

# OSA 220

## Split System Outdoor Unit

## Installation & Maintenance

### GENERAL

**OSA 220** - A general designation for outdoor unit  
**OSA 220C** - Outdoor unit, cooling only version  
**OSA 220R** - Outdoor unit, reverse cycle version

This OSA 220 Outdoor Unit must be installed in accordance with all national and local safety codes.

### INSTALLATION

#### Positioning

Refer to dimension diagram below for minimum 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 beneath the unit. These springs are not supplied with the unit.

#### Wall Mounting Option:

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

#### Drain

Install the unit with a positive fall to the rear to ensure condensate and/or rain water drains away freely through the drain holes provided. For a totally drip free installation mount the unit in a separate drain tray.

#### OPTIONAL FAN SPEED CONTROLLER

Fit a head pressure fan speed controller where cooling is required in below 20°C ambient conditions for long periods of time. An electronic HP Fan Speed Controller (4 amp) is available from **temperzone**.

### REFRIGERATION PIPING

#### General

The OSA 220 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 220 units have one flare and one brazed pipe connection.

#### Recommended Pipe Sizes

Suction pipe : 28 mm OD  
 Liquid pipe : 13 mm OD

#### Line Lengths

For line lengths in excess of 30 m, fit a compressor crankcase heater to prevent liquid refrigerant condensing in the 'off' cycle. Refer also to *Oil Charge* overleaf. Maximum extended line length is 50 m.

#### Height Separation Limits

##### Reverse Cycle Systems

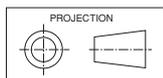
Outdoor Unit above Indoor Unit : 12 m  
 Outdoor Unit below Indoor Unit : 12 m

##### Cooling Only Systems

Outdoor Unit above Indoor Unit : 18 m  
 Outdoor Unit below Indoor Unit : 12 m

## Dimensions (mm)

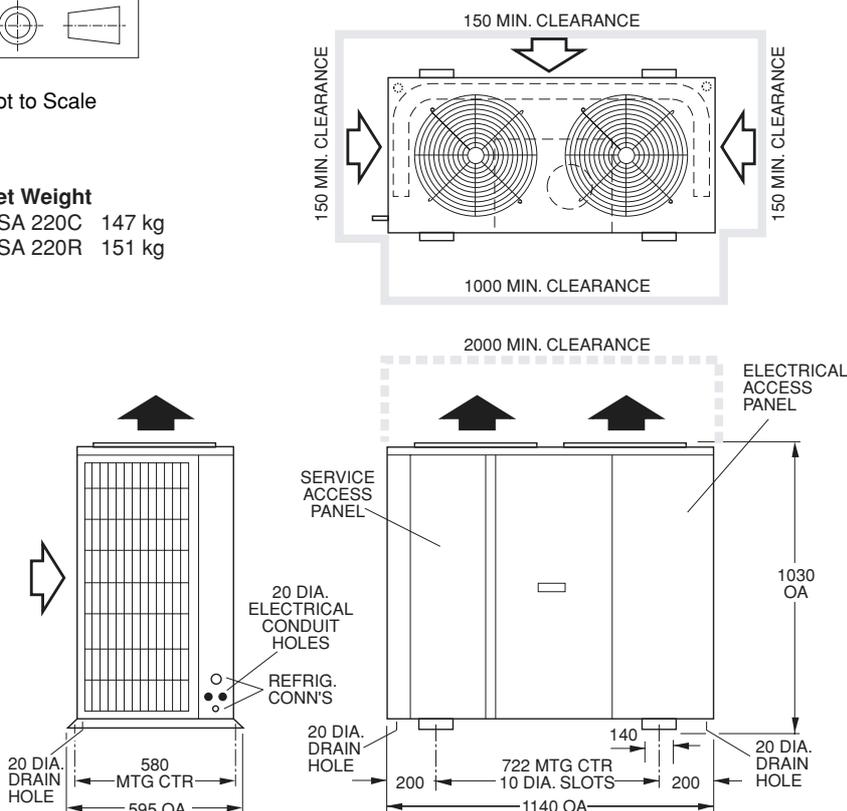
## OSA 220



Not to Scale

#### Net Weight

OSA 220C 147 kg  
 OSA 220R 151 kg



### 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 5 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.
  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. Filter dryer may be fitted in the liquid line (bi-flow type on reverse cycle systems).
  6. Include a process point in 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.

continued...

## Charging

The unit is supplied with 5.76 kg of refrigerant HCFC-22 (R22) which is sufficient for up to 10 m of pipework between the indoor and outdoor units. Add 60 g of HCFC-22 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 (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 240–280 psig (1750–1950 kPag). Alter charge up or down to establish correct superheat.

### WARNING:

This unit is designed for use ONLY with the refrigerant HCFC-22. 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, Suniso 4GS oil (or similar) should be added to the refrigerant at the rate of 1/2 fluid ounce per metre (13 ml/m) of suction piping.

### 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.

*OSA 220R only* - It is recommended electricians run two spare wires between Outdoor Unit and Indoor Unit in case one, or both, of the following options becomes a requirement. **Note:** Leave the wires unconnected until required.

*Option 1* - Indoor Fan Off During De-Ice

*Option 2* - Electric Boost Heat.

Refer indoor unit's wiring diagram.

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 separate pamphlet for approved thermostats, or contact the manufacturer's nearest sales office.

If a compressor crankcase heater is fitted, then a 24 hour power supply to the crankcase heaters is required, otherwise the warranty is void.

### 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 (if fitted) to drive any liquid refrigerant out of the compressor oil.
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, be noisy, 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.  
**Note:** If crankcase heater fitted, switch on the unit after the four hour delay period has expired.
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.

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 (OSA 220R only).
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 all outdoor unit paintwork damage to prevent corrosion.

### 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 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. 2186 dated 02/03. Start up, wiring revision A.

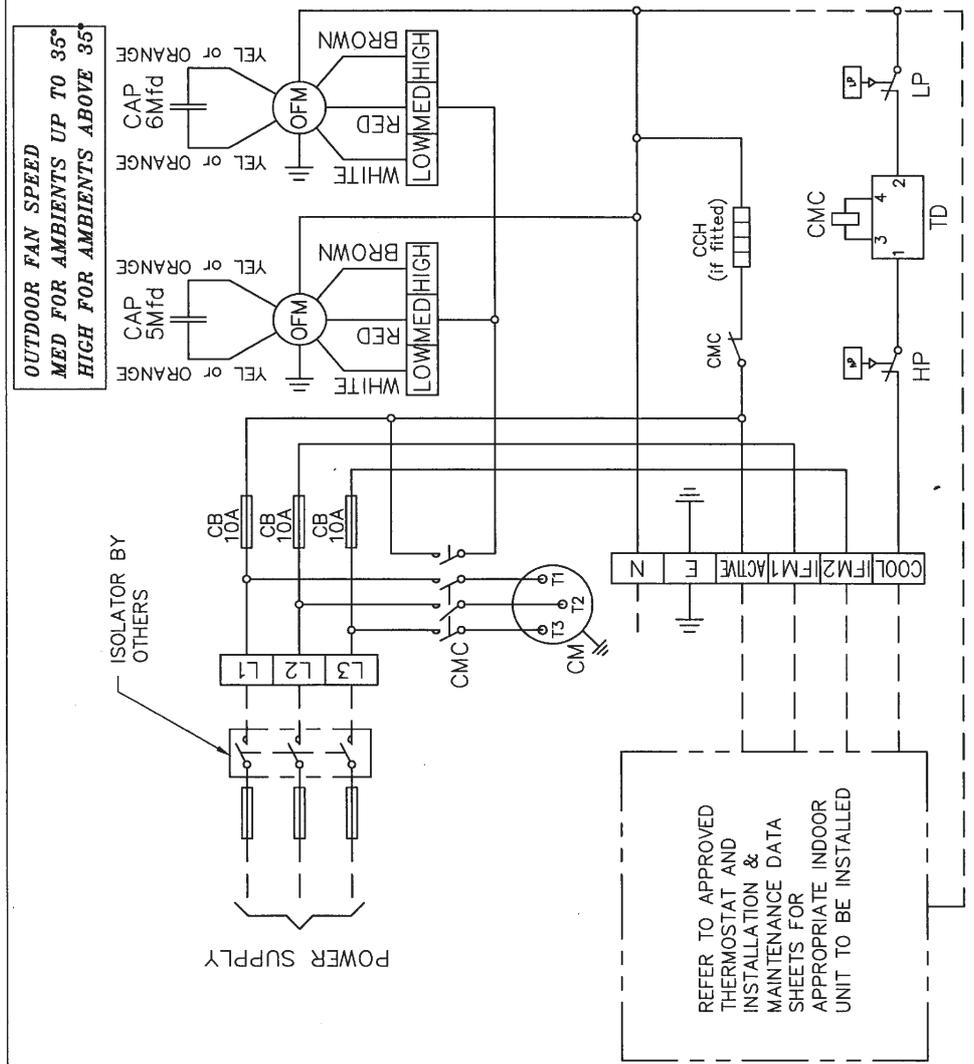
## Pipe Length Capacity Loss

### 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) |         | Equivalent Line Pipe Length (m) |       |        |       |       | Additional Pipe Length to allow per Bend |        |
|----------------|---------|---------------------------------|-------|--------|-------|-------|--|--------|
| Liquid         | Suction | 5                               | 10    | 15     | 20    | 30    | Suction Pipe Size OD                     | 28 mm  |
| 13             | 28      | 1.2 %                           | 1.7 % | 2.25 % | 2.7 % | 4.0 % | Large 90° Radius (2 x pipe dia.)         | 0.61 m |

|  |                |
|--|----------------|
| OUTDOOR UNIT :- OSA 220 C  | ISD 220        |
| WITH INDOOR UNIT   |                |
| CAPACITIES - NET to AS/NZS 3823  |                |
| COOLING -  | kw 20.86       |
| ELECTRICAL INPUT @ 3PH 400V ~ 50Hz                                       |                |
| COOLING -  | kw 7.4         |
| E.E.R. (COOLING)   | kw/kw 2.819    |
| ELECTRICAL   |                |
| SUPPLY REQUIRED 3PH 342-436V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS |                |
| COMPRESSOR (3PH) RUN AMPS RATED CONDITIONS                               | A 11           |
| COMPRESSOR (3PH) STARTING AMPS   | A 14 A/Ph      |
| INDOOR FAN MOTOR (1PH) FULL LOAD AMPS                                    | A 5.7 X 2      |
| INDOOR FAN MOTOR CAPACITOR   | MFD 10 X2      |
| OUTDOOR FAN MOTOR (1PH) FULL LOAD AMPS                                   | A 0.8 X2       |
| OUTDOOR FAN MOTOR CAPACITOR (ONE MOTOR = 5MFD THE OTHER = 6MFD)          | MFD 5 & 6      |
| RUNNING AMPS (TOTAL)   | 12.2/13.5/13.5 |
| RECOMMENDED EXTERNAL FUSE SIZE   | A 25           |
| RECOMMENDED EXTERNAL FUSE SIZE WITH OPTIONAL ELECTRIC HEAT               | A 32           |
| WEIGHT - NETT OSA 220 C  | 147 Kg         |
| REFRIGERANT - HCFC (R22)   |                |
| UNIT PRECHARGED (10 METRE LINE LENGTH) 5.76 Kg                           |                |
| BASE CHARGE UNIT 5.16Kg PLUS 60 grams PER METRE. LINE LENGTH             |                |



**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.

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

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

| ABB | DESCRIPTION          |
|-----|----------------------|
| CAP | CAPACITOR            |
| CB  | CIRCUIT BREAKER      |
| CCH | CRANK CASE HEATER    |
| CM  | COMPRESSOR MOTOR     |
| CMC | COMPRESSOR CONTACTOR |
| HP  | HI PRESSURE CONTROL  |
| IFM | INDOOR FAN MOTOR     |
| LP  | LOW PRESSURE CONTROL |
| OFM | OUTDOOR FAN MOTOR    |
| TD  | TIME DELAY 6 MINS    |

|               |               |                  |             |
|---------------|---------------|------------------|-------------|
| Title         |               | OSA 220 C        |             |
| Programmed by |               | WIRING SCHEMATIC |             |
| Plotted       |               | temperzone       |             |
| Drawn D.A.B   | Date 05-05-03 | Drawing No.      | 327-484-002 |
| Scale         | 1/20          | Revision         | A           |

| ISSUE | MODIFICATION                | ECN | DATE     | APPROV | DRG SIZE | No. | DESCRIPTION | Mat.l | FINISH | ASSY No. |
|-------|-----------------------------|-----|----------|--------|----------|-----|-------------|-------|--------|----------|
| A     | DRAWING No. WAS 011-911-001 | 930 | 07-06-03 | D.A.B  |          |     |             |       |        |          |

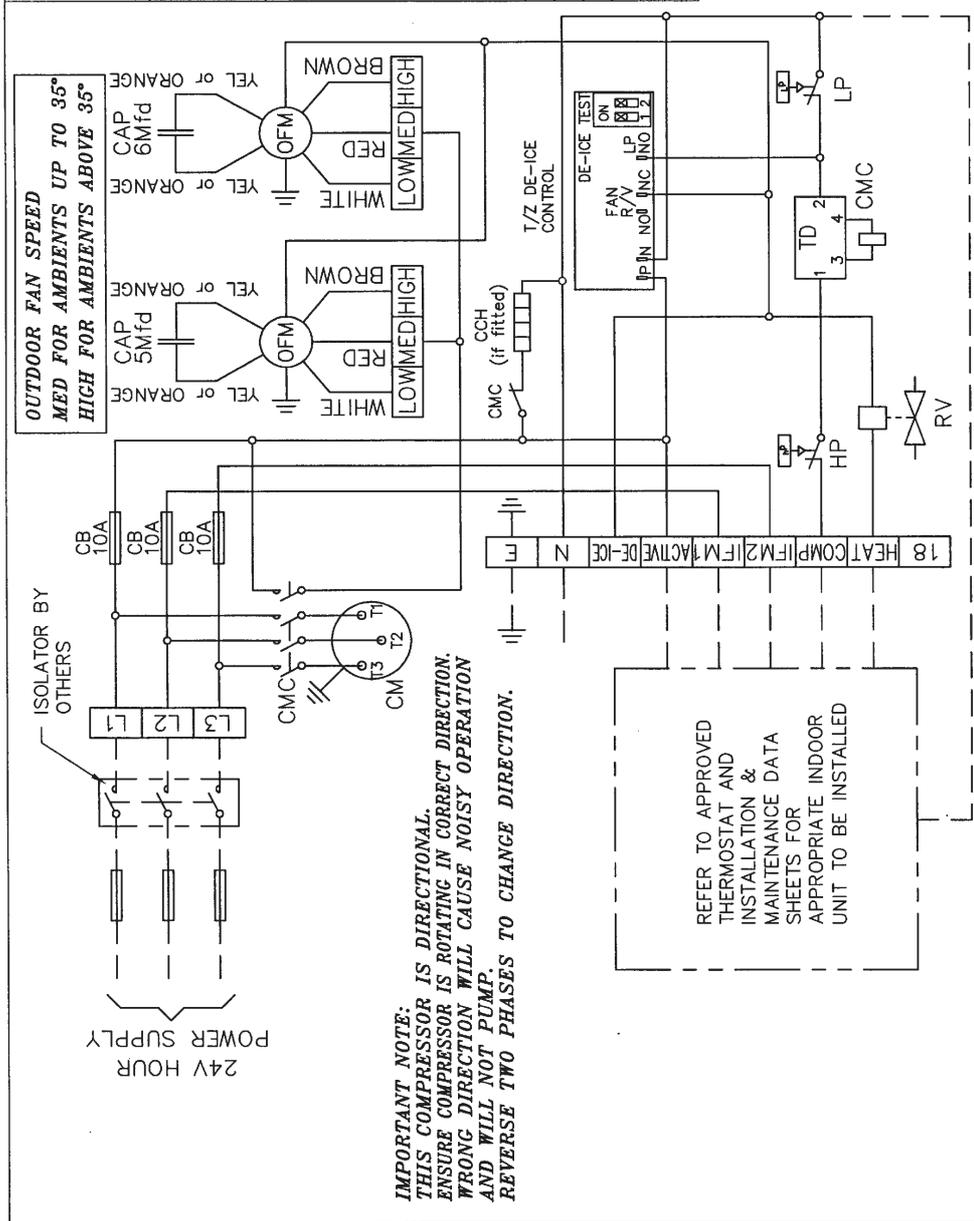
OUTDOOR UNIT :- OSA 220 R  
 WITH INDOOR UNIT  
 CAPACITIES - NET to AS/NZS 3823  
 COOLING - kW 20.86  
 HEATING - REVERSE CYCLE kW 21.2  
 ELECTRICAL INPUT @ 3PH 400V ~ 50Hz  
 COOLING - kW 7.4  
 HEATING - REVERSE CYCLE kW 6.0  
 E.E.R. (COOLING) kW/kw 2.819  
 ELECTRICAL

SUPPLY REQUIRED 3PH 342-436V ~ 50Hz INCLUDING VOLTAGE FLUCTUATION LIMITS  
 COMPRESSOR (3PH) RUN AMPS RATED CONDITIONS A 11  
 COMPRESSOR (3PH) STARTING AMPS A 14  
 INDOOR FAN MOTOR (1PH) FULL LOAD AMPS A 5.7 X2  
 INDOOR FAN MOTOR CAPACITOR MFD 10 X2  
 OUTDOOR FAN MOTOR (1PH) FULL LOAD AMPS A 0.8 X2  
 OUTDOOR FAN MOTOR CAPACITOR (ONE MOTOR = 5MFD THE OTHER = 6MFD) MFD 5 & 6  
 RUNNING AMPS (TOTAL) 12.2/13.5/13.5  
 RECOMMENDED EXTERNAL FUSE SIZE A 25  
 RECOMMENDED EXTERNAL FUSE SIZE WITH OPTIONAL ELECTRIC HEAT A 32  
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| HP  | HI PRESSURE CONTROL  |
| IFM | INDOOR FAN MOTOR     |
| LP  | LOW PRESSURE CONTROL |
| OFM | OUTDOOR FAN MOTOR    |
| RV  | REVERSING VALVE      |
| TD  | TIME DELAY 6 MINS    |

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

|                      |  |                         |  |
|----------------------|--|-------------------------|--|
| Title                |  | OSA 220 R               |  |
| Programmed by        |  | WIRING SCHEMATIC        |  |
| PLOTTED              |  | temperzone              |  |
| 16-05-03             |  | Drawing No. 326-484-002 |  |
| ©temperzone ltd 2003 |  | Revision A              |  |
| Scale                |  | Date 05-05-03           |  |



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|-------|------------------------------|-----|----------|-------|----------|-----|-------------|-------|--------|----------|
| A     | DRAWING No. WAS 011-910-0019 | 30  | 07-05-03 | D.A.B |          |     |             |       |        |          |