

OSA 280RKTGV (Digital c/w UC7 Controller)

Reverse Cycle R410A Split System Outdoor Unit

Installation & Maintenance

GENERAL

This OSA 280RKTGV 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. Anti-vibration mounts (rubber).
4. Drain connection adaptors - right angle.

INSTALLATION

Positioning

Refer to dimension diagram below for minimum clearances. Fasten the unit down to a firm flat horizontal base using the 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. These springs 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 280 is shipped with a refrigerant charge sufficient for a 10 m line length; refer wiring diagram specification table for amount. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 280 units have shut-off service valves and swaged assemblies. Two loose pipe extensions are supplied to enable a choice of exit – side or rear; both require brazing.

Recommended Pipe Sizes

Suction pipe: 28 mm OD
Liquid pipe: 13 mm OD

Line Lengths

The standard unit is suitable for a line length up to 40 m. For line lengths between 40 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

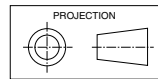
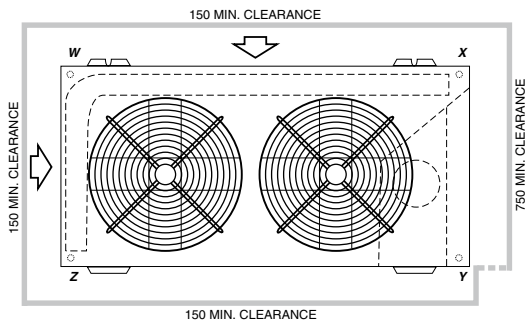
Outdoor Unit above Indoor Unit : 20 m
Outdoor Unit below Indoor Unit : 20 m

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)

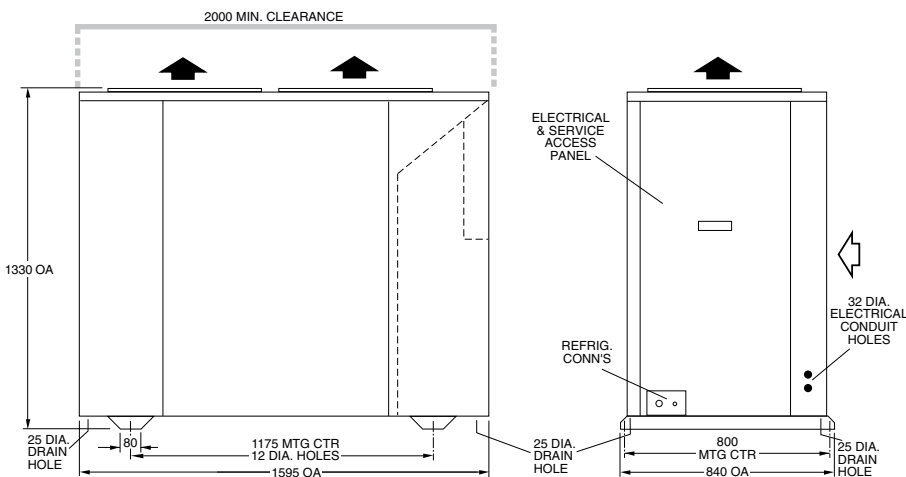
OSA 280RKTGV



Not to Scale

Net Weight 284 kg

CORNER LOADS (kg)			
W	X	Y	Z
64	94	87	39



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. Purge pipes using Nitrogen during brazing.
 9. 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 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 valve extension pipes.

- 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: This oil absorbs moisture quickly if exposed to open air. 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 280 is provided with a 24V AC control circuit for a thermostat, on/off switch and/or time clock.

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 'control' phase is required to power the crankcase heaters, otherwise warranty is void.

SYSTEM CHECK TESTS

- Check the tightness of all electrical connections and sign the check label.
- Leave the remote ON/OFF switch, if fitted, 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. Leave power applied and do not start either compressor during this time. Check CCH elements heat up.
- 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.
- Touch up any outdoor unit paintwork damage to prevent corrosion.

START UP PROCEDURE

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

- Fit discharge and suction gauges.
Important: Gauges must be designed specifically for use with R410A.
- 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.
- Measure the suction and discharge pressures.
- 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.

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. 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.

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. 3973a dated 06/13. Wiring revision B.

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	28	1.5 %	0.61 m
13	35	0.7 %	0.76 m

Capacities - Net to AS/NZS 3823	OSA 280RKTGV
Cooling -	KW 26.46
Heating - Reverse Cycle	KW 26.79
Electrical Input	
Cooling -	KW 8.25
Heating - Reverse Cycle	KW 7.59
E.E.R. (Cooling)	KW/KW 3.208
A.E.E.R. (Cooling)	KW/KW 3.195
Electrical	
Supply required 3Ph 342-436V ~ 50Hz	
Including voltage fluctuation limits	
Compressor type : Scroll	
Compressor (3Ph) run amps rated conditions	A/Ph 11.9/13/12.8
Oil type : Polyolester (P.O.E.)	
Indoor Fan Motor (1Ph)	KW 1.25 + 0.9
Indoor fan motor (1Ph) Full load amps	A 8 + 5
Outdoor fan motor (1Ph) Full load amps	A 0.82 x 2
Outdoor motor capacitor	MFD 6 x 2
Running amps (Total)	A/Ph 17.2/13/12.8
Max running amps (Total)	A/Ph 23/17/16
Control circuit breaker	A 20
24V(CB) 24 Volt circuit breaker	A 2
Unit Weight - Nett	Kg 284

Unit precharge (10 metre line length) 1.1Kg (R410A Refrigerant)
 Base charge unit: 10.4Kg Plus 60 grams per metre line length (based on dia 12.7 liq line & dia 28.6 gas line. Add additional oil (10ml per metre over 40 metre line length)).

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

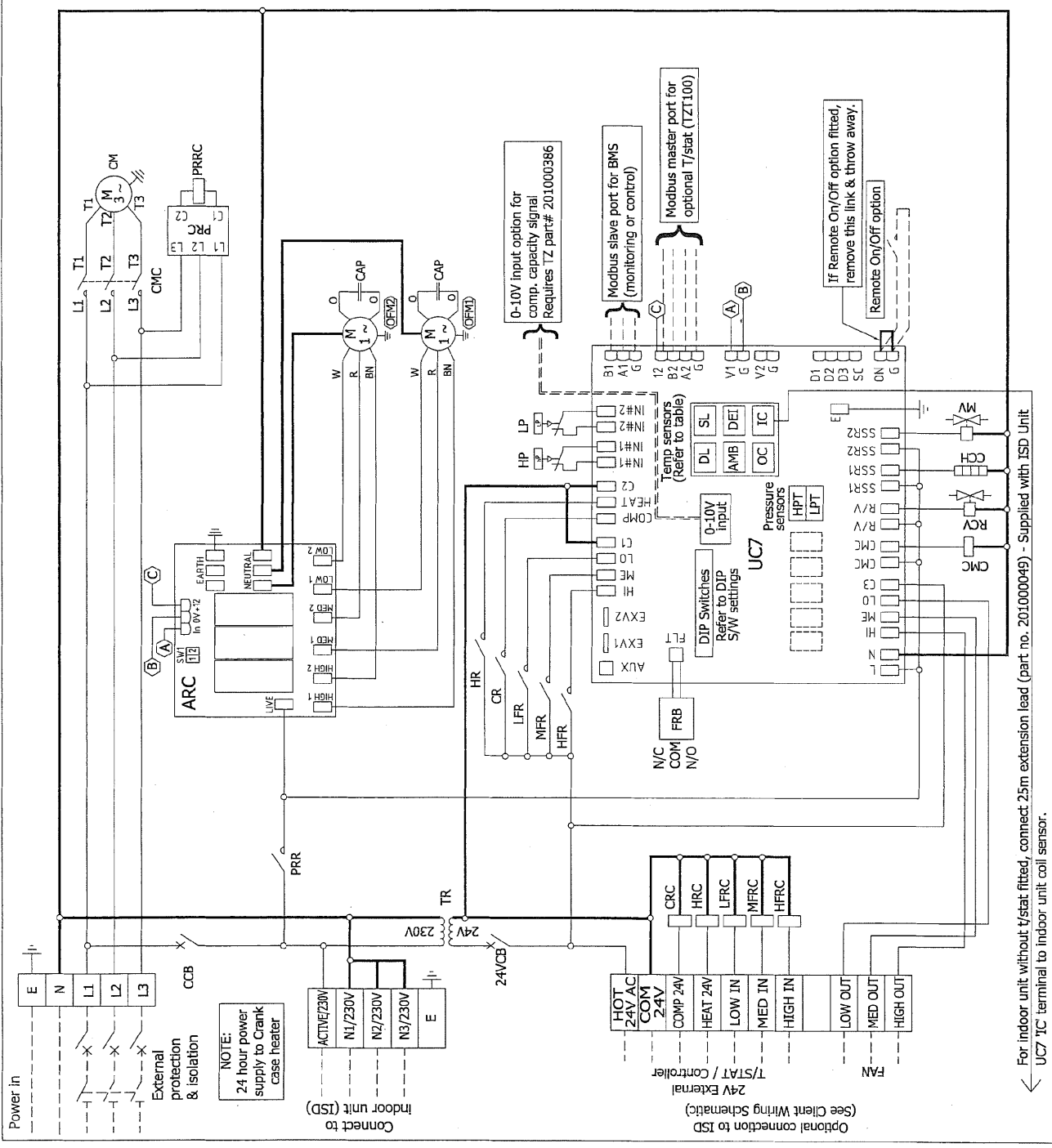
Temperature Sensor	
Sensor	Color
DL	Discharge
SL	Suction
AMB	Ambient
DEL	Deice
OC	O/D Coil
IC	I/D Coil
UC7 Dip switch settings	
DIP switch	On/Off
2,4	On
1,3,5,6,7,8,9,	Off
10,11,12,13,14,	
15,16	

ARC SW1 (DIP S/W) settings
 DIP On/Off
 1,2 Off

Title
OSA 280RKTGV
WIRING SCHEMATIC

temperzone

Plot date	16-04-14	Drawn EBA	Drawn No.	291-000-144	Revision	B
Client	temperzone test	Aprvd	date	15-05-13	Drawing No.	
Year	2014					



Power in
 External protection & isolation
 NOTE: 24 hour power supply to Crank case heater
 Connect to Indoor unit (ISD)
 24V(CB) 24 Volt circuit breaker
 230V
 24V
 24V AC
 COM 24V
 COMP 24V
 HEAT 24V
 LOW IN
 MED IN
 HIGH IN
 LOW OUT
 MED OUT
 HIGH OUT
 T/STAT / Control
 24v External
 (See Client Wiring Schematic)
 Optional connection to ISD
 FAN
 N/C
 COM
 N/O
 AUX
 EXV1
 EXV2
 ECV2
 ME
 LO
 COMP
 HEAT
 C2
 Temp sensors (Refer to table)
 HP
 LP
 Modbus slave port for BMS (monitoring or control)
 Modbus master port for optional T/stat (T/ZT100)
 0-10V input option for comp. capacity signal Requires Tz part# 20110003986
 If Remove On/Off option fitted, remove this link & throw away.
 Remote On/Off option
 UC7
 DIP Switches Refer to DIP S/W settings
 Pressure sensors HPT LPT
 Temp sensors (Refer to table)
 DL SL AMB DEL OC IC
 Modbus master port for optional T/stat (T/ZT100)
 Modbus slave port for BMS (monitoring or control)
 0-10V input option for comp. capacity signal Requires Tz part# 20110003986
 If Remove On/Off option fitted, remove this link & throw away.
 Remote On/Off option

Client wiring
 Visit www.temperzone.biz for client wiring diagrams
 Client writing
 E.B.A
 N3499 16-04-14
 Replace circuit breaker to 20Amp was 16Amp.
 ECN DATE APRVD
 MODIFICATION
 ISSUE
 ← For indoor unit without t/stat fitted, connect 25m extension lead (part no. 201000049) - Supplied with ISD Unit
 UC7 'IC' terminal to indoor unit coil sensor.

