Pump Type	Basic Description	Key Features	Applications Used	Recommended Media (Fluid)	Advantages	Flow Rate Ranges	Total Head (Pressure) Ranges
Centrifugal Pumps	General name for pumps with one or more impellers. Many types and configurations for different applications. See below for specific centrifugal pump types.	One or more impellers. Casing is volute or diffuser type. Normally electric motor driven, but other drive types available.	All sorts of liquids can be pumps with centrifugal pumps. Highest flow rates of all pump types. Handles clean or dirty liquids, and liquids with low viscosity. Liquid should not contain air or vapors.	Water and relatively thin liquids (won't pump thicker oils). Can pump liquids with or without solids if proper impeller type is chosen. Available in alloys for corrosive services.	Best pump choice for lower viscosity (thin) liquids and high flow rates. No pulsations that may be found in some positive displacement pumps.	5 - 200,000 gpm -------- 19 - 757,080 lpm	10 - 7,500 ft -------- 3 - 2,286 m
Circulator Pumps	Circulator pumps is generally a pump with in-line suction and discharge flanges.	In-line suction and discharge piping connections. Pump may be equipped with a traditional motor and coupling, or may have a wetted rotor motor that eliminates the seal.	Circulator pumps are used in HVAC systems in buildings (chilled water circulation, hot water circulation, potable water circulation). Also circulation of cooling water in plants.	Water and relatively thin liquids.	In-line design saves on floor space.	5 - 750 gpm -------- 19 - 2,839 lpm	20 - 180 ft -------- 9 - 78 psi

Magnetic Drive Pumps	Magnetic drive pumps are a type of sealless centrifugal pump. It transmits the torque from the motor to the impeller by means of a rotating outer magnet which transmits the magnetic flux through a can to an inner magnet that is attached to the impeller. The inside of the can is thus isolated, with no shaft penetration, and the seal is eliminated.	Magnets are typically made of ceramic, samarium cobalt, or neodymium. Bushings and thrust surfaces inside the can are made of silicon carbide or tungsten carbide, or ceramic, to handle the potentially abrasive liquid that circulates inside the can. Most must be protected against loss of flow, which could seriously damage the pump due to temperature build-up due to the magnetic flux.	Pumping chemicals, hydrocarbons, or other liquids that are difficult to seal, or where the consequences of leakage are serious. Pumping heat transfer fluids which are high temperature or which are prone to costly evaporative losses with traditional mechanical seals.	All types of thin (non-viscous liquids).	Eliminates the mechanical seal, one of the largest components of pump maintenance cost. Plus, the pump is assured to be leak-free.	5 - 4,000 gpm -------- 19 - 15,142 lpm	25 - 1,000 ft -------- 11 - 434 psi
Multistage Pumps	Multistage pumps use multiple impellers with either diffusers or volutes generate more head than single stage (single impeller) pumps. Available in horizontal and vertical orientations.	Casing may be split radially or axially. Axial thrust may or may not be balanced out, depending on design. Impellers are enclosed design with diffuser or volute casing.	Higher pressure services such as boiler feed water, condensate, pipelines, reverse osmosis, and decaling.	Water and relatively thin liquids (won't pump thicker oils). Normally not used for liquids containing solids. Available in alloys for corrosive services.	Best ways to get high pressure with a centrifugal pump. Thrust loads may be lower than single stage designs.	5 - 10,000 gpm -------- 19 - 37,854 lpm	200 - 7,500 ft -------- 87 - 3,251 psi

Submersible Pumps	Submersible pumps involve a submersible motor with a close coupled to single stage pump that allows the entire assembly to operated submerged.	Submerged motor, either air-filled or oil-filled. Different impellers are designed to accommodate solids of various sizes.	Sump pump services, effluent and sewage services ranging in size from products for homes to main sewage treatment plants.	Water and relatively thin liquids (won't pump thicker oils). Can pump liquids with or without solids if proper impeller type is chosen.	Eliminates column shaft and bearings found in column sump pump. More compact, reduced sump installation cost. May be located in areas prone to flooding.	5 - 7,500 gpm -------- 19 - 28,391 lpm	10 - 200 ft ..... 4 - 87 psi
Vertical Turbine Pumps	Vertical turbine pumps are a vertical shaft pump that is designed to fit in a bore-hole well. Can also pump out of open reservoir, river, intake structure, or tank, or can be mounted in barrel for booster pump applications. Pump can have one or more impellers and diffuser bowls, depending on total head requirement.	Available with open and enclosed impellers. Sleeve bearings in pump diffuser bowls are lubricated by liquid pumped. Vertical high thrust motor mounted on top for product lubricated lineshaft bearings, or submersible motor mounted below pump to eliminate lineshaft and lineshaft bearings.	Irrigation, potable water supply, plant make-up water, cooling water, fire pumps, potable water distribution, booster pumps, process pumps.	Water and relatively thin liquids (won't pump thicker oils). Can pump liquids with or without solids if proper impeller type is chosen. Available in alloys for corrosive services.	Only practical way to pump from a deep well. Wide flow and head ranges. Low floor space usage. Immersed pump eliminates priming. Canned pump version excellent for low NPSH services	50 - 150,000 gpm -------- 189 - 567,810 lpm	15 - 2,000 ft -------- 7 - 867 psi

Well Pumps	A type of vertical turbine pump designed especially for use in a drilled bore-hole well. Also, for lower flow rates refer to jet pump type above.	Available with open and enclosed impellers. Sleeve bearings in pump diffuser bowls are lubricated by liquid pumped. Vertical high thrust motor mounted on top for product lubricated lineshaft bearings, or submersible motor mounted below pump to eliminate lineshaft and lineshaft bearings.	Irrigation, potable water supply, plant make-up water, cooling water, fire pumps, potable water distribution	Water and relatively thin liquids. Can pump liquids with or without solids if proper impeller type is chosen.	Only practical way to pump from a deep well. Wide flow and head ranges. Low floor space usage. Immersed pump eliminates priming.	50 - 20,000 gpm -------- 189 - 75,708 lpm	20 - 1,000 ft -------- 9 - 434 psi
Screw Pumps	Screw pumps use two intermeshing screws, driven by timing gears, move oils and other viscous liquids. Also available with three screws, one driving the other.	Two screw pumps make use of timing gears so that meshing screws don't drive each other. Triple screw types have one screw driving the other two and don't include timing gears.	Fuel transfer, elevators, and other applications requiring relatively high flow rates of viscous liquids.	Oils, fuels, and other high viscosity liquids. Also handles two-phase liquid/gas mixtures.	Highest flow rate of positive displacement pumps.	50 - 15,000 gpm -------- 189 - 56,781 lpm	50 - 4,500 psi -------- 3 - 310 bar