

OSA 520RKTBV

Reverse Cycle R410A Split System Outdoor Unit

Installation & Maintenance

GENERAL

The OSA 520RKTBV outdoor unit is a twin system that provides the facility for capacity control (staging) or staggered starting.

Alternatively, the OSA outdoor unit can be connected to two indoor units of half capacity, controlled by a single thermostat. Four indoor units of one quarter capacity, i.e. two pairs connected in tandem, is also an option. In either case, refer to **temperzone** engineering for wiring details.

This OSA 520RKTBV Outdoor Unit must be installed in accordance with all national and local safety codes.

Combinations

- One OSA 520RKTBV with one ISD 520KB
- One OSA 520RKTBV with two ISD 270K
- One OSA 520RKTBV with four ISD 140K

INSTALLATION

Positioning

Refer to dimension diagram below for minimum clearances. Fasten the unit down to a firm flat horizontal base using the six 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. These springs are not supplied with the unit.

Drain

Four drain holes are provided in the base of the unit to release condensate and/or rain water.

Coil Protection

A coil protection guard is available as an optional extra.

REFRIGERATION PIPING

General

The OSA 520 is shipped with a holding charge of refrigerant. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 520 units have brazed pipe connections.

Recommended Pipe Sizes

- Suction pipe (x2): 28 mm OD
- Liquid pipe (x2): 13 mm OD

Line Lengths

The standard unit is suitable for a line length up to 40 m. For line lengths between 40 m and 90 m, refer to **temperzone's Split Systems Installation Guide** (refer www.temperzone.biz/Technical Support). Refer also to *Oil Charge* overleaf.

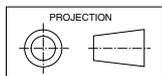
Maximum line length when extended is 90m.

Height Separation Limits

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

Dimensions (mm)

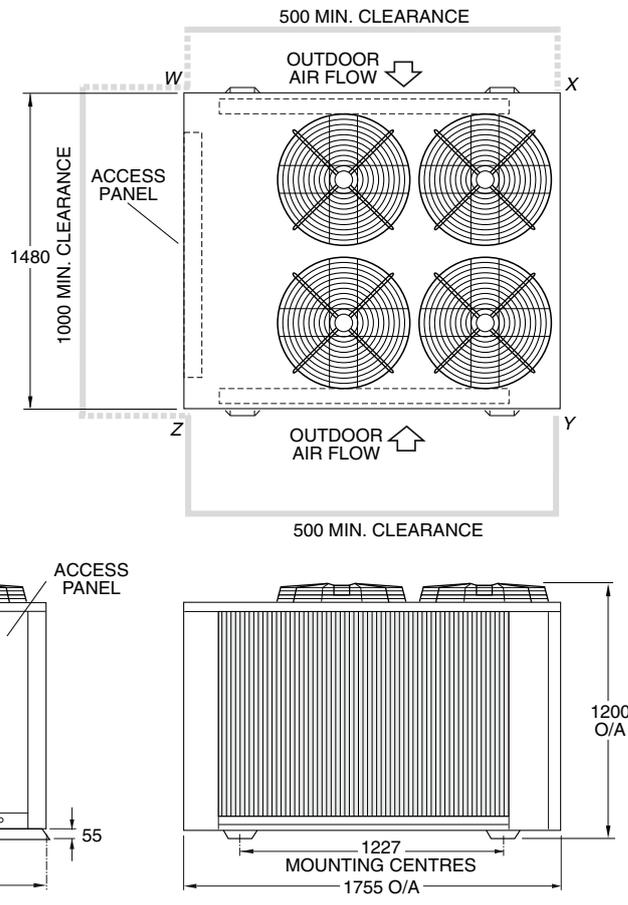
OSA 520RKTBV



Not to Scale

Net Weight 438 kg

CORNER LOADS (kg)			
W	X	Y	Z
151	68	68	151



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 on the interconnecting pipework.
 7. Ensure open pipe ends are sealed until the final connection is made.
 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.

Important

Do not connect System 1 to System 2.

Charging

The unit is supplied with a 1 kg holding charge of refrigerant HFC-410A (R410A) per system. Add 7.2 kg of HFC-410A per system to complete the base charge, then add 60 g per metre of pipework between indoor and outdoor units.

Procedure (per system):

1. Evacuate Indoor Unit and interconnecting pipework to a pressure of 500 microns and hold for 15 mins.
2. Add refrigerant via the Schraeder connection on the smaller of the Outdoor Unit's two service valve extension pipes.
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 (on a reverse cycle unit) or other heat source to raise the indoor air temperature to about 24°C 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 (R410A). 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 30 m, Emkarate RL22CF polyolester oil (or similar) should be added to the refrigerant at the rate of 30 ml/m of suction piping.

Note: This oil absorbs moisture quickly if exposed to open air. 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.

The OSA 520 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.

Refer to **temperzone** for recommended thermostats.

If 'Indoor Fan Off During De-Ice' is a requirement, refer outdoor unit's wiring diagram for instructions.

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 for correct rotation of the compressor. If rotation is incorrect the compressor will not pump and will draw minimal current. To correct motor rotation, change the phasing at the main power terminal.
4. Check that the thermostat is correctly wired to the unit and is set at the desired temperature.
5. Check that the air filters, if any, have been correctly installed.
6. Check any supply air diffuser dampers are open.

START UP PROCEDURE

Check each system independently first before running complete system. 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 indoor unit's fan belt tension after 20 mins of operation and adjust if necessary (refer Commissioning Sheet).
10. Check the supply air flow at each outlet.
11. Check the tightness of all electrical connections and sign the check label.
12. 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 run efficiently on cooling cycle at 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.

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 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 air supply at all diffusers.
3. Check for excessive noise and vibration and correct as necessary.
4. Check for insulation and duct damage and repair as necessary.
5. Remove lint and dust accumulation from outdoor coil fins.
6. Touch up all outdoor unit paintwork damage to prevent corrosion.

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		
13	28	1.5 %	0.61 m
13	35	0.7 %	0.76 m

MODEL : OSA 520 RKTV & ISD 520

CAPACITIES — NET to AS/NZS 3823

COOLING — kW 49.88

HEATING — REVERSE CYCLE kW 52.2

ELECTRICAL INPUT

COOLING — kW 16.85

HEATING — REVERSE CYCLE kW 16.36

E.F.R. (COOLING) kW/kW 2.96

ELECTRICAL

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

COMPRESSOR (3Ph) RUN AMPS RATED CONDITIONS A/Ph 14 X2

INDOOR FAN MOTOR (3Ph) kW 3

INDOOR FAN MOTOR (1Ph) FULL LOAD AMPS A 6.2/PH

OUTDOOR FAN MOTOR (1Ph) FULL LOAD AMPS A 1.7 x4

OUTDOOR MOTOR CAPACITOR MFD 8 x4

RUNNING AMPS (TOTAL) A 36.7/319/314

RECOMMENDED EXTERNAL FUSE SIZE A/Ph 60

WEIGHT—NETT OSA 520 RKTV Kg 438

OIL TYPE : POLYOLESTER (P.O.E.)

EACH SYSTEM HAS A HOLDING CHARGE OF 1 KG

BASE CHARGE PER SYSTEM 8.2 kg PLUS 60grams PER METRE LINE LENGTH

BASED ON Ø12.7 OD LIQUID LINE & Ø28.6 OD GAS LINE

APS	AIR PRESSURE SWITCH	HR2	HEATING RELAY 2
CAP	CAPACITOR	HRC	HEATING RELAY COIL
CB	CIRCUIT BREAKER	HR2C	HEATING RELAY 2 COIL
CCH	CRANKCASE HEATER	HP	HIGH PRESSURE SWITCH
CCHT	CRANKCASE HEATER T/STAT	IFC	INDOOR FAN CONTACTOR
GLT	COMPRESSOR LOW LIMIT T/STAT	IFCC	INDOOR FAN CONTACTOR COIL
CM	COMPRESSOR MOTOR	IFM	INDOOR FAN MOTOR
CMC	COMPRESSOR CONTACTOR	IFOL	INDOOR FAN OVERLOAD
CMCC	COMPRESSOR CONTACTOR COIL	LP	LOW PRESSURE SWITCH
CMOL	COMPRESSOR OVERLOAD	OFM	OUTDOOR FAN MOTOR
CR	COMPRESSOR RELAY 24 V CONTROL	ORC	OUTDOOR UNIT CONTROLLER
GRC	COMPRESSOR RELAY COIL 24V PRC	PRC	PHASE ROTATION CONTROL
DO	TIME DELAY 30 SEC. DELAY ON MAKE	PRR	PHASE ROTATION RELAY
DR	DE-ICE RELAY	PRRC	PHASE ROTATION RELAY COIL
DRC	DE-ICE RELAY COIL	RCV	REVERSE CYCLE VALVE
F	INDOOR FAN CONTROL	(Z)	DE-ICE INHIBIT LEAD
FR	INDOOR FAN CONTROL RELAY		
FRC	INDOOR FAN CONTROL RELAY COIL		
HR	HEATING RELAY		

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

Sensor Locations

Red to service valve pipe pocket

Yellow to coil return bend pocket

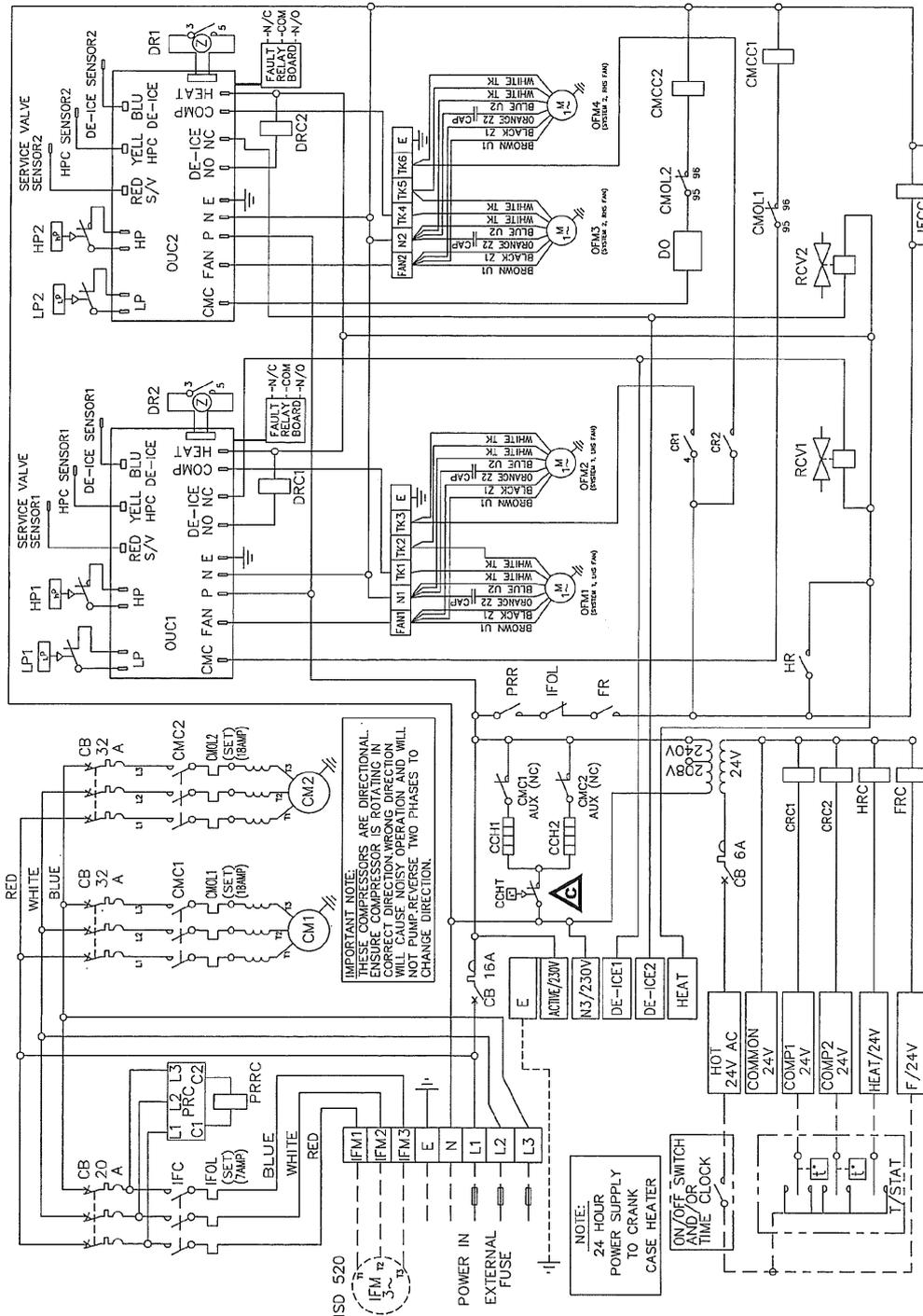
Blue to bottom of coil in fins.

R410A

Title		OSA 520 RKTBV	
WIRING SCHEMATIC			
Sensor Locations			
Red to service valve pipe pocket			
Yellow to coil return bend pocket			
Blue to bottom of coil in fins.			
DRAWING INFORMATION			
Drawn SDH	Date 16-04-08	Drawing No.	526-644-002
Scale	1:1	Revision	C



Programmed by			
PLOTTED		26-01-11	
©temperzone ltd		2006	
DESCRIPTION			
Mat'l			
FINISH No.			
ASSY No.			
DRG SIZE			
No.			
APRVD			
DATE			
EC/N			
MODIFICATION			
SDH			
22-09-08			
N2019			
FROM R/V/S			
REMOVE			
SNUBBERS			
ADD			
DISCONNECT			
CCH NOTE			
N2343			
16-11-09			
ROD			
N2727			
26-01-11			
ROD			
T/STAT			
ADDED			
C			



IMPORTANT NOTE:
THESE COMPRESSORS ARE DIRECTIONAL. ENSURE COMPRESSOR IS ROTATING IN CORRECT DIRECTION. WRONG DIRECTION WILL CAUSE NOISY OPERATION AND WILL NOT PUMP. REVERSE TWO PHASES TO CHANGE DIRECTION.

NOTE:
24-HOUR POWER SUPPLY TO CRANK CASE HEATER

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

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

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

APRVD			
DATE			
22-09-08			
N2019			
FROM R/V/S			
REMOVE			
SNUBBERS			
ADD			
DISCONNECT			
CCH NOTE			
N2343			
16-11-09			
ROD			
N2727			
26-01-11			
ROD			
T/STAT			
ADDED			
C			

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. 3567 dated 03/11.
Pipe length cap. loss.