

OSA 480

Split System Outdoor Unit

Installation & Maintenance

GENERAL

OSA 480 - A general designation for outdoor unit
OSA 480C - Outdoor unit, cooling only version
OSA 480R - Outdoor unit, reverse cycle version

This OSA 480 Outdoor Unit must be installed in accordance with all national and local safety codes.

INSTALLATION

Positioning

Refer to dimension diagram below for minimum clearances. Fasten the unit down to a firm flat horizontal base using the four holes provided in the mounting rails.

When the unit is being installed on a roof it is recommended that the unit is installed on a substantial structure with vibration isolating springs beneath the unit. These springs are not supplied with the unit.

Drains

Four drain holes are provided in the base of the unit for the release of condensate and/or rain water. For a totally drip free installation mount the unit in a separate drain tray.

Coil Protection

A coil protection guards are available as an optional extra.

OPTIONAL FAN SPEED CONTROLLER

Fit a head pressure fan speed controller where cooling is required in below 20°C ambient conditions for long periods of time. An electronic HP Fan Speed Controller (8 amp) is available from **temperzone**.

REFRIGERATION PIPING

General

The OSA 480 is shipped with a holding charge of refrigerant. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 480 units have one flare and one brazed pipe connection.

Recommended Pipe Sizes

Suction pipe : 35 mm OD
 Liquid pipe : 19 mm OD

Line Lengths

For line lengths in excess of 50 m, contact the manufacturer's nearest sales office for additional piping requirements. Refer also to *Oil Charge* overleaf.

Maximum extended line length is 70 m.

Height Separation Limits

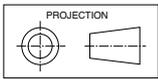
Outdoor Unit above Indoor Unit : 18 m
 Outdoor Unit below Indoor Unit : 12 m

Vertical Risers

If the outdoor unit is to be installed above the indoor unit, then the suction riser should be trapped at the bottom of the vertical rise and then again at 5 m (maximum) intervals. This is to ensure oil return to the compressor. The trap to be a 'swan neck' curve in the pipe, with no change in the pipe size.

Dimensions (mm)

OSA 480

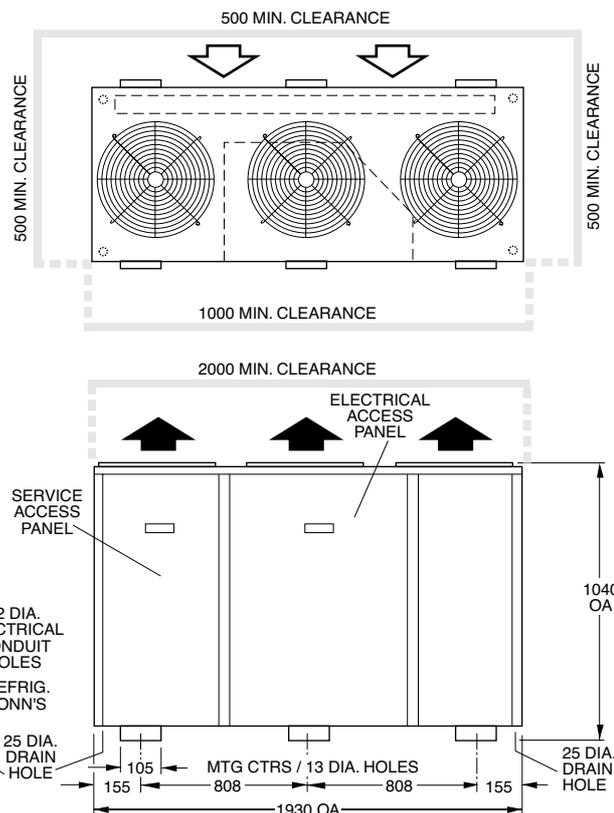


Not to Scale

Net Weight

OSA 480C 350 kg
 OSA 480R 354 kg

Point loads are approx. 59 kg at each mounting rail end.



Piping

1. Use clean sealed refrigeration grade piping.
2. Cut pipe with a pipe cutter ONLY.
3. Use long radius bends (2 x pipe dia.).
4. Insulate the suction (gas) line and seal all insulation joints.
5. Filter dryer may be fitted in the liquid line (bi-flow type on reverse cycle systems).
6. Include a process point on the interconnecting pipework.
7. Ensure open pipe ends are sealed until the final connection is made.
8. **Caution:** To avoid damage to teflon seals, braze liquid pipework to stub connection (supplied loose) **before** connecting to unit's valve. Remove valve's dust cap and lubricate teflon seal with refrigeration oil prior to final assembly and connection.

Charging

The unit is supplied with a 1 kg holding charge of refrigerant HCFC-22 (R22). Add 9.1 kg of HCFC-22 to complete the base charge, then add 150 g per metre of pipework between indoor and outdoor units.

Procedure:

1. Evacuate Indoor Unit and interconnecting pipework to a pressure of 500 microns and hold for 15 mins.
2. Add refrigerant via the Schraeder connection on the smaller of the Outdoor Unit's two service valves.
3. Open the service valve at the Outdoor Unit to allow refrigerant to flow throughout the system.
4. Leak check all brazed and fitted joints.

IMPORTANT :

Step 9 of the 'Start Up Procedure' requires you to check that the superheat on the suction line (where it enters the Outdoor Unit) is between 3°C - 5°C on cooling cycle with an indoor air temperature in the range 21° - 27°C and outdoor air temperature in the range 24° - 35°C. If the conditions of the day do not allow this, use the heating cycle (on a reverse cycle unit) or other heat source to raise the indoor air temperature to about 24°C and blank off the outdoor coil to raise the head pressure to 240–280 psig (1750–1950 kPag). Alter charge up or down to establish correct superheat.

WARNING:

This unit is designed for use ONLY with the refrigerant HCFC-22. The use of other refrigerants is NOT authorised or approved by the manufacturer and may cause operational problems such as poor performance and efficiency, loss of capacity, degradation of materials and refrigerant leaks. **The use of flammable or explosive materials as a refrigerant creates the additional risks of fire and explosion which may result in property damage, personal injury or death.**

Oil Charge

For line lengths in excess of 35 m, *Emcarate RL22CF* polyol ester oil (or similar) should be added to the refrigerant at the rate of 30 ml/m of suction piping. **Note:** Do not use mineral oil.

ELECTRICAL REQUIREMENTS

Electrical work must be done by a qualified electrician. The outdoor unit must be wired directly from a distribution board by means of a circuit breaker or H.R.C. fuse, and a mains isolator provided - preferably close to the Outdoor Unit.

Note: DO NOT USE REWIRABLE FUSES.

The OSA 480 is provided with a 24V AC control circuit for a thermostat, on/off switch and/or time clock.

The control transformer 240V primary voltage is used for countries with 230-240V power supply. For countries with supply voltages 200-220V, change the primary voltage on the transformer to 208V.

OSA 480R only - It is recommended electricians run a spare wire between Outdoor Unit and Indoor Unit in case boost electric heat becomes a requirement. **Note:** Leave the wire unconnected until required.

The OSA 480R offers two stage cooling and one stage heating.

Standard units are suitable for use with thermostats with either manual Heat/Cool selection or automatic changeover subject to the contact ratings of the thermostats.

A 24 hour power supply to the crankcase heaters is required, otherwise the warranty is void.

SYSTEM CHECK TESTS

1. Leave the remote switch in the off position and close the mains isolating switch.
A four hour delay period is required to allow the crankcase heater to drive any liquid refrigerant out of the compressor oil.
2. Check that all fan motors are free running.
3. Check that the thermostat is correctly wired to the unit and is set at the desired temperature.
4. Check that the air filters, if any, have been correctly installed.
5. Check any supply air diffuser dampers are open.

START UP PROCEDURE

Use the supplied Commissioning Sheet to help you complete the following procedure:

1. After the four hour delay period has expired switch on the unit.
2. Check the supply voltage.
3. Fit gauges and measure the suction and discharge pressures.
4. Check for correct rotation of the compressors. If rotation is incorrect a compressor will not pump, be noisy, and will draw minimal current. To correct motor rotation, change the phasing at the main power terminal.
5. Measure the current draw on each phase to the compressor motor and measure the current draw of each fan motor. Check all readings against the specified values - particularly the indoor fan amps if the unit is installed in a free blow application.
6. Test the operation of the high pressure safety control by switching off the outdoor unit's fan.
7. Test the operation of the reversing valve by running the unit in both the heating and cooling mode (OSA 480R only).
8. Check that the air flow over the outdoor unit's coil is adequate and that the fan is running smoothly.
9. Check the superheat - refer charging procedure.
10. Check the supply air flow at each outlet.
11. Touch up any outdoor unit paintwork damage to prevent corrosion.

OUTDOOR UNIT CONTROLLER (OUC) (OSA 480R only)

The Outdoor Unit Controller (OUC) includes a temperature sensing head pressure control which enables the system to compensate for outdoor ambient temperatures below 20°C, and heating cycle above 15°C. The OUC also has features which protect against icing or overheating of coils, rapid cycling of the compressor and loss of refrigerant charge.

If the outdoor unit fans take some time to begin rotating when the system is powered on, or they don't appear to be rotating appropriately while the compressor is running, consult the OUC label on the electrical box. If necessary, refer to **temperzone** for further diagnostic information.

MAINTENANCE

Weekly For First Four Weeks

1. Check indoor unit air filters (if fitted) and vacuum or wash clean as necessary.
2. Check condensate drain for free drainage.
3. Check compressor compartment for oil stains indicating refrigerant leaks.
4. Check tightness of electrical connections.

Three Monthly (or every 1200 hrs of operation)

Check the indoor unit's fan belt tension and adjust if necessary (ISD 480Q only).

Six Monthly

1. Check the tightness of all fan and motor mountings.
2. Check tightness of electrical connections.
3. Check that fan motors are free running.
4. Check suction and discharge operating pressures.
5. Replace indoor unit air filters (if fitted).
6. Check condensate drain for free drainage.
7. Check Schraeder valve service access port end caps are tight.

Yearly

1. Check all refrigerant piping for chafing and vibration.
2. Check the operation of electric heaters if fitted.
3. Check air supply at all diffusers.
4. Check for excessive noise and vibration and correct as necessary.
5. Check for insulation and duct damage and repair as necessary.
6. Remove lint and dust accumulation from outdoor coil fins.
7. Touch up any outdoor unit paintwork damage to prevent corrosion.

NOTE

The manufacturer reserves the right to change specifications at any time without notice or obligation. Certified dimensions available on request.

This pamphlet replaces the previous issue no. 2550 dated 10/05. OSA 480C wire revision; Oil Charge.

Pipe Length Capacity Loss

On Cooling Cycle Due to Pressure Drop

Note : Loss percentages are approximations only, due to piping variations. No allowance made for vertical piping.

Pipe Size (mm)		Equivalent Line Pipe Length (m)				Additional Pipe Length to allow per Bend	
Liquid	Suction	10	20	30	40	Suction Pipe Size OD	35 mm
19	35	1.5 %	3 %	5 %	6.5 %	Long 90° Radius (i.e. 2 x pipe dia.)	0.76 m

OUTDOOR UNIT: - OSA_480 R-X

WITH INDOOR UNIT	ISD 470Q	ISD 480Q
CAPACITIES - NET TO AS/NZS 3823		
COOLING -	KW	44.80
HEATING - REVERSE CYCLE	KW	47.5
ELECTRICAL INPUT		
COOLING -	KW	17.3
HEATING - REVERSE CYCLE	KW	14.9
E.E.R. (COOLING)	KW/KW	2.578
ELECTRICAL		
SUPPLY REQUIRED 3Ph 342-436V ~ 50Hz		
INCLUDING VOLTAGE FLUCTUATION LIMITS		
COMPRESSOR (3Ph) RUN AMPS RATED CONDITIONS	A/Ph	23
COMPRESSOR (3Ph) STARTING AMPS	A/Ph	23
INDOOR FAN MOTOR ISD 470 (1Ph) FULL LOAD AMPS	A	1.6 x3
INDOOR FAN MOTOR ISD 480 (3Ph) FULL LOAD AMPS	A/Ph	6.5 3Ph
INDOOR FAN MOTOR ISD 470 CAPACITOR	MFD	22.5
INDOOR FAN MOTOR (1Ph) FULL LOAD AMPS	A	1.6 x3
INDOOR FAN MOTOR (3Ph) FULL LOAD AMPS	A	8 x3
INDOOR FAN MOTOR CAPACITOR	MFD	8 x3
RUNNING AMPS (TOTAL)	A	30
RECOMMENDED EXTERNAL FUSE SIZE	A/Ph	63
ELECTRIC HEAT OPTION, 12kW TOTAL	A/Ph	17.4
RECOMMENDED EXTERNAL FUSE SIZE WITH ELECTRIC HEAT OPTION	A/Ph	80
WEIGHT-NETT OSA 480 R-X		354 kg
REFRIGERANT - HCFC (R22)		
UNIT HOLDING CHARGE 1.0 kg		
BASE CHARGE UNIT 10.1kg PLUS 150grams PER METRE LINE LENGTH		
BASED ON LIQUID LINE Ø19 mm & GAS LINE Ø35 mm		

CAP	CAPACITOR	HP	HIGH PRESSURE SWITCH
CB	CIRCUIT BREAKER	HR	HEATING RELAY
CCH	CRANKCASE HEATER	HRC	HEATING RELAY COIL
CM	COMPRESSOR MOTOR	IFC	INDOOR FAN CONTACTOR
CMC	COMPRESSOR CONTACTOR	IFCC	INDOOR FAN CONTACTOR COIL
CMCC	COMPRESSOR CONTACTOR COIL	IFM	INDOOR FAN MOTOR
CMOL	COMPRESSOR OVERLOAD	IFOL	INDOOR FAN OVERLOAD
CPP	COMPRESSOR PROTECTION PACK	LISC	LIQUID INJECTION SOLENOID COIL
CR1	COOL1 RELAY CONTACTOR	LP	LOW PRESSURE SWITCH
CR2	COOL2 RELAY CONTACTOR	OFM	OUTDOOR FAN MOTOR
CR1	COOL1 RELAY COIL	OUC	OUTDOOR UNIT CONTROLLER
CR2	COOL2 RELAY COIL	PRC	PHASE ROTATION CONTROL
F	INDOOR FAN CONTROL	PRR	PHASE ROTATION RELAY
FR	INDOOR FAN CONTROL RELAY	PRRC	PHASE ROTATION RELAY COIL
FRC	INDOOR FAN CONTROL RELAY COIL	RCV	REVERSE CYCLE VALVE
HBR	HOT BYPASS RELAY	R	RESISTOR
HBR	HOT BYPASS RELAY COIL	SNUB	SNUBBER P/N 201 000 007
HGSC	HOT GAS SOLENOID COIL		

Title

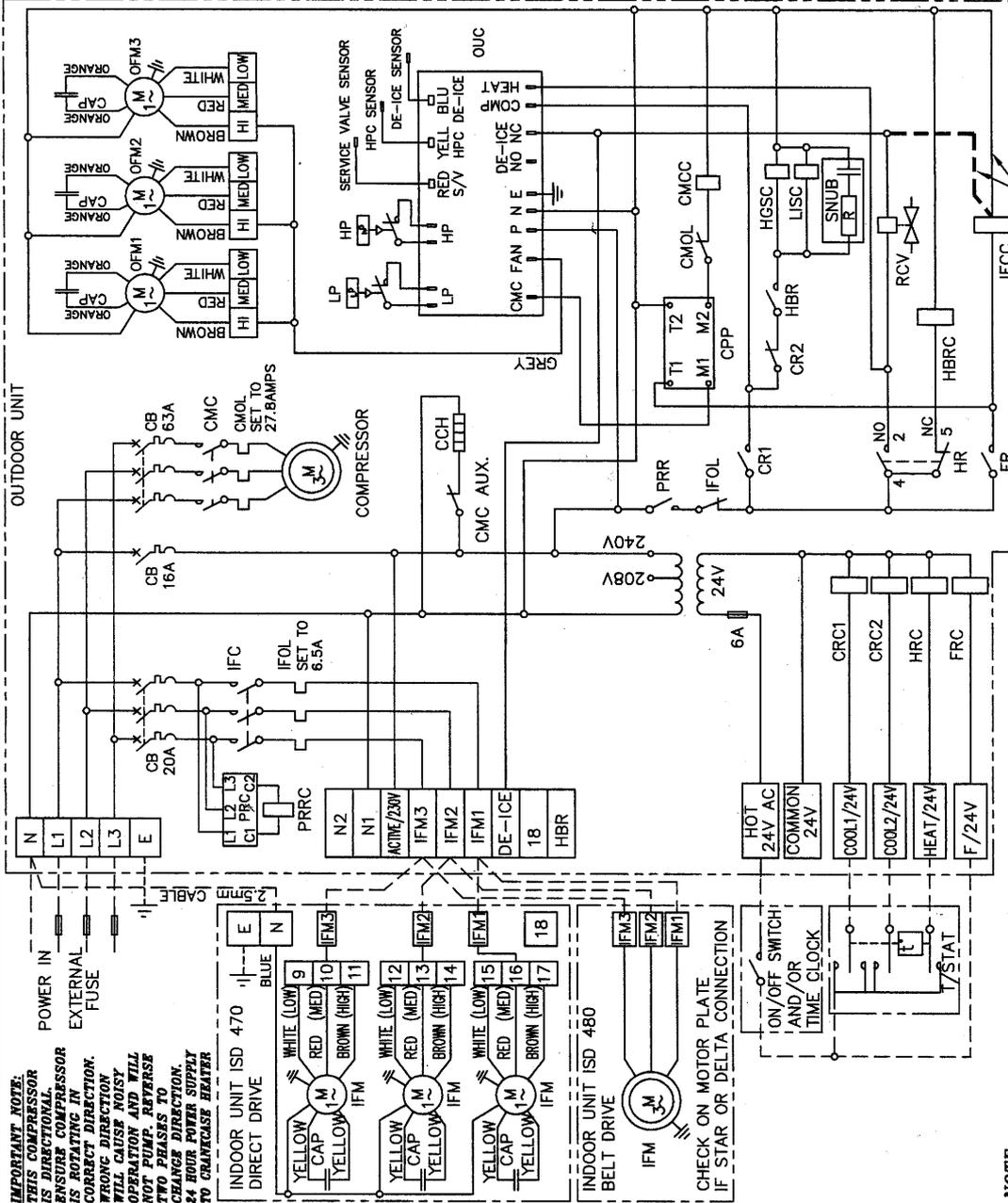
OSA 480R (OUC)

WIRING SCHEMATIC



temperzone

Drawn P.W-M	Date 20-10-05	Drawing No.	Revision
Scale	<i>1:1</i>	426-674-002	



NOTE: WIRE FROM IFCC TO NEUTRAL MOVES TO IFCC TO DE-ICE TERMINAL FOR INDOOR FAN OFF DURING DE-ICE CYCLE

Consult Outdoor Unit Controller label for further details, or refer to Temperzone for fault diagnosis information.

Sensor Locations
 Red to service valve pipe pocket.
 Yellow to coil return bend pocket.
 Blue to bottom of coil in fins.

NOTE: CONTROL TRANSFORMER 240V PRIMARY VOLTAGE IS USED FOR COUNTRIES WITH 230 - 240V POWER SUPPLY. FOR COUNTRIES WITH SUPPLY VOLTAGE 200 - 220V CHANGE PRIMARY VOLTAGE TO 208V ON TRANSFORMER.

PLOTTED
20-10-05

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NOTE: CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS.

CLIENT WIRING interconnections between units by client. Double insulated multi-core cable.

ISSUE	MODIFICATION	ECN	DATE	APRVD