

OSA 235RKTGH (Digital)

Reverse Cycle R410A Split System Outdoor Unit

Installation & Maintenance

GENERAL

This OSA 235RKT Outdoor Unit must be installed in accordance with all national and local safety codes.

Options

1. TZT-100 Room Temperature Controller
2. Signal Input for Controller 0–10V (ref p.2).
3. Vertical discharge grille (2 required).
4. Anti-vibration mounts (rubber).
5. Drain connection adaptors - right angle.

INSTALLATION

Positioning

Refer to dimension diagram below for minimum clearances. Position the unit so that prevailing winds do not blow onto the exhaust to slow the fan, and one unit does not exhaust toward the inlet of another unit. A generous clearance in front of the fan will improve performance in extreme conditions. The surroundings must not induce immediate recirculation of air from the front to the back of the unit. The optional vertical discharge grilles can be used to deflect prevailing winds and reduce clearances.

Fasten the unit down to a firm flat horizontal base using the four holes provided in the mounting rails. To avoid transfer of vibration, mount the unit on the optional rubber mounts available from **temperzone**.

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 or rubber mounts (optional extra) beneath the unit. These items are not supplied with the unit.

Drain

Four drain holes are provided in the base. Three plastic bungs are supplied (loose) should you want to direct the condensate and/or rain water to one of the holes provided. Drain connection adaptors (25/13) are available as an optional extra.

REFRIGERATION PIPING

General

The OSA 235 is shipped with a refrigerant charge sufficient for a 10 m line length. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 235 units

have brazed pipe connections. Two loose pipe extensions are supplied to enable a choice of exit – side or rear.

Recommended Pipe Sizes

Suction pipe : 22 mm OD
Liquid pipe : 13 mm OD

Line Lengths

The standard unit contains allows for a line length up to 60 m. For line lengths between 60 m and 90 m, refer to **temperzone's Split Systems Installation Guide** (refer www.temperzone.biz/Technical Support). Refer also to *Oil Charge* overleaf.

Maximum line length when extended is 90m.

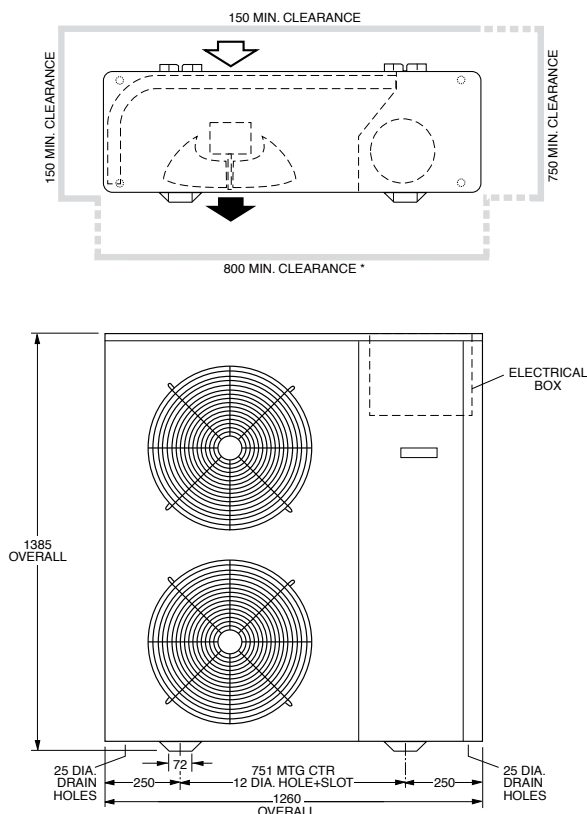
Height Separation Limits

Outdoor Unit above Indoor Unit : 20 m
Outdoor Unit below Indoor Unit : 20 m

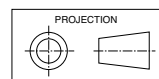
Vertical Risers

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 8 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)

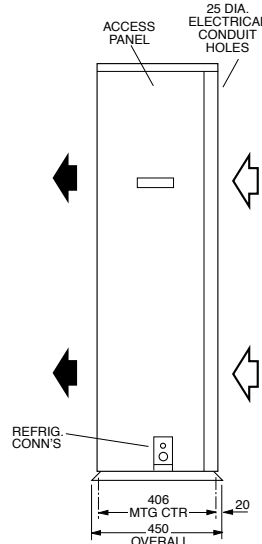


OSA 235RKTGH



Not to Scale

Net Weight 189 kg



Piping

1. Use clean sealed refrigeration grade piping and accessories designed specifically for R410A.
2. Cut pipe with a pipe cutter ONLY.
3. Use long radius bends (2x pipe dia.).
4. Insulate the suction (gas) line and seal all insulation joints.
5. Bi-flow type filter dryer may be fitted in the liquid line.
6. Include a process point on the interconnecting pipework.
7. Ensure open pipe ends are sealed until the final connection is made.
8. Immediately before removing brazed pipe connection's seal, reduce holding charge between connection points and service valves to atmospheric pressure.
Warning: Failure to do so may cause injury.

Charging

The unit is supplied with sufficient refrigerant HFC-410A (R410A) for 10 m of pipework between the indoor and outdoor units; refer wiring specification table for amount. Add, or subtract, 60 g of HFC-410A per metre to suit the installed line length.

Procedure:

1. Evacuate Indoor Unit and interconnecting pipework to a pressure

* 600 min with optional Vertical Discharge Grille

- of 500 microns and hold for 15 mins.
- Add refrigerant via the Schraeder connection on the smaller of the Outdoor Unit's two service valves.
 - Open the service valve at the Outdoor Unit to allow refrigerant to flow throughout the system.
 - Leak check all brazed and fitted joints.

IMPORTANT :

Step 8 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 400 psig (2760 kPag). Alter charge up or down to establish correct superheat.

WARNING:

This unit is designed for use ONLY with the refrigerant HFC-410A (R410A). 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 30 m, Emkarate RL22CF polyolester 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.

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.

The matched ISD indoor unit is supplied with a 25m coil sensor lead that must be connected as per the wiring diagram.

The system is set up for the compressor to be controlled variably by:

- TZT-100 Controller (via modbus),
- 0-10V dc command via BMS modbus, or
- 0-10V dc command via a client supplied external controller.

If option 3 is chosen, then the optional Signal Input for Controller 0-10V is required (temperzone Part No. 201-000-386).

If a TZT-100 Controller is used then variable capacity control is automatically included and no additional wiring is required.

Note: The TZT-100 Controller can automatically switch the indoor fan off during de-ice, if selected, therefore no additional wiring is required to achieve this result.

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

SYSTEM CHECK TESTS

- 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.
- Check that all fan motors are free running.
- Check for correct rotation of the compressor. If rotation is incorrect the compressor will not pump and will draw minimal current. To correct motor rotation, change the phasing at the main power terminal.
- Check that the thermostat is correctly wired to the unit and is set at the desired temperature.
- Check that the indoor coil sensor lead is correctly wired to the unit.
- Check that the air filters, if any, have been correctly installed.
- Check any supply air diffuser dampers are open.

START UP PROCEDURE

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

- Switch on the unit after the four hour delay period for the crankcase heater has expired.
- Check the supply voltage.
- Measure the current draw on the compressor motor and on 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.
- Fit gauges and measure the suction and discharge pressures. **Important:** Gauges must be designed specifically for use with R410A.
- Test the operation of the high pressure safety control by switching off the outdoor unit's fan.
- Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
- Check that the air flow over the outdoor unit's coil is adequate and that the fan is running smoothly.
- Check the superheat - refer charging procedure.

- Check the supply air flow at each outlet.
- Touch up any outdoor unit paintwork damage to prevent corrosion.

UNIT CONTROLLER (UC7)

The Unit Controller provides system protection functions such as coil frost protection, de-icing, high head pressure and low suction pressure cut-out. It also protects against rapid cycling of the compressor(s) and loss of refrigerant. Various methods of head pressure control (or limiting) are employed in temperzone units. The particular method used varies from model to model, but is also handled by the Unit Controller. In combination, these features deliver optimised performance across a wide operating temperature range.

As a result of the UC's control of these inter-related functions, the outdoor fans may take some time to start rotating after each compressor start. They may also run on when the compressor stops. The fans will stop during a de-ice cycle and the speed will vary either smoothly, or in steps, in order to protect against excessively low or high head pressure.

Refer to UC7 Controller label on the unit or www.temperzone.biz for operation & fault diagnostics information.

MAINTENANCE

Weekly For First Four Weeks

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

Six Monthly

- Check the tightness of all fan and motor mountings.
- Check tightness of electrical connections.
- Check that fan motors are free running.
- Check suction and discharge operating pressures.
- Replace indoor unit air filters (if fitted).
- Check condensate drain for free drainage.

Yearly

- Check all refrigerant piping for chafing and vibration.
- Check air supply at all diffusers.
- Check for excessive noise and vibration and correct as necessary.
- Check for insulation and duct damage and repair as necessary.
- Remove lint and dust accumulation from outdoor coil fins.
- Touch up all outdoor unit paintwork damage to prevent corrosion.

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)		Performance Loss per additional 10m beyond first 5m.	Additional Pipe Length to allow per Suction Pipe Bend Long 90° Radius (2 x pipe dia.)
Liquid	Suction		
13	22	2.10 %	0.50 m
13	28	0.75 %	0.61 m

Capacities - Nett to AS/NZS 3823

Cooling -	KW	22.41
Heating - Reverse Cycle	KW	22.63
Electrical Input		
Cooling -	KW	7.18
Heating - Reverse Cycle	KW	6.61
E.E.R. (Cooling)	KW/KW	3.121
A.E.E.R. (Cooling)	KW/KW	3.109

Electrical

Supply required 3Ph 342-436V ~ 50Hz
Including voltage fluctuation limits

Compressor type :	Scroll
Compressor (3Ph) run amps rated conditions	A/Ph
Oil type :	Polyolester (P.O.E.)

Indoor fan motor (1Ph)

Indoor fan motor (1Ph) Full load amps	A	8
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Outdoor fan motor (1Ph) Full load amps

Outdoor fan motor (1Ph) Full load amps	A	1.43 X 2
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Outdoor motor capacitor

Outdoor motor capacitor	MFD	6 X 2
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Running amps (Total)

Running amps (Total)	A/Ph	16.4/11.2/11.3
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Max running amps (Total)

Max running amps (Total)	A	23
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Control circuit breaker

Control circuit breaker	A	16 △
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24VCB 24 Volt circuit breaker

24VCB 24 Volt circuit breaker	A	2
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Unit Weight - Nett

Unit Weight - Nett	Kg	190
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Unit precharge (10 metre line length) 8.3Kg (R410A Refrigerant)

Base charge unit 7.7kg Plus 60 grams per metre line length (based on dia 12.7 I/m line & dia 22 gas line).

CAP	Capacitor	MFR	Med I/D Fan Relay
CCB	Control Circuit Breaker	MFRC	Med I/D Fan Relay Coil
CCH	Crank/Case Heater	MV	Modulating Valve
CM	Compressor Motor	LFR	Low I/D Fan Relay
CMC	Compressor Contactor	LFRC	Low I/D Fan Relay Coil
CMCC	Compressor Contactor Coil	LP	Low Pressure Control
CR	Compressor Relay 24 v Control	OFM	Outdoor Fan Motor
CRC	Compressor Relay Coil 24v	PRR	Phase Rotation Control
FRB	Fault Relay Board	PRC	Phase Rotation Relay
HP	High Pressure Control	PRRC	Phase Rotation Relay Coil
HRC	Heating Relay Coil	RCV	Reverse Cycle Valve
HFR	High I/D Fan Relay	TFC	Triac Fan Controller
HFRC	High I/D Fan Relay Coil	TR	Transformer
		UC7	Unit Controller 7

UC7 DIP switch settings	
DIP switch	On/Off ↓
2,4	On
1,3,5,6,7,8,9,10	Off
11,12,13,14,15,	
16	

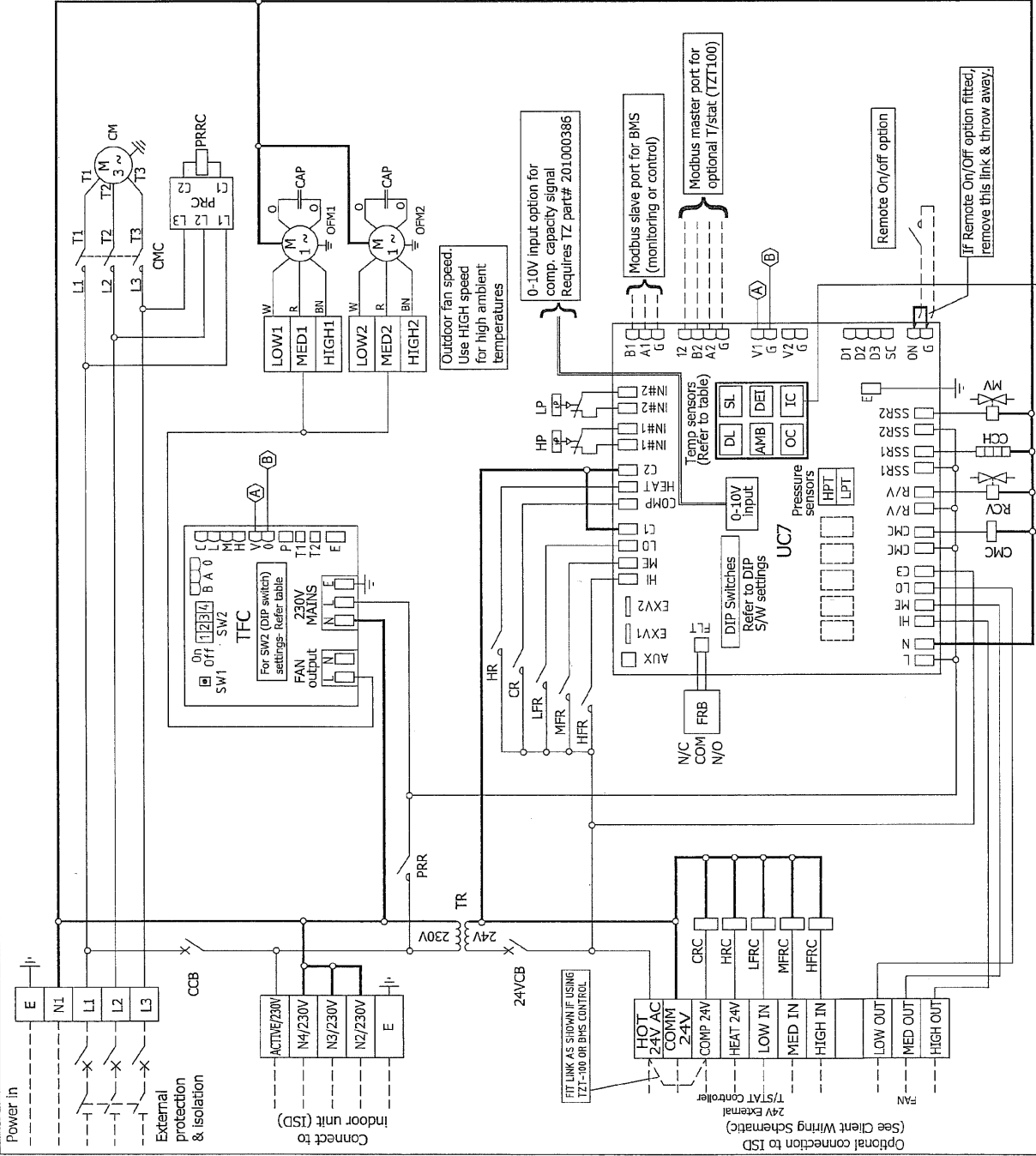
Temperature Sensor		
Sensor	Color	
DL	Discharge	Red
SL	Suction	Blue
AMB	Ambient	Black
DEI	Deice	Blue
OC	O/D Coil	Yellow
IC	I/D Coil	Yellow

TFC SW2 (DIP S/W) settings
DIP On/Off
1,2,3,4 Off

OSA 235RKTIGH
Wiring schematic



Plot date	16-04-14	Drawn S.D.H.	16-02-12	Drawing No.	291-000-029	Revision	C
©temperzone tsc		APRVD					



For indoor unit without t/stat fitted, connect 25m extension lead (part no. 201000049) - Supplied with ISD Unit
UC7 T/C terminal to indoor unit coil sensor.

Issue	MODIFICATION	ECN	DATE	APRVD
B	N4 shown on TB & reordered to suit Ebox layout	N3486	10-04-14	D.A.B.
C	16Amp was 10Amp	N3199	16-04-14	S.D.H.

Visit www.temperzone.biz
for client wiring diagrams

This pamphlet replaces the previous
issue no. 3923 dated 05/14.
Reduced clearance to 800mm.

NOTE

Specifications are subject to change without
notice due to the manufacturer's ongoing
research and development programme.