

Pumping System Installation

An efficient pumping system can only be achieved by paying attention to the correct installation, operation and maintenance of these systems. The following outlines some of the factors that should be considered when installing and operating pumping systems.

- Site the pump as close as possible to the water, as this reduces the potential for cavitation, minimises friction losses and reduces energy use.
- Make sure suction and delivery pipes don't put a strain on the pump casing. Any strain on the pump may lead to damage and premature pump failure.
- Check that all pipe connections are tight. This reduces the potential for air to enter the system on the suction side of the pump, and consequently reduce pumping efficiency. Tight pipe connections on the delivery side of the pump minimise pressure and volume losses.
- Use a foot valve recommended by the pump manufacturer. Incorrectly sized foot valves may cause cavitation, restrict flow rates and reduce system efficiency.
- Anchor the pump securely so that it doesn't move during operation. Any movement can place strain on the casing and fittings, and could lead to premature pump failure.
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- Work the pump within its limits. Operating a pump at its Best Efficiency Point (BEP) maximises efficiency and minimises energy use and repair and maintenance costs.
- Provide adequate ventilation for the motor or engine. This reduces the potential for the motor to overheat and consequently reduce motor efficiency, or cause motor damage. Keeping Variable Frequency Drives (VFD) well ventilated and cool extends their working life.
- Keep the pump and motor connection aligned. Misalignment can cause vibration and accelerate wear of pump components.
- Ensure the pump is well primed. Lack of priming leads to overheating of the pump and can potentially destroy it.
- Install loss of prime cutoffs to prevent the pump operating if there is loss of prime, or flow rates exceed the maximum allowable limits of the pump e.g. a burst main line.
- Keep the foot valve free of debris. This minimises cavitation and maximises flow rates and system efficiency.
- Don't pump corrosive liquids, as this can reduce the life of the pump through premature wear.
- Make sure the pump discharge valve is open when operating the pump. If the valve is closed, recirculation within centrifugal pumps will occur, causing cavitation and overheating of the pump. In positive displacement pumps, equipment failure may occur very quickly if the discharge valve is closed.
- Don't operate the pump if it is vibrating excessively, as this may lead to pump failure due to damage to the pump itself, or failure of other components.



Variable Frequency Drive pump set

- Install suction pipes so air can't build up in them, and so air can be forced out during priming. Air retained in suction pipes leads to hard to prime systems, reduced suction capacity and increased cavitation.
- Have a regular maintenance programme in place. As with all mechanical systems, pumping systems are not set and forget. Regularly check the system for leaks and abnormal operation. Check air tank pressures, pipe work condition, control systems, mechanical seals and ampere draw of the pump motor. Pumping performance against specifications should also be regularly monitored.

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