

Booster Pump Set

Models BPELC1 / BPELC2 - Datasheet Page 1 of 3

Overview

Booster Pump Set packaged on a stainless steel base supplied with pressure vessel and ancillary controls ready for installation. A separate cistern (tank) is required to supply the set. The set is approved for drinking (wholesome) water applications.

The primary purpose is to boost the water pressure where the maintained mains supply pressure is less than 1 bar or where significant water storage is desired (e.g. 15 mins). Or where a high flow rate is required – e.g. for showers and baths. The set may also be used for Fluid Category 5 backflow protection when supplied via a tank with a Type AB air gap.

The standard unit BPELC1 is quiet by virtue of a variable speed centrifugal pump, anti-vibration rubber feet and flexible stainless braided connection hoses. The unit comes with a low level pump cut out, level controller. All sets are supplied with pump controls – inverter, pressure transducer and BMS.

The set has the option of Dual Level Control (model LC2). The level control box provides additional solid state delayed action for cistern (tank) filling, via a solenoid controlled filling arm.

The Arrow Valves automatic Bypass Valve is recommended (up to Fluid Category 3) to enable mains water to be supplied - at mains pressure - during power failure or maintenance.

Arrow Valves also manufacture booster pumps complete with integral filling cistern –
 Domestic boosting – (Wholesome water) “Pent-A-Boost”
 Backflow protection Fluid Category 5 - “Boost-A-Break”

Applications

- Penthouse (3 storey and taller)
- Boosting low water pressure
- “Combi” boilers & showers
- Fluid Category 5 backflow protection when used with cistern with Type AB air gap

Specification

Pressure Supply min.	1.0 m head (0.1 bar)
Pressure Supply max.	1.0 bar
Pressure Outlet	See flow graph – page 2
Pressure Gauge	Ø63 stainless – glycerine filled
Vessel Capacity	24 Lt
Inlet Size	See “Inlet Control” table
Outlet Size	See “Outlet Pressure Control” table
Noise	<70 dBa @ 1 m
Temperature	25° max. ambient

Materials

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



Model BPE3-5LC1

Conductive Electrodes – supplied with “Level Control”. The electrode holder is fitted to the tank lid and one pair of electrodes control low level pump cut-out. A second pair of electrodes control the tank filling (via a suitable solenoid) Or high level cut out. Electrodes supplied 1 m long and must be cut to length on site to suit tank.



Water Regulations

The assembly is fully Water Regulations approved & complies with the requirements of the 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.

Variable Speed Merits

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 merits include -

- 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
- Qualifies for Enhanced Capital Allowance

Arrow Valves Ltd

Tel: 01442 823123 Fax: 01442 823234
 www.arrowvalves.co.uk
 info@arrowvalves.co.uk

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Inlet Connection

Inlet is by flexible stainless steel hose complete with female union connection size DN20-32 dependant on model.

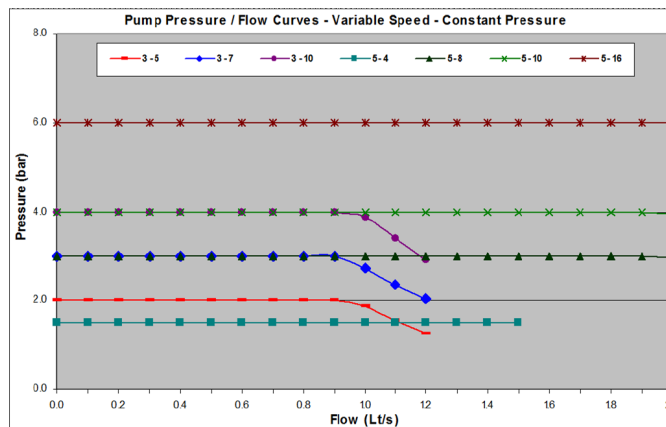
Outlet Connection

A flexible stainless braided hose is supplied for the outlet. This has a female swivel nut (union) and a fibre washer. The outlet connection has a double check valve incorporated.

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.

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 (this is chargeable).*



Level Control

Supplied with Level Control, the control box on the pump set has an electrode holder with 5 m of cable (as standard). The electrode holder must be fitted to the tank lid and the electrodes cut to length to suit the tank.

LC1 – Pump Protection supplied with a DN25 electrode holder with 3 one metre long electrodes. Pre-wired to control box to stop pump if water level drops too low.

LC2 – Pump Protection as above plus additional level controller for solenoid controlled filling arm. Supplied with a DN25 electrode holder with 5 electrodes supplied with 5 m of cable, pre-wired to control box. The electrodes need cutting to length on site to suit tank

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. Accurate level control is achieved with level electrodes which provide on/off full flow control.

Electrical Specification

Motor	230 V 1 ph (3-5 - 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)

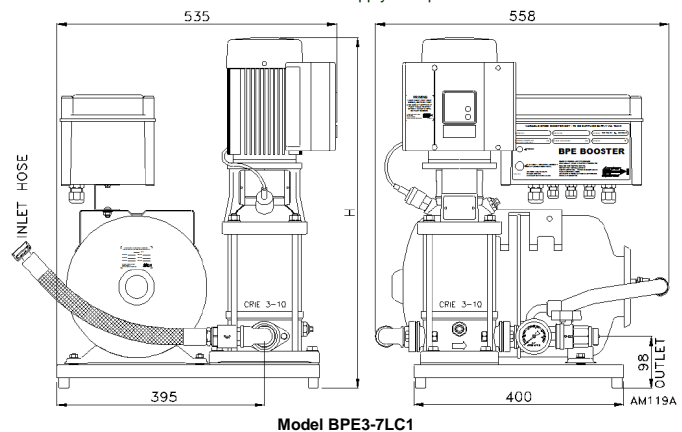
Level Control LC1 and LC2

BMS	Volt free SPDT relay general fault – pump / inverter / low level alarm 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 IP65

Enclosure Connection

1 phase	M20 1 phase + neutral + earth
3 phase ¹	M25 3 phases + neutral + earth

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



Model – BPE	3-5	3-7	3-10	5-4	5-8	5-16
H (mm)	554	590	690	572	626	1168

Note – in addition to "H" - allow 25 mm min. for ventilation and ideally 200 mm for servicing.

Options

Codes and Descriptions

Inlet Size	Code	Description
DN20	BPE3-5LC1	Booster pump 3-5 with low level pump cut out
DN20	BPE3-7LC1	Booster pump 3-7 with low level pump cut out
DN25	BPE3-10LC1	Booster pump 3-10 with low level pump cut out
DN25	BPE5-4LC1	Booster pump 5-4 with low level pump cut out
DN32	BPE5-8LC1	Booster pump 5-8 with low level pump cut out
DN32	BPE5-10LC1	Booster pump 5-10 with low level pump cut out
DN32	BPE5-16LC1	Booster pump 5-16 with low level pump cut out
DN20	BPE3-5LC2-20	Booster Pump 3-5 Variable Dual Level Control 230 V
DN20	BPE3-7LC2-20	Booster Pump 3-7 Variable Dual Level Control 230 V
DN25	BPE3-10LC2-25	Booster Pump 3-10 Variable Dual Level Control 230 V
DN25	BPE5-4LC2-25	Booster Pump 5-4 Variable Dual Level Control 230 V
DN32	BPE5-8LC2-25	Booster Pump 5-8 Variable Dual Level Control 230 V
DN32	BPE5-10LC2-25	Booster Pump 5-10 Variable Dual Level Control 415 V
DN32	BPE5-16LC2-25	Booster Pump 5-16 Variable Dual Level Control 415 V

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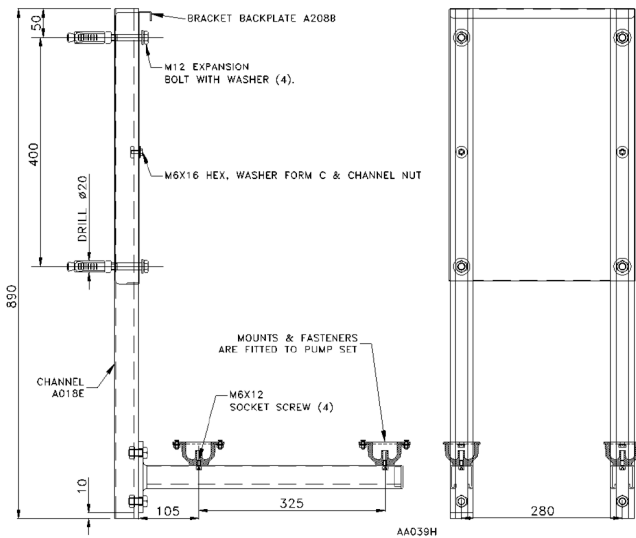
Options

- Bypass Valve
- Wall Brackets – *not suitable for 5-10 or 5-16*
- GRP Drip Trays
- GRP Wall Covers – *use wall brackets*
- GRP Enclosure – exterior use – see “Boost-A-Break”
- 3 phase pumps – only models 5-10 and 5-16

Size	Code	Description
All	BTBRA	Wall Bracket for Break Tanks AV Mounts
All	BTDT1	GRP Drip Tray c/w Float Switch
	BTCAB1	Enc. 1100x1100x1050 GRP c/w Heating
	BTCAB2	Enc. 660x600x780 GRP c/w Frost Protection
	BTCAB3	BT Wall Cover 1035hx735Wx610D

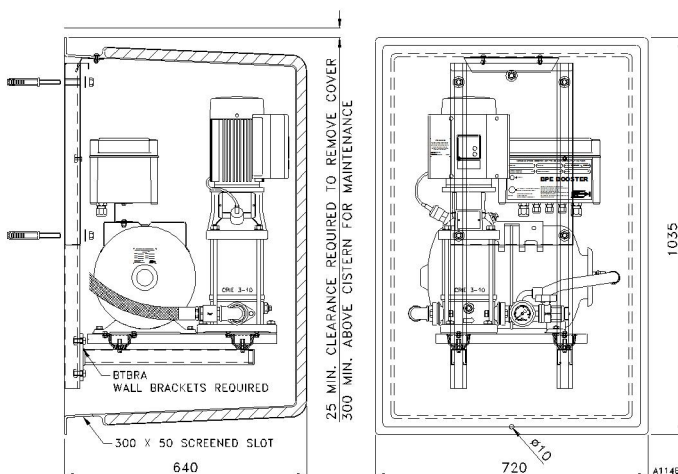
Wall Brackets BTBRA – Dimensions

(Not suitable for models 5-10 or 5-16)



Wall Cover – Dimensions

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



Bypass Valve



If the pumps 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.

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 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 the outlet pipe. Thoroughly flush supply pipes before connecting.

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

Check the pump switches on and off at the required pressures using the gauge fitted.

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