OSA 310RKTBV (c/w UC6 Controller)

Reverse Cycle R410A Split System Outdoor Unit

Installation & Maintenance

GENERAL
The OSA 310RKTBV outdoor unit is a twin system that provides the facility for capacity control (staging) or staggered starting.

This OSA 310RKTBV Outdoor Unit must be installed in accordance with all national and local safety codes.

Combinations
OSA 310RKTBV with ISD 310KBY
OSA 310RKTBV with ISD 310KB-P

Options
1. TZT-100 Room Temperature Controller
2. UC6 Service Interface tool.

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 of the unit to release condensate and/or rain water.

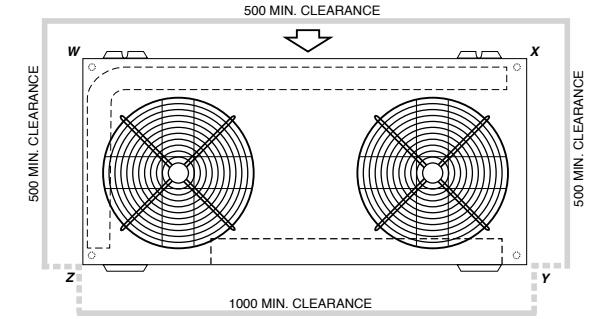
REFRIGERATION PIPING

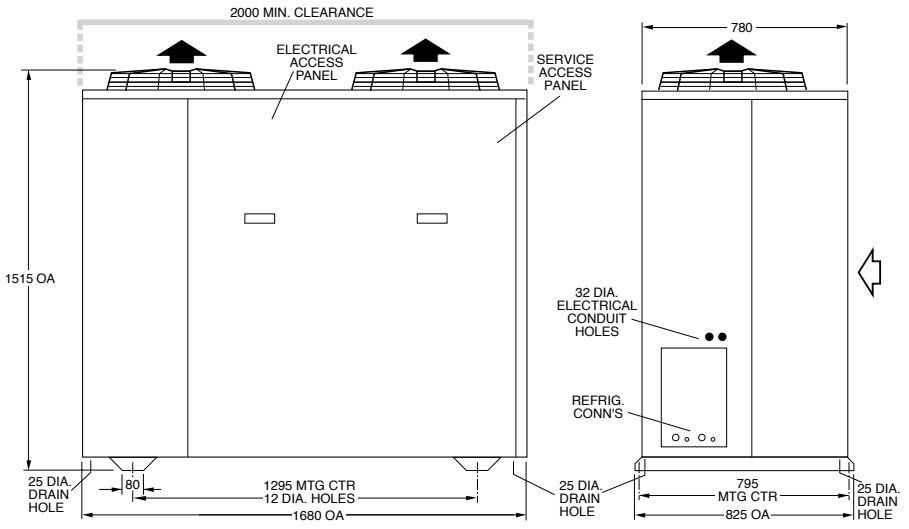
General
The OSA 310 is shipped with a refrigerant charge sufficient for a 10 m line length. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 310 units have brazed pipe connections.

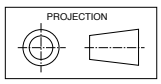
Recommended Pipe Sizes
Suction pipe (x2): 22 mm OD
Liquid pipe (x2): 13 mm OD

Dimensions (mm)

OSA 310RKTBV







Not to Scale

Net Weight 373 kg

CORNER LOADS (kg)			
W	X	Y	Z
74	90	78	131

Line Lengths
The standard unit is suitable for a line length up to 60 m maximum; no extensions. Refer also to *Oil Charge* overleaf.

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.

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.

Important
Do not connect System 1 to System 2.

Charging
The unit is supplied with sufficient refrigerant HFC-410A (R410A) for 10 m of pipework between the indoor and outdoor units; refer wiring diagram specification table for amount. Add 100 g per metre above 10 m.

Procedure (per system):
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.
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 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 310 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.

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.

Refer to **temperzone** for recommended thermostats.

If 'Indoor Fan Off During De-Ice' is a requirement, re-configure the unit's controller using the optional *UC6 Service Interface*.

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

SYSTEM CHECK TESTS
1. Check by hand that all fan motors can turn freely.
2. Check that the air filters have been correctly installed, if fitted.
3. Check air diffuser dampers are open if appropriate.
4. Check that the thermostat, or external 24V controller, is correctly wired to the unit and is set at the desired temperature.
5. Check the tightness of all electrical connections and sign the check label.
6. Leave the thermostat, or external 24V controller, 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.)
7. Check the supply voltage between each phase and neutral.

ISD 310KB-P version only:
8. Turn on the thermostat, or external 24V controller. Set it to 'FAN only' operation and select HIGH speed. When the fan has reached full speed adjust the 'POT' (see wiring diagram) to deliver the design air flow. Do not set the fan speed unnecessarily high.
9. Select Medium, then Low fan speed. Check that the Indoor fan slows down as the selected speed is reduced. Turn fan off.

START UP PROCEDURE
Check each system independently first before running complete system. After the four hour delay for the crankcase heater has expired, use the supplied Commissioning Sheet (Form NS 215) to record results when completing the following 'Start-up' procedure. Ideally a UC6 Service Interface and associated communication cable (temperzone part no.s 201-000-379 and 201-000-378) should be used to read, pressures, superheat and its set-point, compressor amps etc.
1. Select a sensible Fan speed (or Auto Fan mode), operating cycle (cool or heat), and room temperature set point, depending on the time of year, such that the compressor will start and run at a high capacity.
2. Turn ON the thermostat / external controller. Wait for the compressor to start and 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.
4. Measure the current draw of each fan motor. Check all readings against the specified values in the wiring diagram.
5. If a *UC6 Service Interface* is available, operating pressures and status can be read from its various display screens. If a *UC6 Service Interface* is not available, fit gauges and measure the suction and discharge pressures of both refrigeration circuits.
6. Check that the outdoor air fan motors are running smoothly and drawing less than the full load amps specified.
7. Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
8. Check the supply air flow at each outlet.
9. Touch up any outdoor unit paintwork damage to prevent corrosion.

SETTING SUPPLY AIR FLOW
Consult ISD/OSA 310 Technical Data pamphlet at www.temperzone.biz for details of airflow/duct static pressure, if required.

If the indoor air returning to the unit is regularly expected to be above 50%RH, then the coil face velocity should be limited to be 2.5 m/s or less (refer Air Handling graph in Technical Data pamphlet) to avoid water carry-over problems.

UNIT CONTROLLER (UC6)
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 by the Unit Controller. In combination, these features deliver optimised performance across a wide operating temperature range.

Refer to UC6 Controller label on the unit for operation & fault diagnostics information. Many operating status conditions can be determined, without gauges, simply by using a *UC6 Service Interface* graphical display available from **temperzone.**

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.

Six Monthly
1. Check the tightness of electrical connections.
2. Check the tightness of fans and motor mountings.
3. Check suction and discharge operating pressures. (Using a *UC6 Service Interface* avoids fitting and removing gauges with consequential refrigerant loss.)
4. Replace indoor unit air filters (if fitted).
5. Check condensate drain for free drainage.

cont'd...

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.

Performance Loss per each additional 10m beyond first 5m.
2.1 %

Suction Pipe Size OD	Additional Pipe Length to allow per Bend Long 90° Radius (2 x pipe dia.)
22 mm	0.5 m

MAINTENANCE (cont'd)

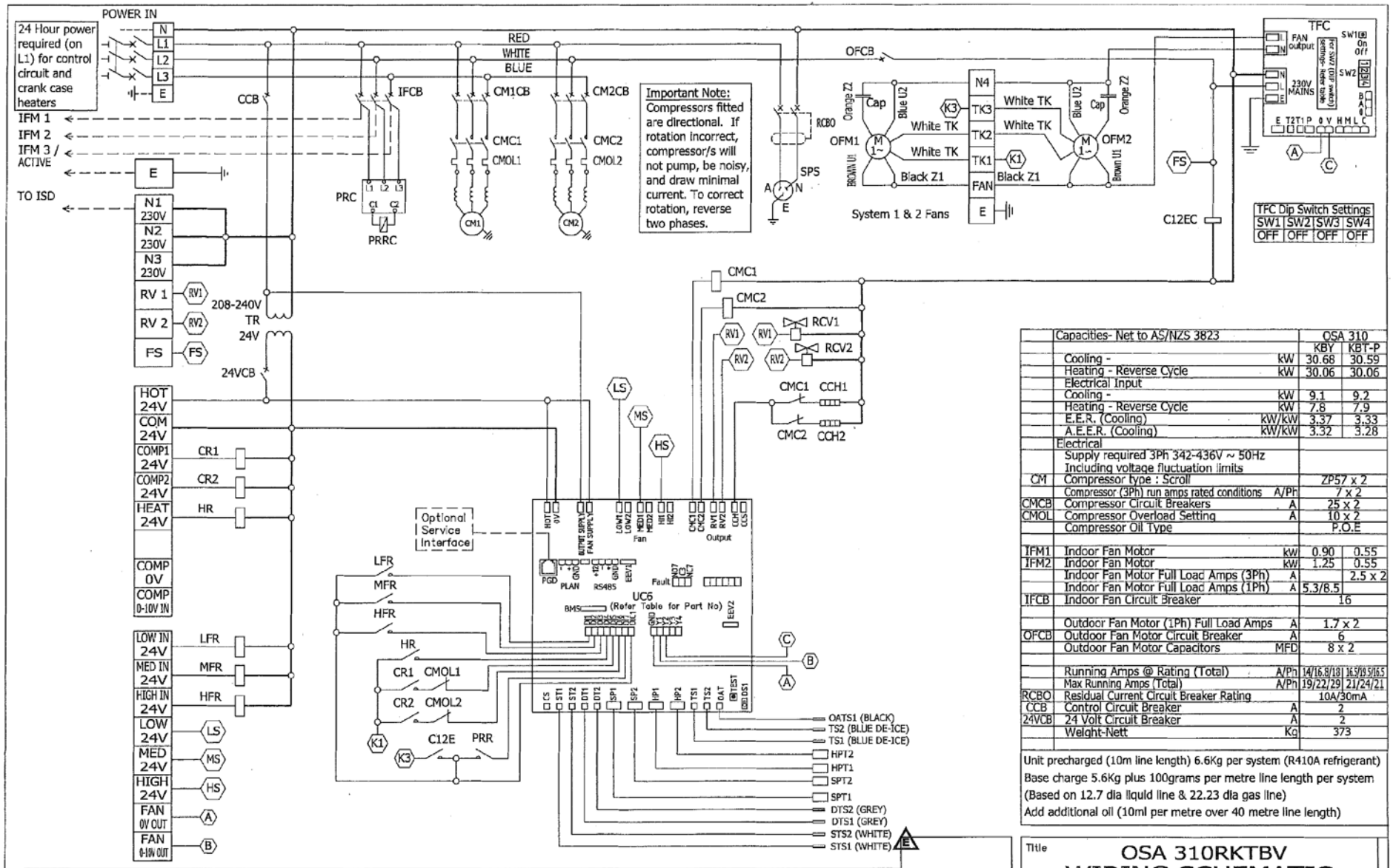
Yearly

1. Check all refrigerant piping for chafing and vibration.
2. Check air supply at all diffusers.
3. Check for excessive noise and vibration and correct as necessary.
4. Check for insulation and duct damage and repair as necessary.
5. Remove lint and dust accumulation from outdoor coil fins.
6. 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. 3924 dated 10/14.
Wiring rev. D & E - precharge for 10m.



	Capacities- Net to AS/NZS 3823		OSA 310 KBY	OSA 310 KBT-P
	Cooling -	kW	30.68	30.59
	Heating - Reverse Cycle	kW	30.06	30.06
	Electrical Input			
	Cooling -	kW	9.1	9.2
	Heating - Reverse Cycle	kW	7.8	7.9
	E.E.R. (Cooling)	kW/kW	3.37	3.33
	A.E.E.R. (Cooling)	kW/kW	3.32	3.28
	Electrical			
	Supply required 3Ph 342-436V ~ 50Hz Including voltage fluctuation limits			
CM	Compressor type : Scroll		ZP57 x 2	
	Compressor (3Ph) run amps rated conditions	A/Ph	7 x 2	
CMCB	Compressor Circuit Breakers	A	25 x 2	
CMOL	Compressor Overload Setting	A	10 x 2	
	Compressor Oil Type		P.O.E	
IFM1	Indoor Fan Motor	kW	0.90	0.55
IFM2	Indoor Fan Motor	kW	1.25	0.55
	Indoor Fan Motor Full Load Amps (3Ph)	A		2.5 x 2
	Indoor Fan Motor Full Load Amps (1Ph)	A	5.3/8.5	
IFCB	Indoor Fan Circuit Breaker		16	
	Outdoor Fan Motor (1Ph) Full Load Amps	A	1.7 x 2	
OFCB	Outdoor Fan Motor Circuit Breaker	A	6	
	Outdoor Fan Motor Capacitors	MFD	8 x 2	
	Running Amps @ Rating (Total)	A/Ph	14/16.8/18	16.5/19.5/16.5
	Max Running Amps (Total)	A/Ph	19/22/29	21/24/21
RCBO	Residual Current Circuit Breaker Rating		10A/30mA	
CCB	Control Circuit Breaker	A	2	
24VCB	24 Volt Circuit Breaker	A	2	
	Weight-Nett	Kg	373	

Unit precharged (10m line length) 6.6Kg per system (R410A refrigerant)
Base charge 5.6Kg plus 100grams per metre line length per system
(Based on 12.7 dia liquid line & 22.23 dia gas line)
Add additional oil (10ml per metre over 40 metre line length)

C12E	Compressor 1 & 2 Enable	CMCB	Compressor Motor Circuit Breaker
CB	Circuit Breaker	CMOL	Compressor Overload
CCB	Control Circuit Breaker	CR	Compressor Input Relay
CCH	Crankcase Heater	DTS	Discharge Temperature Sensor
CM	Compressor Motor	HFR	Fan High Relay
CMC	Compressor Contactor	HR	Heat Input Relay

HPT	High Pressure Transducer	PRRC	Phase Rotation Relay Coil
IFCB	Indoor Fan Circuit Breaker	RCV	Reverse Cycle Valve
LFR	Fan Low Relay	RCBO	Residual Current Circuit Breaker
MFR	Fan Med Relay	SPS	Single Phase Socket
OATS	Outdoor Ambient Temp. Sensor	SPT	Suction Pressure Transducer
OFCB	Outdoor Fan Circuit Breaker	STS	Suction Temperature Sensor
OFK	Outdoor Fan Kixon	TFC	Fan Speed Controller
OFM	Outdoor Fan Motor	TR	Transformer
PRC	Phase Rotation Control	TS	Temperature Sensor (De-Ice)
PRR	Phase Rotation Relay	UC6	Unit Controller 6

E	STS1 & STS2 NOW WHITE	N3671	10-03-15	R.A.S
ISSUE	MODIFICATION	ECN	DATE	APRVD

Client wiring

Visit www.temperzone.biz for client wiring diagrams.

PLOTTED 10-03-15

Title: OSA 310RKTBV WIRING SCHEMATIC

temperzone

Drawn S.D.H.	Date 19-02-11	Drawing No. 291-000-628	Revision E
Scale	Aprvd		