

Dura Pump

A complete guide to booster pump pressure vessels

Booster pump pressure vessels are essential components in water and pump systems, playing a critical role in maintaining pressure stability, reducing pump cycling and prolonging pump life. They help maintain consistent water pressure, improve pump efficiency and protect the entire system from unnecessary wear and tear.

In this guide, we will cover the basics of booster pump pressure vessels, how they work, why they are essential and how to maintain them.



What is a booster set pressure vessel?

A booster pump pressure vessel is a tank that stores pressurised water to balance the system and reduce fluctuations in water pressure. It works alongside a booster pump to maintain consistent pressure in the water distribution system.

Key components of a pressure vessel:

- Steel or composite outer shell: A robust material to handle internal pressure
- Bladder or diaphragm: Separates air from water and provides flexibility
- Air chamber: Holds compressed air that exerts pressure on the water
- Water inlet/outlet: The port where water enters and exits the tank.



How does a pressure vessel work?

A booster pump pressure vessel works by using compressed air to exert force on stored water, maintaining a steady pressure level. Here is a step-by-step look at how it works:

- Initial filling: When the pump runs, water fills the bladder inside the vessel, compressing the air chamber
- Maintaining pressure: The compressed air exerts pressure on the water, ensuring that pressure remains consistent even when the pump is not actively running
- Pressure drop: When water demand increases and the pressure drops below a set threshold, the pump kicks in again to refill the bladder, maintaining the required system pressure
- Release: Water is released from the pressure vessel to meet demand, allowing for less pump cycling and more efficient operation.



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Why is a pressure vessel important?

Pressure vessels offer several benefits to your booster pump system, improving efficiency, performance and longevity:

- **Reduced pump cycling:** Without a pressure vessel, your pump would start and stop frequently to keep up with pressure demands. A pressure vessel reduces pump cycling, prolonging the life of the pump by preventing excessive wear
- **Consistent water pressure:** The pressure vessel ensures steady water pressure, reducing the impact of sudden drops, especially during peak demand periods. This is particularly important in tall buildings and facilities with fluctuating water use
- **Energy savings:** Fewer pump cycles translate to energy savings as the pump only operates when necessary, optimising energy use
- **System protection:** Pressure vessels protect the overall system from water hammer, pressure surges, and unnecessary mechanical stress, all of which can lead to system failure or damage over time
- **Increased water availability:** The vessel stores water at a pressurised state, ensuring an instant supply of pressurised water during brief periods of high demand, such as showers or industrial cleaning processes.

Selecting the Right Pressure Vessel for Your Booster Pump.

Choosing the right pressure vessel is crucial to the efficient operation of your pump system.

Key Considerations:

- **Size of the vessel:** The capacity of the pressure vessel is related to how much water it can store and how effectively it can regulate pressure. Larger systems require bigger tanks to maintain consistent pressure.
- **Operating pressure:** The vessel should be at 85% of the set point of the booster set. The vessel's pre-charge pressure (the pressure inside the air chamber) must be set to correspond to the system's cut-in and cut-out pressures to ensure it works effectively.
- **Material and build quality:** Pressure vessels are made from various materials such as steel, stainless steel and composites. Select a vessel with high durability, especially if used in environments exposed to corrosive elements or extreme weather.
- **Bladder or diaphragm:** Ensure the pressure vessel includes a high-quality bladder or diaphragm that separates the water from the air chamber, ensuring longer service life and preventing waterlogging, which could reduce system efficiency.

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Maintaining your booster set pressure vessel.

Regular maintenance is crucial to the long-term functionality of the pressure vessel. Key maintenance tasks include:

- Check the pre-charge pressure: Over time, the air pressure inside the vessel may drop. Regularly check the pre-charge pressure and adjust it as necessary according to the manufacturer's recommendations
- Inspect for leaks or corrosion: Visually inspect the vessel for signs of leaks, rust or damage. Any deterioration could impact the vessel's ability to maintain pressure and lead to system failure
- Bladder/diaphragm replacement: If the bladder/diaphragm inside the vessel becomes damaged, water can enter the air chamber, causing waterlogging. Regularly check for signs of damage and replace it if necessary
- Check valves and connections: Ensure all inlet and outlet valves are functioning correctly and the connections are tight to prevent any loss of pressure or leakage.



Booster pump pressure vessels are essential components in any system that relies on steady and consistent water pressure. They help to reduce pump wear, improve energy efficiency and ensure reliable water supply.

By selecting the right pressure vessel and keeping up with regular maintenance, you can ensure your booster pump system operates efficiently and delivers long-term benefits, including cost savings and improved system reliability.

If you need any help in repairing or choosing a pressure vessel and/or a booster set, please get in touch.



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