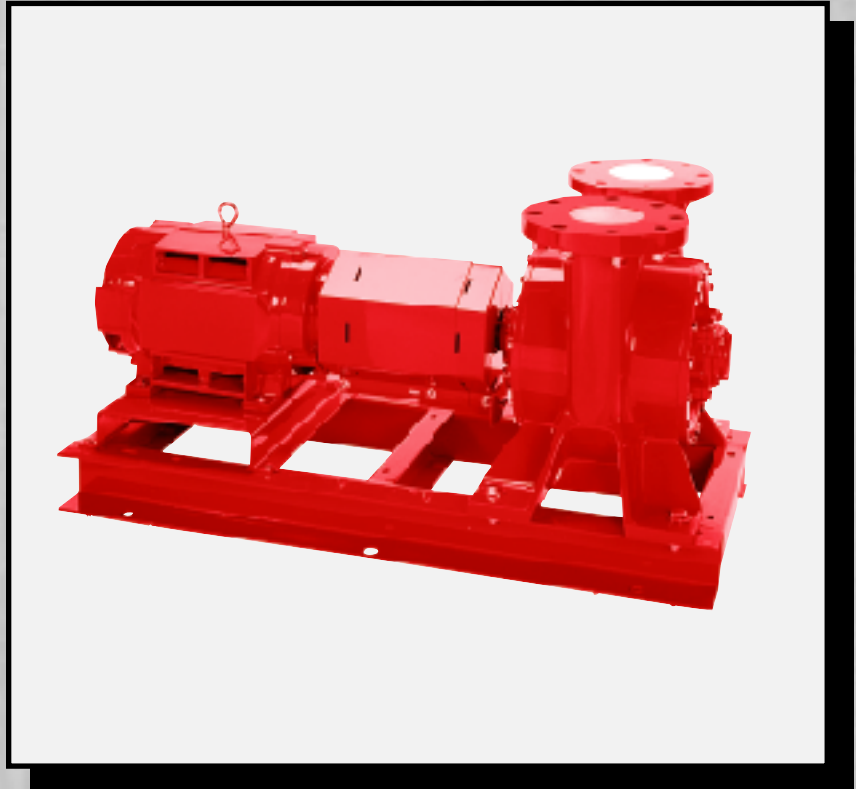




Bulletin BX-420C

Bell & Gossett



VSC®/VSCS® Pumps – Technical Bulletin



VSC/VSCS Construction Materials

STANDARD SEAL CONFIGURATION

| PART NAME | STANDARD CONSTRUCTION | ASTM NO. |
|---------------------------------|-----------------------------|---------------------|
| Casing | Cast iron | A159 Class G3000 |
| Volute cover plate (Outboard) | Cast iron | A159 Class G3000 |
| Volute cover plate (Inboard) | Cast iron | A159 Class G3000 |
| Impeller | Bronze | B584 Alloy C87500 |
| Shaft | 18-8 Stainless | A276 Type 304 |
| Shaft Collar | Bronze | B16 Alloy C36000 |
| Impeller nut | Bronze | B16 Alloy C36000 |
| Bearing housing (radial/thrust) | Cast iron | A159 Class G3000 |
| Bearing (Radial/thrust)** | Grease lubricated | |
| Bearing cover (radial/thrust) | Cast iron | A159-70 Class G2500 |
| Gasket | Cellulose fiber/SBR | Lexide SV-360 |
| Shaft seal/seat (standard) | Buna/Carbon/Ceramic | Type 21*** |
| Shaft seal/seat (optional) | Buna/Carbon/Ceramic | Type 2 |
| | EPT/Carbon/Tungsten Carbide | Type 2 |

STUFFING BOX CONFIGURATION

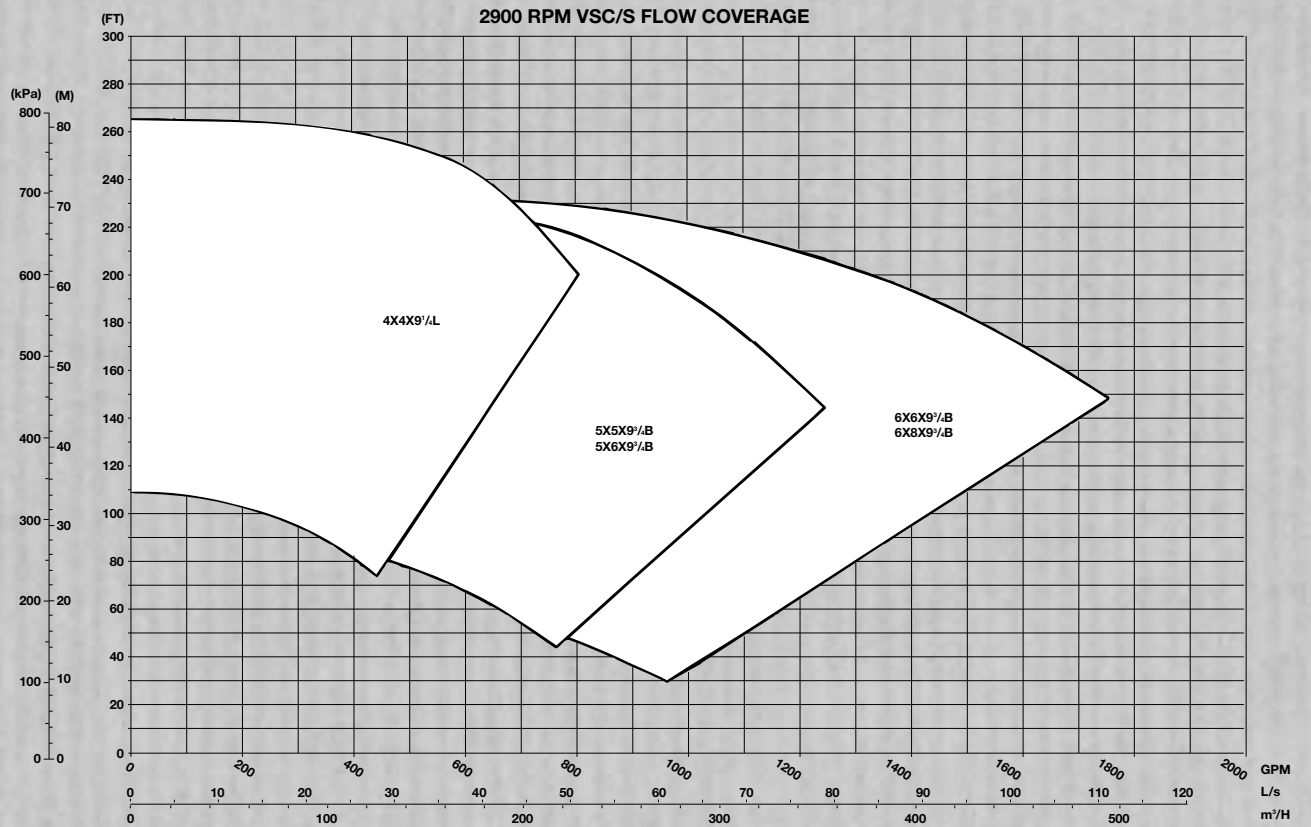
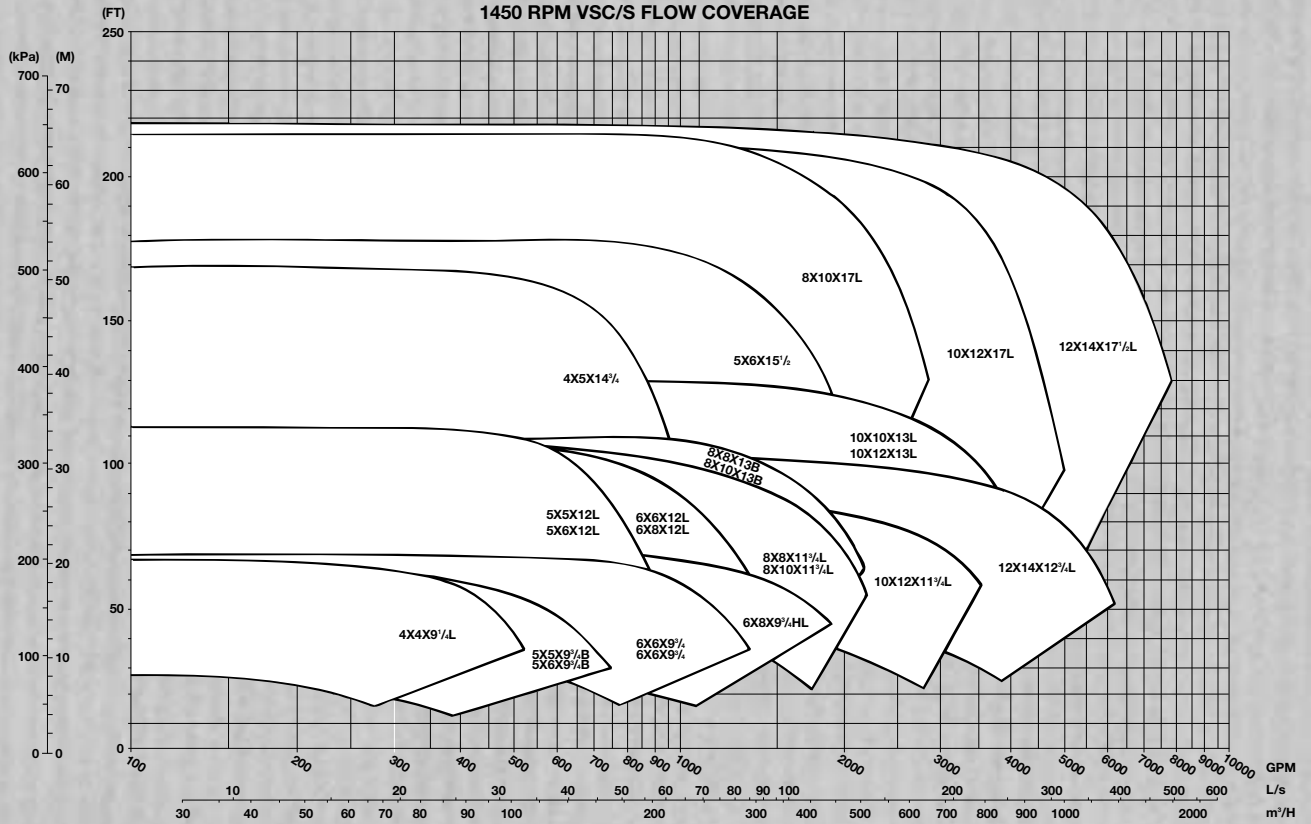
| PART NAME | STANDARD CONSTRUCTION | ASTM NO. |
|---------------------------------|----------------------------------|---------------------|
| Casing | Cast iron | A159 Class G3000 |
| Volute cover plate (Outboard) | Cast iron | A159 Class G3000 |
| Volute cover plate (Inboard) | Cast iron | A159 Class G3000 |
| Impeller | Bronze | B584 Alloy C87500 |
| Shaft | Carbon steel | A108 Grade 1144 |
| Shaft sleeve | 18-8 Stainless* | A269 Type 304 |
| Shaft sleeve collar | Carbon Steel | SAE 1018 |
| Impeller nut | Bronze | B16 Alloy C36000 |
| Bearing housing (radial/thrust) | Cast iron | A159 Class G3000 |
| Bearing (radial/thrust)** | Grease lubricated | |
| Bearing cover (radial/thrust) | Cast iron | A159-70 Class G2500 |
| Gasket | Cellulose fiber | Lexide SV-360 |
| Shaft seal/seat | | |
| Single seal (-S) | Carbon/Tungsten Carbide standard | Durametallic RO |
| Wear ring (optional) | Bronze | B584 Alloy C93200 |

* Bronze for 12x14x17½ ASTM B505 Alloy C93200

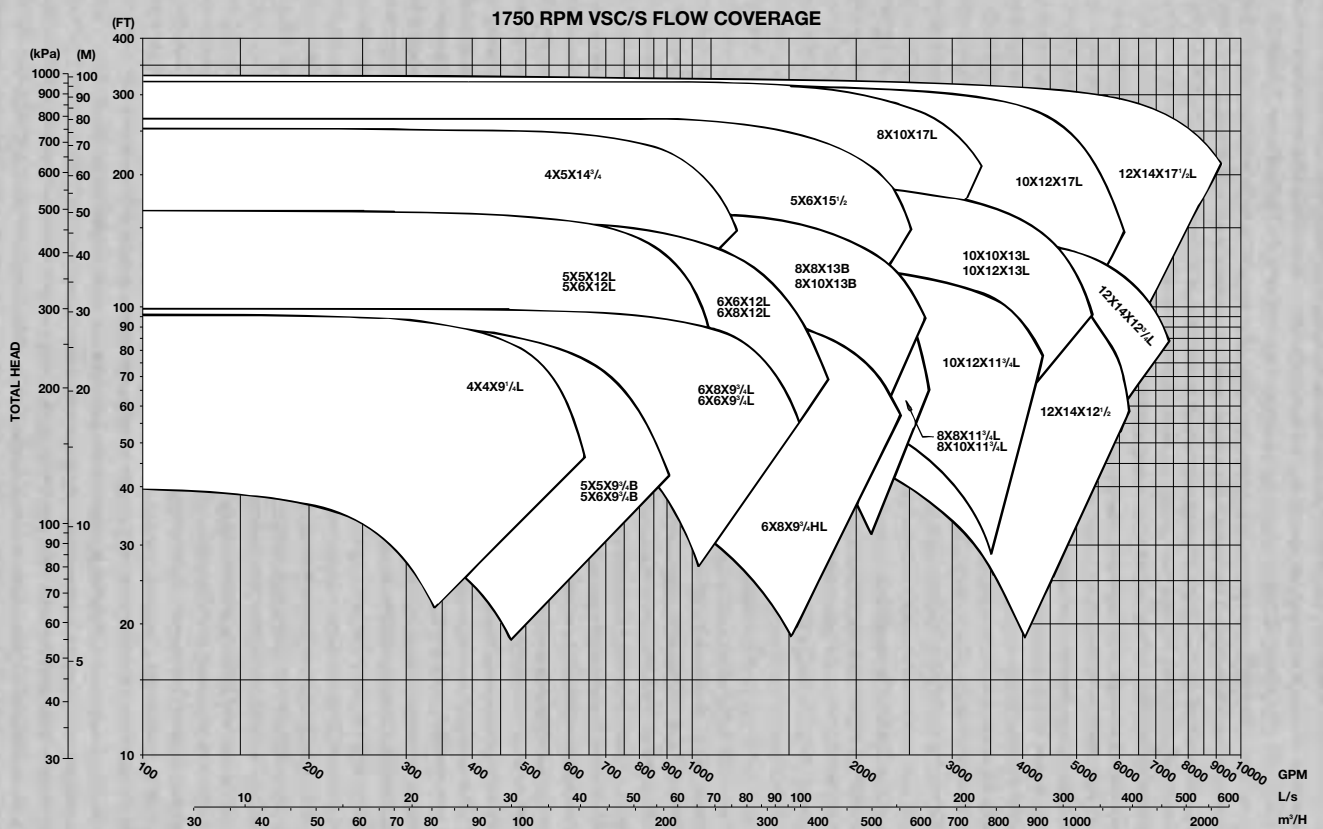
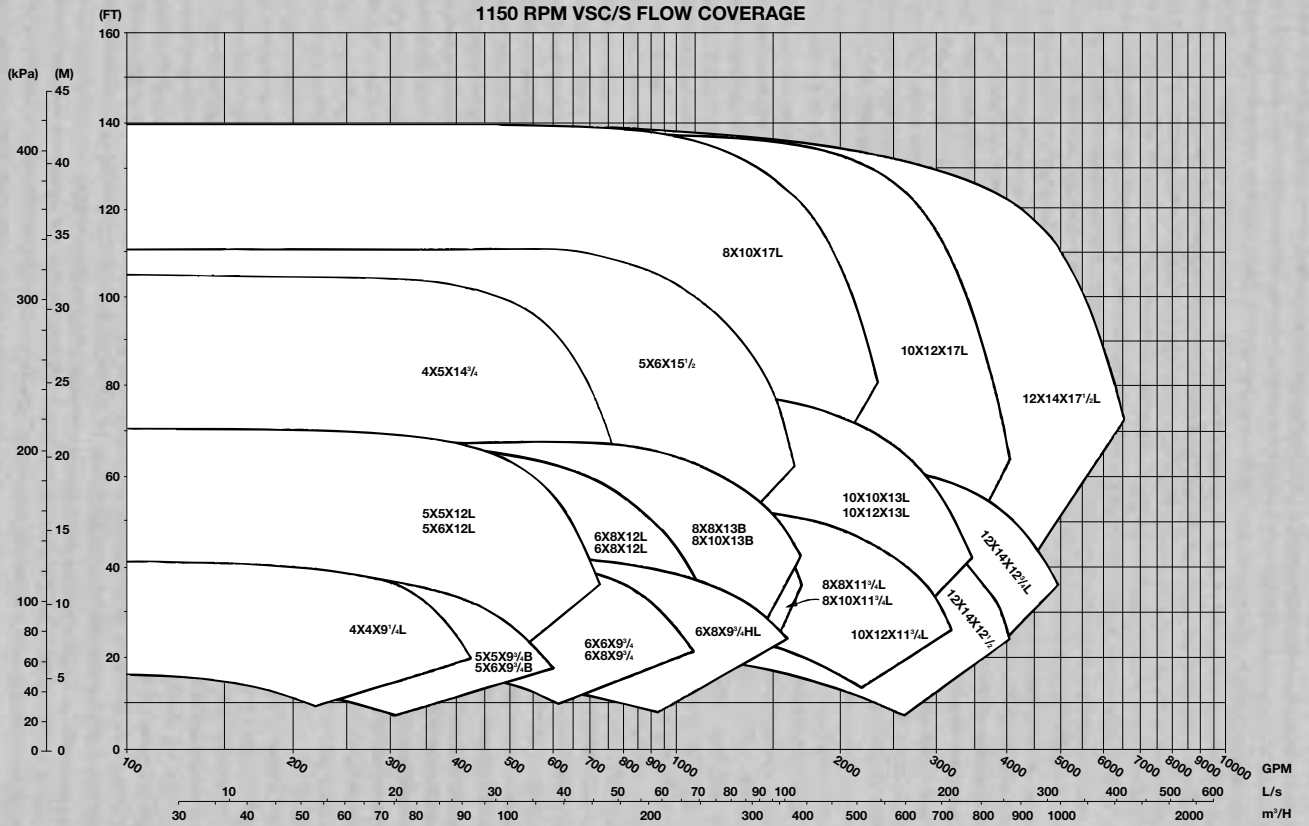
** Fafnir wide inner ring type (except 10x12x17, 12x14x12½ and 12x14x17½)

*** Type 2 is standard on sizes 10x12x17L, 12x14x12¾L and 12x14x17½L.

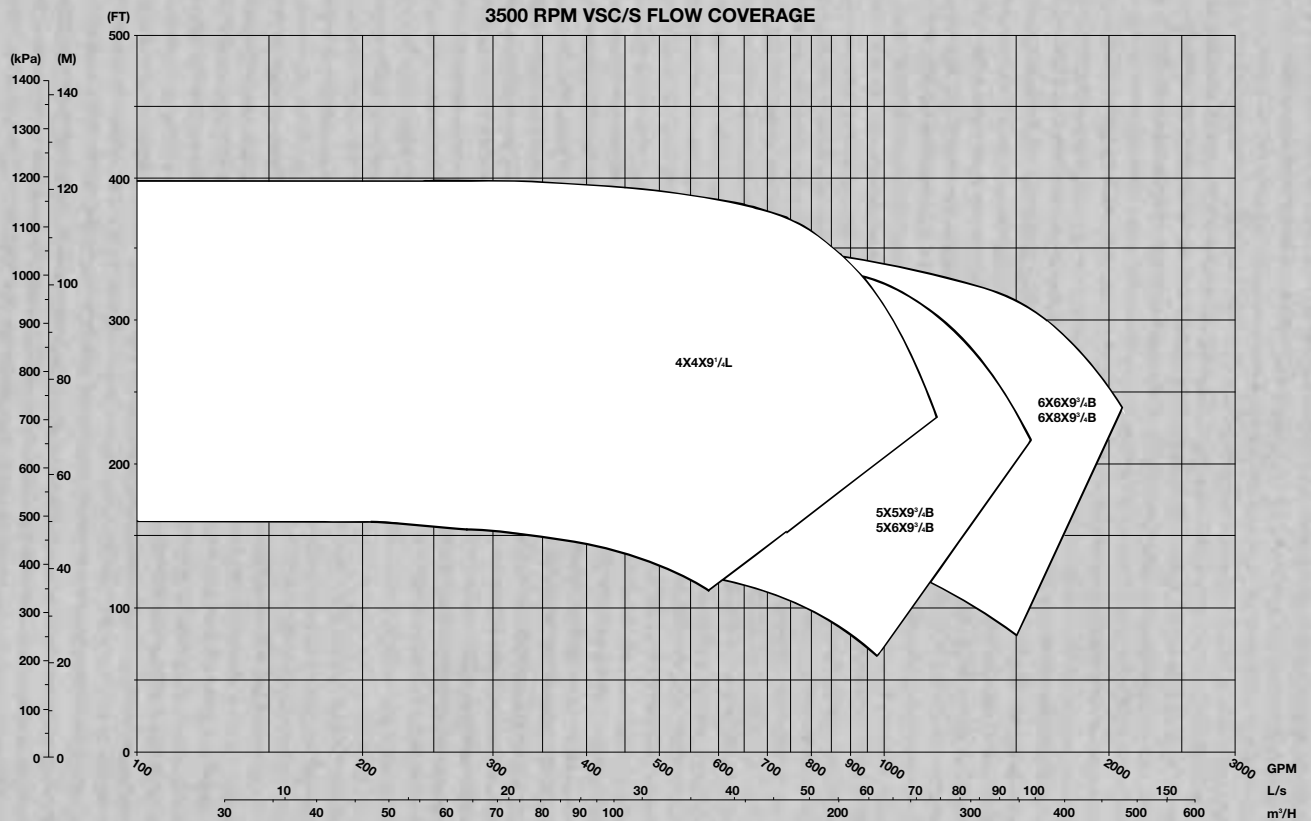
50 Hertz Performance Curves



60 Hertz Performance Curves



60 Hertz Performance Curves



Useful Pump Formulas

$$\text{Pressure (PSI)} = \frac{\text{Head (Feet)} \times \text{Specific Gravity}}{2.31}$$

$$\text{Head (Feet)} = \frac{\text{Pressure (PSI)} \times 2.31}{\text{Specific Gravity}}$$

$$\text{Vacuum (Inches of Mercury)} = \frac{\text{Dynamic Suction Lift (Feet)} \times .883}{\text{Specific Gravity}}$$

$$\text{Horsepower (Brake)} = \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}}$$

$$\text{Horsepower (Water)} = \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960}$$

$$\text{Efficiency (Pump)} = \frac{\text{Horsepower (Water)}}{\text{Horsepower (Brake)}} \times 100 \text{ Per Cent}$$

$$\text{NPSH (Available)} = \text{Positive Factors} - \text{Negative Factors}$$

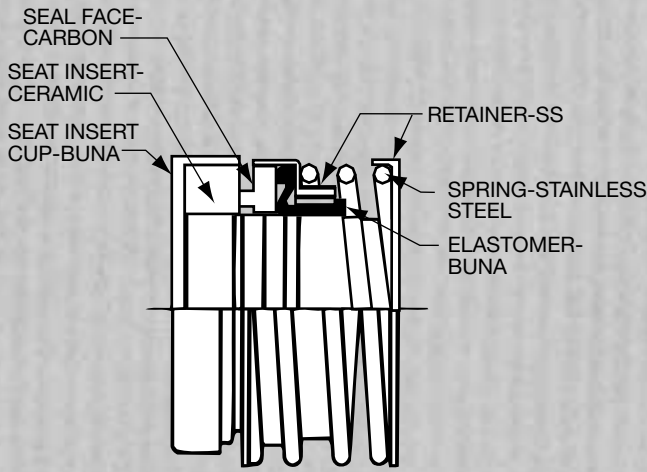
Affinity Laws: Effect of change of speed or impeller diameter on centrifugal pumps.

| | GPM Capacity | Ft. Head | BHP |
|--------------------------|---|--|--|
| Impeller Diameter Change | $Q_2 = \frac{D_2}{D_1} Q_1$ | $H_2 = \left(\frac{D_2}{D_1}\right)^2 H_1$ | $P_2 = \left(\frac{D_2}{D_1}\right)^3 P_1$ |
| Speed Change | $Q_2 = \frac{\text{RPM}_2}{\text{RPM}_1} Q_1$ | $H_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^2 H_1$ | $P_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^3 P_1$ |

Where Q = GPM, H = Head, P = BHP, D = Impeller Dia., RPM = Pump Speed

Engineering Data VSC/VSCS Series

MECHANICAL SEALS

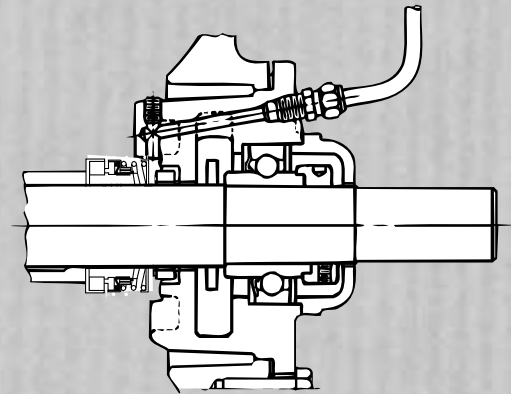


SELECTION GUIDE

Standard Size VSC/VSCS Series

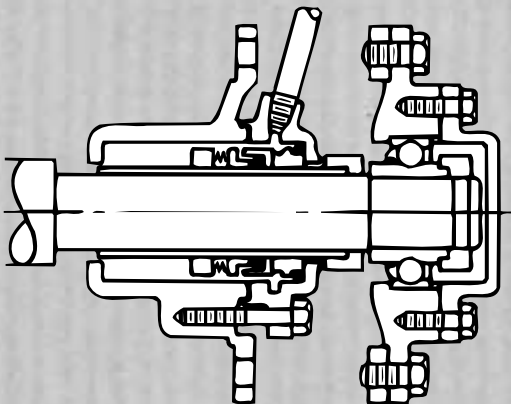
Type 21*, Carbon/Ceramic, Buna elastomer, 316 S.S. spring. Temperature range -20° to 225°F (-29° to 107°C). PH limitation 7-9. Ideally suited for open or closed systems with relatively clean liquid and few abrasives.

Also available in Carbon/Tungsten Carbide, EPT elastomers construction. Temperature range -20 to 300°F (-29° to 149°C). PH limitation 7-11.



VSC/VSCS-F

Standard configuration pump, Type 21*, Buna elastomer, Carbon/Ceramic seal supplied with an external flush to the seal faces. Temperature range -20 to 225°F (-29° to 107°C), PH limitation 7-9. Best suited for fluid environments containing moderate amounts of abrasives. Ideal for cooling tower applications.



VSC/VSCS-S

Stuffing box configuration pump utilizes a Durametallc RO, Carbon/Tungsten Carbide with an external flush to the seal faces. Elastomers are EPR (ethylene propylene rubber) and wetted metal parts 316 S.S. Temperature range -20 to 300°F^{**} (-29° to 149°C), PH limitations 7-11. For use on open or closed systems where temperature or pressure requirements exceed the limits of the standard Type 21 seal.

NOTE: Refer to product submittals for individual temperature and pressure capabilities.

* Type 2 is standard on sizes 10x12x17L, 12x14x12³/₄L and 12x14x17¹/₂L (Type 2 shown in diagram).

** For operating temperatures above 250°F (121°C) a cooled flush is recommended for optimum seal life. On closed systems cooling is accomplished by inserting a small heat exchanger in the flush line to cool the seal flushing liquid.

Flush-line Filters and Sediment Separators are available on special request.

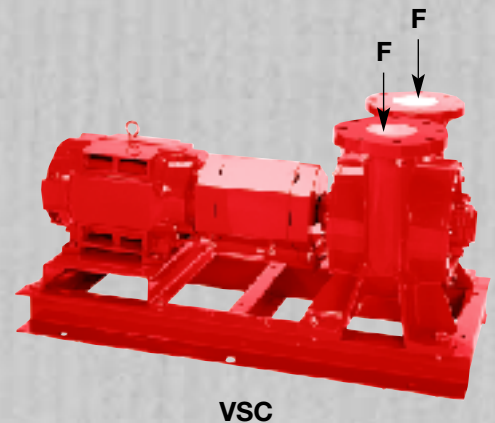
Engineering Data VSC/VSCS Series

ALLOWABLE STATIC FLANGE LOADINGS

The orientation of the nozzles on the VSC/VSCS Series Pumps permits static loads which can be supported without impairing pump operation.

The following schedule gives the maximum vertical static forces (downward) which we know from experience and judgment can be tolerated.

| VSC PUMPS | VSCS PUMPS | FORCE (F) IN POUNDS ON EACH VERTICAL FLANGE |
|--|---|---|
| 4x4x9 ¹ / ₄ L | — | 2,000 (8,896) |
| 5x5x9 ³ / ₄ B | 5x6x9 ³ / ₄ B | 2,750 (12,232) |
| 5x5x12B & L | 5x4x5x12B & L | 2,200 (9,786) |
| 6x6x9 ³ / ₄ B & L | 6x8x9 ³ / ₄ B & L | 3,300 (14,678) |
| 6x8x9 ³ / ₄ H & HL | 6x8x9 ³ / ₄ H & HL | 4,800 (21,350) |
| 6x6x12L | 6x8x12L | 3,600 (16,013) |
| 8x8x10 ¹ / ₂ | 8x10x10 ¹ / ₂ | 5,000 (22,240) |
| 8x8x13B | 8x10x13B | 5,000 (22,240) |
| — | 4x5x14 ³ / ₄ | 2,900 (12,899) |
| — | 5x6x15 ¹ / ₂ | 4,000 (17,792) |
| 10x10x13B & L | 10x12x13B & L | 6,200 (27,578) |
| — | 8x10x17L | 5,700 (25,354) |
| — | 10x12x11 & 11 ³ / ₄ L | 7,500 (33,360) |
| — | 10x12x17 & L | 6,800 (30,246) |
| — | 12x14x12 ¹ / ₂ | 8,100 (36,029) |
| — | 12x14x12 ³ / ₄ L | 8,100 (36,029) |
| — | 12x14x17 ¹ / ₂ B & L | 9,000 (40,032) |

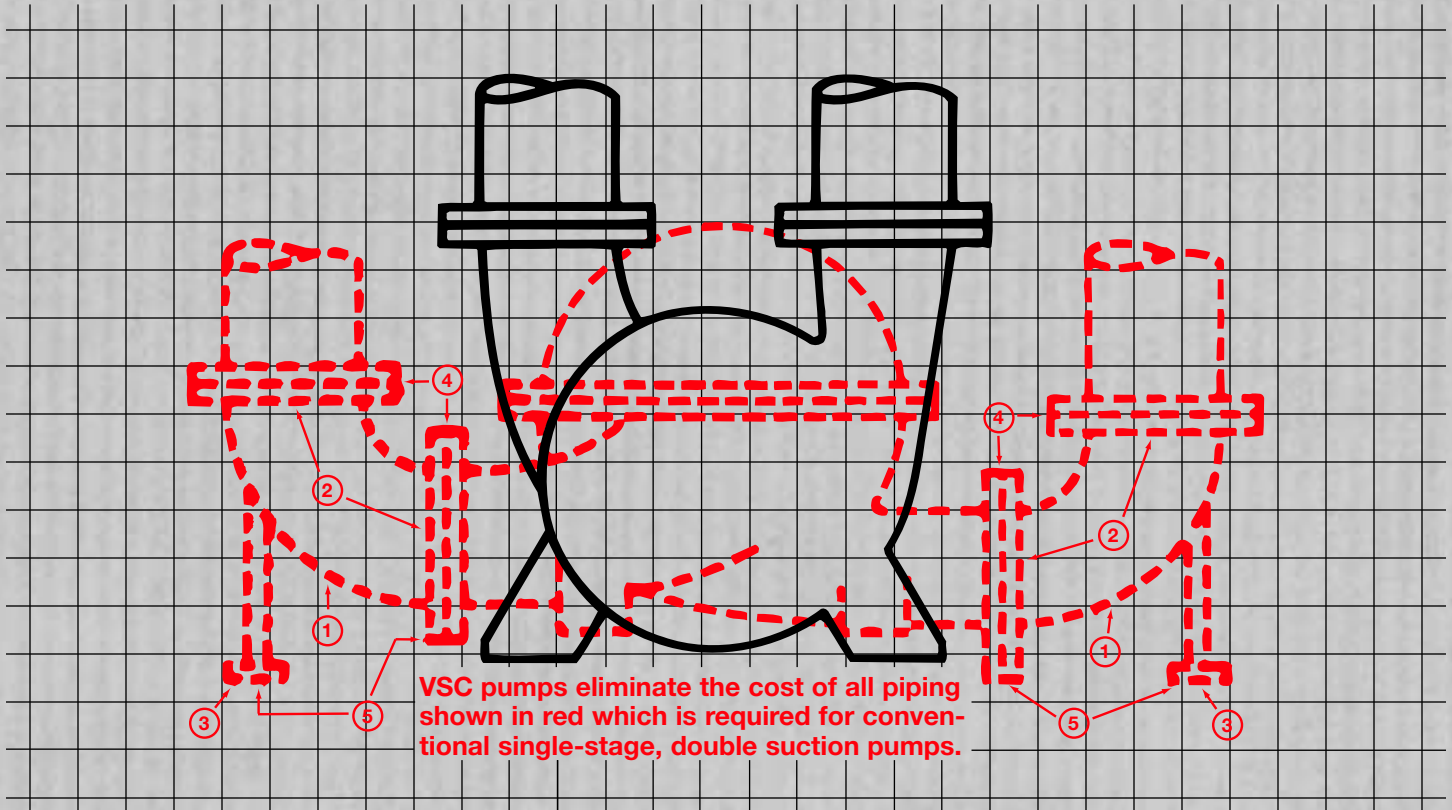


- a. The VSC Series Pumps must be installed, with the baseplate completely grouted in accordance with Bell & Gossett and Hydraulic Institute Standards.
- b. No external moments or transverse forces should be applied to the nozzles of the VSC/VSCS Series Pumps.

Should the schedule of maximum vertical static forces (F) be exceeded, or the above limitations not be considered, malfunction of the pump and shorter life of the wearing parts will occur.

VSC/VSCS Series

FLOOR SPACE SAVINGS FOR A VSC/VSCS PUMP AS COMPARED TO A HORIZONTAL SPLIT CASE PUMP.



ESTIMATED ADDITIONAL INSTALLED COSTS FOR HORIZONTAL SPLIT CASE SINGLE-STAGE DOUBLE-SUCTION PUMPS

| ITEM | DESCRIPTION | 4" PIPE | 6" PIPE | 8" PIPE | 10" PIPE |
|------|--|-----------------|-----------------|-----------------|------------------|
| 1 | Two 90° long radius butt weld elbows | \$ 24.00 | \$ 62.00 | \$ 115.00 | \$ 207.00 |
| 2 | Four welding neck flanges | 71.00 | 107.00 | 199.00 | 311.00 |
| 3 | Materials for fabricating two pipe supports | 14.00 | 17.00 | 24.00 | 38.00 |
| 4 | Time for welding four flanges to elbows, gapping and setting flange | 8 hrs | 9.6 hrs | 12.6 hrs | 15.8 hrs |
| 5 | Time for locating and welding two pipe supports; positioning and bolting two elbow assemblies. | 1.9 hrs | 2.1 hrs | 2.6 hrs | 2.8 hrs |
| 6 | Total labor time | 10 hrs | 11.7 hrs | 15.2 hrs | 18.6 hrs |
| 7 | Labor @ \$35.00 per hr | \$350.00 | \$409.00 | \$532.00 | \$651.00 |
| 8 | Total estimated additional installed cost over B&G VSC Pump | \$459.00 | \$595.00 | \$870.00 | \$1207.00 |

FLOOR SPACE SAVED WITH B&G VSC PUMPS

| PIPE SIZE | AREA FOR CONVENTIONAL PUMPS | AREA FOR VSC PUMPS | AREA SAVED WITH VSC PUMPS |
|-----------|-----------------------------|-------------------------|---------------------------|
| 4" | 16 sq. ft. 1.5 sq. m | 10 sq. ft. 1.0 sq. m | 6 sq. ft. .6 sq. m |
| 6" | 19 sq. ft. 1.8 sq. m | 12 sq. ft. 1.1 sq. m | 7 sq. ft. .7 sq. m |
| 8" | 24 sq. ft. 2.2 sq. m | 15 sq. ft. 1.4 sq. m | 9 sq. ft. .8 sq. m |
| 10" | 32 sq. ft. 3.0 sq. m | 20 sq. ft. 1.9 sq. m | 12 sq. ft. 1.1 sq. m |

COST SAVINGS IN FLOOR SPACE WITH B&G VSC PUMPS

| PIPE SIZE | AVERAGE FLOOR SPACE SAVED WITH VSC PUMPS | SAVINGS WITH VSC PUMPS \$80.00* PER SQ. FT. |
|-----------|--|---|
| 4" | 6 sq. ft. .6 sq. m | \$480.00 |
| 6" | 7 sq. ft. .7 sq. m | 560.00 |
| 8" | 9 sq. ft. .8 sq. m | 720.00 |
| 10" | 12 sq. ft. 1.1 sq. m | 960.00 |

The above estimated additional installed costs for conventional single-stage, double-suction pumps are conservative. Actual cost differentials will depend upon locale and piping practices employed.

1994 Price of Labor Estimated

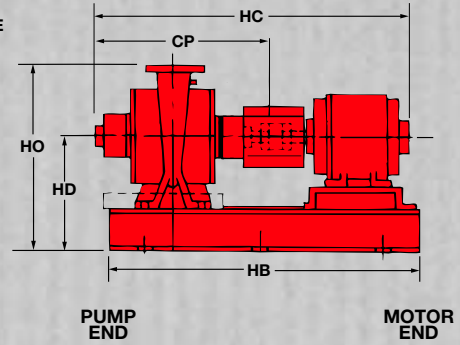
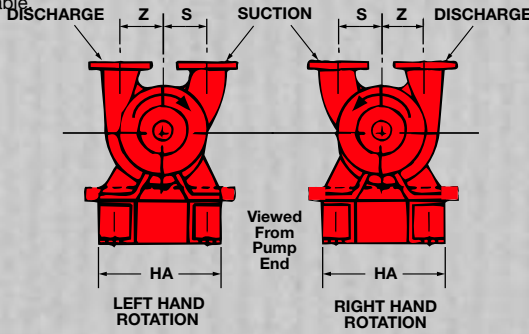
* Based on average construction costs per sq. ft. of various buildings as supplied by Dodge Construction Statistic for 1994.

DIMENSIONS

Dimensions subject to change without notice. Do not use for construction purposes.

NOTE: Flanges are 125# ANSI Standard.
Optional 250# ANSI rating is available.

Right hand rotation is furnished unless otherwise specified.



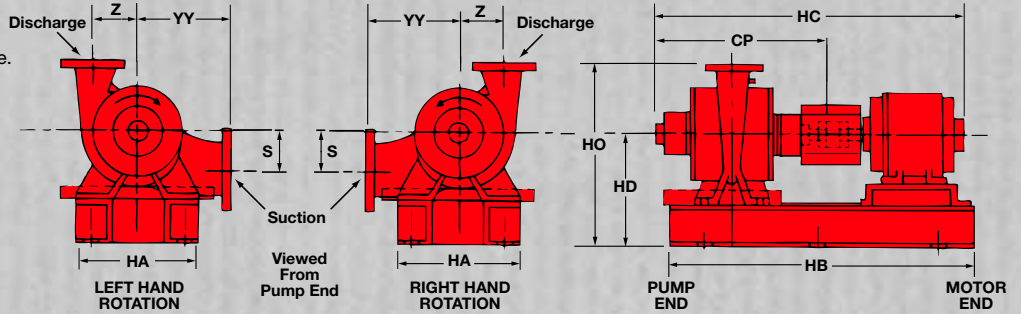
| PUMP SIZE | MOTOR FRAME | STANDARD MECHANICAL SEAL CONSTRUCTION PUMP MODEL VSC, VSC-F | | | | | | | | STUFFING BOX CONSTRUCTION VSC-PF, VSC-S & VSC-D | | | | | | | | | |
|--------------------------|--------------|--|--------------|--------------|--------------|-------------|-------------|------------|------------|--|-------------|--------------|--------------|-------------|-------------|------------|------------|--------------|--------------|
| | | DIMENSIONS IN INCHES (MM) | | | | | | | | DIMENSIONS IN INCHES (MM) | | | | | | | | | |
| | | CP | HA | HB | HC MAX. | HD | HO | S | Z | CP | HA | HB | HC MAX. | HD | HO | S | Z | | |
| 4x4x9"/L | 182T-184T | 19(483) | 19 1/4(495) | 38 1/4(972) | 40 1/4(1019) | 13 1/4(337) | 22 1/4(578) | 6(152) | 6(152) | 25 1/4(641) | 19 1/4(495) | 38 1/4(972) | 46 1/4(1178) | 13 1/4(337) | 22 1/4(578) | 6(152) | 6(152) | | |
| | 43 1/4(1102) | | | 43 1/4(1102) | 49 1/4(1260) | | | | | | | 49 1/4(1260) | | | | | | | |
| | 43 1/4(1102) | | | 48 1/4(1222) | 49 1/4(1260) | | | | | | | 54 1/4(1381) | | | | | | | |
| 4x4x9"/L 3500 RPM | 254T-256T | 19(483) | 19 1/4(495) | 49 1/4(1260) | 49 1/4(1260) | 14 1/4(362) | 23 1/4(603) | 6(152) | 6(152) | 25 1/4(641) | 19 1/4(495) | 49 1/4(1260) | 56 1/4(1426) | 14 1/4(362) | 23 1/4(603) | 6(152) | 6(152) | | |
| | 284TS-286TS | | | | 50 1/4(1289) | | | | | | | | 57(1448) | | | | | 60 1/4(1534) | |
| | 324TS-326TS | | | | 54 1/4(1375) | | | | | | | | 58 1/4(1489) | | | | | 62 1/4(1591) | 64 1/4(1648) |
| | 364TS-365TS | | | | 56 1/4(1432) | | | | | | | | 58 1/4(1489) | | | | | 62 1/4(1591) | 64 1/4(1648) |
| | 404TS | | | | 58 1/4(1489) | | | | | | | | 64 1/4(1648) | | | | | 64 1/4(1648) | 64 1/4(1648) |
| | 444TS | | | | 58 1/4(1489) | | | | | | | | 64 1/4(1648) | | | | | 64 1/4(1648) | 64 1/4(1648) |
| 5x5x9"/B | 182T-184T | 19(483) | 19 1/4(495) | 38 1/4(972) | 40 1/4(1019) | 13 1/4(337) | 23 1/4(603) | 7 1/4(184) | 7 1/4(184) | 25 1/4(641) | 19 1/4(495) | 38 1/4(972) | 46 1/4(1178) | 13 1/4(337) | 23 1/4(603) | 7 1/4(184) | 7 1/4(184) | | |
| | 43 1/4(1102) | | | | 49 1/4(1260) | | | | | | | 49 1/4(1260) | 56 1/4(1426) | | | | | | |
| | 43 1/4(1102) | | | | 49 1/4(1260) | | | | | | | 49 1/4(1260) | 56 1/4(1426) | | | | | | |
| 5x5x9"/B 3550 RPM | 284TS | 19(483) | 19 1/4(495) | 49 1/4(1260) | 49 1/4(1260) | 14 1/4(362) | 24 1/4(629) | 7 1/4(184) | 7 1/4(184) | 25 1/4(641) | 19 1/4(495) | 49 1/4(1260) | 55 1/4(1410) | 14 1/4(362) | 24 1/4(629) | 7 1/4(184) | 7 1/4(184) | | |
| | 286TS | | | | 50 1/4(1289) | | | | | | | | 57(1448) | | | | | 60 1/4(1534) | |
| | 324TS | | | | 52 1/4(1337) | | | | | | | | 58 1/4(1495) | | | | | 62 1/4(1591) | 62 1/4(1591) |
| | 326TS | | | | 54 1/4(1375) | | | | | | | | 58 1/4(1495) | | | | | 62 1/4(1591) | 62 1/4(1591) |
| | 364TS | | | | 55 1/4(1416) | | | | | | | | 62 1/4(1591) | | | | | 62 1/4(1591) | 62 1/4(1591) |
| | 365TS | | | | 56 1/4(1432) | | | | | | | | 62 1/4(1591) | | | | | 62 1/4(1591) | 62 1/4(1591) |
| 5x5x12B 5x5x12L | 213T-215T | 19(483) | 19 1/4(495) | 38 1/4(972) | 43 1/4(1102) | 13 1/4(337) | 24 1/4(629) | 8(203) | 8(203) | 25 1/4(641) | 19 1/4(495) | 43 1/4(1102) | 49 1/4(1260) | 13 1/4(337) | 24 1/4(629) | 8(203) | 8(203) | | |
| | 254T-256T | | | | 43 1/4(1102) | | | | | | | 49 1/4(1260) | 58 1/4(1483) | | | | | | |
| | 284T-286T | | | | 43 1/4(1102) | | | | | | | 49 1/4(1260) | 58 1/4(1483) | | | | | | |
| 6x6x9"/B 6x6x9"/L | 213T-215T | 22 1/4(578) | 26(660) | 53 1/4(1365) | 48 1/4(1222) | 15 1/4(394) | 27(686) | 8(203) | 8(203) | 30 1/4(772) | 26(660) | 55 1/4(1416) | 61 1/4(1556) | 15 1/4(394) | 27(686) | 8(203) | 8(203) | | |
| | 254T-256T | | | | 53 1/4(1365) | | | | | | | 59 1/4(1505) | 63 1/4(1613) | | | | | | |
| | 284T-286T | | | | 53 1/4(1365) | | | | | | | 59 1/4(1505) | 63 1/4(1613) | | | | | | |
| 6x6x9"/B 3550 RPM | 286TS | 22 1/4(578) | 26(660) | 53 1/4(1365) | 54 1/4(1384) | 15 1/4(394) | 27(686) | 8(203) | 8(203) | 30 1/4(772) | 26(660) | 53 1/4(1365) | 62 1/4(1578) | 15 1/4(394) | 27(686) | 8(203) | 8(203) | | |
| | 324TS | | | | 56 1/4(1432) | | | | | | | 64(1626) | 65 1/4(1664) | | | | | | |
| | 326TS | | | | 57 1/4(1470) | | | | | | | 65 1/4(1664) | 65 1/4(1664) | | | | | | |
| | 364TS | | | | 59 1/4(1511) | | | | | | | 67 1/4(1705) | 67 1/4(1721) | | | | | | |
| | 365TS | | | | 60 1/4(1527) | | | | | | | 67 1/4(1721) | 67 1/4(1721) | | | | | | |
| | 404TS | | | | 62 1/4(1584) | | | | | | | 70(1778) | 71 1/4(1816) | | | | | | |
| 6x8x9"/H 6x8x9"/HL | 213T-215T | 21 1/4(552) | 26(660) | 53 1/4(1365) | 47 1/4(1197) | 15 1/4(394) | 28(711) | 8 1/4(210) | 8 1/4(210) | 28 1/4(729) | 26(660) | 53 1/4(1365) | 54 1/4(1375) | 15 1/4(394) | 28(711) | 8 1/4(210) | 8 1/4(210) | | |
| | 254T-256T | | | | 52 1/4(1337) | | | | | | | 59 1/4(1514) | 61 1/4(1568) | | | | | | |
| | 284T-286T | | | | 54 1/4(1394) | | | | | | | 61 1/4(1568) | 65 1/4(1661) | | | | | | |
| 6x6x12L | 213T-215T | 22 1/4(578) | 26(660) | 53 1/4(1365) | 48 1/4(1222) | 15 1/4(394) | 28(711) | 8 1/4(222) | 8 1/4(222) | 30 1/4(772) | 26(660) | 53 1/4(1365) | 55 1/4(1416) | 15 1/4(394) | 28(711) | 8 1/4(222) | 8 1/4(222) | | |
| | 254T-256T | | | | 53 1/4(1365) | | | | | | | 59 1/4(1505) | 61 1/4(1556) | | | | | | |
| | 284T-286T | | | | 55 1/4(1419) | | | | | | | 63 1/4(1613) | 63 1/4(1613) | | | | | | |
| 8x8x10 1/2 8x8x11 1/4 | 254T-256T | 23 1/4(608) | 26(660) | 53 1/4(1365) | 54 1/4(1394) | 15 1/4(394) | 29 1/4(749) | 8 1/4(216) | 8 1/4(216) | 31 1/4(802) | 26(660) | 53 1/4(1365) | 62 1/4(1588) | 15 1/4(394) | 29 1/4(749) | 8 1/4(216) | 8 1/4(216) | | |
| | 284T-286T | | | | 57(1448) | | | | | | | 64 1/4(1641) | 64 1/4(1641) | | | | | | |
| | 324T-326T | | | | 60 1/4(1540) | | | | | | | 68 1/4(1734) | 68 1/4(1734) | | | | | | |
| 8x8x13B | 256T | 23 1/4(608) | 26(660) | 53 1/4(1365) | 54 1/4(1394) | 17(432) | 31(787) | 9 1/4(241) | 9 1/4(241) | 31 1/4(802) | 26(660) | 53 1/4(1365) | 62 1/4(1588) | 17(432) | 31(787) | 9 1/4(241) | 9 1/4(241) | | |
| | 284T-286T | | | | 57(1448) | | | | | | | 64 1/4(1641) | 64 1/4(1641) | | | | | | |
| | 324T-326T | | | | 60 1/4(1540) | | | | | | | 68 1/4(1734) | 68 1/4(1734) | | | | | | |
| 10x10x13 10x10x13L | 286T | 27 1/4(695) | 32(813) | 71(1803) | 60 1/4(1537) | 20(508) | 37(940) | 11(279) | 11(279) | 35 1/4(905) | 32(813) | 71(1803) | 68 1/4(1746) | 20(508) | 37(940) | 11(279) | 11(279) | | |
| | 324T-326T | | | | 64(1626) | | | | | | | 72 1/4(1835) | 72 1/4(1835) | | | | | | |
| | 364T-365T | | | | 64 1/4(1645) | | | | | | | 75 1/4(1908) | 75 1/4(1908) | | | | | | |
| | 364TS-365TS | | | | 68 1/4(1740) | | | | | | | 73(1854) | 73(1854) | | | | | | |
| | 404TS-405TS | | | | 74 1/4(1902) | | | | | | | 76 1/4(1949) | 76 1/4(1949) | | | | | | |
| 444TS-445TS | 66 1/4(1699) | 83 1/4(2111) | 83 1/4(2111) | 83 1/4(2111) | | | | | | | | | | | | | | | |

DIMENSIONS

NOTE: Flanges are 125# ANSI Standard.
Optional 250# ANSI rating is available.

Right hand rotation is furnished unless otherwise specified.

Dimensions subject to change without notice. Do not use for construction purposes.



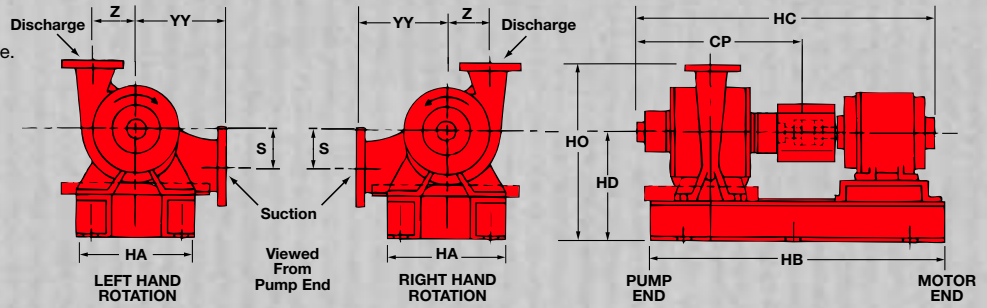
| PUMP SIZE | MOTOR FRAME | STANDARD MECHANICAL SEAL CONSTRUCTION PUMP MODEL VSCS, VSCS-F | | | | | | | | | | STUFFING BOX CONSTRUCTION VSCS-PF, VSCS-S & VSCS-D | | | | | | | |
|------------------------------|--------------|--|-------------|--------------|--------------|-------------|-------------|------------|-------------|-------------|-------------|---|--------------|--------------|-------------|-------------|------------|-------------|-------------|
| | | DIMENSIONS IN INCHES (MM) | | | | | | | | | | DIMENSIONS IN INCHES (MM) | | | | | | | |
| | | CP | HA | HB | HC MAX. | HD | HO | S | YY | Z | CP | HA | HB | HC MAX | HD | HO | S | YY | Z |
| 4x5x1 1/4 | 254T-256T | 22 1/2(578) | 26(660) | 53 1/4(1365) | 55 1/4(1413) | 17(432) | 30(762) | 6(152) | 15(381) | 9(229) | 30 1/4(772) | 26(660) | 59 1/4(1505) | 61 1/4(1556) | 17(432) | 30(762) | 6(152) | 15(381) | 9(229) |
| | 55 1/4(1419) | | | | 63 1/4(1613) | | | | | | | | | | | | | | |
| | 59 1/4(1508) | | | | 67(1702) | | | | | | | | | | | | | | |
| | 60 1/4(1527) | | | | 67 1/4(1721) | | | | | | | | | | | | | | |
| | 62 1/4(1584) | | | | 70(1778) | | | | | | | | | | | | | | |
| 404TST | 59 1/4(1505) | 62 1/4(1584) | | | | | | | | | | | | | | | | | |
| 5x6x9 1/8 B | 182T-184T | 19(483) | 19 1/4(495) | 38 1/4(972) | 40 1/4(1019) | 13 1/4(337) | 23 1/4(603) | 3(76) | 13(330) | 7 1/4(184) | 25 1/4(641) | 19 1/4(495) | 38 1/4(972) | 46 1/4(1178) | 13 1/4(337) | 23 1/4(603) | 3(76) | 13(330) | 7 1/4(184) |
| | 43 1/4(1102) | | | | 49 1/4(1260) | | | | | | | | | | | | | | |
| | 49 1/4(1260) | | | | 56 1/4(1426) | | | | | | | | | | | | | | |
| 254T-256T | 43 1/4(1102) | 49 1/4(1260) | | | | | | | | | | | | | | | | | |
| 5x6x9 1/8 B 3550 RPM | 284TS | 19(483) | 19 1/4(495) | 49 1/4(1260) | 49 1/4(1251) | 13 1/4(337) | 23 1/4(603) | 3(76) | 13(330) | 7 1/4(184) | 25 1/4(641) | 19 1/4(495) | 55 1/4(1410) | 57(1448) | 13 1/4(337) | 23 1/4(603) | 3(76) | 13(330) | 7 1/4(184) |
| | 286TS | | | | 50 1/4(1289) | | | | | | | | 57 1/4(1448) | | | | | | |
| | 324TS | | | | 52 1/4(1337) | | | | | | | | 57 1/4(1470) | | | | | | |
| | 326TS | | | | 54 1/4(1375) | | | | | | | | 60 1/4(1533) | | | | | | |
| | 364TS | | | | 55 1/4(1416) | | | | | | | | 62 1/4(1575) | | | | | | |
| | 365TS | | | | 56 1/4(1432) | | | | | | | | 62 1/4(1591) | | | | | | |
| | 404TS | | | | 58 1/4(1489) | | | | | | | | 64 1/4(1648) | | | | | | |
| 5x6x12 B 5x6x12 L | 213T-215T | 19(483) | 19 1/4(495) | 43 1/4(1102) | 38 1/4(968) | 13 1/4(337) | 24 1/4(629) | 2(51) | 12 1/4(327) | 8(203) | 25 1/4(641) | 19 1/4(495) | 43 1/4(1102) | 49 1/4(1260) | 13 1/4(337) | 24 1/4(629) | 2(51) | 12 1/4(327) | 8(203) |
| | 254T-256T | | | | 43 1/4(1102) | | | | | | | | 49 1/4(1260) | | | | | | |
| | 284T-286T | | | | 49 1/4(1260) | | | | | | | | 52 1/4(1324) | | | | | | |
| | 324T-326T | | | | 55 1/4(1413) | | | | | | | | 61 1/4(1572) | | | | | | |
| | 404TS | | | | 58 1/4(1489) | | | | | | | | 64 1/4(1648) | | | | | | |
| 5x6x15 1/2 | 254T-256T | 23 3/4(608) | 26(660) | 53 1/4(1365) | 54 1/4(1394) | 17(432) | 30(762) | 4 1/4(116) | 17 1/4(451) | 10 1/2(267) | 31 1/4(802) | 26(660) | 53 1/4(1365) | 62 1/4(1588) | 17(432) | 30(762) | 4 1/4(116) | 17 1/4(451) | 10 1/2(267) |
| | 284T-286T | | | | 57(1448) | | | | | | | | 64 1/4(1641) | | | | | | |
| | 324T-326T | | | | 60 1/4(1540) | | | | | | | | 68 1/4(1734) | | | | | | |
| | 364TS-365TS | | | | 61 1/4(1559) | | | | | | | | 69(1753) | | | | | | |
| | 404TS | | | | 65 1/4(1654) | | | | | | | | 72 1/4(1848) | | | | | | |
| 405TS-444TS | 59 1/4(1505) | 65 1/4(1654) | | | | | | | | | | | | | | | | | |
| 6x8x9 1/8 B 6x8x9 1/4 L | 213T-215T | 22 1/4(578) | 26(660) | 53 1/4(1365) | 48 1/4(1222) | 15 1/2(394) | 27(686) | 3(76) | 15(381) | 8(203) | 30 1/4(772) | 26(660) | 53 1/4(1365) | 55 1/4(1416) | 15 1/2(394) | 27(686) | 3(76) | 15(381) | 8(203) |
| | 254T-256T | | | | 53 1/4(1365) | | | | | | | | 61 1/4(1556) | | | | | | |
| | 284T-286T | | | | 55 1/4(1419) | | | | | | | | 63 1/4(1613) | | | | | | |
| | 324T | | | | 58(1473) | | | | | | | | 65 1/4(1667) | | | | | | |
| | 286TS | | | | 54 1/4(1384) | | | | | | | | 62 1/4(1578) | | | | | | |
| 6x8x9 1/8 B 3550 RPM | 324TS | 22 1/4(578) | 26(660) | 53 1/4(1365) | 56 1/4(1432) | 15 1/2(394) | 27(686) | 3(76) | 15(381) | 8(203) | 30 1/4(772) | 26(660) | 53 1/4(1365) | 62 1/4(1578) | 15 1/2(394) | 27(686) | 3(76) | 15(381) | 8(203) |
| | 326TS | | | | 57 1/4(1470) | | | | | | | | 64(1626) | | | | | | |
| | 364TS | | | | 59 1/4(1511) | | | | | | | | 65 1/4(1664) | | | | | | |
| | 365TS | | | | 60 1/4(1527) | | | | | | | | 67 1/4(1705) | | | | | | |
| | 404TS | | | | 62 1/4(1584) | | | | | | | | 67 1/4(1721) | | | | | | |
| | 405TS | | | | 63 1/4(1622) | | | | | | | | 70(1778) | | | | | | |
| | 444TS | | | | 63 1/4(1622) | | | | | | | | 71 1/4(1816) | | | | | | |
| 6x8x9 1/8 H 6x8x9 1/4 HL | 213T-215T | 21 1/2(552) | 26(660) | 53 1/4(1365) | 47 1/4(1197) | 15 1/2(394) | 28(711) | 5(127) | 16(406) | 8 1/4(210) | 28 1/4(729) | 26(660) | 53 1/4(1365) | 54 1/4(1375) | 15 1/2(394) | 28(711) | 5(127) | 16(406) | 8 1/4(210) |
| | 254T-256T | | | | 52 1/4(1337) | | | | | | | | 59 1/4(1514) | | | | | | |
| | 284T-286T | | | | 54 1/4(1394) | | | | | | | | 61 1/4(1568) | | | | | | |
| | 324T-326T | | | | 58 1/4(1483) | | | | | | | | 65 1/4(1661) | | | | | | |
| | 286TS | | | | 54 1/4(1384) | | | | | | | | 62 1/4(1578) | | | | | | |
| 6x8x12 L | 215T | 22 1/4(578) | 26(660) | 53 1/4(1365) | 48 1/4(1222) | 15 1/2(394) | 28(711) | 2 1/2(64) | 15(381) | 8 1/4(222) | 30 1/4(772) | 26(660) | 53 1/4(1365) | 55 1/4(1416) | 15 1/2(394) | 28(711) | 2 1/2(64) | 15(381) | 8 1/4(222) |
| | 254T-256T | | | | 53 1/4(1362) | | | | | | | | 61 1/4(1556) | | | | | | |
| | 284T-286T | | | | 55 1/4(1419) | | | | | | | | 63 1/4(1613) | | | | | | |
| | 324T-326T | | | | 59 1/4(1508) | | | | | | | | 67(1702) | | | | | | |
| | 364TS | | | | 59 1/4(1511) | | | | | | | | 67 1/4(1705) | | | | | | |
| 8x10x10 1/2 8x10x11 1/4 L | 254T-256T | 23 3/4(608) | 26(660) | 53 1/4(1365) | 54 1/4(1394) | 15 1/2(394) | 29 1/4(749) | 4 1/4(114) | 17(432) | 8 1/4(216) | 31 1/4(802) | 26(660) | 53 1/4(1365) | 62 1/4(1588) | 15 1/2(394) | 29 1/4(749) | 4 1/4(114) | 17(432) | 8 1/4(216) |
| | 284T-286T | | | | 57(1448) | | | | | | | | 64 1/4(1641) | | | | | | |
| | 324T-326T | | | | 60 1/4(1540) | | | | | | | | 68 1/4(1734) | | | | | | |
| | 364TS-365TS | | | | 61 1/4(1556) | | | | | | | | 68 1/4(1749) | | | | | | |
| 8x10x13 B | 256T | 23 3/4(608) | 26(660) | 53 1/4(1365) | 54 1/4(1394) | 17(432) | 31(787) | 5 1/4(140) | 17(432) | 9 1/4(241) | 31 1/4(802) | 26(660) | 53 1/4(1365) | 62 1/4(1588) | 17(432) | 31(787) | 5 1/4(140) | 17(432) | 9 1/4(241) |
| | 284T-286T | | | | 57(1448) | | | | | | | | 64 1/4(1641) | | | | | | |
| | 324T-326T | | | | 60 1/4(1540) | | | | | | | | 69 1/4(1759) | | | | | | |
| | 364TS-365TS | | | | 61 1/4(1559) | | | | | | | | 69(1753) | | | | | | |
| | 404TS | | | | 63 1/4(1616) | | | | | | | | 71 1/4(1810) | | | | | | |
| 10x12x11 10x12x11 1/4 L | 256T | 23 3/4(608) | 26(660) | 53 1/4(1365) | 54 1/4(1394) | 18 1/4(470) | 34 1/4(876) | 4 1/4(114) | 18(457) | 10(254) | 31 1/4(802) | 26(660) | 53 1/4(1365) | 62 1/4(1588) | 18 1/4(470) | 34 1/4(876) | 4 1/4(114) | 18(457) | 10(254) |
| | 284T-286T | | | | 57(1448) | | | | | | | | 64 1/4(1641) | | | | | | |
| | 324T-326T | | | | 60 1/4(1540) | | | | | | | | 68 1/4(1734) | | | | | | |
| | 364TS-365TS | | | | 61 1/4(1559) | | | | | | | | 69(1753) | | | | | | |
| | 404TS-405TS | | | | 65 1/4(1654) | | | | | | | | 72 1/4(1848) | | | | | | |
| 10x12x13 10x12x13 L | 286T | 27 1/4(695) | 32(813) | 71(1803) | 60 1/4(1537) | 20(508) | 37(940) | 6 1/4(165) | 21(533) | 11(279) | 35 1/4(905) | 32(813) | 68 1/4(1746) | 72 1/4(1835) | 20(508) | 37(940) | 6 1/4(165) | 21(533) | 11(279) |
| | 324T-326T | | | | 64(1626) | | | | | | | | 72 1/4(1835) | | | | | | |
| | 364T-365T | | | | 66 1/4(1699) | | | | | | | | 75 1/4(1908) | | | | | | |
| | 364TS-365TS | | | | 64 1/4(1645) | | | | | | | | 73(1854) | | | | | | |
| | 404TS-405TS | | | | 68 1/4(1740) | | | | | | | | 76 1/4(1949) | | | | | | |
| 444TS-445TS | 74 1/4(1902) | 83 1/4(2111) | | | | | | | | | | | | | | | | | |

DIMENSIONS

Dimensions subject to change without notice. Do not use for construction purposes.

NOTE: Flanges are 125# ANSI Standard.
Optional 250# ANSI rating is available.

Right hand rotation is furnished unless otherwise specified.



| PUMP SIZE | MOTOR FRAME | DIMENSIONS IN INCHES (MM) | | | | | | | | | |
|---|-------------------|--|-----------------|--------------|--|---|--|--|-------------|--|--|
| | | CP | HA | HB | HC MAX. | HD | HO | S | YY | Z | |
| 8x10x17 Stuffing Box Only | 284T-286T | 31 ⁹ / ₁₆ (802) | 32 (813) | 71 (1803) | 64 ⁷ / ₁₆ (1641) | 20 (508) | 39 (991) | 5 ¹ / ₂ (140) | 21 (533) | 11 ¹ / ₈ (302) | |
| | 324T-326T | | | | 68 ¹ / ₁₆ (1734) | | | | | | |
| | 364T-365T | | | | 71 ¹ / ₁₆ (1807) | | | | | | |
| | 364TS-365TS | | | | 69(1753) | | | | | | |
| | 404TS-405TS | | | | 72 ¹ / ₁₆ (1848) | | | | | | |
| 8x10x17L Standard Mechanical Seal Only | 286T | 23 ³ / ₁₆ (608) | 32 (813) | 71 (1803) | 57(1448) | 20 (508) | 39 (991) | 5 ¹ / ₂ (140) | 21 (533) | 11 ¹ / ₈ (302) | |
| | 324T-326T | | | | 60 ⁹ / ₁₆ (1540) | | | | | | |
| | 364T-365T | | | | 63 ¹ / ₁₆ (1613) | | | | | | |
| | 365TS | | | | 61 ³ / ₁₆ (1559) | | | | | | |
| | 404T-405T | | | | 65 ¹ / ₁₆ (1554) | | | | | | |
| 10x12x17 Stuffing Box Only | 326T | 36 ¹ / ₈ (918) | 32 (813) | 71 (1803) | 72 ¹ / ₁₆ (1848) | 21 ¹ / ₂ (546) | 40 ¹ / ₂ (1029) | 7 (178) | 21 (533) | 12 ³ / ₁₆ (310) | |
| | 364T-365T | | | | 75 ¹ / ₁₆ (1921) | | | | | | |
| | 404T-405T | | | | 80 ¹ / ₁₆ (2038) | | | | | | |
| | 444T | | | | 85 ¹ / ₁₆ (2169) | | | | | | |
| | 404TS-405TS | | | | 77 ¹ / ₁₆ (1962) | | | | | | |
| | 444TS-445TS | 83 ³ / ₁₆ (2124) | | | | | | | | | |
| | 250 HP | 36 (914) | Consult Factory | | | | | | | | |
| | 1800 RPM | | Consult Factory | | | | | | | | |
| | 300 HP | | Consult Factory | | | | | | | | |
| | 1800 RPM | | Consult Factory | | | | | | | | |
| | Consult Factory | | | | | | | | | | |
| 10x12x17L Standard Mechanical Seal Only | 326T | 29 ¹ / ₈ (740) | 32 (813) | 71 (1803) | 65 ¹ / ₁₆ (1670) | 21 ¹ / ₂ (546) | 40 ¹ / ₂ (1029) | 7 (178) | 21 (533) | 12 ³ / ₁₆ (310) | |
| | 364T-365T | | | | 68 ¹ / ₁₆ (1743) | | | | | | |
| | 404T-405T | | | | 73 ¹ / ₁₆ (1861) | | | | | | |
| | 444T | | | | 78 ¹ / ₁₆ (1991) | | | | | | |
| | 404TS-405TS | | | | 70 ¹ / ₁₆ (1784) | | | | | | |
| | 444TS-445TS | | | | 76 ³ / ₁₆ (1946) | | | | | | |
| 250 HP and Larger | 36(914) | Consult Factory | | | | | | | | | |
| 12x14x12 ¹ / ₂ Stuffing Box Only | 284T-286T | 36 ¹ / ₈ (918) | 32 (813) | 71 (1803) | 69 ¹ / ₁₆ (1759) | 21 ¹ / ₂ (546) | 39 ¹ / ₂ (1003) | 6 ¹ / ₄ (171) | 21 (533) | 10 ¹ / ₄ (276) | |
| | 324T-326T | | | | 72 ¹ / ₁₆ (1848) | | | | | | |
| | 364TS-365TS | | | | 73 ¹ / ₁₆ (1867) | | | | | | |
| | 404TS-405TS | | | | 77 ¹ / ₁₆ (1962) | | | | | | |
| | 444TS-445TS | | | | 83 ³ / ₁₆ (2124) | | | | | | |
| 12x14x12 ¹ / ₂ L Standard Mechanical Seal Only | 324T-326T | 29 ¹ / ₈ (740) | 32 (813) | 71 (1803) | 65 ¹ / ₁₆ (1670) | 21 ¹ / ₂ (546) | 39 ¹ / ₂ (1003) | 6 ¹ / ₄ (171) | 18 (457) | 10 ¹ / ₈ (276) | |
| | 364T-365T | | | | 68 ¹ / ₁₆ (1743) | | | | | | |
| | 404T | | | | 71 ¹ / ₁₆ (1822) | | | | | | |
| | 364TS-365TS | | | | 66 ¹ / ₁₆ (1689) | | | | | | |
| | 404TS-405TS | | | | 70 ¹ / ₁₆ (1784) | | | | | | |
| | 444TS-445TS | | | | 76 ³ / ₁₆ (1946) | | | | | | |
| 250 HP and Larger | 36(914) | Consult Factory | | | | | | | | | |
| 12x14x17 ¹ / ₂ (Not available in PF Construction) Stuffing Box Only | 365T | 41 ¹ / ₄ (1060) | 36 (914) | 81 (2057) | 81 ¹ / ₁₆ (2063) | 23 ¹ / ₂ (597) | 45 ¹ / ₄ (1149) | 7 ¹ / ₄ (197) | 25 (635) | 13 ¹ / ₂ (343) | |
| | 404T-405T | | | | 85 ¹ / ₁₆ (2181) | | | | | | |
| | 444T-445T | | | | 93(2362) | | | | | | |
| | 445TS | | | | 89 ¹ / ₁₆ (2267) | | | | | | |
| | 250 HP | | | | Consult Factory | | | | | | |
| | 1800 RPM | | | | Consult Factory | | | | | | |
| | 300 HP | | | | Consult Factory | | | | | | |
| | 1800 RPM | | | | Consult Factory | | | | | | |
| 12x14x17 ¹ / ₂ B 12x14x17 ¹ / ₂ L Standard Mechanical Seal Only | 365T | 34 (864) | 32(813) | 71(803) | 73 ¹ / ₁₆ (1867) | 23 ¹ / ₂ (597) | 45 ¹ / ₄ (1149) | 7 ¹ / ₄ (197) | 25 (635) | 13 ¹ / ₂ (343) | |
| | 404T-405T | | 36(914) | | 81(2057) | | | | | | 78 ¹ / ₁₆ (1984) |
| | 444T-445T | | | | | | | | | | 85 ¹ / ₁₆ (2165) |
| | 444TS-445TS | | | | | | | | | | 81 ¹ / ₁₆ (2070) |
| | 250 HP and Larger | | 36(914) | | Consult Factory | | | | | | |

Typical Specifications

Furnish and install pumps with performance characteristics as shown on plans. Pumps shall be double suction vertically-split case design to facilitate servicing all internal components without disturbing the pump piping, electrical motor connections or pump to motor alignment. The pump volute shall be supplied with plugged vent, drain and gage tappings. The pump casing shall be Class 30 cast iron, suitable for 175 PSI (1207kPa) working pressure (standard) or 300 PSI (2068kPa) working pressure (optional). Flanges shall be 125 PSI ANSI (standard) or 250 PSI ANSI (optional).

The impeller shall be enclosed double suction type in cast bronze construction and shall be dynamically balanced to ANSI/HI 1.1-1.5-1994, section 1.4.6.1.3.1, figure 1.106, balance grade G6.3 for quiet operation.

The liquid cavity shall be sealed off at the pump shaft by an internally-flushed mechanical seal with ceramic seal seat and carbon seal ring, suitable for continuous operation at 225°F (107°C). The seals shall be capable of being serviced without disconnecting the pump from piping.

The pump bearings shall be regreaseable camlock ball bearing type with provision for purging or flushing through the bearing surface, and capable of being inspected by removing the bearing covers. The shaft shall be of 18-8 stainless steel on standard mechanical seal models.

A flexible type, center drop-out spacer coupling, capable of absorbing torsional vibration, shall be employed between the pump and motor. Pumps for variable speed application shall be provided with a suitable coupler sleeve. The coupling shall be shielded by a dual rated ANSI B15.1, Section 8 & OSHA 1910.219 compliant coupling guard and contain viewing windows for inspection of the coupling.

The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 1.1-1.5-1994, section 1.4.6.1.1 for recommend acceptable unfiltered field vibration limits (as measured per HI 1.4.6.5.2, Figures 1.107) for pumps with rolling contact bearings.

Base plate shall be of structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members. Grouting area shall be fully open. The combined pump and motor baseplate shall be sufficiently stiff as to limit the susceptibility of vibration. The minimum base plate stiffness shall conform to ANSI/HI 1.3.4-1997 for *Horizontal Baseplate Design* standards.

The seismic capability of the pump shall allow it to withstand a horizontal load of 0.5g, excluding piping and/or fasteners used to anchor the pump to mounting pads or to the floor, without adversely affecting pump operation.

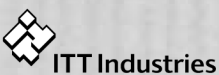
Sixty (60) cycle motors shall meet NEMA and EPACT '92 (where applicable) specifications and shall be of the size, voltage and enclosure called for on the plans. Pump and motor shall be factory aligned, and shall be realigned by the contractor per factory recommendations after installation.

The pump(s) selected shall conform to ANSI/HI 9.6.3.1 standards for Preferred Operating Region (POR) unless otherwise approved by the engineer. The pump NPSH shall conform to the ANSI/HI 9.6.1-1997 standards for *Centrifugal and Vertical Pumps for NPSH Margin*.

Each pump shall be factory hydrostatically tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high grade paint prior to shipment.

The pump(s) shall be manufactured, assembled and tested in an ISO 9001 approved facility.

Pumps shall be Series VSC, VSC/S as manufactured by ITT Bell and Gossett or equal.



Bell & Gossett

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