

# Diaphragm Valves

## Two-Step Pneumatic Diaphragm Valves

### DPT Series

#### Introduction

DPT series two-step pneumatic diaphragm valves, designed for high purity and ultra high purity applications, provide a “soft start” for equipment by rapidly switching between low and high flow modes. This prevents pressure surges in the cavity and avoids scattering of particles that could contaminate the process equipment cavity as a result of the rapid flow of media into the process equipment cavity.



#### Features

- ⦿ Fast switching between low and high flow rates
- ⦿ Minimum particle generation and dead space
- ⦿ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ No internally wetted threads or springs which minimizes particle generation and particle entrapment for high purity
- ⦿ Low flow coefficient (Cv) is preset at the factory but also may be adjusted in the field

#### Technical Data

|                                     |   |  |
|-------------------------------------|---|--|
| Port Size                           | 1/4"  |  |
| Flow Coefficient (Cv)               | High-Flow (HF) Port: 0.27<br>Low-Flow (LF) Port: 0.02 ~ 0.12 <sup>①</sup> |  |
| Orifice Size                        | 0.16 in. (4.1 mm)   |  |
| Working Pressure                    | Vacuum to 145 psig (10 bar)   |  |
| Pneumatic Actuator Working Pressure | 79.75 ~ 94.25 psig (5.5 ~ 6.5 bar)  |  |
| Working Temperature                 | PFA: 14 ~ 302 °F (-10 ~ 150 °C)<br>PCTFE: 14 ~ 176 °F (-10 ~ 80 °C)       |  |
| Leak Rate (Helium)                  | Internal  | ≤1x10 <sup>-9</sup> std cm <sup>3</sup> /s |
|                                     | External  | ≤1x10 <sup>-9</sup> std cm <sup>3</sup> /s |

① Note: Cv values for valves in low flow mode can be preset at the factory as per customer-specified values, or adjusted by customers themselves according to process parameters. Please refer to **Dimensions and Ordering Information** for operating instructions.

#### Flow Data

Air @ 70 °F (21 °C)

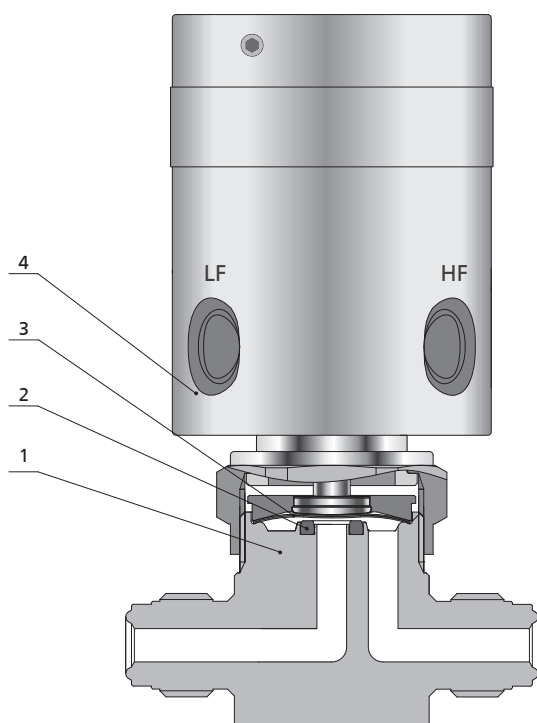
Water @ 60 °F (16 °C)

| Orifice in. (mm) | Pressure Drop to Atmosphere psig (bar) | Air (l/min) | Water (l/min) |
|------------------|--|-------------|---------------|
| 0.16 (4.1)       | 10 (0.68)                              | 86          | 3.2           |
|                  | 50 (3.4)                               | 230         | 7.2           |
|                  | 100 (6.8)                              | 410         | 10.2          |

## Process Specification

| Technology               | Material | 316L SS or 316L VAR                      |
|--------------------------|----------|--|
| Process Specification    |          | Ultra High Purity (FC-03)                |
| Wetted Surface Roughness |          | Ra 5 µin. (0.13 µm)                      |
| Polishing Process        |          | Electropolished                          |
| Assembly Environment     |          | Cleanroom                                |
| Packaging                |          | Double bagged, packaged in the cleanroom |

## Standard Materials of Construction

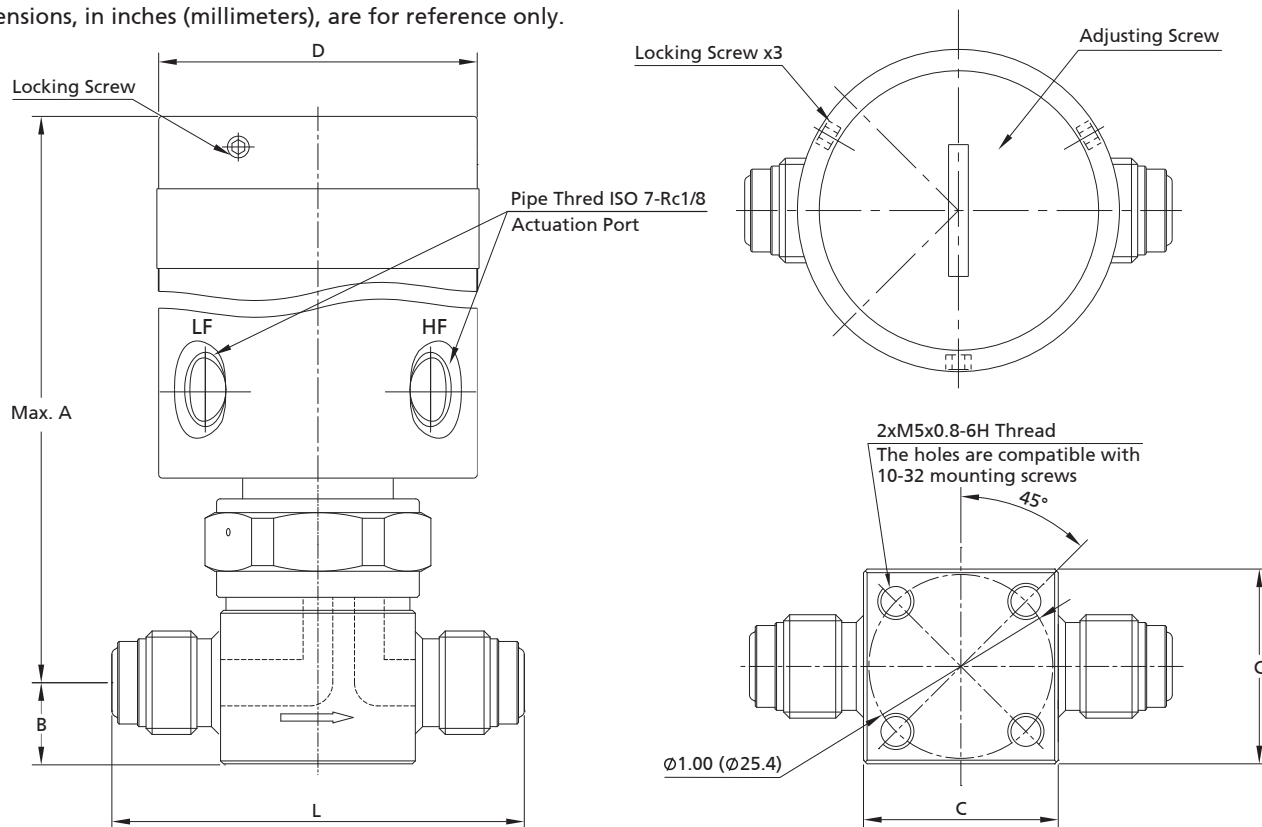


Nomally Closed Pneumatic Actuator

| Item | Component | Material/Specification |
|------|-----------|------------------------|
| 1    | Body      | 316L SS or 316L VAR    |
| 2    | Seat      | PCTFE/ASTM D1430       |
| 3    | Diaphragm | Cobalt Alloy/AMS 5876  |
| 4    | Actuator  | Aluminium              |

## Dimensions and Ordering Information

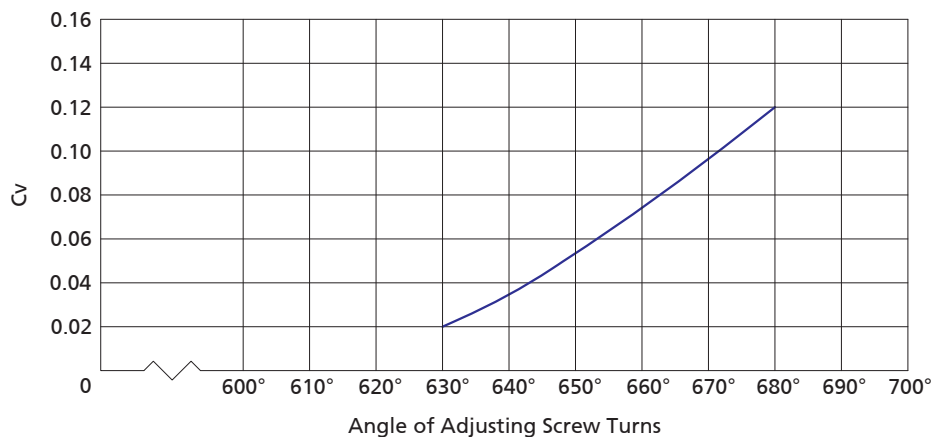
Dimensions, in inches (millimeters), are for reference only.



### Low-flow adjustment instruction:

Loosen three locking screws and reach the groove of the adjusting screw on the top with the tool to turn the adjusting screw to the end in the clockwise direction and then rotate it counterclockwise until the required Cv is reached (see the Cv Graph for the relationship between Cv and adjusting angle). Tighten locking screws after desired Cv is reached.

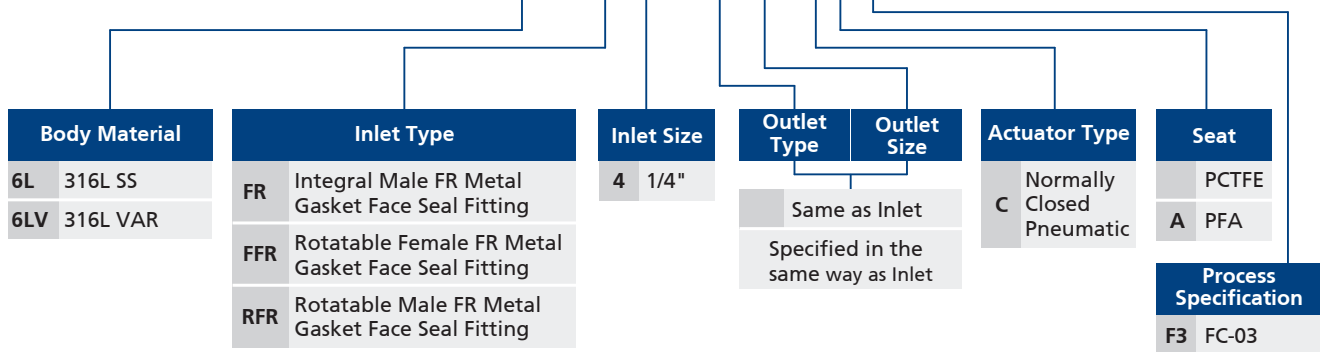
**Cv Graph for Low Flow Mode**



| Basic Ordering Number | Connection Type and Size                                | Dimensions, in. (mm) |             |             |             |             |
|-----------------------|---|----------------------|-------------|-------------|-------------|-------------|
|                       |   | A                    | B           | C           | D           | L           |
| DPT6L-FR4-CAF3        | 1/4" Integral Male FR Metal Gasket Face Seal Fitting    | 3.54 (90.0)          | 0.44 (11.2) | 1.06 (26.9) | 1.73 (44.0) | 2.24 (57.0) |
| DPT6L-FFR4-CAF3       | 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting | 3.54 (90.0)          | 0.44 (11.2) | 1.06 (26.9) | 1.73 (44.0) | 2.78 (70.6) |

## Ordering Number Description

DPT6L - FFR4 - RFR4 - CAF3



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.