

“Pent-A-Boost” – Compact Domestic Booster Sets

Model BTAF – Fixed and Variable Speeds – Datasheet Page 1 of 5

Overview

Compact booster pump set designed to boost pressure for tall buildings where the mains supply is inadequate - e.g. penthouse suites.

The unit is supplied as a complete package on a stainless steel base plate ready for installation. The set is approved for drinking (wholesome) water applications since it has a screened overflow and vent – conforming to G16.13 (Byelaw 30) – use optional insulating jacket.

The primary purpose is to boost the water pressure for elevated areas or where a high flow rate is required – e.g. for showers and baths. The performance, compactness ratio often enables the unit to be installed in a ground floor cupboard rather than a full size plant room. Frequently one unit per luxury apartment is used.

The unit is quiet by virtue of a centrifugal pump, anti-vibration rubber feet and flexible stainless braided connection hoses. There is a range of fixed and variable speed (inverter) pumps. The variable speed range has the compactness of the fixed speed range plus additional benefits – see page 3.

Fast filling is achieved by a servo-controlled solenoid valve with solid-state level probe control. This system has proved to be more reliable and accurate than conventional float valves. The small cistern and high throughput minimises the risk of legionella.

The Arrow Valves automatic Bypass Valve is recommended to enable mains water to be supplied (at mains pressure) during power failure or maintenance.

For Fluid Category 5 risks use “Boost-A-Break” model BTAB.

Applications

- Penthouse (3 storey and taller)
- Boosting low water pressure
- “Combi” boilers & showers

Water Regulations

The assembly is fully Water Regulations approved & complies with the requirements of the new Water Regulations when installed and used correctly. Water supply companies are only obliged to supply a minimum pressure of 1 bar @ 9 Lt/min. This means mains water will only reach 10 m. Since many boilers and showers require 1 bar (or even 1.5 bar) this means boosting is often essential to the third storey and higher. The “Pent-A-Boost” has a Type AF air gap providing protection against Fluid Category 4 risks.

Specification

Pressure Supply min.	1.2 bar maintained (dynamic)
Pressure Supply max.	10 bar
Pressure Outlet	See flow graph – page 2
Pressure Gauge	Ø63 stainless – glycerine filled
Vessel Capacity	24 Lt
Cistern Capacity	18 Lt
Inlet Size	See “Inlet Control” table
Outlet Size	See “Outlet Pressure Control” table
Noise	<70 dBa @ 1 m
Temperature	25° max. ambient
Approval (complete)	KIWA UK A040755

Materials

Base / drip tray / fasteners	Stainless steel 304
Pump (wetted parts)	Stainless steel 304
Pipes / fittings	Copper / Brass / Stainless
Cistern 18 Lt	Polypropylene



Model 900
Fixed speed
1.2 Lt/s output.
Only 705 mm high.
Shown with optional
insulating cistern jacket,
which reduces noise and
complies with G16.13



Model 3-5
Quiet variable
speed
Height 765 mm.
High flow pump
range up to
2 Lt/s output



Optional Wall
Brackets
code BTBRA.
Second set can be
located underneath
on floor



Optional Wall
Cover code
BTCAB3 (brackets
required code
BTBRA).
Provides thermal
protection and
guards Break Tank
against tampering
and pests.
Ideal for bin stores

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“Pent-A-Boost” – Compact Domestic Booster Set

Model BTAF – Fixed Speed 700, 900, 1200 - Datasheet Page 2 of 5

Description – Fixed Speed

There is a choice of three pump duties – see chart. The pump operation is automatically controlled. The initial cost of fixed speed pumps is less than the equivalent variable speed but fixed speed pumps consume more energy over a lifetime. For low use applications or where the demand is high and near constant, a fixed speed pump is adequate. The pumps are self-priming.

The relatively large 24 litre pressure vessel allows approximately 5 litres of water to be supplied without switching the pump on.

To improve peak-demand performance, efficiency and longevity, an additional expansion vessel (e.g. 100 or 200 Lt) should be installed to any part of the boosted system – or use a variable speed pump.

Inlet Control

Fast and accurate level control is achieved with a solenoid valve. Electrodes provide on/off full flow control with 60 mm delayed action. DN20 inlet is equivalent to ten ½” BS1212 HP float valves. DN25 is fitted as standard to high flow models - see table below – and optional on others – e.g. for low pressure supplies. Providing the following minimum dynamic supply pressure is maintained at the inlet, the cistern will not run dry even with an open outlet.

Model	Inlet size	Minimum Dynamic Pressure	Pipe Velocity m/s
700, 900	DN20 female union	1.0 bar	3.7
1200	DN25 female union	1.0 bar	2.8

Outlet Pressure Control

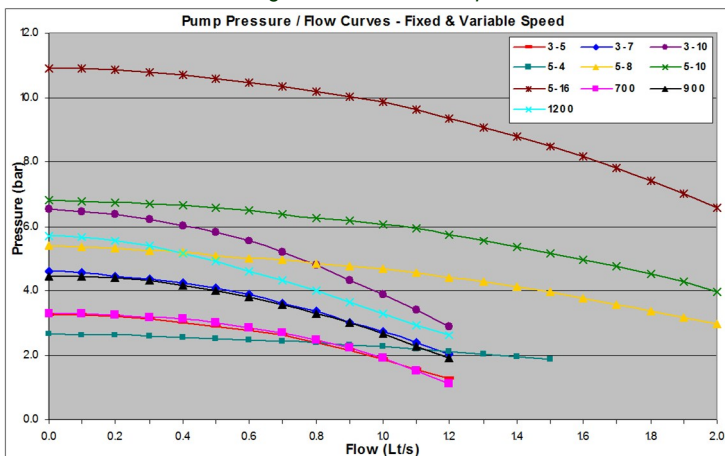
The pressure switch is factory set according to the table below. To stabilise the outlet pressure, a factory fitted Pressure Regulating Valve (PRV) is optional – code BTPRV.

The outlet flow is automatically limited to 1.17 Lt/s.

Model	Outlet Size	Pressure Switch on (min.)	Outlet with Optional PRV ¹	Pressure Max ² .	Vessel Pressure ³
700	DN20	2.0 bar	2.0 bar	3.3 bar	1.8 bar
900	DN20	3.0 bar	3.0 bar	4.5 bar	2.8 bar
1200	DN25	4.0 bar	3.0 bar	5.7 bar	3.8 bar

Notes - 1. Adjustable. 2. Without PRV 3. Vessel air pressure with zero water pressure.

Note - variable speed shown for comparison – running uncontrolled at full speed

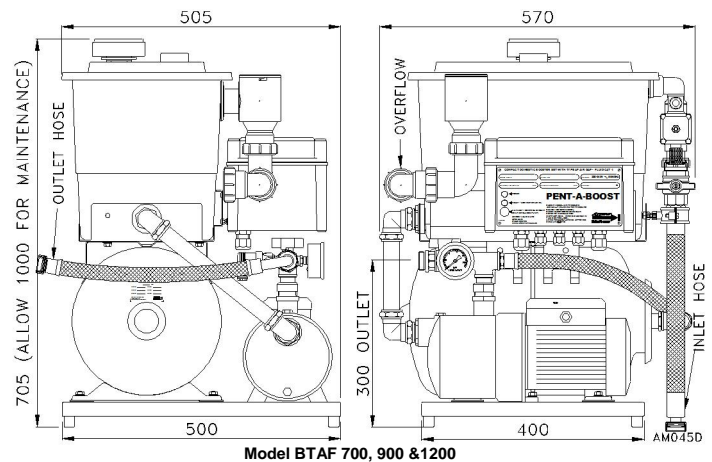


Note - models 900 (fixed speed) and 3-7, 5-8 (variable speed) are most commonly used

Electrical Specification

Motor	2 – Pole 50 Hz IP54
Model	230 V 1 ph or 400 V 3 ph
700	3.0 A (9.8 start) 1 ph or 2.4 A 3 ph
900	4.2 A (13.8 start) 1 ph or 2.8 A 3 ph
1200	5.4 A (18.0 start) 1 ph or 3.5 A 3 ph
Class	Class 1 (requires earth wire)
Run-on Timer	180 sec
BMS	Volt free SPDT for low level alarm
Low level cut out	Stops pump via electrodes in tank (Warning lamp on control box) – auto reset once tank refilled
Connection	M20 hole in control box
Protection	IP65 (Enclosure) / IP54 (Pump)

Dimensions



Kg Dry	Kg Gross	Base Width	Base Depth
28 - 36	68 - 74	400	500

Connection Pipes

Flexible stainless braided hoses are supplied for the inlet and outlet. These have a female swivel nut (union) and a fibre washer. See Inlet Control and Outlet Pressure Control tables for size. A full bore inlet servicing valve – as required by the Regulations (G16.4) - is fitted upstream of the solenoid filling valve. The Overflow is 40 mm plastic with compression nut.

Codes and Descriptions – Fixed Speed

Inlet Size	Code	Description
DN20	BTAF700	Pent-A-Boost Compact 700 Fixed 230 V
DN20	BTAF900	Pent-A-Boost Compact 900 Fixed 230 V
DN25	BTAF1200	Pent-A-Boost Compact 1200 Fixed 230 V

Optional extras – see page 5

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“Pent-A-Boost” – Compact Domestic Booster Set

Model BTAF – Variable Speed 3-5, 3-7, 3-10, 5-4, 5-8, 5-10, 5-16 - Datasheet Page 3 of 5

Description – Variable Speed

Variable speed pumps provide only the pressure required to meet demand making the unit economical and extending the lifespan of the pump.

There is a choice of 7 variable speed pumps – see chart. Speed control is achieved by a full-wave inverter which varies the frequency to the induction motor. The variable speed range has all the benefits of the fixed speed pumps plus -

- Higher flow rate – up to 2 Lt/s output
- Variable speed – speed changes to meet demand
- Quiet – especially at low demand
- Surge free – inverter pump avoids high current demand
- Constant supply pressure
- Electronically controlled automatic pump venting system

Inlet Control

Fast and accurate level control is achieved with solenoid valve(s). Level electrodes provide on/off full flow control with 60 mm delayed action. The DN32 inlet on the 5 series is equivalent to more than thirty ½” BS1212 HP float valves.

Model	Inlet Size	Minimum Dynamic Pressure	Pipe Velocity m/s
3-5, 3-7	DN20 female union	1.0 bar	3.7
3-10, 5-4	DN25 female union	1.0 bar	2.8
5-8, 5-10, 5-16	DN32 female union	1.0 bar	2.4

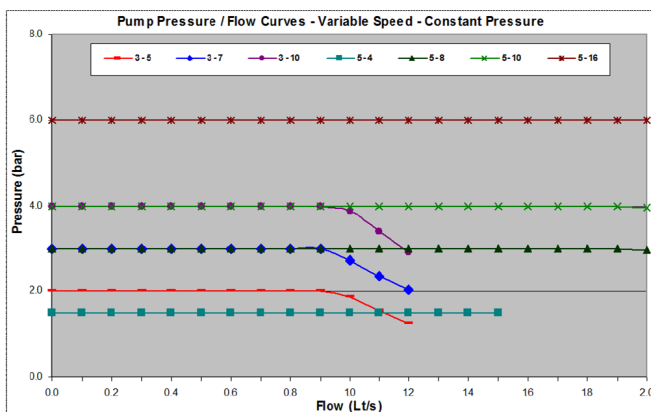
Outlet Pressure Control

The outlet pressure is controlled by a transducer, which is factory set to the “default set point” in the table below and controlled to within a 10% band. The outlet pressure is therefore constant up to the maximum duty of the pump.

Model	Outlet Size	Default Set point	Pressure Switch on (min.) ¹	Pressure Switch off (Max) ¹	Pressure Max ²	Vessel Air Pressure ³
3-5	DN20	2.0 bar	1.8 bar	2.2 bar	3.2 bar	1.4 bar
3-7	DN20	3.0 bar	2.7 bar	3.3 bar	4.6 bar	2.1 bar
3-10	DN25	4.0 bar	3.6 bar	4.4 bar	6.5 bar	2.8 bar
5-4	DN25	1.5 bar	1.4 bar	1.7 bar	2.7 bar	1.1 bar
5-8	DN32	3.0 bar	2.7 bar	3.3 bar	5.4 bar	2.1 bar
5-10	DN32	4.0 bar	3.6 bar	4.4 bar	6.8 bar	2.8 bar
5-16	DN32	6.0 bar	5.4 bar	6.6 bar	10.9 bar	4.2 bar

Notes - 1. Differential +/- 10% of set point. 2. If set to full speed. 3. Vessel air pressure with zero water pressure, 0.7 X set point.

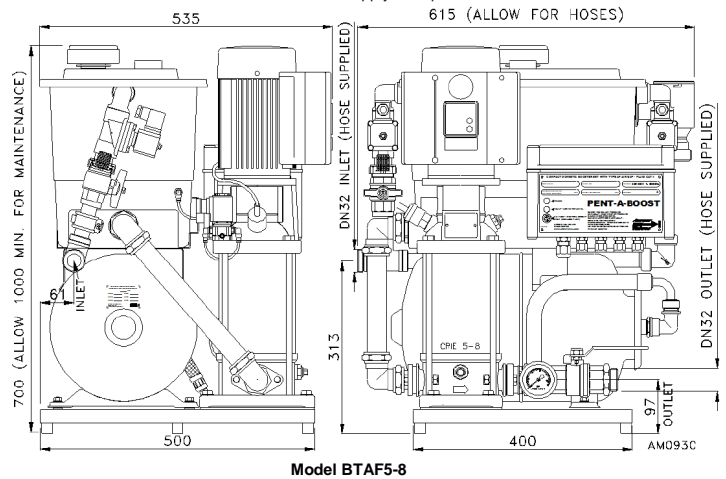
The graph below illustrates the benefit of variable speed pumps. The outlet pressure is constant despite varying flow demand. Note – using default set point. The set point can be altered at the factory. On-site alterations require a commissioning service. 5-16 limited to 10 bar.



Electrical Specification

Motor	230 V 1 ph (5-4, 5-8) 415 V 3 ph (5-10, 5-16)
3-5	3.0 A 1 ph
3-7	4.3 A 1 ph
3-10	5.1 A 1 ph
5-4 (inverter)	4.3 A 1 ph
5-8 (inverter)	7.4 A 1 ph
5-10 (inverter)	3.3 A 3 ph
5-16 (inverter)	4.6 A 3 ph
Class	Class 1 (requires earth wire)
BMS	Volt free SPDT relay general fault – pump / inverter / low level alarm Volt free SPDT for low level alarm Stops pump via electrodes in tank (Warning lamp on control box) – auto reset once tank refilled
Low level cut out	IP65 (Enclosure) / IP55 (Pump)
Protection	
Connection	
1 phase	M20 1 phase + neutral + earth
3 phase ¹	M20 3 phases + neutral + earth

Note – 1. The control circuit is 230 V so a neutral supply is required



Kg Dry	Kg Gross	Base Width	Base Depth
46 - 85	86 - 125	400	500

Connection Pipes

Flexible stainless braided hoses are supplied for the inlet and outlet. These have a female swivel nut (union) and a fibre washer. See Inlet Control and Outlet Pressure Control tables for size. A full bore inlet servicing valve – as required by the Regulations (G16.4) - is fitted upstream of the solenoid filling valve. The Overflow is 40 mm plastic with compression nut.

Codes and Descriptions – Variable Speed

Inlet Size	Code	Description
DN20	BTAF3-5	Pent-A-Boost Compact 3-5 Variable 230 V
DN20	BTAF3-7	Pent-A-Boost Compact 3-7 Variable 230 V
DN25	BTAF3-10	Pent-A-Boost Compact 3-10 Variable 230 V
DN25	BTAF5-4	Pent-A-Boost Compact 5-4 Variable 230 V
DN32	BTAF5-8	Pent-A-Boost Compact 5-8 Variable 230 V
DN32	BTAF5-10	Pent-A-Boost Compact 5-10 Variable 415 V
DN32	BTAF5-16	Pent-A-Boost Compact 5-16 Variable 415 V

Optional extras – see page 5

“Pent-A-Boost” – Compact Domestic Booster Set

Model BTAF – Dual Pump - Duty Assist & Duty Standby – Datasheet Page 4 of 5

Description – Dual Pump

Dual pump sets are available as Duty Standby or Duty Assist. Both pumps are variable speed and set to provide constant pressure. Remarkably, the foot print is the same as the single pump set yet the duty is up to 2.4 Lt/s. The parallel mounted pumps draw water from the integral ultra-fast filling tank.

The set is approved for drinking (wholesome) water – conforming to G16.13 – use optional insulating jacket.

Duty Standby - only one pump runs at any one time. The pumps alternate on a daily basis to avoid stagnation and ensure even use. A manual override switch “hand” allows either pump to be isolated and run only the healthy pump.

Duty Assist - allows the second pump to automatically switch on when required, thus doubling the output. Alternate starting avoids stagnation and ensures even use. If one pump develops a fault, the controller isolates and continues with the healthy pump (the BMS fault relay activates together with panel lamps). Normal demand is often met with only one small pump running at optimum efficiency, offering substantial energy saving compared to one larger pump. Furthermore smaller pumps are quieter.



Model 3-7
Dual Pump
Duty Assist
Quiet and efficient
2.4 Lt/s output

Model	Outlet Size	Default Set point	Pressure Switch on (min.) ¹	Pressure Switch off (Max) ¹	Pressure Max ²	Vessel Air Pressure ³
Duty Standby						
3-7	DN20	3.0 bar	2.7 bar	3.3 bar	4.6 bar	2.1 bar
3-10	DN25	4.0 bar	3.6 bar	4.4 bar	6.5 bar	2.8 bar
5-4	DN25	1.5 bar	1.4 bar	1.7 bar	2.7 bar	1.1 bar
5-8	DN32	3.0 bar	2.7 bar	3.3 bar	5.4 bar	2.1 bar
Duty Assist						
3-7	DN32	3.0 bar	2.7 bar	3.3 bar	4.6 bar	2.1 bar
3-10	DN32	4.0 bar	3.6 bar	4.4 bar	6.5 bar	2.8 bar

Notes - 1. Differential +/- 10% of set point. 2. If set to full speed. 3. Vessel air pressure with zero water pressure, 0.7 X set point.

Specification & Materials

See page 1 and 3

Electrical Specification

Voltage 230 V 1 phase
 Protection MCB in control box for each pump
 motors thermal protection (IEC 34-11: TP 211)
 3-7 Duty Assist 2 x 4.3 = 8.6 A
 3-10 Duty Assist 2 x 5.1 = 0.2 A
 Class Class 1 (requires earth wire)
 BMS Volt free SPDT relay general fault-pump / inverter / low level alarm
 Volt free SPDT for low level alarm
 Stops pump via electrodes in tank (Warning lamp on control box) – auto reset once tank refilled
 Protection IP65 (Enclosure) / IP55 (Pump)

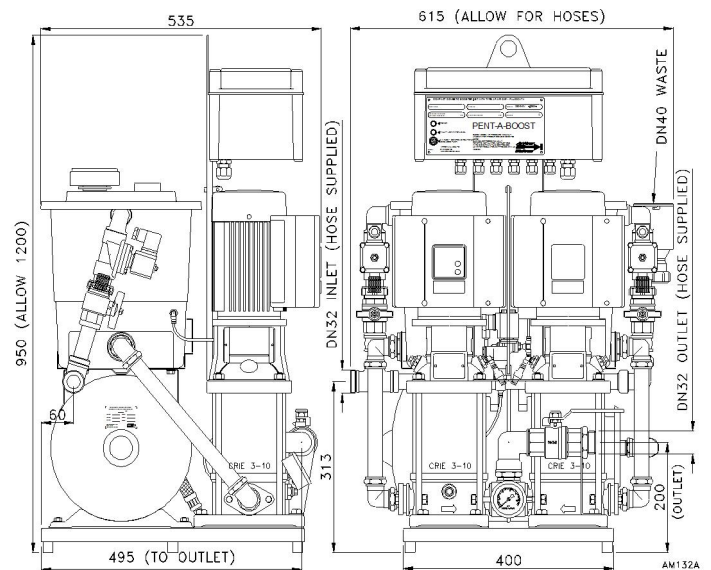
Low level cut out

Protection

Connection

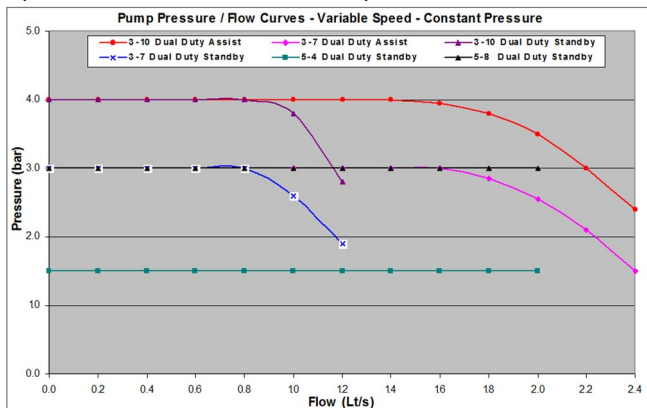
1 phase M20 1 phase + neutral + earth

Dimensions



Codes and Descriptions – Dual Pump

Inlet Size	Code	Description
DN20	BTAF3-7S	Pent-A-Boost 3-7 Duty Standby Vari 230 V
DN25	BTAF3-10S	Pent-A-Boost 3-10 Duty Standby Vari 230 V
DN25	BTAF5-4S	Pent-A-Boost 5-4 Duty Standby Vari 230 V
DN32	BTAF5-8S	Pent-A-Boost 5-8 Duty Standby Vari 230 V
DN32	BTAF3-7A	Pent-A-Boost 3-7 Duty Assist Vari 230 V
DN32	BTAF3-10A	Pent-A-Boost 3-10 Duty Assist Vari 230 V



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“Pent-A-Boost” – Compact Domestic Booster Set

Model BTAF – Options – Datasheet Page 5 of 5

Options

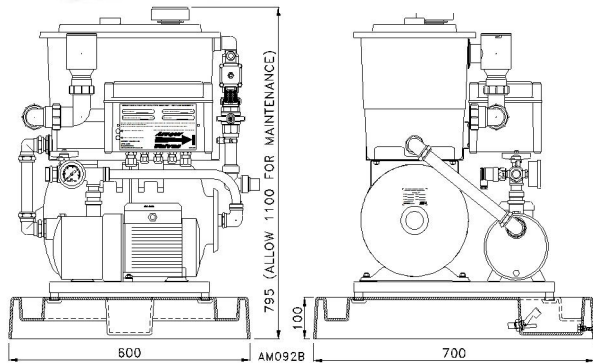
- Break tank high level alarm- Recommended to minimise the risk of water damage, by BMS warning when the tank is excessively full
- Bypass Valve
- Cistern insulating jacket
- Pressure Regulating Valve (PRV) – constant pressure – factory fitted – fixed speed only
- Wall Brackets – not suitable for 5-10, 5-16 or duals
- GRP Drip Trays
- GRP Wall Covers – use wall brackets
- GRP Enclosure – exterior use – see “Boost-A-Break”
- 3 phase pumps – standard on 5-10 and 5-16
- Additional expansion vessel – reduces pump starts – only for fixed speed without PRV on pump set

Suitability	Code	Description
Up to 5-8 single	BTBRA	Wall Bracket for Break Tanks AV Mounts
All fixed speed	BTJAC4	Jacket Pent-A-Boost Fixed Speed 4 Hole
All variable speed	BTJAC5	Jacket Pent-A-Boost Variable Speed 5 Hole
All DN20	BT20-25	Upgrade from DN20 to DN25 Solenoid
All except dual	BTPT	Pulse Timer - Infrequent Use/Anti Seize
All fixed speed	BT2-3	Upgrade to 3 phase pump
Up to 3-7 single	BTDT1	GRP Drip Tray c/w Float Switch (up to 3-7)
Up to 3-7 single	BTDT2	Controller & Additional Sol for Drip Tray
All fixed speed	EVUP100V	Exp. Vessel 10 bar Ø450X910 High Vert
All fixed speed	BTPRV	PRV for Fixed Speed Break Tank
All	BTCAB1	Enc. 1100x1100x1050 GRP c/w Heating
All Single	BTCAB2	Enc. 660x600x780 GRP c/w Frost Protection
Up to 5-8 Single	BTCAB3	BT Wall Cover 1035hx735Wx610D

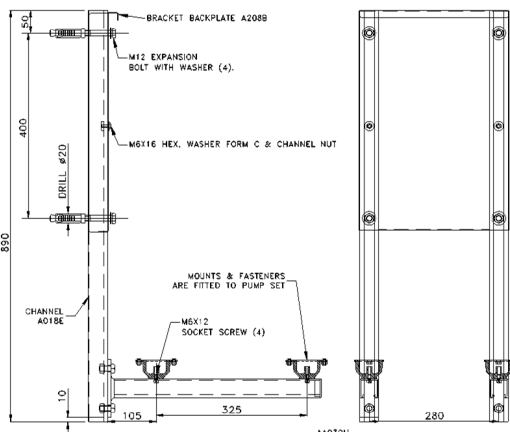
GRP Drip Tray – Dimensions



Where it is impractical to fit an overflow – e.g. when retro fitting in a stairwell – we suggest the GRP drip tray. The whole pump set sits on top so any water leaking from the tank or pump is captured in the “moat” and runs into the well, activating the float switch and isolating the water supply, which stops the pump. The pump restarts once water is drained from the well. Code - BTDT1 (models up to 3-7). Additional isolating solenoid – BTDT2.



Wall Brackets BTBRA - Dimensions



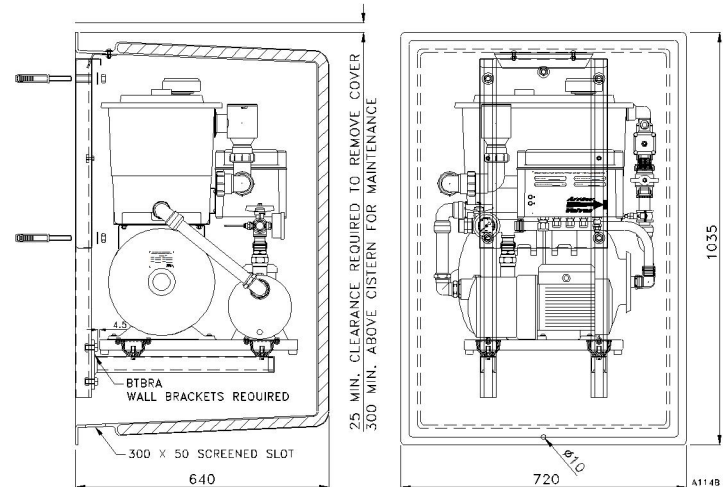
Bypass Valve



If the pump fails - or is turned off for maintenance – the Bypass Valve continues to feed water through the system at mains pressure, which is often sufficient to provide water for domestic purposes – see “BPV” datasheet.

Wall Cover – Dimensions

(Not suitable for 5-10, 5-16 or duals)



Installation Notes

The unit must be located in a frost-protected area that is not liable to flooding – heated GRP housings available. The unit is generally floor mounted on standard rubber feet. Alternatively use the special wall brackets which feature special acoustic mounts. Where possible mount to a solid external wall.

All controls and serviceable components are accessible from the front, so allow room for servicing. The vessel air charge valve is located on the left.

The flexible stainless hose provided should be connected to a supply pipe. Thoroughly flush pipes before connecting.

40 mm plastic - or 42 mm copper - overflow pipe should be connected to the compression elbow fitted to the drip tray. The pipe should be as short as possible and slope down.

The unit must be hardwired through a 2 pole isolator (4 pole for 3 phase) and protected with a suitable MCB.

The pump will not run until the cistern is almost full. If pump does not stop after 4 minutes with outlet valve closed, isolate power for 20 seconds then switch on. This assists with self priming.

Check the pump switches on and off at the required pressures using the (glycerine filled) gauge fitted.

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