

How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

Pumps Support Widespread Applications in Water Systems

Pumping facilities are required wherever gravity can't be used to supply water to the distribution system under sufficient pressure to meet all service demands. When used, pumping accounts for most of the energy consumed in water supply operations. Pumping equipment also represents a major part of a utility's investment in equipment and machinery. Typical uses of pumps in a water system are detailed below.

1. **Low-Service:** Centrifugal pumps lift water from the source to treatment processes or from storage to a filter-backwashing system.
2. **Well:** Centrifugal or vertical turbine pumps lift water from shallow or deep wells and discharge it to the treatment plant, storage facility, or distribution system.
3. **Chemical Feed:** Positive displacement pumps add chemical solutions at desired dosages for treatment processes.
4. **Sampling:** Positive displacement or centrifugal pumps pump water from sampling points to the laboratory or automatic analyzers.
5. **High-Service:** Centrifugal pumps discharge water under pressure to the distribution system.
6. **Booster:** Centrifugal pumps increase pressure in the distribution system or supply water to elevated storage tanks.
7. **Sludge:** Positive displacement or centrifugal pumps pump sludge from sedimentation facilities to further treatment or disposal.

Common Types of Pumps

Two basic categories of pumps are used in water supply operations: velocity pumps and positive-displacement pumps. Velocity pumps, which include centrifugal (A) and vertical turbine pumps (B), are used for most distribution system applications (see complete list below left). Positive-displacement pumps, such as lobe-type rotary pumps (C), are most commonly used in water treatment plants for chemical metering.

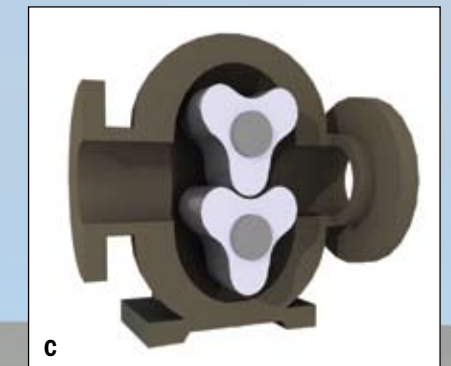
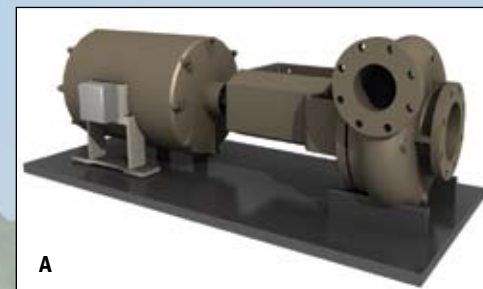


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ENGINEERING DRAWINGS: CAROLLO ENGINEERS

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