

Layne/Verli-Line®

Pentair Water

1100 Series Multi-Stage Vertical Turbine Pumps

Capacities to 40,000 GPM

Heads to 1,500 Feet

Temperatures to 200° F

*Vertical Turbine
Pump Products*



Water Lubricated Open Lineshaft

Vertical Hollow Shaft Motor

The vertical hollow shaft motor is designed specifically for turbine pump applications. Available in NEMA Weather-Protected Type I, Weather-Protected Type II, and Totally-Enclosed Fan Cooled enclosures.

Surface Discharge Head

The surface discharge head supports the column, shafting, motor and pump assembly. Standard design consists of a minimum 30,000 PSI tensile strength cast iron, and non-asbestos packing is compressed around the shaft by an adjustable gland. An optional lantern ring relieves pump pressure from the upper packing rings. The pumped liquid lubricates the packing rings. A drip basin collects the packing lubrication which is drained off. A grease fitting provides additional lubrication to a bronze upper shaft bearing. The top shaft and motor drive shaft are made of high tensile, C-1045 AISI pump shaft quality carbon steel. (Optional tube tension assembly for enclosure lineshaft available.) Horsepower rating, straightness and machining tolerance conform to ANSI/AWWA E101 standards.

Column Assembly

Column Assembly Column pipe conforms to ASTM A-53 Standards. Pipe ends are precisely machine faced to provide a positive butt fit between pipe sections and to maintain alignment throughout. The line shaft is made of high tensile, C-1045 AISI pump shaft quality carbon steel (optional materials available.) Lineshaft bearing assembly includes a cast bronze bearing retainer held concentrically, and butted between mating sections of column pipe for alignment. A long length, resilient, abrasion resisting neoprene bearing is provided. Grooves allow pumped liquid to lubricate bearing surface and entrained abrasives are flushed through. Column pipe couplings are made of steel. (Optional enclosed lineshaft for oil, water or grease lubricated lineshaft available.)

Bowl Assembly

Bowl castings are of ASTM A-30 cast iron. Enclosed bronze impellers are precision cast from bronze alloy B584-C83600 and statically balanced to provide highest efficiency and vibration free operation. Bowl bearings made of bronze alloy B505-C93200 are provided with each intermediate stage to assure alignment of the bowl shaft at each impeller. The pump shaft is made of 416 stainless steel AISI alloy pump shaft quality. The suction bell bearing made of bronze alloy B505-C93200 stabilizes the bottom of the pump shaft and provides accurate alignment of all impellers. The optional galvanized strainer is constructed of corrosion-resistant heavy gauge metal.

Lineshaft Options

Open lineshaft and bowl bearings are normally lubricated by the pumped liquid. There are applications, however, where the pumped liquid is either inadequate due to its lubricating qualities, or the upper line shaft bearings are not submerged. Enclosed lineshaft bearings are normally lubricated with oil fed by gravity from a standard one gallon, manually fed oil reservoir mounted on the discharge head. The oil flows through the tube tension assembly and within the shaft enclosing tube to each individual lineshaft bearing. Pump discharge case, bowls, and suction bearings are lubricated by the pumped liquid.



Column and Lineshaft Assemblies

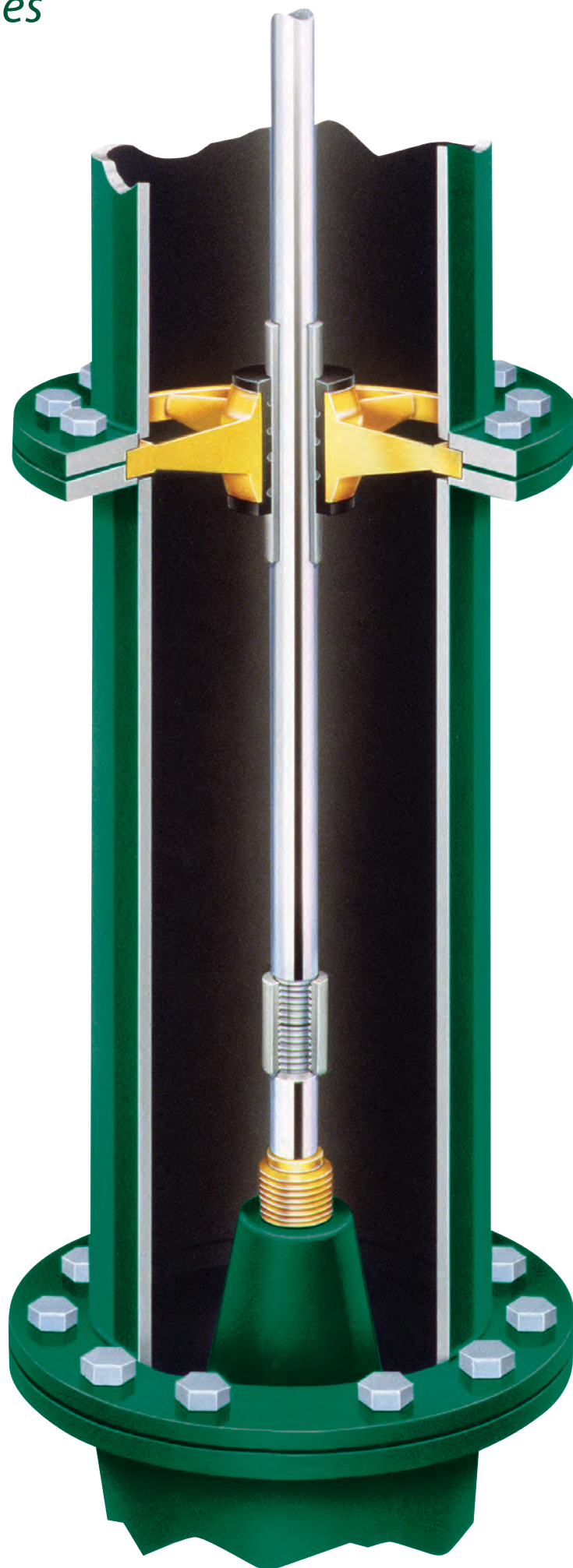
Threaded steel discharge column is available in standard sizes through 14" diameter. Where greater strength or ease of assembly and disassembly is required, flanged column pipe is also available in these sizes. Welded flanged column is supplied as standard in column sizes 16" and larger.

In open lineshaft construction thru 16", bearing retainers house neoprene spiral grooved rubber bearings. The shaft and renewable shaft sleeve rotate within these bearings. In 18" column and larger, the spider/bearing hub is welded in place just below the upper column flange.

On enclosed lineshaft applications, proper alignment is maintained by butting the pipe together within the sleeve-type pipe coupling. When open lineshafting is used, pipe ends are butted on the bearing retainer flange.

The driver horsepower is transmitted to the bowl assembly through a precision-ground, high tensile strength lineshaft. The shafting is coupled with an extra strong threaded coupling. The shaft size and bearing spacing is selected to meet horsepower and thrust requirements and to avoid operation at critical speeds.

Use of an enclosing tube protects the shaft from the liquid being pumped. Lubricant may be oil, grease or water flush. Interchangeable sections of five feet in length have machined ends to receive bronze connector bearings. Deep set turbines with an enclosed lineshaft utilize a tube stabilizer approximately every 50 feet of setting.



Turbine Bowl Assemblies

Where enclosed lineshaft is used, the connector bearings are lubricated with water, oil or grease depending upon the lubricant used in the enclosing tube.

Bowl bearings are lubricated with the liquid pumped, and assure accurate shaft alignment.

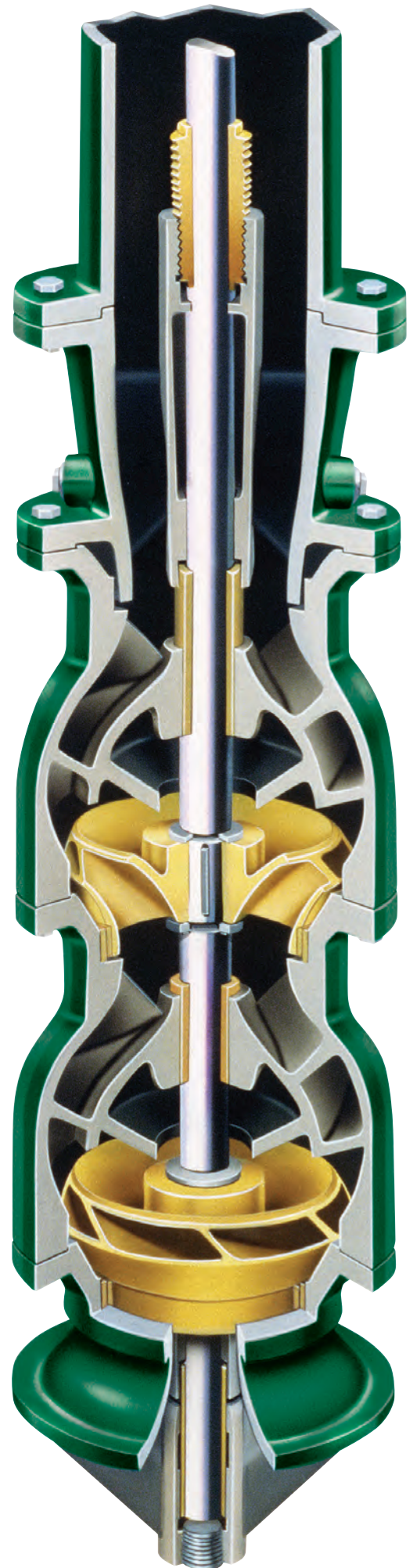
Bowl castings are manufactured of heavy-duty, high quality cast iron and feature a minimum 30,000 PSI tensile strength, with smooth passages designed for efficient operation. Optional coated passages are available to further pump efficiency. Bowls can be staged to produce higher pressures for a given capacity.

Enclosed impellers are matched to the pump bowls. The precision-cast impellers are statically balanced to avoid vibration. The impellers are secured to the shaft with tapered lock collets. On larger sized units, a key and ring are used to secure the impeller to the shaft. A top shaft adjusting nut or an adjustable type coupling are used to adjust the clearance between the impellers and bowls.

Impeller and bowl wear rings are available as options to renew impeller clearances when no further external adjustment is possible. These renewable rings enable the owner to restore a worn and inefficient unit to nearly original condition, extending operation for many years.

The cast iron suction bell and its integrally-cast guide vanes provide a smooth flow into the first stage impeller. This reduces the formation of vortexes and contributes to a more efficient operation. A suction case is available for well pump applications.

To ensure long life, the suction bearing is grease-packed and fitted with a sand collar to keep grit and abrasives from entering the bearing.



Discharge Heads

Rugged cast iron discharge heads meet sanitary requirements and support the column, lineshaft and bowl assemblies, while accepting any vertical driver. Large openings allow easy access to the stuffing box or mechanical seal, and smooth passageways ensure reduced friction loss and efficient overall operation. The integrally-cast discharge flange can be either a 125 lb or 250 lb design.

Cast iron or steel soleplates for mounting the discharge heads are available. Once the soleplate is leveled and grouted into place, the pump can easily be removed for maintenance, and then reset without realignment.

A water flush lubrication arrangement uses packing or mechanical seal to seal the shaft. An external water source is introduced at the packing or seal, and flows through the shaft enclosing tube to lubricate the lineshaft bearings. A renewable sleeve protects the shaft throughout the stuffing box area.

Fabricated discharge heads are formed from high quality steel, with the discharge in either flanged or plain-end design. The three segment elbow design smooths the fluid flow and reduces friction losses, for efficient operation.

Two-piece top shaft construction is supplied for ease of driver removal.

The shaft can be sealed with most mechanical seals. When mechanical seals are used with a vertical solid shaft driver, a spacer coupling is required to simplify seal maintenance and replacement.

The L-type fabricated discharge heads are designed to accept the column, shaft and bowl weight as well as the hydraulic thrust. The heads are formed from high quality steel and gusseted, providing a rigid base to eliminate vibration and assure smooth operation. Plain-end and flanged discharge designs are available.

A fabricated steel pedestal provides the means to mount the driver and provides access to the stuffing box or mechanical seal area. Air release connections are provided above the base plate.

The product-lubricated packing box is available through 400 PSI. Packing is graphite synthetic material. Seepage bypass box is available. Leakage drain connection is provided in the head to permit easy disposal of the liquid present in the packed box arrangement.

Underground discharge elbows are fabricated from high quality steel and available with either flanged or plain-end discharge. The centerline of discharge may be located any distance below grade.

(Oil lube pumps only)



Layne/Verti-Line Turbine Pumps . . . for every service.

Layne/Verti-Line is a manufacturer and distributor of vertical turbine pumps for the industrial process, agricultural, utility, petroleum, petro-chemical and municipal water supply and water treatment markets. For more than a century Layne/Verti-Line has been one of the leaders in the industry, constantly improving design to satisfy changing market requirements.

Layne/Verti-Line's history can be traced to 1882 when inventor Mahlon Layne drilled the first well. Then in 1903, Layne and entrepreneur P. D. Bowler joined in a manufacturing venture - soon the Layne & Bowler vertical turbine pump became the standard of excellence in the well pump industry. In less than 10 years the company had spread from the Mississippi basin west and overseas.

Today Layne/Verti-Line is a division of a multi-million dollar corporation with worldwide distribution. The Kansas City plant has over 500,000 square feet of complete manufacturing facilities, including testing capabilities.

Layne/Verti-Line vertical turbine pumps have proven superior under the most demanding condition - time.



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