



Service Manual

KN Cassette R410A Series

Indoor Units	Outdoor Units	Indoor Units	Outdoor Units
KN 24 ST	OU7-24 ST	KN 30 RC 3PH	OU8-30T RC
KN 24 ST 3PH	OU7-24T ST	KN 36 ST	OU10-36 ST
KN 24 RC	OU7-24 RC	KN 36 ST 3PH	OU10-36T ST
KN 24 RC 3PH	OU7-24T RC	KN 36 RC	OU10-36 RC
KN 30 ST	OU8-30 ST	KN 36 RC 3PH	OU10-36T RC
KN 30 ST 3PH	OU8-30T ST	KN 45 ST 3PH	OU10-47T ST
KN 30 RC	OU8-30 RC	KN 45 RC 3PH	OU10-47T RC



REFRIGERANT R410A	COOLING ONLY HEAT PUMP
MAY - 2006	

LIST OF EFFECTIVE PAGES

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**Photos are not contractual

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1. INTRODUCTION

1.1 General

The cassette (900X900) split ceiling mounted range comprise the ST (cooling only) and RC (heat pump) models, as follows:

- **Cooling Only** KN24ST, KN30ST, KN36ST 1PH & 3PH; KN45ST 3PH units
- **Heat Pump** KN24RC, KN30RC, KN36RC 1PH & 3PH; KN45RC 3PH units

1.2 Main Features

The (900X900) Cassette series benefits from the most advanced technological innovations, namely:

- R410A units
- Microprocessor control.
- Indoor spacial centrifugal fan for low noise operation
- High COP.
- Easy access to interconnecting tubing and wiring connections,
- Integral condensate water pump.
- Automatic treated air sweep.
- Easy installation and service.

1.3 Indoor Unit

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

It includes:

- Square bended coil with hydrophilic aluminum fins.
- A large diameter centrifugal fan
- Motorized flaps
- Advanced electronic control box assembly.

1.4 Filtration

The Cassette series presents with easily accessible, and re-usable pre-filters (mesh)

1.5 Control

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

1.6 Outdoor Unit

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

It includes :

- A **Rotary** Compressor mounted in a soundproofed compartment
- Axial fan.
- Outdoor coil with hydrophilic louver fins for RC units.
- Outlet air fan grill.
- Service valves" flare" type connection.
- Interconnecting wiring terminal block.
- Electrical phase protector (on 3PH models).
- Advanced TYPHOON PCB

1.7 Tubing Connections

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

1.8 Accessories

ASK (All Season Kit):

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

RCW Wall Mounted Remote Control


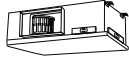
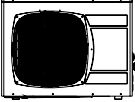
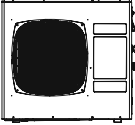
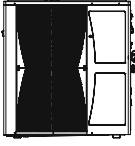
The RCW1/ RCW2 remote control is a wall mounted remote controller, for multi indoor unit applications and functioning
For further details please refer to Optional Accessories, Chapter 14.




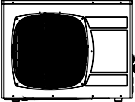
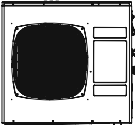

1.9 Inbox Documentation


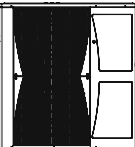
Each unit is supplied with its own installation and operation manuals.

1.10 Matching Table

1.10.1 R410A

OUTDOOR UNITS			INDOOR UNITS							
										
	MODEL	REF'	KN24	KN30	KN36	KN45	DNG24	DNG30	DNG36	DNG44
	OU7-24ST	R410A	√				√			
	OU7-24T ST	R410A	√				√			
	OU7-24 RC	R410A	√				√			
	OU7-24T RC	R410A	√				√			
	OU8-30 ST	R410A		√				√		
	OU8-30T ST	R410A		√				√		
	OU8-30 RC	R410A		√				√		
	OU8-30T RC	R410A		√				√		
	OU10-36 ST	R410A			√				√	
	OU10-36T ST	R410A			√				√	
	OU10-36 RC	R410A			√				√	
	OU10-36T RC	R410A			√				√	
	OU10-47T ST	R410A				√				√
	OU10-47T RC	R410A				√				√

OUTDOOR UNITS			INDOOR UNITS							
										
	MODEL	REF'	PXD24	PXD30	WNG24	WNG30	WNG36	EMDB24	EMDB30	EMDB36
	OU7-24ST	R410A	√		√			√		
	OU7-24T ST	R410A	√		√			√		
	OU7-24 RC	R410A	√		√*			√		
	OU7-24T RC	R410A	√		√*			√		
	OU8-30 ST	R410A		√		√			√	
	OU8-30T ST	R410A		√		√			√	
	OU8-30 RC	R410A		√		√			√	
	OU8-30T RC	R410A		√		√			√	
	OU10-36 ST	R410A					√			√
	OU10-36T ST	R410A					√			√
	OU10-36 RC	R410A					√			√
	OU10-36T RC	R410A					√			√

OUTDOOR UNITS		INDOOR UNITS	
			
	MODEL	REF'	EMDB47
	OU10-47T ST	R410A	√
	OU10-47T RC	R410A	√

√* - this combination is out of the lego concept and cannot be matched with other types of indoor units.

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

2. PRODUCT DATA SHEET

2.1 KN 24 / OU7-24 R410A

Model Indoor Unit		KN-24		
Model Outdoor Unit		OU7-24		
Installation Method of Pipe		Flared		
Characteristics	Units	Cooling Only	Cooling	Heating
Capacity ⁽¹⁾	Btu/hr	23100	23100	24150
	kW	6.77	6.77	7.08
Power input ⁽¹⁾	kW	2.25	2.25	2.33
EER (Cooling) or COP(Heating) ⁽¹⁾	W/W	3.01	3.01	3.04
Energy efficiency class		B	B	D
Power supply	V/Ph/Hz	220-240V/Single/50Hz		
Rated current	A	9.6	9.6	9
Starting current	A	63		
Circuit breaker rating	A	20		
INDOOR	Fan type & quantity		Centrifugal x 1	
	Fan speeds	H/M/L	RPM	
	Air flow ⁽²⁾	H/M/L	m3/hr	
	External static pressure	Min-Max	Pa	
	Sound power level ⁽³⁾	H/M/L	dB(A)	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	
	Moisture removal		l/hr	
	Condensate drain tube I.D		mm	
	Dimensions	WxHxD	mm	
	Weight		kg	
	Package dimensions	WxHxD	mm	
	Packaged weight		kg	
	Units per pallet		units	
	Stacking height		units	
OUTDOOR	Refrigerant control		Capillary tube restrictor for heating)	
	Compressor type, model		Rotary, Mitsubishi NN27VBAMT	
	Fan type & quantity		Propeller(direct) x 1	
	Fan speeds	H/L	RPM	
	Air flow	H/L	m3/hr	
	Sound power level	H/L	dB(A)	
	Sound pressure level ⁽⁴⁾	H/L	dB(A)	
	Dimensions	WxHxD	mm	
	Weight		kg	
	Package dimensions	WxHxD	mm	
	Packaged weight		kg	
	Units per pallet		Units	
	Stacking height		units	
	Refrigerant type		R410A	
	Refrigerant chargless distance		kg/m	
	Additional charge per 1 meter		g/m	
	Connections between units	Liquid line	In.(mm)	3/8"(9.53)
Suction line		In.(mm)	5/8"(15.88)	
Max .tubing length		m.	Max.30	
Max .height difference		m.	Max.15	
Operation control type		Remote control		
Heating elements	kW			
Others		Crankcase heater (50W)		

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

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

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

(4) Sound pressure level measured at 1 meter distance from unit.

2.2 KN 24 / OU7-24T R410A

Model Indoor Unit		KN-24			
Model Outdoor Unit		OU7-24T			
Installation Method of Pipe		Flared			
Characteristics		Units	Cooling Only	Cooling	Heating
Capacity ⁽¹⁾		Btu/hr	23100	23100	24150
		kW	6.77	6.77	7.08
Power input ⁽¹⁾		kW	2.25	2.25	2.33
EER (Cooling) or COP(Heating) ⁽¹⁾		W/W	3.01	3.01	3.04
Energy efficiency class			B	B	D
Power supply		V/Ph/Hz	400V/3PH/50Hz		
Rated current		A	3 X 7.4	3 X 7.4	3 X 7.6
Starting current		A	55		
Circuit breaker rating		A	3 X 16		
INDOOR	Fan type & quantity		Centrifugal x 1		
	Fan speeds	H/M/L	RPM	570/510/460	
	Air flow ⁽²⁾	H/M/L	m3/hr	910/800/690	
	External static pressure	Min-Max	Pa	N/A	
	Sound power level ⁽³⁾	H/M/L	dB(A)	54/50/48	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	44/41/38	
	Moisture removal		l/hr	2.5	
	Condensate drain tube I.D		mm	32	
	Dimensions	WxHxD	mm	840x230x840 (Unit) / 950x46x950 (Frame)	
	Weight		kg	36 (unit) / 6 (Frame)	
	Package dimensions	WxHxD	mm	1011x333x931 (Unit) / 1013x145x1013(Frame)	
	Packaged weight		kg	40 (unit) / 7 (Frame)	
	Units per pallet		units	5(Unit) / 15(Frame)	
	Stacking height		units	5 Levels (unit) / 15 Levels (Frame)	
OUTDOOR	Refrigerant control		Capillary tube (restrictor for heating)		
	Compressor type, model		Rotary, Mitsubishi NN27VDAMT		
	Fan type & quantity		Propeller(direct) x 1		
	Fan speeds	H/L	RPM	850	
	Air flow	H/L	m3/hr	3100	
	Sound power level	H/L	dB(A)	67	
	Sound pressure level ⁽⁴⁾	H/L	dB(A)	58	
	Dimensions	WxHxD	mm	900x680x340	
	Weight		kg	78	
	Package dimensions	WxHxD	mm	985x730x406	
	Packaged weight		kg	82	
	Units per pallet		Units	6	
	Stacking height		units	2 Levels	
	Refrigerant type			R410A	
	Refrigerant chargless distance		kg/m	2.16kg/12.5m	
	Additional charge per 1 meter		g/m	25	
Connections between units	Liquid line	ln.(mm)	3/8"(9.53)		
	Suction line	ln.(mm)	5/8"(15.88)		
	Max .tubing length	m.	Max.30		
	Max .height difference	m.	Max.15		
Operation control type			Remote control		
Heating elements		kW			
Others			Crankcase heater (50W), 3 Phase Protector		

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

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

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

(4) Sound pressure level measured at 1 meter distance from unit.

2.3 KN 30 / OU8-30 R410A

Model Indoor Unit		KN-30		
Model Outdoor Unit		OU830		
Installation Method of Pipe		Flared		
Characteristics	Units	Cooling Only	Cooling	Heating
Capacity ⁽¹⁾	Btu/hr	28,300	28,300	30,500
	kW	8.30	8.30	8.94
Power input ⁽¹⁾	kW	2.94	2.94	2.88
EER (Cooling) or COP(Heating) ⁽¹⁾	W/W	2.82	2.82	3.10
Energy efficiency class		C	C	D
Power supply	V/Ph/Hz	220-240V/Single/50Hz		
Rated current	A	12.3	12.3	12.3
Starting current	A	80		
Circuit breaker rating	A	25		
INDOOR	Fan type & quantity		Centrifugal x 1	
	Fan speeds	H/M/L	RPM	
	Air flow ⁽²⁾	H/M/L	m3/hr	
	External static pressure	Min-Max	Pa	
	Sound power level ⁽³⁾	H/M/L	dB(A)	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	
	Moisture removal		l/hr	
	Condensate drain tube I.D		mm	
	Dimensions	WxHxD	mm	
	Weight		kg	
	Package dimensions	WxHxD	mm	
	Packaged weight		kg	
	Units per pallet		units	
	Stacking height		units	
	OUTDOOR	Refrigerant control		Capillary
Compressor type, model		Rotary, Mitsubishi NN33VAAMT		
Fan type & quantity		Propeller(direct) x 1		
Fan speeds		H/L	RPM	
Air flow		H/L	m3/hr	
Sound power level		H/L	dB(A)	
Sound pressure level ⁽⁴⁾		H/L	dB(A)	
Dimensions		WxHxD	mm	
Weight			kg	
Package dimensions		WxHxD	mm	
Packaged weight			kg	
Units per pallet			Units	
Stacking height			units	
Refrigerant type			R410A	
Refrigerant chargeless distance			kg/m	
Additional charge per 1 meter			g/m	
Connections between units		Liquid line	In.(mm)	3/8"(9.53)
	Suction line	In.(mm)	5/8"(15.88)	
	Max .tubing length	m.	Max.30	
	Max .height difference	m.	Max.15	
Operation control type		Remote control		
Heating elements	kW			
Others		Crankcase heater (50W)		

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

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

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

(4) Sound pressure level measured at 1 meter distance from unit.

2.4 KN 30 / OU8-30T R410A

Model Indoor Unit		KN-30			
Model Outdoor Unit		OU830T			
Installation Method of Pipe		Flared			
Characteristics		Units	Cooling Only	Cooling	Heating
Capacity ⁽¹⁾		Btu/hr	28,300	28,300	30,500
		kW	8.30	8.30	8.94
Power input ⁽¹⁾		kW	2.86	2.86	2.79
EER (Cooling) or COP(Heating) ⁽¹⁾		W/W	2.9	2.9	3.20
Energy efficiency class			C	C	D
Power supply		V/Ph/Hz	400V/3PH/50Hz		
Rated current		A	3 x 5.2	3 x 5.2	3 x 5.2
Starting current		A	35		
Circuit breaker rating		A	3 x 16		
INDOOR	Fan type & quantity		Centrifugal x 1		
	Fan speeds	H/M/L	RPM	740/700/620	
	Air flow ⁽²⁾	H/M/L	m3/hr	1200/1120/985	
	External static pressure	Min-Max	Pa	N/A	
	Sound power level ⁽³⁾	H/M/L	dB(A)	61/59/56	
	Sound pressure level ⁽⁴⁾	H/M/L	dB(A)	52/50/47	
	Moisture removal		l/hr	3.2	
	Condensate drain tube I.D		mm	32	
	Dimensions	WxHxD	mm	840x230x840 (Unit) / 950x46x950 (Frame)	
	Weight		kg	36 (unit) / 6 (Frame)	
	Package dimensions	WxHxD	mm	1011x333x931 (Unit) / 1013x145x1013(Frame)	
	Packaged weight		kg	40 (unit) / 7 (Frame)	
	Units per pallet		units	5(Unit) / 15(Frame)	
	Stacking height		units	5 Levels (unit) / 15 Levels (Frame)	
	OUTDOOR	Refrigerant control		Capillary	
Compressor type, model		Rotary, Mitsubishi NN33YCAMT			
Fan type & quantity		Propeller(direct) x 1			
Fan speeds		H/L	RPM	850	
Air flow		H/L	m3/hr	3150	
Sound power level		H/L	dB(A)	69	
Sound pressure level ⁽⁴⁾		H/L	dB(A)	59	
Dimensions		WxHxD	mm	900x860x340	
Weight			kg	78	
Package dimensions		WxHxD	mm	985x907x435	
Packaged weight			kg	82	
Units per pallet			Units	6	
Stacking height			units	2 Levels	
Refrigerant type				R410A	
Refrigerant chargeless distance			kg/m	2.42kg/15m	
Additional charge per 1 meter		g/m	30		
Connections between units	Liquid line	In.(mm)	3/8"(9.53)		
	Suction line	In.(mm)	5/8"(15.88)		
	Max .tubing length	m.	Max.30		
	Max .height difference	m.	Max.15		
Operation control type			Remote control		
Heating elements		kW			
Others			Crankcase heater (50W),3PH Protector		

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

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

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

(4) Sound pressure level measured at 1 meter distance from unit.

2.5 KN 36 / OU10-36 R410A

Model Indoor Unit			KN 36			
Model Outdoor Unit			OU10-36 R410A			
Installation method			CASSETE			
Characteristics		Units	Cooling	Heating		
Capacity (1)	Btu/hr		34,500	34,500		
	kW		10.10	10.10		
Power input (1)	kW		3.48	3.60		
COP (1)	W/W		2.90	2.80		
Energy efficiency class			C	D		
Power supply	V/ Ph /Hz		230/50/1			
Rated current	A		16.2	16.3		
Starting current	A		92			
Circuit breaker rating	A		25			
INDOOR	Fan type & quantity		Centrifugal & 1			
	Fan speeds	H/ M/ L	RPM	580	540	500
	Air flow (2)	H/ M/ L	m ³ /hr	1220	1125	1025
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/ M/ L	dB(A)	53	51	49
	Sound pressure level (4)	H/ M/ L	dB(A)	46	44	42
	Moisture removal	L/hr		4.1		
	Condensate drain tube I.D	mm		32		
	Dimensions (Unit / Frame)	W/ H / D	mm	840 / 950	840 / 950	300 / 46
	Weight	kg		48		
	Package dimensions (Unit / Frame)	W/ H / D	mm	1011 / 1013	931/ 1013	400 / 145
	Packaged weight	kg		52		
	Units / Frames per pallet	Units		5 / 15		
	Stacking height Units / Frames	Units		5 / 15		
OUTDOOR	Refrigerant control		Capillary tube			
	Compressor type, model		Scroll			
	Fan type & quantity		Axial & 2			
	Fan speeds	H / L	RPM	1150		
	Air flow	H / L	m ³ /hr	4150		
	Sound power level	H / L	dB(A)	70.4		
	Sound pressure level (4)	H / L	dB(A)	61.1		
	Dimensions	W/ H / D	mm	900	970	340
	Weight	kg		87		
	Package dimensions	W/ H / D	mm	985	1020	435
	Packaged weight	kg		91		
	Units per pallet	Units		6		
	Stacking height	Units		2		
	Refrigerant type			R 410A		
	Refrigerant charges distance	kg/m		2.55/15		
	Additional charge per 1 meter	g/m		30		
Connections between units	Liquid line	In.	3/8			
	Suction line	In.	3/4			
	Max. tubing length	m.	50			
	Max. height difference	m.	25			
Operation control type			LCD Remote Control			
Heating elements	kW		3.0			
Others			Crankcase heater (50W)			

- (1) Rating conditions in accordance to 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-meter distance from unit.

2.6 KN 36 / OU10-36T R410A

Model Indoor Unit			KN 36				
Model Outdoor Unit			OU10-36T R410A				
Installation method			CASSETE				
Characteristics		Units	Cooling		Heating		
Capacity (1)	Btu/hr		33,100		35,150		
	kW		9.70		10.30		
Power input (1)	kW		3.34		3.68		
COP (1)	W/W		2.90		2.80		
Energy efficiency class			C		D		
Power supply		V/ Ph /Hz	400/3N/50				
Rated current		A	3x6.1		3x6.5		
Starting current		A	43				
Circuit breaker rating		A	3x16				
INDOOR	Fan type & quantity		Centrifugal & 1				
	Fan speeds	H/ M/ L	RPM	580	540	500	
	Air flow (2)	H/ M/ L	m ³ /hr	1220	1125	1025	
	External static pressure		Min-Max	Pa			
	Sound power level (3)		H/ M/ L	dB(A)			
	Sound pressure level (4)		H/ M/ L	dB(A)			
	Moisture removal		L/hr	4.1			
	Condensate drain tube I.D		mm	32			
	Dimensions (Unit / Frame)		W/ H / D	mm	840 / 950	840 / 950	300 / 46
	Weight		kg	48			
	Package dimensions (Unit / Frame)		W/ H / D	mm	1011 / 1013	931/ 1013	400 / 145
	Packaged weight		kg	52			
	Units / Frames per pallet		Units	5 / 15			
	Stacking height Units / Frames		Units	5 / 15			
OUTDOOR	Refrigerant control		Capillary tube				
	Compressor type, model		Scroll				
	Fan type & quantity		Axial & 2				
	Fan speeds	H / L	RPM	1150			
	Air flow	H / L	m ³ /hr	4150			
	Sound power level	H / L	dB(A)	70			
	Sound pressure level (4)	H / L	dB(A)	61			
	Dimensions	W/ H / D	mm	900	970	340	
	Weight		kg	87			
	Package dimensions	W/ H / D	mm	985	1020	435	
	Packaged weight		kg	91			
	Units per pallet		Units	6			
	Stacking height		Units	2			
	Refrigerant type		R 410A				
	Refrigerant charges distance		kg/m	2.45/15			
	Additional charge per 1 meter		g/m	30			
Connections between units	Liquid line		In.				
	Suction line		In.				
	Max. tubing length		m.				
	Max. height difference		m.				
Operation control type		LCD Remote Control					
Heating elements		kW	3.0				
Others		Crankcase heater (50W), 3 Phase Protector					

- (1) Rating conditions in accordance to 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-meter distance from unit.

2.7 KN 45 / OU10-47 R410A

Model Indoor Unit			KN 45			
Model Outdoor Unit			OU10-47T R410A			
Installation method			CASSETTE			
Characteristics		Units	Cooling		Heating	
Capacity (1)		Btu/hr	42,150		45,000	
		kW	12.35		13.20	
Power input (1)		kW	4.40		4.63	
COP (1)		W/W	2.80		2.85	
Energy efficiency class			C		D	
Power supply		V/ Ph /Hz	400/3N/50			
Rated current		A	3x8.4		3x8.9	
Starting current		A	61			
Circuit breaker rating		A	3x20A			
INDOOR	Fan type & quantity		Centrifugal & 1			
	Fan speeds	H/ M/ L	RPM	810	630	570
	Air flow (2)	H/ M/ L	m³/hr	1600	1330	1200
	External static pressure	Min-Max	Pa	N/A		
	Sound power level (3)	H/ M/ L	dB(A)	63.0	57.0	53.0
	Sound pressure level (4)	H/ M/ L	dB(A)	55.0	49.0	46.0
	Moisture removal		L/hr	5.4		
	Condensate drain tube I.D		mm	32		
	Dimensions (Unit / Frame)	W/ H / D	mm	840 / 950	840 / 950	300 / 46
	Weight		kg	48		
	Package dimensions (Unit / Frame)	W/ H / D	mm	1011 / 1013	931/ 1013	400 / 145
	Packaged weight		kg	52		
	Units / Frames per pallet		Units	5 / 15		
Stacking height Units / Frames		Units	5 / 15			
OUTDOOR	Refrigerant control		Capillary tube			
	Compressor type, model		Scroll			
	Fan type & quantity		Axial & 2			
	Fan speeds	H / L	RPM	1240		
	Air flow	H / L	m³/hr	4350		
	Sound power level	H / L	dB(A)	71		
	Sound pressure level (4)	H / L	dB(A)	64		
	Dimensions	W/ H / D	mm	900	970	340
	Weight		kg	96		
	Package dimensions	W/ H / D	mm	985	1020	435
	Packaged weight		kg	100		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type		R 410A			
	Refrigerant charges distance		kg/m	3,00/15		
	Additional charge per 1 meter		g/m	45		
Connections between units	Liquid line	In.	3/8			
	Suction line	In.	3/4			
	Max. tubing length	m.	50			
	Max. height difference	m.	25			
Operation control type		LCD Remote Control				
Heating elements		kW	3.0			
Others		Crankcase heater (50W), 3 Phase Protector				

- (1) Rating conditions in accordance to 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-meter distance from unit.

3. RATING CONDITIONS

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

Cooling:

Indoor: 27°C DB 19°C WB

Outdoor: 35°C DB

Heating:

Indoor: 20°C DB

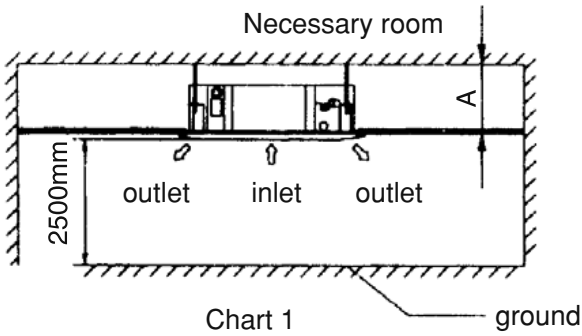
Outdoor: 7°C DB 6°C WB

3.1 Operating Limits

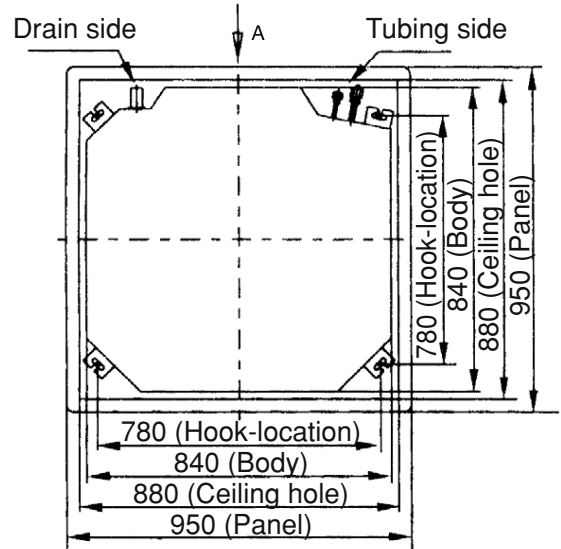
		Indoor	Outdoor
Cooling	Upper limit	32°C DB 23°C WB	46°C DB
	Lower limit	21°C DB 15°C WB	21°C DB
Heating	Upper limit	27°C DB	24°C DB 18°C WB
	Lower limit	20°C DB	-9°C DB -10°C WB
Voltage	1PH	198 – 264 V	
	3PH	360 - 440 V	

4. OUTLINE DIMENSIONS

4.1 Indoor Unit: KN 24, 30, 36, 45



Note: 24/27/30 Series A 260mm
36/45 Series A 330mm



(Unit: mm)

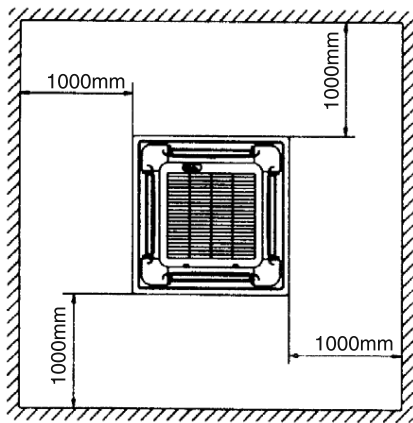


Chart 2

Chart 3

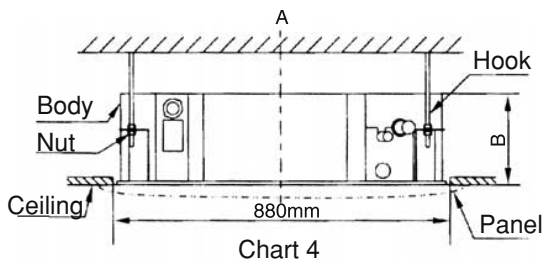


Chart 4

Note: 24/27/30 Series B 240mm
36/45 Series B 310mm

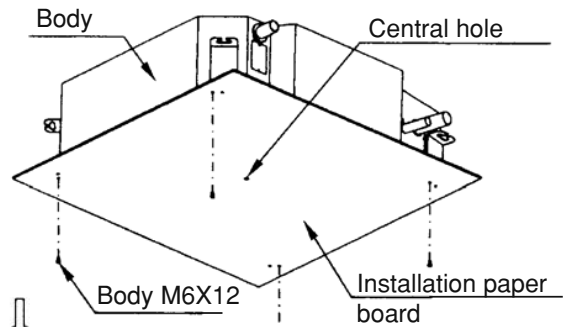


Chart 7

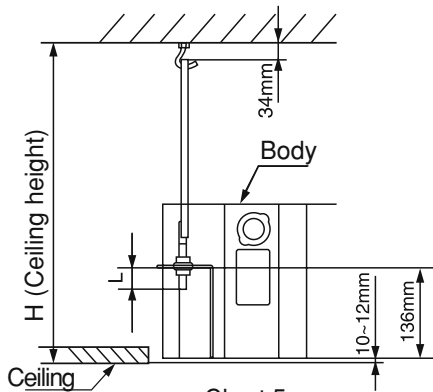


Chart 5

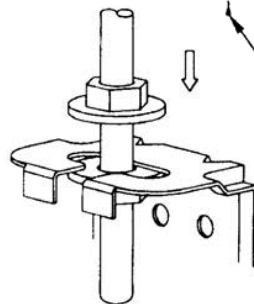
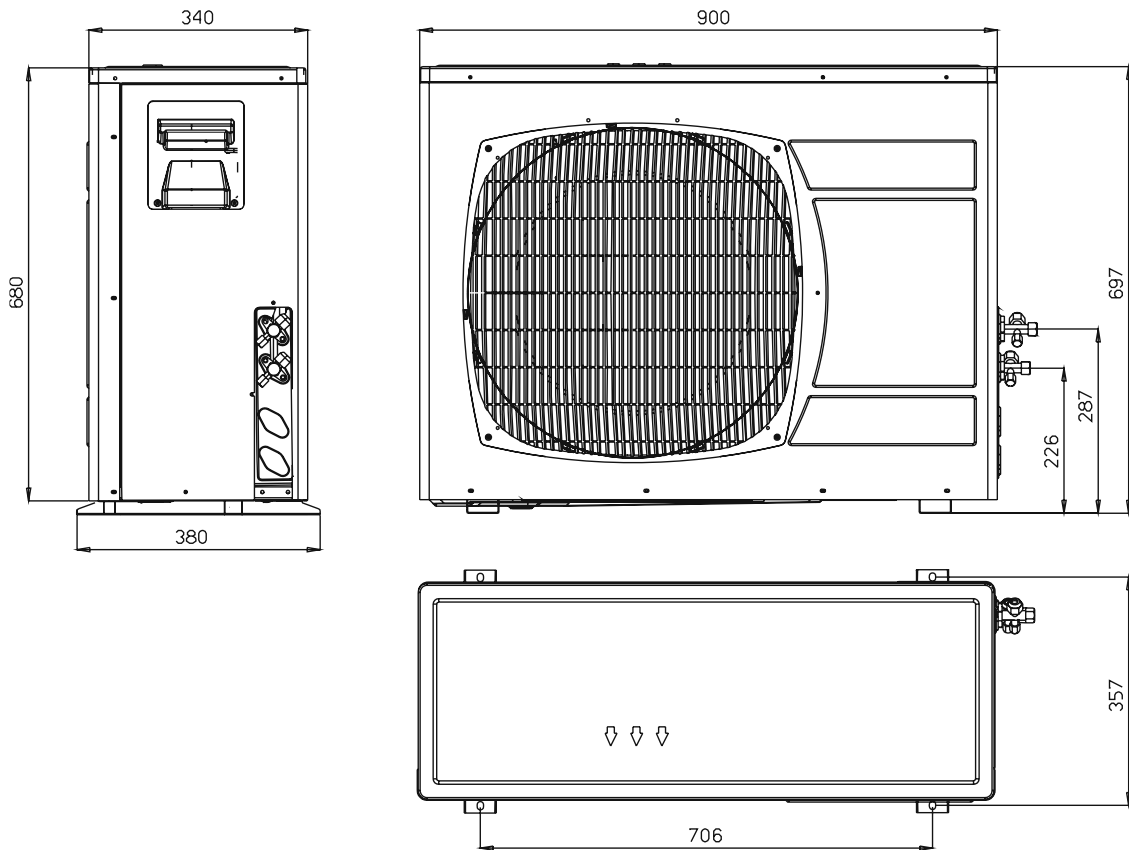
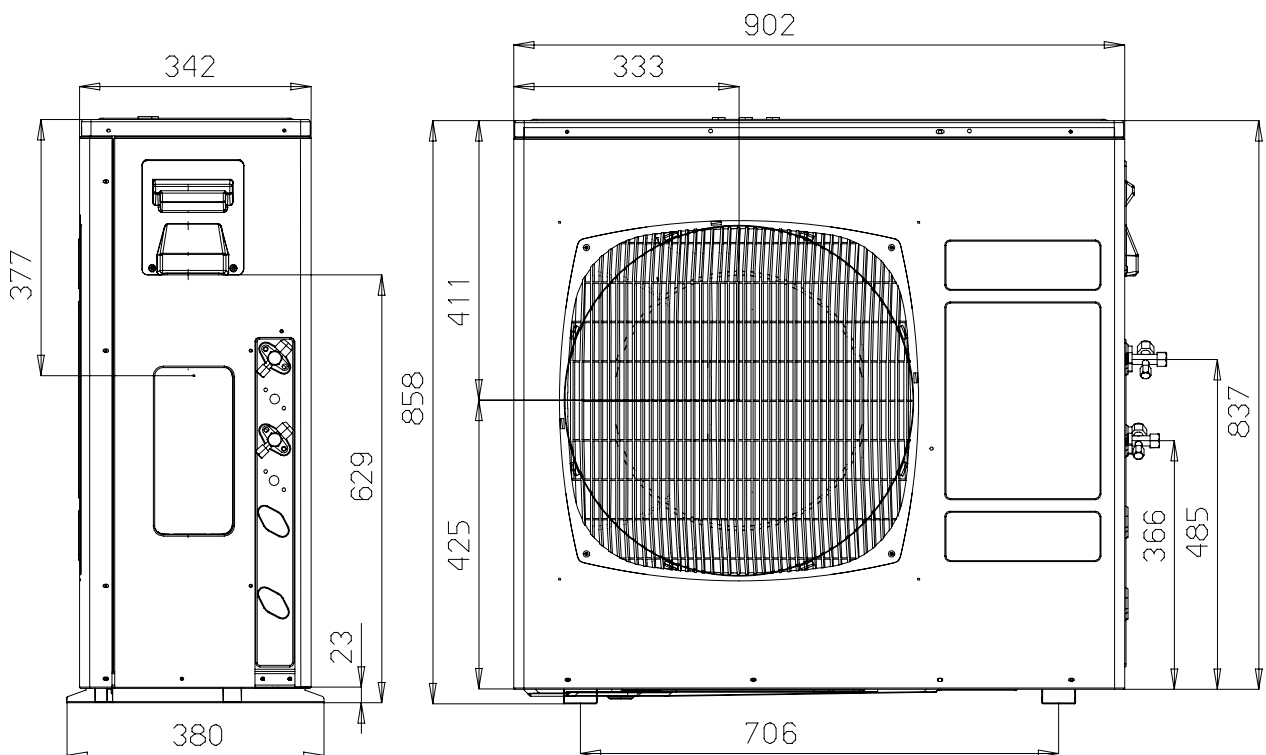


Chart 6

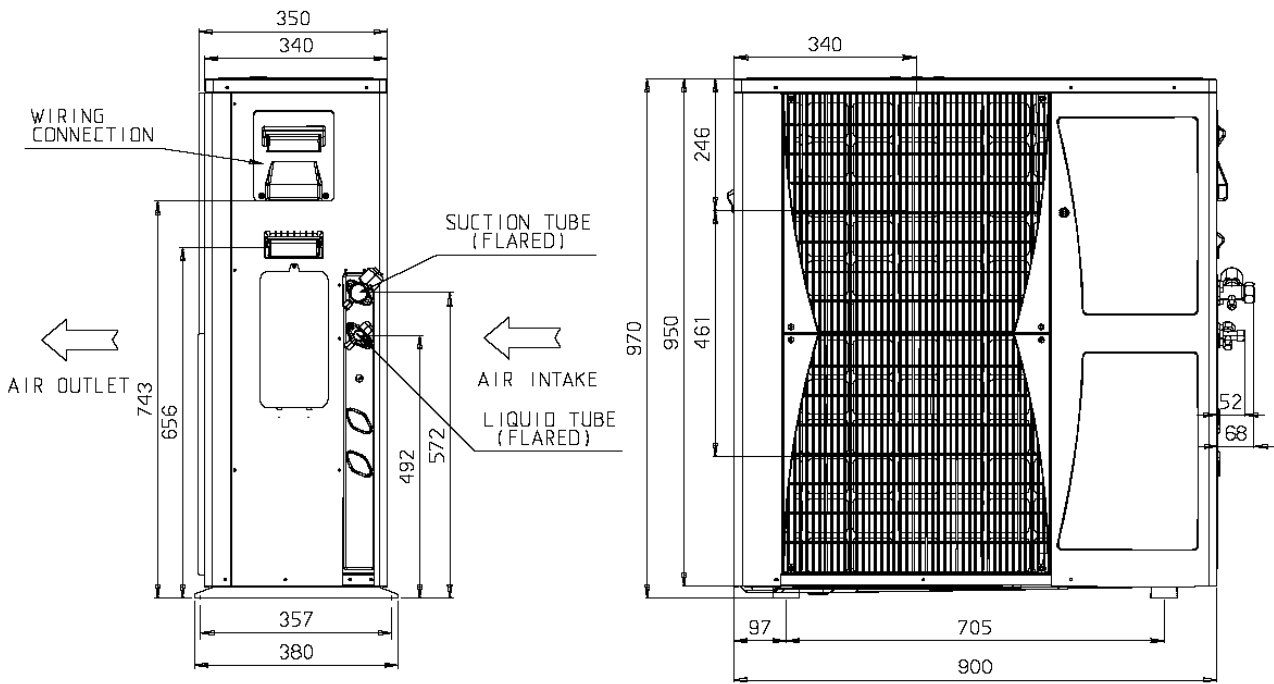
4.2 Outdoor Unit: OU7-24



4.3 Outdoor Unit: OU8-30



4.4 Outdoor Unit: OU10-36, OU10-47



5. PERFORMANCE DATA

5.1 KN24 / OU7-24 R410A 1PH/3PH

5.1.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	7.14	7.39	7.57	7.74	7.86
	SC	4.80	5.00	5.20	5.33	5.43
	PI	1.60	1.60	1.60	1.60	1.61
20 ⁽¹⁾	TC	6.90	7.28	7.51	7.68	7.85
	SC	4.70	4.96	5.17	5.31	5.41
	PI	1.73	1.74	1.74	1.75	1.76
25	TC	6.53	7.05	7.42	7.64	7.83
	SC	4.58	4.86	5.13	5.28	5.37
	PI	1.87	1.88	1.90	1.91	1.92
30	TC	6.11	6.65	7.19	7.44	7.66
	SC	4.44	4.72	5.02	5.16	5.26
	PI	2.02	2.05	2.07	2.08	2.10
35	TC	5.66	6.14	6.77	7.11	7.45
	SC	4.22	4.52	4.90	5.04	5.14
	PI	2.18	2.21	2.25	2.27	2.28
40	TC	5.14	5.60	6.11	6.68	7.02
	SC	3.98	4.28	4.64	4.78	4.88
	PI	2.35	2.39	2.43	2.46	2.48
46	TC	4.46	4.88	5.37	5.93	6.39
	SC	3.66	3.93	4.23	4.37	4.47
	PI	2.57	2.60	2.66	2.70	2.73

LEGEND

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

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

5.1.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	4.09	1.86	3.93	1.99	3.78	6.34
-7	4.40	1.91	4.24	2.02	4.09	6.46
-2	4.67	1.93	4.52	2.05	4.36	6.58
2	5.69	2.03	5.45	2.16	5.22	6.94
6	7.29	2.18	7.08	2.33	6.83	7.52
10	7.93	2.30	7.72	2.46	7.50	7.99
15	8.57	2.40	8.35	2.59	8.14	8.35
20	9.03	2.47	8.81	2.68	8.57	8.78

* the above chart includes the weighted deicing influence.

LEGEND

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

5.2 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.01	1	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

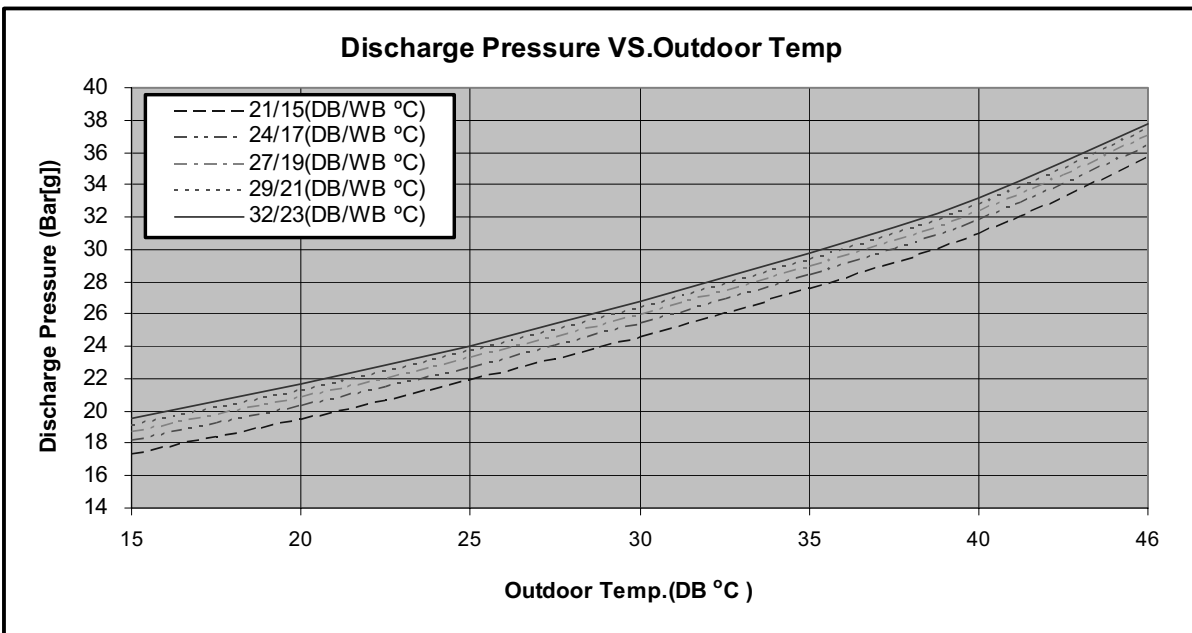
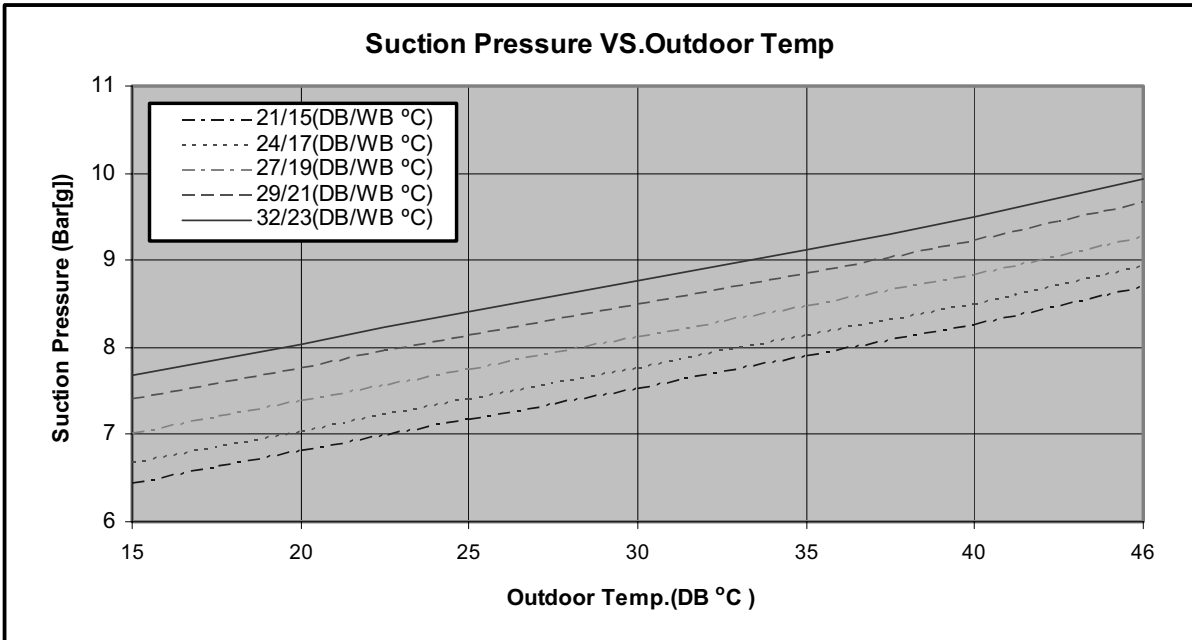
5.2.1 Heating

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	0.99	0.98	0.97	0.97	---	---

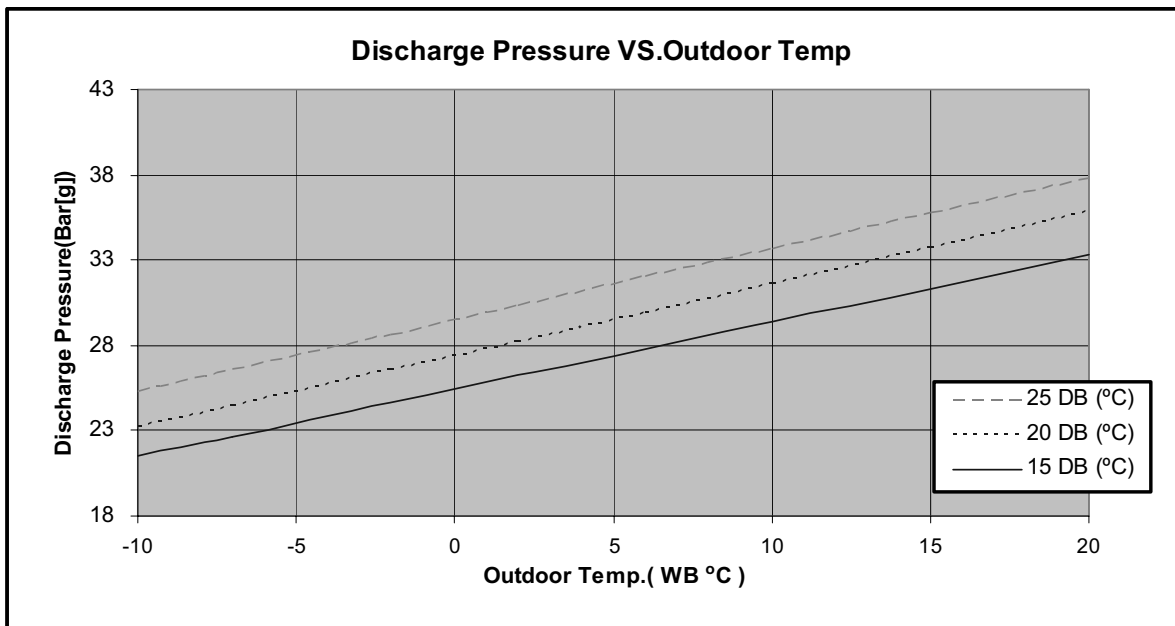
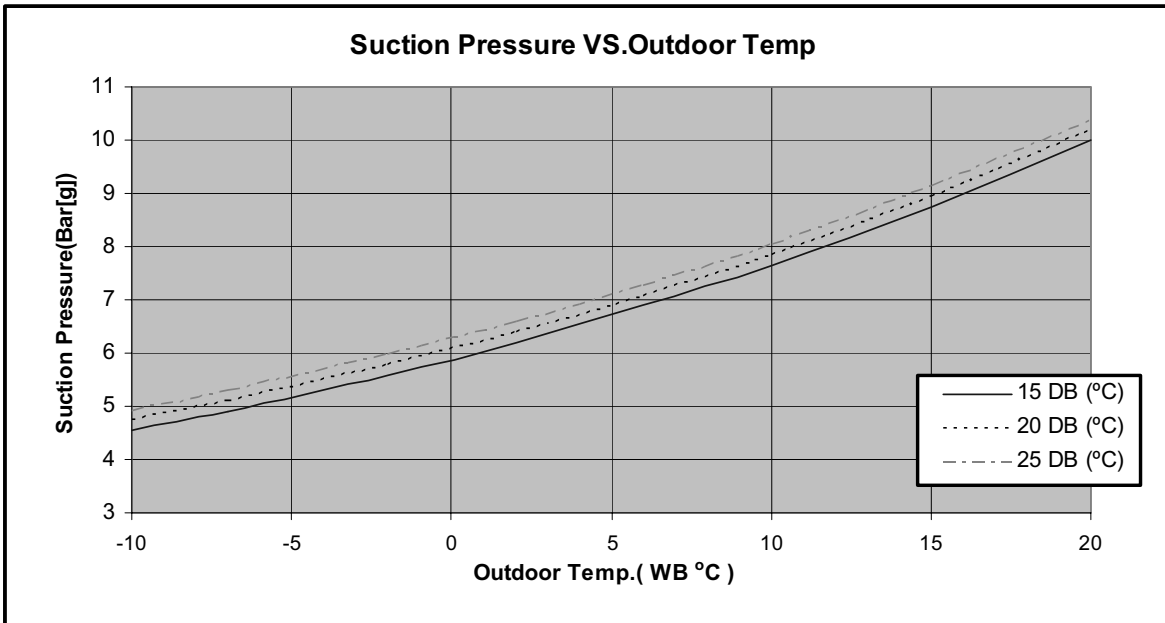
* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.3 Pressure Curves.

5.3.1 Cooling.



5.3.2 Heating.



5.4 KN30 / OU8-30 R410A

5.4.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	8.75	9.06	9.27	9.49	9.64
	SC	5.88	6.13	6.37	6.53	6.65
	PI	2.08	2.09	2.09	2.10	2.11
20 ⁽¹⁾	TC	8.46	8.92	9.20	9.42	9.62
	SC	5.76	6.07	6.33	6.51	6.63
	PI	2.26	2.27	2.28	2.29	2.29
25	TC	8.01	8.65	9.09	9.37	9.59
	SC	5.61	5.95	6.28	6.46	6.58
	PI	2.45	2.46	2.48	2.50	2.51
30	TC	7.49	8.15	8.81	9.12	9.39
	SC	5.43	5.78	6.14	6.32	6.44
	PI	2.64	2.68	2.70	2.72	2.75
35	TC	6.93	7.52	8.30	8.72	9.13
	SC	5.17	5.54	6.00	6.17	6.29
	PI	2.85	2.89	2.94	2.96	2.98
40	TC	6.31	6.86	7.49	8.19	8.61
	SC	4.87	5.24	5.68	5.86	5.98
	PI	3.07	3.12	3.17	3.21	3.24
46	TC	5.47	5.98	6.58	7.27	7.83
	SC	4.49	4.81	5.18	5.36	5.48
	PI	3.35	3.40	3.48	3.53	3.57

LEGEND

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

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

5.4.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.16	2.30	4.97	2.45	4.77	2.58
-7	5.56	2.36	5.36	2.49	5.16	2.63
-2	5.90	2.39	5.70	2.53	5.51	2.68
2	7.18	2.51	6.88	2.66	6.59	2.82
6	9.21	2.69	8.94	2.88	8.63	3.06
10	10.01	2.84	9.74	3.04	9.48	3.25
15	10.82	2.97	10.55	3.20	10.28	3.40
20	11.40	3.05	11.13	3.31	10.82	3.57

* the above chart includes the weighted deicing influence.

LEGEND

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

5.5 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.01	1	0.98	0.97	0.96	0.95	0.94	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.5.1 Heating

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	0.99	0.98	0.97	0.97	---	---

* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.6 KN30 / OU8-30T R410A

5.6.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	8.75	9.06	9.27	9.49	9.64
	SC	5.88	6.13	6.37	6.53	6.65
	PI	2.03	2.03	2.04	2.04	2.05
20 ⁽¹⁾	TC	8.46	8.92	9.20	9.42	9.62
	SC	5.76	6.07	6.33	6.51	6.63
	PI	2.20	2.21	2.22	2.23	2.23
25	TC	8.01	8.65	9.09	9.37	9.59
	SC	5.61	5.95	6.28	6.46	6.58
	PI	2.38	2.40	2.41	2.43	2.44
30	TC	7.49	8.15	8.81	9.12	9.39
	SC	5.43	5.78	6.14	6.32	6.44
	PI	2.57	2.60	2.63	2.65	2.67
35	TC	6.93	7.52	8.30	8.72	9.13
	SC	5.17	5.54	6.00	6.17	6.29
	PI	2.77	2.81	2.86	2.88	2.90
40	TC	6.31	6.86	7.49	8.19	8.61
	SC	4.87	5.24	5.68	5.86	5.98
	PI	2.99	3.03	3.08	3.12	3.15
46	TC	5.47	5.98	6.58	7.27	7.83
	SC	4.49	4.81	5.18	5.36	5.48
	PI	3.26	3.31	3.39	3.43	3.47

LEGEND

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

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

5.6.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.16	2.23	4.97	2.38	4.77	2.50
-7	5.56	2.29	5.36	2.41	5.16	2.54
-2	5.90	2.32	5.70	2.46	5.51	2.59
2	7.18	2.43	6.88	2.58	6.59	2.73
6	9.21	2.61	8.94	2.79	8.63	2.96
10	10.01	2.75	9.74	2.94	9.48	3.15
15	10.82	2.87	10.55	3.10	10.28	3.29
20	11.40	2.96	11.13	3.21	10.82	3.46

* the above chart includes the weighted deicing influence.

LEGEND

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

5.7 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.01	1	0.98	0.97	0.96	0.95	0.94	—	—

* Minimum recommended tubing length between indoor and outdoor units is 4m.

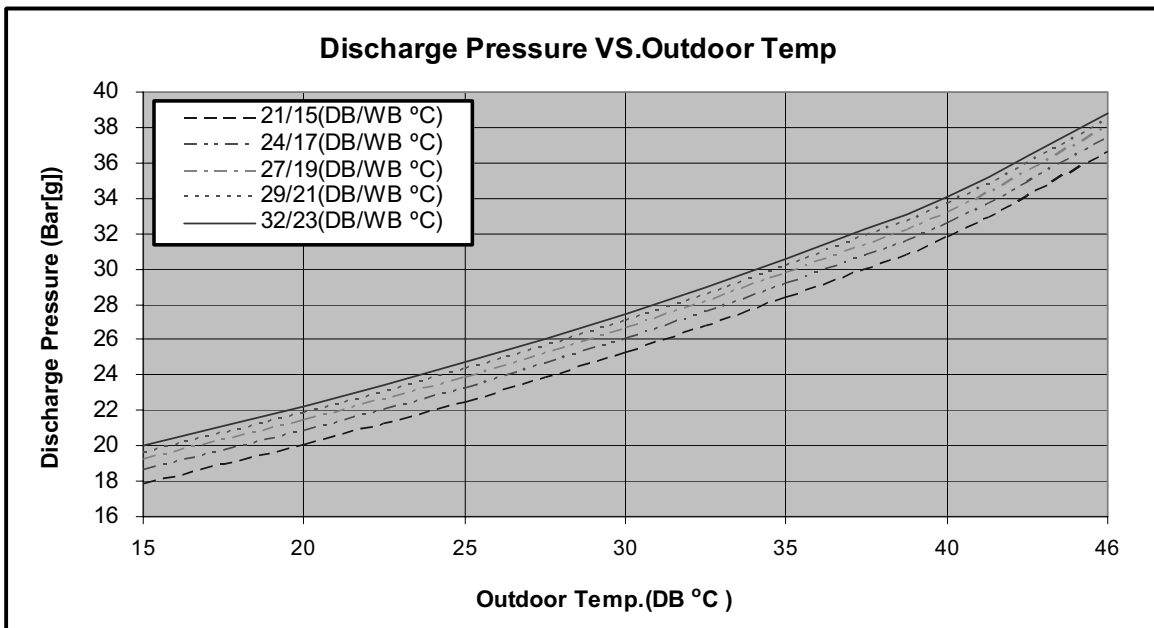
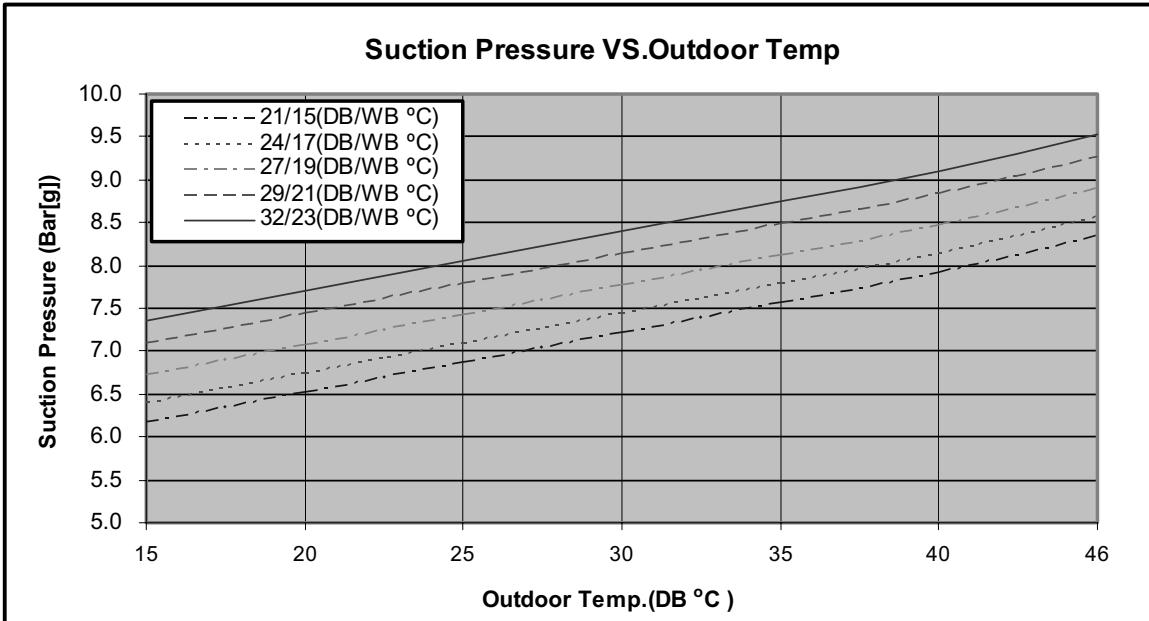
5.7.1 Heating

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	0.99	0.98	0.97	0.97	—	—

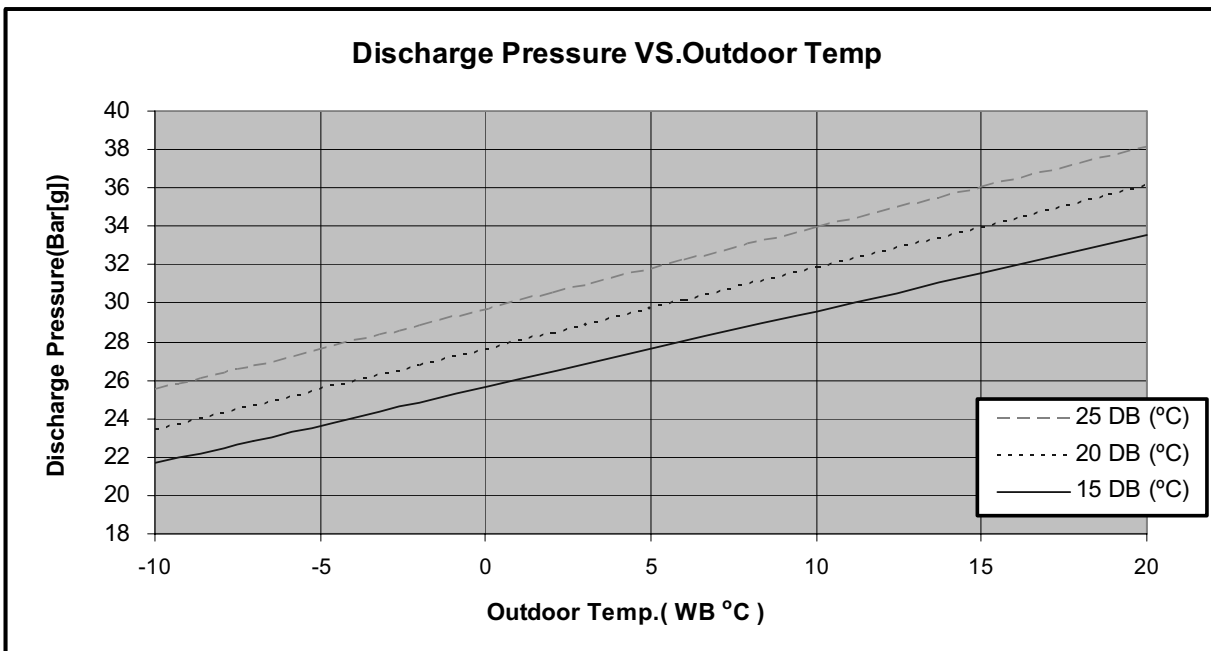
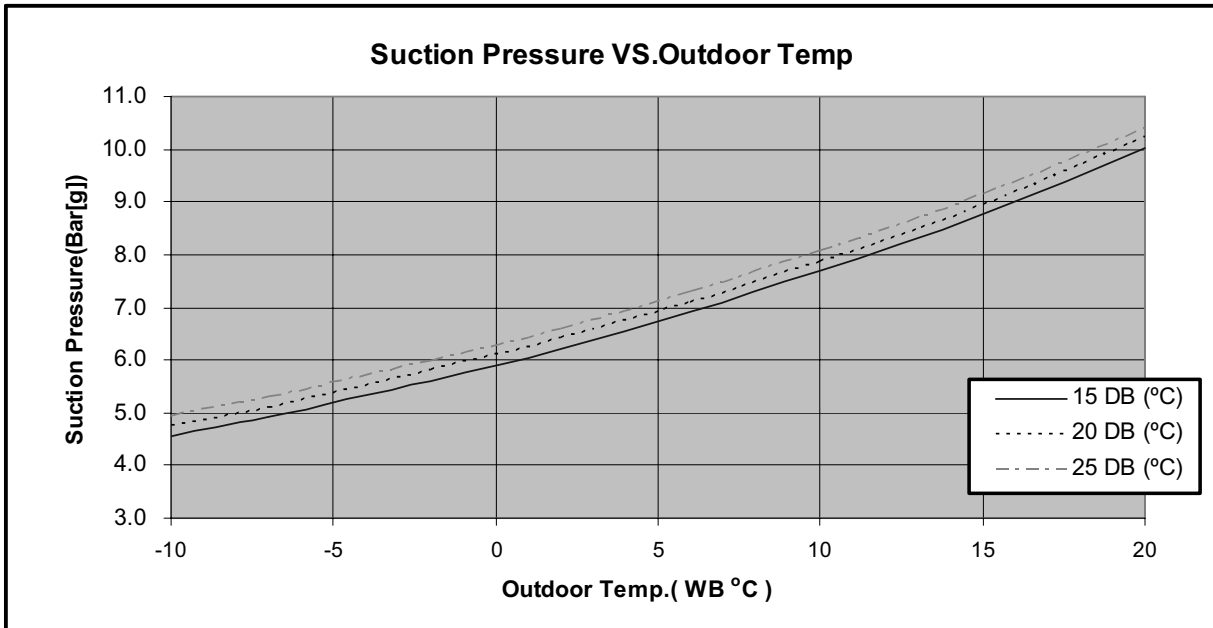
* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.8 Pressure Curves.

5.8.1 KN30 / OU8-30 R410A - Cooling:

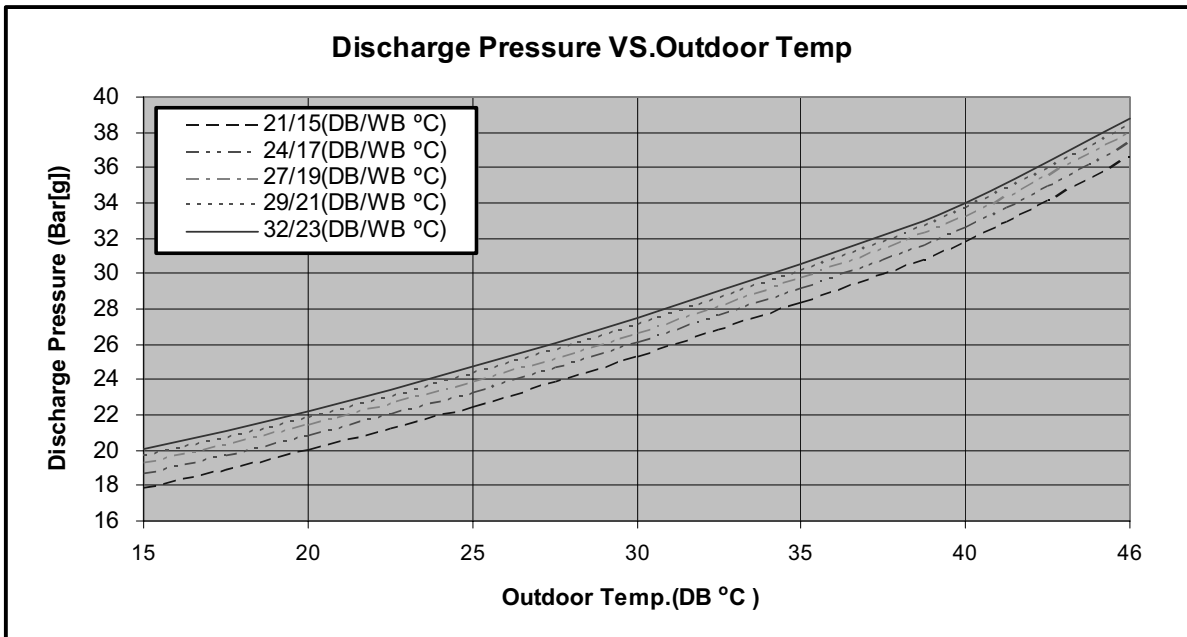
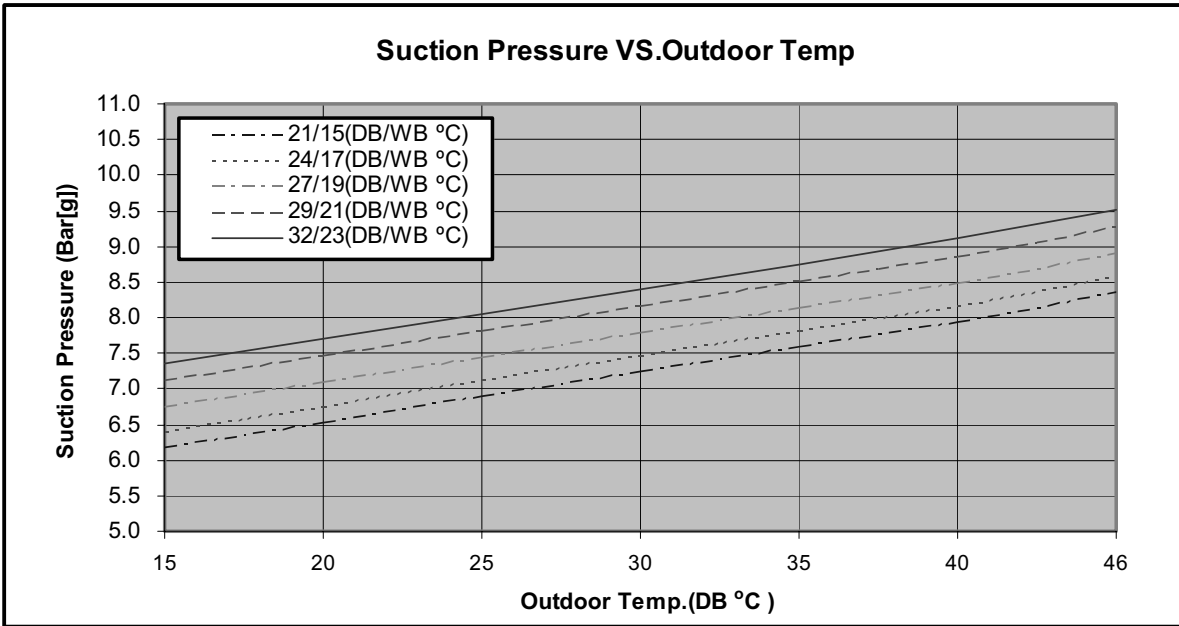


5.8.2 Heating.

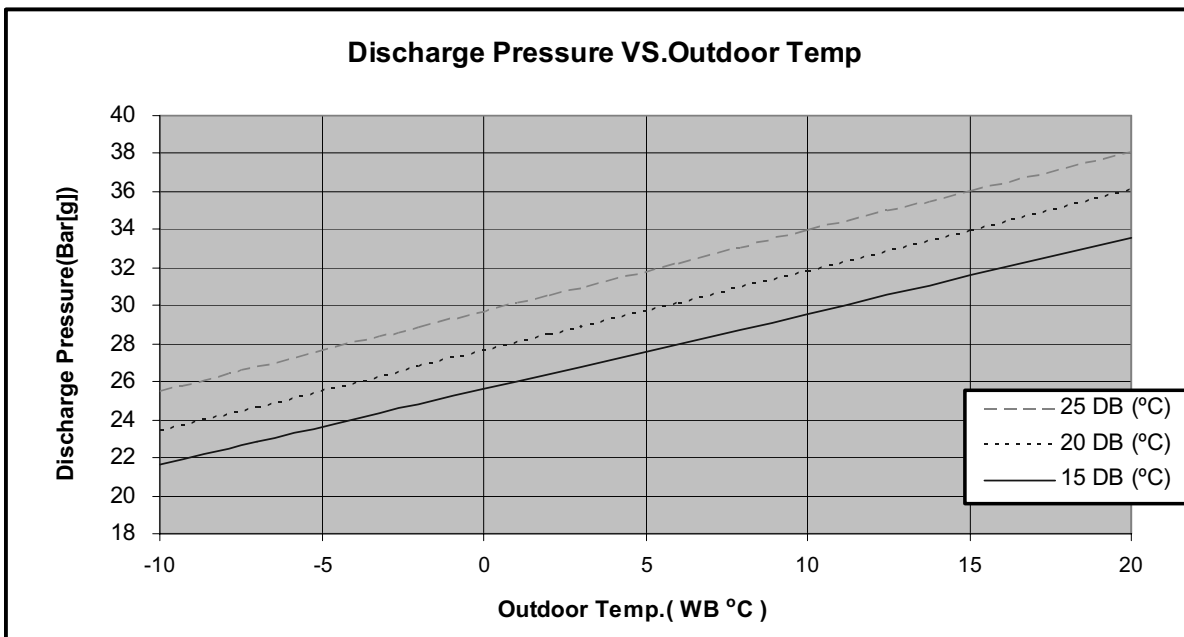
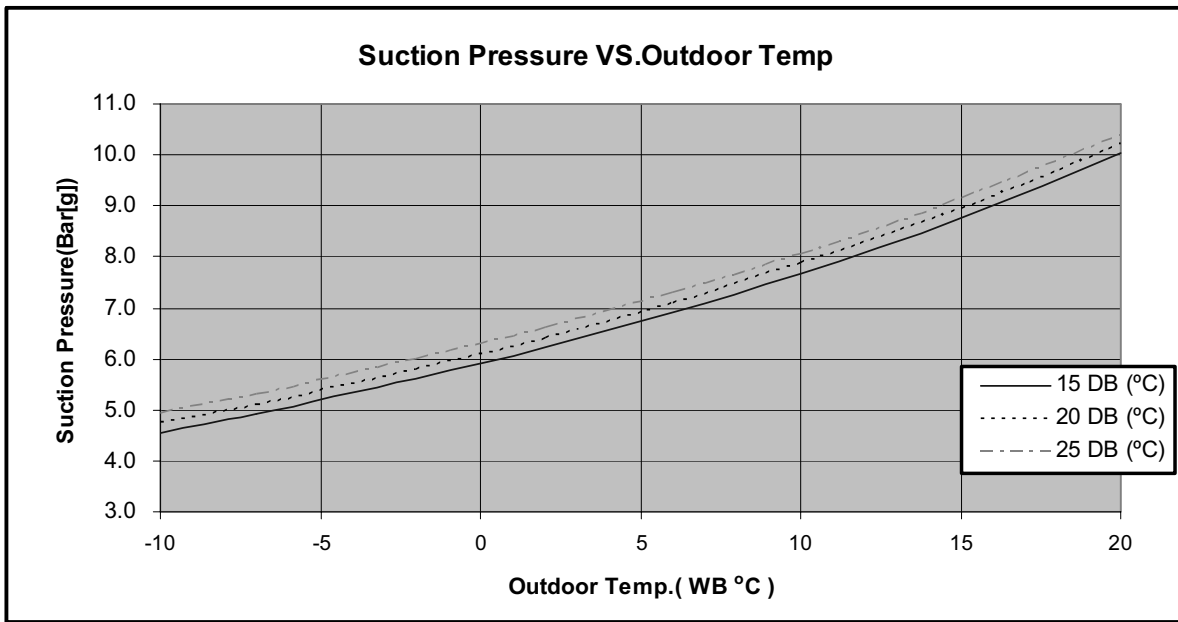


5.9 Pressure Curves.

5.9.1 KN30 / OU8-30T R410A - Cooling:



5.8.2 Heating.



5.9 KN36 / OU10-36 R410A

5.9.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	10.65	11.03	11.29	11.55	11.73
	SC	6.74	7.03	7.30	7.48	7.62
	PI	2.47	2.47	2.48	2.48	2.50
20 ⁽¹⁾	TC	10.30	10.86	11.20	11.46	11.71
	SC	6.60	6.96	7.26	7.46	7.60
	PI	2.68	2.69	2.70	2.71	2.72
25	TC	9.74	10.52	11.06	11.40	11.67
	SC	6.43	6.83	7.20	7.41	7.54
	PI	2.89	2.91	2.93	2.95	2.97
30	TC	9.11	9.92	10.72	11.10	11.43
	SC	6.23	6.62	7.04	7.25	7.39
	PI	3.12	3.17	3.20	3.22	3.25
35	TC	8.44	9.16	10.10	10.61	11.11
	SC	5.93	6.35	6.88	7.08	7.22
	PI	3.37	3.42	3.48	3.51	3.53
40	TC	7.67	8.35	9.11	9.97	10.48
	SC	5.59	6.01	6.51	6.71	6.85
	PI	3.63	3.69	3.75	3.80	3.84
46	TC	6.66	7.28	8.00	8.84	9.53
	SC	5.14	5.51	5.93	6.14	6.28
	PI	3.97	4.03	4.12	4.18	4.23

LEGEND

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

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

5.9.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.30	2.88	5.10	3.07	4.90	3.22
-7	5.71	2.95	5.50	3.11	5.30	3.28
-2	6.06	2.99	5.86	3.17	5.66	3.35
2	7.37	3.13	7.07	3.33	6.77	3.53
6	10.40	3.37	10.10	3.60	9.75	3.82
10	11.31	3.55	11.01	3.80	10.71	4.06
15	12.22	3.71	11.92	4.00	11.62	4.25
20	12.88	3.82	12.57	4.14	12.22	4.46

* the above chart includes the weighted deicing influence.

LEGEND

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

5.10 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.01	1	0.98	0.97	0.96	0.95	0.94	0.93	0.90

* Minimum recommended tubing length between indoor and outdoor units is 4m.

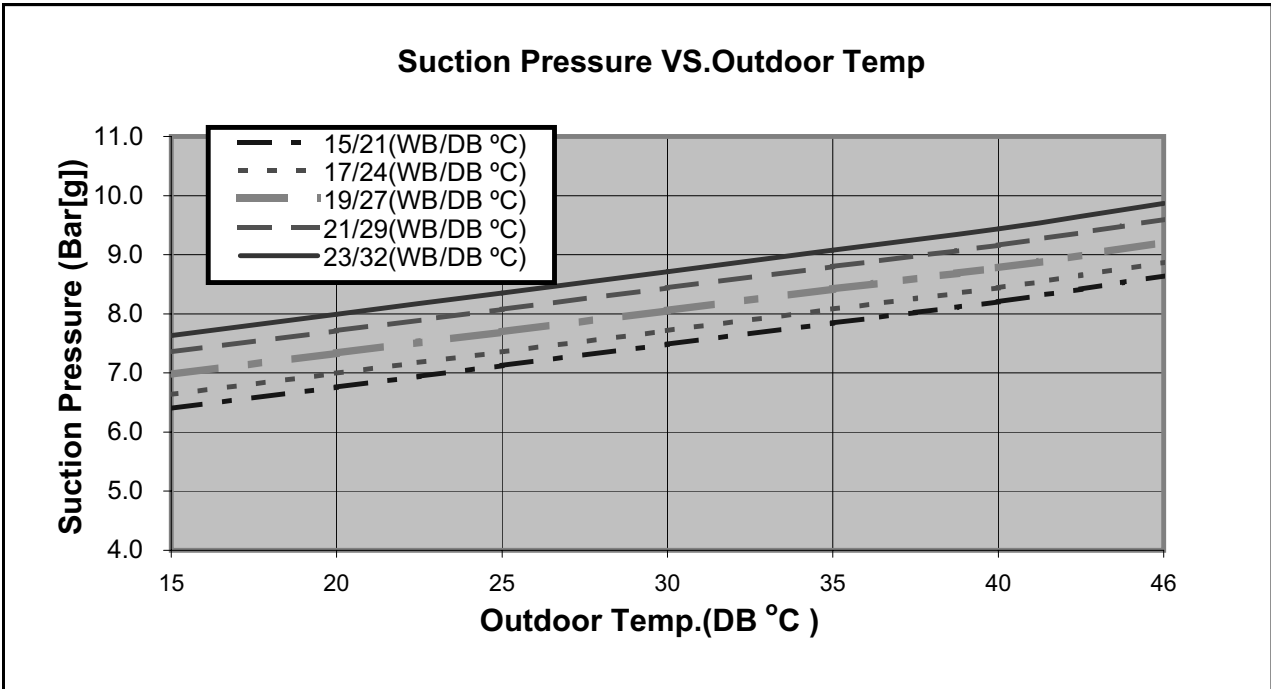
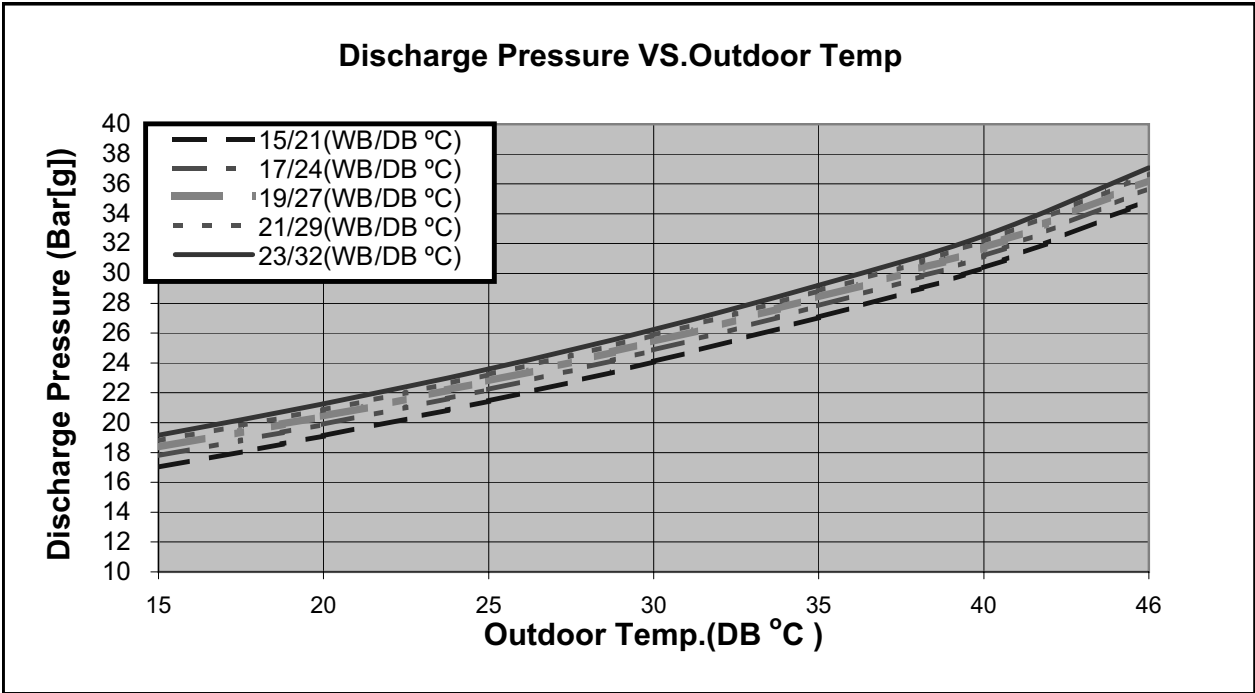
5.10.1 Heating

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	0.99	0.98	0.97	0.97	0.96	0.95

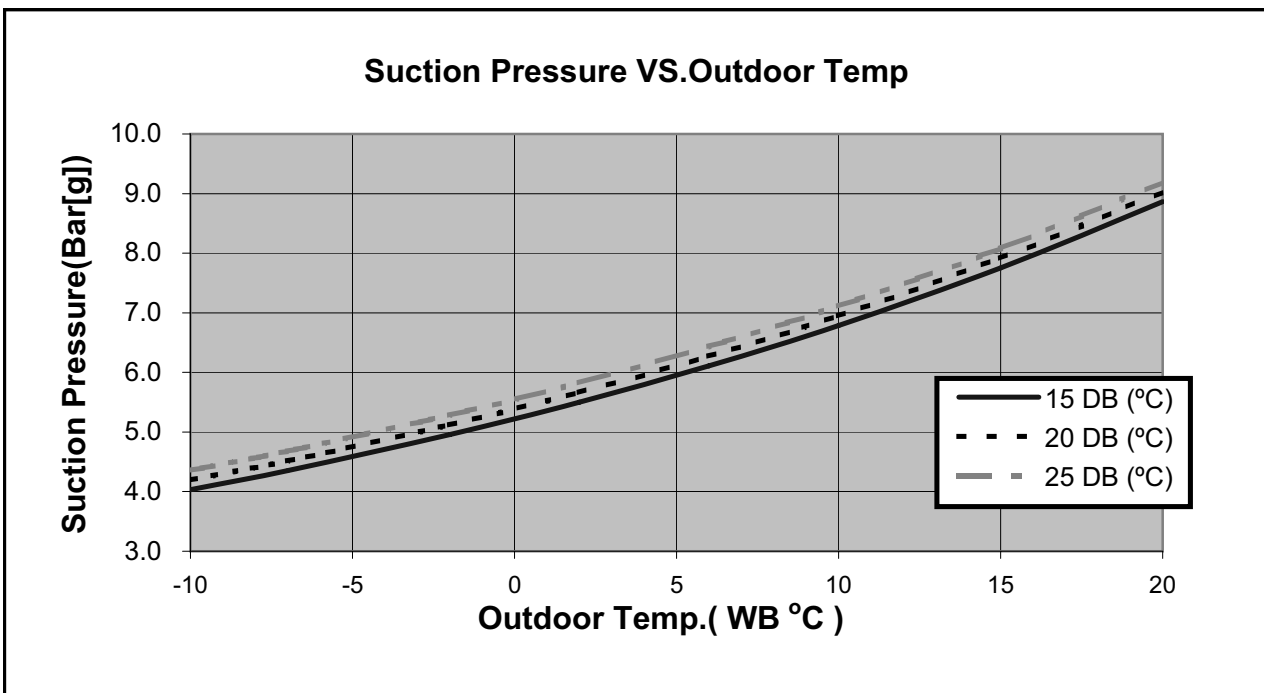
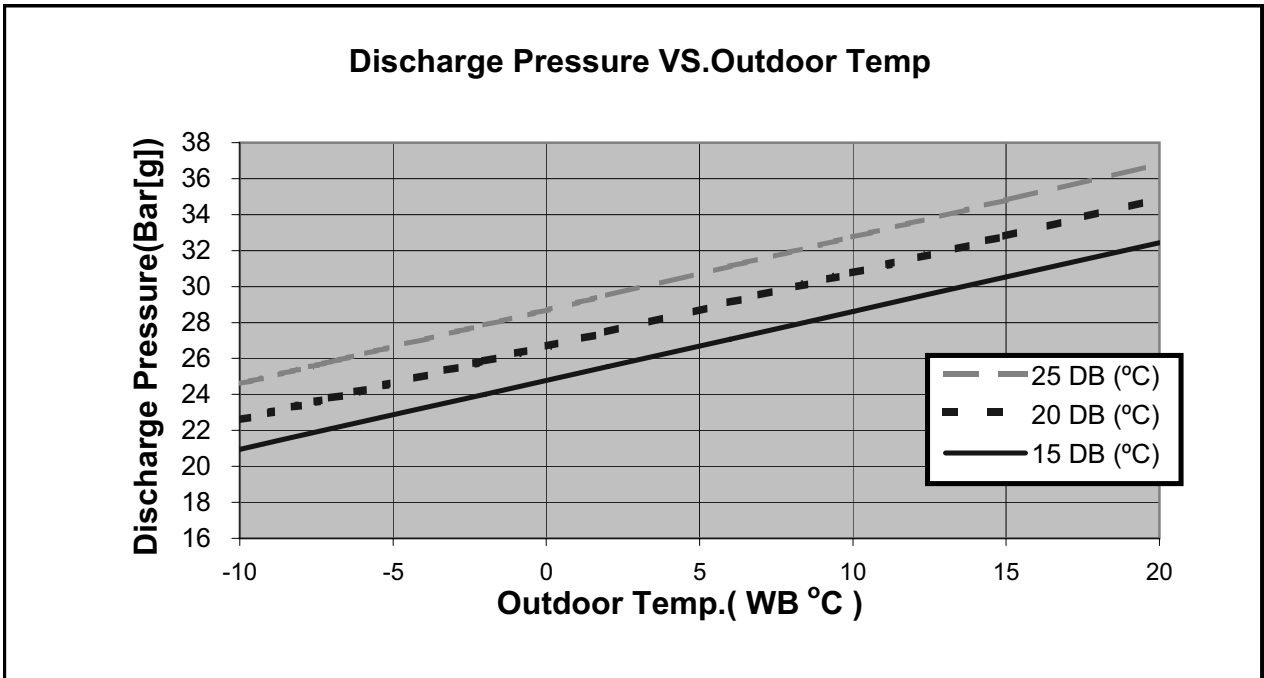
* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.11 Pressure Curves.

5.11.1 Cooling:



5.11.2 Heating



5.12 KN36 / OU10-36T R410A

5.12.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	10.22	10.59	10.84	11.10	11.26
	SC	6.35	6.62	6.88	7.05	7.18
	PI	2.37	2.37	2.38	2.38	2.40
20 ⁽¹⁾	TC	9.89	10.43	10.76	11.01	11.25
	SC	6.22	6.56	6.83	7.03	7.16
	PI	2.57	2.58	2.59	2.60	2.61
25	TC	9.36	10.10	10.62	10.95	11.21
	SC	6.06	6.43	6.78	6.98	7.11
	PI	2.78	2.80	2.82	2.83	2.85
30	TC	8.75	9.53	10.29	10.66	10.98
	SC	5.87	6.24	6.63	6.83	6.96
	PI	3.00	3.04	3.07	3.09	3.12
35	TC	8.10	8.79	9.70	10.19	10.67
	SC	5.58	5.98	6.48	6.67	6.80
	PI	3.23	3.29	3.34	3.37	3.38
40	TC	7.37	8.02	8.75	9.57	10.06
	SC	5.26	5.66	6.13	6.32	6.45
	PI	3.49	3.54	3.60	3.65	3.68
46	TC	6.39	6.99	7.69	8.49	9.15
	SC	4.85	5.19	5.59	5.78	5.91
	PI	3.81	3.87	3.96	4.01	4.06

LEGEND

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

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

5.12.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	5.41	2.94	5.20	3.14	5.00	3.29
-7	5.82	3.02	5.61	3.18	5.41	3.36
-2	6.18	3.05	5.97	3.24	5.77	3.42
2	7.52	3.20	7.21	3.40	6.90	3.61
6	10.61	3.44	10.30	3.68	9.94	3.91
10	11.54	3.63	11.23	3.88	10.92	4.15
15	12.46	3.79	12.15	4.08	11.85	4.34
20	13.13	3.90	12.82	4.23	12.46	4.56

* the above chart includes the weighted deicing influence.

LEGEND

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

5.13 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.01	1	0.98	0.97	0.96	0.95	0.94	0.93	0.90

* Minimum recommended tubing length between indoor and outdoor units is 4m.

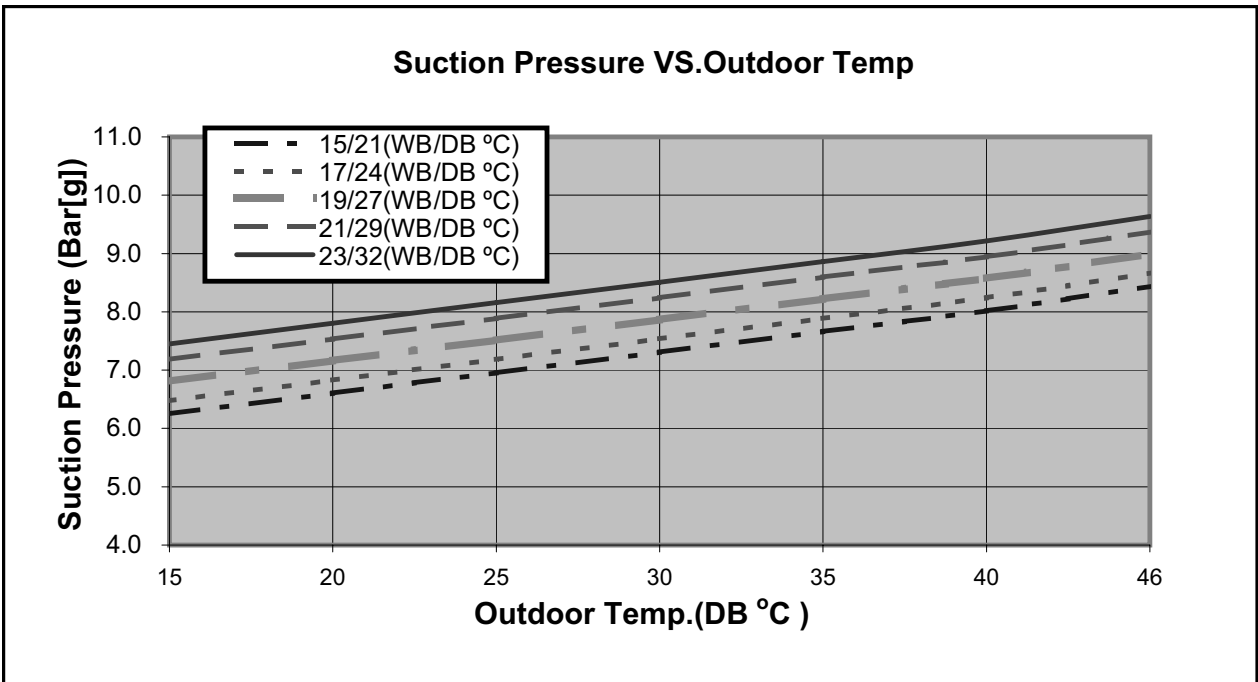
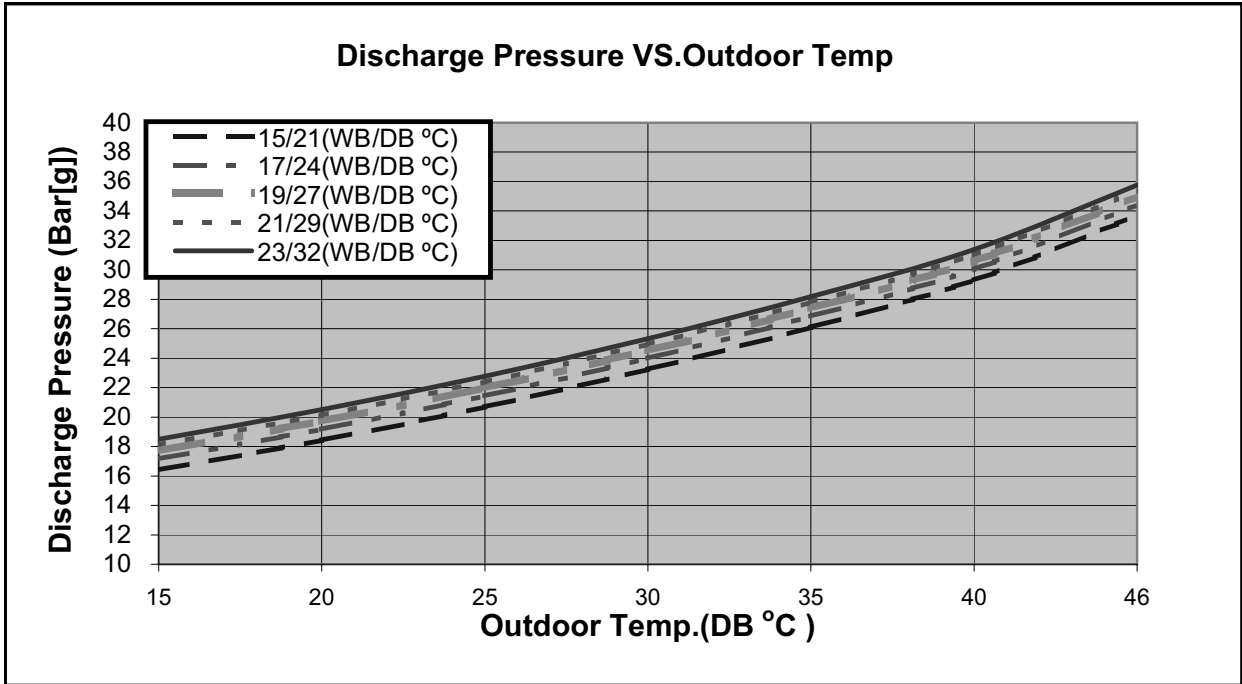
5.13.1 Heating

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	0.99	0.98	0.97	0.97	0.96	0.95

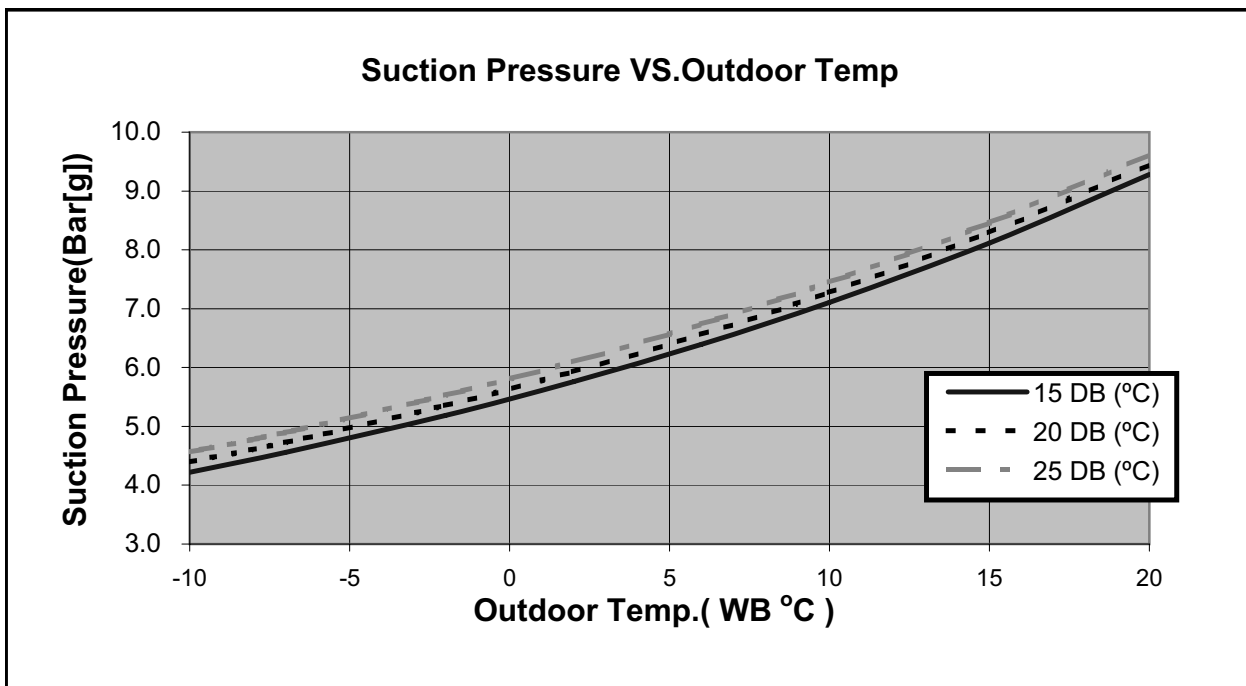
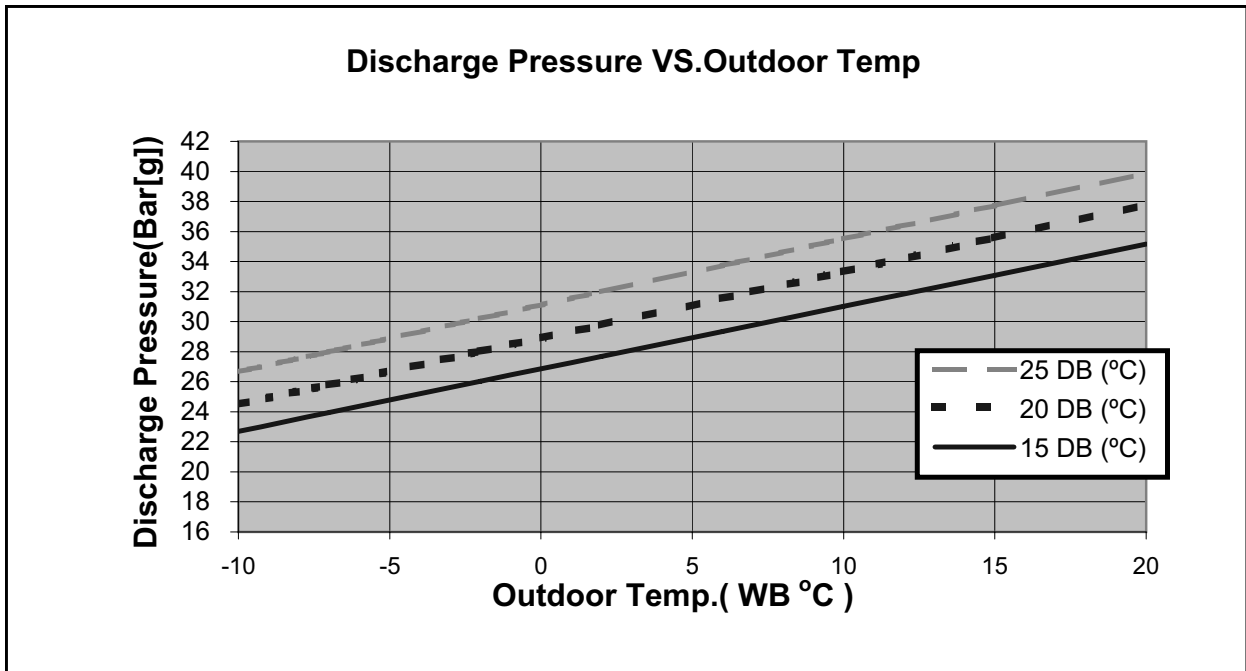
* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.14 Pressure Curves.

5.14.1 Cooling:



5.14.2 Heating:



5.15 KN45 / OU10-47T R410A

5.15.1 Cooling Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR DB OD COIL (°C)	DATA	ENTERING AIR WB/DB ID COIL (°C)				
		15/21	17/24	19/27	21/29	23/32
15 ⁽¹⁾	TC	13.02	13.48	13.80	14.13	14.34
	SC	8.17	8.52	8.85	9.07	9.24
	PI	3.12	3.13	3.13	3.14	3.16
20 ⁽¹⁾	TC	12.59	13.27	13.69	14.02	14.32
	SC	8.00	8.44	8.80	9.05	9.21
	PI	3.39	3.40	3.41	3.43	3.43
25	TC	11.92	12.87	13.53	13.94	14.28
	SC	7.80	8.28	8.73	8.98	9.15
	PI	3.66	3.69	3.71	3.73	3.76
30	TC	11.14	12.13	13.11	13.57	13.98
	SC	7.55	8.03	8.54	8.79	8.95
	PI	3.95	4.01	4.04	4.07	4.11
35	TC	10.32	11.20	12.35	12.97	13.58
	SC	7.18	7.70	8.34	8.58	8.75
	PI	4.26	4.33	4.40	4.43	4.46
40	TC	9.38	10.21	11.14	12.19	12.81
	SC	6.77	7.29	7.89	8.14	8.31
	PI	4.59	4.66	4.74	4.80	4.85
46	TC	8.14	8.90	9.79	10.81	11.65
	SC	6.24	6.68	7.19	7.44	7.61
	PI	5.02	5.09	5.21	5.28	5.34

LEGEND

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

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

5.15.2 Heating Mode at 7.5m Tubing Connection.

230V : Indoor Fan at High Speed.

ENTERING AIR WB OU COIL (°C)	ENTERING AIR DB ID COIL (°C)					
	15		20		25	
	TH	PI	TH	PI	TH	PI
-10	6.93	3.70	6.67	3.94	6.40	4.14
-7	7.46	3.80	7.19	4.00	6.93	4.22
-2	7.92	3.84	7.66	4.07	7.39	4.31
2	9.64	4.03	9.24	4.28	8.84	4.54
6	13.60	4.33	13.20	4.63	12.74	4.92
10	14.78	4.57	14.39	4.88	13.99	5.22
15	15.97	4.77	15.58	5.14	15.18	5.46
20	16.83	4.91	16.43	5.32	15.97	5.74

* the above chart includes the weighted deicing influence.

LEGEND

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

5.16 Capacity Correction Factor Due to Tubing Length (One Way)

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.01	1	0.98	0.97	0.96	0.95	0.94	0.93	0.90

* Minimum recommended tubing length between indoor and outdoor units is 4m.

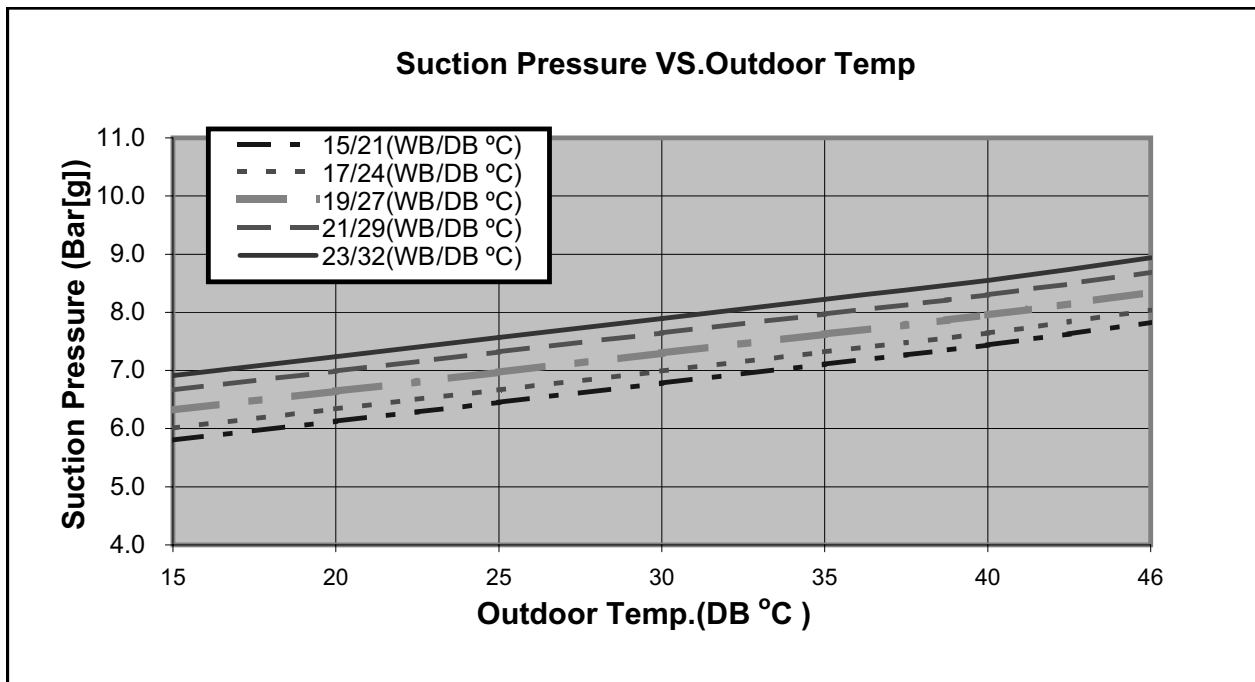
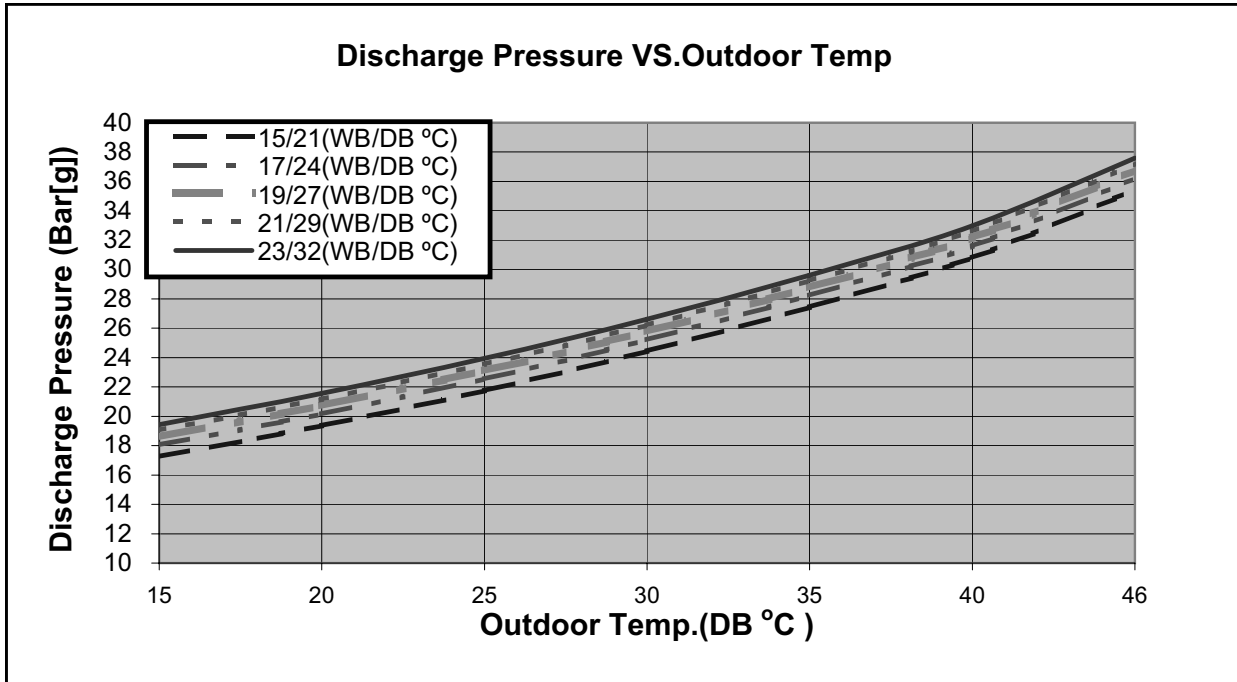
5.16.1 Heating

TOTAL TUBING LENGTH								
4m	7.5m	10m	15m	20m	25m	30m	40m	50m
1.02	1	0.99	0.99	0.98	0.97	0.97	0.96	0.95

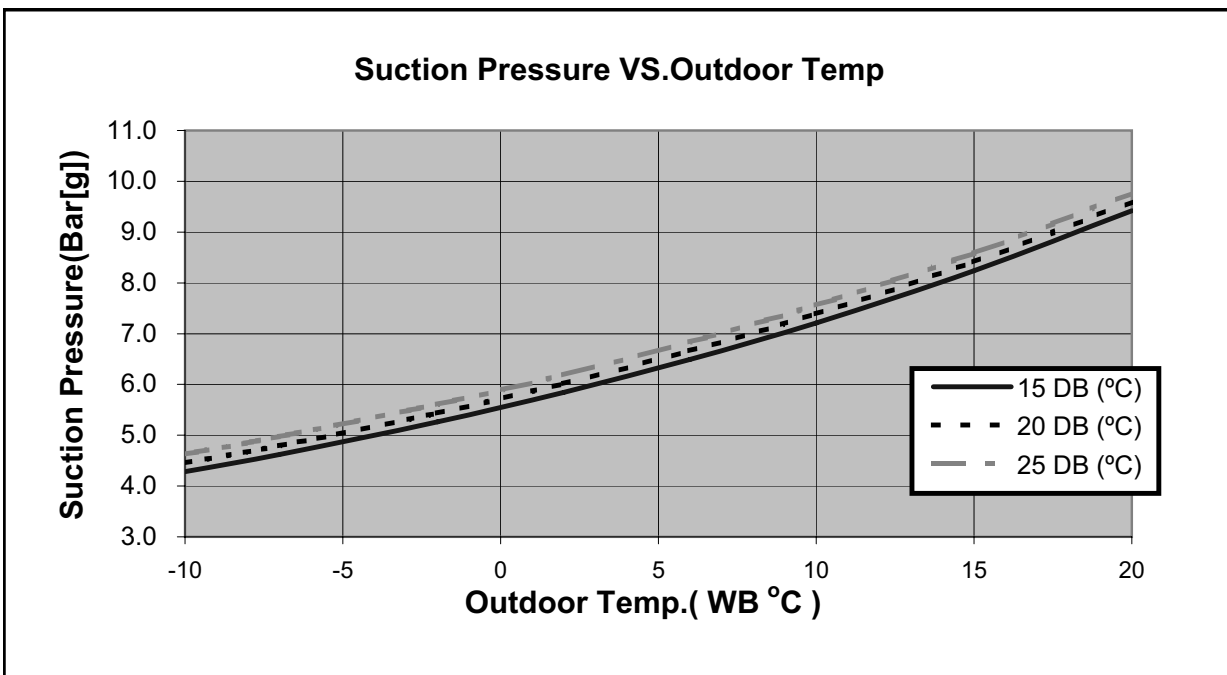
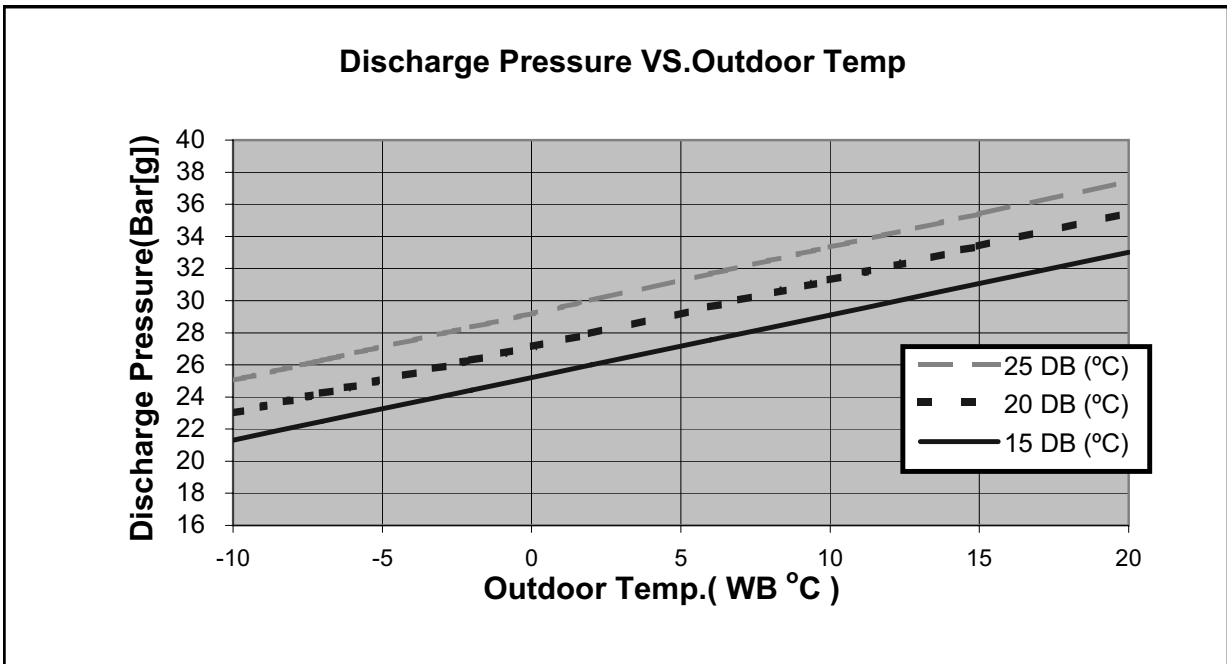
* Minimum recommended tubing length between indoor and outdoor units is 4m.

5.17 Pressure Curves.

Cooling:



5.17.2 Heating



6. ELECTRICAL DATA

6.1 Single Phase Units

MODEL	KN 24	KN 30
Power Supply	To Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Max Current, A	15	17
Circuit Breaker	20	25
Power Supply Wiring No. X Cross Section mm ²	3 X 2.5 mm ²	3 X 4 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	6X1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	5X1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

MODEL	KN 36
Power Supply	To Outdoor
	1PH – 230V – 50 Hz
Max Current, A	22.4
Circuit Breaker	25
Power Supply Wiring No. X Cross Section mm ²	3 X 4 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

6.2 Single Phase Units + Optional Heating Element

MODEL	KN 24	KN30
Power Supply	To Outdoor	To Outdoor
	1PH – 230V – 50 Hz	1PH – 230V – 50 Hz
Heating Element, kW	2.1	2.7
Max Current, A	25.5	28
Circuit Breaker	32	32
Power Supply Wiring No. X Cross Section mm ²	3 X 4 mm ²	3 X 4 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	6 X 2.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	6 X 2.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	5 X 2.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	5 X 2.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

6.3 Three Phase Units

MODEL	KN 24T	KN30T
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Max Current, A	3 x 7.5	3 x 9.2
Circuit Breaker	3 x 10	3 x 16
Power Supply Wiring No. X Cross Section mm ²	5 X 1.5 mm ²	5 X 1.5 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

MODEL	KN 36T	KN 45T
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Max Current, A	3 x 11.9	3 x 17.5
Circuit Breaker	3 x 16	3 x 20
Power Supply Wiring No. X Cross Section mm ²	5 X 2.5 mm ²	5 X 2.5 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	5 X 2.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

6.4 Three Phase Units + Optional Heating Element

MODEL	KN 24T	KN 30T
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Heating Element, kW	2.1	2.7
Max Current, A	3 X 10.1	3 X 14.6
Circuit Breaker	3 X 16	3 X 16
Power Supply Wiring No. X Cross Section mm ²	5 X 1.5 mm ²	5 X 2.5 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	6 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	5 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

MODEL	KN 36T	KN 45T
Power Supply	To Outdoor	To Outdoor
	3PH – 400V – 50 Hz	3PH – 400V – 50 Hz
Heating Element, kW	3.0	3.0
Max Current, A	3 X 16.2	3 X 21.9
Circuit Breaker	3 X 20	3 X 25
Power Supply Wiring No. X Cross Section mm ²	5 X 2.5 mm ²	5 X 2.5 mm ²
Interconnecting Cable RC Model No. X Cross Section mm ²	8 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	8 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)
Interconnecting Cable ST Model No. X Cross Section mm ²	7 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)	7 X 1.5 mm ² + 2 X 0.5 mm ² (OCT Sensor)

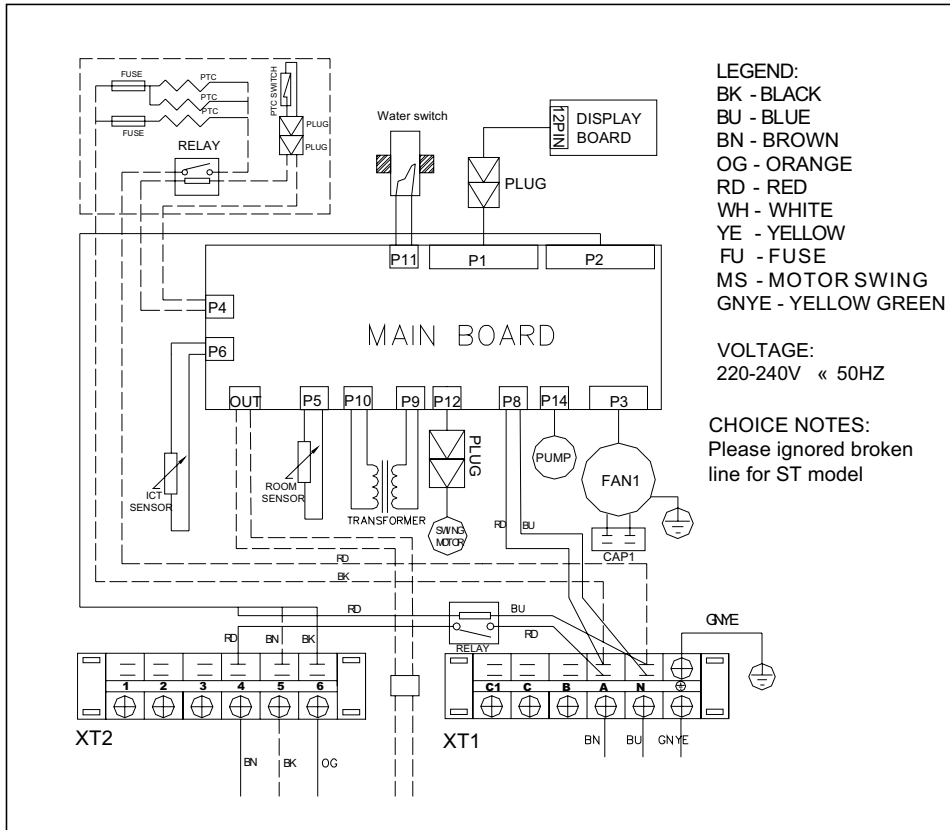
(1) The power supply to the heating element kit is provided separately from the main power supply unit.

NOTE

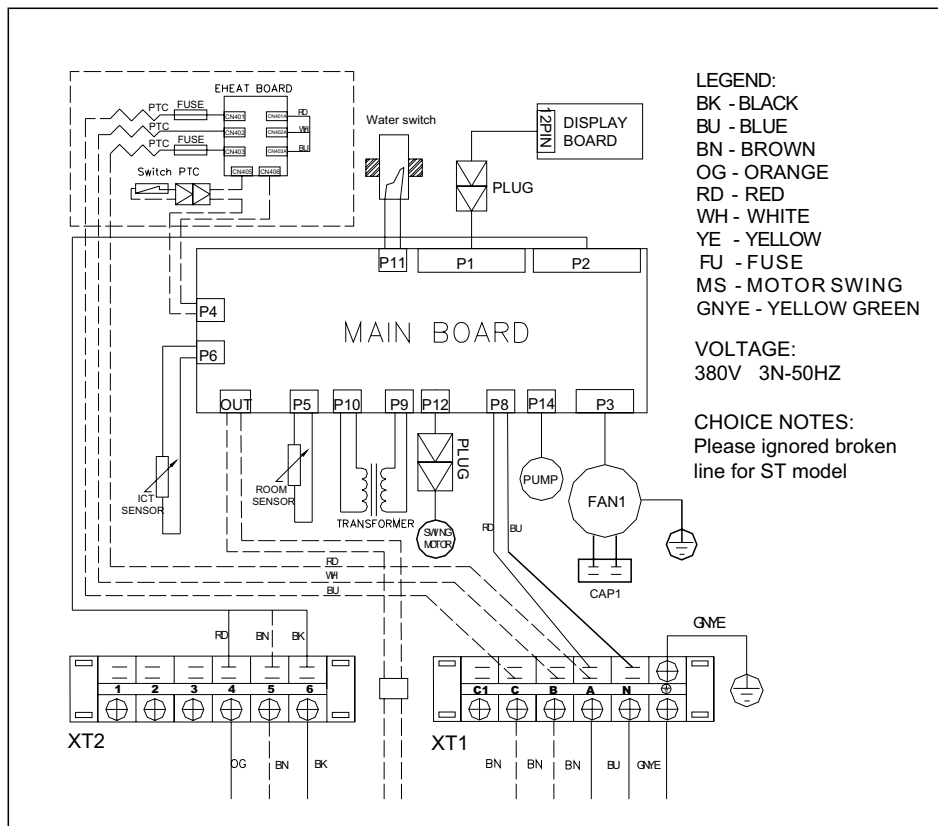
Power wiring cord should comply with local laws and electrical regulations requirements.

7. WIRING DIAGRAMS

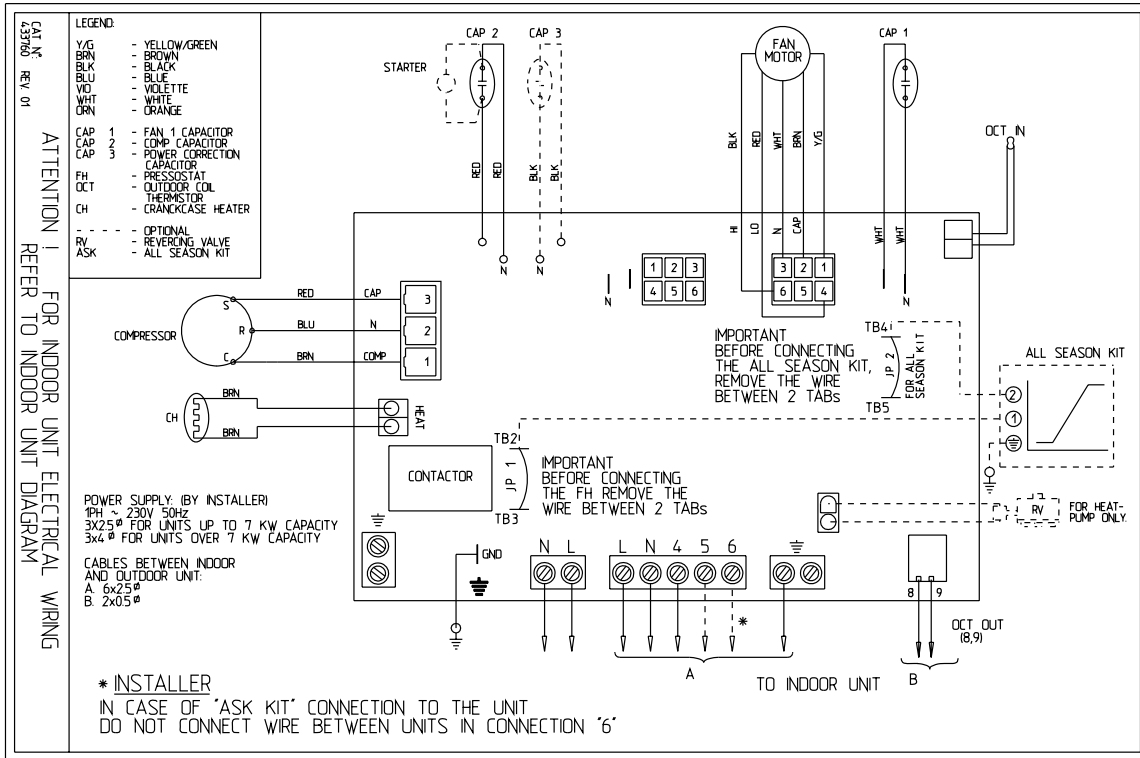
7.1 Indoor Unit: KN 24/30 (Power Supply to Outdoor)



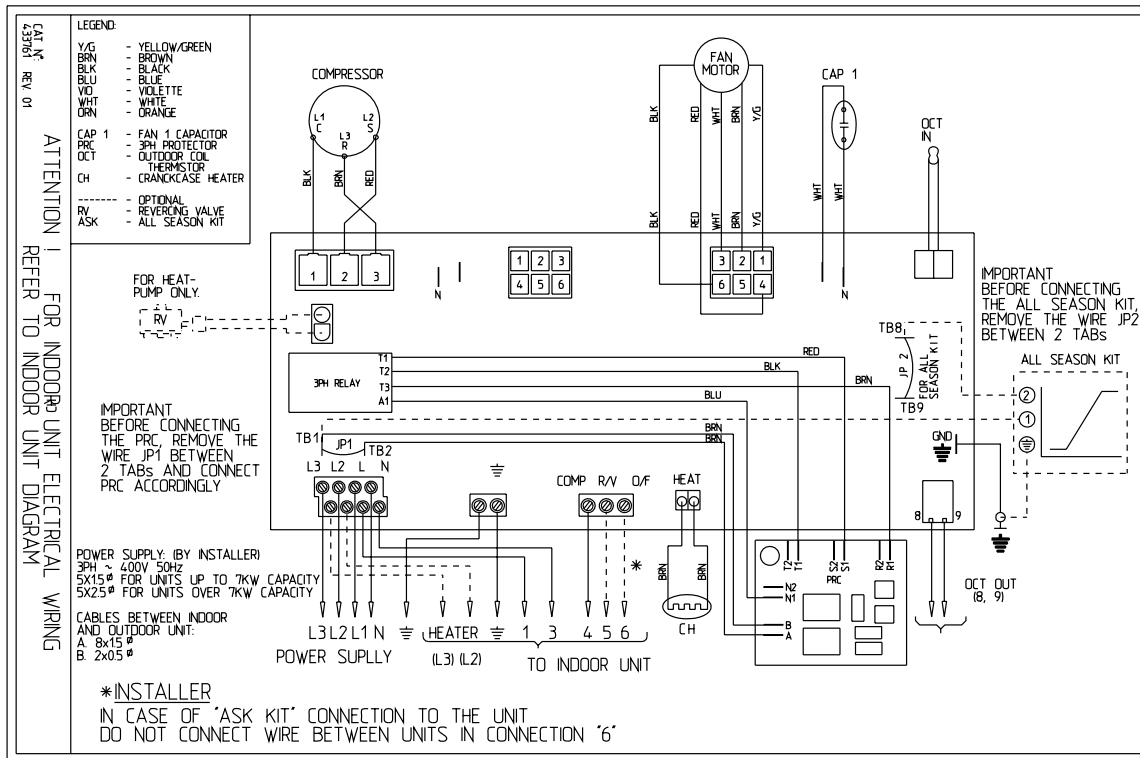
7.2 Indoor Unit: KN 24 /30 (Power Supply to Outdoor 3PH)



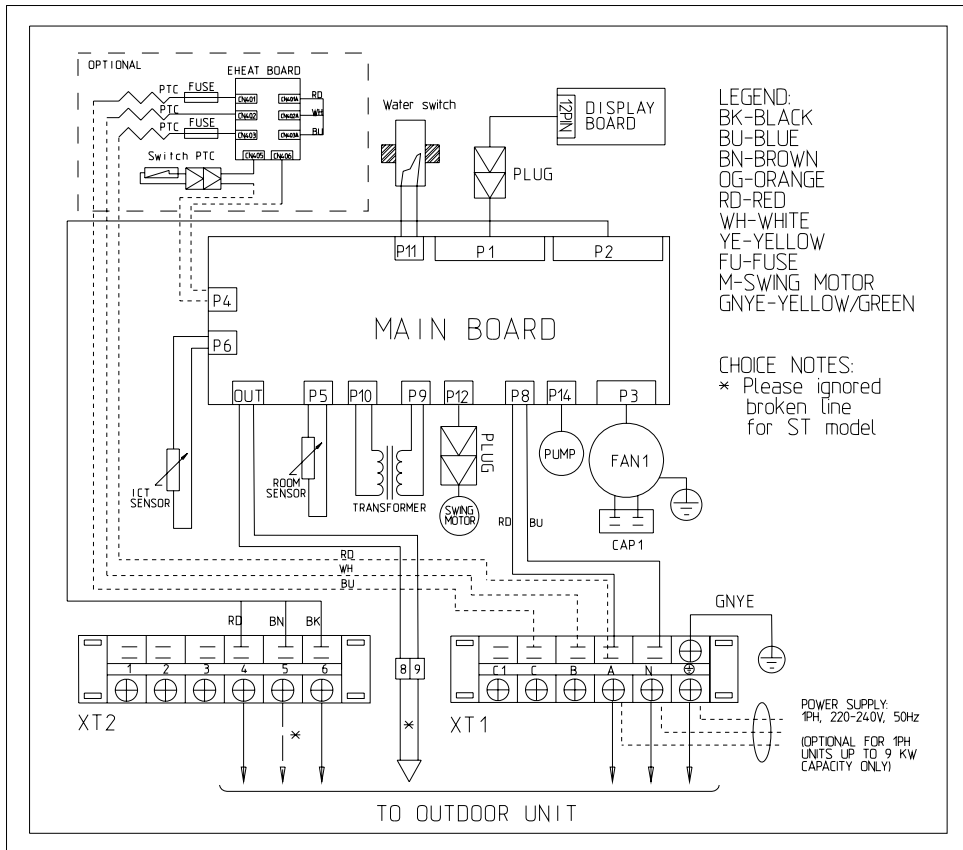
7.3 Outdoor Unit: OU7-24 / 30 1PH



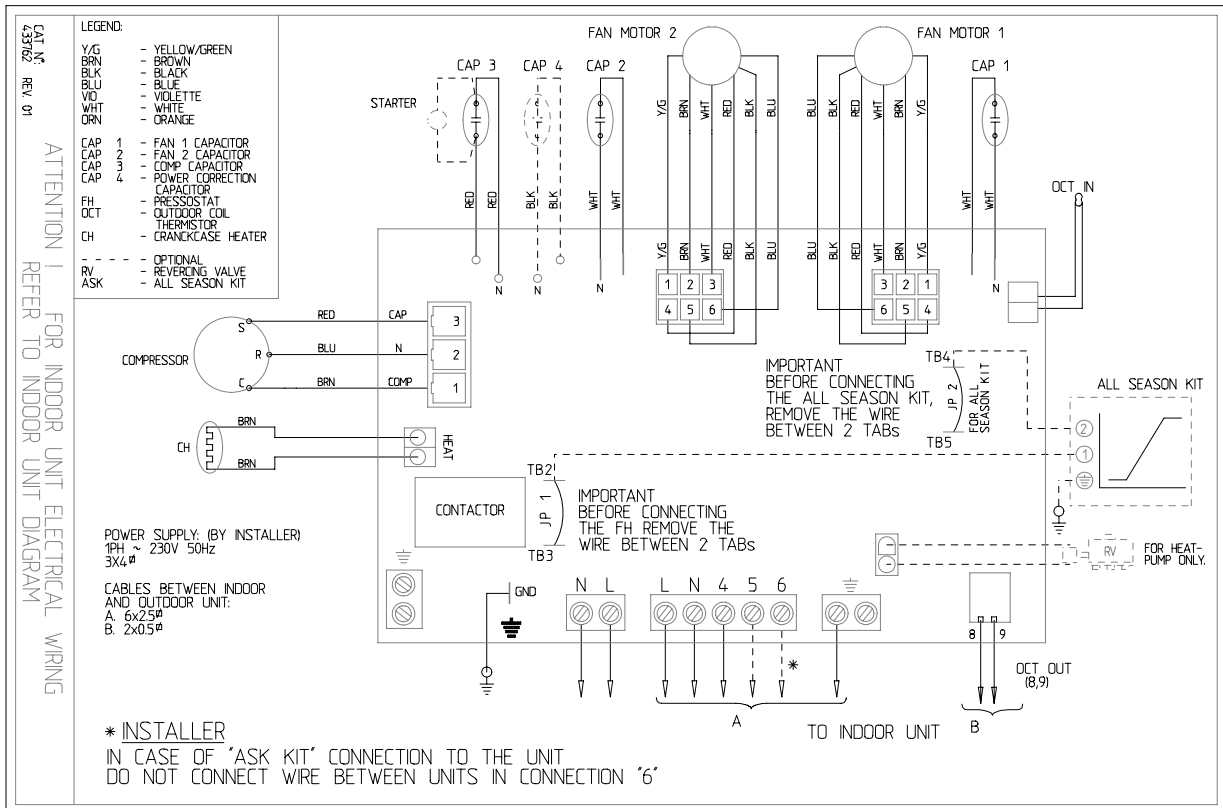
7.4 Outdoor Unit: OU7-24 / 30 3PH



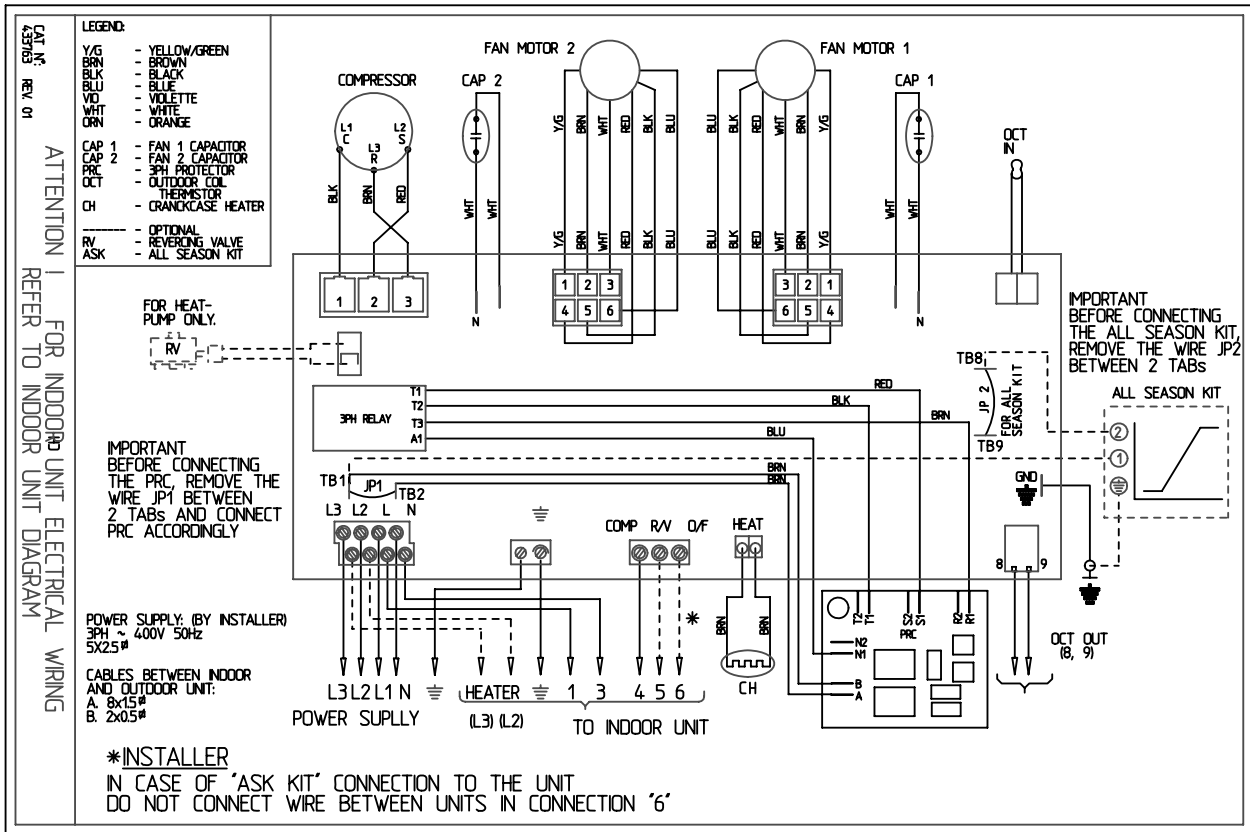
7.5 Indoor Unit: KN 36 / 36T / 45T



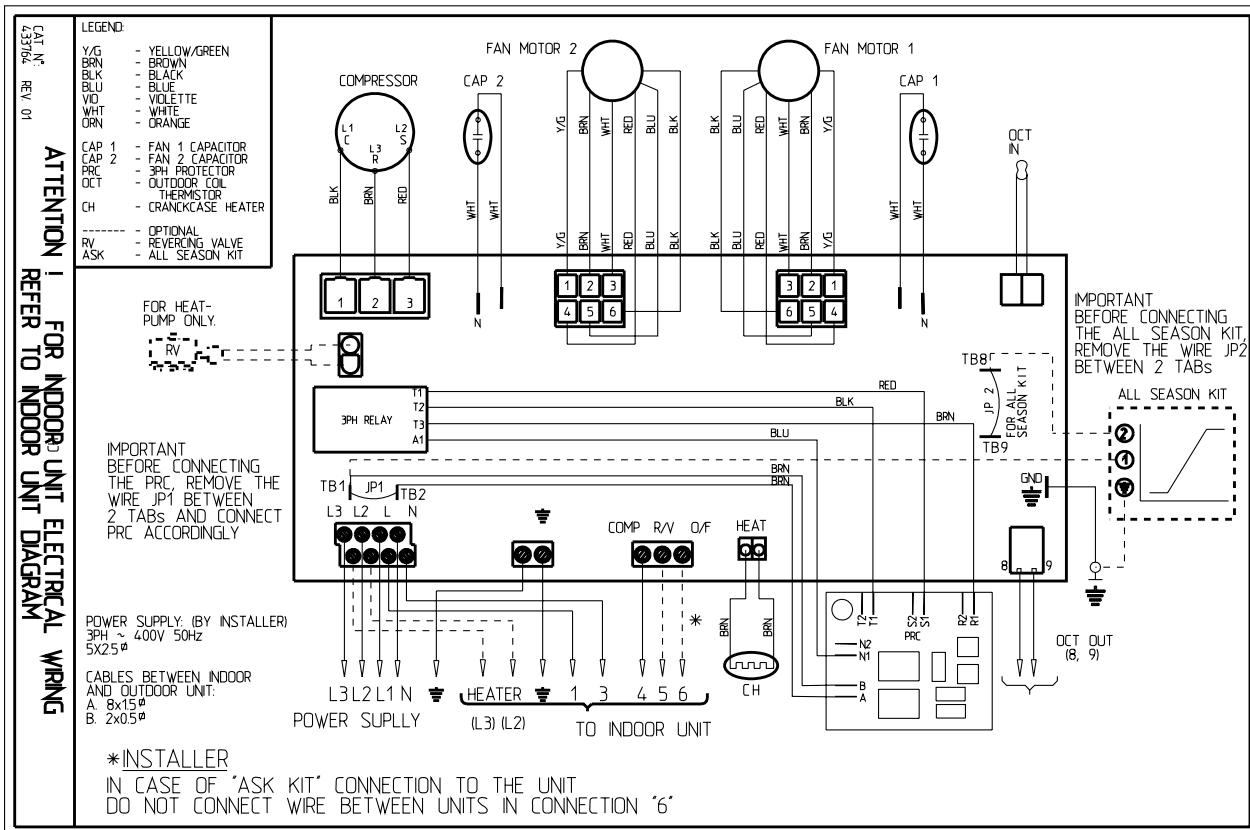
7.6 Outdoor Unit: OU10-36



7.7 Outdoor Unit: OU10-36T

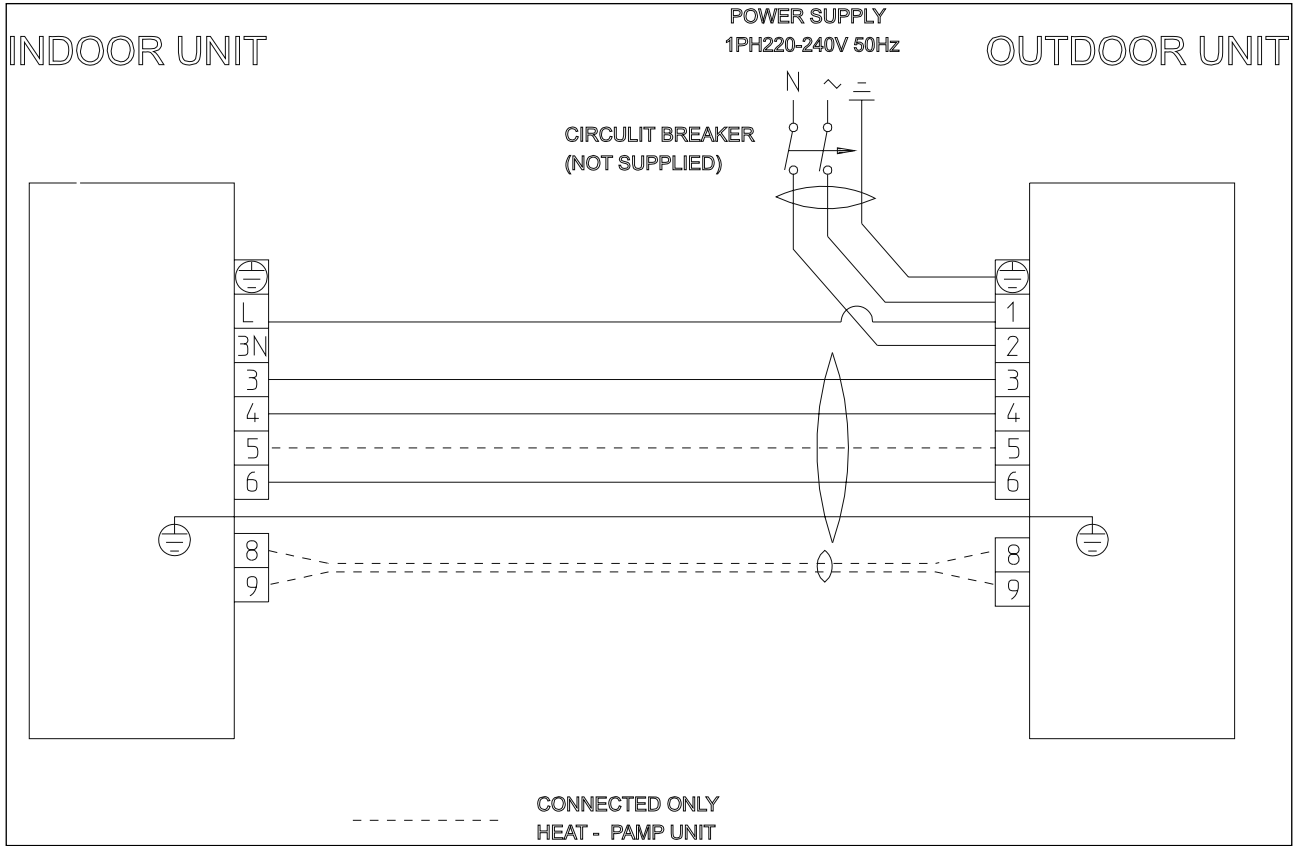


7.8 Outdoor Unit: OU10-47T

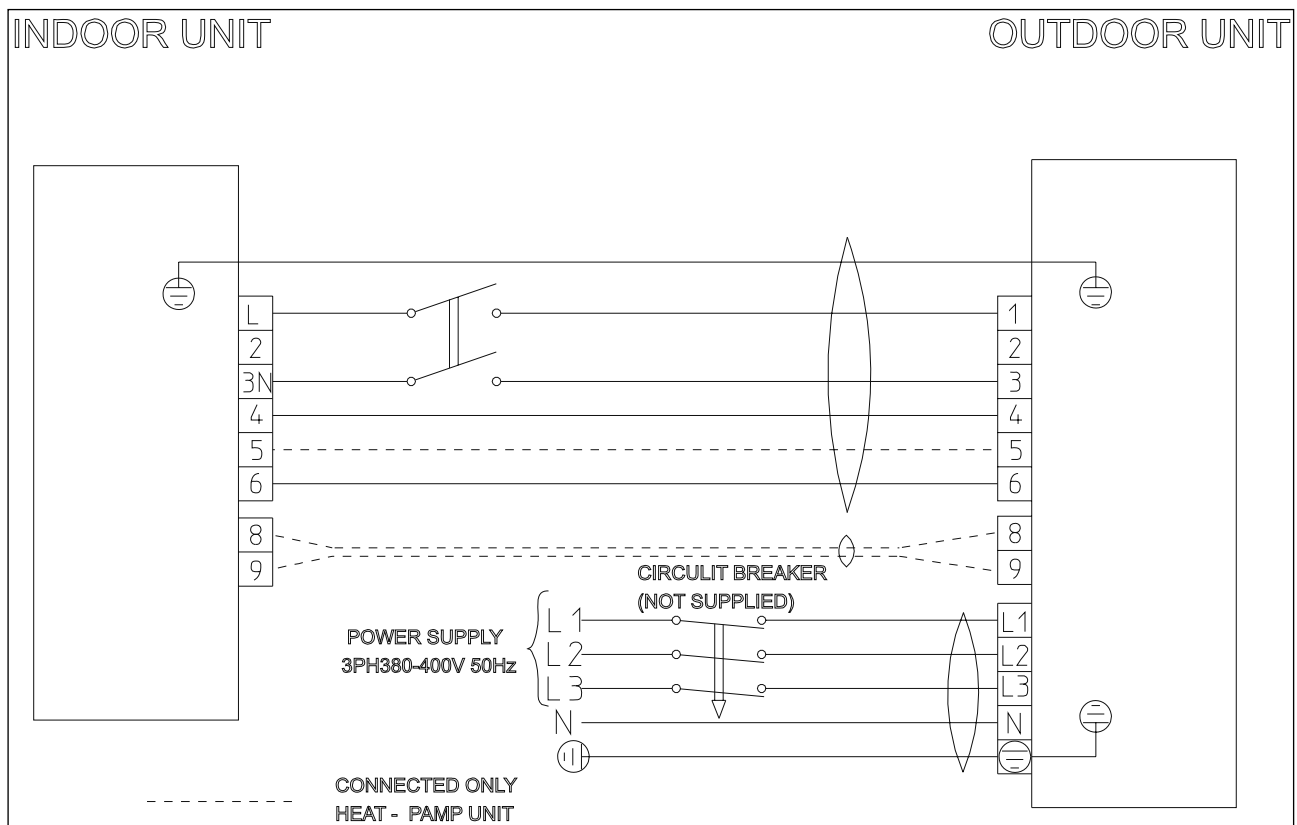


8. ELECTRICAL CONNECTIONS

8.1 KN 24/30/36/45 (Power Supply to Outdoor)



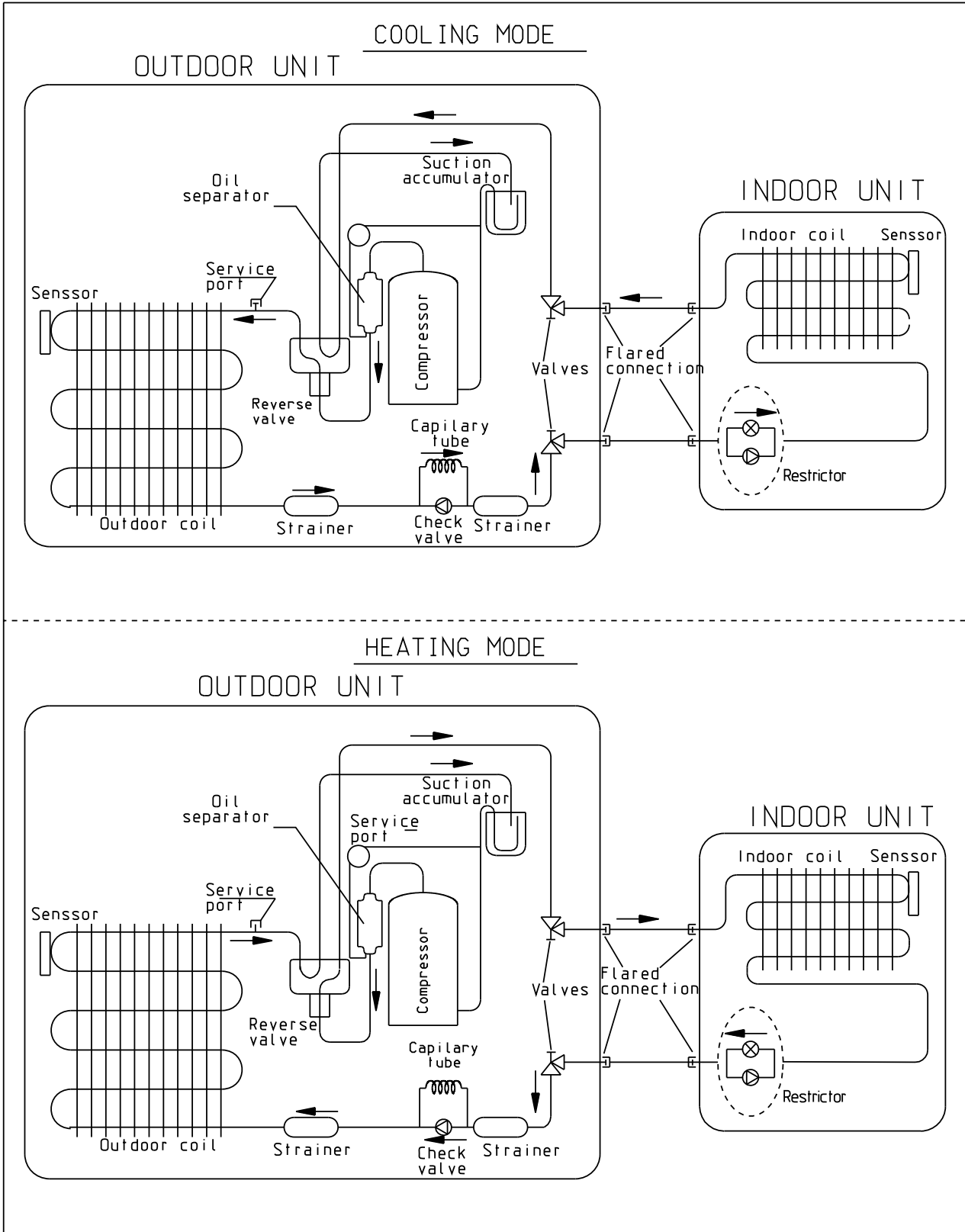
8.2 KN 24/30/36/45 3PH



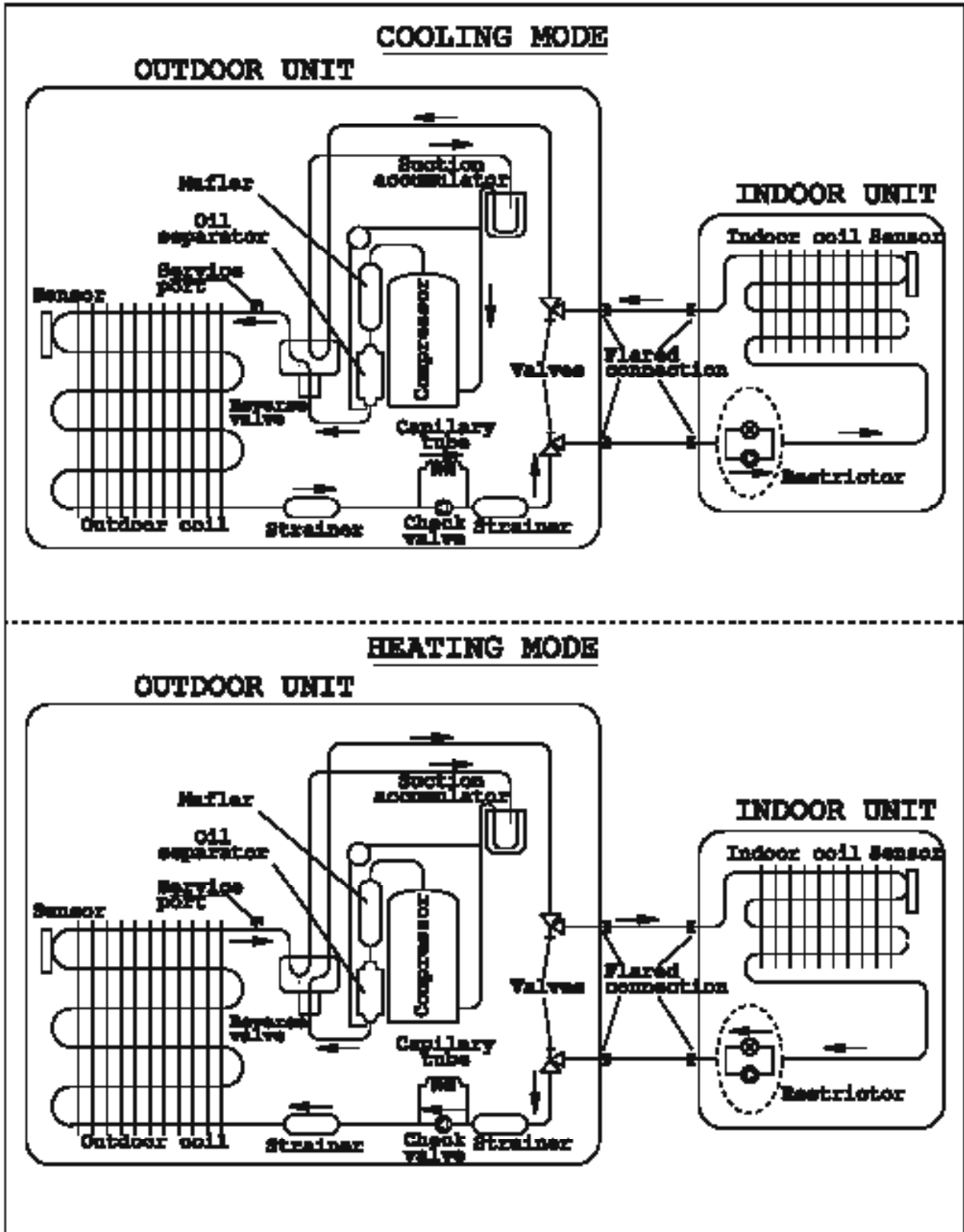
9. REFRIGERATION DIAGRAMS

9.1 Heat Pump Models

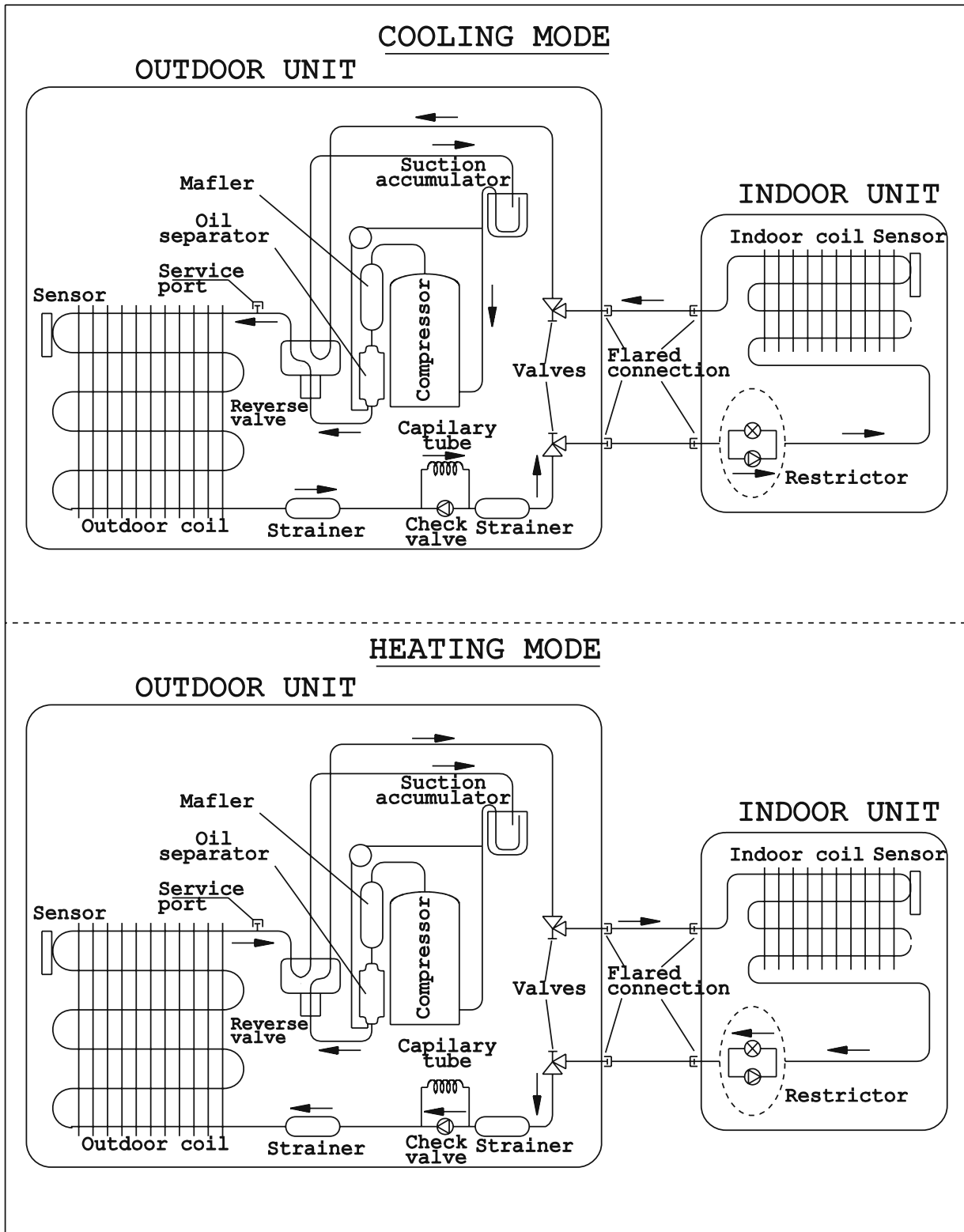
9.1.1 KN 24 R410A



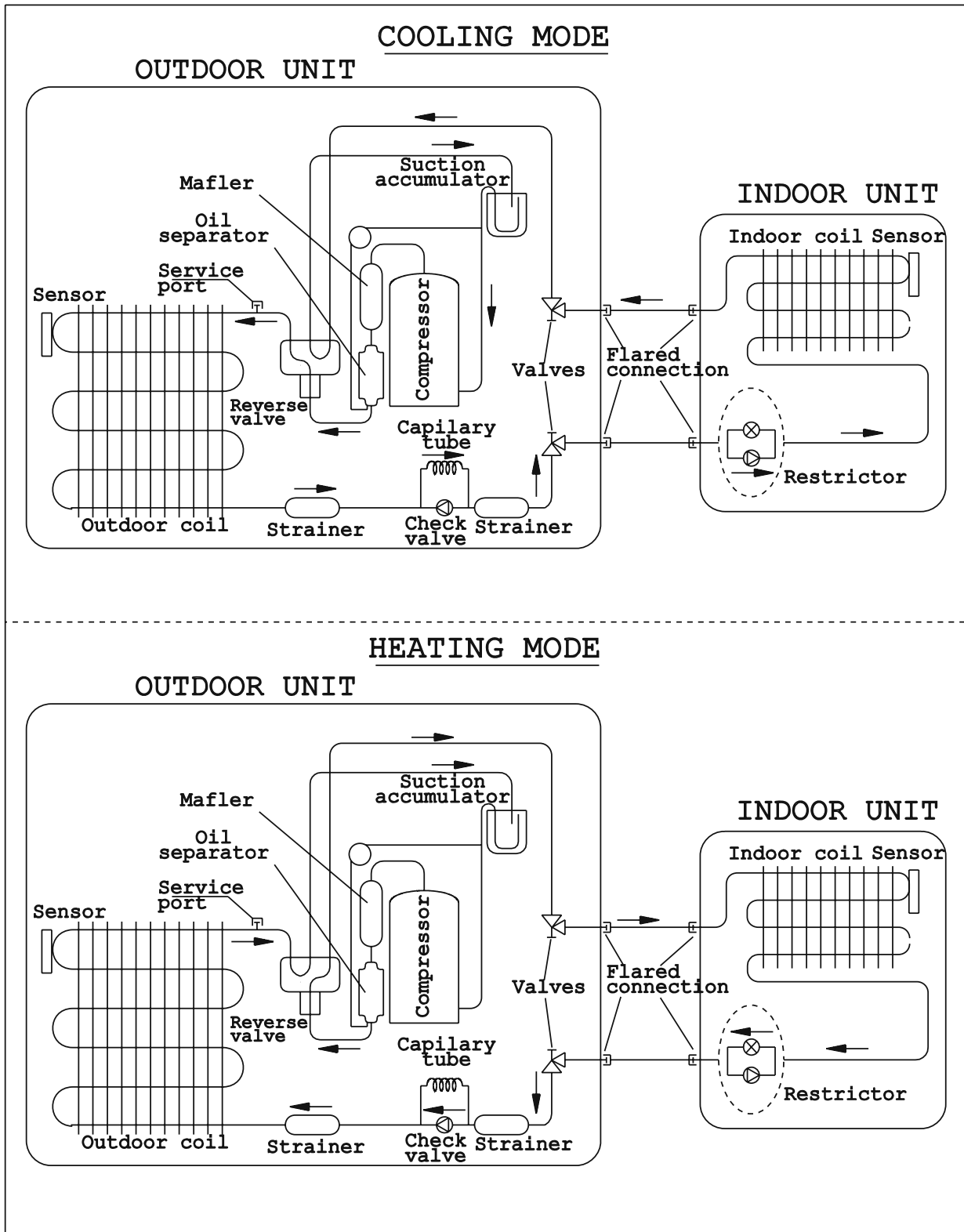
9.1.2 KN 30 R410A



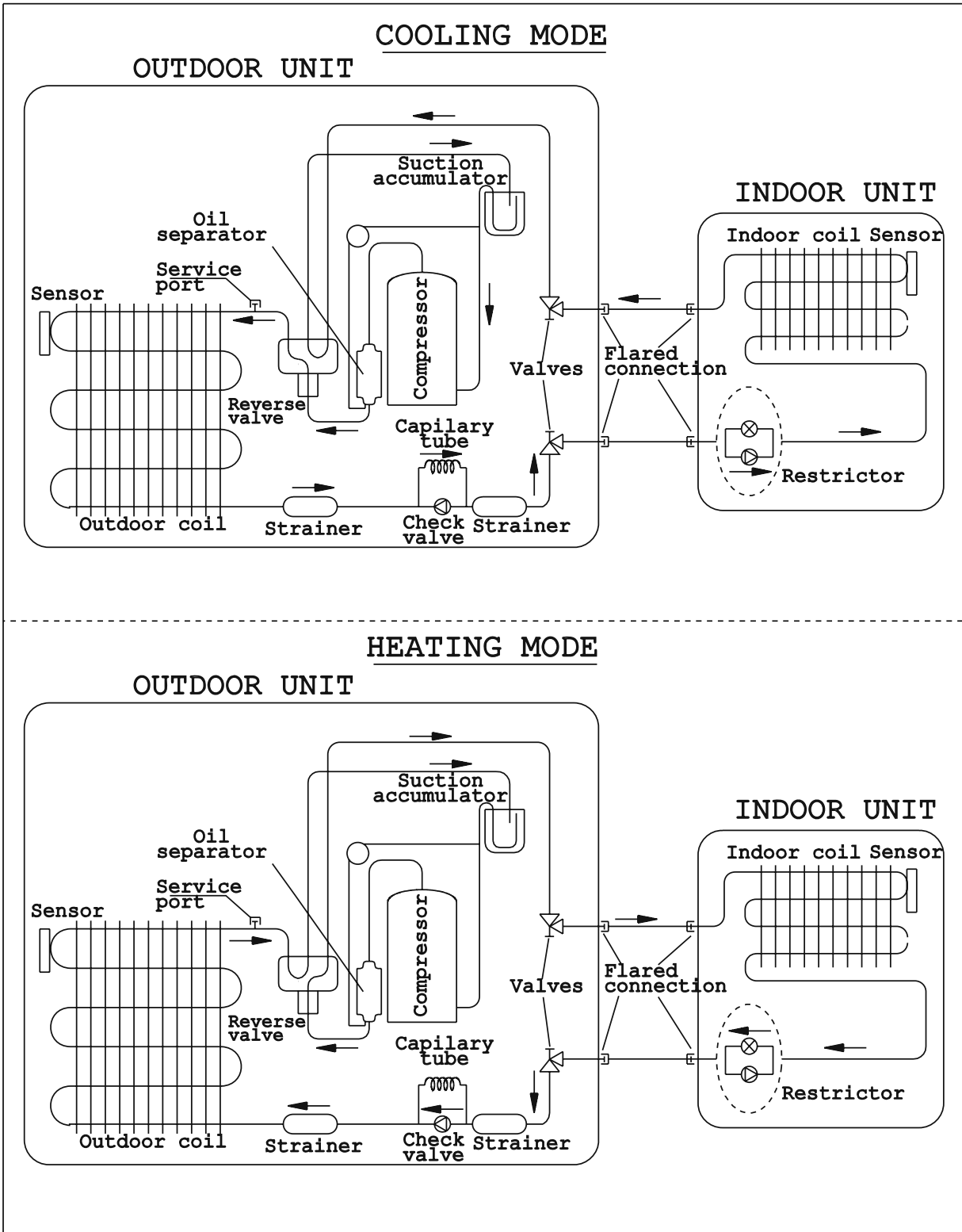
9.1.3 KN 36 R410A



9.1.4 KN 36T R410A

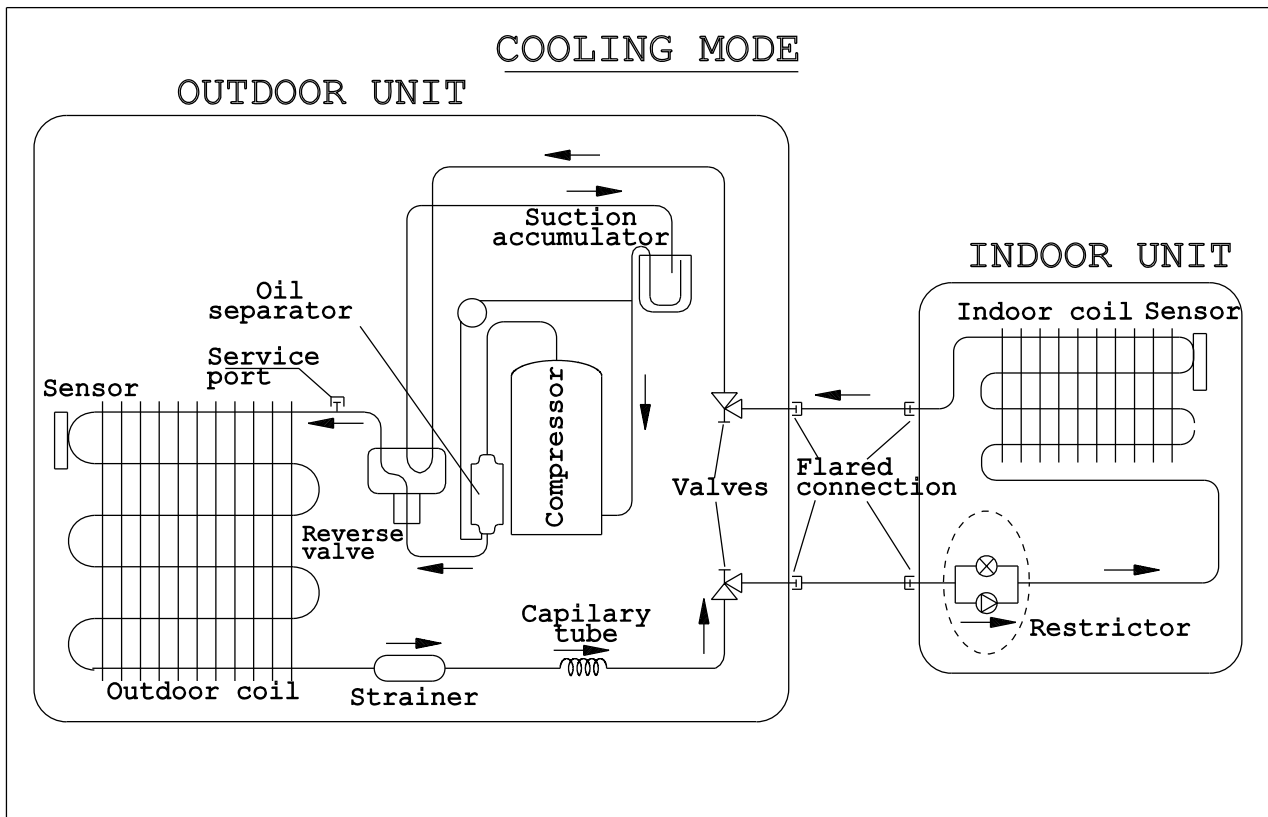


9.1.5 KN 45T R410A

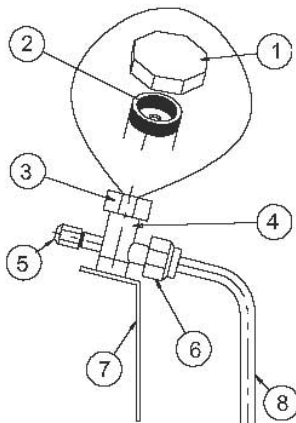
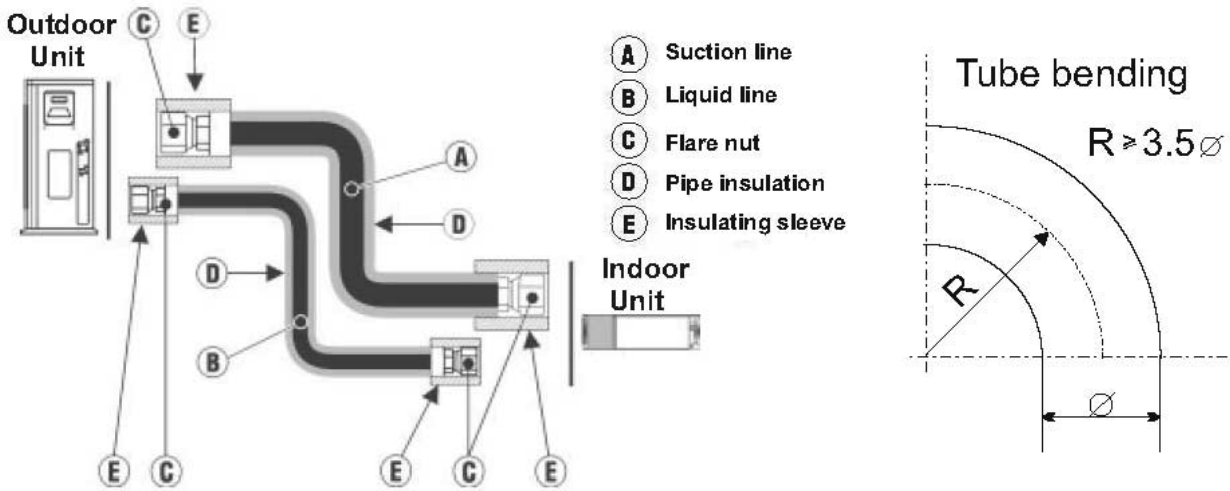


9.2 Cooling Only Models

9.2.1 KN 24 / 30 / 36 / 45 R410A



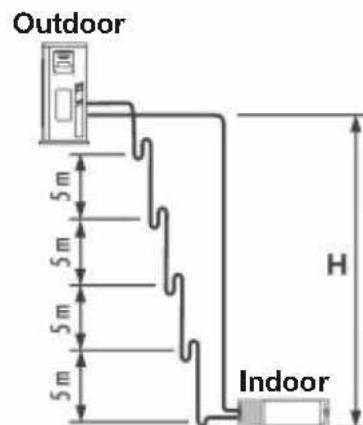
10. TUBING CONNECTIONS



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

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

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



11. CONTROL SYSTEM

11.1 Electronic Control

11.1.1 Introduction

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

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

11.1.2 Remote Control DIP Switch Settings

SETTING SWITCH STATUS				DEFINITION	
SW. NO. 1	SW. NO. 2	SW. NO. 3	SW. NO. 4	RC3	RC4
OFF	OFF	--	--	RC-ALL MODES OF OPERATION	
ON	OFF	--	--	STD-COOL, FAN, DRY, ACTIVE	
OFF	ON	--	--	HEAT-COOL, FAN, DRY, ACTIVE	
ON	ON	--	--	AUTO FAN (AF)	
--	--	OFF	--	TEMP. DISPLAY IN °C DEGREES	VERTICAL SWING ONLY
--	--	ON	--	TEMP. DISPLAY IN °F DEGREES	HORIZONTAL & VERTICAL SWING FUNCTIONS TOGETHER
--	--	--	OFF	TIMER & CLOCK 12H AM, PM	DISABLE LCD & KEY ILLUMINATION
--	--	--	ON	TIMER & CLOCK 24H	ENABLE LCD & KEY ILLUMINATION

Reset operation - Press the 4 buttons simultaneously: "CLEAR ", "SET", "HR +", "HR -" for 5 seconds

LEGEND

SW1, SW2 - Selection of RC/ST

SW3 – Selection of Display °C or °F in RC3 or swing function in RC4

SW4 – Selection of Time Display 12H AM/PM or 24H in RC3 or illumination in RC4

OFF = 0

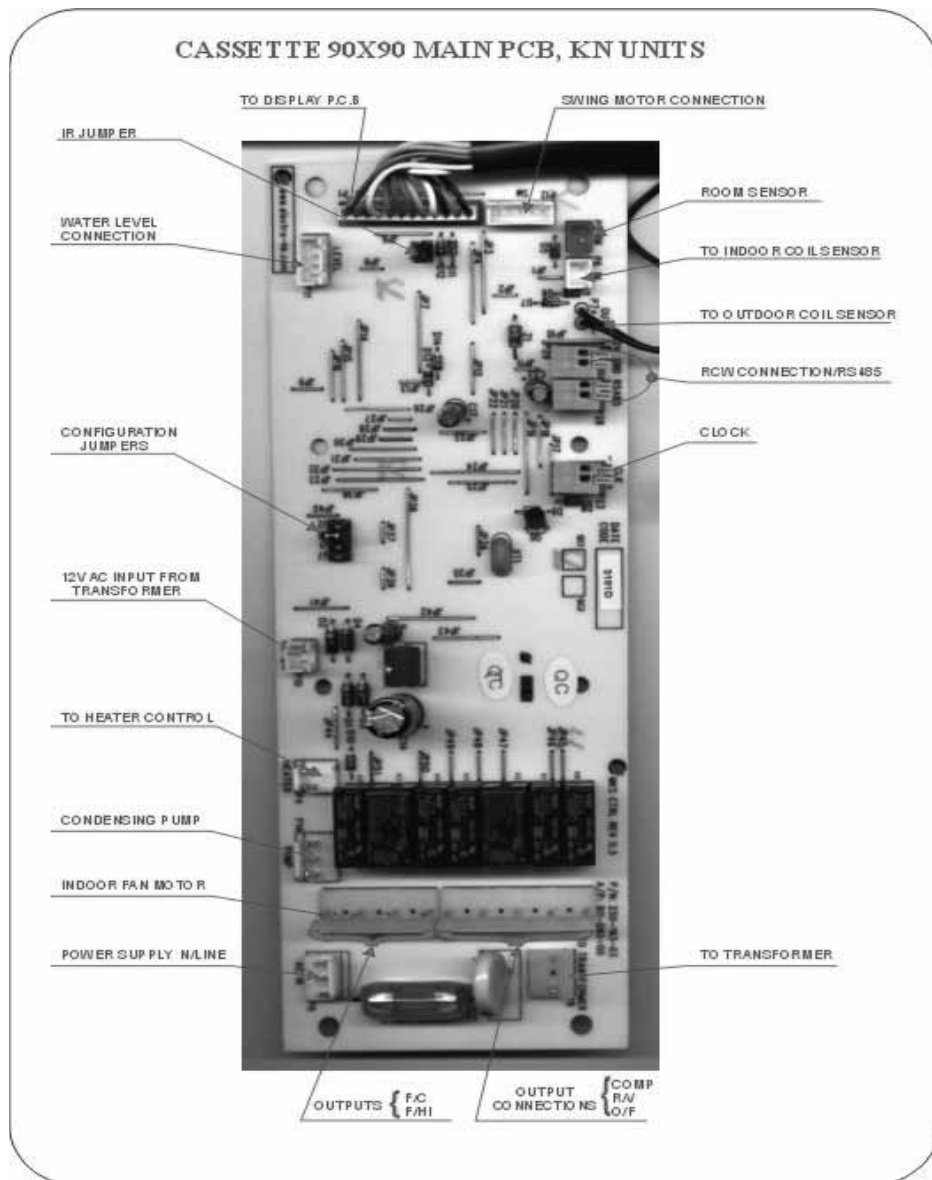
ON = 1

NOTE

After setting the DIP switches perform reset operation.

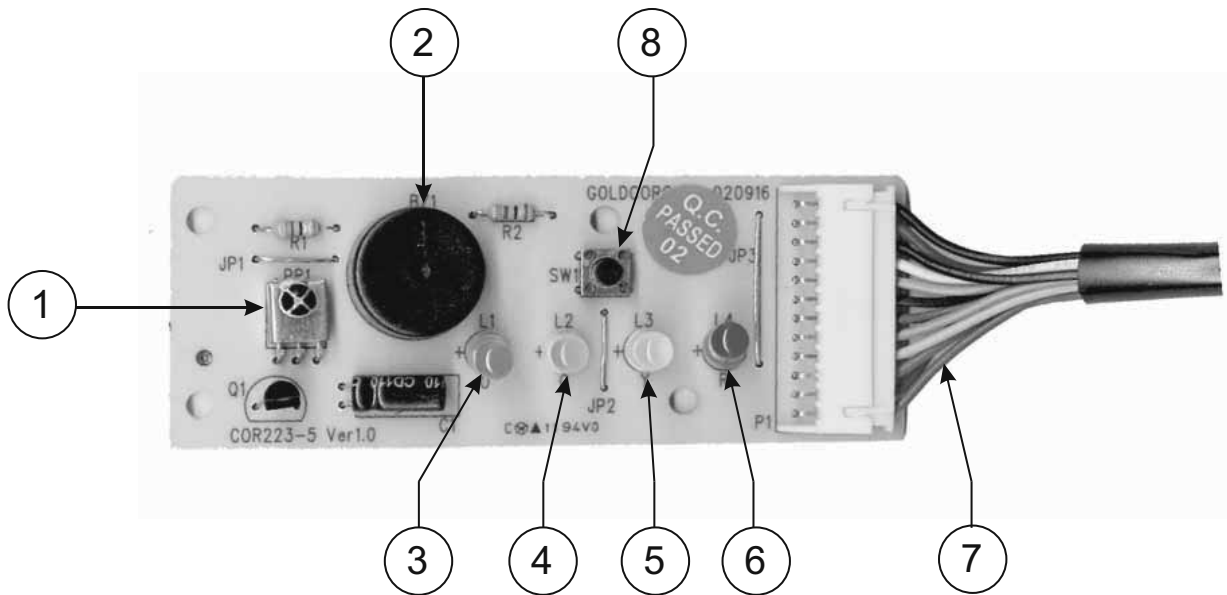


11.1.3 Main PCB Controller



11.1.4

Display Board PCB



Legend

- 1. IR Receiver
- 2. Buzzer
- 3. STBY LED
- 4. Operation LED
- 5. Timer LED
- 6. Heating LED
- 7. Display Port Connection
- 8. Push Button (Mode)

11.2 Control Function

11.2.1 Abbreviations

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

11.3 General Functions

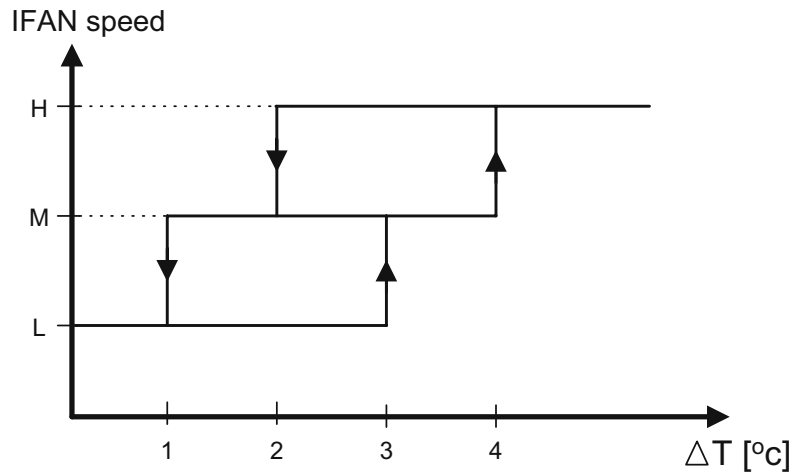
11.3.1 COMP Operation

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

Operation Mode	Min Operation Time of COMP
Heat, Cool, HP protection or Auto Modes	3 min.
Fan, Dry, Overflow, Protection Modes, or Mode Change	Ignored

11.3.2 IFAN operation

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



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

11.3.3 OFAN Operation

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

11.3.4 HE Operation

- a. Min Heaters ON or OFF time is 30 sec.
- b. Heaters can never be in operation while IFAN is OFF.
- c. In RH group, HE-1 and HE-2 will be activated only when COMP is not operating, except in Dry Mode.

11.3.5 Protections

- a. High pressure protection is applicable to all operating modes.
- b. Deicing control is valid in Heat and Auto Heat Modes only.
- c. Defrosting control is valid in Dry, Cool, and Auto Cool Modes.

11.3.6 Thermistors Operation

- a. Return air Temp. is detected by RAT in normal Mode, or by RCT (R/C sensor) in I-FEEL Mode.
- b. Indoor Coil Temp. is detected by ICT.
- c. Outdoor Coil Temp. is detected by OCT.
- d. Definition of thermistor faults:
 - 1) Thermistor is disconnected - the thermistor reading is below -30°C .
 - 2) Thermistor is shorted - the thermistor reading is above 75°C .
 - 3) Thermistor Temp reading doesn't change -
 - a) This test is performed only once after a unit is switched from OFF/STBY to operation. At the first occurrence of 10 min continuous COMP operation, the current ICT are compared with those when the COMP was switched from OFF to ON 10 min before. If the ΔT is less than 3°C , the thermistor is regarded as defective.
 - b) The ICT no-change error can be disabled together by connecting a $4.7\text{k}\Omega$ resistor (5%) to the ICT connector. These resistors are equivalent to a thermistor $48\pm 1^{\circ}\text{C}$.
- e. Cases for disabling ICT thermistor disconnected detection:
 - 1) The detection of thermistor faults a. and b. above is disabled when Deicer Protection is started. The detection will be enabled again only after (1) the deicing is completed, and (2) COMP has been restarted and operated for 30 sec.
 - 2) When all the following conditions are fulfilled:
 - a) $4.7\text{k}\Omega$ resistor is connected to the OCT.
 - b) IFAN is OFF.
 - c) Compressor is ON.
 - d) $\text{ICT} < -30$ (disconnected).

11.3.7 RV Fault

This test is applied only in compressor units where 4.7k Ω resistor is not connected to the OCT.

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

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

In this case, the COMP will stop and the SB LED will blink. The fault is reset after switching to SB or after mode change.

11.3.8 General Features

- a. Allowed (control target) range for RAT is SPT +/-1°C.
- b. Whenever the unit is changed from COOL/DRY/STBY mode to HEAT mode or vice versa, the procedures below are followed:
Stop COMP for 3 min → Change RV state → Start COMP if necessary.

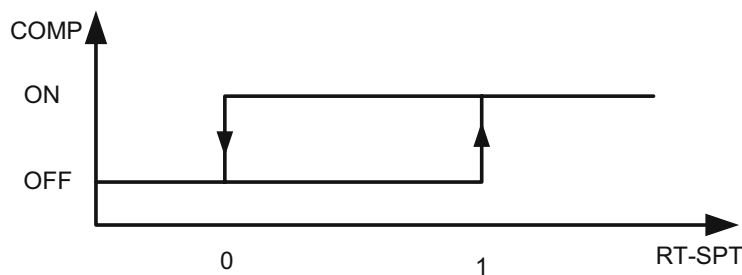
11.4 Cooling Mode

11.4.1 Cooling Mode – General

- a. Mode Definition
 - Mode: COOL, AUTO (at Cooling)
 - Temp: Selected desired temperature.
 - Fan: HIGH, MED, LOW, AUTO.
 - Timer: Any
 - I-FEEL: ON or OFF
- b. Room Temperature, RT, is detected by:
 - RAT in normal operation, or
 - RCT (R/C sensor) in I-FEEL mode.
- c. Indoor Coil Temp is detected by ICT.
- d. Outdoor Coil Temp is detected by OCT.

11.4.2 Control Functions

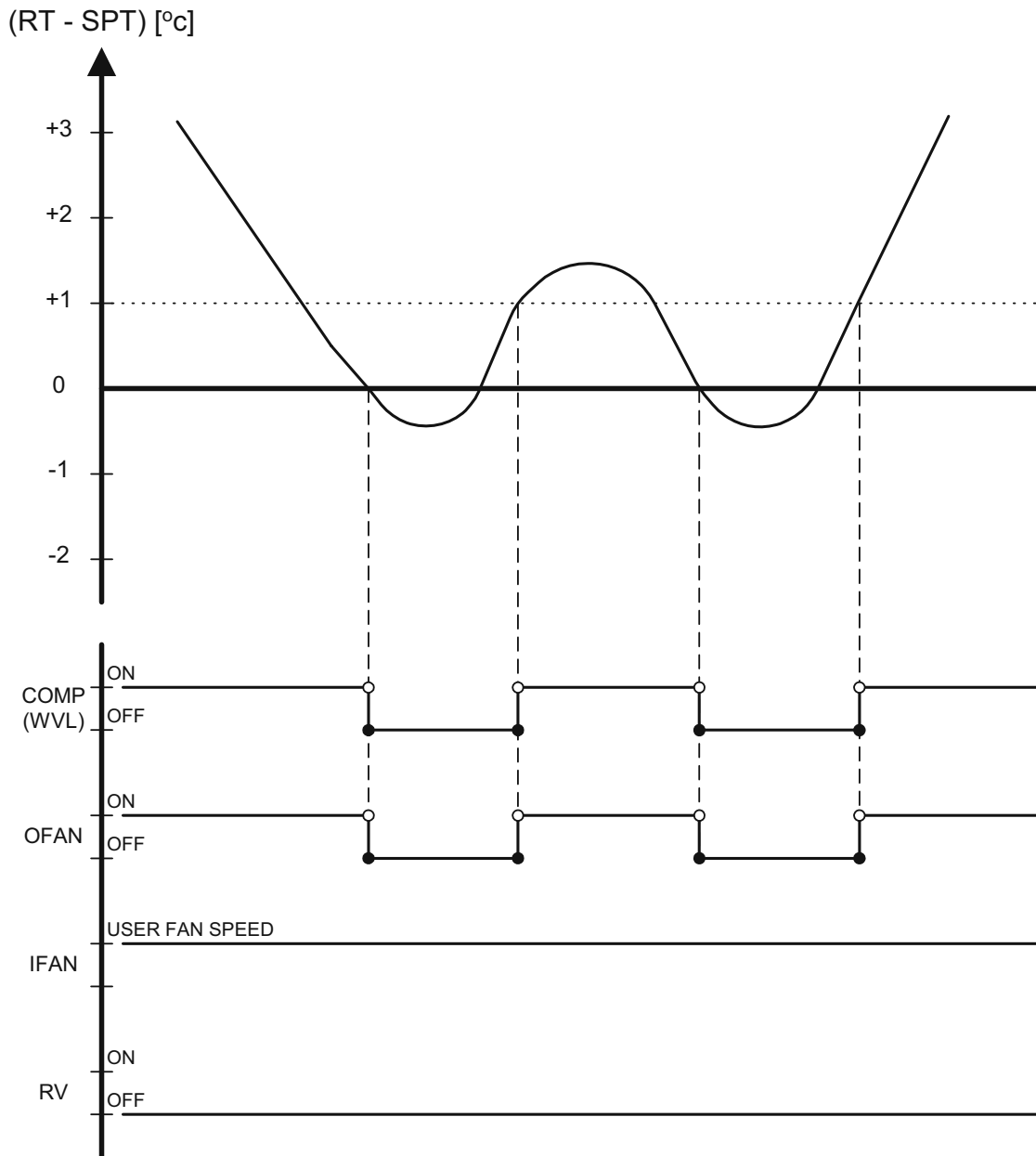
- a. COMP Operation



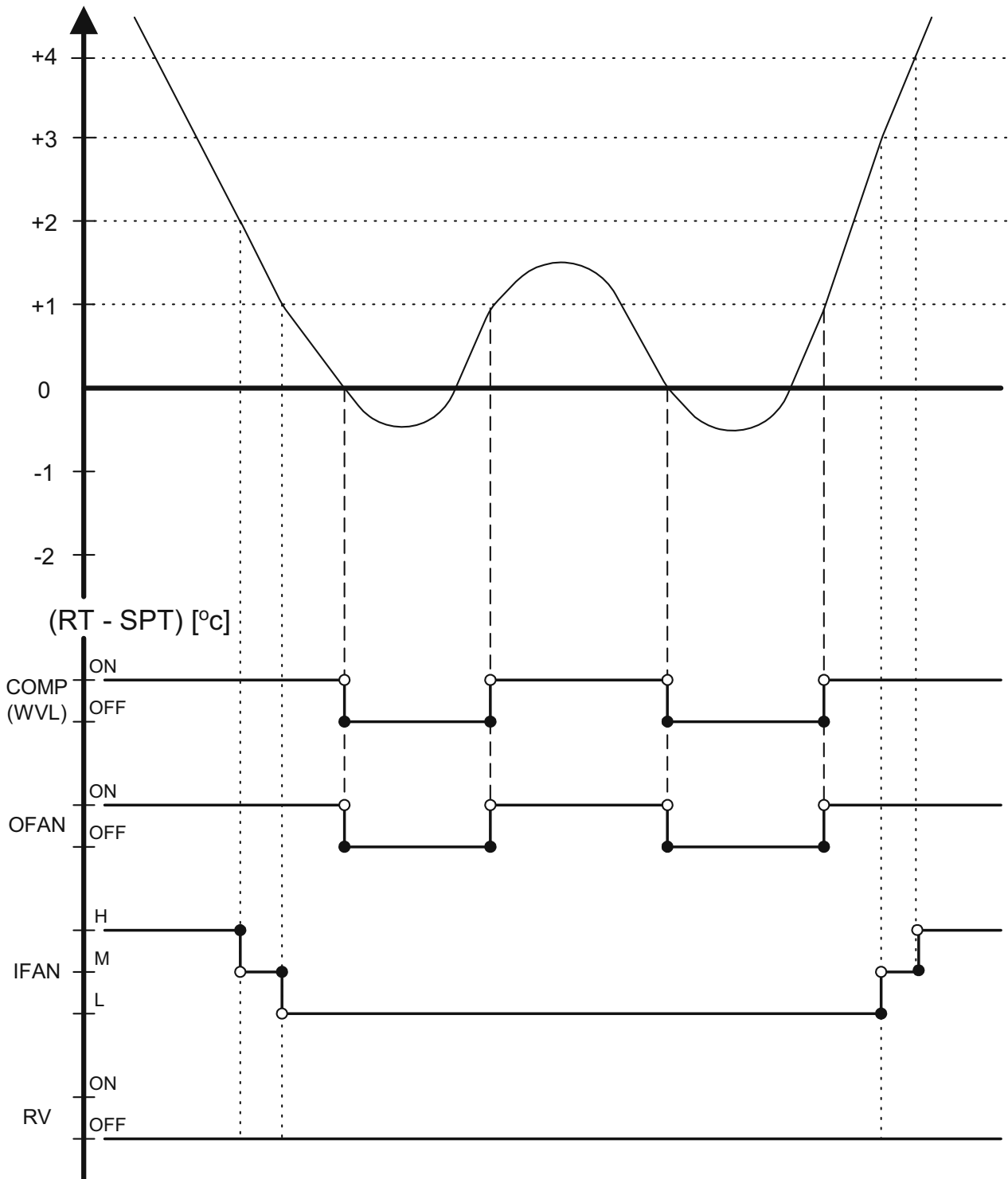
- b. OFAN Operation
 - In normal operation OFAN operates together with the COMP.
- c. IFAN Operation
 - IFAN will operate in ANY speed regardless the ICT or COMP state.
 - IFAN speed will be determined according to user selection or AUTO-FAN logic
- d. RV and HEATERS outputs
 - RV and HEATERS are in OFF state in COOL mode.

11.4.3 Sequence Diagrams

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



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



11.5 Heating Mode

11.5.1 Heating Mode - General

a. Compensation Procedure

When I-FEEL is OFF during HEAT mode: $RT = RAT - CTV$.

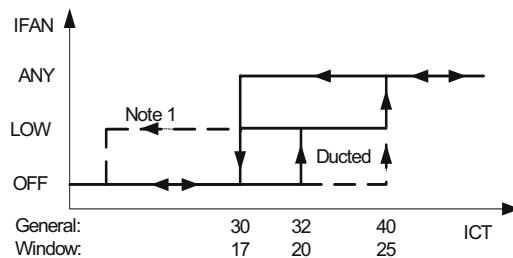
When I-FEEL is ON during HEAT mode: $RT = RCT$.

Type of Indoor	CTV
Wall Mounted	+3 °C
Mobiles / Floor Ceiling	+0 °C
Square /Window	+2 °C
Ducted	+4 °C
Cassettes	+4 °C

No compensation will be activated in Forced operation modes

b. IFAN operation rules for RC and SH groups:

- 1) As a general rule for **RC and SH groups**, IFAN will be switched ON according to the following graph:



NOTE 1

When COMP is ON (except WAX Model), IFAN will change from LOW to OFF either when:

- a) $ICT < 28$ and IFAN is on for 5 min or longer.
- Or,
- b) $ICT < 20$

NOTE 2

When ICT is faulty:

When the compressor switches from OFF to ON (excluding deicing), IFAN will be on in ANY speed.

When the compressor switches from ON to OFF, the IFAN will change to LOW speed for 30 seconds and then it will be off.

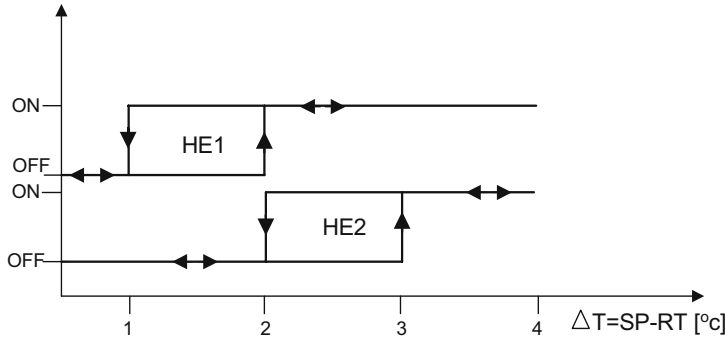
- 2) In SH or RC group, IFAN will operate for Min 30 sec according to 1) above after HEs are turned off, where in a case it has to be OFF, it will be forced to LOW speed.

c. IFAN operation rules for RH group

- 1) In RH group, IFAN starts when HE starts. When HE switches to OFF, IFAN switches to LOW for 30 sec and then stops.

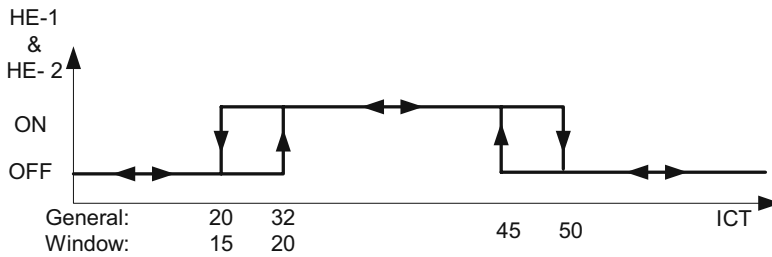
d. Heaters operation rules for RC and SH groups:

- 1) For both RC and SH groups, Heaters versus ΔT is as follows:



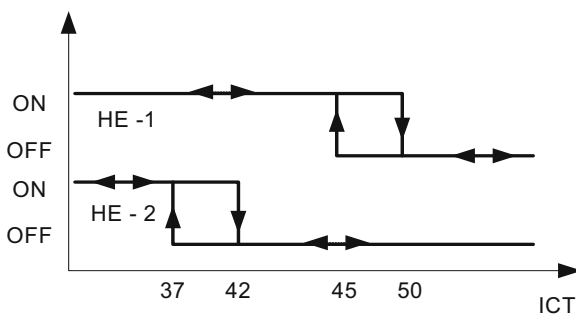
2) Operation rules for Heaters in RC group:

- a) Heaters can be enabled only if IFAN is ON.
- b) Heaters will operate according to ΔT and the following graph:



3) Rules for Heaters operation in SH group:

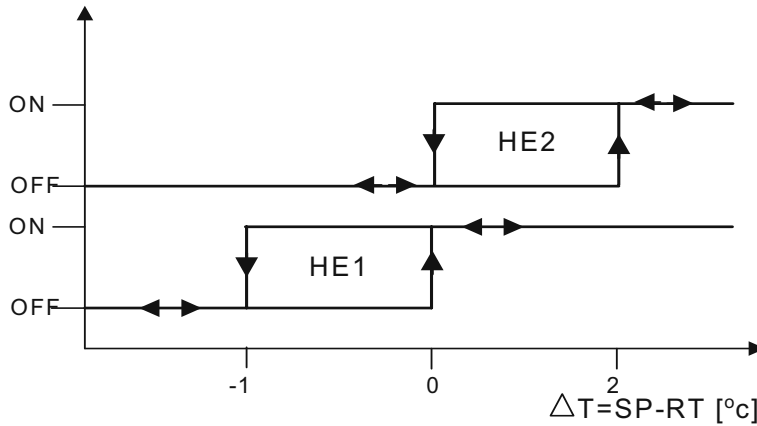
- a) When heaters are to be ON and IFAN is to be OFF according to d. 1) above, IFAN will be forced to LOW speed.
- b) Heaters will operate according to ΔT and the following graph:



- 4) For both RC and SH groups, excluding deicing, HE1 and HE2 can be ON only when the compressor is ON.

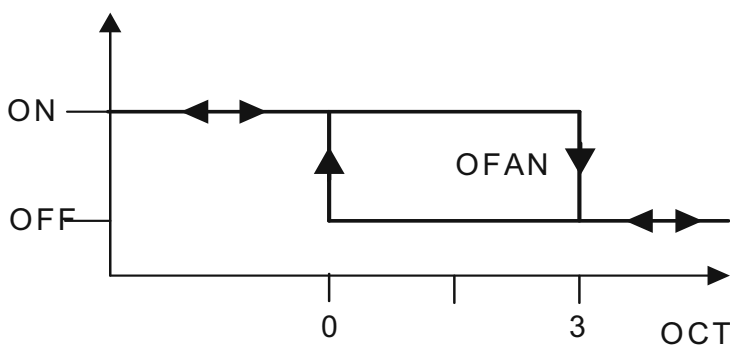
e. Heaters operation rules for RH groups:

- 1) In RH group, HE operation is according to the difference between RAT and SPT.



f. OFAN Operation for RC and SH groups

- 1) As a general rule for RC and SH groups, excluding protection modes, OFAN starts with the compressor.
- 2) When OFAN is ON it will operate according to the following conditions:
 - a) OFAN operates together with the compressor.
 - b) When $(RT \geq SPT - 2)$ and $ICT \geq 50$ and the $4.7k\Omega$ resistor is not connected to the OCT, OFAN will operate according to the following curve:

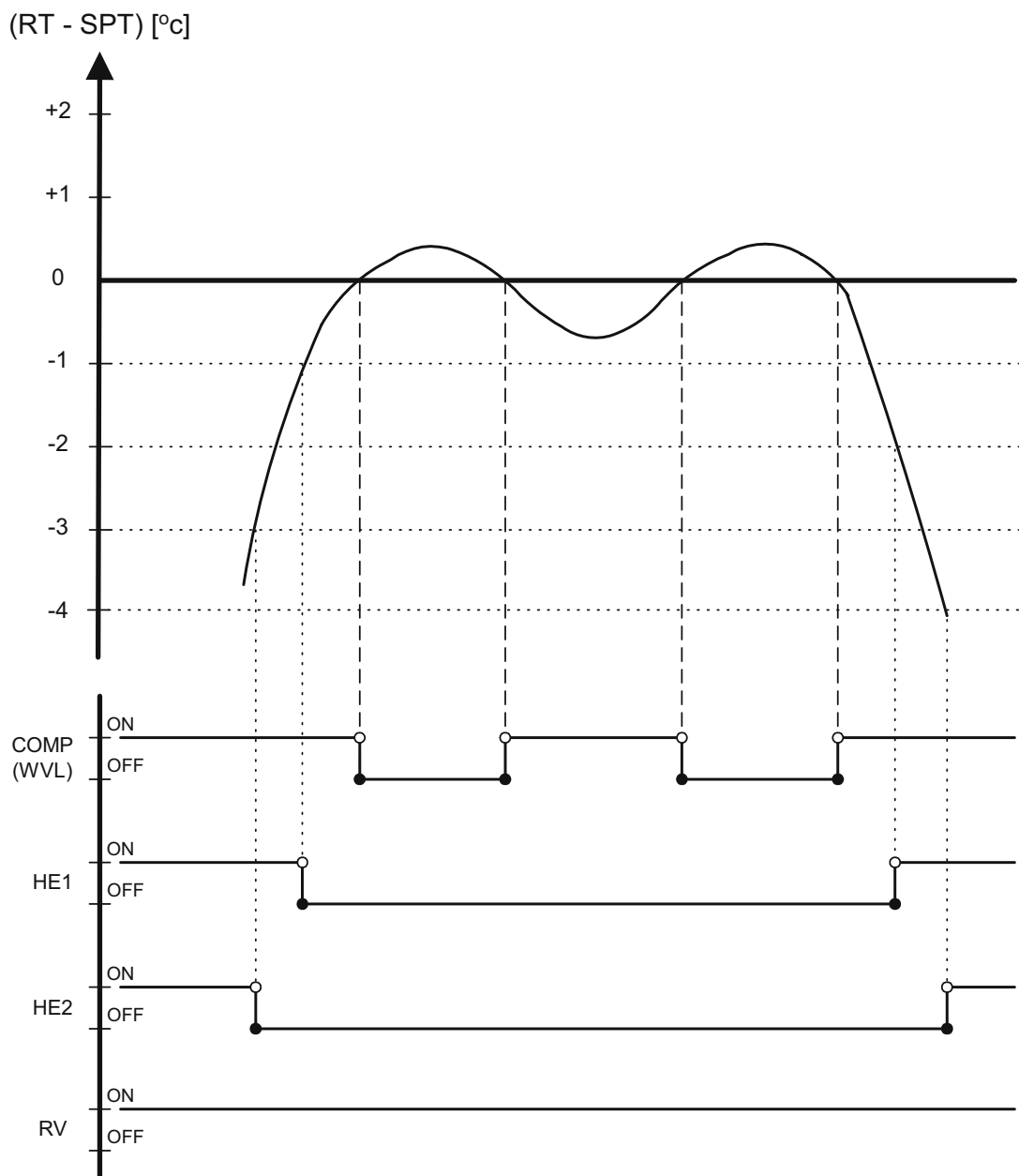


11.6 Heating, RC or SH Group

- Mode: HEAT, AUTO (at heating)
- Temp: Selected desired temperature
- Fan: HIGH, MED, LOW
- Timer: Any
- I-FEEL: ON or OFF

11.6.1 Sequence Diagram

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

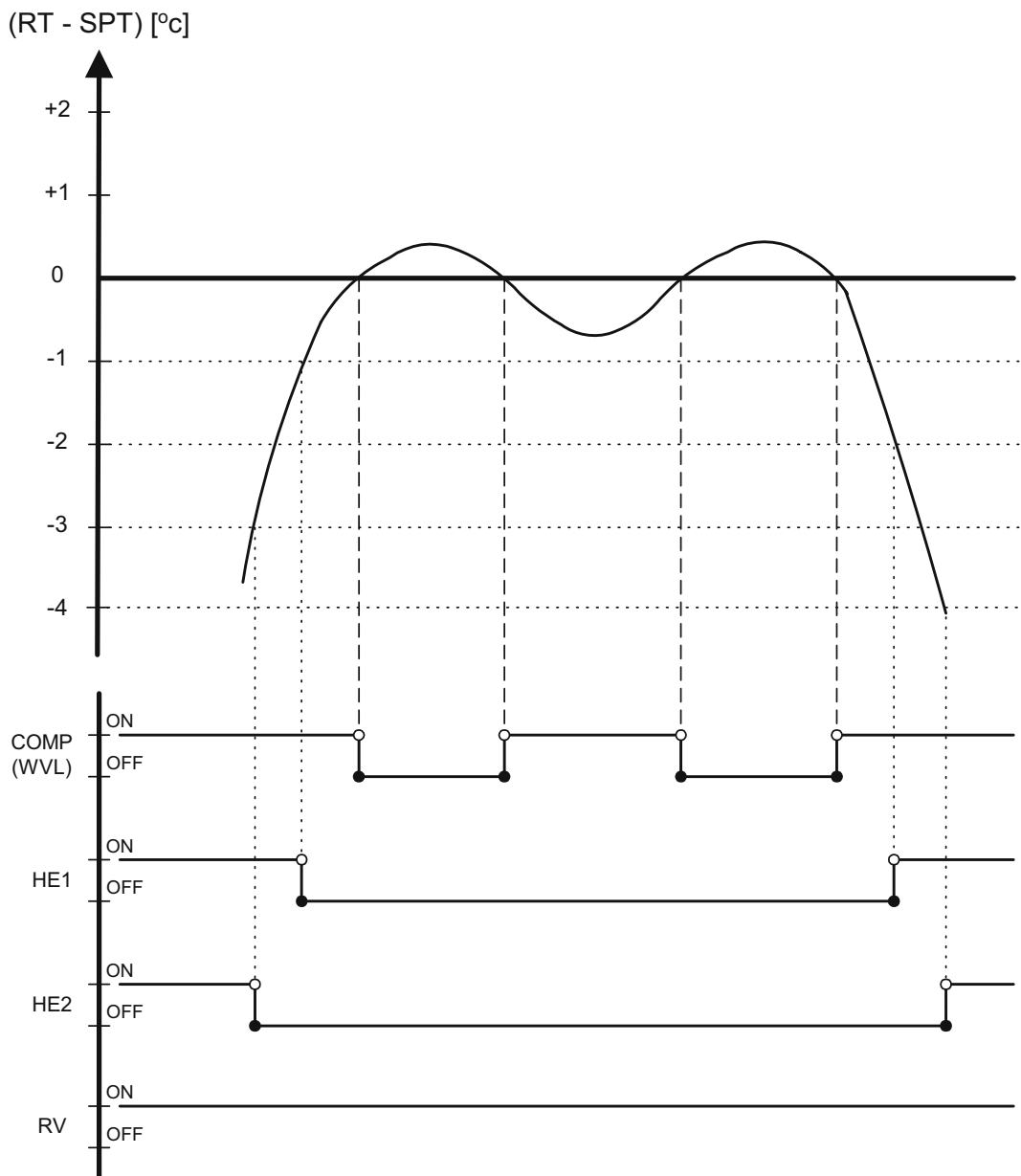


11.7 Heating, RC or SH Group with Autofan

- Mode: HEAT, AUTO (at heating)
- Temp: Selected desired temperature
- Fan: AUTO
- Timer: Any
- I-FEEL: ON or OFF

11.7.1 Sequence Diagram

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

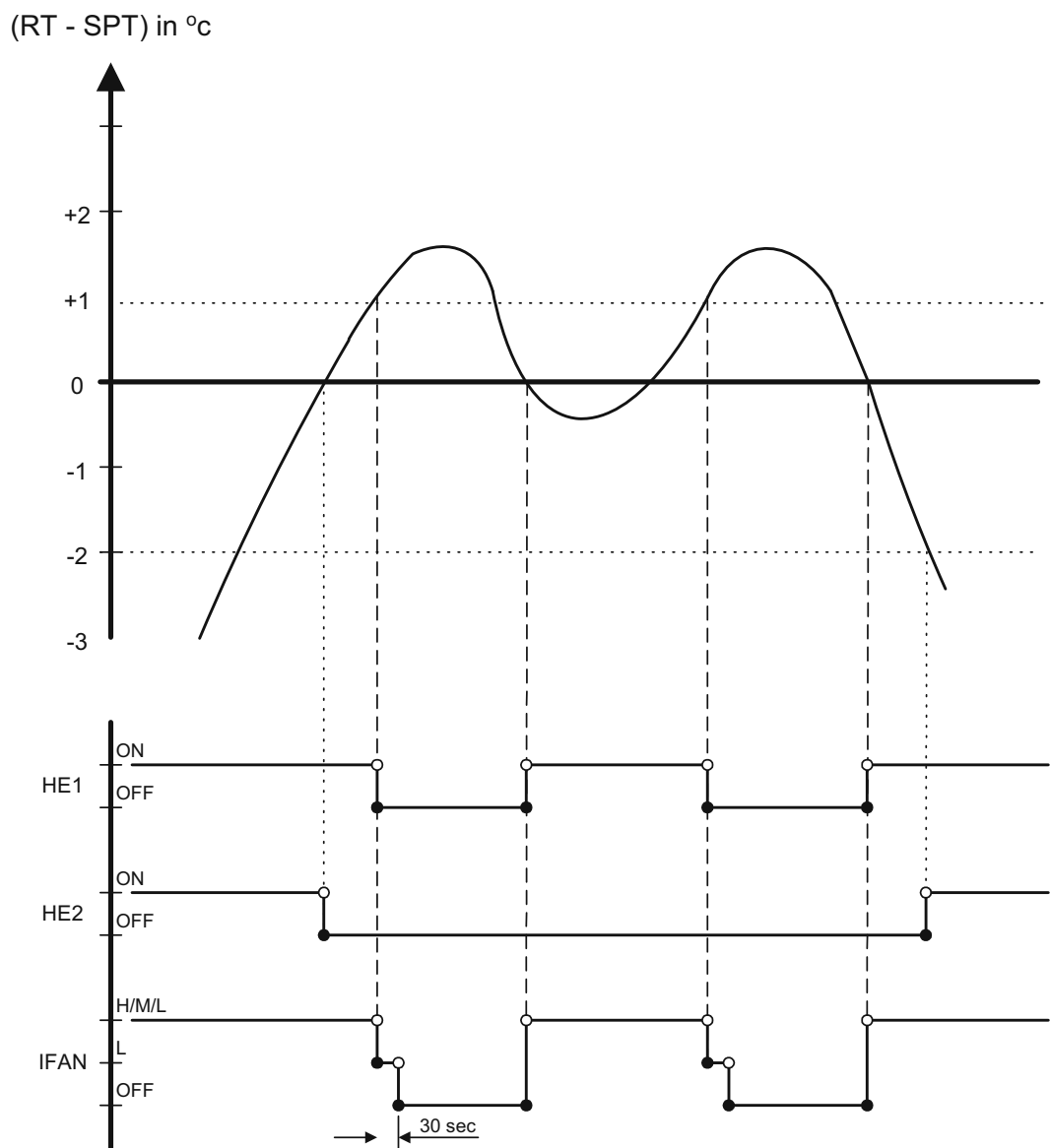


11.8 Heating, RH Group

- Mode: HEAT, AUTO (at Heating)
- Temp: Selected desired temperature
- Fan: HIGH, MED, LOW
- Timer: Any
- I-FEEL: ON or OFF

11.8.1 Sequence Diagram

Maintains room temp at desired level by controlling Heating Elements: HE1 or HE2.

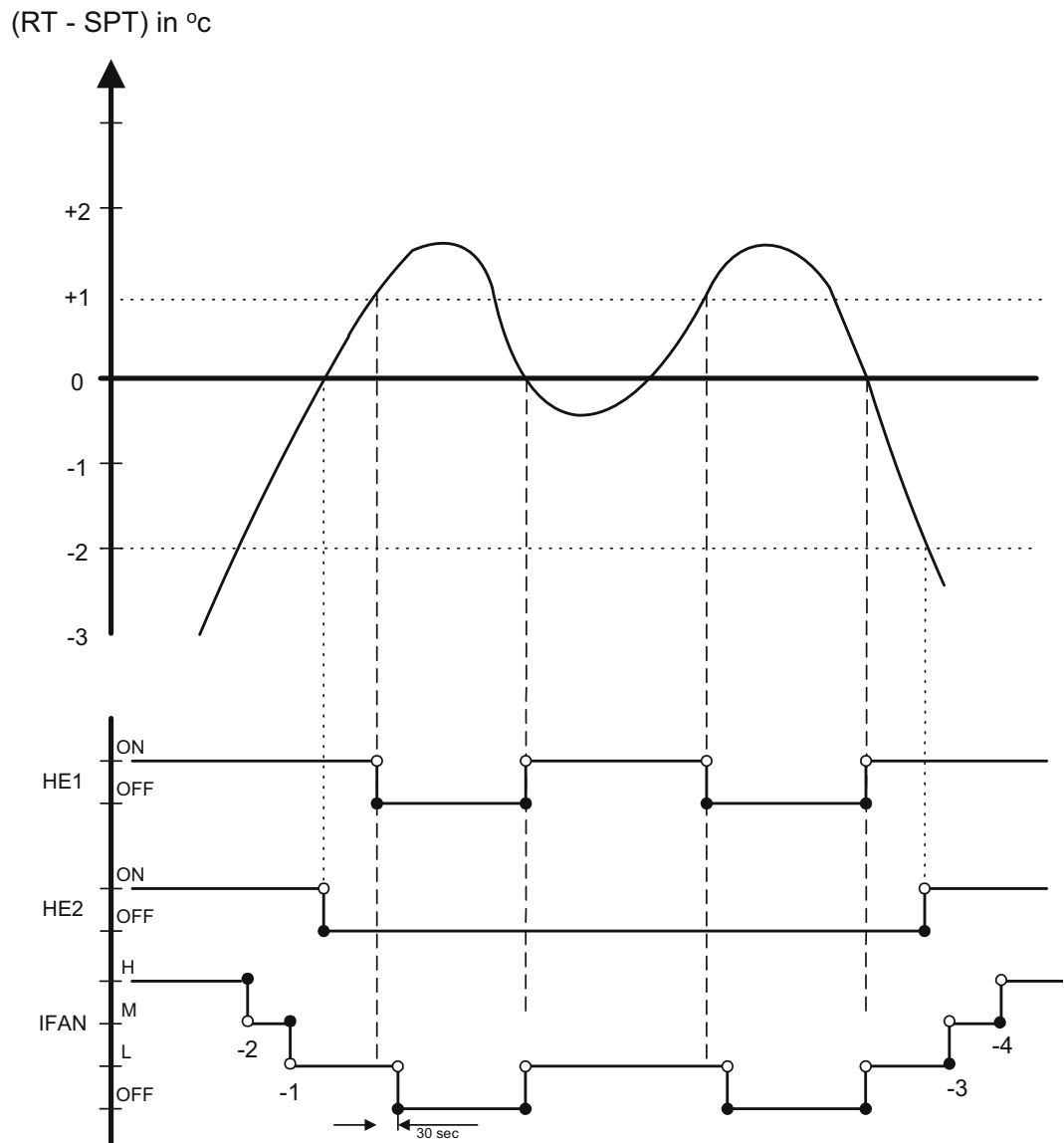


11.9 Heating, RH Group, with AUTOFAN

- Mode: HEAT, AUTO (at Heating)
- Temp: Selected desired temperature
- Fan: AUTO
- Timer: Any
- I-FEEL: ON or OFF

11.9.1 Sequence Diagram

Maintains room temp. at desired level by controlling the 2-Stage Electric Heaters.



11.10 Automatic Cooling or Heating

11.10.1 Automatic Cooling or Heating - General

The AUTO Mode is for models with compressor and the WVLRH only. The WVLRST, RC and SH units do not work in AUTO Mode.

a. Mode Definition

Mode: AUTO

Temp: Selected desired temperature

Fan: Any

Timer: Any

I-FEEL: ON or OFF

b. Switching-temperature between Cooling and Heating is $SPT \pm 3^{\circ}\text{C}$.

c. When the AUTO Mode is started with $SPT \pm 0^{\circ}\text{C}$, the unit will not select Auto Heat or Auto Cool mode immediately. Instead, the unit will be in a temporary FAN Mode with IFAN operating at low speed. The proper Auto Heat mode or Auto Cool will be started whenever the RT reaches $SPT-1^{\circ}\text{C}$ or $SPT+1^{\circ}\text{C}$ respectively.

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

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

e. For RH and WVLRH units, Mode change between Auto Heat & Auto Cool Modes is possible after the COMP/HEs have been OFF during the last T minutes.

Mode Change	Time, T
Auto Cool to Auto Heat	COMP off for 3 min
Auto Heat to Auto Cool	HEs off for 3 min

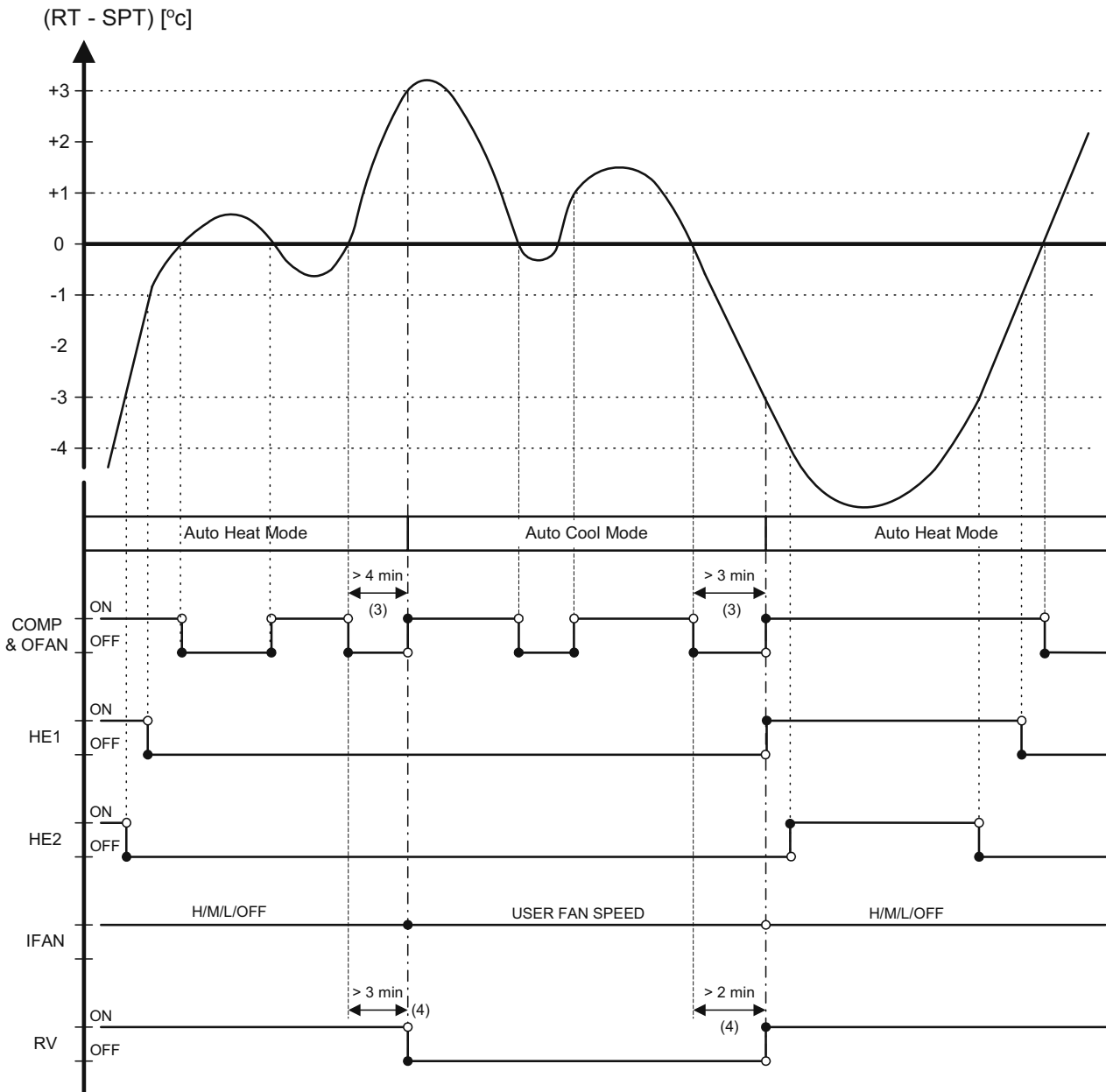
f. When unit is changed from Cool/Dry Mode to Auto Mode, the unit will continue to operate in (Auto) Cool Mode until the conditions for switching from Auto Cool to Auto Heat are satisfied.

Similarly, when unit is changed from Heat Mode to Auto Mode, the unit will continue to operate in (Auto) Heat Mode until the conditions for switching from Auto Heat to Auto Cool are satisfied.

11.10.2 Sequence Diagrams

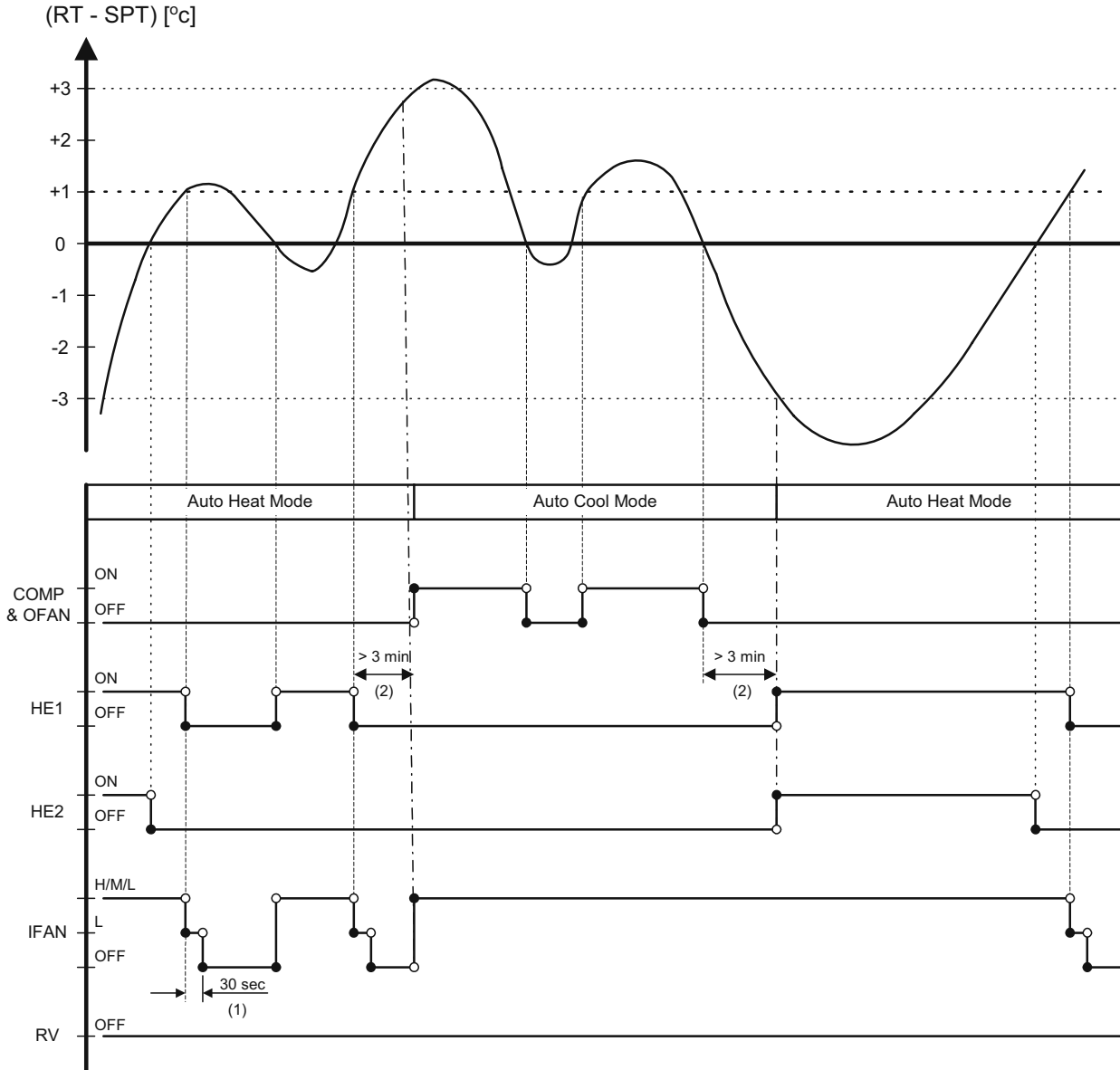
a. Auto Cooling or Heating, RC or SH Groups

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



b. Auto Cooling or Heating RH Group

Maintains room temp. at desired level by selecting between Cooling or Heating Modes.



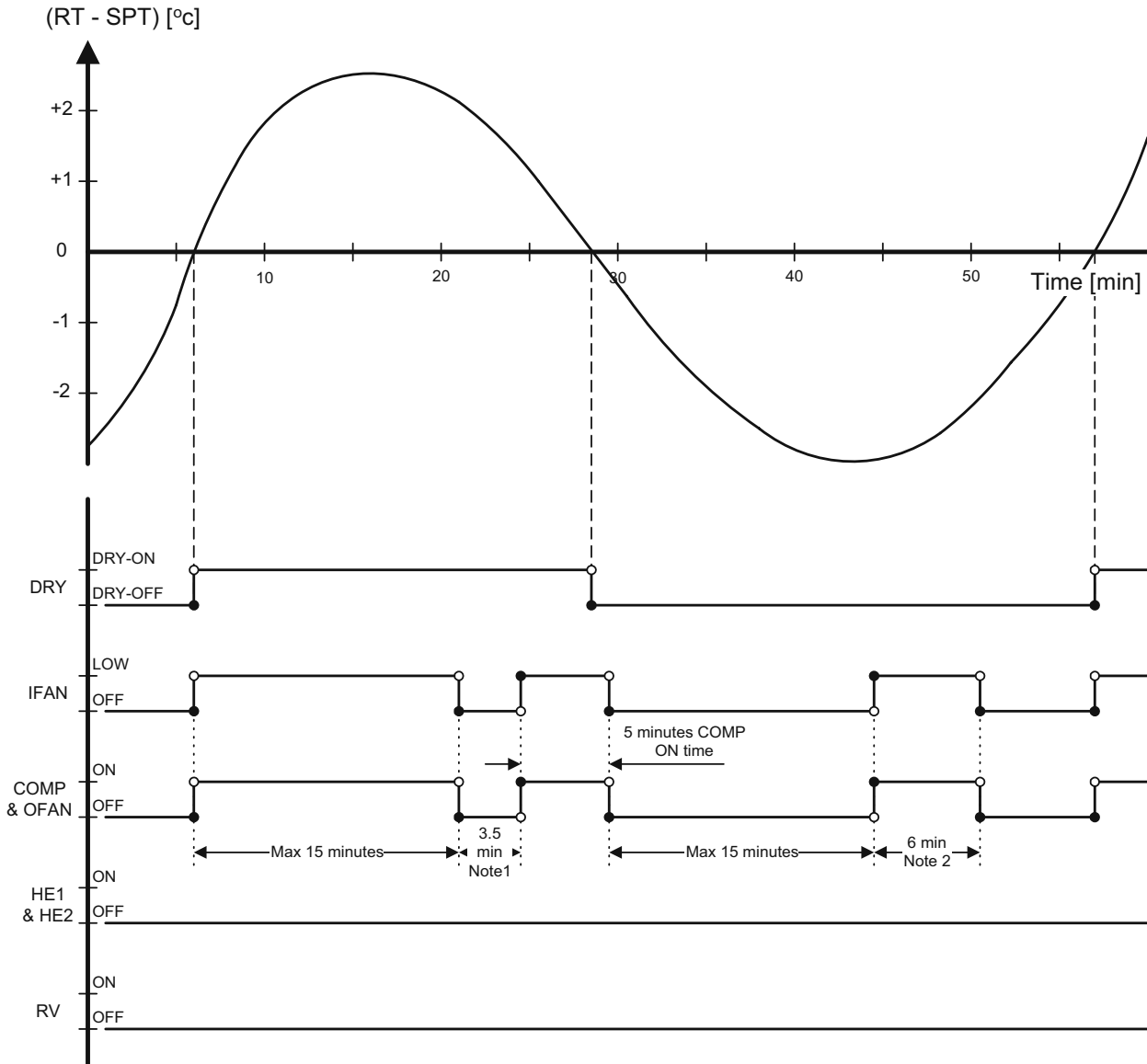
11.11 Dry Mode

11.11.1 Dry, ST or RC Group or P2000 Model with Any Group Settings

- Mode: DRY
- Temp: Selected desired temperature
- Fan: LOW (automatically selected by software)
- Timer: Any
- I-FEEL: Any

Control function

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



NOTES

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

11.11.2 DRY, SH or RH group

Mode: DRY

Temp: Selected desired temperature

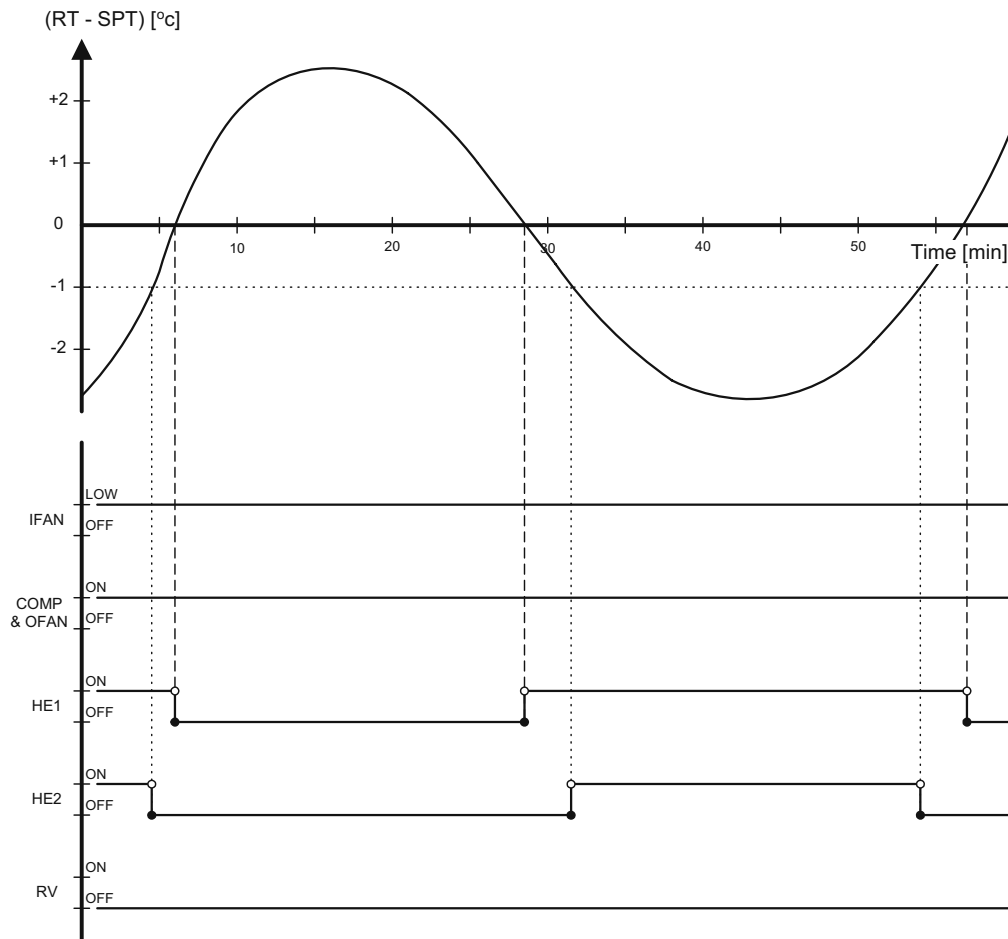
Fan: LOW (automatically selected by software)

Timer: Any

I-FEEL: Any

Control function

Reduces room humidity with minimum temp. fluctuations by operating in Cool Mode with LOW speed IFAN and HE.



11.12 Protection

11.12.1 Cooling Mode Protections

a. Indoor Coil Defrost

Mode: COOLING, DRY, AUTO

Temp: Selected desired temp.

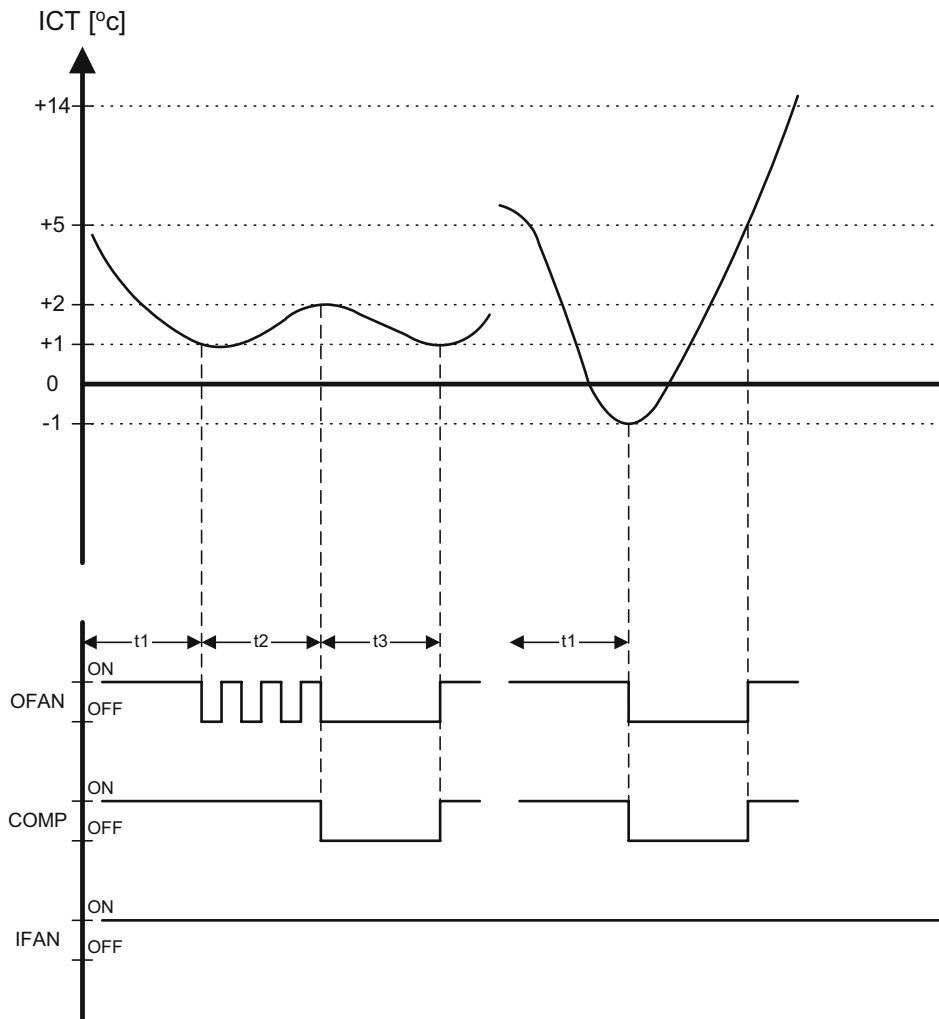
Fan: Any

Timer: Any

I-FEEL: ON or OFF

Control Function

Protects the indoor coil from ice formation at low ambient temperatures.



t1 = 5 min minimum for each COMP starting.

t2 = OFAN cycling (alternate between ON and OFF every 30 sec) for 20 min maximum.

t3 = COMP and OFAN stops for 10 min minimum.

b. High Pressure Protection

Mode: (AUTO) COOLING or DRY

Temp: Selected desired temperature

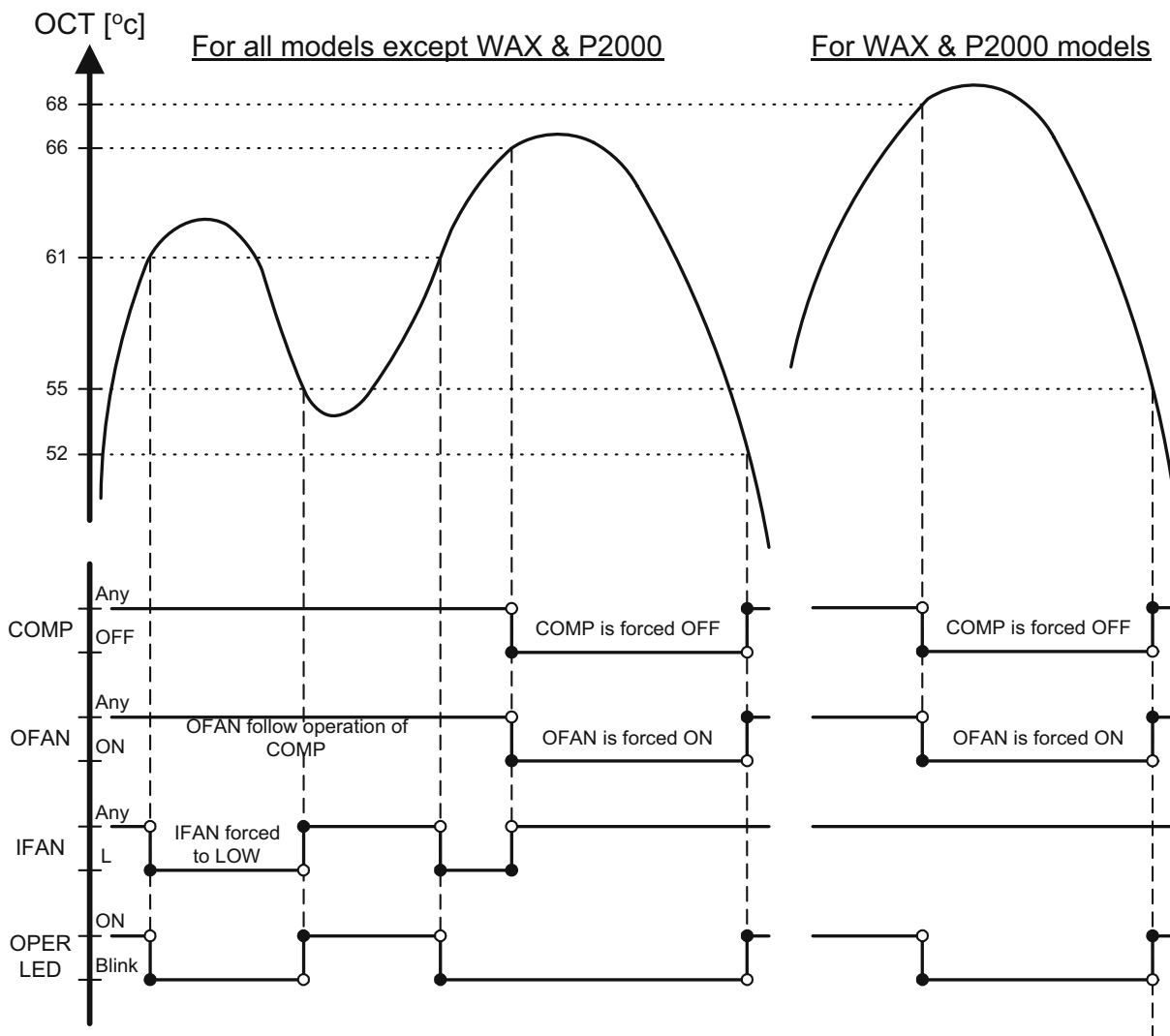
Fan: Any

Timer: Any

I-FEEL: ON or OFF

Control Function

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



NOTE

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

11.12.2 Condensation Pump.

Mode: Cool, Dry, Auto

Temp: Selected desired temperature

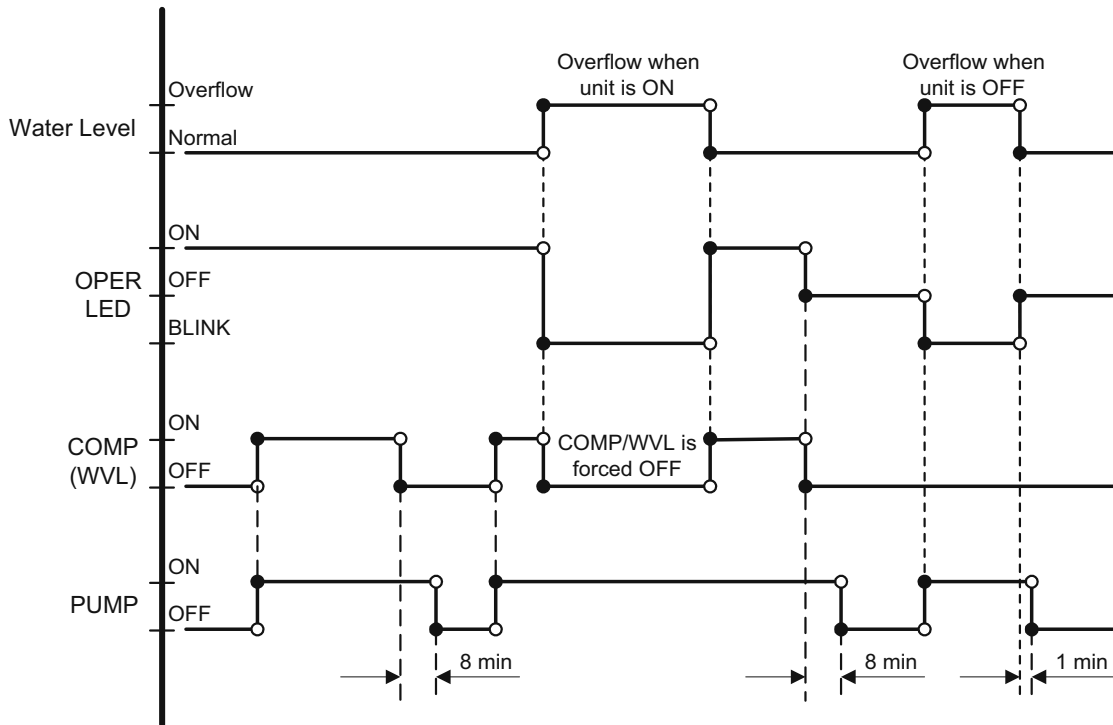
Fan: Any

Timer: Any

I FEEL: Any

Control function:

Prevent Condensed water from Overflowing.



Notes:

1. The switch used for water level detection is closed under normal condition, and is open when water overflow.
2. For the NEC version of MCU, the "Over Flow" & "Normal" condition are indicated by logic "0" & "1" at the LEVEL4 input pin respectively.
3. For the Fujitsu version of MCU, the "Over Flow" & "Normal" condition are indicated by logic "1" & "0" at the LEVEL4 input pin respectively.
4. The "Overflow" condition can activate the water pump in SB and operating modes.

11.12.3 Heating Mode Protections

- a. Outdoor Coil Deicing (excluding RH Group)

Mode: HEATING, AUTO (at heating)

Temp: Selected desired temperature

Fan: Any

Timer: Any

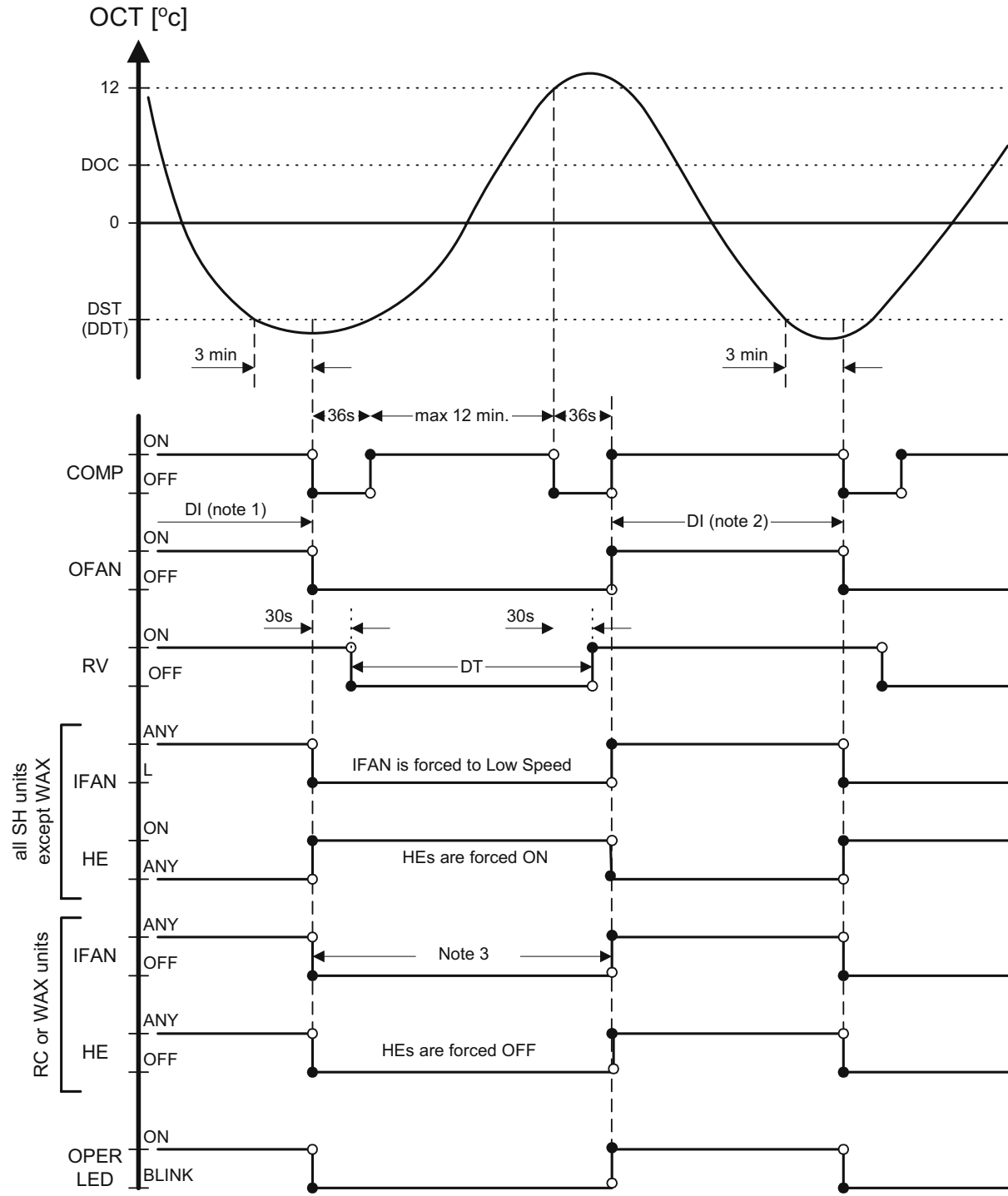
I-FEEL: Any

Control function

To protect the outdoor coil from ice formation by controlling COMP & RV operation.

- 1) Deicer Activation Algorithm
 - a) Static deicer threshold is -5°C
 - b) Dynamic deicer threshold changes of 3°C in 3 minutes in the OCT temperature
 - c) In first COMP activation (after SB or OFF), if $\text{OCT} < 0^{\circ}\text{C}$, min time to first deicer is 10 min else 40 min.
 - d) In a case of reading 3 successive OCT values below -10°C and previously 3 successive OCT values of 43°C (4.7 K), the unit will activate deicing procedure.

2) Deicing procedure



NOTES

1. In the following Deicing cycles, the time interval between two Deicing cycles activation is between 30 to 80 min.
2. For RC group, IFAN is forced OFF.
3. For SH group, HEs are forced ON and IFAN is forced to operate at LOW speed, regardless of the ICT and difference between RAT & SPT.
4. When jumper J7 is set, the DST value is -2°C.

b. High Pressure Protection (excluding RH Group)

Mode: (AUTO) HEATING

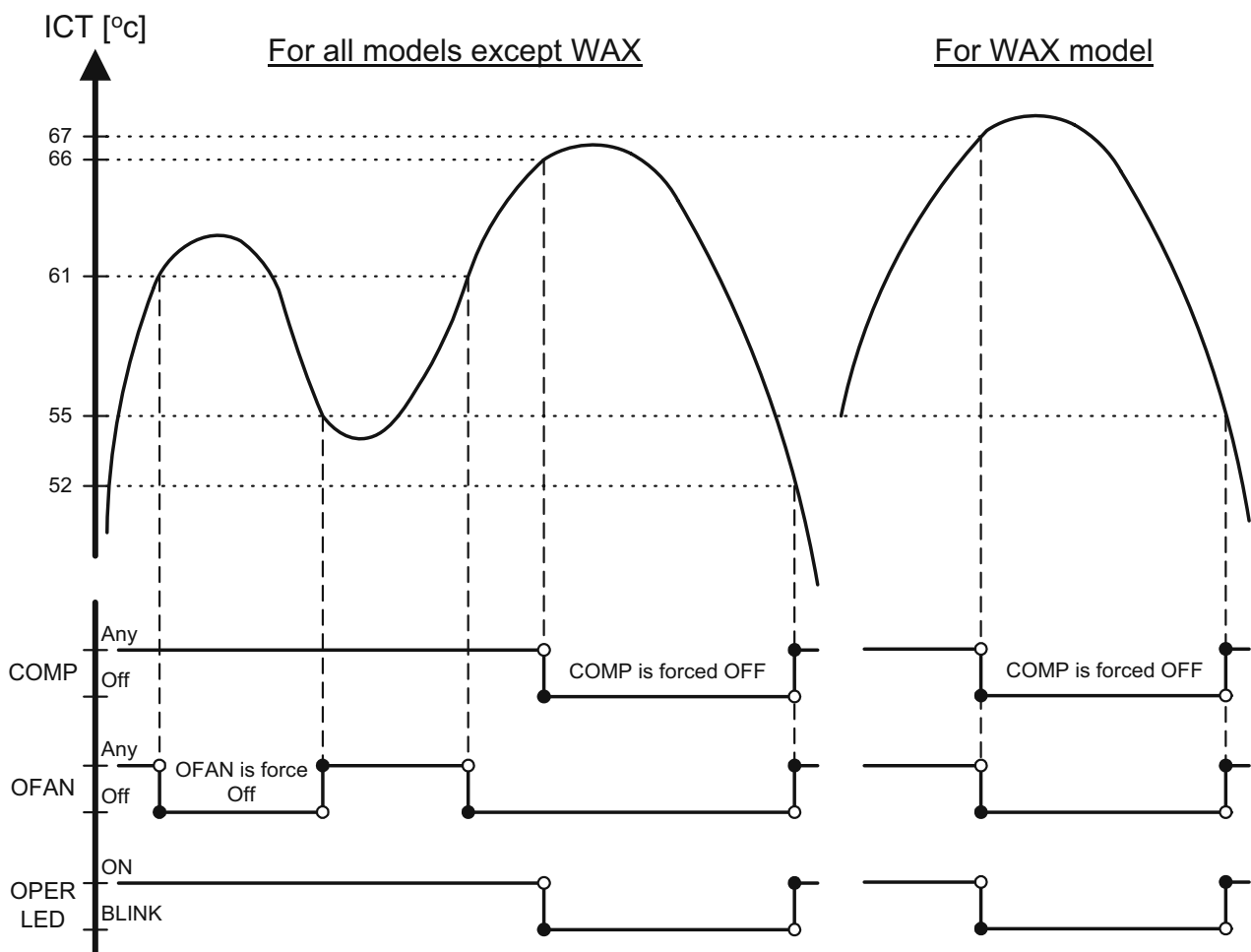
Fan: Any

Timer: Any

I-FEEL: ON or OFF

Control Function

Protects the compressor from high pressure by switching OFF the OFAN and COMP.



11.13 Forced Operation (Excluding PRX & PXD Models)

- a. Forced operation allows units to start, stop and operate in cooling or heating in preset temp. according to the following table:

Forced Operation Mode	Pre-set Temp for : MBX, P2000, PX Models	Pre-set Temp for : FCD, RWK ,ELD, ECC, WAX, WNX, WMN Models
Cooling	20 °C	22 °C
Heating	25 °C	28 °C

NOTES

1. **While under the forced operation, the temperature compensation schedule is disabled.**
2. **The forced operation is activated when the mode button on the Display Board is used to switch the unit to COOL or HEAT mode.**
3. **The IFAN is always set to Autofan Speed in forced operation.**

Temp: Set – desired temperature selected

Fan: Any

Timer: Interact with Sleep Timer

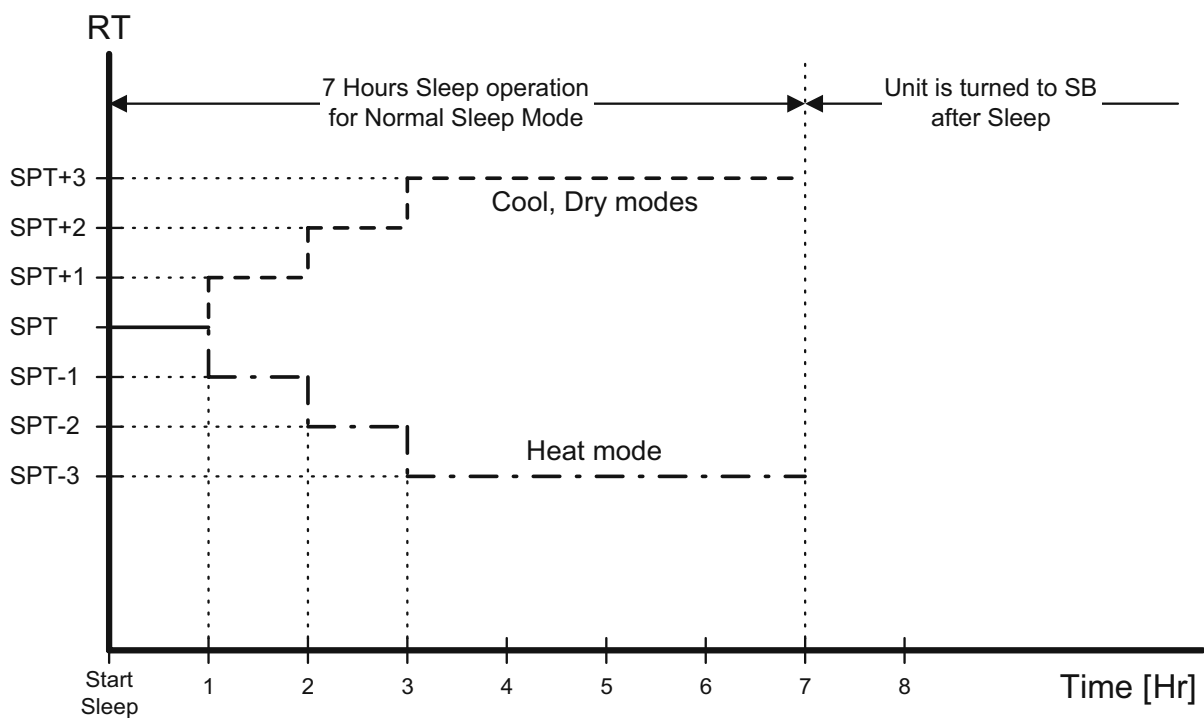
I-FEEL: ON or OFF

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

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

11.14 SPT Adjustment in Sleep Mode

- In COOL, AUTO COOL or DRY modes, the SPT adjustment is positive (from 0 to +3°C).
- In HEAT or AUTO HEAT modes, the SPT adjustment is negative (from 0 to -3°C).
- In other modes, there is no SPT adjustment.
- The SPT adjustment is cancelled when the Sleep mode is cancelled.



NOTE

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

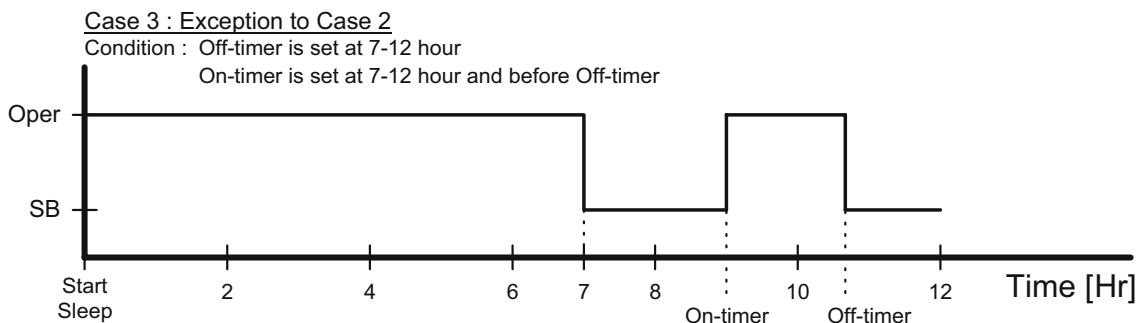
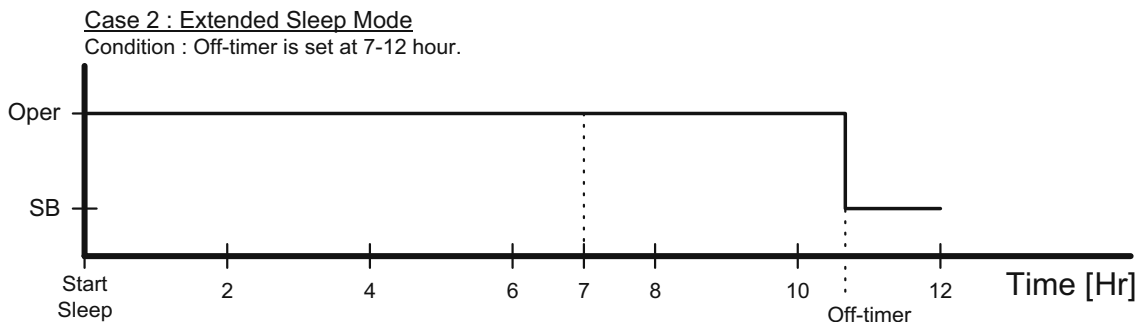
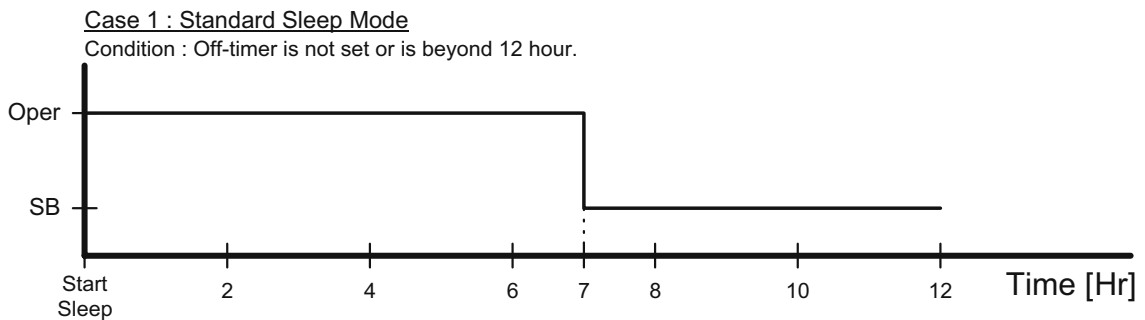
11.14.1 Time Adjustment in SLEEP Mode

In 10V4, the user can make use of the Off-Timer to extend the Sleep Time from 7 hours to 12 hour (max). The operation of the new “Extended Sleep Mode” is illustrated by the graphs below.

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

Case 2 is the new Extended Sleep Mode. If an active Off-Timer is set to turn off the A/C between 7-12 hour, relative to the starting of Sleep, the Sleep time is extended. And, instead of going to SB at the 7th hour, the A/C will work until reaching the Off-time.

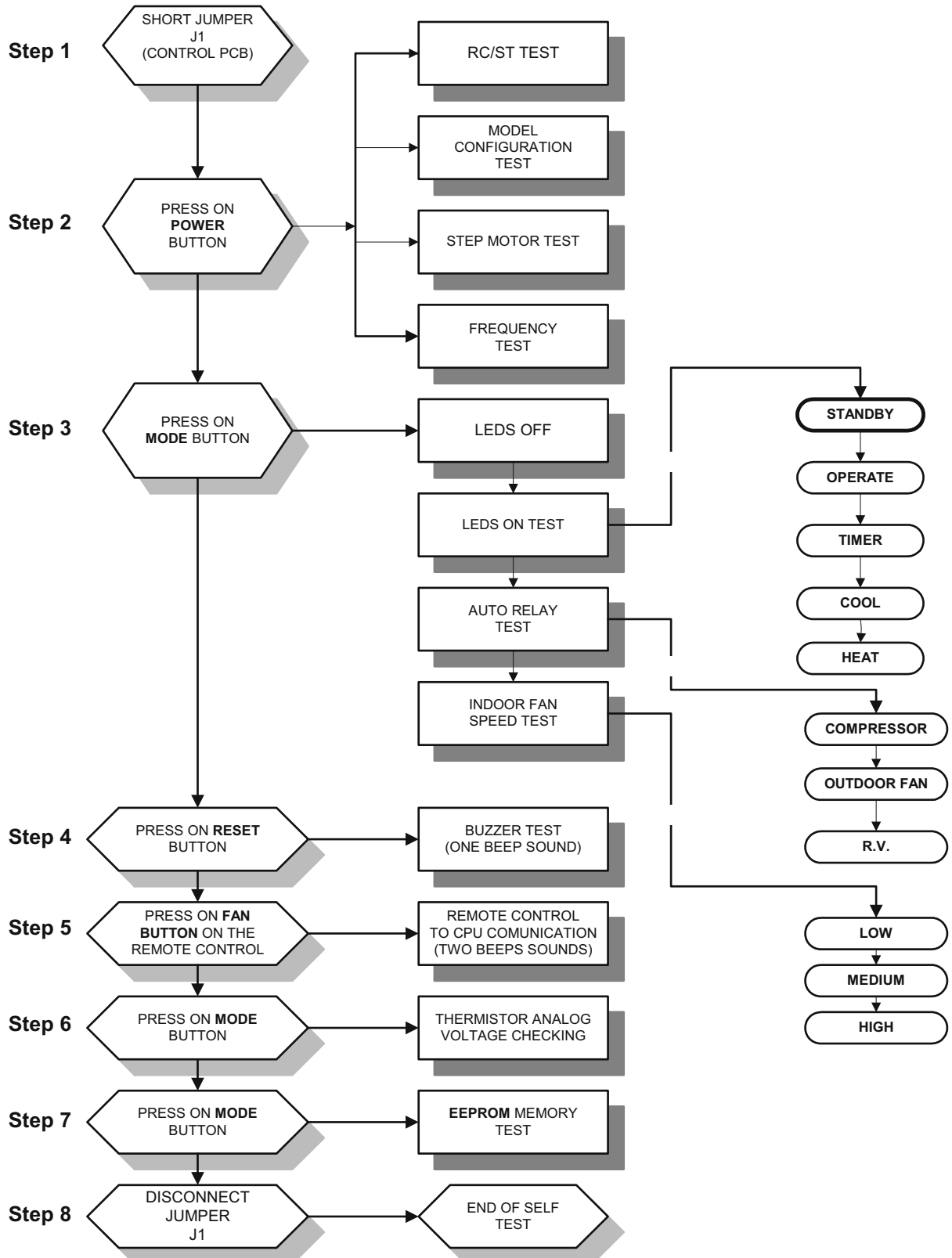
Case 3 is an exception to case 2. The Sleep Mode will not be extended to the Off-Time when the Off-Timer is preceded by an On-Timer, which is also between 7-12 hour.



11.15 Controller Self-Test Procedure

11.15.1 By Shorting Test Jumper J1

SELF-TEST FLOW CHART
FOR CONTROLLER (VERSION 4V5 OR HIGHER)



11.15.2 By Remote Control Settings:

- a. STEP 1: TURNING ON THE POWER.
Turn ON the power, make sure that the unit is in operation.
- b. STEP 2 : ENABLE SELF-TEST MODE
 - 1) Use the remote control to send the first settings to display / indoor unit HEAT mode, HIGH IFAN, set temperature to 16 °C, no I-FEEL Sleep or any other timer settings are needed.
 - 2) Cover the IR transmitter components in the remote control so that it will not transmit the signals to the indoor unit display.
 - 3) Use the remote control to send the second settings to display / indoor unit COOL mode, LOW IFAN, no I-FEEL Sleep or any other timer settings.
 - 4) Uncover the remote control IR transmitter and change the temperature settings. If the display/indoor unit receive the settings properly the following steps will start:
- c. STEP 3: MODEL SETTING CONFIRMATION
 - 1) The STAND-BY and COOL LEDS will indicate the operation mode as follows:

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

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

MODEL	COMP	OPERATE LED	TIMER LED	FILTER LED
WNG	ON	OFF	OFF	OFF
MBX	ON	OFF	OFF	ON
WNX	ON	OFF	ON	OFF
PRX	ON	ON	OFF	OFF
WMN1	ON	ON	OFF	ON
EMD/LS	ON	ON	ON	OFF
ECC-K	ON	ON	ON	ON
WMN 4	OFF	OFF	ON	OFF
PXD	OFF	OFF	ON	ON
WMN 2/WHX	OFF	ON	OFF	ON
WMN 3	OFF	ON	ON	ON

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

d. STEP 3: AUTO LED WALK TEST.

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

e. STEP 4: AUTO REALY WALK TEST:

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

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

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

f. STEP 5: FREQUENCY TESTING:

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

g. STEP 6: INPUT TEST.

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

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

h. STEP 7: TIMING RESET TEST (WATCH DOG).

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

The results of the test are coded as follows:

Pass condition:

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

Fail condition:

0 sec - STAND-BY is turned ON

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

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

i. STEP 8: MEMORY TEST (EEPROM)

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

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

AT THIS POINT THE SELF-TEST IS COMPLETED.

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

Values of Sensors Temperature VS. Voltage (DC)

Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)	Temp. (°C)	Voltage (V)
-20	4,554	2	3.744	24	2.555	46	1.487
-19	4,529	3	3.695	25	2.5	47	1.447
-18	4,502	4	3.646	26	2.445	48	1.409
-17	4,475	5	3.595	27	2.391	49	1.371
-16	4.446	6	3.544	28	2.338	50	1.334
-15	4.417	7	3.492	29	2.284	51	1.298
-14	4.386	8	3.439	30	2.232	52	1.263
-13	4.354	9	3.386	31	2.18	53	1.228
-12	4.322	10	3.332	32	2.128	54	1.195
-11	4.287	11	3.278	33	2.077	55	1.162
-10	4.252	12	3.223	34	2.027	56	1.13
-9	4.216	13	3.168	35	1.978	57	1.099
-8	4.178	14	3.113	36	1.929	58	1.069
-7	4.14	15	3.058	37	1.881	59	1.04
-6	4.1	16	3.002	38	1.834	60	1.011
-5	4.059	17	2.946	39	1.798	61	0.983
-4	4.017	18	2.89	40	1.742	62	0.956
-3	3.974	19	2.833	41	1.698	63	0.929
-2	3.93	20	2.777	42	1.654	64	0.904
-1	3.885	21	2.722	43	1.611	65	0.879
0	3.839	22	2.666	44	1.569	66	0.854
1	3.792	23	2.61	45	1.527	67	0.831

11.16 System Diagnostics

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

In DIAGNOSTICS mode, system failures will be indicated by the blinking of HEAT & COOL LEDs.

The coding method is as follows:

- HEAT LED blinks 5 times in 5 seconds, and then turns off for the next 5 seconds.
- COOL LED blinks during the same 5 seconds according to the following table:

No.	Problem	1	2	3	4	5
1	RT1 is disconnected	○	●	●	●	●
2	RT1 is shorted	○	●	●	●	○
3	RV fault	○	●	●	○	●
4	RT2 is disconnected	●	○	●	●	●
5	RT2 is shorted	●	○	●	●	○
6	(Reserved)	●	○	●	○	●
7	RT2 temp reading doesn't change	●	○	●	○	○
8	RT3 is disconnected	●	●	○	●	●
9	RT3 is shorted	●	●	○	●	○
10	(Reserved)	●	●	○	○	●
11	RT3 temp reading doesn't change	●	●	○	○	○
12	RT2 & RT3 temp reading doesn't change	●	○	○	○	○

LEGEND

○ - ON, ● - OFF

NOTES

1. If faults occur in more than one thermistor (except case number 12 in table above), only one fault will be indicated according to the following order: RT3, RT2, RT1.
2. A/C will return to normal mode when sending a command by the R/C during system DIAGNOSTICS mode. If the command from the R/C contains a Group ID, the ID will become the new Group ID of the ELCON unit.

12. TROUBLESHOOTING

ELECTRICAL & CONTROL TROUBLESHOOTING

ATTENTION : check for broken or loose cable lugs first.

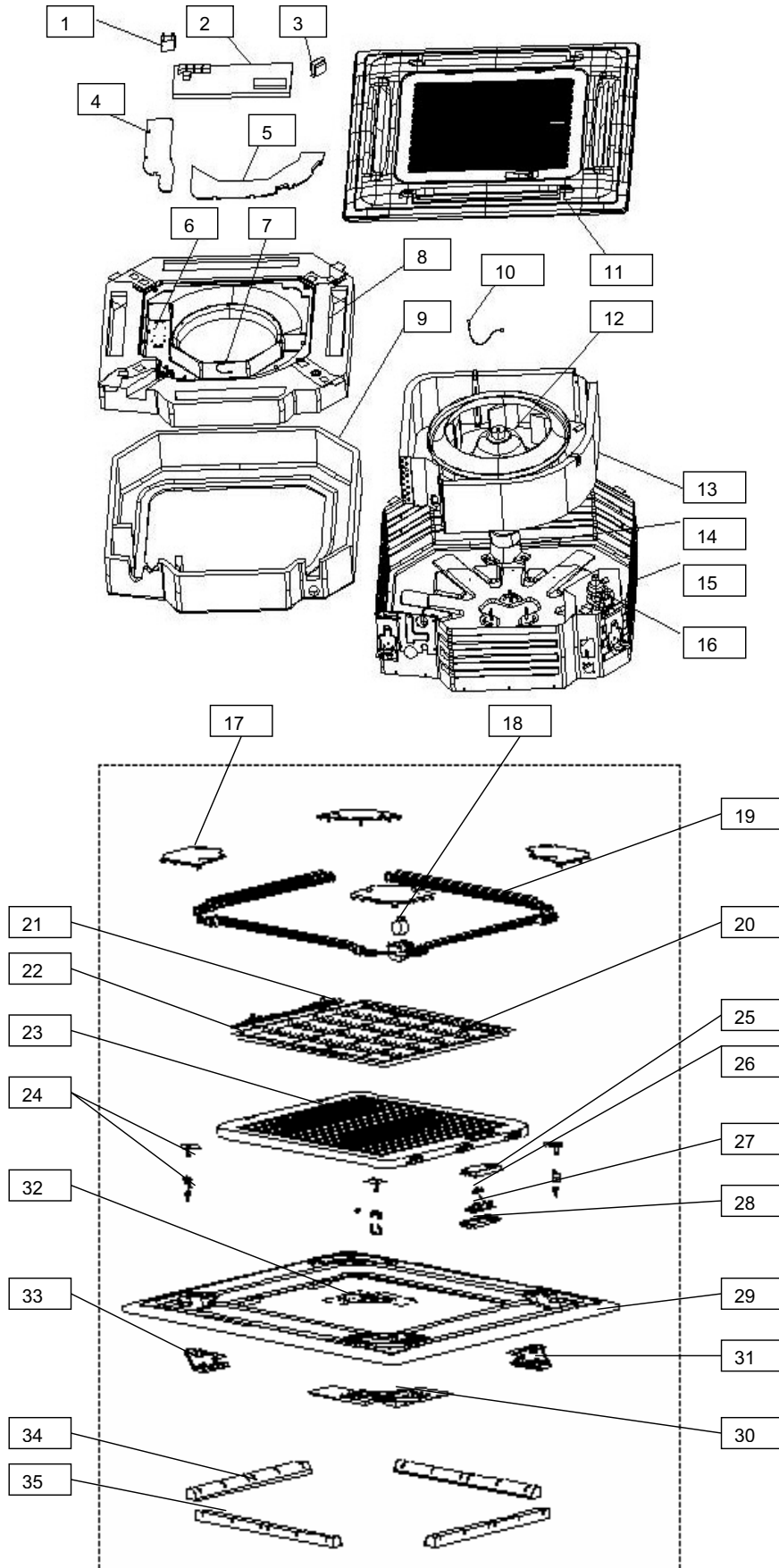
NO	SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
1.	The power supply indicator (red led) doesn't light up.	There is no correct voltage between the line and neutral terminals on main P.C.B.	-If the voltage is low repair power supply. -If there is no voltage repair general wiring. -If there is correct voltage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

ATTENTION : check for broken or loose cable lugs first

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

13. EXPLODED VIEWS AND SPARE PARTS LISTS

13.1 Indoor Unit: KN 24 / 30



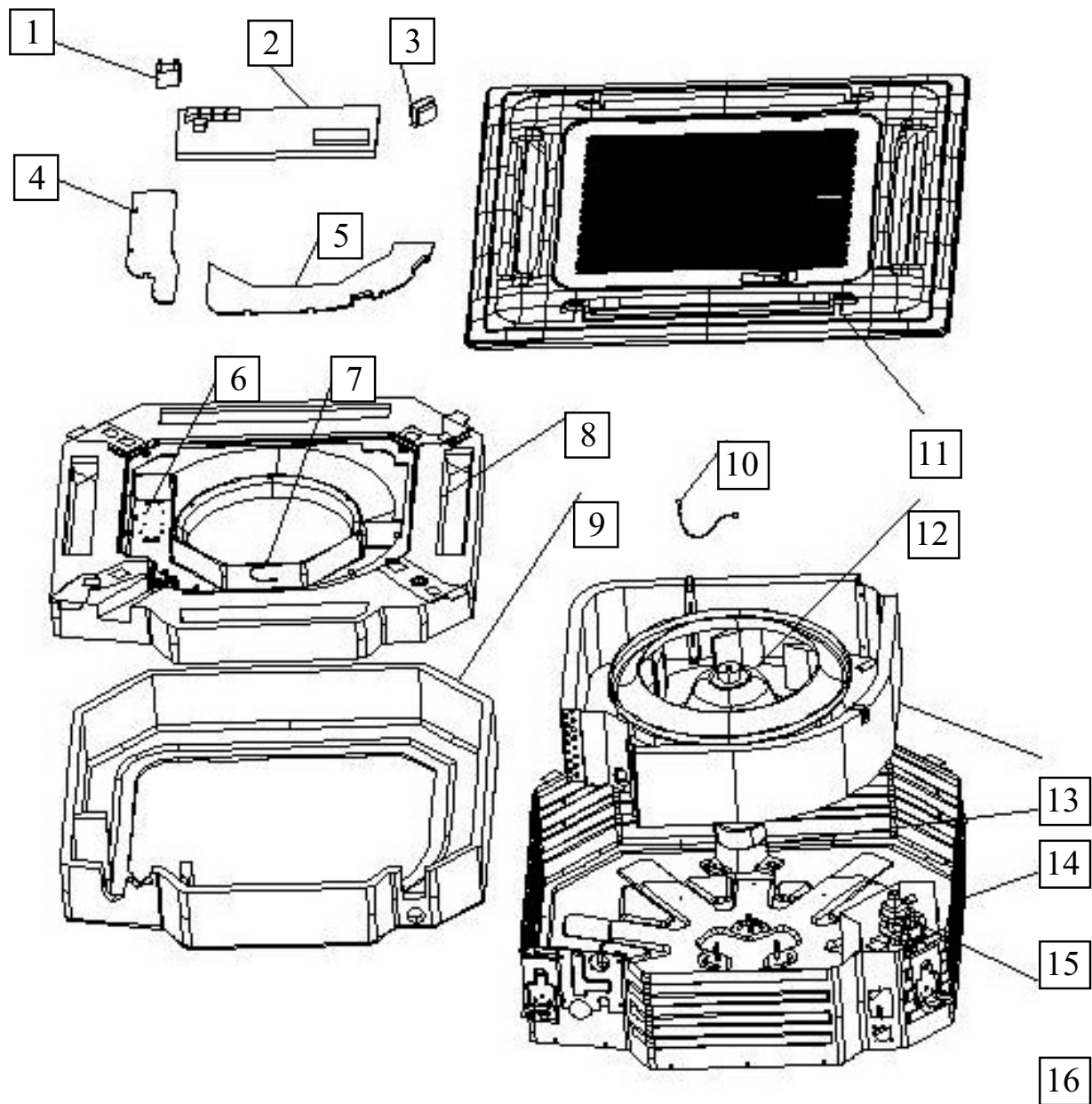
13.2 Indoor Unit: KN 24

No	Part No	Item Desc	Qty
1	455000103	Double patch Capacitor for fan	1
2	452949400	MKS DST-5 911-085-02	1
3	4523162	TRANSFORMER ASSY.	1
4	2114200004	E-Parts Box Cover1 for SPL OEM	1
5	2114200005	E-Parts Box Cover2 for SPL OEM	1
6	2114200008	E-Parts Box Assy for SPL OEM	1
7	4523278	RW SENSOR	1
8	2224200052	Recieve Water Assy for SPL OEM	1
9	2224200050	Evaporator Base Assy for SPL OEM	1
9	2224209003	EvaporatorBaseAssyforOEMCASSETTESPL	1
10	4523277	ICT SENSOR	1
11	452928400	Indoor Unit Frame Assy. OEM	1
12	2114200003	Fan Assy for SPL OEM CASSETTE	1
13	2154209043	Evaporator Assy R410A for SPL OEM	1
13	462350010	Evaporator Assy./KN 24 R410A	1
14	4525518	KN-24 INDOOR MOTOR	1
15	2124200050	Base Pan Assy for SPL OEM CASSETTE	1
16	4525530	pump PSB-12 for OEM CASSETTE90X90	1
17	2114200015	Cover	4
18	2240010007	Swing motor	1
19	8224200007	Louver	4
20	2114200024	Filter	1
21	2114200021	Switch for grille	2
22	8144200001	Switch cover for grille	1
23	2114200020	Air inlet grille	1
24	8141990001	Hanger for panel assy.	4
25	2114200011	Control box	1
26	2114200007	LED holder	1
27	4523483	Display PCB EHK: 901-085-00	1
28	2114200022	Control box cover	1
29	452997004	Front panel Airwell AIR-MBQ4-02C.1-1	1
30	2114200016	Back board, air outlet 1	1
31	2114200017	Back board, air outlet 2	1
32	2114200018	Back board, air outlet 3	1
33	2114200019	Back board, air outlet 4	1
34	8224200005	EPS foam, air outlet 1	4
35	8224200006	EPS foam, air outlet 2	4

13.3 Indoor Unit: KN 30

No	Part No	Item Desc	Qty
1	455000103	Double patch Capacitor for fan	1
2	4523482	Main PCB HK 911-085-01 10v5	1
None	4523482	Main PCB HK 911-085-01 10v5	1
3	4523162	TRANSFORMER ASSY.	1
4	2114200004	E-Parts Box Cover1 for SPL OEM	1
5	2114200005	E-Parts Box Cover2 for SPL OEM	1
6	2114200008	E-Parts Box Assy for SPL OEM	1
7	4523278	RW SENSOR	1
8	2224200052	Recieve Water Assy for SPL OEM	1
9	2224200050	Evaporator Base Assy for SPL OEM	1
9	2224209003	EvaporatorBaseAssyforOEMCASSETTESPL	1
10	4523277	ICT SENSOR	1
11	453014400	Indoor Unit Frame Assy. OEM	1
12	2114200003	Fan Assy for SPL OEM CASSETTE	1
13	2154209043	Evaporator Assy R410A for SPL OEM	1
13	462350011	Evaporator Assy./KN 30 R410A	1
14	4525519	OEM CASSETTE90X90K N-30 INDOOR MOTOR	1
15	2124200050	Base Pan Assy for SPL OEM CASSETTE	1
16	4525530	pump PSB-12 for OEM CASSETTE90X90	1
17	2114200015	Cover	4
18	2240010007	Swing motor	1
19	8224200007	Louver	4
20	2114200024	Filter	1
21	2114200021	Switch for grille	2
22	8144200001	Switch cover for grille	1
23	2114200020	Air inlet grille	1
24	8141990001	Hanger for panel assy.	4
25	2114200011	Control box	1
26	2114200007	LED holder	1
27	4523483	Display PCB EHK: 901-085-00	1
28	2114200022	Control box cover	1
29	453043100	OEM CASSETTE90X90 Indoor Unit	1
30	2114200016	Back board, air outlet 1	1
31	2114200017	Back board, air outlet 2	1
32	2114200018	Back board, air outlet 3	1
33	2114200019	Back board, air outlet 4	1
34	8224200005	EPS foam, air outlet 1	4
35	8224200006	EPS foam, air outlet 2	4
None	4523482R	Main PCB HK 911A085-00 10v5	1

13.4 Indoor Unit: KN 36 / 45



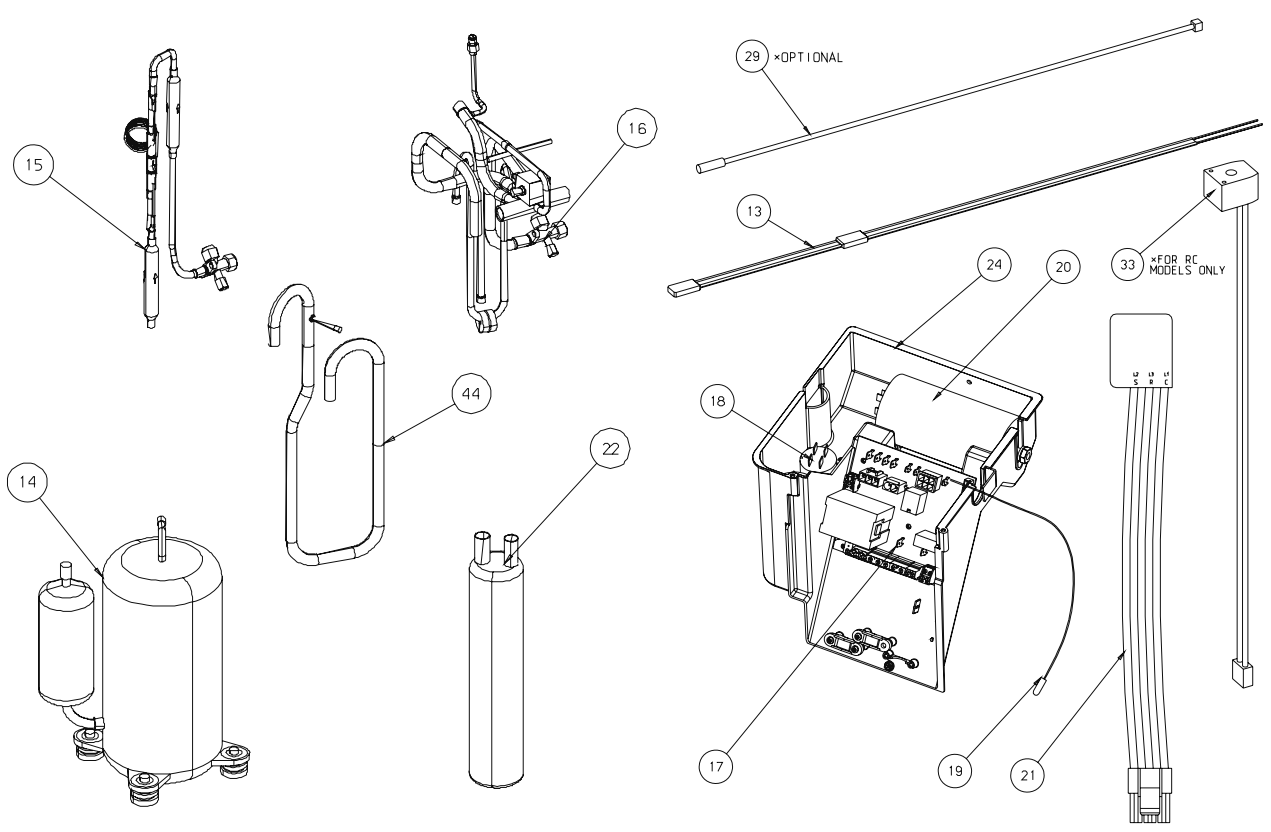
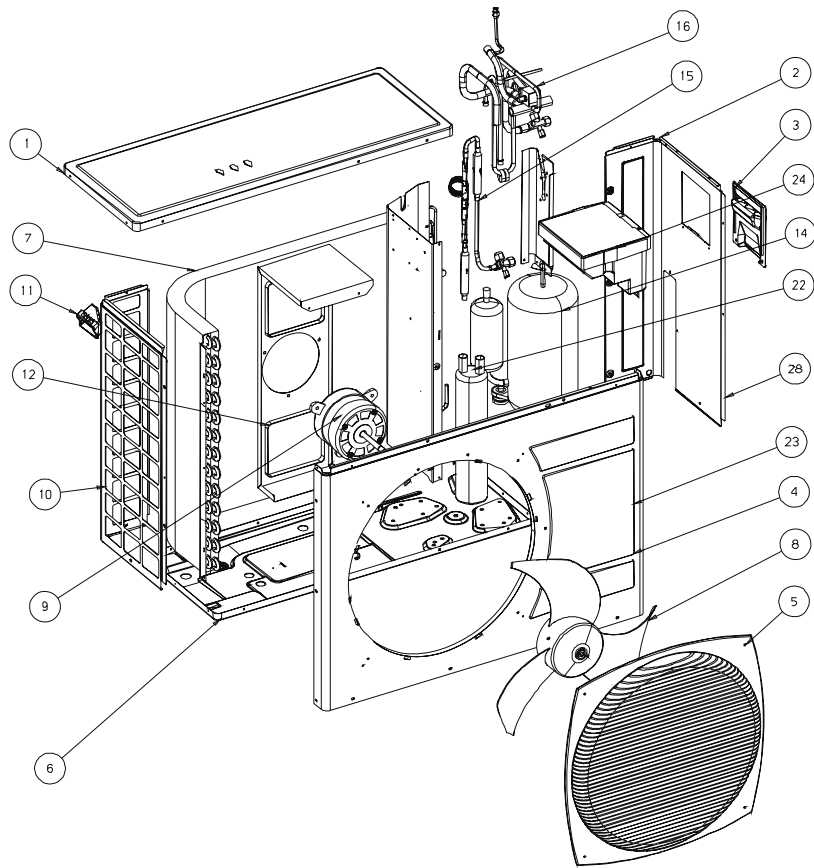
13.5 Indoor Unit: KN 36

No.	Item	Description	Qty
4	2114200004	1 E-Parts Box Cover1 for SPL OEM	1
5	2114200005	2 E-Parts Box Cover2 for SPL OEM	1
26	2114200007	LED holder	1
25	2114200011	Control box	1
17	2114200015	Cover	4
30	2114200016	Back board, air outlet 1	1
31	2114200017	Back board, air outlet 2	1
32	2114200018	Back board, air outlet 3	1
33	2114200019	Back board, air outlet 4	1
23	2114200020	Air inlet grille	1
21	2114200021	Switch for grille	2
28	2114200022	Control box cover	1
20	2114200024	Filter	1
12	2114200601	Fan Assy for OEM CASSETTE SPL	1
15	2124200601	Base Pan Assy for OEM CASSETTE SPL	1
9	2124200603	Evaporator Base Assy for OEM	1
13	2154200610	Evaporator Assy for OEM CASSETTE SPL	1
8	2224200601	Receive Water Assy for OEM CASSETTE	1
9	2224209005	EvaporatorBaseAssyforOEMCASSETTESPL	1
18	2240010007	Swing motor	1
6	2334209153	E-Parts Box Assy for OEM CASSETTE	1
1	4518042	Capacitor 3.5uf	1
3	4523162	TRANSFORMER ASSY.	1
10	4523277	ICT SENSOR	1
7	4523278	RW SENSOR	1
2	4523482	Main PCB HK 911-085-01 10v5	1
2	4523482R	Main PCB HK 911A085-00 10v5	1
27	4523483	Display PCB EHK: 901-085-00	1
11	4525514	OEM CASSETTE90X90 KN24/30/36/45	1
14	4525520	OEM CASSETTE 90X90 KN-36 INDOOR MOTOR	1
16	4525530	Pump PSB-12 for OEM CASSETTE90X90	1
11	452928700	KN GRILL Assy. ELECTRA	1
29	452997001	Front panel ELECTRA (EXPORT) EL-MBQ4-02C.1-	1
1	455000103	Double patch Capacitor for fan	1
24	8141990001	Hanger for panel assy.	4
22	8144200001	Switch cover for grille	1
34	8224200005	Ä1 EPS foam, air outlet 1	4
35	8224200006	Ä2 EPS foam, air outlet 2	4
19	8224200007	Louver	4

13.6 Indoor Unit: KN 45

No.	Item	Description	Qty
4	2114200004	1 E-Parts Box Cover1 for SPL OEM	1
5	2114200005	2 E-Parts Box Cover2 for SPL OEM	1
26	2114200007	LED holder	1
25	2114200011	Control box	1
17	2114200015	Cover	4
30	2114200016	Back board, air outlet 1	1
31	2114200017	Back board, air outlet 2	1
32	2114200018	Back board, air outlet 3	1
33	2114200019	Back board, air outlet 4	1
23	2114200020	Air inlet grille	1
21	2114200021	Switch for grille	2
28	2114200022	Control box cover	1
20	2114200024	Filter	1
12	2114200601	Fan Assy for OEM CASSETTE SPL	1
15	2124200601	Base Pan Assy for OEM CASSETTE SPL	1
13	2154200610	Evaporator Assy for OEM CASSETTE SPL	1
8	2224200601	Receive Water Assy for OEM CASSETTE	1
9	2224209005	EvaporatorBaseAssyforOEMCASSETTESPL	1
18	2240010007	Swing motor	1
6	2334209153	E-Parts Box Assy for OEM CASSETTE	1
3	4523162	TRANSFORMER ASSY.	1
10	4523277	ICT SENSOR	1
7	4523278	RW SENSOR	1
2	4523482R	Main PCB HK 911A085-00 10v5	1
27	4523483	Display PCB EHK: 901-085-00	1
14	4525521	OEM CASSETTE90X90 KN-45 INDOOR MOTOR	1
16	4525530	Pump PSB-12 for OEM CASSETTE90X90	1
11	452928700	KN GRILL Assy. ELECTRA	1
29	452997001	Front panel ELECTRA (EXPORT) EL-MBQ4-02C.1-	1
1	455000106	Double patch Capacitor for fan	1
24	8141990001	Hanger for panel assy.	4
22	8144200001	Switch cover for grille	1
34	8224200005	1 EPS foam, air outlet 1	4
35	8224200006	2 EPS foam, air outlet 2	4
19	8224200007	Louver	4

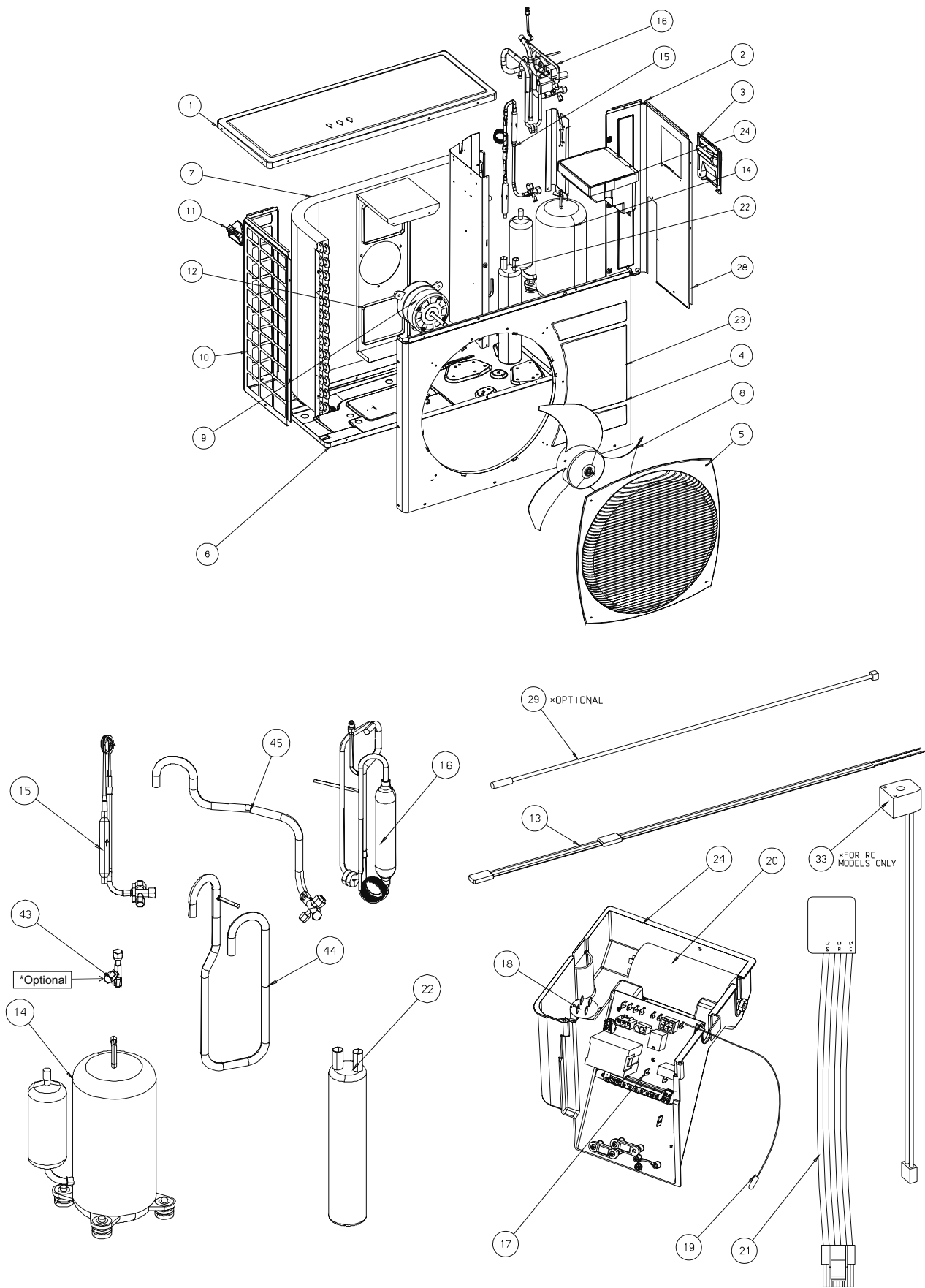
13.7 Outdoor Unit: OU7-24 RC 1PH



13.8 Indoor Unit: OU7-24 RC 1PH

No.	SP No.	Part No.	Description	Qty
1	13	190443	HEATER CRANKCASE MITSUBISHI CO	1
2	22	402283	SUCTION ACCUMULATOR 3"x5/8" 3.	1
3	17	402495	BOARD TPHN 5B	1
4	7	433285	COIL OU7-24 HDR	1
5	15	433288	CAPILLARY ASSY OU7-24 R410A	1
6	16	433291	TUBING ASSY OU7 R410A	1
7	14	433293	COMPRESSOR NN27VBAMT	1
8	6	433294	NEW BASE ASSY OU 2005 EXPORT	1
9	44	433816	SUCTION ASSY OU7 R410A	1
10	9	434062	MOTOR 86W,2S,OU7-24	1
11	19	434716	THERMISTOR+CAP WTH CONNECTOR L	1
12	3	436357	SMALL ELECTRICAL COVER OU	1
13	11	436358	OU LEADING HANDLE	1
14	1	437045	UPPER COVER EL13 OU LARGE	1
15	5	437091	OU SQUARE FAN GUARD	1
16	24	437229	ELECTRICAL BOX TPHN	1
17	21	437274	COMPRESOR WIRING OU7/8-1PH MIT	1
18	4	439329	FRONT COVER/COLLECTOR OU7-35/9	1
19	12	439342	MOTOR SUPPORT OU7	1
20	18	442007	CAPACITOR 6mF 400V P1/P2	1
21	20	442016	CAPACITOR 55mF 400V P1/P2	1
22	33	442466	VALVE COIL L700 MOLEX-SANHUA	1
23	8	4529604	AXIAL FAN D493*143	1

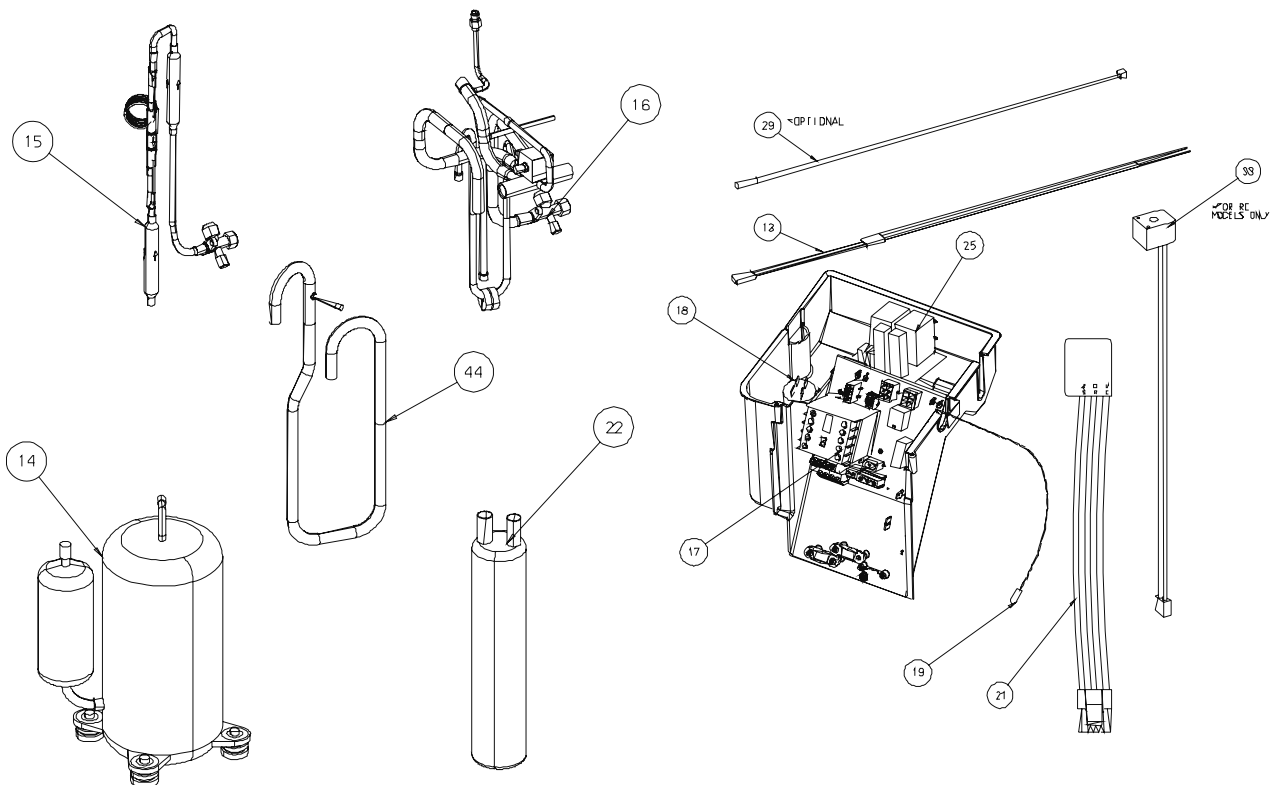
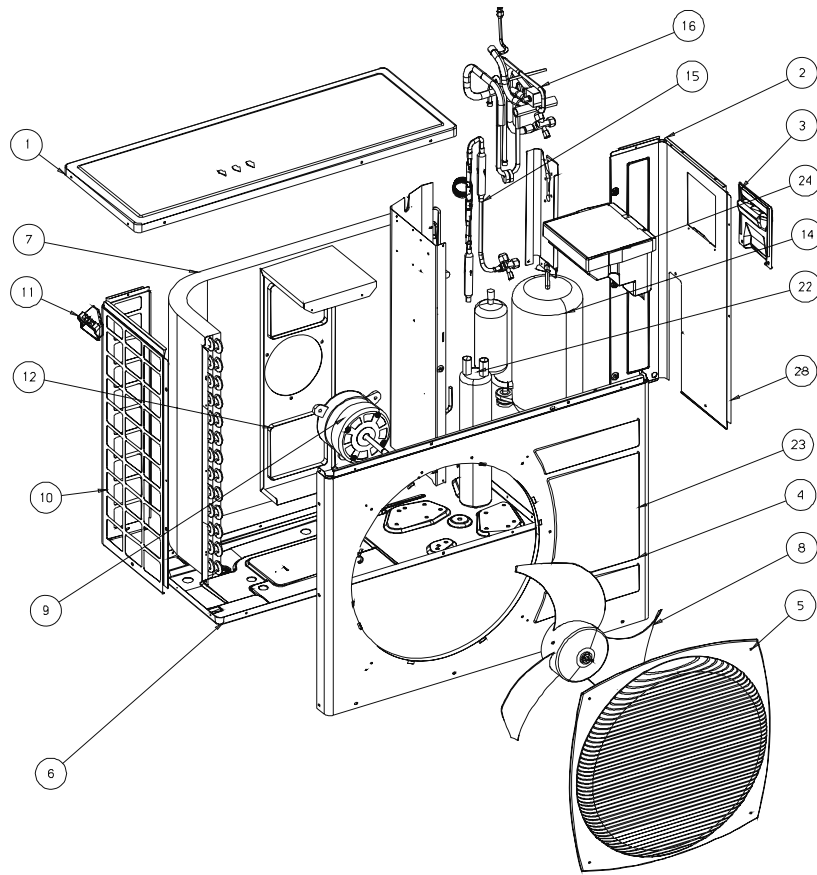
13.9 Outdoor Unit: OU7-24 ST 1PH



13.10 Outdoor Unit: OU7-24 ST 1PH

No.	SP No.	Part No.	Description	Qty
1	13	190443	HEATER CRANKCASE MITSUBISHI CO	1
2	22	402283	SUCTION ACCUMULATOR 3"x5/8" 3.	1
3	17	402495	BOARD TPHN 5B	1
4	14	433293	COMPRESSOR NN27VBAMT	1
5	6	433705	NEW BASE ASSY OU 2005 LOCAL	1
6	44	433816	SUCTION ASSY OU7 R410A	1
7	16	433817	TUBING ASSY OU7 ST R410A	1
8	15	433845	CAPILLARY ASSY OU7-24 ST R410A	1
9	7	433846	COIL OU7-24 ST	1
10	45	433847	GAS VAVE ASSY OU7 ST R410A	1
11	9	434062	MOTOR 86W,2S,OU7-24	1
12	19	434716	THERMISTOR+CAP WTH CONNECTOR L	1
13	3	436357	SMALL ELECTRICAL COVER OU	1
14	11	436358	OU LEADING HANDLE	1
15	1	437045	UPPER COVER EL13 OU LARGE	1
16	5	437091	OU SQUARE FAN GUARD	1
17	24	437229	ELECTRICAL BOX TPHN	1
18	21	437274	COMPRESOR WIRING OU7/8-1PH MIT	1
19	4	439329	FRONT COVER/COLLECTOR OU7-35/9	1
20	12	439342	MOTOR SUPPORT OU7	1
21	18	442007	CAPACITOR 6mF 400V P1/P2	1
22	20	442016	CAPACITOR 55mF 400V P1/P2	1
23	8	4529604	AXIAL FAN D493*143	1

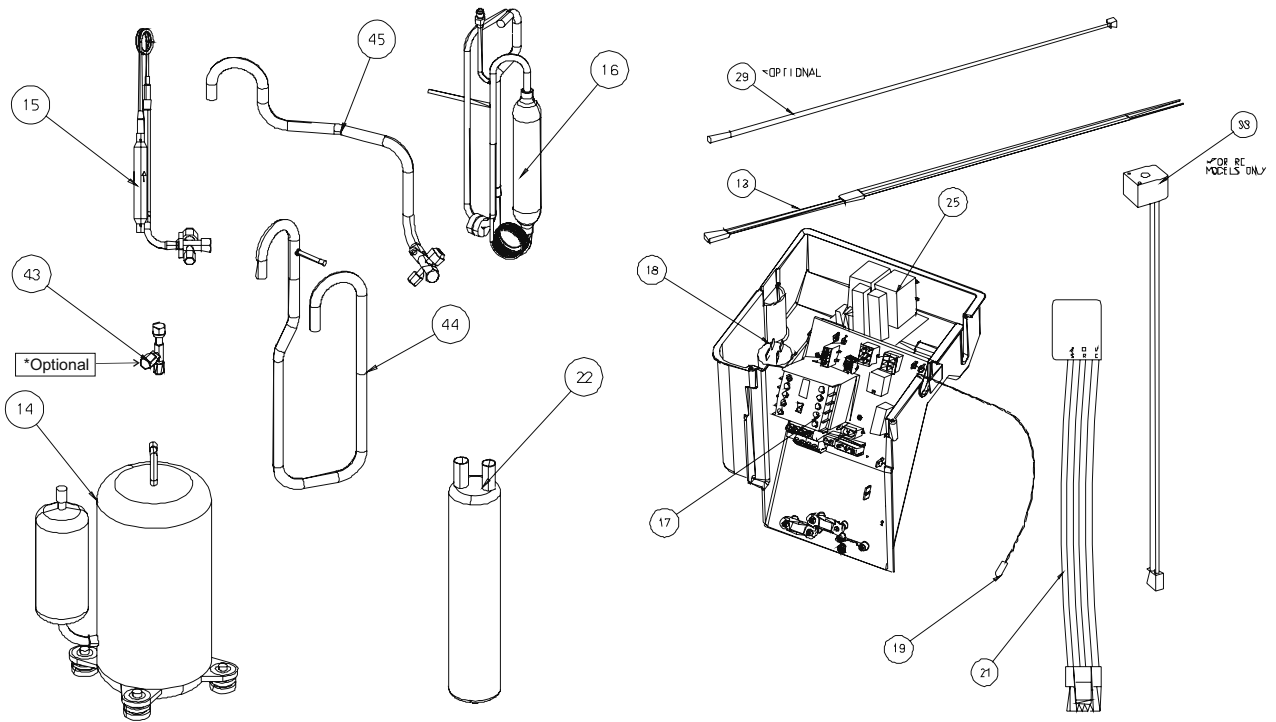
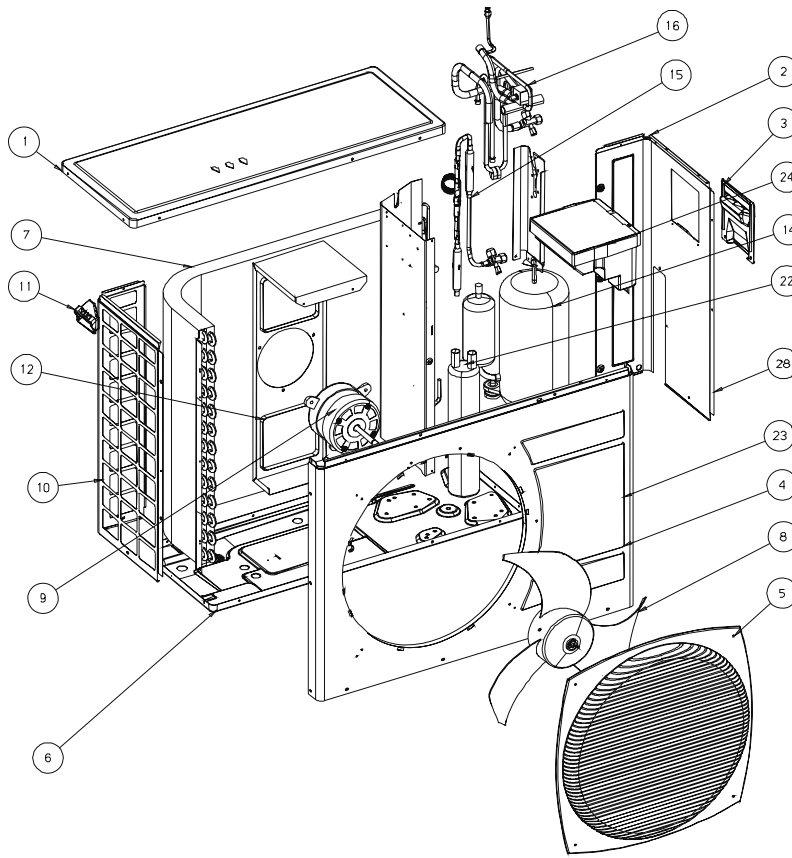
13.11 Outdoor Unit: OU7-24 RC 3PH



13.12 Outdoor Unit: OU7-24 RC 3PH

No.	SP No.	Part No.	Description	Qty
1	13	190443	HEATER CRANKCASE MITSUBISHI CO	1
2	22	402283	SUCTION ACCUMULATOR 3"x5/8" 3.	1
3	17	402494	BOARD TPHN 3C	1
4	7	433285	COIL OU7-24 HDR	1
5	15	433288	CAPILLARY ASSY OU7-24 R410A	1
6	16	433291	TUBING ASSY OU7 R410A	1
7	6	433294	NEW BASE ASSY OU 2005 EXPORT	1
8	14	433753	COMPRESSOR NN27YDAMT	1
9	44	433816	SUCTION ASSY OU7 R410A	1
10	9	434062	MOTOR 86W,2S,OU7-24	1
11	19	434716	THERMISTOR+CAP WTH CONNECTOR L	1
12	3	436357	SMALL ELECTRICAL COVER OU	1
13	11	436358	OU LEADING HANDLE	1
14	1	437045	UPPER COVER EL13 OU LARGE	1
15	5	437091	OU SQUARE FAN GUARD	1
16	24	437229	ELECTRICAL BOX TPHN	1
17	21	437278	COMPRESSOR WIRING OU7/8-3PH MI	1
18	4	439329	FRONT COVER/COLLECTOR OU7-35/9	1
19	12	439342	MOTOR SUPPORT OU7	1
20	25	439795	3PH MOTOR PROTECTOR	1
21	18	442007	CAPACITOR 6mF 400V P1/P2	1
22	33	442466	VALVE COIL L700 MOLEX-SANHUA	1
23	8	4529604	AXIAL FAN D493*143	1

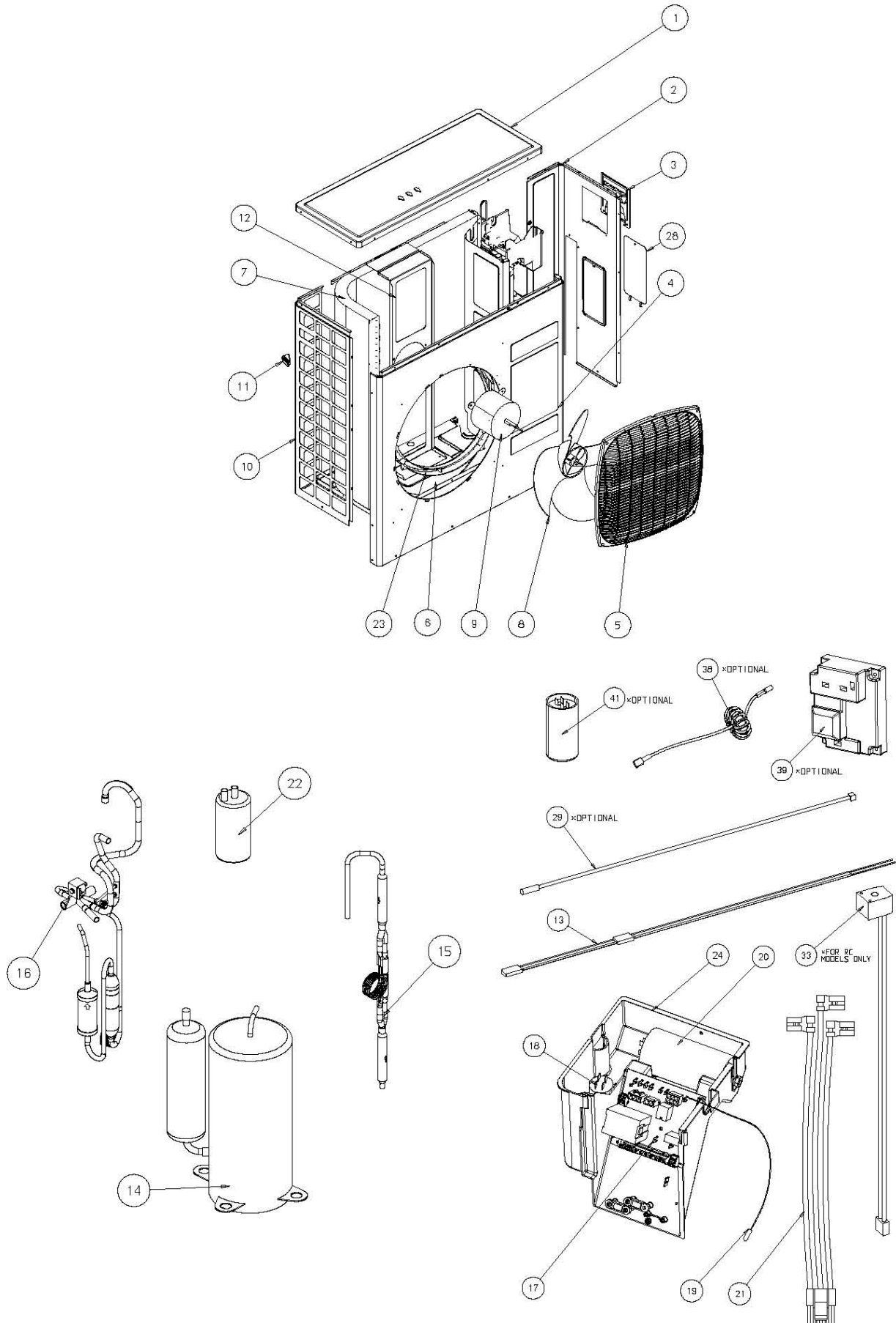
13.13 Outdoor Unit: OU7-24 ST 3PH



13.14 Outdoor Unit: OU7-24 ST 3PH

No.	SP No.	Part No.	Description	Qty
1	1	437045	LARGE UPPER COVER CUE	1
2	2	433280	SIDE PANEL OU7-24 R410A	1
3	3	436357	SMALL ELECTRICAL COVER CUE	1
4	4	439329	COVERAIR COLLECTOR	1
5	5	437091	OU SQUARE FAN GUARD	1
6	6	433705	NEW BASE ASSY OU 2005 LOCAL R410	1
7	7	433846	COIL OU7-24 ST	1
8	8	4529604	AXIAL FAN D493*143	1
9	9	434062	MOTOR 86W,2S,OU7-24	1
10	10	433281	SIDE GUARD OU7-24 R410	1
11	11	436358	TRANSPORT HANDLE CUE	1
12	12	439342	MOTOR BASE OU7	1
13	13	190443	HEATER CRANKCASE MITSUBISHI COMP	1
14	14	433753	COMPRESSOR NN27YDAMT	1
15	15	433845	CAPILLARY ASSY OU7-24 ST R410A	1
16	16	433817	TUBING ASSY OU7 ST R410A	1
17	17	402494	BOARD TPHN 3C	1
18	18	442007	CAPACITOR 6mF 400V P2	1
19	19	434716	THERMISTOR L1050 (for coil)	1
20	21	437278	MITSUBISHI	1
21	22	402283	R410A	1
22	24	437229	ELECTRICAL BOX TPHN	1
23	25	439795	BOARD 3PH PROTECTOR	1
24	44	433816	SUCTION ASSY OU7 R410A	1
25	45	433847	GAS VAVE ASSY OU7 ST R410A	1

13.15 Outdoor Unit: OU8-30 RC 1PH



13.16 Outdoor Unit: OU8-30 RC 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433807	COIL OU8-30 GR HDR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433822	CAPILLARY ASSY OU8-30 R410A RC	1	15
433829	TUBING ASSY OU8-30 R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437274	COMPRESOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

13.17 Outdoor Unit: OU8-30 RC 1PH Soft Starter

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433807	COIL OU8-30 GR HDR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433822	CAPILLARY ASSY OU8-30 R410A RC	1	15
433829	TUBING ASSY OU8-30 R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437292	COMPRESSOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33
433607	CHOCK FOR SOFT STARTER	1	38
433296	SOFT STARTER	1	39
442022	SOFT STARTER CAPACITOR 161-193	1	41

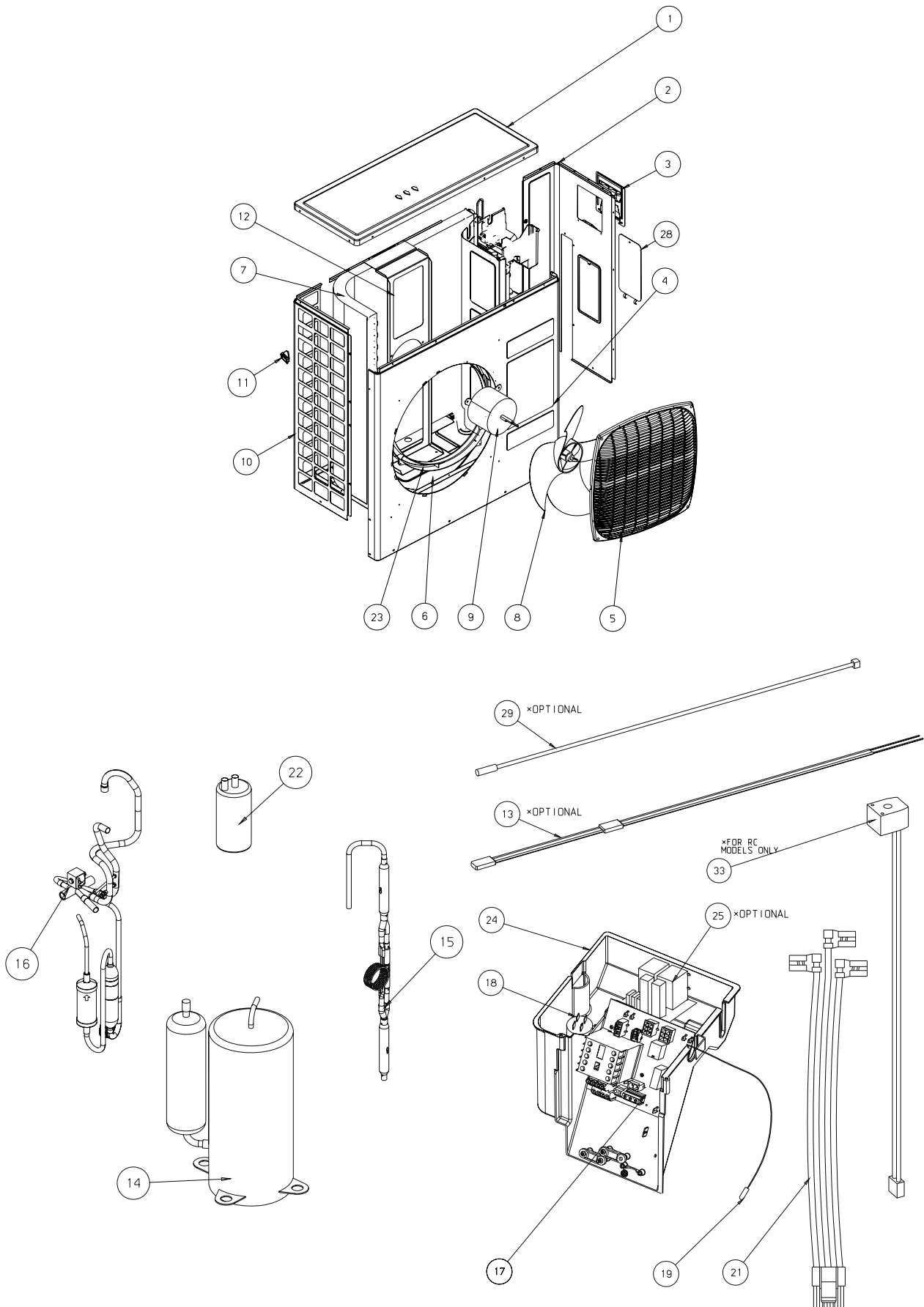
13.19 Outdoor Unit: OU8-30 ST 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433834	COIL OU8-30 ST GR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433830	CAPILLARY ASSY OU8-30 R410A ST	1	15
433833	TUBING ASSY OU8-30 ST R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437274	COMPRESOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28

13.20 Outdoor Unit: OU8-30 ST 1PH Soft Starter

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433834	COIL OU8-30 ST GR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433297	COMPRESSOR NN33VAAMT	1	14
433830	CAPILLARY ASSY OU8-30 R410A ST	1	15
433833	TUBING ASSY OU8-30 ST R410A	1	16
402495	BOARD TPHN 5B	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442016	CAPACITOR 55mF 400V P1/P2	1	20
437292	COMPRESSOR WIRING OU7/8-1PH	1	21
402284	SUCTION ACCUMULATOR 5"x3/4"	1	22
439928	OUTLET PLASTIC RING OU 8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439656	SIDE COVER OU-8/10	1	28
433607	CHOCK FOR SOFT STARTER	1	38
433296	SOFT STARTER	1	39
442022	SOFT STARTER CAPACITOR 161-193	1	41

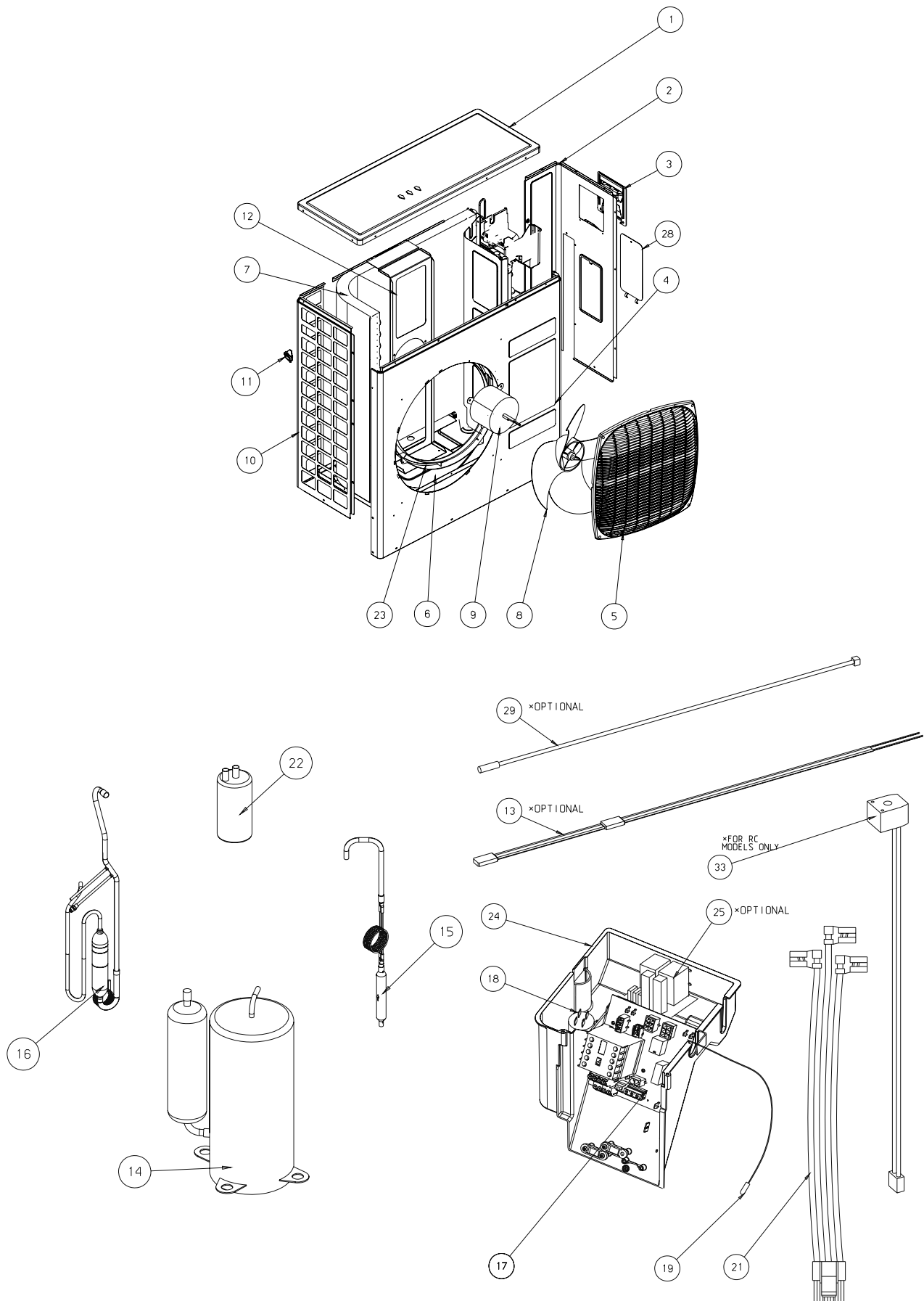
13.21 Outdoor Unit: OU8-30 RC 3PH



13.22 Outdoor Unit: OU8-30 RC 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433807	COIL OU8-30 GR HDR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433298	COMPRESSOR NN33YCAMT	1	14
433822	CAPILLARY ASSY OU8-30 R410A RC	1	15
433829	TUBING ASSY OU8-30 R410A	1	16
402494	BOARD TPHN 3C	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437278	COMPRESSOR WIRING OU7/8-3PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

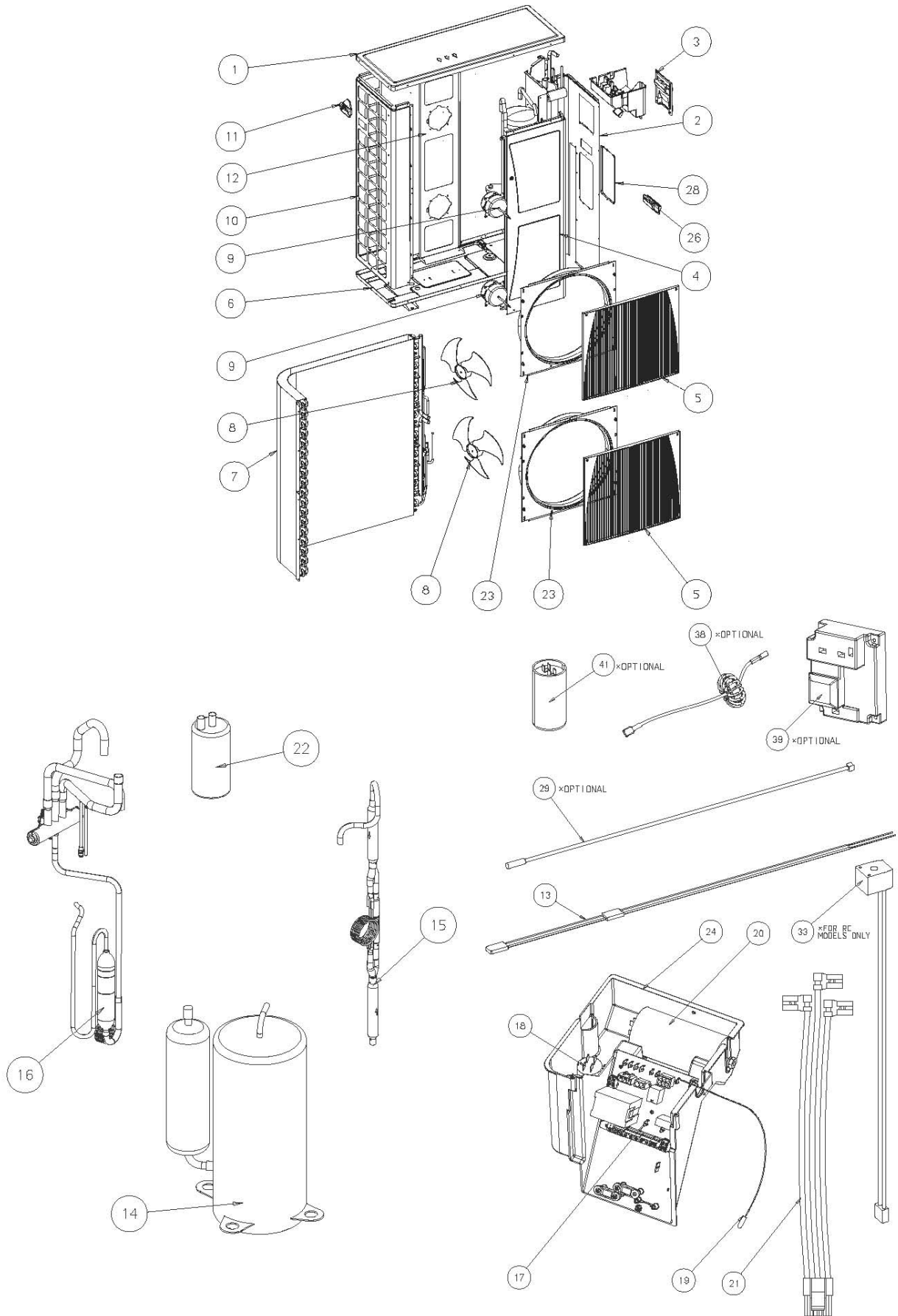
13.23 Outdoor Unit: OU8-30 ST 3PH



13.24 Outdoor Unit: OU8-30 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
402930	SIDE PANEL OU8-33	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439929	FRONT PANEL/COLLECTOR OU8-30	1	4
437091	OU SQUARE FAN GUARD	1	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433834	COIL OU8-30 ST GR R410A	1	7
4529604	AXIAL FAN D493*143	1	8
434062	MOTOR 86W,2S,OU7-24	1	9
403996	SIDE GUARD OU8-33Z	1	10
436358	OU LEADING HANDLE	1	11
439775	MOTOR SUPPORT OU8	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433298	COMPRESSOR NN33YCAMT	1	14
433830	CAPILLARY ASSY OU8-30 R410A ST	1	15
433833	TUBING ASSY OU8-30 ST R410A	1	16
402494	BOARD TPHN 3C	1	17
442007	CAPACITOR 6mF 400V P1/P2	1	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437278	COMPRESSOR WIRING OU7/8-3PH	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439928	OUTLET PLASTIC RING OU8	1	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
439656	SIDE COVER OU-8/10	1	28

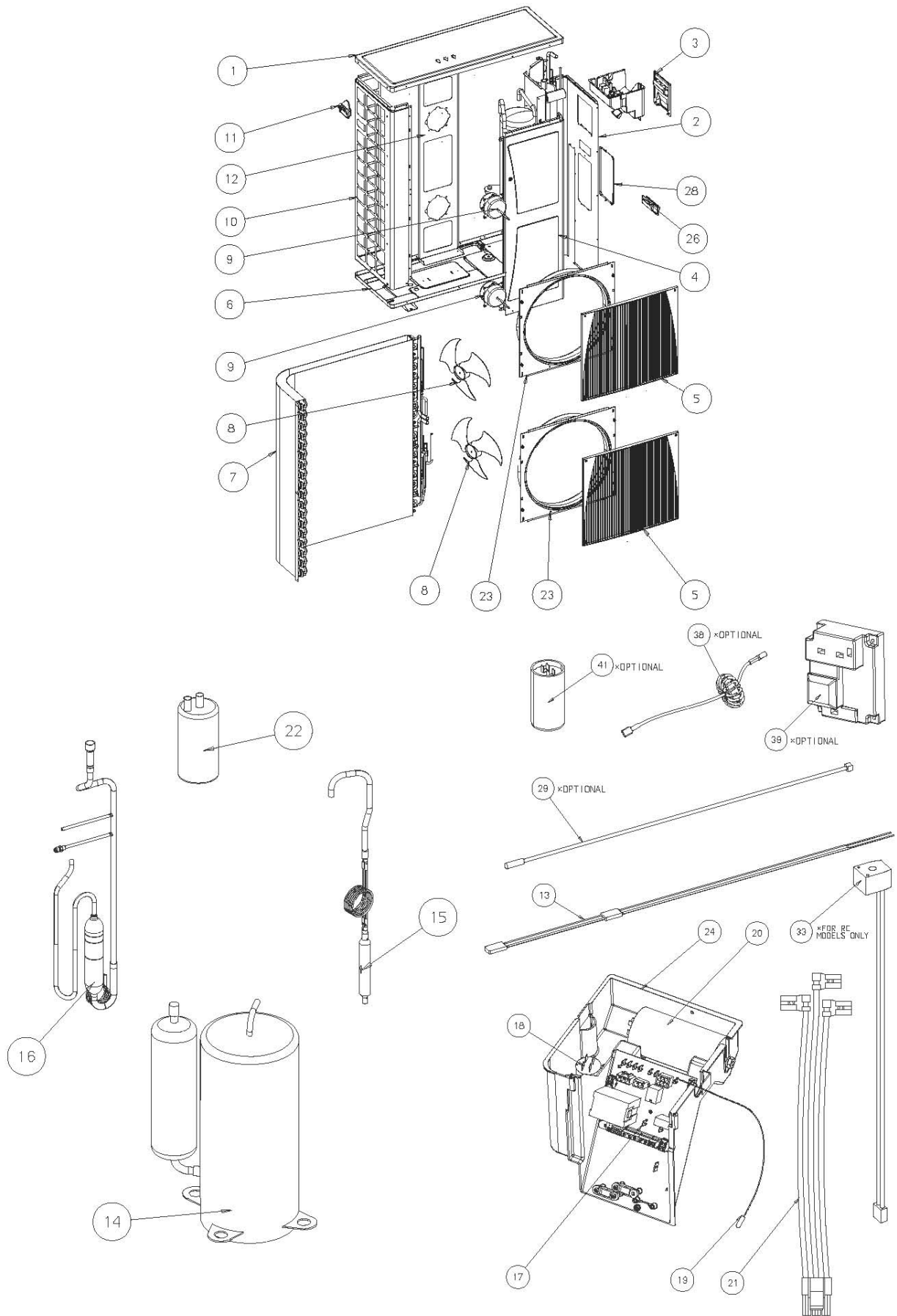
13.25 Outdoor Unit: OU10-36 RC 1PH



13.26 Outdoor Unit: OU10-36 RC 1PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433854	COIL OU10-36 GR HDR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433279	COMPRESSOR NN40VAAMT	1	14
433857	CAPILLARY ASSY OU10-36 R410A	1	15
433865	TUBING ASSY OU10-36 R410A	1	16
402495	BOARD TPHN 5B	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442010	CAPACITOR 60mF 400V P1/P2	1	20
437279	COMPRESSOR WIRING OU10-1PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

13.27 Outdoor Unit: OU10-36 ST 3PH



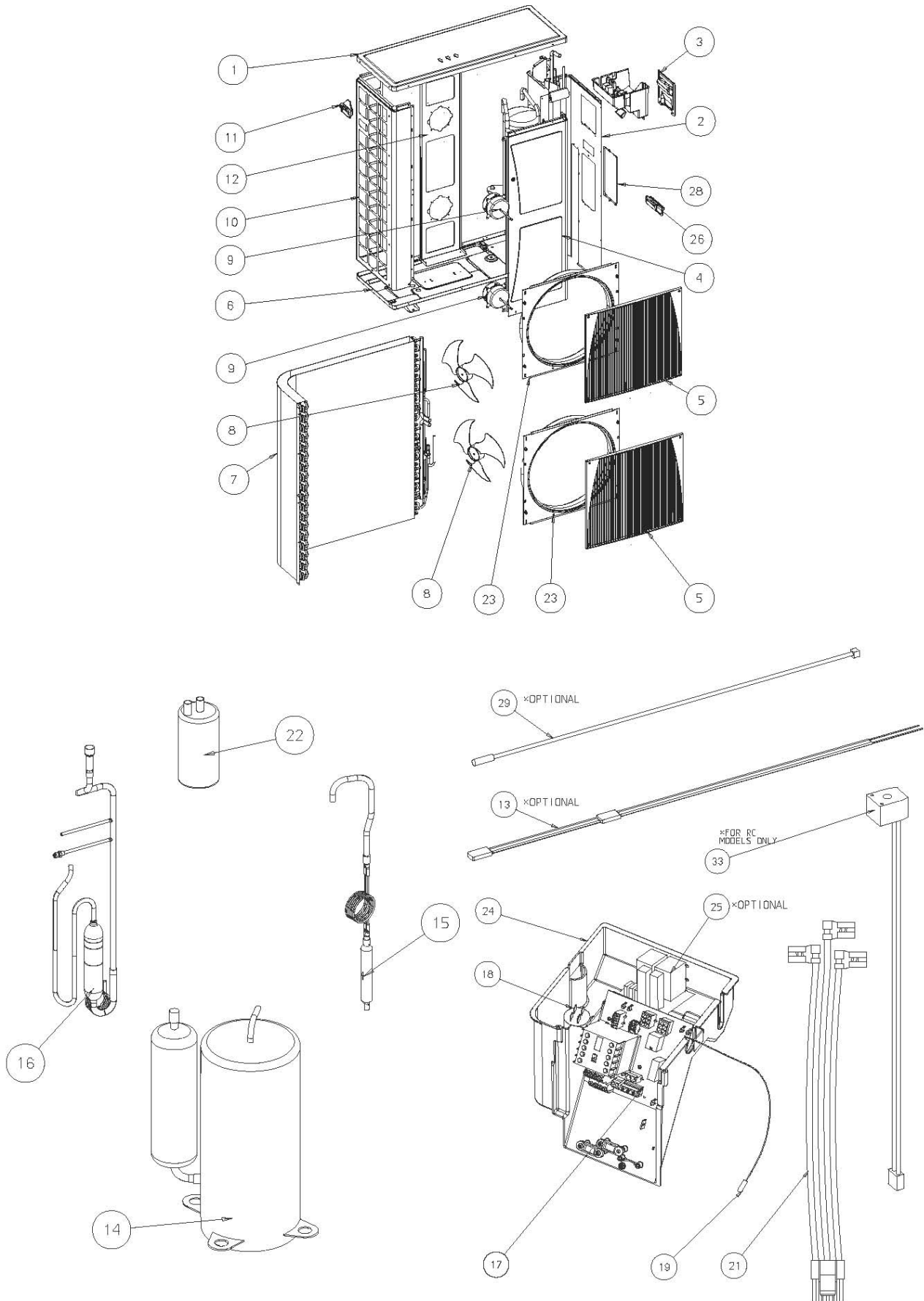
13.28 Outdoor Unit: OU10-36 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433868	COIL OU10-36 ST GR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433279	COMPRESSOR NN40VAAMT	1	14
433872	CAPILLARY ASSY OU10-36 ST R410	1	15
433873	TUBING ASSY OU10-36 ST R410A	1	16
402495	BOARD TPHN 5B	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
442010	CAPACITOR 60mF 400V P1/P2	1	20
437279	COMPRESSOR WIRING OU10-1PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28

13.30 Outdoor Unit: OU10-36 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433294	NEW BASE ASSY OU 2005 EXPORT	1	6
433854	COIL OU10-36 GR HDR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433855	COMPRESSOR NN40YCAMT	1	14
433857	CAPILLARY ASSY OU10-36 R410A	1	15
433865	TUBING ASSY OU10-36 R410A	1	16
402494	BOARD TPHN 3C	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437280	COMPRESSOR WIRING OU10-3PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

13.31 Outdoor Unit: OU10-36 ST 3PH



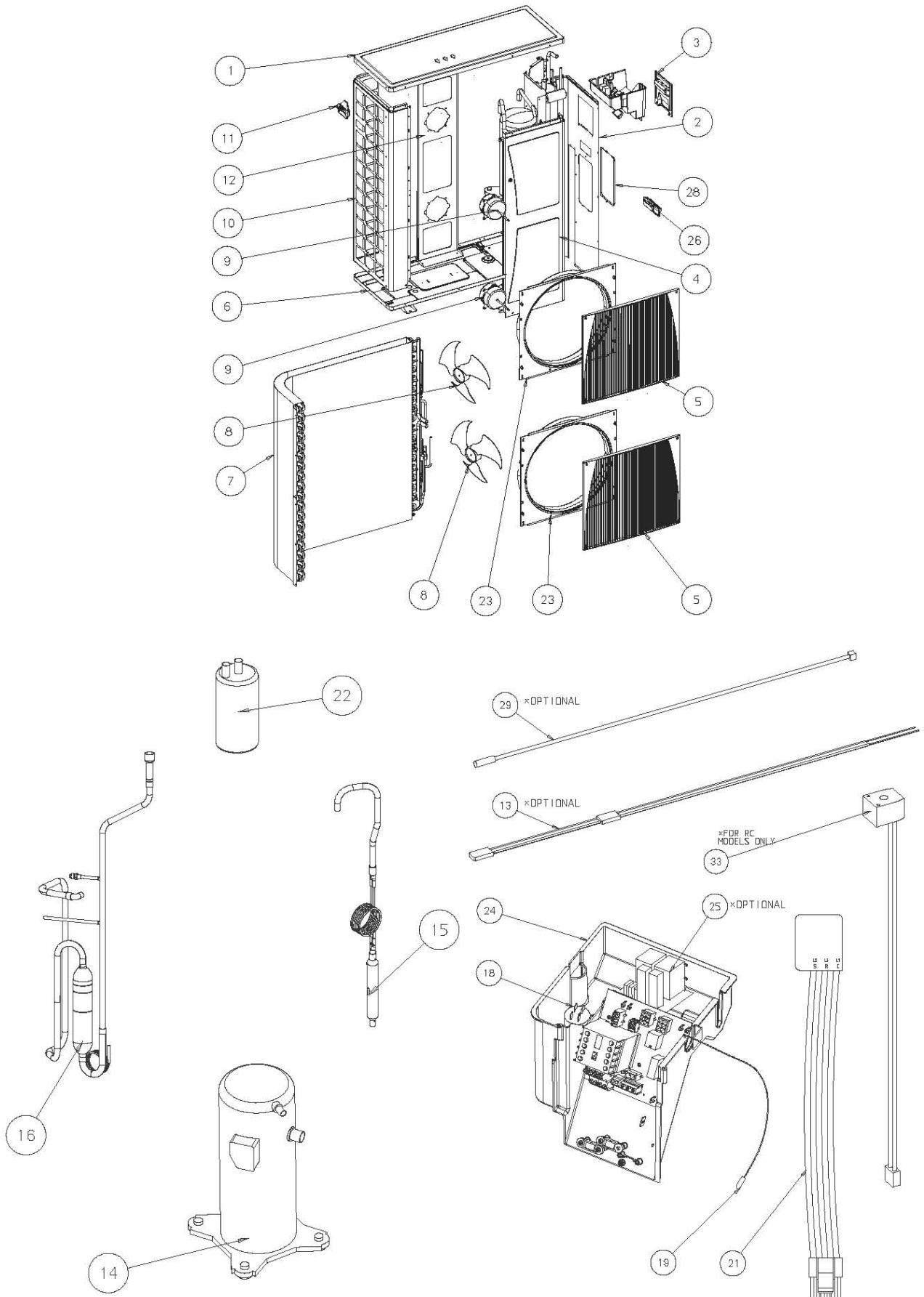
13.32 Outdoor Unit: OU10-36 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
433705	NEW BASE ASSY OU 2005 LOCAL	1	6
433868	COIL OU10-36 ST GR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439865	MOTOR 70W,3S,OU10-38	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190443	HEATER CRANKCASE MITSUBISHI	1	13
433855	COMPRESSOR NN40YCAMT	1	14
433872	CAPILLARY ASSY OU10-36 ST R410	1	15
433873	TUBING ASSY OU10-36 ST R410A	1	16
402494	BOARD TPHN 3C	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
437280	COMPRESSOR WIRING OU10-3PH	1	21
402189	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28

13.34 Outdoor Unit: OU10-47 RC 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
439833	NEW BASE ASSY OU EXPORT	1	6
433875	COIL OU10-44 GR HDR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439651	MOTOR 70W,3S,OU10-50	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190442	HEATER CRANKCASE OU10 LG	1	13
438764	COMPRESSOR ARA053YAA	1	14
433924	CAPILLARY ASSY OU10-44 RC R410	1	15
433908	TUBING ASSY OU10-44 R410A	2	16
402494	BOARD TPHN 3C	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR	1	19
435545	COMPRESSOR WIRING WTH PLUG	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28
442466	VALVE COIL L700 MOLEX-SANHUA	1	33

13.35 Outdoor Unit: OU10-47 ST 3PH



13.36 Outdoor Unit: OU10-47 ST 3PH

Item Code	Item Description	Quantity	Drawing Number
437045	UPPER COVER EL13 OU LARGE	1	1
439655	SIDE PANEL OU10	1	2
436357	SMALL ELECTRICAL COVER OU	1	3
439653	FRONT PANEL OU10	1	4
439662	GRILLE OU10	2	5
439841	NEW BASE ASSY OU LOCAL	1	6
433876	COIL OU10-44 ST GR R410A	1	7
439650	AXIAL FAN D400*112	2	8
439651	MOTOR 70W,3S,OU10-50	2	9
430838	SIDE NET PANEL EL13 OU10-44Z	1	10
436358	OU LEADING HANDLE	1	11
439657	MOTOR SUPPORT OU10	1	12
190442	HEATER CRANKCASE OU10 LG	1	13
438764	COMPRESSOR ARA053YAA	1	14
433929	CAPILLARY ASSY OU10-44 ST R410	1	15
433933	TUBING ASSY OU10-44 ST R410A	1	16
402494	BOARD TPHN 3C	1	17
442017	CAPACITOR 3mF 400V P1/P2	2	18
434716	THERMISTOR+CAP WTH CONNECTOR L	1	19
435545	COMPRESSOR WIRING WTH PLUG L12	1	21
402284	SUCTION ACCUMULATOR 5" x 3/4"	1	22
439661	CONES OU10	2	23
437229	ELECTRICAL BOX TPHN	1	24
439795	3PH MOTOR PROTECTOR	1	25
436352	RAISING HANDLE OU10	1	26
439656	SIDE COVER OU-8/10	1	28

14. OPTIONAL ACCESSORIES

14.1 RCW Wall Mounted Remote Control

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

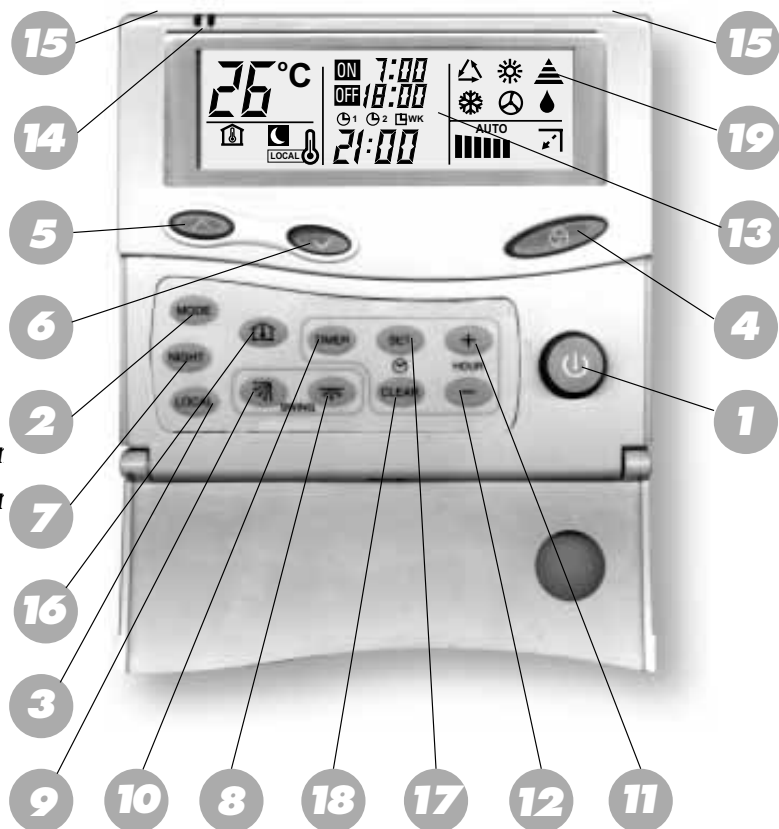
The max wiring length between the controller to the last indoor unit is 300m. for application on WNG LED indoor units an additional interface PCB is needed.

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



7

4

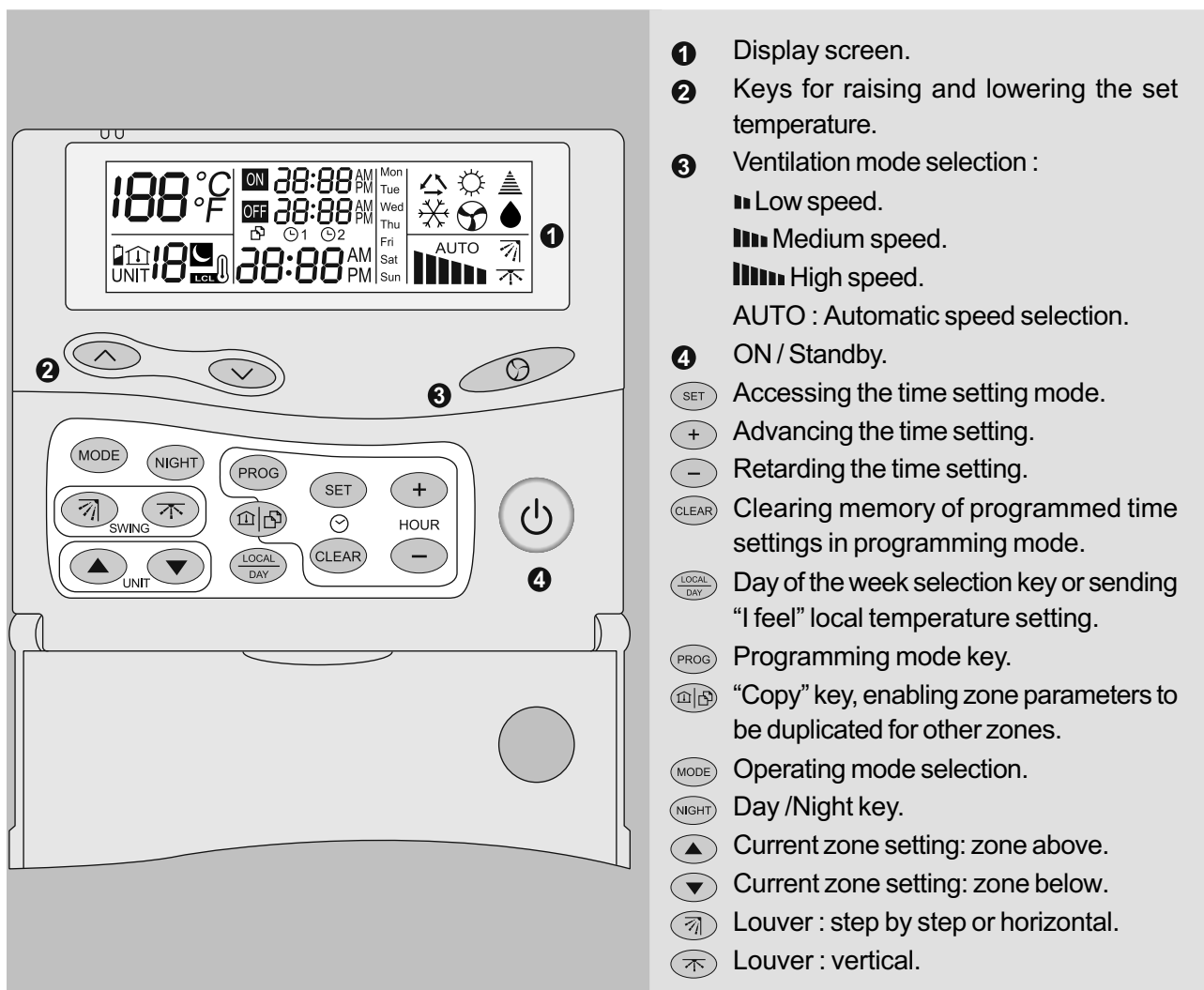
14.2 RCW2 Wall Mounted Remote Control

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

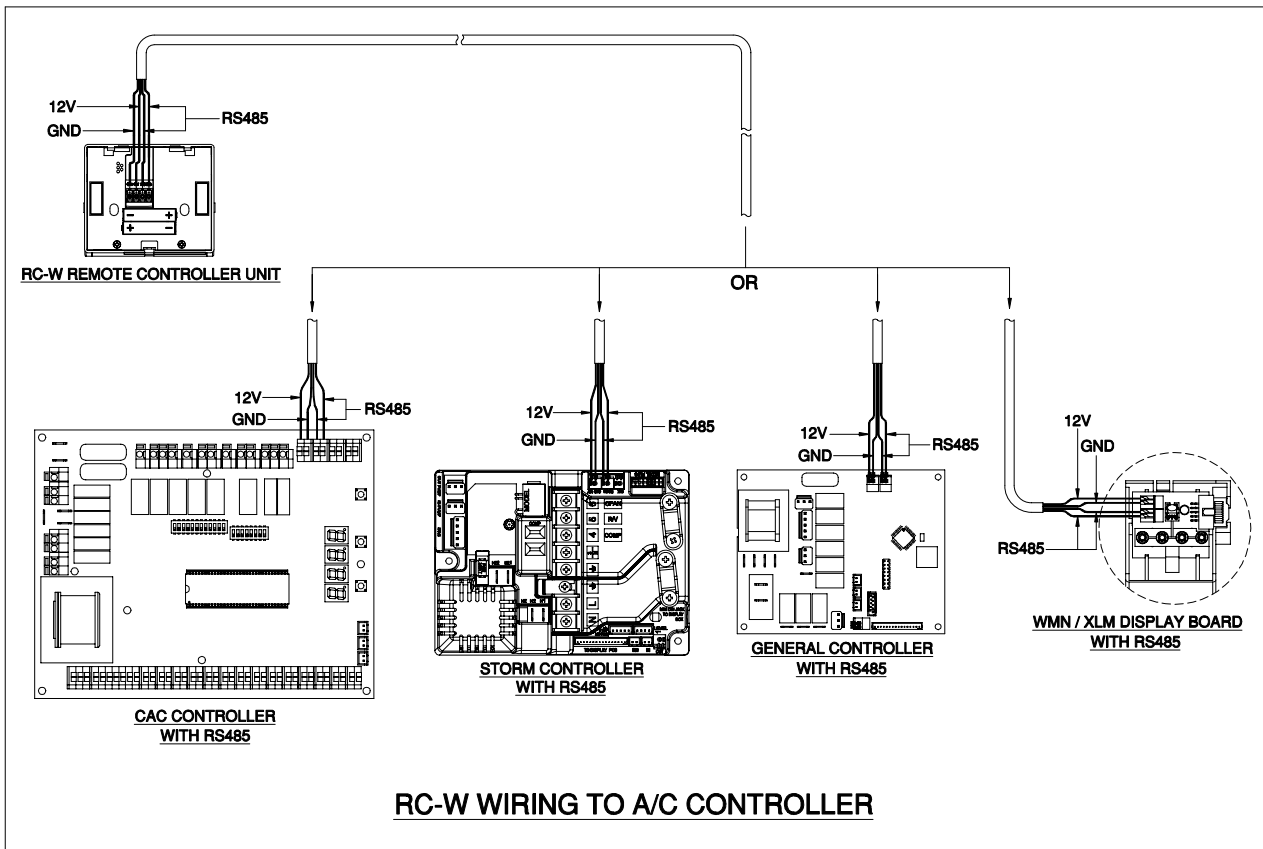
The RCW2 can be connected up to a max' of 32 units, allowing a max wiring length of 1000m. for application on WNG LED indoor units an additional interface PCB is needed.

Ordering code no':

RCW2 – SP000000081
 WNG add' PCB - SP000000290



14.3 RCW/RCW2 Wiring Connections as Shown on Kit



All Season Kit Installation Instruction(for ST units only)



Switch off power supply to the unit

Fig.1

- Remove:
 - Cover **A**;
 - Power panel handle **B**;
 - Side cover **C** (if it exist).

Fig.1

Fig.2

- Mount the Fan speed controller on the partition of the compressor compartment in the holes provided, using four supplied screws .

Note:

- In outdoor models OU8, the Fan Speed Controller should be mounted on the partition toward the outdoor fan motor side.

Fig.2

Fig.3

- Unscrew the cap of the provided service valve **D** and connect to the **T-valve**, supplied in the kit. Use Copper sealing gasket between the flare nut and it's connection to service valve **D**.

Note:

- The “**T-valve**” supplied in the kit is installed between valve **D** and capillary **E** offering the possibility of an additional pressure connecting output for service.

Fig.3

Fig.4

- Connect capillary **E** to **T-valve**.
Use Copper sealing gasket between the flare nut and the connection to **T-valve**.

Note:

- Installing the Copper sealing gasket is mandatory in order to avoid refrigerant leak.

Fig.4

Fig.5

Electrical connections for 1PH units:

- Disconnect the wire from point “6” on main terminal outdoor PCB Typhoon and isolate it with isolation tape.
- Disconnect the JP1 and JP2 wires from tabs TB2; TB4; TB5 on PCB Typhoon.
Connect the Red Wire from Fan Speed Controller to tab “TB4” on PCB Typhoon.
- Connect Green Wire from Fan Speed Controller to tab “TB2” on PCB Typhoon.
- Connect Y/Green wire from Fan Speed Controller to ground screw on units partition.
- Return “JP1” wire, previously disconnected, to tab “TB2”.

Fig.5

Fig.6

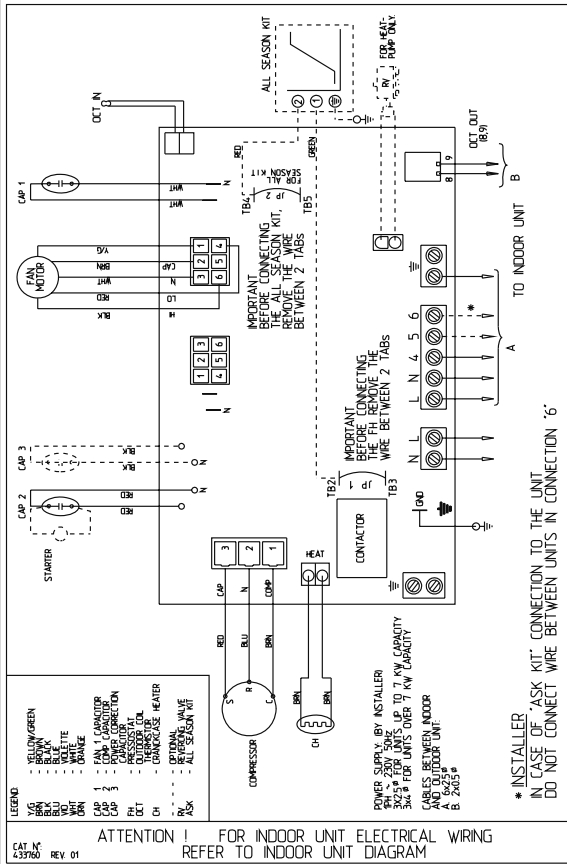
Electrical connections for 3PH units:

- Disconnect the wire from point “6” on main terminal PCB Typhoon and isolate it with isolation tape.
- Disconnect the JP1 and JP2 wires from tabs TB1; TB8; TB9 on PCB Typhoon.
- Connect Red Wire from Fan Speed Controller to tab “TB8” on PCB Typhoon.
- Connect Green Wire from Fan Speed Controller to Tab “TB1” on PCB Typhoon.
- Connect Y/Green wire from Fan Speed Controller to ground screw on units partition.
- Return “JP1” wire, previously disconnected, to

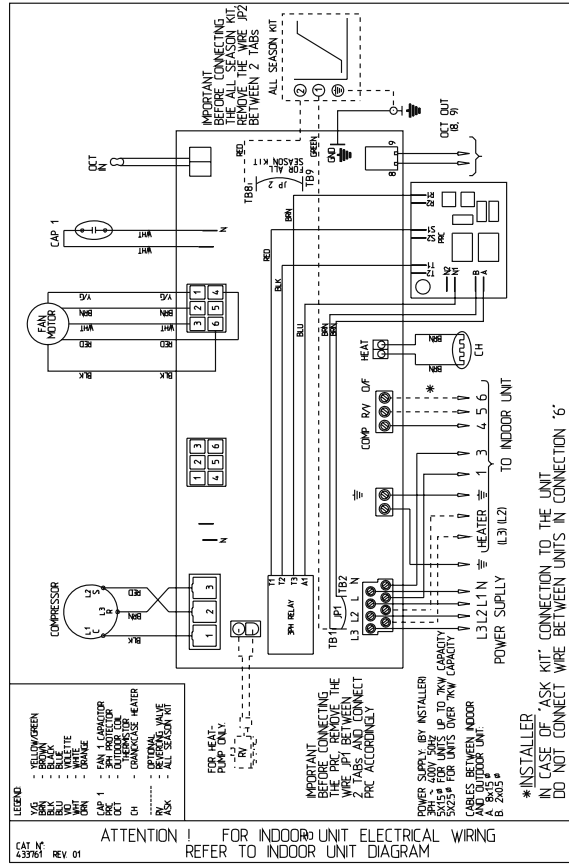
Fig.6

Fig.7

- Verify the wiring to electrical diagram.



1PH Unit



3PH Unit

Fig.8

- Arrange the wires and capillary tube together with plastic ties, don't fold or break the capillary tube, keep a large loop for extra length of capillary tube.
- Check for refrigerant leaks.

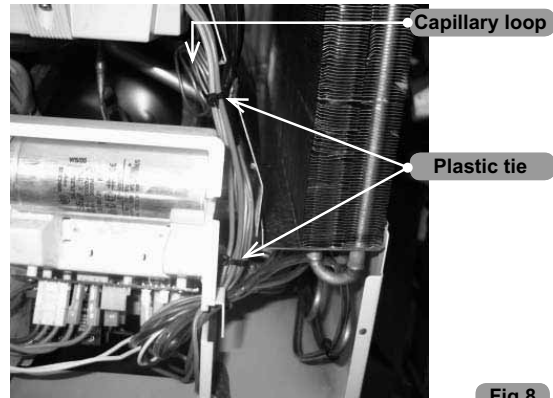


Fig.8

- Re-assemble the previously removed elements.

APPENDIX A

INSTALLATION AND OPERATION MANUAL

- ▶ OPERATION MANUAL KN 24, 30, 36, 45
- ▶ INSTALLATION MANUAL KN 24, 30, 36, 45

CONTENTS

ENGLISH

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INSTALLATION

CAUTION

Don't attempt to install this unit yourself. The unit requires installation by qualified persons.

POWER

- Be sure to use the special switch with effective grounding. The connector socket in the air conditioner has been grounding already, please don't change it freely.
- If necessary, use power fuse or circuit breaker of appropriate amperes with wiring of enough capacity.
- Don't pull the power wiring hard.
- If you want to change the power wiring, please contact your dealer.

LOCATION

- Both the indoor and outdoor units must be fixed firmly.
- It is important that the airflow for the outdoor unit is not impeded as this will result in reducing heating or cooling performance. Also, please select the position where it will not be subject to snow drifts, accumulation of leaves or other seasonal debris as well as direct sunlight.
- Please keep the indoor unit more than one meter away from TV set, radio set or stereo set in order to avoid interference to picture and sound.
- Don't install the unit in the place with extreme moisture.
- To prevent distortion of the indoor unit, please do not leave under it anything requiring dry circumstances or any heaters.
- Powerful radio transmitters or any other devices radiating high frequency radio waves can cause malfunction of the air conditioner. Please consult the dealer where you purchased before installing your air conditioner.
- Don't install the unit in the dangerous place with combustible gas and volatile material.
- Operation in an atmosphere containing oils (machine oil), salt (near a coastal area) or sulfide gas (near a hot spring) may lead to the failure of the air conditioner.
- To guarantee normal performance of it, please avoid direct sunlight on the outdoor unit.
- In cooling operation, the air conditioner will dry the room air, so please fix a pipe to drain all the water away from the air conditioner.
- In heating mode (cooling only type without) and at sub-zero temperatures, the melt ice- water will flow out from the under pan of the outdoor unit. So please provide adequate drainage.

INSTALLATION

BE CAREFUL OF NOISE OR VIBRATION

- Please install the unit in stable place to avoid noise or vibration.
- Location the outdoor unit where noise emitted by it or hot air from its air outlet will flow out from the under pan of the outdoor unit. So please provide adequate drainage.
- If the air conditioner sounds abnormal during operation, stop the unit immediately and contact the correlative servicer.

REQUIREMENT FOR ELECTRIC SAFETY

1. The wiring work must be done by qualified person.
2. All the wiring must be performed according to safety rules.
3. The main switch must be linked well with the earth.
4. A separate power source for the air conditioner according to the specifications as follow must be provided.

NOTICE

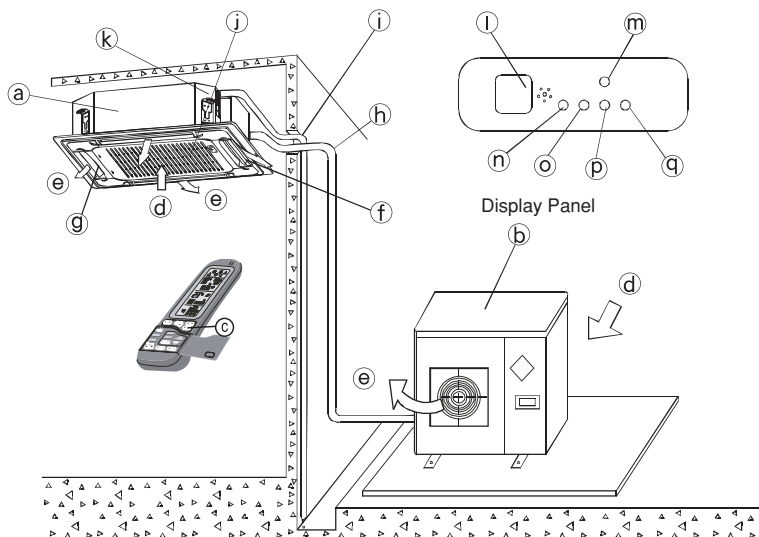
- In no circumstance should the ground wire or the main power switch be cut off.
- Don' t use ruined wiring, if you have found any, please replace it immediately.
- Please pre-heat the air conditioner for at least 12 hours before operation. If use it for a long time, please keep the power on.

CAUTION

- The appliance is not intended for use by young children or infirm persons without supervision.
- Young children should be supervised to ensure that they do not play with appliance.
- The indoor unit should be installed more than 2.3m upward from the floor.

PARTS NAMES AND THEIR FUNCTIONS

The air conditioner consists of the indoor unit , the outdoor unit , the connecting pipe and the remote controller.



NOTICE

This chart is based on KN-27SH, so, a few differences may exist on the outlook and functions by yours.

NAMES AND FUNCTIONS

- | | |
|--|--------------------------------------|
| a) Indoor unit | b) Outdoor unit |
| c) Remote controller | d) Air-in |
| e) Air-out | f) Air outlet |
| g) Air flow louver (at air outlet) | h) Connecting pipe |
| i) Drain hose | j) Air inlet (with air filter in it) |
| k) Drain pump (drain water from indoor unit) | l) Infrared signal receiver |
| m) Temporary button | n) Power supply indicator |
| o) Operation indicator | |
| p) Timer indicator | |
| q) Heat indicator | |

OPERATION ATTENTION

NOTICE

- Please read this "Owner's Manual" carefully operation.
- This air conditioner is designed to provide comfortable circumstances and to guarantee the functions described in this manual only.

1. CHECK BEFORE OPERATION

- Check that the ground wiring is not broken off and is connected well.
- Check that the air filter is installed well.
- Clean the air filter at first after a long time rest. If you plan to use it continuously, please clean it once the other week. (Refer to the chapter "Maintenance")
- Be sure that air inlet and air outlet of the indoor and outdoor units are not blocked.

2. SAFETY INFORMATION

- To avoid the risk of serious electrical shock. Never sprinkle or spill water or liquid on the indoor unit and the remote controller.
- To avoid the risk of fire, please keep inflammables such as hair-glue, spray lacquer and gasoline away from the air conditioner.
- Don't touch the grill while the airflow louver is running. Or your finger or machine parts may be hurt.
- Don't replace the blown fuse with insulated one or other wiring. It may do harm to the unit or cause fires.
- Don't put hands or objects into the air outlet and inlet. These units contain a fan running at a high speed. Contacting with the moving fan will cause serious injury.
- Don't remove the fan hood from the outdoor unit, without which it is very dangerous.
- Please use the ON/OFF button on the remote controller to start or stop the air conditioner, instead of the main power switch.
- Don't let children play with the air conditioner.
- Don't attempt to service the unit yourself, please consult qualified person.
- Because linked to the ground, this unit has a double-security function, which ensures safety for normal replacement and cleaning. To guarantee your absolute safety, however, please turn off the power before any routine maintenance.

3. AIR CONDITIONER OPERATING CONDITIONS

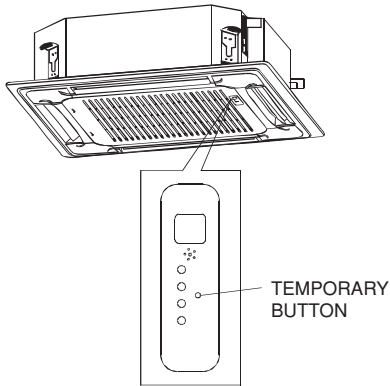
(According to T1 temperature condition)

COOLING	Outdoor Temperature: 21°C to 43°C
	CAUTION ! Room temperature humidity must be less than 80%. If the air conditioner operates in excess of this figure, the surface of the air conditioner may attract condensation. At this time, HIGH wind speed is advised.
HEATING	Outdoor Temperature: -5°C to 21°C R22
	Outdoor Temperature: -9°C to 21°C R407C/R410A

NOTICE

If the air conditioner is used outside of the above conditions, malfunctions may be caused.

TEMPORARY OPERATIONS



This function is used to operate the unit temporarily in case you misplace the remote controller or its batteries are exhausted. Two modes including mandatory HEAT and mandatory COOL can be selected through the TEMPORARY BUTTON on the air inlet grill control box of the indoor unit. Once you push this button, the air conditioner will run in such order mandatory HEAT mandatory COOL, OFF and back to mandatory HEAT.

1. Mandatory HEAT

The HEAT lamp (q) is lit, and the air conditioner will run under HEAT mode.

2. Mandatory COOL

The air conditioner will run under COOL mode.


3. OFF

The OPERATION lamp (o) goes off, and the air conditioner will be STAND-BY.


ADJUSTING AIR FLOW DIRECTION

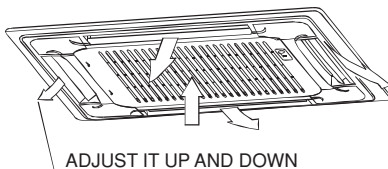
While the unit is in operation, you can adjust the air flow louver to change the flow direction and naturalize the room temperature evenly. Thus you can enjoy it more comfortably.

1. Set the desired air flow direction.

Push the  button to adjust the louver to the desired position and push this button again to maintain the louver at this position.

2. Adjust the air flow direction automatically.

Push the  button, the louver will swing automatically.



While this function is set, the swing motor of indoor unit runs, otherwise, the swing motor doesn't run. The swing scale of every side is 30°.

HINTS FOR ECONOMICAL OPERATION

The following should be noticed ensure an economical operation. (Refer to corresponding chapter for details)

- Adjust the air flow direction properly to avoid winding toward your body.
- Adjust the room temperature properly to get a comfortable situation and to avoid supercooling and superheat.
- In cooling, close the curtains to avoid direct sunlight.
- To keep cool or warm air in the room, never open doors or windows more often than necessary.
- Set the timer for the desired operating time.
- Never put obstructions near the air outlet or the air inlet. Or it will cause lower efficiency, even a sudden stop.
- If you don't plan to use the unit for a long time, please disconnect power and remove the batteries from the remote controller. When the power switch is connected, some energy will be consumed, even if the air conditioner isn't in operation. So please disconnect the power to save energy. And please switch the power on 12 hours before you restart the unit to ensure a smooth operation.
- A clogged air filter will reduce cooling or heating efficiency, please clean it once two weeks.

MAINTENANCE

CAUTION

- Maintenance work can only be performed by specialized maintenance personnel.
- The main power switch must be turned off before doing electrical connections or cleaning of air filter.
- Do not use water or air of temperature above 50°C to clean air filter or face panel.

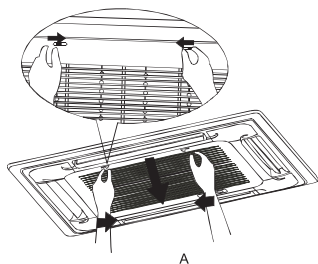
METHOD FOR CLEANING AIR FILTER

- The air filter can prevent the dust or other particulate from going inside. In case of blockage of the filter, the working efficiency of the air conditioner may greatly decrease. Therefore, the filter must be cleaned once two weeks during long time usage.
- If the air conditioner is positioned in a dust place, the cleaning frequency of the air filter must be increased.
- If the accumulated dust is too heavy to be cleaned, please replace the filter with a new one (replaceable air filter is an optional fitting).

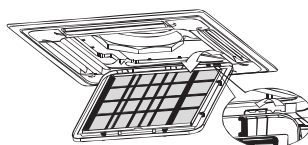
1. Open the air-in grill

Push the grill switches towards the middle simultaneously as indicated in sketch A. Then pull down the air-in grill.

Cautions: The control box cables, which are originally connected with the main body electrical terminators, must be pulled off before doing as indicated above.



A



B

2. Take out the air-in grill (together with the air filter shown in sketch B)
Pull the air-in grill down at 45° and lift it up to take out the grill.
3. Dismantle the air filter.
4. Clean the air filter (Vacuum cleaner or pure water may be used to clean the air filter. If the dust accumulation is too heavy, please use soft brush and mild detergent to clean it and dry out in cool place).

MAINTENANCE

- The air-in side should face up when using vacuum cleaner.
 - The air-in side should face down when using water.
- Cautions:** Do not dry out the air filter under direct sunshine or with fire.
5. Re-install the air filter.
 6. Install and close the air-in grill in the reverse order of step 1 and 2 and connect the control box cables to the corresponding terminators of the main body.

CLEANING THE AIR OUTLET AND THE PANEL

- Use a dry cloth to wipe it.
- Pure water or mild detergent may be used if it is very dirty.


CAUTIONS

- Do not use benzene, thinner, polishing power, or similar solvents for cleaning. These may cause the surface to crack or deform.
- To avoid the risk of electrical shock or fire, do not let water fall into the indoor unit.
- Never wipe the air flow louver violently.
- An air conditioner without air filter cannot expel the dust out of the room, which would cause malfunctions by accumulation.

THE MAINTENANCE OF THE OUTDOOR UNIT

1. Injures may happen by improper operations because of the sharp blade of some plates and the freezer.
2. Check the air outlet and the air inlet of the outdoor unit regularly to ensure that they are not choked by filth or soot.
3. The coil pipe and other parts of the outdoor unit should also be checked regularly. Please contact with your local dealer.

IF YOU DO NOT PLAN TO USE THE UNIT FOR A LONG TIME

- Operate the fan for about half a day to dry the inside of the unit. (Refer to the COOLING /HEATING (cooling only type without)/FAN ONLY chapter)
- Turn off the unit with the  button on the remote controller. Then disconnect the power.

MAINTENANCE

- When the power switch is connected, some energy will be consumed, even if the unit is not in operation. So please disconnect the power to save energy.
- Remove the batteries from the remote controller.
- A degree of filth will be accumulated due to certain performance after several seasons of operation. So special maintenance is advised.

RESTART AFTER A LONG TIME

1. Check before operation

- Check that air outlets of the outdoor and indoor are not blocked.
- Check that the ground wiring is not broken off and is connected well.

2. Restore the air filter and the front panel


The air filter and the front panel must be fixed to the original position after having been cleaned.

3. Connect the main power switch

To protect the air conditioner, power should be provided 12 hours before operation. Then the OPERATION lamp on the control box of the indoor unit will flash once a second .

PHENOMENA NOT CONCERNING MALFUNCTIONS

1. No operation

- The air conditioner does not work immediately after  button is pushed.
For each Mode including Power OFF and SB, a Min time delay of 3 min before Comp. restarting, excluding Deicing Mode.

2. A white mist of chilled air is generated from the indoor unit.

- Cooling in a room with a high relative humidity (in a place with much oil mist or dusts),
- The room temperature will be uneven if there is much filth inside the indoor unit. In this case, cleaning is necessary. This work requires qualified person.
- If the air conditioner heats right after defrosting, the water will be sent out in the form of steam.

3. Noise

A kind of continuous low sound of hiss could be heard while the air conditioner is on operation. This is caused by Freon flowing between the indoor and outdoor units causes this.

- A kind of hiss could be heard during the time of defrosting or right after stop. This is caused by Freon changing its flow volume or not flowing any more.
- A kind of continuous low sound of rustle could be heard while the air conditioner is on COOLING(including AUTO)or DRYING. This is caused by the drain pump which is running .
- A kind of squeak will be heard while the air conditioner is on or off operation. This is caused by the inflation or deflation of the plastics of the unit due to the temperature fluctuation.

4. Dusts are blown out of the indoor unit

This occurs only in the case of the first use after a longtime rest.

5. Bad odor is coming out from the indoor unit

This is because the indoor unit gives off the smell impregnated from the wall, furniture, or smoking.

6. Turning to FAN ONLY while COOLING

- To prevent the heat exchanger from frosting, turn to FAN ONLY mode automatically and the COOLING mode will be restored before long.
- When the room temperature reaches the set one, the compressor will stop to turn to FAN ONLY. In the HEATING mode, the process is reversed.

TROUBLES AND CAUSES (concerning the unit)

1. If any or the following conditions occurs, stop the air conditioner immediately, set off the power:

- The indicator lamps flash rapidly (two times per second), you disconnect the unit with the power and then connect it again, but the lamp still flashes.
- Remote controller or switch operations are erratic.
- The fuse is blown frequently or the circuit breaker is tripped frequently.
- Foreign matter or water has fallen inside the unit.
- Water leaks from the indoor unit.
- Any other unusual condition is observed.

2. As for the failures besides what are mentioned above, please check the following points.

- 1) Inoperative
 - The power supply is broken. Wait for a while.
 - The power switch is set off. Set it on.
 - The power fuse is blown or the circuit breaker has been tripped. Replace it.
 - The batteries in the remote controller are exhausted. Replace them.
 - The timer is set, and it is not the set time yet.
- 2) Does not cool completely, though air flows out.
 - The temperature is set improperly. Either set the temperature above the room temperature while cooling or below the room temperature while heating, for which the compressor can't work.
 - Three-minute protection feature is working.
- 3) Does not cool or heat well
 - The air outlet or inlet of the unit is blocked. Dredge it.
 - The air filter is clogged. Clean it.
 - The fan speed is set to LOW.
 - The louver is not at the correct position.
 - Doors or windows are open. Close them to prevent external wind.
 - Direct sunlight (in cooling). Please close the curtains or shades.
 - Too many people in the room (in cooling). The cooling effect will be offset by the huge volume of heat generated.
 - The outdoor temperature is too high. It is normal that the cooling effect will be reduced by the extremely high outdoor temperature.

TROUBLES AND CAUSES (concerning the remote controller)

Before you ask for servicing or repairing, check the following points.

Setting change is impossible		
Symptoms	Causes	Reason and Disposal
The fan speed can not be changed.	• Check whether the MODE indicated on the display is AUTO.	When the automatic mode is selected, the air conditioner automatically selects the fan speed.
	• Check whether the MODE indicated on the display is DRY .	When dry operation is selected, the air conditioner automatically selects the fan speed. The fan speed can be selected among Cooling, Fan only and Heating.

The Transmission indicator ▲ Never Comes On		
Symptoms	Causes	Reason and Disposal
The remote control signal is not transmitted when the I/O button is pushed.	<ul style="list-style-type: none"> • Check whether the batteries in the remote controller are exhausted. 	The remote control signal is not transmitted, because the power supply is off.

The TEMP. indicator Never Comes On		
Symptoms	Causes	Reason
The TEMP. indicator does not come on .	<ul style="list-style-type: none"> • Check whether the MODE indicated on the display is FAN ONLY. 	The temperature cannot be set during Fan Only operation.

Display Goes Off		
Symptoms	Causes	Reason
The indicator on the display disappears after a lapse of time.	<ul style="list-style-type: none"> • Check whether the timer operation has come to an end when the TIMER OFF is indicated on the display. 	The air conditioner operation stops since the set time has elapsed.
The TIMER ON indicators go off after a lapse of certain time.	<ul style="list-style-type: none"> • Check whether the timer operation is started when the TIMER ON is indicated on the display. 	When the time set to start the air conditioner is reached, the air conditioner will automatically start and the corresponding indicator will go off.

The signal Receiving Tone Does Not Sound		
Symptoms	Cause	Reason
No receiving tone sounds from the indoor unit when the I/O button is pushed.	<ul style="list-style-type: none"> • Check whether the signal transmitter of the remote controller is properly directed to the receiver of the indoor unit when the I/O button is pushed. 	Direct the signal transmitter of the remote controller to the receiver of the indoor unit, and then push the I/O button twice.
The remote controller button do not work.	<ul style="list-style-type: none"> • Check the display screen of the remote controller. 	The buttons are locked.

REPARATION

If your air conditioner can not operate normally, please turn off the power immediately.

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PRECAUTION

SAFETY CONSIDERATIONS

Installation and servicing of air conditioning equipment can be hazardous due to system pressure and electric components. Only trained and qualified service personnel should install, repair or service air conditioning equipment.

All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe precautions in the literature, tags and labels attached to the unit and other safety precautions that may apply. Follow all safety codes. Wear glasses and work gloves. Use quenching cloth for brazing and unbrazing operations. These are fire extinguishers available for all brazing operations.

WARNING

This manual describes the installation of specified indoor units. Do not install them connected with any other indoor and outdoor unit. Mismatching of units and incompatibility between control devices in the two units could lead to damage of both units.

WARNING

Before performing service or maintenance operations on system, turn off main power switch of the unit. Electrical shock could cause personal injury.

This unit shall be installed in accordance with national wiring regulations.

WARNING

If the supply cord is damaged, it must be replaced by the manufacture or its service agent or similarly qualified person in order to avoid a hazard.

The means for disconnection from the supply having a contact separation of at least 3 mm in all poles.

CAUTION

1. Wire the outdoor unit, then wire the indoor unit. You are not allowed to connect the air conditioner with the power source unit wiring and piping the air conditioner is done.
2. For installation of the indoor unit, outdoor unit, and connection piping in between, follow the instructions given in this manual as strictly as possible.
3. Installation in the following places may cause trouble. If it is unavoidable, please consult with the dealer.
 - (1) A place full of machine oil.
 - (2) A saline place such as coast.
 - (3) Hot-spring resort.
 - (4) A place full of sulfide gas.
 - (5) A place where there are high frequency machines such as wireless installation, welding machine, medical facilities.
 - (6) A place of special environmental conditions.

NOTE

Remark per EMC Directive 89/336/EEC

To prevent flicker impressions during the start of the compressor (technical process), following installation conditions do apply.

1. The power connection for the air conditioner has to be done at the main power distribution. The distribution has to be of a low impedance, normally the required impedance reaches at a 32 A fusing point.
2. No other equipment has to be connected with this power line.
3. For detailed installation acceptance please refer to your contract with the power supplier, if restrictions to apply for products like washing machines, air conditioners or electrical oven.
4. For power details of the air conditioner refer to the rating plate of the product.
5. For any question contact your local dealer.

INSTALLATION INFORMATION

- & To install properly, please read this "installation manual" at first.
- & The air conditioner must be installed by qualified persons.
- & When installing the indoor unit or its tubing, please follow this manual as strictly as possible.
- & When all the installation work is finished, please turn on the power only after a thorough check.

CAUTIONS FOR THE REMOTE CONTROLLER OPERATION





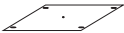










- & Please do not throw the remote controller or beat it.
- & Please use the remote controller within the allowed distance, and keep the transmitter toward the receiver of the indoor unit.
- & Please keep the remote controller more than 1 m away from TV or stereo set.
- & Never put the remote controller at the place with humid or direct sunlight, or near heaters.

INSTALLATION ORDER

1. Select the location
2. Install the indoor unit
3. Install the outdoor unit
4. Install the connecting pipe
5. Connect the drain pipe
6. Wiring
7. Test operation

ATTACHED FITTINGS

Please check whether the following fittings are of full scope. If there are some attached fittings free from use, please restore them carefully.

Installation fittings	Drainpipe Fittings
1. Expansive hook 4 	5. Out-let pipe sheath 1 
2. Installation hook 4 	6. Out-let pipe clasp 1 
3. Installation paper board 1 	7. Tightening band 20 
4. Bolt M6X12 4 	8. Drain elbow 1 
	9. Seal ring 1 
Protect Pipe Fittings	Remote controller & Its Frame
10. Wall conduit 1 	12. Remote controller 1 
11. Wall conduit cover 1 	13. Frame 1
	14. Mounting screw (ST2.9 X 10-C-H) 2 
	15. Alkaline by batteries (AM4) 2 
Others	
16. Owner's manual 1 17. Installation manual 1 18. Rcw operating manual 1 19. Rcw installation manual 1 20. One-way valve throttle 1 set (only KN30/36/45)	
	

INSTALLATION PLACE

CAUTION

Location in the following places may cause malfunction of the machine. (If unavoidable, please consult your local dealer)

- a. There is petrolatum existing.
- b. There is salty air surrounding (near the coast)
- c. There is caustic gas (the sulfide, for example) existing in the air (near a hot spring).
- d. The Volt vibrates violently (in the factories).
- e. In buses or cabinets.
- f. In kitchen where it is full of oil gas.
- g. There is strong electromagnetic wave existing.
- h. There are inflammable materials or gas.
- i. There is acid or alkaline liquid evaporating.
- j. Other special conditions.

NOTICES BEFORE INSTALLATION

1. Select the correct carry-in path.
2. Move this unit as originally packaged as possible .
3. If the air conditioner is installed on a metal part of the building ,it must be electrically insulated according to the relevant standards to electrical appliances.

1. The indoor unit

- There is enough room for installation and maintenance.
- The ceiling is horizontal, and its structure can endure the weight of the indoor unit.
- The air outlet and the air inlet are not impeded, and the influence of external air is the least.
- The air flow can reach throughout the room.
- The connecting pipe and drainpipe could be extracted out easily.
- There is no direct radiation from heaters.

2. The outdoor unit

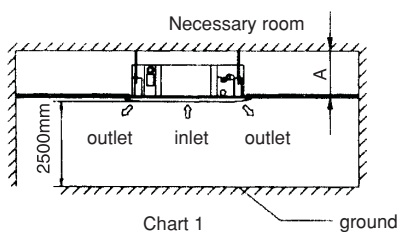
- There is enough room for installation and maintenance.
- The air outlet and the air inlet are not impeded, and can not be reached by strong wind.
- It must be a dry and well ventilating place.
- The support is flat and horizontal and can stand the weight id the outdoor unit. And will no additional noise or vibration.
- Your neighborhood will not feel uncomfortable with the noise or expelled air.
- There is no leakage of combustible air.
- It is easy to install the connecting pipe or cables.
- Determine the air outlet direction where the discharged air is not blocked.
- A place free of a leakage of combustible gases.
- In the case that the installation place is exposed to a strong wind such as seaside or high position, secure the normal fan operation by putting the unit lengthwise along the wall or using a duct or shield plates.
- If possible, do not install the unit where it is exposed to direct sunlight.
If necessary, install a blind that does not interfere with the air flow.
- During the heating mode, the water drained off the outdoor unit. the condensate should be well drained away by the drain hole to an appropriate place, so as not to interfere other people or public.
- Select the position where it will not be subject to snow drifts, accumulation of leaves or other seasonal debris. It is important that air flow for the outdoor unit is not impeded as this will result in reduction ion heating or cooling performance.

INDOOR UNIT INSTALLATION

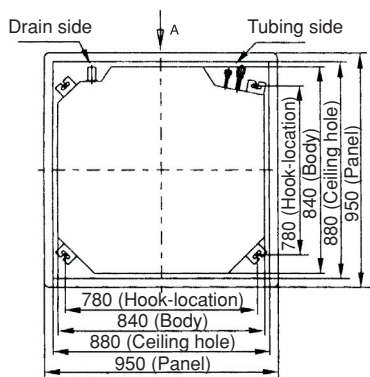
1. Install the main body

A. The existing ceiling (to be horizontal)

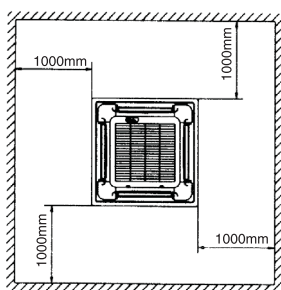
- a. Please cut a quadrangular hole of 880X880mm in the ceiling according to the shape of the installation paper board. (Refer to Chart 3, 4)
 - The center to the hole should be at the same position of that of the air conditioner body.
 - Determine the lengths and outlets of the connecting pipe, drainpipe and cables.
 - To balance the ceiling and to avoid vibration, please enforce the ceiling when necessary.
- b. Please select the position of installation hooks according to the hook holes in the installation board.
 - Drill four holes of M12mm, 45-50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).
 - Face the concave side of the installation hooks towards the expansible hooks. Determine the length of the installation hooks from the height of ceiling, then cut off the unnecessary part.



Note: 24/27/30 Series A 260mm
36/45 Series A 330mm



(Unit: mm)



The length could be calculated from Chart 5:

Length= H-181+L (in general, L=100mm and is half of the whole length of the installation hook)

- c. Please adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body.
 - If the drainpipe is away, leakage will be caused by the malfunction of the water-level switch.
 - Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10-12mm (Refer to Chart 5).
 - Location the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

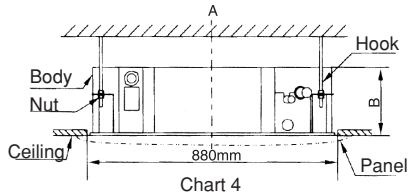


Chart 4

Note: 24/27/30 Series B 240mm
36/45 Series B 310mm

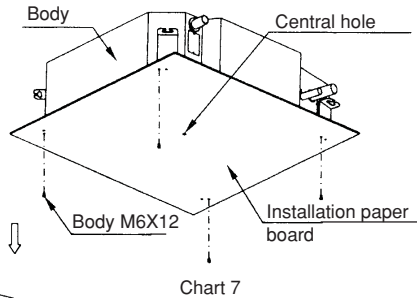


Chart 7

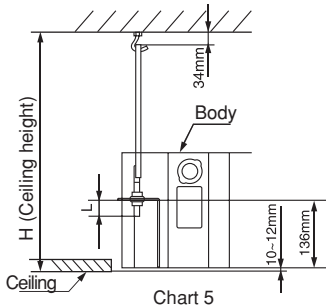


Chart 5

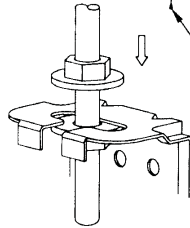


Chart 6

B. New built houses and ceilings

- a. In the case of new built house, the hook can be embedded in advance (refer to the A. B mentioned above).

But it should be strong enough to bear the indoor unit and will not become loose because of concrete shrinking.

- b. After installing the body, please fasten the installation paper board onto the air conditioner with bolts (M6X12) to determine in advance the sizes and positions of the hole opening on ceiling.

Please first guarantee the flatness and horizontal of ceiling when installing it.

Refer to the A. a mentioned above for others.

- c. Refer to the A. c mentioned above for installation.
d. Remove the installation paper board.

CAUTIONS

After completion of installing the body, the four bolts (M6X12) must be fastened to the air conditioner to ensure the body is grounded well.

2. Install the panel

CAUTIONS

- Never put the panel face down on floor or against the wall, or on bulgy objects.
- Never crash or strike it.

(1) Remove the inlet grid

- a. Slide two grid switches toward the middle at the same time, and then pull them up. (Refer to chart 8)
b. Draw the grid up to an angle of about 45°, and remove it. (Refer to chart 9)

(2) Remove the installation covers at the four corners.

Wrench off the bolts, loose the rope of the installation covers, and remove them. (Refer to chart 10)



Chart 8



Chart 9

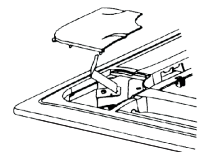


Chart 10

(3)Install the panel

- a. Align the swing motor on the panel to the tubing joints of the body properly. (Refer to chart 11)
- b. Fix hooks of the panel at swing motor and its opposite sides to the hooks of corresponding water receiver. (Refer to chart 11①) Then hang the other two panel hooks onto corresponding hangers of the body. (Refer to chart 11②)

CAUTION Do not coil the wiring of the swing motor into the seal sponge.

- c. Adjust the four panel hook screws to keep the panel horizontal, and screw them up to the ceiling evenly. (Refer to chart 11③)
- d. Regulate the panel in the direction of the arrow in Chart 11④ slightly to fit the panel's center to the center of the ceiling's opening. Guarantee that hooks of four corners are fixed well.
- e. Keep fastening the screws under the panel hooks, until the thickness of the sponge between the body and the panel's outlet has been reduced to about 4~6mm. The edge of the panel should contact with the ceiling well. (Refer to chart 12)

- Malfunction described in Chart 13 can be caused by inappropriate tightness the screw.
- If the gap between the panel and ceiling still exists after fastening the screws, the height of the indoor unit should be modified again. (Refer to chart 14-left)
- You can modify the height of the indoor unit through the openings on the panel's four corners, if the lift of the indoor unit and the drainpipe is not influenced. (Refer to chart 14-right)

(4)Hang the air-in grid to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

(5)Relocate the air-in grid in the procedure of reversed order.

(6)Relocate the installation cover.

- a. Fasten the rope of installation cover on the bolt of the installation cover. (Refer to chart 15-left)
- b. Press the installation cover into the panel slightly. (Refer to chart 15-right)

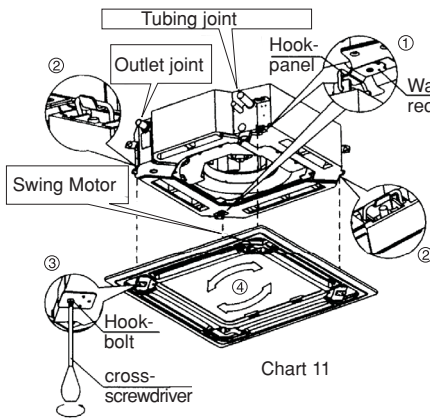


Chart 11

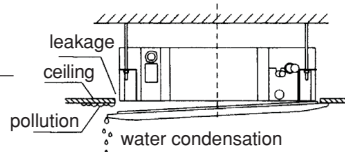


Chart 13

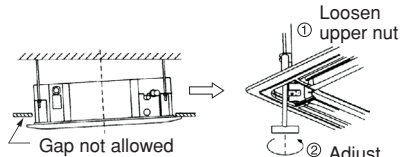


Chart 14

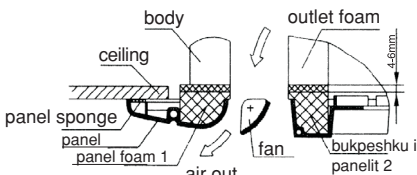


Chart 12

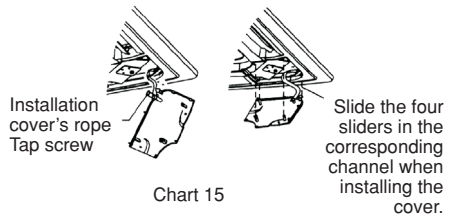


Chart 15

OUTDOOR UNIT INSTALLATION

CAUTIONS

- Keep this unit away from direct radiation of the sun or other heaters.
If unavoidable, please cover it with a shelter.
- In places near coast or with a high altitude where the wind is violent, please install the outdoor unit against the wall to ensure normal performance.
Use a baffle when necessary.
- In the case of extremely strong wind, please prevent the air from flowing backwards into the outdoor unit. (Refer to chart 16)
- Locate the outdoor unit as close to the indoor unit as possible.

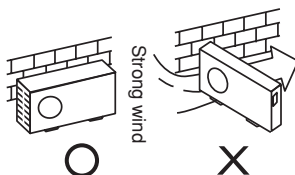


Chart 16

NECESSARY ROOM FOR installation and maintenance

(Refer to chart 17, chart 18)

If possible, please remove the obstacles nearby to prevent the performance from being impeded by too little of air circulation.

The minimum distance between the outdoor unit and obstacles described in the installation chart does not mean that the same is applicable to the situation of an airtight room. Leave open two of the three directions (A,B,C).

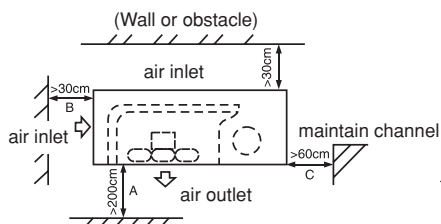


Chart 17

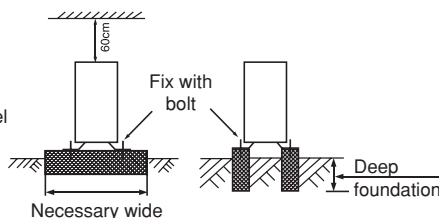


Chart 18

MOVING AND INSTALLING

- Since the gravity center of this unit is not at its physical center, so please be careful when lifting it with a sling.
- Never hold the air-in of the outdoor unit to prevent it from deforming.
- Do not touch the fan with hands or other objects.
- Do not lean it more than 45°, and do not lay it sidelong.
- Please fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind.

INSTALL THE CONNECTING PIPE

CAUTIONS

check whether the height drop between the indoor unit and outdoor unit , the length of refrigerant pipe, and the number of the bends meet the following requirements:

- The max height drop 20m.
(If the height drop is more than 10m, you had better put the outdoor unit over above the indoor unit.)
- The length of refrigerant pipe less than 30m.
- The number of bends less than 15

CAUTIONS

- Do not let air ,dust or other impurities fall in the pipe system during the time of installation .
- The connecting pipe should not be installed until the indoor and outdoor units have been fixed already.
- Keep the connecting pipe dry, and do not let moisture in during installation .

The Procedure of Connecting Pipes

1. Measure the necessary length of the connecting pipe, and make it by the following way. (Refer to “Connect The Pipes “ for details)

- 1) Connect the one-way valve restrictor in accessories to liquid tube assy, indoor unit at first (Note :only KN-30/36/45)
 - 2) Connect the indoor unit, then the outdoor unit.
- Bend the tubing in proper way. Do not harm to them.

CAUTION

- Daub the surface of the flare pipe and the joint nuts with frozen oil, and wrench it for 3/4 rounds with hands before fasten the flare nuts. (Refer to chart 19)
- Be sure to use two wrenches simultaneously when you connect or disconnect the pipes .

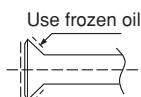


Chart 19

Bend the pipe with thumb



Min-radius 100m

Chart 20



Make the end straight

Chart 21

- 3) The stop valve of the outdoor unit should be closed absolutely (as original state).Every time you connect it ,first loosen the nuts at the part of stop value , then connect the flare pipe immediately (in 5 minutes).If the nuts have been loosened for a long time ,dusts and other impurities may enter the pipe system and may cause malfunction later .So please expel the air out of the pipe with refrigerant (R-22) before connection .
- 4) Expel the air (refer to the “Expel The Air “) after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the nuts at the repair-points.

Notices For Bendable Pipe

- The bending angle should not exceed 90°
- Bending position is preferably in the middle of the bendable pipe .The larger the bending radius the better it is.
- Do not bend the pipe more than three times.

Bend the connecting pipe of small wall thickness (K 9.53mm)

- Cut out a desired concave at the bending part of the insulating pipe.
- Then expose the pipe (cover it with tapes after bending).
- To prevent collapsing or deforming, please bend the pipe at its biggest radius.
- Use bender to get a small radius pipes .

Use the market brass pipe

- Be sure to use the same insulating materials when you buy the brass pipe.
- 2. Locate The Pipes**
 - Drill a hole in the wall (suitable just for the size of the wall conduit, 50,53,71 series diameter is M90mm, and 120 series diameter is M105mm in general), then set on the fittings such as the wall conduit and its cover.
 - Bend the connecting pipe and the cables together tightly with binding tapes .Do not let air in, which will cause water leakage by condensation.
 - Pass the bound connecting pipe through the wall conduit from outside .Be careful of the pipe allocation to do no damage to the pipe.
 - 3. Connect the pipes**
 - 4. Then ,open the stem of stop valves of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit in fluent flow .**
 - 5. Be sure of no leakage by checking it with leak detector or soap water .**
 - 6. Cover the joint of the connecting pipe to the indoor unit with the soundproof /insulating sheath (fittings),and bind it well the tapes to prevent leakage .**

Flaring

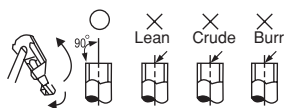


Chart 22

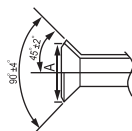


Chart 23

1. Cut a pipe with a pipe cutter.
2. Insert a flare nut into a pipe and flare the pipe.

Outside-diameter (mm)	A (mm)	
	Mak	Min
6.35	8.7	8.3
9.53	12.4	12.0
2.7	15.8	15.4
16	19.0	18.6
19	23.3	22.9

Flaring the nuts

- Put the connecting tubing at the proper position, wrench the nuts with hands, then fasten it with a wrench. (Refer to Chart 24)

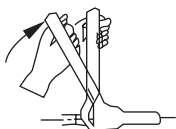


Chart 24

CAUTIONS

Too large torque will harm the bellmouthing and too small will cause leakage. Please determine the torque according to Table 2.

Tubing Size	Torque
M6.35	1420-1720 N cm (144 - 176 kgf cm)
M9.53	3270-3990 N cm (333 - 407 kgf cm)
M12.7	4950-6030 N cm (504 - 616 kgf cm)
M16	6180-7540 N cm (630-770 kgf cm)
M19	9720-11860 N cm (990-1210 kgf cm)

Table 2

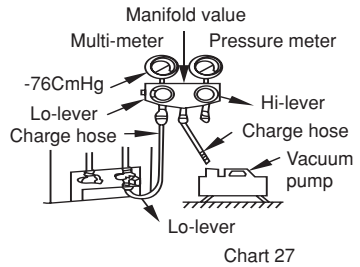
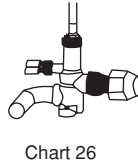
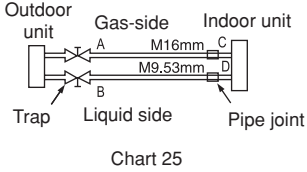
Expel the air with a vacuum pump

(Refer to Chart 27)

(please refer to its manual for the way of using manifold value)

1. Loosen and remove the maintenance nuts of stop values A and B, and connect the charge hose of the manifold value with the maintenance terminator of stop value A. (Be sure that stop values A and B are both closed)
2. Connect the joint of the charge hose with the vacuum pump .
3. Open the Lo-lever of the manifold value completely.
4. Turn on the vacuum pump. At the beginning of pumping, loosen the maintenance terminator nut of stop value B a little to check whether the air comes in (the sound of the pump changes, and the indicator of compound meter turns below zero). Then fasten the nut.
5. when the pumping has finished ,close the Lo-lever of the manifold value completely and turn off the vacuum pump.
 - When you have pumped for over 15 minutes ,please confirm that the indicator of multi-meter is on -10×10^{-5} Pa (-76mHg).
6. Loosen and remove the quadrangle cover of stop values A and B to open stop value A and B completely, then fasten them.

7. Disassemble the charge hose from the repair-mouth of stop value A, and fasten the unit.

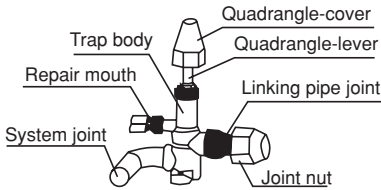


Operate the stop valves

- Open the value stem until it reaches the limiter. Do not open it any further.
- Fasten the stop valves with a wrench or such tools.
- The wrench torque is listed in the Table 2 mentioned above.

CAUTIONS

All the stop valves should be opened before test operation. Each air conditioner has two stop valves of different sizes on the side of the outdoor unit, which operate as Lo-stop value and Hi-stop value; respectively. The ON/OFF operation is described in the left chart. (Refer to Chart 28)



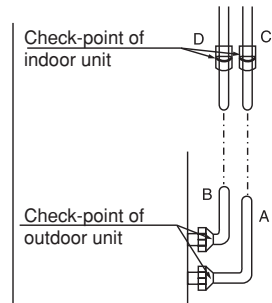
- 1) ON operation: Take off quadrangle cover, clip the quadrangle head with a wrench and turn it anticlockwise to the end. Then fasten the quadrangle cover.
- 2) OFF operation: The operation is the same as the ON operation, but you should turn it clockwise this time.

CHECK THE LEAKAGE

Check all the joints with the leak detector or soap water. (refer to Chart 29)

NOTE: in the chart

- A Lo-stop value
- B Hi-stop value
- C,D Joints of the connecting pipe to the indoor unit .



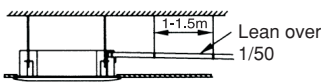
INSULATION

- Be sure to with insulating materials cover all the exposed parts of the flare pipe joints and refrigerant pipe on the liquid-side and the gas-side .Ensure that there is no gap between them.
- Incomplete insulation may cause water condensation.

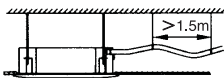
CONNECT THE DRAIN PIPE

1. Install the drainpipe of the indoor unit .

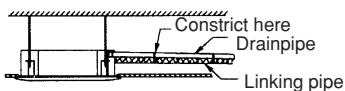
- You can use a polyethylene tube as the drainpipe (out-dia, 37-39mm, in-dia. 32mm).It could be bought at local market or from your dealer .
- Set the mouth of the drainpipe onto the root of the body's pump-pipe, and clip the drainpipe and the out-let pipe sheath (fittings) together firmly with the out-let pipe clasp (fittings).
CAUTIONS: Use your strength carefully to prevent the pump-pipe from breaking.
- The body's pump pipe and the drainpipe (especially the indoor part) should be covered evenly with the out-let pipe sheath (fittings) and be bound tightly with the constrictor to prevent condensation caused by entered air.
- To prevent water from flowing backwards into the air conditioner while the air conditioner stops, please lean the drainpipe down toward outdoor (outlet-side) at a degree of over 1/50. And please avoid and bulge or water deposit. (Refer to chart 30. a)
- Do not drag the drainpipe violently when connecting to prevent the body from being pulled. Meanwhile, one support-point should be set every 1~1.5m to prevent the drainpipe from yielding (Refer to chart 30. b). Or you can tie the drainpipe with the connecting pipe to fix it. (Refer to chart 30. c)
- In the case of prolonged drainpipe, you had better tighten its indoor part with a protection tube to prevent it from loosening.
- If the outlet of the drainpipe is higher than the body's pump joint, the pipe should be arranged as vertically as possible. And the lift distance must be less than 200mm, otherwise the water will overflow when the air conditioner stops. (Refer to Chart 31)
- The end of the drainpipe should be over 50 mm higher than the ground or the bottom of the drainage chute, and do not immerse it in water. If you discharge the water directly into sewage, be sure to make a U-form aquaseal by bending the pipe up to prevent the smelly gas entering the house through the drain pipe.



a ○



b ×



c ○

Chart 30

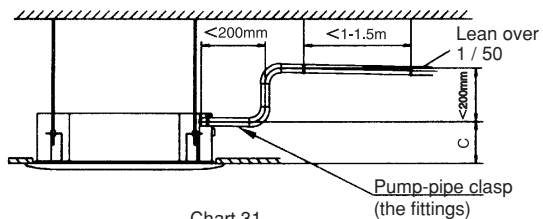


Chart 31

Note: 24/27/30 Series C=200mm
 36/45 Series C=212mm

2. Drainage test

- Check whether the drainpipe is unhindered
- New built house should have this test done before paving the ceiling.
 - 1) Refer to chart 32)

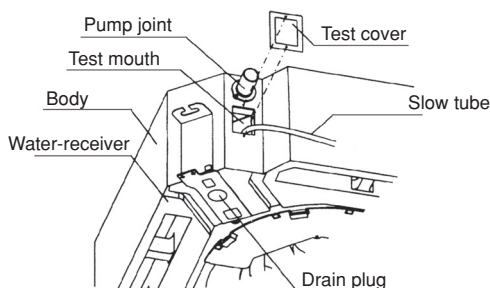


Chart 32

- 2) Turn on the power, and operate the air conditioner under the "COOLING " mode. Listen to the sound of the drain pump. Check whether the water is discharged well (a long of 1 min is allowed before discharging, according to the length of the drain pipe), and check whether water leaks from the joints.

CAUTIONS: If there is any malfunction, please resolve it immediately.

- 3) Stop the air conditioner, turn off the power, and reset the test cover to its original position.
- Imposition at all times during operation to avoid leakage.

3. Drain Elbow Installation (Cooling Only Type without)

Fit the seal into the drain elbow, then insert the drain elbow into the base pan hole of outdoor condensate draining off the outdoor unit the heating mode.

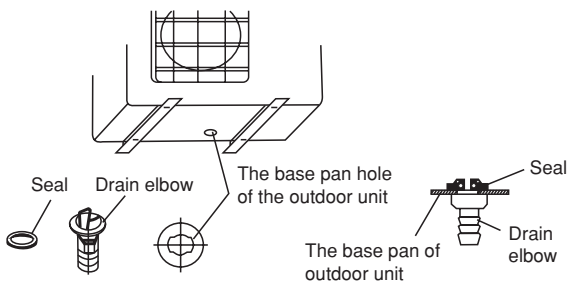


Chart 33

WIRING

CAUTION

1. The air conditioner should use separate power supply with rated voltage.
2. The external power supply to the air conditioner should have ground wiring, which is linked to the ground wiring of the indoor and outdoor unit.
3. The wiring work should be done by qualified persons according to circuit drawing.
4. A disconnection device having an air gap contact separation in all active conductors should be incorporated in the fixed wiring according to the national wiring regulation.
5. Be sure to locate the power wiring and the signal wiring well to avoid cross-disturbance and their contact with connecting pipe or stop valve body.
6. The wiring attached to this air conditioner is 6m long. Be sure to prolong it with wiring of the same type and proper length if necessary. Generally, do not twist two wiring together unless the joint is soldered well and covered with insulator tape.
7. Do not turn on the power until you checked carefully after wiring.

1. The Specification of Power

TYPE		KN-24/27/30 SH	KN-27/30 SH3	KN-36 SH	KN-45 SH
POWER	PHASE	1-PHASE	3-PHASE	3-PHASE	3-PHASE
	FREQUENCY	50Hz	50Hz	50Hz	50Hz
	VOLT	220-230V	380V	380V	380V
CIRCUIT BREAKER/FUSE		40/PHASE	20/PHASE	20/PHASE	20/PHASE
WIRING SIZE (mm ²)	POWER WIRING (INDOOR UNIT)	2.5	1.5	1.5	1.5
	GROUND WIRING	2.5	1.5	1.5	1.5
	POWER (INDOOR/OUTDOOR CONNECTING WIRING)	2.5	1.5	1.5	1.5
	STRONG ELECTRIC SIGNAL (INDOOR/OUTDOOR CONNECTING WIRING)	0.75	0.75	0.75	0.75

2. Remove the protection board

Disassemble the bolts from the maintenance board, and pull it in the direction of the arrow to remove the protection board.

Notice: Do not scratch the surface during operation.

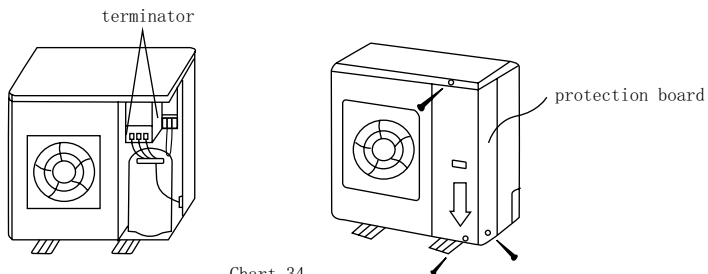


Chart 34

ATTENTION: Chart 34 is based on the standard model, which may lock a little different from your own outdoor unit.

3. ELECTRICAL CONNECTIONS

3.1 Power supply

WARNING

Electrical connection shall be made only by authorized electricians and in accordance with local electrical requirements and codes. The system must be grounded.

Single-phase models and three phase models are available; for each of them, the necessary wiring diagram is shown. connect the unit to the main power supply as for its applicable wiring diagram.

- a) Single-phase models (See figure 35)

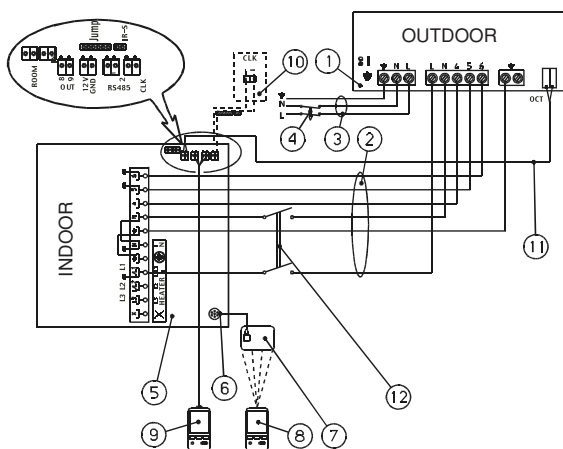
The main power supply cable must be HO5VV-K5G-type and contain 3X4 mm² leads.

- b) Three-phase models (See Figure 36)

The main power supply cable must be HOVV-K5G- type and contain 5X2.5mm² leads.

WARNING

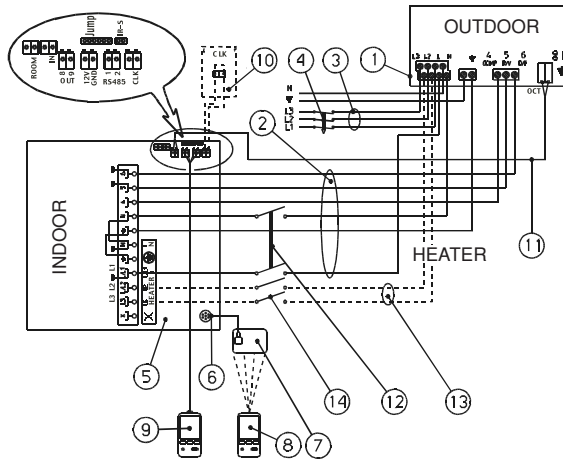
On unit with scroll type compressors, it is mandatory to listen to compressor operation upon initial startup. Should there be an unusual noise in operation, it is necessary to interchange the phases at the power supply connection.



- | | |
|----------------------------|---|
| 1. Outdoor unit | 7. Display control unit |
| 2. Inter connecting cable | 8. Wireless Remote Control |
| 3. Power supply cord | 9. Wired Remote Control(optional) |
| 4. Semi-automatic switch | 10. Remote ON/OFF Switch (by Installer) |
| 5. Indoor unit | 10. Control Cable (shielded) |
| 6. Display Quick connector | 12. Switch ON/OFF (by installer) |

Figure 35: single Phase Units: electrical Scheme power to outdoor

MODEL	INTERCONNECTING CABLE WIRELESS (mm ²)	CIRCUIT BREAKER WITHOUT HEATING ELEMENT
KN 30	6x2.5	20A
KN 36	6x2.5	25A



- | | |
|----------------------------|---|
| 1. Outdoor unit | 8. Wireless Remote Control |
| 2. Inter connecting cable | 9. Wired Remote Control (optional) |
| 3. Power supply | 10. Remote ON/OFF Switch (by installer) |
| 4. Semi-automatic switch | 11. Control Cable (Shielded) |
| 5. Indoor unit | 12. Switch ON/OFF (by installer) |
| 6. Display Quick connector | 13. Heater Cable (Optional) |
| 7. Display control unit | 14. Switch ON/OFF for Heater (by installer) |

MODEL	INTERCONNECTING CABLE WIRELESS (mm ²)	CIRCUIT BREAKER WITHOUT HEATING ELEMENT
KN 30	6x2,5	3x16A
KN 36	6x2,5	3x16A
KN 46	6x2,5	3x16A

Figure 36: Three Phase Units

3.2 Interconnecting cable

The electrical cable between the indoor and outdoor units, for all models, must be HO5VV-K5G-type. Conductors shall be of size and number as indicated in Figure 35,36. The electrical cable must be one piece, without any joints. When installing the cable under the floor, it must be protected and isolated from any possible contact with water. When the cable path runs through a wall or an acoustic ceiling, it will be protected with fireproof tubing. In addition, the two units should be interconnected by a telephone type cable, 2X0.5mm². See applicable wiring diagram in Figure 35, 36.

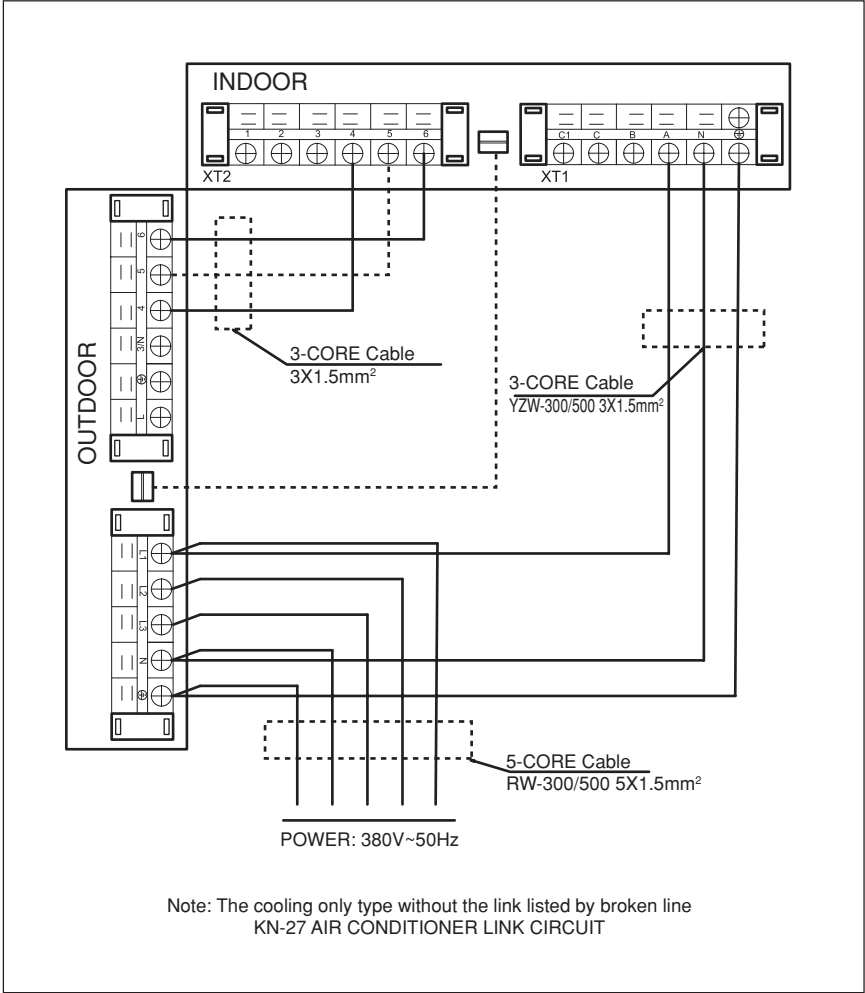


Chart 37

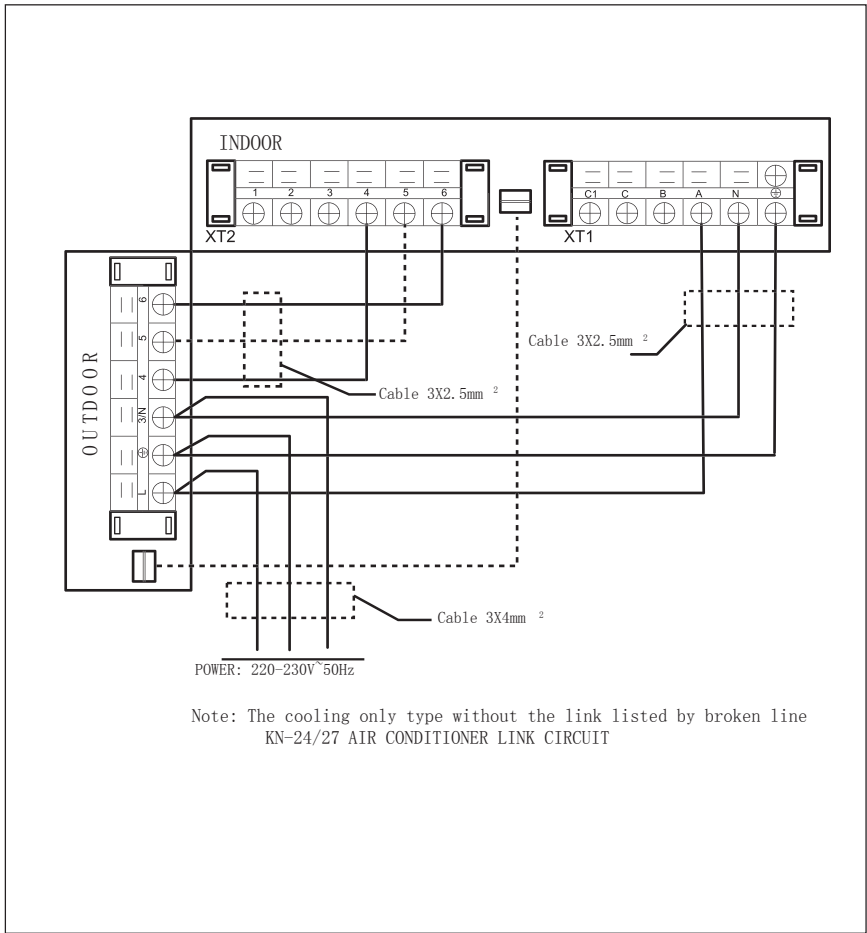


Chart 38

TEST OPERATION

1. The test operation must be carried out after the entire installation has been completed.
2. Please confirm the following points before the test operation.
 - The indoor unit and outdoor unit are installed properly.
 - Tubing and wiring are correctly completed.
 - The refrigerant pipe system is leakage checked.
 - The drainage is unimpeded.
 - The ground wiring is connected correctly.
 - The length of the tubing and the added stow capacity of the refrigerant have been recorded.
 - The power voltage fits the rated voltage of the air conditioner.
 - There is no obstacle at the outlet and inlet of the outdoor and indoor units.
 - The gas-side and liquid-side stop valves are both opened.
 - The air conditioner is pre-heated by turning on the power .
3. According to the user's requirement, install the remote controller frame where the remote controller's signal can reach the indoor unit smoothly.
4. Test operation
 - Set the air conditioner under the mode of "COOLING" with the remote controller, and check the following points per the "Owner's manual ". If there is any malfunction, please resolve it as per chapter "Troubles and Cause" in the "Owner's Manual".
 - 1) The indoor unit
 - a. Whether the switch on the remote controller works well.
 - b. Whether the buttons on the remote controller works well.
 - c. Whether the air flow louver moves normally.
 - d. Whether the room temperature is adjusted well.
 - e. Whether the indicator lights normally.
 - f. Whether the temporary buttons works well.
 - g. Whether the drainage is normal.
 - h. Whether there is vibration or abnormal noise during operation.
 - i. Whether the air conditioner heats well in the case of the HEATING /COOLING type.
 - 2) The outdoor unit
 - a. Whether there is vibration or abnormal noise during operation.
 - b. Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
 - c. Whether any of the refrigerant is leaked.

CAUTION

A protection feature prevents the air conditioner from being activated fro approximately 3 minutes when it is restarted immediately after shut off.