

OPA 280RKTG01-P (Digital c/w EC Plug fan & UC7 Controller)

Packaged Reverse Cycle R410A Air Cooled Air Conditioner

Installation & Maintenance

GENERAL

This OPA 280RKTG01-P unit must be installed in accordance with all national and local safety codes.

Options

1. TZT-100 Room Temperature Controller.
2. Filters - pleated, rated EU4.

REFRIGERATION SYSTEM

General

The refrigeration system has been charged with HFC-410A (R410A) refrigerant; refer wiring diagram specification table for amount. Service valves are provided to measure discharge and suction operating pressures.

Compressor

The compressor is a digital scroll type which provides capacity variability. The compressor lubricant is polyol ester oil (POE). Note, this oil absorbs moisture quickly if exposed to open air.

INSTALLATION

Positioning

Refer to dimension diagrams for minimum clearances. If multiple units are to be placed side-by-side then allow at least 2 m between coil faces.

Mounting

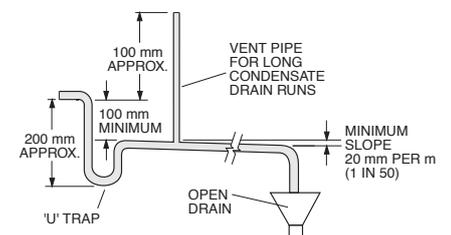
The unit should be fastened to a firm flat horizontal base using the holes supplied in the box mounting channel.

When the unit is being installed on a roof it is recommended that the unit is installed on a substantial structure with anti-vibration mounts or pads.

Flexible duct connections are recommended between the supply and return ducts and the unit.

Condensate Drain

The condensate drain should be 'U' trapped outside the unit. The trap should have a Downward height of at least 100 mm. The drain should have a slope of at least 1 in 50 and must not be piped to a level above the unit drain pipe.



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, and a mains isolator provided - preferably close to the unit.

Note: DO NOT USE REWIRABLE FUSES.

The OPA 280 is provided with a 24V AC control circuit for a thermostat, on/off switch and/or time clock.

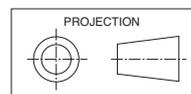
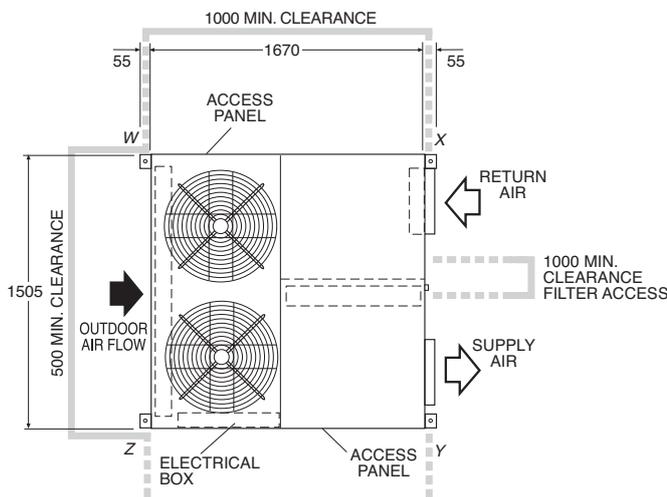
Standard units are suitable for use with manual or auto changeover thermostats. These can be powered from the HOT 24V and COM 24V terminals and must deliver 24V AC to the COMP, HEAT and FAN terminals. Alternatively a 'communicating' thermostat such as temperzone's TZT-100 can be connected to the 12V / B2 / A2 / G terminals as shown on sheet 2 of the wiring schematics.

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.

A 24 hour power supply to the crankcase heaters is required, via the UC7 Controller, otherwise the warranty is void.

DIMENSIONS (mm)

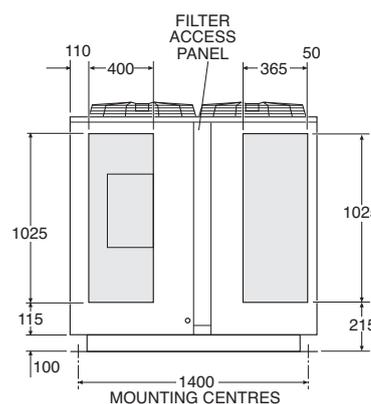
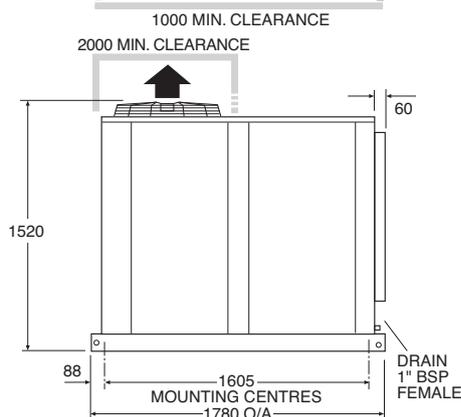


Not to Scale

POINT LOADS (kg)			
W	X	Y	Z
139	106	110	145

Net Weight 500 kg

Note: A 2 m clearance is required above the exhaust air fans



CHECK TESTS

1. Check that the shipping block beneath the compressor has been removed and that the compressor is secure on its mounts.
2. Check by hand that all fan motors can turn freely.
3. Check that the air filters have been correctly installed, if fitted.
4. Check air diffuser dampers are open if appropriate.
5. Check that the thermostat, or external 24V controller, is correctly wired to the unit and is set at the desired temperature.

6. Check the tightness of all electrical connections and sign the check label.
7. This unit has a single Indoor Fan Speed selection terminal – FAN 24V. It activates 'High' speed via a switched 24V AC input which should take its feed from the HOT 24V terminal. If using a TZT-100 'communicating thermostat', it can be configured for either 1 or 3 indoor fan speeds. Use the tables on the wiring schematic (Sheet 2, of 2) to set the DIP switches on the 'LC' (0-10V Level Controller) to adjust the 'Maximum' fan speed and the 'Range' for the Indoor fan if the factory default settings are not suitable. (N.B. If any setting adjustments are needed, turn off the power, make changes, then apply power again.) Refer to www.temperzone.biz for more information on the "0-10V / Analog Level Controller" if necessary.
8. 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.)
9. Check the supply voltage between each phase and neutral.
10. Ensure that the CCB and IFCB are closed. Check the 7-segment display on the UC7 controller illuminates. (If not check for Mains supply voltage between the 'L' and 'N' terminals on the UC7. If no voltage is present, it is likely there is a phase sequence error on the main supply to L1 / L2 / L3. Isolate the main power supply then reverse two of the supply phases. Turn on the power again. This time the PRR relay contact should close and the UC7 controller should come to life.)
11. Close the CMCB circuit breaker.
12. Turn on the thermostat, or external 24V controller. Set it to 'FAN only' mode and select 'High' fan speed if the 3-speed configuration is used on the TZT-100 Thermostat. Wait for fan to ramp up to full speed and check fan amps are not above FLA specified. (If FLA is exceeded, either increase supply air static pressure or reduce the maximum indoor fan speed by adjusting the 'LC' DIP switches.)
13. Select 'Medium' speed (if available). Check that fan speed reduces.
14. Then select Low speed (if available) and check fan speed reduces further, but does not go too low, potentially resulting in insufficient air flow and indoor coil icing issues on Cool cycle or high head pressure on Heat cycle.
15. Turn fan OFF via thermostat (or external controller) and check fan runs on for 40 or 120 secs. as per the 'LC' DIP switch 6 setting shown on wiring diagram sheet 2.

START UP PROCEDURE

After the four hour delay for the crankcase heater has expired, use the supplied Commissioning Sheet (Form NS 217) to record results when completing the following 'Start-up' procedure:

1. Fit gauges to the suction and discharge ports. Fit a temperature sensor to a horizontal section of the suction pipe.
2. Select Cool or Heat cycle according to the ambient temperature at the time of commissioning.
3. When the compressor starts, check for any abnormal noises. If it is running in reverse it may make additional noise and will not pump effectively. Check the connections to the compressor terminals have the correct phase sequence. The incoming phase sequence should be correct because of the test performed at 'CHECK TESTS' step number 10.
4. Wait for about 5 minutes for the refrigeration system pressures to stabilise. Then check the compressor current draw on each phase. Measure the current draw of each fan motor. Check all readings against the specified values in the wiring diagram data table.
5. Check that indoor and outdoor fans are running smoothly.
6. Check the suction and discharge pressures and calculate the suction superheat.
7. Check the supply air flow at each outlet.
8. Change cycle from Cool to Heat or vice versa and ensure reversing valve changes over and unit runs correctly in the opposite cycle. (N.B. Many thermostats enforce a minimum time delay between cycle change over.)
9. If the unit is working within acceptable limits, turn the unit off at the thermostat.
10. Touch up any outdoor unit paintwork damage to prevent corrosion.

SETTING SUPPLY AIR FLOW

Consult OPA 280RKT-P 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).

High humidity levels can occur in tropical or subtropical conditions, and/or when heavily moisture laden fresh air is introduced. Select a fan speed that avoids water carry-over problems.

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. The UC7 regulates the superheat of the refrigeration system by controlling the position of an Electronic Expansion Valve (EEV). 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 UC7'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 the UC7 Controller label on the unit or www.temperzone.biz for operation & fault diagnostics information.

MAINTENANCE

Monthly

1. Check 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.

Six Monthly

1. Check the tightness of electrical connections.
2. Check the tightness of fans, motor mountings.
3. Check suction and discharge operating pressures.
4. Replace indoor air filters (if fitted).
5. 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 paintwork damage to prevent corrosion.

NOTE

The manufacturer reserves the right to make changes in specifications at any time without notice or obligation. Certified data is available on request.

This pamphlet replaces the previous issue no. 3998 dated 03/14a. Wiring revision D.

Important Notes:

1) Crankcase Heater Note
24 Hour power required (on L1) for control circuit and crankcase heaters

2) Important Note
Compressors fitted are directional. If rotation incorrect, compressor/s will not pump, be noisy, and draw minimal current. To correct rotation, reverse two phases.



Sensors (S) / Transducers (T)		Name	Type	Colour
DL	Discharge Temp	S	RED	
SL	Suction Temp	S	BLUE	
AMB	Ambient Temp	S	YELLOW	
DEI	De-ice Temp	S	BLUE	
LPT	Suction Pressure	T	3 Core Grey Cable	
HPT	High Pressure	T	Cable	

UC7 DIP switch settings

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

IFC DIP switch settings

DIP switch	On/Off
-	On
1, 2, 3, 4	Off

LC DIP switch settings

DIP switch	On/Off
1, 3, 5	On
2, 4, 6	Off

3) TZT-100 Note
To connect TZT100 to unit use 2 pair twisted cable - screen grounded. (F/UTP 24G (0.2mm²) or thicker recommended)

Table 1: TZT100 connection to UC7 terminals

TZT100 terminals	UC7 terminals
24	12
24C	G
B	B2
A	A2
	Screen to G

Indoor Fan Speed Level Controller (LC) DIP s/w settings

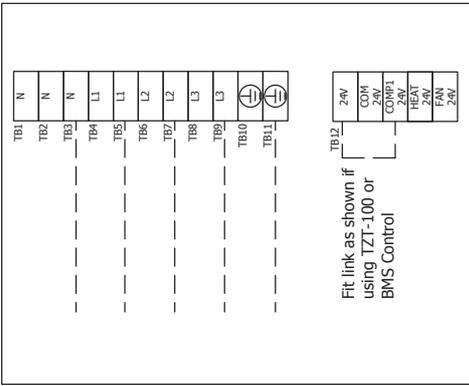
DIP Switch	Max Vdc	Output
1	2	3
0	0	0
1	0	0
0	1	0
1	1	0
0	0	1
1	0	1
0	1	1
1	1	1

DIP Switch	Speed Range	Vdc	Application
4	5		
0	0	2	Standard
1	0	3	
0	1	4	
1	1	6	

Fan Run On Time (sec)
6 40 120 Elec. Heat

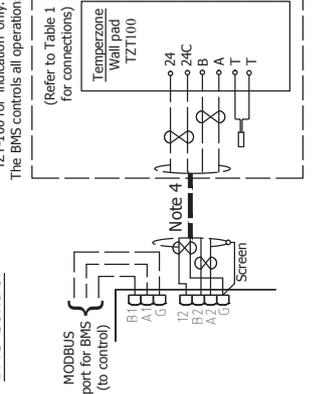
LC DIP Switch Example:
Dip Switches 1 2 3 4 5
0 0 0 0 0 = Speed Range = 6.7 to (6.7-2) = 6.7Vmax to 4.7Vmin

Client Wiring

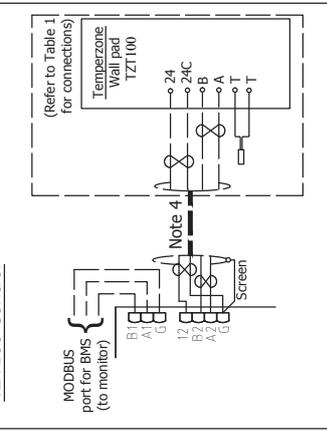


Fit link as shown if using TZT-100 or BMS Control

BMS Control



TZT100 Control



REV	DESCRIPTION	ECN	DATE	APPROVED
A	Initial release			
B	Sensor/Transducer Table updated; Note Added	N3434	27-02-14	C.M.W.
C	LC DIP s/w Default Settings Added	N3473	11-03-14	C.M.W.
D	TR, ext protection & per sys note removed, ETH was GRD	N3856	02-02-17	C.M.W.

DO NOT SCALE - ASK

Client Wiring

Drawn: C.M.W. Date: 26-08-13

Title:

OPA 280RKTG-P UC7 Wiring Schematic

Drawing No: 291-000-597 SHEET 2 OF 2

Rev: D



