



These instructions are to be left with the User

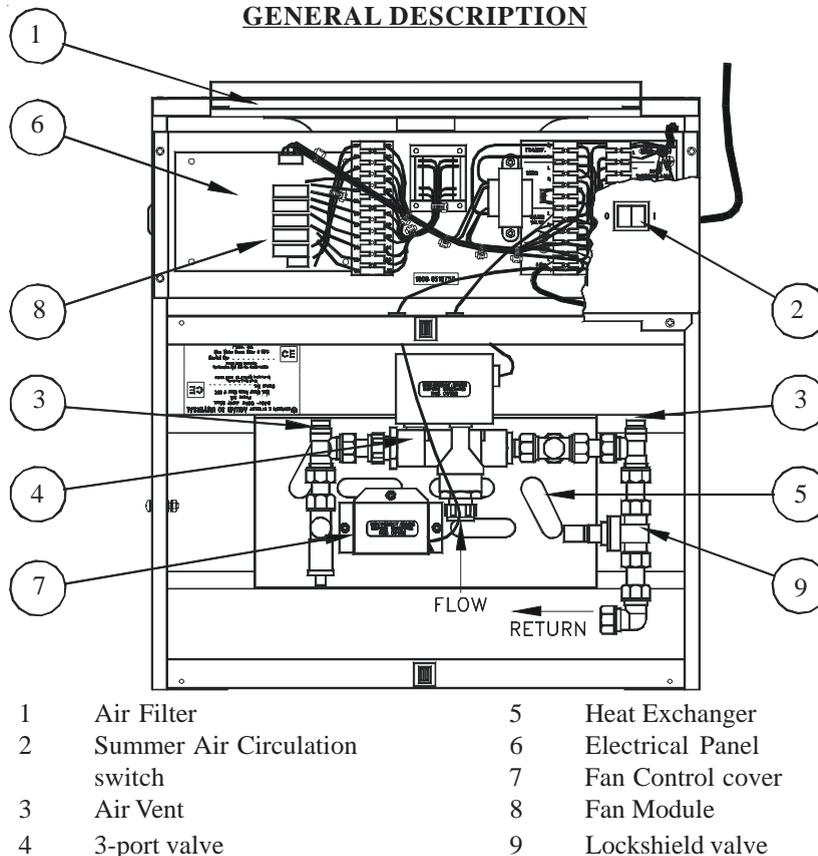
AQUAIR 80UNIVERSAL

Water-to-Air Heat Exchange Unit

INSTALLATION, COMMISSIONING & SERVICING INSTRUCTIONS

Publication No. ZZ 829/3
January 2000

1. GENERAL DESCRIPTION



- | | | | |
|---|-------------------------------|---|-------------------|
| 1 | Air Filter | 5 | Heat Exchanger |
| 2 | Summer Air Circulation switch | 6 | Electrical Panel |
| 3 | Air Vent | 7 | Fan Control cover |
| 4 | 3-port valve | 8 | Fan Module |
| | | 9 | Lockshield valve |

Fig. 1

AQUAIR 80 UNIVERSAL (downflow configuration shown)

- 1.1 AQUAIR 80 UNIVERSAL is a water-to air heat exchange unit with a heat output of up to 8kW (assuming a hot water supply at 80°C is available). It is supplied as a downflow unit, but may be converted to upflow configuration. Modairflow control is incorporated. A wire mesh filter is fitted as standard, with a CLEANFLOW electronic air cleaner being available as an option for the downflow configuration only. The unit requires a supply of hot water at a minimum temperature of 75°C. Water connections can be either left or right handed through knockouts in the sides of the cabinet.
- 1.2 Water flow to the unit is controlled by a 3-way motorised valve, which directs the flow either through the unit's heat exchanger, or through a free flow bypass (see sect. 4.4 for guidance on connection). Flow through the heat exchanger is regulated by means of a lockshield valve.
- 1.3 Air is drawn in through the air filter or air cleaner (if fitted) and the heat exchanger by a centrifugal fan, and is discharged through the opposite end of the unit. A Summer Air Circulation switch provides the facility to supply unheated air to the air outlets during warm weather. An external timer (not provided) will be required if it is necessary to set the periods of operation.

2. TECHNICAL INFORMATION

| | |
|---|------------------------------|
| Maximum output (with 80°C water supply temperature and 70°C return temperature) | 8.0kW (27,300Btu/h) |
| Water connection | 15mm copper |
| Max. working pressure | 10bar at 85°C |
| Electrical supply | 230V, 50Hz, fuse rated at 3A |
| Weight (empty) | 26kg |
| Height | 540mm |
| Width | 475mm |
| Depth | 490mm |
| Return Air Spigot | 375mm x 370mm |
| Water capacity | 1.5litres (approx) |

3. CONVERSION TO UPFLOW CONFIGURATION

- 3.1 Remove the front cover from the unit by pulling to release the 2 x spring clips.
- 3.2 Remove the air filter, and the panel containing the 'SUMMER AIR CIRCULATION' switch by undoing the 2 x retaining screws and sliding the panel out. Disconnect the flying terminal strip on the wires to the Summer Air Circulation switch and lay the panel to one side.
- 3.3 Disconnect the water valve and fan control wires from the terminal strip on the electrical panel, noting their positions for subsequent reconnection.
- 3.4 Remove the 4 screws retaining the electrical panel and pull the panel forward, whilst withdrawing the mains input cable from the retaining bush in the side of the cabinet. Disconnect the fan supply lead from the fan tray, and lay the electrical panel to one side.
- 3.5 Remove the 4 x M6 screws securing the heat exchanger, and withdraw the heat exchanger complete with water valve and fan control wiring.
Note: The heat exchanger matrix is fragile and easily damaged.
- 3.6 Remove the 8 x self tapping screws and remove the return air frame from the top of the unit.
- 3.7 Turn the cabinet upside down with the fan still in place, and reassemble the return air frame in its new position on the top of the unit, using the screws previously removed.
- 3.8 Swap over the blind grommet and retaining bush in the sides of the unit. Feed the mains input cable through the retaining bush, reconnect the fan and refit the electrical panel to the cabinet, using the screws previously removed.
- 3.9 Refit the heat exchanger using the screws previously removed.
- 3.10 Feed the water valve and fan control wiring through the original grommets, and reconnect the wiring to the electrical panel terminal strip.
- 3.11 Release the 'SUMMER AIR CIRCULATION' switch by unclipping from the panel, rotate the switch by 180°, and refit the switch.
- 3.12 Reconnect the 'SUMMER AIR CIRCULATION' switch at the flying terminal strip, refit the switch panel using the screws previously removed, and refit the air filter and front cover.

4. INSTALLATION

- 4.1 The unit should be positioned to suit existing duct work and mounted, if necessary, on a plinth or frame strong enough to avoid strain being placed on associated pipe and duct work.
- 4.2 Clearance of 490mm is required at the front of the casing for servicing and replacement of the heat exchanger. It is recommended that provision be made for complete removal of the unit.
- 4.3 Sufficient clearance must be provided for the assembly of ducting and pipework.
- 4.4 Water connections to the unit should be by compression fittings that are suitable for the duty, and isolation valves must be fitted to facilitate the removal of the heat exchanger assembly.
IMPORTANT: It is recommended that the water system be drained and flushed prior to the installation of the unit. A strainer should be fitted upstream of the unit.
- 4.5 On downflow units, if a return air duct is not to be fitted, the top of the unit must be suitably guarded to prevent blockage.

5. ELECTRICAL CONNECTIONS

- 5.1 The appliance is supplied with PVC sheathed, 3 core (Brown-Blue-Green/Yellow) 0.75mm² csa rated at 6A, connected to a terminal block and exiting through the casing at the top right hand front. The cable is suitable for a 230V 50Hz single phase supply.
- 5.2 The means of isolating the appliance **MUST** be via a double pole switch with a contact separation of at least 3mm in both poles, and fused at 3A. A 500mA anti-surge circuit protection fuse, and a 63mA anti-surge transformer protection fuse are fitted internally.
- 5.3 A Thermista-stat is supplied with the unit, which is to be connected using PVC sheathed to BS6500, 2 core cable of 0.5mm² csa rated at 3A, to the terminals marked '**ROOM THERMISTA-STAT**' on the electrical panel in accordance with Fig. 2 and **observing correct polarity**.
- 5.4 The unit is supplied with a conductor linking terminals '17' and '18'. If a timer (not provided) is to be fitted, this link must be removed, and the timer connected in its place.

6. COMMISSIONING

- 6.1 Fill the water system and clear any air locks, manually operating the motorised valve by means of the lever at the side of the actuator cover, whilst opening the adjacent air vents. Thoroughly flush the system through, checking for water soundness, and then isolate the unit from the water supply.

- 6.2 With the timer (if fitted) set to an 'OFF' position, and the Thermista-stat at a setting which does not call for heat, switch the electrical supply ON, and set the 'SUMMER AIR CIRCULATION' switch to 'I' and ensure that the fan operates.
- 6.3 Adjust the ducting system grilles and dampers to provide the required design velocity balance.
- 6.4 Open the isolation valves (external to the appliance) and the lockshield valve to allow water into the heat exchanger, Set the 'SUMMER AIR CIRCULATION' switch to 'O' and ensure that the fan stops.
- 6.5 With the water system operating at the design temperature set the timer (if fitted) to an ON position, set the Thermista-stat to call for heat. Ensure that the motorised three port valve opens allowing water to flow through the heat exchanger, and after a short delay that the fan starts.
- 6.6 Set the lockshield valve to provide a 10°C temperature differential between the flow and return. The heat exchanger is based upon a flow temperature of 80°C and a return temperature of 70°C.
- 6.7 Allow the system to warm up, and then check that the return air temperature differential at the registers is approximately 40°C.
- 6.8 Test the operation of the Thermista-stat and the timer (if fitted) by setting them to an OFF position. Ensure that the three port valve changes over to 'bypass' allowing the heat exchanger to cool, followed by the fan switching off after approximately 3 minutes. (The fan control turns the fan on when the water temperature reaches 70°C, and off at 60°C.)
- 6.9 Operate the 'SUMMER AIR CIRCULATION SWITCH' with the system running, and ensure that the three port valve changes over to 'bypass' and that the fan continues to run.
- 6.10 Set the Thermista-stat, and timer (if fitted) to the user's requirements.

7. INSTRUCTIONS TO USER

- 7.1 Leave these instructions with the user for use on future service visits, and ensure that the user is aware of the following:
 - 7.1.1 The importance of regular cleaning of the filter, at least once every month.
 - 7.1.2 How to control the heating system by opening and closing the warm air vents.
 - 7.1.3 That the warm air outlets in the rooms served by the heater **MUST NOT BE BLOCKED**.
 - 7.1.4 That the return air inlet must not be obstructed.
 - 7.1.5 How to obtain Summer Air Circulation.

8. MAINTENANCE

8.1 **ROUTINE MAINTENANCE:**

IMPORTANT: Before carrying out any work on the unit, ALWAYS ENSURE THAT IT IS ISOLATED FROM THE MAINS ELECTRICAL SUPPLY. Remove the front cover of the unit by gently pulling it forward to release the two spring clips. Maintenance should be carried out at least once per year.

- 8.1.1 Check that the heat exchanger airways are free from obstructions. If necessary, clean with a vacuum cleaner from the air inlet end of the unit, taking care to not damage the airways.

CAUTION: THE ELEMENTS OF THE HEAT EXCHANGER ARE VERY FRAGILE.

- 8.1.2 Check the condition of the strainer, cleaning as necessary.
- 8.1.3 Check that the air filter is being regularly cleaned in accordance with the User's Instructions.

8.2 **ELECTRICAL PANEL FUSE REPLACEMENT:**

- 8.2.1 Ensure that the electrical supply is switched off and isolated.
- 8.2.2 Release the 2 x retaining screws and withdraw the panel containing the 'SUMMER AIR CIRCULATION' switch, disconnect the flying terminal strip and remove the panel from the unit.
- 8.2.3 Two fuses are mounted in fuse holders at the right hand end of the panel. Fuses are only to be replaced with ANTI-SURGE fuses of the correct value.

8.3 **ELECTRICAL PANEL REMOVAL:**

- 8.3.1 Ensure that the electrical supply is switched off and isolated.
- 8.3.2 Release the 2 x retaining screws and withdraw the panel containing the 'SUMMER AIR CIRCULATION' switch, disconnect the flying terminal strip and remove the panel from the unit.
- 8.3.3 Disconnect the wiring to the water valve and time control (if fitted) at the electrical panel terminal block.
- 8.3.4 Release the 4 screws securing the electrical panel and withdraw the panel, disconnecting the fan supply lead at the fan tray terminal block.
- 8.3.5 Reassembly or replacement is in reverse order.

8.4 THREE WAY VALVE or MOTOR REMOVAL:

- 8.4.1 Ensure that the electrical supply is switched off and isolated.
- 8.4.2 Close the isolating valves and drain down the unit, taking care to prevent water from dripping onto the electrical panel or fan on UPFLOW models.
- 8.4.3 Disconnect the unit pipework from the left hand (lower) connection the heat exchanger, and the FLOW connection beneath the three way valve.
- 8.4.4 Slacken the connection at the left hand end of the three way valve to permit the pipework to swing away from the heat exchanger. Disassemble the three way valve from the pipework.
- 8.4.5 To gain access to the motor, loosen the screw at the right hand side of the valve actuator and lift the cover.
- 8.4.6 To replace the motor, follow the manufacturer's instructions included with the motor kit.
- 8.4.7 Reassembly is in reverse order. Ensure that all air locks are expelled, and check for water soundness.

8.5 FAN CONTROL REMOVAL:

- 8.5.1 Ensure that the electrical supply is switched off and isolated.
- 8.5.2 Release the single screw and remove the fan control cover.
- 8.5.3 Disconnect the 2 leads from the fan control, leaving the earth connected.
- 8.5.4 Release the 2 screws securing the fan control and remove the control.
- 8.5.5 Refitment or replacement is in reverse order.

8.6 HEAT EXCHANGER REMOVAL:

- 8.6.1 Ensure that the electrical supply is switched off and isolated.
- 8.6.2 Close the isolating valves and drain down the unit, taking care to prevent water from dripping onto the electrical panel or fan on UPFLOW models.
- 8.6.3 Release the 2 x retaining screws and withdraw the panel containing the 'SUMMER AIR CIRCULATION' switch, disconnect the flying terminal strip and remove the panel from the unit.
- 8.6.4 Disconnect the wiring to the water valve and time control (if fitted) at the electrical panel terminal block and earth post, noting their positions for subsequent reconnection.
- 8.6.5 Release the 4 hexagonal headed screws and remove the heat exchanger and its associated pipework from the unit.
- 8.6.6 Refitment or replacement is in reverse order. Ensure that all air locks are expelled, and check for water soundness.

8.7 FAN ASSEMBLY REMOVAL:

- 8.7.1 Remove the electrical panel as detailed in para. 8.3.
- 8.7.2 Release the 2 screws at either end of the fan tray, and withdraw the fan assembly.
- 8.7.3 Refitment is in reverse order.

8.8 FAN CAPACITOR REPLACEMENT:

- 8.8.1 Remove the fan assembly as detailed in para 8.7.
- 8.8.2 Disconnect the capacitor leads at the capacitor.
- 8.8.3 Remove the capacitor from its securing clip.
- 8.8.4 Refitment or replacement.

8.9 FAN REPLACEMENT:

- 8.9.1 Remove the fan assembly as detailed in para 8.7.
- 8.9.2 Disconnect the 4 x fan wires from the terminal block and withdraw the leads from the grommet and 'P' clip.
- 8.9.3 Release the 4 x round headed screws and lock washes and remove the fan from the fan assembly.
- 8.9.4 Refitment or replacement is in reverse order. Do not omit the lock washers from beneath the 4 x screws, and ensure that the capacitor is connected correctly.

8.10 AIR FILTER REMOVAL:

- 8.10.1 The air filter is removed by sliding it out from the front of the unit.

9.

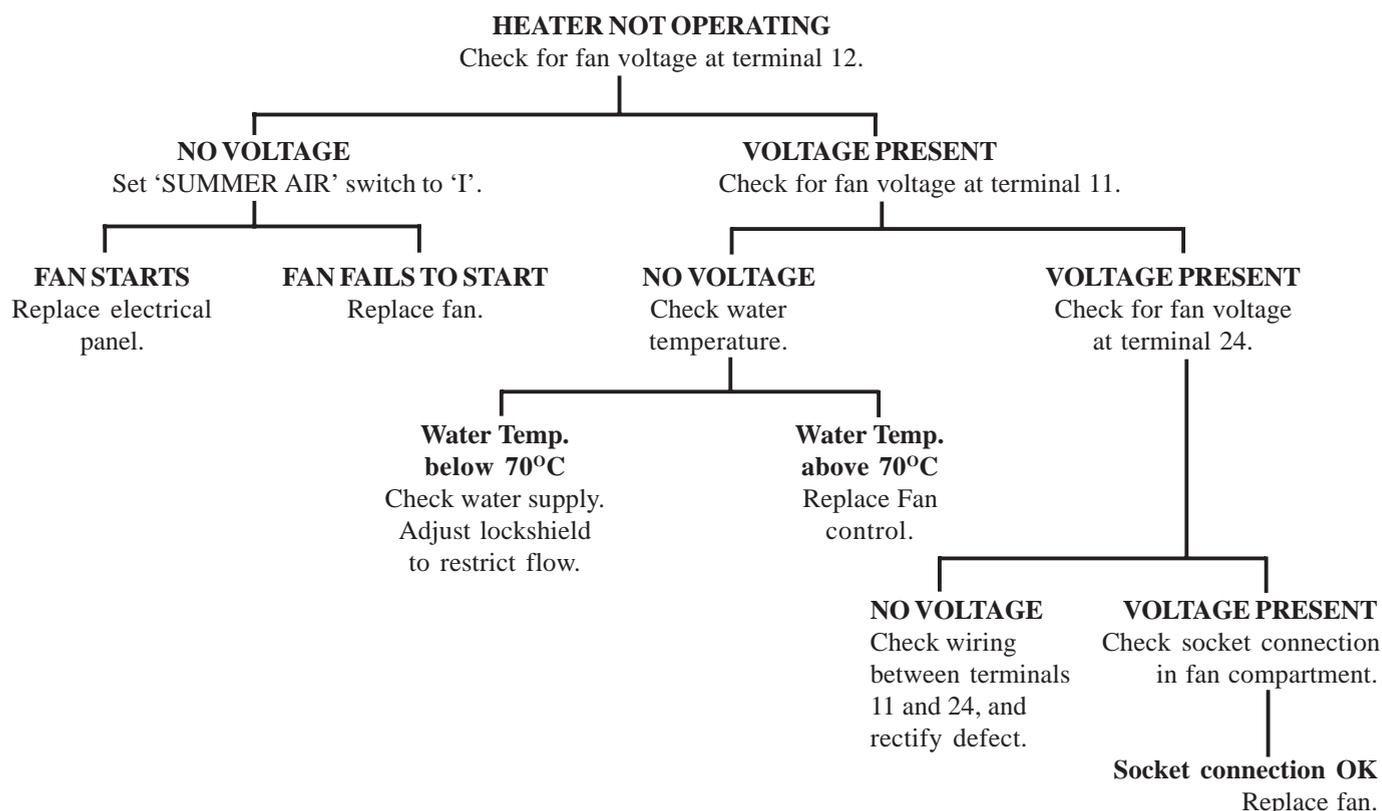
DEFECT DIAGNOSIS

IMPORTANT: If an electrical defect occurs after installation of the appliance, preliminary earth continuity, polarity and resistance to earth checks should be carried out using a multimeter. Upon completion of any service or fault finding task that has required the breaking and remaking of electrical connections, then checks of continuity, polarity and resistance to earth must be repeated.

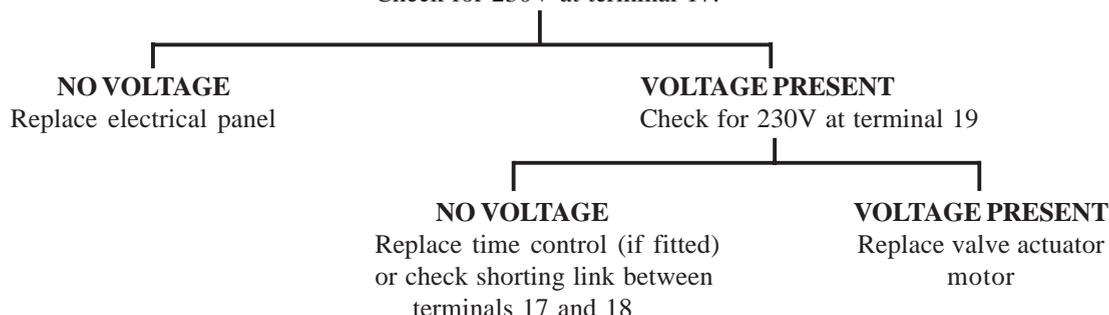
WARNING: When carrying out electrical testing, a test meter MUST be used. Low resistance test devices can cause damage to the electronics module.

Prior to commencement of fault finding, set the Thermista-stat to maximum, turn the mains electrical supply ON and check that the time control (if fitted) is set to an on position.

Care must be taken during the replacement and handling of electronic assemblies (i.e. electrical assembly and Thermista-stat). It is not practical to rectify any defects in these assemblies except in the factory, and any attempt to do so may render any guarantee or factory replacement agreement void.

9.1 OPERATIONAL CHECKS:**WATER VALVE NOT OPERATING**

Check that Thermista-stat is calling for heat.
Check Mains electrical supply.
Check supply to electrical panel at supply terminals.
Check 500mA fuse.
Check time control (if fitted) is at an ON setting.
Check for 230V at terminal 17.

**FAN RUNNING WHEN NO HEAT REQUIRED**

Check 'SUMMER AIR' switch is set to 'O', and check water temperature.
If water temperature is below 60°C, replace fan control.

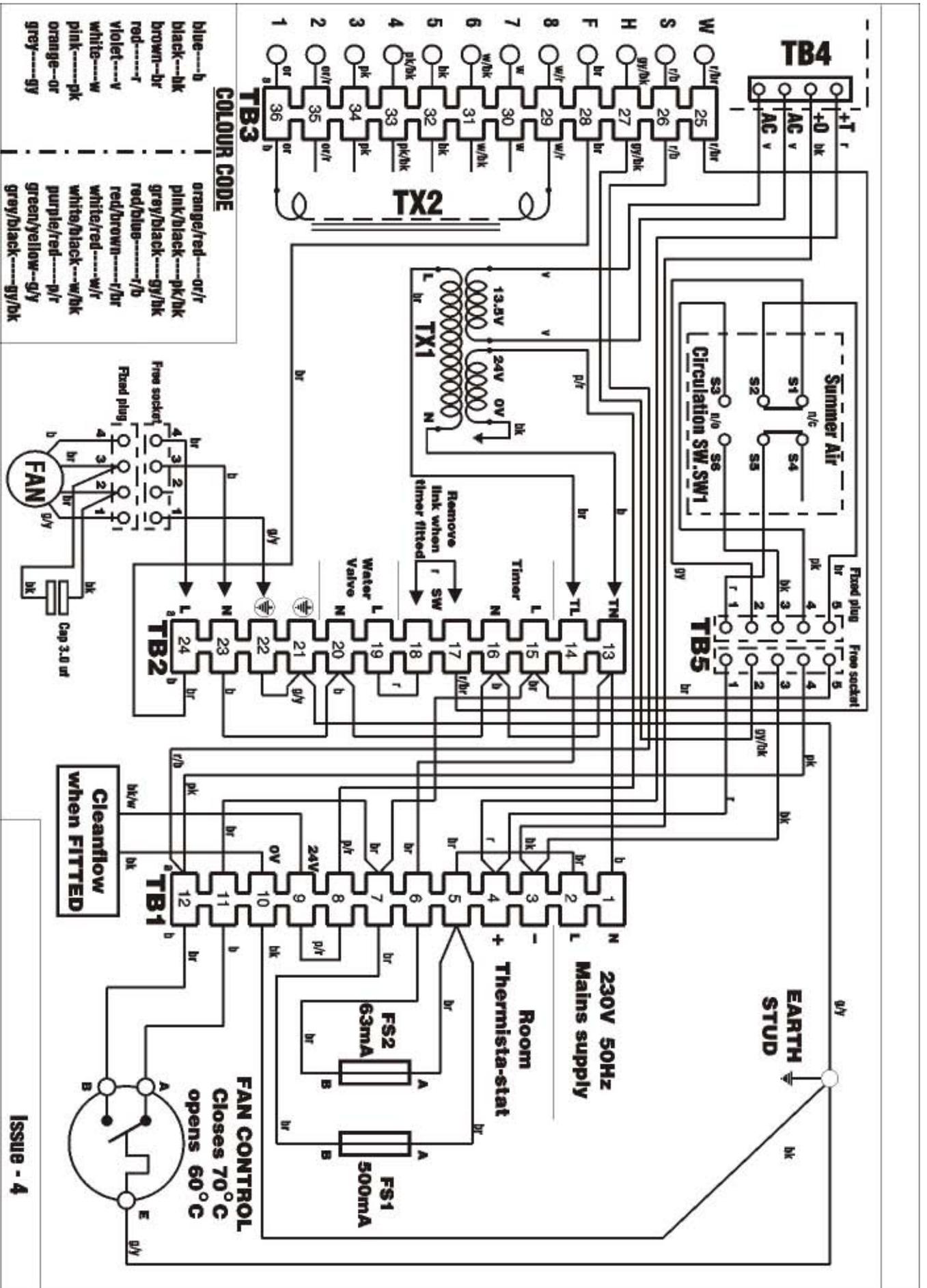


Fig. 2

AQUAIR 80 UNIVERSAL CIRCUIT DIAGRAM

10.

SPARES LIST

| Part No. | Description | Qty |
|-----------------|--------------------------------|------------|
| 1000-0516700 | Air Circulating Fan | 1 |
| 1000-0300330 | Fan Control | 1 |
| 1000-0300200 | Motorised Valve | 1 |
| 1000-0510750 | Capacitor 3 μ f | 1 |
| S00552 | Motor pack for three way valve | 1 |
| 1000-0516755 | Electrical Panel Assembly | 1 |
| BOS 01242 | Thermista-stat | 1 |
| S00569 | Heat Exchanger | 1 |
| 1000-0513800 | Fuse 63mA Anti-surge | 1 |
| 1000-0502240 | Fuse 500mA Anti-surge | 1 |
| AQ83-0115000 | Filter assembly | 1 |

Johnson and Starley prides itself on its ability to supply spare parts quickly and efficiently. If you have a problem in obtaining a spare part, please contact Johnson and Starley Spares Department at the address below.

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