

# 3"- 6" SE-SERIES SUBMERSIBLE CHOPPER PUMPS

## Materials of Construction:

Impeller/Upper Cutter/Cutter Nut/Cutter Bar:	Cast alloy steel, heat treated to minimum Rockwell C 60.
Casing/Backplate:	Ductile cast iron.
Mechanical Seal:	
Flange:	
Paint:	

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

A     B     C     D     E     F     G     H     J     K     P       SES     6-3/8     6-3/8     4-7/8     7-7/8     7-7/8     9-7/16     4-9/16     11-9/16     8-5/8     22-5/8     3       SESI     6-3/8     5-1/8     7-7/8     7-7/8     9-7/16     4-9/16     11-7/8     9-5/8     23-5/8     3       SESI     6-3/8     5-1/8     7-7/8     7-7/8     9-7/16     4-9/16     11-1/8     12-3/8     2-5/8     3       SEX     7-11/16     7-11/16     5-9/16     4-9/16     11-7/8     12-3/8     2-6-7/8     4       SEX     9-1/16     4-1/2     7-7/8     9-13/16     4-9/16     11-7/8     12-3/8     26-7/8     4       SEX     10-1/8     11-1/8     12-3/8     26-7/8     4										-				
BE30 SE31 SE31 SE31 SE31 SE31 SE31 SE31 SE31		Α	В	С	D	Е	F	G	Н	J	K	Ρ		
5-31   6-38   6-38   6-18   7-18   1718   9-716   4-916   11-718   26   3     5E387   7-11/16   7-11/16   5-916   7-778   9-71/16   4-916   11-18   11-778   26   3     5E44   7-11/16   7-11/16   7-778   9-13/16   4-916   11-16   10-378   24-778   4     5E44   7-11/16   9-916   4-112   7-778   9-13/16   4-9116   11-5716   10-378   24-778   4     5E44   7-11/16   9-916   4-112   7-778   9-13/16   4-9116   11-778   2-376   4     5E45   9-1170   5   7-78   7-778   11   4-9116   14-112   14-318   30-1116   6     7.5   1770   180TY   17-14   12-378   7-778   11   4-9116   14-112   14-318   30-1116   6     7.5   1770   180TY   17-14   12-378   15   15   MINUTE IN AIR FRAME SIZES ONLY   15   MINUTE IN AIR FRAME SIZES ONLY   15   MINUTE IN AIR FRAME SIZES ONLY <th>SE3F SE3G</th> <th>6-3/8</th> <th>6-3/8</th> <th>4-7/8</th> <th>7-7/8</th> <th>7-7/8</th> <th>9-7/16</th> <th>4-9/16</th> <th>11-9/16</th> <th>8-5/8</th> <th>22-5/8</th> <th>3</th> <th></th>	SE3F SE3G	6-3/8	6-3/8	4-7/8	7-7/8	7-7/8	9-7/16	4-9/16	11-9/16	8-5/8	22-5/8	3		
SE3P   7-11/16   7-11/16   5-91/16   7-7/8   7-7/8   9-7/16   11-1/8   11-7/8   2.6   3     SEXAL   7-11/16   7-11/16   4-31/8   7-7/8   7-7/8   9-13/16   4-91/16   11-17/8   2.6   3     SEXAL   7-11/16   7-11/16   4-31/8   7-7/8   7-7/8   9-13/16   4-91/16   11-5/16   10-3/8   24-7/8   4     Sexes   9-11/16   9-91/16   4-11/2   7-7/8   7-7/8   9-13/16   4-91/16   11-7/8   12-3/8   26-7/8   4     Sexes   10-11/8   11-11/16   6   9-7/78   7-7/8   9-13/16   4-91/16   11-7/8   12-3/8   26-7/8   4     Sexes   10-11/16   6   9-7/78   7-7/8   11   4-91/6   14-1/2   14-3/8   30-11/16   6     Sexes   1170   10   1750   180TY   17-1/4   12-3/8   15   MINUTE IN AIR FRAME SIZES ONLY   15   MINUTE IN AIR FRAME SIZES ONLY     20   1170   25   1750   210TY   21-1/8   17	SE3L	6-3/8	6-3/8	5-1/8	7-7/8	7-7/8	9-7/16	4-9/16	10-7/8	9-5/8	23-5/8	3		
SE4K SE4K SE4 SE4 SE4 SE4 SE4 SE4 SE4 SE4 SE4 SE4		7-11/16	7-11/16	5-0/16	7-7/8	7-7/8	9-7/16	1-9/16	11-1/8	11-7/8	26	2		
SE41   P-11/10														
SEAT   9-17.16   9-17.16   17.16   17.17.17.17.16   17.17.17.17.17.17.17.17.17.17.17.17.17.1	SE4L	7-11/16	7-11/16	4-3/8	7-7/8	7-7/8	9-13/16	4-9/16	11-5/16	10-3/8	24-7/8	4		
SEGX   11-1/10   0   9-1/6   11   4-9/10   11-1/2   14-3/8   0-1/10   TOP   BRACKET   FLOAT SWITCHES     HP   SPEED   FRAME   M   W   (2) 2" SCH 40 GUIDE PIPES (BY OTHERS)   FLOAT SWITCHES     5   1170   10   1170   17.5   1170   10   1170     10   1170   1170   15   3510   20   15   1170     20   1750   210TY   21-7/8   15-1/4   15-1/4   15-1/4   15-1/4     15   1170   1170   1750   20   1170   1750   20   1170     20   1170   25-1170   1730   174   17   17     25   1170   250TY   25-1/8   17   17     30   1170   1750   320TY   25-1/2   18-3/4   180TY   ALL 3"-6" PUMPS     30   1170   30   1170   1170   180TY   ALL 3"-6" PUMPS   16     30   1170   30   1170   117   180TY   ALL 3"-6" PUMPS		9-1/16	9-9/16	4-1/2	7-7/8	7-7/8	9-13/16	4-9/16	11-7/8	12-3/8	26-7/8	4	"W" MOTOR FLANGE-	
SPEED   FRAME   M   W     5   1170   5   1170   5     5   1750   180TY   17-1/4   12-3/8     7.5   1750   10   1750   10     10   1170   1170   10   1750     20   1750   210TY   21-7/8   15-1/4     15   1170   15   1170     20   1750   210TY   21-7/8   15-1/4     15   1170   1750   20   1770     20   1770   1770   1770   1770     20   1770   25-11/2   17-1/8   17-1/4     15   1170   1770   1770   1770     20   1750   200TY   25-1/8   17     30   3510   200TY   25-1/8   17     30   1170   1750   320TY   25-1/2   18-3/4     30   1170   1750   320TY   25-1/2   18-3/4     30   1170   1170   180TY   ALL 3"-6" PUMPS   100TY <th>SE6W</th> <th>10-1/8</th> <th>11-1/16</th> <th>6</th> <th>9-7/8</th> <th>7-7/8</th> <th>11</th> <th>4-9/16</th> <th>14-1/2</th> <th>14-3/8</th> <th>30-1/16</th> <th>6</th> <th></th>	SE6W	10-1/8	11-1/16	6	9-7/8	7-7/8	11	4-9/16	14-1/2	14-3/8	30-1/16	6		
HP     SPEED     FRAME     M     W       5     1170     180TY     17.1/4     12.3/8       7.5     1750     180TY     17.1/4     12.3/8       7.5     1750     180TY     17.1/4     12.3/8       7.5     1750     180TY     17.1/4     12.3/8       10     1750     1750     210TY     21.7/8     15.1/4       15     1750     210TY     21.7/8     15.1/4       15     1770     20     3510     200       20     3510     250TY     25.1/8     17       25     1750     250TY     25.1/8     17       30     1750     320TY     25.1/2     18.3/4       40     3510     320TY     25.1/2     18.3/4       30     1750     320TY     25.1/2     18.3/4	SE6X			•	••								TOP BRACKET	
HP   SPEED   FRAME   M   W     5   1170   180TY   17-1/4   12-3/8     7.5   1750   180TY   17-1/4   12-3/8     7.5   1170   10   1770     10   1170   10   1750     10   1750   210TY   21-7/8   15-1/4     15   1170   20   1750     20   3510   15   1170     20   1750   250TY   25-1/8   17     175   1750   250TY   25-1/8   17     30   1750   320TY   25-1/2   18-3/4     80   1170   1170   1170     30   1170   1170   1170   1170     30   1170   1170   1170   1170     30   1170   1170   1170   1170     30   1170   1170   1170   1170     30   1170   1170   1170   1170     30   1170   1170   1170   1170     <														
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7.5   1750   1750     7.5   1170     10   1170     10   1170     10   1750     10   1750     10   1750     10   1750     10   1750     10   1750     20   1750     20   1750     20   1770     20   1170     20   1170     20   1170     20   1170     20   1170     20   1170     20   1170     25   1170     25   1170     25   1170     25   1170     25   1170     25   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170 <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>(BY OTHERS)</th></t<>													(BY OTHERS)	
7.5   1170     10   1170     10   1170     10   1750     15   1750     20   1750     20   1750     20   1770     20   1170     20   1750     20   1170     20   1170     20   1170     20   1170     20   1170     20   1170     25   1170     25   1170     25   1170     25   1170     25   1170     25   1170     25   1170     25   1170     25   1170     25   1750     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1			180TY	′ 17-′	1/4 1	2-3/8								
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15   3510     20   1750     20   3510     15   1170     20   1170     25   1170     25   1750     25   1750     26   1750     27   250TY     25   1750     26   1750     30   1750     30   1750     30   1170     40   1750     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     30   1170     20   2														
20   1750   20   3510     20   3510   20   1770     20   1170   25   1170     25   1170   25   1750     25   1750   250TY   25-1/8   17     25   1750   250TY   25-1/8   17     25   3510   250TY   25-1/8   17     40   1750   30   1170   750     30   1170   320TY   25-1/2   18-3/4     180TY   ALL 3"-6" PUMPS   10TY   ALL 3"-6" PUMPS     210TY   ALL 3"-6" PUMPS   10TY   11.3"-6" PUMPS			210TY		7/8 1									
20   3510														
15   1170     20   1170     25   1170     25   1750     25   3510     26   1750     30   1750     30   1770     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   1750     30   1170     50   17														
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25   1750     25   3510     25   3510     30   1750     30   3510     40   1750     30   1170     50   1750     30   1170     50   1750     30   320TY     25-1/2   18-3/4		1170						"P" DISCHARGE PIPE-						
25   3510   250TY   25-1/8   17     30   1750   1750   1750   1750     30   1750   1750   1750     30   1700   1750   18-3/4     50   1750   1750     30   1750   18-3/4													Х И ШИ / Д мілімим	
30   1750     30   3510     40   1750     40   3510     30   1170     50   1750     50   1750     60   1750     75   18-3/4			2507	25	1/0	/8 17								
30   3510     40   1750     40   3510     30   1170     50   1750     60   1750     75   1750     75   1750     1750   25-1/2     18-3/4   180TY     ALL 3"-6" PUMPS     210TY   ALL 3"-6" PUMPS     10TY   ALL 3"-6" PUMPS			20011	20-	1/0									
40   1750     40   3510     30   1170     50   1750     60   1750     75   18-3/4											2.00			
40   3510     30   1170     50   1750     60   1750     75   1750     75   1750     1750   25-1/2     18-3/4   180TY     ALL 3"-6" PUMPS     210TY   ALL 3"-6" PUMPS		1750												
50     1750     320TY     25-1/2     18-3/4     180TY     ALL 3"-6" PUMPS     1       60     1750     1750     1750     18-3/4     180TY     ALL 3"-6" PUMPS     1     <														
60 1750 32011 23-1/2 10-3/4 180TY ALL 3"-6" PUMPS			320TY	Y 25-1/2			F	RAME	FITS	PUMP	MODE	L	┉┋┉╶┯┰╤╲║╢┇╦╣╖ <sub>┍</sub> <u>┹┶</u> ┷┶╼┷┷╼╸╴╴╸	
					1/2 1	8-3/4	1	80TY	ALL 3"	-6" PUN	<b>NPS</b>			
							2	10TY	ALL 3"	-6" PUN	<b>MPS</b>			

**DIMENSIONS IN INCHES** 

#### VAUGHAN CO., INC.

3P/4K/4L/4S/4T/6W/6X

ALL 3"-6" PUMPS

250TY

320TY





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## SPECIFICATIONS, 3"-6" SE-SERIES SUBMERSIBLE CHOPPER PUMPS

The 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 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 Class 125 flanged centerline discharge. Back pull-out design shall incorporate adjusting sleeves for accurate adjustment of impeller-to-cutter bar clearance. Casing & backplate shall be cast ductile 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 C60 alloy steel cutter adjustable for 0.005-0.050" 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 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 C60 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 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. Shafting: Pump shafting shall be heat-treated alloy steel. The pump shaft shall directly couple to the motor shaft, with a bolt and keyway.
- G. Submersible Electric Motor: The submersible motor shall be U/L or FM listed and suitable for Class I, Group C & D, Division I hazardous locations, rated at \_\_\_ HP, \_\_\_ RPM, \_\_\_ Volts, 60 Hertz and 3 phase, 1.15 service factor (1.0 for Continuous In-Air) with Class F insulation. Motor shall be equipped with tandem independently mounted mechanical seals in oil bath and with dual moisture sensing probes. Moisture probes must be connected to indicate water intrusion. The inner and outer seals shall be separated by an oil-filled chamber. The oil chamber shall act as a barrier to trap moisture and provide sufficient time for a planned shutdown. The oil shall also provide lubrication to the internal seal. The inner seal shall be a standard UL listed John Crane Type 21 or equal, with carbon rotating faces and ceramic stationary faces. The outer seal construction shall be designed for easy replacement. Outer mechanical seal shall be 316 stainless steel metal bellows type with silicon carbide or tungsten carbide faces. Seal shall be positively driven by set screws. Elastomers shall be of Viton®. Motor shall include two normally closed automatic resetting thermostats connected in series and imbedded 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.
- **H.** 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.
- I. Guide Rail System: Provide a guide rail system consisting of two galvanized or stainless steel guide rails (by others), cast ductile iron pump guide bracket, cast ductile iron discharge elbow with mounting feet and Class 125 flanges, 316 stainless steel upper guide rail mounting bracket, and 316 stainless steel intermediate guide rail stiffener bracket every 10 feet.
- J. Optional Spark Proof Guide Rail System: Provide a non-sparking guide rail system consisting of two galvanized or stainless steel guide rails (by others), cast bronze pump guide bracket, cast ductile iron discharge elbow with mounting feet and Class 125 flanges, 316 stainless steel upper guide rail mounting bracket, and 316 stainless intermediate guide rail stiffener bracket every 10 feet. System design shall prevent spark ignition of explosive gases during pump installation and removal.
- **K.** Surface Preparation: Solvent wash and a single coat of Tnemec 431 epoxy applied at 5 MDFT minimum (except motor).
- L. *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).

Form V387, Rev. 5

10/19, ECN4548