SECTION CONTENTS

07

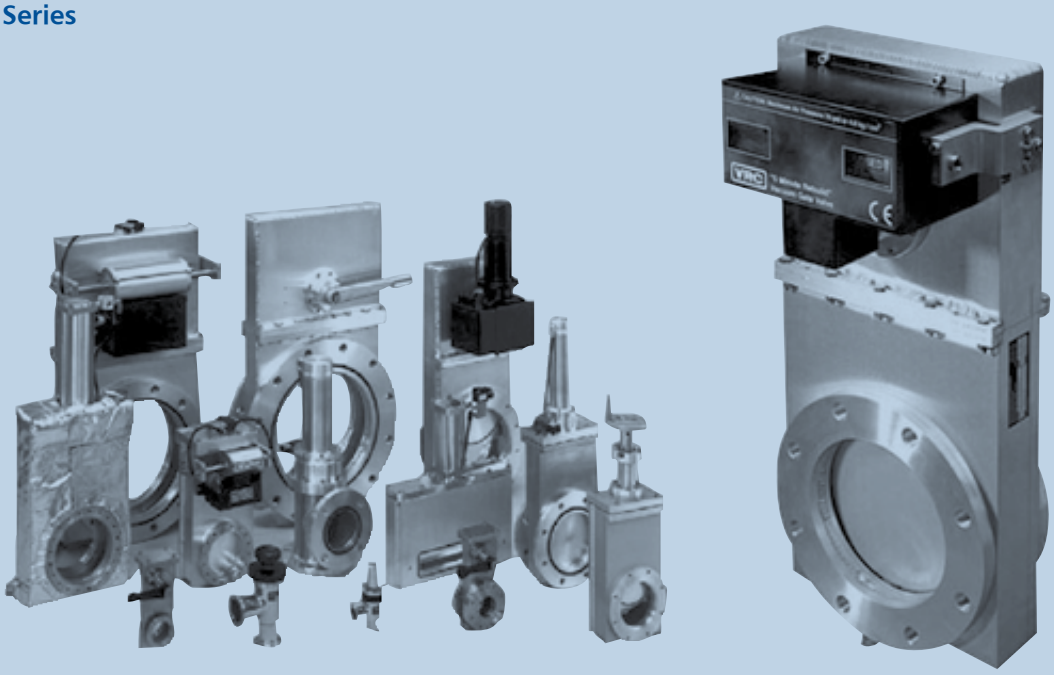
GATE VALVE

07 CHAPTER GATE VALVE

General Information

Theory of Operation

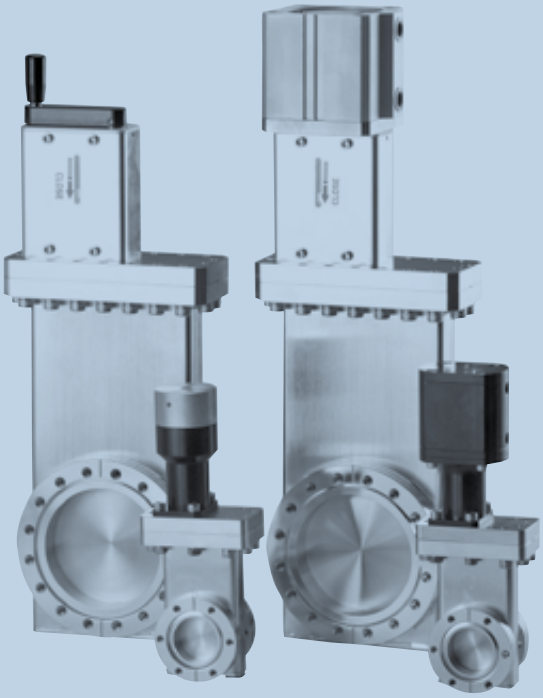
A.HV Series



- HV Series valves are rotary action, linear travel gate valves. The gate carriage moves in the valve body on a set of wheels, moved back and forth by a manual or pneumatically-actuated valve stem.
- To close the valve, the carriage moves forward on wheels until it reaches the end of the valve case. When the carriage stops, the sine waved rotary linkage continues to travel and extend. The gate does not move forward, only upward toward the port seal surface. There is no abrasion or damage to the O-ring. The gate moves up to the port into its sealing position. The O-ring is compressed, making a leak-tight seal. The sine waved rotary linkage continues to move forward until the linkage reach bottom dead end and locks, providing positive closure protection in the event control power, or air pressure, is lost.

Dimension in mm unless otherwise noted

B.UHV



- UHV Series valves are toggle action, linear travel gate valves. The gate carriage moves in the valve body on a set of wheels, moved back and forth by a manual or pneumatically actuated valve stem which passes through a metal bellows.
- To close the valve, the carriage moves forward on wheels until it reaches the end of the valve case. When the carriage stops, the toggle linkage continues to travel and extend. The gate does not move forward, only upward toward the port seal surface. There is no abrasion or damage to the O-ring. The gate moves up to the port into its sealing position. The O-ring is compressed, making a leak-tight seal. The toggle linkage continues to move forward until the toggle knee passes center and locks, providing positive closure protection in the event control power, or air pressure, is lost.

Specifications

A.HV Series

1	Material :	Body	304 S.S. or A6061T6
		Carriage	A6061T6
		Gate	304 S.S. or A6061T6
2	Life Cycle :	size under 4" (included)	100,000 cycles
		size above 4"	50,000 cycles
3	Hellium leak rates at 1 atm differential :	$< 2 \times 10^{-9}$ std cc/sec for Viton® bonnet seal	
4	Bakeable Temperature :	Open	200℃ Viton® bonnet seal
		Closed	150℃ Viton® bonnet seal
5	Pressure Range :	10^{-8} torr ~ ATM	
6	Maximun △P :	20 Torr before opening	
7	Standard Seal :	Gate	Viton® O'ring
		Bonnet	Buna N O'ring
8	Size :	2" to 8"	
9	Actuator :	Electro-Pneumatic or Manual	
10	Surface Treatment :	Scotch Polished	
11	Options:	a. Position indicator	
		b. Pneumatic control solenoid valve	
		c. Roughing port	
		d. Other material Gate O'ring seal	

Dimension in mm unless otherwise noted

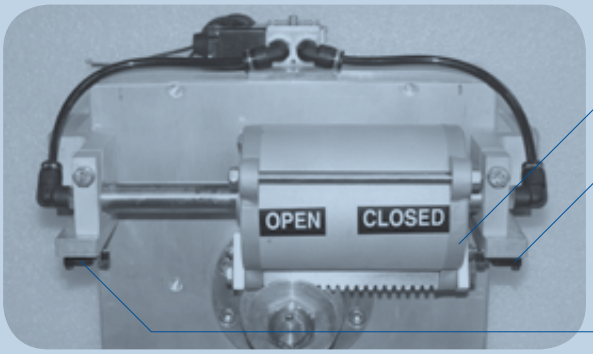
Position Indicators

B.UHV

1	Material :	Body	304 S.S.
		Carriage	304 S.S.
		Gate	304 S.S.
		Bellows	AM350
2	Life Cycle :	size under 4" (included)	100,000 cycles
		size above 4"	50,000 cycles
3	Hellium leak rates at 1 atm differential :	$< 5 \times 10^{-10}$ std cc/sec for Viton® bonnet seal	
4	Bakeable Temperature :	Open	200℃ Viton® bonnet seal
		Closed	150℃ Viton® bonnet seal
5	Pressure Range :	10^{-10} torr ~ ATM	
6	Maximun △P :	20 Torr before opening	
7	Standard Seal :	Gate	Viton® O'ring
		Bonnet	OFHC gasket
8	Size :	2" to 8"	
9	Actuator :	Electro-Pneumatic or Manual	
10	Surface Treatment :	Scotch Polished	
11	Options:	a. Position indicator	
		b. Pneumatic control solenoid valve	
		c. Roughing port	
		d. Other material Gate O'ring seal	

Position Indicators

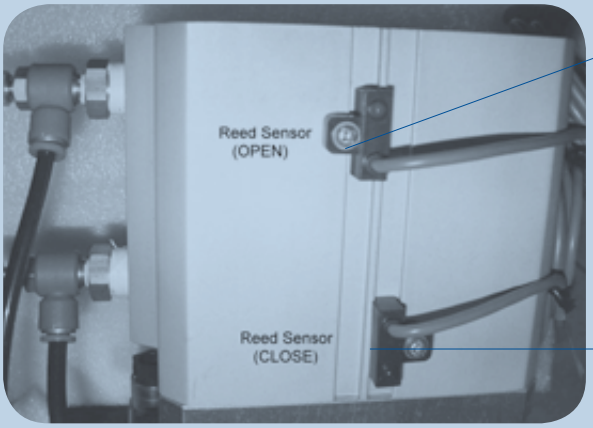
HV Series



Actuator Pneumatic

Position Indicator

UHV Series

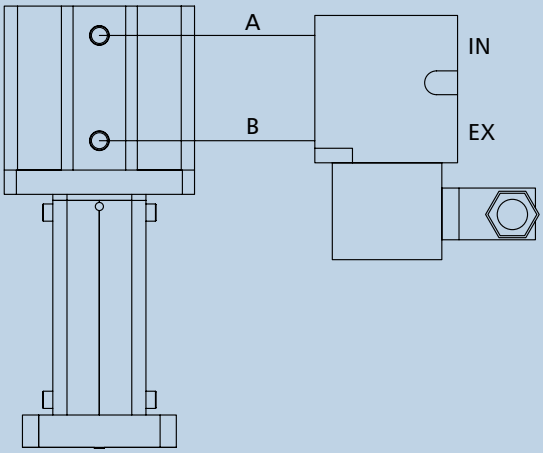


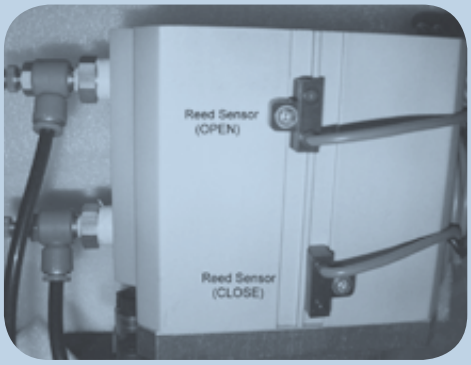
Position Indicator

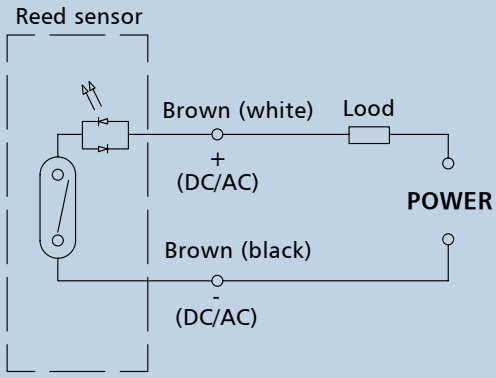
- A selection of three position indicators are offered by HTC to fill a range of mechanical, electronic and economic requirements. Signals from the switches can be employed to activate a variety of external devices such as indicator lights, alarms or other instruments. A valve can be wired so that its accidental opening would affect the shutdown of an entire system for its protection. These position indicators are very useful in automatic process control applications. Signals from the opening or closing of a valve can be employed to trigger complex procedures in computer controlled high vacuum systems.

Dimension in mm unless otherwise noted

External Position Indicator



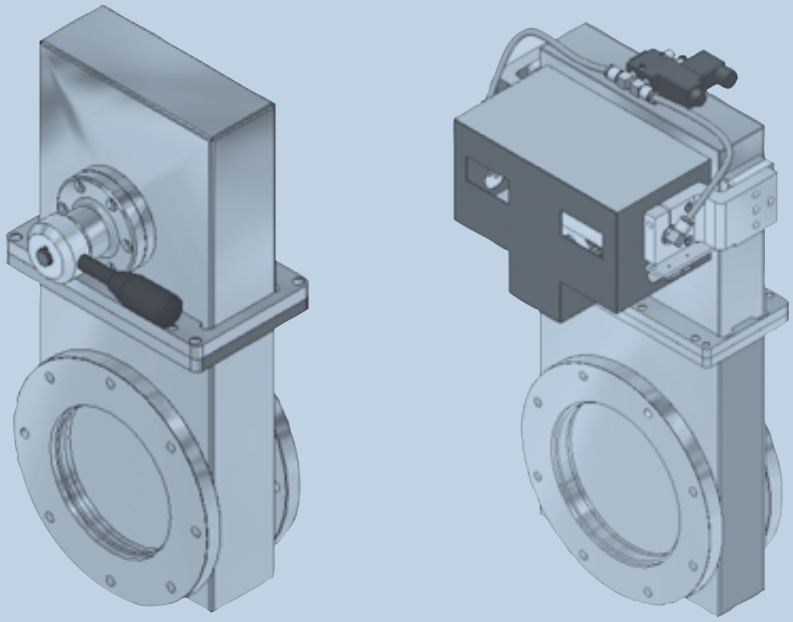




- This option employs two reed sensors , which are positioned in-line with a vertical stem extension of the pneumatic actuator piston. These positions correspond to the closed and open positions of the valve gate.

07 CHAPTER GATE VALVE

HV Gate Valve

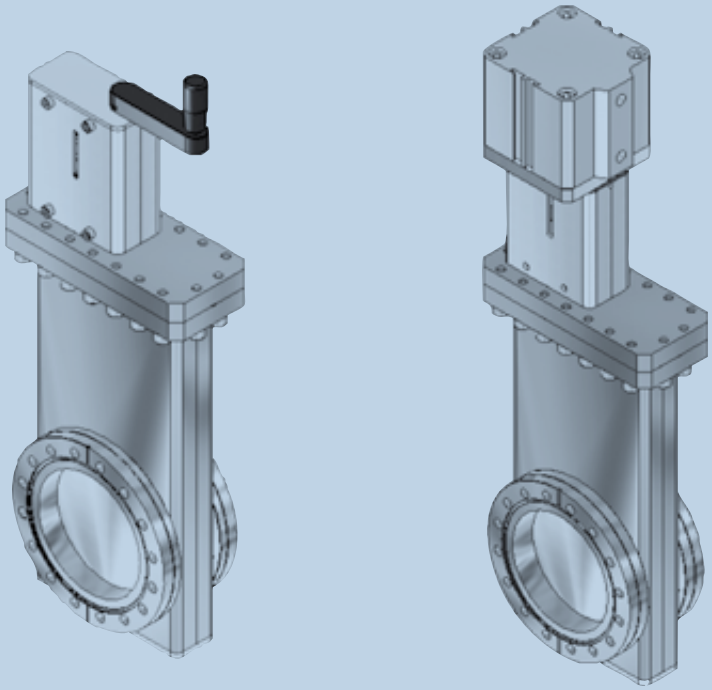


Applications

- The HTC stainless steel body offers one of the smallest interior surface areas in the vacuum industry. The body and all major internal components has been welded by TIG (Tungsten Inert Gas), Welding Fixture for the special use ensuring maximum joint integrity. This eliminates the possibility of " virtual leaks " or entrapment areas and minimizes body distortion found in gate valves. For maintenance purposes, the carriage assembly can be removed from the body without removing the valve from the system. These valves can be used with cryo-pumps, turbo molecular pumps or in any applications requiring clean, high life cycle, low maintenance and low outgassing valves with positive shut-off characteristics. Available in all flange configurations. KF, ISO, ANSI, JIS, and CF.

Dimension in mm unless otherwise noted

UHV Gate Valve



- Here are some general options that are available with most of our valve products. These options are in addition to whatever features you choose for your valve. (See the Gate Valve Ordering Information for more information on these features.)
- 1.Flange Options: Port flanges are available in a variety of configurations and geometries. The more common flange types are listed here. Others are routinely supplied, please call the factory for information.
- 2.Solenoid Control Valves: HTC valves with pneumatic actuators are supplied with a 110 VAC, 60 Hz solenoid control valve. Other solenoids are available, refer to Ordering Information for a partial list. There is an additional charge for most special solenoid valves. Please consult the factory for current price information.

- 3. Fittings Option: Fittings, such as VCR® or PT fittings, may be installed on valves. The fittings are used to add items, i.e.: gas lines, T.C. tubes, leak valves or up-to-air valves, to a system via the valve. Consult the factory for prices and configurations.
- 4. Roughing Ports: Are available for valves, the most commonly supplied are:

Valves with ConFlat port flanges are usually supplied with a ConFlat flange roughing port(s). Valves with ISO port flanges are usually supplied with an ISO flange roughing port(s). You may choose and specify otherwise.

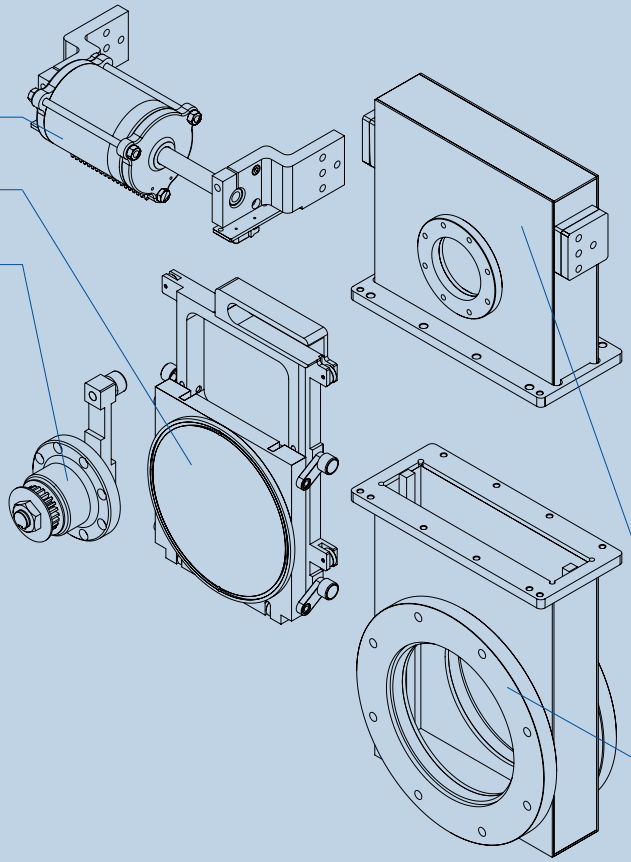
Roughing ports with flanges other than those listed above, i.e.: ANSI, VCR® fittings or tubes without flanges, are also available, please consult the factory for prices.

When ordering roughing ports, please consider:

- 1. the roughing port I.D., and
- 2. the roughing port flange O.D.

Dimension in mm unless otherwise noted

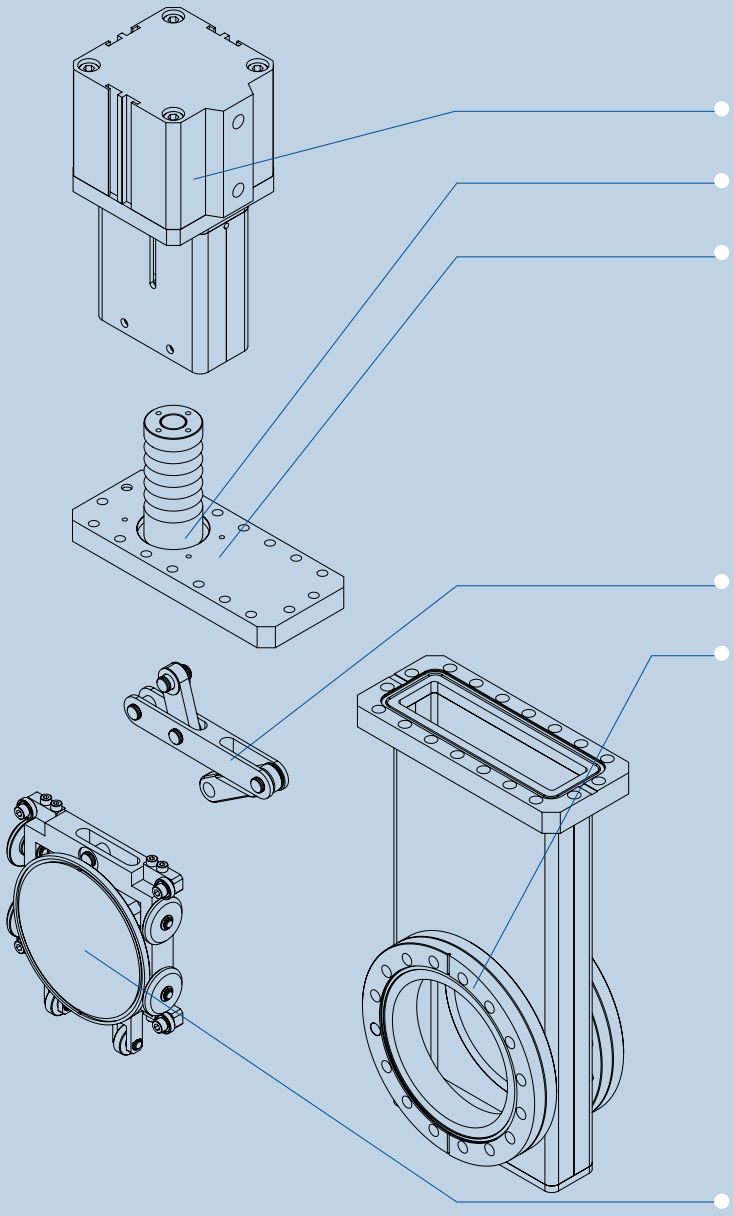
HV TYPE



Gate Valves Ordering Information

- Not finding the exact valve configuration you need on our Specifications page? Use the Ordering Information on this page to build a valve to your exact specifications.
- Select your valve configuration options from the list below. Then generate a HTC part number representing the requirements of your valve.

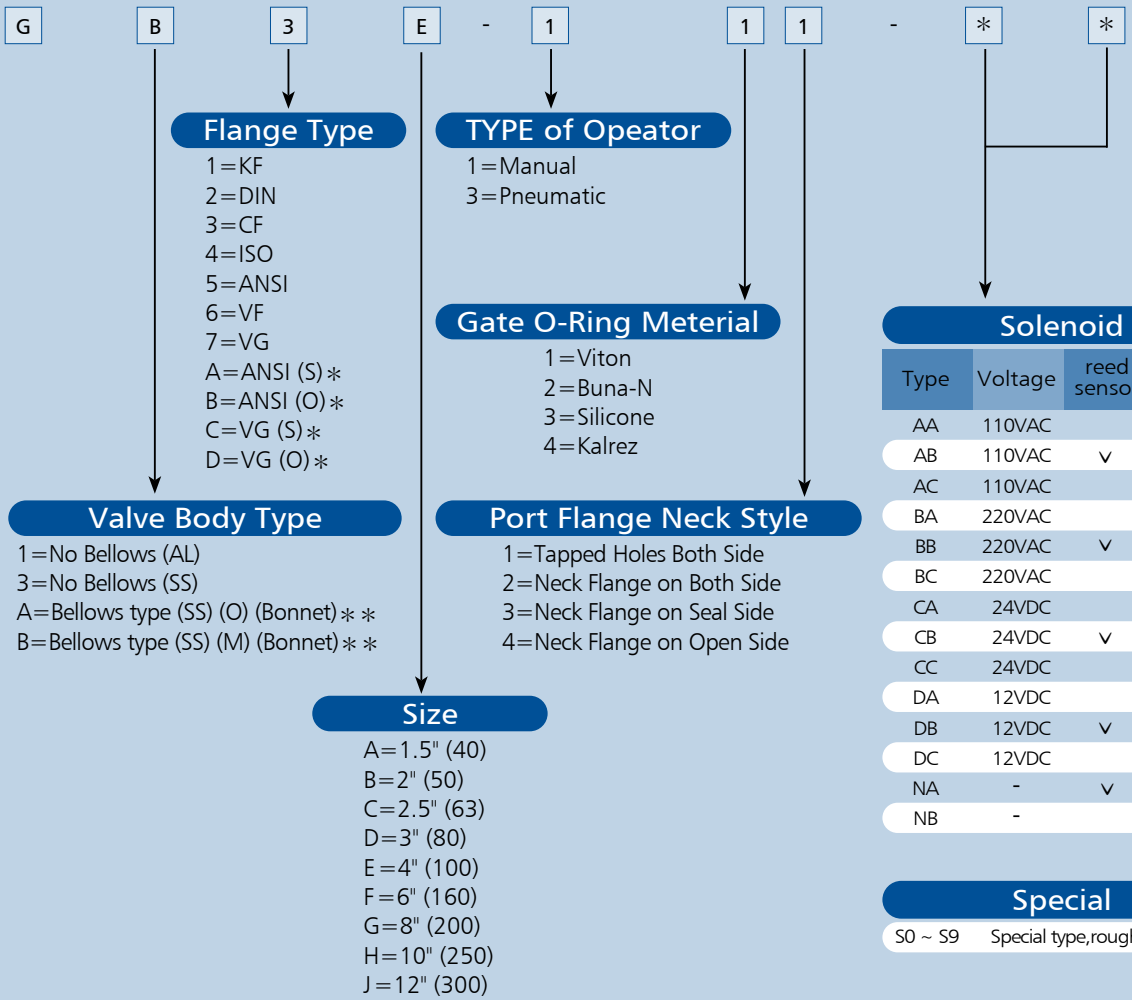
UHV TYPE



Dimension in mm unless otherwise noted

Numbering System

- This numbering system was developed to insure the valve supplied is exactly what you need. It addresses questions concerning available features and options for the valve, and incorporates that information in the valve number.



Solenoid

Type	Voltage	reed sensor	limit switch
AA	110VAC		
AB	110VAC	V	
AC	110VAC		V
BA	220VAC		
BB	220VAC	V	
BC	220VAC		V
CA	24VDC		
CB	24VDC	V	
CC	24VDC		V
DA	12VDC		
DB	12VDC	V	
DC	12VDC		V
NA	-	V	
NB	-		V

Special

S0 ~ S9	Special type,roughing port

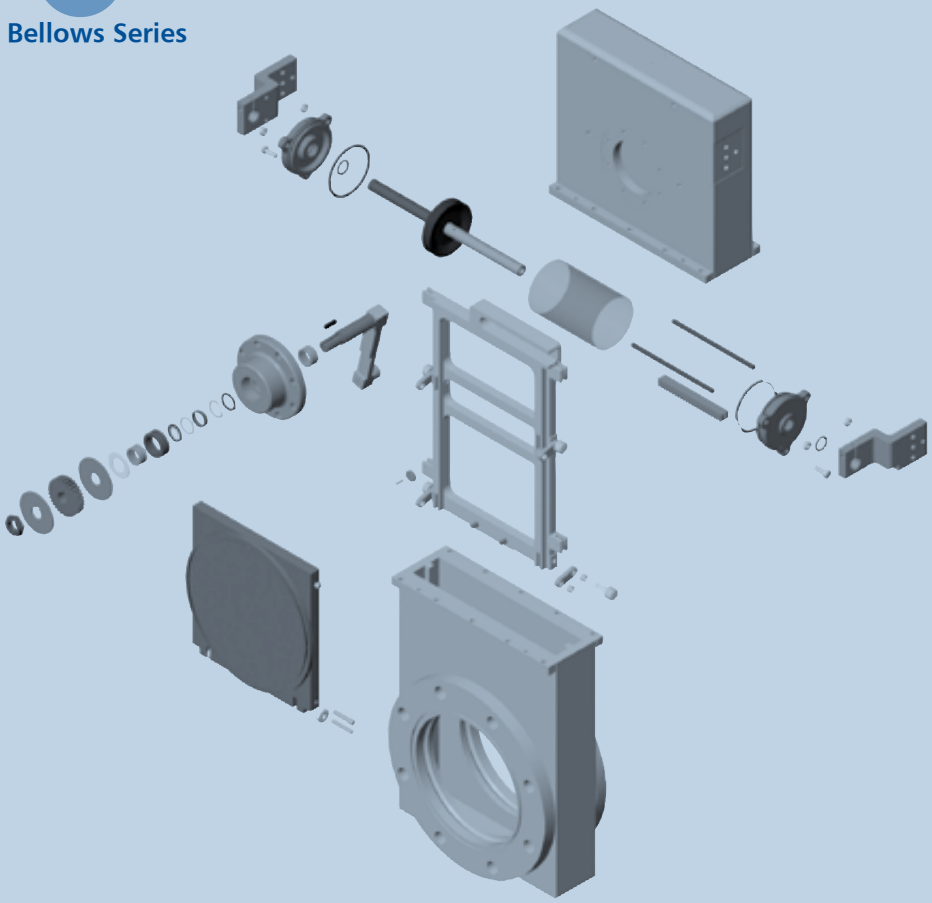
Note:

*ANSI / VG (S) is flange with o-ring on seal side.
*ANSI / VG (O) is flange with o-ring on open side.
**Bellows type (SS)(M) is bonnet with Metal seal.
**Bellows type (SS)(O) is bonnet with o-ring seal.

07 CHAPTER GATE VALVE

Technical Data

A. (HV) Without Bellows Series

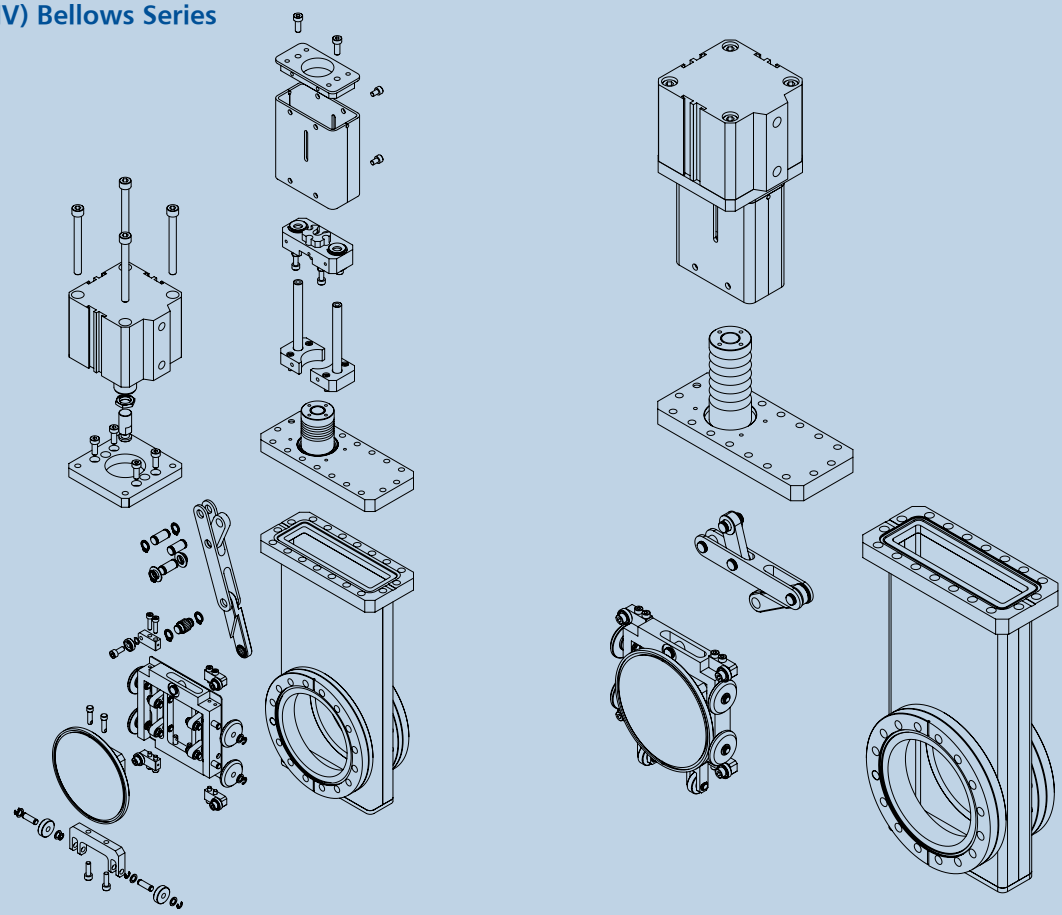


Body Size	Standard Flange O.D.				Weight	Air Pressure	Actuated Frequency
	ISO	CF	ANSI	JIS	kg	kg/cm²	Opening & Closing time
3"	165/130	151.6	152.4	100	15	4 ~ 6	2 seconds
4"	225/180	202.5	228.6	150	31	4 ~ 6	3 seconds
6"	285/240	253.2	279.4	200	40	4 ~ 6	5 seconds

Dimension in mm unless otherwise noted

Technical Data

B. (UHV) Bellows Series

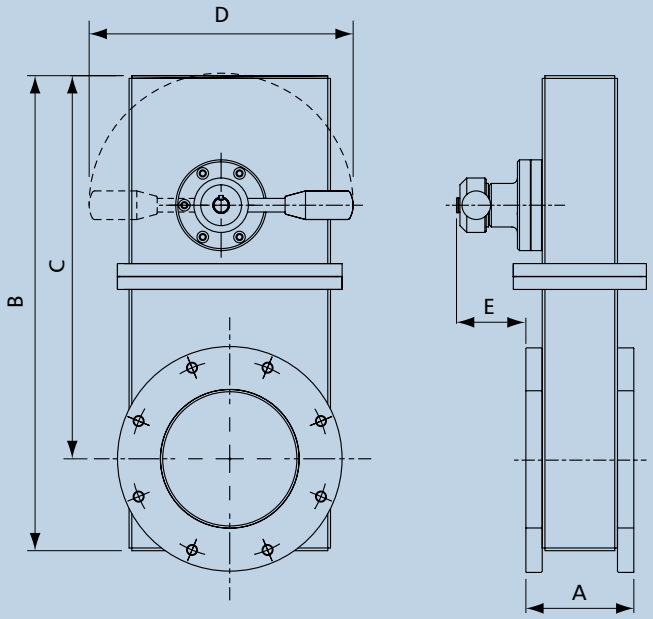


Body Size	Standard Flange O.D.			Weight	Air Pressure	Actuated Frequency
	ISO	CF	KF	kg	kg/cm^2	Opening & Closing time
1.5"	*	69.5	50	2.6	5 ~ 8	2 seconds
2"	*	86	75	4	5 ~ 8	2 seconds
2.5"	130	113.6	*	10	5 ~ 8	3 seconds
4"	165	151.6	*	22	5 ~ 8	3 seconds
6"	225	202.5	*	28	5 ~ 8	5 seconds
8"	285	253.2	*	40	5 ~ 8	5 seconds

Dimension in mm unless otherwise noted

Manually Operated (AL) With ANSI Flange

HV (Without Bellows) Series



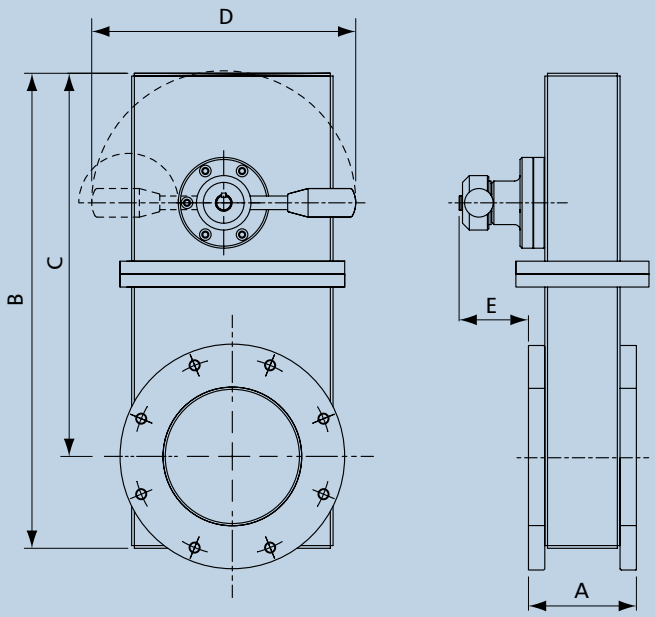
Model No.	Part No.	Flange	Bolt	Bolt
		O.D.	P.C.D.	Size
GV-WA-2-ANSI-N1-M	G15B-111	152.4	120.7	5/8"-11×4
GV-WA-3-ANSI-N1-M	G15D-111	190.5	152.4	5/8"-11×4
GV-WA-4-ANSI-N1-M	G15E-111	228.6	190.5	5/8"-11×8
GV-WA-6-ANSI-N1-M	G15F-111	279.4	241.3	3/4"-10×8
GV-WA-8-ANSI-N1-M	G15G-111	342.9	298.5	3/4"-10×8

Model No.	A	B	C	D	E
GV-WA-2-ANSI-N1-M	95	317	251	250	52
GV-WA-3-ANSI-N1-M	95	317	251	250	52
GV-WA-4-ANSI-N1-M	106	498	397	406	57
GV-WA-6-ANSI-N1-M	111	620	490	406	67
GV-WA-8-ANSI-N1-M	111	620	490	406	67

Dimension in mm unless otherwise noted

Manually Operated (SS) With ANSI Flange

HV (Without Bellows) Series



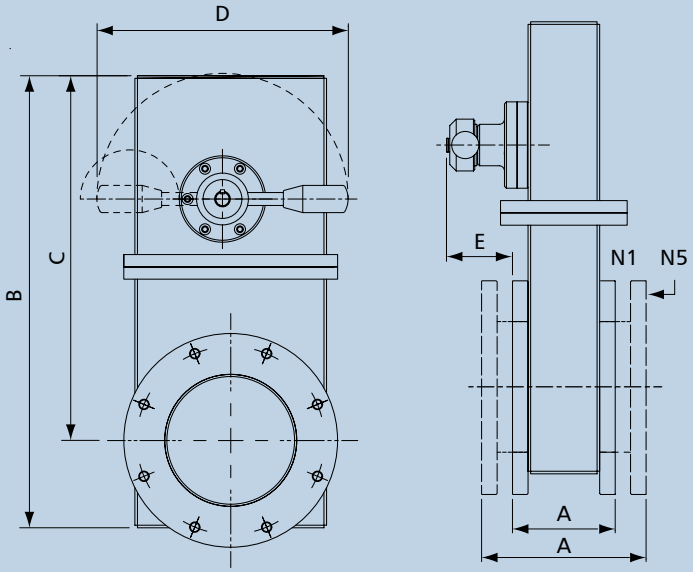
Model No.	Part No.	Flange	Bolt	Bolt
		O.D.	P.C.D.	Size
GV-SS-2-ANSI-N1-M	G35B-111	152.4	120.7	5/8"-11×4
GV-SS-3-ANSI-N1-M	G35D-111	190.5	152.4	5/8"-11×4
GV-SS-4-ANSI-N1-M	G35E-111	228.6	190.5	5/8"-11×8
GV-SS-6-ANSI-N1-M	G35F-111	279.4	241.3	3/4"-10×8
GV-SS-8-ANSI-N1-M	G35G-111	342.9	298.5	3/4"-10×8

Model No.	A	B	C	D	E
GV-SS-2-ANSI-N1-M	78	300	233	250	61
GV-SS-3-ANSI-N1-M	78	300	233	250	61
GV-SS-4-ANSI-N1-M	89	481	380	406	66
GV-SS-6-ANSI-N1-M	94	603	473	406	66
GV-SS-8-ANSI-N1-M	94	603	473	406	76

Dimension in mm unless otherwise noted

Manually Operated (AL) With ISO Flange

HV (Without Bellows) Series



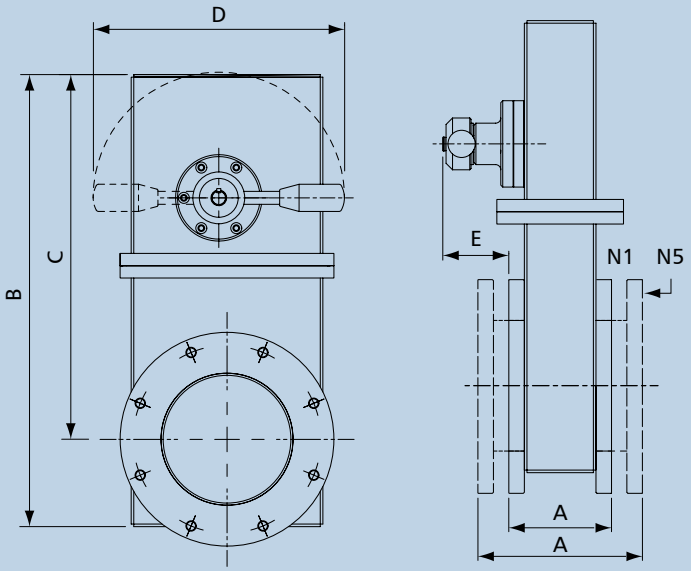
Model No.	Part No.	Flange	Port	Bolt	Bolt
		O.D.	Dia.	P.C.D.	Size
GV-WA-80-N1-M	G14D-111	145	83	110	M8×8
GV-WA-80-N5-M	G14D-112	110	83		
GV-WA-100-N1-M	G14E-111	165	102	145	M8×8
GV-WA-100-N5-M	G14E-112	130	102		
GV-WA-160-N1-M	G14F-111	225	153	200	M10×8
GV-WA-160-N5-M	G14F-112	180	153		
GV-WA-200-N1-M	G14G-111	285	213	260	M10×12
GV-WA-200-N5-M	G14G-112	240	213		

Model No.	A	B	C	D	E
GV-WA-80-N1-M	95	317	251	250	40
GV-WA-80-N5-M	105	317	251	250	35
GV-WA-100-N1-M	95	317	251	250	40
GV-WA-100-N5-M	127	317	251	250	24
GV-WA-160-N1-M	105	498	397	406	57
GV-WA-160-N5-M	143	481	380	406	38
GV-WA-200-N1-M	111	620	490	406	54
GV-WA-200-N5-M	155	620	490	406	32

Dimension in mm unless otherwise noted

Manually Operated (SS) With ISO Flange

HV (Without Bellows) Series



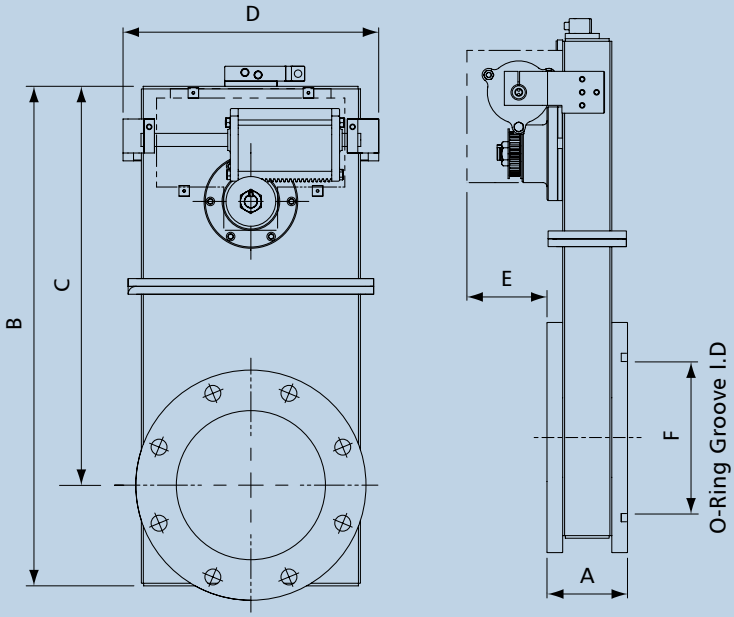
Model No.	Part No.	Flange O.D.	Port Dia.	Bolt P.C.D.	Bolt Size
GV-SS-100-ISO-N1-M	G34E-111	165	102	145	M8×8
GV-SS-100-ISO-N5-M	G34E-112	130	102		
GV-SS-160-ISO-N1-M	G34F-111	225	153	200	M10×8
GV-SS-160-ISO-N5-M	G34F-112	180	153		
GV-SS-200-ISO-N1-M	G34G-111	285	213	260	M10×12
GV-SS-200-ISO-N5-M	G34G-112	240	213		

Model No.	A	B	C	D	E
GV-SS-100-ISO-N1-M	78	300	233	250	47
GV-SS-100-ISO-N5-M	105	300	233	250	31
GV-SS-160-ISO-N1-M	88	481	380	406	64
GV-SS-160-ISO-N5-M	143	481	380	406	45
GV-SS-200-ISO-N1-M	88	603	473	406	61
GV-SS-200-ISO-N5-M	143	603	473	406	39

Dimension in mm unless otherwise noted

Pneumatically Actuated (AL) With ANSI Flange

HV (Without Bellows) Series



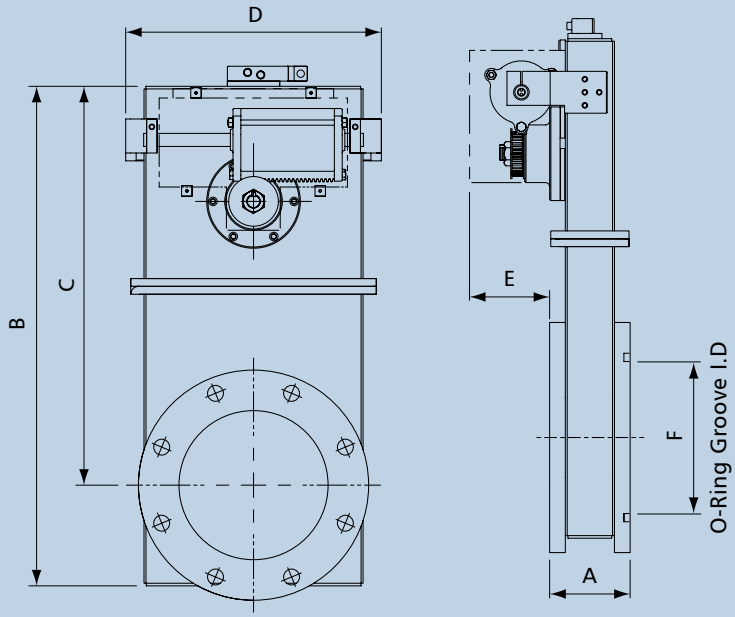
Model No.	Part No.	Flange	Bolt	Bolt
		O.D.	P.C.D.	Size
GV-WA-2-ANSI-N1-P	G1BB-311	152.4	120.7	5/8"-11×4
GV-WA-3-ANSI-N1-P	G1BD-311	190.5	152.4	5/8"-11×4
GV-WA-4-ANSI-N1-P	G1BE-311	228.6	190.5	5/8"-11×8
GV-WA-6-ANSI-N1-P	G1BF-311	279.4	241.3	3/4"-10×8
GV-WA-8-ANSI-N1-P	G1BG-311	342.9	298.5	3/4"-10×8

Model No.	A	B	C	D	E	F
GV-WA-2-ANSI-N1-P	95	317	251	216	52	92.1
GV-WA-3-ANSI-N1-P	95	317	251	216	52	101.6
GV-WA-4-ANSI-N1-P	106	498	397	258	57	146
GV-WA-6-ANSI-N1-P	111	620	490	318	67	190.5
GV-WA-8-ANSI-N1-P	111	620	490	318	67	228.6

Dimension in mm unless otherwise noted

Pneumatically Operated (SS) With ANSI Flange

HV (Without Bellows) Series



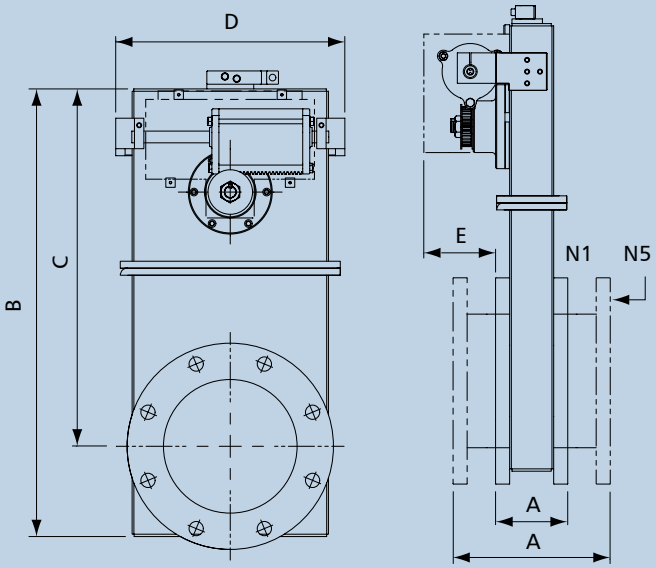
Model No.	Part No.	Flange O.D.	Bolt P.C.D.	Bolt Size
GV-SS-2-ANSI-N1-P	G3BB-311	152.4	120.7	5/8"-11×4
GV-SS-3-ANSI-N1-P	G3BD-311	190.5	152.4	5/8"-11×4
GV-SS-4-ANSI-N1-P	G3BE-311	228.6	190.5	5/8"-11×8
GV-SS-6-ANSI-N1-P	G3BF-311	279.4	241.3	3/4"-10×8
GV-SS-8-ANSI-N1-P	G3BG-311	342.9	298.5	3/4"-10×8

Model No.	A	B	C	D	E	F
GV-SS-2-ANSI-N1-P	78	300	233	250	61	92.1
GV-SS-3-ANSI-N1-P	78	300	233	250	61	101.6
GV-SS-4-ANSI-N1-P	89	481	380	406	66	146
GV-SS-6-ANSI-N1-P	94	603	473	406	66	190.5
GV-SS-8-ANSI-N1-P	94	603	473	406	76	228.6

Dimension in mm unless otherwise noted

Pneumatically Operated (AL) With ISO Flange

HV (Without Bellows) Series



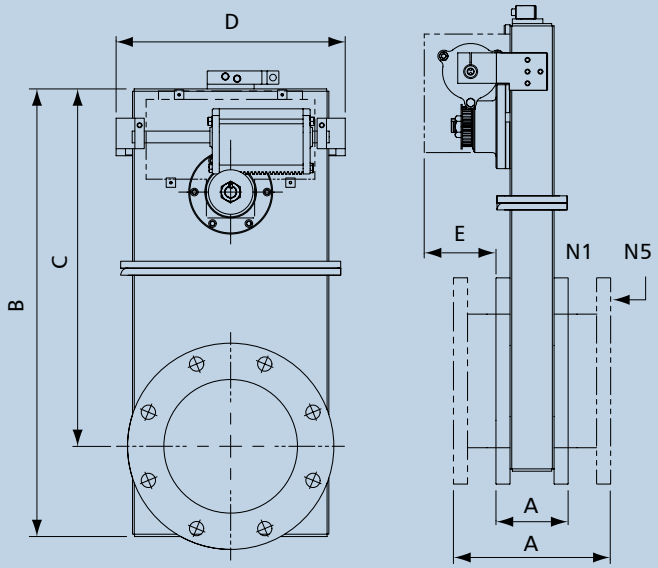
Model No.	Part No.	Flange O.D.	Port Dia.	Bolt P.C.D.	Bolt Size
GV-WA-80-ISO-N1-P	G14D-311	145	83	110	M8×8
GV-WA-80-ISO-N5-P	G14D-312	110	83		
GV-WA-100-ISO-N1-P	G14E-311	165	102	145	M8×8
GV-WA-100-ISO-N5-P	G14E-312	130	102		
GV-WA-160-ISO-N1-P	G14F-311	225	153	200	M10×8
GV-WA-160-ISO-N5-P	G14F-312	180	153		
GV-WA-200-ISO-N1-P	G14G-311	285	213	260	M10×12
GV-WA-200-ISO-N5-P	G14G-312	240	213		

Model No.	A	B	C	D	E
GV-WA-80-ISO-N1-P	95	317	251	216	40
GV-WA-80-ISO-N5-P	105	317	251	216	35
GV-WA-100-ISO-N1-P	95	317	251	216	40
GV-WA-100-ISO-N5-P	127	317	251	216	24
GV-WA-160-ISO-N1-P	105	498	397	258	57
GV-WA-160-ISO-N5-P	143	481	380	258	38
GV-WA-200-ISO-N1-P	111	620	490	318	54
GV-WA-200-ISO-N5-P	155	620	490	318	32

Dimension in mm unless otherwise noted

Pneumatically Operated (SS) With ISO Flange

HV (Without Bellows) Series



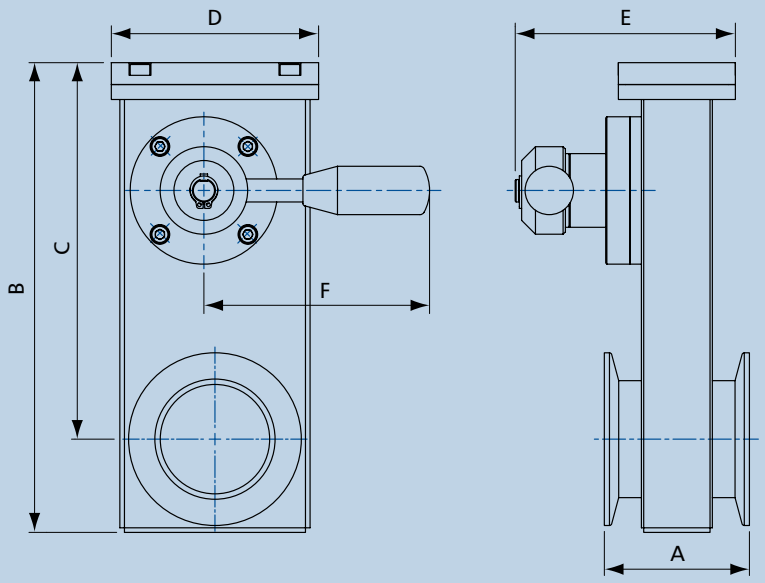
Model No.	Part No.	Flange O.D.	Port Dia.	Bolt P.C.D.	Bolt Size
GV-SS-100-ISO-N1-P	G34E-311	165	102	145	M8×8
GV-SS-100-ISO-N5-P	G34E-312	130	102		8
GV-SS-160-ISO-N1-P	G34F-311	225	153	200	M10×8
GV-SS-160-ISO-N5-P	G34F-312	180	153		
GV-SS-200-ISO-N1-P	G34G-311	285	213	260	M10×12
GV-SS-200-ISO-N5-P	G34G-312	240	213		

Model No.	A	B	C	D	E
GV-SS-100-ISO-N1-P	78	300	233	216	47
GV-SS-100-ISO-N5-P	105	300	233	216	31
GV-SS-160-ISO-N1-P	88	481	380	258	64
GV-SS-160-ISO-N5-P	143	481	380	258	45
GV-SS-200-ISO-N1-P	88	603	473	318	61
GV-SS-200-ISO-N5-P	143	603	473	318	39

Dimension in mm unless otherwise noted

Small Stainless Gate Valve With KF Flange

HV (Without Bellows) Series

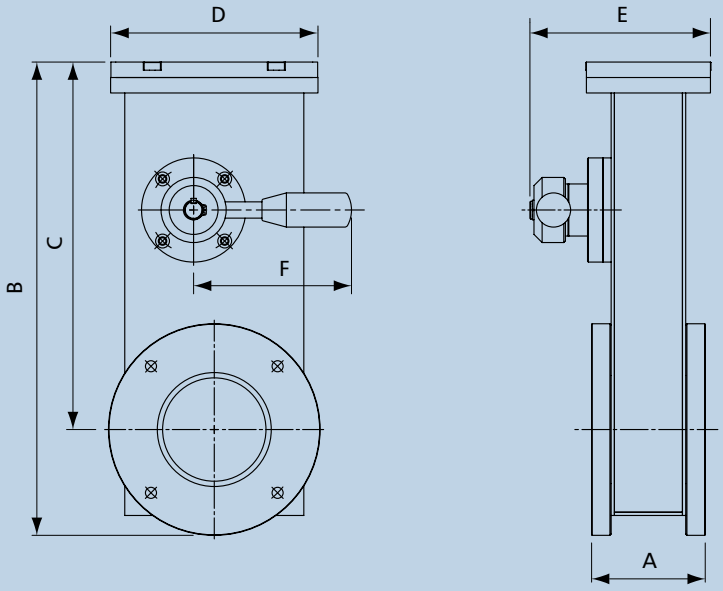


Model No.	Part No.	Flange O.D.	Bonnet seal	A	B	C	D	E	F
GV-SS-KF40-M	G31A-112	55	Viton®	63	204	163.5	90	95.6	95
GV-SS-KF50-M	G31B-112	75	Viton®	63	204	163.5	90	95.6	95

Dimension in mm unless otherwise noted

Small Stainless Gate Valve with ISO Flange

HV (Without Bellows) Series

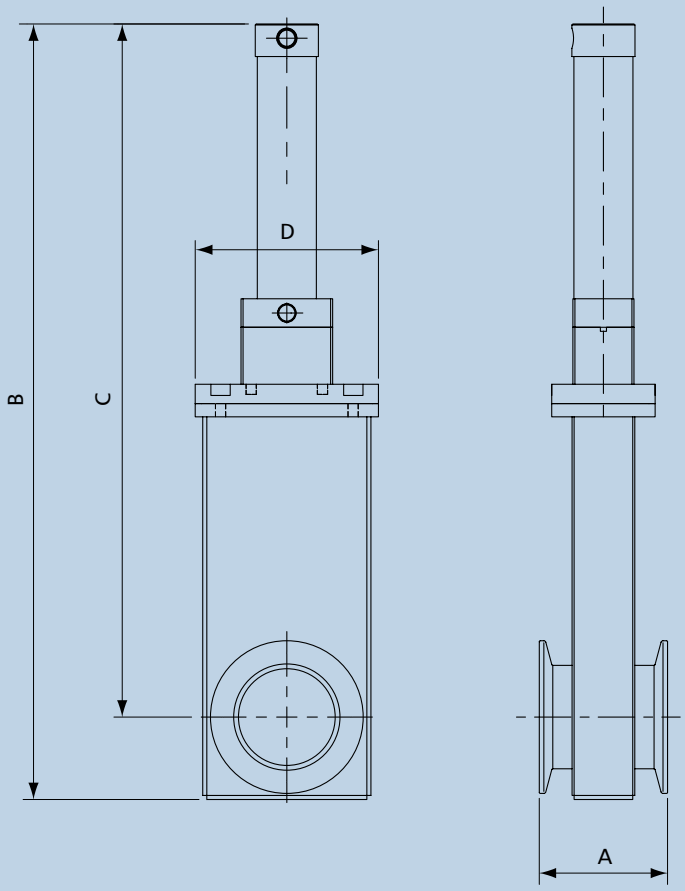


Model No.	Part No.	Flange O.D.	Bolt P.C.D	Bolt Size	A	B	C	D	E	F
GV-SS-ISO63-M	G34C-111	130	110	M8×4	70	290	226	127	111	95

Dimension in mm unless otherwise noted

Small Stainless Gate Valve with KF Flange

Pneumatically Actuated(Without Bellows)

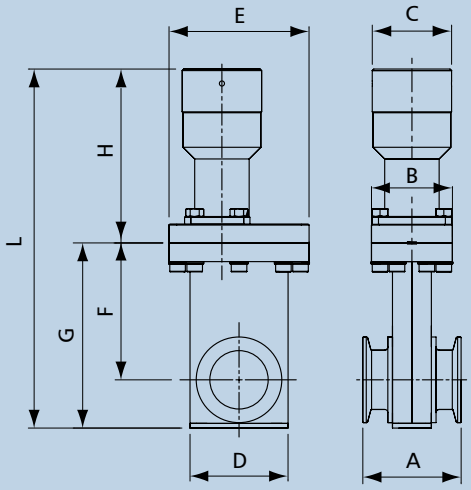


Model No.	Part No.	Flange O.D.	Bonnet Seal	A	B	C	D
GV-SS-KF40-P	G31A-312	55	Viton®	63	381	340	50.8
GV-SS-KF50-P	G31B-312	75	Viton®	63	381	340	50.8

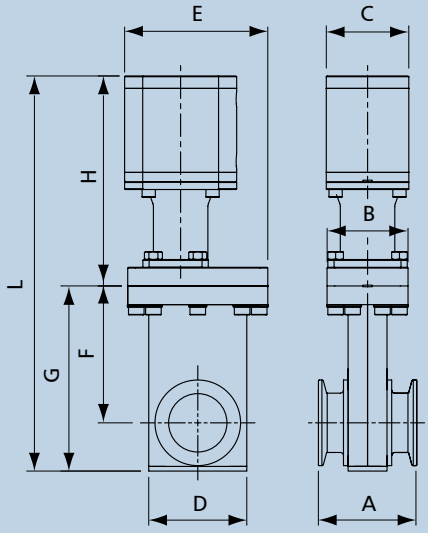
Dimension in mm unless otherwise noted

KF Flange

HV Series (with Bellows)



Manual (Fig1)



Pneumatic (Fig2)

Model No.	Part No.	Port Dia	Bonnet Seal	Actuator type	Fig.	Flange O.D.
GVB-SS-KF40-M	GA1A-112	37.5	Viton®	M*	1	55
GVB-SS-KF40-P	GA1A-312	37.5	Viton®	P**	2	55
GVB-SS-KF50-M	GA1B-112	50	Viton®	M*	1	75
GVB-SS-KF50-P	GA1B-312	50	Viton®	P**	2	75

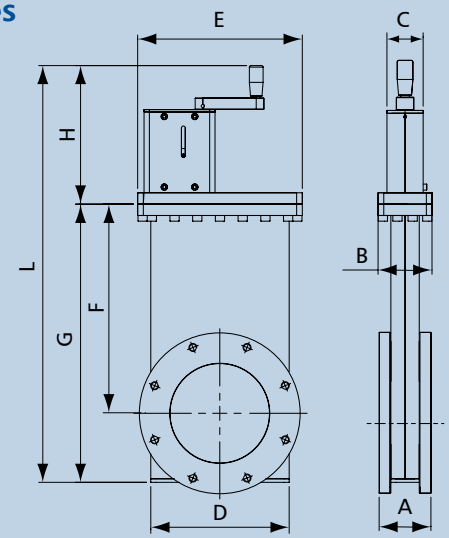
Model No.	A	B	C	D	E	F	G	H	L
GVB-SS-KF40-M	50	52	51	63	90	88	119	111	230
GVB-SS-KF40-P	50	52	53	63	90	88	119	135	254
GVB-SS-KF50-M	59	56	51	81	104	123	167	128	295
GVB-SS-KF50-P	59	56	53	81	104	123	167	154	321

＊M：Manual　　＊＊P：Pneumatic

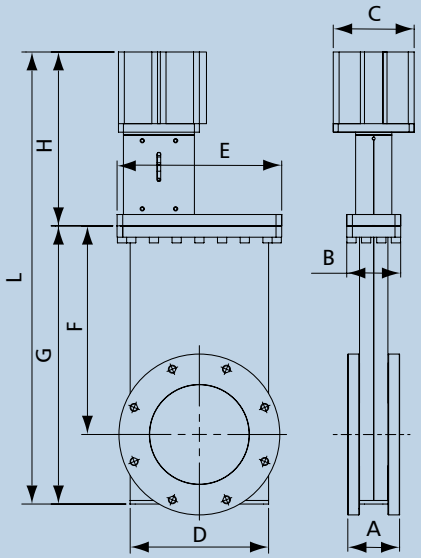
Dimension in mm unless otherwise noted

ISO - Flange

HV Series



Manual (Fig3)



Pneumatic (Fig4)

Model No.	Part No.	Port Dia.	Bonnet Seal	Actuator type	Fig.	Flange O.D.	Bolt P.C.D.	Bolt Size
GVB-SS-ISO63-M	GA4C-111	63.5	Viton®	M*	3	130	110	M8×4
GVB-SS-ISO63-P	GA4C-311	63.5	Viton®	P**	4	130	110	M8×4
GVB-SS-ISO100-M	GA4E-111	100	Viton®	M*	3	165	145	M8×8
GVB-SS-ISO100-P	GA4E-311	100	Viton®	P**	4	165	145	M8×8
GVB-SS-ISO160-M	GA4F-111	152	Viton®	M*	3	225	200	M10×8
GVB-SS-ISO160-P	GA4F-311	152	Viton®	P**	4	225	200	M10×8
GVB-SS-ISO200-M	GA4G-111	200	Viton®	M*	3	285	260	M10×12
GVB-SS-ISO200-P	GA4G-311	200	Viton®	P**	4	285	260	M10×12

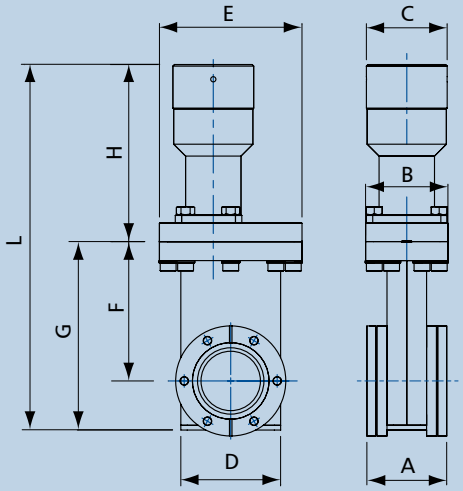
Model No.	A	B	C	D	E	F	G	H	L
GVB-SS-ISO63-M	57	76	46	112	145	189	251	183	470
GVB-SS-ISO63-P	57	76	94	112	145	189	251	219	469
GVB-SS-ISO100-M	57	76	46	142	178	224	305	183	488
GVB-SS-ISO100-P	57	76	94	142	178	224	305	223	528
GVB-SS-ISO160-M	66	76	51	196	232	294	392	260	652
GVB-SS-ISO160-P	66	76	114	196	232	294	392	245	637
GVB-SS-ISO200-M	65	78	51	243	277	348	472	260	732
GVB-SS-ISO200-P	65	78	114	243	277	348	472	245	717

＊M：Manual　　＊＊P：Pneumatic

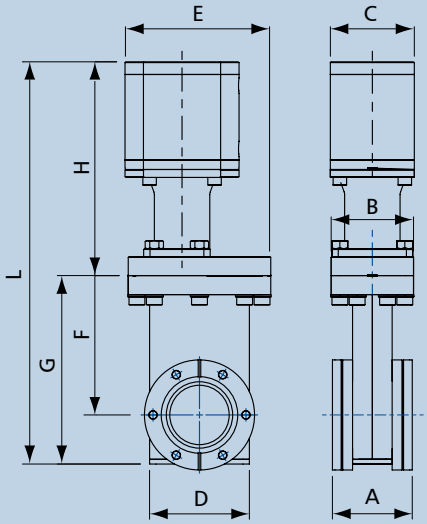
Dimension in mm unless otherwise noted

CF - Flange (Small)

UHV Series



Manual (Fig5)



Pneumatic (Fig6)

Model No.	Part No.	Port Dia.	Bonnet Seal	Actuator type	Fig.	Flange O.D.	Bolt P.C.D.	Bolt Size
GVB-SS-CF35-M	GA3A-111	37.5	Metal	M*	5	69.5	58.7	M6×6
GVB-SS-CF35-P	GA3A-311	37.5	Metal	P**	6	69.5	58.7	M6×6
GVB-SS-CF50-M	GA3B-111	50	Metal	M*	5	86	72.4	M6×8
GVB-SS-CF50-P	GA3B-311	50	Metal	P**	6	86	72.4	M6×8

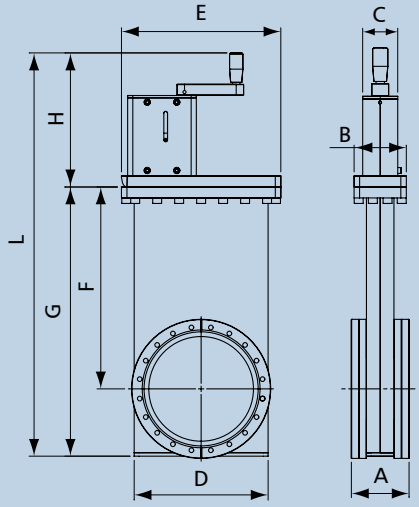
Model No.	A	B	C	D	E	F	G	H	L
GVB-SS-CF35-M	45.4	52	51	63	90	88	119	111	230
GVB-SS-CF35-P	45.4	52	53	63	90	88	119	135	254
GVB-SS-CF50-M	56	56	51	81	104	123	167	128	295
GVB-SS-CF50-P	56	56	53	81	104	123	167	154	321

＊M：Manual　　＊＊P：Pneumatic

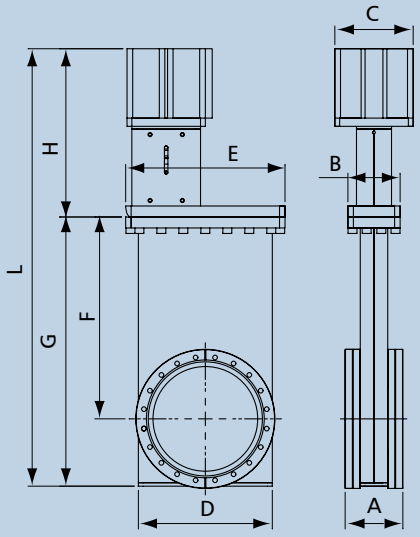
Dimension in mm unless otherwise noted

CF - Flange

UHV Series



Manual (Fig7)



Pneumatic (Fig8)

Model No.	Part No.	Port Dia.	Bonnet Seal	Actuator type	Fig.	Flange O.D.	Bolt P.C.D.	Bolt Size
GVB-SS-CF63-M	GB3C-111	63.5	Metal	M*	7	113.6	92.1	M8×8
GVB-SS-CF63-P	GB3C-311	63.5	Metal	P**	8	113.6	92.1	M8×8
GVB-SS-CF100-M	GB3E-111	100	Metal	M*	7	151.6	130.3	M8×16
GVB-SS-CF100-P	GB3E-311	100	Metal	P**	8	151.6	130.3	M8×16
GVB-SS-CF150-M	GB3F-111	152	Metal	M*	7	202.5	181	M8×20
GVB-SS-CF150-P	GB3F-311	152	Metal	P**	8	202.5	181	M8×20
GVB-SS-CF200-M	GB3G-111	200	Metal	M*	7	253.2	231.8	M8×24
GVB-SS-CF200-P	GB3G-311	200	Metal	P**	8	253.2	231.8	M8×24

Model No.	A	B	C	D	E	F	G	H	L
GVB-SS-CF63-M	69	76	46	112	145	189	251	183	434
GVB-SS-CF63-P	69	76	94	112	145	189	251	219	470
GVB-SS-CF100-M	73	76	46	142	178	224	305	183	486
GVB-SS-CF100-P	73	76	94	142	178	224	305	223	528
GVB-SS-CF150-M	78	76	51	195	232	294	392	260	652
GVB-SS-CF150-P	78	76	114	195	232	294	392	245	637
GVB-SS-CF200-M	82.4	78	51	243	277	348	472	260	732
GVB-SS-CF200-P	82.4	78	114	243	277	348	472	245	717

＊M：Manual　　＊＊P：Pneumatic

Dimension in mm unless otherwise noted