

# OSA 160RKTGH (Digital c/w UC7 Controller)

## Reverse Cycle R410A Split System Outdoor Unit

## Installation & Maintenance

### GENERAL

This OSA 160RKTGH Outdoor Unit must be installed in accordance with all national and local safety codes.

### Options

1. TZX-100 Room Temperature Controller
2. Signal Input for Controller 0-10V (ref p.2).
3. Vertical discharge grille (2 required).
4. Wall mounting brackets.
5. Anti-vibration mounts (rubber).
6. 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. The optional vertical discharge grilles can be used to deflect prevailing winds and reduce clearances.

Mount either free standing or on a wall using the optional mounting brackets available.

#### Free Standing :

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

#### Wall Mounting Option:

Complete wall mounting instructions are supplied with the optional wall mounting kit.

#### 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 160 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 160 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 : 22 mm OD  
Liquid pipe : 13 mm OD

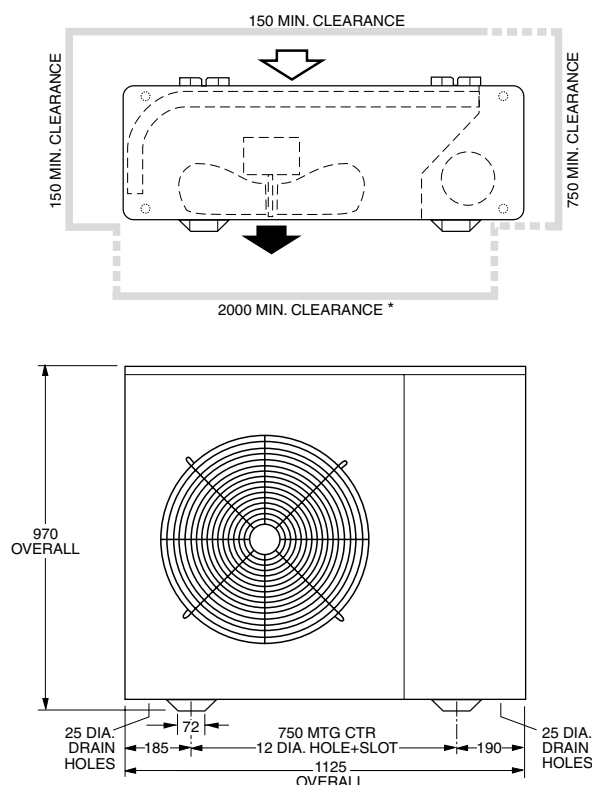
#### Line Lengths

The standard unit allows for a line length up to 30 m. For line lengths between 30 m and 60 m, refer to **temperzone's Split Systems Installation Guide** (refer [www.temperzone.biz/Technical Support](http://www.temperzone.biz/Technical Support)). Refer also to *Oil Charge* overleaf.

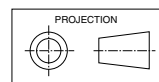
#### Height Separation Limits

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

### Dimensions (mm)

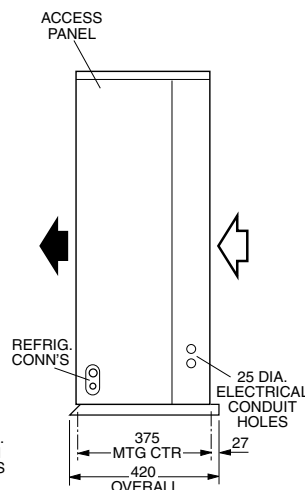


### OSA 160RK



Not to Scale

Net Weight 133 kg



#### 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 in the interconnecting pipework.
  7. Ensure open pipe ends are sealed until the final connection is made.
  8. Immediately before removing brazing 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 refrigerant HFC-410A (R410A) sufficient for up to 10 m of pipework between the indoor and outdoor units; refer wiring diagram specification table for amount. Add 60 g of HFC-410A per metre above 10 m.

\* 600 min with optional Vertical Discharge Grille

**Procedure:**

1. Evacuate Indoor Unit and interconnecting pipework to a pressure of 500 microns and hold for 15 mins.
2. Add refrigerant, if needed, 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 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 or other heat source to raise the indoor air temperature to about 24°C. Return to cooling cycle 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. 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 40 m, Emkarate RL22CF polyolester oil (or similar) should be added to the refrigerant at the rate of 10 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:

1. TZT-100 Controller (via modbus),
2. 0-10V dc command via BMS modbus, or
3. 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**

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 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. Check that the thermostat is correctly wired to the unit and is set at the desired temperature.
5. Check that the indoor coil sensor lead is correctly wired to the unit.
6. Check that the air filters, if any, have been correctly installed.
7. Check any supply air diffuser dampers are open.

**START UP PROCEDURE**

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

1. Switch on the unit after the four hour delay period for the crankcase heater has expired.
2. Check the supply voltage.
3. 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.
4. Fit gauges and measure the suction and discharge pressures.  
**Important:** Gauges must be designed specifically for use with R410A.
5. Test the operation of the high pressure safety control by switching off the outdoor unit's fan.
6. Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
7. Check that the air flow over the outdoor unit's coil is adequate and that the fan is running smoothly.
8. Check the superheat - refer charging procedure.
9. Check the supply air flow at each outlet.
10. 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](http://www.temperzone.biz) for operation & fault diagnostics 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.

**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.

**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.

**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 | 5                               | 10    | 15    | 20    | 30    | Suction Pipe Size OD                     | 22 mm |
| 13             | 22      | 0.7 %                           | 2.1 % | 3.4 % | 4.7 % | 6.1 % | Long 90° Radius (2 x pipe dia.)          | 0.5 m |

|  |         |         |
|--|---------|---------|
| OUTDOOR UNIT :- OSA 160RKT   | ISD 160 | ISU 160 |
| WITH INDOOR UNIT   |         |         |
| CAPACITIES - NET to AS/NZS 3923  |         |         |
| COOLING -  | kW      | 14.68   |
| HEATING - REVERSE CYCLE  | kW      | 15.17   |
| ELECTRICAL INPUT @ 3PH 400V ~ 50HZ                                       |         |         |
| COOLING -  | kW      | 5.101   |
| HEATING - REVERSE CYCLE  | kW      | 4.57    |
| E.E.R. (COOLING)   | kW/kW   | 2.88    |
| ELECTRICAL   |         |         |
| SUPPLY REQUIRED 3PH 342-436V ~ 50HZ INCLUDING VOLTAGE FLUCTUATION LIMITS |         |         |
| COMPRESSOR (3PH) RUN AMPS RATED CONDITIONS                               | A       | 7.1/PH  |
| INDOOR FAN MOTOR (1PH) FULL LOAD AMPS                                    | A       | 4.4     |
| INDOOR FAN MOTOR CAPACITOR   | MFD     | 10      |
| INDOOR FAN MOTOR (1PH) FULL LOAD AMPS                                    | A       | 0.94    |
| OUTDOOR FAN MOTOR CAPACITOR  | MFD     | 5       |
| RUNNING AMPS (TOTAL)   | A       | 12/8/8  |
| RECOMMENDED EXTERNAL FUSE SIZE   | A       | 25      |
| WEIGHT - NETT OSA 160RKT 133Kg   |         |         |
| REFRIGERANT - R410A  |         |         |
| UNIT PRECHARGED (10 METRE LINE LENGTH) 3.6 Kg                            |         |         |
| BASED ON Ø13 OD LIQUID LINE & Ø22 OD GAS LINE                            |         |         |
| COMPRESSOR TYPE: SCROLL  |         |         |
| OIL TYPE: POLYESTER (POE)  |         |         |
| ADD ADDITIONAL OIL 13ml PER METRE OVER 30 METRE LINE LENGTH              |         |         |

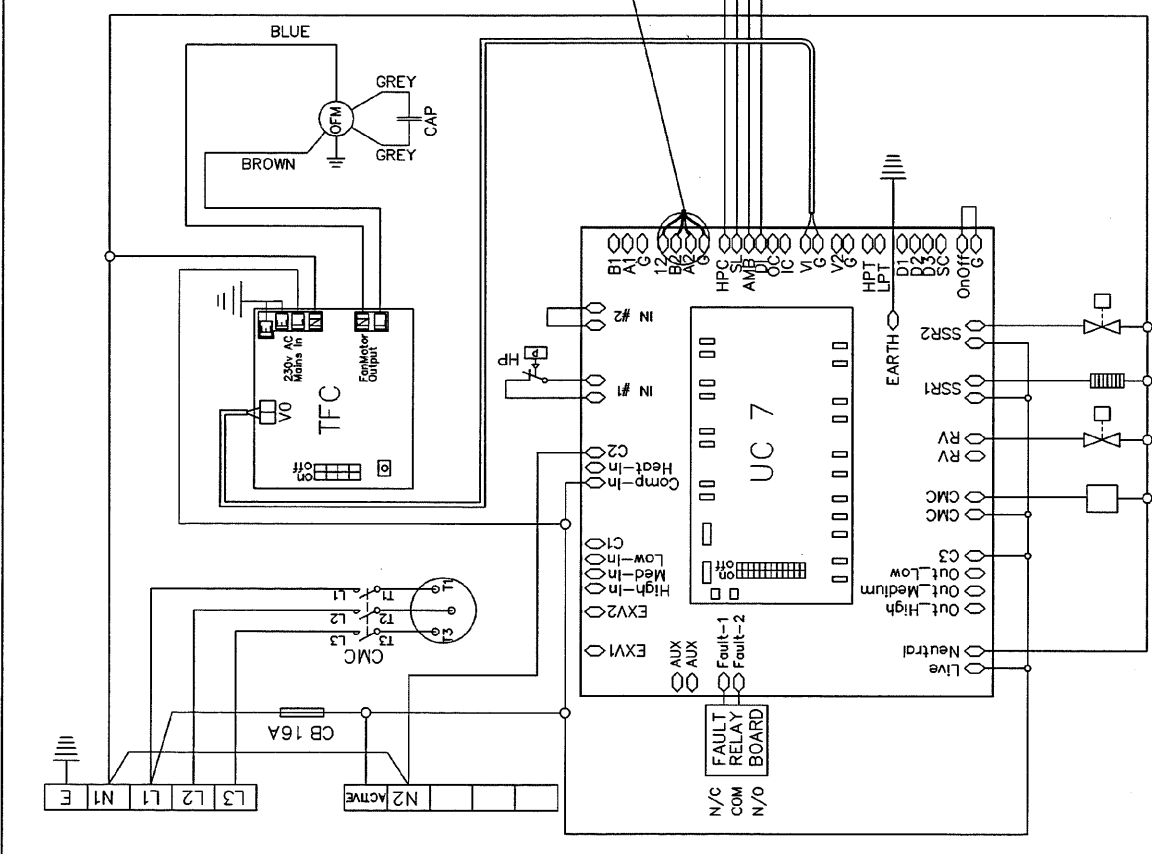
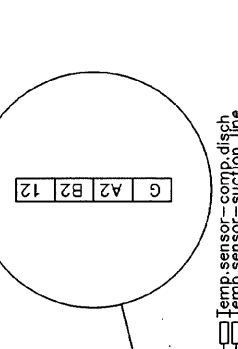
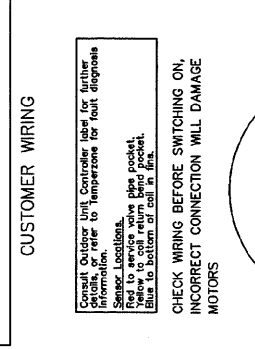
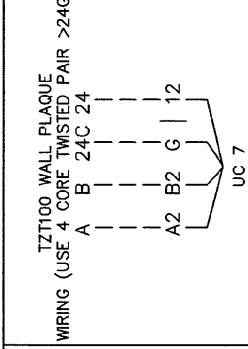
| ABB | DESCRIPTION                |
|-----|----------------------------|
| CAP | CAPACITOR                  |
| CB  | CIRCUIT BREAKER            |
| COH | CRANK CASE HEATER          |
| CM  | COMPRESSOR MOTOR           |
| CMC | COMPRESSOR CONTACTOR       |
| HP  | HI PRESSURE CONTROL        |
| LP  | LOW PRESSURE CONTROL       |
| OU  | OUTDOOR UNIT CONTROLLER    |
| OFM | OUTDOOR FAN MOTOR          |
| RV  | REVERSING VALVE            |
| DTS | DISCHARGE TEMP SENSOR      |
| TFC | TEMPERATURE FAN CONTROLLER |
| UC  | UNIT CONTROLLER            |
| RV  | REGULATING VALVE           |

| UC7 DIP SWITCH SETTINGS |           |
|-------------------------|-----------|
| DIP SWITCH NO.          | TON/OFF ↓ |
| 1                       | DN        |
| 2                       | DN        |
| 3                       | OFF       |
| 4                       | DN        |
| 5                       | OFF       |
| 6                       | OFF       |
| 7                       | OFF       |
| 8                       | OFF       |
| 9                       | OFF       |
| 10                      | OFF       |
| 11                      | OFF       |
| 12                      | OFF       |
| 13                      | DN        |
| 14                      | OFF       |
| 15                      | OFF       |
| 16                      | OFF       |

| TFC DIP SWITCH SETTINGS |           |
|-------------------------|-----------|
| DIP SWITCH NO.          | TON/OFF ↓ |
| 1                       | OFF       |
| 2                       | OFF       |
| 3                       | OFF       |
| 4                       | OFF       |

| SENSORS   | COLOUR |
|-----------|--------|
| Discharge | RED    |
| Suction   | BLUE   |
| Ambient   | Black  |
| De-ice    | Blue   |
| O/Coil    | Yellow |

**THIS COMPRESSOR IS DIRECTIONAL. ENSURE COMPRESSOR IS ROTATING IN CORRECT DIRECTION. WRONG DIRECTION WILL CAUSE NOISY OPERATION AND WILL NOT PUMP. REVERSE TWO PHASES TO CHANGE DIRECTION. INDOOR UNIT POWER SUPPLY MUST BE OFF ACTIVE IN OUTDOOR UNIT (SAME PHASE)**



|                 |  |
|-----------------|--|
| Programmed by   |  |
| PLOTTED         |  |
| 24-04-08        |  |
| ©temperzone ltd |  |
| 2003            |  |

| ISSUE | MODIFICATION | DATE | APRVD | DRG SIZE | No. | DESCRIPTION | Mat./ | FINISH | ASSTY |
|-------|--------------|------|-------|----------|-----|-------------|-------|--------|-------|
|       |              |      |       |          |     |             |       |        |       |

|             |                                     |
|-------------|-------------------------------------|
| Title       | OSA 160RKTG (3 PH) WIRING SCHEMATIC |
| Matched to  | ISF450                              |
| Drawn       | BS                                  |
| Date        | 30-06-11                            |
| Drawing No. | BES-74537-400                       |
| Revision    |                                     |

