



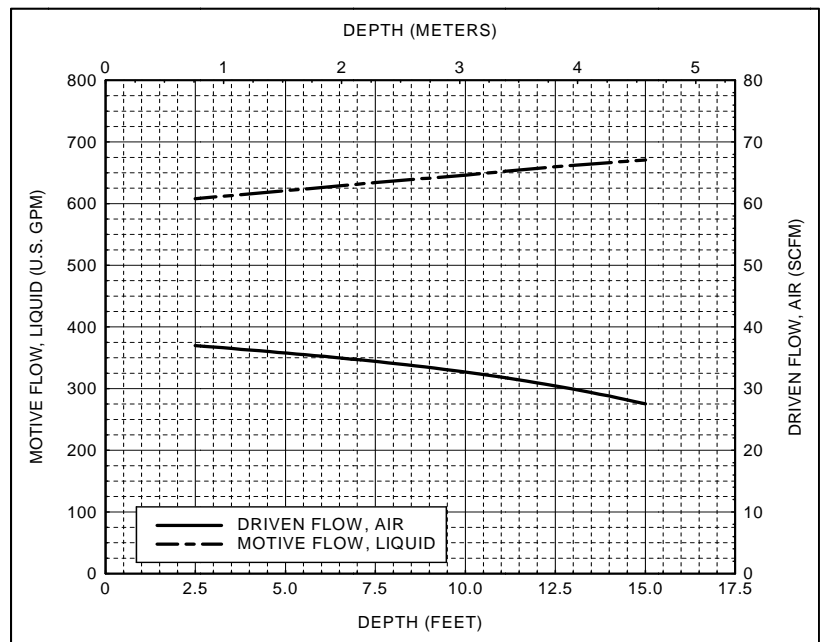
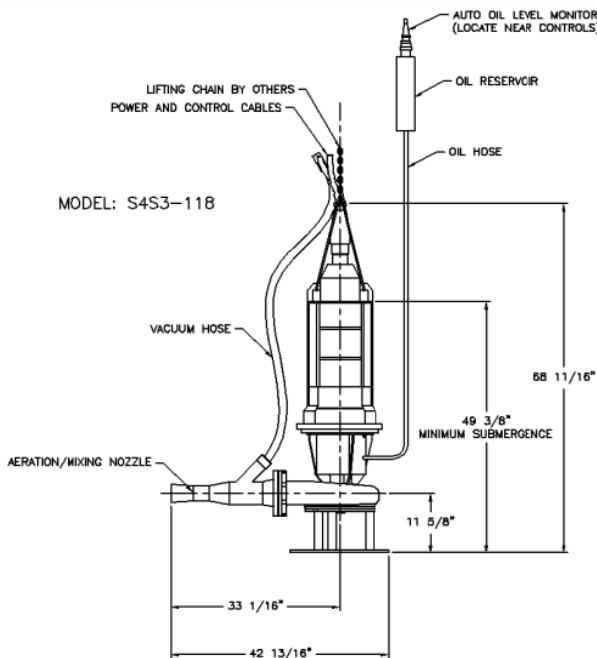
# Lift Station Conditioning Pump With Aeration Nozzle

## Features:

- Provides economical mixing and aeration of existing lift stations.
- Conditions wastewater to reduce plugging of main lift pumps.
- Industrial grade reinforced vacuum hose. No external piping required.
- Portable configuration for easy installation.
- Operates at depths of up to 15 feet, providing a minimum 27 scfm of air.

## Materials of Construction

Impeller/Cutter Bar/Upper Cutter/Cutter Nut .....Cast Alloy Steel, Heat Treated to Min. Rc 60  
 Casing/Bearing Housing .....Ductile Cast Iron  
 Mechanical Seal .....Cartridge Type, Silicon Carbide Faces (optional Tungsten Carbide), and Stainless Steel Sleeve  
 Thrust Bearings .....Angular Contact Ball Bearings  
 Lubrication .....ISO Grade 46 Oil  
 Aeration/Mixing Nozzle .....Powder Coated Steel



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## SPECIFICATIONS, 4" S-SERIES PORTABLE SUBMERSIBLE CHOPPER PUMPS FOR LIFT STATION AERATION AND CONDITIONING

The portable submersible 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:** Shall be of volute design, spiraling outward to the ANSI Class 125 flanged centerline discharge. Casing shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. Casing shall include a replaceable Rockwell C 60 alloy steel cutter 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/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 casing 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 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 casing or 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:** Shafting shall be heat treated alloy steel, with a minimum diameter of 1.5 inches in order to minimize deflection during solids chopping.

**G. Bearing Housing:** Shall be ductile cast iron, and machined with piloted bearing fits for concentricity of all components. Piloted motor mount shall securely align motor on top of bearing housing.

**H. Thrust Bearings:** Shaft thrust in both directions shall be taken up by two back-to-back mounted single-row angular contact ball bearings, or a matched set of face to face tapered roller bearings, with a minimum L-10 rated life of 100,000 hours. Overhang from the centerline of the lower thrust bearing to the seal faces shall be a maximum of 1.7". A third mechanical seal (two in motor) shall also be provided to isolate the bearings from the pumped media. The third seal, as well as the thrust bearings shall be oil bath lubricated in the bearing housing by ISO Grade 46 oil. Shaft overhang exceeding 1.7 inches from the center of the lowest thrust bearing to the seal faces shall be considered unacceptable.

**I. Pump Mechanical Seal:** The mechanical seal shall be located immediately behind the impeller hub to 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 a ductile cast iron seal gland.

**J. Automatic Oil Level Monitor:** An oil level switch shall be mounted at the top of the wet well, with a hose feeding down to the side of the bearing housing to monitor oil level and shut off the motor in event of low oil level. A relay shall be included for mounting in the motor control panel.

**K. Shaft Coupling:** The submersible motor shall be close coupled directly to the pump shaft using a solid sleeve coupling, which is keyed to both the pump and motor shafts. Slip clutches and shear pins between the shaft and the motor are considered unacceptable.

**L. Submersible Motor:** The submersible motor shall be U/L and CSA listed and suitable for Class I, Group C & D, Division 1 hazardous locations, rated at 15 HP, 1160 RPM, 230/480 Volts, 60 Hertz and 3 phase, 1.15 service factor with Class F insulation. Motor shall have tandem mechanical seals in oil bath and dual moisture sensing probes. Moisture probes must be connected to indicate water intrusion. The lower motor seal shall be exposed only to the lubricant in the bearing housing, with no exposure to the pumped media. Motor shall include two normally closed automatic resetting thermostats connected in series and embedded in adjoining phases. The thermostats must be connected per local, state, and/or the National Electric Code to maintain hazardous location rating and to disable motor starter if overheating occurs. Motor frame shall be cast iron, and all external hardware and shaft shall be stainless steel. Motor shall be sized for non-overloading conditions.

**M. 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.

**N. Portable Stand:** Shall be fabricated steel, with a base plate of suitable diameter to support the pump without tipping.

**O. Aeration/Mixing Nozzle:** Shall be fabricated steel, designed to entrain air into the pumped liquid and provide adequate velocity at nozzle exit for mixing and conditioning of sump without plugging.

**P. Surface Preparation:** Solvent wash and a single coat of Tnemec 431 epoxy applied at 5 MDFT minimum (except motor).

**OPTIONAL Surface Preparation:** SSPC-SP6 commercial sandblast (except motor), a prime coat of Tnemec 431 epoxy and a finish coat of Tnemec 431 epoxy for total finish of 30 MDFT minimum (except motor).