



# **PWA-SP**

**SELF-PRIMING  
PROCESS PUMP**



# PWA-SP SELF-PRIMING PROCESS PUMP

## COMPETITIVE ADVANTAGES

### Carbon Steel vs. Ductile Iron

- High strength, impact resistant Carbon Steel liquid ends for improved durability and pressure containment at no additional cost.
- Replaces non-repairable, ductile iron casing and impellers, with repairable carbon steel, for extended component life.

### Flange Arrangement Options

- Standard ANSI class 150# flange pressure rating, flat or raised face design, provided to meet customer specified requirements at no additional cost.



### Shaft and Bearing Assembly

- Upgraded 316 SS vs. 4140 steel pump shaft is standard at no additional cost.
- Proven flinger disk lubrication device to ensure effective bearing lubrication. Provides 30% increased bearing L-10 life and minimum 15°F lower bearing operating temperatures compared to flood oil design.

### Casing

- High strength Carbon Steel casing, resistant to rupture due to retained priming fluid during freezing temperature conditions.
- Self venting, centerline discharge, back pull out design.
- Air separators, valves or special priming chambers not required.
- Standard 150# FF and 150# RF optional flange connections.



**5 Year Unconditional Power Frame Warranty is Standard at No Additional Cost.**



### Power Frame Superiority

- Superior high strength carbon steel vs. inferior cast iron power frame material.
- Addresses environmental and safety concerns.
- Exclusive finned bearing frame for maximum heat dissipation.
- Convenient dual oil level sight glasses provide flexible viewing as standard.
- Internal surfaces cleaned, rust preventative applied, and enamel coated assuring internal casting cleanliness.



Standard bore



Tapered bore



Big bore



Component seal



Single cartridge seal



Dual cartridge seal

### Seal Chamber / Sealing Solutions

- Multiple seal chambers for maximum sealing flexibility for all process applications.
- Accommodates all mechanical seal manufacturer's component and ANSI cartridge seal configurations.
- Supports the full array of CPI seal support system options.
- Ensures superior leak protection with maximum heat dissipation, maximizing seal life and pump reliability.

**All materials are USA sourced to meet all Country of Origin requirements.**

# PWA-SP SELF-PRIMING PROCESS PUMP

## LEVERAGING TECHNOLOGY

PumpWorks Industrial leverages technology by providing:

- Superior manufacturing capabilities.
- Company owned USA foundry.
- Extensive inventory selection.
- Professional, reliable service.



## FOUNDRY PumpWorks Castings

- Precision investment cast impellers yields exceptionally smooth surface finish ensuring repeatable, efficient hydraulic performance.
- One ton piece part capacity. Metallurgies from Carbon Steel through Titanium.
- Complete in house casting inspection includes certified spectrographic, hardness, physical properties and live casting X-ray analysis.



## MANUFACTURING

- All of our pumps are manufactured and tested in the United States of America, utilizing exclusive state-of-the-art manufacturing equipment and US foundries for all castings. This ensures consistent quality, product availability, and low cost of ownership.



## INVENTORY

- Pump and component inventory in a variety of material options are strategically located through the Northern hemisphere ensuring consistent, rapid shipment tailored to customer requirements.

## SERVICE

- Fully staffed professional sales and service teams providing superior customer support is available 24/7/365.



- ePOD Pump Selector access by end users and specifiers available online at no additional cost at [www.pumpworksindustrial.com](http://www.pumpworksindustrial.com)



## DESIGN FEATURES AND BENEFITS

### ● Casing Gasket

- Fully confined to maximize liquid sealing
- Protects casing fits from corrosion, therefore increase maintenance ease and proper alignment during reassembly

### ● Seal Chamber / Sealing Options

- Multiple seal chambers for maximum sealing flexibility for all process applications.
- Accommodates all mechanical seal manufacturer's component and ANSI cartridge seal configurations
- Supports the full array of CPI seal support system options
- Ensures superior leak protection with maximum heat dissipation, maximizing seal life and pump reliability.

### ● Casing

- Self venting, centerline discharge back pull out design
- Precision serrated flange face finish for optimum gasket retention and sealing
- High strength Carbon Steel casing, resistance to rupture due to retained priming fluid during ambient freezing temperatures
- Air separators, valves or special priming chambers not required
- Standard 150# FF and 150# RF optional flange connections

### ● Quality

- Manufactured and tested in the USA

### ● Impeller

- Fully open for increased corrosion, abrasion and solids wear resistance
- Back pump out vanes for reduced thrust loading and seal chamber operating pressure

### ● Delivery

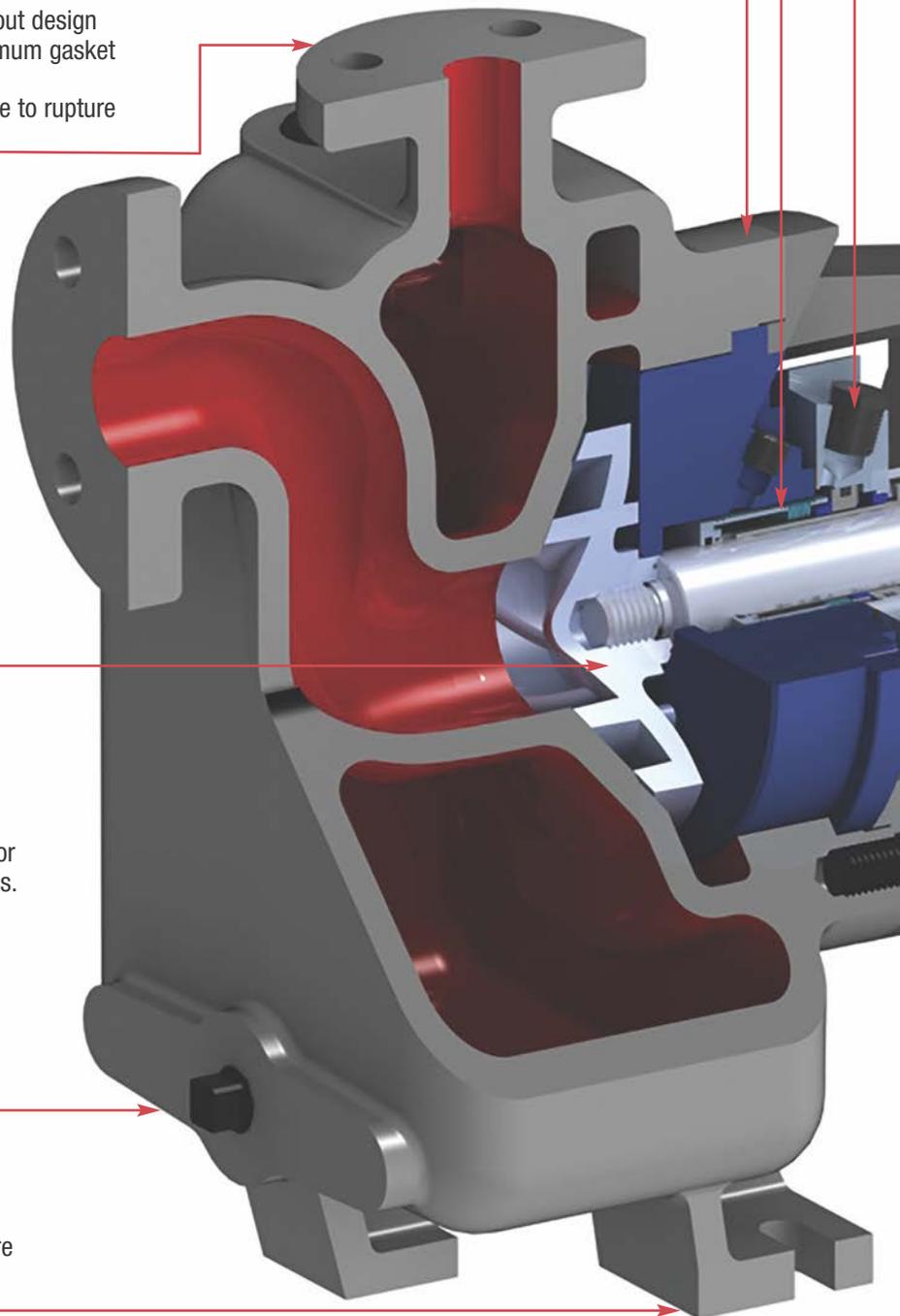
- Pump components strategically inventoried for rapid shipment in a variety of material options.

### ● Casing Drain

- Optional casing drain and drain piping

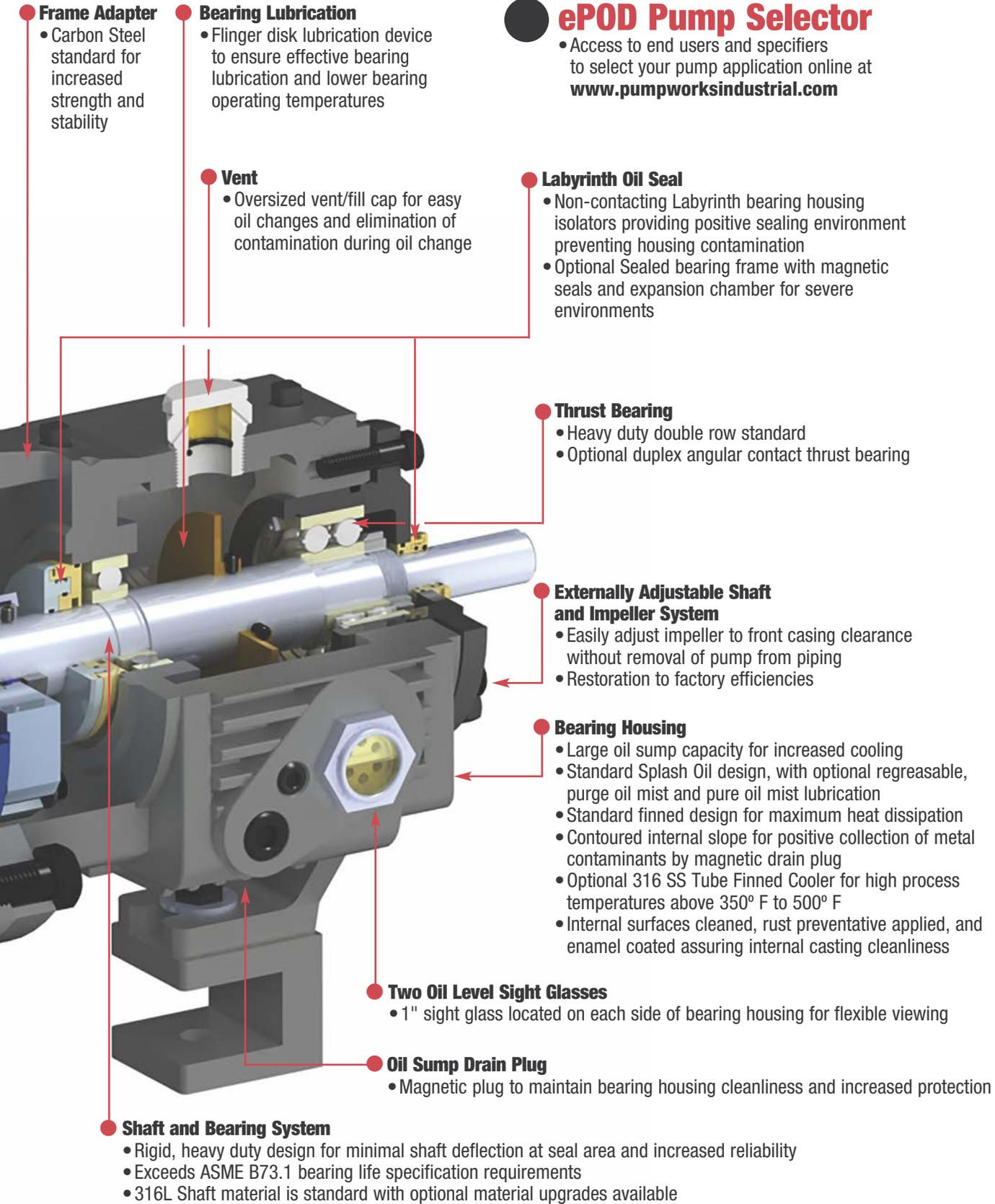
### ● Foot Mounted Casing

- Maximum casing stability and support for back pull out maintenance feature
- Reduced vibration



## ePOD Pump Selector

- Access to end users and specifiers to select your pump application online at [www.pumpworksindustrial.com](http://www.pumpworksindustrial.com)



**Frame Adapter**

- Carbon Steel standard for increased strength and stability

**Bearing Lubrication**

- Flinger disk lubrication device to ensure effective bearing lubrication and lower bearing operating temperatures

**Vent**

- Oversized vent/fill cap for easy oil changes and elimination of contamination during oil change

**Labyrinth Oil Seal**

- Non-contacting Labyrinth bearing housing isolators providing positive sealing environment preventing housing contamination
- Optional Sealed bearing frame with magnetic seals and expansion chamber for severe environments

**Thrust Bearing**

- Heavy duty double row standard
- Optional duplex angular contact thrust bearing

**Externally Adjustable Shaft and Impeller System**

- Easily adjust impeller to front casing clearance without removal of pump from piping
- Restoration to factory efficiencies

**Bearing Housing**

- Large oil sump capacity for increased cooling
- Standard Splash Oil design, with optional regreasable, purge oil mist and pure oil mist lubrication
- Standard finned design for maximum heat dissipation
- Contoured internal slope for positive collection of metal contaminants by magnetic drain plug
- Optional 316 SS Tube Finned Cooler for high process temperatures above 350° F to 500° F
- Internal surfaces cleaned, rust preventative applied, and enamel coated assuring internal casting cleanliness

**Two Oil Level Sight Glasses**

- 1" sight glass located on each side of bearing housing for flexible viewing

**Oil Sump Drain Plug**

- Magnetic plug to maintain bearing housing cleanliness and increased protection

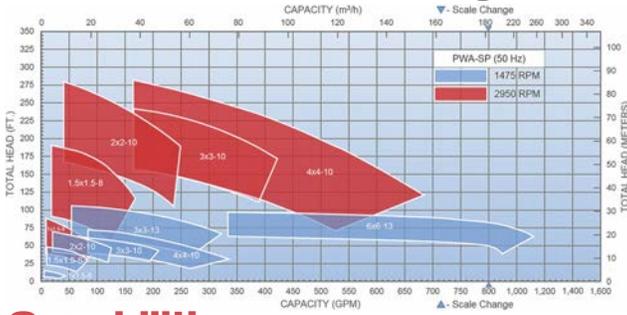
**Shaft and Bearing System**

- Rigid, heavy duty design for minimal shaft deflection at seal area and increased reliability
- Exceeds ASME B73.1 bearing life specification requirements
- 316L Shaft material is standard with optional material upgrades available

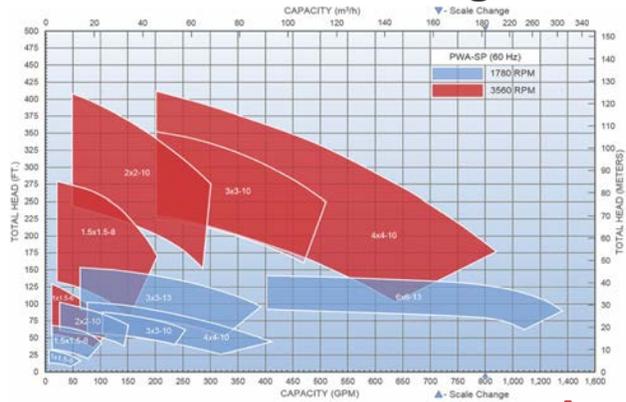
# PWA-SP SELF-PRIMING PROCESS PUMP

## HYDRAULIC PERFORMANCE COVERAGE

### 50 Hz Performance Coverage



### 60 Hz Performance Coverage



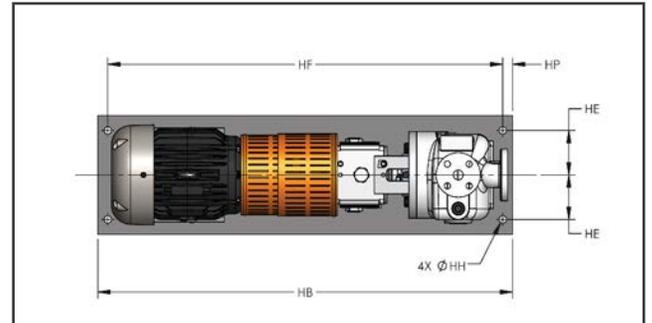
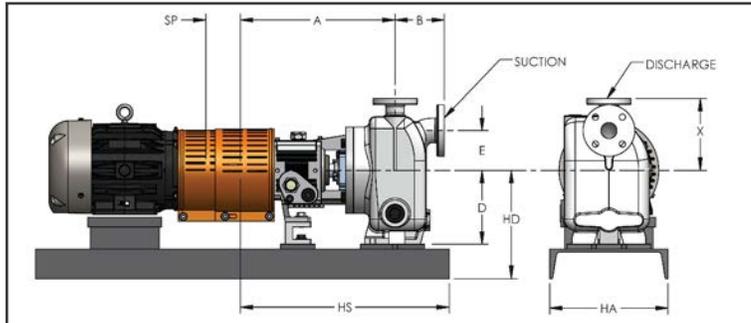
### Capabilities

- Capacities to 284 m<sup>3</sup>/h | 1,250 GPM
- Heads to 131 m | 430 ft
- Temperatures to 260° C | 500° F
- Pressures to 26 bar | 375 PSIG
- Suction Lifts to 6 m | 20 ft

Visit our web site at [www.pumpworksindustrial.com](http://www.pumpworksindustrial.com) and specify flow and performance needs and obtain pump selection and performance curve.



Performances shown are nominal and are to be used for preliminary selection only.



Not to be used for construction unless certified by manufacturer.

## PUMP DIMENSIONS AND WEIGHTS

Dimensions in inches (mm), weights in lbs. (kg)

| POWER FRAME       | SIZE      | DISCHARGE | SUCTION      | X            | A            | B            | D         | E         | SP        | HS MAX     | WEIGHT BARE PUMP lb (kg) | NEMA MOTOR FRAME | WEIGHT lb (kg) |      |           |
|-------------------|-----------|-----------|--------------|--------------|--------------|--------------|-----------|-----------|-----------|------------|--------------------------|------------------|----------------|------|-----------|
| GROUP 1           | 1X1.5X6   | 1         | 1.5          | 7.25 (184)   | 15.5 (394)   | 5.0 (127)    | 7.5 (191) | 4.0 (102) | 3.75 (95) | 23.5 (597) | 145 (66)                 | 182T             | 98 (45)        |      |           |
|                   | 1.5X1.5X8 | 1.5       | 1.5          | 7.875 (200)  |              |              |           |           |           |            | 154 (70)                 |                  |                |      |           |
| GROUP 2 / GROUP 3 | 2X2X10    | 2         | 2            | 10 (254)     | 21.75 (552)  | 6.5 (165)    | 10 (254)  | 6.0 (152) | 3.75 (95) | 37 (940)   | 384 (174)                | 213T             | 197 (89)       |      |           |
|                   | 3X3X10    | 3         | 3            |              | 22.625 (575) | 6.75 (171)   |           |           |           | 37 (940)   | 396 (179)                |                  |                |      |           |
|                   | 4X4X10    | 4         | 4            |              | 23.375 (594) | 9.1875 (233) |           |           |           | 37 (940)   | 453 (205)                |                  |                | 254T | 375 (170) |
|                   | 3X3X13    | 3         | 3            |              | 22.625 (575) | 6.75 (171)   |           |           |           | 37 (940)   | 481 (218)                |                  |                |      |           |
| 4X4X13            | 4         | 4         | 23.375 (594) | 9.1875 (233) | 37 (940)     | 583 (264)    | 284T      | 495 (225) |           |            |                          |                  |                |      |           |
| 6X6X13            | 6         | 6         | 15 (356)     | 27.75 (704)  | 7.5 (191)    | 12 (356)     |           |           | 7.0 (178) | 39 (991)   | 715 (324)                | 286T             | 519 (235)      |      |           |

Pump approximate weights shown are Group 2 Power Frame. For Group 3 Power Frame add 25 lb (11.5)

Weights and dimensions are approximate and not to be used for construction. HS dimension varies with base plate type. Consult factory for specific dimension.

## BASEPLATE DIMENSIONS AND WEIGHTS

Dimensions in inches (mm), weights in lbs. (kg)

| MAX NEMA FRAME | HA       | HB        | HE        | HF          | HT         | HH        | WEIGHT lb (Kg) |
|----------------|----------|-----------|-----------|-------------|------------|-----------|----------------|
| 145T           | 12 (305) | 39 (991)  | 4.5 (114) | 36.5 (927)  | 3.8 (97)   | 0.75 (19) | 120 (55)       |
| 215T           | 15 (381) | 45 (1143) | 6 (152)   | 42.5 (1080) | 4.03 (102) | 0.75 (19) | 167 (76)       |
| 286T           | 18 (457) | 52 (1321) | 7.5 (191) | 49.5 (1257) | 4.58 (116) | 0.75 (19) | 279 (127)      |

| MAX NEMA FRAME | HA       | HB        | HD         |          |          | HE        | HF          | HT      | HH     | WEIGHT lb (kg) |
|----------------|----------|-----------|------------|----------|----------|-----------|-------------|---------|--------|----------------|
|                |          |           | D=7.5      | D=10     | D=12     |           |             |         |        |                |
| 215T           | 18 (457) | 60 (1524) | 12.5 (318) | 15 (381) | note (1) | 7.5 (191) | 57.5 (1461) | 5 (127) | 1 (25) | 283 (129)      |
| 286T           | 18 (457) | 66 (1676) | 12.5 (318) | 15 (381) | n/a      | 7.5 (191) | 63.5 (1613) | 5 (127) | 1 (25) | 313 (142)      |
| 286T           | 18 (457) | 70 (1778) | 12.5 (318) | n/a      | 17 (434) | 7.5 (191) | 67.5 (1715) | 5 (127) | 1 (25) | 330 (150)      |
| 365T           | 18 (457) | 72 (1829) | n/a        | 15 (381) | n/a      | 7.5 (191) | 69.5 (1765) | 5 (127) | 1 (25) | 346 (157)      |
| 365T           | 18 (457) | 74 (1880) | n/a        | n/a      | 17 (434) | 7.5 (191) | 71.5 (1816) | 5 (127) | 1 (25) | 356 (162)      |
| 405TS          | 18 (457) | 78 (1981) | n/a        | 15 (381) | note (1) | 7.5 (191) | 65.5 (1664) | 5 (127) | 1 (25) | 340 (155)      |

Note (1): Pump size 6x6x13 not available on baseplate size.

Weights and dimensions are approximate and not to be used for construction.

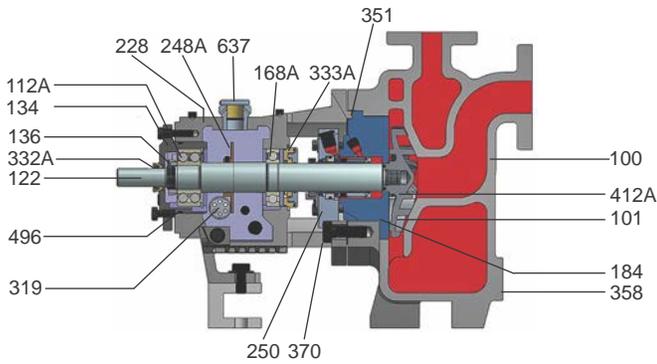
# PWA-SP SELF-PRIMING PROCESS PUMP

## PARTS LIST AND MATERIALS OF CONSTRUCTION

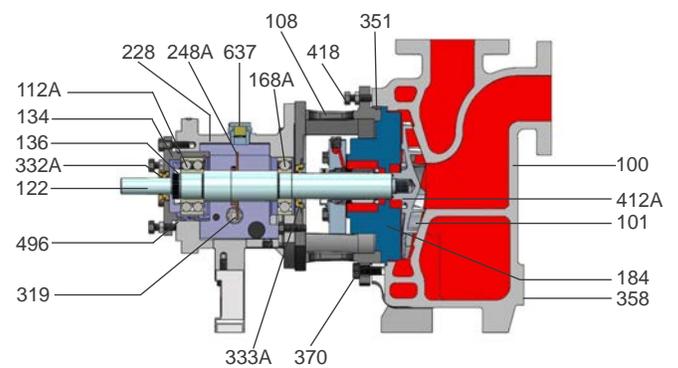
| Item Ref Number | Part Name                        | Materials                                     |                                 |                    |                    |                          |                    |                    |          |
|-----------------|----------------------------------|---|---------------------------------|--------------------|--------------------|--------------------------|--------------------|--------------------|----------|
|                 |                                  | Carbon Steel                                  | Carbon Steel w 316L SS Impeller | 316L SS            | Duplex SS          | Super Duplex SS          | Alloy 20           | Hastelloy B, C & G | Titanium |
| 100             | Casing                           | Carbon Steel                                  | Carbon Steel                    | 316L SS            | Duplex SS CD4 Gr1B | Super Duplex SS CD4 Gr5A | Alloy 20           | Hastelloy B, C & G | Titanium |
| 101             | Impeller                         | Carbon Steel                                  | 316L SS                         | 316L SS            | Duplex SS CD4 Gr1B | Super Duplex SS CD4 Gr5A | Alloy 20           | Hastelloy B, C & G | Titanium |
| 105             | Lantern Ring                     | Glass Filled Teflon                           |                                 |                    |                    |                          |                    |                    |          |
| 106             | Packing, Stuffing Box            | Teflon - Impregnated Fibers                   |                                 |                    |                    |                          |                    |                    |          |
| 108             | Adapter, Frame                   | Carbon Steel                                  |                                 |                    |                    |                          |                    |                    |          |
| 112A            | Thrust Bearing                   | Double Row Angular Contact <sup>(1)</sup>     |                                 |                    |                    |                          |                    |                    |          |
| 122             | Shaft - Less Sleeve              | 316L SS (Optional Alloy 20 & Duplex SS A2205) |                                 | Duplex A2205       |                    | Alloy 20                 | Hastelloy B, C & G | Titanium           |          |
| 122             | Shaft with Sleeve                | 316L (Optional Alloy 20 & Duplex SS A2205)    |                                 |                    |                    |                          |                    |                    |          |
| 126             | Shaft Sleeve                     | 316L SS (Optional Alloy 20 & Duplex SS A2205) |                                 | Super Duplex SS    |                    | Alloy 20                 | Hastelloy B, C & G | Titanium           |          |
| 134             | Thrust Bearing Housing           | Carbon Steel                                  |                                 |                    |                    |                          |                    |                    |          |
| 136             | Bearing Lock Nut and Lock Washer | Steel   |                                 |                    |                    |                          |                    |                    |          |
| 168A            | Radial Bearing                   | Single Row Deep Groove                        |                                 |                    |                    |                          |                    |                    |          |
| 184             | Cover, Stuffing Box (Packed Box) | Carbon Steel                                  | Carbon Steel                    | 316L SS            | Duplex SS CD4 Gr1B | Super Duplex SS CD4 Gr5A | Alloy 20           | Hastelloy B, C & G | Titanium |
| 184             | Seal Chamber (Mechanical Seal)   | Carbon Steel                                  | Carbon Steel                    | 316L SS            | Duplex SS CD4 Gr1B | Super Duplex SS CD4 Gr5A | Alloy 20           | Hastelloy B, C & G | Titanium |
| 228             | Frame, Bearing                   | Carbon Steel                                  |                                 |                    |                    |                          |                    |                    |          |
| 248A            | Flinger with set screws          | Bronze with steel set screws                  |                                 |                    |                    |                          |                    |                    |          |
| 250             | Gland - Seal/Packing             | 316L SS                                       |                                 | Duplex SS CD4 Gr1B |                    | Super Duplex SS CD4 Gr5A | Alloy 20           | Hastelloy B, C & G | Titanium |
| 370H            | Stud/Nut, Cover to Adapter       | 304SS   |                                 |                    |                    |                          |                    |                    |          |
| 319             | Sight Glass - Oil                | Glass/Steel                                   |                                 |                    |                    |                          |                    |                    |          |
| 332A            | Labyrinth Seal (Outboard)        | Bronze  |                                 |                    |                    |                          |                    |                    |          |
| 333A            | Labyrinth Seal (Inboard)         | Stainless Steel/Bronze                        |                                 |                    |                    |                          |                    |                    |          |
| 351             | Gasket, Casing                   | Aramid Fiber with Binder                      |                                 |                    |                    |                          |                    |                    |          |
| 358             | Plug, Casing Drain (Optional)    | Carbon Steel                                  | Carbon Steel                    | 316L SS            | Duplex SS CD4 Gr1B | Super Duplex SS CD4 Gr5A | Alloy 20           | Hastelloy B, C & G | Titanium |
| 360F            | Gasket, Frame to Adapter         | Buna Rubber                                   |                                 |                    |                    |                          |                    |                    |          |
| 360C            | Gasket, Bearing End Cover        | Cellulose Fiber with Binder                   |                                 |                    |                    |                          |                    |                    |          |
| 370             | Cap Screw, Adapter to Casing     | Stainless Steel, ASTM A193                    |                                 |                    |                    |                          |                    |                    |          |
| 412A            | O-ring, Impeller                 | Glass Filled Teflon                           |                                 |                    |                    |                          |                    |                    |          |
| 418             | Jacking Bolt                     | 304SS   |                                 |                    |                    |                          |                    |                    |          |
| 469B            | Dowel Pin, Frame to Adapter      | Steel   |                                 |                    |                    |                          |                    |                    |          |
| 496             | O-ring, Bearing Housing          | Buna Rubber                                   |                                 |                    |                    |                          |                    |                    |          |
| 637             | Filter Vent                      | Carbon Steel                                  |                                 |                    |                    |                          |                    |                    |          |

(1) Duplex angular contact bearing Standard on Group 3, Bearing Frame and optional on Group 1 and 2.

**GROUP 1** Sectional View PWA-SP



**GROUP 2 / GROUP 3** Sectional View PWA-SP



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## TECHNICAL DATA All dimensions in inches and (mm)

|   |   | GP1   | GP2         | GP3         |
|---|---|---|-------------|-------------|
| <b>Shaft</b>                              | Shaft Diameter at Impeller                                      | 0.75 (19)   | 1 (25)      | 1.25 (32)   |
|   | Diameter in Stuffing Box/Seal Chamber                           |   |             |             |
|   | (Less sleeve)   | 1.375 (35)  | 1.75 (45)   | 2.125 (54)  |
|   | (With sleeve)   | 1.125 (29)  | 1.5 (38)    | 1.875 (48)  |
|   | Diameter Between Bearings                                       | 1.5 (38)  | 2.125 (54)  | 2.5 (64)    |
|   | Diameter at Coupling  | 0.875 (22)  | 1.125 (29)  | 1.875 (48)  |
|   | Overhang  | 6.125 (156)   | 8.375 (213) | 8.375 (213) |
|   | Maximum Shaft Deflection  | 0.002 (0.05)  |             |             |
|   | Shaft Deflection Index ( $L^3/D^4$ )                            |   |             |             |
| (Less sleeve)                             | 64  | 63  | 29          |             |
| (With sleeve)                             | 143   | 116   | 48          |             |
| <b>Sleeve</b>                             | Outside Diameter thru Stuffing Box/Seal Chamber                 | 1.375 (35)  | 1.75 (45)   | 2.125 (54)  |
| <b>Bearings</b>                           | Radial  | 6207  | 6309        | 6311        |
|   | Thrust  | 3306  | 3309        | 7310        |
|   | Bearing Span  | 4.125 (105)   | 6.75 (171)  | 6.875 (164) |
| <b>Large Bore Seal Chamber</b>            | Bore  | 2.875 (73)  | 3.5 (89)    | 3.875 (98)  |
| <b>Stuffing Box</b>                       | Bore  | 2 (51)  | 2.5 (64)    | 2.875 (73)  |
| <b>Maximum Power Limits</b>               | HP (kW) per 100 RPM   | 1.1 (0.82)  | 3.4 (2.6)   | 5.6 (4.2)   |
| <b>Maximum Allowable Working Pressure</b> | MAWP PSI (kPa)*   | up to 285 PSI (1965 kPa) at 100° F with 150# flanges – consult factory for higher pressure requirements<br>*Consult Pressure Temperature chart for various temperatures |             |             |
| <b>Maximum Temperature</b>                | Oil or Grease Lubricated Bearing Frame without Optional Cooling | 350° F (177°C)  |             |             |
|   | Oil Lubricated Power Frame with Tube Finned Cooler              | 500° F (260°C)  |             |             |
| <b>Casing</b>                             | Corrosion Allowance   | 0.125 (3) minimum   |             |             |

Hydro-static test pressure equal to 1.5 times Maximum Allowable Working Pressure

### Test Facilities

- Test flows up to 7,500 GPM.
- Discharge test pressures up to 740 PSI.
- Supply tank rated from full vacuum to 65 psi.
- 460 volt through 500 HP, 3600 RPM.
- Variable Frequency Drive for precise speed control through 500 HP @ 460 volt.

See our Test Facilities Brochure for more information.



### Typical Industries

- Chemical/Petrochemical
- Pulp and Paper
- Food and Beverage
- Oil and Gas
- Primary Metals Manufacturing
- Mining
- Power Generation
- Waste Treatment
- General Industrial

