

**CARTEN**<sup>®</sup>  
Ultra High Purity Valves

# DUPLEX SERIES

**Ultra-High Purity Diaphragm Valves (DPC)**

**Ultra-High Purity Bellows Valves (DFC)**

**Ultra-High Purity Block Bellows Valves (DBC)**



# DUPLEX SERIES

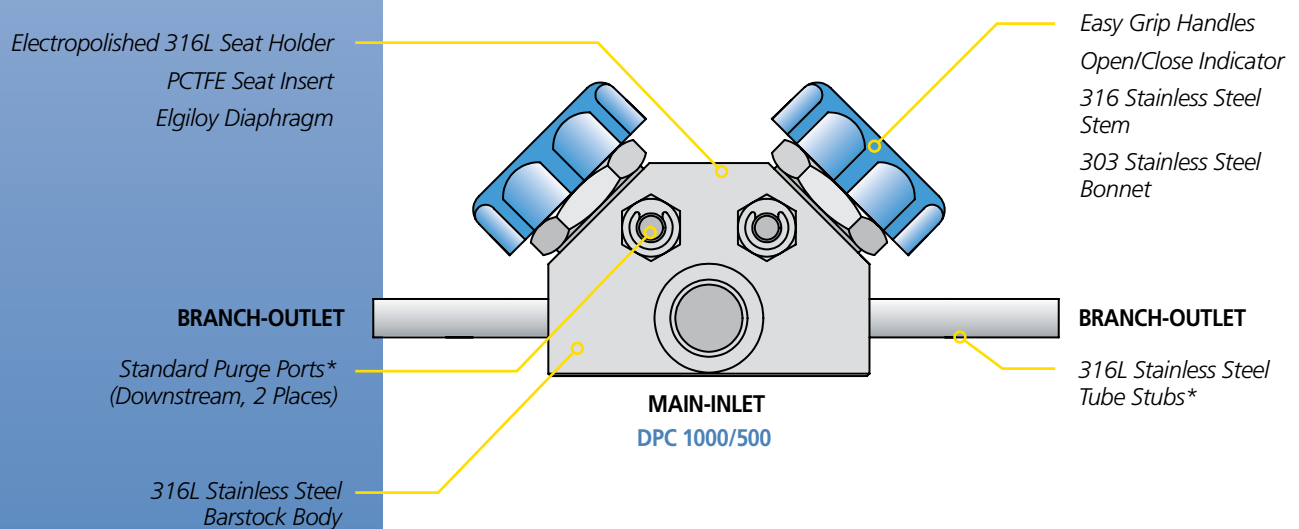
This compact Duplex (diaphragm design) valve series is intended for bulk gas distribution service where containment, cleanliness and purity are of utmost importance. Applications for this valve include:

- ***Ultra-high purity gas system control valves***
- ***Ultra-high purity gas control for point-of-use or service for hookups***
- ***Superior containment and cleanliness for your most critical valve applications***
- ***Suitability for inert and most toxic gases***

## DPC Series Product Features

- Diaphragm Design for Ultra-High Purity and Long Cycle Life
- Elgiloy Tied-Diaphragm for Maximum Flow and 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 in Ultra-High Purity Gas Containment
- Assembled and Tested in Class 10 Cleanroom
- Valve Bodies and Tube Stubs are Serialized for Material Certification
- Purge Connections and Purge Valves are Integral in Valve Body
- Inboard and Across the Seat Leak Tested with Helium
- Cleaned for Ultra-High Purity Gas Service
- Purged and Final Packaged in Class 1 Cleanroom. Double-Bag Packaging with Ultra-High Purity N<sub>2</sub> Gas Environment

## DPC Construction Materials



\*See corresponding Code Chart for available end connections.

DPC Series Technical Data

|                                    |   |  |
|------------------------------------|---|--|
| MATERIAL OF CONSTRUCTION           | Wetted Areas  | Elgiloy, 316L Stainless Steel, PCTFE   |
|                                    | Non-Wetted Areas  | 316L Stainless Steel, 303 Stainless Steel  |
| MAXIMUM OPERATING PRESSURE         | DPC Series  | Vacuum to 375 psig (25.8 bar)  |
| OPERATING TEMPERATURE RANGE        | DPC Series  | -22° F (-30°C) to 180° F (82°C)  |
| FLOW COEFFICIENT (C <sub>v</sub> ) | DPC Series  | 2.96   |
|                                    | DPV/DPT Series  | 3.10   |
| HELIUM LEAK TEST                   | Inboard   | 1 x 10 <sup>-11</sup> Pa-m 3/s (1 x 10 <sup>-10</sup> atm-cc (He)/s)   |
|                                    | Across the Seat   | 1 x 10 <sup>-10</sup> Pa-m 3/s (1 x 10 <sup>-9</sup> atm-cc (He)/s)  |
|                                    | Outboard Pressure Test  | 1 x 10 <sup>-7</sup> Pa-m 3/s (1 x 10 <sup>-6</sup> atm-cc (He)/s)   |
| CLEANLINESS                        | 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 <sub>2</sub> gas environment. |  |
| STANDARD FINISH                    | Electropolished to 10 Ra Max (0.25 µm) on all wetted surfaces   |  |
| OPTIONS                            | Surface finish - 10 Ra, 20 Ra, 25 Ra EP, 20 Ra BA<br>Particle, moisture, THC and O <sub>2</sub> testing<br>SEM and ESCA testing, Auger analysis<br>Pneumatic actuators available-types: NC/NO/DA                              | Fitting connections available for up to 1.00" size – inlet/outlet<br>Material: Vespel® seat<br>Handle color (Std. white)<br>JIS tube stubs and tube length |

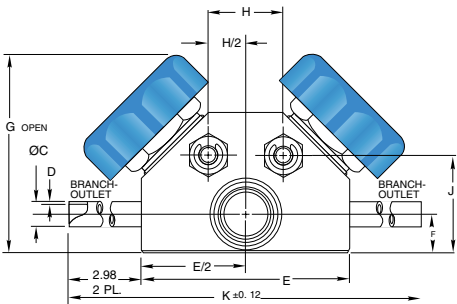
Specifications are subject to change without notice. Vespel® is a registered trademark of the DuPont Company.

DPC Series Technical Dimensions

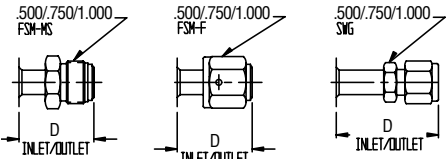
| Size             | A                  | B                | C                  | D                | E                 | F                | G                 | H                | J                | K                  | L                 |
|------------------|--------------------|------------------|--------------------|------------------|-------------------|------------------|-------------------|------------------|------------------|--------------------|-------------------|
| DPC/DPV 750/500  | Ø 0.75<br>(19.1mm) | 0.065<br>(1.6mm) | Ø 0.50<br>(12.7mm) | 0.049<br>(1.2mm) | 4.16<br>(105.6mm) | 0.75<br>(19.1mm) | 3.81<br>(96.7mm)  | 1.50<br>(38.1mm) | 1.92<br>(48.8mm) | 10.10<br>(256.5mm) | 7.94<br>(201.6mm) |
| DPC/DPV 750/750  | Ø 0.75<br>(19.1mm) | 0.065<br>(1.6mm) | Ø 0.75<br>(19.0mm) | 0.065<br>(1.6mm) | 4.16<br>(105.6mm) | 0.75<br>(19.1mm) | 3.81<br>(96.7mm)  | 1.50<br>(38.1mm) | 1.92<br>(48.8mm) | 10.10<br>(256.5mm) | 7.94<br>(201.6mm) |
| DPC/DPV 1000/500 | Ø 1.00<br>(25.4mm) | 0.065<br>(1.6mm) | Ø 0.50<br>(12.7mm) | 0.049<br>(1.2mm) | 4.16<br>(105.6mm) | 0.75<br>(19.1mm) | 3.81<br>(96.7mm)  | 1.50<br>(38.1mm) | 1.92<br>(48.8mm) | 10.10<br>(256.5mm) | 7.94<br>(201.6mm) |
| DPC/DPV 1000/750 | Ø 1.00<br>(25.4mm) | 0.065<br>(1.6mm) | Ø 0.75<br>(19.0mm) | 0.065<br>(1.6mm) | 4.16<br>(105.6mm) | 0.75<br>(19.1mm) | 3.81<br>(96.7mm)  | 1.50<br>(38.1mm) | 1.92<br>(48.8mm) | 10.10<br>(256.5mm) | 7.94<br>(201.6mm) |
| DPC/DPV 1500/500 | Ø 1.50<br>(38.1mm) | 0.065<br>(1.6mm) | Ø 0.50<br>(12.7mm) | 0.049<br>(1.2mm) | 4.86<br>(118.4mm) | 1.13<br>(28.7mm) | 4.42<br>(112.2mm) | 2.00<br>(50.8mm) | 2.55<br>(64.7mm) | 10.58<br>(268.7mm) | 7.94<br>(201.6mm) |
| DPC/DPV 1500/750 | Ø 1.50<br>(38.1mm) | 0.065<br>(1.6mm) | Ø 0.75<br>(19.0mm) | 0.065<br>(1.6mm) | 4.86<br>(118.4mm) | 1.13<br>(28.7mm) | 4.42<br>(112.2mm) | 2.00<br>(50.8mm) | 2.55<br>(64.7mm) | 10.58<br>(268.7mm) | 7.94<br>(201.6mm) |
| DPC/DPV 2000/500 | Ø 2.00<br>(50.8mm) | 0.065<br>(1.6mm) | Ø 0.50<br>(12.7mm) | 0.049<br>(1.2mm) | 4.86<br>(118.4mm) | 1.13<br>(28.7mm) | 4.42<br>(112.2mm) | 2.00<br>(50.8mm) | 2.55<br>(64.7mm) | 10.58<br>(268.7mm) | 9.92<br>(251.9mm) |
| DPC/DPV 2000/750 | Ø 2.00<br>(50.8mm) | 0.065<br>(1.6mm) | Ø 0.75<br>(19.0mm) | 0.065<br>(1.6mm) | 4.86<br>(118.4mm) | 1.13<br>(28.7mm) | 4.42<br>(112.2mm) | 2.00<br>(50.8mm) | 2.55<br>(64.7mm) | 10.58<br>(268.7mm) | 9.92<br>(251.9mm) |

DPC Series Typical Valve Dimensions

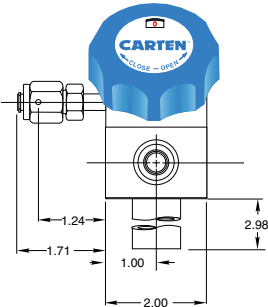
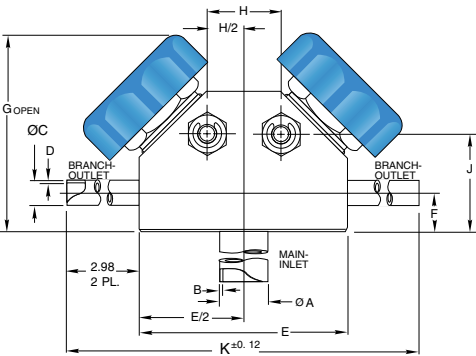
DPC 750/500 (DUPLEX CROSS)



OPTIONAL VALVE END CONNECTIONS  
AVAILABLE ON DPC BODY SIZES



DPV 750/500 (DUPLEX VERTICAL)



| Size | Dimension "D"    |                  |                  |
|------|------------------|------------------|------------------|
|      | FSM-M            | FSM-F            | SWG              |
| 500  | 1.54<br>(39.1mm) | 1.54<br>(39.1mm) | 2.10<br>(53.3mm) |
| 750  | 2.04<br>(51.8mm) | 2.04<br>(51.8mm) | 2.03<br>(51.6mm) |
| 1000 | 2.36<br>(59.9mm) | 2.36<br>(59.9mm) | 2.49<br>(63.2mm) |

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.  
NOTE 3: This tube stub is not applicable for the DPT version.

# DUPLEX SERIES

This compact Duplex (diaphragm design) valve series is intended for bulk gas distribution service where containment, cleanliness and purity are of utmost importance. Applications for this valve include:

- ***Ultra-high purity gas system control valves***
- ***Ultra-high purity gas control for point-of-use or service for hookups***
- ***Superior containment and cleanliness for your most critical valve applications***
- ***Suitability for inert and most toxic gases***

## DPC Series Product Features

- Diaphragm Design for Ultra-High Purity and Long Cycle Life
- Elgiloy Tied-Diaphragm for Maximum Flow and 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 in Ultra-High Purity Gas Containment
- Assembled and Tested in Class 10 Cleanroom
- Valve Bodies and Tube Stubs are Serialized for Material Certification
- Purge Connections and Purge Valves are Integral in Valve Body
- Inboard and Across the Seat Leak Tested with Helium
- Cleaned for Ultra-High Purity Gas Service
- Purged and Final Packaged in Class 1 Cleanroom. Double-Bag Packaging with Ultra-High Purity N<sub>2</sub> Gas Environment

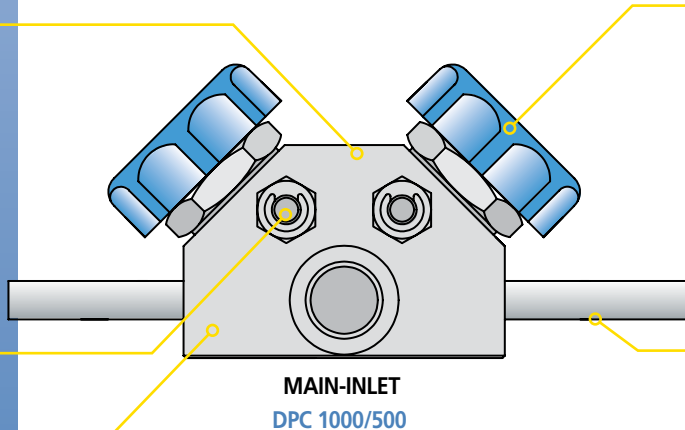
## DPC Construction Materials

Electropolished 316L Seat Holder  
PCTFE Seat Insert  
Elgiloy Diaphragm

BRANCH-OUTLET

Standard Purge Ports\*  
(Downstream, 2 Places)

316L Stainless Steel  
Barstock Body



Easy Grip Handles  
Open/Close Indicator  
316 Stainless Steel  
Stem  
303 Stainless Steel  
Bonnet

BRANCH-OUTLET

316L Stainless Steel  
Tube Stubs\*

\*See corresponding Code Chart for available end connections.

# DUPLEX SERIES



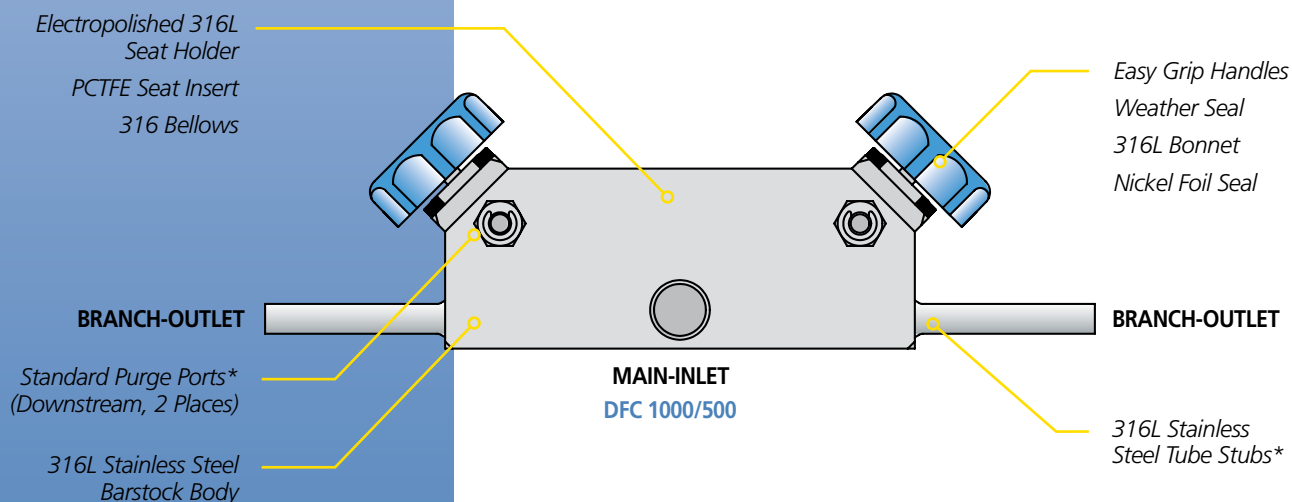
This Duplex series is bellows designed for high performance applications which require high flow rates and superior leak, moisture and particle capabilities. Applications for this valve include:

- **Highest Cv available**
- **Ultra-high purity gas distribution system control valves**
- **Superior containment and cleanliness for your most critical valve applications**
- **Suitability for inert and most toxic gases**

## DFC Series Product Features

- High Performance, Compact Design
- 316 Bellows Design for Ultra-High Purity and Long Cycle Life
- Electropolished Wetted Surfaces to 10 Ra Max (Optional surface finishes available)
- Industry Leading Design in Ultra-High Purity Gas Containment
- Purge Connections are Integral to Valve Body
- Assembled and Tested in Class 10 Cleanroom
- Inboard and Across the Seat Leak Tested with Helium
- Valve Bodies and Tube Stubs are Serialized for Material Certification
- Purged and Final Packaged in Class 1 Cleanroom, Double-Bag Packaging with Ultra-High Purity N<sub>2</sub> Gas Environment

## DFC Construction Materials



\*See corresponding Code Chart for available end connections.

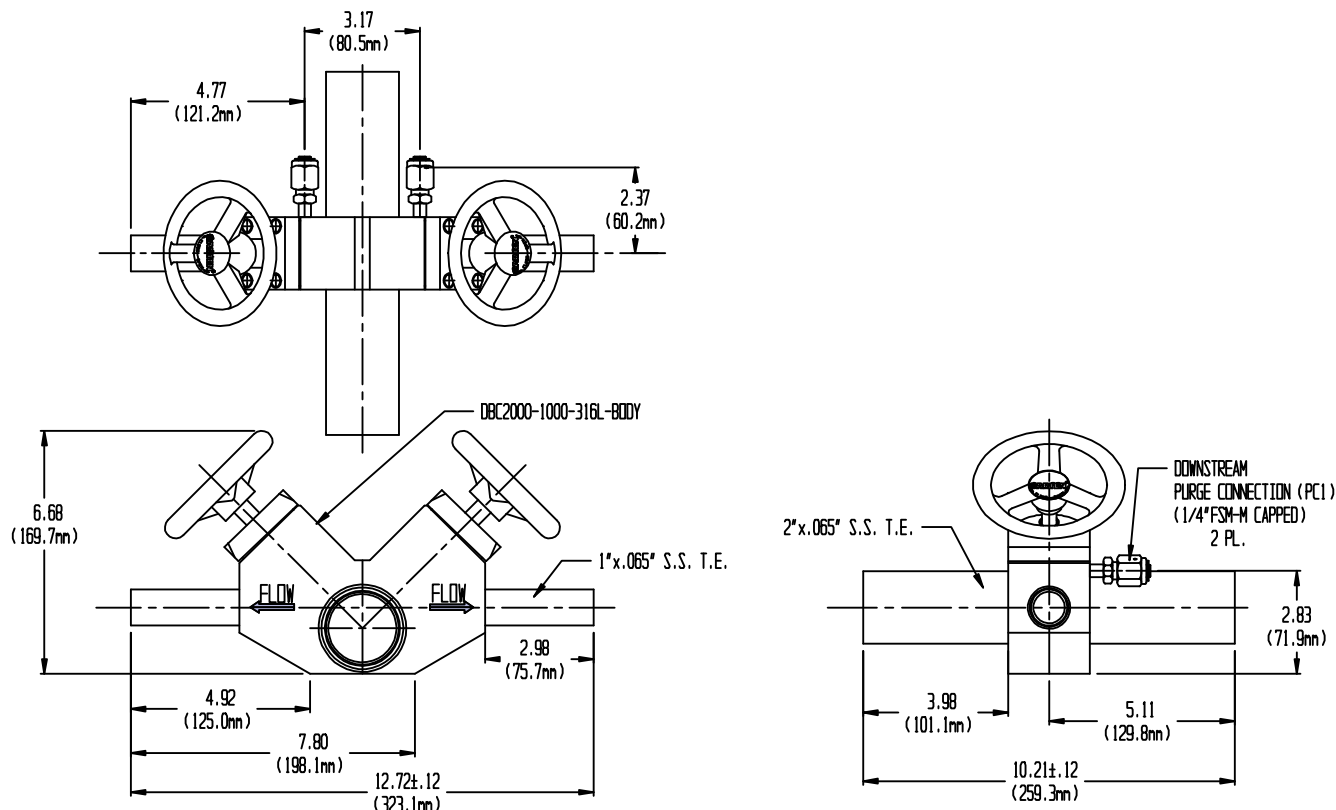
# DBC Series Technical Data

|                                    |   |  |
|------------------------------------|---|--|
| MATERIAL OF CONSTRUCTION           | Wetted Areas  | 321, 316L Stainless Steel, PCTFE   |
|                                    | Non-Wetted Areas  | 316L Stainless Steel, Nickel Foil, 303 Stainless Steel   |
| MAXIMUM OPERATING PRESSURE         | UBC Series  | Vacuum to 375 psig (25.8 bar)  |
| MAXIMUM OPERATING TEMPERATURE      | UBC Series  | -22° F (-30°C) to 180° F (82°C)  |
| FLOW COEFFICIENT (C <sub>v</sub> ) | DBC 1000/750  | 10.20  |
|                                    | DBC 1500/750  | 10.20  |
|                                    | DBC 1000/1000   | 14.30  |
|                                    | DBC 1500/1000   | 14.30  |
|                                    | DBC 2000/1000   | 14.30  |
|                                    | DBC 2000/1500   | 16.60  |
| HELIUM LEAK TEST                   | Inboard   | 1 x 10 <sup>-11</sup> Pa·m 3/s (1 x 10 <sup>-10</sup> atm.cc (He) /s)  |
|                                    | Across the Seat   | 1 x 10 <sup>-10</sup> Pa·m 3/s (1 x 10 <sup>-9</sup> atm.cc (He) /s)   |
|                                    | Outboard Pressure Test  | 1 x 10 <sup>-7</sup> Pa·m 3/s (1 x 10 <sup>-6</sup> 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 <sub>2</sub> gas environment. |  |
| STANDARD FINISH                    | Electropolished to 10 Ra Max (0.25 µm) on all wetted surfaces   |  |
| OPTIONS                            | Surface finish – 5 Ra, 15 Ra, 20 Ra, 30 Ra<br>Testing: Particle, moisture, THC and O <sub>2</sub><br>Handwheel color options available<br>Air acutated operation available all sizes  | Fitting type and location – Inlet and Outlet<br>Optional seat material available for higher temperature applications |

Specifications are subject to change without notice.

## DBC Series Typical Valve Dimensions

### DBC 2000/1000



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.

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Ultra High Purity Valves

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REV 2010