

OPA 1370RKTMO1-Z(-C) (c/w Economiser and/or Fresh Air Cowl)

Packaged Reverse Cycle R410A Air Cooled Air Conditioner

Installation & Maintenance

GENERAL

This OPA 1370RKTMO Outdoor Unit must be installed in accordance with all national and local safety codes.

Supplied Separately

1. Economiser Fresh Air Cowl.
2. Economiser electronic control system (supplied by others; alternatively factory fitted by temperzone).

REFRIGERATION SYSTEM

General

The OPA 1370 has four independent refrigeration circuits and four compressors to provide the flexibility and economy of two stage operation, i.e. utilising one or two 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

This OPA 1370RKTMO-Z unit is equipped with an Economiser. The purpose of the Economiser is to allow the introduction of low ambient outside air into the air conditioner during the cooling cycle, thereby lowering operating costs.

A fresh air and return air damper is supplied built-in to the sides of the OPA 1370RKTMO-Z unit.

Note: This unit is not supplied with an electronic control system to operate the Economiser – unless it was requested as a factory fitted option. It is recommended that the economiser dampers' control is by enthalpy or wet bulb temperature sensing – not by dry bulb temperature control.

If the outdoor air temperature or heat content preferably, is below that of the return air the fresh air damper should open and the return air damper close 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. A low limit thermostat is fitted to prevent

compressors operating with a mixed air-on coil temperature below 18°C; resets at 20°C. This is by-passed during heating mode.

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.

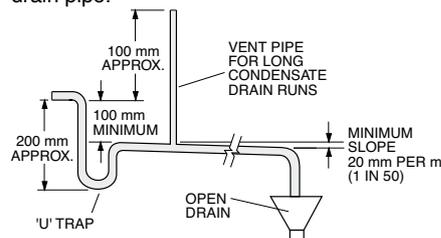
When the unit is being installed on a roof it is recommended that the unit is installed on a substantial structure with vibration isolating springs beneath the unit. These springs are not supplied with the unit.

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

Refer separate instructions for installation of the Economiser Fresh Air Cowl.

Drains

Both the condensate drain and the fresh air cowl rainwater 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 1370 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.

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

CHECK TESTS

1. Check that all the shipping bolts on the back of the compressor frame have 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.
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 compressor to start. Measure the current for each phase feeding into the compressor's. Compare against the compressor amps specified on the unit's wiring diagram.
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.
4. Measure the current draw of each fan motor. Check all readings against the specified values in the wiring diagram.
5. 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.
6. Check that the outdoor air fan motors are running smoothly and drawing less than

- the full load amps specified.
7. Check the indoor unit's fan belt tension after 20 mins of operation and adjust if necessary (refer Commissioning Sheet).
 8. Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
 9. Check the supply air flow at each outlet.
 10. Touch up any outdoor unit paintwork damage to prevent corrosion.

SETTING SUPPLY AIR FLOW

Consult OPA 1370 Technical Data pamphlet 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.

Air flow through the damper should not exceed 15% of the OPA unit's nominal

air flow when the OPA unit's refrigeration system is operating.

Note: Excessive amounts of low ambient fresh air will reduce the performance of a reverse cycle OPA unit on heating cycle.

Set the economiser Fresh Air Damper motor 'stop' to the equivalent negative static pressure as with F/A damper closed. This is to ensure the air flow volume remains constant and does not dramatically increase when introducing fresh air. Failure to set the correct 'stop' position could result in rain/moisture entrainment in the incoming fresh air resulting in water deposited inside the unit.

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 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.

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

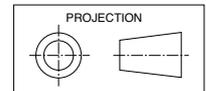
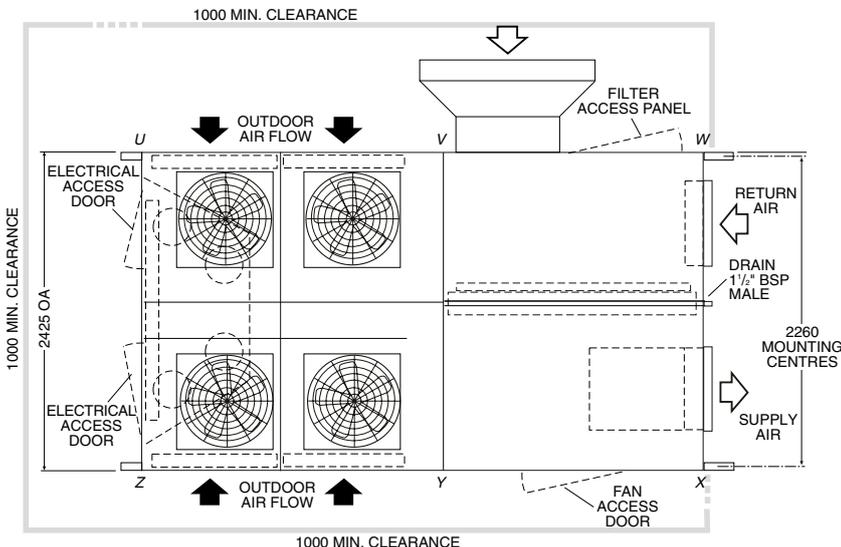
1. Check the tightness of electrical connections.
2. Check the tightness of all fans, motor mountings, pulleys and belt tension.
3. Check suction and discharge operating pressures. (Using the UC6 Service Interface avoids fitting and removing gauges with consequential refrigerant loss.)
4. Replace indoor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

DIMENSIONS (mm)

OPA 1370RKT01-Z(-C)

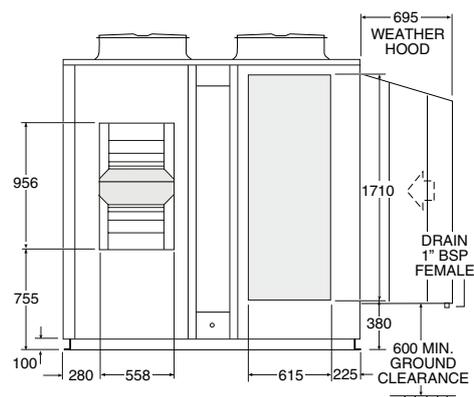
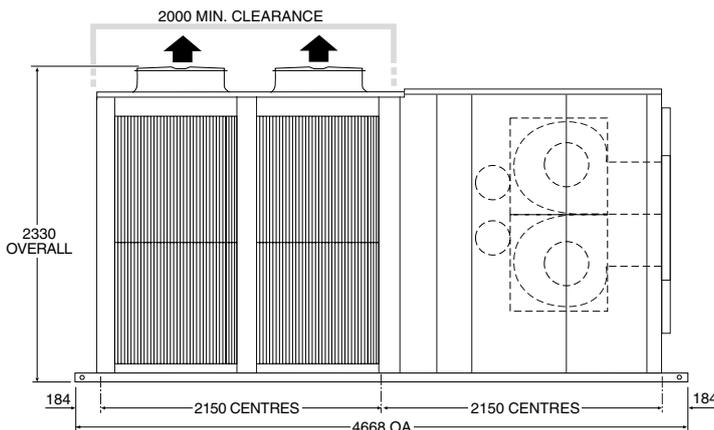


Not to Scale

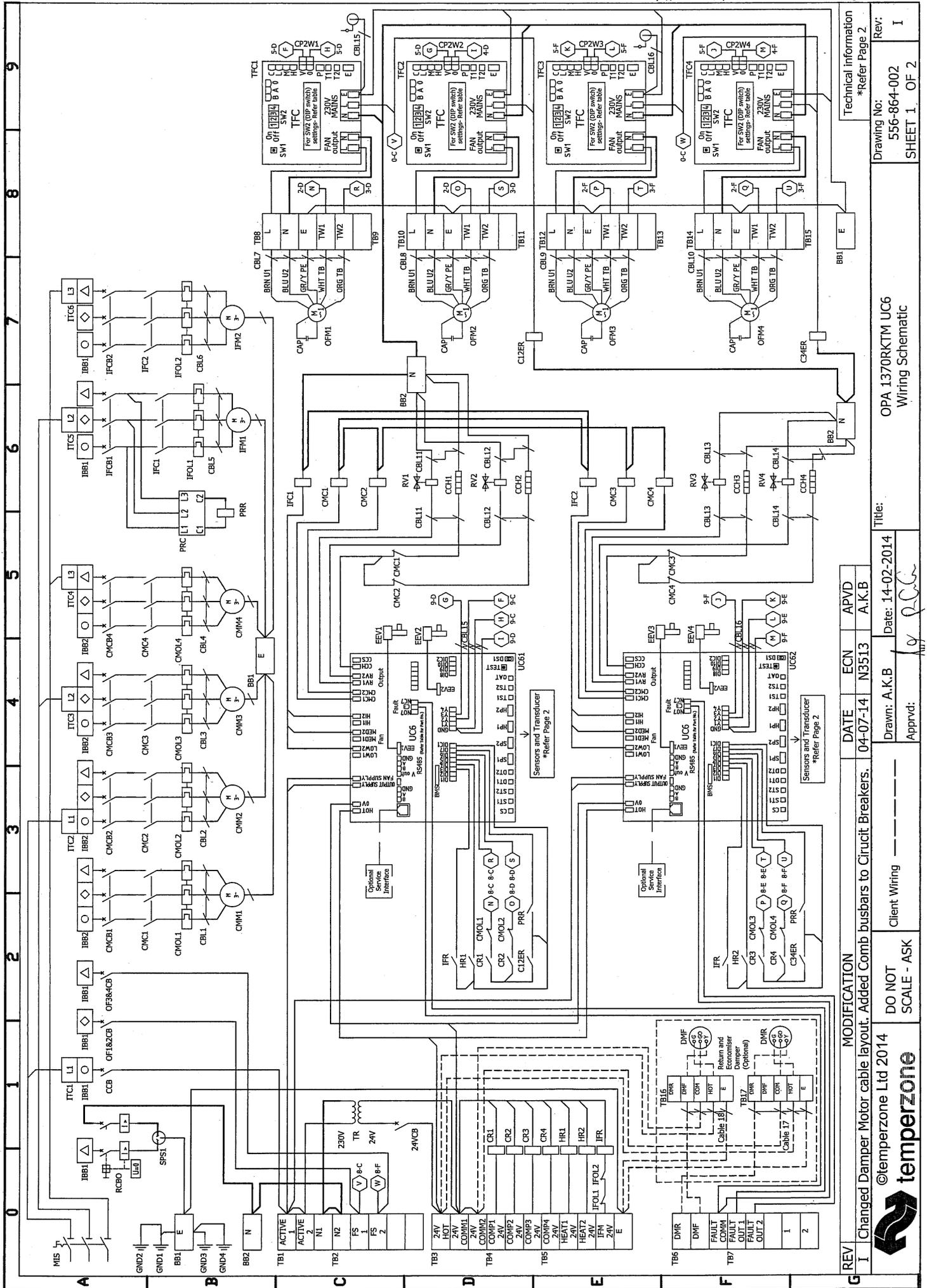
POINT LOADS (kg)					
U	V	W	X	Y	Z
430	347	262	406	419	433

Net Weight 2297 kg

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



OPA 1370RKTM – Wiring Diagram Part 1, of 2



Technical information
*Refer Page 2

Drawing No: 556-864-002
SHEET 1. OF 2

OPA 1370RKTM UC6
Wiring Schematic

Title:

Date: 14-02-2014
Drawn: A.K.B
Apprvd: [Signature]

REV	MODIFICATION	DATE	ECN	APVD
I	Changed Damper Motor cable layout. Added Comb busbars to Circuit Breakers.	04-07-14	N3513	A.K.B

Client Wiring
SCALE - ASK

DO NOT SCALE - ASK



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<p>Important Notes:</p> <p>1) Crankcase Heater Note 24 Hour power required (on L1) for control circuit and crankcase heaters</p> <p>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.</p> <p>3) IFC Dip Switch Settings SW1 SW2 SW3 SW4 Off Off Off Off</p>	<p>Sensors (S) / Transducers (T)</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Colour</th> </tr> </thead> <tbody> <tr> <td>ST1 Suction Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>ST2 Suction Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>DT1 Discharge Temp</td> <td>S</td> <td>GREY</td> </tr> <tr> <td>DT2 Discharge Temp</td> <td>S</td> <td>GREY</td> </tr> <tr> <td>SP1 Suction Pressure</td> <td>T</td> <td></td> </tr> <tr> <td>SP2 Suction Pressure</td> <td>T</td> <td></td> </tr> <tr> <td>HP1 High Pressure</td> <td>T</td> <td></td> </tr> <tr> <td>HP2 High Pressure</td> <td>T</td> <td></td> </tr> <tr> <td>TS1 De-ice Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>TS2 De-ice Temp</td> <td>S</td> <td>BLUE</td> </tr> <tr> <td>OAT Ambient Temp</td> <td>S</td> <td>YELLOW</td> </tr> </tbody> </table>	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		SP2 Suction Pressure	T		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;">Client Wiring</p> <p style="text-align: center;">Fit links as shown if using BMS Control</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>MODIFICATION</th> <th>DATE</th> <th>ECN</th> <th>APVD</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>Changed Damper Motor cable layout. Added Comb busbars to Circuit Breakers.</td> <td>04-07-14</td> <td>N3513</td> <td>A.K.B</td> </tr> </tbody> </table> <p>Client Wiring</p> <p>DO NOT SCALE - ASK</p>	REV	MODIFICATION	DATE	ECN	APVD	I	Changed Damper Motor cable layout. Added Comb busbars to Circuit Breakers.	04-07-14	N3513	A.K.B	<p>OPA 1370RKTM UC6 Wiring Schematic</p> <p>Drawing No: 556-864-002 SHEET 2 OF 2</p> <p>Rev: I</p>
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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. 3930 dated 03/14. Wiring revisions I.