



Installation & Operating Instructions

RESPONSE 2000

INSTANTANEOUS HOT WATER UNIT

Introduction



This leaflet contains specific information regarding the safe installation and operation of the equipment mentioned. These instructions must be read and understood by anyone responsible for the installation of this equipment.

Warning Symbols



Safety instruction where non-compliance would affect safety.



Safety instruction where electrical hazard is involved.

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Safety instruction relating to safe operation of the equipment. (ATTENTION)

Instructions for Safe Use

General

This equipment has been designed for the transfer of heat from primary boiler water to secondary clean water, to the operating conditions shown.



No installation of this equipment should take place until these notes and installation and maintenance instructions have been studied carefully.

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Handling, transportation and installation of this equipment should be done so with the proper use of lifting gear and guidance from the appropriate drawings.

Storage of this equipment should be in a dry frost free environment.

Caution



When this equipment is in operation some internal surfaces run hot.

Noise Emission

This equipment runs at a level lower than 70 dBA.

Installation

Pipework

Isolation valves should be fitted to both primary and secondary pipework to enable the unit to be isolated, it is also advisable to fit a by-pass loop to the secondary pipework to allow the availability of cold water should the unit be isolated for any reason. The instantaneous hot water package should be connected to the primary and secondary pipework in accordance with the appropriate drawings.

Note: All local water company bye-laws must be observed.



Expansion vessels, pressure relief valves, check valves etc., should be fitted as required.

Positioning

The unit should be positioned on a flat level floor capable of supporting its weight, with good all round access for ease of maintenance. The minimum clearance required to service the plate pack is shown on the general arrangement drawing. Each large unit is fitted with 2 off lifting/fixing feet with two 12mm dia. holes. Discard 4 off eyebolts, remove 2 off bolts securing each angle to baseframe rotate angle through 180 degrees and re-attach to baseframe. The unit can now be bolted down using 4 off M10/12 bolts. Small units with baseplates should be bolted down using 4 off M10 bolts.

Electrical Supply

Make electrical connections to the control cubical using a suitably fused supply. Cables should be routed to the control panel from either the rear or top of the main clad unit.



Check accompanying wiring diagram for electrical details and ensure supply is compatible.
Ensure unit is earthed correctly.

NOTE: All electrical installations should be made in accordance with the current I.E.E. regulations.

Commissioning

Fill the system by introducing water to both primary and secondary circuits in turn, all pipework vents should be open to allow air to escape freely. Ensure all air is removed from pump/s by venting pump casing.

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NOTE: Never run pumps dry.

P.I.D. Digital Controller

Set desired water temperature (normally 60°C by pressing the F key, this will cause the upper display to show set point and lower display will read SP, press the raise/lower keys to set desired temperature, press the F key once more to return to the normal display. If there is no key activity within 1 minute the display will automatically return to normal. Units with dual set point facility should be set as follows:

1. Press the F key, this will cause the upper display to show set point 1 and the lower display will read SP1.
2. Press the raise/lower keys to set desired temperature.
3. Press the F key again and the upper display will show set point 2 and the lower display will read SP2, set the desired temperature for set point 2 as above.
4. Press the F key once more to return to the normal display. Under normal running conditions the upper display will show actual temperature and lower display will show desired temperature.
5. To close/open the valve manually press the HAND key, and the display will read actual temperature in the upper display and P in the lower display, the SET indicator will also flash.
6. Press the raise key and the valve will move towards the open position.
7. Press the lower key and the valve will move towards the closed position.
8. Press the HAND key to return to normal display. All other parameters have been factory set, no attempt should be made to alter these without consulting Armstrong Holden Brooke Pullen.

Dual Set Back Time Clock (if fitted)

Set the time clock so that the ON periods represent set back times (set point 2).

24 hour model: Turn dial so correct time coincides with the white triangle.

7 day model: Turn dial so correct time and day coincides with the white triangle.

Both models are complete with battery back up.

The red and blue pins are inserted in the dial rim as required. A red pin marked 1 gives an ON operation, and a blue pin marked 0 gives an OFF operation. Both models have a manual override switch; 1 = ON, 0 = OFF.

High Temperature Alarm

Set the high temperature sensor (normally 12°C above set point) by adjusting the screw within the sensor body. **NOTE:** this sensor must be manually reset once tripped. (See G.A. for location).

Operation Tests

1. Switch on main power supply feeding unit. Turn isolator switch on control panel to the ON position, the mimic POWER ON indicator should now be illuminated.
2. Turn pump selector switch to the ON position for one pump units or position 1 for two pump units. Check that PUMP 1 mimic indicator is illuminated. Repeat procedure for secondary pump if fitted. If a three phase supply is being used check pump is running in the correct direction, if not reverse two phases at main isolator. On two pump units turn selector switch to PUMP 2 position and check PUMP 2 mimic indicator is illuminated.
3. Press the F key on the digital controller to enter HAND condition. Press the raise key and check valve is moving towards the open position, press the lower key and check valve is moving towards closed position. Press F key to return to normal display.
4. On twin pump units turn pump selector switch to position 1. Trip circuit breaker 1 by pressing its red test button, this should stop PUMP 1 and start PUMP 2 automatically. Press green button to reset circuit breaker.
5. Simulate a high temperature alarm by providing heat from the boiler and driving open the valve to admit heat, or adjust high temperature sensor to a lower setting. Once tripped the high temperature alarm indicator should be illuminated and the valve should motor to the closed position. The unit will remain shut down until the sensor is manually reset.

Operation

Never operate this unit with guards or parts missing.



Once the unit has been commissioned, it will operate automatically in the following modes: Continuously Normal, Continuously Economy or Timed Set Back (if fitted).

The unit can also be switched ON/OFF from a remote timed or direct signal. On twin pump units rotate lead pump at regular intervals to equalise wear and prevent seizing.

Units with 40/50mm Pumps

Pumps used within the unit contain an internal thermal contact. If this contact operates it will cause the appropriate circuit breaker to operate, the appropriate TRIPPED indicator to illuminate and lock out the pump until manually reset.

Units with 32mm Pumps

Pumps used within this unit contain an internal thermal contact. If this contact operates, it will cause the pump to stop running, when the contact resets, the pump will resume normal operation. No visual indication is given for this condition.

NOTE: If the package has not been fitted internally with a secondary circulation pump, one must be fitted in the system pipework to maintain circulation whilst the system is in use.

Maintenance



Ensure that the unit is electrically isolated before any maintenance is carried out.

Plate Pack

If after a period of time, the plate pack is found to be leaking, the plates can be tightened further. It is essential that we are informed, and advice shall be given regarding the 'A' minimum dimension. (See Fig. 1) The guide bars at the top and bottom of the plate heat exchanger and the threaded plate pack clamping bolts should be kept clean and lightly greased. It is occasionally necessary to strip down the plate heat exchanger for inspection and cleaning.

Procedure as follows:

1. Close the unit isolating valves and remove the front and two side covers from the unit, this will provide adequate access to the plate heat exchanger.
2. Ensure the plate pack is at ambient temperature.
3. Drain the heat exchanger as much as possible, using the appropriate drain valves.
4. Release the clamping bolts gradually and uniformly, so that the frame plates are kept as parallel as possible. Continue until the clamping bolts can be removed.

5. Separate the mobile pressure plate away from the plate pack and avoid personal injury or damage to the plate.
6. Access to individual plates is now possible. Care should be taken when removing these plates so as not to damage the gaskets. Make a note of the plate order and orientation to ensure correct re-assembly.
7. Deposits on the heat transfer plates can be removed with a scrubbing brush and rinsed with clean water. **A steel wire or carbon steel wool brush must never be used.**

The plates can be cleaned with a soda solution, or with a solution of water and a synthetic detergent. After cleaning, the plates must be thoroughly rinsed with clean water. Other chemical cleaners can be used, but check first that they are not harmful to plate or gasket material.

If lime deposits have occurred on the service medium side, this can be removed as follows:

- a) Open up the heat exchanger (at room temperature) and apply a fine coat of 10% Nitric Acid solution to the plates. Let the acid solution soak in for 1 minute, then rinse and wash the plates clean. If necessary, repeat the treatment.
- b) When all deposits have been removed, brush the plates with a dilute Sodium Hydroxide, or Caustic Soda solution.
- c) Finally rinse the plates with clean water.

Sterilisation with active chlorinated agents involves the risk of damage to stainless steel. If sterilisation with Hypochlorite or other chlorinated agents is specified, the concentration of active chlorine must not exceed 100ppm and the temperature must not exceed 20°C. Circulation time should be restricted to 10 minutes only.

8. If the gaskets require replacing this can be done by unclipping the existing gaskets, cleaning the plate grooves and fitting the new gaskets. Care should be taken to ensure that the gaskets are the correct way up, compare the position with the old gasket.
9. When re-assembling the plate pack, ensure that the gasket side of the plates face the fixed end of the frame. The plates are placed in the frame according to the plate arrangement details. The plates are numbered from the fixed end of the frame. The first plate, plate number one, is referenced as a Dplate. All 4 port holes are surrounded by gaskets, thereby preventing liquid from entering the space between the plate and the fixed end frame plate. The second plate within the pack is referenced as type B, the third is referenced as type A, the fourth is referenced as type B and so on. (All odd numbered plates are generally type A, whilst all even numbered plates are generally type B). The last plate in the plate pack is a blank plate, i.e. no port holes. The mobile pressure plate is then re-fitted and the clamping bolts positioned.

10. The plate pack is re-tightened by tightening the clamping bolts. Care should be taken to ensure that these clamps are tightened as uniformly as possible, i.e. the frame plates will be parallel as possible when tightening. Avoid end plate skewing greater than 10mm. These clamps should be tightened until the correct 'A' dimension is achieved. (See Fig. 1 for details)

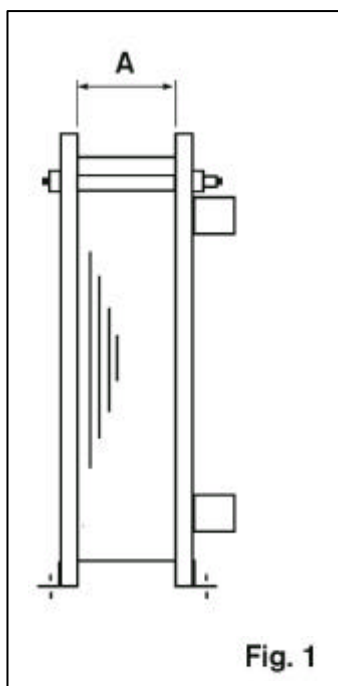


Fig. 1

'A' for 032 plates = total number of plates x 2.9mm
'A' for 150 plates = total number of plates x 2.5mm

The following information is required when ordering spare plates and gaskets.

1. The equipment serial number and model type.
2. The quantity and type of plates (number of port holes and position).
3. The quantity and type of gaskets (A, B or D gaskets).

Electrical

The Response? control system is designed to operate for long periods with only the following checks.

At 6 monthly intervals check:-

1. The pump/s are running smoothly and are not noisy or vibrating.
2. The pump seals are not leaking.
3. The electrical installation thoroughly for defects. Ensure that the earth connections are making good contact and all terminal screws are tight.
4. The valve actuator is running smoothly and not noisy.

Spares & Service

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Only replace parts with original Armstrong Holden Brooke Pullen spares.

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