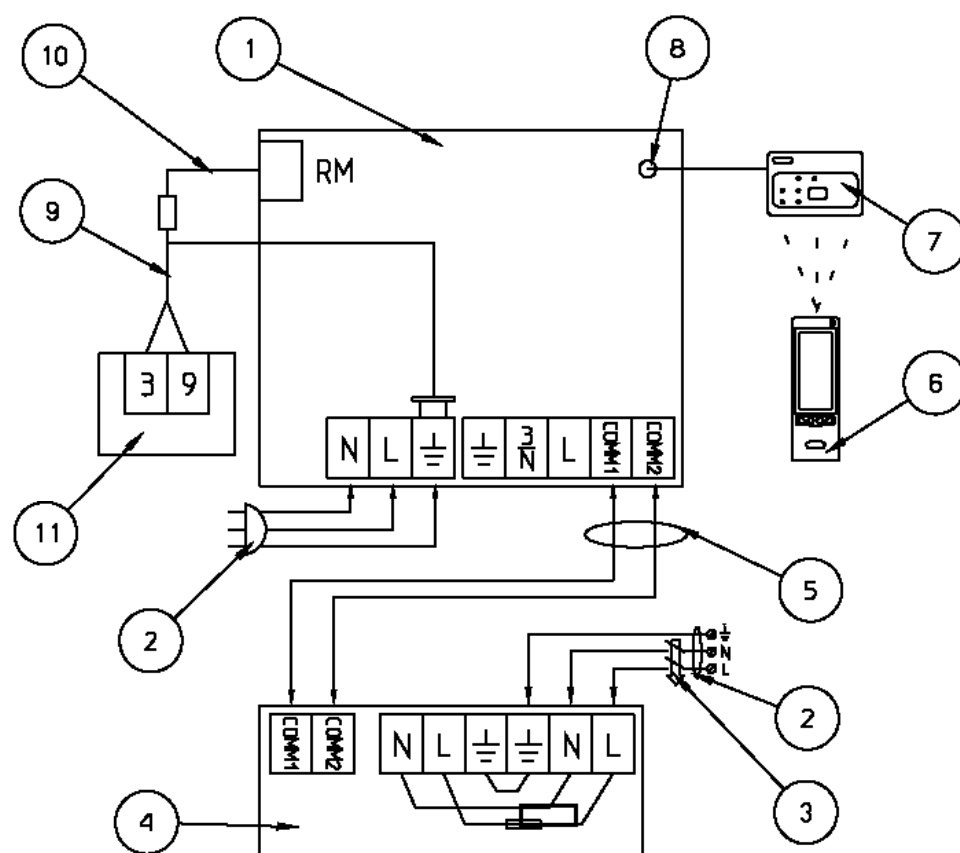
1. Indoor Unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting cable (2x0.75mm²)**
6. Power Interconnecting Cable (3x1.5mm²)
7. Wireless remote Control
8. Display Unit
9. Display Connector
10. Power Breaker (*by installer)
11. Control Cable**
12. Sensor Wire with connector
13. Room Temperature Sensor

* The power breaker must be of type that disconnects all poles with 3 mm contact opening.

** Use shielded cable and connect the shield to earth point

9.7 1PH UNITS POWER SUPPLY TO OUTDOOR and INDOOR UNIT SEPERATELY

(10.0, 12.5 Kw units)



1. Indoor Unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting cable (2x0.75mm²)*
6. Wireless remote Control
7. Display Unit
8. Display Connector
9. Control Cable*
10. Sensor Wire with connector
11. Room Temperature Sensor

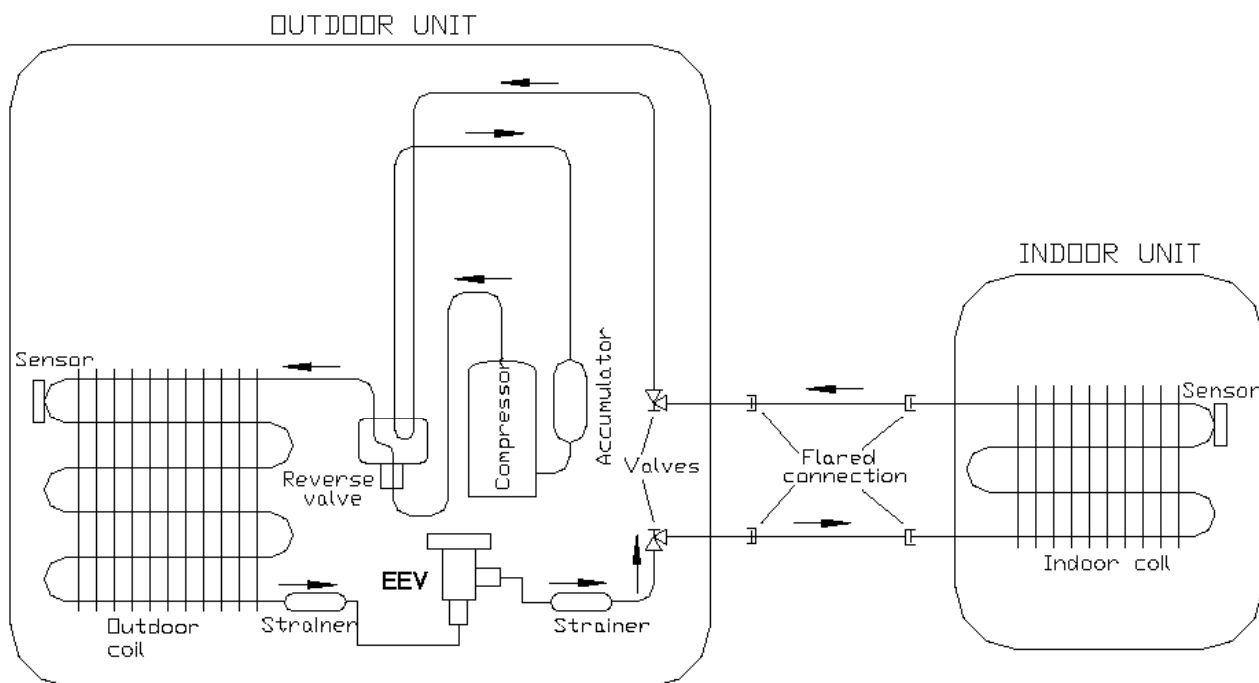
* Use shielded cable and connect the shield to earth point.

10. REFRIGERATION DIAGRAMS

10.1 Heat Pump Models

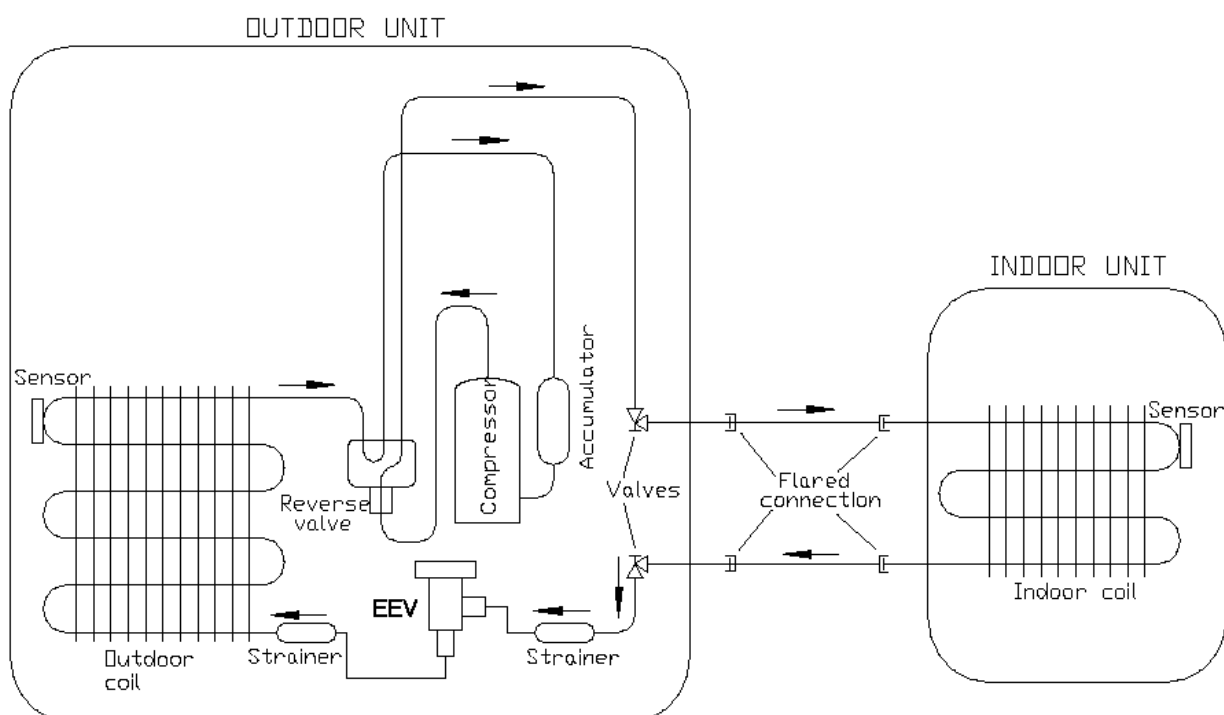
10.1.1 DNG 100 / 125 DCI, EMD 100 / 125, CD 140 DCI

Cooling mode



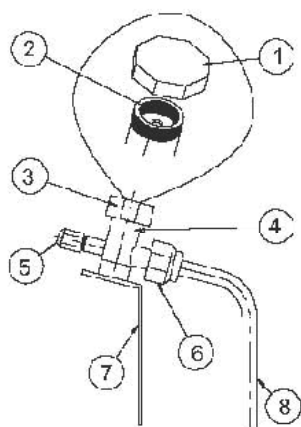
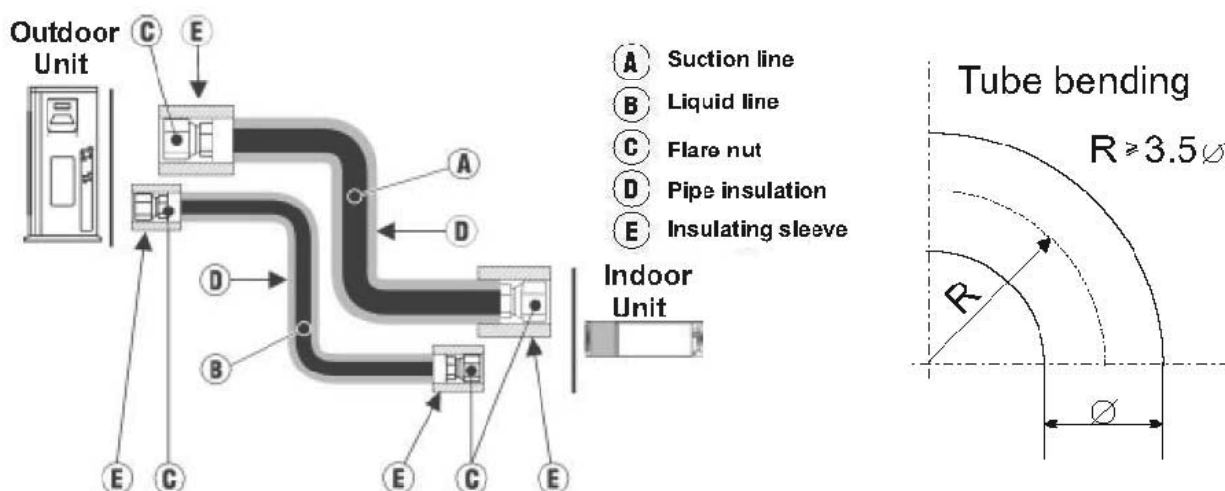
COOLING & DRY MODE

Heating mode



HEATING MODE

11. TUBING CONNECTIONS



TUBE (Inch)	1/4"	3/8"	1/2"	5/8"	3/4"
TORQUE (Nm)					
Flare Nuts	15-18	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

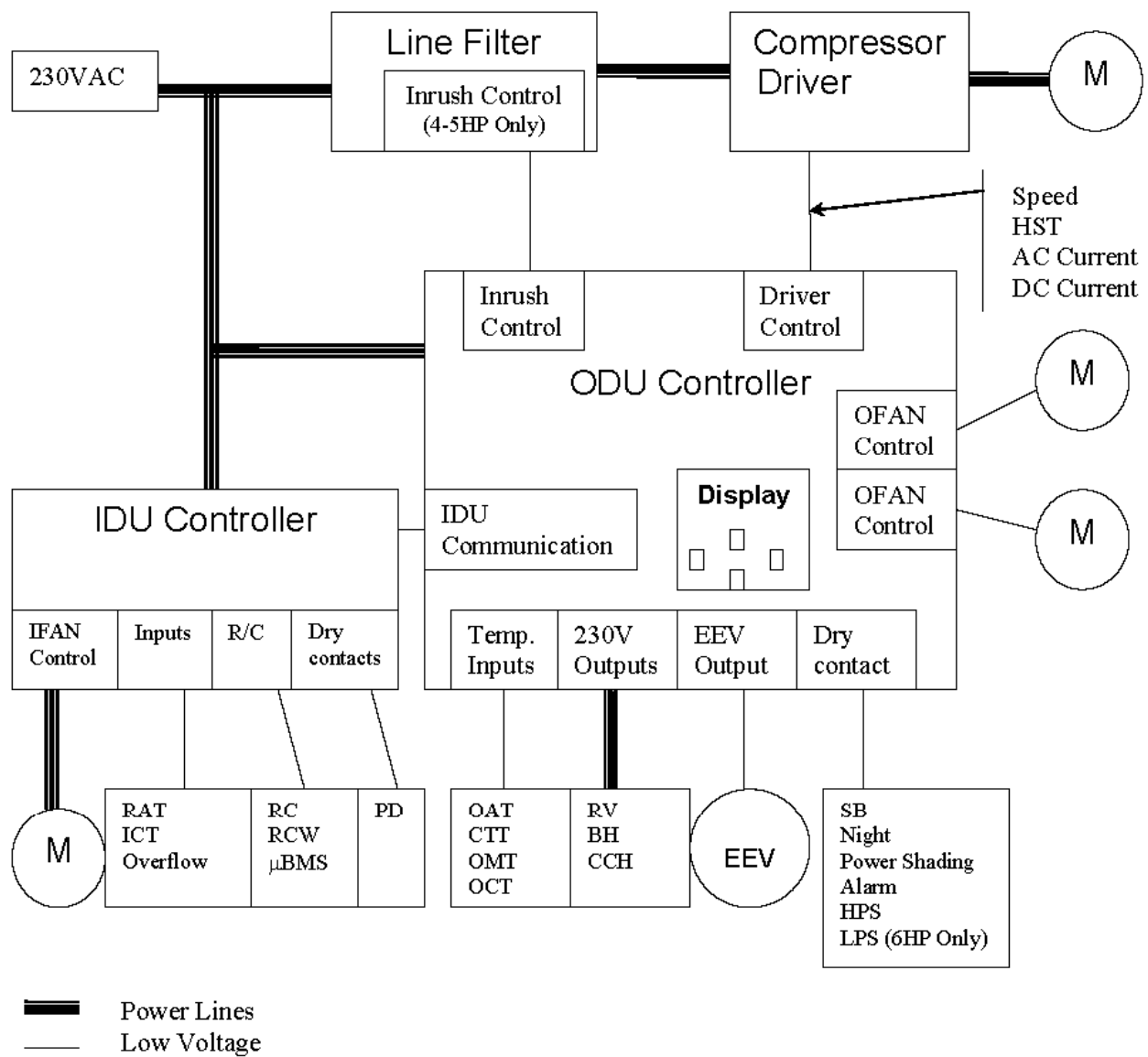
12. CONTROL SYSTEM

12.1 Abbreviations

Abbreviation	Definition
A/C	Air Conditioner
BMS	Building Management System
CCR	Compressor Current
CCH	Crankcase Heater
COMP	Compressor
CTT	Compressor Top Temperature sensor
DCI	DC Inverter
E ² PROM, EEP	Erase Enable Programmable Read Only Memory
EEV	Electronic Expansion Valve
HE	Heating Element
HMI	Human Machine Interface
HST	Heat Sink Temperature sensor
Hz	Hertz (1/sec) – electrical frequency
ICT	Indoor Coil Temperature (RT2) sensor
IDU	Indoor Unit
IFAN	Indoor Fan
M2L	Mega Tool (Monitoring SW)
MCU	Micro Controller Unit
NA	Not Applicable
OAT	Outdoor Air Temperature sensor
OCT	ODU Coil Temperature sensor
OMT	Outdoor middle coil temperature
ODU	Outdoor Unit
OFAN	Outdoor Fan
PFC	Power Factor Corrector
RAC	Residential A/C
RC	Reverse Cycle (Heat Pump)
RPS	Rounds per second (mechanical speed)
RV	Reverse Valve
SB,STBY	Stand By
SH	Superheat
SUCT/SCT	Compressor Suction Temperature sensor
S/W	Software
TBD	To Be Defined
TEMP	Temperature
TMR	Timer

12.2 Product Overview

12.2.1 Block Diagram



12.2.2 Compressor

DC brush less and sensor less motor inverter driven compressor.

12.2.3 Compressor Drive

DC inverter module to drive compressor.

12.2.4 Outdoor Fan

DC brush less motor.

12.2.5 RV

Reverse Valve set the direction of refrigerant flow in the system, thus setting the operation mode for cooling or heating.

When the solenoid is powered, system will work in heat mode.

12.2.6 EEV

Expansion valve operated by step motor which controls the size of the orifice.

12.2.7 HMI

Consists of Four "7-Segments" + four Push buttons for display, monitoring and setup features.

12.2.8 Dry Contacts

Dry contacts are used to interface the system with an external building management system (BMS).

12.2.8.1 ODU Dry Contacts

- **Night** input. Switches the system to night mode when closed. During night mode, the outdoor unit speed will be reduced in order to reduce the system noise level.
- **SB** input. System will be turned to Stand-by when the contact is closed.
- **Power Shedding** input. Limits the maximum power consumption when closed.
- **Alarm** output indicates a failure in the system.

Alarm output will be activated when there in the following ODU Faults/Protections 1 to 11, 13 to 20, 22 to 26, 28 to 29.

Alarm output will be OFF when the Fault/Protection is cleared.

12.2.8.2 IDU Dry Contacts

Presence detector input.

12.2.9 Temperature Sensors

CTT – Compressor Top Temperature
OAT – Outdoor Air Temperature
OCT – Outdoor Coil (heat exchanger inlet) Temperature
OMT – Outdoor Coil (heat exchanger) Temperature
HST – Heat Sink Temperature
ICT – Indoor Coil (heat exchanger) Temperature
RAT – Return Air Temperature (Indoor Unit)

12.2.10 Base Heater

Heating element designed to melt any ice that is accumulated on the outdoor unit base during low heating operation.

12.2.11 Cranck case Heater

Heating element designed to heat up the compressor oil cranck case during low heating operation.

12.2.12 Internal coil heater

Only exists in 6HP unit. The compressor is equipped with built-in heating coils designed to heatup the compressor oil cranck case during low heating operation.

12.3 General Operating Rules

12.3.1 Communication with Indoor Unit

12.3.1.1 Communication Failures Definition

12.3.1.1.1 'Bad Communication' fault

The system keeps a balance of a good/bad communication packet ratio. When the ratio becomes high the system enters 'Bad Communication' fault. The system recovers from that fault when the ratio reduced below the threshold.

When in 'Bad Communication' fault, system continues its normal operation and fault code is shown in diagnostics.

12.3.1.1.2 'No Communication' fault

If no legal transmission or no message received for 30 seconds, system enters 'No Communication' fault.

When in 'No Communication' fault, the fault code will be shown in diagnostics. In this case, the system will force the compressor to off.

The system will recover from 'No Communication' fault when counter is below 10 and legal message is received

12.3.2 Temperature Measurements

12.3.2.1 Thermistor failures definition

Thermistor	Thermistor is Disconnected	Thermistor is Shorted
OCT	Temp < -35 °C	Temp > 75 °C
OAT	Temp < -30 °C	Temp > 75 °C
CTT	Temp < -30 °C	Temp > 130 °C
OMT	Temp < -30 °C	Temp > 75 °C
ICT	Temp < -30 °C	Temp > 75 °C
RAT	Temp < -30 °C	Temp > 75 °C

12.3.2.2 System responses for different thermistor failure

Thermistor	Default value		System Reaction
	COOL	HEAT	
OCT	1°C	1°C	(1)
OAT	43°C	6°C	
CTT	43°C	43°C	Forced compressor to OFF
HST	75°C	75°C	
OMT	43°C	43°C	Replaced by OCT (1)
ICT	43°C	43°C	
RAT	SPT+4°C	SPT-4°C	

Notes:

(1) Whenever both OCT and OMT are faulty the compressor will be forced to OFF.

- (2) Thermistor is defined as faulty (shorted/disconnected) if it's faulty for more than 10 seconds continuously. During this time, the system uses the last valid temperature.

12.4 Indoor Unit Control

12.4.1 Indoor Fan Control

When user sets the indoor fan speed to a fixed speed (Low/ Medium/ High), unit will operate constantly at set speed.

When Auto Fan is selected, indoor fan will operate in all speeds according to the cool/heat load.

12.4.2 Load calculation

LOAD is calculated according to the difference between actual room temperature and user set point temperature by PI control.

In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.

In AutoFan user setting, fan speed will be adjusted automatically according to the calculated LOAD.

12.4.3 Heat Mode

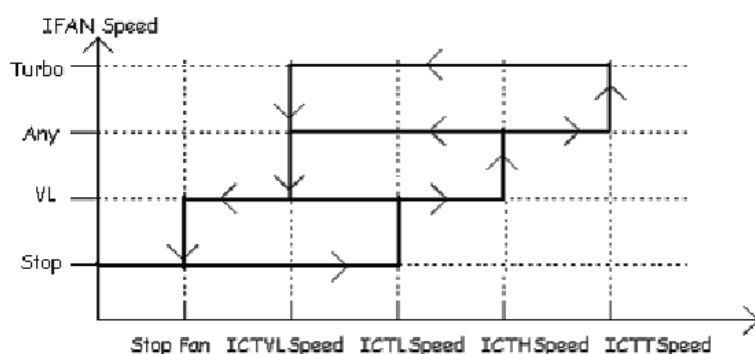
12.4.3.1 Temperature Compensation

A compensation value of 2-4 degrees is reduced from room temperature reading (except when in I-Feel mode), to compensate for temperature difference between high and low areas in the heated room, and for coil heat radiation on room thermistor.

The temperature compensation can be enabled/disabled by closing/opening J2 on the indoor unit controller.

12.4.3.2 Indoor Fan Control in Heat Mode

When in heat mode, including protections and except Deicing, and when the conditions in the table below are fulfilled, IFAN will be working according to the graph below.



12.4.4 Auto Cool/Heat Mode

When in auto cool heat mode unit will automatically select between cool and heat mode according to the difference between actual room temperature and user set point temperature (ΔT).

Unit will switch from cool to heat when compressor is off for 3 minutes, and $\Delta T < -3$.

Unit will switch from heat to cool when compressor is off for 5 minutes, and $\Delta T < -3$.

12.4.5 Dry Mode

As long as room temperature is higher than the set point, indoor fan will work in low speed and compressor will work between 0 and maximum frequency in cooling.

When the room temperature is lower than the set point, compressor will be switched OFF and indoor fan will cycle 3 minutes OFF, 1 minute ON.

12.4.6 Heating Element Control

Heating element can be turn on if high LOAD is more than 80% and Indoor Coil temperature is less than 45°C.

The heating element will be off when LOAD is less than 50% OR if Indoor Coil temperature is more than 50°C.

12.4.7 Indoor Unit Dry Contact

“Presence Detector” feature in the indoor unit is done for cases that external SB (Stand-By) is required via a presence detector sensor or others such as window closed detector, etc.

The dry contact can be set to operate if the contacts are shorted as follows:

Function	Contact = Open	Contact = Short
Presence Detector Connection	No Action – normal operation (Default)	Forced to STBY

Notes:

- o When the A/C is forced to STBY mode, all R/C commands are ignored, and the operation LED blinks with 1 seconds cycle time.
- o Any change in the Presence Detector state during the first 6 sec after the system reset is ignored.

12.4.8 Operating the Unit from the Mode Button

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

Forced operation Mode	Pre-set Temperature
Cooling	20°C
Heating	28°C

12.4.9 On Unit Controls and Indicators

Indications during OFF, Fan, Cool, Heat, Dry, and Auto modes are shown below. For operation in other modes, check the relevant paragraphs.

STANDBY INDICATOR	Lights up when the Air Conditioner is connected to power and is ready for operation
OPERATE INDICATOR	1. Lights up during operation. 2. Blinks for 300 msec to announce that a R/C infrared signal has been received and stored. 3. Blinks continuously during protections (according to the relevant spec section).
TIMER INDICATOR	Lights up during Timer and Sleep operation.
COOLING INDICATOR	Lights up when system is switched to Cool Mode by using the Mode Switch <u>on the unit</u> .
HEATING INDICATOR	Lights up when system is switched to Heat Mode by using the Mode Switch <u>on the unit</u> .
Mode SWITCH (COOL/HEAT/OFF)	Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB → ... In long pressing system enters diagnostic mode.

12.5 Run Mode

Run mode is the default operation mode of the system. This is the standard operation mode that is active in field application (at customer site).

System can go from run mode to other operation modes through keyboard or serial ports.

12.5.1 Mode Setting

Mode defines the ODU operation mode. There are three possible operation modes:

1. STBY – standby mode
2. COOL - the unit operating at cooling cycle
3. HEAT - the unit operating at heat pump cycle

SB mode can be set also by dry-contact.

12.5.1.1 ODU Protections

There are 4 ODU protections:

- Compressor overheating
- Heat sink overheating
- AC over current
- DC Over curren – not in 6HP unit

12.5.2 Compressor Speed Control

12.5.2.1 Compressor Min On/Off time

Compressor minimum OFF time is 3 minutes except during Deicing protection.

Compressor minimum ON time is 3 minutes, minimum ON time is ignored during protections, and when unit is turned to STBY.

12.5.2.2 Compressor Startup

When started, compressor speed reaches 40 RPS and will not go below that during the first 5 minutes of compressor operation except when compressor forced OFF.

12.5.2.3 Compressor start up fail

If the compressor does not succeed to complete the startup procedure, it will report a compressor-lock fault code.

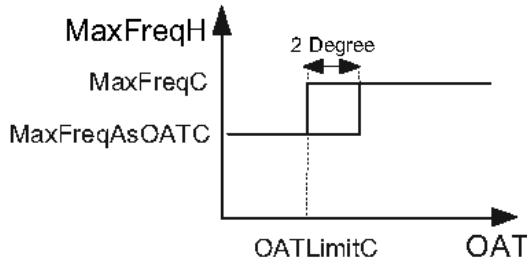
It then retries the startup procedure for 3 times on every 10 seconds and enter a 3 minutes wait condition before starting the next compressor startup sequence.

12.5.2.4 Compressor operation while OFAN Error

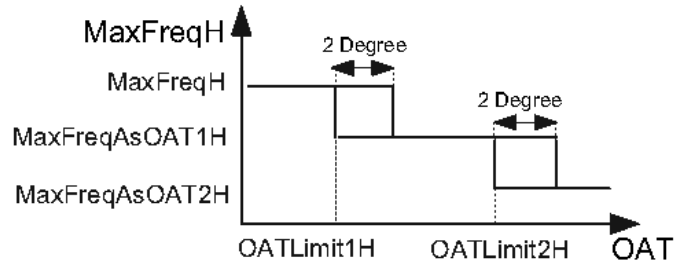
In case an OFAN error a cured for 10 continues seconds and the compressor is on, the compressor will be set to OFF until OFAN error will recover.

12.5.2.5 Maximum allowed speed limitation

For cool mode:



For Heat mode:



Note: If OAT is faulty, there will be no limits.

12.5.2.6 Speed Change Limitations

When rising or lowering speed within the allowed operating range, the acceleration or deceleration will be 1 RPS/sec.

12.5.2.7 Compressor Speed calculation

During normal operation (excluding protections) the compressor target speed is set according to the NLOAD number received from the indoor unit and CompFac. CompFac is an indoor-outdoor matching parameter, once it is 0, the compressor will be forced off, if it is number between 0.01 to 1, the compressor target frequency is set by the following table.

NLOAD	Target Speed [Hz]
<10	0
10	MinFreqC in cool OR MinFreqH in heat mode
11– 126	$NLOAD * CompFac$
127	MaxFreqC in cool OR MaxFreqH in heat mode

12.5.2.8 Speed Step Limitations

The compressor speed have some step limitations which it will not go above them for few minuits after startup.

12.5.2.9 Compressor shutdown Procedure

There are 2 procedures for compressor shutdown:

1. Immediate shutdown – compressor is stopped on the spot.
2. Gradual shutdown – compressor speed is reduced gradually to the minimum speed by NormAccel Hz/sec and then stops.

#	Shutdown Reason	Shutdown procedure	
1	IDU NLOAD=0 (or IDU protections)	Gradual	Minimum On time is kept.
2	IDU Shutdown (idle)	Immediate	
3	Deicing	Immediate	
4	ODU Protections	Gradual	
5	Sensor faulty (CTT or OCT+OMT)	Immediate	
6	HPS protection	Immediate	
7	LPS protection	Gradual	(Only in 6HP units)

12.5.3 EEV Control

12.5.3.1 EEV General Rules

The EEV is controlled to keep the discharge superheat temperature within preset control values.

12.5.3.2 EEV initialization procedure

After power up the EEV performs initialization procedure while it closed completely and reopened to predefined position. During initialization, the compressor is forced to off.

12.5.3.3 Balance time

During the first minutes after SB the correction is not calculated. After that the correction value is updated every $EEVCVTConst$ seconds.

12.5.3.4 Operation Range

The EEV operation range is defined according to the operation mode as following

ODU Mode	Normal operation	Notes
SB	450	May change according to model
COOL	60 to 480	
HEAT	60 to 480	

12.5.3.5 EEV initial value determination (EEV_{OL})

The EEV initial value (open loop) is determined according to the operation mode, the actual frequency and ODU model. The values are determined according to the " EEV_{OL} Parameters Table".

12.5.3.6 EEV opening determination in normal run mode

The target EEV value is the sum of open loop value (OL) and a result of the accumulative correction values (CV). The EEV corrections are calculated every $EEVCVTConst$ seconds.

$$EEV = EEV_{OL} + \sum EEV_{CV}$$

12.5.4 Outdoor Fan Speed Control

12.5.4.1 Speed Definition

The outdoor fans can work in 16 speed states controlled by OMT sensor in cool mode and ICT sensor in heat mode in relation to outdoor conditions.

12.5.4.2 General Rules

- ❖ The fans will be off when the compressor is off unless $HST > 55$ or faulty and than OFAN_up will remain ON.
- ❖ Min time for speed change between speed states is 60 seconds.
- ❖ The fan speed is also related to protections.
- ❖ Whenever OFAN fault occurs the compressor will be stopped.

12.5.4.3 Night mode

During night mode, the OFAN and the compressor will be limited to lower speeds (Cool model only).

12.5.5 RV State Setting

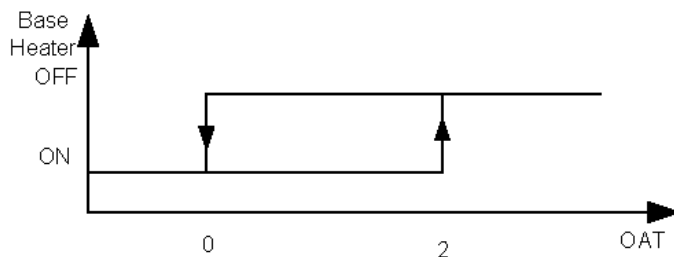
During heat mode (except during Deicing) RV is ON.

During cool/SB mode RV is OFF.

RV status will be changed only if COMP is OFF for 3 minutes or more.

12.5.6 Base Heater Setting

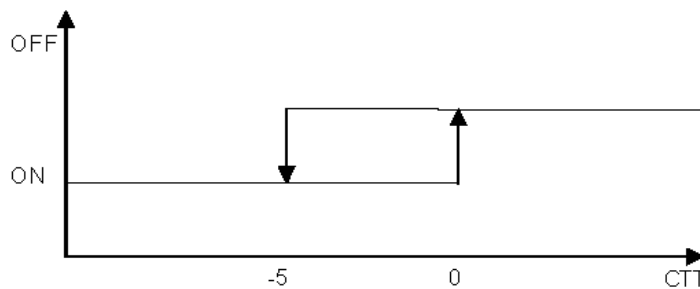
The base heater will be working only when RV is "ON" according to the following graph:



When OAT is faulty the base heater will be "ON" continuously in HEAT mode.

12.5.7 Crank case heater Operation

The crank case heater operates only when compressor is off and according to CTT as following:



12.5.8 Compressor internal heating coil Operation

Only in 6HP unit.

The crank case heater operates only when compressor is off and according to CTT and OAT.

12.5.9 Thermodynamic Protections

12.5.9.1 Protection level definition

Five protection levels are defined:

Normal – No protection status.

Stop-Rise (SR) – Compressor not allowed raise speed.

D1 - Compressor speed reduced.

D2 - Compressor speed reduced rapidly.

Stop-Compressor (SC) – Compressor stops.

12.5.9.2 IDU Protections

ICT Value		ICT Trend				
Indoor Coil Defrost Protection	Indoor Coil Over Heating Protection	Fast Increasing	Increasing	No change	Decreasing	Fast Decreasing
ICT < -2	ICT > 62	SC	SC	SC	SC	SC
-2 ≤ ICT < 0	60 < ICT ≤ 62	D1	D1	D2	D2	D2
0 ≤ ICT < 2	55 < ICT ≤ 60	SR	SR	D1	D2	D2
2 ≤ ICT < 4	53 < ICT ≤ 55	SR	SR	SR	D1	D2
4 ≤ ICT < 6	51 < ICT ≤ 53	Normal	Normal	SR	SR	D1
6 ≤ ICT < 8	49 < ICT ≤ 51	Normal	Normal	Normal	SR	SR
8 ≤ ICT	ICT ≤ 49	Normal				

Operation logic of all protections is the same. The controlled input (CTT, HST, ACC, DCC) is controlled by changing the protection level using the fuzzy logic algorithm according the input level and the change rate.

The following table summarizes the basic levels of each protection:

Protection level	Compressor Overheat (CTT)	Compressor AC Over current (ACC)	Compressor DC Over current (DCC)	Heat Sink (HST)
SC	95	25.0	22.0	90
D2	92	24.6	21.4	87
D1	90	24.2	20.8	85
SR	87	23.6	20.0	83
Normal				78

There are two sets of ACC values, the selection of the values are set according to the state of the Power-Shed dry contact input.

Power-Shed input open ACC

Power-Shed input short PSOC

12.5.9.3 Total Protection Level Definition

The total protection level is defined by the higher level of protection received.

12.5.10 Deicing

12.5.10.1 Deicing Starting Conditions

Deicing operation will start when either one of the following conditions exist:

Case 1: OCT is 8 degree lower then the ambient temp and the minimum time from the last deicer is passed.

Case 2: OCT is 12 degree lower then the ambient temp and 30 minutes from the last deicer wa passed.

OCT – Outdoor Coil Temperature

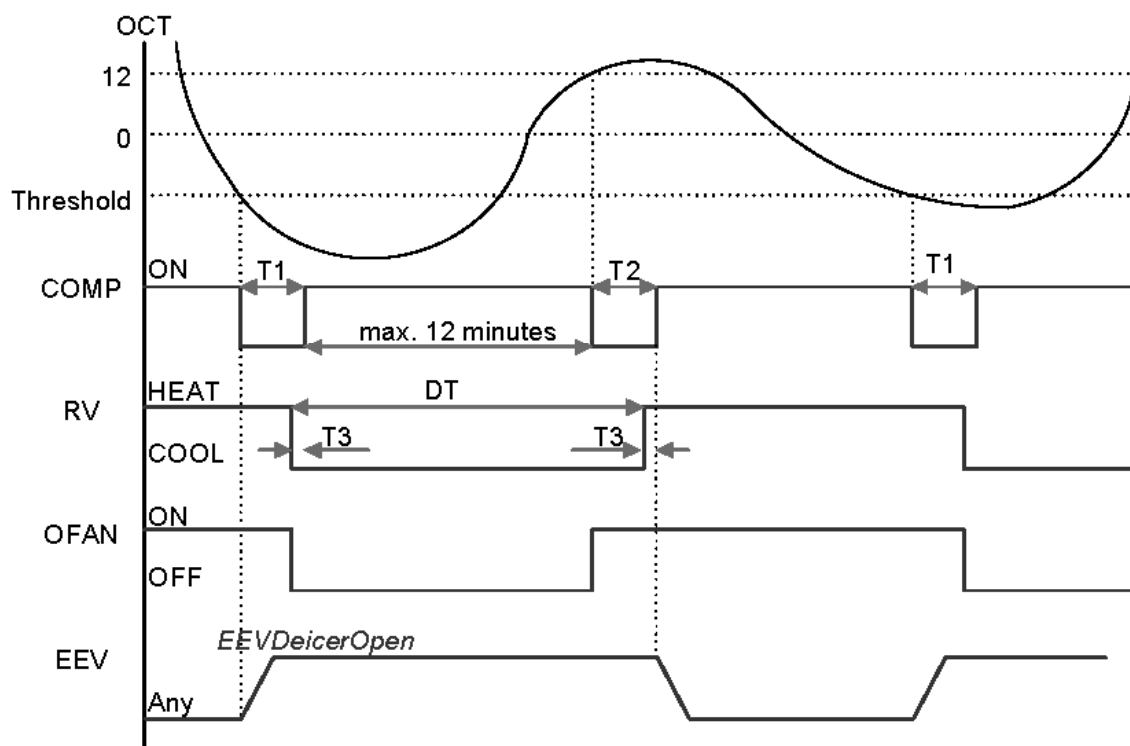
Deicing interval time when compressor is first started in heat mode, is 10 minutes if $OCT < -2$, and is 40 minutes in other cases.

Deicing interval time is changed (increased/ decreased in 10 minutes steps) as a function of deicing time.

In case one of the thermistors is bad the deicer will initiate in predefined intervals

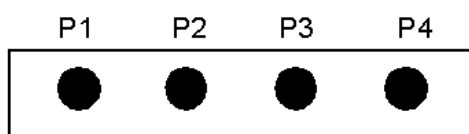
Deicer may accure also when the unit switch to stanby and the OCT is 8 degree lower then ambient temperature.

12.5.10.2 Deicing Protection Procedure



$T1 = T2 = 36$ seconds, $T3 = 6$ seconds

12.5.11 Condensate Water over Flow Protection



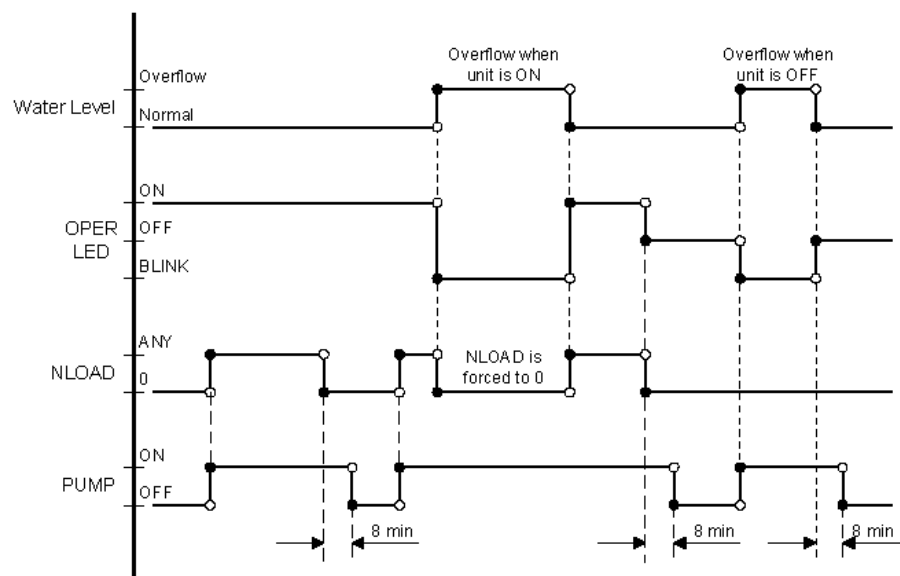
Each of the pins P1, P2, P3 can have two options:

1 – When it is shorted with P4

0 – When it is not shorted to P4

12.5.11.1 1 Level Logic

P2	P3	Level
Don't care	1	Normal
Don't care	0	Overflow



12.5.12 High/Low Pressure Protection

Whenever high or low pressure occurs in the system which extend beyond the system pre-defined limits, the high and low pressure switches turn on (short) and stop the compressor until these limits are redrawn.

Fault code error 28 (HPS) or 29 (LPS) will be shown until the compressor will resume operation.

12.6 Technician Test Mode

This test is aimed for technicians to check the system under a preset compressor and outdoor fan values while the expansion valves will function according to the normal running mode.

12.6.1 Entering technician mode

- This mode is entered through the outdoor unit using the HMI (refer to user interface section).
- It can be selected either for cool or heat.
- Technician test is not possible to enter during deicer.

Exiting technician mode

Technician mode will be terminated either when:

- Escaping by the HMI (exit from the ttC or ttH menus)
- 60 minutes are passed from entering

12.6.2 Technician mode procedure

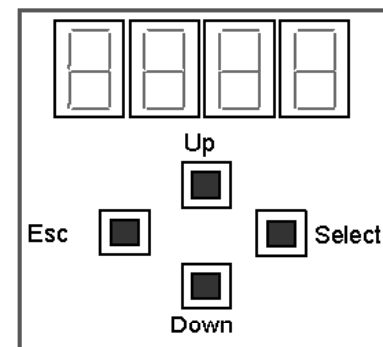
- Indoor unit will enter technician test at high indoor fan speed.
- The outdoor unit will be working normally (according to the run mode control logic) except the following changes:
 - The dry contacts inputs will be ignored.
 - Protections will be operative for stop compressor only.
 - The compressor and the outdoor fan will be working in target preset values according to the following table:

Technician Test			
Unit	Compressor Speed		OFAN speed
	Cool	Heat	
4HP	54	64	800
5HP	71	75	800
6HP	55	63	800

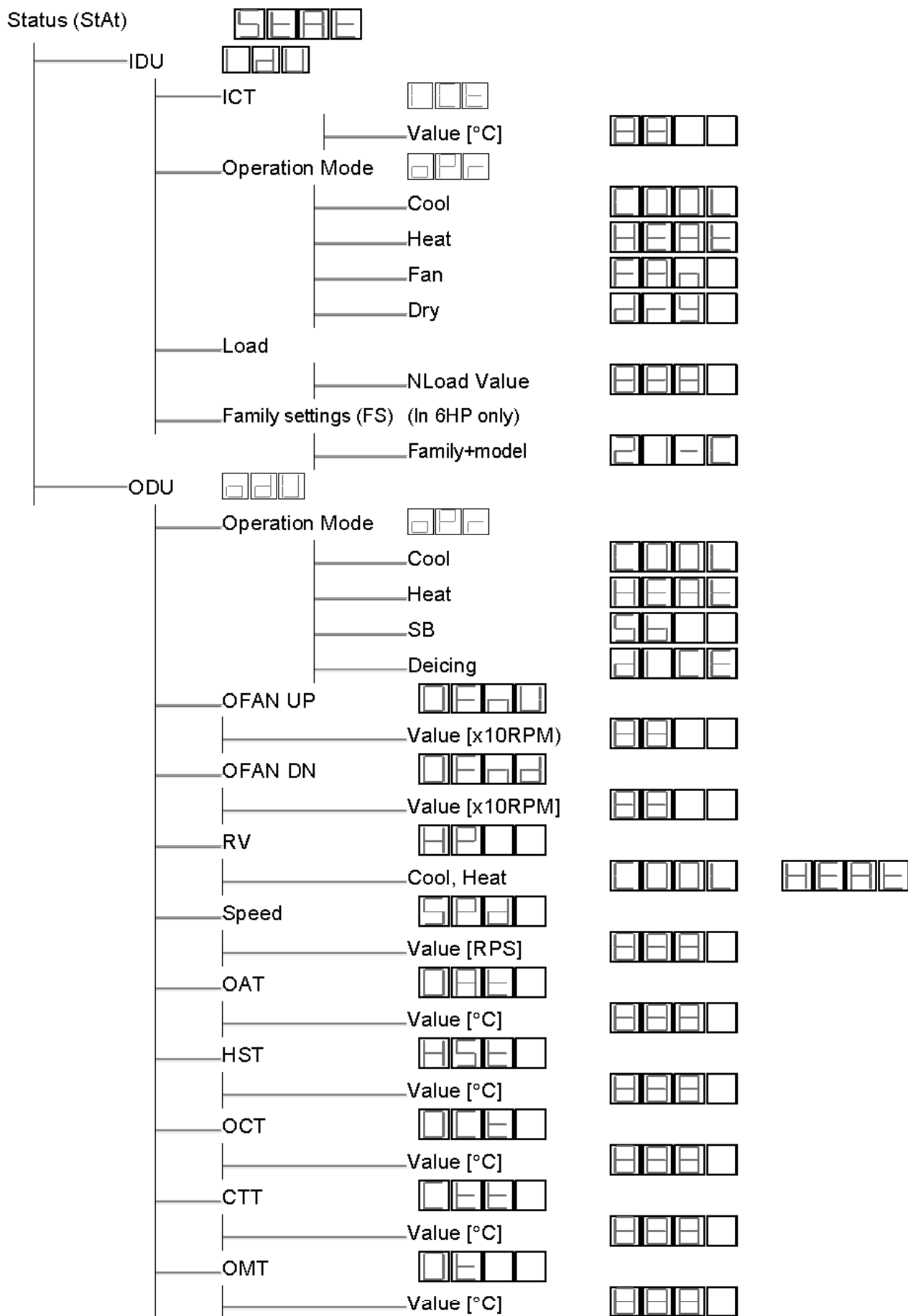
12.7 User Interface

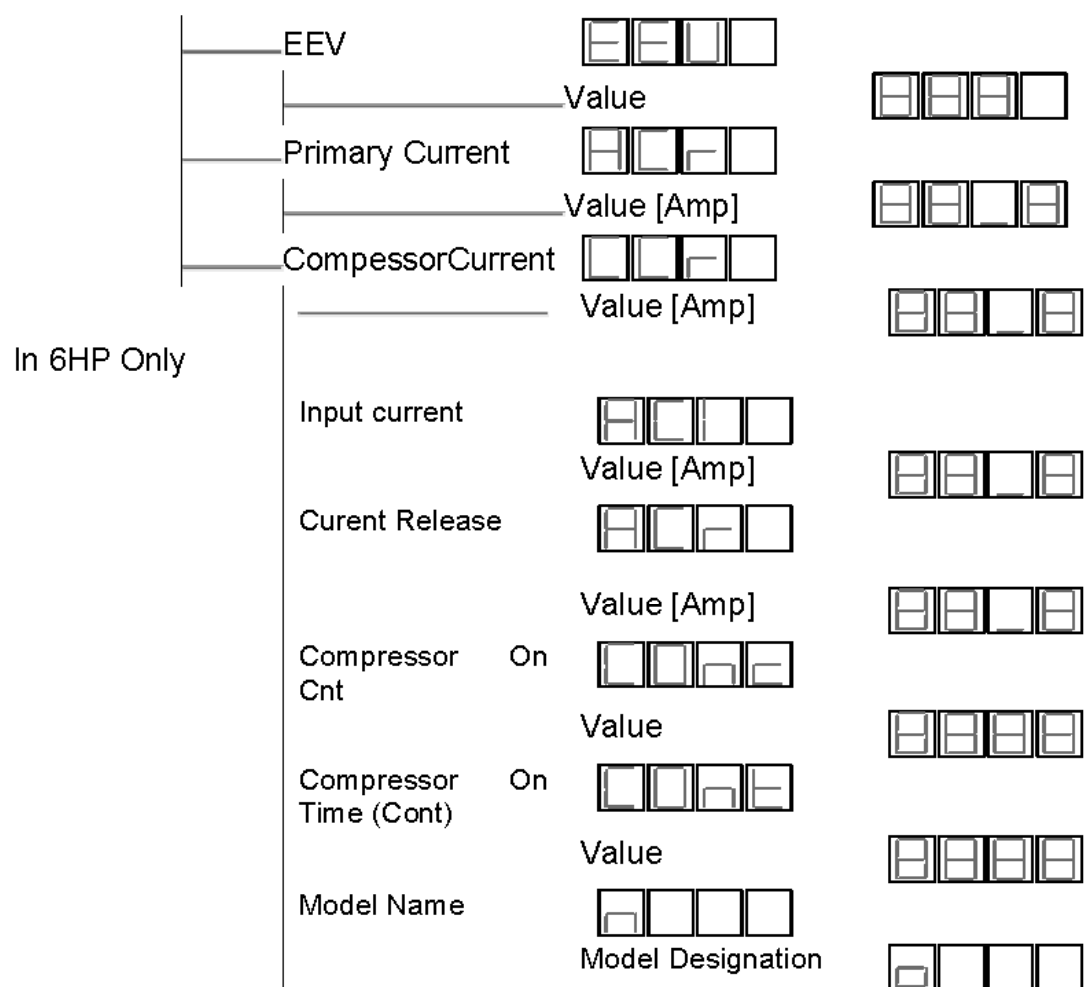
12.7.1 User interface description

- The user interface uses four 7-segments, and 4 keys.
- The 4 keys are:
 - Scroll - used to scroll between options (up and down)
 - Select - use to select an option
 - Escape - Will go up one level in the menu
- The user interface concept is Tree menus.



12.7.1.1 Status (Sub Menu)

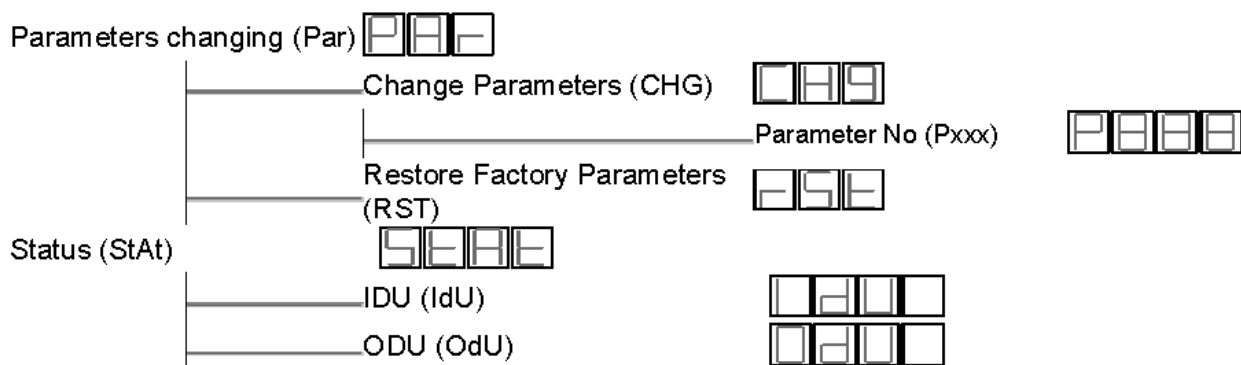




12.7.2 Menus

12.7.2.1 Main Menu

Mode (Cl/Ht/Sb)	<div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div><div></div></div>	
Technician Test (tt)	<div><div></div><div></div><div></div></div>	
Technician Test Cool (ttC)	<div><div></div><div></div><div></div></div>	
Technician Test Heat (ttH)	<div><div></div><div></div><div></div></div>	
Diagnostics (dia)	<div><div></div><div></div><div></div></div>	
Outdoor Unit (OdU)	<div><div></div><div></div><div></div><div></div></div>	
First Fault code	<div><div></div><div></div><div></div><div></div></div>	
Second Fault code	<div><div></div><div></div><div></div><div></div></div>	
Third Fault code	<div><div></div><div></div><div></div><div></div></div>	
Forth Fault code	<div><div></div><div></div><div></div><div></div></div>	
Fifth Fault code	<div><div></div><div></div><div></div><div></div></div>	
Indoor Unit (IdU)	<div><div></div><div></div><div></div><div></div></div>	
First Fault code	<div><div></div><div></div><div></div><div></div></div>	
Second Fault code	<div><div></div><div></div><div></div><div></div></div>	
Third Fault code	<div><div></div><div></div><div></div><div></div></div>	
Forth Fault code	<div><div></div><div></div><div></div><div></div></div>	
Fifth Fault code	<div><div></div><div></div><div></div><div></div></div>	
Set Up (Set)	<div><div></div><div></div><div></div><div></div></div>	
IDU power supply source (IdSU)	<div><div></div><div></div><div></div><div></div></div>	
Outdoor unit	<div><div></div><div></div><div></div><div></div></div>	
Indoor source	<div><div></div><div></div><div></div><div></div></div>	
Max Current Limit (curL)	<div><div></div><div></div><div></div><div></div></div>	
Limit 30 A	<div><div></div><div></div><div></div><div></div></div>	
Limit 27 A	<div><div></div><div></div><div></div><div></div></div>	
Limit 23 A	<div><div></div><div></div><div></div><div></div></div>	
Limit 18 A	<div><div></div><div></div><div></div><div></div></div>	
Limit 14 A	<div><div></div><div></div><div></div><div></div></div>	
Power shade current limit (PSC)		
50% of max current	<div><div></div><div></div><div></div><div></div></div>	
60% of max current	<div><div></div><div></div><div></div><div></div></div>	
70% of max current	<div><div></div><div></div><div></div><div></div></div>	
80% of max current	<div><div></div><div></div><div></div><div></div></div>	



Notes:

- The default presentation will be the mode of the unit (Cool/Heat/Stby).
- In diagnostics menu:
 - xx means failure code two numbers.
 - Maximum 5 faults are presented for each unit (each IDUs/ODU). When no faults, a "----" sign will be shown.
 - The active faults have higher priority for presentation than non active ones.
 - Active errors will blink on/off each sec.
 - Non active faults are presented according to their chronological order, starting from the latest one.
 - Whenever a new active fault occurs, it will be presented immediately.
- The Parameters changing and Status menus (Technician menus) will be enabled to be presented and navigated, only by pressing select + escape together for more than 5 seconds under the main menu.
- Exiting both 'Parameters Changing' and 'Status' menus and their sub-menus back to the main menu is done only by either pressing escape for more than 5 seconds or after continuous 10 minutes out of any press.
- Technician Test mode is exited after 60 minutes from entry.
- All the menus, except technician menus- Parameter changing, Status, Technician Test and their sub menus, are automatically exited to the main menu after 1 continuous minute out of any press.
- When Technician test cool or heat menus are selected (operative), it will be blinking constantly until, this menu is escaped.
- Pressing select and escape buttons together when in RST for more than 5 seconds will restore only the parameters of the factory settings. Acknowledge for restored parameters will be indicated by blinking RST for 3 seconds.
- For the first 6 seconds after power is ON the display will show the current SW version. The display will show each 4 letters of the SW version at the time.

Example – SW Version 361V1-A01:

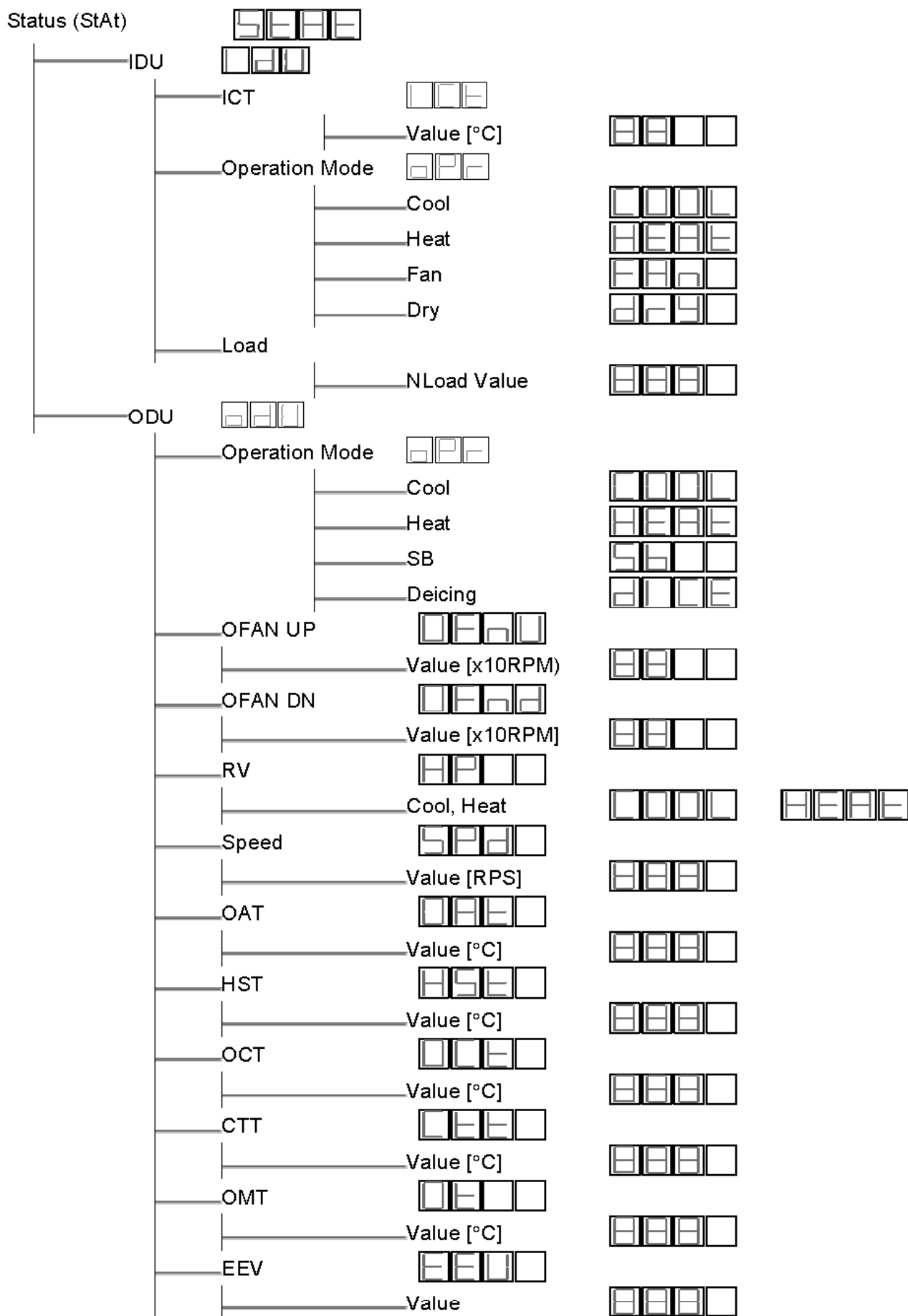
Will be displayed as:

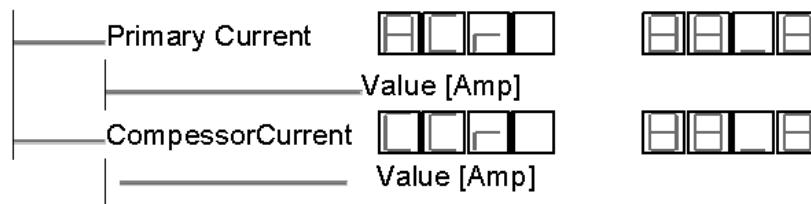
361u	1A01
3sec	3sec

12.7.2.2 Parameter Change (Sub Menu)

- The parameters names will be indicated by the sequence 001, 002,...,999.
- When a parameter is selected, the parameter's stored value is presented-aligned to the right.
- Scrolling changes the presented value, incrementing or decrementing, but does not store the value.
- Selecting a value, by pressing the selection key for 3 seconds, stores an updated value.

12.7.2.3 Status (Sub Menu)



**Notes:**

- For the temperature display, when a thermistor is shorted or disconnected it shows FLT (FLt), when it is disabled it shows DIS (dis).
- It's possible to present a number between 999 and 99,999 by alternating between two numbers (each number is presented for 1 second). The two numbers format is "xx, yyy".
- Pressing select + escape together for 5 seconds will reset the counter to 0.
- The compressor time is measured in hours.

12.8 Jumper (DIP Switch) Setting

12.8.1. Jumper Definition

0 = Open (Disconnected)

1 = Close (Shorted)

12.8.2. IDU Jumpers



12.8.2.1. Self test Jumper/DIP – J1

Position	Status	Description
0	Open (Disconnected)	Normal Operation (Default)
1	Close (Shorted)	Self Test enabled

12.8.2.2. Compensation Jumper/DIP – J2

Position	Status	Description
0	Open (Disconnected)	Compensation deactivated
1	Close (Shorted)	Compensation activated (Default)

12.8.2.3. Family selection Jumper/DIP – J3, J4, J5

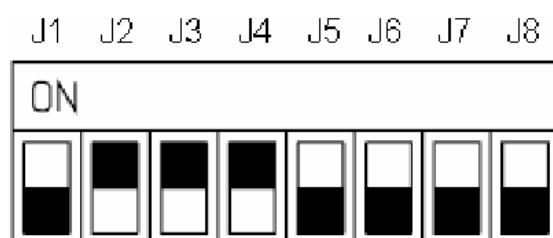
# Family Name	J3	J4	J5
DNG 4-5HP	1	1	0
EMD 4-5HP	0	1	0
CD 6HP	1	0	1

12.8.2.4. Model selection Jumper/DIP – J7, J8

Model	J7	J8
A – 4HP	0	0
B – 5HP	1	0
C – 6HP	0	1

12.8.2.5. Presence Detector/DIP – J9

Position	Status	Description
0	Open (Disconnected)	Presence detector enabled (Default)
1	Close (Shorted)	NA (Not to be used)

12.8.3. ODU Jumpers**12.8.3.1. Self test Jumper/DIP – J1**

Position	Status	Description
0	Open (Disconnected)	Normal Operation (Default)
1	Close (Shorted)	Self Test enabled

12.8.3.2. ODU Model Selection Jumper/DIP – J2, J3, J4, J5

ODU Model	J2	J3	J4	J5
M (DCI 100)	ON	OFF	ON	ON
N (DCI 125)	OFF	ON	ON	ON
O (DCI 140)	ON	ON	ON	ON

12.8.4. Dip-Switch Setting table

ODU

		1	2	3	4	5	6	7	8
ODU 4HP	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ODU 5HP	ON	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ODU 6HP	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

IDU

		1	2	3	4	5	7	8	9
DNG100	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DNG125	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EMD100	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EMD125	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CD140	ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: in some cases where an external room thermostat kit is installed, the configuration of J2 in the indoor unit controller will be set to OFF.

12.9 System Parameters

12.9.1 General Parameters for All Models

12.9.1.1 4-5HP

Name	Default Value	Units
<i>MinOFFTime</i>	3	minute
<i>MinONTime</i>	3	minute
<i>HzDown1</i>	3	Hz/min
<i>HzDown2</i>	10	Hz/min
<i>DImin</i>	30	minute
<i>DImax</i>	120	minute
<i>TimeD</i>	1	minute
<i>DTmin</i>	2	minute
<i>DTmax</i>	12	minute
<i>DIT</i>	10	minute
<i>CTMRUP</i>	15	minute
<i>DIF</i>	30	minute
<i>TCT</i>	10	second
<i>HSTOH1</i>	78	°C
<i>HSTOH2</i>	83	°C
<i>HSTOH3</i>	85	°C
<i>HSTOH4</i>	87	°C
<i>HSTOH5</i>	90	°C
<i>HSTOHDelta1</i>	-1	NA
<i>HSTOHDelta2</i>	1	NA
<i>EEVCVTConst</i>	15	second
<i>BalanceTime</i>	1	minute
<i>EEVInitOpen</i>	300	step
<i>DEICT1</i>	60	second
<i>DEICT2</i>	36	second
<i>DEICT3</i>	6	second
<i>EEVNormRate</i>	33	ms/pulse
<i>EEVHighRate</i>	12	ms/pulse
<i>EEVMaxOpen</i>	500	step
<i>DST</i>	8	°C
<i>DSTF</i>	12	°C
<i>DeiceFreqChRV</i>	0	Hz
<i>EEVDeiceTcnst</i>	20	second
<i>OFBIncTime</i>	2	minute
<i>OFTcnst</i>	60	second
<i>OFMinTimeReduce</i>	60	second

12.9.1.2 6HP

Name	Default Value	Units
<i>MinOFFTime</i>	3	minute
<i>MinONTime</i>	3	minute
<i>HzDown1</i>	3	Hz/min
<i>HzDown2</i>	10	Hz/min
<i>Dlmin</i>	30	minute
<i>Dlmax</i>	120	minute
<i>TimeD</i>	1	minute
<i>DTmin</i>	2	minute
<i>DTmax</i>	12	minute
<i>DIT</i>	10	minute
<i>CTMRUP</i>	15	minute
<i>DIF</i>	30	minute
<i>TCT</i>	10	second
<i>HSTOH1</i>	88	°C
<i>HSTOH2</i>	93	°C
<i>HSTOH3</i>	95	°C
<i>HSTOH4</i>	97	°C
<i>HSTOH5</i>	100	°C
<i>HSTOHDelta1</i>	-1	NA
<i>HSTOHDelta2</i>	1	NA
<i>EEVCVTConst</i>	15	second
<i>BalanceTime</i>	1	minute
<i>EEVInitOpen</i>	300	step
<i>DEICT1</i>	60	second
<i>DEICT2</i>	36	second
<i>DEICT3</i>	6	second
<i>EEVNormRate</i>	33	ms/pulse
<i>EEVHighRate</i>	12	ms/pulse
<i>EEVMaxOpen</i>	500	step
<i>DST</i>	8	°C
<i>DSTF</i>	12	°C
<i>DeiceFreqChRV</i>	0	Hz
<i>EEVDeiceTcnst</i>	20	second
<i>OFBIncTime</i>	2	minute
<i>OFTcnst</i>	60	second
<i>OFMinTimeReduce</i>	60	second

12.9.2 ODU Model Dependent Parameters

#	Name	M DCI112	N DCI140	O DCI160	Unit
1.	<i>MinFreqC</i>	25	25	20	Hz
2.	<i>MaxFreqC</i>	75	85	70	Hz
3.	<i>MinFreqH</i>	25	25	20	Hz
4.	<i>MaxFreqH</i>	90	100	75	Hz
5.	<i>Step1Freq</i>	40	40	40	Hz
6.	<i>Step2Freq</i>	90	90	90	Hz
7.	<i>Step3Freq</i>	120	120	120	Hz
8.	<i>NightRPM</i>	60	60	60	*10RPM
9.	<i>CTTOH1</i>	87	87	87	°C
10.	<i>CTTOH2</i>	90	90	90	°C
11.	<i>CTTOH3</i>	92	92	92	°C
12.	<i>CTTOH4</i>	95	95	95	°C
13.	<i>ACCOC1</i>	16.6	23.6	23.0	A
14.	<i>ACCOC2</i>	17.2	24.2	23.8	A
15.	<i>ACCOC3</i>	17.6	24.6	24.4	A
16.	<i>ACCOC4</i>	18.0	25.0	25.0	A
17.	<i>DCCOC1</i>	20.0	20.0	-	A
18.	<i>DCCOC2</i>	20.8	20.8	-	A
19.	<i>DCCOC3</i>	21.4	21.4	-	A
20.	<i>DCCOC4</i>	22.0	22.0	-	A
21.	<i>EEVMinOperOpenC</i>	60	60	60	step
22.	<i>EEVMaxOperOpenC</i>	400	400	480	step
23.	<i>EEVMinOperOpenH</i>	60	60	60	step
24.	<i>EEVMaxOperOpenH</i>	480	480	480	step
25.	<i>OATLimitC</i>	25	25	25	°C
26.	<i>OATLimit1H</i>	4	4	4	°C
27.	<i>OATLimit2H</i>	15	15	15	°C
28.	<i>MaxFreqAsOATC</i>	70	70	60	Hz
29.	<i>MaxFreqAsOAT1H</i>	90	90	80	Hz
30.	<i>MaxFreqAsOAT2H</i>	60	60	60	Hz
31.	<i>NormAccel</i>	1	1	1	Hz/s
32.	<i>NormDecel</i>	1	1	1	Hz/s
33.	<i>OCTExitDeicer</i>	12	12	12	°C
34.	<i>MaxDeicerTime</i>	12	12	12	minute
35.	<i>DryContactDis</i>	1	1	1	Byte
36.	<i>NightRPS</i>	60	60	55	RPS

12.9.3 Indoor Units SW Parameters

Parameters defining the indoor fan speed as a function of Indoor Coil temperature in heat mode (ICT):

12.9.3.1 Parameters for defrost protection:

ICTST Speed	ICT to stop indoor fan	25
ICTVLSpeed	ICT to go down to very low speed	28
ICTLSpeed	ICT to start in very low speed	30
ICTHSpeed	ICT to start in increase speed from very low	32
ICTTSpeed	ICT to enable Turbo fan speed	40
ICTDef1	ICT to go back to normal	8
ICTDef2	ICT to 'stop rise' when ICT decrease	6
ICTDef3	ICT to 'stop rise' when ICT is stable	4
ICTDef4	ICT to 'Hz Down' when ICT decrease	2
ICTDef5	ICT to 'Hz Down' when ICT is stable	0
ICTDef6	ICT to stop compressor	-2

12.9.3.2 Parameters for indoor coil over heating protection:

ICTOH1	ICT to go back to normal	49
ICTOH2	ICT to 'stop rise' when ICT increase	51
ICTOH3	ICT to 'stop rise' when ICT is stable	53
ICTOH4	ICT to 'Hz Down' when ICT increase	55
ICTOH5	ICT to 'Hz Down' when ICT is stable	60
ICTOH6	ICT to stop compressor	62

13. TROUBLESHOOTING

13.1 Precaution, Advise and Notice Items

13.1.1 High voltage in Indoor and Outdoor unit electrical assembly

- Open the Outdoor unit controller assembly only after one minute from power off.
- Whole controller assembly, including the wires, connected to the Outdoor unit may have the potential hazard voltage when power is on.
- Touching the Outdoor unit controller assembly may cause an electrical shock.
- Do not touch the naked lead wire and don't insert finger, conductor or anything else into the controller when power is on.

13.1.2 Charged Capacitors

- Large capacity electrolytic capacitors are used in the outdoor unit controller and driver.
- Charging voltage (380VDC) remains after power is down.
- Discharging takes about one minute after turned off.
- Touching the outdoor unit electrical assembly before discharging may cause an electrical shock.
- Measure the electrolytic capacitors voltage to be below 50VDC before further checking electrical assembly parts.

13.1.3 Advisory Notes

- When open the Outdoor unit electrical assembly, don't touch the soldering pin by hand or by any conductive material.
- When connecting or disconnecting the connectors on the PCB, hold the whole housing, don't pull the wire.

WARNING!!!

- When Power Up – the outdoor and indoor unit electrical assemblies, including the wiring, are under HIGH VOLTAGE!!!
- Never open the outdoor or indoor units before turning off **ALL** Power sources!!!
- When turned off, the outdoor unit electrical assembly is still charged (400V)!!!
- DC capacitors are discharging for about 1 Minute after power is OFF.
- Touching the electrical before discharging may cause an electrical shock!!!
- For safe handling of the electrical assembly please refer to section **13.1** above.

13.2 General System Failures and Corrective Actions

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Indoor unit			
1.	Indoor unit power supply indicator (Red LED) does not light up.	No Power supply	Check supply voltage to main terminals L and N with volt meter.
		No supply from outdoor	Check fuse at the connection wiring on outdoor unit terminals (see Electrical Scheme 9.4)
		Miss-wiring	Check all supply wiring to controller and terminals according to wiring diagram
		Loose connection	Check all power wiring connections
		Display and display cable	Check continuity of each wire of the display wires/pins with Ohm meter
		If still not OK	Check if fuse burnt
2	Fuse burned in indoor unit controller	Short Circuit between wires	Check for any cuts or exposed supply wires or miss-wiring
		Failure of Indoor Unit Fan Motor	Check the motor and capacitor (13.5.19) Check for any cuts or exposed wires
		If still not OK	Replace fuse
3	Indoor unit does not respond to remote control message	Remote control message not reached the indoor unit	Check remote control batteries
			Check continuity of each wire of the display wires/pins with Ohm meter
		If still not OK	Replace display box or indoor Electronic Assembly (14.2.2, 14.2.3)
4	Indoor unit responds to remote control message but Operate indicator (Green LED) does not light up	Problem with display PCB	Replace display PCB (14.2.3).
		If still not OK	Replace indoor Electronic Assembly (14.2.2)
5	Indoor fan does not start (louvers are opened and Green LED is ON)	Unit in heat mode and coil is still not warm	Change to Cool or Fan mode
		Failure of Indoor Unit Fan Motor	Check the motor and capacitor (13.5.19) Check for any cuts or exposed wires
		Problem with controller or motor capacitor	Change to high speed and Check power supply to motor is higher than 220VAC
		If still not OK	Replace indoor Electronic Assembly (14.2.2)
6	Indoor fan works when unit is OFF, and indoor fan speed is not changed by remote control command.	Controller problem	Replace indoor Electronic Assembly (14.2.2)

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
7	Water leakage from indoor unit	Indoor unit drainage tube is blocked	Check and open drainage tube
Outdoor unit			
8	Outdoor unit display board and leds are off	No power supply	Check supply voltage to main terminals L and N with volt meter.
		Miss-wiring	Check all supply wiring to controller and terminals according to wiring diagram
		Loose connection	Check all power wiring connections
		Burnt fuse	Check fuse on the main board (13.5.8)
		If still not OK	Replace main board (14.1.13)
9	Compressor does not start operation	One or some components are not operating well	Check for any fault code shown on display board and act accordingly (13.4)
		Electronics control problem or protection	
		PFC Chock coil	Check the PFC Chock coil (13.5.6)
		Driver failure	Check if fault code #11, 18, 19 or 26 is shown on display board. If so, fix the problem according to (13.5.5) or replace driver (14.1.15).
		If still not OK	Replace compressor (14.1.10)

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
10	Cooling capacity is not sufficient	Unit size not match the load	Check if the size chosen for the complete room(s) load is enough or need bigger units
		Piping size not matching system	Check if piping is installed correctly and proper diameter size and total length is according to unit specifications
		Refrigerant leakage	Check refrigeration system (13.3)
		Refrigerant over-charge	
		Refrigerant clog	Check and repair clogging specially near the EEV
		Electronics control problem or protection	Check for any fault code shown on display board and act accordingly (13.4)
		Compressor failure	Check if fault code #11 or 26 is shown on display board. If so, fix the problem according to (13.5.10) or replace driver
		Indoor coil block	Clean filters and/or remove block or air by-pass
		Indoor fan malfunction	Check the motor and capacitor (13.5.19)
		Overflow	Check if the overflow switch is ON. Replace faulty switch or correct drain piping.
		Outdoor coil block	Remove block and/or avoid air by-pass
		Outdoor fan malfunction	Check outdoor fan motors (13.5.9)
		Indoor fan malfunction	Check if the overflow switch is ON. Replace faulty switch or correct drain piping.
		EEV malfunction	Check EEV (13.5.12)
11	Heating capacity is not sufficient	Check all according to above cooling problem (11)	
		Reverse valve	Check reversing valve operation (13.5.11)
		Deicing not performed well (during low outdoors temperatures)	Check OCT and OAT thermistors fault codes (#1-2 and 7-8) Check OCT thermistor if connected well to pipe Check OAT thermistor if connected well Check the thermistors operation (13.5.13)

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
12	Compressor is over heated	Electronic control	Check for any fault code shown on display board and act accordingly (13.4)
		EEV problem	Check EEV (13.5.12)
		Refrigerant leakage	Check refrigeration system (13.3)
		Indoor coil block	Clean filters and/or remove block
		Indoor fan malfunction	Check indoor fan motor and capacitor (13.5.19)
		Outdoor coil block	Remove block and/or avoid air by-pass
		Outdoor fan malfunction	Check outdoor fan motors (13.5.9)
		Compressor malfunction	Check the compressor (13.5.10)
13	Compressor stops many times during operation	Check all according to above problem (13)	
		HP Switch	Check if HPS fault code (#28) is accruing frequently. If so, check the switch operation (13.5.14)
		LP Switch	Check if LPS fault code (#29) is accruing frequently. If so, check the switch operation (13.5.15)
14	Unit is cooling while in heat mode	RV problem	Check RV operation (13.5.11)
		IDU-ODU communication	Check the communication between outdoor and indoor units (13.5.17)
15	Compressor is generating abnormal noise	Phase order to compressor is wrong	Check compressor phase order
		Compressor internal parts wearing	Replace compressor (14.1.10)
		Vibration	Check all piping connections Check compressor rubbers are fixed well Check all screws on unit metal chassis are tightened Check that no piping is in contact with each other or with other parts.
16	Freezing of outdoor unit coil in heat mode and outdoor unit base is blocked with ice		Connect base heater
17	The unit stop suddenly during operation	EMC interference to the A/C unit	Check for EMC problems (13.5.20.1)
18	Indoor unit Indicator leds may flicker		

No.	SYMPTOM / PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
19.	Other home appliances operation is faulty such as noise appears in the television picture, or the picture is distorted or static occurs in the radio sound	EMC interference by the A/C unit	Check for EMC problems (13.5.20.2)
20.	All others	Specific problems of indoor or outdoor units	Check for any fault code shown on display board and act accordingly (13.4)

13.3 Checking the refrigeration system

Checking system pressures and other thermodynamic measures should be done when system is in technician Mode where the system operates as in fixed settings. The performance curves given in this manual are given for unit performance in Technician mode when high indoor fan speed is selected.

For entering technician mode see **12.6**.

13.4 Troubleshooting by Diagnostics Codes

13.4.1 Fault Code for Outdoor Unit

If any fault exists in the system, its fault will be shown according to the following coding method. The 5 last fault occurred in the system will be stored in the EEPROM.

If no fault exist in the system, no fault code will be displayed during normal operation mode. STATUS LED is blinking 5 times in 5 seconds, and shut off for the next 5 seconds.

FAULT LED will blink during the same 5 seconds according to the following table

The LED coding method is as follow:



No	Problem	5	4	3	2	1
1	OCT is disconnected	0	0	0	0	1
2	OCT is shorted	0	0	0	1	0
3	CTT is disconnected	0	0	0	1	1
4	CTT is shorted	0	0	1	0	0
5	HST is disconnected (when enabled)	0	0	1	0	1
6	HST is shorted (when enabled)	0	0	1	1	0
7	OAT is disconnected	0	0	1	1	1
8	OAT is shorted	0	1	0	0	0
9	OMT is disconnected	0	1	0	0	1
10	OMT is shorted	0	1	0	1	0
11	IPM Fault	0	1	0	1	1
12	Bad EEPROM	0	1	1	0	0
13	DC under voltage	0	1	1	0	1
14	DC over voltage	0	1	1	1	0
15	AC under voltage	0	1	1	1	1
16	IDU/ODU Communication mismatch	1	0	0	0	0
17	No Communication to IDU	1	0	0	0	1
18	No Communication to Driver	1	0	0	1	0
19	Current sensor Fault	1	0	0	1	1
20	Heat sink Over Heating	1	0	1	0	0
21	Deicing	1	0	1	0	1
22	Compressor Over Heating	1	0	1	1	0
23	Compressor Over Current	1	0	1	1	1
24	OFAN_UP error	1	1	0	0	0
25	OFAN_DN error	1	1	0	0	1
26	Compressor Lock	1	1	0	1	0
27	Bad Communication	1	1	0	1	1
28	High pressure protection	1	1	1	0	0
29	Low pressure protection	1	1	1	0	1
30	Reserved	1	1	1	1	0
31	Reserved	1	1	1	1	1

1 - ON, 0 - OFF

Only one code is shown. Order of priority is lower to the higher number. Diagnostics is continuously ON as long power is on.

13.4.2 Outdoor unit diagnostics and corrective actions

No	Fault Name	Fault Description	Corrective Action
1	OCT is disconnected	Thermistor not connected or damaged	Check Thermistor (13.5.13)
2	OCT is shorted		
3	CTT is disconnected		
4	CTT is shorted		
5	HST is disconnected (when enabled)		
6	HST is shorted (when enabled)		
7	OAT is disconnected		
8	OAT is shorted		
9	OMT is disconnected		
10	OMT is shorted		
11	IPM Fault	Over current / IPM malfunction	Check no obstruction to electrical box and outdoor coil air inlet. Check if the inrush wiring is connected and if the inrush circuitry is operating well (13.5.4) Check Compressor (13.5.10) Check Driver (13.5.5) Check Capacitors (13.5.7)
12	Bad EEPROM	EEPROM parameters are corrupted	Reset the power. If problem still exist replace PCB only when change is required parameters
13	DC under voltage	DC voltage is lower than limit	Check if input voltage lower than limit (198VAC), if not and the problem persists, replace driver. If voltage is low, recommend the customer to fix the power supply Check driver (13.5.5) Check DC capacitors (13.5.7)
14	DC over voltage	DC voltage exceeds its high -	Check if input voltage higher than limit (253VAC), if not and the problem persists, replace driver. If voltage is high, shut off the power and recommend the customer to fix the power supply
15	AC under voltage	AC input voltage is lower than limit	Check if input voltage lower than limit (198VAC), if not and the problem persists, replace driver. If voltage is low, recommend the customer to fix the power supply
16	IDU/ODU Communication mismatch	Mismatch between IDU and ODU models	Units are not designed to operate together as system. Check and replace the models installed.
17	No Communication to IDU	IDU-ODU communication	Check communication between indoor and outdoor units (13.5.17)

No	Fault Name	Fault Description	Corrective Action
18	No Communication to Driver	Driver fault	Check power supply to driver Check driver communication (13.5.16)
19	Current sensor Fault	Driver fault	Replace Compressor Driver
20	Heat sink Over Heating	Compressor stopped due to heat sink protection	Check that the airflow around the ODU is free and the fan is running free Check the screws connecting the driver to heat sink are tighten Check outdoor fan motors (13.5.9)
21	Deicing	During deicing procedure	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak and thermodynamic operation (13.3)
22	Compressor Over Heating	Compressor stopped due to over heat protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak and thermodynamic operation (13.3) Check the EEV (13.5.12) Check the Outdoor fans (13.5.9) Check the Indoor fans (13.5.19) Check the Compressor (13.5.10) Check the CTT Thermistor (13.5.13)
23	Compressor Over Current	Compressor stopped due to over current protection	Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak or clog and thermodynamic operation (13.3) Check the EEV (13.5.12) Check the Outdoor fans (13.5.9) Check the Indoor fans (13.5.19) Check the Compressor (13.5.10)
24	OFAN_UP error	Outdoor fan(s) does not rotate	Check no obstruction to outdoor unit coil air path Check OFAN motor (13.5.9)
25	OFAN_DN error		
26	Compressor Lock	Compressor does not rotate	Check if the inrush wiring is connected and if the if the inrush circuitry is operating well (13.5.4) Check Compressor (13.5.10) Check driver (13.5.5) Check Zero-cross wiring from driver to Line Filter (6HP Only)
27	Bad Communication	Bad communication lines	Check communication between indoor and outdoor units (13.5.17)

No	Fault Name	Fault Description	Corrective Action
28	High pressure protection	Compressor stopped due to high pressure protection	<p>Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant clog.</p> <p>Check the switch operation (13.5.14) Check the EEV (13.5.12) Check the Outdoor fans (13.5.9) Check the Indoor fans (13.5.19) Check the Compressor (13.5.10)</p>
29	Low pressure protection	Compressor stopped due to low pressure protection	<p>Normally no action is required If the problem persists for more than twice on each hour, check for refrigerant leak.</p> <p>Check the switch operation (13.5.15) Check the EEV (13.5.12) Check the Outdoor fans (13.5.9) Check the Indoor fans (13.5.19) Check the Compressor (13.5.10) Check the CTT Thermistor (13.5.13)</p>

13.4.3 Fault Code for Indoor unit

Note: Indoor unit diagnostics can be viewed by the outdoor unit display board (13.4).

The below procedure is for viewing the indoor unit codes via the indoor unit led display.

Pressing Mode button for more than 5 seconds will activate diagnostic mode by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LED's.

When Indoor diagnostics is displayed, all four LED's (STBY, Operate, Filter, TMR) are on.

Entering diagnostics in STBY mode allows only viewing of status (fault-display).

In diagnostic mode, system problems / information will be indicated by blinking of Heat & Cool LED's.

The coding method will be as follows:

Heat led will blink 5 times in 5 seconds, and then will be shut off for the next 5 seconds. Cool Led will blink during the same 5 seconds according to the following table:

No	Fault Name	5	4	3	2	1
1	RT-1 is disconnected	0	0	0	0	1
2	RT-1 is shorted	0	0	0	1	0
3	RT-2 is disconnected	0	0	0	1	1
4	RT-2 is shorted	0	0	1	0	0
...	Reserved	0	0	1	0	1
7	Communication mismatch	0	0	1	1	1
8	No Communication	0	1	0	0	0
9	No Encoder	0	1	0	0	1
10	Reserved	0	1	0	1	0
11	Outdoor Unit Fault	0	1	0	1	1
...	Reserved					
17	Defrost protection	1	0	0	0	1
18	Deicing Protection	1	0	0	1	0
19	Outdoor Unit Protection	1	0	0	1	1
20	Indoor Coil HP Protection	1	0	1	0	0
21	Overflow Protection	1	0	1	0	1
...	Reserved					
24	EEPROM Not Updated	1	1	0	0	0
25	Bad EEPROM	1	1	0	0	1
26	Bad Communication	1	1	0	1	0
27	Using EEPROM data	1	1	0	1	1
28	Model A	1	1	1	0	0
29	Model B	1	1	1	0	1
30	Model C	1	1	1	1	0
31	Model D	1	1	1	1	1

1 - ON, 0 - OFF

Only one code is shown. Order of priority is lower to the higher number. Diagnostics is continuously ON as long power is on.

13.4.4 Indoor unit diagnostics and corrective actions

No.	Fault	Probable Cause	Corrective Action
1-4	Sensor failures	Sensors not connected or damaged	Check Thermistor (13.5.13)
7	Communication mismatch	Mismatch between IDU and ODU models	Units are not designed to operate together as system. Check and replace the models installed.
8	No Communication	IDU-ODU communication	Check communication between indoor and outdoor units (13.5.17)
9	No Encoder	Indoor electronics or motor	Check motor wiring, if ok, replace motor
		If still not ok	replace Indoor electronic assembly (14.2.2)
11	Outdoor Unit Fault	Outdoor controller problem	Check for any fault code shown on outdoor unit display board and act accordingly (13.4)
17-18	Protections	Indication	No action

No.	Fault	Probable Cause	Corrective Action
19	Outdoor Unit Protection	Compressor stopped due to outdoor unit protection	<p>Normally no action is required</p> <p>If the problem persists for more than twice on each hour, Check for any fault code shown on outdoor unit display board and act accordingly (13.4)</p> <p>Check the EEV (13.5.12)</p> <p>Check the Outdoor fans (13.5.9)</p> <p>Check the Indoor fans (13.5.19)</p> <p>Check the Compressor (13.5.10)</p> <p>Check the CTT Thermistor (13.5.13)</p>
20	Indoor Coil HP Protection	Compressor stopped due to high pressure (heating) protection	<p>Normally no action is required</p> <p>If the problem persists for more than twice on each hour, check for refrigerant leak and thermodynamic operation (13.3)</p> <p>Check the EEV (13.5.12)</p> <p>Check the Outdoor fans (13.5.9)</p> <p>Check the Indoor fans (13.5.19)</p> <p>Check the Compressor (13.5.10)</p> <p>Check the CTT Thermistor (13.5.13)</p>
21	Overflow Protection	Compressor stopped due to water level overflow protection	<p>Check the drainage tube for any clog. Correct drain piping or float switch if needed.</p> <p>It is highly recommended to install a siphon into the unit drainage point.</p>
24	EEPROM Not Updated	System is using ROM parameters and not EEPROM parameters	No action, unless special parameters are required for unit operation.
25	Bad EEPROM		No action, unless special parameters are required for unit operation.
26	Bad Communication	IDU-ODU communication	Check communication between indoor and outdoor units (13.5.17)
27	Using EEPROM data	No problem	
28	IDU model	Indoor unit model connected is shown: Model A - 4HP unit	No problem
29		Indoor unit model connected is shown: Model B - 5HP unit	
30		Indoor unit model connected is shown: Model C - 6HP unit	
31		Not applicable	

13.5 Procedures for checking Main Parts

13.5.1 Discharge DC Voltage



High voltage!!!

Wait for DC voltage to be discharged before touching any part of the driver to avoid electric shock.

Check to ensure that DC voltage has reduced to below 50VDC, if not, keep waiting until it does.

13.5.2 Checking Line Mains Voltage

Confirm that the Mains voltage is between 198 and 253 VAC. If Mains voltage is out of this range, abnormal operation of the system is expected. If in range, check the Power (Circuit) Breaker and look for broken or loosed cable lugs or wiring mistakes.

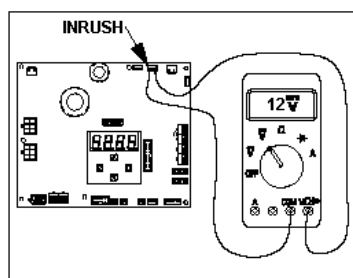
13.5.3 Checking Line Filter Board

- 1) Check for any burn signs on the filter board and its coils and relays, replace if any.
- 2) Check voltage at the inlet and outlet of the line filter. If no output voltage, replace line filter.

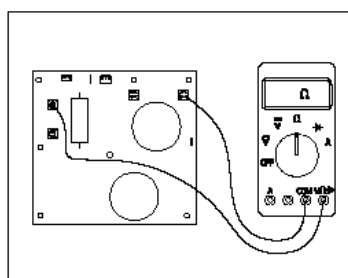
Replacing line filter - (14.1.19)

13.5.4 Checking Inrush Circuitry

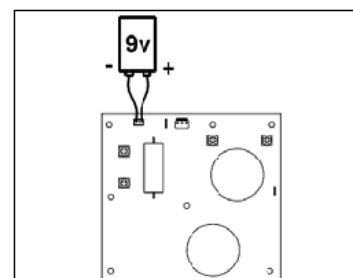
- 1) Check continuity of each wire on the inrush wiring cable – repair if needed.
- 2) Power ON the unit, check voltage between both of the inrush pins on the ODU main board – should be 0 at first and 12VDC after 1 minute. A click sound should also occur after 1 minute. If no voltage – replace ODU main Board.
- 3) While power is off check resistance between line input and line output in the filter board – should be 200Ω. Turn on the power and check again, after 1 minute (after the click should be 0Ω. If not, the resistor is burned - replace Line filter.
- 4) Disconnect the inrush connector (red) from the line filter controller and Connect 9V battery to pins 1 and 3 (Non-polarity). A click sound should occur. If not, the relay is burned - replace Line filter.



2) Inrush connector pin check



3) Inrush resistor check



4) Inrush connector pin check

Replacing line filter - (14.1.19)

Replacing main board - (14.1.13)

13.5.5 Checking Compressor Driver

13.5.5.1 4-5HP

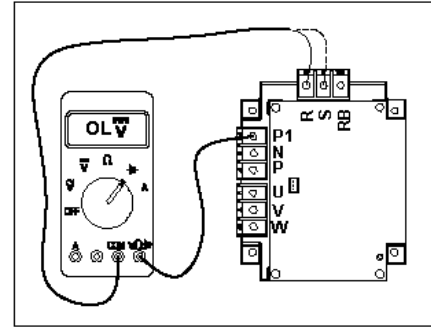
Remove all the terminals of the driver before checking.

If items 1) to 11) are performed and the results are satisfactory, driver is normal.

Use a digital multi meter in diode checking function

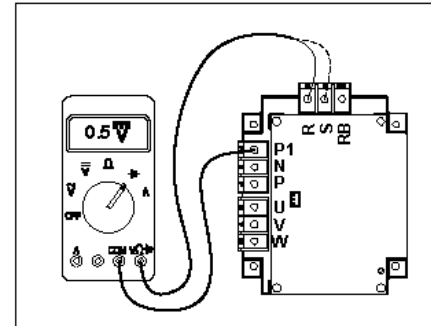
- 1) Connect the "VΩ" side of the tester to the "P1" terminal of driver and the "COM" side of the tester to "R" and "S" of driver, measure the diode voltage.

Voltage should be "OL" (Over Load).



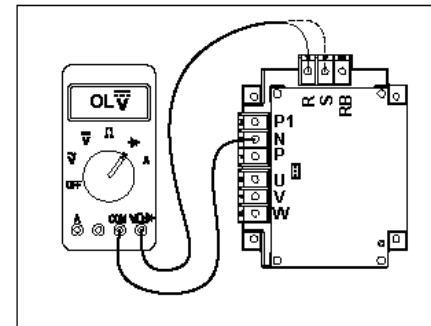
- 2) Connect the "COM" side of the tester to the "P1" terminal of driver and the "VΩ" side of the tester to "R" and "S" of driver, measure the diode voltage.

Voltage should be 0.4~0.8VDC.



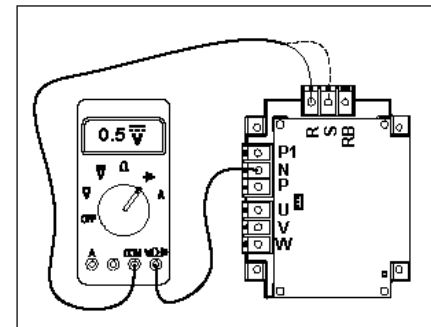
- 3) Connect the "COM" side of the tester to the "N" terminal of driver and the "VΩ" side of the tester to "R" and "S" of driver, measure the diode voltage.

Voltage should be "OL" (Over Load).



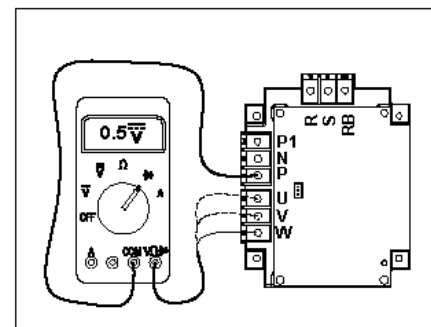
- 4) Connect the "VΩ" side of the tester to the "N" terminal of driver and the "COM" side of the tester to "R" and "S" of driver, measure the diode voltage.

Voltage should be 0.4~0.8VDC.

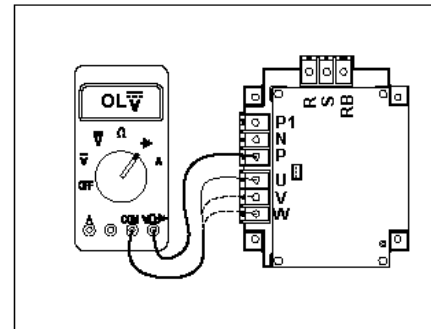


- 5) Connect the "COM" side of the tester to the "P" terminal of driver and the "VΩ" side of the tester to "U", "V" and "W" of driver, measure the diode voltage.

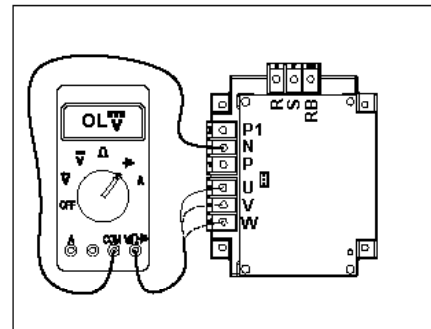
Voltage should be 0.4~0.8VDC.



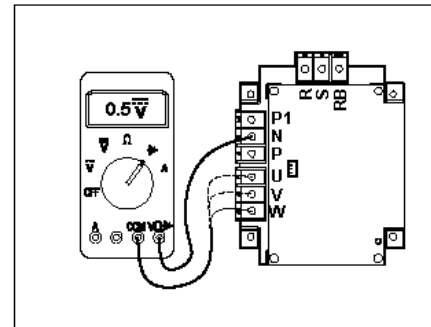
- 6) Connect the "VΩ" side of the tester to the "P" terminal of driver and the "COM" side of the tester to "U", "V" and "W" of driver, measure the diode voltage.
Voltage should be "OL" (Over Load).



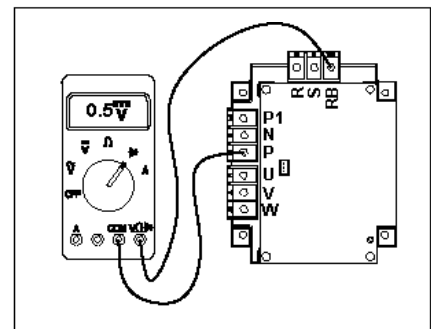
- 7) Connect the "COM" side of the tester to the "N" terminal of driver and the "VΩ" side of the tester to "U", "V" and "W" of driver, measure the diode voltage.
Voltage should be "OL" (Over Load).



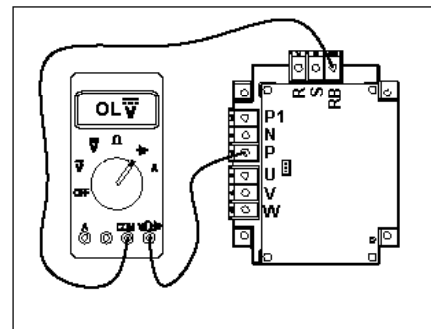
- 8) Connect the "VΩ" side of the tester to the "N" terminal of driver and the "COM" side of the tester to "U", "V" and "W" of driver, measure the diode voltage.
Voltage should be 0.4~0.8VDC.



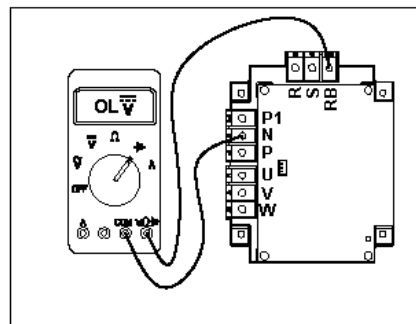
- 9) Connect the "COM" side of the tester to the "P" terminal of driver and the "VΩ" side of the tester to "T/RB" of driver, measure the diode voltage.
Voltage should be 0.3~0.8VDC.



- 10) Connect the "VΩ" side of the tester to the "P" terminal of driver and the "COM" side of the tester to "T/RB" of driver, measure the diode voltage.
Voltage should be "OL" (Over Load).



- 11) Connect the "COM" side of the tester to the "N" terminal of driver and the "VΩ" side of the tester to "T/RB" of driver, measure the diode voltage.
Voltage should be "OL" (Over Load).



Replacing driver - (14.1.15)

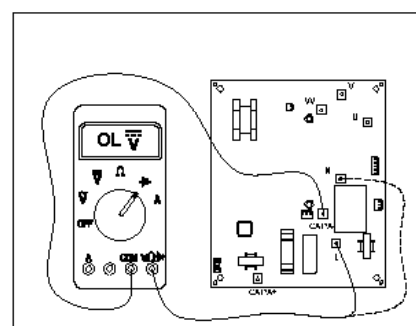
13.5.5.2 6HP

Remove all the terminals of the driver before checking.

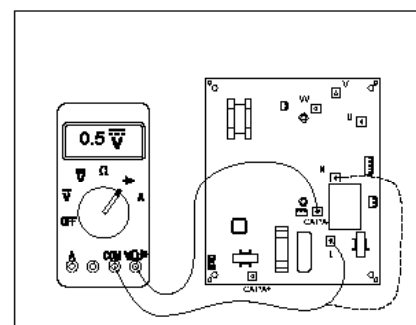
If items 1) to 8) are performed and the results are satisfactory, driver is normal.

Use a digital multi meter in diode checking function

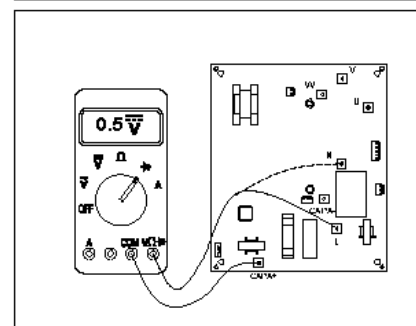
- 1) Connect the "COM" side of the tester to the "CAPA-" terminal of driver and the "VΩ" side of the tester to "LIVE" and "NEUTRAL" of driver, measure the diode voltage.
Voltage should be "OL" (Over Load).



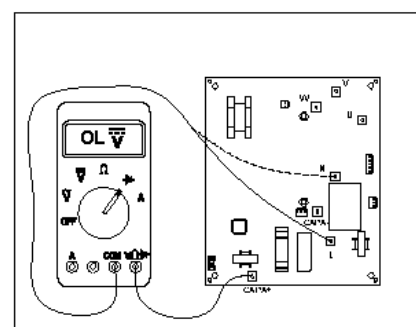
- 2) Connect the "VΩ" side of the tester to the "CAPA-" terminal of driver and the "COM" side of the tester to "LIVE" and "NEUTRAL" of driver, measure the diode voltage.
Voltage should be 0.4~0.8VDC.



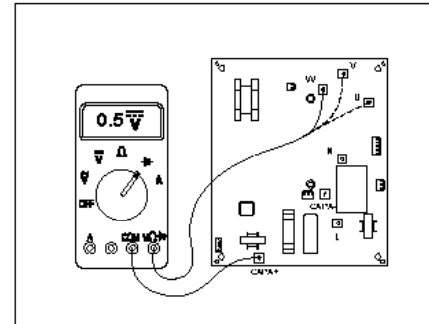
- 3) Connect the "COM" side of the tester to the "CAPA+" terminal of driver and the "VΩ" side of the tester to "LIVE" and "NEUTRAL" of driver, measure the diode voltage.
Voltage should be 0.4~0.8VDC.



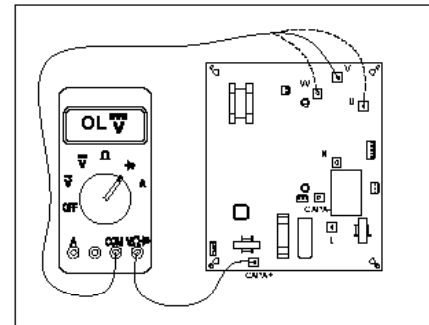
- 4) Connect the "VΩ" side of the tester to the "CAPA+" terminal of driver and the "COM" side of the tester to "LIVE" and "NEUTRAL" of driver, measure the diode voltage.
Voltage should be "OL" (Over Load).



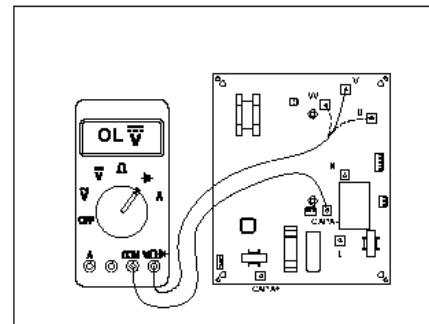
- 5) Connect the "COM" side of the tester to the "CAPA+" terminal of driver and the "VΩ" side of the tester to "U", "V" and "W" of driver, measure the diode voltage. Voltage should be 0.4~0.8VDC.



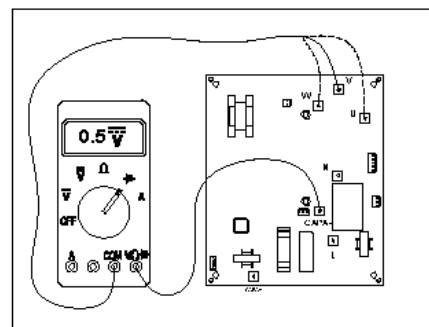
- 6) Connect the "VΩ" side of the tester to the "CAPA+" terminal of driver and the "COM" side of the tester to "U", "V" and "W" of driver, measure the diode voltage. Voltage should be "OL" (Over Load).



- 7) Connect the "COM" side of the tester to the "CAPA-" terminal of driver and the "VΩ" side of the tester to "U", "V" and "W" of driver, measure the diode voltage. Voltage should be "OL" (Over Load).



- 8) Connect the "VΩ" side of the tester to the "CAPA-" terminal of driver and the "COM" side of the tester to "U", "V" and "W" of driver, measure the diode voltage. Voltage should be 0.4~0.8VDC.



Replacing driver - (14.1.15.2)

13.5.6 Checking PFC Chock coil

- 1) Check PFC chock connections – repair if needed.
- 2) Visually check to see any burn marks on the wires – replace the chock(s) if needed.
- 3) Disconnect the chock from the driver and check if the 2 ending wires of each chock are shorted (continuity check) – if they are NOT shorted replace the chock(s), if they are shorted – check the driver (13.5.5).

Replacing PFC chock - (14.1.17)

13.5.7 Checking DC Capacitors

- 1) Check visually for burn marks on the capacitor PCB and the capacitors for swelling casing – replace if needed.

- 2) Check capacitance between the + and – poles, should be $2820 \pm 560 \mu\text{F}$ (4-5HP) or $4920 \pm 980 \mu\text{F}$ (6HP) – replace if not.

Replacing DC Capacitor board - (14.1.18)

13.5.8 Checking fuse on Main Board

If the 3.15A fuse on the main Board is burnt check the outdoor fans or any other peripheral that can cause a short:

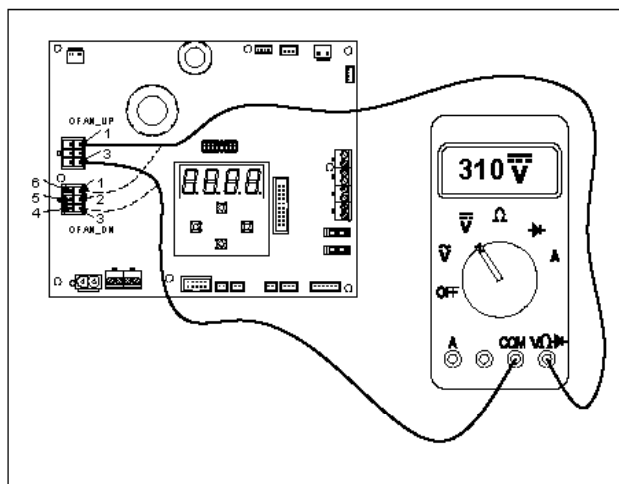
- 1) In case of a problematic peripheral - replace it.
- 2) In case no problematic peripheral replace the burnt fuse.
- 3) In case of frequent burning fuse, replace the controller.

Replacing main board - (14.1.13)

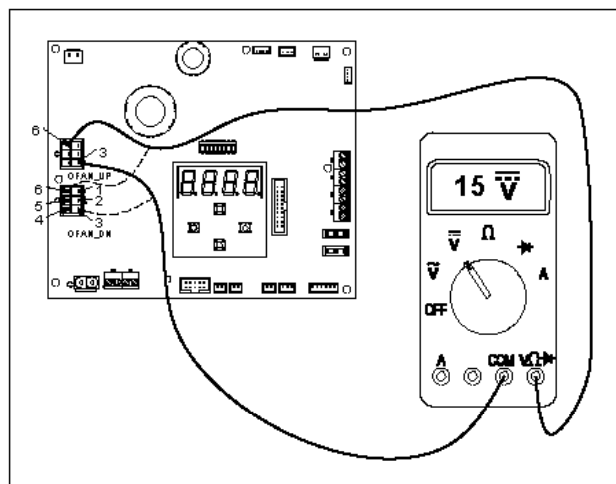
13.5.9 Checking Outdoor Fan Motor

An Outdoor fan motor fault message may occur during very high winds outdoors that may stop the fan rotation for short periods. If so, need to relocate the outdoor unit to a more protected place from winds or install measure of air deflection in front of the fan outlets.

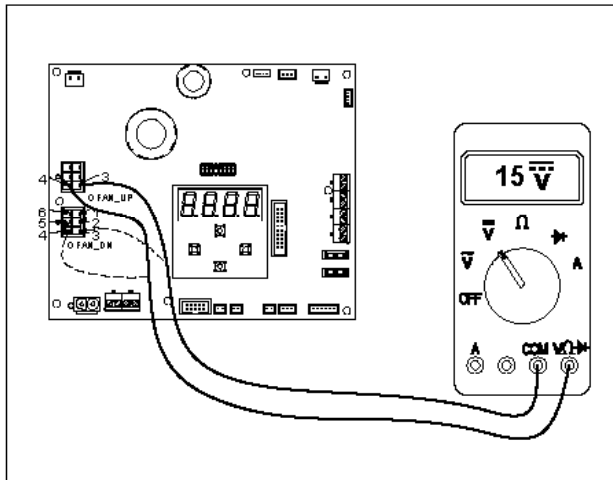
- 1) Check OFAN connections - Repair if needed.
- 2) Rotate the fan slowly by hand - If the fan does not rotate easily, check whether something is obstructing the fan preventing it from rotating – remove the obstruction if necessary. If no obstruction and still not operating - the fan motor bearings have seized - Replace the motor.
- 3) Disconnect the OFAN connector from the main board, switch ON the power and check the fan motor connector on the main board:
 - a. Between 1 and 3 – should be 310VDC. If very low or 0VDC, replace main board.
 - b. Between 3 and 4 – should be 15VDC. If very low or 0VDC, replace main board.
 - c. Between 3 and 6 – should be 15VDC. If very low or 0VDC, replace main board.
- 4) Connect back the motor connector to the main board, switch ON the power and check the motor current while operating. Current should be around 1A - In case of abnormal current (no current or excessive current), replace fan motor.



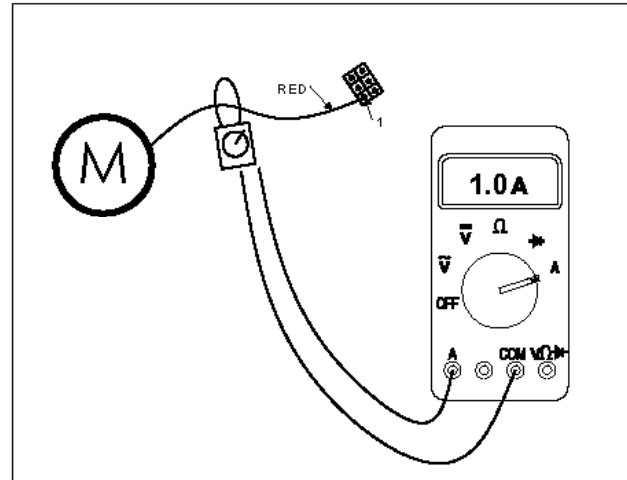
3)a Check motor current



3)c Check motor current



3)b Check motor current



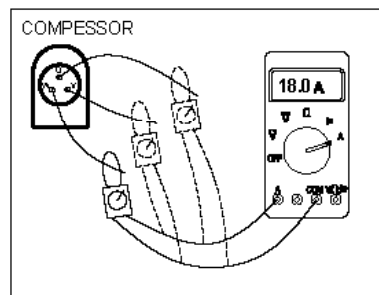
4) Check motor current

Replacing outdoor unit fan motor - (14.1.6)

Replacing main board - (14.1.13)

13.5.10 Checking Compressor

- 1) Check Compressor connections - Repair if needed.
- 2) Check the resistance between the three phases – all three coil resistances should be the same: around 0.188Ω .
- 3) Check the compressor current while operating to be the same on each wire - In case of abnormal current (no current or excessive current), the problem could be of driver or compressor – if driver is checked to be operating well (13.5.5), replace the compressor.



3) Check Compressor motor current

Replacing compressor- (14.1.10)

13.5.11 Checking Reverse Valve (RV)

The RV has two parts, Solenoid and valve.

- 1) Disconnect the RV connector from the main board and operate the unit in heating mode, check the voltage between two pins of reverse valve connector on the controller, normal voltage is 230VAC - if no power supply to RV, replace outdoor main board.
- 2) Check RV operation with direct 230VAC power supply. If RV solenoid is OK (but still no heating operation while compressor is ON), replace the RV valve from the refrigeration system. if not, replace the RV coil.

Replacing RV Coil (14.1.7)

Replacing RV Valve - (14.1.9)

Replacing main board - (14.1.13)

13.5.12 Checking Electrical Expansion Valve (EEV)

The EEV has two parts, step motor and valve. Use additional set of valve and coil to check the system.

- 1) Check the impedance in the coil wires to be as following:
Grey wire to each of the other wires – about 100Ω
Other wires – each one to the others (except grey) – about 50Ω
- 2) When Outdoor unit is powered on, EEV shall have vibration and click sound. If not, replace the coil with the additional one and check again – turn OFF the unit and then turn it ON, vibration and click sound should be performed. If OK, the coil was damaged and require to be replaced.
- 3) Turn OFF the unit, insert a good coil onto an additional operating valve and turn the unit ON, vibration and click sound should be performed. If OK, replace EEV valve from the unit.
- 4) If both EEV coil and valve are still not operating, replace the ODU main board.

Replacing EEV Valve Coil - (14.1.8)

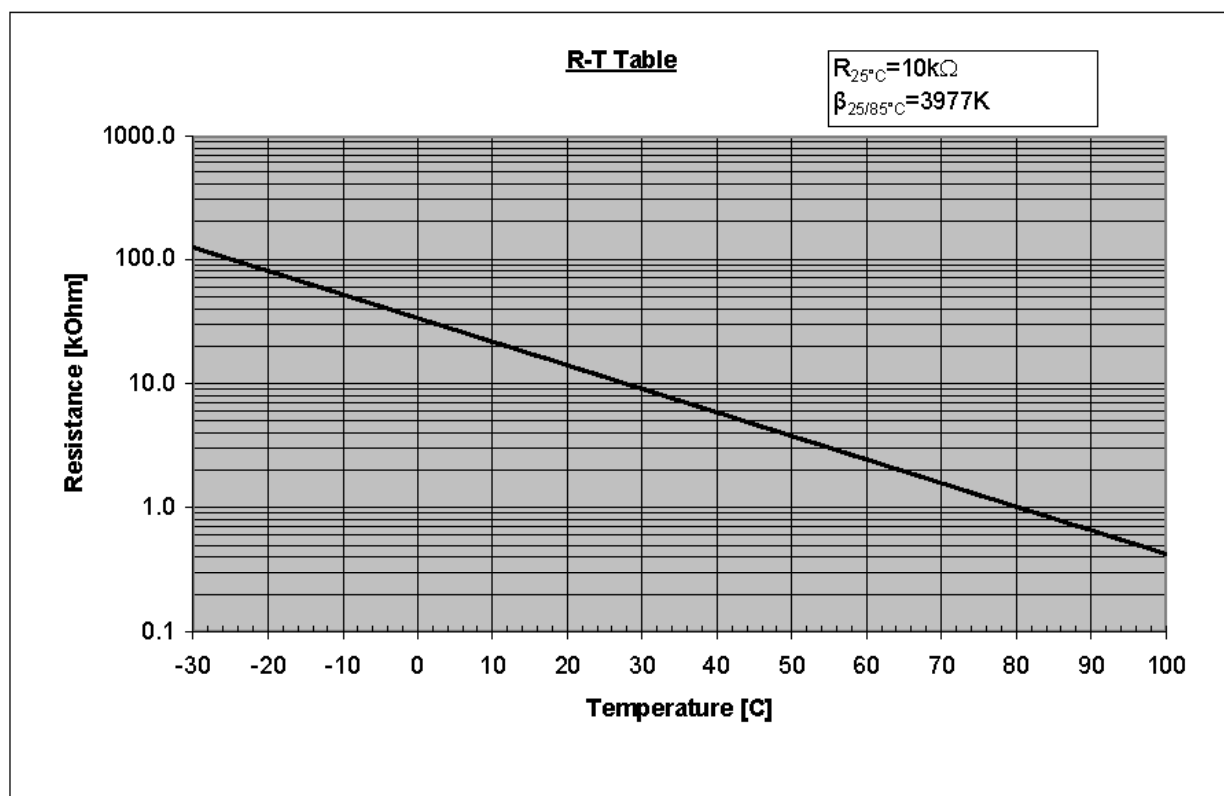
Replacing EEV Valve - (14.1.9)

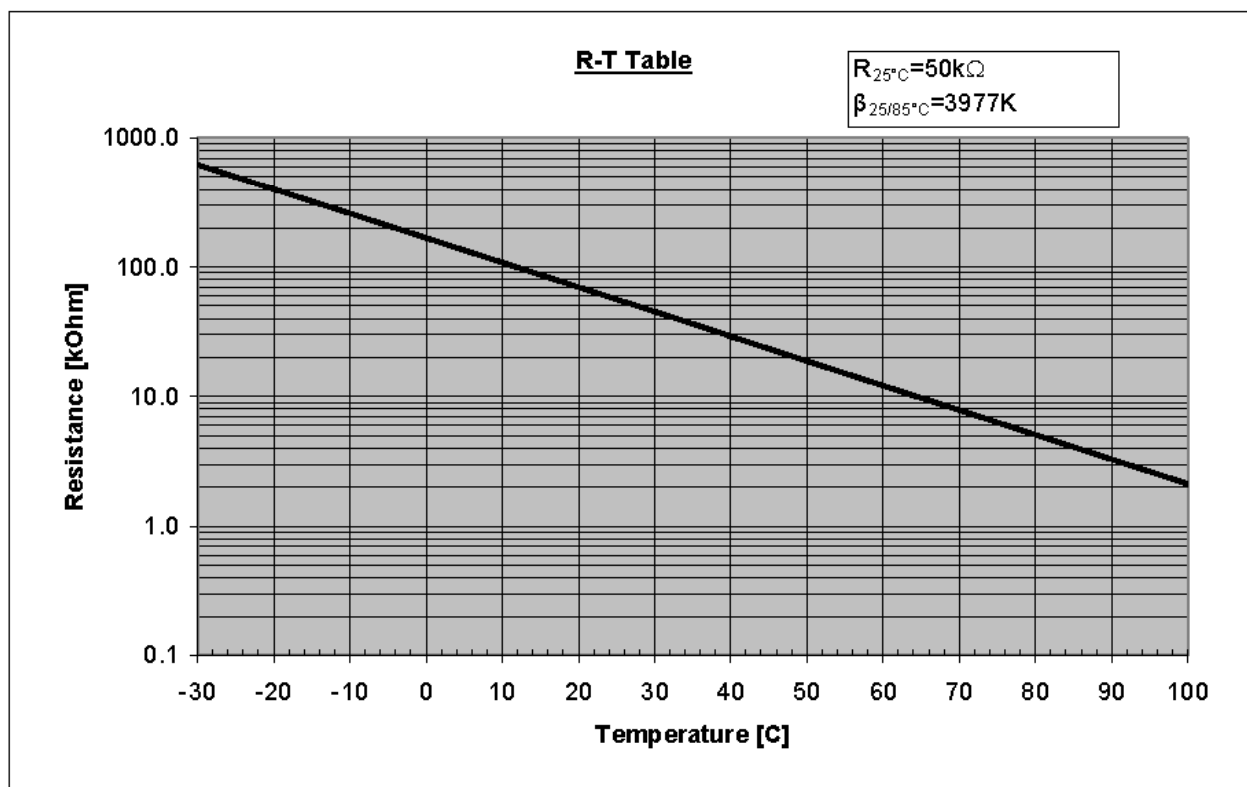
Replacing main board - (14.1.13)

13.5.13 Checking Thermistors

- 1) Check Thermistor connections and wiring - Replace if needed.
- 2) Check sensor visually - Replace if needed.
- 3) Check thermistor sensor attachment to pipe (or other parts), specially pay attention to the spring holding the sensor towards its sensing part – repair if needed.
- 4) Disconnect the connector from the main board and check Thermistor resistance – should be according the charts below for each sensor. If not in range of 10%, replace thermistor.
- 5) If thermistor resistance check is OK but reading is still wrong, replace main board.

OAT, OCT, OMT, ICT, RAT Chart



CTT Chart

Replacing thermistor - (14.1.11, 14.1.12, 14.2.9)

Replacing main board - (14.1.13)

13.5.14 Checking High Pressure Switch (HPS)

- 1) Disconnect HPS connector from the main board and check resistance between the 2 pins of the HPS connector – if shorted the HPS is OK, otherwise replace HPS.

Replacing HPS - (14.1.9)

13.5.15 Checking Low Pressure Switch (LPS)

- 1) Disconnect LPS connector from the main board and check resistance between the 2 pins of the HPS connector – if shorted the LPS is OK otherwise replace LPS.

Replacing LPS - (14.1.9)

13.5.16 Checking Compressor Driver Communications

- 1) Disconnect the wire cable from the connectors on both sides (driver and main board), check the wiring continuity – Repair or replace wiring if needed.
- 2) Turn power ON and check if the red led in the driver is lighted. If OK and still no communications, replace main board. If the led is OFF, replace driver.

Replacing Outdoor Unit main board - (14.1.13)

Replacing driver - (14.1.15)

13.5.17 Checking Indoor-Outdoor Unit Communications

- 1) Disconnect the wire cable from the connectors on both sides (main board and terminal block), check the wiring continuity – Repair or replace wiring if needed.
- 2) Check the continuity of the connecting wiring between indoor and outdoor units – Repair or replace wiring if needed.
- 3) Problem could be either in outdoor unit main board or indoor unit controller. To verify which one is faulty use additional boards and replace the one which is faulty.

Replacing Outdoor Unit main board - (14.1.13)

Replacing Indoor unit electrical assembly - (14.2.2)

13.5.18 Checking Indoor Unit Fuse on Controller

If the 3.15A fuse on the main Board is burnt check the fan or any other peripheral that can cause a short:

- 1) In case of a problematic peripheral - replace it.
- 2) In case no problematic peripheral replace the burnt fuse.
- 3) In case of frequent burning fuse, replace the controller.

Replacing Indoor unit electrical assembly - (14.2.2)

13.5.19 Checking Indoor Unit Fan Motor

- 1) Check the motor wiring from the controller.
- 2) Check the motor capacitor for capacitance according to the capacitor name plate.
- 3) Check the resistance between each coil of the motor to be within normal range (30-300Ω).
- 4) Check resistance between each wire to ground to be above 5Ω.

Replacing Indoor unit Fan Motor - (14.2.6)

Replacing Indoor unit electrical assembly - (14.2.2)

Replacing motor capacitor - (14.2.8)

13.5.20 Checking for electromagnetic interference (EMC problems)

13.5.20.1 EMC interference to the A/C unit

Locations most susceptible to interference

- 1) Locations near broadcast stations where there are strong electromagnetic waves.
- 2) Locations near amateur radio (short wave) stations.
- 3) Locations near electronic sewing machines and arc-welding machines.

Problem:

- 1) The unit may stop suddenly during operation.
- 2) Indicator lamps may flicker

Correction Actions:

The fundamental concept is to make the system less susceptible to noise by Insulation for noise or distance from the noise source.

- 1) Use shielded wires.
- 2) Move unit away from the noise source.

13.5.20.2 EMC interference to near by home appliances

Locations most susceptible to interference:

- 1) A television or radio is located near the A/C and A/C wiring.
- 2) The antenna cable for a television or radio is located close to the A/C and A/C wiring.
- 3) Locations where television and radio signals are weak.

Problem:

- 1) Noise appears in the television picture, or the picture is distorted.
- 2) Static occurs in the radio sound.

Correction Actions:

- 1) Select a separate power source.
- 2) Keep the A/C and A/C wiring at least 1 meter away from wireless devices and antenna cables.
- 3) Change the wireless device's antenna to a high sensitivity antenna.
- 4) Change the antenna cable to a BS coaxial cable.
- 5) Use a noise filter (for the wireless device).
- 6) Use a signal booster.

14. SERVICING

14.1 Outdoor Unit



Note: To reassemble perform the procedures in reverse.

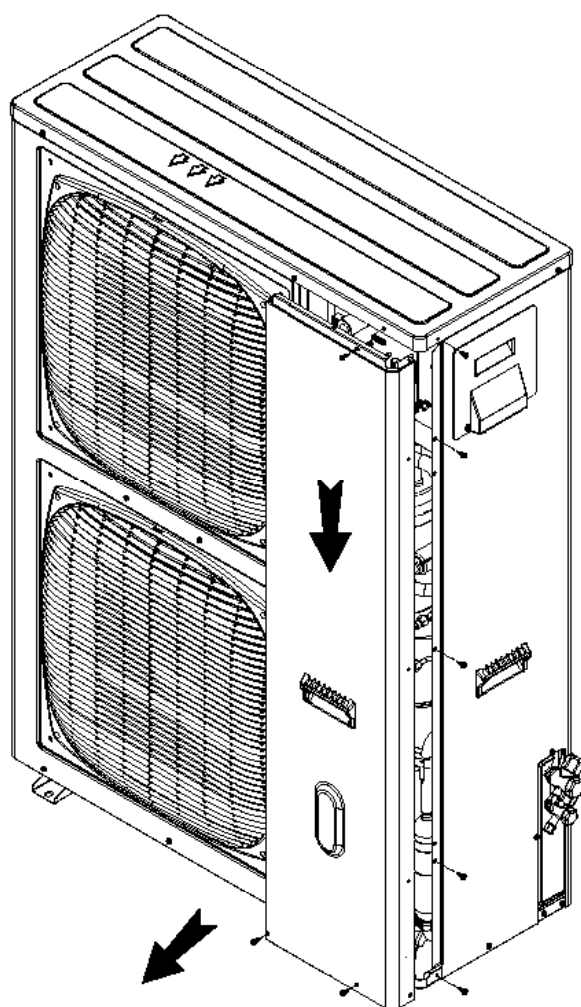
14.1.1 Removing Service (front) panel

Remove the 8 fixing screws and slide the service (front) panel downwards to remove it.

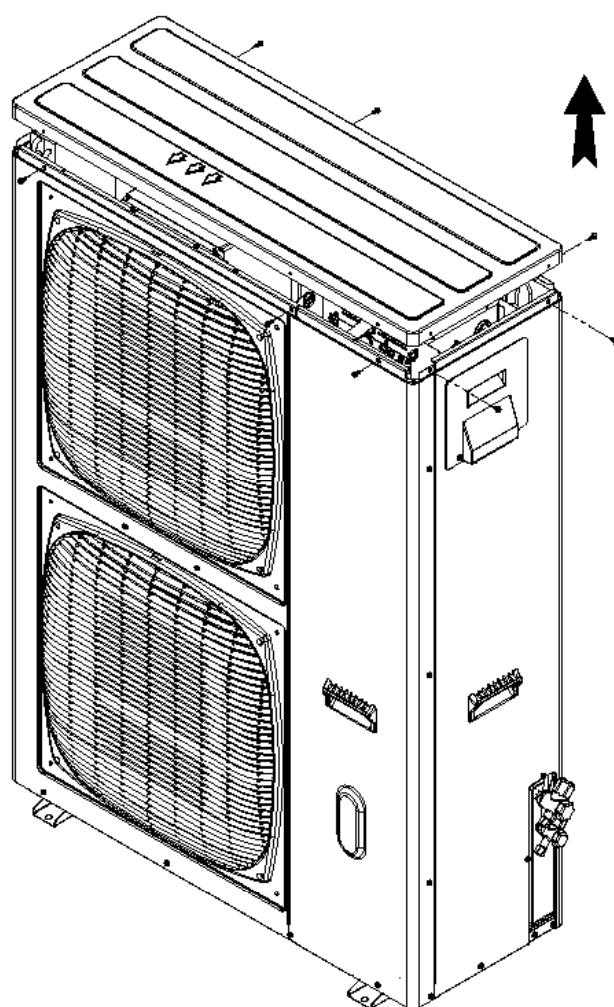
Note: Do not flip the panel forward on the top side as not to damage the controller.

14.1.2 Removing top panel

Remove the 8 fixing screws and take out the top cover.



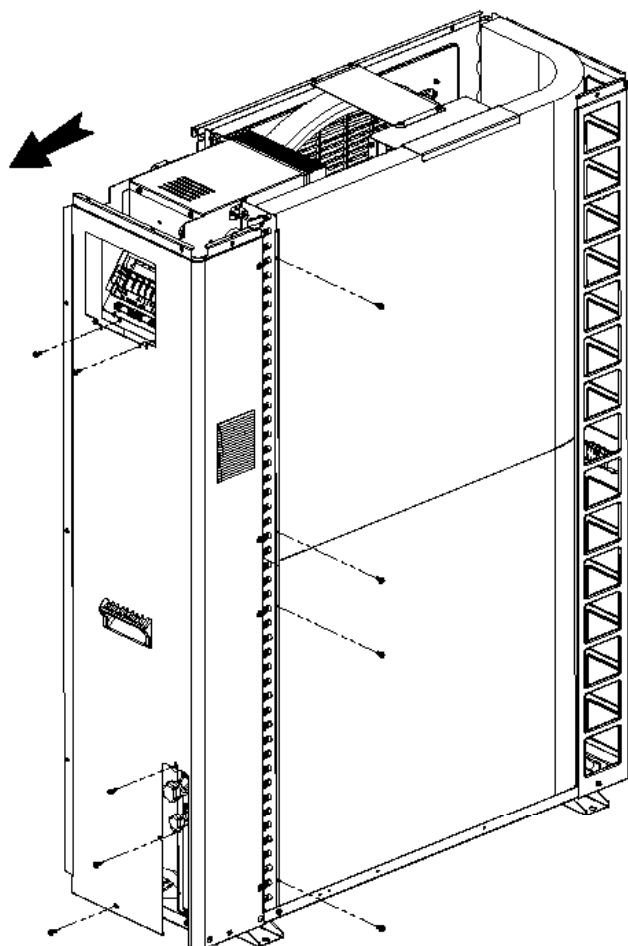
Removing Service (front) panel



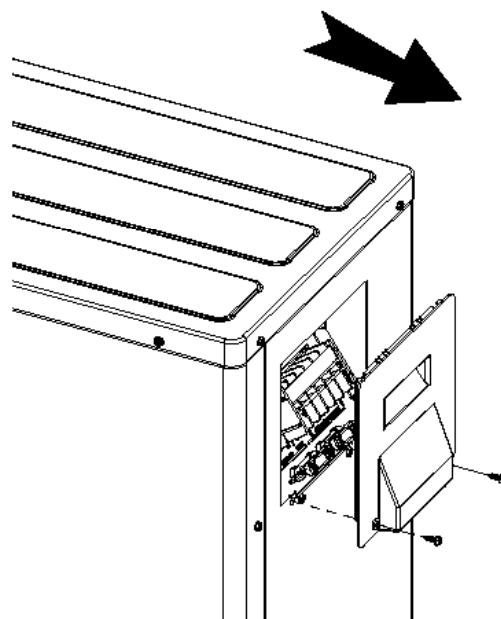
Removing Top panel

14.1.3 Removing side panel

1. Remove the top cover as in above **14.1.2**.
2. Remove the 2 screws holding the electrical plastic cover and disconnect the power supply cords.
3. Remove the 9 fixing screws and take out the side panel.



Removing side panel



Removing Electrical Cover

14.1.4 Removing Air Outlet Grille(s)

Remove the 4 fixing screws of the each grille.

14.1.5 Removing Outdoor Fan

1. Remove the air outlet grille according to **14.1.4**.
2. Remove the hex nut from the motor shaft. To ease the removal, use rubber hammer to hit on the hex nut while pulling out the fan.

NOTES for re-assemble the fan:

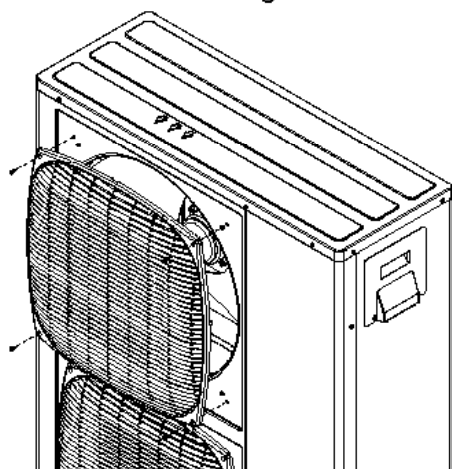
1. Insert the skidding protection part of fan boss in accordance with the cutting part of the motor shaft. Push hard until fan can no longer be inserted.
2. Fix the screw after with tightening Torque of 8.0 Nm (80kg.cm)

14.1.6 Removing Outdoor Fan Motor

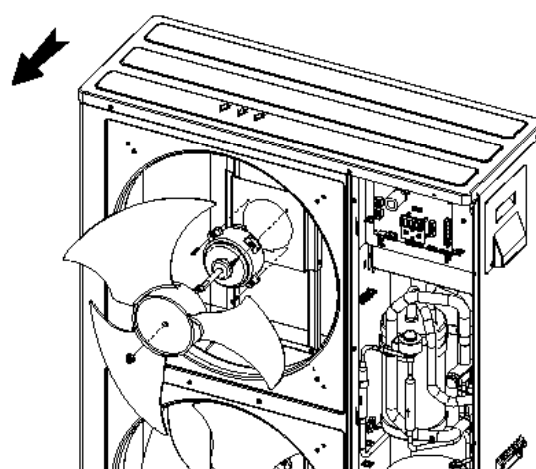
1. Remove the outdoor fan according to **14.1.5**.
2. Disconnect the motor connector from the main board.
3. Cut the nylon ties holding the motor cable.
4. Remove the four (4) fixing screws for the motor.

NOTES for re-assemble the motor:

1. When mounting the motor, ensure the cables point downwards.
2. Fix the protection tube edge downward to ensure the water may not keep in it.
3. Fix the motor wires with a nylon ties to prevent them obstructing the propeller fan.
4. When connecting the motor wire, check to ensure that the labels on the connectors match the PCB connectors.
5. Fix back the air outlet grille.



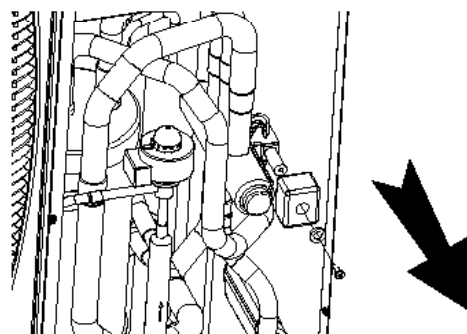
Removing Air Outlet Grille



Removing Outdoor Fan & Motor

14.1.7 Removing Reversing Valve coil

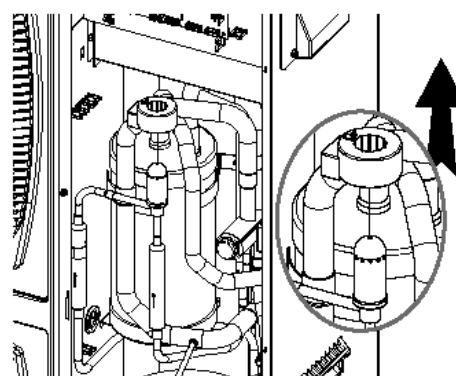
1. Remove the service front panel according to **14.1.1**.
2. Check to ensure that LEDs and display board are OFF.
3. Disconnect the RV connector from the main board.
4. Remove the RV wires from the cable holders along the electronics box.
5. Remove the fixing screw from the reversing valve coil and take the coil out.



Removing Reversing Valve coil

14.1.8 Removing Expansion Valve coil

1. Remove the service front panel according to **14.1.1**.
2. Check to ensure that LEDs and display board are OFF.
3. Disconnect the EEV connector from the main board.
4. Remove the EEV wires from the cable holders along the electronics box.
5. Pull up the EEV coil.



Removing Expansion Valve coil

14.1.9 Removing Refrigeration parts

Refrigeation parts: Expansion valve, Reversing valve, high pressure switch, etc.

1. Remove the refrigerant from the unit by a pumping machine via the 2 valves.

Note: *open the valves gradually and leave them only partially open for as long as the refrigerant exerts from the unit. Do not open the valves fully as not to loose any oil.*

2. Remove the service front panel according to **14.1.1**.
3. Check to ensure that LEDs and display board are OFF.
4. Remove the part connector from the main board.
5. Remove the part wires from the cable holders along the electronics box and or the partition.
6. Remove the part from its pipes using burner.

14.1.10 Removing Compressor

1. Remove the refrigerant from the unit by a pumping machine via the 2 valves.

Note: *open the valves gradually and leave them only partially open for as long as the refrigerant exerts from the unit. Do not open the valves fully as not to loose any oil.*

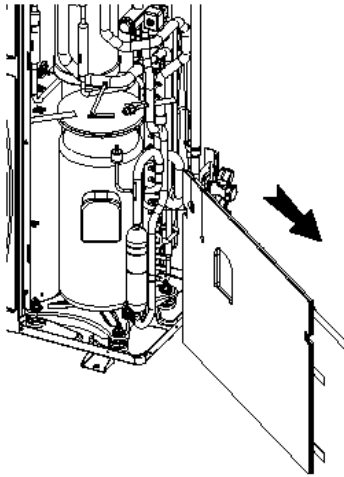
2. Remove the service front panel according to **4.1.1**.
3. Remove the side and top panels according to **14.1.2, 14.1.3**.
4. Check to ensure that LEDs and display board are OFF.
5. Take out the insulation surrounding the compressor and the cover.
6. Remove the compressor electrical cover. Use flat screw driver if required.
7. Remove the compressor wires from the terminals.
8. Remove the compressor wires from the cable holders along the partition and secure the wire on the top of the unit to avoid its burning by the burner.
9. Disconnect the suction pipe from the compressor.
10. Disconnect the discharge pipe from the compressor.

Remove the four nuts fixing the compressor and remove the compressor by lifting.

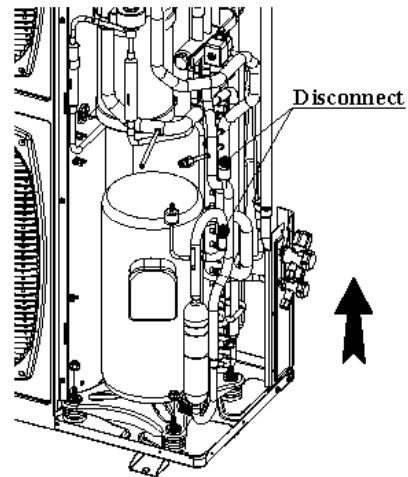
NOTES for re-assembling new compressor:

1. To prevent contamination of the refrigerant with water or foreign particles, do not expose open pipes to atmosphere for long periods. If necessary, seal pipe ends using caps or tape.
2. Remove the caps for the new compressor just before replacing the compressor. Seal suction and discharge pipe using tape when mounting to prevent the foreign particles entering the compressor.

Check to ensure each wire color goes to correct compressor terminal. If wrongly connected, the compressor may fail due to reverse rotation.



Removing Compressor Insulation



Removing Compressor

14.1.11 Removing Tubing Thermistors

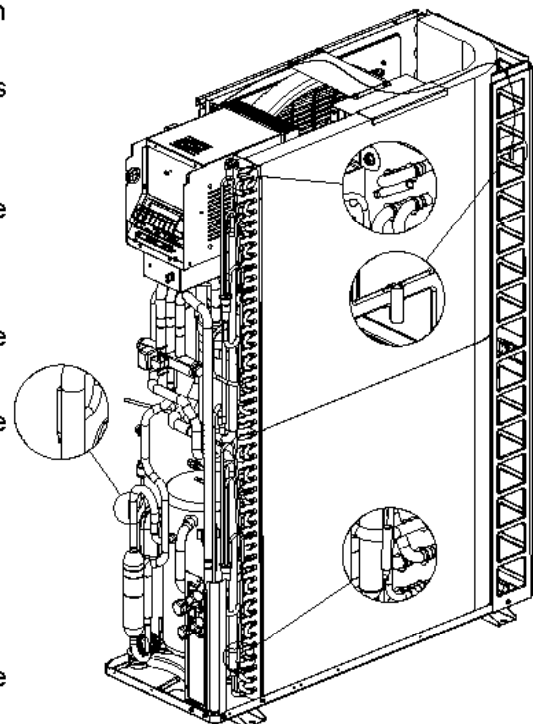
1. Remove the service front panel according to **14.1.1**.
2. Remove the side and top panels according to **14.1.2**, **14.1.3**
3. Check to ensure that LEDs and display board are OFF.
4. Disconnect the thermistor connector from the main board.
5. Remove the thermistor wires from the cable holders along the electronics box.
6. Cut the nylon ties holding the wires to the pipes.
7. Pull up the spring from the housing while pulling the thermistor.

Notes for re-assemble the thermistor:

1. Make sure the spring is inserted first and is facing the tube to be attached to.
2. hold the thermistor wires to the tube with nylon tie holding both the wires and the protective sleeve.

14.1.12 Removing Outdoor Air Thermistor

1. Remove the service front panel according to **14.1.1**.
2. Remove the top panel according to **14.1.2**.
3. Check to ensure that LEDs and display board are OFF.
4. Disconnect the thermistor connector from the main board.
5. Remove the thermistor wires from the cable holders along the electronics box and the fan motor assembly.
6. Cut the nylon ties holding the wires to the metal chassis.



Removing Thermistors

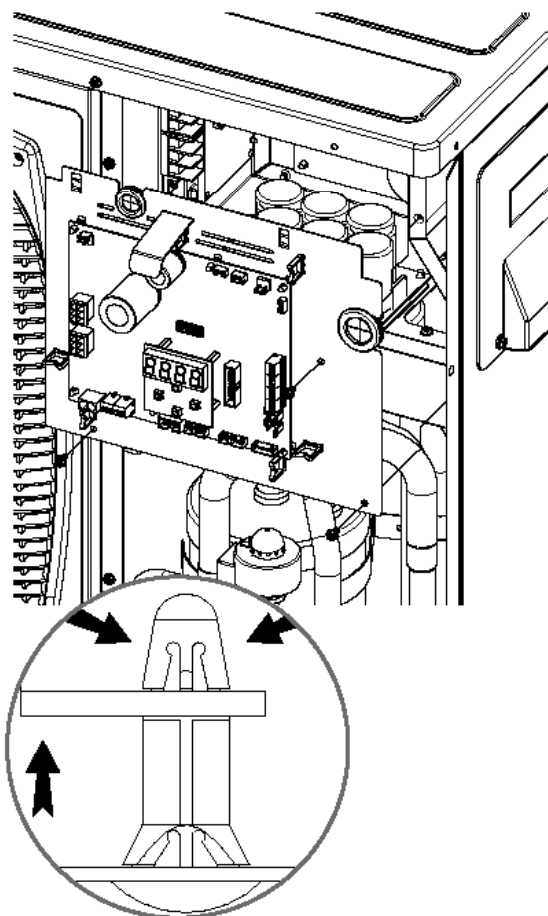
14.1.13 Removing main board

1. Remove the service front panel according to **14.1.1**.
2. Check to ensure that LEDs and display board are OFF.
3. Disconnect all connectors from the main board.
4. Squeeze the 8 spacers head with Long-Nose Pliers and pull out the board.

Note: It might be easier to remove the main board panel first and then pull out the board from its spacers.

Notes for re-assemble the main board:

1. Make sure to correct all the connectors into the connect locations. If incorrectly connected, malfunction or damage to the electrical parts may occur.
2. Hold the wires to the cable holders.
3. Ensure to set all the dip switches to the same configuration as the original.



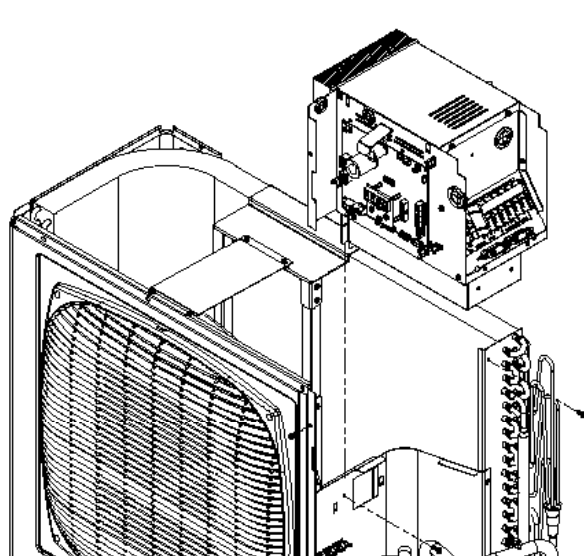
Removing main board Panel

14.1.14 Removing Electrical assembly

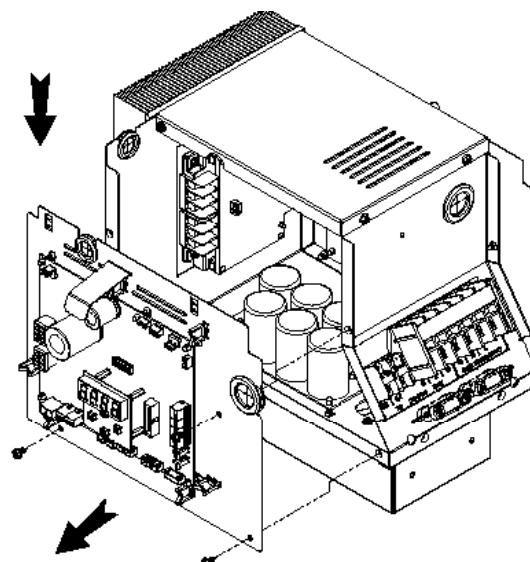
1. Remove the service front panel according to **14.1.1**.
2. Remove the side and top panels according to **14.1.2, 14.1.3**.
3. Check to ensure that LEDs and display board are OFF.
4. Disconnect the following connectors from the main board: RV, thermistors (4), HPS and EEV.
5. Remove the compressor electrical cover. Use flat screw driver if required.
6. Remove the compressor wires from the terminals.
7. Remove the three (3) screws fixing the electrical box to the front fan panel, the partition and the coil plate.
8. Pull up the box.

Notes for re-assemble the Electrical assembly:

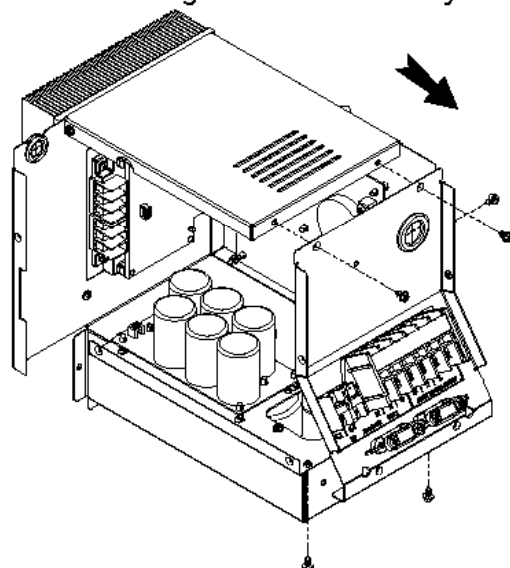
1. Make sure to connect all the connectors into the right locations. If incorrectly connected, malfunction or damage to the electrical parts may occur.
2. Hold the wires to the cable holders.



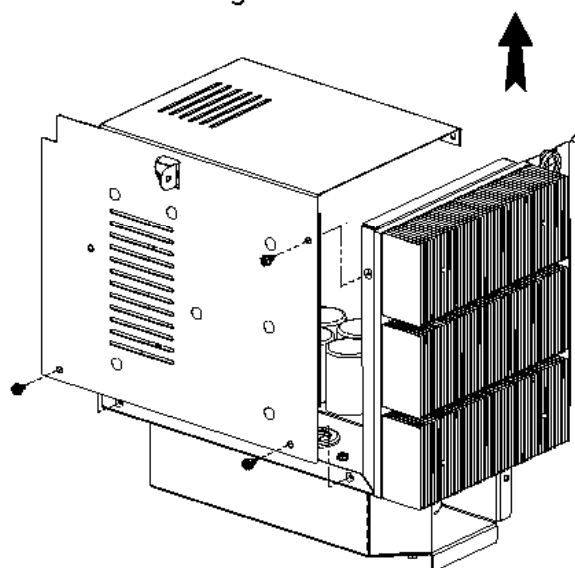
Removing Electrical assembly



Removing main board Panel



Removing Terminal Panel

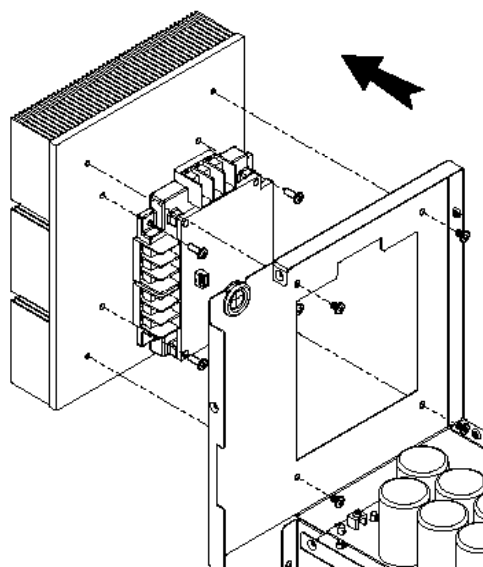


Removing Electrical assembly Cover

14.1.15 Removing driver module

14.1.15.1 4-5HP

1. Remove the electrical assembly according to **4.1.14**.
2. Remove the three (3) screws fixing the main board panel to the assembly and take the panel out.
3. Remove the earth tab connection from the line filter.
4. Remove the five (5) screws fixing the terminal panel to the assembly and take the panel out.
5. Disconnect all the wires from the driver terminals and the communication connector.
6. Remove the five (5) screws fixing the line filter panel to the driver panel and take the panel out.
7. Remove the four (4) screws fixing the driver module to the heatsink.
8. Wipe out the grease paste with cloth soaked with alcohol.



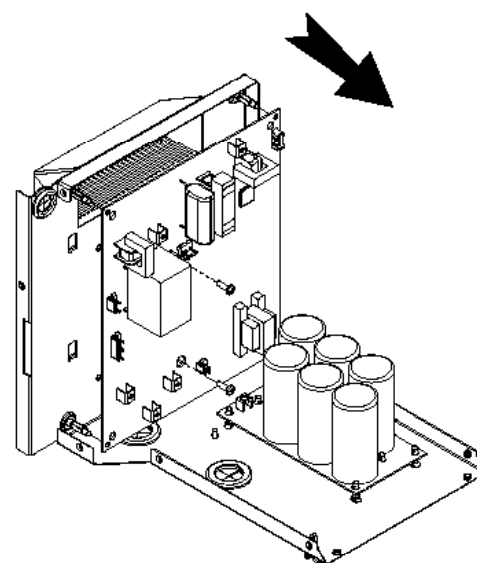
Removing driver module

Notes:

- Do not hold the PCB part of the driver module when removing the driver module.
- When handling the module, take care of not to use excessive force as this may cause damage.

14.1.15.2 6HP

1. Remove the electrical assembly according to **14.1.14**.
2. Remove the three (4) screws fixing the main board panel to the assembly and take the panel out.
3. Remove the earth tab connection from the line filter.
4. Remove the five (5) screws fixing the terminal panel to the assembly and take the panel out.
5. Disconnect all the wires from the driver terminals and the communication connector.
6. Remove the five (5) screws fixing the back panel to the driver panel and take the panel out.
7. Remove the four (2) screws fixing the driver module to the heatsink.
8. Squeeze the 4 spacers head with Long-Nose Pliers and pull out the board.
9. Wipe out the grease paste with cloth soaked with alcohol.



Removing driver module

Notes:

- Do not hold the PCB part of the driver module when removing the driver module.
- When handling the module, take care of not to use excessive force as this may cause damage.

14.1.16 Re-assembling driver module

14.1.16.1 4-5H

1. Wipe out the heat sink and the driver plate with cloth soaked with alcohol. Wipe out the heat sink screw holes as well by inserting the cloth deeply into the holes but beware not to damage the screwing paths.
2. Spread thermal grease paste on the driver back plate. Grease thickness should be 0.1-0.15mm evenly spread.
3. Place the driver module according the picture and screw the 4 screws gently with torque meter of 0.25Nm by the following order: 1-3-4-2.
4. Further tighten the screw with torque meter of 1.2Nm, same order. Make 1 turn backward with each screw.
5. Wait for 1 hour and further tighten the screws with torque meter of 1.2 Nm, same order.
6. Perform the removal procedure in **14.1.15** backwards.

Notes:

- Do not hold the PCB part of the driver module when handling the driver module.
- When handling the module, take care of not to use excessive force as this may cause damage.

14.1.16.2 6HP

1. Wipe out the heat sink and the driver plate with cloth soaked with alcohol. Wipe out the heat sink screw holes as well by inserting the cloth deeply into the holes but beware not to damage the screwing paths.
2. Spread thermal grease paste on the driver back plate. Grease thickness should be 0.1-0.15mm evenly spread.
3. Place the driver module according the picture and screw the 2 screws gently with torque meter of 0.25Nm.
4. Further tighten the screw with torque meter of 1.2Nm, same order. Make 1 turn backward with each screw.
5. Wait for 1 hour and further tighten the screws with torque meter of 1.2Nm.
6. Perform the removal procedure in **14.1.15** backwards.

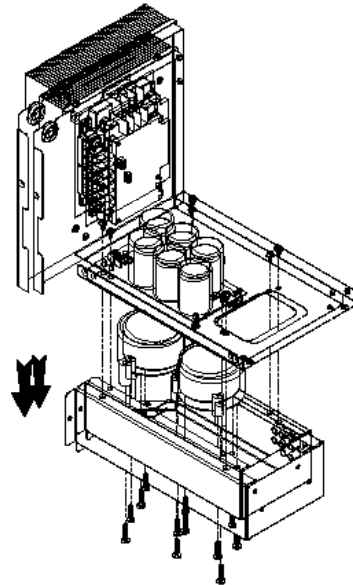
Notes:

- Do not hold the PCB part of the driver module when handling the driver module.
When handling the module, take care of not to use excessive force as this may cause damage.

14.1.17 Removing Chocks Coils

14.1.17.1 4-5HP

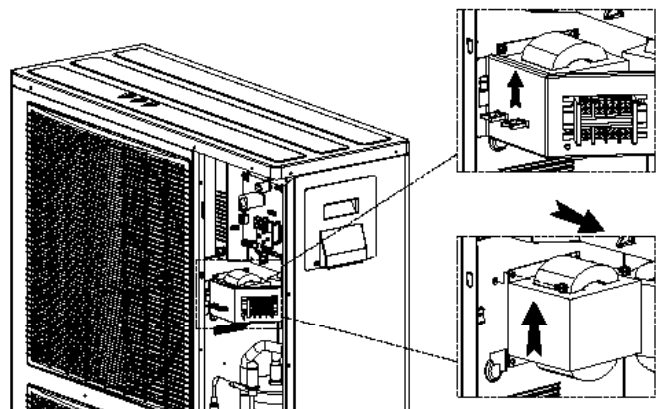
1. Perform the driver module removal procedure in **14.1.15** from 1 to 6.
2. Remove the 4 screws holding the chock coils box to the driver panel.
3. Take out the chock coils box while pulling the wires out through the rubber grommet.
4. Remove the chock coils wires from the terminal block.
5. Remove the 3 screws for each chock coil to release the chock coils from the box.



Removing Chocks Coils

14.1.17.2 6HP

1. Remove the chock coils wires from the chock terminal block.
2. Remove the terminal block holder.
3. Remove the 2 screws for each chock coil to release the chock coils from the partition.



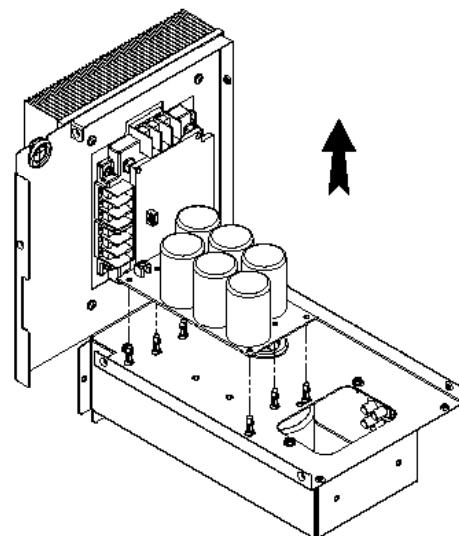
Removing Chocks Coils

14.1.18 Removing capacitor board

1. Perform the driver module removal procedure in **14.1.15** from 1 to 4. You may perform #6 as it will ease the board removal but first release N and L wires from the line filter.
2. Remove the capacitor wires from the board.
3. Squeeze the 6 spacers head with Long-Nose Pliers and pull out the board.

Notes to re-assemble the capacitor board:

- Capacitors has polarity (+ and -), check to ensure each terminal before connecting.

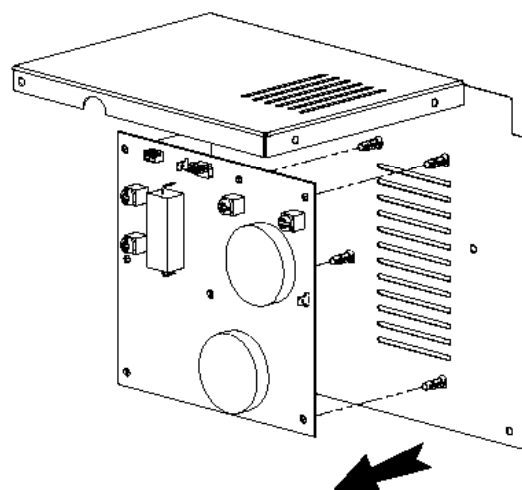


Removing capacitor board

14.1.19 Removing Line Filter board

14.1.19.1 4-5HP

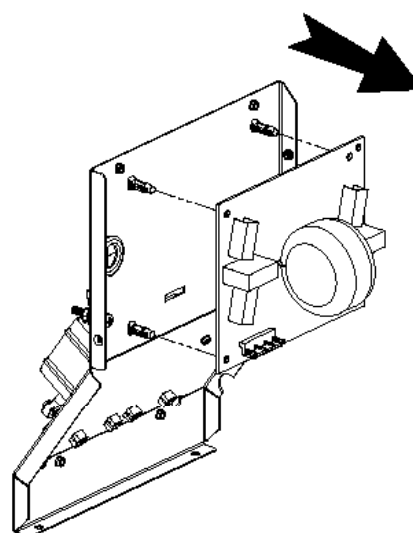
1. Perform the driver module removal procedure in **14.1.15** from 1 to 4 and #6 but first release N and L wires from the line filter.
2. Squeeze the 7 spacers head with Long-Nose Pliers and pull out the board.



Removing Line Filter board

14.1.19.2 6HP

1. Perform the driver module removal procedure in **14.1.15** from 1 to 4.
2. Release all wires from the line filter.
3. Squeeze the 4 spacers head with Long-Nose Pliers and pull out the board.



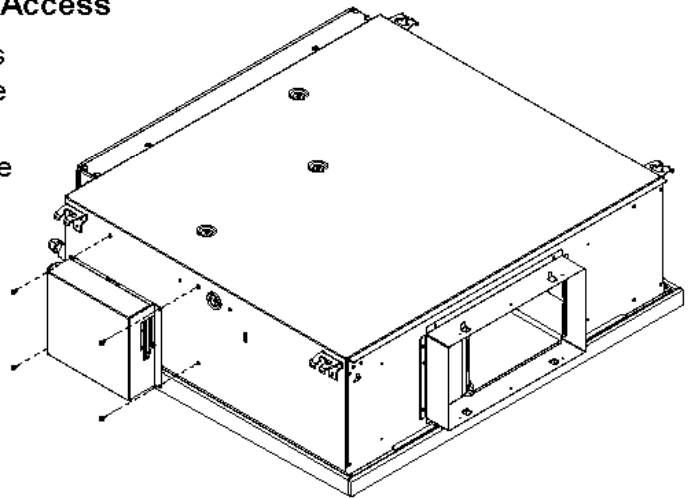
Removing Line Filter board

14.2 Indoor Unit: DNG

14.2.1 Electronics Assembly Remote Access

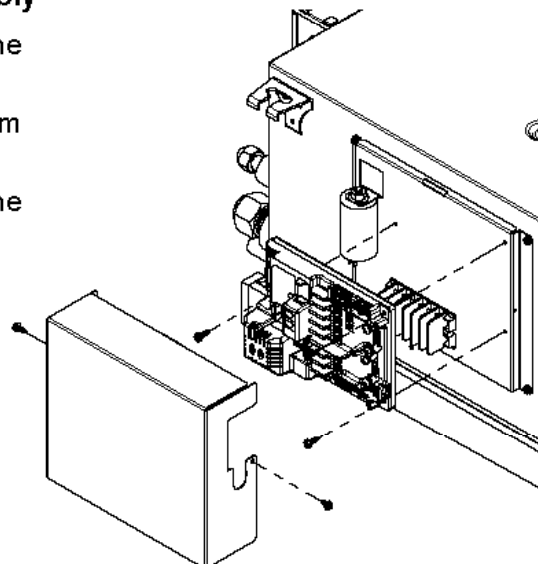
In cases of hard access to control assembly it is made possible to release the assembly from the indoor unit chassis.

1. Remove the 4 fixing screws and relocate the Electronics assembly .



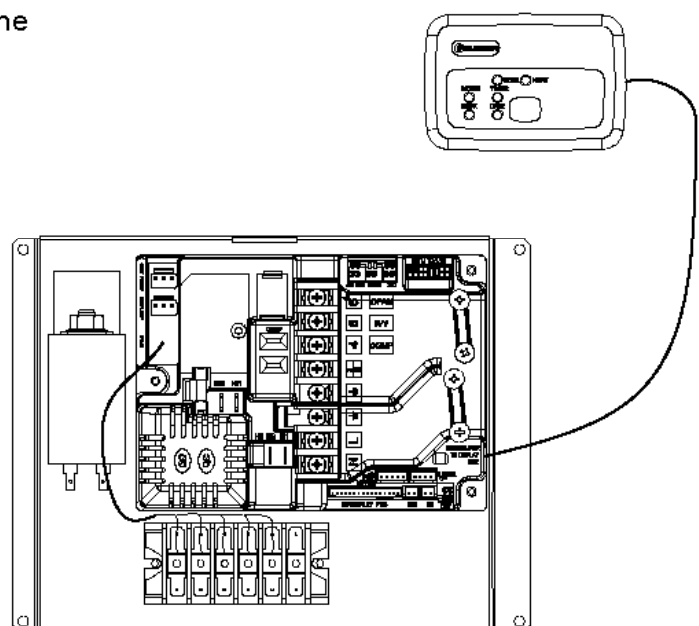
14.2.2 Removing Electronics Assembly

1. Remove the 2 fixing screws and take out the cover.
2. Disconnect all connectors and wires from the Electronics Board
3. Remove the 3 fixing screws and take out the Electronics Board.



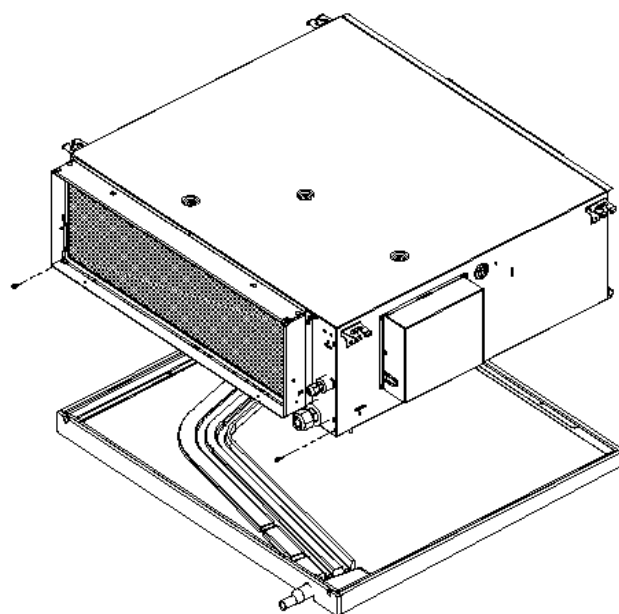
14.2.3 Removing Display unit

1. Take out the display connector from the electronics board.



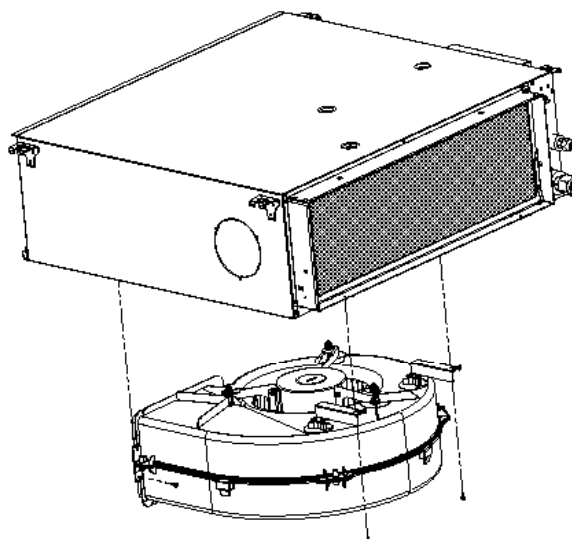
14.2.4 Removing Service Panel

1. Remove the 2 fixing screws from the filter side, push the service panel back and remove it.



14.2.5 Removing Fan Assembly

1. Remove the Service Panel according to **14.2.4**.
2. Disconnect the motor connector inside the unit and cut off the nylon ties holding the motor cable.
3. Remove the 3 fixing screws and take out the Fan assembly.

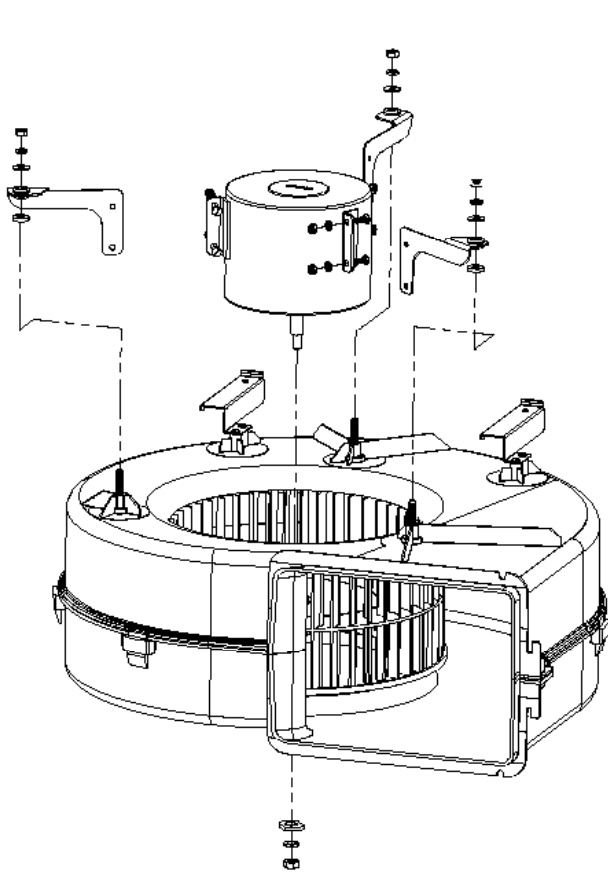


14.2.6 Removing Fan Motor

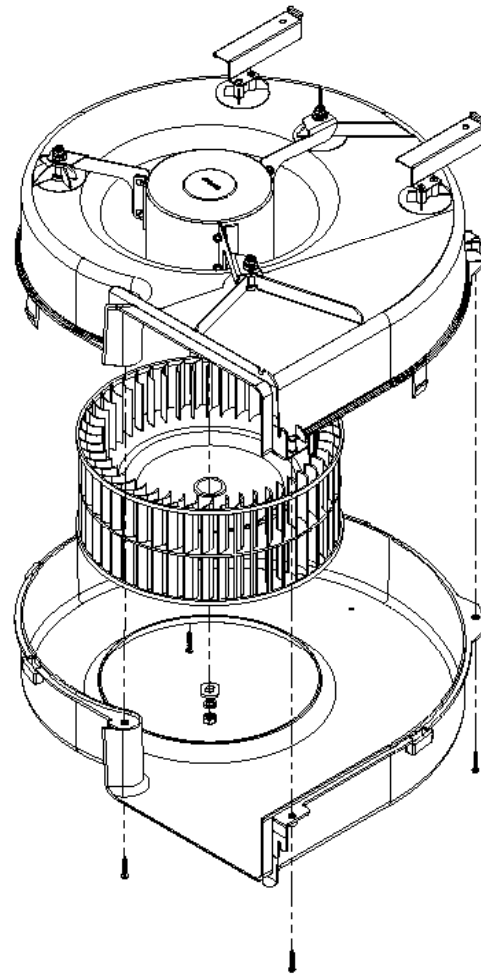
1. Remove the Fan Assembly according to **14.2.5**.
2. Remove the hex nut and the spring washer from the motor shaft.
3. Remove the 3 fixing hex nuts and the spring washers that connect the legs support to fan house and take out the motor with the 3 legs.
4. Remove the 6 fixing screw and nuts that connect the legs support with the fan motor and separate them.

14.2.7 Removing Fan

1. Remove the Fan Assembly according to **14.2.6**.
2. Remove the 4 fixing screws and separate the fan house.
3. Remove the hex nut and the spring washer from the motor shaft and take out the fan.



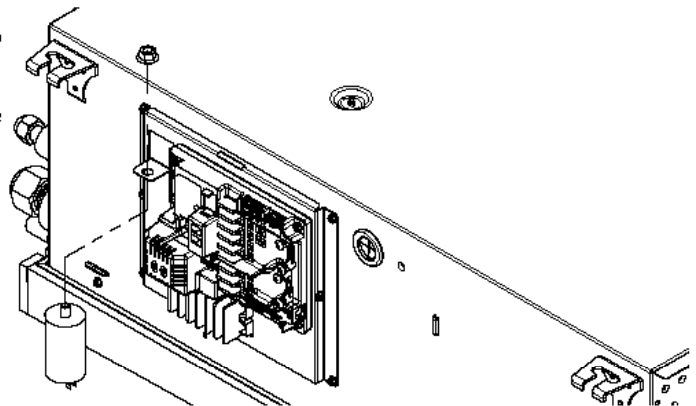
14.2.6 Removing Fan Motor



14.2.7 Removing Fan

14.2.8 Removing motor capacitor

1. Disconnect the tab connections from the to be capacitor.
2. Remove the nut holding the capacitor to be holder.



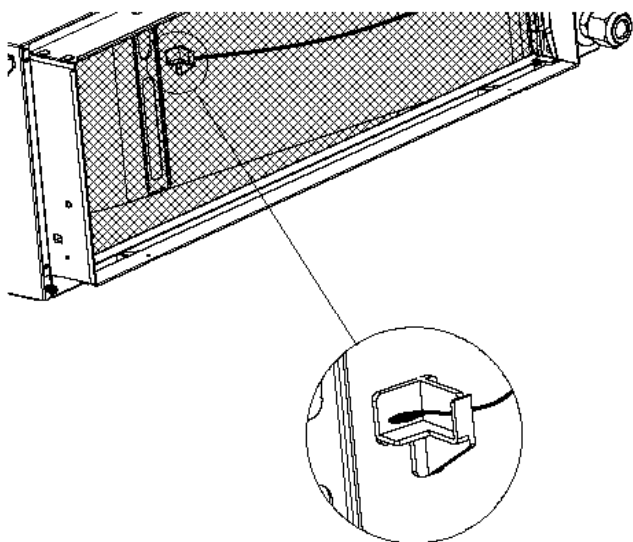
14.2.9 Removing Thermistors

1. Disconnect the thermistor connector from the main board.
2. Cut the nylon ties holding the wires to the pipes or chassis.

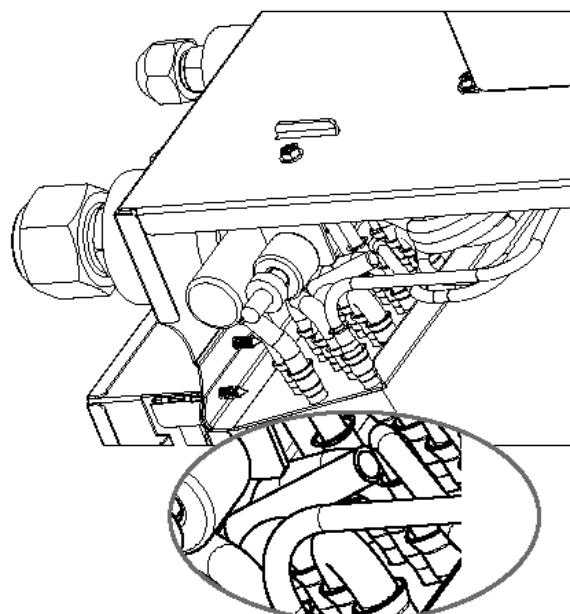
ICT thermistor only - Pull up the spring from the housing while pulling out the thermistor.

Notes for re-assemble the ICT thermistor:

1. Make sure the spring is inserted first and is facing the tube to be attached to. Hold the thermistor wires to the tube with nylon tie holding both the wires and the protective sleeve



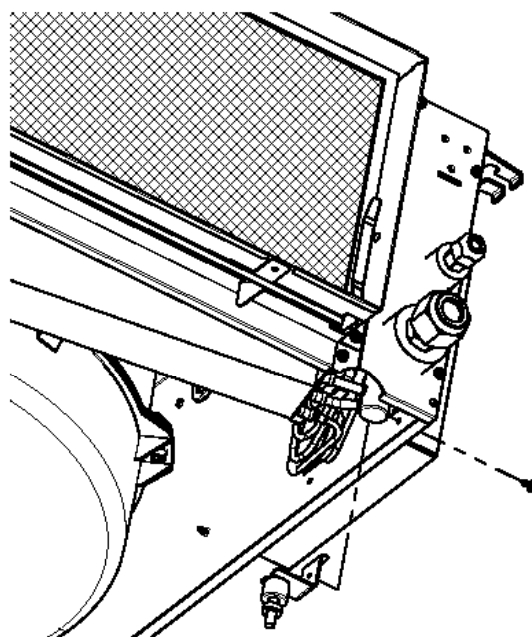
Indoor Air Thermistor (RAT)



Indoor Coil Thermistor (ICT)

14.2.10 Removing Float Switch

1. Disconnect the wire to wire float switch connector inside the unit.
2. Cut the nylon ties holding the wires to the pipes or chassis.
3. Remove the screw holding the switch holder to the unit chassis.
4. Use two open spanners to remove the nylon nuts of the switch and take out the switch.

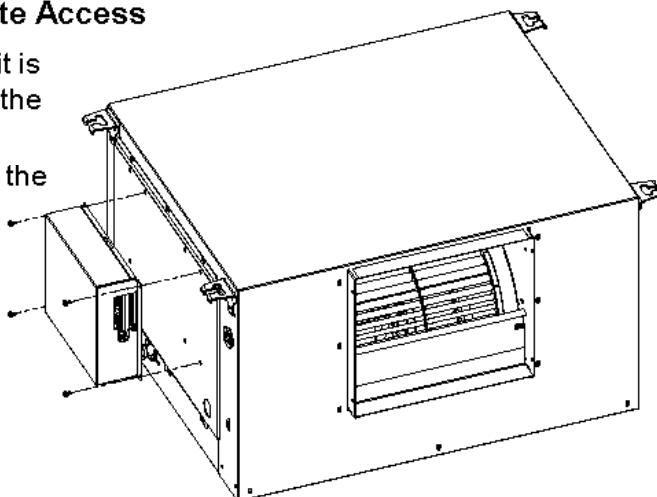


14.3 Indoor Unit: EMD

14.3.1 Electronics Assembly Remote Access

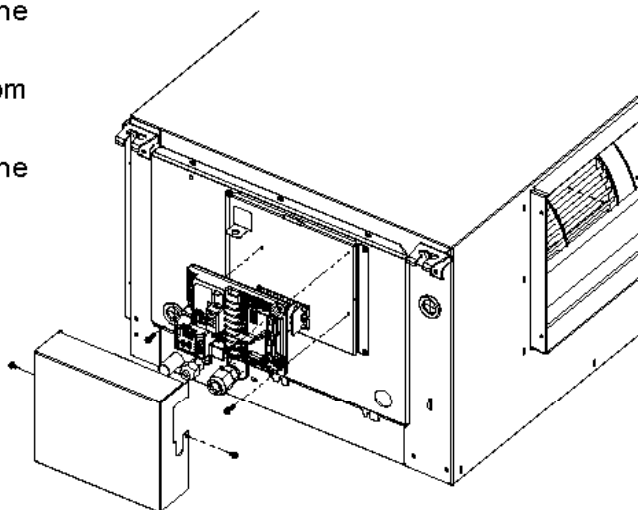
In cases of hard access to control assembly it is made possible to release the assembly from the indoor unit chassis.

1. Remove the 4 fixing screws and relocate the Electronics assembly .



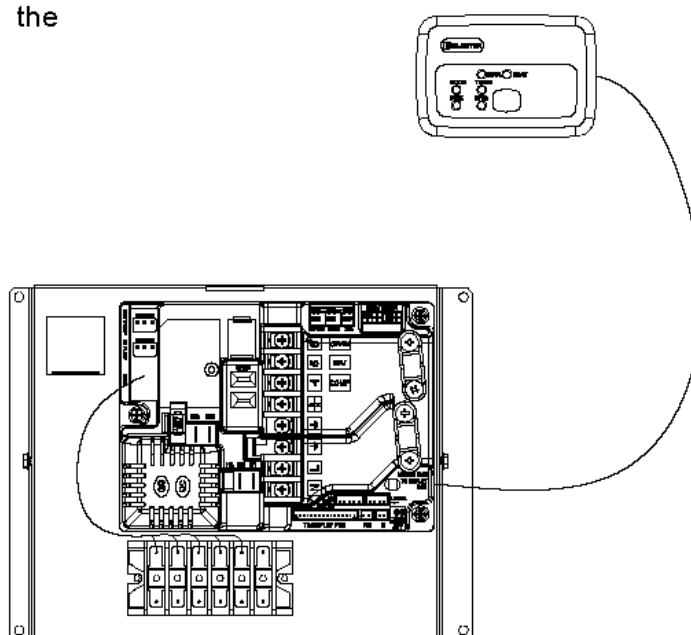
14.3.2 Removing Electronics Assembly

1. Remove the 2 fixing screws and take out the cover.
2. Disconnect all connectors and wires from the Electronics Board.
3. Remove the 3 fixing screws and take out the Electronics Board.



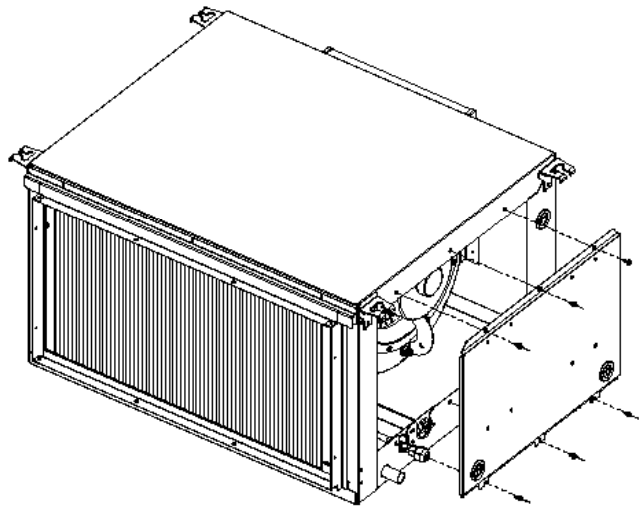
14.3.3 Removing Display unit

1. Take out the display connector from the electronics board.



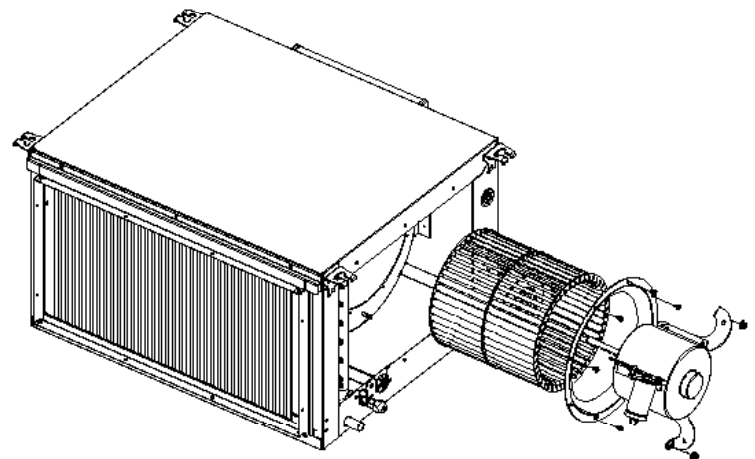
14.3.4 Removing Service Panel

1. Remove the 6 fixing screws and pull the service panel to remove it.



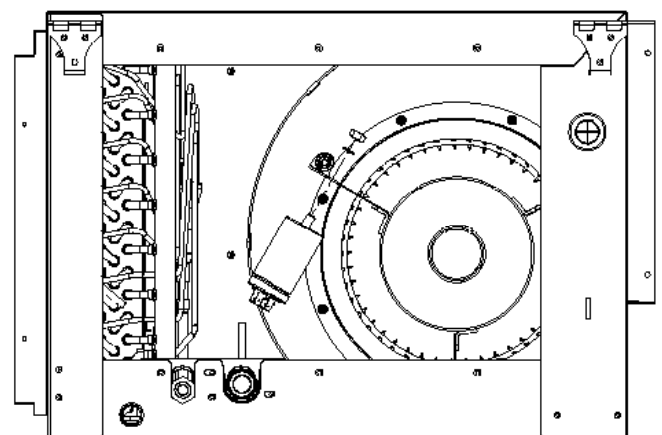
14.3.5 Removing Fan and Fan Motor

7. Disconnect the motor connector from the Electronics Board.
8. Remove the Service Panel according to **14.3.4**.
9. Push the motor cable back into the unit through the grommet.
10. Remove the 6 fixing screw connecting the ring to the fan housing.
11. Remove the 3 fixing hex nuts and the spring washers that connect the legs support to fan house and take out the motor with the 3 legs.
12. Release the allen screw fixing the fan to fan motor axis and separate it.



14.3.6 Removing motor Capacitor

1. Remove the Service Panel according to **14.3.4**.
2. Disconnect the tab connections from the capacitor.
3. Remove the nut holding the capacitor to the holder.



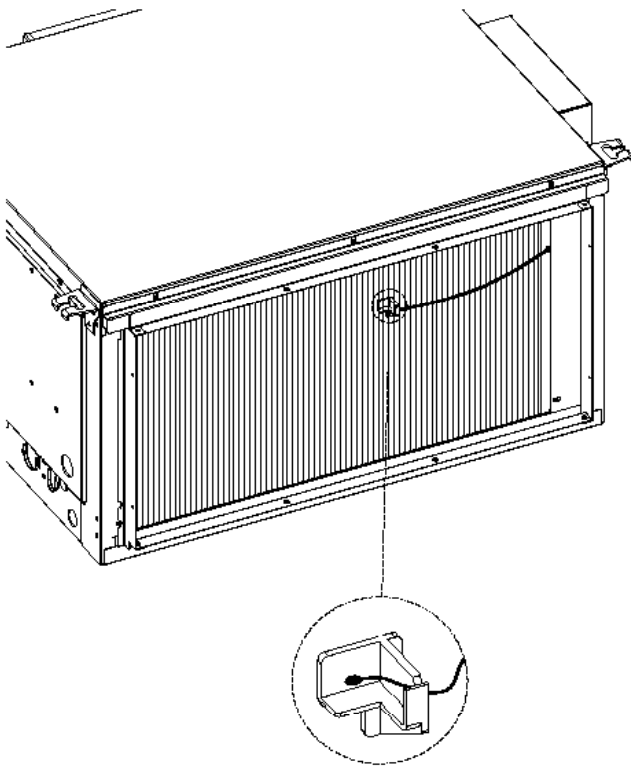
14.3.7 Removing Thermistors

1. Disconnect the thermistor connector from the main board.
2. Cut the nylon ties holding the wires to the pipes or chassis.

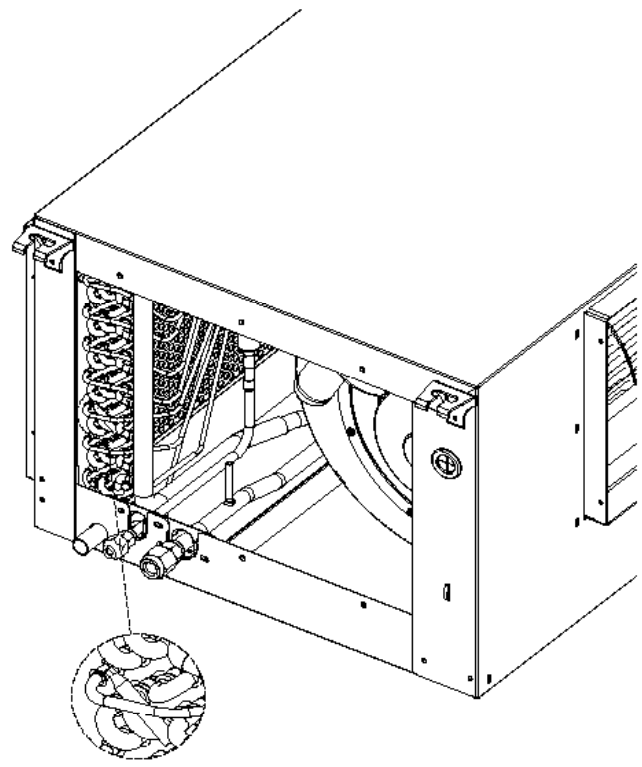
ICT thermistor only - Pull up the spring from the housing while pulling out the thermistor.

Notes for re-assemble the ICT thermistor:

1. Make sure the spring is inserted first and is facing the tube to be attached to. Hold the thermistor wires to the tube with nylon tie holding both the wires and the protective sleeve



Indoor Air Thermistor (RAT)



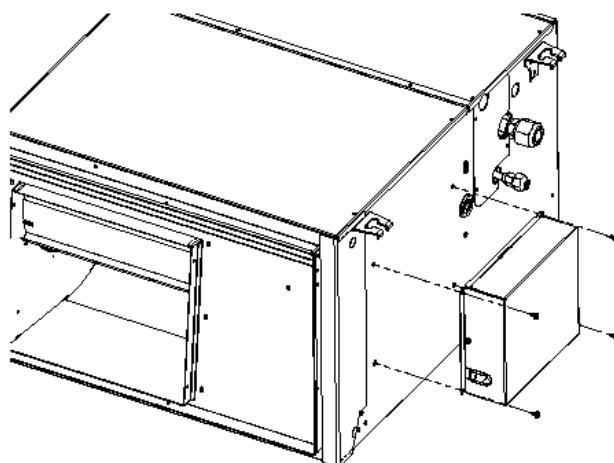
Indoor Coil Thermistor (ICT)

14.4 Indoor Unit: CD

14.4.1 Electronics Assembly Remote Access

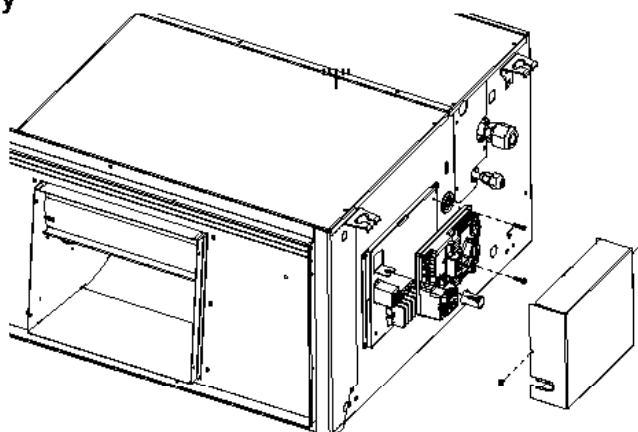
In cases of hard access to control assembly it is made possible to release the assembly from the indoor unit chassis.

1. Remove the 4 fixing screws and relocate the Electronics assembly .



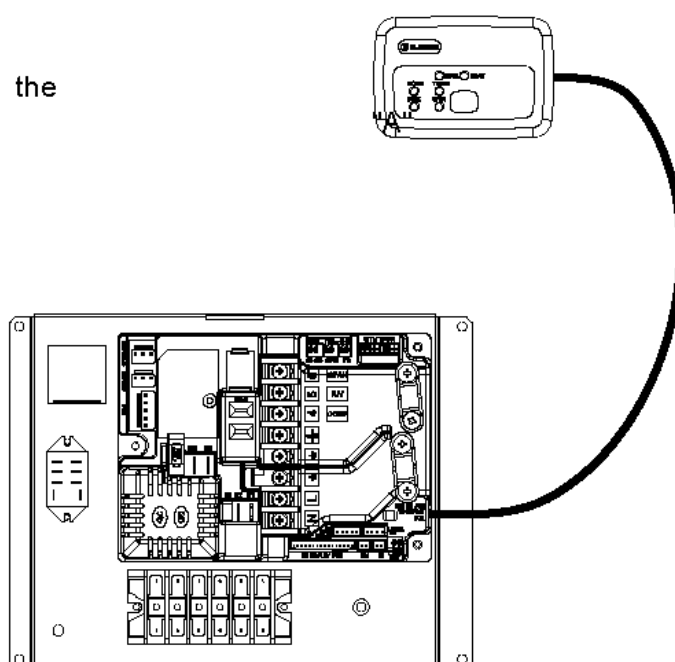
14.4.2 Removing Electronics Assembly

1. Remove the 2 fixing screws and take out the cover.
2. Disconnect all connectors and wires from the Electronics Board
3. Remove the 3 fixing screws and take out the Electronics Board.



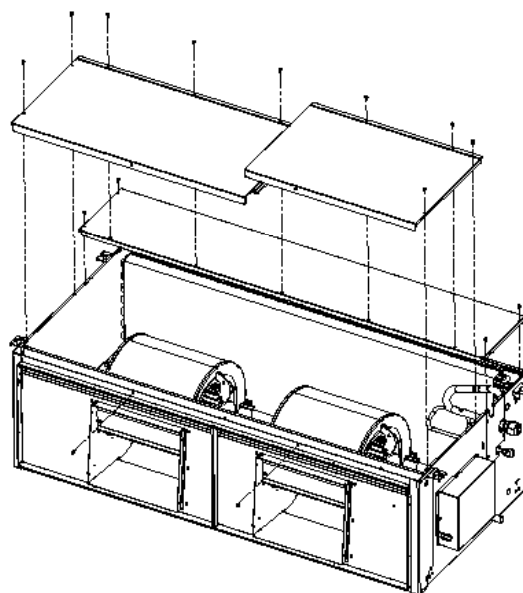
14.4.3 Removing Display Unit

1. Take out the display connector from the electronics board.



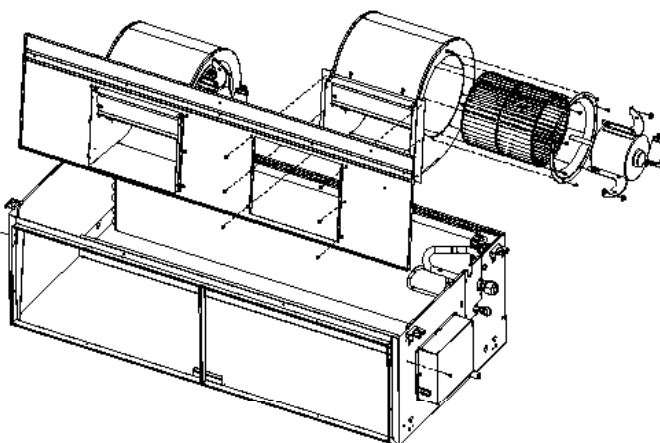
14.4.4 Removing Service Panels

1. Remove the 15 fixing screws and pull the service panel to remove it.



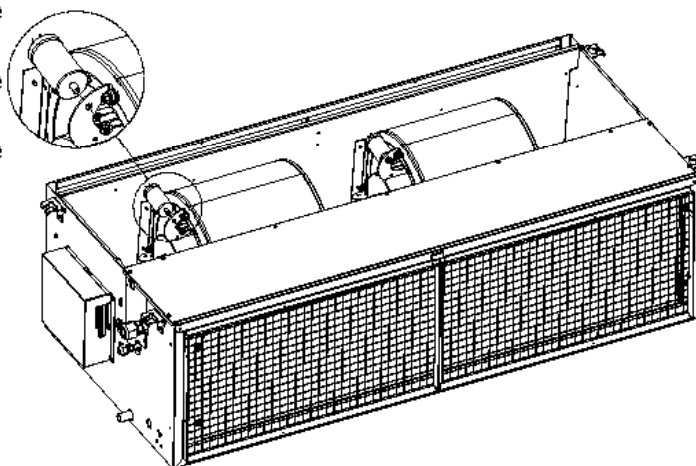
14.4.5 Removing Fan and Fan Motor

1. Disconnect the motor connectors from the Electronics Board.
2. Remove the Service Panel according to 14.3.4.
3. Push the motors cable back into the unit through the gromet.
4. Remove the 2 fixing screw connecting the fan housing assembly to base and pull it .
5. Remove the 6 fixing screw connecting the ring to the fan housing.
6. Remove the 3 fixing hex nuts and the spring washers that connect the legs support to fan house and take out the motor with the 3 legs.
7. Release the allen screw fixing the fan to fan motor axis and separate it.



14.4.6 Removing Motor Capacitor

1. Remove the Service Panels, from fans side only, according to 14.3.4.
2. Disconnect the tab connections from the capacitor.
3. Remove the nut holding the capacitor to the holder.

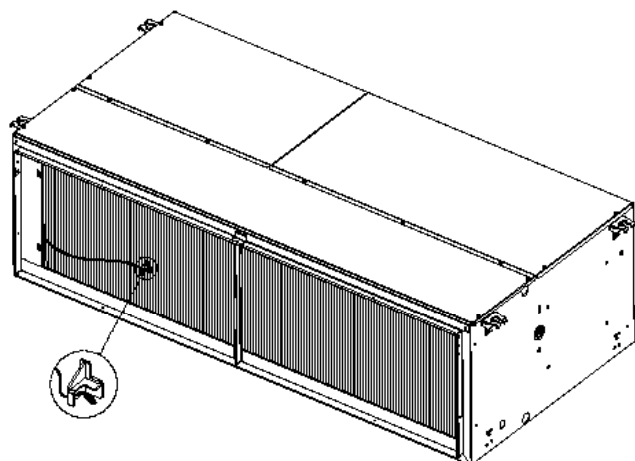


14.4.7 Removing Thermistors

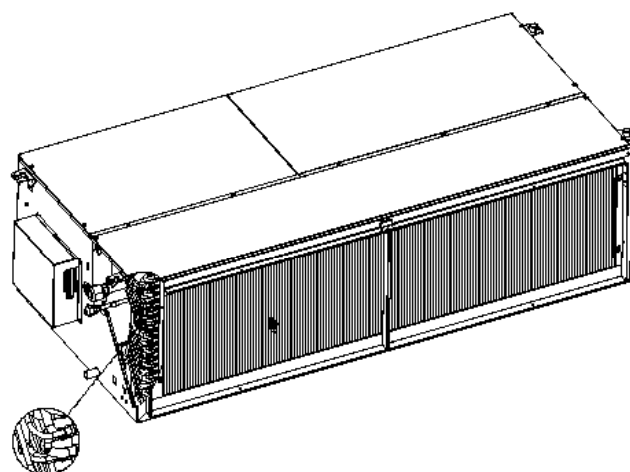
1. Disconnect the thermistor connector from the main board.
 2. Cut the nylon ties holding the wires to the pipes or chassis.
- ICT thermistor only - Pull up the spring from the housing while pulling out the thermistor.

Notes for re-assemble the ICT thermistor:

1. Make sure the spring is inserted first and is facing the tube to be attached to. Hold the thermistor wires to the tube with nylon tie holding both the wires and the protective sleeve.



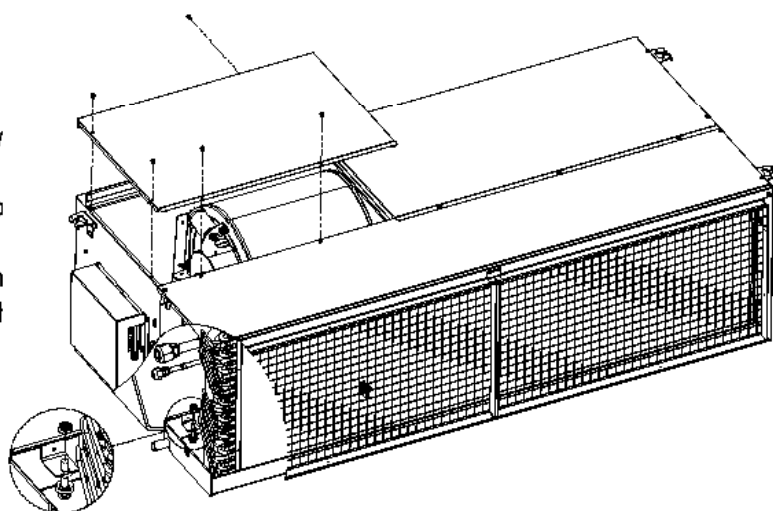
Indoor Air Thermistor (RAT)



Indoor Coil Thermistor (ICT)

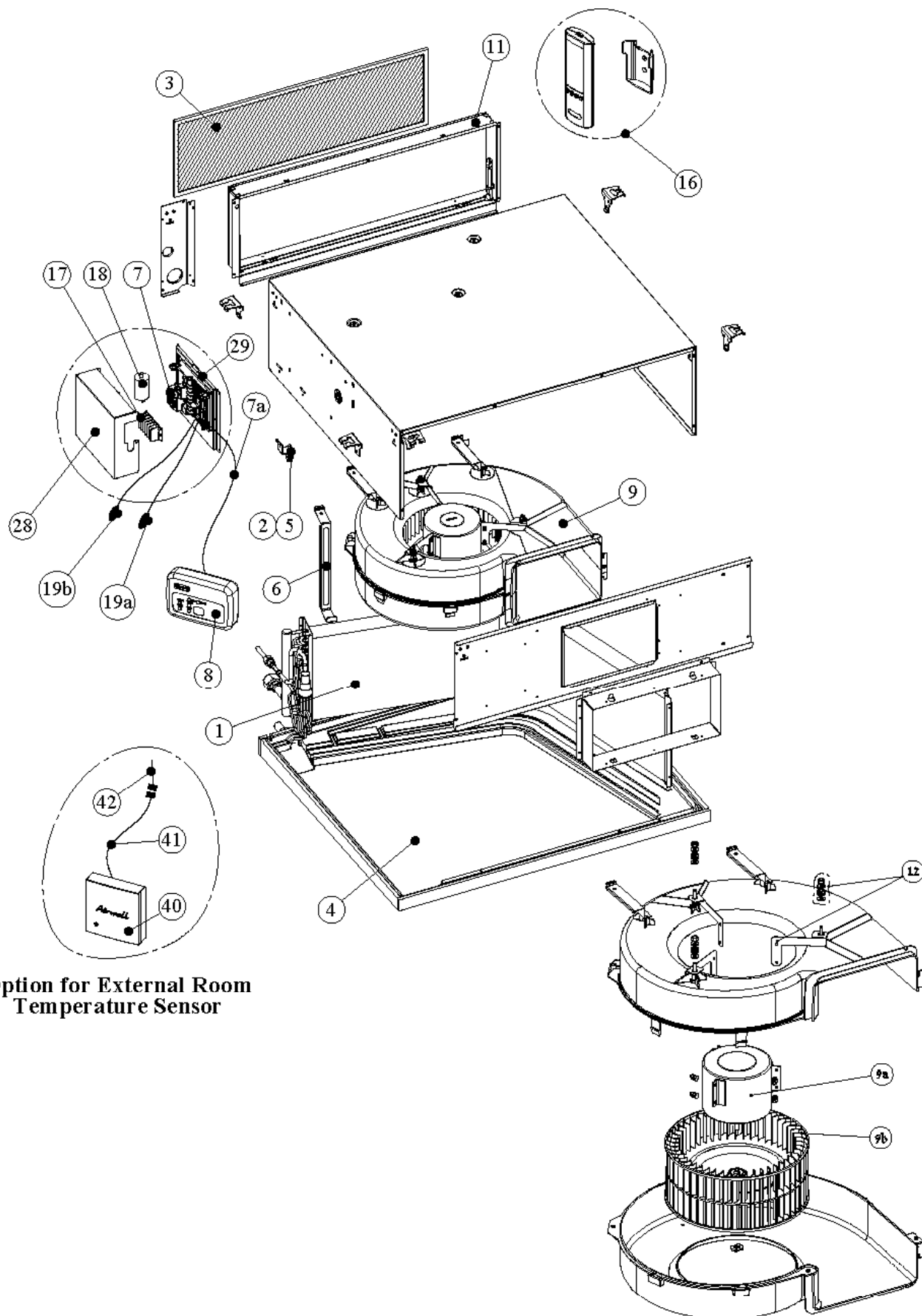
14.4.8 Removing Float Switch

1. Remove the Service Panel, from fan only, according to **14.3.4**.
2. Disconnect the wire to wire float switch connector inside the unit.
3. Cut the nylon ties holding the wires to pipes or chassis.
4. Use 2 open spanners to remove the nuts of the switch and take out the switch



15. EXPLODED VIEWS AND SPARE PARTS LISTS

15.1 Indoor Unit: DNG100, 125 DCI - Exploded View



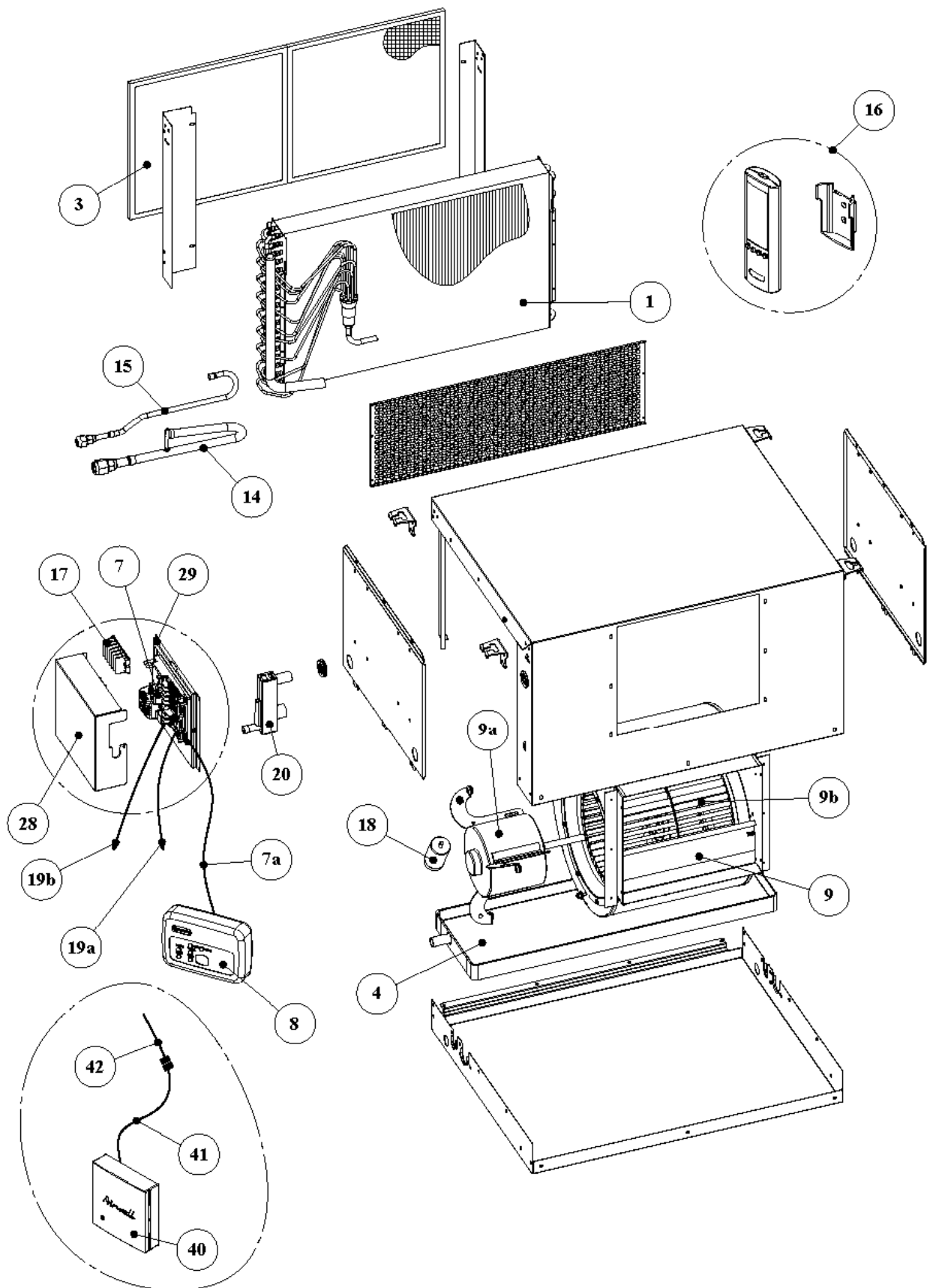
15.2 Indoor Unit: DNG 100 DCI - Spare Part List

No.	Part No.	Description	Qty
1	473525	IU COIL GR/HDR DNG 100 DCI	1
2	473231	FLOAT SUPPORT DNG	1
3	473902	DNG METAL FILTER 37-44	1
4	473247	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473211	COIL SUPPORT DNG 44	1
7	467300107R	DCI 456 HP IDU STORM	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoHS)	1
9	473906	FAN HOUSING ASSY DNG 37-44	1
9a	473006	MOTOR DNG 37/44	1
9b	473301	CENTRIFUGAL FAN DNG 300/130	1
11	473249	AIR FILTER FRAME ASSY DNG 37-4	1
12	473250	MOTOR LEG ASSY DNG	3
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	430535	*TERMINAL BLOCK RW-52 P6/90	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
28	473415	ELECTRICAL COVER DNG DCI	1
29	473416	ELECTRICAL BASE PANEL DNG DCI	1
Option for External Room Temperature Sensor			
40	442297	THERMISTOR BOX AIRWELL	1
41	467030054	SHIELDED DEFROST CABLE	1
42	442296	ADAPTOR THERMISTOR WTH CONNE	1

15.3 Indoor Unit: DNG 125 DCI - Spare Part List

No.	Part No.	Description	Qty
1	473532	IU COIL GR/HDR DNG 125 DCI	1
2	473231	FLOAT SUPPORT DNG	1
3	473902	DNG METAL FILTER 37-44	1
4	473247	INSULATED DRAIN POOL ASSY DNG	1
5	473700	DNG OVER FLOW SWITCH	1
6	473245	COIL SUPPORT DNG 37	1
7	467300107R	DCI 456 HP IDU STORM	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoHS)	1
9	473906	FAN HOUSING ASSY DNG 37-44	1
9a	473006	MOTOR DNG 37/44	1
9b	473301	CENTRIFUGAL FAN DNG 300/130	1
11	473249	AIR FILTER FRAME ASSY DNG 37-4	1
12	473250	MOTOR LEG ASSY DNG	3
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	430535	*TERMINAL BLOCK RW-52 P6/90	1
18	442019	CAPACITOR 8mF 400V P1/P2	1
19a	473720	THERMISTOR+CAP WITH CONNECTOR	1
19b	473710	THERMISTOR WITH CONNECTOR L235	1
28	473415	ELECTRICAL COVER DNG DCI	1
29	473416	ELECTRICAL BASE PANEL DNG DCI	1
Option for External Room Temperature Sensor			
40	442297	THERMISTOR BOX AIRWELL	1
41	467030054	SHIELDED DEFROST CABLE	1
42	442296	ADAPTOR THERMISTOR WTH CONNE	1

15.4 Indoor Unit: EMD 100 DCI - Exploded View

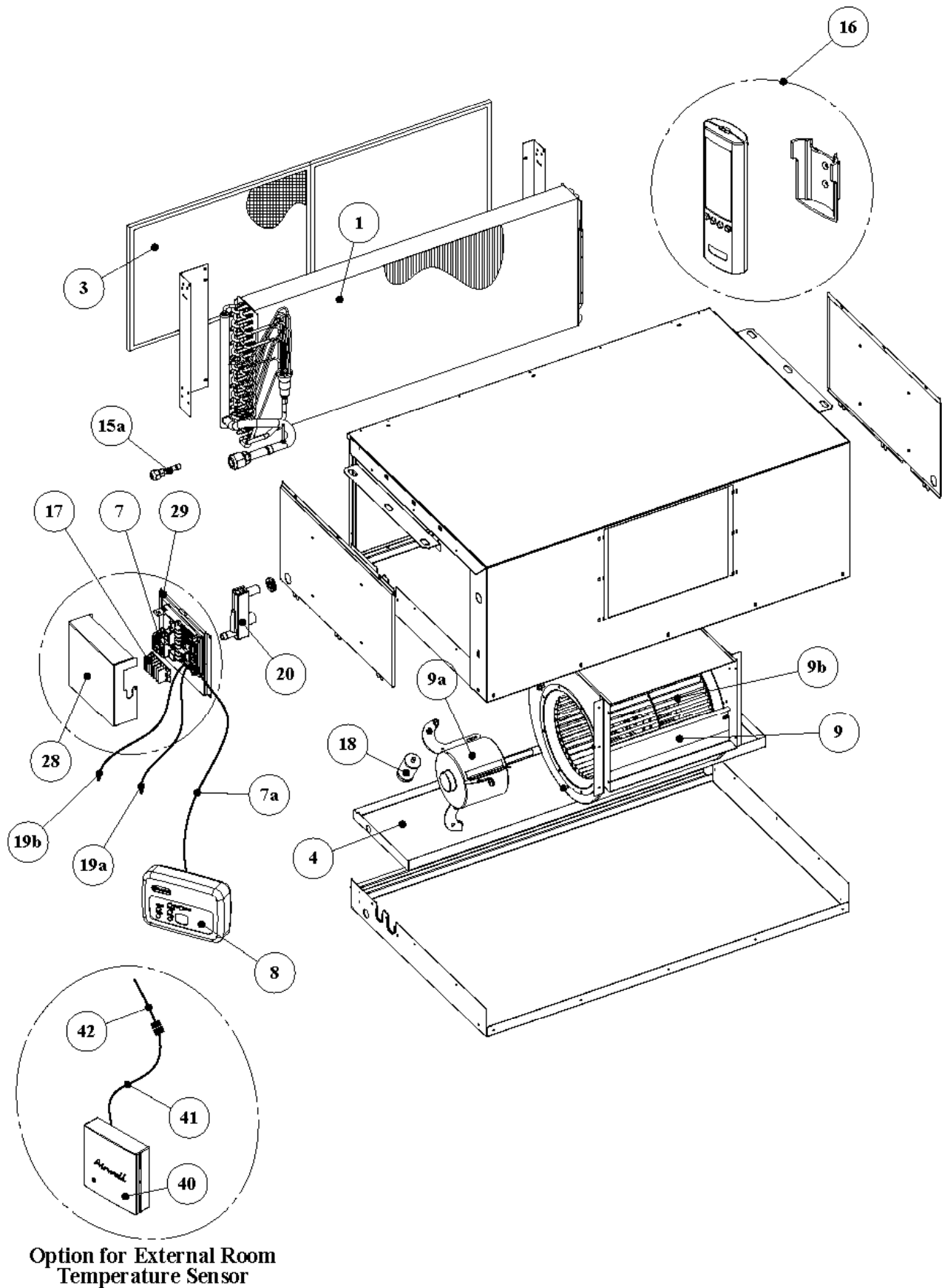


Option for External Room
Temperature Sensor

15.5 Indoor Unit: EMD 100 DCI - Spare Part List

No.	Part No.	Description	Qty
1	439978	IU COIL GR/HDR EMD 34/ 100	1
3	402347	AIR FILTER EMD 775-1000	2
4	438032	RT DRAIN PAN ASSY 3/4 EMD B 2	1
7	467300107R	DCI 456 HP IDU STORM	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECT	1
8	438778	WIRED DISPLAY BOX EMD/ELD (R	1
9	182241	RT FAN MOTOR DD9*9 CAP. P2	1
9a	402003	MOTOR 343W, 4S, EMD 1100	1
9b	435413	FAN 240*240	1
14	434762	RT OUTLET ASSY EMD 24 R410A	1
15	439980	RIGHT INLET MANIFOLD ASSY EM	1
16	4527178R	REMOTE CONTROL RC RC7 GRAY	1
17	430535	*TERMINAL BLOCK RW-52 P6/90	1
18	442015	CAPACITOR 15mF 400V P1/P2	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR	1
19b	402701	THERMISTOR WTH CONNECTORS L1800	1
20	438056	DRAIN SIPHON ASSY	1
28	473415	ELECTRICAL COVER DNG DCI	1
29	473416	ELECTRICAL BASE PANEL DNG DC	1
Option for External Room Temperature Sensor			
40	442297	THERMISTOR BOX AIRWELL	1
41	467030054	SHIELDED DEFROST CABLE	1
42	442296	ADAPTOR THERMISTOR WTH CONNE	1

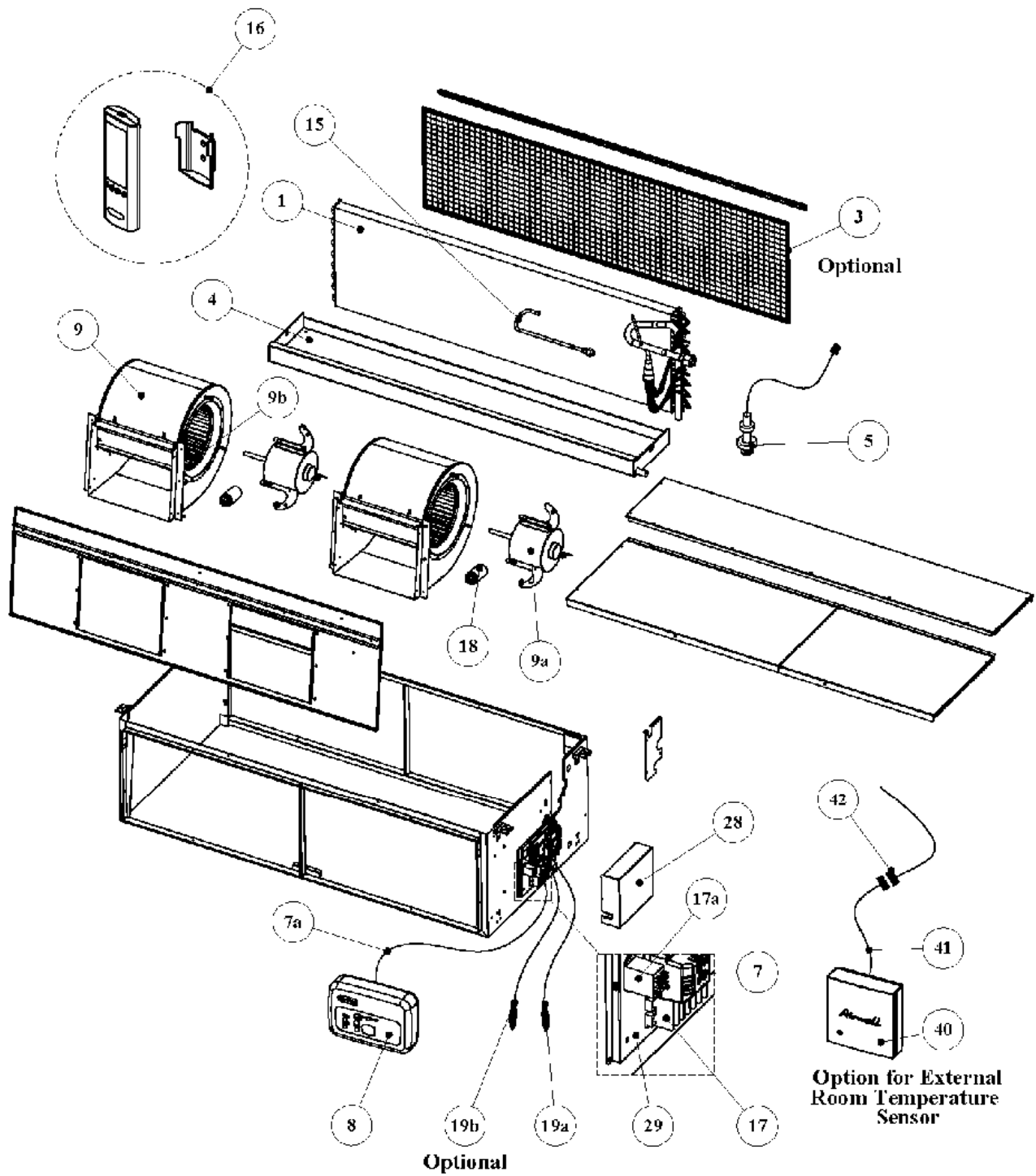
15.6 Indoor Unit: EMD 125 DCI - Exploded View



15.7 Indoor Unit: EMD 125 DCI - Spare Part List

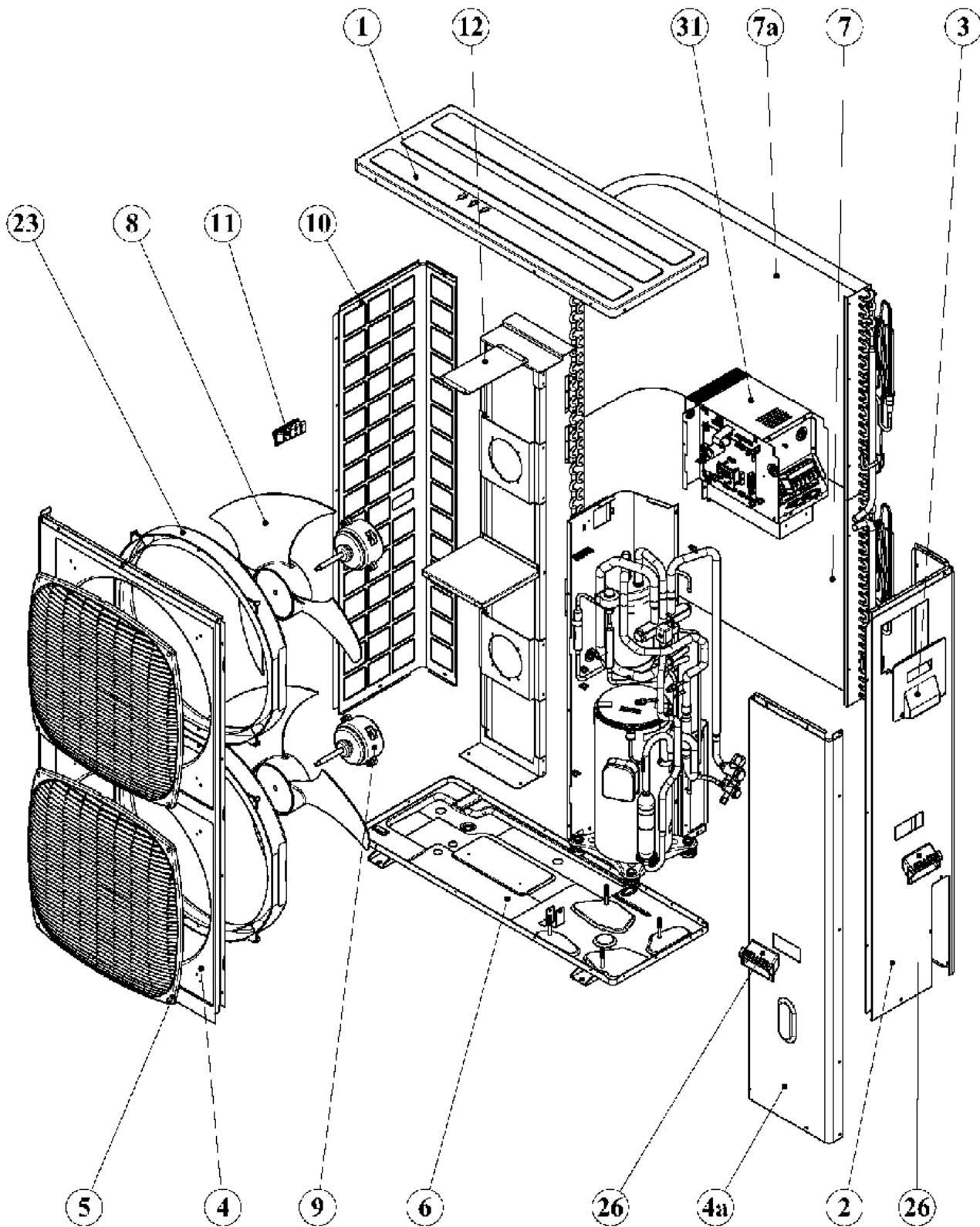
No.	Part No.	Description	Qty
1	439991	RT IU COIL GR/HDR EMD 125 DCI	1
3	402083	AIR FILTER EMD 1800	2
4	438069	DRAIN PAN ASSY EMDB60	1
7	467300107R	DCI 456 HP IDU STORM	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoH	1
9	182244	RT FAN MOTOR DD9*11 CAP. P2 EM	1
9a	186320	MOTOR 371W, 4S, EMD1400	1
9b	435410	FAN 253*298	1
15a	433223	SOCKET FLARE ASSY 3/8"	1
16	4527178R	REMOTE CONTROL RC RC7 GRAY	1
17	430535	*TERMINAL BLOCK RW-52 P6/90	1
18	442018	CAPACITOR 10mF 400V P1/P2	1
19a	400275	THERMISTOR+CAP WTH CONNECTOR L	1
19b	402701	THERMISTOR WTH CONNECTORS L1800	1
20	438056	DRAIN SIPHON ASSY	1
28	473415	ELECTRICAL COVER DNG DCI	1
29	473416	ELECTRICAL BASE PANEL DNG DCI	1
Option for External Room Temperature Sensor			
40	442297	THERMISTOR BOX AIRWELL	1
41	467030054	SHIELDED DEFROST CABLE	1
42	442296	ADAPTOR THERMISTOR WTH CONNECT	1

15.8 Indoor Unit: CD 140 DCI - Exploded View

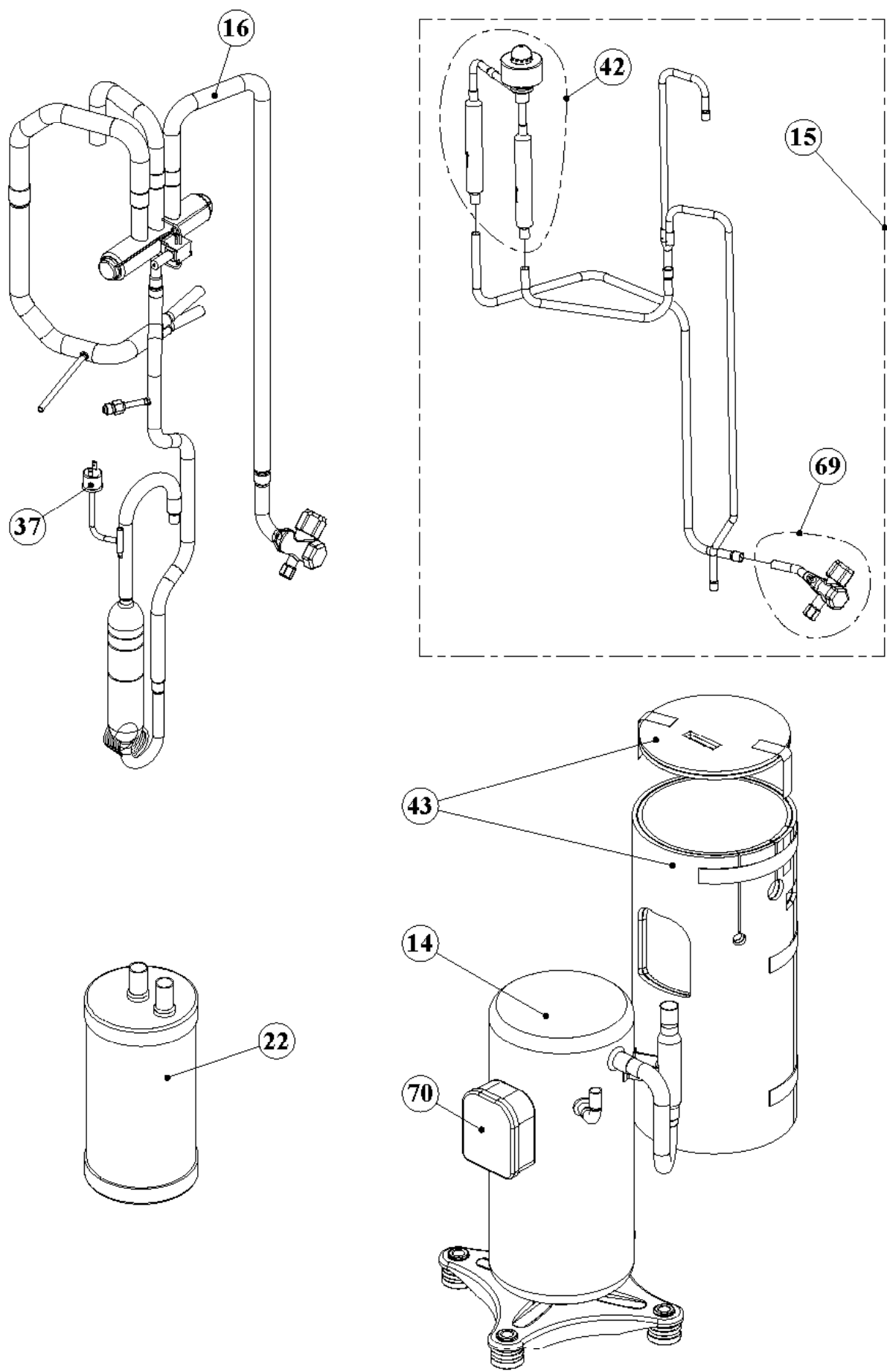


15.9 Indoor Unit: CD 140 DCI - Spare Part List

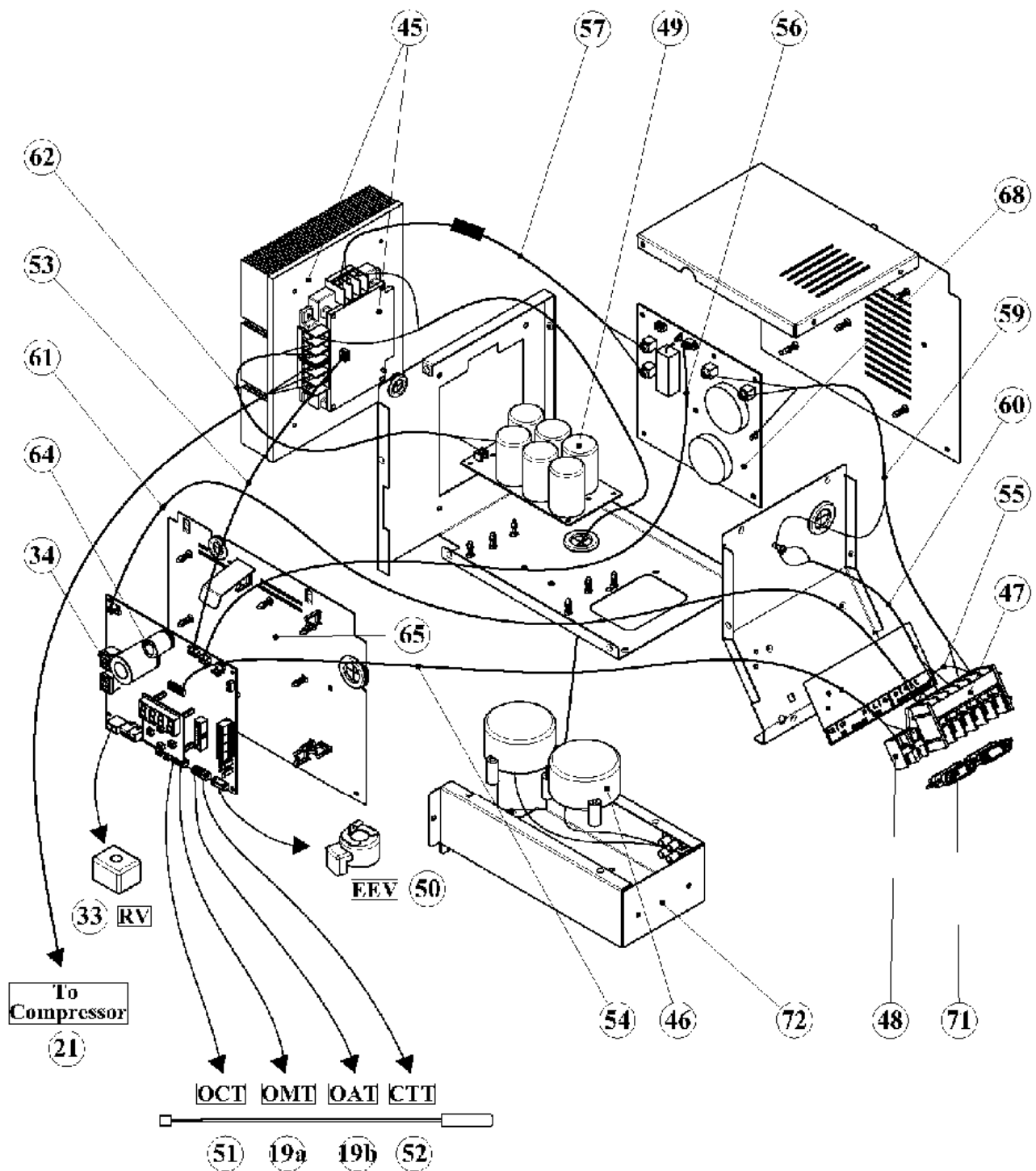
No.	Part No.	Description	Qty
1	475530	Indoor Coil 3Rows 7mm CD60 DCI	1
3	221546	AIR FILTER CD 60	1
4	475015	INSULATED DRAIN PAN ASSY CD 60	1
5	473700	DNG OVER FLOW SWITCH	1
7	467300208R	STORM DCI 6HP	1
7a	404020	CABLE 8 WIRES 7M WTH CONNECTOR	1
8	438778	WIRED DISPLAY BOX EMD/ELD (RoHS)	1
9	182241	RT FAN MOTOR DD9*9 CAP. P2	2
9a	402003	MOTOR 343W, 4S, EMD 1100	2
9b	435413	FAN 240*240	2
15	475536	Right Inlet Manifold Assembly	1
16	438783	REMOTE CONTROL RC4/RC (RoHS)	1
17	430535	TERMINAL BLOCK RW-52 P6/90	1
17a	192106	RELAY 230V 10A	1
18	442015	CAPACITOR 15mF 400V P1/P2	2
19a	400275	THERMISTOR+CAP WTH CONNECTOR	1
19b	402701	THERMISTOR WTH CONNECTORS	1
28	473415	ELECTRICAL COVER DNG DC	1
29	473416	ELECTRICAL BASE PANEL DNG DCI	1
Option for External Room Temperature Sensor			
40	442297	THERMISTOR BOX AIRWELL	1
41	467030054	SHIELDED DEFROST CABLE	1
42	442296	ADAPTOR THERMISTOR WTH CONNECTORS	1

15.10 OU12 4-5HP DCI - Exploded View**15.10.1 Outdoor Unit General Assembly**

15.10.2 Outdoor Unit Tubing Assembly



15.10.3 Outdoor Unit Electronics Assembly



15.11 Outdoor Unit: OU12 4HP DCI - Spare Part List

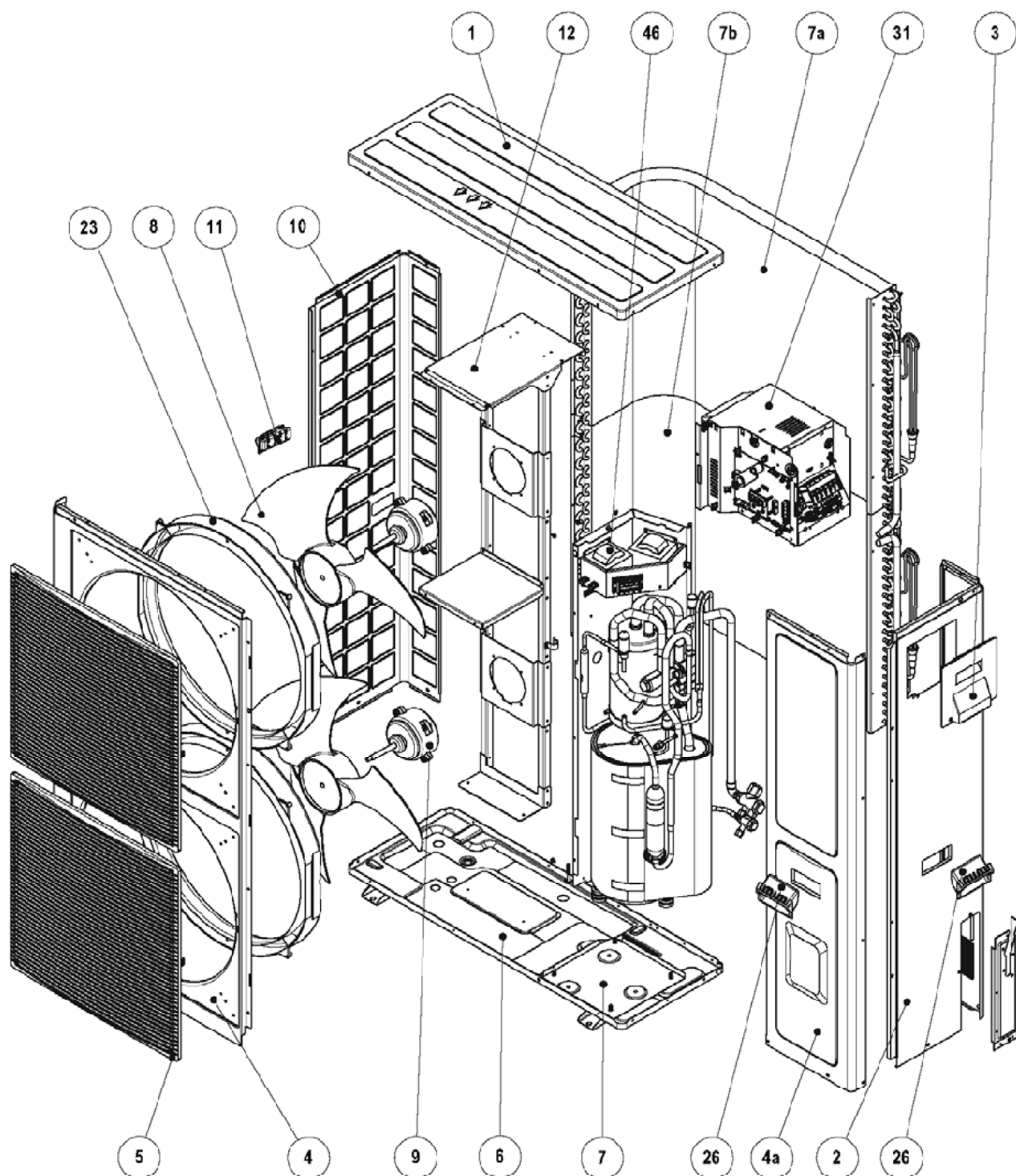
No.	PN	Description	Qty
1	437045	UPPER COVER EL13 OU LARGE	1
2	416217	SIDE PANEL OU12 DCI 4-5HP	1
3	436356	LARGE ELECTRICAL COVER OU/MMQ	1
4	416215	FRONT COVER OU12 DCI 4-5HP	1
4a	416216	FRONT Panel OU12 DCI 4-5HP	1
5	437091	OU SQUARE FAN GUARD	2
6	416213	NEW BASE ASSY OU12 DCI 4-5HP	1
7	416400	LOWER COIL GR HDR OU12 DCI R41	1
7a	416401	UPPER COIL GR HDR OU12 DCI R41	1
8	4529604	AXIAL FAN D493*143	2
9	416310	DC MOTOR 70W OU12 DCI 4-5HP	2
10	416218	SIDE GUARD OU12 DCI 4-5HP	1
11	436358	OU LEADING HANDLE	1
12	416222	MOTOR SUPPORT ASSEMBLY OU12-DC	1
14	416300	COMPRESSOR ANB33FBDMT	1
15	416534	Tubing Assembly EEV OU12 DCI	1
16	416543	Tubing Assembly 4-Way OU12 4HP DCI	1
19a	413712	THERMISTOR+CAP WITH CONNECTOR	1
19b	402741	THERMISTOR WTH CONNECTOR L1250	1
21	416760	COMPRESSOR WIRING L1300	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439928	OUTLET PLASTIC RING OU8	2
26	436352	RAISING HANDLE OU10	2
31	416230	ELECTRONICS BOX DCI 4-5HP	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1
34	416712	DCI 456 HP ODU Main Board (SPL)	1
37	416740	HP Switch 4.2/3.7 Mpa(g)	1
42	416550	EEV Assembly OU12 4-5HP DCI (SPL)	1
43	416602	COMPRESSOR INSULATION DCI 4-5HP Assembly (SPL)	1
45	416711	DRIVER 4-5HP DCI Assembly (SPL)	1
46	416715	PFC Chocks 4-5HP	2
47	416724	Terminal Block 6P	1
48	416726	Terminal block 2P DCI	1
49	416713	456 HP ODU Capacitor Board (SPL)	1
50	416730	EEV COIL VKV MOZS348E0	1
51	416751	OCT-THERMISTOR+CAP WTH CONNECT	1
52	416752	CTT-THERMISTOR+CAP WTH CONNECT	1
53	416762	Cable Driver Communication	1
54	416763	Cable IDU Communication	1
55	416764	CABLE INDOOR INPUT	1
56	416766	Cable Inrush Communication	1
57	416767	Cable Line filter-Driver	1
59	416769	Cable Terminals-Line filter	1
60	416770	Cable Terminal Ground	1
61	416774	CABLE CONTROLLER INPUT -OUT	1
62	416776	CABLE CAPACITOR DRIVER (EHK)	1
64	416906	*P.C SPACER RS-10	21
65	416910	CABLE HOLDER KWS-1	4
68	416714	456 HP ODU Filter Board (SPL)	1
69	416542	Tubing Assembly LIQUID VALVE O	1
70	416921	TERMINAL COVER DCI MITSUBISHI	1
71	438551	SUPPLY CORD CLAMP 20mm	2
72	762245	TERMINAL BLOCK N0.3	2/12

15.12 Outdoor Unit: OU12 5HP DCI - Spare Part List

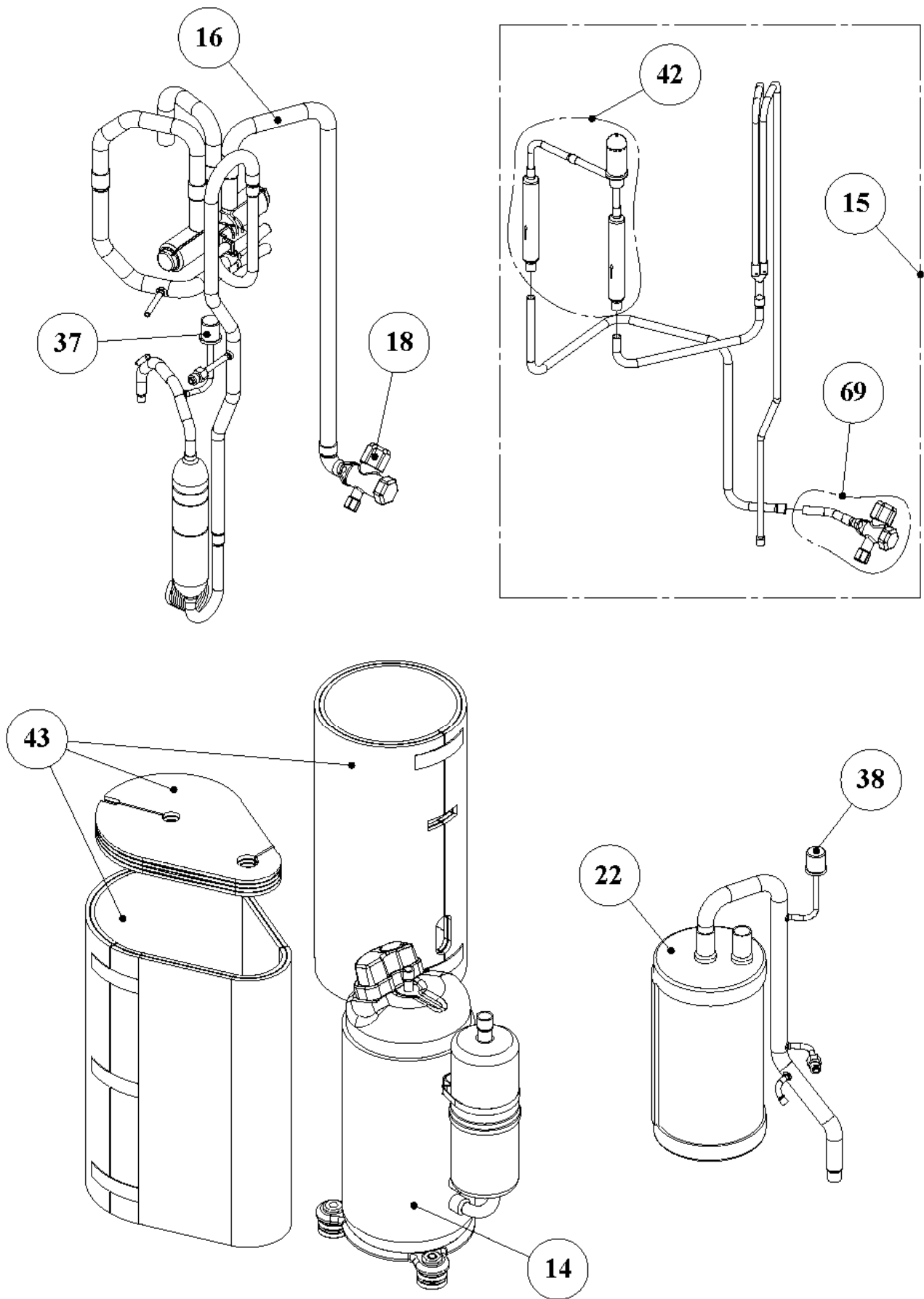
No.	PN	Description	Qty
1	437045	UPPER COVER EL13 OU LARGE	1
2	416217	SIDE PANEL OU12 DCI 4-5HP	1
3	436356	LARGE ELECTRICAL COVER OU/WMQ	1
4	416215	FRONT COVER OU12 DCI 4-5HP	1
4a	416216	FRONT Panel OU12 DCI 4-5HP	1
5	437091	OU SQUARE FAN GUARD	2
6	416213	NEW BASE ASSY OU12 DCI 4-5HP	1
7	416400	LOWER COIL GR HDR OU12 DCI R41	1
7a	416401	UPPER COIL GR HDR OU12 DCI R41	1
8	4529604	AXIAL FAN D493*143	2
9	416310	DC MOTOR 70W OU12 DCI 4-5HP	2
10	416218	SIDE GUARD OU12 DCI 4-5HP	1
11	436358	OU LEADING HANDLE	1
12	416222	MOTOR SUPPORT ASSEMBLY OU12-DC	1
14	416300	COMPRESSOR ANB33FBDMT	1
15	416534	Tubing Assembly EEV OU12 DCI	1
16	416527	Tubing Assembly 4-Way OU12 5HP DCI	1
19a	413712	THERMISTOR+CAP WITH CONNECTOR	1
19b	402741	THERMISTOR WTH CONNECTOR L1250	1
21	416760	COMPRESSOR WIRING L1300	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439928	OUTLET PLASTIC RING OU8	2
26	436352	RAISING HANDLE OU10	2
31	416230	ELECTRONICS BOX DCI 4-5HP	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1
34	416712	DCI 456 HP ODU Main Board (SPL)	1
37	416740	HP Switch 4.2/3.7 Mpa(g)	1
42	416550	EEV Assembly OU12 4-5HP DCI (SPL)	1
43	416602	COMPRESSOR INSULATION DCI 4-5HP Assembly (SPL)	1
45	416711	DRIVER 4-5HP DCI Assembly (SPL)	1
46	416715	PFC Chocks 4-5HP	2
47	416724	Terminal Block 6P	1
48	416726	Terminal block 2P DCI	1
49	416713	456 HP ODU Capacitor Board (SPL)	1
50	416730	EEV COIL VKV MOZS348E0	1
51	416751	OCT-THERMISTOR+CAP WTH CONNECT	1
52	416752	CTT-THERMISTOR+CAP WTH CONNECT	1
53	416762	Cable Driver Communication	1
54	416763	Cable IDU Communication	1
55	416764	CABLE INDOOR INPUT	1
56	416766	Cable Inrush Communication	1
57	416767	Cable Line filter-Driver	1
59	416769	Cable Terminals-Line filter	1
60	416770	Cable Terminal Ground	1
61	416774	CABLE CONTROLLER INPUT -OUT	1
62	416776	CABLE CAPACITOR DRIVER (EHK)	1
64	416906	*P.C SPACER RS-10	21
65	416910	CABLE HOLDER KWS-1	4
68	416714	456 HP ODU Filter Board (SPL)	1
69	416542	Tubing Assembly LIQUID VALVE O	1
70	416921	TERMINAL COVER DCI MITSUBISHI	1
71	438551	SUPPLY CORD CLAMP 20mm	2
72	762245	TERMINAL BLOCK N0.3	2/12

15.13 OU12 6HP DCI - Exploded View

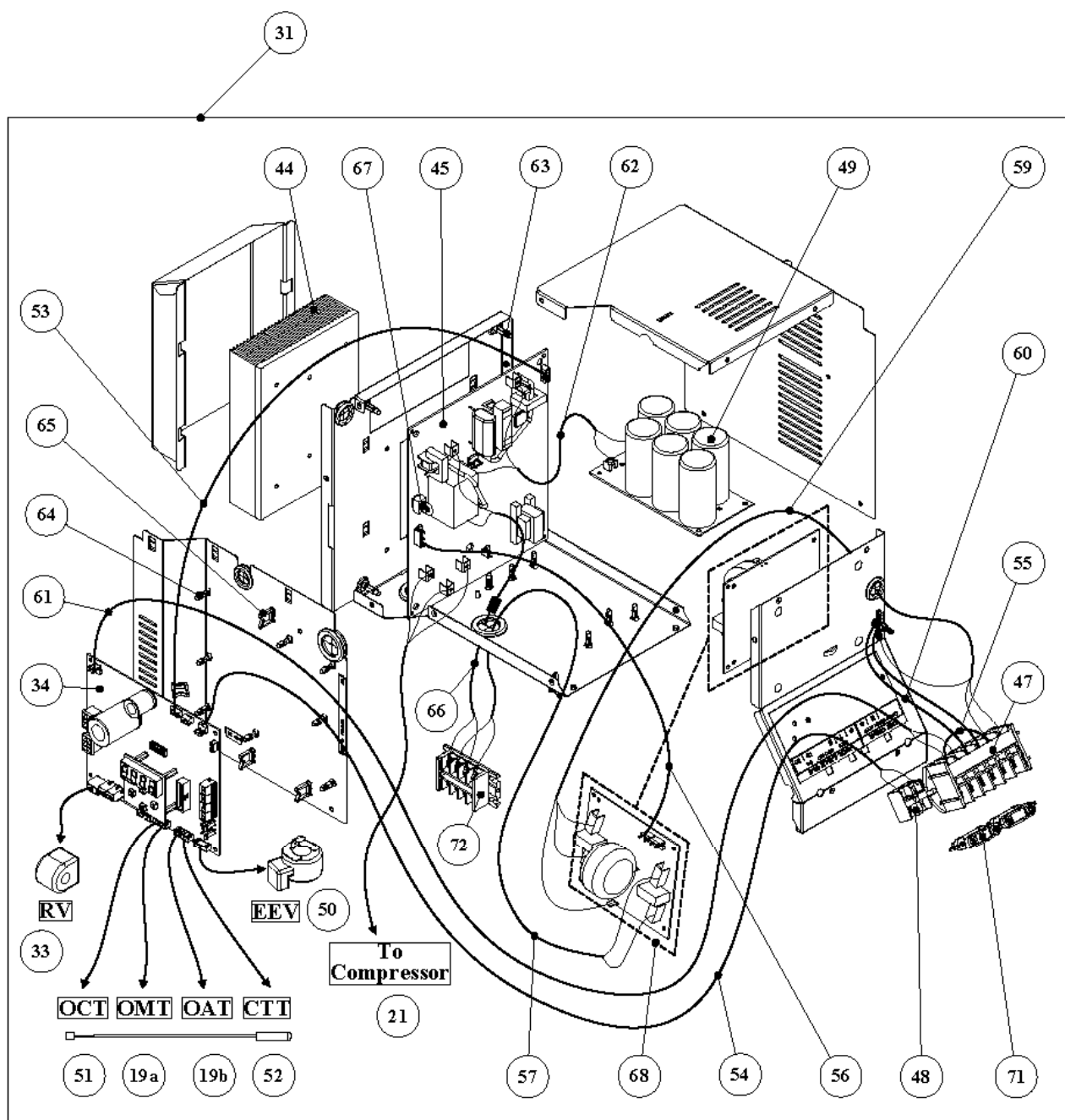
15.13.1 Outdoor Unit General Assembly



15.13.2 Outdoor Unit Tubing Assembly



15.13.3 Outdoor Unit Electronics Assembly



15.13.4 Outdoor Unit Spare Part List

No.	Item	Description	Quantity
1	416246	UPPER COVER ASSY OU12 DCI 4-5H	1
2	417218	SIDE PANEL ASSY OU12 6HP DCI	1
3	436356	LARGE ELECTRICAL COVER OU/WMQ	1
4	416215	FRONT COVER OU12 DCI 4-5HP	1
4a	417219	FRONT PANEL ASSY OU12 6HP DCI	1
5	437091	OU SQUARE FAN GUARD	2
6	417200	NEW BASE ASSY OU12 6HP DCI	1
7	417201	Compressor Base Plate ASSY OU1	1
7a	417401	UPPER COIL GR HDR OU12 6HP DCI	1
7b	417400	LOWER COIL GR HDR OU12 6HP DCI	1
8	4529604	AXIAL FAN D493*143	2
9	416310	DC MOTOR 70W OU12 DCI 4-5HP	2
10	416218	SIDE GUARD OU12 DCI 4-5HP	1
11	436358	OU LEADING HANDLE	1
12	416222	MOTOR SUPPORT ASSEMBLY OU12-DC	1
14	417300	COMPRESSOR DA420A3F-20M	1
15	417528	Tubing Assembly OU12 6HP DCI	1
16	417518	Tubing Assembly OU12 6HP DCI	1
18	434549	SERVICE VALVE ASSY 3/4F 3 WAY R410A	1
19a	413712	THERMISTOR+CAP WITH CONNECTOR	1
19b	402741	THERMISTOR WTH CONNECTOR L1250	1
21	416760	COMPRESSOR WIRING L1300	1
22	402284	SUCTION ACCUMULATOR 5" x 3/4"	1
23	439928	OUTLET PLASTIC RING OU8	2
26	436352	RAISING HANDLE OU10	1
26	436352	RAISING HANDLE OU10	1
31	417230	CONTROLLER ASSEMBLY DCI 6HP	1
33	442466	VALVE COIL L700 MOLEX-SANHUA	1
34	417713	DCI 6 HP ODU Main Board ASSY	1
37	416740	HP Switch 4.2/3.7 Mpa(g)	1
38	417742	LP Switch 0.15/0.2 Mpa(g)	1
42	417531	EEV Assembly OU12 6HP DCI	1
43	417603	COMPRESSOR INSULATION DCI 6HP	1
44	417711	HS DCI 6HP COATED	1
45	417712	DRIVER 6HP DCI Assembly	1
46	417715	PFC Chocks 6HP	2
47	416724	Terminal Block 6P	1
48	416726	Terminal block 2P DCI	1
49	417714	6 HP ODU Capacitor Board ASSY	1
50	416730	EEV COIL VKV-MOZS330E0(N-KV-13	1
51	416751	OCT-THERMISTOR+CAP WTH CONNECT	1
52	416752	CTT-THERMISTOR+CAP WTH CONNECT	1
53	417781	Cable Driver Communication	1
54	416763	Cable IDU Communication	1
55	416764	CABLE INDOOR INPUT	1
56	417782	CABLE ZERO CROSS	1
57	417784	CABLE LF-CHOCK	1
59	417785	Cable Terminals-Line filter	1
60	416770	Cable Terminal Ground	1
61	416774	CABLE CONTROLLER INPUT -OUT	1
62	417783	CABLE CAPS DRIVER	1
63	417914	P.C SPACER RS-14	4
64	416906	P.C SPACER RS-10	4
65	416910	CABLE HOLDER KWS-1	4
66	417787	CABLE DRIVER-CHOCK	1
67	417788	Cable Thermo Switch Shorted	1
68	417716	6 HP ODU Filter Board ASSY	1
69	416542	Tubing Assembly LIQUID VALVE O	1
71	438551	SUPPLY CORD CLAMP 20mm	2
72	417720	Terminal Block 4P	1

16. OPTIONAL ACCESSORIES

16.1 RCW Wall Mounted Remote Control

- 16.1.1** 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.

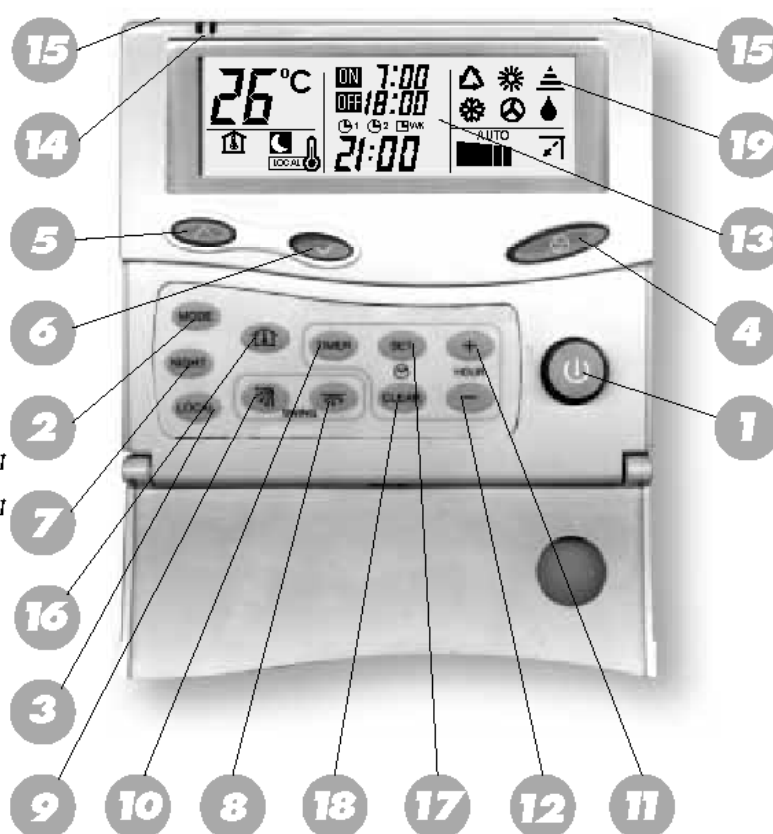
Ordering code no':

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 cor
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



16.2 RCW2 Wall Mounted Remote Control

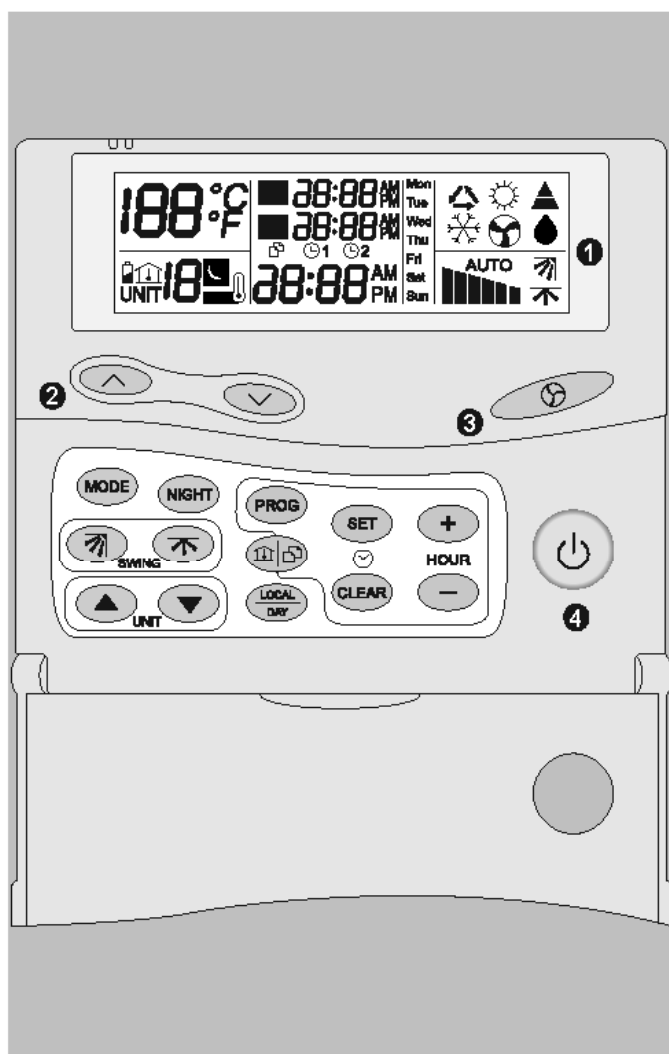
16.2.1 The RCW2 wall mounted remote controller is a wired controller that can provide effective controlling management up to 15 different settings and temp' zones.

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



- ① Display screen.
- ② Keys for raising and lowering the set temperature.
- ③ Ventilation mode selection :
 - Low speed.
 - Medium speed.
 - High speed.
 - AUTO : Automatic speed selection.
- ④ ON / Standby.
- Ⓡ Accessing the time setting mode.
- Ⓢ Advancing the time setting.
- Ⓣ Retarding the time setting.
- Ⓤ Clearing memory of programmed time settings in programming mode.
- Ⓥ Day of the week selection key or sending "I feel" local temperature setting.
- Ⓦ Programming mode key.
- Ⓧ "Copy" key, enabling zone parameters to be duplicated for other zones.
- Ⓨ Operating mode selection.
- Ⓩ Day /Night key.
- ⓐ Current zone setting: zone above.
- ⓑ Current zone setting: zone below.
- ⓒ Louver : step by step or horizontal.
- ⓓ Louver : vertical.

16.3 Base Heater

PN: 439878

Before starting the heaters connection verify that the unit is disconnected from main power supply!!

BASE HEATERT INSTALLATION INSTRUCTIONS

Check the installation manual for further information

The kit includes:

1. One 70W PT heating element.
2. One Heater holder.
3. Two magnets for assemble of heater to outdoor base.
4. 4 Strips.

Instructions:

1. Open the outdoor unit electrical cover and service panel.
2. Connect the base heater wires to connections marked as "BH" on the main controller (refer to Figure 1).
3. Route the wires into the cable holders and through the grommet and attach the wires with strips to other wires as per Figure 1 & 2.
4. Locate the heater under the outdoor base with the magnets according to Figure 3.
5. Attach with strips the wires to the pipes and the base unit.
6. Close the outdoor electrical cover and service panel.

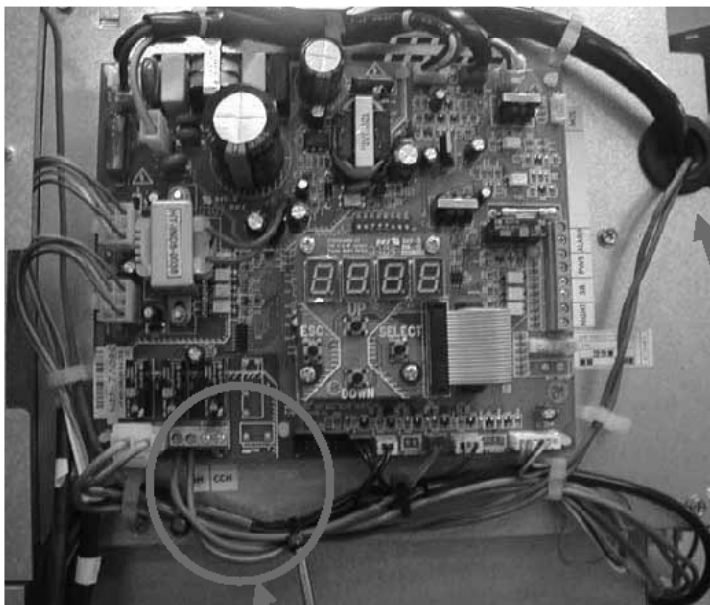


Figure 1

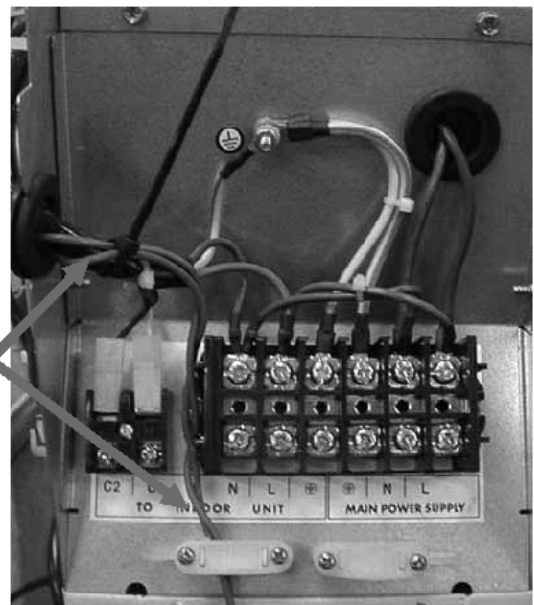
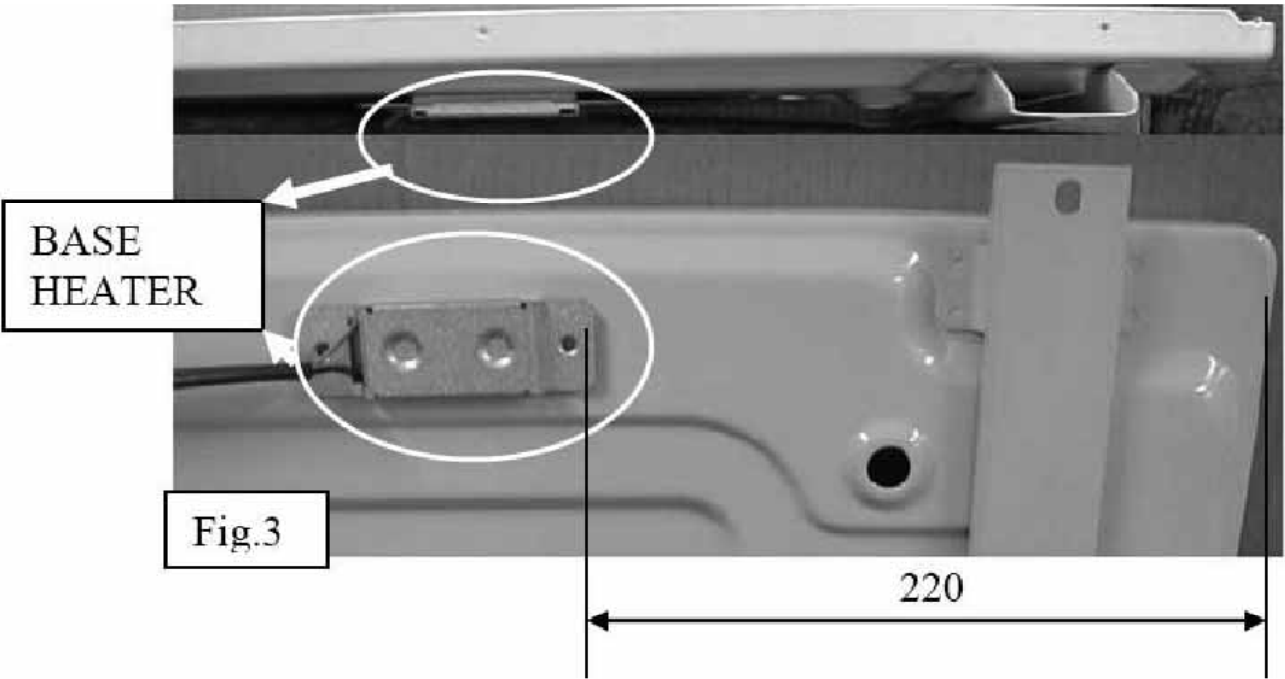


Figure 2



16.4 Crank Case Heater

PN: 190443

Before starting the heaters connection verify that the unit is disconnected from main power supply!!

CRANK CASE HEATERS INSTALLATION INSTRUCTIONS

Check the installation manual for further information

The kit includes:

1. One 50W heating element.
2. One spring holder.

Instructions:

1. Open the outdoor unit electrical cover and service panel.
2. Remove the compressor insulation layers.
3. Locate the heater around the compressor and close with the spring according to Figure 1.
4. Route the wires into the cable holders as per Figure 2.
5. Connect the heater wires to connections marked as "CCH" on the main controller (refer to Figure 3).
6. Attach the wires with strips to other wires as per Figure 3.
7. Put back the compressor insulation layers.
8. Close the outdoor electrical cover and service panel.



Figure 1

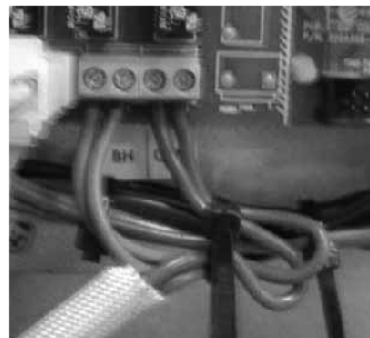


Figure 3

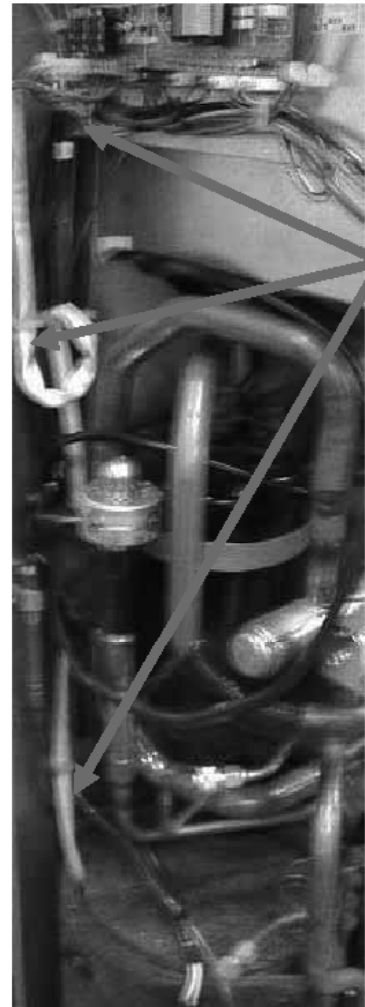


Figure 2

16.5 Room Thermostat

Room Thermostat kit PN: 442298

Thermistor with connector PN: 442296

Before starting the connection verify that the unit is disconnected from main power supply!!

ROOM THERMOSTAT INSTALLATION INSTRUCTIONS

Check the installation manual for further information

Supplied components list:

No.	Item	QTY	PN
1	Thermostat box	1	442298
2	Shielded cable	1	
3	Screws and plugs	2	
4	LABEL	1	
5	BAG	1	

1	Extension cable with connector	1	442296
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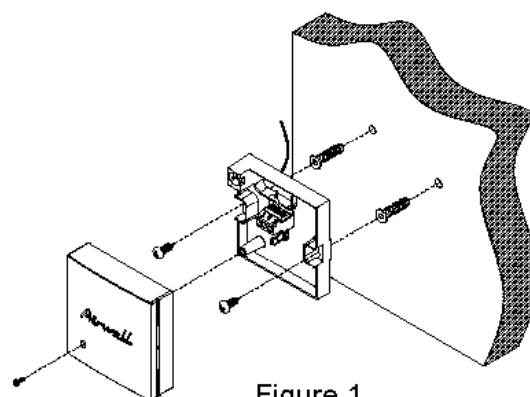


Figure 1

Choosing location of installation:

- Away from air drafts
 - Away from direct sun light rays
 - Average height – 1.5 meters above floor
 - Away from any heat source
1. Install the thermostat box on the wall according the above location preferences. See figure 1.
 2. Connect the shielded cable supplied to the thermostat box into points 3 and 9 (non polarity).
 3. Disconnect the existing “RM” sensor from the indoor unit main controller.
 4. Connect the other end of “RM” extension cable to the the sheilded cable. Also connect the grounding fork terminal into the grounding terminal point.
 5. In the indoor unit main controller, move the dip switch #2 to OFF position.

APPENDIX A

INSTALLATION AND OPERATION MANUALS

- ▶ INSTALLATION INSTRUCTION DLS DCI
- ▶ INSTALLATION INSTRUCTION DXV DCI
- ▶ INFRARED REMOTE CONTROL RECEIVER
- ▶ OPERATION MANUAL RC-3
- ▶ OPERATION MANUAL RC-4
- ▶ OPERATION MANUAL RC-7

PROGRAMMING
AND OPERATING MANUAL

ENGLISH

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IF YOUR AIR CONDITIONER IS FOR COOLING ONLY, PLEASE DISREGARD THE HEATING INSTRUCTIONS

PLEASE READ THESE INSTRUCTIONS BEFORE OPERATING THE AIR CONDITIONER

OPERATION MODES, FUNCTIONS AND FEATURES



COOL

Cools, dehumidifies and filters the room air. Maintains the desired room temperature.



HEAT

Heats and filters the room air. Maintains the desired room temperature.



AUTO

Automatically switches from COOLING to HEATING or from HEATING to COOLING, maintaining the desired temperature according to the room conditions.



DRY

Dehumidifies and softly cools the room. In DRY Mode, the air conditioner operates at an increased dehumidifying power. This function is recommended to be used when temperature is rather low but the humidity is high.



FAN

Recirculates and filters the room air. Maintains constant air movement.



AUTO FAN

The air conditioner automatically selects the FAN speed in accordance with the room temperature. At the start, the unit operates at high fan speed. As the room air approaches the desired temperature, the fan switches to a lower speed for quieter operation.



I FEEL

Switches the temperature sensing point to the place where the remote control is located. (Generally the temperature sensor is located behind the intake grille of the air conditioner). This function is designed to provide a personalized environment by transmitting the temperature control command from your location. The communication between the Remote Control and the unit is done by infrared signal. Therefore, in using this function, the Remote Control should always be aimed, directly, at the air conditioner.



TIMER

Real time control and display, automatically turns the air conditioner ON and OFF according to the time of day setting, ensuring comfort conditions before returning home, without wasting electricity. It turns the air conditioner off automatically when sleeping.



SLEEP

Designed to create comfortable sleeping conditions. When in COOLING mode, the temperature rises one degree centigrade every hour, for three hours, from the start of the mode. The temperature rise prevents the feeling of over-cooling while sleeping (when your body is at rest). In HEATING mode the reverse occurs; the air conditioner lowers its temperature one degree every hour. When in SLEEP mode, the air conditioner will be automatically turned off after seven hours. The result is a more comfortable and invigorating sleep, which leaves you feeling fresh and energetic in the morning.

**AUTO
LOUVRE**

The air louvre is automatically positioned for the most suitable blow-out angle, when COOL, HEAT, DRY or FAN modes are selected. When the air conditioner is turned off, the louvre will close automatically providing an aesthetic appearance.

Note: applicable on some models only.

**VERTICAL
AIR SWING**

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

Note: applicable on some models only.

**AIR DIRECTION
POSITIONING**

Manual positioning of the air louvre to provide desirable air flow angle.

Note: applicable on some models only.

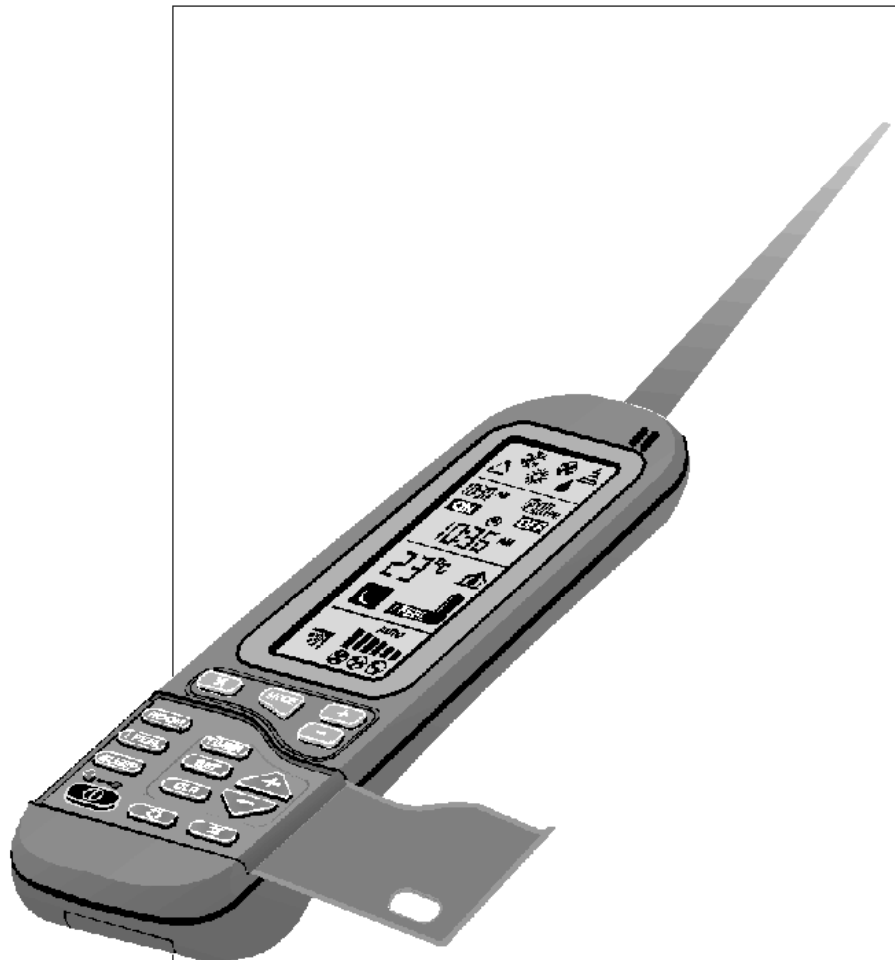
**ROOM
TEMPERATURE**

Measures and displays room temperature.

LOCK

Freezes the last operation setting on the remote control. when LOCK is activated, the remote control will not be able to control the air-conditioner.

USE OF WIRELESS REMOTE CONTROL



WIRELESS REMOTE CONTROL PUTS ALL FUNCTIONS AT YOUR FINGERTIPS

- Aim at the infrared signal receiver on the room air conditioner when operating.
- The remote control signal can be received at a distance of up to about 8 m.
- Ensure that there is nothing between the remote control and the signal receptor.
- Do not drop or throw the remote control.
- Do not place the remote control in a location exposed to direct sunlight, or next to a heating unit, and/or other heat source.
- Do not expose the air conditioner signal receiver to a strong light such as fluorescent lamp or sunlight.

REMOTE CONTROL BATTERY CHANGE

- Remove the batteries from the remote control as shown.
- Use two 1.5 volt size AAA batteries.
- For protecting the environment please return used batteries for recycling process.
- Do not charge batteries which are not rechargeable.

PRIOR TO OPERATION

Prior to operating your air conditioner, make sure that:

- *The red tab protecting the remote control batteries has been removed.*
- *For clock setting see page 8.*

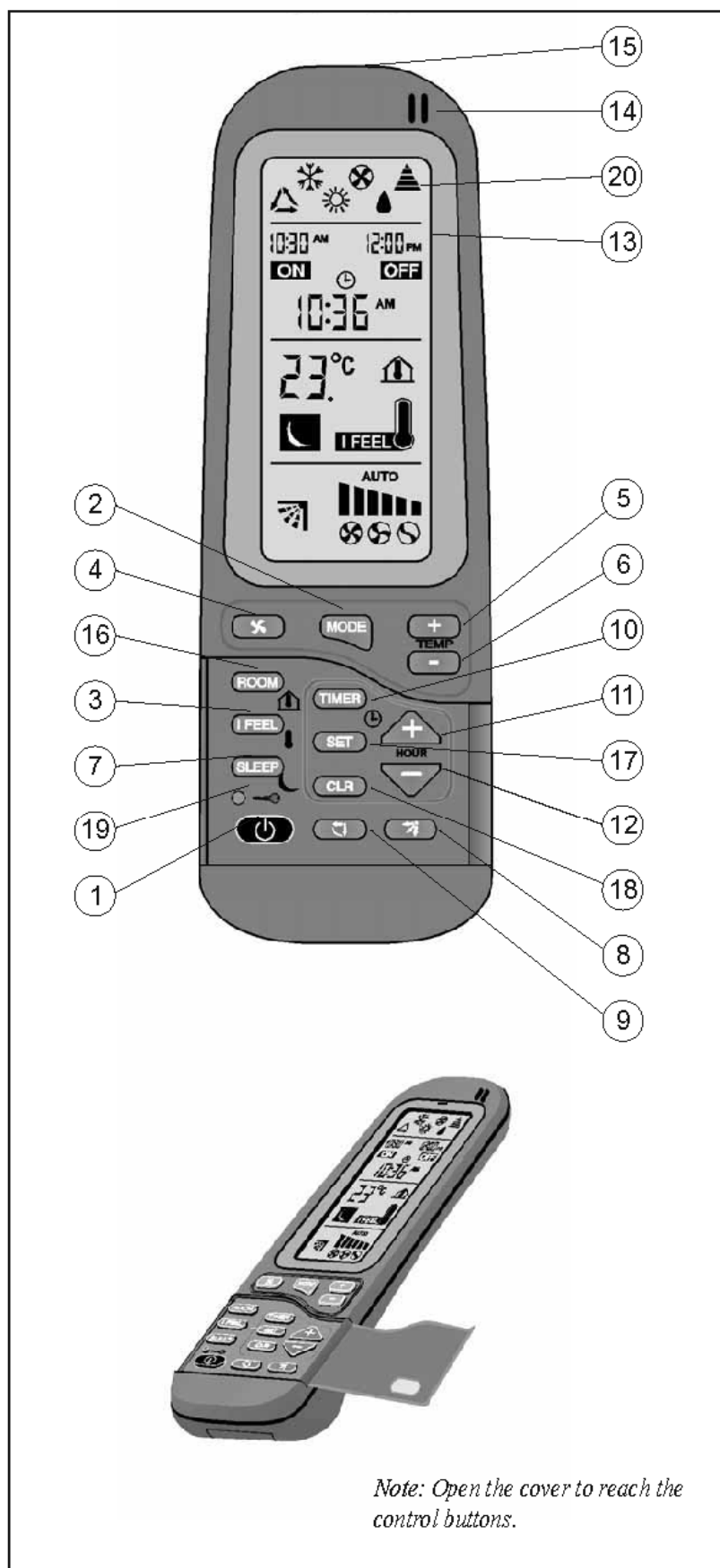


REMOTE CONTROL HOLDER

Use the remote control holder when unit is not in use. Remote control can be slipped in or out its holder.



REMOTE CONTROL



- 1 START/STOP button
- 2 Operation mode selection button
COOLING
HEATING
AUTO COOL / HEAT
DRY
FAN
- 3 I FEEL temperature sensing mode button
- 4 FAN SPEED and AUTO FAN button
- 5 Room temperature UP button
- 6 Room temperature DOWN button
- 7 SLEEP 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 I FEEL sensor
- 15 Infrared signal transmitter
- 16 ROOM temperature button
- 17 TIMER SET button
- 18 TIMER CLEAR button
- 19 LOCK button
- 20 Transmission sign

* Applicable on some models only

OPERATION PROCEDURE



TURNING ON THE AIR CONDITIONER

Press START/STOP button (1) to turn the air conditioner on. Note that the LCD operation display (13) will always show the last mode of operation and previous function used.

Follow the instructions if you choose to change the control settings; otherwise, the air conditioner will start and operate in the same mode and functions prior to being turned off.



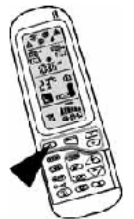
VENTILATING OPERATION

Select the ventilating mode by pressing MODE button (2). Switch to the desired fan speed by pressing FAN speed button (4).



COOLING OPERATION

Select the COOLING mode by pressing MODE button (2). Switch to the desired FAN SPEED or to AUTO FAN by pressing button (4). Select suitable temperature setting. By selecting the COOLING mode, the air flap will move automatically to horizontal air delivery position, optimal for cooling.



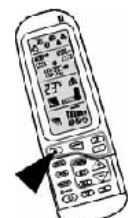
COOLING OPERATION WITH AUTO FAN MODE

This operation starts with the highest air flow in order to quickly lower the room temperature. It will then automatically switch to the low air flow to quietly maintain the selected temperature.



HEATING OPERATION

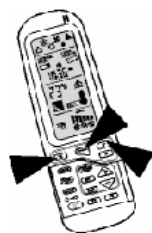
Select the HEATING mode by pressing MODE button (2). Switch to the desired FAN SPEED or to AUTO FAN by pressing FAN button (4). Select suitable temperature setting. By selecting the HEATING mode, the air flap will move automatically to vertical air delivery position, optimal for heating.



HEATING OPERATION WITH AUTO FAN MODE

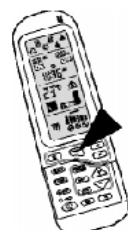
This operation starts with the highest air flow in order to quickly raise the room temperature. It will then automatically switch to a lower air flow to quietly maintain the selected temperature. HEATING with AUTO FAN will automatically provide the user with the HOT KEEP function. The fan will be turned off when the indoor coil temperature is not sufficiently hot to prevent uncomfortable cold air drafts.





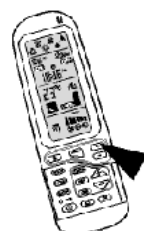
AUTO COOLING/HEATING OPERATION

Select the AUTO mode by pressing MODE button (2). Switch to the desired FAN SPEED or to AUTO FAN by pressing button (4). Select suitable temperature setting. The air flap will automatically move to either horizontal air delivery for cooling or to vertical air delivery for heating. At start, the air conditioner will select its mode of operation according to the room temperature and the temperature setting.



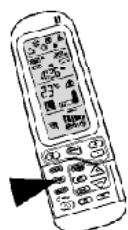
DRY OPERATION

Select the DRY mode by pressing MODE button (2). Select the suitable temperature setting. While in DRY mode, the air conditioner will operate at low fan speed, regardless of the fan setting on the LCD operation display. Fan might terminate operation from time to time to prevent from over cooling. By selecting the mode, the air flap will move automatically to optimal horizontal air delivery position.



SELECTING THE TEMPERATURE

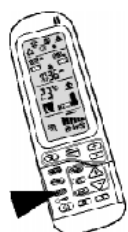
Press TEMP buttons (5) or (6) to change the temperature setting in the LCD operation display (13). The temperature setting is shown in degrees centigrade. A higher number indicates a higher room temperature. A lower number indicates a lower room temperature.



I FEEL FUNCTION

Press I FEEL button (3) to activate the I FEEL function. Thermometer sign will appear on the LCD operation display (13). Select suitable temperature setting.

Make sure that the remote control unit is aimed at the air conditioner, with the I FEEL sensor (14) in front. Prevent the I FEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the wrong temperature data, thereby disturbing the performance of the I FEEL function.



SLEEP FUNCTION

Press the SLEEP button (7) to select the SLEEP function. When the sleep function is activated the air conditioner will be automatically turned OFF after seven hours. If at the same time TIMER is activated, as well, the air conditioner will be turned ON and OFF according to the TIMER setting.

To cancel the SLEEP function press on one of the following :

- START/STOP button (1)
- SLEEP button (7)





TIMER OPERATION

Press TIMER select button (10) to activate the timed operation mode. Each time the TIMER button (10) is pressed, one of the following four types of operation modes will appear on the LCD display. The operation modes are sequenced in the direction of arrow. Indicator (C) on the air conditioner will light up during TIMER operation:

Note: After power failure indicator (C) blinking (when the unit is in timer mode) The unit will be automatically turned to stand-by mode and the timer operation will be cancelled. To resume the timer wait 30 sec. before restarting. Follow the instructions above.



TIMER OPERATING MODES

I. TIMER ON

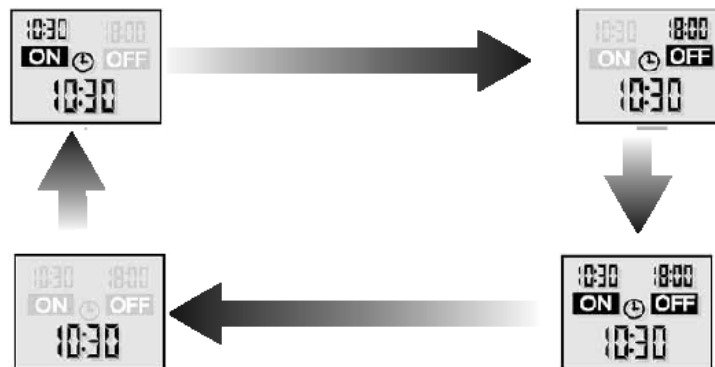
This mode enables you to set a start operating time. Press the TIMER button (10) till the ON sign blinks. Start time can be adjusted using up and down buttons (11) and (12) respectively. Press SET button (17) to activate the timer.

Example: Operation is restored at 10:30.

II. TIMER OFF

This mode enables you to set the stop time of operation. Press the TIMER button (10) till the OFF sign blinks. Time can be adjusted using up and down buttons (11) and (12) respectively. Press SET button (17) to activate the timer.

Example: Operation stops at 18:00



IV. CLEAR

Use this mode to cancel timer operation. Press CLEAR button (18), timer operation will terminate and the LCD display will be cleared for each timer mode.

Note: If timer button (10) is selected and neither time adjust, SET, or CLEAR buttons are pressed within 15 seconds, the timer operation will be cancelled and the last set-up will be displayed.

III. TIMER ON AND OFF

This mode enables you to set the start and stop time of operation. Press the TIMER button (10) till the OFF sign blinks. By pressing again the ON sign blinks. Time can be adjusted by using the up and down buttons (11) and (12), respectively. Press SET button (17) to activate the timer.

Example: Operation is restored at 10:30 and stops at 18:00

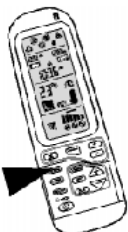
ROOM TEMPERATURE DISPLAY

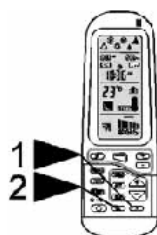
By pressing on ROOM temperature, button (16), the measured room temperature and the room temperature sign will be displayed.

To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM temperature button (16).
- Change of MODE button (2)

Note: Room temperature range is between 0°C and 36°C in 1°C increments. Display should show "HI" or "LOW" to represent temperature that is above 36°C or below 2°C.





AIR DIRECTION OPERATION (on some models only)

1. Air Direction Positioning

Press button (8) to position the air flap to any desired angle.

2. Automatic Vertical Air Swing

Press button (9) to activate the auto air swing. Press button (8) to deactivate this function.



TURNING OFF THE AIR CONDITIONER

Press START/STOP button (1) to turn off the air conditioner. Indicator (A) will stay lit, indicating that the air conditioner is in STAND-BY mode and ready to accept any new command from the remote control. The remote control LCD will display the clock time. The last operating set-up will be kept for the next operation.



CURRENT CLOCK TIME SET

Clock setting is performed when batteries are inserted. The remote control displays the setting and the clock display will blink "0:00" or "12:00" AM (AM sign will blink, too) till a new time is set.

For clock setting, use buttons (11) and (12) for setting the hours and minutes, respectively, and then press timer SET button (17). The clock setting can be also performed by pressing timer SET button (17) for 5 seconds.

The clock display will blink, for new setting follow the steps described above.

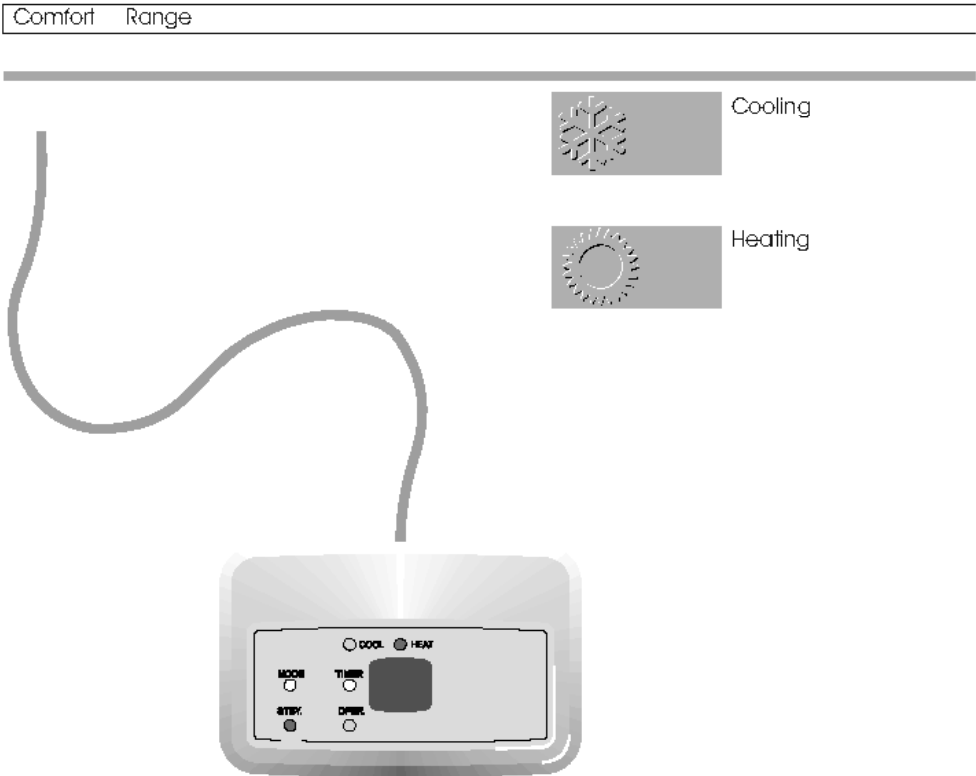


LOCK FUNCTION

By pressing LOCK button (19), the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button (19) again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign (20) will be on.

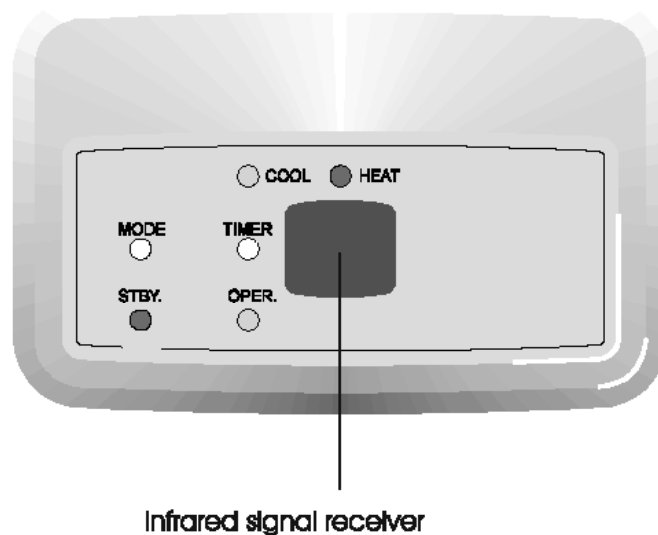


AIR CONDITIONNING



INFRARED REMOTE CONTROL RECEIVER

- COOL: CoolingLED
- HEAT: HeatingLED
- TIMER : Timer active
- OPER : Operation LED. Comes on when the system is operating.
Flashes to indicate reception of an infrared signal.
OFF when compressor is deactivated in protection modes.
- STBY: StandbyLED. Lit when the system is connected and
ready to receive commands from the remote control unit.
- MODE: Emergency switch. In case of unavailability of the remote
unit, this switch is used to select heating or cooling.



Notes:

1) The COOL and HEAT LEDs only come on when the receiver MODE switch is used.

2) Protection Modes

Your air conditioner includes several automatic protection modes which enables you to use it virtually at any time and in any season, regardless of the outdoor temperature. Some of the protection modes are listed below:

Mode	Operation conditions	Protection from	Controlled remedy
Cooling	Low outdoor temperature	Indoor coil freezes up	Stops outdoor fan and compressor when approaching freezing conditions. Resumes operation automatically. Operating indicator (Oper.) blinks.
	High outdoor temperature	Outdoor coil overheating	Stops compressor when approaching over heating conditions. Resumes operation automatically. Operating indicator (Oper.) blinks.
	Any	Indoor water overflowing	Stops compressor when approaching overflowing conditions. Resumes operation automatically. Operating indicator (Oper.) blinks. (Compatible in some models only)
Heating	Low outdoor temperature	Outdoor coil ice build up	Reverses operation from heating to cooling for short periods to de-ice outdoor coil. Operating indicator (Oper.) blinks.
	High Indoor or outdoor temperature	Indoor coil overheating	Stops outdoor fan and compressor when approaching high indoor coil temperature. Resumes operation automatically. Operating indicator (Oper.) blinks.

3) In DCI models, when switching the unit to OFF after heating operation, the unit may perform outdoor coil deicing operation. In such a case, the compressor will continue to run for some time after the unit has switched to OFF. This feature is a part of the normal unit operation.

EXCEPTION FOR MULTI-SPLIT TYPE

In multi split applications where more than a single indoor unit is connected to the same outdoor unit, it may happen that the requested operation mode can not be operated. The reason for that is that the system is currently operating in a different mode.

The system operation mode can be either cooling or heating and is set by the outdoor unit controls, based on indoor and outdoor unit settings.

The rules for the mode settings may be different from one application to another.

In most applications the system operation mode will not be changed as long as there is an operating indoor unit requesting the active mode. The operation mode in such application will be set by the first indoor unit that is turned ON from Stand By.

The following table shows the indoor unit operation modes that can be operated per active system mode:

		System Active Mode	
		Cooling	Heating
Requested indoor unit operation mode	Cooling	v	x
	Heating	x	v
	Dry	v	x
	Auto Cool/Heat	v (cooling only)	v (heating only)
	Ventilation	v	x

{v - enabled indoor unit operation mode, X - disabled indoor unit operation mode}

Indoor unit operation when the requested mode is disabled is as following:

- Green (OPER) LED blinks once in two seconds;
- Indoor fan is forced off;

TEST MODE

Test mode is set only for performance testing purposes, and not for user operation.

Test mode can be initiated by either one of the following conditions:

- 1) Operating the unit with the following remote control settings and temperature conditions:

Cool Mode, SPT=16 °C and RAT = 27(+1/-2) °C and OAT = 35 (+2/-1) °C for 30 minutes :

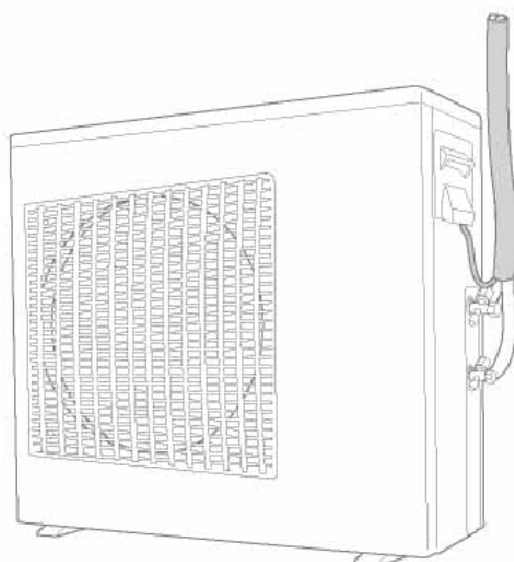
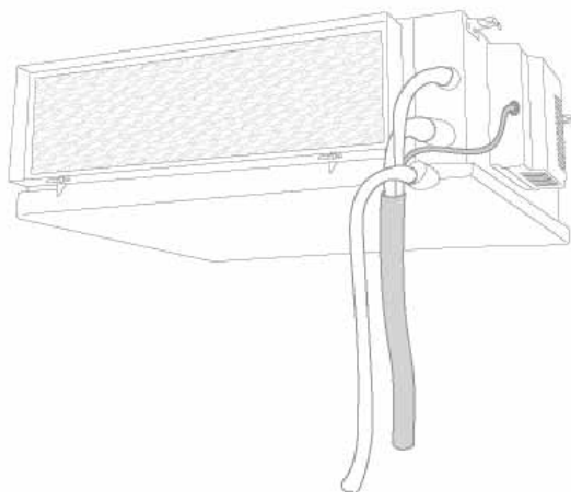
Heat Mode, SPT=30 °C and RAT = 20 ± 1 °C and OAT = 7 (+1/-2) °C for 30 minutes :

- 2) Entering Diagnostics with Cool/SPT=16 °C or Heat/SPT=30 °C

Operating Temperature
Range:
-15 °C ~ 46 °C

CENTRAL AIR CONDITIONER WITH ELECTRONIC CONTROL

SPLIT SYSTEM SERIES DLS DCI



INSTALLATION INSTRUCTIONS

Getting started...

REQUIRED TOOLS LIST

1. Screw driver	8. Gas leak detector	15. Torque wrench
2. Electric drill, hole core drill (60 mm)	9. Measuring tape	18 N.m (1.8 kgf.m)
3. Hexagonal wrench	10. Thermometer	45 N.m (4.5 kgf.m)
4. Spanner	11. Megameter	65 N.m (6.5 kgf.m)
5. Pipe cutter	12. Multimeter	75 N.m (7.5 kgf.m)
6. Reamer	13. Vacuum pump	85 N.m (8.5 kgf.m)
7. Knife	14. Gauge manifold (for R-410A)	

ATTENTION

- Selection of the units location.
Select a location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
- Do not release refrigerant during piping work for installation, reinstallation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
- Installation work. It may need two people to carry out the installation work.
- Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.

SAFETY PRECAUTIONS

Read the following "SAFETY PRECAUTIONS" carefully before installation. Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.

The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

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

The items to be followed are classified by the symbols:



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



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









WARNING

- Use qualified installer and follow careful this instructions, otherwise it will cause electrical shock, water leakage, or aesthetic problem.
- Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
- For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough it will cause electrical shock or fire.
- Use the specified cable and connecting tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
- Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
- Before obtaining access to terminals, all supply circuits must be disconnected.
- When carrying out piping connection, take care not to let air substance other than the specified refrigerant go into refrigeration cycle, otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion or injury.
- Do not damage or use unspecified power supply cord. Otherwise, it will cause fire or electrical shock.
- Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.
- This equipment must be earthed. It may cause electrical shock if grounding is not perfect.
- Do not install the unit at place where leakage of flammable gas may occur. In case of leaks and accumulates at surrounding of the unit, it may cause fire.
- Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
- If supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

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Installation/Service Tooling for R410A		Changes
Gauge manifold		As the working pressure is high, it is impossible to measure the working pressure using conventional gauges. In order to prevent any other refrigerant from being charged, the port diameters have been changed.
Charge hose		In order to increase pressure resisting strength, hose materials and port sizes have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.
Electronic scale for refrigerant charging		As working pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal dia. 1/2, 5/8)		The size of opposing flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)		By increasing the clamp bar's receiving hole size, strength of spring in the tool has been improved.
Gauge for projection adjustment		Used when flare is made by conventional flare tool.
Vacuum pump adapter & check valve		Connected to a conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back into the charge hose. The charge hose connecting part has two ports -- one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector		Exclusive for HFC refrigerant.

Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U.S.'s ARI specified rose colour (ARI colour code: PMS 507). Also, the "charge port and packing for refrigerant cylinder" requires 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

CAUTION R410A Air Conditioner Installation

THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER. R410A refrigerant is apt to be affected by impurities such as water, oxidizing membrane, and oils because the working pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22. Accompanied with the adoption of the new refrigerant, the refrigeration machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigeration machine oil does not enter into the new type refrigerant R410A air conditioner circuit. To prevent mixing of refrigerant or refrigerating machine oil, the sizes of connecting sections of charging port on main unit and installation tools are different from those used for the conventional refrigerant units. Accordingly, special tools are required for the new refrigerant (R410A) units. For connecting pipes, use new and clean piping materials with high pressure fittings made for R410A only.

Moreover, do not use the existing piping because there are some problems with pressure fittings and possible impurities in existing piping.

Changes in the product and components











In air conditioners using R410A, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch).

In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed. (for copper pipes with nominal dimensions 1/2 and 5/8).

In case of pipes welding please make sure to use dry Nitrogen inside the pipes.

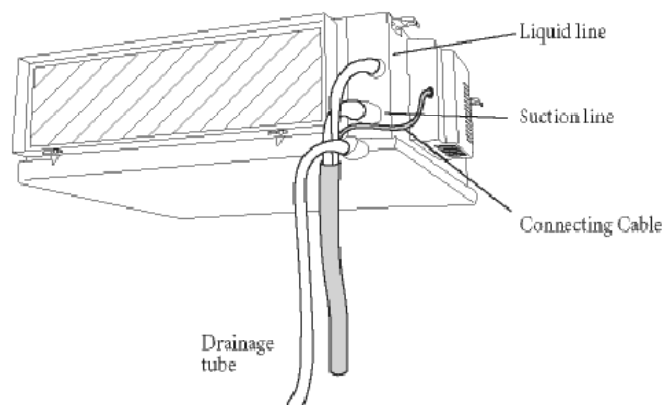
Use copper tube of special thickness for R410A: 1/4"-1/2" 0.8 mm
5/8"-3/4" 1 mm
7/8" 1.1 mm

ATTACHED ACCESSORIES

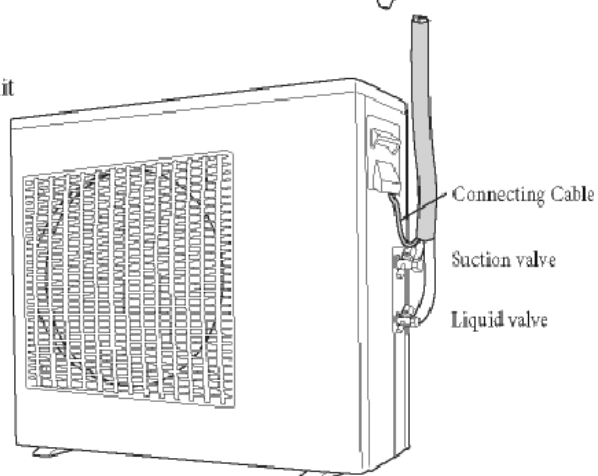
Description	Amount	Name	USE
	1	Technician's installation manual	Installation instructions
	1	Instruction manual for remote control	Operation instructions for remote
	1	Instruction manual for unit display	Operation instructions
	1	Remote control including batteries	Operating the air-conditioner
	1	Remote control bracket	Hanging the remote control on the wall
	1	Central control display	Operating and main working display
	4	Rubber mounting pads	Padding of the outdoor unit
	4	Tie - Wraps	Tightening the indoor and the outdoor units electrical cables
	4each	Diibbles - Screws - Washers	Installing bracket for remote control and central control display
	1	Drain elbow	Connecting drain hose to outdoor

GENERAL INFORMATION

Indoor Unit



Outdoor Unit



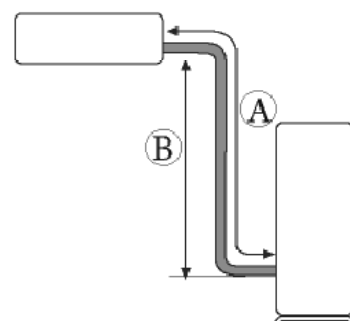
MAXIMUM PIPES LENGTH & HEIGHT

NOMINAL CAPACITY	TUBES O.D	LENGTH (A)	HEIGHT (B)
5kW	1/4"-1/2"	30	15
6kW	1/4"-1/2"	30	15
7.2kW	3/8"-5/8"	50	25
8.0kW	3/8"-5/8"	50	25
10.0 kW	3/8"-5/8"	70	30
12.5 kW	3/8"-3/4"	70	30

*Special Order

EXTERNAL STATIC PRESSURE

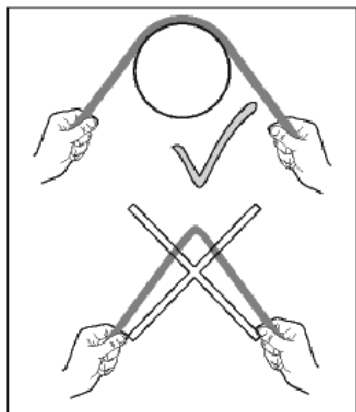
NOMINAL CAPACITY	NOMINAL	MIN-MAX
5kW	25	25-65
6kW	25	25-70
7.2kW	25	25-75
8.0kW	25	37-85
10.0 kW	37	20-100
12.5 kW	50	30-100



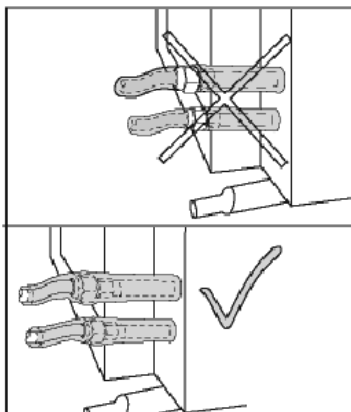
also below the outdoor unit.



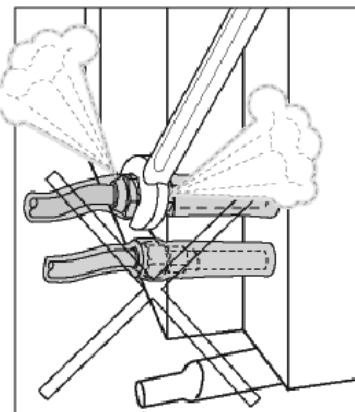
GENERAL PRECAUTIONS



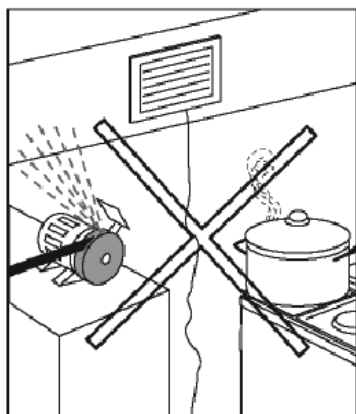
Always use the support of a large radius cylinder for banding the tubes, using pipe bending tools



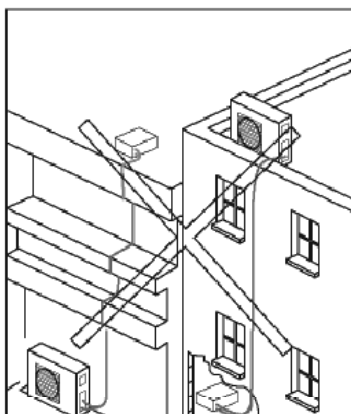
Do not leave nuts of gas tubes uncovered



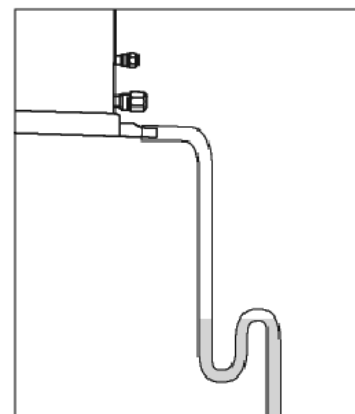
Do not untie gas tubes after installation



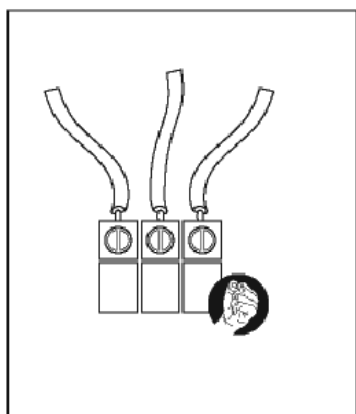
Avoid placing the indoor unit near water or oily mist.



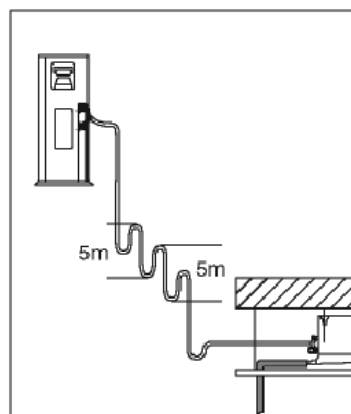
Avoid pipes bending and keep pipes as short as possible.



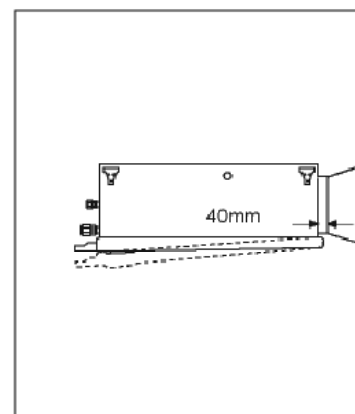
Making of a water trap (Siphon) will prevent bad odors and assure proper drainage.



Tighten electrical circuits cables



Oil trap for units up to 5Kw. In case the outdoor unit is under the indoor unit no trap is required



Keep 40 mm distance between duct plenum and the unit for easy drain removal.

INDOOR UNIT

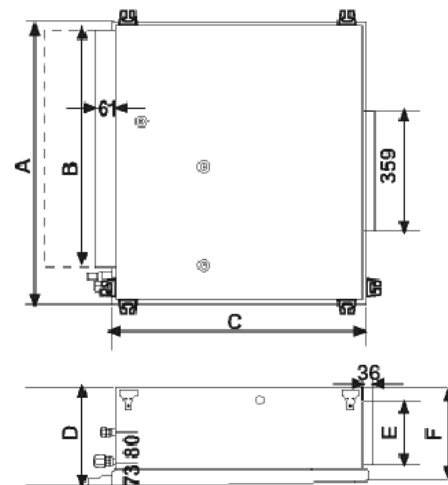
UNIT LOCATION

While selecting a place for the indoor unit:

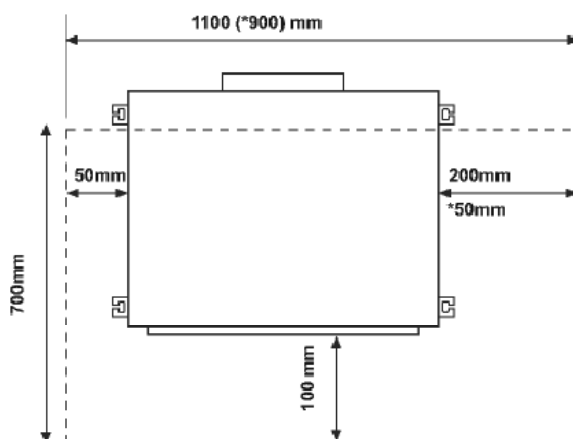
- Allow max. air flow to the desired space
- Allow max return air flow
- Ensure adequate drainage of condensed water
- Ensure noise reduction near bedrooms
- Leave a minimum 250 mm free space in front of the filter
- Allow a free service access to electrical box.
- Allow easy access to the base of the indoor unit while providing enough space from the ceiling
- Use serrated rubber under the unit and flexible joints to avoid resonance vibrations

NOMINAL CAPACITY	A	B	C	D	E	F
5-8.0 kW	790	853	749	256	162	242
10-12.5 kW	854	715	816	297	193	282

UNIT DIMENSIONS

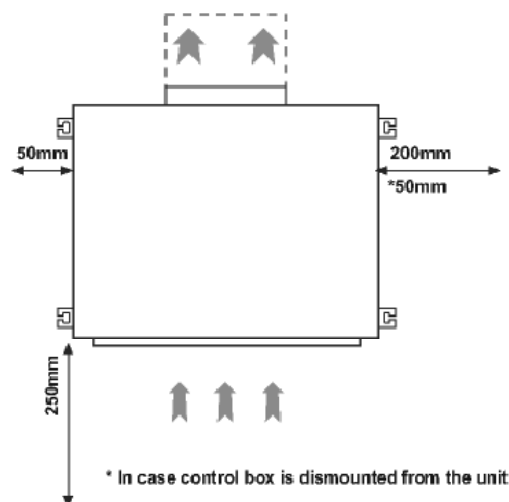


ACCESS TO THE UNIT



* In case control box is dismounted from the unit

CLEARANCES AROUND THE UNIT



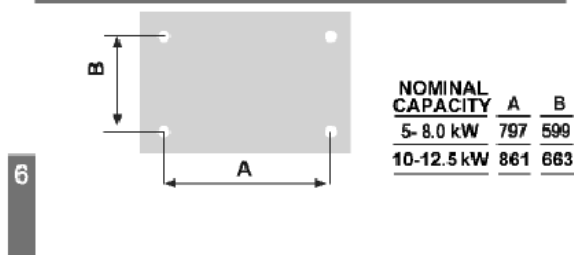
* In case control box is dismounted from the unit

UNIT INSTALLATION

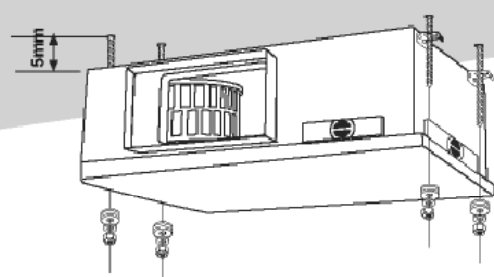
- Insert 4 M10 or 3/8" threads rods into the ceiling.
- Introduce the rods through the slots of unit suspension brackets.
- Position the shock absorbers, add washers and screw the nuts until the unit is firmly supported.
- In case of a gap between the unit and the ceiling, put a rubber or a neoprene sheet.

IMPORTANT The unit must be perfectly levelled

HOLES DRILLING LOCATION ON THE CEILING FOR INDOOR UNIT



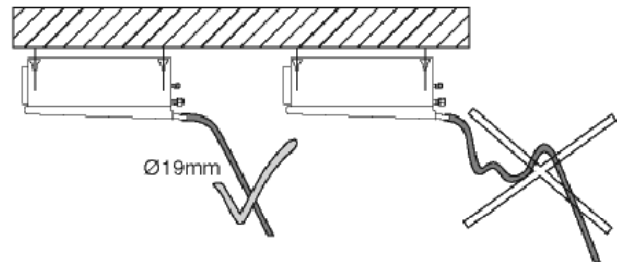
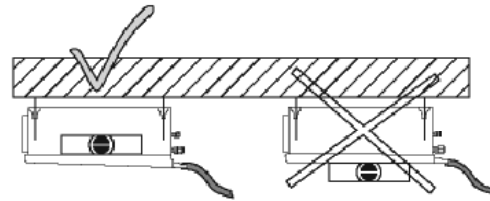
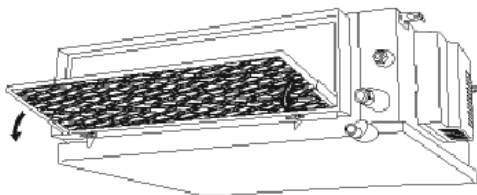
NOMINAL CAPACITY	A	B
5-8.0 kW	797	599
10-12.5 kW	861	663



DRAINAGE INSTALLATION

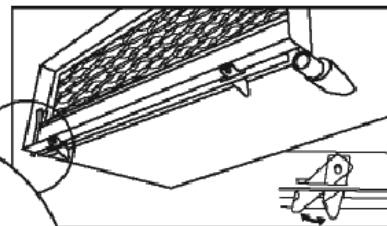
For an efficient functioning of the drainage system please take care of the following:

- Since the drainage basin bottom is sloppy, Alwaysways balance the unit by the suspension brackets and not by the drainage basin itself.
- Always lay the drain with downward inclination 2%. Prevent any upward flow or reverse flow in any part.
- Use 19 mm tube for drainage.

**AIR FILTER ACCESS****ACCESS FROM BACK OF UNIT**

Pull the eyelets in both sides of the filter till the filter is in horizontal position.

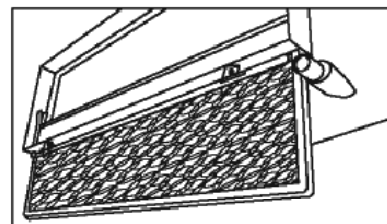
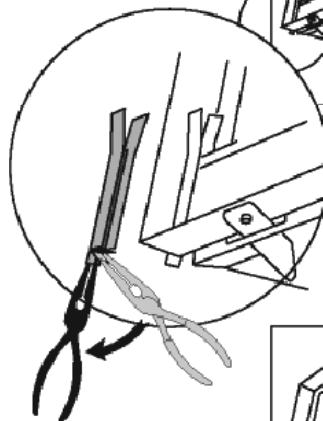
Pull the air filter for further treatment.

**ACCESS FROM BOTTOM OF UNIT
(For return air duct application)**

For first time use: Straighten the shim as shown in figure

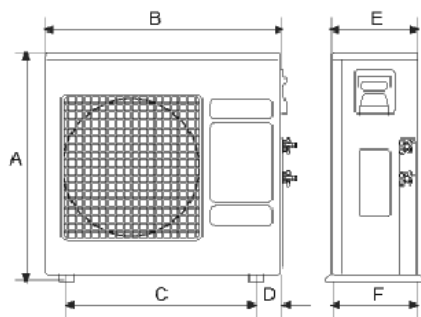
Release the locking clip

Pull down the air filter for further treatment



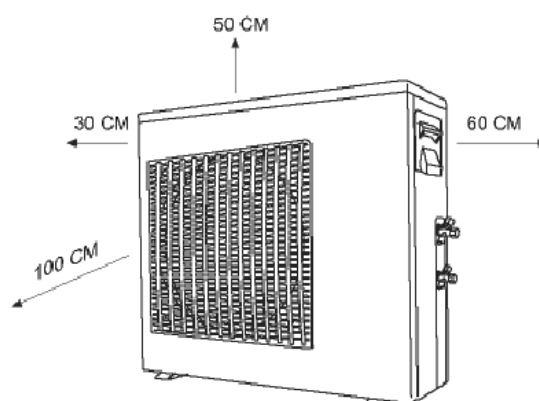
OUTDOOR UNIT

UNIT DIMENSIONS



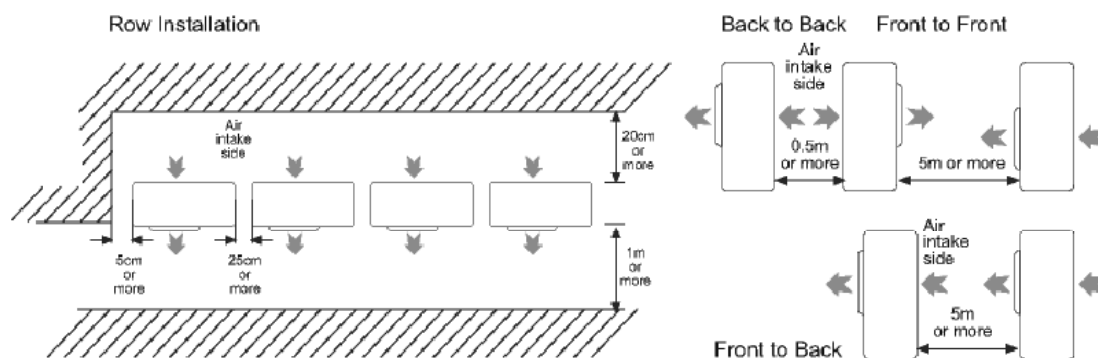
NOMINAL CAPACITY	A	B	C	D	E	F
5 kW	610	795	500	148	290	293
6 kW	690	846	545	152	302	370
7.2-8.0 kW	864	950	627	212	340	378
10-12.5 kW	1255	900	705	97	340	357

CLEARANCES AROUND THE UNIT



SEVERAL OUTDOORS INSTALATION

When installing several outdoors units please take into account the air flow around the units and follow the minimum distance suggestions as shown in the diagrams below.

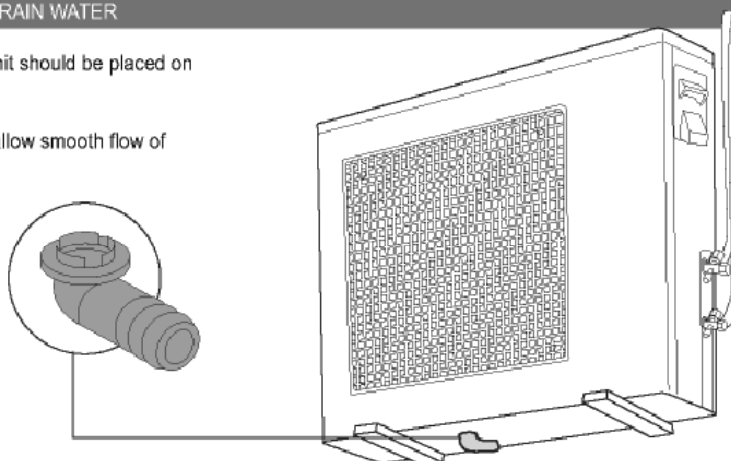


DISPOSAL OF OUTDOOR UNIT DRAIN WATER

In case of using a drain elbow, the unit should be placed on a stand at least 3 cm high.

Install the hose with a downward to allow smooth flow of draining water.

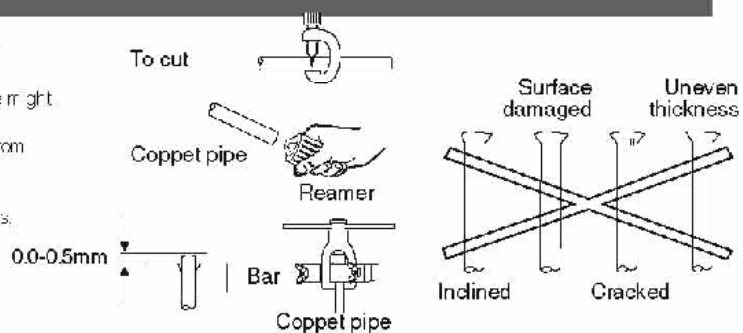
Use 16mm I.D. tube for drainage.



PIPES CONNECTIONS

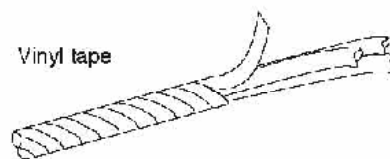
CUTTING AND FLARING THE PIPES

1. Please use the pipe cutter for cutting the pipes.
2. Remove all burrs by using reamer. Gas leakage might happen if burrs are not removed.
Turn pipes edge down to avoid metal powder from entering down the pipes.
3. After inserting the flare nut to the copper pipes, please make a flare.



PIPE INSULATION

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/ Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2. If drain hose or connecting pipes is in the room (where dew may form), please increase the insulation by using POLYURETHANE FOAM with thickness of 9 mm or more.



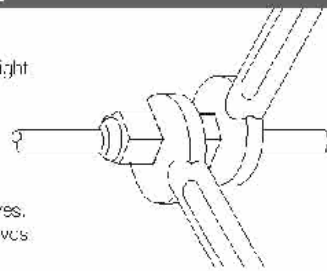
PIPES CONNECTIONS TO THE UNIT

Connecting to the indoor unit

1. Align the center of the pipes and finger-tighten the flare nut.
2. Use the torque wrench to tighten the nut firmly.

Connecting to the outdoor unit

1. Align the center of the pipes to the valves.
2. Use the torque wrench to tighten the valves firmly according to table.

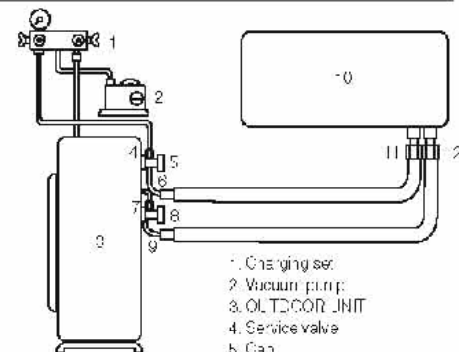


Torque (N.m)	1/4	3/8	1/2	5/8	3/4
Flare Nuts	13-18	40-45	60-65	70-75	80-85
Valve Cap	13-20	15-20	18-25	18-25	40-50
Service Port Cap	11-13	11-15	11-13	11-13	11-15

EVACUATION OF PIPES AND INDOOR UNIT

After connection the unions of the indoor and outdoor units, evacuate the air from the tubes and from the indoor unit as the follow

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 suction and liquid valves. Be sure to connect the end of the charging hose with the push pin to the service port.
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 0KPa (0mm Hg) to -0.1 MPa (-760mm Hg). Let the pump run for fifteen minutes.
4. Close the valves of both the low and high sides of the charging set and turn off the vacuum pump. Note that the needle in the gauge should not move after approximately five minutes.
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 from both valves, and open them using a hexagonal Allen wrench.
7. Remove the valve caps from both valves, and open them using a hexagonal Allen wrench.
8. Remount valve caps onto both of the valves.
9. Check for gas leaks from the four unions and from the valve caps. Test with a electronic leak detector or with a sponge immersed in soapy water for bubbles.



Sample

CAPACITY AND ADDITIONAL CHARGE FOR VARIOUS APPLICATIONS					
INDOOR	WING 3K	P40 3K	EOC XL 3K	WING 3K	WING 3K
FLO 3K	5.6 3K	5.6 3K	5.6 3K	5.6 3K	5.6 3K
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER
CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER	CONDENSER

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

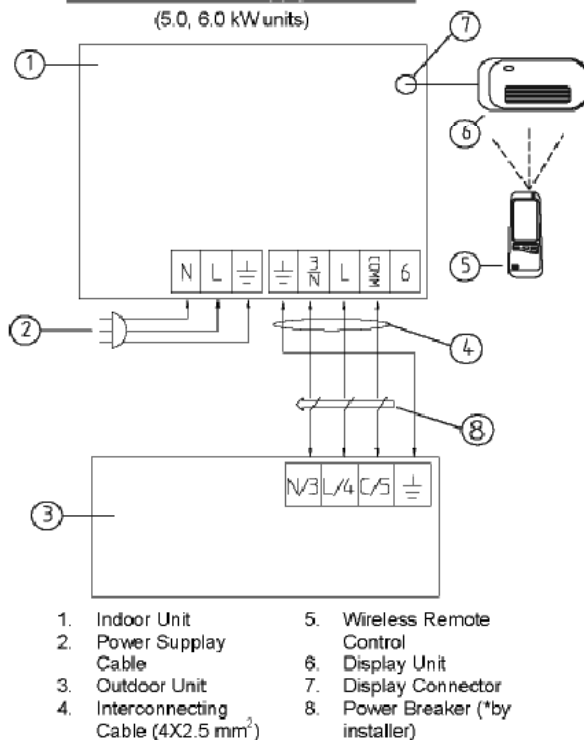
NOTE: For additional charge of various tubing lengths refer to outdoor unit table

ELECTRICAL CONNECTIONS**ELECTRICAL SPECIFICATIONS****POWER SUPPLY****230V/50Hz/1PH**

Electrical wiring and connections should be made by qualified electricians in accordance with local electrical codes and regulation. The air conditioner units must be grounded.

The air conditioner units must be connected to an adequate power outlet from a separate branch circuit protected by a time delay circuit breaker, as specified on unit's nameplate. Voltage should not vary beyond $\pm 10\%$ of the rated voltage.

1. Prepare the multiple wire cable ends for connection.
2. Take away the Indoor/outdoor cover and open the terminals, take away the cable clamp screw and turn over the cable clamp.
3. Connect the cable ends to the terminals of the indoor and outdoor units.
4. Connect the other end of the twin wire cable to the outdoor unit twin wire terminal.
5. Secure the multiple wire power cable with the cable clamps.

1PH Units Power supply to indoor
 (5.0, 6.0 kW units)


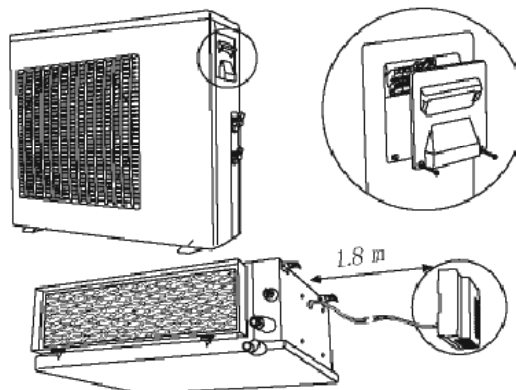
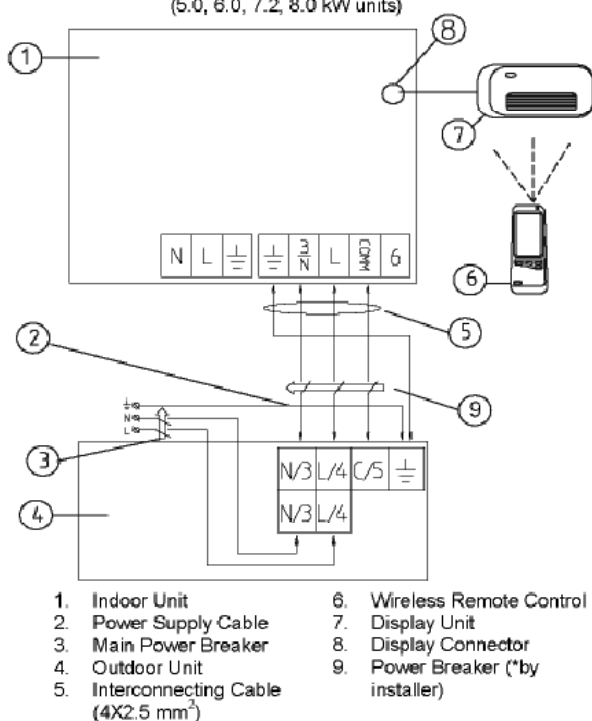
1. Indoor Unit
2. Power Supply Cable
3. Outdoor Unit
4. Interconnecting Cable (4X2.5 mm²)
5. Wireless Remote Control
6. Display Unit
7. Display Connector
8. Power Breaker (*by installer)

10

1PH UNITS

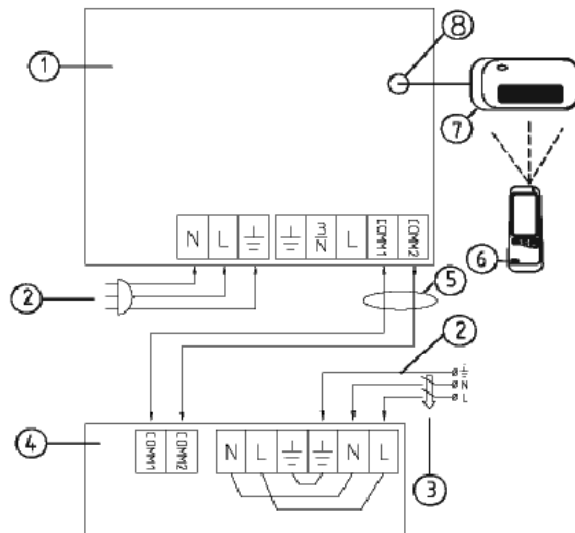
POWER SUPPLY TO OUTDOOR UNIT ONLY			POWER SUPPLY TO INDOOR UNIT	
NOMINAL CAPACITY	CIRCUIT BREAKER	POWER SUPPLY CABLE	CIRCUIT BREAKER	POWER SUPPLY CABLE
5.0kW	20A	3x2.5mm ²	20A	3X2.5mm ²
6.0kW	20A	3x2.5mm ²	20A	3X2.5mm ²
7.2kW	20A	3x2.5mm ²	NOT APPLICABLE	
8.0kW	20A	3x2.5mm ²		
10.0kW *	25A	3x4mm ²	10A	3x1.5mm ²
	32A	3x6mm ²		
12.5kW *	20A	3x2.5mm ²	10A	3x1.5mm ²
	25A	3x4mm ²		
	32A	3x6mm ²		

* Current can be set via display Board - see "Feature setup" paragraph

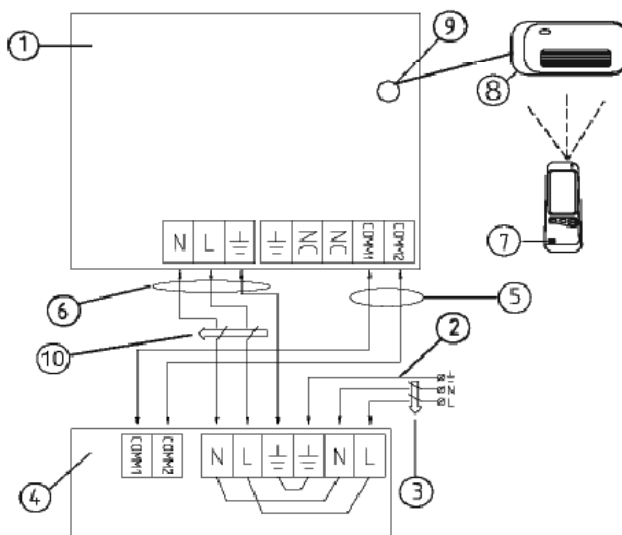

1PH Units Power supply to outdoor
 (5.0, 6.0, 7.2, 8.0 kW units)


1. Indoor Unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting Cable (4X2.5 mm²)
6. Wireless Remote Control
7. Display Unit
8. Display Connector
9. Power Breaker (*by installer)

*The power breaker must be of type that disconnects all poles with 3 mm contact opening.

ELECTRICAL CONNECTIONS**10.0, 12.5 kW Units****1PH Units Power supply to both Outdoor and Indoor units**

1. Indoor unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting Cable (2x0.75mm²)
6. Wireless Remote Control
7. Display Unit
8. Display Connector

1PH Units Power supply to Outdoor unit

1. Indoor unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting Cable (2x0.75mm²)
6. Power Interconnecting Cable (3x1.5mm²)
7. Wireless Remote Control
8. Display Unit
9. Display Connector
10. Power Breaker (*by installer)

*The power breaker must be of type that disconnects all poles with 3 mm contact opening.

DISPLAY CONTROL UNIT

LOCATION CRITERIA

It is recommended to install the Display Control Unit close to a ceiling in a central and neutral zone at typical conditions. In addition, the aesthetic aspect should be considered. The Display Control Unit is connected to the main control board on the air conditioner (the indoor unit) by a communication cable. The cable is connected to the Display Control Unit by a quick-connector. (8 pin plug)

INSTALLATION OF DISPLAY CONTROL UNIT ON WALL

Drill a 12 mm diameter hole on the wall, for routing the communication cable

Open the unit cover, drill 3 holes in the wall to match the holes in the Display Control Unit, install the inserts and fasten the unit to the wall with 3 screws.

The Display Control Unit is provided of a special communication cable, 7 meters long, terminated by a plug, connected in the housing itself to a distribution box, which enables the control of the air conditioner from several different rooms, each one from its own Display Control Unit.

Connect the quick connector to the appropriate socket on the main control board in the indoor unit electrical box.

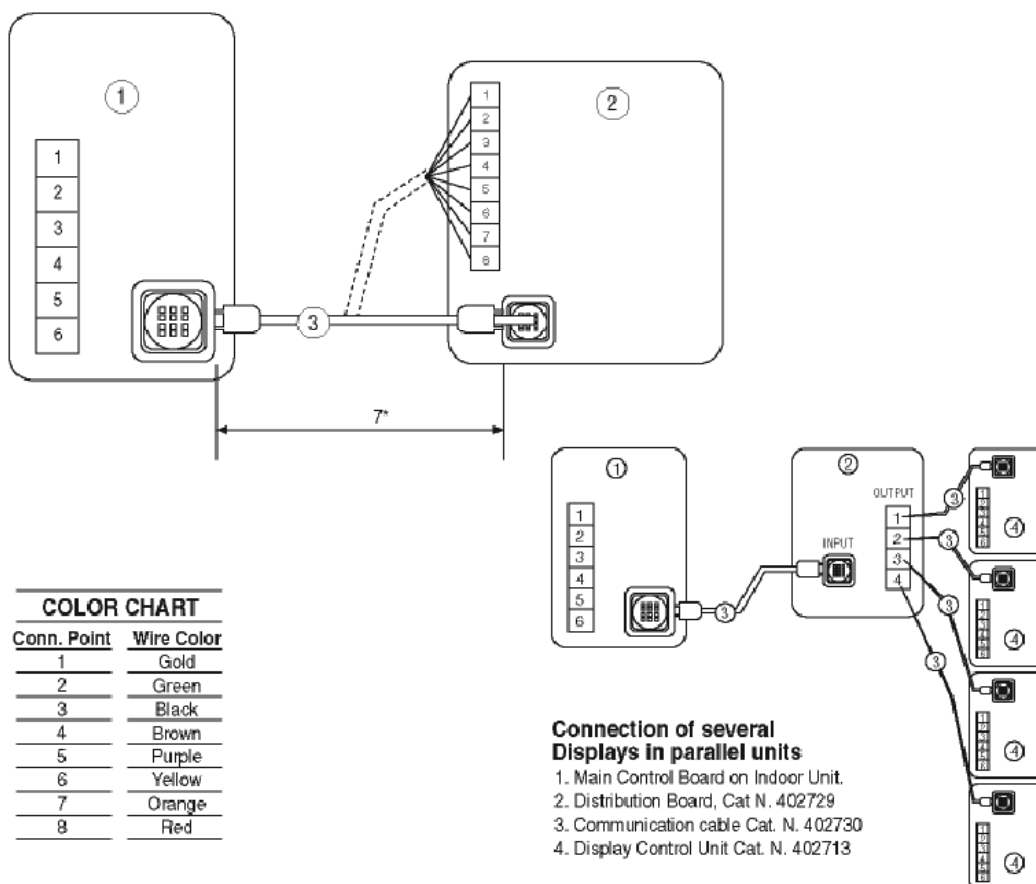


WARNING

The plug should not be cut off the communication cable if the cable length is insufficient. In such case, a 5-meter extension cable may be added.

CONSIDERATIONS IN LOCATING THE REMOTE CONTROL UNIT

- Locate the Remote Control Unit in such a way that when mounted on its support on the wall, it will be in line sight with the Display Control Unit (at less than 8 m).
- It is recommended to establish the final location of the Remote Control Unit only after the first operation, assuring proper transmission and reception between the Remote Control Unit and the Display Control Unit.



ADDITIONAL OPTIONS FOR 4-5HP (10-12.5KW) DCI UNITS ONLY

1. FEATURES SETUP

1.1. DISPLAY BOARD GENERAL DESCRIPTION

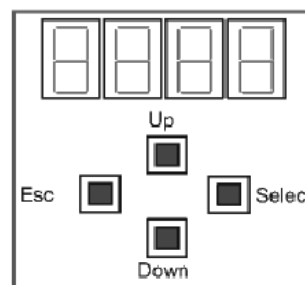
The display board serves as interface between the installer/technician and the A/C unit.

Buttons description:

Up & Down - used to scroll between options (up and down)

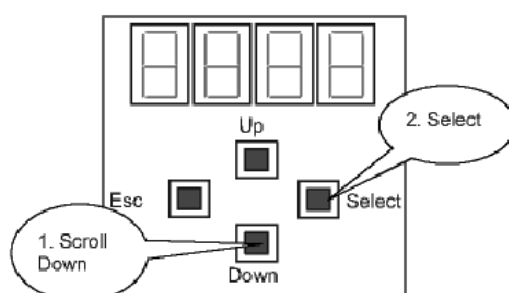
Select - used to select an option

Escape - Will go up one level in the menu



1.2. SET-UP

There are 2 types of current limitation for the maximum current drawn by the outdoor unit, one is to set maximum limit to the current and the other is to set power shedding limit. For both actions follow the below described procedure.



1. Scroll down the "Down" button until setup is displayed (Set) and then press the "Select" button.
2. Scroll down the "Down" button to choose the option required and press the "Select" button.

Mode (Cl/Ht/Sb)		
Technician Test (tt)		
	-	Technician Test Cool (ttC)
	-	Technician Test Heat (ttH)
Diagnostics (dla)		
	-	Outdoor Unit (Odu)
	-	Indoor Unit (Idu)
Set Up (Set)		
	-	Indoor Unit Supply (IdSU)
	-	Max Current Limit (Curl)
	-	Power Shedding (PSC)

1.2.1 Maximum Current Limit

The maximum operating current of the unit can be selected by the table in order to reduce/increase the circuit breaker value. This operation will affect the maximum capacity of the unit.

The default values are: indoor unit supplied from outdoor unit ("OUT") and the current is 30A for 12.5kW unit and 25A for 10.0 kW unit.

Enter the Set Up menu by Scrolling down to "Set" and set the Indoor unit supply (IdSU) parameter to either "Out" for external power supply for Indoor unit (via Outdoor unit) or "In" for supplying the indoor unit from separate internal circuit breaker.

Escape one time and scroll to "CURL".

Enter the value corresponding the max current as per the table.

Display	Max. Current setting	Circuit breaker
30_A	30A	32A
27_A	27A	30A/32A
23_A	23A	25A
18_A	18A	20A
14_A	14A	16A

1.2.2 Power Shedding Current Limit

The maximum operating current of the unit can be limited by setting the unit into power shedding mode which will control the unit up to pre-defined current percentage (out the max current). This operation will reduce the maximum capacity of the unit.

ADDITIONAL OPTIONS FOR 4-5HP (10-12.5KW) DCI UNITS ONLY

Activation of this feature is described in the next paragraph of "Dry Contacts".

The upper limit of the power consumption (Current) can be setup by the display board according to the table.

In order for this feature to become active you must shorten the "PWS" dry contact (see below procedure).

Enter the Set Up menu by Scrolling down to "Set" and set the power shedding control ("PSC") parameter according the table.

Display	Max. Current setting
50%	% of Max Current
60%	
70%	
80%	

1.3 FEATURE SET UP WITH DRY CONTACTS (INPUT)

The input dry contacts are used for controlling.

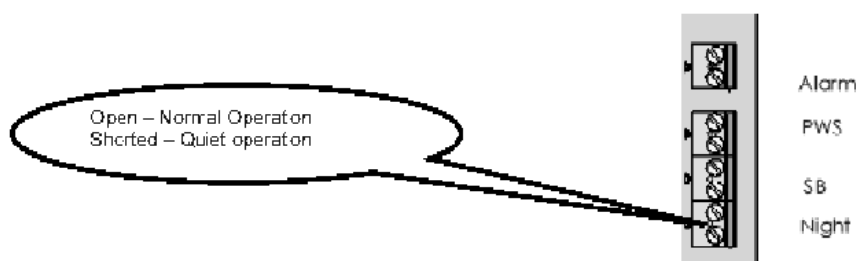
An external circuitry which may include a switch or a relay should be used for closing the internal circuit to indicate that some change is required.

A wire of up to 1.5mm² is recommended to be used.

Note: NO external power should be used in this case!

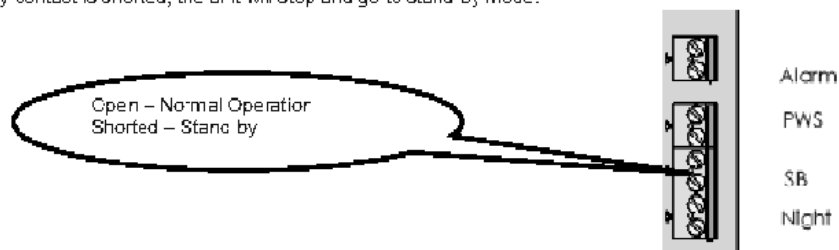
1.3.1 Night Mode quiet operation (Cool mode)

When "Night" dry contact is shorted, the unit will enter to a special mode and reduce the compressor and outdoor fans speed to allow quiet operation.



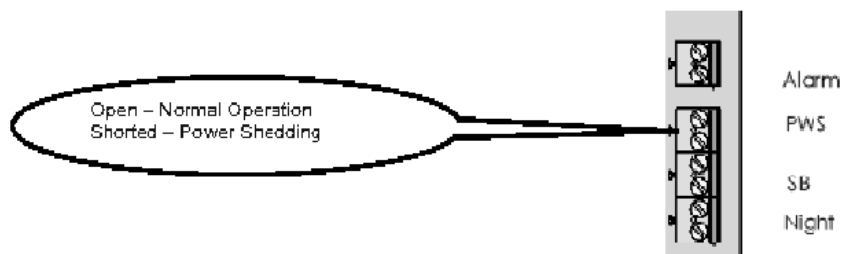
1.3.2 Stand-By

When "SB" dry contact is shorted, the unit will stop and go to stand by mode.



1.3.3 Power Shedding

When "PWS" dry contact is shorted, the unit will limit its maximum power consumption according to a pre defined value. This value can be changed via the display board (see above procedure).



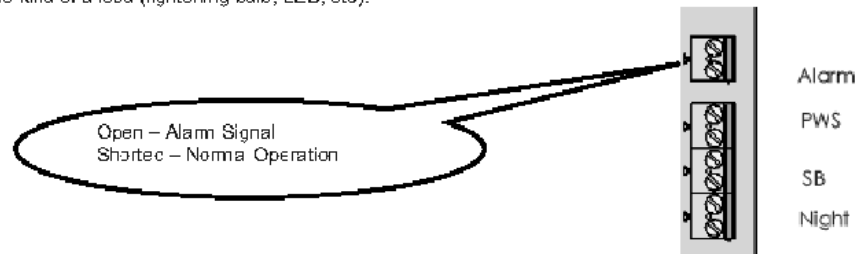
ADDITIONAL OPTIONS FOR 4-5HP (10-12.5KW) DCI UNITS ONLY

1.4 FEATURE SET UP WITH DRY CONTACTS (OUTPUT)

1.4.1 Alarm

The alarm dry contacts is used to indicate a problem or any malfunction of the system.

An internal relay is used to close an external circuit which may include an external power supply. The external circuit should include some kind of a load (lightening bulb, LED, etc).



When "Alarm" dry contact is open, alarm output will be activated when there is any ODU fault or protection.

Alarm output will turn off as soon as the fault is cleared.

Output specifications: Voltage – Max 24VAC/DC

Current – Max 3.0Amp

A wire of up to 1.5mm² is recommended to be used.

1.5 ACCESSORIES SET UP

1.5.1 BASE HEATER (BH)

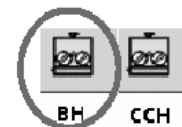
Base Heater is an heating element designed to melt any ice that is accumulated on the outdoor unit base during heating operation.

The unit will automatically detect the heater and operate unique operation logic to ensure operation only at freeze time.

Output specifications: Voltage – Max 240VAC

Current – Max 1.0Amp

A wire of up to 1.5mm² is recommended to be used



1.5.2 CRANK CASE HEATER (CCH)

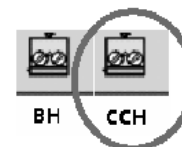
Crank Case Heater is an heating element designed to heat-up the compressor oil crank case during heating operation.

The unit will automatically detect the heater and operate unique operation logic to ensure operation only at freeze time.

Output specifications: Voltage – Max 240VAC

Current – Max 1.0Amp

A wire of up to 1.5mm² is recommended to be used



Check list before operation

CHECK THE DRAINAGE

Pour water into the drain tray-styrofoam.
Ensure that water flows out from drain hose of the indoor unit.

EVALUATION OF THE PERFORMANCE

Operate the unit at cooling mode and high fan speed 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.

CHECK ITEMS

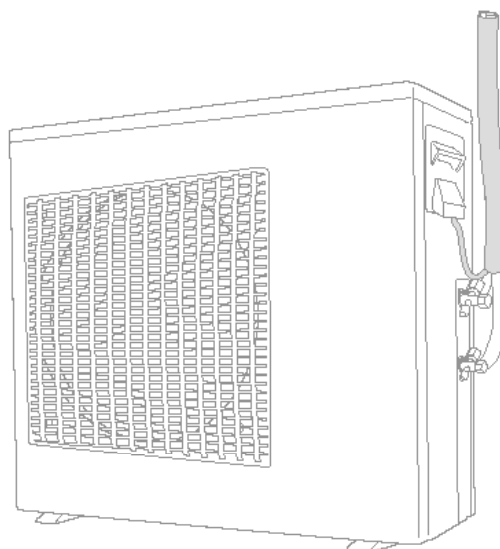
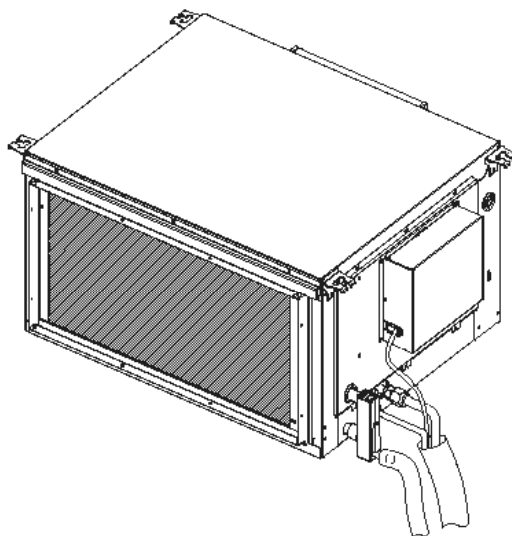
- | | |
|--|---|
| <input type="checkbox"/> Is there any gas leakage at flare nut connections? | <input type="checkbox"/> Is the indoor unit properly mounted to the ceiling? |
| <input type="checkbox"/> Has the heat insulation been carried out at flare nut connection? | <input type="checkbox"/> Is the power supply voltage complied with rated value? |
| <input type="checkbox"/> Is the connecting cable being fixed to terminal board firmly? | <input type="checkbox"/> Is there any abnormal sound? |
| <input type="checkbox"/> Is the connecting cable being clamped firmly? | <input type="checkbox"/> Is the cooling operation normal? |
| <input type="checkbox"/> Is the drainage OK?
(Refer to 'Check the drainage' section) | <input type="checkbox"/> Is the thermostat operation normal? |
| <input type="checkbox"/> Is the earth wire connection properly done? | <input type="checkbox"/> Is the remote control's LCD operation normal? |

AIR VOLUME/STATIC PRESSURE											
Static pr. (Pa)		15	20	30	40	50	60	70	80	90	100
Air Volume		(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)
5.0 kW	Elevé			1145	1120	1100	1080				
	Moyen	920	900	870	840						
	Faible	722	700	680							
6.0 kW	Elevé			1225	1200	1170	1145	1110			
	Moyen	875	865	850	830						
	Faible	710	700	680							
7.2 kW	Elevé			1310	1290	1260	1235	1220			
	Moyen		1115	1070	1035	985					
	Faible	890	875	850							
8.0 kW	Elevé				1410	1380	1350	1315	1275		
	Moyen			1155	1130	1100	1080				
	Faible	940	935	915	895						
10.0 kW	Elevé				2171	2136	2100	2058	2016	1974	1931
	Moyen			1877	1853	1834	1815	1798	1780		
	Faible		1436	1426	1415	1414					
12.5 kW	Elevé					2164	2127	2080	2033	1984	1935
	Moyen				1949	1915	1888	1854	1819		
	Faible			1616	1598	1580	1578				

Non working range area

CENTRAL AIR CONDITIONER WITH ELECTRONIC CONTROL

SPLIT SYSTEM SERIES DXV DCI



INSTALLATION INSTRUCTION

Getting started...

REQUIRED TOOLS LIST

1. Screw driver	8. Gas leak detector	15. Torque wrench
2. Electric drill, hole core drill (60 mm)	9. Measuring tape	18 Nm (1.8 kgf.m)
3. Hexagonal wrench	10. Thermometer	45 Nm (4.5 kgf.m)
4. Spanner	11. Megameter	65 Nm (6.5 kgf.m)
5. Pipe cutter	12. Multimeter	75 Nm (7.5 kgf.m)
6. Reamer	13. Vacuum pump	85 Nm (8.5 kgf.m)
7. Knife	14. Gauge manifold (for R-410A)	

ATTENTION

- Selection of the units location.
Select a location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
- Do not release refrigerant during piping work for installation, reinstallation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
- Installation work. It may need two people to carry out the installation work.
- Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.

SAFETY PRECAUTIONS

Read the following "SAFETY PRECAUTIONS" carefully before installation. Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.

The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

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

The items to be followed are classified by the symbols:



WARNING

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



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




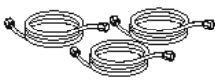




WARNING

- Use qualified installer and follow careful this instructions, otherwise it will cause electrical shock, water leakage, or aesthetic problem.
- Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
- For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough it will cause electrical shock or fire.
- Use the specified cable and connecting tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
- Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
- Before obtaining access to terminals, all supply circuits must be disconnected.
- When carrying out piping connection, take care not to let air substance other than the specified refrigerant go into refrigeration cycle, otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion or injury.
- Do not damage or use unspecified power supply cord. Otherwise, it will cause fire or electrical shock.
- Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.
- This equipment must be earthed. It may cause electrical shock if grounding is not perfect.
- Do not install the unit at place where leakage of flammable gas may occur. In case of leaks and accumulates at surrounding of the unit, it may cause fire.
- Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
- If supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

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Installation/Service Tooling for R410A		Changes
Gauge manifold		As the working pressure is high, it is impossible to measure the working pressure using conventional gauges. In order to prevent any other refrigerant from being charged, the port diameters have been changed.
Charge hose		In order to increase pressure resisting strength, hose materials and port sizes have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.
Electronic scale for refrigerant charging		As working pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal dia. 1/2, 5/8)		The size of opposing flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)		By increasing the clamp bar's receiving hole size, strength of spring in the tool has been improved.
Gauge for projection adjustment		Used when flare is made by conventional flare tool.
Vacuum pump adapter & check valve		Connected to a conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back into the charge hose. The charge hose connecting part has two ports -- one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector		Exclusive for HFC refrigerant.

Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U.S.'s ARI specified rose colour (ARI colour code: PMS 507). Also, the "charge port and packing for refrigerant cylinder" requires 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

CAUTION R410A Air Conditioner Installation

THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER. R410A refrigerant is apt to be affected by impurities such as water, oxidizing membrane, and oils because the working pressure of R410A refrigerant is approx. 1.6 times of refrigerant R22. Accompanied with the adoption of the new refrigerant, the refrigeration machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigeration machine oil does not enter into the new type refrigerant R410A air conditioner circuit. To prevent mixing of refrigerant or refrigerating machine oil, the sizes of connecting sections of charging port on main unit and installation tools are different from those used for the conventional refrigerant units. Accordingly, special tools are required for the new refrigerant (R410A) units. For connecting pipes, use new and clean piping materials with high pressure fittings made for R410A only.

Moreover, do not use the existing piping because there are some problems with pressure fittings and possible impurities in existing piping.

Do not vent R410A into atmosphere. R410A is a fluorinated greenhouse gas, covered by Kyoto Protocol, with a global warming potential (GWP) = 1725.

Changes In the product and components











In air conditioners using R410A, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch).

In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed. (for copper pipes with nominal dimensions 1/2 and 5/8).

In case of pipes welding please make sure to use dry Nitrogen inside the pipes.

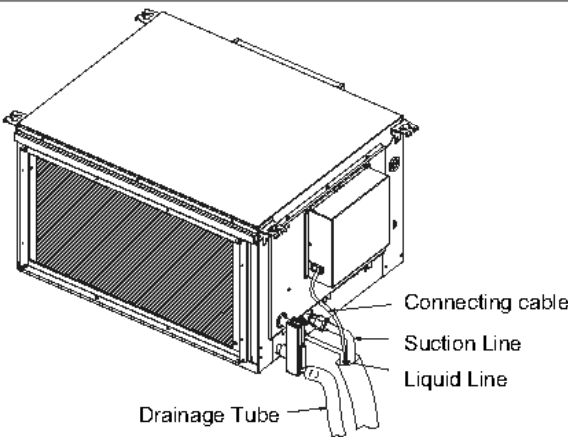
Use copper tube of special thickness for R410A: 1/4"-1/2" 0.8 mm
5/8"-3/4" 1 mm
7/8" 1.1 mm

ATTACHED ACCESSORIES

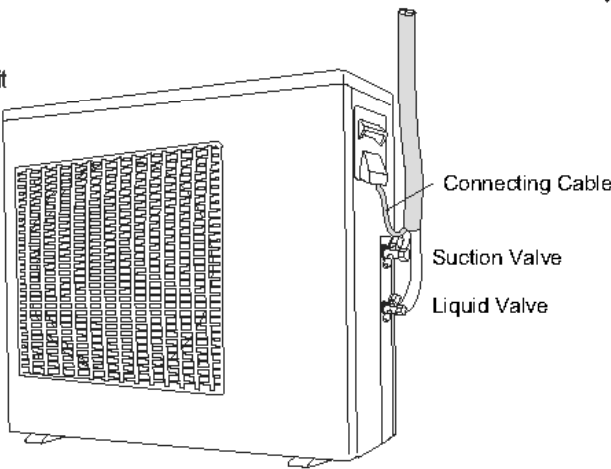
Description	Amount	Name	USE
	1	Technician's installation manual	Installation instructions
	1	Instruction manual for remote control	Operation instructions for remote
	1	Instruction manual for unit display	Operation instructions
	1	Remote control including batteries	Operating the air-conditioner
	1	Remote control bracket	Hanging the remote control on the wall
	1	Central control display	Operating and main working display
	4	Rubber mounting pads	Padding of the outdoor unit
	4	Tie - Wraps	Tightening the indoor and the outdoor units electrical cables
	4each	Dibbles - Screws - Washers	Installing bracket for remote control and central control display
	1	Drain elbow	Connecting drain hose to outdoor

GENERAL INFORMATION

Indoor Unit

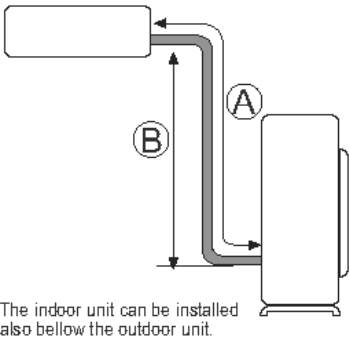


Outdoor Unit

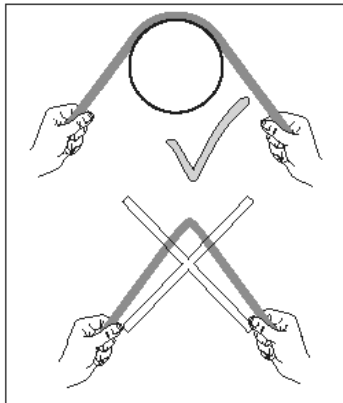


MAXIMUM PIPES LENGHT & HEIGHT			
NOMINAL CAPACITY	TUBES O.D.	LENGHT (A)	HEIGHT (B)
7.2 kW	3/8"-5/8"	50	25
8.0 kW	3/8"-5/8"	50	25
10.0 kW	3/8"-5/8"	70	30
12.5 kW	3/8"-3/4"	70	30
14.0 kW	3/8"-3/4"	70	30

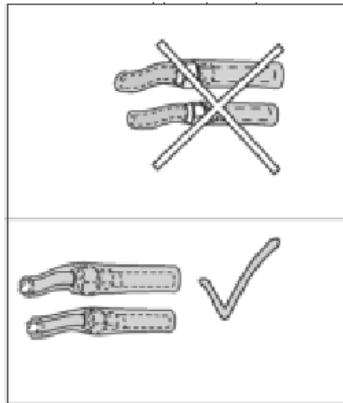
EXTERNAL STATIC PRESSURE		
NOMINAL CAPACITY	NOMINAL	MIN-MAX
7.2 kW	25	25-60
8.0 kW	25	25-80
10.0 kW	37	37-100
12.5 kW	50	50-100
14.0 kW	140	80-200



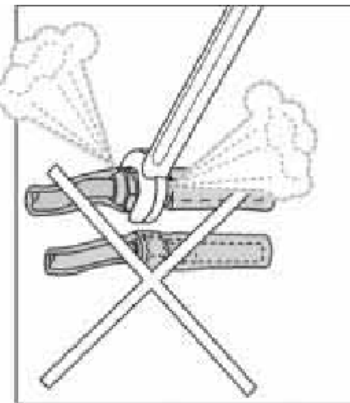
GENERAL PRECAUTIONS



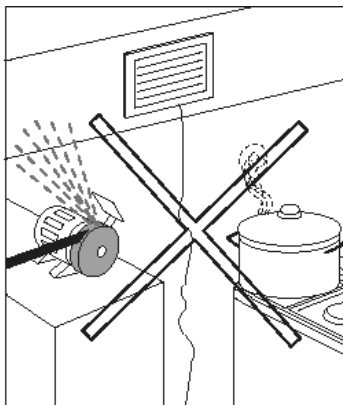
Always use the support of a large radius cylinder for bending the tubes, using pipe bending tools



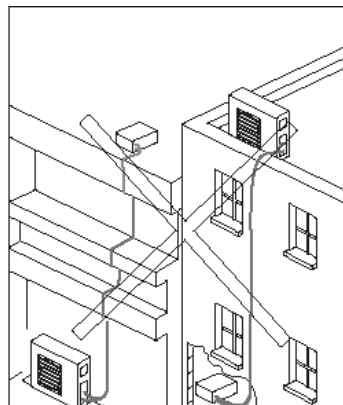
Do not leave nuts of gas tubes uncovered



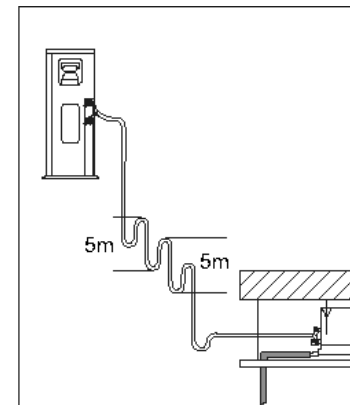
Do not untie gas tubes after installation



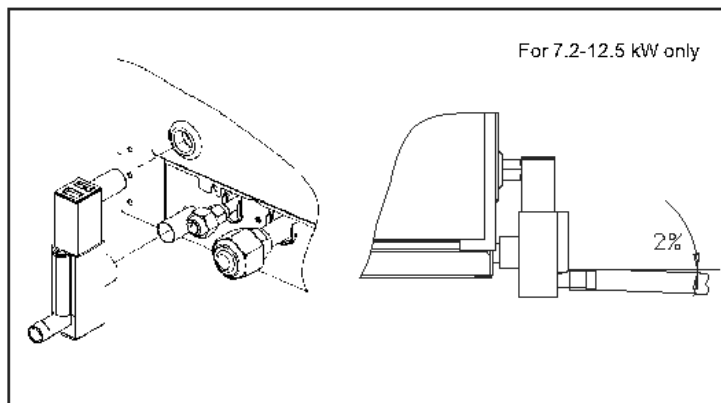
Avoid placing the indoor unit near water or oily mist.



Avoid pipes bending and keep pipes as short as possible.

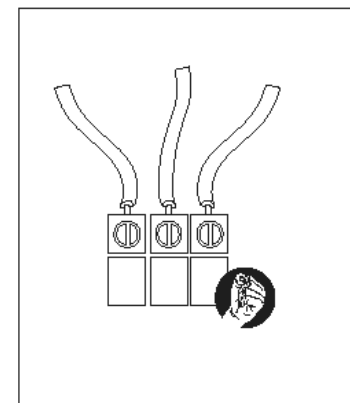


Oil trap for units up to 5Kw. In case the outdoor unit is under the indoor unit no trap is required



For assuring a correct operation of the draining system, pay attention to the following points:

- Draining tubes should be slanted down at an angle of at least 2° (see figure). Up slanting should be avoided to prevent liquid back-flow.
- Use always 16 mm diameter tube for draining.
- Install a draining siphon close to the unit (see figure)



Tighten electrical circuits cables

UNIT LOCATION

While selecting a place for the indoor unit:

- a. Allow max. air flow to the desired space

b. Allow max return air flow

c. Ensure adequate drainage of condensed water

d. Ensure noise reduction near bedrooms
- e. Leave a minimum 250 mm free space in front of the filter

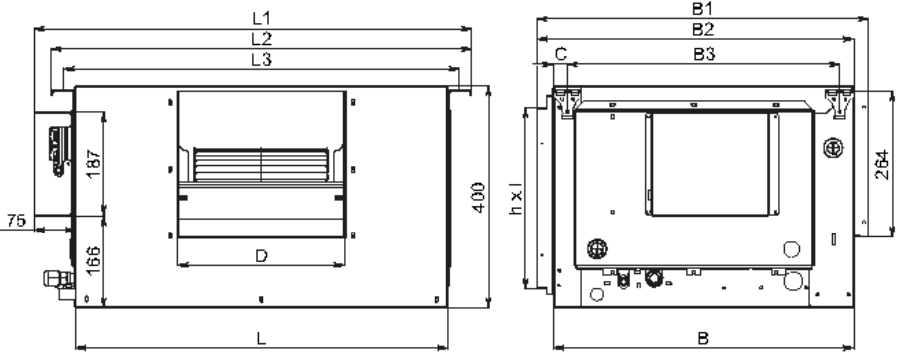
f. Allow a free service access to electrical box.

h. Allow easy access to the base of the indoor unit while providing enough space from the ceiling

i. Use serrated rubber under the unit and flexible joints to avoid resonance vibrations

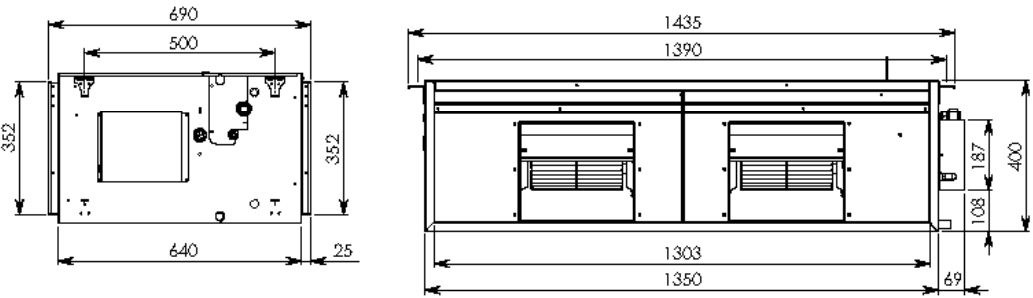
UNIT DIMENSION

7.2-12 kW Units



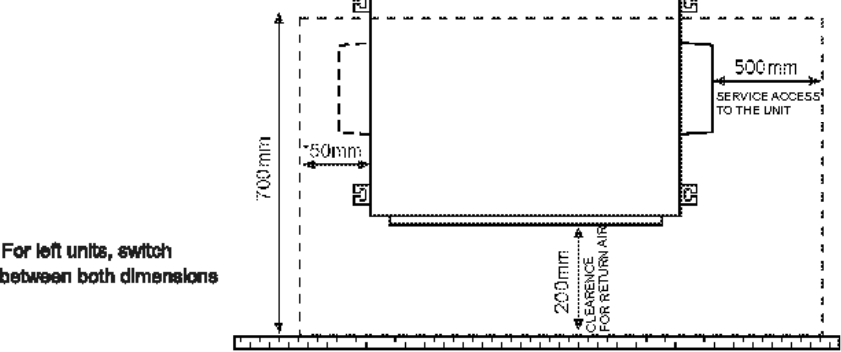
NOMINAL CAPACITY	L	L1	L2	L3	B	B1	B2	B3	C	D	h	l
7.2 - 10.0 kW	670	785	755	710	540	600	570	490	25	300	325	610
12.5 kW	1025	1145	1115	1085	640	700	670	370	155	360	350	995

14 kW Units



CLEARANCE AROUND THE UNIT

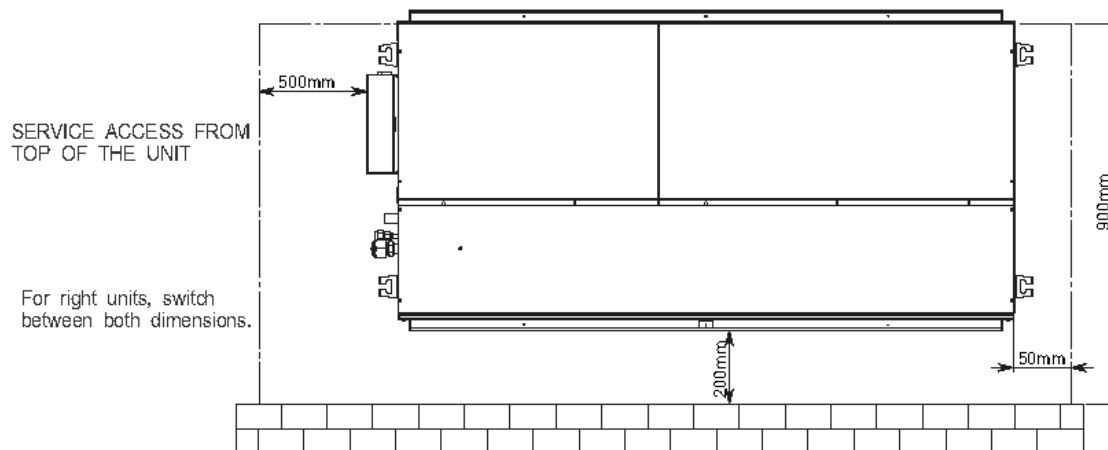
7.2-12.5 kW Units



* For left units, switch between both dimensions

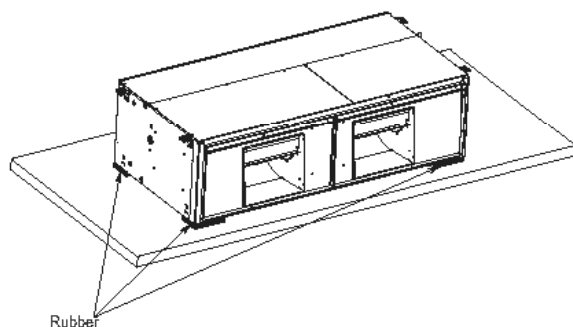
CLEARANCE AROUND THE UNIT

14.0 kW Unit

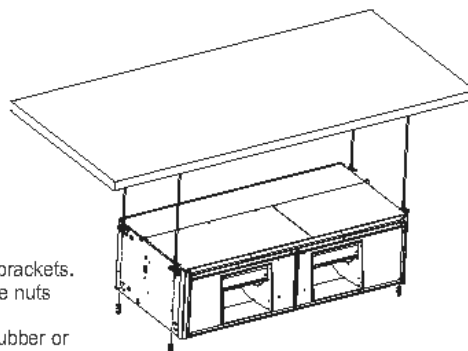


UNIT INSTALLATION

Floor Installation

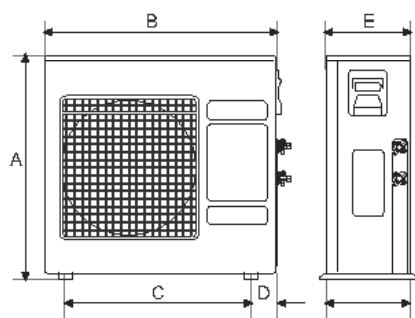


Ceiling Installation

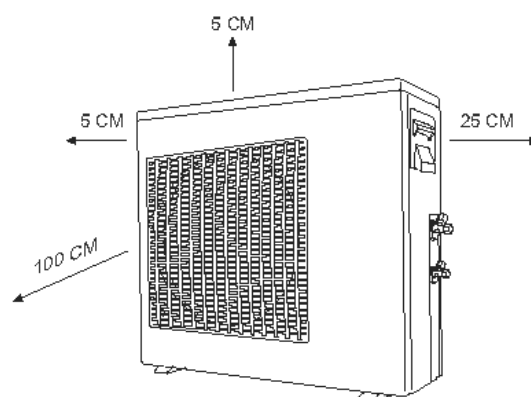


- Insert 4 M10 or 3/8 threads rods into the ceiling.
- Introduce the rods through the slots of unit suspension brackets.
- Position the shock absorbers, add washers and screw the nuts until the unit is firmly supported.
- In case of a gap between the unit and the ceiling, put a rubber or a neoprene sheet.

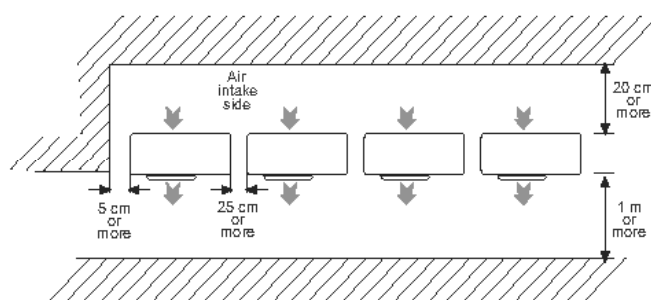
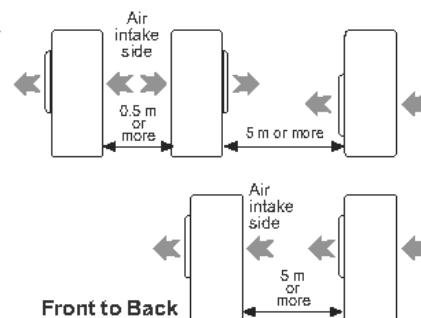
IMPORTANT The unit must be perfectly levelled.

OUTDOOR UNIT**UNIT DIMENSION**

NOMINAL CAPACITY	A	B	C	D	E	F
7.2-8.0 kW	835	950	527	212	340	378
10-14.0 kW	1250	900	705	97	340	357

CLEARANCES AROUND THE UNIT**SEVERAL OUTDOORS INSTALLATION**

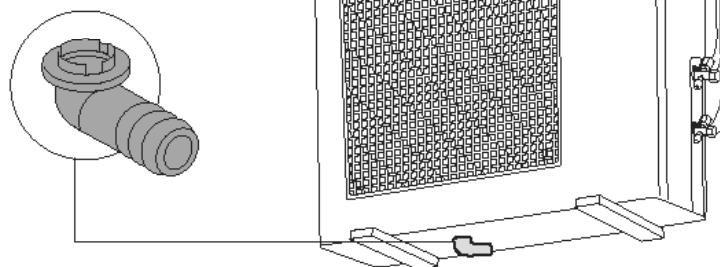
When installing several outdoors units, please take into account the air flow around the units and follow the minimum distance suggestions as shown in the diagrams below.

Row Installation**Back to Back Front to Front****DISPOSAL OF OUTDOOR UNIT DRAIN WATER**

In case of using a drain elbow, the unit should be placed on a stand at least 3 cm high.

Install the hose with a downward to allow smooth flow of draining water.

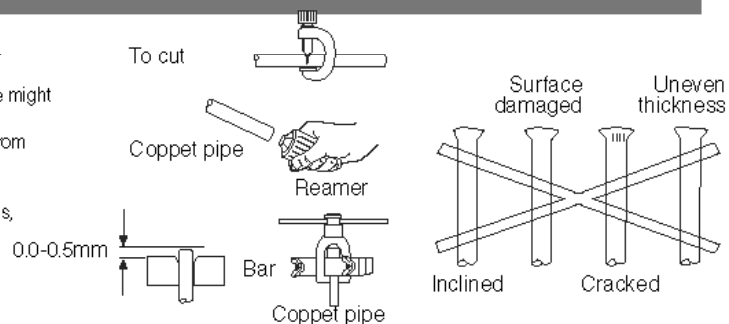
Use 16 mm I.D. tube or drainage.



PIPES CONNECTIONS

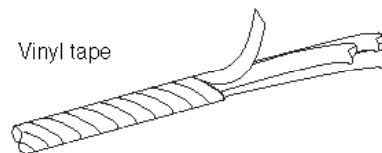
CUTTING AND FLARING THE PIPES

1. Please use the pipe cutter for cutting the pipes.
2. Remove all burrs by using reamer. Gas leakage might happen if burrs are not removed!
Turn pipes edge down to avoid metal powder from entering down the pipes.
3. After inserting the flare nut into the copper pipes, please make a flare.



PIPE INSULATION

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/ Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2. If drain hose or connecting pipes is in the room (where dew may form). Please increase the insulation by using POLY-E FOAM with thickness of 9 mm or more.



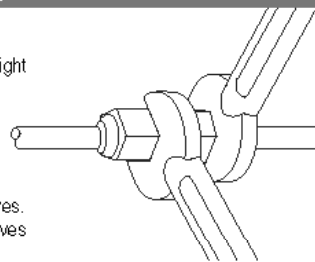
PIPES CONNECTIONS TO THE UNIT

Connecting to the Indoor unit

1. Align the center of the pipes and finger tight the flare nut.
2. Use the torque wrench to tighten the nut firmly.

Connecting to the outdoor unit

1. Align the center of the pipes to the valves.
2. Use the torque wrench to tighten the valves firmly according to table:

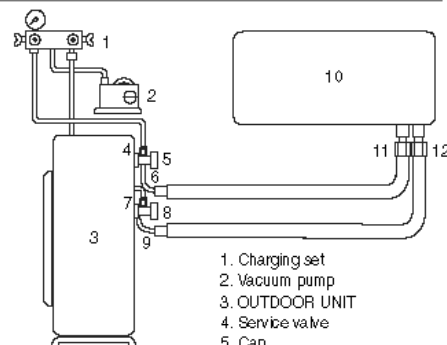


Torque(N.m)	1/4	3/8	1/2	5/8	3/4
Flare Nuts	13-18	40-45	60-65	70-75	80-85
Valve Cap	13-20	13-20	18-25	18-25	40-50
Service Port Cap	11-13	11-13	11-13	11-13	11-13

EVACUATION OF PIPES AND INDOOR UNIT

After connection the unions of the indoor and outdoor units, evacuate the air from the tubes and from the indoor unit as the follow

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 suction and liquid valves. Be sure to connect the end of the charging hose with the push pin to the service port.
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 (-76cm Hg). Let the pump run for fifteen minutes.
4. Close the valves of both the low and high sides of the charging set and turn off the vacuum pump. Note that the needle in the gauge should not move after approximately five minutes.
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 from both valves, and open them using a hexagonal Allen wrench.
7. Remove the valve caps from both valves, and open them using a hexagonal Allen wrench.
8. Remount valve caps onto both of the valves.
9. Check for gas leaks from the four unions and from the valve caps. Test with electronic leak detector or with a sponge immersed in soapy water for bubbles.



Sample

CAPACITY AND ADDITIONAL CHARGE FOR VARIOUS APPLICATIONS				
CONDENSER	PIPE SIZE	PIPE LENGTH	PIPE WEIGHT	ADDITIONAL CHARGE
1/2"	1/2"	100'	100'	100'
3/8"	3/8"	100'	100'	100'
1/4"	1/4"	100'	100'	100'
1/8"	1/8"	100'	100'	100'
1/16"	1/16"	100'	100'	100'
1/32"	1/32"	100'	100'	100'
1/64"	1/64"	100'	100'	100'
1/128"	1/128"	100'	100'	100'
1/256"	1/256"	100'	100'	100'
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ELECTRICAL CONNECTIONS**ELECTRICAL SPECIFICATIONS****POWER SUPPLY****230V / 50Hz / 1PH**

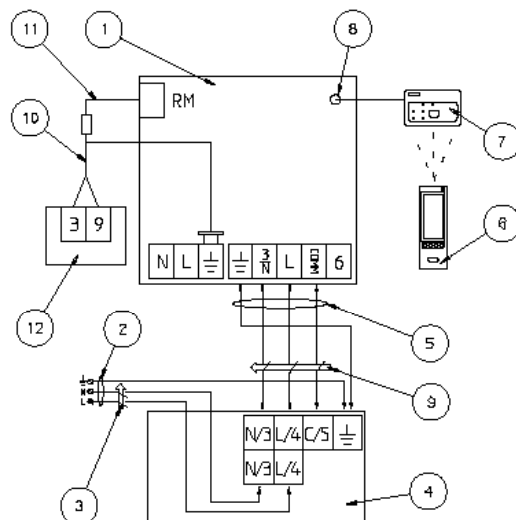
Electrical wiring and connections should be made by qualified electricians in accordance with local electrical codes and regulation. The air conditioner units must be grounded.

The air conditioner units must be connected to an adequate power outlet from a separated branch circuit protected by a time delay circuit breaker, as specified on units nameplate.

Voltage should not vary beyond $\pm 10\%$ of the rated voltage.

For all power supply connections to the outdoor unit, also for the connecting cable between indoor and outdoor unit, only HO5RN-F (80245 IEC 57) cable is to use. for the optional power supply on the indoor unit at least HO5VV-F (80227 IEC 53) is to use.

1. Prepare the multiple wire cable ends for connection.
2. Take away the indoor/outdoor cover and open the terminals, take away the cable clamp screw and turn over the cable clamp.
3. Connect the cable ends to the terminals of the indoor and outdoor units.
4. Connect the other end of the twin wire cable to the outdoor unit twin wire terminal.
5. Secure the multiple wire power cable with the cable clamps.
6. The cable between controller and indoor unit shall be fixed accordingly to local electrical requirements.

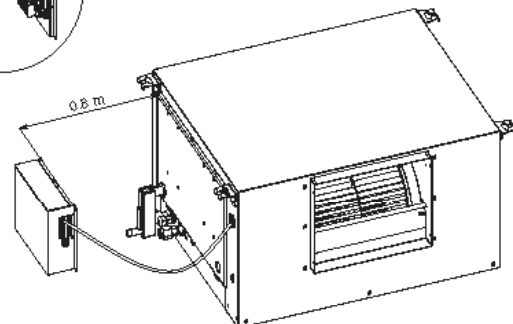
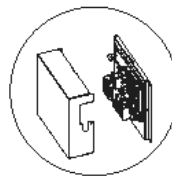
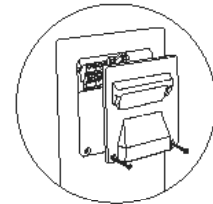
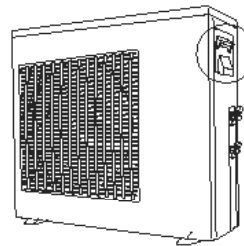
1PH Units Power supply to outdoor**(7.2, 8.0kW units)**

1. Indoor Unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting Cable (4x2.5mm²)
6. Wireless Remote Control
7. Display Unit
8. Display connector
9. Power Breaker (*by Installer)
10. Control Cable**
11. Sensor Wire with Connector
12. Room Temperature Sensor

* The power breaker must be of type that disconnects all poles with 3 mm contact opening.
 ** Use shielded cable and connect the shield to earth point.

1PH UNITS				
POWER SUPPLY TO OUTDOOR UNIT ONLY			POWER SUPPLY TO INDOOR UNIT	
NOMINAL CAPACITY	CIRCUIT BRAKER	POWER SUPPLY CABLE	CIRCUIT BRAKER	POWER SUPPLY CABLE
7.2kW	20A	3x2.5mm ²	NOT APPLICABLE	
8.0kW	20A	3x2.5mm ²		
10.0kW *	25A	3x4mm ²	10A	3x1.5mm ²
12.5kW *	32A	3x6mm ²		
14.0kW				

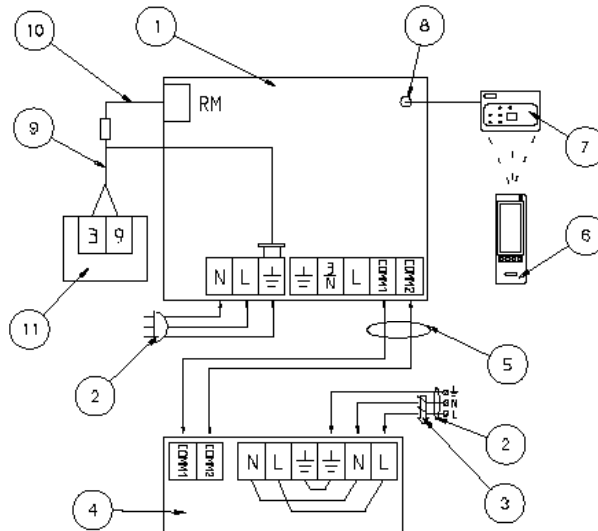
* Current can be set via display Board - see "Feature setup" paragraph



ELECTRICAL CONNECTIONS

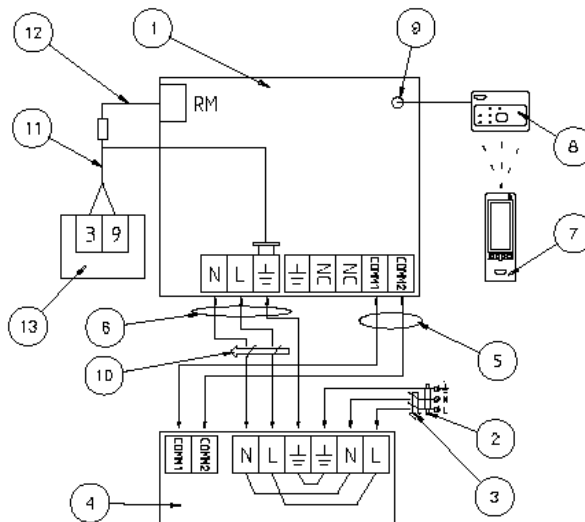
10.0, 12.5, 14.0 kW Units

1PH Units Power supply to both Outdoor and Indoor units



1. Indoor Unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting Cable (2x0.75mm²)**
6. Wireless Remote Control
7. Display Unit
8. Display connector
9. Control Cable**
10. Sensor Wire with Connector
11. Room Temperature Sensor

1PH Units Power supply to Outdoor unit



1. Indoor Unit
2. Power Supply Cable
3. Main Power Breaker
4. Outdoor Unit
5. Interconnecting Cable (2x0.75mm²)**
6. Power Interconnecting Cable (3x1.5mm²)
7. Wireless Remote Control
8. Display Unit
9. Display connector
10. Power Breaker (*by Installer)
11. Control Cable**
12. Sensor Wire with Connector
13. Room Temperature Sensor

* The power breaker must be of type that disconnects all poles with 3 mm contact opening.

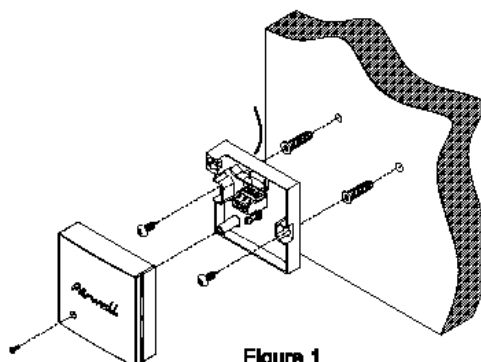
** Use shielded cable and connect the shield to earth point.

ELECTRICAL CONNECTIONS**Room Thermostat Installation Instructions****Supplied components list**

#	Item	QTY
1	Thermostat box	1
2	Shielded cable	1
3	Screws	2
4	Plugs	2

Choosing location of installation:

- Away from air drafts
- Away from direct sun light rays
- Average height – 1.5 meters above floor.
- Away from any heat source

**Figure 1**

1. Install the thermostat box on the wall according the above location preferences. See figure 1.
2. Connect the shielded cable supplied to the thermostat box into points 3 and 9 (non polarity).
3. Connect the other end of the cable to the Indoor unit main controller into the "RM" extension cable connector. Also connect the grounding fork terminal into the grounding terminal point. See electrical scheme in previous page.
4. Connect Earth at Indoor Unit only.

DISPLAY CONTROL UNIT

LOCATION CRITERIA

It is recommended to install the Display Control Unit close to a ceiling in a central and neutral zone at typical conditions. In addition, the aesthetic aspect should be considered. The Display Control Unit is connected to the main control board on the air conditioner (the indoor unit) by a communication cable. The cable is connected to the Display Control Unit by a quick-connector. (8 pin plug)

INSTALLATION OF DISPLAY CONTROL UNIT ON WALL

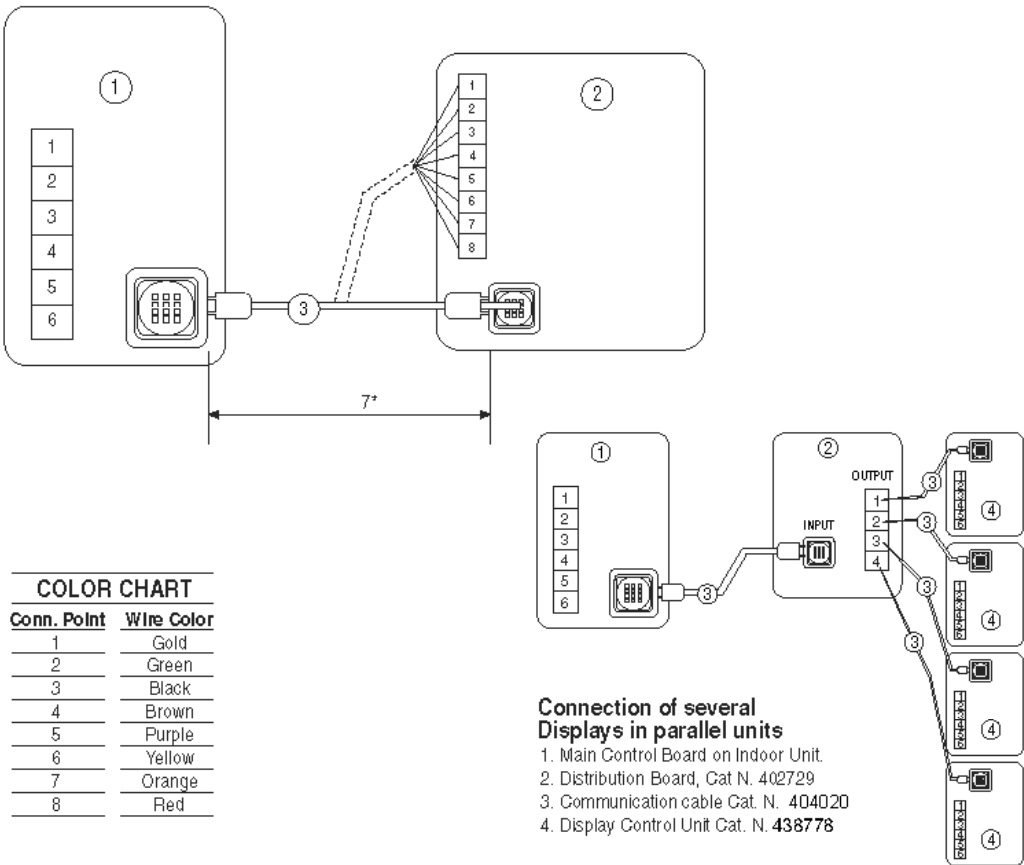
Drill a 12 mm diameter hole on the wall, for routing the communication cable
Open the unit cover, drill 3 holes in the wall to match the holes in the Display Control Unit, install the inserts and fasten the unit to the wall with 3 screws.
The Display Control Unit is provided of a special communication cable, 7 meters long, terminated by a plug, connected in the housing itself to a distribution box, which enables the control of the air conditioner from several different rooms, each one from its own Display Control Unit.
Connect the quick connector to the appropriate socket on the main control board in the indoor unit electrical box.



WARNING
The plug should not be cut off the communication cable if the cable length is insufficient. In such case, a 5-meter extension cable may be added.

CONSIDERATIONS IN LOCATING THE REMOTE CONTROL UNIT

- a) Locate the Remote Control Unit in such a way that when mounted on its support on the wall, it will be in line sight with the Display Control Unit (at less than 8 m).
- b) It is recommended to establish the final location of the Remote Control Unit only after the first operation, assuring proper transmission and reception between the Remote Control Unit and the Display Control Unit.



ADDITIONAL OPTIONS FOR 4-5-6 HP (10-14.0 KW) DCI UNITS ONLY

1. FEATURES SETUP

1.1. DISPLAY BOARD GENERAL DESCRIPTION

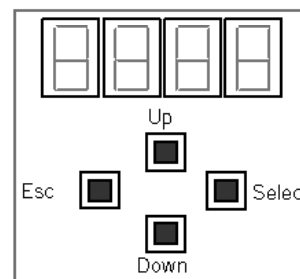
The display board serves as interface between the installer/technician and the A/C unit.

Buttons description:

Up & Down - used to scroll between options (up and down)

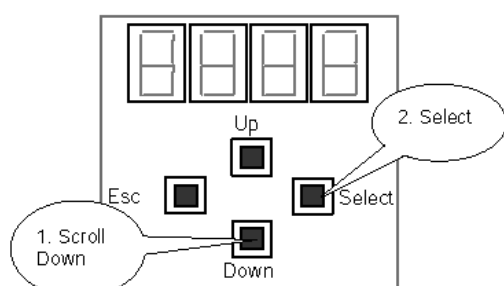
Select - used to select an option

Escape - Will go up one level in the menu



1.2. SET-UP

There are 2 types of current limitation for the maximum current drawn by the outdoor unit, one is to set maximum limit to the current and the other is to set power shedding limit. For both actions follow the below described procedure.



1. Scroll down the "Down" button until setup is displayed (Set) and then press the "Select" button.
2. Scroll down the "Down" button to choose the option required and press the "Select" button

Mode (Cl/Ht/Sb)		
Technician Test (tt)		
	-	Technician Test Cool (ttC)
	-	Technician Test Heat (ttH)
Diagnostics (dia)		
	-	Outdoor Unit (Odu)
	-	Indoor Unit (Idu)
Set Up (Set)		
	-	Indoor Unit Supply (IdSU)
	-	Max Current Limit (Curl)
	-	Power Shedding (PSC)

1.2.1 Maximum Current Limit

The maximum operating current of the unit can be selected by the table in order to reduce/increase the circuit breaker value. This operation will affect the maximum capacity of the unit.

The default values are: indoor unit supplied from outdoor unit ("OUT") and the current is 30A for 12.5kW unit and 25A for 10.0 kW unit.

Enter the Set Up menu by Scrolling down to "Set" and set the indoor unit supply (IdSU) parameter to either "Out" for external power supply for Indoor unit (via Outdoor unit) or "In" for supplying the indoor unit from separate internal circuit breaker.

Escape one time and scroll to "CURL".

Enter the value corresponding the max current as per the table.

Display	Max. Current setting	Circuit breaker
30_A	30A	32A
27_A	27A	30A/32A
23_A	23A	25A
18_A	18A	20A
14_A	14A	16A

1.2.2 Power Shedding Current Limit

The maximum operating current of the unit can be limited by setting the unit into power shedding mode which will control the unit up to pre-defined current percentage (out the max current). This operation will reduce the maximum capacity of the unit.

ADDITIONAL OPTIONS FOR 4-6 HP (10-14.0 KW) DCI UNITS ONLY

Activation of this feature is described in the next paragraph of "Dry Contacts".
The upper limit of the power consumption (Current) can be setup by the display board according to the table.
In order for this feature to become active you must shorten the "PWS" dry contact (see below procedure).
Enter the Set Up menu by Scrolling down to "Set" and set the power shedding control ("PSC") parameter according the table.

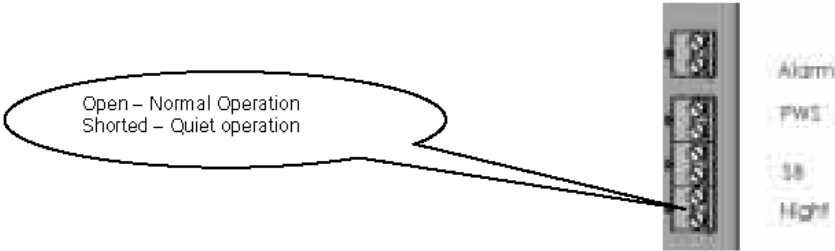
Display	Max. Current setting
50%	% of Max Current
60%	
70%	
80%	

1.3 FEATURE SET UP WITH DRY CONTACTS (INPUT)

The input dry contacts are used for controlling.
An external circuitry which may include a switch or a relay should be used for closing the internal circuit to indicate that some change is required.
A wire of up to 1.5mm² is recommended to be used.
Note: NO external power should be used in this case!

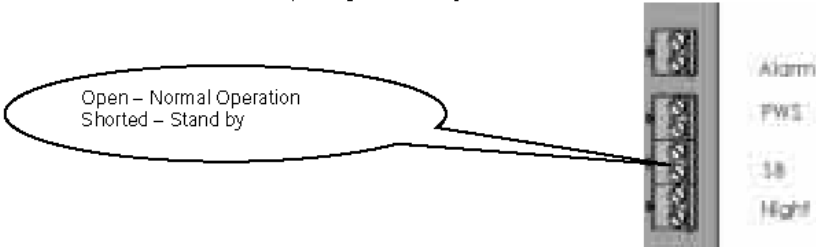
1.3.1 Night Mode quiet operation (Cool mode)

When "Night" dry contact is shorted, the unit will enter to a special mode and reduce the compressor and outdoor fans speed to allow quiet operation.



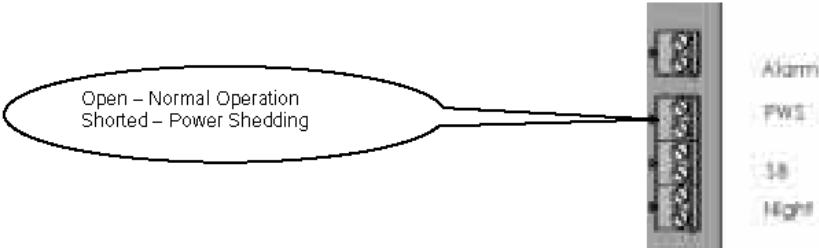
1.3.2 Stand-By

When "SR" dry contact is shorted, the unit will stop and go to stand by mode



1.3.3 Power Shedding

When "PWS" dry contact is shorted, the unit will limits its maximum power consumption according to a pre defined value.
This value can be changed via the display board (see above procedure).



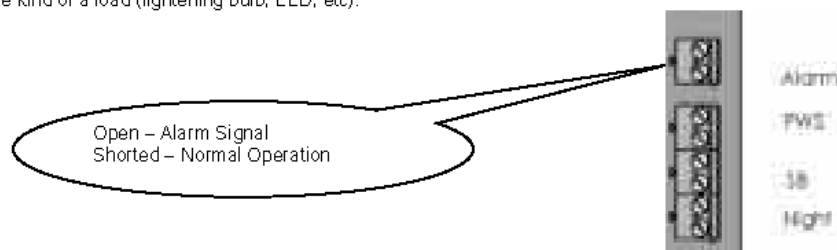
ADDITIONAL OPTIONS FOR 4-6 HP (10-14.0 KW) DCI UNITS ONLY

1.4 FEATURE SET UP WITH DRY CONTACTS (OUTPUT)

1.4.1 Alarm

The alarm dry contacts is used to indicate a problem or any malfunction of the system.

An internal relay is used to close an external circuit which may include an external power supply. The external circuit should include some kind of a load (lightening bulb, LED, etc).



When "Alarm" dry contact is open, alarm output will be activated when there is any ODU fault or protection.

Alarm output will turn off as soon as the fault is cleared.

Output specifications: Voltage – Max 24VAC/DC

Current – Max 3.0Amp

A wire of up to 1.5mm² is recommended to be used.

1.5 ACCESSORIES SET UP

1.5.1 BASE HEATER (BH)

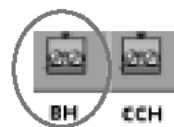
Base Heater is an heating element designed to melt any ice that is accumulated on the outdoor unit base during heating operation.

The unit will automatically detect the heater and operate unique operation logic to ensure operation only at freeze time.

Output specifications: Voltage – Max 240VAC

Current – Max 1.0Amp

A wire of up to 1.5mm² is recommended to be used



1.5.2 CRANK CASE HEATER (CCH)

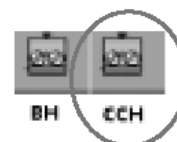
Crank Case Heater is an heating element designed to heat-up the compressor oil crank case during heating operation.

The unit will automatically detect the heater and operate unique operation logic to ensure operation only at freeze time.

Output specifications: Voltage – Max 240VAC

Current – Max 1.0Amp

A wire of up to 1.5mm² is recommended to be used



Note: Heaters should be orderd and provided safety approved by the manufacturer

Check list before operation

CHECK THE DRAINAGE

Pour water into the drain tray-styrofoam.

Ensure that water flows out from drain hose of the indoor unit.

EVALUATION OF THE PERFORMANCE

Operate the unit at cooling mode and high fan speed for fifteen min 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.

CHECK ITEMS

- | | |
|--|---|
| <input type="checkbox"/> Is there any gas leakage at flare nut connections? | <input type="checkbox"/> Is the indoor unit properly mounted to the ceiling? |
| <input type="checkbox"/> Has the heat insulation been carried out at flare nut connection? | <input type="checkbox"/> Is the power supply voltage complied with rated value? |
| <input type="checkbox"/> Is the connecting cable being fixed to terminal board firmly? | <input type="checkbox"/> Is there any abnormal sound? |
| <input type="checkbox"/> Is the connecting cable being clamped firmly? | <input type="checkbox"/> Is the cooling operation normal? |
| <input type="checkbox"/> Is the drainage OK?
(Refer to "Check the drainage" section) | <input type="checkbox"/> Is the thermostat operation normal? |
| <input type="checkbox"/> Is the earth wire connection properly done? | <input type="checkbox"/> Is the remote control's LCD operation normal? |

CARE AND MAINTENANCE



Caution!

Before any maintenance operation the unit should be disconnected from mains.

DISPLAY CLEANING

- Clean the unit with a dry, soft cloth
- Don't use warm water or solvents, in order to avoid damage to the external surfaces.

BEFORE OPERATING SEASON

- Make sure that no object obstacles return and exiting air flow, in both internal and external units.
- Make sure that the air conditioner is properly connected to mains.
- Remember that power is supplied to the external unit through the internal unit.

PROTECTION FOR THE ELECTRONIC SYSTEM

- The distance between remote control unit and any electrical appliance should be at least 1 m.

AIR VOLUME / STATIC PRESSURE

Static pr. (Pa)		20	30	40	50	60	70	80	9	1 0
Air Volume		(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)	(M³/Hr)
7.2 kW	High	1461	1382	1278	1173	1068	995			
	Low	1196	1150	1076	1001	927				
8.0 kW	High			1763	1739	1714	1691	1667		
	Med		1572	1550	1529	1507	1486			
	Low	1300	1282	1264	1247					
10.0 kW	High			1971	1936	1900	1870	1840	1796	1752
	Med		1845	1814	1783	1752	1711	1671	1638	
	Low	1447	1412	1377	1342	1307				
12.5 kW	High				2498	2464	2440	2416	2344	2272
	Med			2112	2081	2051	2005	1958		
	Low	1735	1710	1671	1631					

AIR VOLUME / STATIC PRESSURE

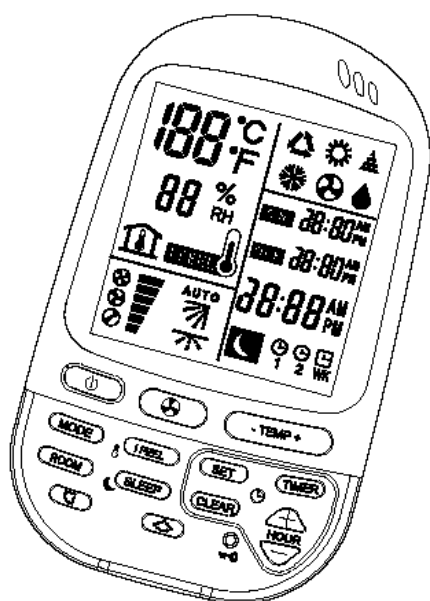
Static pr. (Pa)		80	90	100	110	120	130	140	150	160	170	180	190	200
Air Volume		M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr	M³/Hr
14.0 kW	High							3265	3170	3075	2995	2910	2835	2760
	Med					3070	2980	2885	2835	2785	2670	2555		
	Low	2430	2370	2305	2230	2150								



Non working range area

REMOTE CONTROL MANUAL

ENGLISH



CONTENT

PRECAUTIONS1-2

USING THE REMOTE
CONTROL UNIT3

OPERATION4-10



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

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

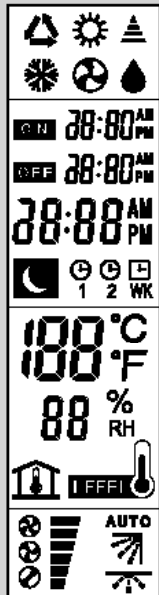
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PRECAUTIONS

DISPLAY

Information are displayed when the remote control unit is switched on.

Operation Mode



- Automatic
- Heating
- Cooling
- Fan only
- Dehumidification (dry)
- Displayed when data transmitted Or remote control unit lock
- Shows the type of timer
- Clock (hours and minutes)
- Displayed when the timer on is set and activated
- Displayed when the timer off is set and activated
- Displayed in Sleep Mode Operation
- Set temperature or room temperature
- Displayed when the temperature is the room temperature
- Indicate that the air conditioner is operating in I FEEL mode
- Automatic horizontal air flow oscillation switched on (option)
- Automatic flap oscillation switched on

Fan speed indication

- Automatic fan speed
- Low speed
- Medium speed
- High speed

ON/OFF OPERATION BUTTON

This button turns the air conditioner ON and OFF.

MODE SELECTOR BUTTON

Press this button to modify the air conditioner mode.

(automatic) ★

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the "cool" or "heat" mode.

(heating)

The air conditioner makes the room warmer.

dehumidification (dry)

The air conditioner reduces the humidity in the room.

(cooling)

The air conditioner makes the room cooler.

(fan)

The air conditioner circulate the air.

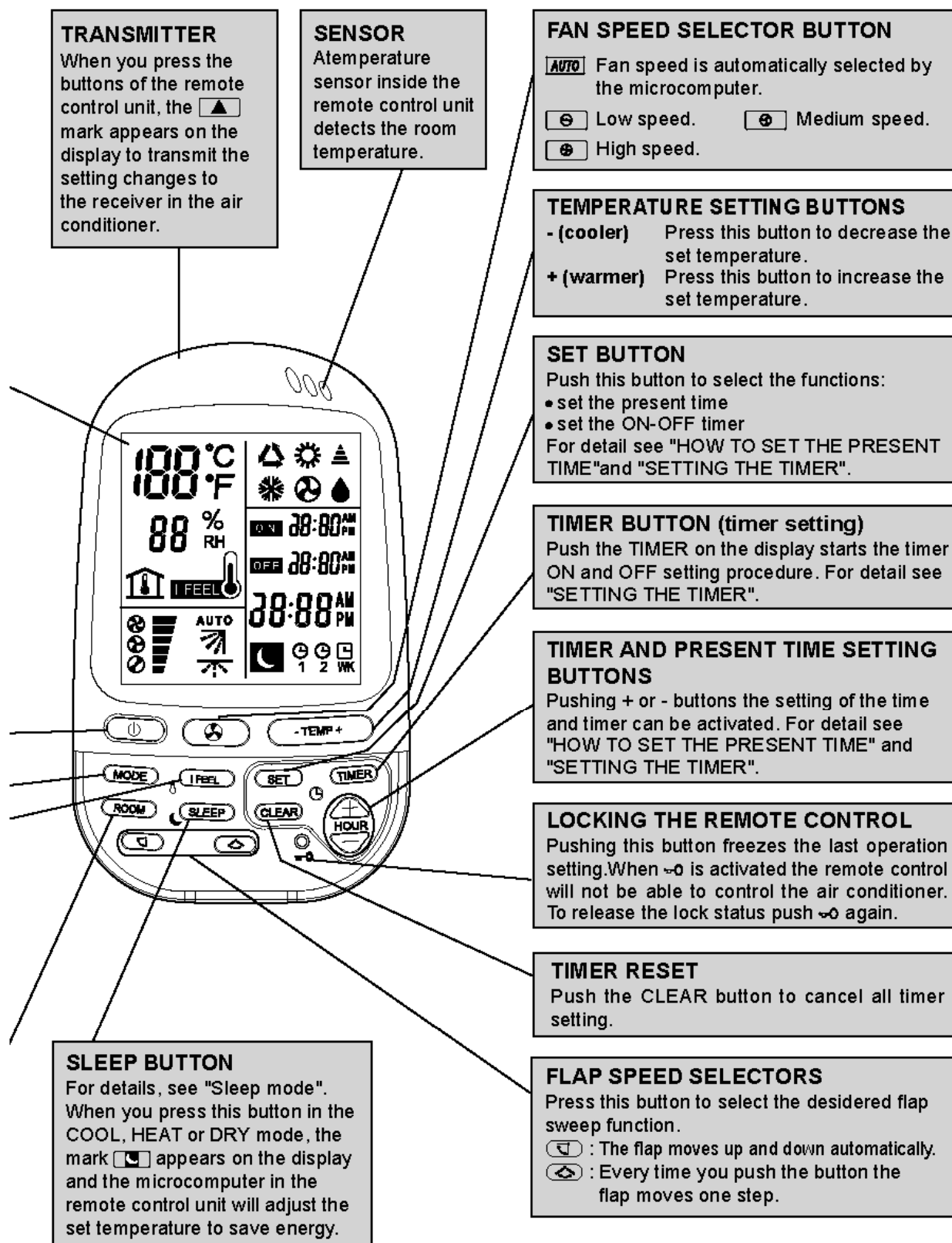
★ **COOL / DRY / HEAT / FAN Models**

TEMPERATURE SENSOR SELECTOR

Push IFEEL button to activate the temperature control in the remote control unit. This function provides a more comfortable temperature control.

ROOM TEMPERATURE

Push the ROOM button to show the actual room temperature around the remote control.



USING THE REMOTE CONTROL UNIT

HOW TO INSTALL BATTERIES

- Remove the lid in the rear part of the remote control unit.
- Insert two AAA alkaline batteries of 1,5 V-DC. Make sure the batteries point in the direction marked in the battery compartment.
- The batteries last about six months. Depending on how much you use the remote control unit. Remove the batteries if you do not use the remote control unit for more than one month. Press the +, -, SET and CLEAR buttons together after batteries replacement. (This operation allows you to reset correctly all the programs. The remote control unit is to be set up again).
Replace the batteries when the remote control unit lamp fails to light, or when the air conditioner does not receive the remote control unit signals.
- The batteries of the remote control contain polluted substances exhausted batteries must be disposed according to the laws in force.

TEMPERATURE SENSOR SELECTOR

- Under normal conditions the room temperature is detected and checked by the temperature sensor placed in the air conditioner.
- Press the remote control I FEEL button to activate the temperature sensor placed in the remote control. This function is designed to provide a personalised environment by transmitting the temperature control command from the location next to you. Therefore, in using this function, the remote control should always be aimed, without obstruction, at the air conditioner.

NOTE

The remote control unit sends the temperature signal to the air conditioner regularly at two minute intervals. If the signal from the remote control unit stops for more than five minutes due to some troubles, the air conditioner will switch to the temperature sensor which is built into the indoor unit and controls the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected in the air conditioner position.

OPERATION WITH THE REMOTE CONTROL UNIT

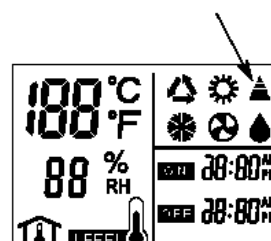


Caution

Check that the circuit breaker on the power panel is turned ON and the STANDBY lamp is light up. When using the remote control unit, always point the unit transmitter head directly at the air conditioner receiver.

HOW TO TURN ON THE AIR CONDITIONER

Press the ON/OFF button to turn the air conditioner on. The indicator OPERATION will light up, indicating the unit is in operation.



REMOTE CONTROL
UNIT DISPLAY


OPERATION

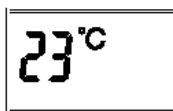
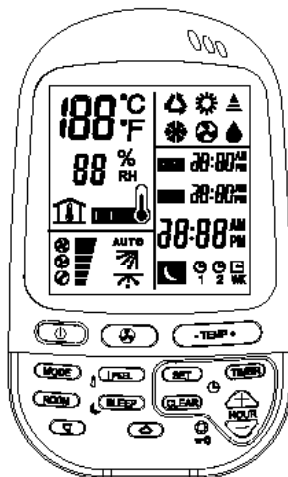
HOW TO SET THE PRESENT TIME

1. Press the SET button for five seconds. The time indication alone flashes.
2. Press the + or - buttons until the present time is displayed.
3. Press the SET button to stop the indication flashing.

COOLING

Verify that the unit is connected to the main power and the STANDBY lamp is light up.


1. Set the MODE selector to COOL .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30°C max. and 16°C min.).

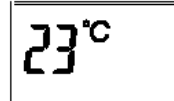


THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired(see adjustment of air flow). Make sure that the remote control is switched on.

HEATING

1. Set the MODE selector to HEAT .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).



THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired(see adjustment of air flow). Make sure that the remote control is switched on.

NOTE

For several minutes after the start of heating operation, the indoor fan will not run until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating.

• DEFROSTING OF HEAT EXCHANGE OUT DOOR UNIT "STANDBY"


When the outdoor temperature is low, frost or ice may appear on the heat exchanger coil, reducing the heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan in the indoor unit stops and the OPERATION lamp is flashing until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending on the room and outdoor temperature).

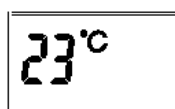
• HEATING PERFORMANCE

A heat pump conditioner heats a room by taking heat from outside air. The heating efficiency will fall off when the outdoor temperature is very low. If enough heat is not obtained with this air conditioner, use another heating appliance in conjunction with it.

OPERATION

AUTOMATIC OPERATION


1. Set the MODE selector to AUTO .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).

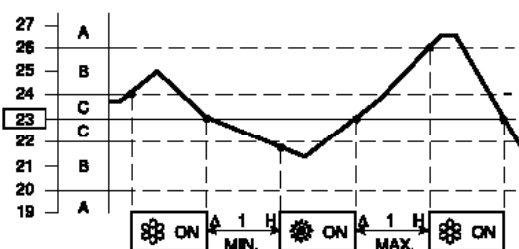


THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the COOL or HEAT mode as appropriate.

4. Switch the FAN SPEED selector button to the setting you want.

Example of operation diagram in the  (Auto) mode with the set room temperature at 23°C.




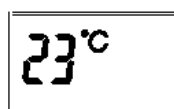
NOTE

The air conditioner changes the operation mode (from cool to heat), if one of the following conditions occurs:

- **ZONE A:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 3°C..
- **ZONE B:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 1°C, one hour after the compressor stop.
- **ZONE C:** never changes if the difference between the room temperature and the temperature set on the remote control unit is no more than 1°C.

DEHUMIDIFYING (DRY)

1. Set the MODE selector switch to "DRY" .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).




THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

NOTE

- Use DRY operation when you want to reduce the humidity in the room.
- Once the room temperature reaches the set level, the unit repeats the cycle of turning on and off automatically.
- During DRY operation, the fan speed is automatically set to low or stops to prevent overcooling.
- Dry operation is not possible if the indoor temperature is 15 °C or less.

FAN ONLY

If you want to make air circulate without any temperature control, follow these steps:

1. Set the MODE selector switch to "FAN" .
2. Press the ON/OFF button and switch the air conditioner ON.

OPERATION

ADJUSTING THE FAN SPEED

• AUTOMATIC

Simply set the FAN SPEED selector to the **AUTO** position. A microcomputer automatically controls the fan speed when the AUTO mode is selected. When the air conditioner starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

NOTE

In FAN Only mode the fan speed is adjusted automatically as in cooling mode.





WHEN DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET TEMPERATURE IS		FAN SPEED
Cooling and dehumidifying modes:	2 °C and over	High
	Between 2 and 1 °C	Medium
	Below 1 °C	Low
Heating mode:	2 °C and over	High
	Below 2 °C	Medium

The above mentioned data make reference to the conditioner operating when the sensor on the remote control unit is ON. If the sensor on the indoor unit is being used then actual operation will slightly differ from that described in the above tables.

• MANUAL


If you want to manually adjust speed just set the FAN SPEED selector as desired.

Each time the button is pressed, the fan speed is changed in sequence:

 (Lo) →  (Med) →  (Hi) →  (AUTO)

SLEEP MODE

The SLEEP mode enables you to save energy.

1. Set the MODE selector to cool, dry or heat.
2. Press the SLEEP button.
3. The  mark appears on the display. Press the SLEEP button again to release the SLEEP function.

What does the SLEEP mode mean?

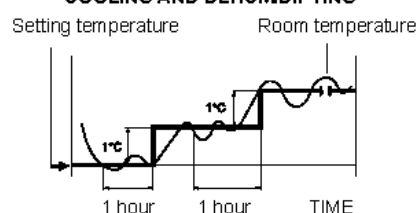


In this mode, the air conditioner will cool or heat the room to the set temperature, and then the thermostat will make the unit pause. After about 1 hour, the air conditioner will automatically reset the set temperature as follows (also refer to graphs).

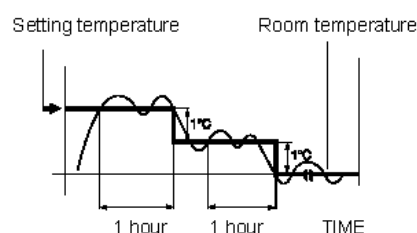
OPERATING MODE	SET TEMPERATURE CHANGE
Heating	Lowered by 1 °C
Cooling and Dehumidifying	Raised by 1 °C

When the room temperature reaches the new set value, the thermostat will cause the unit to pause. After about 1 hour the temperature will be raised by 1 °C in cooling, or lowered by 1 °C in heating. This enables you to save energy without sacrificing your comfort.

COOLING AND DEHUMIDIFYING




HEATING




OPERATION

I FEEL TEMP FUNCTION OPERATION

Press button IFEEL to activate the IFEEL function. Thermometer sign will appear on the LCD operation display . Select suitable temperature setting. Make sure that the remote control unit is aimed at the air conditioner, with the IFEEL sensor in front. Prevent the IFEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the wrong temperature data, thereby disturbing the performance of the IFEEL function.

ROOM TEMP FUNCTION OPERATION


Press the ROOM button to show the actual room temperature around the remote control unit. The measured room temperature and the room temperature sign  will be displayed. To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM Temperature button.
- Change of MODE button.

NOTE

Room temperature range is between 6 and 36 in 1 increments. Display should show "HI" or "LO" to represent temperature that is above 36 or below 6.

LOCK FUNCTION

By pressing LOCK button, the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign  will be on.

SETTING THE TIMER

There are four timers that can be selected on the remote control. Two daily timers (designated as T1, T2), and two optional weekend timers (designated as WKT1, WKT2). Each timer can be selected by pressing TIMER button.

The daily timers T1 and T2 can be set for ON and OFF separately for two different time periods.

Timer setting will not change until new setting is input.

The weekend timers WKT1 and WKT2 can be set for ON and OFF separately for two different time periods and they are effective two days only. These timers will be effective on the day of setting and on the day after only.

At 24:00 on the second day, the WK timer will not be effective anymore and the daily timer will be effective again.

WKT1 - effective on the setting day

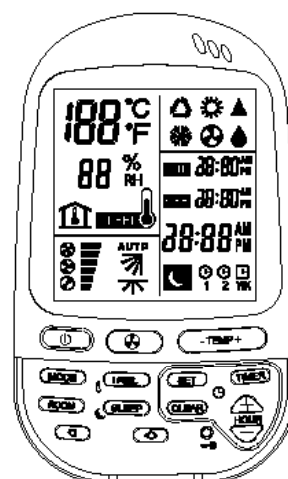
WKT2 - effective one day after the setting day.

NOTE:

1. During the weekend timer operation, the daily timers will be disabled.
2. The WK timers must be reactivated before every weekend.

A) HOW TO SET THE ON TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



OPERATION

B) HOW TO SET THE OFF TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the OFF sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



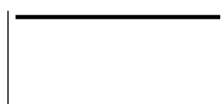
C) HOW TO SET A PROGRAM FOR DAILY ON/OFF OPERATION

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button again, the OFF sign blinks.
5. Press the + or - (HOUR) button until the desired value is displayed.
6. Press the SET button to activate the timer.



D) HOW TO CLEAR THE TIMER

1. Press the TIMER button to select the timer.
2. Press the CLEAR button if you want that every timer operation will be cleared.



NOTE

If the procedure to set the timer is not completed, by pushing the SET button, within 15 seconds the timer operation will be cancelled and the last set-up is restored.

ADJUSTING THE AIR FLOW DIRECTION

HORIZONTAL (manual)

The horizontal air flow can be adjusted by moving the vertical vanes to the left or right, as indicated in the following figures.

VERTICAL (with remote control unit)

The remote control gives you the possibility to control the flap in two way:

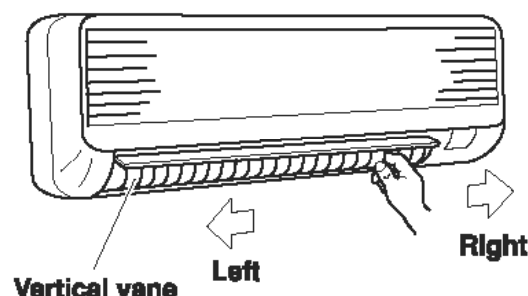
1. Push the button to start the flap sweep. If you push again the flap stops immediately.
2. Push the button to move the flap step by step. Or activate the horizontal air flow option is selectable via switch.

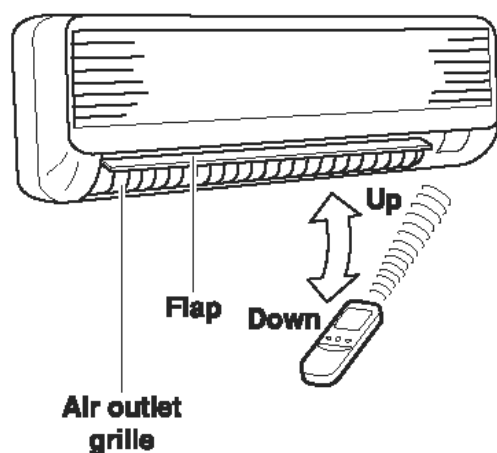


Set vertical vanes to the front position during COOLING/DRY operation if humidity is high. If the vertical vanes are set to the left-most or right-most position, condensation will form around the air outlet and drip off.



Do not move the flap with your hands when the air conditioner is running.





Caution

Use the FLAP button on the remote control to adjust the position of the flap. If you move the flap by hand, the factual flap position and the flap position on the remote control may no longer match. If this should happen, shut off the unit, wait for the flap to close, and then turn on the unit again; the flap position will now be normal again.

Do not have the flap pointed down during cooling operation. Condensation may begin to form around the air vent and drip down.

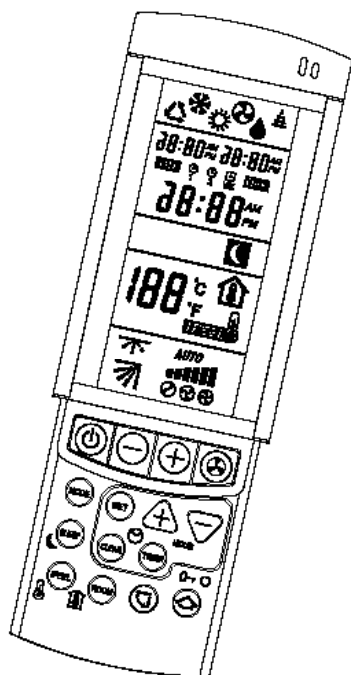
NOTES

The flap automatically closes when the unit is off.

During the heating operation, the fan speed will be very low and the flap will be in the horizontal position until the air being blown out of the unit begins to warm. Once the air warms up, the flap position and fan speed change to the settings specified with the remote control.

REMOTE CONTROL MANUAL

ENGLISH



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PRECAUTIONS1-2

USING THE REMOTE
CONTROL UNIT3

OPERATION4-9



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

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

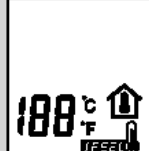
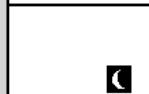
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PRECAUTIONS

DISPLAY

Information are displayed when the remote control unit is switched on.

Operation Mode



- Automatic
- Heating
- Cooling
- Fan only
- Dehumidification (dry)
- Displayed when data transmitted Or remote control unit lock
- Shows the type of timer
- Clock (hours and minutes)
- Displayed when the timer on is set and activated
- Displayed when the timer off is set and activated
- Displayed in Sleep Mode Operation
- Set temperature or room temperature
- Displayed when the temperature is the room temperature
- Indicate that the air conditioner is operating in I FEEL mode
- Automatic horizontal air flow oscillation switched on (option)
- Automatic flap oscillation switched on

Fan speed indication

- Automatic fan speed
- Low speed
- Medium speed
- High speed

ON/OFF OPERATION BUTTON

This button turns the air conditioner ON and OFF.

MODE SELECTOR BUTTON

Press this button to modify the air conditioner mode.

(automatic) ★

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the "cool" or "heat" mode.

(heating)

The air conditioner makes the room warmer.

dehumidification (dry)

The air conditioner reduces the humidity in the room.

(cooling)

The air conditioner makes the room cooler.

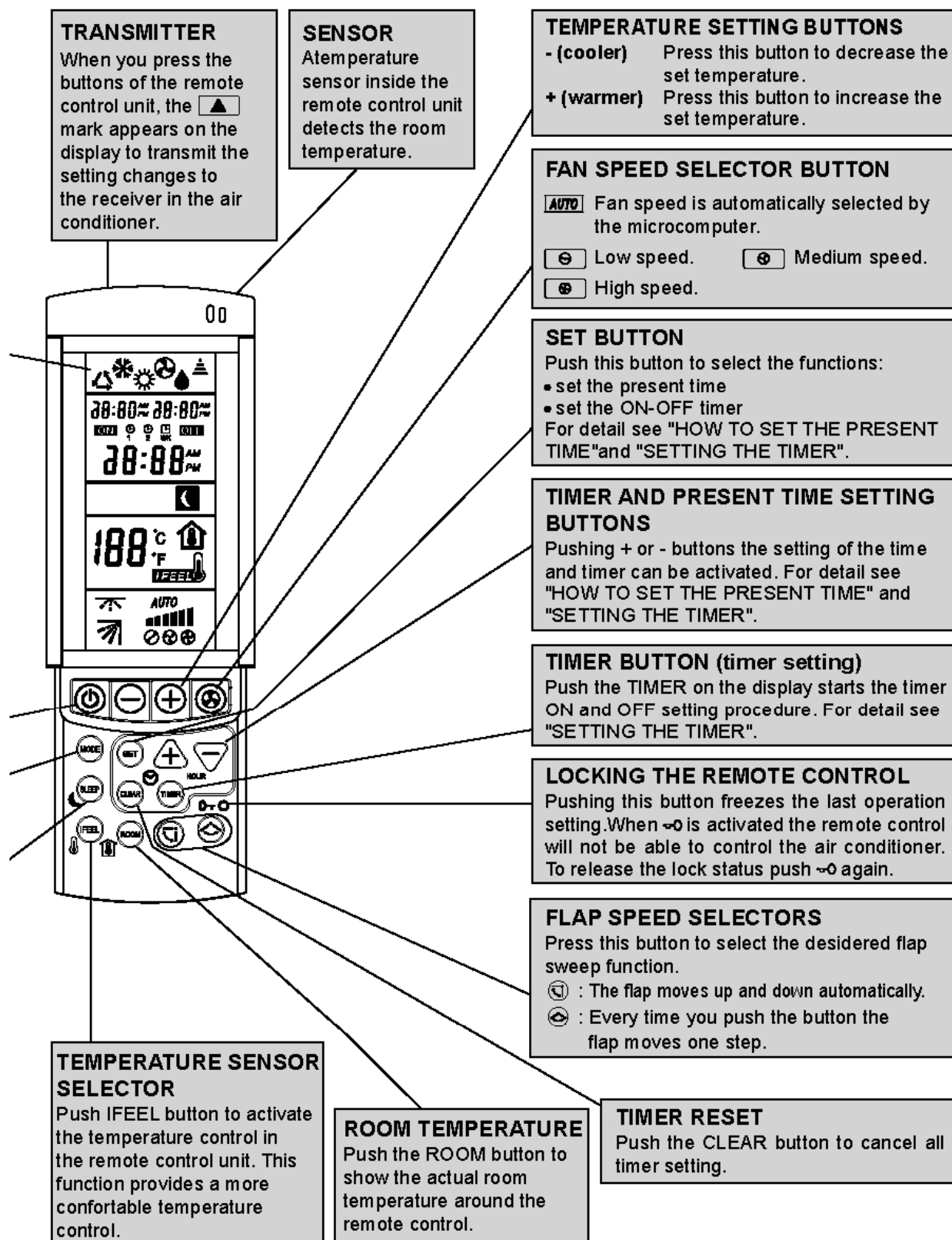
(fan)

The air conditioner circulate the air.

★ **COOL / DRY / HEAT / FAN Models**

SLEEP BUTTON

For details, see "Sleep mode". When you press this button in the COOL, HEAT or DRY mode, the mark appears on the display and the microcomputer in the remote control unit will adjust the set temperature to save energy.



USING THE REMOTE CONTROL UNIT

HOW TO INSTALL BATTERIES

- Remove the lid in the rear part of the remote control unit.
- Insert two AAA alkaline batteries of 1,5 V-DC. Make sure the batteries point in the direction marked in the battery compartment.
- The batteries last about six months. Depending on how much you use the remote control unit. Remove the batteries if you do not use the remote control unit for more than one month. Press the +, -, SET and CLEAR buttons together after batteries replacement. (This operation allows you to reset correctly all the programs. The remote control unit is to be set up again).
Replace the batteries when the remote control unit lamp fails to light, or when the air conditioner does not receive the remote control unit signals.
- The batteries of the remote control contain polluted substances exhausted batteries must be disposed according to the laws in force.

TEMPERATURE SENSOR SELECTOR

- Under normal conditions the room temperature is detected and checked by the temperature sensor placed in the air conditioner.
- Press the remote control I FEEL button to activate the temperature sensor placed in the remote control. This function is designed to provide a personalised environment by transmitting the temperature control command from the location next to you. Therefore, in using this function, the remote control should always be aimed, without obstruction, at the air conditioner.

NOTE

The remote control unit sends the temperature signal to the air conditioner regularly at two minute intervals. If the signal from the remote control unit stops for more than five minutes due to some troubles, the air conditioner will switch to the temperature sensor which is built into the indoor unit and controls the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected in the air conditioner position.

OPERATION WITH THE REMOTE CONTROL UNIT



Caution

Check that the circuit breaker on the power panel is turned ON and the STANDBY lamp is light up. When using the remote control unit, always point the unit transmitter head directly at the air conditioner receiver.

HOW TO TURN ON THE AIR CONDITIONER

Press the ON/OFF button to turn the air conditioner on. The indicator OPERATION will light up, indicating the unit is in operation.



REMOTE CONTROL
UNIT DISPLAY


OPERATION

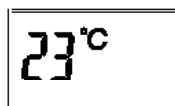
HOW TO SET THE PRESENT TIME

1. Press the SET button for five seconds. The time indication alone flashes.
2. Press the + or - buttons until the present time is displayed.
3. Press the SET button to stop the indication flashing.

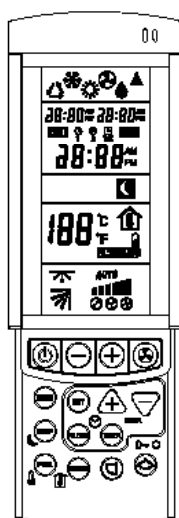
COOLING

Verify that the unit is connected to the main power and the STANDBY lamp is light up.

1. Set the MODE selector to COOL .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30°C max. and 16°C min.).




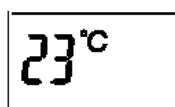
THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.



4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired (see adjustment of air flow). Make sure that the remote control is switched on.

HEATING

1. Set the MODE selector to HEAT .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).



THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

4. Press the FAN SPEED button to select the fan speed.
5. Press the FLAP buttons and adjust the air flow direction as desired (see adjustment of air flow). Make sure that the remote control is switched on.

NOTE

For several minutes after the start of heating operation, the indoor fan will not run until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating.

• DEFROSTING OF HEAT EXCHANGE OUT DOOR UNIT "STANDBY"


When the outdoor temperature is low, frost or ice may appear on the heat exchanger coil, reducing the heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan in the indoor unit stops and the OPERATION lamp is flashing until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending on the room and outdoor temperature).

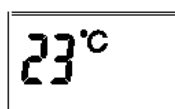
• HEATING PERFORMANCE

A heat pump conditioner heats a room by taking heat from outside air. The heating efficiency will fall off when the outdoor temperature is very low. If enough heat is not obtained with this air conditioner, use another heating appliance in conjunction with it.

OPERATION

AUTOMATIC OPERATION


1. Set the MODE selector to AUTO .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).

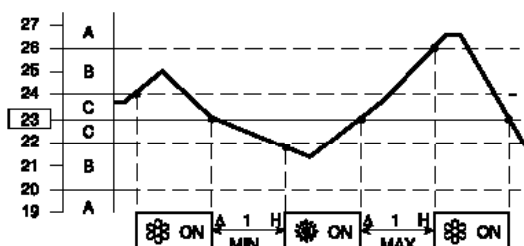


THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

When this setting is selected, the air conditioner calculates the difference between the thermostat setting and the room temperature and automatically switches to the COOL or HEAT mode as appropriate.

4. Switch the FAN SPEED selector button to the setting you want.

Example of operation diagram in the  (Auto) mode with the set room temperature at 23°C.




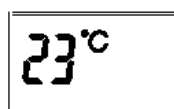
NOTE

The air conditioner changes the operation mode (from cool to heat), if one of the following conditions occurs:

- **ZONE A:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 3°C..
- **ZONE B:** changes if the difference between the room temperature and the temperature set on the remote control unit is at least 1°C, one hour after the compressor stop.
- **ZONE C:** never changes if the difference between the room temperature and the temperature set on the remote control unit is no more than 1°C.

DEHUMIDIFYING (DRY)

1. Set the MODE selector switch to "DRY" .
2. Press the ON/OFF button and switch the air conditioner ON.
3. Press the TEMP. buttons to set the desired temperature (the temperature range is between 30 °C max. and 16 °C min.).




THE DISPLAY SHOWS THE
SELECTED TEMPERATURE.

NOTE

- Use DRY operation when you want to reduce the humidity in the room.
- Once the room temperature reaches the set level, the unit repeats the cycle of turning on and off automatically.
- During DRY operation, the fan speed is automatically set to low or stops to prevent overcooling.
- Dry operation is not possible if the indoor temperature is 15 °C or less.

FAN ONLY

If you want to make air circulate without any temperature control, follow these steps:

1. Set the MODE selector switch to "FAN" .
2. Press the ON/OFF button and switch the air conditioner ON.

OPERATION

ADJUSTING THE FAN SPEED

• AUTOMATIC

Simply set the FAN SPEED selector to the **AUTO** position. A microcomputer automatically controls the fan speed when the AUTO mode is selected. When the air conditioner starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

NOTE

In FAN Only mode the fan speed is adjusted automatically as in cooling mode.

WHEN DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET TEMPERATURE IS		FAN SPEED
Cooling and dehumidifying modes:	2 °C and over	High
	Between 2 and 1 °C	Medium
	Below 1 °C	Low
Heating mode:	2 °C and over	High
	Below 2 °C	Medium

The above mentioned data make reference to the conditioner operating when the sensor on the remote control unit is ON. If the sensor on the indoor unit is being used then actual operation will slightly differ from that described in the above tables.

• MANUAL


If you want to manually adjust speed just set the FAN SPEED selector as desired.

Each time the button is pressed, the fan speed is changed in sequence:

● (Lo) → ●● (Med) → ●●● (Hi) → ●●●● (AUTO)

SLEEP MODE

The SLEEP mode enables you to save energy.

1. Set the MODE selector to cool, dry or heat.
2. Press the SLEEP button.
3. The  mark appears on the display. Press the SLEEP button again to release the SLEEP function.

What does the SLEEP mode mean?

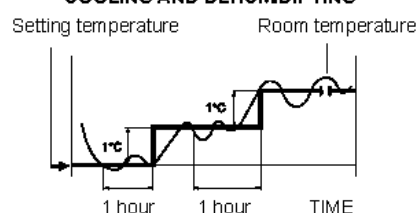


In this mode, the air conditioner will cool or heat the room to the set temperature, and then the thermostat will make the unit pause. After about 1 hour, the air conditioner will automatically reset the set temperature as follows (also refer to graphs).

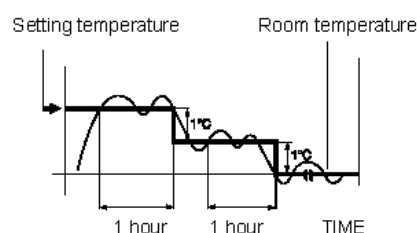
OPERATING MODE	SET TEMPERATURE CHANGE
Heating	Lowered by 1 °C
Cooling and Dehumidifying	Raised by 1 °C

When the room temperature reaches the new set value, the thermostat will cause the unit to pause. After about 1 hour the temperature will be raised by 1 °C in cooling, or lowered by 1 °C in heating. This enables you to save energy without sacrificing your comfort.

COOLING AND DEHUMIDIFYING




HEATING




OPERATION

I FEEL TEMP FUNCTION OPERATION

Press button IFEEL to activate the IFEEL function. Thermometer sign will appear on the LCD operation display . Select suitable temperature setting. Make sure that the remote control unit is aimed at the air conditioner, with the IFEEL sensor in front. Prevent the IFEEL sensor from being affected by heat sources such as lamps, heaters, direct sun, etc. or from being directly affected by the air conditioner air flow. These may cause the sensor to transmit the wrong temperature data, thereby disturbing the performance of the IFEEL function.

ROOM TEMP FUNCTION OPERATION


Press the ROOM button to show the actual room temperature around the remote control unit. The measured room temperature and the room temperature sign  will be displayed. To cancel the ROOM Temperature display press on one of the following:

- Press again on ROOM Temperature button.
- Change of MODE button.

NOTE

Room temperature range is between 6 and 36 in 1 increments. Display should show "HI" or "LO" to represent temperature that is above 36 or below 6.

LOCK FUNCTION

By pressing LOCK button, the remote control will lock the last operation program. All the function buttons will be inoperative, including START/STOP button. By pressing LOCK button again the remote control will be released from its locked position. When lock mode is functioning, the transmission sign  will be on.

SETTING THE TIMER

There are four timers that can be selected on the remote control. Two daily timers (designated as T1, T2), and two optional weekend timers (designated as WKT1, WKT2). Each timer can be selected by pressing TIMER button.

The daily timers T1 and T2 can be set for ON and OFF separately for two different time periods.

Timer setting will not change until new setting is input.

The weekend timers WKT1 and WKT2 can be set for ON and OFF separately for two different time periods and they are effective two days only. These timers will be effective on the day of setting and on the day after only.

At 24:00 on the second day, the WK timer will not be effective anymore and the daily timer will be effective again.

WKT1 - effective on the setting day

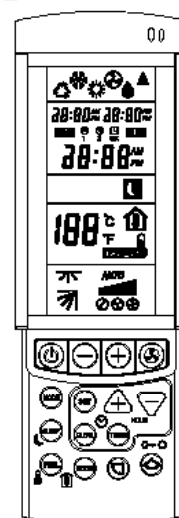
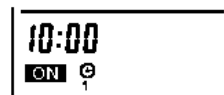
WKT2 - effective one day after the setting day.

NOTE:

1. During the weekend timer operation, the daily timers will be disabled.
2. The WK timers must be reactivated before every weekend.

A) HOW TO SET THE ON TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.

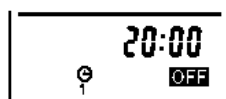


B) HOW TO SET THE OFF TIME

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the OFF sign blinks.

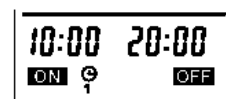
OPERATION

3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button to activate the timer.



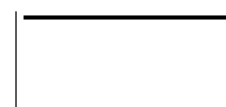
C) HOW TO SET A PROGRAM FOR DAILY ON/OFF OPERATION

1. Press the TIMER button to select the desired timer.
2. Press the SET button till the ON sign blinks.
3. Press the + or - (HOUR) button until the desired value is displayed.
4. Press the SET button again, the OFF sign blinks.
5. Press the + or - (HOUR) button until the desired value is displayed.
6. Press the SET button to activate the timer.



D) HOW TO CLEAR THE TIMER

1. Press the TIMER button to select the timer.
2. Press the CLEAR button if you want that every timer operation will be cleared.



NOTE

If the procedure to set the timer is not completed, by pushing the SET button, within 15 seconds the timer operation will be cancelled and the last set-up is restored.

ADJUSTING THE AIR FLOW DIRECTION

HORIZONTAL (manual)

The horizontal air flow can be adjusted by moving the vertical vanes to the left or right, as indicated in the following figures.

VERTICAL (with remote control unit)

The remote control gives you the possibility to control the flap in two way:

1. Push the button to start the flap sweep. If you push again the flap stops immediately.
2. push the button to move the flap step by step. Or activate the horizontal air flow option is selectable via switch.



Caution

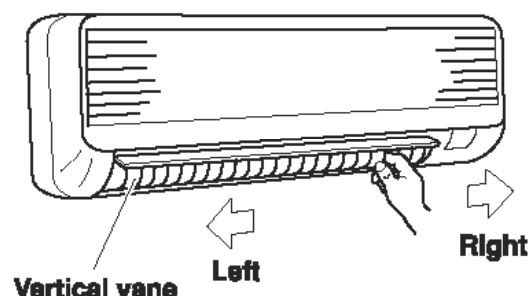
Set vertical vanes to the front position during COOLING/DRY operation if humidity is high.

If the vertical vanes are set to the left-most or right-most position, condensation will form around the air outlet and drip off.

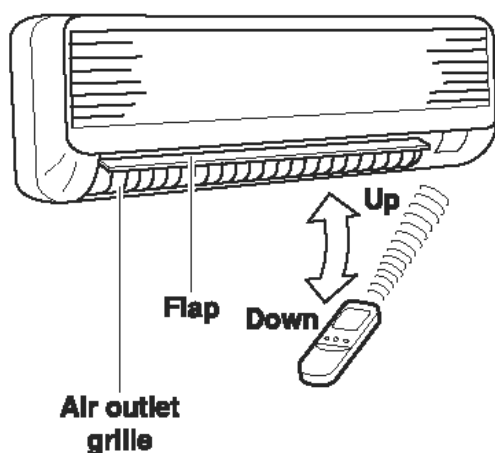


Caution

Do not move the flap with your hands when the air conditioner is running.



OPERATION



Caution

Use the FLAP button on the remote control to adjust the position of the flap. If you move the flap by hand, the factual flap position and the flap position on the remote control may no longer match. If this should happen, shut off the unit, wait for the flap to close, and then turn on the unit again; the flap position will now be normal again.

Do not have the flap pointed down during cooling operation. Condensation may begin to form around the air vent and drip down.

NOTES

The flap automatically closes when the unit is off.

During the heating operation, the fan speed will be very low and the flap will be in the horizontal position until the air being blown out of the unit begins to warm. Once the air warms up, the flap position and fan speed change to the settings specified with the remote control.