



**Installation Instructions /
Operating & Maintenance Manual
“Ablution Plant”
Model – BTHW-1**



Model shown – BTHW-1

FOREWORD

The Ablution Plant provides Fluid Category 5 backflow protection and a boosted hot water supply at a safe temperature. The operation is automatic. Dry running pump and heater protection is via a low level float switch in the cistern.

SUPPORTING LITERATURE

- BTHW “Ablution Plant” Datasheet
- TMV5213 Datasheet
- Wiring Diagram AM139*
- Factory Commissioning Certificate

WARNING



Disconnect electrical power before removing electrical cover guard for any servicing

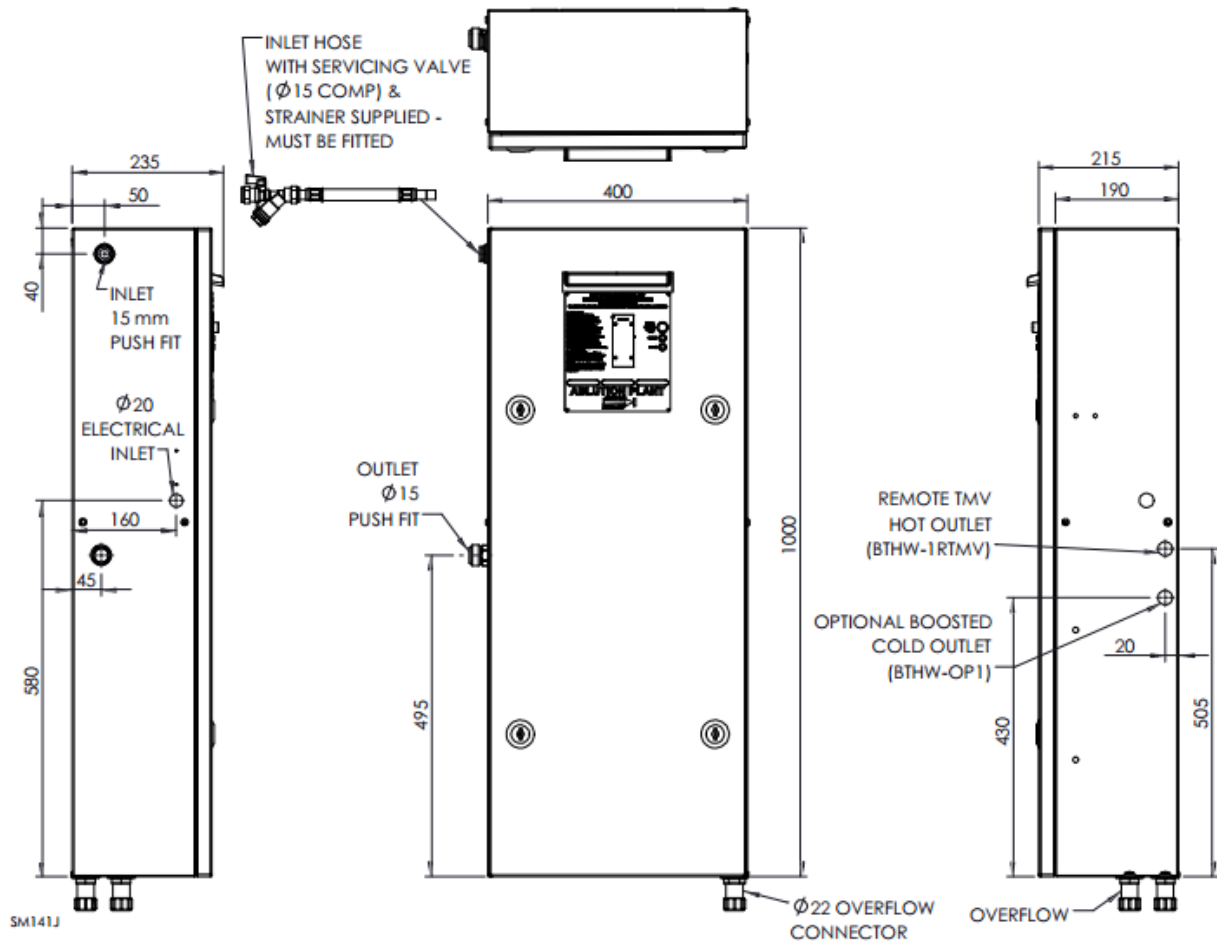
Operating & Maintenance Manual – ABLUTION PLANT – Arrow Valves

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1.0 INSTALLATION

- 1.1. The Ablution Plant should be installed by a competent person with regard to the relevant requirements of the Health and Safety Regulations, building regulations, IEE Regulations, Water Supply (water fitting). Water Bye-Laws (Scotland) and other local Bye-laws.
- 1.2. Do not install in a potentially freezing location or above 25° C.
- 1.3. Wall mount the unit ensuring sufficient clearance below the cabinet to connect the overflow pipe. Secure using suitable fasteners or the optional wall bracket – *code MIDIBRA (see section 1.4 for instructions)*. Do not mount above electrical equipment or where any discharge could cause damage. *An optional Drip Tray is available – code BTDT3.*
- 1.4. Instructions for installing optional MIDIBRA wall bracket:
 - 1.4.1. Offer bracket to wall as a template.
 - 1.4.2. Mark centres of top of the two keyhole slots and mark centres of other two holes.
 - 1.4.3. Remove bracket, drill and fit wall plugs to the four holes.
 - 1.4.4. Fit bracket to DF cabinet with the supplied M6 flanged nuts.
 - 1.4.5. Fit cabinet to wall with suitable fasteners.
 - 1.4.6. Consider fitting screws to two lower holes in the cabinet.
- 1.5. The plant weighs 50kg dry and 60kg wet. Safe lifting practises should be used.
- 1.6. Electrical supply must be via a double pole isolator and RCD. The cabinet features a 20mm entry for conduit. The unit requires a 230V 50 Hz supply fused at 13 A (or 16A MCB). The switch must have a double pole disconnection with a separation gap of at least 3mm. See ratings plate for electrical details.
- 1.7. Adequately support the supply pipe – normally 15mm copper tube.
- 1.8. Thoroughly flush the cold water supply pipe before connecting. The water supply pressure must be 1.0 bar min. (dynamic) - 10 bar max.
- 1.9. The flexible hose and servicing valve – incorporating a strainer and flow limiter - provided must be installed.
- 1.10. The Servicing valve assembly incorporates an automatic flow limiter and strainer. Note - If the dynamic pressure is too low and the tank is running dry, remove flow limiter cartridge from servicing valve – see 4.0.
- 1.11. The overflow discharges into the bottom of the unit. Connect overflow pipe to the front connector. Ensure any discharge would be conspicuous and not cause any damage. The rear overflow is to prevent the cabinet from flooding in the unlikely event of the main overflow not coping – this can be connected to waste.
- 1.12. Connect outlet pipe, and optional cold boosted outlet if using option BTHW-OP1. See Drawing AM141*. *Note - If pipe run is greater than 5m, a remote TMV (BTHW-1RTMV) should be used.*
- 1.13. The overflow should be in accordance with Water Regulations - G16.8, G16.10 & G16.11. **WARNING!** If the overflow cannot cope, water will discharge via the weir slot in the door.
- 1.14. If the minimum outlet flow rate of 0.008 Lt/s (0.5 Lt/min) cannot be guaranteed fit an additional pressure vessel of at least 4 litres (pre-charge 2 bar).

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2.0 COMMISSIONING

- 2.1. The unit is factory commissioned, but the outlet temperature must be checked and the TMV adjusted as required. *Note - it is not possible to alter the outlet pressure. The pump is self-priming.*
- 2.2. Turn water supply on. The solenoid valve should commence filling and cease filling when the tank is full.
- 2.3. Open a tap connected to the outlet system.
- 2.4. Switch on the electrical power.
- 2.5. When a tap is opened - or trigger of abluion hose depressed - the pump should start automatically. Continue to draw off water until all air has been purged from the system. *If the pump does not start, isolate the electrical supply and investigate. Check the pump has not seized – see 7.2.*
- 2.6. Turn heater on.
- 2.7. Once the heater is up to temperature its red neon will extinguish, this will take approximately 10.5 minutes. Set the water heater thermostat to 62° C min - G18.2. To check, hold the probe of a digital thermometer against the hot metal outlet of the heater hose whilst water is being drawn off.
- 2.8. Set the outlet temperature to the required temperature, 41° C max. To adjust the temperature, prise off the plastic cover of the TMV, invert cover and use as an adjusting tool to rotate the hexagon spindle. A brass lock nut is provided for locking the desired temperature. The plastic cover should then be replaced.
- 2.9. The table below shows the recommended maximum temperatures for use -

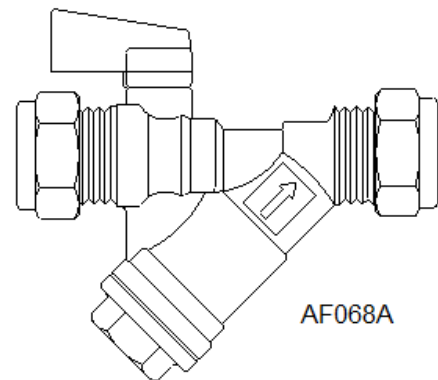
Bidet – max recommended temperature	38° C	NHS Estates Health Guidance Note
Shower - max recommended temperature	41° C	NHS Estates Health Guidance Note

3.0 OPERATION

- 3.1. When electrically powered and all water draw offs closed, the pump should be at rest. When a tap is opened - or trigger of abluion hose depressed - the pump should start automatically. *There may be about 1 second delay before the pump starts.*
- 3.2. When all taps are closed, the pump should automatically stop within 3 seconds.
- 3.3. For applications with a continuous draw off less than 0.008 Lt/s (0.5 Lt/min) a pressure vessel of at least 4 Lt (pre-charge 2 bar) must be fitted to the system otherwise pump damage will occur due to the continuous stop/start cycling and this will invalidate the warranty.
- 3.4. The plant contains a small storage tank and a legionella risk assessment should be conducted. The greatest risk is associated with aerosol applications – e.g. shower heads. These should be operated periodically to purge stagnant water and replenish the internal tank and outlet pipe work. *Note – the Automatic Tank Purge Option (BTHW-OP2) can automatically purge the internal tank – but not the outlet pipe work.*
- 3.5. The unit must be run at least once every two weeks to exercise the pump by drawing off water from the boosted system. Ensure the pump runs for 2 minutes.

4.0 MAINTENANCE

- 4.1. Check the pump runs by drawing water off from tap or trigger. Check the filling rate can cope with the maximum demand. If low inlet flow is suspected – check and clean the inlet strainer in the servicing valve. See AF068A diagram -.
- 4.2. Close valve.
- 4.3. Unscrew hexagonal cap.
- 4.4. Remove strainer cartridge with long nose pliers.
- 4.5. Remove flow limiter from strainer (if fitted) by pushing out with small screwdriver.
- 4.6. Clean or replace basket and cartridge, with the same size and colour.
- 4.7. Insert flow rate cartridge into strainer - push to limit.
- 4.8. Insert strainer into valve – push to limit.
- 4.9. Replace hexagonal cap.
- 4.10. Turn valve on.
- 4.11. If the pre-charge air pressure in the 0.5 Lt vessel needs to be checked, we advise that an air pressure gauge should not be used as air will escape. Instead, the pressure should be checked with a pressure gauge on the outlet water pipe; where the sudden drop in pressure with a slow draw off (pump switched off) indicates the pre-charge pressure, which should be 2.0 ± 0.3 bar.



5.0 ANNUAL TANK INSPECTION & DISINFECTION

- 5.1. Tank inspection, cleaning and chlorination of the tank is recommended on an annual basis and when there is visible evidence of any of the following:
 - Sediment
 - Stagnant water
 - Biofilm
 - Corrosion
 - Flora growth
 - Animal Contamination
- 5.2. It is also recommended:
 - 5.2.1. If the system or part of it has been substantially altered or entered for maintenance or remedial purposes in a manner that may lead to contamination.
 - 5.2.2. During or following an outbreak or suspected outbreak of Legionellosis.

6.0 FLOW LIMITING CARTRIDGE

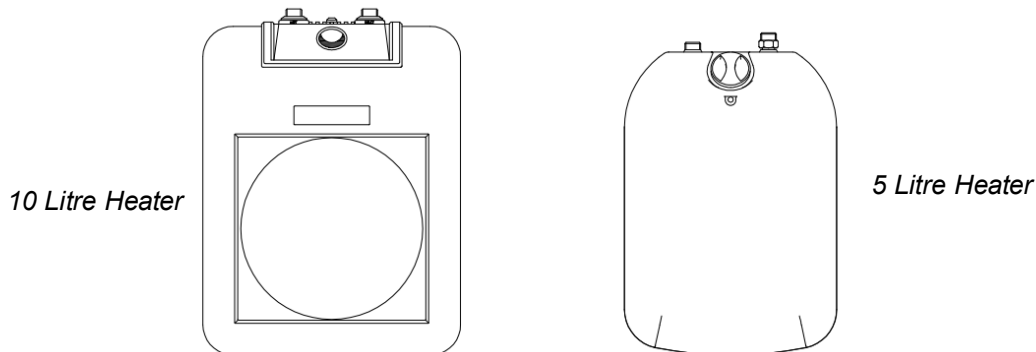
- 6.1. If the BTHW-1 is using an aeration trigger it may be necessary to change the flow limiting cartridge to enhance the flow characteristics of the water from the trigger. Please note that this will affect the duration that warm water can be provided.

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- 6.2. To change the flow limiting cartridge:
- 6.2.1. Isolate the power and water supplies.
 - 6.2.2. Drain the system as far as possible by holding the trigger open.
 - 6.2.3. Separate the push-fit connector at the end of the braided hose inside the unit, on the right hand side of the unit just above the shelf.
 - 6.2.4. Use bent nose pliers to extract the flow limiting cartridge from the remaining connector, via the metal bar.
 - 6.2.5. Insert new flow limiter (supplied) into connector with metal bar facing upward.
 - 6.2.6. Reconnect the push-fit connector.
 - 6.2.7. Reconnect power and water supplies.

7.0 HIGH LIMIT RESET BUTTON

- 7.1. In the event of the element overheating, a Safety Cut-Out Switch (High Limit Reset Button) switches off the electrical supply to the water heater. Use the following instructions to locate the Reset Button.
- 7.2. Serial numbers up to HW415 have a 10 litre water heater –
- 7.2.1. To access the High Limit Reset Button, unscrew the grey access cover plate.
 - 7.2.2. The cut-out is identified by a red button and is located in the centre of the top of the immersion heater.
 - 7.2.3. To reset the heater, press down the red button.
- 7.3. Serial number HW416 and over have a 5 litre water heater –
- 7.3.1. To access the High Limit Reset Button, gently prise off the front of the plastic housing (this is clipped in place at the top, bottom and both sides).
 - 7.3.2. The cut-out is identified by a black button and is located in the centre on the front of the immersion heater.
 - 7.3.3. To reset the heater, press down the black button.
- 7.4. Contact Arrow Valves for advice.



8.0 FAULT FINDING

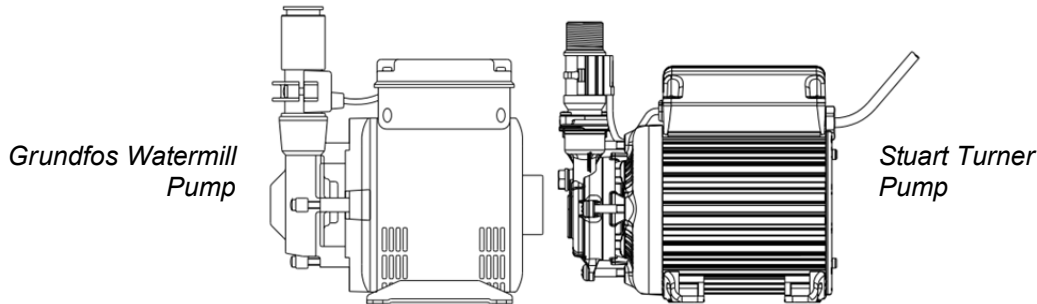
- 8.1. See fault finding chart – available to download from the BTHW Ablution page of the Arrow Valves website - <https://www.arrowvalves.co.uk/media/wysiwyg/pdfs/AM162B-BTHW-FAULT-FINDING-CHART.pdf>

9.0 SEIZED PUMP

- 9.1. If the pump has not been used for several weeks, it is likely to be seized. Use the following instructions to free the pump.
- 9.2. Serial numbers up to HW190 have a *Grundfos Watermill* pump –
- 9.2.1. **Isolate power!**
 - 9.2.2. Using a screwdriver, rotate the fan in the rear of the pump until free.
 - 9.2.3. Restore power.
- 9.3. Serial number MD590 and over have a *Stuart Turner* pump –
- 9.3.1. **Isolate power!**
 - 9.3.2. Unscrew the four screws securing the metal plate to the right hand side of the pump.
 - 9.3.3. Prise off the metal plate with a screwdriver to reveal the fan.
 - 9.3.4. Manually rotate the fan until free.

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- 9.3.5. Reassemble the pump.
- 9.3.6. Restore power.
- 9.4. Contact Arrow Valves for advice.



10.0 FILLING SOLENOID

- 10.1. Under normal operation the Solenoid is closed – open when energised, closed when de-energised.
- 10.2. If the BTHW's tank is constantly overflowing, with the power isolated, this is likely to be caused by dirt/debris trapped in the diaphragm of the Solenoid Valve.
- 10.3. Please use the following link to a service video for instructions on how to inspect and clean the Solenoid Valve - <https://www.youtube.com/watch?v=qf-1iMNBKc0&t=13s>

11.0 OPTIONS

Option	Code
Wall Mounting Bracket for Midi range	MIDIBRA
Ablution Hose & Trigger Chrome	CSHT-2
Ablution FC5 Cold Water Outlet Option	BTHW-OP1
Automatic Tank Purge System 24h	BTHW-OP2
Remote TMV Option	BTHW-1RTMV
BTMD/BTHW Alarm BMS – Volt Free	BTBMS3
Drip Tray for Midi range Stainless	BTDT3

Wall Mounting Bracket – Stainless steel wall bracket for the BTHW-1 unit.

Ablution Hose & Trigger Chrome - Ablution hose and trigger supplied.

Ablution FC5 Cold Water Outlet Option - An additional outlet that provides cold water only.

Automatic Tank Purge System /24h - Purges the tank every day for legionella control.

Remote TMV Option - Thermostatic Mixing Valve is supplied remote from the unit.

BTHW Alarm BMS - Volt Free BMS fault monitor with changeover. Activates fault lamp and BMS relay if tank water level is too high or low, or if there is a low pressure fault.

Drip Tray – Catches any water discharged through weir if inlet valve is faulty and overflow blocked.