

# CECO Dean

## Dean Pump® High Temperature Chemical Process Inline Pumps

*Series DL*



# Dean Pump® Series DL High Temperature Chemical Process Inline Pumps

- Capacities to 600 GPM (182 m<sup>3</sup>/hr)
- Heads to 550 feet (167 m)
- Pumping Temperatures to 550°F (288°C)
- Working Pressures to 275 PSIG (1,896 kPa)
- Seven Sizes

DL Series Pumps are excellent for high temperature chemical process applications. Features include a space saving design and a fully open impeller. Seven sizes are available in ductile iron and 316SS construction.

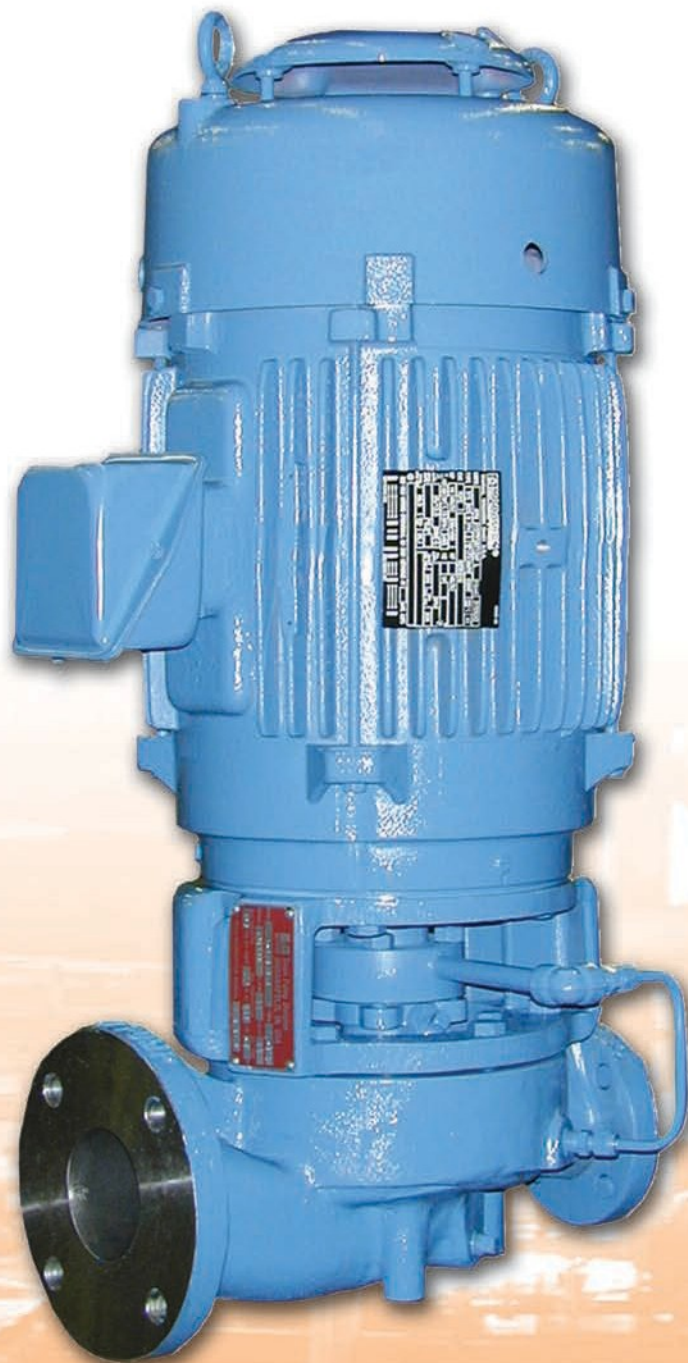
The quality construction of the DL200/230 Series Pumps provides a pump with maximum service life that is simple to install and maintain.

DL200/230 Series Pumps utilize a close-coupled design which eliminates the need for couplings. There are no shaft alignment problems often associated with coupled pumps.

Shafts are furnished by the motor manufacturers to Dean's rigid specifications for materials, size and configuration to insure long, trouble-free operation. Shafts have a maximum end play of 0.006" thereby extending the life of the mechanical seal.

## Additional Features Include:

- **Removable Backhead** allows removal of the entire rotating assembly without removing the pump casing from the line.
- **Low Shaft Deflection** design provides a maximum of 0.002 inch shaft deflection at the face of the stuffing box, assuring maximum packing and seal life.
- **Renewable Shaft Sleeve** is a standard Dean Pump feature.
- **Seal Face Flushing** is provided for pumps furnished with mechanical seals. Dean Seal guards may be used.
- **Positive Impeller Adjustment** can be set on the impeller/backhead/motor before insertion into the casing.
- **Stuffing Box Versatility** provides for standard packing and a wide selection of mechanical seal types and materials.
- **Choice of Materials** includes ductile iron and 316 stainless steel.

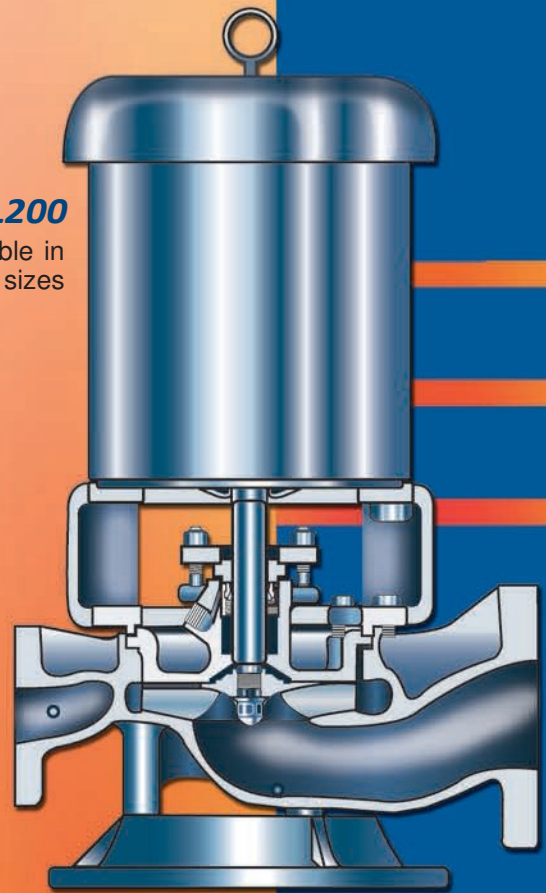


# Common Features

## Dean Pump® DL200/230

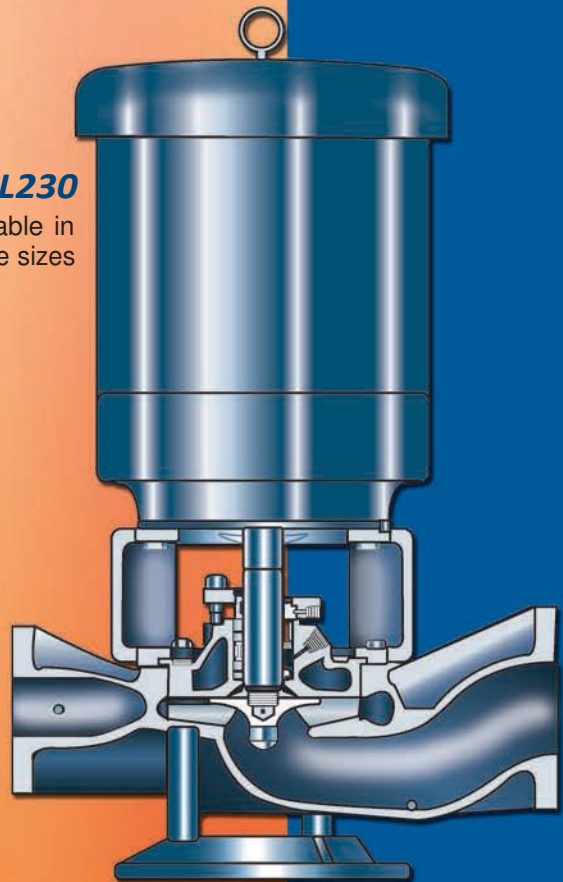
- Chemical duty design
- Class 150 flat face flanges
- Close-coupled design eliminates alignment issues
- Space saving vertical design
- Ductile iron and 316SS construction available
- ANSI type fully open impeller
- ANSI type backhead

**DL200**  
Available in  
two sizes

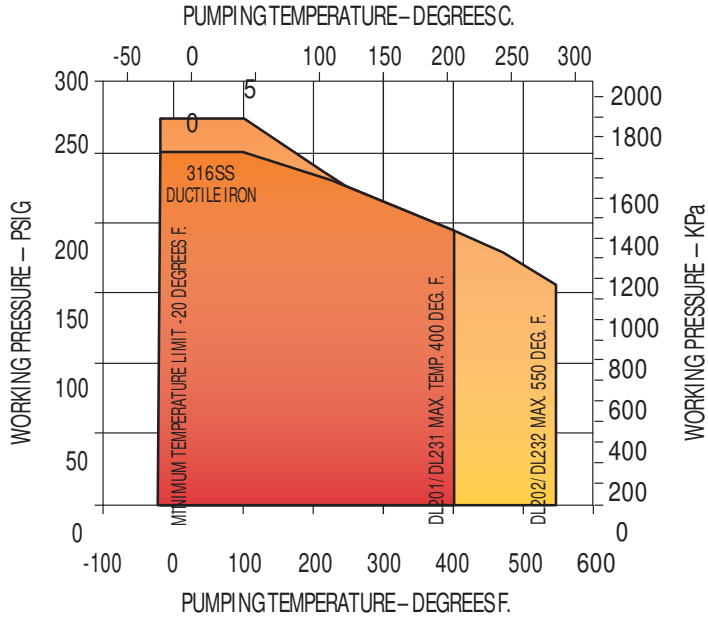


- 400°F (205°C) operating temperature without cooling
- 550°F (288°C) maximum operating temperature with cooling
- Back pull-out design
- Positive impeller adjustment
- Single and double seal arrangements available
- Oversized gland bolts

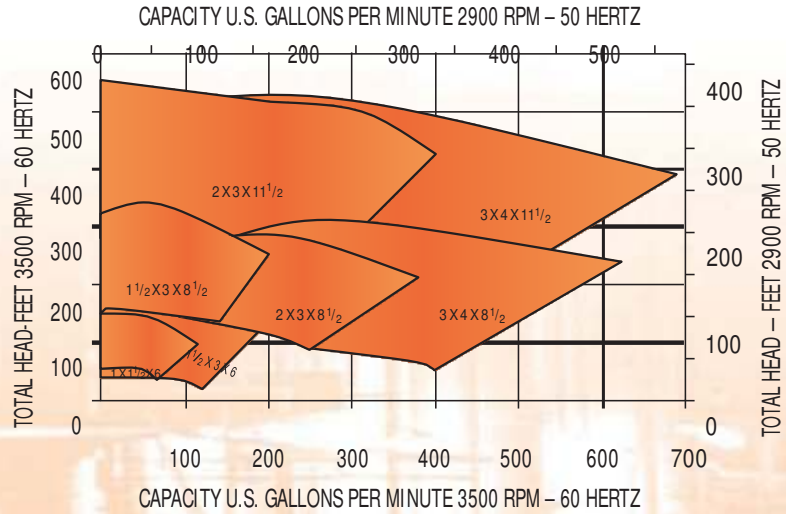
**DL230**  
Available in  
five sizes



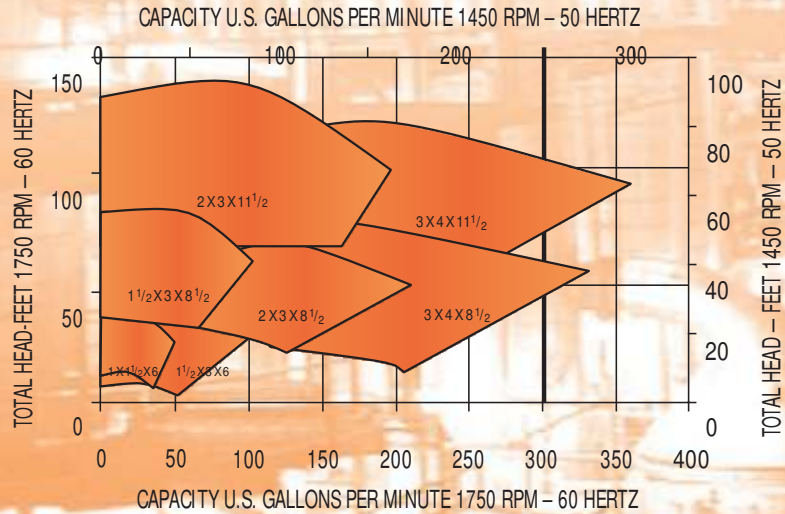
## ALLOWABLE WORKING PRESSURE VS. PUMPING TEMPERATURE

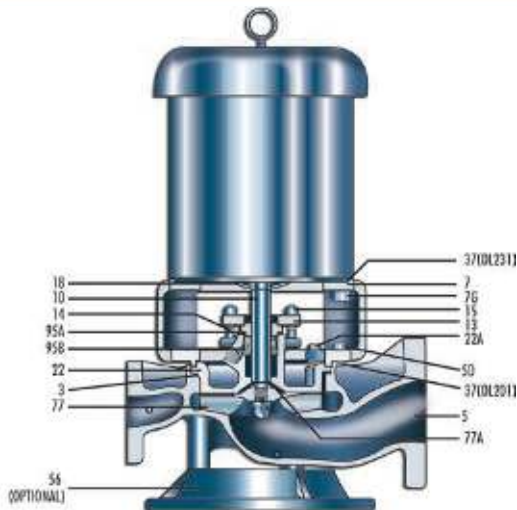


## DL HEAD - CAPACITY RANGE CHART WITH TWO POLE MOTOR

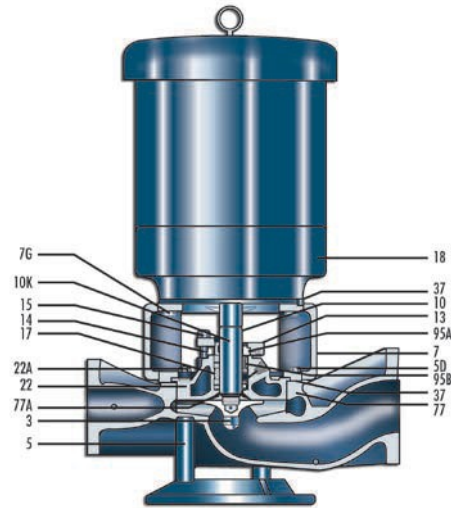


## DL HEAD - CAPACITY RANGE CHART WITH FOUR POLE MOTOR





DL201 and DL231 standard inline model with plain casing back cover.  
DL201 Section No. 01934-1, DL231 Section No. 01935-1



DL202 and DL232 standard inline model with jacketed casing back cover.  
DL202 Section No. 01934-3, DL232 Section No. 01935-3

| MECHANICAL DESIGN SPECIFICATIONS  |                               |                 |  |
|---|-------------------------------|-----------------|--|
|   | DL200                         | DL230           |  |
| Direction of Rotation:<br>Viewed From Motor End   | Clockwise                     |                 |  |
| Horsepower Rating, Maximum:<br>Plated Horsepower of Driver<br>Not to Exceed<br>@1750 rpm<br>@3500 rpm | 7 1/2 HP<br>15 HP             | 50 HP<br>100 HP |  |
| Casing Thickness, Minimum   | 5/16"                         |                 |  |
| Bearings – Ball Type:<br>Motor Lubrication  | Grease                        |                 |  |
| Flanges: ASME/ANSI Rating<br>Ductile Iron (Cl. 22)<br>316SS (Cl. 50)<br>Facing<br>Finish              | CL 150<br>FF<br>125 Ra        |                 |  |
| Impeller  | Single Plane Dynamic Balanced |                 |  |
| Maximum Suction Pressure For 2-Year<br>Minimum Thrust Bearing Life                                    | 100 psig                      |                 |  |
| Stuffing Box Jacket Pressure  | Maximum 125 psig              |                 |  |
| Hydrostatic Test Pressure:<br>Ductile Iron (Cl. 22)<br>316SS (Cl. 50)                                 | 415 psig                      |                 |  |
| Stuffing Box Dimensions:  |                               |                 |  |
| Length (Depth)  | 2 1/8"                        | 2 3/4"          |  |
| Inside Diameter (Bore Dia.)   | 1 5/8"                        | 2 1/2"          |  |
| Shaft Sleeve Diameter   | 1"                            | 1 3/4"          |  |
| Lantern Gland Width   | 7/16"                         | 5/8"            |  |
| Distance: Lantern Gland To Open<br>End of Stuffing Box  | 1 3/8"                        | 1 3/4"          |  |
| Packing:  |                               |                 |  |
| Size (Square)   | 5/16"                         | 3/8"            |  |
| Number of Rings With Lantern Gland<br>Spacing   | 5<br>2-R-3                    | 5<br>2-R-3      |  |
| Number of Rings Lantern<br>Gland Omitted  | 6                             | 7               |  |

| MECHANICAL SEAL SPECIFICATIONS |                |                        |      |
|--------------------------------|----------------|------------------------|------|
| Pump Type                      | Material Class | Pumping Temperature °F |      |
|                                |                | Min.                   | Max. |
| DL201 and DL231                | 22 or 50       | -20                    | +400 |
| DL202 and DL232                | 22 or 50       | -20                    | +550 |

All single mechanically sealed pumps contain a seal flushing connection in the gland and internal seal circulating piping.

All single mechanically sealed DL202 and DL232 pumps used with cooling jackets require a Min-Flo Bushing.

| STANDARD MATERIALS OF CONSTRUCTION |   |                          |                  |
|------------------------------------|---|--------------------------|------------------|
| Part#                              | Part Name                               | Iron (Class 22)          | 316SS (Class 50) |
| 3                                  | Impeller                                | C.I. (1)                 | 316SS (3)        |
| 5                                  | Casing                                  | D.I. (7)                 | 316SS (3)        |
| 5D                                 | Casing Capscrew                         | Steel (8)                |                  |
| 7                                  | Cradle Spacer                           | C.I. (1)                 |                  |
| 7G                                 | Cradle Spacer Capscrew                  | Steel (9)                |                  |
| 10                                 | Shaft Sleeve                            | 316SS (6)                |                  |
| 10K                                | Shaft Sleeve Key<br>(DL230 Series only) | 304SS                    |                  |
| 13                                 | Stuffing Box Gland                      | Steel (4)                | 316SS (3)        |
| 14                                 | Stuffing Box Gland Stud                 | 304SS (5)                |                  |
| 14A                                | External Seal Flush Plug                | Steel (2)                | 316SS (6)        |
| 15                                 | Stuffing Box Gland Stud Nut             | 304SS (5)                |                  |
| 17                                 | Lantern Ring                            | Teflon†                  |                  |
| 18                                 | Splash Collar                           | 18-8 Stainless Steel^^   |                  |
| 22                                 | Casing Back Cover                       | D.I. (7)*                | 316SS (3)        |
| 22A                                | Back Cover Capscrew                     | Steel (9)                |                  |
| 37                                 | Clearance Shim                          | Steel                    |                  |
| 56                                 | Base (Optional)                         | C.I. (1)                 |                  |
| 77                                 | Casing Gasket                           | Teflon†                  |                  |
| 77A                                | Impeller Gasket                         | Teflon†                  |                  |
| 95A                                | Stationary Seal Element                 | Optional – See Seal Data |                  |
| 95B                                | Rotating Seal Face                      | Optional – See Seal Data |                  |

† Trademark of E.I duPont de Nemours & Co.

\* DL 202 & DL 232: jacketed backhead is Cast Steel – A.S.T.M. A216 Grade WCB

^^ DL230 pumps with motor frames 182TC and 184TC will have a Cast Iron (1) Splash Collar

#### Material Specifications\*

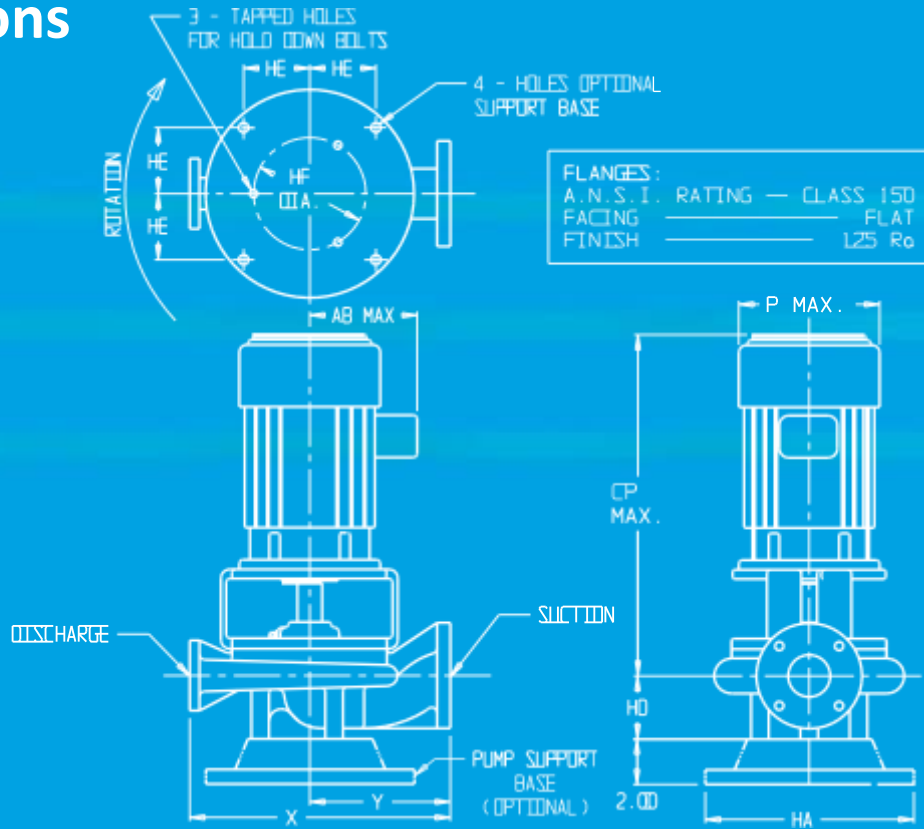
- |   |                                 |
|---|---------------------------------|
| (1) Cast Iron                             | (5) A.I.S.I 304SS               |
| (2) A.I.S.I 1020                          | (6) A.I.S.I. 316SS              |
| (3) A.S.T.M. A 744 Grade CF-8M            | (7) Ductile Iron-A.S.T.M. A 395 |
| (4) Cast Steel A.S.T.M. A216<br>Grade WCB | (8) A.S.T.M. A449 Type 1        |
|   | (9) A.S.T.M. A307               |

\*Specifications subject to change without notice.

#### Electric Motor Specifications

Standard motors are vertical, solid shaft, normal thrust, "C" base, 230/460 volts, 3 phase, 60 cycle, Class B insulation, NEMA Design B, for 40°C maximum ambient temperature. The motor shaft is steel. The bearings are regreasable. Stocked explosion proof motors are Dual label, Class I Group D and Class II Groups F&G, with T-3B temperature code and a 1.0 service factor.

# Dimensions



| FRAME | P (MAX) | CP (MAX) | AB (MAX) |
|-------|---------|----------|----------|
| 143TC | 9.000   | 21.250   | 9.250    |
| 145TC | 9.000   | 22.250   | 9.250    |
| 182TC | 10.500  | 26.250   | 10.750   |
| 184TC | 10.500  | 26.250   | 10.750   |
| 213TC | 12.750  | 30.000   | 11.375   |
| 215TC | 12.750  | 30.000   | 11.375   |
| 254TC | 14.000  | 32.250   | 12.500   |
| 256TC | 14.000  | 32.250   | 12.500   |

| FRAME | P (MAX) | CP (MAX) | AB (MAX) |
|-------|---------|----------|----------|
| 284TC | 16.250  | 34.500   | 14.500   |
| 286TC | 16.250  | 34.500   | 14.500   |
| 324TC | 17.750  | 36.250   | 17.500   |
| 326TC | 17.750  | 36.250   | 17.500   |
| 364TC | 20.000  | 42.250   | 18.500   |
| 365TC | 20.000  | 42.250   | 18.500   |
| 405TC | 22.000  | 44.250   | 19.000   |

| PUMP SIZE | SUCTION |      |      |       |      | DISCHARGE |      |      |       |      | HA    | HD   | HE   | HF    | X     | Y     |
|-----------|---------|------|------|-------|------|-----------|------|------|-------|------|-------|------|------|-------|-------|-------|
|           | SIZE    | OD   | BC   | BOLTS | THK  | SIZE      | OD   | BC   | BOLTS | THK  |       |      |      |       |       |       |
| 1X1½X6    | 1.50    | 5.00 | 3.88 | 4-½   | .688 | 1.00      | 4.25 | 3.13 | 4-½   | .563 | 11.00 | 2.38 | 3.50 | 6.00  | 12.50 | 6.50  |
| 1½X3X6    | 3.00    | 7.50 | 6.00 | 4-⅝   | .938 | 1.50      | 5.00 | 3.88 | 4-½   | .688 | 11.00 | 2.88 | 3.50 | 6.00  | 14.50 | 8.00  |
| 1½X3X8½   | 3.00    | 7.50 | 6.00 | 4-⅝   | .938 | 1.50      | 5.00 | 3.88 | 4-½   | .688 | 13.00 | 4.50 | 4.13 | 7.00  | 18.50 | 10.00 |
| 2X3X8½    | 3.00    | 7.50 | 6.00 | 4-⅝   | .938 | 2.00      | 6.00 | 4.75 | 4-⅝   | .750 | 13.00 | 4.50 | 4.13 | 7.00  | 20.50 | 11.00 |
| 3X4X8½    | 4.00    | 9.00 | 7.50 | 8-⅝   | 1.00 | 3.00      | 7.50 | 6.00 | 4-⅝   | .938 | 13.00 | 5.50 | 4.13 | 7.00  | 24.00 | 13.00 |
| 2X3X11½   | 3.00    | 7.50 | 6.00 | 4-⅝   | .938 | 2.00      | 6.00 | 4.75 | 4-⅝   | .750 | 17.00 | 4.50 | 5.50 | 10.00 | 22.50 | 12.00 |
| 3X4X11½   | 4.00    | 9.00 | 7.50 | 8-⅝   | 1.00 | 3.00      | 7.50 | 6.00 | 4-⅝   | .938 | 17.00 | 5.75 | 5.50 | 10.00 | 25.00 | 14.00 |

All dimensions are in inches.

**IMPORTANT:** Do not use for construction unless certified.

## CECO Dean Pump



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