



**Installation Instructions/  
Operating & Maintenance Manual  
Boost-A-Break, Break Tank & Pump Sets -  
Models BTAB 700 900 1200 4-2 4-3 4-4  
230-240 V Single Phase & 415 V 3Phase**



*Model shown BTAB900*

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## FOREWORD

Break Tank assembly with Fluid Category 5 protection by virtue of the integral Type AB air gap. The primary purpose is to provide backflow protection in accordance with the Water Regulations. The Boost-A-Break unit also boosts the water pressure for elevated areas or where a high flow rate is required – e.g. wash-down. The cistern has a screened overflow and weir, making it suitable for unorthodox drinking water applications, which require a “Hygienic type AB air gap” – e.g. dental spittoons & food preparation.

## 1. LITERATURE PROVIDED

Datasheet BTAB  
Wiring Diagram AM009\*  
Factory Commissioning Certificate

## 2. APPLICATIONS

The unit should be installed to provide point of use protection. See Water Regulations Guide. The Break Tank has a type AB air gap making it suitable for all non domestic use applications. For drinking water (wholesome) refer to Pent-A- Boost – model BTAF

## 3. INSTALLATION NOTES

- 3.1. The units weigh between 28-36 kg dry and 68-74 kg wet, safe lifting practices should be implemented.
- 3.2. The BTAB 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
- 3.3. Unpack the unit, taking care not to lift on the black tank. Suitable lifting points are the base of the unit, the stainless tray below the black tank, the 28 mm copper tube from the tank to the pump and the 20 mm elbow close to the vessel.
- 3.4. Install in an area not liable to flooding or freezing (outdoor heated GRP enclosures are available). Normally the unit is floor mounted, wall brackets can be used option BTBRA (see datasheet).
- 3.5. Thoroughly flush the supply pipe before connecting – debris can damage the solenoid valve. A strainer is fitted between the solenoid and servicing valve as standard.
- 3.6. Connect the supply pipe to the solenoid valve. Normally the supply is DN20 for models 700 & 900 and DN25 for models 1200 and 4 series. A stainless braided hose is supplied. Ensure this is not kinked or stressed. The supply pressure should be in excess of 1 bar dynamic. It is advised to connect a servicing valve before the inlet pipe and fit with a fibre washer in the joint.
- 3.7. If the BTDT2 option has been specified, fit this in line with the inlet supply.
- 3.8. Connect the pump outlet flexible hose to the system. Ensure fibre washers (supplied) are used and the union nut is tight.
- 3.9. BTPRV options incorporate a factory fitted, pre-set pressure reducing valve before the outlet hose, the outlet pressure should be set to match the Pressure Switch On point.
- 3.10. Drip Tray has a 40 mm outlet tube in the corner of the tray. A DN40 plastic compression elbow is supplied. This can be replaced with a brass 42 mm compression elbow for copper tube. Ensure the pipe slopes downwards and the discharge is conspicuous.
- 3.11. Connect waste outlet as appropriate and ensure compliance with water regulation G16.8, G16.10 & G16.11. Check that overflow can cope and no water damage will occur if it can't, by lifting lid on tank until it overflows. Replace lid to stop water flow.
- 3.12. Electrical Connection 230-240 V single phase. The electrical supply must be via a circuit breaker (see datasheet). Screw terminals are supplied and colour coded according to standards. *Connect a minimum 1.5 mm<sup>2</sup> three core cable to the control box. Feed through gland and tighten. Strip 10 mm of insulation off each wire and insert into screw terminals fully tighten.*

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- 3.13. *Electrical Connection 415 V 3 phase - The electrical supply must be via a circuit breaker (see datasheet). The wiring requires 3 phases and neutral. Strip 10 mm of insulation off each wire and insert into screw terminals fully tighten. After connection it is advised that the motor direction is checked.*
- 3.14. **Ensure the cistern lid is fitted correctly. **WARNING!** If the lid is not fitted, the unit will continually fill and eventually flood, the pump will not run.**
- 3.15. For options BTBMS and BTDT use pole 1 on the BMS relay to connect to the BMS.

### 3. PRIMING & TESTING

*The unit is designed to self-prime by switching the pump on and off.*

- 3.1. Shut the outlet valve and open the inlet Servicing Valve.
- 3.2. Switch electrical and water supplies on.
- 3.3. The cistern should commence filling and the pump start once the cistern is half full.
- 3.4. To aid the self priming, manually switch the pump off for 10 seconds and then back on during the initial fill.
- 3.5. The pump should stop about 3 minutes after the gauge reaches approximately 1.5 – 2 bar above pressure switch on. If the pump fails to switch off after four minutes, switch the electricity off for 1 minute, then switch on. If this does not work see AM120B BT FAULT FINDING CHART
- 3.6. Open the outlet valve and check the pump starts, when water is drawn off from the system.
- 3.7. Sequentially open all draw off points that the BTAB is supplying to vent the system.
- 3.8. The pump will run continuously if the filling solenoid valve is energised, this prevents unnecessary stop start cycles.
- 3.9. Check the solenoid valve shuts off completely.

### 4. ADJUSTMENTS

#### **WARNING! ISOLATE POWER FOR 1 MINUTE BEFORE REMOVING COVER**

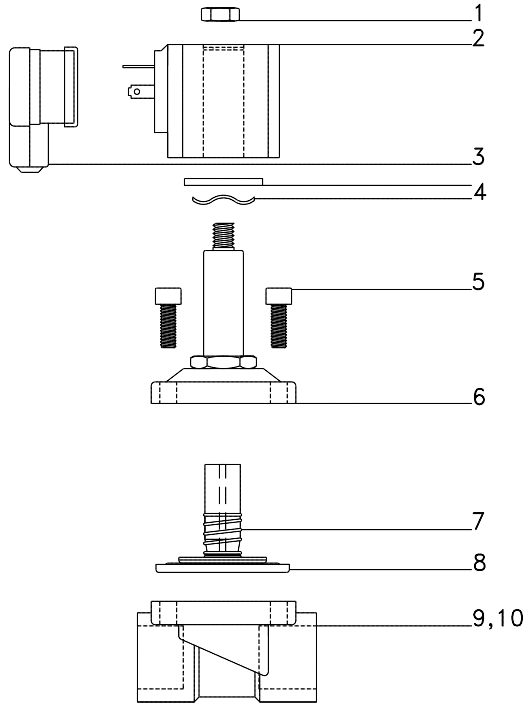
- 4.1. There generally is no need to alter the pressure switch. Adjusting the pressure switch will not increase or decrease the pressure supplied by the pump or limit the maximum pressure that the pump can achieve. Use BTPRV Option.
- 4.2. If required, the pressure switch is on the opposite side to the pressure gauge, remove the centre screw holding the electrical plug on, remove the plug. Remove the 8 mm brass nut to allow access to the adjusting screw. If necessary, adjust the pressure switch, (clockwise to increase, 1 turn approx = 1 bar). If the pressure is adjusted, remember to set the vessel air pressure to 0.2 bar below switch-on pressure. The cap can be pushed on to check the pressure switch settings temporarily, remember to fit the securing screws when done to ensure electrical insulation. Do not set higher than the pump can achieve.
- 4.3. The run-on timer is factory set to 3 minutes. This can be increased to 5 minutes if required. To increase, rotate the wheel on the timer clockwise. Check the time with a stop watch with the outlet valve closed.
- 4.4. BTFPS Option (Break tank frost protection system) Factory fitted and used in conjunction with Wall Cabinets options BTCAB2 and BTCAB3. A thermostat attached to the control box will cause the pump to run against a closed head to generate heat, Pre-set to 5° C, adjust accordingly.

### 6. MAINTENANCE

It is recommended the electrodes are annually cleaned, with Scotch-Brite and the vessel pressure checked. This must be done with zero water pressure indicated on the pressure gauge.

7. SOLENOID SERVICE INFORMATION

Model SOL\*\*FACD



Two-way, normally closed, anti-water hammer solenoid valves with hung diaphragm.

Valve bodies and bonnets are of brass construction.

Standard valves have a General Purpose Solenoid Enclosure.

1.1.1.1 DESCRIPTION	
1.	Retaining clip
2.	Coil & nameplate
3.	Connector assy.
4.	Spring washer
5.	Screw (4x)
6.	Bonnet assy.
7.	Spring
8.	Diaphragm/core assy.
9.	O-ring, valve body
10.	Valve body

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8. PUMP DETAILS

a) Electrical Connection



Single-phase MXHM pumps are supplied with a capacitor connected to the terminals and (for 220-240 V – 50 Hz) with an incorporated thermal protector.

3 phase pumps are supplied with connection terminals for 415 V supply with incorporated thermal protector.

**ATTENTION!**

Never allow washers or other metal parts to fall into the internal cable opening between the terminal box and stator.

If this occurs, isolate power, dismantle the motor to recover the object(s) which has fallen inside, reassemble and reconnect power.

b) Maintenance

For pumps that have been supplied with BTPT (Pulse Timer – Infrequent use / anti seize) option the pump will rotate for 1 second on a daily basis to prevent seizure. (Do not drain) the BTAB must be powered for this function to work.

For good measure, as in the case of temporary operation with dirty liquids, run the pump briefly with clean water to remove deposits. In any case, when the pump remains inactive it must be emptied completely if there is a risk of freezing. Before restarting the unit, check that the shaft is not jammed and fill the pump casing completely with liquid see section 4 Priming and Testing.



Disconnect electrical power before any servicing operation and make sure the pump cannot be accidentally switched on.

A Wiring diagram can also be found on the inside of the electrical box cover.

**c) Dismantling**

Close the suction and delivery gate valves and drain the pump casing before dismantling the pump.

For dismantling and re-assembly see construction in the cross section drawing.

By removing the screws (14.24) and the square nuts (14.28) the motor can be taken out complete, with all internal parts of the pump, without removing the pump casing (14.00) and the pipes.

**1.1.1.1.1 CROSS SECTION DRAWING – PUMP**

**1.1.1.1.2**

**1.1.1.1.3 DESCRIPTION**

Number	Designation	1.1.1.1.3.1 Number	Designation
14.00	Pump casing	64.10	Bearing sleeve (2)
14.04	Plug (filling)	64.15	Spacer sleeve
14.06	O-ring	64.19	Spacer sleeve, bearing stage (2)
14.12	Plug (draining)	70.00	Lantern bracket
14.16	O-ring	70.20	Screw
14.20	O-ring	73.00	Pump-side bearing
14.24	Screw	76.00	Motor casing with winding
14.28	Square nut	76.04	Cable gland
14.54	Wear ring (1)	76.16	Support
25.01	First stage casing	76.54	Terminal box, set
25.02	Stage casing	78.00	Shaft with rotor packet
25.03	Stage casing with bearing (2)	81.00	Fan-side bearing
25.05	Last stage casing	82.00	Motor end shield, fan side
25.10	Washer for missing impeller	82.04	Compensating spring
25.11	First stage spacer	82.08	Screw
28.00	Impeller	88.00	Motor fan
28.04	Impeller nut	90.00	Fan cover
28.08	Washer	92.00	Tie-bolt
34.00	Casing cover	94.00	Capacitor
36.00	Mechanical seal	94.02	Capacitor gland
36.51	Retaining ring, split	98.00	Terminal box cover
36.52	Shoulder ring	98.04	Screw
46.00	Deflector	98.08	Gasket

9. “BROYCE” LEVEL CONTROLLER

**Installation**

**a) Principle of Operation**

Relies on the conductivity properties of liquids to complete an electrical circuit. A low voltage A.C. signal is used on the electrodes to avoid electrolysis.

**b) Technical:**

RELAY OUTPUT – Double pole changeover voltage free contacts rated 8 A @ 250 V AC resistive.



10. OPTIONS

The table below shows part numbers and descriptions for upgrades available for Break Tanks.

Code	Description
BTPRV	PRV for fixed speed break tank
BTPT	Pulse timer – infrequent use/ anti seize
BT20-25	Upgrade from DN20 – DN25
BT2-3	Upgrade to a 3 phase pump
BTDT1	GRP Drip Tray c/w float switch (up to 3-7)
BTDT2	Controller and additional sol for drip tray
BTBMS1	BT High alarm BMS – Fixed Pump
BTDO	Break tank drain tap

**BTPRV - PRV** – Pressure regulating valve ensures constant water pressure (Factory Fitted)

**BTPT: - Pulse Timer** - turns the pump over daily at no specified time to prevent the pumps from seizing, if left unused - requires power to be left on.

**BT20-25:- Upgrade from DN20 –DN25** – is a larger diameter inlet hose and solenoid.

**BT2-3 - Upgrade to a 3 phase pump** – Make the pumps more economical to run.

**BTDT1: GRP Drip tray with float switch** – A drip tray to capture any leak if an overflow pipe is not feasible, the water inlet solenoid is isolated if the float switch is activated, when the drip tray is full and requires emptying.

**BTDT2: - Controller and additional solenoid for drip tray** – Is in addition to the drip tray option an additional solenoid can be fitted on the inlet in case of device failure.

**BTBMS1: - BT High Alarm BMS–Fixed Pump** - generates a warning on the BMS if the water level in the break tank gets too high.

**11. SPARES**

The table below shows part numbers, codes and descriptions for spares, which may be required for the Break Tank, contact Arrow Valves on 01442 823123 or online at [www.arrowvalves.co.uk](http://www.arrowvalves.co.uk).

Code	Size	Description
ELCT3A3OU		Timer Off 11 Pin Plug/Socket 0.2-720s 230V
ELC10A10X230A		Relay IRC Single Pole LED Indication 230VAC
BT		Level Controller 2 Pole Output 230VAC
SOLIP4962A/2	DN15-25	Solenoid Spares Kit for model ACD DN15-25
ELF4/M3-2	1/4"	Pressure Switch & Plug 2 Bar (BT700)
ELF4/M3-3	1/4"	Pressure Switch & Plug 3 Bar (BT900)
ELF4/M3-4	1/4"	Pressure Switch & Plug 4 Bar (BT1200)
ELF4/M3-1.2	1/4"	Pressure Switch & Plug 1.2 Bar (BTMD-1)
ELF4/M3-2.2	1/4"	Pressure Switch & Plug 2.2 Bar (BTMD-3)
12µFCAP700		12 µF Capacitor For BT700
15µFCAP900		15 µF Capacitor For BT900
20µFCAP1200		20 µF Capacitor For BT1200
A232A	DN20	BT Outlet Hose DN20
A230A	DN20	BT Inlet Hose DN20
A231A	DN25	BT Inlet Hose DN25

Arrow Valves Ltd reserves the right to change specifications at any time without notice.