

## PSC12D: 12" VERTICAL DRY PIT SCREW CENTRIFUGAL PUMP

### Materials of Construction:

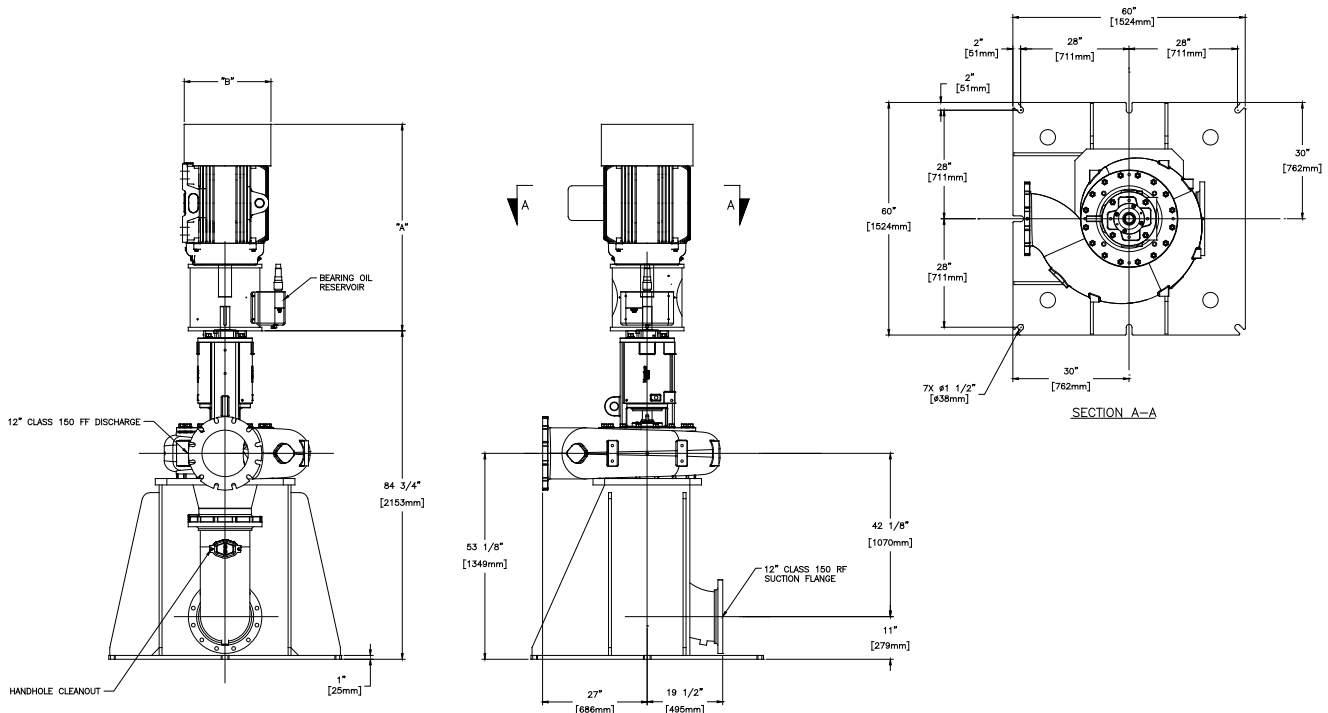
**Impeller/Casing/Suction Cone/Back Pull-Out Plate:** ....Ductile cast iron.  
**Back Wear Plate/Cutter:** ..... Alloy steel, heat treated to minimum Rockwell C 60.  
**Flushless Mechanical Seal:**..... Cartridge type with silicon carbide (or tungsten carbide) faces and stainless steel sleeve. (See following page for other sealing options)  
**Thrust Bearings:** ..... Face to face tapered roller type.  
**Radial Bearings:**..... Spherical roller type  
**Shaft:**..... Heat treated alloy steel.  
**Lubrication:** ..... ISO 46 hydraulic oil.  
**Flanges:** ..... ANSI Class 150 suction and Class 125 discharge.  
**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.**

IEC FRAME	*A	*B
200L	985 mm	395 mm
225S	1040 mm	445 mm
225M	1065 mm	445 mm
250M	1145 mm	485 mm
280S	1240 mm	580 mm
280M	1670 mm	580 mm
315L	1700 mm	655 mm
315M	1500 mm	655 mm

\*Note: Figures are for guidance only. Dimensions may differ between motor manufacturers.

NEMA FRAME	*A	*B
284TC	33"	14.5"
286TC	35"	14.5"
324TC	38"	16.5"
326TC	40"	16.5"
364TC/365TC	41"	18.5"
404TC/405TC	47"	23.5"
444TC/445TC	54"	23.5"
447TC	57.5"	23.5"
449TC	62.5"	23.5"



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## SPECIFICATION, 12" VERTICAL DRY PIT SCREW CENTRIFUGAL PUMP

The Vendor shall furnish ( ) horizontal, end suction, screw-centrifugal pump(s) and all appurtenances as specified below. The pump(s) shall be of heavy-duty construction intended for services requiring reliable solids handling, gentle pumping action, high efficiency, and low NSPHR. Pump shall be manufactured by Vaughan Co., Inc.

### DETAILS OF CONSTRUCTION

- A. Casing, Back Plate and Wear Plate:** The pump casing shall be of volute design, spiraling outward to the Class 125 flanged centerline discharge. Back pull-out design shall incorporate adjusting sleeves for accurate adjustment of impeller-to-suction cone clearance, and shall allow removal of pump components without requiring disconnection of casing from inlet or discharge piping. A 1/2"-NPT pressure tap shall be included on or near the discharge flange. Casing and back plate shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. The replaceable wear plate shall be heat treated alloy steel with cutting groove to cut against insert cutter in the impeller hub.
- B. Inlet Suction Cone:** The inlet suction cone shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. The suction cone shall incorporate a spiral groove to channel trapped fiber into the casing that would otherwise bind between the impeller OD and the inlet cone ID. The clearance of the impeller to the cone shall be externally adjustable without requiring pump or piping disassembly or special tools.
- C. Impeller:** Shall be open channel, screw-centrifugal type. The impeller shall be ductile cast iron and shall be dynamically balanced. The single-passage impeller shall combine the action of a positive displacement screw and a single-vane centrifugal impeller.
- D. Impeller Hub Cutter:** Shall be alloy steel hardened to minimum Rockwell C 60 and fitted into the impeller hub.
- E. Pump Shafting:** The pump shaft and impeller shall be supported by spherical roller and tapered roller bearings. Shafting shall be heat treated steel.
- F. Stuffing Box:** The 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 stuffing box.
- G. Seal:** [NOTE TO CONSULTING ENGINEER: Please choose one of the 4 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 pumpout 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 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.
  - 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 (11 liter) per hour flow rate.
  - 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 6-10 gal./hr. (25-40 liter/hour) 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 (.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.
- H. Bearings:** Shaft thrust in both directions shall be taken up by two face to face mounted tapered roller bearings. Spherical roller bearings shall be provided for radial loads. Bearings shall be rated with a minimum L10 bearing life of 100,000 hours at any acceptable operating point on the performance curve.
- I. Bearing Housing:** Shall be ductile cast iron, and machined with piloted bearing fits for concentricity of all components. Bearing housing shall have oil bath lubrication using ISO 46 hydraulic oil, and shall include a side mounted oil reservoir. Viton double lip seals riding on chromed and ground stainless steel shaft sleeves are to provide sealing at each end of the bearing housing.
- J. Inlet Manifold:** The pump assembly shall be mounted vertically with a Class 150 inlet flange, cleanout, 1/2" NPT suction pressure tap, drain connection and mounting base.
- K. 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.
- L. 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.
- M. Drive Motor:** Shall be \_\_\_ HP(KW), \_\_\_ RPM, \_\_\_ volts, 3 phase, 60 (50) hertz, 1.15 service factor, C-flange (B5) mounted, TEFC enclosure. The motor shall be sized for non-overloading conditions.
- N. Surface Preparation:** Solvent wash and a single coat of Tnemec 431 epoxy (except motor).
- O. OPTIONAL Premium Surface Preparation:** Solvent wash, sandblast, and coat with minimum 30 MDFT Tnemec Perma-Shield PL Series 431 epoxy (except motor).