



3"- 6" E-Series Horizontal Chopper Pumps Metric Specs

Materials of Construction:

Impeller/ Cutter Nut /

Upper Cutter: Cast Steel, heat treated to minimum Rockwell C 60.

Cutter Bar: Plate Steel, heat treated to minimum Rockwell C 60.

Casing/Back Pull-Out Plate: Ductile Cast Iron.

Flushed Mechanical Seal: Welded bellows with silicon carbide (or tungsten carbide) faces.

Flushless Mechanical Seal: Cartridge type with silicon carbide (or tungsten carbide) faces.

Seal Sleeve: Stainless steel.

Thrust Bearings: Back-to-back angular contact ball type.

Radial Bearings: Ball type.

Shaft: Heat treated steel.

Lubrication: ISO Gr. 100 oil.

Flanges: 125 lb. ANSI rated.

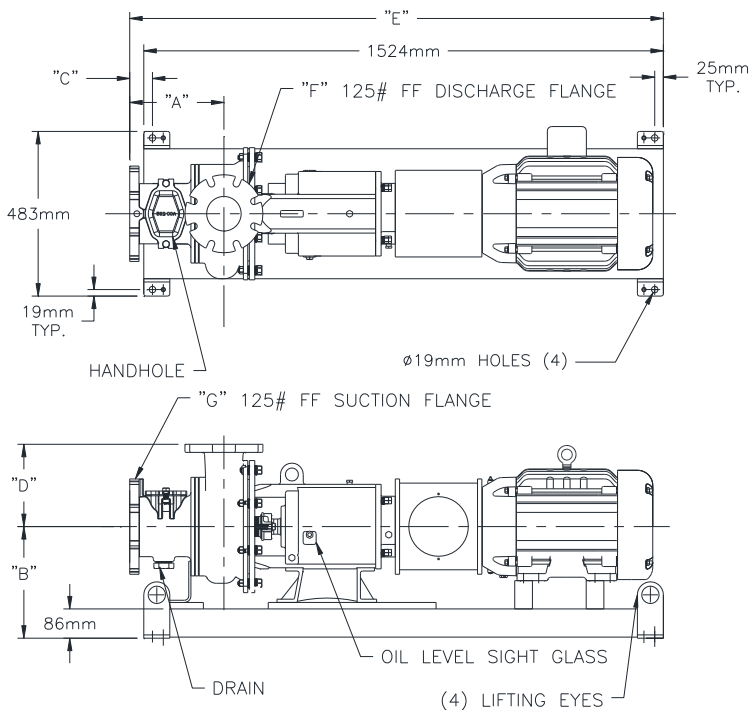
Mounting Base: Carbon Steel.

Paint: Acrylic Urethane.

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

MODEL	A	B	C	D	E	F	G
HE3F6 / HE3G6	267	276	54	194	1553	3 in.	6 in.
HE3L6 / HE3M6	260	276	35	219	1534	3 in.	6 in.
HE3V6 / HE3W6	246	327	35	219	1534	3 in.	6 in.
HE3P6	246	327	35	279	1534	3 in.	6 in.
HE4K6 / HE4L6	276	327	67	241	1565	4 in.	6 in.
HE4P6 / HE4R6	273	327	48	292	1546	4 in.	6 in.
HE4S6 / HE4T6	273	327	48	292	1546	4 in.	6 in.
HE6U8	295	327	86	305	1584	6 in.	8 in.
HE6W8 / HE6X8	298	383	86	343	1584	6 in.	8 in.

UNITS: mm
UNLESS NOTED
OTHERWISE



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CURRENT U.S. PATENTS: Nos. 7,125,221, 5,460,482; 5,460,483; 5,456,580; 5,256,032; 5,076,757; 4,840,384; 4,842,479.

CURRENT FOREIGN PATENTS: Nos. 2 371 834; 2 188 138; 1,290,981; 276224; 0 774 045.

OTHER PATENTS PENDING.

SPECIFICATIONS – 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 Pull-Out Plate: The pump casing shall be of volute design, spiraling outward to the 125 lb. 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 & backplate 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. Backplate shall include a replaceable Rockwell C 60 steel cutter adjustable for 0.005-0.015" clearance to cut against the rotating impeller pumpout vanes for removing fiber and debris.
- B. Impeller: Shall be semi-open type with pump out vanes to reduce seal area pressure. Chopping/maceration 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 maximum 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 Plate: Shall be recessed into the pump bowl and shall contain at least 2 shear bars extending diametrically across the intake opening to within 0.010-0.020" 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 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 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 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 Gr. 100 turbine 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. B10 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. Viton® double lip seals riding on stainless steel shaft sleeves are to provide sealing at each end of the bearing housing. 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 as described below does not require stuffing box.
- J. Seal: [NOTE TO CONSULTING ENGINEER: Please choose one of the 3 options below]:
- Packing design with 5-ring Kevlar 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 22-38 L/hr. packing flush with filtered water, a rotameter, throttle valve, and solenoid operated isolation valve interlocked with an auxiliary contact of the motor starter.
 - Mechanical seal with throttle bushing and water fitting for seal water flush. The seal shaft sleeve shall be AISI 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 22-38 L/hr. seal flush with filtered water, a rotameter, throttle valve, and solenoid operated isolation valve interlocked with an auxiliary contact of the motor starter.
 - 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 pumpout vanes. The seal shall be a cartridge-type mechanical seal with Viton O-rings and silicon 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 a CF8M stainless steel seal gland.
- K. Inlet Manifold: Shall be cast ductile iron assembly mounted horizontally with a 125 lb. inlet flange, ½"-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 Nameplates: Shall be attached to the pump and drive motor giving the manufacturer's model and serial number, rated capacity, head, speed and all pertinent data.
- O. Motor Requirements: Drive motor shall be ____ KW, _____ RPM, ____ volts, __ phase, ____ hertz, _____ service factor, C-flange mounted, _____ enclosure. The motor shall be sized for non-overloading conditions.
- P. Surface Preparation: Degreased and coated with an acrylic urethane (except motor).
- Q. OPTIONAL ADDER Surface Preparation: SSPC-SP5 commercial sandblast, primed with 3 MDFT zinc-filled primer and finish coated with 3 MDFT epoxy (except Motor).



8"–12" E-Series Horizontal Chopper Pumps Metric Specs

Materials of Construction:

Impeller / Upper Cutter /

External Cutter:Cast alloy steel, heat treated to minimum Rockwell C 60.

Cutter Bar / Back Wear Plate:Plate steel, heat treated to minimum Rockwell C 60.

Casing/Back Pull-Out Plate:Ductile cast iron.

Flushed Mechanical Seal:Welded bellows with silicon carbide (or tungsten carbide) faces.

Flushless Mechanical Seal:Cartridge type with silicon carbide (or tungsten carbide) faces.

Optional Packing:5-ring packing with split Teflon lantern ring.

Seal Sleeve:Stainless steel.

Thrust Bearings:Back-to-back angular contact ball type.

Radial Bearings:Spherical roller type.

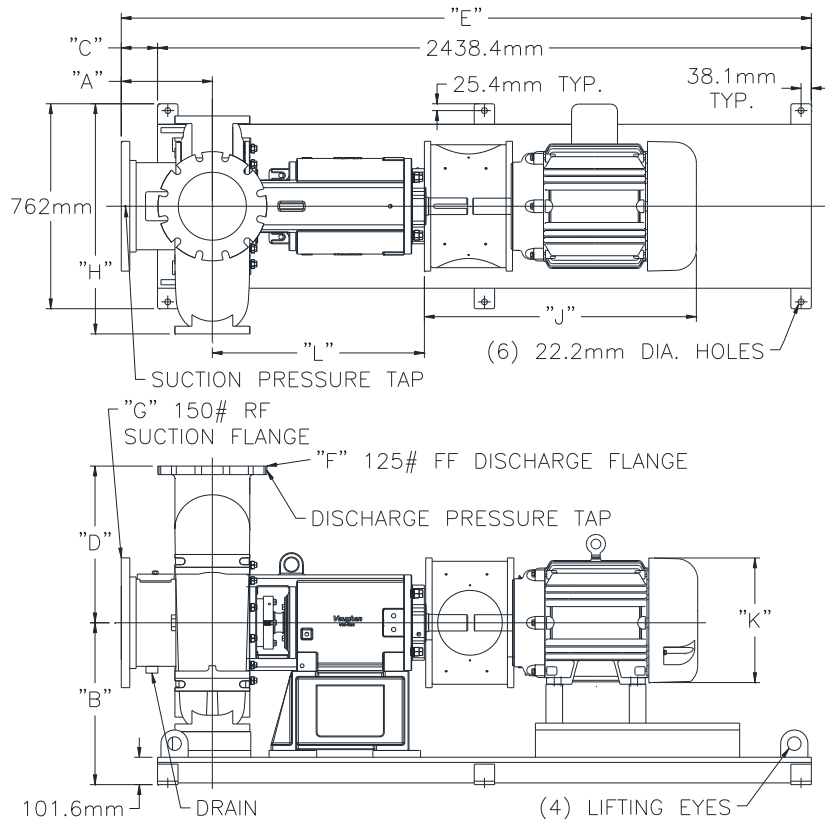
Shaft:Heat treated steel.

Lubrication:ISO Gr. 100 oil.

Flanges:125 lb. Discharge, 150 lb. suction ANSI rated.

Mounting Base:Carbon Steel.

Paint:Acrylic Urethane.



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

UNITS: mm UNLESS NOTED OTHERWISE

MODEL	A	B	C	D	E
HE8N10	325	470	114	451	2,546
HE8P10	303	470	81	476	2,519
HE10R12	337	602	132	584	2,570
HE12U14	191*	699*	-13	686*	2,426*

MODEL	F	G	H	L
HE8N10	203	254	732	791
HE8P10	203	254	691	770
HE10R12	254	305	856	791
HE12U14	305	457*	954	803

* Suction manifold not standard on HE12U. 14", 16" or 18" adapter flanges available.

MOTOR FRAME SIZE	J	K
286TC	1010	371
324TC / 326TC	1080	419
364TC / 365TC	1156	464
404TC / 405TC	1284	511
444TC / 445TC	1486	568



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CURRENT FOREIGN PATENTS: Nos. 2 371
834; 2 188 138; 1,290,981; 276224; 0 774 045.
OTHER PATENTS PENDING.

SPECIFICATIONS – 8" – 12" E-SERIES 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, Back Pull-Out Adapter Plate and Wear Plate: The pump casing shall be of volute design, spiraling outward to the 125 lb. flanged centerline discharge. A 1/2"-NPT pressure tap shall be included on or near the discharge flange. Back pull-out adapter plate shall allow removal of pump components from outboard of the casing, and allow external adjustment of impeller-to-cutter bar clearance. Casing and adapter plate shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. The back pull-out wear plate shall be heat treated low-alloy steel plate. Backplate will include a replaceable Rockwell C 60 steel wear plate adjustable for .13-1.27mm clearance to cut against the rotating impeller pumpout vanes for removing fiber and debris.
- B. Impeller: Shall be semi-open type with pump out vanes to reduce seal area pressure. Chopping/maceration 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 maximum set clearance between the impeller and cutter bar of .38-.64mm. Impeller shall be cast steel, heat treated to minimum Rockwell C 60 and dynamically balanced. The impeller shall be threaded to the shaft and shall have no axial adjustments and no set screws.
- C. Cutter Bar Plate: Shall be recessed into the pump bowl and shall contain at least 2 shear bars extending diametrically across the intake opening to within .51-1.02mm for 8"-10" pumps and 1.02-1.52mm for 12" pumps of the rotating external cutter tooth, for the purpose of preventing intake opening blockage and wrapping of debris at the shaft area. Chopper pumps utilizing individually mounted shear bars, and which do not have a rotating external cutter extending through to the opposite side of the shear bar, shall not be acceptable. Cutter bar shall be alloy steel heat-treated to minimum Rockwell C 60.
- D. Upper Cutter: Shall be bolted 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 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 3.6 or less.
- E. External Cutter: The external cutter shall be used to eliminate binding or build-up of stringy materials at the pump inlet. The external cutter shall consist of opposing cutter wings which shear against the outside surface of the shear bars on the cutter bar plate to within .25-.51mm, an integral cast anvil which shears against the adjacent surface of the shear bars on the cutter bar plate, and a hex head sufficiently sized for ease of removal. The external cutter shall be cast steel and heat treated to a minimum 60 Rockwell C Hardness.
- F. Pump Shafting: The pump shaft and impeller shall be supported by ball bearings. All shafting shall be heat treated.
- G. Bearings: Shaft thrust in both directions shall be taken up by two back-to-back mounted single-row angular contact ball bearings, mounted in an adjustable position thrust bearing cartridge to permit upper cutter to impeller adjustment. A single spherical roller radial bearing shall also be provided. B10 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 be oil bath lubricated with ISO Gr. 100 turbine oil and a side-mounted site glass. Vitor® double lip seals riding on stainless steel shaft sleeves are to provide sealing at each end of the bearing housing.
- I. Stuffing Box: The stuffing box shall be ductile cast iron. The stuffing box shall be designed to accommodate the flushed mechanical seal, or packing as described below.
- J. Seal: [NOTE TO CONSULTING ENGINEER: Please choose one of the 3 options below]:
- Packing design with 5-ring Kevlar 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 23-38 L/hr. packing flush with filtered water, a rotameter, throttle valve, and solenoid operated isolation valve interlocked with an auxiliary contact of the motor starter.
 - 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 Alloy 20 with silicon 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 23-38 L/hr. seal flush with filtered water, a rotameter, throttle valve, and solenoid operated isolation valve interlocked with an auxiliary contact of the motor starter.
 - 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 pumpout vanes. The seal shall be a screw-in, cartridge-type mechanical seal with Viton O-rings and silicon carbide (or tungsten carbide) faces. This cartridge seal shall be a pre-assembled, 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 a ductile iron seal gland.
- K. Inlet Manifold: The pump assembly shall be mounted horizontally with a 150 lb. standard inlet flange, cleanout, 1/2" NPT suction pressure tap, 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 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 Nameplates: Shall be attached to the pump and drive motor giving the manufacturer's model and serial number, rated capacity, head, speed and all pertinent data.
- O. Drive motor: Shall be _____ KW, _____ RPM, _____ volts, _____ phase, _____ hertz, _____ service factor, foot and C-flange mounted, _____ enclosure. The motor shall be sized for non-overloading conditions.
- P. Degreased and coated with an acrylic urethane (except motor).
- Q. OPTIONAL ADDER Surface Preparation: SSPC-SP5 commercial sandblast, 3 MDFT zinc-filled primer, and 3 MDFT epoxy finish coat (except Motor).