

Bourdon Tube Isolators

Bourdon tube isolators are chemical seals that provide isolation between Bourdon tubes in Fisher™ pneumatic instruments and process fluids. They are designed to prevent corrosive or clogging process fluids from entering the Bourdon tube. Each isolator consists of a continuous-duty welded diaphragm seal and armored flexible tubing that is factory-welded to the control connection of a Fisher instrument.

The connecting tubing and the sealed portion of the instrument Bourdon tube are factory-filled with a suitable hydraulic liquid, which is retained by the thin, flexible diaphragm that divides the isolator (figure 1). The other side of the isolator is connected to the process fluid. Diaphragm movement transmits the true process pressure at a one-to-one ratio through the sealed liquid to the instrument.

Features

- **Isolator Overpressure Protection**—The machined surface in the instrument half of the isolator bowl exactly fits the shape of the diaphragm and serves as a travel stop for the isolator only. Excess process pressure can force the diaphragm against the machined surface without damage to the isolator.
- **Application Flexibility**—Both the diaphragm and process half of the isolator bowl are available in a wide selection of materials for compatibility with many hard-to-handle process fluids.
- **Easy Cleaning**—A flushing connection construction permits removal of clogging process fluids without isolator disassembly.



**TYPICAL BOURDON TUBE ISOLATOR
AND CONTROLLER ASSEMBLY**

Specifications

Process Connection Sizes

Without Flushing Connection: ■ 1/4, ■ 3/8, ■ 1/2, ■ 3/4, ■ 1, or ■ 1-1/2 NPT
 With Flushing Connection: ■ 1/4, ■ 3/8, ■ 1/2, ■ 3/4, or ■ 1 NPT

Connecting Tubing

Size and Construction: 3.2 mm (1/8-inch) outside diameter tubing protected by 7.9 mm (5/16-inch) flexible armor soldered at each end, roll-pinned to isolator, and welded to instrument process connection
 Length: ■ 3 m (10 feet) (standard), ■ shorter lengths available at no extra cost, ■ greater lengths may be ordered

Temperature Ratings and Hydraulic Liquid Information

See table 1

Maximum Isolator Input Pressure

172 bar (2500 psig) standard; up to 689 bar (10 000 psig) available upon request

Output Pressure To Instrument⁽¹⁾

Same as isolator input pressure

Construction Materials

Bourdon Tube Bowl: Forged steel
Typical Diaphragm and Process Bowl Material Combinations: See table below

Diaphragm	Exposed Surfaces of Process Bowl	Notes
316L SST	316 SST	Standard construction materials - For optional materials, contact your Emerson Automation Solutions sales office.

1. The pneumatic instrument Bourdon tube will yield if the isolator output pressure is greater than the Bourdon tube maximum pressure.

Table 1. Fill Fluids

Fill Fluid	Process Temperature Limits ⁽¹⁾		Viscosity in Centistokes
	°C	°F	
Mansfield & Green AAA Tester Oil	-1 to 150	30 to 300	16 cs at 38°C (100°F) 3.3 cs at 99°C (210°F)
Dow Corning [®] 200, Silicone - 20cs	-45 to 205	-49 to 401	20 cs at 25°C (77°F)
Dow Corning 200 Silicone - 10cs	-45 to 205	-49 to 401	10 cs at 25°C (77°F)

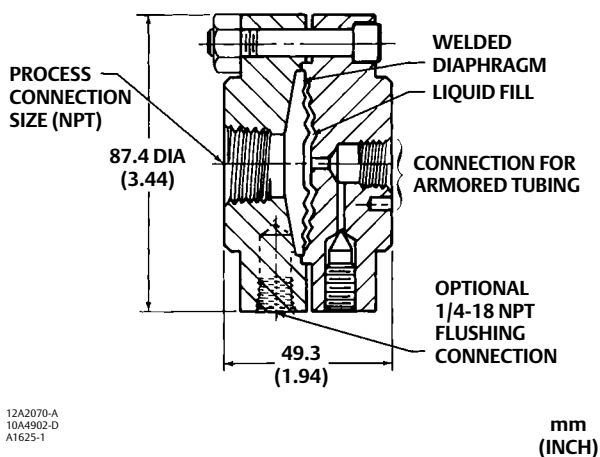
1. This temperature range is for the filled liquid in the Bourdon tube isolator. The temperature at the pneumatic instrument Bourdon tube cannot exceed the ambient temperature range of the pneumatic instrument to which the Bourdon tube isolator is connected.

Installation

The Bourdon tube isolator must not be disassembled, nor any of the connections between it and the Bourdon tube broken, as any air admitted will destroy the accuracy of the process indications. To avoid kinking the armored flexible tubing, while at the same time maintaining the integrity of the sealed system, install the process connection into the isolator bowl, rather than vice versa.

Bowl dimensions are shown in figure 1.

Figure 1. Internal Construction and Dimensions of Bowl



12A2070-A
10A4902-D
A1625-1

Ordering Information

When ordering, specify:

1. Type number and control connection size of Fisher pneumatic instrument for which isolation is desired (no bellows instruments may be specified)
2. Process connection size
3. Flushing connection, if desired
4. Operating temperature range and hydraulic liquid
5. Diaphragm and process bowl materials
6. Length of tubing, if other than 3 m (10 feet)

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