

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 N₂ Gas Environment

DPC Construction Materials

Electropolished 316L Seat Holder
PCTFE Seat Insert
Elgiloy Diaphragm

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

BRANCH-OUTLET
Standard Purge Ports*
(Downstream, 2 Places)

BRANCH-OUTLET
316L Stainless Steel Tube Stubs*

316L Stainless Steel Barstock Body

MAIN-INLET
DPC 1000/500

*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 _v)	DPC Series	2.96
	DPV/DPT Series	3.10
HELIUM LEAK TEST	Inboard	1 x 10 ⁻¹¹ Pa-m 3/s (1 x 10 ⁻¹⁰ atm-cc (He) /s)
	Across the Seat	1 x 10 ⁻¹⁰ Pa-m 3/s (1 x 10 ⁻⁹ atm-cc (He) /s)
	Outboard Pressure Test	1 x 10 ⁻⁷ Pa-m 3/s (1 x 10 ⁻⁶ 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 ₂ 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	Fitting connections available for up to 1.00" size – inlet/outlet
	Particle, moisture, THC and O ₂ testing SEM and ESCA testing, Auger analysis Pneumatic actuators available-types: NC/NO/DA	Material: Vespel® seat Handle color (Std. white) JIS tube stubs and tube length

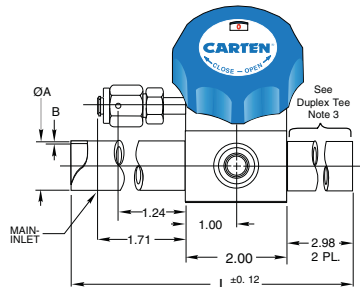
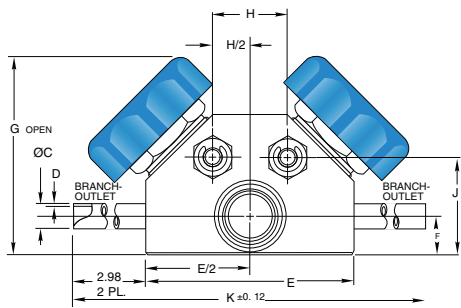
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DPC Series Technical Dimensions

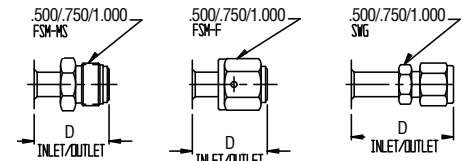
Size	A	B	C	D	E	F	G	H	J	K	L
DPC/DPV 750/500	Ø 0.75 (19.1mm)	0.065 (1.6mm)	Ø 0.50 (12.7mm)	0.049 (1.2mm)	4.16 (105.6mm)	0.75 (19.1mm)	3.81 (96.7mm)	1.50 (38.1mm)	1.92 (48.8mm)	10.10 (256.5mm)	7.94 (201.6mm)
DPC/DPV 750/750	Ø 0.75 (19.1mm)	0.065 (1.6mm)	Ø 0.75 (19.0mm)	0.065 (1.6mm)	4.16 (105.6mm)	0.75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

DPC Series Typical Valve Dimensions

DPC 750/500 (DUPLEX CROSS)

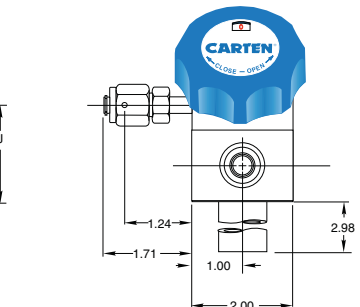
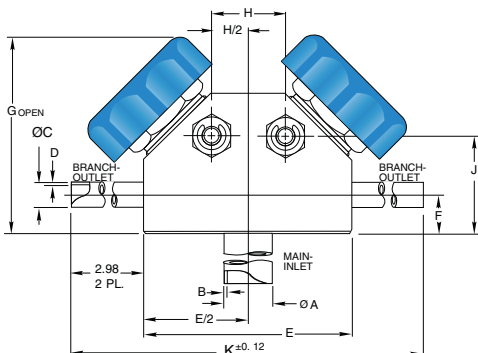


OPTIONAL VALVE END CONNECTIONS AVAILABLE ON DPC BODY SIZES



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

DPV 750/500 (DUPLEX VERTICAL)

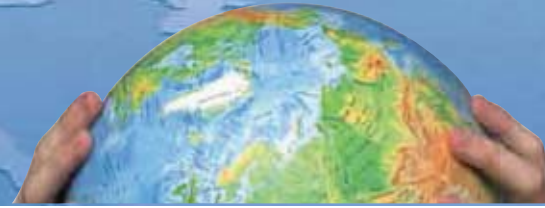


NOTE 1: All tolerances are ±0.06 in. (±1.52mm) unless otherwise stated.

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



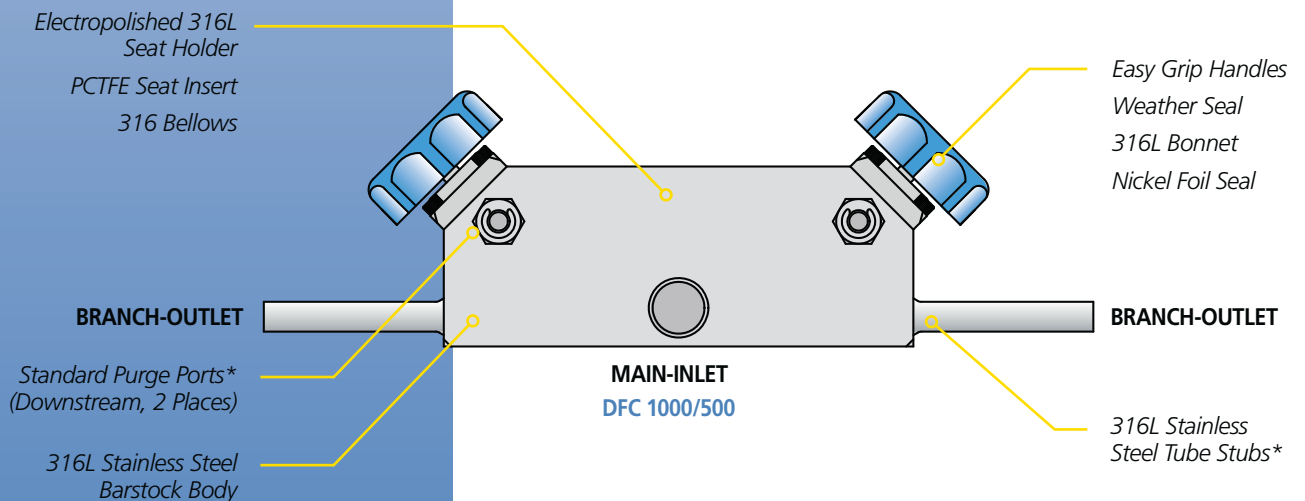
This Duplex series is bellows designed for high performance applications which require high flow rates and superior leak, moisture and particle capabilities. Applications for this valve include:

- **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 N₂ Gas Environment

DFC Construction Materials



*See corresponding Code Chart for available end connections.

DFC Series Technical Data

MATERIAL OF CONSTRUCTION	Wetted Areas	316, 316L Stainless Steel, Nickel/PCTFE
	Non-Wetted Areas	316L Stainless Steel, 17-4 PH Stainless Turcite
MAXIMUM OPERATING PRESSURE	DFC/DBC Series	Vacuum to 375 psig (25.8 bar)
MAXIMUM OPERATING TEMPERATURE	DFC/DBC Series	-22° F (-30° C) to 180° F (82° C)
FLOW COEFFICIENT (C _v)	DFC/DFT/DFV 500/500	3.26
	DFC/DFT/DFV 750/500	3.52
	DFC/DFT/DFV 1000/500	3.67
	DFC/DFT/DFV 1500/500	3.95
	DFC/DFT/DFV 2000/500	4.15
HELIUM LEAK TEST	Inboard	1 x 10 ⁻¹¹ Pa-m 3/s (1 x 10 ⁻¹⁰ atm-cc (He) /s)
	Across the Seat	1 x 10 ⁻¹⁰ Pa-m 3/s (1 x 10 ⁻⁹ atm-cc (He) /s)
	Outboard Pressure Test	1 x 10 ⁻⁷ Pa-m 3/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, 20 Ra Testing: Particle, moisture, THC, O ₂ , SEM, ESCA and Auger Pneumatic actuators available-types: NC/NO/DA	Fitting connections available for up to 1.00" size – inlet/outlet Handle colors JIS tube stubs and tube length

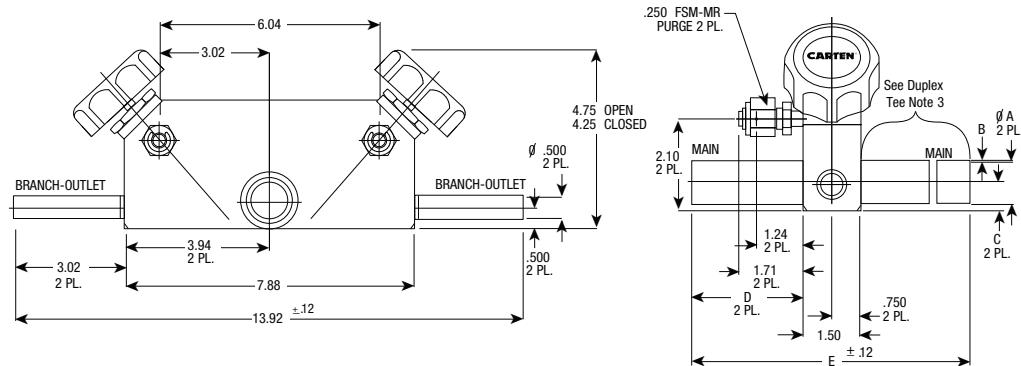
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DFC Series Technical Dimensions

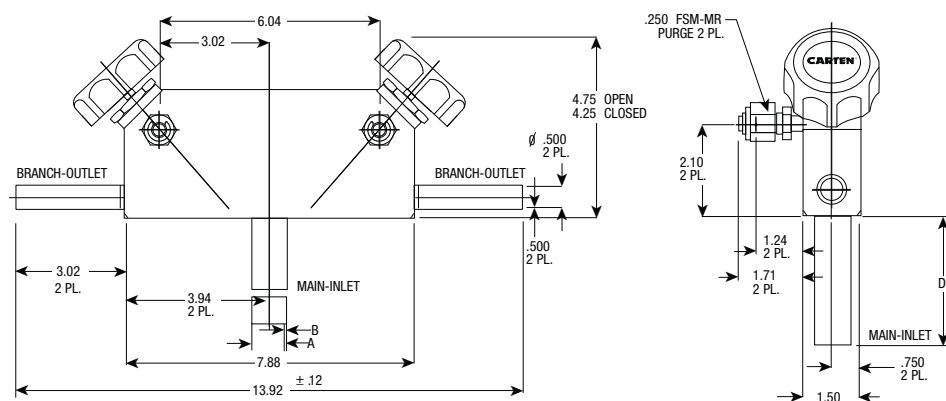
Size	A	B	C	D	E
DFC/DFT/DFV 500/500	Ø 0.50 (12.7mm)	0.049 (1.2mm)	0.50 (12.7mm)	3.96 (100.5mm)	9.42 (239.2mm)
DFC/DFT/DFV 750/500	Ø 0.75 (19.1mm)	0.065 (1.6mm)	0.50 (12.7mm)	2.95 (74.9mm)	7.40 (187.9mm)
DFC/DFT/DFV 1000/500	Ø 1.00 (25.4mm)	0.065 (1.6mm)	0.65 (16.5mm)	2.95 (74.9mm)	7.40 (187.9mm)
DFC/DFT/DFV 1500/500	Ø 1.50 (38.1mm)	0.065 (1.6mm)	0.90 (22.8mm)	2.95 (74.9mm)	7.40 (187.9mm)
DFC/DFT/DFV 2000/500	Ø 2.00 (50.8mm)	0.065 (1.6mm)	1.50 (38.1mm)	2.95 (74.9mm)	7.40 (187.9mm)

DFC Series Typical Valve Dimensions

DFC 1000/500 (DUPLEX CROSS)



DFV 1000/500 (DUPLEX VERTICAL)



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 DFT version.

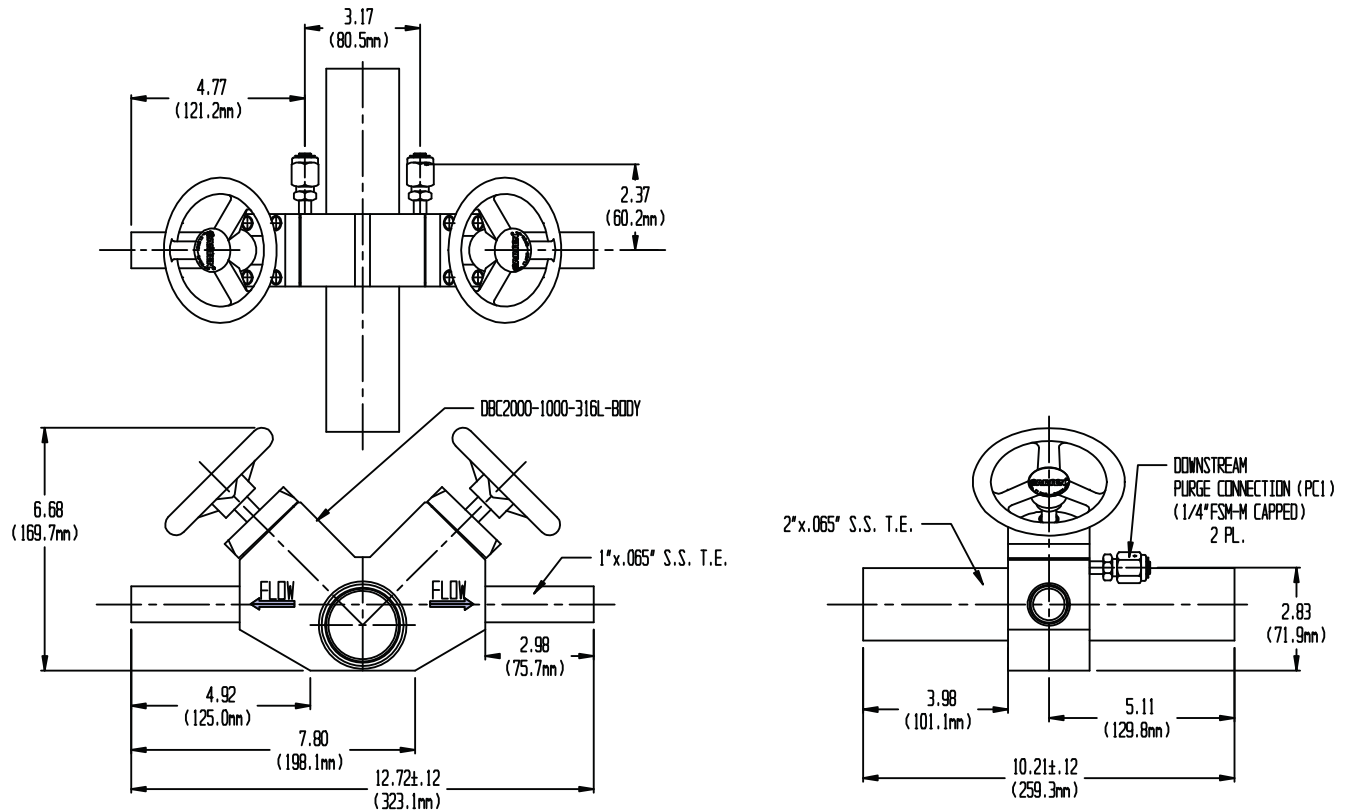
DBC Series Technical Data

MATERIAL OF CONSTRUCTION	Wetted Areas	321, 316L Stainless Steel, PCTFE
	Non-Wetted Areas	316L Stainless Steel, Nickel Foil, 303 Stainless Steel
FLOW COEFFICIENT (C _v)	DBC 1000/750 DBC 1500/750 DBC 1000/1000 DBC 1500/1000 DBC 2000/1000 DBC 2000/1500	10.20 10.20 14.30 14.30 14.30 16.60
HELIUM LEAK TEST	Inboard Across the Seat Outboard Pressure Test	1 x 10 ⁻¹¹ Pa·m ³ /s (1 x 10 ⁻¹⁰ atm·cc (He) /s) 1 x 10 ⁻¹⁰ Pa·m ³ /s (1 x 10 ⁻⁹ atm·cc (He) /s) 1 x 10 ⁻⁷ Pa·m ³ /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, 15 Ra, 20 Ra, 30 Ra Testing: Particle, moisture, THC and O ₂ Handwheel color options available Air acutated operation available all sizes	Fitting type and location – Inlet and Outlet 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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