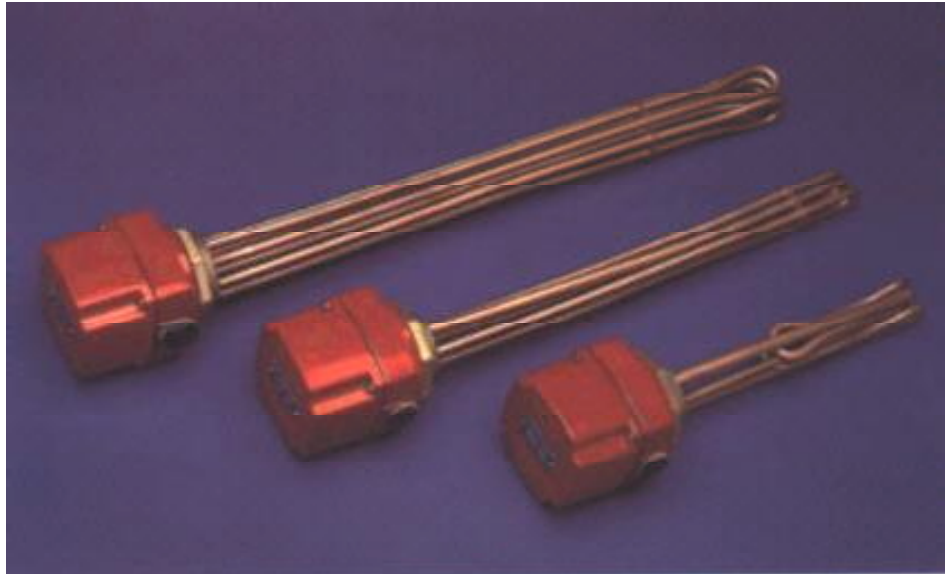


Installation Instructions for Immersion Heaters with Fixed Rod Type Elements

Heater Type AP



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1.0 Application

The AP range of boss mounting immersion heaters, depending upon specification, are intended to heat water in bulk storage vessels and flow boilers, etc. The heaters are suitable for horizontal mounting only although vertical mounting heaters can be supplied. To avoid localised boiling or air locks, care should be taken to ensure that the cold zone extends beyond any neck piece. Refer to the supplied Heater Specification / Data Sheet for the detailed construction and specification of the heater.

2.0 Construction

The metal sheathed elements are brazed into the screwed boss. The boss is screwed to suit a 2" or 2.¼" BSP thread fixing and comes complete with a fibre gasket. The terminal enclosure is aluminium or polypropylene and is rated to IP56 (min) with one M25 conduit entry and one M25-M20 reducer. The AP range is designed a maximum operating pressure of 6 bar(g). The maximum operating temperature is 120°C. The heater generally conforms to BS7798.

3.0 Installation

The heater is supplied with a gasket ready to be screwed to the appropriate flange on the vessel. It is not recommended that sealing compounds are used. Installation should ensure that the thermostats are positioned uppermost. Heaters with immersed lengths of greater than 1500mm should be provided with internal tank support. After fitting the heater into the vessel the system should be filled with water and a check made for leaks around the joint. The vessel should be filled according to your standard procedure ensuring that all air pockets are purged from the system. It is important that the heating elements are immersed at all times during operation.

Control thermostats (if fitted) should be set to suit site requirements. The control thermostat is provided to regulate the temperature to the desired setting. When the set temperature is reached the heater circuit will switch off until the temperature falls below the differential of the thermostat. When this happens the heater circuit will energise and start the cycle again.

Recommended settings :

Soft Water areas : up to 82°C

Medium Hard Water areas : up to 71°C

Hard Water areas : up to 65°C

Note that scalding temperature of water is 66°C

The High Limit thermostat (if fitted) contains a manual reset cut-out. This should be set at approx. 15°C above the setting of the control thermostat. This is a safety device intended to prevent overheating. It is highly recommended that the high limit thermostat is included in all installations for safety purposes.

If any cleaning or sterilising solutions are to be "flushed" through the system prior to commissioning a check should be made to ensure that the solution will not damage the heater.

4.0 ELECTRICAL CONNECTIONS

All electrical wiring must be carried out by a competent person and must comply with current IEE regulations to BS7671.

We recommend that the insulation of each circuit within the heater is checked prior to each installation. The minimum reading between live and earth should not fall below 1 M Ω. If the readings are low the element may be faulty and must be checked. See "Low Element Insulation" below.

A terminal layout drawing is supplied to be used as a guide when wiring the heater.

The immersion heater must be connected to fixed wiring.

Check all electrical connections to ensure that they are tight.

After all electrical connections have been made replace the heater terminal enclosure.

Immersion heaters are designed to operate **ONLY** when the heating elements are immersed in water and **MUST NOT** be switched on when the heating elements are exposed to air.

The heater will only heat the contents of the tank above the immersion heater.

Should the vessel be drained at any time and the heater removed, this installation procedure must be repeated before proceeding to switch the heater circuits on.

WARNING
THIS APPLIANCE MUST BE EARTHED

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5.0 MAINTENANCE

It is recommended that routine periodic checks are performed every 12 months, or every 6 months where local water supply is particularly hard or contains a high proportion of solids. All precautions must be taken against electrical shock, in particular by switching off at the mains fuse between maintenance checks. The recommended procedure is as follows :

WARNING

ALWAYS ISOLATE ELECTRICAL POWER AT THE MAINS SWITCH BEFORE REMOVING THE TERMINAL ENCLOSURE.

- 1) Isolate electrical power at the mains isolator and remove fuses.
- 2) Isolate mains cold water supply.
- 3) Visually check all water joints, ensuring no leaks are evident.
- 4) Remove heater terminal cover
- 5) Disconnect incoming wiring (line connections)
- 6) Remove busbars / wire links and carry out a resistance check on the element to verify continuity
- 7) Faulty element(s) must be replaced. (Refer to 7.0 below)
- 8) Check operation of thermostat(s).
- 9) We only recommend removing the heater from the vessel if the water is particularly aggressive or contains a high concentration of dissolved solids.
- 10) Drain vessel and connecting pipes according to your standard procedure before removing heater
- 11) Unbolt and completely remove the assembly from the vessel
- 12) Visually inspect elements for scale and corrosion. In extreme cases heavy scaling will cause increased element running temperatures and eventual element failure.
- 13) Heavily scaled or corroded elements must be replaced
- 14) Replace any defective parts (Refer to the spare parts section)
- 15) Fit a new fibre gasket to the flange

6.0 SPARES ORDERING INFORMATION

It is essential when ordering spares to quote **all** the details given on the nameplate :

SERIAL NUMBER DATE KILOWATT RATING

6.1 Parts List

**Control Thermostat
High Limit Thermostat
Flange Gasket**

7.0 ELEMENT REPLACEMENT PROCEDURE

Elements may only be replaced with the screwed boss. Refer to us for advice.

8.0 OPERATIONAL FAULTS

Always isolate electrical power at the mains before removing the terminal cover.

8.1 LOWER THAN EXPECTED OUTPUT

- Check :
- a) Has Control Thermostat been correctly set ?
 - b) There is an element failure - check resistances
 - c) There is a fuse failure in the control unit
 - d) There is an error in the sizing of the heater

8.2 HEATER NOT OPERATING

- Check :
- a) Has the High Limit Thermostat (where fitted) tripped ?
This may be rectified by re-setting, done by depressing the button on the face of the unit.
This should only be attempted after locating and rectifying the cause of excessive temperature, which could be a fault in the control thermostat, control gear or lack of fluid in the vessel.
 - b) Main Fuses
 - c) Main Electrical Supply
 - d) Control Thermostat - may have failed in "open" position
 - e) Contactor operation and contactor coil fuse. Fault in contactor or control gear
 - f) Wiring to heater - check for loose connections
 - g) Element failure - check resistances

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8.3 LOW ELEMENT INSULATION

All elements are sealed prior to despatch to prevent any ingress of water. However, storage conditions after despatch are not always ideal. In particular if there is a long delay between purchase and commissioning there may be some degree of water ingress into the elements. The immersion heater will not be affected by the lower insulation readings, however to allow any current control device to operate it is suggested that the following procedures be carried out.

- 1) The terminals at the end of the element can be dried to remove any moisture with a hairdryer or similar device.
- 2) When brought into operation the element will naturally improve in insulation value.
- 3) If an RCD is being used this can be disconnected while the heater is switched on to allow the insulation readings to increase.
- 4) The heater can be placed in an oven at 200-250C for a period of time to raise the insulation levels. If an oven is not available then the heater can be returned to A.K. Waugh Ltd.
- 5) To maintain the insulation during periods of low use it is advisable to switch the heater on in the tank, in water, approximately once a month for 48 hours.

9.0 GUARANTEE

The manufacturer will make good, by repair or at his option by supply of a replacement, defects which, after proper installation has been carried out in accordance with the instructions provided above, appear in the product within a period of twelve calendar months after the goods have been delivered and arise solely from failure in design, materials or workmanship. Provided always that defective parts are promptly returned by the user free to the manufacturers works, unless otherwise arranged, the repaired parts or new parts will be delivered by the manufacturer free of charge.

The policy of A.K. Waugh is that of continuous improvement and development. The right is therefore reserved to change specifications without notice.