

OPA 500RB

Packaged Reverse Cycle Air Cooled Air Conditioner

Installation & Maintenance

GENERAL

This OPA 500RB Outdoor Unit must be installed in accordance with all national and local safety codes.

CONFIGURATIONS

The OPA 500RB is supplied in one of three standard configurations :

1. Horizontal supply/return air with mounting rails,
2. Downward supply air with mounting rails, or
3. Downward supply air with plinth mount.

REFRIGERATION SYSTEM

General

The OPA 500RB 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 7.5 kg each of HCFC-22 (R22) refrigerant. 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).

Compressors are fitted with adjustable anti-rapid cycle timers. Another adjustable time delay prevents simultaneous starting of compressors (see wiring diagram for settings). System 1 has a delay 'on break' timer (i.e. stop-to-start), while System 2 has a delay 'on make' timer (i.e. start).

ECONOMISER (Option)

If the outdoor air heat content or temperature 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. The compressor(s) will then operate to provide more cooling if required.

INSTALLATION

Unpacking

Units configured with horizontal supply/return air have their spigots inverted for ease of shipping. Remove the spigot and replace it, facing outwards.

Units configured with downward supply air and mounting rails, have their spigots shipped loose inside the return air cavity.

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 rails. Refer to figure 4 for plinth mount details.

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. Three 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 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 (refer Fig. 5).

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 500 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 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.
2. Check that the shipping blocks beneath each compressor have been removed and that each 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. System 1's compressor will start straight away. System 2's compressor will start six minutes later due to the built in delay timer.
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.
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 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 500 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.

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.
4. Replace indoor air filters (if fitted).
5. Check condensate drain for free drainage.

Yearly

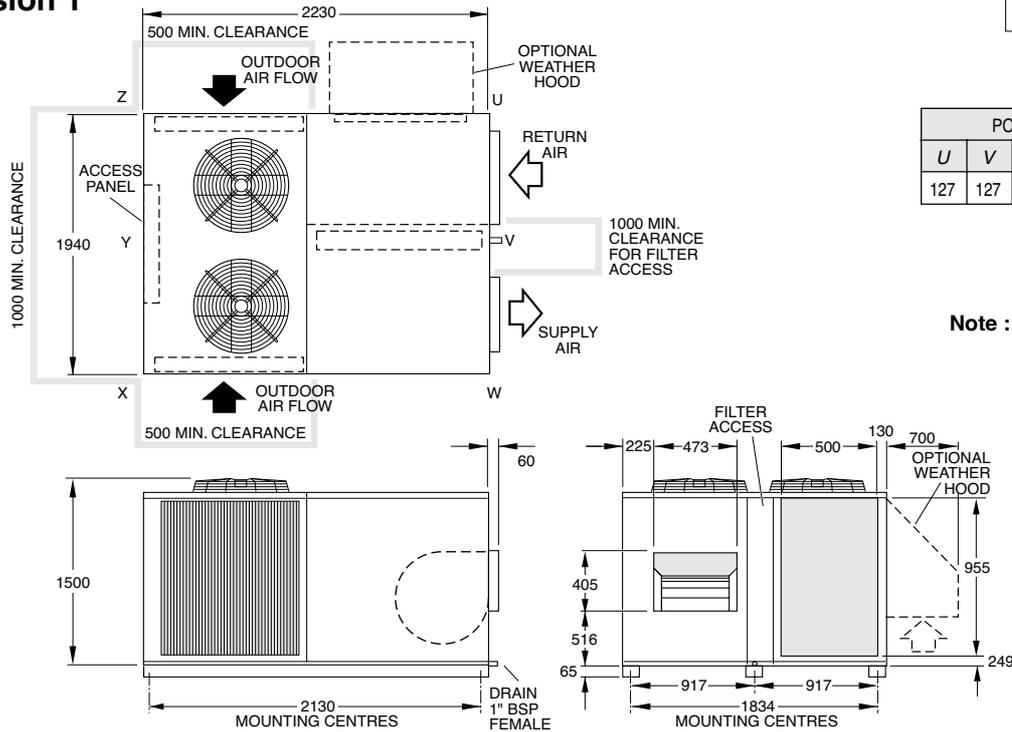
1. Check all refrigerant piping for chafing

and vibration.

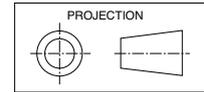
2. Check the operation of electric heaters, if fitted.
3. Check air supply at all diffusers.
4. Check for excessive noise and vibration and correct as necessary.
5. Check fan and motor bearings and lubricate or replace as necessary.
6. Check for insulation and duct damage and repair as necessary.
7. Remove lint and dust accumulation from outdoor coil fins.
8. Touch up any paintwork damage to prevent corrosion.

DIMENSIONS (mm)

Fig. 1 Horizontal Supply & Return Air / Mounting Rails Version 1



OPA 500RB



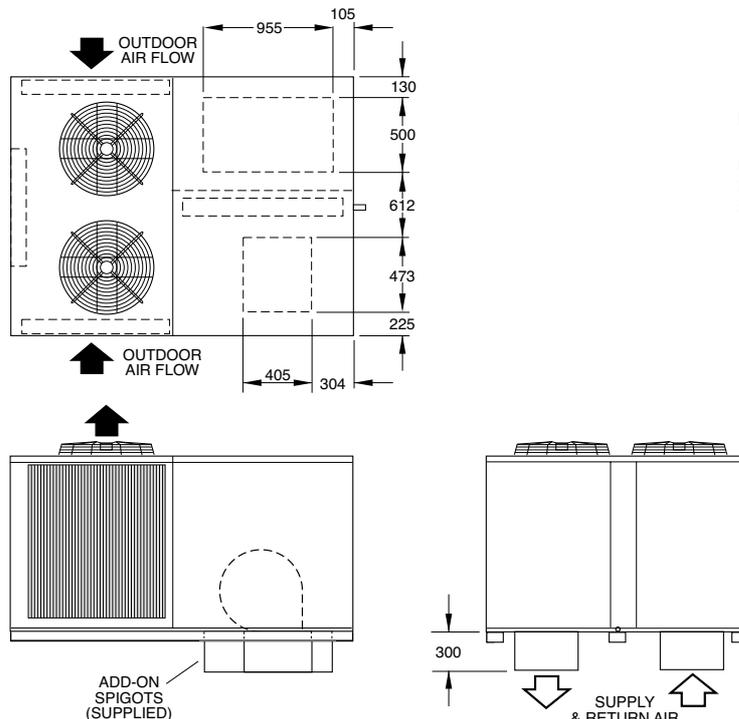
Not to Scale

POINT LOADS (kg)					
U	V	W	X	Y	Z
127	127	152	152	147	127

Net Weight 832 kg

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

Fig. 2 Downward Supply Air / Mounting Rails Version 2



NOTE

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

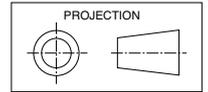
Note:

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

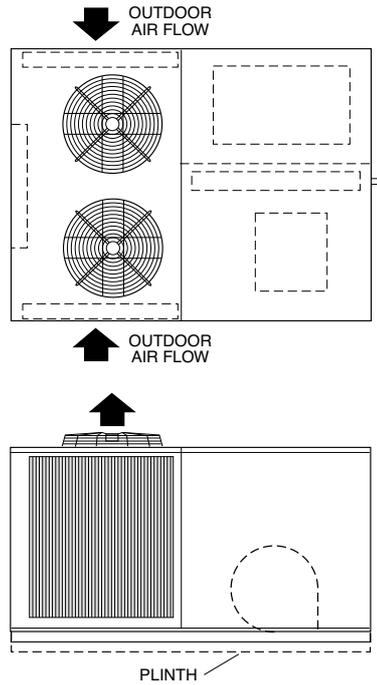
DIMENSIONS (mm)

OPA 500RB

Fig. 3 Downward Supply Air / Plinth Mounted Version 3

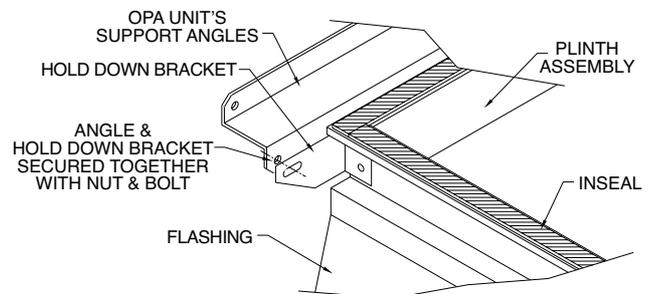
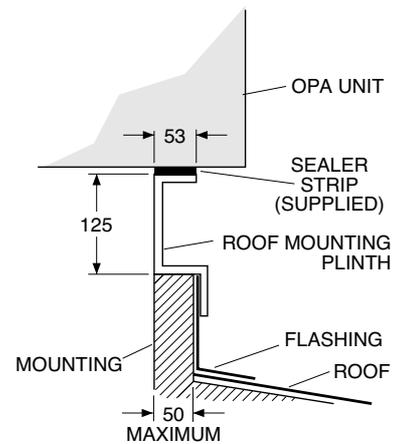
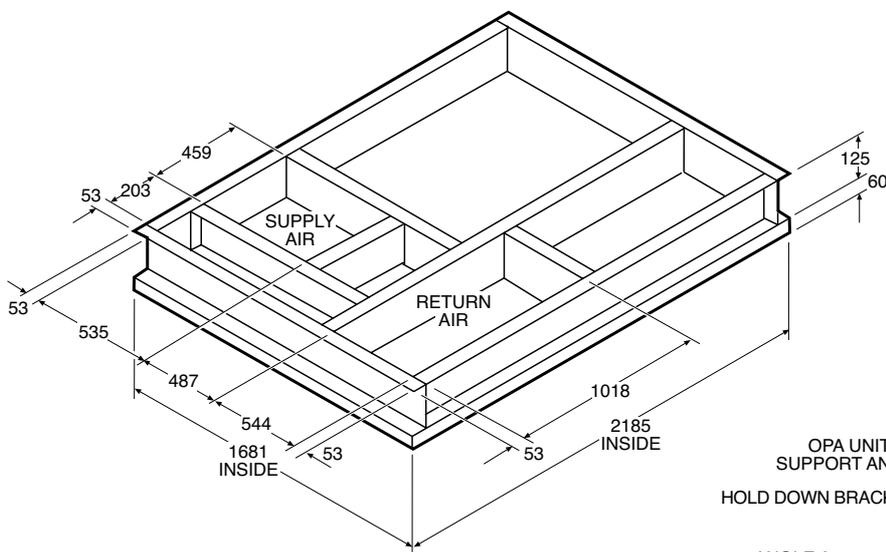


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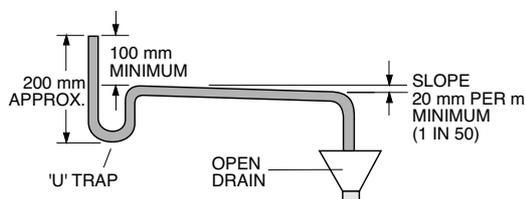
Note:
Refer to Fig.1 for overall dimensions and Fig.4 for further plinth dimensions.

Fig. 4 Roof Mounting Plinth (Kitset)



TYPICAL CORNER ASSEMBLY

Fig. 5 Condensate Drain



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This pamphlet replaces the previous issue no. 2636 dated 09/06. Wiring revision D.

OUTDOOR UNIT: — OPA 500 R

CAPACITIES — NET to AS/NZS 3823

COOLING —	kW	50.25
HEATING — REVERSE CYCLE	kW	52.2
ELECTRICAL INPUT @ 3Ph 400V ~ 50Hz		
COOLING —	kW	18.45
HEATING — REVERSE CYCLE	kW	17.35
E.F.R. (COOLING)	kW/kW	2.72

SUPPLY REQUIRED 3Ph, 342-436V ~ 50Hz
INCLUDING VOLTAGE FLUCTUATION LIMITS

COMPRESSOR (3Ph) RUN AMPS RATED CONDITIONS	A/Ph	13.4 x 2
INDOOR FAN MOTOR (3Ph) FULL LOAD AMPS	A/Ph	6.5
INDOOR MOTOR (1Ph) FULL LOAD AMPS	kW	3.0
OUTDOOR MOTOR (1Ph) FULL LOAD AMPS	A	3.3 x 2
OUTDOOR FAN MOTOR CAPACITOR	MFD	12 x 2
RUNNING AMPS (TOTAL)	A/Ph	33/33/37.3
RECOMMENDED EXTERNAL FUSE SIZE	A/Ph	60.0
RECOMMENDED EXTERNAL FUSE SIZE (WITH ELECTRIC HEAT)	A/Ph	80.0
WEIGHT—NETT UNIT	kg	832.0
REFRIGERANT — HCFC (R22)	kg/SYSTEM	7.5

APC	AIR PRESSURE SWITCH	FR	INDOOR FAN RELAY 24V CONTROL
CB	CIRCUIT BREAKER	FRC	INDOOR FAN RELAY COIL 24V
CCH	CRANK CASE HEATER	HR	HEATING RELAY 24V CONTROL
CM	COMPRESSOR MOTOR	HRC	HEATING RELAY COIL 24V
CMC	COMPRESSOR CONTACTOR	HP	HI PRESSURE SWITCH
CMCC	COMPRESSOR CONTACTOR COIL	HST	HIGH TEMP.SAFETY
CMOL	COMPRESSOR OVER LOAD	IFC	INDOOR FAN CONTACTOR
GPP	COMPRESSOR PROTECTOR PACK	IFCC	INDOOR FAN CONTACTOR COIL
CIR	COOLING 1 RELAY 24V CONTROL	IFM	INDOOR FAN MOTOR
CIRC	COOLING 1 RELAY COIL 24V	IFOL	INDOOR FAN OVERLOAD
C2R	COOLING 2 RELAY 24V CONTROL	LAT	LOW AMBIENT T/STAT
C2RC	COOLING 2 RELAY COIL 24V	LP	LOW PRESSURE SWITCH
DMR	DAMPER MOTOR RETURN AIR	OFM	OUTDOOR FAN MOTOR
DMF	DAMPER MOTOR FRESH AIR	OPR	PHASE ROTATION CONTROL
DO	TIME DELAY 60 MIN, DELAY ON MAKE	PRR	PHASE ROTATION RELAY
EHC	ELECTRIC HEAT CONTACTOR	PRRC	PHASE ROTATION RELAY COIL
EHCC	ELEC.HEAT CONTACTOR COIL	RCV	REVERSE CYCLE VALVE
		TD	TIME DELAY 5.0 MIN, DELAY ON BREAK

NOTE: CHECK WIRING BEFORE SWITCHING ON, INCORRECT interconnections between units by client. Double insulated multi-core cable.

NOTE: TESTING OF DE-ICE SWITCH DIPSWITCH 1 OFF TO ALLOW REPEATED DE-ICE CYCLES WITHOUT A 33 MINUTES DELAY. SWITCH DIPSWITCH 2 OFF TO FORCE A DE-ICE CYCLE. ALWAYS RETURN BOTH SWITCHES TO 'ON' POSITION FOR NORMAL OPERATION.

IMPORTANT NOTE:
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

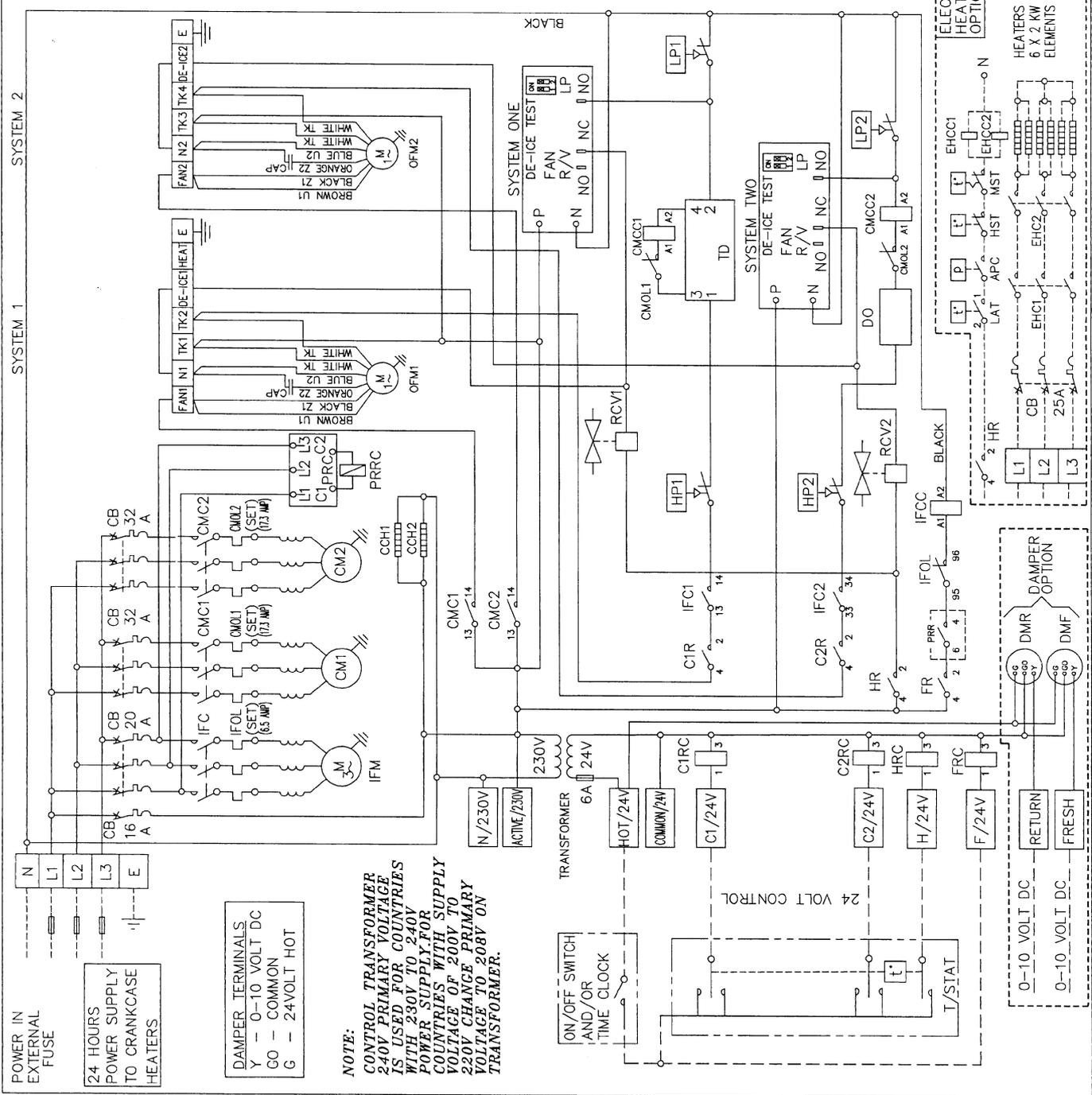
D	REFRIGERANT 7.5 (POE) WAS 7.1 (MIN OIL) N146416-01-07	ROD
C	REFRIGERANT CHARGE CHANGE TO ESTER OIL N1415107.09.06 B.P	

ISSUE MODIFICATION EC/N DATE APRVD

temperzone logo

OPA 500 R WIRING SCHEMATIC (SEPARATE OUTDOOR CHAMBERS)

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Revision D



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

POWER IN EXTERNAL FUSE

24 HOURS POWER SUPPLY TO CRANKCASE HEATERS

DAMPER TERMINALS
Y — 0-10 VOLT DC
CO — COMMON
G — 24VOLT HOT