

OPA 2000RKT10 (Opposite Hand)

Packaged Reverse Cycle R410A Air Cooled Air Conditioner

Installation & Maintenance

GENERAL

This OPA 2000RKT Outdoor Unit must be installed in accordance with all national and local safety codes.

REFRIGERATION SYSTEM

General

The OPA 2000 has four independent refrigeration circuits and four compressors to provide the flexibility and economy of four stage operation, i.e. utilising one or more circuits as conditions vary, plus the advantage of staggered starting.

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

Compressors

The compressors are directional scroll type. The compressor lubricant is polyol ester oil (POE). Note, this oil absorbs moisture quickly if exposed to open air. On commissioning, the compressors must be checked for correct rotation (refer Start Up Procedure). A time delay prevents simultaneous starting of the compressors.

ECONOMISER (Option)

If the outdoor air temperature or heat content preferably, is below that of the return air the fresh air damper opens and the return air damper closes to provide the first stage of cooling. A spill air facility in the building may be necessary for when the return air damper is closed. The fresh air damper should return to minimum setting and the return air damper open before compressors are allowed to operate to provide further cooling.

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

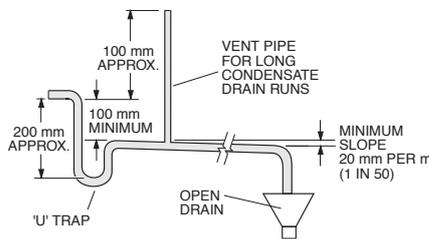
The unit should be fastened to a firm flat horizontal base using the holes supplied in the mounting channels.

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

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 vertical 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 or H.R.C. fuse, and a mains isolator provided - preferably close to the unit.

Note: DO NOT USE REWIRABLE FUSES.

The OPA 2000 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.

A 24 hour power supply to the control circuit is required, otherwise the warranty is void.

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. 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.)

8. Check the supply voltage between each phase and neutral.

START UP PROCEDURE

After the four hour delay for the crankcase heater has expired, use the supplied Commissioning Sheet (Form NS 228) to record results when completing the following 'Start-up' procedure. A *UC6 Service Interface* tool is supplied 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 compressors to start.
3. Compressors fitted are directional. Check for correct rotation. If rotation is incorrect the compressor will not pump, be noisy, and will draw minimal current. To correct motor rotation, change the phasing at the main power terminal. If changing the phasing, check the indoor air fan then runs in the correct direction also.
3. Measure the current draw on each phase to the compressor motors and measure the current draw of each fan motor. Check all readings against the specified values in the wiring diagram.
4. Use the *UC6 Service Interface* tool to check operating pressures and status. If the *UC6 Service Interface* is not available, fit gauges and measure the suction and discharge pressures of both refrigeration circuits.
5. Check that the outdoor air fan motors are running smoothly and drawing less than the full load amps specified.
6. Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
7. Check the supply air flow at each outlet.
8. Touch up any outdoor unit paintwork damage to prevent corrosion.

SETTING SUPPLY AIR FLOW

Consult OPA 2000 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.

In a free blow or low resistance application, beware of exceeding the fan motor's full load amp limit (refer wiring diagram).

The indoor air fan motor is fitted with a factory set adjustable pitch pulley. Instructions for the adjustment of pulleys is included on the back page of the supplied Commissioning Sheet. One revolution of adjustment is equal to approx. 7% change in air volume flow rate.

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. The UC 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 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 UC6 Controller label on the unit for operation & fault diagnostics information. Many operating status conditions can be determined, without gauges, simply by using the *UC6 Service Interface* graphical display supplied with the unit.

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.

Three Monthly (or every 1200 hrs of operation)

Check the indoor unit's fan belt tension and adjust if necessary.

Six Monthly

1. Check the tightness of electrical connections.
2. Check the tightness of all fans, motor mountings, pulleys and belt tension.
3. Check suction and discharge operating pressures. (Using the *UC6 Service Interface* avoids fitting and removing gauges with consequential refrigerant loss.)

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.

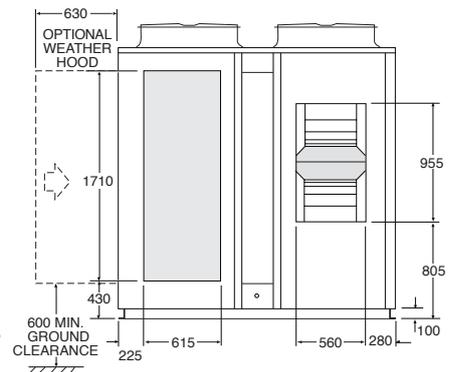
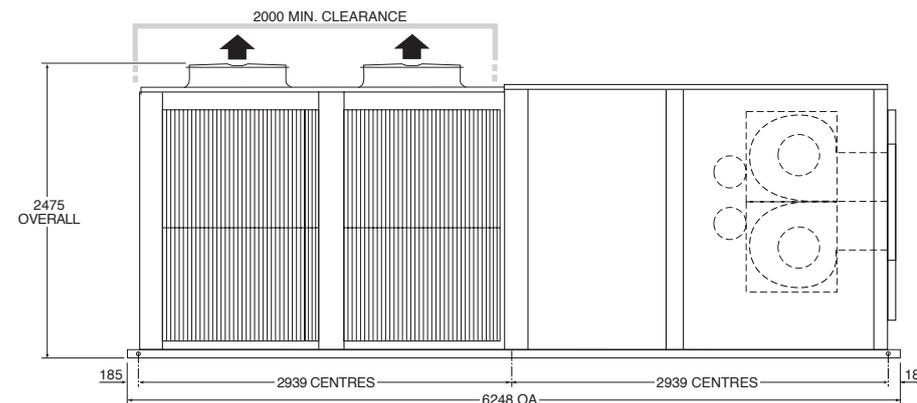
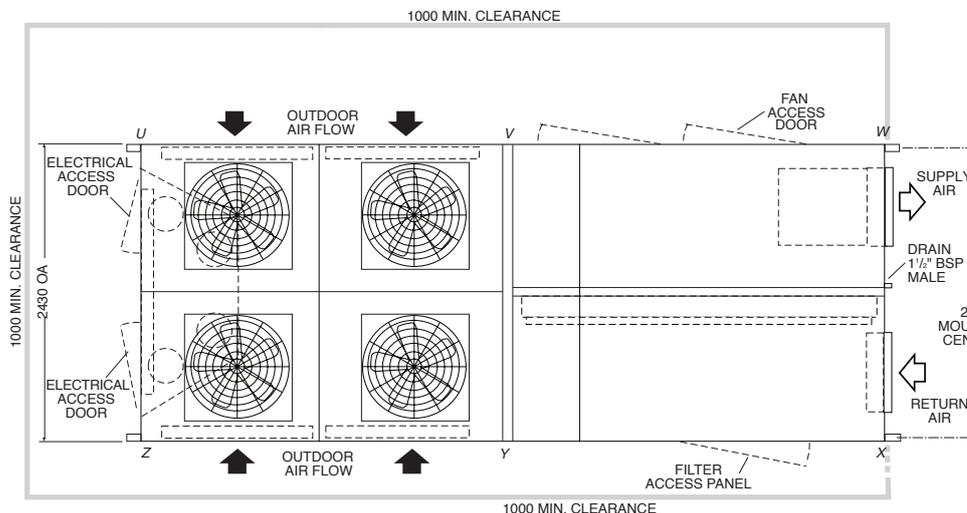
NOTE

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

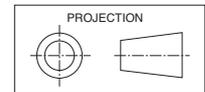
This pamphlet replaces the previous issue no. 4026 dated 12/18. Wiring revision I.

DIMENSIONS (mm)

OPA 2000RKT10 – Horizontal Supply & Return Air



OPA 2000RKT10



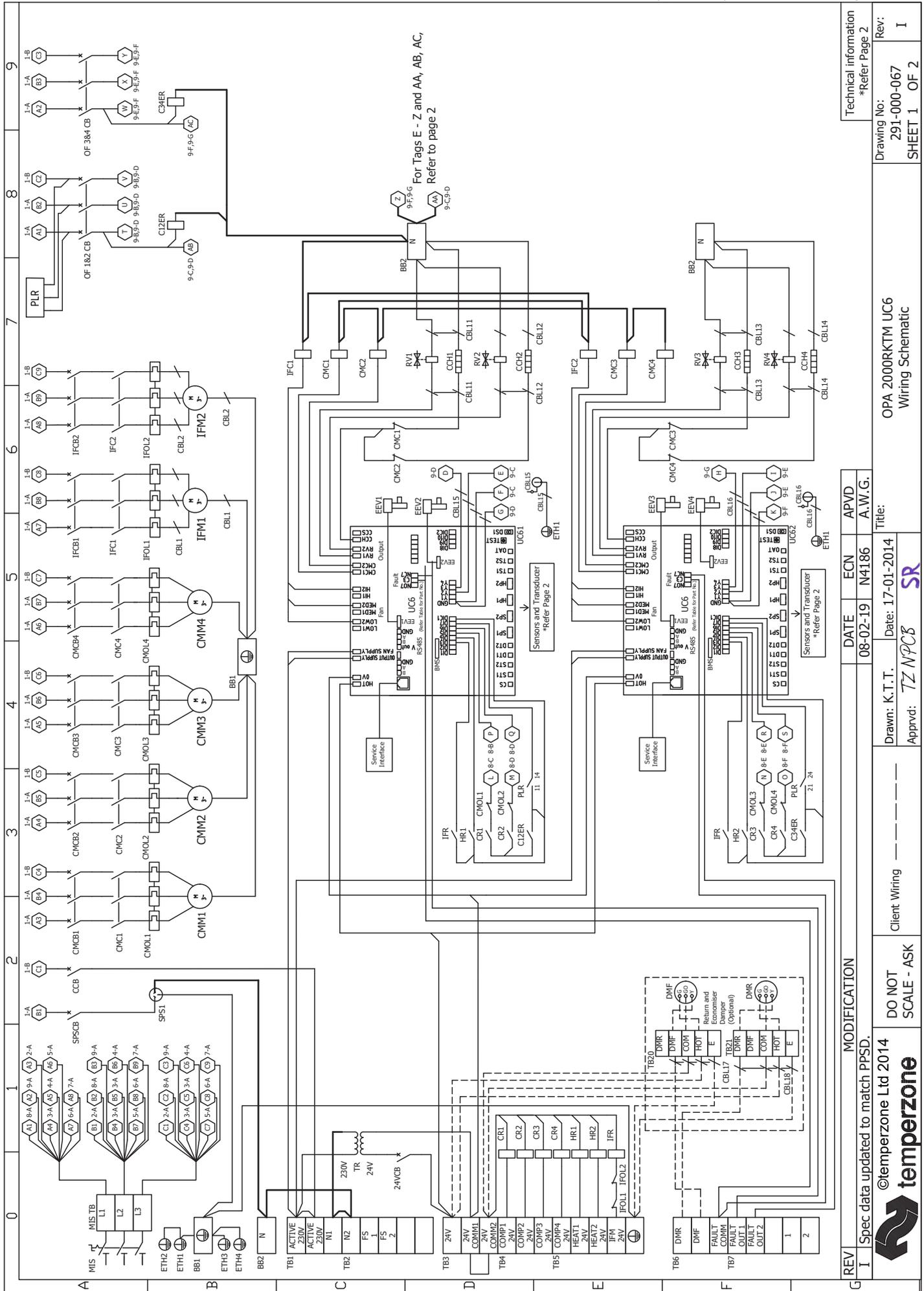
Not to Scale

POINT LOADS (kg)					
U	V	W	X	Y	Z
587	543	507	415	474	544

Net Weight 3070 kg

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

OPA 2000RKTM – Wiring Diagram Part 1, of 2



For Tags E - Z and AA, AB, AC, Refer to page 2

REV	I	Spec data updated to match PPSD.	MODIFICATION	DATE	ECN	APVD	Technical information
				08-02-19	N4186	A.W.G.	*Refer Page 2
		DO NOT SCALE - ASK	Client Wiring	Drawn: K.T.T.	Date: 17-01-2014	Title:	Drawing No: 291-000-067
				Appvd: TZ NCB			SHEET 1 OF 2
							Rev: I



OPA 2000RKTM UC6
Wiring Schematic

OPA 2000RKTm – Wiring Diagram Part 2, of 2

Options

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G	<p style="text-align: center;">Client Wiring</p>			<p style="text-align: center;">Client External Protection and Isolator switch</p> <p style="text-align: center;">Fit links as shown ONLY if using T/ZT-100 connected to UC6 "T"/ST terminals OR a BMS which communicates with the UC6 via mod bus</p>			<p style="text-align: center;">Important Notes:</p> <ol style="list-style-type: none"> 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. 4) SDC Dip Switch Settings SW1 SW2 SW3 SW4 Off Off Off Off 			<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Sensors (S) / Transducers (T)</th> <th>Name</th> <th>Type</th> <th>Colour</th> </tr> </thead> <tbody> <tr> <td>ST1</td> <td>Suction Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>ST2</td> <td>Suction Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>DT1</td> <td>Discharge Temp</td> <td>S</td> <td>GREY</td> </tr> <tr> <td>DT2</td> <td>Discharge Temp</td> <td>S</td> <td>GREY</td> </tr> <tr> <td>SP1</td> <td>Suction Pressure</td> <td>T</td> <td>3 CORE</td> </tr> <tr> <td>SP2</td> <td>Suction Pressure</td> <td>T</td> <td>GREY CABLE</td> </tr> <tr> <td>HP1</td> <td>High Pressure</td> <td>T</td> <td></td> </tr> <tr> <td>HP2</td> <td>High Pressure</td> <td>T</td> <td></td> </tr> <tr> <td>TS1</td> <td>De-ice Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>TS2</td> <td>De-ice Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>OAT</td> <td>Ambient Temp</td> <td>S</td> <td>YELLOW</td> </tr> </tbody> </table>			Sensors (S) / Transducers (T)	Name	Type	Colour	ST1	Suction Temp	S	BLUE	ST2	Suction Temp	S	BLUE	DT1	Discharge Temp	S	GREY	DT2	Discharge Temp	S	GREY	SP1	Suction Pressure	T	3 CORE	SP2	Suction Pressure	T	GREY CABLE	HP1	High Pressure	T		HP2	High Pressure	T		TS1	De-ice Temp	S	BLUE	TS2	De-ice Temp	S	BLUE	OAT	Ambient Temp	S	YELLOW	<p style="text-align: center;">Capacities - Nett to AS/NZS 3823</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Capacity</th> <th>Rating</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>Cooling -</td> <td>2000RKTm</td> <td>OPA</td> </tr> <tr> <td>Heating - Reverse Cycle</td> <td>184</td> <td>KW</td> </tr> <tr> <td>Electrical Input</td> <td>213</td> <td>KW</td> </tr> <tr> <td>Cooling -</td> <td>65.6</td> <td>KW</td> </tr> <tr> <td>Heating - Reverse Cycle</td> <td>60.0</td> <td>KW</td> </tr> <tr> <td>E.F.R. 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Electrical Input	213	KW																																																																																																																																																																																																																																																																																					
Cooling -	65.6	KW																																																																																																																																																																																																																																																																																					
Heating - Reverse Cycle	60.0	KW																																																																																																																																																																																																																																																																																					
E.F.R. (Cooling)	2.810	KW/KW																																																																																																																																																																																																																																																																																					
A.E.F.R. (Cooling)	2.803	KW/KW																																																																																																																																																																																																																																																																																					
Code	Description	Rating																																																																																																																																																																																																																																																																																					
CM	Compressors Type : Scroll																																																																																																																																																																																																																																																																																						
Compressor 1 (3Ph) run amps rating conditions	A/Ph	20.5																																																																																																																																																																																																																																																																																					
Compressor 2 (3Ph) run amps rating conditions	A/Ph	20.5																																																																																																																																																																																																																																																																																					
Compressor 3 (3Ph) run amps rating conditions	A/Ph	20.5																																																																																																																																																																																																																																																																																					
Compressor 4 (3Ph) run amps rating conditions	A/Ph	20.5																																																																																																																																																																																																																																																																																					
Compressor Circuit Breakers	A	63A x 4																																																																																																																																																																																																																																																																																					
Compressor Overload settings	A	32A x 4																																																																																																																																																																																																																																																																																					
Compressor Oil Type	P/O F																																																																																																																																																																																																																																																																																						
Indoor Fan Motor (3Ph)	KW	7.5 X 2																																																																																																																																																																																																																																																																																					
Indoor Fan Motor (3Ph) Full Load amps	A	14 X 2																																																																																																																																																																																																																																																																																					
Indoor Fan Motor Circuit Breaker	A	25A X 2																																																																																																																																																																																																																																																																																					
Indoor Fan Motor Overload settings	A	15A X 2																																																																																																																																																																																																																																																																																					
Outdoor Fan Motor (3Ph) Full Load amps	A	4.8 X 4																																																																																																																																																																																																																																																																																					
Outdoor Fan Motor 1 & 2 Circuit Breaker	A	16A																																																																																																																																																																																																																																																																																					
Outdoor Fan Motor 3 & 4 Circuit Breaker	A	16A																																																																																																																																																																																																																																																																																					
Running Amps (total)	A/Ph	102/110/110																																																																																																																																																																																																																																																																																					
Max Running Amps	A/Ph	153/162/162																																																																																																																																																																																																																																																																																					
SPSCB Single Phase Socket Circuit Breaker	A	10A																																																																																																																																																																																																																																																																																					
CCB Control Circuit Breaker	A	4A																																																																																																																																																																																																																																																																																					
24VCB 24 Volt Circuit Breaker	A	4A																																																																																																																																																																																																																																																																																					
Weight-Nett	Kg	3070																																																																																																																																																																																																																																																																																					
Main Isolator Switch	A	200A																																																																																																																																																																																																																																																																																					
Refrigerant Charge - per system	Kg	15																																																																																																																																																																																																																																																																																					
Code	Description	Rating																																																																																																																																																																																																																																																																																					
24VCB	24 Volt Circuit Breaker																																																																																																																																																																																																																																																																																						
BB	Bus Bar																																																																																																																																																																																																																																																																																						
C12ER	Compressor 1&2 Enable Relay																																																																																																																																																																																																																																																																																						
C34ER	Compressor 3&4 Enable Relay																																																																																																																																																																																																																																																																																						
CAP	Capacitor																																																																																																																																																																																																																																																																																						
CBL	Compressor Cable																																																																																																																																																																																																																																																																																						
CCB	Control Circuit Breaker																																																																																																																																																																																																																																																																																						
CCH	Crankcase Heater																																																																																																																																																																																																																																																																																						
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CMCB	Compressor Circuit Breaker																																																																																																																																																																																																																																																																																						
CMVM	Compressor Motor																																																																																																																																																																																																																																																																																						
CMOL	Compressor Overload																																																																																																																																																																																																																																																																																						
CR	Compressor Relay																																																																																																																																																																																																																																																																																						
DMF	Damper Motor Fresh Air																																																																																																																																																																																																																																																																																						
EEM	Damper Motor Return Air																																																																																																																																																																																																																																																																																						
EY	Electronic Expansion Valve																																																																																																																																																																																																																																																																																						
ETH	Earth Stud																																																																																																																																																																																																																																																																																						
HR	Heat Relay																																																																																																																																																																																																																																																																																						
IBB	Insulated Bus Bar																																																																																																																																																																																																																																																																																						
IFC	Indoor Fan Contactor																																																																																																																																																																																																																																																																																						
IFCB	Indoor Fan Circuit Breaker																																																																																																																																																																																																																																																																																						
IFM	Indoor Fan Motor																																																																																																																																																																																																																																																																																						
IFOL	Indoor Fan Overload																																																																																																																																																																																																																																																																																						
IFR	Indoor Fan Relay																																																																																																																																																																																																																																																																																						
ITC	Insulated Terminal Connector																																																																																																																																																																																																																																																																																						
MIS	Main Isolator Switch																																																																																																																																																																																																																																																																																						
OFM	Outdoor Fan Motor																																																																																																																																																																																																																																																																																						
OFM	Outdoor Fan Circuit Breaker																																																																																																																																																																																																																																																																																						
PRC	Phase Rotation Controller																																																																																																																																																																																																																																																																																						
PRR	Phase Rotation Relay																																																																																																																																																																																																																																																																																						
RV	Reversing Valve																																																																																																																																																																																																																																																																																						
SDC	Star/Delta Controller																																																																																																																																																																																																																																																																																						
SPSCB	Single Phase Socket Circuit Breaker																																																																																																																																																																																																																																																																																						
SPS	Single Phase Socket																																																																																																																																																																																																																																																																																						
TJ	Terminal Joiner																																																																																																																																																																																																																																																																																						
TR	Transformer																																																																																																																																																																																																																																																																																						
UC6	Unit Controller 6 (201-000-485)																																																																																																																																																																																																																																																																																						
<p style="text-align: center;">REV I Spec data updated to match PPSP.</p>				<p style="text-align: center;">MODIFICATION</p>				<p style="text-align: center;">DATE 08-02-19</p>		<p style="text-align: center;">ECN N4186</p>		<p style="text-align: center;">APVD A.W.G.</p>																																																																																																																																																																																																																																																																											
<p style="text-align: center;">DO NOT SCALE - ASK</p>				<p style="text-align: center;">Client Wiring</p>				<p style="text-align: center;">Title: OPA 2000RKTm UC6 Wiring Schematic</p>		<p style="text-align: center;">Date: 17-01-2014</p>		<p style="text-align: center;">SR</p>																																																																																																																																																																																																																																																																											
<p style="text-align: center;">temperzone</p>				<p style="text-align: center;">temperzone Ltd 2014</p>				<p style="text-align: center;">Approved: TZ MPCB</p>		<p style="text-align: center;">Rev: I</p>		<p style="text-align: center;">SHEET 2 OF 2</p>																																																																																																																																																																																																																																																																											