

OSA 159RKSH & OSA 159RKTH

Reverse Cycle R410A Split System Outdoor Unit

Installation & Maintenance

GENERAL

OSA 159RKS – single phase version

OSA 159RKT – three phase version

This OSA 159RK Outdoor Unit must be installed in accordance with all national and local safety codes.

Options

1. Vertical discharge grille (2 required).
2. Wall mounting brackets.
3. Anti-vibration mounts (rubber).
4. Drain connection adaptors - right angle.

INSTALLATION

Positioning

Refer to dimension diagram below for minimum clearances. Position the unit so that prevailing winds do not blow onto the exhaust to slow the fan, and one unit does not exhaust toward the inlet of another unit.

The optional vertical discharge grille can be used to deflect prevailing winds and reduce clearances.

Mount either free standing or on a wall using the optional mounting brackets available.

Free Standing :

Fasten the unit down to a firm flat horizontal base using the four holes provided in the mounting rails.

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 or rubber mounts (optional extra) beneath the unit. These items are not supplied with the unit.

Wall Mounting Option:

Complete wall mounting instructions are supplied with the optional wall mounting kit.

Drain

Four drain holes are provided in the base. Three plastic bungs are supplied (loose) should you want to direct the condensate and/or rain water to one of the holes provided. Drain connection adaptors (25/13) are available as an optional extra.

REFRIGERATION PIPING

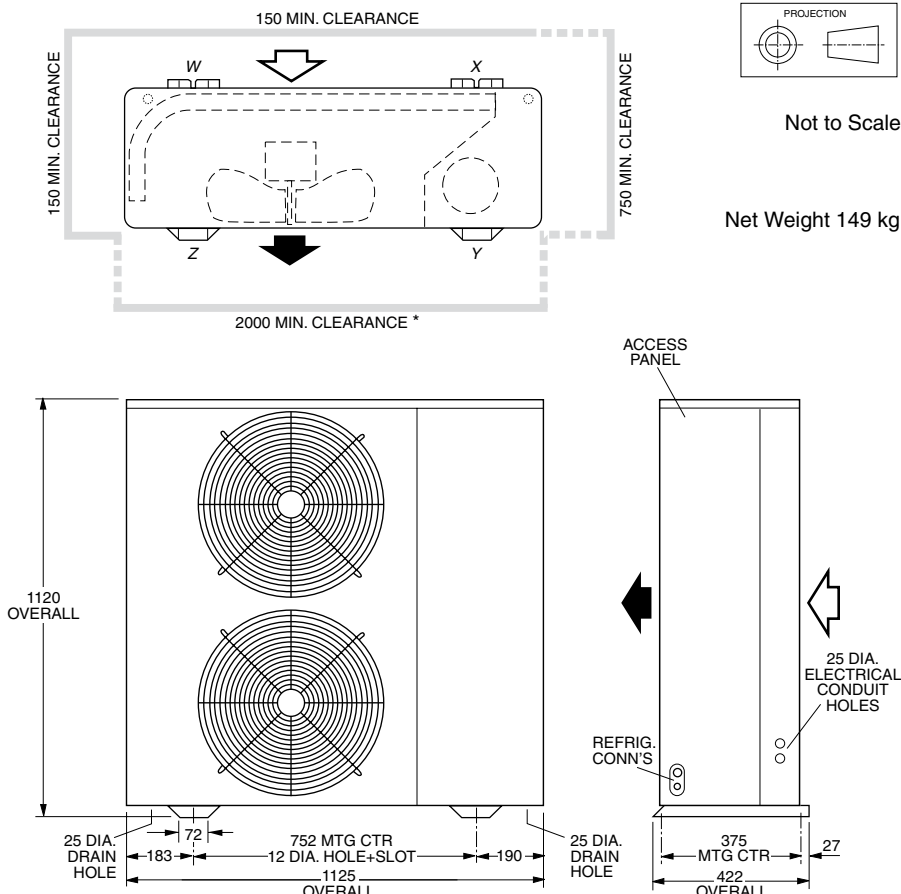
General

The OSA 159 is shipped with a refrigerant charge sufficient for a 10 m line length. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 159 units have shut-off service valves and swaged assemblies. Two loose pipe extensions are supplied to enable a choice of exit – side or rear; both require brazing.

Recommended Pipe Sizes

Suction pipe : 22 mm OD
Liquid pipe : 13 mm OD

Dimensions (mm)



Line Lengths

The standard unit allows for a line length up to 30 m. For line lengths between 30 m and 60 m, refer to **temperzone's Split Systems Installation Guide** (refer www.temperzone.biz/Technical Support). Refer also to *Oil Charge* overleaf.

Maximum line length when extended is 60m.

Height Separation Limits

Outdoor Unit above Indoor Unit : 20 m
Outdoor Unit below Indoor Unit : 20 m

Vertical Risers

If the outdoor unit is to be installed above the indoor unit, then the suction riser should be trapped at the bottom of the vertical rise and then again at 8 m (maximum) intervals. This is to ensure oil return to the compressor. The trap to be a 'swan neck' curve in the pipe, with no change in the pipe size.

Piping

1. Use clean sealed refrigeration grade piping and accessories designed specifically for R410A.
2. Cut pipe with a pipe cutter ONLY.
3. Use long radius bends (2x pipe dia.).
4. Insulate the suction (gas) line and seal all insulation joints.
5. Bi-flow type filter dryer may be fitted in the liquid line.
6. Include a process point in the interconnecting pipework.
7. Ensure open pipe ends are sealed until the final connection is made.

cont'd...

* 600 min with optional Vertical Discharge Grille

8. Immediately before removing brazed pipe connection's seal, reduce holding charge between connection points and service valves to atmospheric pressure.
Warning: Failure to do so may cause injury.

Charging

The unit is supplied with refrigerant HFC-410A (R410A) sufficient for up to 10 m of pipework between the indoor and outdoor units; refer wiring diagram specification table for amount. Add 60 g of HFC-410A per metre above 10 m.

Procedure:

1. Evacuate Indoor Unit and interconnecting pipework to a pressure of 500 microns and hold for 15 mins.
2. Add refrigerant, if needed, via the Schraeder connection on the smaller of the Outdoor Unit's two service valves.
3. Open the service valve at the Outdoor Unit to allow refrigerant to flow throughout the system.
4. Leak check all brazed and fitted joints.

IMPORTANT :

Step 8 of the 'Start Up Procedure' requires you to check that the superheat on the suction line (where it enters the Outdoor Unit) is between 3°C – 5°C on cooling cycle with an indoor air temperature in the range 21° – 27°C and outdoor air temperature in the range 24° – 35°C. If the conditions of the day do not allow this, use the heating cycle or other heat source to raise the indoor air temperature to about 24°C. Return to cooling cycle and blank off the outdoor coil to raise the head pressure to 400 psig (2760 kPag). Alter charge up or down to establish correct superheat.

WARNING:

This unit is designed for use ONLY with the refrigerant HFC-410A. The use of other refrigerants is NOT authorised or approved by the manufacturer and may cause operational problems such as poor performance and efficiency, loss of capacity, degradation of materials and refrigerant leaks. **The use of flammable or explosive materials as a refrigerant creates the additional risks of fire and explosion which may result in property damage, personal injury or death.**

Oil Charge

For line lengths in excess of 40 m, Emkarate RL22CF polyolester oil (or similar) should be added to the refrigerant at the rate of 10 ml/m of suction piping. **Note:** Do not use mineral oil.

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 Outdoor Unit.

Note: DO NOT USE REWIRABLE FUSES.

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.

Refer to **temperzone** for recommended thermostats.

It is recommended electricians run a spare wire between Outdoor Unit and Indoor Unit in case 'Indoor Fan Off During De-Ice' becomes a requirement. Leave this spare wire unconnected until required. (Not required when using **temperzone** SAT Controller). Refer indoor unit's wiring diagram.

A 24 hour power supply is required to the unit. Disconnect the crankcase heater if the total line length is less than 8 m.

SYSTEM CHECK TESTS

1. Leave the remote switch 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. Bypass the crankcase heater thermostat (CCHT) for this period only.
2. Check that all fan motors are free running.
3. Check that the thermostat is correctly wired to the unit and is set at the desired temperature.
4. Check that the air filters, if any, have been correctly installed.
5. Check any supply air diffuser dampers are open.

START UP PROCEDURE

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

1. Switch on the unit after the four hour delay period for the crankcase heater has expired. Ensure the crankcase heater thermostat has been reconnected.
2. Check the supply voltage.
3. Measure the current draw on the compressor motor and on each fan motor. Check all readings against the specified values - particularly the indoor fan amps if the unit is installed in a free blow application.
4. Fit gauges and measure the suction and discharge pressures.
Important: Gauges must be designed specifically for use with R410A.
5. Test the operation of the high pressure safety control by switching off the outdoor unit's fan.
6. Test the operation of the reversing valve by running the unit in both the heating and cooling mode.
7. Check that the air flow over the outdoor unit's coil is adequate and that the fan is running smoothly.
8. Check the superheat - refer charging procedure.
9. Check the supply air flow at each outlet.

10. Touch up any outdoor unit paintwork damage to prevent corrosion.

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, and heating cycle above 15°C. 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 unit 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

Weekly For First Four Weeks

1. Check indoor unit 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.
4. Check tightness of electrical connections.

Six Monthly

1. Check the tightness of all fan and motor mountings.
2. Check tightness of electrical connections.
3. Check that fan motors are free running.
4. Check suction and discharge operating pressures.
5. Replace indoor unit air filters (if fitted).
6. 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 outdoor unit paintwork damage to prevent corrosion.

NOTE

The manufacturer reserves the right to change specifications at any time without notice or obligation. Certified dimensions available on request.

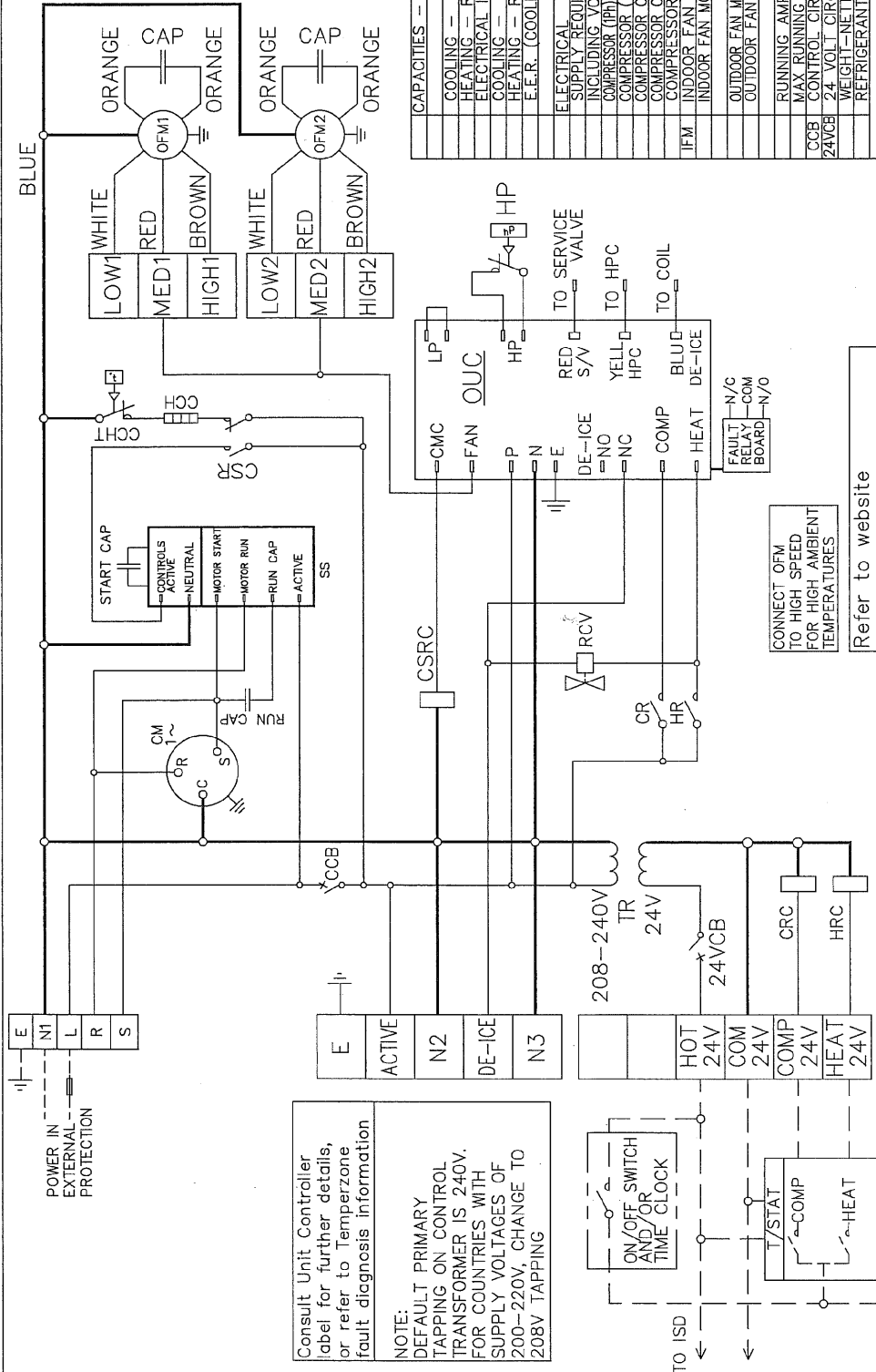
This pamphlet replaces the previous issue no. 3648 dated 01/13. OSA 159RKSH wiring revision A.

Pipe Length Capacity Loss

On Cooling Cycle Due to Pressure Drop

Note : Loss percentages are approximations only, due to piping variations. No allowance made for vertical piping.

Pipe Size (mm)		Performance Loss per additional 10m beyond first 5m.	Additional Pipe Length to allow per Suction Pipe Bend Long 90° Radius (2 x pipe dia.)
Liquid	Suction		
10	16	4.0 %	0.30 m
13	22	2.1 %	0.50 m



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

NOTE:
 DEFAULT PRIMARY TAPPING ON CONTROL TRANSFORMER IS 240V. FOR COUNTRIES WITH SUPPLY VOLTAGES OF 200-220V, CHANGE TO 208V TAPPING

CONNECT OFM TO HIGH SPEED FOR HIGH AMBIENT TEMPERATURES

Refer to website www.temperzone.biz for up to date information.

CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS

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

CAP	CAPACITOR
CCB	CONTROL CIRCUIT BREAKER
CCH	CRANK CASE HEATER
CCHT	CRANK CASE HEATER 7" T/STAT
CM	COMPRESSOR MOTOR
CR	COMPRESSOR RELAY
CRC	COMPRESSOR RELAY COIL
CSR	COMPRESSOR START RELAY
CSRC	COMPRESSOR START RELAY COIL
HP	HI PRESSURE CONTROL
HR	HEAT RELAY
HRC	HEAT RELAY COIL
LP	LOW PRESSURE CONTROL
OFM	OUTDOOR FAN MOTOR
OUC	OUTDOOR UNIT CONTROLLER
RCV	REVERSING VALVE
SR	START RELAY
SS	SOFT STARTER
TR	TRANSFORMER

CAPACITIES -- NET to AS/NZS 3823	
COOLING --	ISD159
HEATING -- REVERSE CYCLE	ISD159
ELECTRICAL INPUT	15.48
14.85	14.67
COOLING --	4.90
HEATING -- REVERSE CYCLE	4.73
E.E.R. (COOLING)	3.99
	3.159
	3.14
	3.141

ELECTRICAL SUPPLY REQUIRED 1PH, 200-252V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS	
COMPRESSOR (1PH) RUN AMPS RATED CONDITIONS	A
COMPRESSOR CAPACITOR RUN	A
COMPRESSOR CAPACITOR START	MFD
COMPRESSOR OIL TYPE	MFD
INDOOR FAN MOTOR	1.25
INDOOR FAN MOTOR AMPS (MAX)	6.5
OUTDOOR FAN MOTOR (1PH) FULL LOAD AMPS	1.43
OUTDOOR FAN MOTOR CAPACITOR	2x5
RUNNING AMPS (TOTAL)	A
MAX RUNNING AMPS (TOTAL)	A
CCB CONTROL CIRCUIT BREAKER	A
24VCB 24 VOLT CIRCUIT BREAKER	A
WEIGHT-NET	kg
REFRIGERANT -- R410A	kg
	5.55

UNIT PRECHARGED (10 METRE LINE LENGTH) 5.55kg
 BASE CHARGE UNIT 4.95 kg PLUS 60 GRAMS PER METRE LINE LENGTH. SUBTRACT 800 GRAMS FOR ISU. BASED ON Ø12.7 OD LIQUID LINE & Ø22 OD GAS LINE.
 ADD ADDITIONAL OIL 10ml PER METRE OVER 40 METRE LINE LENGTH

R410A

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Title
OSA 159RKSH
WIRING SCHEMATIC



Drawn D.A.B	Date 06/06-11	Drawing No.	Revision
Scale	Aprvd <i>[Signature]</i>	526-304-202	A

ISSUE	MODIFICATION	ECN	DATE	APRVD	DRG SIZE	No.	DESCRIPTION	Mat'l	FINISH	ASSY No.
A	50mF WAS 80mF	N3444	01-04-14	S.D.H.						

CAP	CAPACITOR
CCB	CONTROL CIRCUIT BREAKER
CCH	CRANK CASE HEATER
CCHT	CRANK CASE HEATER T/STAT
CM	COMPRESSOR MOTOR
GMC	COMPRESSOR CONTACTOR
CMCC	COMPRESSOR CONTACTOR COIL
CR	COMPRESSOR RELAY
CR	COMPRESSOR RELAY COIL
HP	HI PRESSURE CONTROL
HR	HEAT RELAY
HRC	HEAT RELAY COIL
LP	LOW PRESSURE CONTROL
OFM	OUTDOOR FAN MOTOR
OUC	OUTDOOR UNIT CONTROLLER
PRC	PHASE ROTATION CONTROL
PRR	PHASE ROTATION RELAY
PRRC	PHASE ROTATION RELAY COIL
RCV	REVERSING VALVE
TR	TRANSFORMER


CAPACITIES — NET to AS/NZS 3823	
ISD159	OSA 159RKT
ISUT159	ISUT159
COOLING — REVERSE CYCLE	kW 15.48
HEATING — REVERSE CYCLE	kW 14.51
ELECTRICAL INPUT	kW 14.67
COOLING —	kW 4.90
HEATING — REVERSE CYCLE	kW 3.99
E.E.R. (COOLING)	kW/kW 3.159
	kW/kW 3.14
	A.E.E.R. 3.12

ELECTRICAL SUPPLY REQUIRED 3Ph 342-436V ~ 50HZ INCLUDING VOLTAGE FLUCTUATION LIMITS COMPRESSOR 3PH RUN AMPS RATED CONDITIONS A/Ph	7
COMPRESSOR OIL TYPE	P.O.E
INDOOR FAN MOTOR	kW 1.25
INDOOR FAN MOTOR AMPS (MAX)	A 6.5
	0.23 x 2
	1.5 x 2
OUTDOOR FAN MOTOR (PH) FULL LOAD AMPS	A 1.43
OUTDOOR FAN MOTOR CAPACITOR	MFD 2x5
RUNNING AMPS (TOTAL)	A/Ph 9.7/7/7
MAX RUNNING AMPS (TOTAL)	A/Ph 13
CCB CONTROL CIRCUIT BREAKER	A 10
24VCB 24 VOLT CIRCUIT BREAKER	A 2
WEIGHT-NET	kg 149
REFRIGERANT — R410A	kg 5.55

UNIT PRECHARGED (10 METRE LINE LENGTH) 5.55kg
 BASE CHARGE UNIT 4.95 kg PLUS 60 GRAMS PER METRE LINE LENGTH. SUBTRACT 800 GRAMS FOR ISU BASED ON Ø12.7 OD LIQUID LINE & Ø22 OD GAS LINE.
 ADD ADDITIONAL OIL 10ml PER METRE OVER 40 METRE LINE LENGTH

R410A

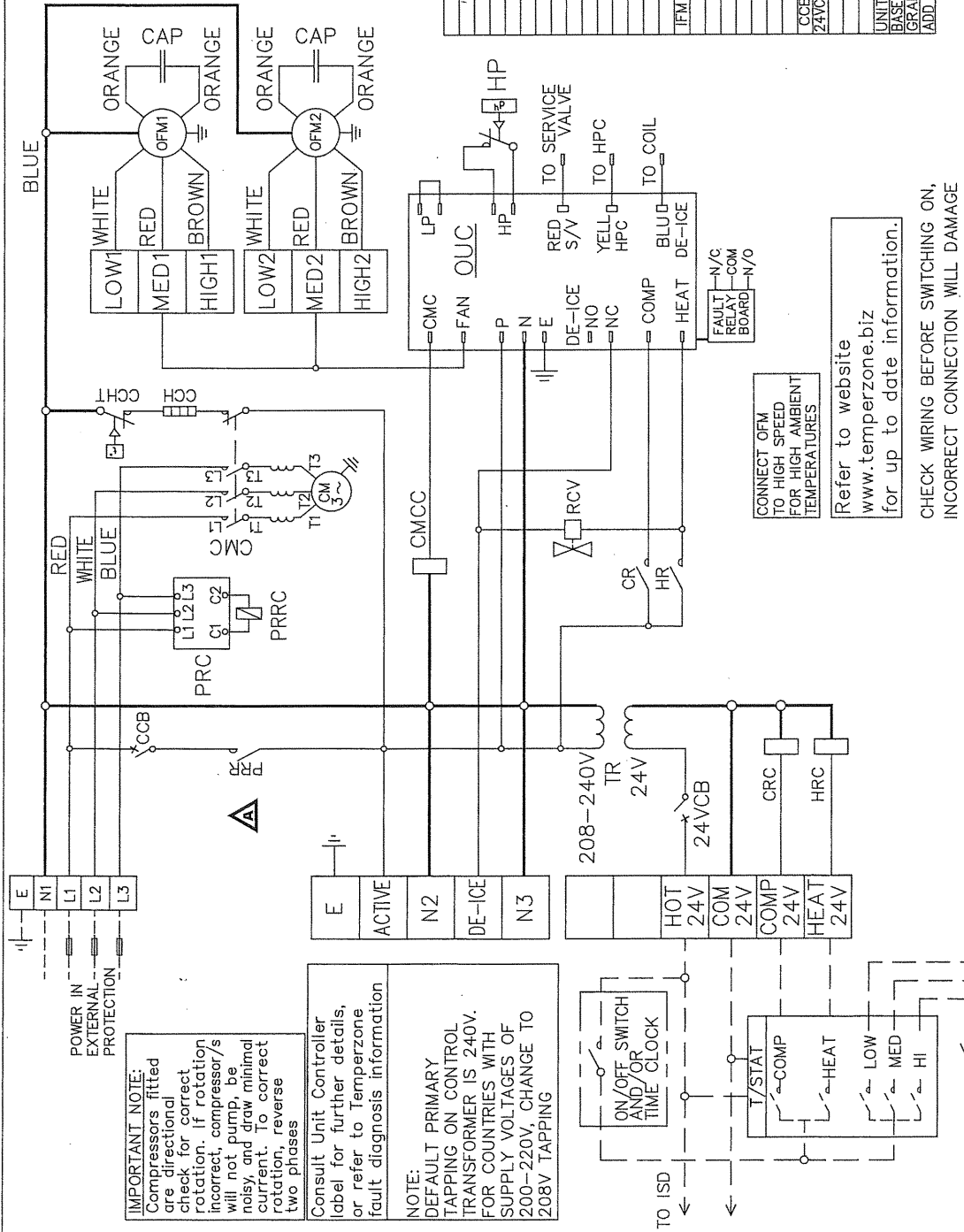
Title OSA 159RKT
 WIRING SCHEMATIC



Drawn D.A.B Date 06-06-11
 Scale *As per* *PL*

Revision 526-314-202
 A

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CONNECT OFM TO HIGH SPEED FOR HIGH AMBIENT TEMPERATURES

Refer to website www.temperzone.biz for up to date information.

CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS

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

IMPORTANT NOTE:
 Compressors fitted are directional check for correct rotation. If rotation incorrect, compressor/s will not pump, be noisy, and draw minimal current. To correct rotation, reverse two phases

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

NOTE:
 DEFAULT PRIMARY TAPPING ON CONTROL TRANSFORMER IS 240V. FOR COUNTRIES WITH SUPPLY VOLTAGES OF 200-220V, CHANGE TO 208V TAPPING

ISSUE	MODIFICATION	ECN	DATE	APPRD	DRG SIZE	No.	DESCRIPTION	Mat'l	FINISH	ASSY No.
A	PRR RELAY CONTACT REPOSITIONED	N295516-12-11	R.A.S							