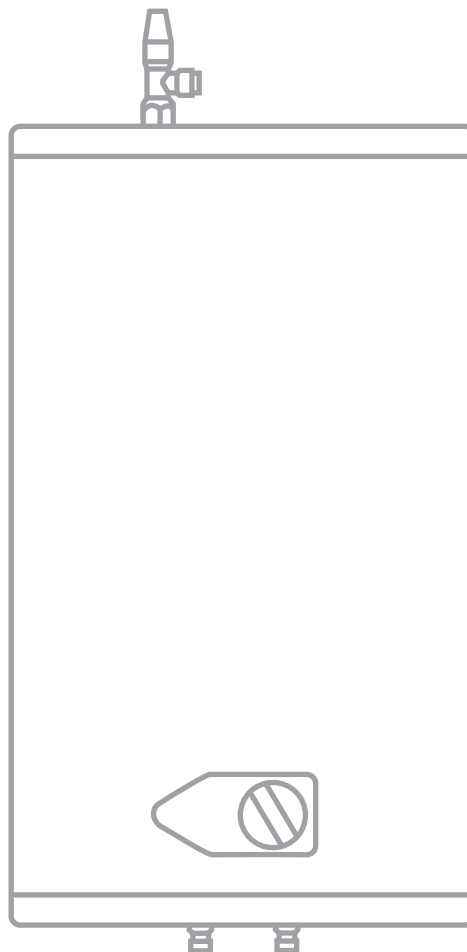




Product Instruction Manual

# Powerflow



**Unvented water heater**

30, 50 and 90 litres

Thank you for purchasing a Powerflow series unvented electric water heater. The Powerflow is suitable for hand washing and dishwashing where a number of hot water outlets are required such as kitchens, schools, restaurants, washrooms and offices. The Powerflow is the ideal solution for light industrial, commercial and light domestic hot water requirements. Please read and understand these instructions before commencing installation, and leave them with the user when installation is complete.

## 1. Important safety points



Installation must be undertaken by a competent installer trained in the installation of unvented water heating systems in accordance with building regulations G3.



Building regulations G3 requires a temperature and pressure relief valve to be factory fitted. This must not be removed or blocked in any way.



Installation must comply with the latest edition of the IEE wiring regulations.



These units are very heavy. They must be securely fastened to a suitably strong wall using the fixings supplied. Remember to allow for the weight of the water (one KG per litre of capacity) when assessing the suitability of the wall.

## 2. Installation

### Overview

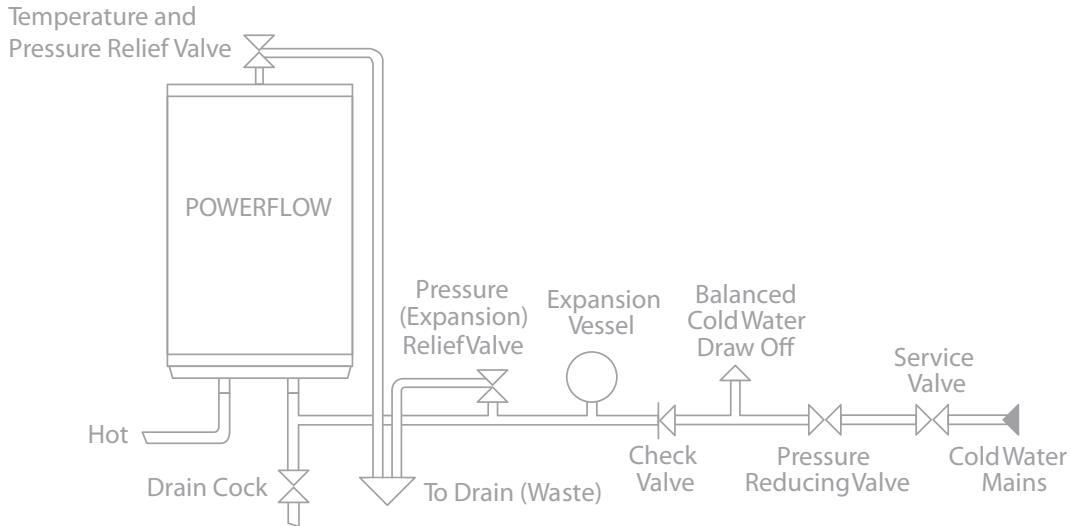
Components Checklist	✓
Expansion Vessel 3/4" MBSP, precharge pressure 3.5 bar	
Pressure Reducing Valve, factory set at 3 bar	
Single Check Valve 15mm x 15mm compression	
Pressure (expansion) Relief Valve 1/2" BSP male inlet, 1/2" BSP female discharge, factory set at 6 bar	
Tundish 15mm x 22mm	

- This unit must be installed vertically, with the pipes pointing downwards and the temperature and pressure relief valve at the top.
- Ensure the wall is strong enough to support the heater, including the weight of the water when full.
- This heater is not suitable for outdoor installation.
- Do not install where there is any risk of freezing.
- The heater is bulky and heavy, Do not attempt to lift alone.

Plan your installation carefully and choose a suitable position for the heater, allowing suitable space for accessories such expansion vessels, pipework and subsequent maintenance.

See schematic Diagram 1 for the correct relative positions of the components.

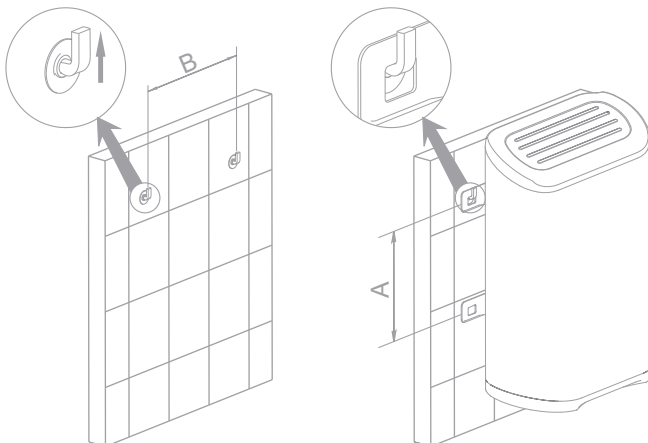
**Diagram 1**



- Fit all the components supplied, components may be supplied loose or connected to a manifold. The manifold aids installation but does not alter the relative positions of the components.
- Do not remove the factory fitted temperature and pressure relief valve.
- Ensure in particular that there are no valves of any kind between the expansion relief valve and the heater.
- Allow at least 400mm of space above and below the unity to permit for maintenance.
- Observe flow direction arrows on components.

### Wall mounting

Drill holes for supplied heavy duty bolts to wall at the spacings shown in the table below (also See Diagram 2). Insert bolt hooks and tighten ensuring that they are secure then hang heater on the protruding hooks.



**Diagram 2**

Model	Vertical Bolt Spacing A (mm)	Horizontal Bolt Spacing B (mm)
PF30LC	270	320
PF50LC	520	320
PF90LC	430	320

## Plumbing connections

Connect ALL the plumbing valves in the sequence shown in diagram 1.

The cold water inlet to the heater is marked BLUE and the hot water outlet is marked RED.



Observe flow direction arrows on supplied valves.

- The drain valve must be fitted close to the COLD inlet to allow drain down if necessary.
- An isolating valve should be fitted UPSTREAM of all of the valves to allow the heater to be maintained without impacting on other facilities.
- Do NOT fit a service or other valves between the heater and the pressure relief (safety) valve as this could impede its correct operation.
- The pressure reducing valve is factory set at 3 bar. If a balanced cold water draw off is required this should be tee-ed off down stream of this valve.
- A balanced cold water feed is recommended as it ensures hot and cold water is supplied at the same pressure. Some mixer taps and thermostatic showers require hot and cold water to be to be at the same pressure for correct operation.
- The expansion vessel supplied must be supported using a bracket or similar fixing. Do not rely on the pipework alone – it will not be strong enough. The orientation of the vessel is not important.
- When all valves are correctly fitted, open a hot tap and wait until the water flow is steady and without traces of air. Close the tap to allow the system to reach full pressure and carefully check system for leaks.



Control valves may be supplied loosely connected for identification purposes, but these joints have not been leak tested. This must be done at installation.



It is essential to also check the temperature pressure relief valve connection to the heater for leaks. Note that a leak from the temperature and pressure relief vlv may not be immediately obvious, as the connection is at the top of the heater and leaking water may in the first instance run down the pipework and collect in the heater insulation.

## Discharge pipe connections

This product falls within the scope of Building Regulation G3 which stipulates certain conditions relating to the way any water discharge from relief valves is transported away.

These conditions are designed to ensure that any discharge will not present a hazard to people or to property, and that any discharge is clearly visible so that the underlying cause is likely to be rectified promptly.

The essential requirement of G3 in relation to water discharge is that the discharge pipe MUST terminate in a safe, visible position.

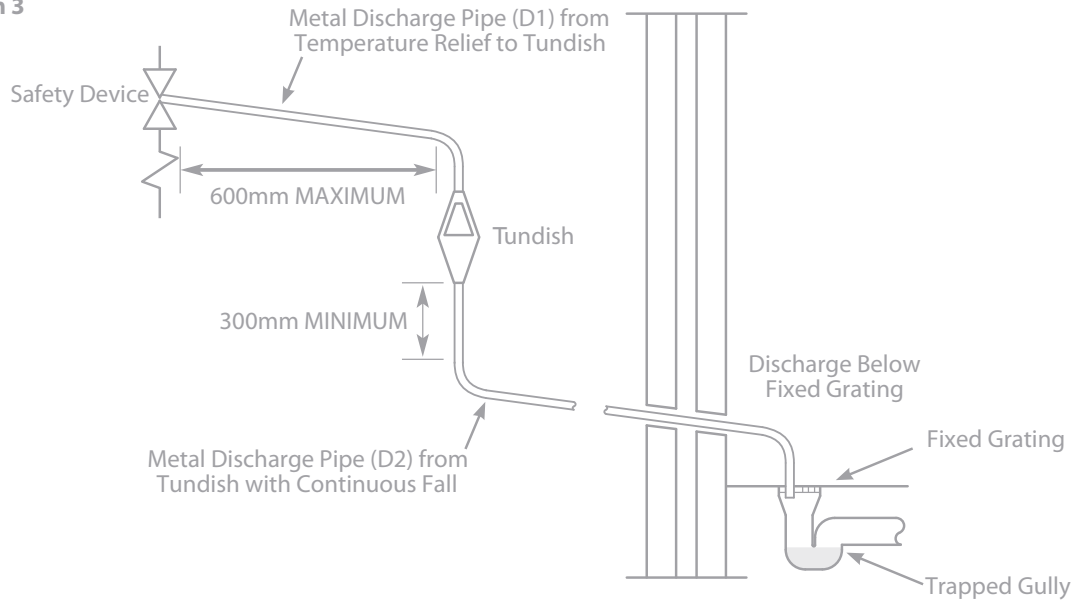
In achieving this aim the G3 regulations strongly recommended that:

- The tundish is located within 500mm of the Temperature and Pressure Relief valve and it is wherever possible oriented vertically. It must be visible to occupants and positioned away from electrical devices.
- The discharge pipe has a vertical fall of at least 300mm immediately below the tundish.
- The discharge pipe below the tundish is at least 22mm diameter (i.e. one size larger than the Temperature and Pressure Relief valve outlet).
- The discharge pipe should be as straight and as short as is possible and positioned away from electrical components.

Diagram 3 illustrates an acceptable discharge pipe arrangement. The table below the diagram specifies how the maximum acceptable pipe length from the tundish to the final outlet depends on the pipe diameter and the number of bends (reference the chart on page 4 for pipe sizing).

For example in 22mm copper with no bends the pipe could be up to 9m long. With two bends present the maximum length drops to  $9.0\text{m} - (2 \times 0.80\text{m}) = 7.4\text{m}$ .

**Diagram 3**



Sizing of D2 Copper Discharge pipe for common temperature relief valve outlet size				
Valve outlet size	Minimum size of discharge pipe (D1)	Minimum size of discharge pipe (D2) from Tundish	Maximum resistance allowed, expressed as a length of straight pipe (I.E. no elbows or bends)	Resistance created by each elbow or bend
G1/2	15mm	22mm	up to 9m	0.8m
		28mm	up to 18m	1.0m
		35mm	* to 27m	1.4m

### Electrical connections

- The heater is supplied pre-wired with appropriate cable.
- Electrical installation should conform to the latest edition of the IEE Wiring Regulations.
- Electrical supply should be capable of isolation via a user-accessible double pole isolation switch rated for a 13A supply.

### 3. Commissioning

Visually re-confirm all plumbing and electrical connections are sound.

- Open a hot water tap and turn on mains water supply to the Powerflow heater.
- Allow unit to fill and leave tap running for a short time to flush out the pipework and purge any air from the system before closing the hot tap and checking the system for any leaks.

Check the operation of the Temperature and Pressure relief valve located at the top of the heater twisting the knob at the top of the valve. This lifts the valve seat and water will flow rapidly and be visible at the tundish.

Ensure the discharge pipe can cope with this flow rate continuously. Release the Temperature and Pressure relief valve. The flow should stop completely.

Open the expansion relief valve and likewise check that water flows freely through the discharge pipe, that the discharge pipe can cope with the flow rate and that the water flow ceases when the valve is released.

Switch on the electrical supply and select an appropriate heater setting on the thermostat knob (the thermostat is adjustable in the approximate range 20°C to 65°C).

The neon indicator light comes on when the element is heating.

## 4. Operation

This water heater will store water at a temperature selected via the thermostat on the front of the heater.

To set the temperature turn the control clockwise to increase the temperature and anti-clockwise to decrease it. The indicator light comes on when the unit is heating.

Maximum energy efficiency and product life is obtained avoiding very high temperature settings. The optimal temperature setting balances these factors.



The maximum temperature settings is about 65 degrees, this can be excessively hot for some situations. In situations where very young children, the elderly or other vulnerable people are likely users a suitable thermostatic mixing valve should be fitted by your installer.

If there is any risk of frost the heater should be left switched on at its lowest heat setting. If the heater is to be left unused for long periods, it should be drained.

This unit should be maintained in accordance with the instruction in the sections 12-16.



Never interfere with any safety valves.



Beware that hot water discharged from safety valves could be very hot.

## 5. Maintenance

### Draining the unit

To drain the unit disconnect electrical supply and close service valve on cold inlet.

Open the drain cock on cold inlet and open a hot water outlet to enable air to replace draining water.



Note that a small quantity of water will remain in the tank. This residual water can be drained by removing the heating element.

### Electrical components




Always switch the electrical supply off before undertaking any maintenance to the heater unit.



Servicing of electrical parts should only be undertaken by competent individuals.

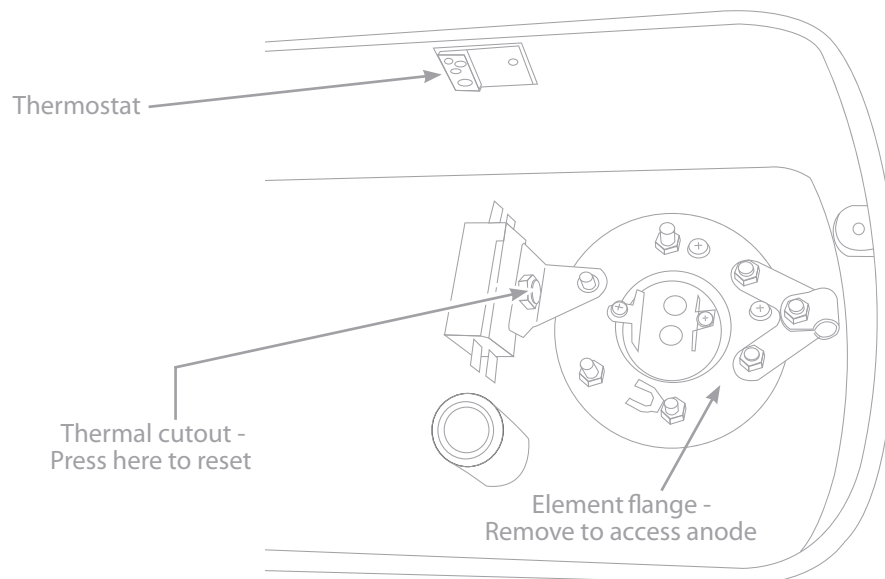
All maintainable electrical components are located under a plastic cover that is next to the inlet and outlet pipes and held in position with two small screws. Remove screws and lower cover to provide access to components. See diagram below for electrical parts identification.

 If replacing electrical parts take particular attention to ensure that the earthing connections (green/yellow) to the element flange and thermostat housing are sound.

### Thermal cut-out reset


This unit contains a manually re-settable thermal cut-out that will switch the power off if the temperature reaches an abnormally high level. To reset the cut-out the press button as shown in Diagram 4.

**Diagram 4**



### De-scaling procedure

If scale is allowed to build up heater performance will suffer and the life of the product will be reduced.

 The effects of limescale are excluded from any warranty.

To de-scale the heater, gain access to the element following the instructions set out in section 10.

- Remove thermostat and thermal cut-out bulbs from respective pockets and unscrew the 6 nuts holding the element flange in position. Withdraw element.
- Remove scale carefully. If necessary, dip element in a de-scaling solution available from DIY or plumbing outlets. Do not allow electrical connections to become wet.
- It is not normally necessary (or practical) to attempt to remove any scale from the tank walls.
- Refit element and follow commissioning instructions as per section 8.

## **Anode & tank inspection**

- It is possible to view the tank by removing the element to gain access. It is advisable the tank is inspected at regular intervals for signs of corrosion.
- There is a magnesium anode fitted to most models of the Power flow.
- It is a grey magnesium cylinder fitted to the element base and its role is to reduce the rate of corrosion of the tank.
- It should be inspected periodically and replaced if there are signs of disintegration from a solid metallic structure.
- To access the anode, follow instructions in section 10.
- Remove scale carefully. If necessary, dip element in a de-scaling solution available from DIY or plumbing outlets. Do not allow electrical connections to become wet.
- It is not normally necessary (or practical) to attempt to remove any scale from the tank walls.
- Rest element and follow commissioning instructions as per section 8.

## **Safety valve checks**

- The Temperature and Pressure relief and expansion relief valve relieve any dangerous pressure or temperature build up that may arise as a consequence of abnormal operation.
- BOTH valves should be tested periodically by twisting the cap and checking that water flows freely. The water flow should cease when the valve is released.
- The pressure reducing valve contains a wire mesh gauze that may become clogged over time. To clean, close off mains water and open a hot outlet to drain the system of water.
- Unscrew the plastic top of the pressure reducing valve from the brass housing and remove complete mechanism including wire mesh. Rinse mesh to remove grit, scale etc as necessary and replace.
- Re-commission system following instructions as per section 8.

## **Expansion vessel**

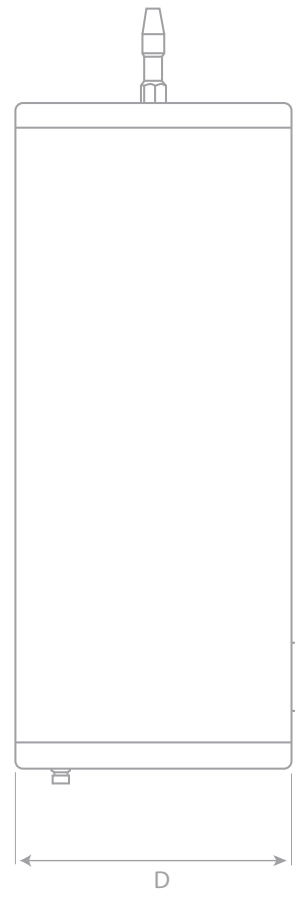
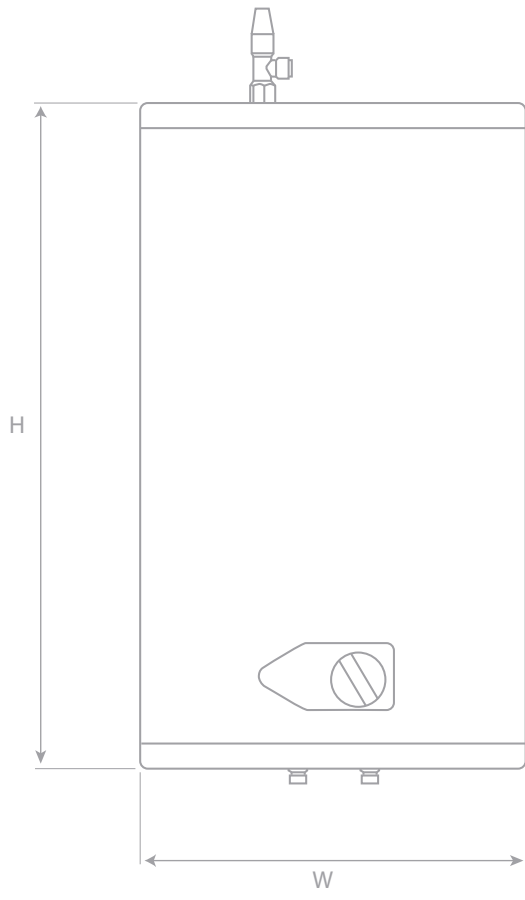
- Water expands when it is heated. The expansion vessel accommodates expanded water during the heating cycle via a pressurised diaphragm arrangement so that water is not wasted.
- The vessel is supplied already pressurised to 3 bar. Over time the pressure may be lost and water may be discharged during the heating cycle.
- The pressure should be checked using a standard car tyre foot pump or similar device. The pressure should be re-set to 3 bar.



## 6. Specifications

Model	PF30LC	PF50LC	PF90LC
Maximum water pressure to pressure reducing valve	12 bar		
Power (kW)*	3.0		
Voltage (V)	230V ~ 50 Hz		
Current (A)	13A		
Capacity (Litres)	30	50	90
Operating Pressure	3 bar		
Maximum design pressure	6 bar		
Expansion vessel charge pressure	3 bar		
Expansion relief valve setting	6 bar		
Pressure Reducing Valve setting	3 bar		
Temperature and Pressure Relief	7 Bar 90 degrees°C		
Minimum recommended pressure	0.8 bar		
Immersion heater specification	Hyco PFEL30 EN60335 x 1		
Weight empty (kg)	9	13	24
Weight full (kg)	39	63	114
Heat up time (from 13°C to 60°C) in minutes	21	40	86
Reheat time (70% contents to 60°C) in minutes	16.5	28	57
Standing heat losses(kW/h)	0.93	1.16	1.26
Height (mm)	620	915	930
Width (mm)	380	380	540
Depth (mm)	295	295	385
Tank Material	Stainless steel		
Inlet / Outlet	½ " BSP male		

\*Units also available with 1kW element. Add suffix of 1KW to product code e.g. PF30LC1KW



## 7. Troubleshooting

Symptom	Likely Fault(s)	Remedy
Water not heating	Thermal cut-out needs re-setting Element failure Thermostat failure Thermal cut-out failure Electrical supply failure	Reset as section 11. Replace. Replace. Replace. Check supply is present.
Water too hot	Thermostat set too high	Reduce setting. Fit thermostatic mixing valve.
Water milky coloured	Dissolved gases coming out of solution as they are heated – this is normal condition for pressurised systems	No action needed. Water will turn clear after standing for a few seconds.
Water discharged during heating cycle only	Expansion vessel has lost its charge	Re-pressurise vessel as section 15.
Water discharged all the time	Either the pressure reducing valve is failing to reduce the water pressure to 3 bar approx, or one of the safety valves is operating at below is nominal level.  To differentiate measure the water pressure downstream of the pressure reducing valve. If the pressure is more than about 4 bar, replace the pressure reducing valve.  If the pressure is less than 4 bar, replace the safety valve that is opening.	Replace appropriate valve.
No / limited water flow	Check mains water is turned on.	Check pressure reducing valve for grit.
Mixing valves not working	Unbalanced pressure.	Ensure cold is tee-ed off correctly after pressure reducing valve so hot and cold are at equal pressure.

## 8. Guarantee and service policy

This product is guaranteed against faulty materials and manufacture for a period of one year from the date of purchase. Hycowill in its sole discretion replace, repair or refund any faulty unit. Incorrect installation, frost damage, and the consequences of limescale deposits are excluded. Consequential costs such as labour charges or damage to fittings and surroundings are expressly excluded.



INFORMATION FOR CORRECT DISPOSAL OF THE PRODUCT IN ACCORDANCE WITH THE EUROPEAN DIRECTIVE 2002/96/E.

At the end of its working life this equipment must not be disposed of as household waste. It must be taken to a local authority waste collection centre or to a dealer providing this service. Disposing of electrical and electronic equipment separately enables its components to be recovered and recycled to obtain significant savings in energy and resources. In order to underline the duty to dispose of this equipment separately, the product is marked with a crossed out dustbin.

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