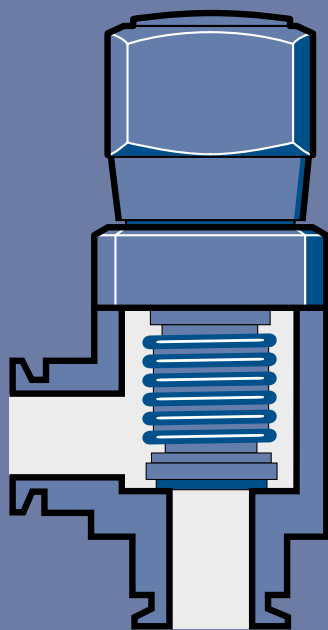


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Product Section C14
Edition May 2005



C14

Vacuum Valves

Manually Operated
Electropneumatically Operated
Electromagnetically Operated
Special Valves
Gate Valves

General

The Leybold Valve Program	C14.03
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Products**Small Valves of the “micro” Range**

Overview	C14.07
Right-Angle and Straight-Through Valves, Bellows-Sealed, Various Drives	C14.08

Valves with KF Flanges

Overview	C14.11
Nominal Width DN 16 KF to DN 40 KF	
Right-Angle and Straight-Through Valves, Bellows-Sealed, Manually Operated	C14.12
Right-Angle Valves, Bellows-Sealed, Electropneumatically Operated	C14.14
Straight-Through Valves, Bellows-Sealed, Electropneumatically Operated	C14.16
Right-Angle Valves, Bellows-Sealed, Electromagnetically Operated .	C14.18

Valves with ISO-K Flanges

Overview	C14.20
Nominal Width DN 63 ISO-K to DN 160 ISO-K	
Right-Angle Valves, Bellows-Sealed, Manually Operated	C14.21
Right-Angle Valves, Bellows-Sealed, Electropneumatically Operated	C14.22
Nominal Width DN 250	
Right-Angle Valves, Bellows-Sealed, Electropneumatically Operated	C14.24

Special Valves with KF- / ISO-K Flange

Overview	C14.26
Nominal Width DN 10 KF to DN 40 KF or ISO-K	
SECUVAC Vacuum Safety Valves	C14.27
Variable-Leak Valves	C14.30
Venting Valves	C14.32
Power Failure Venting Valves	C14.34
Ball Valves	C14.35
Vacuum Locks and Sealing Valves	C14.36
Right-Angle Valve for Mobile Systems according to DOT	C14.38
Accessories for the Electropneumatically Operated Valves, Valves with KF-/ISO-K Flange	C14.39

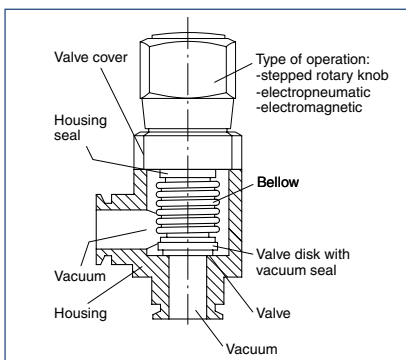
Gate Valves with KF- / CF- / ISO-F Flange

Overview	C14.41
Miniature HV and UHV Gate Valves, Manually Operated, KF and CF Flange	C14.42
Miniature HV and UHV Gate Valves, Electropneumatically Operated, KF and CF Flange	C14.46
HV Gate Valves, Manually Operated, ISO-F Flange	C14.48
HV Gate Valves, Electropneumatically Operated, ISO-F Flange	C14.50
UHV Gate Valves, Manually Operated, CF Flange	C14.52
UHV Gate Valves, Electropneumatically Operated, ISO-F Flange . . .	C14.54
UHV Gate Valves, Electropneumatically Operated, CF Flange	C14.56

The Leybold Valve Program

The long-standing experience of Leybold in the area of vacuum engineering is reflected in the selection and the design of the valves and vacuum protection components for a wide variety of applications. The range of products is such that a reliable solution can be offered for every vacuum engineering application. Many years of service and the reliability of the valves is ensured by design. Leybold vacuum valves are well-proven in many widely varying areas of research and industry.

The Design of a Vacuum Valve



Scope of the Range of Valves

The range of Leybold valves comprises:

- Small valves micro
 - Right-angle and straight-through valves (no slanted seat valve) with a nominal width of DN 16 to DN 40 with KF flanges
 - Right-angle valves with a nominal width of DN 63 to DN 250 with ISO-K flanges
 - Gate valves with a nominal width of DN 16 to DN 250 with various flanges
 - Ball valves
 - Special valves
- Coating
 - Short switching cycles (e.g. 1.5 s)
 - Very high number of opening and switching cycles (e.g. over 10 million cycles)
 - Analytical engineering
 - High conductance (similar to the corresponding flange components, like bends, for example)
 - High integral leak tightness for the valves (leak rates below 10^{-9} mbar l/s)
 - Lamps and tubes manufacture
 - Temperature resistant
 - Permissible ambient temperatures, 50 °C max.
 - Accelerator technology
 - Materials capable of resisting radiation, high temperatures and corrosion at the same time
 - Metallurgy and furnace manufacture
 - Rugged and insensitive to contamination
 - Chemistry
 - Choice of materials in contact with the medium for the valve body

It is the aim of Leybold to meet, through the offered range of isolation components and valves, the customers requirements regarding the design of such components. For this reason all valves are available with different driving systems.

With the exception of the special valves you may select between a stepped rotary knob manual drive, an electropneumatic drive or an electromagnetic drive system.

Right-angle valves DN 16 to DN 40 KF as well as DN 63 to DN 160 ISO-K are either available with an aluminium or stainless steel body (the latter up to DN 100 ISO-K only).

The special characteristics of the application in each case result in special requirements concerning features of the valves, for example:

All applications have the following requirements in common:

- Quiet opening action with very little vibration
- Compact design, low weight
- Highly visible, unambiguous position indicator
- For use within the pressure range from 10^{-8} to 2500 mbar, if not stated otherwise
- Fully operational within the entire specified pressure range

Leybold valves meet these requirements, unless otherwise stated by the technical data.

Quality Assurance

The various markets, like Analytical or Coating, for example are very demanding regarding certain important features for the valves which are to be used in the new generation of instruments currently under development. Demanded are, among other things, high reliability during the entire service life, high integral leak tightness, a high number of opening/closing cycles as well as a fast response.

The valves from Leybold meet all these demanding requirements!

For further information on flange connections and flange components please refer to Product Section C13 "Vacuum Fittings and Feedthroughs" as well as C15 "Ultra-high Vacuum Components".

Flange Designations

The flange designations used in this Product Section are in line with the international standards and the nomenclature used in practice:

Flange Type	Standard	Designation with standardized nominal width ¹⁾ (DN)
Small flanges	ISO 2861/1 DIN 28 403	„KF“ e.g. DN 40 KF
Clamp flanges	ISO 1609 DIN 28 404	„ISO-K“ e.g. DN 100 ISO-K
Fixed flanges/ collar flanges with retaining ring	ISO 1609 DIN 28 404	„ISO-F“ „F“ for fixed flange e.g. DN 250 ISO-F

¹⁾ The standardized nominal width (DN) corresponds approximately to the inside diameter, but need not necessarily be identical to the inside diameter.

In the case of gate valves equipped with CF flanges the following must be noted:

The designation DN 35 CF for UHV flanges has been changed to DN 40 CF with the sealing parameters remaining unchanged; the same applies to DN 150 CF which has changed to DN 160 CF.

Advantages to the User

- Compact design
- Integral leak rate less than 10^{-8} mbar l x s⁻¹
- FPM sealed
- For pressures up to 2000 mbar
- Seal in both directions ²⁾
- Principal dimensions comparable to Leybold flange components of the same nominal width
- Reliable operation ensured regardless of the valve's orientation
- Optical valve position indicator as standard (not for valves of the "micro" range)
- Electrical valve position indicator as standard (not for valves of the "micro" range)
- Operation of electromagnetic KF valves off supply voltages ranging from 100 to 230 V AC
- The inside of the housing in contact with the medium is sealed off against the atmosphere by a bellows type seal which is absolutely free of any lubricants.

All further technical data as well possible deviations from the general specifications stated here can be found along with the descriptions for the individual valve types.

For various applications and special design requirements Leybold offers a range of special valves:

- SECUVAC vacuum safety valves (DN 16 KF to DN 100 ISO-K)
- Venting valves / power failure venting valves
- Vacuum locks / sealing valves
- Variable leak valves
- Ball valves (straight-through valve)
- Right-angle valves for mobile systems which comply with the American standard of the Department of Transportation (DOT)

Accessories

All connecting components like centering rings, clamps or clamping rings needed to connect the valves must be ordered separately (see Product Section C13 "Vacuum Fittings and Feedthroughs").

Materials

The valve bodies and the inside parts are made of selected, vacuum compatible materials, like wrought aluminum or cast stainless steel.

The raw components are subjected to a 100% test before they are further processed.

The materials which are used are described in the tables at the end of the section "General".

Gaskets

Shown in the table at the end of the section "General" are the types of gasket used in the valves together with their brief or chemical designations and their thermal ratings.

Other Materials

Plastic:	Polyamide 6 (PA 6)
Grey cast iron:	GG 20 (0.6020)
Brass:	Ms 58
Brass (nickel-plated):	CuZn39Pb3
Nimonic	
Bronze	
Spring steel	

²⁾ High vacuum systems are very demanding as to the leak tightness of the vacuum components used. For this reason each individual Leybold valve is subjected to a helium leak test before delivery. The valves are only considered as leak tight, if a leak rate of less than 10^{-9} mbar x l x s⁻¹ can be measured for the body and the valve seat.

In the case of our high vacuum valves with KF and ISO-K flanges a leak rate of less than 10^{-9} mbar x l x s⁻¹ is maintained also during actuation.

This means that in the case of a gas flow of the mentioned order of magnitude the pressure would increase only by 3 mbar in a vessel of 1 liter and in 100 years.

Materials

Aluminum Alloys

Material No.		Brief Designation
DIN	AA	DIN
3.0615	–	AlMgSiPbF28
3.2153	–	G AlSi7Cu3
3.2315	6081	AlMgSi1F28
3.2341	–	G AlSi5Mg wa
3.2371	–	G AlSi7Mg06
3.2373	–	G AlSi9Mg
3.2381	–	G AlSi10Mg wa
3.3527	–	AlMg2Mn0,8F20

Stainless Steels

Material No.		Brief Designation
DIN	AISI	DIN
1.4034	420	X 46 Cr 13
1.4301	304	X5 CrNi 18 10
1.4305	303	X10 CrNi 51 89
1.4306	304 L	X2 CrNi 18 10
1.4308	–	G-X6 CrNi 18 1
1.4310	301	X12 CrNi 17 7
1.4404	316 L	X2 CrNiMo 17 13 3
1.4435	316 L	X2 CrNiMo 18 14 3
1.4541	321	X10 CrNiTi 18 10
1.4571	316 Ti	X6 CrNiMoTi 17 12 2

Standard Steels

Material No.	Brief Designation
DIN	DIN
1.0388	St4/St14
1.0425	H II

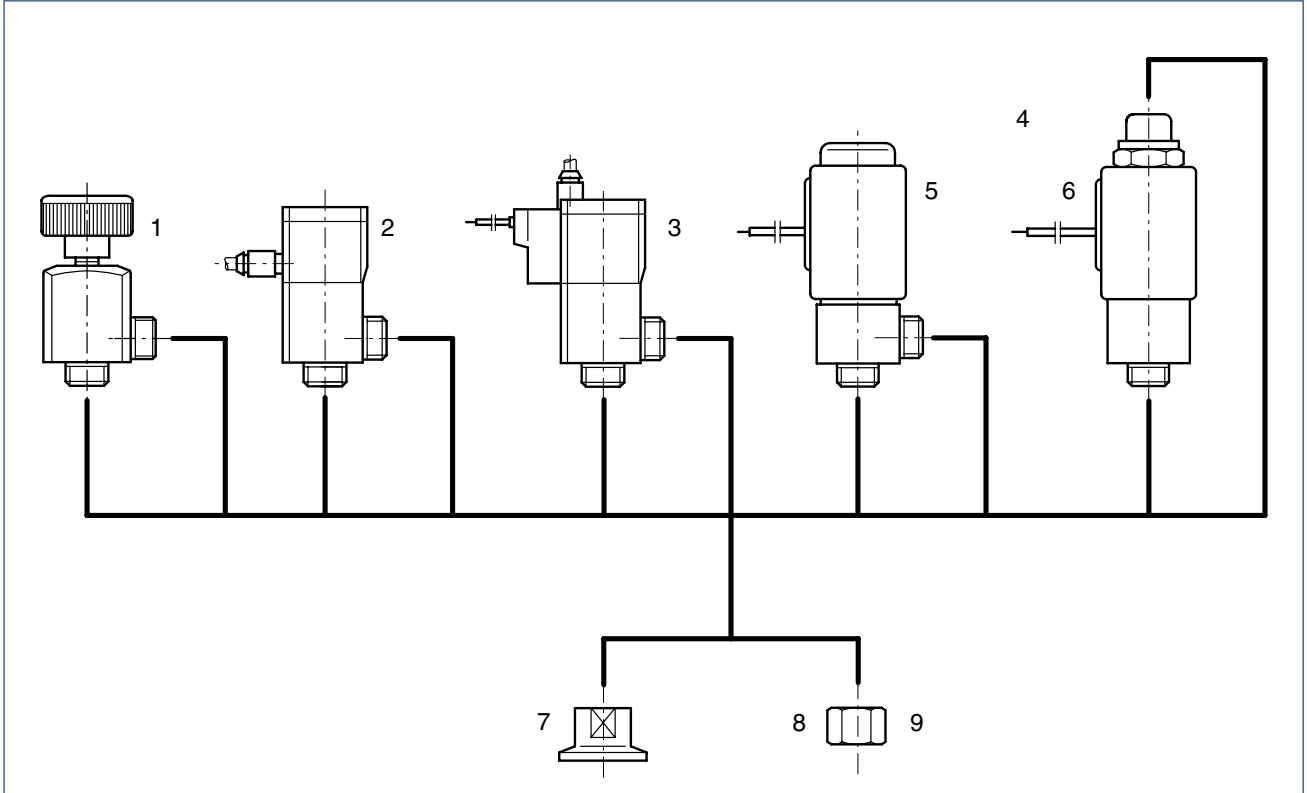
Materials used for the Gaskets

Brief Designation	Chemical Designation	Typical Trade Name	Degassing Temperature
FPM	Fluor caoutchouc	Viton	up to 150 °C
NBR	Acrylonitrile-butadiene rubber	Perbunan	up to 080 °C
PTFE	Polytetrafluor ethylene	Teflon	up to 250 °C
EPDM	Ethylene-propylenedien caoutchouc	–	up to 150 °C

Abbreviations used in the valve designations

Brief Designation	Valve Type
EMD	Solenoid straight-through valve
EME	Solenoid right-angle valve
EPD	Electro-pneumatic straight-through valve
EPE	Electro-pneumatic right-angle valve
MAN	Manual operation
PD	Pneumatic straight-through valve
PE	Pneumatic right-angle valve

Overview



Leybold small valves **micro** are available with any of four drive systems, two types of body and three adapters.

Types of drive

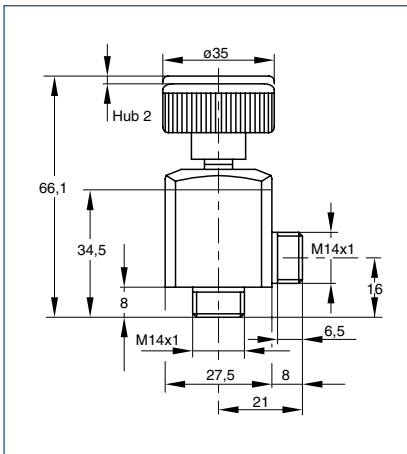
- Manual (1)
- Pneumatic (2)
- Electropneumatic (3)
- Electromagnetic (4)

Types of valve body

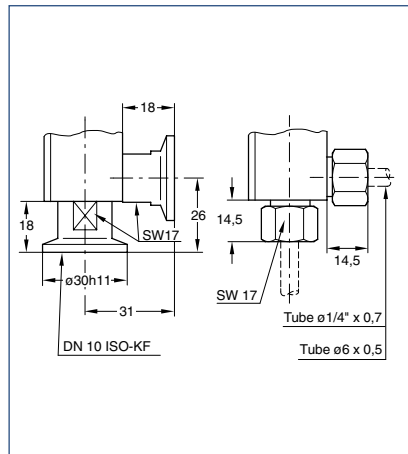
- Right-angle valve (5)
- Straight-through valve (6)

as well as adaptor

- DN 10 KF flange (7)
- 1/4" tube (8)
- 6 mm tube (9)



Dimensional drawing for the **micro MAN**



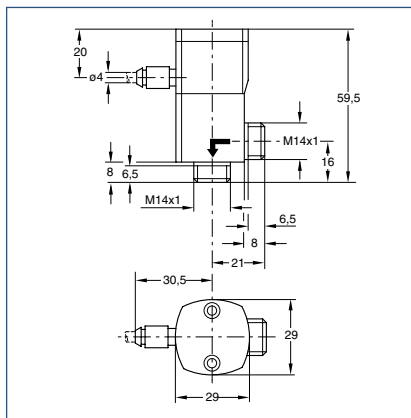
Connection dimensions for small valves **micro**

Technical Information

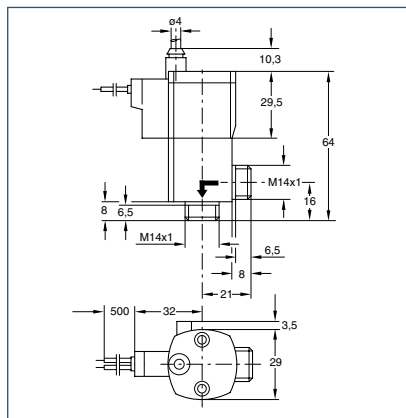
micro valves are supplied without adaptor.

The adaptors must be ordered additionally.

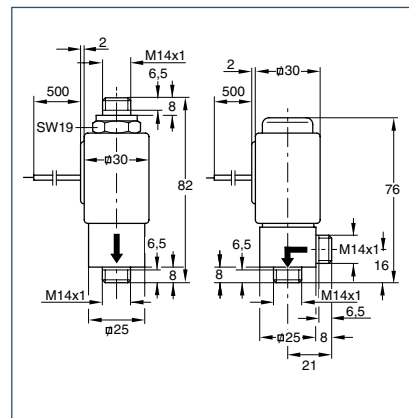
Right-Angle and Straight-Through Valves, Bellows-Sealed, Various Drives



Dimensional drawing for the pneumatically actuated small valves **micro**



Dimensional drawing for the electropneumatically actuated small valves **micro**



Dimensional drawing for the electromagnetic actuated small valves **micro**

Advantages to the User

- Small size
- High conductance in the molecular flow range
- Long service life of over 2 million switching cycles
- High switching frequency
- Protection class IP 50

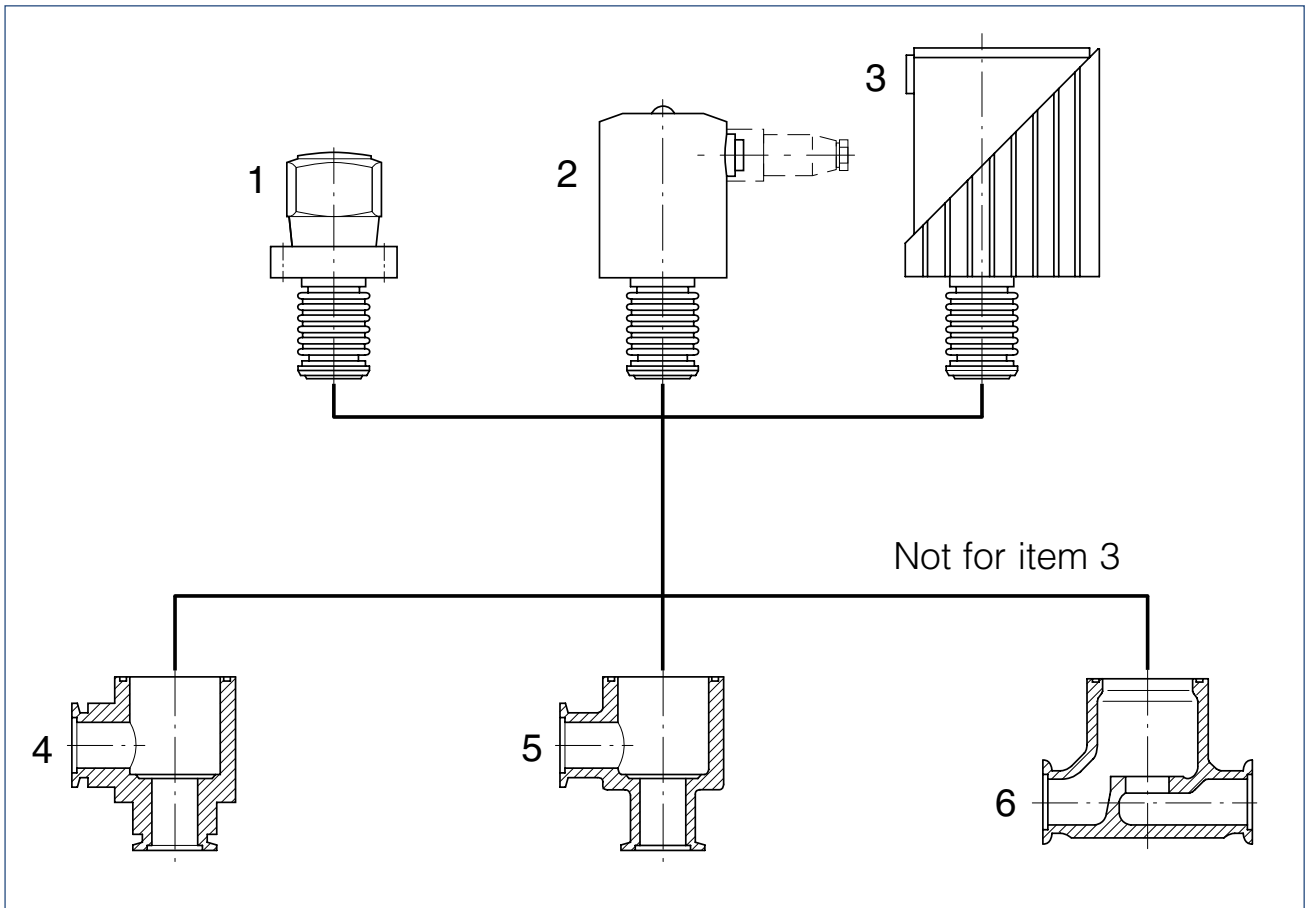
Typical Applications

- Gas handling systems in production machines
- Latest generation analytical equipment

Technical Data		Small Valves micro			
		Manual	Electropneumatic	Pneumatic	Electromagnetic
Nominal width	mm	5	5	5	5
Integral leak rate	mbar x l/s	10 ⁻⁹	10 ⁻⁹	10 ⁻⁹	10 ⁻⁹
Switching cycles		–	5 mio.	5 mio.	2 mio.
Max. pressure differential	bar abs.	4	3	3	1
Closure time	ms	–	35	35	7
Opening time	ms	–	35	35	30
Max. switching frequency	min ⁻¹	–	150	150	300
Conductance, molecular	l/s	0.4	0.4	0.4	0.3
Supply voltage	VDC	–	24 (with pilot valve)	–	24
Max. power consumption	W	–	1	–	10
Material					
Valve body		stainless steel (1.4301)	stainless steel (1.4301)	stainless steel (1.4301)	stainless steel (1.4301)
Inside section		stainless steel (1.4301)	stainless steel (1.4301)	stainless steel (1.4301)	stainless steel (1.4301)
Gaskets		O-rings of FPM	O-rings of FPM	O-rings of FPM	O-rings of FPM
Drive		aluminum/ plastic	aluminum anodized	aluminum anodized	stainless steel 1.4105

Ordering Information		Small Valves micro			
		Manual	Electropneumatic	Pneumatic	Electromagnetic
Right-angle valves	Type				
Manual	MAN	Part No. 284 48	-	-	-
Without pilot valve, normally closed	PE	-	-	Part No. 284 40	-
With pilot valve, normally closed	EPE	-	Part No. 284 41	-	-
With pilot valve, normally open	EPE	-	Part No. 284 42	-	-
With pilot valve, normally closed, with flanges	PE DN 10 KF	-	-	Part No. 284 47	-
Electromagnetic, normally closed	EME	-	-	-	Part No. 284 44
Straight-through valves					
Electromagnetic, normally closed	EMD	-	-	-	Part No. 284 45
Electromagnetic, normally open	EMD	-	-	-	Part No. 284 46
Adapter (1 piece)					
Flange DN 10 KF		Part No. 284 50	Part No. 284 50	Part No. 284 50	Part No. 284 50
Tube 1/4"		Part No. 284 51	Part No. 284 51	Part No. 284 51	Part No. 284 51
Tube 6 mm		Part No. 284 52	Part No. 284 52	Part No. 284 52	Part No. 284 52
Spare parts					
Seal kit		Part No. 105 80	Part No. 105 81	Part No. 105 81	Part No. 108 82
Inside section		Part No. 105 80	Part No. 105 82	Part No. 105 82	Part No. 108 83/84/89

Overview



Leybold KF valves are available with any of three drive systems and three types of body having a nominal width of DN 16, 25 and 40 KF.

Types of drive

- Stepped rotary knob (1) with bellows seal
- Electropneumatic with bellows seal (2)
- Solenoid with bellows seal (3)

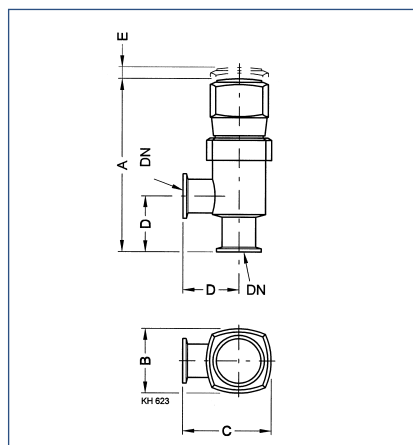
Types of valve body

- Right-angle valve, aluminum body (4)
- Right-angle valve, stainless steel body (5)
- Straight-through valve, stainless steel body (6)

Connection Pictograms

- ⊕ Position indicator connection
- ① Compressed air connection
- ⚡ Power connection
- ⤴ Position indicator

Right-Angle Valves, Bellows-Sealed, Manually Operated



Dimensional drawing for the manually operated, bellows-sealed, right-angle valves

Dimension table

DN	KF	16	25	40
A	mm	118.3	154.5	173.8
B	mm	44	58	82
C	mm	62	79	106
D	mm	40	50	65
E	mm	5	10	12

Advantages to the User

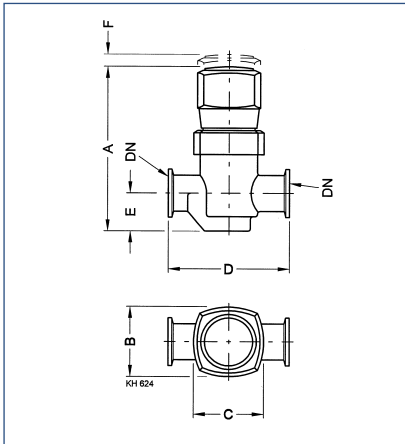
Valves with Rotary Knob

Isolation component with handy and easy to operate four position rotary knob

- Permits careful venting of systems
- Suited as a manually operated variable leak valve to roughly control gas flows
- Leak tight in both directions up to a pressure of 2.0 etc. 1.5 bar and easy to open
- Installation in any orientation

Technical Data		DN 16 KF		DN 25 KF		DN 40 KF	
		Aluminum	Stainless steel	Aluminum	Stainless steel	Aluminum	Stainless steel
Service life	cycles	10,000	10,000	10,000	10,000	10,000	10,000
Conductance at molecular flow	$l \times s^{-1}$	4.5	4.5	16.0	16.0	40.0	40.0
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	$10^{-8} - 2000$	$10^{-8} - 2000$	$10^{-8} - 2000$	$10^{-8} - 2000$	$10^{-8} - 2000$	$10^{-8} - 1500$
Differential pressure, closing and opening direction	bar	2.0 / 2.0	2.0 / 2.0	2.0 / 2.0	2.0 / 2.0	2.0 / 2.0	2.0 / 1,5
Opening against differential pressure	bar	2	2	3	3	4	4
Ambient / operating temperature, max.	°C	50	50	50	50	50	50
Seal		FPM	FPM	FPM	FPM	FPM	FPM
Weight	kg	0.30	0.43	0.40	0.68	0.55	1.35
Ordering Information		DN 16 KF		DN 25 KF		DN 40 KF	
		Aluminum	Stainless steel	Aluminum	Stainless steel	Aluminum	Stainless steel
Right-Angle Valve, rotary knob							
aluminum body		Part No. 285 30	–	Part No. 285 31	–	Part No. 285 32	–
stainless steel body		–	Part No. 286 30	–	Part No. 286 31	–	Part No. 286 32
Spare parts							
Seal kit		Part No. 215 025	Part No. 215 025	Part No. 215 075	Part No. 215 075	Part No. 215 125	Part No. 215 125
Inside section		Part No. 215 042	Part No. 215 042	Part No. 215 092	Part No. 215 092	Part No. 215 142	Part No. 215 142

Straight-Through Valves, Bellows-Sealed, Manually Operated



Dimensional drawing for the manually operated, bellows-sealed straight-through valves

Dimension table

DN	KF	16	25	40
A	mm	100.3	136.0	154.3
B	mm	44	58	82
C	mm	44	58	82
D	mm	80	100	130
E	mm	22	31.5	44,5
F	mm	5	10	12

Advantages to the User

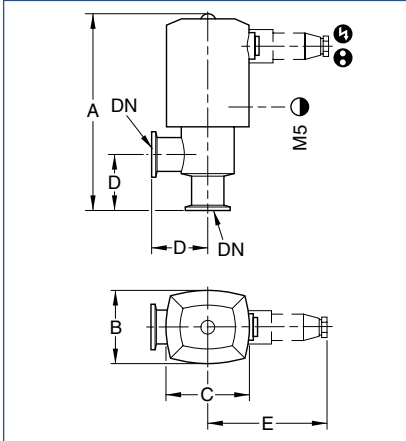
Valves with Rotary Knob

Isolation component with handy and easy to operate four position rotary knob

- Permits careful venting of systems
- Suited as a manually operated variable leak valve to roughly control gas flows
- Leak tight in both directions up to a pressure of 2.0 etc. 1.5 bar and easy to open
- Installation in any orientation

Technical Data		DN 16 KF Stainless steel	DN 25 KF Stainless steel	DN 40 KF Stainless steel
Service life	cycles	10,000	10,000	10,000
Conductance at molecular flow	$l \times s^{-1}$	2.5	8.0	20.0
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	$10^{-8} / 2000$	$10^{-8} / 2000$	$10^{-8} / 1500$
Differential pressure, closing and opening direction	bar	2.0 / 2.0	2.0 / 2.0	2.0 / 1.5
Opening against differential pressure	bar	2	3	4
Ambient / operating temperature, max.	°C	50	50	50
Seal		FPM	FPM	FPM
Weight	kg	0.48	0.70	1.40
Ordering Information		DN 16 KF Stainless steel	DN 25 KF Stainless steel	DN 40 KF Stainless steel
Straight-Through Valve, rotary knob Stainless steel body		Part No. 286 00	Part No. 286 01	Part No. 286 02
Spare parts				
Seal kit		Part No. 215 025	Part No. 215 075	Part No. 215 125
Inside section		Part No. 215 042	Part No. 215 092	Part No. 215 142

Right-Angle Valves, Bellows-Sealed, Electropneumatically Operated



Dimensional drawing for the aluminum right-angle valves with built-in pilot valve

Dimension table

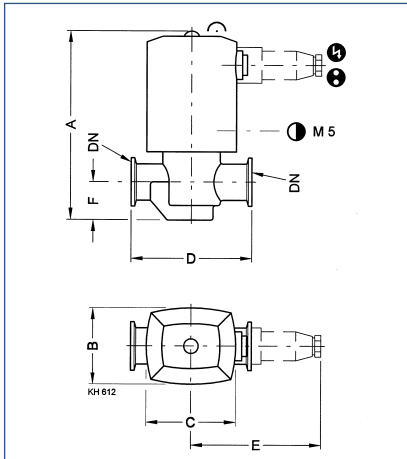
DN	KF	16	25	40
A	mm	154.0	176.0	196.5
B	mm	51	63	83
C	mm	60	74	98
D	mm	40	50	65
E	mm	100	108	120
●	mm	∅ 4	∅ 4	∅ 4

Advantages to the User

- Quiet opening and closing action with very little vibration
- Short opening and closing times
- Optical valve position indicator as standard
- Very low leak rate and insensitive to particles owing to bellows seal. Always closed in case the compressed air supply fails
- Electric position indicator is standard
- With and without pilot valve as standard
- Standard electrical and compressed air connections
- Protection class IP 50
- The valves are closed by the restoring force of a spring
- Installation in any orientation and no restrictions as to the direction of flow

Technical Data		DN 16 KF		DN 25 KF		DN 40 KF	
		Aluminum	Stainless steel	Aluminum	Stainless steel	Aluminum	Stainless steel
Service life	cycles	10 mio.	10 mio.	10 mio.	10 mio.	10 mio.	10 mio.
Conductance at molecular flow	$l \times s^{-1}$	4.5	4.5	16.0	16.0	40.0	40.0
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	10^{-8} - 2000	10^{-8} - 2000	10^{-8} - 2000	10^{-8} - 2000	10^{-8} - 1500	10^{-8} - 1500
Differential pressure, closing and opening direction	bar	4.0 / 2.0	4.0 / 2.0	4.0 / 2.0	4.0 / 2.0	2.0 / 1.5	2.0 / 1.5
Opening against differential pressure at the valve disk	bar	4	4	4	4	2	2
Ambient / Operating temperature, max.	°C	50	50	50	50	50	50
Seal		FPM	FPM	FPM	FPM	FPM	FPM
Closing time / opening time	ms	200 / 100	200 / 100	290 / 110	290 / 110	250 / 150	250 / 150
Switching frequency	1/min	100	100	100	100	75	75
Electrical position indicator, load capacity	V AC / A V DC / A	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25
Compressed air, overpressure	bar	3 to 5	3 to 5	3 to 5	3 to 5	3 to 6	3 to 6
Air cylinder, volume	cm ³	5.5	5.5	12.1	12.1	26.2	26.2
Compressed air connection	mm	4 and 6	4 and 6	4 and 6	4 and 6	4 and 6	4 and 6
Weight, with pilot valve	kg	0.3	0.4	0.4	0.7	0.9	1.6
Ordering Information		DN 16 KF		DN 25 KF		DN 40 KF	
		Aluminum	Stainless steel	Aluminum	Stainless steel	Aluminum	Stainless steel
Right-angle valves, bellows sealed, electropneumatic drive without pilot valve Aluminum body		Part No. 287 15	-	Part No. 287 16	-	Part No. 287 17	-
Stainless steel body		-	Part No. 288 15	-	Part No. 288 16	-	Part No. 288 17
with pilot valve 24 V DC, aluminum body		Part No. 287 45	-	Part No. 287 46	-	Part No. 287 47	-
24 V DC, stainless steel body		-	Part No. 288 45	-	Part No. 288 46	-	Part No. 288 47
24 V AC, aluminum body		Part No. 287 28	-	Part No. 287 29	-	Part No. 287 30	-
24 V AC, stainless steel body		-	Part No. 288 28	-	Part No. 288 29	-	Part No. 288 30
100 - 115 V AC, aluminum body		Part No. 287 55	-	Part No. 287 56	-	Part No. 287 57	-
100 - 115 V AC, stainless steel body		-	Part No. 288 55	-	Part No. 288 56	-	Part No. 288 57
200 - 240 V AC, aluminum body		Part No. 287 75	-	Part No. 287 76	-	Part No. 287 77	-
200 - 240 V AC, stainless steel body		-	Part No. 288 35	-	Part No. 288 36	-	Part No. 288 37
Spare parts Seal kit		Part No. 215 025	Part No. 215 025	Part No. 215 075	Part No. 215 075	Part No. 215 125	Part No. 215 125
Inside section		Part No. 215 027	Part No. 215 027	Part No. 215 077	Part No. 215 077	Part No. 215 127	Part No. 215 127

Straight-Through Valves, Bellows-Sealed, Electropneumatically Operated



Dimensional drawing for the stainless steel straight-through valves

Dimension table

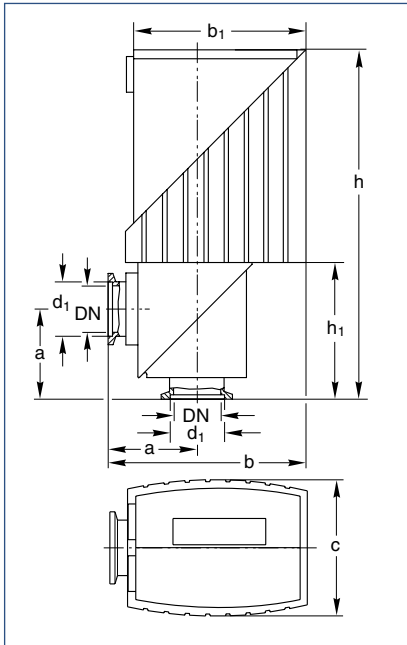
DN	KF	16	25	40
A	mm	39.5	157.5	177.0
B	mm	51	63	83
C	mm	60	74	98
D	mm	80	100	130
E	mm	100	108	120
F	mm	22.0	31.5	45.5
●	mm	∅ 4	∅ 4	∅ 4

Advantages to the User

- Quiet opening and closing action with very little vibration
- Short opening and closing times
- Optical valve position indicator as standard
- Very low leak rate and insensitive to particles owing to bellows seal – thus always closed in case the compressed air supply fails
- Electric position indicator is standard
- With and without pilot valve as standard
- Protection class IP 50
- Standard electrical and compressed air connections
- The valves are closed by the restoring force of a spring

Technical Data		DN 16 KF	DN 25 KF	DN 40 KF
Service life	cycles	10 mio.	10 mio.	10 mio.
Conductance at molecular flow	$l \times s^{-1}$	2.5	8.0	20.0
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	10^{-8} - 2000	10^{-8} - 2000	10^{-8} - 1500
Differential pressure, closing and opening direction	bar	4.0 / 2.0	4.0 / 2.0	2.0 / 1.5
Opening against differential pressure at the valve disk	bar	4	4	2
Ambient / Operating temperature, max.	°C	50	50	50
Seal		FPM	FPM	FPM
Closing time / opening time	ms	200 / 100	290 / 110	250 / 150
Switching frequency	1/min	100	100	75
Electrical position indicator, load capacity	V AC / A V DC / A	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25	250 / 0.1 50 / 0.25
Compressed air, overpressure	bar	3 to 5	3 to 5	3 to 6
Air cylinder, volume	cm ³	5.5	12.1	26.2
Compressed air connection	mm	4 and 6	4 and 6	4 and 6
Weight, with pilot valve	kg	0.5	1.0	1.5
Ordering Information		DN 16 KF	DN 25 KF	DN 40 KF
Straight-through valve, bellows sealed, electropneumatic drive without pilot valve, Stainless steel body with pilot valve Stainless steel body 24 V DC 24 V AC 100 - 115 V AC 200 - 240 V AC		Part No. 289 15 Part No. 289 45 Part No. 289 28 Part No. 289 55 Part No. 289 35	Part No. 289 16 Part No. 289 46 Part No. 289 29 Part No. 289 56 Part No. 289 36	Part No. 289 17 Part No. 289 47 Part No. 289 30 Part No. 289 57 Part No. 289 37
Spare parts Seal kit Inside section		Part No. 215 025 Part No. 215 027	Part No. 215 075 Part No. 215 077	Part No. 215 125 Part No. 215 127

Right-Angle Valves, Bellows-Sealed, Electromagnetically Operated



Dimensional drawing for the stainless steel right-angle valves, bellows-sealed

Electromagnetic valves are particularly well suited for vacuum systems in which the valves need to be remotely controlled and where compressed air is not readily available.

Advantages to the User

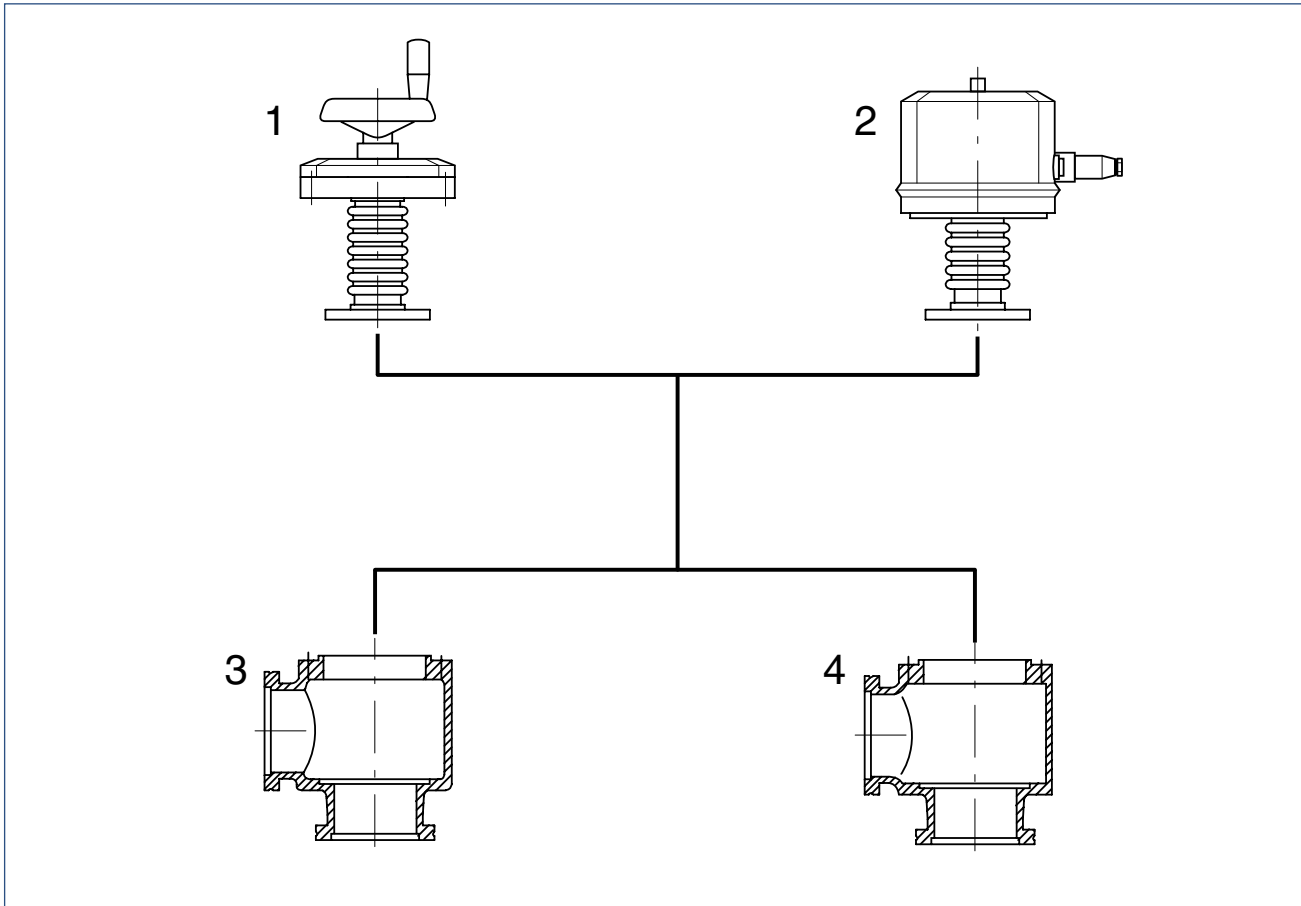
- Selectable operating mode:
 - Remote control via programmable control or personal computer
 - direct operation by switching the supply voltage on and off
- Well visible, unambiguous optical position indicator: open (green LED) and closed (red LED)
- Integrated electrically floating position indicator (opto-coupler for 24 V DC)
- Optical overload indicator (red flashing LED)
- Protection class IP 54
- Spring action closure, thus closed when the power fails
- Low operating temperature
- Inverting operation of the remote control logic
- Installation in any orientation and no restrictions as to the direction of flow

Dimension table

DN	KF	16	25	40
DN	mm	14.5	23.2	38.5
d ₁	mm	18.5	27.5	42.5
a	mm	40	50	65
b	mm	96	111	138
b ₁	mm	84.5	96.5	119.5
c	mm	59	75	96
h	mm	160	194	230
h ₁	mm	58	76	98
Travel	mm	4.0	6.25	10.0

Technical Data		DN 16 KF	DN 25 KF	DN 40 KF
Service life	cycles	2 mio.	2 mio.	2 mio.
Conductance at molecular flow	$l \times s^{-1}$	4	16	40
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	10^{-9} - 1300	10^{-9} - 1300	10^{-9} - 1300
Differential pressure, closing and opening direction	bar	1.3	1.3	1.3
Opening against differential pressure at the valve disk	bar	1.3	1.3	1.3
Ambient / operating temperature, max.	°C	50	50	50
Opening / closing time	ms	100 / 240	120 / 240	230 / 700
Switching frequency at ambient temperature	1/min °C	30, 20 40, 50	30, 20 40, 50	30, 20 40, 50
Switch-off delay	ms	50	170	500
Rating for the valve position indicator	V DC / mA	15 - 30 / 100	15 - 30 / 100	15 - 30 / 100
Power consumption, max.	W	400	400	400
Actuation and holding current	A	5.2 / 0.7	5.3 / 0.7	4.8 / 0.7
Supply voltage	V AC	100 - 230, +8 %/-15 %	100 - 230, +8 %/-15 %	100 - 230, +8 %/-15 %
Frequency	Hz	50/60 Hz	50/60 Hz	50/60 Hz
Protection class		54	54	54
Weight				
Aluminum body	kg	1.3	2.2	4.0
Stainless steel body	kg	1.5	2.9	5.4
Material				
Valve body		aluminum alloy (G AISi7Mg06) or stainless steel (1.4308)	aluminum alloy (G AISi7Mg06) or stainless steel (1.4308)	aluminum alloy (G AISi7Mg06) or stainless steel (1.4308)
Inside section		stainless steel (1.4301/1.4541)	stainless steel (1.4301/1.4541)	stainless steel (1.4301/1.4541)
Gaskets		O-rings made of FPM	O-rings made of FPM	O-rings made of FPM
Lid		high-quality plastic, temperature-resistant to 80 °C	high-quality plastic, temperature-resistant to 80 °C	high-quality plastic, temperature-resistant to 80 °C
Ordering Information		DN 16 KF	DN 25 KF	DN 40 KF
Right-angle valve, bellows-sealed, electromagnetic actuator, microprocessor controlled				
Aluminum body		Part No. 287 65	Part No. 287 66	Part No. 287 67
Stainless steel body		Part No. 288 65	Part No. 288 66	Part No. 288 67
Spare parts				
Seal kit		Part No. 289 75	Part No. 289 76	Part No. 289 77
Inside section		Part No. 288 88	Part No. 288 89	Part No. 288 90

Overview



Leybold valves with ISO-K flanges are available with any of two drives and either of two bodies.

Types of drive

- Handwheel (1)
- Electropneumatic drive, bellows-sealed (2)

Body types

- Right-angle valve with aluminum body (3)
- Right-angle valve with stainless steel body (4)

Advantages to the User

- Full exchangeability of the subassemblies
- Three types of drive
- Two body options
- Standard nominal widths to DIN 28 404 and ISO 1609
- Simplified stocking of spare parts

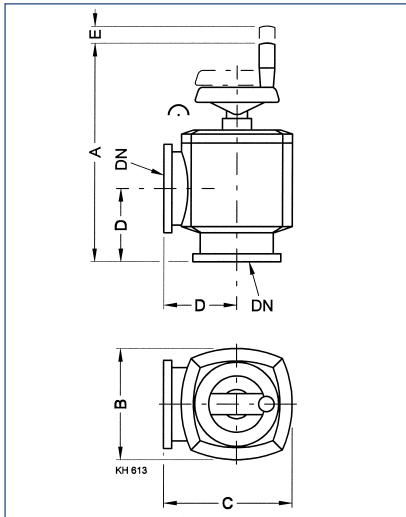
Connection Pictograms

- ⊕ Position indicator connection
- Ⓜ Compressed air connection
- ⚡ Power connection
- ⌒ Position indicator

From DN 63 ISO-K only right-angle valves are available.

Nominal widths DN 63 ISO-K and DN 100 ISO-K are available in aluminum and stainless steel, DN 160 ISO-K in aluminum only.

Right-Angle Valves, Bellows-Sealed, Manually Operated



Dimensional drawing for the right-angle valves, bellows-sealed, manually operated

These universal valves are ideal especially for smaller systems, where remote control is not essential. They may be also installed in larger systems, where backing pumps or condensate separators or similar units are to be cut off at longer intervals for maintenance purposes by maintenance personnel.

Dimension table

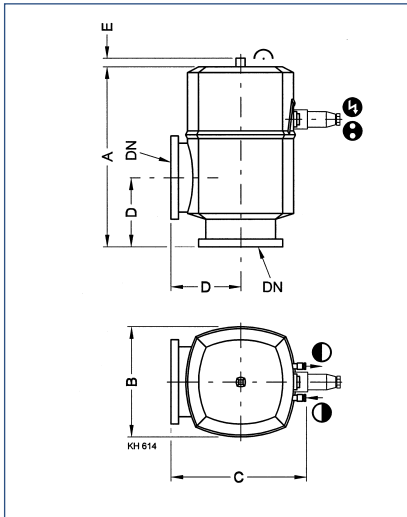
DN	ISO-K	63	100
A	mm	266	320
B	mm	124	164
C	mm	150	190
D	mm	88	108
E	mm	20	25

Advantages to the User

- Gentle venting of systems
- Seal in both directions up to a pressure difference of 1.5 bar
- Easy manual operation, for an effortless vacuum-tight seal
- May also be used as a variable leak valve to roughly control gas flows
- Installation in any orientation and no restrictions as to the direction of flow

Technical Data		DN 63 ISO-K	DN 100 ISO-K
Service life	cycles	> 1.5 mio.	> 1.5 mio.
Conductance at molecular flow	$l \times s^{-1}$	140	330
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	10^{-8} - 1500	10^{-8} - 1500
Differential pressure, closing and opening direction	bar	1.5	1.5
Opening against differential pressure at the valve disk	bar	1.5	1.5
Ambient / Operating temperature, max.	°C	60	60
Seal		FPM	FPM
Weight			
Aluminum body	kg	3.6	6.1
Stainless steel body	kg	6.5	11.1
Material			
Valve body		aluminum alloy (3.2373.63) or stainless steel (1.4305)	aluminum alloy (3.2373.63) or stainless steel (1.4305)
Inside section		stainless steel (1.4541/1.4301)	stainless steel (1.4541/1.4301)
Lid		grey cast iron (GG 20)	grey cast iron (GG 20)
Gaskets		O-rings made of FPM	O-rings made of FPM
Ordering Information		DN 63 ISO-K	DN 100 ISO-K
Right-angle valve, bellows-sealed, manually operated			
Aluminum body		Part No. 107 80	Part No. 107 81
Stainless steel body		Part No. 107 83	Part No. 107 84
Spare parts			
Seal kit		Part No. 215 251	Part No. 215 271
Inside section		Part No. 215 254	Part No. 215 274

Right-Angle Valves, Bellows-Sealed, Electropneumatically Operated



Dimensional drawing for the electropneumatically actuated right-angle valves

Electropneumatically actuated right-angle valves are used in automated vacuum systems which need to be controlled electrically.

Dimension table

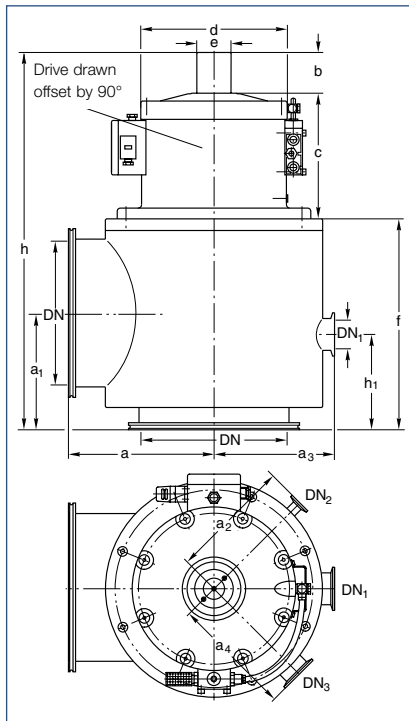
DN	ISO-K	63	100	160
A	mm	250	282	366
B	mm	130	170	221
C	mm	168	208	264
D	mm	88	108	138
E	mm	14	14	14
⊙	mm	6	6	6

Advantages to the User

- Pneumatic or electropneumatic opening
- Short opening and closing times
- Optical position indicator
- Electric position indicator
- With and without pilot valve IP 54
- Protection class IP 54
- The valves are closed by the restoring force of a spring
- Installation in any orientation and no restrictions as to the direction of flow

Technical Data		DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Service life, cycles	Million	1.5	1.5	1.5
Conductance for molecular flow	$l \times s^{-1}$	140	330	800
Leak rate	$mbar \times l \times s^{-1}$	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure range	mbar	1×10^{-8} - 1500	1×10^{-8} - 1500	1×10^{-8} - 1500
Differential pressure, closing and opening direction	bar	1.5	1.5	1.5
Opening against differential pressure at the valve disk	bar	1.5	1.5	1.5
Ambient / operating temperature, max.	°C	60	60	60
Seal		FPM	FPM	FPM
Closing time / opening time	ms	250 / 300	300 / 450	550 / 450
Switching frequency	1/min	60	60	40
Position indicator, rating	V AC/A V DC/A	250 / 0.125 50 / 0.25	250 / 0.125 50 / 0.25	250 / 0.125 50 / 0.25
Compressed air, overpressure	bar	4 to 8	4 to 8	4 to 8
Compressed air volume	cm ³	75	195	570
Compressed air connection	mm	6	6	6
Weight with pilot valve				
Aluminum housing	kg	4.0	6.7	11.4
Stainless steel housing	kg	6.8	11.7	-
Ordering Information		DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Right-angle valve, bellows-sealed, electropneumatic drive without solenoid coil				
Aluminum body		Part No. 107 90	Part No. 107 91	Part No. 107 92
Stainless steel body		Part No. 107 93	Part No. 107 94	-
Valve with pilot valve 24 V DC				
Aluminum body		Part No. 108 00	Part No. 108 01	Part No. 108 02
Stainless steel body		Part No. 108 10	Part No. 108 11	-
Valve with pilot valve 24 V AC				
Aluminum body		Part No. 108 03	Part No. 108 04	Part No. 108 05
Stainless steel body		Part No. 108 13	Part No. 108 14	-
Valve with pilot valve 100 - 115 V AC				
Aluminum body		Part No. 108 20	Part No. 108 21	Part No. 108 22
Stainless steel body		Part No. 108 30	Part No. 108 31	-
Valve with pilot valve 200 - 240 V AC				
Aluminum body		Part No. 108 25	Part No. 108 26	Part No. 108 27
Stainless steel body		Part No. 108 35	Part No. 108 36	-
Spare parts				
Seal kit		Part No. 215 251	Part No. 215 271	Part No. 215 291
Inside section		Part No. 215 253	Part No. 215 273	Part No. 215 293

Right-Angle Valves, Bellows-Sealed, Electropneumatically Operated



Dimensional drawing for the right-angle valves with bellows

Right-angle valves of this size are used, for example in metallurgy, large coaters, in the area of space simulation.

Dimension table

	DN	250 ISO-K
DN	mm	261
h, ca.	mm	650
a	mm	250
a₁	mm	200
a₂, a₄	mm	208
a₃	mm	205
h₁	mm	163
DN₁, for bypass 1		50 KF
DN₂, for bypass 2		40 KF
DN₃, for meas. conn.		16 KF
b	mm	69.5
c	mm	218
d	mm	250
e	mm	58
f	mm	363
Travel	mm	62.5
Travel/DN ¹⁾	mm	1/4

¹⁾ For example travel = 1/4 DN

Advantages to the User

- No vibrations when the valve open or closes
- Low leak rate ($< 10^{-9}$ mbar x l x s⁻¹) – drive system basically insensitive to particles
- Non-contact valve position indicator for reliable indication of the valve's position (open/closed)
- Wide range of different solenoid coils for all commonly used control voltages
- Additional flange for bypass lines and for connecting vacuum gauges (see Product Section C16 "Total Pressure Gauges")

Technical Data	DN 250 ISO-K
Service life, vertical cycles, approx.	1 x 10 ⁶
Conductance at molecular flow l x s ⁻¹	2700
Leak rate mbar x l x s ⁻¹	1 x 10 ⁻⁹
Opening / closing time, at 6 bar compr. air pressure s	6 / 6
Compressed air, overpressure bar	4 to 8
Hose diameter mm	6 x 1
Compressed air cylinder, volume cm ³	2100
Max. ambient temperature °C	40
Weight kg	66
Supply voltage V	Various voltages are possible; see section "Special Valves with KF/ISO-K Flanges", para. "Accessories for the Electropneumatically Operated Valves", product "Solenoid Coils"
Material	
Body, valve disk	stainless steel
Drive / Compressed air cylinder	aluminum / cast aluminum (3.2153)
Piston rod, Intermediate flange	stainless steel (1.4305)
Gaskets	FPM
Lid	aluminum (3.2341)
Hood	plastic (PA 6)
Ordering Information	DN 250 ISO-K
Right-angle valve, bellows-sealed, electropneumatic drive without solenoid coil Stainless steel body	Part No. 281 84
Solenoid coil for various supply voltages	X
Interference suppression kits for different voltages	Y
Spare parts	
Seal kit	Part No. 105 65
Inside section	Part No. 105 75

X = Part Nos. see section "Special Valves with KF/ISO-K Flanges", para. "Accessories for the Electropneumatically Operated Valves", product "Solenoid Coil"
Y = Part Nos. see section "Special Valves with KF/ISO-K Flanges", para. "Accessories for the Electropneumatically Operated Valves", product "Pilot Valves"

Overview



Leybold offers a range of special valves for a variety of different applications and to meet special design requirements of customers.

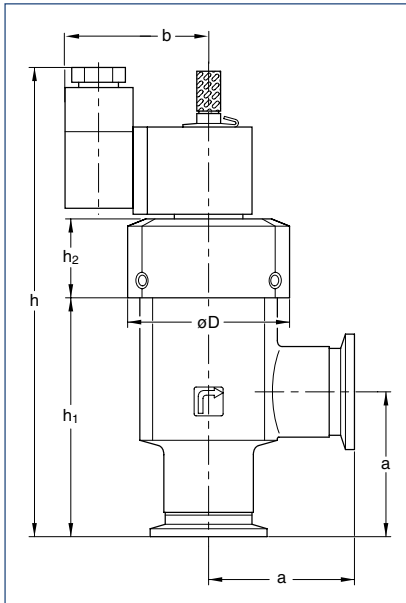
Among these are:

- SECUVAC vacuum safety valves (DN 16 KF to DN 100 ISO-K) **1**
- Venting Valves **2**
- Power failure venting valves **3**
- Vacuum Locks **4**

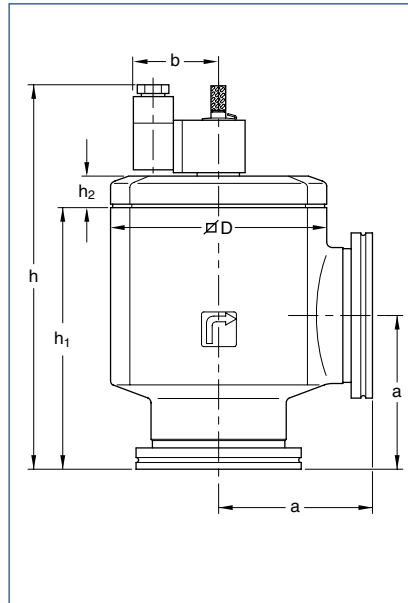
- Sealing Valves **4**
- Variable leak valves **5**
- Ball Valves **6**
- Right-angle valves for mobile systems in accordance with the American standard of the Department of Transportation (DOT) **7**

These valves ideally supplement our range of KF- and ISO-K valves.

SECUVAC Vacuum Safety Valves



Dimensional drawing for the SECUVAC valves with KF small flanges



Dimensional drawing for the SECUVAC valves with ISO-K clamp flanges

These solenoid right-angle valves were specially developed for use with rotary vacuum pumps which are not equipped with a built-in anti-suck-back valve.

The SECUVAC safety valve protects the vacuum system against unplanned venting via the backing pump in case of a power failure **and** it ensures that the vacuum system remains sealed until the backing pump, after it has restarted, has evacuated the connecting lines.

Dimension table (KF)

	DN	16 KF	25 KF	40 KF
a	mm	40	50	65
b	mm	49	49	49
D	mm	44	56	82
h	mm	138.6	161.8	178.3
h₁	mm	62.3	82.5	100.0
h₂	mm	24	27	26

Dimension table (ISO-K)

	DN	63 ISO-K	100 ISO-K
a	mm	88	108
b	mm	49	49
D	mm	124	164
h	mm	220.5	263.5
h₁	mm	150	175
h₂	mm	18.2	36.2

Advantages to the User

Two valve functions in one:

- Fast-closing high vacuum isolation valve for separating the vacuum chamber or a vapor jet pump (a diffusion pump, for example) from the backing pump
- Venting valve for venting of the valve's chamber and thus the pump (backing pump)
- Immediate closing action upon power failure
- Opening action only after the intake line has been evacuated
- Delayed isolation of the vacuum chamber and venting the vacuum pump (negligible "gulp")

Typical Applications

- Safety isolation valve between backing pump and vacuum chamber or vapour jet pumps (protection of the vacuum chamber against venting in the event of a power failure)

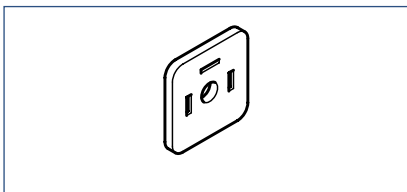
Technical Data		SECUVAC valve		
		DN 16 KF	DN 25 KF	DN 40 KF
Conductance at molecular flow	$l \times s^{-1}$	3.8	11.0	30.5
Current consumption DC	W	2,5	2,5	2,5
Actuation / holding AC	VA	5.0 / 3.7	5.0 / 3.7	5.0 / 3.7
Leak tightness, body	$mbar \times l \times s^{-1}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$
Leak tightness, valve disk	$mbar \times l \times s^{-1}$	$< 1 \times 10^{-5}$	$< 1 \times 10^{-5}$	$< 1 \times 10^{-5}$
Installation orientation		any	any	any
Operating pressure range	mbar	$1 \times 10^{-8} - 1000$	$1 \times 10^{-8} - 1000$	$1 \times 10^{-8} - 1000$
Differential pressure Δ_p for opening	mbar	150	150	150
for closing	mbar	150	150	150
Opening time	s	< 15	< 15	< 15
Closing time / reaction time	ms	< 100 / < 50	< 100 / < 50	< 100 / < 50
Ambient temperature	°C	5 to 50	5 to 50	5 to 50
Protection	IP	65	65	65
Weight	kg	0.3	0.5	0.9
Material				
Body		aluminum	aluminum	aluminum
Gaskets		FPM	FPM	FPM

Technical Data		SECUVAC valve	
		DN 63 ISO-K	DN 100 ISO-K
Conductance at molecular flow	$l \times s^{-1}$	126	300
Current consumption DC	W	2.5	2.5
Actuation / holding AC	VA	5.0 / 3.7	5.0 / 3.7
Leak tightness, body	$mbar \times l \times s^{-1}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$
Leak tightness, valve disk	$mbar \times l \times s^{-1}$	$< 1 \times 10^{-5}$	$< 1 \times 10^{-5}$
Installation orientation		any	any
Operating pressure range	mbar	$1 \times 10^{-8} - 1000$	$1 \times 10^{-8} - 1000$
Differential pressure Δ_p for opening	mbar	150	150
for closing	mbar	150	150
Opening time	s	< 30	< 30
Closing time / reaction time	ms	< 100 / < 50	< 100 / < 50
Ambient temperature	°C	5 to 50	5 to 50
Protection	IP	65	65
Weight	kg	2.4	5.1
Material			
Body		aluminum	aluminum
Gaskets		FPM	FPM

Ordering Information	SECUVAC-Ventil		
	DN 16 KF	DN 25 KF	DN 40 KF
SECUVAC valve 24 V DC 100 - 115 V AC 200 - 230 V AC	Part No. 215 015 Part No. 215 016 Part No. 215 017	Part No. 215 065 Part No. 215 066 Part No. 215 067	Part No. 215 135 Part No. 215 136 Part No. 215 137
Spare parts Seal kit Solenoid coils for SECUVAC valves and power failure venting valves 24 V DC 100 - 115 V AC / 50/60 Hz 200 - 230 V AC / 50/60 Hz Filter for SECUVAC valves and power failure venting valves (set of 5 pcs.)	Part No. 105 02 Part No. 215 242 Part No. 215 241 Part No. 215 240 Part No. 215 701	Part No. 105 04 Part No. 215 242 Part No. 215 241 Part No. 215 240 Part No. 215 701	Part No. 105 05 Part No. 215 242 Part No. 215 241 Part No. 215 240 Part No. 215 701

Ordering Information	SECUVAC valve	
	DN 63 ISO-K	DN 100 ISO-K
SECUVAC valve 24 V DC 100 - 115 V AC 200 - 230 V AC	Part No. 215 205 Part No. 215 206 Part No. 215 207	Part No. 215 225 Part No. 215 226 Part No. 215 227
Spare parts Seal kit Solenoid coils for SECUVAC valves and power failure venting valves 24 V DC 100 - 115 V AC / 50/60 Hz 200 - 230 V AC / 50/60 Hz Filter for SECUVAC valves and power failure venting valves (set of 5 pcs.)	Part No. 105 07 Part No. 215 242 Part No. 215 241 Part No. 215 240 Part No. 215 701	Part No. 105 08 Part No. 215 242 Part No. 215 241 Part No. 215 240 Part No. 215 701

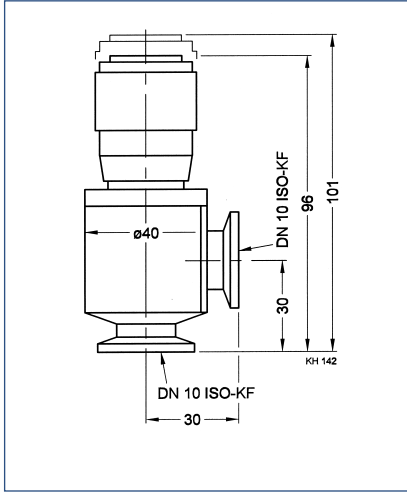
Interference Suppression Kit - Illuminated



As an option for the solenoid coil, an interference suppression kit is offered which reliably prevents any interferences from affecting other equipment operating in the vicinity.

Ordering Information	Interference Suppression Kit
Interference suppression kit 24 V DC 110 - 230 V AC	Part No. 104 96 Part No. 104 95

Variable Leak Valves without Isolation Valve



Dimensional drawing for the variable leak valve without isolation valve

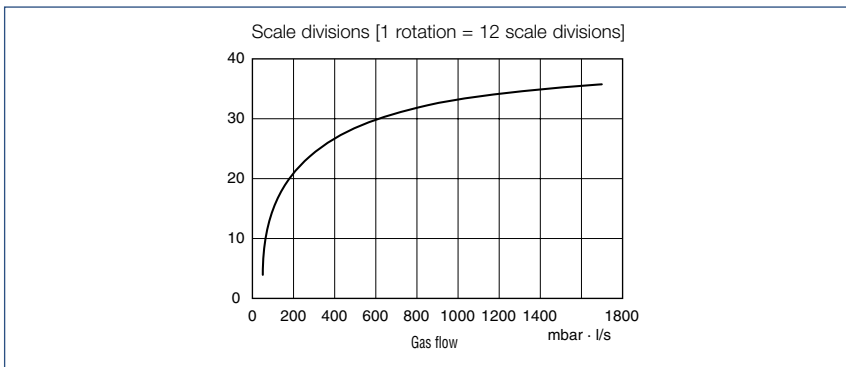
With variable leak valves precisely defined quantities of gas may be admitted within a controllable period of time into evacuated vessels.

Applications

- Gas admission rates of 1000 to 5×10^{-6} mbar x l x s⁻¹ allow variable leak valves to be used in almost all applications
- Through the integrated digital display, the opening point may be accurately set at any time or a certain gas flow may be defined

Technical Note

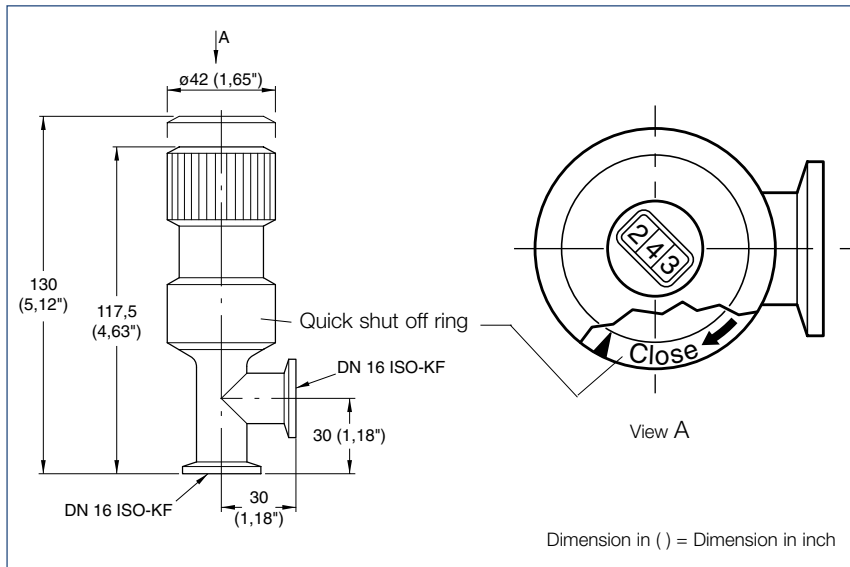
When using helium as the process gas, it must be taken into account that the needle sleeve made of modified PTFE is to a certain extent permeable to helium.



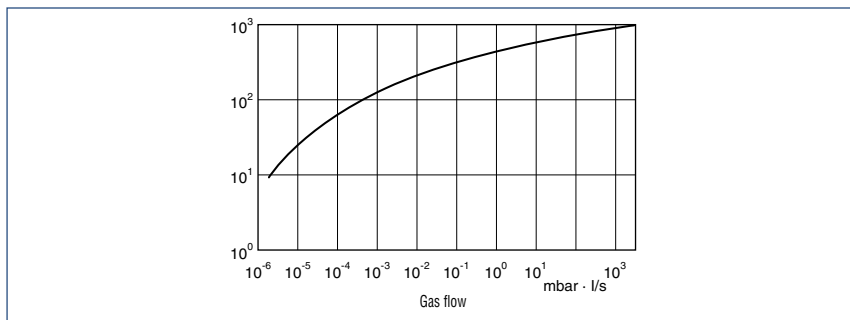
Variable leak characteristic for the variable leak valve without isolation valve

Technical Data		Variable Leak Valve without Isolation Valve	
Gas flow controllable	mbar x l x s ⁻¹	40 - 1700	
Tightness	mbar x l x s ⁻¹	1×10^{-9}	
Differential pressure	bar	3	
Operating temperature	°C	1000	
Material (Housing, needle, filter)		aluminum	
Seal		FPM	
Weight	kg	0.2	
Ordering Information		Variable Leak Valve without Isolation Valve	
Variable leak valve without isolation valve DN 10 KF		Part No. 215 020	

Variable Leak Valves with Isolation Valve



Dimensional drawing for the variable leak valve with isolation valve



Variable leak characteristic for the variable leak valve with isolation valve

Variable leak valves with an isolation valve permit an interruption of the gas supply without changing the gas admission rate setting.

Applications

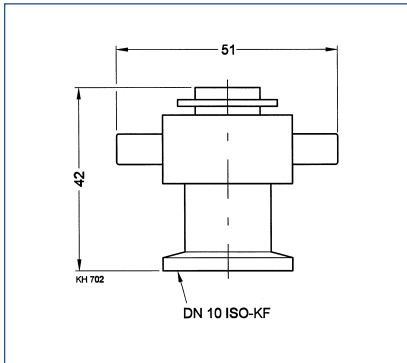
- Gas admission rates of 1000 to 5×10^{-6} mbar \times l \times s $^{-1}$ allow variable leak valves to be used in almost all applications
- Through the integrated digital display, the opening point may be accurately set at any time or a certain gas flow may be defined
- Blocking valve

Technical Note

When using helium as the process gas, it must be taken into account that the needle sleeve made of modified PTFE is to a certain extent permeable to helium.

Technical Data		Variable Leak Valve with Isolation Valve	
Gas flow controllable	mbar \times l \times s $^{-1}$	5×10^{-6} - 1000	
Tightness	mbar \times l \times s $^{-1}$	1×10^{-9}	
Differential pressure	bar	2,5	
Dead volume	cm 3	0.032	
Operating temperature	°C	80	
Bakeout temperature, flanges	°C	150	
Material (housing, needle, filter)		stainless steel	
Material (needle sleeve)		fluoroplastomer	
Seal		FPM	
Weight	kg	0.4	
Ordering Information		Variable Leak Valve with Isolation Valve	
Variable leak valve with isolation Valve, DN 16 KF		Part No. 215 010	

Venting Valves, Manually Operated



Dimensional drawing for the venting valve, manually operated

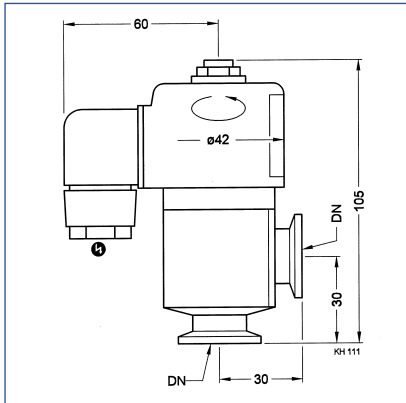
Venting valves are used to vent small vacuum systems.

Advantages to the User

- Simple opening and closing of the valve by loosening or tightening the screw cap

Technical Data		Venting Valve manually operated
Tightness	mbar x l x s ⁻¹	< 1 x 10 ⁻⁹
Weight	kg	0.15
Dimensions (W x H x D)	mm	51 x 42 x 30
Material		
Body		aluminum (3.0615), stainless steel (1.4301)
Inside section		aluminum (3.0615), stainless steel (1.4301)
Seal		FPM
Screw cap		brass (nickel-plated)
Ordering Information		Venting Valve manually operated
Venting valve DN 10 KF, manually operated (screw cap)		
Aluminum		Part No. 173 24
Stainless steel		Part No. 173 37

Venting Valves, Electromagnetically Actuated



Dimensional drawing for the venting valve,
electromagnetically actuated

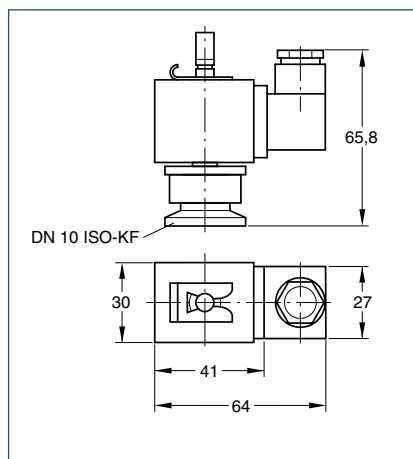
Venting valves are used to vent small vacuum systems and are closed when no power is applied.

Advantages to the User

- Open when power is applied, closed with no power
- Seals on one side against atmospheric pressure
- Protected against dirt by a filter

Technical Data	Venting Valve electromagnetically actuated	
Leak rate	mbar x l x s ⁻¹	< 1 x 10 ⁻⁹
Venting time for a 100 l chamber	s	23
Mains connection	V / Hz	230 / 50/60
	V / Hz	115 / 50/60
	V DC	24
Power consumption, actuation / holding	VA	35 / 15
Differential pressure in closing / opening direction	bar	10 / 1
Can be opened to a pressure difference of	bar	2
Service life	cycles	1.5 Mio.
Switching frequency	1/min	50
Opening / closing time	ms	60 / 45
Conductance for molecular flow	l x s ⁻¹	1
Weight	kg	0.46
Dimensions (W x H x D)	mm	105 x 120 x 42
Material		
Valve body		aluminum
Gasket		FPM
Ordering Information	Venting Valve electromagnetically actuated	
Venting valve DN 10 KF, electromagnetically actuated 24 V DC 115 V AC 230 V AC		Part No. 215 021 Part No. 215 023 Part No. 215 024
Spare coil for 24 V DC for 230 V AC		Part No. 215 011 Part No. 215 014
Centering ring with sintered metal filter, DN 10 KF		Part No. 883 50
Seal kit		Part No. 215 208

Power Failure Venting Valves, Electromagnetically Actuated



Dimensional drawing for the power failure venting valve

Power failure venting valves are open when de-energised and are used to automatically vent pumps, systems or vacuum vessels in the event of a power failure.

Permissible pressure difference < 2.5 bar (0 bar on the vacuum side).

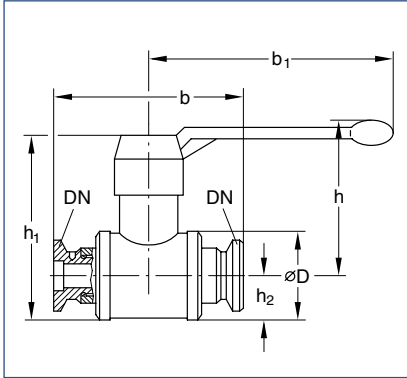
Advantages to the User

- Can be installed in any orientation
- Protection against being contaminated by filtering of the inflowing air
- Easy to install
- Simple filter exchange

Technical Data		Power failure venting valves electromagnetically actuated	
Leak tightness	mbar x l x s ⁻¹	< 1 x 10 ⁻⁷	
Venting time for a 50 l vessel	s	270	
Opening time / closing time ¹⁾	ms	30 / 30	
Protection class to DIN 40050	IP	65	
Permissible ambient temperature	°C	50	
Weight	kg	0.1	
Dimensions (W x H x D)	mm	64 x 66 x 30	
Material			
Body			aluminum
Seal			NBR
Armature			brass
Filter			bronze
Ordering Information		Power failure venting valves electromagnetically actuated	
Power failure venting valves DN 10 KF, electromagnetically actuated, with inlet filter 230 V / 50/60 Hz 24 V DC		Part No. 174 26 Part No. 174 46	
Centering ring DN 10 KF with sinter filter		Part No. 883 50	
Spare solenoid valves		see SECUVAC valves	
Filter for SECUVAC valves and power failure venting valves (set of 5 pcs.)		Part No. 215 701	

¹⁾ at a differential pressure of $\Delta p = 0$ bar

Ball Valves



Dimensional drawing for the DN 10 KF ball valve

Dimension table

	DN	10 KF	16 KF	25 KF	40 KF
b	mm	75	100	130	160
b₁	mm	80	80	110	138
h	mm	55	55	62	90
h₁	mm	55	58	80	110
h₂	mm	15.0	15.0	20.0	27.5
D	mm	26	30	42	60

Ball valves are rugged and cost-effective straight-through valves of small size, which are opened or closed simply by operating a lever. The valve position (OPEN/CLOSED) can be determined from the lever's position. The lever may be detached.

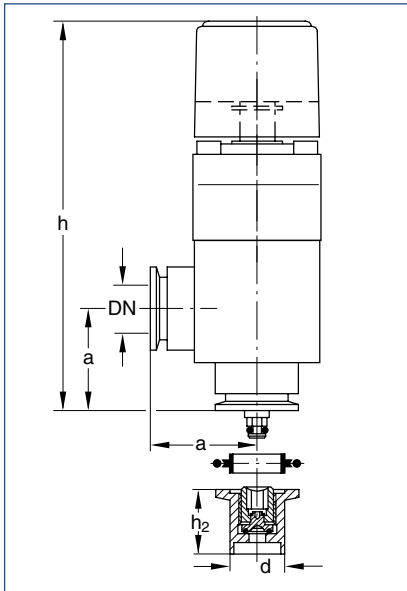
Ball valves are provided with lubricated gaskets and when open they permit an unobstructed passage.

Advantages to the User

- Leak tight on both sides against the atmosphere; can be opened against atmospheric pressure

Technical Data	Ball Valve			
	DN 10 KF	DN 16 KF	DN 25 KF	DN 40 KF
Leak rate mbar x l x s ⁻¹	< 1 x 10 ⁻⁶	< 1 x 10 ⁻⁶	< 1 x 10 ⁻⁶	< 1 x 10 ⁻⁶
Conductance for molecular flow l x s ⁻¹	60	130	350	550
Pressure absolute, min. / max. mbar / bar	10 ⁻⁵ / 5	10 ⁻⁵ / 5	10 ⁻⁵ / 5	10 ⁻⁵ / 5
Weight kg	0.35	0.4	0.75	2.6
Material				
Body	brass (nickel-plated)	brass (nickel-plated)	brass (nickel-plated)	brass (nickel-plated)
Gaskets	PTFE	PTFE	PTFE	PTFE
Ball	brass (hard chromium-plated)	brass (hard (chromium-plated)	brass (hard chromium-plated)	brass (hard chromium-plated)
KF flanges	aluminum (3.0615)	aluminum (3.0615)	aluminum (3.0615)	aluminum (3.0615)
Ordering Information	Ball Valve			
	DN 10 KF	DN 16 KF	DN 25 KF	DN 40 KF
Ball valve Brass body (nickel-plated)	Part No. 174 94	Part No. 174 95	Part No. 174 96	Part No. 174 97

Vacuum Locks and Sealing Valves



Dimensional drawing for the sealing valves

Dimension table

	DN	16 KF	25 KF	40 KF
a	mm	40	50	65
d	mm	16	25	38
h	mm	124	160	190
h₂	mm	30	30	40

A screw-in sealing element with a hex. socket into which the spindle of the gas lock is inserted for actuation has been integrated within the tubulation.

After having filled in the gas or evacuated the chamber, the gas lock is detached from the small flange and may thus be reused for an unlimited number of times on other sealing valves.

Advantages to the User

- Simple to use, handy knob
- Compact, low weight
- Also well-suited for operating older types of sealing valves from Leybold
- Long travel and high conductance, thus short pumpdown times
- Spindle can be arrested in its end position
- Double O-ring seal offering a very low leak rate ($< 1 \times 10^{-7}$ mbar \times l \times s⁻¹) and a long service life

- May be used in the entire rough and medium vacuum range
- Long service life
- Secured against inadvertent opening
- Temperature resistant

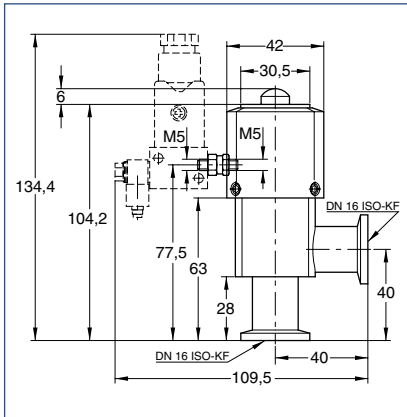
Vacuum lock	60 °C
Blocking valve	100 °C
- May be protected by a standard blank flange against becoming dirty

Typical Applications

- Sealing of evacuated or gas-filled chambers
- Post-evacuation of vessels
- Topping up and exchanging the gas filling in vessels
- Sealing valves with stainless steel KF connection and stainless steel tubulation for welding to the chamber

Technical Data	Vacuum Lock / Sealing Valve		
	DN 16 KF	DN 25 KF	DN 40 KF
Leak rate			
Sealing valve	1×10^{-7}	1×10^{-7}	1×10^{-7}
Vacuum lock	1×10^{-9}	1×10^{-9}	1×10^{-9}
Unit: mbar x l x s ⁻¹			
Travel for the vacuum lock	56	76	108
Unit: mm			
Free passage in the sealing valve	3	8	18
Unit: mm			
Absolute pressure	2.5	2.5	2.5
Unit: bar			
Weight			
Vacuum lock	0.5	1.0	1.8
Sealing valve	0.04	0.1	0.12
Unit: kg			
Material			
Vacuum lock	aluminum	aluminum	aluminum
Seal	FPM	FPM	FPM
Ordering Information	Vacuum Lock / Sealing Valve		
	DN 16 KF	DN 25 KF	DN 40 KF
Vacuum lock, aluminum body	Part No. 283 25	Part No. 283 26	Part No. 283 27
Sealing valve with tubulation, stainless steel body	Part No. 283 21	Part No. 283 22	Part No. 283 23
Clamping ring	Part No. 183 41	Part No. 183 42	Part No. 183 43
Centering ring	Part No. 883 46	Part No. 883 47	Part No. 883 48
Repair kit			
Sealing valve	Part No. 215 055	Part No. 215 056	Part No. 215 057
Vacuum lock	Part No. 107 70	Part No. 107 71	Part No. 107 72

Right-Angle Valves for Mobile Systems according to DOT



Dimensional drawing for the stainless steel right-angle valves with pilot valve

This valve was especially developed for applications which involve brake fluid (in accordance with DOT) and with special attention regarding safety in the presence of increased differential pressures.

Advantages to the User

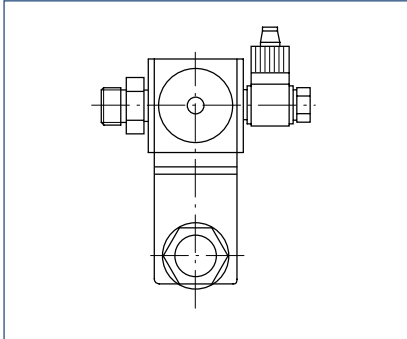
- High degree of reliability and safety due to EPDM gaskets at the valve disk as well as within the body

- Stronger spring action on the valve disk
- Long service life
- Pilot valves for adaptation to all common control voltages and the interference suppression kit can be retrofitted
- Visual valve position indicator is standard
- Installation in any orientation and no restrictions as to the direction of flow

Technical Data		Right-Angle Valves for Mobile Systems according to DOT	
Service life	cycles		10 mio.
Conductance at molecular flow	$l \times s^{-1}$		4.5
Leak rate	$mbar \times l \times s^{-1}$		1×10^{-9}
Operating pressure range	mbar		10^{-8} - 5000
Differential pressure, closing and opening direction	bar		5 / 5
Opening against differential pressure	bar		5
Ambient / Operating temperature, max.	°C		50
Protection class			65
Opening / closing time for compressed air at 6 bar	ms		100 / 100
Switching frequency	1/min		100
Compressed air, overpressure	bar		4 - 8
Compressed air volume	cm ³		5.5
Compressed air connection	mm		4 and 6
Weight with pilot valve			0.3
Material			
Body			aluminum alloy (3.2381)
Inside section			stainless steel (1.4541 / 1.4301)
Gaskets			EPDM
Ordering Information		Right-Angle Valves for Mobile Systems according to DOT	
Right-angle valve, without pilot valve, aluminum body		Part No. 215 009	
Pilot valves		X	
Interference suppression kits for different voltages		X	
Seal kit EPDM		Part No. 215 012	

X = Part Nos. see section "Valves with KF/ISO-K flanges", para "Accessories for the Electropneumatically Operated Valves"

Pilot Valves



Pilot valve

A range of pilot valves is available for actuation of the electropneumatic KF valves, which cover all commonly used control voltages.

Advantages to the User

- Easy to fit to the pneumatic cylinder, adapter is included with the DOT valve

Supplied Equipment

- Hose connection and gasket for connection to the compressed air supply

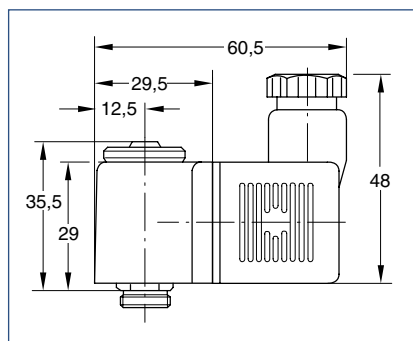
Ordering Information	KF Pilot Valves for DOT valves (incl. Solenoid Coil)
KF pilot valve for DOT valves, incl. solenoid coil 230 V AC / 50/60 Hz (normally closed) 110 - 120 V AC / 50/60 Hz (normally closed) 24 V DC (normally closed)	Part No. 280 70 Part No. 280 72 Part No. 280 74
Ordering Information	Spare Pilot Valve for ISO-K valves from DN 250, without coil
Spare pilot valve for DN 250 ISO-K to DN 630 ISO-K	Part No. 200 07 927

Interference Suppression Kit - Illuminated

As an option for the solenoid coil and the pilot valves an interference suppression kit is offered so as to reliably prevent any pick-up of interference by sensitive equipment in the vicinity of the solenoid coils.

Ordering Information	Interference Suppression Kit for different voltages
Interference Suppression Kit 24 V DC/AC 110 V AC 230 V AC	Part No. 287 84 Part No. 287 82 Part No. 287 83

Solenoid Coils for DN 250 ISO-K



Dimensional drawing for the solenoid coils

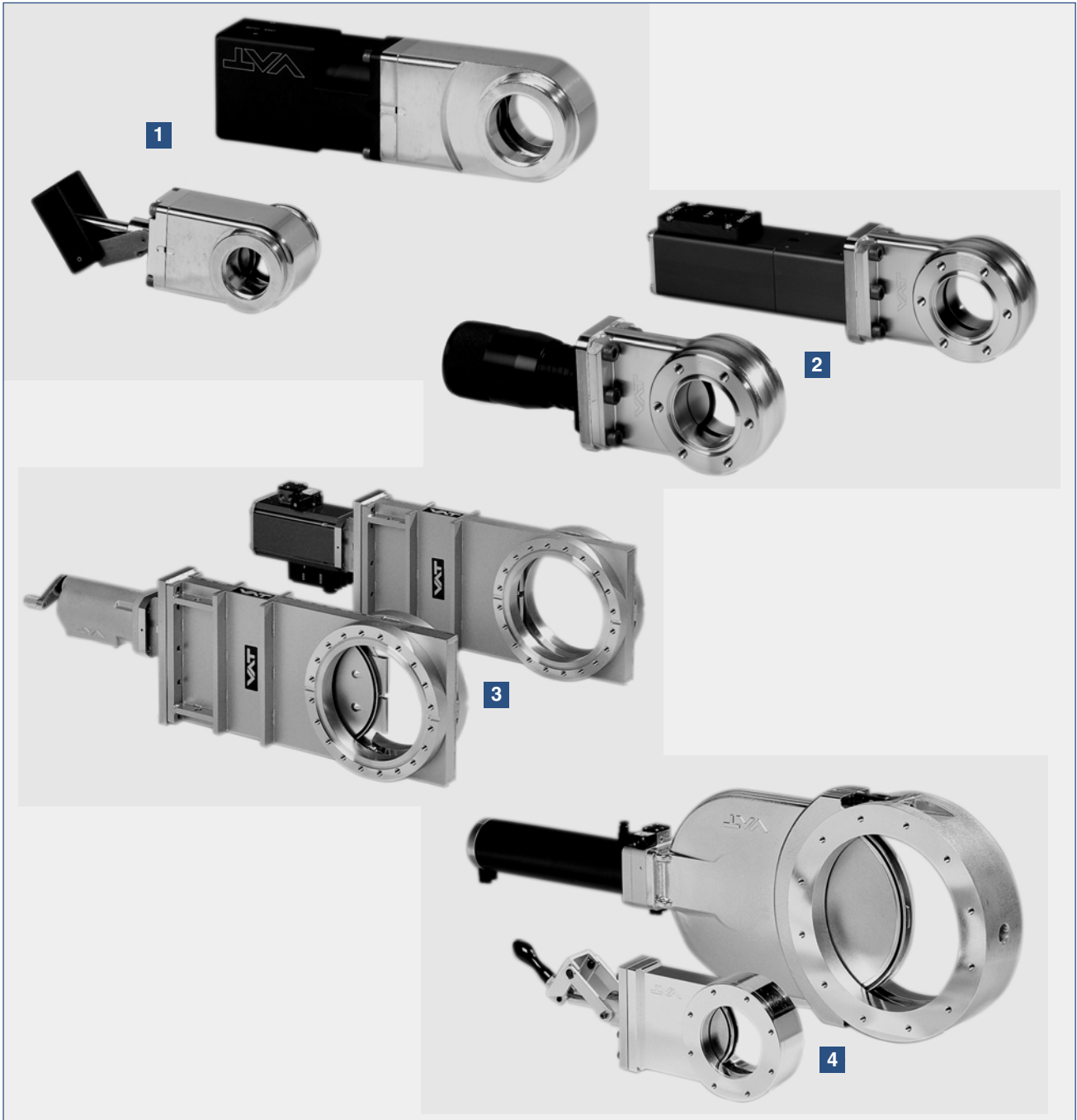
Leybold is offering a range of solenoid coils for the purpose of adapting the electropneumatically operated valve to different commonly used control voltages.

Advantages to the User

- Easy to fit (plug on and tighten with a knurled screw)

Technical Data		Solenoid Coils for Pilot valves	
		V=	V≈
Voltage	V	24 DC	24/110/230 AC; 50/60 Hz
Permissible voltage variation	%	± 10	± 10 at nominal frequency
Permissible frequency variation	%	–	± 10 at nominal frequency
Power consumption at nominal operating voltage	W	4.1 at 12 V / 4.5 at 24 V	Actuate: 7.5 VA / Hold: 6.0 VA
Operating time		100 % ED	100 % ED
Type of protection to DIN 0450	IP	65	65
Hose connection		Pg 9	Pg 9
Class of insulation material to VDE 0580		F	F
Test mark		VDE	VDE
Max. response time	ms	10	10
Weight	kg	0.065	0.055
Torque for the knurled screw, min. / max	Ncm	100 / 150	100 / 150
Ordering Information		Solenoid Coils for Pilot valves	
Solenoid coils for pilot valves 230 V AC / 50/60 Hz 110 - 120 V AC/ 50/60 Hz 24 V AC / 50/60 Hz 24 V DC		Part No. 280 77 Part No. 280 78 Part No. 280 79 Part No. 280 80	

Overview



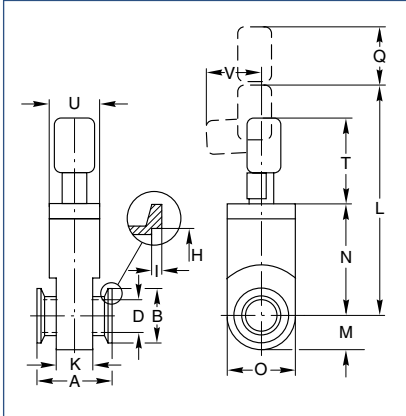
1 Miniature UHV gate valves,
KF flange

2 Miniature UHV gate valves,
CF flange

3 UHV gate valves

4 HV gate valves

Miniature HV and UHV Gate Valves, Manually Operated (Articulated Lever)



Dimensional drawing for the miniature UHV gate valves, articulated lever, KF flange

Dimension table

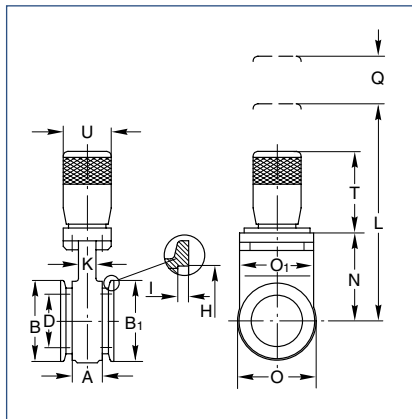
	DN	16 KF	25 KF	40 KF
A	mm	40	50	51
B	mm	30	40	55
D	mm	15	24	39
H	mm	17.2	26.2	41.2
I	mm	3	3	3
K	mm	25	32	31
L	mm	100	139	208
M	mm	15.0	22.0	32.5
N	mm	39	59	93
O	mm	30	44	65
Q	mm	25	35	55
T	mm	37	50	85
U	mm	25	32	40
V	mm	30	30	50

Advantages to the User

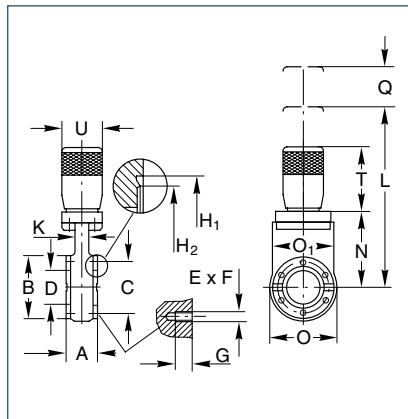
- Manually actuated
- Valve technology with only one moving part
- Equipped with a mechanical position indicator
- Low particle generating and vibration free actuation
- Compact, light-weight design

Technical Data	Miniature UHV Gate Valve		
	DN 16 KF	DN 25 KF	DN 40 KF
Tightness			
Body mbar x l x s⁻¹	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁹	< 1 x 10 ⁻⁹
Valve seat mbar x l x s⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
Pressure range, abs.	1 x 10 ⁻⁷ mbar to 2 bar	1 x 10 ⁻⁷ mbar to 2 bar	1 x 10 ⁻⁷ mbar to 2 bar
High vacuum conductance l x s⁻¹	10	34	140
Differential pressure at the valve disk bar	≤ 2 in both directions	≤ 2 in both directions	≤ 2 in both directions
Max. differential pressure during opening mbar	≤ 30	≤ 30	≤ 30
Service life until first maintenance cycles	50000	50000	50000
Degassing temperature for the valve °C	100 / 100	100 / 100	100 / 100
manual open / closed °C	80	80	80
Installation orientation	any	any	any
Weight kg	0.4	0.4	0.7
Material			
Valve body	AlMgSi1 (3.2315)	AlMgSi1 (3.2315)	AlMgSi1 (3.2315)
Valve disk	AISI 301 (1.4310)	AISI 301 (1.4310)	AISI 301 (1.4310)
Seal (head, disk)	Viton/Viton	Viton/Viton	Viton/Viton
Ordering Information	Miniature UHV Gate Valve		
	DN 16 KF	DN 25 KF	DN 40 KF
Miniature gate valve, manually operated, articulated lever	Part No. 286 06	Part No. 286 08	Part No. 286 09

Miniature HV and UHV Gate Valves, Manually Operated (Handwheel)



Dimensional drawing for the miniature UHV gate valves, manually operated (handwheel), DN 40 KF



Dimensional drawing for the miniature UHV gate valves, manually operated (handwheel), DN 40 CF

Advantages to the User

- Bellows-sealed push gate feed-through
- Valve technology with only one moving part
- Equipped with a mechanical position indicator
- Low particle generating and vibration free actuation
- Compact, light-weight design

Dimension table

	DN	40 KF	40 CF
A	mm	50	35
B	mm	72	72
B₁	mm	55	–
C	mm	–	58.7
D	mm	40	40
E x F		–	6 x M 6
G	mm	–	7
H	mm	41.2	–
H₁	mm	–	48.3
H₂	mm	–	42
I	mm	3	–
K	mm	16	16
L	mm	198	198
N	mm	82	82
O	mm	76	76
O₁	mm	70	70
Q	mm	55	55
T	mm	73	73
U	mm	45	45

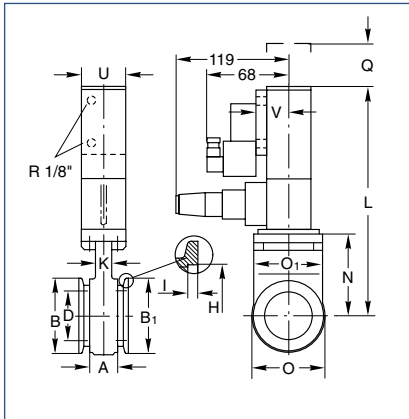
Connections for CF

	DN	63 CF	100 CF	160 CF	200 CF
A	mm	70	70	70	80
B₂	mm	113.5	151.6	202.4	253.2
C	mm	92.1	130.2	181.0	231.8
D	mm	70	100	150	200
E x F		8 x M8	16 x M8	20 x M8	24 x M8
H₁	mm	82.5	120.65	171.45	222.3
H₂	mm	77.4	115.5	166.0	217.0

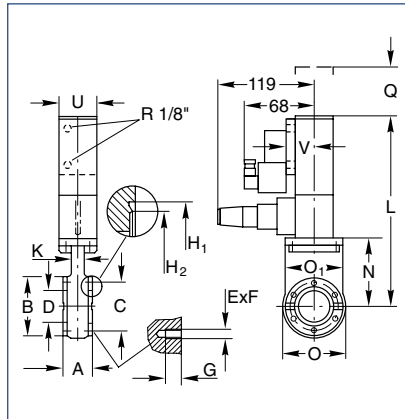
Technical Data	Miniature UHV Gate Valve	
	DN 40 KF	DN 40 CF
Tightness		
Body	$\text{mbar} \times \text{l} \times \text{s}^{-1}$	$< 5 \times 10^{-10}$
Valve seat	$\text{mbar} \times \text{l} \times \text{s}^{-1}$	$< 1 \times 10^{-9}$
Pressure range, abs.	1×10^{-10} mbar to 2 bar	1×10^{-10} mbar to 2 bar
High vacuum conductance	$\text{l} \times \text{s}^{-1}$	160
Differential pressure at the valve disk	bar	≤ 2 in both directions
Max. differential pressure during opening	mbar	≤ 30
Service life until first maintenance	cycles	50000
Degassing temperature		
valve open / closed	°C	250 / 200
manually operated	°C	250
Installation orientation		any
Weight	kg	1.5
Material		
Valve body	AlMgSi1 (3.2315)	AISI 304 (1.4301)
Valve disk	AISI 304 (1.4301)	AISI 304 (1.4301)
Bellows	AISI 316 L (1.4435)	AISI 316 L (1.4435)
Seal (head, disk)	Viton/Viton	Viton/Viton
Ordering Information	Miniature UHV Gate Valve	
	DN 40 KF	DN 40 CF
Miniature gate valve, manually operated, handwheel	Part No. 286 15	Part No. 286 84
6 set screws with nuts and washers ¹⁾	–	Part No. 839 11

¹⁾ For dimensions E x F see table "Connections for CF"

Miniature HV and UHV Gate Valves, Electropneumatically Operated



Dimensional drawing for the miniature UHV gate valves; electropneumatically operated, KF flange



Dimensional drawing for the miniature UHV gate valves; electropneumatically operated, CF flange

Advantages to the User

- Double-acting electropneumatic actuator (with position indicator and pilot valve); bellows-sealed push gate feedthrough
- Valve technology with only one moving part
- Equipped with a mechanical position indicator
- Actuation free of particles and vibrations
- Short closing time, very long service life
- Compact, light-weight design

Dimension table

	DN	40 KF	40 CF
A	mm	50	35
B	mm	72	72
B₁	mm	55	–
C	mm	–	58.7
D	mm	40	40
E x F	mm	–	6 x M 6
G	mm	–	7
H	mm	41.2	–
H₁	mm	–	48.3
H₂	mm	–	42
I	mm	3	–
K	mm	16	16
L	mm	198	230
N	mm	82	82
O	mm	76	76
O₁	mm	70	70
Q	mm	55	55
T	mm	73	73
U	mm	45	45
V	mm	–	32.5

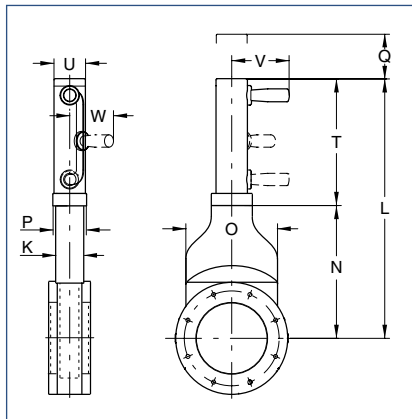
Connections for CF

	DN	63 CF	100 CF	160 CF	200 CF
A	mm	70	70	70	80
B₂	mm	113.5	151.6	202.4	253.2
C	mm	92.1	130.2	181.0	231.8
D	mm	70	100	150	200
E x F		8 x M8	16 x M8	20 x M8	24 x M8
H₁	mm	82.5	120.65	171.45	222.3
H₂	mm	77.4	115.5	166.0	217.0

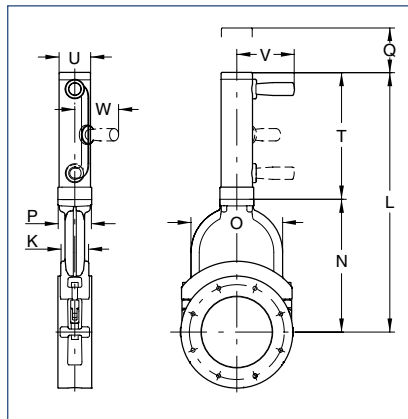
Technical Data	Miniature UHV Gate Valve		
	DN 40 KF (Aluminum)	DN 40 KF (Stainless steel)	DN 40 CF (Stainless steel)
Tightness			
Body	mbar x l x s ⁻¹	< 1 x 10 ⁻⁹	< 5 x 10 ⁻¹⁰
Valve seat	mbar x l x s ⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
5 x 10 ⁻¹⁰			
Pressure range, abs.		1 x 10 ⁻⁷ mbar to 2 bar	1 x 10 ⁻¹⁰ mbar to 2 bar
High vacuum conductance	l x s ⁻¹	140	160
Differential pressure at the valve disk	bar	≤ 2 in both directions	≤ 2 in both directions
Max. differential pressure during opening	mbar	≤ 30	≤ 30
at reduced service live	bar	1	1
Service life until first maintenance	cycles	50000	50000
Degassing temperature valve open / closed	°C	≤ 100 / 100	≤ 250 / 200
pneumatic actuation	°C	≤ 80	≤ 200
position indicator / pilot valve	°C	≤ 80 / 50	80 / 50
Warming-up and cooling down speed	°C x h ⁻¹	80	80
Compressed air, min. / max.	bar	4.5 / 7.0	4.5 / 7.0
Closing / opening time	s	1.1	0.7
Pilot valve supply voltage / power consumption	- / W	24 V DC / 6 or 230 V AC, 50/60 Hz / 2	24 V DC / 6 or 230 V AC, 50/60 Hz / 2
Switching capacity of the pos. indicator at 80 °C	A	0.5 at 50 V AC; max. 10 W / 0.5 at 75 V DC; max. 10 W	5 at 250 V AC; 3 at 50 V DC
at 200 °C	A	-	1 at 48 V AC; 1 at 72 V DC
Installation orientation		any	any
Weight	kg	1.2	1.8
Material			
Valve body		AlMgSi1 (3.2315)	AISI 304 (1.4301)
Disk		AISI 301 (1.4310)	AISI 304 (1.4301)
Bellows		-	AISI 316 L (1.4435)
Seal (head, disk)		Viton/Viton	Metal/Viton
			AISI 316 L (1.4435)
			Metal/Viton
Ordering Information	Miniature UHV Gate Valve		
	DN 40 KF (Aluminum)	DN 40 KF (Stainless steel)	DN 40 CF (Stainless steel)
Miniature gate valve, electropneumatically operated			
24 V DC / 6 W	Part No. 286 54	Part No. 286 36	Part No. 286 99
230 V AC, 50/60 Hz / 2 W	Part No. 286 44	Part No. 286 35	Part No. 286 94
6 set screws with nuts and washers ¹⁾	-	-	Part No. 839 11

¹⁾ For dimensions E x F see table "Connections for CF"

HV Gate Valves, Manually Operated



Dimensional drawing for the HV gate valves; manually operated, DN 63 ISO-F and DN 100 ISO-F



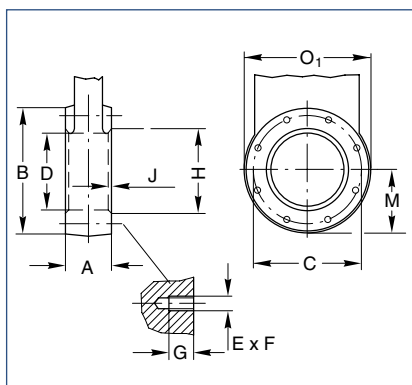
Dimensional drawing for the HV gate valves; manually operated, DN 160 ISO-F

Advantages to the User

- Cost-effective gate valve for industrial applications with elastomer-sealed push gate feedthrough
- Aluminum body
- Slim and light-weight
- Low play in the locked state and low wear

Dimension table

	DN	63 ISO-F	100 ISO-F	160 ISO-F
K	mm	36	36	58
L	mm	329.5	413	547
N	mm	155.5	203.5	280
O	mm	100	140	192
P	mm	48	48	70
Q	mm	25	25	60
T	mm	174	209.5	267
U	mm	43	43	65
V	mm	94	94	122
W	mm	75	75	95



Connection dimensions for ISO-F flanges (HV gate valves)

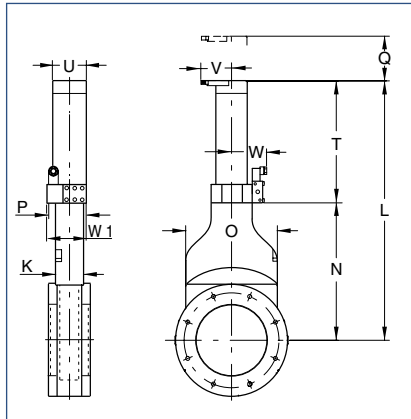
Connections for ISO-F

	DN	63 ISO-F	100 ISO-F	160 ISO-F	200 ISO-F	250 ISO-F
A	mm	60	60	70	80	100
B	mm	130	165	235	288	350
C	mm	110	145	200	260	310
D	mm	65	100	150	200	261
E x F		4 x M8	8 x M8	8 x M10	12 x M10	12 x M10
G	mm	12	12	16	16	16
H	mm	70	102	153	213	-
J	mm	3	3	5	5	-
M	mm	65.5	83.0	117.5	144.0	175.0
O₁	mm	131	166	237	290	352

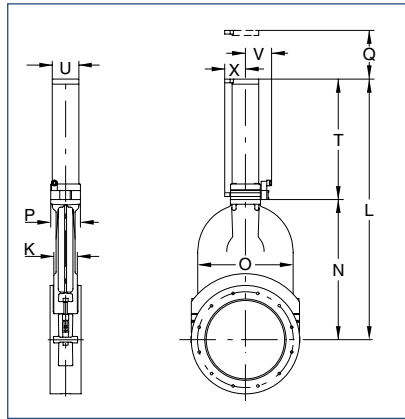
Technical Data	HV Gate Valve		
	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F
Tightness			
Body mbar x l x s⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
Valve seat mbar x l x s⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
Pressure range, abs.	1 x 10 ⁻⁷ mbar to 1.6 bar	1 x 10 ⁻⁷ mbar to 1.6 bar	1 x 10 ⁻⁷ mbar to 1.6 bar
High vacuum conductance l x s⁻¹	550	2000	6000
Differential pressure at the valve disk bar	1.6 in both directions	1.6 in both directions	1.6 in both directions
Max. differential pressure during opening mbar	≤ 30	≤ 30	≤ 30
Service life until first maintenance cycles	200000	200000	100000
Degassing temperature			
valve °C	120	120	120
manually operated °C	80	80	80
Installation orientation	any	any	any
Weight kg	3.0	4.5	9.0
Material			
Valve body	AlMg4.5Mn	AlMg4.5Mn	G-AlSi7Mg
Valve disk	AISI 304 (1.4301)	AISI 304 (1.4301)	AlMgSi1
Mechanism	AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034)	AISI 301 (1.4310), AISI 304(1.4301), AISI 420 (1.4034)	AISI 301 (1.4310), AISI 304(1.4301), AISI 420 (1.4034)
Gaskets (head, disk)	Viton	Viton	Viton
Ordering Information	HV Gate Valve		
	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F
HV gate valve, manually operated	Part No. 286 25	Part No. 286 26	Part No. 215 633
Set screws with nuts and washers ¹⁾	Part No. 839 13	Part No. 839 13	Part No. 210 071
(Package each containing) pieces	16	16	12

¹⁾ For dimensions E x F see table "Connections for ISO-F"

HV Gate Valves, Electropneumatically Operated



Dimensional drawing for the gate valves;
DN 63 ISO-F and DN 100 ISO-F



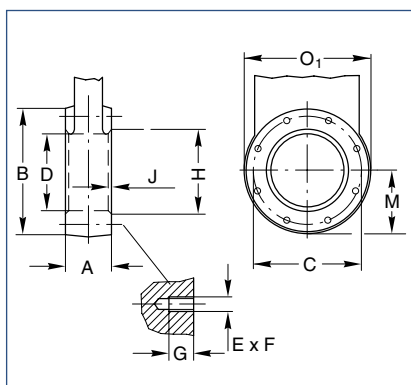
Dimensional drawing for the gate valves;
DN 160 ISO-F to DN 250 ISO-F

Advantages to the User

- Cost-effective gate valve for industrial applications with elastomer-sealed push gate feedthrough
- Aluminum body
- Slim and light-weight
- Low play in the locked state and low wear

Dimension table

	DN	63 ISO-F	100 ISO-F	160 ISO-F	200 ISO-F	250 ISO-F
K	mm	36	36	58	66	76
L	mm	341.5	424.0	547.0	688.0	843.0
L₁	mm	155.5	203.5	280.0	363.5	453.0
N	mm	100	140	192	240	308
O	mm	58	58	70	80	96
P	mm	25	25	60	80	100
Q	mm	186.0	221.5	267.0	324.5	390.0
T	mm	55	55	65	75	86
U	mm	56.0	56.0	71.5	76.5	84.5
V	mm	72	72	-	-	-
W	mm	65.5	65.5	-	-	-
X	mm	59	59	57	62	67



Connection dimensions for ISO-F flanges
(HV Gate Valves)

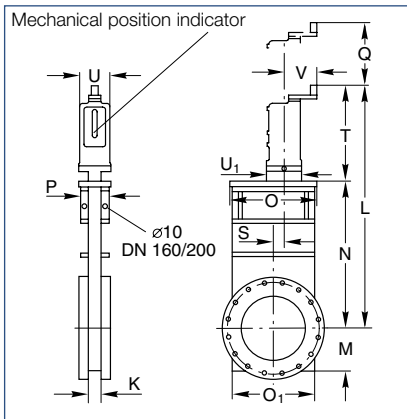
Connections for ISO-F

	DN	63 ISO-F	100 ISO-F	160 ISO-F	200 ISO-F	250 ISO-F
A	mm	60	60	70	80	100
B	mm	130	165	235	288	350
C	mm	110	145	200	260	310
D	mm	65	100	150	200	261
E x F		4 x M8	8 x M8	8 x M10	12 x M10	12 x M10
G	mm	12	12	16	16	16
H	mm	70	102	153	213	-
J	mm	3	3	5	5	-
M	mm	65.5	83.0	117.5	144.0	175.0
O₁	mm	131	166	237	290	352

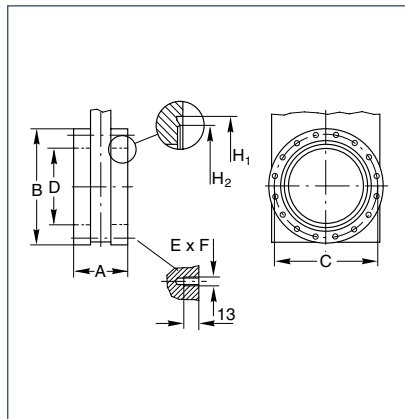
Technical Data		HV Gate Valve				
		DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 200 ISO-F	DN 250 ISO-F
Tightness						
Body	mbar x l x s⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
Valve seat	mbar x l x s⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
Pressure range, abs.		1 x 10 ⁻⁷ mbar to 1.6 bar	1 x 10 ⁻⁷ mbar to 1.6 bar	1 x 10 ⁻⁷ mbar to 1.6 bar	1 x 10 ⁻⁷ mbar to 1.6 bar	1 x 10 ⁻⁷ mbar to 1.2 bar
High vacuum conductance	l x s⁻¹	550	2000	6000	12000	22000
Differenzdruck am Ventilteller, max.	mbar	≤ 1600 in both directions /	≤ 1600 in both directions /	≤ 1600 in both directions /	≤ 1600 in both directions /	≤ 1200 in both directions /
during opening, max.	mbar	≤ 30	≤ 30	≤ 30	≤ 30	≤ 30
Compressed air, min. / max.	bar	4 / 7	4 / 7	4 / 7	4 / 7	4 / 7
Closing / opening time	s	1.5	2.0	2.0	3.0	5.0
Service life until first maintenance	cycles	200000	200000	100000	100000	100000
Degassing temperature valve	°C	120	120	120	120	120
pneumatic drive	°C	80	80	80	80	80
position indicator	°C	80	80	80	80	80
pilot valve	°C	50	50	50	50	50
Switching capacity for the position indicator	A	5 at 230 V AC; 3 at 50 V DC	5 at 230 V AC; 3 at 50 V DC	5 at 230 V AC; 3 at 50 V DC	5 at 230 V AC; 3 at 50 V DC	5 at 230 V AC; 3 at 50 V DC
Installation orientation		any	any	any	any	any
Weight	kg	3.0	4.5	9.0	18.0	25.0
Material						
Valve body		AlMg4.5Mn	AlMg4.5Mn	G-AlSi7Mg	G-AlSi7Mg	G-AlSi7Mg
Valve disk		AISI 304 (1.4301)	AISI 304 (1.4301)	AlMgSi1,	AlMgSi1,	AlMgSi1,
Mechanism		AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034)	AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034)	AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034)	AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034)	AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034)
Gaskets (head, disk)		Viton	Viton	Viton	Viton	Viton
Ordering Information		HV Gate Valve				
		DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 200 ISO-F	DN 250 ISO-F
HV gate valve, electropneumatically operated						
24 V DC / 2,5 W		Part No. 286 55	Part No. 286 56	–	–	–
24 V DC / 6 W		–	–	Part No. 215 643	Part No. 215 644	Part No. 215 645
230 V AC, 50 Hz / 7.1 W		Part No. 286 45	Part No. 286 46	Part No. 215 653	Part No. 215 654	Part No. 215 655
Set screws		Part No. 839 13	Part No. 839 13	Part No. 210 071	Part No. 210 071	Part No. 210 071
with nuts and washers ¹⁾						
(Package each containing) pieces		16	16	12	12	12

1) For dimensions E x F see table "Connections for ISO-F"

UHV Gate Valves, Manually operated



Dimensional drawing for the UHV gate valves
DN 63 CF to DN 200 CF



Connection dimensions for CF flanges
(UHV gate valves)

Advantages to the User

- Valve and wheel can be degassed at temperatures up to 250 °C
- Steel body (non-rusting)
- Bellows-sealed push gate feed-through
- Low play in the locked state and low wear
- Compact
- Mechanically locked in the closed state
- Mechanical position indicator

Dimension table

	DN	63 CF	100 CF	160 CF	200 CF
K	mm	27	27	27	35
L	mm	408	462	552	660
M	mm	57	73	99	125
N	mm	192	247	336	430
O	mm	115	145	200	250
O₁	mm	112	142	192	240
P	mm	70	70	70	80
Q	mm	180	220	290	350
S	mm	11.0	9.0	25.0	38.5
T	mm	184	184	184	200
U	mm	70	70	70	90
U₁	mm	83	83	83	103
V	mm	77	77	77	94

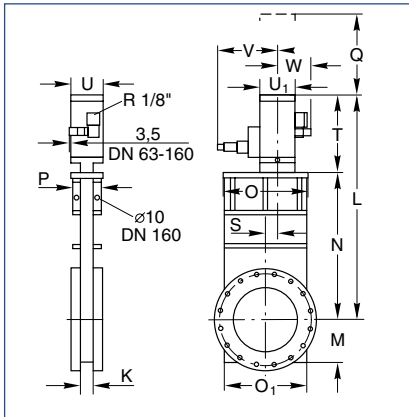
Connections for CF

	DN	63 CF	100 CF	160 CF	200 CF
A	mm	70	70	70	80
B₂	mm	113.5	151.6	202.4	253.2
C	mm	92.1	130.2	181.0	231.8
D	mm	70	100	150	200
E x F		8 x M8	16 x M8	20 x M8	24 x M8
H₁	mm	82.5	120.65	171.45	222.3
H₂	mm	77.4	115.5	166.0	217.0

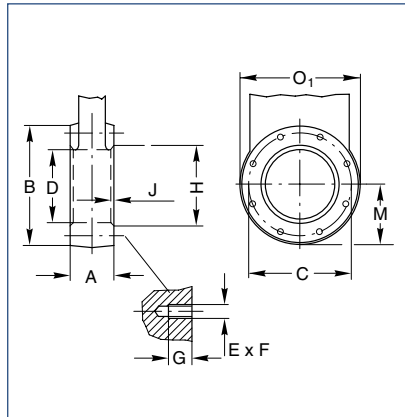
Technical Data	UHV Gate Valve			
	DN 63 CF	DN 100 CF	DN 160 CF	DN 200 CF
Tightness				
Body	$\text{mbar} \times \text{l} \times \text{s}^{-1}$	$< 5 \times 10^{-10}$	$< 5 \times 10^{-10}$	$< 5 \times 10^{-10}$
Valve seat	$\text{mbar} \times \text{l} \times \text{s}^{-1}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$
Pressure range, abs.		1×10^{-10} mbar to 1.6 bar	1×10^{-10} mbar to 1.6 bar	1×10^{-10} mbar to 1.6 bar
High vacuum conductance	$\text{l} \times \text{s}^{-1}$	600	1700	6000
Differential pressure at the valve disk	bar	≤ 1.6 in both directions	≤ 1.6 in both directions	≤ 1.6 in both directions
Max. differential pressure during opening	mbar	≤ 30	≤ 30	≤ 30
Number of spindle turns for full travel		10	13	17
Service life until first maintenance	cycles	50000	50000	50000
Degassing temperature				
valve open / closed	$^{\circ}\text{C}$	250 / 200	250 / 200	250 / 200
manually operated	$^{\circ}\text{C}$	250	250	250
Warming-up / cooling down speed	$^{\circ}\text{C} \times \text{h}^{-1}$	80	80	80
Installation orientation		any	any	any
Weight	kg	9	12	18
Material				
Body		AISI 304 (1.4301)	AISI 304 (1.4301)	AISI 304 (1.4301)
Bellows		AISI 316 L (1.4435)	AISI 316 L (1.4435)	AISI 316 L (1.4435)
Mechanism		AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)
Gaskets (head, disk)		Metal / Viton	Metal / Viton	Metal / Viton
Ordering Information	UHV Gate Valve			
	DN 63 CF	DN 100 CF	DN 160 CF	DN 200 CF
UHV gate valve, manually operated	Part No. 286 85	Part No. 286 86	Part No. 286 87	Part No. 286 88
16 set screws with nuts and washers ¹⁾	Part No. 839 13	Part No. 839 13	2 x Part No. 839 13	2 x Part No. 839 13

¹⁾ For dimensions E x F see table "Connections for ISO-F"

UHV Gate Valves ISO-F, Electropneumatically Operated



Dimensional drawing for the UHV gate valves ISO-F,



Connection dimensions for ISO-F flanges (UHV gate valves)

Advantages to the User

- Valve and pneumatic drive can be degassed at temperatures up to 250 °C and 200 °C respectively
- Steel body (non-rusting)
- Double-acting electropneumatic actuator (with position indicator and pilot valve)
- Bellows-sealed push gate feed-through
- Low play in the locked state and low wear
- Compact
- Mechanically locked in the closed state

Dimension table

	DN	63 ISO-F	100 ISO-F	160 ISO-F	250 ISO-F
K	mm	27	27	27	41
L	mm	346	418	523	800
M	mm	57	73	99	161
N	mm	192	247	336	560
O	mm	115	145	200	345
O₁	mm	112	142	192	322
P	mm	70	70	70	80
Q	mm	180	220	290	450
S	mm	11	9	25	65
T	mm	154	171	187	240
U	mm	70	70	70	90
U₁	mm	83	83	83	103
V	mm	145	145	145	155
W	mm	77	77	77	87

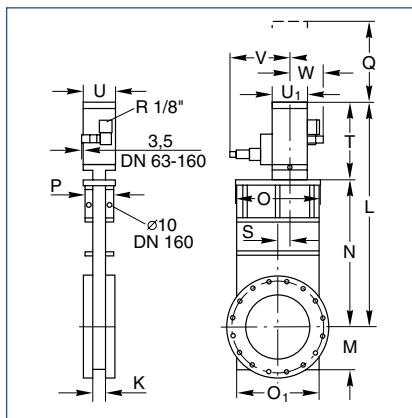
Connections for ISO-F

	DN	63 ISO-F	100 ISO-F	160 ISO-F	250 ISO-F
A	mm	70	70	70	100
B	mm	130	165	225	350
C	mm	110	145	200	310
D	mm	70	100	150	261
E x F		4 x M8	8 x M8	8 x M10	12 x M10
G	mm	13	13	13	15
H	mm	-	102	153	-
J	mm	-	3	5	-

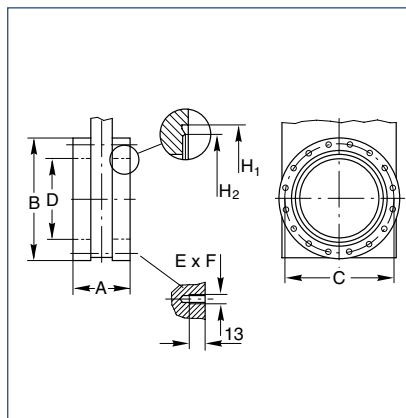
Technical Data		UHV Gate Valve			
		DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 250 ISO-F
Tightness					
Body	mbar x l x s⁻¹	< 5 x 10 ⁻¹⁰	< 5 x 10 ⁻¹⁰	< 5 x 10 ⁻¹⁰	< 5 x 10 ⁻¹⁰
Valve seat	mbar x l x s⁻¹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹	< 1 x 10 ⁻⁹
Pressure range, abs.		1 x 10 ⁻¹⁰ mbar to 1 bar	1 x 10 ⁻¹⁰ mbar to 1 bar	1 x 10 ⁻¹⁰ mbar to 1 bar	1 x 10 ⁻¹⁰ mbar to 1 bar
High vacuum conductance	l x s⁻¹	600	1700	6000	26000
Differential pressure at the valve disk	bar	1 in both directions	1 in both directions	1 in both directions	1 in both directions
Max. differential pressure during opening	mbar	30	30	30	30
Compressed air, min. / max.	bar	4 / 7	4 / 7	4 / 7	5 / 7
Closing / opening time	s	1.0	1.2	1.5	4.0
Compressed air cylinder, volume	l	0.08	0.11	0.14	0.35
Service life until first maintenance	cycles	50000	50000	50000	50000
Degassing temperature					
valve open / closed	°C	250 / 200	250 / 200	250 / 200	250 / 200
pneumatic drive	°C	200	200	200	200
position indicator / pilot valve	°C	80 / 50	80 / 50	80 / 50	80 / 50
Warming-up / cooling down speed	°C x h⁻¹	80	80	80	80
Pilot valve					
supply voltage / power consumption	- / W	24 V DC / 6 or 230 V AC, 50 Hz / 7.1	24 V DC / 6 or 230 V AC, 50 Hz / 7.1	24 V DC / 6 or 230 V AC, 50 Hz / 7.1	24 V DC / 6 or 230 V AC, 50 Hz / 7.1
Switching capacity for the position indicator					
at 80 °C	A	5 at 250 V AC; 3 at 50 V DC 1 at 48 V AC;	5 at 250 V AC; 3 at 50 V DC 1 at 48 V AC;	5 at 250 V AC; 3 at 50 V DC 1 at 48 V AC;	5 at 250 V AC; 3 at 50 V DC 1 at 48 V AC;
at 200 °C	A	1 at 72 V DC	1 at 72 V DC	1 at 72 V DC	1 at 72 V DC
Installation orientation		any	any	any	any
Weight	kg	9	12	18	42
Material					
Body		AISI 304 (1.4301) AISI 316 L (1.4435)	AISI 304 (1.4301) AISI 316 L (1.4435)	AISI 304 (1.4301) AISI 316 L (1.4435)	AISI 304 (1.4301) AISI 316 L (1.4435)
Bellows		AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)
Mechanism		Metal / Viton	Metal / Viton	Metal / Viton	Metal / Viton
Gaskets (head, disk)					
Ordering Information		UHV Gate Valve			
		DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 250 ISO-F
UHV gate valve, electropneumatically operated 24 V DC / 6 W 230 V AC, 50 Hz / 7,1 W		Part No. 286 72 Part No. 286 75	Part No. 286 73 Part No. 286 76	Part No. 286 74 Part No. 286 77	Part No. 286 81 –
Set screws with nuts and washers ¹⁾ (Package each containing)		Part No. 839 13 16	Part No. 839 13 16	Part No. 210 071 12	Part No. 210 071 12

¹⁾ For dimensions E x F see table "Connections for ISO-F"

UHV Gate Valves CF, Electropneumatically Operated



Dimensional drawing for the UHV gate valves CF electropneumatically operated



Connection dimension for CF flanges (UHV Gate Valves)

Advantages to the User

- Double-acting electropneumatic actuator (with position indicator and pilot valve)
- Bellows-sealed push gate feed-through
- Valve and pneumatic drive can be degassed at temperatures up to 250 °C and 200 °C respectively
- Steel body (non-rusting)
- Low play in the locked state and low wear
- Compact
- Mechanically locked in the closed state

Dimension table

	DN	63 CF	100 CF	160 CF	200 CF
K	mm	27	27	27	35
L	mm	346	418	523	630
M	mm	57	73	99	125
N	mm	192	247	336	430
O	mm	115	145	200	250
O₁	mm	112	142	192	240
P	mm	70	70	70	80
Q	mm	180	220	290	350
S	mm	11	9	25	38,5
T	mm	154	171	187	200
U	mm	70	70	70	90
U₁	mm	83	83	83	103
V	mm	145	145	145	155
W	mm	77	77	77	87

Connections for CF

	DN	63 CF	100 CF	160 CF	200 CF
A	mm	70	70	70	80
B₂	mm	113.5	151.6	202.4	253.2
C	mm	92.1	130.2	181.0	231.8
D	mm	70	100	150	200
E x F		8 x M8	16 x M8	20 x M8	24 x M8
H₁	mm	82.5	120.65	171.45	222.3
H₂	mm	77.4	115.5	166.0	217.0

Technical Data	UHV Gate Valve			
	DN 63 CF	DN 100 CF	DN 160 CF	DN 200 CF
Tightness				
Body	$\text{mbar} \times \text{l} \times \text{s}^{-1}$	$< 5 \times 10^{-10}$	$< 5 \times 10^{-10}$	$< 5 \times 10^{-10}$
Valve seat	$\text{mbar} \times \text{l} \times \text{s}^{-1}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$	$< 1 \times 10^{-9}$
Pressure range, abs.		1×10^{-10} mbar to 1 bar	1×10^{-10} mbar to 1 bar	1×10^{-10} mbar to 1 bar
High vacuum conductance	$\text{l} \times \text{s}^{-1}$	600	1700	6000
Differential pressure at the valve disk	bar	1 in both directions	1 in both directions	1 in both directions
Max. differential pressure during opening	mbar	30	30	30
Compressed air, min. / max.	bar	4 / 7	4 / 7	5 / 7
Closing / opening time	s	1.0	1.2	1.5
Compressed air cylinder, volume	m³	0.08	0.11	0.35
Service life until first maintenance	cycles	50000	50000	50000
Degassing temperature				
valve open / closed	°C	250 / 200	250 / 200	250 / 200
pneumatic drive	°C	200	200	200
position indicator / pilot valve	°C	80 / 50	80 / 50	80 / 50
Warming-up / cooling down speed	°C x h⁻¹	80	80	80
Pilot valve				
supply voltage / power consumption	- / W	24 V DC / 6 or 230 V AC, 50 Hz / 7.1	24 V DC / 6 or 230 V AC, 50 Hz / 7.1	24 V DC / 6 or 230 V AC, 50 Hz / 7.1
Switching capacity for the position indicator				
at 80 °C	A	5 at 250 V AC; 3 at 50 V DC	5 at 250 V AC; 3 at 50 V DC	5 at 250 V AC; 3 at 50 V DC
at 200 °C	A	1 at 48 V AC; 1 at 72 V DC	1 at 48 V AC; 1 at 72 V DC	1 at 48 V AC; 1 at 72 V DC
Installation orientation		any	any	any
Weight	kg	9	12	18
Material				
Body		AISI 304 (1.4301)	AISI 304 (1.4301)	AISI 304 (1.4301)
Bellows		AISI 316 L (1.4435)	AISI 316 L (1.4435)	AISI 316 L (1.4435)
Mechanism		AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)	AISI 304 (1.4301), AISI 316 L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)
Gaskets (head, disk)		Metal / Viton	Metal / Viton	Metal / Viton
Ordering Information	UHV Gate Valve			
	DN 63 CF	DN 100 CF	DN 160 CF	DN 200 CF
UHV gate valve, electropneumatically operated				
24 V DC / 6 W	Part No. 286 89	Part No. 286 90	Part No. 286 91	Part No. 286 92
230 V AC, 50 Hz / 7,1 W	Part No. 286 95	Part No. 286 96	Part No. 286 97	Part No. 286 98
16 set screws with nuts and washers ¹⁾	Part No. 839 13	Part No. 839 13	2 x Part No. 839 13	2 x Part No. 839 13

1) For dimensions E x F see table "Connections for ISO-F"

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