

# OSA 110RK

## Reverse Cycle R410A Split System Outdoor Unit

## Installation & Maintenance

### GENERAL

**OSA 110RKSH** – single phase version  
**OSA 110RKTH** – three phase version

This OSA 110RK Outdoor Unit must be installed in accordance with all national and local safety codes.

### Options

1. Vertical discharge grille.
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 110 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 110 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 : 19 mm OD  
 Liquid pipe : 10 mm OD

#### Line Lengths

The standard unit allows for a line length up to 30 m. For line lengths between 30 m and 40 m, refer to **temperzone's Split Systems Installation Guide** (refer [www.temperzone.biz/Technical Support](http://www.temperzone.biz/Technical Support)). Refer also to *Oil Charge* overleaf.

Maximum line length when extended is 40m.

#### Height Separation Limits

Outdoor Unit above Indoor Unit : 16 m  
 Outdoor Unit below Indoor Unit : 16 m

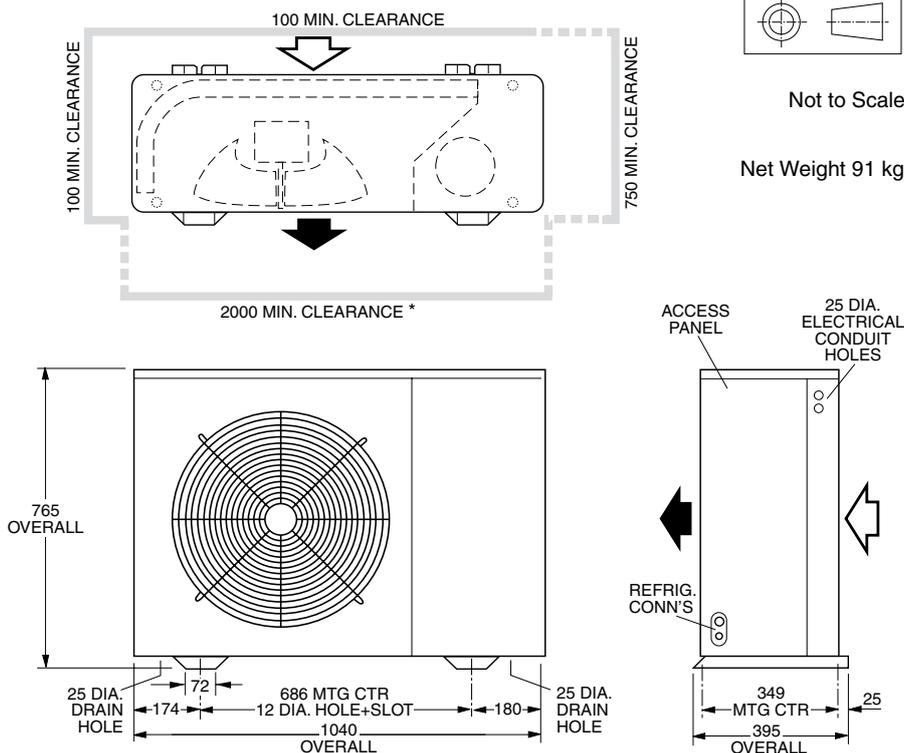
#### Vertical Risers

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 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.

### Dimensions (mm)



\* 600 min with optional Vertical Discharge Grille

## Charging

The unit is supplied with 2.74 kg of refrigerant HFC-410A (R410A) which is sufficient for up to 10 m of pipework between the indoor and outdoor units. Add 47 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 30 m, *Idemitsu* polyolvinylether oil (PVE) should be added to the refrigerant at the rate of 10 ml/m of suction piping. **Note:** As an alternative, mineral oil or polyol ester oil (POE) may be added, but no more than 65 ml.

## 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. *OSA 110RKT only.* 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 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. 3553 dated 10/12.  
Wiring revisions H & G resp.

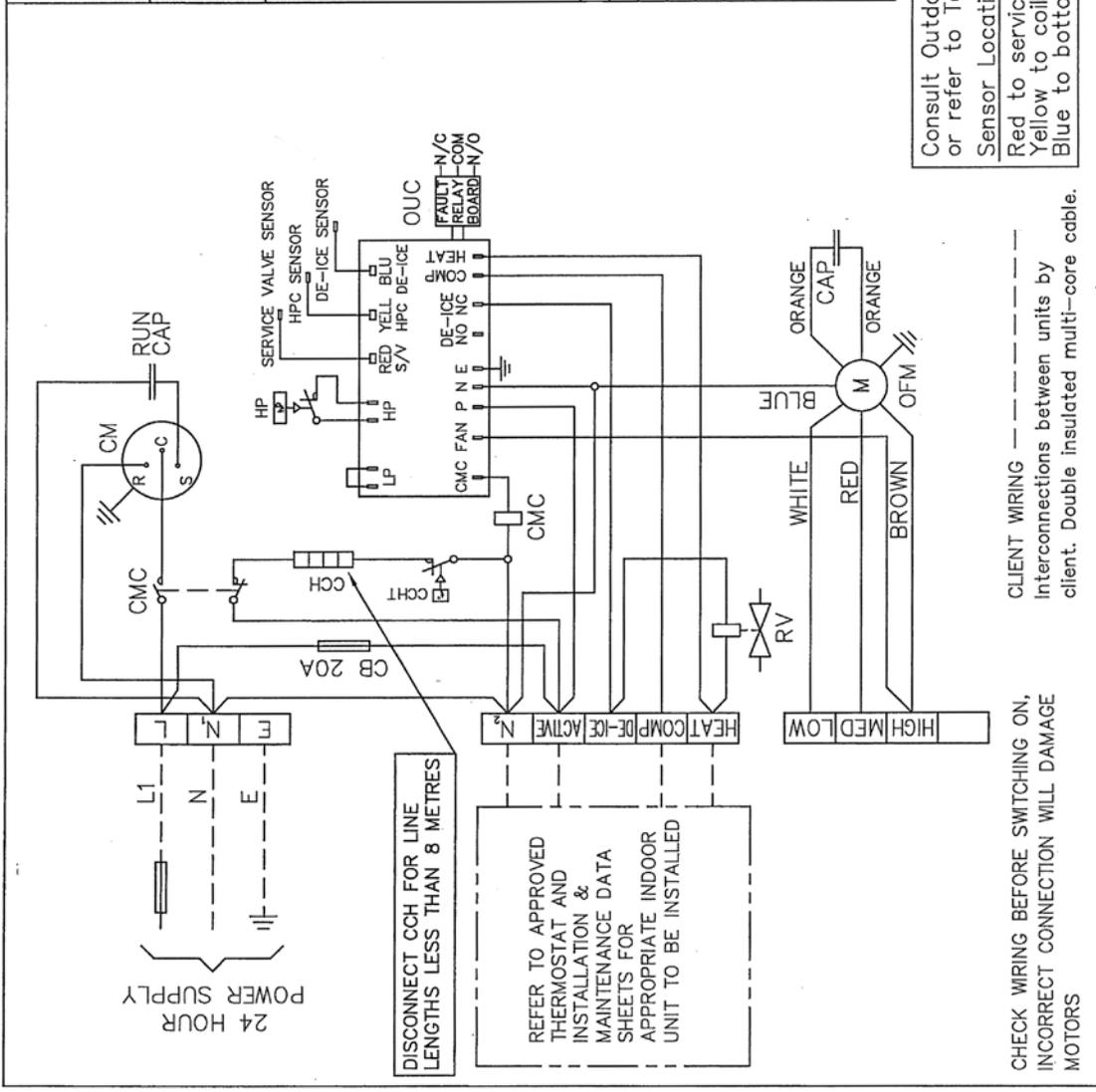
## Pipe Length Capacity Loss On Cooling Cycle Due to Pressure Drop

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

Pipe Size (mm)		Equivalent Line Pipe Length (m)					Additional Pipe Length to allow per Bend	
Liquid	Suction	5	10	15	20	30	Suction Pipe Size OD	19 mm
10	19	0.75 %	1.5 %	2.25 %	3 %	5 %	Long 90° Radius (i.e. 2 x pipe dia.)	0.4 m

OUTDOOR UNIT :- OSA 110RKSH	ISDL 110	ISD 110
WITH INDOOR UNIT		
CAPACITIES - NET to AS/NZS 3823		
COOLING -	kW	9.95
HEATING - REVERSE CYCLE	kW	9.90
ELECTRICAL INPUT		<b>H</b>
COOLING -	kW	3.55
HEATING - REVERSE CYCLE	kW	3.15
E.E.R. (COOLING)	kW/kW	2.80
ELECTRICAL A.E.E.R. (COOLING)	kW/kW	2.78
SUPPLY REQUIRED 1PH 200-252V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS		
COMPRESSOR (1PH) RUN AMPS RATED CONDITIONS	A	14.5
COMPRESSOR (1PH) STARTING AMPS	A	40
COMPRESSOR CAPACITOR RUN	MFD	60
INDOOR FAN MOTOR (1PH) FULL LOAD AMPS	A	0.7, 1.42
INDOOR FAN MOTOR CAPACITOR	MFD	5
OUTDOOR FAN MOTOR (1PH) FULL LOAD AMPS	A	1.4
OUTDOOR FAN MOTOR CAPACITOR	MFD	6
RUNNING AMPS (TOTAL)	A	16.30
MAX. RUNNING AMPS (TOTAL)	A	22.4
MAX. AMP WITH 3kW OPTIONAL ELECT. HEAT		22.4
WEIGHT - NETT OSA 110RKSH 91 kg		
REFRIGERANT - R410A		
UNIT PRECHARGED (10 METRE LINE LENGTH) 2.74 kg		
BASE CHARGE UNIT 2.27 kg PLUS 47 grams PER METRE LINE LENGTH		
BASED ON ø10 mm OD LIQUID LINE & ø19 mm OD GAS LINE		
COMPRESSOR TYPE: ROTARY		
COIL TYPE: POLYVINYL ETHER (PVE)		
ADD ADDITIONAL OIL 10ml PER METRE OVER		
30 METRE LINE LENGTH		

Title		OSA 110RKSH
WIRING SCHEMATIC		
		
Drawn D.W.H	Date 14-12-06	Drawing No. 526-164-002
Aprvd P.C.C.		Revision H



Programmed by	
PLOTTED	
04-07-13	
©temperzone ltd	
2012	
ASSY No.	
FINISH No.	
Mat.I	
DESCRIPTION	
DRG No.	
SIZE	

ISSUE	MODIFICATION	EON	DATE	APRVD
H	UPDATE DATA TO MEPS REGISTRATION	N3278	04-07-13	R.A.S
G	Remove Start Relay & Start CAP	N3106	27-09-12	EBA
F	T/STAT FOR CCH ADDED. FAN SPEED WAS MED	N2727	19-01-11	ROD
E	UPDATE DATA TO MEPS REGISTRATION	N2594	05-07-10	ROD
D	FAULT RELAY BOARD ADDED. PROTECTION WAS FUSE WEIGHT WAS 888kg. TITLE UPDATED	N2425	9-01-10	D.A.B
C	ADD DISCONNECT CCH NOTE	N2343	03-11-09	ROD

CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS

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

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

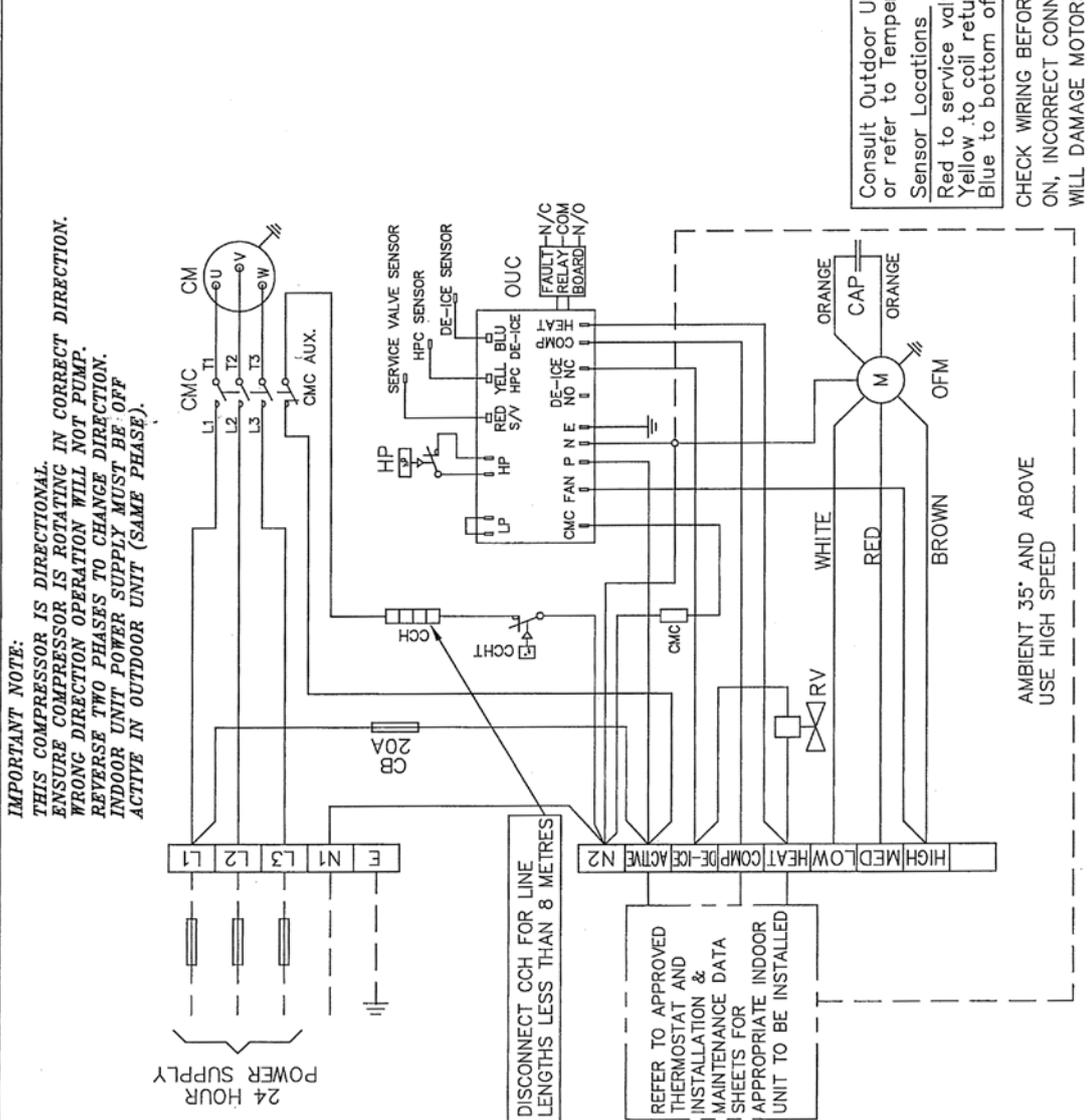
Sensor Locations  
Red to service valve pipe pocket.  
Yellow to coil return bend pocket.  
Blue to bottom of coil in fins.

DISCONNECT CCH FOR LINE LENGTHS LESS THAN 8 METRES

REFER TO APPROVED THERMOSTAT AND INSTALLATION & MAINTENANCE DATA SHEETS FOR APPROPRIATE INDOOR UNIT TO BE INSTALLED

OUTDOOR UNIT :- OSA 110RKTH	ISDL 110	ISD 110
WITH INDOOR UNIT		
CAPACITIES - NET to AS/NZS 3823		
COOLING -	kW	9.95
HEATING - REVERSE CYCLE	kW	9.9
ELECTRICAL INPUT @ 3PH 400V ~ 50Hz		
COOLING -	kW	3.55
HEATING - REVERSE CYCLE	kW	3.15
E.E.R. (COOLING)	kW/kW	2.80
ELECTRICAL A.E.E.R. (COOLING)	kW/kW	2.78
SUPPLY REQUIRED 3PH 342-436V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS		
COMPRESSOR (3PH) RUN AMPS RATED CONDITIONS	A	5.0
INDOOR FAN MOTOR (1PH) FULL LOAD AMPS	A	0.7, 1.42
INDOOR FAN MOTOR CAPACITOR	MFD	3.5&5
OUTDOOR FAN MOTOR (1PH) FULL LOAD AMPS	A	1.4
OUTDOOR FAN MOTOR CAPACITOR	MFD	6
RUNNING AMPS (TOTAL)		7/5/5 7.6/4.7/4.8
MAX AMPS	A	12
MAX AMPS WITH 3KW OPTIONAL ELECT.HEAT	A	12
WEIGHT - NETT OSA 110RKTH 91 kg		
REFRIGERANT - R410A		
UNIT PRECHARGED (10 METRE LINE LENGTH) 2.74 kg		
BASE CHARGE UNIT 2.27 kg PLUS 47 grams PER METRE LINE LENGTH		
BASED ON Ø10 mm OD LIQUID LINE & Ø19 mm OD GAS LINE		
COMPRESSOR TYPE: ROTARY		
OIL TYPE: POLYVINYL ETHER (PVE)		
ADD ADDITIONAL OIL 10 ml PER METRE OVER 30 METRE LINE LENGTH	ABB	DESCRIPTION
	CAP	CAPACITOR
	CB	CIRCUIT BREAKER
	CCH	CRANK CASE HEATER T/STAT
	CCHT	CRANK CASE HEATER
	CM	COMPRESSOR MOTOR
	CMC	COMPRESSOR CONTACTOR
	HP	HI PRESSURE CONTROL
	LP	LOW PRESSURE CONTROL
	OFM	OUTDOOR FAN MOTOR
	OUC	OUTDOOR UNIT CONTROLLER
	RV	REVERSING VALVE

Title		OSA 110RKTH WIRING SCHEMATIC	
Programmed by	temperzone		
PLOTTED	03-07-13	©temperzone ltd	2004
Drawn D.W.H	Date 19-01-07	Drawing No.	526-184-002
Scale	As per DW	Revision	G



ISSUE	MODIFICATION	ECN	DATE	APPRD	DRG SIZE	No.	Mat.I	FINISH	ASSY No.
G	UPDATE DATA TO MEPS REGISTRATION	N3278	03-07-13	R.A.S					
F	T/STAT FOR CCH ADDED. FAN SPEED WAS MED	N2727	19-01-11	ROD					
E	UPDATE DATA TO MEPS REGISTRATION	N2594	26-07-10	ROD					
D	FAULT RELAY BOARD ADDED. PROTECTION WAS FUSE WEIGHT WAS 880g. TITLE UPDATED. CCH NOTE ADDED	N2423	19-01-10	D.A.B					
C	30 WAS 10, ADD "RKT"	N1571	07-08-07	DMW					

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.

CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS

CLIENT WIRING ---  
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