

As many homeowners look to develop and improve their properties, the demand on the **mains supply** becomes greater, requiring the introduction of additional products. Ian Hunt reviews how to choose the most suitable solution.



The author

As Technical Manager at Pump Express Ltd, **Ian Hunt** is used to finding solutions for all the different ways people want to increase water pressure in their properties. With an engineering background, he has become an expert at understanding the problem and selecting the best solution for every situation.

Under the pump

There is no 'one-size-fits-all' solution to a poor water supply. The ideal will always be to upgrade the mains supply (when possible) but the cost of this is generally very high. However, there are a number of options if the water supply is inadequate and can't be upgraded cost effectively.

In-line booster pump

There are a couple of mains boosting pumps on the market now that are designed to be installed "in line" on the supply pipe. Easy to fit, they can provide extra pressure if there is enough water volume but are restricted in the amount of water they can provide by the limitations of the supply pipe and the Water Byelaws, which require them to be flow limited to 12 litres/minute. They are likely to be most

suitable for a household with a single shower and fewer people as these can only cope with a couple of outlets at a time.

Pressurised storage tank

These are also known as pressure vessels, accumulators or expansion tanks. They can be connected directly to the mains so that they fill with water and are pressurised by the mains to the maximum value that it reaches. If there is good pressure when a single tap is in use but a problem when more outlets are used, this solution could be perfect.

Typically a 200 to 300-litre vessel would be selected, but due to the use of air in the vessel as a 'spring' to store the pressure, the amount of water available is only around half of the nominal size of the tanks. Because the tank is under pressure, they rarely fill while in use and must be sized

for the maximum demand. This means that they tend to be the bulkiest option.

This solution tends to suit situations where there are occasional periods of high demand that can be accommodated by the water stored, and slack periods in which the tank can recharge. This might be a family where a number of people are all using bathrooms at the same time in the morning but there will be minimal use once the rush is over. Getting the vessel size right is important because once the tank is discharged, the problem will return.

Pressurised tank with top up pump

If the pressure from the main isn't high enough for a standard pressure vessel system, it can be augmented by a 12 l/min pump

that provides the top up pressure for the system to operate. Other advantages of this upgrade are that some tank refilling can take place during use so that the available volume from the vessel is increased and, if the tank is completely emptied, there will still be some supply directly from the pump - although now limited to the lower of what the mains can supply or 12 l/min.

Break tank with unrestricted booster pump

A break tank is filled from the mains and stores the water that is needed for periods of high use. If it incorporates an air gap as required by the byelaws, the installation is freed from both the water supply limitations of the mains and the restrictions on pump performance from the regulations. Because the restrictions to the mains are minimal, there will almost certainly be more water available to fill the tank than when the

mains supply was used directly, and this refill rate is completely unaffected by the use of the water in the tank.

» The pump can also be submersible and installed in the water for maximum space saving and minimal noise. «

How much performance is achieved is now entirely dependent on the pump that is used as there are no constraints from the supply. The only limit is the size of the tank, which needs to be sized to match overall usage. This is the system used in commercial buildings that routinely have greater demands

on water than can be met from the mains.

For domestic situations, it is possible to have tanks sized to take advantage of the spaces available and almost all of the tank volume can be used for storing water. The pump (or pumps, for bigger applications) can also be submersible and installed in the water for maximum space saving and minimal noise.

The more sophisticated systems use electronic inverter controls to regulate the speed of the pump(s) in such a way as to keep the water supply at constant pressure regardless of the number of users. This is energy efficient and allows a system to respond to a wide range of demands, hence is virtually standard in hotels and larger applications in these times of energy awareness. ■



There is a wide range of products supporting different technologies offering different solutions to low-pressure situations.