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Bulletin B-305F

Bell & Gossett®



**Series 1531 Pumps
The Industry Standard
In End Suction Pump Design**

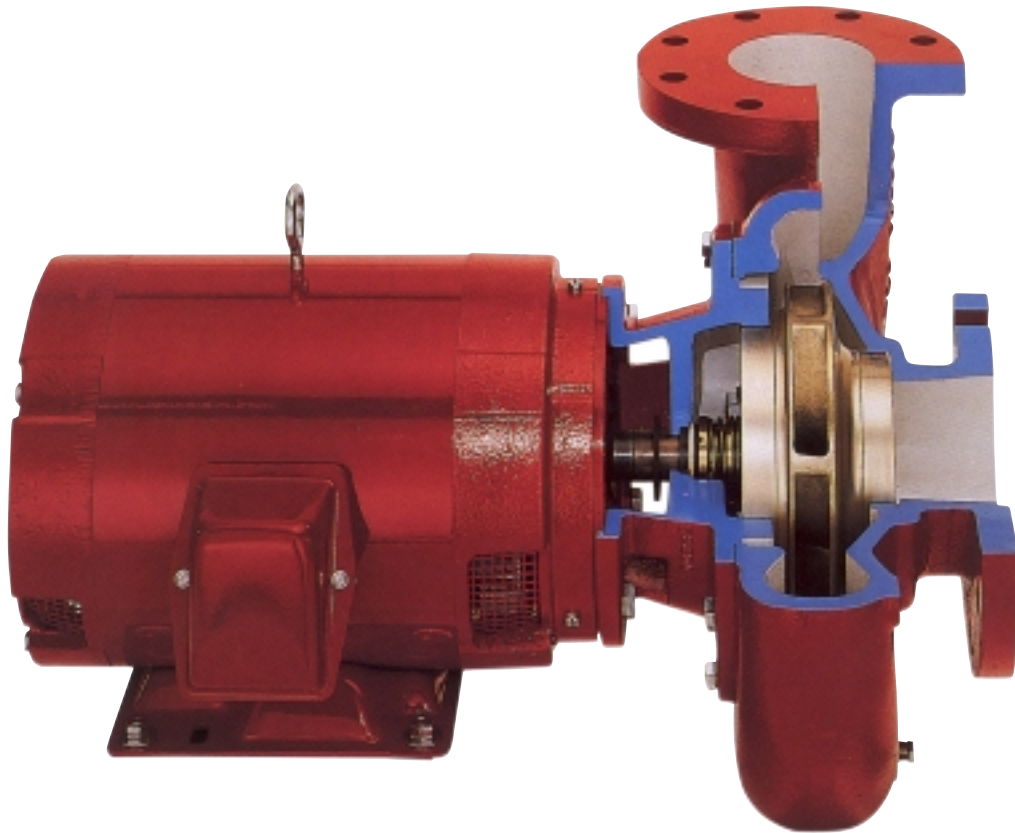
Engineered for life

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Part of the
ES PLUS
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SERIES 1531 CLOSE-COUPLED PUMPS



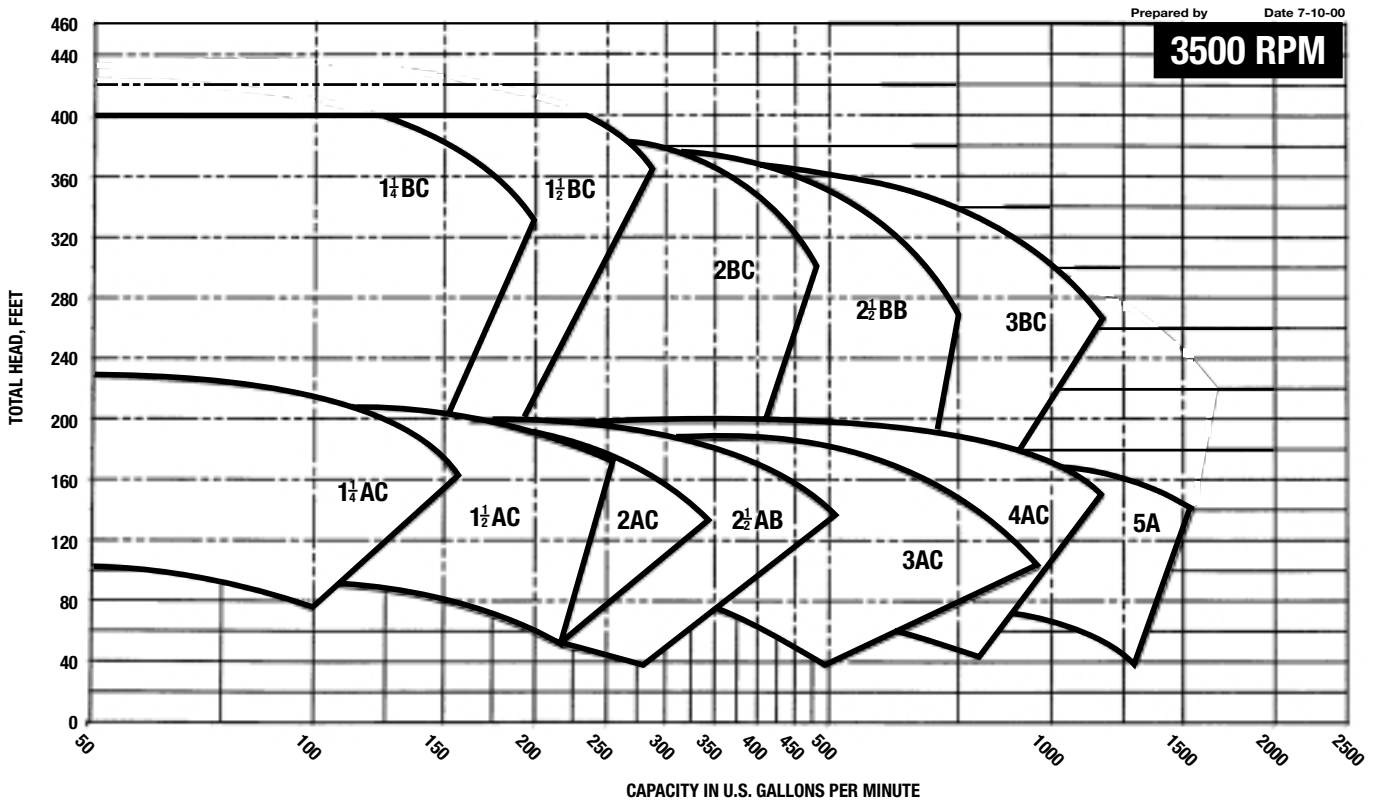
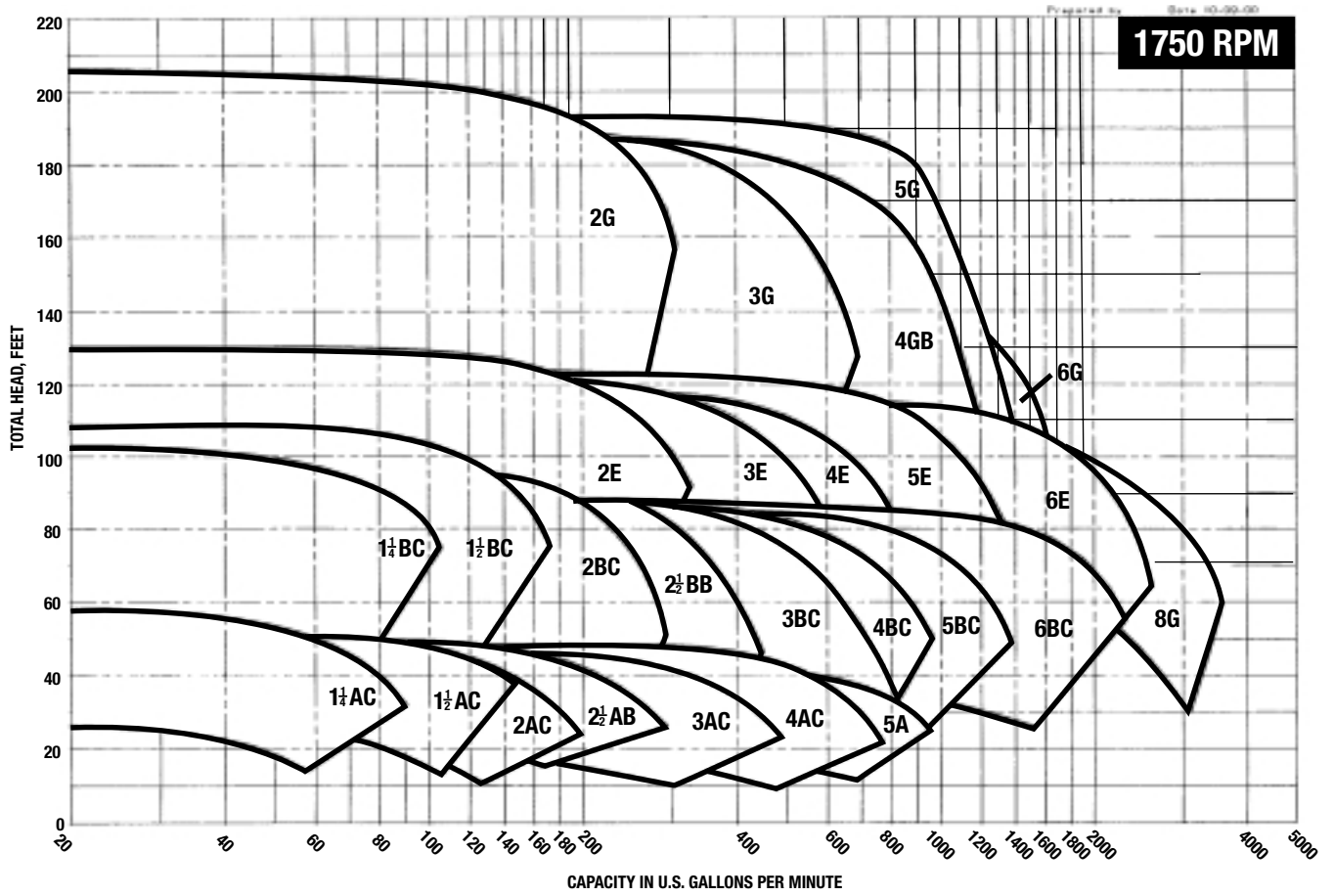
STANDARD DESIGN FEATURES

1. **Self-flushing mechanical seals** ensure maximum seal face lubrication, heat dissipation and debris removal without vulnerable, external flush tubing. As much as 25 percent of the total pump flow continuously flushes the seal faces.
2. **Back pull-out** design allows one service tech ease of maintenance.
3. **Aluminum bronze shaft sleeve** construction is standard. Special sealing between the sleeve and shaft prevents corrosion of the shaft by the pumped fluid.
4. **Enclosed, balanced impeller** for quiet, vibration free performance. Impellers are precision fitted to the shaft and positively locked with a shaft key.
5. **Heavy duty cast iron volute** construction for 175 PSI working pressure.
6. **Jacking bolts** provide ease of volute disassembly.
7. **Gauge tappings** on the suction and discharge flanges along with volute vent and drain tappings are standard.
8. **Hydrostatic testing** of each pump is standard.

OPTIONAL EQUIPMENT

- All iron construction
- All bronze construction
- Bronze casing wear ring
- Vertical mounting
- Footed volute
- Mechanical seal construction

SERIES 1531 PERFORMANCE CURVES



SERIES 1531 DIMENSIONS

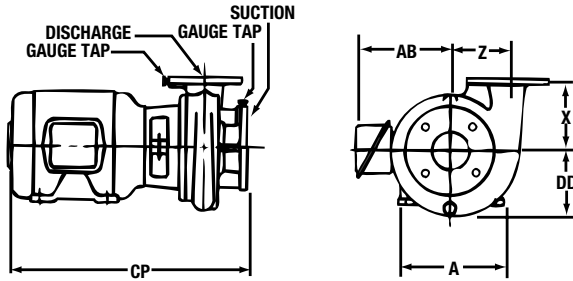


FIGURE 1

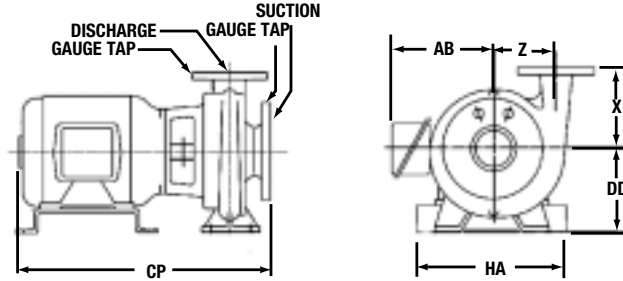


FIGURE 2

Standard working pressure 175 PSI (12 BAR). Flanges drilled and faced per 125# ANSI Standards*.

| SIZE OF PUMP AND DISCHARGE | SUCTION | PUMP DIMENSIONS FIGURE 1 - INCHES (MM) | | | | | |
|----------------------------|-----------|--|--------------|---------------|-----------------------|----------------------|-----------------------|
| | | DD | X | Z | AB (MAX) ¹ | A (MAX) ¹ | CP (MAX) ¹ |
| 1 1/4 AC (NPT) | 1 1/2 NPT | 4 3/4 (121) | 5 (127) | 4 1/2 (114) | 10 3/4 (273) | 10 1/2 (267) | 25 1/2 (648) |
| 1 1/2 AC (NPT) | 2 NPT | 5 (127) | 6 (152) | 4 5/8 (117) | 10 3/4 (273) | 12 1/2 (318) | 32 1/4 (819) |
| 2 AC | 2 1/2 | 5 1/2 (140) | 6 1/2 (165) | 4 3/4 (121) | 10 3/4 (273) | 12 1/2 (318) | 34 1/2 (876) |
| 2 1/2 AB | 3 | 5 13/16 (148) | 6 (152) | 4 11/16 (119) | 10 3/4 (273) | 12 1/2 (318) | 35 1/4 (895) |
| 3 AC | 4 | 6 1/4 (159) | 6 (152) | 5 (127) | 12 5/8 (321) | 14 (356) | 36 1/8 (918) |
| 4 AC | 5 | 6 7/8 (175) | 7 1/2 (191) | 5 3/4 (146) | 15 1/8 (384) | 16 (406) | 40 5/8 (1032) |
| 5 A | 6 | 7 7/8 (200) | 8 1/2 (216) | 6 1/4 (159) | 15 1/8 (384) | 16 (406) | 42 (1067) |
| 1 1/4 BC (NPT) | 1 1/2 NPT | 6 1/8 (156) | 8 (203) | 5 1/2 (140) | 12 5/8 (321) | 14 (356) | 35 1/8 (892) |
| 1 1/2 BC (NPT) | 2 NPT | 6 1/4 (159) | 6 1/2 (165) | 5 3/4 (146) | 15 1/8 (384) | 16 (406) | 36 3/8 (924) |
| 2 BC | 2 1/2 | 6 1/8 (156) | 7 (178) | 5 7/8 (149) | 15 1/8 (384) | 16 (406) | 39 (991) |
| 2 1/2 BB | 3 | 7 1/4 (184) | 6 3/4 (171) | 6 (152) | 15 1/8 (384) | 16 (406) | 39 1/8 (994) |
| 3 BC | 4 | 7 (178) | 7 1/2 (191) | 6 1/8 (156) | 15 1/8 (384) | 16 (406) | 40 (1016) |
| 4 BC | 5 | 8 5/8 (219) | 8 (203) | 7 (178) | 10 3/4 (273) | 12 1/2 (318) | 36 3/8 (924) |
| 5 BC | 6 | 9 1/2 (241) | 10 (254) | 7 1/2 (191) | 12 5/8 (321) | 14 (356) | 37 1/8 (943) |
| 6 BC | 8 | 10 3/8 (264) | 10 1/2 (267) | 8 1/4 (210) | 15 1/8 (384) | 16 (406) | 43 1/2 (1105) |
| 2 E | 3 | 7 5/8 (194) | 8 (203) | 6 1/2 (165) | 10 3/4 (273) | 12 1/2 (318) | 39 1/4 (997) |
| 3 E | 4 | 8 1/2 (216) | 9 1/2 (241) | 7 3/8 (187) | 10 3/4 (273) | 12 1/2 (318) | 35 1/2 (902) |
| 4 E | 5 | 9 1/4 (235) | 9 3/4 (248) | 7 1/4 (184) | 12 5/8 (321) | 14 (356) | 35 (889) |
| 5 E | 6 | 9 5/8 (244) | 10 1/2 (267) | 7 15/16 (202) | 15 1/8 (384) | 16 (406) | 38 (965) |
| 6 E | 8 | 10 7/8 (276) | 11 (279) | 8 15/32 (215) | 15 1/8 (384) | 16 (406) | 40 5/8 (1032) |

Dimensions are subject to change. Not to be used for construction purposes unless certified.
¹Varies with motor manufacturer.

| SIZE OF PUMP AND DISCHARGE | SUCTION | PUMP DIMENSIONS FIGURE 2 - INCHES (MM) | | | | | |
|----------------------------|---------|--|---------------|--------------|-----------------------|-----------------------|-----------------------|
| | | DD | X | Z | AB (MAX) ¹ | HA (MAX) ¹ | CP (MAX) ¹ |
| 2G | 3 | 10 (254) | 9 (229) | 7 1/4 (184) | 11 1/2 (292) | 14 (356) | 31 7/8 (810) |
| 3G | 4 | 10 (254) | 9 1/2 (241) | 8 (203) | 14 5/8 (371) | 15 3/4 (400) | 34 1/16 (865) |
| 4GB | 5 | 11 (279) | 10 (254) | 8 9/16 (217) | 14 5/8 (371) | 15 3/4 (400) | 36 1/16 (916) |
| 5G | 6 | 12 (305) | 13 (330) | 9 (229) | 14 5/8 (371) | 22 1/2 (571) | 36 5/16 (922) |
| 6G | 8 | 12 (305) | 14 (357) | 9 5/16 (236) | 14 5/8 (371) | 22 1/2 (571) | 37 1/16 (941) |
| 8G** | 10* | 14 3/8 (365) | 17 5/16 (440) | 0 | 15 7/8 (403) | 27 1/2 (698) | 40 27/64 (1026) |

Dimensions are subject to change. Not to be used for construction purposes unless certified.
¹Varies with motor manufacturer.
 *8G suction flange drilled and tapped per ANSI B16.1 standard.
 **8G is Stuffing Box Configuration only.

Consult Publication B-360 "Performance Curves" for required horsepower.

SERIES 1531 CONSTRUCTION FEATURES AND OPTIONS

| STANDARD | OPTIONAL |
|--------------------------|--|
| Cast Iron Volute | All Iron Construction |
| Bronze Impeller | All Bronze Construction* |
| Alloy Steel Shaft | Bronze Casing Wear Ring |
| Bronze Shaft Sleeve | Stainless Steel Shaft Sleeve |
| Internal Flushed Seal | Bypass Flush Line |
| | Stuffing Box Configuration |
| Buna/Carbon-Ceramic Seal | (Standard Configuration only) |
| | EPR/Tungsten Carbide-Carbon Seal |
| | EPR/Silicone Carbide-Silicone Carbide Seal |
| | Stuffing Box Configuration |
| | EPR/Tungsten Carbide-Carbon Seal |

SEAL SELECTION GUIDE

STANDARD CONFIGURATION

Buna/Carbon-Ceramic – PH Limitations 7-9; Temperature Range -20 to +225°F

EPR/Tungsten Carbide-Carbon – PH Limitations 7-11; Temperature Range -20 to +250°F

EPR/Silicone Carbide-Silicone Carbide – PH Limitations 7-12.5; Temperature Range -20 to +250°F

Recommended for use on closed or open systems which are relatively free of dirt and/or other abrasive particles.

STUFFING BOX CONFIGURATION

Flushed Single Seal

EPR/Tungsten Carbide-Carbon – PH Limitations 7-11; Temperature Range -20 to +300°F†

Recommended for use on closed or open systems which may contain a high concentration of abrasives. An external flush is required.

Flushed Double Seal

EPR/Carbon-Ceramic – PH Limitations 7-9; Temperature Range 0 to +250°F

Recommended for use on closed or open systems which may contain a high concentration of abrasives. An external flush is required.

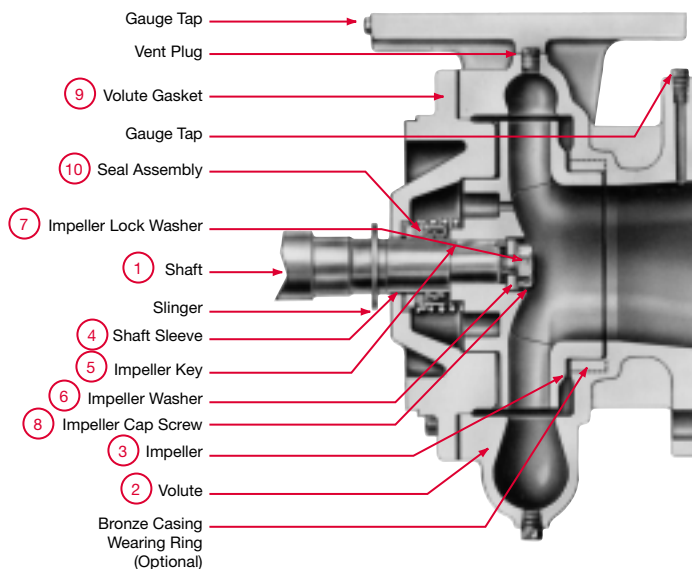
Packing

Braided Graphite PTFE-PH Limitations 7-9; Temperature Range 0 to +250°F

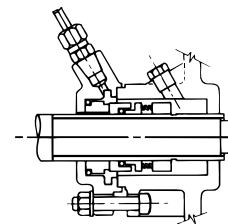
Recommended for use on closed or open systems which require a large amount of makeup water, as well as systems which are subjected to widely varying chemical conditions and solids buildup.

† For operating temperatures above 250°F a cooled flush is required and is recommended for temperatures above 225°F 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 fluid.

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



**1531-F OPTION
BYPASS FLUSH LINE
INTERNALLY FLUSHED SEAL**



**1531-S OPTION
FLUSH SINGLE SEAL
STUFFING BOX CONSTRUCTION**

| DESCRIPTION | BRONZE FITTED PUMP | ALL IRON PUMP | ALL BRONZE PUMP* |
|-------------------------|----------------------------|---------------------------------|----------------------------|
| 1 Shaft | Steel SAE 1144 | Steel SAE 1144 | Steel SAE 1144 |
| 2 Volute | Cast Iron ASTM #A159 | Cast Iron ASTM #A159 | Cast Bronze ASTM #B584 |
| 3 Impeller | Cast Bronze ASTM #B854 | Cast Iron ASTM #159 | Cast Bronze ASTM #B584 |
| 4 Shaft Sleeve | Aluminum Bronze ASTM #B111 | #304 Stainless Steel ASTM #A312 | Aluminum Bronze ASTM #B111 |
| 5 Impeller Key | #304 Stainless Steel | #304 Stainless Steel | #304 Stainless Steel |
| 6 Impeller Washer | 1531 – Brass | Stainless Steel | Brass |
| 7 Impeller Lock Washer | #304 Stainless Steel | #304 Stainless Steel | #304 Stainless Steel |
| 8 Impeller Cap Screw | #304 Stainless Steel | #304 Stainless Steel | #304 Stainless Steel |
| 9 Volute Gasket | Cellulose Fiber | Cellulose Fiber | Cellulose Fiber |
| 10 Seal Assemblies | | | |
| Standard Seal | | | |
| Bellows | Buna N | Buna N | Buna N |
| Faces | Carbon-Ceramic | Carbon-Ceramic | Carbon-Ceramic |
| Metal Parts | Brass | Stainless Steel | Brass |
| Spring | Stainless Steel | Stainless Steel | Stainless Steel |
| For Stuffing Box | | | |
| 10A Flushed Single | | | |
| O-Rings | EPR | EPR | |
| Faces | Carbon-Tungsten Carbide | Carbon-Tungsten Carbide | |
| Metal Parts | Stainless Steel | Stainless Steel | |
| Spring | Stainless Steel | Stainless Steel | |
| 10B Flushed Double | | | |
| O-Rings | EPR | EPR | |
| Faces | Carbon-Ceramic | Carbon-Ceramic | |
| Metal Parts | Stainless Steel | Stainless Steel | |
| Spring | Stainless Steel | Stainless Steel | |
| Packed | | | |
| Packing | Graphited Braided Yarn | Graphited Braided Yarn | |
| Gland | Bronze | Cast Iron | |
| Lantern Ring | Filled TFE | Filled TFE | |

*All Bronze Construction **NOT** available in **stuffing box construction** or any of the following sizes: 1 1/2AC, 4AC, 5A, 3AC, 3BC, 4BC, 5BC, 6BC, all E and G sizes.



ENGINEERING SPECIFICATIONS FOR BELL & GOSSETT SERIES 1531 HORIZONTAL CLOSE COUPLED PUMPS

Furnish and install pumps with capacities as shown on plans. Pumps shall be close coupled, single stage, end suction design, capable of being serviced without disturbing piping connections.

Pump volute shall be Class 30 cast iron. The impeller shall be cast bronze enclosed type, balanced, keyed to the shaft and secured by a locking capscrew.

The liquid cavity shall be sealed off at the motor shaft by an internally flushed mechanical seal with ceramic seal seat and carbon seal ring, suitable for continuous operation at 225°F. A replaceable shaft sleeve of bronze alloy shall completely cover the wetted area under the seal.

Pumps shall be rated for 175 psi maximum working pressure. Volute shall have gauge tapings at the suction and discharge nozzles and vent and drain tapings at the top and bottom.

Motor shall meet NEMA specifications and shall be of the size, voltage and enclosure called for on the plans. It shall

have heavy duty grease lubricated ball bearings, completely adequate for the maximum load for which the motor is designed.

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 tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high-grade machinery enamel prior to shipment.

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

Pumps shall be Series 1531 as manufactured by ITT Bell and Gossett.

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