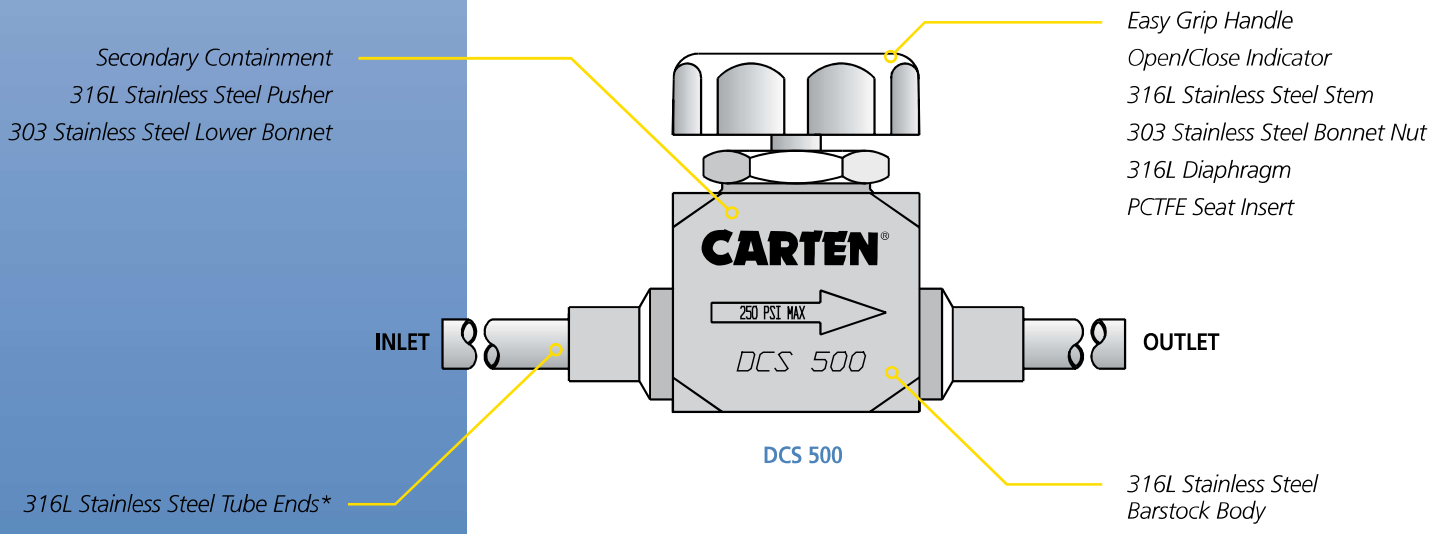
# DCS SERIES

This DCS (diaphragm design) valve series is intended for bulk gas or solvent double containment distribution service where cleanliness and purity are of the utmost importance. These springless, packless, diaphragm valves control the passage of gas or solvent through the primary tube while providing a complete secondary containment flow path. The secondary flow path remains open regardless of the primary passage being opened or closed.

## DCS Series Product Features

- Dual Containment Directly Through the Valve
- Diaphragm Design for Ultra-High Purity and Long Cycle Life
- High Purity Stainless/PCTFE Gas Construction
- Elgiloy Tied-Diaphragm for Maximum Flow & High Life Cycle
- Springless, Packless Design
- No Internal Particle Shedding Components
- Electropolished Wetted Surfaces to 10 Ra Max (Optional surface finishes available)
- Industry Leading Design for Ultra-High Purity Gas Containment
- Purge Connections and Purge Valves are Integrated in Valve Body
- Assembled and Tested in Class 10 Cleanroom
- Valve Bodies and Tube Stubs are Serialized for Material Certification
- Inboard and Across the Seat Leak Tested with 100% Helium
- Cleaned For Ultra-High Purity Gas Service
- Purged and Final Packaged in Class 1 Cleanroom. Double-Bag Packaging with Ultra-High Purity $N_2$ Gas Environment
- Field Retrofit Manual or Air Actuated

## DCS Construction Materials




DCS 500

*See corresponding Code Charts for available end connections.
U.S. Patent # 4,867,201

# DCS Series Technical Data

| | | |
|---|---|---|
| MATERIAL OF CONSTRUCTION | Primary Wetted Areas | 316L Stainless Steel, PCTFE |
| | Secondary Non-Wetted Areas | 316L Stainless Steel, 303 Stainless Steel |
| MAXIMUM OPERATING PRESSURE | Primary and Secondary | Vacuum to 250 psig (0-17.2 bar) (See Application Note) |
| MAXIMUM OPERATING TEMPERATURE | PCTFE Seat<br>Vespel® Seat | -22° F (-30° C) to 180°F (82°C)<br>302°F (150°C) |
| ORIFICE | DCS 250 & 375<br>DCS 500 & 750 | 0.250 in. (6.35 mm)<br>0.437 in. (10.96 mm) |
| FLOW COEFFICIENT ($C_V$) | DCS 250<br>DCS 375<br>DCS 500<br>DCS 750 | 0.41<br>0.41<br>1.2<br>1.2 |
| HELIUM LEAK TEST | Inboard<br>Across the Seat<br>Outboard Pressure Test | 1 x $10^{-11}$ Pa·m³/s (1 x $10^{-10}$ atm·cc (He) /s)<br>1 x $10^{-10}$ Pa·m³/s (1 x $10^{-9}$ atm·cc (He) /s)<br>1 x $10^{-7}$ Pa·m³/s (1 x $10^{-6}$ atm·cc (He) /s) |
| CLEANLINESS AND PACKAGING | Assembled and tested in Class 10 Cleanroom. Purged and Final Packaged in Class 1 Cleanroom. Double-bag packaging (2 mil nylon inner bag, 6 mil polyethylene outer bag) with Ultra-High Purity $N_2$ gas environment. | |
| STANDARD FINISH | Electropolished to 10 Ra Max (0.25 µm) on all wetted surfaces | |
| OPTIONS | Surface finish – 5 Ra<br>Testing: Particle, moisture, THC and $O_2$<br>SEM and ESCA testing, AES analysis<br>Handwheel color | |

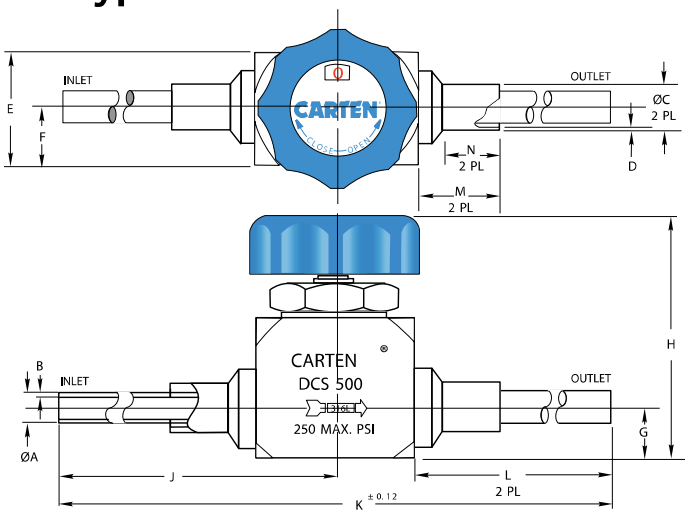
Specifications are subject to change without notice. *Vespel® is a registered trademark of Dupont Company.

# DCS Series Technical Dimensions

| Size | A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCS 250/500 | 0.250 | 0.035 | 0.500 | 0.049 | 1.75 (44.5mm) | 0.85 (22.2mm) | 0.625 (15.8mm) | 3.08 (78.2mm) | 4.00 (101.6mm) | 8.00 (203.2mm) | 3.00 (76.2mm) | 1.11 (28.1mm) | 0.75 (19.05mm) |
| DCS 375/625 | 0.375 | 0.035 | 0.625 | 0.049 | 1.75 (44.5mm) | 0.85 (22.2mm) | 0.625 (15.8mm) | 3.08 (78.2mm) | 4.00 (101.6mm) | 8.00 (203.2mm) | 3.00 (76.2mm) | 1.11 (28.1mm) | 0.75 (19.05mm) |
| DCS 500/750 | 0.500 | 0.049 | 0.750 | 0.065 | 2.00 (50.8mm) | 1.000 (25.4mm) | 0.687 (17.4mm) | 3.52 (89.4mm) | 4.25 (107.9mm) | 8.50 (215.9mm) | 3.00 (76.2mm) | 1.11 (28.1mm) | 0.75 (19.05mm) |
| DCS 750/1000 | 0.750 | 0.065 | 1.000 | 0.065 | 2.00 (50.8mm) | 1.000 (25.4mm) | 0.687 (17.4mm) | 3.52 (89.4mm) | 4.25 (107.9mm) | 8.50 (215.9mm) | 3.00 (76.2mm) | 1.11 (28.1mm) | 0.75 (19.05mm) |

# DCS Series Typical Valve Dimensions

DCS 250/500
DCS 375/625
DCS 500/750
DCS 750/1000




**Application Note (DCS Series):**
A typical application utilizes a vacuum on the secondary line. However, the secondary line pressure can exceed the primary if desired. As the secondary pressure increases to more than 60 psi over the primary (for DCS 250) or 20 psi (for DCS 500), reduced primary flow rate could result. Increasing secondary pressure to more than 110 psi over the primary (for DCS 250) or 50 psi (for DCS 500), the flow in the primary will be essentially shut off.

NOTE 1: All tolerances are ±0.06 in. (±1.52mm) unless otherwise stated;
NOTE 2: Dimensional drawings shown are for reference only. Please contact CARTEN® for customer drawings.

CARTEN®
Ultra High Purity Valves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