

OPA 440RKTBG (Digital)

Packaged Reverse Cycle R410A Air Cooled Air Conditioner

Installation & Maintenance

GENERAL

This OPA 440RKTBG unit must be installed in accordance with all national and local safety codes.

CONFIGURATIONS

The OPA 440RKTBG is supplied in one of two standard configurations :

1. Horizontal supply/return air with box mounting channel (RKTBGH), or
2. Downward supply/return air with box mounting channel (RKTBGU).

REFRIGERATION SYSTEM

General

The OPA 440 has two independent refrigeration circuits and two 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

One of two systems has a digital scroll compressor. This has a variable capacity ability that enables closer control of room temperature.

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 delay 'on make' timer 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. 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. Two channels are provided under the base for spring mounts or bolting down.

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 (see figure 3).

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 440 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.

An optional **TZT-701** room temperature controller is available. Refer separate document for installation instructions.

A 24 hour power supply to the compressor crank case heaters is required, otherwise the warranty is void.

CHECK TESTS

1. Leave the on/off switch in the off position and close the mains isolating switch. A four hour delay period is required to allow the crankcase heaters to drive any liquid refrigerant out of the compressor oil.

- Bypass the crankcase heater thermostat (CCHT) for this period only.
2. Check that all the shipping blocks beneath both compressors have been removed and that the compressor is secure on its mounts.
 3. Check that all fan motors are free running.
 4. Check that the thermostat is correctly wired to the unit and is set at the desired temperature.
 5. Check that the air filters have been correctly installed if fitted.
 6. Check air diffuser dampers are open if appropriate.

START UP PROCEDURE

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

1. After the four hour delay period has expired, switch on the unit. Ensure the crankcase heater thermostat has been reconnected.
2. Check the supply voltage between each phase and neutral.
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 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.
5. Fit R410A compatible gauges and measure the suction and discharge pressures of both refrigeration circuits.
6. Check that the outdoor air fan motors are running smoothly.
7. Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
8. Check the indoor unit's fan belt tension after 20 mins of operation and adjust if necessary (refer Commissioning Sheet).
9. Check the supply air flow at each outlet.
10. Check the tightness of all electrical connections and sign the check label.
11. Touch up any outdoor unit paintwork damage to prevent corrosion.

SETTING SUPPLY AIR FLOW

Consult OPA 440 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.

OUTDOOR UNIT CONTROLLER (OUC)

The Outdoor Unit Controller (OUC) includes a temperature sensing head pressure control which enables the system to compensate for outdoor ambient temperatures below 20°C on cooling cycle, and above 15°C on heating cycle. The OUC also has features which protect against icing or overheating of coils, rapid cycling of the compressor and loss of refrigerant charge.

If the outdoor air fans take some time to begin rotating when the system is powered on, or they don't appear to be rotating appropriately while the compressor is running, consult the OUC label on the electrical box. If necessary, refer to **temperzone** for further diagnostic 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.

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 fans, motor mountings, pulleys and belt tension.
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

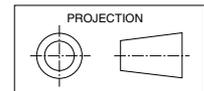
The manufacturer reserves the right to make changes in specifications at any time without notice or obligation. Certified data is available on request.

This pamphlet replaces the previous issue no. 3581 dated 03/11. Wiring revision E.

DIMENSIONS (mm)

Fig. 1 OPA 440RKTBGH – Horizontal Supply & Return Air

OPA 440RKTBG

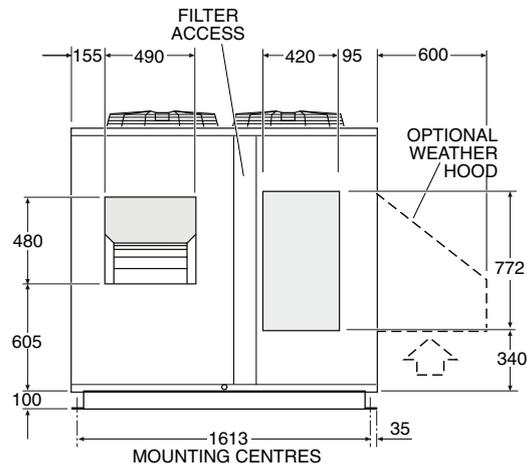
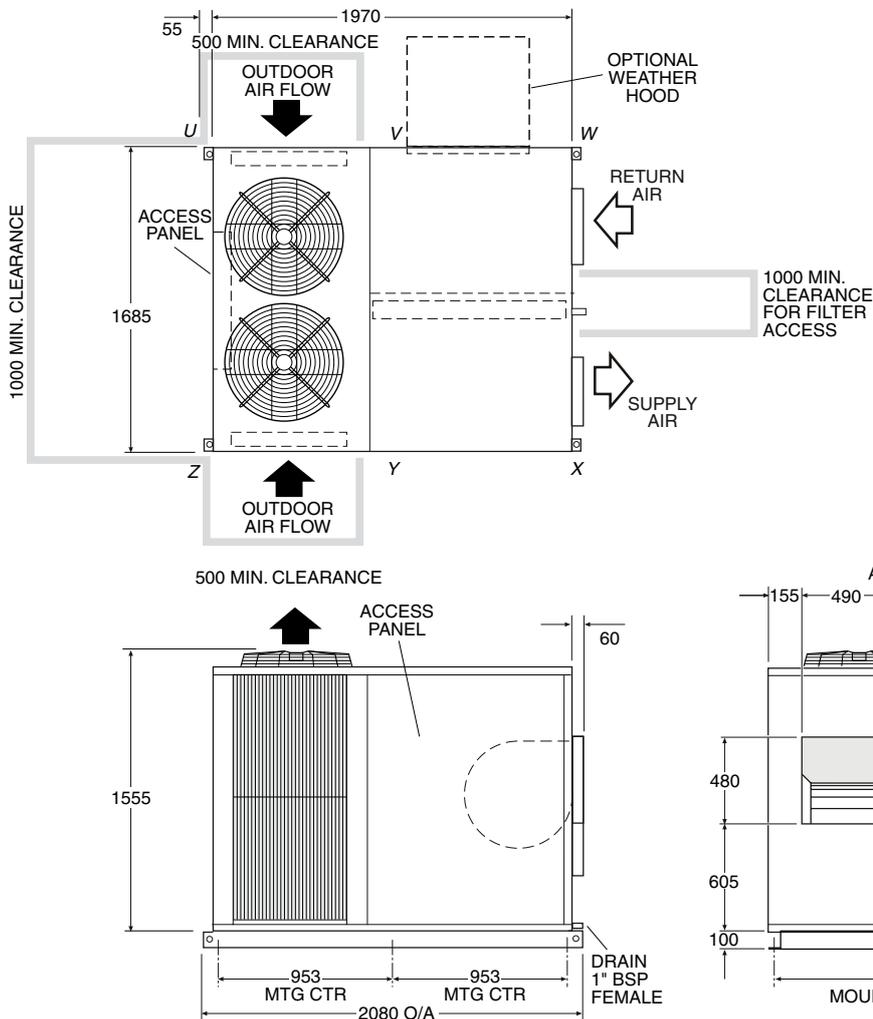


Not to Scale

POINT LOADS (kg)					
U	V	W	X	Y	Z
113	109	106	121	125	129

Net Weight 703 kg

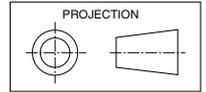
Note : A 2 m clearance is required above the exhaust air fans



DIMENSIONS (mm)

OPA 440RKTBG

Fig. 2 OPA 440RKTBGU – Downward Supply & Return Air



Not to Scale

Note:
Supply and return air spigots are shipped loose inside the return air cavity.

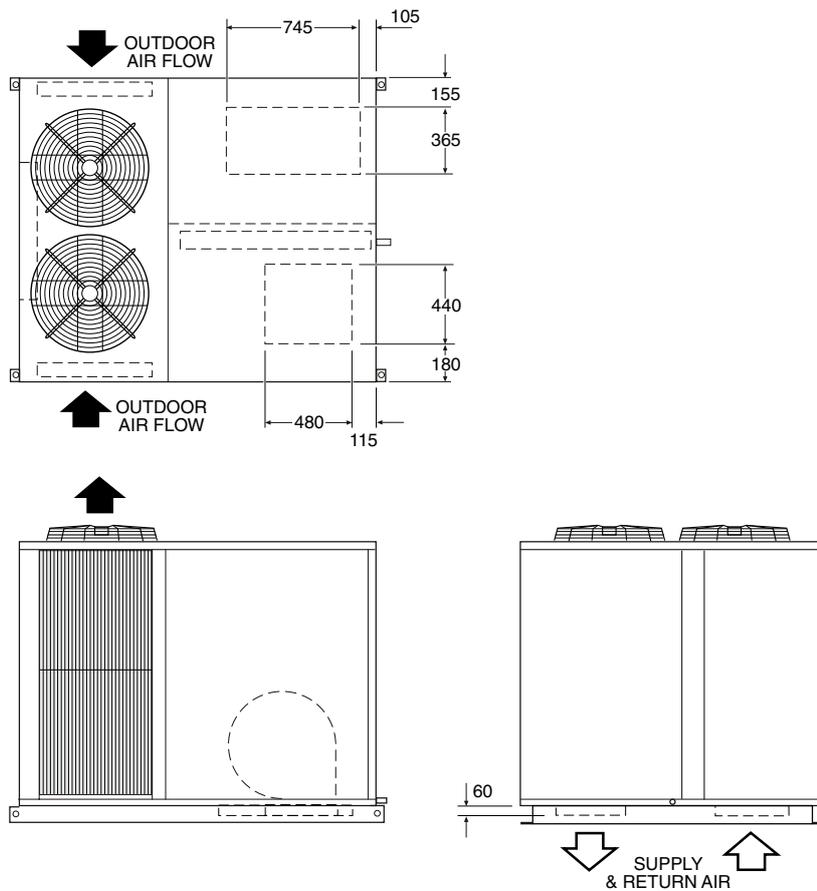
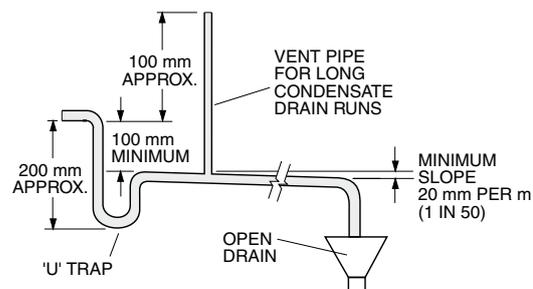


Fig. 3 Condensate Drain



CAPACITIES — NET TO AS/NZS 3823

COOLING — REVERSE CYCLE	KW	42.70
ELECTRICAL INPUT	KW	43.41
COOLING —	KW	14.55
HEATING — REVERSE CYCLE	KW	12.68
E.E.R. (COOLING)	KW/AKW	2.93

ELECTRICAL

SUPPLY REQUIRED 3Ph, 342-438V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS

COMPRESSOR (3PH) RUN AMPS RATED CONDITIONS A / Ph 10.8

INDOOR FAN MOTOR (3PH) FULL LOAD AMPS A 6.1

INDOOR FAN MOTOR (1PH) FULL LOAD AMPS A 2.7 x 2

OUTDOOR MOTOR CAPACITOR MFD 12 x 2

RUNNING AMPS (TOTAL) A 30.6/39/26

ELECTRIC HEAT OPTION 9 kW TOTAL A/Ph 13

RECOMMENDED EXTERNAL PROTECTION WITH ELECTRIC HEAT OPTION A/Ph 60

WEIGHT-NETTY OPA 440RKTBG Kg 70.3

REFRIGERANT — R410A Kg / SYSTEM 7

COMPRESSOR TYPE : SCROLL

APS	AIR PRESSURE SWITCH	HBR	HEATING BOOST RELAY
CAP	CAPACITOR	HR	HEATING RELAY
CB	CIRCUIT BREAKER	HR2	HEATING RELAY 2
CCH	CRANKCASE HEATER	HRC	HEATING RELAY COIL
CCHT	CRANKCASE HEATER 7-T/STAT	HR2C	HEATING RELAY 2 COIL
CLT	COMPRESSOR LOW LIMIT T/STAT	HP	HIGH PRESSURE SWITCH
CM	COMPRESSOR MOTOR	HST	HIGH TEMP. SAFETY
CMC	COMPRESSOR CONTACTOR	IFC	INDOOR FAN CONTACTOR
CMCC	COMPRESSOR CONTACTOR COIL	IFCC	INDOOR FAN CONTACTOR COIL
CMOL	COMPRESSOR OVERLOAD	IFM	INDOOR FAN MOTOR
CR	COMPRESSOR RELAY 24 V CONTROL	IFOL	INDOOR FAN OVERLOAD
CRS	COMPRESSOR RELAY COIL 24V	LAT	INDOOR FAN OVERLOAD
DCC	DIGITAL COMP CONTROLLER	LP	LOW PRESSURE SWITCH
DMF	DAMPER MOTOR FRESH AIR	MST	MANUAL HI TEMP/SAFETY
DMR	DAMPER MOTOR RETURN AIR	MV	MODULATION VALVE
DO	TIME DELAY 50 SEC DELAY ON MAKE	OFM	OUTDOOR FAN MOTOR
DR	DE-ICE RELAY	OUC	OUTDOOR UNIT CONTROLLER
DRC	DE-ICE RELAY COIL	PRC	PHASE ROTATION CONTROL
DTS	DISCHARGE TEMP SENSOR	PRR	PHASE ROTATION RELAY
D/O	DIODE	PRRG	PHASE ROTATION RELAY COIL
EHC	ELECTRIC HEAT CONTACTOR	RCV	REVERSE CYCLE VALVE
EHC2	ELECTRIC HEAT CONTACTOR COIL	R	RESISTOR
F	INDOOR FAN CONTROL	(Z)	DE-ICE INHIBIT LEAD
FR	INDOOR FAN CONTROL RELAY		
IFC	INDOOR FAN CONTROL RELAY COIL		

CLIENT WIRING
Interconnections between units by client. Double insulated multi-core cable.

NORE: CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS.

NOTE:
24 HOUR POWER SUPPLY TO CRANK CASE HEATER

Consult Outdoor Unit Controller label for further details, or refer to Temperzone for fault diagnosis information.

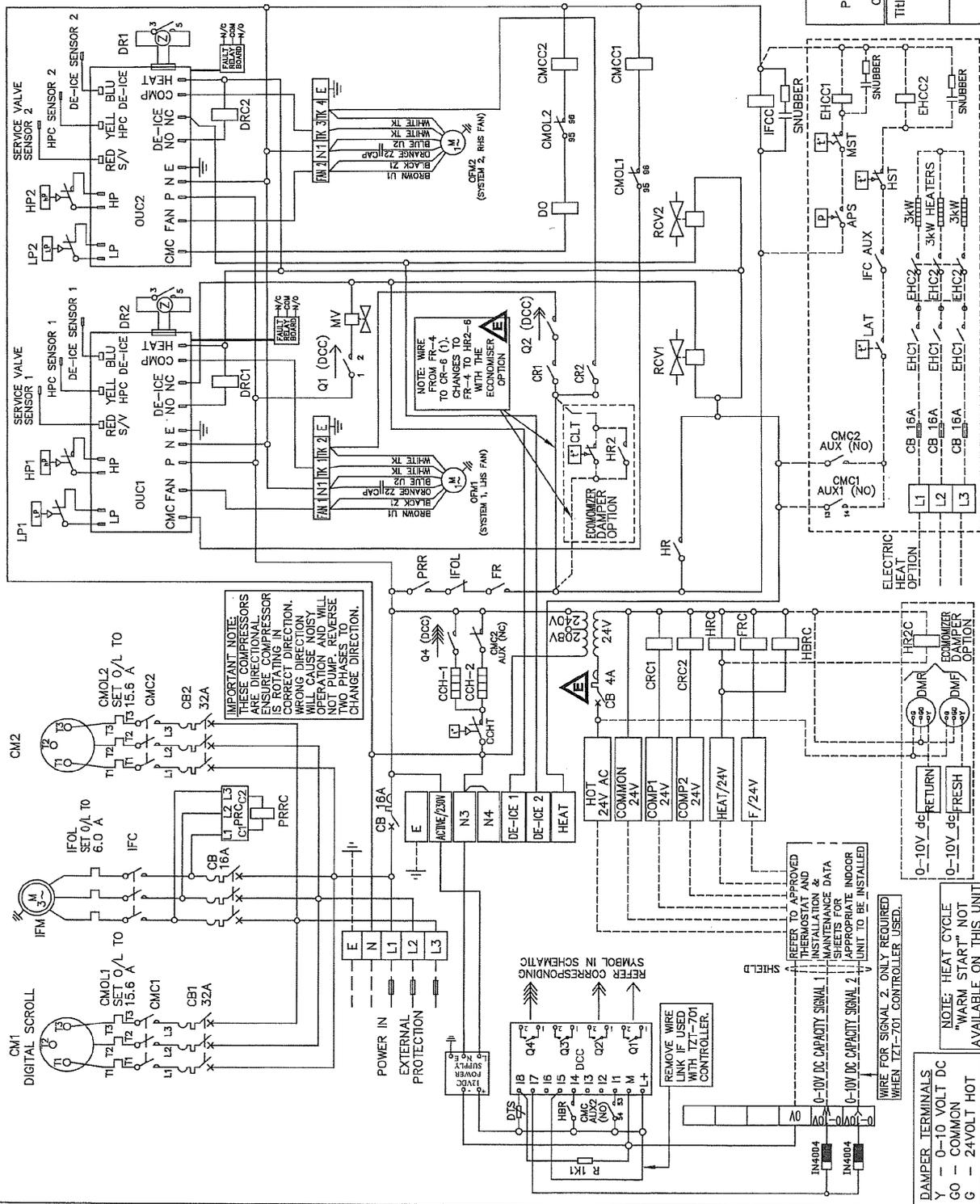
R410A

Sensor Locations
Red to service valve pipe pocket.
Yellow to coil return bend pocket.
Blue to bottom of coil in fins.

Title OPA 440RKTBG & OPP HAND WIRING SCHEMATIC



Drawn CMW	Date 17-03-09	Drawing No. 566-594-202	Revision
Scale	<i>Kgvd</i>		E



NOTE:
THE SYSTEM "1" IS SOMETIMES REFERRED TO AS "LHS" SYSTEM. THE SYSTEM "2" IS SOMETIMES REFERRED TO AS "RHS" SYSTEM.

NOTE:
CONTROL TRANSFORMER 240V PRIMARY VOLTAGE IS USED FOR COUNTRIES WITH 230 - 240V POWER SUPPLY. FOR COUNTRIES WITH SUPPLY VOLTAGE 200 - 220V CHANGE PRIMARY VOLTAGE TO 208V ON TRANSFORMER.

PLOTTED 20-06-11 ©temperzone ltd 2008

E	FR-OR-HR CHANGES FOR OMBON RELAYS/4A	CB WAS 6A	CB N280820-06-11	ROD
D	T/STAT	ADDED	N272702-02-11	ROD
ISSUE	MODIFICATION	ECN	DATE	APRVD