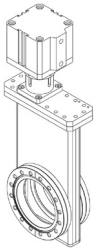
Ideal® vacuum



OUR PRODUCTS DEVELOP TOMORROW'S TECHNOLOGIES™

ULTRALOCK™ Gate Valve

USER MANUAL

ULGV-09302024- V 1.0.5S

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Prior to returning any product, we require that you contact us by phone or email to determine if the issue can be resolved quickly. A technical support representative will work with you to resolve the problem. If the issue cannot be resolved in that manner, we will issue an RMA number and provide product return instructions.

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SAFETY

IMPORTANT SAFETY INFORMATION

Thank you for purchasing this equipment from Ideal Vacuum Products. We want you to operate it safely.

- **Read this manual and all associated equipment manuals before installing or operating this equipment. Failure to follow the warnings and instructions may result in serious injury or equipment damage.**
- **Keep this manual in a safe location for future reference.**
- **This equipment should only be installed and operated by trained, qualified personnel, wearing appropriate protective equipment.**
- **Follow all codes that regulate the installation and operation of this equipment.**

WARNING SYMBOLS AND DEFINITIONS

This is the universal safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER	**Indicates an imminently hazardous situation that, if not avoided, will result in death or severe injury.**
WARNING	**Indicates an imminently hazardous situation that, if not avoided, could result in death or severe injury.**
CAUTION	**Indicates a potentially hazardous situation that, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.**
NOTICE	**Indicates a potentially hazardous situation that, if not avoided, could result in equipment or property damage.**
NOTE	**Indicates helpful tips and recommendations, as well as information for efficient, trouble-free operation.**

Internationally recognized safety symbols may be used with safety warnings to specify the type of hazard or a safety protocol to follow. For example:

Indicates an electric shock hazard

Indicates safety glasses are required

1. INTRODUCTION

Ideal Vacuum's ULTRALock gate valves are designed for dependable high (HV) and ultra-high vacuum (UHV) applications and are often used in combination with turbomolecular, diffusion, cryogenic, and ion pumps. All but our largest ISO flanged ULTRALock gate valves are available with either manual or pneumatic operation. Large ISO valves (ISO-320 and larger) are pneumatic. Pneumatic valves require compressed house air to operate. To protect a high vacuum pump, pneumatic valves close automatically and seal tightly upon loss of air pressure or if a power interruption occurs.

Available ultra-high vacuum (UHV) CF flanged valves include:

- CF 2.75" (DN CF-35)
- CF 4.5" (DN CF-63)
- CF 6.0" (DN CF-100)
- CF 8.0" (DN CF-150)
- CF 10.0" (DN CF-200)
- CF 12.0" (DN CF-250)

Available high vacuum (HV) KF quick flanged valves include:

- ISO-KF NW 40
- ISO-KF NW 50

Available high vacuum (HV) ISO flanged sizes include:

- ISO-F 63
- ISO-F 100
- ISO-F 160
- ISO-F 200
- ISO-F 250
- ISO-F 320
- ISO-F 400
- ISO-F 500
- ISO-F 630

Seal and gasket kits are available (please inquire) and field replaceable. This allows the user to keep the valve in peak operating condition and reduces down time. Solenoid kits for pneumatic valves are sold separately so that the user can select the most convenient operating voltage. Solenoids are offered in 24 VDC and 110 VAC versions. Solenoid kits include a double-acting solenoid valve, a mounting bracket with fasteners used to attach the solenoid to the valve, push-to-connect fittings, and flexible 1/4" OD airlines that connect between the gate valve's pneumatic cylinder and the solenoid valve. House air at 60-85 psi (low volume) is required. On larger valves, gate operation can be increased by changing the 1/4" fittings and air lines to 3/8".

Most of our pneumatic UltraLock series of gate valves include a visible external position indicator - a white ring conveniently mounted below the pneumatic piston. Many include open and closed position switches (on/off type) mounted on the valve's pneumatic cylinder. These switches can be used to activate indicator lights or used to control a more complex or automated vacuum protection system.

2. PARTS OF A GATE VALVE

For manually operated valves, turn the actuator clockwise to close the valve. Slowly turn the actuator until the gate O-ring makes contact with the flange. Continue turning the actuator until you hear and feel the gate lock close. Once closed, additional tightening does not improve the gate seal.

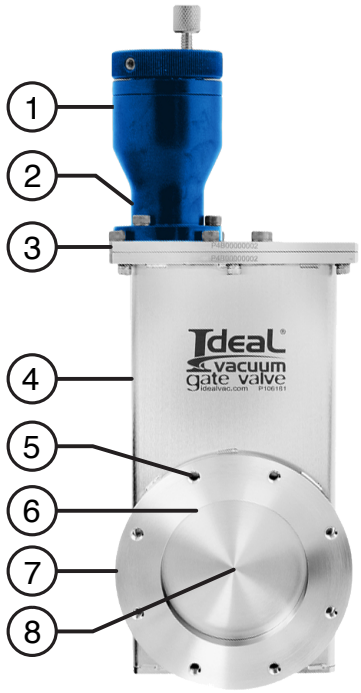


Figure 1 - Manual Gate Valve Parts

Item	Description
1	Manual Actuator
2	Bellows Assembly (inside actuator)
3	Bonnet Plate
4	Valve Body
5	Threaded Flange Mounting Holes
6	Port
7	Flange (ISO Flange shown)
8	Gate (see Items 14& 15 below)
9	Pneumatic Cylinder (Actuator)
10	Position Sensors (Pneumatic only, with cables)
11	Bonnet Seal HV Valves (KF and ISO) use Viton UHV Valves (CF) use OFHC Copper
12	Push-to-Connect Air Line Fittings (Connect to Solenoid - not shown)
13	Visible External Position Indicator (Only on Some Valves)
14	Carriage and Gate Mechanism (Ball Groove Type Shown)
15	Viton O-Ring gate Seal (All Valves)

Table 1- Major gate valve components

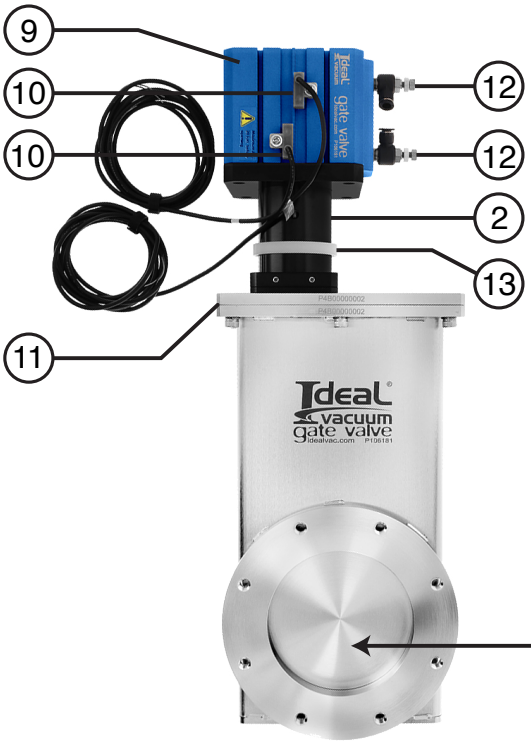


Figure 2 - Pneumatic Gate Valve Parts

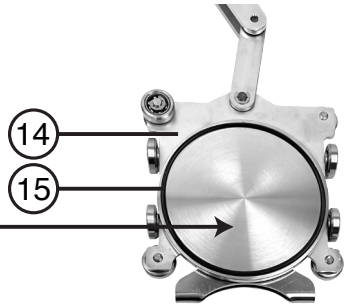


Figure 3 - Carriage and Gate (ball groove mechanism type shown)

3. LINKAGE AND BALL-GROOVE MECHANISMS

ULTRALock gate valves may use one of two different operating mechanisms: Linkage and ball-groove. Both securely lock and seal the gate closed.

Linkage Locking Mechanism

Our linkage locking type UltraLock gate valves employ a positive lock-over center mechanism. When the valve is actuated, the carriage-gate assembly is slid towards the vacuum port. When the gate is aligned concentrically with the valve port, a pair of sliding push rods are pressed against the end of the valve body. The rods force eccentrics (cams) to rotate outwardly from the carriage onto the gate. The outward force exerted by the cams pushes the gate closed. A leak-tight seal is obtained as the pressure forces the gate's O-ring seal to be pressed against the valve body's sealing surface.

Our smallest valves (KF40, KF50, and CF 2.75") and our largest valves (ISO-320 and larger) use the linkage locking mechanism. All others, whether manual or pneumatic, use our ball groove type mechanism.

Ball-Groove Locking Mechanism

Most of our UltraLock high vacuum and ultra-high vacuum gate valves employ an ingenious ball-groove mechanism to lock the valve. Inside the valve body is a rolling carriage-gate assembly. When the valve is actuated, the assembly is slid towards the vacuum port until the carriage reaches the end of the valve body. This positions the gate concentric to the port. Continued pressure on the carriage causes a set of stainless-steel balls, riding in a decreasing depth groove between the carriage and the gate, to exert outward pressure on the gate. This outward force pushes the gate into its closed position. A leak-tight seal is obtained as the outward pressure forces the gate's O-ring seal to be pressed against the valve body's sealing surface.

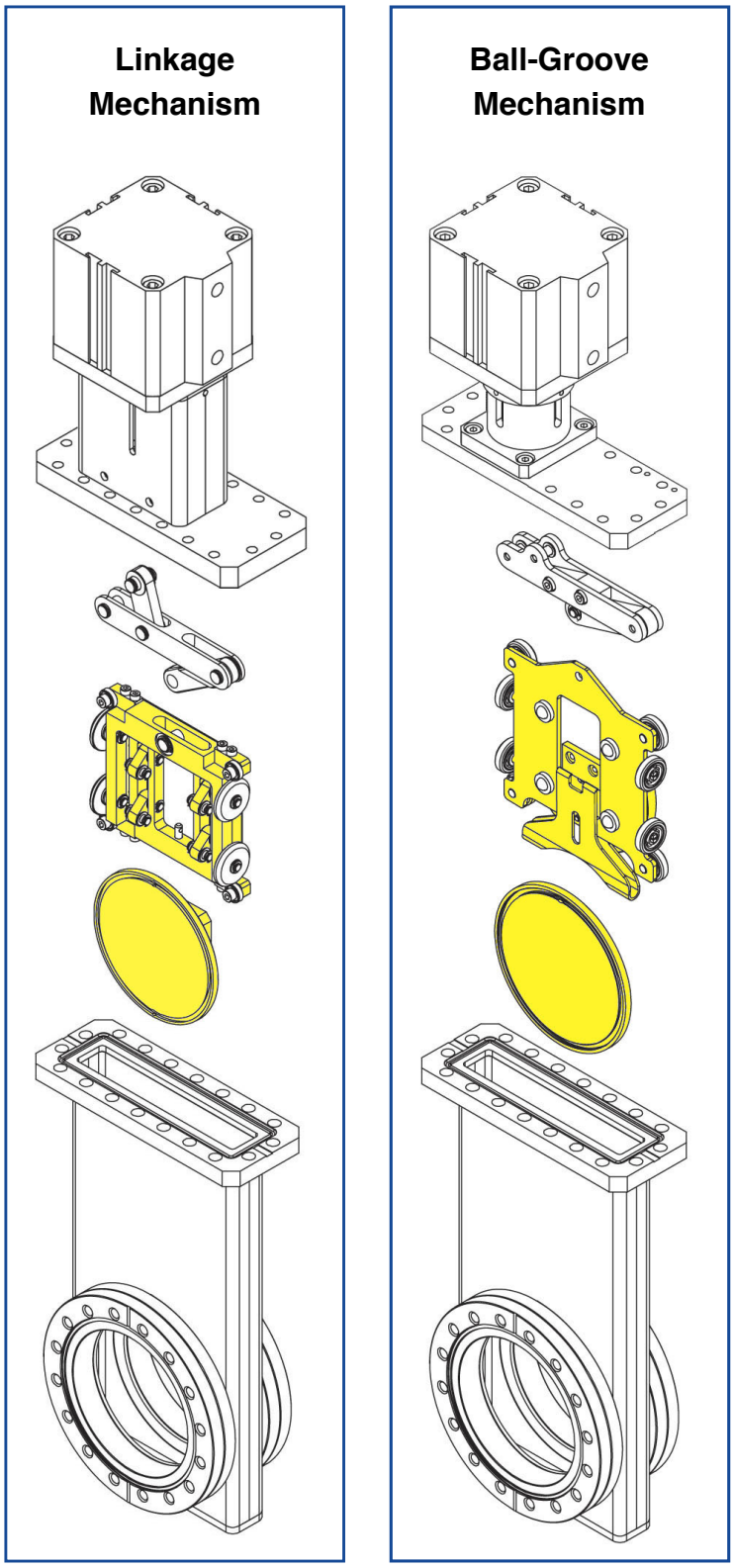


Figure 4 - Mechanism Types

4. GATE VALVE GENERAL SPECIFICATIONS

4.1 CF FLANGED ULTRA-HIGH VACUUM VALVES (UHV)

All UHV UltraLock valves are unlubricated.

Flange Size (Conflat)	CF 2.75”	CF 4.5”	CF 6.0”	CF 8.0”	CF 10.0”
Flange Size (DN)	CF35	CF63	CF100	CF150	CF200
Mechanism Type*	L	BG	BG	BG	BG
Actuation	Manual or Pneumatic				
# Flange Holes	6	8	16	20	24
Thread (standard)	1/4-28	5/16-24			
Bolt Torque (lb-in.)	150	180			
Thread Depth (in.)	0.39	0.71	0.79	0.87	0.94
Speed Open/Close (sec.)	2	3			5
Conductance (l/sec)	-	480	1800	5400	11400
Cycle Life	100k			50k	
Body and Gate Material	304 Stainless Steel				
Gate Seal	Viton O-Ring				
Bonnet Seal	OFHC Copper Gasket				
Helium Leak Rate	< 3.75×10^{-10} Torr l/sec (@1 atm differential)				
Bakeout Valve Body, Gate Open	≤ 200 °C				
Bakeout Valve Body, Gate Closed	≤ 150 °C				
Bakeout Actuator Manual	≤ 200 °C				
Bakeout Actuator Pneumatic	≤ 80 °C				
Sealing Pressure Range	7.5×10^{-11} to 760 Torr				
Maximum ΔP	20 Torr				
Compressed Air Pneumatic Valves Only	1/4” OD Tubing, 60 - 85 psi				

* Mechanism Type: L = Linkage Locking, BG = Ball-Groove Locking ** Actuation: M = Manual, P = Pneumatic

Table 2 - Ultra-high vacuum valves, CF flanged, general specifications

4.2 KF FLANGED HIGH VACUUM VALVES (HV)

All HV UltraLock valves are lubricated.

Flange Size (ISO NW)	KF-40	KF-50
Mechanism Type	Linkage Locking	
Actuation	Manual or Pneumatic	
Speed Open/Close (sec.)	2	
Cycle Life	200k	
Body and Gate Material	304 Stainless Steel	
Gate and Bonnet Seals	Viton O-Ring	
Helium Leak Rate (@1 atm differential)	$< 2 \times 10^{-9}$ Torr l/sec	
Bakeout Valve Body Gate Open or Closed	≤ 150 °C	
Bakeout Actuator Manual or Pneumatic	≤ 80 °C	
Sealing Pressure Range	7.5×10^{-9} to 760 Torr	
Maximum ΔP	20 Torr	
Compressed Air Pneumatic Valves Only	1/4” OD Tubing, 60 - 85 psi	

Table 3 - KF flanged, high vacuum valves, general specifications

4.3 ISO-F FLANGED HIGH VACUUM VALVES (HV)

Flange Size (ISO-F)	63	100	160	200	250	320	400	500
Mechanism Type*	BG	BG	BG	BG	BG	L	L	L
Actuation**	M/P	M/P	M/P	M/P	M/P	P	P	P
# Flange Holes	4	8		12			16	
Thread (metric)	M8 x 1.25		M10 x 1.50			M12 x 1.75		
Torque (lb-in [kg-cm])	86 [100]			130 [150]			173 [200]	
Thread Depth (mm)	12		16		19	20	24	
Speed Open/Close (sec.)	2	3	3	5	5	7	~9	~11
Conductance (l/sec)	590	2300	6400	14000	-	-	52000	90000
Cycle Life	300k				50k		20k	
Body Material	304 Stainless Steel							
Gate Material	304 Stainless Steel				6061 Aluminum			
Gate and Bonnet Seals	Viton O-Ring							
Helium Leak Rate	< 3.75 x 10^{-10} Torr l/sec (@1 atm differential)							
Bakeout Valve Body Gate Open	≤ 200 °C							
Bakeout Valve Body Gate Closed	≤ 150 °C							
Bakeout Actuator Manual	≤ 80 °C							
Bakeout Actuator Pneumatic	≤ 200 °C							
Sealing Pressure Range	7.5 x 10^{-9} to 760 Torr							
Maximum ΔP	20 Torr							
Compressed Air Pneumatic Valves Only	1/4” OD Tubing, 60 - 85 psi						3/8” Tubing	

* Mechanism Type: L = Linkage Locking, BG = Ball-Groove Locking ** Actuation: M = Manual, P = Pneumatic

Table 4 - ISO flanged, high vacuum valves, general specifications

5. CF FLANGED VALVES (UHV) - DIMENSIONS

5.1 CF MANUAL, LINKAGE LOCKING

Manually operated Conflat CF flanged UltraLock gate valves are unlubricated. These valves do not include position sensors.

Flange	CF 2.75”
DN Size	CF 35
Part #	P1013056
A	**45.4 mm** (1.79 in.)
B	**52** (2.05)
C	**51** (2.01)
D	**63** (2.48)
E	**90** (3.54)
F	**100** (3.94)
G	**131** (5.16)
H	**101** (3.98)
J	**235.8** (9.28)
# Flange Holes	6
Ø K	**37.5** (1.48)
Ø L	**58.7** (2.31)
Ø M	**69.5** (2.74)
N	1/4-28

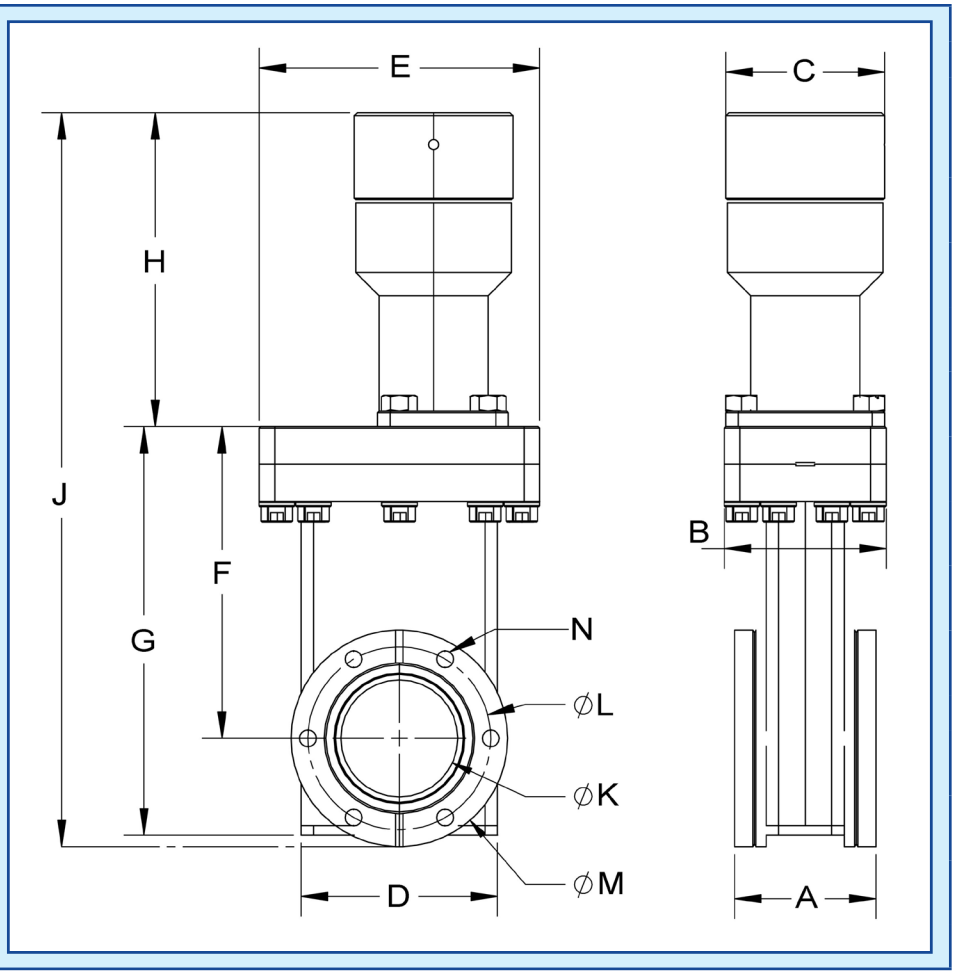


Table 5 - CF flanged, linkage type, manually operated valve dimensions

5.2 CF PNEUMATIC, LINKAGE LOCKING

Pneumatically operated Conflat CF flanged UltraLock gate valves are unlubricated. These valves do not include position sensors.

Flange	CF 2.75”
DN Size	CF 35
Part #	P1013057
A	**45.4 mm** (1.79 in.)
B	**52** (2.05)
C	**53** (2.09)
D	**63** (2.48)
E	**90** (3.54)
F	**100** (3.94)
G	**131** (5.16)
H	**123** (4.84)
J	**257.8** (10.15)
# Flange Holes	6
Ø K	**37.5** (1.48)
Ø L	**58.7** (2.31)
Ø M	**69.5** (2.74)
N	1/4-28

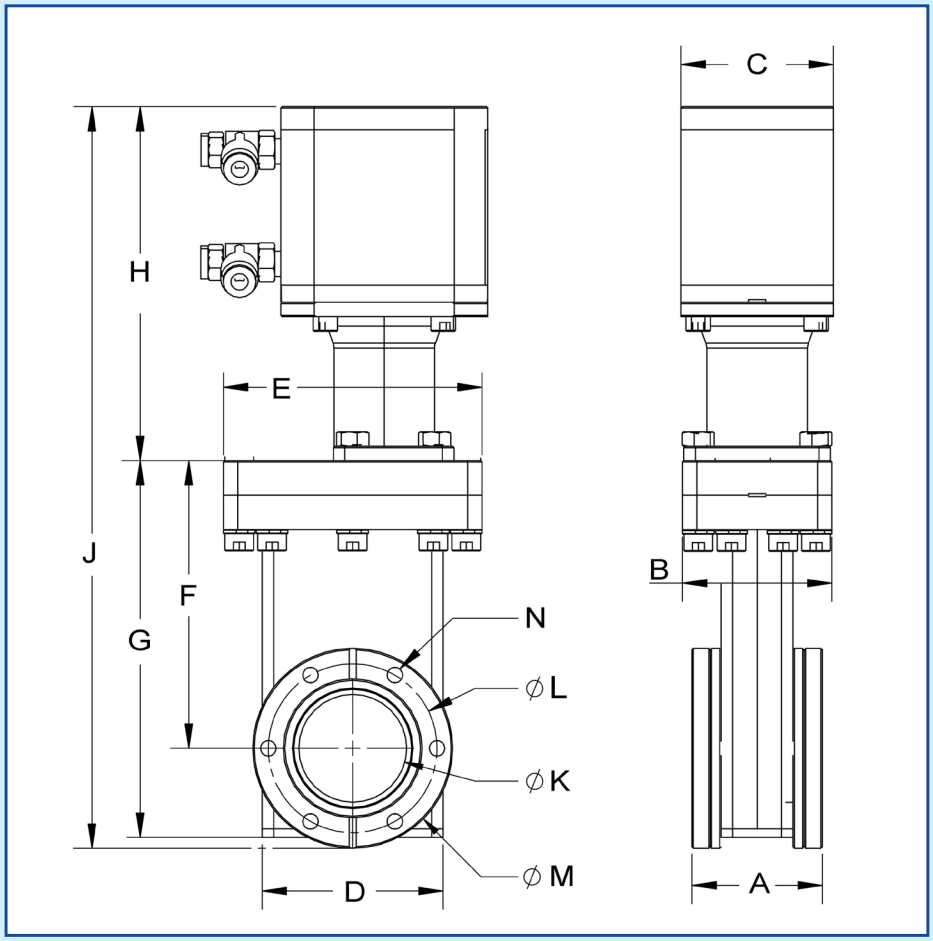


Table 6 - CF flanged, linkage type, pneumatically operated valve dimensions

5.3 CF MANUAL, BALL-GROOVE LOCKING

Manually operated Conflat CF flanged UltraLock gate valves are unlubricated. These valves do not include position sensors.

Flange	CF 4.5”	CF 6.0”	CF 8.0”	CF 10.0”
DN Size	CF 63	CF 100	CF 150	CF 200
Part #	P1013058	P1013060	P1013062	P1013064
A	**65 mm** (2.56 in.)	**69.6 mm** (2.74 in.)	**79 mm** (3.11 in.)	**84.4 mm** (3.32 in.)
B	**68** (2.68)	**68** (2.68)	**70** (2.76)	**70** (2.76)
C	**70** (2.76)	**70** (2.76)	**78** (3.07)	**78** (3.07)
D	**107** (4.21)	**146** (5.75)	**204** (8.03)	**245** (9.65)
E	**143** (5.63)	**182** (7.17)	**238** (9.37)	**282** (11.10)
F	**170** (6.69)	**234** (9.21)	**318.5** (12.54)	**396** (15.59)
G	**219** (8.62)	**309** (12.17)	**419** (16.50)	**520** (20.47)
H	**148** (5.83)	**148** (5.83)	**171** (6.73)	**212** (8.35)
J	**374.8** (14.78)	**457.8** (18.02)	**590.8** (23.26)	**734.6** (28.92)
# Flange Holes	**8**	**16**	**20**	**24**
Ø K	**63.7** (2.51)	**102** (4.02)	**153** (6.02)	**200** (7.87)
Ø L	**92.1** (3.63)	**130.3** (5.13)	**181** (7.13)	**231.8** (9.13)
Ø M	**113.6** (4.47)	**151.6** (5.97)	**202.5** (7.97)	**253.2** (9.97)
N	5/16-24			

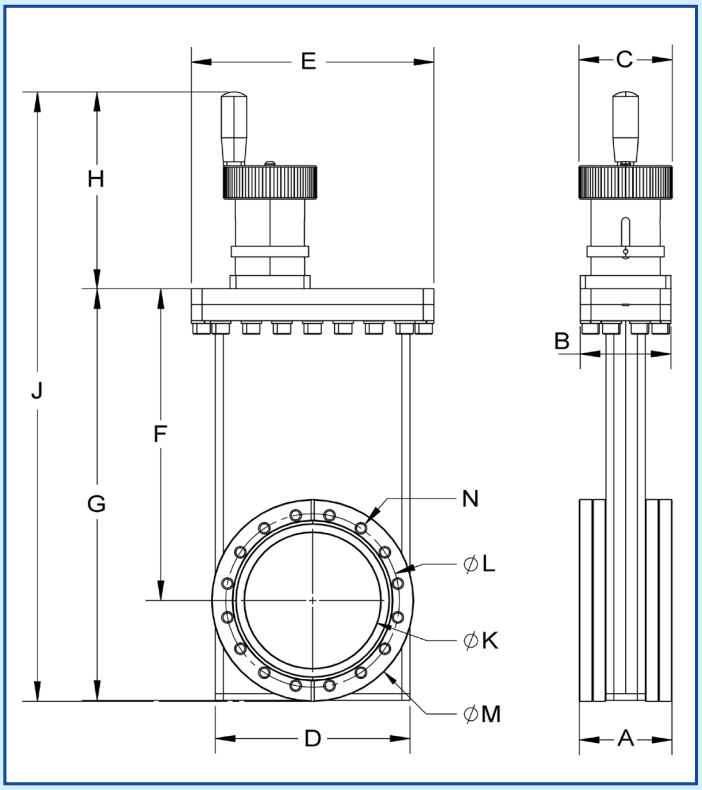


Table 7 - CF flanged, ball-groove type, manually operated valve dimensions

5.4 CF PNEUMATIC, BALL-GROOVE LOCKING

Pneumatically operated Conflat CF flanged UltraLock gate valves are unlubricated. These valves include position sensors.

Flange	CF 4.5”	CF 6.0”	CF 8.0”	CF 10.0”
DN Size	CF 63	CF 100	CF 150	CF 200
Part #	P1013059	P1013061	P1013063	P1013065
A	**65 mm** (2.56 in.)	**69.6 mm** (2.74 in.)	**79 mm** (3.11 in.)	**84.4 mm** (3.32 in.)
B	**68** (2.68)	**68** (2.67)	**70** (2.76)	**70** (2.76)
C	**75** (2.95)	**94** (3.70)	**94** (3.70)	**94** (3.70)
D	**107** (4.21)	**146** (5.75)	**204** (8.03)	**245** (9.65)
E	**143** (5.63)	**182** (7.17)	**238** (9.37)	**282** (11.10)
F	**170** (6.69)	**234** (9.21)	**318.5** (12.54)	**396** (15.59)
G	**219** (8.62)	**309** (12.17)	**419** (16.50)	**520** (20.47)
H	**147** (5.79)	**158** (6.22)	**186** (7.32)	**248** (9.76)
J	**373.8** (14.72)	**467.8** (18.42)	**605.8** (23.85)	**770.6** (30.34)
# Flange Holes	**8**	**16**	**20**	**24**
Ø K	**63.7** (2.51)	**102** (4.02)	**153** (6.02)	**200** (7.87)
Ø L	**92.1** (3.63)	**130.3** (5.13)	**181** (7.13)	**231.8** (9.13)
Ø M	**113.6** (4.47)	**151.6** (5.97)	**202.5** (7.97)	**253.2** (9.97)
N	5/16-24			

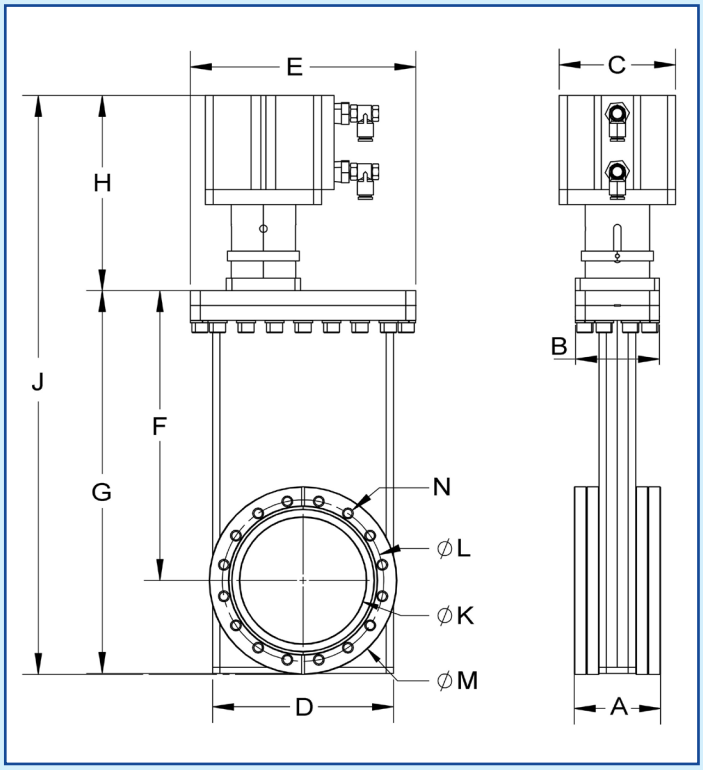


Table 8 - CF flanged, ball-groove type, pneumatically operated valve dimensions

6. KF FLANGED VALVES (HV) - DIMENSIONS

6.1 KF MANUAL, LINKAGE LOCKING

Manually operated KF flanged UltraLock gate valves are lubricated. These valves do not include position sensors.

Flange	KF-40	KF-50
Part #	**P1013052**	**P1013054**
A	**50 mm** (1.97 in.)	**59 mm** (2.32 in.)
B	**52** (2.05)	**56** (2.20)
C	**51** (2.01)	**51** (2.01)
D	**63** (2.48)	**81** (3.19)
E	**90** (3.54)	**104** (4.09)
F	**100** (3.94)	**135** (5.31)
G	**131** (5.18)	**179** (7.05)
H	**101** (3.98)	**117** (4.61)
J	**232** (9.13)	**296** (11.65)
Ø K	**38** (1.50)	**50** (1.97)
Ø L	**55** (2.17)	**75** (2.95)

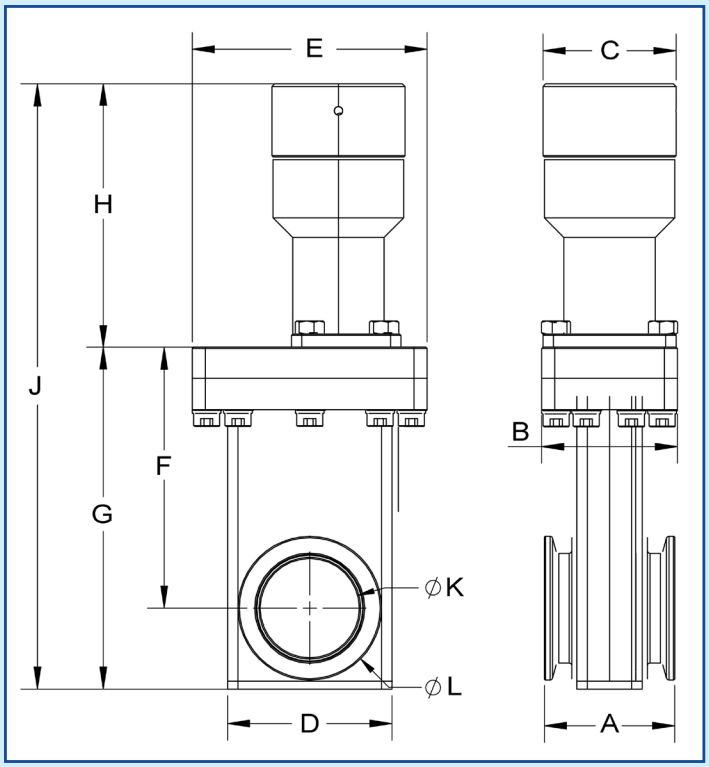


Table 9 - KF flanged, manually operated valve dimensions

6.2 KF PNEUMATIC, LINKAGE LOCKING

Pneumatically operated KF flanged UltraLock gate valves are lubricated. These valves include position sensors.

Flange	KF-40	KF-50
Part #	**P1013053**	**P1013055**
A	**50 mm** (1.97 in.)	**59 mm** (2.32 in.)
B	**52** (2.05)	**56** (2.20)
C	**53** (2.09)	**53** (2.01)
D	**63** (2.48)	**81** (3.19)
E	**90** (3.54)	**104** (4.09)
F	**100** (3.94)	**135** (5.31)
G	**131** (5.16)	**179** (7.05)
H	**123** (4.84)	**142** (5.59)
J	**254** (10.00)	**321** (12.64)
Ø K	**38** (1.50)	**50** (1.97)
Ø L	**55** (2.17)	**75** (2.95)

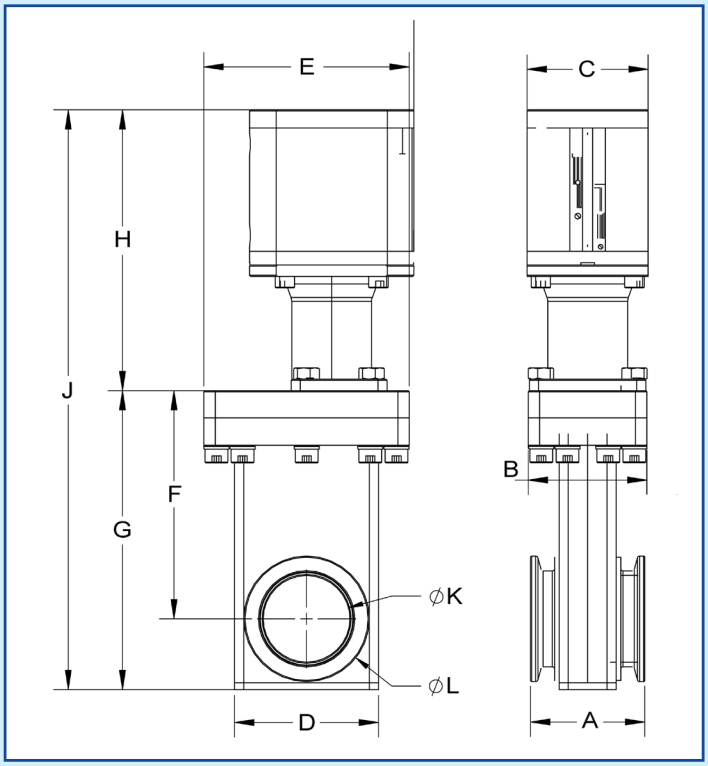


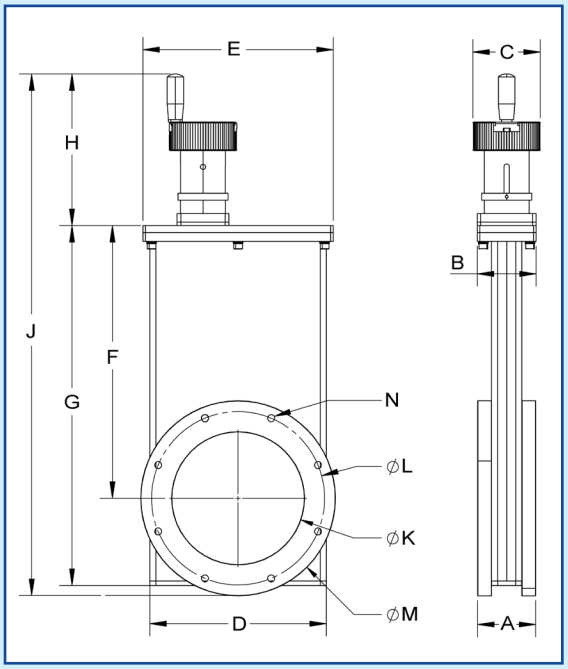
Table 10 - KF flanged, pneumatically operated valve dimensions

7. ISO-F FLANGED VALVES (HV) - DIMENSIONS

7.1 ISO-F MANUAL, BALL-GROOVE LOCKING

Manually operated ISO-F flanged UltraLock gate valves are lubricated. These valves do not include position sensors.

Flange	ISO-63	ISO-100	ISO-160	ISO-200	ISO-250*
Part #	P1013066	P1013068	P1013070	P1013072	P1013074
A	**53 mm** (2.09)	**53.6 mm** (2.11 in.)	**67 mm** (2.64 in.)	**67 mm** (2.64 in.)	**80 mm** (3.15 in.)
B	**68** (2.68)	**68** (2.68)	**68** (2.68)	**70** (2.76)	**75** (2.95)
C	**70** (2.76)	**70** (2.76)	**78** (3.07)	**78** (3.07)	**99** (3.90)
D	**107** (4.21)	**146** (5.75)	**204** (8.03)	**245** (9.65)	**321** (12.64)
E	**128** (5.04)	**170** (6.69)	**220** (8.66)	**267** (10.51)	**340** (13.39)
F	**166.5** (6.55)	**232** (9.13)	**318.5** (12.54)	**395** (15.55)	**512** (20.16)
G	**215.5** (8.48)	**307** (12.09)	**419** (16.50)	**519** (20.43)	**662** (26.06)
H	**151.5** (5.83)	**150** (5.91)	**171** (6.73)	**212** (8.35)	**328.5** (12.93)
J	**383** (15.08)	**464.5** (18.29)	**602** (23.70)	**749.5** (29.51)	**1008** (39.69)
# Flange Holes	**4**	**8**		**12**	
Ø K	**63.7** (2.51)	**102** (4.02)	**153** (6.02)	**200** (7.87)	**255** (10.04)
Ø L	**110** (4.33)	**145** (5.71)	**200** (7.87)	**260** (10.24)	**310** (12.20)
Ø M	**130** (5.12)	**165** (6.50)	**225** (8.86)	**285** (11.22)	**335** (13.19)
N	M8 x 1.25		M10 x 1.50		



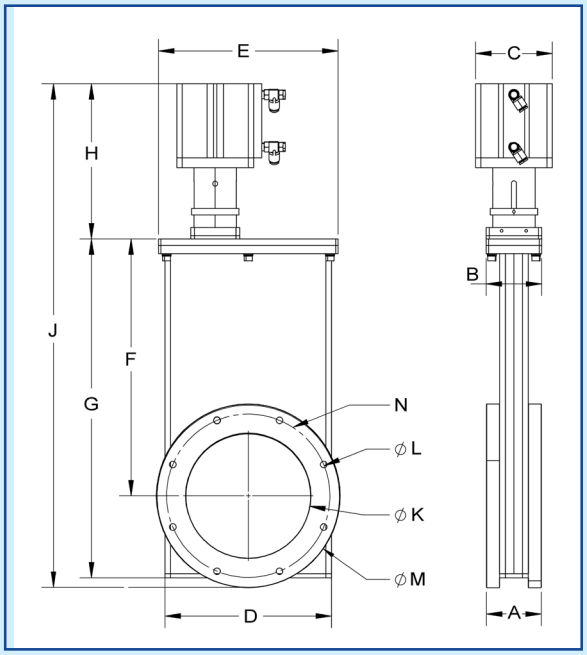
***** Valve gate is aluminum (to reduce weight).

Table 11 - ISO-F flanged, ball-groove type, manually operated valve dimensions

7.2 ISO-F PNEUMATIC, BALL-GROOVE LOCKING

Pneumatically operated ISO-F flanged UltraLock gate valves are lubricated. These valves include position sensors.

Flange	ISO-63	ISO-100	ISO-160	ISO-200	ISO-250*
Part #	P1013067	P1013045	P1013071	P1013073	P1013076
A	**53 mm** (2.09)	**53.6 mm** (2.11 in.)	**67 mm** (2.64 in.)	**67 mm** (2.64 in.)	**80 mm** (3.15 in.)
B	**68** (2.68)	**68** (2.68)	**68** (2.68)	**70** (2.76)	**75** (2.95)
C	**75** (2.95)	**94** (3.70)	**94** (3.70)	**94** (3.70)	**114** (4.49)
D	**107** (4.21)	**146** (5.75)	**204** (8.03)	**245** (9.65)	**321** (12.64)
E	**128** (5.04)	**170** (6.69)	**220** (8.66)	**267** (10.51)	**340** (13.39)
F	**166.5** (6.55)	**230.5** (9.07)	**316.5** (12.46)	**395** (15.55)	**510** (20.08)
G	**215.5** (8.48)	**305.5** (12.03)	**417** (16.42)	**519** (20.43)	**662** (26.06)
H	**150.5** (5.93)	**161.5** (6.36)	**188** (7.40)	**248** (9.76)	**272.5** (10.73)
J	**382** (15.04)	**474.5** (18.68)	**617** (24.29)	**785.5** (30.93)	**950** (37.40)
# Flange Holes	**4**	**8**		**12**	
Ø K	**63.7** (2.51)	**102** (4.02)	**153** (6.02)	**200** (7.87)	**255** (10.04)
Ø L	**110** (4.33)	**145** (5.71)	**200** (7.87)	**260** (10.24)	**310** (12.20)
Ø M	**130** (5.12)	**165** (6.50)	**225** (8.86)	**285** (11.22)	**335** (13.19)
N	M8 x 1.25		M10 x 1.50		



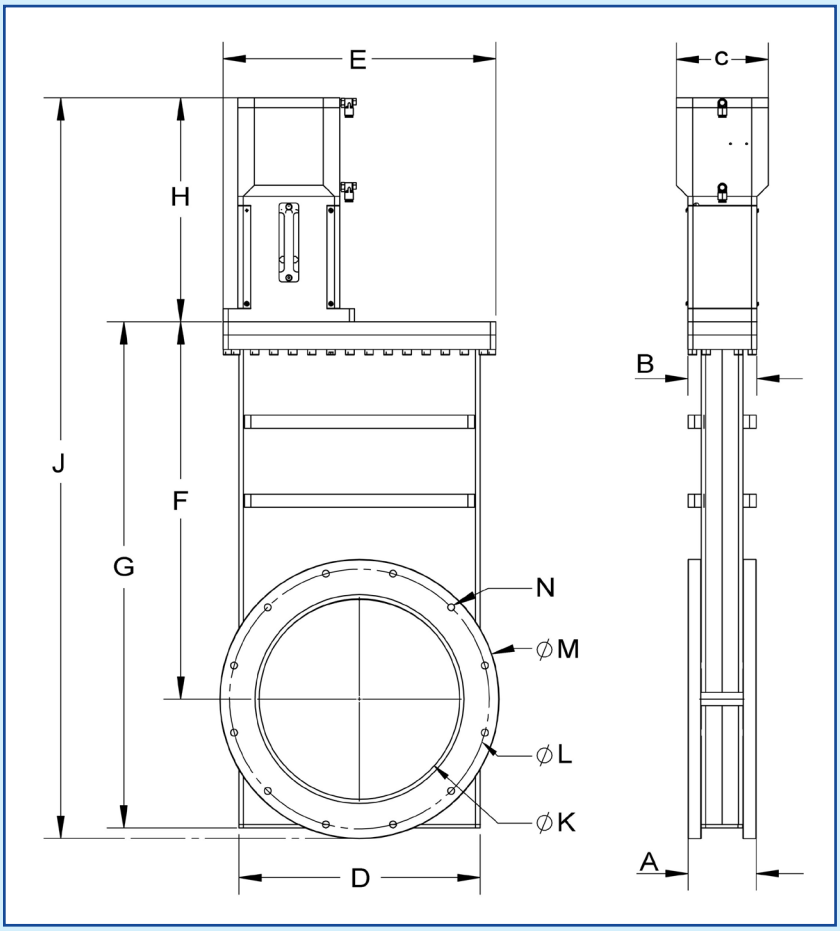
* Valve gate is aluminum (to reduce weight).

Table 12 - ISO-F flanged, ball-groove type, pneumatically operated valve dimensions

7.3 ISO-F PNEUMATIC, LINKAGE LOCKING, LIMIT SWITCH

Pneumatically operated ISO-F flanged UltraLock gate valves are lubricated. These valves include internal limit switches which can be used as position sensors. A DB9 connector is provided on the pneumatic actuator to connect the limit switches.

Flange	ISO-320*
Part #	P1013077
A	**103.6 mm** (4.08 in.)
B	**105** (4.13)
C	**140** (5.51)
D	**367** (14.45)
E	**415** (16.34)
F	**574** (22.60)
G	**770** (30.32)
H	**341** (13.43)
J	**1127.5** (14.75)
# Flange Holes	**12**
Ø K	**305** (12.01)
Ø L	**395** (15.55)
Ø M	**425** (16.69)
N	M12 x 1.75



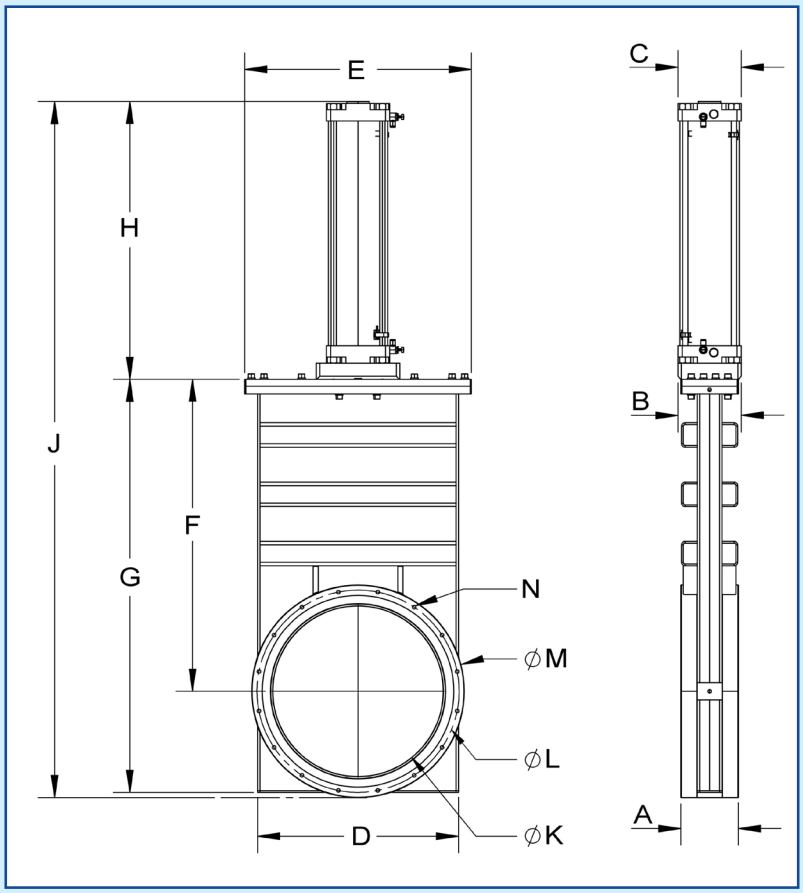
* Valve gate is aluminum (to reduce weight).

Table 13 - ISO-F flanged, pneumatic, ball-groove, limit switch valve dimensions

7.4 ISO-F PNEUMATIC, LINKAGE LOCKING

Pneumatically operated ISO-F flanged UltraLock gate valves are lubricated. These valves include position sensors.

Flange	ISO-400*	ISO-500*	ISO-630*
Part #	P1013069	P1012807	P1013405
A	**150 mm** (5.91 in.)	**165 mm** (6.50 in.)	**180 mm** (7.09 in.)
B	**144** (5.67)	**165** (6.50)	**240** (9.45)
C	**140** (5.51)	**182** (7.17)	**182** (7.17)
D	**468** (18.43)	**576.5** (22.70)	**732** (28.82)
E	**525** (20.67)	**650** (25.59)	**806** (31.73)
F	**742** (29.21)	**895** (35.24)	**1195** (47.05)
G	**970** (38.19)	**1185** (46.65)	**1560** (61.42)
H	**681** (26.81)	**797** (31.38)	**956** (37.64)
J	**1678** (66.06)	**1997** (78.62)	**2546** (100.24)
# Flange Holes	16		20
Ø K	**400** (15.75)	**501** (19.72)	**639** (25.16)
Ø L	**480** (18.90)	**580** (22.83)	**720** (28.35)
Ø M	**510** (20.08)	**610** (24.02)	**780** (30.71)
N	M12 x 1.75		



* Valve gate is aluminum (to reduce weight).

Table 14 - ISO-F flanged, ball-groove type, pneumatically operated valve dimensions

8. SOLENOIDS

Solenoid kits are available in two voltages: 110 VAC and 24 VDC. Kits include pre-installed push-to-connect fittings for 1/4” OD tubing, 6 ft. of 1/4” OD air tubing, exhaust mufflers, a mounting bracket, and mounting screws.

Solenoid Voltage	Power	Part Number
110 VAC	4.5 W	P1013464
24 VDC	4.5 W	P1013465

Table 15 - Available solenoids

Most ULTRALock gate valves have threaded solenoid mounting holes on the top of the bonnet (Figure 5). The smallest and largest valves do not have mounting holes. For these valves, the solenoid must be mounted remotely (Table 22).

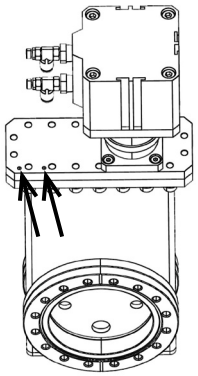


Figure 5 - Solenoid mounting holes on bonnet

Valve Flange	Part Number
CF 2.75”	P1013057
KF-40	P1013053
KF-50	P1013055
ISO-320	P1013077
ISO-400	P1013069
ISO-500	P1012807
ISO-630	P1013405

Table 16 - Valves without solenoid mounting holes

When the solenoid is not energized, the P port sends air through the A port into the top of the pneumatic piston keeping the gate valve closed. When the solenoid is energized, the P port sends air into the B port and into the pneumatic piston’s lower port closest to the valve’s bonnet. The air pushes the pneumatic piston upward which opens the valve’s gate.

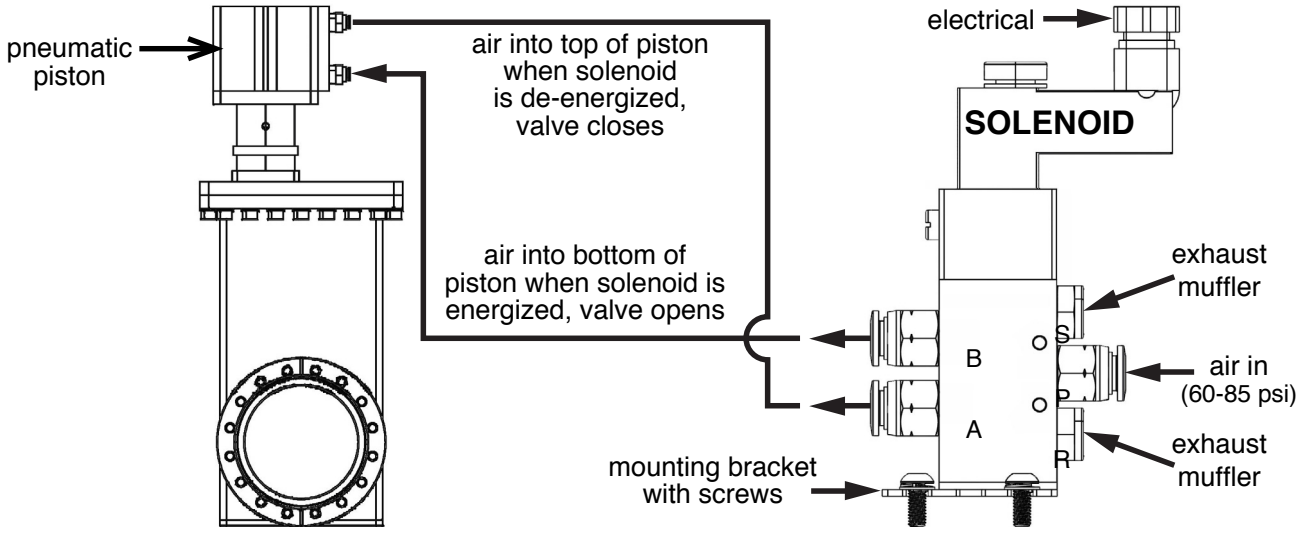


Figure 6 - Valve and solenoid air connections

8.1 SOLENOID ELECTRICAL CONNECTIONS

Each solenoid is delivered without a power cable and with the connector housing reversed (to fit into a smaller box). It must be wired and the housing orientation reversed before use.

1. Use a #1 Phillips screwdriver to remove the connector housing screw.

Figure 7 - Remove connector screw

2. Detach the connector housing from the solenoid.

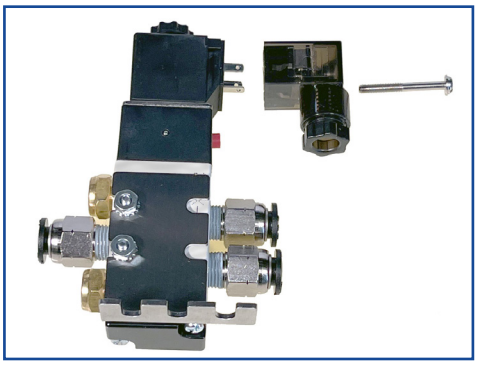


Figure 8 - Separate housing from manifold

3. Use a jeweler's screwdriver or probe to pry the connector out of its housing.

Figure 9 - Pry out connector

4. The connector has three terminals: Positive, negative, and ground (Figure 10). Back out the (+) and (-) terminal screws with the #1 Phillips screwdriver.

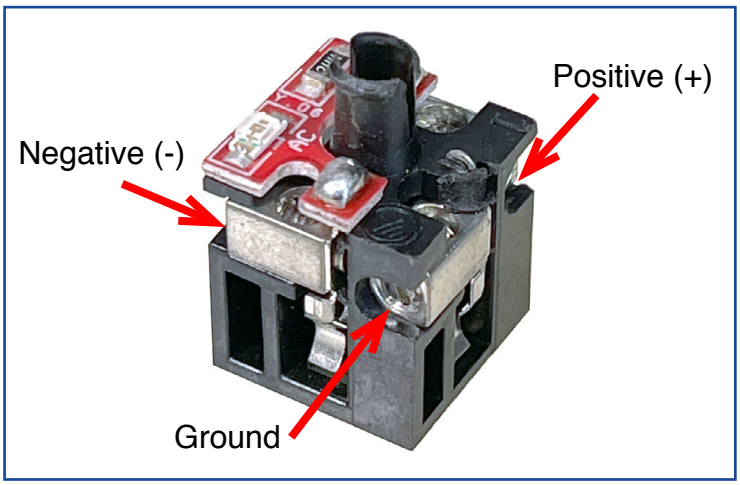


Figure 10 - Connector terminals

5. Pass the power cable through the housing BEFORE making connections. Insert the appropriate wire into its terminal and tighten each terminal screw.

⚠ CAUTION **AC solenoids must be properly grounded!**

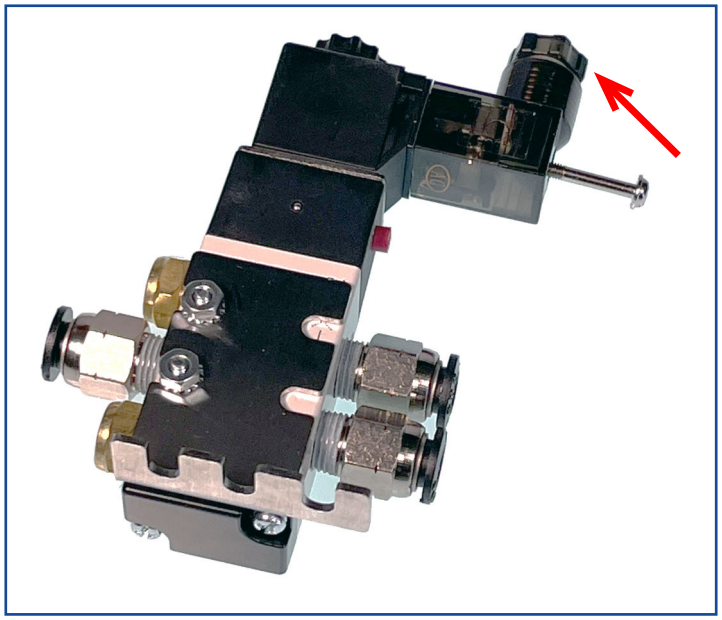


Figure 11 - Reverse housing and reassemble

6. Reverse the housing so that it points away from the solenoid manifold (Figure 11, above).

7. Snap the connector back into the housing.

8. Replace and secure the connector housing screw.

9. The solenoid is ready to attach to the valve.

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