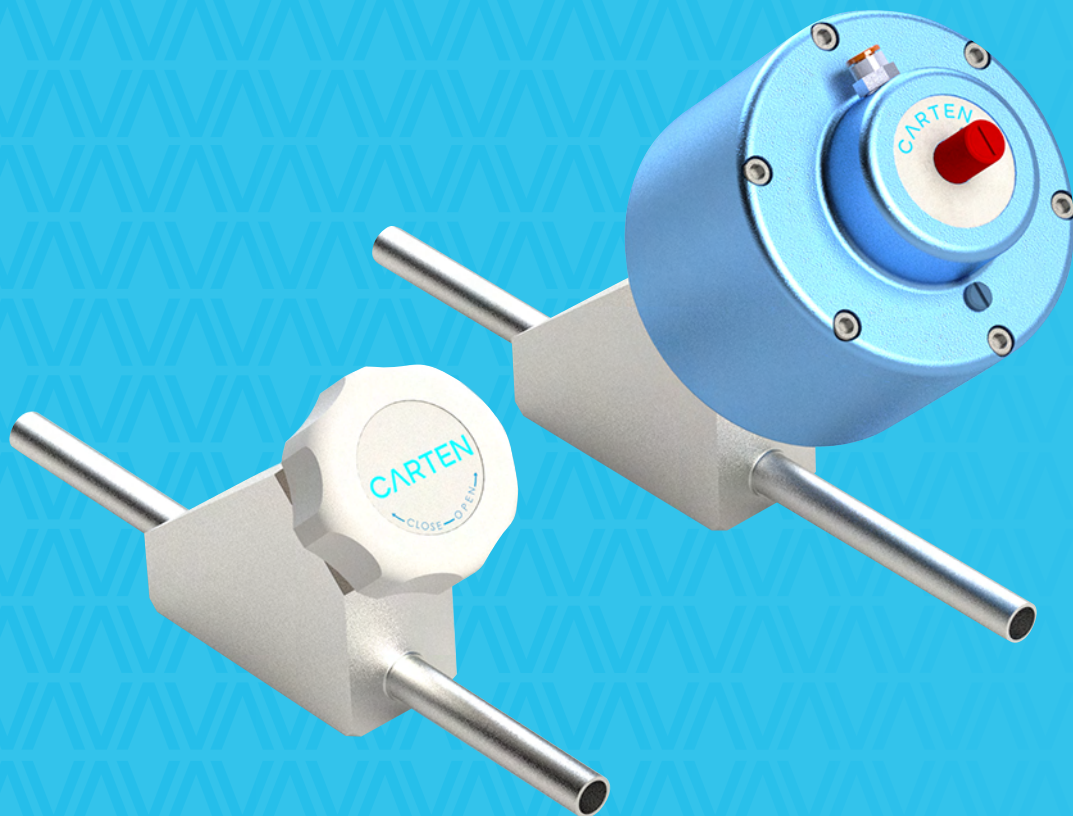


# CARTEN

FLOW SOLUTIONS - **WE GO BEYOND**

## INTRODUCING CARTEN'S HF SERIES

ULTRA-HIGH PURITY, HIGH  
FLOW BELLOWS VALVES



## HF Series

### Ultra-High Purity High Flow Bellows Valves

UHP bellows globe valve for semiconductor applications containing all the advantages of our HB standard series, with extended valve stroke to deliver the highest flow rates, with minimum pressure drop, in the semiconductor industry.

### Key Features

Available in line sizes up to 12"

Metal-to-metal external seals

Highest Cv (flow coefficient) in semiconductor industry

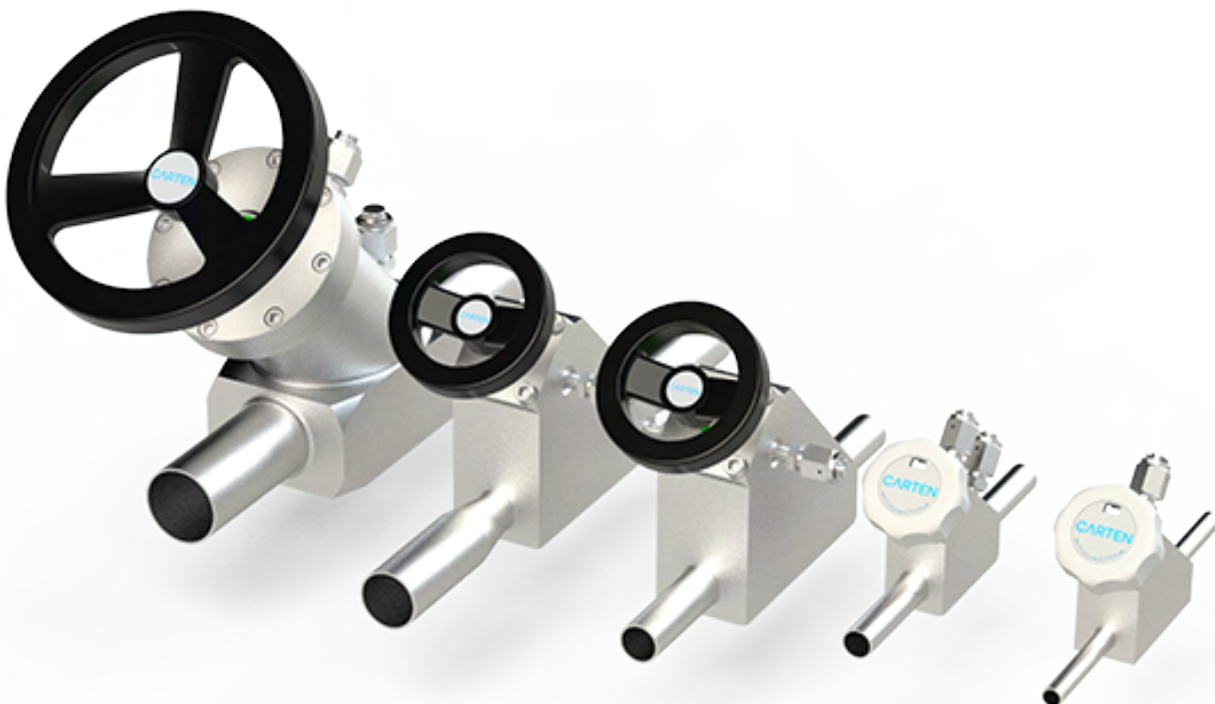
Multi-ply bellow construction for high durability

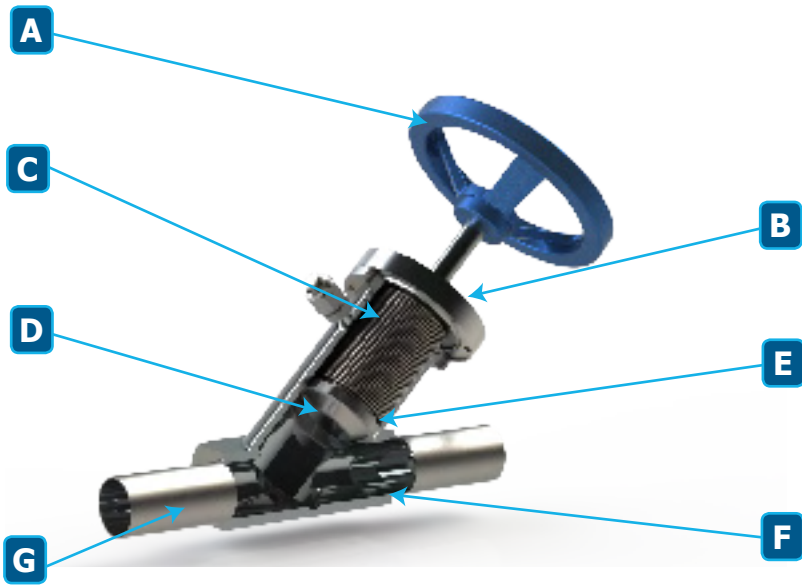
### Typical Applications

High flow bulk gas distribution (BGD), lateral end-of-line (EOL) shut-off, high flow ultra-high-purity gas control for filtration and purification, and critical application containment functionality.

### Key Specifications

Materials of Construction	Cleanliness	Specifications	Options
316L stainless body	Manufactured in Class 10 Cleanroom	Leak tested using Mass spectrometer $<1 \times 10^{-9}$ mbar.l/s	Manual or pneumatic
Inconel 625 or bellows 316Ti	Zero particles @0.1 $\mu$ m	<10Ra micro-inch surface roughness	PFA / PI seat high temperature (up to 150C)
Barstock-only source	<10ppb O2/H2O outgassing	Vacuum and pressure tested 100% production control	4/20mA switching / signalling automation
PCTFE standard seat (minimal volume)	Cleaned using 18.2M $\Omega$ .cm DI water	375p.s.i. operating pressure	5 - 2000 Cv (flow coefficient)

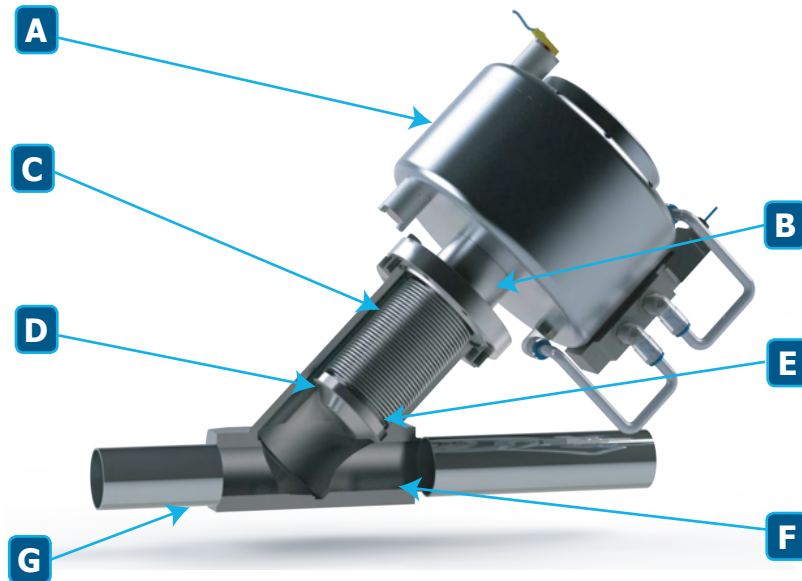




## Material of Construction

Item	Part
A	Manual Handle (ABS or Aluminium)
B	Bonnet Stainless Steel
C	Bellows Inconel® 625 or 316Ti
D	Seat PCTFE
E	Seat Holder 316L
F	Body Barstock 316L
G	Tube Ends 316L

® Inconel is a registered trademark of Special Metals Corporation.



## Material of Construction

Item	Part
A	Actuator (Aluminium Anodized)
B	Bonnet Stainless Steel
C	Bellows Inconel® 625 or 316Ti
D	Seat PCTFE
E	Seat Holder 316L
F	Body Barstock 316L
G	Tube Ends 316L

® Inconel is a registered trademark of Special Metals Corporation.

## HF Series Technical Specification

Maximum Operating Pressure	HF Series	Vacuum -375 psig (0-25.8 bar)
Maximum Operating Temperature	PCTFE Seat* Vespel® Seat	-22°F (-30°C) to 180°F (82°C) 302°F (150°C)

Inch Model		Cv
Description	Line Size (Body) Size	
HF 500	.500 (.500)	5
HF 755	.750 (.500)	10
HF 750	.750 (.750)	11.5
HF 1075	1.000 (.750)	20
HF 751	.750 (1.000)	15
HF 1000	1.000 (1.000)	29
HF 1501	1.500 (1.000)	27
HF 1502	1.500 (2.000)	85
HF 2000	2.000 (2.000)	178
HF 3002	3.000 (2.000)	117
HF 3004	3.000 (4.000)	452
HF 4000	4.000 (4.000)	758
HF 6004	6.000 (4.000)	758*

Helium Leak Test	Inboard Across the Seat Outboard Pressure Test	<1 x 10 <sup>-9</sup> scc/s He (1 x 10 <sup>-10</sup> Pa-M <sup>3</sup> /s) <1 x 10 <sup>-9</sup> scc/s He (1 x 10 <sup>-10</sup> Pa-M <sup>3</sup> /s) <1 x 10 <sup>-6</sup> scc/s He (1 x 10 <sup>-7</sup> Pa-M <sup>3</sup> /s)
Cleanliness and Packaging	Assembled and tested in Class 10 Cleanroom. Purged and Final Packaged in Class 10 Cleanroom. Double-bag packaging with Ultra-High Purity N <sup>2</sup> gas environment.	
Standard Finish	Electropolished to 10 Ra µin Max (0.25 µm) on all wetted surfaces	
Options	<p>Option surface finished available.</p> <p>Testing: particle, moisture, O<sub>2</sub>, SEM, ESCA and AES on request.</p> <p>Purge connections and Purge valves are available as requested.</p> <p>Face seal, twin ferrule compression fittings available up to 1" lines.</p> <p>Higher temperature operation possible up to 150°C (302°F) upon request.</p>	

\*Ref HF4000

## HFA Series Technical Specification

Maximum Operating Pressure	HFA Series	Vacuum -250 psig (0-17.2 bar) See below for pneumatic actuation pressure
Maximum Operating Temperature	PCTFE Seat* Vespel® Seat	-22°F (-30°C) to 180°F (82°C) 302°F (150°C)

Inch Model		Max Pressure	HFA Series	Cv	Cycle Life**	Actuation Pressure
Description	Line Size (Body) Size					
HFA 500	.500 (.500)	250 PSIG (17.2 BAR)	NO, NC, DA	5	20,000	90-100PSIG (4.1-6.9BAR)
HFA 755	.750 (.500)	250 PSIG (17.2 BAR)	NO, NC, DA	10	20,000	90-100PSIG (4.1-6.9BAR)
HFA 750	.750 (.750)	250 PSIG (17.2 BAR)	NO, NC, DA	11.5	30,000	60-100PSIG (4.1-6.9BAR)
HFA 1075	1.000 (.750)	250 PSIG (17.2 BAR)	NO, NC, DA	20	30,000	60-100PSIG (4.1-6.9BAR)
HFA 751	.750 (1.000)	250 PSIG (17.2 BAR)	NO, NC, DA	15	30,000	90-100PSIG (6.2-6.9BAR)
HFA 1000	1.000 (1.000)	250 PSIG (17.2 BAR)	NO, NC, DA	29	30,000	90-100PSIG (6.2-6.9BAR)
HFA 1501	1.500 (1.000)	250 PSIG (17.2 BAR)	NO, NC, DA	27	30,000	90-100PSIG (6.2-6.9BAR)
HFA 1502	1.500 (2.000)	250 PSIG (17.2 BAR)	DA	85	8,000	60-80PSIG (4.1-5.5BAR)
HFA 2000	2.000 (2.000)	250 PSIG (17.2 BAR)	DA	178	8,000	60-80PSIG (4.1-5.5BAR)
HFA 3002	3.000 (2.000)	250 PSIG (17.2 BAR)	DA	117	8,000	60-80PSIG (4.1-5.5BAR)
HFA 3004	3.000 (4.000)	150 PSIG (10.3 BAR)	DA	452	8,000	60-80PSIG (4.1-5.5BAR)
HFA 4000	4.000 (4.000)	150 PSIG (10.3 BAR)	DA	758	8,000	60-80PSIG (4.1-5.5BAR)
HFA 6004	6.000 (4.000)	150 PSIG (10.3 BAR)	DA	758*	8,000	60-80PSIG (4.1-5.5BAR)

<b>Helium Leak Test</b>	<b>Inboard Across the Seat Outboard Pressure Test</b>	<1 x 10 <sup>-9</sup> scc/s He (1 x 10 <sup>-10</sup> Pa-M <sup>3</sup> /s) <1 x 10 <sup>-9</sup> scc/s He (1 x 10 <sup>-10</sup> Pa-M <sup>3</sup> /s) <1 x 10 <sup>-6</sup> scc/s He (1 x 10 <sup>-7</sup> Pa-M <sup>3</sup> /s)
<b>Cleanliness and Packaging</b>	<b>Assembled and tested in Class 10 Cleanroom. Purged and Final Packaged in Class 10 Cleanroom. Double-bag packaging with Ultra-High Purity N<sup>2</sup> gas environment.</b>	
<b>Standard Finish</b>	<b>Electropolished to 10 Ra µin Max (0.25 µm) on all wetted surfaces</b>	
<b>Options</b>	<p>Pneumatic actuator types: NO, NC and DA for ½", 1" and 1 ½" sizes. DA type only for 2" and 4" sizes. Optional surface finishes available.</p> <p>Testing: particle, moisture, O<sup>2</sup>, SEM, ESCA and AES on request. Purge connections and Purge valves are available as requested. Face seal, twin ferrule compression fittings available up to 1" lines. Higher temperature operation possible up to 150°C (302°F) upon request. Optional instrumentation for actuator signalling, actuator control, etc.</p>	

\* Vespel is a registered trademark of DuPont Company.

\*Ref HF4000

\*\* Rating at maximum system pressure

## Order Information

Sample: HF1000 - 065 - PC2

HF - 1000 - 065 - Blank - PC2 - Green

Manual Multi Turn Version - 1" - 1" TE - 1" TE - 1/4" Upstream & Downstream Purge Connections - Green Handwheel Supplied

Series	Size	Inlet Connection	Outlet Connection <sup>1</sup>	Purge Type	Handle Colour <sup>2</sup>	Actuator Designator <sup>3</sup>	Actuator Accessories <sup>3</sup>
HF – Manual Multi Turn Version	500 (1/2")	1/2" TE = 049	1/2" TE = 049	Blank - No Purge	Blank (White Handwheel Supplied up to and including HF750 Black Handwheel Supplied for HF1000 and above)	NO - Normally Open	PS (Proximity Sensor)
HFA – Pneumatic Air Operated Version	755 (3/4")	1/2" FSM M(S)	1/2" FSM M(S)	PC1 - 1/4" Downstream Purge Connection	White (White Handwheel Supplied)	NC - Normally Closed	PSEx (Explosion Proof Proximity Sensor)
	750 (3/4")	1/2" FSM FM	1/2" FSM FM	PC2 - 1/4" Upstream and Downstream Purge Connection	Red (Red Handwheel Supplied)		
	751 (3/4")	3/4" TE = 065	3/4" TE = 065	PC3 - 1/4" Upstream Purge Connection	Yellow (Yellow Handwheel Supplied)		
	1075 (1")	1" FSM M(S)	3/4" FSM M(S)	PV1 - 1/4" Downstream Purge Valve	Green (Green Handwheel Supplied)		
	1000 (1")	3/4" FSM FM	3/4" FSM FM	PV2 - 1/4" Upstream and Downstream Purge Valve	Orange (Orange Handwheel Supplied)		
	2000 (2")	1 1/2" TE = 065	1" TE = 065	PV3 - 1/4" Upstream Purge Valve	Black (Black Handwheel Supplied)		
	3000 (3")	2" TE = 065	2" TE = 065	PC15 - 1/2" Downstream Purge Connection	Blue (Blue Handwheel Supplied)		
	4000 (4")	3" TE = 065		PC25 - 1/2" Upstream and Downstream Purge Connection	Pink (Pink Handwheel Supplied)		
	6000 (6")	4" TE = 083		PC35 - 1/2" Upstream Purge Connection	Brown (Brown Handwheel Supplied)		
	6" TE = 109		PV15 - 1/2" Downstream Purge Valve	Gold (Gold Handwheel Supplied)			
			PV25 - 1/2" Upstream and Downstream Purge Valve	Grey (Grey Handwheel Supplied)			
			PV35 - 1/2" Upstream Purge Valve	Silver (Silver Handwheel Supplied)			
				Purple (Purple Handwheel Supplied)			

<sup>1</sup> Only Specify the Outlet connection when different from the Inlet connection

<sup>2</sup> Manual Version only

<sup>3</sup> Actuated Version only

# CARTEN

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