21200

Million Cycle Gate Valves

Table of Contents

Introduction

Model Number 21220-0600R
6” ID (DN150) Pneumatic CF-F

Product Features

- 1,000,000 Cycle
- HV and UHV with stainless steel body and internal components
- Sizes from 0.625” ID (DN16) to 24” ID (DN600)
- Pneumatic actuation
- Stainless steel welded bellows
- Standard KF, ISO, CF, ANSI, JIS or custom flange options
- Roughing, gauge, purge ports available
- High temperature options up to 250°C
- 440C hardened stainless steel drive shaft and pins
- Easily customizable to work with almost any application
- Designed, manufactured and assembled in the USA

Description

The 21200 Series Gate Valves feature a positive shut off; the valve will maintain its closed status in the event of a power loss followed by a drop in pressure.
Linear actuation allows the use of a welded bellows to seal the actuator (i.e. no rotary seals). Shock and vibration are reduced to a minimum by a unique air cylinder design.
There are no mechanical locks inside vacuum, which is extremely beneficial for semiconductor and sensitive processes requiring vibration-free operation. All moving joints have hardened shafts, reducing particulate generation and providing smoother actuation.
The HVA stainless steel body offers one of the smallest interior surface areas in the vacuum valve industry. The body and all major internal components are vacuum furnace brazed at 1100°C, at $1x10^{-6}$ mbar, ensuring maximum joint integrity. This eliminates the possibility of virtual leaks or entrapment areas and minimizes body distortion found in conventionally welded valves. For maintenance purposes, the carriage assembly can be removed from the body without removing the valve from the system.

Applications

These valves can be used with cryopumps, turbomolecular pumps, ion pumps, or in any application requiring clean, high cycle, low maintenance and low outgassing valves with positive shut off characteristics. Available in three standard flange configurations of CF-F, KF/ISO and ANSI flanges, and may also be special ordered with JIS or custom designed flanges.

Standard Specifications

Materials

Valve body and mechanism	304 stainless steel
Welded bellows shaft seal	AM-350
Drive shaft and pins	440C hardened stainless steel
Bonnet / gate seals	
HV	Viton® elastomer
UHV	OFHC copper / Viton® elastomer

Vacuum

Pressure range	
HV	1 x 10^{-9} mbar
UHV	1 x 10^{-10} mbar
Leak rate	< 2 x 10^{-9} mbar l/s
Differential pressure	1 bar in either direction
Maximum Δ pressure before opening	≤ 30 mbar

Temperature

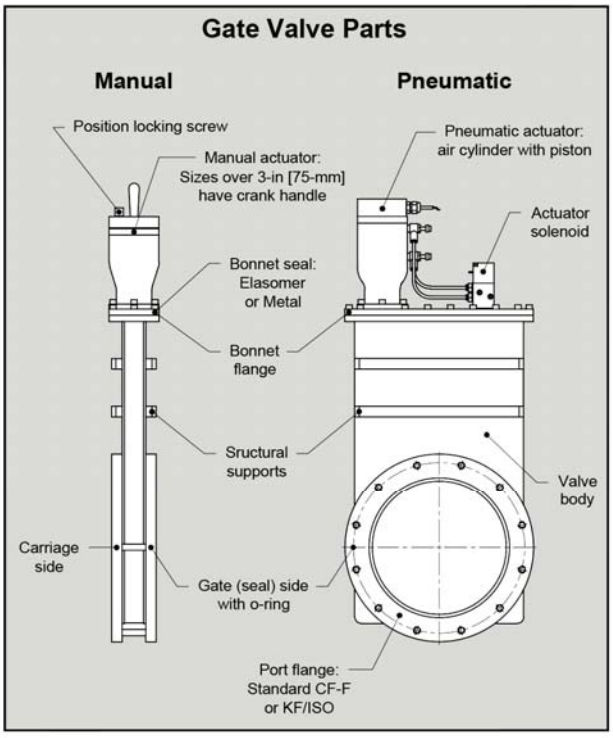
	without solenoid
Elastomer sealed bonnet	150°C
Metal sealed bonnet	
Valve open	200°C
Valve closed	150°C
Actuator	
Pneumatic	60°C

Mechanism

Air service	80 psig (5.5 bar)
Solenoid	4.0 Watts
supplied voltage	120 VAC 50/60 Hz
optional voltage	24, 200, 240 VAC 50/60 Hz or 12, 24 VDC
Position indicator, max.	115 VAC or 28 VDC, 20 mA

Cycles Until Service

Sizes 0.625" to 12" [DN16 to 300]	1,000,000
Sizes 14" to 24" [DN350 to 600] designated as long life valves (Application dependent)	> 500,000



Notes

- Dimensions given in U.S. System and [metric]
- Conductance ratings based on air, given in liters per second
- Due to ongoing product development, prices, dimensions and specifications are subject to change without notice

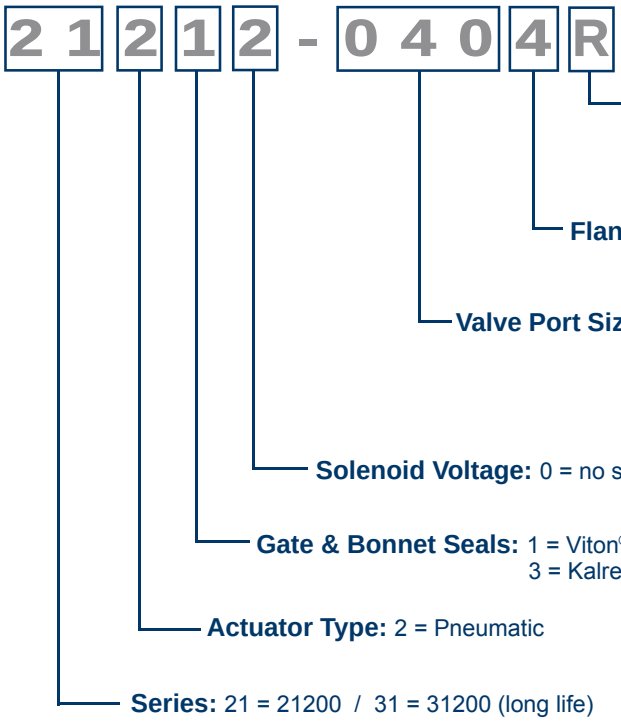
Options

All 21200 Series Valves may be equipped with alternative flanges, solenoids and seals. Contact HVA to discuss your requirements.

- Alternate voltage controls
- JIS configurations
- Custom flange sizes
- Gauge ports, roughing ports and purge ports
- Microswitches for position indicators
- Quick clamp bonnet
- Low profile actuators
- High temperature components, including O-rings microswitches and actuator
- Water cooled flanges
- Custom materials, such as Inconel® or Kalrez®
- Special solenoid or position indicator connectors

Model Key Guide

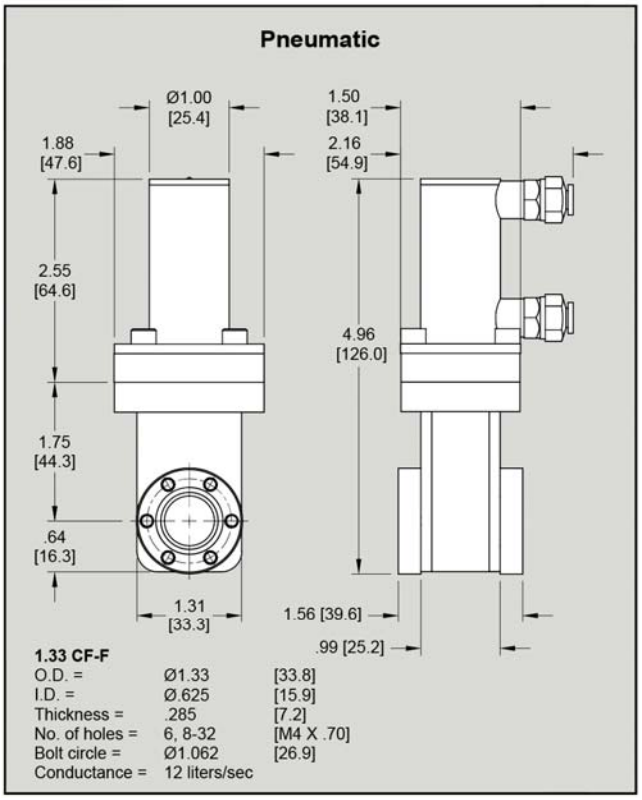
Example: 21212-0404R = 21200 Series gate valve, pneumatic actuator, Viton gate & bonnet seals,120VAC solenoid, 4" ID CF (6" OD) flanges with Metric thread, reed switch position indicator



Note

- A suffix of -001 to -999 at the end of or a '9' or 'S' within a Model Number indicates a valve with custom configuration.
- If a roughing/gauge/purge port is needed add the following after the position indicator:

A = KF 25
B = KF 40
C = 1.33" OD CF fixed with thru holes
D = 2.75" OD CF fixed with thru holes
S = special/custom or other



CF-F 1.33 Flanges			16-mm .625-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	3 [1]	21212-0060

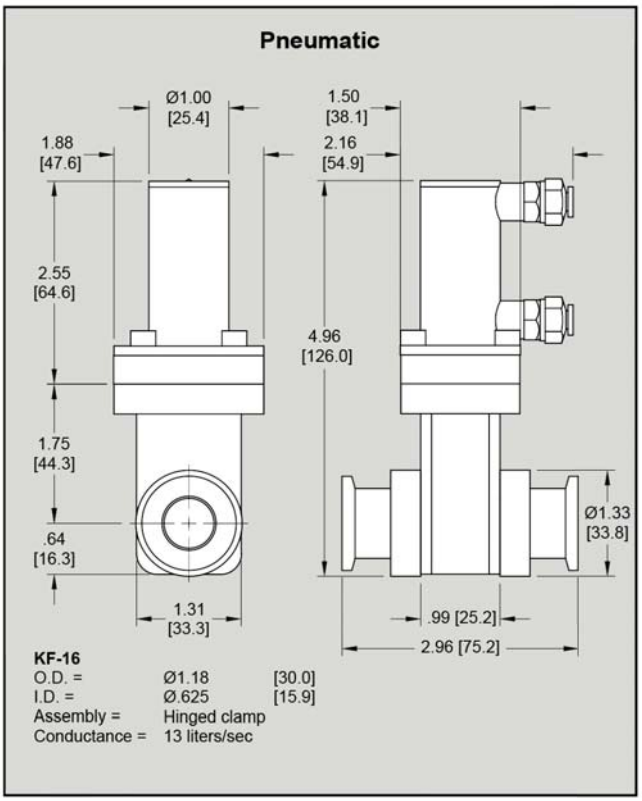
* For metric flanges, replace last 0 in model number with 4

Specifications

HV Pressure Range: 1 x 10^{-9} mbar
UHV Pressure Range: 1 x 10^{-10} mbar
Helium Leak Rate: Materials: < 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:
Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

Operating Temperature:
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

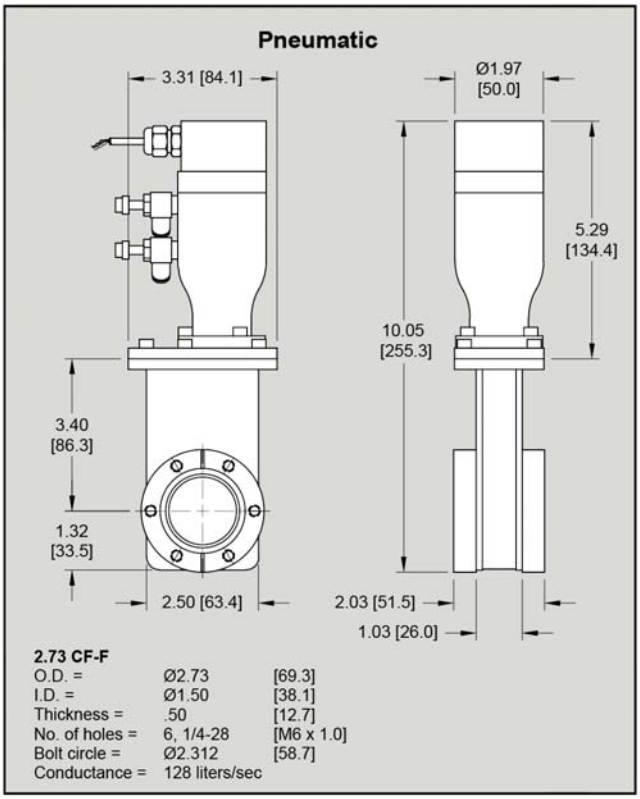
**250°C options available on request.*



KF-16 Flanges			16-mm .625-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number**
Pneumatic			
Viton-Viton (HV)	Hinged clamp	3 [1]	21212-0063

21200 Series Million Cycle Gate Valves

40-mm 1.5-inch



CF-F 2.73 Flanges			40-mm 1.5-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	10 [5]	21212-0150R

* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

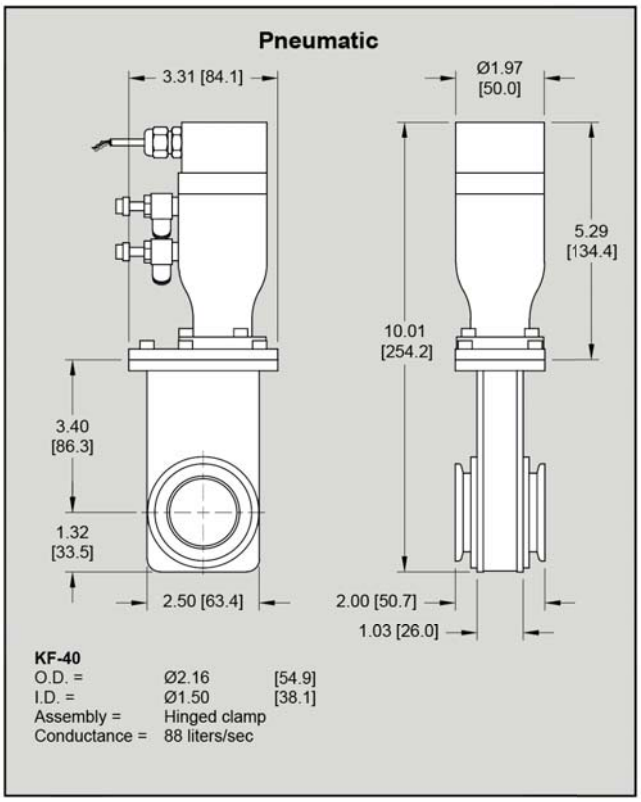
HV Pressure Range: 1 x 10^{-9} mbar
UHV Pressure Range: 1 x 10^{-10} mbar
Helium Leak Rate: Materials: < 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

Operating Temperature:

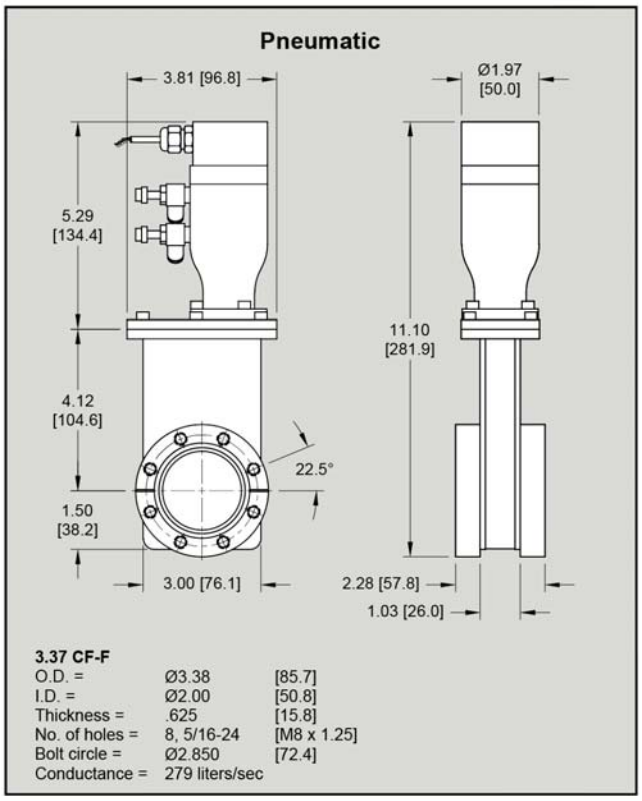
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

**250°C options available on request.*



KF-40 Flanges			40-mm 1.5-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Hinged clamp	10 [5]	21212-0153R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



CF-F 3.37 Flanges			50-mm 2.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	10 [5]	21212-0200R

* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range:	1×10^{-9} mbar
UHV Pressure Range:	1×10^{-10} mbar
Helium Leak Rate: Materials:	$< 2 \times 10^{-9}$ mbar l/s
Maximum Δ Pressure Before Opening:	≤ 30 mbar

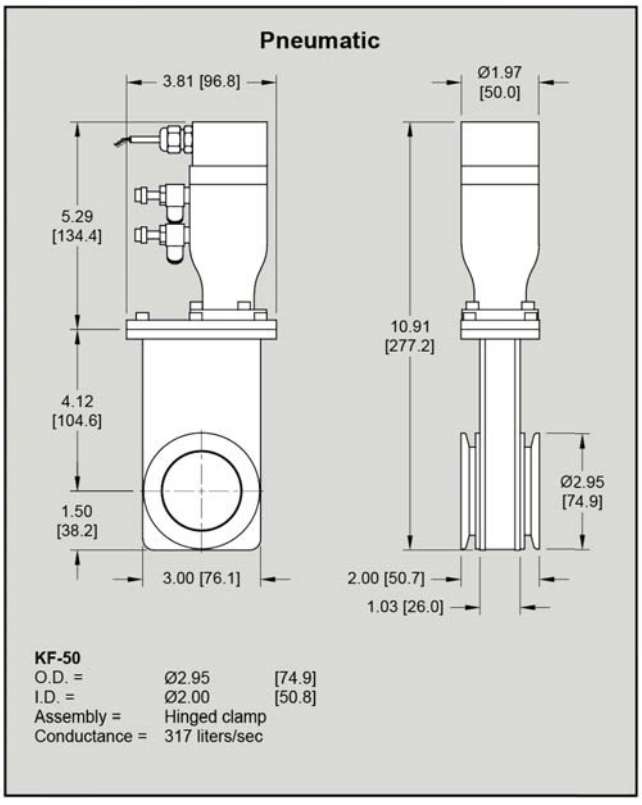
Materials:

Body =	304 Stainless Steel
Gate =	304 Stainless Steel
Drive shaft and pins =	440C hardened stainless steel
Bellows =	AM-350
Actuator =	6061-T6 Aluminum

Operating Temperature:

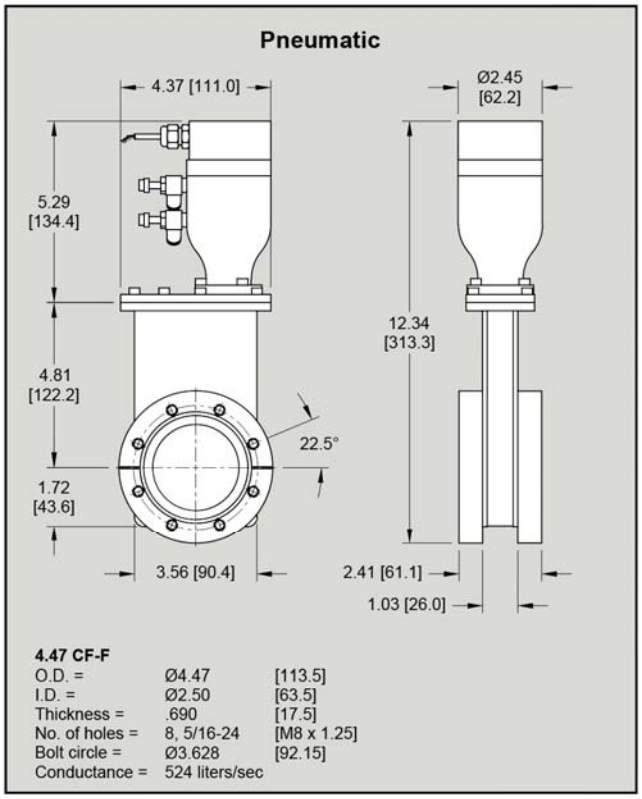
Body, Gate Open (Viton® / Copper bonnet) =	150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) =	150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) =	60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) =	150°C / 150°C*

**250°C options available on request.*



KF-50 Flanges			50-mm 2.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Hinged clamp	13 [6]	21212-0203R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



CF-F 4.47 Flanges			63-mm 2.5-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	10 [5]	21212-0250R

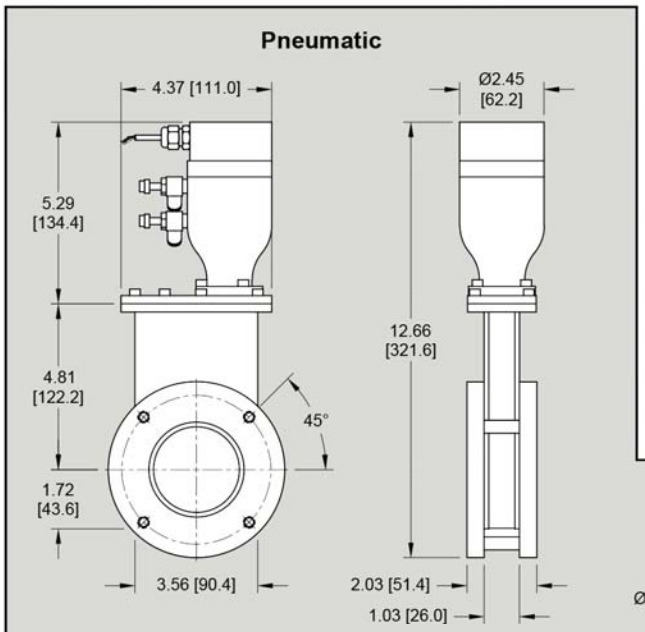
* For metric flanges, replace last 0 in model number with 4

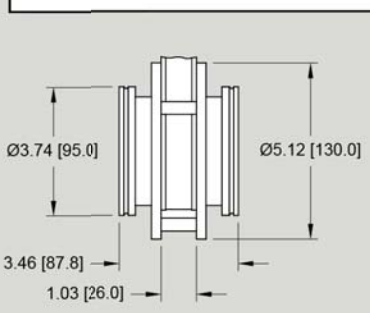
For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range: 1×10^{-9} mbar
UHV Pressure Range: 1×10^{-10} mbar
Helium Leak Rate: Materials: $< 2 \times 10^{-9}$ mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:
Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum
Operating Temperature:
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

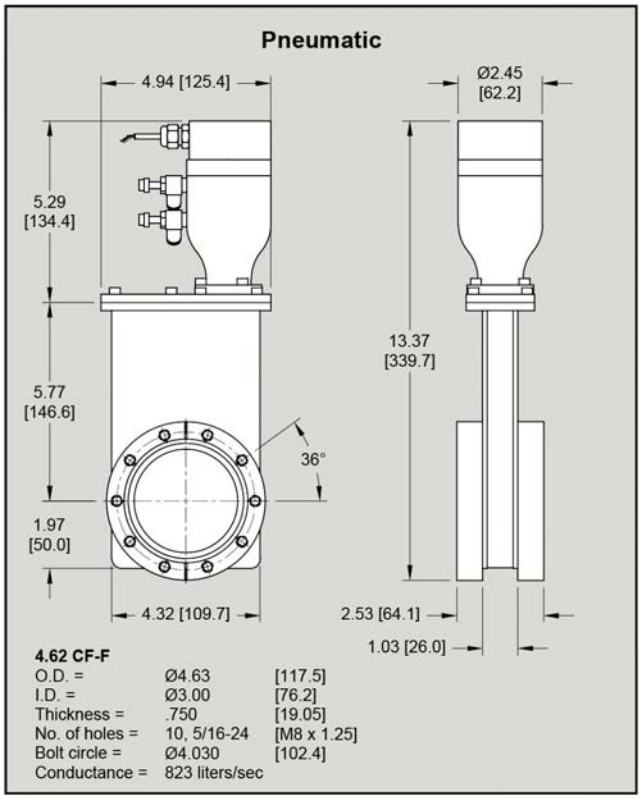
*250°C options available on request.





ISO-63 Flanges			63-mm 2.5-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	18 [8]	21212-0253R
Viton-Viton (HV)	Clamp	25 [11]	21212-0256R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



CF-F 4.62 Flanges			75-mm 3.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	22 [10]	21212-0300R

* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range:	1 x 10^{-9} mbar
UHV Pressure Range:	1 x 10^{-10} mbar
Helium Leak Rate: Materials:	< 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening:	≤ 30 mbar

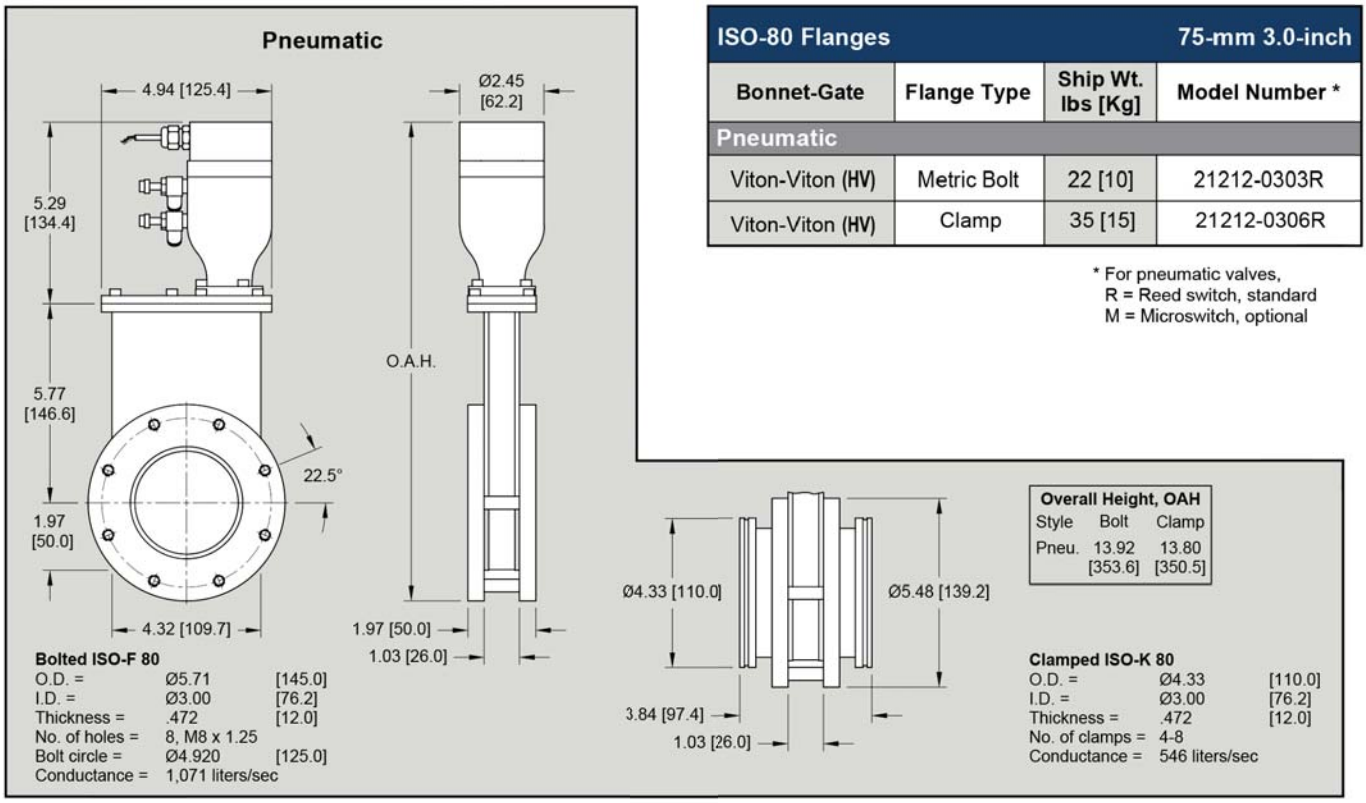
Materials:

Body =	304 Stainless Steel
Gate =	304 Stainless Steel
Drive shaft and pins =	440C hardened stainless steel
Bellows =	AM-350
Actuator =	6061-T6 Aluminum

Operating Temperature:

Body, Gate Open (Viton® / Copper bonnet) =	150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) =	150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) =	60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) =	150°C / 150°C*

250°C options available on request.

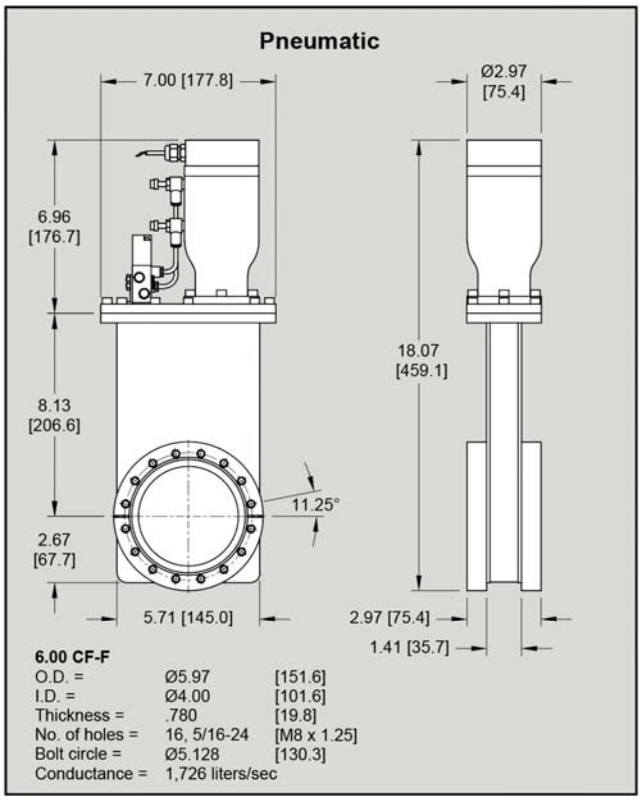


ISO-80 Flanges			75-mm 3.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	22 [10]	21212-0303R
Viton-Viton (HV)	Clamp	35 [15]	21212-0306R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

21200 Series Million Cycle Gate Valves

100-mm 4.0-inch



CF-F 6.00 Flanges			100-mm 4.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	33 [15]	21212-0400R

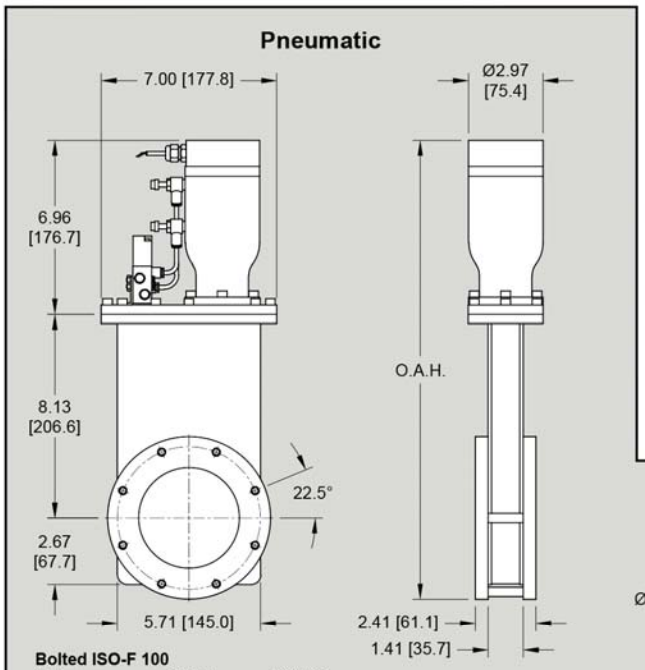
* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

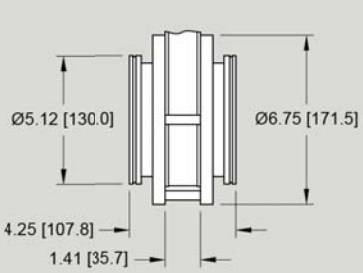
HV Pressure Range: 1×10^{-9} mbar
UHV Pressure Range: 1×10^{-10} mbar
Helium Leak Rate: Materials: $< 2 \times 10^{-9}$ mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:
Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum
Operating Temperature:
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-100 Flanges			100-mm 4.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	33 [15]	21212-0403R
Viton-Viton (HV)	Clamp	43 [20]	21212-0406R

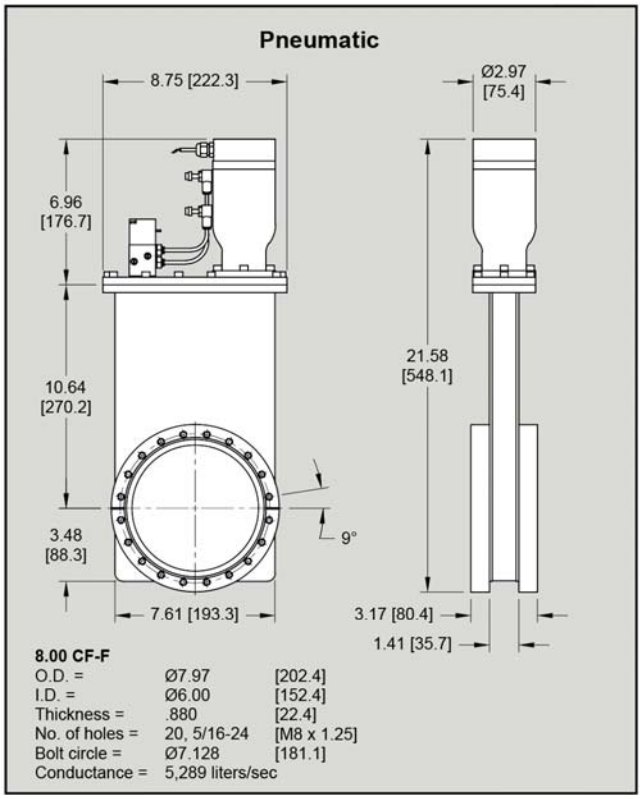
* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



Overall Height, OAH

Style	Bolt	Clamp
Pneu.	18.34 [465.8]	18.46 [468.9]

Clamped ISO-K 100
O.D. = Ø5.12 [130.0]
I.D. = Ø4.00 [101.6]
Thickness = .472 [12.0]
No. of clamps = 4-8
Conductance = 1,199 liters/sec



CF-F 8.00 Flanges			150-mm 6.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	50 [23]	21212-0600R

* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range:	1 x 10^{-9} mbar
UHV Pressure Range:	1 x 10^{-10} mbar
Helium Leak Rate: Materials:	< 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening:	≤ 30 mbar

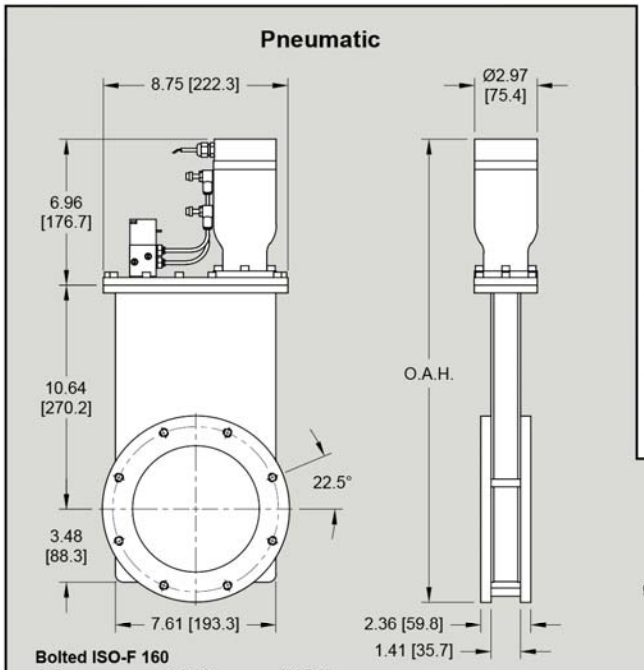
Materials:

Body =	304 Stainless Steel
Gate =	304 Stainless Steel
Drive shaft and pins =	440C hardened stainless steel
Bellows =	AM-350
Actuator =	6061-T6 Aluminum

Operating Temperature:

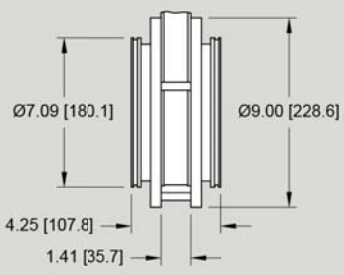
Body, Gate Open (Viton® / Copper bonnet) =	150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) =	150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) =	60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) =	150°C / 150°C*

**250°C options available on request.*



ISO-160 Flanges			150-mm 6.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	50 [23]	21212-0603R
Viton-Viton (HV)	Clamp	70 [32]	21212-0606R

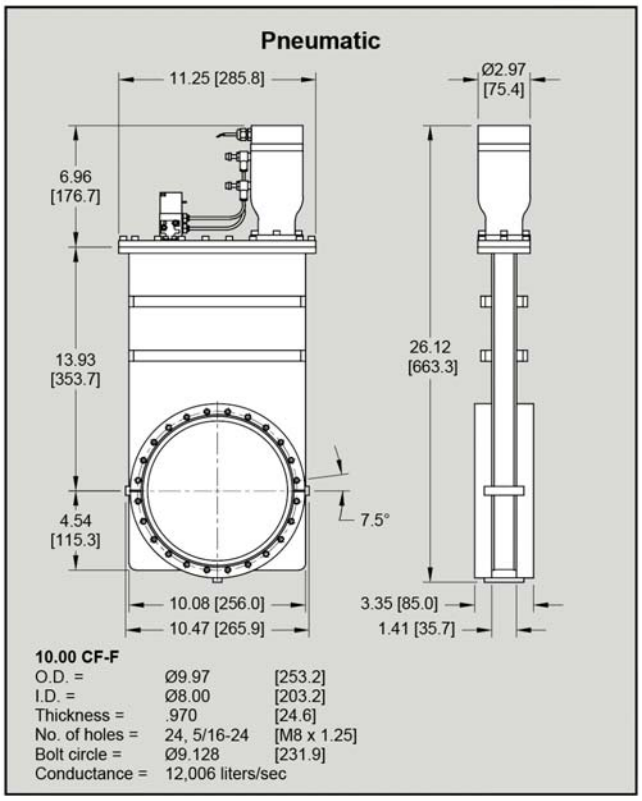
* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



Overall Height, OAH		
Style	Bolt	Clamp
Pneu.	22.02 [559.3]	22.09 [461.1]

Clamped ISO-K 160

O.D. =	Ø7.09	[180.1]
I.D. =	Ø6.00	[152.4]
Thickness =	.472	[12.0]
No. of clamps =	4-8	
Conductance =	3,967 liters/sec	



CF-F 10.00 Flanges			200-mm 8.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	75 [34]	21212-0800R

* For metric flanges, replace last 0 in model number with 4

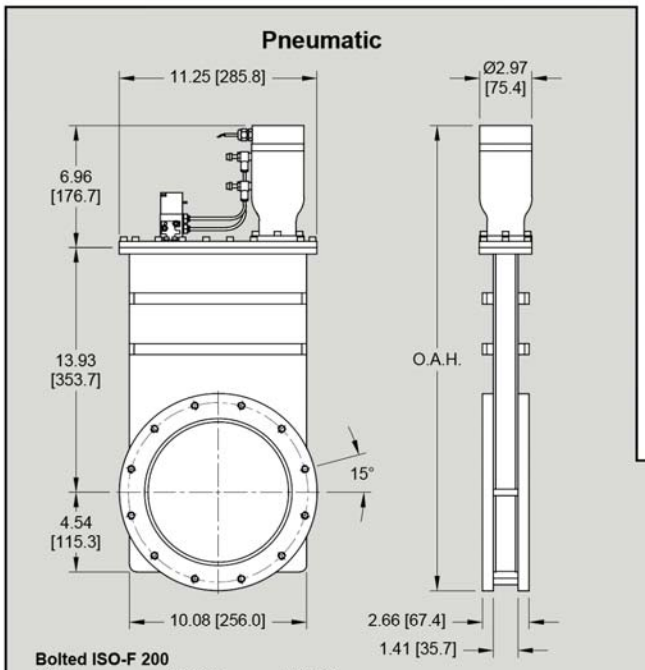
For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range: 1 x 10^{-9} mbar
UHV Pressure Range: 1 x 10^{-10} mbar
Helium Leak Rate: Materials: < 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:
Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

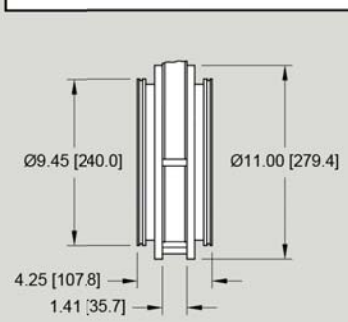
Operating Temperature:
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

**250°C options available on request.*



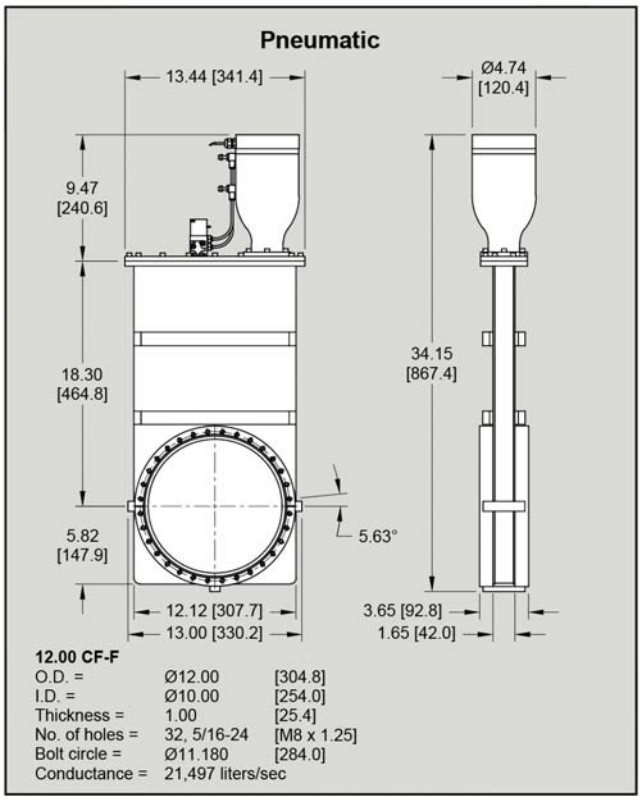
ISO-200 Flanges			200-mm 8.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	75 [34]	21212-0803R
Viton-Viton (HV)	Clamp	95 [43]	21212-0806R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



Overall Height, OAH		
Style	Bolt	Clamp
Pneu.	26.51 [673.4]	26.38 [670.1]

Clamped ISO-K 200
O.D. = Ø9.45 [240.0]
I.D. = Ø8.00 [203.2]
Thickness = .472 [12.0]
No. of clamps = 6-12
Conductance = 9,449 liters/sec



12.00 CF-F

O.D. =	Ø12.00	[304.8]
I.D. =	Ø10.00	[254.0]
Thickness =	1.00	[25.4]
No. of holes =	32, 5/16-24	[M8 x 1.25]
Bolt circle =	Ø11.180	[284.0]
Conductance =	21,497 liters/sec	

CF-F 12.00 Flanges			250-mm 10.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	147 [67]	21212-1000R

* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range:	1 x 10^{-9} mbar
UHV Pressure Range:	1 x 10^{-10} mbar
Helium Leak Rate: Materials:	< 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening:	≤ 30 mbar

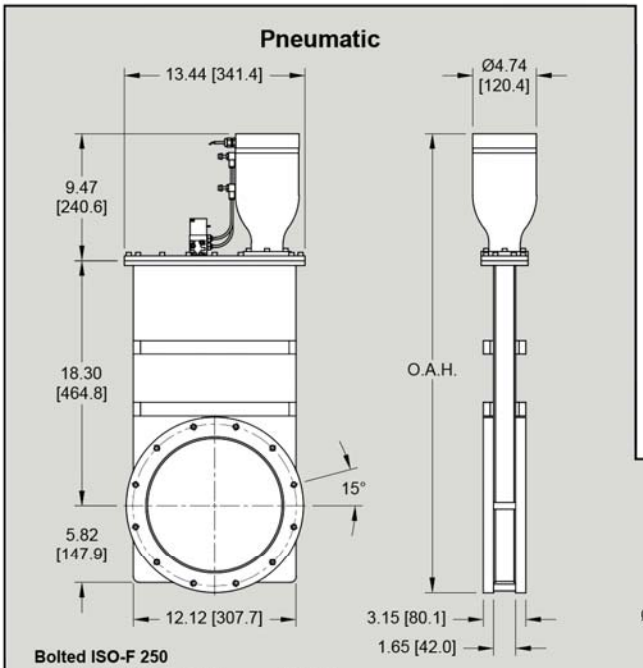
Materials:

Body =	304 Stainless Steel
Gate =	304 Stainless Steel
Drive shaft and pins =	440C hardened stainless steel
Bellows =	AM-350
Actuator =	6061-T6 Aluminum

Operating Temperature:

Body, Gate Open (Viton® / Copper bonnet) =	150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) =	150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) =	60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) =	150°C / 150°C*

**250°C options available on request.*

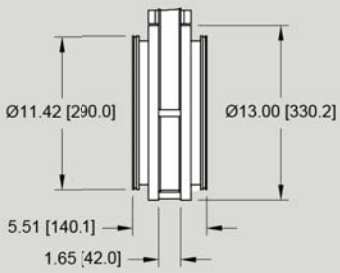


Bolted ISO-F 250

O.D. =	Ø13.19	[335.0]
I.D. =	Ø10.00	[254.0]
Thickness =	.75	[19.1]
No. of holes =	12, M10 x 1.50	
Bolt circle =	Ø12.205	[310.0]
Conductance =	24,990 liters/sec	

ISO-250 Flanges			250-mm 10.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	160 [73]	21212-1003R
Viton-Viton (HV)	Clamp	190 [86]	21212-1006R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



Overall Height, OAH

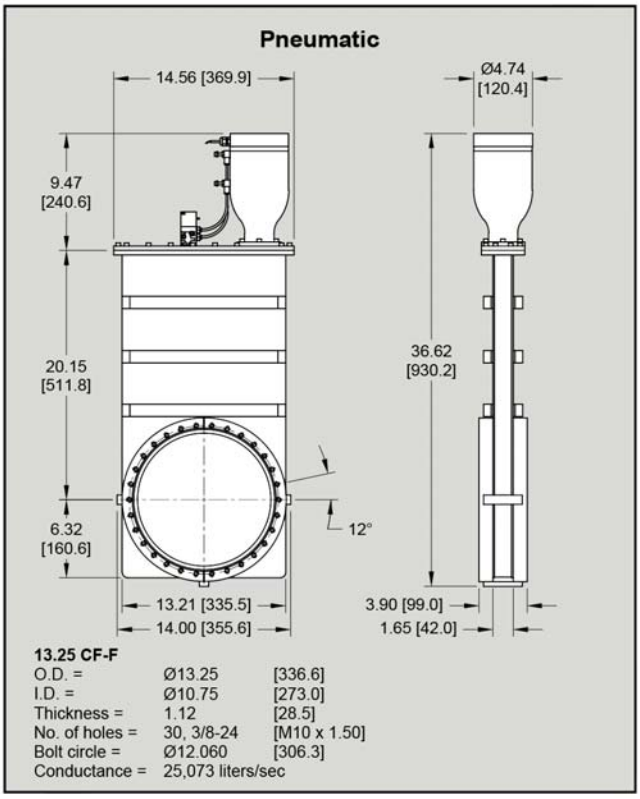
Style	Bolt	Clamp
Pneu.	34.37 [873.0]	34.27 [870.5]

Clamped ISO-K 250

O.D. =	Ø11.42	[290.0]
I.D. =	Ø10.00	[254.0]
Thickness =	.472	[12.0]
No. of clamps =	6-12	
Conductance =	17,537 liters/sec	

21200 Series Million Cycle Gate Valves

273-mm 10.75-inch



CF-F 13.25 Flanges			273-mm 10.75-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	160 [73]	21212-1070R

* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

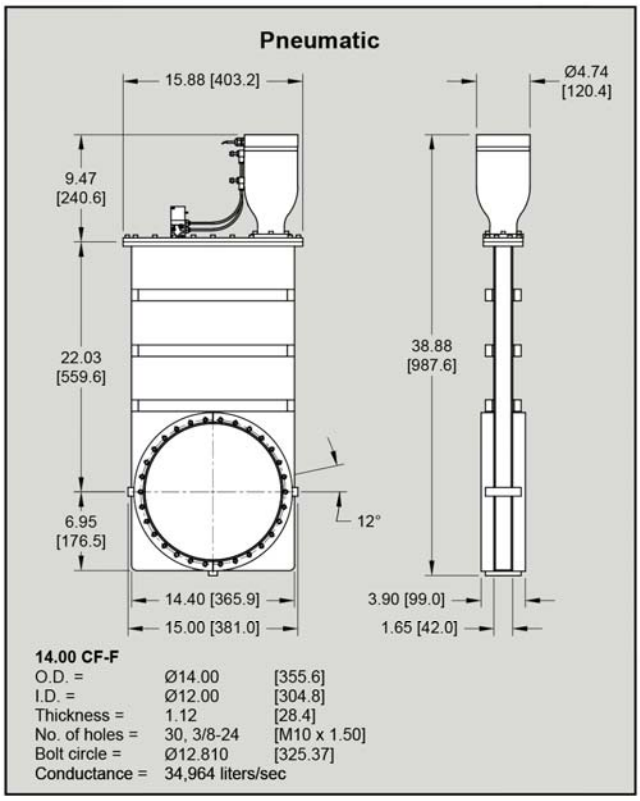
HV Pressure Range: 1 x 10^{-9} mbar
UHV Pressure Range: 1 x 10^{-10} mbar
Helium Leak Rate: Materials: < 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

Operating Temperature:

Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

**250°C options available on request.*



14.00 CF-F

O.D. =	Ø14.00	[355.6]
I.D. =	Ø12.00	[304.8]
Thickness =	1.12	[28.4]
No. of holes =	30, 3/8-24	[M10 x 1.50]
Bolt circle =	Ø12.810	[325.37]
Conductance =	34,964 liters/sec	

CF-F 14.00 Flanges			300-mm 12.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	170 [77]	21212-1200R

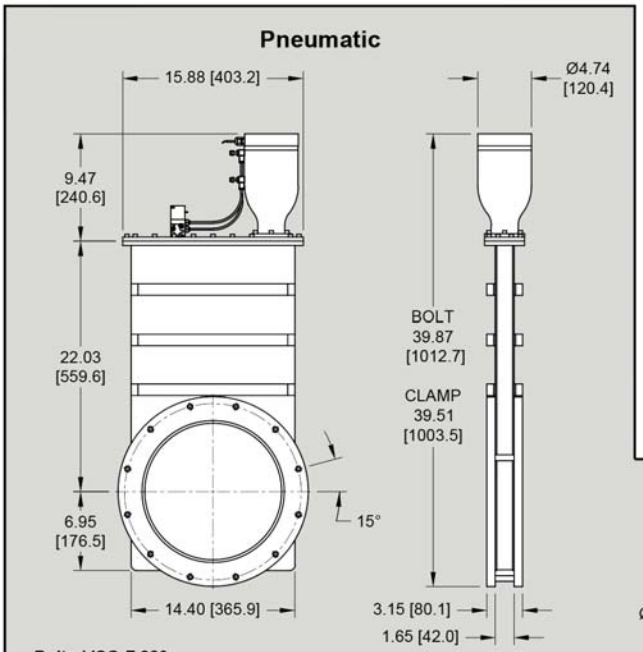
* For metric flanges, replace last 0 in model number with 4

For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

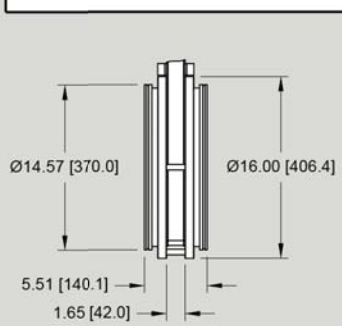
HV Pressure Range:	1 x 10^{-9} mbar
UHV Pressure Range:	1 x 10^{-10} mbar
Helium Leak Rate: Materials:	< 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening:	≤ 30 mbar
Materials:	
Body =	304 Stainless Steel
Gate =	304 Stainless Steel
Drive shaft and pins =	440C hardened stainless steel
Bellows =	AM-350
Actuator =	6061-T6 Aluminum
Operating Temperature:	
Body, Gate Open (Viton® / Copper bonnet) =	150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) =	150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) =	60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) =	150°C / 150°C*

**250°C options available on request.*



Bolted ISO-F 320

O.D. =	Ø16.73	[424.9]
I.D. =	Ø12.00	[304.8]
Thickness =	.75	[19.1]
No. of holes =	12, M12 x 1.75	
Bolt circle =	Ø15.551	[395.0]
Conductance =	43,268 liters/sec	



Clamped ISO-K 320

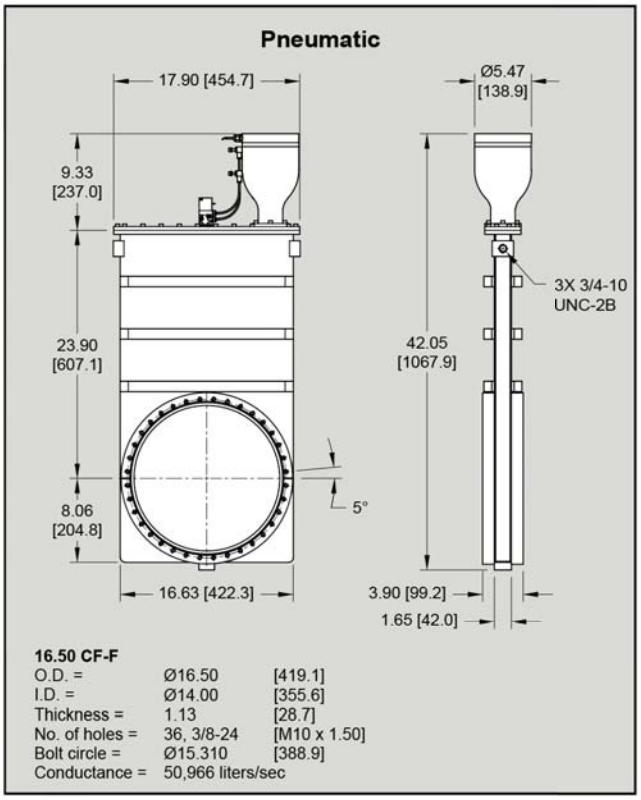
O.D. =	Ø16.00	[406.4]
I.D. =	Ø12.00	[304.8]
Thickness =	.669	[17.0]
No. of clamps =	6-12	
Conductance =	24,735 liters/sec	

ISO-320 Flanges			300-mm 12.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	170 [77]	21212-1203R
Viton-Viton (HV)	Clamp	195 [88]	21212-1206R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

21200 Series Million Cycle Gate Valves

350-mm 14.0-inch / 400-mm 16.0-inch



CF-F 16.50 Flanges			350-mm 14.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	315 [143]	31212-1400R

* For metric flanges, replace last 0 in model number with 4

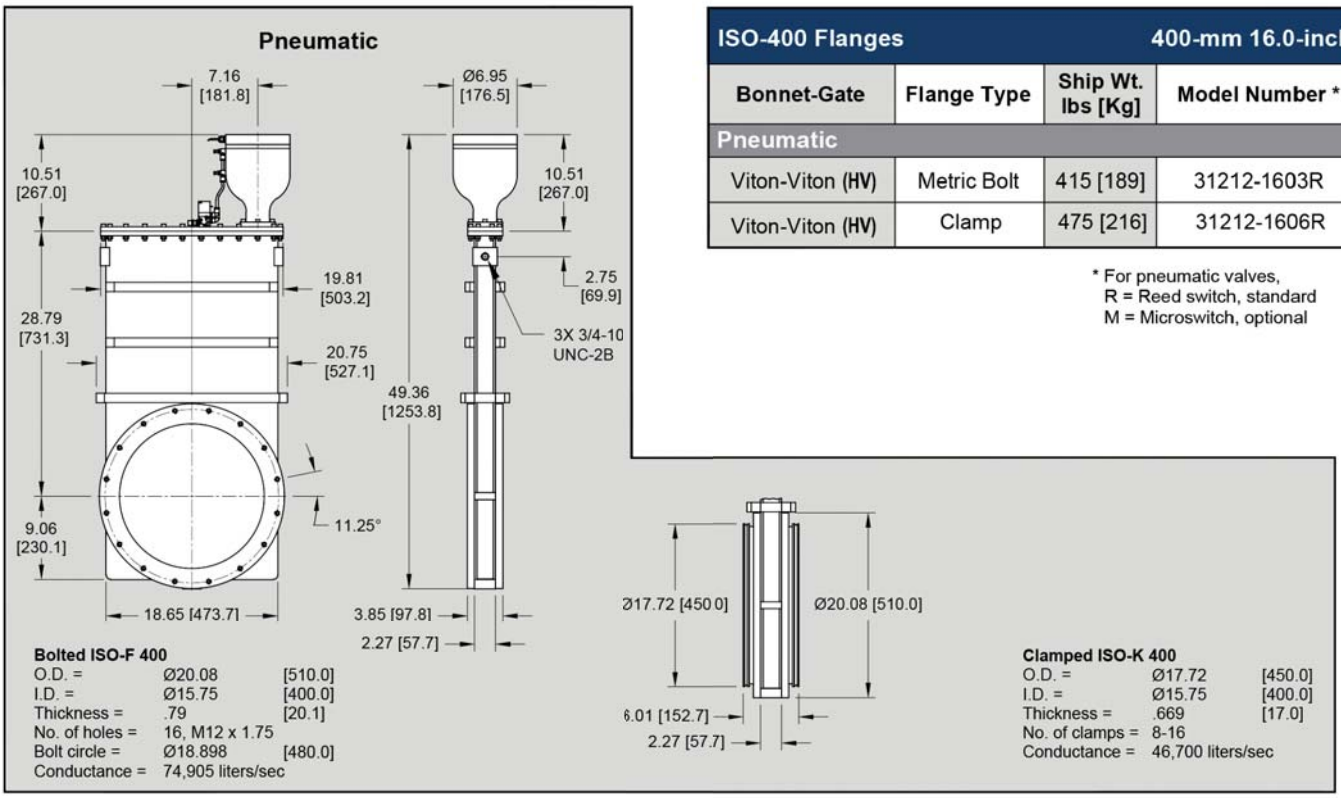
For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range: 1 x 10^{-9} mbar
UHV Pressure Range: 1 x 10^{-10} mbar
Helium Leak Rate: Materials: < 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:
Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

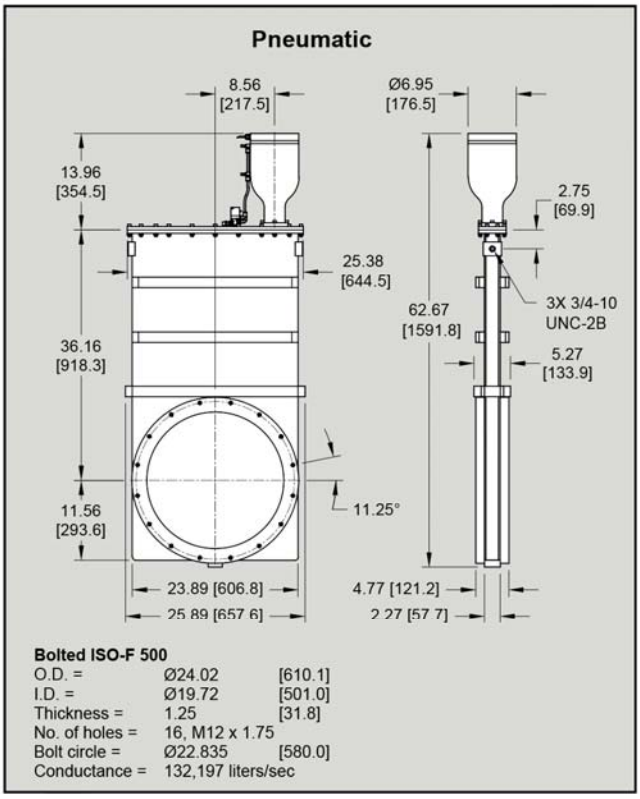
Operating Temperature:
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-400 Flanges			400-mm 16.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	415 [189]	31212-1603R
Viton-Viton (HV)	Clamp	475 [216]	31212-1606R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional



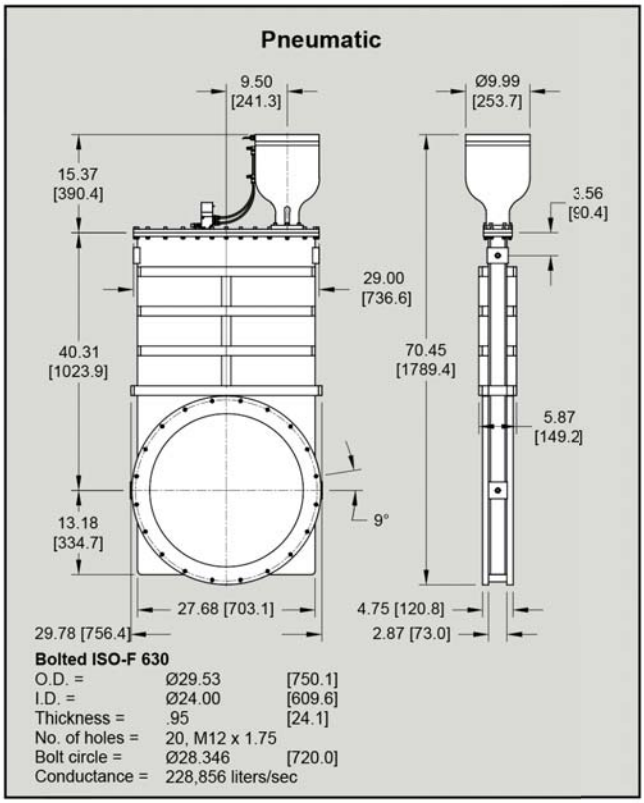
ISO-500 Flanges			500-mm 20.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	680 [309]	31212-2003R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Specifications

HV Pressure Range: 1 x 10^{-9} mbar
UHV Pressure Range: 1 x 10^{-10} mbar
Helium Leak Rate: Materials: < 2 x 10^{-9} mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:
Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum
Operating Temperature:
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

**250°C options available on request.*



ISO-630 Flanges			600-mm 24.0-inch
Bonnet-Gate	**Flange Type**	**Ship Wt. lbs [Kg]**	**Model Number ***
Pneumatic			
Viton-Viton (HV)	Metric Bolt	725 [330]	31212-2403R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

ANSI Flange Models

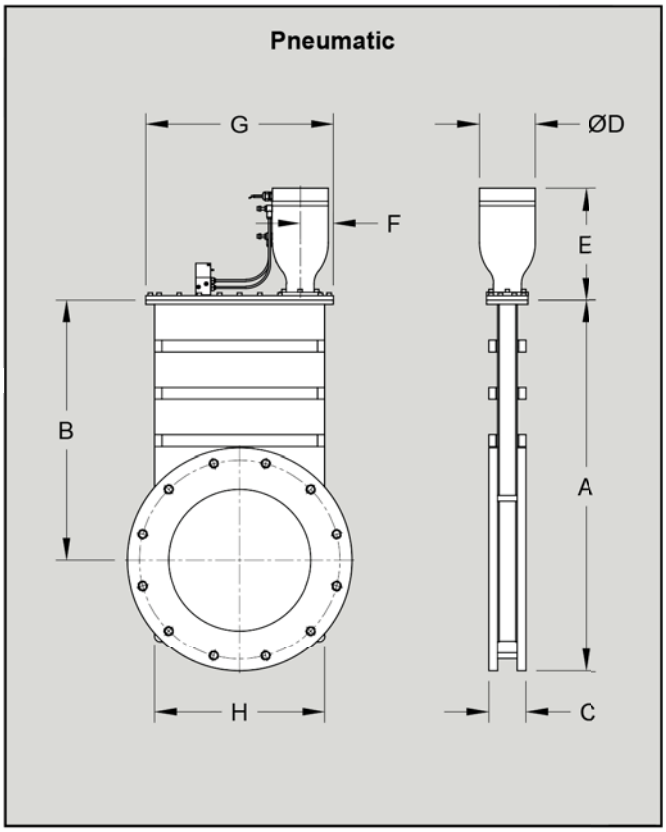
ANSI Flange Models are designed for high vacuum applications, specifically when pressure ranges approximate $1x10^{-9}$ mbar and bakeout temperatures do not exceed 200ºC. The bonnet comes standard with a Viton® elastomer O-ring. These valves provide valving for cryopumps, turbomolecular pumps, ion pumps and other applications requiring clean, low outgassing valves. Pneumatic valves are supplied with a 120 VAC solenoid and a Reed switch position indicator. Standard flanges are smooth faced, non-rotatable and threaded. When O-ring grooves are required on flanges, please specify one of the following options:

- O-ring groove on gate side only
- O-ring groove on carriage side only
- O-ring grooves on both gate side and carriage side

O-ring groove I.D. is 0.250-inch larger than the valve I.D. Flange O-rings are not included with the valve, and may be purchased separately.

JIS and Custom Flange Models

Valves requiring JIS flanges may be obtained through HVA (see page 195). Additionally, other specialty flanges for non-standard installations may be custom ordered through HVA. Contact HVA Technical Services to discuss your requirements.



ANSI Flange Dimensions

MM	Inch	Flange Size	Conductance liter/sec air	No. Holes	Thread	B.C. mm	B.C. inch	O.D. mm	O.D. inch	I.D. mm	I.D. inch
50	2.0	2.0 ANSI	311	4	3/8-16	Ø121	Ø4.75	Ø152	Ø5.97	Ø51	Ø2.00
63	2.5	2.0 ANSI	615	4	3/8-16	Ø121	Ø4.75	Ø152	Ø5.97	Ø64	Ø2.50
75	3.0	2.0 ANSI	1,029	4	3/8-16	Ø121	Ø4.75	Ø152	Ø5.97	Ø76	Ø3.00
75	3.0	3.0 ANSI	1,029	4	3/8-16	Ø152	Ø6.00	Ø190	Ø7.49	Ø76	Ø3.00
100	4.0	4.0 ANSI	2,122	8	3/8-16	Ø190	Ø7.50	Ø229	Ø8.99	Ø102	Ø4.00
150	6.0	6.0 ANSI	7,023	8	3/4-10	Ø241	Ø9.50	Ø279	Ø11.00	Ø152	Ø6.00
200	8.0	6.0 ANSI	14,374	8	3/4-10	Ø241	Ø9.50	Ø279	Ø11.00	Ø203	Ø8.00
200	8.0	8.0 ANSI	14,374	8	3/4-10	Ø298	Ø11.75	Ø343	Ø13.50	Ø203	Ø8.00
250	10.0	10.0 ANSI	24,990	12	3/4-10	Ø362	Ø14.25	Ø406	Ø16.00	Ø254	Ø10.00
273	10.75	10.0 ANSI	31,028	12	3/4-10	Ø362	Ø14.25	Ø406	Ø16.00	Ø273	Ø10.75
300	12.0	10.0 ANSI	43,268	12	3/4-10	Ø362	Ø14.25	Ø406	Ø16.00	Ø305	Ø12.00
300	12.0	12.0 ANSI	43,268	12	3/4-10	Ø432	Ø17.00	Ø483	Ø19.00	Ø305	Ø12.00
350	14.0	14.0 ANSI	68,804	12	3/4-10	Ø476	Ø18.75	Ø533	Ø21.00	Ø356	Ø14.00
400	16.0	14.0 ANSI	74,905	12	3/4-10	Ø476	Ø18.75	Ø533	Ø21.00	Ø406	Ø16.00
400	16.0	16.0 ANSI	74,905	16	3/4-10	Ø540	Ø21.25	Ø597	Ø23.50	Ø406	Ø16.00
450	18.0	16.0 ANSI	106,827	16	3/4-10	Ø540	Ø21.25	Ø597	Ø23.50	Ø457	Ø18.00
450	18.0	18.0 ANSI	106,827	16	3/4-10	Ø578	Ø22.75	Ø635	Ø25.00	Ø457	Ø18.00
500	20.0	20.0 ANSI	130,030	20	1-8	Ø635	Ø25.00	Ø698	Ø27.50	Ø508	Ø20.00
525	21.0	20.0 ANSI	150,188	20	1-8	Ø635	Ø25.00	Ø698	Ø27.50	Ø533	Ø21.00
600	24.0	24.0 ANSI	227,000	20	1-8	Ø749	Ø29.50	Ø813	Ø32.00	Ø610	Ø24.00

*32" ID (DN800) size available.

ANSI Valve Dimensions

Nom I.D.	A	B	C	D	E	F	G	H
50 mm	180	105	52	Ø50	134	31	97	76
2.0 in	7.10	4.12	2.03	Ø1.97	5.29	1.23	3.81	3.00
63 mm	198	122	52	Ø62	134	31	111	90
2.5 in	7.80	4.81	2.03	Ø2.45	5.29	1.23	4.37	3.56
75 mm	222	147	52	Ø62	134	31	125	110
3.0 in	8.76	5.77	2.03	Ø2.45	5.29	1.23	4.94	4.32
75 mm	242	147	52	Ø62	134	31	125	110
3.0 in	9.52	5.77	2.03	Ø2.45	5.29	1.23	4.94	4.32
100 mm	321	207	61	Ø75	177	55	178	145
4.0 in	12.63	8.13	2.41	Ø2.97	6.96	2.17	7.00	5.71
150 mm	410	270	61	Ø75	177	52	222	193
6.0 in	16.14	10.64	2.41	Ø2.97	6.96	2.05	8.75	7.61
200 mm	494	354	70	Ø75	177	57	286	255
8.0 in	19.43	13.93	2.76	Ø2.97	6.96	2.24	11.25	10.08
200 mm	525	345	71	Ø75	177	57	286	255
8.0 in	20.68	13.93	2.78	Ø2.97	6.96	2.24	11.25	10.08
250 mm	668	465	80	Ø120	241	71	341	308
10.0 in	26.30	18.30	3.15	Ø4.74	9.47	2.81	13.44	12.12
273 mm	715	512	80	Ø120	241	71	370	336
10.75 in	28.15	20.15	3.15	Ø4.74	9.47	2.81	14.56	13.21
300 mm	763	560	80	Ø120	241	71	403	363
12.0 in	30.03	22.03	3.15	Ø4.74	9.47	2.81	15.88	14.40
300 mm	801	560	80	Ø120	241	71	403	363
12.0 in	31.53	22.03	3.15	Ø4.74	9.47	2.81	15.88	14.40
350 mm	874	607	93	Ø139	237	71	455	419
14.0 in	34.40	23.90	3.65	Ø5.47	9.33	2.81	17.90	16.63
400 mm	998	731	108	Ø177	267	70	503	474
16.0 in	39.29	28.79	4.27	Ø6.95	10.51	2.75	19.81	18.65
400 mm	1030	731	108	Ø177	267	70	503	474
16.0 in	40.54	28.79	4.27	Ø6.95	10.51	2.75	19.81	18.65
450 mm	1105	806	108	Ø177	355	105	559	524
18.0 in	43.49	31.74	4.27	Ø6.95	13.96	4.13	22.00	20.62
450 mm	1124	806	108	Ø177	355	105	559	524
18.0 in	44.24	31.74	4.27	Ø6.95	13.96	4.13	22.00	20.62
500 mm	1268	918	121	Ø177	355	105	645	604
20.0 in	49.91	36.16	4.77	Ø6.95	13.96	4.13	25.38	23.89
525 mm	1268	918	121	Ø177	355	105	645	604
21.0 in	49.91	36.16	4.77	Ø6.95	13.96	4.13	25.38	23.89
600 mm	1430	1024	136	Ø254	390	127	737	703
24.0 in	56.31	40.31	5.37	Ø9.99	15.37	5.00	29.00	27.68

*32" ID (DN800) size available.

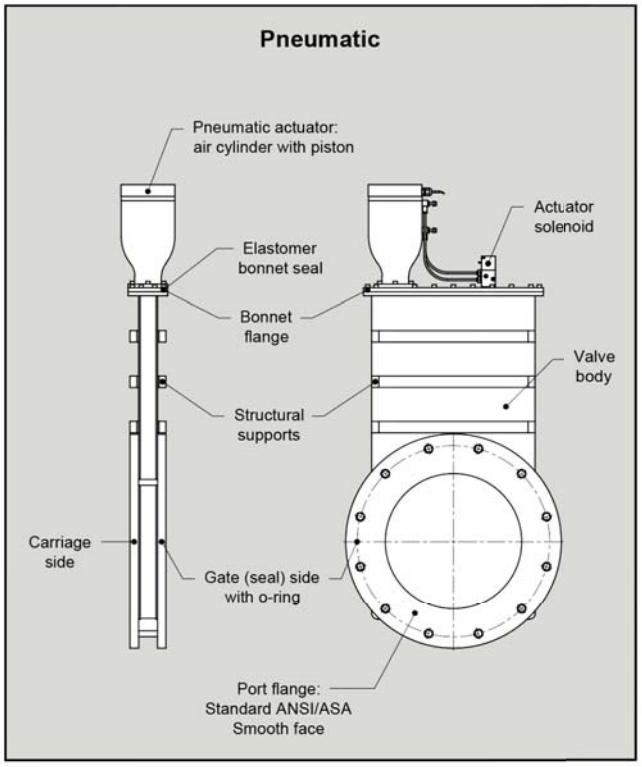
21200 Series Million Cycle Gate Valves

ANSI Valves

ANSI Flanges			Viton Bonnet and Gate
Size inch [mm]	Flange Size	Ship Wt. lbs [Kg]	Model Number *
Pneumatic			
2.0 [50]	2.0 ANSI	13 [6]	21212-0201R
2.5 [63]	2.0 ANSI	18 [8]	21212-0251R
3.0 [75]	2.0 ANSI	22 [10]	21212-0301R
3.0 [75]	3.0 ANSI	22 [10]	21212-0302R
4.0 [100]	4.0 ANSI	33 [15]	21212-0401R
6.0 [150]	6.0 ANSI	50 [23]	21212-0601R
8.0 [200]	6.0 ANSI	75 [34]	21212-0801R
8.0 [200]	8.0 ANSI	75 [34]	21212-0802R
10.0 [250]	10.0 ANSI	160 [73]	21212-1001R
10.75 [273]	10.0 ANSI	160 [73]	21212-1071R
12.0 [300]	10.0 ANSI	170 [77]	21212-1201R
12.0 [300]	12.0 ANSI	180 [82]	21212-1202R
14.0 [350]	14.0 ANSI	315 [143]	31212-1401R
16.0 [400]	14.0 ANSI	415 [189]	31212-1601R
16.0 [400]	16.0 ANSI	435 [198]	31212-1602R
18.0 [450]	16.0 ANSI	520 [234]	31212-1801R
18.0 [450]	18.0 ANSI	530 [241]	31212-1802R
20.0 [500]	20.0 ANSI	680 [309]	31212-2001R
21.0 [525]	20.0 ANSI	680 [309]	31212-2101R
24.0 [600]	24.0 ANSI	725 [330]	31212-2401R

* For pneumatic valves,
R = Reed switch, standard
M = Microswitch, optional

Pneumatic



Specifications

HV Pressure Range: 1×10^{-9} mbar
UHV Pressure Range: 1×10^{-10} mbar
Helium Leak Rate: Materials: $< 2 \times 10^{-9}$ mbar l/s
Maximum Δ Pressure Before Opening: ≤ 30 mbar
Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Drive shaft and pins = 440C hardened stainless steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

Operating Temperature:

Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

**250°C options available on request.*