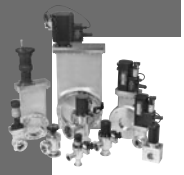
Section 2

Valves



Gate valves Million cycle line MC+

Introduction

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 valves carriage/gate. The actuator is attached to the valves body via a rectangular bonnet flange. The gate closes or opens one of the valves 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 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. Caburn-MDC stainless steel vacuum gate valves incorporate patented C-Loc™ and Uni-Loc™ gate valve locking mechanisms. No contact is made between a valves body and the locking mechanism, a feature which markedly decreases vibration and insures smooth valve operation. Caburn-MDC gate valves require about half the number of moving parts found in comparable competitor valves. This reduction in moving components minimises 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. Caburn-MDC circular gate valves are offered in various sizes ranging from 16mm to 305mm port diameters. Standard port mounts include: CF metal seal flanges, which are recommended for ultrahigh vacuum service; ISO KF and ISO LF fast make and break elastomer sealed flanges, ideal for high vacuum applications requiring frequent assembly and disassembly. Gate valve actuation is available in both manual and electropneumatic configurations. Custom designed valves are available on request.

Standard gate valve features

- UHV and HV series
- Ports with circular or rectangular apertures
- CF, ISO KF or ISO LF port flanges
- Manual and electropneumatic actuators
- Patented C-Loc™ and Uni-Loc™ locking mechanism
- 24V DC air control solenoid valve (Circular and 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

Optional gate valve features

- Modular electromechanical position indicators
- Valve body roughing ports
- High temperature 250°C Kalrez® elastomer gate seal

Million cycle valves MC+

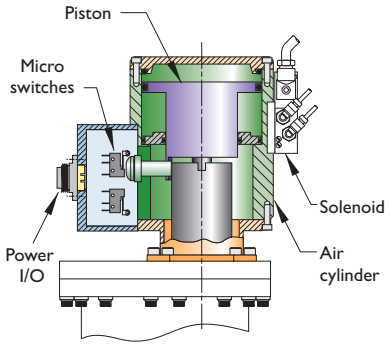
Features

- Enhanced to withstand 1 million cycles before requiring service.
- Low vibration, quiet operation
- Pneumatically locked in the closed position
- Remains closed in the event of power loss
- Fewer internal parts produce low particle generation

Mechanical position indicator Option -01

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 Caburn-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.

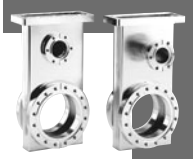
MPI / Pneumatic actuator detail



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

Options



Air control solenoid valve Option -09 240VAC

Caburn-MDC circular gate valves fitted with standard electropneumatic actuators are equipped with Humphrey 410 series 24V DC air control solenoid valves, optional 240V AC solenoid valves are available on request. All solenoid valves (AC/DC power consumption is 4 watts) 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 8.6 bar. 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 elements. 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 (aluminium).

24V DC solenoid valves are supplied as standard.

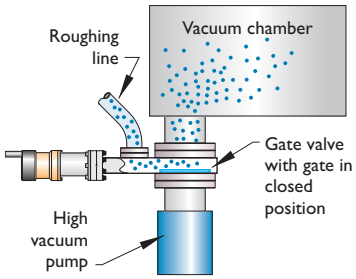
Roughing port Option -04, -05 and -06

With the exception of the DN16 gate valve, all valves can be fitted with roughing ports. Valves with CF port flanges are supplied with CF roughing port flanges. Flush mounted roughing port flanges have tapped bolt holes, but those with tubular extensions have drilled through bolt holes. Gate valves fitted with ISO KF and ISO LF port flanges are supplied with ISO KF 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	DN40CF to DN63CF valves	DN16CF or DN16KF port
Option-05	DN100CF to DN200CF valves	DN40CF or DN40KF port
Option-06	10 and 12" valves	DN63CF or DN50KF port

High temperature gate seal Option -11

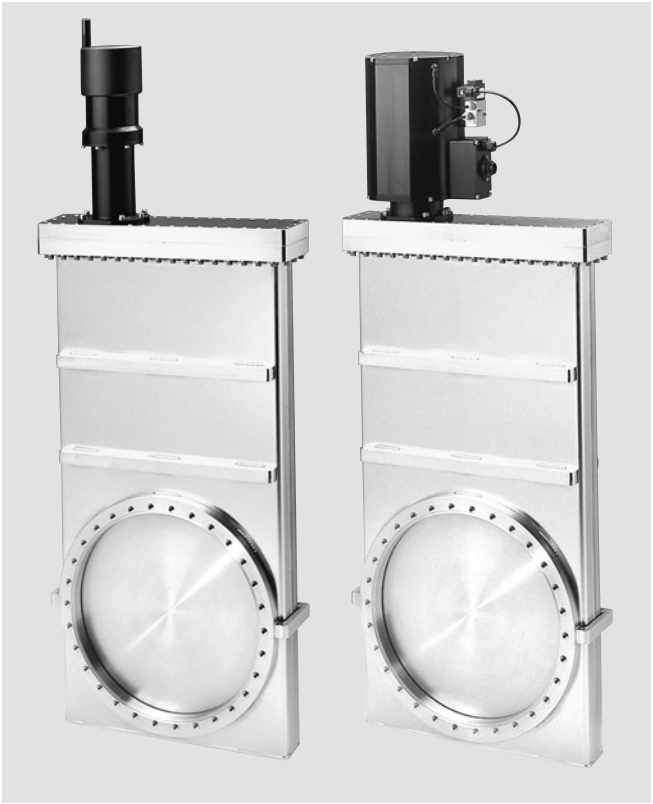
Gate valves are supplied standard with Viton® gate seals. UHV series valves, which have metal sealed bonnet flanges, can be ordered with the high temperature Kalrez® compound 4079 gate seal gasket option. Kalrez® compound 4079 O-rings are suitable for vacuum bakeout to 250°C (with gate in an open position).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

- 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.

All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

Specifications



Sealing

Valves will seal against 1 bar 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 $2x10^{-10}$ mbar litre/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.

Circular gate valves

Specifications

Material	
Body, carriage and gate	300 Series ss
Bellows	AM-350 ss
Air cylinder	Teflon® coated aluminium
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	5 to 7 bar
Air control valve	410 Series Humphrey solenoid valve
Solenoid power	24V DC, 240V AC 4W
Power loss	Valve closes*
Position indicators	Mechanical, vernier adjustable, hinged-roller type micro switches suitable for 5A, 240V AC
Vacuum	
Range	$1x10^{-11}$ mbar
Leak test	$2x10^{-10}$ mbar litre/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

* Can be changed to valve open by customer

Million cycle valves MC+

Features

- Enhanced to withstand 1 million cycles before requiring service.
- Low vibration, quiet operation
- Pneumatically locked in the closed position
- Remains closed in the event of power loss
- Fewer internal parts produce low particle generation

All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

Specifications

Sealing

Valves will seal against 1 bar 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 $2x10^{-10}$ mbar litre/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.

Rectangular gate valves

Specifications

Material	
Body, carriage and gate	300 Series ss
Bellows	AM-350 ss
Air cylinder	Teflon® coated aluminium
Bolts	300 Series ss, silver plated
Gaskets	
Bonnet	Viton® elastomer
Gate	Viton® elastomer
Piston	Viton® elastomer
Electropneumatic actuator	
Air pressure	5 to 7 bar
Air control valve	Herion, double impulse solenoid valve
Solenoid power	24V DC
Power loss	Valve remains in position during air or power failure
Position indicators	Mechanical, vernier adjustable, hinged-roller type micro switches suitable for 5A, 240VAC
Vacuum	
Range	$1x10^{-8}$ mbar
Leak test	$2x10^{-10}$ mbar litre/sec of He
Temperature range	Bakeability under vacuum in open-closed positions, with the following bonnet-gate seal combination:

Series	Open	Closed	Bonnet	Gate
HV	150°C	150°C	Viton®	Viton®

Weight	See table
Dimensions	See table

Million cycle valves MC+

Features

- Enhanced to withstand 1 million cycles before requiring service.
- Low vibration, quiet operation
- Pneumatically locked in the closed position
- Remains closed in the event of power loss
- Fewer internal parts produce low particle generation

All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

DN16 16mm ports

E-GV-625V E-GV-625M-P

UHV Series

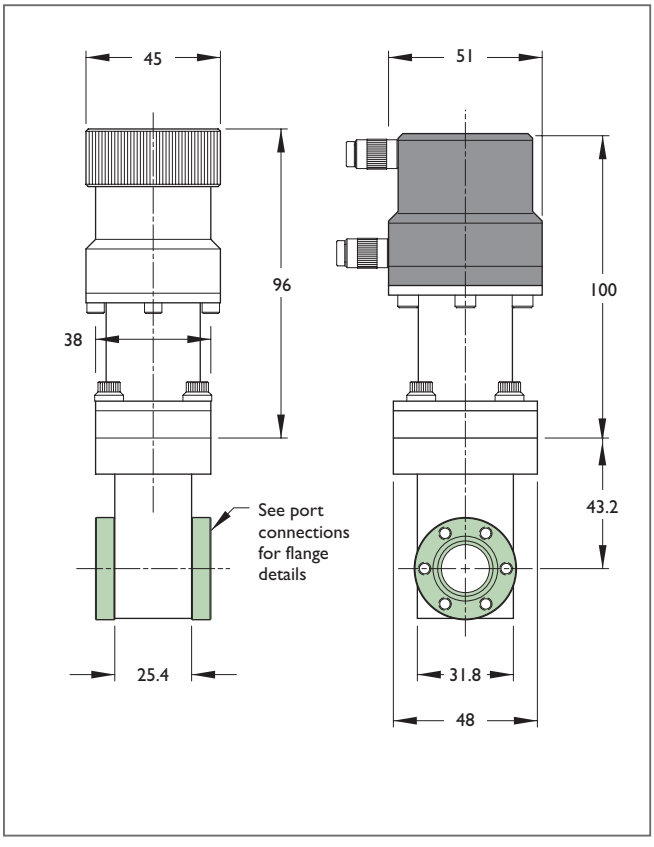
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

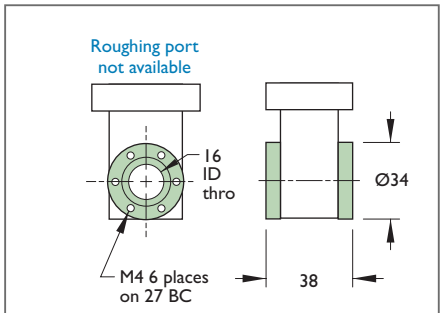
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



Port connections

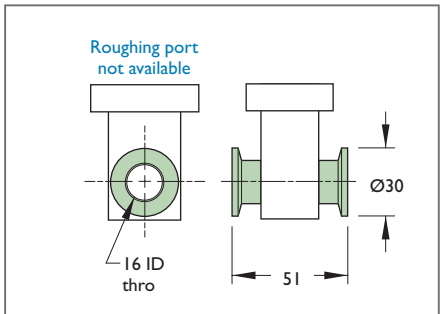
CF

DN16CF



ISO KF

DN16KF



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

DN16 16mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN16CF	M4	Metal	0.9	E-GV-625M	**302011**
Pneumatic	DN16CF	M4	Metal	0.9	E-GV-625M-P	**303011-03**

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN16CF	M4	Viton®	0.9	E-GV-625V	**300011**
Manual	DN16KF	–	Viton®	0.9	KGV-625V	**306000**
Pneumatic	DN16CF	M4	Viton®	0.9	E-GV-625V-P	**301011-03**
Pneumatic	DN16KF	–	Viton®	0.9	KGV-625V-P	**307000-03**

Valve options

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C gate seal

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 **303016-03**-11

Description	Option number
240V AC air control solenoid valve[1]	**-09**
Kalrez high temp O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-625	**354000**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-625M	**355000**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric socket head	M4 x 16mm	DN16CF	25	M4-16	**1113000**
Clamp	_	DN16KF	1	K16-C	**7701000**
Centring ring	–	DN16KF	1	K16-CR	**7710000**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

Gate valves Million cycle line MC+

DN40 38mm ports

E-GV-1500M E-GV-1500M-P

UHV Series

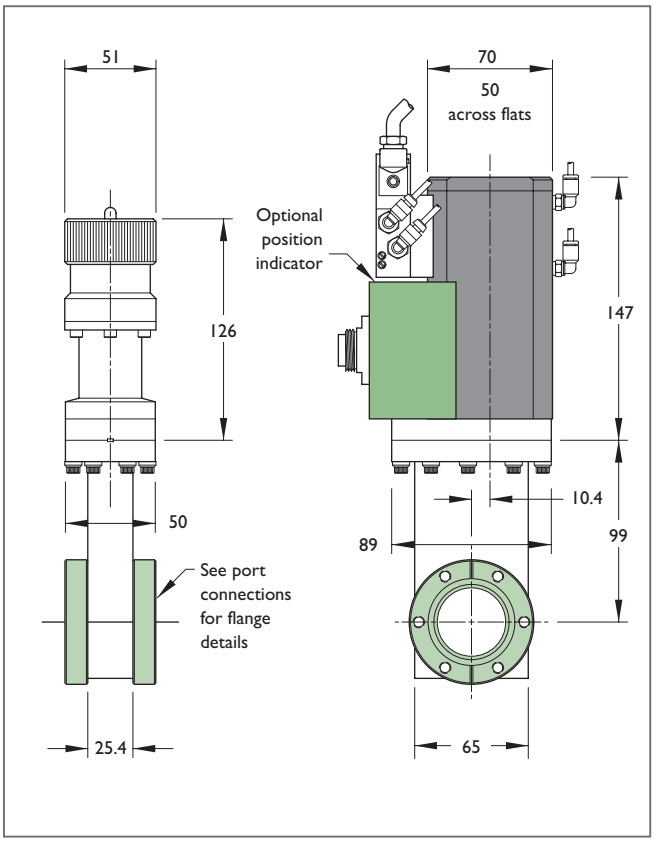
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

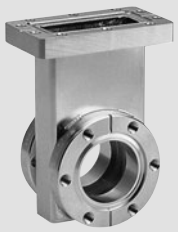
Features

- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation

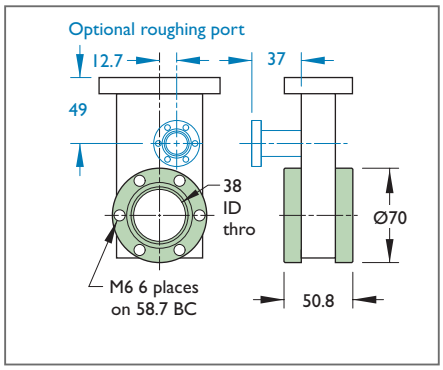


Port connections

CF

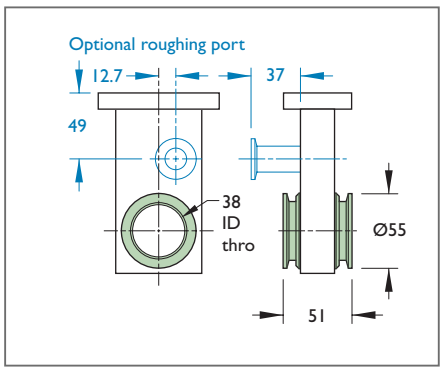


DN40CF



ISO KF

DN40KF



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

DN40 38mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN40CF	M6	Metal	2.7	E-GV-1500M	**302012**
Pneumatic	DN40CF	M6	Metal	2.7	E-GV-1500M-P	**303012-03**

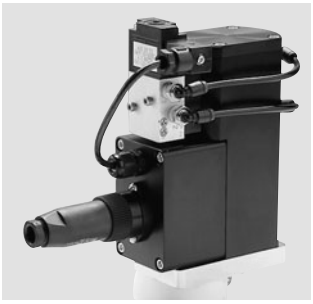
HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN40CF	M6	Viton®	2.7	E-GV-1500V	**300012**
Manual	DN40KF	–	Viton®	2.3	KGV-1500V	**306001**
Pneumatic	DN40CF	M6	Viton®	2.7	E-GV-1500V-P	**301012-03**
Pneumatic	DN40KF	–	Viton®	2.3	KGV-1500V-P	**307001-03**

Valve options

Option -01
Mechanical position indicator



Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **303016-03**-11

Description	Option number
Mechanical position indicator	**-01**
DN16CF or DN16KF roughing ports	**-04**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-1500	**354001**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-1500M	**355001**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M6 x 25mm	DN40CF	25	M6-25	**1113006**
Clamp	_	DN40KF	1	K40-C	**7701002**
Centring ring	–	DN40KF	1	K40-CR	**7710002**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

Del-Seal® 3 3/8" 50mm ports

E-GV-2000M E-GV-2000M-P

UHV Series

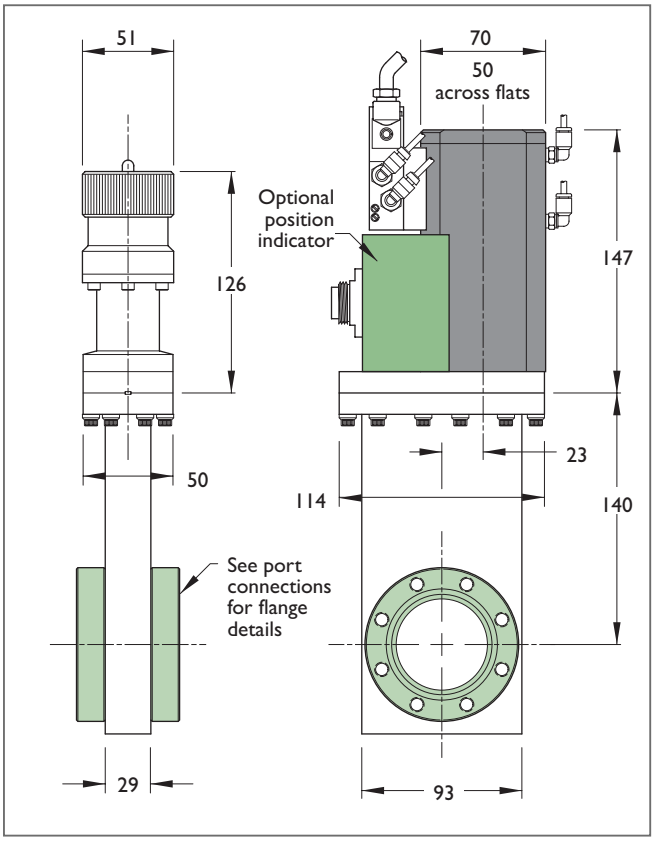
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

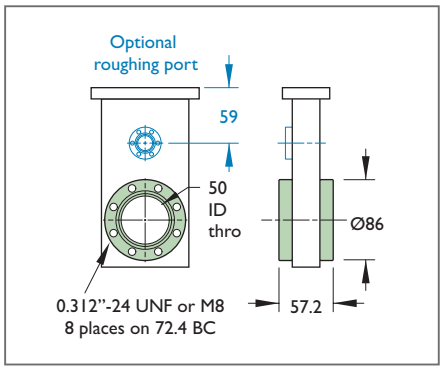
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



Port connections

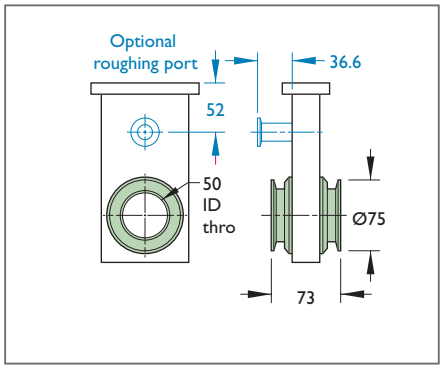
CF

(DN40CF)*
3 3/8" Del-Seal® CF



ISO KF

DN50KF



* 3 3/8 (DN50CF) is not an international ISO size

All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

Del-Seal® 3 3/8" 50mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN50CF*	M8	Metal	5.0	E-GV-2000M	**302013**
Pneumatic	DN50CF*	M8	Metal	5.0	E-GV-2000M-P	**303013-03**

HV Series

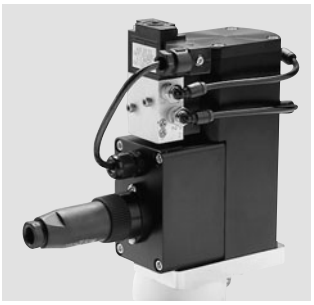
Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN50CF*	M8	Viton®	5.0	E-GV-2000V	**300012**
Manual	DN50KF	–	Viton®	3.2	KGV-2000V	**306002**
Pneumatic	DN50CF*	M8	Viton®	5.0	E-GV-2000V-P	**301013-03**
Pneumatic	DN50KF	–	Viton®	3.2	KGV-2000V-P	**307002-03**

* 3 3/8 (DN50CF) is not an international ISO size

Valve options

Option -01
Mechanical position indicator



Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **303016-03-11**

Description	Option number
Mechanical position indicator	**-01**
DN16CF or DN16KF roughing ports	**-04**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-2000	**354002**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-2000M	**355002**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M8 x 25mm	DN50CF*	25	M8-30	**1113007**
Clamp	_	DN50KF	1	K50-C	**7701003**
Centring ring	–	DN50KF	1	K50-CR	**7710003**

* 3 3/8 (DN50CF) is not an international ISO size

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

DN63 63.5mm ports

E-GV-2500M E-GV-2500M-P

UHV Series

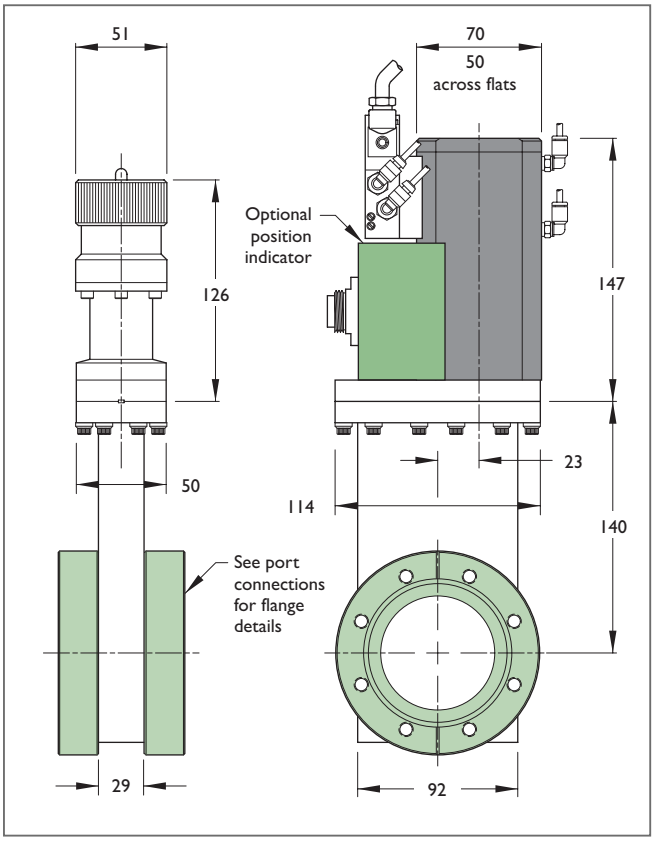
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

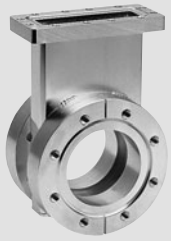
Features

- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation

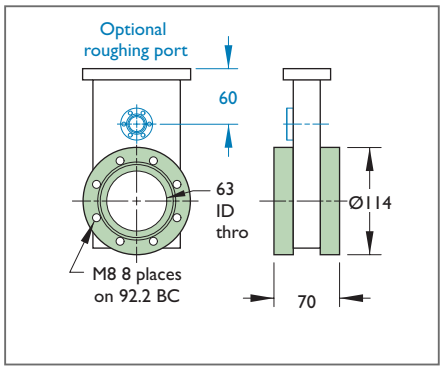


Port connections

CF

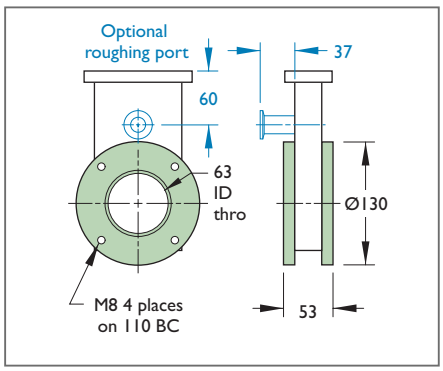


DN63CF



ISO LF

DN63KF



All dimensions are nominal in millimetres unless specified

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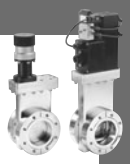
CABURN MDC EUROPE

Gate valves Million cycle line MC+

DN63 63.5mm ports



UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN63CF	M8	Metal	5.0	E-GV-2500M	**302014**
Pneumatic	DN63CF	M8	Metal	5.0	E-GV-2500M-P	**303014-03**

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN63CF	M8	Viton®	5.0	E-GV-2500V	**300014**
Manual	DN63LF	M8	Viton®	4.5	LGV-2500V	**306003**
Pneumatic	DN63CF	M8	Viton®	5.0	E-GV-2500V-P	**301014-03**
Pneumatic	DN63LF	M8	Viton®	4.5	LGV-2500V-P	**307003-03**

Valve options

Option -01
Mechanical position indicator

Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **303016-03**-11

Description	Option number
Mechanical position indicator	**-01**
DN16CF or DN16KF roughing ports	**-04**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-2500	**354002**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-2500M	**355002**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M8 x 30mm	DN63CF	25	M8-30	**1113007**
Metric hex head set	M8 x 20mm	DN63LF	25	M8-20	**1113009**
Single claw clamp	_	DN63LF	1[4]	SCC63/100	**1130000**
Centring ring	–	DN63LF	1[5]	L63-CR	**7810000**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

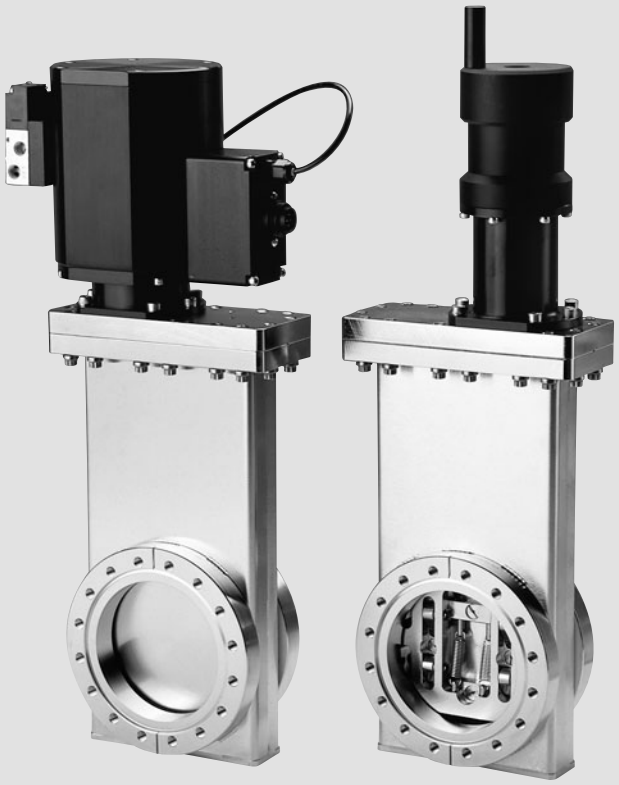
[4] 3-4 required per flange connection

[5] Includes one elastomer gasket seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

DN100 102mm ports



E-GV-4000M-P E-GV-4000M

UHV Series

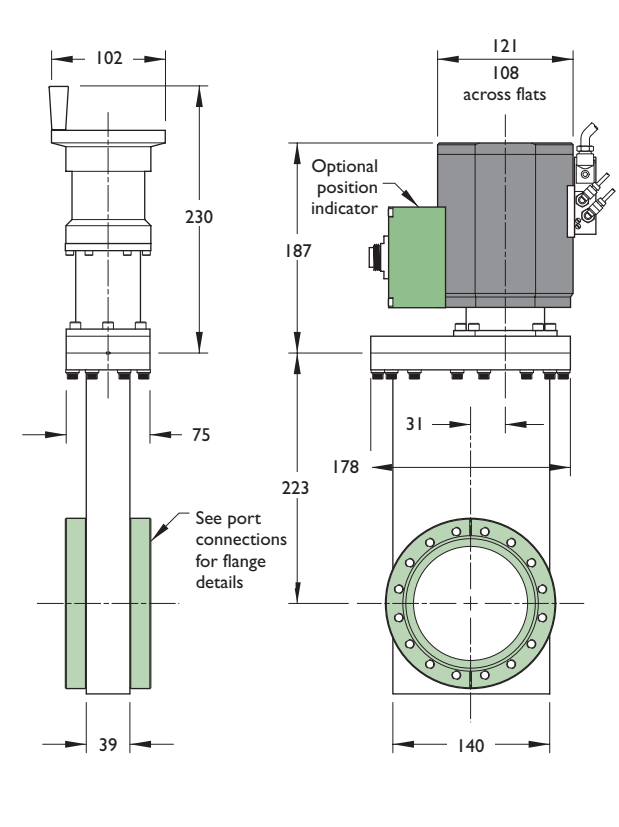
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

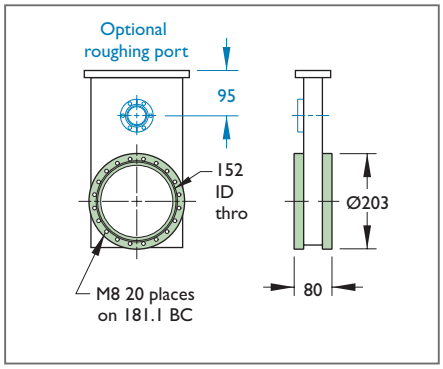
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



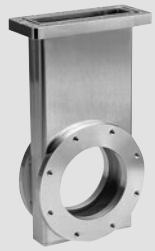
Port connections

CF

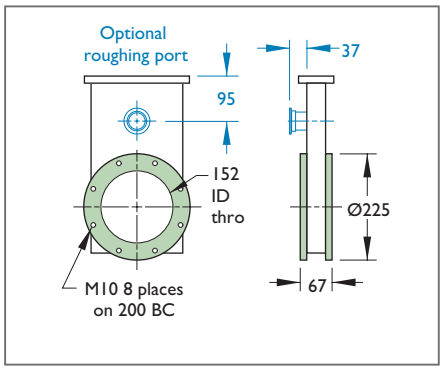
DN100CF



ISO LF



DN100LF



All dimensions are nominal in millimetres unless specified

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CABURN MDC EUROPE

Gate valves Million cycle line MC+

DN100 102mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN100CF	M8	Metal	11.5	E-GV-4000M	**302016**
Pneumatic	DN100CF	M8	Metal	11.5	E-GV-4000M-P	**303016-03**

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN100CF	M8	Viton®	11.5	E-GV-4000V	**300016**
Manual	DN100LF	–	Viton®	11.5	LGV-4000V	**306005**
Pneumatic	DN100CF	M8	Viton®	11.5	E-GV-4000V-P	**301016-03**
Pneumatic	DN100LF	–	Viton®	11.5	LGV-4000V-P	**307005-03**

Valve options

Option -01
Mechanical position indicator

Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **303016-03**-11

Description	Option number
Mechanical position indicator	**-01**
DN40CF or DN40KF roughing ports	**-05**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG4000	**354004**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-4000M	**355004**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M8 x 35mm	DN100CF	25	M8-35	**1113008**
Metric hex head set	M8 x 20mm	DN100LF	25	M8-20	**1113009**
Single claw clamp	_	DN100LF	1[4]	SCC63/100	**1130000**
Centring ring	–	DN100LF	1[5]	L100-CR	**7810001**

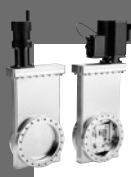
[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

[4] 3-4 required per flange connection

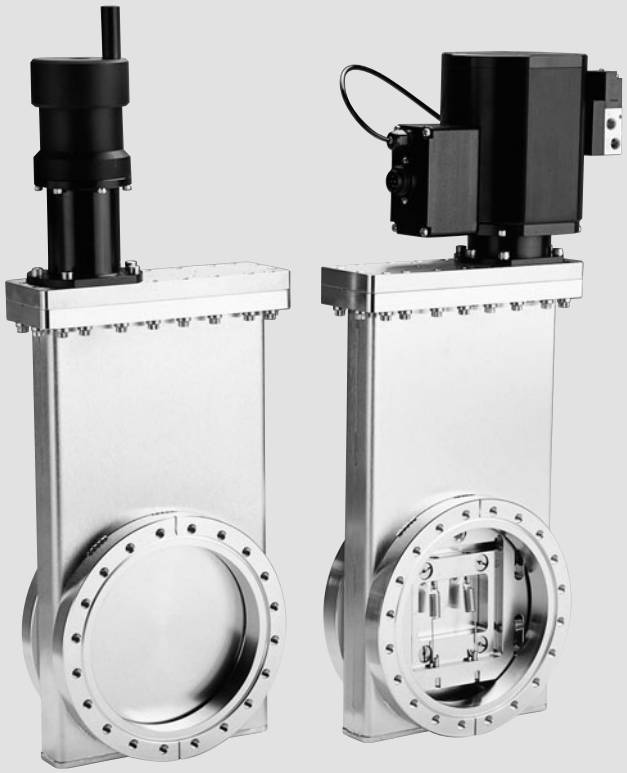
[5] Includes one elastomer gasket seal

All dimensions are nominal in millimetres unless specified Weights given are approximate



Gate valves Million cycle line MC+

DN160 152mm ports



E-GV-6000M E-GV-6000M-P

UHV Series

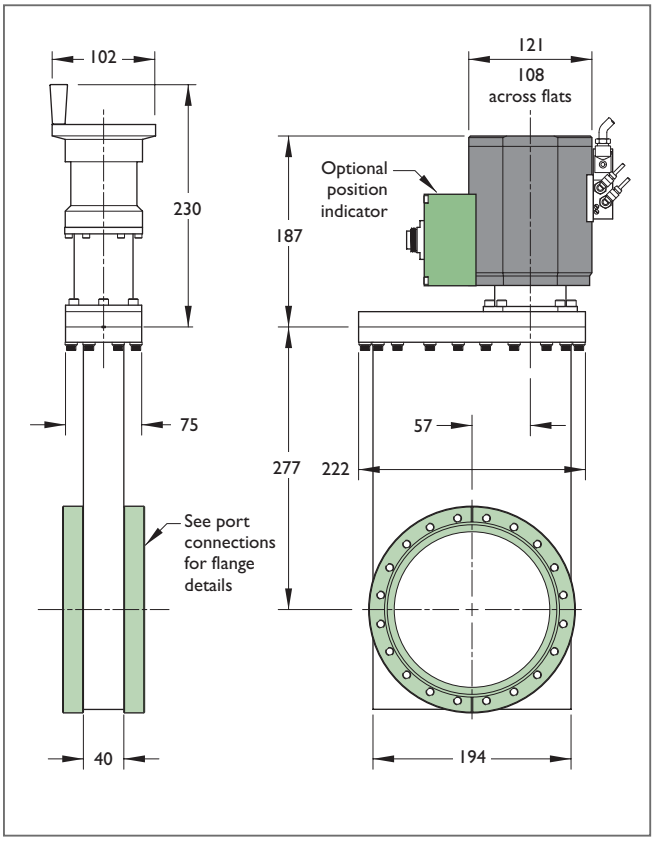
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

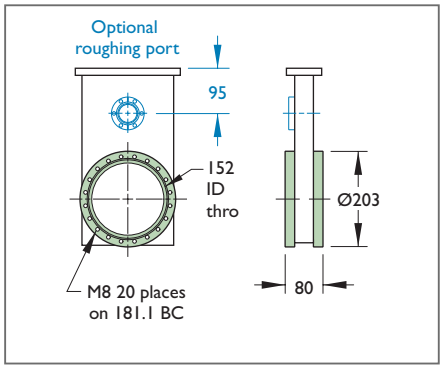
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



Port connections

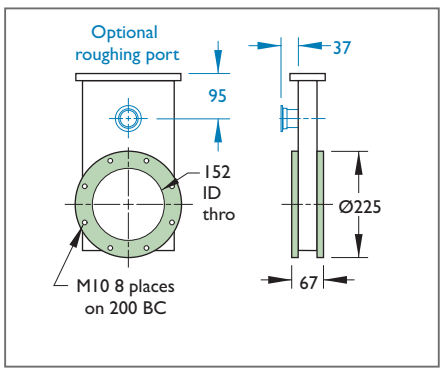
CF

DN160CF



ISO LF

DN160LF



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

DN160 152mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN160CF	M8	Metal	16.8	E-GV-6000M	**302018**
Pneumatic	DN160CF	M8	Metal	16.8	E-GV-6000M-P	**303018-03**

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN160CF	M8	Viton®	16.8	E-GV-6000V	**300018**
Manual	DN160LF	M10	Viton®	15.9	LGV-6000V	**306006**
Pneumatic	DN160CF	M8	Viton®	16.8	E-GV-6000V-P	**301018-03**
Pneumatic	DN160LF	M10	Viton®	15.9	LGV-6000V-P	**307006-03**

Valve options

Option -01
Mechanical position indicator

Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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.

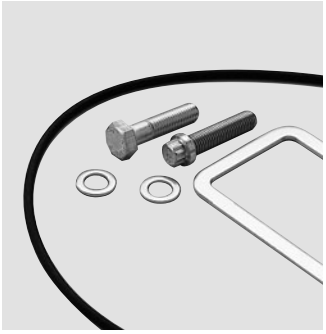
For example **303016-03**-11

Description	Option number
Mechanical position indicator	**-01**
DN40CF or DN40KF roughing ports	**-05**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets



Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG6000	**354006**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-6000M	**355006**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M8 x 35mm	DN160CF	25	M8-35	**1113008**
Metric hex head set	M10 x 30mm	DN160LF	12	M10-30 (12)	**1113011**
Single claw clamp	_	DN160LF	1[4]	SCC160/250	**1130001**
Centring ring	–	DN160LF	1[5]	L160-CR	**7810002**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

[4] 3-4 required per flange connection

[5] Includes one elastomer gasket seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

DN200 203mm ports

E-GV-6000M E-GV-6000M-P

UHV Series

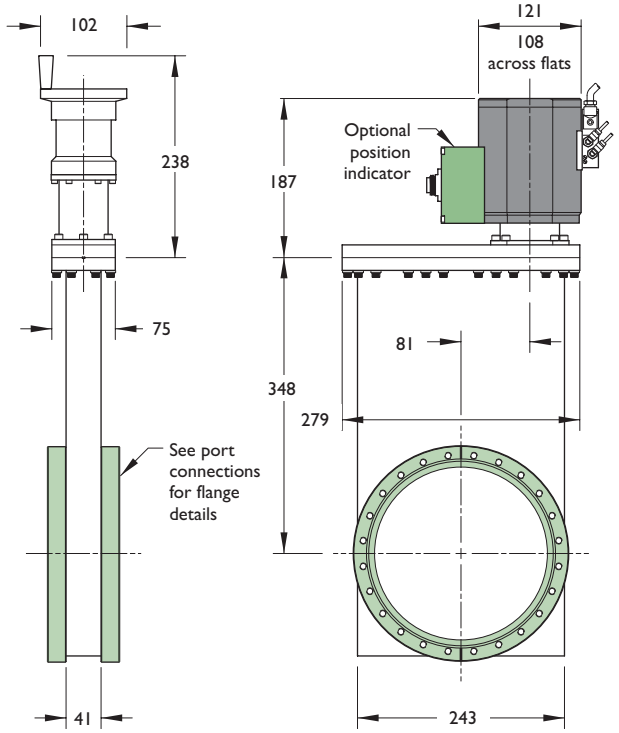
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

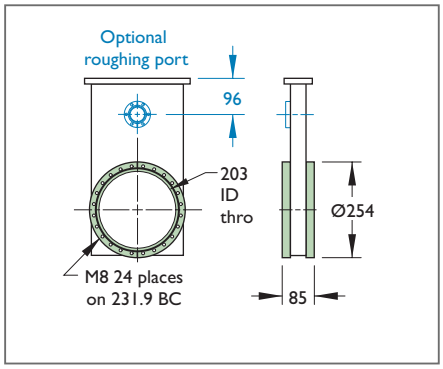
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



Port connections

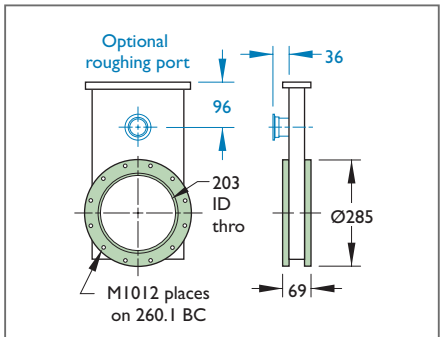
CF

DN200CF



ISO LF

DN200LF



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

DN200 203mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN200CF	M8	Metal	25	E-GV-8000M	**302019**
Pneumatic	DN200CF	M8	Metal	25	E-GV-8000M-P	**303019-03**

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN200CF	M8	Viton®	25	E-GV-8000V	**300019**
Manual	DN200LF	M10	Viton®	25	LGV-8000V	**306007**
Pneumatic	DN200CF	M8	Viton®	25	E-GV-8000V-P	**301019-03**
Pneumatic	DN200LF	M10	Viton®	25	LGV-8000V-P	**307007-03**

Valve options

Option -01
Mechanical position indicator

Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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.

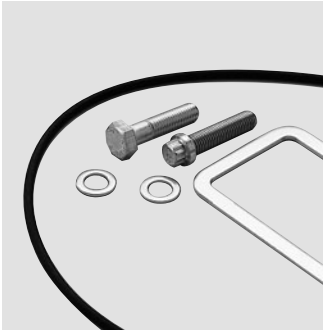
For example **303016-03-11**

Description	Option number
Mechanical position indicator	**-01**
DN40CF or DN40KF roughing ports	**-05**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets



Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-8000	**354007**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-8000M	**355007**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M8 x 35mm	DN200CF	25	M8-35	**1113008**
Metric hex head set	M10 x 30mm	DN200LF	12	M10-30 (12)	**1113011**
Single claw clamp	_	DN200LF	1[4]	SCC160/250	**1130001**
Centring ring	–	DN200LF	1[5]	L200-CR	**7810004**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

[4] 3-4 required per flange connection

[5] Includes one elastomer gasket seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

DN250 254mm ports

E-GV-10000M E-GV-10000M-P

UHV Series

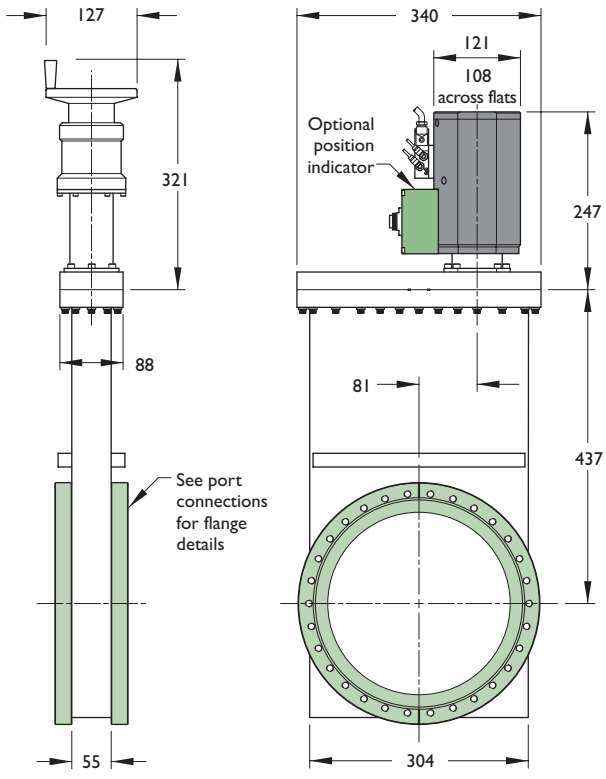
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

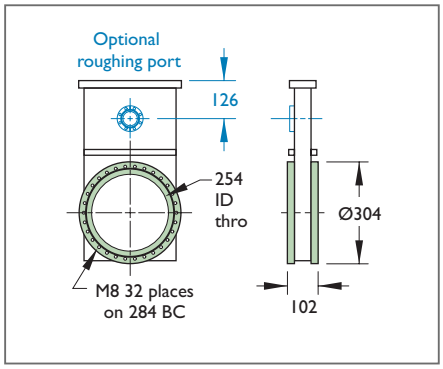
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



Port connections

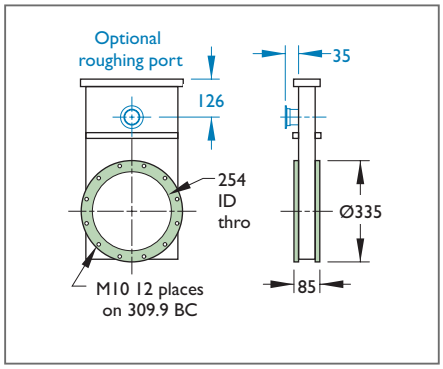
CF

DN250CF



ISO LF

DN250LF



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

DN250 254mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN250CF	M8	Metal	49.9	E-GV-10000M	**302022**
Pneumatic	DN250CF	M8	Metal	49.9	E-GV-10000M-P	**303022-03**

HV Series

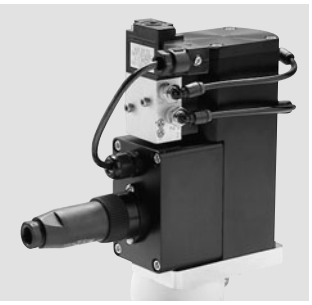
Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	DN250CF	M8	Viton®	49.9	E-GV-10000V	**300022**
Manual	DN250LF	M10	Viton®	47.7	LGV-10000V	**306008**
Pneumatic	DN250CF	M8	Viton®	49.9	E-GV-10000V-P	**301022-03**
Pneumatic	DN250LF	M10	Viton®	47.7	LGV-10000V-P	**307008-03**

Note E-GV1000M valves have Balzers compatible flanges

Valve options

Option -01
Mechanical position indicator



Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **303016-03**-11

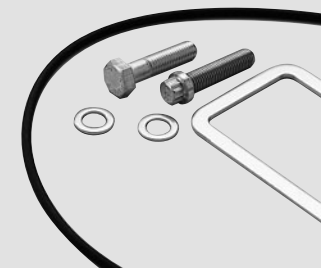
Description	Option number
Mechanical position indicator	**-01**
DN50KF or DN50CF roughing ports*	**-06**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

* 3⅜ (DN50CF) is not an international ISO size

Accessories

Hardware and gaskets



Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-10000	**354008**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-10000M	**355008**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	M8 x 50mm	DN250CF	32	M8-50 (32)	**1113010**
Metric hex head set	M10 x 30mm	DN250LF	12	M10-30 (12)	**1113011**
Single claw clamp	_	DN250LF	1[4]	SCC160/250	**1130001**
Centring ring	–	DN250LF	1[5]	L200-CR	**7810003**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

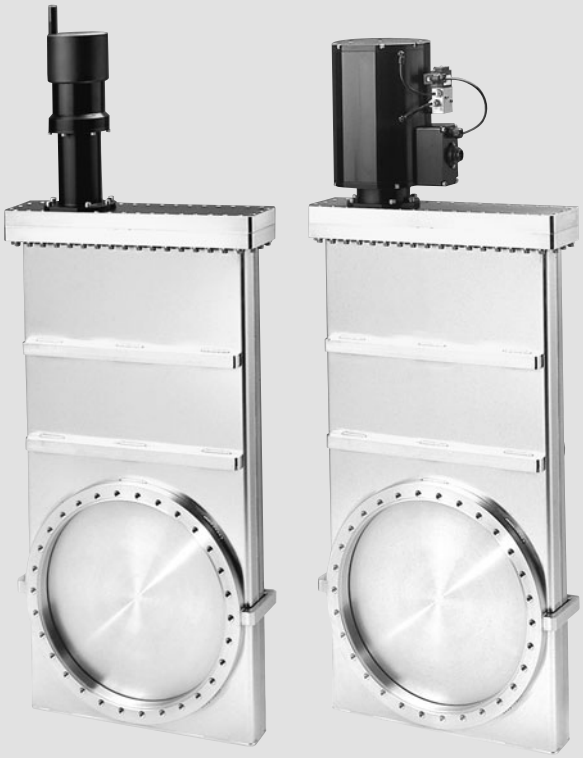
[4] 3-4 required per flange connection

[5] Includes one elastomer gasket seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

CF355-304 / DN320LF 305mm ports



E-GV-12000M E-GV-12000M-P

UHV Series

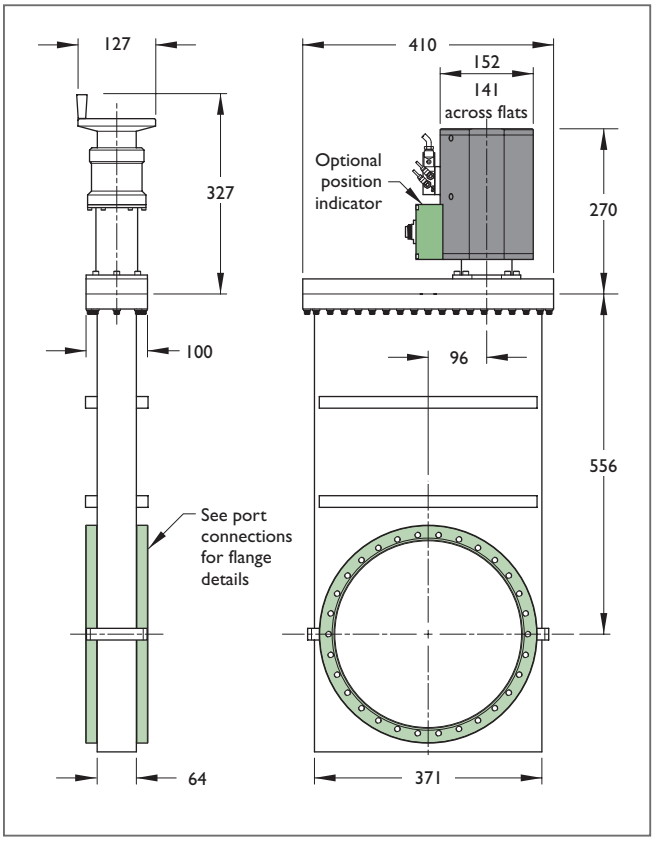
250°C metal sealed bonnets

HV Series

150°C Viton® O-ring sealed bonnets

Features

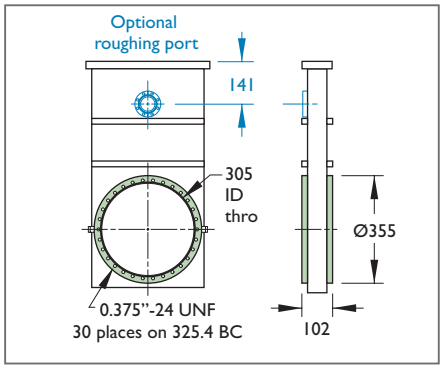
- Viton® O-ring sealed gates
- Stainless steel construction
- Manual or electropneumatic operation



Port connections

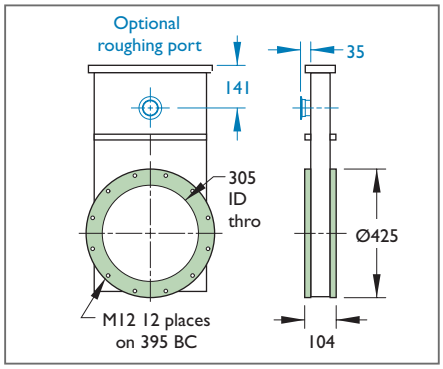
CF

CF355-304



ISO LF

DN320LF



All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

CF355-304 / DN320LF 305mm ports

UHV Series

Metal seal bonnet 250°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	CF355-304	3/8"-24 UNF	Metal	69.5	GV-12000M	**302009**
Pneumatic	CF355-304	3/8"-24 UNF	Metal	69.5	GV-12000M-P	**303009-03**

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Flange thread	Bonnet seal	Wt kg	Reference	Part number
Manual	CF355-304	3/8"-24 UNF	Viton®	69.5	GV-12000V	**300009**
Manual	DN320LF	M12	Viton®	67.2	LGV-12000V	**306009**
Pneumatic	CF355-304	3/8"-24 UNF	Viton®	69.5	GV-12000V-P	**301009-03**
Pneumatic	DN320LF	M12	Viton®	67.2	LGV-12000V-P	**307009-03**

Valve options

Option -01
Mechanical position indicator

Option -09
Air control solenoid valves

Option -04 DN16CF or DN16KF roughing ports

Option -11
4079 Kalrez® 250°C gate seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **303016-03**-11

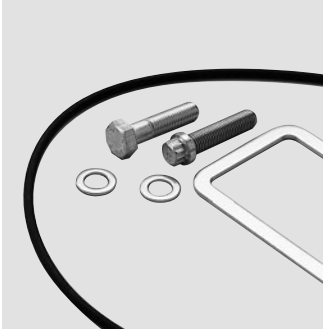
Description	Option number
Mechanical position indicator	**-01**
DN50KF or DN50CF roughing ports*	**-06**
240V AC air control solenoid valve[1]	**-09**
Kalrez high temperature O-ring	**-11**

[1] Supplied as a spare part – not fitted to valve

* 3 3/8 (DN50CF) is not an international ISO size

Accessories

Hardware and gaskets



Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal[2]	Viton®	1[3]	GVG-12000	**354009**
Gate and bonnet seal[2]	Viton® and copper	1[3]	GVG-12000M	**355009**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Metric hex head set	3/8"-24 x 2"	CF355-304	30	BA-1001-SP	**190065**
Metric hex head set	M12 x 40mm	DN320LF	16	M12-40 (16)	**1113012**
Single claw clamp	–	DN320LF	1[4]	SCC320/500	**1130002**
Centring ring	–	DN320LF	1[5]	L250-CR	**7810004**

[2] When ordering gasket kits please supply serial number of valve to ensure we supply the correct kit

[3] Each gasket kit contains one bonnet and one gate seal

[4] 3-4 required per flange connection

[5] Includes one elastomer gasket seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Gate valves Million cycle line MC+

SEMI / MESC

LVHC-18SB LVHC-50SB

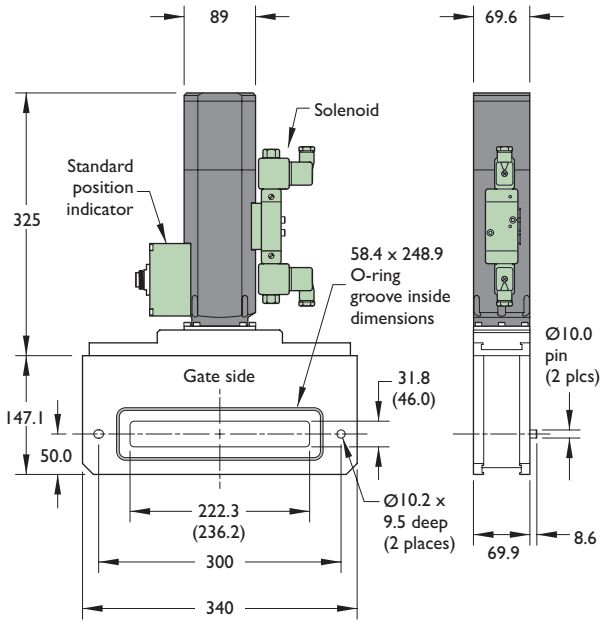
HV Series

150°C Viton® O-ring sealed bonnets

Features

- Viton® O-ring sealed gates
- Stainless steel construction
- Electropneumatic operation
- Mechanical position indicator
- Patented Uni-Loc™ locking mechanism
- Double impulse 24V DC air control solenoid

Pneumatic LVHC-18SB



SEMI short for 'Semiconductor Equipment and Materials International' developed the 'Modular Equipment Standards Committee', better known as MESC, to establish global interchangeability and modularity between products from the numerous sources in the semiconductor manufacturing equipment and components industry.

Caburn-MDC LVHC series rectangular gate valves meet or exceed all applicable MESC standards. LVHC valves incorporate a patented one piece gate and carriage design that virtually eliminates vibration and particle generation. O-ring scuffing and wear are non-existent because of a floating driver bar design. The one piece gate and carriage can be removed through the valves bonnet flange for gate seal replacement, cleaning, etc., without disassembling the valve body from the system.

LVHC valves are available in either 70mm (2.75") or 50mm (1.97") flange-to-flange thicknesses, with rectangular ports of 32 x 222mm (1.25" x 8.75") or 46 x 236mm (1.81" x 9.30") dimensions. These valves are designed for use in high vacuum load-lock systems used in semiconductor processing, where low vibration and low particle generation are imperative. 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. Custom design valves are available on request.

Pneumatic actuators are fitted with mechanical position indicators which indicate fully open and fully closed positions. This 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 via a seven pin circular threaded connector. Mating female cable connectors are included.

All dimensions are nominal in millimetres unless specified

Gate valves Million cycle line MC+

SEMI / MESC

Normally closed switch wiring is available on request. Precise positioning of micro switches is made possible by a patented vernier adjustment mechanism only available on Caburn-MDC gate valves.

Pneumatic actuators are equipped with dual impulse Herion 24V DC air control solenoid valves.

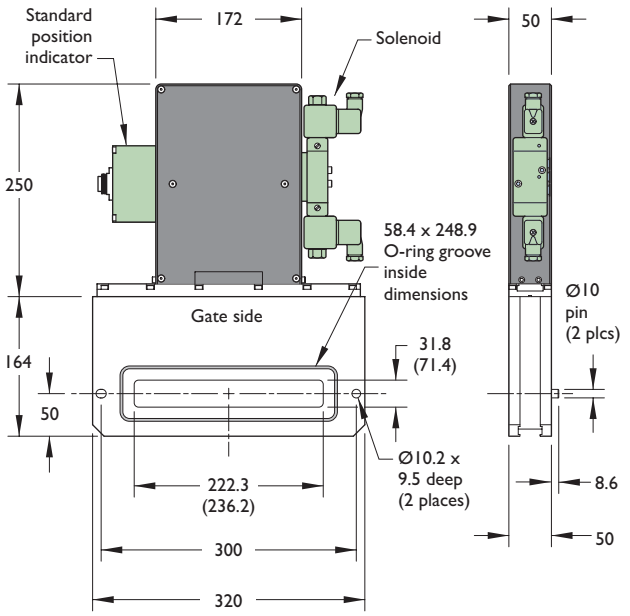
All solenoid valves are fitted with DIN type connectors that conform to international standards. DIN connectors provide simplicity, convenience and fast, easy electrical installation.

Solenoid valves are designed for use with compressed air from 0 to 8.7 bar (working pressure of 4.8 to 6.9 bar). 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.

Additional features

- SEMI / MESC port flanges for use with claw type fasteners
- 32 x 222mm (1.25" x 8.75") and 46 x 236mm (1.81" x 9.30") rectangular port apertures
- 70mm (2.75") or 50mm (1.97") flange-to-flange body thickness
- Viton® elastomer bonnet and gate seals
- Welded bellows actuator seal
- TIG welded internal body joints
- Electropolished interior and exterior surfaces
- Low vibration and particle generation
- Dry film lubricated bearings

Pneumatic LVHC-50SB



SEMI / MESC

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
Pneumatic	32 x 222	Viton®	18.6	LVHC-18SB	**330001**
Pneumatic	32 x 236	Viton®	18.6	LVHC-18LB	**330004**
Pneumatic	46 x 222	Viton®	18.6	LVHC-50SB	**330005**
Pneumatic	46 x 236	Viton®	18.6	LVHC-50LB	**330006**

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal	Viton®	1[1]	LVHCG-18-SB/LB	**330101**
Gate and bonnet seal	Viton®	1[1]	LVHCG-50-SB/LB	**330102**
Body flange seal	Viton®	2	LVHCG-1850B	**330103**

Hardware[2]	Thread length	For use with	Reference	Part number
Single claw-clamp	M8 x 35mm	MESC	SCC63/100	**1130000**
Double claw-clamp	M8 x 35mm	MESC	DCC63/100	**1130008**

[1] Each gasket kit contains one bonnet and one gate seal

[2] Recommended use of 8 to 12 clamps per side

All dimensions are nominal in millimetres unless specified Weights given are approximate

Rectangular gate valves Million cycle line MC+

C-Loc™

RGV-18 RGV-18P

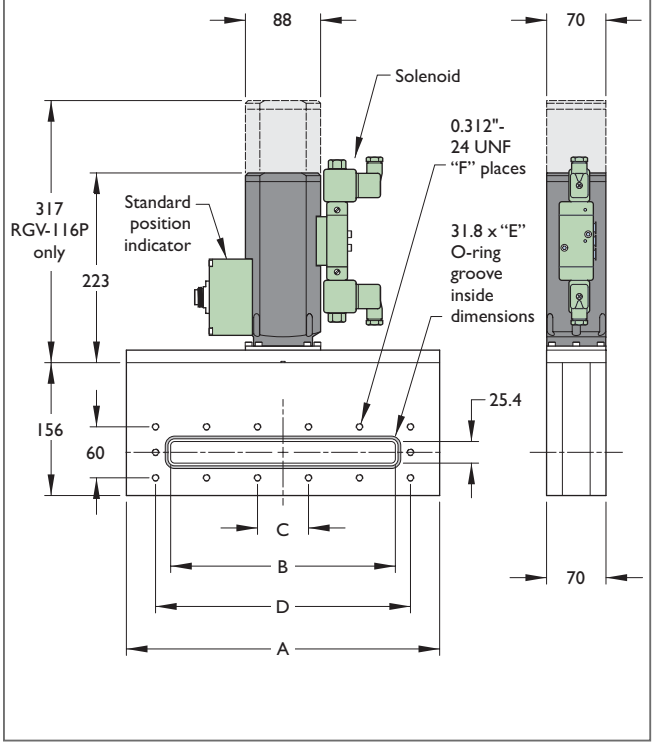
HV Series

150°C Viton® O-ring sealed bonnets

Features

- Viton® O-ring sealed gates
- Stainless steel construction
- Electropneumatic operation
- Mechanical position indicator
- Patented Uni-Loc™ locking mechanism
- Double impulse 24V DC air control solenoid

Pneumatic RGV



RGV stainless steel vacuum gate valves incorporate patented C-Loc™ gate valve locking technology. No contact is made between the valve body and the locking mechanism, a feature which markedly decreases vibration and insures smooth valve operation. RGV valves are designed for use in high vacuum load-lock systems used in semiconductor processing. Low outgassing characteristics can be attributed to fusion welded 300 series stainless steel body and AM-350 stainless steel nesting bellows, small cross-section O-rings and the elimination of blind internal cavities.

Caburn-MDC RGV gate valves are offered in four standard sizes ranging from 25 x 160mm (1" x 6.3") to 25 x 420mm (1" x 16.5") rectangular port dimensions. Flange-to-flange body thickness is 70mm (2.75"). Gate valve actuators are available in both manual and electropneumatic configurations. The gate and carriage can be removed through the valves bonnet flange for gate seal replacement, cleaning, etc., without disassembling the valve body from the system. Custom design valves are available on request.

Pneumatic actuators are fitted with mechanical position indicators which indicate fully open and fully closed positions. This MPI system consists of two single pole, double throw micro switches fitted with integral hinged lever and roller actuators.

All dimensions are nominal in millimetres unless specified

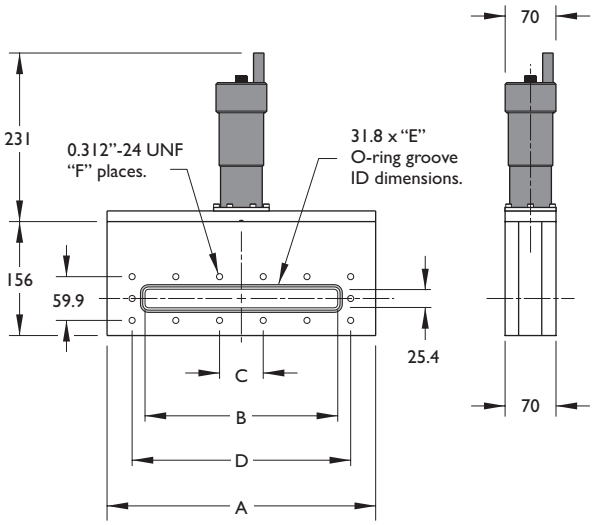
Rectangular gate valves Million cycle line MC+

C-Loc™

Each micro switch is wired in a normally open position via a seven pin circular threaded connector. Mating female cable connectors are included. Normally closed switch wiring is available on request. Precise positioning of micro switches is made possible by a patented vernier adjustment mechanism only available on Caburn-MDC gate valves.

Pneumatic actuators are equipped with dual impulse Herion 24V DC air control solenoid valves. 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 are designed for use with compressed air from 0 to 8.7 bar (working pressure of 4.8 to 6.9 bar). 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.

Manual RGV



■ Flange detail is typical both sides

HV Series 150°C

Actuator	A	B	C	D	E	F	Port flange	Bonnet seal	Wt kg	Reference	Part number
Manual	267	160.0	69.9	209.5	171.5	10	25 x 160	Viton®	27	RGV-16	**331000**
Manual	317	210.8	59.9	240.0	222.3	12	25 x 211	Viton®	28	RGV-18	**331002**
Manual	368	264.2	59.9	299.7	270.5	14	25 x 264	Viton®	30	RGV-110	**331004**
Manual	508	419.1	64.8	453.4	425.5	18	25 x 419	Viton®	34	RGV-116	**331013**
Pneumatic	267	160.0	69.9	209.5	171.5	10	25 x 160	Viton®	30	RGV-16P	**331001**
Pneumatic	317	210.8	59.9	240.0	222.3	12	25 x 211	Viton®	31	RGV-18P	**331003**
Pneumatic	368	264.2	59.9	299.7	270.5	14	25 x 264	Viton®	32	RGV-110P	**331005**
Pneumatic	508	419.1	64.8	453.4	425.5	18	25 x 419	Viton®	36	RGV-116P	**331014**

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
25 x 160 Gate and bonnet seal	Viton®	1[1]	RGVG-16	**331101**
25 x 210 Gate and bonnet seal	Viton®	1[1]	RGVG-18	**331102**
25 x 264 Gate and bonnet seal	Viton®	1[1]	RGVG-110	**331103**
25 x 419 Gate and bonnet seal	Viton®	1[1]	RGVG-116	**331104**
25 x 160 Gate and bonnet seal	Viton®	2	RGVG-16B	**331105**
25 x 210 Gate and bonnet seal	Viton®	2	RGVG-18B	**331106**
25 x 264 Gate and bonnet seal	Viton®	2	RGVG-110B	**331107**
25 x 419 Gate and bonnet seal	Viton®	2	RGVG-116B	**331108**

Hardware	For use with	Quantity per pack	Reference	Part number
Socket head screw	5/16"-24 x 1"	24	BA-RGV-18	**331012**

[1] Each gasket kit contains one bonnet and one gate seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Rectangular gate valves Million cycle line MC+

SEMI / MESC 300mm

LVHC-300MM

HV Series

Features

- Viton® O-ring sealed gate
- Stainless steel construction
- Electropneumatic operation
- Mechanical position indicators
- Patented Uni-Loc™ locking mechanism
- Double impulse 24V DC air control solenoid

Description

Caburn-MDC LVHC series rectangular gate valves meet or exceed all applicable MESC standards. LVHC valves incorporate a patented one piece gate design that virtually eliminates vibration and particle generation. O-ring scuffing and wear are non-existent because of a floating driver bar design. The one piece gate can be removed through the valves bonnet flange for gate seal replacement, cleaning, etc., without disassembling the valve body from the system.

SEMI short for 'Semiconductor Equipment & Materials International' developed the 'Modular Equipment Standards Committee', better known as MESC, to establish global interchangeability and modularity between products from the numerous sources in the semiconductor manufacturing equipment and components industry.

The 300mm valve is the latest addition to the LVHC series. These valves are designed for use in high vacuum load-lock systems used in semiconductor processing, where low vibration and low particle generation are imperative. The valves low outgassing characteristics can be attributed to a fusion welded stainless steel body, welded AM-350 stainless steel nesting bellows as well as small cross section O-rings.

This LVHC valve has a 50 x 335mm rectangular opening to accommodate the next generation of wafer processing. Other standard LVHC valves are available with rectangular ports from 32 x 222mm to 46 x 236mm. The SEMI / MESC port flanges are joined using claw-clamp type fasteners.

Pneumatic actuators are fitted with vernier adjustable mechanical position indicators (MPI) which indicate fully open and fully closed positions. The MPI system consists of two single pole, double throw microswitches fitted with integral hinged lever and roller actuators. Precise positioning of microswitches is made possible by a patented vernier adjustment mechanism only available on Caburn-MDC gate valves. The position indicator is wired via a seven pin circular threaded connector - mating female cable connectors are included.

Pneumatic actuators are equipped with dual impulse Herion 24V DC air control solenoid valves. Solenoid valves are fitted with DIN type connectors, which conform to international standards and provide simplicity, convenience and fast, easy electrical installation. Solenoid valves are designed for use with compressed air from 0-8.6 bar, and are well suited for use with the 4.8 to 6.9 bar pneumatic actuator. 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.

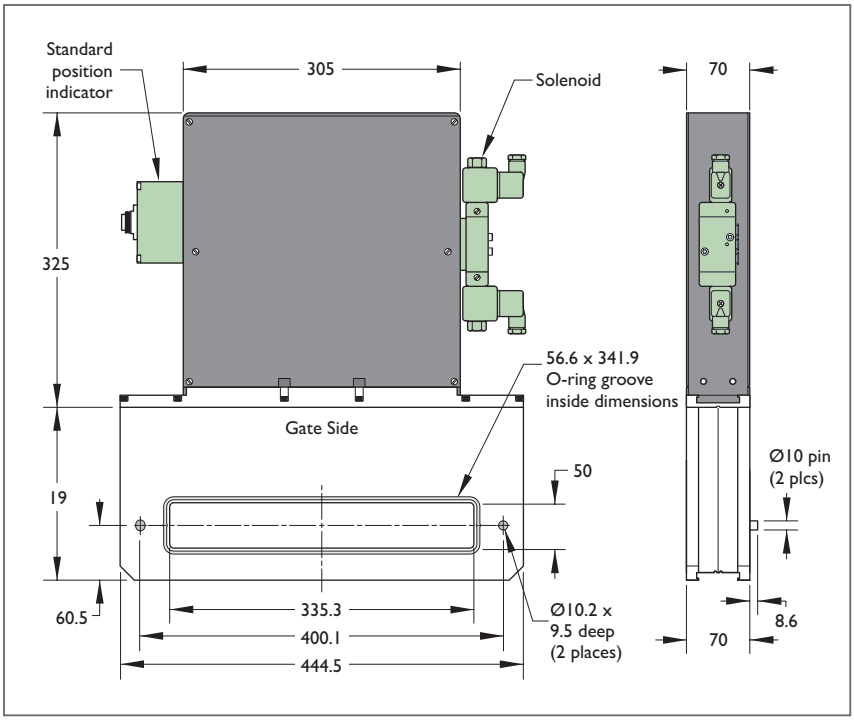
Specifications

Material	
Body and gate	300 Series ss
Bellows	AM-350 ss
Air cylinder	Anodised aluminium
Bolts	300 Series ss
Gaskets	
Bonnet	Viton® elastomer
Gate	Viton® elastomer
Piston	Viton® elastomer
Electropneumatic actuator	
Air pressure	4.8 to 6.9 bar
Air control valve	Herion, double impulse solenoid valve
Solenoid power	24V DC
Power loss	Valve remains in position during air or power failure
Position indicators	Mechanical, vernier adjustable, hinged-roller type micro switches suitable for 5A, 120/240V AC
Vacuum	
Range	1×10^{-8} mbar
Leak test	2×10^{-10} cc/sec of He
Temperature range	150°C Open/150°Closed
Weight	34 kg
Dimensions	See drawing

All dimensions are nominal in millimetres unless specified Weights given are approximate

Rectangular gate valves Million cycle line MC+

SEMI / MESC 300mm



Features

- SEMI / MESC port flanges for use with claw type fasteners
- Welded bellows actuator seal
- Electropolished interior and exterior surfaces
- Low vibration and particle generation

General guidelines

Sealing

Valves will seal against 1 bar 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} mbar litre/sec of He.

Maintenance

Gate mechanism may be removed with the bonnet flange for seal replacement, cleaning or retrofitting without removing the valve body from the system.

Electropneumatic actuation

Actuation is accomplished by dual air cylinders for uniform sealing pressure. Actuation is directed by a Herion 24V DC double impulse solenoid valve. The solenoid requires an electrical signal to redirect air flow and therefore remains in a static position upon either air or power loss.

SEMI / MESC

HV Series

Viton® seal bonnet 150°C

Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
Pneumatic	50 x 35	Viton®	18.6	LVHC-300MM	**330007**

Accessories

Gasket kits

Gasket kit	Material	Quantity per pack	Reference	Part number
Gate and bonnet seal	Viton®	1[1]	LVHCG-300MM	**330104**
Body flange seal	Viton®	2	LVHCG-300B	**330105**

Hardware	Thread length	For use with	Reference	Part number
Single claw-clamp	M8 x 35mm	MESC	SCC63/100	**1130000**
Double claw-clamp	M8 x 35mm	MESC	DCC63/100	**1130008**

[1] Each gasket kit contains one bonnet and one gate seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Angle valves Million cycle line MC+

Introduction

Angle and In-line valves

Vacuum angle 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. Valve assemblies consist of an actuator, a poppet and a valve body. The actuator provides the power to position or transport the valves poppet which is attached to the valves body via a circular bonnet flange. The poppet closes or opens one of the valves body ports. The valve body is a vacuum tight chamber.

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 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.

Caburn-MDC stainless steel vacuum angle valves have been designed for maximum conductance and minimum size for easy installation. These valves are ideally suited for systems requiring high reliability and low outgassing. The valves' low outgassing characteristics can be attributed to a fusion welded 304 stainless steel body, welded AM-350 stainless steel nesting bellows as well as small cross-section elastomers and the elimination of blind internal cavities.

Caburn-MDC angle valves are offered in various sizes ranging from 6.4 to 254mm port diameters. Standard port mounts include: CF metal seal flanges, recommended for ultrahigh vacuum service; ISO KF and ISO LF fast-make and fast-break elastomer seal flanges, ideal for high vacuum applications requiring frequent assembly and disassembly.

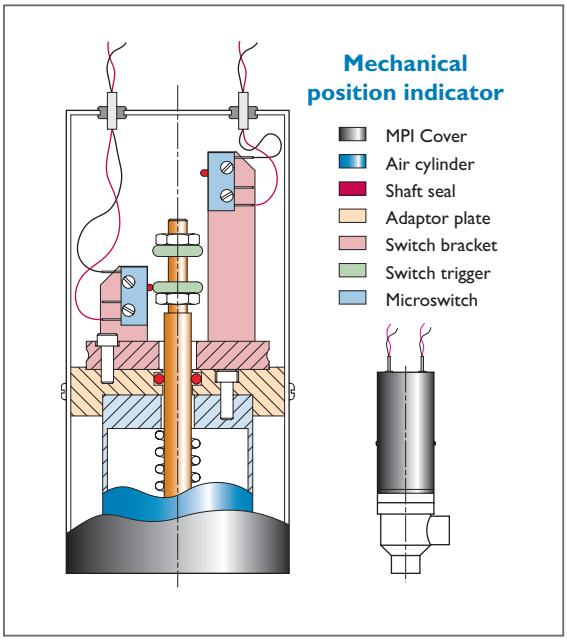
Standard features

- Enhanced to withstand 1 million cycles before requiring service
- UHV and HV series
- CF, ISO KF and ISO LF port connections
- Manual and electropneumatic actuators
- 24V DC air control solenoid valve
- OFE copper metal and Viton® elastomer bonnet seals
- Welded bellows actuator seal
- TIG welded internal body joints
- Electropolished interior and exterior surfaces

Optional features

- Electromechanical position indicator
- Magnetic reed switch position indicators
- Air control solenoid valves for 240VAC
- High temperature 250°C Kalrez® elastomer poppet seal

Mechanical position indicator Option -01



Caburn-MDC angle valves are available with precision mechanical position indicator (MPI) option. The MPI system consists of two single pole, double-throw micro switches mounted on top of the pneumatic actuator air cylinder. Each micro switch is wired in the normally open position. Wiring in a normally closed position is available on request, and easily modified by reversing standard factory wiring. Precise actuation of each micro switch is factory adjusted by positioning individual switch triggers mounted on the actuator shaft.

All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

Options

Magnetic reed-switch position indicator Option -02

Caburn-MDC magnetic reed switches consist of four basic components: a glass capsule, a gas filler (the atmosphere inside the glass capsule), electrical contacts and two ferromagnetic reeds.

The reeds are hermetically sealed into the glass capsule in a cantilever fashion so that the ends align and overlap, while maintaining a small gap between them. The floating end of each reed will assume opposite magnetic polarity when brought into the proximity of a magnetic field. When the magnetic flux density is sufficient, the attraction force of the opposing magnetic poles will overcome the reed stiffness causing them to flex towards each other and make electrical contact. Since these switches have no mechanical parts to wear out this operation can be repeated millions of times.

The characteristic life expectancy of these switches is rated at 100 million cycles, provided electrical ratings are not exceeded.

Contacts normally open, Caburn-MDC reed switch position indicators will operate at temperatures ranging from -40°C to +125°C.

Air control solenoid valve Option -09 240V AC

Angle valves fitted with standard electropneumatic actuators are equipped with Humphrey 310 or 410 series 24V DC standard and 240VAC 50/60Hz optional air control solenoid valves. Air-open/spring-close angle and in-line valves use the 310 series solenoids, while the 410 series solenoid is used with the air-open/air-close angle and in-line valves. AC/DC power consumption for this solenoid valve is 4 watts.

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. The manual override is located at the top of the solenoid and identified by a prominent red push button.

Air control solenoid valves are designed for use with compressed air from 0 to 8.6 bar (gauge working pressure of 4.8 to 6.9 bar). Air should be clean and uncontaminated. When in doubt, install a filter with a 40 micron filtering capacity. Periodically remove and clean or replace the filter element.

High temperature poppet seal Option -11

Angle valves are supplied standard with Viton® elastomer poppet seals. UHV series valves, which have metal sealed bonnet flanges, can be ordered with the high temperature Kalrez® compound 4079 poppet seal gasket option. Kalrez® compound 4079 elastomers are suitable for vacuum bakeout to 250°C (with poppet 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.

As with standard poppet seals, Kalrez® elastomer seals have a small amount of Krytox® LVP vacuum grease applied at the time of installation. Vacuum grease should be applied to elastomer gaskets in order to maximise its sealing properties and extend its cycle life.

Installation of a poppet seal is accomplished by pressing an O-ring into the poppet groove first at the 12 and 6 o'clock positions then at the 3 and 9 o'clock positions, etc. Pressing the O-ring into the groove in this manner avoids twisting the O-ring.

Note Kalrez® has a much faster permeation rate for helium than does Viton®.

Angle valves Million cycle line MC+

Specifications

General guidelines

Installation and orientation – Angle valves can be installed using one of various port connections as summarised on page 149. Valves up to and including 100mm ports can be installed in either a vertical or horizontal orientation. Valves with 150mm and larger ports must be installed in a vertical orientation, as shown in the figure below. The bottom port is usually oriented towards the vacuum environment. Mounting in this fashion minimises the in-vacuum volume and also aids poppet sealing when the side port is vented to air.

Sealing – Angle valves can be sealed via manual or electropneumatic actuation. All valves up to 75mm ports will seal against 1 bar differential atmospheric pressure in either a bottom or side port direction. Those with 100mm and larger ports should be installed with vacuum at the valve seat port only, shown as bottom port.

Electropneumatic angle valves with 6.4 to 38mm diameter ports are fitted with air-open/spring-close actuators. Valves with 50mm or larger diameter ports employ air-open/air-close pneumatic actuators. Custom actuator designs are available on request. The solenoid valve temperature should not exceed 50°C. Pneumatically actuated air cylinder seals are Viton® elastomer O-rings and therefore have a temperature limit of 150°C.

Maintenance

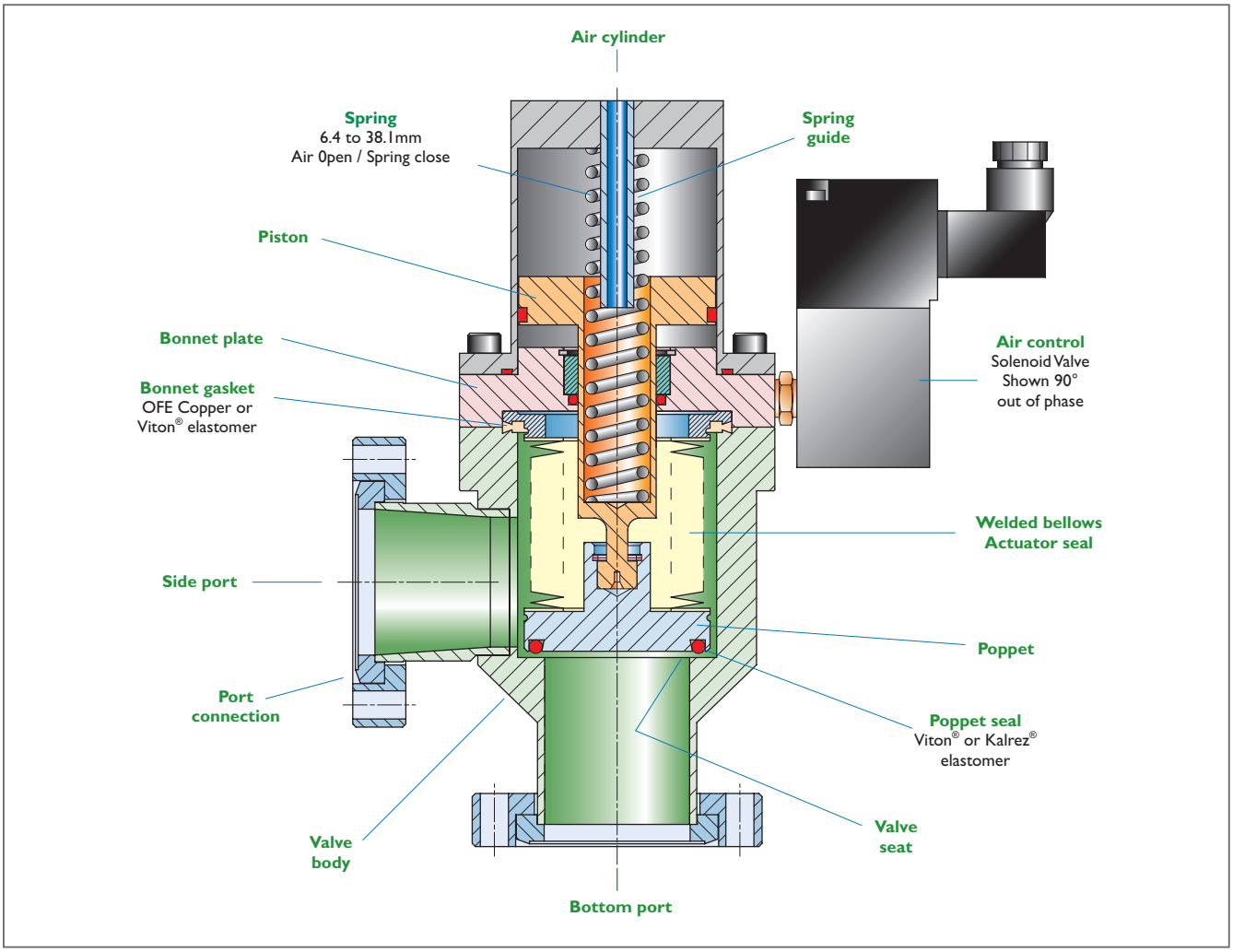
Actuator and poppet mechanism may be removed through the bonnet flange for seal replacement, cleaning or retrofitting without removing the valve body from the system. Refer to instruction manual for details.

Leak testing

Each valve is tested using a helium mass spectrometer leak detector calibrated for a minimum sensitivity of $2x10^{-10}$ mbar litre/sec of Helium. Internal welds are inspected for pits, cracks, and other irregularities which may cause virtual leaks.

Customer note

Bakeout – Air control solenoid valves must be removed or remotely mounted for valve maximum bakeout conditions.



All dimensions are nominal in millimetres unless specified

Specifications

Material	
Flanges	304ss
Valve body	304ss
Air cylinder	Teflon® coated aluminium
Actuator seal	AM-350 welded bellows
Gaskets, bonnet	OFE Copper or Viton® elastomer
Gaskets, poppet	Viton® or Kalrez® 4079 elastomer
Gaskets, pneumatic actuator	Viton® elastomer
Bolts	300 Series Stainless Steel

Electropneumatic actuator	
Air pressure	4.8 to 6.9 bar
Air control valve 6.4 to 38.1	310 Series Humphrey solenoid valve
Air control valve 50.8 to 254	410 Series Humphrey solenoid valve
Solenoid power	24V DC/240V AC 50/60Hz, 4Watts
Power loss	Valve closes
Position indicators, magnetic	0.5A, 240V AC, 10W maximum
Position indicators, mechanical	5A, 240V AC micro switch

Port fastening	
Bolt type	Hex head bolts
Nut type	Hexagonal nuts

Fastening torque for CF port flanges	
M4	10 Nm
M6	16 Nm
M8	20 Nm

Vacuum	
Range	To 1×10^{-11} mbar
Leak test	2×10^{-10} mbar litre/sec of He

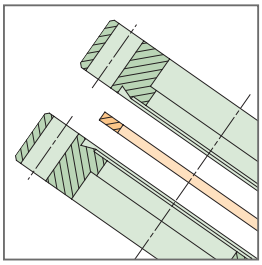
Temperature range	Bakeability, under vacuum in open/closed positions with the following bonnet/poppet seal combinations
UHV Series with Copper/Viton®	200°C open/150°C closed
UHV Series with Copper/Kalrez®	250°C open/200°C closed
HV Series with Viton®/Viton®	150°C open/150°C closed
Weight and Dimensions	See tables

Port connection guide

Caburn-MDC offers four industry standard port connections. The port connections available for each valve size are depicted in the specific two page valve spread. Port connections not shown, are either not available for that specific valve size or only available on request.

The following port connection guide summarises the four standard connection solutions available. For a detailed discussion of these connections reference Section 1.

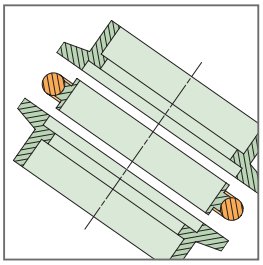
CF
Meat Seal flanges



UHV Flange

CF flanges employ a Conflat® compatible knife-edge sealing mechanism which produces a cold-flow deformation of a metal copper gasket. Flanges are available for tube sizes from 6.4 to 355.6mm diameters. They are used in UHV environments where high temperature bake-outs are a must. Both port flanges are rotatable.

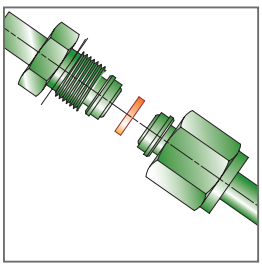
ISO KF
ISO Elastomer seal flanges



HV Flange

ISO KF flanges are ideal for vacuum systems requiring frequent assembly and disassembly. Fastening and sealing is achieved by a hinged radial clamp which provides compression of an elastomer gasket. KF flanges comply with all ISO specifications for vacuum hardware and are available for tube sizes up to 50.8mm in diameter.

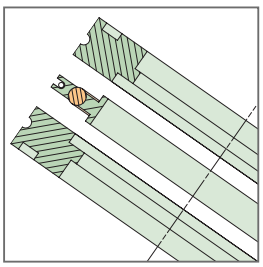
VCR®
Swagelock metal seal fittings



UHV Tube fitting

Swagelok VCR® tube fittings are designed for rapid make-up in tube, pipe and welded systems. They are zero clearance fittings, ideal for installation in limited space. Sealing is accomplished with the compression of a copper metal gasket. They are typically used for gas admission into UHV systems. VCR in 1/4" (6.4mm) tube only.

ISO LF
ISO Elastomer seal flanges



HV Flange

LF flanges cover the range from 63.5 to 508mm tube diameters. The main difference between LF and KF flanges is their method of fastening. LF flanges use multiple claw-clamps versus a single hinged radial clamp in KF flanges. They also meet all ISO specifications for vacuum hardware.

Customer note VCR® fittings are imperial sizes only

All dimensions are nominal in millimetres unless specified Weights given are approximate

Angle valves Million cycle line MC+

6.4 and 12.7mm ports

AV-050 VAV-025-P

UHV and HV series

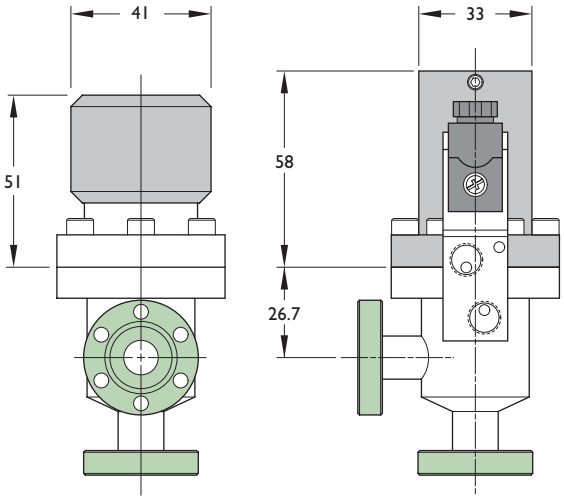
Metal and elastomer seal bonnets

Features

- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder

See port connections for flange details.

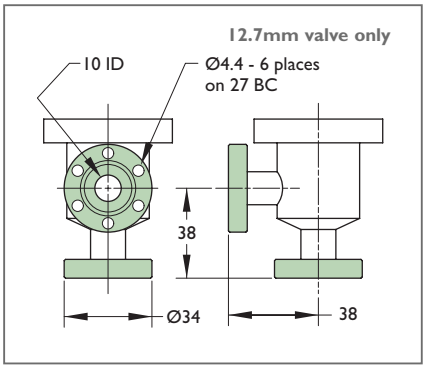
Position indicators are not a standard option for 6.4 and 12.7mm valves. Contact sales office for additional information.



Port connections

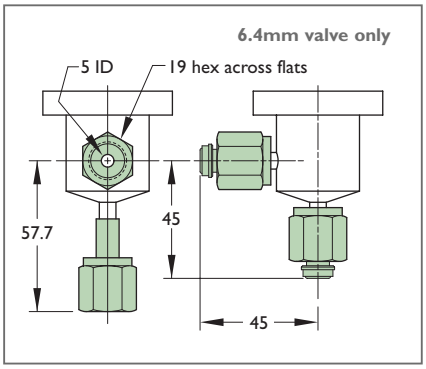
CF

DN16CF
Metal seal flange



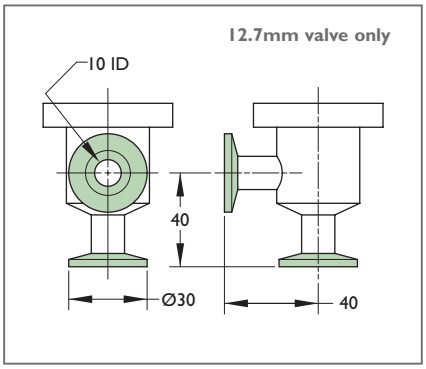
Female VCR

¼" (6.4mm)
Swagelock® VCR fitting



ISO KF

DN16KF
Elastomer seal flanges



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

6.4 and 12.7mm ports

UHV Series

Metal seal bonnet 250°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
6.4	Manual	Female VCR	Metal	0.5	VAV-025M	**301053**
6.4	Pneumatic	Female VCR	Metal	0.5	VAV-025M-P	**313070-03**
12.7	Manual	DN16CF	Metal	0.5	AV-050M	**312055**
12.7	Pneumatic	DN16CF	Metal	0.5	AV-050M-P	**313072-03**

HV Series

Viton® seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
6.4	Manual	Female VCR	Metal	0.5	VAV-025	**310080**
6.4	Pneumatic	Female VCR	Metal	0.5	VAV-025-P	**311087-03**
12.7	Manual	DN16CF	Viton®	0.5	AV-050	**310082**
12.7	Manual	DN16KF	Viton®	0.5	KAV-050	**310083**
12.7	Pneumatic	DN16CF	Viton®	0.5	AV-050-P	**311089-03**
12.7	Pneumatic	DN16KF	Viton®	0.5	KAV-050-P	**311090-03**

Valve options

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

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 **313072-03**-11

Description	Option number
240VAC air control solenoid valve[1]	**-09**
High temperature poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	Viton® and copper	1[2]	AVG-050M	**351016**
Poppet and bonnet seal	Viton®	1[2]	AVG-050	**350013**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Socket cap head bolts	M4 x 20mm	DN16CF	25	M4-20	**1113014**
Clamp	_	DN16KF	1	K16-C	**7701000**
Centring ring	–	DN16KF	1	K16-CR	**7710000**

[2] Each gasket kit contains one bonnet and one gate seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Angle valves Million cycle line **MC+**

DN16CF and DN16KF ports

AV-075 AV-075-P

UHV Series

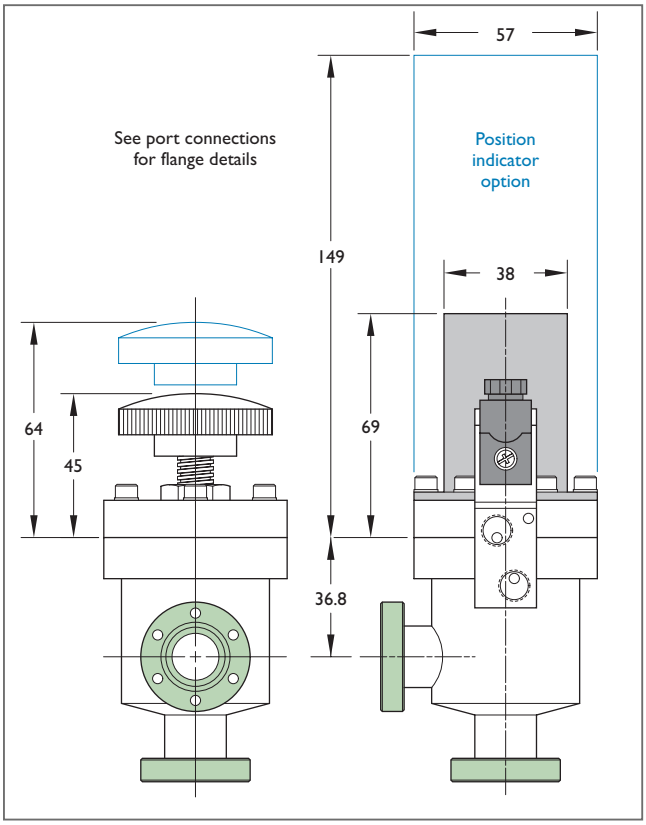
250°C Metal seal bonnets

HV Series

150° Elastomer sealed bonnets

Features

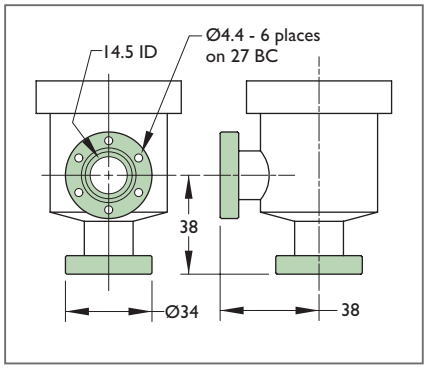
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

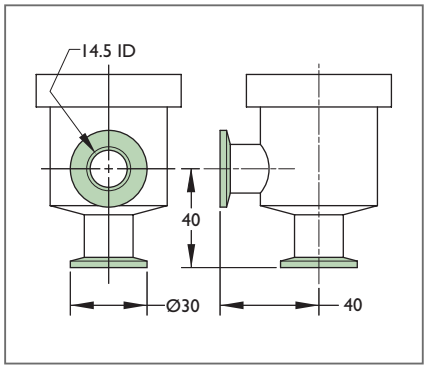
CF

DN16CF
Metal seal flange



ISO KF

ISO DN16KF
Elastomer seal flanges



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

DN16CF and DN16KF ports

UHV Series

Metal seal bonnet 250°C

Valve Nominal ID	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
16	Manual	DN16CF	Metal	0.5	AV-075M	**312015**
16	Pneumatic	DN16CF	Metal	0.9	AV-075M-P	**313015-03**

HV Series

Viton® seal bonnet 150°C

Valve Nominal ID	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
16	Manual	DN16CF	Viton®	0.5	AV-075	**310015**
16	Manual	DN16KF	Viton®	0.5	KAV-075	**310072**
16	Pneumatic	DN16CF	Viton®	0.9	AV-075-P	**311015-03**
16	Pneumatic	DN16KF	Viton®	0.5	KAV-075-P	**311072-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **313015-03**-02-01-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240VAC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	UHV	Viton® and copper	1[2]	AVG-075M	**351004**
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-075	**350004**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Socket cap head bolts	M4 x 20mm	DN16CF	25	M4-20	**1113014**
Clamp	_	DN16KF	1	K16-C	**7701000**
Centring ring	–	DN16KF	1[3]	K16-CR	**7710000**

[2] Each gasket kit contains one bonnet and one gate seal

[3] Includes one elastomer seal

Angle valves

DN25KF ports

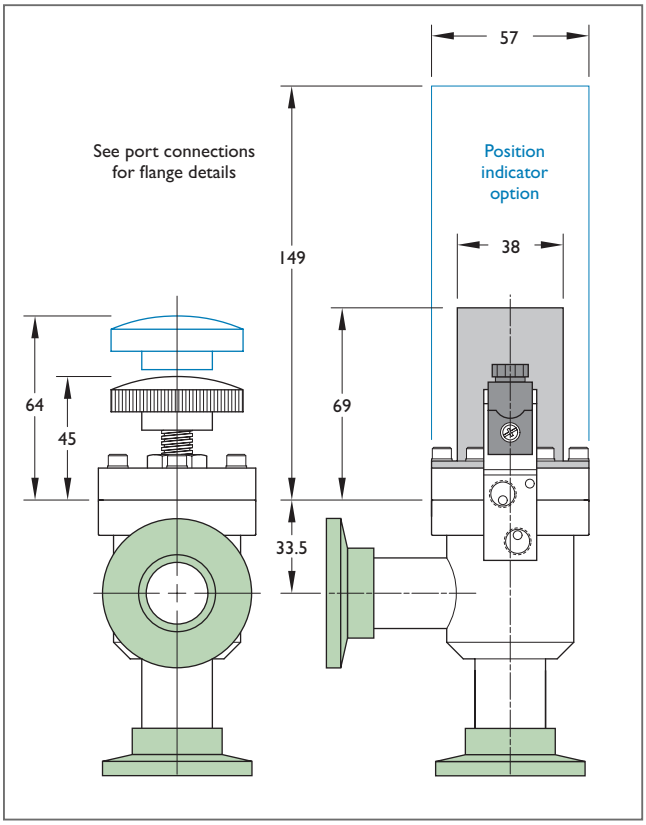
KAV-100 KAV-100-P

HV Series

150° Elastomer sealed bonnets

Features

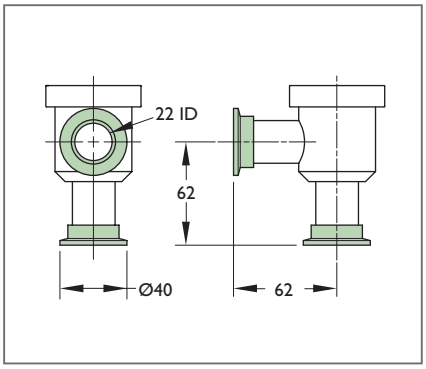
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

CF

ISO DN25KF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
25	Manual	DN25KF	Viton®	0.5	KAV-100	**310073**
25	Pneumatic	DN25KF	Viton®	0.9	KAV-100-P	**311073-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **313022-03**-02-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-100	**350004**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Clamp	_	DN25KF	1	K25-C	**7701001**
Centring ring	–	DN25KF	1[3]	K25-CR	**7710001**

[2] Each gasket kit contains one bonnet and one gate seal

[3] Includes one elastomer seal

Angle valves

DN40CF and DN40KF ports

AV-150 AV-150-P

UHV Series

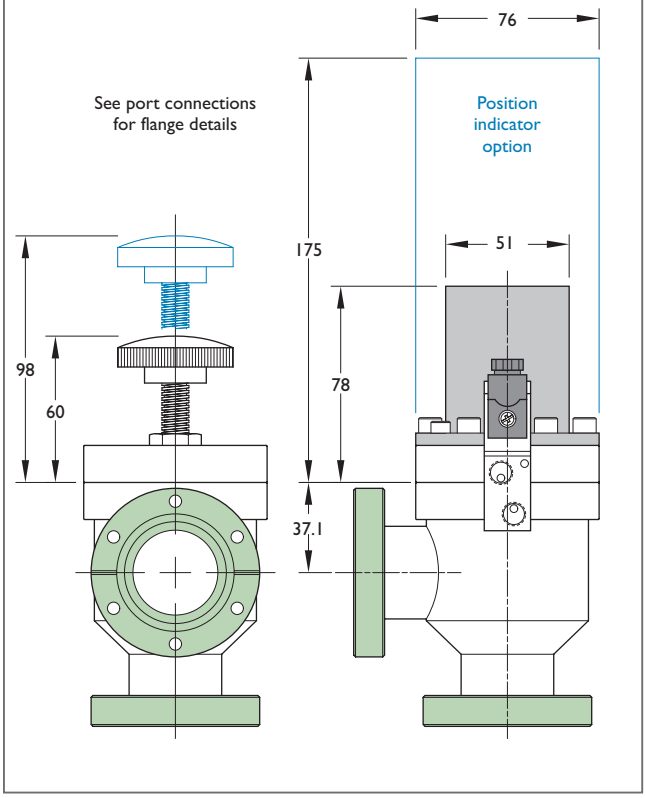
250°C Metal seal bonnets

HV Series

150° Elastomer sealed bonnets

Features

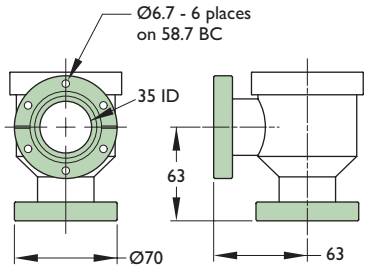
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

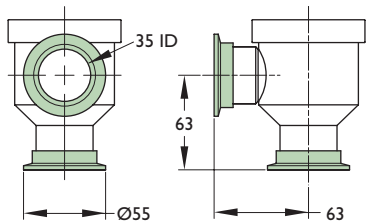
CF

DN40CF
Metal seal flange



ISO KF

ISO DN40KF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

UHV Series

Metal seal bonnet 250°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
38	Manual	DN40CF	Metal	2.7	AV-150M	**312029**
38	Pneumatic	DN40CF	Metal	2.3	AV-150M-P	**313029-03**

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
38	Manual	DN40CF	Viton®	1.8	AV-150	**310029**
38	Manual	DN40KF	Viton®	1.8	KAV-150	**310074**
38	Pneumatic	DN40CF	Viton®	2.7	AV-150-P	**311029-03**
38	Pneumatic	DN40KF	Viton®	2.3	KAV-150-P	**311074-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **312029-03-02-11**

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	UHV	Viton® and copper	1[2]	AVG-150M	**351005**
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-150	**350005**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M6 x 35mm	DN40CF	25	M6-35	**1113021**
Clamp	_	DN40KF	1	K40-C	**7701002**
Centring ring	–	DN40KF	1[3]	K40-CR	**7710002**

[2] Each gasket kit contains one bonnet and one gate seal

[3] Includes one elastomer seal

Angle valves Million cycle line **MC+**

DN50KF ports

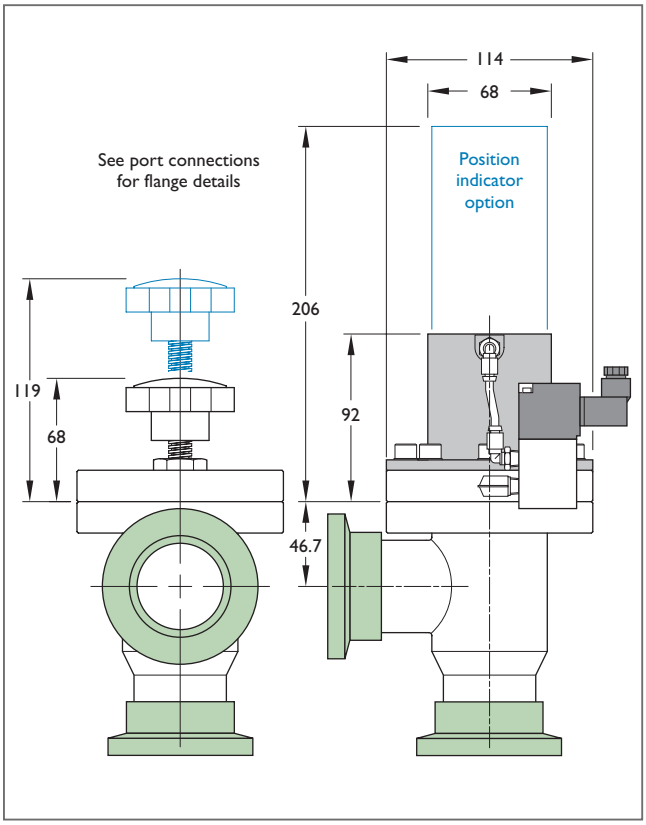
KAV-200 KAV-200-PAA

HV Series

150° Elastomer sealed bonnets

Features

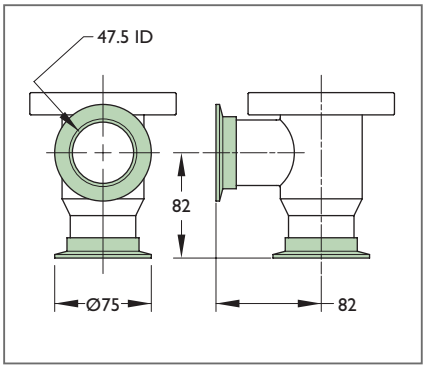
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

CF

ISO DN50KF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

DN50KF ports

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
50	Manual	DN50KF	Viton®	4.5	KAV-200	**310075**
50	Pneumatic	DN50KF	Viton®	4.9	KAV-200-PAA	**311075-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **313033-03-02-11**

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-200	**350006**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Clamp	–	DN50KF	1	K50-C	**7701003**
Centring ring	–	DN50KF	1[3]	K50-CR	**7710003**

[2] Each gasket kit contains one bonnet and one gate seal

[3] Includes one elastomer seal

Angle valves Million cycle line **MC+**

DN63CF and DN63LF ports

AV-250 AV-250-P

UHV Series

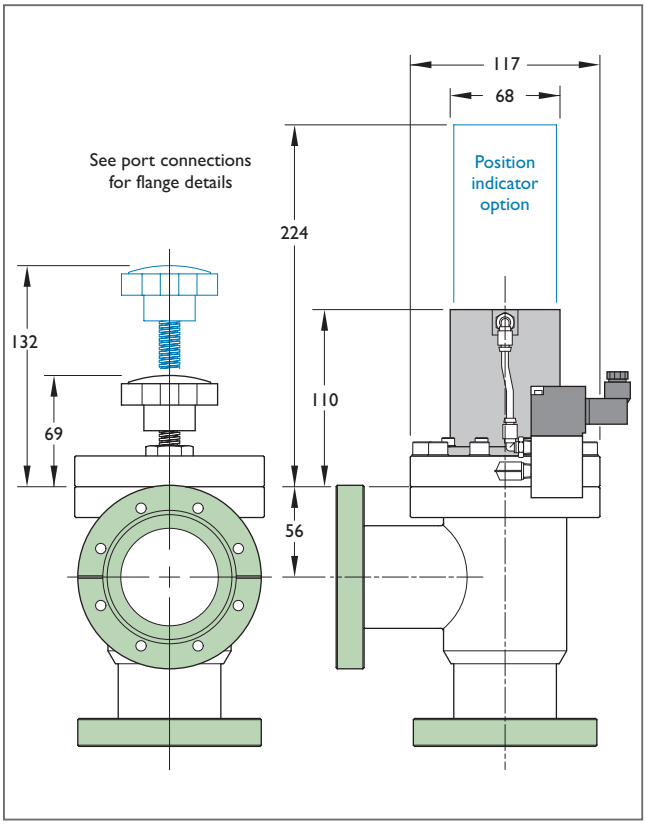
250°C Metal seal bonnets

HV Series

150° Elastomer sealed bonnets

Features

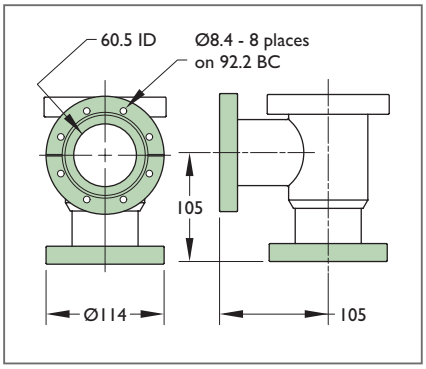
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

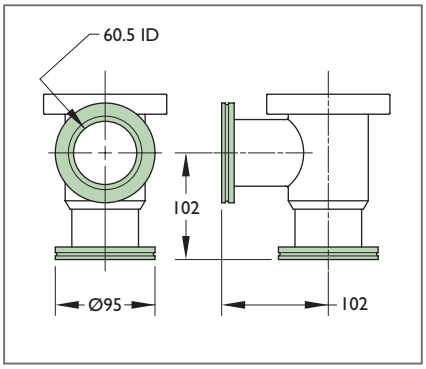
CF

DN63CF
Metal seal flange



ISO LF

ISO DN63LF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

DN63CF and DN63LF ports

UHV Series

Metal seal bonnet 250°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
63	Manual	DN63CF	Metal	5.4	AV-250M	**312037**
63	Pneumatic	DN63CF	Metal	5.4	AV-250M-PAA	**313037-03**

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
63	Manual	DN63CF	Viton®	5.4	AV-250	**310037**
63	Manual	DN63LF	Viton®	5.4	KAV-250	**310076**
63	Pneumatic	DN63CF	Viton®	5.4	AV-250-P	**311037-03**
63	Pneumatic	DN63LF	Viton®	5.4	KAV-250-P	**311078-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **310076-03-02-11**

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	UHV	Viton® and copper	1[2]	AVG-250M	**351007**
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-250	**350007**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M8 x 50mm	DN63CF	25	M8-50	**1113026**
Double claw-clamp	_	DN63LF	1	DCC63/100	**1130008**
Centring ring	–	DN63LF	1[3]	L63-CR	**7810000**

[2] Each gasket kit contains one bonnet and one gate seal

[3] Includes one elastomer seal

Angle valves Million cycle line MC+

DN100CF and DN100LF ports

AV-400 AV-400-PAA

UHV Series

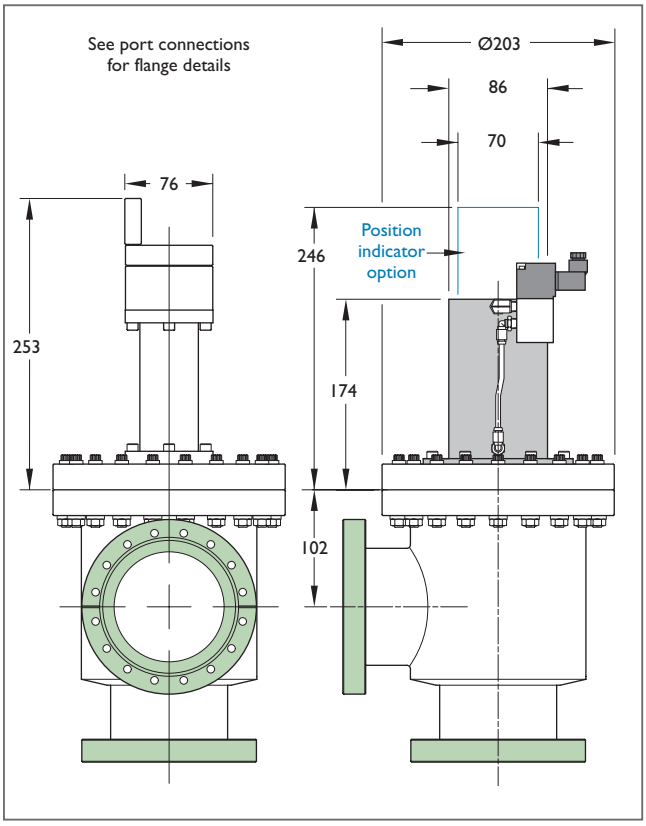
250°C Metal seal bonnets

HV Series

150° Elastomer sealed bonnets

Features

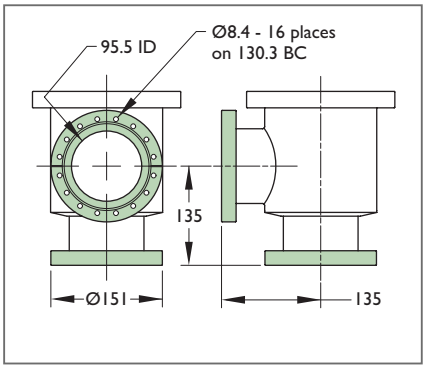
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

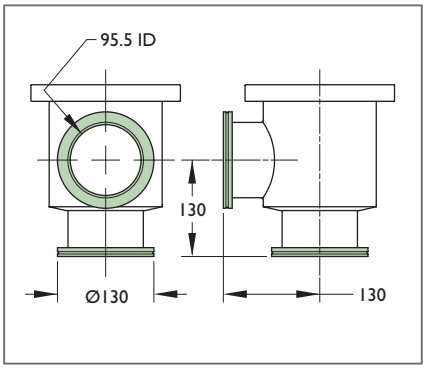
CF

DN100CF
Metal seal flange



ISO LF

ISO DN100LF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

DN100CF and DN100LF ports

UHV Series

Metal seal bonnet 250°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
100	Manual	DN100CF	Metal	16.8	AV-400M	**312045**
100	Pneumatic	DN100CF	Metal	16.8	AV-400M-PAA	**313045-03**

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
100	Manual	DN100CF	Viton®	16.8	AV-400	**310045**
100	Manual	DN100LF	Viton®	16.8	LAV-400	**310078**
100	Pneumatic	DN100CF	Viton®	16.8	AV-400-PAA	**311045-03**
100	Pneumatic	DN100LF	Viton®	16.8	LAV-400-PAA	**311080-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **313045-03**-02-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	UHV	Viton® and copper	1[2]	AVG-400M	**351009**
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-400	**350009**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M8 x 50mm	DN100CF	25	M8-50	**1113026**
Double claw-clamp	_	DN100LF	1[3]	DCC63/100	**1130008**
Centring ring	–	DN100LF	1[4]	L100-CR	**7810001**

[2] Each gasket kit contains one bonnet and one gate seal

[3] 4-8 required per flange connection

[4] Includes one elastomer seal

Angle valves Million cycle line **MC+**

DN160CF and DN160LF ports

AV-600 AV-600-PAA

UHV Series

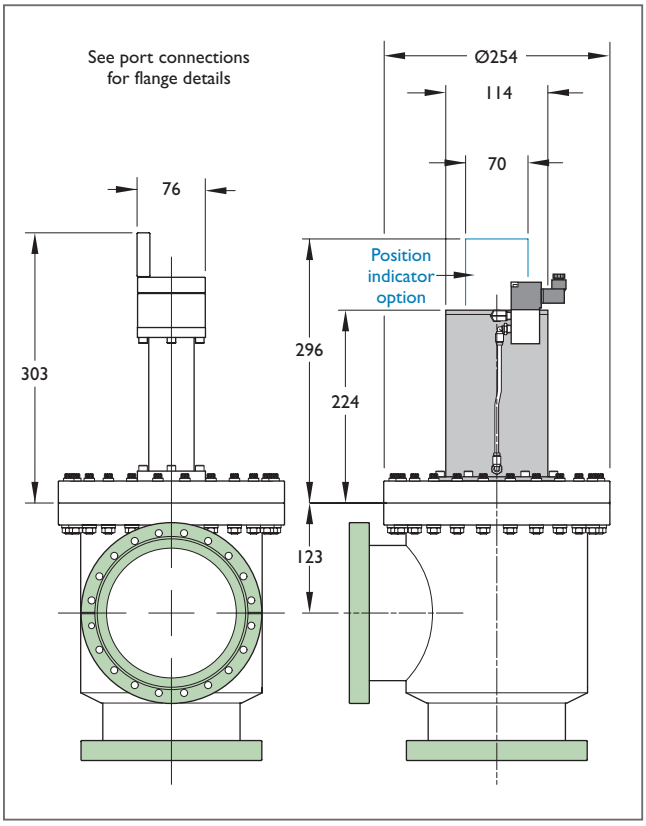
250°C Metal seal bonnets

HV Series

150° Elastomer sealed bonnets

Features

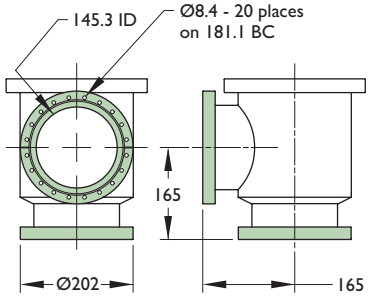
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

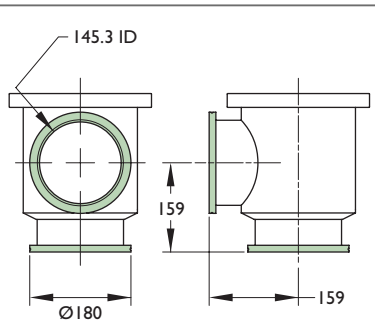
CF

DN160CF
Metal seal flange



ISO LF

ISO DN160LF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

DN160CF and DN160LF ports

UHV Series

Metal seal bonnet 250°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
150	Manual	DN160CF	Metal	28.6	AV-600M	**312049**
150	Pneumatic	DN160CF	Metal	28.6	AV-600M-PAA	**313049-03**

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
150	Manual	DN160CF	Viton®	28.6	AV-600	**310049**
150	Manual	DN160LF	Viton®	28.6	LAV-600	**310079**
150	Pneumatic	DN160CF	Viton®	28.6	AV-600-PAA	**311049-03**
150	Pneumatic	DN160LF	Viton®	28.6	LAV-600-PAA	**311081-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **313049-03**-02-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	UHV	Viton® and copper	1[2]	AVG-600M	**351010**
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-600	**350010**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M8 x 60mm	DN160CF	25	M8-60	**1113027**
Double claw-clamp	_	DN160LF	1[3]	DCC160/250	**1130009**
Centring ring	–	DN160LF	1[4]	L160-CR	**7810002**

[2] Each gasket kit contains one bonnet and one gate seal

[3] 4-8 required per flange connection

[4] Includes one elastomer seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

Angle valves Million cycle line MC+

DN200CF and DN200LF ports

AV-800-PAA

UHV Series

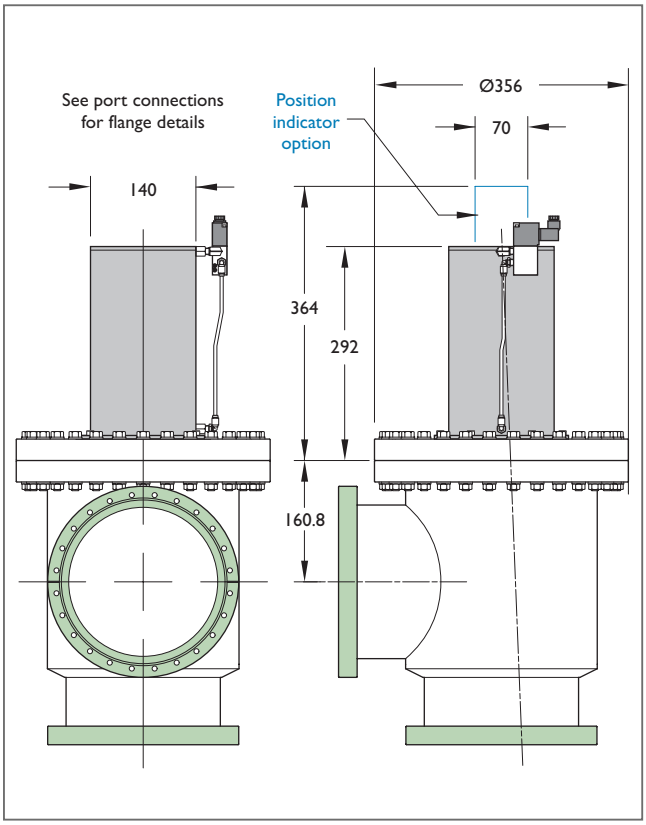
250°C Metal seal bonnets

HV Series

150° Elastomer sealed bonnets

Features

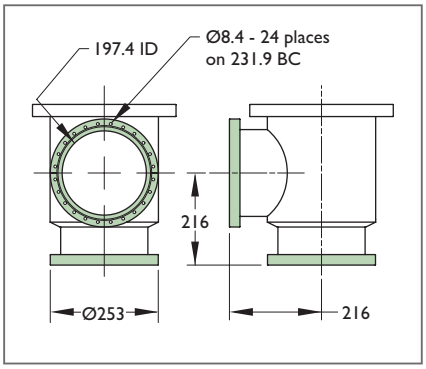
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

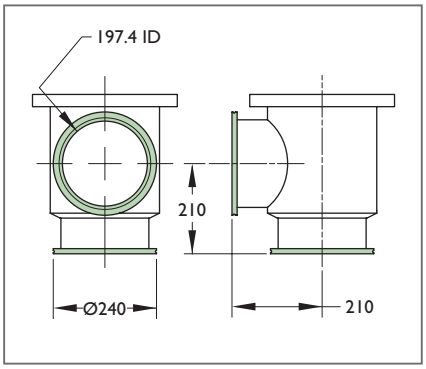
CF

DN200CF
Metal seal flange



ISO LF

ISO DN200LF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

Angle valves Million cycle line MC+

DN200CF and DN200LF ports

UHV Series

Metal seal bonnet 250°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
200	Pneumatic	DN200CF	Metal	36.3	AV-800M-PAA	**313053-03**

HV Series

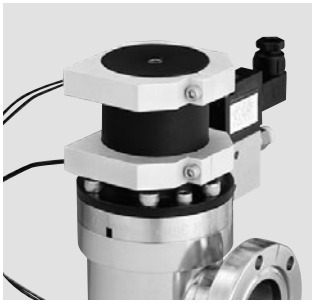
Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
200	Pneumatic	DN200CF	Viton®	36.3	AV-800-PAA	**311053-03**
200	Pneumatic	DN200LF	Viton®	36.3	LAV-800-PAA	**311082-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator



Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **313053-03-02-11**

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**
High temperature Kalrez® poppet seal	**-11**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	UHV	Viton® and copper	1[2]	AVG-800M	**351011**
Poppet and bonnet seal	HV	Viton®	1[2]	AVG-800	**350011**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M8 x 60mm	DN200CF	25	M8-60	**1113027**
Double claw-clamp	_	DN200LF	1[3]	DCC160/250	**1130009**
Centring ring	–	DN200LF	1[4]	L200-CR	**7810003**

[2] Each gasket kit contains one bonnet and one gate seal

[3] 4-8 required per flange connection

[4] Includes one elastomer seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

In-line valves Million cycle line MC+

DN16 ports

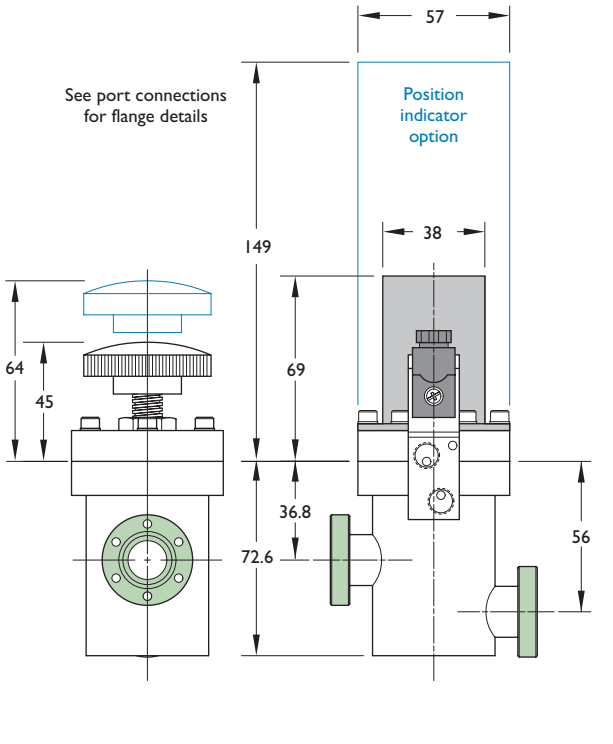
IV-075 IV-075-P

HV Series

150° Elastomer sealed bonnets

Features

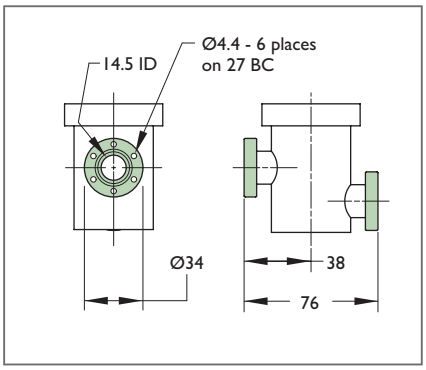
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

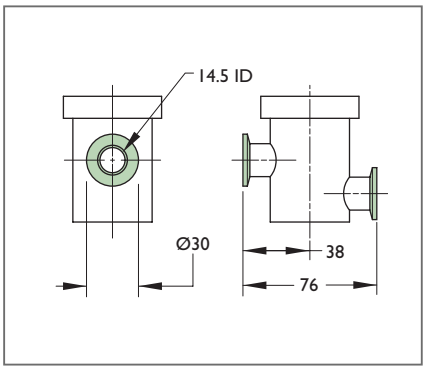
CF

DN16CF
Metal seal flange



ISO KF

ISO DN16KF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

In-line valves Million cycle line MC+

DN16 ports

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
19	Manual	DN16CF	Viton®	0.9	IV-075	**320004**
19	Manual	DN16KF	Viton®	0.5	KIV-075	**320052**
19	Pneumatic	DN16CF	Viton®	0.9	IV-075-P	**321004-03**
19	Pneumatic	DN16KF	Viton®	0.5	KIV-075-P	**321052-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **323004-03**-02-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[1]	**-09**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	HV	Viton®	1[2]	IVG-075	**350004**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Socket cap head bolts	M4 x 20mm	DN16CF	25	M4-20	**1113014**
Clamp	_	DN16KF	1[3]	K16-C	**7701000**
Centring ring	–	DN16KF	1[4]	K16-CR	**7710000**

[2] Each gasket kit contains one bonnet and one gate seal

[3] 3-4 required per flange connection

[4] Includes one elastomer seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

In-line valves Million cycle line MC+

DN40 ports

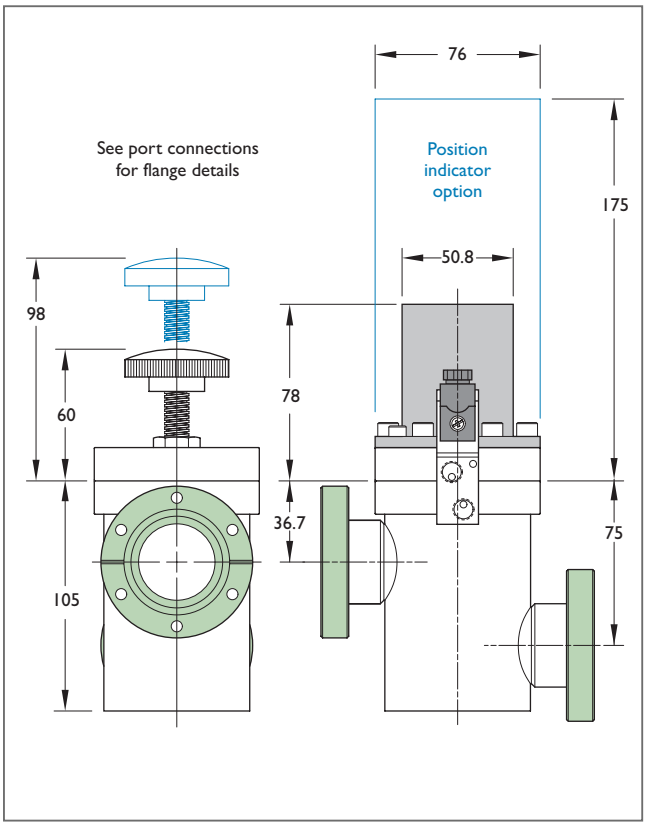
IV-150 IV-150-P

HV Series

150° Elastomer sealed bonnets

Features

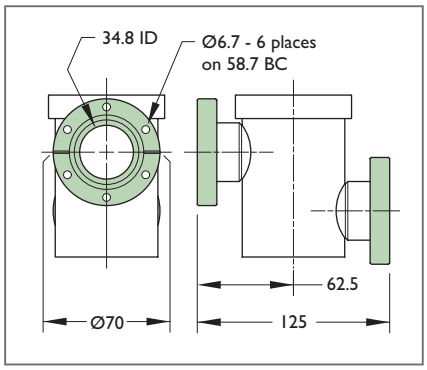
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

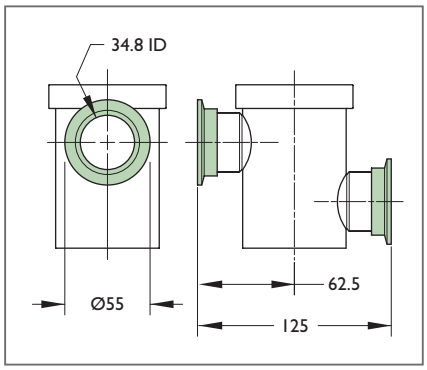
CF

DN40CF
Metal seal flange



ISO KF

ISO DN40KF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

In-line valves Million cycle line MC+

DN40 ports

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
38	Manual	DN40CF	Viton®	2.3	IV-150	**320018**
38	Manual	DN40KF	Viton®	1.8	KIV-150	**320054**
38	Pneumatic	DN40CF	Viton®	2.3	IV-150-P	**321018-03**
38	Pneumatic	DN40KF	Viton®	1.8	KIV-150-P	**321054-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **323004-03**-02-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[2]	**-09**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	HV	Viton®	1[2]	IVG-150	**350005**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M6 x 35mm	DN40CF	25	M6-35	**113021**
Clamp	_	DN40KF	1[3]	K40-C	**7701002**
Centring ring	–	DN40KF	1[4]	K40-CR	**7710002**

[2] Each gasket kit contains one bonnet and one gate seal

[3] 3-4 required per flange connection

[4] Includes one elastomer seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

In-line valves Million cycle line MC+

DN63 ports

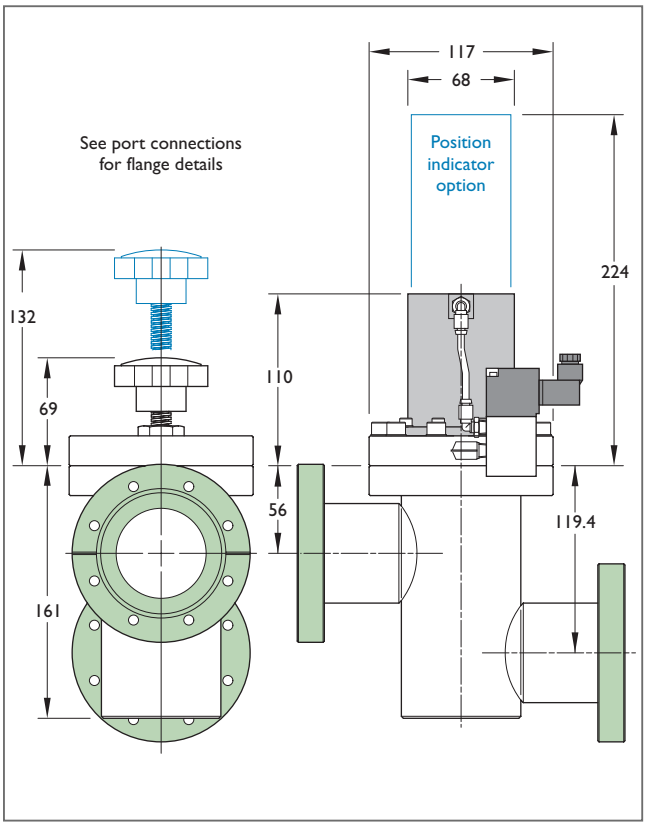
IV-250 IV-250-P

HV Series

150° Elastomer sealed bonnets

Features

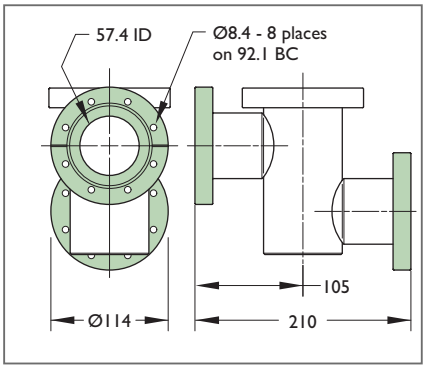
- Poppet elastomer seals made from Viton®
- Stainless steel construction
- Manual or electropneumatic operation
- Air-open / spring-close air cylinder



Port connections

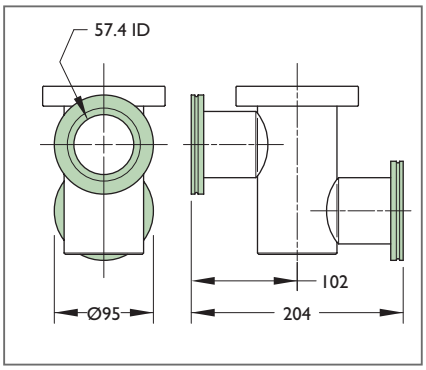
CF

DN63CF
Metal seal flange



ISO KF

ISO DN63LF
Elastomer seal flange



All dimensions are nominal in millimetres unless specified

In-line valves Million cycle line MC+

DN63 ports

HV Series

Elastomer seal bonnet 150°C

Valve size	Actuator	Port flange	Bonnet seal	Wt kg	Reference	Part number
63.5	Manual	DN63CF	Viton®	5.5	IV-250	**320026**
63.5	Manual	DN63LF	Viton®	5.5	LIV-250	**320056**
63.5	Pneumatic	DN63CF	Viton®	5.5	IV-250-PAA	**321026-03**
63.5	Pneumatic	DN63LF	Viton®	5.5	LIV-250-PAA	**321056-03**

Valve options

Option -01
Mechanical position indicator

Option -02
Magnetic position indicator

Option -09
Air control solenoid valves

Option -11
4079 Kalrez® 250°C poppet seal

All pneumatic valves are supplied with 24V DC air control solenoids as standard.

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 **323004-03**-02-11

Description	Option number
Mechanical position indicator	**-01**
Magnetic position indicators	**-02**
240V AC Air control solenoid valve[2]	**-09**

[1] Supplied as a spare part – not fitted to valve

Accessories

Hardware and gaskets

Gasket kit	For use with	Material	Quantity per pack	Reference	Part number
Poppet and bonnet seal	HV	Viton®	1[2]	IVG-250	**350007**

Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Hex head bolt set	M8 x 50mm	DN40CF	25	M8-50	**1113026**
Clamp	_	DN40KF	1[3]	DCC63/100	**1130008**
Centring ring	–	DN40KF	1[4]	L63-CR	**7810000**

[2] Each gasket kit contains one bonnet and one gate seal

[3] 3-4 required per flange connection

[4] Includes one elastomer seal

All dimensions are nominal in millimetres unless specified Weights given are approximate

All-metal valves

Angle and in-line specifications

MAV-150 MIV-150

UHV Series

450°C Metal seal bonnet and poppet

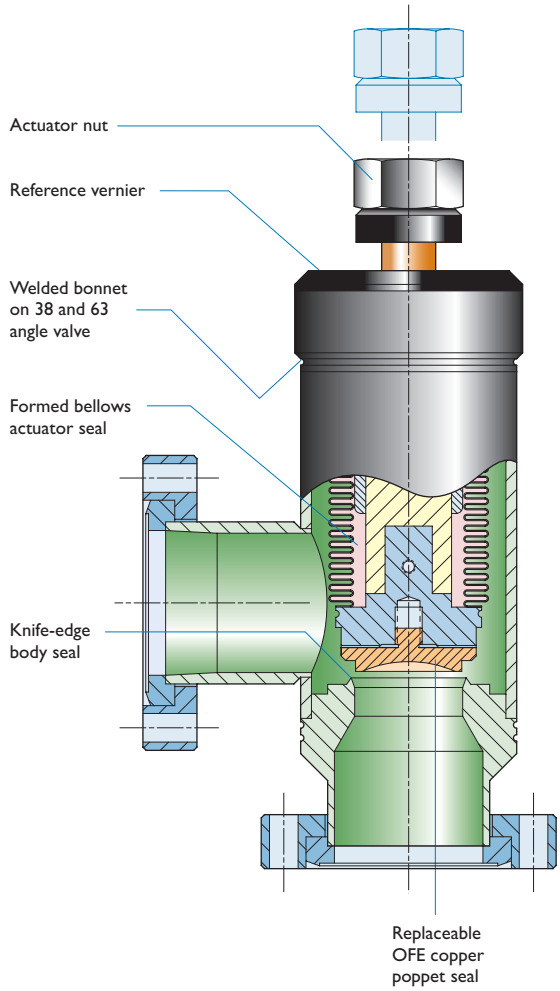
Features

- UHV-compatible to $1x10^{-11}$ mbar
- Manual actuation
- Hundreds of seal cycles per gasket
- Replaceable OFE copper poppet gasket
- High temperature service to 450°C
- 300 Series stainless steel construction
- Stainless steel bellows sealed actuator
- High conductance design

Specifications

Material	
Flanges	304ss
Valve body	304ss
Bolts	300ss
Gaskets, poppet and bonnet	OFE Copper
Port fastening	
Bolt type	Socket head bolts
Nut type	Hexagonal nuts
Vacuum	
Range	$1x10^{-11}$ mbar
Leak test	$2x10^{-10}$ mbar litre/sec of He
Poppet sealing torque	
19 Valve, first/subsequent seals	10-14/8-10 Nm
38 Valve, first/subsequent seals	5-11/5-10 Nm
63 Valve, first/subsequent seals	10-14/8-10 Nm
Temperature range	
Closed/open	300°C/450°C
Weight and dimensions	See tables

38mm All-metal angle valve cross section



All dimensions are nominal in millimetres unless specified

All-metal valves

Angle and in-line specifications

Caburn-MDC bakeable all-metal angle and in-line valves are designed for use in ultrahigh vacuum environments where elevated temperatures preclude the use of elastomers and low temperature gasket metals. These valves provide reliable high temperature seals from atmospheric pressures to below 10^{-11} mbar.

Wherever possible, bonnet gasket seals have been eliminated in an effort to minimise the number of potential leak paths. Valves fitted with bonnet seals have been so designed to facilitate gasket replacement. The size and orientation of the valve body ports on bonnet fitted valves precludes gasket removal through its ports.

When operated at ambient temperatures, all-metal valves provide hundreds of leak free cycles between routine poppet gasket replacements. In high temperature applications, life cycles are inversely proportional to the bakeout temperatures. When operated at the maximum bakeout temperature of 450°C, the poppet seal gasket life is reduced to approximately 50 open/close cycles.

Seal design

A vacuum seal is made by pressing the poppet OFE copper gasket onto a conical stainless steel knife edge seat as depicted in the diagram at top-right. The sealing pressure deforms the copper gasket, which conforms to the conical knife-edge seat. During thermal cycling the valves loading mechanism counteracts component differential expansion to maintain a uniform pressure necessary for seal integrity.

Poppet gasket replacement

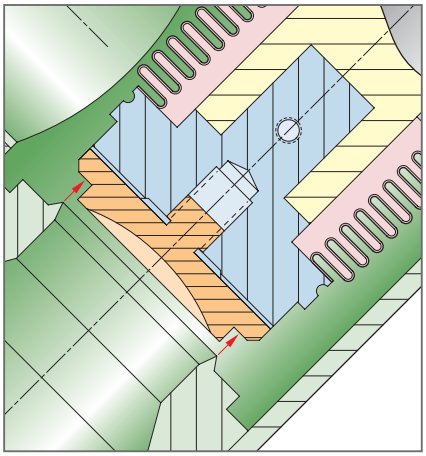
Poppet gasket replacement for the DN40 and DN63 all-metal angle valves must be done by removing the valve from the system, as these two valves have welded bonnets. Once detached from the system, gasket replacement is easily accomplished by inserting a standard blade screw driver into the bottom port and unscrewing the copper gasket, which is then extracted through the side port of the valve. The DN16 angle valve and all in-line valves are fitted with bonnet seals and do not require complete removal from the system for gasket replacement. Gasket removal and replacement is performed by detaching the bonnet flange from the valve body. Once the bonnet has been opened the gasket is easily detached by unscrewing with a standard blade screw driver.

Seal torque

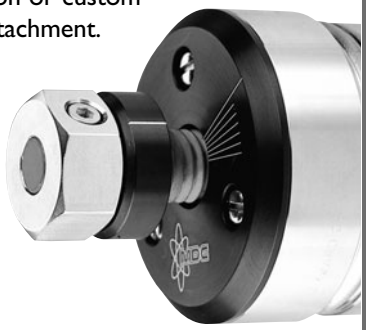
The first seal or closure in an all-metal valve causes plastic deformation of a virgin copper gasket leaving a permanent impression. This first closure is made at the factory and shipped to the customer in a ready to install sealed condition. Upon breaking this seal, resealing can be accomplished by torquing the valve according to the "Poppet Sealing Torque" data found in the specifications chart shown on page 172. To aid in the process of subsequent seal cycles the top of each valve body is fitted with a radially graduated vernier plate. The vernier plate provides a visual cue for previous and subsequent cycle or torque positions.

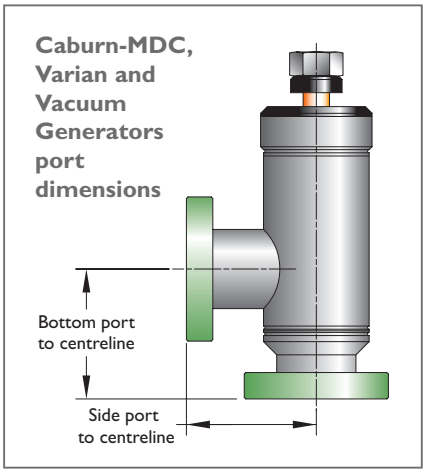
Valve compatibility

Caburn-MDC offers Varian and Vacuum Generators (VG) compatible all-metal angle and in-line valves. The Varian compatible valves have been labelled as "V" in the valve type column found in each product table. Vacuum Generators compatible valves are identified by a "VG" designation in the valve type column. Compatibility is defined herein as the ability to replace or interchange Varian and/or Vacuum Generators valves with Caburn-MDC all-metal valves. Compatibility is limited



to valves fitted with CF port flanges and exclusively to the port to port dimensional characteristics. In other words, the dimensions from any valves' flanged port centreline to the opposite ports' flange face are direct equivalents to Varian and VG valves. Other Caburn-MDC all-metal valve dimensions may vary from those found on Varian and Vacuum Generators products. The "T" designation in the valve type column pertains to valves designed for either tube weld installation or custom flange attachment.



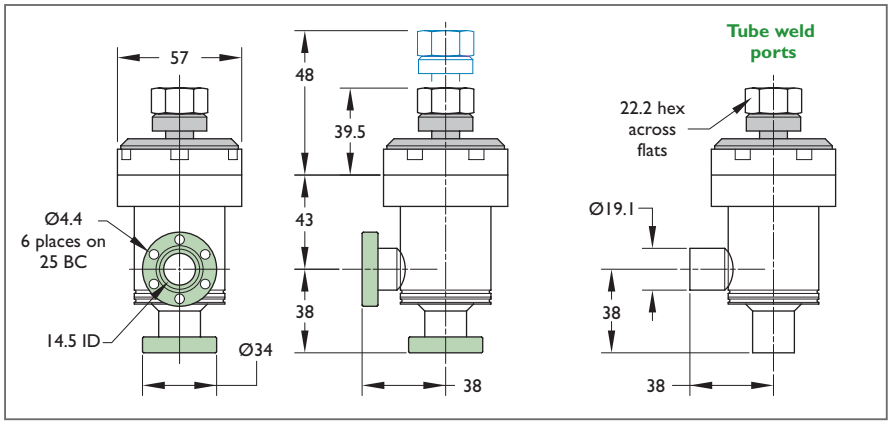


All dimensions are nominal in millimetres unless specified Weights given are approximate

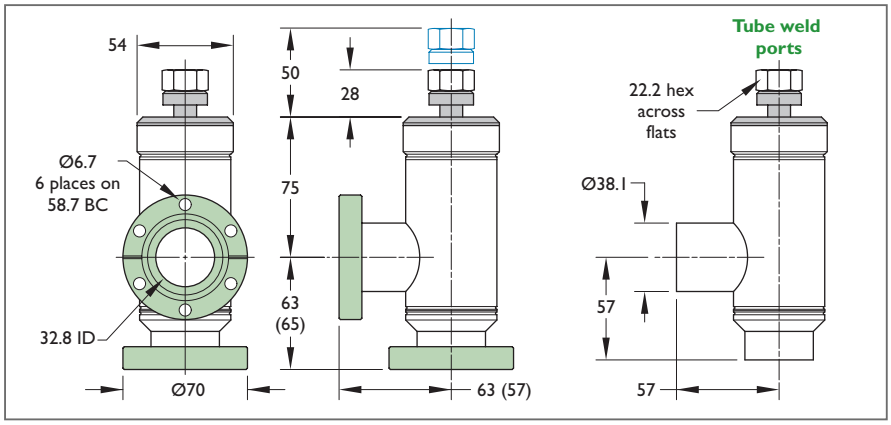
All-metal valves

Angle

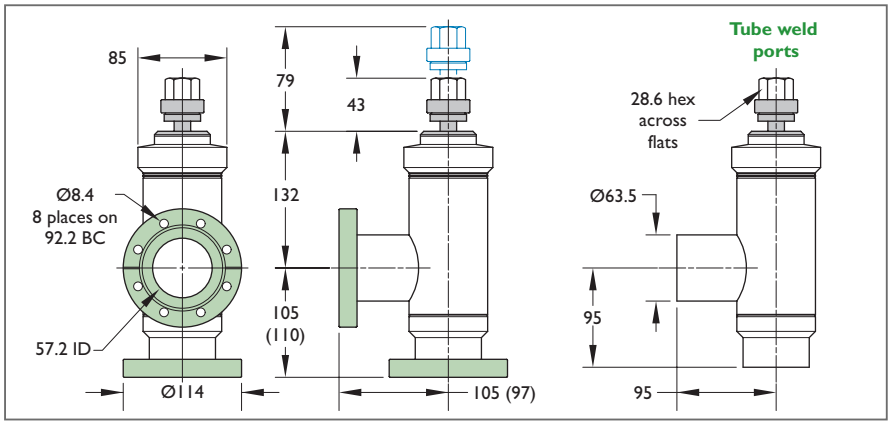
DN16 Angle valve



DN40 Angle valve



DN63 Angle valve



Angle valves UHV

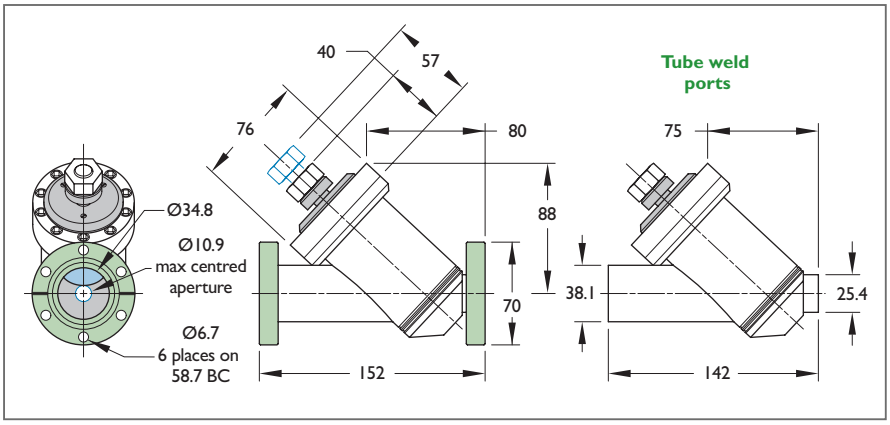
All-metal series 450°C

Caburn-MDC all-metal angle valves designated as type "V" will interface in systems currently fitted with Varian all-metal angle valves. They have port to port dimensions which are compatible with Varian products. All-metal angle valves designated as type "VG" will interface in systems currently fitted with Vacuum Generators all-metal angle valves. They have port to port dimensions which are compatible with Vacuum Generators products. All metal angle valves designated as type "T" will interface with a tube weld installation or custom flange

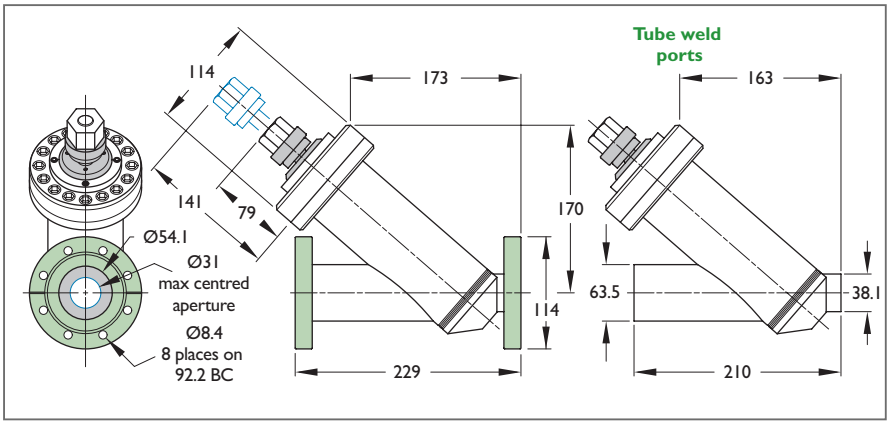
Valve size	Valve type	Port flange	Bonnet seal	Wt kg	Reference	Part number
DN16	T	Tube weld	Metal	0.5	MAV-075-T	**314000**
DN16	V	DN16CF	Metal	0.9	MAV-075-V	**314001**
DN40	T	Tube weld	Welded	1.4	MAV-150-T	**314002**
DN40	V	DN40CF	Welded	1.8	MAV-150-V	**314003**
DN40	VG	DN40CF	Welded	1.8	MAV-150-VG	**314004**
DN63	T	Tube weld	Welded	6.8	MAV-250-T	**314005**
DN63	V	DN63CF	Welded	7.3	MAV-250-V	**314006**
DN63	VG	DN63CF	Welded	7.3	MAV-250-VG	**314007**

All dimensions are nominal in millimetres unless specified

DN40 In-line valve



DN63 In-line valve



In-line valves UHV

All-metal series 450°C

Caburn-MDC all-metal in-line valves designated as type "V" will interface in systems currently fitted with Varian all-metal in-line valves. They have port to port dimensions which are compatible with Varian products. All metal angle valves designated as type "T" will interface with a tube weld installation or custom flange attachment.

Valve size	Valve type	Port flange	Bonnet seal	Wt kg	Reference	Part number
38	T	Tube weld	Metal	2.3	MIV-150-T	**316000**
38	V	DN40CF	Metal	2.7	MIV-150-V	**316001**
63	T	Tube weld	Metal	7.7	MIV-250-T	**316002**
63	V	DN63CF	Metal	8.2	MIV-250-V	**316003**

Accessories

Gaskets

Gasket kit used with	Gasket total	Poppet	Bonnet	Port	Material	Reference	Part number
16 Angle	2	1	1	–	OFE Copper	MAVG-075	**351013**
40 Angle	4	1	12	2	OFE Copper	MAVG-150	**351014**
63 Angle	3	1	–	2	OFE Copper	MAVG-250	**351015**
40 In-line	4	1	1	2	OFE Copper	MIVG-150	**351014**
63 In-line	3	1	2	–	OFE Copper	MIVG-250	**351015**

[2] Used with In-line valve only

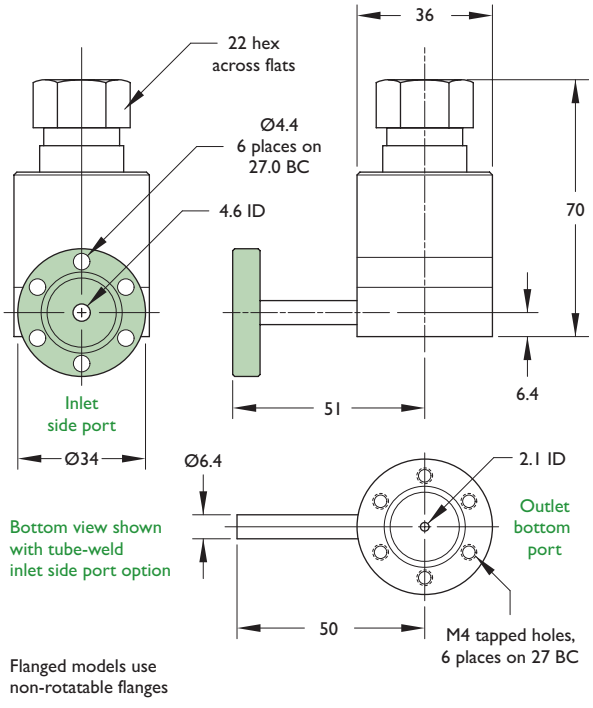
Hardware	Thread length	For use with	Quantity per pack	Reference	Part number
Socket cap head bolts	M4 x 20mm	DN16CF	25	M4-20	**1113014**
Head head bolt set	M6 x 35mm	DN40CF	25	M6-35	**1113021**
Head head bolt set	M8 x 50mm	DN63CF/DN100CF	25	M8-50	**1113026**
Head head bolt set	M8 x 60mm	DN160CF/DN200CF	25	M8-60	**1113027**
Head head bolt set	M8 x 60mm	DN250CF	25	M8-60(32)	**1113033**

All dimensions are nominal in millimetres unless specified Weights given are approximate

All-metal valves

Fine leak

E-MLV-22



UHV Series

450°C Metal seal bonnets

Features

- Adjustable leaks to $1x10^{-7}$ mbar l/sec
- High-temperature service to 450°C
- Durable stellite superalloy seat
- Replaceable nickel diaphragm seal
- Manual actuator
- Stainless steel construction
- Dry film lubricated actuator
- CF ports

Specifications

Material	
Flanges	304ss
Valve body/seat	304ss/Stellite
Bolts	300ss
Gaskets, poppet and bonnet	Nickel
Port fastening	
Bolt type	Socket head
Nut type	Hexagonal
Leak rate	$1x10^{-3}$ to $1x10^{-7}$ mbar l/sec
Inlet pressure	1 bar maximum
Temperature rating	450°C
Weight	0.5 kg

All-metal MLV series leak valves are specifically designed to control gas admission into ultrahigh vacuum systems. They are manually actuated and ideally suited for handling hot or corrosive gases commonly used in demanding research environments. The valve body is constructed of type 304 stainless steel and fitted with a knife-edge seat made of a durable stellite superalloy.

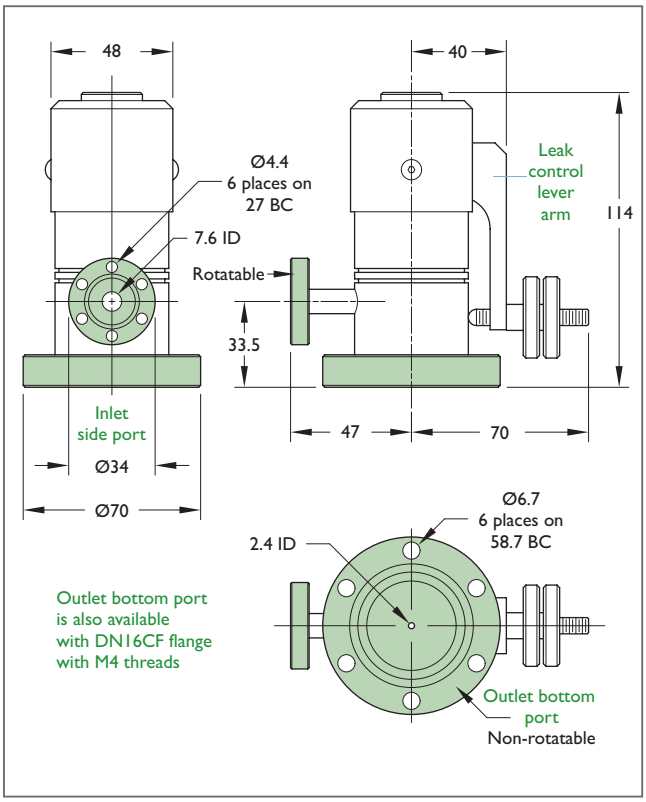
Caburn-MDC ultrahigh vacuum leak valves are shipped in a leak-tight condition. Valve leak rates can be adjusted down to a minimum leak of $1x10^{-7}$ mbar l/sec. Leak rate is controlled by relieving the pressure applied to a replaceable nickel diaphragm. Although these valves can be fully closed and rendered leak tight, doing so repeatedly will reduce the life of the nickel diaphragm and require periodic replacement.

Description	Wt kg	Reference	Part number
Valve, DN16CF	0.5	E-MLV-22	**315000**
Valve, tube weld	0.5	E-MLV-21	**315001**
Nickel diaphragm	0.5	MLV-ND	**931585**

Bolt set	Thread length	For use with	Quantity per pack	Reference	Part number
Socket cap head bolts	M4 x 20mm	DN16CF	25	M4-20	**1113014**

All dimensions are nominal in millimetres unless specified Weights given are approximate

ULV-150 ULV-075



UHV Series

450°C Welded bonnets

Features

- Adjustable leaks to 1.3×10^{-10} mbar l/sec
- High-temperature service to 450°C
- Replaceable sapphire poppet
- Replaceable OFE copper seat
- Manual cantilever actuator
- Stainless steel construction
- Dry film lubricated actuator
- CF ports

Specifications

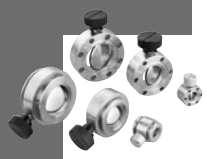
Material	
Flanges	304ss
Valve body/seat	304ss/OFE Copper
Poppets	Sapphire
Bolts	300ss
Port fastening	
Bolt type	Socket head
Nut type	Hexagonal
Leak rate	1.3×10^{-10} mbar l/sec
Inlet pressure	1 bar maximum
Temperature rating	450°C
Weight	0.5 kg

All-metal ULV series precision ultrahigh vacuum leak valves are designed to control gas admission into high and ultrahigh vacuum systems. They are manually actuated via a cantilever arm fitted with extra-fine pitch threads for precise adjustment. They are ideally suited for handling hot and corrosive gases commonly used in demanding research environments. The valve body is constructed of type 304 stainless steel and a replaceable OFE copper seat. The valve poppet is made of high purity sapphire and is also replaceable. ULV series precision leak valves are shipped in a leak-tight condition. Leak rates are controlled by relieving the pressure applied to the replaceable copper seat. Leak rates are adjustable down to a minimum of 1.3×10^{-10} mbar l/sec.

Description	Wt kg	Reference	Part number
Valve, DN16CF	1.4	E-ULV-075	**315013**
Valve, DN40CF	1.8	ULV-150	**315010**
Sapphire spare kit	0.5	ULV-SA	**315011**

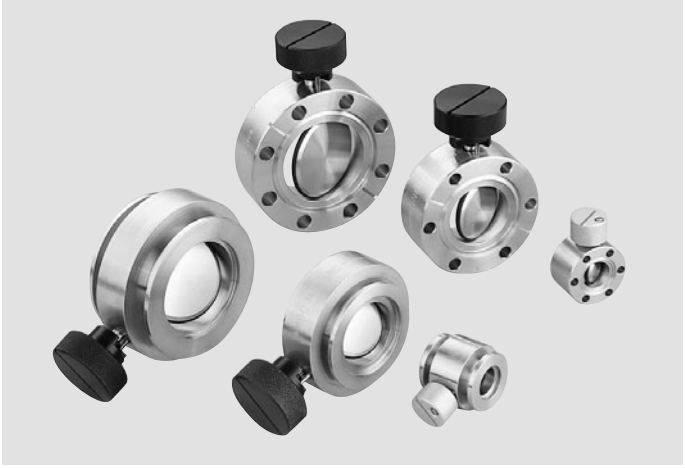
Bolt set	Thread length	For use with	Quantity per pack	Reference	Part number
Socket cap head bolts	M6 x 35mm	DN40CF	25	M6-35	**1113021**

All dimensions are nominal in millimetres unless specified Weights given are approximate



Butterfly valves

19 to 50mm ports



Features

- Quick open/quick close with positive locks
- Positive Viton® O-ring vacuum seal
- Type 304 stainless steel valve body
- High conductance
- Choice of CF or KF Flange

Description

Caburn-MDC butterfly valves require only one-quarter turn rotation of the handle to go from fully open to the fully closed position. In the DN16CF and DN16KF flange series, a spring loaded ball bearing becomes seated in an indent providing a positive mechanical stop. All other size valves employ a roll pin stop method.

These quick-acting butterfly valves feature an improved sealing action. The opening in the body of the valve has been machined at a slight angle to the plane of the flapper. The flapper is set to rotate slightly off-centre. On closure, this causes the sealing pressure to be applied more uniformly all around the O-ring. A reliable, positive seal is made and the tendency of previous designs to roughen the surface of the O-ring and eject it from its groove is eliminated.

Caburn-MDC butterfly valves are low outgassing. All internal surfaces are machined from solid stainless steel bar stock. The handle is made of aluminium. A small O-ring on the stem prevents shaft leakage.

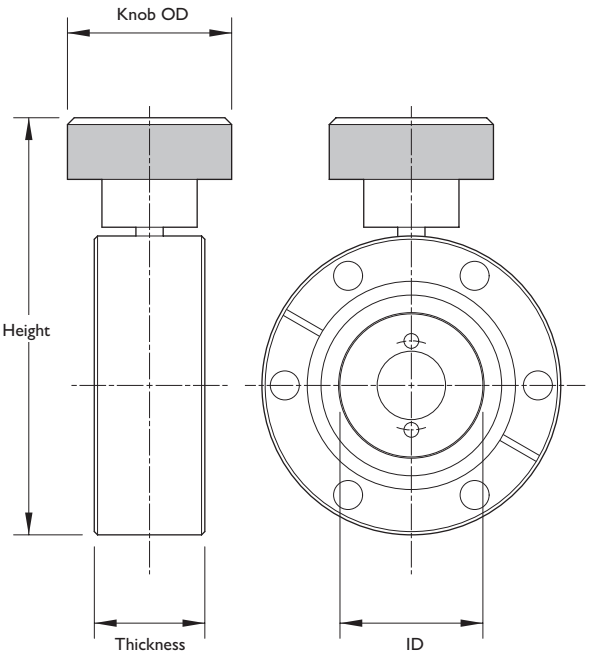
The valves are offered with a choice of CF ultrahigh vacuum metal-seal flanges or ISO KF O-ring seal flanges.

Specifications

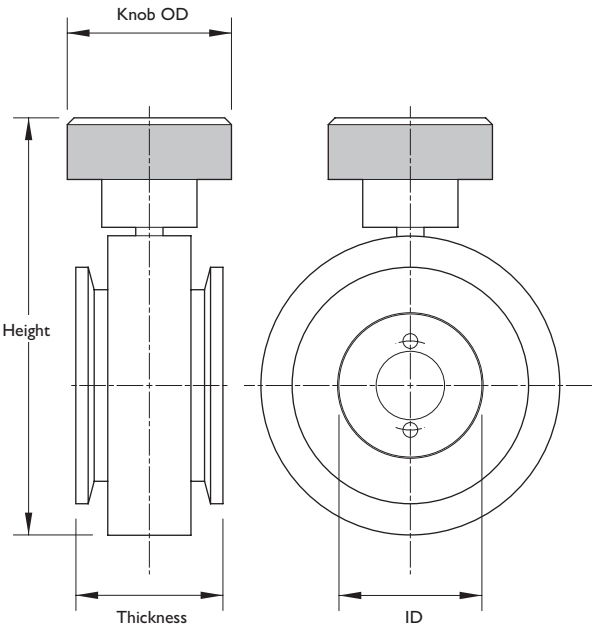
Material	
Flanges and body	304ss
Knob	Aluminium
O-rings	Viton® elastomer
Vacuum range	1.3×10^{-8} mbar
Temperature rating	150°C open/125°C closed
Weight and dimensions	See table

UHV and HV series

CF



ISO KF



- All valves have identical flanges both sides

All dimensions are nominal in millimetres unless specified

Butterfly valves

19 to 50mm ports

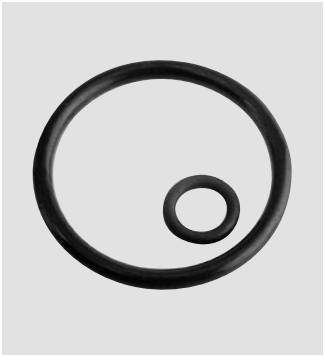
CF

Nominal size	Type flange	Flange OD	Through height	ID	Thickness	Knob dia	Wt kg	Reference	Part number
19	DN16CF	34	50	15.2	19.1	19	0.5	BFV-075	**360000**
38	DN40CF	70	97	33.8	25.4	38	0.5	BFV-150	**360001**

ISO KF

Nominal size	Type flange	Flange OD	Through height	ID	Thickness	Knob dia	Wt kg	Reference	Part number
19	DN16KF	30	46	15.2	37.8	19	0.5	KBFV-075	**360010**
25	DN25KF	40	59	22.1	31.8	19	0.5	KBFV-100	**360011**
38	DN40KF	55	97	33.3	34.0	38	0.5	KBFV-150	**360012**
50	DN50KF	75	113	47.5	42.7	38	1.2	KBFV-200	**360013**

Accessories



Description[1]	Nominal size	Wt kg	Reference	Part number
Seal kit	19	0.1	BFVG-075	**360500**
Seal kit	25	0.1	BFVG-100	**360501**
Seal kit	38	0.1	BFVG-150	**360502**
Seal kit	50	0.1	BFVG-200	**360503**

[1] Includes one stem seal and one flapper seal

All dimensions are nominal in millimetres unless specified Weights given are approximate