

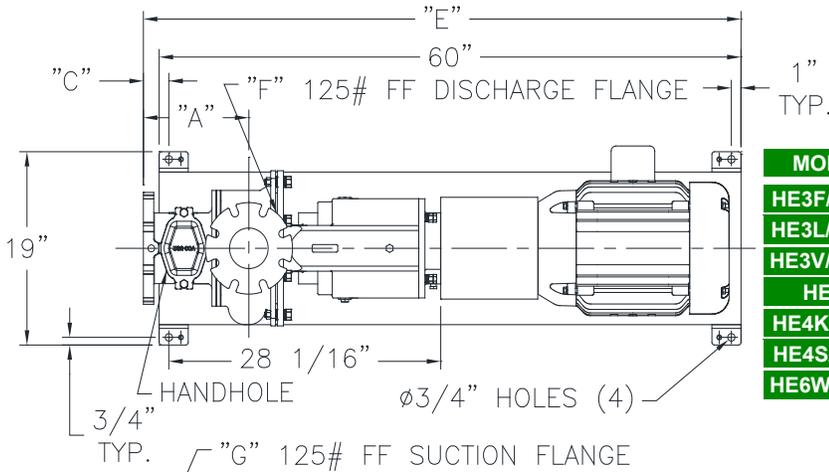


# 3"- 6" HE-SERIES HORIZONTAL CHOPPER PUMPS

## Materials of Construction:

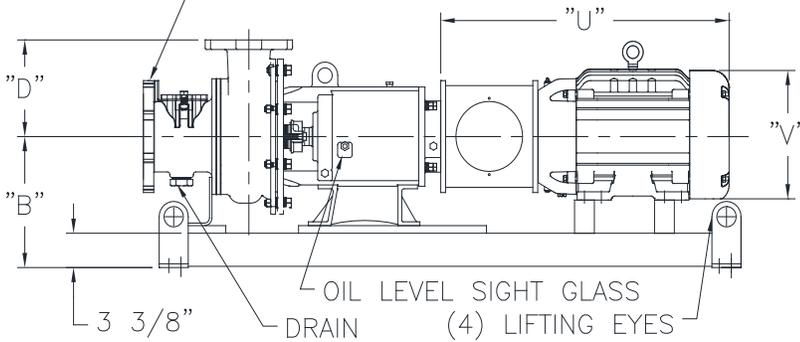
- Impeller/ Cutter Nut /Upper Cutter:** ..... Cast alloy steel, heat treated to minimum Rockwell C 60.
- Cutter Bar:** ..... Alloy steel or cast alloy steel, heat treated to minimum Rockwell C 60.
- Casing/Back Pull-Out Plate:** ..... Ductile cast iron.
- Flushless Mechanical Seal:** ..... Cartridge 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 type or face to face tapered roller type.
- Radial Bearings:** ..... Ball type or cylindrical roller type.
- Shaft:** ..... Heat treated alloy steel.
- Lubrication:** ..... ISO 46 hydraulic oil.
- Flanges:** ..... ANSI Class 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.



DIMENSIONS IN INCHES

MODEL	A	B	C	D	E	F	G
HE3F/HE3G	10-1/2	10-7/8	2-1/8	7-5/8	61-1/8	3	6
HE3L/HE3M	10-1/4	10-7/8	1-3/8	8-5/8	60-3/8	3	6
HE3V/HE3W	9-11/16	12-7/8	1-3/8	8-5/8	60-3/8	3	6
HE3P	9-11/16	12-7/8	1-3/8	11	60-3/8	3	6
HE4K/HE4L	10-7/8	12-7/8	2-5/8	9-1/2	61-5/8	4	6
HE4S/HE4T	10-3/4	12-7/8	1-7/8	11-1/2	60-7/8	4	6
HE6W/HE6X	11-3/4	15-1/16	3-3/8	13-1/2	62-3/8	6	8



Frame Size	*U	*V
184TC	23	10
213TC	25	11
215TC	26	11
254TC	30	13
256TC	32	13
284TC	33	15
284TSC	33	15
286TC	34	15
286TSC	28	15
324TC	36	17
324TSC	34	17
326TC	38	17
326TSC	34	17
364TC	40	19
364TSC	38	19
365TC	40	19

\*FOR REFERENCE ONLY. DIMENSIONS WILL VARY SLIGHTLY BY MOTOR MANUFACTURER



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# SPECIFICATIONS- HE SERIES 3"- 6" 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/macerated 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 Back-plate:** The pump casing shall be of volute design, spiraling outward to the Class 125 flanged centerline discharge. Back pull-out design shall incorporate jacking bolts 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 & back-plate shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. A pressure tap shall be included on or near the discharge flange. Back-plate shall include a replaceable Rockwell C 60 cast alloy steel cutter adjustable for 0.005-0.050" clearance to cut against the rotating impeller pump-out vanes for removing fiber and debris.
- B. Impeller:** Shall be 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" 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" of the rotating cutter nut tooth, for the purpose of preventing intake opening blockage and wrapping of debris at the shaft area. Chopper pumps utilizing individually mounted shear bars shall not be acceptable. Cutter bar shall be cast alloy steel or alloy steel heat-treated to minimum Rockwell C 60.
- 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 C 60.
- E. Upper Cutter:** Shall be threaded into the back pull-out adapter plate 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 C 60. 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:** 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 or two face to face mounted tapered roller bearings. Two adjacently mounted single-row radial bearings or one cylindrical roller type 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 site 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 upper cutter adjustment.
- 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 does not require stuffing box.
- J. Seal:** [NOTE TO CONSULTING ENGINEER]: 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 17-4PH, heat-treated seal sleeve and 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 17-4PH, heat-treated seal sleeve and stainless steel seal housing. Seal requires flush to drain at 3 US gallons per hour 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 gal./hr. 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 SS with Nickel-Chrome-Boron coating. Contractor is to provide a filtered water packing flush at 10 PSI 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 a Class 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-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 horsepower 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, \_\_\_\_ RPM, \_\_\_\_ volts, 3 phase, 60 hertz, 1.15 service factor, C-flange 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).