



Pressure and Surge Control

This databyte has been produced to highlight the many points that should be considered in relation to the correct selection, installation and use of water fittings and appliances with regard to pressure and surge.

Minimum Pressure and Flow

The minimum standard for pressure set by the Director General for Water Services is as low as 8 metres head, with an acceptable flow of no less than 9 litres or 2 gallons per minute. Within parameters set out in the Water Industry Act Water Companies are obliged to meet these minimum standards. Flows of 7 litres per minute as described in the Governments 'Guaranteed Standards Scheme' may result in a Water Company having to compensate its customer. 10 metres head can generally be expressed in pressure terms as 1 bar or 100 kPa.

Maximum Pressure

The Water Company's maximum supply pressure is variable depending on the source of supply and could in some areas easily be in excess of 16 bar. This is much too high for some water fittings without the use of a pressure reducing valve or break pressure cistern.

Surge

Rarely considered the natural and largely unavoidable characteristic of surge in pipes occurs whenever a tap or valve is closed. If not properly controlled surge can, and frequently does, cause damage to pipes, fittings and appliances. Solenoid valves and quarter turn ceramic disc type taps are prone to exaggerate surge in plumbing systems simply because they can instantly stop the flow of water. The effect of surge is further exaggerated where check valves are fitted in a system, as they prevent the surge spike from dissipating back along the service pipe toward the water main.

Usually not as destructive due to the presence of air, surge also occurs when any system is filled with water from new or after an interruption for repair, renewal or any situation where the system has been drained and refilled.

Surge is a phenomenon that can be controlled and should be accounted for in the design of a plumbing system, particularly where rapid closing taps or valves and check valves are used. (See the Water Supply (Water Fittings) Regulations 1999).

Where surge is likely to occur or is proving to be a problem 'surge arresters' are available to protect vulnerable fittings.

Pressure surges have been recorded as spikes on a graph as much as 15 times normal working pressure.

Manufacturers Recommendations

All reputable manufacturers of fittings and appliances will specify a minimum and maximum recommended operating pressure and the flow requirements. These details are usually on the appliance, in the installer guide or they may be found in the Water Fittings and Materials Directory published by The Water Regulations Advisory Scheme.

Pressure, Flow and Safety

The installer should always ensure that the following points are addressed before proceeding with the installation of a plumbing system or a particular fitting or appliance:

1. There is sufficient pressure available for the system or appliance to function properly.
2. The fittings are capable of withstanding the pressure they are likely to be subjected to. *Water Companies will generally advise on the maximum pressure available in their distribution systems.*
3. There is sufficient flow available to satisfy the demand of all fittings and appliances initially and later should the system be extended.
4. There is adequate provision for the control of surge if it is likely to cause damage to fittings during the normal operation of a plumbing system.

The Institute of Plumbing & Heating Engineering cannot accept responsibility for any errors or omissions contained in this information.