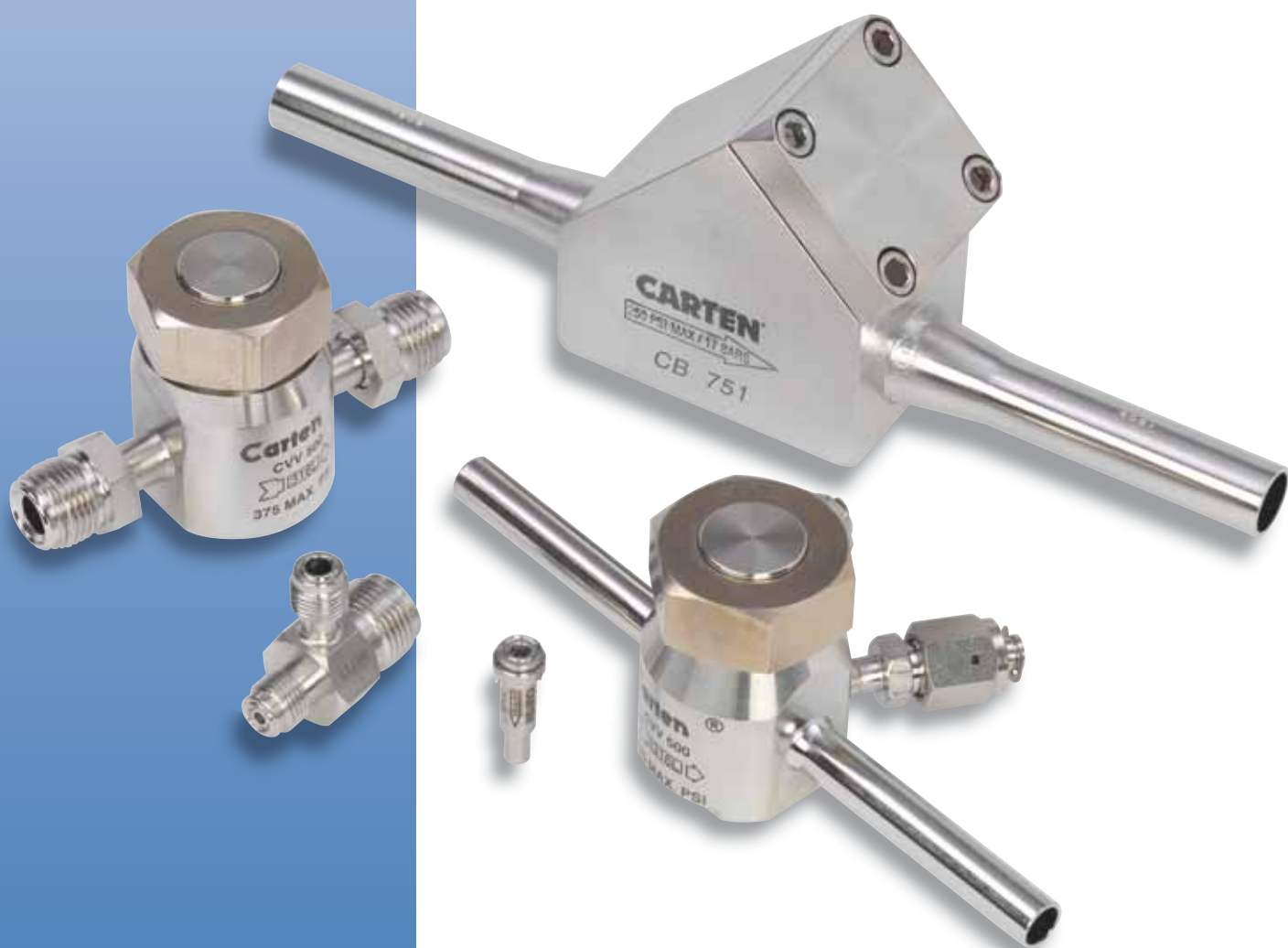


SYSTEM COMPONENT SERIES

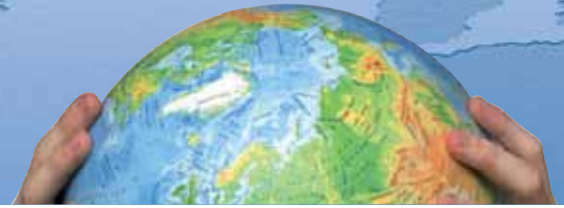
Ultra-High Purity Check Valves (CB/CVV)

Ultra-High Purity Check Valve (2048)

Ultra-High Purity Vacuum Generators (2028)



CB SERIES



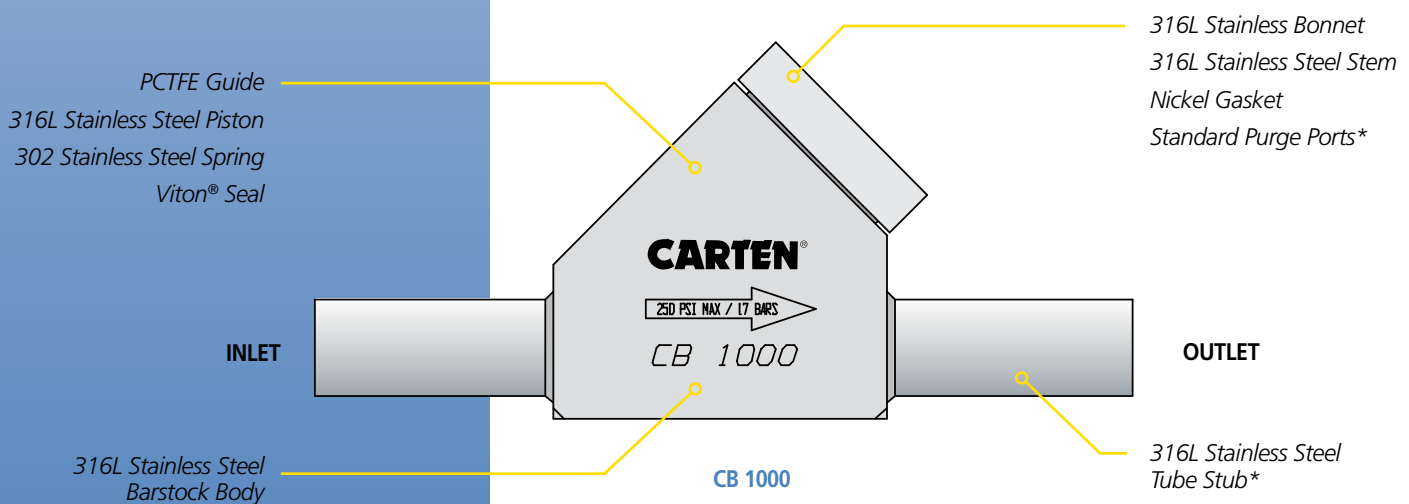
The CB stainless steel check valve series is intended for bulk gas distribution service where containment, cleanliness and purity are of utmost importance. Applications for this check valve are:

- **High purity gas service for the semiconductor industry**
- **Prevents undesired reverse flow in high-purity gas systems**
- **Superior containment and cleanliness for your most critical valve applications**
- **Suitable for inert and most toxic gases**
- **Most suitable for isolation applications**

CB Series Product Features

- Designed for Ultra-High Purity
- Ultra-High Purity Stainless Steel/PCTFE Gas Construction
- 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
- 1/4" FSM-M PCX
- Purge Connections and Purge Valves are Integral in Valve Body
- Assembled and Tested in Class 10 Cleanroom
- Inboard and Across the Seat/Leak Tested with 100% Helium
- Valve Bodies and Tube Stubs are Serialized for Material Certification
- Cleaned for High-Purity Gas Service
- Purged and Final Packaged in Class 1 Cleanroom. Double-Bag packaging with N₂ Gas Environment

CB Construction Materials



*See corresponding Code Chart for tube sizes, purge and locations.

CB Series Technical Data

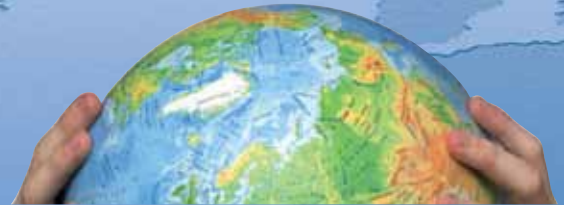
MATERIAL OF CONSTRUCTION	Wetted Areas	316L Stainless Steel, Nickel, Viton®, PCTFE		
	Non-Wetted Areas	316L, Nickel Plated Brass (CVV 500)		
MAXIMUM OPERATING PRESSURE	CB Series	Vacuum to 250 psig (17.2 bar)		
MAXIMUM OPERATING TEMPERATURE	CB Series	250° F (121°C)		
FLOW COEFFICIENT (C _V)* CRACKING PRESSURE (CP) PRESSURE TO FULL OPEN (PFO)	MODEL	C _V	CP	PFO
	CVV 250	1.93	1.65 psig	4.3 psig
	CVV 500	1.93	1.65 psig	4.3 psig
	CVV 755	2.00	1.65 psig	5.0 psig
	CB 751	10.96	1.60 psig	12.0 psig
	CB 1000	15.21	1.60 psig	12.0 psig
	CB 1501	16.73	1.60 psig	12.0 psig
	CB 1502	42.43	0.60 psig	6.0 psig
	CB 2000	51.26	0.60 psig	6.0 psig
	CB 3002	78.00	0.60 psig	6.0 psig
	CB 3004	158.80	0.10 psig	2.0 psig
	CB 4000	165.50	0.10 psig	2.0 psig
	CB 6004	185.00	0.10 psig	1.0 psig
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 Ra µm) on all wetted surfaces			
OPTIONS	Surface finish - 5 Ra Particle/Moisture testing SEM and ESCA testing AES analysis		Single purge valve connection Tube extension length or fittings JIS Tubing/Flanges Fitting connections available for up to 1.00" size – inlet/outlet	

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

CB Series Technical Dimensions

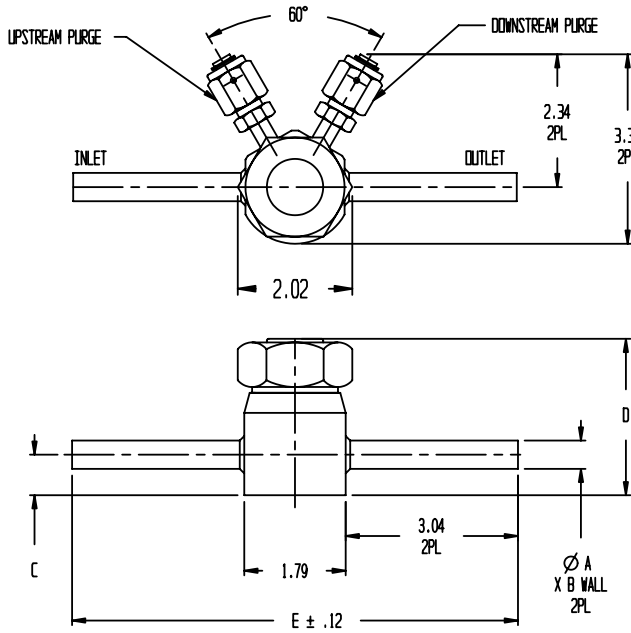
Size	A	B	C	D	E	F	G
CVV 250	Ø 0.25 (6.35mm)	0.035 (0.8mm)	0.715 (18.1mm)	2.76 (70.1mm)	8.88 (225.6mm)	N/A	N/A
CVV 500	Ø 0.50 (12.7mm)	0.049 (1.2mm)	0.715 (18.1mm)	2.76 (70.1mm)	7.87 (72.8mm)	N/A	N/A
CVV 755	Ø 0.75 (19.0mm)	0.065 (1.6mm)	0.720 (18.2mm)	2.76 (70.1mm)	7.75 (196.9mm)	N/A	N/A
CB 751	Ø 0.75 (19.0mm)	0.065 (1.6mm)	0.75 (19.0mm)	3.94 (100.1mm)	11.61 (294.8mm)	4.51 (114.5mm)	2.50 (63.5mm)
CB 1000	Ø 1.00 (25.4mm)	0.065 (1.6mm)	0.75 (19.0mm)	3.94 (100.1mm)	9.61 (244.0mm)	3.60 (91.4mm)	2.50 (63.5mm)
CB 1501	Ø 1.50 (38.1mm)	0.065 (1.6mm)	0.75 (19.0mm)	3.94 (100.1mm)	13.51 (343.1mm)	5.46 (138.6mm)	2.50 (63.5mm)
CB 1502	Ø 1.50 (38.1mm)	0.065 (1.6mm)	1.25 (31.7mm)	6.28 (159.5mm)	15.40 (391.1mm)	5.88 (127.5mm)	250 (63.5 mm)
CB 2000	Ø 2.00 (50.8mm)	0.065 (1.6mm)	1.25 (31.7mm)	6.28 (159.5mm)	13.59 (345.1mm)	6.12 (155.4mm)	2.50 (63.5mm)
CB 3002	Ø 3.00 (76.2mm)	0.065 (1.6mm)	1.25 (31.7mm)	6.28 (159.5mm)	21.12 (536.4mm)	8.74 (221.9mm)	2.50 (63.5mm)
CB 3004	Ø 3.00 (76.2mm)	0.065 (1.6mm)	2.13 (54.1mm)	8.93 (221.7mm)	25.62 (650.7mm)	10.94 (277.8mm)	4.25 (107.9mm)
CB 4000	Ø 4.00 (101.6mm)	0.083 (2.1mm)	2.13 (54.1mm)	8.93 (221.7mm)	17.86 (453.6mm)	6.55 (166.3mm)	4.25 (107.9mm)
CB 6004	Ø 6.00 (152.4mm)	0.109 (2.7mm)	2.13 (54.1mm)	8.93 (221.7mm)	32.90 (835.7mm)	14.07 (357.4mm)	4.25 (107.9mm)

CB SERIES

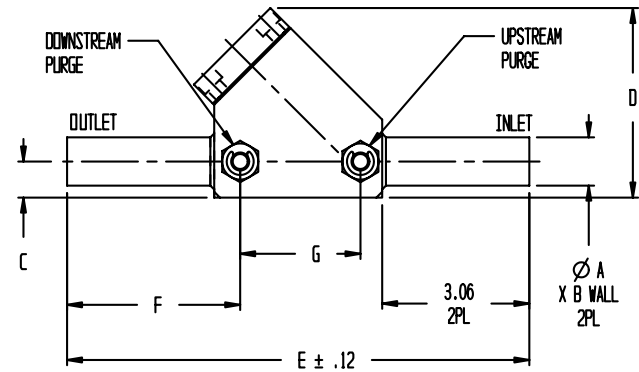


CB Series Typical Valve Dimensions

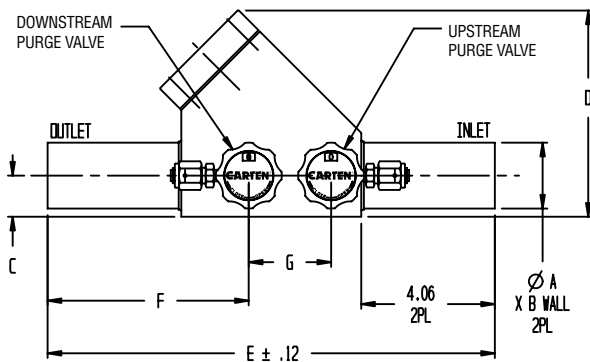
CVV 500 BODY
(250/500/750)



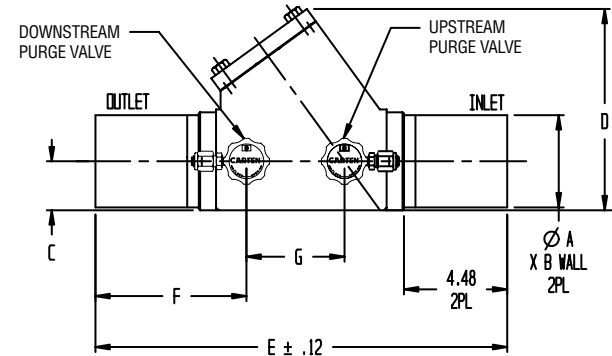
CB 1000 BODY
(751/1000/1501)



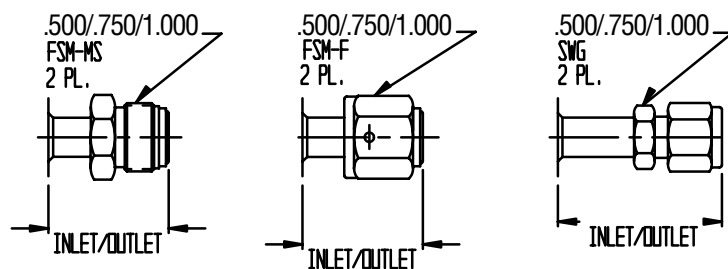
CB 2000 BODY
(1502/2000/3002)



CB 4000 BODY
(3004/4000/6004)



OPTIONAL VALVE END CONNECTIONS AVAILABLE ON CB SERIES 1/2" - 1" BODY SIZES



Size	Length		
	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 ± 0.06 in. (± 1.52 mm) unless otherwise stated.

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

2048 SERIES

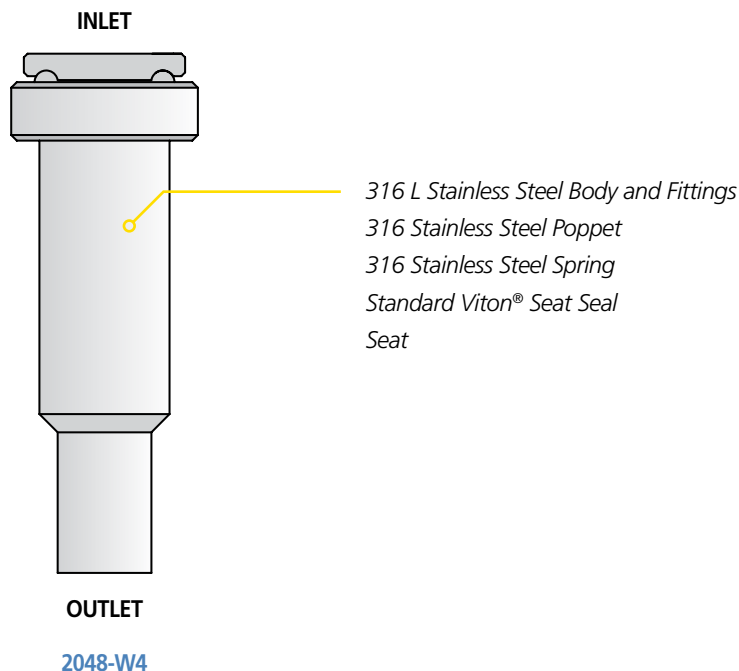
The stainless steel 2048 Ultra-High Purity Check Valve Connection Series is intended for process gas distribution service where containment, cleanliness, and purity are of the utmost importance. Applications include:

- ***Prevention of undesired reverse flow***
- ***Gas cabinet process lines***
- ***Reactor gas line protection***

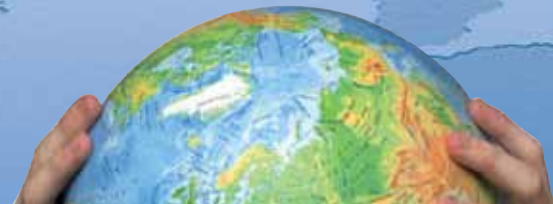
2048 Series Product Features

- High Performance, Compact Design
- Vacuum to 3500 psig Operating Pressure
- Ultrasonically Cleaned to Semiconductor Ultra-High Purity Standards
- 100% Tested for Check Performance and External Leakage
- Choice of End Connections
- Compatible with Standard Face Seal Components
- Purged and Final Packaged in Class 1 Cleanroom. Double-Bag packaging with N₂ Gas Environment

2048 Construction Materials



2048 SERIES



2048 Series Technical Data

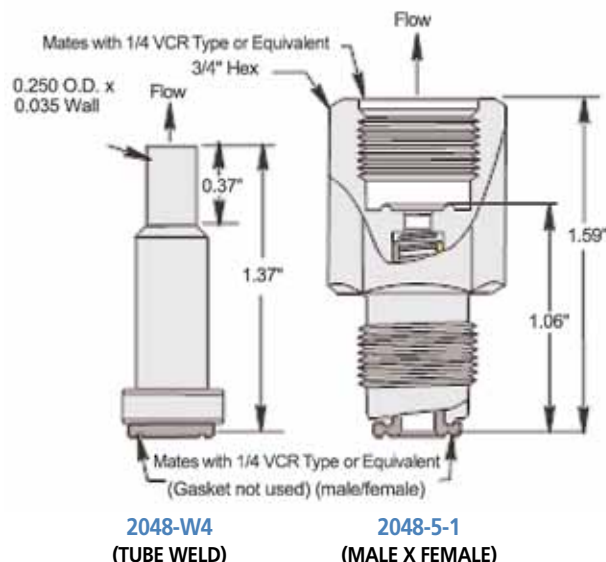
MATERIAL OF CONSTRUCTION	Wetted Areas	316L Stainless Steel, Viton®	
	Non-Wetted Areas	316L Stainless Steel	
TEMPERATURE RANGE	2048 Series	0°F -300°F	
FLOW COEFFICIENT (C _v)	2048 Series	0.25 at full flow	
CRACKING PRESSURE OPTIONS	2048 Series	Crack Pressure - psi	Reseat Pressure - psi
		1/2 ± 1/4	1/4
		2 ± 1/2	1
		5 ± 1	3
		10 ± 2	7
		50 ± 3	47
	105 + 10, -5	90	
LINE PRESSURE	2048 Series	Vacuum to 3500 psig	
LEAK RATES	Forward Pressure	Bubble tight to crack pressure	
	Back Pressure	Bubble tight vacuum to 20 2500 PSID	
		Vacuum Tested	
	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 16 Ra Max (0.41 Ra µm) on all wetted surfaces		
OPTIONS	Cracking pressures	End connection configurations	
	Seal materials: Kalrez®, EPR, Buna-N	Female/Male VCR type (-1-5)	
	Swivel end connection		

Specifications are subject to change without notice. Kalrez® and Viton® are registered trademarks of DuPont Company.

Component Selection

The total system design must be considered when selecting a valve to ensure performance. Valve application, materials compatibility, installation, operation and maintenance are the responsibility of the system design engineer.

2048 Series Typical Valve Dimensions



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.

2028 SERIES

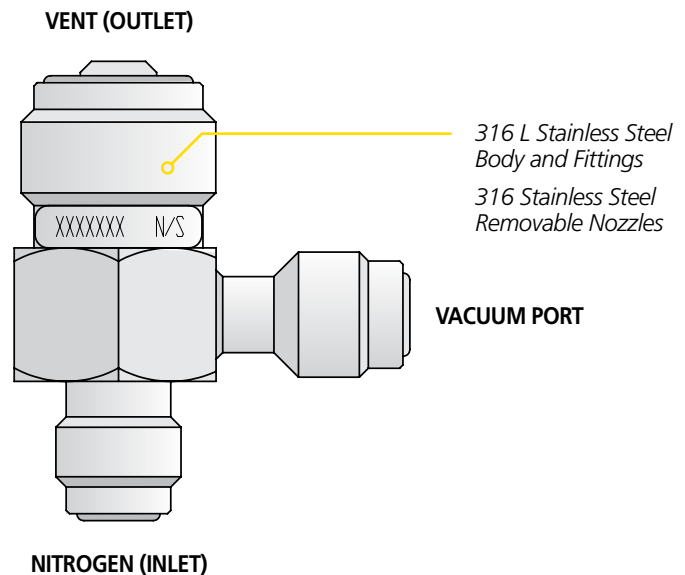
This stainless steel Vacuum Generator Series is nitrogen operated and is available with single or dual vacuum parts. Applications for this generator include:

- ***Primary vacuum generation in gas cabinets***
- ***Chamber evacuation for semiconductor manufacture***
- ***Dilution of vented gases***

2028 Series Product Features

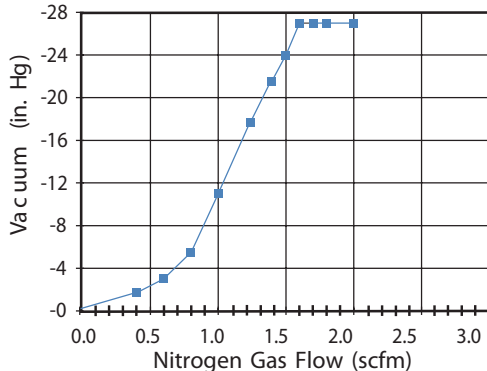
- High Performance, Compact Design
- Lowest Nitrogen Consumption to Obtain Max. Vacuum
- Requires Only 1.6 scfm N₂ at 60 psig to Achieve 27 in. Hg Vac.
- Compatible with Standard Face Seal Fittings
- 100% Tested for Vacuum Performance and External Leakage
- Ultrasonically Cleaned to Semiconductor Ultra-High Purity Standards
- Purged and Final Packaged in Class 1 Cleanroom. Double-bag Packaging with N₂ Gas Environment
- High Velocity Nozzles
- 316 L Stainless Steel Body and Fittings
- 316 L Stainless Steel Removable Nozzles

2028 Construction Materials



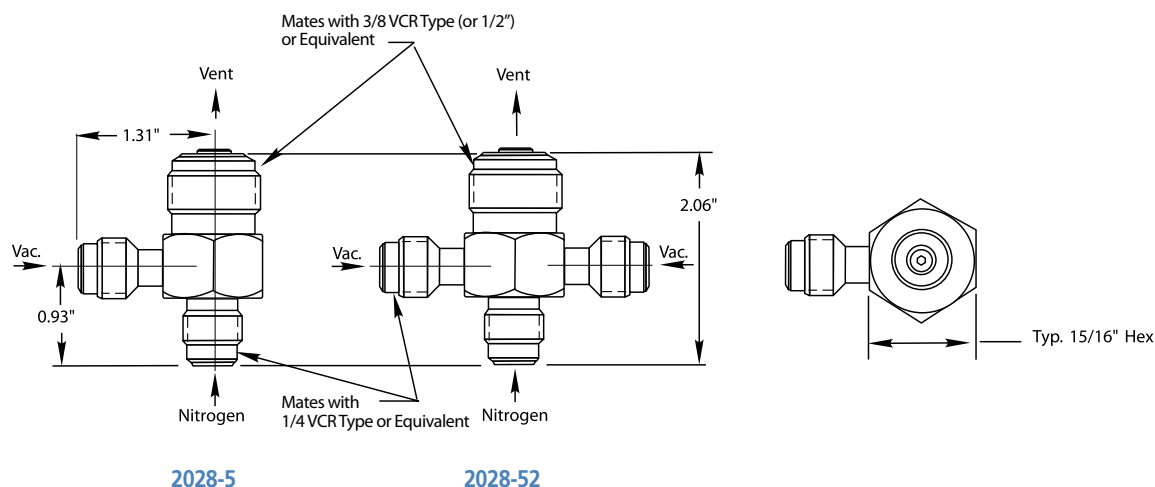
2028

2028 Series Technical Data

MATERIAL OF CONSTRUCTION	Wetted Areas	316L Stainless Steel																																
	Non-Wetted Areas	316L Stainless Steel																																
VACUUM	2028 Series	27" of Hg with inlet nitrogen pressure at 60 – 80 psig																																
ENTRAINMENT RATIO	2028 Series	Approx. 7:1 at 1 Atm																																
NITROGEN FLOW	2028 Series	Maximum 2.7 scfm of N ₂ @ 80 psig																																
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)																																
PERFORMANCE	 <table><caption>Approximate data points from the Vacuum vs. Nitrogen Gas Flow graph</caption><thead><tr><th>Nitrogen Gas Flow (scfm)</th><th>Vacuum (in. Hg)</th></tr></thead><tbody><tr><td>0.0</td><td>0</td></tr><tr><td>0.2</td><td>-1</td></tr><tr><td>0.4</td><td>-2</td></tr><tr><td>0.6</td><td>-3</td></tr><tr><td>0.8</td><td>-5</td></tr><tr><td>1.0</td><td>-10</td></tr><tr><td>1.2</td><td>-15</td></tr><tr><td>1.4</td><td>-20</td></tr><tr><td>1.6</td><td>-25</td></tr><tr><td>1.8</td><td>-27</td></tr><tr><td>2.0</td><td>-27</td></tr><tr><td>2.2</td><td>-27</td></tr><tr><td>2.4</td><td>-27</td></tr><tr><td>2.6</td><td>-27</td></tr><tr><td>2.7</td><td>-27</td></tr></tbody></table>		Nitrogen Gas Flow (scfm)	Vacuum (in. Hg)	0.0	0	0.2	-1	0.4	-2	0.6	-3	0.8	-5	1.0	-10	1.2	-15	1.4	-20	1.6	-25	1.8	-27	2.0	-27	2.2	-27	2.4	-27	2.6	-27	2.7	-27
Nitrogen Gas Flow (scfm)	Vacuum (in. Hg)																																	
0.0	0																																	
0.2	-1																																	
0.4	-2																																	
0.6	-3																																	
0.8	-5																																	
1.0	-10																																	
1.2	-15																																	
1.4	-20																																	
1.6	-25																																	
1.8	-27																																	
2.0	-27																																	
2.2	-27																																	
2.4	-27																																	
2.6	-27																																	
2.7	-27																																	
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 16 Ra Max (0.41 Ra μm) on all wetted surfaces																																	
OPTIONS	Weld on tube extension																																	

Specifications are subject to change without notice.

2028 Series Typical Valve Dimensions



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