

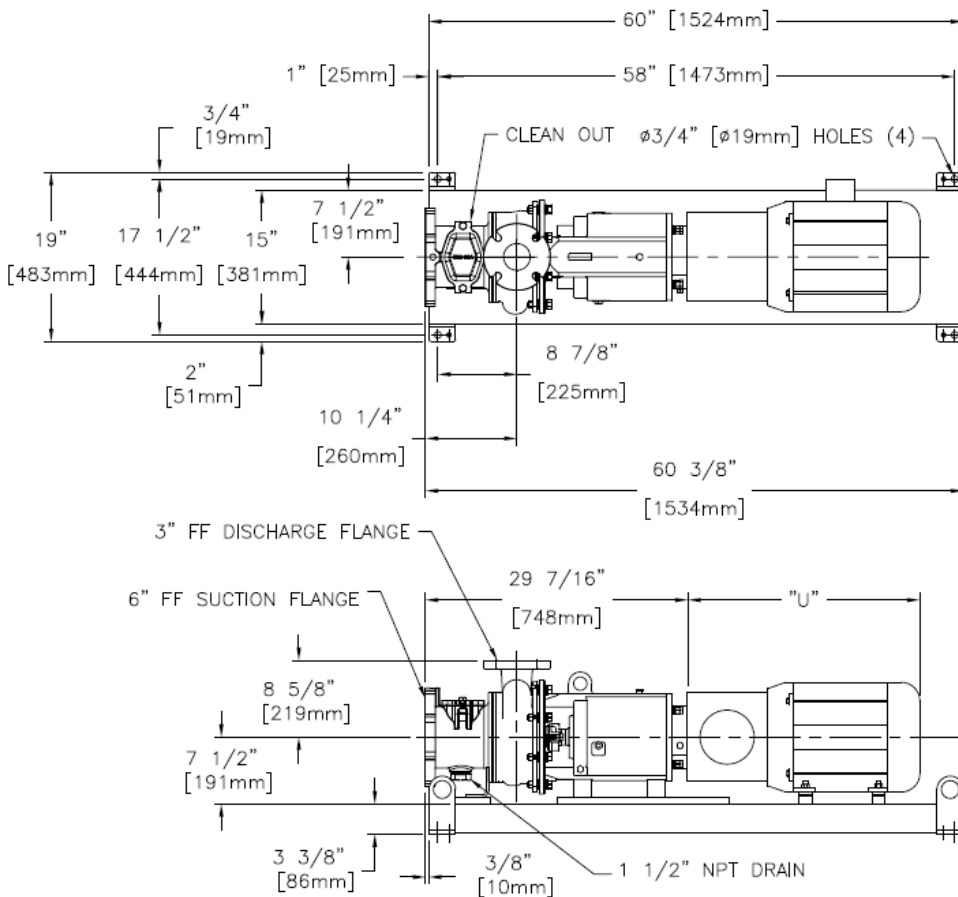


HE3L & HE3M HORIZONTAL CHOPPER PUMPS

Materials of Construction:

Impeller/Cutter Nut/Upper Cutter/Cutter Bar:	Cast alloy steel, heat treated to minimum Rockwell C 60.
Casing/Backplate:	Ductile cast iron.
Flushless Mechanical Seal:	Cartridge type with silicon carbide (or tungsten carbide) faces and stainless steel sleeve. (See following page for other sealing options)
Thrust Bearings:	Back-to-back angular contact ball bearings.
Radial Bearings:	Ball bearings.
Shaft:	Heat treated alloy steel.
Lubrication:	ISO 46 hydraulic oil.
Suction flange:	6" ANSI CL 125, DIN 150 compatible
Discharge flange:	3" ANSI CL 125
Mounting Base:	Carbon Steel.
Paint:	Epoxy.

DRAWINGS AND DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE. DO NOT USE FOR CONSTRUCTION PURPOSES. CONTACT VAUGHAN FOR CERTIFIED CONSTRUCTION PRINTS.



NEMA Frame Size	*U
184TC	23.00"
213TC	24.75"
215TC	26.25"
254TC	29.00"
256TC	30.75"
284TC	32.25"
286TC	33.75"
324TC	37.60"

IEC Frame Size	*U
112M	648 mm
132S	691 mm
160M	813 mm
180M	955 mm
200L	962 mm

MODEL: HE3L/3M SPEC SHEET DWG. #119970 REV. 0 08/2/18

*FOR REFERENCE ONLY. DIMENSION WILL VARY BY MOTOR MANUFACTURER



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For all current patents, see <https://www.chopperpumps.com/patents/>

**MADE IN THE
USA**

SPECIFICATION: HE3L & HE3M HORIZONTAL CHOPPER PUMPS

The horizontal chopper pump shall be specifically designed to pump waste solids at heavy consistencies without plugging or dewatering of the solids. Materials shall be chopped and conditioned by the pump as an integral part of the pumping action. The pump must have demonstrated the ability to chop through and pump high concentrations of solids such as plastics, heavy rags, grease and hair balls, wood, paper products and stringy materials without plugging, both in tests and field applications. Pump shall be manufactured by Vaughan Co., Inc.

DETAILS OF CONSTRUCTION

- A. Casing and Backplate:** The pump casing shall be of volute design, spiraling outward to the ANSI CL 125 flanged centerline discharge. Back pull-out design shall incorporate adjusting sleeves for accurate adjustment of impeller-to-cutter bar clearance, and shall allow removal of pump components without requiring disconnection of casing from inlet or discharge piping. Casing and backplate shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. A 1/4" NPT pressure tap shall be included on the discharge flange. The backplate shall include a replaceable Rockwell C60 cast alloy steel cutter adjustable for 0.005"–0.050" (0.015–1.25 mm) clearance to cut against the rotating impeller pump-out vanes for removing fiber and debris.
- B. Impeller:** Shall be 3 blade (3L) or 5 blade (3M) semi-open type with pump out vanes to reduce seal area pressure. Chopping of materials shall be accomplished by the action of the cupped and sharpened leading edges of the impeller blades moving across the cutter bar at the intake openings, with a set clearance between the impeller and cutter bar of 0.015–0.025" (0.40–0.65 mm) cold. Impeller shall be cast alloy steel heat treated to minimum Rockwell C 60 and dynamically balanced. The impeller shall be keyed to the shaft and shall have no axial adjustments and no set screws.
- C. Cutter Bar:** Shall be recessed into the pump bowl and shall contain at least 2 shear bars extending diametrically across the intake opening to within 0.010"–0.030" (0.25–0.75 mm) of the rotating cutter nut tooth, for the purpose of preventing intake opening blockage and wrapping of debris at the shaft area. Cutter bar shall be cast alloy steel heat-treated to minimum Rockwell C60.
- D. Cutter Nut:** The impeller shall be secured to the shaft using a cutter nut, designed to cut stringy materials and prevent binding using a raised, rotating cutter tooth. The cutter nut shall be cast alloy steel heat treated to minimum Rockwell C60.
- E. Upper Cutter:** Shall be threaded into the backplate behind the impeller, designed to cut against the pump-out vanes and the impeller hub, reducing and removing stringy materials from the mechanical seal area. Upper cutter shall be cast alloy steel heat treated to minimum Rockwell C60. The upper cutter teeth are positioned as closely as possible to the center of shaft rotation to minimize cutting torque and nuisance motor tripping. The ratio of upper cutter cutting diameter to shaft diameter in the upper cutter area of the pump shall be 3.0 or less.
- F. Pump Shafting:** The pump shaft and impeller shall be supported by rolling element bearings. Shafting shall be heat treated alloy steel.
- G. Bearings:** Shall be oil-bath lubricated with ISO 46 hydraulic oil. Shaft thrust in both directions shall be taken up by two back-to-back mounted single-row angular contact ball bearings. Two adjacently mounted single-row radial bearings shall also be provided. L-10 bearing life shall be minimum 100,000 hours.
- H. Bearing Housing:** Shall be ductile cast iron and machined with piloted bearing fits for concentricity of all components. Bearing housing shall include a side-mounted sight glass. Bronze non-contacting labyrinth style, O-ring mount bearing isolators shall be provided at each end of the bearing housing to prevent egress of oil and ingress of contaminants. Thrust bearings are mounted in an adjustable cartridge to allow external adjustment of the upper cutter.
- I. Stuffing Box:** Shall be ductile cast iron. The stuffing box shall be designed to accommodate the mechanical seal, or packing. Mechanical seal with no seal water flush and flushed tandem mechanical seal as described below do not require a stuffing box.
- J. Seal:** Please choose one of the four options below:
- Mechanical Seal system specifically designed to require no seal flush: The mechanical seal shall be located immediately behind the impeller hub to eliminate the stuffing box and maximize the flushing available from the impeller pump-out vanes. The seal shall be a cartridge-type mechanical seal with Viton O-rings and silicon carbide (or tungsten carbide) faces. This cartridge seal shall be pre-assembled, and pre-tested so that no seal settings or adjustments are required from the installer. Any springs used to push the seal faces together must be shielded from the fluid to be pumped. The cartridge shall also include a heat treated 17-4PH stainless steel seal sleeve and 316 stainless steel seal housing.
 - Flushed Tandem Mechanical Seal: The seal shall be cartridge-type tandem mechanical seal with Viton O-rings and silicon carbide (or tungsten carbide) faces. This cartridge seal shall be a pre-assembled and pre-tested so that no seal settings or adjustments are required from the installer. Any springs used to push the seal faces together must be shielded from the fluid to be pumped. The cartridge shall also include a heat treated 17-4PH stainless steel seal sleeve and stainless steel seal housing. Seal requires flush to drain at 3 GPH (11L/h) flow rate.
 - Mechanical seal with throttle bushing and water fitting for seal water flush. The seal shaft sleeve shall be 316 SS. Mechanical seal materials shall be either 316 stainless steel or Alloy 20 with silicon carbide or tungsten carbide faces. Seal shall be positively driven by set-screws. Elastomers shall be of Buna N, and stationary seal member shall be of the cup-mounted type to ensure cushioning of face material from mechanical shock. Contractor is to provide a 6-10 GPH (25–40 L/h) seal flush with filtered water, a rotameter, throttle valve, and solenoid operated isolation valve interlocked with an auxiliary contact of the motor starter.
 - Packing design with 5-ring packing split Teflon lantern ring and water fitting. The packing shaft sleeve shall be 316 stainless steel with Nickel-Chrome-Boron coating. Contractor is to provide a filtered water packing flush at 10 PSI (0.7 bar) greater than pump discharge pressure. The flush water line is to be interlocked with an auxiliary contact of the motor starter so it is automatically turned on when the motor is started.
- K. Inlet Manifold:** Shall be cast ductile iron assembly mounted horizontally with ANSI CL 125 inlet flange, 1/2"-NPT pressure tap, cleanout, drain connection and mounting feet.
- L. Shaft Coupling:** Bearing housing and motor stool design is to provide accurate, self-aligning mounting for a C or B5 flanged, electric motor. Pump and motor coupling shall be T.B. Woods Sureflex elastomeric type.
- M. Optional Belt Drive:** Adjustable brackets shall be used to support an over-head or side mounted motor. Sheaves and belts shall be properly sized for power ratings, and all guards are to be supplied with the belt drive system.
- N. Stainless Steel Nameplate:** Shall be attached to the pump giving the manufacturer's model and serial number, rated capacity, head, speed and all pertinent data.
- O. Motor Requirements:** Drive motor shall be ____ HP (KW), ____ RPM, ____ volts, 3 phase, 60(50) hertz, 1.15 service factor, C or B5 flange and foot mounted, TEFC enclosure. The motor shall be sized for non-overloading conditions.
- P. Surface Preparation:** Solvent wash and a single coat of Tnemec 431 epoxy (except motor).
- Q. Optional Premium Surface Preparation:** Solvent wash, sandblast, and coat with minimum 30 MDFT Tnemec Perma-Shield PL Series 431 epoxy (except motor).