ELECTRA

Service Manual

EMD series

Indoor Units	Outdoor Units
EMD 27	OU6-27
EMD 35	OU8-33
EMD 40	OU10-38
EMD 45	OU10-44
EMD 50	OU10-50
EMD 60	OU12-60

REFRIGERANT	
R22 R407C	HEAT PUMP COOLING ONLY

JULY 2005

CONTENT

DUCTED

LIST OF EFFECTIVE PAGES

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

Dates of issue for original and changed pages are:

Original ..... 0 ..... July 2005

Total number of pages in this publication is 109 consisting of the following:

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

- Zero in this column indicates an original page.

*Due to constant improvements please note that the data on this service manual can be modified with out notice.
**Photos are not contractual.

Table of Contents

1. FEATURES

MODES OF OPERATION , FUNCTIONS AND FEATURES

The air conditioner is based on a microcomputer control system with remote wall mounted LCD display and control unit, programmed for the following modes and functions:

	**COOL**	Cools, dehumidifies and filters the room air. Maintains desired site temperature.
	**HEAT**	Heats and filters the air. Maintains desired site temperature.
	**AUTO**	Automatically switches from COOLING to HEATING or from HEATING to COOLING, maintaining the desired temperature according to the room conditions.
	**DRY**	Dehumidifies and moderately cools the room. In DRY Mode the air conditioner operates at an increased dehumidifying power. This function is recommended to be used when temperature is rather cool but the humidity is high.
	**FAN**	Recalculates and filters the room air. Maintains constant air movement in the room.
	**AUTO FAN**	**T**he air conditioner automatically selects the FAN speed in accordance to the room temperature. At the start, the unit operates at high fan speed. As the room air gets closer to the desired temperature, the fan switches on a lower speed for quieter operation.
	HOT KEEP	In HEATING and in AUTO FAN, the fan will be turned off when the compressor is not in operation and will not be restarted, unless the indoor coil reaches adequate temperature. This HOT KEEP feature prevents uncomfortable cold air drafts. AUTO FAN Is therefore, recommended to be used when the air conditioner is in HEATING mode.
	**I FEEL**	Switches the temperature sensing point to the place where the remote control is located (in normal operation the temperature sensor is located behind the intake grille of the air conditioner). This function is designed to provide a personalized environment by transmitting the temperature control information from where the remote control is placed. The communication between the remote control and the central control unit is done by infrared signal. When using this function, the remote control should always be aimed without obstructions at the air conditioner.
	**TIMER**	Real time control and display, automatically turns the air conditioner ON or OFF according to the time of day setting, ensuring comfort conditions before returning home, without wasting electricity. It turns off the air conditioner automatically when sleeping.
	**SLEEP**	Designed to automatically reset the temperature setting. In COOLING mode the temperature rises one degree centigrade after each consecutive hour, up to three hours, from the start of the mode. In HEATING mode, the reverse occurs, the air conditioner lowers its temperature one degree every hour. When in SLEEP Mode, the operation will automatically turn off after seven hours. This function saves energy when the air conditioner is operating during off hours.

VERTICAL AIR SWING	Not Applicable in Ducted unit.
AIR DIRECTION POSITIONING	Not Applicable in Ducted unit.
ROOM TEMP.	Measures and displays room temperature.
FILTER INDICATION	Filter indicator on the indoor unit display is turned on when the filter requires cleaning. After cleaning and reinstalling the filter, the system should be reset.
BUZZER	A soft buzzer will sound from the indoor unit display to indicate that a command sent by the remote control has been accepted and stored in the unit's memory. This feature may be easily canceled by the user from the display panel.
ON UNIT OPERATION	The air conditioner can be turned ON for COOLING or HEATING or be turned OFF directly from the indoor unit display panel without the use of the remote control.
3-MIN DELAYED RUN	The compressor is protected by a three minute delayed restart.
MEMORY	The microprocessor retains the last data entry whether or not the unit is plugged in. Therefore, when the unit restarts after a power disruption or power failure, it will resume operation in the same mode as before the power disruption.
LOCK	Freezes the last operation setting on the remote control. When LOCK is activated, the remote control will not be able to control the air conditioner.

2. PRODUCT DATA SHEET

2.1 R22/R407C

Model (Indoor & Outdoor)				EMD 27 & OU6-27 RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**	**Heating**	
Capacity			Btu/Hr	26600	27300	
			Kw	7.8	8.0	
Power input			Kw	2.8	2.4	
COP			W/W	2.79	3.28	
Power supply			V/Hz/Ph	230V/50Hz/1PH		
Rated current			A	11.6	10.0	
Starting current			A	67		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	900	800	700
	Air flow *	H/ M/ L	M³/Hr	1800	1560	1300
	External static pressure	Min-Max	Pa	25 - 70		
	Sound power level **	H/ M/ L	dBa	68.2	65.5	61.3
	Sound pressure level ***	H/ M/ L	dBa	54.3	51.5	48.5
	Moisture removal		Lt/Hr	1.7		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	32		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	34		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 1		
	Fan speeds	H / L	RPM	920		
	Air flow	H / L	M³/Hr	2350		
	Sound power level	H / L	dBa	69		
	Sound pressure level ***	H / L	dBa	62		
	Dimensions	W/ H / D	mm	900	580	340
	Weight		Kg	64		
	Package dimensions	W/ H / D	mm	985	640	410
	Package weight		Kg	67		
	Units per pallet		Units	9		
	Stacking height		Units	3		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.1/ 7.5		
	Additional charge per 1 meter		Grams	25		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	5/8		
		Max. tubing length	Meter	25		
		Max. height difference	Meter	10		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				**EMD 27 & OU6-27 ST R22**			
Installation method				Ducted			
Characteristics			**Units**	**Cooling**			
Capacity			Btu/Hr	26600			
			Kw	7.8			
Power input			Kw	2.8			
COP			W/W	2.79			
Power supply			V/Hz/Ph	230V/50Hz/1PH			
Rated current			A	11.6			
Starting current			A	67			
Circuit breaker rating			A	20			
INDOOR	Fan type & quantity			Centrifugal & 1			
	Fan speeds	H/ M/ L	RPM	900	800	700	
	Air flow *	H/ M/ L	M³/Hr	1800	1560	1300	
	External static pressure	Min-Max	Pa	25 - 70			
	Sound power level **	H/ M/ L	dBa	68.2	65.5	61.3	
	Sound pressure level ***	H/ M/ L	dBa	54.3	51.5	48.5	
	Moisture removal		Lt/Hr	1.7			
	Condensate drain tube I.D		mm	19			
	Dimensions	W/ H / D	mm	785	400	595	
	Weight		Kg	32			
	Package dimensions	W/ H / D	mm	825	425	610	
	Package weight		Kg	34			
	Units per pallet		Units	8			
	Stacking height		Units	4			
OUTDOOR	Refrigerant control			Capillary tube			
	Compressor type			Scroll			
	Fan type & quantity			Axial & 1			
	Fan speeds	H / L	RPM	920			
	Air flow	H / L	M³/Hr	2350			
	Sound power level	H / L	dBa	69			
	Sound pressure level ***	H / L	dBa	62			
	Dimensions	W/ H / D	mm	900	580	340	
	Weight		Kg	64			
	Package dimensions	W/ H / D	mm	985	640	410	
	Package weight		Kg	67			
	Units per pallet		Units	9			
	Stacking height		Units	3			
	Refrigerant type			R22			
	Charge / Distance		Kg/ M	2.1/ 7.5			
	Additional charge per 1 meter		Grams	25			
	Connections between units	Liquid line	Inch	3/8			
		Suction line	Inch	5/8			
		Max. tubing length	Meter	25			
		Max. height difference	Meter	10			
Operation control type				LCD Remote control			
Heating elements			Kw	No			
Others				Crankcase heater (60W)			

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 35 & OU8-33 RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	32500		34800
			Kw	9.5		10.1
Power input			Kw	3.3		2.9
COP			W/W	2.87		3.53
Power supply			V/Hz/Ph	230V/50Hz/1PH		
Rated current			A	14.4		12.3
Starting current			A	76		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	890	800	680
	Air flow *	H/ M/ L	M³/Hr	1770	1570	1300
	External static pressure	Min-Max	Pa	37 - 80		
	Sound power level **	H/ M/ L	dBa	68.2	65.5	61.3
	Sound pressure level ***	H/ M/ L	dBa	54.3	51.5	48.5
	Moisture removal		Lt/Hr	2.7		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 1		
	Fan speeds	H / L	RPM	850		
	Air flow	H / L	M³/Hr	3110		
	Sound power level	H / L	dBa	69		
	Sound pressure level ***	H / L	dBa	62		
	Dimensions	W/ H / D	mm	900	860	340
	Weight		Kg	78		
	Package dimensions	W/ H / D	mm	985	900	410
	Package weight		Kg	82		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.33 / 7.5		
	Additional charge per 1 meter		Grams	25		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	5/8		
		Max. tubing length	Meter	30		
		Max. height difference	Meter	10		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 35 & OU8-33 ST R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		
Capacity			Btu/Hr	32500		
			Kw	9.5		
Power input			Kw	3.3		
COP			W/W	2.87		
Power supply			V/Hz/Ph	230V/50Hz/1PH		
Rated current			A	14.4		
Starting current			A	76		
Circuit breaker rating			A	20		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	890	800	680
	Air flow *	H/ M/ L	M³/Hr	1770	1570	1300
	External static pressure	Min-Max	Pa	37 - 80		
	Sound power level **	H/ M/ L	dBa	68.2	65.5	61.3
	Sound pressure level ***	H/ M/ L	dBa	54.3	51.5	48.5
	Moisture removal		Lt/Hr	2.7		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 1		
	Fan speeds	H / L	RPM	850		
	Air flow	H / L	M³/Hr	3110		
	Sound power level	H / L	dBa	69		
	Sound pressure level ***	H / L	dBa	62		
	Dimensions	W/ H / D	mm	900	860	340
	Weight		Kg	78		
	Package dimensions	W/ H / D	mm	985	900	410
	Package weight		Kg	82		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.33 / 7.5		
	Additional charge per 1 meter		Grams	25		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	5/8		
		Max. tubing length	Meter	30		
		Max. height difference	Meter	10		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 35T & OU8-33T RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	31800		34100
			Kw	9.4		10.0
Power input			Kw	3.2		2.8
COP			W/W	2.91		3.58
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x9.1		3x8.1
Starting current			A	36		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	890	800	680
	Air flow *	H/ M/ L	M³/Hr	1770	1570	1300
	External static pressure	Min-Max	Pa	37 - 80		
	Sound power level **	H/ M/ L	dBa	68.2	65.5	61.3
	Sound pressure level ***	H/ M/ L	dBa	54.3	51.5	48.5
	Moisture removal		Lt/Hr	2.6		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 1		
	Fan speeds	H / L	RPM	850		
	Air flow	H / L	M³/Hr	3110		
	Sound power level	H / L	dBa	69		
	Sound pressure level ***	H / L	dBa	62		
	Dimensions	W/ H / D	mm	900	860	340
	Weight		Kg	78		
	Package dimensions	W/ H / D	mm	985	900	410
	Package weight		Kg	82		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.33 / 7.5		
	Additional charge per 1 meter		Grams	25		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	5/8		
		Max. tubing length	Meter	30		
		Max. height difference	Meter	10		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W), 3PH Protector		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 35T & OU8-33T ST R22		
Installation method				Ducted		
Characteristics		**Units**		**Cooling**		
Capacity		Btu/Hr		31800		
		Kw		9.4		
Power input		Kw		3.2		
COP		W/W		2.91		
Power supply		V/Hz/Ph		400V/50Hz/3N		
Rated current		A		3x9.1		
Starting current		A		36		
Circuit breaker rating		A		3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	890	800	680
	Air flow *	H/ M/ L	M³/Hr	1770	1570	1300
	External static pressure	Min-Max	Pa	37 - 80		
	Sound power level **	H/ M/ L	dBa	68.2	65.5	61.3
	Sound pressure level ***	H/ M/ L	dBa	54.3	51.5	48.5
	Moisture removal		Lt/Hr	2.6		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 1		
	Fan speeds	H / L	RPM	850		
	Air flow	H / L	M³/Hr	3110		
	Sound power level	H / L	dBa	69		
	Sound pressure level ***	H / L	dBa	62		
	Dimensions	W/ H / D	mm	900	860	340
	Weight		Kg	78		
	Package dimensions	W/ H / D	mm	985	900	410
	Package weight		Kg	82		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.33 / 7.5		
	Additional charge per 1 meter		Grams	25		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	5/8		
		Max. tubing length	Meter	30		
		Max. height difference	Meter	10		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W), 3PH Protector		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 40 & OU10-38 RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	37700		40200
			Kw	11.0		11.6
Power input			Kw	3.9		3.5
COP			W/W	2.82		3.32
Power supply			V/Hz/Ph	230V/50Hz/1PH		
Rated current			A	17.9		15.9
Starting current			A	114.0		
Circuit breaker rating			A	25		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1130	1020	830
	Air flow *	H/ M/ L	M³/Hr	1740	1530	1250
	External static pressure	Min-Max	Pa	37- 80		
	Sound power level **	H/ M/ L	dBa	70.8	67.1	62.8
	Sound pressure level ***	H/ M/ L	dBa	54.1	50.6	49.2
	Moisture removal		Lt/Hr	3.6		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1125		
	Air flow	H / L	M³/Hr	4150		
	Sound power level	H / L	dBa	65		
	Sound pressure level ***	H / L	dBa	58		
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	88.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	93		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.65 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 40 & OU10-38 ST R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		
Capacity			Btu/Hr	37700		
			Kw	11.0		
Power input			Kw	3.9		
COP			W/W	2.82		
Power supply			V/Hz/Ph	230V/50Hz/1PH		
Rated current			A	17.9		
Starting current			A	114.0		
Circuit breaker rating			A	25		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1130	1020	830
	Air flow *	H/ M/ L	M³/Hr	1740	1530	1250
	External static pressure	Min-Max	Pa	37- 80		
	Sound power level **	H/ M/ L	dBa	70.8	67.1	62.8
	Sound pressure level ***	H/ M/ L	dBa	54.1	50.6	49.2
	Moisture removal		Lt/Hr	3.6		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1125		
	Air flow	H / L	M³/Hr	4150		
	Sound power level	H / L	dBa	65		
	Sound pressure level ***	H / L	dBa	58		
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	88.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	93		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.65 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 40T & OU10-38T RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	35800		38900
			Kw	10.5		11.3
Power input			Kw	3.6		3.4
COP			W/W	2.95		3.35
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x9.8		3x9.3
Starting current			A	48		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1130	1020	830
	Air flow *	H/ M/ L	M³/Hr	1740	1530	1250
	External static pressure	Min-Max	Pa	37- 80		
	Sound power level **	H/ M/ L	dBa	70.8	67.1	62.8
	Sound pressure level ***	H/ M/ L	dBa	54.1	50.6	49.2
	Moisture removal		Lt/Hr	3.5		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1125		
	Air flow	H / L	M³/Hr	4150		
	Sound power level	H / L	dBa	65		
	Sound pressure level ***	H / L	dBa	58		
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	88.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	93		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.6 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				**EMD 40T & OU10-38T ST R22**		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		
Capacity			Btu/Hr	35800		
			Kw	10.5		
Power input			Kw	3.6		
COP			W/W	2.95		
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x9.8		
Starting current			A	48		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1130	1020	830
	Air flow *	H/ M/ L	M³/Hr	1740	1530	1250
	External static pressure	Min-Max	Pa	37- 80		
	Sound power level **	H/ M/ L	dBa	70.8	67.1	62.8
	Sound pressure level ***	H/ M/ L	dBa	54.1	50.6	49.2
	Moisture removal		Lt/Hr	3.5		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	785	400	595
	Weight		Kg	36		
	Package dimensions	W/ H / D	mm	825	425	610
	Package weight		Kg	38		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1125		
	Air flow	H / L	M³/Hr	4150		
	Sound power level	H / L	dBa	65		
	Sound pressure level ***	H / L	dBa	58		
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	88.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	93		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.6 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 45T & OU10-44T RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	43400		45000
			Kw	12.7		13.0
Power input			Kw	4.8		4.0
COP			W/W	2.64		3.24
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x13.1		3x11.1
Starting current			A	61.8		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1000	900	800
	Air flow *	H/ M/ L	M³/Hr	2180	1960	1740
	External static pressure	Min-Max	Pa	50 - 100		
	Sound power level **	H/ M/ L	dBa	73.2	70.1	66.1
	Sound pressure level ***	H/ M/ L	dBa	56.3	54.0	51.7
	Moisture removal		Lt/Hr	3.8		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1040	400	595
	Weight		Kg	42		
	Package dimensions	W/ H / D	mm	1100	435	620
	Package weight		Kg	45		
	Units per pallet		Units	8		
	Stacking height		Units	2		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1125		
	Air flow	H / L	M³/Hr	4150		
	Sound power level	H / L	dBa	65		
	Sound pressure level ***	H / L	dBa	58		
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	88.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	93		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.75 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 45T & OU10-44T ST R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		
Capacity			Btu/Hr	43400		
			Kw	12.7		
Power input			Kw	4.8		
COP			W/W	2.64		
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x13.1		
Starting current			A	61.8		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1000	900	800
	Air flow *	H/ M/ L	M³/Hr	2180	1960	1740
	External static pressure	Min-Max	Pa	50 - 100		
	Sound power level **	H/ M/ L	dBa	73.2	70.1	66.1
	Sound pressure level ***	H/ M/ L	dBa	56.3	54.0	51.7
	Moisture removal		Lt/Hr	3.8		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1040	400	595
	Weight		Kg	42		
	Package dimensions	W/ H / D	mm	1100	435	620
	Package weight		Kg	45		
	Units per pallet		Units	8		
	Stacking height		Units	2		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1125		
	Air flow	H / L	M³/Hr	4150		
	Sound power level	H / L	dBa	65		
	Sound pressure level ***	H / L	dBa	58		
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	88.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	93		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	2.75 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 50T & OU10-50T RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	47500		51000
			Kw	13.9		14.9
Power input			Kw	5.1		4.5
COP			W/W	2.74		3.30
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x14.7		3x13.2
Starting current			A	65.5		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1030	930	820
	Air flow *	H/ M/ L	M³/Hr	2400	2160	1910
	External static pressure	Min-Max	Pa	50 - 100		
	Sound power level **	H/ M/ L	dBa	73.2	70.1	66.1
	Sound pressure level ***	H/ M/ L	dBa	56.3	54.0	51.7
	Moisture removal		Lt/Hr	4.8		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1040	400	595
	Weight		Kg	43		
	Package dimensions	W/ H / D	mm	1100	435	620
	Package weight		Kg	46		
	Units per pallet		Units	8		
	Stacking height		Units	2		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1220		955
	Air flow	H / L	M³/Hr	4345		3400
	Sound power level	H / L	dBa	69		63
	Sound pressure level ***	H / L	dBa	62		56
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	90.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	95		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	4.2 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				**EMD 50T & OU10-50T ST R22**		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		
Capacity			Btu/Hr	47500		
			Kw	13.9		
Power input			Kw	5.1		
COP			W/W	2.74		
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x14.7		
Starting current			A	65.5		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1030	930	820
	Air flow *	H/ M/ L	M³/Hr	2400	2160	1910
	External static pressure	Min-Max	Pa	50 - 100		
	Sound power level **	H/ M/ L	dBa	73.2	70.1	66.1
	Sound pressure level ***	H/ M/ L	dBa	56.3	54.0	51.7
	Moisture removal		Lt/Hr	4.8		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1040	400	595
	Weight		Kg	43		
	Package dimensions	W/ H / D	mm	1100	435	620
	Package weight		Kg	46		
	Units per pallet		Units	8		
	Stacking height		Units	2		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1220	955	
	Air flow	H / L	M³/Hr	4345	3400	
	Sound power level	H / L	dBa	69	63	
	Sound pressure level ***	H / L	dBa	62	56	
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	90.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	95		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	4.2 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 50T & OU10-50T RC R407C		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	45700		51500
			Kw	13.4		15.1
Power input			Kw	5.4		5.6
COP			W/W	2.5		2.7
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x15.0		3x15.3
Starting current			A	57		
Circuit breaker rating			A	3x16		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1030	930	820
	Air flow *	H/ M/ L	M³/Hr	2400	2160	1910
	External static pressure	Min-Max	Pa	50 - 100		
	Sound power level **	H/ M/ L	dBa	73.2	70.1	66.1
	Sound pressure level ***	H/ M/ L	dBa	56.3	54.0	51.7
	Moisture removal		Lt/Hr	4.9		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1040	400	595
	Weight		Kg	43		
	Package dimensions	W/ H / D	mm	1100	435	620
	Package weight		Kg	46		
	Units per pallet		Units	8		
	Stacking height		Units	2		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	1220		955
	Air flow	H / L	M³/Hr	4345		3400
	Sound power level	H / L	dBa	69		63
	Sound pressure level ***	H / L	dBa	62		56
	Dimensions	W/ H / D	mm	900	970	350
	Weight		Kg	90.5		
	Package dimensions	W/ H / D	mm	985	1020	435
	Package weight		Kg	95		
	Units per pallet		Units	6		
	Stacking height		Units	2		
	Refrigerant type			R407C		
	Charge / Distance		Kg/ M	4.15 / 7.5		
	Additional charge per 1 meter		Grams	30		
	Connections between units	Liquid line	Inch	3/8		
		Suction line	Inch	3/4		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W), 3PH Protector		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 60T & OU12-60T RC R22		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	55000		56900
			Kw	16.1		16.5
Power input			Kw	5.9		5.2
COP			W/W	2.74		3.16
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x16.3		3x14.8
Starting current			A	74		
Circuit breaker rating			A	3x20		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1000	840	700
	Air flow *	H/ M/ L	M³/Hr	2950	2480	2065
	External static pressure	Min-Max	Pa	50 - 110		
	Sound power level **	H/ M/ L	dBa	71.8	68.9	62.3
	Sound pressure level ***	H/ M/ L	dBa	60.2	55.7	51.5
	Moisture removal		Lt/Hr	4.8		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1140	400	680
	Weight		Kg	46		
	Package dimensions	W/ H / D	mm	1195	440	730
	Package weight		Kg	50		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	825		560
	Air flow	H / L	M³/Hr	4850		3300
	Sound power level	H / L	dBa	70		62.0
	Sound pressure level ***	H / L	dBa	60.4		53.7
	Dimensions	W/ H / D	mm	900	1255	350
	Weight		Kg	110		
	Package dimensions	W/ H / D	mm	985	1395	435
	Package weight		Kg	120		
	Units per pallet		Units	1		
	Stacking height		Units	1		
	Refrigerant type			R22		
	Charge / Distance		Kg/ M	5000 / 7.5		
	Additional charge per 1 meter		Grams	40		
	Connections between units	Liquid line	Inch	1/2		
		Suction line	Inch	7/8		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

Model (Indoor & Outdoor)				EMD 60T & OU12-60T RC R407C		
Installation method				Ducted		
Characteristics			**Units**	**Cooling**		**Heating**
Capacity			Btu/Hr	51860		61400
			Kw	15.2		18.0
Power input			Kw	6.0		6.3
COP			W/W	2.52		2.86
Power supply			V/Hz/Ph	400V/50Hz/3N		
Rated current			A	3x16.4		3x16.8
Starting current			A	74		
Circuit breaker rating			A	3x20		
INDOOR	Fan type & quantity			Centrifugal & 1		
	Fan speeds	H/ M/ L	RPM	1000	840	700
	Air flow *	H/ M/ L	M³/Hr	2950	2480	2065
	External static pressure	Min-Max	Pa	50 - 110		
	Sound power level **	H/ M/ L	dBa	71.8	68.9	62.3
	Sound pressure level ***	H/ M/ L	dBa	60.2	55.7	51.5
	Moisture removal		Lt/Hr	4.7		
	Condensate drain tube I.D		mm	19		
	Dimensions	W/ H / D	mm	1140	400	680
	Weight		Kg	46		
	Package dimensions	W/ H / D	mm	1195	440	730
	Package weight		Kg	50		
	Units per pallet		Units	8		
	Stacking height		Units	4		
OUTDOOR	Refrigerant control			Capillary tube		
	Compressor type			Scroll		
	Fan type & quantity			Axial & 2		
	Fan speeds	H / L	RPM	825		560
	Air flow	H / L	M³/Hr	4850		3300
	Sound power level	H / L	dBa	70		62.0
	Sound pressure level ***	H / L	dBa	60.4		53.7
	Dimensions	W/ H / D	mm	900	1255	350
	Weight		Kg	110		
	Package dimensions	W/ H / D	mm	985	1395	435
	Package weight		Kg	120		
	Units per pallet		Units	1		
	Stacking height		Units	1		
	Refrigerant type			R407C		
	Charge / Distance		Kg/ M	4550 / 7.5		
	Additional charge per 1 meter		Grams	40		
	Connections between units	Liquid line	Inch	1/2		
		Suction line	Inch	7/8		
		Max. tubing length	Meter	50		
		Max. height difference	Meter	25		
Operation control type				LCD Remote control		
Heating elements			Kw	No		
Others				Crankcase heater (60W)		

* Airflow in ducted units; according to nominal external static pressure.
** Sound power in ducted units is measured at air outlet side.
*** Sound pressure level is measured at 1-meter distance from the unit.

3. RATING CONDITIONS

NOTES:

1. Rating conditions ISO/CD 13253R
   Cooling: indoor: 27°C (80°F) DB 19°C (66°F) WB
   Outdoor: 35°C (95°F) DB

   Heating: indoor: 20°C (68°F) DB
   Outdoor: 7°C (45°F) DB 6°C (43°F) WB

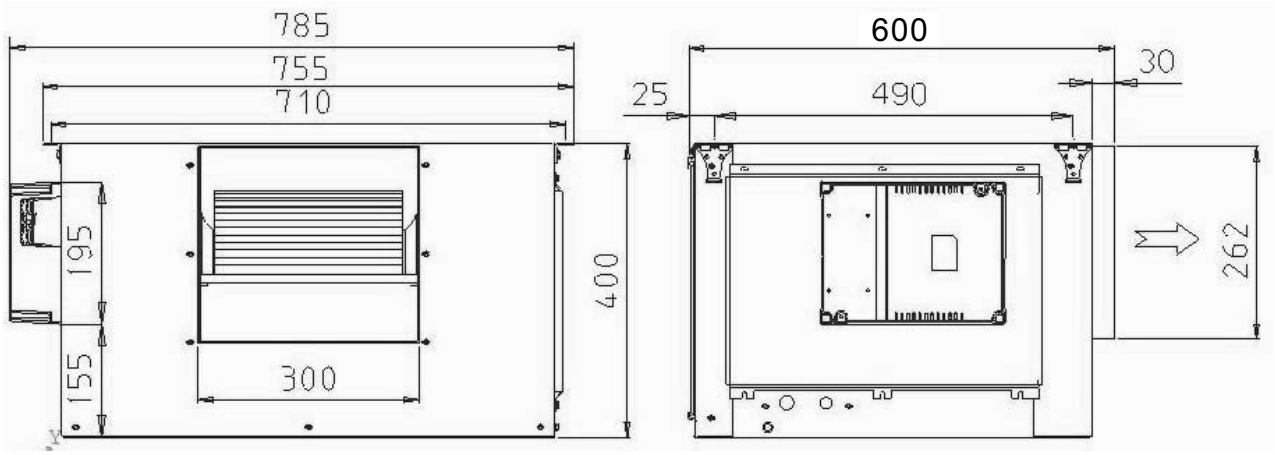
   Refrigerant tubing length (one way) 7.5m (24.6 ft)

2. Guaranteed operating range:

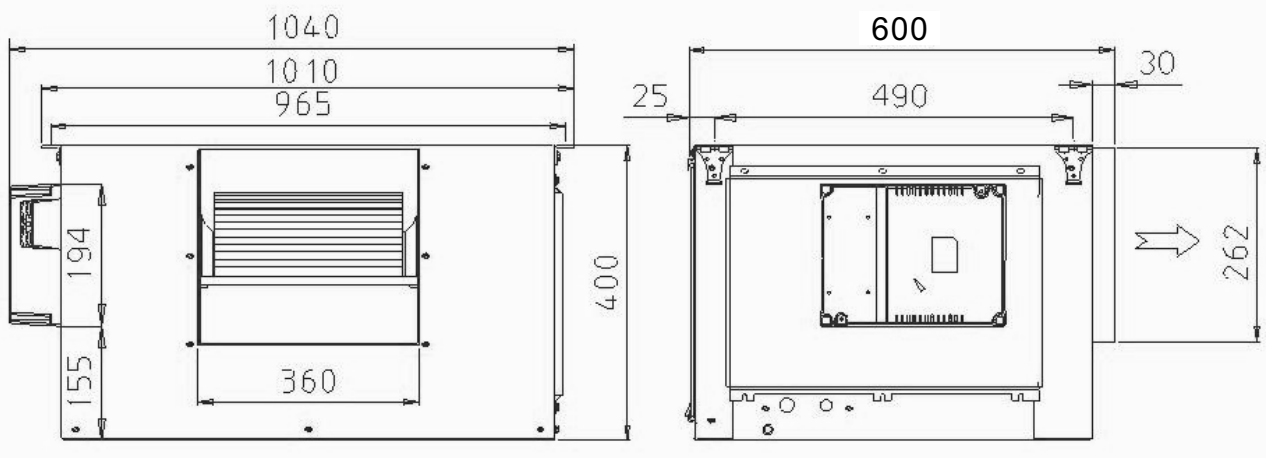
		Indoor	Outdoor
Cooling	Upper limit	32°C DB, 23°C WB	46°C DB
	Lower limit	21°C DB, 15°C WB	21°C DB
Heating	Upper limit	27°C DB	24°C DB, 18°C WB
	Lower limit	20°C DB	-5°C DB, -6°C WB (For R22)
			-9°C DB, -10°C WB (For R407C)
Voltage	1 PH	198 – 242 V	
	3 PH	360 – 440 V	

4. OUTLINE DIMENSIONS

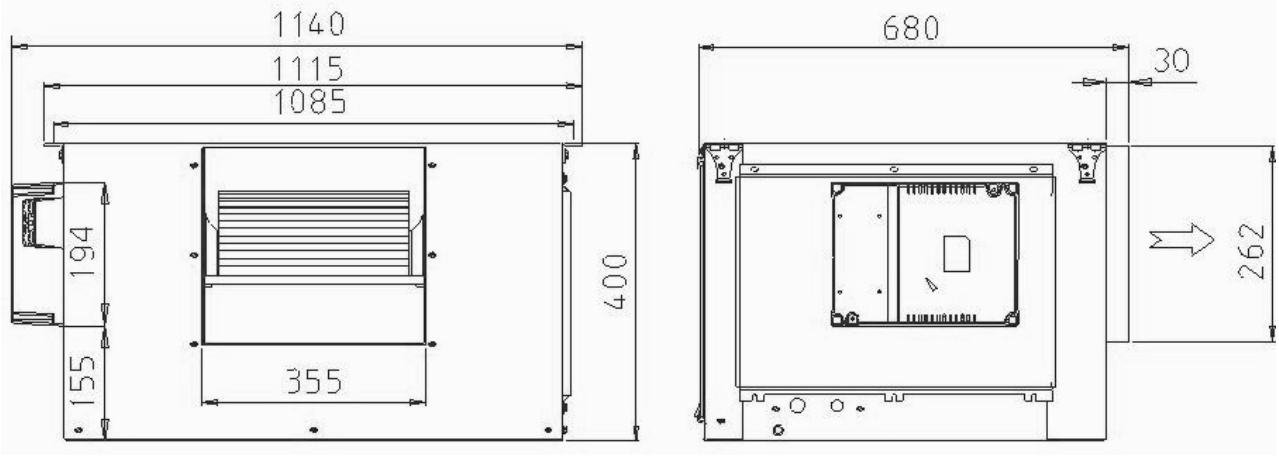
4.1 Indoor Unit: EMD 27, 35, 40



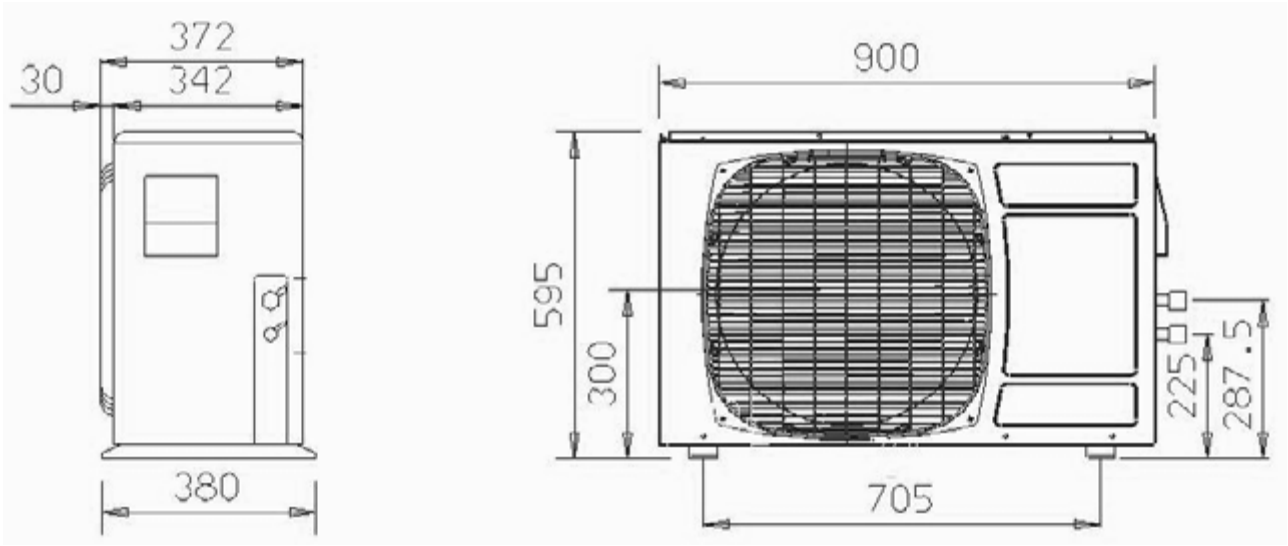
4.2 Indoor Unit: EMD 45, 50



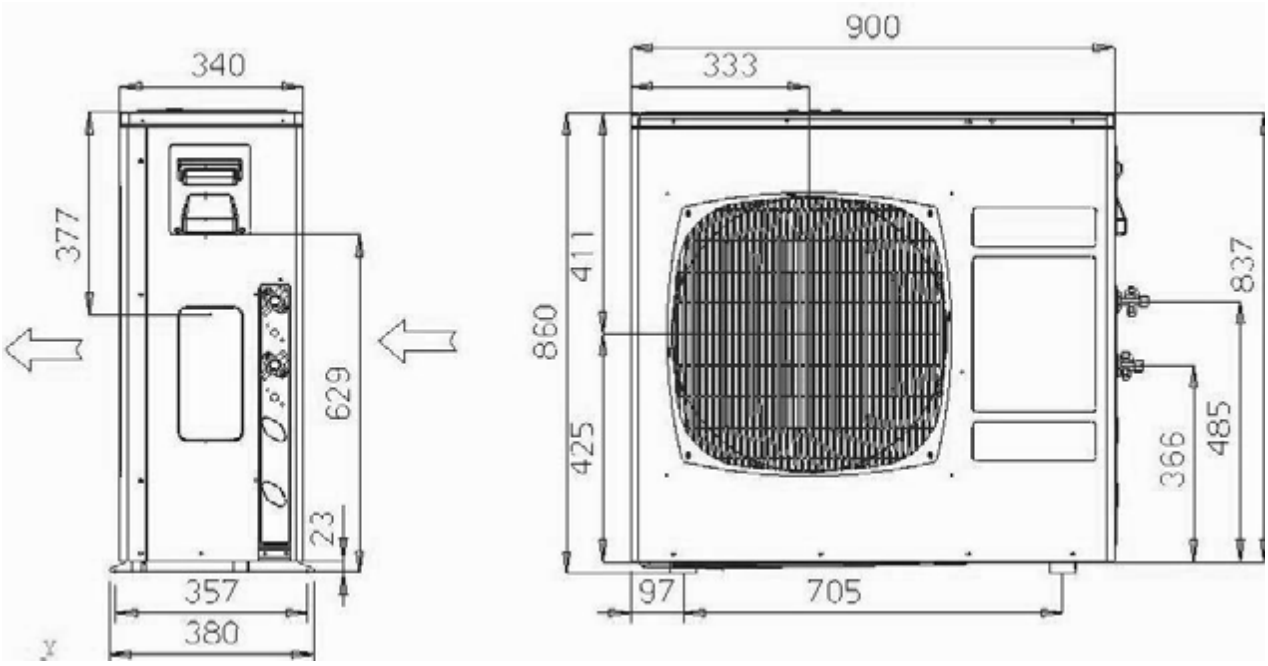
4.3 Indoor Unit: EMD 60



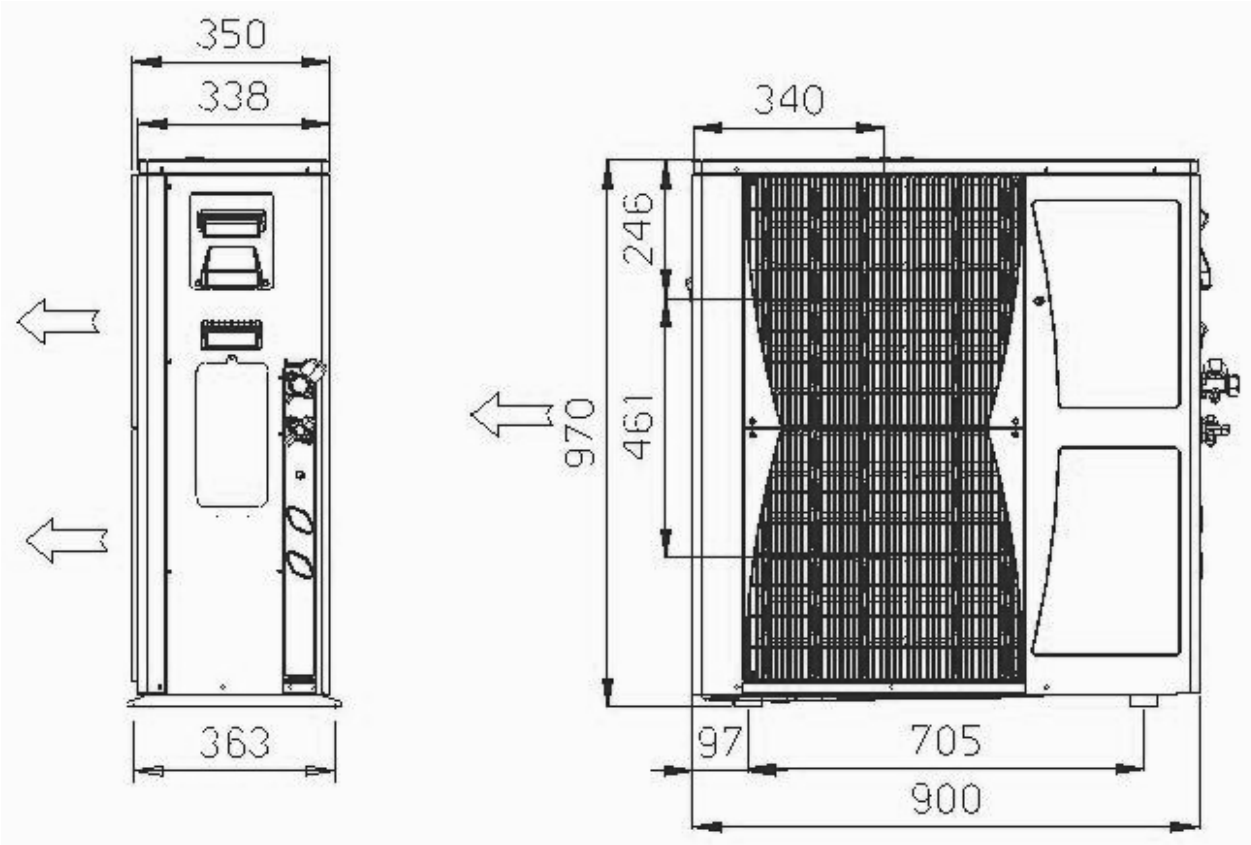
4.4 Outdoor Unit: OU6-27



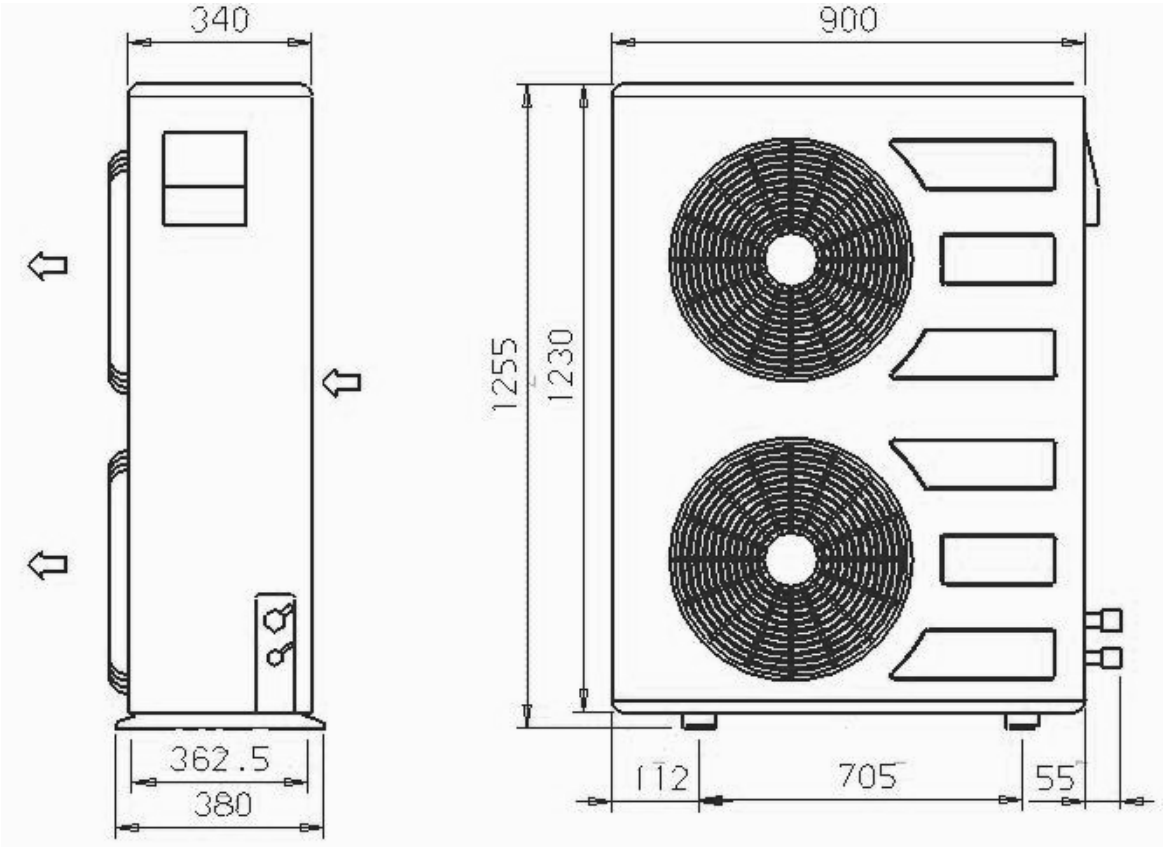
4.5 Outdoor Unit: OU8-33



4.6 Outdoor Unit: OU10-38/45/50



4.7 Outdoor Unit: OU12-60

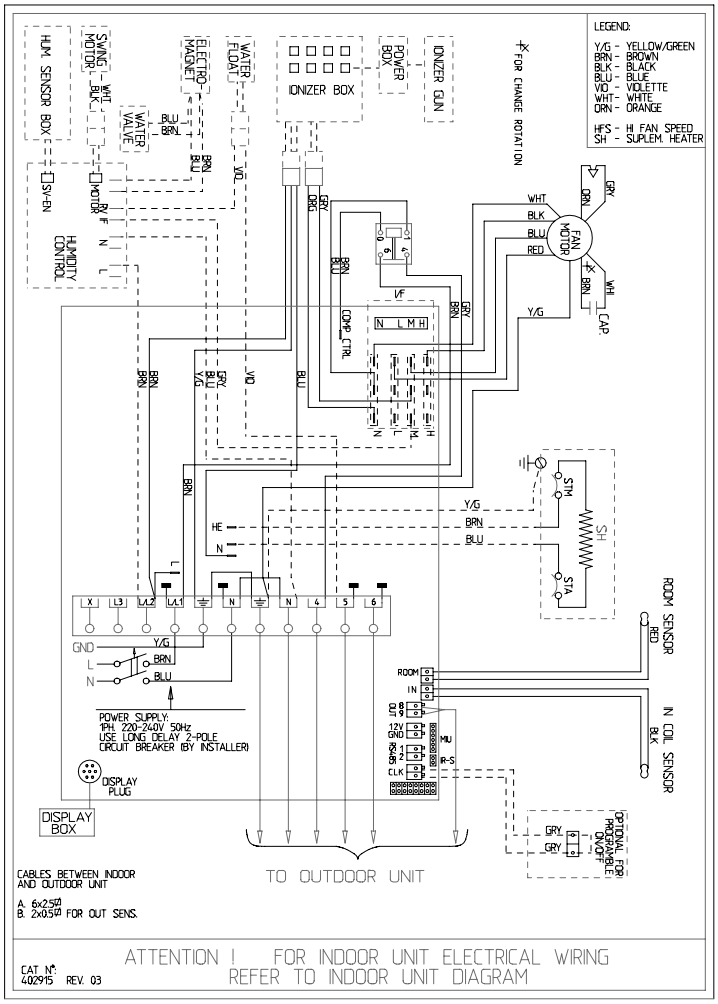


5. WIRING DIAGRAMS

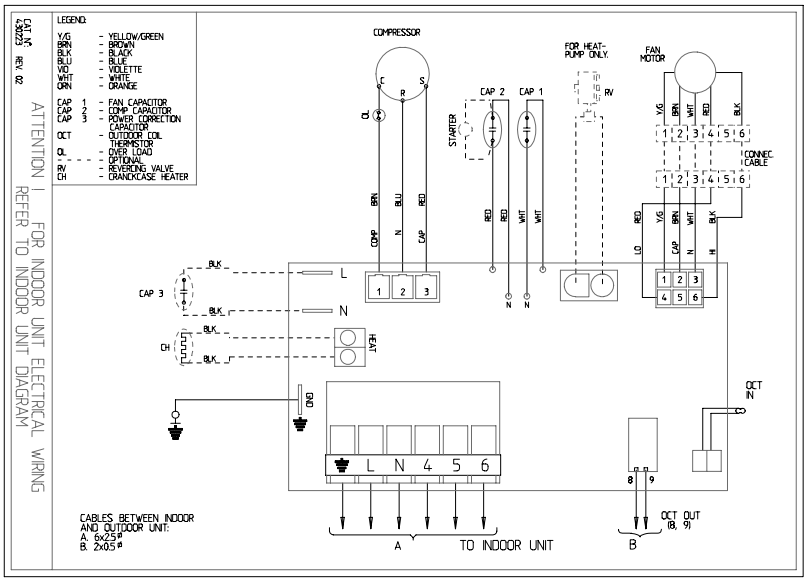
5.1 EMD 27 1PH

INDOOR POWER SUPPLY

INDOOR

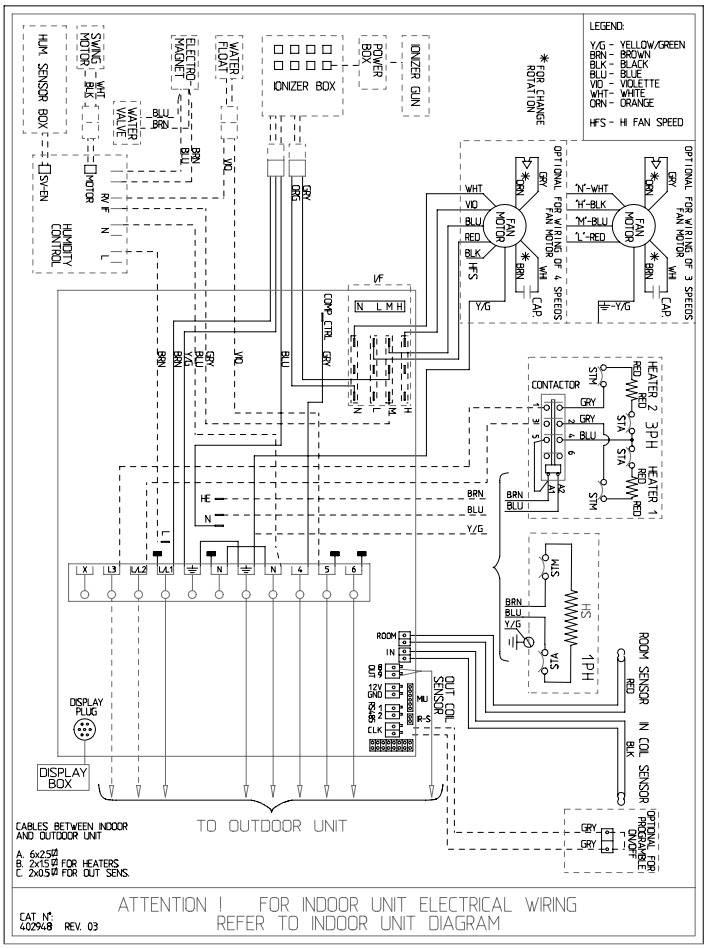


OUTDOOR

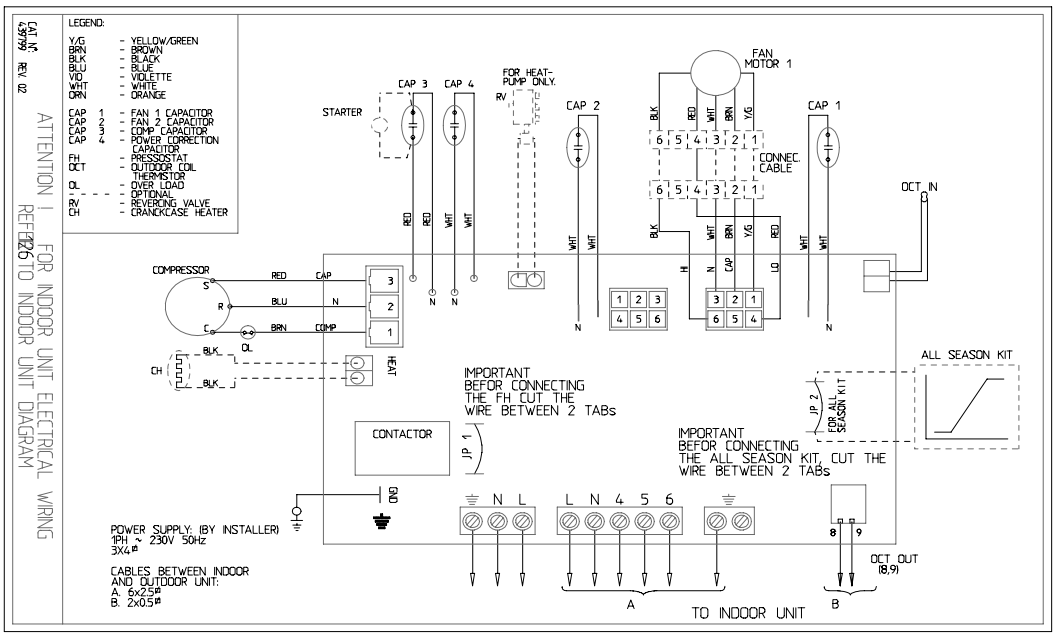


5.2 EMD 35 1PH
OUTDOOR POWER SUPPLY

INDOOR

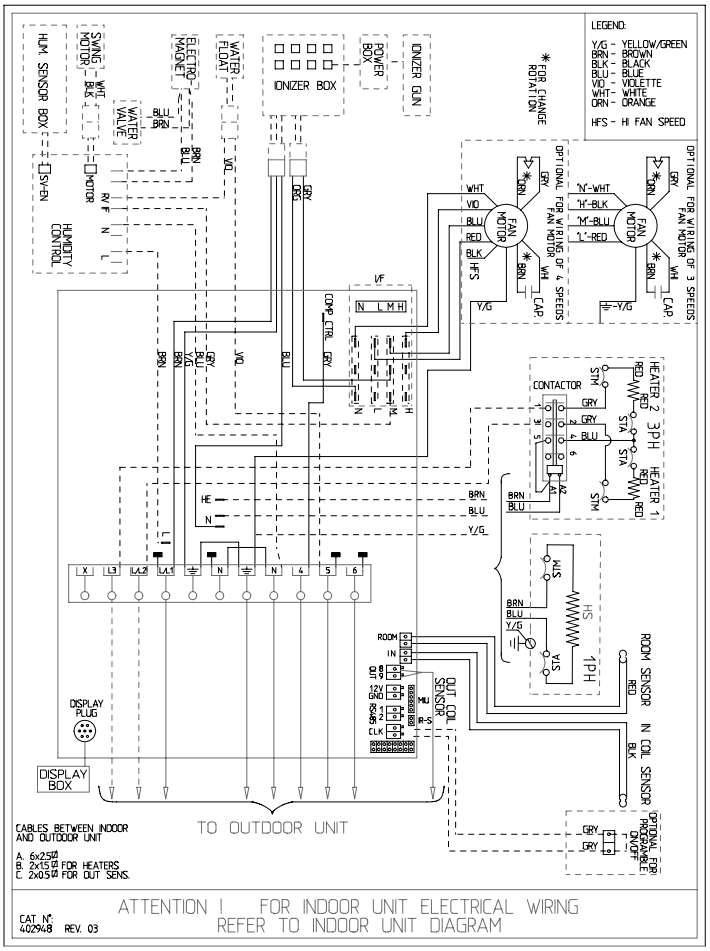


OUTDOOR

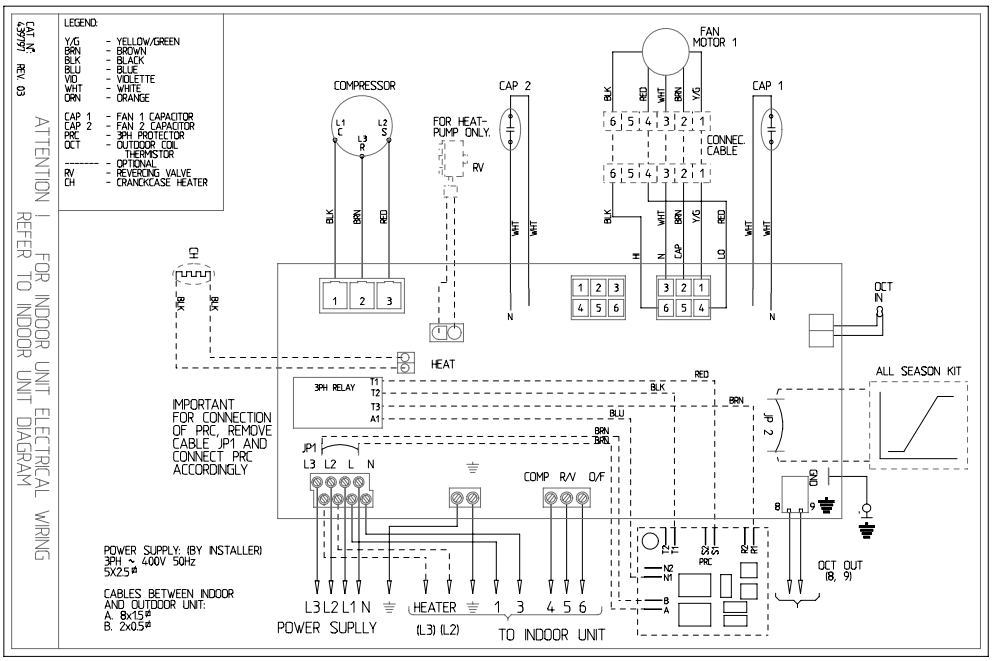


5,3 EMD 35 3PH
OUTDOOR POWER SUPPLY

INDOOR

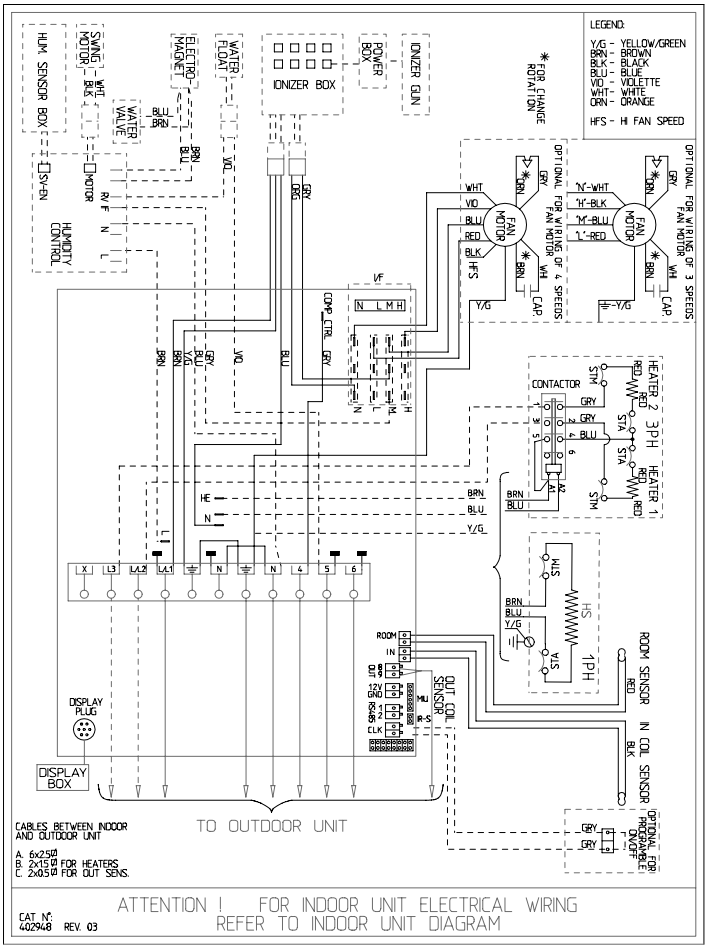


OUTDOOR

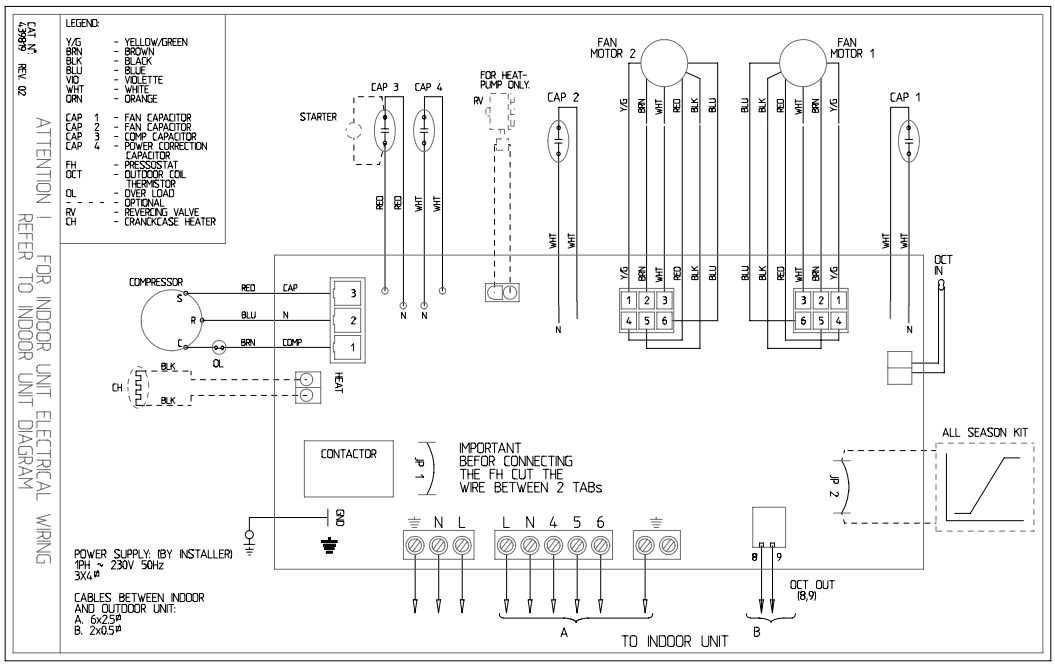


5.4 EMD 40 1PH
OUTDOOR POWER SUPPLY

INDOOR

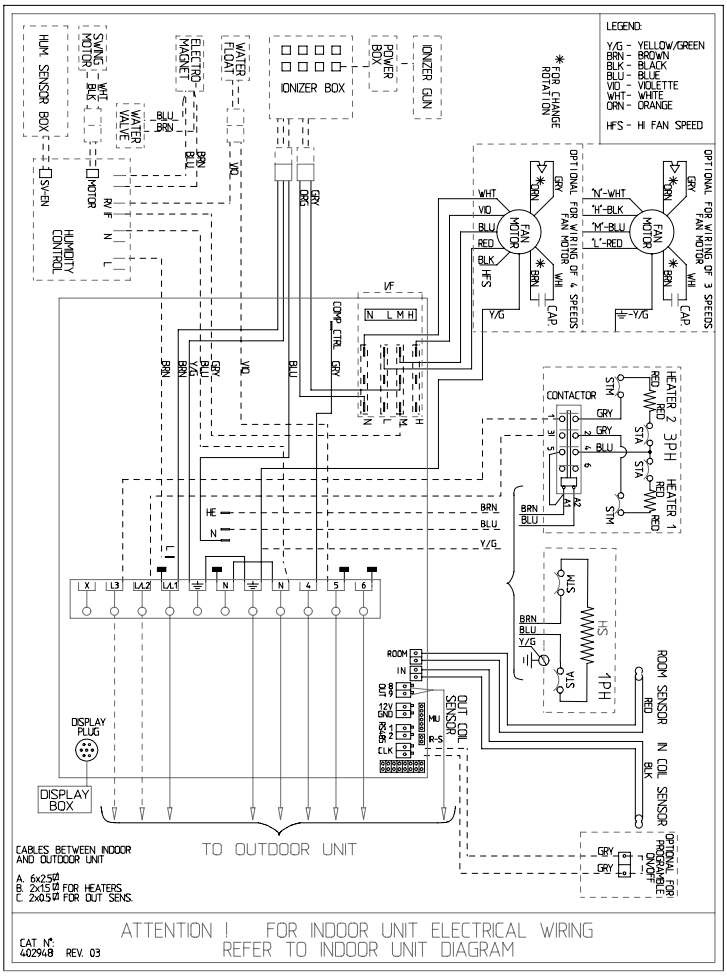


OUTDOOR

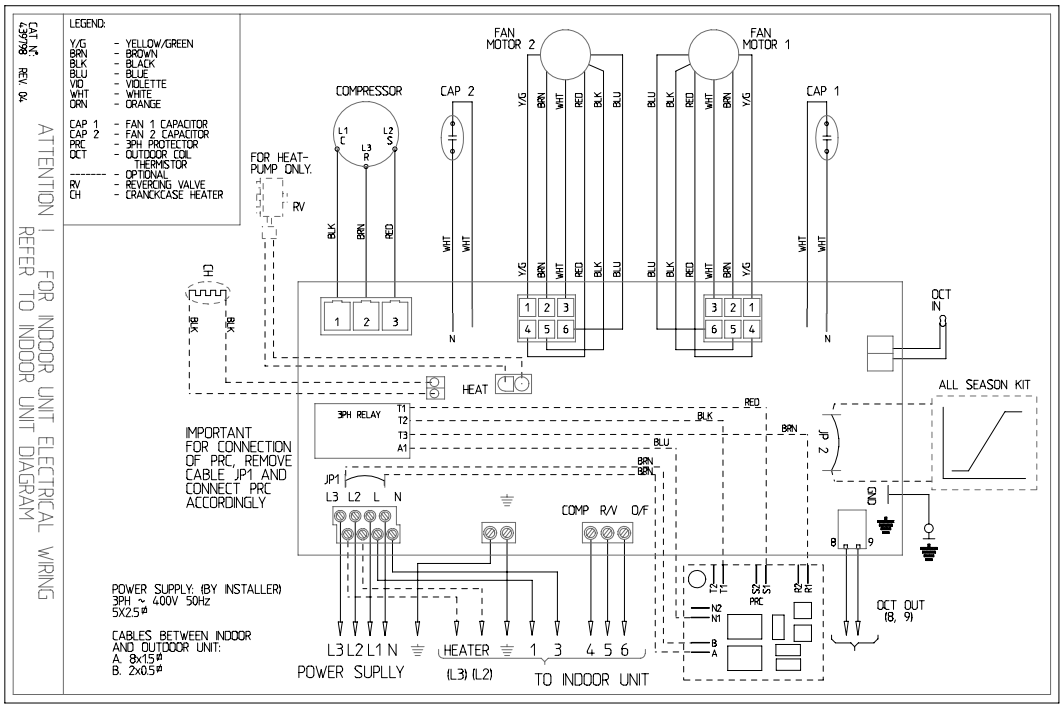


5.5 EMD 40, 45 3PH
OUTDOOR POWER SUPPLY

INDOOR

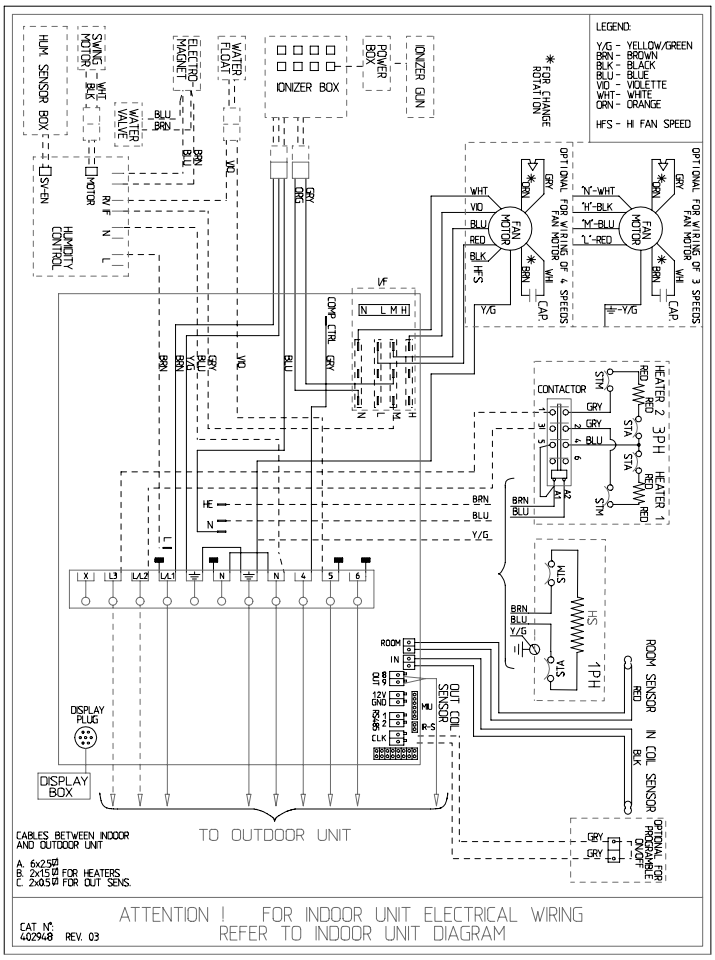


OUTDOOR

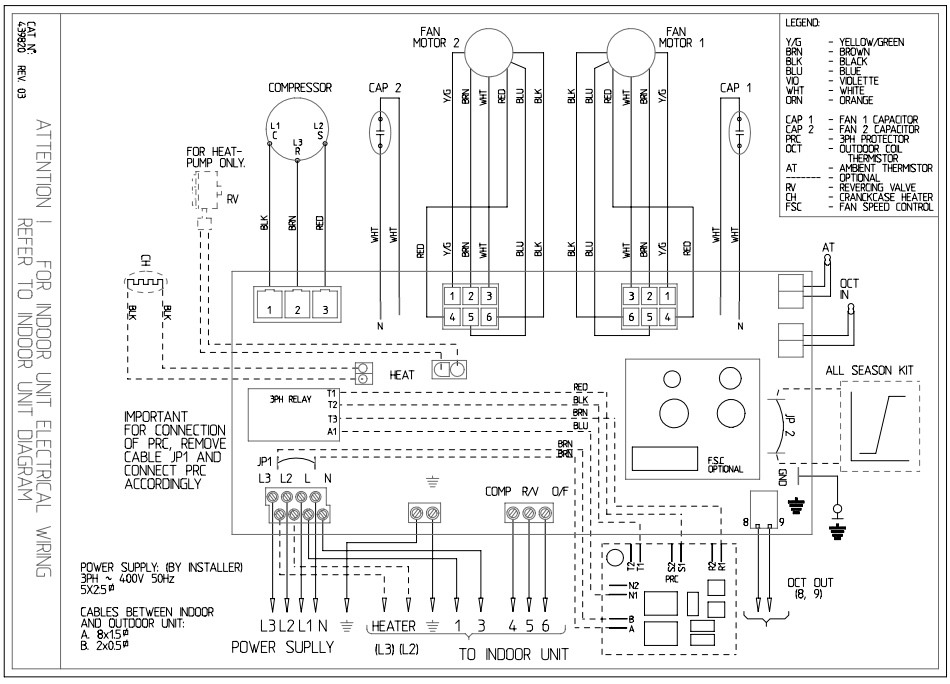


5,6 EMD 50 3PH
OUTDOOR POWER SUPPLY

INDOOR

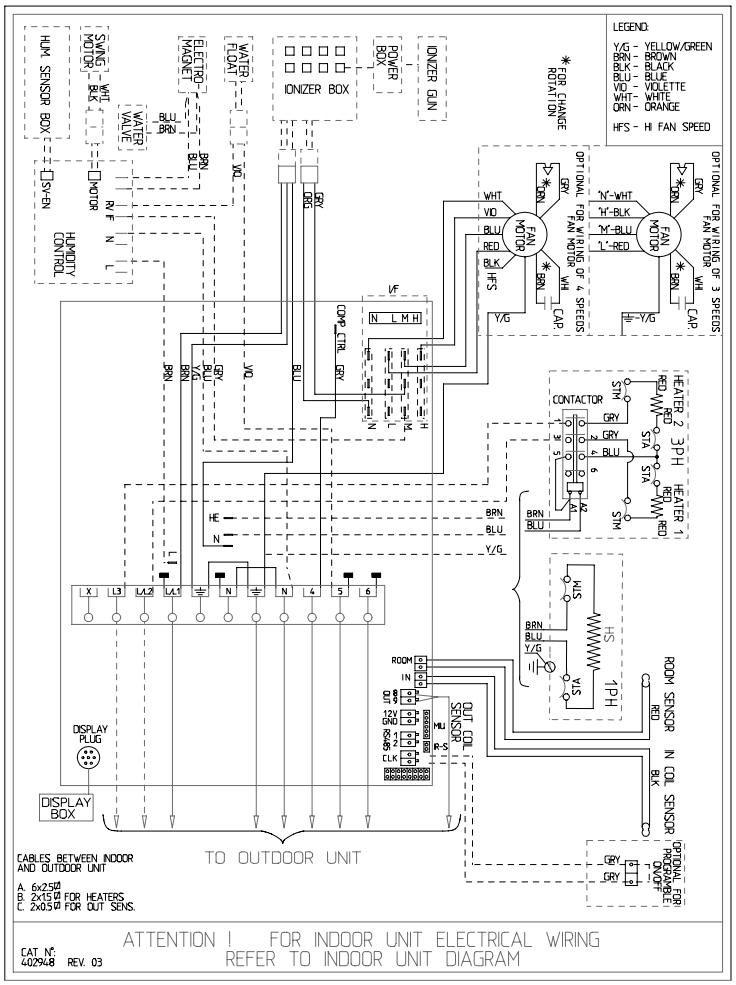


OUTDOOR

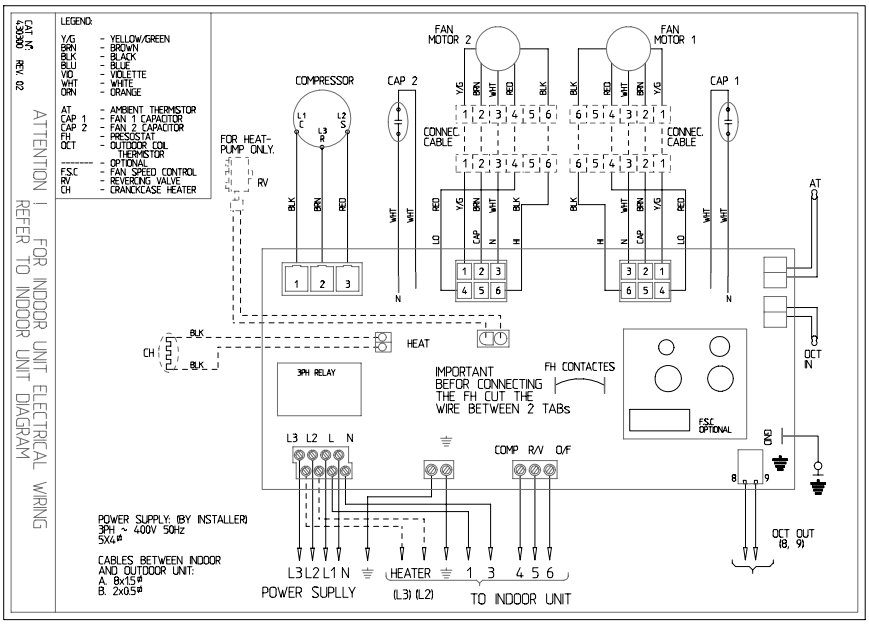


5,7 EMD 60 3PH
OUTDOOR POWER SUPPLY

INDOOR



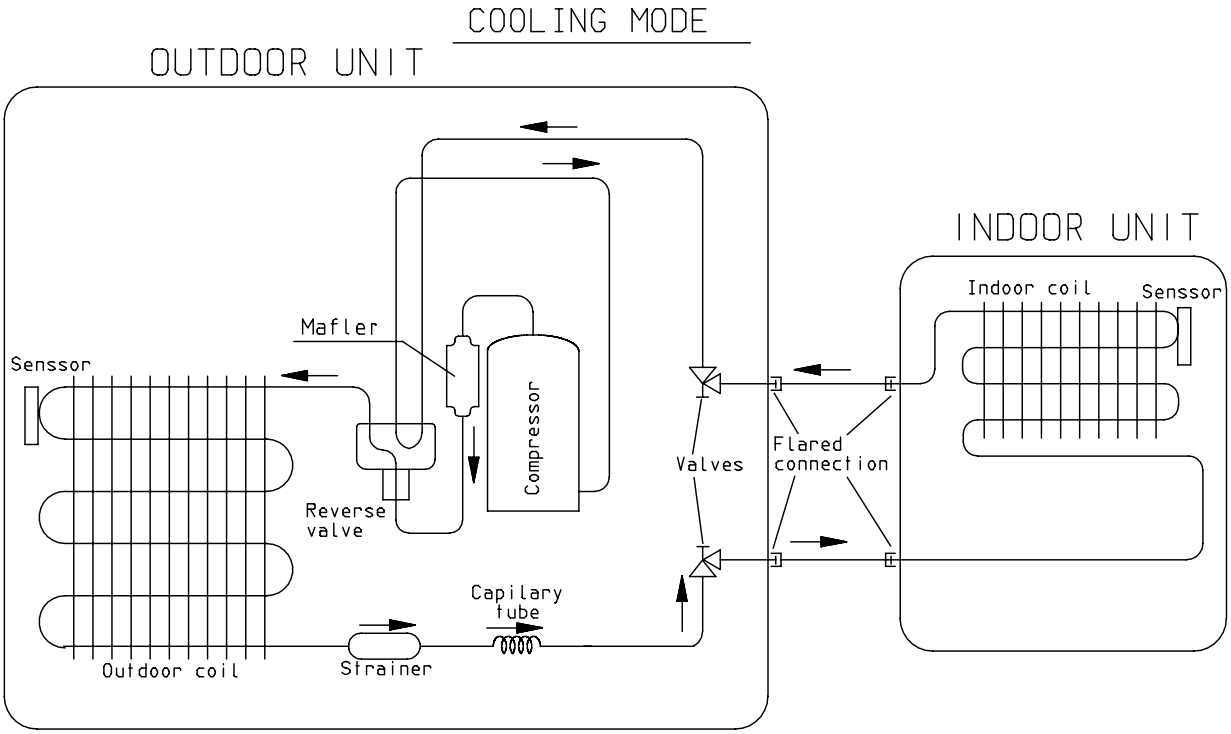
OUTDOOR

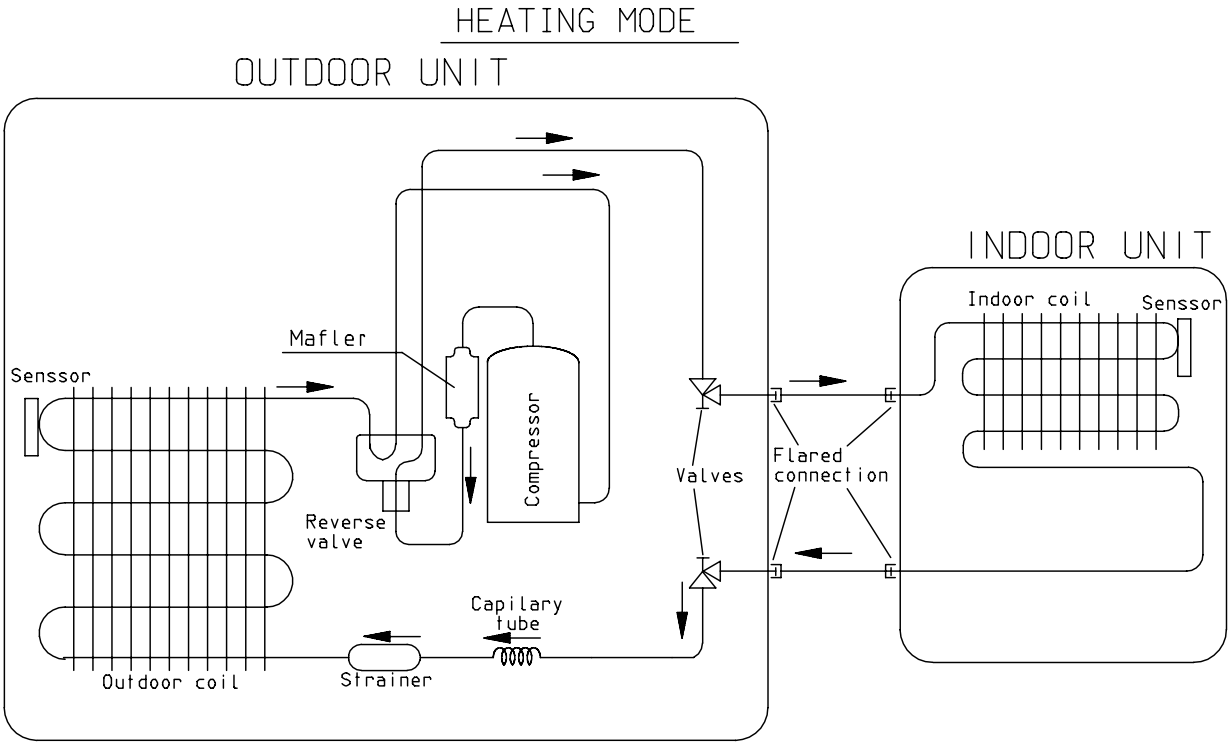


6. REFRIGERATION DIAGRAMS

6.1 Model: EMD 27 RC

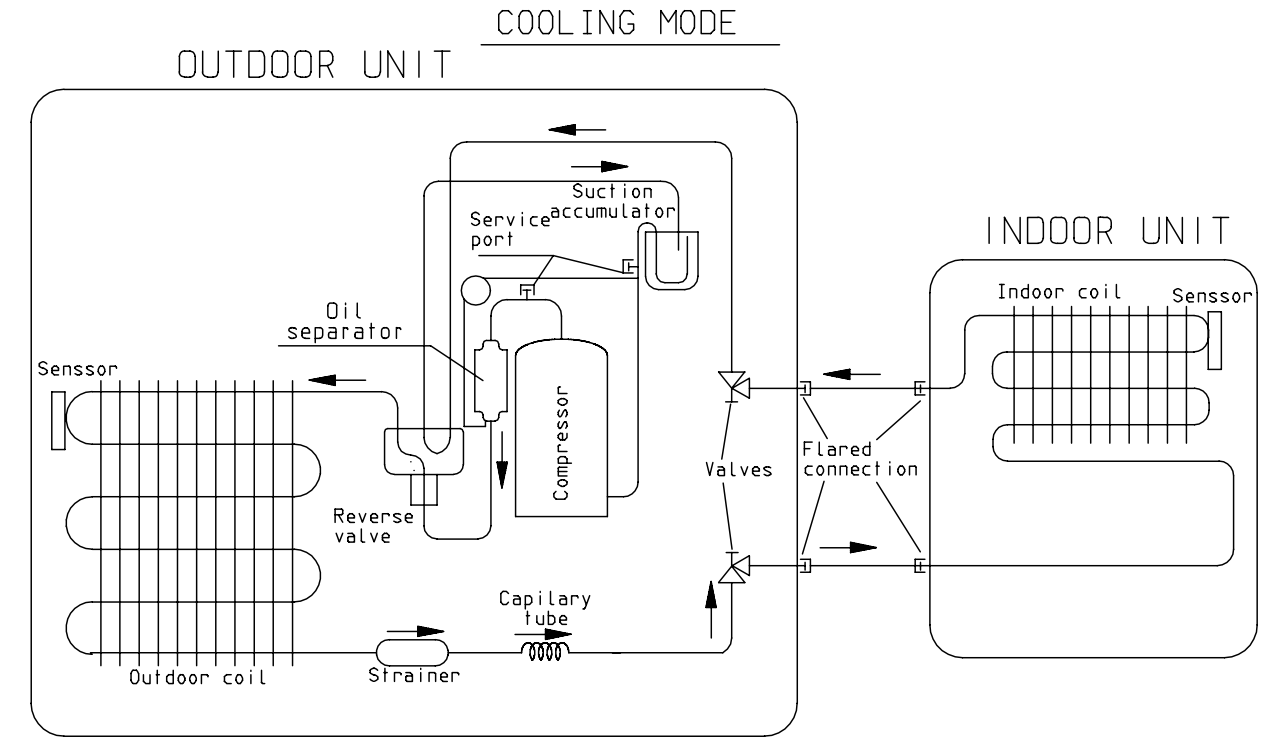
Heat Pump

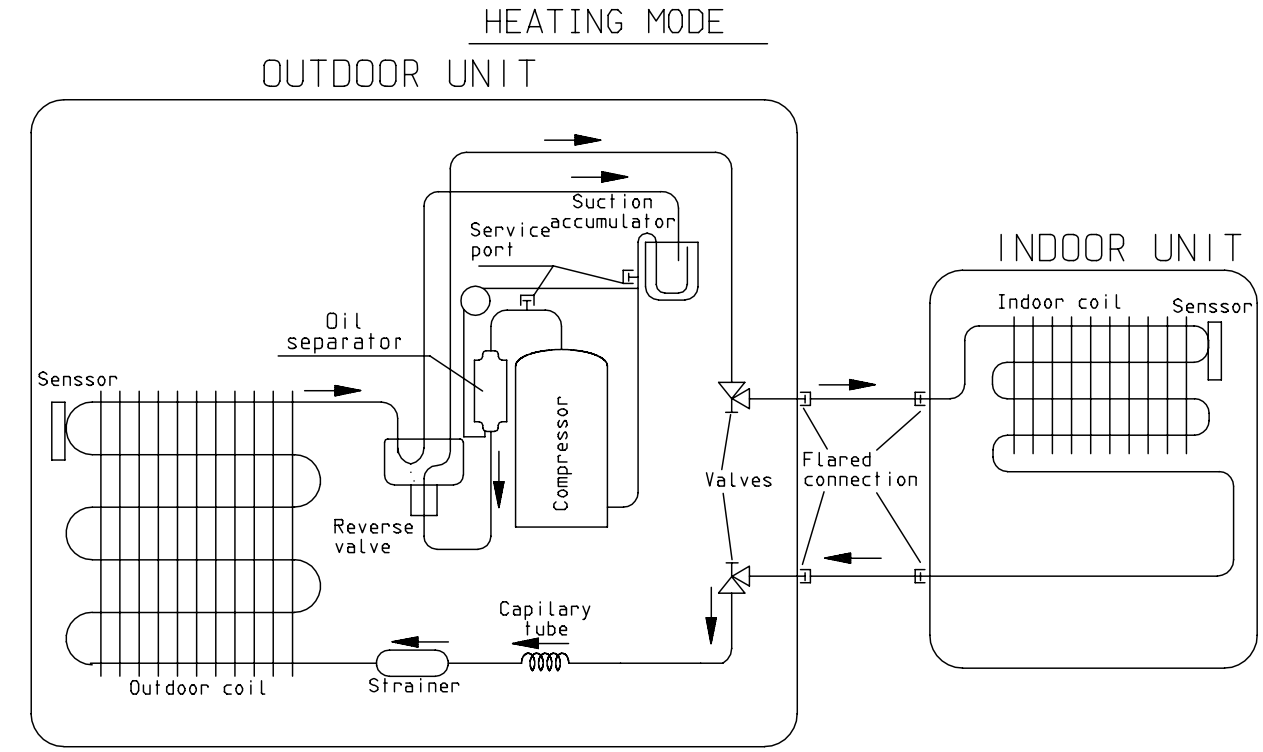




6.2 Model: EMD 35 RC

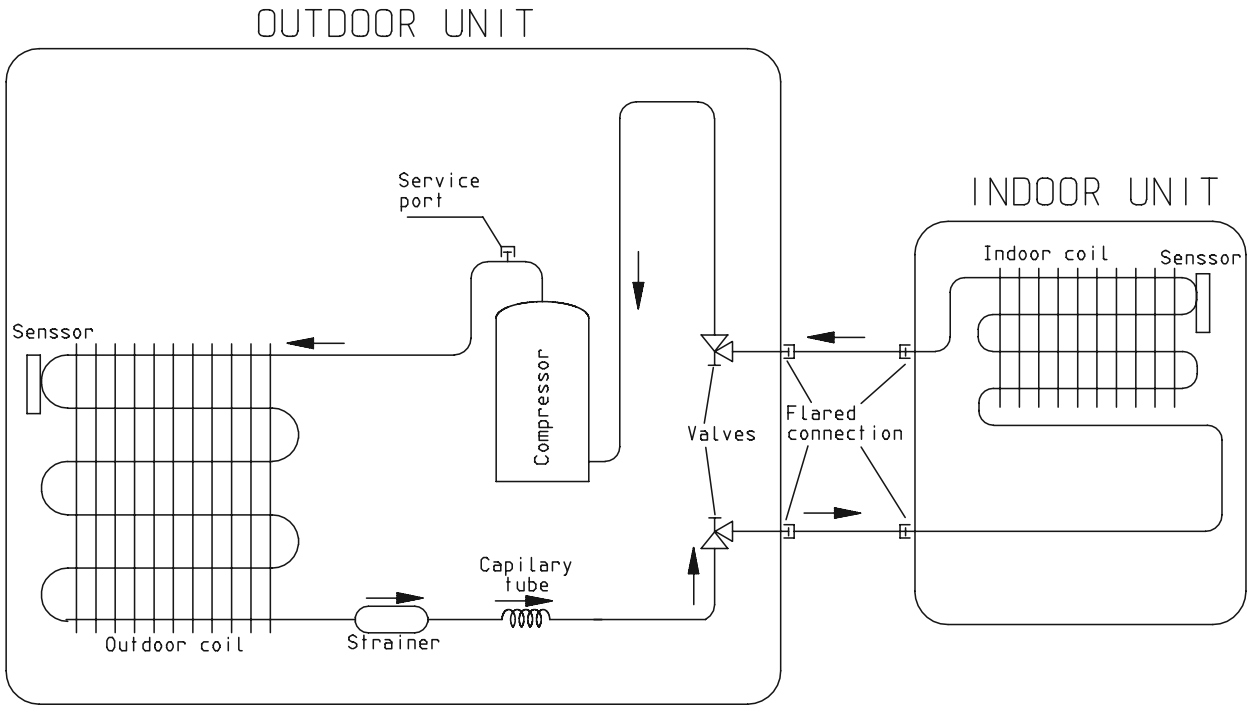
Heat Pump





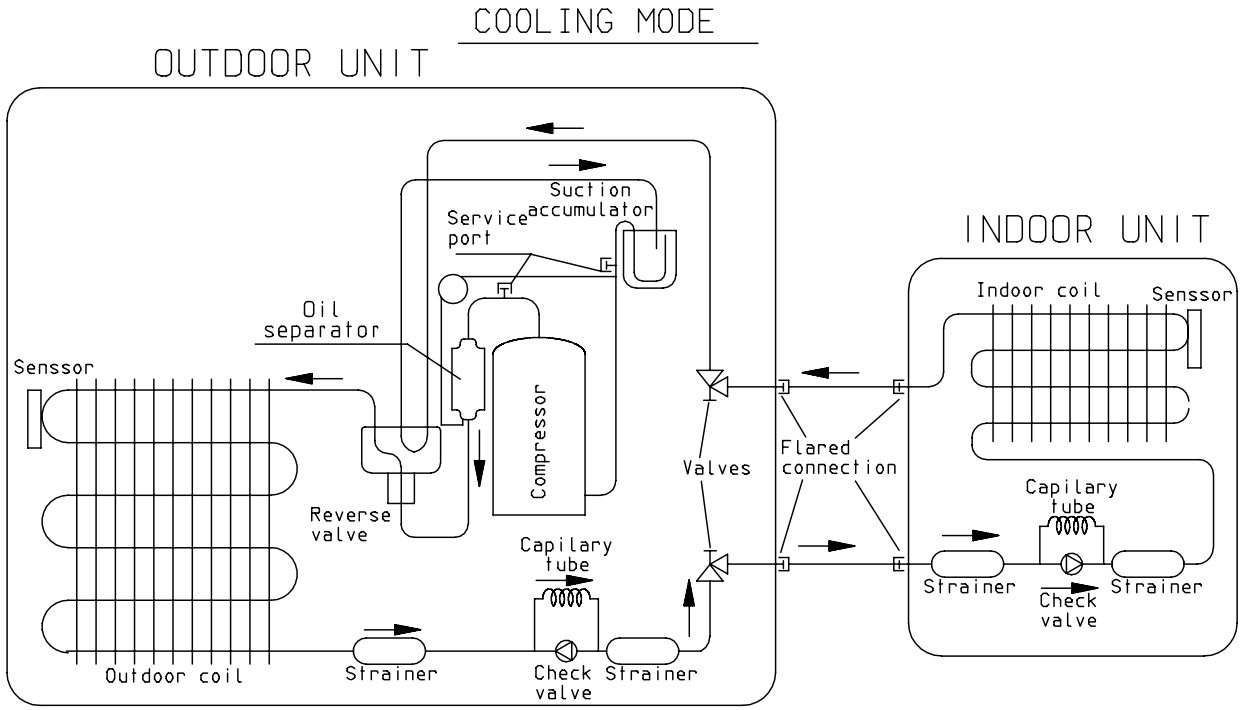
6.3 Models: EMD 27, 35 ST

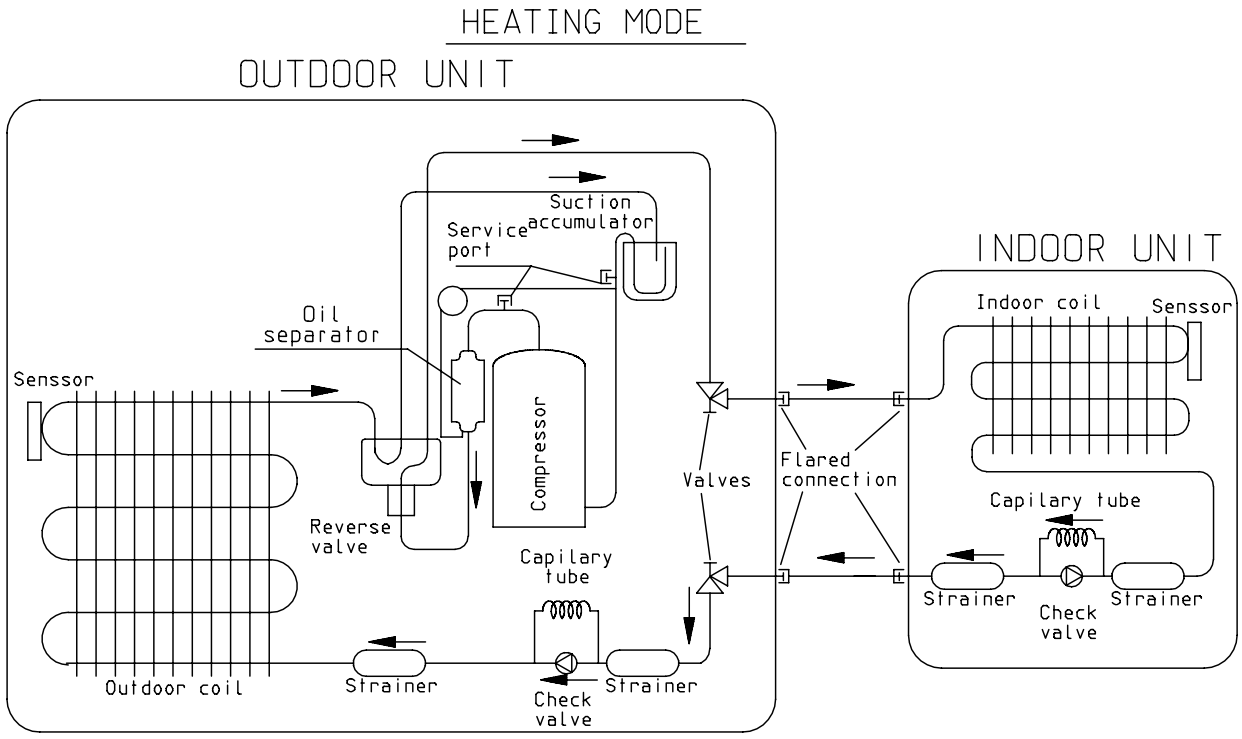
Cooling Only



6.4 Models: EMD 40, 45, 50, 60 RC

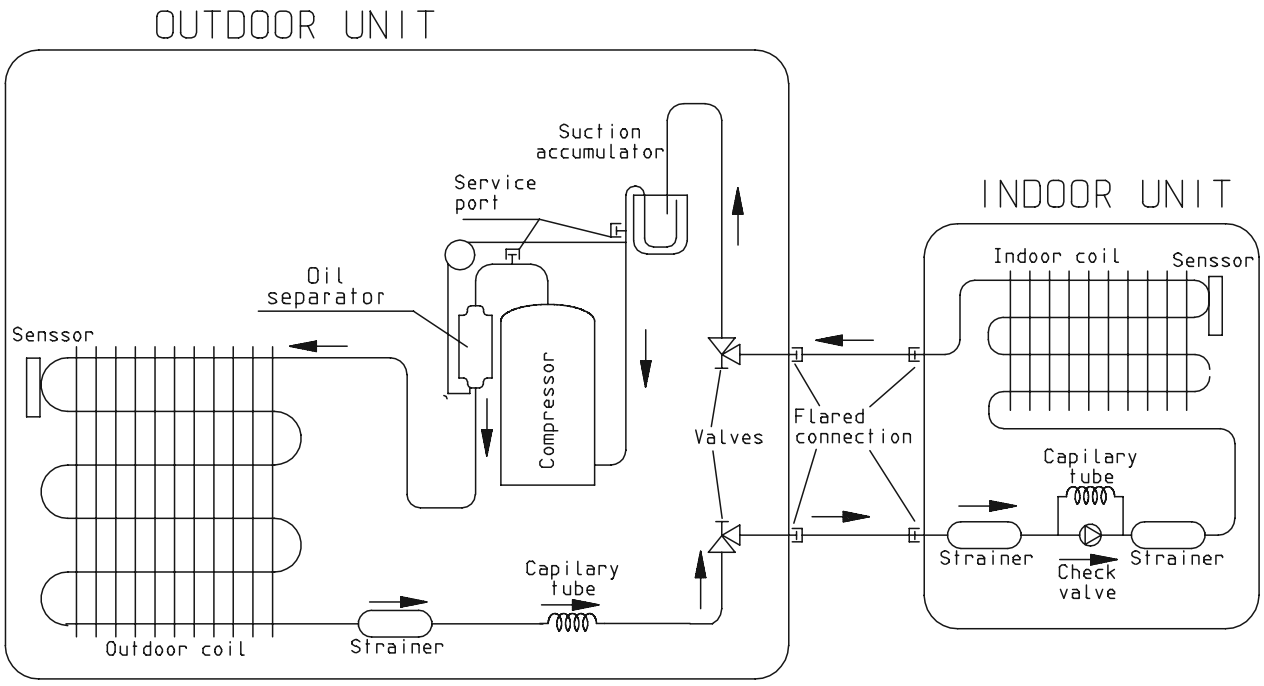
Heat Pump





6.5 Model: EMD 40, 45, 50 ST

Cooling Only

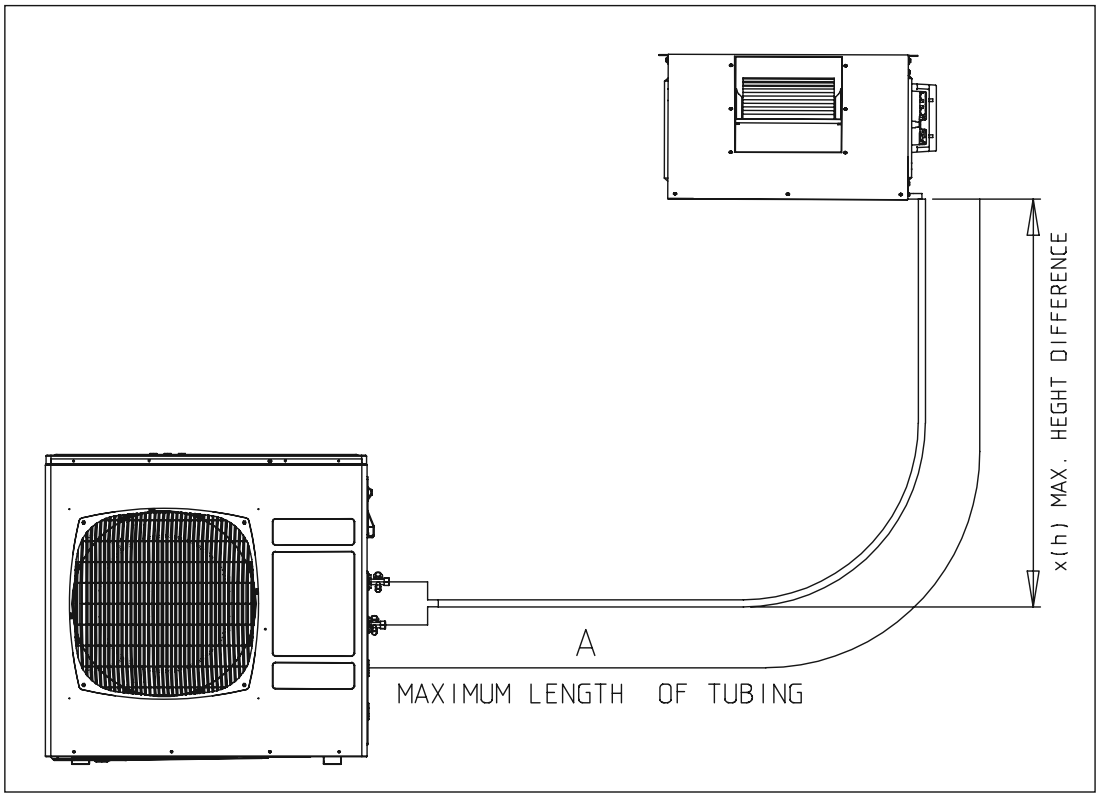


6.6 Additional Refrigerant Charge (R 22, R407C gr.)

MODEL	REFRIGERANT TUBING LENGTH (ONE WAY)				
	10m	15m	25m	30m	50m
EMD 27	60	185	435	-	-
EMD 35	60	185	435	560	-
EMD 40	75	225	525	675	1275
EMD 45	75	225	525	675	1275
EMD 50	75	225	525	675	1275
EMD 60	100	300	700	900	1700

MAXIMUM REFRIGARANT TUBING LENGTH AND HEIGHT DIFFERENCE

MODEL	LENGTH (m) (A)	HEIGTH DIFFERENCE (m)
EMD 27	25	10
EMD 35	30	10
EMD 40	50	25
EMD 45	50	25
EMD 50	50	25
EMD 60	50	25



* THE INDOOR UNIT CAN BE ABOVE OR BELOW THE OUTDOOR UNIT.

7. CONTROL SYSTEM

Instructions for

Electronic Control Service Package

INTRODUCTON

The electronic control package is designated for service and is common for the following group of air-conditioners.

1. **ST/RC** group - Cooling only / Cooling and Heating by heat pump.
2. **SH** group - Cooling and Heating by heat pump and supplementary heater.
3. **RH** group - Cooling and Heating by heaters only.

Before installation , be sure that you select and set for the right group .

PACKAGE CONTENT

The following should be included in the electronic control service package:

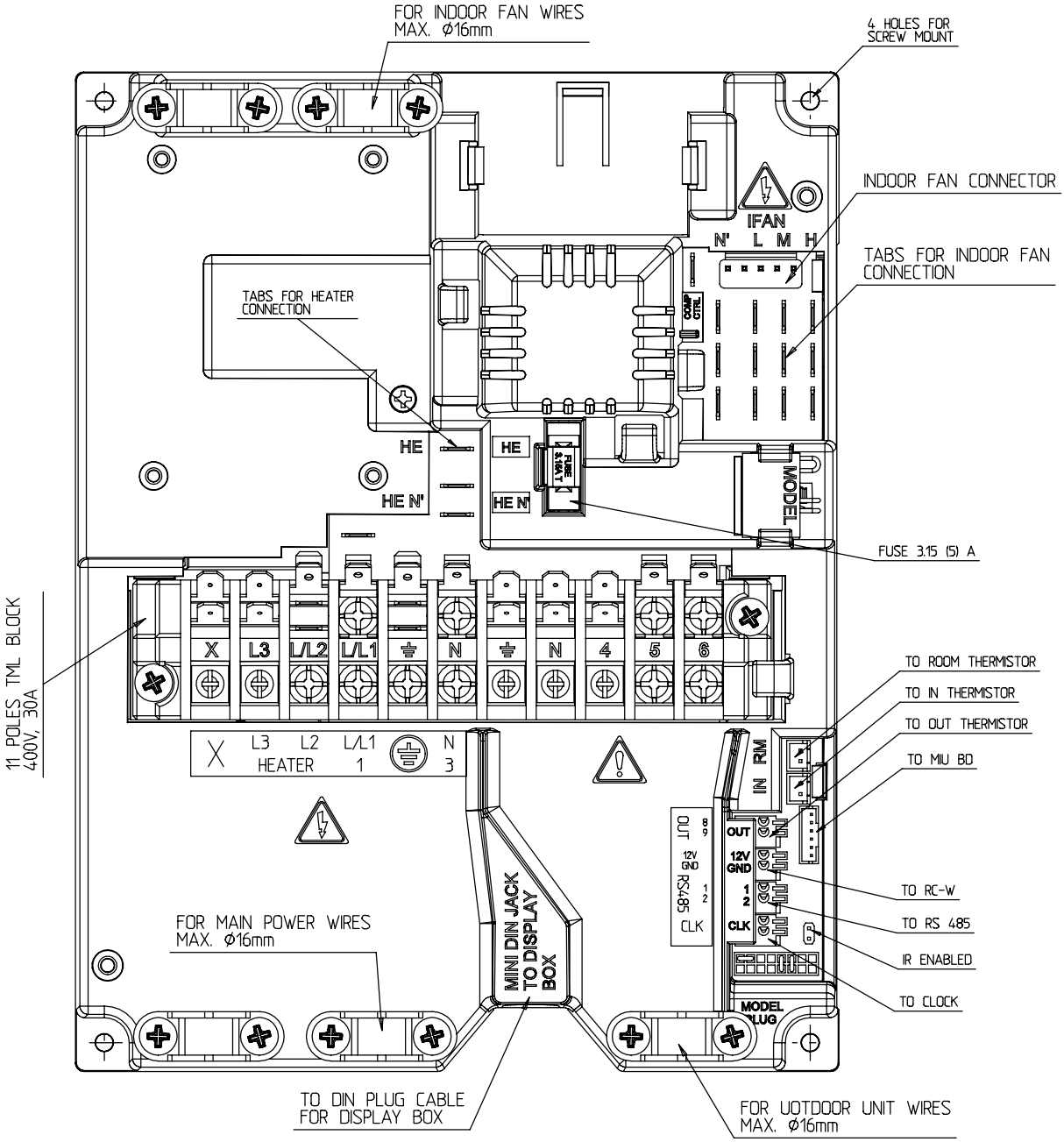
- Controller designated for service
- Model plug

MODEL PLUG SETTINGS

Before installation, make sure to set the model plug to conform with the suitable group.

GROUP	**J6** Setting	**J2** Setting
ST / RC	open	open
SH	closed	open
RH	closed	closed

POWER CONTROLLER



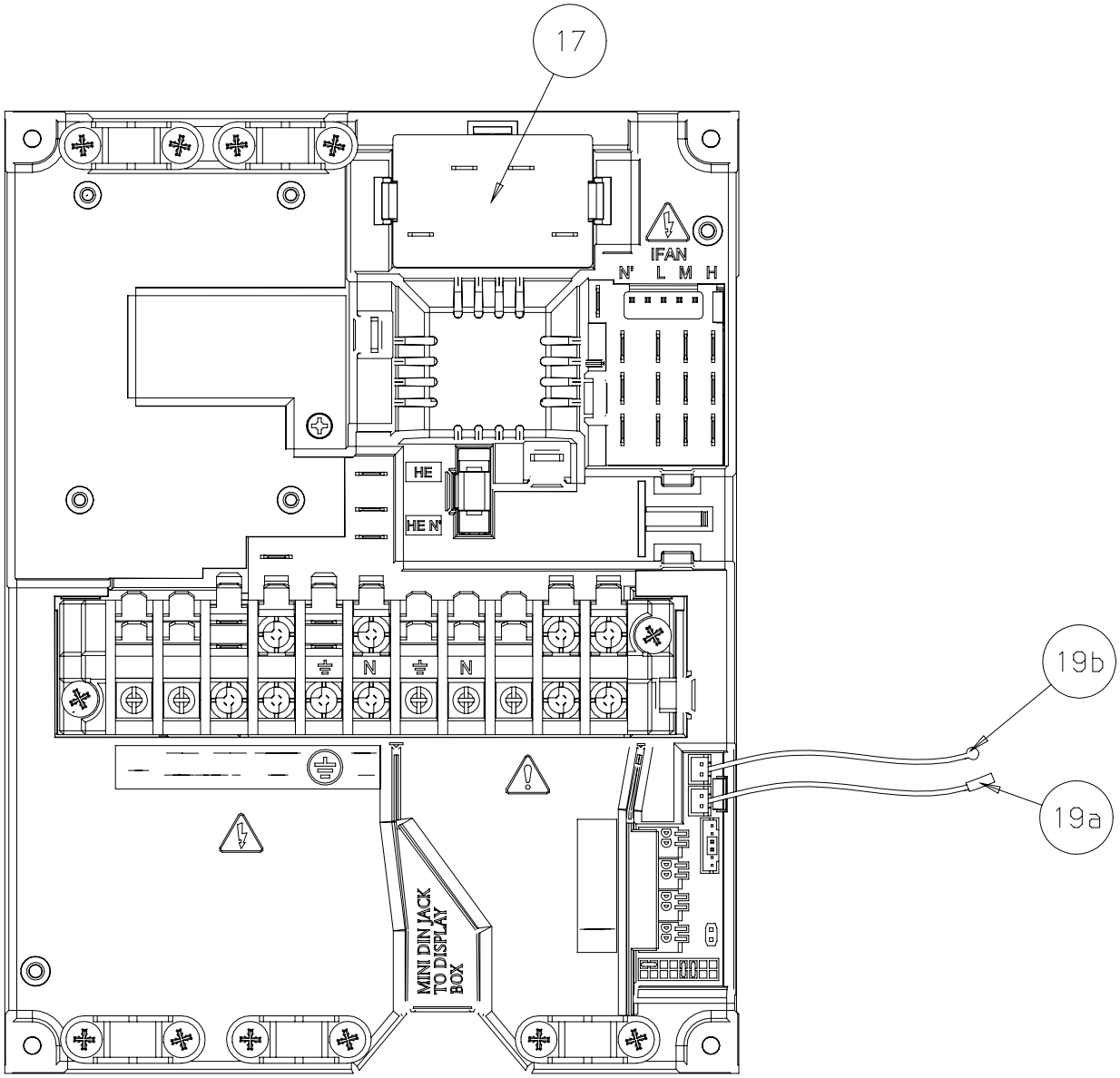
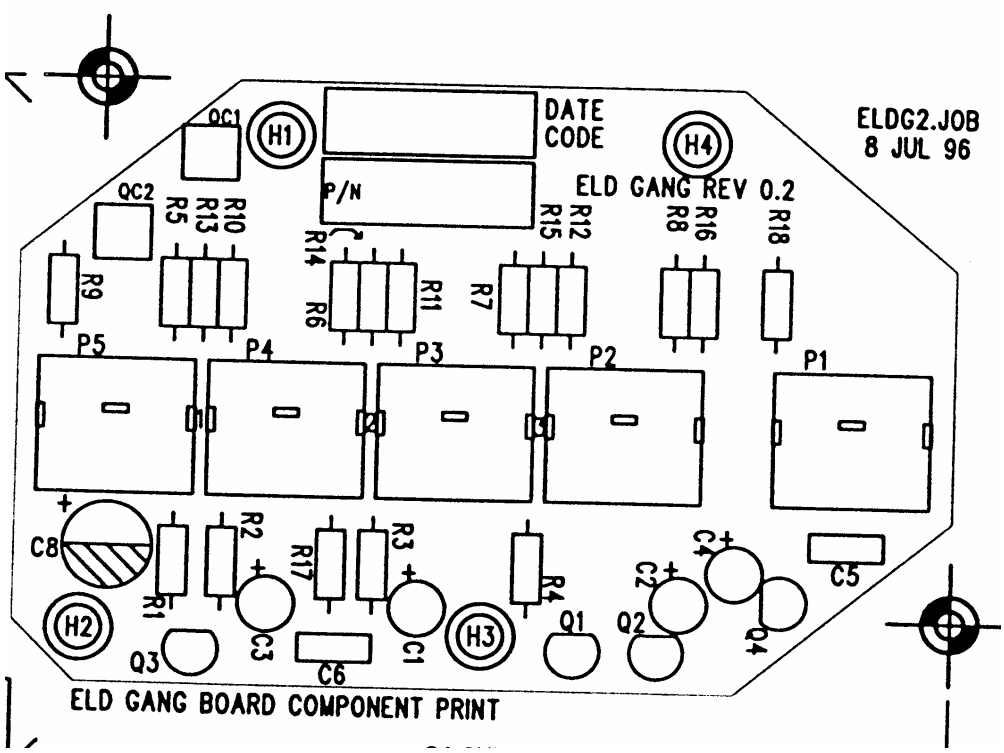


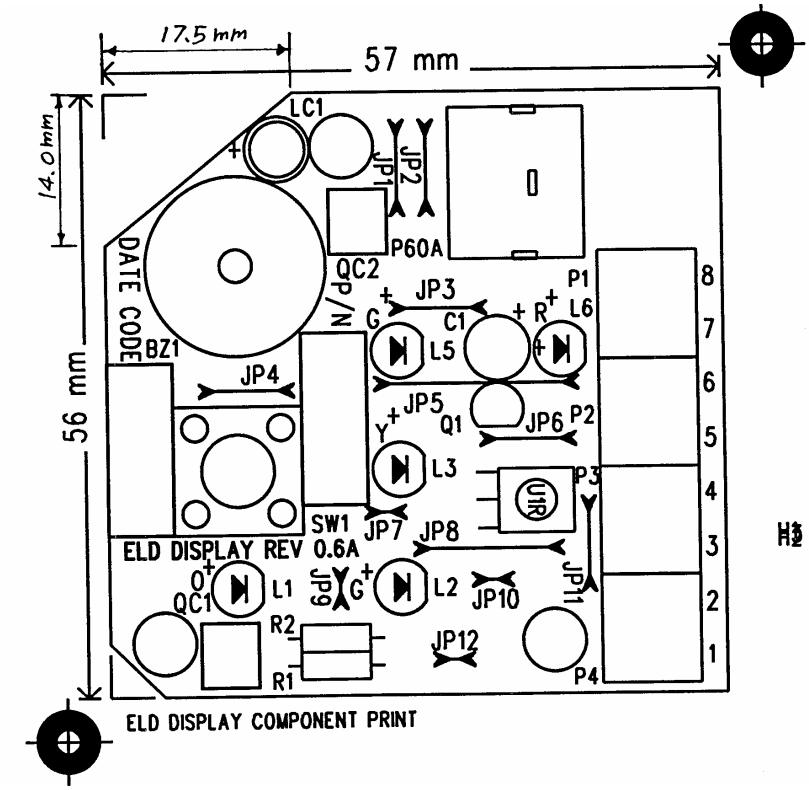
FIG.4 ELECTRICAL ASSEMBLY – EMD

FOR COMPONENTS DESCRIPTION AND CATALOG NUMBERS REFER TO SPARE PARTS LIST FOR THE RELEVANT PRODUCT NO.

GANG BOARD



DISPLAY BOARD



CONFIGURATION OF THE APPLIANCE

REMOTE CONTROL DIP SWITCH SETTING

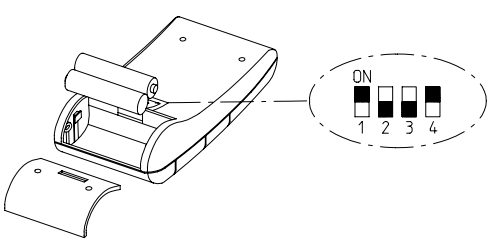
SETTING SWITCH STATUS				DEFINITION	
SW. NO. 1	SW. NO. 2	SW. NO. 3	SW. NO.4	RC3	RC4
OFF	OFF	_	_	RC-ALL MODES OF OPERATION	
ON	OFF	_	_	STD-COOL, FAN, DRY, ACTIVE	
OFF	ON	_	_	HEAT-COOL, FAN, DRY, ACTIVE	
ON	ON	_	_	AUTO FAN (AF)	
_	–	OFF	_	TEMP. DISPLAY IN °C DEGREES	VERTICAL SWING ONLY
_	–	ON	_	TEMP. DISPLAY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

RESET OPERATION - Press at the same time the 4 buttons :“CLEAR “, “SET” , "HR +”, “HR -” for 5 seconds

LEGEND:

SW1, SW2 - SELECTION OF RC/ST
SW3 - SELECTION OF TEMP. DISPLAY °C or °F IN RC3 OR SWING FUNCTION IN RC4.
SW4 - SELECTION OF TIME DISPLAY 12H AM/PM or 24H IN RC3 0R ILLUMINATION FUNCTION IN RC4.
OFF = 0
ON =1

NOTE: After setting the dip switches perform reset operation..



1 Legend

1.1 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	- Infra Red
LEVEL1	- Normal Water Level
LEVEL2/3	- Medium/High Water Level
LEVEL4	- Overflow Level
Max	- Maximum
Min	- Minimum
min	- Minute (time)
NA	- Not Applicable
OCP	- Outdoor Condensation Pump
OCT	- Outdoor Coil Temperature (RT3) sensor
OF, OFAN	- Outdoor Fan
OPER	- Operate
Para.	- Paragraph
RAT	- Return Air Temperature (RT1) sensor
RC	- Reverse Cycle (Heat Pump)
R/C	- Remote Control
RCT	- Remote Control Temperature
RH	- Resistance Heater
RT	- Room Temperature (i.e. RCT in IFEEL mode, RAT otherwise)
RV	- Reversing Valve
SB, STBY	- Stand-By
sec	- Second (time)
Sect	- Section
SH	- Supplementary Heater
SPT	- Set Point Temperature
ST	- Standard (a Model with Cooling Only)
S/W	- Software
TEMP	- Temperature
W/O	- Without
ΔT	- The difference between SPT and RT. in Heat Mode: ΔT = SPT - RT in Cool/Dry/Fan Mode: ΔT = RT - SPT

2 General functions for all models

2.1 COMP operation

2.1.1 For each Mode including POWER OFF & SB, a Min time delay of 3 min before COMP restarting, excluding DEICING Mode (see 7.2.1).

2.1.2 The Min operation time of COMP under different operating conditions is

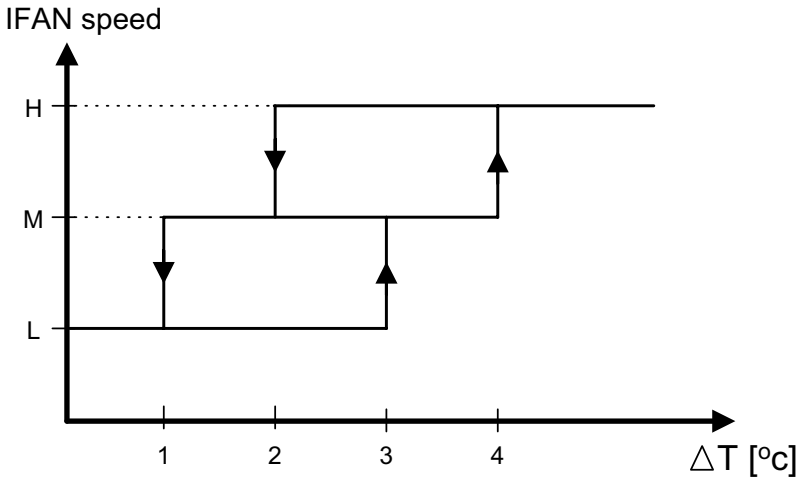
Operation Mode	Min operation time of COMP
Heat, Cool, H.P protection or Auto Modes	3 min.
Fan, Dry, Overflow, Protection modes, or mode change	ignored

2.2 IFAN operation

2.2.1 Min time interval between IFAN speed change in AUTOFAN Mode, is 30 sec.

2.2.2 Min time interval between IFAN speed change in H/M/L Mode is 1 sec.

2.2.3 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: $\Delta T = RT - SPT$

2.3 OFAN operation

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

2.4 HE operation

2.4.1 Minimum Heaters ON or OFF time is 30 sec.

2.4.2 Heaters can never be in operation while IFAN is OFF.

2.4.3 In RH group, HE-1 and HE-2 will be activated only when COMP is not operating, except in Dry Mode.

2.5 Protections

2.5.1 High pressure protection is applicable to all operating modes.

2.5.2 Deicing control is valid in Heat and Auto Heat Mode only.

2.5.3 Defrosting control is valid in Dry, Cool, and Auto Cool Modes.

2.6 Thermistors operation

2.6.1 Return air Temp. is detected by RAT in normal Mode, or by RCT (R/C sensor) in I-FEEL Mode.

2.6.2 Indoor Coil Temp. is detected by ICT.

2.6.3 Outdoor Coil Temp. is detected by OCT.

2.6.4 Definition of thermistor faults:

a. Thermistor is disconnected -

The thermistor reading is below -30°c.

b. Thermistor is shorted -

The thermistor reading is over 75°c.

c. Thermistor Temp reading doesn't change -

(i) This test is performed only once after a unit is switched from OFF/STBY to operation. At the first occurrence of 10 min continuous COMP operation, the current ICT are compared with those when the COMP was switched from OFF to ON 10 min before. If the ΔT is less than 3°c, the thermistor is regarded as defective.

(ii) The ICT no-change error can be disabled together by connecting a 4.7 k ohm resistor (5%) to the ICT connector. These resistors are equivalent to a thermistor 48+/-1°c.

2.6.5 Cases for disabling ICT thermistor disconnected detection

i. 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.

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

2.7 RV Fault

This test is applied only in compressor units where 4.7k Ohm is not connected to the OCT.
This test is performed every time the unit is switched from OFF/STBY to OPER in Heat mode or changes operation mode from COOL/DRY to HEAT or (this applies also in AUTO COOL/HEAT mode).

If ICT is lower than 35^{0}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 in more than 5 ^{0}C.

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

2.8 General features

2.8.1 Allowed (control target) rage for RAT is SPT +/-1°C.

2.8.2 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.

3 Cooling Mode

3.1 Cooling Mode – General

3.1.1 Mode Definition

MODE: COOL, AUTO (AT COOLING)

TEMP: SELECTED DESIRED TEMPERATURE.

FAN: HIGH, MED, LOW, AUTO.

TIMER: ANY

I FEEL: ON OR OFF

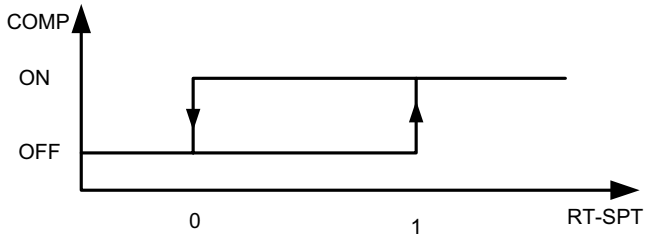
3.1.2 Room Temperature, RT, is detected by
- RAT in normal operation, or
- RCT (R/C sensor) in I-FEEL mode.

3.1.3 Indoor Coil Temp is detected by ICT.

3.1.4 Outdoor Coil Temp is detected by OCT.

3.2 Control Functions

3.2.1 COMP Operation



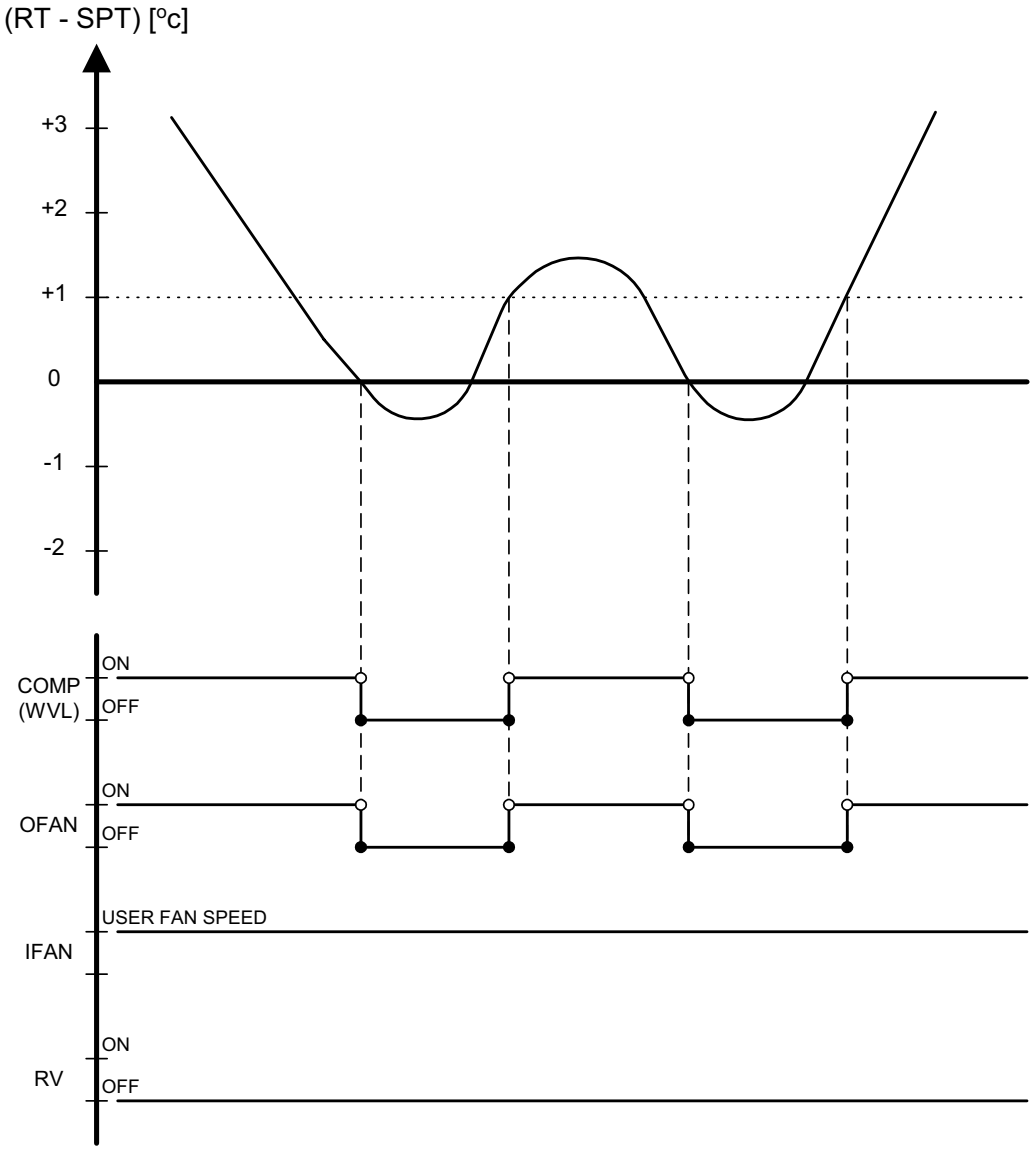
3.2.2 OFAN Operation
- In normal operation OFAN operates together with the COMP.

3.2.3 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 (sect. 2.2)

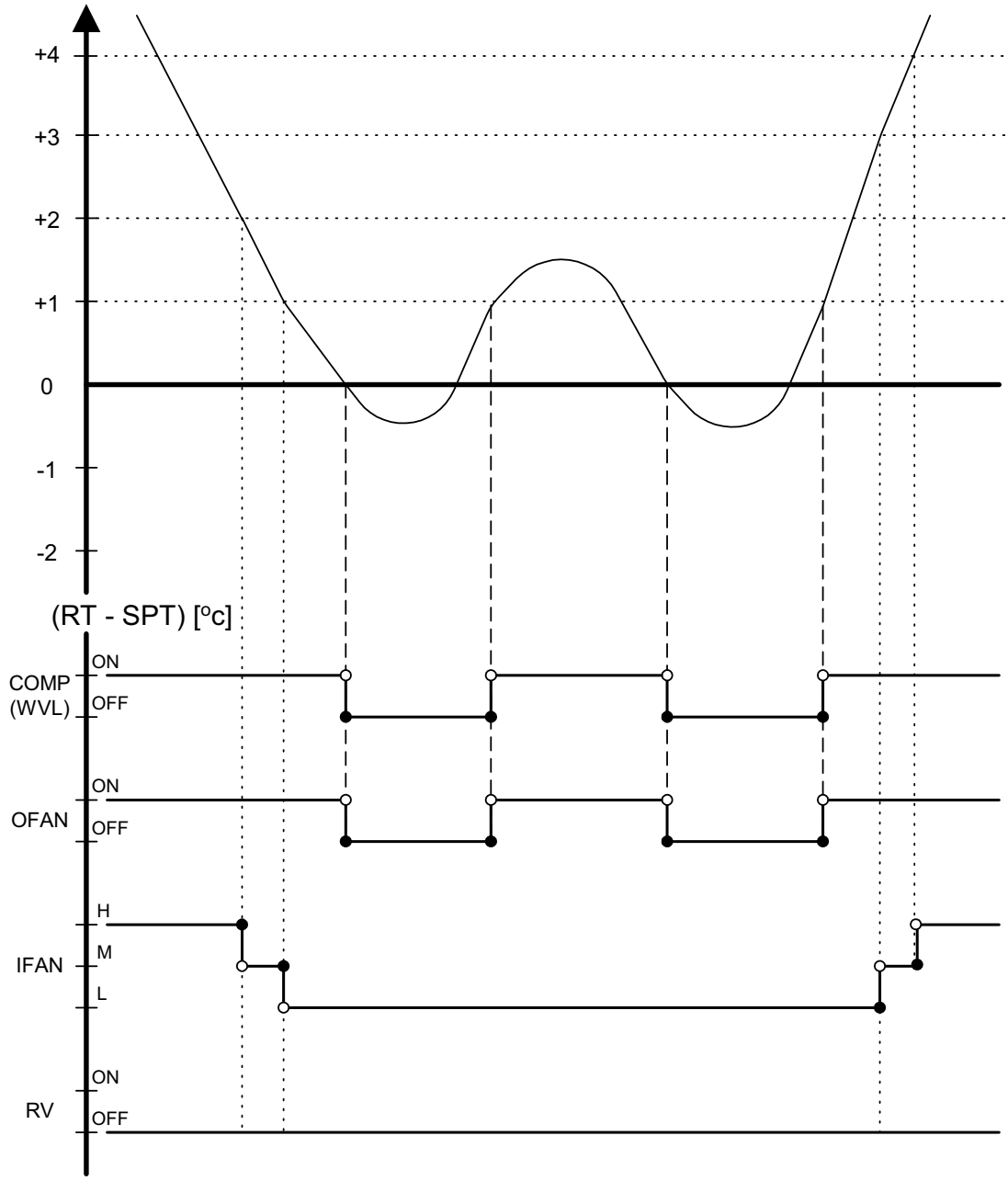
3.2.4 RV and HEATERS outputs
- RV and HEATERS are in OFF state in cool mode.

3.3 Sequence Diagrams

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



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



Note: Refer to Sect 2.22.2 for IFAN operations in Auto-fan mode.

4 Heating Mode

4.1. Heating Mode - General

4.1.1. Compensation Procedure

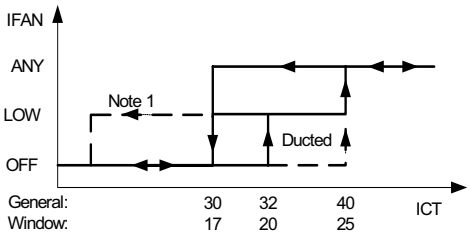
When I feel is OFF during heat mode: RT= RAT – CTV.
When I feel is ON during heat mode: RT= RCT.

Model	CTV
WNG, WMN, RWK.	+3 °C
MBX, PX, PRX, P2000, PXD	+0 °C
WMF, WAX	+2 °C
EMD/ELD	+4 °C
ECC-K	+4 °C

No compensation will be activated in Forced operation modes (Cf. Sect 11).

4.1.2. IFAN operation rules for RC and SH groups

(a) 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:

(1) ICT<28 and IFAN is on for 5 min or longer.
Or,
(2) 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.

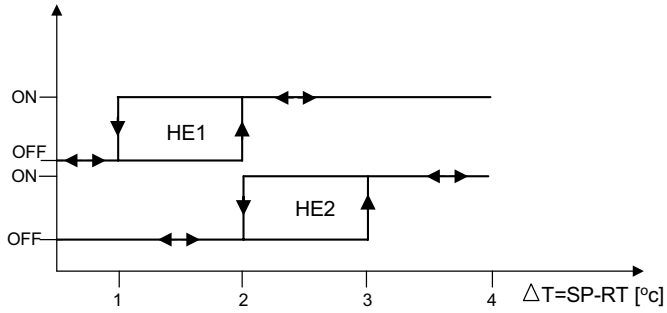
(b) In **SH or RC group**, IFAN will operate for min 30 sec according to 0-(a) after HE's turned off, where in a case it has to be OFF, it will be forced to low speed.

4.1.1 IFAN operation rules for **RH group**

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

4.1.2 Heaters operation rules for **RC and SH groups**

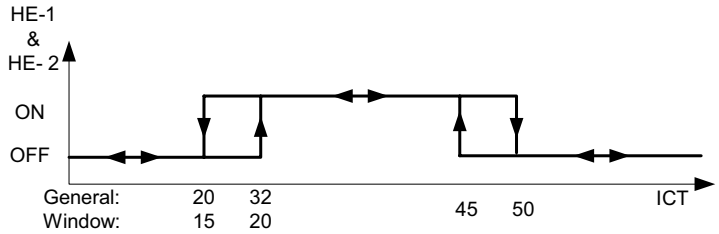
(a) For both **RC** and **SH groups**, Heaters versus ΔT is as the following:



(b) Operation rules for Heaters in **RC group**:

(i) Heaters can be enabled only if IFAN is ON.

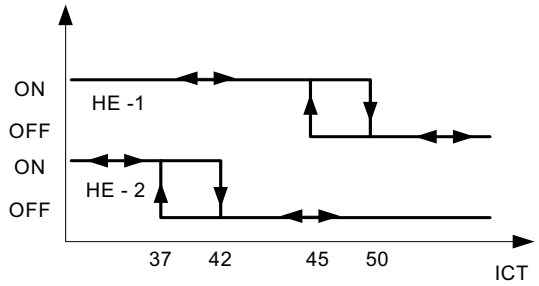
(ii) Heaters will operate according to ΔT **and** the following graph:



(c) Rules for Heaters operation in **SH group**:

(i) When heaters are to be ON and IFAN is to be OFF according to 4.1.2 (a), IFAN will be forced to low speed.

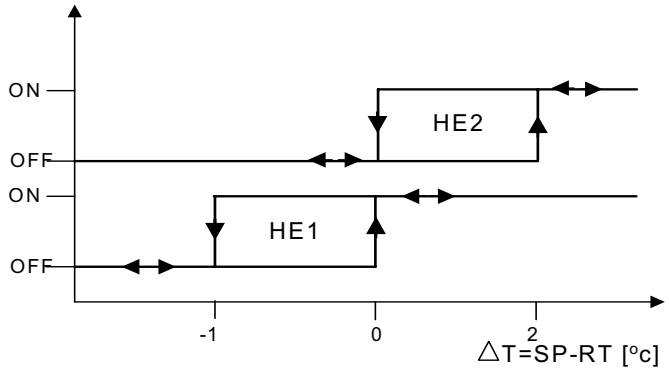
(ii) Heaters will operate according to ΔT **and** the following graph:



(d) For both **RC** and **SH** groups, excluding deicing, HE1 and HE2 can be on only when the compressor is on.

4.1.5 Heaters operation rules for **RH groups**

(a) In **RH group**, HE operation is according to the difference between RAT and SPT.



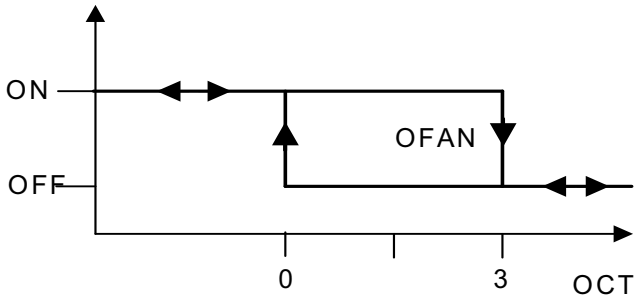
4.1.6 OFAN Operation for **RC and SH groups**

(i) As a general rule for **RC and SH groups**, excluding protection modes, OFAN starts with the compressor.

(ii) When OFAN is then ON it will operate according to the following conditions:

a) OFAN operates together with the compressor.

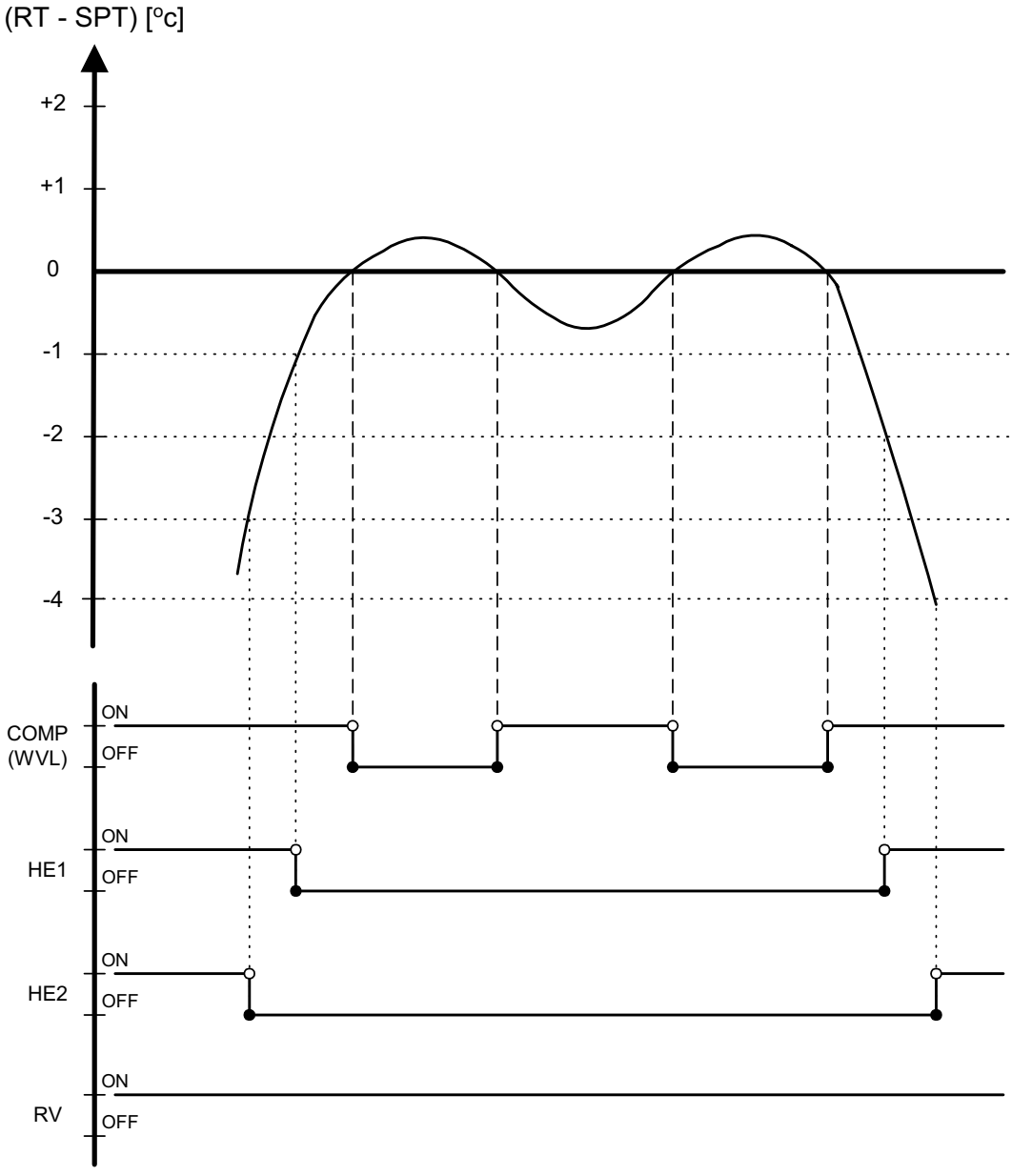
b) When $(RT \geq SPT - 2)$ *and* $ICT \geq 50$ and the 4.7k Ohm resistor is not connected to the OCT, OFAN will operate according to the following curve:



4.2. 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

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

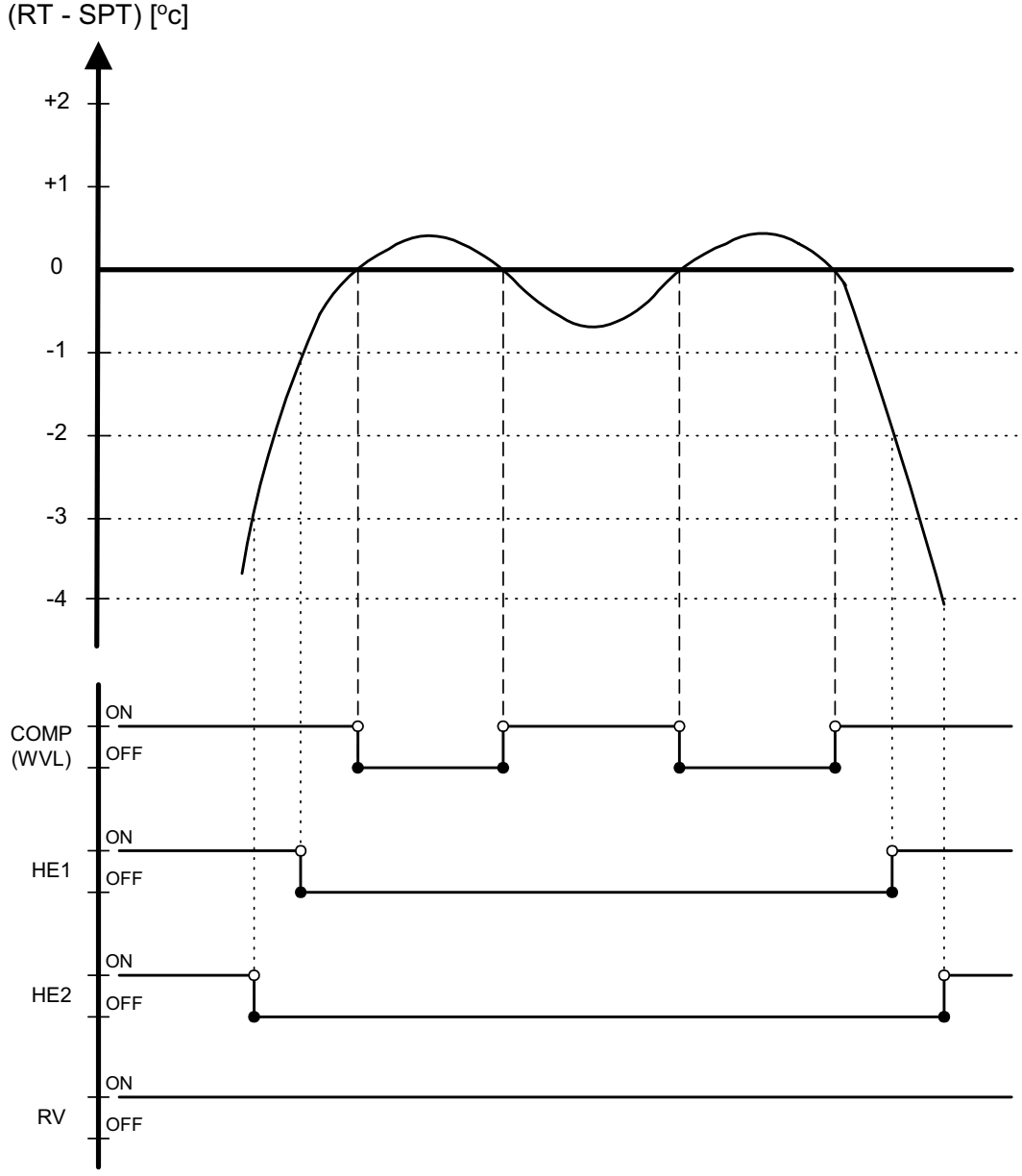


4.3. Heating, RC or SH Group with Autofan

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

Sequence Diagram

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

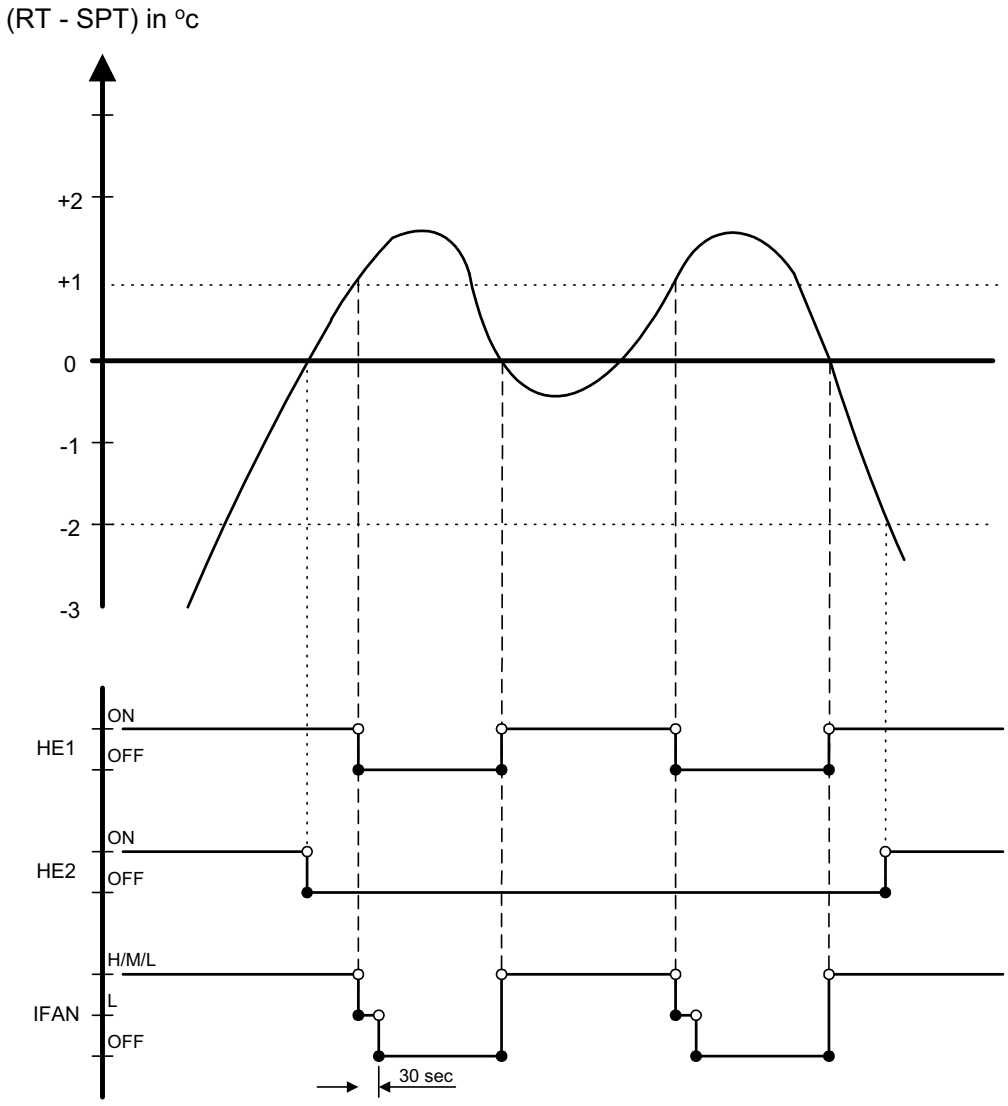


4.4. Heating, RH Group

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

Sequence Diagram

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

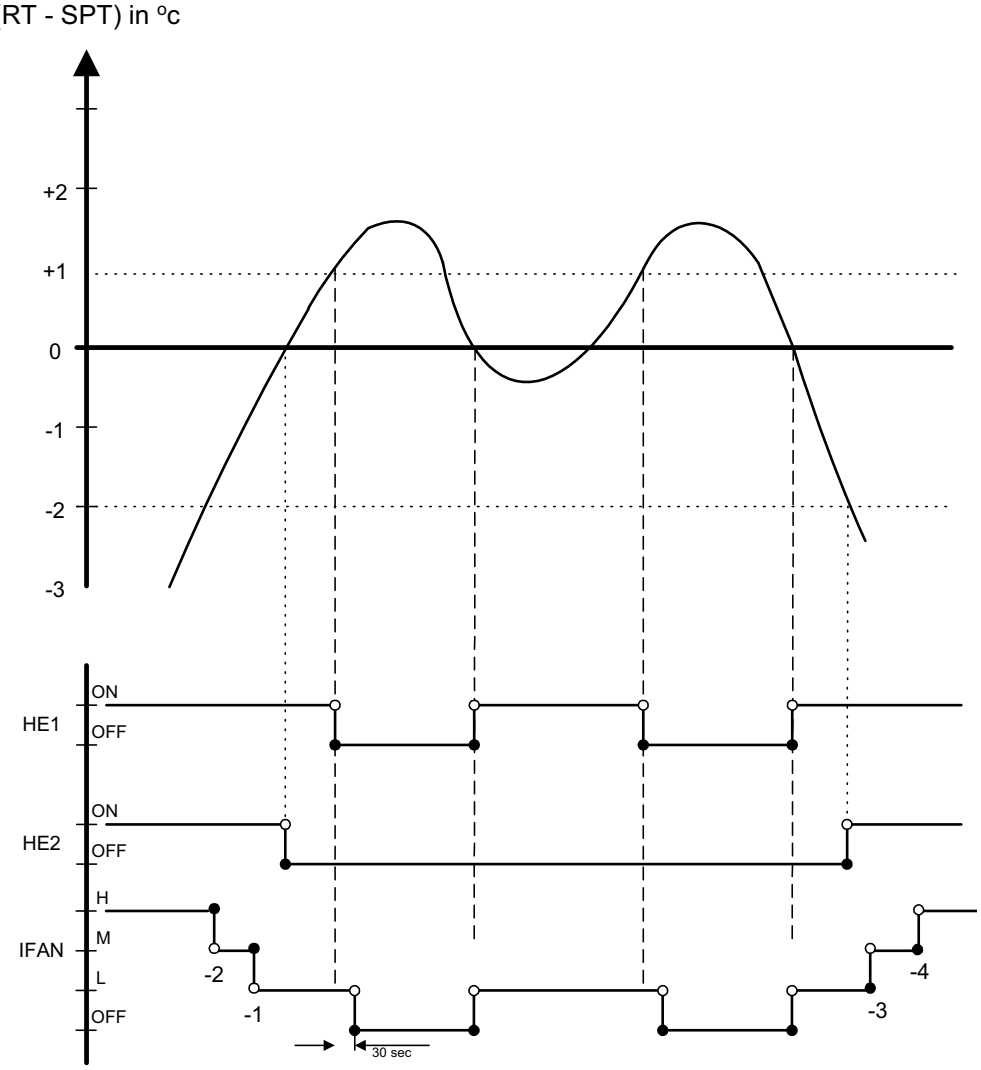


4.5. Heating, RH Group, with Autofan

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

Sequence Diagram

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



5 Automatic Cooling or Heating

5.1 Automatic Cooling or Heating - General

The Auto Mode is for model with compressor and the WVL-RH only. The WVL-ST, RC and SH units do not work in Auto Mode.

5.1.1 Mode Definition

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

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

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

5.1.4 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

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

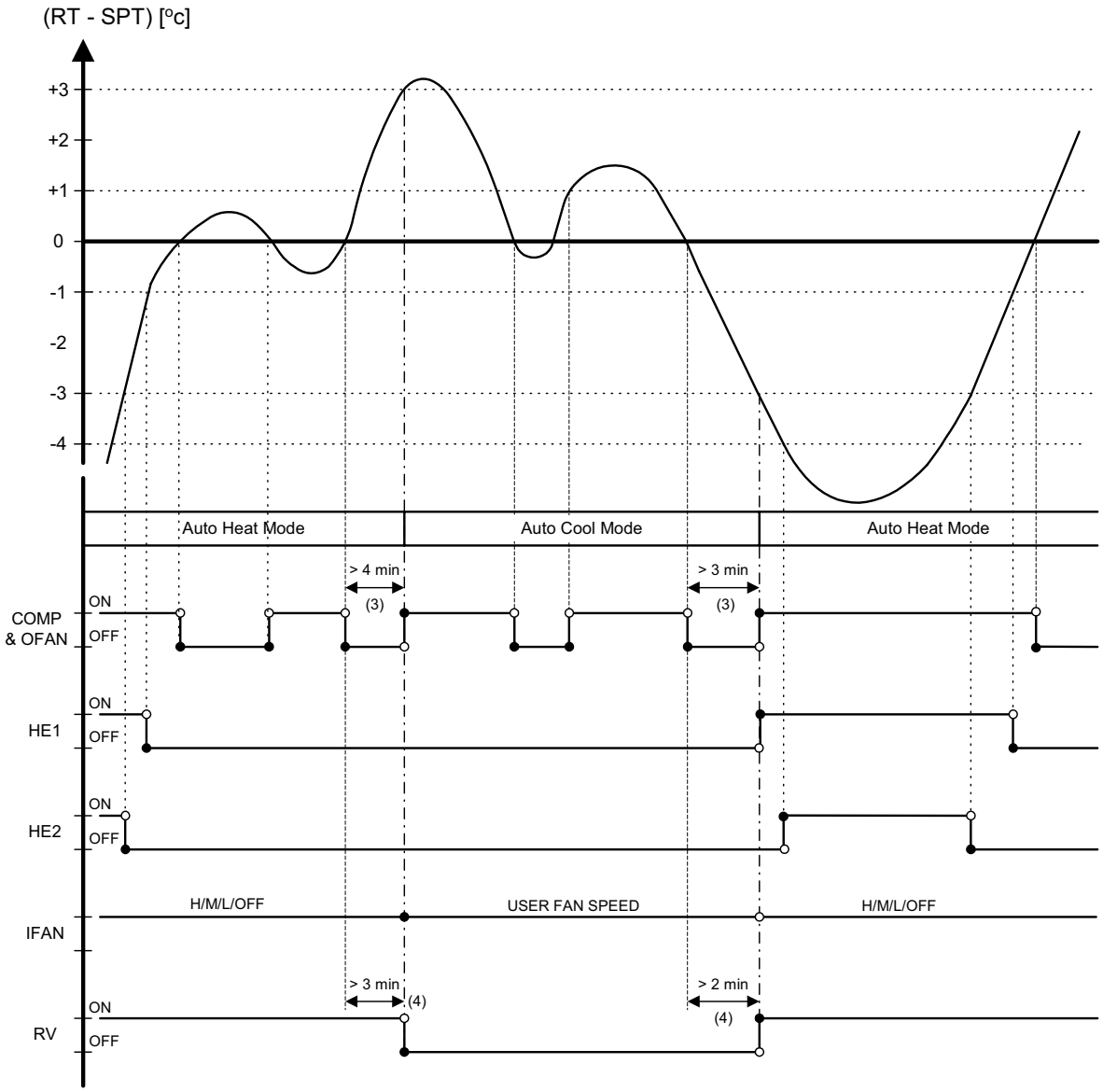
Mode Change	time, T
Auto Cool to Auto Heat	COMP off for 3 min
Auto Heat to Auto Cool	HEs off for 3 min

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

5.2 Sequence Diagrams

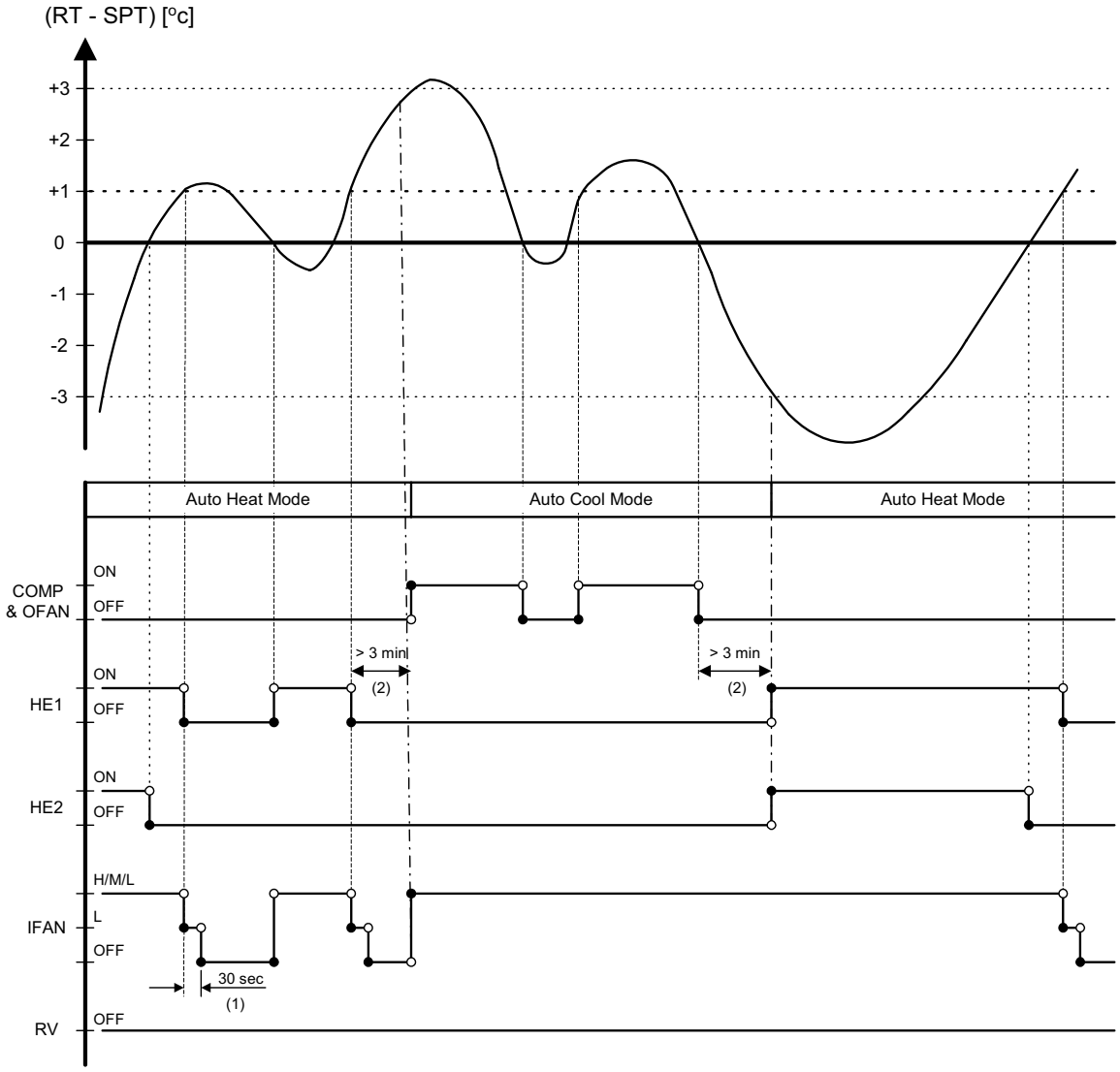
5.2.1 Auto Cooling or Heating, RC or SH Groups

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



5.2.2 Auto Cooling or Heating RH Group

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

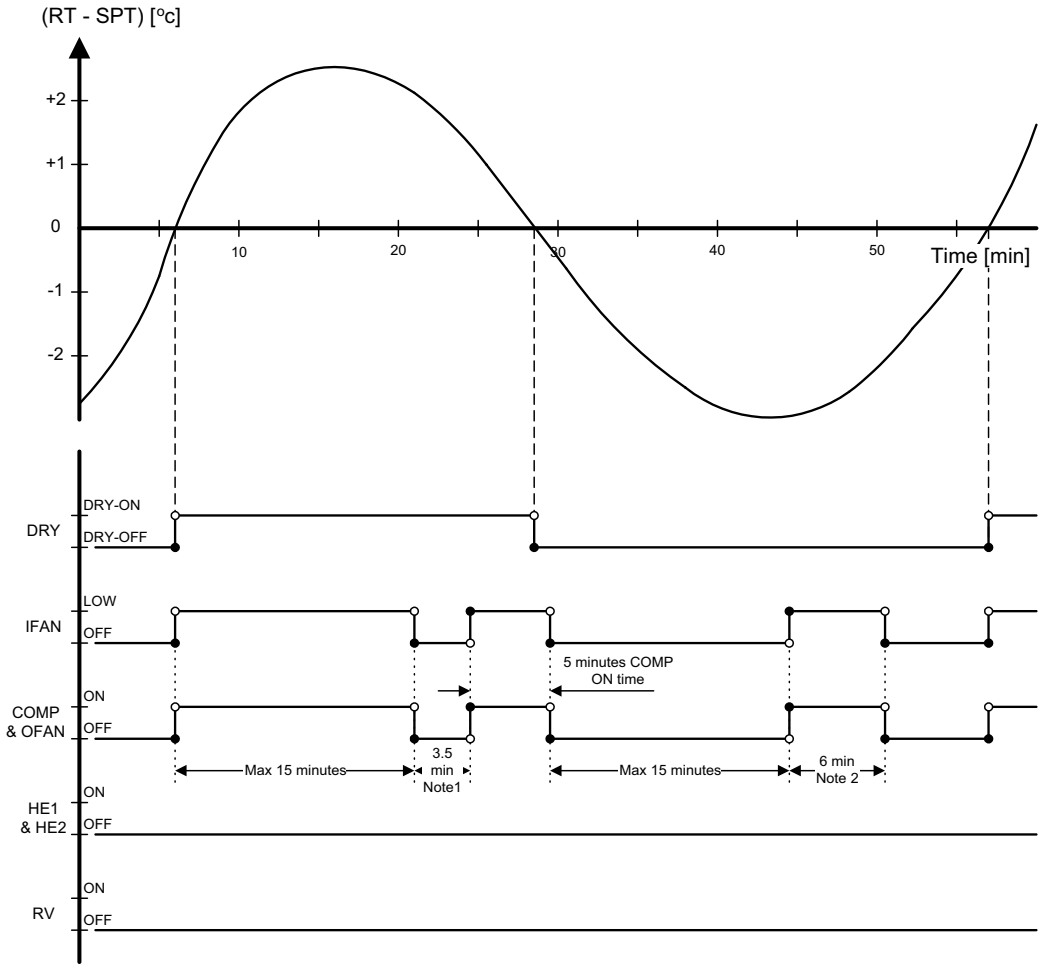


6 Dry Mode

6.1 Dry, ST or RC group or P2000 model with any group settings

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

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



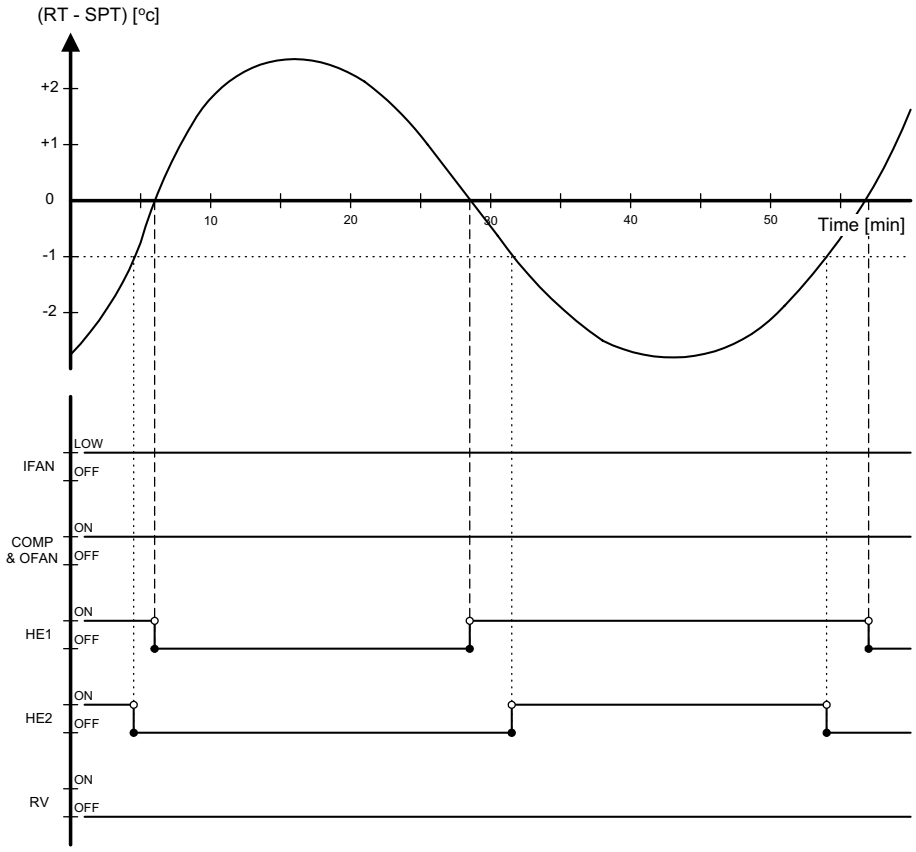
Notes :

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. Pumps are operating as indicated in Sect. 7.3, 7.4, and 7.5.
6. HEs are always OFF in Dry Mode.

6.2. Dry, SH or RH group excluding P2000 model

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

Control function
Reduce room humidity with minimum Temp. fluctuations by operating in Cool Mode with low speed IFAN and HE.

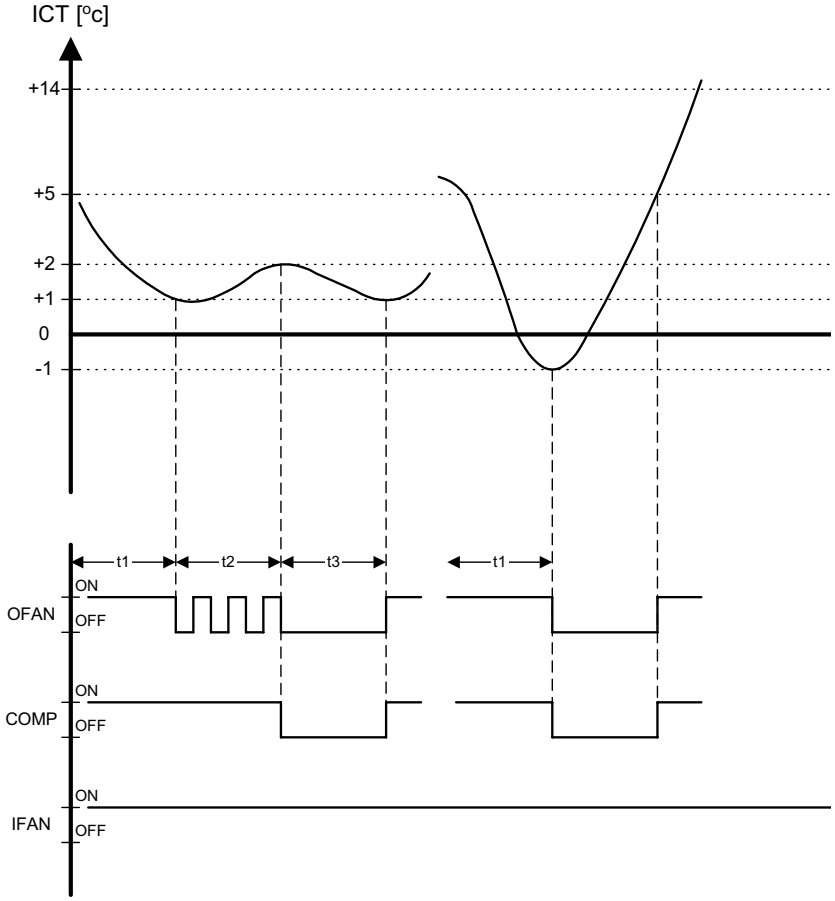


7 Protection

7.1. Cooling Mode Protections

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

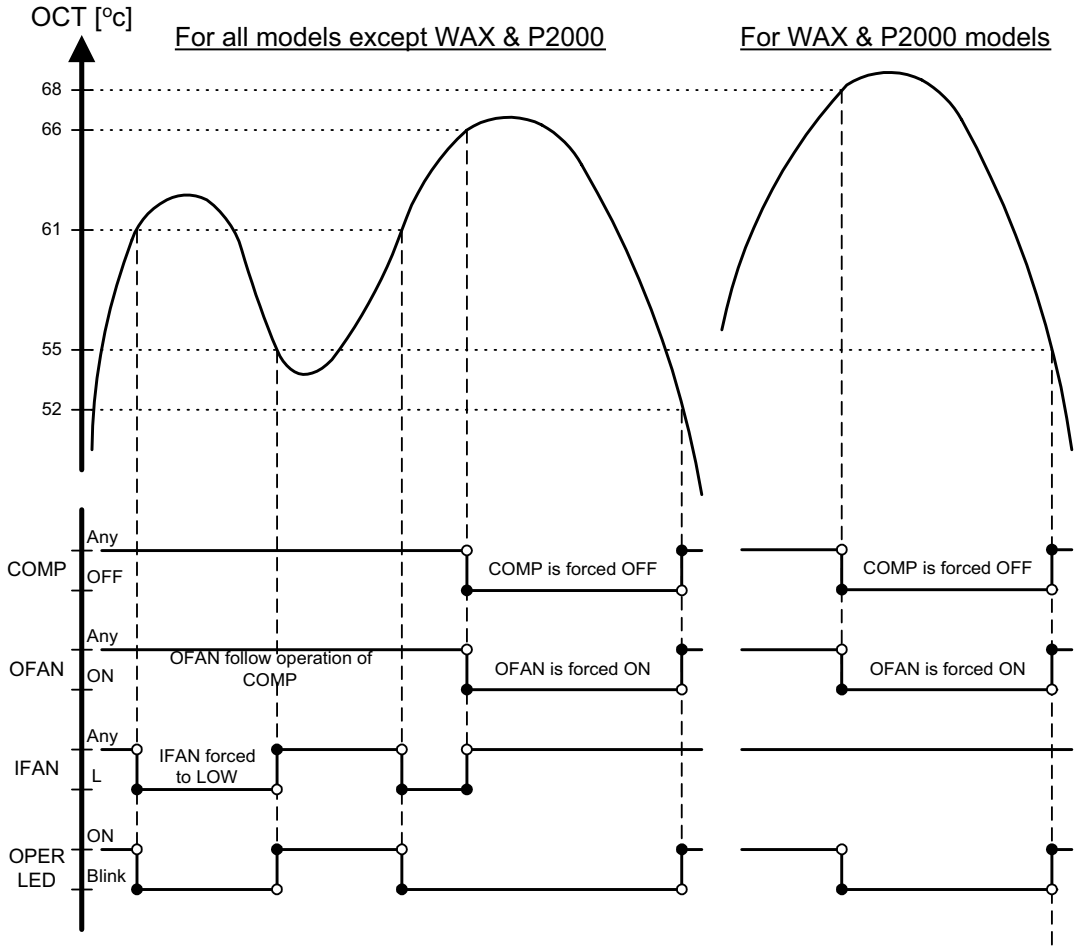
Control Function
Protect the indoor coil from ice formation at low ambient temperature.



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

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

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



Note:

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

7.2. Heating Mode Protections

7.2.1. Outdoor coil Deicing (excluding RH Group)
Mode: Heating, Auto (at heating)
Temp: Selected desired Temp
Fan: Any
Timer: Any
I FEEL:Any

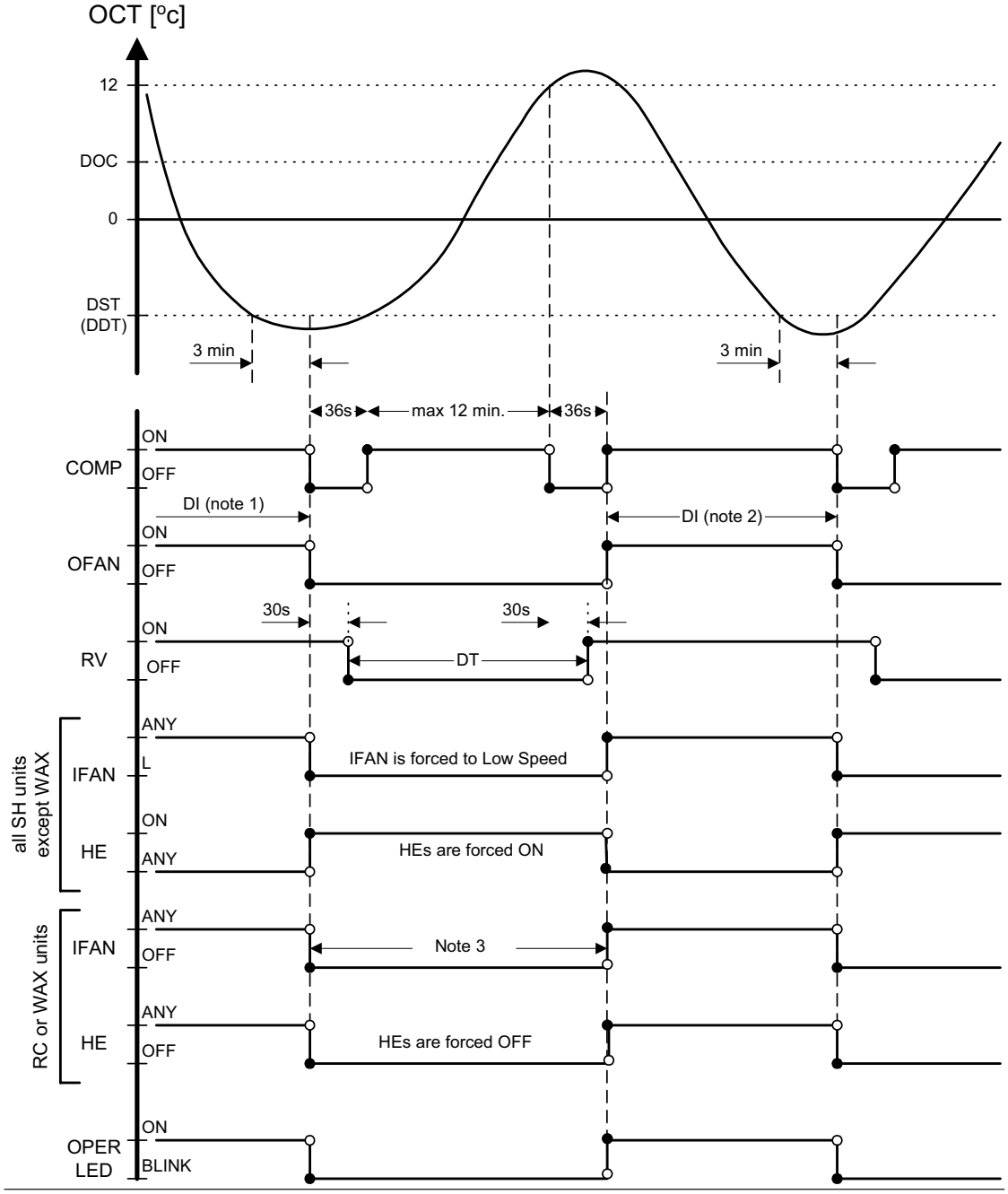
Control function

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

7.2.1.1. Deicer Activation Algorithm

1. static deicer threshold is -5°C
2. dynamic deicer threshold is change of 3°C in 3 minute in the OCT temperature
3. In first COMP activation (after SB or OFF), if OCT < 0^{o}c, min time to first deicer id 10 min else 40 min.
4. 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.

7.2.1.2. Deicing procedure



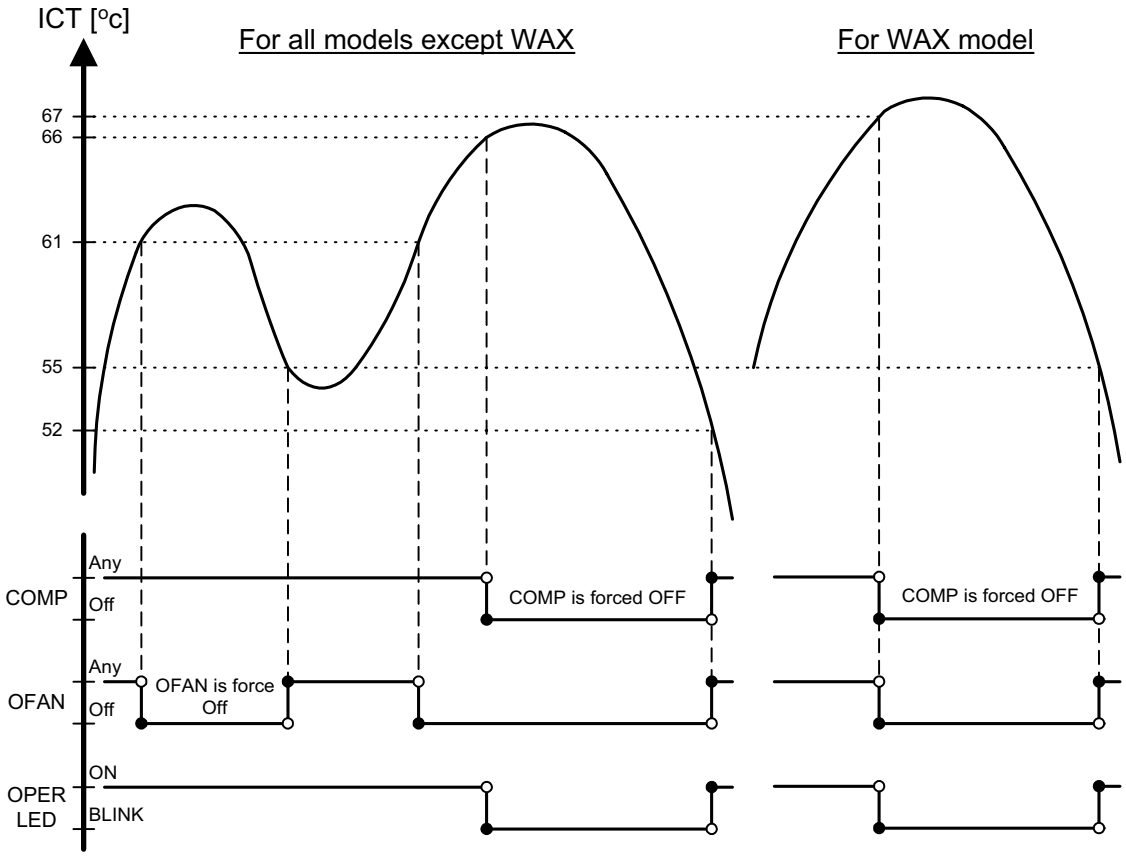
Notes :

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 in Low speed, regardless of the ICT and difference between RAT & SPT.
4. When jumper J7 is set, the DST value is -2°C.

7.2.2. High pressure protection (excluding RH Group)
Mode: (Auto) Heating
Fan: Any
Timer: Any
I Feel: On or Off

Control Function

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



SELF TEST for General Controller

STEP 1: TURNING ON THE POWER .

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

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 16 ºC , no I FEEL Sleep or any Timer settings needed.

2. Cover the IR transmitter components in the head of 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 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:

STEP 3 : MODEL SETTING CONFIRMATION

1.The STAND-BY and COOL LEDS will indicate the operation mode as following:

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:

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.

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.

STEP 4: AUTO REALY WALK TEST:

All relays will turn ON 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.

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.

STEP 6 : INPUT TEST.

This stage is testing the analog real time indicators (thermistors, LEVEL and clock) according 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

STEP 7 : TIMING RESET TEST (WATCH DOG).

The test purpose is to find out 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 are turning ON one by one.

The results of the test are coded as follow:

pass condition
1 sec - STAND-BY and OPER are turn ON
2 sec - STAND-BY ,OPER and TIMER are turn ON
Fail condition
0 sec - STAND-BY is turn ON
3 sec - STAND-BY ,OPER , TIMER and FILTER are turn ON

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

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:

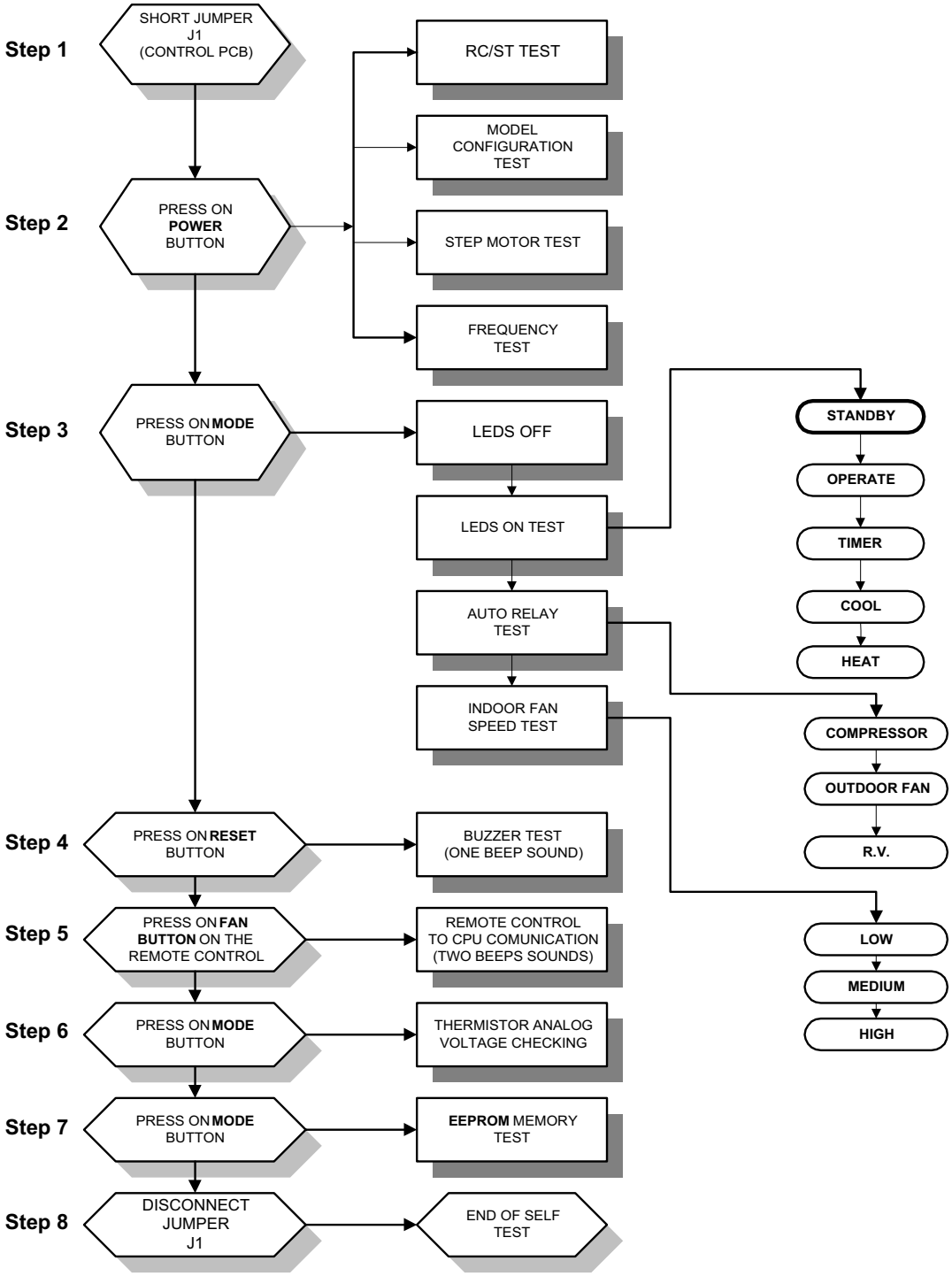
LED indicator	Condition for LED to be ON
STAND-BY LED	Test passed
FILTER LED	Test failed

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.

SELF TEST DIAGRAM

FOR CONTROLLER (VERSION 4V5 OR HIGHER)



System diagnostics

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

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

The coding method will be as follow:

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

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

○ - ON, ● - OFF

Notes:

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