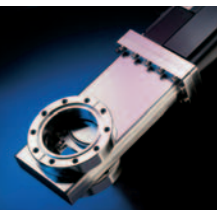


Gate Valves

Introduction


MDC

Section 2.1

Valves


In the simplest of terms, vacuum gate valves are devices that regulate the flow of gases, fluids or materials through a structure or aperture by opening, closing or obstructing a port or passageway. Gate valve assemblies consist of three key components: an actuator, a carriage/gate and a valve body. The actuator provides the power to position or transport the valve's carriage/gate. The actuator is attached to the valve's body via a rectangular bonnet flange. The gate closes or opens one of the valve's body ports. The valve body is a vacuum tight chamber that is screwed, flanged or welded into a larger vacuum vessel or system. It is worth noting that reliable vacuum valves were not commercially available until the late 1940s with the advent of O-ring elastomer seals. The elastomer O-ring was developed during WWII for use in aircraft hydraulic systems, and was soon thereafter adopted by the vacuum community as the standard means

of making vacuum seals. Prior to this it was common practice, even in large research establishments, to upgrade general service valves for vacuum use by winding actuator shaft gaskets from string soaked in an Apiezon grease. MDC stainless steel vacuum gate valves incorporate patented C-Loc® and Uni-Loc™ gate valve locking mechanisms. No contact is made between a valve's body and the locking mechanism, a feature which markedly decreases vibration and insures smooth valve operation. MDC gate valves require about half the number of moving parts found in comparable competitor valves. This reduction in moving components minimizes wear and particulate generation which in turn provides valves of superior performance and reliability. The valves' low outgassing characteristics can be attributed to a fusion welded 300 series stainless steel body, welded AM-350 stainless steel nesting bellows as well as small cross-section O-rings and the elimination of blind internal cavities. MDC circular gate valves are offered in various sizes ranging from .625" to 12" port diameters. Standard port mounts include: Del-Seal™ CF metal seal flanges, which are recommended for ultrahigh vacuum service; ISO Kwik-Flange™ and ISO Large-Flange™ fast make and break elastomer sealed flanges, ideal for high vacuum applications requiring frequent assembly and disassembly; and ANSI ASA elastomer seal port flanges for use in high vacuum applications where ANSI standards are specified. Gate valve actuation is available in both manual and electropneumatic configurations. Custom designed valves are available on request.

All dimensions in this catalog are given in inches unless specified otherwise.

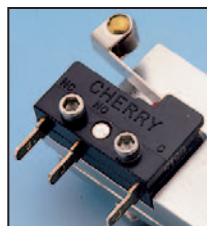
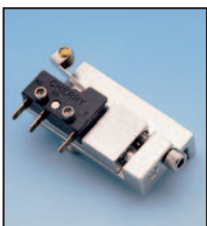
Gate Valve Standard Features

- UHV and HV series
- Ports with circular or rectangular apertures
- Del-Seal™ CF, ISO Kwik-Flange™, ISO Large-Flange™ or ANSI ASA port flanges
- Manual and Electropneumatic actuators
- Patented C-Loc® and Uni-Loc™ locking mechanism
- 120VAC air control solenoid valve (Circular gate valves)
- 24VDC air control solenoid valve (Rectangular gate valves)
- OFE copper metal and Viton® elastomer bonnet seals
- Welded bellows actuator seal
- TIG welded internal body joints
- Electropolished interior and exterior surfaces
- Dry film lubricated bearings

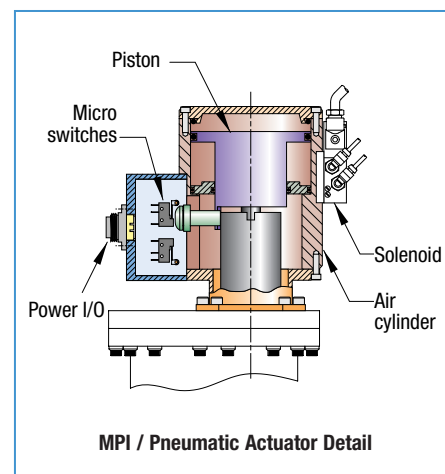
Gate Valve Optional Features

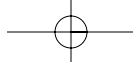
- Modular Electromechanical position indicators
- Air control solenoid valves for 240VAC and 24VDC service
- Valve body roughing ports
- High temperature 250°C Kalrez® elastomer gate seal

Mechanical Position Indicator Option -01



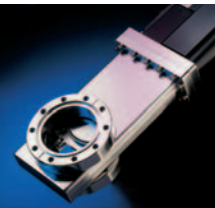
MDC circular C-Loc® gate valves can be fitted with optional high precision, modular mechanical position indicators (MPI). This new MPI system consists of two single pole double throw micro switches fitted with integral hinged lever and roller actuators. Each micro switch is wired in a normally open position. Normally closed switches are available on request, and easily modified by reversing standard factory wiring. Precise positioning of each micro switch is possible by a patented vernier mechanism found only on MDC gate valves. MPI connections are made via industry standard seven pin circular threaded connectors supplied with mating female cable connectors. All pneumatic valves include solenoids pre-wired through MPI connector box.





Gate Valves Options

Section 2.1



Air Control Solenoid Valve Option -03 and -09



MDC circular gate valves fitted with standard electropneumatic actuators are equipped with Humphrey 410 series 120VAC 50/60Hz air control solenoid valves. AC/DC power consumption is 4.0 watts. Optional 24VDC or 240VAC solenoid valves are available on request. All solenoid valves are fitted with DIN type connectors that conform to international standards. DIN connectors provide simplicity, convenience and fast, easy electrical installation. Solenoid valves come standard with push button/spring return manual override. Manual override is located at top of

solenoid and identified by a prominent red push button. Solenoid valves are designed for use with compressed air from 0 to 100psig. Air should be clean and uncontaminated. When in doubt, install a filter with filtering capacity of 40 microns. Periodically remove and clean or replace filter element. All solenoid electrical leads are pre-wired to MPI box connector.

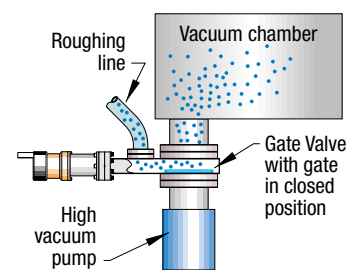
Caution: Check voltage label on solenoid before connecting power. Do not separate coil portion (black) from body (aluminum).

Roughing Port Option -04, -05 and -06

With the exception of the .625 inch gate valve, all valves can be fitted with roughing ports. Valves with Del-Seal™ CF and ANSI ASA port flanges are supplied with Del-Seal™ CF roughing port flanges. All Del-Seal™ CF roughing ports are tapped. Valves with metric port flanges have Del-Seal™ CF roughing port flanges with metric tapped holes. Gate valves fitted with ISO Kwik and ISO Large port flanges are supplied with ISO Kwik roughing port flanges. Roughing ports will be installed on the side opposite the

gate seal (the carriage side of the valve). Although the location of the roughing port does not affect its function, the positioning of the gate is important. A roughing port provides a path to a vacuum chamber through the gate valve body. With the gate closed, the valve body and chamber may be evacuated by a vacuum roughing pump.

Typical Installation



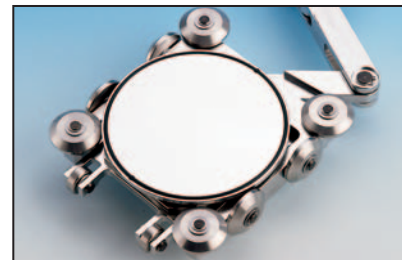
Standard gate valve roughing ports include:

Option-04	1.5" to 3.0" valves	.75" port	1.33 Del-Seal™ CF or ISO-NW16 Kwik-Flange™
Option-05	4.0" to 8.0" valves	1.5" port	2.75 Del-Seal™ CF or ISO-NW40 Kwik-Flange™
Option-06	10" and 12" valves	2.0" port	3.37 Del-Seal™ CF or ISO-NW50 Kwik-Flange™

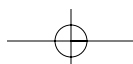
High Temperature Gate Seal Option -11

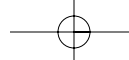
Gate valves are supplied standard with Viton® gate seals. UHV series valves, which have metal sealed bonnet flanges, can be ordered with the high temperature Kalrez® compound 4079 gate seal gasket option. Kalrez® compound 4079 O-rings are suitable for vacuum bakeout to 250°C (with gate in an open position). Kalrez®

compound 4079 offers excellent chemical resistance and good mechanical properties. When compared to Viton® elastomers, Kalrez® has lower outgassing characteristics for any given temperature from ambient to 250°C. Other special seal materials may be discussed with the MDC technical sales engineers.



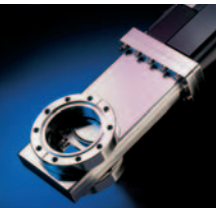
- When ordering Gate Valve Options, please add the option number(s) to the end of the desired UHV or HV Series Gate Valve Part Number





Section
2.1

Gate Valves Specifications



Valves



CIRCULAR GATE VALVES

Specifications

Sealing

Valves will seal against 15 psi differential atmospheric pressure in either direction.

Orientation

Valves can be installed in either a vertical or horizontal orientation.

Leak Tightness

Each valve is tested using a helium mass spectrometer leak detector calibrated for a minimum sensitivity of 2×10^{-10} Std. Atm. cc/sec of He. Internal welds are inspected for pits, cracks, and other irregularities which may cause virtual leaks.

Maintenance

Carriage and gate mechanism may be removed through the bonnet flange for seal replacement, cleaning or retrofitting without removing the valve body from the system.

Manual Actuation

Actuators are constructed with non-rising Acme threads for smooth and quick operation. Visual open position indicators are standard on all manual valves.

Material

Body, Carriage & Gate	300 Series ss
Bellows	AM-350 ss
Air Cylinder	Teflon [®] coated Aluminum
Bolts	300 Series ss, silver plated

Gaskets

Bonnet UHV / HV	OFE Copper / Viton [®] elastomer
Gate	Viton [®] or optional Kalrez [®] 4079 elastomer
Piston	Viton [®] elastomer

Electropneumatic Actuator

Air Pressure	70 to 100 psig
Air Control Valve	410 Series Humphrey solenoid valve
Solenoid Power	120VAC, 50/60Hz, 4W
Power Loss	Valve closes
Position Indicators	Mechanical, vernier adjustable, hinged-roller type micro switches suitable for 5A, 120/240VAC

Vacuum

Range	1×10^{-11} Torr
Leak Test	2×10^{-10} cc/sec of He

Temperature Range

Bakeability under vacuum in Open-Closed positions, with the following Bonnet-Gate seal combinations

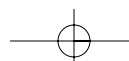
Series	Open	Closed	Bonnet	Gate
UHV	200°C	150°C	Copper	Viton [®]
UHV	250°C	200°C	Copper	Kalrez [®]
HV	150°C	150°C	Viton [®]	Viton [®]

Weight

See table

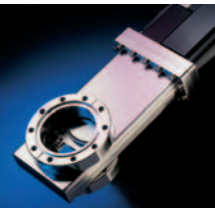
Dimensions

See table



Gate Valves

3" Ports



Section
2.1



Valves



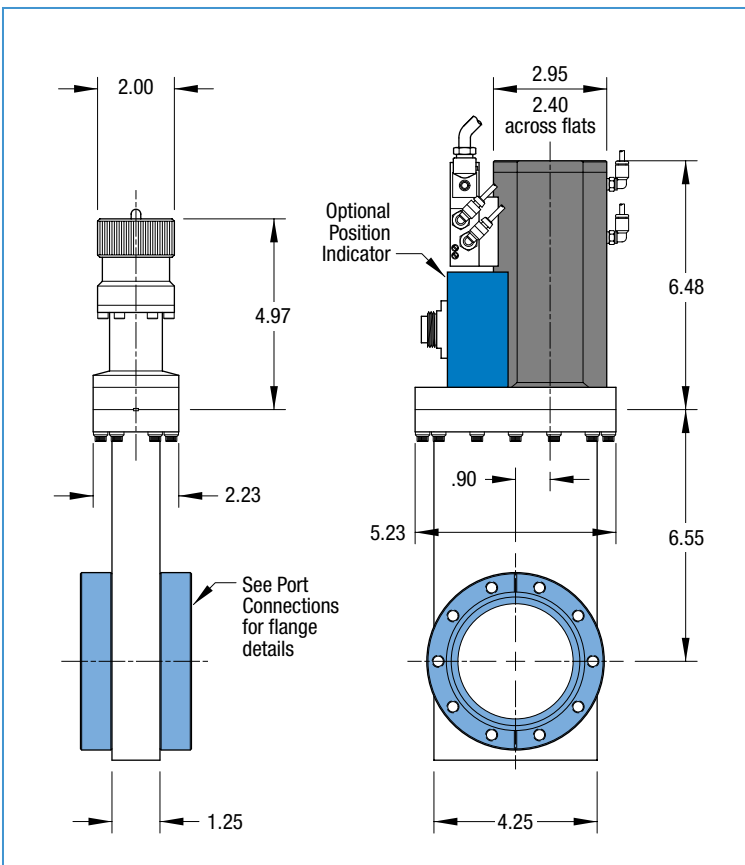
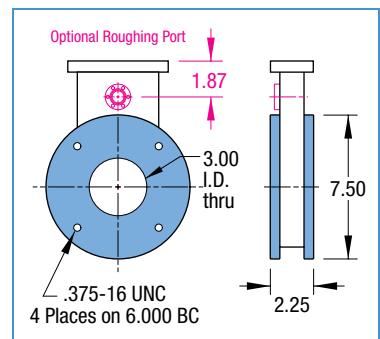
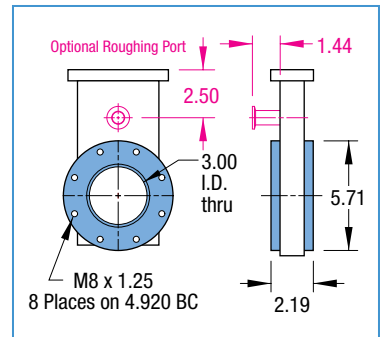
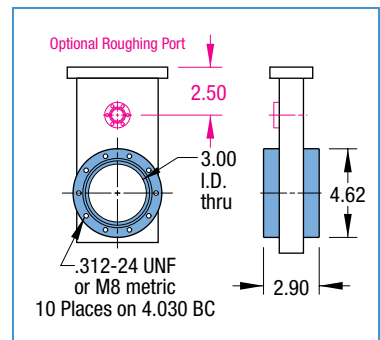
ULTRAHIGH VACUUM SERIES
250°C Metal Sealed Bonnets

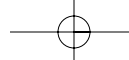
HIGH VACUUM SERIES
150°C Viton® O-Ring Sealed Bonnets

Features

- Viton® O-Ring Sealed Gates
- Stainless Steel Construction
- Manual or Electropneumatic Operation

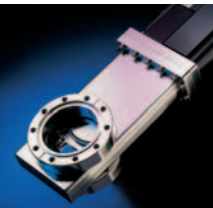
PORT CONNECTIONS





Gate Valves

3" Ports



Section 2.1

ULTRAHIGH VACUUM SERIES

METAL SEAL BONNET 250°C¹

ACTUATOR	PORT FLANGE	FLANGE THREAD	BONNET SEAL	WEIGHT POUNDS	REFERENCE	PART NUMBER	PRICE \$
MANUAL	DEL-SEAL	UNF	METAL	22	GV-3000M	302003	1710
MANUAL	DEL-SEAL	METRIC	METAL	22	E-GV-3000M	302015	1710
PNEUMATIC	DEL-SEAL	UNF	METAL	22	GV-3000M-P	303003	1860
PNEUMATIC	DEL-SEAL	METRIC	METAL	22	E-GV-3000M-P	303015	1860

HIGH VACUUM SERIES

VITON SEAL BONNET 150°C¹

ACTUATOR	PORT FLANGE	FLANGE THREAD	BONNET SEAL	WEIGHT POUNDS	REFERENCE	PART NUMBER	PRICE \$
MANUAL	DEL-SEAL	UNF	VITON	22	GV-3000V	300003	1510
MANUAL	DEL-SEAL	METRIC	VITON	22	E-GV-3000V	300015	1510
MANUAL	ISO	METRIC	VITON	20	LGV-3000V	306004	1510
MANUAL	ASA	UNC	VITON	22	GV-3000V-ASA	304001	1510
PNEUMATIC	DEL-SEAL	UNF	VITON	22	GV-3000V-P	301003	1660
PNEUMATIC	DEL-SEAL	METRIC	VITON	22	E-GV-3000V-P	301015	1600
PNEUMATIC	ISO	METRIC	VITON	20	LGV-3000V-P	307004	1660
PNEUMATIC	ASA	UNC	VITON	22	GV-3000V-ASA-P	305001	1660

¹ See page 166 for detailed bakeout specification

VALVE OPTIONS



DESCRIPTION	OPTION NUMBER	PRICE \$
MECHANICAL POSITION INDICATOR	-01	150
24 VDC AIR CONTROL SOLENOID VALVE	-03	55
240 VAC AIR CONTROL SOLENOID VALVE	-09	55
3/4" ROUGHING PORT	-04	175
KALREZ HIGH TEMP O-RING	-11	195

When ordering Gate Valve Options, please add the option number(s) to the end of the desired UHV or HV Series Gate Valve Part Number listed above. For example 303016-09 Detailed descriptions of each option begin on page 164.

ACCESSORIES

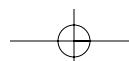


GASKET KIT	MATERIAL	QUANTITY PER PACK	REFERENCE	PART NUMBER	PRICE \$
GATE & BONNET SEAL	VITON	1 ²	GVG-3000	354003	20
GATE & BONNET SEAL	VITON & COPPER	1 ²	GVG-3000M	355003	25

HARDWARE	THREAD LENGTH	FOR USE WITH	QUANTITY PER PACK	REFERENCE	PART NUMBER	PRICE \$
12PT HEAD BOLT SET	.312-24 x 1-1/4"	DEL-SEAL	25	BA-125-12-SP	190058	36
METRIC HEX HEAD SET	M8, 35mm LONG	DEL-SEAL	25	M8-35-SP	190170	36
METRIC HEX HEAD SET	M8, 25mm LONG	ISO	25	M8-25-SP	190169	41
HEX HEAD SET ³	.375-16 x 1"	ASA	8	GVBA-300-SP	190175	39
BOLT HOLE BUSHING	3/4" TO 3/8" REDUCER	ASA	8	GVBHB	190110	24

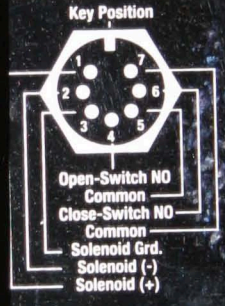
² Each gasket kit contains one Bonnet and one Gate seal

³ Includes bolt hole bushings



PATENTED
 SERIAL NO. 09-29-110
 MODEL NO. 303003-162
 MDS
 Medical Products Corporation
 23942 CABOT BLVD., HAYWARD, CA 94545 USA • 800-443-0817

RECEPTACLE PIN ASSIGNMENT



2-81-162-60
 2-81-162-60