

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

# HF SERIES

**Ultra-High Purity High-Flow Bellows Valves  
Air-Actuated Bellows Valves**



# HF SERIES

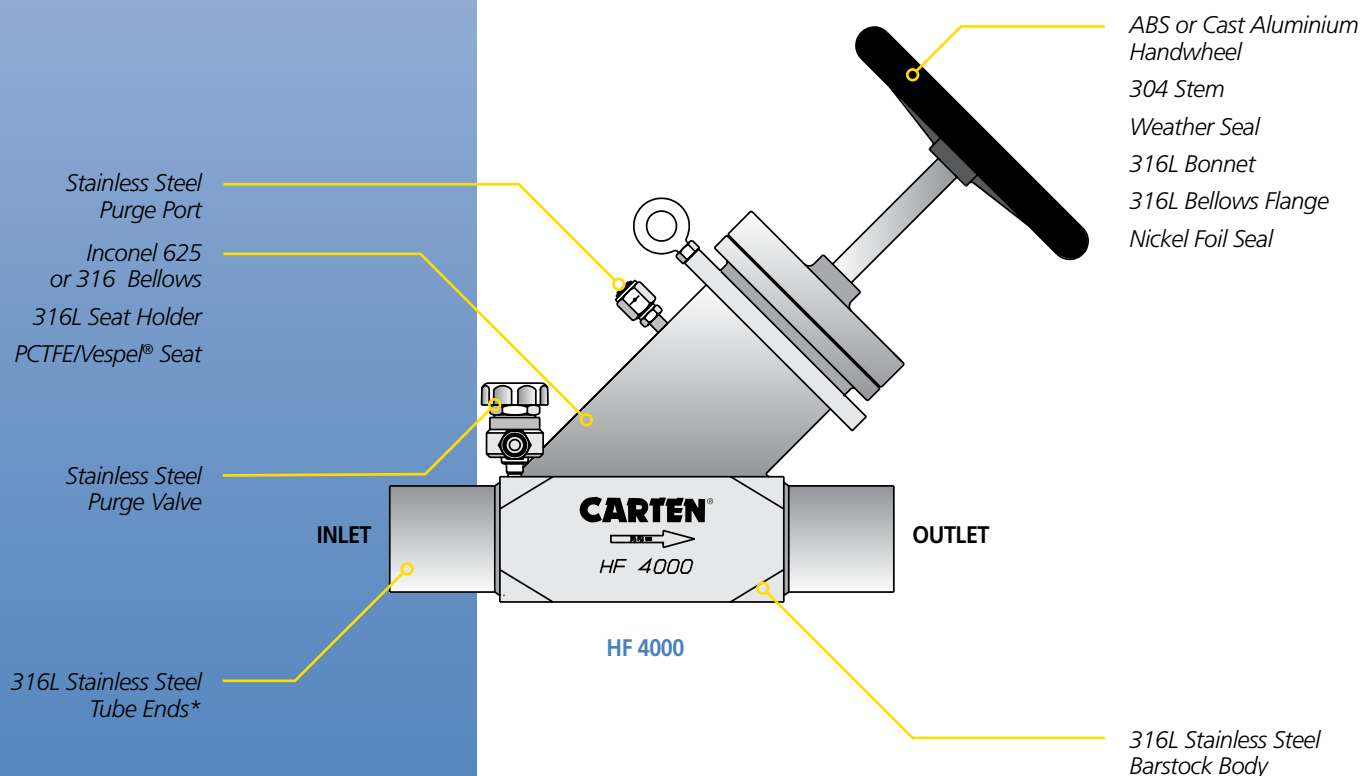
This HF valve series is designed for high-performance gas and chemical distribution systems combined with the lowest overall operating costs, which makes this valve series an excellent candidate for:

- ***Ultra-high purity gas distribution system control***
- ***Superior containment and cleanliness for your most critical valve applications***
- ***Suitable for inert and most spec. gases***

## HF Series Product Features

- Highest Cv and Most Compact Design
- Ultra-High Purity Stainless Steel/PCTFE Gas Construction
- Inconel 625 or 316 Bellows for High Cycle Life and Superior Corrosion Resistance
- Electropolished 10 Ra Max Surface Finish Available
- Industry Leading Design in Ultra-High Purity Gas Containment
- Purge Connections and Purge Valves are Integrated in Valve Body
- Pneumatic Repair Kits Available
- Valve Body and Tube Stubs are Serialized for Material Certification

## HF Construction Materials



\*See corresponding Code Charts for available end connections.

# HF SERIES

## HF Series Technical Data

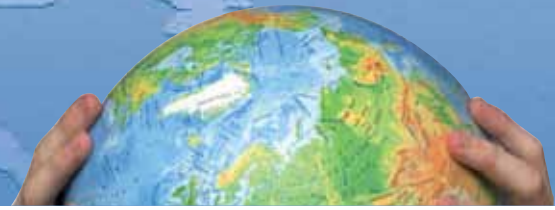
MATERIAL OF CONSTRUCTION		Wetted Areas	316L Stainless Steel, Inconel 625/316, PCTFE, Vespel®	
		Non-Wetted Areas	304, 316L Stainless Steel	
MAXIMUM OPERATING PRESSURE		HF Series	Vacuum-375 psig (25.8 bar)	
		HFA* Series (Pneumatic)	Vacuum-250 psig (0-17.2 bar) 90-100 psig for actuator (6.2 – 6.9 bar)	
MAXIMUM OPERATING TEMPERATURE		PCTFE Seat Vespel® Seat*	-22°F (-30°C) to 180°F (82°C) 302°F (150°C)	
Inch Model		JIS Model		C <sub>v</sub>
Description	Body (Seat) Sizes	Description	Body (Seat) Sizes	
HF/HFA 500	.500 (.500)	HF/HFA 10A**	10A (.500)	5
HF/HFA 755	.750 (.500)			6.1
HF/HFA 750**	.750 (.750)	HF/HFA 15A	15A (.750)	14.5
HF/HFA 1075**	1.000 (.750)	HF/HFA 20A	20A (.750)	21
		HF/HFA 25A	25A (.750)	27
HF/HFA 751	.750 (1.000)			22
HF/HFA 1000	1.000 (1.000)			28
HF/HFA 1501	1.500 (1.000)	HF/HFA 32A	32A (1.000)	46
		HF/HFA 40A	40A (1.000)	64
		HF/HFA 50A	50A (1.000)	76
HF 1502	1.500 (2.000)			85
HF 2000	2.000 (2.000)			157
HF 3002	3.000 (2.000)	HF 65A	65A (2.000)	245
		HF 80A	80A (2.000)	333
		HF 100A	100A (2.000)	421
HF 3004	3.000 (4.000)			389
HF 4000	4.000 (4.000)			758
HF 6004	6.000 (4.000)	HF 125A	125A (4.000)	1000
		HF 150A	150A (4.000)	1050
		HF 200A	200A (4.000)	1175
		HF 250A	250A (4.000)	1350
HELIUM LEAK TEST		Inboard Across the Seat Outboard Pressure Test	1 x 10 <sup>-11</sup> Pa·m³/s (1 x 10 <sup>-10</sup> atm·cc (He) /s) 1 x 10 <sup>-10</sup> Pa·m³/s (1 x 10 <sup>-9</sup> atm·cc (He) /s) 1 x 10 <sup>-7</sup> Pa·m³/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		Pneumatic operating types: Normally open, normally closed, dual acting Surface finish — 5 Ra, 20 Ra EP Testing: Particle, moisture, THC, O <sub>2</sub> , SEM, ESCA, and AES Purge connection, valve type and location for sizes .250 / .500 Rotatable flanges available Fitting connections available for up to 1.00" size – inlet/outlet High temperature Vespel® seat		

Specifications are subject to change without notice.

\* Vespel® is a registered trademark of DuPont Company.

\*\* Call for availability.

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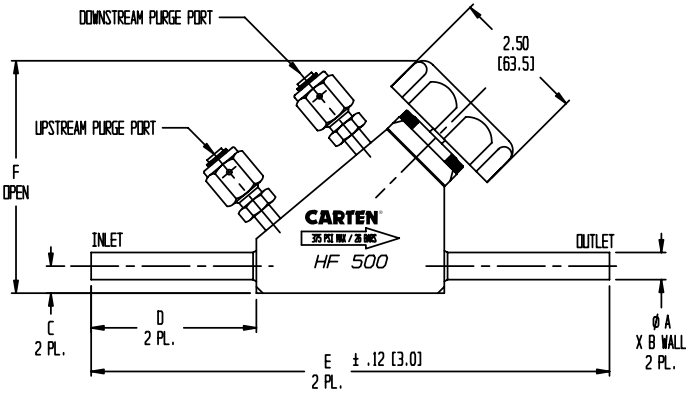


## HF Series Technical Dimensions

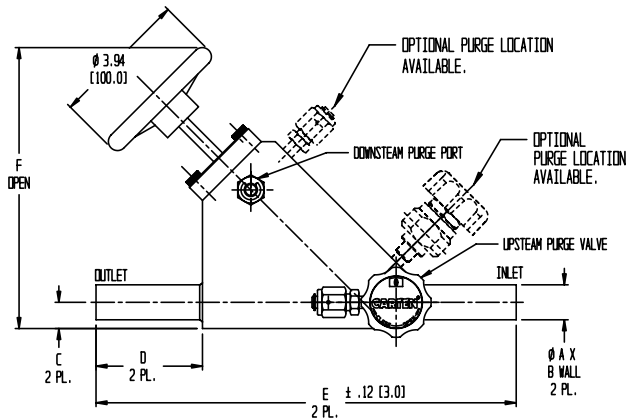
Size	A	B	C	D	E	F
HF-500	Ø5.00 (12.7mm)	0.049 (1.24mm)	0.500 (12.7mm)	3.04 (77.21mm)	9.54 (242.31mm)	4.75 (120.7mm)
HF-755	Ø7.50 (19.05mm)	0.065 (1.65mm)	0.500 (12.7mm)	3.04 (77.21mm)	9.54 (242.31mm)	4.75 (120.7mm)
HF-750	Ø7.50 (19.05mm)	0.065 (1.65mm)	0.610 (15.49mm)	3.04 (77.21mm)	9.31 (236.47mm)	4.75 (120.7mm)
HF-1075	Ø1.000 (25.4mm)	0.065 (1.65mm)	0.600 (15.24mm)	3.04 (77.21mm)	9.31 (236.47mm)	4.75 (120.7mm)
HF-751	Ø7.50 (19.05mm)	0.065 (1.65mm)	0.750 (19.05mm)	4.06 (103.1mm)	14.09 (356.6mm)	8.05 (204.5mm)
HF-1000	Ø1.000 (25.4mm)	0.065 (1.65mm)	0.750 (19.05mm)	3.06 (77.72mm)	12.04 (303.81mm)	8.05 (204.5mm)
HF-1501	Ø1.500 (38.1mm)	0.065 (1.65mm)	0.750 (19.05mm)	5.01 (127.3mm)	15.94 (404.9mm)	8.05 (204.5mm)
HF-1502	Ø1.500 (38.1mm)	0.065 (1.65mm)	1.310 (33.27mm)	5.09 (129.28mm)	17.16 (435.86mm)	8.05 (204.5mm)
HF-2000	Ø2.000 (50.8mm)	0.065 (1.65mm)	1.310 (33.27mm)	4.16 (105.66mm)	15.30 (388.62mm)	13.15 (334.01mm)
HF-3002	Ø3.000 (76.2mm)	0.065 (1.65mm)	1.310 (33.27mm)	8.09 (205.48mm)	23.17 (588.51mm)	13.15 (334.01mm)
HF-3004	Ø3.000 (76.2mm)	0.065 (1.65mm)	2.370 (60.19mm)	7.97 (202.43mm)	26.64 (676.65mm)	21.70 (551.18mm)
HF-4000	Ø4.000 (101.6mm)	0.083 (2.10mm)	2.370 (60.19mm)	4.15 (105.41mm)	19.00 (482.60mm)	21.70 (551.18mm)
HF-6004	Ø6.000 (152.4mm)	0.109 (2.76mm)	2.370 (60.19mm)	11.71 (297.43mm)	34.12 (866.64mm)	21.70 (551.18mm)

# HF Series Typical Valve Dimensions

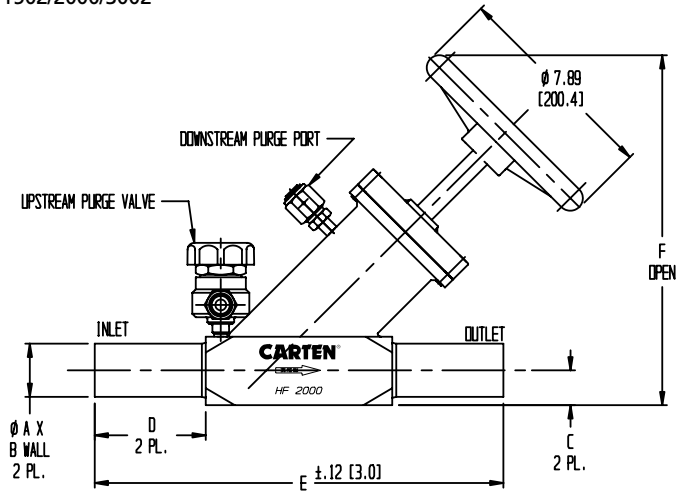
HF 500 BODY  
500/755/750/1075



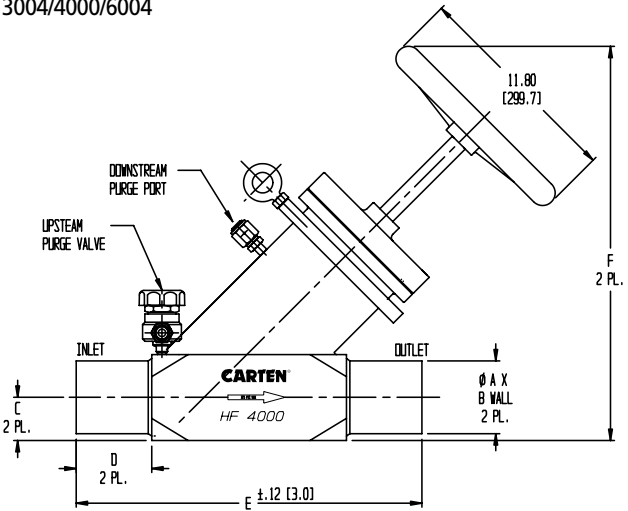
HF 1000 BODY  
751/1000/1501



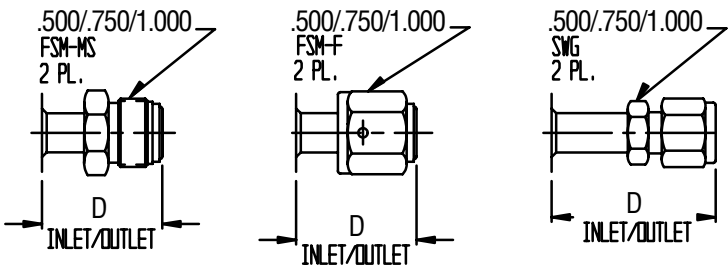
HF 2000 BODY  
1502/2000/3002



HF 4000 BODY  
3004/4000/6004



## OPTIONAL VALVE END CONNECTIONS AVAILABLE ON HF 1/2" - 1" BODY SIZES

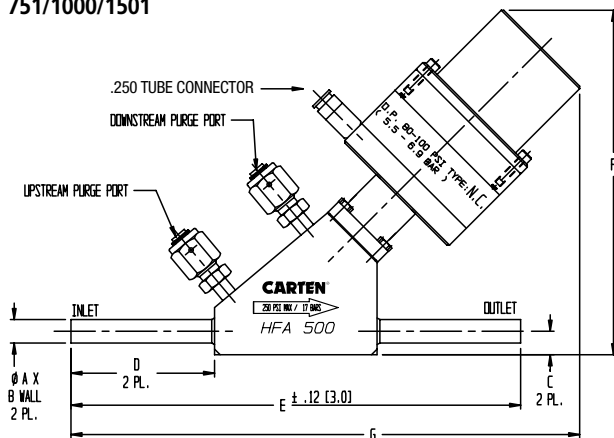


Size	Dimension "D"		
	FSM-M	FSM-F	SWG
500	1.54 (39.1mm)	1.54 (39.1mm)	2.10 (53.3mm)
750	2.04 (51.8mm)	2.04 (51.8mm)	2.03 (51.6mm)
1000	2.36 (59.9mm)	2.36 (59.9mm)	2.49 (63.2mm)

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

# HFA Series Typical Valve Dimensions

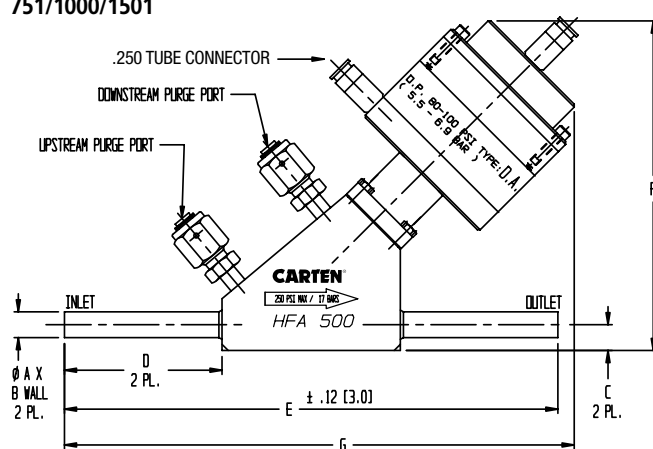
**HFA 500/1000-NC**  
**500/755/750/1075**  
**751/1000/1501**



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

NOTE 2: Dimensional drawings shown are for reference only. Please contact CARTEN® for customer drawings.

**HFA 500/1000-NO/DA**  
**500/755/750/1075**  
**751/1000/1501**



## HFA Series Technical Dimensions

Size	A	B	C	D	E	F	G
HFA 500-NC	Ø .500 (12.7mm)	0.049 (1.24mm)	0.500 (12.7mm)	304 (77.21mm)	9.54 (242.31mm)	7.34 (186.43mm)	10.83 (275.08mm)
HFA 500-NO	Ø .500 (12.7mm)	0.049 (1.24mm)	0.500 (12.7mm)	304 (77.21mm)	9.54 (242.31mm)	6.39 (162.30mm)	9.87 (250.69mm)
HFA 500-DA	Ø .500 (12.7mm)	0.049 (1.24mm)	0.500 (12.7mm)	304 (77.21mm)	9.54 (242.31mm)	6.39 (162.30mm)	9.87 (250.69mm)
HFA 755-NC	Ø .750 (19.05mm)	0.065 (1.65mm)	0.500 (12.7mm)	304 (77.21mm)	9.54 (242.31mm)	7.34 (186.43mm)	10.83 (275.08mm)
HFA 755-NO	Ø .750 (19.05mm)	0.065 (1.65mm)	0.500 (12.7mm)	304 (77.21mm)	9.54 (242.31mm)	6.39 (162.30mm)	9.87 (250.69mm)
HFA 755-DA	Ø .750 (19.05mm)	0.065 (1.65mm)	0.500 (12.7mm)	304 (77.21mm)	9.54 (242.31mm)	6.39 (162.30mm)	9.87 (250.69mm)
HFA 750-NC	Ø .750 (19.05mm)	0.065 (1.65mm)	0.61 (15.49mm)	304 (77.21mm)	9.31 (236.47mm)	7.34 (186.43mm)	10.58 (268.73mm)
HFA 750-NO	Ø .750 (19.05mm)	0.065 (1.65mm)	0.61 (15.49mm)	304 (77.21mm)	9.31 (236.47mm)	6.39 (162.30mm)	9.64 (244.85mm)
HFA 750-DA	Ø .750 (19.05mm)	0.065 (1.65mm)	0.61 (15.49mm)	304 (77.21mm)	9.31 (236.47mm)	6.39 (162.30mm)	9.64 (244.85mm)
HFA 1075-NC	Ø 1.000 (25.0mm)	0.065 (1.65mm)	0.61 (15.49mm)	304 (77.21mm)	9.31 (236.47mm)	7.34 (186.43mm)	10.58 (268.73mm)
HFA 1075-NO	Ø 1.000 (25.0mm)	0.065 (1.65mm)	0.61 (15.49mm)	304 (77.21mm)	9.31 (236.47mm)	6.39 (162.30mm)	9.64 (244.85mm)
HFA 1075-DA	Ø 1.000 (25.0mm)	0.065 (1.65mm)	0.61 (15.49mm)	304 (77.21mm)	9.31 (236.47mm)	6.39 (162.30mm)	9.64 (244.85mm)
HFA 751-NC	Ø .750 (19.05mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	4.06 (103.1mm)	14.09 (356.6mm)	13.45 (341.63mm)	18.13 (460.5mm)
HFA 751-NO	Ø .750 (19.05mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	4.06 (103.1mm)	14.09 (356.6mm)	11.10 (281.94mm)	15.74 (399.7mm)
HFA 751-DA	Ø .750 (19.05mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	4.06 (103.1mm)	14.09 (356.6mm)	11.10 (281.94mm)	15.74 (399.7mm)
HFA 1000-NC	Ø 1.000 (25.0mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	3.06 (77.72mm)	12.04 (303.81mm)	13.45 (341.63mm)	17.13 (435.10mm)
HFA 1000-NO	Ø 1.000 (25.0mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	3.06 (77.72mm)	12.04 (303.81mm)	11.10 (281.94mm)	14.75 (374.65mm)
HFA 1000-DA	Ø 1.000 (25.0mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	3.06 (77.72mm)	12.04 (303.81mm)	11.10 (281.94mm)	14.75 (374.65mm)
HFA 1501-NC	Ø 1.500 (38.1mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	5.01 (127.3mm)	15.94 (404.9mm)	13.45 (341.63mm)	19.05 (483.9mm)
HFA 1501-NO	Ø 1.500 (38.1mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	5.01 (127.3mm)	15.94 (404.9mm)	11.10 (281.94mm)	16.66 (423.2mm)
HFA 1501-DA	Ø 1.500 (38.1mm)	0.065 (1.65mm)	Ø .750 (19.05mm)	5.01 (127.3mm)	15.94 (404.9mm)	11.10 (281.94mm)	16.66 (423.2mm)

**CARTEN®**  
**Ultra High Purity Valves**

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REV 2010