

## Dean Pump® High Temperature Air-Cooled Hot Water & Water/Glycol Pumps

No Water  
Cooling  
Required



**RWA4166**



**RWA2096**

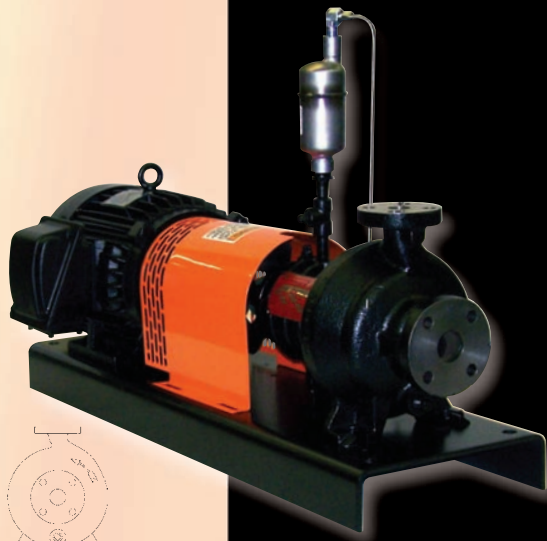
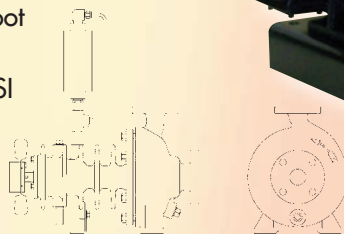


**RWA4206**

# Dean Pump® RWA2096

The smaller, foot mounted, economy version of the air-cooled RWA series pumps.

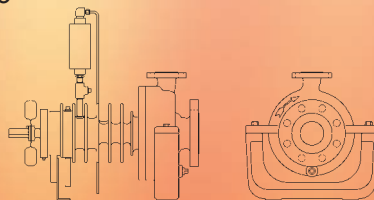
- Available in three sizes
- Thrust bearing is double row sealed design
- Flanges are Class 150 with flat face
- Small size casings are subject to less thermal growth at higher pumpage temperatures allowing economical foot type construction
- Dimensionally interchangeable with small ASME/ANSI B73.1 pumps



# Dean Pump® RWA4166

The larger, centerline supported, yoke mounted version of the air cooled RWA series pumps.

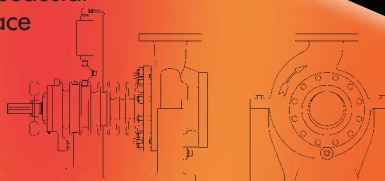
- Available in nine sizes
- Dimensionally interchangeable with R4140 series pumps and baseplates
- Thrust bearings are a pair of angular contact type
- Flanges are Class 300 with raised face
- Centerline mounted casing minimizes thermal growth about the pump centerline without disturbing alignment; rugged yoke mount casing support holds the pump securely in place resisting thermal expansion piping loads
- Pumps can be mounted on ASME/ANSI B73.1 design baseplate



# Dean Pump® RWA4206

The largest, centerline supported, pedestal mounted version of the air cooled RWA series pumps.

- Available in one size
- Dimensionally interchangeable with R4184 series pump piping and dimension envelope
- Thrust bearings are a pair of angular contact type
- Flanges are Class 300 with raised face
- Centerline mounted casing minimizes thermal growth about the pump centerline without disturbing alignment; rugged pedestal mounted casing support holds the pump securely in place resisting thermal expansion loads

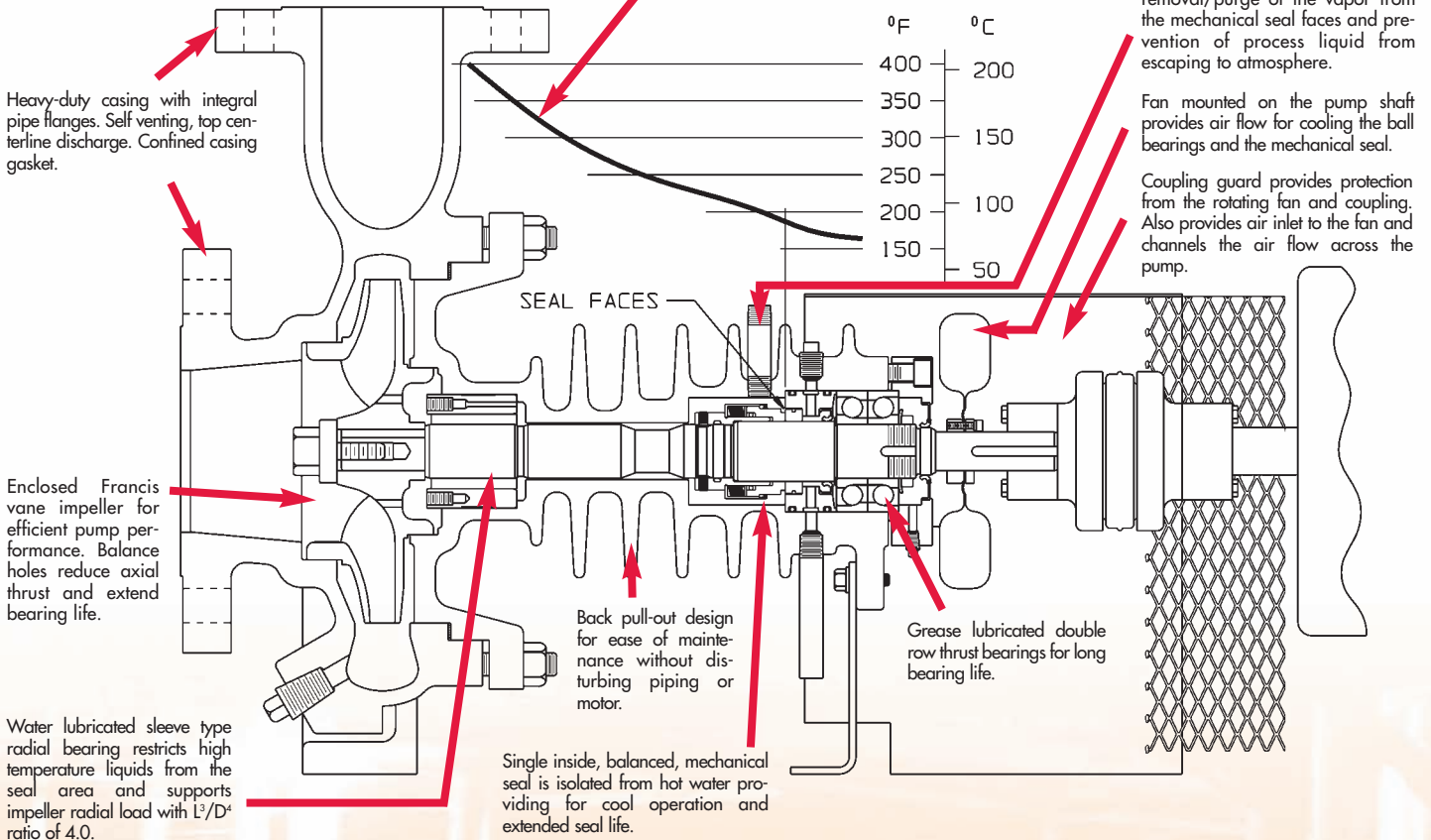


## DEAN PUMP® SERIES RWA FAN COOLED "HOT WATER" PUMPS

### No Liquid Cooling Required

The air fan cooling design of RWA Series pumps permits temperature drop in the pump from the casing to seal faces. When pumping at 400°F (204°C), the seal face temperature is 190°F (88°C). The efficient gradient breakdown protects the mechanical seal and bearing.

Temperature drop in pump from casing to bearings when pumping at 400°F (204°C).



## Experience counts!

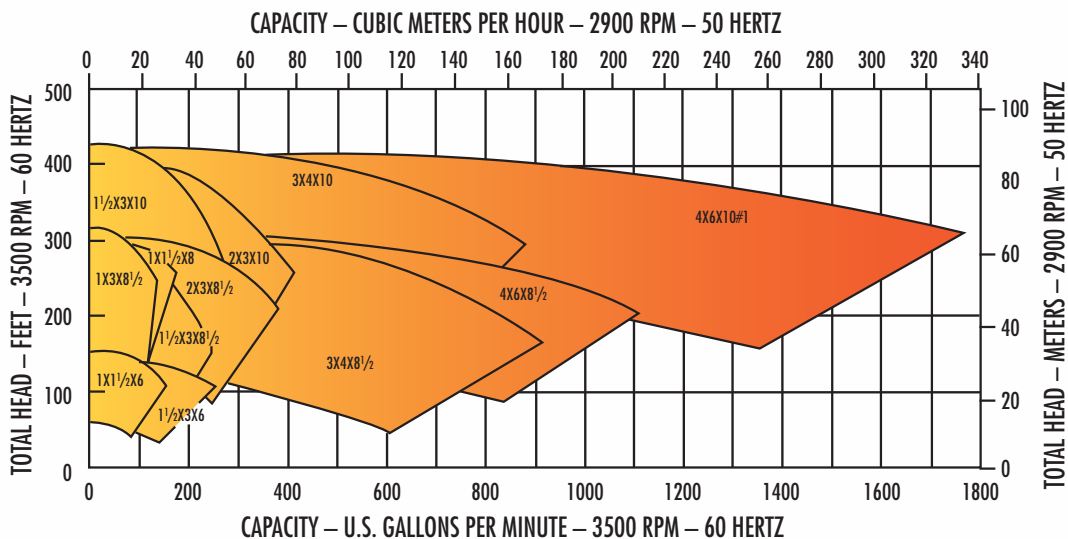
Dean Pump has designed and manufactured high temperature service pumps for well over 100 years. The Series RWA pump continues Dean's tradition of experience in this field, and represents the highest quality and most cost effective hot water pumping equipment currently available in the market.

Engineered for maximum parts interchangeability, the RWA pumps are designed specifically for use on hot water, ethylene glycol, propylene glycol, and triethylene glycol systems. The key feature of this pump line – **NO EXTERNAL WATER COOLING REQUIRED FOR THE BEARINGS AND THE MECHANICAL SEAL** – provides significant savings by eliminating additional, secondary utility and operating costs.

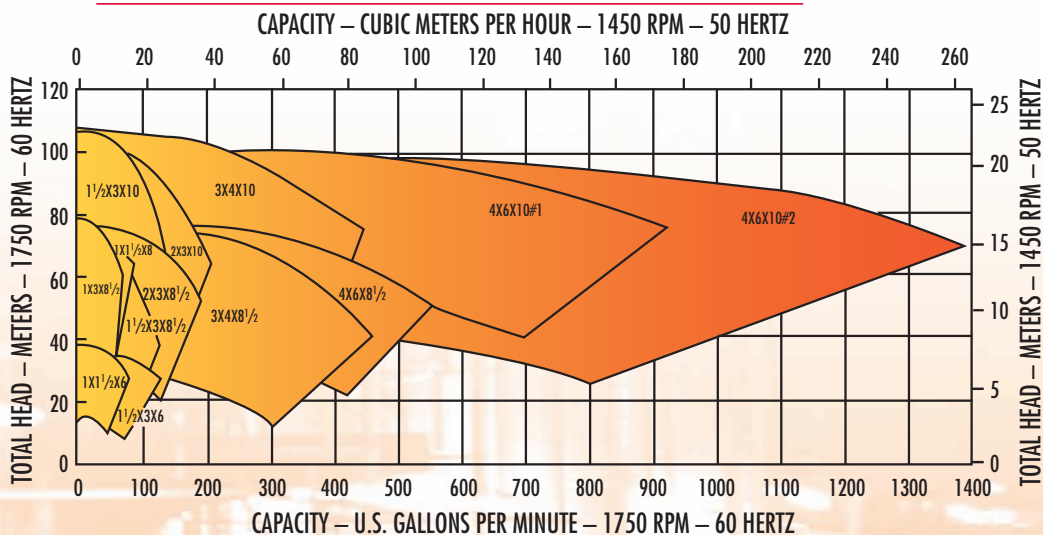
Given the appropriate consideration, the pumping of hot water does not have to be a problem. Almost any centrifugal pump can handle water in the 200°F (93°C) to 250°F (121°C). Beyond that range, however, there are many issues that must be evaluated in order to obtain the proper pump for a particular application or system. The main issues include the mechanical design of the pump, working pressure limits of the pump, and mechanical seal selection. With maximum allowable pumping temperatures of 320°F (160°C) for the RWA2096 pumps, and 400°F (204°C) for the RWA4166 and RWA4206 pumps, the Series RWA is uniquely designed to withstand the above-referenced issues, and is an ideal choice for applications that include, but are not limited to, boiler feed, steam condensate return, HVAC, and heat transfer.

## HEAD/CAPACITY RANGE CHARTS

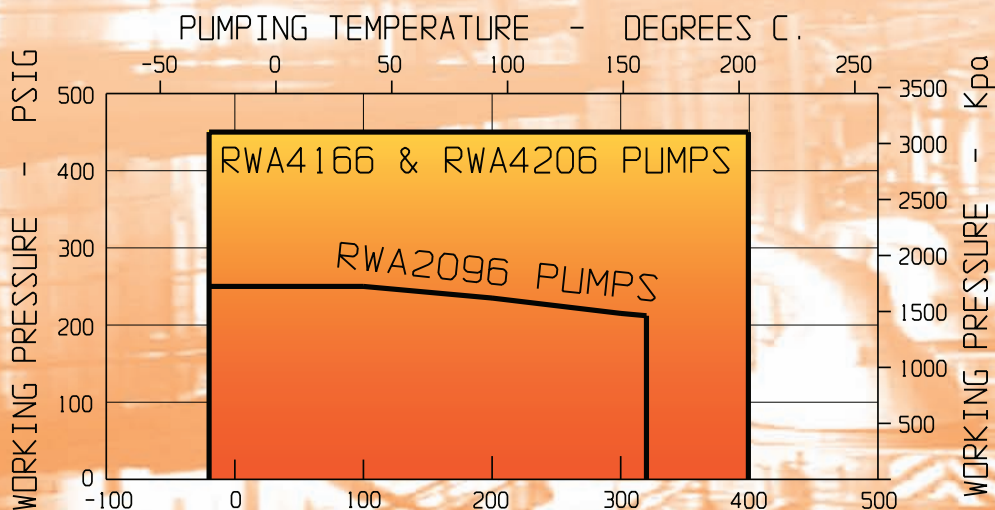
### Two Pole Motor

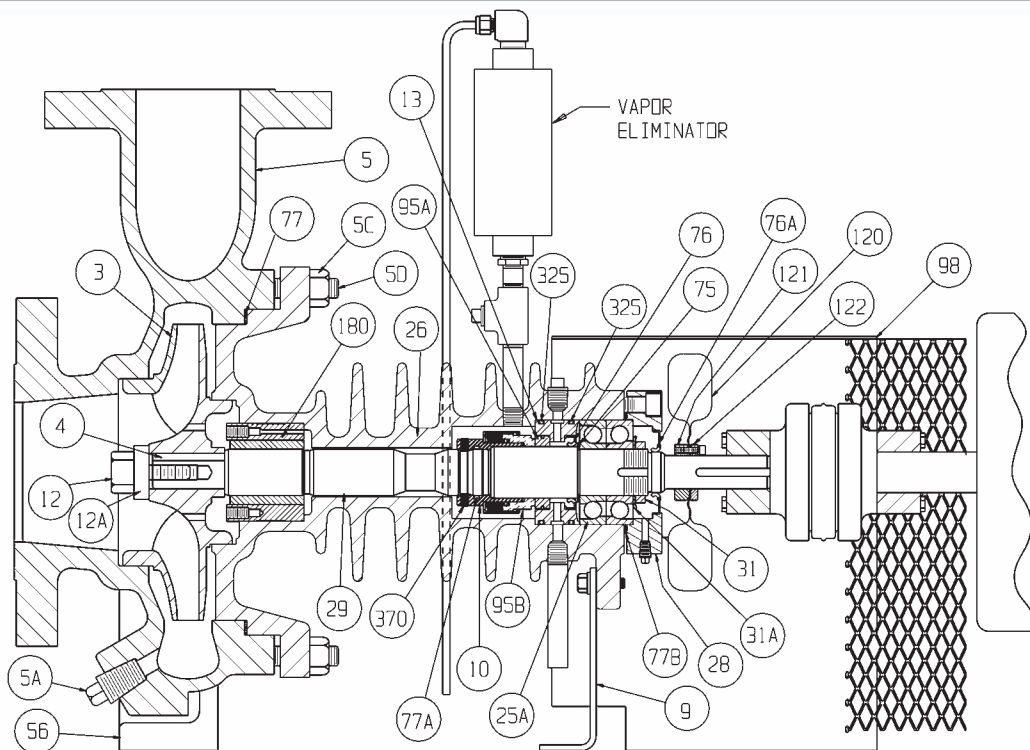


### Four Pole Motor



### WORKING PRESSURE VS. PUMPING TEMPERATURE





## MECHANICAL DESIGN SPECIFICATIONS

| PUMP TYPE   | RWA 2096                | RWA 4166                           | RWA 4206                           |
|---|-------------------------|------------------------------------|------------------------------------|
| Direction of Rotation (Viewed from Coupling End)  | CW                      | CCW                                | CCW                                |
| Casing Thickness, Minimum   | 5/16"                   | 5/16"                              | 5/16"                              |
| Corrosion Allowance   | 1/8"                    | 1/8"                               | 1/8"                               |
| Impeller Balance – Standard<br>Optional Extra   | Single Plane<br>Dynamic | Single Plane<br>Dynamic            | Single Plane<br>Dynamic            |
| Flanges<br>ANSI Class   | 150                     | 300                                | 300                                |
| Facing  | Flat Face               | Raised Face                        | Raised Face                        |
| Finish  | 125 Ra                  | 125 Ra                             | 125 Ra                             |
| Suction Pressure, Maximum   | 100 PSIG                | 260 PSIG                           | 260 PSIG                           |
| Horsepower Rating, Maximum<br>@3500 RPM<br>@1750 RPM<br>@1150 RPM   | 35<br>15<br>10          | 100<br>40<br>25                    | 250<br>125<br>75                   |
| Bearings:<br>Thrust Bearing, Ball Type, Grease Lubricated   | 5306 2RS<br>Double Row  | 7308 BG<br>Angular<br>Contact Pair | 7311 BG<br>Angular<br>Contact Pair |
| Radial Bearing, Sleeve Type, Pumpage Lubricated   |                         |                                    |                                    |
| Seal Chamber Dimensions<br>Length (Depth)   | 1 5/8"                  | 2 13/16"                           | 3 7/8"                             |
| Inside Diameter (Bore Dia.)   | 2 1/16"                 | 3 1/8"                             | 4 5/16"                            |
| Shaft Diameter  | 1 1/8"                  | 2"                                 | 2 1/2"                             |
| Pump Shaft Dimensions<br>Span Between Bearings<br>Span Between Radial Bearing Centerline<br>and Impeller Centerline | 8 11/16"                | 11 7/16"                           | 14 5/8"                            |
| Diameter at Coupling  | 1 5/8"                  | 2 5/16"                            | 3 1/4"                             |
| Diameter Between Bearings   | 7/8"                    | 1 1/8"                             | 1 5/8"                             |
| Diameter at Impeller  | 1 5/16"                 | 1 9/16"                            | 1 7/8"                             |
| L <sup>3</sup> /D <sup>4</sup>  | 4.3                     | 2.1                                | 2.8                                |
| Material Class  | 22<br>(Ductile Iron)    | 22<br>(Ductile Iron)               | 22<br>(Ductile Iron)               |
| Maximum Working Pressure  | 250 PSIG<br>@100°F      | 450 PSIG                           | 450 PSIG                           |
| Pumping Temperature<br>Minimum  | -20°F @<br>250 PSIG     | -20°F                              | -20°F                              |
| Maximum   | 320°F @<br>210 PSIG     | 400°F                              | 400°F                              |
| Maximum Ambient Temperature<br>(temp. within 12" of the pump)   | 118°F                   | 118°F                              | 118°F                              |
| Hydrostatic Test Pressure   | 430 PSIG                | 700 PSIG                           | 700 PSIG                           |

Seal chamber pressure equals pump suction pressure plus .06 x developed head.

**THESE PUMPS ARE DESIGNED SPECIFICALLY FOR USE ON HOT WATER, ETHYLENE GLYCOL, PROPYLENE GLYCOL, AND TRIETHYLENE GLYCOL SYSTEMS.**

## STANDARD MATERIALS OF CONSTRUCTION

| Part No. | Part Name                     | RWA 2096<br>Class 22       | RWA 4166<br>Class 22       | RWA 4206<br>Class 22       |
|----------|-------------------------------|----------------------------|----------------------------|----------------------------|
| 3        | Impeller                      | C.I. (1)                   | C.I. (1)                   | C.I. (1)                   |
| 4        | Impeller Key                  | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| 5        | Casing                        | D.I. (10)                  | D.I. (10)                  | D.I. (10)                  |
| 5A       | Casing Drain Plug             | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| 5C       | Casing Stud Nut               | N.A.                       | Steel (5)                  | Steel (5)                  |
| 5D       | Casing Stud/Cap Screw         | Steel (3) Screw            | Steel (4) Stud             | Steel (4) Stud             |
| 6A       | Casing Ring (only some sizes) | N.A.                       | Iron (7)                   | Iron (7)                   |
| 9        | Bearing Housing Foot          | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| *10      | Shaft Sleeve                  | N.A.                       | 316 S/S                    | 316 S/S                    |
| *12      | Impeller Bolt/Nut             | Steel (2) Nut              | Steel (2) Bolt             | Steel (2) Bolt             |
| *12A     | Impeller Washer               | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| *13      | Mechanical Seal Gland         | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| *25A     | Shaft Bearing – Thrust – Ball | Double Row                 | Angular<br>Contact Pair    | Angular<br>Contact Pair    |
| 26       | Bearing Housing               | D.I. (10)                  | D.I. (10)                  | D.I. (10)                  |
| *28      | Bearing End Cover             | C.I. (1)                   | Steel (2)                  | D.I. (9)                   |
| *29      | Pump Shaft                    | 11-13 S/S<br>(12)          | 11-13 S/S<br>(12)          | 11-13/316 S/S<br>(8)       |
| *31      | Thrust Bearing Lock Nut       | N.A.                       | Steel (2)                  | Steel (2)                  |
| *31A     | Thrust Bearing Lock Washer    | N.A.                       | Steel (2)                  | Steel (2)                  |
| 56       | Casing Foot                   | N.A.                       | C.I. (1)                   | C.I. (1)                   |
| *75      | Snap Ring                     | N.A.                       | Steel (2)                  | N.A.                       |
| *75A     | Snap Ring                     | Steel (2)                  | N.A.                       | N.A.                       |
| *76      | Grease Seal – Front           | Viton (13)                 | Viton (13)                 | Viton (13)                 |
| *76A     | Grease Seal – Rear            | N.A.                       | Buna (14)                  | Buna (14)                  |
| 77       | Casing Gasket                 | Teflon (11)                | Teflon (11)                | Teflon (11)                |
| *77A     | Sleeve Gasket                 | N.A.                       | Aflas                      | Aflas                      |
| *77B     | Bearing End Cover Gasket      | N.A.                       | Buna (14)                  | Buna (14)                  |
| *95A     | Mechanical Seal Stationary    | Silicon Carbide<br>& Aflas | Silicon Carbide<br>& Aflas | Silicon Carbide<br>& Aflas |
| *95B     | Mechanical Seal Rotary        | S/S, Carbon,<br>& Aflas    | S/S, Carbon,<br>& Aflas    | S/S, Carbon,<br>& Aflas    |
| 98       | Coupling Guard                | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| *120     | Fan                           | Aluminum                   | Aluminum                   | Aluminum                   |
| *121     | Fan Collar                    | N.A.                       | Steel (2)                  | Steel (2)                  |
| *122     | Fan Clamp Ring                | Steel (2)                  | Steel (2)                  | Steel (2)                  |
| *180     | Radial Bearing Cartridge      | Carbon &<br>Steel          | Carbon &<br>Steel          | Carbon &<br>416 S/S        |
| *325     | Seal Gland Gasket             | Aflas (13)                 | Aflas (13)                 | Aflas (13)                 |
| *370     | Sleeve Set Screw              | N.A.                       | 18-8 S/S                   | 18-8 S/S                   |
| *375     | Anti-Rotation Pin             | N.A.                       | N.A.                       | 316 S/S                    |

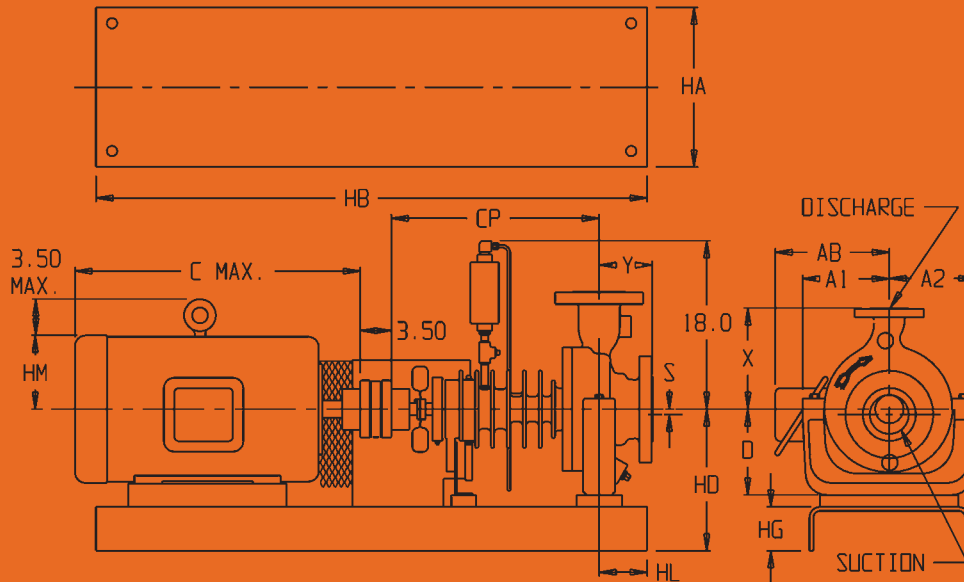
\* Denotes parts interchangeability in all pump sizes of a given series.

### MATERIAL SPECIFICATIONS (REFER TO NUMBERS IN PARENTHESES)

- |   |                               |
|---|-------------------------------|
| (1) Cast Iron   | (9) Ductile Iron – ASTM A536  |
| (2) AISI 1020   | (10) Ductile Iron – ASTM A395 |
| (3) SAE Grade 5 or ASTM A449 Type 1 Steel                   | (11) Teflon® Elastomer        |
| (4) AISI 4140, ASTM A193-B7 Steel                           | (12) ANSI 420 S/S             |
| (5) ASTM A194 Grade 2 Steel                                 | (13) Viton® Elastomer         |
| (7) Hardened Iron   | (14) Buna N Rubber            |
| (8) ANSI 316 S/S with ANSI 416 S/S<br>at the sleeve bearing |                               |

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Teflon® is a registered Trademark of E. I. DuPont Co.

# Dimensions



## Dimensions Determined by Pump

| Series  | Pump Size     | Suction |       |      | Discharge |       |      | A1    | A2    | D    | S    | X    | Y | CP   | HL  |
|---------|---------------|---------|-------|------|-----------|-------|------|-------|-------|------|------|------|---|------|-----|
|         |               | Size    | Class | Face | Size      | Class | Face |       |       |      |      |      |   |      |     |
| RWA2096 | 1x1-1/2x6     | 1.5     | 150   | FF   | 1         | 150   | FF   | 5.5   | 5.5   | 5.25 | 0    | 6.5  | 4 | 13.5 | 4.5 |
|         | 1-1/2x3x6     | 3       |       |      | 1.5       |       |      | 5.5   | 5.5   | 5.25 | 0    | 6.5  | 4 | 13.5 | 4.5 |
|         | 1x1-1/2x8     | 1.5     |       |      | 1         |       |      | 5.5   | 5.5   | 5.25 | 0    | 6.5  | 4 | 13.5 | 4.5 |
| RWA4166 | 1x3x8-1/2     | 3       | 300   | RF   | 1         | 300   | RF   | 8.13  | 8.13  | 8.25 | 0    | 7.5  | 4 | 19.5 | 4.5 |
|         | 1-1/2x3x8-1/2 | 3       |       |      | 1.5       |       |      | 8.13  | 8.13  | 8.25 | 0    | 8.5  | 4 | 19.5 | 4.5 |
|         | 2x3x8-1/2     | 3       |       |      | 2         |       |      | 8.13  | 8.13  | 8.25 | 0    | 9.5  | 5 | 19.5 | 4.5 |
|         | 3x4x8-1/2     | 4       |       |      | 3         |       |      | 9.0   | 8.13  | 10.0 | 0    | 11.0 | 5 | 19.5 | 4.5 |
|         | 4x6x8-1/2     | 6       |       |      | 4         |       |      | 10.25 | 8.13  | 10.0 | 0.63 | 11.5 | 6 | 19.5 | 4.5 |
|         | 1-1/2x3x10    | 3       |       |      | 1.5       |       |      | 9.0   | 8.75  | 10.0 | 0    | 9.0  | 4 | 19.5 | 4.5 |
|         | 2x3x10        | 3       |       |      | 2         |       |      | 9.0   | 8.75  | 10.0 | 0    | 9.5  | 5 | 19.5 | 4.5 |
|         | 3x4x10        | 4       |       |      | 3         |       |      | 10.38 | 8.75  | 10.0 | 0    | 11.0 | 5 | 19.5 | 4.5 |
|         | 4x6x10 #2     | 6       |       |      | 4         |       |      | 11.75 | 10    | 11.5 | 0.13 | 12.5 | 6 | 19.5 | 4.5 |
| RWA4206 | 4x6x10 #1     | 6       | 300   | RF   | 4         | 300   | RF   | 12.25 | 10.50 | 12.0 | 0.25 | 12.0 | 6 | 26.0 | 9.0 |

## Dimensions Determined by Electric Motor Manufacturer

| Frame Size | C (Max) | AB    | HM    | RWA2096 |    |       |      | RWA4166 |    |      | RWA4206 |    |    |
|------------|---------|-------|-------|---------|----|-------|------|---------|----|------|---------|----|----|
|            |         |       |       | HA      | HB | HD    | HG   | HA      | HB | HG   | HA      | HB | HG |
| 140T       | 13.75   | 6.5   | 4     | 12      | 39 | 8.5   | 3.25 | 12      | 45 | 3.75 | --      | -- | -- |
| 182T       | 14.63   | 7.5   | 5.25  | 12      | 39 | 8.5   | 3.25 | 12      | 45 | 3.75 | --      | -- | -- |
| 184T       | 15.63   | 7.5   | 5.25  | 12      | 39 | 8.5   | 3.25 | 12      | 45 | 3.75 | --      | -- | -- |
| 210T       | 19.63   | 9.5   | 6.0   | 12      | 39 | 8.5   | 3.25 | 12      | 45 | 3.75 | --      | -- | -- |
| 250T       | 24.88   | 10.75 | 7.0   | 15      | 52 | 10.38 | 4.13 | 15      | 52 | 4.13 | 26      | 68 | 6  |
| 280T       | 28.38   | 12.63 | 7.75  | 15      | 52 | 11.13 | 4.13 | 15      | 52 | 4.13 | 26      | 68 | 6  |
| 320T       | 31.38   | 14.75 | 8.75  | --      | -- | --    | --   | 18      | 58 | 4.75 | 26      | 72 | 6  |
| 360T       | 34.13   | 15.63 | 9.88  | --      | -- | --    | --   | 18      | 58 | 4.75 | 26      | 72 | 6  |
| 400T       | 38      | 17.5  | 10.75 | --      | -- | --    | --   | --      | -- | --   | 26      | 78 | 6  |
| 440T       | 40.50   | 18.5  | 12.25 | --      | -- | --    | --   | --      | -- | --   | 26      | 82 | 6  |

# CECO Dean

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