

OSA 405RKTV

Reverse Cycle R410A Split System Outdoor Unit

Installation & Maintenance

GENERAL

This OSA 405RKT Outdoor Unit must be installed in accordance with all national and local safety codes.

Options

1. Anti-vibration mounts (rubber).
2. Drain connection adaptors - right angle.

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 or rubber mounts (optional extra) beneath the unit. These items 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. Drain connection adaptors (25/13) are available as an optional extra.

Coil Protection

A coil protection guard is available as an optional extra.

REFRIGERATION PIPING

General

The OSA 405 is shipped with a holding charge of refrigerant. The matched indoor unit is shipped with a holding charge of nitrogen. OSA 405 units have brazed pipe connections.

Recommended Pipe Sizes

Suction pipe : 35 mm OD
Liquid pipe : 16 mm OD

Line Lengths

The standard unit is suitable for a line length up to 50 m. For line lengths between 50 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

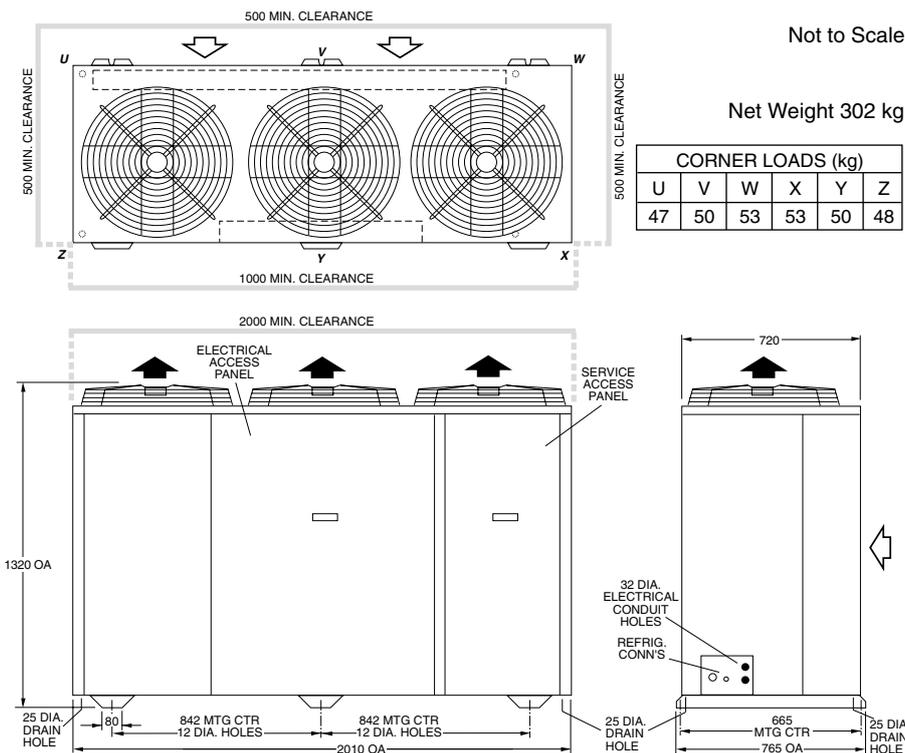
Outdoor Unit above Indoor Unit : 20 m
Outdoor Unit below Indoor Unit : 20 m

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.

Dimensions (mm)

OSA 405RKT



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.

Charging

The unit is supplied with a 1 kg holding charge of refrigerant HFC-410A (R410A). Add 9.7 kg of HFC-410A to complete the base charge, then add 105 g per metre of pipework between indoor and outdoor units.

Procedure:

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 405 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

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 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.

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.

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. 3109 dated 06/09. Wiring revision F.

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)		Equivalent Line Pipe Length (m)			
Liquid	Suction	10	20	30	40
16	35	1 %	2 %	3 %	4 %

Additional Pipe Length to allow per Bend	
Suction Pipe Size OD	35 mm
Long 90° Radius (i.e. 2 x pipe dia.)	0.76 m

OUTDOOR UNIT: - OSA 405RKTV	
WITH INDOOR UNIT - ISD 405K ISD 406K	
CAPACITIES - NET to AS/NZS 3823	
COOLING -	kW 39.6 40.8
HEATING - REVERSE CYCLE	kW 39.5 40.425
ELECTRICAL INPUT	
COOLING -	kW 13.68 13.24
HEATING - REVERSE CYCLE	kW 13.29 11.00
E.E.R. (COOLING)	kW/kW 2.9 3.082
ELECTRICAL	
SUPPLY REQUIRED 3Ph 342-436V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS	
COMPRESSOR (3Ph) RUN AMPS RATED CONDITIONS A/Ph 18	
INDOOR FAN MOTOR ISD405 (1Ph) FULL LOAD AMPS A 4.1 x 3	
INDOOR FAN MOTOR CAPACITOR MFD 18	
INDOOR FAN MOTOR ISD406 (3Ph) FULL LOAD AMPS A/Ph 4.5 (2.2 kW)	
OUTDOOR FAN MOTOR (1Ph) FULL LOAD AMPS A 1.7 x 3	
OUTDOOR MOTOR CAPACITOR MFD 8	
RUNNING AMPS (TOTAL)	1 Ph 3 Ph
RECOMMENDED EXTERNAL PROTECTION	A/Ph 50
COMPRESSOR TYPE: SCROLL	
OIL TYPE: POLYOLESTER	
WEIGHT-NETT OSA 405RKTV (302 kg)	
REFRIGERANT - (R410A)	
UNIT HOLDING CHARGE 1.0 kg	
BASE CHARGE UNIT 11.4 kg PLUS 105 grams PER METRE LINE	
LENGTH BASED ON LIQUID LINE Ø16mm & GAS LINE Ø35 mm	

CAP	CAPACITOR	HP	HI PRESSURE SWITCH
CB	CIRCUIT BREAKER	IFC	INDOOR FAN CONTACTOR
CCH	CRANK CASE HEATER	IFCC	INDOOR FAN CONTACTOR COIL
CCHT	CRANK CASE HEATER T/STAT	IFM	INDOOR FAN MOTOR
CM	COMPRESSOR MOTOR	LP	LOW PRESSURE SWITCH
CMC	COMPRESSOR CONTACTOR	OFM	OUTDOOR FAN MOTOR
CMCC	COMPRESSOR CONTACTOR COIL	OUC	OUTDOOR UNIT CONTROLLER
CMOL	COMPRESSOR OVERLOAD	PRC	PHASE ROTATION CONTROL
CR	COOLING RELAY	PRR	PHASE ROTATION RELAY
CRC	COOLING RELAY COIL	PRRC	PHASE ROTATION RELAY COIL
F	INDOOR FAN CONTROL	RCV	REVERSE CYCLE VALVE
FR	INDOOR FAN CONTROL RELAY	TK	CIRCUIT FOR OVERLOAD IN
FRC	INDOOR FAN CONTROL RELAY COIL		OUTDOOR FAN MOTOR
HR	HEATING RELAY		
HRC	HEATING RELAY COIL		

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

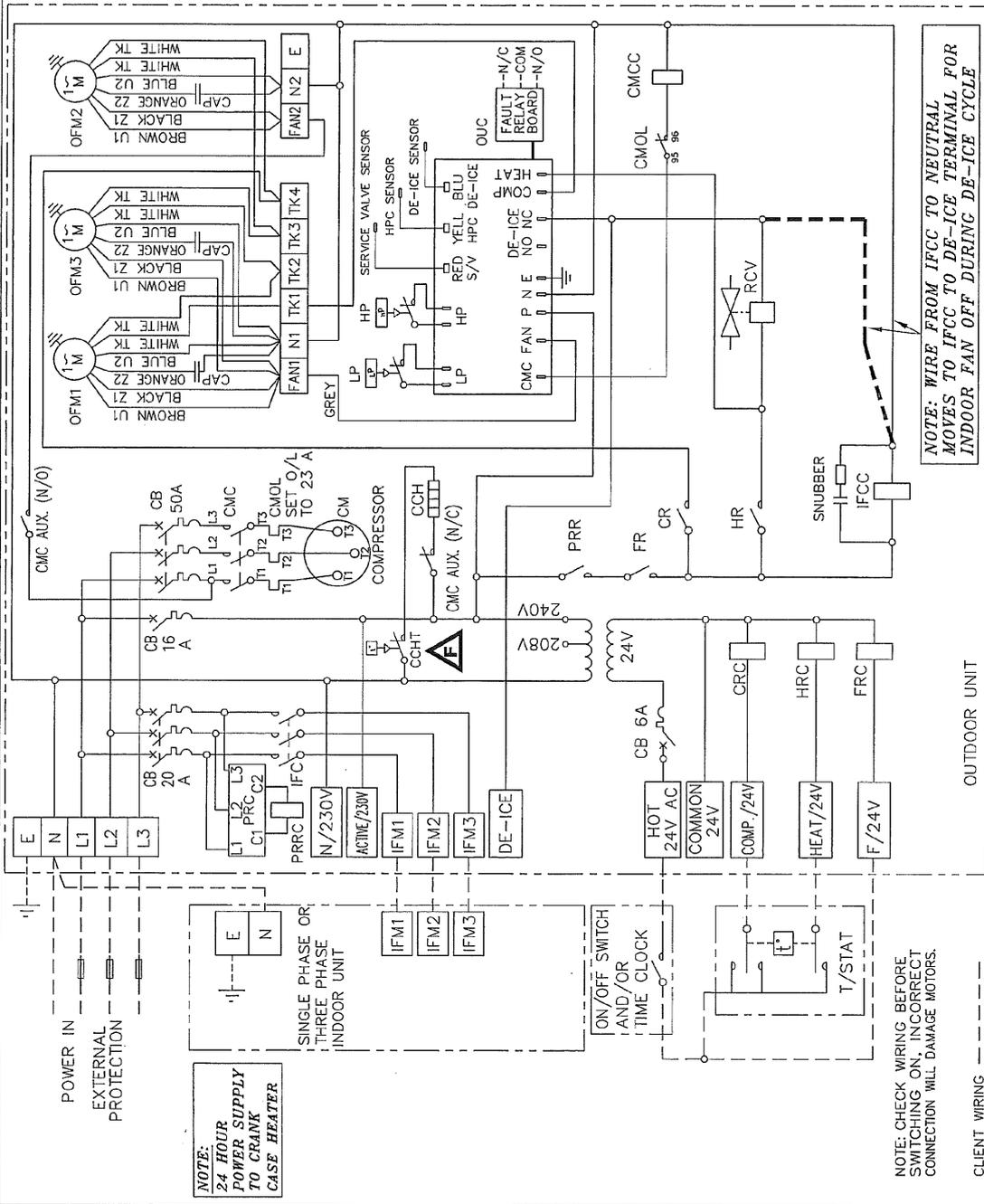
Sensor Locations

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

Title
OSA 405RKTV
WIRING SCHEMATIC



Drawn	SDH	Date	07-01-08	Drawing No.	526-614-002	Revision	F
Scale							



NOTE: WIRE FROM IFCC TO NEUTRAL MOVES TO IFCC TO DE-ICE TERMINAL FOR INDOOR FAN OFF DURING DE-ICE CYCLE

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

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

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

NOTE: HEAT CYCLE 'WARM START' NOT AVAILABLE ON THIS UNIT.

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.

ISSUE	MODIFICATION	ECN	DATE	APRVD
E	ADD DISCONNECT CCH NOTE	N2343	13-11-08	ROD
D	ISD 406K DATA ADDED. SNUBBERS REMOVED.	N2069	28-11-08	KTT
C	NOW WITH ZEHL FANS. WIRING CHANGED TO SUIT.	N1875	02-09-08	D.A.B
C	WEIGHT WAS 301kg. CB WAS 63A. FLA WAS 2.34	N1875	02-09-08	D.A.B
F	T/STAT ADDED FOR CCH	N2727	25-01-11	ROD

PLOTTED
25-01-11
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