

16000

Shielded Gate Valves

16000

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Introduction

Product Features

- Shield to protect the gate from process while open
- PTFE wiper removes particulates
- HV and UHV with stainless steel body and internal components
- Sizes from 1.5" ID (DN40) to 14" ID (DN350)
- Manual and 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
- Positive mechanical lock
- Easily customizable to work with almost any application
- Designed, manufactured and assembled in the USA



Model Number 16210-0256R
2.5" ID (DN63) Pneumatic ISO-K

Description

The 16000 Series Shielded Gate Valves feature a travelling shield that moves with the gate to protect it from debris. These valves are used in extremely aggressive applications in which recurring down time is not an option. The shield, used with or without the purge port, greatly reduces particulate migration and prolongs the sealing integrity of the gate O-ring.

The body material is 304 stainless steel, which can be changed to other high temperature, non-corrosive materials for exceptionally aggressive applications. Alternative elastomer O-rings are also available.

The shielded gate valves are generally used in a pneumatically operated system and can also be configured for manual actuation. Standard flanges include CF-F metal seal flanges for UHV applications and KF/ ISO elastomer seal flanges for HV ranges. Other industry flanges or custom designed flanges are available upon request.

Applications

KF Flanges, ISO Bolted and Clamped Flanges, and optional ANSI or JIS Models are designed for high vacuum applications specifically when pressure ranges approximate 1×10^{-9} mbar and bakeout temperatures do not exceed 250°C. The international KF/ISO configurations and elastomer O-ring flanges are used in areas requiring an easily mountable and demountable flange seal. These valves provide valving for cryopumps, turbomolecular pumps, ion pumps and other applications requiring clean, low outgassing valves.

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	1×10^{-9} mbar
UHV	1×10^{-10} mbar
Leak rate	$< 2 \times 10^{-9}$ mbar l/s
Differential pressure	1 bar in either direction
Maximum Δ pressure before opening	≤ 30 mbar

Temperature

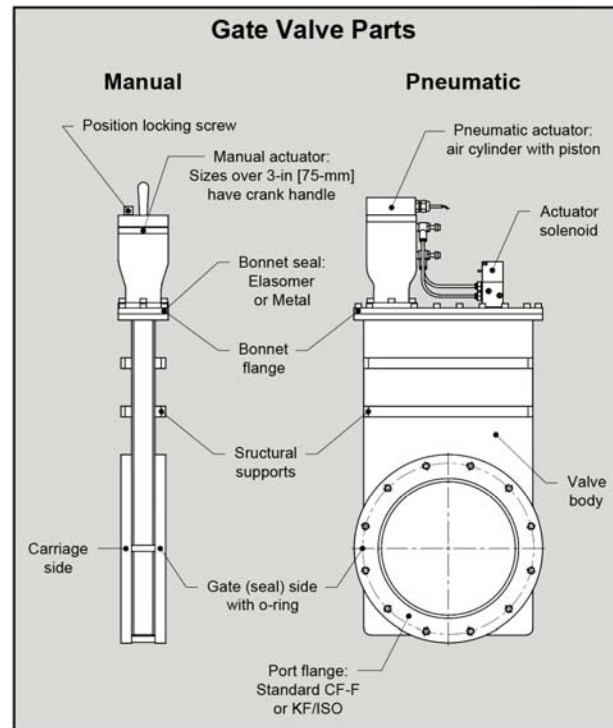
	without solenoid
Elastomer sealed bonnet	150°C
Metal sealed bonnet	
Valve open	200°C
Valve closed	150°C
Actuator	
Pneumatic	60°C

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

(Application dependent) 100,000



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

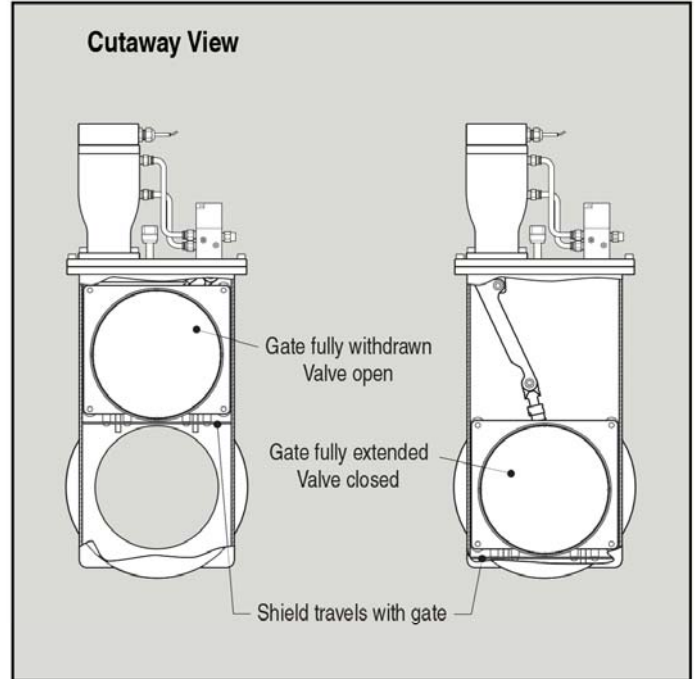
All 16000 Series Valves may be equipped with alternative flanges, solenoids and seals. Contact HVA to discuss your requirements.

- 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

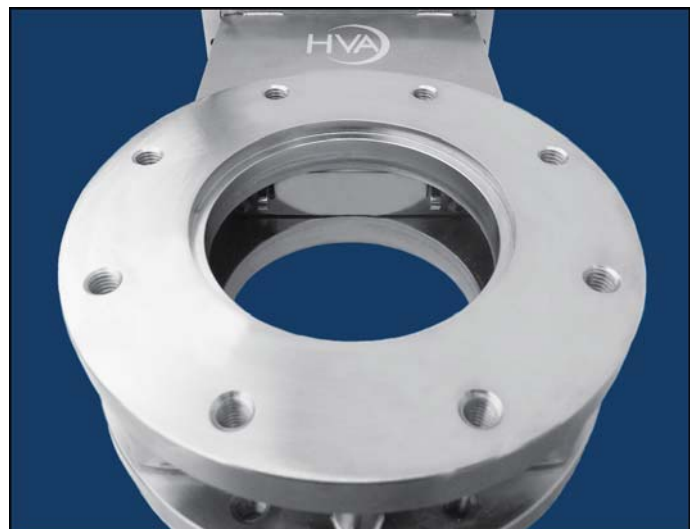
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Theory of Operation

The Shielded Gate Valves incorporate a metal shield that travels with the gate during normal operation. When the gate is fully open, the shield protects the gate from deposition materials. A purge port at the top of the bonnet provides evacuation of gases trapped by the withdrawn gate and shield. When the gate is fully closed, the shield is at the bottom-most part of the valve body and completely out of the way of the gate. The gate closes normally.

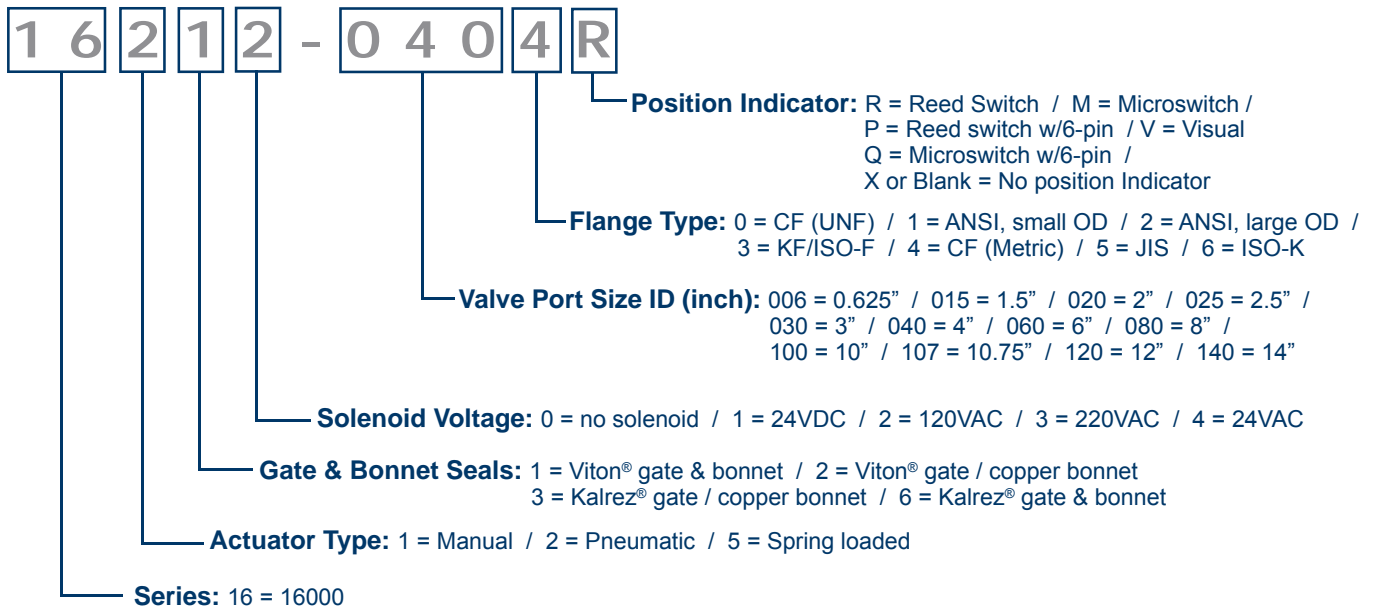


A photo of the valve highlights the shield in the fully open position with the gate and shield withdrawn. This concept can be added to almost any size valve that needs protection from the application process and contaminants originating from process work. In order to ensure even greater protection, there is a Teflon® wiper attached to the shield. In the fully open or withdrawn position, this wiper presses against all sides of the gate valve body interior. This positive fit is not a full seal but it assures that the solid particles that are generated will not migrate onto the gate, gate seal and strong back assembly, which is the transport mechanism behind the gate.





Example: 16212-0404R = 16000 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

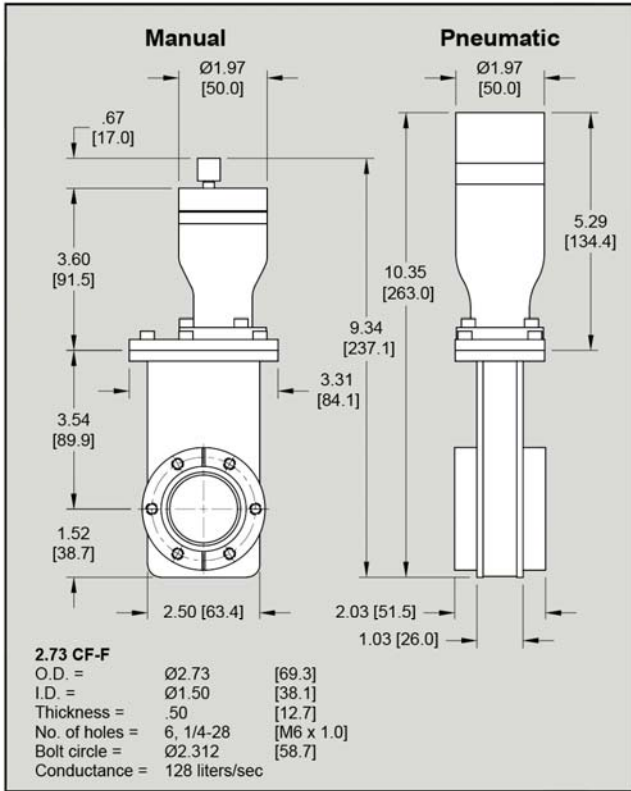
- A suffix of -001 to -999 at the end of or a '9' or 'S' within a Model Number indicates a valve with custom configuration.
- If a roughing/gauge/purge port is needed add the following after the position indicator:
 - A = KF 25
 - B = KF 40
 - C = 1.33" OD CF fixed with thru holes
 - D = 2.75" OD CF fixed with thru holes
 - S = special/custom or other

16000 Series Shielded Gate Valves

40-mm 1.5-inch



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CF-F 2.73 Flanges			40-mm 1.5-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	10 [5]	16110-0150
Copper-Viton (UHV)	U.S. Bolt	10 [5]	16120-0150
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	10 [5]	16212-0150R
Copper-Viton (UHV)	U.S. Bolt	10 [5]	16222-0150R

* 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

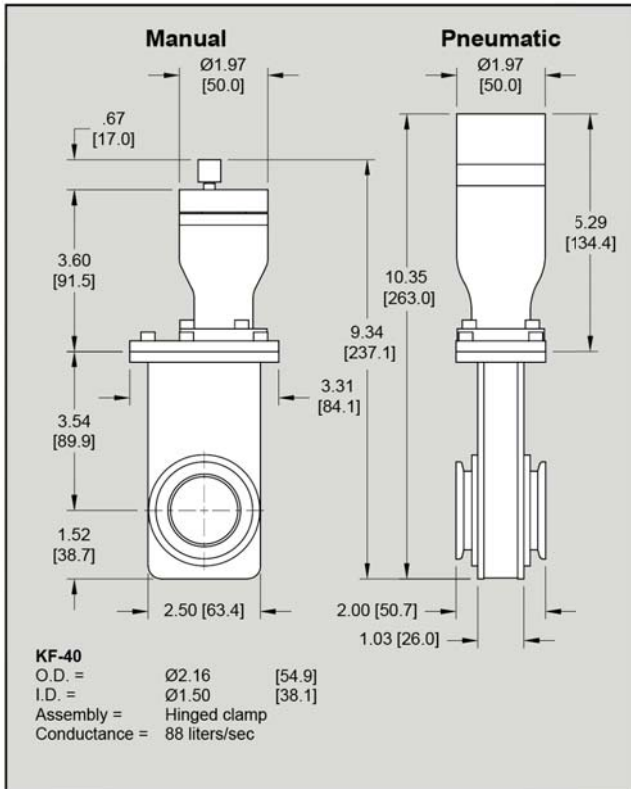
Materials:

- Body = 304 Stainless Steel
- Gate = 304 Stainless Steel
- 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 *
Manual			
Viton-Viton (HV)	Hinged clamp	10 [5]	16110-0153
Pneumatic			
Viton-Viton (HV)	Hinged clamp	10 [5]	16212-0153R

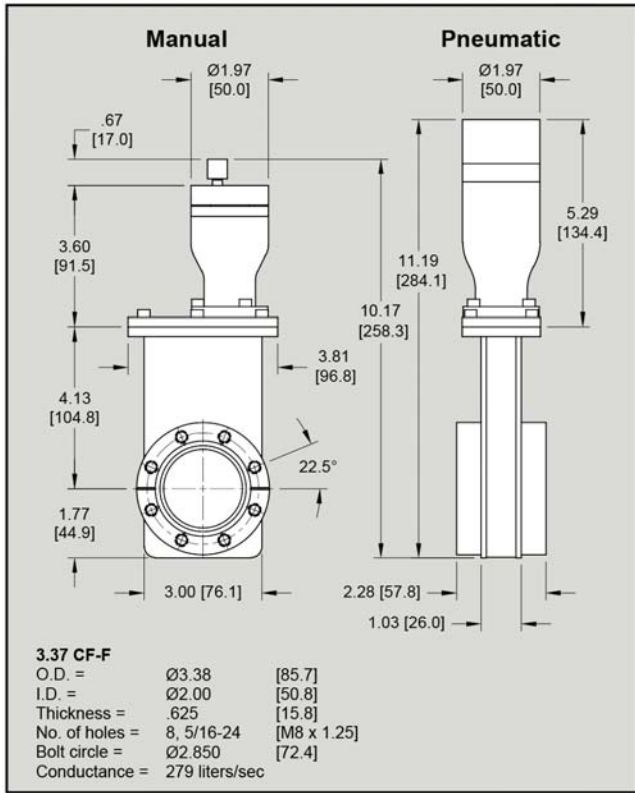
* For pneumatic valves,
 R = Reed switch, standard
 M = Microswitch, optional



16000 Series Shielded Gate Valves

50-mm 2.0-inch

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CF-F 3.37 Flanges		50-mm 2.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	10 [5]	16110-0200
Copper-Viton (UHV)	U.S. Bolt	10 [5]	16120-0200
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	10 [5]	16212-0200R
Copper-Viton (UHV)	U.S. Bolt	10 [5]	16222-0200R

* 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 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

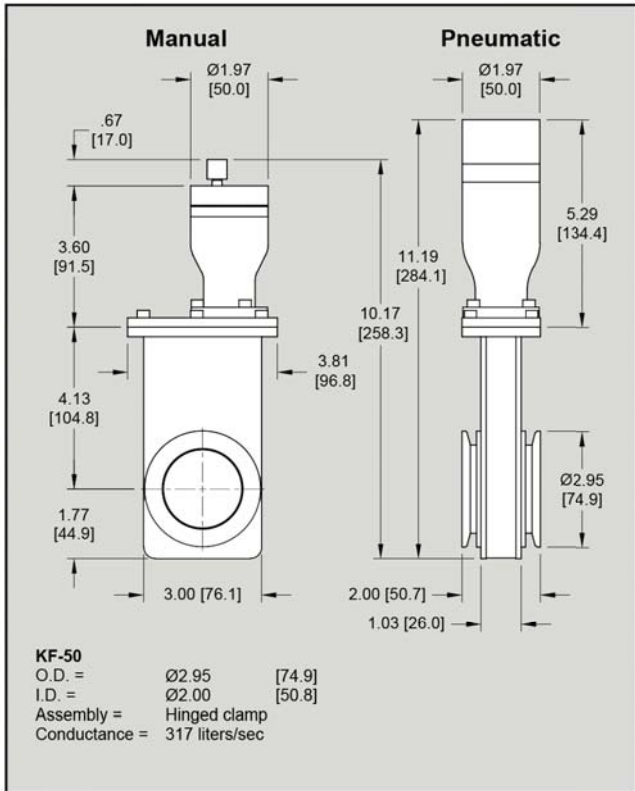
Materials:

- Body = 304 Stainless Steel
- Gate = 304 Stainless Steel
- 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 *
Manual			
Viton-Viton (HV)	Hinged clamp	13 [6]	16110-0203
Pneumatic			
Viton-Viton (HV)	Hinged clamp	13 [6]	16212-0203R

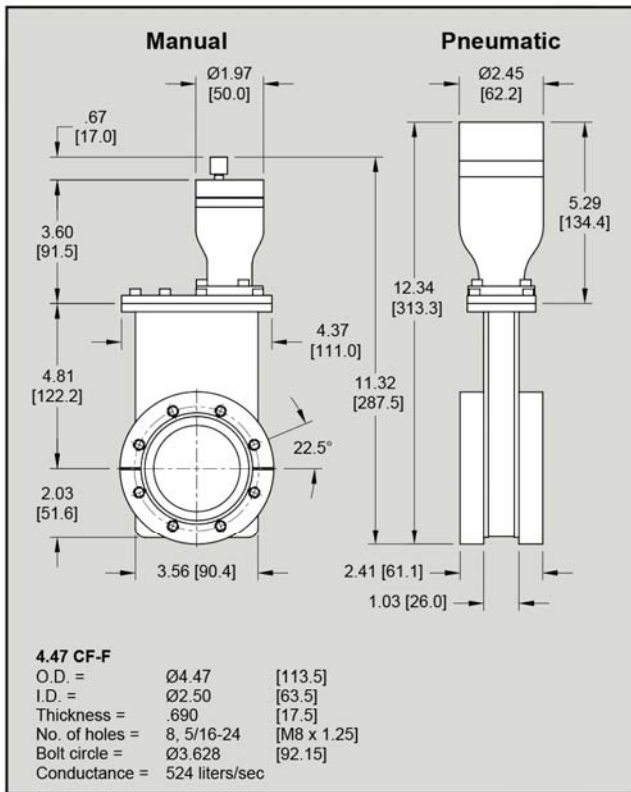
* For pneumatic valves,
 R = Reed switch, standard
 M = Microswitch, optional

16000 Series Shielded Gate Valves

63-mm 2.5-inch



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CF-F 4.47 Flanges			63-mm 2.5-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	10 [5]	16110-0250
Copper-Viton (UHV)	U.S. Bolt	10 [5]	16120-0250
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	10 [5]	16212-0250R
Copper-Viton (UHV)	U.S. Bolt	10 [5]	16222-0250R

* 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 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

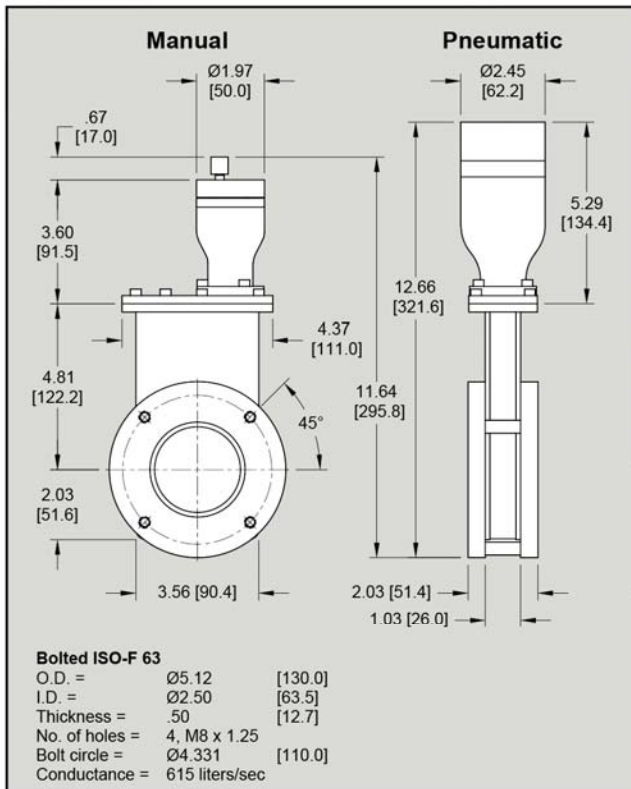
Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

Operating Temperature:

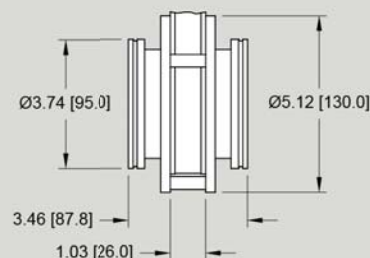
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-63 Flanges			63-mm 2.5-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	18 [8]	16110-0253
Viton-Viton (HV)	Clamp	25 [11]	16110-0256
Pneumatic			
Viton-Viton (HV)	Metric Bolt	18 [8]	16212-0253R
Viton-Viton (HV)	Clamp	25 [11]	16212-0256R

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



Clamped ISO-K 63

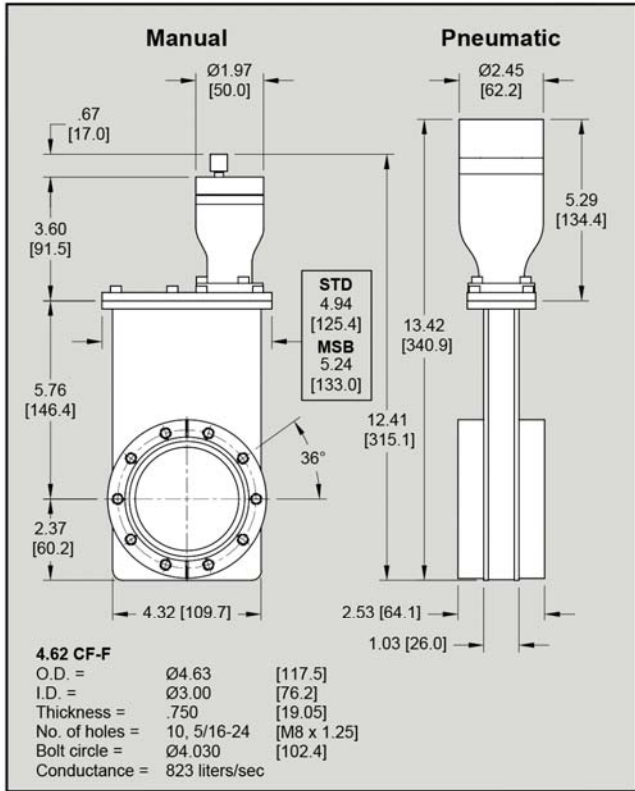
O.D. = Ø3.74 [110.0]
I.D. = Ø2.50 [76.2]
Thickness = .472 [12.0]
No. of clamps = 3-4
Conductance = 363 liters/sec



16000 Series Shielded Gate Valves

75-mm 3.0-inch

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CF-F 4.62 Flanges			75-mm 3.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	22 [10]	16110-0300
Copper-Viton (UHV)	U.S. Bolt	35 [15]	16120-0300
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	22 [10]	16212-0300R
Copper-Viton (UHV)	U.S. Bolt	35 [15]	16222-0300R

* 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:

1×10^{-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

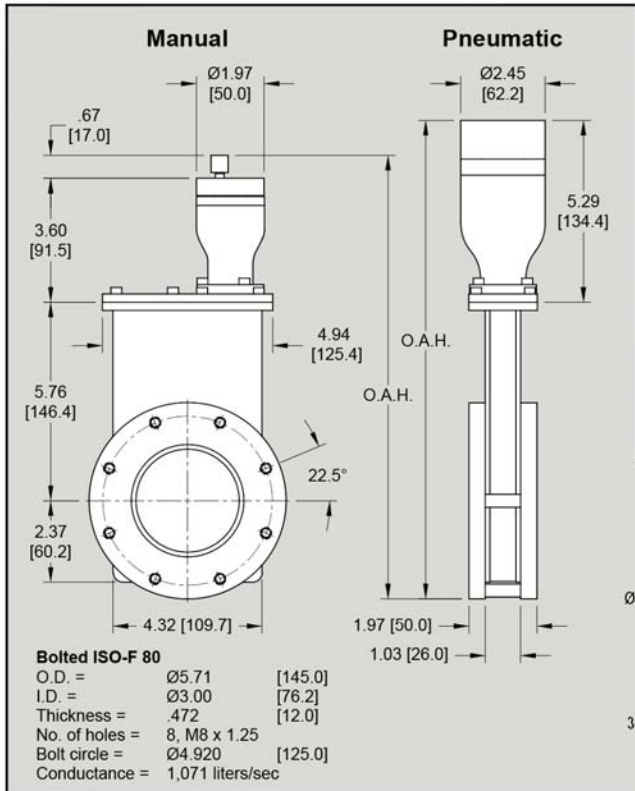
Materials:

- Body = 304 Stainless Steel
- Gate = 304 Stainless Steel
- Bellows = AM-350
- Actuator = 6061-T6 Aluminum

Operating Temperature:

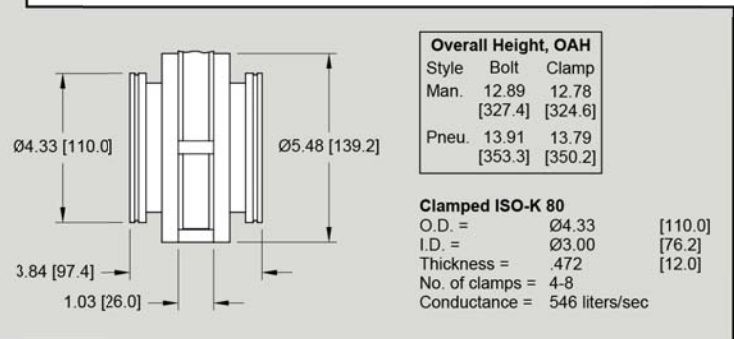
- Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
- Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
- Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
- Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-80 Flanges			75-mm 3.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	22 [10]	16110-0303
Viton-Viton (HV)	Clamp	35 [15]	16110-0306
Pneumatic			
Viton-Viton (HV)	Metric Bolt	22 [10]	16212-0303R
Viton-Viton (HV)	Clamp	35 [15]	16212-0306R

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

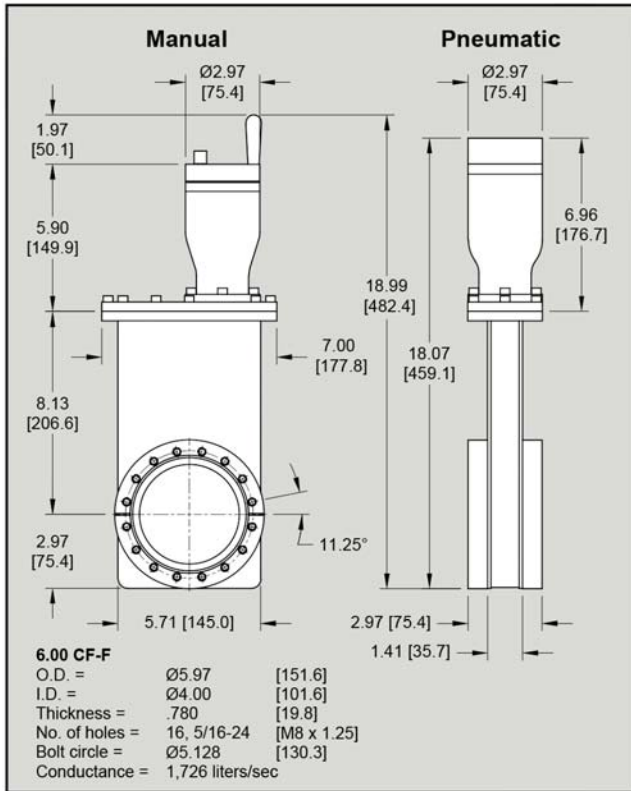


16000 Series Shielded Gate Valves

100-mm 4.0-inch



16000



CF-F 6.00 Flanges			100-mm 4.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	33 [15]	16110-0400
Copper-Viton (UHV)	U.S. Bolt	33 [15]	16120-0400
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	33 [15]	16212-0400R
Copper-Viton (UHV)	U.S. Bolt	33 [15]	16222-0400R

* 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 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

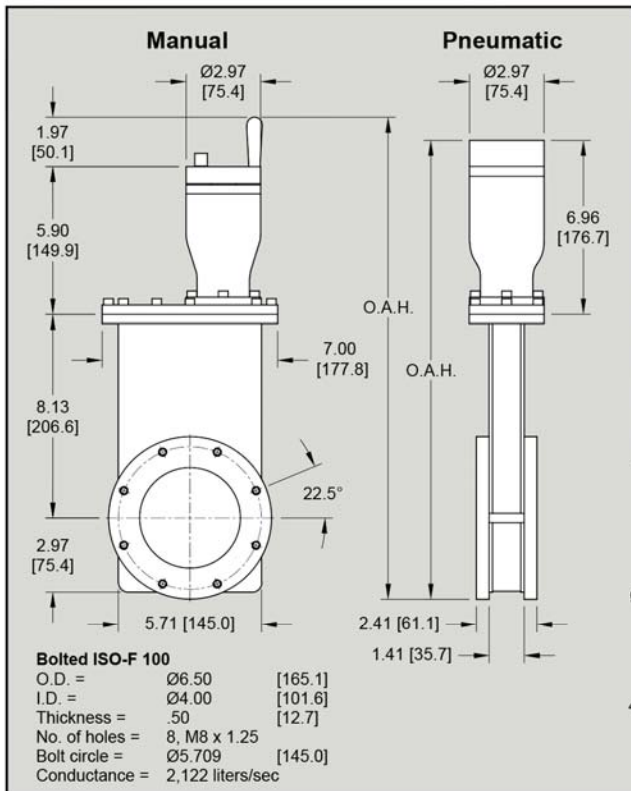
Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

Operating Temperature:

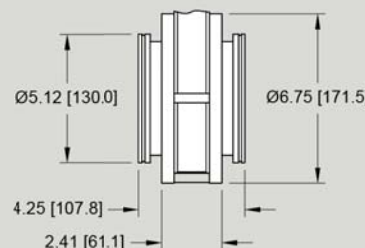
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-100 Flanges			100-mm 4.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	33 [15]	16110-0403
Viton-Viton (HV)	Clamp	43 [20]	16110-0406
Pneumatic			
Viton-Viton (HV)	Metric Bolt	33 [15]	16212-0403R
Viton-Viton (HV)	Clamp	43 [20]	16212-0406R

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



Overall Height, OAH		
Style	Bolt	Clamp
Man.	19.26 [489.2]	19.38 [492.3]
Pneu.	18.34 [465.8]	18.46 [468.9]

Clamped ISO-K 100

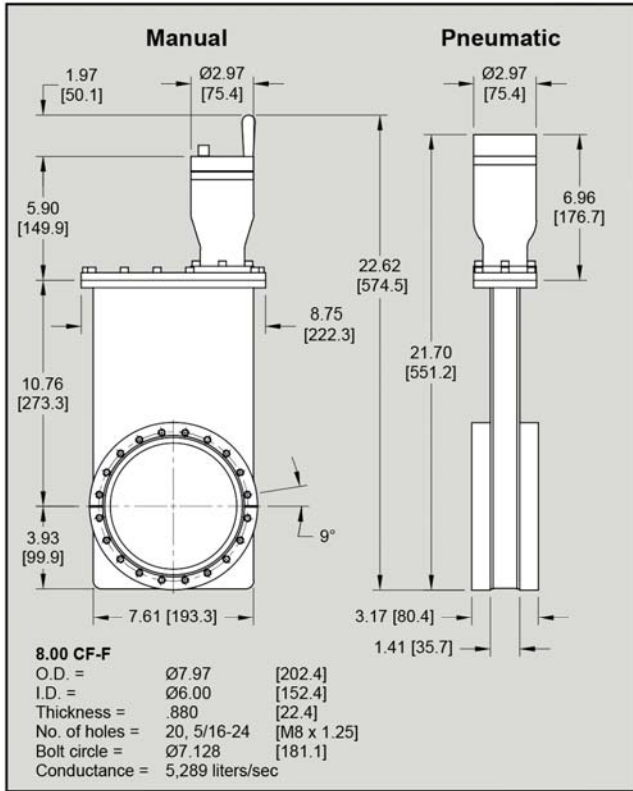
O.D. = Ø5.12 [130.0]
I.D. = Ø4.00 [101.6]
Thickness = .472 [12.0]
No. of clamps = 4-8
Conductance = 1,199 liters/sec



16000 Series Shielded Gate Valves

150-mm 6.0-inch

16000



CF-F 8.00 Flanges			150-mm 6.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	50 [23]	16110-0600
Copper-Viton (UHV)	U.S. Bolt	50 [23]	16120-0600
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	50 [23]	16212-0600R
Copper-Viton (UHV)	U.S. Bolt	50 [23]	16222-0600R

* 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

Bellows = AM-350

Actuator = 6061-T6 Aluminum

Operating Temperature:

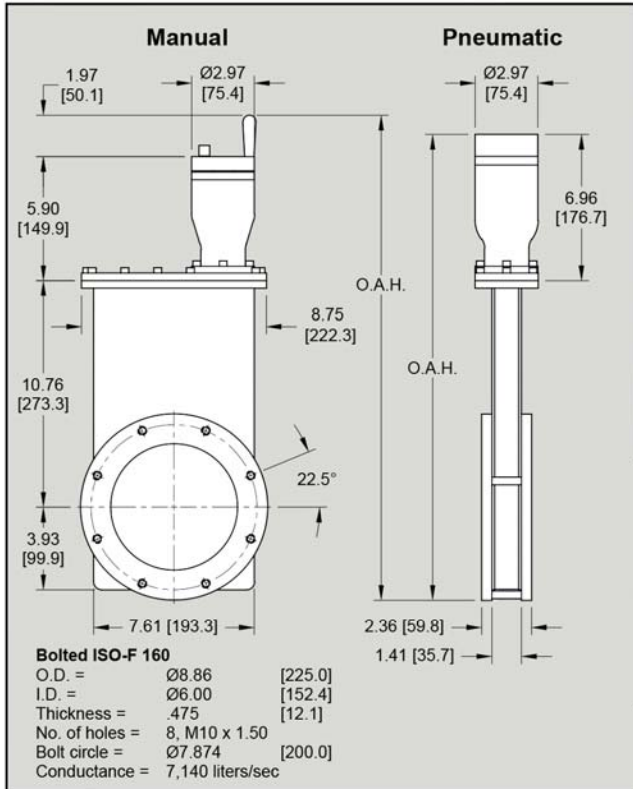
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*

Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*

Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*

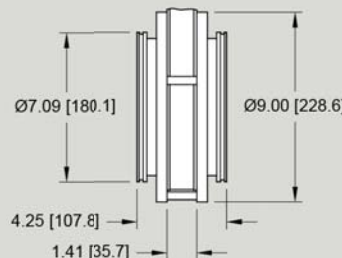
Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-160 Flanges			150-mm 6.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	50 [23]	16110-0603
Viton-Viton (HV)	Clamp	70 [32]	16110-0606
Pneumatic			
Viton-Viton (HV)	Metric Bolt	50 [23]	16212-0603R
Viton-Viton (HV)	Clamp	70 [32]	16212-0606R

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



Overall Height, OAH		
Style	Bolt	Clamp
Man.	23.06 [585.8]	23.13 [587.5]
Pneu.	22.14 [562.4]	22.22 [564.3]

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

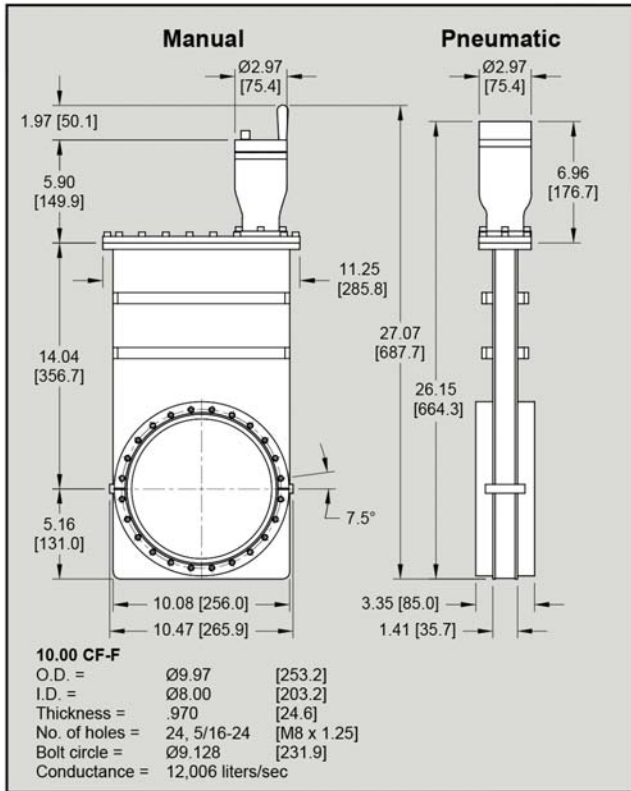
Conductance = 3,967 liters/sec

16000 Series Shielded Gate Valves

200-mm 8.0-inch



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CF-F 10.00 Flanges		200-mm 8.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	75 [34]	16110-0800
Copper-Viton (UHV)	U.S. Bolt	75 [34]	16120-0800
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	75 [34]	16212-0800R
Copper-Viton (UHV)	U.S. Bolt	75 [34]	16222-0800R

* 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

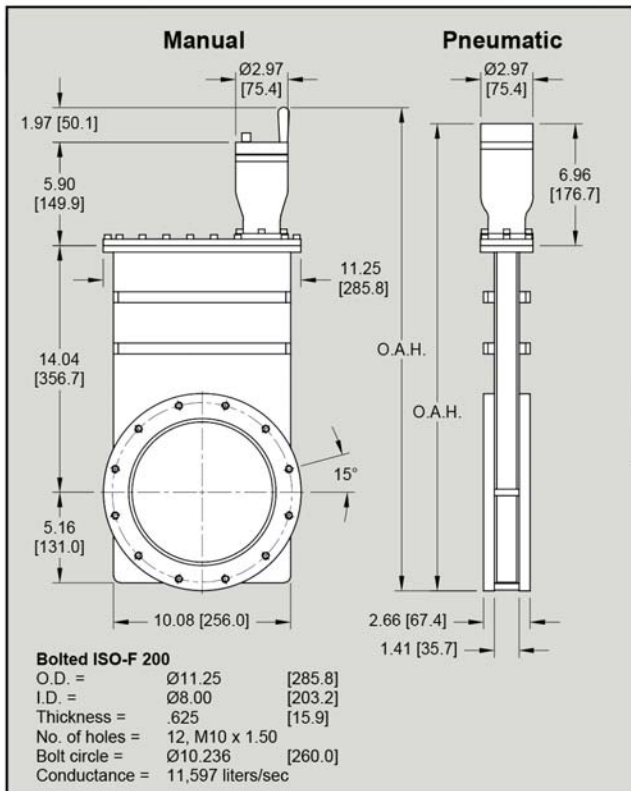
Materials:

- Body = 304 Stainless Steel
- Gate = 304 Stainless Steel
- Bellows = AM-350
- Actuator = 6061-T6 Aluminum

Operating Temperature:

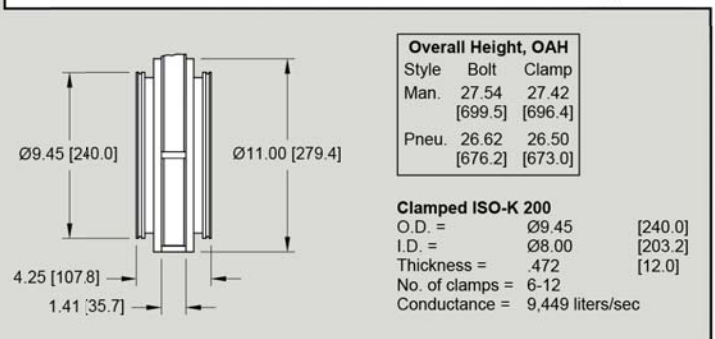
- Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
- Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
- Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
- Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-200 Flanges		200-mm 8.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	75 [34]	16110-0803
Viton-Viton (HV)	Clamp	95 [43]	16110-0806
Pneumatic			
Viton-Viton (HV)	Metric Bolt	75 [34]	16212-0803R
Viton-Viton (HV)	Clamp	95 [43]	16212-0806R

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

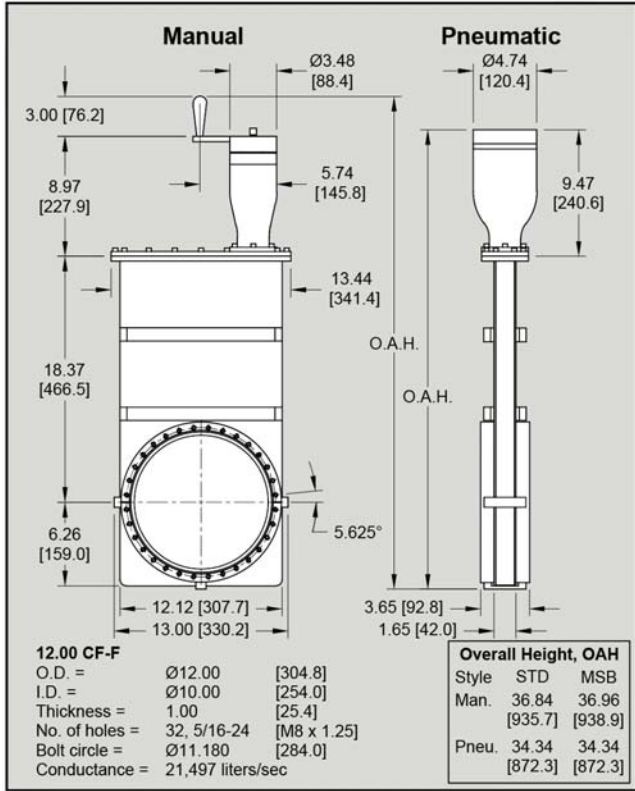




16000 Series Shielded Gate Valves

250-mm 10.0-inch

16000



CF-F 12.00 Flanges		250-mm 10.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	147 [67]	16110-1000
Copper-Viton (UHV)	U.S. Bolt	147 [67]	16120-1000
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	147 [67]	16212-1000R
Copper-Viton (UHV)	U.S. Bolt	147 [67]	16222-1000R

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

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

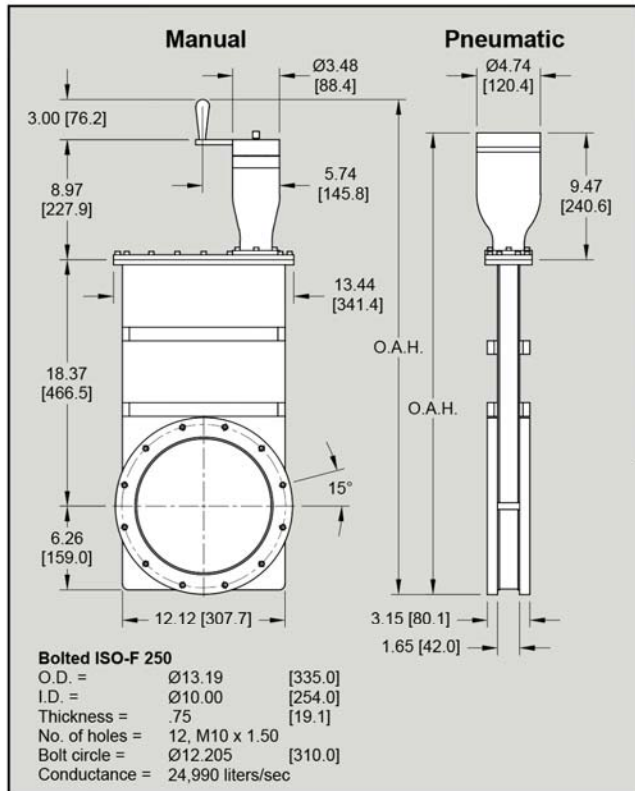
Specifications

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
 Bellows = AM-350
 Actuator = 6061-T6 Aluminum

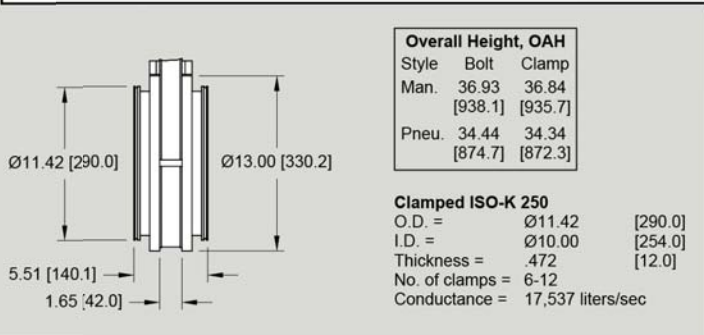
Operating Temperature:
 Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
 Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
 Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
 Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-250 Flanges		250-mm 10.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	160 [73]	16110-1003
Viton-Viton (HV)	Clamp	190 [86]	16110-1006
Pneumatic			
Viton-Viton (HV)	Metric Bolt	160 [73]	16212-1003R
Viton-Viton (HV)	Clamp	190 [86]	16212-1006R

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

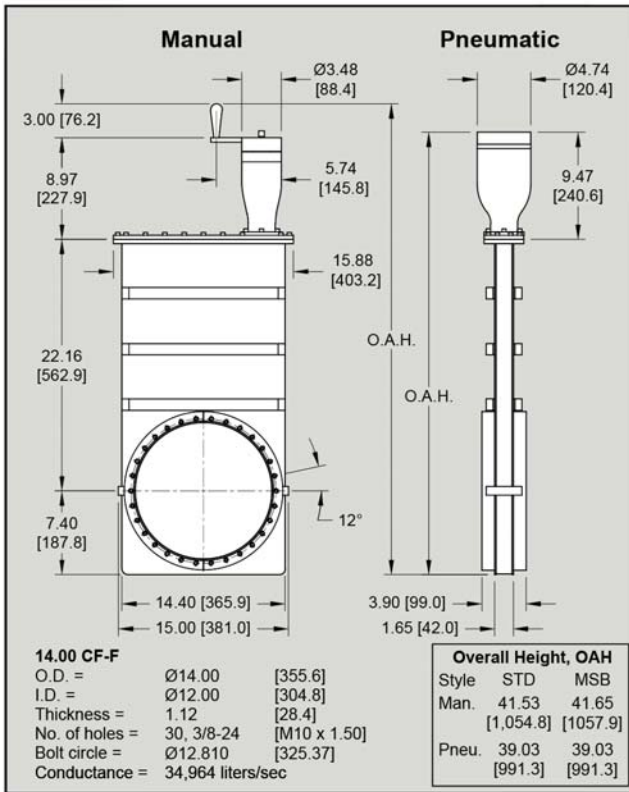


16000 Series Shielded Gate Valves

300-mm 12.0-inch



16000



CF-F 14.00 Flanges		300-mm 12.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	170 [77]	16110-1200
Copper-Viton (UHV)	U.S. Bolt	170 [77]	16120-1200
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	170 [77]	16212-1200R
Copper-Viton (UHV)	U.S. Bolt	170 [77]	16222-1200R

* 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

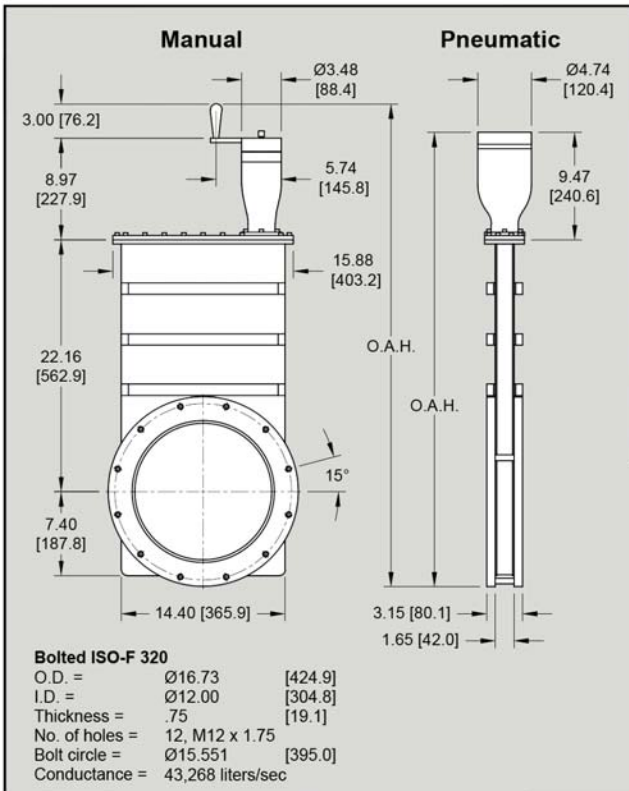
Materials:

Body = 304 Stainless Steel
 Gate = 304 Stainless Steel
 Bellows = AM-350
 Actuator = 6061-T6 Aluminum

Operating Temperature:

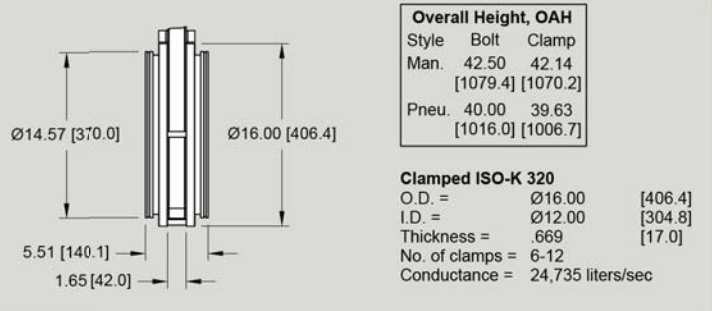
Body, Gate Open (Viton® / Copper bonnet) = 150°C / 200°C*
 Body, Gate Closed (Viton® / Copper bonnet) = 150°C / 150°C*
 Actuator w/out solenoid (Viton® / Copper bonnet) = 60°C / 60°C*
 Position Indicator (Viton® / Copper bonnet) = 150°C / 150°C*

*250°C options available on request.



ISO-320 Flanges		300-mm 12.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	Metric Bolt	170 [77]	16110-1203
Viton-Viton (HV)	Clamp	195 [88]	16110-1206
Pneumatic			
Viton-Viton (HV)	Metric Bolt	170 [77]	16212-1203R
Viton-Viton (HV)	Clamp	195 [88]	16212-1206R

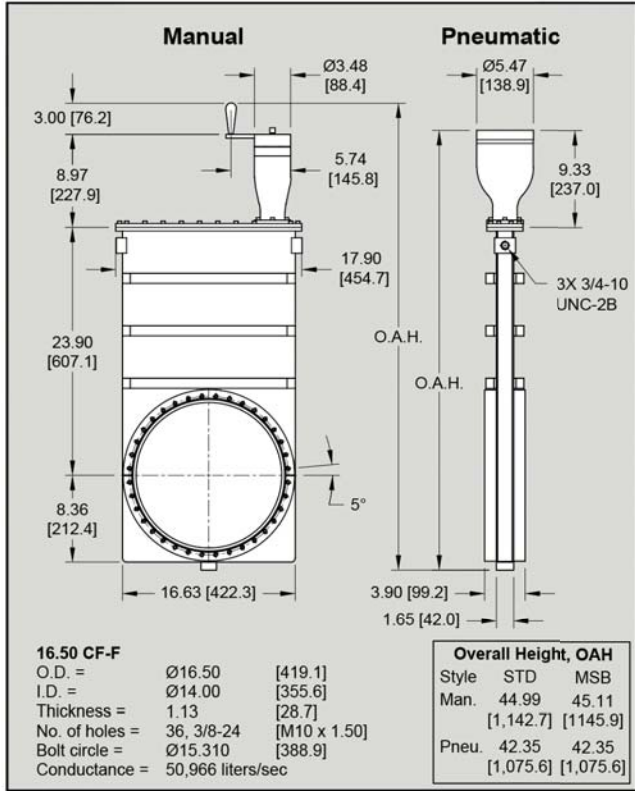
* For pneumatic valves,
 R = Reed switch, standard
 M = Microswitch, optional





16000 Series Shielded Gate Valves

350-mm 14.0-inch



CF-F 16.50 Flanges		350-mm 14.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	315 [143]	16110-1400
Copper-Viton (UHV)	U.S. Bolt	315 [143]	16120-1400
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	315 [143]	16212-1400R
Copper-Viton (UHV)	U.S. Bolt	315 [143]	16222-1400R

* 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

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.

16000

ANSI Flange Models

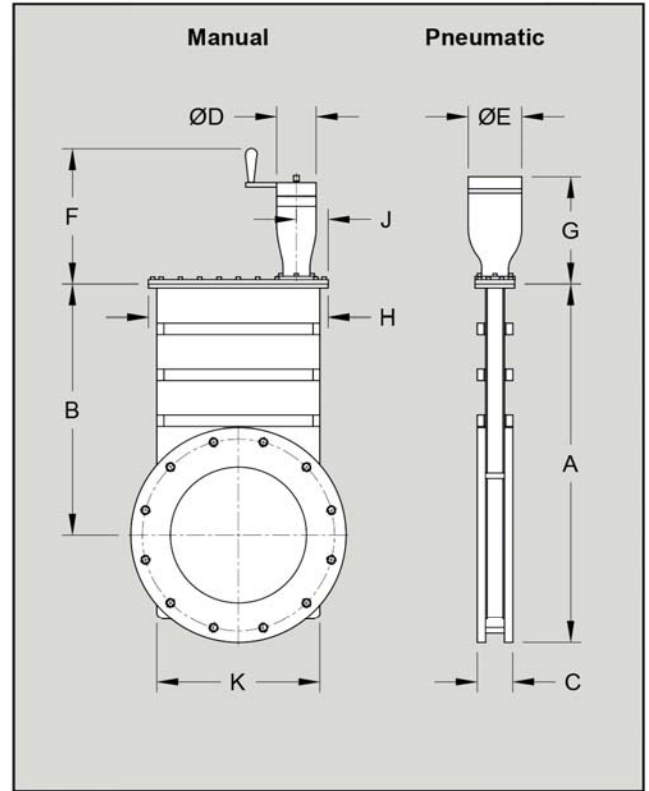
ANSI Flange Models are designed for high vacuum applications, specifically when pressure ranges approximate 1×10^{-9} mbar and bakeout temperatures do not exceed 200°C. The bonnet comes standard with a Viton® elastomer O-ring. These valves provide valving for cryopumps, turbomolecular pumps, ion pumps 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



16000 Series Shielded Gate Valves

ANSI Valve Dimensions

Nom. I.D.	A	B	C	D	E	F	G	H	J	K
50 mm	181	105	52	Ø50	Ø50	108	134	97	31	76
2.0 in	7.12	4.13	2.03	Ø1.97	Ø1.97	4.27	5.29	3.81	1.23	3.00
63 mm	198	122	52	Ø50	Ø62	108	134	111	31	90
2.5 in	7.80	4.81	2.03	Ø1.97	Ø2.45	4.27	5.29	4.37	1.23	3.56
75 mm	222	146	52	Ø50	Ø62	108	134	125	31	110
3.0 in	8.75	5.76	2.03	Ø1.97	Ø2.45	4.27	5.29	4.94	1.23	4.32
75 mm	241	146	52	Ø50	Ø62	108	134	125	31	110
3.0 in	9.51	5.76	2.03	Ø1.97	Ø2.45	4.27	5.29	4.94	1.23	4.32
100 mm	321	207	61	Ø75	Ø75	200	177	178	55	145
4.0 in	12.63	8.13	2.41	Ø2.97	Ø2.97	7.87	6.96	7.00	2.17	5.71
150 mm	413	273	61	Ø75	Ø75	200	177	222	52	193
6.0 in	16.26	10.76	2.41	Ø2.97	Ø2.97	7.87	6.96	8.75	2.05	7.61
200 mm	496	357	70	Ø75	Ø75	200	177	286	57	255
8.0 in	19.54	14.04	2.76	Ø2.97	Ø2.97	7.87	6.96	11.25	2.24	10.08
200 mm	528	357	71	Ø75	Ø75	200	177	286	57	255
8.0 in	20.79	14.04	2.78	Ø2.97	Ø2.97	7.87	6.96	11.25	2.24	10.08
250 mm	670	467	80	Ø88	Ø120	304	241	341	71	308
10.0 in	26.37	18.37	3.15	Ø3.48	Ø4.74	11.97	9.47	13.44	2.81	12.12
300 mm	766	563	80	Ø88	Ø120	304	241	403	71	363
12.0 in	30.16	22.16	3.15	Ø3.48	Ø4.74	11.97	9.47	15.88	2.81	14.40
300 mm	804	563	80	Ø88	Ø120	304	241	403	71	363
12.0 in	31.66	22.16	3.15	Ø3.48	Ø4.74	11.97	9.47	15.88	2.81	14.40
350 mm	874	607	93	Ø88	Ø139	304	237	455	71	419
14.0 in	34.40	23.90	3.65	Ø3.48	Ø5.47	11.97	9.33	17.90	2.81	16.63

16000

16000 Series Shielded Gate Valves

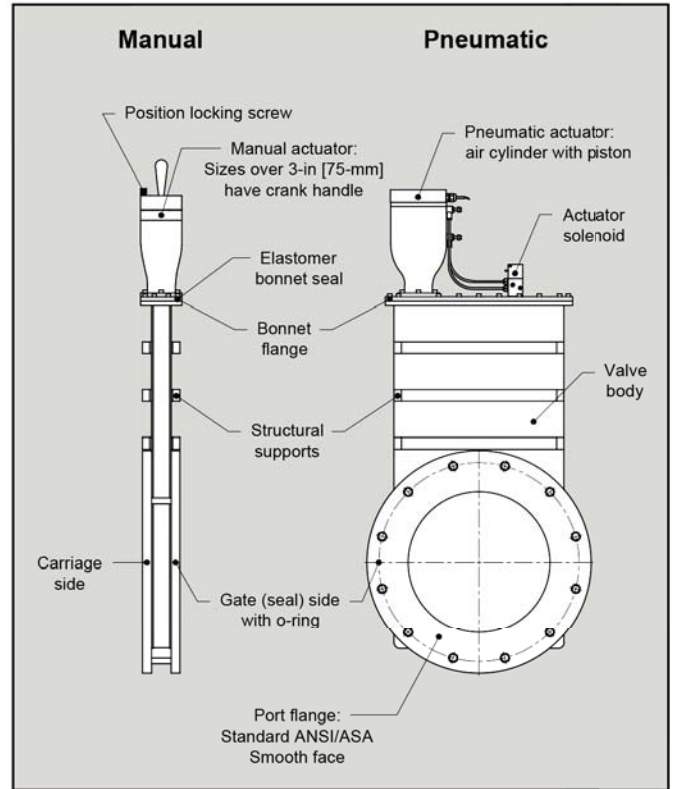
ANSI Valves



16000

ANSI Flanges		Viton Bonnet and Gate	
Size inch [mm]	Flange Size	Ship Wt. lbs [Kg]	Model Number *
Manual			
2.0 [50]	2.0 ANSI	13 [6]	16110-0201
2.5 [63]	2.0 ANSI	18 [8]	16110-0251
3.0 [75]	2.0 ANSI	22 [10]	16110-0301
3.0 [75]	3.0 ANSI	22 [10]	16110-0302
4.0 [100]	4.0 ANSI	33 [15]	16110-0401
6.0 [150]	6.0 ANSI	50 [23]	16110-0601
8.0 [200]	6.0 ANSI	75 [34]	16110-0801
8.0 [200]	8.0 ANSI	75 [34]	16110-0802
10.0 [250]	10.0 ANSI	160 [73]	16110-1001
10.75 [273]	10.0 ANSI	160 [73]	16110-1071
12.0 [300]	10.0 ANSI	170 [77]	16110-1201
12.0 [300]	12.0 ANSI	180 [82]	16110-1202
14.0 [350]	14.0 ANSI	315 [143]	16110-1401
Pneumatic			
2.0 [50]	2.0 ANSI	13 [6]	16212-0201R
2.5 [63]	2.0 ANSI	18 [8]	16212-0251R
3.0 [75]	2.0 ANSI	22 [10]	16212-0301R
3.0 [75]	3.0 ANSI	22 [10]	16212-0302R
4.0 [100]	4.0 ANSI	33 [15]	16212-0401R
6.0 [150]	6.0 ANSI	50 [23]	16212-0601R
8.0 [200]	6.0 ANSI	75 [34]	16212-0801R
8.0 [200]	8.0 ANSI	75 [34]	16212-0802R
10.0 [250]	10.0 ANSI	160 [73]	16212-1001R
10.75 [273]	10.0 ANSI	160 [73]	16212-1071R
12.0 [300]	10.0 ANSI	170 [77]	16212-1201R
12.0 [300]	12.0 ANSI	180 [82]	16212-1202R
14.0 [300]	14.0 ANSI	315 [143]	16212-1401R

* 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

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.