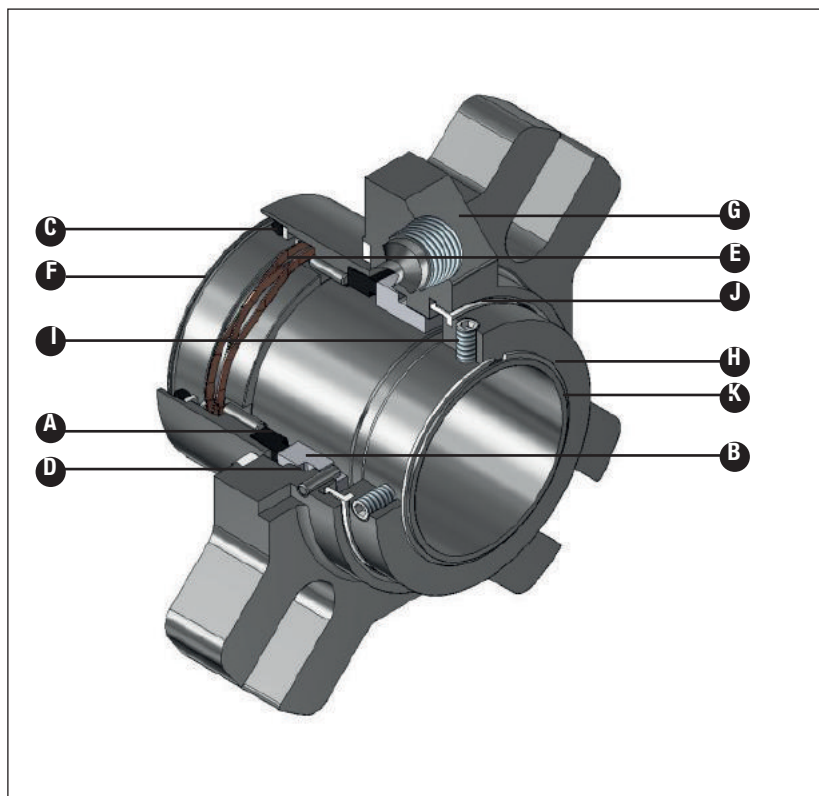


- A - Face/Primary Ring Ass'y
- B - Seat/Mating Ring
- C - Dynamic O-Ring
- D - Static O-Ring
- E - Nonclogging Wave Spring
- F - Sleeve
- G - Gland
- H - Collar
- I - Set Screws
- J - Centralizing Spacer Ring
- K - Retaining Ring



4610 shown

### Product Description

The 4600 series cartridge seal is the complete, affordable and off-the-shelf sealing solution for industrial liquid applications.

Type 4600 series meets key industry pump standards, and is designed to permit use in rotating shaft equipment including ANSI/DIN pumps, close-coupled pumps, vertical pumps, and similar rotating shaft equipment.

### Typical Applications

- Water and wastewater
- Pulp and paper
- Power generation
- Chemical
- Food and beverage
- Pharmaceutical
- Mining
- Steel production
- General industrial

### Design Features

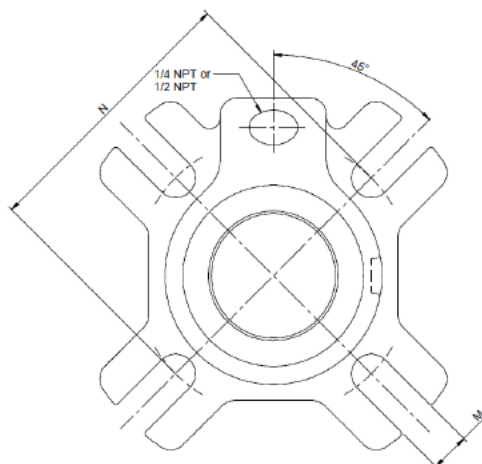
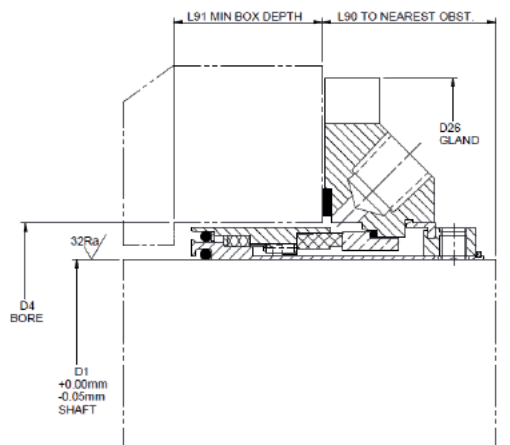
- Single and Dual O-ring Pusher Design
- Optimized running face design
- Non-clogging, crest-to-crest wave spring
- Pre-assembled unique centralizing spacer ring does not require removal before equipment startup
- Compact cartridge design
- Dual arrangement design can operate as tandem (unpressurized) or double (pressurized)
- Dual seal sleeve offers standard pumping vanes which improve flow and cooling
- Robust pin drive mechanism for both primary and mating ring

# TYPE 4610/4620P

## SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Technical Specification

### Type 4610 Standard Bore Arrangement



See Installation Instructions for piping arrangements

# TYPE 4610/4620P

## SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Technical Specification

### Type 4610 Standard Bore Dimensional Data

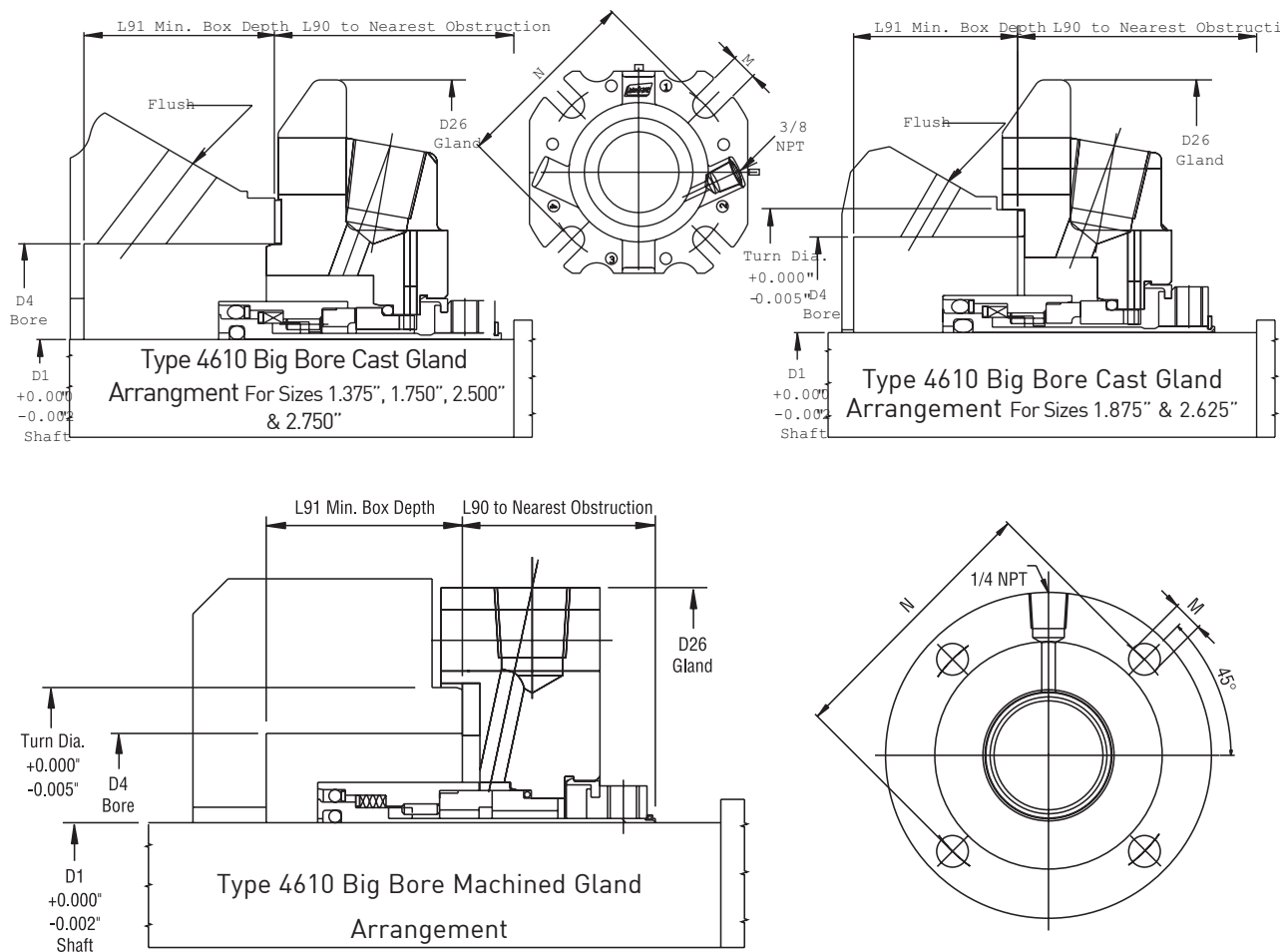
inches

| Seal Size | Size Code | D1 Shaft Size | D4 Box Bore |       | D26   | L90   | L91   | M     | N     |       |
|-----------|-----------|---------------|-------------|-------|-------|-------|-------|-------|-------|-------|
|           |           |               | Min.        | Max.  |       |       |       |       |       |       |
| 1.000     | 24        | 0240          | 0.945       | 1.575 | 1.937 | 4.126 | 1.476 | 1.260 | 0.437 | 2.626 |
|           | 25        | 0250          | 0.984       | 1.614 | 1.937 | 4.126 | 1.476 | 1.260 | 0.437 | 2.626 |
|           | 28        | 0280          | 1.102       | 1.732 | 2.063 | 4.126 | 1.476 | 1.260 | 0.437 | 2.626 |
| 1.125     | 30        | 0300          | 1.181       | 1.811 | 2.189 | 4.252 | 1.476 | 1.260 | 0.437 | 2.752 |
|           | 32        | 0320          | 1.260       | 1.874 | 2.189 | 4.252 | 1.476 | 1.260 | 0.437 | 2.752 |
| 1.250     | 33        | 0330          | 1.299       | 1.929 | 2.311 | 4.370 | 1.476 | 1.260 | 0.437 | 2.874 |
|           | 35        | 0350          | 1.378       | 2.000 | 2.311 | 4.370 | 1.476 | 1.260 | 0.437 | 2.874 |
| 1.375     | 38        | 0380          | 1.496       | 2.250 | 2.500 | 4.370 | 1.476 | 1.260 | 0.437 | 2.874 |
|           | 40        | 0400          | 1.575       | 2.362 | 2.500 | 4.500 | 1.476 | 1.260 | 0.437 | 3.063 |
| 1.500     | 43        | 0430          | 1.693       | 2.480 | 2.626 | 4.500 | 1.476 | 1.260 | 0.437 | 3.063 |
|           | 44        | 0444          | 1.750       | 2.500 | 2.626 | 5.000 | 1.476 | 1.260 | 0.437 | 3.063 |
| 1.625     | 45        | 0450          | 1.772       | 2.500 | 2.626 | 5.000 | 1.516 | 1.299 | 0.563 | 3.437 |
|           | 47        | 0476          | 1.875       | 2.626 | 3.000 | 5.000 | 1.516 | 1.299 | 0.563 | 3.437 |
| 1.750     | 48        | 0480          | 1.890       | 2.626 | 3.000 | 5.000 | 1.516 | 1.299 | 0.563 | 3.437 |
|           | 50        | 0500          | 1.969       | 2.750 | 3.000 | 5.252 | 1.516 | 1.299 | 0.563 | 3.563 |
| 1.875     | 53        | 0530          | 2.087       | 2.874 | 3.311 | 5.252 | 1.516 | 1.299 | 0.563 | 3.563 |
|           | 55        | 0550          | 2.165       | 2.874 | 3.311 | 5.252 | 1.516 | 1.299 | 0.563 | 3.563 |
| 2.000     | 58        | 0580          | 2.283       | 3.126 | 3.563 | 5.500 | 1.516 | 1.299 | 0.689 | 4.374 |
|           | 60        | 0600          | 2.362       | 3.126 | 3.563 | 5.500 | 1.516 | 1.299 | 0.689 | 4.374 |
| 2.125     | 63        | 0630          | 2.480       | 3.252 | 3.874 | 5.748 | 1.516 | 1.299 | 0.689 | 4.374 |
|           | 65        | 0650          | 2.559       | 3.500 | 3.874 | 5.748 | 1.516 | 1.299 | 0.689 | 4.374 |
| 2.250     | 66        | 0666          | 2.625       | 3.500 | 3.874 | 5.748 | 1.516 | 1.299 | 0.689 | 4.374 |
|           | 68        | 0688          | 2.750       | 3.740 | 3.874 | 6.000 | 1.516 | 1.299 | 0.689 | 4.626 |
| 2.375     | 70        | 0700          | 2.756       | 3.740 | 3.874 | 6.000 | 1.516 | 1.299 | 0.689 | 4.626 |
|           | 73        | 0730          | 2.875       | 4.000 | 4.500 | 6.000 | 1.516 | 1.299 | 0.689 | 4.626 |
| 2.500     | 75        | 0750          | 2.953       | 4.000 | 4.500 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 76        | 0762          | 3.000       | 4.000 | 4.500 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 2.625     | 79        | 0793          | 3.125       | 4.252 | 4.748 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 80        | 0800          | 3.150       | 4.252 | 4.748 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 2.750     | 82        | 0825          | 3.250       | 4.252 | 4.748 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 85        | 0850          | 3.346       | 4.370 | 4.874 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 2.875     | 87        | 0875          | 3.375       | 4.370 | 4.874 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 88        | 0889          | 3.500       | 4.500 | 5.000 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.000     | 90        | 0900          | 3.543       | 4.626 | 5.118 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 92        | 0920          | 3.625       | 4.626 | 5.118 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.125     | 95        | 0950          | 3.740       | 4.752 | 5.252 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 96        | 0962          | 3.750       | 4.752 | 5.252 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.250     | 98        | 0984          | 3.875       | 4.874 | 5.374 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 100       | 1000          | 3.937       | 5.000 | 5.512 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.375     | 101       | 1016          | 4.000       | 5.000 | 5.512 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 102       | 1047          | 4.125       | 5.252 | 5.906 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.500     | 105       | 1050          | 4.134       | 5.252 | 5.906 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 107       | 1079          | 4.250       | 5.252 | 5.906 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.625     | 110       | 1100          | 4.331       | 5.500 | 6.102 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 111       | 1111          | 4.375       | 5.500 | 6.102 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.750     | 113       | 1143          | 4.500       | 5.500 | 6.102 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 115       | 1150          | 4.528       | 5.500 | 6.102 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 3.875     | 117       | 1174          | 4.625       | 5.752 | 6.378 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 120       | 1200          | 4.724       | 5.752 | 6.378 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 4.000     | 126       | 1206          | 4.750       | 5.752 | 6.378 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 128       | 1238          | 4.875       | 6.299 | 6.929 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 4.125     | 125       | 1250          | 4.921       | 6.299 | 6.929 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 127       | 1270          | 5.000       | 6.299 | 6.929 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 4.250     | 130       | 1300          | 5.118       | 6.299 | 6.929 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 131       | 1301          | 5.125       | 6.299 | 6.929 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 4.375     | 133       | 1333          | 5.250       | 6.850 | 7.480 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 135       | 1350          | 5.315       | 6.850 | 7.480 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 4.500     | 136       | 1365          | 5.375       | 6.850 | 7.480 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 139       | 1397          | 5.500       | 6.850 | 7.480 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
| 4.625     | 140       | 1400          | 5.512       | 6.850 | 7.480 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |
|           | 142       | 1428          | 5.625       | 6.850 | 7.480 | 6.252 | 1.516 | 1.417 | 0.689 | 4.874 |

metric

| Seal Size | Size Code | D1 Shaft Size | D4 Box Bore |        | D26    | L90    | L91   | M     | N     |        |
|-----------|-----------|---------------|-------------|--------|--------|--------|-------|-------|-------|--------|
|           |           |               | Min.        | Max.   |        |        |       |       |       |        |
| 1.000     | 24        | 0240          | 24.00       | 40.00  | 49.20  | 104.80 | 37.50 | 32.00 | 11.10 | 66.70  |
|           | 25        | 0250          | 25.00       | 41.00  | 49.20  | 104.80 | 37.50 | 32.00 | 11.10 | 66.70  |
|           | 28        | 0280          | 28.00       | 44.00  | 52.40  | 108.00 | 37.50 | 32.00 | 11.10 | 69.90  |
| 1.125     | 30        | 0300          | 30.00       | 46.00  | 55.60  | 111.00 | 37.50 | 32.00 | 11.10 | 73.00  |
| 1.250     | 32        | 0320          | 32.00       | 47.60  | 55.60  | 111.00 | 37.50 | 32.00 | 11.10 | 73.00  |
|           | 33        | 0330          | 33.00       | 49.00  | 58.70  | 114.30 | 37.50 | 32.00 | 11.10 | 77.80  |
| 1.375     | 35        | 0350          | 35.00       | 50.80  | 58.70  | 114.30 | 37.50 | 32.00 | 11.10 | 77.80  |
|           | 38        | 0380          | 38.00       | 57.15  | 63.50  | 127.00 | 38.50 | 33.00 | 14.30 | 87.30  |
|           | 40        | 0400          | 40.00       | 60.00  | 63.50  | 127.00 | 38.50 | 33.00 | 14.30 | 87.30  |
| 1.500     | 43        | 0430          | 43.00       | 63.00  | 66.70  | 133.40 | 38.50 | 33.00 | 14.30 | 90.50  |
|           | 44        | 0444          | 44.40       | 63.50  | 66.70  | 133.40 | 38.50 | 33.00 | 14.30 | 90.50  |
| 1.625     | 45        | 0450          | 45.00       | 63.50  | 66.70  | 133.40 | 38.50 | 33.00 | 14.30 | 90.50  |
|           | 47        | 0476          | 47.60       | 66.70  | 76.20  | 139.70 | 38.50 | 33.00 | 14.30 | 98.40  |
| 1.750     | 48        | 0480          | 48.00       | 66.70  | 76.20  | 139.70 | 38.50 | 33.00 | 14.30 | 98.40  |
|           | 50        | 0500          | 50.00       | 69.85  | 76.20  | 139.70 | 38.50 | 33.00 | 14.30 | 98.40  |
| 1.875     | 53        | 0530          | 53.00       | 73.00  | 84.10  | 146.00 | 38.50 | 33.00 | 17.50 | 111.10 |
|           | 55        | 0550          | 55.00       | 73.00  | 84.10  | 146.00 | 38.50 | 33.00 | 17.50 | 111.10 |
| 2.000     | 57        | 0571          | 57.10       | 76.20  | 84.10  | 146.00 | 38.50 | 33.00 | 17.50 | 111.10 |
|           | 58        | 0580          | 58.00       | 79.40  | 90.50  | 152.40 | 38.50 | 33.00 | 17.50 | 117.50 |
| 2.125     | 60        | 0600          | 60.00       | 79.40  | 90.50  | 152.40 | 38.50 | 33.00 | 17.50 | 117.50 |
|           | 63        | 0630          | 63.00       | 82.60  | 98.40  | 158.80 | 38.50 | 36.00 | 17.50 | 123.80 |
| 2.250     | 65        | 0650          | 65.00       | 88.90  | 98.40  | 158.80 | 38.50 | 36.00 | 17.50 | 123.80 |
|           | 66        | 0666          | 66.60       | 88.90  | 98.40  | 158.80 | 38.50 | 36.00 | 17.50 | 123.80 |
| 2.375     | 68        | 0688          | 68.80       | 95.00  | 98.40  | 158.80 | 38.50 | 36.00 | 17.50 | 123.80 |
|           | 70        | 0700          | 70.00       | 95.00  | 98.40  | 158.80 | 38.50 | 36.00 | 17.50 | 123.80 |
| 2.500     | 73        | 0730          | 73.03       | 101.60 | 114.30 | 206.00 | 46.00 | 42.50 | 20.60 | 145.00 |
|           | 75        | 0750          | 75.00       | 101.60 | 114.30 | 206.00 | 46.00 | 42.50 | 20.60 | 145.00 |
| 2.625     | 76        | 0762          | 76.20       | 101.60 | 114.30 | 206.00 | 46.00 | 42.50 | 20.60 | 145.00 |
|           | 79        | 0793          | 79.38       | 108.00 | 120.60 | 206.00 | 46.00 | 42.50 | 20.60 | 151.00 |
| 2.750     | 80        | 0800          | 80.00       | 108.00 | 120.60 | 206.00 | 46.00 | 42.50 | 20.60 | 151.00 |
|           | 82        | 0825          | 82.55       | 108.00 | 120.60 | 206.00 | 46.00 | 42.50 | 20.60 | 151.00 |
| 2.875     | 85        | 0850          | 85.00       | 111.00 | 123.80 | 206.00 | 46.00 | 42.50 | 20.60 | 154.00 |
|           | 87        | 0857          | 85.73       | 111.00 | 123.80 | 206.00 | 46.00 | 42.50 | 20.60 | 154.00 |
| 3.000     | 88        | 0889          | 88.90       | 114.30 | 127.00 | 216.00 | 46.00 | 42.50 | 20.60 | 158.00 |
|           | 90        | 0900          | 90.00       | 117.50 | 130.00 | 216.00 | 46.00 | 42.50 | 20.60 | 160.00 |
| 3.125     | 92        | 0920          | 92.08       | 117.50 | 130.00 | 216.00 | 46.00 | 42.50 | 20.60 | 160.00 |
|           | 95        | 0950          | 95.00       | 120.70 | 133.40 | 246.00 | 46.00 | 42.50 | 20.60 | 164.00 |
| 3.250     | 96        | 0952          | 95.25       | 120.70 | 133.40 | 246.00 | 46.00 | 42.50 | 20.60 | 164.00 |
|           | 98        | 0984          | 98.43       | 123.80 | 136.50 | 246.00 | 46.00 | 42.50 | 20.60 | 167.00 |
| 3.375     | 100       | 1000          | 100.00      | 127.00 | 140.00 | 246.00 | 46.00 | 42.50 | 20.60 | 171.00 |
|           | 101       | 1016          | 101.60      | 127.00 | 140.00 | 246.00 | 46.00 | 42.50 | 20.60 | 171.00 |
| 3.500     | 104       | 1047          | 104.77      | 133.4  | 150.00 | 246.00 | 62.00 | 44.00 | 20.60 | 181.00 |
|           | 105       | 1050          | 105.00      | 133.4  | 150.00 | 246.00 | 62.00 | 44.00 | 20.60 | 181.00 |
| 3.625     | 107       | 1079          | 107.95      | 133.4  | 150.00 | 246.00 | 62.00 | 44.00 | 20.60 | 181.00 |
|           | 110       | 1100          | 110.00      | 139.7  | 155.00 | 246.00 | 62.00 | 44.00 | 20.60 | 188.00 |
| 3.750     | 111       | 1111          | 111.12      | 139.7  | 155.00 | 246.00 | 62.00 | 44.00 | 20.60 | 188.00 |
|           | 113       | 1143          | 114.30      | 139.7  | 155.00 | 246.00 | 62.00 | 44.00 | 20.60 | 188.00 |
| 3.875     | 115       | 1150          | 115.00      | 139.7  | 155.00 | 246.00 | 62.00 | 44.00 | 20.60 | 188.00 |
|           | 117       | 1174          | 117.47      | 146.1  | 162.00 | 266.00 | 62.00 | 44.00 | 20.60 | 194.00 |
| 4.000     | 120       | 1200          | 120.00      | 146.1  | 162.00 | 266.00 | 62.00 | 44.00 | 20.60 | 194.00 |
|           | 126       | 1206          | 120.65      | 146.1  | 162.00 | 266.00 | 62.00 | 44.00 | 20.60 | 194.00 |
| 4.125     | 128       | 1238          | 123.82      | 160.00 | 176.00 | 266.00 | 62.00 | 44.00 | 20.60 | 210.00 |
|           | 125       | 1250          | 125.00      | 160.00 | 176.00 | 266.00 | 62.00 | 44.00 | 20.60 | 210.00 |
| 4.250     | 127       | 1270          | 127.00      | 160.00 | 176.00 | 266.00 | 62.00 | 44.00 | 20.60 | 210.00 |
|           | 130       | 1300          | 130.00      | 160.00 | 176.00 | 266.00 | 62.00 | 44.00 | 20.60 | 210.00 |
| 4.375     | 131       | 1301          | 130.17      | 160.00 | 176.00 | 266.00 | 62.00 | 44.00 | 20.60 | 210.00 |
|           | 133       | 1333          | 133.35      | 174.00 | 190.00 | 296.00 | 62.00 | 44.00 | 23.80 | 226.00 |
| 4.500     | 135       | 1350          | 135.00      | 174.00 | 190.00 | 296.00 | 62.00 | 44.00 | 23.80 | 226.00 |
|           | 136       | 1365          | 136.52      | 174.00 | 190.00 | 296.00 | 62.00 | 44.00 | 23.80 | 226.00 |
| 4.625     | 137       | 1397          | 139.70      | 174.00 | 190.00 | 296.00 | 62.00 | 44.00 | 23.80 | 226.00 |
|           | 140       | 1400          | 140.00      | 174.00 | 190.00 | 296.00 | 62.00 | 44.00 | 23.80 | 226.00 |
| 4.750     | 142       | 1428          | 142.87      | 174.00 | 190.00 | 296.00 | 62.00 | 44.00 | 23.80 | 226.00 |

### Type 4610 Big Bore Typical Arrangement



### Type 4610 Big Bore Dimensional Data

#### Big Bore Cast Gland (inches)

| Pump<br>Manufacturer                                  | D1<br>Shaft<br>Size | D4<br>Box Bore |       | D26   | L90   | L91   | M     | N     | Turn<br>Dia. |
|-------------------------------------------------------|---------------------|----------------|-------|-------|-------|-------|-------|-------|--------------|
|                                                       |                     | Min.           | Max.  |       |       |       |       |       |              |
| Durco Mk III Group IK, Goulds 3196 STX, Sulzer ALB #1 | 1.375               | 2.875          | 3.023 | 5.375 | 2.059 | 0.600 | 0.562 | 4.062 | —            |
| Goulds 3196 MTX                                       | 1.750               | 3.500          | 3.925 | 6.500 | 2.100 | 0.638 | 0.687 | 5.093 | —            |
| Durco Mk III Group II                                 | 1.875               | 3.625          | 3.734 | 6.500 | 1.929 | 0.809 | 0.687 | 5.093 | 4.125        |
| Goulds 3196 XLTX                                      | 2.500               | 4.750          | 4.875 | 8.000 | 2.479 | 0.377 | 0.687 | 6.062 | —            |
| Durco Mk III Group III                                | 2.625               | 4.625          | 4.740 | 8.000 | 2.432 | 0.424 | 0.687 | 6.062 | 5.125        |
| Goulds 3196 X-17                                      | 2.750               | 4.750          | 4.875 | 8.000 | 2.386 | 0.470 | 0.687 | 6.062 | —            |

#### Big Bore Machined Gland (inches)

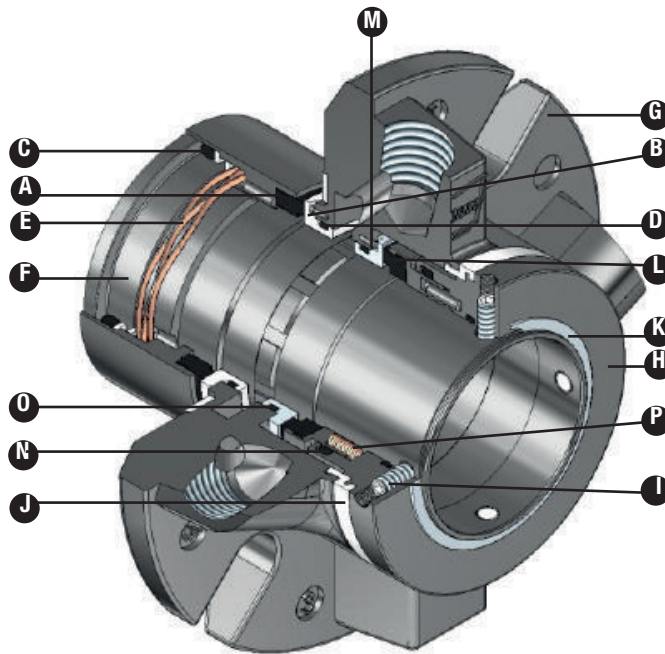
|                       |       |       |       |       |       |       |       |       |       |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Durco Mk III Group IJ | 1.125 | 1.730 | 2.750 | 4.500 | 1.422 | 1.180 | 0.437 | 3.750 | 3.125 |
| Goulds 3196 LTX       | 2.125 | 2.875 | 4.336 | 7.125 | 1.462 | 1.220 | 0.687 | 6.000 | 4.711 |
| Sulzer ALB #2         | 2.125 | 2.875 | 4.187 | 7.156 | 1.462 | 1.220 | 0.437 | 5.250 | 4.562 |
| Sulzer ALB #3         | 2.500 | 3.250 | 4.750 | 8.000 | 1.462 | 1.220 | 0.562 | 6.000 | 5.125 |

# TYPE 4610/4620P

## SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Technical Specification

- A- Inboard Face/ Primary Ring Ass'y
- B- Inboard Seat/ Mating Ring
- C- Inboard Dynamic O-Ring
- D- Inboard Static O-Ring
- E- Non-clogging Wave Spring
- F- Sleeve
- G- Gland
- H- Collar
- I- Set Screws
- J- Centralizing Spacer Ring
- K- Retaining Ring
- L- Outboard Face/ Primary Ring Ass'y
- M- Outboard Seat/ Mating Ring
- N- Outboard Dynamic O-Ring
- O- Outboard Static O-Ring
- P- Outboard Springs



4620P shown

### Product Description

The 4600 series cartridge seal is the complete, affordable and off-the-shelf sealing solution for industrial liquid applications.

Type 4600 series meets key industry pump standards, and is designed to permit use in rotating shaft equipment including ANSI/DIN pumps, close-coupled pumps, vertical pumps, and similar rotating shaft equipment.

### Typical Applications

- Water and wastewater
- Pulp and paper
- Power generation
- Chemical
- Food and beverage
- Pharmaceutical
- Mining
- Steel production
- General industrial

### Design Features

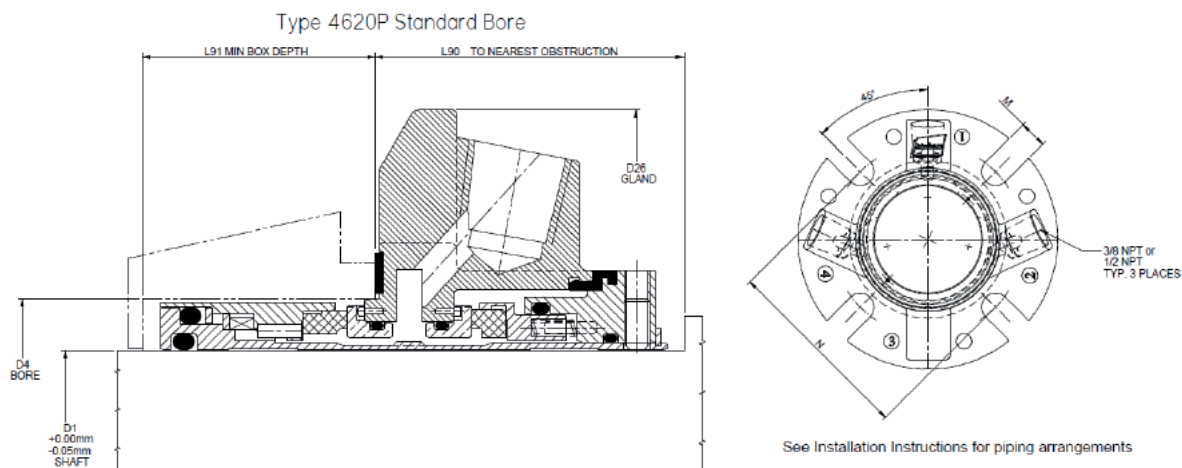
- Single and Dual O-ring Pusher Design
- Optimized running face design
- Non-clogging, crest-to-crest wave spring
- Pre-assembled unique centralizing spacer ring does not require removal before equipment startup
- Compact cartridge design
- Dual arrangement design can operate as tandem (unpressurized) or double (pressurized)
- Dual seal sleeve offers standard pumping vanes which improve flow and cooling
- Robust pin drive mechanism for both primary and mating ring

# TYPE 4610/4620P

## SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Technical Specification

### Type 4620P Standard Bore Arrangement



# TYPE 4610/4620P

## SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Technical Specification

### Type 4620P Standard Bore Dimensional Data

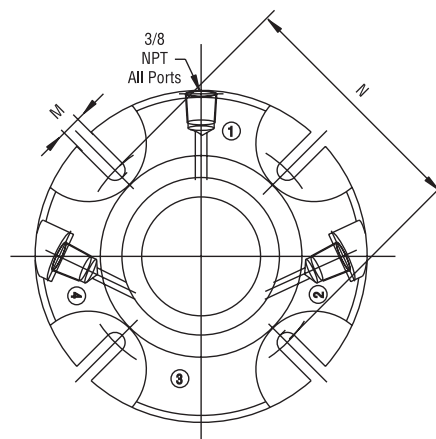
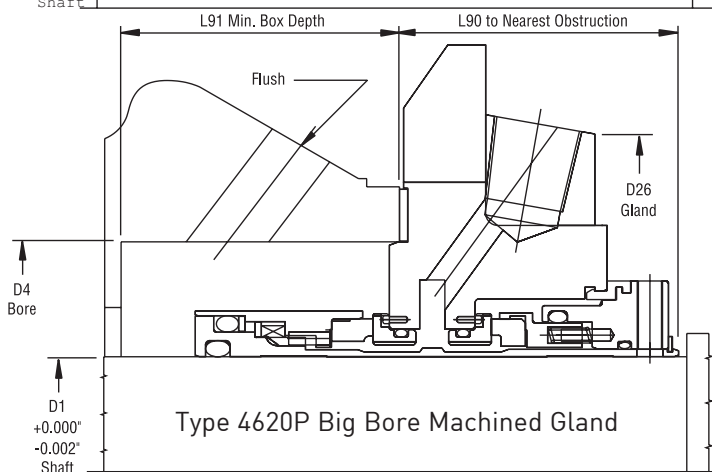
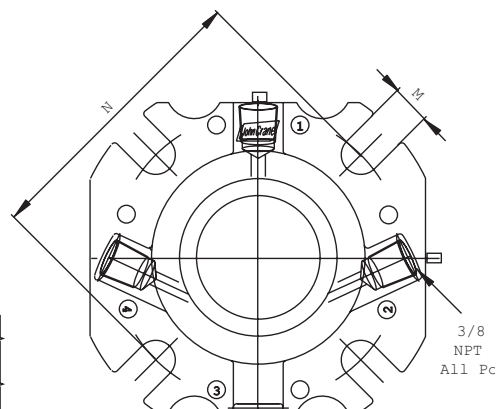
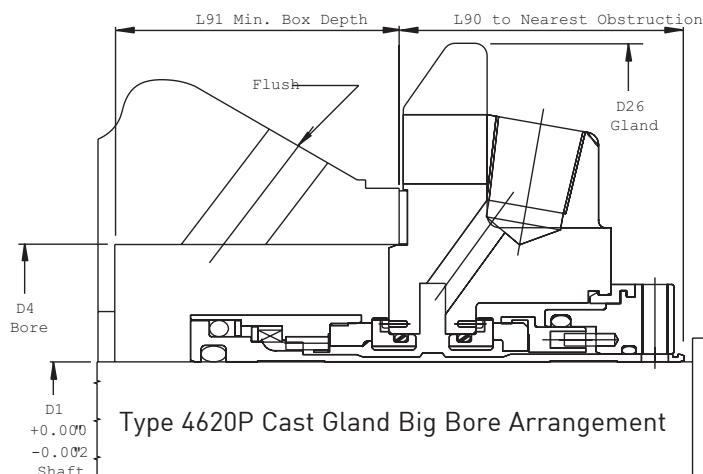
inches

| Seal Size | Size Code | D1 Shaft Size | D4 Box Bore |       | D26   | L90    | L91   | M     | N     |        |
|-----------|-----------|---------------|-------------|-------|-------|--------|-------|-------|-------|--------|
|           |           |               | Min.        | Max.  |       |        |       |       |       |        |
| 1.000     | 24        | 0240          | 0.945       | 1.626 | 1.890 | 4.000  | 2.000 | 1.634 | 0.524 | 2.803  |
|           | 25        | 0250          | 0.984       | 1.626 | 1.890 | 4.000  | 2.000 | 1.634 | 0.524 | 2.803  |
|           | 28        | 0280          | 1.102       | 1.752 | 2.016 | 4.126  | 2.126 | 1.602 | 0.524 | 2.933  |
| 1.125     | 30        | 0300          | 1.181       | 1.811 | 2.295 | 4.252  | 2.126 | 1.602 | 0.524 | 2.933  |
| 1.250     | 32        | 0317          | 1.250       | 1.874 | 2.295 | 4.252  | 2.126 | 1.602 | 0.524 | 3.213  |
|           | 33        | 0320          | 1.260       | 1.874 | 2.295 | 4.252  | 2.126 | 1.602 | 0.524 | 3.213  |
|           | 33        | 0330          | 1.299       | 2.000 | 2.421 | 4.374  | 2.126 | 1.602 | 0.524 | 3.339  |
| 1.375     | 35        | 0349          | 1.375       | 2.000 | 2.421 | 4.374  | 2.126 | 1.602 | 0.524 | 3.339  |
|           | 35        | 0350          | 1.378       | 2.000 | 2.421 | 4.374  | 2.126 | 1.602 | 0.524 | 3.339  |
|           | 38        | 0380          | 1.496       | 2.252 | 2.681 | 4.874  | 2.185 | 1.681 | 0.524 | 3.598  |
| 1.500     | 40        | 0381          | 1.500       | 2.252 | 2.681 | 4.874  | 2.185 | 1.681 | 0.524 | 3.598  |
| 1.625     | 40        | 0400          | 1.575       | 2.374 | 2.811 | 5.000  | 2.185 | 1.681 | 0.563 | 3.768  |
|           | 43        | 0412          | 1.625       | 2.374 | 2.811 | 5.000  | 2.185 | 1.681 | 0.563 | 3.768  |
|           | 43        | 0430          | 1.693       | 2.500 | 2.917 | 5.252  | 2.185 | 1.681 | 0.563 | 3.768  |
| 1.750     | 45        | 0444          | 1.750       | 2.500 | 2.917 | 5.252  | 2.185 | 1.681 | 0.563 | 3.874  |
| 1.875     | 45        | 0450          | 1.772       | 2.500 | 2.917 | 5.252  | 2.185 | 1.681 | 0.563 | 3.874  |
|           | 48        | 0476          | 1.875       | 2.626 | 2.917 | 5.252  | 2.185 | 1.681 | 0.563 | 3.874  |
|           | 48        | 0480          | 1.890       | 2.626 | 2.917 | 5.252  | 2.185 | 1.681 | 0.563 | 3.874  |
| 2.000     | 50        | 0500          | 1.969       | 2.752 | 3.016 | 5.500  | 2.374 | 1.713 | 0.563 | 4.000  |
|           | 53        | 0508          | 2.000       | 2.752 | 3.016 | 5.500  | 2.374 | 1.713 | 0.563 | 4.000  |
|           | 53        | 0530          | 2.087       | 2.874 | 3.358 | 5.858  | 2.374 | 1.713 | 0.689 | 4.469  |
| 2.125     | 55        | 0539          | 2.125       | 2.874 | 3.358 | 5.858  | 2.374 | 1.713 | 0.689 | 4.469  |
| 2.250     | 55        | 0550          | 2.165       | 2.874 | 3.358 | 5.858  | 2.374 | 1.713 | 0.689 | 4.469  |
|           | 58        | 0571          | 2.250       | 3.000 | 3.484 | 6.500  | 2.476 | 1.713 | 0.689 | 4.567  |
|           | 58        | 0580          | 2.283       | 3.126 | 3.610 | 6.500  | 2.528 | 1.713 | 0.689 | 4.720  |
| 2.375     | 60        | 0600          | 2.362       | 3.126 | 3.610 | 6.500  | 2.528 | 1.713 | 0.689 | 4.720  |
|           | 63        | 0603          | 2.375       | 3.126 | 3.610 | 6.500  | 2.528 | 1.713 | 0.689 | 4.720  |
|           | 63        | 0630          | 2.480       | 3.374 | 3.890 | 6.752  | 2.626 | 1.705 | 0.689 | 5.000  |
| 2.500     | 65        | 0635          | 2.500       | 3.374 | 3.890 | 6.752  | 2.626 | 1.705 | 0.689 | 5.000  |
| 2.625     | 65        | 0650          | 2.559       | 3.374 | 3.890 | 6.752  | 2.626 | 1.705 | 0.689 | 5.000  |
|           | 66        | 0666          | 2.625       | 3.685 | 4.063 | 6.752  | 2.563 | 1.728 | 0.689 | 5.169  |
|           | 66        | 0698          | 2.750       | 3.685 | 4.063 | 6.752  | 2.563 | 1.728 | 0.689 | 5.169  |
| 2.750     | 70        | 0700          | 2.756       | 3.685 | 4.063 | 6.752  | 2.563 | 1.728 | 0.689 | 5.169  |
|           | 73        | 0730          | 2.874       | 3.812 | 4.186 | 7.000  | 2.562 | 1.727 | 0.687 | 5.312  |
|           | 75        | 0750          | 2.953       | 4.000 | 4.469 | 7.750  | 2.625 | 2.250 | 0.812 | 5.720  |
| 3.000     | 75        | 0762          | 3.000       | 4.000 | 4.469 | 7.750  | 2.625 | 2.250 | 0.812 | 5.720  |
| 3.125     | 80        | 0793          | 3.125       | 4.125 | 4.600 | 7.875  | 2.687 | 2.250 | 0.812 | 5.845  |
| 3.250     | 80        | 0800          | 3.150       | 4.125 | 4.600 | 7.437  | 2.635 | 2.250 | 0.812 | 5.845  |
|           | 85        | 0825          | 3.250       | 4.125 | 4.600 | 7.437  | 2.635 | 2.250 | 0.812 | 5.845  |
|           | 85        | 0850          | 3.346       | 4.375 | 4.850 | 8.125  | 2.687 | 2.250 | 0.812 | 6.095  |
| 3.375     | 85        | 0857          | 3.375       | 4.375 | 4.850 | 8.125  | 2.687 | 2.250 | 0.812 | 6.095  |
| 3.500     | 90        | 0889          | 3.500       | 4.500 | 4.975 | 8.250  | 2.687 | 2.250 | 0.812 | 6.220  |
| 3.625     | 90        | 0900          | 3.543       | 4.625 | 5.100 | 8.375  | 2.687 | 2.250 | 0.688 | 6.250  |
|           | 95        | 0920          | 3.625       | 4.625 | 5.100 | 8.375  | 2.687 | 2.250 | 0.688 | 6.250  |
|           | 95        | 0950          | 3.740       | 4.724 | 5.199 | 8.750  | 2.687 | 2.250 | 0.688 | 6.770  |
| 3.750     | 95        | 0952          | 3.750       | 4.724 | 5.199 | 8.750  | 2.687 | 2.250 | 0.688 | 6.770  |
| 3.875     | 100       | 0984          | 3.875       | 4.875 | 5.375 | 8.750  | 2.687 | 2.250 | 0.812 | 6.636  |
| 4.000     | 100       | 1000          | 3.937       | 5.000 | 5.500 | 9.000  | 2.687 | 2.250 | 0.812 | 6.761  |
|           | 106       | 1016          | 4.000       | 5.000 | 5.500 | 9.000  | 2.687 | 2.250 | 0.812 | 6.761  |
|           | 105       | 1047          | 4.125       | 5.125 | 5.625 | 9.000  | 2.687 | 2.250 | 0.812 | 6.886  |
| 4.125     | 105       | 1050          | 4.134       | 5.125 | 5.625 | 9.000  | 2.687 | 2.250 | 0.812 | 6.886  |
| 4.250     | 107       | 1079          | 4.250       | 5.250 | 5.750 | 9.250  | 2.687 | 2.625 | 0.812 | 7.011  |
|           | 110       | 1100          | 4.331       | 5.500 | 6.000 | 9.500  | 2.687 | 2.625 | 0.812 | 7.261  |
|           | 111       | 1111          | 4.375       | 5.500 | 6.000 | 9.500  | 2.687 | 2.625 | 0.812 | 7.261  |
| 4.375     | 111       | 1111          | 4.375       | 5.500 | 6.000 | 9.500  | 2.687 | 2.625 | 0.812 | 7.261  |
| 4.500     | 114       | 1143          | 4.500       | 5.500 | 6.000 | 9.500  | 2.687 | 2.625 | 0.812 | 7.261  |
|           | 115       | 1150          | 4.528       | 5.500 | 6.000 | 9.500  | 2.687 | 2.625 | 0.812 | 7.261  |
|           | 117       | 1174          | 4.625       | 5.750 | 6.313 | 10.375 | 2.687 | 2.625 | 0.812 | 7.574  |
| 4.625     | 120       | 1200          | 4.724       | 5.750 | 6.313 | 10.375 | 2.687 | 2.625 | 0.812 | 7.574  |
|           | 126       | 1206          | 4.750       | 5.750 | 6.313 | 10.375 | 2.687 | 2.625 | 0.812 | 7.574  |
|           | 125       | 1250          | 4.921       | 6.350 | 7.260 | 12.000 | 3.168 | 2.598 | 0.812 | 10.000 |
| 5.000     | 127       | 1270          | 5.000       | 6.350 | 7.260 | 12.000 | 3.168 | 2.598 | 0.812 | 10.000 |
| 5.250     | 130       | 1300          | 5.118       | 6.600 | 7.510 | 12.250 | 3.168 | 2.598 | 0.812 | 10.250 |
|           | 133       | 1333          | 5.250       | 6.600 | 7.510 | 12.250 | 3.168 | 2.598 | 0.812 | 10.250 |
|           | 135       | 1350          | 5.315       | 6.850 | 8.000 | 12.687 | 3.168 | 2.598 | 0.937 | 10.500 |
| 5.500     | 139       | 1397          | 5.500       | 6.850 | 8.000 | 12.687 | 3.168 | 2.598 | 0.937 | 10.500 |
|           | 140       | 1400          | 5.512       | 6.850 | 8.000 | 12.687 | 3.168 | 2.598 | 0.937 | 10.500 |

metric

| Seal Size | Size Code | D1 Shaft Size | D4 Box Bore |        | D26    | L90    | L91   | M     | N     |        |
|-----------|-----------|---------------|-------------|--------|--------|--------|-------|-------|-------|--------|
|           |           |               | Min.        | Max.   |        |        |       |       |       |        |
| 1.000     | 24        | 0240          | 24.00       | 41.3   | 48.0   | 101.6  | 50.8  | 41.5  | 13.3  | 71.2   |
|           | 25        | 0250          | 25.00       | 41.3   | 48.0   | 101.6  | 50.8  | 41.5  | 13.3  | 71.2   |
|           | 28        | 0280          | 28.00       | 44.5   | 51.2   | 104.8  | 54.0  | 40.7  | 13.3  | 74.5   |
| 1.125     | 30        | 0300          | 30.00       | 46.0   | 58.3   | 108.0  | 54.0  | 40.7  | 13.3  | 81.6   |
| 1.250     | 32        | 0317          | 31.75       | 47.6   | 58.3   | 108.0  | 54.0  | 40.7  | 13.3  | 81.6   |
| 1.375     | 33        | 0320          | 32.00       | 47.6   | 58.3   | 108.0  | 54.0  | 40.7  | 13.3  | 81.6   |
|           | 33        | 0330          | 33.00       | 50.8   | 61.5   | 111.1  | 54.0  | 40.7  | 13.3  | 84.8   |
|           | 35        | 0349          | 34.93       | 50.8   | 61.5   | 111.1  | 54.0  | 40.7  | 13.3  | 84.8   |
| 1.500     | 35        | 0350          | 35.00       | 50.8   | 61.5   | 111.1  | 54.0  | 40.7  | 13.3  | 84.8   |
|           | 38        | 0380          | 38.00       | 57.2   | 68.1   | 123.8  | 55.5  | 42.7  | 13.3  | 91.4   |
|           | 40        | 0381          | 38.10       | 57.2   | 68.1   | 123.8  | 55.5  | 42.7  | 13.3  | 91.4   |
| 1.625     | 40        | 0400          | 40.00       | 60.3   | 71.4   | 127.0  | 55.5  | 42.7  | 14.3  | 95.7   |
| 1.750     | 43        | 0412          | 41.28       | 60.3   | 71.4   | 127.0  | 55.5  | 42.7  | 14.3  | 95.7   |
|           | 43        | 0430          | 43.00       | 63.5   | 74.1   | 133.4  | 55.5  | 42.7  | 14.3  | 98.4   |
|           | 44        | 0444          | 44.45       | 63.5   | 74.1   | 133.4  | 55.5  | 42.7  | 14.3  | 98.4   |
| 1.875     | 45        | 0450          | 45.00       | 63.5   | 74.1   | 133.4  | 55.5  | 42.7  | 14.3  | 98.4   |
| 2.000     | 47        | 0476          | 47.63       | 66.7   | 74.1   | 133.4  | 55.5  | 42.7  | 14.3  | 98.4   |
|           | 48        | 0480          | 48.00       | 66.7   | 74.1   | 133.4  | 55.5  | 42.7  | 14.3  | 98.4   |
|           | 50        | 0500          | 50.00       | 69.9   | 76.6   | 139.7  | 60.3  | 43.5  | 14.3  | 101.6  |
| 2.125     | 50        | 0508          | 50.80       | 69.9   | 76.6   | 139.7  | 60.3  | 43.5  | 14.3  | 101.6  |
| 2.250     | 53        | 0530          | 53.00       | 73.0   | 85.3   | 148.8  | 60.3  | 43.5  | 17.5  | 113.5  |
|           | 53        | 0539          | 53.98       | 73.0   | 85.3   | 148.8  | 60.3  | 43.5  | 17.5  | 113.5  |
|           | 55        | 0550          | 55.00       | 73.0   | 85.3   | 148.8  | 60.3  | 43.5  | 17.5  | 113.5  |
| 2.375     | 55        | 0571          | 57.15       | 76.2   | 88.5   | 165.1  | 62.9  | 43.5  | 17.5  | 116.0  |
|           | 58        | 0580          | 58.00       | 79.4   | 91.7   | 165.1  | 64.2  | 43.5  | 17.5  | 119.9  |
|           | 60        | 0600          | 60.00       | 79.4   | 91.7   | 165.1  | 64.2  | 43.5  | 17.5  | 119.9  |
| 2.500     | 60        | 0603          | 60.33       | 79.4   | 91.7   | 165.1  | 64.2  | 43.5  | 17.5  | 119.9  |
| 2.625     | 63        | 0630          | 63.00       | 85.7   | 98.8   | 171.5  | 66.7  | 43.3  | 17.5  | 127.0  |
|           | 65        | 0635          | 63.50       | 85.7   | 98.8   | 171.5  | 66.7  | 43.3  | 17.5  | 127.0  |
|           | 65        | 0650          | 65.00       | 85.7   | 98.8   | 171.5  | 66.7  | 43.3  | 17.5  | 127.0  |
| 2.750     | 66        | 0666          | 66.68       | 93.6   | 103.2  | 171.5  | 65.1  | 43.9  | 17.5  | 131.3  |
| 2.875     | 66        | 0698          | 69.85       | 93.6   | 103.2  | 171.5  | 65.1  | 43.9  | 17.5  | 131.3  |
|           | 70        | 0700          | 70.00       | 93.6   | 103.2  | 171.5  | 65.1  | 43.9  | 17.5  | 131.3  |
|           | 70        | 0730          | 73.03       | 96.8   | 106.3  | 177.8  | 65.1  | 43.9  | 17.5  | 134.9  |
| 3.000     | 75        | 0750          | 75.00       | 101.60 | 113.51 | 196.85 | 66.68 | 57.15 | 20.62 | 145.29 |
| 3.125     | 75        | 0762          | 76.20       | 101.60 | 113.51 | 196.85 | 66.68 | 57.15 | 20.62 | 145.29 |
|           | 80        | 0793          | 79.38       | 104.78 | 116.84 | 200.03 | 68.25 | 57.15 | 20.62 | 148.46 |
|           | 80        | 0800          | 80.00       | 104.78 | 116.84 | 188.90 | 66.93 | 57.15 | 20.62 | 148.46 |
| 3.250     | 80        | 0825          | 82.55       | 104.78 | 116.84 | 188.90 | 66.93 | 57.15 | 20.62 | 148.46 |
| 3.375     | 85        | 0850          | 85.00       | 111.13 | 123.19 | 206.38 | 68.25 | 57.15 | 20.62 | 154.81 |
|           | 85        | 0857          | 85.73       | 111.13 | 123.19 | 206.38 | 68.25 | 57.15 | 20.62 | 154.81 |
|           | 90        | 0889          | 88.90       | 114.30 | 126.37 | 209.55 | 68.25 | 57.15 | 20.62 | 157.99 |
| 3.500     | 90        | 0900          | 90.00       | 117.48 | 129.54 | 212.73 | 68.25 | 57.15 | 17.48 | 158.75 |
| 3.625     | 90        | 0920          | 92.08       | 117.48 | 129.54 | 212.73 | 68.25 | 57.15 | 17.48 | 158.75 |
|           | 95        | 0950          | 95.00       | 119.99 | 132.05 | 222.25 | 68.25 | 57.15 | 17.48 | 171.96 |
|           | 95        | 0952          | 95.25       | 119.99 | 132.05 | 222.25 | 68.25 | 57.15 | 17.48 | 171.96 |
| 3.750     | 98        | 0984          | 98.43       | 123.83 | 136.53 | 222.25 | 68.25 | 57.15 | 20.62 | 168.55 |
| 4.000     | 100       | 1000          | 100.00      | 127.00 | 139.70 | 228.60 | 68.25 | 57.15 | 20.62 | 171.73 |
|           | 100       | 1016          | 101.60      | 127.00 | 139.70 | 228.60 | 68.25 | 57.15 | 20.62 | 171.73 |
|           | 105       | 1047          | 104.78      | 130.18 | 142.88 | 228.60 | 68.25 | 57.15 | 20.62 | 174.90 |
| 4.125     | 105       | 1050          | 105.00      | 130.18 | 142.88 | 228.60 | 68.25 | 57.15 | 20.62 | 174.90 |
| 4.250     | 107       | 1079          | 107.95      | 133.35 | 146.05 | 234.95 | 68.25 | 66.68 | 20.62 | 178.08 |
|           | 110       | 1100          | 110.00      | 139.70 | 152.40 | 241.30 | 68.25 | 66.68 | 20.62 | 184.43 |
|           | 111       | 1111          | 111.12      | 139.70 | 152.40 | 241.30 | 68.25 | 66.68 | 20.62 | 184.43 |
| 4.375     | 114       | 1143          | 114.30      | 139.70 | 152.40 | 241.30 | 68.25 | 66.68 | 20.62 | 184.43 |
| 4.500     | 115       | 1150          | 115.00      | 139.70 | 152.40 | 241.30 | 68.25 | 66.68 | 20.62 | 184.43 |
|           | 115       | 1174          | 117.47      | 146.05 | 160.35 | 263.53 | 68.25 | 66.68 | 20.62 | 192.38 |
|           | 120       | 1200          | 120.00      | 146.05 | 160.35 | 263.53 | 68.25 | 66.68 | 20.62 | 192.38 |
| 4.625     | 120       | 1206          | 120.65      | 146.05 | 160.35 | 263.53 | 68.25 | 66.68 | 20.62 | 192.38 |
| 4.750     | 125       | 1250          | 125.00      | 161.29 | 184.40 | 304.80 | 80.47 | 65.99 | 20.62 | 254.00 |
|           | 127       | 1270          | 127.00      | 161.29 | 184.40 | 304.80 | 80.47 | 65.99 | 20.62 | 254.00 |
|           | 130       | 1300          | 130.00      | 167.64 | 190.75 | 311.15 | 80.47 | 65.99 | 20.62 | 260.35 |
| 5.000     | 133       | 1333          | 133.35      | 167.64 | 190.75 | 311.15 | 80.47 | 65.99 | 20.62 | 260.35 |
| 5.250     | 135       | 1350          | 135.00      | 173.99 | 203.20 | 322.25 | 80.47 | 65.99 | 23.80 | 266.70 |
|           | 135       | 1397          | 139.70      | 173.99 | 203.20 | 322.25 | 80.47 | 65.99 | 23.80 | 266.70 |
|           | 140       | 1400          | 140.00      | 173.99 | 203.20 | 322.25 | 80.47 | 65.99 | 23.80 | 266.70 |

### Type 4620P Big Bore Typical Arrangement



### Type 4620P Big Bore Dimensional Data

#### Big Bore Cast Gland (inches)

| Pump<br>Manufacturer                                  | D1<br>Shaft<br>Size | D4<br>Box Bore |       | D26   | L90   | L91   | M     | N     |
|-------------------------------------------------------|---------------------|----------------|-------|-------|-------|-------|-------|-------|
|                                                       |                     | Min.           | Max.  |       |       |       |       |       |
| Durco Mk III Group IK, Goulds 3196 STX, Sulzer ALB #1 | 1.375               | 2.875          | 3.023 | 5.375 | 2.125 | 1.603 | 0.562 | 4.062 |
| Goulds 3196 MTX                                       | 1.750               | 3.500          | 3.925 | 6.500 | 2.187 | 1.680 | 0.687 | 5.093 |
| Durco Mk III Group II                                 | 1.875               | 3.625          | 3.734 | 6.500 | 2.187 | 1.680 | 0.687 | 5.093 |
| Goulds 3196 XLTX                                      | 2.500               | 4.750          | 4.875 | 8.000 | 2.532 | 1.859 | 0.687 | 6.062 |
| Durco Mk III Group III                                | 2.625               | 4.625          | 4.740 | 8.000 | 2.562 | 1.727 | 0.687 | 6.062 |
| Goulds 3196 X-17                                      | 2.750               | 4.750          | 4.875 | 8.000 | 2.532 | 1.820 | 0.687 | 6.062 |

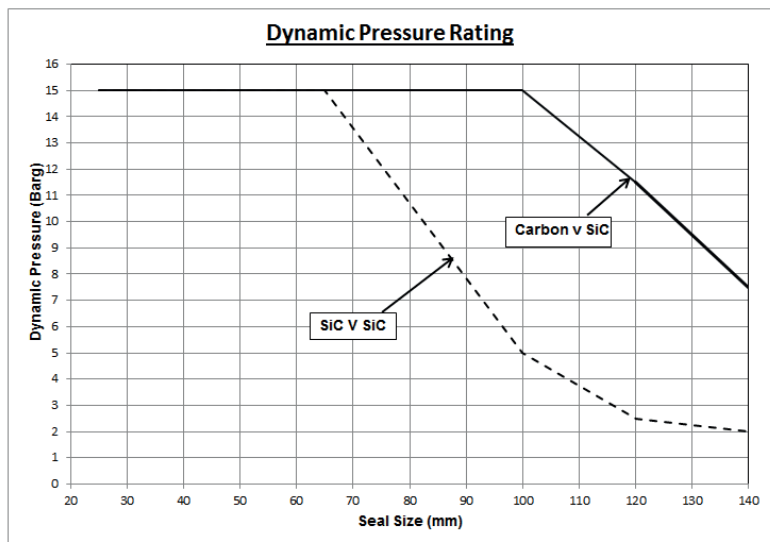
#### Big Bore Machined Gland (inches)

|                 |       |       |       |       |       |       |       |       |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Goulds 3196 LTX | 2.125 | 3.875 | 4.250 | 7.156 | 2.408 | 1.742 | 0.687 | 5.687 |
| Sulzer ALB #2   | 2.125 | 4.125 | 4.250 | 7.156 | 2.407 | 1.742 | 0.437 | 5.250 |
| Sulzer ALB #3   | 2.500 | 4.750 | 4.875 | 8.000 | 2.532 | 1.859 | 0.687 | 6.062 |

### Materials of Construction

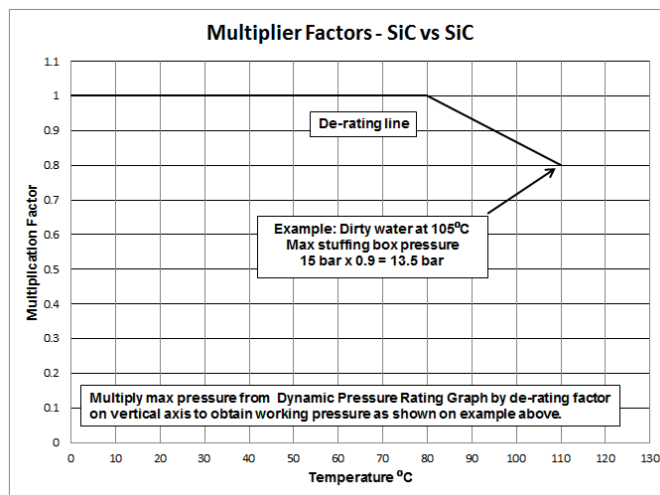
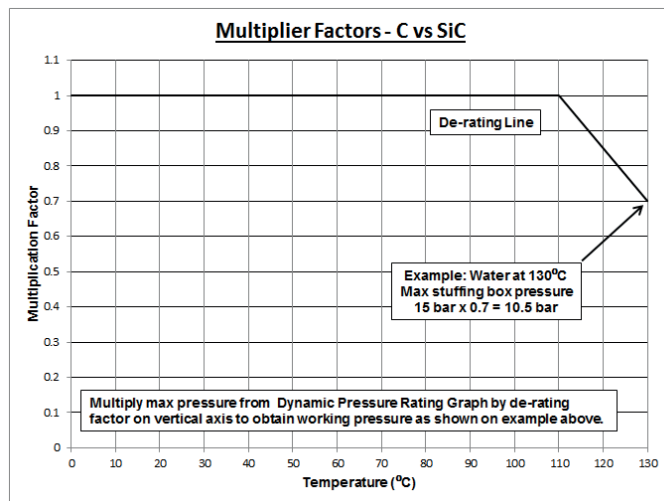
| SEAL COMPONENTS               | MATERIALS                                                      |                                             |
|-------------------------------|----------------------------------------------------------------|---------------------------------------------|
|                               | Standard                                                       | Options                                     |
| Description                   |                                                                |                                             |
| Face/Primary Ring             | Carbon Graphite                                                | Silicon Carbide (Inboard Only)              |
| Seat/Mating Ring              | Silicon Carbide                                                | —                                           |
| O-ring                        | Fluoroelastomer                                                | EPDM<br>TFE Propylene<br>Perfluoroelastomer |
| Springs                       | Alloy-C-276                                                    | —                                           |
| Gasket, Centering Ring        | Glass-filled PTFE<br>Note: Some sizes have Sint. 316SS Spacers | —                                           |
| Hardware                      | 316SS or better                                                |                                             |
| Inboard Primary Ring Adaptor  | Duplex SS                                                      | —                                           |
| Outboard Primary Ring Adaptor | Alloy 20                                                       | —                                           |

### Basic Pressure Rating



The basic pressure rating is for a standard seal, as shown in the typical arrangement, when installed according to the criteria given in this data sheet and generally industrial practices. The basic pressure rating assumes stable operation at the speeds indicated on the above chart in a clean, cool, lubricating, nonvolatile liquid with an adequate flush rate. When used with the multiplier factors, the basic pressure rating can be adjusted to provide a conservative estimate of the dynamic pressure rating. For process services outside this range or a more accurate assessment of the dynamic pressure rating, contact John Crane for more information.

### Multiplier Factors



| Single Type 4610 and Tandem <sup>1</sup> Type 4620P                                                |
|----------------------------------------------------------------------------------------------------|
| Process Pressure                                                                                   |
| Up to 15 barg or 220 psig<br>Seal size and material dependent<br>See Dynamic Pressure Rating Graph |

| Double <sup>2</sup> Type 4620P                                                                                               |                                                    |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Barrier Fluid Pressure <sup>2</sup>                                                                                          | Inboard Seal Internal Pressure Rating <sup>3</sup> |
| Up to 15 barg or 220 psig<br>Seal Size, Material & Barrier Fluid dependent <sup>2</sup><br>See Dynamic Pressure Rating Graph | 1-2 barg or 15-30 psig                             |

<sup>1</sup>Tandem (Unpressurized) : Uses a "buffer" with pressure lower than process seal chamber or stuffing box pressure (Plan 52). Pressure rating is same as Single.

<sup>2</sup>Double (Pressurized): Uses a "barrier" fluid with pressure higher than process seal chamber fluid or stuffing box pressure (Plan 53).

As a Double (Pressurized) Arrangement, maximum barrier fluid pressure is same as Dynamic Pressure Rating for Type 4620P carbon vs. SiC inboard seal (see Figure 3). Maximum barrier fluid pressure is 9 barg or 130 psig for 3.000" (75mm) and larger sizes when barrier fluid is oil and shaft speed is greater than 1800 rpm.

<sup>3</sup>Inboard Seal Internal Pressure Rating = Barrier Pressure – Process Pressure

When using as a Double Pressurized Arrangement, set the barrier fluid pressure at 15-30 psig / 1-2 barg above process fluid.

It is not recommended to operate at higher pressure differential due to the inboard seal internal pressure limit.

**Additional Notes:**

\*Barrier fluid must have a viscosity less than 15 cSt/65 SSU and fluid lubricity equal or better than water at 40°C. It is recommended that the barrier temperature be maintained below 65°C.

\*\*The ratio of sealed pressure to vapor pressure must be greater than 1.5, otherwise contact Engineering. If the specific gravity is less than 0.6, contact Engineering.



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