Diaphragm - Type Diaphragm Seal
Type L990.10 - Standard Welded Diaphragm Seal

Applications

Process industry diaphragm seal to combine bourdon tube pressure gauges. Intended for corrosive, contaminated, hot or viscous pressure media.

Features

- Multi-purpose diaphragm seal
- Threaded process connection
- Diaphragm welded to upper housing

Design

The diaphragm is welded to the upper housing which allows the replacement of the lower housing without jeopardizing the integrity of the system fill fluid and installed instrument. The upper and lower housing are bolted together and sealed by use of an O-ring. Process wetted components can be manufactured with solid metallic and nonmetallic materials.

Pressure Rating,
Maximum: 3,675 psi

Suitable Pressure Span,
Minimum:
Gauge (Range):  2½", ≥ 15 psi
4" or 4½", ≥ 15 psi

Pressure Transmitters (TRONIC):
≥ 15 psi

Operating Temperature:
-130°F to 752°F (-90°C to 400°C)
<table>
<thead>
<tr>
<th>Field No.</th>
<th>Code</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Process Connection</td>
</tr>
<tr>
<td></td>
<td>GN2</td>
<td>1/4 NPT Female</td>
</tr>
<tr>
<td></td>
<td>GN4</td>
<td>1/2 NPT Female</td>
</tr>
<tr>
<td></td>
<td>GN5</td>
<td>3/4 NPT Female</td>
</tr>
<tr>
<td></td>
<td>GN6</td>
<td>1 NPT Female</td>
</tr>
<tr>
<td></td>
<td>GNB</td>
<td>1/4 NPT Male</td>
</tr>
<tr>
<td></td>
<td>GND</td>
<td>1/2 NPT Male</td>
</tr>
<tr>
<td></td>
<td>GNE</td>
<td>3/4 NPT Male</td>
</tr>
<tr>
<td></td>
<td>GNF</td>
<td>1.0 NPT Male</td>
</tr>
<tr>
<td></td>
<td>???</td>
<td>Other - Please Specify</td>
</tr>
</tbody>
</table>

| 2 | | Nominal Pressure Rating |
|   | XA  | 200 psi MWP (Maximum 300 °F) |
|   | XB  | 1500 psi MWP (Standard 4 bolts) |
|   | XT  | 3675 psi |
|   | ??  | Other - Please Specify |

| 3 | | Upper Housing Material |
|   | AP  | Carbon Steel 1018 Nickel Plated |
|   | A2  | Stainless Steel 316L (1.4435) |
|   | A1  | Stainless Steel 316TI (1.4571) |
|   | AE  | Titanium Grade 2 (3.7035) |
|   | ??  | Other - Please Specify |

| 4 | | Diaphragm Material |
|   | A2  | Stainless Steel 316L (1.4435) |
|   | A5  | Hastelloy B2 (2.4617) |
|   | A7  | Hastelloy C276 (2.4819) |
|   | A8  | Monel 400 (2.4360) |
|   | A9  | Inconel 600 (2.4816) |
|   | AA  | Incoloy 825 (2.4858) |
|   | AB  | Tantalum |
|   | AC  | Nickel 200 (2.4066) |
|   | AE  | Titanium Grade 2 (3.7035)  Upper Titanium required |
|   | C2  | Carpenter 20 |
|   | AG  | Stainless Steel 316TI (1.4571) with PTFE-foil |
|   | BB  | Stainless Steel 316L with PFA-coating |
|   | BD  | Stainless Steel 316TI (1.4571) with Gold Lining 25 µm |
|   | ??  | Other - Please Specify |

| 5 | | Lower Housing Material |
|   | AP  | Carbon Steel 1018 Nickel Plating |
|   | A1  | Stainless Steel 316TI (1.4571) |
|   | A2  | Stainless Steel 316L (1.4435) |
|   | A5  | Hastelloy B2 (2.4617) |
|   | A7  | Hastelloy C276 (2.4819) |
|   | A8  | Monel 400 (2.4360) |
|   | A9  | Inconel 600 (2.4816) |
|   | AA  | Incoloy 825 (2.4858) |
|   | AE  | Titanium Grade 2 (3.7035) |
### Lower Housing Material (continued)
- AN: Solid Teflon (PTFE) max. 200 psi
- C2: Carpenter 20
- ??: Other - Please Specify

### Fastening Parts
- A: Retainer Flange and Bolts in Galvanized Steel
- B: Retainer Flange and Bolts in Stainless Steel
- C: Retainer Flange Stainless Steel and High Tensile Bolts

### Gasket (Process Seal)
- Z: Without
- G: BUNA-N (NBR) Max. 212°F
- J: Viton (FPM) Max. 400°F
- E: Teflon (PTFE) Max. 500°F
- C: Metal Seal Form C, Stainless Steel / Silver
- D: Metal Seal Form C, Inconel / Silver
- ??: Other - Please Specify

### Connection to the Pressure Instrument
- 3: 1/2 NPT Female
- 4: 1/4 NPT Female
- 5: Axial Weld-in Connection
- ??: Other - Please Specify

### Flushing Connection
- 1: Without
- 2: 1 x 1/8 NPT
- 3: 1 x 1/4 NPT
- 4: 2 x 1/8 NPT
- 5: 2 x 1/4 NPT
- ??: Other - Please Specify

### System Fillport
- A: Without
- C: Filler Hole M6 Set Screw
- ??: Other - Please Specify

### Quality Certificates
- Z: Without
- 1: Quality Certificates

### Additional Order Details
- Z: Without
- T: Additional Order Details

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**Note:**
1) NO Flushing ports available.
2) Lot charges for annealing apply

**Order Code:**

```plaintext
L990.10 - _______ _______ _______ _______ _______ _______ _______ _______ _______ _______ _______ _______  

*Additional order details__________________________
```
### Description Ordering Code - L990.10

<table>
<thead>
<tr>
<th>Description Ordering Code - L990.10</th>
</tr>
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<tbody>
<tr>
<td>L990.10,1/4X1/4F,CS,CS-0,CS,SS,VI</td>
</tr>
</tbody>
</table>

#### Notes

1. Includes previous type 990.10.502.

2. Capillary connection requires a stainless steel upper housing.

3. Teflon® lower housing available in welded diaphragm (type 990.10.501) design only. (MWP 200 psi@ 200°F) Available with 1/4" or 1/2" NPT female process connections only.

4. Customer to supply flushing plug.

5. For all welded design (990.10.520) only.

6. Nuts and bolts only. Clamp rings, support ring and washers are 316 stainless steel. Requires silver-plated stainless steel gasket.

7. Viton® diaphragm is available for clamped design only.

8. For titanium diaphragm welded to upper housing, a titanium upper housing is required.

9. For Teflon® lower housing and all welded design (990.10.520) only. All other lower housings require gaskets.

10. Standard material for stainless steel and carbon steel wetted parts is Viton® (400°F max.). Teflon® is standard for all other wetted parts (500°F max.). Silver-plated stainless steel gasket is used for high temperature applications (752°F max.).

#### Gasket Material (See note 10)

- **VI** = Viton®
- **BN** = Buna “N”
- **TF** = Teflon®, virgin
- **AS** = Stainless steel, silver-plated
- **NA** = None (See note 9)

#### Diaphragm Material

- **SS** = 316L stainless steel
- **MO** = Monel® 400
- **HB** = Hastelloy® B-2
- **HC** = Hastelloy® C-276
- **PF** = 316 stainless steel, Teflon® coated
- **TF** = 316 stainless steel, virgin Teflon® lined
- **TA** = Tantalum
- **Ti** = Titanium, grade 2 (See note 8)
- **NI** = Nickel 200
- **IN** = Inconel® 600
- **IC** = Incoloy® 800
- **CA** = Carpenter® 20

#### Clamp & Support Material (Including nuts and bolts)

- **CS** = Carbon steel, zinc-plated
- **SS** = Stainless steel
- **HS** = High temperature stainless steel (See note 6)
- **NA** = None (See note 5)

#### Flushing Connection (See note 4)

- **0** = None
- **1** = 1/8" NPT female
- **2** = 1/4" NPT female

#### Lower Housing Material

- **CS** = Carbon steel, nickel-plated
- **SS** = 316 stainless steel
- **MO** = Monel® 400
- **HB** = Hastelloy® B-2
- **HC** = Hastelloy® C-276
- **TF** = Teflon®, virgin (See note 3)
- **TI** = Titanium, grade 2
- **NI** = Nickel 200
- **IC** = Inconel® 600
- **CA** = Carpenter® 20

#### Upper Housing Material

- **CS** = Carbon steel, nickel-plated
- **SS** = 316 stainless steel
- **TI** = Titanium, grade 2

#### Process Connection

- **1/4F** = 1/4" NPT female
- **1/2F** = 1/2" NPT female
- **3/4F** = 3/4" NPT female
- **1.0F** = 1" NPT female
- **1/4M** = 1/4" NPT male
- **1/2M** = 1/2" NPT male
- **3/4M** = 3/4" NPT male

#### Instrument Connection

- **1/4** = 1/4" NPT female
- **1/2** = 1/2" NPT female
- **CPL** = Capillary connection (To weld capillary directly to seal, see note 2)

#### Diaphragm Seal Design

- **L990.10** = Welded Diaphragm (Pressure rating up to 3675PSI, see note 1)