



VACUUM VALVES 2016

VACUUM VALVES 2016



Page	
4	Main applications
6	Valve series according to vacuum levels
8	Valve series according to nominal diameters
9	Quality certification, CAD drawings
10	Company profile
12	Ordering information

A Page Series Gate valves, pendulum valves

14	01.0	Mini UHV gate valve	universal application
22	01.2	Mini vacuum gate valve	low-cost gate valve in small diameters
26	08	Insertable gate valve	thin valve for direct integration between DIN flanges
30	09	HV gate valve	for very contaminating processes
36	10	UHV gate valve	the standard for UHV applications, free of lubricants
44	11	HV gate valve	low-cost bellows sealed valve
52	12	Vacuum gate valve	the standard for vacuum applications
58	14.1	HV gate valve	the standard for HV applications DN 63–320
66	14.0	HV gate valve	the standard for HV applications DN 400
72	15	Low particle gate valve	for vacuum systems requiring extremely low particle count
80	16.2	Pendulum valve	for corrosive processes, low particle count
86	16.8	Large pendulum valve	for coating and FPD production systems
90	17	HV gate valve with protective ring	for contaminating processes, with gas purge port
98	19	Large gate valves	from DN 400 mm (16") diameter
104	20	Vatterfly valve	compact alternative to gate valves
110	48	All-metal gate valve	for extreme UHV or aggressive media

B Page Series Control valves

118	61.2	Butterfly valve control system	for pressure control, integrated controller
122	61.5	Butterfly valve control system	for pressure control and isolation, integrated controller
126	64	Gate valve control system	for pressure control and isolation, integrated controller
134	65.0	Pendulum valve control system	for pressure control and isolation, integrated controller
140	65.2	Pendulum valve control system	for pressure control and isolation, extended control range
144	95	Combo control valve	control valve and isolation valve in one body
146		Pressure controllers for valves	

C Page Series Transfer valves and doors for SEMI

150	02/03	Transfer valve/insert MONOVAT	for 200 / 300 / 450 mm wafers
156	04/05	Transfer valve/insert L-MOTION	for corrosive semiconductor processes
160	07.6	Door L-VAT	for load lock chamber isolation on the atmospheric side

D Page Series Transfer valves and doors for FPD and PV

162	02.4	Large transfer valve MONOVAT	for FPD production systems
164	02.7	Roll-to-Roll transfer valve MONOVAT	for web/foil coating systems
166	06.0	Large transfer valve XL-VAT	for FPD production systems
168	06.6	Large transfer valve SolVAT	for PV and large coating systems
170	06.8	Large transfer valve FlapVAT	for PV and large coating systems
172	07.5/8	Large door L-VAT	for FPD and PV production systems

E Page Series Angle valves, diaphragm valves

178	22	Diaphragm valve	for venting and rough metering
180	24	Vacuum angle valve	with shaft feedthrough
182	26	HV angle valve	with bellows
192	28	UHV angle valve	for most demanding applications
196	29	Angle valve with soft-pump function	for less turbulences, particles and condensation
202	25	HV cylinder valve	for harsh process environments
206	54	All-metal angle valve	«Easy close», maintenance-free
208	57	All-metal angle valve	very long lifetime
214	59	All-metal variable leak valve	for accurate gas metering

F Page Series Special valves for accelerators/synchrotrons

216	47	RF all-metal gate valve	sector valve with RF bridge or waveguide valve
222	75	Fast closing valve	closes vacuum-tight in a few milliseconds
226	77	Fast closing shutter	closes to a small leak in a few milliseconds, all-metal design
230	77	Controller	for fast closing system
232	79	Beam stopper	for integration into beam lines, all-metal design

G Page Series Special valves for gases

234	01.0	Gate valves for gas analysis	for pressure reduction of the process gas
236	27	Angle valve for chemistry	for aggressive and corrosive gases
238	62	Control angle valve	for high temperatures and high pressures
239	66.0	Control angle valve for chemistry	for aggressive and corrosive gases
240	66.3	Control angle valve for chemistry	for aggressive and corrosive gases
241	67	Symmetrical control system	for symmetrical gas glows

H Page Series Flange connections

242	31	ISO-KF	small flange components, soft-start throttle
252	32	ISO-K, ISO-F	clamp flange components
260	33	CF	Conflat components
268	35	VATSEAL	metal seal for any shape of flange openings

I Page

270	Heaters	to reduce deposition and pump-down times
271	Coatings	to reduce corrosion from aggressive processes
272	Multi-valve modules	for direct installation into the customer system, saves space and cost

274	Glossary
285	Vacuum levels
286	Materials
287	Conversion tables
288	Trade marks

A



B



C



D



E



F



G



H



I



A Gate valves, pendulum valves

Series	Vacuum level	Main applications	Page
01.0	UHV	General purpose valve for isolation in UHV or other demanding applications.	14
01.2	Vacuum	General purpose valve for isolation in vacuum applications.	22
08	Vacuum	General purpose valve for isolation in vacuum applications where space or design constraints prevent the use of standard vacuum flanges.	26
09	HV	Valve for demanding pump isolation applications. Especially suited to applications with high levels of process byproduct in the gas stream.	30
10	UHV	The standard valve for UHV isolation applications in research and industry.	36
11	HV	General purpose valve for isolation in high vacuum systems. Especially suited to pump isolation.	44
12	Vacuum	The standard valve for vacuum isolation applications in research and industry.	52
14	HV	General purpose valve for isolation in high or rough vacuum applications. Especially suited to industrial processes.	58
15	Vacuum, HV, UHV	Isolation valve for extremely particle and shock sensitive vacuum systems.	72
16.2	HV	Applications requiring a compact design. Especially suited to demanding corrosive processes.	80
16.8	HV	Applications requiring a compact design in larger DN sizes. Especially suited to large coating and FPD production systems.	86
17	HV	Isolation valve for contaminating processes.	90
19	Vacuum, HV, UHV	Isolation valve for research and industrial applications requiring large DN sizes. Especially suited to space simulation systems.	98
20.0/20.2	UHV	Compact isolation valve for clean processes.	104
20.3/20.4	HV	Compact isolation valve for contaminating and aggressive processes.	106
48	XHV	Isolation valve for vacuum applications in extreme UHV, high temperature or aggressive media.	110

B Control valves

Series	Vacuum level	Main applications	Page
61.2	HV	Downstream pressure control valve for SEMI, FPD, PV, SOLAR and industrial processes. Optimal for fast and demanding processes, e. g. CVD.	118
61.5	HV	Downstream pressure control and isolation valve for SEMI, FPD, PV, SOLAR and industrial processes. Optimal for fast and demanding processes, e. g. CVD.	122
64.2	HV	Control and isolation valve for SEMI, FPD and industrial processes. Optimal for sputtering and etching processes.	126
65.0/65.2	HV	Downstream pressure control and isolation valve for SEMI and FPD processes. Optimal for corrosive etching and cleaning processes.	134

C Transfer valves and doors for SEMI

Series	Vacuum level	Main applications	Page
02.2/03.2	HV	Load lock and process chamber isolation in semiconductor production systems for 200, 300 and 450 mm wafers.	150
04.3/05.3	HV	Transfer and process chamber isolation in semiconductor production systems for 200, 300 and 450 mm wafers. Corrosive processes such as etching and CVD. HB-LED manufacturing.	156
07.6		Load lock chamber isolation on the atmospheric side of semiconductor production systems for 200, 300 and 450 mm wafers.	160

D Transfer valves and doors for FPD and PV

Series	Vacuum level	Main applications	Page
02.4	Vacuum	FPD production systems up to generation 6. Suitable for use in high vacuum environment, e. g. in vapor deposition systems for organic materials.	162
02.7	Vacuum	Web/foil coating systems.	164
06.0	Vacuum	FPD production systems up to generation 11.	166
06.6	Vacuum	PV and large coating systems.	168
06.8	Vacuum	PV and large coating systems.	170
07.5/07.8		FPD and PV production systems.	172

E Angle valves, diaphragm valves

Series	Vacuum level	Main applications	Page
22	Vacuum	For roughing/backing line isolation and rough metering of gases and liquids.	178
24	Vacuum	For pumping and venting of vacuum systems with large gas flows.	180
26	HV	For pumping and venting of HV systems.	182
26	HV	For pumping and venting of HV systems where no compressed air is available.	190
28	UHV	For pumping and venting of UHV systems when an extremely low outgassing rate is important. Suitable for most corrosive gases.	192
29	Vacuum, HV	For pumping and venting of HV systems when few turbulences, particles, substrate movements and condensation are important.	196
25	HV	For pumping and venting of HV systems when maximum conductance is important. For harsh process environments (high resistance to corrosion and fluor).	202
54	XHV	For vacuum processes with extreme UHV requirements.	206
57	XHV	For vacuum processes with extreme UHV requirements and/or when using aggressive media.	208
59	XHV	Gas inlet valve for smallest gas flows to control the process pressure.	214

F Special valves for accelerators and synchrotrons

Series	Vacuum level	Main applications	Page
47	XHV	Sector valve for storage rings in accelerators and synchrotrons. Isolation valve in microwave transmission lines.	216
75/77	HV	To preserve the vacuum in accelerators and storage rings in case of an air inrush.	222
79	HV	Beam stopper for use in multiple applications, e. g. photon stopper.	232

G Special valves for gases

Series	Vacuum level	Main applications	Page
01.0	UHV	For pressure reduction of the process gas and for analysis of the residual gases at base pressure with the open valve.	234
27	HV	For processes with aggressive and corrosive gases.	236
62	HV	Pressure control and isolation valve for processes with high temperatures and high pressures (e. g. SEMI, MOCVD).	238
66.0/66.3	HV	For processes with aggressive and corrosive gases.	239
67	HV	Downstream pressure control and isolation valve for SEMI and FPD processes if symmetrical gas flows are required. Optimal for demanding processes (e. g. uniformity).	241

Gate valves, transfer valves (free opening)

Vacuum

Valve series:	01.2	02.4 02.7	06.0 06.6	06.8	08	12	15.0	19.0
Seal, feedthrough:								
	FKM (Viton®)	FKM (Viton®)	FKM (Viton®)	FKM (Viton®)	FKM (Viton®)	FKM (Viton®)	FKM (Viton®)	FKM (Viton®)
	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar	$> 1 \cdot 10^{-7}$ mbar
Actuator:	H/P	P	P	P	H/P	H/P	P	P

HV (high vacuum)

Valve series:	02.2 03.2 02.4	04.3 05.3	09	11	14.0/14.1 64.0 16.8	15.1	16.2	17.2	19.1
Seal, feedthrough:									
	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows	FKM (Viton®) Bellows
	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar	$> 1 \cdot 10^{-8}$ mbar
Actuator:	P	P	H/P	H/P	H/P ³⁾ P ⁴⁾	P	P	H/P	P

UHV (ultra high vacuum)

Valve series:	01.0 17.4	10	15.2	19.2
Seal, feedthrough:				
	FKM (Viton®) Metal Bellows	FKM (Viton®) Metal Bellows	FKM (Viton®) Metal Bellows	FKM (Viton®) Metal Bellows
	$> 1 \cdot 10^{-10}$ mbar	$> 1 \cdot 10^{-10}$ mbar	$> 1 \cdot 10^{-10}$ mbar	$> 1 \cdot 10^{-10}$ mbar
Actuator:	H/P	H/P	P	P

XHV (extreme UHV)

Valve series:	47	48
Seal, feedthrough:		
	Metal VATRING Bellows	Metal VATRING Bellows
	$< 10^{-10}$ mbar	$< 10^{-10}$ mbar
Actuator:	P	H/P

Angle/inline valves Diaphragm valves Vatfly valves	Control valves
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22 H	24 29 ¹⁾ H/P	
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¹⁾ Series 29, DN 100–160

20.3 20.4 P	25 P	26 29 ²⁾ H/P/EM ⁵⁾ P ⁶⁾	61.2 61.5 M	64.2 M	65.0 M	65.2 M	
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²⁾ Series 29, DN 25–80

³⁾ Series 14.0, 14.1, 64.0

⁴⁾ Series 16.8

⁵⁾ Series 26

⁶⁾ Series 29

20.0 20.2 H	28 H/P	
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54 H	57 H/P	59 H/M	
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H Manual actuator
P Pneumatic actuator
M Motor
EM Electromagnetic actuator

Valve series according to nominal diameters



Nominal diameter		Gate valves (free, circular passage) Flap valves linear pendulum		Angle valves	Butterfly valves Diaphragm valves	Control valves
mm	inch					
		Valve series				
10	$\frac{3}{8}$			24, 26, 57		
16	$\frac{5}{8}$	01.2, 48		24, 25, 26, 27, 28, 54, 57, 59	22	66.0
25	1	01.0, 01.2		24, 25, 26, 27, 29	22	61.2, 66.0
40	1½	01.0, 01.2, 17, 48, 75, 77		24, 25, 26, 27, 28, 29, 54, 57	22	61.2, 61.5, 66.0, 66.3
50	2	01.0, 01.2, 08, 09, 17		24, 26, 29		61.2, 61.5, 66.0, 66.3
63	2½	08, 09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75, 77, 79	16.2	24, 26, 27, 28, 29, 54, 57	20.0, 20.2, 20.3, 20.4	61.2, 61.5, 64.2, 66.3
80	3	08, 09, 10, 11, 12, 14.1		24, 26, 29	20.3, 20.4	61.2, 61.5, 64.2
100	4	08, 09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75, 77, 79	16.2	24, 26, 27, 29, 57	20.0, 20.2, 20.3, 20.4	61.2, 61.5, 62, 64.2, 65.0, 66.3
160	6	09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75, 77, 79	16.2	24, 26, 27, 29, 57	20.0, 20.2, 20.3, 20.4	61.2, 64.2, 65.0
200	8	09, 10, 11, 12, 14.1, 15, 17, 47, 48, 75	16.2	24	20.3, 20.4	61.2, 64.2, 65.0, 65.2
250	10	09, 10, 11, 12, 14.1, 15, 17, 48	16.2	24		61.2, 64.2, 65.0, 65.2
320	12	10, 11, 12, 14.1, 17, 48	16.2			64.2, 65.0, 67
350	14		16.2			64.2, 65.0, 67
400	16	14.0, 19, 64.0	16.2, 16.8			64.2, 65.0, 67
450	18					67
500	20	19	16.2, 16.8			
630	25	19				
800	32	19				
900	36	19				
1000	40	19				
1250	50	19				
1600	63	19				
2000	78	19				

Sizes for valves with rectangular openings see

section C: series 02.2/03.2, 04.3/05.3, 07.6 pages 150–161

section D: series 02.4, 02.7, 06.0, 06.6, 06.8, 07.5, 07.8 pages 162–177

Other sizes on request

Quality certification

ISO 9001:2008, ISO 14001:2004

VAT maintains a quality management system according to ISO 9001:2008 and an environmental management system according to ISO 14001:2004. Both systems are regularly audited and certified by the SQS (Swiss Commission for Quality and Management Systems). The current certificates may be downloaded from our website www.vatvalve.com/About us/Promise of quality/Quality.

EC Declaration of Incorporation and Conformity

VAT products are in conformity with the effective EC guidelines. A Declaration of Incorporation and Conformity is supplied with the relevant product on customer request.

Inspection certificates

All valves are tested according to standard inspection procedures. A written, individual inspection certificate (Inspection Plan and Certificate according to EN10204 2.2) can be supplied as an option.

Special quality documents

Declarations of compliance according to EN10204 2.1 or customer specified quality documents, e. g. for materials, weldings, bake-outs, etc. are supplied on request according to the agreed specifications.

Acceptance tests

of our products and other audits at our manufacturing base in Haag/Switzerland are always possible upon agreement and welcome.

CAD drawings

can be downloaded from our website
www.vatvalve.com/Products/Catalog/ ... (select product) ... /Show/ ...
 (select product) ... /Downloads
 in the following formats:

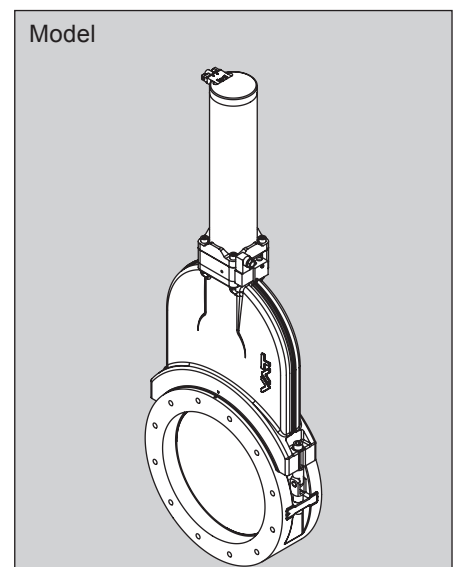
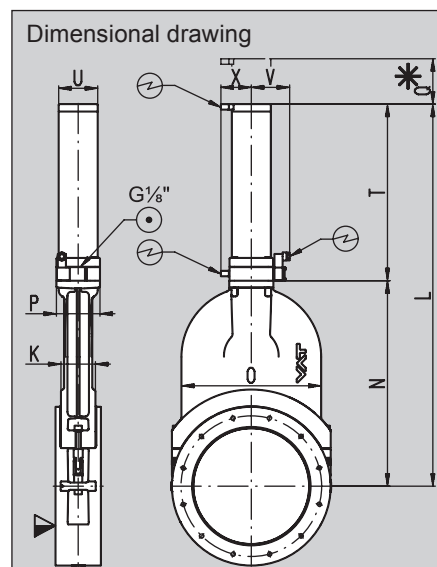
3D: STEP AP 203
 2D: PDF

Further formats can be supplied on request.

Important!

In order to ensure an optimum data exchange we ask you to let us know your current CAD system data when you request dimensional drawings or models.

Example:
 series 12.1, DN 250,
 with pneumatic actuator,
 12148-PA44



Ordering number:
 Product-dimensional drawing/model

e. g. 12148-PA44-dimensional drawing

e. g. 12148-PA44-model

INNOVATION



Worldwide leader in vacuum valve technology

More than 1000 employees deal with nothing but vacuum valves. The entire development and a major part of the manufacturing and assembly are based at the headquarter in Switzerland.

The patented innovations include

- VATLOCK mechanism for gate valves
- VATRING sealing element for all-metal valves
- MONOVAT configurations for particle-free valves
- L-MOTION valves

ENGINEERING



7 specialized product groups

with designers and product managers for

- designing customer specified valves
- continuous improvement of standard valves

are assisted by 4 valve testing labs and an electronics lab. Fundamental research takes place in a central R&D department.



PARTS MANUFACTURING



Industrial manufacturing according to ISO 9001

Critical parts are manufactured by VAT, others are purchased from qualified and proven suppliers all over the world.

VAT has 3 production facilities located in Switzerland, Romania and Malaysia. They include

- specialized production cells
- 26 000 m² production area
- FCKW-free cleaning
- 3D control



VALVE ASSEMBLY INSPECTION



Our valves are

- assembled in the cleanroom
- function tested
- leak-tested

The employee in charge verifies with his signature that the product has passed all the tests. All important test data is logged.

We welcome customers to attend final acceptance tests and to qualify our quality assurance system.

GLOBAL SUPPORT



Worldwide customer support

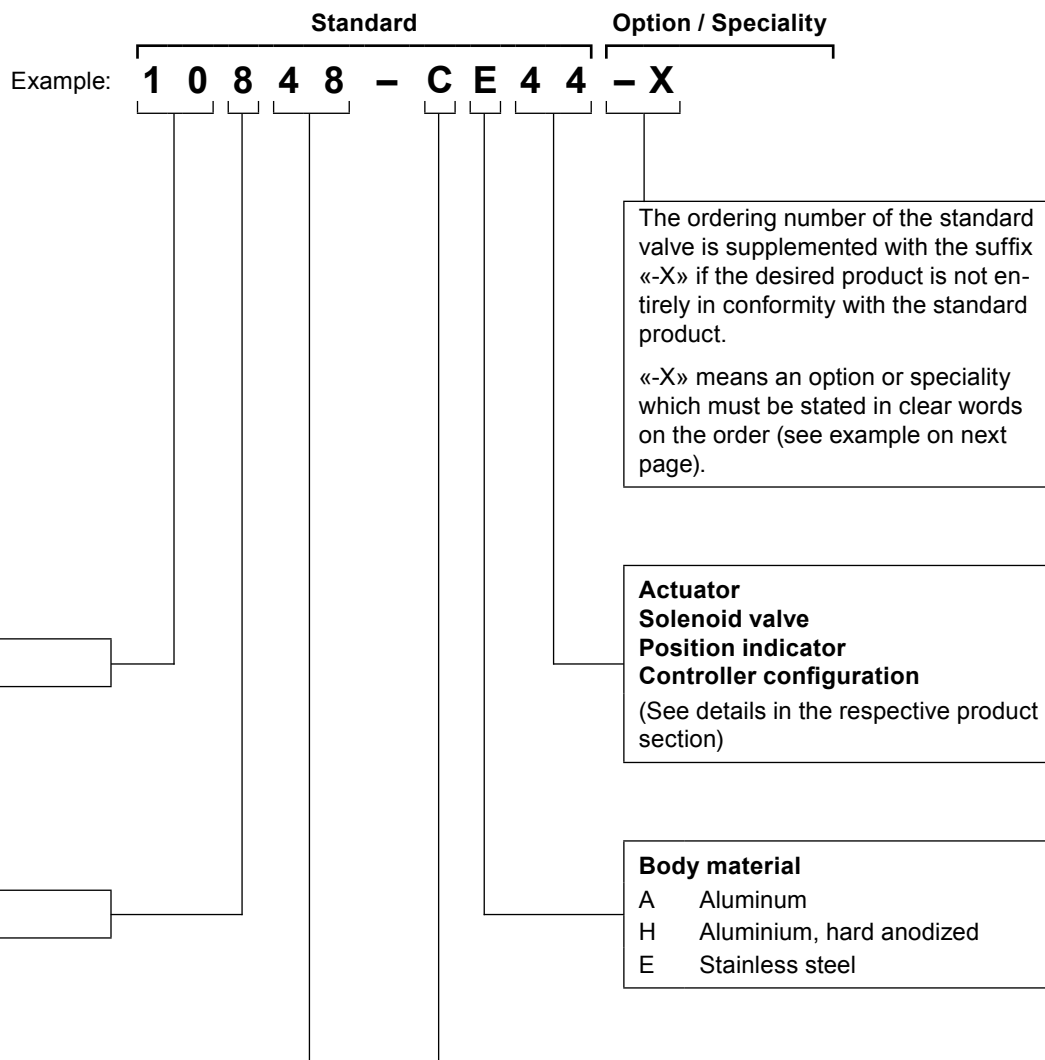
- VAT service centers in America, Asia, Europe
- VAT subsidiaries in Benelux, England, France, Germany, China, Japan, Korea, Singapore, Taiwan, USA
- Representatives in many other countries

Contact addresses: on back cover of the catalog or www.vatvalve.com

For further information we would like to send you our brochure «**VAT Leader in Vacuum Valves**». Or even better, come and see us in Switzerland to get an impression of our company on a **company tour**.

Ordering number

The ordering number of VAT products is composed as follows:



Nominal diameter

Code	mm	inch	Code	mm	inch	Code	mm	inch
20	10	$\frac{3}{8}$	39	88	$3\frac{1}{2}$	52	400	16
24	16	$\frac{5}{8}$	40	100	4	54	500	20
28	25	1	44	160	6	56	630	25
32	40	$1\frac{1}{2}$	46	200	8	58	800	32
34	50	2	48	250	10	59	900	36
36	63	$2\frac{1}{2}$	50	320	12	60	1000	40
38	80	3	51	350	14	62	1250	50

Series 02.2/03.2, 04.3/05.3, 07.6 (SEMI):
see pages 150–161

Series 02.4, 02.7, 06.0, 06.6, 06.8, 07.5, 07.8 (FPD/PV):
code on request

Flange type / Product type

A	ASA	N	ISO-F
B	ISO-KF «quick»		(double number of holes)
C	CF-F (fixed flange)	P	ISO-F
D	DIN	Q	ISO-K
E	ISO-KF «claw»	R	Weld neck
F	DIN centering ring	T	ASA-LP (ANSI)
G	CF-R (rotatable flange)	U	CF-F (UNF threads)
J	JIS	X	Customer specified flange
K	ISO-KF	Z	Rectangular flange

Series 02.2/03.2, 04.3/05.3, 07.6 (SEMI):
see pages 150–161

Series 02.4, 02.7, 06.0, 06.6, 06.8, 07.5, 07.8 (FPD/PV):
code on request

Ordering procedure

Valve selection

1. Select the suitable product with the help of the following information:
 - Table of contents, pages 2–3
 - Main applications, pages 4–5
 - Valve series according to vacuum levels, pages 6–7
 - Valve series according to nominal diameters, page 8
2. Check the technical data of the selected product.
3. Select the ordering number, specify «-X» if applicable.

Ordering examples

Standard valve

Ordering text UHV gate valve, solenoid valve 24 VDC
 Ordering number **10846-CE44**

Valve with option/speciality

Ordering text UHV gate valve, solenoid valve 200 V/60 Hz,
 position indicator for 200 °C, special flanges
 Ordering number **10846-XE44-X**
 X = solenoid valve 200 V/60 Hz, position indicator for 200 °C,
 special flange according to attached drawing

Spare parts, accessories, after sales service

Please contact us.

In order to provide the best advice, we ask you to let us know the fabrication number of the product. You will find it directly on the product or on an identification plate attached to the product.

Example:



Series 01.0

Main applications

General purpose valve for isolation in UHV or other demanding applications



Ordering information

Valve with manual actuator
turning handle

DN		Ordering numbers		
mm	inch	ISO-KF	CF-F metric threads	CF-F UNF threads
25	1	01028-KE01	–	–
40	1½	01032-KE01	01032-CE01	01032-UE01
50	2	01034-KE01	–	–

with position indicator: 010 . . . E08

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
without position indicator

DN		Ordering numbers		
mm	inch	ISO-KF	CF-F metric threads	CF-F UNF threads
25	1	01028-KE11	–	–
40	1½	01032-KE11	01032-CE11	01032-UE11
50	2	01034-KE11	–	–

without solenoid valve, with position indicator: 010 . . . E21

with solenoid valve, with position indicator: 010 . . . E41 (specify control voltage)

Valve with pneumatic actuator
double acting
without solenoid valve
without position indicator

DN		Ordering numbers		
mm	inch	ISO-KF	CF-F metric threads	CF-F UNF threads
25	1	01028-KE14	–	–
40	1½	01032-KE14	01032-CE14	01032-UE14
50	2	01034-KE14	–	–

without solenoid valve, with position indicator: 010 . . . E24

with solenoid valve, with position indicator: 010 . . . E44 (specify control voltage)

Features

Body material: stainless steel

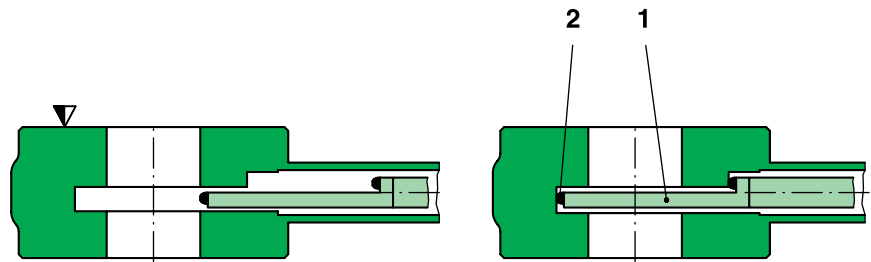
Modular design: see next page

Bellows sealed, unlubricated mechanism

Vulcanized seal (no dead volumes at the gate seal): see glossary

MONOVAT system: see glossary

Functional principle



1 Gate 2 Gate seal ▽ Valve seat side

Technical data

Leak rate	
– Valve body	$< 5 \cdot 10^{-10} \text{ mbar ls}^{-1}$
– Valve seat	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-10} \text{ mbar to 2 bar (abs)}$
Differential pressure on the gate	$\leq 2 \text{ bar}$
Differential pressure at opening	$\leq 30 \text{ mbar}$
Cycles until first service	50 000
Temperature ¹⁾	
– Valve body	$\leq 250 \text{ °C open, } \leq 200 \text{ °C closed}$
– Manual actuator	$\leq 250 \text{ °C}$
– Pneumatic actuator	$\leq 200 \text{ °C}$
– Solenoid valve	$\leq 50 \text{ °C}$
– Position indicator	$\leq 80 \text{ °C}$
Heating and cooling rate	$\leq 50 \text{ °C h}^{-1}$
Material	
– Valve body	AISI 304 (1.4301), AISI 316L (1.4435)
– Gate	AISI 304 (1.4301)
– Bellows	AISI 316L (1.4435)
Seal	
– Bonnet	metal
– Gate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any
Solenoid valve	
– Actuator with closing spring	24 VDC, 9.0 W (others on request)
– Actuator double acting	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	$\leq 250 \text{ VAC}$ $\leq 50 \text{ VDC}$
– Current	$\leq 5 \text{ A}$ $\leq 3 \text{ A}$
Valve position indication	visual (mechanical)

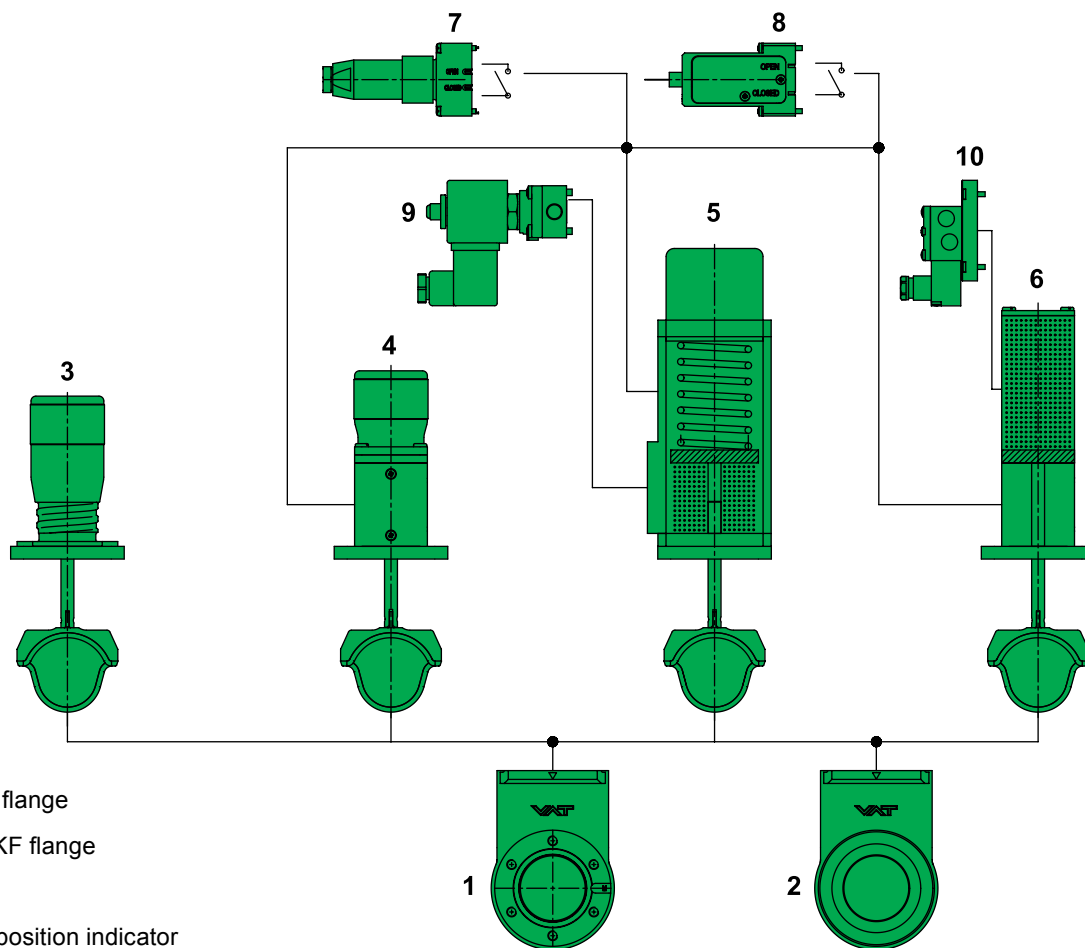
¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

					Valve with manual actuator			Valve with pneumatic actuator									
DN (nominal I. D.)		Standard flanges		Conductance (molecular flow) (depending on A-dimension and flange type)		Turns per stroke		Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time		Weight	
			ISO-KF	CF-F									w. closing spring		double acting		
mm	inch	See pages 19–21	ls ⁻¹	ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs	
25	1		38	–	5	1.5	3.3	5–7	73–102	0.1	0.004	0.7	4.2	9.26	2.2	4.85	
40	1½		160	220	5	1.5	3.3	5–7	73–102	0.1	0.004	0.7	4.2	9.26	2.2	4.85	
50	2		160	–	5	1.5	3.3	5–7	73–102	0.1	0.004	0.7	4.2	9.26	2.2	4.85	

Modular design



- 1 Valve body with CF-F flange
- 2 Valve body with ISO-KF flange
- 3 Manual actuator
- 4 Manual actuator with position indicator
- 5 Pneumatic actuator, single acting with closing spring (NC)
- 6 Pneumatic actuator, double acting, mechanically locked
- 7 Position indicator for 80 °C (standard)
- 8 Position indicator for 200 °C (option)
- 9 3/2-way solenoid valve
- 10 4/2-way solenoid valve

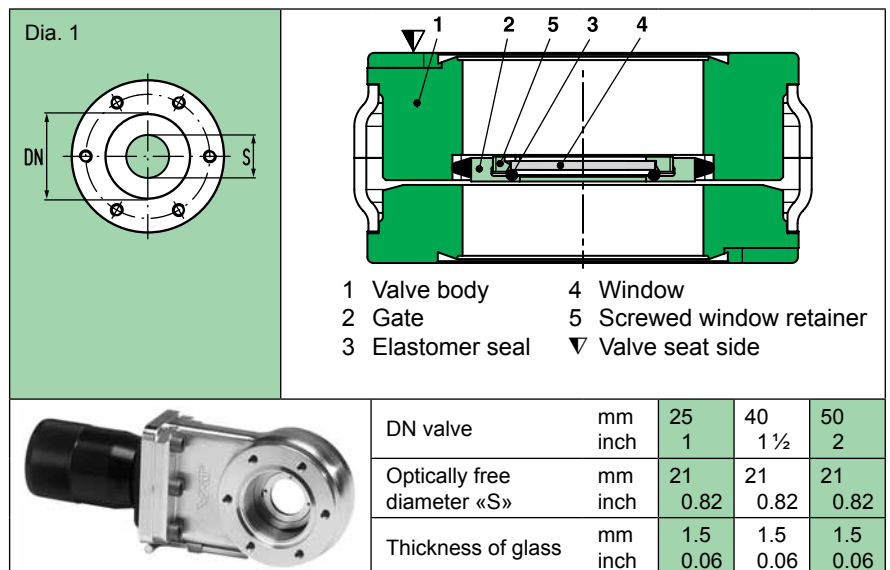
Options

Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable
- Manual actuator with position indicator
- Bakeable position indicator with connection cable 0.3 m:
actuator bakeable to max. 200 °C, contact rating: $\leq 50 \text{ VAC/DC}$, $\leq 1 \text{ A}$
- Pneumatic actuator, single acting with opening spring (NO)
- Special bellows for 1 million cycles

Valve

- Customer specified flanges
- Insert version (without body, for integration into the vacuum system)
- Other sealing materials
- With protective ring: see series 17
- Special gate for the installation of various foils or orifices
- Window in gate (Dia. 1):
window screwed into gate, window material: e. g. borosilicate, elastomer seal



Ordering information for options:

Ordering No. of valve-X (e. g. 01032-CE44-X, X = special bellows for 1 million cycles)

Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Flange connections**
for installation of the valve: see series 31 and 33

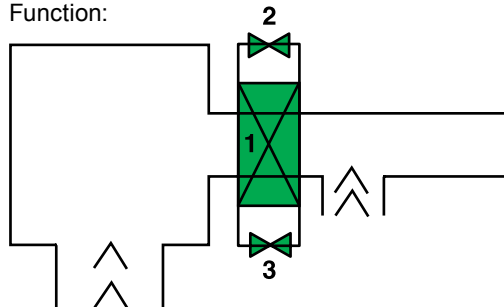
Special versions

for gas analysis



Pressure reduction of the process gas by means of two bypass valves with orifice

Function:



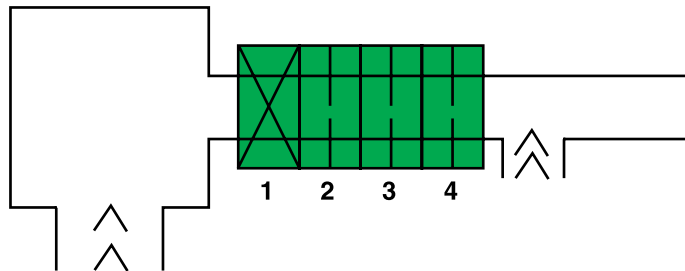
1: Vacuum-tight valve with manual or pneumatic actuator

2, 3: Bypass valves with manual or pneumatic actuator and application specific, easily exchangeable orifice



Pressure reduction of the process gas by means of maximum three gate valves with orifice

Function:



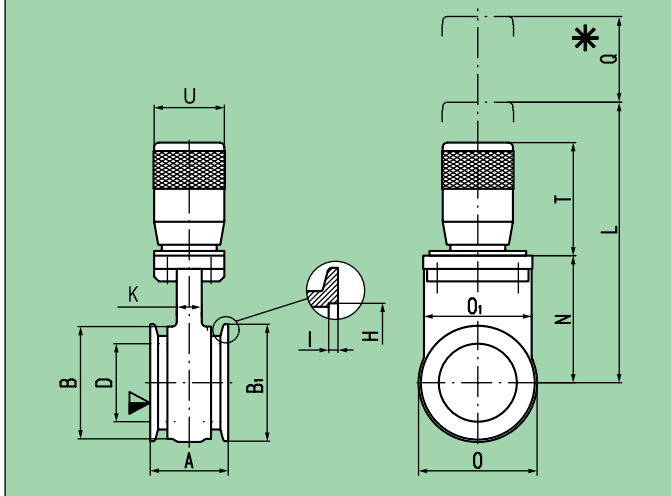
1: Vacuum-tight valve with manual or pneumatic actuator

2, 3, 4: One to three gate valves, each rotated by 90°, with manual or pneumatic actuator and application specific, easily exchangeable orifice

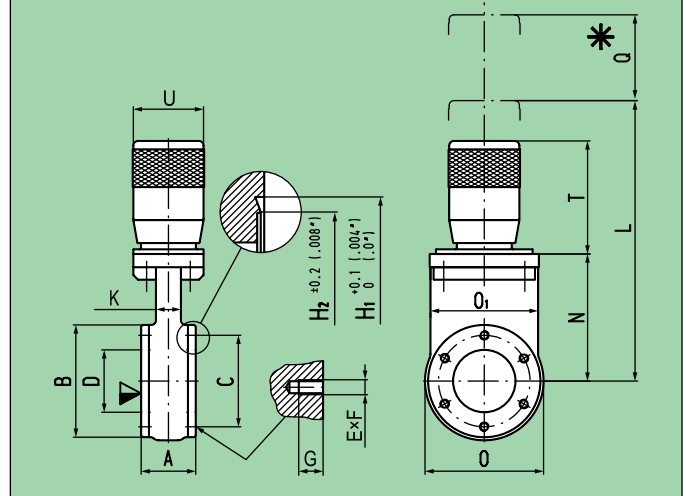
Details see pages 234 + 235.

Dimensions

Valve with manual actuator: turning handle
DN 25–50 (1"–2") ISO-KF



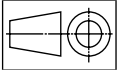
Valve with manual actuator: turning handle
DN 40 (1½") CF-F



▽ Valve seat side

* Required for dismantling

Projection E

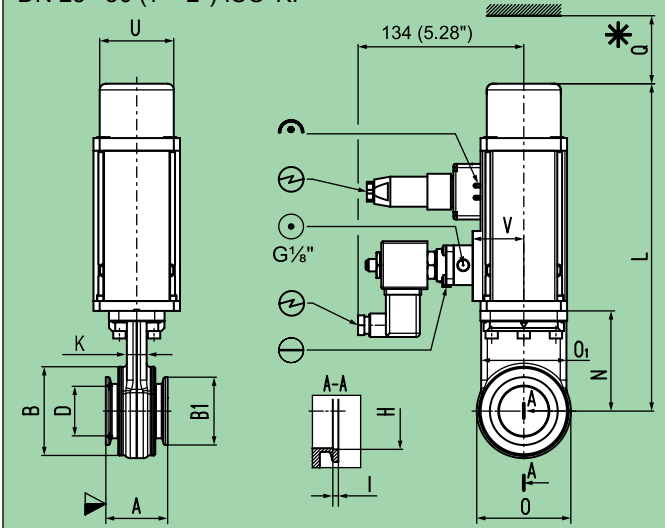


DN	mm inch	25 1	40 1½	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97
B	mm inch	72 2.83	72 2.83	72 2.83
B1	mm inch	40 1.57	55 2.16	75 2.95
D	mm inch	25 0.98	40 1.57	40 1.57
H	mm inch	26.20 1.03	41.20 1.62	52.20 2.05
I	mm inch	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63
L	mm inch	198 7.80	198 7.80	198 7.80
N	mm inch	82 3.23	82 3.23	82 3.23
O	mm inch	76 2.99	76 2.99	76 2.99
O1	mm inch	70 2.76	70 2.76	70 2.76
Q	mm inch	55 2.17	55 2.17	55 2.17
T	mm inch	73 2.87	73 2.87	73 2.87
U	mm inch	45 1.77	45 1.77	45 1.77

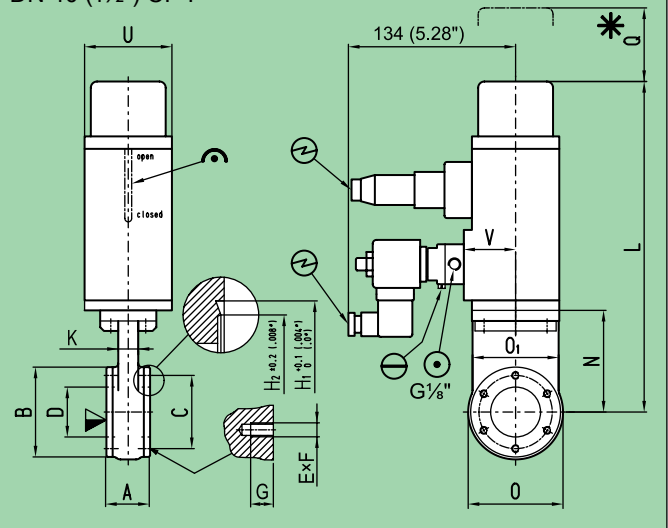
DN	mm inch	40 1½		
A	mm inch	35 1.38		
B	mm inch	72 2.83		
C	mm inch	58.70 2.31		
D	mm inch	40 1.57		
E x F		6 x M6 6 x ¼\"-28 UNF		
G	mm inch	7 0.28		
H1	mm inch	48.30 1.90		
H2	mm inch	42 1.65		
K	mm inch	16 0.63		
L	mm inch	198 7.80		
N	mm inch	82 3.23		
O	mm inch	76 2.99		
O1	mm inch	70 2.76		
Q	mm inch	55 2.17		
T	mm inch	73 2.87		
U	mm inch	45 1.77		

Dimensions

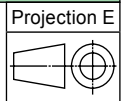
**Valve with pneumatic actuator:
single acting with closing spring (NC)**
DN 25–50 (1"–2") ISO-KF



**Valve with pneumatic actuator:
single acting with closing spring (NC)**
DN 40 (1½") CF-F



- ▼ Valve seat side ⊕ Compressed air connection ⤴ Mechanical position indication
 * Required for dismantling ⊖ Electrical connection ⤵ Emergency operation

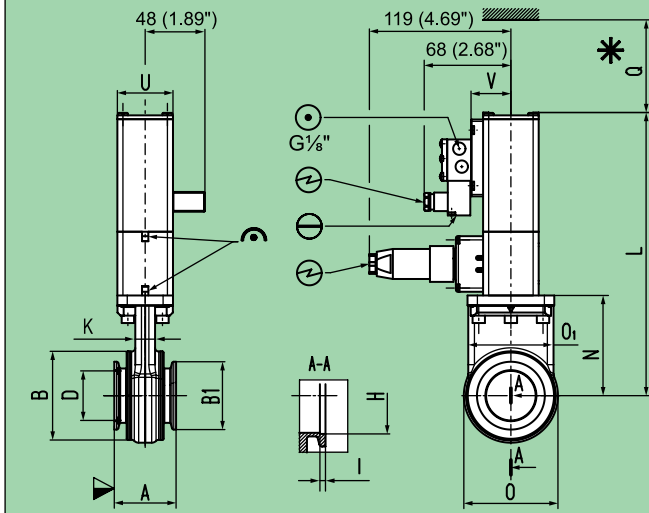


DN	mm inch	25 1	40 1½	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97
B	mm inch	72 2.83	72 2.83	72 2.83
B1	mm inch	40 1.57	55 2.16	75 2.95
D	mm inch	25 0.98	40 1.57	40 1.57
H	mm inch	26.20 1.03	41.20 1.62	52.20 2.05
I	mm inch	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63
L	mm inch	266 10.47	266 10.47	266 10.47
N	mm inch	82 3.23	82 3.23	82 3.23
O	mm inch	76 2.99	76 2.99	76 2.99
O1	mm inch	70 2.76	70 2.76	70 2.76
Q	mm inch	55 2.17	55 2.17	55 2.17
U	mm inch	45 1.77	45 1.77	45 1.77
V	mm inch	42 1.65	42 1.65	42 1.65

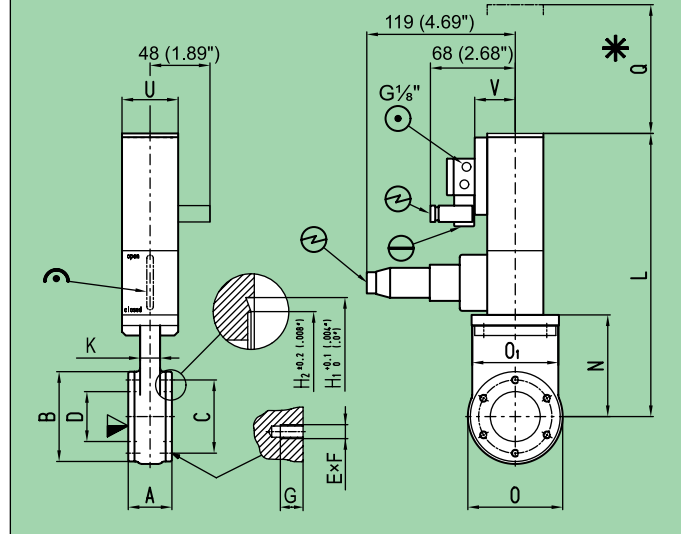
DN	mm inch	40 1½		
A	mm inch	35 1.38		
B	mm inch	72 2.83		
C	mm inch	58.70 2.31		
D	mm inch	40 1.57		
E × F		6 × M6 6 × ¼"-28 UNF		
G	mm inch	7 0.28		
H1	mm inch	48.30 1.90		
H2	mm inch	42 1.65		
K	mm inch	16 0.63		
L	mm inch	266 10.47		
N	mm inch	82 3.23		
O	mm inch	76 2.99		
O1	mm inch	70 2.76		
Q	mm inch	55 2.17		
U	mm inch	70 2.75		
V	mm inch	42 1.65		

Dimensions

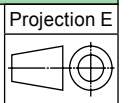
Valve with pneumatic actuator: double acting
DN 25–50 (1"–2") ISO-KF



Valve with pneumatic actuator: double acting
DN 40 (1½") CF-F



- ▽ Valve seat side ⊙ Compressed air connection ⊕ Mechanical position indication
 * Required for dismantling ⊗ Electrical connection ⊖ Emergency operation



DN	mm inch	25 1	40 1½	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97
B	mm inch	72 2.83	72 2.83	72 2.83
B1	mm inch	40 1.57	55 2.16	75 2.95
D	mm inch	25 0.98	40 1.57	40 1.57
H	mm inch	26.20 1.03	41.20 1.62	52.20 2.05
I	mm inch	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63
L	mm inch	230 9.06	230 9.06	230 9.06
N	mm inch	82 3.23	82 3.23	82 3.23
O	mm inch	76 2.99	76 2.99	76 2.99
O1	mm inch	70 2.76	70 2.76	70 2.76
Q	mm inch	55 2.17	55 2.17	55 2.17
U	mm inch	45 1.77	45 1.77	45 1.77
V	mm inch	42 1.65	42 1.65	42 1.65

DN	mm inch	40 1½		
A	mm inch	35 1.38		
B	mm inch	72 2.83		
C	mm inch	58.70 2.31		
D	mm inch	40 1.57		
E x F		6 x M6 6 x ¼"-28 UNF		
G	mm inch	7 0.28		
H1	mm inch	48.30 1.90		
H2	mm inch	42 1.65		
K	mm inch	16 0.63		
L	mm inch	230 9.06		
N	mm inch	82 3.23		
O	mm inch	76 2.99		
O1	mm inch	70 2.76		
Q	mm inch	55 2.16		
U	mm inch	45 1.77		
V	mm inch	32.50 1.28		

Series 01.2

Main applications

General purpose valve for isolation in vacuum applications



Ordering information

Valve with manual actuator
toggle lever

DN		Ordering numbers
mm	inch	ISO-KF
16	$\frac{5}{8}$	01224-KA06
25	1	01228-KA06
40	1½	01232-KA06
50	2	01234-KA06

Valve with pneumatic actuator
double acting
without solenoid valve
without position indicator

DN		Ordering numbers
mm	inch	ISO-KF
16	$\frac{5}{8}$	01224-KA14
25	1	01228-KA14
40	1½	01232-KA14
50	2	01234-KA14

without solenoid valve, with position indicator: 012 . . -KA24

with solenoid valve, with position indicator: 012 . . -KA44 (specify control voltage)

Features

Body material: aluminum

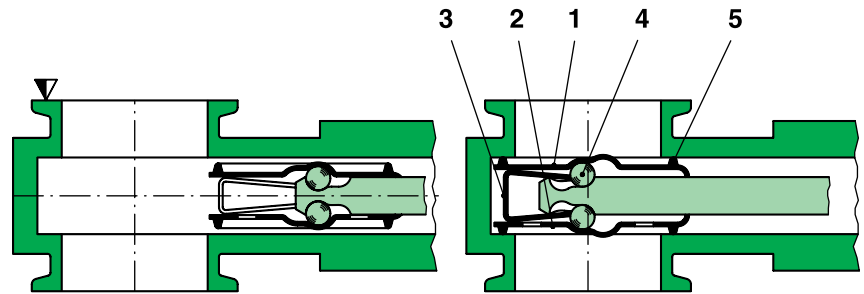
Small and leight-weight

Low cost

Vulcanized seal (no dead volumes at the gate seal): see glossary

VATLOCK system: see glossary

Functional principle



- | | | |
|-----------------|---------------|-------------------|
| 1 Gate | 3 Spring stop | 5 Gate seal |
| 2 Counter-plate | 4 Ball pairs | ▽ Valve seat side |

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-7} \text{ mbar to } 1 \text{ bar (abs)}$
Differential pressure on the gate	$\leq 1 \text{ bar}$
Differential pressure at opening	$\leq 30 \text{ mbar}$
Cycles until first service	50 000
Temperature ¹⁾	
– Valve body	$\leq 100 \text{ }^{\circ}\text{C}$
– Manual and pneumatic actuator	$\leq 80 \text{ }^{\circ}\text{C}$
– Solenoid valve	$\leq 50 \text{ }^{\circ}\text{C}$
– Position indicator	$\leq 80 \text{ }^{\circ}\text{C}$
Heating and cooling rate	$\leq 30 \text{ }^{\circ}\text{C h}^{-1}$
Material	
– Valve body	EN AW-6082 (3.2315)
– Gate	AISI 301 (1.4310)
Seal: bonnet, gate	FKM (Viton®)
Feedthrough	shaft feedthrough
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	$\leq 50 \text{ VAC / DC}$
– Current	$\leq 0.1 \text{ A}$
– Power	max. 10 W
Valve position indication	visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

				Valve with manual actuator		Valve with pneumatic actuator						
DN (nominal I. D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension)	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch		ls ⁻¹	kg	lbs	bar	psi	l	ft³	s	kg	lbs
16	⅝	See page 25	10	0.4	0.9	4.5–7	65–102	0.01	0.0004	0.8	0.8	1.8
25	1		34	0.4	0.9	4.5–7	65–102	0.03	0.001	1.1	0.8	1.8
40	1 ½		140	0.7	1.5	4.5–7	65–102	0.07	0.002	1.2	1.2	2.7
50	2		260	0.7	1.5	4.5–7	65–102	0.07	0.002	1.3	1.2	2.7

Options

Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable

Ordering information for options:

Ordering No. of valve-X
(e. g. 01232-KA44-X, X = solenoid valve for impulse actuation)

Spare parts

– Seals

on request (specify fabrication number of valve)

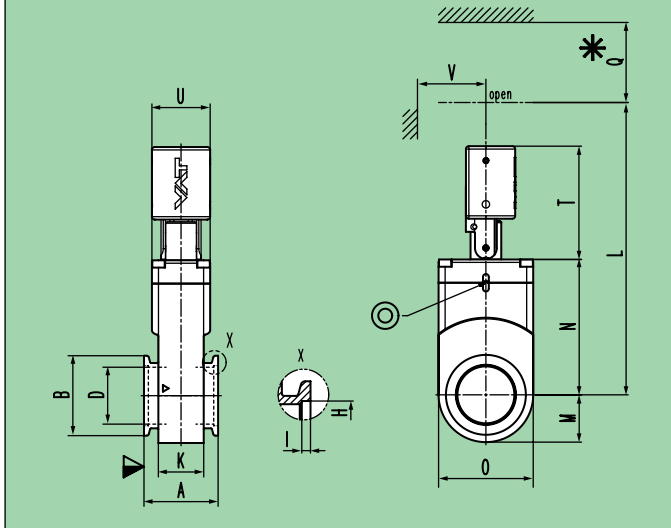
Accessories

– Flange connections

for installation of the valve: see series 31

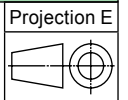
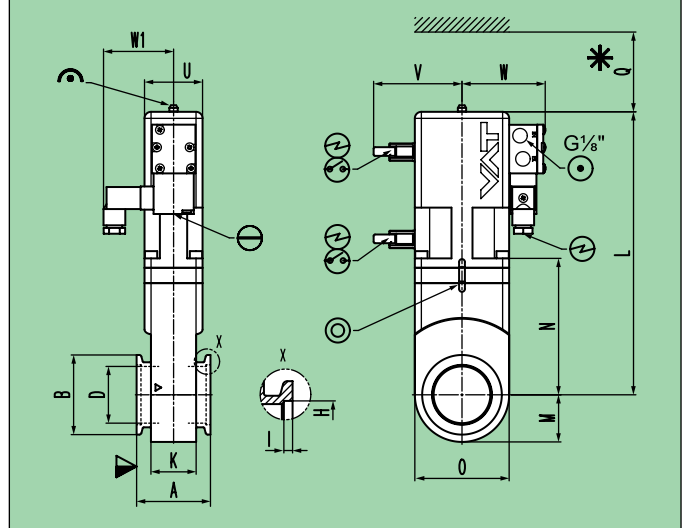
Dimensions

Valve with manual actuator: toggle lever
DN 16–50 (5/8"–2") ISO-KF



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊖ Electrical connection
- ⊙ Mechanical position indication
- ⊖ Position indicator
- ⊖ Emergency operation

Valve with pneumatic actuator: double acting
DN 16–50 (5/8"–2") ISO-KF



DN	mm inch	16 5/8	25 1	40 1 1/2	50 2
A	mm inch	40 1.57	50 1.97	51 2.01	55 2.17
B	mm inch	30 1.18	40 1.57	55 2.17	75 2.95
D	mm inch	15 0.59	24 0.94	39 1.54	49 1.93
H	mm inch	17.20 0.68	26.20 1.03	41.20 1.62	52.20 2.06
I	mm inch	3 0.12	3 0.12	3 0.12	3 0.12
K	mm inch	25 0.98	32 1.26	31 1.22	33 1.30
L	mm inch	100 3.94	139 5.47	208 8.19	240 9.45
M	mm inch	15 0.59	22 0.87	32.50 1.28	37.50 1.48
N	mm inch	39 1.55	59 2.32	93 3.66	108 4.25
O	mm inch	30 1.18	44 1.73	65 2.56	75 2.95
Q	mm inch	25 0.98	35 1.38	55 2.17	65 2.56
T	mm inch	37 1.46	50 1.97	85 3.35	93 3.67
U	mm inch	25 0.98	32 1.26	40 1.57	40 1.57
V	mm inch	30 1.18	30 1.18	50 1.97	55 2.17

DN	mm inch	16 5/8	25 1	40 1 1/2	50 2
A	mm inch	40 1.57	50 1.97	51 2.01	55 2.17
B	mm inch	30 1.18	40 1.57	55 2.17	75 2.95
D	mm inch	15 0.59	24 0.94	39 1.54	49 1.93
H	mm inch	17.20 0.68	26.20 1.03	41.20 1.62	52.20 2.06
I	mm inch	3 0.12	3 0.12	3 0.12	3 0.12
K	mm inch	25 0.98	32 1.26	31 1.22	33 1.30
L	mm inch	105 4.13	136 5.35	196 7.72	220 8.66
M	mm inch	15 0.59	22 0.87	32.50 1.28	37.50 1.48
N	mm inch	39 1.55	56 2.20	88 3.46	103 4.06
O	mm inch	30 1.18	44 1.73	65 2.56	75 2.95
Q	mm inch	25 0.98	35 1.38	55 2.17	65 2.56
U	mm inch	25 0.98	32 1.26	40 1.57	40 1.57
V	mm inch	56 2.20	61 2.40	65 2.56	65 2.56
W	mm inch	55 2.17	60 2.36	61 2.40	66 2.60
W1	mm inch	50 1.97	50 1.97	50 1.97	50 1.97

Main applications

General purpose valve for isolation in vacuum applications where space or design constraints prevent the use of standard vacuum flanges



Ordering information

Valve with manual actuator

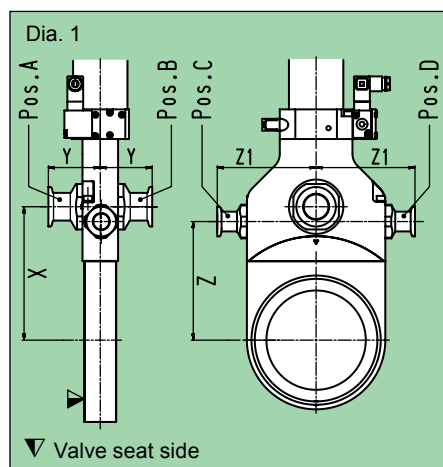
DN 50: toggle lever
DN 63–100: push rod

DN		Ordering numbers	
mm	inch	with toggle lever	with push rod
50	2	08234-FA06	–
63	2 ½	–	08136-FA03
80	3	–	08138-FA03
100	4	–	08140-FA03

Valve with pneumatic actuator double acting

DN		Ordering numbers (* specify control voltage)			
mm	inch	w/o solenoid valve w/o position indicator	w/o solenoid valve with position indicator	with solenoid valve w/o position indicator	with solenoid valve with position indicator
50	2	08234-FA14	08234-FA24	08234-FA34 *	08234-FA44 *
63	2 ½	08136-FA14	08136-FA24	08136-FA34 *	08136-FA44 *
80	3	08138-FA14	08138-FA24	08138-FA34 *	08138-FA44 *
100	4	08140-FA14	08140-FA24	08140-FA34 *	08140-FA44 *

Options



Actuator

- Other solenoid valve voltage (standard: 24 VDC)

Valve

- Other sealing materials
- Nominal diameters DN 16, 25, 40
- Ports for venting or for gauges for DN 63–100 (Dia. 1), possible in positions A, B, C and D
Recommended ports: ISO-KF 16 for DN 63, ISO-KF 25 for DN 80/100, dimensions on request
- Ports for roughing (by-pass)

Ordering information for options:

Ordering No. of valve-X (e. g. 08140-FA44-X, X = port ISO-KF 25 in position A)

Spare parts

- **Seals**
on request (specify fabrication number of valve)

Features

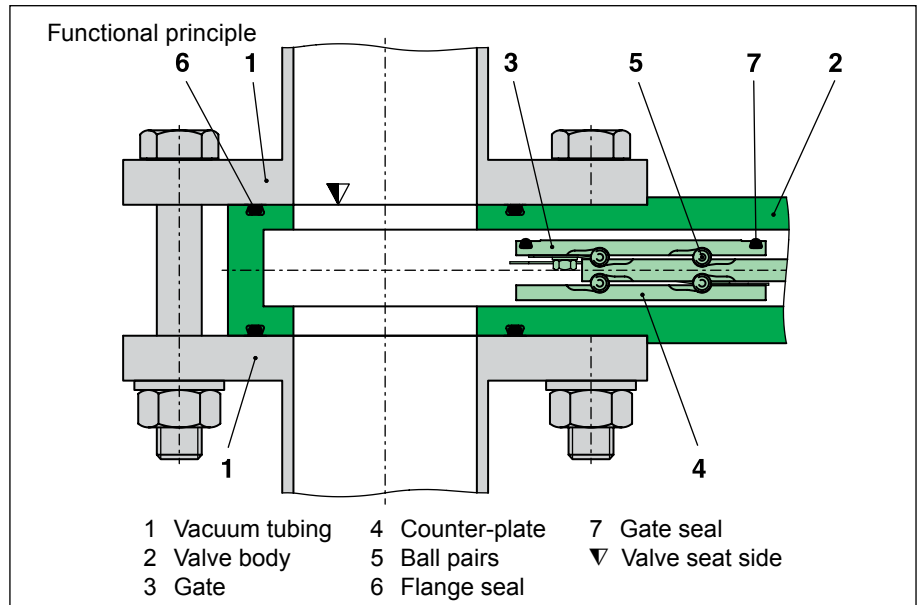
Body material: aluminum

Space saving due to direct mounting between DIN flanges or sealing surfaces

Flanges with DIN centering insert

DN 50 with vulcanized seal (no dead volumes at the gate seal): see glossary

VATLOCK configuration: see glossary



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-7} \text{ mbar to } 1.6 \text{ bar (abs)}$
Differential pressure on the gate – DN 50 / DN 63–100	$\leq 1.0 \text{ bar} / \leq 1.6 \text{ bar}$
Differential pressure at opening	$\leq 30 \text{ mbar}$
Cycles until first service – DN 50 – DN 63–100	50000 200000
Temperature ¹⁾ – Valve body DN 50 DN 63–100 – Manual and pneumatic actuator – Solenoid valve – Position indicator	$\leq 100 \text{ }^{\circ}\text{C}$ $\leq 120 \text{ }^{\circ}\text{C}$ $\leq 80 \text{ }^{\circ}\text{C}$ $\leq 50 \text{ }^{\circ}\text{C}$ $\leq 80 \text{ }^{\circ}\text{C}$
Heating and cooling rate	$\leq 30 \text{ }^{\circ}\text{C h}^{-1}$
Material – Valve body DN 50 DN 63–100 – Mechanism DN 50 DN 63–100	EN AW-6082 (3.2315) EN AW-5083 (3.3547), -6061 (3.3211) AISI 301 (1.4310) AISI 304 (1.4301)
Seal: bonnet, gate	FKM (Viton®)
Feedthrough	shaft feedthrough
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating – Voltage DN 50 DN 63–100 – Current DN 50 DN 63–100 – Power DN 50	$\leq 50 \text{ VAC/DC}$ $\leq 250 \text{ VAC}, \leq 50 \text{ VDC}$ $\leq 0.1 \text{ A}$ $\leq 2 \text{ A}, \leq 1.2 \text{ A}$ max. 10 W
Valve position indication	visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

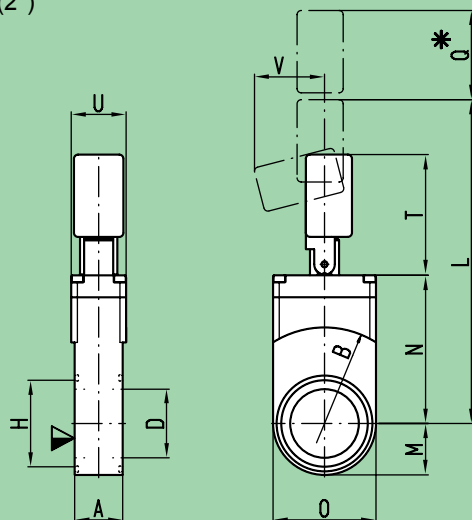
Further technical data on next page →

Continued Technical data

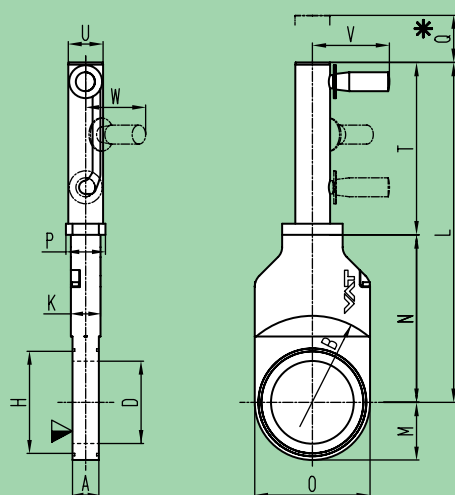
			Valve with manual actuator		Valve with pneumatic actuator						
DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension)	Weight		Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time	Weight	
mm	inch	ls ⁻¹	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
50	2	410	0.7	1.5	4.5–7	65–102	0.07	0.002	1.2	1.2	2.7
63	2½	1000	1.5	3.3	4–7	58–102	0.16	0.0056	1.5	1.5	3.3
80	3	2000	2.3	5.1	4–7	58–102	0.20	0.0071	1.7	2.3	5.1
100	4	3800	3	6.6	4–7	58–102	0.22	0.0078	2	3	6.6

Dimensions

Valve with manual actuator: toggle lever
DN 50 (2")



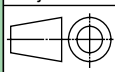
Valve with manual actuator: push rod
DN 63–100 (2½"–4")



DN	mm	50	63	80	100
	inch	2	2½	3	4
A	mm	35	32	32	32
	inch	1.38	1.26	1.26	1.26
B	mm	140	160	190	210
	inch	5.51	6.30	7.48	8.27
D	mm	50	65	80	100
	inch	1.97	2.56	3.15	3.94
H	mm	63	88	104	124
	inch	2.48	3.46	4.09	4.88
I.D. × d ¹⁾		63.09 × 3.53 2.48 × 0.139	88.49 × 3.53 3.49 × 0.139	104.37 × 3.53 4.11 × 0.139	123.42 × 3.53 4.86 × 0.139
K	mm	–	36	36	36
	inch	–	1.42	1.42	1.42
L	mm	240	329.50	363	413
	inch	9.45	12.97	14.29	16.26
M	mm	37.50	50	59	70
	inch	1.48	1.97	2.32	2.76
N	mm	108	155.50	173.50	203.50
	inch	4.25	6.12	6.83	8.01
O	mm	75	100	118	140
	inch	2.95	3.94	4.65	5.51
P	mm	–	48	48	48
	inch	–	1.89	1.89	1.89
Q	mm	65	25	25	25
	inch	2.56	0.98	0.98	0.98
T	mm	93	174	189.50	209.50
	inch	3.67	6.85	7.46	8.25
U	mm	40	43	43	43
	inch	1.57	1.69	1.69	1.69
V	mm	55	94	94	94
	inch	2.17	3.70	3.70	3.70
W	mm	–	75	75	75
	inch	–	2.95	2.95	2.95

¹⁾ Dimensions of flange seal

Projection E

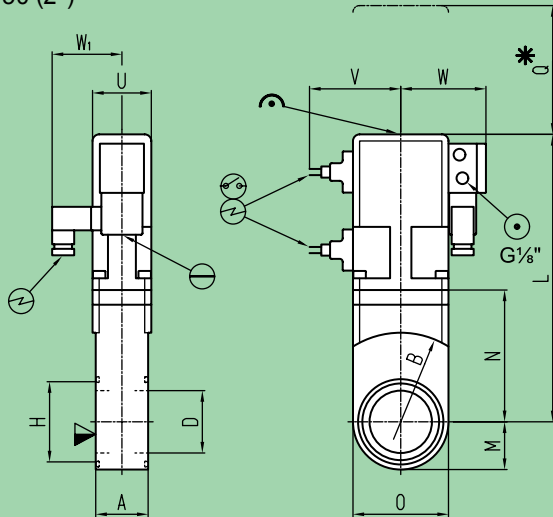


▼ Valve seat side

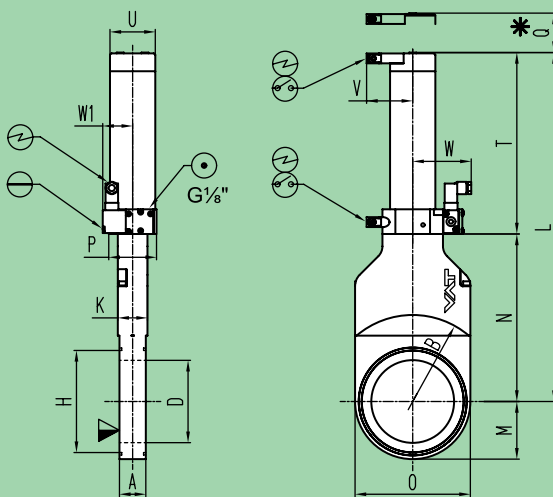
* Required for dismantling

Dimensions

Valve with manual actuator: double acting
DN 50 (2")

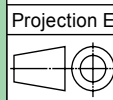


Valve with manual actuator: double acting
DN 63–100 (2½"–4")



DN	mm inch	50 2	63 2½	80 3	100 4
A	mm inch	35 1.38	32 1.26	32 1.26	32 1.26
B	mm inch	140 5.51	160 6.30	190 7.48	210 8.27
D	mm inch	50 1.97	65 2.56	80 3.15	100 3.94
H	mm inch	63 2.48	88 3.46	104 4.09	124 4.88
I. D. × d ¹⁾		63.09×3.53 2.48×0.139	88.49×3.53 3.49×0.139	104.37×3.53 4.11×0.139	123.42×3.53 4.86×0.139
K	mm inch	–	36 1.42	36 1.42	36 1.42
L	mm inch	220 8.66	341.50 13.44	375 14.76	425 16.73
M	mm inch	37.50 1.48	50 1.97	59 2.32	70 2.76
N	mm inch	103 4.06	155.50 6.12	173.50 6.83	203.50 8.01
O	mm inch	75 2.95	100 3.94	118 4.65	140 5.51
P	mm inch	–	58 2.28	58 2.28	58 2.28
Q	mm inch	65 2.56	25 0.98	25 0.98	25 0.98
T	mm inch	–	186 7.32	201.50 7.93	221.50 8.72
U	mm inch	40 1.57	55 2.17	55 2.17	55 2.17
V	mm inch	65 2.56	56 2.20	56 2.20	56 2.20
W	mm inch	66 2.60	72 2.83	72 2.83	72 2.83
W1	mm inch	50 1.97	36.50 1.44	36.50 1.44	36.50 1.44

¹⁾ Dimensions of flange seal

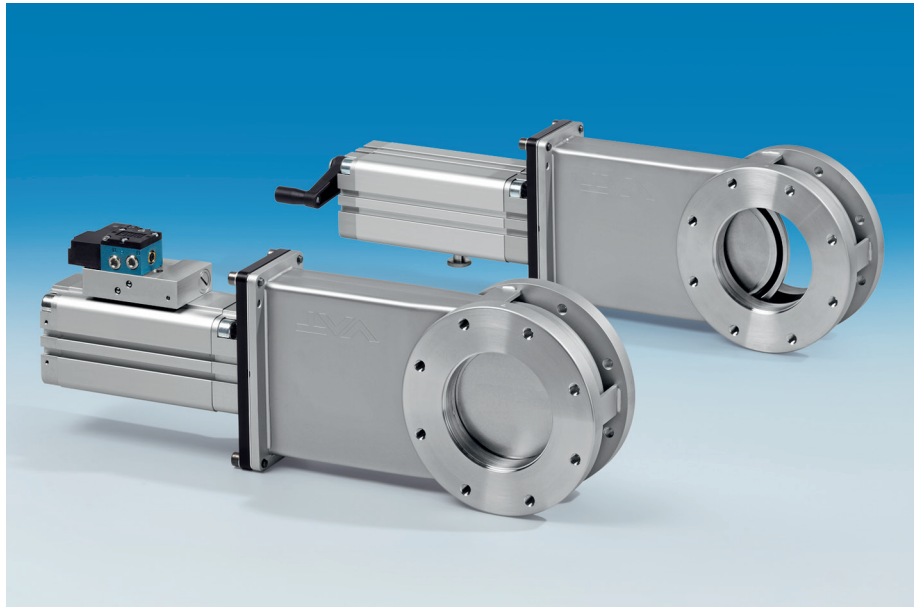


- ▽ Valve seat side
- * Required for dismantling
- ⊗ Compressed air connection
- ⊕ Electrical connection
- ⊙ Mechanical position indication
- ⊙ Position indicator
- ⊕ Emergency operation

Main applications

Valve for demanding pump isolation applications

Especially suited to applications with high levels of process byproduct in the gas stream



Ordering information

Valve with manual actuator
crank handle

DN		Ordering numbers				
mm	inch	ISO-KF ¹⁾ ISO-F ²⁾	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
50	2	09134-KE01 ¹⁾	09134-CE01	09134-UE01	—	—
63	2½	09136-PE01 ²⁾	09136-CE01	09136-UE01	09136-TE01	09136-JE01
80	3	09138-PE01 ²⁾	09138-CE01	09138-UE01	09138-TE01	09138-JE01
100	4	09140-PE01 ²⁾	09140-CE01	09140-UE01	09140-TE01	09140-JE01
160	6	09144-PE01 ²⁾	09144-CE01	09144-UE01	09144-TE01	09144-JE01
200	8	09146-PE01 ²⁾	09146-CE01	09146-UE01	09146-TE01	09146-JE01
250	10	09148-PE01 ²⁾	09148-CE01	09148-UE01	09148-TE01	09148-JE01

with position indicator: 091 . . . E08

Valve with pneumatic actuator
double acting
without solenoid valve
without position indicator

DN		Ordering numbers				
mm	inch	ISO-KF ¹⁾ ISO-F ²⁾	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
50	2	09134-KE14 ¹⁾	09134-CE14	09134-UE14	—	—
63	2½	09136-PE14 ²⁾	09136-CE14	09136-UE14	09136-TE14	09136-JE14
80	3	09138-PE14 ²⁾	09138-CE14	09138-UE14	09138-TE14	09138-JE14
100	4	09140-PE14 ²⁾	09140-CE14	09140-UE14	09140-TE14	09140-JE14
160	6	09144-PE14 ²⁾	09144-CE14	09144-UE14	09144-TE14	09144-JE14
200	8	09146-PE14 ²⁾	09146-CE14	09146-UE14	09146-TE14	09146-JE14
250	10	09148-PE14 ²⁾	09148-CE14	09148-UE14	09148-TE14	09148-JE14

without solenoid valve, with position indicator: 091 . . . E24

with solenoid valve, with position indicator: 091 . . . E44 (specify control voltage)

Features

Body material: stainless steel

With bellows

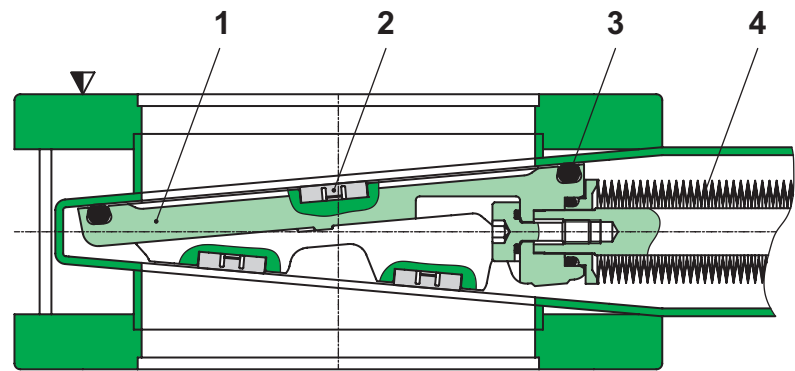
For very contaminating processes

No grease and no moving parts in the vacuum

Opening at 1 bar differential pressure possible

Very easy maintenance thanks to simple wedge design

Functional principle



- | | | |
|--------------------|-------------|-------------------|
| 1 Gate | 3 Gate seal | ▼ Valve seat side |
| 2 Sliding elements | 4 Bellows | |

Technical data

Leak rate	
– Valve body	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
– Valve seat	$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-8} \text{ mbar to } 1.2 \text{ bar (abs)}$
Differential pressure on the gate	$\leq 1.2 \text{ bar}$
Differential pressure at opening	$\leq 1 \text{ bar}$
Cycles until first service ¹⁾	5000
Bellows cycles ¹⁾	100000
Temperature ²⁾	
– Valve body	$\leq 150 \text{ }^{\circ}\text{C}$
– Manual and pneumatic actuator	$\leq 100 \text{ }^{\circ}\text{C}$
– Solenoid valve	$\leq 50 \text{ }^{\circ}\text{C}$
– Position indicator	$\leq 60 \text{ }^{\circ}\text{C}$
Material	
– Valve body	AISI 304 (1.4301)
– Gate	AISI 304 (1.4301)
– Bellows	AISI 633 (AM350)
Seal: bonnet, gate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	10–30 VDC
– Current	$\leq 0.5 \text{ A}$
– Power	max. 10 W

¹⁾ Depending on the process conditions shorter service intervals may be required

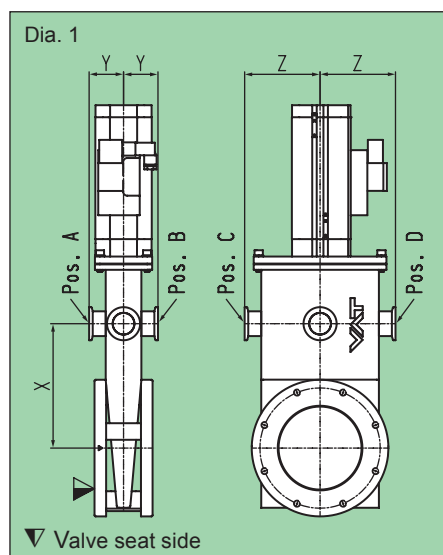
²⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

		Valve with manual actuator				Valve with pneumatic actuator							
DN (nominal I.D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator	Closing or opening time	Weight		
mm	inch		ls ⁻¹	n	kg	lbs	bar	psi	l	ft³	s	kg	lbs
50	2	See pages 34 – 35	250	22	3.4	6.8	4–7	58–102	0.08	0.003	<1.5	3.4	7.5
63	2½		600	27	5.6	12.4	4–7	58–102	0.16	0.005	<2	5.6	12.4
80	3		900	33	7	14	4–7	58–102	0.21	0.007	<2	7	15.4
100	4		1700	39	8.1	17.9	4–7	58–102	0.25	0.008	<2	7.8	17.2
160	6		5000	41	15.1	33.3	4–7	58–102	0.53	0.017	<3	15.1	33.3
200	8		on request										
250	10		on request										

Options



Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)

Valve

- Shaft feedthrough
- PTFE bellows for shaft feedthrough
- Ports for roughing (by-pass), venting or for gauges (Dia. 1),
possible in positions A, B, C and D

DN valve	mm inch	50 2	63 2 ½	80 3	100 4	160 6	200 8	250 10
Recommended port ISO-KF		25	25	25	25	25	on request	on request
X	mm inch	90 3.54	110 4.33	130 5.12	150 5.91	215 8.46		
Y	mm inch	41.50 1.63	41.50 1.63	41.50 1.63	41.50 1.63	52 2.05		
Z	mm inch	65 2.56	72.50 2.85	91 3.58	91 3.58	116 4.57		
Other ports on request								

Ordering information for options:

Ordering No. of valve-X (e. g. 09140-PE14-X, X = port ISO-KF 25 in position A)

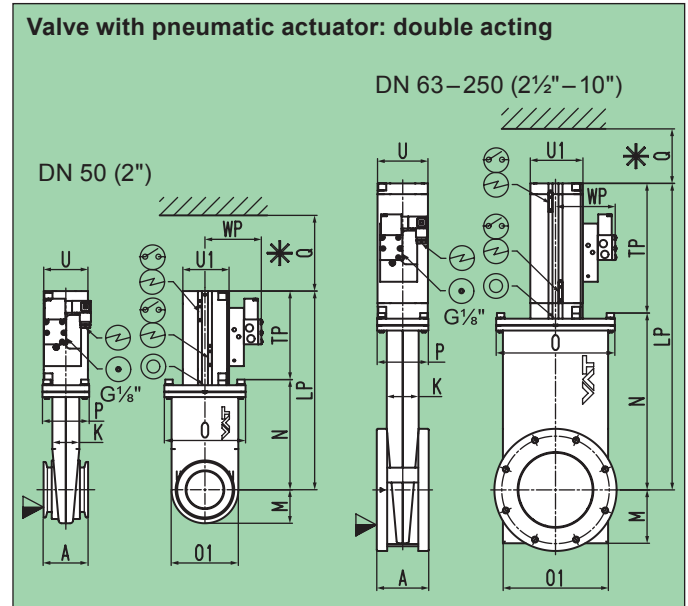
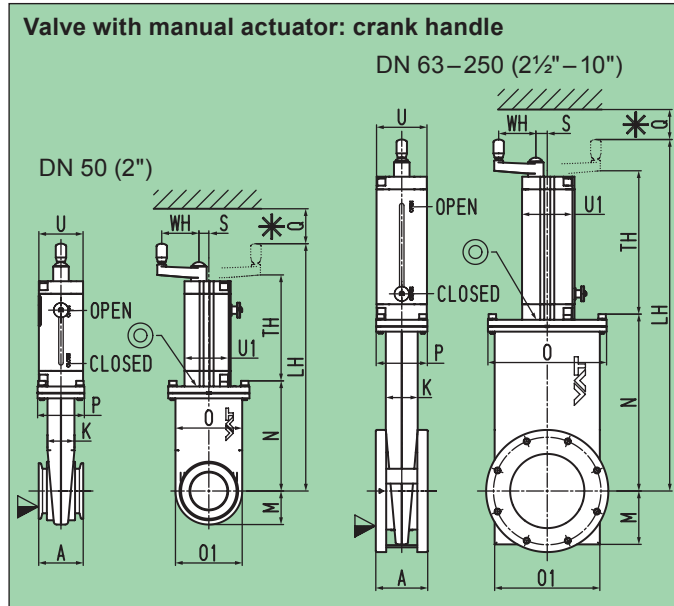
Spare parts

- **Seals**
on request (specify fabrication number of valve)

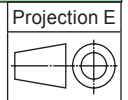
Accessories

- **Heater**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 32 and 33

Main dimensions



- ▼ Valve seat side ⊙ Compressed air connection ⊗ Position indicator
 * Required for dismantling ⊕ Electrical connection ⊖ Leak detection hole

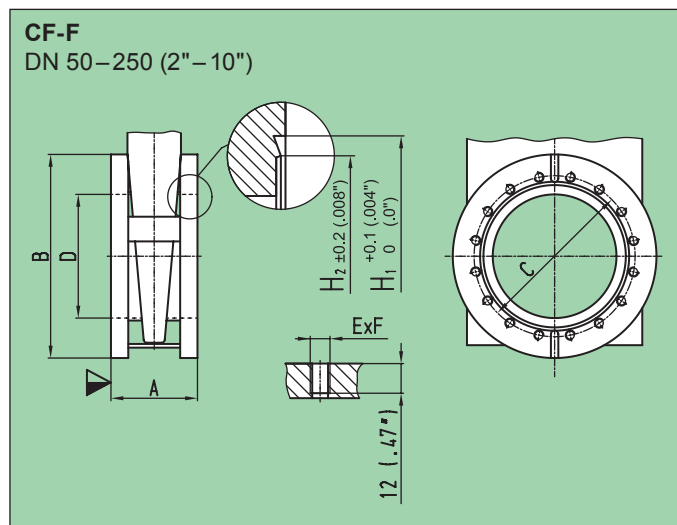
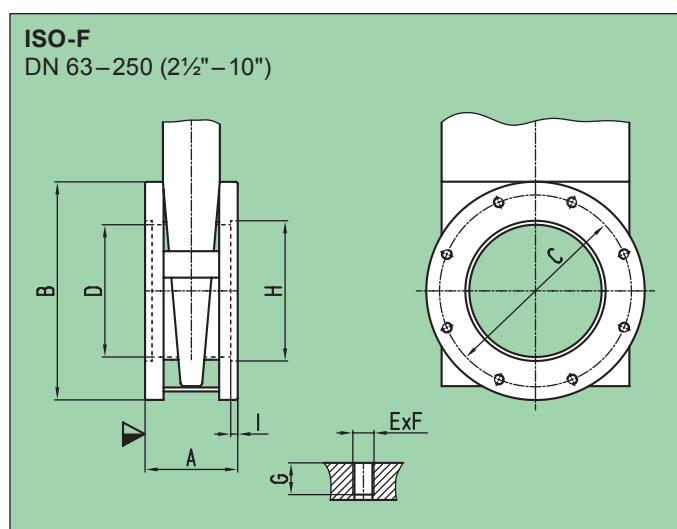
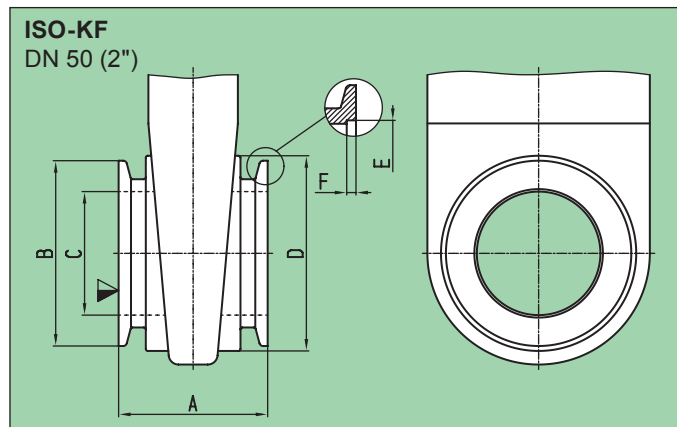


Flange dimensions: see pages 34–35
 DN 200–250 (8"–10") on request

DN	mm	50	63	80	100	160
	inch	2	2½	3	4	6
A	mm	60	70	70	70	90
	inch	2.36	2.75	2.75	2.75	3.54
K	mm	36	43	43	43	52.50
	inch	1.42	1.69	1.69	1.69	2.06
LH	mm	320	375	424	474	651
	inch	12.60	14.76	16.69	18.66	25.62
M	mm	45	53.50	72.50	72	97
	inch	1.77	2.10	2.85	2.83	3.83
N	mm	149	176	209	239	337
	inch	5.87	6.92	8.29	9.40	13.27
O	mm	109.50	123	142	160	210
	inch	4.31	4.84	5.59	6.30	8.26
O1	mm	90	105	124	142	192
	inch	3.54	4.13	4.88	5.59	7.55
P	mm	63	69	69	69	87
	inch	2.48	2.71	2.71	2.71	3.42
Q	mm	120	160	200	200	260
	inch	4.72	6.30	7.87	7.87	10.23
S	mm	13	15.50	15.50	15.50	20.50
	inch	0.51	0.61	0.61	0.61	0.80
TH	mm	131	149	165	185	264
	inch	5.16	5.86	6.50	7.28	10.39
U	mm	60	68	68	68	87
	inch	2.36	2.67	2.67	2.67	3.42
U1	mm	62.50	71	71	71	91
	inch	2.46	2.79	2.79	2.79	3.58
WH	mm	21	57	57	57	73
	inch	0.83	2.24	2.24	2.24	2.87

DN	mm	50	63	80	100	160
	inch	2	2½	3	4	6
A	mm	60	70	70	70	90
	inch	2.36	2.75	2.75	2.75	3.54
K	mm	36	43	43	43	52.50
	inch	1.42	1.69	1.69	1.69	2.06
LP	mm	268	314	384	413.50	578
	inch	10.55	12.36	15.12	16.27	22.75
M	mm	45	53.50	72.50	72	97
	inch	1.77	2.10	2.85	2.83	3.83
N	mm	149	176	209	239	337
	inch	5.87	6.92	8.29	9.40	13.27
O	mm	109.50	123	142	160	210
	inch	4.31	4.84	5.59	6.30	8.26
O1	mm	90	105	124	142	192
	inch	3.54	4.13	4.88	5.59	7.55
P	mm	63	69	69	69	87
	inch	2.48	2.71	2.71	2.71	3.42
Q	mm	120	160	200	200	260
	inch	4.72	6.30	7.87	7.87	10.23
TP	mm	119	138	175	174.50	241
	inch	4.69	5.43	6.89	6.87	9.48
U	mm	60	68	68	68	87
	inch	2.36	2.67	2.67	2.67	3.42
U1	mm	62.50	71	71	71	91
	inch	2.46	2.79	2.79	2.79	3.58
WP	mm	77	82	82	82	92
	inch	3.03	3.22	3.22	3.22	3.62

Flange dimensions



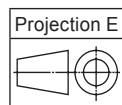
- 1) Metric threads
2) UNF threads

		ISO-KF	ISO-F			
DN	mm inch	50 2	63 2½	80 3	100 4	160 6
A	mm inch	60 2.36	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	75 2.95	136 5.35	145 5.70	165 6.50	225 8.86
C	mm inch	50 1.97	110 4.33	125 4.92	145 5.71	200 7.87
D	mm inch	79 3.11	63 2.48	80 3.15	100 3.94	150 5.91
E	mm inch	52.20 2.06	–	–	–	–
F	mm inch	3 0.19	–	–	–	–
E × F	–	–	4 × M8	8 × M8	8 × M8	8 × M10
G	mm inch	–	12 0.47	12 0.47	12 0.47	15 0.59
H	mm inch	–	70 2.76	83 3.27	102 4.02	153 6.02
I	mm inch	–	3 0.12	3 0.12	3 0.12	5 0.20

DN 200–250 (8"–10") on request

DN	mm inch	50 2	63 2 ½	80 3	100 4	160 6
O.D.	inch	3	4 ½	4 ⅝	6	8
A	mm inch	60 2.36	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	85.80 3.38	135.80 5.35	145 5.71	164.80 6.49	224.80 8.85
C	mm inch	72.40 2.85	92.10 3.63	102.4 4.08	130.30 5.13	181 7.13
D	mm inch	50 1.97	63 2.48	80 3.15	100 3.94	150 5.91
E × F ¹⁾		8 × M8	8 × M8	10 × M8	16 × M8	20 × M8
E × F ²⁾		8 × ⁵ / ₁₆ " 24 UNF	8 × ⁵ / ₁₆ " 24 UNF	10 × ⁵ / ₁₆ " 24 UNF	16 × ⁵ / ₁₆ " 24 UNF	20 × ⁵ / ₁₆ " 24 UNF
H1	mm inch	61.80 2.43	82.50 3.25	91.50 3.60	120.65 4.75	171.45 6.75
H2	mm inch	56.40 2.22	77.40 3.05	86.30 3.40	115.50 4.55	166 6.54

DN 200–250 (8"–10") on request



▼ Valve seat side

Flange dimensions

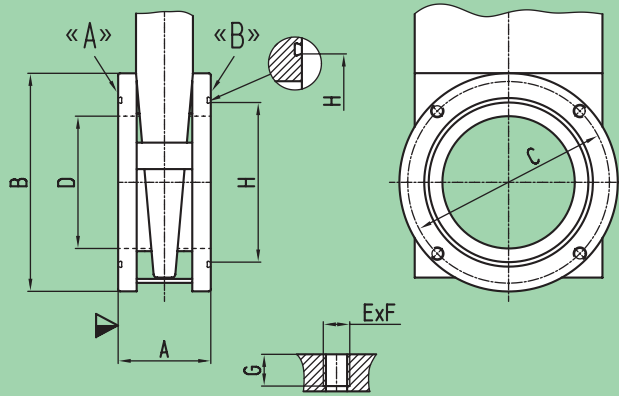
ASA-LP

DN 63–250 (2½"–10")

with or without O-ring groove

For orders with O-ring groove specify:

«A», «B» or «A+B»

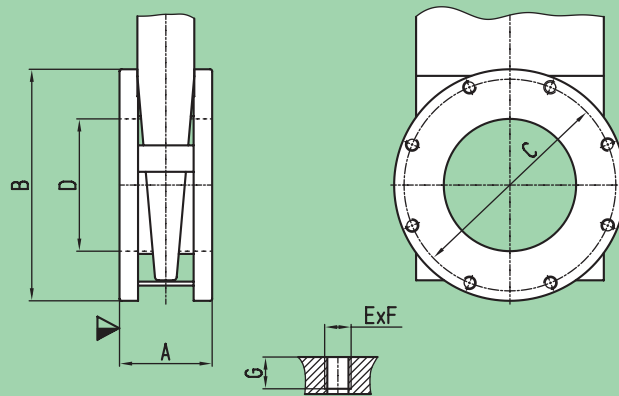


DN	mm inch	63 2½	80 3	100 4	160 6
ASA-LP		2	–	3	4
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	152.40 6	177.80 7	190.50 7.50	225 8.86
C	mm inch	120.70 4.75	139.70 5.50	152.40 6	190.50 7.50
D	mm inch	70 2.76	76 3	100 3.94	150 5.91
E×F		4 × ⅜" 16 UNC	4 × ⅜" 16 UNC	4 × ⅜" 16 UNC	8 × ⅜" 16 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	15 0.59
H	mm inch	88.90 3.50	88.90 3.50	120.65 4.75	158.75 6.25
O-ring I.D. × d		88.49 × 3.53 3.48 × 0.139	88.49 × 3.54 3.48 × 0.140	120.24 × 3.53 4.73 × 0.139	158.34 × 3.53 6.23 × 0.139

DN 200–250 (8"–10") on request

JIS B 2290: 1998 / ISO 1609

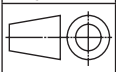
DN 65–250 (2½"–10")



DN	mm inch	65 2½	80 3	100 4	150 6
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	136 5.35	165 6.50	175 6.89	225 8.86
C	mm inch	120 4.72	135 5.31	160 6.31	210 8.27
D	mm inch	63 2.48	80 3.15	100 3.94	150 5.91
E×F		4 × M10	8 × M10	8 × M10	8 × M10
G	mm inch	12 0.47	12 0.47	12 0.47	15 0.59

DN 200–250 (8"–10") on request

Projection E



▼ Valve seat side

Main applications

The standard valve for UHV isolation applications in research and industry



Ordering information

Valve with manual actuator
crank handle

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	10836-PE01	10836-CE01	10836-UE01	10836-TE01	10836-JE01
80	3	10838-PE01	10838-CE01	10838-UE01	10838-TE01	10838-JE01
100	4	10840-PE01	10840-CE01	10840-UE01	10840-TE01	10840-JE01
160	6	10844-PE01	10844-CE01	10844-UE01	10844-TE01	10844-JE01
200	8	10846-PE01	10846-CE01	10846-UE01	10846-TE01	10846-JE01
250	10	10848-PE01	10848-CE01	10848-UE01	10848-TE01	10848-JE01
320	12	10850-PE01	on request	on request	10850-TE01	10850-JE01

with position indicator: 108 . . . E08

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	10836-PE44	10836-CE44	10836-UE44	10836-TE44	10836-JE44
80	3	10838-PE44	10838-CE44	10838-UE44	10838-TE44	10838-JE44
100	4	10840-PE44	10840-CE44	10840-UE44	10840-TE44	10840-JE44
160	6	10844-PE44	10844-CE44	10844-UE44	10844-TE44	10844-JE44
200	8	10846-PE44	10846-CE44	10846-UE44	10846-TE44	10846-JE44
250	10	10848-PE44	10848-CE44	10848-UE44	10848-TE44	10848-JE44
320	12	10850-PE44	on request	on request	10850-TE44	10850-JE44

without solenoid valve, without position indicator: 108 . . . E14

without solenoid valve, with position indicator: 108 . . . E24

with solenoid valve, without position indicator: 108 . . . E34 (specify control voltage)

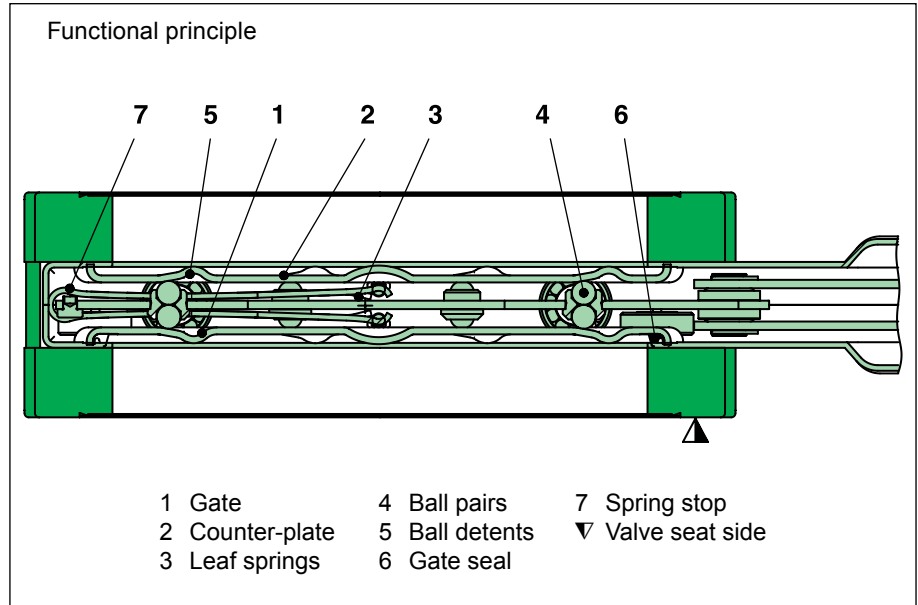
————— Further ordering information on next page —————>

Features

Body material: stainless steel

Bellows sealed, unlubricated mechanism

DN 63–200 with vulcanized seal
(no dead volumes at the gate seal):
see glossary



Technical data

Leak rate

– Valve body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
– Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹

Pressure range

– DN 63–200	$1 \cdot 10^{-10}$ mbar to 1.6 bar (abs)
– DN 250–320	$1 \cdot 10^{-10}$ mbar to 1.2 bar (abs)

Differential pressure on the gate

– DN 63–200	≤ 1.6 bar
– DN 250–320	≤ 1.2 bar

Differential pressure at opening

≤ 30 mbar

Cycles until first service

50 000

Temperature ¹⁾

– Valve body	≤ 250 °C open, ≤ 200 °C closed
– Manual actuator	≤ 250 °C
– Pneumatic actuator	≤ 200 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 80 °C

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Ordering information

**Valve with 3-position
pneumatic actuator**
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	10836-PE48	10836-CE48	10836-UE48	10836-TE48	10836-JE48
80	3	10838-PE48	10838-CE48	10838-UE48	10838-TE48	10838-JE48
100	4	10840-PE48	10840-CE48	10840-UE48	10840-TE48	10840-JE48
160	6	10844-PE48	10844-CE48	10844-UE48	10844-TE48	10844-JE48
200	8	10846-PE48	10846-CE48	10846-UE48	10846-TE48	10846-JE48
250	10	10848-PE48	10848-CE48	10848-UE48	10848-TE48	10848-JE48
320	12	10850-PE48	on request	on request	10850-TE48	10850-JE48

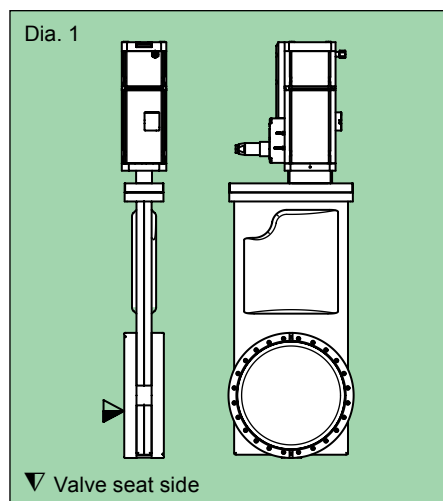
without solenoid valve, with position indicator: 108 . . . E28

Continued Technical data

Heating and cooling rate	≤ 50 °C h ⁻¹
Material	
– Valve body	AISI 304 (1.4301)
– Mechanism DN 63–200	AISI 316L (1.4404)
DN 250–320	AISI 304 (1.4301)
– Bellows	AISI 316L (1.4404, 1.4435)
Seal	
– Bonnet	metal
– Gate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 50 VAC/DC
– Current	≤ 1.2 A
Valve position indication	visual (mechanical)

DN (nominal I.D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Turns per stroke	Valve with manual actuator		Valve with pneumatic actuator						
					Weight		Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time	Weight	
mm	inch		ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	See pages 42–43	600	10	9	20	4–7	58–102	0.08	0.0028	1	9	20
80	3		765	10	9	20	4–7	58–102	0.08	0.0028	1	9	20
100	4		1740	13	12	26	4–7	58–102	0.11	0.0038	1.2	12	26
160	6		5880	17	18	40	4–7	58–102	0.14	0.0049	1.5	18	40
200	8		12200	17	25	55	4–7	58–102	0.25	0.0087	2	24	53
250	10		21690	40	52	114	5–7	73–102	0.35	0.0122	4	42	92
320	12		29130	45	86	190	5–7	73–102	0.48	0.0167	5	95	210

Options



Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable
- 3-position pneumatic actuator for throttling (Dia. 1):
ordering information on page 37, technical data on request
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Bakeable position indicator:
manual actuator bakeable to max. 250 °C, pneumatic actuator to max. 200 °C
- Position indicator with change-over contact

Dia. 2

O-ring seal



Vulcanized seal



See glossary

Valve

- Customer specified flanges with/without watercooling
- Other sealing materials
- O-ring seal in gate (Dia. 2) with DN 63, 100, 160, 200 (standard: vulcanized seal)
- Ports for roughing (by-pass), venting or for gauges (Dia. 3), possible in positions A and B

DN valve	mm inch	63 2 ½	80 3	100 4	160 6	200 8	250 10	320 12
Recommended port CF-F		40	40	40	40	40	40	40
X	mm inch	110 4.33	110 4.33	120 4.72	205 8.07	260 10.24	335 13.19	415 16.34
Y	mm inch	44 1.73	44 1.73	44 1.73	44 1.73	48 1.89	62 2.44	72 2.83
Other ports on request								

Dia. 3

Pos A

Pos B

X

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

▼ Valve seat side

Dia. 4

Pos A

Pos B

X

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

Y

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Y

Y

Y

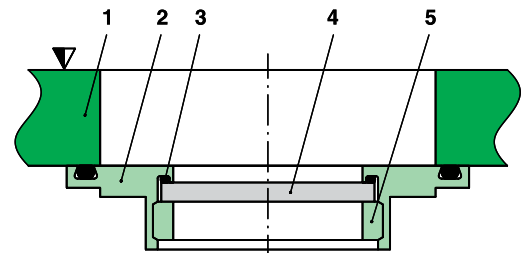
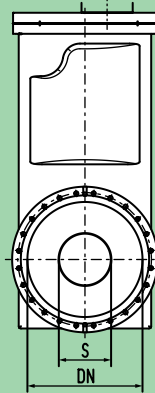
Y

Y

Y

▼ Valve seat side

Dia. 5



- 1 Valve body
- 2 Gate
- 3 Elastomer seal
- 4 Window
- 5 Screwed window retainer

▼ Valve seat side



DN valve	mm inch	63 2 ½	100 4	160 6	200 8
Optically free diameter «S»	mm inch	40 1.57	43 1.69	68 2.67	90 3.54
Thickness of glass	mm inch	4 0.15	4 0.15	6 0.23	6 0.23

Ordering information for options:

Ordering No. of valve-X (e. g. 10846-CE44-X, X = port CF-F 40 in position A)

Spare parts

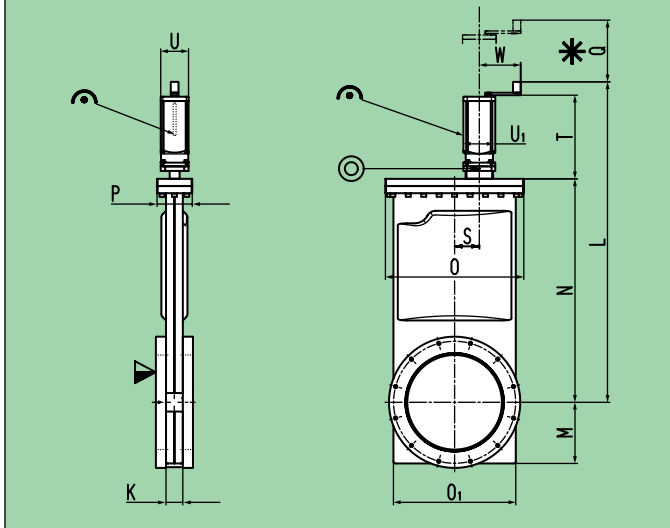
- **Seals**
on request (specify fabrication number of valve)

Accessories

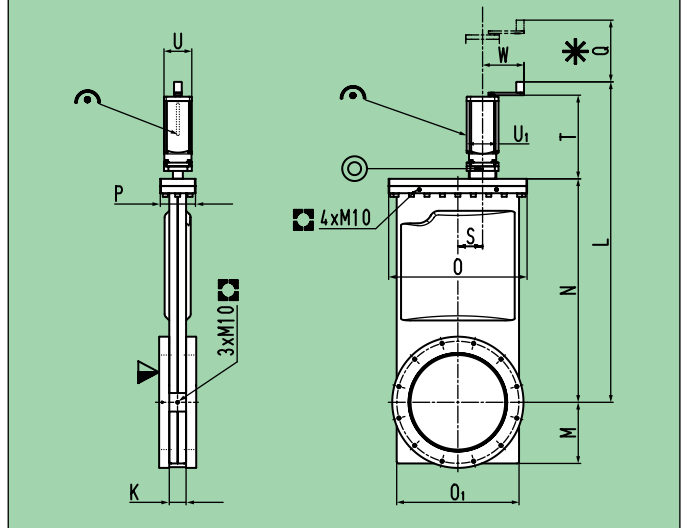
- **Heater**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 32 and 33

Main dimensions

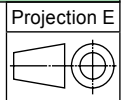
Valve with manual actuator: crank handle
DN 63–200 (2½"–8")



Valve with manual actuator: crank handle
DN 250–320 (10"–12")



- ▽ Valve seat side
- * Required for dismantling
- ☉ Mechanical position indication
- ⊙ Leak detection hole
- For attachment

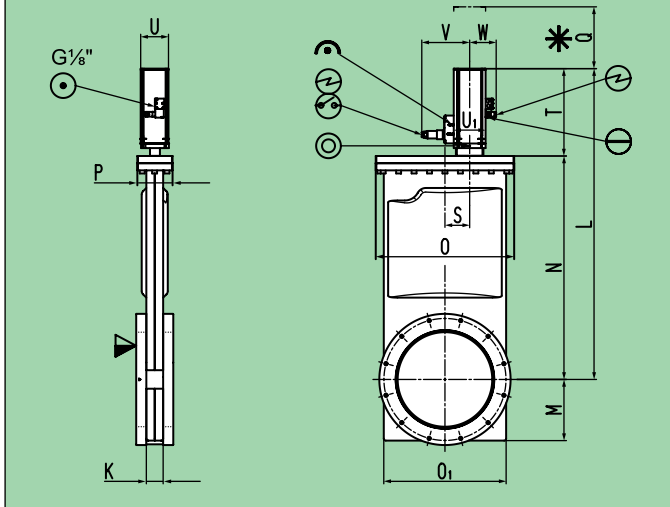


Flange dimensions: see pages 42–43

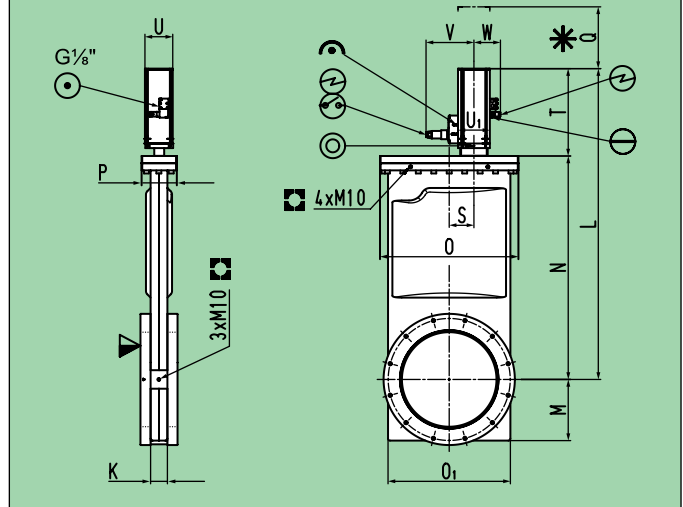
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
K	mm inch	25.55 1.01	25.55 1.01	25.55 1.01	25.55 1.01	31 1.22	41 1.61	54 2.13
L	mm inch	408 16.06	421 16.57	462 18.19	552 21.73	660 25.98	841 33.11	1038 40.87
M	mm inch	53 2.09	53 2.09	69 2.72	94.50 3.72	120 4.72	161 6.34	198 7.80
N	mm inch	192 7.56	205 8.07	247 9.72	336 13.23	430 16.93	559 22.01	724 28.50
O	mm inch	115 4.53	115 4.53	145 5.71	200 7.87	250 9.84	344 13.54	448 17.64
O1	mm inch	104.60 4.12	104.60 4.12	134.60 5.30	184.80 7.28	230 9.06	321 12.64	396 15.59
P	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	80 3.15	114 4.49
Q	mm inch	112 4.41	112 4.41	142 5.59	192 7.56	350 13.78	450 17.72	560 22.05
S	mm inch	11 0.43	11 0.43	9 0.35	25 0.98	38.50 1.52	67 2.64	80 3.15
T	mm inch	184 7.24	184 7.24	184 7.24	184 7.24	200 7.87	240 9.45	272 10.71
U	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	90 3.54	90 3.54	90 3.54
U1	mm inch	83 3.27	83 3.27	83 3.27	83 3.27	103 4.06	103 4.06	103 4.06
W	mm inch	77 3.03	77 3.03	77 3.03	77 3.03	94 3.70	134 5.28	134 5.28

Main dimensions

Valve with pneumatic actuator: double acting
DN 63–200 (2½"–8")

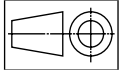


Valve with pneumatic actuator: double acting
DN 250–320 (10"–12")



- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⌚ Mechanical position indication
- ⊙ Position indicator
- ⊙ Leak detection hole
- ⊖ Emergency operation
- For attachment

Projection E

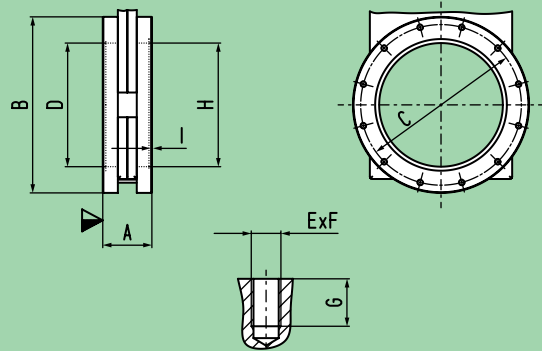


Flange dimensions: see pages 42–43

DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
K	mm inch	25.55 1.01	25.55 1.01	25.55 1.01	25.55 1.01	31 1.22	41 1.61	54 2.13
L	mm inch	346 13.62	358 14.09	418 16.46	523 20.59	630 24.80	800 31.50	1013 39.88
M	mm inch	53 2.09	53 2.09	69 2.72	94.50 3.72	120 4.72	161 6.34	198 7.80
N	mm inch	192 7.56	205 8.07	247 9.72	336 13.23	430 16.93	559 22.01	724 28.50
O	mm inch	115 4.53	115 4.53	145 5.71	200 7.87	250 9.84	344 13.54	448 17.64
O1	mm inch	104.60 4.12	104.60 4.12	134.60 5.30	184.80 7.28	230 9.06	321 12.64	396 15.59
P	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	80 3.15	114 4.49
Q	mm inch	112 4.41	112 4.41	142 5.59	192 7.56	350 13.78	450 17.72	560 22.05
S	mm inch	11 0.43	11 0.43	9 0.35	25 0.98	38.50 1.52	67 2.64	80 3.15
T	mm inch	154 6.06	154 6.06	171 6.73	187 7.36	200 7.87	240 9.45	289 11.38
U	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	90 3.54	90 3.54	90 3.54
U1	mm inch	83 3.27	83 3.27	83 3.27	83 3.27	103 4.06	103 4.06	103 4.06
V	mm inch	145 5.71	145 5.71	145 5.71	145 5.71	155 6.10	155 6.10	155 6.10
W	mm inch	77 3.03	77 3.03	77 3.03	77 3.03	87 3.43	87 3.43	87 3.43

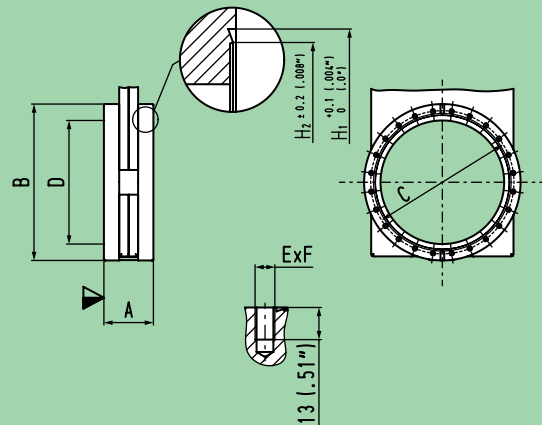
Flange dimensions

ISO-F
DN 63–320 (2½"–12")



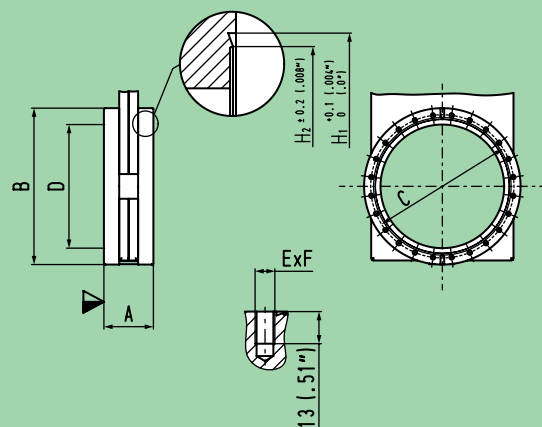
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	350 13.78	425 16.73
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	261 10.28	306 12.05
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12
G	mm inch	13 0.51	13 0.51	13 0.51	13 0.51	15 0.59	15 0.59	18 0.71
H	mm inch	–	83 3.27	102 4.02	153 6.02	213 8.39	–	318 12.52
I	mm inch	–	3 0.12	3 0.12	5 0.20	5 0.20	–	5 0.20

CF-F, metric threads
DN 63–250 (2½"–10")



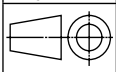
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	
O.D.	inch	4½	4⅝	6	8	10	12	
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	
B	mm inch	113.50 4.47	117.50 4.63	151.60 5.97	202.40 7.97	253.20 9.97	350 13.78	
C	mm inch	92.10 3.63	102.40 4.03	130.20 5.13	181 7.13	231.80 9.13	284 11.18	
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10.00	
E × F		8 × M8	10 × M8	16 × M8	20 × M8	24 × M8	32 × M8	
H1	mm inch	82.50 3.25	91.65 3.61	120.70 4.75	171.45 6.75	222.40 8.76	273.15 10.75	
H2	mm inch	77.40 3.05	86.30 3.40	115.50 4.55	166 6.54	217 8.54	267 10.51	

CF-F, UNF threads
DN 63–250 (2½"–10")



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 ^{*)} 10	250 ^{*)} 10
O.D.	inch	4½	4⅝	6	8	10	12	13¼
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	100 3.94
B	mm inch	113.50 4.47	117.50 4.63	151.60 5.97	202.40 7.97	253.20 9.97	350 13.78	350 13.78
C	mm inch	92.10 3.63	102.40 4.03	130.20 5.13	181 7.13	231.80 9.13	284 11.18	306.30 12.06
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10.00	254 10.00
E × F		8 × 5/16" 24 UNF	10 × 5/16" 24 UNF	16 × 5/16" 24 UNF	20 × 5/16" 24 UNF	24 × 5/16" 24 UNF	32 × 5/16" 24 UNF	30 × 3/8" 24 UNF
H1	mm inch	82.50 3.25	91.65 3.61	120.70 4.75	171.45 6.75	222.40 8.76	273.15 10.75	294.64 11.60
H2	mm inch	77.40 3.05	86.30 3.40	115.50 4.55	166 6.54	217 8.54	267 10.51	288.30 11.35

Projection E



▼ Valve seat side

^{*)} O.D. 12" VAT standard, O.D. 13¼" option

Ordering information for option: O.D. 13¼"

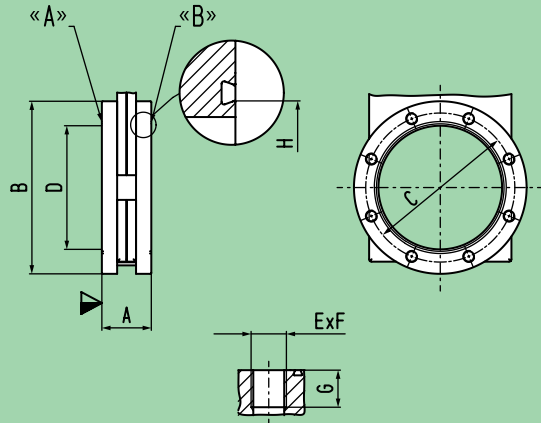
Ordering No. of valve-X (e. g. 10848-UE44-X, X = O.D. 13¼")

Flange dimensions

ASA-LP

DN 63–320 (2½"–12")
with or without O-ring groove

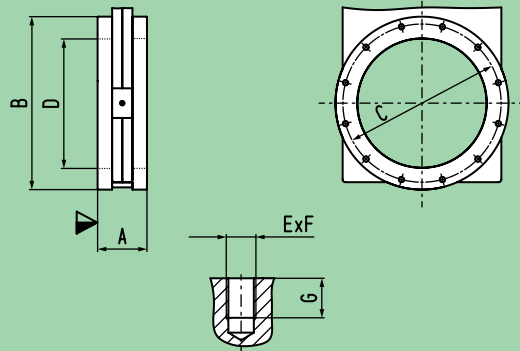
For orders with O-ring groove specify:
«A», «B» or «A+B»



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
ASA-LP		2	–	3	4	6	8	10
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	152.40 6.00	177.80 7.00	190.50 7.50	225 8.86	279.40 11.00	350 13.78	425 16.73
C	mm inch	120.70 4.75	139.70 5.50	152.40 6.00	190.50 7.50	241.30 9.50	298.50 11.75	362 14.25
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10.00	300 11.81
E x F		4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	8 x ⅜" 16 UNC	8 x ⅜" 16 UNC	8 x ⅜" 10 UNC	8 x ⅜" 10 UNC	12 x ⅜" 10 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	15 0.59	19 0.75	19 0.75	19 0.75
H	mm inch	88.90 3.50	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13	266.70 10.50	317.50 12.50
O-ring I.D. x d	mm inch	88.49 x 3.53 3.48 x .139	88.49 x 3.53 3.48 x .139	120.24 x 3.53 4.73 x .139	158.34 x 3.53 6.23 x .139	202.79 x 3.53 7.98 x .139	266.29 x 3.53 10.48 x .139	316.87 x 7.00 12.47 x .275

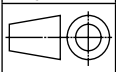
JIS B 2290: 1998 / ISO 1609

DN 65–300 (2½"–12")



DN	mm inch	65 2½	80 3	100 4	150 6	200 8	250 10	300 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	136 5.35	165 6.50	185 7.28	235 9.25	300 11.81	350 13.78	425 16.73
C	mm inch	120 4.72	135 5.31	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	261 10.28	306 12.05
E x F		4 x M10	8 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12
G	mm inch	13 0.51	13 0.51	13 0.51	13 0.51	15 0.59	15 0.59	16 0.63

Projection E



▼ Valve seat side

Main applications

General purpose valve for isolation
in high vacuum systems

Especially suited to pump isolation



Ordering information

Valve with manual actuator
crank handle

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	11036-PE01	11036-CE01	11036-UE01	11036-TE01	11036-JE01
80	3	11038-PE01	11038-CE01	11038-UE01	11038-TE01	11038-JE01
100	4	11040-PE01	11040-CE01	11040-UE01	11040-TE01	11040-JE01
160	6	11044-PE01	11044-CE01	11044-UE01	11044-TE01	11044-JE01
200	8	11046-PE01	11046-CE01	11046-UE01	11046-TE01	11046-JE01
250	10	11048-PE01	11048-CE01	11048-UE01	11048-TE01	11048-JE01
320	12	11050-PE01	on request	on request	11050-TE01	11050-JE01

with position indicator: 110 . . . E08

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	11036-PE44	11036-CE44	11036-UE44	11036-TE44	11036-JE44
80	3	11038-PE44	11038-CE44	11038-UE44	11038-TE44	11038-JE44
100	4	11040-PE44	11040-CE44	11040-UE44	11040-TE44	11040-JE44
160	6	11044-PE44	11044-CE44	11044-UE44	11044-TE44	11044-JE44
200	8	11046-PE44	11046-CE44	11046-UE44	11046-TE44	11046-JE44
250	10	11048-PE44	11048-CE44	11048-UE44	11048-TE44	11048-JE44
320	12	11050-PE44	on request	on request	11050-TE44	11050-JE44

without solenoid valve, without position indicator: 110 . . . E14

without solenoid valve, with position indicator: 110 . . . E24

with solenoid valve, without position indicator: 110 . . . E34 (specify control voltage)

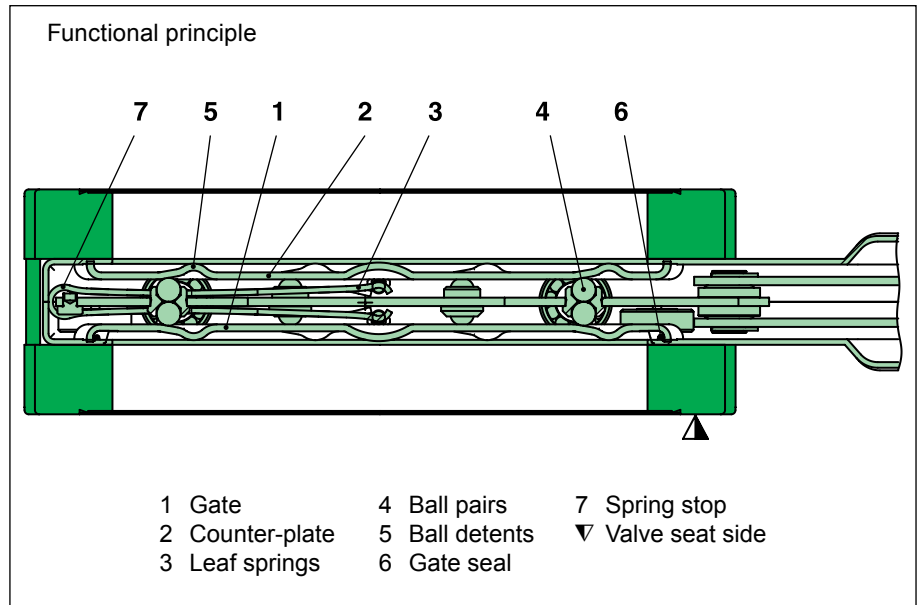
————— Further ordering information on next page —————>

Features

Body material: stainless steel

Low-cost bellows sealed valve

DN 63–200 with vulcanized seal
(no dead volumes at the gate seal):
see glossary



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	
– DN 63–200	$1 \cdot 10^{-8}$ mbar to 1.6 bar (abs)
– DN 250–320	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	
– DN 63–200	≤ 1.6 bar
– DN 250–320	≤ 1.2 bar
Differential pressure at opening	≤ 30 mbar
Cycles until first service	200 000
Temperature ¹⁾	
– Valve body	≤ 150 °C
– Manual and pneumatic actuator	≤ 80 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 50 °C

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Ordering information

**Valve with 3-position
pneumatic actuator**
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	11036-PE48	11036-CE48	11036-UE48	11036-TE48	11036-JE48
80	3	11038-PE48	11038-CE48	11038-UE48	11038-TE48	11038-JE48
100	4	11040-PE48	11040-CE48	11040-UE48	11040-TE48	11040-JE48
160	6	11044-PE48	11044-CE48	11044-UE48	11044-TE48	11044-JE48
200	8	11046-PE48	11046-CE48	11046-UE48	11046-TE48	11046-JE48
250	10	11048-PE48	11048-CE48	11048-UE48	11048-TE48	11048-JE48
320	12	11050-PE48	on request	on request	11050-TE48	11050-JE48

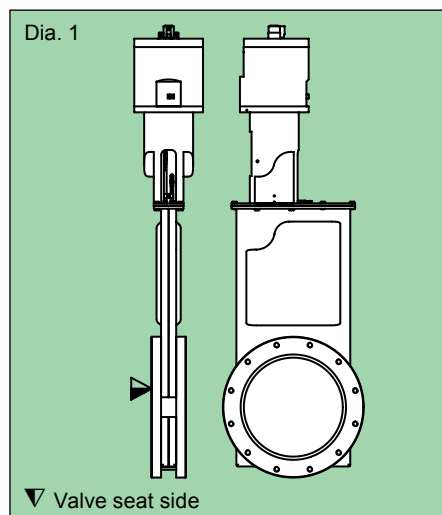
without solenoid valve, with position indicator: 110 . . . E28

Continued Technical data

Heating and cooling rate	≤ 50 °C h ⁻¹
Material	
– Valve body	AISI 304 (1.4301)
– Mechanism DN 63–200	AISI 316L (1.4404)
DN 250–320	AISI 304 (1.4301)
– Bellows	AISI 633 (AM350)
Seal: bonnet, gate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	10–30 VDC
– Current	max. 200 mA
Valve position indication	LED

DN (nominal I. D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator		Valve with pneumatic actuator							
				Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time	Weight	
mm	inch		ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	Sse pages 50–51	600	10	7	16	4–7	58–102	0.096	0.0034	1	7	16
80	3		765	10	8	18	4–7	58–102	0.096	0.0034	1	8	18
100	4		1740	14	10	22	4–7	58–102	0.127	0.0045	1.5	10.5	23
160	6		5880	17	12	27	4–7	58–102	0.150	0.0053	2.5	13.5	30
200	8		13940	17	21	47	4–7	58–102	0.260	0.0092	3.5	21	47
250	10		27 110	24	45	100	5–7	73–102	0.350	0.0124	4.5	39	86
320	12		34 955	32	70	155	5–7	73–102	0.460	0.0162	5.5	70	155

Options

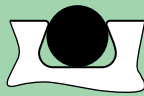


Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable
- 3-position pneumatic actuator for throttling (Dia. 1):
ordering information on page 45, technical data on request

Dia. 2

O-ring seal



Vulcanized seal



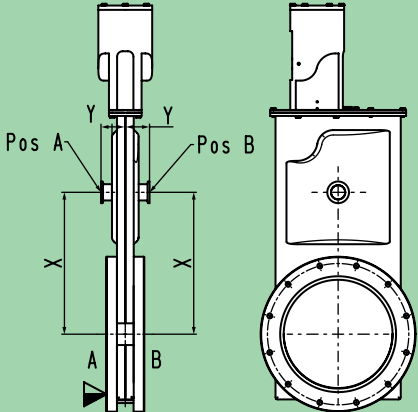
See glossary

Valve

- Customer specified flanges with/without watercooling
- Other sealing materials
- O-ring seal in gate (Dia. 2) with DN 63, 100, 160, 200 (standard: vulcanized seal)
- Ports for roughing (by-pass), venting or for gauges (Dia. 3), possible in positions A and B

DN valve	mm inch	63 2 ½	80 3	100 4	160 6	200 8	250 10	320 12
Recommended port ISO-KF		40	40	40	40	40	40	40
X	mm inch	110 4.33	110 4.33	150 5.91	205 8.07	260 10.24	335 13.19	415 16.34
Y	mm inch	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
Other ports on request								

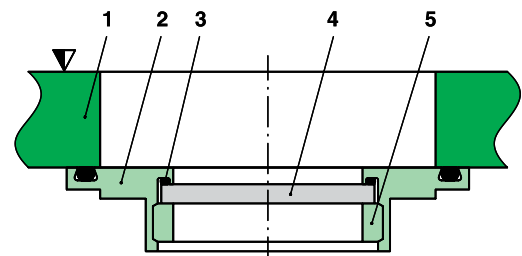
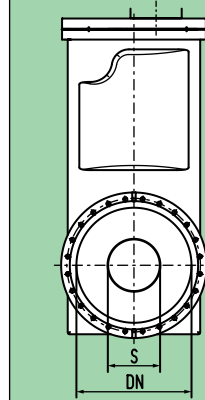
Dia. 3



▽ Valve seat side

- Window in gate with DN 63, 100, 160, 200 (Dia. 4):
screwed, window material: e.g. borosilicate, elastomer seal

Dia. 4



- 1 Valve body
 - 2 Gate
 - 3 Elastomer seal
 - 4 Window
 - 5 Screwed window retainer
- ▽ Valve seat side

DN valve	mm inch	63 2 ½	100 4	160 6	200 8
Optically free diameter «S»	mm inch	40 1.57	43 1.69	68 2.67	90 3.54
Thickness of glass	mm inch	4 0.15	4 0.15	6 0.23	6 0.23

Ordering information for options:

Ordering No. of valve-X (e. g. 11040-CE44-X, X = port ISO-KF 40 in position A)

Spare parts

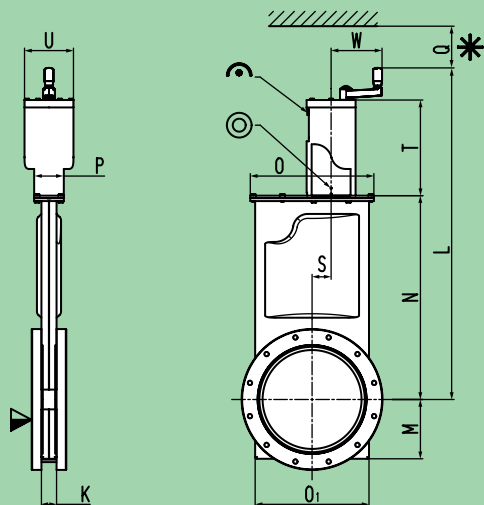
- **Seals**
on request (specify fabrication number of valve)

Accessories

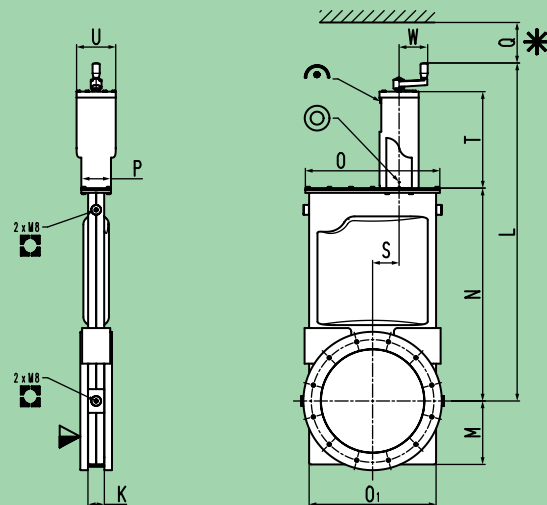
- **Heater**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 32 and 33

Main dimensions

Valve with manual actuator: crank handle
DN 63–200 (2½"–8")

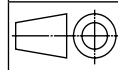


Valve with manual actuator: crank handle
DN 250–320 (10"–12")



- ▽ Valve seat side
- * Required for dismantling
- ⌢ Mechanical position indication
- ⊙ Leak detection hole
- For attachment

Projection E

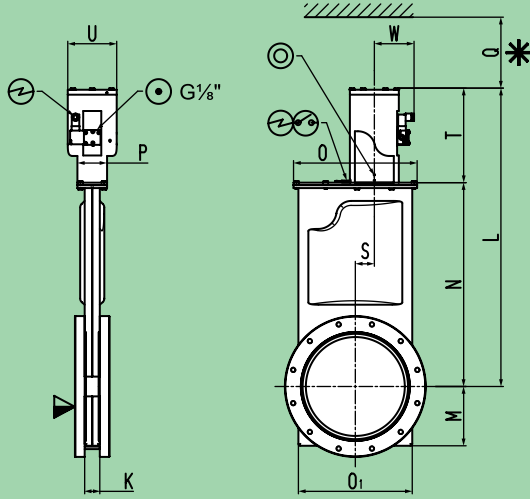


Flange dimensions: see pages 50–51

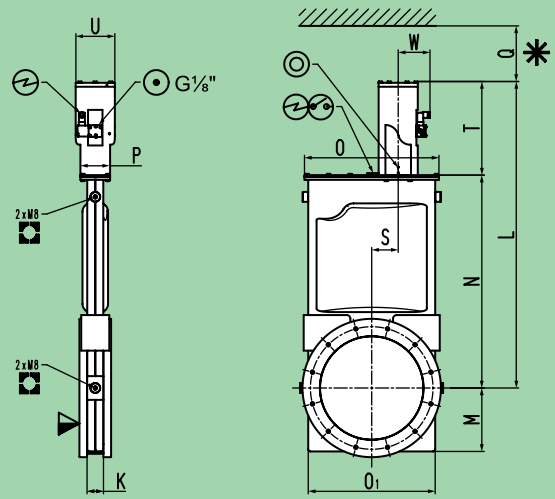
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
K	mm inch	25.55 1.01	25.55 1.01	25.55 1.01	25.55 1.01	31 1.22	41 1.61	54 2.13
L	mm inch	390.60 15.38	390.60 15.38	472.60 18.61	601.40 23.68	684.60 26.95	855 33.66	1074.60 42.31
M	mm inch	53 2.09	53 2.09	69 2.72	94.50 3.72	120 4.72	161 6.34	198 7.80
N	mm inch	179 7.05	179 7.05	238 9.37	328.40 12.93	412.50 16.24	538.50 21.20	701 27.60
O	mm inch	124.60 4.91	124.60 4.91	155 6.10	205 8.07	250 9.84	340 13.39	420 16.54
O1	mm inch	104.60 4.12	104.60 4.12	134.60 5.30	184.80 7.28	230 9.06	321 12.64	396 15.59
P	mm inch	60 2.36	60 2.36	60 2.36	60 2.36	60 2.36	75 2.95	90 3.54
Q	mm inch	150 5.91	150 5.91	190 7.48	270 10.63	350 13.78	400 15.75	550 21.65
S	mm inch	11 0.43	11 0.43	9 0.35	25 0.98	38.50 1.52	67 2.64	80 3.15
T	mm inch	156.40 6.16	156.40 6.16	179.20 7.06	203.20 8.00	202.40 7.97	246.80 9.72	303.90 11.96
U	mm inch	89 3.50	89 3.50	89 3.50	89 3.50	99 3.90	99 3.90	99 3.90
W	mm inch	76.50 3.01	76.50 3.01	76.50 3.01	92.50 3.64	103 4.06	73 2.87	73 2.87

Main dimensions

Valve with pneumatic actuator: double acting
DN 63–200 (2½"–8")

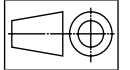


Valve with pneumatic actuator: double acting
DN 250–320 (10"–12")



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊗ Position indicator
- ⊙ Leak detection hole
- For attachment

Projection E

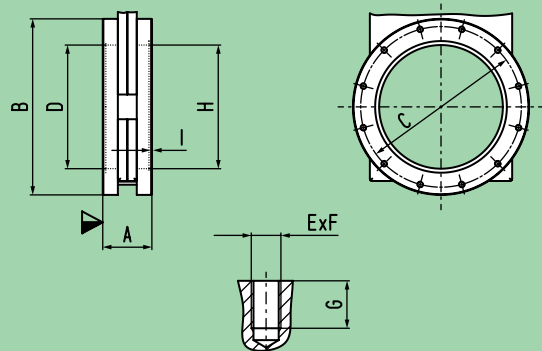


Flange dimensions: see pages 50–51

DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
K	mm inch	25.55 1.01	25.55 1.01	25.55 1.01	25.55 1.01	31 1.22	41 1.61	54 2.13
L	mm inch	329.80 12.98	329.80 12.98	409 16.10	523 20.59	607.90 23.93	778.30 30.64	998 39.29
M	mm inch	53 2.09	53 2.09	69 2.72	94.50 3.72	120 4.72	161 6.34	198 7.80
N	mm inch	183 7.20	183 7.20	238.3 9.38	328.40 12.93	412.50 16.24	538.50 21.20	701 27.60
O	mm inch	124.60 4.91	124.60 4.91	155 6.10	205 8.07	250 9.84	340 13.39	420 16.54
O1	mm inch	104.60 4.12	104.60 4.12	134.60 5.30	184.80 7.28	230 9.06	321 12.64	396 15.59
P	mm inch	60 2.36	60 2.36	60 2.36	60 2.36	60 2.36	75 2.95	90 3.54
Q	mm inch	150 5.91	150 5.91	190 7.48	270 10.63	350 13.78	400 15.75	550 21.65
S	mm inch	11 0.43	11 0.43	9 0.35	25 0.98	38.50 1.52	67 2.64	80 3.15
T	mm inch	146.80 5.78	146.80 5.78	170.80 6.72	194.30 7.65	195.40 7.69	239.80 9.44	297 11.69
U	mm inch	89 3.50	89 3.50	89 3.50	89 3.50	99 3.90	99 3.90	99 3.90
W	mm inch	78.90 3.11	78.90 3.11	78.90 3.11	78.90 3.11	83.90 3.30	83.90 3.30	83.90 3.30

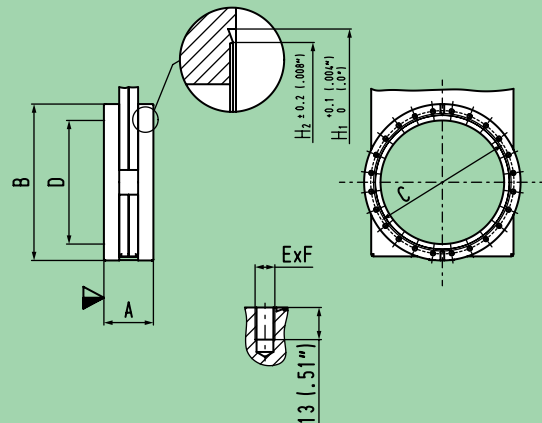
Flange dimensions

ISO-F
DN 63–320 (2½"–12")



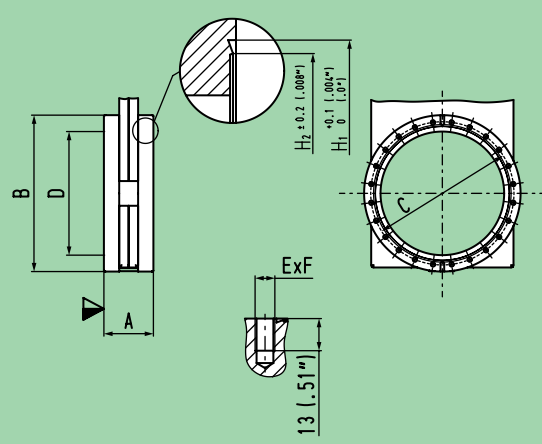
DN	mm	63	80	100	160	200	250	320
	inch	2 ½	3	4	6	8	10	12
A	mm	70	70	70	70	70	80	100
	inch	2.76	2.76	2.76	2.76	2.76	3.15	3.94
B	mm	130	145	165	225	285	350	425
	inch	5.12	5.71	6.50	8.86	11.22	13.78	16.73
C	mm	110	125	145	200	260	310	395
	inch	4.33	4.92	5.71	7.87	10.24	12.20	15.55
D	mm	70	76	100	150	200	261	306
	inch	2.76	2.99	3.94	5.91	7.87	10.28	12.05
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12
G	mm	13	13	13	13	15	15	18
	inch	0.51	0.51	0.51	0.51	0.59	0.59	0.71
H	mm	–	83	102	153	213	–	318
	inch	–	3.27	4.02	6.02	8.39	–	12.52
I	mm	–	3	3	5	5	–	5
	inch	–	0.12	0.12	0.20	0.20	–	0.20

CF-F, metric threads
DN 63–250 (2½"–10")



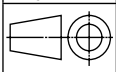
DN	mm	63	80	100	160	200	250	
	inch	2 ½	3	4	6	8	10	
O.D.	inch	4 ½	4 ⅝	6	8	10	12	
A	mm	70	70	70	70	80	100	
	inch	2.76	2.76	2.76	2.76	3.15	3.94	
B	mm	113.50	117.50	151.60	202.40	253.20	350	
	inch	4.47	4.63	5.97	7.97	9.97	13.78	
C	mm	92.10	102.40	130.20	181	231.80	284	
	inch	3.63	4.03	5.13	7.13	9.13	11.18	
D	mm	70	76	100	150	200	254	
	inch	2.76	2.99	3.94	5.91	7.87	10.00	
E × F		8 × M8	10 × M8	16 × M8	20 × M8	24 × M8	32 × M8	
H1	mm	82.50	91.65	120.70	171.45	222.40	273.15	
	inch	3.25	3.61	4.75	6.75	8.76	10.75	
H2	mm	77.40	86.30	115.50	166	217	267	
	inch	3.05	3.40	4.55	6.54	8.54	10.51	

CF-F, UNF threads
DN 63–250 (2½"–10")



DN	mm	63	80	100	160	200	250 ¹⁾	250 ¹⁾
	inch	2 ½	3	4	6	8	10	10
O.D.	inch	4 ½	4 ⅝	6	8	10	12	13 ¼
A	mm	70	70	70	70	80	100	100
	inch	2.76	2.76	2.76	2.76	3.15	3.94	3.94
B	mm	113.50	117.50	151.60	202.40	253.20	350	350
	inch	4.47	4.63	5.97	7.97	9.97	13.78	13.78
C	mm	92.10	102.40	130.20	181	231.80	284	306.30
	inch	3.63	4.03	5.13	7.13	9.13	11.18	12.06
D	mm	70	76	100	150	200	254	254
	inch	2.76	2.99	3.94	5.91	7.87	10.00	10.00
E × F		8 × 5/16" UNF	10 × 5/16" UNF	16 × 5/16" UNF	20 × 5/16" UNF	24 × 5/16" UNF	32 × 5/16" UNF	30 × 3/8" UNF
H1	mm	82.50	91.65	120.70	171.45	222.40	273.15	294.64
	inch	3.25	3.61	4.75	6.75	8.76	10.75	11.60
H2	mm	77.40	86.30	115.50	166	217	267	288.30
	inch	3.05	3.40	4.55	6.54	8.54	10.51	11.35

Projection E



▼ Valve seat side

¹⁾ O.D. 12" VAT standard, O.D. 13¼" option

Ordering information for option: O.D. 13¼"

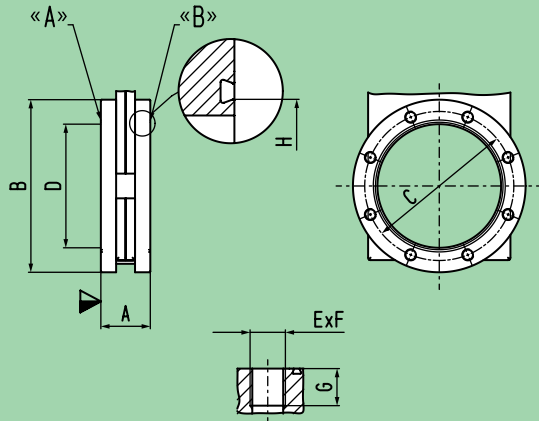
Ordering No. of valve-X (e. g. 11048-UE44-X, X = O.D. 13¼")

Flange dimensions

ASA-LP

DN 63–320 (2½"–12")
with or without O-ring groove

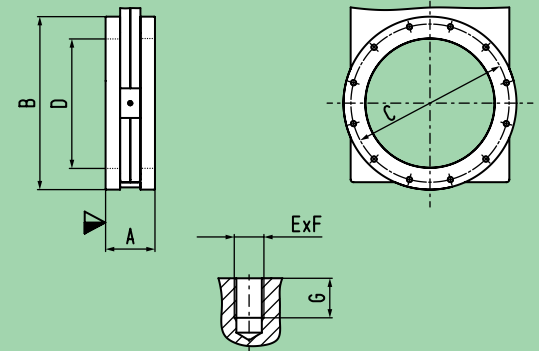
For orders with O-ring groove specify:
«A», «B» or «A+B»



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
ASA-LP		2	–	3	4	6	8	10
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	152.40 6.00	177.80 7.00	190.50 7.50	225 8.86	279.40 11.00	350 13.78	425 16.73
C	mm inch	120.70 4.75	139.70 5.50	152.40 6.00	190.50 7.50	241.30 9.50	298.50 11.75	362 14.25
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10.00	300 11.81
E x F		4 x ¾" 16 UNC	4 x ¾" 16 UNC	8 x ¾" 16 UNC	8 x ¾" 16 UNC	8 x ¾" 10 UNC	8 x ¾" 10 UNC	12 x ¾" 10 UNC
G	mm inch	13 0.51	15 0.59	15 0.59	15 0.59	19 0.75	19 0.75	19 0.75
H	mm inch	88.90 3.50	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13	266.70 10.50	317.50 12.50
O-ring I.D. x d	mm inch	88.49 x 3.53 3.48 x .139	88.49 x 3.53 3.48 x .139	120.24 x 3.53 4.73 x .139	158.34 x 3.53 6.23 x .139	202.79 x 3.53 7.98 x .139	266.29 x 3.53 10.48 x .139	316.87 x 7.00 12.47 x .275

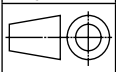
JIS B 2290: 1998 / ISO 1609

DN 65–300 (2½"–12")



DN	mm inch	65 2½	80 3	100 4	150 6	200 8	250 10	300 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94
B	mm inch	136 5.35	165 6.50	185 7.28	235 9.25	300 11.81	350 13.78	425 16.73
C	mm inch	120 4.72	135 5.31	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	261 10.28	306 12.05
E x F		4 x M10	8 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12
G	mm inch	13 0.51	13 0.51	13 0.51	13 0.51	15 0.59	15 0.59	16 0.63

Projection E



▼ Valve seat side

Main applications

The standard valve for vacuum isolation applications in research and industry



Ordering information

Valve with manual actuator
push rod

DN		Ordering numbers	
mm	inch	ISO-F	JIS
63	2½	12136-PA03	12136-JA03
80	3	12138-PA03	12138-JA03
100	4	12140-PA03	12140-JA03
160	6	12144-PA03	12144-JA03

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)	
mm	inch	ISO-F	JIS
63	2½	12136-PA44	12136-JA44
80	3	12138-PA44	12138-JA44
100	4	12140-PA44	12140-JA44
160	6	12144-PA44	12144-JA44
200	8	12146-PA44	12146-JA44
250	10	12148-PA44	12148-JA44
320	12	12150-PA44	12150-JA44
Larger sizes: see series 14.0, 16.8, 19			

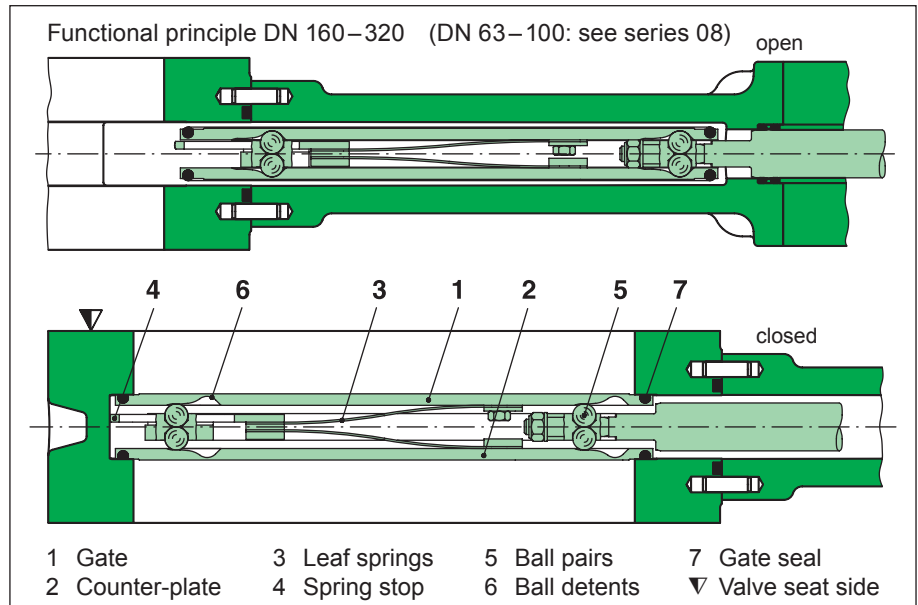
without solenoid valve, without position indicator: 121 . . . A14

without solenoid valve, with position indicator: 121 . . . A24

with solenoid valve, without position indicator: 121 . . . A34 (specify control voltage)

Features

Body material: aluminum
 Low cost gate valve
 Split body for easy cleaning
 VATLOCK configuration: see glossary



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$	
Pressure range		
– DN 63–200	$1 \cdot 10^{-7} \text{ mbar to } 1.6 \text{ bar (abs)}$	
– DN 250–320	$1 \cdot 10^{-7} \text{ mbar to } 1.2 \text{ bar (abs)}$	
Differential pressure on the gate		
– DN 63–200	$\leq 1.6 \text{ bar}$	
– DN 250–320	$\leq 1.2 \text{ bar}$	
Differential pressure at opening	$\leq 30 \text{ mbar}$	
Cycles until first service		
– DN 63–100	200 000	
– DN 160–320	100 000	
Temperature ¹⁾		
– Valve body	$\leq 120 \text{ }^{\circ}\text{C}$	
– Manual and pneumatic actuator	$\leq 80 \text{ }^{\circ}\text{C}$	
– Solenoid valve	$\leq 50 \text{ }^{\circ}\text{C}$	
– Position indicator	$\leq 80 \text{ }^{\circ}\text{C}$	
Heating and cooling rate	$\leq 30 \text{ }^{\circ}\text{C h}^{-1}$	
Material		
– Valve body	DN 63–100	EN AW-5083 (3.3547), -6061 (3.3211)
	DN 160–320	EN AC-42100 (3.2371)
– Mechanism	DN 63–100	AISI 304 (1.4301)
	DN 160–320	EN AW-6082 (3.2315)
Seal: bonnet, gate	FKM (Viton®)	
Feedthrough	shaft feedthrough	
Mounting position	any	
Solenoid valve	24 VDC, 5.4 W (others on request)	
Position indicator: contact rating		
– Voltage	$\leq 250 \text{ VAC}$	$\leq 50 \text{ VDC}$
– Current	$\leq 2 \text{ A}$	$\leq 1.2 \text{ A}$
Valve position indication	visual (mechanical)	

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

DN (nominal I.D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator		Valve with pneumatic actuator						
				Weight		Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time	Weight	
mm	inch		ls ⁻¹	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	See page 57	550	3	7	4–7	58–102	0.16	0.006	1.5	3	6.6
80	3		1000	3.8	9	4–7	58–102	0.20	0.007	1.7	3.8	8.4
100	4		2000	4.5	10	4–7	58–102	0.22	0.008	2	4.5	9.9
160	6		6000	9	20	4–7	58–102	0.50	0.018	2	9	19.8
200	8		12000	–	–	4–7	58–102	0.90	0.032	3	18	39.7
250	10		22000	–	–	4–7	58–102	1.50	0.053	5	25	55.1
320	12		33000	–	–	4–7	58–102	2.80	0.099	7	40	88.2

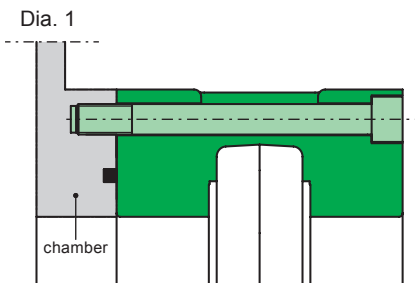
Options

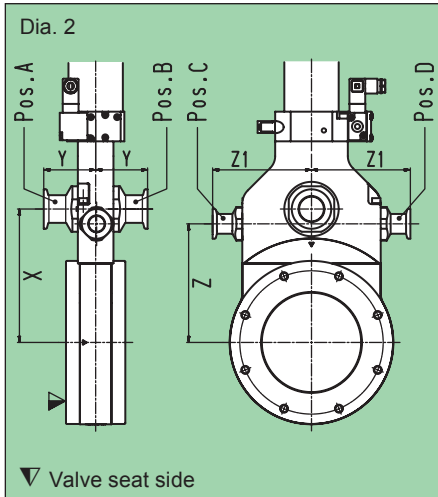
Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Bakeable position indicator: actuator bakeable to max. 140 °C

Valve

- Through holes for mounting the valve to the flat chamber wall (Dia. 1)
- Insert version (no valve body) for direct integration into the vacuum system
- Surface treatment, e. g. hard anodized valve body
- Customer specified flanges
- Other sealing materials
- Stainless steel gate for DN 160–320
- Shutter for laser application (gate without seal)
- ASA-LP flanges





- Ports for venting or for gauges (Dia. 2)
 - with DN 63–100 possible in positions C and D
 - with DN 63–320 possible in positions A, B, C and D

DN valve	mm inch	63 2 1/2	80 3	100 4	160 6	200 8	250 10	320 12
Recommended port ISO-KF		16	16	25	25	40	40	40
X	mm inch	105 4.13	110 4.33	135 5.31	190 7.48	232 9.13	285 11.22	350 13.78
Y	mm inch	48 1.89	48 1.89	63 2.48	54 2.13	60 2.36	65 2.56	74 2.91
Z	mm inch	90 3.54	100 3.94	120 4.72	–	–	–	–
Z1	mm inch	80 3.15	89 3.50	100 3.94	–	–	–	–
Other ports on request								

- Ports for roughing (by-pass)

Ordering information for options:

Ordering No. of valve-X (e. g. 12148-PA44-X, X = port ISO-KF 40 in position A)

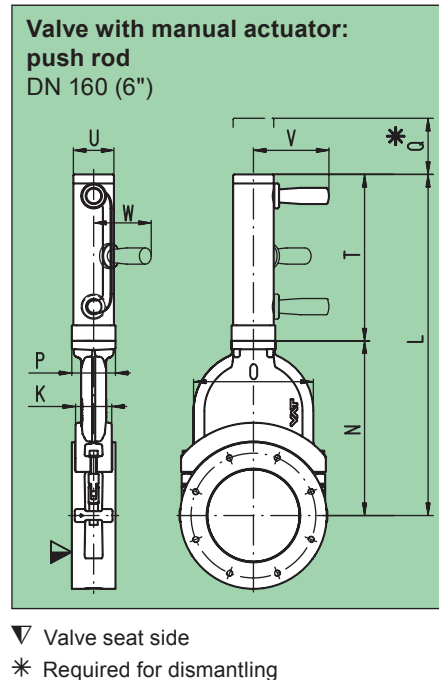
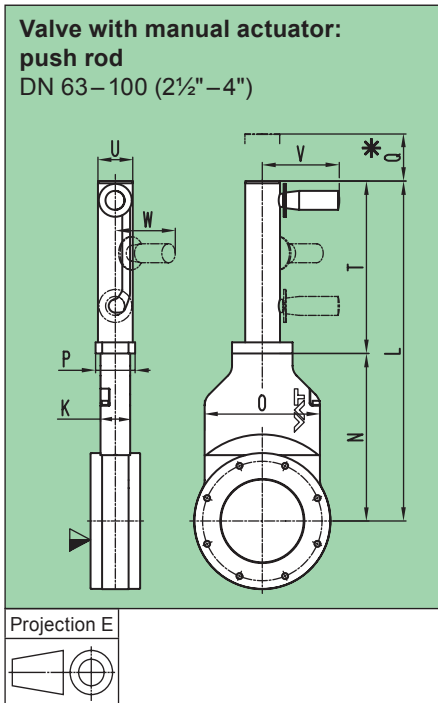
Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Heater and insulation jacket**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 32

Main dimensions

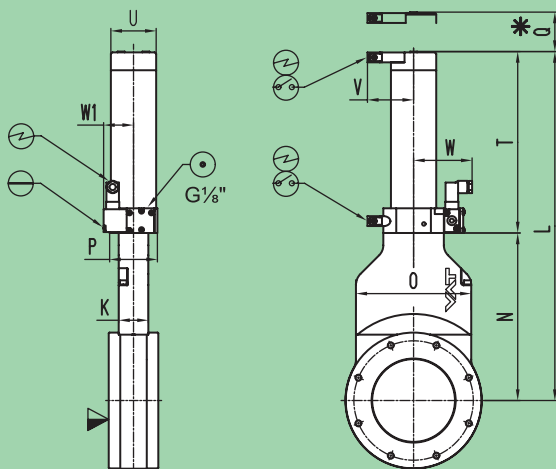


DN	mm inch	63 2 1/2	80 3	100 4	160 6
K	mm inch	36 1.42	36 1.42	36 1.42	58 2.28
L	mm inch	329.50 12.97	363 14.29	413 16.26	547 21.54
N	mm inch	155.50 6.12	173.50 6.83	203.50 8.01	280 11.02
O	mm inch	100 3.94	118 4.65	140 5.51	192 7.56
P	mm inch	48 1.89	48 1.89	48 1.89	70 2.76
Q	mm inch	25 0.98	25 0.98	25 0.98	60 2.36
T	mm inch	174 6.85	189.50 7.46	209.50 8.25	267 10.51
U	mm inch	43 1.69	43 1.69	43 1.69	65 2.56
V	mm inch	94 3.70	94 3.70	94 3.70	122 4.80
W	mm inch	75 2.95	75 2.95	75 2.95	95 3.74

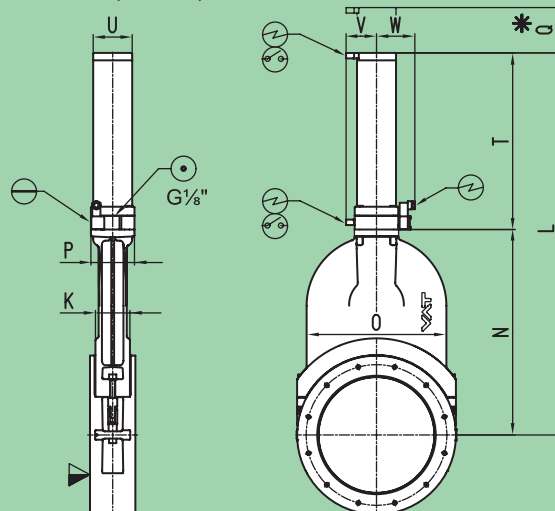
Flange dimensions: see page 57

Main dimensions

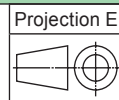
Valve with pneumatic actuator: double acting
DN 63–100 (2½"–4")



Valve with pneumatic actuator: double acting
DN 160–320 (6"–12")



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Position indicator
- ⊖ Emergency operation



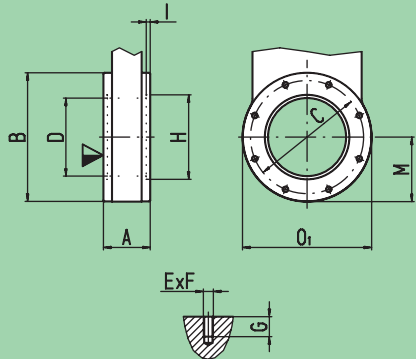
Flange dimensions: see page 57

DN	mm	63	80	100
	inch	2½	3	4
K	mm	36	36	36
	inch	1.42	1.42	1.42
L	mm	341.50	375	425
	inch	13.45	14.76	16.69
N	mm	155.50	173.50	203.50
	inch	6.12	6.83	8.01
O	mm	100	118	140
	inch	3.94	4.65	5.51
P	mm	58	58	58
	inch	2.28	2.28	2.28
Q	mm	25	25	25
	inch	0.98	0.98	0.98
T	mm	186	201.50	221.50
	inch	7.32	7.93	8.72
U	mm	55	55	55
	inch	2.17	2.17	2.17
V	mm	56	56	56
	inch	2.20	2.20	2.20
W	mm	72	72	72
	inch	2.83	2.83	2.83
W1	mm	36.50	36.50	36.50
	inch	1.44	1.44	1.44

DN	mm	160	200	250	320
	inch	6	8	10	12
K	mm	58	66	76	96
	inch	2.28	2.60	2.99	3.78
L	mm	547	688	843	1029
	inch	21.54	27.09	33.19	40.51
N	mm	280	363.50	453	558
	inch	11.02	14.31	17.83	21.97
O	mm	192	240	308	370
	inch	7.56	9.45	12.13	14.57
P	mm	70	80	96	114
	inch	2.76	3.15	3.78	4.49
Q	mm	60	80	100	120
	inch	2.36	3.15	3.94	4.72
T	mm	267	324.50	390	471
	inch	10.51	12.78	15.35	18.54
U	mm	65	75	86	106
	inch	2.56	2.95	3.39	4.17
V	mm	57	62	67	75
	inch	2.24	2.44	2.64	2.95
W	mm	71.50	76.50	84.50	93.50
	inch	2.82	3.01	3.33	3.68

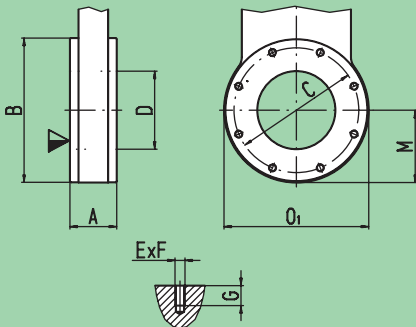
Flange dimensions

ISO-F
DN 63–320 (2½"–12")



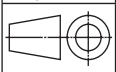
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	60 2.36	60 2.36	60 2.36	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	130 5.12	145 5.71	165 6.50	235 9.25	288 11.34	350 13.78	425 16.73
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55
D	mm inch	65 2.56	80 3.15	100 3.94	150 5.91	200 7.87	261 10.27	318 12.52
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12
G	mm inch	12 0.47	12 0.47	12 0.47	16 0.63	16 0.63	16 0.63	20 0.79
H	mm inch	70 2.76	83 3.27	102 4.02	153 6.02	213 8.39	–	–
I	mm inch	3 0.12	3 0.12	3 0.12	5 0.20	5 0.20	–	–
M	mm inch	65.50 2.58	73 2.87	83 3.27	117.50 4.63	144 5.67	175 6.89	212.50 8.37
O1	mm inch	131 5.16	146 5.75	166 6.54	237 9.33	290 11.42	352 13.86	428 16.85

JIS B 2290: 1998 / ISO 1609
DN 65–300 (2½"–12")



DN	mm inch	65 2½	80 3	100 4	150 6	200 8	250 10	300 12
A	mm inch	60 2.36	60 2.36	60 2.36	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	145 5.71	160 6.30	185 7.28	235 9.25	288 11.34	350 13.78	425 16.73
C	mm inch	120 4.72	135 5.31	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57
D	mm inch	65 2.56	80 3.15	100 3.94	150 5.91	200 7.87	261 10.27	318 12.52
E × F		4 × M10	4 × M10	8 × M10	8 × M10	8 × M12	12 × M12	12 × M12
G	mm inch	12 0.47	12 0.47	12 0.47	16 0.63	16 0.63	16 0.63	20 0.79
M	mm inch	73 2.87	81 3.19	93 3.66	117.50 4.63	144 5.67	175 6.89	212.50 8.37
O1	mm inch	146 5.75	161 6.34	186 7.32	237 9.33	290 11.42	352 13.86	428 16.85

Projection E



▼ Valve seat side

Series 14.1

Main applications

General purpose valve for isolation in high or rough vacuum applications
Especially suited to industrial processes



Ordering information

Valve with manual actuator
crank handle

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	14136-PE01	14136-CE01	14136-UE01	14136-TE01	14136-JE01
80	3	14138-PE01	14138-CE01	14138-UE01	14138-TE01	14138-JE01
100	4	14140-PE01	14140-CE01	14140-UE01	14140-TE01	14140-JE01
160	6	14144-PE01	14144-CE01	14144-UE01	14144-TE01	14144-JE01
200	8	14146-PE01	14146-CE01	14146-UE01	14146-TE01	14146-JE01
250	10	14148-PE01	14148-CE01	14148-UE01	14148-TE01	14148-JE01
320	12	14150-PE01	on request	on request	14150-TE01	14150-JE01

with position indicator: 141 . . . E08

with lever (instead of crank handle): 141 . . . E06

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	14136-PE44	14136-CE44	14136-UE44	14136-TE44	14136-JE44
80	3	14138-PE44	14138-CE44	14138-UE44	14138-TE44	14138-JE44
100	4	14140-PE44	14140-CE44	14140-UE44	14140-TE44	14140-JE44
160	6	14144-PE44	14144-CE44	14144-UE44	14144-TE44	14144-JE44
200	8	14146-PE44	14146-CE44	14146-UE44	14146-TE44	14146-JE44
250	10	14148-PE44	14148-CE44	14148-UE44	14148-TE44	14148-JE44
320	12	14150-PE44	on request	on request	14150-TE44	14150-JE44

without solenoid valve, without position indicator: 141 . . . E14

without solenoid valve, with position indicator: 141 . . . E24

with solenoid valve, without position indicator: 141 . . . E34 (specify control voltage)

————— Further ordering information on next page —————>

Valve DN 400: see series 14.0, pages 66–71

Features

Body material: stainless steel

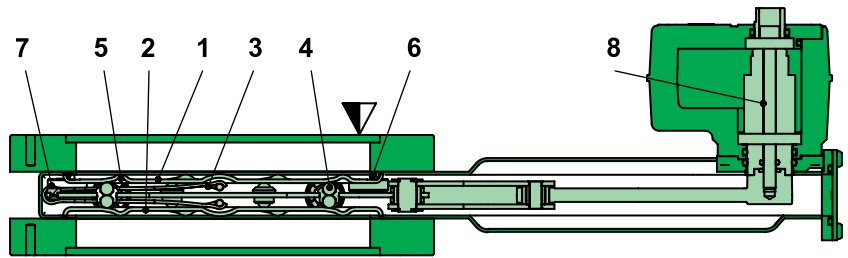
Very compact design

Manual and pneumatic actuator mountable in 6 positions

Rotary feedthrough for a high number of cycles

DN 63–200 with vulcanized seal (no dead volumes at the gate seal): see glossary

Functional principle



- | | | |
|-----------------|----------------|-------------------|
| 1 Gate | 4 Ball pairs | 7 Spring stop |
| 2 Counter-plate | 5 Ball detents | 8 Actuator |
| 3 Leaf springs | 6 Gate seal | ▽ Valve seat side |

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	
– DN 63–200	$1 \cdot 10^{-8}$ mbar to 1.6 bar (abs)
– DN 250–320	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	
– DN 63–200	≤ 1.6 bar
– DN 250–320	≤ 1.2 bar
Differential pressure at opening	≤ 30 mbar
Cycles until first service	200 000
Temperature ¹⁾	
– Valve body	≤ 150 °C
– Manual and pneumatic actuator	≤ 80 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 80 °C

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Ordering information

Valve with 3-position pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	14136-PE48	14136-CE48	14136-UE48	14136-TE48	14136-JE48
80	3	14138-PE48	14138-CE48	14138-UE48	14138-TE48	14138-JE48
100	4	14140-PE48	14140-CE48	14140-UE48	14140-TE48	14140-JE48
160	6	14144-PE48	14144-CE48	14144-UE48	14144-TE48	14144-JE48
200	8	14146-PE48	14146-CE48	14146-UE48	14146-TE48	14146-JE48
250	10	14148-PE48	14148-CE48	14148-UE48	14148-TE48	14148-JE48
320	12	14150-PE48	on request	on request	14150-TE48	14150-JE48

without solenoid valve, with position indicator: 141 . . . E28

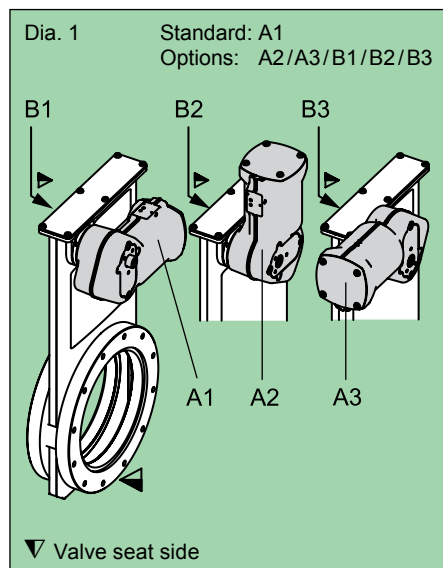
Valve DN 400: see series 64.0, pages 66–71

Continued Technical data

Heating and cooling rate	≤ 50 °C h ⁻¹
Material	
– Valve body	AISI 304 (1.4301)
– Mechanism DN 63–200	AISI 316L (1.4404)
DN 250–320	AISI 304 (1.4301)
Seal: bonnet, gate	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 50 VAC/DC
– Current	≤ 1.2 A
Valve position indication	visual (mechanical)

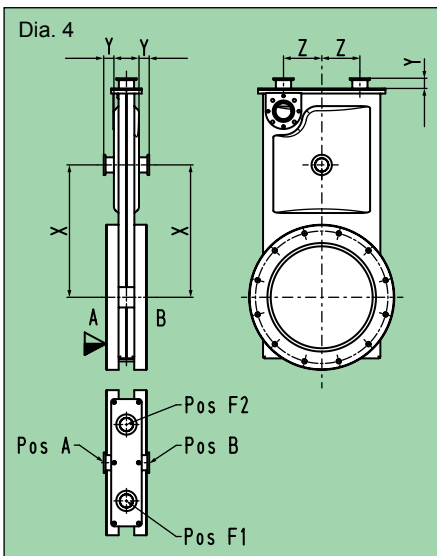
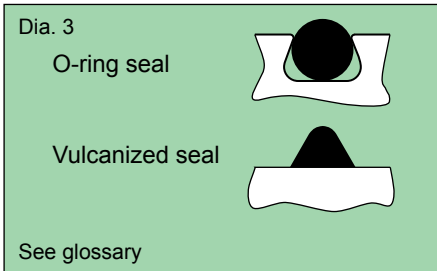
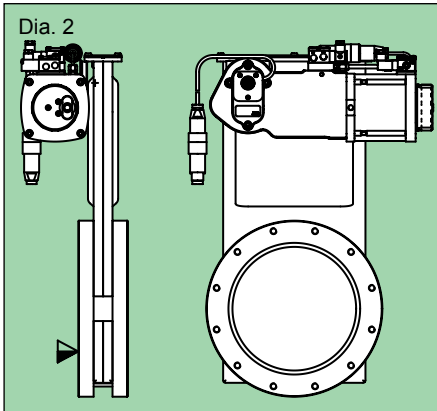
DN (nominal I.D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator					Valve with pneumatic actuator							
				with crank handle			with lever									
mm	inch	See pages 64 – 65	ls ⁻¹	Turns per stroke	Weight		Angle of rotation per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
				n	kg	lbs	°	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2 ½		600	14	6	13.2	83.5	6	13.2	4–7	58–102	0.25	0.0088	1.5	7.5	16.5
80	3		765	14	6	13.2	83.5	6	13.2	4–7	58–102	0.25	0.0088	1.5	7.5	16.5
100	4		1740	14	8	17.6	83.5	8	17.6	4–7	58–102	0.25	0.0088	1.5	10	22.1
160	6		5880	15	13	28.7	83.5	13	28.7	4–7	58–102	0.53	0.0187	2.5	16	35.3
200	8		12200	15	21	46.3	83.5	21	46.3	4–7	58–102	0.53	0.0187	2.5	24.5	54
250	10		21690	16	40	88.2	83.5	40	88.2	4–7	58–102	0.88	0.0311	4.5	46.5	102.5
320	12	29130	16	73	160.9	83.5	73	160.9	4–7	58–102	0.88	0.0311	4.5	77.5	170.9	

Options



Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable
- Standard pneumatic actuator mountable in 6 positions (Dia. 1):
 - position A1, A2, A3 on A-side (valve seat side): to be specified with order
 - position B1, B2, B3 on B-side (rear side): to be specified with order
- 3-position pneumatic actuator for throttling (Dia. 2),
mountable in 6 positions (Dia. 1):
 - position A1, A2, A3 on A-side (valve seat side): to be specified with order
 - position B1, B2, B3 on B-side (rear side): to be specified with order
 ordering information on page 59, technical data on request
- Double position indicator
(2 switches each for the positions «open» and «closed»)



▽ Valve seat side

Valve

- Customer specified flanges with/without watercooling
- Other sealing materials
- O-ring seal in gate (Dia. 3) with DN 63, 100, 160, 200 (standard: vulcanized seal)
- Intermediate pumping of the rotary feedthrough
- Ports for roughing (by-pass), venting or for gauges (Dia. 4)
 - possible in positions B, F1 and F2 with DN 63–250
 - possible in positions A, B, F1 and F2 with DN 320

DN valve	mm inch	63 2 ½	80 3	100 4	160 6	200 8	250 10	320 12
Recommended port Pos. A+B: ISO-KF		40	40	40	40	40	40	40
Recommended port Pos. F1 + F2: ISO-KF		16	16	16	16	16	25	25
X	mm inch	110 4.33	110 4.33	150 5.91	205 8.07	260 10.24	335 13.19	415 16.34
Y	mm inch	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
Z	mm inch	30 1.18	30 1.18	47.50 1.87	59 2.32	85 3.35	100 3.94	135 5.31
Other ports on request								

Ordering information for options:

Ordering No. of valve-X (e. g. 14146-CE01-X,

X = actuator A2, port ISO-KF 40 in position F2)

Spare parts

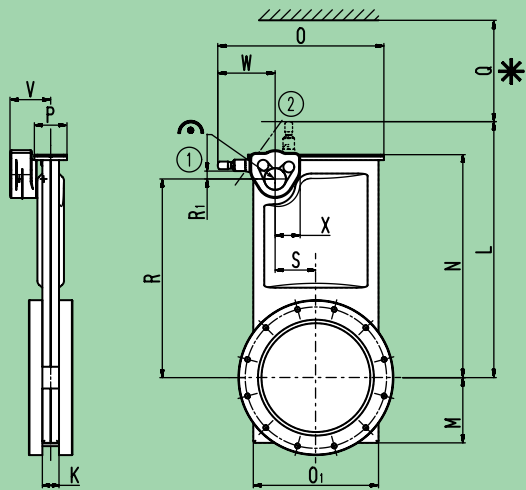
- **Seals**
on request (specify fabrication number of valve)

Accessories

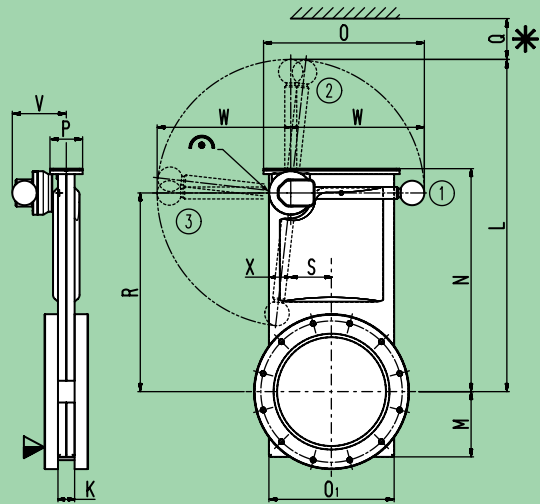
- **Heater**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 32 and 33

Main dimensions

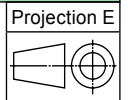
Valve with manual actuator: crank handle
DN 63–320 (2½"–12")



Valve with manual actuator: lever
DN 63–320 (2½"–12")



- ▽ Valve seat side
- * Required for dismantling
- ↻ Mechanical position indication
- ① Standard actuator position
- ② ③ Optional actuator positions



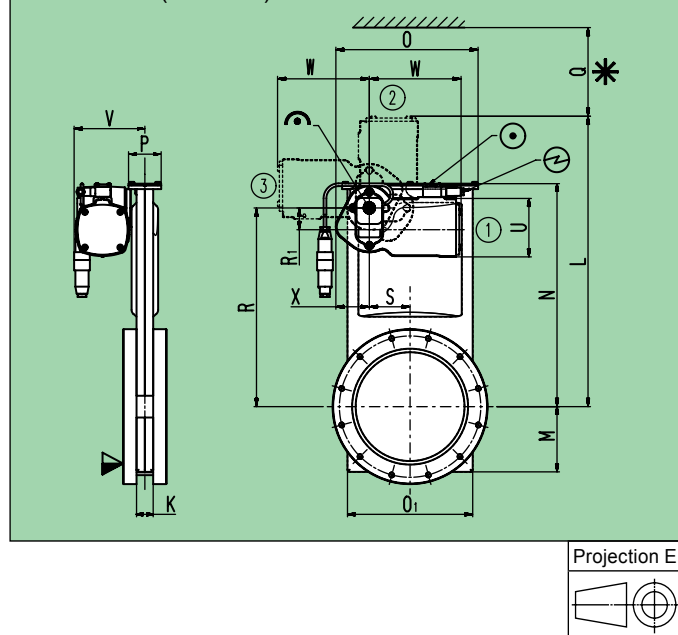
Flange dimensions: see pages 64–65

DN	mm	63	80	100	160	200	250	320
inch		2½	3	4	6	8	10	12
K	mm	26	26	26	25	31	41	54.40
	inch	1.02	1.02	1.02	0.98	1.22	1.61	2.14
L	mm	266	266	306	388	462	606	768.50
	inch	10.47	10.47	12.05	15.28	18.19	23.86	30.26
M	mm	53	53	69	94.50	120	160.50	198
	inch	2.09	2.09	2.72	3.72	4.72	6.32	7.80
N	mm	196	196	236	327	410	536	700
	inch	7.72	7.72	9.29	12.87	16.14	21.10	27.56
O	mm	193.50	193.50	219.50	264.50	305.50	424	481
	inch	7.62	7.62	8.64	10.41	12.03	16.69	18.94
O1	mm	105	105	135	185	230	321	396
	inch	4.13	4.13	5.31	7.28	9.06	12.64	15.59
P	mm	50	50	60	60	60	75	90
	inch	1.97	1.97	2.36	2.36	2.36	2.95	3.54
Q	mm	140	140	180	250	300	400	500
	inch	5.51	5.51	7.09	9.84	11.81	15.75	19.69
R	mm	162	162	202	282.50	365.50	465	627.50
	inch	6.38	6.38	7.95	11.12	14.39	18.31	24.70
R1	mm	23	23	23	25	25	35	35
	inch	0.91	0.91	0.91	0.98	0.98	1.38	1.38
S	mm	27	27	38	56.50	75	113	130
	inch	1.06	1.06	1.50	2.22	2.95	4.45	5.12
V	mm	71	71	71	72	75	99	105.50
	inch	2.80	2.80	2.80	2.83	2.95	3.90	4.15
W	mm	104	104	104	105.50	105.50	141	141
	inch	4.09	4.09	4.09	4.15	4.15	5.55	5.55
X	mm	44	44	44	46	46	59	59
	inch	1.73	1.73	1.73	1.81	1.81	2.32	2.32

DN	mm	63	80	100	160	200	250	320
inch		2½	3	4	6	8	10	12
K	mm	26	26	26	26	31	41	54.40
	inch	1.02	1.02	1.02	1.02	1.22	1.61	2.14
L	mm	343	343	383	527	609	835	998
	inch	13.50	13.50	15.08	20.75	23.98	32.87	39.29
M	mm	53	53	69	94.50	120	160.50	198
	inch	2.09	2.09	2.72	3.72	4.72	6.32	7.80
N	mm	196	196	236	327	410	536	700
	inch	7.72	7.72	9.29	12.87	16.14	21.10	27.56
O	mm	218	218	222	292	295	430	453
	inch	8.58	8.58	8.74	11.50	11.61	16.93	17.83
O1	mm	105	105	135	185	230	321	396
	inch	4.13	4.13	5.31	7.28	9.06	12.64	15.59
P	mm	50	50	60	60	60	75	90
	inch	1.97	1.97	2.36	2.36	2.36	2.95	3.54
Q	mm	140	140	180	250	300	400	500
	inch	5.51	5.51	7.09	9.84	11.81	15.75	19.69
R	mm	162	162	202	282.50	365.50	465	627.50
	inch	6.38	6.38	7.95	11.12	14.39	18.31	24.70
S	mm	27	27	38	56.50	75	113	130
	inch	1.06	1.06	1.50	2.22	2.95	4.45	5.12
V	mm	97	97	97	97	99	107	113.50
	inch	3.82	3.82	3.82	3.82	3.90	4.21	4.47
W	mm	182	182	182	246	246	373	373
	inch	7.17	7.17	7.17	9.69	9.69	14.69	14.69
X	mm	25	25	29	36	40	47.50	68
	inch	0.98	0.98	1.14	1.42	1.57	1.87	2.68

Main dimensions

Valve with pneumatic actuator: double acting
DN 63–320 (2½"–12")



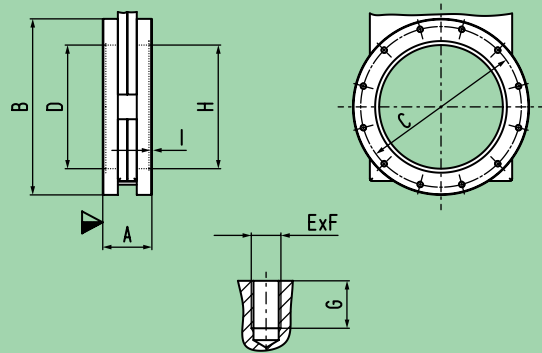
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Mechanical position indication
- ① Standard actuator position
- ② ③ Optional actuator positions

Flange dimensions: see pages 64–65

DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
K	mm inch	26 1.02	26 1.02	26 1.02	26 1.02	31 1.22	41 1.61	54.40 2.14
L	mm inch	294 11.57	294 11.57	334 13.15	448 17.64	531 20.91	661 26.02	823.50 32.42
M	mm inch	53 2.09	53 2.09	69 2.72	94.50 3.72	120 4.72	160.50 6.32	198 7.80
N	mm inch	196 7.72	196 7.72	236 9.29	327 12.87	410 16.14	536 21.10	700 27.56
O	mm inch	140 5.51	140 5.51	166 6.54	220.50 8.68	261.50 10.30	352 13.86	409.50 16.12
O1	mm inch	105 4.13	105 4.13	135 5.31	185 7.28	230 9.06	321 12.64	396 15.59
P	mm inch	50 1.97	50 1.97	60 2.36	60 2.36	60 2.36	75 2.95	90 3.54
Q	mm inch	140 5.51	140 5.51	180 7.09	250 9.84	300 11.81	400 15.75	500 19.69
R	mm inch	162 6.38	162 6.38	202 7.95	282.50 11.12	365.50 14.39	465 18.31	627.50 24.70
R1	mm inch	30 1.18	30 1.18	30 1.18	40 1.57	40 1.57	48 1.89	48 1.89
S	mm inch	27 1.06	27 1.06	38 1.50	56.50 2.22	75 2.95	113 4.45	130 5.12
U	mm inch	86.50 3.41	86.50 3.41	86.50 3.41	110 4.33	110 4.33	130 5.12	130 5.12
V	mm inch	114 4.49	114 4.49	114 4.49	125 4.92	127.50 5.02	157 6.18	163.50 6.44
W	mm inch	132 5.20	132 5.20	132 5.20	165.50 6.52	165.50 6.52	196 7.72	196 7.72
X	mm inch	50.50 1.99	50.50 1.99	50.50 1.99	61.50 2.42	61.50 2.42	69 2.72	69 2.72

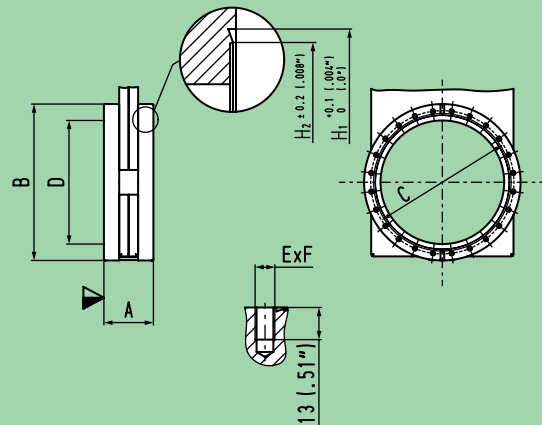
Flange dimensions

ISO-F
DN 63–320 (2½"–12")



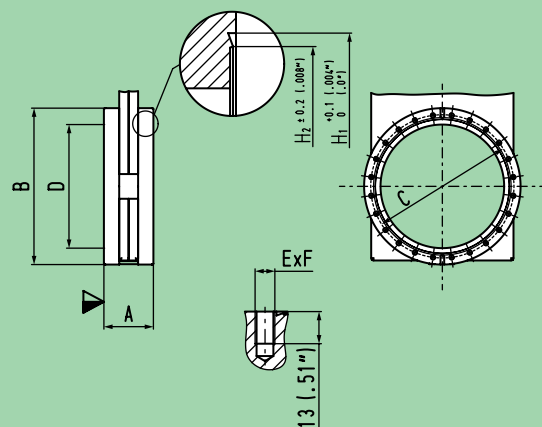
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	350 13.78	425 16.73
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	261 10.28	306 12.05
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12
G	mm inch	13 0.51	13 0.51	13 0.51	15 0.59	15 0.59	15 0.59	18 0.71
H	mm inch	–	83 3.27	102 4.02	153 6.02	213 8.39	–	318 12.52
I	mm inch	–	3 0.12	3 0.12	5 0.20	5 0.20	–	5 0.20

CF-F, metric threads
DN 63–250 (2½"–10")



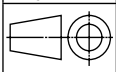
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	
O.D.	inch	4½	4⅝	6	8	10	12	
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	
B	mm inch	113.50 4.47	117.50 4.63	151.60 5.97	202.40 7.97	253.20 9.97	350 13.78	
C	mm inch	92.10 3.63	102.40 4.03	130.20 5.13	181 7.13	231.80 9.13	284 11.18	
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10	
E × F		8 × M8	10 × M8	16 × M8	20 × M8	24 × M8	32 × M8	
H1	mm inch	82.50 3.25	91.65 3.61	120.70 4.75	171.45 6.75	222.40 8.76	273.15 10.75	
H2	mm inch	77.40 3.05	86.30 3.40	115.50 4.55	166 6.54	217 8.54	267 10.51	

CF-F, UNF threads
DN 63–250 (2½"–10")



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 ^{*)} 10	250 ^{*)} 10
O.D.	inch	4½	4⅝	6	8	10	12	13¼
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	100 3.94
B	mm inch	113.50 4.47	117.50 4.63	151.60 5.97	202.40 7.97	253.20 9.97	350 13.78	350 13.78
C	mm inch	92.10 3.63	102.40 4.03	130.20 5.13	181 7.13	231.80 9.13	284 11.18	306.30 12.06
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10	254 10
E × F		8 × 5/16" 24 UNF	10 × 5/16" 24 UNF	16 × 5/16" 24 UNF	20 × 5/16" 24 UNF	24 × 5/16" 24 UNF	32 × 5/16" 24 UNF	30 × 3/8" 24 UNF
H1	mm inch	82.50 3.25	91.65 3.61	120.70 4.75	171.45 6.75	222.40 8.76	273.15 10.75	294.64 11.60
H2	mm inch	77.40 3.05	86.30 3.40	115.50 4.55	166 6.54	217 8.54	267 10.51	288.30 11.35

Projection E



▼ Valve seat side

^{*)} O.D. 12" VAT standard, O.D. 13¼" option

Ordering information for option: O.D. 13¼"

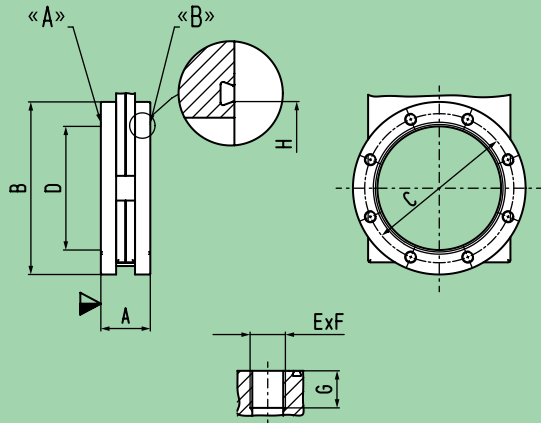
Ordering No. of valve-X (e. g. 14148-UE44-X, X = O.D. 13¼")

Flange dimensions

ASA-LP

DN 63–320 (2½"–12")
with or without O-ring groove

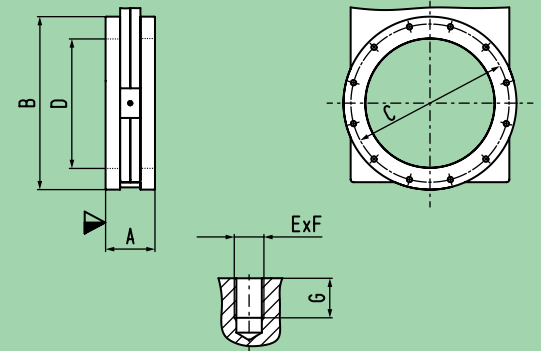
For orders with O-ring groove specify:
«A», «B» or «A+B»



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
ASA-LP		2	–	3	4	6	8	10
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	152.40 6.00	177.80 7.00	190.50 7.50	225 8.86	279.40 11.00	350 13.78	425 16.73
C	mm inch	120.70 4.75	139.70 5.50	152.40 6.00	190.50 7.50	241.30 9.50	298.50 11.75	362 14.25
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10.00	300 11.81
E x F		4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	8 x ⅜" 16 UNC	8 x ⅜" 10 UNC	8 x ⅜" 10 UNC	12 x ⅜" 10 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	15 0.59	19 0.75	19 0.75	19 0.75
H	mm inch	88.90 3.50	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13	266.70 10.50	317.50 12.50
O-ring I.D. x d	mm inch	88.49 x 3.53 3.48 x .139	88.49 x 3.53 3.48 x .139	120.24 x 3.53 4.73 x .139	158.34 x 3.53 6.23 x .139	202.79 x 3.53 7.98 x .139	266.29 x 3.53 10.48 x .139	316.87 x 7.00 12.47 x .275

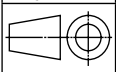
JIS B 2290: 1998 / ISO 1609

DN 65–300 (2½"–12")



DN	mm inch	65 2½	80 3	100 4	150 6	200 8	250 10	300 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	136 5.35	165 6.50	185 7.28	235 9.25	300 11.81	350 13.78	425 16.73
C	mm inch	120 4.72	135 5.31	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	261 10.28	306 12.05
E x F		4 x M10	8 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12
G	mm inch	12 0.47	12 0.47	12 0.47	12 0.47	15 0.59	15 0.59	16 0.63

Projection E



▼ Valve seat side

Series 14.0, 64.0

Main applications

General purpose valve for isolation in high or rough vacuum applications

Especially suited to industrial processes



Ordering information

Series 14.0
Valve with manual actuator
handwheel

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA	JIS
400	16	14052-PE01	on request	on request	14052-AE01	14052-JE01

Series 14.0
Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA	JIS
400	16	14052-PE44	on request	on request	14052-AE44	14052-JE44

without solenoid valve, without position indicator: 140 . . . E14

without solenoid valve, with position indicator: 140 . . . E24

with solenoid valve, without position indicator: 140 . . . E34 (specify control voltage)

Series 64.0
Valve with 3-position
pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA	JIS
400	16	64052-PE48	on request	on request	64052-AE48	64052-JE48

without solenoid valve, with position indicator: 640 . . . E28

Valves DN 63–320: see series 14.1, pages 58–65

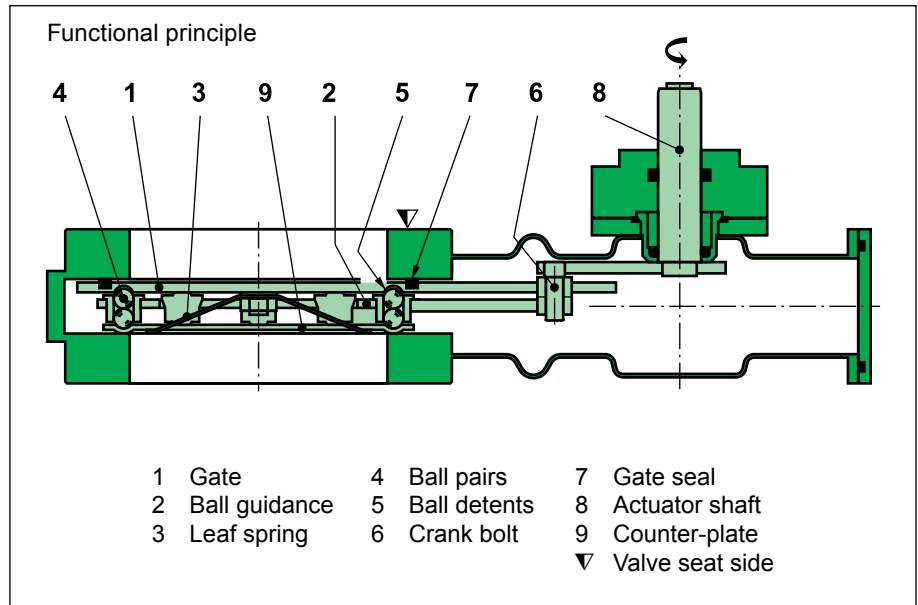
Features

Body material: stainless steel

Very compact design

Manual and pneumatic actuator mountable in 6 positions

Rotary feedthrough for a high number of cycles



Technical data

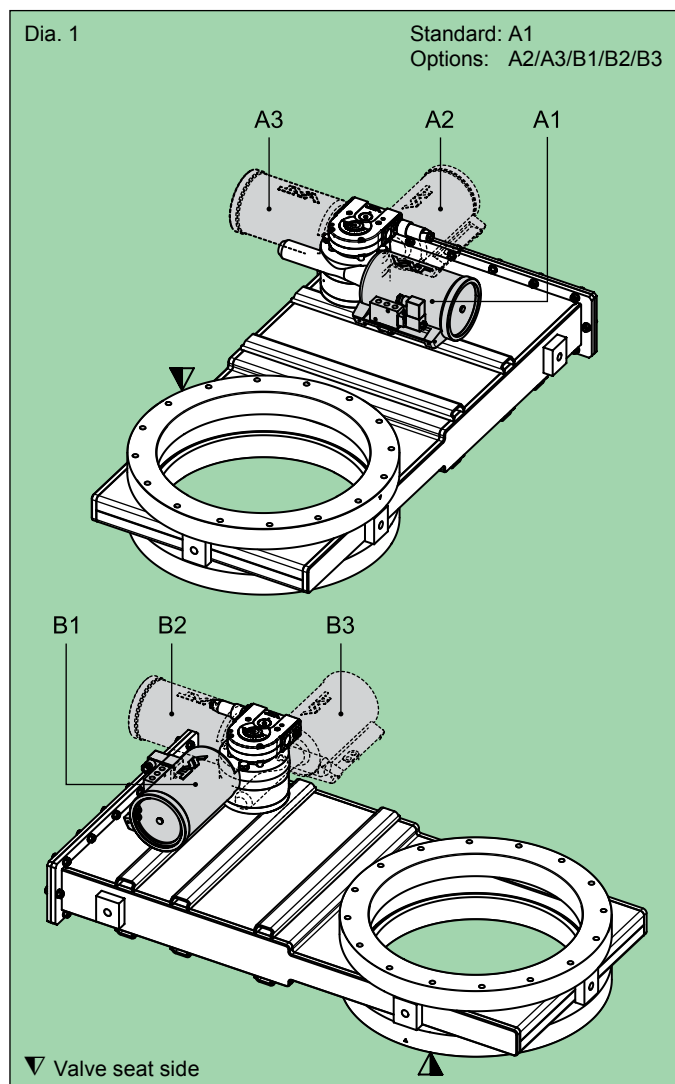
Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	≤ 1.2 bar
Differential pressure at opening	≤ 30 mbar
Cycles until first service	200 000 in horizontal position
Temperature ¹⁾	
– Valve body	≤ 150 °C
– Manual actuator	≤ 80 °C
– Pneumatic actuator	≤ 50 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 80 °C
Heating and cooling rate	≤ 50 °C h ⁻¹
Material: valve body, mechanism	AISI 304 (1.4301)
Seal: bonnet, gate	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position ²⁾	horizontal, seat side towards chamber
Solenoid valve	24 VDC, 2.5 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 250 VAC ≤ 50 VDC
– Current	≤ 5 A ≤ 3 A
Valve position indication	visual (mechanical)
Conductance (molecular flow) ³⁾	52 000 ls ⁻¹
Pneumatic actuator	
– Compressed air, min. – max. overpressure	4 – 7 bar (58 – 102 psi)
– Volume of pneumatic actuator	0.75 l (0.025 ft ³)
– Closing or opening time	5.5 s
Weight	155 kg (340 lbs)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ For other mounting positions please contact VAT

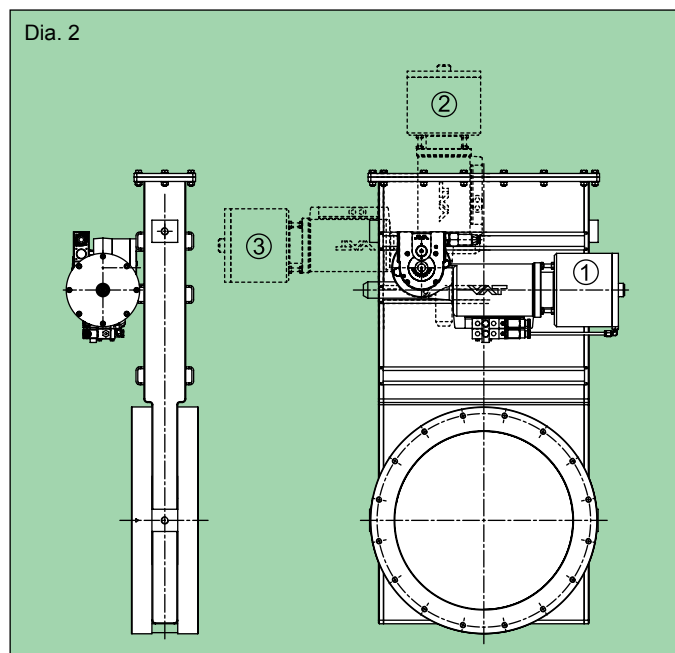
³⁾ Depending on A-dimension and flange type

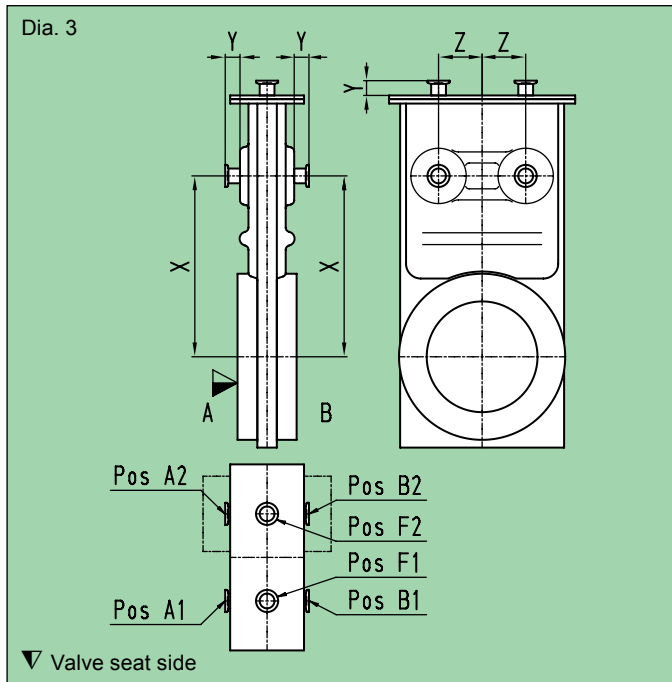
Options



Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Manual emergency operation on solenoid valve lockable
- Standard pneumatic actuator mountable in 6 positions (Dia. 1):
 - position A1, A2, A3 on A-side (valve seat side):
to be specified with order
 - position B1, B2, B3 on B-side (rear side):
to be specified with order
- 3-position pneumatic actuator for throttling (Dia. 2), mountable in 6 positions (Dia. 1):
 - position A1, A2, A3 on A-side (valve seat side):
to be specified with order
 - position B1, B2, B3 on B-side (rear side):
to be specified with order
 ordering information on page 66, technical data on request
- Double position indicator
(2 switches each for the positions «open» and «closed»)





Valve

- Customer specified flanges with/without watercooling
- Other sealing materials
- Intermediate pumping of the rotary feedthrough
- Ports for roughing (by-pass), venting or for gauges (Dia. 3), possible in positions A1, A2, B1, B2, F1 and F2

DN valve		Recommen- ded port	X		Y		Z	
mm	inch		mm	inch	mm	inch	mm	inch
400	16	ISO-KF 40	415	16.34	20	0.79	140	5.51
Other ports on request								

Ordering information for options:

Ordering No. of valve-X (e. g. 14052-PE44-X, X = actuator A2, port ISO-KF 40 in position F1)

Spare parts

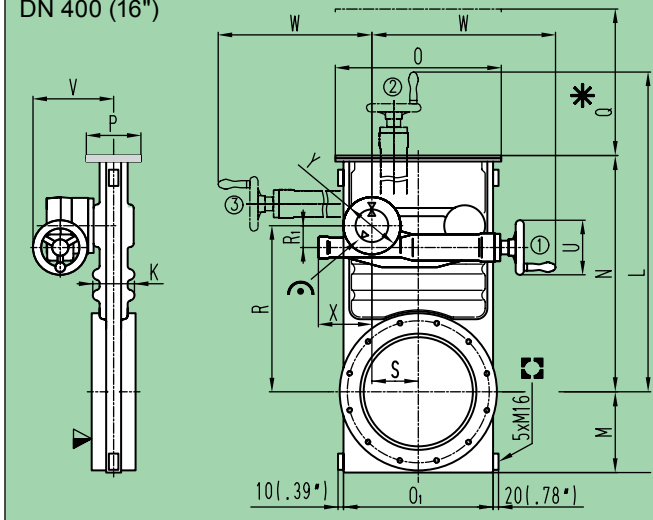
- **Seals**
on request (specify fabrication number of valve)

Accessories

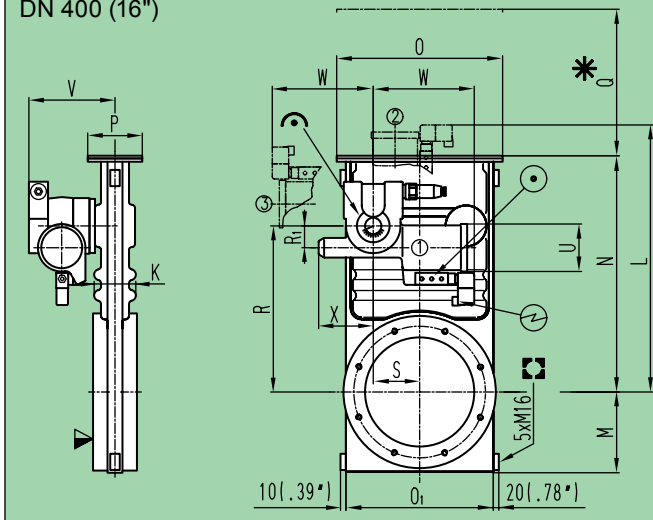
- **Heater**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 32 and 33

Main dimensions

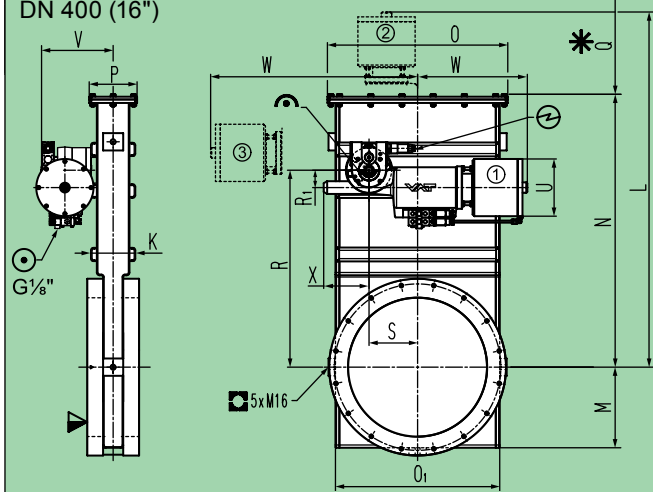
Valve with manual actuator: handwheel
DN 400 (16")



Valve with pneumatic actuator: double acting
DN 400 (16")



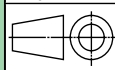
Valve with 3-position pneumatic actuator: double acting
DN 400 (16")



		Valve with manual actuator	Valve with pneumatic actuator	Valve with 3-position pneumatic actuator
K	mm inch	133 5.23	130 5.12	130 5.12
L	mm inch	935 36.81	836 32.91	1024 40.31
M	mm inch	232 9.13	232 9.13	232 9.13
N	mm inch	789 31.06	789 31.06	789 31.06
O	mm inch	520 20.47	520 20.47	520 20.47
O1	mm inch	474 18.66	474 18.66	474 18.66
P	mm inch	138 5.43	138 5.43	138 5.43
Q	mm inch	600 23.62	600 23.62	600 23.62
R	mm inch	568 22.36	568 22.36	568 22.36
R1	mm inch	50 1.97	50 1.97	50 1.97
S	mm inch	140 5.51	140 5.51	140 5.51
U	mm inch	125 4.92	122.50 4.82	165 6.50
V	mm inch	202 7.95	206 8.11	221 8.72
W	mm inch	367 14.45	268 10.55	456 17.95
X	mm inch	130 5.12	131 5.16	131 5.16
Y	mm inch	130 5.12	—	—

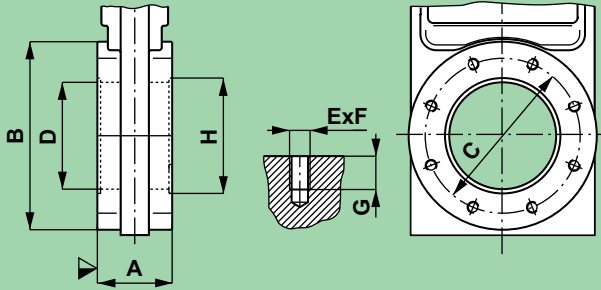
- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊗ Electrical connection
- ⊖ Mechanical position indication
- For attachment
- ① Standard actuator position
- ② ③ Optional actuator positions

Projection E

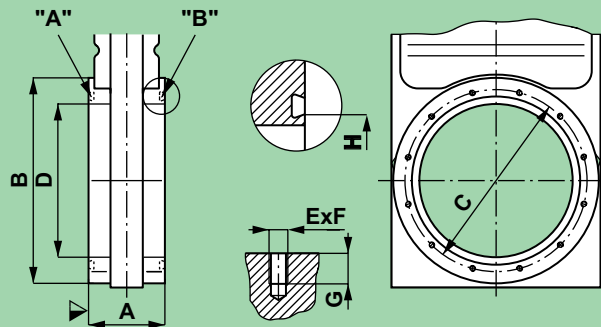


Flange dimensions

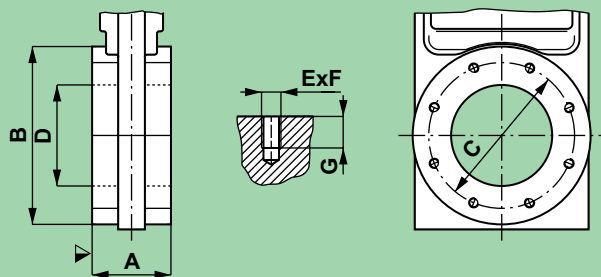
ISO-F
DN 400 (16")



ASA
DN 400 (16")



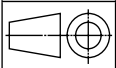
JIS B 2290: 1998 / ISO 1609
DN 400 (16")



▽ Valve seat side

		ISO-F	ASA	JIS
DN	mm inch	400 16	400 16	400 16
A	mm inch	150 5.90	150 5.90	150 5.90
B	mm inch	510 20.08	596.90 23.50	510 20.08
C	mm inch	480 18.90	539.80 21.25	480 18.90
D	mm inch	400 15.75	400 15.75	400 15.75
E x F		16 x M12	16 x 1" 8 UNF	12 x M16
G	mm inch	20 0.79	25.40 1.00	25 0.98
H	mm inch	—	419.10 16.50	—
O-ring I.D. x d	mm inch	—	417.96 x 7.00 16.46 x .275	—

Projection E



Main applications

Isolation valve for extremely particle and shock sensitive vacuum systems



Ordering information

Series 15.0

Vacuum valve with pneumatic actuator

double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)		
mm	inch	ISO-F	ASA-LP	JIS
63	2 ½	15036-PA44	15036-TA44	15036-JA44
100	4	15040-PA44	15040-TA44	15040-JA44
160	6	15044-PA44	15044-TA44	15044-JA44

without solenoid valve, without position indicator: 150 . . . A14

without solenoid valve, with position indicator: 150 . . . A24

with solenoid valve, without position indicator: 150 . . . A34 (specify control voltage)

Series 15.1

HV valve with pneumatic actuator

double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)		
mm	inch	ISO-F	ASA-LP	JIS
63	2 ½	15136-PA44	15136-TA44	15136-JA44
100	4	15140-PA44	15140-TA44	15140-JA44
160	6	15144-PA44	15144-TA44	15144-JA44

without solenoid valve, without position indicator: 151 . . . A14

without solenoid valve, with position indicator: 151 . . . A24

with solenoid valve, without position indicator: 151 . . . A34 (specify control voltage)

Series 15.2

UHV valve with pneumatic actuator

double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	15236-PE44	15236-CE44	15236-UE44	15236-TE44	15236-JE44
100	4	15240-PE44	15240-CE44	15240-UE44	15240-TE44	15240-JE44
160	6	15244-PE44	15244-CE44	15244-UE44	15244-TE44	15244-JE44
200	8	15246-PE44	15246-CE44	15246-UE44	15246-TE44	15246-JE44
250	10	15248-PE44	15248-CE44	15248-UE44	15248-TE44	15248-JE44

without solenoid valve, without position indicator: 152 . . . E14

without solenoid valve, with position indicator: 152 . . . E24

with solenoid valve, without position indicator: 152 . . . E34 (specify control voltage)

Features

Body material:

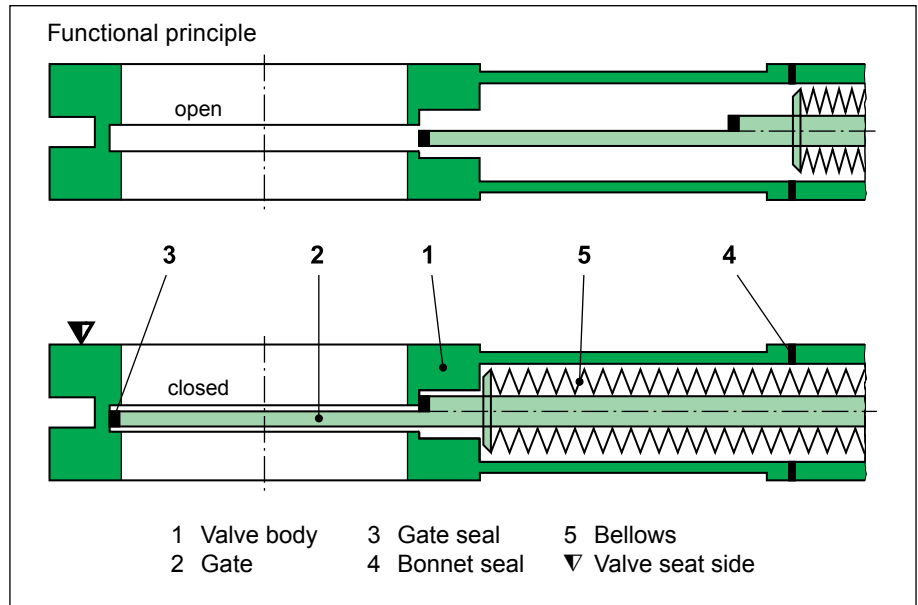
Series 15.0, 15.1: aluminum

Series 15.2: stainless steel

Long lifetime

Very small installation dimension

Vulcanized seal (no dead volumes at the gate seal): see glossary



Technical data

Leak rate

– Valve body	
– Series 15.0, 15.1	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
– Series 15.2	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
– Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹

Pressure range

– Series 15.0	$1 \cdot 10^{-7}$ mbar to 1 bar (abs)
– Series 15.1	$1 \cdot 10^{-8}$ mbar to 1 bar (abs)
– Series 15.2	$1 \cdot 10^{-10}$ mbar to 1 bar (abs)

Differential pressure on the gate ≤ 1.2 bar

Differential pressure at opening ≤ 30 mbar

Cycles until first service ¹⁾ 500 000

Temperature ²⁾

– Valve body	
– Series 15.0, 15.1	≤ 120 °C ³⁾
– Series 15.2 DN 63–200	≤ 250 °C open / ≤ 200 °C closed
– Series 15.2 DN 250	≤ 120 °C ³⁾
– Actuator	
– Series 15.0, 15.1	≤ 100 °C
– Series 15.2 DN 63–160	≤ 200 °C
– Series 15.2 DN 200–250	≤ 100 °C ³⁾
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 80 °C

Heating and cooling rate

– Series 15.0, 15.1	≤ 30 °C h ⁻¹
– Series 15.2	≤ 50 °C h ⁻¹

¹⁾ Higher number of cycles on request

²⁾ Maximum values: depending on operating conditions and sealing materials

³⁾ Higher temperatures on request

Further technical data on next page →

Continued Technical data

Material

- Valve body
 - Series 15.0, 15.1 EN AW-6082 (3.2315)
 - Series 15.2 AISI 304 (1.4301)
- Gate
 - Series 15.0, 15.1 EN AW-6082 (3.2315)
 - Series 15.2 DN 63–200 AISI 304 (1.4301)
 - Series 15.2 DN 250 EN AW-6082 (3.2315)
- Bellows AISI 633 (AM350)

Seal

- Bonnet
 - Series 15.0, 15.1 FKM (Viton®)
 - Series 15.2 metal
- Gate FKM (Viton®)

Feedthrough

- Series 15.0 shaft feedthrough
- Series 15.1, 15.2 bellows

Mounting position

any

Solenoid valve

24 VDC, 5.4 W (others on request)

Position indicator: contact rating

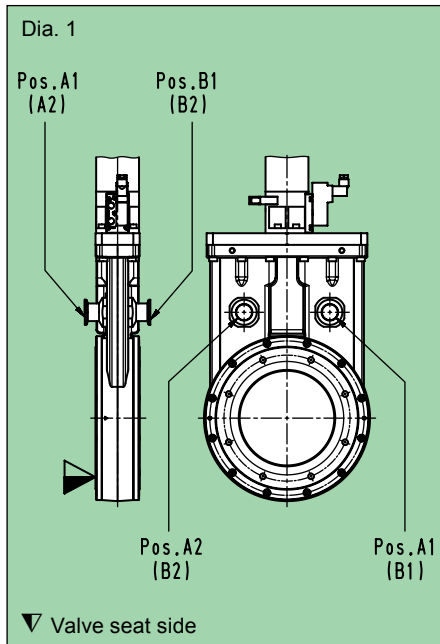
- Voltage ≤ 250 VAC ≤ 50 VDC
- Current ≤ 2 A ≤ 1.2 A

Valve position indication

visual (mechanical)

DN (nominal I.D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time		Weight					
			15.0 15.1	15.2					15.0 15.1	15.2	15.0		15.1		15.2	
mm	inch		ls ⁻¹	ls ⁻¹	bar	psi	l	ft ³	s	s	kg	lbs	kg	lbs	kg	lbs
63	2 ½	See pages 78 – 79	480	480	4–7	58–102	0.22	0.008	1.5	1.5	6.9	15.1	7.7	16.9	7.8	17.2
100	4		1700	1700	4–7	58–102	0.32	0.011	2.8	2.8	8.6	19	10.2	22.5	11.6	25.6
160	6		6000	6000	4–7	58–102	0.46	0.016	3.1	3.1	11.8	26	14	30.9	17	37.5
200	8		–	12000	4–7	58–102	1.08	0.038	–	6	–	–	–	–	34.2	75.4
250	10		–	19400	5–7	73–102	2.10	0.074	–	7	–	–	–	–	60	132.3

Options



Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Bakeable position indicator: bakeable to max. 140 °C

Valve

- Customer specified flanges
- Other sealing materials
- Ports for roughing (by-pass), venting or for gauges (Dia. 1), possible in positions A1, A2, B1 and B2
- Special gate for the installation of various windows and foils

Ordering information for options:

Ordering No. of valve-X (e. g. 15246-CE44-X, X = port CF-F 40 in position A1)

Spare parts

- **Seals**
on request (specify fabrication number of valve)

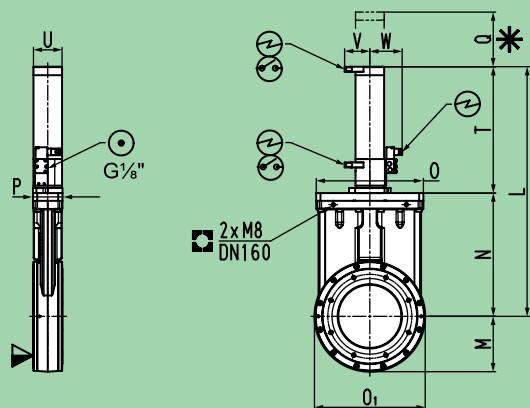
Accessories

- **Flange connections**
for installation of the valve: see series 32 and 33

Main dimensions

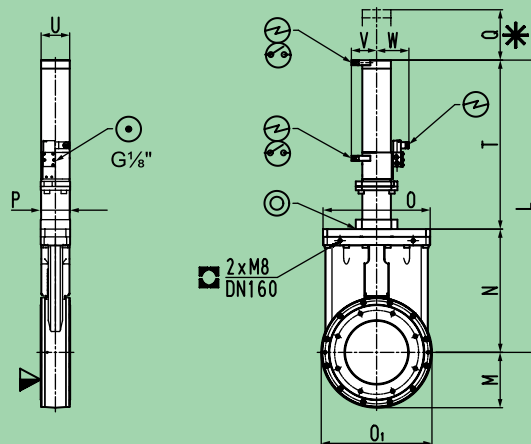
Series 15.0

Vacuum valve with pneumatic actuator: double acting
DN 63–160 (2½"–6")



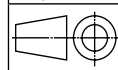
Series 15.1

HV valve with pneumatic actuator: double acting
DN 63–160 (2½"–6")



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊗ Position indicator
- ⊙ Leak detection hole
- For attachment

Projection E



Flange dimensions: see pages 78–79

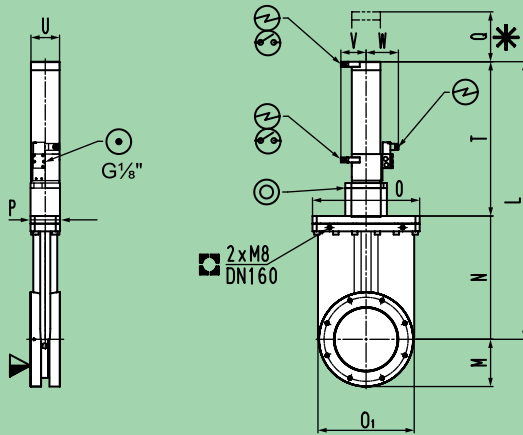
DN	mm inch	63 2½	100 4	160 6
L	mm inch	385 15.16	472 18.58	595 23.43
M	mm inch	87 3.43	107 4.21	132 5.20
N	mm inch	169 6.65	221 8.70	294 11.57
O	mm inch	155 6.10	195 7.68	255 10.04
O1	mm inch	174 6.85	214 8.43	264 10.39
P	mm inch	70 2.76	70 2.76	70 2.76
Q	mm inch	110 4.33	145 5.71	195 7.68
T	mm inch	216 8.50	251 9.88	301 11.85
U	mm inch	68 2.68	68 2.68	68 2.68
V	mm inch	60 2.36	60 2.36	60 2.36
W	mm inch	75 2.95	75 2.95	75 2.95

DN	mm inch	63 2½	100 4	160 6
L	mm inch	443 17.44	553 21.77	700 27.56
M	mm inch	87 3.43	107 4.21	132 5.20
N	mm inch	169 6.65	221 8.70	294 11.57
O	mm inch	155 6.10	195 7.68	255 10.04
O1	mm inch	174 6.85	214 8.43	264 10.39
P	mm inch	70 2.76	70 2.76	70 2.76
Q	mm inch	110 4.33	145 5.71	195 7.68
T	mm inch	274 10.79	332 13.07	406 15.98
U	mm inch	68 2.68	68 2.68	68 2.68
V	mm inch	60 2.36	60 2.36	60 2.36
W	mm inch	75 2.95	75 2.95	75 2.95

Main dimensions

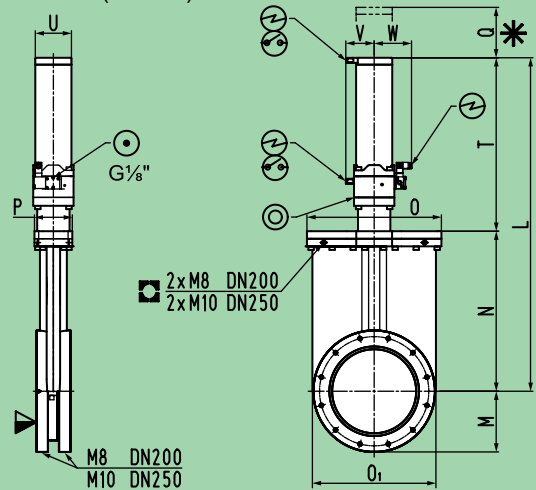
Series 15.2

UHV valve with pneumatic actuator: double acting
DN 63–160 (2½"–6")



Series 15.2

UHV valve with pneumatic actuator: double acting
DN 200–250 (8"–10")



▽ Valve seat side

* Required for dismantling

⊙ Compressed air connection

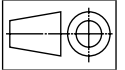
⊕ Electrical connection

⊗ Position indicator

⊙ Leak detection hole

■ For attachment

Projection E



Flange dimensions: see pages 78–79

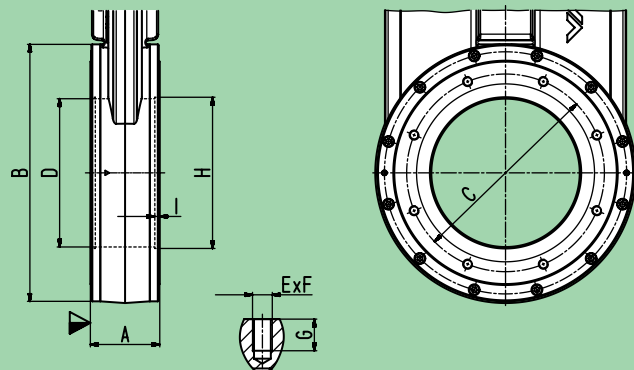
DN	mm	63	100	160
	inch	2½	4	6
L	mm	415	517	661
	inch	16.34	20.35	26.02
M	mm	67.50	87.50	112.50
	inch	2.66	3.44	4.43
N	mm	169	221	294
	inch	6.65	8.70	11.57
O	mm	155	195	255
	inch	6.10	7.68	10.04
O1	mm	139	179	229
	inch	5.47	7.05	9.02
P	mm	70	70	70
	inch	2.76	2.76	2.76
Q	mm	110	145	195
	inch	4.33	5.71	7.68
T	mm	246	296	367
	inch	9.69	11.65	14.45
U	mm	68	68	68
	inch	2.68	2.68	2.68
V	mm	60	60	60
	inch	2.36	2.36	2.36
W	mm	75	75	75
	inch	2.95	2.95	2.95

DN	mm	200	250	
	inch	8	10	
L	mm	795	943	
	inch	31.30	37.13	
M	mm	144.50	176.50	
	inch	5.69	6.95	
N	mm	382	482	
	inch	15.04	18.98	
O	mm	320	391	
	inch	12.60	15.39	
O1	mm	294	360	
	inch	11.57	14.17	
P	mm	96	99	
	inch	3.78	3.90	
Q	mm	255	330	
	inch	10.04	12.99	
T	mm	413	461	
	inch	16.26	18.15	
U	mm	86	106	
	inch	3.39	4.17	
V	mm	67	75	
	inch	2.64	2.95	
W	mm	90	93.50	
	inch	3.54	3.68	

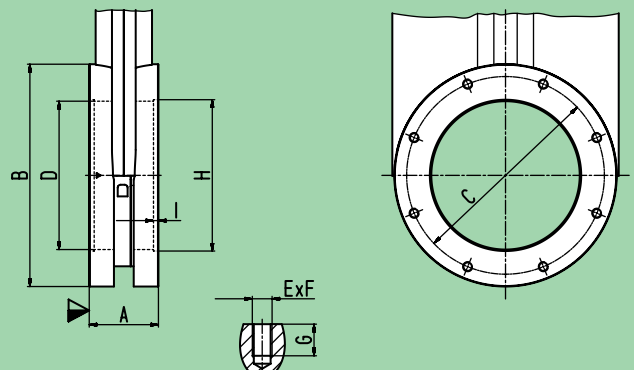
Flange dimensions

ISO-F

Series 15.0, 15.1: DN 63–160 (2½"–6")

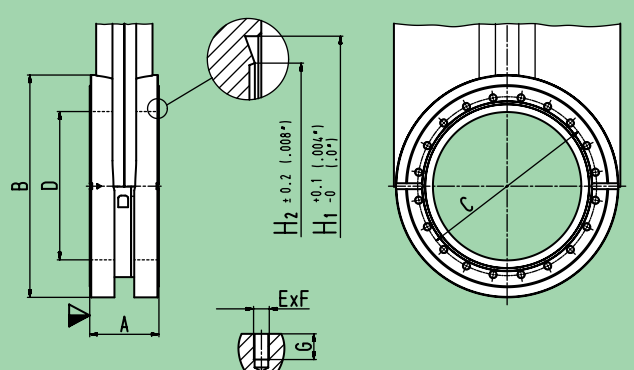


Series 15.2: DN 63–250 (2½"–10")



CF-F

Series 15.2: DN 63–250 (2½"–10")



DN	mm inch	63 2 ½	100 4	160 6	200 8	250 10
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94
B ¹⁾	mm inch	170 6.69	210 8.27	260 10.24	–	–
B ²⁾	mm inch	135 5.31	175 6.89	225 8.86	290 11.42	354 13.94
C	mm inch	110 4.33	145 5.71	200 7.87	260 10.24	310 12.20
D	mm inch	65 2.56	100 3.94	150 5.91	200 7.87	250 9.84
E × F		4 × M8	8 × M8	8 × M10	12 × M10	12 × M10
G	mm inch	12 0.47	12 0.47	15 0.59	15 0.59	15 0.59
H	mm inch	70 2.76	102 4.02	153 6.02	213 8.39	261 10.28
I	mm inch	5 0.20	5 0.20	5 0.20	5 0.20	5 0.20

¹⁾ Series 15.0, 15.1

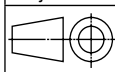
²⁾ Series 15.2

DN	mm inch	63 2 ½	100 4	160 6	200 8	250 10
O.D.	inch	4 ½	6	8	10	12
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94
B	mm inch	135 5.31	175 6.89	225 8.86	290 11.42	354 13.94
C	mm inch	92.10 3.63	130.30 5.13	181 7.13	231.80 9.13	284 11.18
D	mm inch	65 2.56	100 3.94	150 5.91	200 7.87	250 9.84
E × F ¹⁾		8 × M8	16 × M8	20 × M8	24 × M8	32 × M8
E × F ²⁾		8 × 5/16" 24 UNF	16 × 5/16" 24 UNF	20 × 5/16" 24 UNF	24 × 5/16" 24 UNF	32 × 5/16" 24 UNF
G	mm inch	12 0.47	12 0.47	12 0.47	12 0.47	12 0.47
H1	mm inch	82.50 3.25	120.65 4.75	171.45 6.75	222.30 8.75	273.15 10.75
H2	mm inch	77.40 3.05	115.50 4.55	166 6.54	217 8.54	267 10.51

¹⁾ Metric threads

²⁾ UNF threads

Projection E

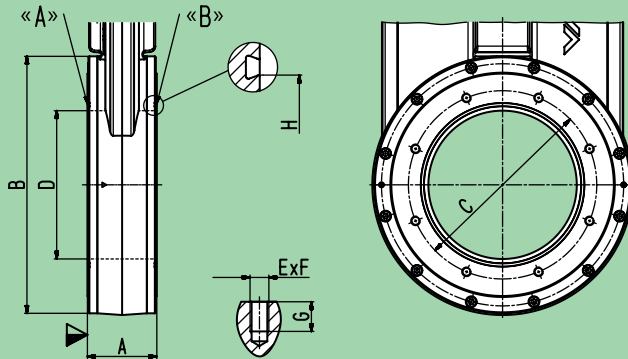


▼ Valve seat side

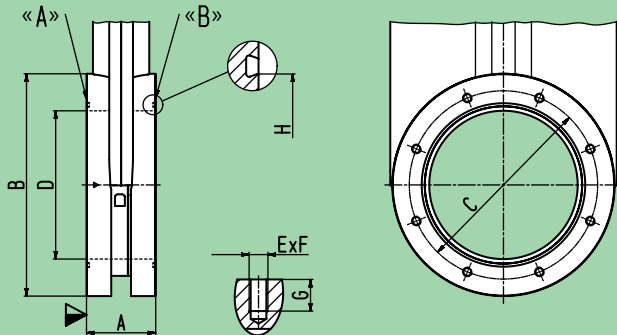
Flange dimensions

ASA-LP¹⁾

Series 15.0, 15.1: DN 63–160 (2½"–6")



Series 15.2: DN 63–250 (2½"–10")



¹⁾ ASA-LP

with or without O-ring groove

For orders with O-ring groove specify:

«A», «B» or «A+B»

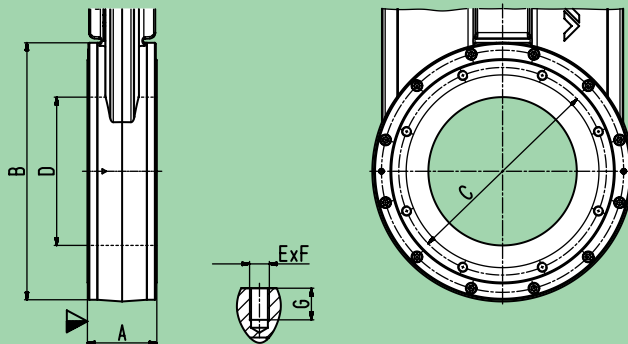
DN	mm inch	63 2 ½	100 4	160 6	200 8	250 10
ASA-LP		2	3	4	6	8
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94
B ¹⁾	mm inch	170 6.69	210 8.27	260 10.24	–	–
B ²⁾	mm inch	135 5.31	175 6.89	225 8.86	290 11.41	354 13.94
C	mm inch	120.70 4.75	152.40 6.00	190.50 7.50	241.30 9.50	298.50 11.75
D	mm inch	65 2.56	100 3.94	150 5.91	200 7.87	250 9.84
E × F		4 × ⅜" 16 UNC	4 × ⅜" 16 UNC	8 × ⅜" 16 UNC	8 × ¾" 10 UNC	8 × ¾" 10 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	19 0.75	19 0.75
H	mm inch	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13	266.70 10.50
O-ring I.D. × d	mm inch	88.49 × 3.53 3.48 × 0.139	120.24 × 3.53 4.73 × 0.139	158.34 × 3.53 6.23 × 0.139	202.79 × 3.53 7.98 × .139	266.29 × 3.53 10.48 × .139

¹⁾ Series 15.0, 15.1

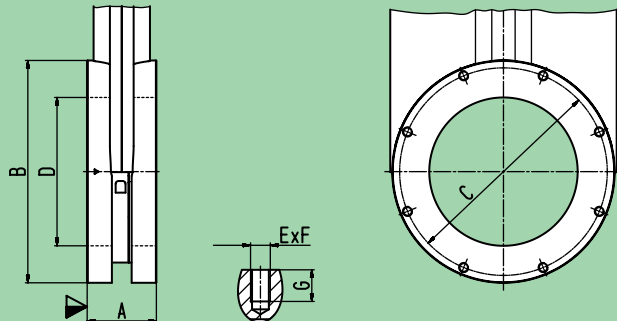
²⁾ Series 15.2

JIS B 2290: 1998 / ISO 1609

Series 15.0, 15.1: DN 65–150 (2½"–6")



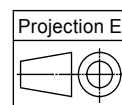
Series 15.2: DN 65–250 (2½"–10")



DN	mm inch	65 2 ½	100 4	150 6	200 8	250 10
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94
B ¹⁾	mm inch	170 6.69	210 8.27	260 10.24	–	–
B ²⁾	mm inch	135 5.31	175 6.89	225 8.86	290 11.42	354 13.94
C	mm inch	120 4.72	160 6.30	210 8.27	270 10.63	320 12.60
D	mm inch	65 2.56	100 3.94	150 5.91	200 7.87	250 9.84
E × F		4 × M10	8 × M10	8 × M10	8 × M12	12 × M12
G ¹⁾	mm inch	12 0.47	12 0.47	15 0.59	–	–
G ²⁾	mm inch	15 0.59	15 0.59	15 0.59	16 0.63	16 0.63

¹⁾ Series 15.0, 15.1

²⁾ Series 15.2



▼ Valve seat side

Series 16.2

Main applications

Applications requiring a compact design

Especially suited to demanding corrosive processes



Ordering information

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
with position indicator

DN		Ordering numbers		
mm	inch	ISO-F	ASA-LP	JIS
63	2 ½	16236-PA21	16236-TA21	16236-JA21
100	4	16240-PA21	16240-TA21	16240-JA21
160	6	16244-PA21	16244-TA21	16244-JA21
200	8	16246-PA21	16246-TA21	16246-JA21
250	10	16248-PA21	16248-TA21	16248-JA21
320	12	16250-PA21	16250-TA21	16250-JA21
350	14	—	16251-TA21	16251-JA21
400	16	16252-PA21	16252-TA21	16252-JA21
500	20	16254-PA21	16254-TA21	16254-JA21
550	22	on request	on request	on request

without solenoid valve, without position indicator: 162 . . . A11

with solenoid valve, without position indicator: 162 . . . A31 (specify control voltage)

with solenoid valve, with position indicator: 162 . . . A41 (specify control voltage)

Valve with 3-position pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
with position indicator

DN		Ordering numbers		
mm	inch	ISO-F	ASA-LP	JIS
63	2 ½	16236-PA28	16236-TA28	16236-JA28
100	4	16240-PA28	16240-TA28	16240-JA28
160	6	16244-PA28	16244-TA28	16244-JA28
200	8	16246-PA28	16246-TA28	16246-JA28
250	10	16248-PA28	16248-TA28	16248-JA28
320	12	16250-PA28	16250-TA28	16250-JA28
350	14	—	16251-TA28	16251-JA28
400	16	16252-PA28	16252-TA28	16252-JA28
500	20	16254-PA28	16254-TA28	16254-JA28
550	22	on request	on request	on request

with solenoid valve, with position indicator: 162 . . . A48 (specify control voltage)

Features

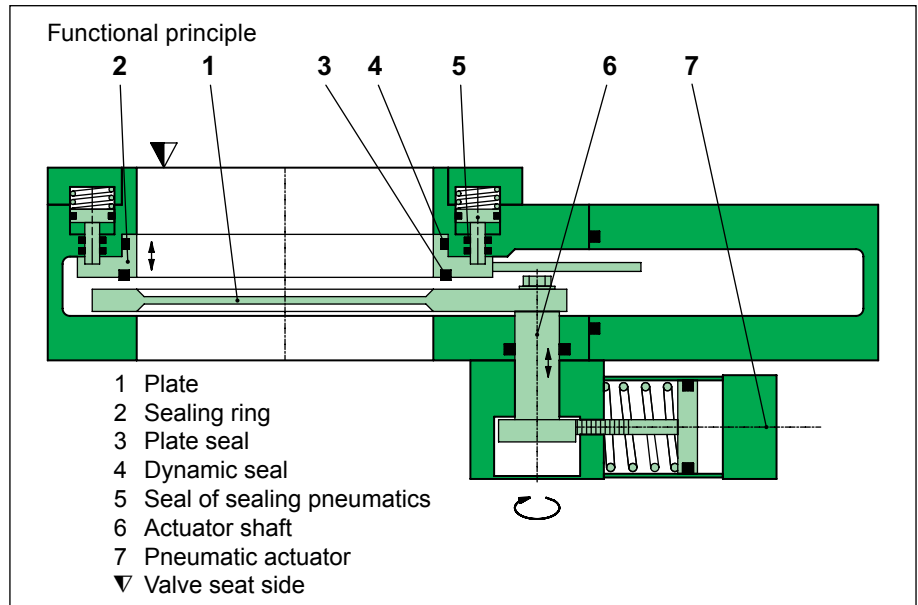
Body material: aluminum

Compact

Low vibration level and low particle count during operation

Split body design for easy maintenance

No readjustment after cleaning



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-8} \text{ mbar}$ to 1.2 bar (abs)
Differential pressure on the plate	$\leq 1.2 \text{ bar}$
Differential pressure at opening	
– DN 63–100	$\leq 30 \text{ mbar}$
– DN 160–200	$\leq 10 \text{ mbar}$
– DN 250–500	$\leq 5 \text{ mbar}$
Cycles until first service	200 000
Temperature ¹⁾	
– Valve body	$\leq 120 \text{ }^{\circ}\text{C}$
– Actuator	$\leq 80 \text{ }^{\circ}\text{C}$
– Solenoid valve	$\leq 50 \text{ }^{\circ}\text{C}$
– Position indicator	$\leq 80 \text{ }^{\circ}\text{C}$
Heating and cooling rate	$\leq 30 \text{ }^{\circ}\text{C h}^{-1}$
Material	
– Valve body, plate, sealing ring	
– DN 63–400	EN AW-5083 (3.3547), -6082 (3.2315)
– DN 500	EN AC-42100 (3.2371)
– Feedthrough (parts in contact with media)	AISI 303 (1.4305), AISI 304 (1.4301)
Seal	
– Bonnet, plate, dynamic, feedthrough	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	$\leq 50 \text{ VAC/DC}$
– Current	$\leq 1.2 \text{ A}$
Valve position indication	visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

DN (nominal I. D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimen- sion and flange type)	Minimum adjustable con- ductance with 3-position pneumatic actuator	Max. differential pressure in closed position	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time *)	Weight	
mm	inch		ls ⁻¹	ls ⁻¹	mbar	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	See page 85	440	6.5	1200	5–7	73–102	0.20	0.007	3	13	28.7
100	4		1700	7.5	1200	5–7	73–102	0.20	0.007	3	13	28.7
160	6		4700	12.5	1200	5–7	73–102	0.25	0.009	3	20	44.1
200	8		11000	15	1200	5–7	73–102	0.30	0.010	4	23	50.7
250	10		21700	22	1200	5–7	73–102	0.35	0.012	4	30	66.1
320	12		32600	54	1200	5–7	73–102	0.55	0.020	5	56	123.5
350	14		41500	62	1200	5–7	73–102	0.60	0.021	5	65	143.3
400	16		61000	69	1200	5–7	73–102	0.65	0.023	5.5	76	167.6
500	20		101500	100	1200	5–7	73–102	1.40	0.047	10	120	264.6

*) extended closing/opening time with 3-position pneumatic actuator

Easy and fast maintenance

- Split body design
- Removable plate and sealing ring
- No readjustment after cleaning



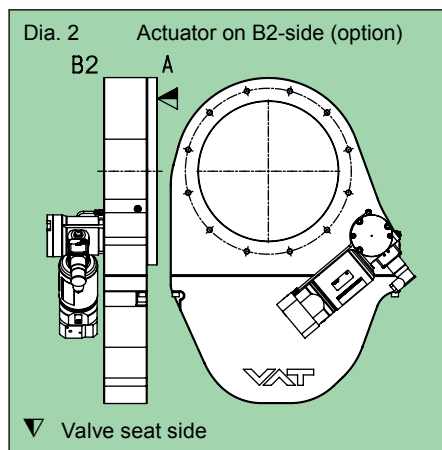
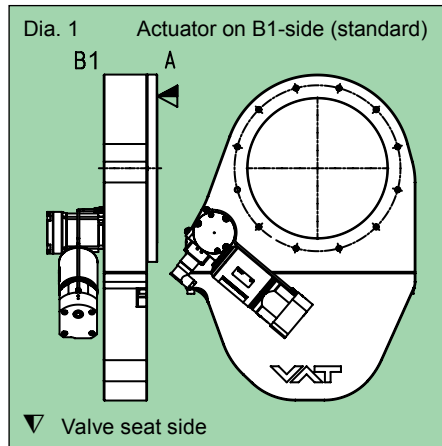
Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Flange connections**
for installation of the valve: see series 32

Options



Actuator

- Other solenoid valve voltage (standard: 24 VDC)
- Actuator on B2-side (Dia. 2). B1-side is standard.

Valve

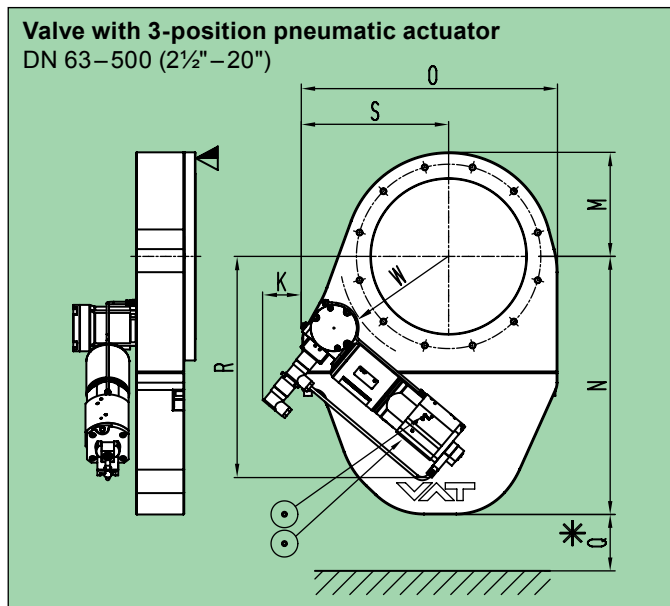
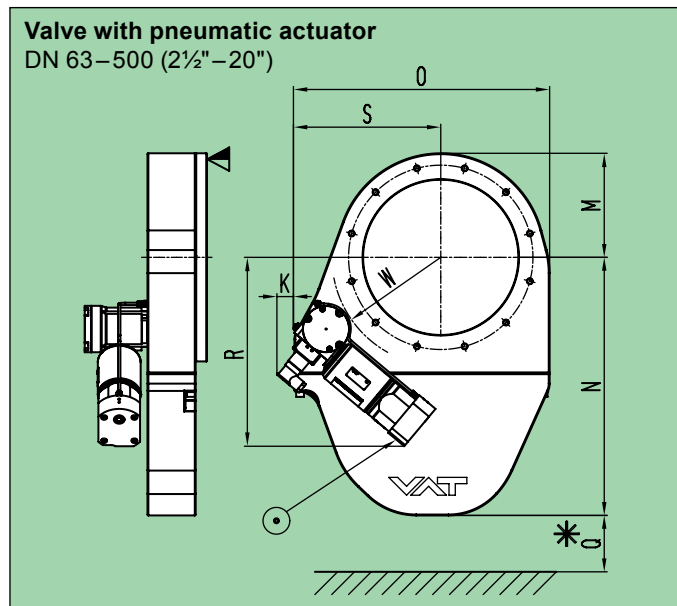
- Customer specified flanges
- Other sealing materials
- Heater with insulation and overtemperature switch (Pic. 3)
- Valve body hard anodized or nickel-plated
- Helicoils for valve flanges
- Ports in valve body for roughing (by-pass), venting or for gauges
- Window in plate (Pic. 4):
window material: borosilicate or sapphire, elastomer seals

1 Plate 3 Flange 5, 6 Seals 2 Screw 4 Window ▼ Valve seat side												
The window is put between two seals (5, 6) and clamped into the plate (1) by means of a flange (3).												
	DN valve	mm	63	100	160	200	250	320	350	400	500	
		inch	2½	4	6	8	10	12	14	16	20	
Borosilicate	Optically free diameter «A»	mm	63	80	90	130	130	150	150	150	on request	
		inch	2.48	3.15	3.54	5.12	5.12	5.91	5.91	5.91		
	Thickness of glass «B»	mm	5	5	6	6	6	8	8	8		
		inch	0.20	0.20	0.24	0.24	0.24	0.31	0.31	0.31		
Sapphire	Optically free diameter «A»	mm	63	80	112	170	200	250	250	250		
		inch	2.48	3.15	4.41	6.69	7.87	9.84	9.84	9.84		
	Thickness of glass «B»	mm	4	4	4	5	6	6	6	6		
		inch	0.16	0.16	0.16	0.20	0.24	0.24	0.24	0.24		
Above specification includes the largest possible windows. Smaller windows on request.												
Due to the weight of the window, it is not possible to mount any valve in any position.												

Ordering information for options:

Ordering No. of valve-X (e. g. 16246-PA21-X, X = window in plate)

Main dimensions

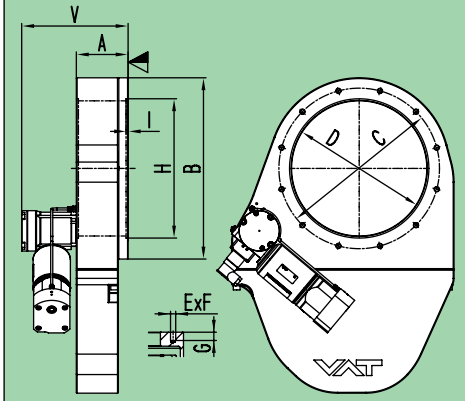


- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection

DN	mm inch		63 2½	100 4	160 6	200 8	250 10	320 12	350 14	400 16	500 20
K	mm inch	Pneumatic actuator	10 0.39	10 0.39	10 0.39	10 0.39	29 1.14	7 0.28	— —	6 0.24	60 2.36
	mm inch	3-position pneu- matic actuator	34 1.34	34 1.34	34 1.34	34 1.34	65 2.56	32 1.26	24 0.94	31 1.22	on request
M	mm inch		95 3.74	95 3.74	121.50 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24	325 12.80
N	mm inch		200 7.87	200 7.87	300 11.81	360 14.17	434 17.09	538 21.18	590 23.23	655 25.79	871 34.29
O	mm inch		258 10.16	258 10.16	321 12.64	367 14.45	429 16.89	533 20.98	579 22.80	630 24.80	812 31.97
Q	mm inch		50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97
R	mm inch	Pneumatic actuator	235 9.25	235 9.25	251 9.88	265 10.43	312 12.28	392 15.43	405 15.94	428 16.85	609 23.98
	mm inch	3-position pneu- matic actuator	282 11.10	282 11.10	304 11.97	318 12.52	363 14.29	424 16.69	438 17.24	460 18.11	on request
S	mm inch		163 6.42	163 6.42	188 7.40	210.50 8.29	246 9.69	276 10.87	300 11.81	320 12.60	401 15.79
W	mm inch		95 3.74	95 3.74	122 4.80	152.50 6	185 7.28	233 9.17	253 9.96	285 11.22	340 13.39

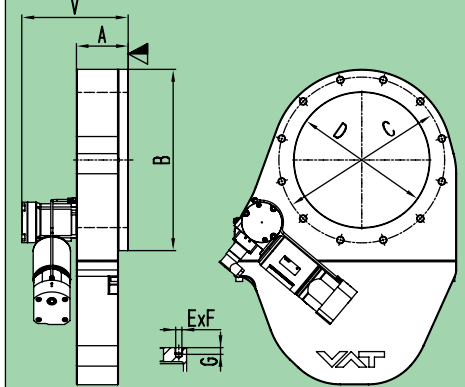
Flange dimensions

ISO-F DN 63–500 (2½"–20")



DN	mm inch	63 2½	100 4	160 6	200 8	250 10	320 12	350 14	400 16	500 20
A	mm inch	70 2.76	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	not available	128 5.04	150 5.91
B	mm inch	190 7.48	190 7.48	242 9.53	300 11.81	350 13.78	428 16.85		520 20.47	635 25
C	mm inch	110 4.33	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55		480 18.90	580 22.83
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87	261 10.28	318 12.52		400 15.75	500 19.69
E × F		4 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12		16 × M12	16 × M12
G	mm inch	12 0.47	12 0.47	14 0.55	15 0.59	16 0.63	18 0.71		20 0.79	20 0.79
H	mm inch	70 2.76	102 4.02	153 6.02	213 8.39	—	—		—	—
I	mm inch	3 0.12	3 0.12	5 0.20	5 0.20	—	—		—	—
V	mm inch	185 7.28	185 7.28	200 7.87	200 7.87	205 8.07	241 9.49		250 9.84	343 13.50

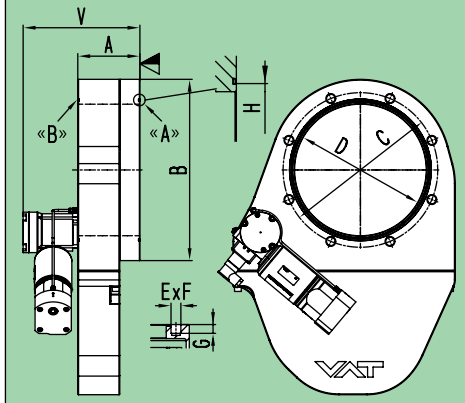
JIS B 2290: 1998 / ISO 1609 DN 65–500 (2½"–20")



DN	mm inch	65 2½	100 4	150 6	200 8	250 10	300 12	350 14	400 16	500 20
A	mm inch	70 2.76	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04	150 5.91
B	mm inch	190 7.48	190 7.48	242 9.53	300 11.81	350 13.78	428 16.85	470 18.50	520 20.47	635 25
C	mm inch	120 4.72	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57	420 16.54	480 18.90	585 23.03
D	mm inch	76.30 3	100 3.94	150 5.91	200 7.87	261 10.28	318 12.52	350 13.78	400 15.75	500 19.69
E × F		4 × M10	8 × M10	8 × M10	8 × M12	12 × M12	12 × M12	12 × M12	12 × M16	16 × M16
G	mm inch	12 0.47	12 0.47	14 0.55	15 0.59	16 0.63	18 0.71	16 0.63	25 0.98	24 0.94
V	mm inch	185 7.28	185 7.28	200 7.87	200 7.87	205 8.07	241 9.49	247 9.72	250 9.84	343 13.50

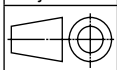
ASA-LP DN 63–320 (2½"–12") with or without O-ring groove

For orders with O-ring groove specify:
«A», «B» or «A+B»



DN	mm inch	63 2½	100 4	160 6	200 8	250 10	320 12
ASA-LP		2	3	4	6	8	10
ANSI		2	3	4	6	8	10
A	mm inch	70 2.76	70 2.76	88 3.46	88 3.46	120 4.72	120 4.72
B	mm inch	190 7.48	190 7.48	243 9.57	300 11.81	350 13.78	428 16.85
C	mm inch	120.70 4.75	152.40 6	190.50 7.50	241.30 9.50	298.50 11.75	362 14.25
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87	254 10	300 11.81
E × F		4 × ⅜" 16 UNC	4 × ⅜" 16 UNC	8 × ⅜" 16 UNC	8 × ¾" 10 UNC	8 × ¾" 10 UNC	12 × ¾" 10 UNC
G	mm inch	12 0.47	12 0.47	14 0.55	15 0.59	16 0.63	18 0.71
H	mm inch	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13	266.70 10.50	317.50 12.50
V	mm inch	185 7.28	185 7.28	200 7.87	200 7.87	225 8.86	241 9.49
O-ring I.D. × d		88.49 × 3.53	120.24 × 3.53	158.34 × 3.53	202.79 × 3.53	266.29 × 3.53	304.17 × 5.33

Projection E



▼ Valve seat side

Larger sizes on request

Series 16.8

Main applications

Applications requiring a compact design
in larger DN sizes

Especially suited to large coating and
FPD production systems



Ordering information

Valve with pneumatic actuator
double acting
without solenoid valve
with position indicator

DN		Ordering numbers		
mm	inch	ISO-F	ASA	JIS
400	16	16852-PA24	on request	16852-JA24
500	20	16854-PA24	16854-AA24	16854-JA24

without solenoid valve, without position indicator: 168 . . . A14

with solenoid valve, with position indicator: 168 . . . A44 (specify control voltage)

**Valve with 3-position
pneumatic actuator**
double acting
without solenoid valve
with position indicator

DN		Ordering numbers		
mm	inch	ISO-F	ASA	JIS
400	16	16852-PA28	on request	16852-JA28
500	20	16854-PA28	16854-AA28	16854-JA28

with solenoid valve, with position indicator: 168 . . . A48 (specify control voltage)

Spare parts

– Seals

on request (specify fabrication number of valve)

Accessories

– Flange connections

for installation of the valve: see series 32

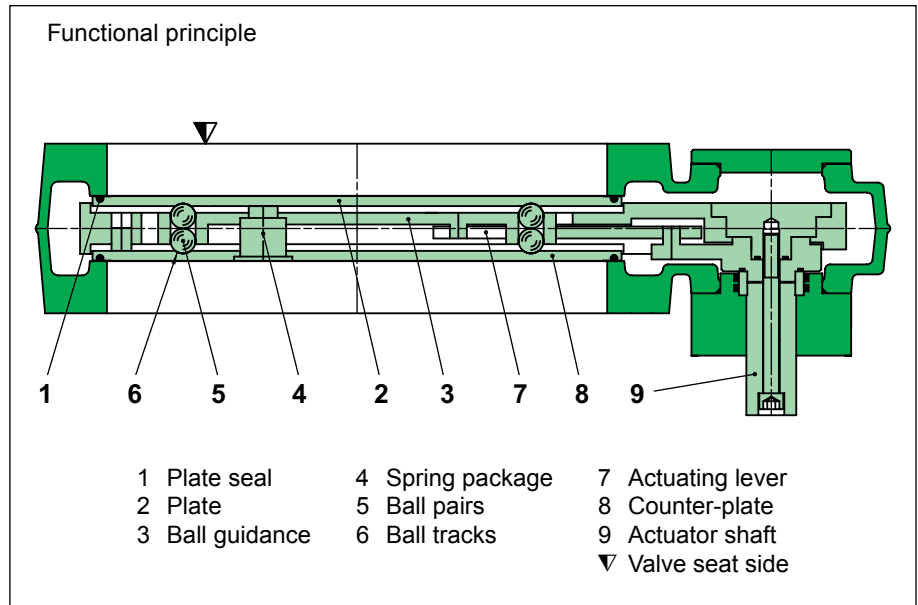
Features

Body material: aluminum

Compact

Low vibration level during operation

Split body design for easy maintenance



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-7} \text{ mbar to } 1.2 \text{ bar (abs)}$
Differential pressure on the plate	$\leq 1.2 \text{ bar}$
Differential pressure at opening	$\leq 30 \text{ mbar}$
Cycles until first service	100 000
Temperature ¹⁾	
– Valve body	$\leq 120 \text{ }^{\circ}\text{C}$
– Actuator	$\leq 80 \text{ }^{\circ}\text{C}$
– Solenoid valve	$\leq 50 \text{ }^{\circ}\text{C}$
– Position indicator	$\leq 80 \text{ }^{\circ}\text{C}$
Heating and cooling rate	$\leq 30 \text{ }^{\circ}\text{C h}^{-1}$
Material	
– Valve body	EN AC-42100 (3.2371)
– Plate	EN AW-6082 (3.2315)
– Feedthrough (parts in contact with media)	EN AW-6082 (3.2315), AISI 303 (1.4305)
Seal: bonnet, plate, feedthrough	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	any
Solenoid valve	24 VDC, 5.4 W (others on request)
Position indicator: contact rating	
– Voltage	$\leq 50 \text{ VAC/DC}$
– Current	$\leq 3 \text{ A}$
Valve position indication	visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

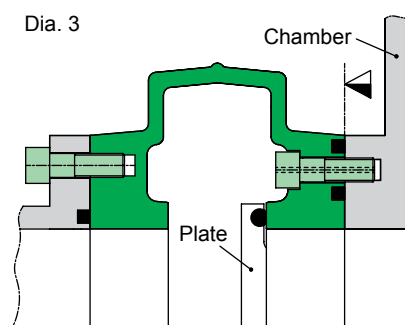
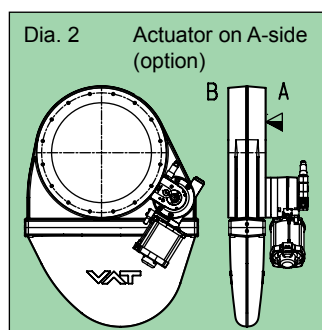
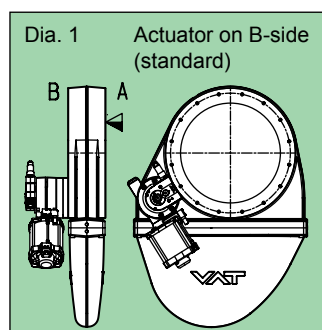
Further technical data on next page →

Continued Technical data

DN (nominal I. D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Minimum adjust- able conductance with 3-pos. pneu- matic actuator	Max. differential pressure in closed position	Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time *)	Weight	
mm	inch		ls ⁻¹	ls ⁻¹	mbar	bar	psi	l	ft ³	s	kg	lbs
400	16	See page 89	50 000	150	1 200	5–7	73–102	2.0	0.071	12	85	187
457	16		68 000	200	1 200	5–7	73–102	3.3	0.116	14	125	276
500	20		90 000	200	1 200	5–7	73–102	3.3	0.116	14	115	254

^{*)} extended closing/opening time with 3-position pneumatic actuator

Options



▼ Valve seat side

Actuator

- Other solenoid valve voltage (standard: 24 VDC)
- Actuator on A-side (Dia. 2). B-side is standard.

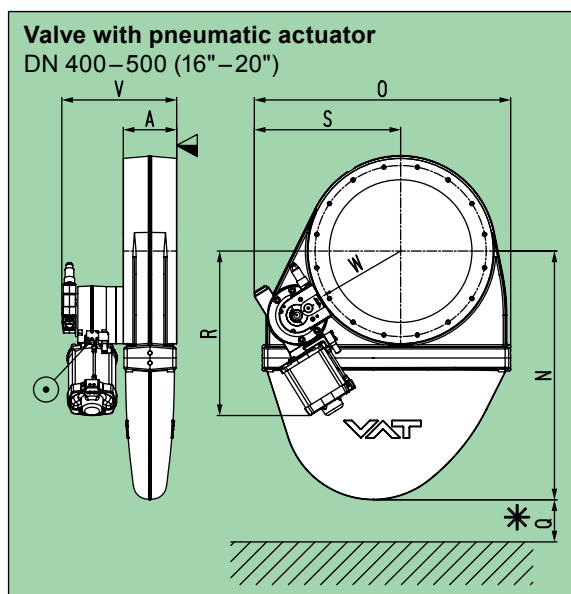
Valve

- Customer specified flanges
- Splinter shield grid for turbo pump
- For direct mounting to chamber (Dia. 3)
- Ports in valve body for roughing (by-pass), venting or for gauges
- Window in plate

Ordering information for options:

Ordering No. of valve-X
(e. g. (16852-PA24-X, X = window in plate)

Main dimensions

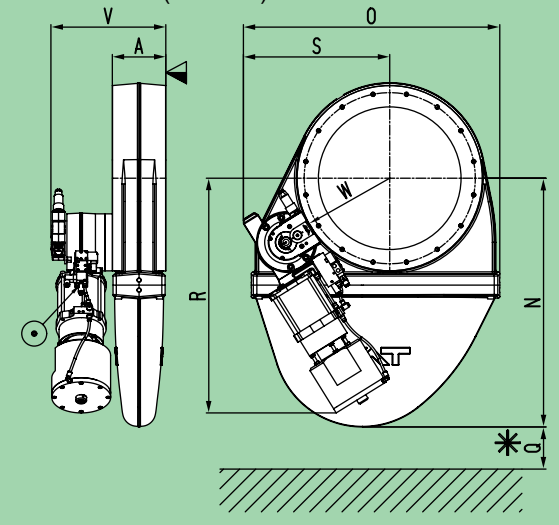


- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection

DN	mm	400	500
	inch	16	20
A	mm	150	170
	inch	5.91	6.69
N	mm	698	850
	inch	27.48	33.46
O	mm	716	854
	inch	28.19	33.62
Q	mm	200	230
	inch	7.87	9.06
R	mm	461	612
	inch	18.15	24.09
S	mm	410	466
	inch	16.14	18.35
V	mm	322	337
	inch	12.68	13.27
W	mm	260	320
	inch	10.24	12.60

Main dimensions

Valve with 3-position pneumatic actuator
DN 400–500 (16"–20")



DN	mm inch	400 16	500 20
A	mm inch	150 5.91	170 6.69
N	mm inch	698 27.48	850 33.46
O	mm inch	716 28.19	854 33.62
Q	mm inch	200 7.87	230 9.06
R	mm inch	659 25.94	805 31.69
S	mm inch	410 16.14	466 18.35
V	mm inch	322 12.68	337 13.27
W	mm inch	260 10.24	320 12.60

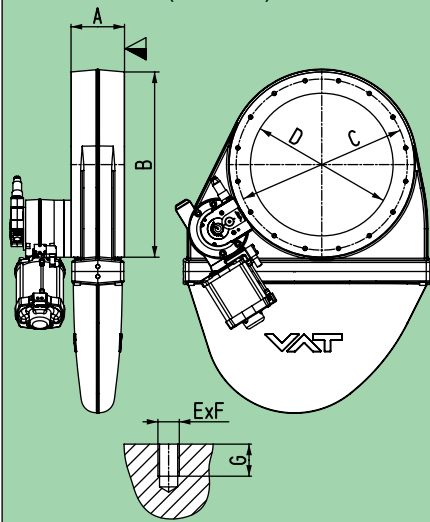
▼ Valve seat side

* Required for dismantling

⊙ Compressed air connection

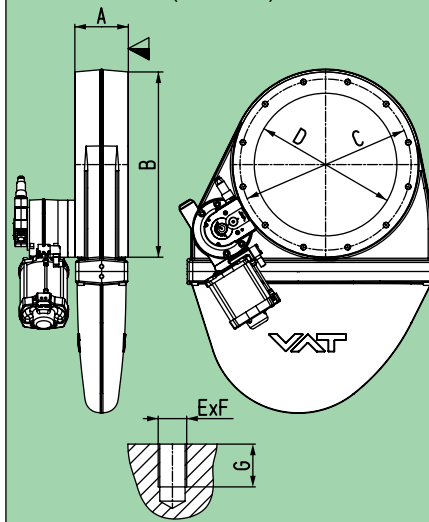
Flange dimensions

ISO-F
DN 400–500 (16"–20")



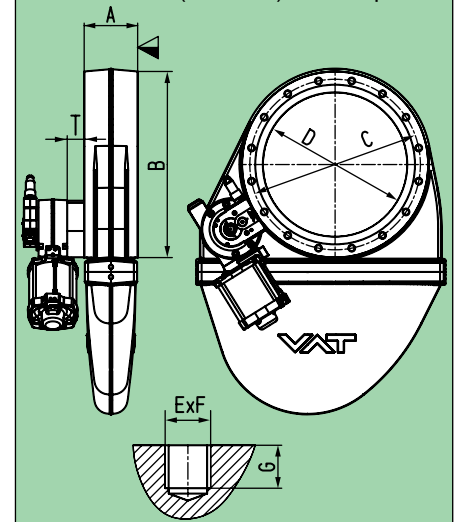
DN	mm inch	400 16	500 20
A	mm inch	150 5.91	170 6.69
B	mm inch	520 20.47	625 24.61
C	mm inch	480 18.90	580 22.83
D	mm inch	400 15.75	501.20 19.73
E x F		16 x M12	16 x M12
G	mm inch	18 0.71	18 0.71

JIS B 2290: 1998 / ISO 1609
DN 400–500 (16"–20")



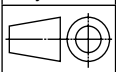
DN	mm inch	400 16	500 20
A	mm inch	150 5.91	170 6.69
B	mm inch	520 20.47	625 24.61
C	mm inch	480 18.90	585 23.03
D	mm inch	400 15.75	500.20 19.69
E x F		12 x M16	16 x M16
G	mm inch	24 0.94	24 0.94

ASA Other sizes
DN 400–500 (16"–20") on request



DN	mm inch	400 16	500 20
ASA		16	20
ANSI		16	20
A	mm inch	170 6.69	170 6.69
B	mm inch	625 24.61	700 27.56
C	mm inch	540 21.25	635 25
D	mm inch	457.20 18	500.20 19.69
E x F		16 x 1" 8 UNC	20 x 1" 8 UNC
G	mm inch	20 0.79	24 0.94
T	mm inch	–	42 1.65

Projection E



▼ Valve seat side

Main applications

Isolation valve for contaminating processes



Ordering information

Series 17.4, DN 40–50
Valve with manual actuator
turning handle

DN		Ordering numbers		
mm	inch	ISO-KF	CF-F metric threads	CF-F UNF threads
40	1 ½	17432-KE01	17432-CE01	17432-UE01
50	2	17434-KE01	on request	on request

with position indicator: 174 . . . E08

Series 17.4, DN 40–50
Valve with pneumatic actuator
single acting with closing spring (NC)
with solenoid valve
with position indicator

40	1 ½	17432-KE41	17432-CE41	17432-UE41
50	2	17434-KE41	on request	on request

without solenoid valve, without position indicator: 174 . . . E11

without solenoid valve, with position indicator: 174 . . . E21

with solenoid valve, without position indicator: 174 . . . E31 (...31/41 specify control voltage)

Series 17.4, DN 40–50
Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

40	1 ½	17432-KE44	17432-CE44	17432-UE44
50	2	17434-KE44	on request	on request

without solenoid valve, without position indicator: 174 . . . E14

without solenoid valve, with position indicator: 174 . . . E24

with solenoid valve, without position indicator: 174 . . . E34 (...34/44 specify control voltage)

Series 17.2, DN 63–320
Valve with manual actuator
handwheel

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	17236-PE01	17236-CE01	17236-UE01	17236-TE01	17236-JE01
100	4	17240-PE01	17240-CE01	17240-UE01	17240-TE01	17240-JE01
160	6	17244-PE01	17244-CE01	17244-UE01	17244-TE01	17244-JE01
200	8	17246-PE01	17246-CE01	17246-UE01	17246-TE01	17246-JE01
250	10	on request	on request	on request	on request	on request
320	12	on request	on request	on request	on request	on request

with position indicator: 172 . . . E08

with lever (instead of handwheel): 172 . . . E06

Further ordering information on next page →

Features

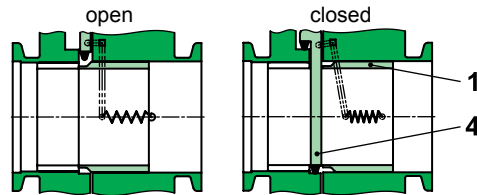
Body material: stainless steel

Long lifetime even under contaminating conditions

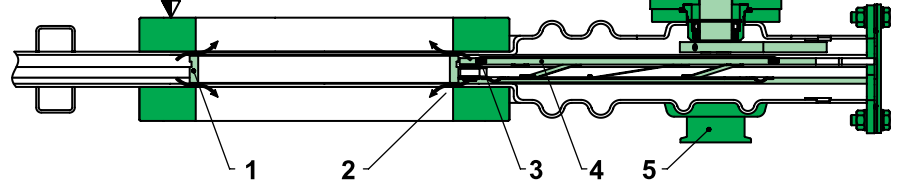
Protective ring

Easy to service: fast exchange of gate seal

Functional principle DN 40–50



Functional principle DN 63–200



- 1 Protective ring 3 Gate seal 5 Port for gas purge or pumping (option)
2 Gas purge 4 Gate ▽ Valve seat side

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 2 bar (abs)
Differential pressure on the gate	≤ 2 bar
Differential pressure at opening	≤ 30 mbar
Cycles until first service	
– DN 40– 50	20 000
– DN 63–200	100 000
Temperature ¹⁾	
– Valve body	
– DN 40– 50	≤ 200 °C
– DN 63–200	≤ 150 °C
– Manual actuator	≤ 80 °C
– Pneumatic actuator	≤ 50 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 80 °C
Heating and cooling rate	≤ 50 °C h ⁻¹

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Ordering information

Series 17.2, DN 63–320
Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	17236-PE44	17236-CE44	17236-UE44	17236-TE44	17236-JE44
100	4	17240-PE44	17240-CE44	17240-UE44	17240-TE44	17240-JE44
160	6	17244-PE44	17244-CE44	17244-UE44	17244-TE44	17244-JE44
200	8	17246-PE44	17246-CE44	17246-UE44	17246-TE44	17246-JE44
250	10	on request	on request	on request	on request	on request
320	12	on request	on request	on request	on request	on request

without solenoid valve, without position indicator: 172 . . . E14

without solenoid valve, with position indicator: 172 . . . E24

with solenoid valve, without position indicator: 172 . . . E34 (specify control voltage)

Continued Technical data

Material

- Valve body, flange AISI 304 (1.4301), AISI 316L (1.4435)
- Mechanism (main components) AISI 304 (1.4301), AISI 316L (1.4404)

Seal

- Bonnet
 - DN 40– 50 metal
 - DN 63–200 FKM (Viton®)
- Gate FKM (Viton®)

Feedthrough

- DN 40– 50 bellows
- DN 63–200 rotary feedthrough with intermediate pumping

Mounting position

any

Solenoid valve

24 VDC, 2.5 W (others on request)

Position indicator: contact rating

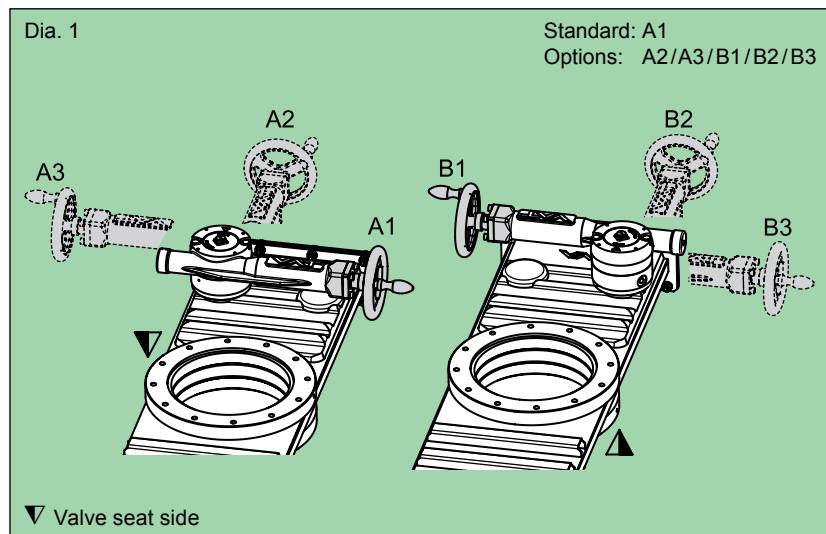
- Voltage ≤ 250 VAC ≤ 50 VAC/DC
- Current ≤ 2 A ≤ 3 A

Valve position indication

visual (mechanical)

DN (nominal I.D.)		Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator						Valve with pneumatic actuator						
				Weight with turning handle		Weight with handwheel		Weight with lever		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch		ls ⁻¹			kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
40	1½	See pages 96 – 97	80	2.3	5.1	–	–	–	–	5–7	73–102	0.06	0.002	1	3	6.6
50	2		80	2.5	5.5	–	–	–	–	5–7	73–102	0.06	0.002	1	3.1	6.8
63	2½		435	–	–	11	24	9	20	4–7	58–102	0.13	0.005	1.5	11	24
100	4		1740	–	–	17	38	15	33	4–7	58–102	0.13	0.005	1.5	17	38
160	6		5 145	–	–	30	66	28	62	4–7	58–102	0.28	0.01	2.5	31	68
200	8		12200	–	–	39	86	37	82	4–7	58–102	0.28	0.01	2.5	39	86

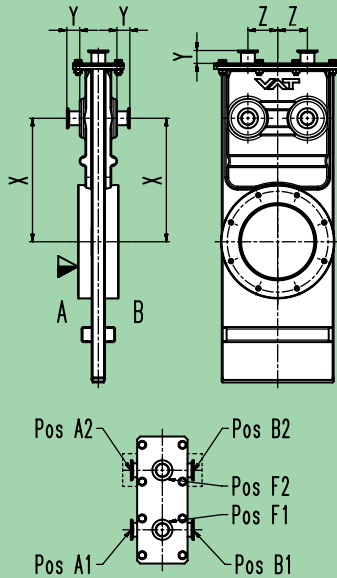
Options



Actuator

- Solenoid valve for impulse actuation: last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- Pneumatic actuator of DN 63–200 mountable in 6 positions (Dia. 1):
 - position A1, A2, A3 on A-side (valve seat side): to be specified with order
 - position B1, B2, B3 on B-side (rear side): to be specified with order
- Double position indicator (2 switches each for the positions «open» and «closed»)

Dia. 2



▽ Valve seat side

Valve

- Customer specified flanges with/without watercooling
- For direct mounting to flat chamber: special flange for mounting to chamber wall, standard flange on opposite side
- Heat-resistant mechanism
- Ports for roughing (by-pass), venting or for gauges (Dia. 2)
 - DN 63–200: possible in positions A1, A2, B1, B2, F1 and F2
 - DN 40– 50: positions on request

DN valve	mm inch	40 1½	50 2	63 2½	100 4	160 6	200 8
Recommended port ISO-KF oder CF-F	mm inch	VCR ¼	VCR ¼	16 ⅝	40 1½	40 1½	40 1½
X	mm inch	45 1.77	45 1.77	146 5.75	185 7.28	245 9.65	304.40 11.98
Y	mm inch	79.50 3.13	79.50 3.13	20 0.79	20 0.79	20 0.79	20 0.79
Z	mm inch	–	–	30 1.18	47.50 1.87	59 2.32	85 3.35
Other ports on request							

Ordering information for options:

Ordering No. of valve-X (e. g. 17246-PE44-X, X = port ISO-KF 40 in position F2)

Spare parts

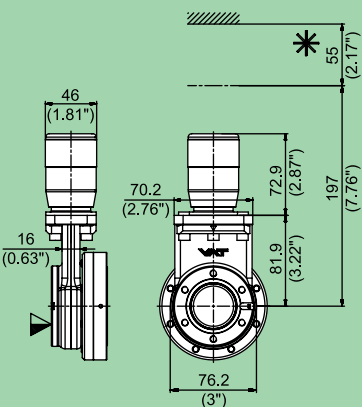
- **Seals**
on request (specify fabrication number of valve)

Accessories

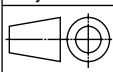
- **Flange connections**
for installation of the valve: see series 31, 32 and 33

Dimensions

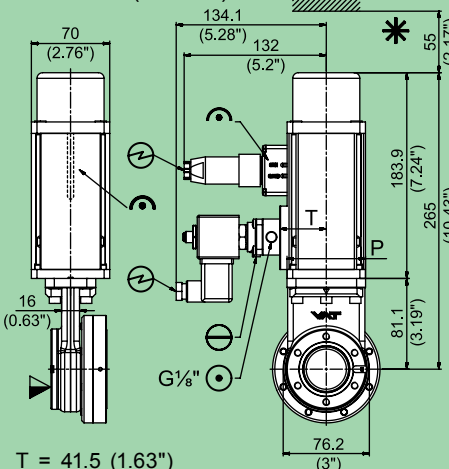
**Valve with manual actuator:
turning handle**
DN 40–50 (1½"–2")



Projection E

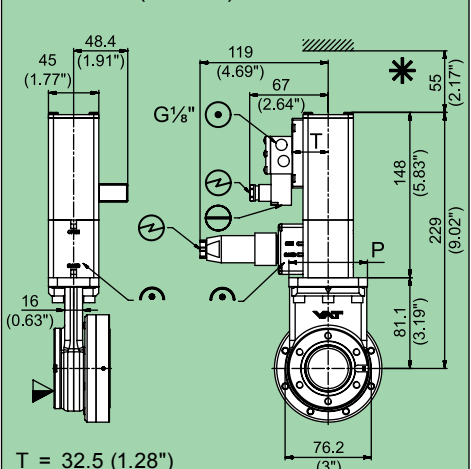


**Valve with pneumatic actuator:
single acting with closing spring (NC)**
DN 40–50 (1½"–2")



T = 41.5 (1.63")
P = 70.2 (2.76")

**Valve with pneumatic actuator:
double acting**
DN 40–50 (1½"–2")



T = 32.5 (1.28")
P = 70.2 (2.76")

▽ Valve seat side

* Required for dismantling

⊙ Compressed air connection

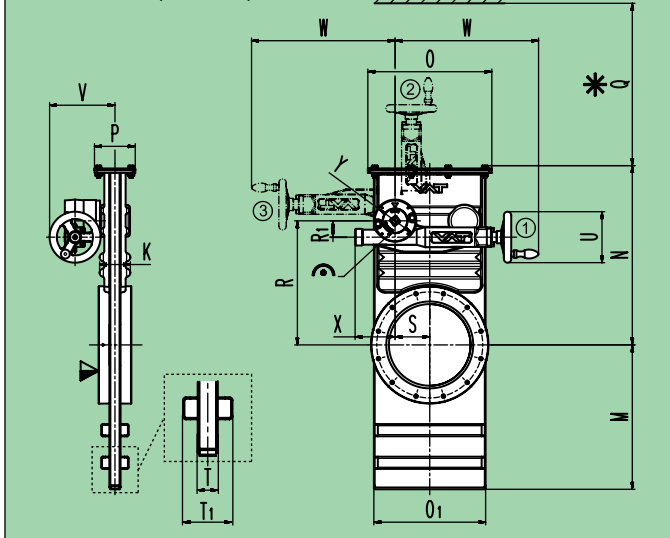
⊖ Electrical connection

⊕ Mechanical position indication

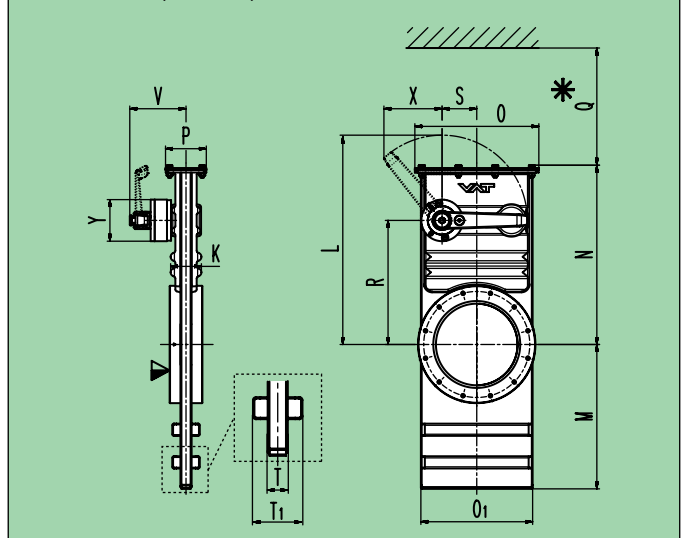
⊖ Emergency operation

Main dimensions

Valve with manual actuator: handwheel
DN 63–200 (2½"–8")



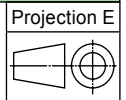
Valve with manual actuator: lever
DN 63–200 (2½"–8")



Flange dimensions: see pages 96–97

DN	mm inch	63 2½	100 4	160 6	200 8
K	mm inch	51 2.01	63 2.48	74 2.91	77 3.03
M	mm inch	151 5.94	200 7.87	279 10.98	354 13.94
N	mm inch	211 8.31	270 10.63	361 14.21	441 17.36
O	mm inch	152 5.98	190 7.48	252 9.92	304 11.97
O1	mm inch	134 5.28	172 6.77	222 8.74	274 10.79
P	mm inch	80 3.15	80 3.15	100 3.94	100 3.94
Q	mm inch	180 7.09	220 8.66	300 11.81	350 13.78
R	mm inch	146 5.75	185 7.28	245 9.65	305 12.01
R1	mm inch	33 1.30	33 1.30	40 1.57	40 1.57
S	mm inch	30 1.18	47.50 1.87	59 2.32	85 3.35
T	mm inch	26.50 1.04	26.50 1.04	26.50 1.04	26.50 1.04
T1	mm inch	–	–	66 2.60	67.50 2.66
U	mm inch	100 3.94	100 3.94	125 4.92	125 4.92
V	mm inch	129 5.08	129 5.08	160.50 6.32	160.50 6.32
W	mm inch	312 12.28	312 12.28	350 13.78	352 13.86
X	mm inch	78 3.07	78 3.07	98 3.86	98 3.86
Y	mm inch	85 3.35	85 3.35	104 4.09	104 4.09

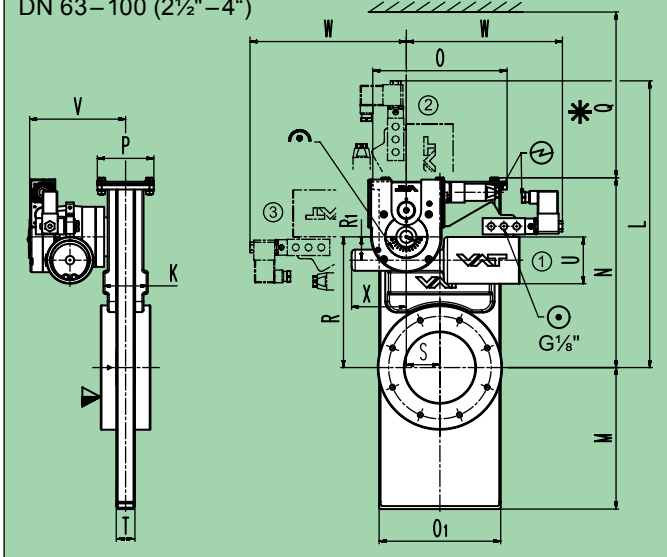
- ▽ Valve seat side
- * Required for dismantling
- ⊙ Mechanical position indication
- ① Standard actuator position
- ② ③ Optional actuator positions



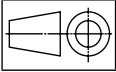
DN	mm inch	63 2½	100 4	160 6	200 8
K	mm inch	51 2.01	63 2.48	74 2.91	77 3.03
L	mm inch	276 10.87	315 12.40	455 17.91	515 20.28
M	mm inch	151 5.94	200 7.87	279 10.98	354 13.94
N	mm inch	211 8.31	270 10.63	361 14.21	441 17.36
O	mm inch	152 5.98	190 7.48	252 9.92	304 11.97
O1	mm inch	134 5.28	172 6.77	222 8.74	274 10.79
P	mm inch	80 3.15	80 3.15	100 3.94	100 3.94
Q	mm inch	180 7.09	220 8.66	300 11.81	350 13.78
R	mm inch	146 5.75	185 7.28	245 9.65	305 12.01
S	mm inch	30 1.18	47.50 1.87	59 2.32	85 3.35
T	mm inch	26.50 1.04	26.50 1.04	26.50 1.04	26.50 1.04
T1	mm inch	–	–	67.50 2.66	67.50 2.66
V	mm inch	120 4.72	120 4.72	138 5.43	138 5.43
X	mm inch	96 3.78	96 3.78	143 5.63	143 5.63
Y	mm inch	85 3.35	85 3.35	104 4.09	104 4.09

Main dimensions

Valve with pneumatic actuator: double acting
DN 63–100 (2½"–4")



Projection E



▽ Valve seat side

* Required for dismantling

⊙ Compressed air connection

⊖ Electrical connection

⌚ Mech. position indication

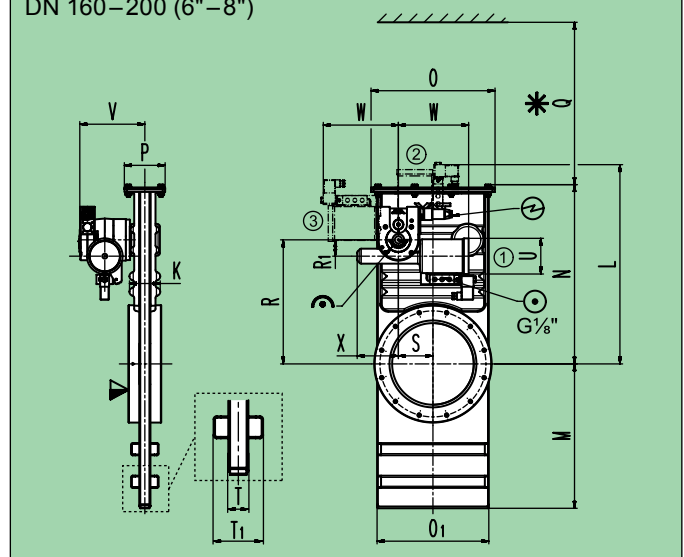
① Standard actuator position

②③ Optional actuator positions

Flange dimensions: see pages 96–97

DN	mm inch	63 2½	100 4		
K	mm inch	51 2.01	63 2.48		
L	mm inch	367 14.45	406 15.98		
M	mm inch	151 5.94	200 7.87		
N	mm inch	211 8.31	270 10.63		
O	mm inch	152 5.98	190 7.48		
O1	mm inch	134 5.28	172 6.77		
P	mm inch	80 3.15	80 3.15		
Q	mm inch	180 7.09	220 8.66		
R	mm inch	146 5.75	185 7.28		
R1	mm inch	33 1.30	33 1.30		
S	mm inch	30 1.18	47.50 1.87		
T	mm inch	26.50 1.04	26.50 1.04		
U	mm inch	66 2.60	66 2.60		
V	mm inch	135 5.31	135.20 5.32		
W	mm inch	221 8.70	221 8.70		
X	mm inch	78 3.07	78 3.07		

Valve with pneumatic actuator: double acting
DN 160–200 (6"–8")

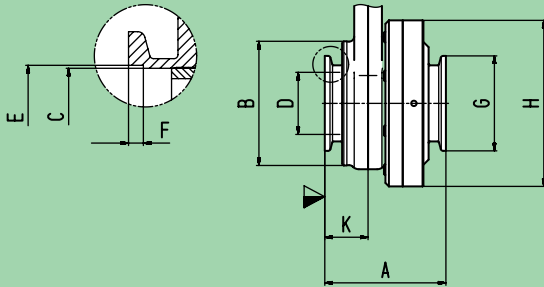


DN	mm inch	160 6	200 8		
K	mm inch	74 2.91	77 3.03		
L	mm inch	435 17.13	495 19.49		
M	mm inch	279 10.98	354 13.94		
N	mm inch	361 14.21	441 17.36		
O	mm inch	252 9.92	304 11.97		
O1	mm inch	222 8.74	274 10.79		
P	mm inch	100 3.94	100 3.94		
Q	mm inch	300 11.81	350 13.78		
R	mm inch	245 9.65	305 12.01		
R1	mm inch	40 1.57	40 1.57		
S	mm inch	59 2.32	85 3.35		
T	mm inch	26.50 1.04	26.50 1.04		
T1	mm inch	66 2.60	67.50 2.66		
U	mm inch	88 3.46	87 3.43		
V	mm inch	159 6.26	159 6.26		
W	mm inch	190 7.48	190 7.48		
X	mm inch	100 3.94	100 3.94		

Flange dimensions

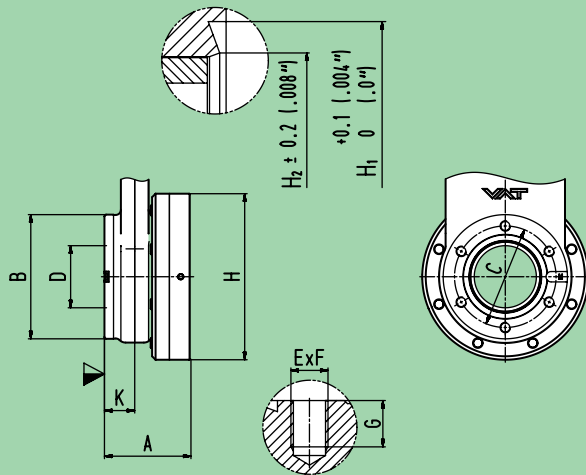
ISO-KF

Series 17.4: DN 40–50 (1½"–2")



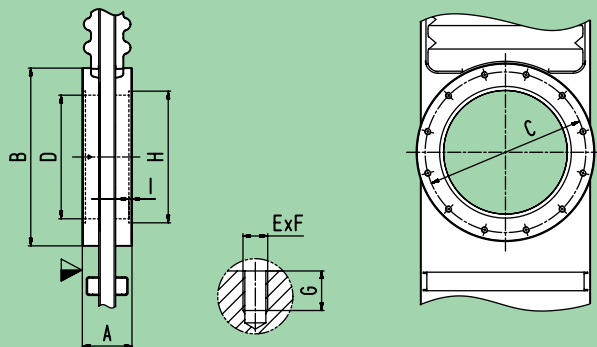
CF-F

Series 17.4: DN 40 (1½")



ISO-F

Series 17.2: DN 63–200 (2½"–8")



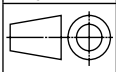
		ISO-KF		CF-F	
DN	mm inch	40 1½	50 2	40 1½	50 2
A	mm inch	70 2.76	70 2.76	50 1.97	on request
B	mm inch	72 2.83	72 2.83	72 2.83	
C	mm inch	40.40 1.59	50 1.97	58.70 2.31	
D	mm inch	36 1.42	36 1.42	36 1.42	
E	mm inch	41.30 1.63	52.30 2.06	–	
E × F ¹⁾		–	–	6 × M6	
E × F ²⁾		–	–	6 × ¼" 28 UNF	
F	mm inch	3 0.12	3 0.12	–	
G	mm inch	55 2.17	75 2.95	7 0.28	
H	mm inch	96 3.78	96 3.78	–	
H1	mm inch	–	–	48.30 1.90	
H2	mm inch	–	–	42 1.65	
K	mm inch	25 0.98	25 0.98	17.50 0.69	

¹⁾ Metric threads

²⁾ UNF threads

DN	mm inch	63 2½	100 4	160 6	200 8
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15
B	mm inch	130 5.12	165 6.50	225 8.86	285 11.22
C	mm inch	110 4.33	145 5.71	200 7.87	260 10.24
D	mm inch	70 2.76	100 3.94	150 5.91	200 7.87
E × F		4 × M8	8 × M8	8 × M10	12 × M10
G	mm inch	13 0.51	13 0.51	15 0.59	15 0.59
H	mm inch	–	102 4.02	153 6.02	213 8.39
I	mm inch	–	3 0.12	5 0.20	5 0.20

Projection E

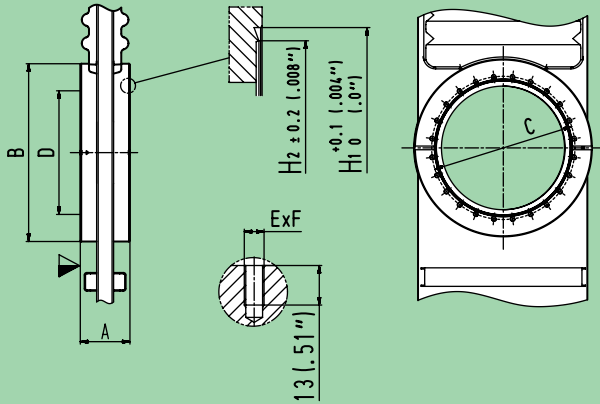


▼ Valve seat side

Flange dimensions

CF-F

Series 17.2: DN 63–200 (2½"–8")



- 1) Metric threads
2) UNF threads

DN	mm inch	63 2½	100 4	160 6	200 8
O.D.	inch	4½	6	8	10
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15
B	mm inch	113.50 4.47	151.60 5.97	202.40 7.97	253.20 9.97
C	mm inch	92.10 3.63	130.20 5.13	181 7.13	231.80 9.13
D	mm inch	70 2.76	100 3.94	150 5.91	200 7.87
E × F ¹⁾		8 × M8	16 × M8	20 × M8	24 × M8
E × F ²⁾		8 × 5/16" 24 UNF	16 × 5/16" 24 UNF	20 × 5/16" 24 UNF	24 × 5/16" 24 UNF
H1	mm inch	82.50 3.25	120.70 4.75	171.45 6.75	222.40 8.76
H2	mm inch	77.40 3.05	115.50 4.55	166 6.54	217 8.54

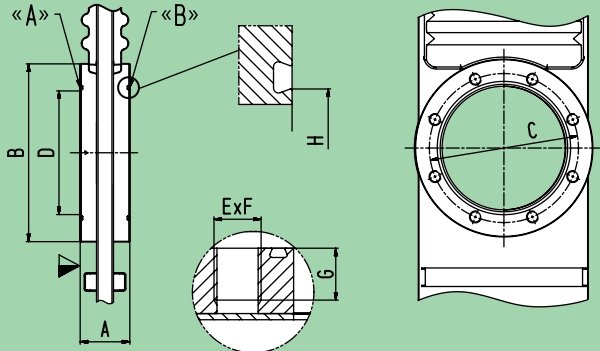
ASA-LP

Series 17.2: DN 63–200 (2½"–8")

with or without O-ring groove

For orders with O-ring groove specify:

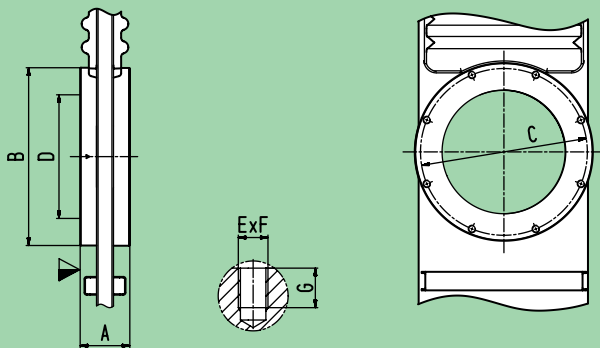
«A», «B» or «A+B»



DN	mm inch	63 2½	100 4	160 6	200 8
ASA-LP		2	3	4	6
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15
B	mm inch	152.40 6	190.50 7.50	225 8.86	279.40 11
C	mm inch	120.70 4.75	152.40 6	190.50 7.50	241.30 9.50
D	mm inch	70 2.76	100 3.94	150 5.91	200 7.87
E × F		4 × 3/8" 16 UNC	4 × 3/8" 16 UNC	8 × 3/8" 16 UNC	8 × 3/4" 10 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	19 0.75
H	mm inch	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13
O-ring I.D. × d	mm inch	88.49 × 3.53 3.48 × .139	120.24 × 3.53 4.73 × .139	158.34 × 3.53 6.23 × .139	202.79 × 3.53 7.98 × .139

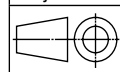
JIS B 2290: 1998 / ISO 1609

Series 17.2: DN 65–200 (2½"–8")



DN	mm inch	65 2½	100 4	150 6	200 8
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15
B	mm inch	136 5.35	185 7.28	235 9.25	300 11.81
C	mm inch	120 4.72	160 6.30	210 8.27	270 10.63
D	mm inch	70 2.76	100 3.94	150 5.91	200 7.87
E × F		4 × M10	8 × M10	8 × M10	8 × M12
G	mm inch	12 0.47	12 0.47	12 0.47	15 0.59

Projection E



▼ Valve seat side

Main applications

Isolation valve for research and industrial applications requiring large DN sizes

Especially suited to space simulation systems



Series 19.0 Vacuum gate valve



Series 19.1 HV gate valve
Series 19.2 UHV gate valve

Ordering information

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)		
mm	inch	Series 19.0: vacuum ISO-F	Series 19.1: HV ISO-F	Series 19.2: UHV ISO-F
400	16	19052-PE44	19152-PE44	19252-PE44
500	20	19054-PE44	19154-PE44	19254-PE44
630	25	19056-PE44	19156-PE44	19256-PE44
800	32	19058-PE44	19158-PE44	19258-PE44
900 ¹⁾	36	19059-PE44	19159-PE44	19259-PE44
1000	40	19060-PE44	19160-PE44	19260-PE44
1250 ¹⁾	50	19062-PE44	19162-PE44	19262-PE44
1600 ¹⁾	63	19064-PE44	19164-PE44	19264-PE44
2000 ¹⁾	78	19066-PE44	19166-PE44	19266-PE44
Other sizes on request				

¹⁾ customer-specific

without solenoid valve, without position indicator: 19 E14

without solenoid valve, with position indicator: 19 E24

with solenoid valve, without position indicator: 19 E34

(...34 specify control voltage)

Projects for special versions

Our product groups are experienced in developing special requirements concerning material, stability, heaters, etc. On customer request, we can perform special test programs, bake-out and provision of customer specific hand-over quality documentation.

Acceptance tests

are conducted for large special projects, and are prepared by our engineers.

References

Large VAT gate valves have proved their reliability in various large systems all over the world. Reference list available on request.

Features

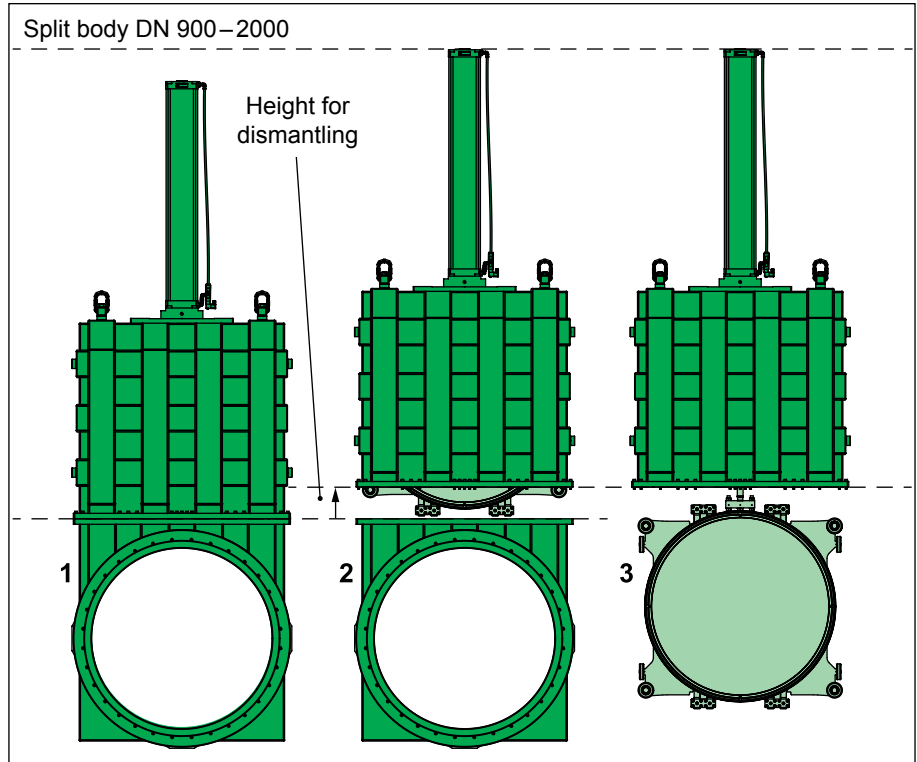
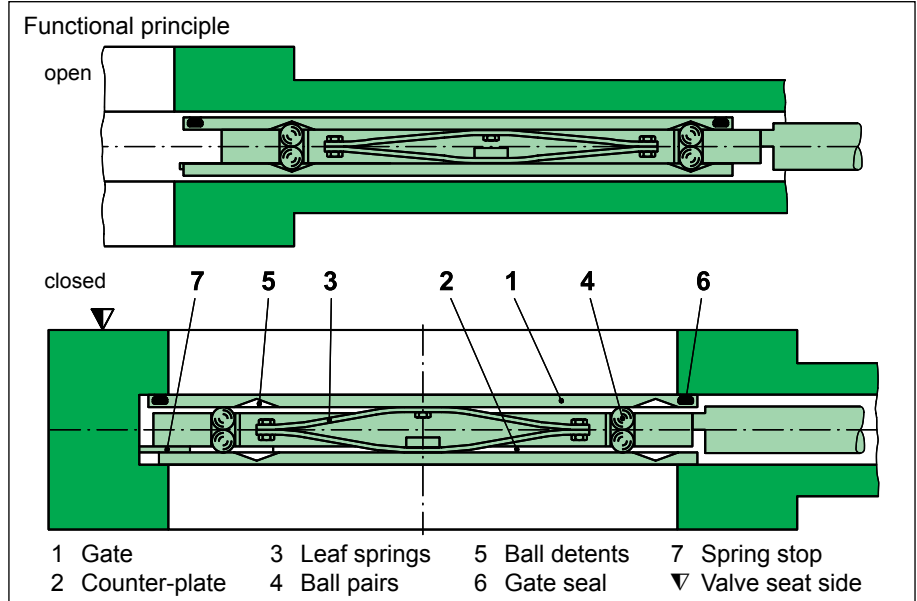
Body material: stainless steel

Damped opening and closing

Differential pressure possible on either side

VATLOCK configuration: see glossary

From DN 900 with split body
(see illustration below): short height for dismantling and convenient maintenance



Technical data

Leak rate

– Valve body	Series 19.0, 19.1	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
	Series 19.2	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
– Valve seat		$< 1 \cdot 10^{-9}$ mbar ls ⁻¹

Pressure range

– Series 19.0	$1 \cdot 10^{-7}$ mbar to 1 bar (abs)
– Series 19.1	$1 \cdot 10^{-8}$ mbar to 1 bar (abs)
– Series 19.2	$1 \cdot 10^{-10}$ mbar to 1 bar (abs)

Differential pressure on the gate	≤ 1 bar
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Further technical data on next page →

Continued Technical data

Differential pressure at opening		
– DN 400– 500		≤ 20 mbar
– DN 630–2000		≤ 10 mbar
Cycles until first service		
– Series 19.0	DN 400–500	100 000
– Series 19.0	DN 630	20 000
– Series 19.1, 19.2	DN 400–630	20 000
– Series 19.0, 19.1, 19.2	DN 800–2000	10 000
Temperature ¹⁾		
– Valve body		≤ 150 °C
– Actuator		≤ 80 °C
– Solenoid valve		≤ 50 °C
– Position indicator		≤ 80 °C
Heating and cooling rate		
– DN 400– 630		≤ 30 °C h ⁻¹
– DN 800–1250		≤ 5 °C h ⁻¹
Material		
– Valve body		AISI 304 (1.4301)
– Mechanism		EN AW-6082 (3.2315), AISI 304 (1.4301)
– Bellows (Series 19.1, 19.2 only)		AISI 316L (1.4435) or AISI 304L (1.4306)
Seal		
– Bonnet	Series 19.0, 19.1	FKM (Viton®)
	Series 19.2	metal
– Gate		FKM (Viton®)
Feedthrough		
– Series 19.0		shaft feedthrough
– Series 19.1, 19.2		bellows
Mounting position		
– DN 400– 800		any
– DN 900–2000		please define
Solenoid valve		24 VDC, max. 2W (others on request)
Position indicator: contact rating		
– Voltage	Series 19.0	Series 19.1 and 19.2
	≤ 50 VAC/DC	≤ 50 VDC ≤ 250 VAC
– Current	≤ 0.1 A	≤ 1.2 A ≤ 2 A
Valve position indication		
– Series 19.0		LED
– Series 19.1, 19.2		visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

DN (nominal I.D.)		Conductance (molecular flow)	Compressed air min. – max. overpressure				Volume of pneumatic actuator				Closing or opening time		Weight			
			19.0		19.1, 19.2		19.0		19.1, 19.2		19.0	19.1, 19.2	19.0		19.1, 19.2	
mm	inch	ls ⁻¹	bar	psi	bar	psi	l	ft ³	l	ft ³	s	s	kg	lbs	kg	lbs
400	16	50 000	5–7	73–102	5–9	73–131	5.9	0.208	2.1	0.074	8	10	140	309	160	353
500	20	90 000	5–7	73–102	5–9	73–131	6.9	0.244	2.7	0.095	8	10	200	441	235	518
630	25	186 000	5–7	73–102	6–9	87–131	8.8	0.311	4.8	0.170	10	14	350	772	385	849
800	32	280 000	5–7	73–102	6–9	87–131	17.9	0.632	11	0.388	21	35	580	1279	730	1610
900	36	430 000	5–7	73–102	6–9	87–131	20.8	0.735	')	')	23	')	760	1676	')	')
1000	40	505 000	5–7	73–102	6–9	87–131	22.6	0.798	18.8	0.664	25	50	1000	2205	1300	2867
1250	50	950 000	5–7	73–102	6–9	87–131	43.6	1.540	25.9	0.915	30	70	1700	3749	2100	4631
1600	63	1 460 000	5–7	73–102	')	')	111.1	3.923	')	')	35	')	2800	6174	')	')
2000	78	2 790 000	5–7	73–102	')	')	217.4	7.677	')	')	55	')	5050	11135	')	')

') on request

Options

Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid for impulse actuation and nonreturn valve:
last valve position is maintained at power failure and compressed air failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard: 24 VDC)
- 3-position pneumatic actuator
- Mechanical position indicator for series 19.0

Valve

- ISO, ASA, ASA-LP, JIS flanges
- Customer specified flanges with/without watercooling
- Static seals made of metal
- Ports for roughing (by-pass), venting or for gauges
- Protective ring
- Heat protection shield
- Leaf springs made of Nimonic
- Other sizes

Ordering information for options:

Ordering No. of valve-X

(e. g. 19254-PE44-X, X = port as per enclosed dimensional drawing)

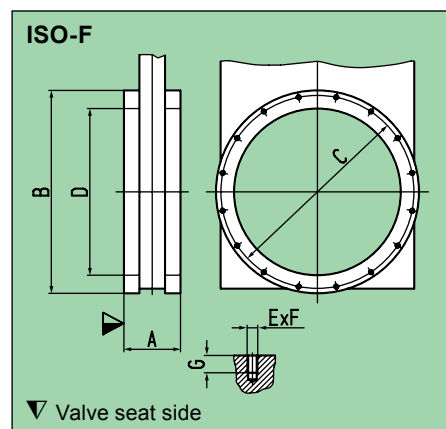
Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Bake-out equipment**
- **Blank-off flanges**
for testing and bake-out

Flange dimensions



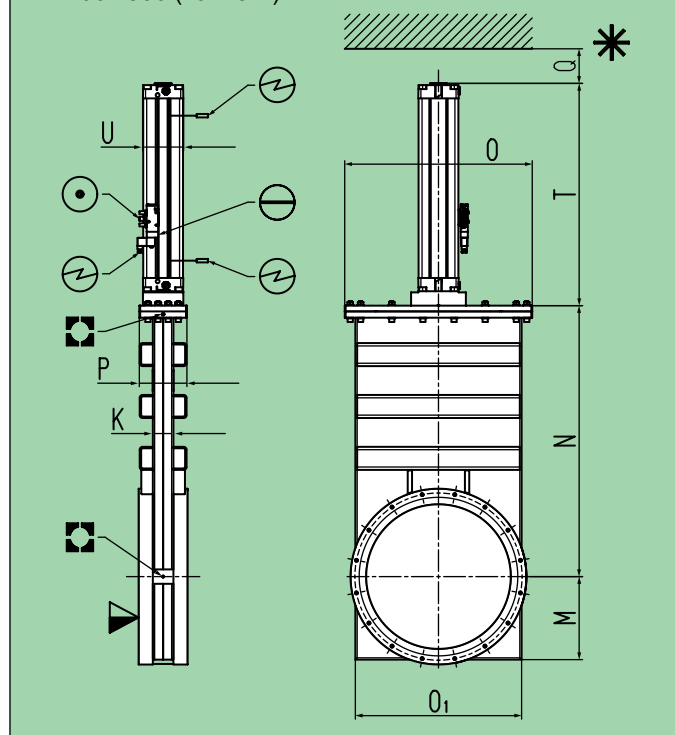
^{*)} customer-specific

DN	mm	400	500	630	800	900 ^{*)}	1000	1250 ^{*)}	1600 ^{*)}	2000 ^{*)}
inch		16	20	25	32	36	40	50	63	78
A	mm	150	170	180	220.50	204	240	250	250	340
	inch	5.90	6.69	7.09	8.66	8.03	9.45	9.84	9.84	13.40
B	mm	510	610	780	960	1060	1168	1500	1830	2232
	inch	20.08	24.02	30.71	37.80	41.70	46	59.05	72.05	87.80
C	mm	480	580	720	890	990	1090	1370	1760	2121
	inch	18.90	22.83	28.35	35.04	38.90	42.91	53.94	69.30	83.50
D	mm	400	501	651	800	900	1000.50	1250	1600	1982
	inch	15.75	19.72	25.63	31.50	35.40	39.37	49.21	63	78
E × F		16 × M12	16 × M12	20 × M12	24 × M12	–	32 × M12	32 × M16	40 × M24	36 × ¾"
G	mm	20	20	20	20	–	20	25	48	34
	inch	0.79	0.79	0.79	0.79	–	0.79	0.98	1.89	1.33

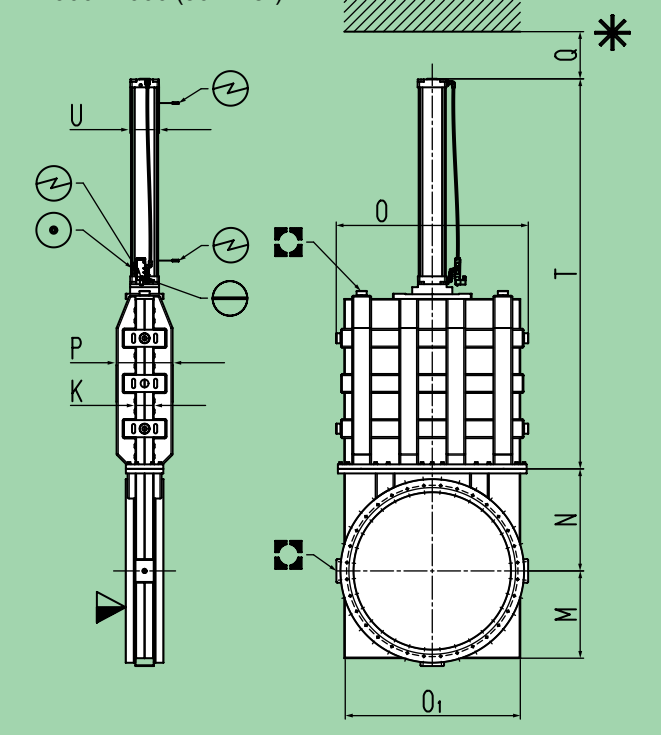
Dimensions for other flanges on request

Main dimensions

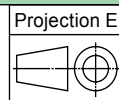
Series 19.0 (with shaft feedthrough):
Vacuum valve with pneumatic actuator: double acting
 DN 400–800 (16"–32")



Series 19.0 (with shaft feedthrough):
Vacuum valve with pneumatic actuator: double acting
 DN 900–2000 (36"–78")



- ▼ Valve seat side ⊕ Compressed air connection ⊖ Emergency operation
 * Required for dismantling ⊗ Electrical connection ■ For attachment



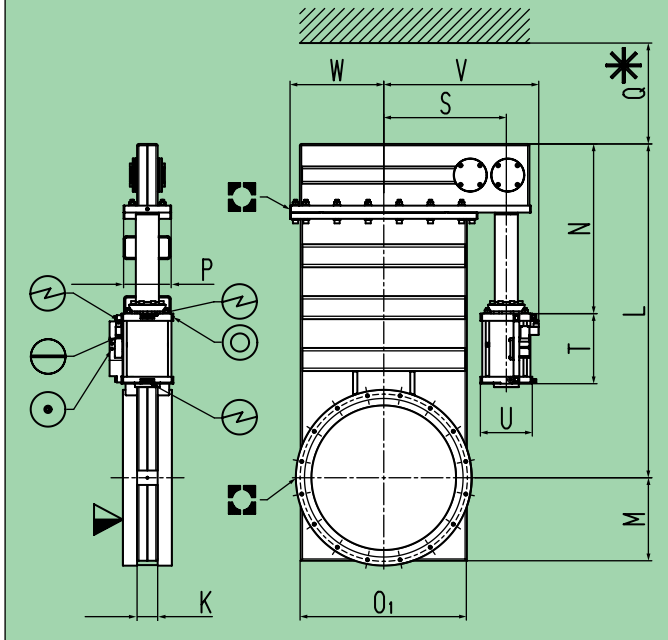
Flange dimensions: see page 101

¹⁾ customer-specific

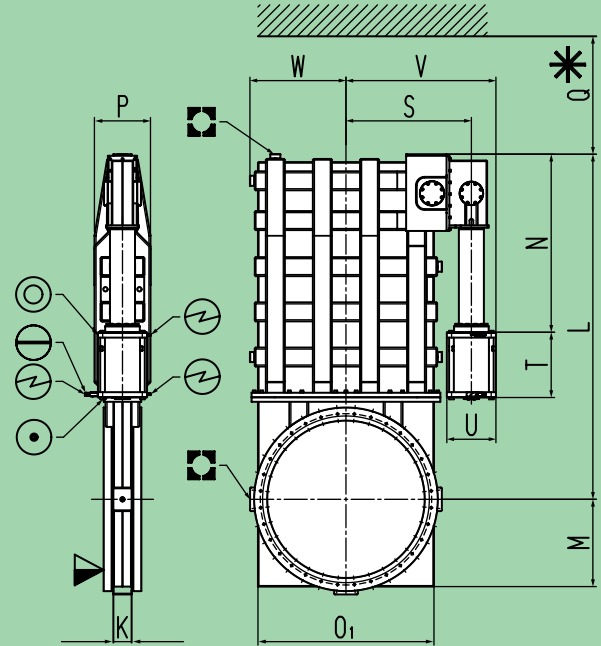
DN	mm	400	500	630	800	900 ¹⁾	1000	1250 ¹⁾	1600 ¹⁾	2000 ¹⁾
	inch	16	20	25	32	36	40	50	63	78
K	mm	67	72	74	87	87	116	116	125	145
	inch	2.64	2.83	2.91	3.43	3.43	4.57	4.57	4.92	5.71
M	mm	233	288	363	455	512	555	709	884	1134.50
	inch	9.17	11.34	14.29	17.91	20.16	21.85	27.91	34.80	44.67
N	mm	792	940	1195	1410	600	649	827	1017	1218
	inch	31.18	37.01	47.05	55.51	23.62	25.55	32.56	40.04	47.95
O	mm	525	650	806	1010	1091	1221	1521	1869	2349
	inch	20.67	25.59	31.73	39.76	42.95	48.07	59.88	73.58	92.48
O1	mm	467	577	732	911	1010	1119	1419	1769	2169
	inch	18.39	22.72	28.82	35.87	39.76	44.06	55.87	69.65	85.39
P	mm	147	165	240	336	212	356	356	365	553
	inch	5.79	6.50	9.45	13.23	8.35	14.02	14.02	14.37	21.77
Q	mm	620	700	845	1032	140	185	210	252	200
	inch	24.41	27.56	33.27	40.63	5.51	7.28	8.27	9.92	7.87
T	mm	690	771	926	1138	2308	2481	3028	3832	4751
	inch	27.17	30.35	36.46	44.80	90.87	97.68	119.21	150.87	187.05
U	mm	140	140	140	184	180	184	224	224	280
	inch	5.51	5.51	5.51	7.24	7.09	7.24	8.82	8.82	11.02

Main dimensions

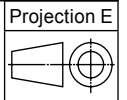
Series 19.1, 19.2 (with bellows):
HV/UHV valve with pneumatic actuator: double acting
 DN 400–800 (16"–32")



Series 19.1, 19.2 (with bellows):
HV/UHV valve with pneumatic actuator: double acting
 DN 900–2000 (36"–78")



- ▼ Valve seat side ⊕ Compressed air connection ⊖ Emergency operation ■ For attachment
 * Required for dismantling ⊕ Electrical connection ⊙ Leak detection hole



Flange dimensions: see page 101

^{*)} customer-specific

DN	mm	400	500	630	800	900 ^{*)}	1000	1250 ^{*)}	1600 ^{*)}	2000 ^{*)}
inch		16	20	25	32	36	40	50	63	78
K	mm	67	72	74	87	on request	116	116	on request	on request
	inch	2.64	2.83	2.91	3.43		4.57	4.57		
L	mm	957	1158	1434	1750		2196	2744		
	inch	37.68	45.59	56.46	68.90		86.46	108.03		
M	mm	233	288	363	455		555	709		
	inch	9.17	11.34	14.29	17.91		21.85	27.91		
N	mm	486	589	683	1047		1123	1353		
	inch	19.13	23.19	26.89	41.22		44.21	53.27		
O1	mm	467	577	732	911		1119	1419		
	inch	18.39	22.72	28.82	35.87		44.06	55.87		
P	mm	147	165	240	336		356	356		
	inch	5.79	6.50	9.45	13.23		14.02	14.02		
Q	mm	605	700	896	1050		140	182		
	inch	23.82	27.56	35.28	41.34		5.51	7.17		
S	mm	340	425	503	626		798	929		
	inch	13.39	16.73	19.80	24.65		31.42	36.57		
T	mm	225	255	260	373		436	525		
	inch	8.86	10.04	10.24	14.69		17.17	20.67		
U	mm	180	180	220	262		312	312		
	inch	7.09	7.09	8.66	10.31		12.28	12.28		
V	mm	448	537	630	757		954	1085		
	inch	17.64	21.14	24.80	29.80		37.56	42.72		
W	mm	263	325	403	505		611	760		
	inch	10.35	12.80	15.87	19.88		24.06	29.92		

Series 20.0/20.2

Main applications

Compact isolation valve for clean processes

Features

Body material:
aluminum or stainless steel

Bellows

No friction of the plate seal

Mechanically locked in open and closed position

Compact alternative to gate valves



Ordering information

Valve with manual actuator
turning handle: ½ turn

DN		Ordering numbers			
mm	inch	Series 20.0 with standard body		Series 20.2 with extended body	
		aluminum	stainless steel	aluminum	stainless steel
		ISO-F	CF-F metric threads	ISO-F	CF-F metric threads
63	2 ½	20036-PA04	20036-CE04	20236-PA04	20236-CE04
100	4	20040-PA04	20040-CE04	20240-PA04	20240-CE04
160	6	20044-PA04	20044-CE04	20244-PA04	20244-CE04

Valve with pneumatic actuator

See series 20.3 / 20.4, pages 106–109

Technical data

further technical data on request

Leak rate: valve body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-9}$ mbar to 1.2 bar (abs)
Differential pressure on the plate	≤ 1.2 bar
Differential pressure at opening	≤ 30 mbar
Cycles until first service	10 000
Temperature ¹⁾ : valve body, actuator	≤ 150 °C
Material	
– Valve body	
– aluminum	EN AW-6060 (3.3206), -6061 (3.3211) -6063 (3.3206), -6082 (3.2315)
– stainless steel	AISI 304 (1.4301)
– Plate, mechanism	AISI 304 (1.4301), AISI 304L (1.4306), AISI 420 (1.4034)
– Bellows	AISI 316L (1.4404)
Seal: bonnet	metal
plate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any

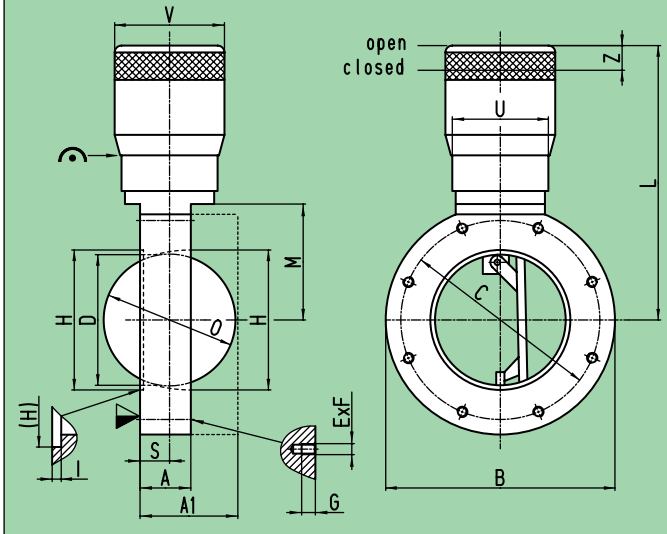
¹⁾ Maximum values: depending on operating conditions and sealing materials

Options, accessories

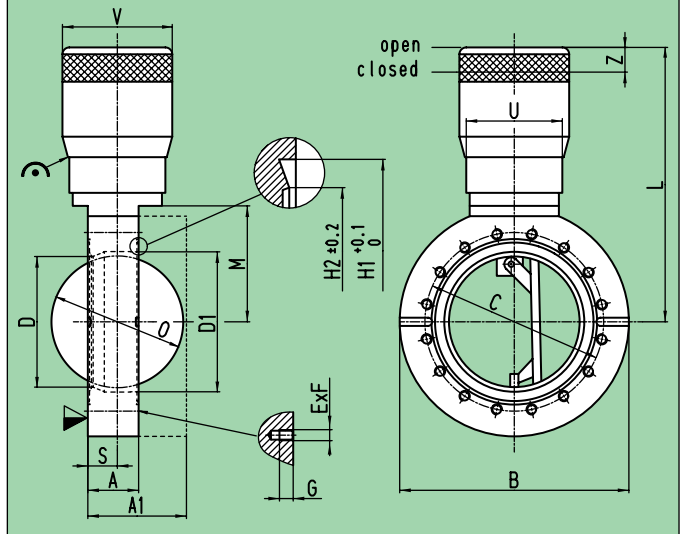
On request

Dimensions

Valve with manual actuator: turning handle
DN 63–160 (2½"–6") ISO-F

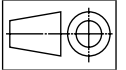


Valve with manual actuator: turning handle
DN 63–160 (2½"–6") CF-F



▼ Valve seat side ◐ Mechanical position indication

Projection E



A: standard body, series 20.0

A1: extended body, series 20.2

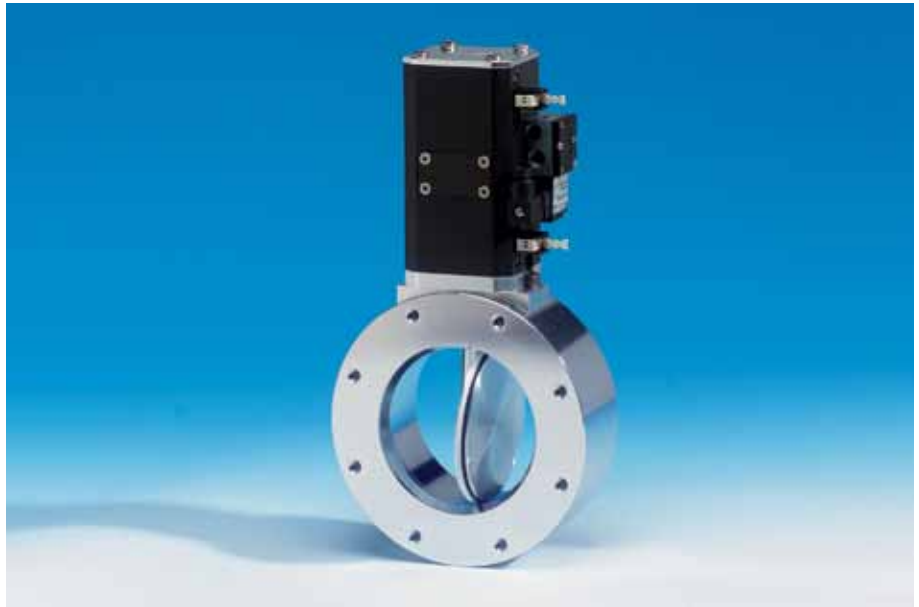
DN	mm inch	63 2½	100 4	160 6
A	mm inch	32 1.26	38 1.50	60 2.36
A1	mm inch	50 1.97	70 2.76	110 4.33
B	mm inch	131 5.16	167 6.57	226 8.9
C	mm inch	110 4.33	145 5.71	200 7.87
D	mm inch	65 2.56	95 3.74	142 5.59
E × F		4 × M8	8 × M8	8 × M10
G	mm inch	10 0.39	16 0.63	15 0.59
H	mm inch	70 2.76	102 4.02	153 6.02
I	mm inch	2.50 0.10	2.50 0.10	4.50 0.18
L	mm inch	145 5.71	190 7.48	245 9.65
M	mm inch	66.50 2.62	84 3.31	113.50 4.47
O	mm inch	67 2.64	96 3.78	144 5.67
S	mm inch	16 0.63	22 0.87	34 1.34
U	mm inch	62 2.44	70 2.76	78 3.07
V	mm inch	70 2.76	80 3.15	90 3.54
Z	mm inch	12 0.47	18 0.71	28 1.10

DN	mm inch	63 2½	100 4	160 6
A	mm inch	32 1.26	38 1.50	60 2.36
A1	mm inch	50 1.97	70 2.76	110 4.33
B	mm inch	131 5.16	167 6.57	226 8.90
C	mm inch	92.10 3.63	130.20 5.13	181 7.13
D	mm inch	65 2.56	95 3.74	142 5.59
D1	mm inch	70 2.76	102 4.02	153 6.02
E × F		8 × M8	16 × M8	20 × M8
G	mm inch	12 0.47	10 0.39	12 0.47
H1	mm inch	82.50 3.25	120.65 4.75	171.45 6.75
H2	mm inch	77.40 3.05	115.50 4.55	166 6.54
L	mm inch	145 5.71	190 7.48	245 9.65
M	mm inch	66.50 2.62	84 3.31	113.50 4.47
O	mm inch	67 2.64	96 3.78	144 5.67
S	mm inch	16 0.63	22 0.87	34 1.34
U	mm inch	62 2.44	70 2.76	78 3.07
V	mm inch	70 2.76	80 3.15	90 3.54
Z	mm inch	12 0.47	18 0.71	28 1.10

Series 20.3/20.4

Main applications

Compact isolation valve for
contaminating and aggressive
processes



Ordering information

Valve with manual actuator

See series 20.0 / 20.2, pages 104–105

Valve with pneumatic actuator double acting without solenoid valve without position indicator

DN		Ordering numbers		
mm	inch	Series 20.3 with standard body		
		aluminum	stainless steel	
		ISO-F	ISO-F	CF-F metric threads
63	2 ½	20336-PA14	20336-PE14	20336-CE14
80	3	20338-PA14	20338-PE14	–
100	4	20340-PA14	20340-PE14	20340-CE14
160	6	20344-PA14	20344-PE14	20344-CE14
200	8	20346-PA14	20346-PE14	20346-CE14

without solenoid valve, with position indicator: 203 **24**

with solenoid valve, without position indicator: 203 **34** (specify control voltage)

with solenoid valve, with position indicator: 203 **44** (specify control voltage)

DN		Ordering numbers		
mm	inch	Series 20.4 with extended body		
		aluminum	stainless steel	
		ISO-F	ISO-F	CF-F metric threads
63	2 ½	20436-PA14	20436-PE14	20436-CE14
80	3	20438-PA14	20438-PE14	–
100	4	20440-PA14	20440-PE14	20440-CE14
160	6	20444-PA14	20444-PE14	20444-CE14
200	8	20446-PA14	20446-PE14	20446-CE14

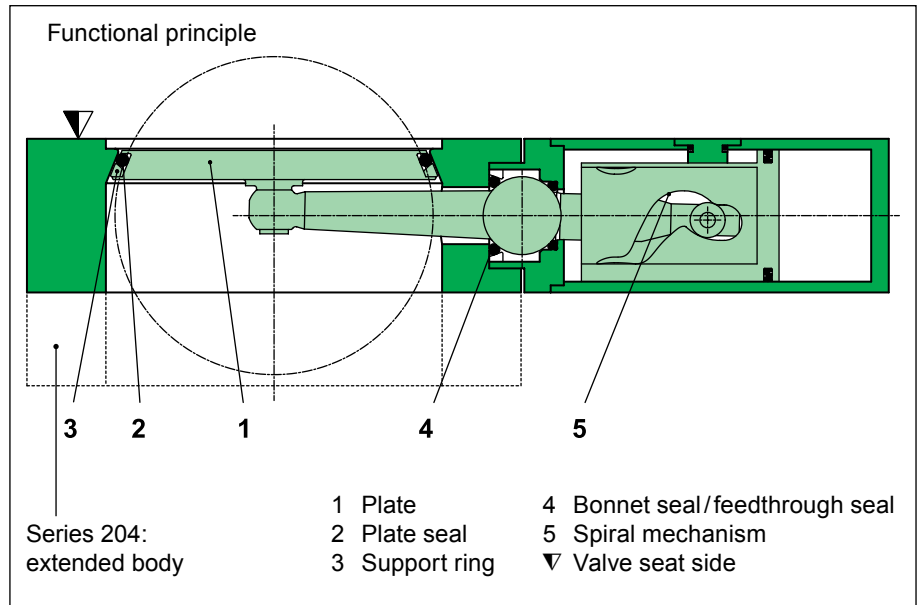
without solenoid valve, with position indicator: 204 **24**

with solenoid valve, without position indicator: 204 **34** (specify control voltage)

with solenoid valve, with position indicator: 204 **44** (specify control voltage)

Features

- Body material:
aluminum or stainless steel
- Rotary feedthrough for a high number of cycles
- No moving parts in the vacuum
- No friction of the plate seal
- Mechanically locked in open and closed position
- Compact alternative to gate valves



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 2 bar (abs)
Differential pressure on the plate	
– In opening direction	≤ 1.2 bar
– In closing direction	≤ 1.6 bar
Differential pressure at opening	≤ 500 mbar
Cycles until first service	100000
Temperature ¹⁾	
– Valve body	≤ 120 °C (150 °C optional)
– Actuator	≤ 120 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 80 °C
Material	
– Valve body and plate	
– aluminum	EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315)
– stainless steel	AISI 304 (1.4301)
– Mechanism	AISI 316L (1.4435), AISI 304 (1.4301)
– Support ring	
– standard	POM
– 150 °C Option	PEEK
Seal: bonnet, plate, feedthrough	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	any
Solenoid valve	24 VDC, 7.6 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 50 VAC/DC
– Current	≤ 0.5 A
– Power	max. 10 W

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

	DN (nominal I. D.)		Conductance (molecular flow)	Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time ¹⁾	Weight			
	mm	inch		bar	psi	l	ft ³		Aluminum valve body		Stainless steel valve body	
Series 20.3 with standard body	63	2 ½	550	4–7	58–102	0.04	0.0014	0.4	2.3	5.1	4.6	10.1
	80	3	700	4–7	58–102	0.08	0.0030	0.8	3.8	8.4	7.5	16.5
	100	4	1400	4–7	58–102	0.08	0.0030	0.8	4.0	8.8	8.0	17.6
	160	6	4000	4–7	58–102	0.13	0.0045	1.4	7.4	16.3	15.6	34.4
	200	8	7500	4–7	58–102	0.30	0.0100	1.8	16.1	35.5	34.2	75.4
Series 20.4 with extended body	63	2 ½	450	4–7	58–102	0.04	0.0014	0.4	2.5	5.5	5.3	11.7
	80	3	600	4–7	58–102	0.08	0.0030	0.8	4.2	9.3	8.5	18.7
	100	4	1050	4–7	58–102	0.08	0.0030	0.8	4.7	10.4	10.1	22.3
	160	6	2550	4–7	58–102	0.13	0.0045	1.4	9.7	21.4	22.3	49.2
	200	8	4700	4–7	58–102	0.30	0.0100	1.8	21.3	47.0	20.8	45.9

¹⁾ depending on pneumatic installation

Options

Pic. 1

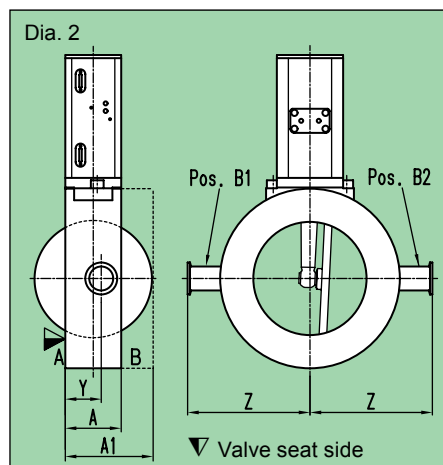


Actuator

- Other solenoid valve voltage (standard: 24 VDC)

Valve

- Customer specified flanges
- CF-F flanges with UNF threads
- Soft-pump function (Pic. 1)
- Ports for roughing (by-pass), venting or for gauges (Dia. 2), possible in positions B1 and B2
 - screwed (aluminum valve body)
 - welded (stainless steel valve body)



DN valve	mm inch	63 2 ½	80 3	100 4	160 6	200 8
Recommended port ¹⁾ aluminum valve body ²⁾ stainless steel valve body	¹⁾ ISO-KF	16 ⅝	25 1	25 1	25 1	40 1 ½
	²⁾ CF-F	16 ⅝	16 ⅝	16 ⅝	40 1 ½	40 1 ½
Y	mm inch	30 1.18	35 1.38	35 1.38	35 1.38	45 1.77
Z ISO-KF	mm inch	92 3.62	112 4.41	122 4.80	152 5.98	185 7.28
Z CF-F	mm inch	90 3.54	100 3.94	110 4.33	145 5.71	180 7.09
Other ports on request						

Ordering information for options:

Ordering No. of valve-X (e. g. 20340-PA44-X, X = port ISO-KF 25 in position B1)

Spare parts

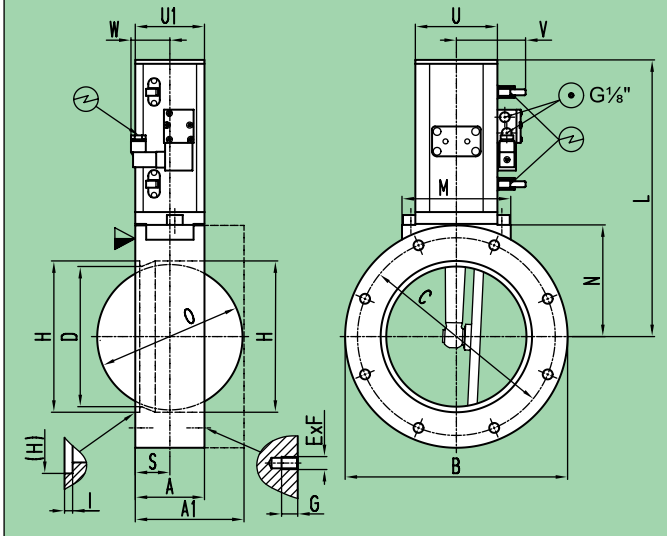
- **Seals**
on request (specify fabrication number of valve)

Accessories

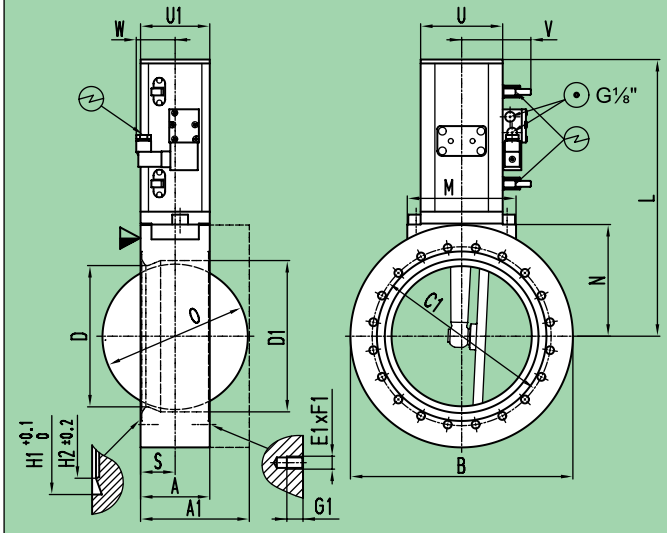
- **Flange connections**
for installation of the valve: see series 32 and 33

Dimensions

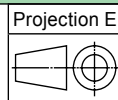
Valve with pneumatic actuator: double acting
DN 63–200 (2½"–8") ISO-F



Valve with pneumatic actuator: double acting
DN 63–200 (2½"–8") CF-F



- ▼ Valve seat side
- ⊙ Compressed air connection
- ⊕ Electrical connection



A: standard body, series 20.3

A1: extended body, series 20.4

DN	mm	63	80	100	160	200
inch		2½	3	4	6	8
A	mm	50	60	60	70	90
inch		1.97	2.36	2.36	2.76	3.54
A1	mm	60	70	80	110	145
inch		2.36	2.76	3.15	4.33	5.71
B	mm	130	145	165	225	300
inch		5.12	5.71	6.50	8.86	11.81
C	mm	110	125	145	200	260
inch		4.33	4.92	5.71	7.87	10.24
C1	mm	92.10	–	130.20	181	231.80
inch		3.63		5.13	7.13	9.13
D	mm	63	76	95	142	192
inch		2.48	2.99	3.74	5.59	7.56
D1	mm	70	–	102	153	208
inch		2.76		4.02	6.02	8.19
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10
E1 × F1		8 × M8	–	16 × M8	20 × M8	24 × M8
G	mm	12	12	12	15	15
inch		0.47	0.47	0.47	0.59	0.59
G1	mm	12	–	12	12	15
inch		0.47		0.47	0.47	0.59
H	mm	70	83	102	153	213
inch		2.76	3.27	4.02	6.02	8.39
H1	mm	82.5	–	120.65	171.45	222.3
inch		3.25		4.75	6.75	8.75
H2	mm	77.40	–	115.50	166	217
inch		3.05		4.55	6.54	8.54
I	mm	2.50	2.50	2.50	4.50	4.50
inch		0.10	0.10	0.10	0.18	0.18
L	mm	181	228	228	285	371
inch		7.13	8.98	8.98	11.22	14.61
M	mm	76	86	86	110	140
inch		2.99	3.39	3.39	4.33	5.51
N	mm	65	82.50	82.50	113	147.50
inch		2.56	3.25	3.25	4.45	5.81
O	mm	66	80	100	147	200
inch		2.6	3.15	3.94	5.79	7.87
S	mm	25	30	30	35	45
inch		0.98	1.18	1.18	1.38	1.77
U	mm	60	70	70	83	103
inch		2.36	2.76	2.76	3.27	4.06
U1	mm	50	60	60	70	90
inch		1.97	2.36	2.36	2.76	3.54
V	mm	60	65	65	70	80
inch		2.36	2.56	2.56	2.76	3.15
W	mm	44	40	40	40	30
inch		1.73	1.57	1.57	1.57	1.18

Main applications

Isolation valve for vacuum applications in extreme UHV, high temperature or aggressive media



Ordering information

Valve with manual actuator
handwheel

DN		Ordering numbers		
mm	inch	CF-F		
		without position indicator	with position indicator 80 °C	with position indicator 200 °C
16	5/8	48124-CE01	48124-CE08	48124-CE05
40	1 1/2	48132-CE01	48132-CE08	48132-CE05
63	2 1/2	48236-CE01	48236-CE08	48236-CE05
100	4	48240-CE01	48240-CE08	48240-CE05
160	6	48244-CE01	48244-CE08	48244-CE05
200	8	48146-CE01	48146-CE08	48146-CE05

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator 80 °C

DN		Ordering numbers (specify control voltage)	
mm	inch	CF-F	
		compact actuator: valve bakeable to 200 °C	extended actuator: valve bakeable to 300 °C
16	5/8	—	48124-CE44
40	1 1/2	—	48132-CE44
63	2 1/2	48236-CE74	48236-CE44
100	4	48240-CE74	48240-CE44
160	6	48244-CE74	48244-CE44
200	8	48146-CE74	48146-CE44
250	10	48148-CE74	48148-CE44
320	12	48150-XE74 X = customer specific	48150-XE44 X = customer specific

without solenoid valve, with position indicator 80 °C: compact actuator 48 E72
extended actuator 48 E24

Other versions: see pages 112 + 113

Bake-out jacket

See page 270: ordering information and technical data on request

To control the heating process we recommend using commercial controllers with settable heating rate and temperature limiting device. Our bake-out jackets are supplied without thermocouples and thermostats.

Features

Body material: stainless steel

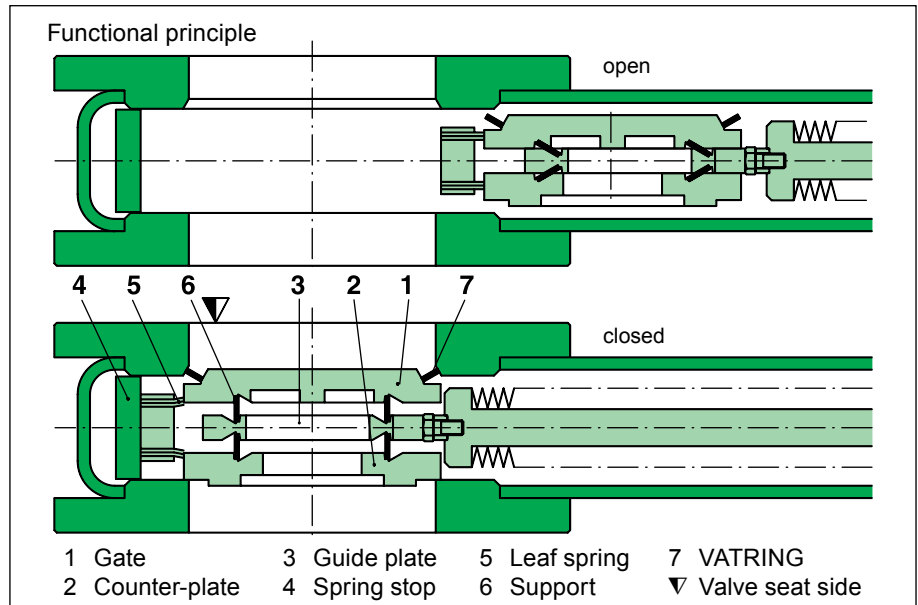
VATRING configuration: see glossary

Sealing surfaces are only elastically deformed

Mechanically locked in closed position

Radiation resistant

Bakeable to 300 °C in open and closed position



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	XHV to 2 bar (abs)
Differential pressure on the gate	≤ 2 bar
Differential pressure at opening	
– DN 16– 40	≤ 1 bar
– DN 63–250	≤ 500 mbar ¹⁾
– DN 320	≤ 500 mbar ²⁾
Cycles until first service	
– DN 16–200	20 000
– DN 250–320	5 000
Bake-out temperature ³⁾	
– Valve body	≤ 300 °C
– Manual actuator	≤ 140 °C (option: 200 °C)
– Pneumatic actuator	≤ 200 °C
– Solenoid valve	≤ 80 °C
– Position indicator	≤ 80 °C (option: 200 °C)
Heating and cooling rate	
– DN 16	≤ 80 °C h ⁻¹
– DN 40–160	≤ 50 °C h ⁻¹
– DN 200–320	≤ 25 °C h ⁻¹
Material	
– Valve body, mechanism	AISI 316L (1.4435, 1.4404)
– Bellows	AISI 316L (1.4435)
Seal: bonnet, gate	metal
Feedthrough	bellows
Mounting position: DN 16–250 / DN 320	any / on request
Solenoid valve	24 VDC, 2.5 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 50 VAC/DC
– Current	80 °C: ≤ 1.2 A / 200 °C: ≤ 1 A
Valve position indication	visual (mechanical)

¹⁾ 1 bar with reduced number of cycles

²⁾ Reduced number of cycles

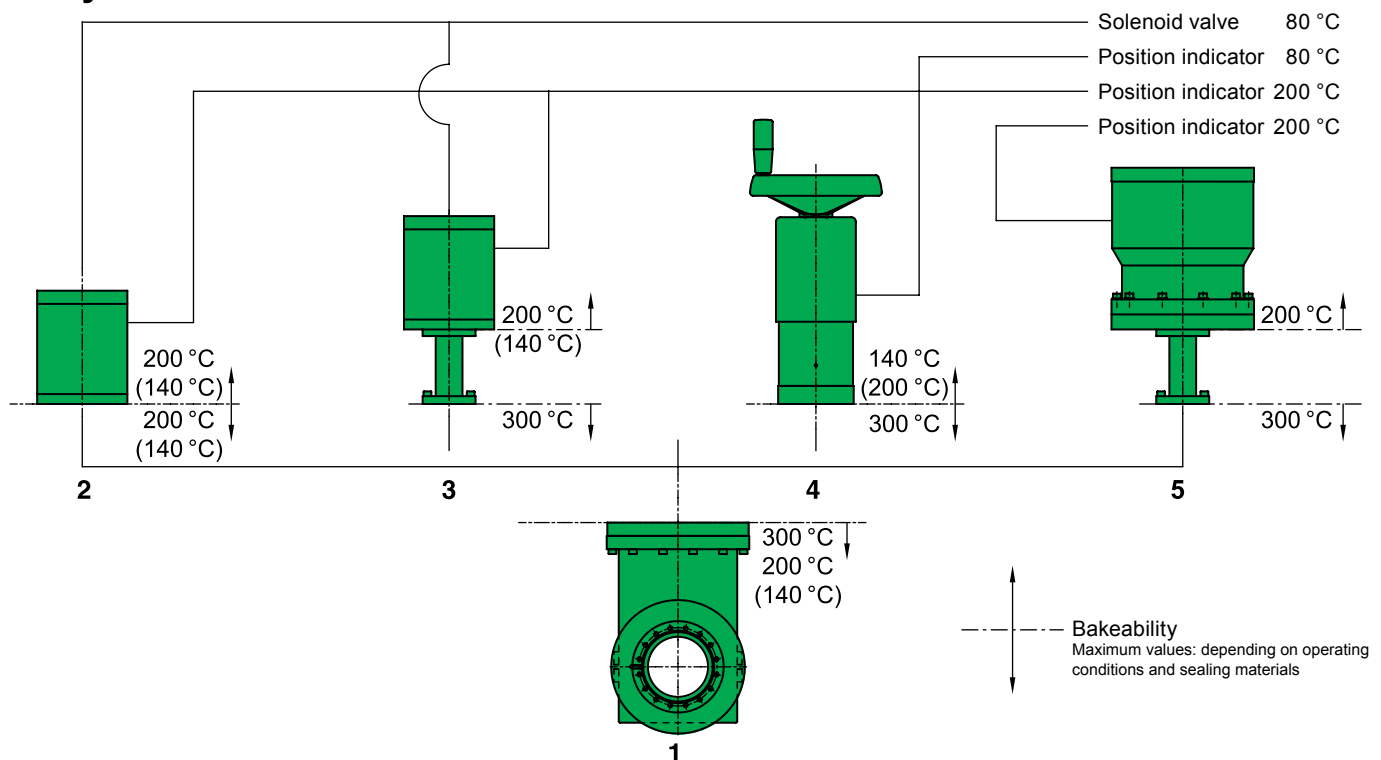
³⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

				Valve with manual actuator			Valve with pneumatic actuator						
DN (nominal I. D.)		CF-F flange	Conductance (molecular flow)	Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch	O. D.	ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
16	5⁄8	1 1⁄8	10	19	3.0	6.6	4–8	58–116	0.1	0.004	1	3.8	8.4
40	1 1⁄2	2 3⁄4	100	21	5.5	12	4–8	58–116	0.27	0.010	1.5	7.2	16
63	2 1⁄2	4 1⁄2	400	32	16	35	4–8	58–116	0.5	0.018	2	17.3	38
100	4	6	1400	46	23.5	52	4–8	58–116	1.4	0.049	4	27	60
160	6	8	4200	66	39	85	4–8	58–116	4.3	0.152	9	45	100
200	8	10	6900	63	74.5	164	4–8	58–116	8.3	0.293	15	88	194
250	10	12	12700	–	–	–	4–8	58–116	10.7	0.378	20	156	344
320	12	X	23500	–	–	–	4–8	58–116	12.9	0.456	20	230	507

Body and actuators: modular selection



Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Flexible bake-out jacket**: see page 270
- **Flange connections**
for installation of the valve: see series 33

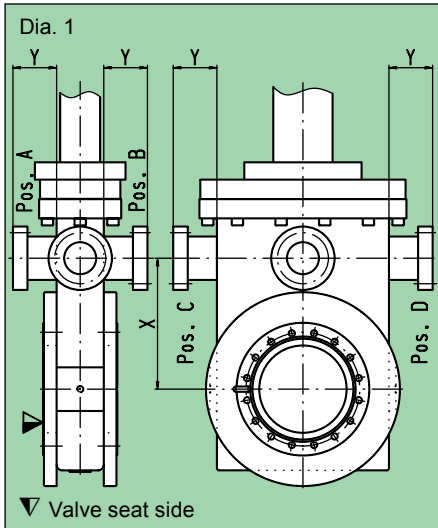
Options

Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Other solenoid valve voltage (standard: 24 VDC)
- Solenoid valve radiation resistant to 10^6 Gy (standard: 10^4 Gy)
- Position indicator for manual and pneumatic actuator bakeable to 200 °C ¹⁾
(standard: 80 °C)
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Accessory for pneumatic actuator for faster closing
- Pneumatic actuator (compact or extended):
radiation resistant to 10^6 Gy, bakeable to 140 °C ¹⁾
- Pneumatic actuator for hot zone:
radiation resistant to 10^8 Gy, bakeable to 200 °C ¹⁾
- Manual actuator bakeable to 200 °C ¹⁾

Valve

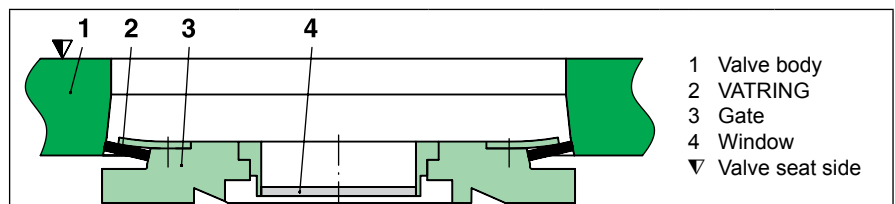
- Customer specified flanges
- Larger nominal diameters
- Antimagnetic version with defined permeability:
see glossary
- Ports for roughing (by-pass), venting or for gauges (Dia. 1),
possible in positions A, B, C and D



DN valve	mm	16	40	63	100	160	200	250	320
	inch	$\frac{5}{8}$	$1\frac{1}{2}$	$2\frac{1}{2}$	4	6	8	10	12
Recommended port CF-F	mm	16	16	16	40	40	40	40	40
	inch	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
X	mm	40	70	115	135	220	280	365	440
	inch	1.57	2.76	4.53	5.31	8.66	11.02	14.37	17.32
Y	mm	18	18	20	50	50	50	50	50
	inch	0.71	0.71	0.79	1.97	1.97	1.97	1.97	1.97

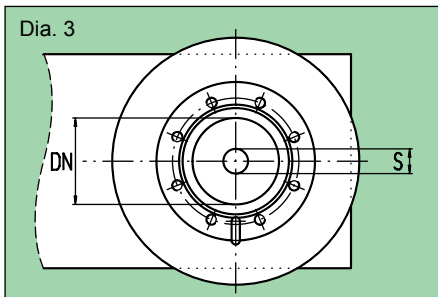
Other ports on request

- Window in gate with DN 40, 63, 100, 160, 200 only (Pic. 2, Dia. 3):
window welded into gate, window material: sapphire



DN valve	mm	40	63	100	160	200
	inch	$1\frac{1}{2}$	$2\frac{1}{2}$	4	6	8
Optically free diameter «S»	mm	12	18	34	34	34
	inch	0.47	0.71	1.34	1.34	1.34
Thickness of glass	mm	2	2	2	2	2
	inch	0.08	0.08	0.08	0.08	0.08

- Options:
- Special glass qualities
 - Other materials (e. g. berillium)
 - Other window sizes

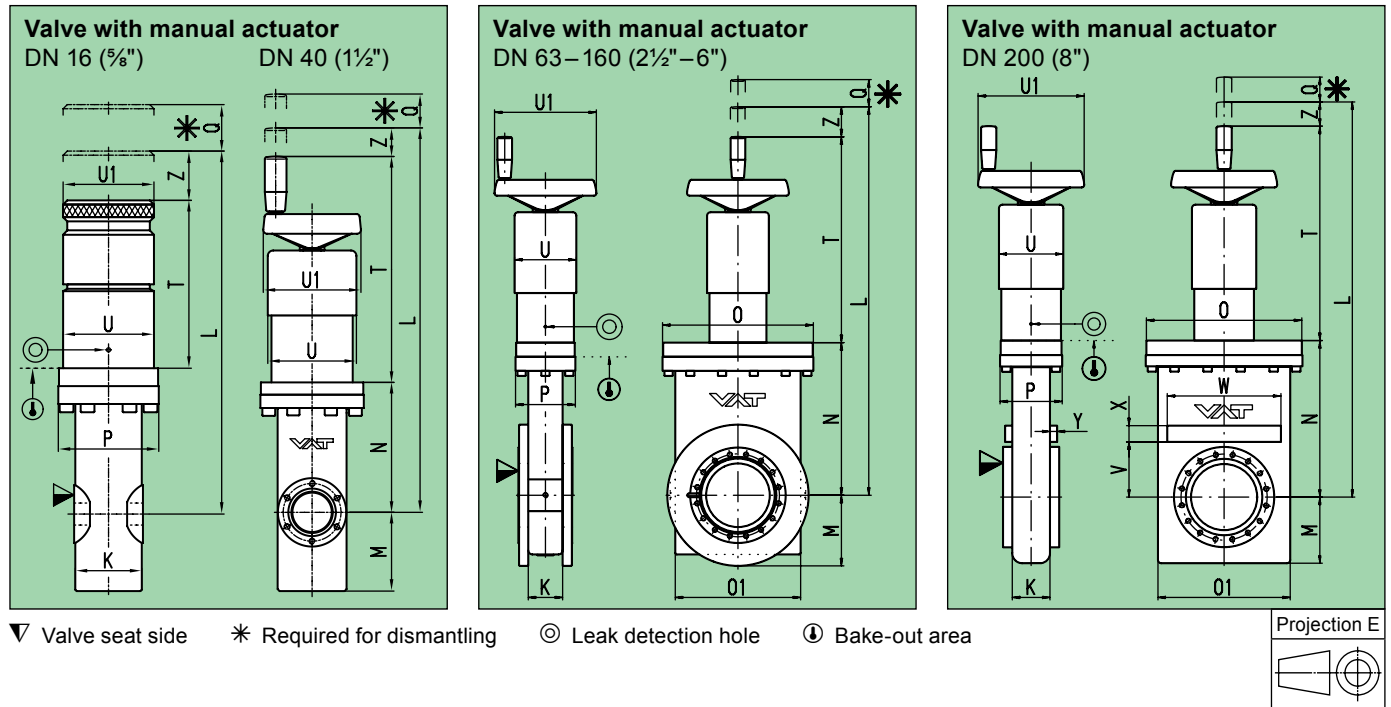


¹⁾ Maximum values: depending on operating conditions and sealing materials

Ordering information for options:

Ordering No. of valve-X (e. g. 48240-CE44-X, X = port CF-F 40 in position A)

Main dimensions

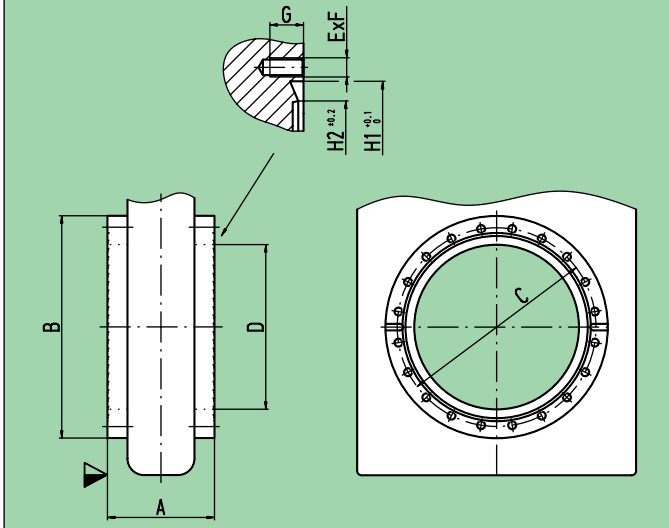


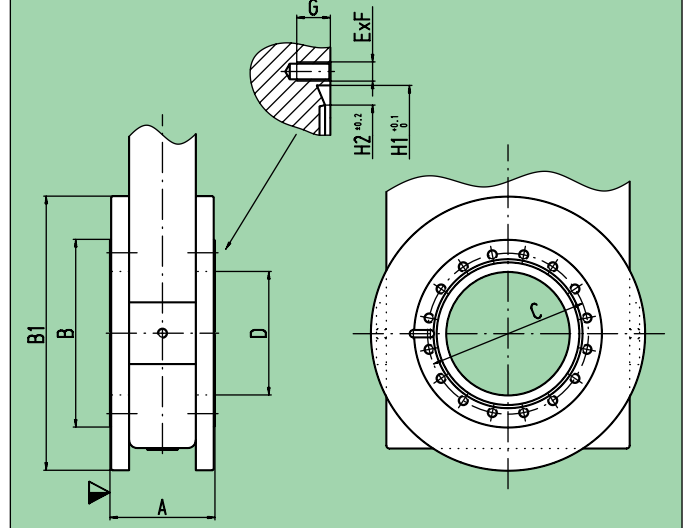
Flange dimensions: see page 115

DN	mm inch	16 5/8	40 1½	63 2½	100 4	160 6	200 8
K	mm inch	48.50 1.91	70 2.76	46 1.81	54 2.13	58 2.28	78 3.07
L	mm inch	261 10.28	414 16.30	554 17.13	678 26.69	873 34.37	1101 43.33
M	mm inch	56 2.20	80 3.15	90 3.54	111 4.37	144 5.67	161 6.34
N	mm inch	106 4.17	132 5.20	209 8.23	240 9.45	329 12.95	410 16.14
O	mm inch	–	–	189 7.44	237 9.33	287 11.30	352 13.86
O1	mm inch	–	–	156 6.14	197 7.76	253 9.96	316 12.44
P	mm inch	73 2.87	105 4.13	77 3.03	94 3.70	93 3.66	114 4.49
Q	mm inch	150 5.90	200 7.87	280 11.02	320 12.60	450 17.72	570 22.44
T	mm inch	122 4.80	230 9.06	266 8.90	324 12.76	378 14.88	473 18.62
U	mm inch	66 2.60	90 3.54	97 3.81	97 3.81	97 3.81	97 3.81
U1	mm inch	66 2.60	100 3.70	100 3.94	160 6.30	160 6.30	200 7.87
V	mm inch	–	–	–	–	–	155 6.10
W	mm inch	–	–	–	–	–	277 10.91
X	mm inch	–	–	–	–	–	40 1.57
Y	mm inch	–	–	–	–	–	30 1.18
Z	mm inch	33 1.30	52 2.05	79 3.11	114 4.49	166 6.54	218 8.58

Flange dimensions

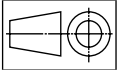
CF-F

 DN 16, 40, 200 ($\frac{5}{8}$ ", $1\frac{1}{2}$ ", 8")

CF-F

 DN 63–160 ($2\frac{1}{2}$ "–6")


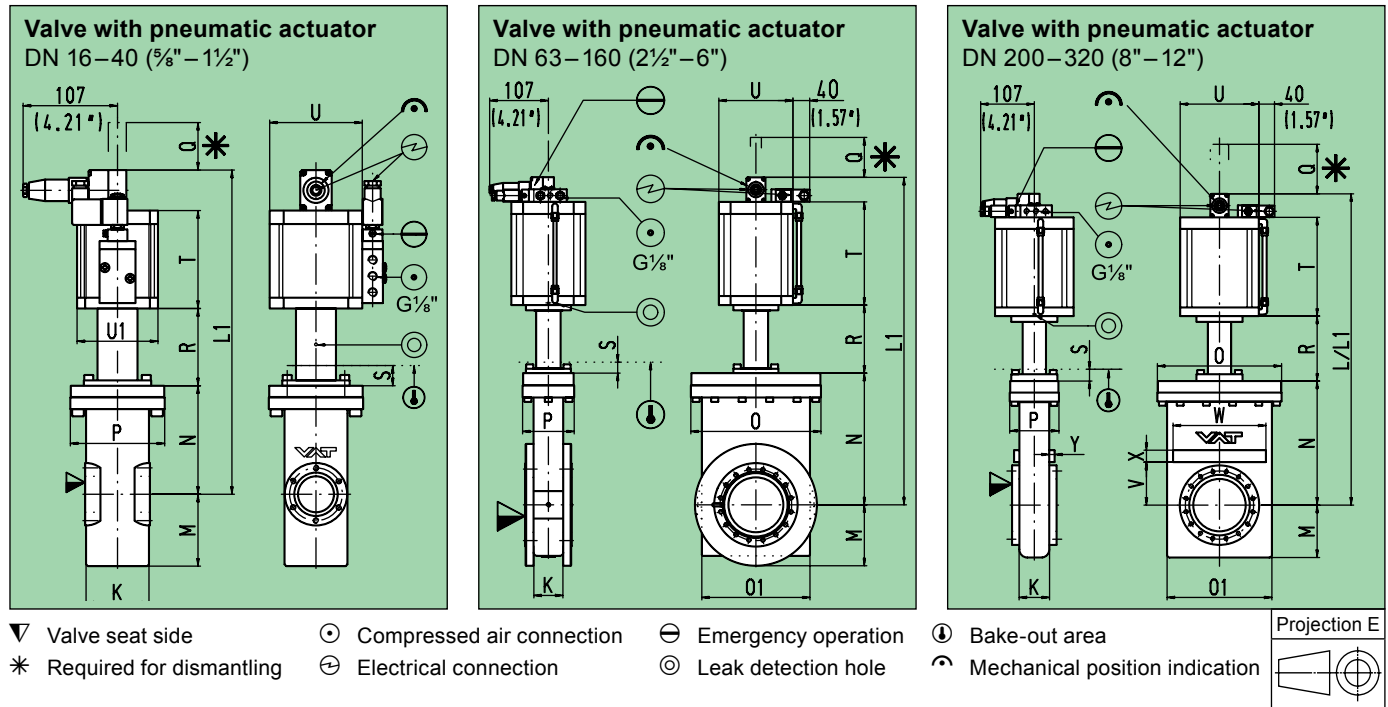
▽ Valve seat side

Projection E



DN	mm inch	16 %	40 $1\frac{1}{2}$	63 $2\frac{1}{2}$	100 4	160 6	200 8
O.D.	inch	$1\frac{1}{8}$	$2\frac{3}{4}$	$4\frac{1}{2}$	6	8	10
A	mm inch	50 1.97	72 2.83	75 2.95	85 3.35	97.50 3.84	140 5.51
B	mm inch	42 1.65	69.50 2.73	113.50 4.47	152 5.98	202.50 7.97	277 10.90
B1	mm inch	—	—	180 7.08	222 8.74	288 11.34	—
C	mm inch	27 1.06	58.70 2.31	92.10 3.63	130.30 5.13	181 7.13	231.80 9.13
D	mm inch	16 0.63	40 1.57	63 2.48	100 3.94	150 5.91	200 7.87
E × F	mm inch	6 × M4	6 × M6	8 × M8	16 × M8	20 × M8	24 × M8
G	mm inch	8 0.31	10 0.39	12 0.47	14 0.55	16 0.63	17 0.67
H1	mm inch	21.40 0.84	48.30 1.90	82.50 3.25	120.65 4.75	171.45 6.75	222.30 8.75
H2	mm inch	18.50 0.72	42 1.65	77.40 3.05	115.50 4.55	166 6.54	217 8.54

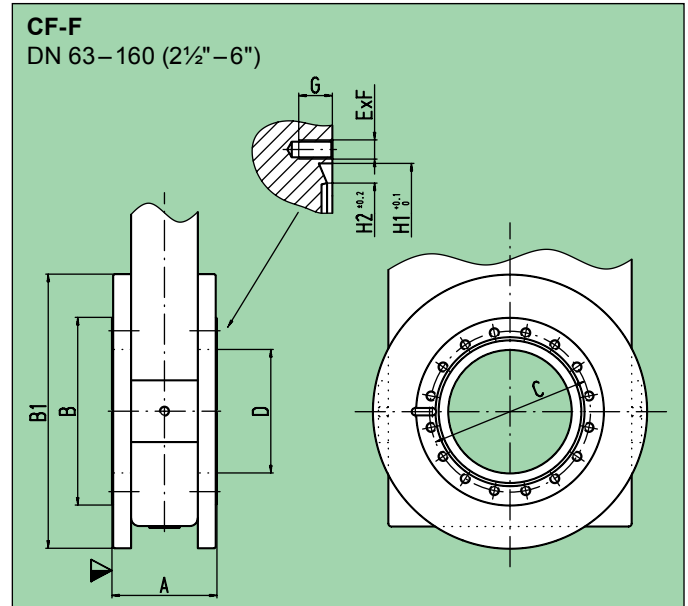
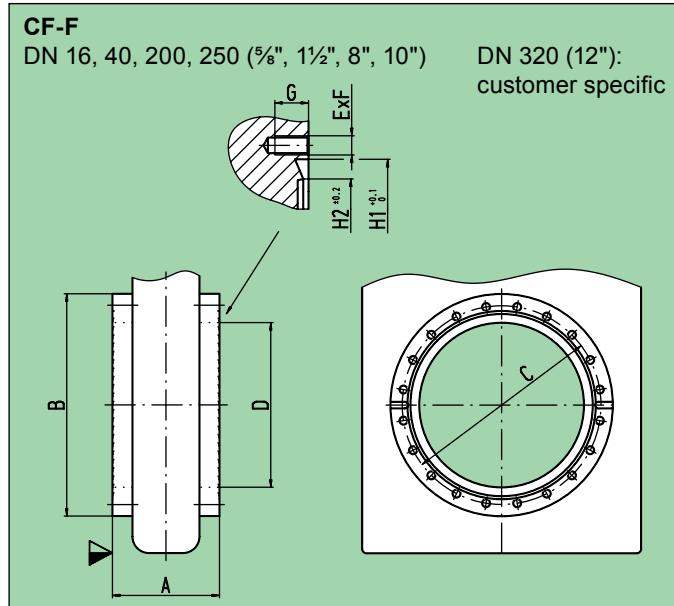
Main dimensions



L1 and R for extended actuator / flange dimensions: see page 117

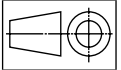
DN	mm inch	16 $\frac{5}{8}$	40 $1\frac{1}{2}$	63 $2\frac{1}{2}$	100 4	160 6	200 8	250 10	320 12
K	mm inch	48.50 1.91	70 2.76	46 1.81	54 2.13	58 2.28	78 3.07	90 3.54	105 4.13
L	mm inch	–	–	403 15.87	473 18.62	616 24.25	770 30.31	947 37.28	1114 43.86
L1	mm inch	312 12.28	372 14.65	527 20.75	597 23.50	740 29.13	894 35.20	1071 42.17	1238 48.74
M	mm inch	56 2.20	80 3.15	90 3.54	111 4.37	144 5.67	161 6.34	205 8.07	240 9.45
N	mm inch	106 4.17	132 5.20	209 8.23	240 9.45	329 12.95	410 16.14	525 20.67	632 24.88
O	mm inch	–	–	189 7.44	237 9.33	287 11.30	352 13.86	446 17.56	516 20.32
O1	mm inch	–	–	156 6.14	197 7.76	253 9.96	316 12.44	410 16.14	480 18.89
P	mm inch	73 2.87	105 4.13	77 3.03	94 3.70	93 3.66	114 4.49	126 4.96	141 5.55
Q	mm inch	150 5.90	200 7.87	280 11.02	320 12.60	450 17.72	535 21.06	675 26.57	800 31.50
R	mm inch	64 2.52	86 3.39	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88
S	mm inch	15 0.59	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
T	mm inch	90 3.54	109 4.29	149 5.87	188 7.40	242 9.53	315 12.40	377 14.84	438 17.24
U	mm inch	83 3.27	103 4.06	98 3.86	135 5.31	190 5.91	230 9.06	230 9.06	230 9.06
U1	mm inch	70 2.76	90 3.54	–	–	–	–	–	–
V	mm inch	–	–	–	–	–	155 6.10	210 8.27	245 9.65
W	mm inch	–	–	–	–	–	277 10.91	441 17.36	511 20.12
X×Y	mm inch	–	–	–	–	–	40×30 1.57×1.18	50×50 1.97×1.97	60×60 2.36×2.36

Flange dimensions



▽ Valve seat side

Projection E



DN	mm inch	16 5/8	40 1½	63 2½	100 4	160 6	200 8	250 10	320 12
O. D.	inch	1½	2¾	4½	6	8	10	12	–
A	mm inch	50 1.97	72 2.83	75 2.95	85 3.35	97.50 3.84	140 5.51	150 5.91	170 6.69
B	mm inch	42 1.65	69.50 2.73	113.50 4.47	152 5.98	202.50 7.97	277 10.90	380 14.96	444 17.48
B1	mm inch	–	–	180 7.08	222 8.74	288 11.34	–	–	–
C	mm inch	27 1.06	58.70 2.31	92.10 3.63	130.30 5.13	181 7.13	231.80 9.13	284 11.18	–
D	mm inch	16 0.63	40 1.57	63 2.48	100 3.94	150 5.91	200 7.87	250 9.84	320 12.60
E × F	mm inch	6 × M4	6 × M6	8 × M8	16 × M8	20 × M8	24 × M8	32 × M8	–
G	mm inch	8 0.31	10 0.39	12 0.47	14 0.55	16 0.63	17 0.67	17 0.67	–
H1	mm inch	21.40 0.84	48.30 1.90	82.50 3.25	120.65 4.75	171.45 6.75	222.30 8.75	273.15 10.75	–
H2	mm inch	18.50 0.72	42 1.65	77.40 3.05	115.50 4.55	166 6.54	217 8.54	267 10.51	–

Series 61.2

Main applications

Downstream pressure control valve for SEMI, FPD, PV, SOLAR and industrial processes

Optimal for fast and demanding processes, e. g. CVD



DN 25–50



DN 63–250

Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers							
mm	inch	aluminum				stainless steel			
		ISO-KF		ISO-F		ISO-KF		ISO-F	
25	1	61228-KA	x y			61228-KE	x y		
40	1½	61232-KA	x y			61232-KE	x y		
50	2	61234-KA	x y			61234-KE	x y		
63	2½			61236-PA	x y			61236-PE	x y
80	3			61238-PA	x y			61238-PE	x y
100	4			61240-PA	x y			61240-PE	x y
160	6			61244-PA	x y			61244-PE	x y
200	8			61246-PA	x y			61246-PE	x y
250	10			61248-PA	x y			61248-PE	x y

Controller configurations:

G = basic version
 A = with SPS
 H = with PFO
 C = with SPS and PFO
 T = basic version with VC master
 V = with SPS and VC master
 U = with PFO and VC master
 W = with SPS, PFO and VC master

SPS = Sensor Power Supply
(±15V DC power supply for sensor)

PFO = Power Failure Option
(valve closes/opens automatically at power failure)

VC = Valve Cluster
(for operating several valves synchronously)

Interface

Number of sensors

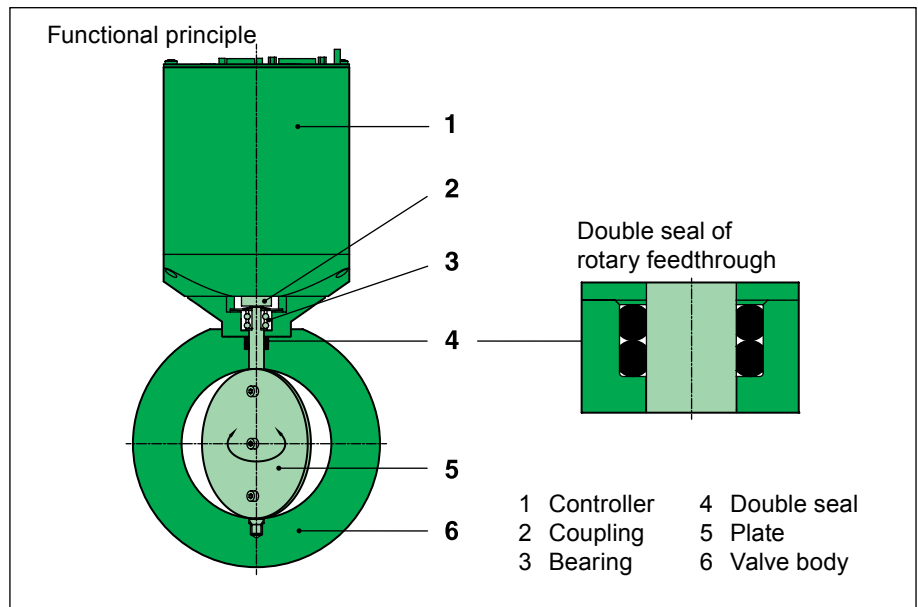
G = RS232 1
 H = RS232 2
 C = Logic 1
 E = Logic 2
 P = DeviceNet® 1
 Q = DeviceNet® 2
 D = Profibus 1
 F = Profibus 2
 J = RS485 1
 K = RS485 2
 Y = Ethernet 1
 Z = Ethernet 2
 L = CC-Link 1
 N = CC-Link 2
 I = EtherCAT 1
 X = EtherCAT 2
 S = VC slave (without interface)

Example: 61240-PAGG
 = Aluminum valve with ISO-F DN 100 flanges,
 RS232 interface, for 1 sensor

Pressure controller: see pages 146–149

Features

Body material:
 aluminum or stainless steel
 Compact design
 Fast operation
 Integrated pressure controller
 Extremely short control response times
 Automatic service signal (contamination)
 Position indication
 Service port for connecting a computer
 or a service box 2
 Excellent resistance to contaminating
 processes
 Easy maintenance



The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control even in very contaminating processes.

Technical data

Leak rate ¹⁾ : valve body, valve seat	$1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range ¹⁾	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	2 million
Temperature ²⁾	
– Valve body	≤ 150 °C
– Ambient	≤ 50 °C
Material	
– Valve body, plate	EN AW-6082 (3.2315)
– aluminum	AISI 316L (1.4404 or 1.4435)
– stainless steel	AISI 316L (1.4404 or 1.4435)
– Shaft	iglidur®X, AISI 316L (1.4404 or 1.4435)
– Other parts	
Seal: feedthrough	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	any

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

DN (nominal I. D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Typical closing or opening time	Weight			
						Aluminum valve		Stainless steel valve	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	s	kg	lbs	kg	lbs
25	1	22	0.15	1000	0.3	2	4.4	2.5	5.5
40	1½	80	0.25	1000	0.3	2.1	4.6	2.6	5.7
50	2	150	0.30	1000	0.3	2.4	5.3	3	6.6
63	2½	360	0.45	1000	0.3	2.6	5.7	4.1	9
80	3	850	0.65	1000	0.3	2.8	6.2	4.7	10.4
100	4	1400	0.85	800	0.3	3	6.6	5	11
160	6	3800	1.70	300	0.3	4.2	9.3	7.2	15.9
200	8	7800	2.80	150	0.3	4.7	10.4	10	22
250	10	15000	5	100	0.3	5.7	12.5	12.3	27.1

Technical data for pressure controller: see pages 146–149

Options

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



Actuator

- Ultra fast actuator (0.1 s)
- Output for control of isolation valve
- Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)
- RS232 interface with 2 analog outputs

Valve

- Other sizes, e.g. DN 10, 320
- Other flanges, e.g. JIS, ASA-LP, CF-F
- Customer specified flanges
- Surface treatment, e. g. aluminum, hard anodized or nickel-plated
- Other sealing materials
- Heater with insulation (picture) for valve temperatures up to 150 °C (for temperatures up to 200 °C on request)
- Industrial version up to DN 160 for harsh conditions, e. g. differential pressure up to 1 bar, heavy contamination
- «Combo» body to combine a series 61.2 control valve with an isolation valve: see series 95, pages 144–145

Ordering information for options:

Ordering No. of valve-X (e. g. 61236-PEGG-X, X = valve with heater for 150 °C)

Spare parts

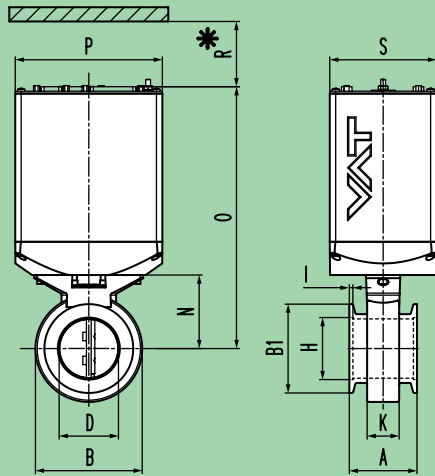
- **Seals**
on request (specify fabrication number of valve)

Accessories

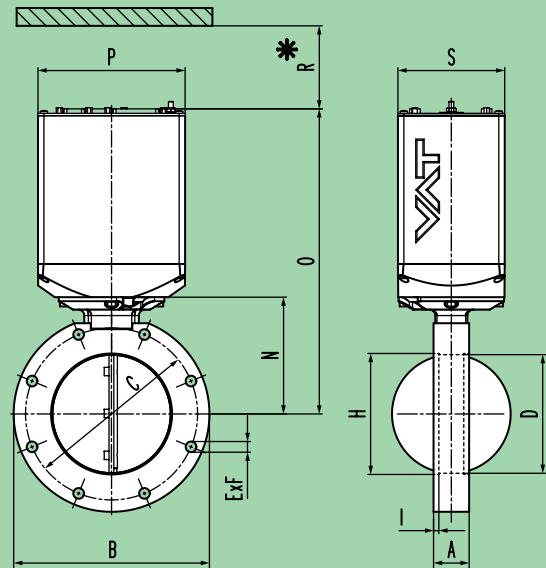
- **Flange connections**
for installation of the valve: see series 31 and 32

Dimensions

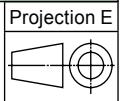
Valve with stepper motor and integrated pressure controller DN 25–50 (1"–2") ISO-KF



Valve with stepper motor and integrated pressure controller DN 63–250 (2½"–10") ISO-F



* Required for dismantling



DN	mm inch	25 1	40 1½	50 2	63 2½	80 3	100 4	160 6	200 8	250 10
A	mm inch	50 1.97	57 2.24	57 2.24	30 1.18	30 1.18	30 1.18	30 1.18	30 1.18	30 1.18
B	mm inch	65 2.56	80 3.15	90 3.54	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	335 13.19
B1	mm inch	39.90 1.57	54.90 2.16	74.90 2.95	—	—	—	—	—	—
C	mm inch	—	—	—	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20
D	mm inch	25 0.98	40 1.57	50 1.97	63 2.48	80 3.15	100 3.94	150 5.91	200 7.87	250 9.84
E × F	mm inch	—	—	—	4 × 9 4 × 0.35	8 × 9 8 × 0.35	8 × 9 8 × 0.35	8 × 11 8 × 0.43	12 × 11 12 × 0.43	12 × 11 12 × 0.43
H	mm inch	26.30 1.04	41.30 1.63	52.30 2.06	70 2.76	83 3.27	102 4.02	153 6.02	213 8.39	261 10.28
I	mm inch	3 0.12	3 0.12	3 0.12	4.50 0.18	4.50 0.18	4.50 0.18	4.50 0.18	4.50 0.18	4.50 0.18
K	mm inch	27 1.06	27 1.06	27 1.06	—	—	—	—	—	—
N	mm inch	49.50 1.95	57 2.24	92 3.62	77.50 3.05	90.50 3.56	98.50 3.88	123.50 4.86	157 6.18	182 7.17
O	mm inch	208.50 8.21	216 8.50	251 9.88	236.50 9.31	249.50 9.82	257.50 10.14	282.50 11.12	316 12.44	341 13.43
P	mm inch	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88
R	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	70 2.76	70 2.76	70 2.76	70 2.76	70 2.76
S	mm inch	90 3.54	90 3.54	90 3.54	90 3.54	90 3.54	90 3.54	90 3.54	90 3.54	90 3.54

Series 61.5

Main applications

Downstream pressure control and isolation valve for SEMI, FPD, PV, SOLAR and industrial processes

Optimal for fast and demanding processes, e. g. CVD



Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers							
mm	inch	aluminum, hard anodized				stainless steel			
		ISO-KF		ISO-F		ISO-KF		ISO-F	
40	1½	61532-KH	x y			61532-KE	x y		
50	2	61534-KH	x y			61534-KE	x y		
63	2½			61536-PH	x y			61536-PE	x y
80	3			61538-PH	x y			61538-PE	x y
100	4			61540-PH	x y			61540-PE	x y

Controller configurations:	x	y	Interface	Number of sensors
G = basic version			G = RS232	1
A = with SPS			H = RS232	2
H = with PFO			C = Logic	1
C = with SPS and PFO			E = Logic	2
T = basic version with VC master			P = DeviceNet®	1
V = with SPS and VC master			Q = DeviceNet®	2
U = with PFO and VC master			D = Profibus	1
W = with SPS, PFO and VC master			F = Profibus	2
			J = RS485	1
			K = RS485	2
			Y = Ethernet	1
			Z = Ethernet	2
			L = CC-Link	1
			N = CC-Link	2
			I = EtherCAT	1
			X = EtherCAT	2
			S = VC slave (without interface)	

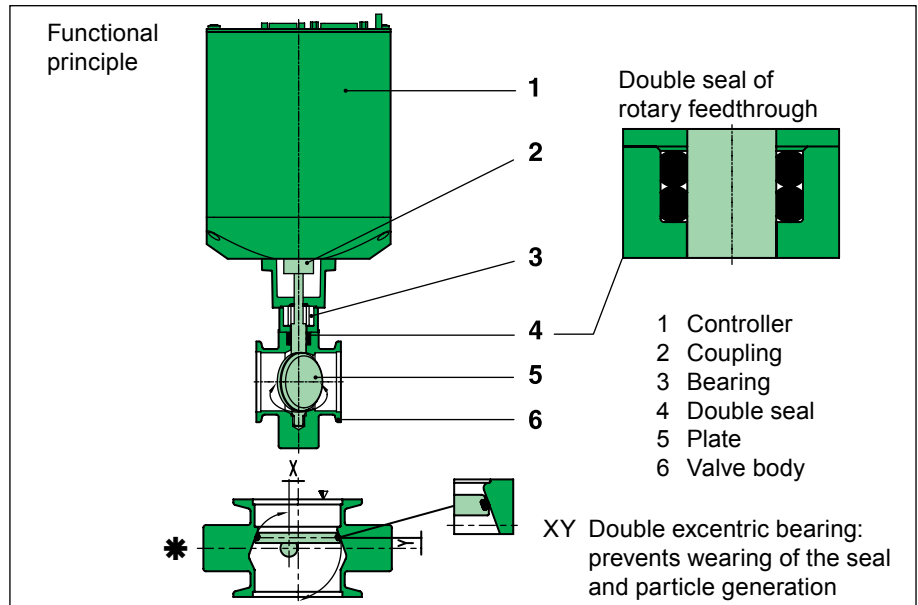
Example: 61534-KHGE
 = Aluminum valve, hard anodized,
 with ISO-KF DN 50 flanges,
 Logic interface, for 2 sensors

Pressure controller: see pages 146 – 149

Features

Body material:
 aluminum, hard anodized
 or stainless steel

 Compact design
 Fast operation
 Integrated pressure controller
 Extremely short control response times
 Automatic service signal (contamination)
 Position indication
 Service port for connecting a computer
 or a service box 2
 Accurate pressure control at high
 pressures and low flows
 Easy maintenance



The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control even in very demanding processes with high pressures and low flows.

The seal which is attached to the plate reduces the minimum controllable conductance and allows leak tight closing of the valve. In closed position, the seal is pressed on the body. See detail * in above drawing.

Technical data

Leak rate ¹⁾ : valve body	
– Aluminum, hard anodized	$1 \cdot 10^{-5} \text{ mbar ls}^{-1}$
– Stainless steel	$1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Leak rate ¹⁾ : valve seat	
– Aluminum, hard anodized	$1 \cdot 10^{-4} \text{ mbar ls}^{-1}$
– Stainless steel	$1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range ¹⁾	
– Aluminum, hard anodized	$1 \cdot 10^{-6} \text{ mbar to } 1.2 \text{ bar (abs)}$
– Stainless steel	$1 \cdot 10^{-8} \text{ mbar to } 1.2 \text{ bar (abs)}$
Cycles until first service ²⁾	
– Pressure control	2 million
– Closing/opening	
- DN 40– 50	250 000
- DN 63–100	100 000
Temperature ²⁾	
– Valve body	$\leq 120 \text{ }^{\circ}\text{C}$
– Ambient	$\leq 50 \text{ }^{\circ}\text{C}$

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

Material

- Valve body, plate
- aluminum
- stainless steel
- Shaft
- Other parts

EN AW-6082 (3.2315)
AISI 316L (1.4404 or 1.4435)
AISI 316L (1.4404 or 1.4435)
iglidur®X, AISI 316L (1.4404 or 1.4435)

Seal: plate, feedthrough

FKM (Viton®)

Feedthrough

rotary feedthrough

Mounting position

valve seat towards chamber

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Operating time for throttling	Typical closing or opening time	Weight			
							Aluminum valve		Stainless steel valve	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	s	s	kg	lbs	kg	lbs
40	1½	60	0.05	1000	0.5	0.6	2.5	5.5	3.3	7.3
50	2	120	0.1	1000	0.5	0.6	2.7	6	3.6	7.9
63	2½	220	0.15	1000	0.5	0.6	3.8	8.4	5.9	13
80	3	360	0.2	1000	0.5	0.6	4.8	10.6	8.8	19.4
100	4	600	0.25	1000	0.5	0.6	5.2	11.5	9.7	21.4

Technical data for pressure controller: see pages 146–149

Options

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



Actuator

- Ultra fast actuator (0.18/0.2 s)
- Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)
- RS232 interface with 2 analog outputs

Valve

- Other flanges, e.g. JIS, ASA-LP, CF-F
- Customer specified flanges
- Other sealing materials
- Heater (picture) for valve temperatures up to 120 °C (DN 40 and 50 with insulation)

Ordering information for options:

Ordering No. of valve-X (e. g. 61534-KHGG-X, X = valve with heater for 120 °C)

Spare parts

– Seals

on request (specify fabrication number of valve)

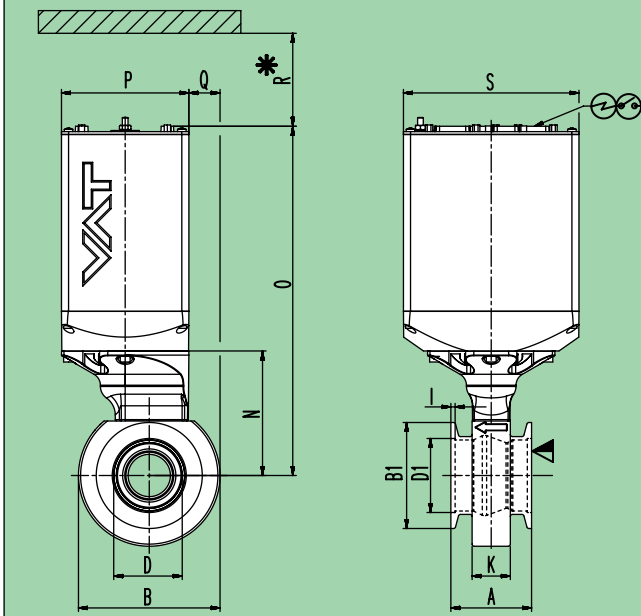
Accessories

– Flange connections

for installation of the valve: see series 31 and 32

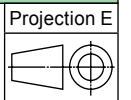
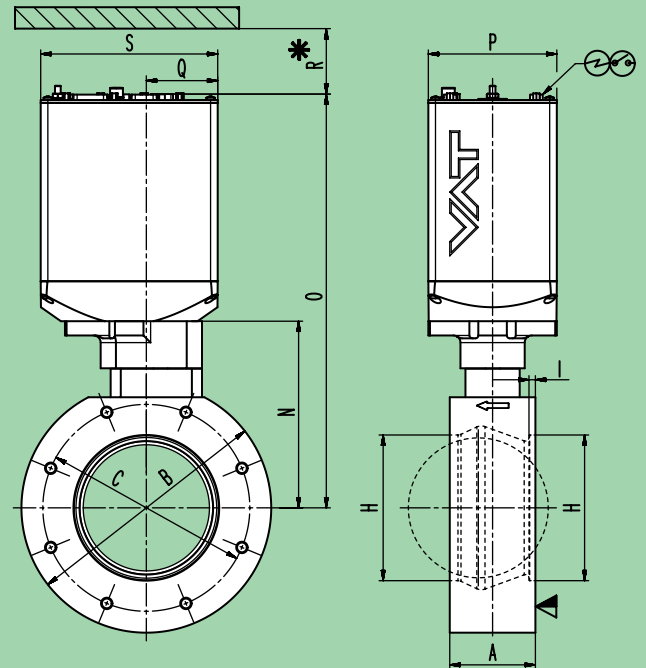
Dimensions

Valve with stepper motor and integrated pressure controller DN 40–50 (1½"–2") ISO-KF



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Electrical connection
- ⊙ Position indicator

Valve with stepper motor and integrated pressure controller DN 63–100 (2½"–4") ISO-F



DN	mm inch	40 1½	50 2	
A	mm inch	57 2.24	57 2.24	
B	mm inch	90 3.54	100 3.94	
B1	mm inch	54.90 2.16	74.90 2.95	
D	mm inch	40 1.57	50 1.97	
D1	mm inch	41.30 1.63	52.30 2.06	
I	mm inch	3 0.12	3 0.12	
K	mm inch	27 1.06	27 1.06	
N	mm inch	83 3.27	88 3.46	
O	mm inch	242 9.53	247 9.72	
P	mm inch	90 3.54	90 3.54	
Q	mm inch	18 0.71	22 0.87	
R	mm inch	70 2.76	70 2.76	
S	mm inch	124 4.88	124 4.88	

DN	mm inch	63 2½	80 3	100 4
A	mm inch	40 1.57	50 1.97	60 2.36
B	mm inch	130 5.12	165 6.50	175 6.89
C	mm inch	110 4.33	125 4.92	145 5.71
H	mm inch	70 2.76	83 3.27	102.10 4.02
I	mm inch	4.50 0.18	4.50 0.18	4.50 0.18
N	mm inch	108 4.25	126 4.96	131 5.16
O	mm inch	267 10.51	285 11.22	290 11.42
P	mm inch	90 3.54	90 3.54	90 3.54
Q	mm inch	46 1.81	48 1.89	50 1.97
R	mm inch	70 2.76	70 2.76	70 2.76
S	mm inch	124 4.88	124 4.88	124 4.88

Main applications

Control and isolation valve for SEMI, FPD and industrial processes

Optimal for sputtering and etching processes



Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers									
mm	inch	ISO-F		CF-F metric threads		CF-F UNF threads		ASA-LP (T) ASA (A)		JIS	
63	2 ½	64236-PE	x y	64236-CE	x y	64236-UE	x y	64236-TE	x y	64236-JE	x y
80	3	64238-PE	x y	64238-CE	x y	64238-UE	x y	64238-TE	x y	64238-JE	x y
100	4	64240-PE	x y	64240-CE	x y	64240-UE	x y	64240-TE	x y	64240-JE	x y
160	6	64244-PE	x y	64244-CE	x y	64244-UE	x y	64244-TE	x y	64244-JE	x y
200	8	64246-PE	x y	64246-CE	x y	64246-UE	x y	64246-TE	x y	64246-JE	x y
250	10	64248-PE	x y	64248-CE	x y	64248-UE	x y	64248-TE	x y	64248-JE	x y
320	12	64250-PE	x y	on request		on request		64250-TE	x y	64250-JE	x y
350	14	—		—		—		—		64251-JE	x y
400	16	64252-PE	x y	on request		on request		64252-AE	x y	64252-JE	x y

Controller configurations:

G = basic version
A = with SPS
H = with PFO
C = with SPS and PFO
T = basic version with VC master
V = with SPS and VC master
U = with PFO and VC master
W = with SPS, PFO and VC master

SPS = Sensor Power Supply
(±15VDC power supply for sensor)

PFO = Power Failure Option
(valve closes/opens automatically at power failure)

VC = Valve Cluster
(for operating several valves synchronously)

Example: 64240-PEGG
 = Valve with ISO-F DN 100 flanges,
 RS232 interface, for 1 sensor

Interface

G = RS232
H = RS232
C = Logic
E = Logic
P = DeviceNet®
Q = DeviceNet®
D = Profibus
F = Profibus
J = RS485
K = RS485
Y = Ethernet
Z = Ethernet
L = CC-Link
N = CC-Link
I = EtherCAT
X = EtherCAT
S = VC slave (without interface)

Number of sensors

1
 2
 1
 2
 1
 2
 1
 2
 1
 2
 1
 2
 1
 2

Further ordering information on next page →

Pressure controller: see pages 146–149

Features

Body material: stainless steel

Compact design

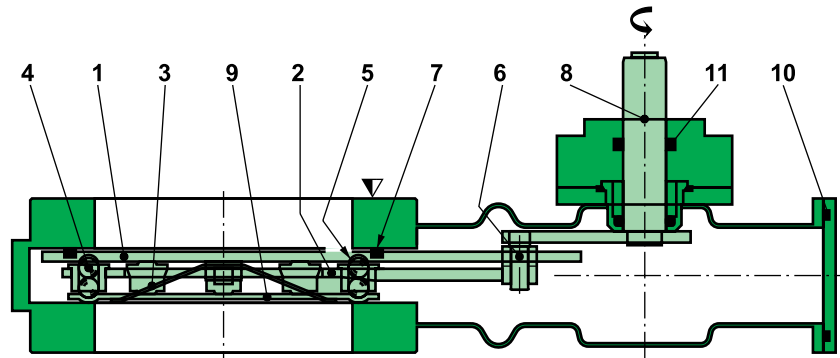
Integrated or external pressure controller

Extremely short control response times

Position indication

Service port for connecting a computer or a service box 2

Functional principle



- | | | |
|-----------------|------------------|---------------------|
| 1 Gate | 5 Ball detents | 9 Counter-plate |
| 2 Ball guidance | 6 Crank bolt | 10 Bonnet seal |
| 3 Leaf spring | 7 Gate seal | 11 Feedthrough seal |
| 4 Ball pairs | 8 Actuator shaft | ▽ Valve seat side |

The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control.

For leaktight closing the VATLOCK configuration is applied. For details see page 282.

Continued Ordering information

Valve with stepper motor
(external pressure controller)

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP (T) ASA (A)	JIS
63	2½	64236-PE52	64236-CE52	64236-UE52	64236-TE52	64236-JE52
80	3	64238-PE52	64238-CE52	64238-UE52	64238-TE52	64238-JE52
100	4	64240-PE52	64240-CE52	64240-UE52	64240-TE52	64240-JE52
160	6	64244-PE52	64244-CE52	64244-UE52	64244-TE52	64244-JE52
200	8	64246-PE52	64246-CE52	64246-UE52	64246-TE52	64246-JE52
250	10	64248-PE52	64248-CE52	64248-UE52	64248-TE52	64248-JE52
320	12	64250-PE52	on request	on request	64250-TE52	64250-JE52
350	14	—	—	—	—	64251-JE52
400	16	64252-PE52	on request	on request	64252-AE52	64252-JE52

Pressure controller: see pages 146–149

Technical data

Leak rate ¹⁾ : valve body, valve seat	1 · 10 ⁻⁹ mbar ls ⁻¹
Pressure range ¹⁾	
– DN 63–200	1 · 10 ⁻⁸ mbar to 2.0 bar (abs)
– DN 250–400	1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
Differential pressure on the gate	
– Valve closed DN 63–200	≤ 2.0 bar
– DN 250–400	≤ 1.2 bar
– During closing/opening	≤ 30 mbar
Cycles until first service ²⁾	
– Pressure control	1 million
– Closing/opening	200 000
Temperature ²⁾	
– Valve body	≤ 150 °C
– Ambient	≤ 50 °C
Material	
– Valve body, plate	AISI 304 (1.4301)
– Mechanism	AISI 301 (1.4310), AISI 304 (1.4301), AISI 420 (1.4034), AISI 420D (1.4037), AISI 430 (1.4016)
Seal: bonnet, gate, feedthrough	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	
– DN 63–350	any ³⁾
– DN 400	horizontal only ⁴⁾
Valve position indication	visual (mechanical and on controller)

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

³⁾ Seat side towards chamber

⁴⁾ Vertical mounting position: see «Options»

DN (nominal I.D.)		Standard flanges	Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Operating time for throttling	Typical closing or opening time	Weight	
mm	inch		ls ⁻¹	ls ⁻¹	s	s	kg	lbs
63	2 ½	See pages 132 – 133	440	0.65	3	4	14	31
80	3		800	0.8	3	4	14	31
100	4		1700	1	3	6	17	37
160	6		5000	1.6	5	6	28	62
200	8		12000	2	5	6	34	75
250	10		22000	2.5	9	10	62	136
320	12		30000	3.2	9	10	112	246
350	14		40000	3.5	9	10	120	264
400	16		50000	4	9	10	155	340

Technical data for pressure controller: see pages 146–149

Spare parts

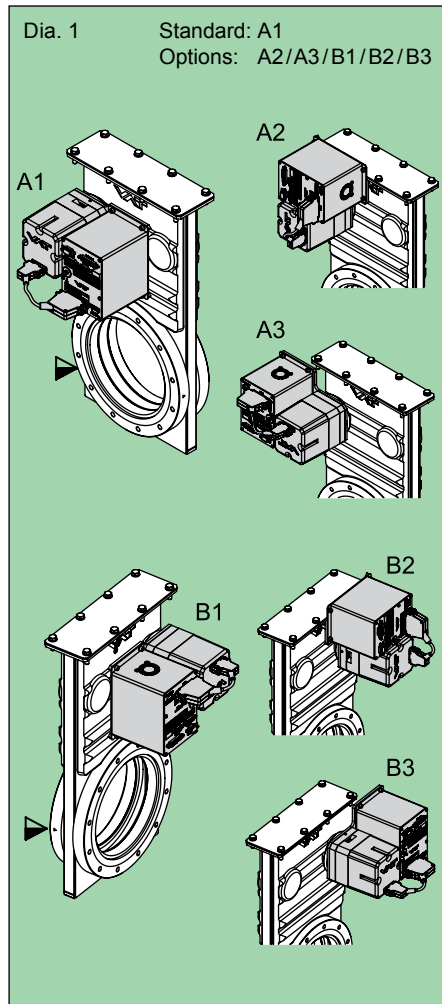
- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Flange connections**
for installation of the valve: see series 32 and 33

Options

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



Actuator

- Stepper motor with integrated controller mountable in 6 positions (Dia. 1):
 - position A1, A2, A3 on A-side (valve seat side): to be specified with order
 - position B1, B2, B3 on B-side (rear side): to be specified with order
- Valve with external pressure controller (Dia. 2), ordering No. ...52, see page 127 (controller and cable must be ordered in addition)
- Actuator for mounting the valve DN 400 in vertical position (extended closing time, fewer cycles)
- Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)
- RS232 interface with 2 analog outputs

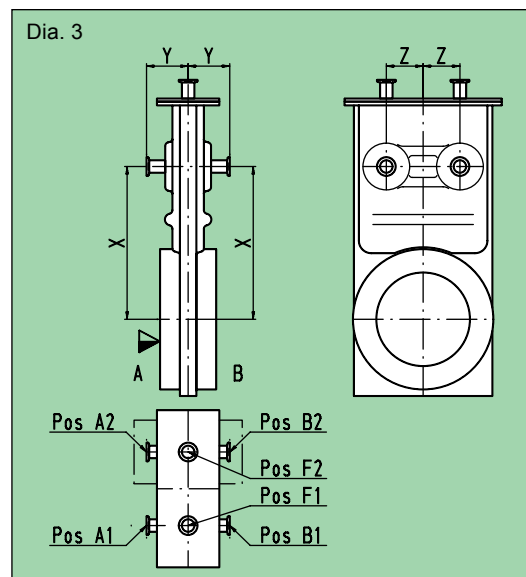
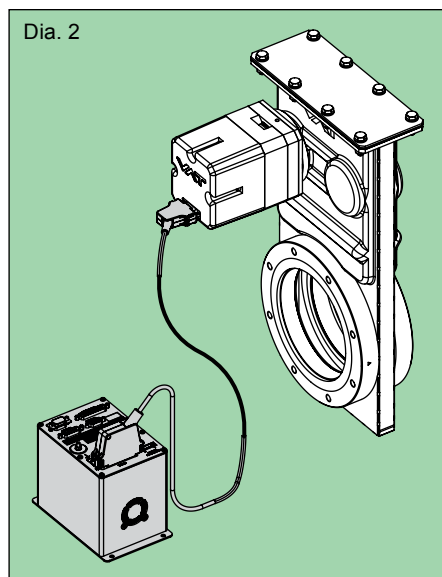
Valve

- Customer specified flanges with/without watercooling
- Other sealing materials
- Intermediate pumping of the rotary feedthrough
- Ports for roughing (by-pass), venting or for gauges, possible in positions A1, A2, B1, B2, F1 and F2 (Dia. 3)

DN valve	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12	350 14	400 16
Recommended port ISO-KF or CF-F		16	16	40	40	40	40	40	40	40
X	mm inch	146 5.75	146 5.75	185 7.28	245 9.65	304.40 11.98	387.30 15.25	482 18.98	482 18.98	415 16.34
Y	mm inch	30 1.18	30 1.18	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
Z	mm inch	30 1.18	30 1.18	47.50 1.87	59 2.32	85 3.35	100 3.94	135 5.31	135 5.31	140 5.51
Other ports on request										

Ordering information for options:

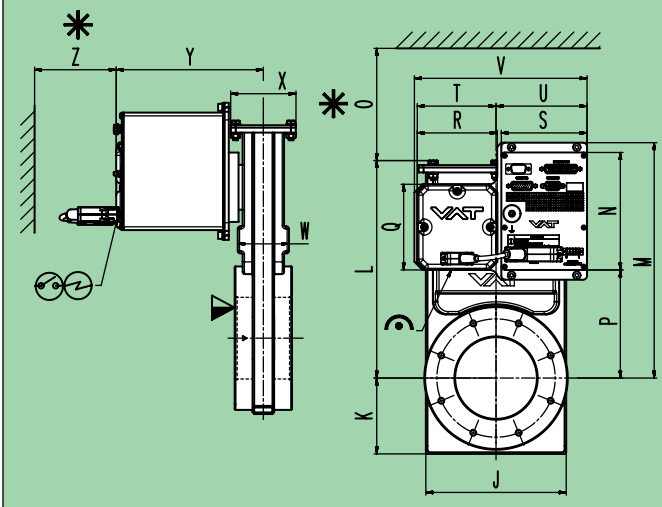
Ordering No. of valve-X (e. g. 64244-PEGH-X, X = port ISO-KF 40 in position F2)



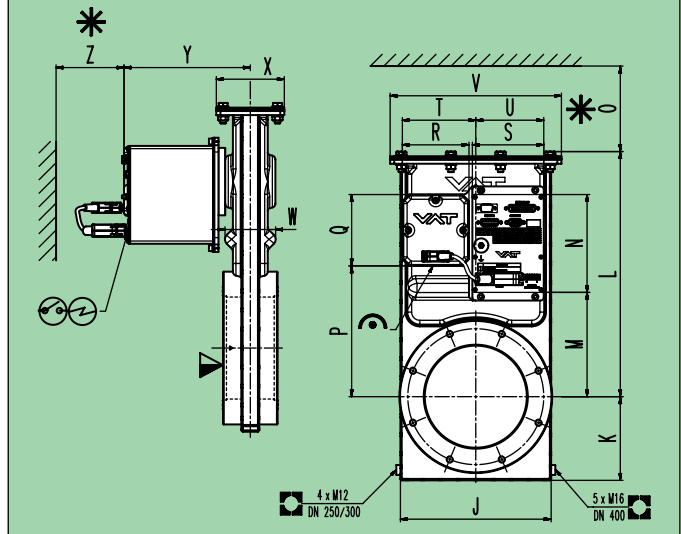
▼ Valve seat side

Main dimensions

Valve with stepper motor and integrated pressure controller DN 63–100 (2½"–4")



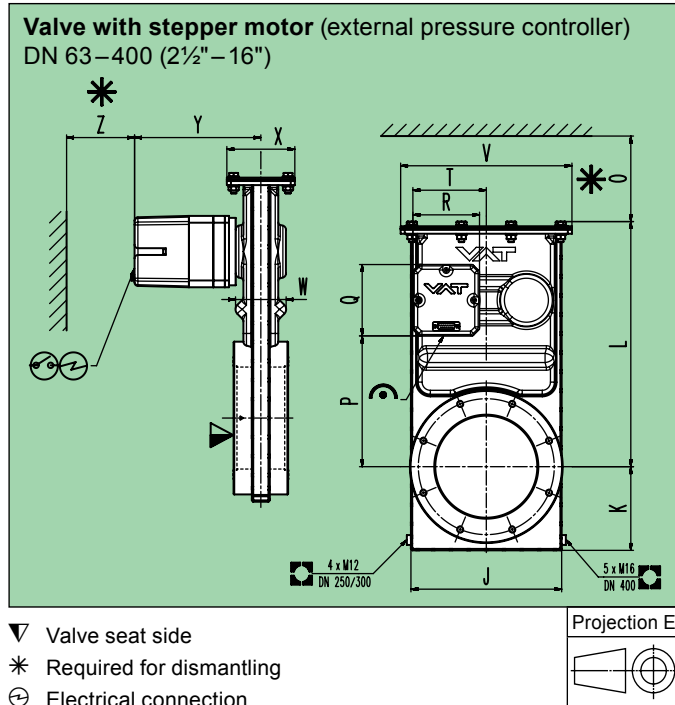
Valve with stepper motor and integrated pressure controller DN 160–400 (6"–16")



Flange dimensions: see pages 132–133

DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12	350 14	400 16
J	mm inch	134 5.28	134 5.28	172 6.77	222 8.74	274 10.79	355 13.98	420 16.54	420 16.54	474 18.66
K	mm inch	73 2.87	73 2.87	93 3.66	123 4.84	148 5.83	177 6.97	214 8.43	214 8.43	232 9.13
L	mm inch	208 8.19	208 8.19	267 10.51	361 14.21	438 17.24	570 22.44	688 27.09	688 27.09	787 30.98
M	mm inch	250 9.84	250 9.84	228 8.98	154 6.06	213 8.39	298 11.73	393 15.47	393 15.47	479 18.86
N	mm inch	144 5.67	144 5.67	144 5.67	144 5.67	144 5.67	144 5.67	144 5.67	144 5.67	144 5.67
O	mm inch	180 7.09	180 7.09	220 8.66	300 11.81	350 13.78	450 17.72	550 21.65	550 21.65	600 23.62
P	mm inch	94 3.70	94 3.70	132 5.20	192 7.56	252 9.92	320 12.60	415 16.34	415 16.34	501 19.72
Q	mm inch	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13	134 5.28	134 5.28	134 5.28	134 5.28
R	mm inch	98 3.86	98 3.86	98 3.86	98 3.86	98 3.86	134 5.28	134 5.28	134 5.28	134 5.28
S	mm inch	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13
T	mm inch	79 3.11	79 3.11	96 3.78	108 4.25	134 5.28	167 6.57	202 7.95	202 7.95	207 8.15
U	mm inch	129 5.08	129 5.08	112 4.41	100 3.94	74 2.91	77 3.03	42 1.65	42 1.65	36 1.42
V	mm inch	212 8.35	212 8.35	212 8.35	252 9.92	304 11.97	400 15.75	475 18.70	475 18.70	520 20.47
W	mm inch	51 2.01	51 2.01	63 2.48	75 2.95	75 2.95	97 3.82	120 4.72	120 4.72	130 5.12
X	mm inch	80 3.15	80 3.15	80 3.15	100 3.94	100 3.94	138 5.43	138 5.43	138 5.43	138 5.43
Y	mm inch	180 7.09	180 7.09	180 7.09	186 7.32	186 7.32	221 8.70	221 8.70	221 8.70	226 8.90
Z	mm inch	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94

Main dimensions

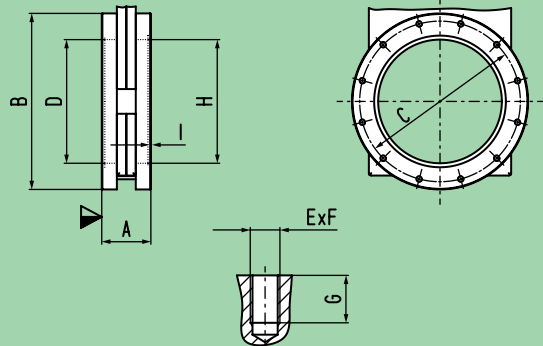


Flange dimensions: see pages 132–133

DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12	350 14	400 16
J	mm inch	134 5.28	134 5.28	172 6.77	222 8.74	274 10.79	355 13.98	420 16.54	420 16.54	474 18.66
K	mm inch	73 2.87	73 2.87	93 3.66	123 4.84	148 5.83	177 6.97	214 8.43	214 8.43	232 9.13
L	mm inch	208 8.19	208 8.19	267 10.51	361 14.21	438 17.24	570 22.44	688 27.09	688 27.09	787 30.98
O	mm inch	180 7.09	180 7.09	220 8.66	300 11.81	350 13.78	450 17.72	550 21.65	550 21.65	600 23.62
P	mm inch	94 3.70	94 3.70	132 5.20	192 7.56	252 9.92	320 12.60	415 16.34	415 16.34	501 19.72
Q	mm inch	105 4.13	105 4.13	105 4.13	105 4.13	105 4.13	134 5.28	134 5.28	134 5.28	134 5.28
R	mm inch	98 3.86	98 3.86	98 3.86	98 3.86	98 3.86	134 5.28	134 5.28	134 5.28	134 5.28
T	mm inch	79 3.11	79 3.11	96 3.78	108 4.25	134 5.28	167 6.57	202 7.95	202 7.95	207 8.15
V	mm inch	212 8.35	212 8.35	212 8.35	252 9.92	304 11.97	400 15.75	475 18.70	475 18.70	520 20.47
W	mm inch	51 2.01	51 2.01	63 2.48	75 2.95	75 2.95	97 3.82	120 4.72	120 4.72	130 5.12
X	mm inch	80 3.15	80 3.15	80 3.15	100 3.94	100 3.94	138 5.43	138 5.43	138 5.43	138 5.43
Y	mm inch	180 7.09	180 7.09	180 7.09	186 7.32	186 7.32	221 8.70	221 8.70	221 8.70	226 8.90
Z	mm inch	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94

Flange dimensions

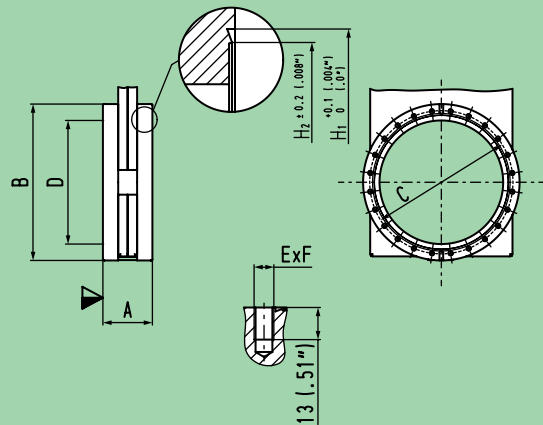
ISO-F DN 63–320 (2½"–12")



DN 400 (16"): see series 14.0, page 71

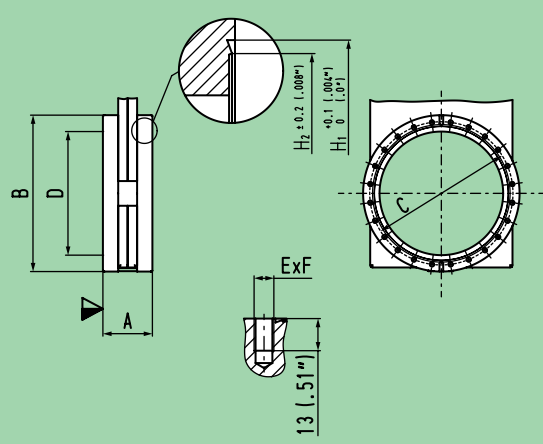
DN	mm	63	80	100	160	200	250	320
	inch	2½	3	4	6	8	10	12
A	mm	70	70	70	70	80	100	120
	inch	2.76	2.76	2.76	2.76	3.15	3.94	4.72
B	mm	130	145	165	225	285	350	425
	inch	5.12	5.71	6.50	8.86	11.22	13.78	16.73
C	mm	110	125	145	200	260	310	395
	inch	4.33	4.92	5.71	7.87	10.24	12.20	15.55
D	mm	70	76	100	150	200	261	306
	inch	2.76	2.99	3.94	5.91	7.87	10.28	12.05
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12
G	mm	13	13	13	15	15	15	18
	inch	0.51	0.51	0.51	0.59	0.59	0.59	0.71
H	mm	–	83	102	153	213	–	318
	inch	–	3.27	4.02	6.02	8.39	–	12.52
I	mm	–	3	3	5	5	–	5
	inch	–	0.12	0.12	0.20	0.20	–	0.20

CF-F, metric threads DN 63–250 (2½"–10")



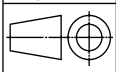
DN	mm	63	80	100	160	200	250	
	inch	2½	3	4	6	8	10	
O.D.	inch	4½	4⅝	6	8	10	12	
A	mm	70	70	70	70	80	100	
	inch	2.76	2.76	2.76	2.76	3.15	3.94	
B	mm	113.50	117.50	151.60	202.40	253.20	350	
	inch	4.47	4.63	5.97	7.97	9.97	13.78	
C	mm	92.10	102.40	130.20	181	231.80	284	
	inch	3.63	4.03	5.13	7.13	9.13	11.18	
D	mm	70	76	100	150	200	254	
	inch	2.76	2.99	3.94	5.91	7.87	10	
E × F		8 × M8	10 × M8	16 × M8	20 × M8	24 × M8	32 × M8	
H1	mm	82.50	91.65	120.70	171.45	222.40	273.15	
	inch	3.25	3.61	4.75	6.75	8.76	10.75	
H2	mm	77.40	86.30	115.50	166	217	267	
	inch	3.05	3.40	4.55	6.54	8.54	10.51	

CF-F, UNF threads DN 63–250 (2½"–10")



DN	mm	63	80	100	160	200	250 ¹⁾	250 ¹⁾
	inch	2½	3	4	6	8	10	10
O.D.	inch	4½	4⅝	6	8	10	12	13¼
A	mm	70	70	70	70	80	100	100
	inch	2.76	2.76	2.76	2.76	3.15	3.94	3.94
B	mm	113.50	117.50	151.60	202.40	253.20	350	350
	inch	4.47	4.63	5.97	7.97	9.97	13.78	13.78
C	mm	92.10	102.40	130.20	181	231.80	284	306.30
	inch	3.63	4.03	5.13	7.13	9.13	11.18	12.06
D	mm	70	76	100	150	200	254	254
	inch	2.76	2.99	3.94	5.91	7.87	10	10
E × F		8 × 5/16" UNF	10 × 5/16" UNF	16 × 5/16" UNF	20 × 5/16" UNF	24 × 5/16" UNF	32 × 5/16" UNF	30 × 3/8" UNF
H1	mm	82.50	91.65	120.70	171.45	222.40	273.15	294.64
	inch	3.25	3.61	4.75	6.75	8.76	10.75	11.60
H2	mm	77.40	86.30	115.50	166	217	267	288.30
	inch	3.05	3.40	4.55	6.54	8.54	10.51	11.35

Projection E



▼ Valve seat side

¹⁾ O.D. 12" VAT standard, O.D. 13¼" option

Ordering information for option: O.D. 13¼"

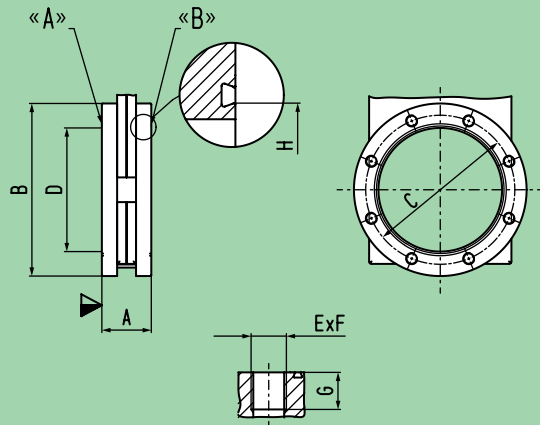
Ordering No. of valve-X (e. g. 64248-UE . . -X, X = O.D. 13¼")

Flange dimensions

ASA-LP

DN 63–320 (2½"–12")
with or without O-ring groove

For orders with O-ring groove specify:
«A», «B» or «A+B»

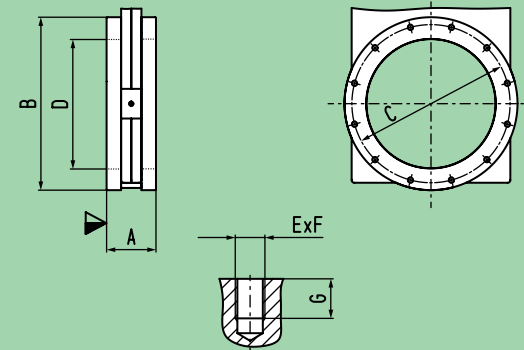


DN 400 (16"): see series 14.0, page 71

DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
ASA-LP		2	–	3	4	6	8	10
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	152.40 6	177.80 7	190.50 7.50	225 8.86	279.40 11	350 13.78	425 16.73
C	mm inch	120.70 4.75	139.70 5.50	152.40 6	190.50 7.50	241.30 9.50	298.50 11.75	362 14.25
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	254 10	300 11.81
E x F		4 x ¾" 16 UNC	4 x ¾" 16 UNC	4 x ¾" 16 UNC	8 x ¾" 16 UNC	8 x ¾" 10 UNC	8 x ¾" 10 UNC	12 x ¾" 10 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	15 0.59	19 0.75	19 0.75	19 0.75
H	mm inch	88.90 3.50	88.90 3.50	120.65 4.75	158.75 6.25	206.40 8.13	266.70 10.50	317.50 12.50
O-ring I.D. x d	mm inch	88.49 x 3.53 3.48 x .139	88.49 x 3.53 3.48 x .139	120.24 x 3.53 4.73 x .139	158.34 x 3.53 6.23 x .139	202.79 x 3.53 7.98 x .139	266.29 x 3.53 10.48 x .139	316.87 x 7.00 12.47 x .275

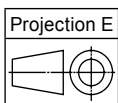
JIS B 2290: 1998 / ISO 1609

DN 65–300 (2½"–12")



DN 400 (16"): see series 14.0, page 71

DN	mm inch	65 2½	80 3	100 4	150 6	200 8	250 10	300 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	136 5.35	165 6.50	185 7.28	235 9.25	300 11.81	350 13.78	425 16.73
C	mm inch	120 4.72	135 5.31	160 6.30	210 8.27	270 10.63	320 12.60	370 14.57
D	mm inch	70 2.76	76 2.99	100 3.94	150 5.91	200 7.87	261 10.28	306 12.05
E x F		4 x M10	8 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12
G	mm inch	12 0.47	12 0.47	12 0.47	12 0.47	15 0.59	15 0.59	16 0.63



▼ Valve seat side

Series 65.0

Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes

Optimal for corrosive etching and cleaning processes



Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers							
mm	inch	aluminum				aluminum, hard anodized			
		ISO-F		JIS		ISO-F		JIS	
100	4	65040-PA	x y	65040-JA	x y	65040-PH	x y	65040-JH	x y
160	6	65044-PA	x y	65044-JA	x y	65044-PH	x y	65044-JH	x y
200	8	65046-PA	x y	65046-JA	x y	65046-PH	x y	65046-JH	x y
250	10	65048-PA	x y	65048-JA	x y	65048-PH	x y	65048-JH	x y
320	12	65050-PA	x y	65050-JA	x y	65050-PH	x y	65050-JH	x y
350	14	—		65051-JA	x y	—		65051-JH	x y
400	16	65052-PA	x y	65052-JA	x y	65052-PH	x y	65052-JH	x y

Controller configurations:

x
 G = basic version
 A = with SPS
 H = with PFO
 C = with SPS and PFO
 T = basic version with VC master
 V = with SPS and VC master
 U = with PFO and VC master
 W = with SPS, PFO and VC master

SPS = Sensor Power Supply
(±15V DC power supply for sensor)

PFO = Power Failure Option
(valve closes/opens automatically at power failure)

VC = Valve Cluster
(for operating several valves synchronously)

y
 Interface
 G = RS232
 H = RS232
 C = Logic
 E = Logic
 P = DeviceNet®
 Q = DeviceNet®
 D = Profibus
 F = Profibus
 J = RS485
 K = RS485
 Y = Ethernet
 Z = Ethernet
 L = CC-Link
 N = CC-Link
 I = EtherCAT
 X = EtherCAT
 S = VC slave (without interface)

Number of sensors

Example: 65040-PAGG
 = Aluminum valve
 with ISO-F DN 100 flanges,
 RS232 interface, for 1 sensor

Pressure controller: see pages 146 – 149

Features

Body material:

aluminum or
aluminum, hard anodized

Compact design

Fast, virtually particle-free and shock-free operation

Integrated or external pressure controller

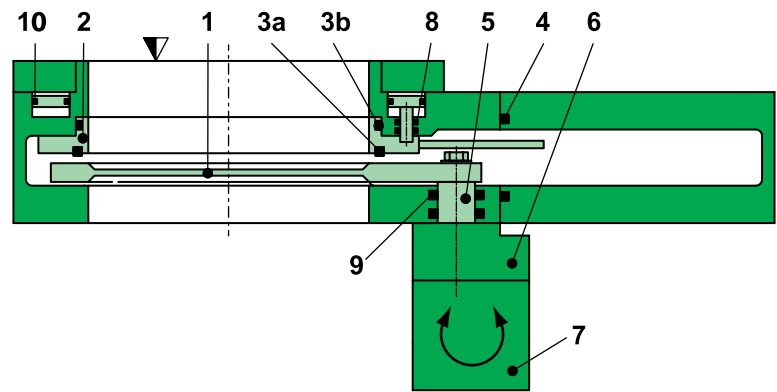
Extremely short control response times

Position indication

Service port for connecting a computer or a service box 2

Easy maintenance

Functional principle

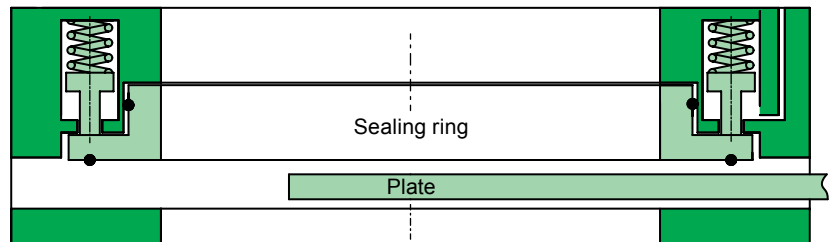


- | | | |
|----------------|------------------|---------------------------|
| 1 Plate | 4 Bonnet seal | 8 Shaft feedthrough seal |
| 2 Sealing ring | 5 Actuator shaft | 9 Rotary feedthrough seal |
| 3a Plate seal | 6 Actuator | 10 Piston ring seal |
| 3b Body seal | 7 Controller | ▽ Valve seat side |

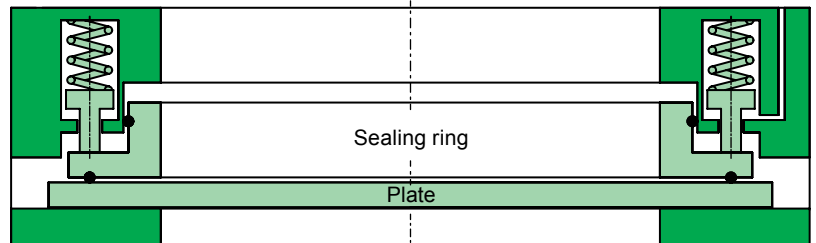
The plate acts as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control.

For leaktight closing the sealing ring is pressed downwards by a spring. For opening the sealing ring is lifted pneumatically.

Pressure control



Isolation



Technical data

Leak rate ¹⁾ : valve body		
– Aluminum		1 · 10 ⁻⁹ mbar ls ⁻¹
– Aluminum, hard anodized		1 · 10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾ : valve seat		
– Aluminum		1 · 10 ⁻⁹ mbar ls ⁻¹
– Aluminum, hard anodized		1 · 10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾		
– Aluminum		1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
– Aluminum, hard anodized		1 · 10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾		
– Pressure control		1 million
– Closing/opening		200 000
Temperature ²⁾		
– Valve body		≤ 120 °C
– Ambient		≤ 50 °C
Material		
– Valve body, plate		EN AW-6082 (3.2315)
– Sealing ring		EN AW-6082 (3.2315), AISI 305 (1.4303), AISI 420C (1.3541), AISI 631 (1.4568)
– Other parts		AISI 316L (1.4404, 1.4435), AISI 440 (1.4122), AISI 301 (1.4310), AISI 316 Ti (1.4571), AISI 304 (1.4301)
Seal: bonnet, plate, body, feedthrough		FKM (Viton®)
Feedthrough		
– Actuator		rotary feedthrough
– Sealing ring		shaft feedthrough
Mounting position		
– DN 100–250		any ³⁾
– DN 320–400		horizontal only ³⁾

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

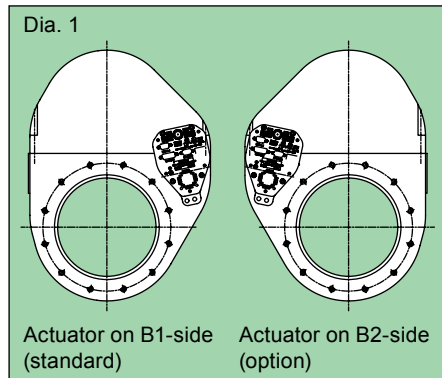
³⁾ Valve seat on chamber side recommended

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Max. differential pressure during operation	Compressed air min. – max. overpressure		Operating time for throttling	Typical closing/ opening time		Weight	
mm	inch					bar	psi		Open → closed	Closed → open	kg	lbs
100	4	1700	3	1200	30	4–7	58–102	0.7	3	4	12	27
160	6	5000	5	1200	10	4–7	58–102	0.8	3	4	18	40
200	8	12000	10	1200	5	4–7	58–102	0.9	3	4	22	49
250	10	22000	15	1200	5	4–7	58–102	0.9	3	4	29	64
320	12	30000	22	1200	5	4–7	58–102	1.1	5	6	48	106
350	14	43000	25	1200	5	4–7	58–102	1.3	5	6	59	130
400	16	61000	30	1200	5	4–7	58–102	1.5	5	6	68	150

Technical data for pressure controller: see pages 146–149

Options

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



Actuator

- Actuator on B2-side (Dia. 1)
- Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)
- RS232 interface with 2 analog outputs

Valve

- Other sizes, e.g. DN 80
- Other flanges, e.g. ASA-LP
- Customer specified flanges, e.g. rectangular flange for direct mounting to chamber
- Surface treatment, e.g. nickel-plated
- Other sealing materials
- KF ports in body
- Heater with insulation (Pic. 2) for valve temperatures up to 120 °C (for valve temperatures up to 200 °C on request)
- Valve with detached pressure controller (Pic. 3)
- Valve for pressure control only (no leaktight closing)
- Wedge-shaped plate for smaller controllable conductances
 - DN 320: 16 ls⁻¹ (standard 22 ls⁻¹)
 - DN 350: 19 ls⁻¹ (standard 25 ls⁻¹)
 - DN 400: 22 ls⁻¹ (standard 30 ls⁻¹)

Ordering information for options:

Ordering No. of valve-X (e. g. 65046-PAGH-X, X = valve with heater for 120 °C)

Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

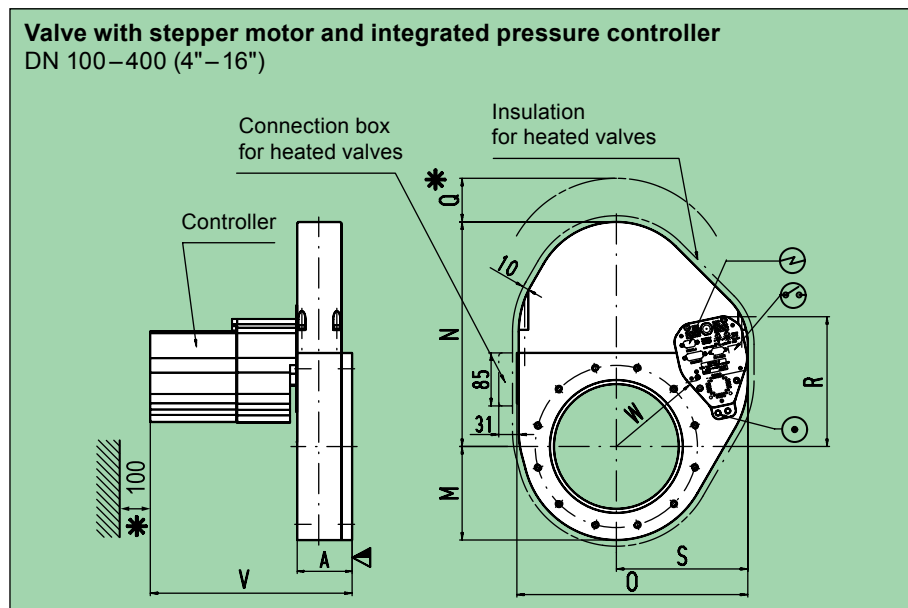
- **Flange connections**
for installation of the valve: see series 32

Easy maintenance



- Valve need not be removed from the system
- Fast removal and reinstallation of plate and sealing ring
- Only 2 standard tools required

Main dimensions

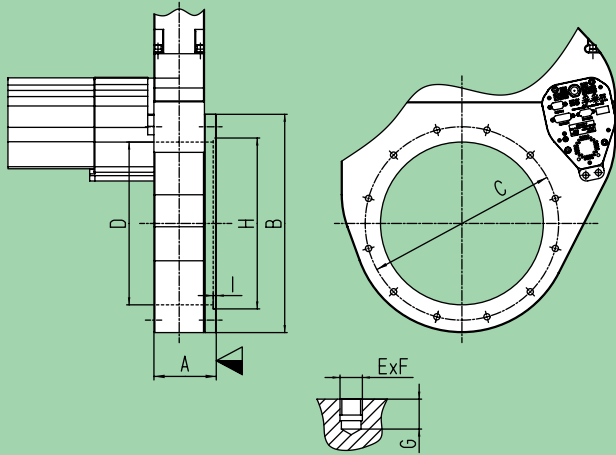


- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊗ Position indicator

DN	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
M	mm inch	95 3.74	121.50 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24
N	mm inch	200 7.87	302 11.88	360 14.17	438 17.24	538 21.18	590 23.23	655 25.79
O	mm inch	260.90 10.27	321 12.64	370.15 14.57	442.70 17.43	536.40 21.12	582 22.91	633 24.92
Q	mm inch	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97
R	mm inch	176 6.93	192 7.56	208.50 8.21	233.50 9.19	277 10.91	290 11.42	313 12.32
S	mm inch	162.90 6.41	184.70 7.27	210.80 8.30	246.40 9.70	274.50 10.81	300 11.81	320 12.60
V	mm inch	308 12.13	326 12.83	326 12.83	331 13.03	351 13.82	358 14.09	360 14.17
W	mm inch	94 3.70	121 4.76	151 5.94	194 7.64	236 9.29	257 10.12	292 11.50

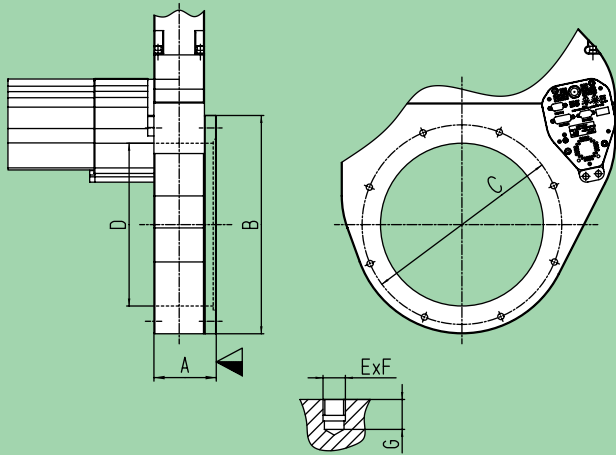
Flange dimensions

ISO-F
DN 100–400 (4"–16")

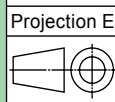


DN	mm	100	160	200	250	320	–	400
	inch	4	6	8	10	12	–	16
A	mm	70	88	88	100	120	–	128
	inch	2.76	3.46	3.46	3.94	4.72	–	5.04
B	mm	190	243	300	350	425	–	520
	inch	7.48	9.57	11.81	13.78	16.73	–	20.47
C	mm	145	200	260	310	395	–	480
	inch	5.71	7.87	10.24	12.20	15.55	–	18.90
D	mm	100	150	200	261	318	–	400
	inch	3.94	5.91	7.87	10.28	12.52	–	15.75
E × F		8 × M8	8 × M10	12 × M10	12 × M10	12 × M12	–	16 × M12
G	mm	12	14	15	16	18	–	20
	inch	0.47	0.55	0.59	0.63	0.71	–	0.79
H	mm	–	153	213.20	–	–	–	–
	inch	–	6.02	8.39	–	–	–	–
I	mm	–	5	5	–	–	–	–
	inch	–	0.20	0.20	–	–	–	–

JIS B 2290: 1998 / ISO 1609
DN 100–400 (4"–16")



DN	mm	100	150	200	250	300	350	400
	inch	4	6	8	10	12	14	16
A	mm	70	88	88	100	120	126	128
	inch	2.76	3.46	3.46	3.94	4.72	4.96	5.04
B	mm	190	243	300	350	425	470	520
	inch	7.48	9.57	11.81	13.78	16.73	18.50	20.47
C	mm	160	210	270	320	370	420	480
	inch	6.30	8.27	10.63	12.60	14.57	16.54	18.90
D	mm	100	150	200	261	318	350	400
	inch	3.94	5.91	7.87	10.28	12.52	13.78	15.75
E × F		8 × M10	8 × M10	8 × M12	12 × M12	12 × M12	12 × M12	12 × M16
G	mm	12	14	15	16	18	18	25
	inch	0.47	0.55	0.59	0.63	0.71	0.71	0.98



▼ Valve seat side

Series 65.2

Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes

Optimal for corrosive etching and cleaning processes



Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers							
mm	inch	aluminum				aluminum, hard anodized			
		ISO-F		JIS		ISO-F		JIS	
200	8	65246-PA	x y	65246-JA	x y	65246-PH	x y	65246-JH	x y
250	10	65248-PA	x y	65248-JA	x y	65248-PH	x y	65248-JH	x y

Controller configurations:

- x

y
- G = basic version
 - A = with SPS
 - H = with PFO
 - C = with SPS and PFO
 - T = basic version with VC master
 - V = with SPS and VC master
 - U = with PFO and VC master
 - W = with SPS, PFO and VC master

- SPS = Sensor Power Supply
(±15VDC power supply for sensor)
- PFO = Power Failure Option
(valve closes/opens automatically at power failure)
- VC = Valve Cluster
(for operating several valves synchronously)

Interface	Number of sensors
G = RS232	1
H = RS232	2
C = Logic	1
E = Logic	2
P = DeviceNet®	1
Q = DeviceNet®	2
D = Profibus	1
F = Profibus	2
J = RS485	1
K = RS485	2
Y = Ethernet	1
Z = Ethernet	2
L = CC-Link	1
N = CC-Link	2
I = EtherCAT	1
X = EtherCAT	2
S = VC slave (without interface)	

Example: 65246-PAGG
= Aluminum valve
with ISO-F DN 200 flanges,
RS232 interface, for 1 sensor

Pressure controller: see pages 146 – 149

Features

Body material:

aluminum or
aluminum, hard anodized

Compact design

Very fast, virtually particle-free and
shock-free operation

Purely electrical actuation

Integrated or external pressure controller

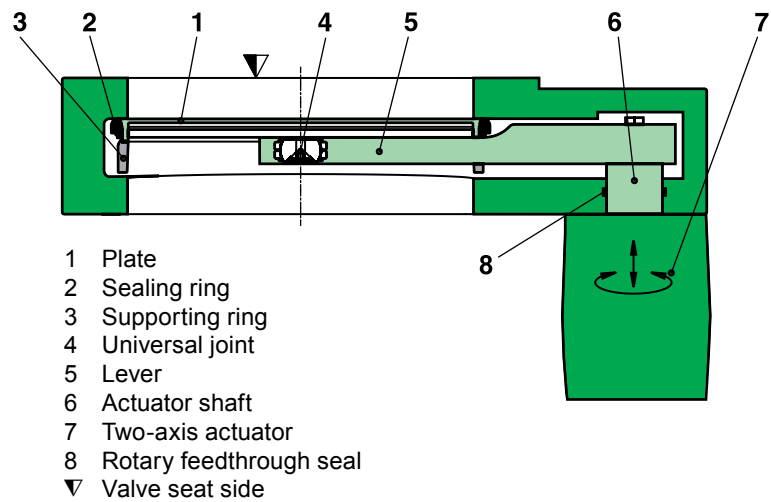
Conductance control to almost 0 ls^{-1}

Position indication

Service port for connecting a computer
or a service box 2

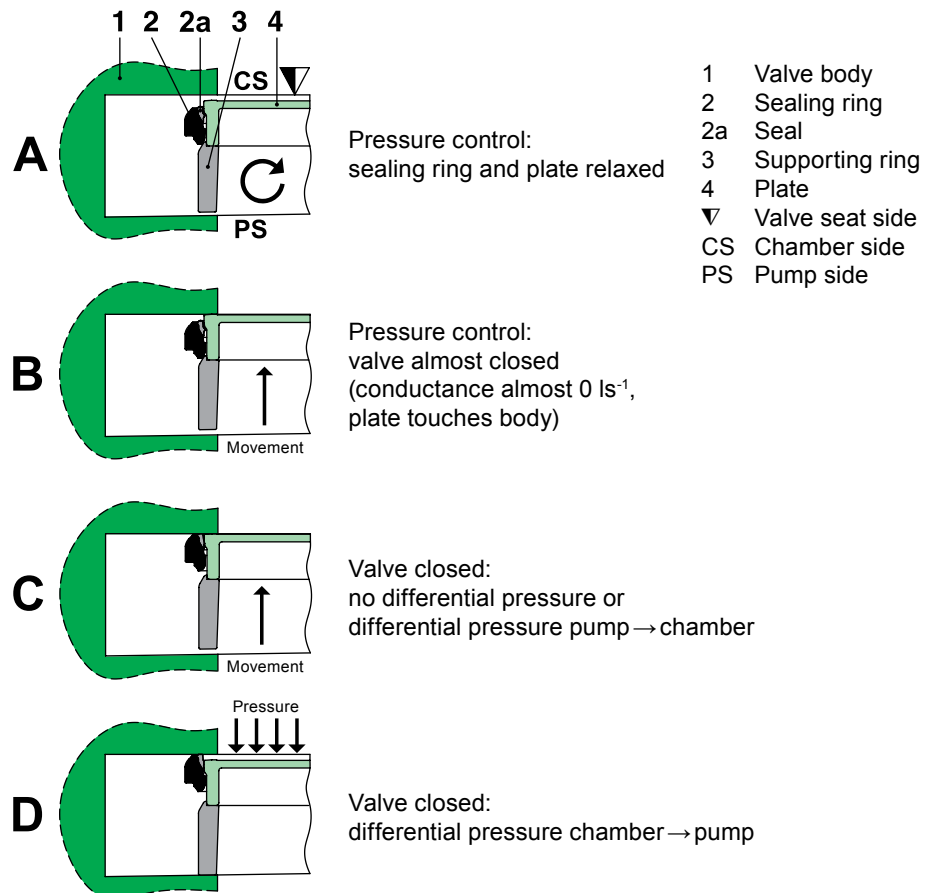
Vulcanized seal (no dead volumes at the
plate seal): see glossary

Functional principle



The plate acts, due to its pendulum and stroke movement, as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 280. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures very fast and accurate process pressure control.

For leaktight closing the sealing ring moves upwards. Opening and closing are performed by the second actuator axis.



Technical data

Leak rate ¹⁾ : valve body		
– Aluminum		1 · 10 ⁻⁹ mbar ls ⁻¹
– Aluminum, hard anodized		1 · 10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾ : valve seat		
– Aluminum		1 · 10 ⁻⁹ mbar ls ⁻¹
– Aluminum, hard anodized		1 · 10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾		
– Aluminum		1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
– Aluminum, hard anodized		1 · 10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾		
– Pressure control		2.5 million
– Closing/opening		20 000
Temperature ²⁾		
– Valve body		≤ 120 °C
– Ambient		≤ 50 °C
Material		
– Valve body		EN AW-6082 (3.2315)
– Plate		EN AW-6082 (3.2315), partly PTFE coated, EN AC-42100 (3.2371.62)
– Lever		EN AW-6082 (3.2315), AISI 304 (1.4301), hard-chrome plated
– Actuator shaft		AISI 304 (1.4301)
Seal: bonnet, plate, feedthrough		FKM (Viton®)
Feedthrough		rotary feedthrough
Mounting position		any ³⁾

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

³⁾ Valve seat on chamber side recommended

DN (nominal I. D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Max. differential pressure during operation	Typical closing/opening time				Weight	
						Open → optically closed	Open → minimum conductance	Open → closed	Closed → open		
mm	inch	ls ⁻¹	ls ⁻¹	mbar	mbar	s	s	s	s	kg	lbs
200	8	12 000	0.20	1 200	10	0.8	1.2	1.9	2.6	27	60
250	10	22 000	0.25	1 200	10	0.9	1.3	2.2	3.1	34	75

Technical data for pressure controller: see pages 146–149

Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Flange connections**
for installation of the valve: see series 32

Options

Certain options are not available for some nominal diameters or cannot be combined. Moreover, options can affect the general technical data.



Actuator

- Controller with configurable PID parameters (adaptive, upstream, downstream, soft-pump)
- RS232 interface with 2 analog outputs

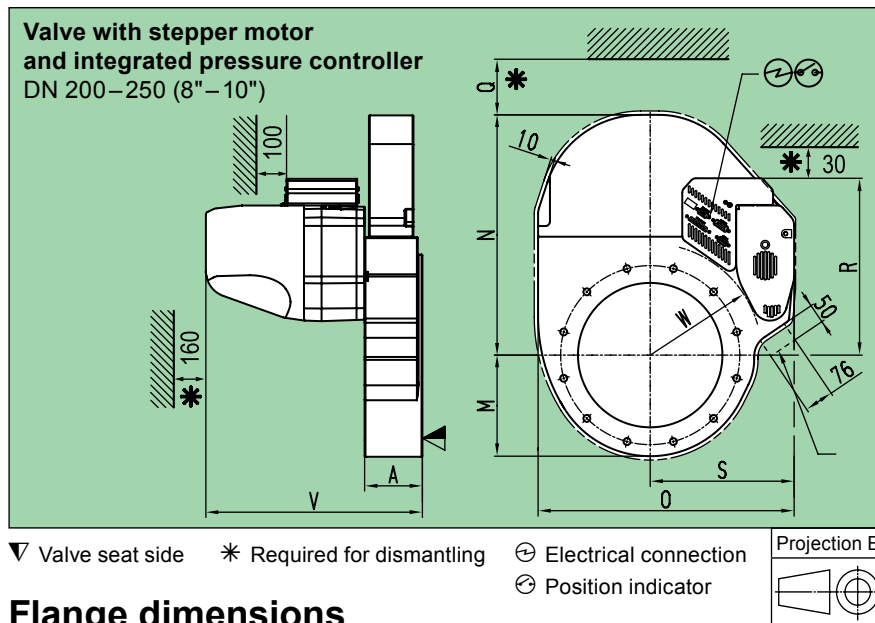
Valve

- Other sizes, e.g. DN 160, 320, 350
- O-ring seal in plate (standard: vulcanized seal)
- Valve with external pressure controller
- Heater with insulation (picture) for valve temperatures up to 120 °C

Ordering information for options:

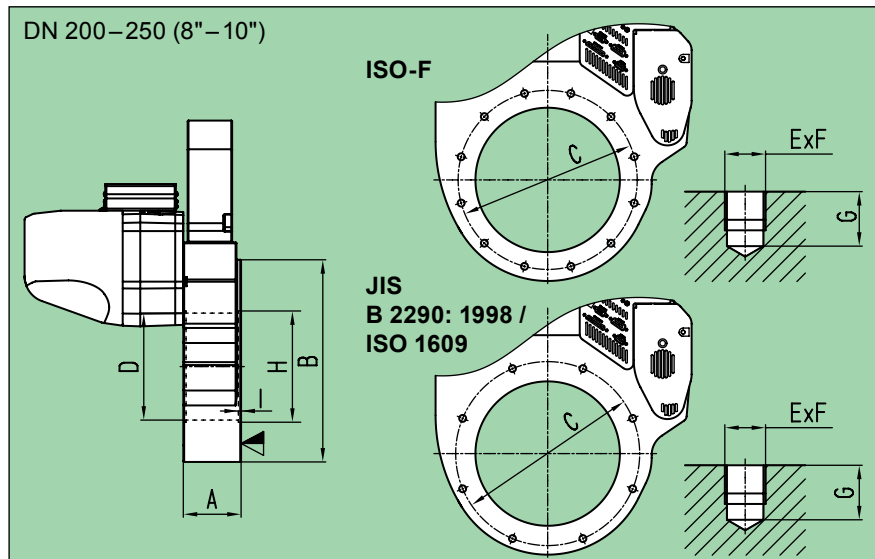
Ordering No. of valve-X (e. g. 65248-PAGH-X, X = valve with heater for 120 °C)

Main dimensions



DN	mm	200	250
	inch	8	10
A	mm	86	100
	inch	3.39	3.94
M	mm	150	175
	inch	5.91	6.89
N	mm	330	416
	inch	12.99	16.38
O	mm	384.50	443
	inch	15.14	17.44
Q	mm	20	20
	inch	0.79	0.79
R	mm	294	306
	inch	11.57	12.05
S	mm	223	249
	inch	8.78	9.80
V	mm	361	375
	inch	14.21	14.76
W	mm	165	195
	inch	6.50	7.68

Flange dimensions



		ISO-F		JIS	
DN	mm	200	250	200	250
	inch	8	10	8	10
A	mm	86	100	86	100
	inch	3.39	3.94	3.39	3.94
B	mm	300	350	300	350
	inch	11.81	13.78	11.81	13.78
C	mm	260	310	270	320
	inch	10.24	12.20	10.63	12.60
D	mm	200	254	200	254
	inch	8	10	8	10
E × F		12 × M10	12 × M10	8 × M12	12 × M12
G	mm	15	16	15	16
	inch	0.59	0.63	0.59	0.63
H	mm	213.20	261	–	–
	inch	8.39	10.28		
I	mm	5	5	–	–
	inch	0.20	0.20		

Main applications

Downstream pressure control and isolation

Features

Control and isolation valve combined as a compact unit

Series 95.1:

Control and angle valve with bellows, opening at 1 bar differential pressure possible

Series 95.2:

Control and gate valve with shaft feed-through



Series 95.1: DN 25–50



Series 95.2: DN 63–250

Ordering information

Valve with stepper motor and integrated pressure controller

DN		Ordering numbers							
		Series 95.1				Series 95.2			
		aluminum ISO-KF		stainless steel ISO-KF		aluminum ISO-F		stainless steel ISO-F	
mm	inch								
25	1	95128-KA	x y	95128-KE	x y	–		–	
40	1½	95132-KA	x y	95132-KE	x y	–		–	
50	2	95134-KA	x y	95134-KE	x y	–		–	
63	2½	–		–		95236-PA	x y	–	
80	3	–		–		95238-PA	x y	–	
100	4	–		–		95240-PA	x y	–	
160	6	–		–		95244-PA	x y	–	
200	8	–		–		95246-PA	x y	–	
250	10	–		–		95248-PA	x y	–	

Controller configurations:	x		y		Interface	Number of sensors
	G	A	H	C		
	G = basic version	A = with SPS	H = with PFO	C = with SPS and PFO	G = RS232	1
	T = basic version with VC master	V = with SPS and VC master	U = with PFO and VC master	W = with SPS, PFO and VC master	H = RS232	2
					C = Logic	1
					E = Logic	2
					P = DeviceNet®	1
					Q = DeviceNet®	2
					D = Profibus	1
					F = Profibus	2
					J = RS485	1
					K = RS485	2
					Y = Ethernet	1
					Z = Ethernet	2
					L = CC-Link	1
					N = CC-Link	2
					I = EtherCAT	1
					X = EtherCAT	2
					S = VC slave (without interface)	

Example: 95240-PAGG
= Valve with ISO-F DN 100 flanges, RS232 interface, for 1 sensor

Pressure controller: see pages 146–149

Technical data

Leak rate ¹⁾: valve body, valve seat

 $< 1 \cdot 10^{-9}$ mbar ls⁻¹

Pressure range ¹⁾

– Series 95.1

 $1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)

– Series 95.2

 $1 \cdot 10^{-7}$ mbar to 1.2 bar (abs)

Cycles until first service ²⁾

– Pressure control

2 million

– Closing/opening DN 25– 50

2 million

DN 63–100

200 000

DN 160–250

100 000

Temperature ²⁾

– Valve body

 ≤ 120 °C

– Ambient

 ≤ 50 °C

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

Mounting position

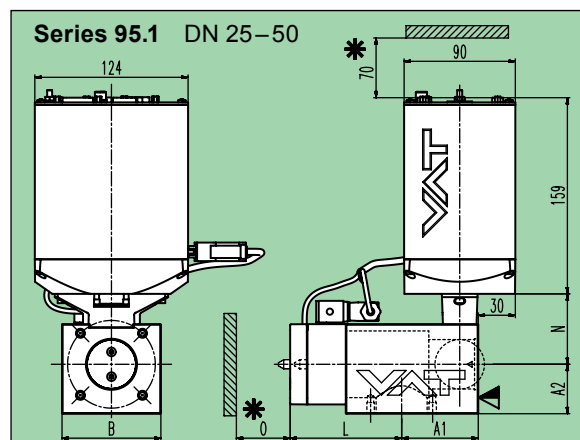
any

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Compressed air min. – max. overpressure		Max. differential pressure			Operating time for throttling	Typical closing or opening time	Weight			
						During closing	During opening	During pressure control			Aluminum valve		Stainless steel valve	
mm	inch	ls ⁻¹	ls ⁻¹	bar	psi	bar	mbar	bar	s	s	kg	lbs	kg	lbs
25	1	8.5	0.15	4–8	58–116	1.2	1000	1	0.3	0.6	2.7	6	3.6	8
40	1½	29	0.25	4–8	58–116	1.2	1000	1	0.3	0.6	3.6	7.9	5.7	12.5
50	2	52	0.30	4–8	58–116	1.2	1000	1	0.3	0.7	4.2	9.3	6.8	15
63	2½	210	0.45	4–7	58–102	1.2	30	1	0.3	1.5	7.1	15.6	–	–
80	3	450	0.65	4–7	58–102	1.2	30	1	0.3	1.7	7.9	17.4	–	–
100	4	800	0.85	4–7	58–102	1.2	30	0.80	0.3	2	9.1	20	–	–
160	6	2300	1.70	4–7	58–102	1.2	30	0.30	0.3	2	15.8	34.8	–	–
200	8	4700	2.80	4–7	58–102	1.2	30	0.15	0.3	3	25.7	56.6	–	–
250	10	8900	5	4–7	58–102	1.2	30	0.10	0.3	5	41.5	91.5	–	–

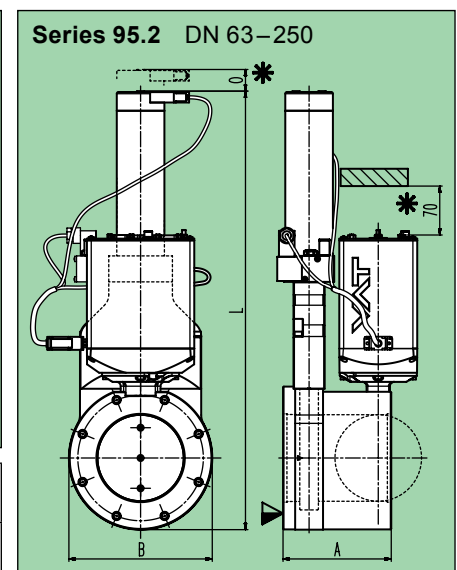
Technical data for pressure controller: see pages 146–149

Dimensions

DN	mm	25	40	50
	inch	1	1½	2
A1	mm	44	62	69
	inch	1.73	2.44	2.72
A2	mm	35	40	43
	inch	1.38	1.57	1.69
B	mm	60	80	86
	inch	2.36	3.15	3.39
L	mm	64	90	99
	inch	2.52	3.54	3.90
N	mm	54	57	62
	inch	2.13	2.24	2.44
O	mm	44	74	85.50
	inch	1.73	2.91	3.37



DN	mm	63	80	100	160	200	250
	inch	2½	3	4	6	8	10
A	mm	125	125	125	140	175	210
	inch	4.92	4.92	4.92	5.51	6.89	8.27
B	mm	131	146	166	237	290	352
	inch	5.16	5.75	6.54	9.33	11.42	13.86
L	mm	407	448	508	665	832	1018
	inch	16.02	17.64	20	26.18	32.76	40.08
O	mm	25	25	25	60	80	100
	inch	0.98	0.98	0.98	2.36	3.15	3.94



▽ Valve seat side

* Required for dismantling

Series 61, 62, 64, 65, 67, 95

Features

Integrated or external pressure controller, depending on valve type

Automatic learning of system parameters

Extremely short control response times

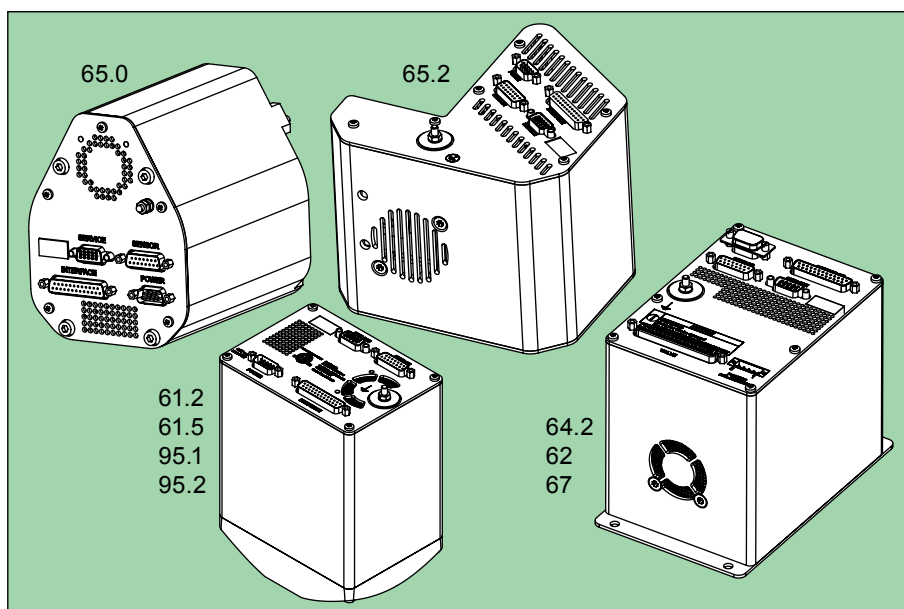
Fast and accurate pressure control

Valve position control

Remote control or local operation

Input for pressure sensor

Information display



Function

By operating the LEARN function – needs to be done only once at start-up – the system parameters are automatically determined. Due to the adaptive algorithm the controller continuously adapts to the process conditions (species of gas, gas flow) and thus ensures optimum pressure control at any time.

In position control mode the valve plate can be moved to any position. Status and position are displayed by means of 4 digits.

The valve can be controlled by a computer via Logic, RS232, RS485, DeviceNet®, Ethernet, Profibus, CC-Link or EtherCAT interface.

The RS232 interface and the field busses also have digital inputs to close and open the valve. In addition, digital outputs are available for «open» and/or «closed».

Control via Logic interface performs via digital and analog inputs and outputs.

Electrical connections

	Connection	Type
POWER	Power input	DB-9 male or Weidmüller SL 3.50 male
SENSOR	Sensor input Sensor power supply	DB-15 female
INTERFACE	Logic, RS232, RS485	DB-25 female
	Ethernet	RJ 45
	DeviceNet® with Logic I/O	Micro-style M12 male
	Profibus with Logic I/O	DB-9 female
	CC-Link with Logic I/O	5-pole terminal screw
	EtherCAT with Logic I/O	2 × RJ 45
	Logic I/O	Binder M8 female

Accessories

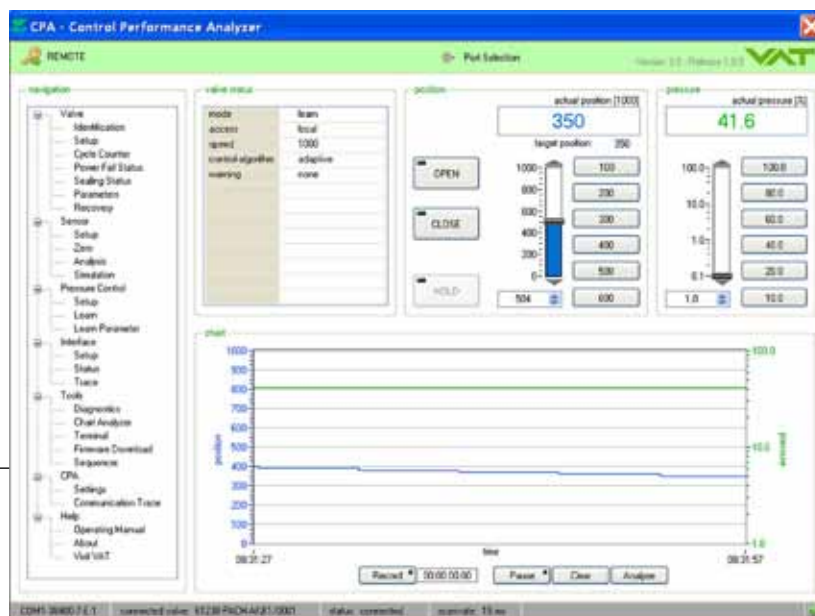
- **CPA software** (see «Operation»)
- **Service box, control panel** (see «Operation»)
- **Connector kits** for the various interfaces
- **AC power supply unit** (input: 100–240 VAC, output: 24 VDC/4A)

Operation

Remote control via computer

Control via computer by using the CPA software developed by VAT offers comfortable functions such as

- Setup
- Operation
- Monitoring
- Diagnostics
- Graphical illustration of the pressure behavior
- Programming and recording of sequences
- Several possibilities for data analysis and process optimization



The software –Control Performance Analyzer (CPA)– may be downloaded for free from our website: [www.vatvalve.com/Customer Service/Information and downloads/Control Performance Analyzer](http://www.vatvalve.com/CustomerService/Informationanddownloads/ControlPerformanceAnalyzer).

For connecting the computer to the valve, a special cable designed by VAT is required. The diagram for the cable is available on our website: [www.vatvalve.com/Customer Service/Information and downloads/Cable description](http://www.vatvalve.com/CustomerService/Informationanddownloads/Cabledescription). The cable and the software «Control Performance Analyzer (CPA)» can also be ordered from VAT.

Local operation by means of a service box or control panel



Standard service box 2 with cable

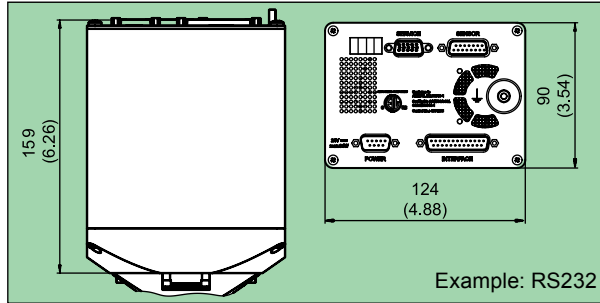


Control panel with cable for integration into a 19" rack

Options

- **Sensor Power Supply (SPS)**
±15VDC power supply for the sensor/sensors
- **Power Failure Option (PFO)**
Valve closes/opens automatically at power failure
- **Valve Cluster (VC)**
For operating several valves synchronously by means of a master valve and one or more slave valves.

Integrated controller: Series 61.2, 61.5, 95.1, 95.2



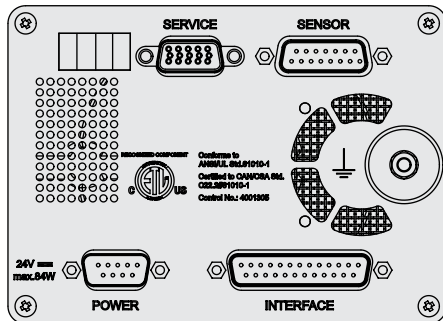
Available interfaces:

- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT

Example: RS232

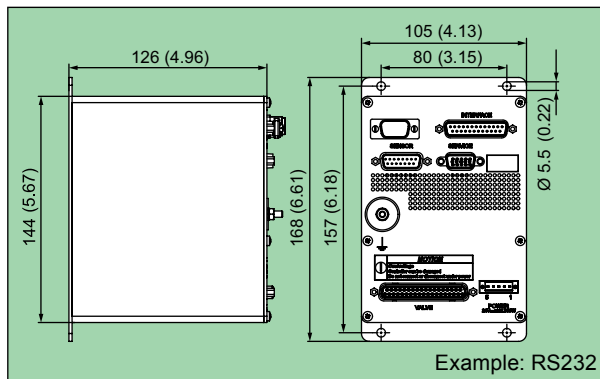
Power consumption	max. +24 VDC (±10 %) @ 0.5 V pk-pk
– Controller + motor	max. 38 W
– Power failure option (PFO)	max. 10 W
– Sensor power supply (SPS)	max. 36 W
Sensor supply	24 VDC or ±15 VDC
Sensor input	0–10 VDC linear with pressure
– Signal voltage	Ri = 100 kΩ
– Input resistance	0.23 mV
– Resolution	10 ms
– Sampling rate	
Control accuracy	5 mV or 0.1% of setpoint ¹⁾
Position resolution	≥20 000 (depending on valve type)
Protective system	IP 30

¹⁾ The higher value applies



Integrated controller: Series 64.2

External controller: Series 62, 67 (for series 64.2 and 65.2 available as an option)



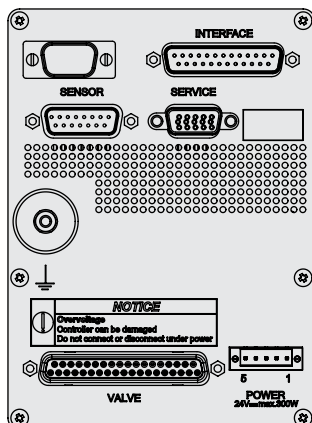
Available interfaces:

- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT

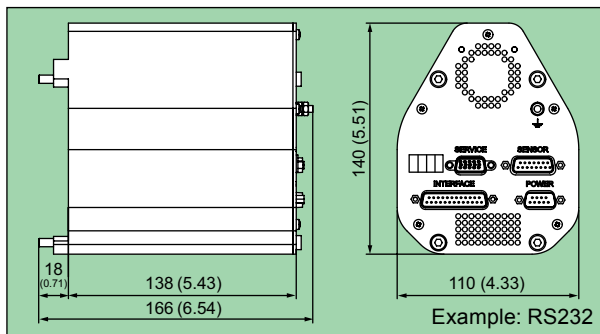
Example: RS232

Power consumption	max. +24 VDC (±10 %) @ 0.5 V pk-pk
– Controller + motor	max. 55 W (S62, 64.2), max. 100 W (S67)
– Power failure option (PFO)	max. 10 W
– Sensor power supply (SPS)	max. 36 W
Sensor supply	24 VDC or ±15 VDC
Sensor input	0–10 VDC linear with pressure
– Signal voltage	Ri = 100 kΩ
– Input resistance	0.23 mV
– Resolution	10 ms
– Sampling rate	
Control accuracy	5 mV or 0.1% of setpoint ¹⁾
Position resolution	depending on valve type
Protective system	IP 20

¹⁾ The higher value applies

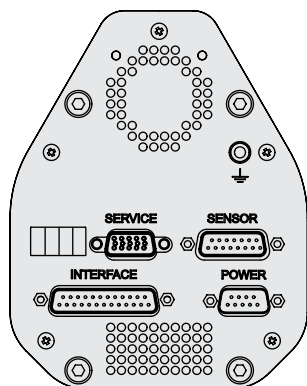


Integrated controller: Series 65.0 (external controller available as an option)



Available interfaces:

- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT



- Power consumption
- Controller + motor
 - Power failure option (PFO)
 - Sensor power supply (SPS)

max. +24 VDC ($\pm 10\%$) @ 0.5 V pk-pk
 max. 50 W
 max. 10 W
 max. 36 W

Sensor supply

24 VDC or ± 15 VDC

Sensor input

- Signal voltage
- Input resistance
- Resolution
- Sampling rate

0–10 VDC linear with pressure
 $R_i = 100\text{ k}\Omega$
 0.23 mV
 10 ms

Control accuracy

5 mV or 0.1% of setpoint ¹⁾

Position resolution

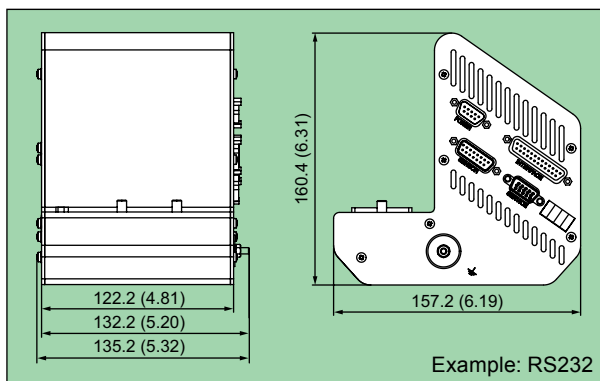
≥ 9155 (depending on nominal diameter)

Protective system

IP 20

¹⁾ The higher value applies

Integrated controller: Series 65.2 (external controller available as an option)



Available interfaces:

- Logic
- RS232
- RS485
- DeviceNet®
- Ethernet
- Profibus
- CC-Link
- EtherCAT

- Power consumption
- Controller + motor
 - Power failure option (PFO)
 - Sensor power supply (SPS)

max. +24 VDC ($\pm 10\%$) @ 0.5 V pk-pk
 max. 100 W
 max. 10 W
 max. 36 W

Sensor supply

24 VDC or ± 15 VDC

Sensor input

- Signal voltage
- Input resistance
- Resolution
- Sampling rate

0–10 VDC linear with pressure
 $R_i = 100\text{ k}\Omega$
 0.23 mV
 10 ms

Control accuracy

5 mV or 0.1% of setpoint ¹⁾

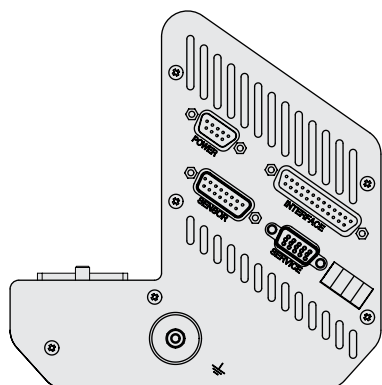
Position resolution

$\geq 100\,000$ (depending on nominal diameter)

Protective system

IP 20

¹⁾ The higher value applies



Series 02.2 Valve

Series 03.2 Insert

Main applications

Load lock and process chamber isolation
in semiconductor production systems
for 200, 300 and 450 mm wafers



Ordering information

Series 02.2

Valve with pneumatic actuator
double acting
with position indicator

Type A

Opening:

Rear side = seat side

SEMI E21-94

SEMI E21-94

SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (* specify control voltage)			
mm	inch	aluminum		stainless steel	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
32 × 222	1.26 × 8.74	02209-AA24	02209-AA44 *	02209-AE24	02209-AE44 *
46 × 236	1.81 × 9.29	02210-AA24	02210-AA44 *	02210-AE24	02210-AE44 *
50 × 336	1.97 × 13.23	02212-AA24	02212-AA44 *	02212-AE24	02212-AE44 *
56 × 496	2.20 × 19.53	02213-AA24	02213-AA44 *	02213-AE24	02213-AE44 *
100 × 500	3.94 × 19.69	02241-AA24	02241-AA44 *	02241-AE24	02241-AE44 *
Other sizes on request					

Series 02.2

Valve with pneumatic actuator
double acting
with position indicator

Type B

Opening:

Rear side > seat side

SEMI E21-94

SEMI E21-94

SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (* specify control voltage)			
mm	inch	aluminum		stainless steel	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
32 × 222	1.26 × 8.74	02209-BA24	02209-BA44 *	02209-BE24	02209-BE44 *
46 × 236	1.81 × 9.29	02210-BA24	02210-BA44 *	02210-BE24	02210-BE44 *
50 × 336	1.97 × 13.23	02212-BA24	02212-BA44 *	02212-BE24	02212-BE44 *
56 × 496	2.20 × 19.53	02213-BA24	02213-BA44 *	02213-BE24	02213-BE44 *
100 × 500	3.94 × 19.69	02241-BA24	02241-BA44 *	02241-BE24	02241-BE44 *
Other sizes on request					

Series 03.2

Insert with pneumatic actuator
double acting
with position indicator

Type C

SEMI E21-94

SEMI E21-94

SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (* specify control voltage)			
mm	inch	aluminum		stainless steel	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
32 × 222	1.26 × 8.74	03209-CA24	03209-CA44 *	03209-CE24	03209-CE44 *
46 × 236	1.81 × 9.29	03210-CA24	03210-CA44 *	03210-CE24	03210-CE44 *
50 × 336	1.97 × 13.23	03212-CA24	03212-CA44 *	03212-CE24	03212-CE44 *
56 × 496	2.20 × 19.53	03213-CA24	03213-CA44 *	03213-CE24	03213-CE44 *
100 × 500	3.94 × 19.69	03241-CA24	03241-CA44 *	03241-CE24	03241-CE44 *
Other sizes and insert types on request					

Features

Body material:
aluminum or stainless steel

Compact design

Virtually particle and vibration-free

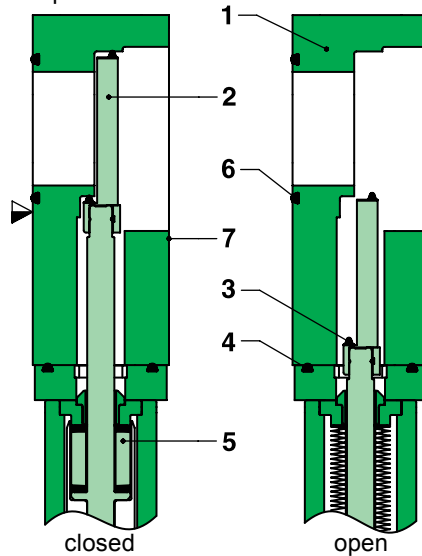
Modular design: same actuator for
different valve sizes

Maintenance-free actuator

Self-adjusting gate without detached
mounting parts

Vulcanized gate seal: see glossary

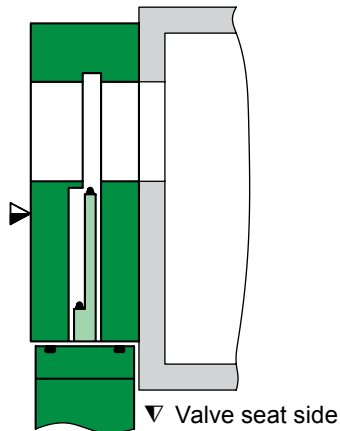
Functional principle



- 1 Valve body
- 2 Gate
- 3 Gate seal
- 4 Bonnet flange seal
- 5 Bellows
- 6 Body flange seal, seat side
- 7 Body flange sealing surface, rear side
- ▼ Valve seat side

Types

Valve type A

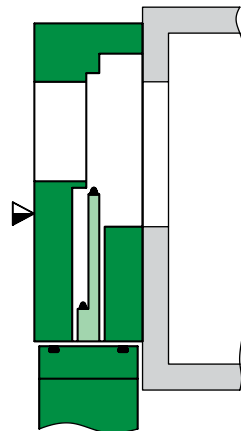


Opening:
Rear side = seat side

With bonnet flange

Gate service through
bonnet flange

Valve type B

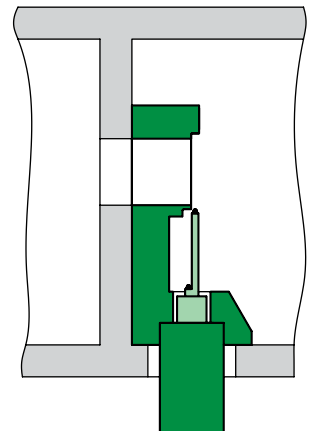


Opening:
Rear side > seat side

With bonnet flange

Gate service through
bonnet flange

Insert type C



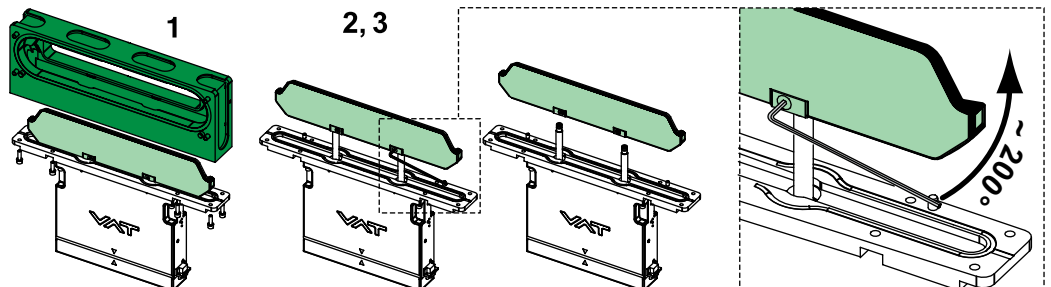
MONOVAT seat mounted
inside of chamber

Insert installation from the
top

Gate service through
chamber

Easy maintenance

- 1 Remove screws and
withdraw actuator/gate
assembly from valve
body
- 2, 3 Remove gate screws by
applying an Allen wrench
and turning it approx.
200°



Technical data

Leak rate ^{1) 2)} at valve body and valve seat in mbar ls⁻¹

Sealing surface	FKM (Viton®) seal		FFKM seal		metal seal
	body	seat	body	seat	body
Metal, blank (milled / ball polished)	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-7}$	$< 5 \cdot 10^{-10}$ (stainless steel only)
Aluminum, hard anodized	$< 1 \cdot 10^{-5}$	$< 1 \cdot 10^{-4}$	$< 1 \cdot 10^{-5}$	$< 1 \cdot 10^{-4}$	
Aluminum, nickel-plated	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-7}$	

Pressure range

- Metal, blank or nickel-plated $1 \cdot 10^{-9}$ mbar to 1.2 bar (abs)
- Aluminum, hard anodized $1 \cdot 10^{-6}$ mbar to 1.2 bar (abs)
- Metal seal $5 \cdot 10^{-10}$ mbar to 1.2 bar (abs)

Differential pressure on the gate

1.2 bar

Differential pressure at opening

≤ 30 mbar

Cycles until first service

up to DN 56 × 496: ≥ 5 million
DN 100 × 500: ≥ 1 million

Temperature ³⁾

Operating temperature of the valve	Configurations			
	valve		actuator	
	body	gate	position indicator	cycle counter
≤ 80 °C	aluminum	aluminum	standard	standard
≤ 150 °C	aluminum	aluminum	bakeable	without
≤ 200 °C	stainless steel	stainless steel	without	without

Heating and cooling rate

≤ 40 °C h⁻¹

Temperature difference seat/gate

< 40 °C

Material

- Valve body, gate
 - aluminum EN AW-5083 (3.3547), EN AW-6061 (3.3211), EN AW-6082 (3.2315)
 - stainless steel AISI 316L (1.4404, 1.4435)
- Differential pressure tabs, stoppers PEEK (Polyetheretherketone)
- Bellows end pieces, shaft AISI 316L (1.4404, 1.4435)
- Bellows AISI 633 (AM 350)
- Clamping piece AISI 301 (1.4310)

Seal: gate, bonnet flange

FKM (Viton®)

Compressed air connection

internal threads 1/8" (ISO/NPT)

Mounting position

actuator up or down

Impulse solenoid valve

24 VDC, 2.5 W (others on request)

Position indicator: contact rating

- Voltage ≤ 50 VAC/DC
- Current ≤ 0.1 A, > 5 mA
- Connection 9 pin subminiature D

¹⁾ At room temperature (25 °C) and in a clean environment

²⁾ Measuring conditions:
 • body: 30 s, He concentration ≥ 20%
 • seat: 15 s, He concentration ≥ 30%
 Automatic leak rate supervision, dp = 1 bar

³⁾ Maximum values: depending on operating conditions and sealing materials

⁴⁾ In order to maximize the lifetime of the gate, the operating pressure should be kept as low as possible, however high enough to ensure the required leak rate in the closed valve position. Depending on the length of the sealing line (size of gate), tolerances of the sealing lip, accuracy of the measurement and required leak rate, the operating pressure settings may be slightly beyond the specified pressure range.

DN (D1 × D) D1 slit height D slit length		Conductance (molecular flow)	Compressed air min. – max. overpressure ⁴⁾			Volume of pneumatic actuator	Closing or opening time	Weight			
								Aluminum valve (type A)		Stainless steel valve (type A)	
mm	inch	ls ⁻¹	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
32 × 222	1.26 × 8.74	1590	3–7	44–102	0.22	0.01	≤ 1	8	18	16	35
46 × 236	1.81 × 9.29	3340	2–7	29–102	0.49	0.02	≤ 1	10	22	20	44
50 × 336	1.97 × 13.23	5000	2–7	29–102	0.49	0.02	≤ 1	12	26	25	55
56 × 496	2.20 × 19.53	9320	3–7	44–102	0.49	0.02	≤ 1	17	37	35	77
100 × 500	3.94 × 19.69	28000	5–7	73–102	0.98	0.04	≤ 2	34	74	68	150

Options

Actuator

- Other solenoid valve voltage (standard: 24 VDC)
- Pneumatically locked in closed and open position
- Manual mechanical locking
- Bakeable to 150 °C
- Double position indicator for the positions «open» and «closed»
- Pressure control for the closed position
- Position indicator with mechanical and electronic sensors with LED display
- Cycle counter

Valve and insert

- Surface
 - Aluminum: hard anodised or nickel-plated
 - Aluminum, stainless steel: ball-polished
 - Stainless steel gate: electro-polished
- Temperature management
 - Valve body prepared for liquid cooling (stainless steel) or nitrogen purge (aluminum, stainless steel)
 - Gate prepared for liquid cooling
 - Gate with heating conductor
 - Heating cartridges with/without thermocouples
 - PTC heating cartridges
 - Temperature sensors with/without overtemperature protection
- FFKM gate seal, other sealing materials on request
- Protective shield for gate
(protection against coating, plasma and process gases, heat radiation)

Valve

- Body flange
 - Sealing surface or groove for O-ring seal
 - FKM (Viton®) or FFKM body seal (O-ring)
 - Metal body seal (stainless steel version)
 - Other sealing materials
 - Screw holes outside or inside of the sealing line
 - Centering pins, centering holes
- UHV version
 - Body flange sealing surfaces for metal seal
 - Metal seal on bonnet flange
- Ports ISO-KF 16 for roughing (by-pass), venting or for gauges
- Valve body prepared for customer-specific sensor systems
(pressure, temperature, wafer detection)

Insert

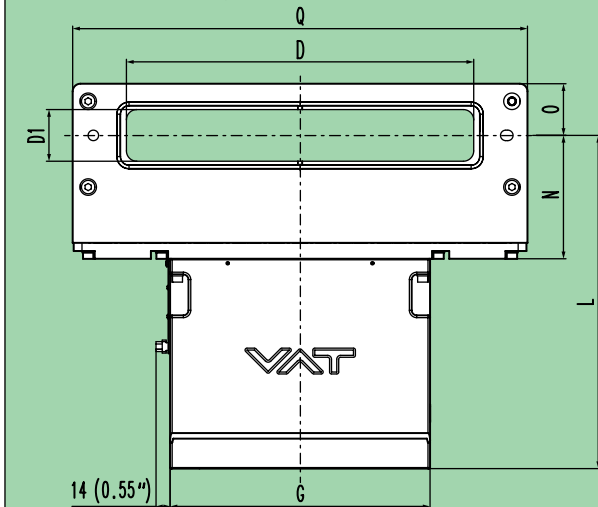
For the types L, M, N the chamber must meet specific requirements regarding stiffness and manufacturing tolerances. VAT recommends using the one-piece type C.

- Type L Seat mounted to chamber wall, with bonnet flange,
gate service through bonnet flange
- Type M Seat mounted to chamber wall, without bonnet flange,
gate service through chamber
- Type N Seat mounted through chamber wall, without bonnet flange,
gate service through chamber

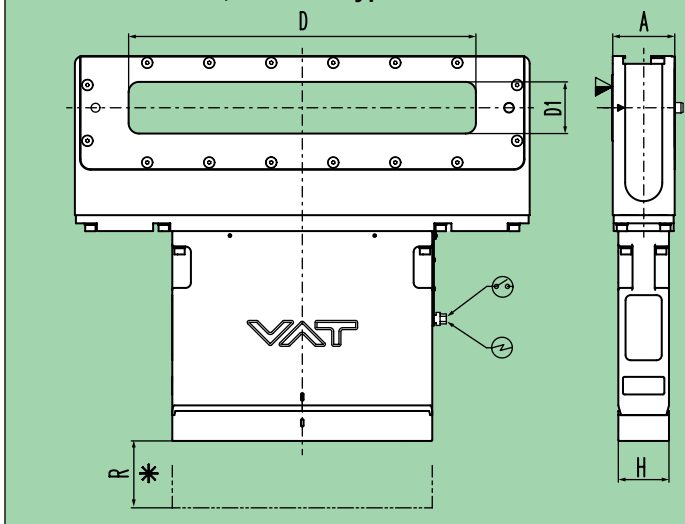
C

Dimensions

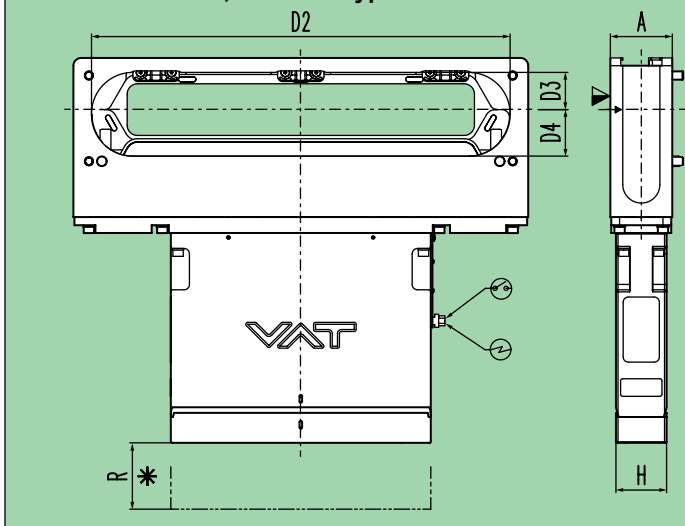
Series 02.2: valve, seat side



Series 02.2: valve, rear side type A



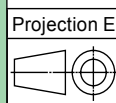
Series 02.2: valve, rear side type B



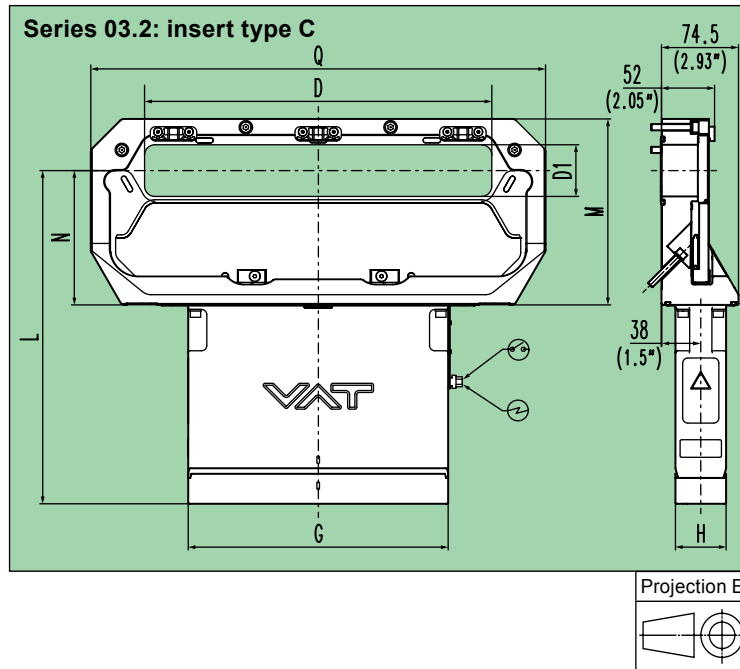
D1 × D	mm	32 × 222	46 × 236	50 × 336	56 × 496	100 × 500
	inch	1.26 × 8.74	1.81 × 9.29	1.97 × 13.23	2.20 × 19.53	3.94 × 19.69
A	mm	50	50	60	60	60
	inch	1.97	1.97	2.36	2.36	2.36
D	mm	222	236	336	496	500
	inch	8.74	9.29	13.23	19.53	19.69
D1	mm	32	46	50	56	100
	inch	1.26	1.81	1.97	2.20	3.94
D2	mm	275	305	405	570	606
	inch	10.83	12.01	15.94	22.44	23.85
D3	mm	29	36	36	39	72
	inch	1.14	1.42	1.42	1.54	2.83
D4	mm	35	44	45	45	67
	inch	1.38	1.73	1.77	1.77	2.64
G	mm	203.50	251.50	251.50	251.50	251.50
	inch	8.01	9.90	9.90	9.90	9.90
H	mm	43	49	49	49	59
	inch	1.69	1.93	1.93	1.93	2.32
L	mm	251.50	322.50	322.50	325.50	540.70
	inch	9.90	12.70	12.70	12.81	21.29
N	mm	112	119	119	122	207.40
	inch	4.41	4.69	4.69	4.80	8.16
O	mm	50	50	50	60	1)
	inch	1.97	1.97	1.97	2.36	
Q	mm	340	340	440	645	640
	inch	13.39	13.39	17.32	25.39	25.20
R	mm	75	90	90	95	115
	inch	3.13	3.54	3.54	3.74	4.53

1) On request

- ▼ Valve seat side
- * Required for dismantling
- ⊙ Position indicator
- ⊕ Electrical connection



Dimensions



D1×D	mm inch	32 × 222 1.26 × 8.74	46 × 236 1.81 × 9.29	50 × 336 1.97 × 13.23	56 × 496 2.20 × 19.53	100 × 500 3.94 × 19.69
D	mm inch	222 8.74	236 9.29	336 13.23	496 19.53	500 19.69
D1	mm inch	32 1.26	46 1.81	50 1.97	56 2.20	100 3.94
G	mm inch	203.50 8.01	251.50 9.90	251.50 9.90	251.50 9.90	251.50 9.90
H	mm inch	43 1.69	49 1.93	49 1.93	49 1.93	59 2.32
L	mm inch	251.50 9.90	322.50 12.70	322.50 12.70	325.50 12.81	540.70 21.29
M	mm inch	135 5.31	175 6.89	180 7.09	185 7.28	1) —
N	mm inch	100 3.94	130 5.12	130 5.12	130 5.12	207.40 8.16
Q	mm inch	290 11.42	320 12.60	440 17.32	610 24.02	640 25.20

⊗ Position indicator

⊕ Electrical connection

1) On request

Spare parts

- **Seals**
on request (specify fabrication number of valve)

Series 04.3 Valve Series 05.3 Insert

Main applications

Transfer and process chamber isolation
in semiconductor production systems
for 200, 300 and 450 mm wafers

Corrosive processes such as
etching and CVD

HB-LED manufacturing



Ordering information

Series 04.3
Valve with pneumatic actuator
double acting
with position indicator

SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (* specify control voltage)			
		aluminum		aluminum, hard anodized	
mm	inch	without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
50 × 336	1.97 × 13.23	04312-BA24	04312-BA44 *	04312-BH24	04312-BH44 *
50 × 480	1.97 × 18.90	on request	on request	on request	on request
56 × 496	2.20 × 19.53	04313-BA24	04313-BA44 *	04313-BH24	04313-BH44 *
80 × 500	3.15 × 19.69	04331-BA24	04331-BA44 *	04331-BH24	04331-BH44 *
100 × 800	3.94 × 31.50	04344-BA24	04344-BA44 *	04344-BH24	04344-BH44 *
Other sizes on request					

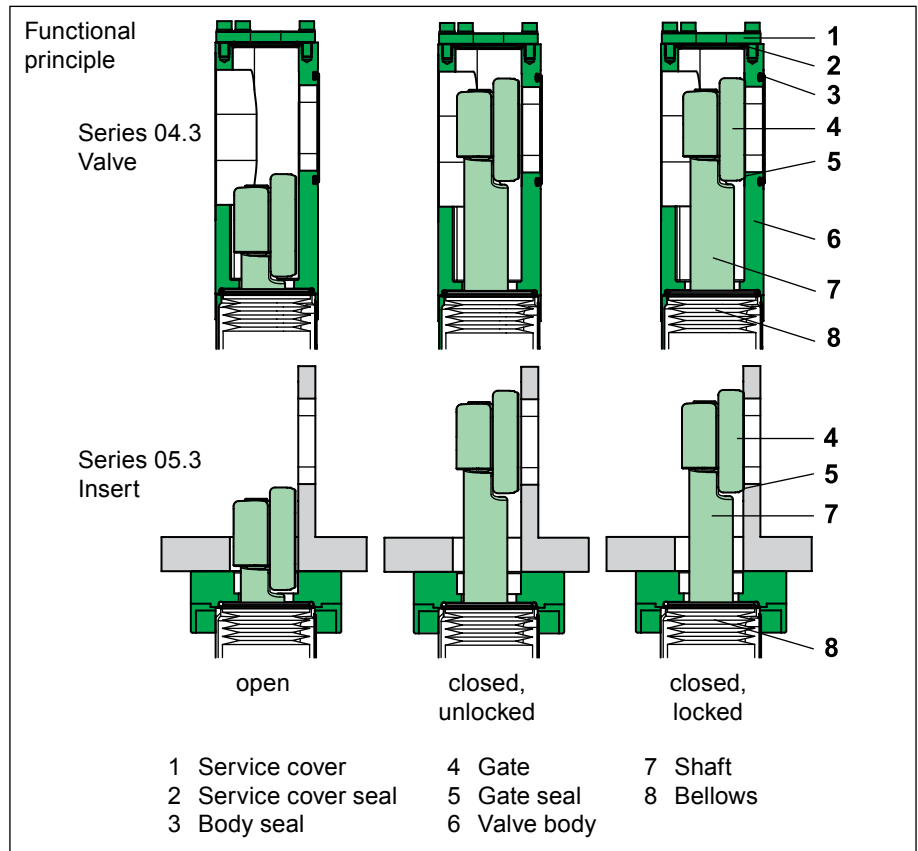
Series 05.3
Insert with pneumatic actuator
double acting
with position indicator

SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (* specify control voltage)			
		aluminum		aluminum, hard anodized	
mm	inch	without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
50 × 336	1.97 × 13.23	05312-LA24	05312-LA44 *	05312-LH24	05312-LH44 *
50 × 480	1.97 × 18.90	on request	on request	on request	on request
56 × 496	2.20 × 19.53	05313-LA24	05313-LA44 *	05313-LH24	05313-LH44 *
80 × 500	3.15 × 19.69	05331-LA24	05331-LA44 *	05331-LH24	05331-LH44 *
100 × 800	3.94 × 31.50	05344-LA24	05344-LA44 *	05344-LH24	05344-LH44 *
Other sizes on request					

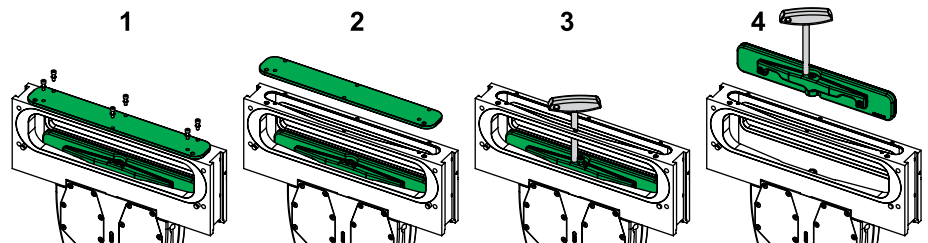
Features

- Body material:
aluminium or
aluminum, hard anodized
- Uniform compression and long lifetime
of the gate seal due to a real L-motion
- Virtually particle-free
- Vulcanized gate seal: see glossary
- Protected bellows
- Fast and smooth operation
- Adjustable sealing force for different
sealing materials
- Pneumatically locked in closed and open
position
- Service cover for easy maintenance



Easy maintenance

- 1 Remove screws
- 2 Remove service cover
- 3 Insert service tool
(see accessories)
- 4 Withdraw gate



Technical data

Leak rate ^{1) 2)} at valve body and valve seat in mbar ls⁻¹

Sealing surface	FKM (Viton®) seal		FFKM seal		metal seal
	body	seat	body	seat	body
Metal, blank (milled / ball polished)	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-7}$	$< 5 \cdot 10^{-10}$
Aluminum, hard anodized	$< 1 \cdot 10^{-5}$	$< 1 \cdot 10^{-4}$	$< 1 \cdot 10^{-5}$	$< 1 \cdot 10^{-4}$	(stainless steel only)
Aluminum, nickel-plated	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-7}$	

Pressure range

- Metal, blank or nickel-plated $1 \cdot 10^{-9}$ mbar to 1.1 bar (abs)
- Aluminum, hard anodized $1 \cdot 10^{-6}$ mbar to 1.1 bar (abs)
- Metal seal $5 \cdot 10^{-10}$ mbar to 1.1 bar (abs)

Differential pressure on the gate

1.1 bar

Differential pressure at opening

- DN 50 × 336 up to 80 × 500 ≤ 30 mbar
- DN 100 × 800 ≤ 10 mbar

¹⁾ At room temperature (25 °C) and in a clean environment

²⁾ Measuring conditions:
• body: 30 s, He concentration $\geq 20\%$
• seat: 15 s, He concentration $\geq 30\%$
Automatic leak rate supervision, dp = 1 bar

Further technical data on next page →

Continued Technical data

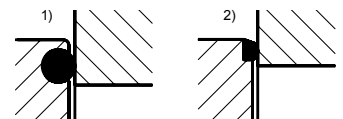
Cycles until first service		
– DN 50×336 up to 56×496		≥ 3 million
– DN 80×500 up to 100×800		≥ 2 million
Temperature ³⁾		
– Gate, valve body		≤ 120 °C
– Actuator		≤ 80 °C
Heating and cooling rate		≤ 40 °C h ⁻¹
Material		
– Valve body, gate, service cover		EN AW-6082 (3.2315), EN AW-5083 (3.3547), EN AW-6061 (3.3211)
– aluminum		AISI 316L (1.4404, 1.4435)
– stainless steel		AISI 316L (1.4404)
– Bellows end pieces, shaft		AISI 633 (AM350)
– Bellows		
Seal: gate, service cover		FKM (Viton®)
Mounting position		actuator up or down
Impulse solenoid valve		24 VDC, 2.5 W (others on request)
Position indicator: contact rating		
– Voltage		≤ 50 VAC/DC
– Current		≤ 0.1 A, > 5 mA
– Connection		9 pin subminiature D
Compressed air connection		
– DN 50×336 up to 80×500		quick connector O.D. 6 mm
– DN 100×800		quick connector O.D. 8 mm

³⁾ Maximum values: depending on operating conditions and sealing materials

DN (D1×D) D1 slit height D slit length		Compressed air min. – max. overpressure (integrated pressure controller)		Volume of pneumatic actuator		Closing or opening time	Weight			
							Valve		Insert	
mm	inch	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
50×336	1.97×13.23	4–7	58–102	0.12	0.004	<1	15	33	11	24
50×480	1.97×18.90	5–7	73–102	0.12	0.004	<1	20.5	45	13	29
56×496	2.20×19.53	4–7	58–102	0.24	0.008	<1	30.5	67	28	62
80×500	3.15×19.69	5–7	73–102	0.36	0.012	<2	52	115	35	77
100×800	3.94×31.50	5–6	73–87	1.00	0.035	<3	92.5	204	78	172

Options

- Other solenoid valve voltage (standard: 24 VDC)
- Surface: aluminum, nickel-plated
- Other sealing materials:
e.g. perfluoro elastomer (FFKM), silicone (VMQ, FVMQ)
- O-ring seal ¹⁾ in gate (standard: vulcanized seal ²⁾)
- Heating and cooling equipment
- Double position indicator
- Stainless steel valve body and gate

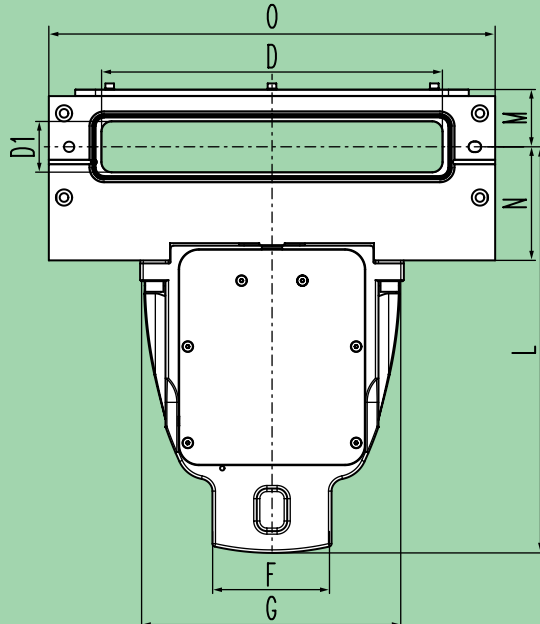
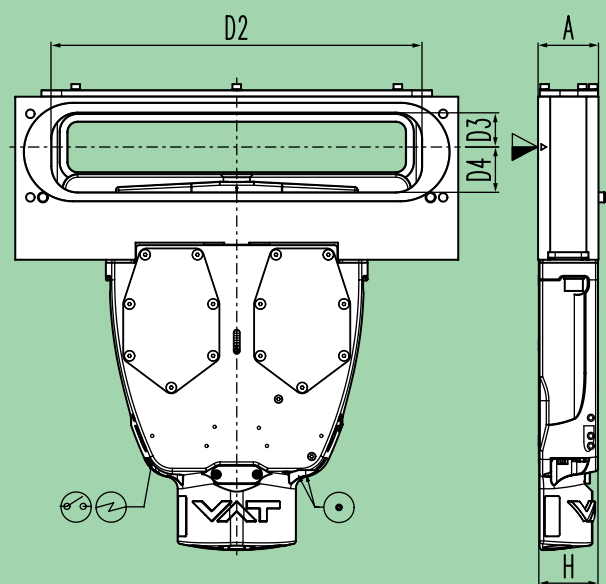
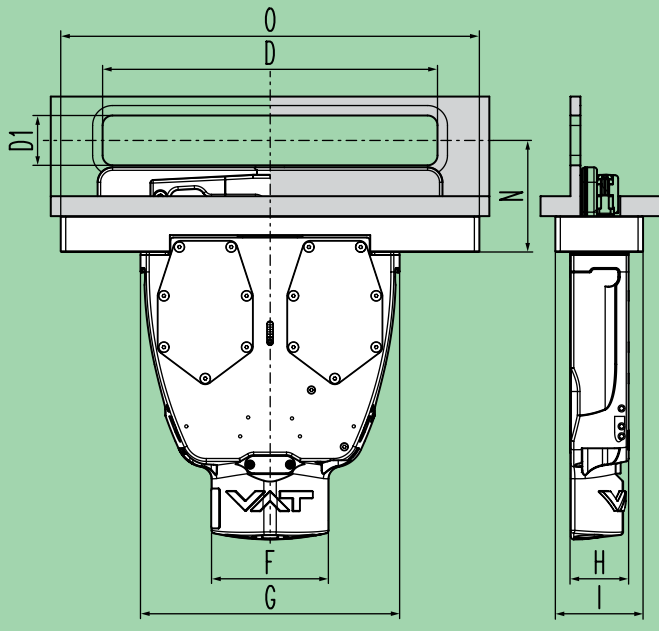


Accessories

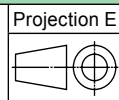
- **Service tool** for gate exchange
Ordering number on request



Dimensions

Series 04.3: valve, seat side

Series 04.3: valve, rear side

Series 05.3: insert


- ▼ Valve seat side
- ⊕ Electrical connection
- ⊙ Compressed air connection
- ⊙ Position indicator



D1×D mm inch	50×336 1.97×13.23	50×480 1.97×18.90	56×496 2.20×19.53	80×500 3.15×19.69	100×800 3.94×31.49
A mm inch	60 2.36	60 2.36	70 2.75	85 3.35	100 3.94
D mm inch	336 13.23	480 18.90	496 19.53	500 19.69	800 31.50
D1 mm inch	50 1.97	50 1.97	56 2.20	80 3.15	100 3.94
D2 mm inch	368.50 14.50	532 20.94	532 20.95	565 22.24	860 33.86
D3 mm inch	34 1.39	39 1.54	34 1.39	60 2.36	70.50 2.78
D4 mm inch	45 1.77	45 1.77	45 1.77	120 4.72	149 5.87
F mm inch	120 4.72	120 4.72	270 10.63	256 10.08	326 12.83
G mm inch	260 10.24	260 10.24	360 14.17	310 12.20	558 21.97
H mm inch	58.80 2.30	58.80 2.30	68 2.67	79 3.11	97 3.82
I mm inch	88 3.46	88 3.46	98 3.85	¹⁾	¹⁾
L mm inch	400.50 15.77	400.50 15.77	473 18.62	586.70 23.10	704.20 27.72
M mm inch	56.50 2.23	70 2.75	70 2.75	110 4.33	122.50 4.82
N mm inch	112 4.41	112 4.41	128.50 5.06	183.70 7.23	226.70 8.93
O ²⁾ mm inch	440 17.32	600 23.62	600 23.62	650 25.60	926 36.46
O ³⁾ mm inch	420 16.54	540 21.26	570 22.40	—	—

¹⁾ On request

²⁾ Valve

³⁾ Insert

Series 07.6

Main applications

Load lock chamber isolation on the atmospheric side of semiconductor production systems for 200, 300 and 450 mm wafers



Ordering information

Door with pneumatic actuator

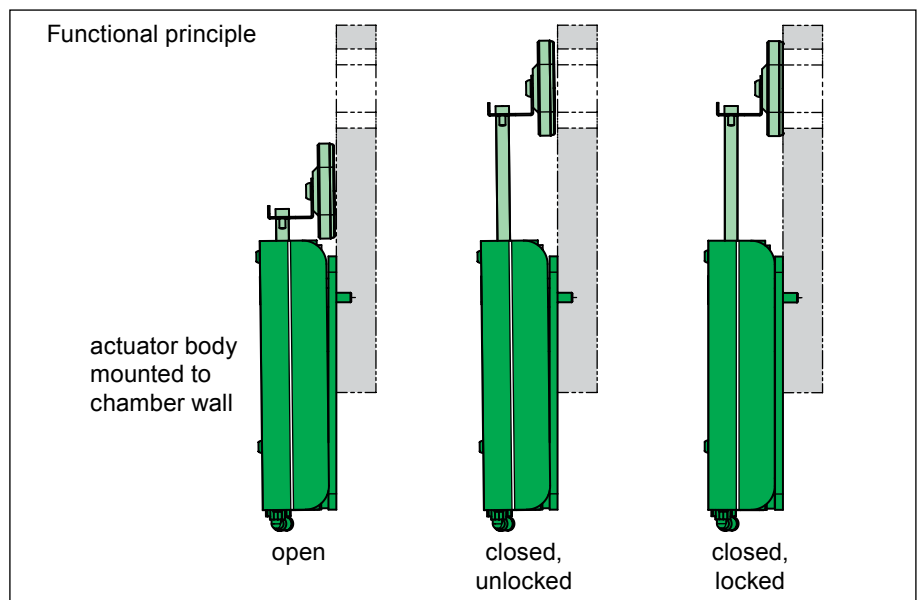
double acting
with position indicator

SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (* specify control voltage)	
mm	inch	aluminum	
		without solenoid valve	with impulse solenoid valve
50 × 336	1.97 × 13.23	07612-UA24	07612-UA44 *
56 × 496	2.20 × 19.53	07613-UA24	07613-UA44 *
Other sizes on request			

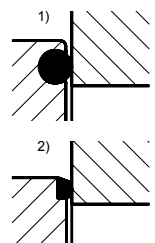
Features

Easy installation
Vulcanized gate seal: see glossary
Fast closing and opening
Long lifetime of actuator
Virtually particle and vibration-free
Easy maintenance



Options

- Other solenoid valve voltage (standard: 24 VDC)
- Other sealing materials
- O-ring seal ¹⁾ in gate (standard: vulcanized seal ²⁾)
- Pneumatically locked in closed and open position
- Parts kit for fast replacement of the door 07.5 against the door 07.6



Technical data

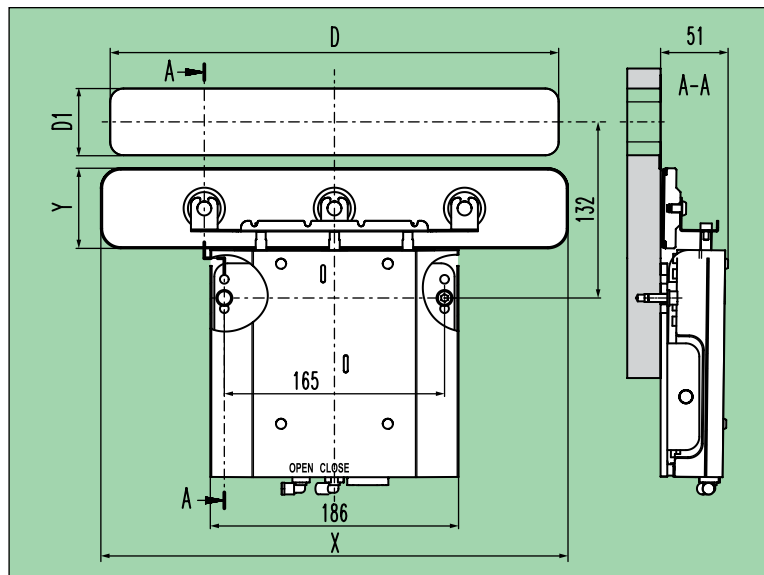
Leak rate ¹⁾ : gate	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-9}$ mbar to 1 bar (abs)
Differential pressure on the gate	
– In closing direction	1 bar
– In opening direction	0 bar
Cycles until first service	≥ 3 million
Temperature ²⁾	
– Gate	≤ 150 °C
– Actuator	≤ 80 °C
– Solenoid valve	≤ 50 °C
– Position indicator	≤ 60 °C
Material: gate	EN AW-6082 (3.2315), EN AW-5083 (3.3547) or EN AW-6061 (3.3211)
Seal: gate	FKM (Viton®)
Compressed air connection	quick connect fitting for 4 mm tube
Mounting position	actuator up or down
Impulse solenoid valve	24 VDC, 2.5 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 50 VAC/DC
– Current	≤ 0.5 A
– Power	max. 10 W
– Connection	9 pin subminiature D

¹⁾ With FKM (Viton®) seal

²⁾ Maximum values: depending on operating conditions and sealing materials

DN (D1 × D) D1 slit height D slit length		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch	bar	psi	l	ft ³	s	kg	lbs
50 × 336	1.97 × 13.23	4–7	58–102	0.25	0.007	≤ 1	4.3	9.5
56 × 496	2.20 × 19.53	4–7	58–102	0.25	0.007	≤ 1	4.9	10.8

Dimensions



D1 × D	mm inch	50 × 336 1.97 × 13.23	56 × 496 2.20 × 19.53
D	mm inch	336 13.23	496 19.53
D1	mm inch	50 1.97	56 2.20
X	mm inch	359 14.13	520 20.47
Y	mm inch	59 2.32	76 3

Series 02.4

Main applications

FPD production systems
up to generation 6

Suitable for use in high vacuum environ-
ment, e. g. in vapor deposition systems
for organic materials



Ordering information

Valve with pneumatic actuator
double acting
with position indicator

Opening sizes	50 × 500 mm (1.97" × 19.69") to 150 × 1250 mm (5.91" × 49.21")
Ordering numbers	on request (example: 02421-BA24- . . .)

Available dimensions:

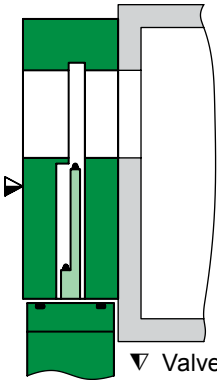
Standard sizes (X)

Special sizes (O),
available on request

		Height mm				
		50	80	100	130	150
Length mm	X = standard	500 / 600 /	X	X	X	X
		700 / 800 /	X	X	X	X
		900 / 1050 /	X	X	X	X
		1150 / 1250 /	X	X	X	X
	O = special	1350 / 1450 /	O	O	O	O
		1550 / 1650 /	O	O	O	O
		1750	O	O	O	O

Types

Valve type A



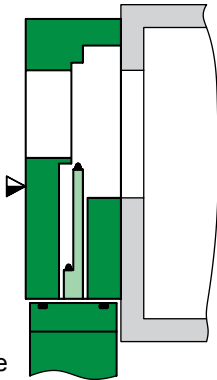
▽ Valve seat side

Opening:
Rear side = seat side

With bonnet flange

Gate service through
bonnet flange

Valve type B

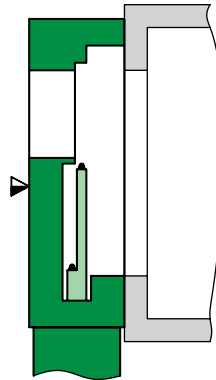


Opening:
Rear side > seat side

With bonnet flange

Gate service through
bonnet flange

Valve type C



Opening:
Rear side > seat side

Without bonnet flange

Gate service through
opening on rear side

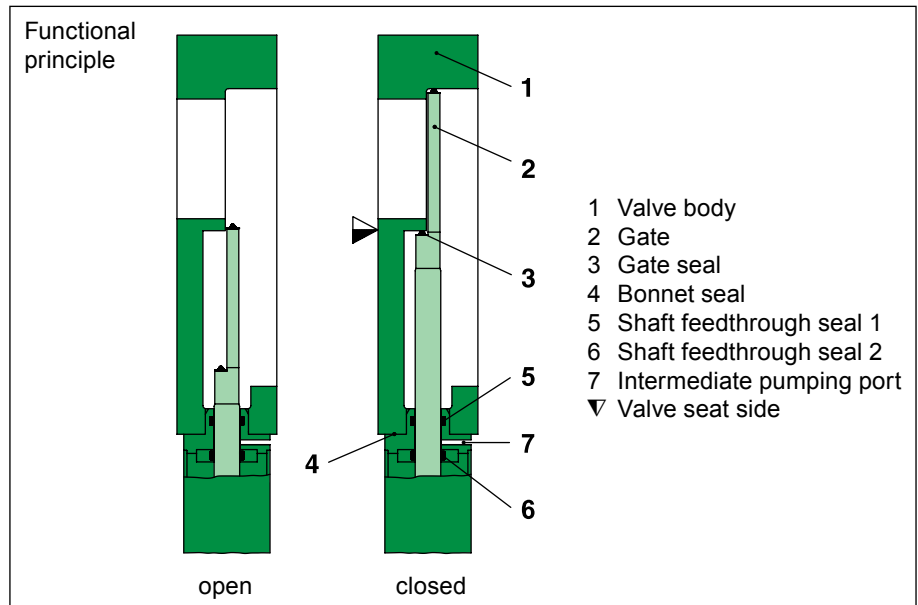
Features

Body material: aluminum

MONOVAT sealing technology:
see glossary

Compact design and small mounting
dimension

- 95 mm with opening lengths
up to 900 mm
- 115 mm with opening lengths
up to 1250 mm



Technical data

Further data on request

Leak rate ¹⁾ : valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Differential pressure on the gate	≤ 1 bar
Differential pressure at opening	≤ 5 mbar
Cycles until first service ^{1) 2)}	1 million
Closing or opening time ¹⁾	≤ 1.5 s (with 100 mm opening height)
Temperature ¹⁾	
– Valve body, gate	≤ 120 °C
– Actuator, position indicator	≤ 60 °C
Temperature difference body/gate	≤ 40 °C (up to 1250 mm opening length)
Material	
– Valve body, gate	EN AW-5083 (3.3547)
– Actuator shafts	AISI 304 (1.4301) hard-chrome plated
– Differential pressure tabs	AISI 304 (1.4301)
Seal	
– Gate, flanges, feedthrough	FKM (Viton®)
Feedthrough	shaft feedthrough with intermediate pumping
Mounting position ²⁾	actuator up, down or lateral
Position indicator: voltage	10–30 VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ Mounting position «actuator lateral» only possible with the option «bellows». Cycles until first service will be reduced to 0.5 million.

Options

- Solenoid for impulse actuation 24 VDC (others on request)
- Surface treatment, e. g. aluminum, hard anodized or nickel-plated
- Other sealing materials
- Bellows
- Grounding of gate

Series 02.7

Main applications

Web/foil coating systems



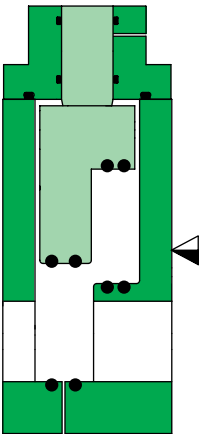
Ordering information

Valve with pneumatic actuator
double acting
with position indicator

Opening sizes	50 × 300 mm (1.97" × 11.81") to 50 × 1250 mm (1.97" × 49.21")
Ordering numbers	on request (example: 0270X-AA24-)

Type

Valve type A



▼ Valve seat side

Opening:
Rear side = seat side
With bonnet flange
Gate service through
bonnet flange

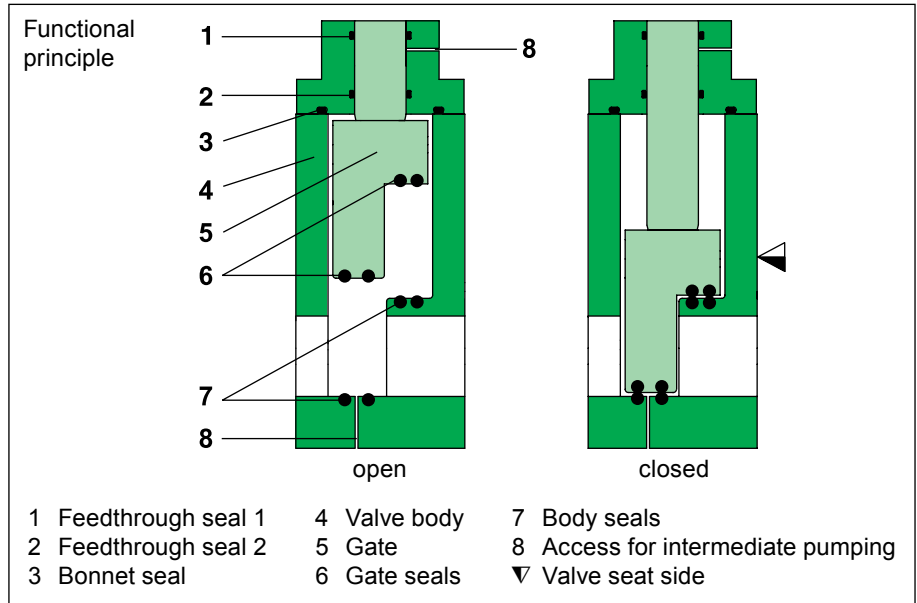
Features

Body material:
aluminum or stainless steel

MONOVAT sealing technology:
see glossary

No damage of the foil due to the
sophisticated sealing technology

Excellent sealing performance and high
safety due to double sealing and inter-
mediate pumping



Technical data

Further data on request

Leak rate ^{1) 2)} : valve body, valve seat	$< 1 \cdot 10^{-5} \text{ mbar ls}^{-1}$
Differential pressure on the gate	$\leq 1 \text{ bar}$
Differential pressure at opening	$\leq 5 \text{ mbar}$
Cycles until first service ²⁾	10 000
Closing or opening time ²⁾	$\leq 1.5 \text{ s}$ (at 50 mm opening height)
Temperature ²⁾	
– Valve body, gate	
– aluminum	$\leq 120 \text{ }^{\circ}\text{C}$
– stainless steel	$\leq 150 \text{ }^{\circ}\text{C}$
– Actuator, position indicator	$\leq 80 \text{ }^{\circ}\text{C}$
Temperature difference body/gate	$\leq 25 \text{ }^{\circ}\text{C}$
Material	
– Valve body, gate	
– aluminum	EN AW-5083 (3.3547)
– stainless steel	AISI 304 (1.4301)
– Actuator shafts	AISI 304 (1.4301)
Seal	
– Gate, flanges, feedthrough	FKM (Viton®)
Feedthrough	shaft feedthrough with intermediate pumping
Mounting position	actuator up or down
Position indicator: voltage	10–30 VDC PNP (NPN optional)
Tensile force of the foil on the gate	max. 0.5 N per mm (e. g. width of foil 300 mm, max. tensile force 150 N)

¹⁾ 4-fold sealing, stainless steel foil, thickness of foil 0.1 mm

²⁾ Maximum values: depending on operating conditions and sealing materials

Options

- Solenoid for impulse actuation 24 VDC (others on request)
- Surface treatment, e. g. aluminum, hard anodized or nickel-plated
- Bellows

Series 06.0

Main applications

FPD production systems
up to generation 11

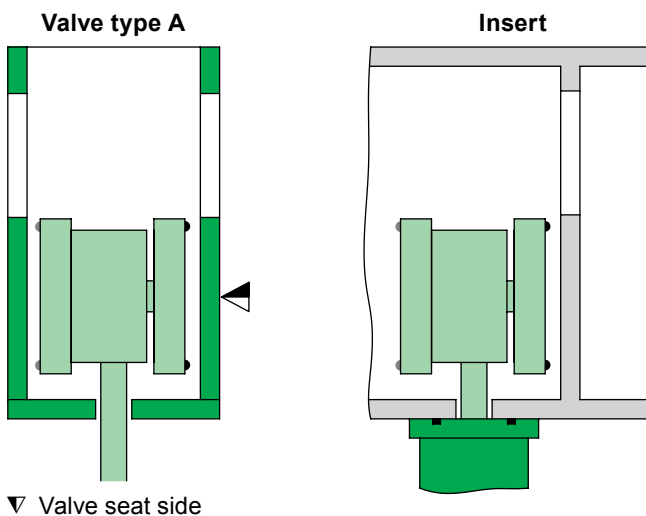


Ordering information

Valve with pneumatic actuator
double acting
with position indicator

Opening sizes	100 × 1300 mm (3.94" × 51.18") to 300 × 3000 mm (11.81" × 118.11")
Ordering numbers	on request (example: 0600X-AA49-)

Types



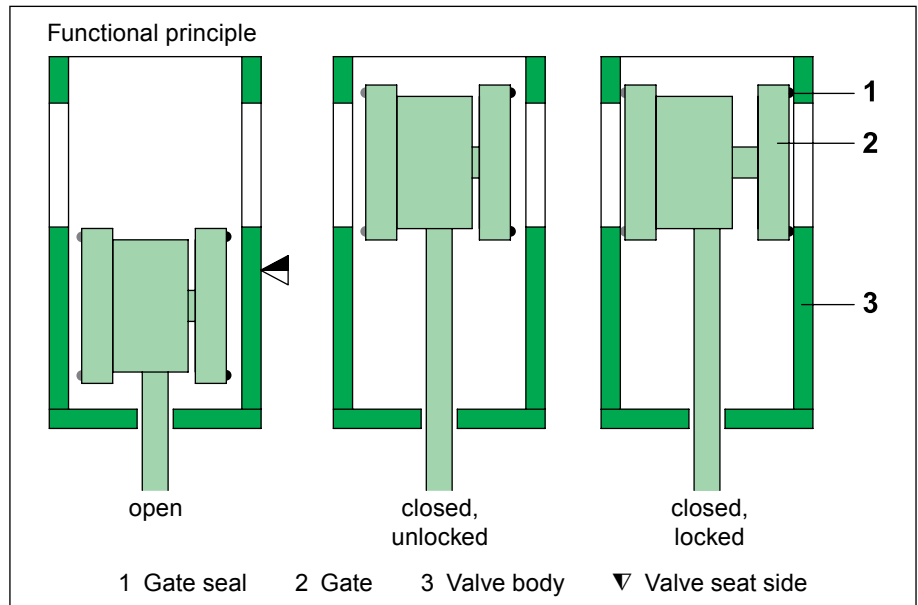
Features

Body material: aluminum

Modular design:
allows to realize a wide range of opening
sizes

Same mounting dimension for all
opening sizes

Logic or RS232 interface



Technical data

Further data on request

Leak rate ¹⁾ : valve body, valve seat	$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$
Differential pressure on the gate	$\leq 1 \text{ bar}$
Differential pressure at opening	$\leq 5 \text{ mbar}$
Cycles until first service ^{1) 2)}	1 million
Closing or opening time ¹⁾	$\leq 4 \text{ s}$ (with 120 mm opening height)
Temperature ¹⁾	
– Valve body, flanges	$\leq 120 \text{ }^{\circ}\text{C}$
– Actuator	$\leq 80 \text{ }^{\circ}\text{C}$
– Control unit	$\leq 50 \text{ }^{\circ}\text{C}$
Material	
– Valve body, gate, flanges	EN AW-6082 (3.2315), EN AW-5083 (3.3547)
– Actuator shafts	AISI 316 (1.4401)
Seal	
– Gate, flanges, feedthrough	FKM (Viton®)
Feedthrough	shaft feedthrough
Mounting position ²⁾	actuator up, down or lateral
Position indicator: voltage	24 VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ In the mounting position «actuator lateral» the cycles until first service will be reduced to 0.5 million

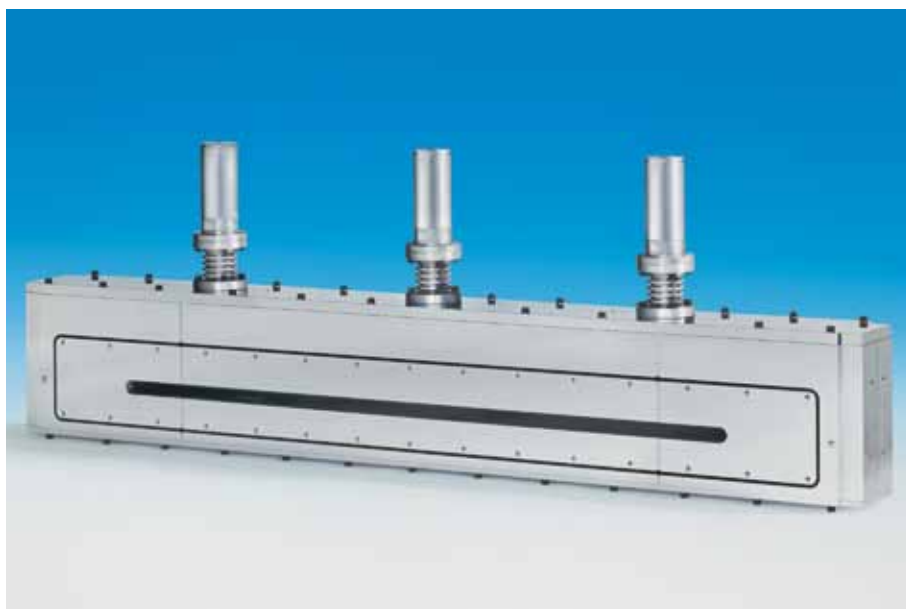
Options

- Other sealing materials
- Bellows
- Grounding of gate
- Resistant against 1 bar differential pressure in opening direction
- Surface treatment, e. g. aluminum, hard anodized

Series 06.6

Main applications

PV and large coating systems



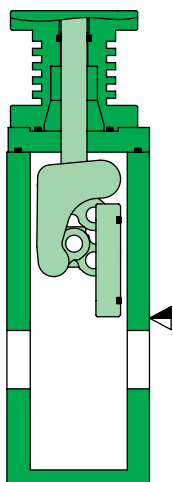
Ordering information

Valve with pneumatic actuator
double acting
with position indicator

Opening sizes	50 × 500 mm (1.97" × 19.69") to 300 × 3000 mm (11.81" × 118.11")
Ordering numbers	on request (example: 0660X-VA24- . . .)

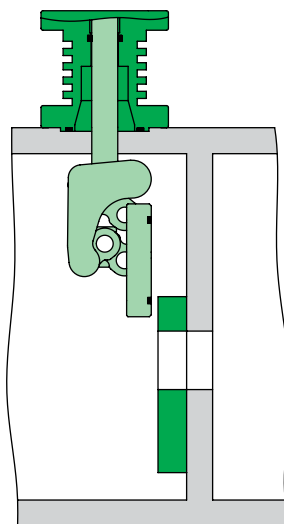
Types

Valve type V

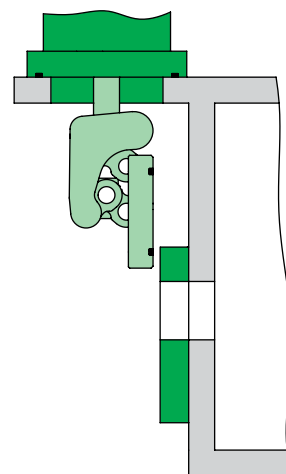


▼ Valve seat side

Insert type I



Door type T

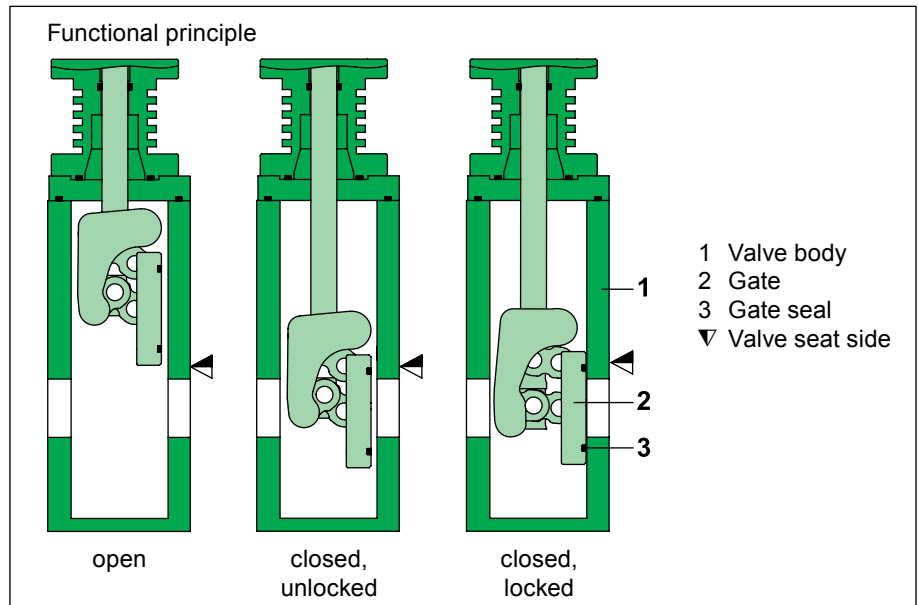


Features

Body material:
aluminum or stainless steel

Mechanism designed for harsh process conditions

Modular design:
allows to realize a wide range of opening sizes



Technical data

Further data on request

Leak rate ¹⁾

- Valve body
- Valve seat

$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$

$< 1 \cdot 10^{-5} \text{ mbar ls}^{-1}$

Differential pressure on the gate

$\leq 1 \text{ bar}$

Differential pressure at opening

$\leq 5 \text{ mbar}$

Cycles until first service ^{1) 2)}

1 million

Closing or opening time ¹⁾

$\leq 2.0 \text{ s}$ (with 100 mm opening height)

Temperature ¹⁾

- Valve body, flanges
- aluminum
- stainless steel
- Actuator, position indicator

$\leq 120 \text{ }^{\circ}\text{C}$

$\leq 200 \text{ }^{\circ}\text{C}$

$\leq 80 \text{ }^{\circ}\text{C}$

Material

- Valve body, gate, flanges
- aluminum
- stainless steel
- Actuator shafts

EN AW-6082 (3.2315),

EN AW-5083 (3.3547)

AISI 304 (1.4301), AISI 316L (1.4404)

AISI 304 (1.4301) hard-chrome plated

Seal

- Gate, flanges, feedthrough

FKM (Viton®)

Feedthrough

shaft feedthrough

Mounting position ²⁾

actuator up, down or lateral

Position indicator: voltage

10–30 VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ In the mounting position «actuator lateral» the cycles until first service will be reduced to 0.5 million

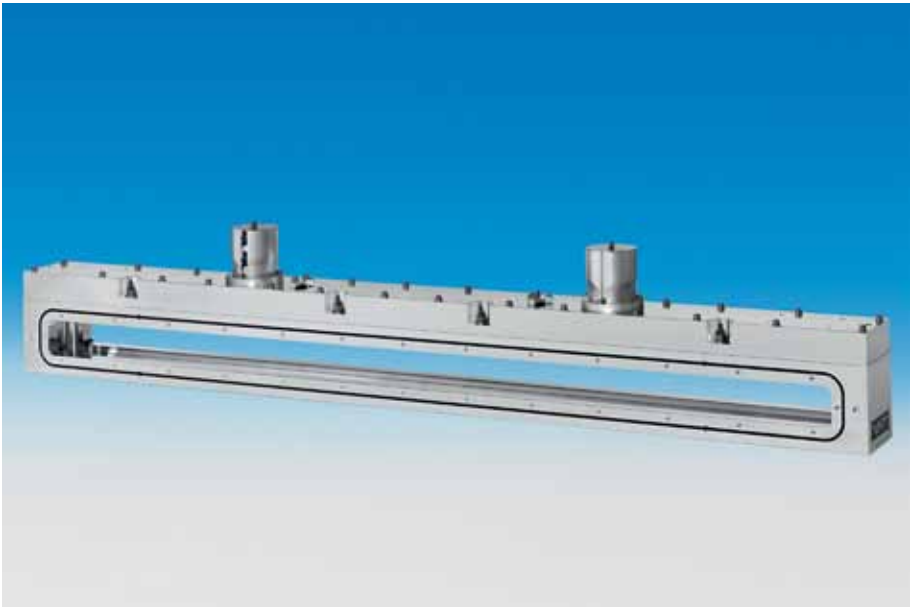
Options

- Solenoid for impulse actuation 24 VDC (others on request)
- Bellows
- Water cooling in valve body and gate
- Pneumatic locking for open gate position

Series 06.8

Main applications

PV and large coating systems

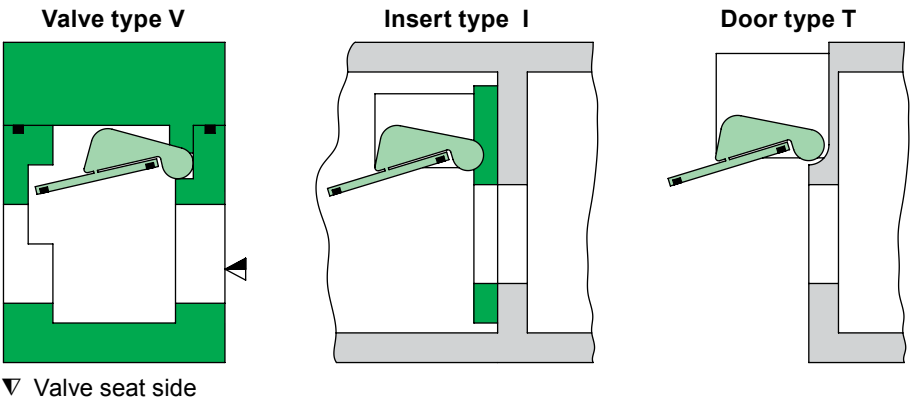


Ordering information

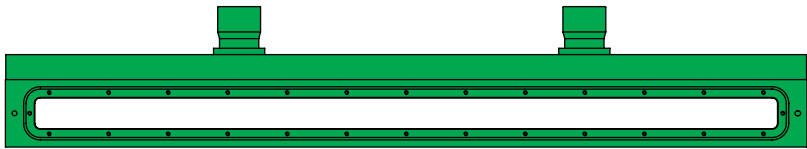
Valve with pneumatic actuator
double acting
with position indicator

Opening sizes	50 × 500 mm (1.97" × 19.69") to 100 × 3000 mm (3.94" × 118.11")
Ordering numbers	on request (example: 0680X-VA24- . . .)

Types



Actuators up



Actuators lateral



Features

Body material:

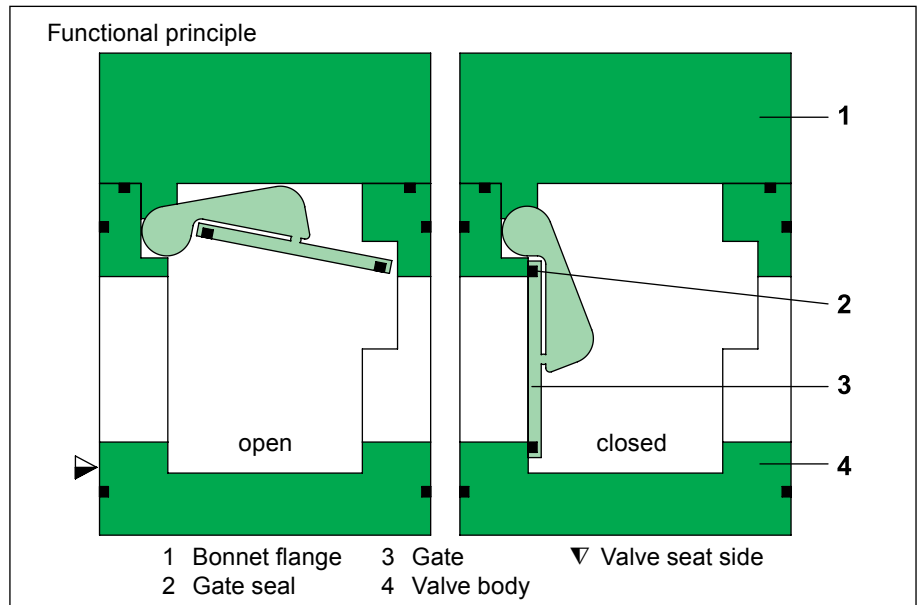
aluminum or stainless steel

Mechanism designed for harsh process conditions

Modular design:

allows to realize a wide range of opening sizes

Mechanically locked in closed position



Technical data

Further data on request

Leak rate ¹⁾

- Valve body
- Valve seat

$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$

$< 1 \cdot 10^{-5} \text{ mbar ls}^{-1}$

Differential pressure on the gate

- In closing direction
- In opening direction

$\leq 1 \text{ bar}$

$\leq 10 \text{ mbar}$ (optional 1 bar)

Differential pressure at opening

$\leq 5 \text{ mbar}$

Cycles until first service ^{1) 2)}

1 million

Closing or opening time ¹⁾

$\leq 1.2 \text{ s}$ (with size $80 \times 1500 \text{ mm}$)

Temperature ¹⁾

- Valve body, gate
- aluminum
- stainless steel
- Actuator

$\leq 120 \text{ }^{\circ}\text{C}$

$\leq 200 \text{ }^{\circ}\text{C}$

$\leq 80 \text{ }^{\circ}\text{C}$

Material

- Valve body, gate, flanges
- aluminum
- stainless steel
- Actuator shafts

EN AW-5083 (3.3547)

AISI 304 (1.4301)

SAE 1045 (1.1191),
nitro carburized and oxidized

Seal: gate, flanges

FKM (Viton®)

Feedthrough

rotary feedthrough

Mounting position ²⁾

actuator up, down or lateral

Position indicator: voltage

10–30VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ In the mounting position «actuator lateral» the cycles until first service will be reduced to 0.5 million

Options

- Solenoid for impulse actuation 24VDC (others on request)
- Other sealing materials
- Water cooling in valve body and gate
- Pneumatic locking for open gate position
- Resistant against 1 bar differential pressure in opening direction

Series 07.5

Main applications

FPD and PV production systems



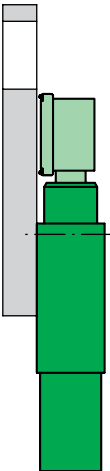
Ordering information

Door with pneumatic actuator
double acting
with position indicator

Opening sizes	25 × 560 mm (0.98" × 22.05") to 80 × 3500 mm (3.15" × 137.80")
Ordering numbers	on request (example: 0750X-UA24- . . .)

Type

Door type U



Actuator body mounted
to chamber wall

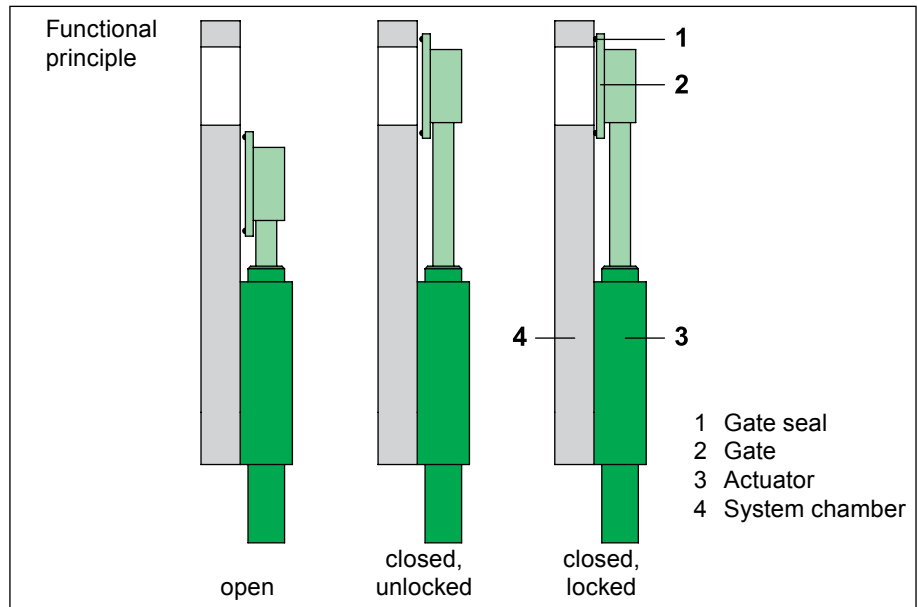
Features

Gate material:
aluminum or stainless steel

L-VAT sealing technology: see glossary

Virtually particle-free and vibration-free
L-movement

Low cost of ownership



Technical data

Further data on request

Leak rate ¹⁾ : gate in closing direction	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹ (Δp at gate = 1 bar)
Differential pressure on the gate	
– In closing direction	≤ 1 bar
– In opening direction	≤ 5 mbar
Differential pressure at opening	≤ 5 mbar
Cycles until first service ^{1) 2)}	1 million
Closing or opening time ¹⁾	
– Opening height 25–50 mm	≤ 1.5 s
– Opening height 51–80 mm	≤ 2.0 s
Temperature ¹⁾	
– Gate	
– aluminum	≤ 120 °C
– stainless steel	≤ 150 °C
– Actuator, position indicator	≤ 80 °C
Material	
– Gate	
– aluminum	EN AW-5083 (3.3547)
– stainless steel	AISI 304 (1.4301), AISI 316L (1.4404)
– Actuator shafts	AISI 304 (1.4301) hard-chrome plated
– Connecting parts	EN AW-6082 (3.2315)
Seal	
– Gate, actuator, pressure plate	FKM (Viton®)
Mounting position ²⁾	actuator up, down or lateral
Position indicator: voltage	10–30 VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ In the mounting position «actuator lateral» the cycles until first service will be reduced to 0.5 million

Options

- Solenoid for impulse actuation 24 VDC (others on request)
- Surface treatment, e. g. aluminum, hard anodized or nickel-plated
- Other sealing materials

Series 07.8 «small»

Main applications

FPD and PV production systems



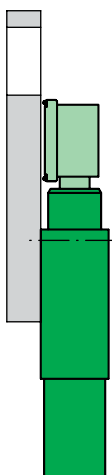
Ordering information

Door with pneumatic actuator
double acting
with position indicator

Opening sizes	81 × 800 mm (3.19" × 31.50") to 200 × 1200 mm (7.87" × 47.24")
Ordering numbers	on request (example: 0780X-UA24-)

Type

Door type U



Actuator body mounted
to chamber wall

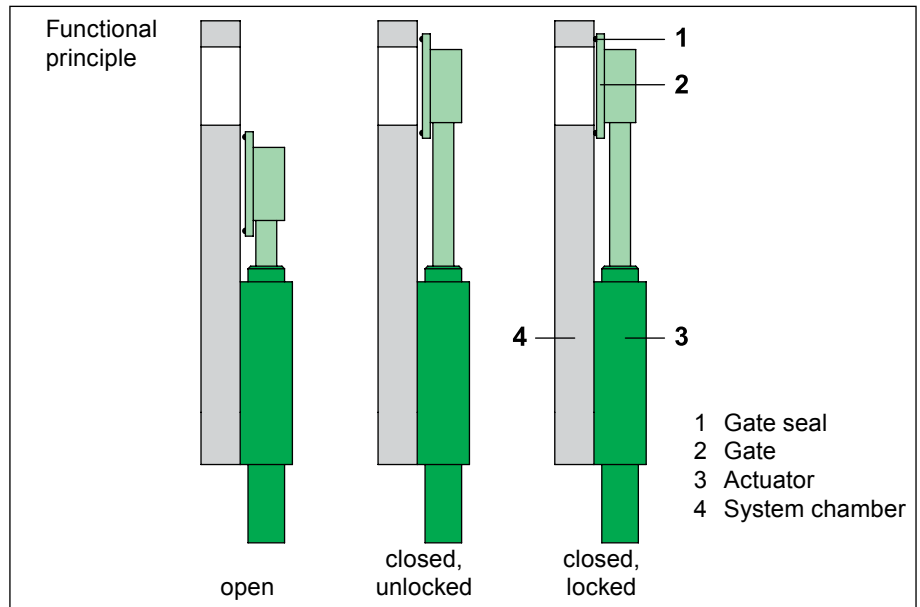
Features

Gate material: aluminum

L-VAT sealing technology: see glossary

Virtually particle-free and vibration-free
L-movement

Low cost of ownership



Technical data

Further data on request

Leak rate ¹⁾ : gate in closing direction	$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$ (Δp at gate = 1 bar)
Differential pressure on the gate	
– In closing direction	$\leq 1 \text{ bar}$
– In opening direction	$\leq 5 \text{ mbar}$
Differential pressure at opening	$\leq 5 \text{ mbar}$
Cycles until first service ^{1) 2)}	1 million
Closing or opening time ¹⁾	$\leq 2.5 \text{ s}$
Temperature ¹⁾	
– Gate	$\leq 120 \text{ }^{\circ}\text{C}$
– Actuator, position indicator	$\leq 80 \text{ }^{\circ}\text{C}$
Material	
– Gate	EN AW-5083 (3.3547)
– Actuator shafts	AISI 304 (1.4301) hard-chrome plated
– Connecting parts	EN AW-6082 (3.2315)
Seal	
– Gate	FKM (Viton®)
– Actuator, pressure plate	FKM (Viton®) and NBR
Mounting position ²⁾	actuator up or down
Position indicator: voltage	10–30 VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ In the mounting position «actuator lateral» the cycles until first service will be reduced to 0.5 million

Options

- Solenoid for impulse actuation 24 VDC (others on request)
- Surface treatment, e. g. aluminum, hard anodized or nickel-plated
- Other sealing materials

Series 07.8

Main applications

FPD and PV production systems



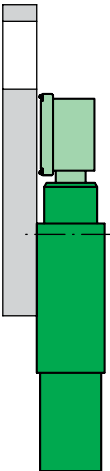
Ordering information

Door with pneumatic actuator
double acting
with position indicator

Opening sizes	81 × 800 mm (3.19" × 31.50") to 250 × 3000 mm (9.84" × 118.11")
Ordering numbers	on request (example: 0780X-UA24-)

Type

Door type U



Actuator body mounted
to chamber wall

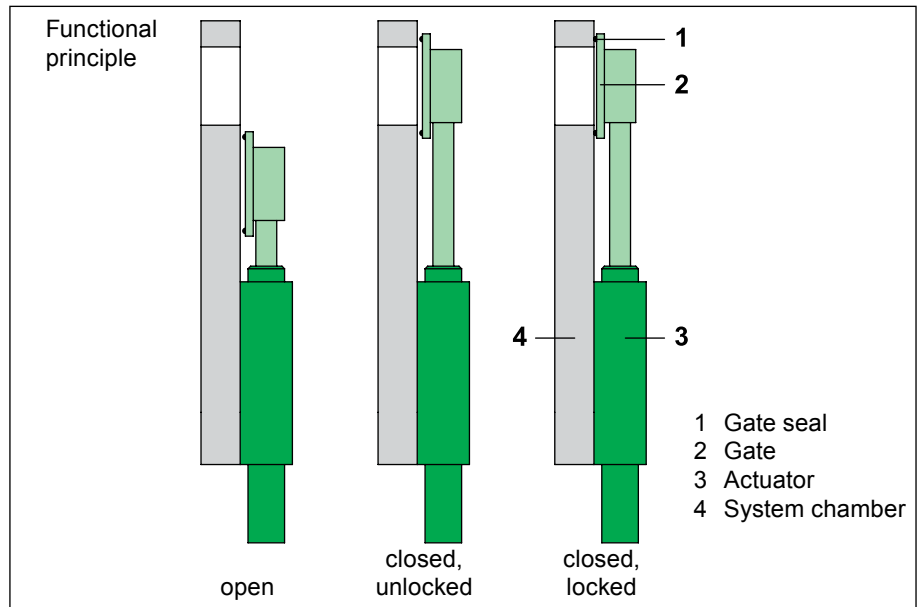
Features

Gate material:
aluminum or stainless steel

L-VAT sealing technology: see glossary

Virtually particle and vibration-free
L-movement

Low cost of ownership



Technical data

Further data on request

Leak rate ¹⁾ : gate in closing direction	$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$ (Δp at gate = 1 bar)
Differential pressure on the gate	
– In closing direction	$\leq 1 \text{ bar}$
– In opening direction	$\leq 5 \text{ mbar}$
Differential pressure at opening	$\leq 5 \text{ mbar}$
Cycles until first service ^{1) 2)}	1 million
Closing or opening time ¹⁾	$\leq 3.5 \text{ s}$
Temperature ¹⁾	
– Gate	
– aluminum	$\leq 120 \text{ }^{\circ}\text{C}$
– stainless steel	$\leq 150 \text{ }^{\circ}\text{C}$
– Actuator, position indicator	$\leq 80 \text{ }^{\circ}\text{C}$
Material	
– Gate	
– aluminum	EN AW-5083 (3.3547)
– stainless steel	AISI 304 (1.4301), AISI 316L (1.4404)
– Actuator shafts	AISI 304 (1.4301) hard-chrome plated
– Connecting parts	EN AW-6082 (3.2315)
Seal	
– Gate	FKM (Viton®)
– Actuator, pressure plate	FKM (Viton®) and NBR
Mounting position ²⁾	actuator up, down or lateral
Position indicator: voltage	10–30 VDC PNP (NPN optional)

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ In the mounting position «actuator lateral» the cycles until first service will be reduced to 0.5 million

Options

- Solenoid for impulse actuation 24 VDC (others on request)
- Surface treatment, e. g. aluminum, hard anodized or nickel-plated
- Other sealing materials

Main applications

For roughing/backing line isolation and rough metering of gases and liquids



Ordering information

Valve with manual actuator
handwheel

DN		Ordering numbers	
mm	inch	Valve ISO-KF	Spare diaphragm
16	$\frac{5}{8}$	22024-KA01	100618-01
25	1	22028-KA01	100619-01
40	1½	22032-KA01	100620-01

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-7}$ mbar to 5 bar (abs)
Cycles until first service	20 000
Temperature ¹⁾	
– Valve body	≤ 100 °C
– Actuator	≤ 50 °C
Material	
– Valve body	EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315)
– Actuator	plastic (POM)
Seal: diaphragm	FKM (Viton®)
Mounting position	any
Valve position indication	visual (mechanical)
Conductance (molecular flow)	
– DN 16 / 25 / 40	2 / 5 / 17 ls ⁻¹
Turns per stroke	
– DN 16 / 25 / 40	3.5 / 5 / 6.5
Weight	
– DN 16	0.16 kg / 0.35 lbs
– DN 25	0.50 kg / 1.10 lbs
– DN 40	1.20 kg / 2.60 lbs

¹⁾ Maximum values: depending on operating conditions and sealing materials

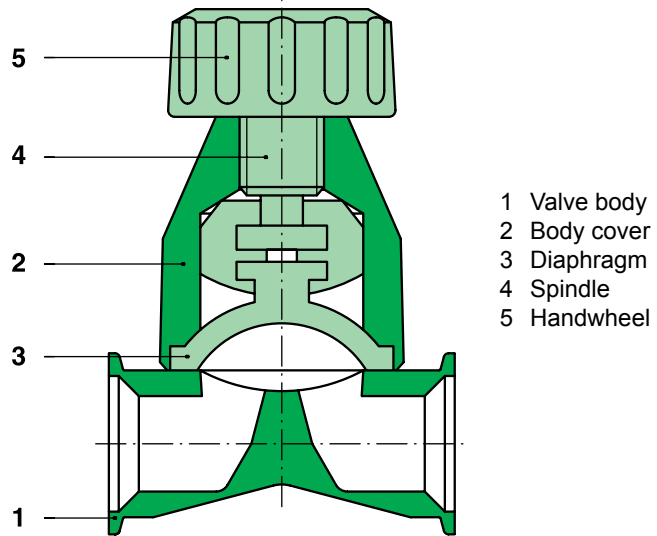
Features

Body material: aluminum

Robust vacuum valve

Easy replacement of the diaphragm

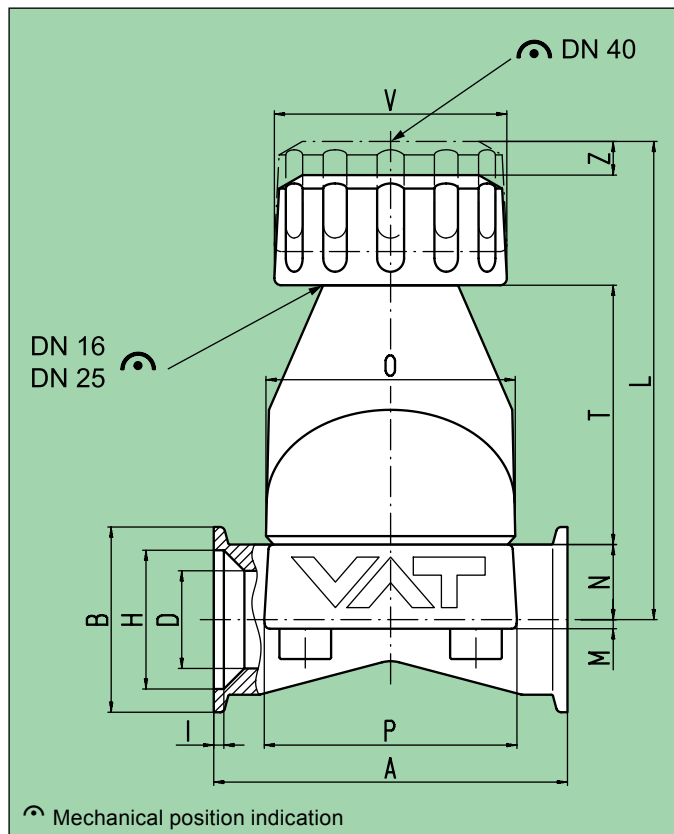
Functional principle



Spare parts

– Spare diaphragm
See ordering information

Dimensions



DN	mm inch	16 5/8	25 1	40 1 1/2
A	mm inch	52 2.05	80 3.15	105 4.13
B	mm inch	30 1.18	40 1.57	55 2.17
D	mm inch	15 0.59	19 0.75	29 1.14
H	mm inch	17.20 0.68	26.20 1.03	41.20 1.62
I	mm inch	3 0.12	3 0.12	3 0.12
L	mm inch	66.50 2.62	111 4.37	132 5.20
M	mm inch	10 0.39	2 0.08	2.70 0.11
N	mm inch	10 0.39	14 0.55	22.30 0.88
O	mm inch	□ 32×32 □ 1.26×1.26	□ 54×54 □ 2.13×2.13	□ 74×79 □ 2.91×3.11
P	mm inch	□ 32×32 □ 1.26×1.26	□ 54×54 □ 2.13×2.13	□ 75×80 □ 2.95×3.15
T	mm inch	27.50 1.08	56 2.20	77 3.03
V	mm inch	30 1.18	47.50 1.87	69 2.72
Z	mm inch	5.50 0.22	10 0.39	–

Main applications

For pumping and venting of vacuum systems with large gas flows



Ordering information

Valve with manual actuator
removable handwheel

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	—	24420-KE01	—	—
	16	5/8	24424-KA01	24424-KE01	24524-KA01	24524-KE01
	25	1	24428-KA01	24428-KE01	24528-KA01	24528-KE01
	40	1 1/2	24432-KA01	24432-KE01	24532-KA01	24532-KE01
	50	2	24434-KA01	24434-KE01	24534-KA01	24534-KE01
ISO-K	63	2 1/2	24436-QA01	24436-QE01	—	—
	80	3	24438-QA01	—	24538-QA01	—

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
without position indicator

ISO-KF	10	3/8	—	24420-KE11	—	—
	16	5/8	24424-KA11	24424-KE11	24524-KA11	24524-KE11
	25	1	24428-KA11	24428-KE11	24528-KA11	24528-KE11
	40	1 1/2	24432-KA11	24432-KE11	24532-KA11	24532-KE11
	50	2	24434-KA11	24434-KE11	24534-KA11	24534-KE11
ISO-K	63	2 1/2	24436-QA11	24436-QE11	—	—
	80	3	24438-QA11	—	24538-QA11	—
	100	4	24440-QA11	—	—	—
	160	6	24444-QA11	—	—	—

without solenoid valve, with position indicator: 24 **21**

with solenoid valve, without position indicator: 24 **31** (specify control voltage)

with solenoid valve, with position indicator: 24 **41** (specify control voltage)

Valve with pneumatic actuator
single acting with opening spring (NO)
without solenoid valve
without position indicator

ISO-KF	10	3/8	—	24420-KE12	—	—
	16	5/8	24424-KA12	24424-KE12	24524-KA12	24524-KE12
	25	1	24428-KA12	24428-KE12	24528-KA12	24528-KE12
	40	1 1/2	24432-KA12	24432-KE12	24532-KA12	24532-KE12
	50	2	24434-KA12	24434-KE12	24534-KA12	24534-KE12

without solenoid valve, with position indicator: 24 **22**

with solenoid valve, without position indicator: 24 **32** (specify control voltage)

with solenoid valve, with position indicator: 24 **42** (specify control voltage)

Further ordering information on next page →

Features

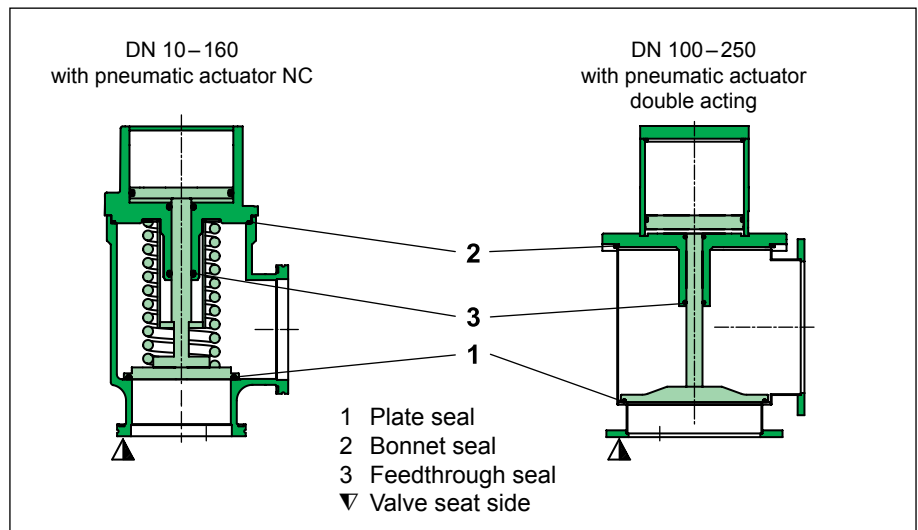
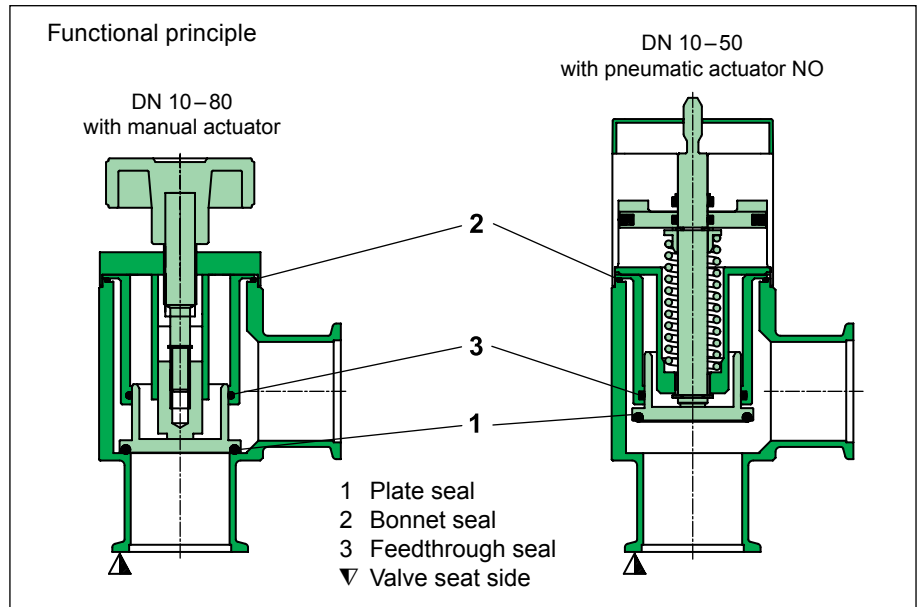
Body material:
aluminum or stainless steel

Angle and inline version

Shaft feedthrough

Resistant against differential pressure

Long lifetime



Technical data

See series 26, pages 183–185

Continued Ordering information

Valve with pneumatic actuator
double acting
without solenoid valve
without position indicator

	DN		Ordering numbers	
	mm	inch	aluminum	stainless steel
ISO-K	100	4	24440-QA14	24440-QE14
	160	6	24444-QA14	24444-QE14
	200	8	–	24446-QE14
	250	10	–	24448-QE14

without solenoid valve, with position indicator: 244 . . -Q . 24

with solenoid valve, without position indicator: 244 . . -Q . 34 (specify control voltage)

with solenoid valve, with position indicator: 244 . . -Q . 44 (specify control voltage)

Valve with electromagnetic actuator

See pages 190–191

Main applications

For pumping and venting of
HV systems

(For large gas flows we recommend
series 24)



Ordering information

Valve with manual actuator
removable handwheel

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	—	26420-KE01	—	—
	16	5/8	26424-KA01	26424-KE01	26524-KA01	26524-KE01
	25	1	26428-KA01	26428-KE01	26528-KA01	26528-KE01
	40	1 1/2	26432-KA01	26432-KE01	26532-KA01	26532-KE01
	50	2	26434-KA01	26434-KE01	26534-KA01	26534-KE01
ISO-K	63	2 1/2	26436-QA01	26436-QE01	—	—
	80	3	26438-QA01	—	26538-QA01	—
	100	4	26440-QA01	26440-QE01	—	—
	160	6	26444-QA01	26444-QE01	—	—

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
without position indicator

ISO-KF	10	3/8	—	26420-KE11	—	—
	16	5/8	26424-KA11	26424-KE11	26524-KA11	26524-KE11
	25	1	26428-KA11	26428-KE11	26528-KA11	26528-KE11
	40	1 1/2	26432-KA11	26432-KE11	26532-KA11	26532-KE11
	50	2	26434-KA11	26434-KE11	26534-KA11	26534-KE11
ISO-K	63	2 1/2	26436-QA11	26436-QE11	—	—
	80	3	26438-QA11	—	26538-QA11	—
	100	4	26440-QA11	26440-QE11	—	—
	160	6	26444-QA11	26444-QE11	—	—

without solenoid valve, with position indicator: 26 **21**

with solenoid valve, without position indicator: 26 **31** (specify control voltage)

with solenoid valve, with position indicator: 26 **41** (specify control voltage)

Valve with pneumatic actuator
single acting with opening spring (NO)
without solenoid valve
without position indicator

ISO-KF	10	3/8	—	26420-KE12	—	—
	16	5/8	26424-KA12	26424-KE12	26524-KA12	26524-KE12
	25	1	26428-KA12	26428-KE12	26528-KA12	26528-KE12
	40	1 1/2	26432-KA12	26432-KE12	26532-KA12	26532-KE12
	50	2	26434-KA12	26434-KE12	26534-KA12	26534-KE12

without solenoid valve, with position indicator: 26 **22**

with solenoid valve, without position indicator: 26 **32** (specify control voltage)

with solenoid valve, with position indicator: 26 **42** (specify control voltage)

Further ordering information on next page →

Features

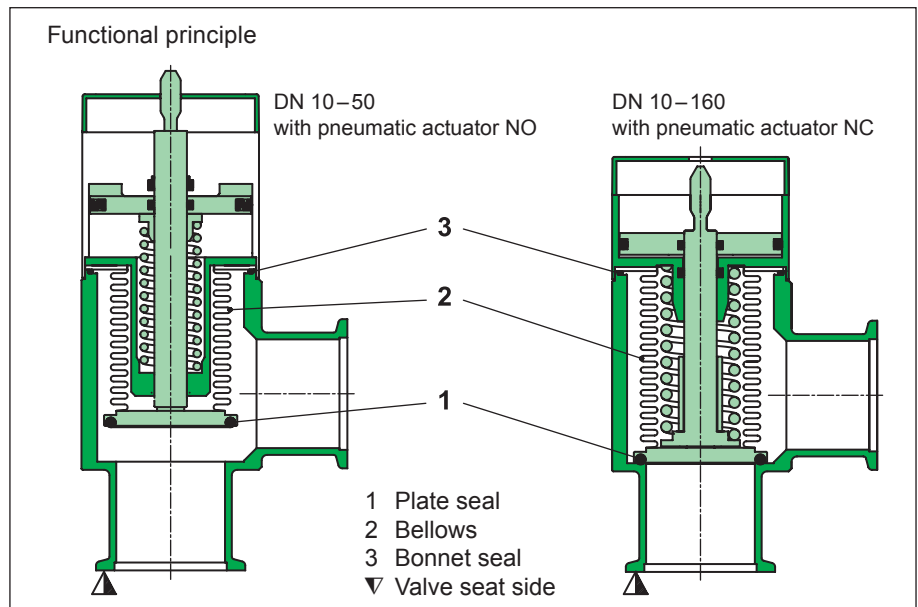
Body material:
aluminum or stainless steel

Angle and inline version

Bellows

Resistant against differential pressure

Long lifetime



Technical data

Leak rate: valve body, valve seat

$< 1 \cdot 10^{-9}$ mbar ls⁻¹

Pressure range, series 24
(shaft feedthrough)

– DN 10– 50	$1 \cdot 10^{-7}$ mbar to 5 bar (abs)
– DN 63– 80	$1 \cdot 10^{-7}$ mbar to 4 bar (abs)
– DN 100–160	$1 \cdot 10^{-7}$ mbar to 2 bar (abs)
– DN 200–250	$1 \cdot 10^{-7}$ mbar to 1.6 bar (abs)

Pressure range, series 26
(bellows)

– DN 10– 50	$1 \cdot 10^{-8}$ mbar to 5 bar (abs)
– DN 63– 80	$1 \cdot 10^{-8}$ mbar to 4 bar (abs)
– DN 100–160	$1 \cdot 10^{-8}$ mbar to 2 bar (abs)

Differential pressure on the plate

– In opening direction	DN 10– 50	≤ 2.0 bar
	DN 63–250	≤ 1.2 bar
– In closing direction	DN 10– 50	≤ 5.0 bar
	DN 63– 80	≤ 4.0 bar
	DN 100–160	≤ 2.0 bar
	DN 200–250	≤ 1.6 bar

Differential pressure at opening

≤ 1 bar

Further technical data on next page →

Continued Ordering information

Valve with pneumatic actuator
double acting
without solenoid valve
without position indicator

	DN		Ordering numbers	
	mm	inch	aluminum	stainless steel
ISO-K	100	4	26440-QA14	26440-QE14
	160	6	26444-QA14	26444-QE14

without solenoid valve, with position indicator: 264 . . -Q . 24

with solenoid valve, without position indicator: 264 . . -Q . 34 (specify control voltage)

with solenoid valve, with position indicator: 264 . . -Q . 44 (specify control voltage)

Valve with electromagnetic actuator

See pages 190–191

Continued Technical data

Cycles until first service

- DN 10– 80
- DN 100–160, series 24
- DN 100–160, series 26
- DN 200–250

with manual actuator	with closing / opening spring	double acting
10000	3 million	–
10000	1 million	2 million
10000	1 million ³⁾	1 million ³⁾
–	–	1 million ^{1) 3)}

Temperature²⁾

- Valve body
- Manual and pneumatic actuator
- Solenoid valve, position indicator
- DN 10– 80
- DN 100–160

≤ 150 °C
≤ 120 °C
≤ 80 °C
≤ 50 °C

Material

- Valve body
 - aluminum DN 16– 63 EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315)
 - DN 80–160 EN AC-42000
 - stainless steel DN 16–160 AISI 304 (1.4301), AISI 316L (1.4404)
 - DN 200–250 AISI 321 (1.4541), AISI 304 (1.4301)
- Plate DN 16–160 AISI 316L (1.4404, 1.4435)
- DN 200–250 AISI 304 (1.4301)
- Bellows AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571)

Seal: bonnet, plate

FKM (Viton®)

Feedthrough

- Series 24
- Series 26

shaft feedthrough
bellows

Mounting position

any

Solenoid valve

- DN 10– 80
- DN 100–160

24 VDC, 2.5 W (others on request)
24 VDC, 1.0 W (others on request)

¹⁾ Reduced lifetime with venting applications

²⁾ Maximum values: depending on operating conditions and sealing materials

³⁾ Tested at room temperature under clean and static conditions

Position indicator: contact rating

- Voltage
- Current

DN 10–160: 5–50 VAC/DC
5–100 mA

DN 200–250: ≤50 VAC/DC
≤1.2 A

Valve position indication

visual (mechanical)

Angle valves

Angle valves			Valve with manual actuator					Valve with pneumatic actuator, single acting with closing spring (NC)								
DN (nominal I.D.)		Conductance (molecular flow)	Turns per stroke	Weight				Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight			
				Aluminum body		Stainless steel body							Aluminum body		Stainless steel body	
mm	inch	ls ⁻¹	n	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
10	¾	3	3.6	–	–	0.26	0.57	4–8	58–116	0.004	0.0001	0.10	–	–	0.34	0.75
16	⅝	5	3.6	0.20	0.44	0.26	0.57	4–8	58–116	0.004	0.0001	0.10	0.28	0.62	0.34	0.75
25	1	14	3.8	0.27	0.60	0.34	0.75	4–8	58–116	0.011	0.0004	0.20	0.41	0.90	0.51	1.12
40	1½	45	4.5	0.60	1.32	0.75	1.65	4–8	58–116	0.035	0.0012	0.55	0.97	2.14	1.13	2.49
50	2	80	4.8	0.94	2.07	1.10	2.43	4–8	58–116	0.047	0.0017	0.65	1.45	3.20	1.61	3.55
63	2½	160	6.6	2.90	6.39	1.70	3.75	4–8	58–116	0.112	0.0040	0.70	2.90	6.39	1.70	3.75
80	3	200	6.6	3.10	6.83	3.39	7.47	4–8	58–116	0.112	0.0040	0.70	3.10	6.83	–	–
100	4	440	11	5.79	12.76	4.85	10.69	4.5–7	65–102	0.330	0.0117	1	10	22	10	22
160	6	1000	11	8.83	19.47	7.35	16.20	4.5–7	65–102	0.650	0.0230	2	14	31	14	31

Angle valves

			Valve with pneumatic actuator, single acting with opening spring (NO)							
DN (nominal I.D.)		Conductance (molecular flow)		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight	
mm	inch	ls ⁻¹		bar	psi	l	ft ³	s	kg	lbs
10	$\frac{3}{8}$	3		4–8	58–116	0.004	0.0001	0.10	0.40	0.88
16	$\frac{5}{8}$	5		4–8	58–116	0.004	0.0001	0.10	0.40	0.88
25	1	14		4–8	58–116	0.011	0.0004	0.15	0.60	1.32
40	1½	45		4–8	58–116	0.035	0.0012	0.20	1.36	3
50	2	80		4–8	58–116	0.047	0.0017	0.25	2.10	4.63

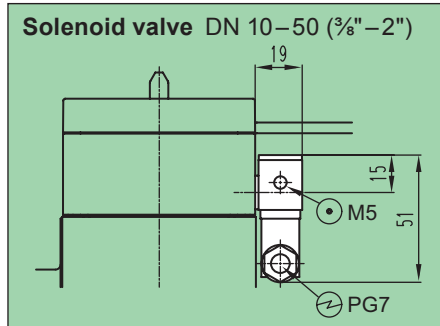
			Valve with pneumatic actuator, double acting							
100	4	440		4.5–7	65–102	0.330	0.0117	1	7.38	16.27
160	6	1000		4.5–7	65–102	0.380	0.0134	2	12.54	27.65
200	8	2000		5–7	73–102	3.100	0.1095	2	21	46.30
250	10	3100		5–7	73–102	3.100	0.1095	2	24	52.91

Inline valves

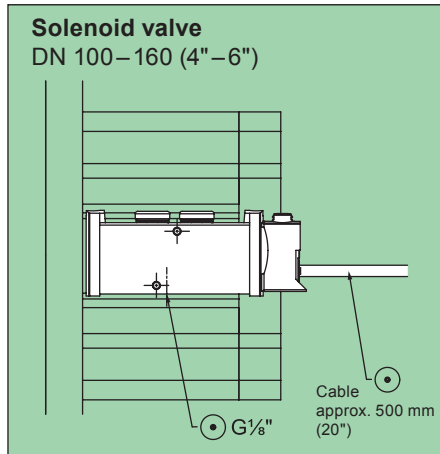
			Valve with manual actuator					Valve with pneumatic actuator, single acting with closing spring (NC)								
DN (nominal I.D.)		Conductance (molecular flow)	Turns per stroke	Weight				Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight			
				Aluminum body		Stainless steel body							Aluminum body		Stainless steel body	
mm	inch	ls ⁻¹	n	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
16	$\frac{5}{8}$	5	3.6	0.28	0.62	0.26	0.57	4–8	58–116	0.004	0.0001	0.10	0.50	1.10	0.50	1.10
25	1	14	3.8	0.42	0.93	1.04	2.29	4–8	58–116	0.011	0.0004	0.20	0.60	1.32	0.60	1.32
40	1½	45	4.5	1	2.20	2.45	5.40	4–8	58–116	0.035	0.0012	0.55	1.40	3.09	1.20	2.65
50	2	80	4.8	1.61	3.55	4.71	10.38	4–8	58–116	0.047	0.0017	0.65	2.60	5.73	2.60	5.73
80	3	200	6.6	3	6.61	–	–	4–8	58–116	0.112	0.0040	0.70	3.75	8.27	–	–

			Valve with pneumatic actuator, single acting with opening spring (NO)									
16	$\frac{5}{8}$	5		4–8	58–116	0.004	0.0001	0.10	0.45	0.99	0.47	1.04
25	1	14		4–8	58–116	0.011	0.0004	0.15	0.70	1.54	0.60	1.32
40	1½	45		4–8	58–116	0.035	0.0012	0.20	1.54	3.40	1.40	3.09
50	2	80		4–8	58–116	0.047	0.0017	0.25	2.90	6.39	2.79	6.15

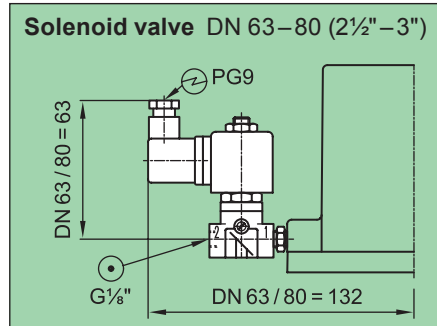
Solenoid valve



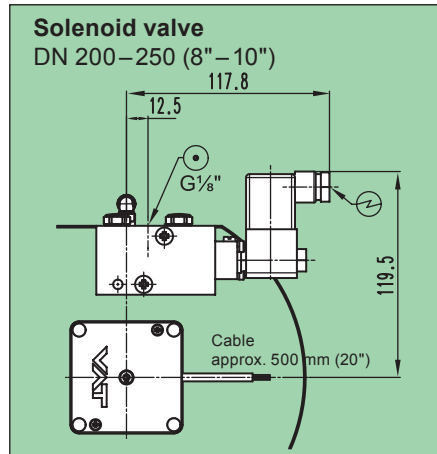
Ordering numbers: 24/26 31/41
24/26 32/42



Ordering numbers: 24/26 31/41
24/26 34/44

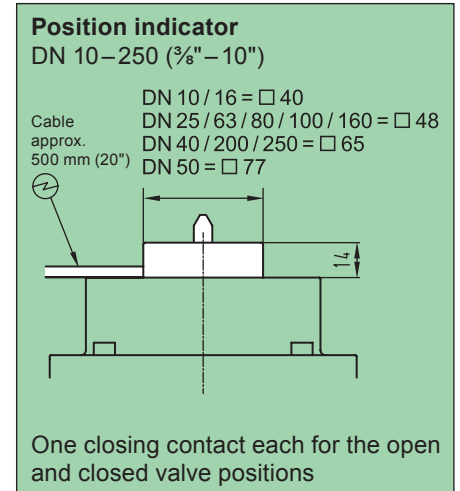


Ordering numbers: 24/26 31/41



Ordering numbers: 24/26 34/44

Position indicator



Ordering numbers: 24/26 21/41
24/26 22/42
24/26 24/44

⊙ Compressed air connection
⊕ Electrical connection

Options

Actuator

- Other solenoid valve voltage (standard: 24 VDC)
- Solenoid valve with manual emergency operation
- Position indicator bakeable to 120 °C or 200 °C
- Common connector for solenoid valve and position indicator (up to 48 V only)
- Customer specified actuators

Valve

- CF flanges
- Other sealing materials
- Customer specified bodies

Ordering information for options:

Ordering No. of valve-X (e. g. 26432-KA41-X, X = pos. indicator bakeable to 200 °C)

Spare parts

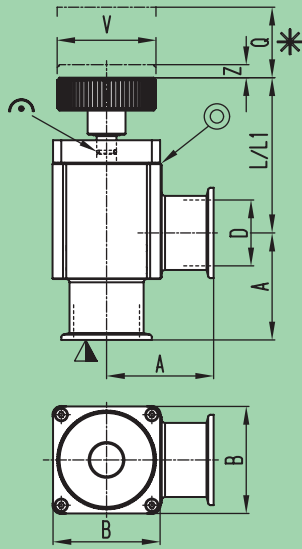
- **Seals**
on request (specify fabrication number of valve)

Accessories

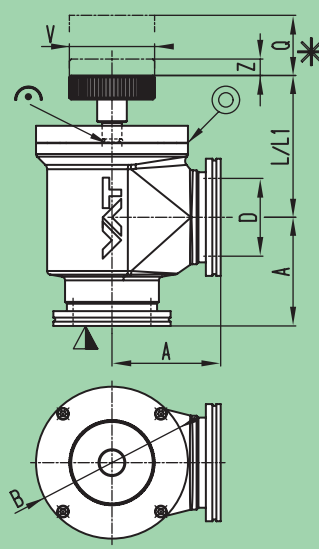
- **Heater**
on request (specify fabrication number of valve)
- **Flange connections**
for installation of the valve: see series 31 and 32

Dimensions

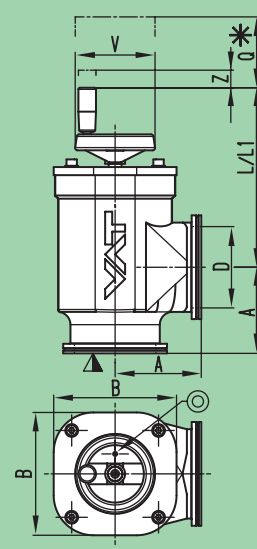
Angle valve with manual actuator
DN 10–50 ($\frac{3}{8}$ "–2") ISO-KF



Angle valve with manual actuator
DN 63–80 ($2\frac{1}{2}$ "–3") ISO-K



Angle valve with manual actuator
DN 100–160 (4"–6") ISO-K



DN	mm	10	16	25	40	50	63	80	100	160
inch		$\frac{3}{8}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	6
A	mm	30	40	50	65	70	88	90	108	138
	inch	1.18	1.57	1.97	2.56	2.76	3.46	3.54	4.25	5.43
B	mm	40	40	48	65	77	123	123	154	215
	inch	1.57	1.57	1.89	2.56	3.03	4.84	4.84	6.06	8.46
D	mm	12	16	25	40	50	63	80	100	153
	inch	0.47	0.63	0.98	1.57	1.97	2.48	3.15	3.94	6.02
L	mm	—	64.90	60.90	94.30	101.10	112	111.70	225.10	240.50
	inch	—	2.56	2.40	3.71	3.98	4.41	4.40	8.86	9.47
L1	mm	67.40	67.40	64.30	97.30	104.10	111.70	—	215.60	244.70
	inch	2.65	2.65	2.53	3.83	4.10	4.40	—	8.49	9.63
Q	mm	46	46	44	73.50	85.50	105	105	170	195
	inch	1.81	1.81	1.73	2.89	3.37	4.13	4.13	6.69	7.68
V	mm	40	40	40	60	60	60	60	100	160
	inch	1.57	1.57	1.57	2.36	2.36	2.36	2.36	3.94	6.30
Z ¹⁾	mm	3.60	3.60	4.70	7.90	9.30	13.30	13.30	22	27.20
	inch	0.14	0.14	0.19	0.31	0.37	0.52	0.52	0.87	1.07

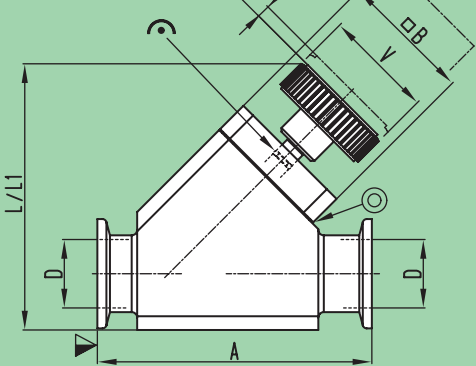
- ▽ Valve seat side
 * Required for dismantling
 ☉ Mechanical position indication
 ☉ Leak detection hole

L = aluminum
 L1 = stainless steel

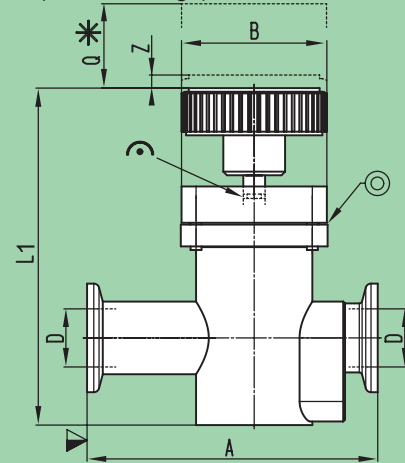
¹⁾ Gate stroke is longer due to transmission

DN 80 on request

Inline valve with manual actuator ISO-KF
DN 16–50 ($\frac{5}{8}$ "–2")
aluminum
DN 25–50 (1"–2")
stainless steel

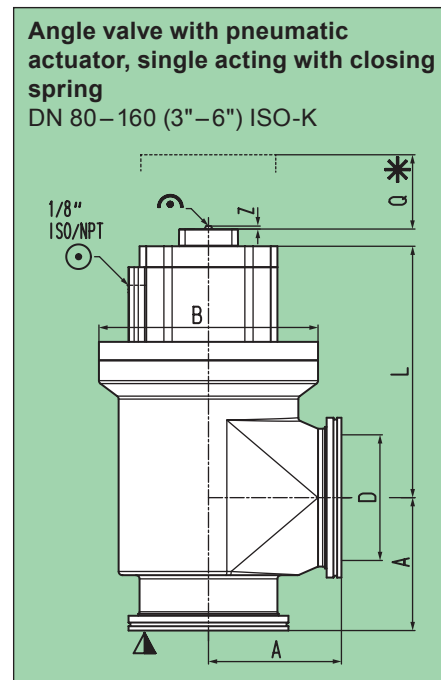
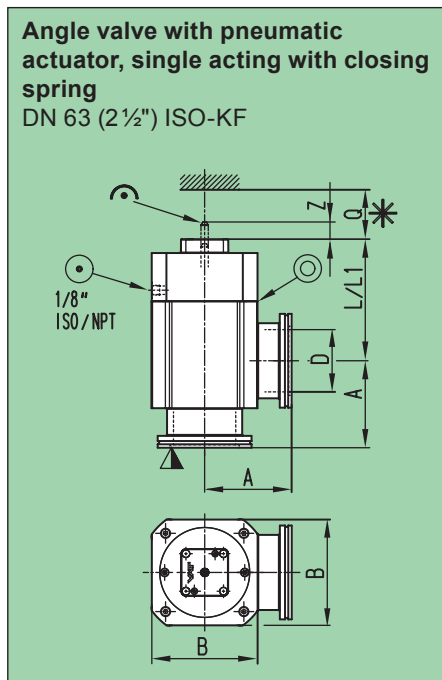
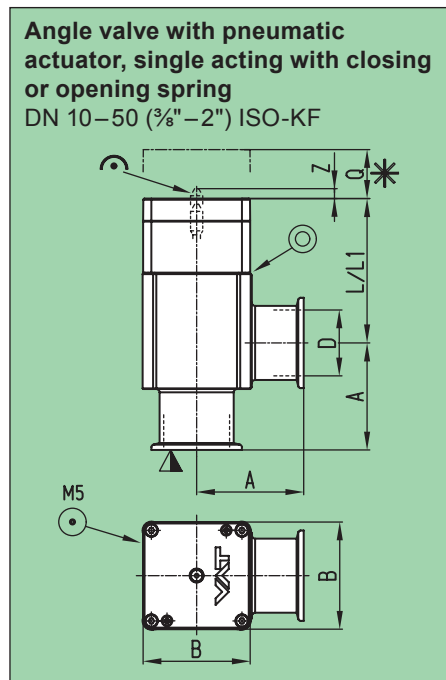


DN 16 ($\frac{5}{8}$ " stainless steel
(vertical design)



DN	mm	16	25	40	50
inch		$\frac{5}{8}$	1	$1\frac{1}{2}$	2
A	mm	80	100	130	178
	inch	3.15	3.94	5.12	7.01
B	mm	40	48	65	77
	inch	1.57	1.89	2.56	3.03
D	mm	16	25	40	50
	inch	0.63	0.98	1.57	1.97
L	mm	90.60	97	143.50	167.20
	inch	3.57	3.82	5.65	6.58
L1	mm	92.80	105.80	152.50	175.10
	inch	3.65	4.17	6	6.89
Q	mm	46	44	73.50	85.50
	inch	1.81	1.73	2.89	3.37
V	mm	40	40	60	60
	inch	1.57	1.57	2.36	2.36
Z	mm	3.60	4.70	7.90	9.30
	inch	0.14	0.19	0.31	0.37

Dimensions



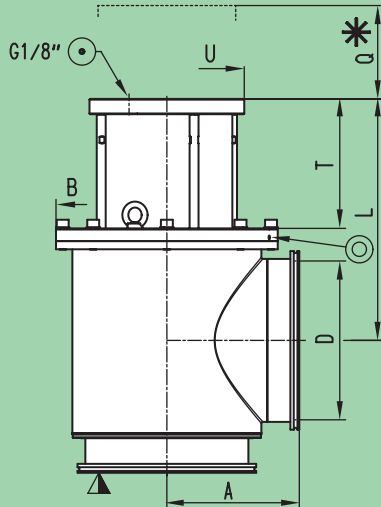
- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ↻ Mechanical position indication
- ⊙ Leak detection hole

L = aluminum
L1 = stainless steel

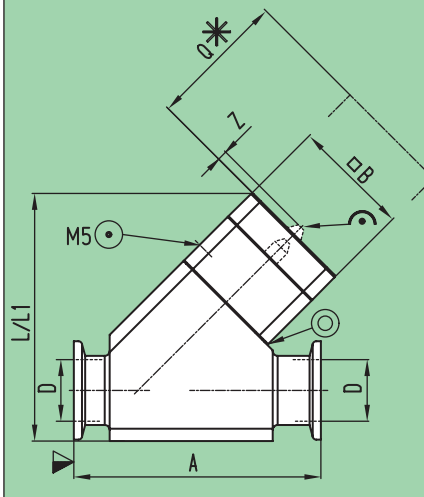
DN	mm inch		10 $\frac{3}{8}$	16 $\frac{5}{8}$	25 1	40 1½	50 2	63 2½	80 3	100 4	160 6
A	mm inch		30 1.18	40 1.57	50 1.97	65 2.56	70 2.76	88 3.46	90 3.54	108 4.25	138 5.43
B	mm inch		40 1.57	40 1.57	48 1.89	65 2.56	77 3.03	107.60 4.24	123 4.84	178 7.01	220 8.66
D	mm inch		12 0.47	16 0.63	25 0.98	40 1.57	50 1.97	63 2.48	80 3.15	102 4.02	153 6.02
L	mm inch	with closing spring	–	65.20 2.57	60.60 2.39	87.70 3.45	96 3.78	123 4.84	109 4.29	218.30 8.59	221.50 8.72
L1	mm inch		67.70 2.67	67.70 2.67	64 2.52	90.70 3.57	99 3.90	118.40 4.66	– –	211.70 8.33	228 8.98
L	mm inch	with opening spring	–	78.90 3.11	79.10 3.11	110.20 4.34	96 3.78	–	–	–	–
L1	mm inch		67.70 2.67	81.30 3.20	82.50 3.25	113.20 4.46	124 4.88	–	–	–	–
Q	mm inch		46 1.81	46 1.81	44 1.73	73.50 2.89	85.50 3.37	105 4.13	115.60 4.55	170 6.69	200 7.87
Z	mm inch		2 0.08	2 0.08	4 0.16	9.50 0.37	10.50 0.41	31.40 1.24	31.40 1.24	2.40 0.09	2.40 0.09

Dimensions

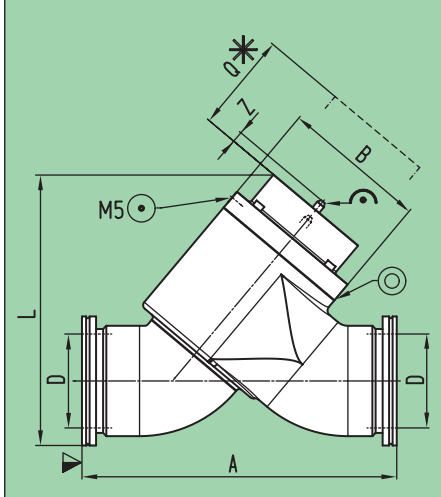
Angle valve with pneumatic actuator, double acting
DN 100–250 (4"–10") ISO-K



Inline valve with pneumatic actuator, single acting with closing or opening spring
DN 16–50 (5/8"–2") ISO-KF



Inline valve with pneumatic actuator, single acting with closing spring
DN 80 (3") ISO-K



- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ↻ Mechanical position indication
- ⊙ Leak detection hole

L = aluminum
L1 = stainless steel

DN	mm inch	100 4	160 6	200 8	250 10
A	mm inch	108 4.25	138 5.43	178 7.01	208 8.19
B	mm inch	178 7.01	220 8.66	298 11.73	339 13.35
D	mm inch	102 4.02	153 6.02	213 8.39	261 10.28
L	mm inch	204.10 8.04	204.50 8.05	324.70 12.78	379.10 14.93
Q	mm inch	170 6.69	200 7.87	258 10.16	305 12.01
T	mm inch	77.50 3.03	84.50 3.30	174.10 6.80	204 7.97
U	mm inch	136 5.35	136 5.35	208 8.19	208 8.19

DN	mm inch		16 5/8	25 1	40 1 1/2	50 2	80 3
A	mm inch		80 3.15	100 3.94	130 5.12	178 7.01	268 10.55
B	mm inch		40 1.57	48 1.89	65 2.56	77 3.03	123 4.84
D	mm inch		16 0.63	25 0.98	40 1.57	50 1.97	80 3.15
L	mm inch	with closing spring	91.50 3.60	100.30 3.95	140.90 5.55	170.10 6.70	230.50 9.07
L1	mm inch		93 3.66	108.90 4.29	149.90 5.90	171.80 6.76	—
L	mm inch	with opening spring	102.10 4.02	118 4.65	157.20 6.19	187.80 7.39	—
L1	mm inch		106.70 4.20	123.20 4.85	166 6.54	189.70 7.47	—
Q	mm inch		46 1.81	44 1.73	73.50 2.89	85.50 3.37	150 5.91
Z	mm inch		2 0.08	4 0.16	9.50 0.37	10.50 0.41	31.40 1.24

Main applications

For pumping and venting of HV systems where no compressed air is available



Ordering information

Valve with electromagnetic actuator
single acting with closing spring (NC)
with control electronics
with position indicator

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	–	26420-KE61	–	–
	16	5/8	26424-KA61	26424-KE61	26524-KA61	26524-KE61
	25	1	26428-KA61	26428-KE61	26528-KA61	26528-KE61
	40	1 1/2	26432-KA61	26432-KE61	26532-KA61	26532-KE61

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	10 ⁻⁸ mbar to 2 bar (abs)
Differential pressure on the plate	2 bar
Cycles until first service	200 000
Temperature ¹⁾	
– Valve body, control electronics	≤ 50 °C
Material	
– Valve body	
– aluminum	EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315)
– stainless steel	AISI 304 (1.4301, 1.4305)
Seal: bonnet, plate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any
Mains voltage	100–115 VAC / 200–240 VAC, 50–60 Hz
Starting power / holding power	700 W / 10 W
Closing or opening time	0.2 s
Operating frequency	max. 15 min ⁻¹ at 20 °C
Conductance (molecular flow): DN 10/16/25/40	3 ls ⁻¹ / 5 ls ⁻¹ / 14 ls ⁻¹ / 45 ls ⁻¹
Weight: angle valve, stainless steel	
DN 10/16/25/40	1.3/1.3/1.5/2.0 kg (2.9/2.9/3.3/4.4 lbs)

¹⁾ Maximum values: depending on operating conditions and sealing materials

Features

Body material:
aluminum or stainless steel

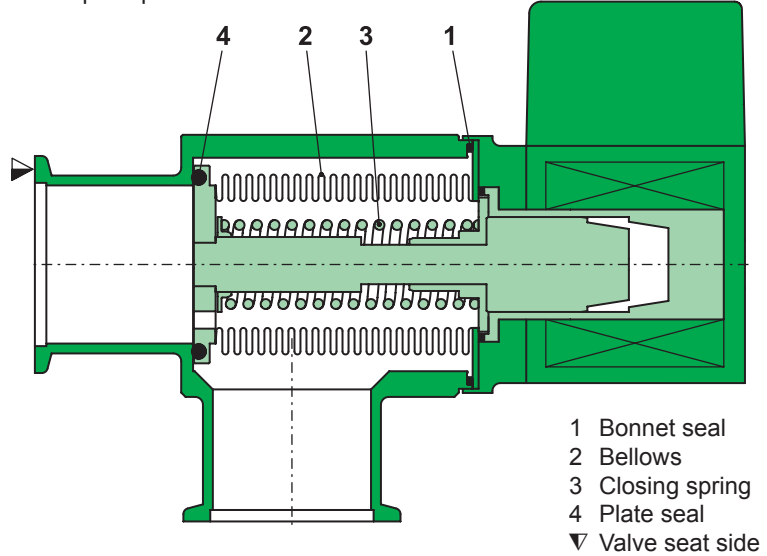
Angle and inline version

Best conductance in its class

Resistant against differential pressure

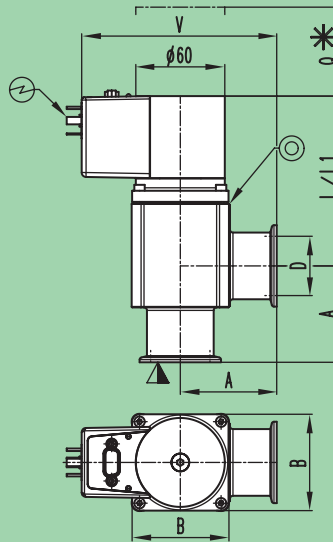
Long lifetime

Functional principle DN 25–40

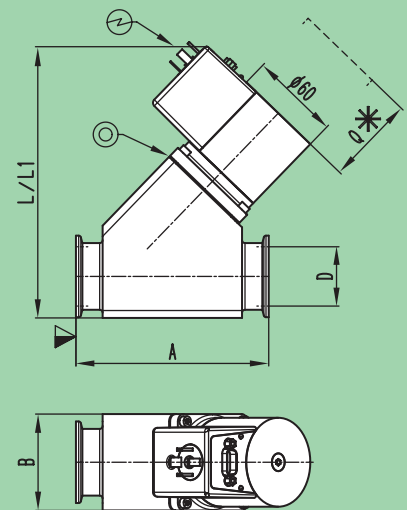


Dimensions

Angle valve
DN 10–40 ($\frac{3}{8}$ "–1½") ISO-K



Inline valve
DN 16–40 ($\frac{5}{8}$ "–1½") ISO-KF



DN	mm inch	10 $\frac{3}{8}$	16 $\frac{5}{8}$	25 1	40 1½
A	mm inch	30 1.18	40 1.57	50 1.97	65 2.56
B	mm inch	40 1.57	40 1.57	48 1.89	65 2.56
D	mm inch	10 0.39	16 0.63	25 0.98	40 1.57
L	mm inch	—	100 3.94	93 3.66	114 4.49
L1	mm inch	102.50 4.04	102.50 4.04	103.40 4.07	117 4.61
Q	mm inch	46 1.81	46 1.81	44 1.73	73.50 2.89
V	mm inch	96.50 3.80	106.50 4.20	116.50 4.59	131.50 5.18

DN	mm inch	16 $\frac{5}{8}$	25 1	40 1½
A	mm inch	80 3.15	100 3.94	130 5.12
B	mm inch	40 1.57	48 1.89	65 2.56
D	mm inch	16 0.63	25 0.98	40 1.57
L	mm inch	148 5.83	153 6.02	183 7.20
L1	mm inch	149.5 5.89	161 6.34	192 7.56
Q	mm inch	46 1.81	44 1.73	73.50 2.89

L = aluminum
L1 = stainless steel

Main applications

For pumping and venting of UHV systems when an extremely low out-gassing rate is important

Suitable for most corrosive gases



Ordering information

Valve with manual actuator
removable handwheel

DN		Ordering numbers
mm	inch	CF-R
16	$\frac{5}{8}$	28424-GE01
40	1½	28432-GE01
63	2½	28436-GE01

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
without position indicator

DN		Ordering numbers
mm	inch	CF-R
16	$\frac{5}{8}$	28424-GE11
40	1½	28432-GE11
63	2½	28436-GE11

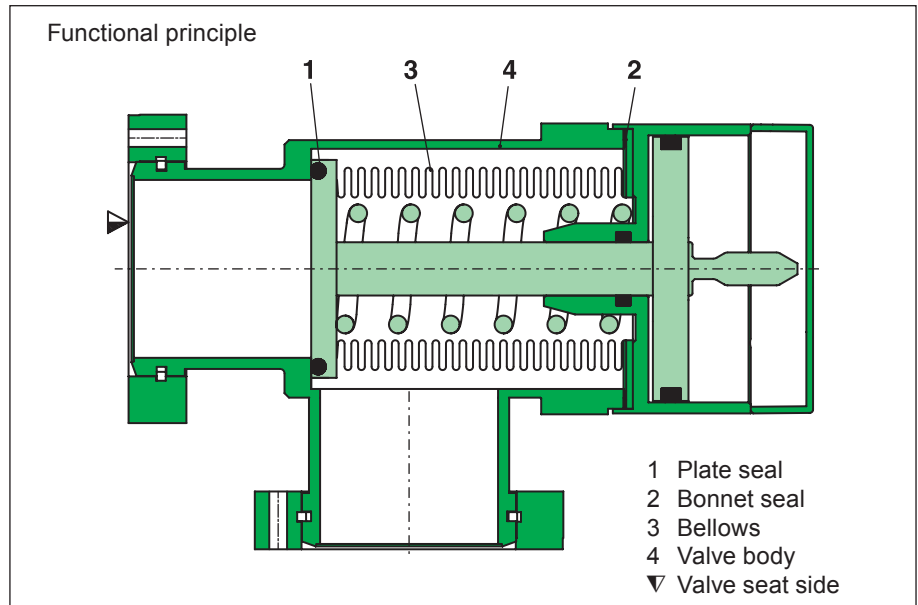
without solenoid valve, with position indicator: 284 . . -GE21

with solenoid valve, without position indicator: 284 . . -GE31 (specify control voltage)

with solenoid valve, with position indicator: 284 . . -GE41 (specify control voltage)

Features

Body material: stainless steel
 Extremely low outgassing rate
 Resistant against differential pressure
 Bellows
 Metal bonnet seal
 Rotatable CF flange



Technical data

Leak rate	
– Valve body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
– Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$5 \cdot 10^{-10}$ mbar to 5 bar (abs)
Differential pressure on the plate	
– In opening direction	≤ 2 bar
– In closing direction	≤ 5 bar
Differential pressure at opening	≤ 1 bar
Cycles until first service	3 million
Temperature ¹⁾	
– Valve body	≤ 150 °C
– Manual actuator	≤ 120 °C (without handwheel 150 °C)
– Pneumatic actuator	≤ 150 °C
– Solenoid valve, position indicator	≤ 80 °C
Material	
– Valve body	AISI 304 (1.4301)
– Plate	AISI 316L (1.4404, 1.4435)
– Bellows	AISI 316L (1.4404, 1.4435)
Seal	
– Bonnet	metal
– Plate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any
Solenoid valve	24 VDC (others on request)
Position indicator: contact rating	
– Voltage	5–50 VAC/DC
– Current	5–100 mA
Valve position indication	visual (mechanical)

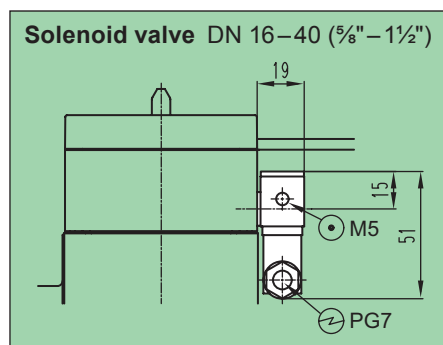
¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

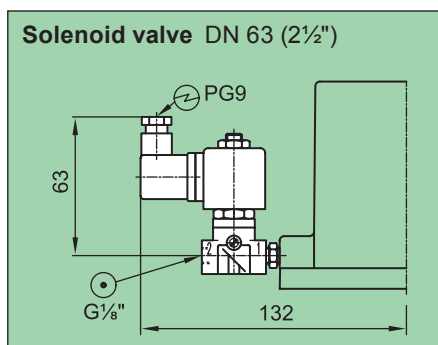
			Valve with manual actuator				Valve with pneumatic actuator, single acting with closing spring (NC)						
DN (nominal I.D.)		CF-R flange	Conductance (molecular flow)	Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight	
mm	inch		ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
16	$\frac{5}{8}$	1 $\frac{1}{8}$	5	3.6	0.3	0.7	4–8	58–116	0.004	0.0001	0.10	0.4	0.9
40	1 $\frac{1}{2}$	2 $\frac{3}{4}$	45	4.5	1.5	3.3	4–8	58–116	0.035	0.0012	0.55	1.6	3.5
63	2 $\frac{1}{2}$	4 $\frac{1}{2}$	160	6.6	5.3	11.7	4–8	58–116	0.112	0.0040	0.70	6.0	13.2

Solenoid valve



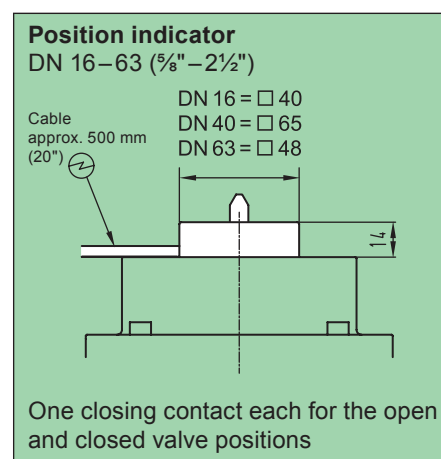
Ordering numbers: 284 . . -GE31/41

- ⊕ Compressed air connection
- ⊖ Electrical connection



Ordering numbers: 284 . . -GE31/41

Position indicator



Ordering numbers: 284 . . -GE21/41

Options



Actuator

- Other solenoid valve voltage (standard: 24 VDC)
- Position indicator bakeable to 120 °C or 150 °C (Pic. 1)
- Manual actuator bakeable to 200 °C
- Pneumatic actuator bakeable to 150 °C

Valve

- Customer specified flanges
- ISO-KF, ISO-K flanges
- Other sealing materials
- Customer specified bodies

Ordering information for options:

Ordering No. of valve-X (e. g. 28432-GE41-X, X = pos. indicator bakeable to 150 °C)

Spare parts

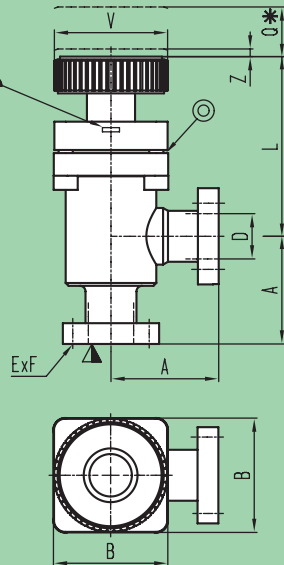
- **Seals**
on request (specify fabrication number of valve)

Accessories

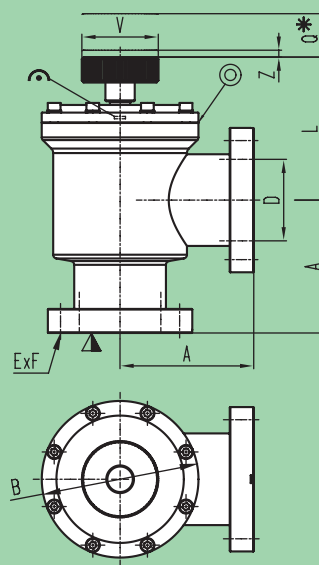
- **Flange connections**
for installation of the valve: see series 33

Dimensions

Valve with manual actuator
DN 16–40 ($\frac{5}{8}$ "–1½")

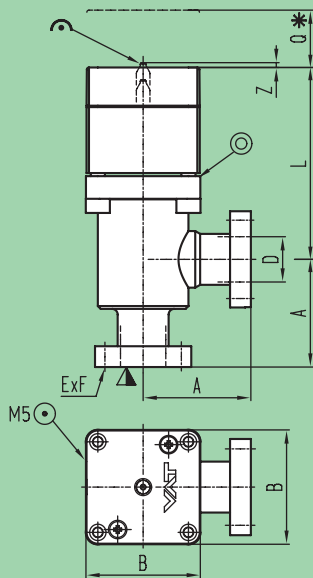


Valve with manual actuator
DN 63 (2½")

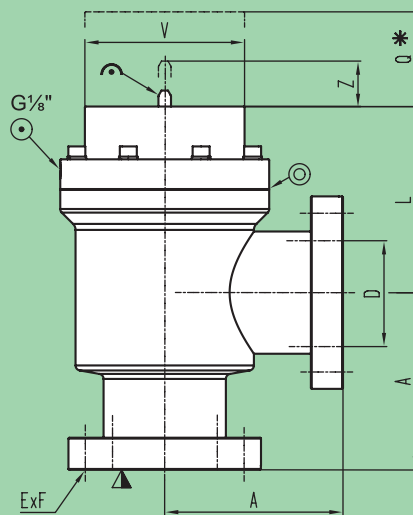


DN	mm inch	16 ⅝	40 1½	63 2½
A	mm inch	38 1.50	63 2.48	105 4.13
B	mm inch	40 1.57	65 2.56	123 4.84
D	mm inch	16 0.63	40 1.57	64 2.52
E × F		6 × 4.30 6 × 0.17	6 × 6.60 6 × 0.26	8 × 8.40 8 × 0.33
L	mm inch	67.30 2.65	97.40 3.83	111.70 4.40
Q	mm inch	45 1.77	73.50 2.89	105 4.13
V	mm inch	40 1.57	60 2.36	60 2.36
Z	mm inch	3.60 0.14	7.90 0.31	13.40 0.53

**Valve with pneumatic actuator,
single acting with closing spring**
DN 16–40 ($\frac{5}{8}$ "–1½")



**Valve with pneumatic actuator,
single acting with closing spring**
DN 63 (2½")



DN	mm inch	16 ⅝	40 1½	63 2½
A	mm inch	38 1.50	63 2.48	105 4.13
B	mm inch	40 1.57	65 2.56	—
D	mm inch	16 0.63	40 1.57	64 2.52
E × F		6 × 4.30 6 × 0.17	6 × 6.60 6 × 0.26	8 × 8.40 8 × 0.33
L	mm inch	67.80 2.67	90.80 3.57	109.60 4.31
Q	mm inch	45 1.77	71 2.80	105 4.13
V	mm inch	—	—	94 3.70
Z	mm inch	2 0.08	9.50 0.37	31.40 1.24

- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⌒ Mechanical position indication
- ⊙ Leak detection hole

Main applications

For pumping and venting of HV systems when few turbulences, particles, substrate movements and condensation are important



Ordering information

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
without position indicator

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	25	1	29028-KA11	29028-KE11	29128-KA11	29128-KE11
	40	1½	29032-KA11	29032-KE11	29132-KA11	29132-KE11
	50	2	29034-KA11	29034-KE11	29134-KA11	29134-KE11
ISO-K	63	2½	29036-QA11	29036-QE11	—	—
	80	3	29038-QA11	—	—	—
	100	4	29240-QA11	on request	—	—
	160	6	29244-QA11	on request	—	—

without solenoid valve, with position indicator: 29 . . . - . . **21**

with solenoid valve, without position indicator: 29 . . . - . . **31** (specify control voltage)

with solenoid valve, with position indicator: 29 . . . - . . **41** (specify control voltage)

Valve with pneumatic actuator
Main valve: double acting
Soft-pump valve: single acting (NC)
without solenoid valve
without position indicator

	DN		Ordering numbers	
	mm	inch	Angle valve	
			aluminum	stainless steel
ISO-K	100	4	29240-QA14	29240-QE14
	160	6	29244-QA14	29244-QE14

without solenoid valve, with position indicator: 292 . . -Q . **24**

with solenoid valve, without position indicator: 292 . . -Q . **34** (specify control voltage)

with solenoid valve, with position indicator: 292 . . -Q . **44** (specify control voltage)

Features

Body material:
aluminum or stainless steel

Angle and inline version

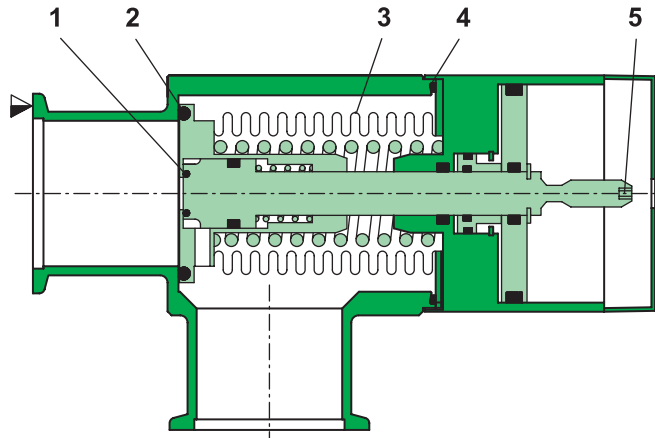
Setting of the orifice opening by means
of a scale

Main valve

- DN 25– 80 with bellows
- DN 100–160 with shaft feedthrough

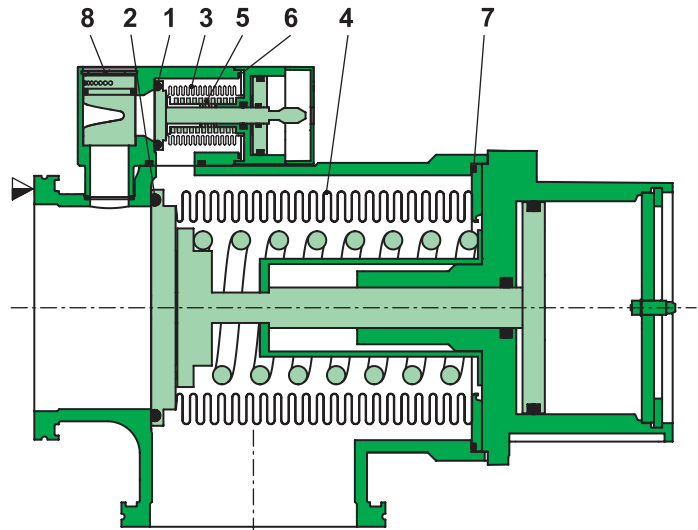
Resistant against differential pressure

Functional principle
DN 25–50
with bellows



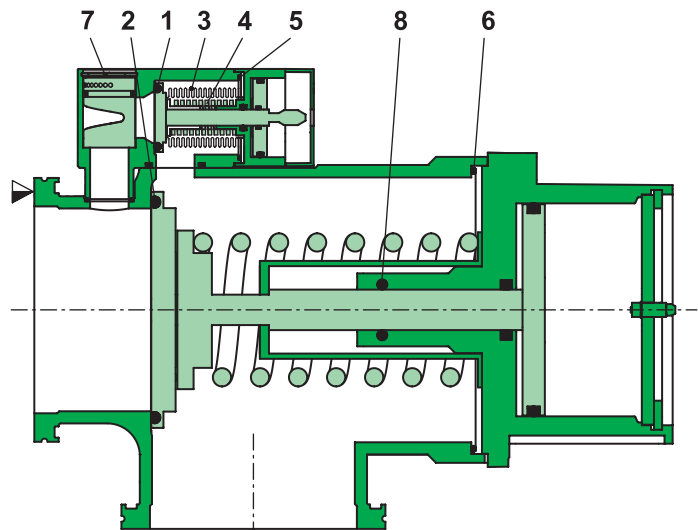
- | | |
|-----------------------------------|----------------------------------|
| 1 Plate seal (soft-pump function) | 4 Bonnet seal |
| 2 Plate seal (valve) | 5 Setting of the orifice opening |
| 3 Bellows | ▼ Valve seat side |

Functional principle
DN 63–80
with bellows



- | |
|------------------------------------|
| 1 Plate seal (soft-pump valve) |
| 2 Plate seal (main valve) |
| 3 Bellows (soft-pump valve) |
| 4 Bellows (main valve) |
| 5 Closing spring (soft-pump valve) |
| 6 Bonnet seal (soft-pump valve) |
| 7 Bonnet seal (main valve) |
| 8 Setting of the orifice opening |
| ▼ Valve seat side |

Functional principle
DN 100–160
with shaft feedthrough



- | |
|------------------------------------|
| 1 Plate seal (soft-pump valve) |
| 2 Plate seal (main valve) |
| 3 Bellows (soft-pump valve) |
| 4 Closing spring (soft-pump valve) |
| 5 Bonnet seal (soft-pump valve) |
| 6 Bonnet seal (main valve) |
| 7 Setting of the orifice opening |
| 8 Shaft feedthrough (main valve) |
| ▼ Valve seat side |

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	
– DN 25– 50	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
– DN 63– 80	$1 \cdot 10^{-8}$ mbar to 4 bar (abs)
– DN 100– 160	$1 \cdot 10^{-7}$ mbar to 2 bar (abs)
Differential pressure on the plate	
– In opening direction	≤ 1.2 bar
– In closing direction	
– DN 25– 50	≤ 1.2 bar
– DN 63– 80	≤ 4.0 bar
– DN 100– 160	≤ 2.0 bar
Differential pressure at opening	≤ 1 bar
Cycles until first service	
– DN 25– 50	2 million
– DN 63– 80	3 million
– DN 100– 160	1 million
Temperature ¹⁾	
– Valve body	≤ 150 °C
– Actuator	
– DN 25– 50	≤ 120 °C
– DN 63– 160	≤ 80 °C
– Solenoid valve, position indicator	≤ 80 °C
Material	
– Valve body: main valve	
– aluminum DN 25– 63	EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315)
– DN 80– 160	EN AC-42000
– stainless steel DN 25– 160	AISI 304 (1.4301), AISI 316L (1.4404)
– Valve body: soft-pump valve	EN AW-6060 (3.3206), -6061 (3.3211), -6063 (3.3206), -6082 (3.2315)
– Plate	AISI 316L (1.4404, 1.4435) or AISI 304L (1.4306)
– Bellows	AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571)
Seal: bonnet, plate	FKM (Viton®)
Feedthrough (main valve)	
– DN 25– 80	bellows
– DN 100– 160	shaft feedthrough
Mounting position	any
Solenoid valve	
– DN 25– 50	24 VDC, 2.5 W
– DN 63– 160	24 VDC, 9.0 W (others on request)
Position indicator: contact rating	
– Voltage	5–50 VAC/DC
– Current	5–100 mA
Valve position indication	visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

Angle valves

Angle valves				Valve with pneumatic actuator, single acting with closing spring (NC)								
DN (nominal I.D.)		Conductance (molecular flow)	Opening range of orifice of the soft-pump valve	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight			
									Aluminum body		Stainless steel body	
mm	inch	ls ⁻¹	mm ²	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
25	1	14	1.7–20	4.5–7	65–102	0.011	0.0004	0.20	0.60	1.32	0.70	1.54
40	1½	45	1.2–40	4–8	58–116	0.035	0.0012	0.55	1.20	2.65	1.40	3.09
50	2	80	1.5–50	4–8	58–116	0.047	0.0017	0.65	1.90	4.19	2.10	4.63
63	2½	160	9–270	4–8	58–116	0.112	0.0040	0.70	4.20	9.26	2.60	5.73
80	3	200	9–270	4–8	58–116	0.112	0.0040	0.70	3.90	8.60	–	–
100	4	440	9–270	4.5–7	65–102	0.330	0.0117	1	9	19.84	10.22	22.53
160	6	1000	9–270	4.5–7	65–102	1.050	0.0371	2.50	15.10	33.29	13.04	28.75

			Valve with pneumatic actuator, double acting									
100	4	440	9–270	4.5–7	65–102	0.330	0.0117	1	8.50	18.74	10.50	23.15
160	6	1000	9–270	4.5–7	65–102	1.050	0.0371	2	12.50	27.56	15.50	34.17

Inline valves

Inline valves				Valve with pneumatic actuator, single acting with closing spring (NC)								
DN (nominal I.D.)		Conductance (molecular flow)	Opening range of orifice of the soft-pump valve	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight			
mm	inch	ls ⁻¹	mm ²	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
25	1	14	1.7–20	4.5–7	65–102	0.011	0.0004	0.20	0.76	1.68	0.45	0.99
40	1½	45	1.2–40	4–8	58–116	0.035	0.0012	0.55	1.60	3.53	1.45	3.20
50	2	80	1.5–50	4–8	58–116	0.047	0.0017	0.65	2.78	6.13	2.30	5.07

Options

Actuator

- Other solenoid valve voltage (standard: 24 VDC)
- Position indicator bakeable to 120 °C

Valve

- CF flanges
- Other sealing materials
- Customer specified bodies

Ordering information for options:

Ordering No. of valve-X (e. g. 29028-KA41-X, X = pos. indicator bakeable to 120 °C)

Spare parts

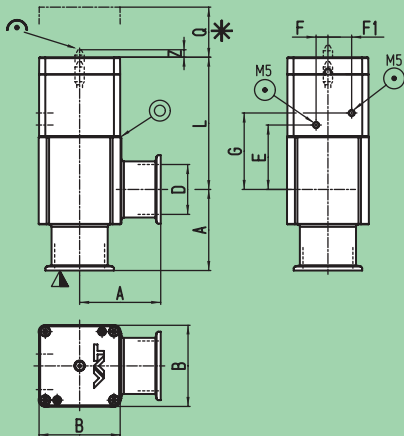
- **Seals**
on request (specify fabrication number of valve)

Accessories

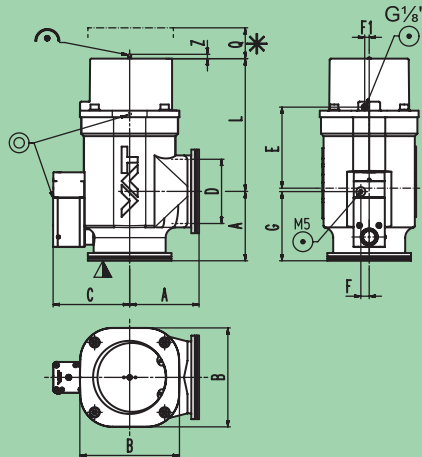
- **Flange connections**
for installation of the valve: see series 31

Dimensions

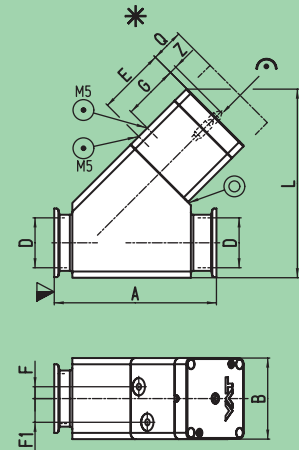
Aluminum angle valve with pneumatic actuator, single acting with closing spring DN 25–50 (1"–2") ISO-KF



Aluminum angle valve with pneumatic actuator, single acting with closing spring DN 63–160 (2½"–6") ISO-K



Aluminum inline valve with pneumatic actuator, single acting with closing spring DN 25–50 (1"–2") ISO-K



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊙ Mechanical position indication
- ⊙ Leak detection hole

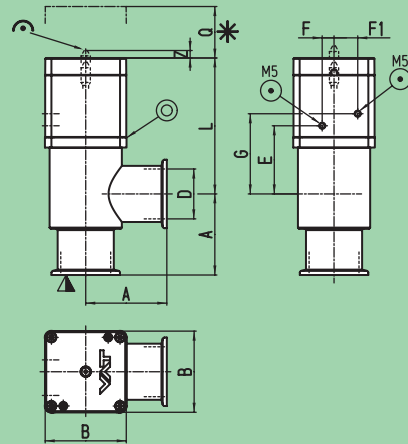
DN	mm	25	40	50
inch		1	1½	2
A	mm	50	65	70
	inch	1.97	2.56	2.76
B	mm	48	65	77
	inch	1.89	2.56	3.03
D	mm	25	40	50
	inch	0.98	1.57	1.97
E	mm	40	51	59
	inch	1.57	2	2.32
F	mm	9.50	12.50	13.60
	inch	0.37	0.49	0.54
F1	mm	13	15	15
	inch	0.51	0.59	0.59
G	mm	49	59	66
	inch	1.93	2.32	2.60
L	mm	89.50	106	115.70
	inch	3.52	4.17	4.56
Q	mm	46	77	85
	inch	1.81	3.03	3.35
Z	mm	5.60	11	12.50
	inch	0.22	0.43	0.49

DN	mm	63	80	100	160
inch		2½	3	4	6
A	mm	88	90	108	138
	inch	3.46	3.54	4.25	5.43
B	mm	123	126.60	154	216
	inch	4.84	4.98	6.06	8.50
C	mm	98.80	107.30	119	144
	inch	3.89	4.22	4.69	5.67
D	mm	63	80	102	153
	inch	2.48	3.15	4.02	6.02
E	mm	71.40	71.40	131	117
	inch	2.81	2.81	5.15	4.61
F	mm	13	13	13	13
	inch	0.51	0.51	0.51	0.51
F1	mm	—	—	7	—
	inch			0.28	
G	mm	98	100	107.70	97.70
	inch	3.86	3.94	4.24	3.85
L	mm	109	109	206.50	202
	inch	4.29	4.29	8.13	7.95
Q	mm	115	115	170	195
	inch	4.53	4.53	6.69	7.68
Z	mm	31.40	31.40	6	6
	inch	1.24	1.24	0.24	0.24

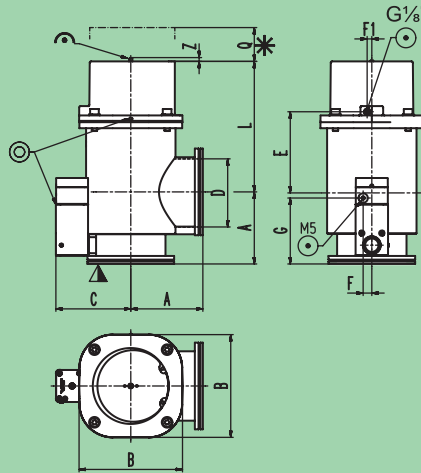
DN	mm	25	40	50
inch		1	1½	2
A	mm	100	130	178
	inch	3.94	5.12	7.01
B	mm	48	65	77
	inch	1.89	2.56	3.03
D	mm	25	40	50
	inch	0.98	1.57	1.97
E	mm	49.50	55	57
	inch	1.95	2.17	2.24
F	mm	9.50	14	13.60
	inch	0.37	0.55	0.54
F1	mm	13	15	15
	inch	0.51	0.59	0.59
G	mm	40.50	47	50
	inch	1.59	1.85	1.97
L	mm	121	154	184
	inch	4.76	6.06	7.24
Q	mm	46	77	85
	inch	1.81	3.03	3.35
Z	mm	5.60	11	12.50
	inch	0.22	0.43	0.49

Dimensions

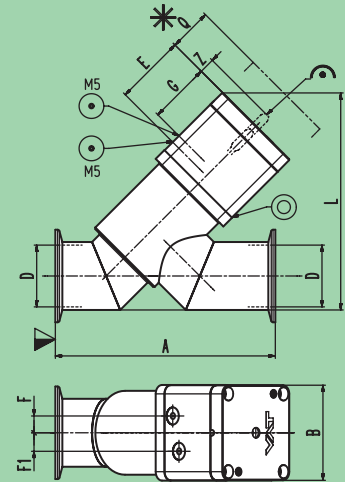
**Stainless steel angle valve
with pneumatic actuator,
single acting with closing spring
DN 25–50 (1"–2") ISO-KF**



**Stainless steel angle valve
with pneumatic actuator,
single acting with closing spring
DN 63–160 (2½"–6") ISO-K
or double acting
DN 100–160 (4"–6") ISO-K**



**Stainless steel inline valve
with pneumatic actuator,
single acting with closing spring
DN 25–50 (1"–2") ISO-K**



- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊙ Mechanical position indication
- ⊙ Leak detection hole

		single acting with closing spring						double acting	
DN	mm inch	25 1	40 1½	50 2	63 2½	100 4	160 6	100 4	160 6
A	mm inch	50 1.97	65 2.56	70 2.76	88 3.46	108 4.25	138 5.43	108 4.25	138 5.43
B	mm inch	48 1.89	65 2.56	77 3.03	123 4.84	154 6.06	216 8.50	154 6.06	216 8.50
C	mm inch	–	–	–	98.30 3.87	116 4.57	138 5.43	119 4.69	144 5.67
D	mm inch	25 0.98	40 1.57	50 1.97	63 2.48	102 4.02	153 6.02	102 4.02	153 6.02
E	mm inch	43 1.69	54 2.13	52 2.05	71 2.80	122 4.80	121 4.76	131 5.16	117 4.61
F	mm inch	9.50 0.37	12.50 0.49	13.60 0.54	13 0.51	13 0.51	13 0.51	13 0.51	13 0.51
F1	mm inch	13 0.51	15 0.59	15 0.59	–	7 0.28	–	7 0.28	–
G	mm inch	52 2.05	62 2.44	69 2.72	98 3.86	104 4.09	106 4.17	107.7 4.24	97.7 3.85
L	mm inch	92.80 3.65	109 4.29	118.70 4.67	109 4.29	197 7.75	207 8.15	206.5 8.13	202 7.95
Q	mm inch	46 1.81	77 3.03	85 3.35	115 4.53	170 6.69	195 7.68	170 6.69	195 7.68
Z	mm inch	5.60 0.22	11 0.43	12.50 0.49	31.40 1.24	6 0.24	6 0.24	6 0.24	6 0.24

DN	mm inch	25 1	40 1½	50 2
A	mm inch	100 3.94	130 5.12	178 7.01
B	mm inch	48 1.89	65 2.56	77 3.03
C	mm inch	–	–	–
D	mm inch	25 0.98	40 1.57	50 1.97
E	mm inch	49.50 1.95	55 2.17	57 2.24
F	mm inch	9.50 0.37	14 0.55	13.60 0.54
F1	mm inch	13 0.51	15 0.59	15 0.59
G	mm inch	40.50 1.59	47 1.85	50 1.97
L	mm inch	131 5.16	163 6.42	176 6.93
Q	mm inch	46 1.81	77 3.03	85 3.35
Z	mm inch	5.60 0.22	11 0.43	12.50 0.49

Main applications

For pumping and venting of HV systems when maximum conductance is important

For harsh process environments (high resistance to corrosion and fluor)



Series 25.0
Angle valve

Series 25.1
Inline valve

Series 25.2
3/2-way valve

Ordering information

Series 25.0
Angle valve with pneumatic actuator
double acting

DN		Ordering numbers	
mm	inch	ISO-KF	
		without position indicator	with position indicator
16	$\frac{5}{8}$	25024-KA14	25024-KA24
25	1	25028-KA14	25028-KA24
40	1½	25032-KA14	25032-KA24

Series 25.1
Inline valve with pneumatic actuator
double acting

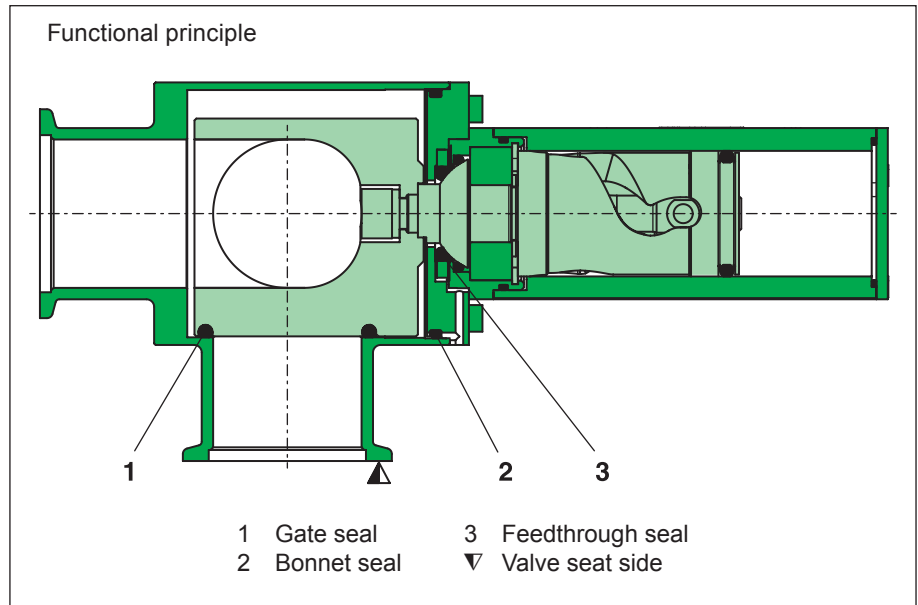
DN		Ordering numbers	
mm	inch	ISO-KF	
		without position indicator	with position indicator
16	$\frac{5}{8}$	25124-KA14	25124-KA24
25	1	25128-KA14	25128-KA24
40	1½	25132-KA14	25132-KA24

Series 25.2
3/2-way valve with pneumatic actuator
double acting

DN		Ordering numbers	
mm	inch	ISO-KF «claw»	
		without position indicator	with position indicator
16	$\frac{5}{8}$	25224-EA14	25224-EA24
25	1	25228-EA14	25228-EA24
40	1½	25232-EA14	25232-EA24

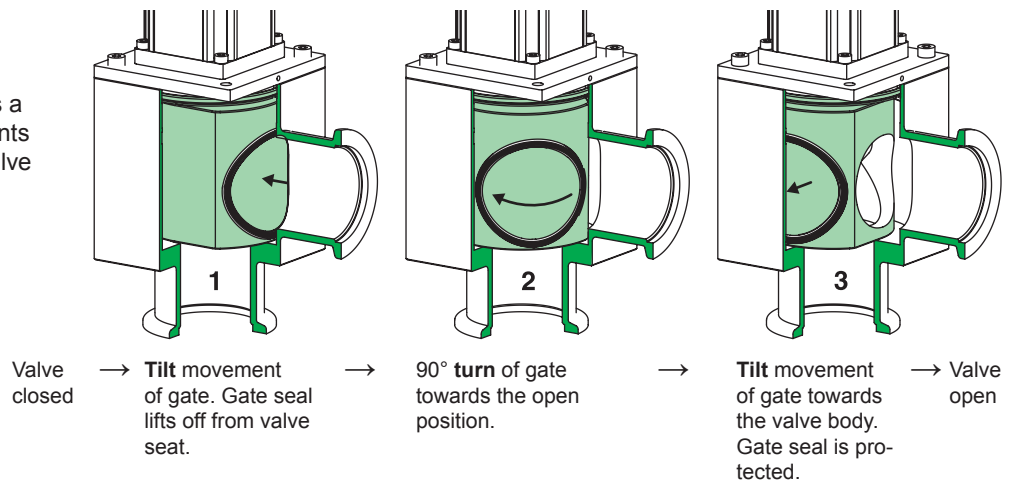
Features

Body material: aluminum
 Parts in contact with vacuum: aluminum
 Angle, inline and 3/2-way versions
 Rotary feedthrough
 Maximum conductance
 Protected gate seal
 Resistant against differential pressure
 Mechanically locked in open and closed position
 Low particle count



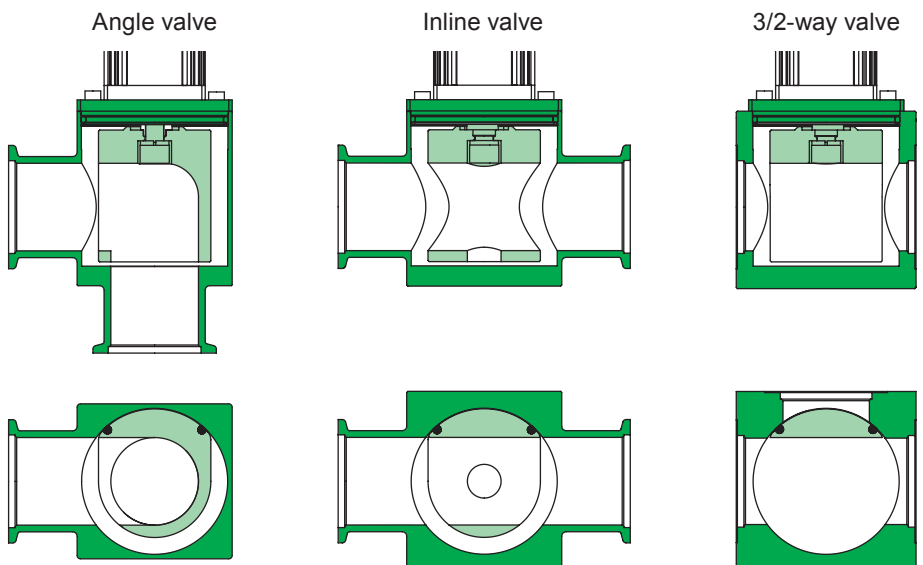
Function

The cylinder-shaped gate performs a **tilt-turn-tilt** movement. This prevents the gate seal from sliding on the valve seat.



Maximum conductance

The conductance is comparable to a 90° elbow (angle valve) or a straight tube (in-line valve). The gas flow passes unobstructed by the gate.



Protected gate seal

The gate seal is pressed against the valve body in closed and open position. The contact with the process gas is minimized.

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 3 bar (abs)
Differential pressure on the gate	
– In opening direction	≤ 1.2 bar
– In closing direction	≤ 3.0 bar
Differential pressure at opening	≤ 1.2 bar
Cycles until first service	100 000
Temperature ¹⁾	
– Valve body	≤ 120 °C
– Actuator	≤ 120 °C
– Position indicator	≤ 80 °C
Material	
– Valve body	EN AW-6060 (3.3206), -6082 (3.2315)
– Gate, bonnet flange	EN AW-6082 (3.2315)
– Shaft	AISI 316L (1.4435) with Ni-PTFE coating
– Gate fastening screw, washer	A4-80 with Ni-PTFE coating
Seal: bonnet, gate, feedthrough	FKM (Viton®)
Feedthrough	rotary feedthrough
Mounting position	any
Position indicator: contact rating	
– Voltage	10–30 VDC
– Current	5–100 mA
Valve position indication	LED ²⁾

¹⁾ Maximum values: depending on operating conditions and sealing materials

²⁾ Valves with position indicator

DN (nominal I.D.)		Standard flanges		Conductance (molecular flow)				Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch			ls ⁻¹				bar	psi	l	ft ³	s	kg	lbs
		Series 25.0/25.1	Series 25.2	Series 25.0	Series 25.1	Series 25.2 1→2 1→3								
16	$\frac{5}{8}$	ISO-KF	ISO-KF «claw»	5	6	8	7	4–8	58–116	0.032	0.0011	0.6	1.4	3.0
25	1	ISO-KF	ISO-KF «claw»	16	19	31	24	4–8	58–116	0.032	0.0011	0.6	1.4	3.0
40	1½	ISO-KF	ISO-KF «claw»	46	55	90	67	4–8	58–116	0.032	0.0011	0.6	1.7	3.7

³⁾ Flange ISO-KF «claw». See Dia. 1 on next page.

Spare parts

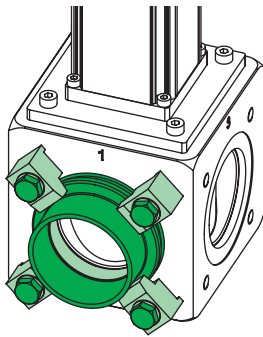
- **Seals**
on request (specify fabrication number of valve)

Accessories

- **Solenoid valve**
for external mounting
- **Flange connections**
for installation of the valve: see series 31

Options

Dia. 1



Flange ISO-KF «claw»

Actuator

- One-touch fitting for pneumatic tube

Valve

- Other sealing materials, e. g. FFKM
- Valve DN 40 with flange ISO-KF DN 50 «claw»
- Stainless steel version
- Heating cartridge for DN 40

Ordering information for options:

Ordering No. of valve-X

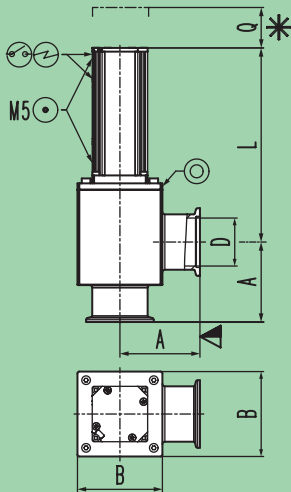
(e. g. 25032-KA14-X, X = one-touch fitting for 4 mm pneumatic tube)

Dimensions

Series 25.0

Angle valve with pneumatic actuator

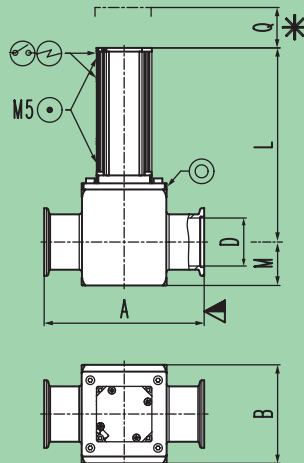
DN 16–40 ($\frac{5}{8}$ " – 1½") ISO-KF



Series 25.1

Inline valve with pneumatic actuator

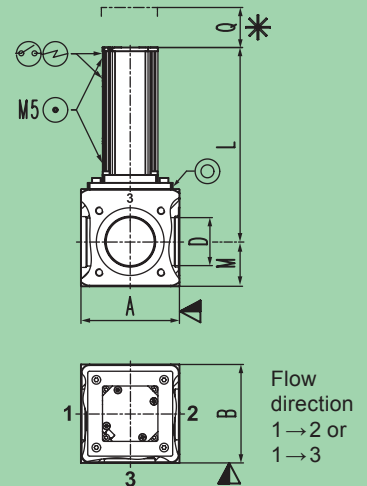
DN 16–40 ($\frac{5}{8}$ " – 1½") ISO-KF



Series 25.2

3/2-way valve with pneumatic actuator

DN 16–40 ($\frac{5}{8}$ " – 1½") ISO-KF «claw»



DN	mm inch	16 $\frac{5}{8}$	25 1	40 1½
A	mm inch	40 1.57	50 1.97	65 2.56
B	mm inch	54 2.13	54 2.13	69 2.72
D	mm inch	16 0.63	25 0.98	39 1.54
L	mm inch	150.80 5.94	150.80 5.94	157.80 6.21
M	mm inch	–	–	–
Q	mm inch	55 2.17	55 2.17	68 2.68

DN	mm inch	16 $\frac{5}{8}$	25 1	40 1½
A	mm inch	80 3.15	100 3.94	130 5.12
B	mm inch	60 2.36	60 2.36	80 3.15
D	mm inch	16 0.63	25 0.98	39 1.54
L	mm inch	150.80 5.94	150.80 5.94	157.80 6.21
M	mm inch	23.30 0.92	23.30 0.92	35.30 1.39
Q	mm inch	55 2.17	55 2.17	68 2.68

DN	mm inch	16 $\frac{5}{8}$	25 1	40 1½
A	mm inch	60 2.36	60 2.36	80 3.15
B	mm inch	60 2.36	60 2.36	80 3.15
D	mm inch	16 0.63	25 0.98	39 1.54
L	mm inch	150.80 5.94	150.80 5.94	157.80 6.21
M	mm inch	29.30 1.15	29.30 1.15	36.30 1.43
Q	mm inch	55 2.17	55 2.17	68 2.68

▽ Valve seat side

⊙ Compressed air connection

⊙ Position indicator

* Required for dismantling

⊙ Electrical connection

⊙ Leak detection hole

Main applications

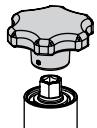
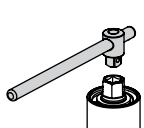
For vacuum processes with extreme UHV requirements



Ordering information

Valve with manual actuator
hexagon head

DN		Valve CF-R	Ordering numbers			
mm	inch		Accessories			
			handwheel ¹⁾	T-bar tool ¹⁾	service kit 1 ²⁾	service kit 2 ²⁾
16	5/8	54124-GE02	240039	312699	529581	529582
40	1 1/2	54132-GE02	531966	530026	530022	530023
63	2 1/2	54136-GE02	—	312731	530024	530025

Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	XHV to 2 bar (abs)
Differential pressure on the gate	≤ 2 bar
Differential pressure at opening	≤ 1 bar ³⁾
Lifetime	≥ 1000 cycles
Bake-out temperature ⁴⁾	≤ 300 °C open and closed
Heating and cooling rate	≤ 60 °C h ⁻¹
Material: valve body, mechanism, bellows	AISI 316L (1.4404, 1.4435)
Seal: bonnet, plate	metal
Feedthrough	bellows
Mounting position	any
Valve position indication	visual (mechanical)
Conductance (molecular flow)	DN16: 5 ls ⁻¹ / DN40: 50 ls ⁻¹ / DN63: 105 ls ⁻¹
Closing force	closes at a mechanical stop
Weight: DN 16 / 40 / 63 kg (lbs)	0.4 (0.9) / 1.9 (4.2) / 5.9 (13.0)

¹⁾ Handwheel or T-bar tool to put on hexagon head for convenient operation

²⁾ Service kits to exchange the FLEX VATRING without remachining the sealing surface on the valve seat. The FLEX VATRING may be replaced up to two times. The service kit 1 is for the first, the service kit 2 for the second exchange.

³⁾ > 1 bar with reduced number of cycles

⁴⁾ Maximum values: depending on operating conditions and sealing materials

Features

Body material: stainless steel

FLEX VATRING configuration:
see glossary

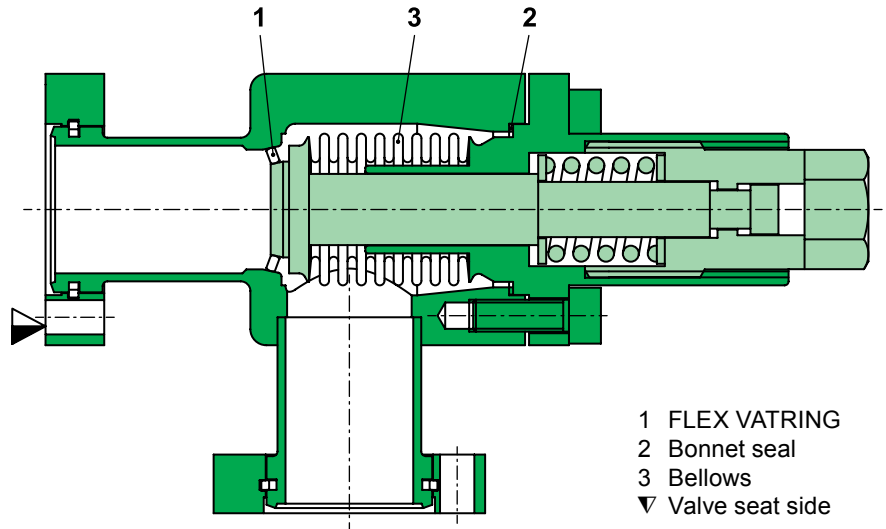
Sealing surfaces are only elastically
deformed

Convenient operation with a standard
hexagon wrench – no torque wrench
required

High conductance

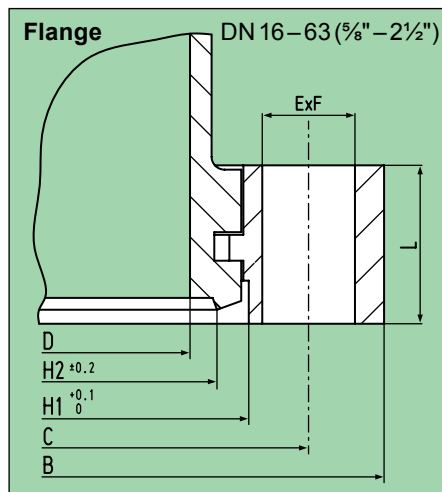
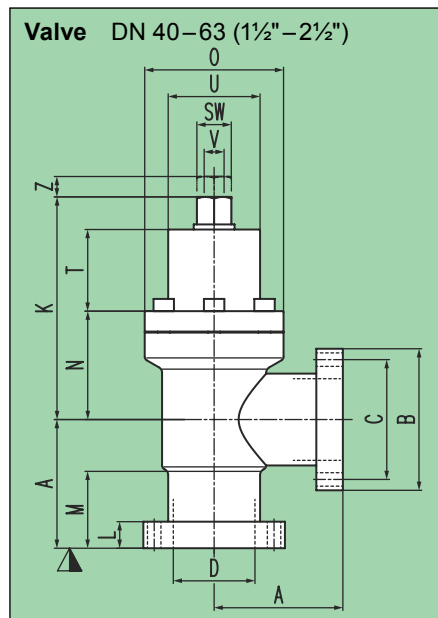
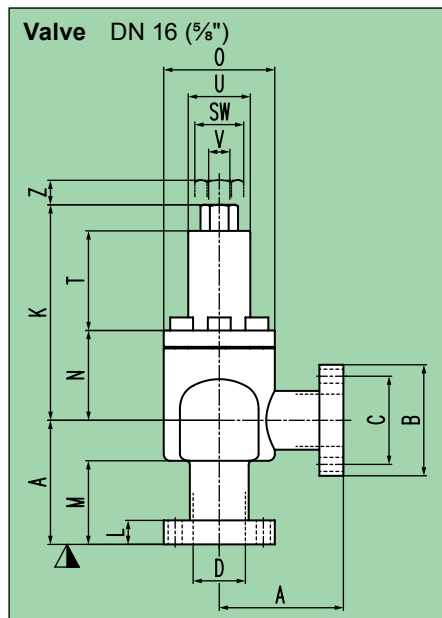
FLEX VATRING exchangeable twice

Functional principle



- 1 FLEX VATRING
- 2 Bonnet seal
- 3 Bellows
- ▼ Valve seat side

Dimensions



▼ Valve seat side

DN	mm inch	16 $\frac{5}{8}$	40 $1\frac{1}{2}$	63 $2\frac{1}{2}$
A	mm inch	38 1.50	63 2.48	105 4.13
B	mm inch	34 1.34	69.35 2.73	113.35 4.46
C	mm inch	27 1.06	58.70 2.31	92.10 3.63
D	mm inch	16 0.63	40 1.57	64 2.52
E×F	mm inch	6×4.30 6×0.17	6×6.60 6×0.26	8×8.40 8×0.33
H1	mm inch	21.40 0.84	48.30 1.90	82.50 3.25
H2	mm inch	18.50 0.73	42 1.65	77.40 3.05
K	mm inch	66 2.60	109.10 4.30	141.50 5.57
L	mm inch	7.35 0.29	13 0.51	18.90 0.74
M	mm inch	25.60 1.01	37.60 1.48	56.60 2.23
N	mm inch	27.50 1.08	53.10 2.09	74 2.91
O	mm inch	34 1.34	68 2.68	94 3.70
SW	mm inch	10 0.39	17 0.67	22 0.87
T	mm inch	30.50 1.20	40 1.57	51.50 2.03
U	mm inch	19 0.75	45 1.77	54 2.13
V	mm inch	6.35 0.25	9.53 0.38	12.70 0.50
Z	mm inch	8.50 0.33	20 0.79	20 0.79

Main applications

For vacuum processes with extreme UHV requirements and/or when using aggressive media



Ordering information

Valve with manual actuator
hexagon head

DN		Ordering numbers		
mm	inch	CF-R		
		without position indicator	with position indicator 80 °C	with position indicator 200 °C
16	5/8	57124-GE02	57124-GE08	57124-GE05
40	1 1/2	57132-GE02	57132-GE08	57132-GE05
63	2 1/2	57036-GE02	57036-GE08	57036-GE05
100	4	57040-GE02	57040-GE08	57040-GE05
160	6	57044-GE02	57044-GE08	57044-GE05

Valve with pneumatic actuator

single acting with closing spring (NC)

DN		Ordering numbers		
mm	inch	CF-R		
		without solenoid valve without position indicator	without solenoid valve with pos. indicator 80 °C	with solenoid valve with pos. indicator 80 °C
10	3/8	57120-XE11 ¹⁾	57120-XE21 ¹⁾	57120-XE41 ¹⁾
16	5/8	57124-GE11	57124-GE21	57124-GE41
40	1 1/2	57132-GE11	57132-GE21	57132-GE41
63	2 1/2	57036-GE11	57036-GE21	57036-GE41
100	4	57040-GE11	57040-GE21	57040-GE41
160	6	57044-GE11	57044-GE21	57044-GE41

double acting

16	5/8	57124-GE14	57124-GE24	57124-GE44
40	1 1/2	57132-GE14	57132-GE24	57132-GE44
63	2 1/2	57036-GE14	57036-GE24	57036-GE44
100	4	57040-GE14	57040-GE24	57040-GE44
160	6	57044-GE14	57044-GE24	57044-GE44

¹⁾ CF-R 16 flanges (others on request)

Other versions: see pages 210 + 211

Bake-out jacket

See page 270: ordering information and technical data on request

To control the heating process we recommend using commercial controllers with settable heating rate and temperature limiting device. Our bake-out jackets are supplied without thermocouples and thermostats.

Features

Body material: stainless steel

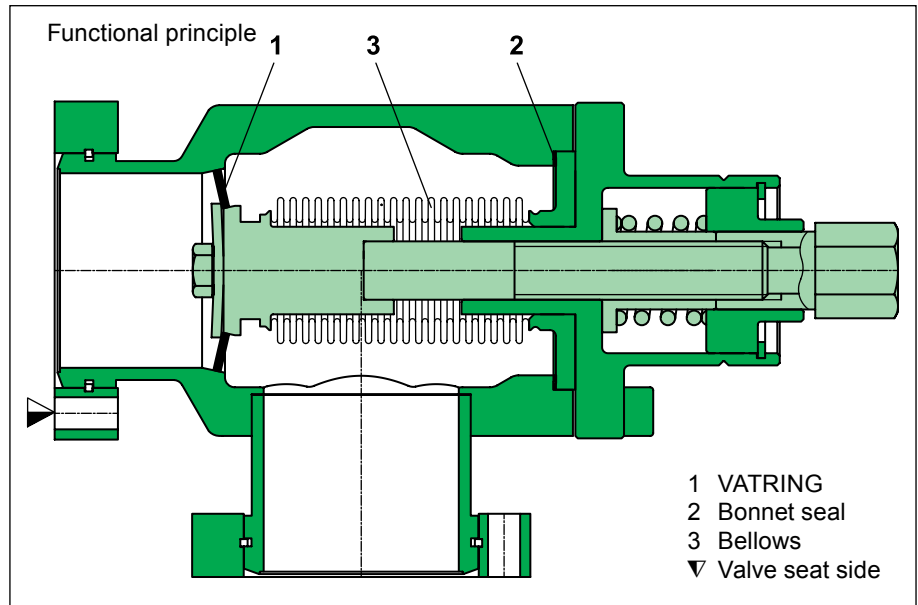
VATRING configuration: see glossary

Sealing surfaces are only elastically deformed

Largest possible conductance for the nominal diameter

Radiation resistant to 10^8 Gy

DN 16–40 closes at a mechanical stop
– no torque wrench required



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	XHV to 5 bar (abs)
Differential pressure on the gate	≤ 5 bar
Differential pressure at opening	≤ 1 bar ¹⁾
Cycles until first service	10 000
Bake-out temperature ²⁾	
– Valve body	≤ 450 °C open ≤ 350 °C closed
– Manual actuator ³⁾ :	
– hexagon head DN 16– 40	≤ 450 °C open ≤ 350 °C closed
DN 63– 160	≤ 300 °C open and closed
– Pneumatic actuator ³⁾ :	
– single acting with closing spring	≤ 150 °C
– double acting	≤ 200 °C
– Solenoid valve ³⁾	≤ 80 °C
– Position indicator ³⁾	≤ 80 °C (option: 200 °C)
Heating and cooling rate	≤ 60 °C h ⁻¹
Material	
– Valve body, mechanism	AISI 316L (1.4404, 1.4435)
– Bellows	AISI 316L (1.4435)
Seal: bonnet, gate	metal
Feedthrough	bellows
Mounting position	any
Solenoid valve	24 VDC, 2.5 W (others on request)
Position indicator: contact rating	
– Voltage	≤ 50 VAC/DC
– Current	80 °C: ≤ 1.2 A 200 °C: ≤ 1 A
Valve position indication	visual (mechanical)

¹⁾ > 1 bar with reduced number of cycles

²⁾ Maximum values: depending on operating conditions and sealing materials

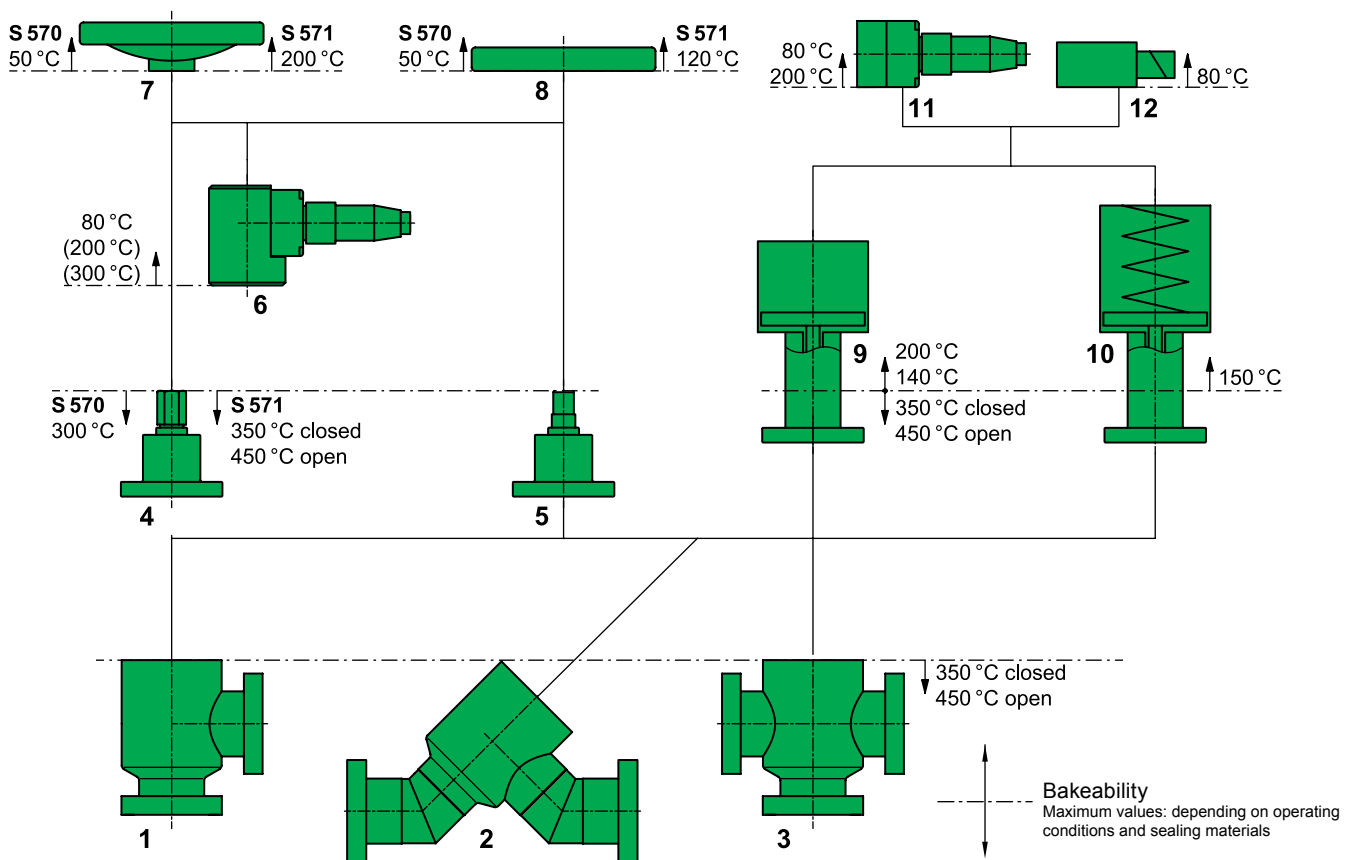
³⁾ Further details and options: see pages 210 + 211

Further technical data on next page →

Continued Technical data

				Valve with manual actuator					Valve with pneumatic actuator, single acting with closing spring							Valve with pneumatic actuator, double acting							
DN (nominal I.D.)		CF-F flange	Conductance (molecular flow)	Torque		Turns per stroke		Weight		Compressed air min. – max. overpressure		Closing or opening time	Volume of pneu- matic actuator		Weight		Compressed air min. – max. overpressure		Closing or opening time	Volume of pneu- matic actuator		Weight	
mm	inch	O.D.	ls ⁻¹	Nm	ftlb	n	kg	lbs	bar	psi	s	l	ft ³	kg	lbs	bar	psi	s	l	ft ³	kg	lbs	
10	¾	1⅓	2	–	–	–	–	–	6–9	87–131	0.5	0.07	0.002	1.75	3.9	–	–	–	–	–	–	–	
16	⅝	1⅓	5	4	3	6	0.8	1.8	6–9	87–131	1	0.12	0.004	4.6	10.1	4–5	58–73	1	0.08	0.003	2.9	6.4	
40	1½	2¾	50	10	7.5	8	2.3	5	6–9	87–131	2	0.35	0.01	9	19.8	4–5	58–73	2	0.32	0.011	6	13	
63	2½	4½	125	45	33	4.5	8	17.8	6–9	87–131	4	0.8	0.028	26	57.3	4–5	58–73	2	0.55	0.02	17.2	37.3	
100	4	6	380	90	66	6.4	16	35.2	6–9	87–131	4	2.4	0.085	35	77.2	4–5	58–73	4	1.5	0.053	26	57.3	
160	6	8	940	125	92	8	36	79.2	6–9	87–131	7	4.8	0.17	136	299	4–5	58–73	7	3.3	0.116	65	143	

Bodies and actuators: modular selection



1–3 Valve body (angle, inline, T valve), plate, bellows

10⁸ Gy, bakeable to 450 °C open / 350 °C closed

4 Manual actuator with hexagon head

DN 16– 40 10⁸ Gy, bakeable to 450 °C open / 350 °C closed

DN 63–160 10⁷ Gy, bakeable to 300 °C open and closed

5 Manual actuator with cylindrical head

DN 16– 40 10⁸ Gy, bakeable to 450 °C open / 350 °C closed

DN 63–160 10⁷ Gy, bakeable to 300 °C open and closed

6 Position indicator for manual actuator		10 ⁵ Gy, bakeable to 80 °C (options: 10 ⁶ Gy/200 °C, 10 ⁸ Gy/300 °C)
7 Handwheel for hexagon head	DN 16– 40 DN 63–100	10 ⁸ Gy, bakeable to 200 °C 10 ⁴ Gy, bakeable to 50 °C
8 Handwheel with free wheel for cylindrical head	DN 16– 40 DN 63–100	10 ⁵ Gy, bakeable to 120 °C 10 ⁴ Gy, bakeable to 50 °C
9 Pneumatic actuator, double acting		10 ⁵ Gy, bakeable to 200 °C (options: 10 ⁶ Gy/140 °C)
10 Pneumatic actuator, single acting with closing spring		10 ⁵ Gy, bakeable to 150 °C (options: 10 ⁶ Gy/140 °C)
11 Position indicator		10 ⁵ Gy, bakeable to 80 °C (option: 10 ⁶ Gy/200 °C)
12 Solenoid valve		10 ⁴ Gy, bakeable to 80 °C

Options

Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Other solenoid valve voltage (standard: 24 VDC)
- Position indicator for manual and pneumatic actuator bakeable to 200 °C ¹⁾
(standard: 80 °C)
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Pneumatic actuator radiation resistant to 10⁶ Gy, bakeable to 140 °C ¹⁾
- Manual actuator with cylindrical head

Valve

- Customer specified flanges
- Antimagnetic version with defined permeability:
see glossary
- CF-F flanges (fixed flanges), ISO-KF flanges, weld necks
- Valve with different flanges (e. g. CF/KF, CF/Cajon VCR)
- Valve without bonnet flange, welded (for tritium systems)
- Inline valve
- T valve

¹⁾ Maximum values: depending on operating conditions and sealing materials

Ordering information for options:

Ordering No. of valve-X (e. g. 57132-GE02-X, X = T valve)

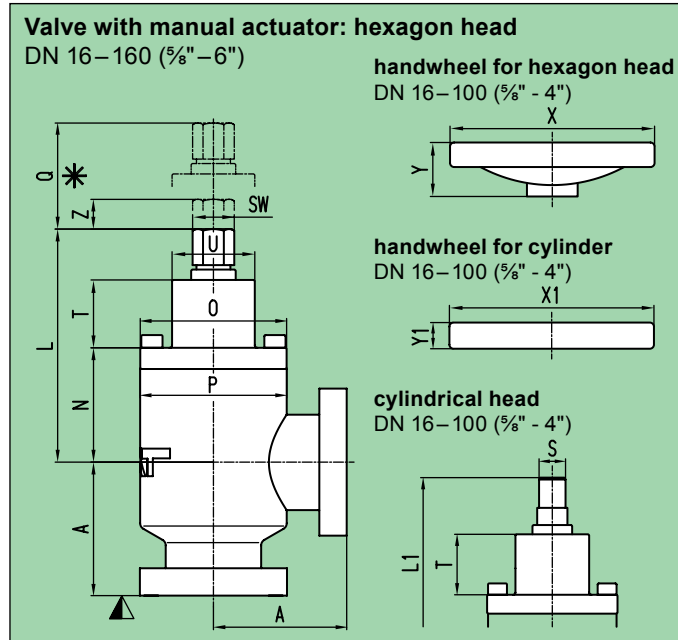
Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

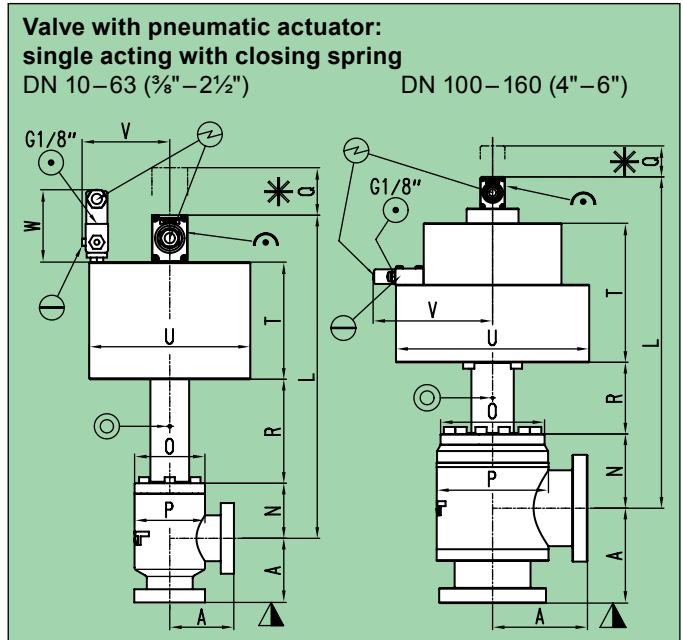
- **Flexible bake-out jacket:** see page 270
- **Flange connections**
for installation of the valve: see series 33
- **Handwheel**
 - for hexagon head (DN 16–40)
 - with free wheel for cylindrical head (DN 16–40)
 - with sliding clutch for hexagon head (DN 63–100)
 - with sliding clutch and free wheel for cylindrical head (DN 63–100)

Main dimensions



Flange dimensions: see page 213

DN	mm inch	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6
A	mm inch	38 1.50	63 2.48	105 4.13	135 5.31	167 6.57
L	mm inch	100.20 3.94	126 4.96	185.50 7.30	258.50 10.18	285.10 11.22
L1	mm inch	115.70 4.55	133.50 5.26	185.50 7.30	258.50 10.18	–
N	mm inch	52.60 2.07	54 2.13	88 3.46	106 4.17	134.60 5.30
O	mm inch	54 2.13	69 2.72	102 4.02	148 5.83	202 7.95
P	mm inch	52 2.05	69 2.72	102 4.02	159 6.26	206 8.11
Q	mm inch	60.80 2.39	78 3.07	134.50 5.29	163.50 6.44	264.90 10.43
S	mm inch	12 0.47	14 0.55	20 0.79	30 1.18	–
SW	mm inch	13 0.51	17 0.67	22 0.87	27 1.06	36 1.42
T	mm inch	33 1.77	34 1.34	68.50 2.70	87 3.43	112 4.41
U	mm inch	32 1.26	39 1.54	60 2.36	68 2.68	78 3.07
X	mm inch	62 2.44	125 4.92	250 9.84	500 19.69	–
X1	mm inch	62 2.44	125 4.92	250 9.84	500 19.69	–
Y	mm inch	23 0.91	33 1.30	72 2.83	80 3.25	–
Y1	mm inch	12 0.47	16 0.63	75 2.95	95 3.74	–
Z	mm inch	7.50 0.30	14 0.55	20 0.79	32 1.26	44 1.73



▽ Valve seat side

* Required for dismantling

⊙ Compressed air connection

⊕ Electrical connection

⌚ Mechanical position indication

⊖ Emergency operation

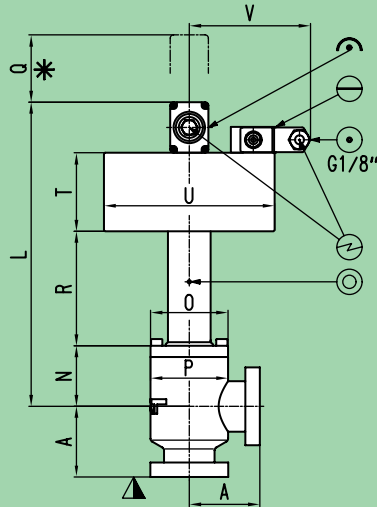
⊙ Leak detection hole

Flange dimensions: see page 213

DN	mm inch	10 3/8	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6
A	mm inch	38 1.50	38 1.50	63 2.48	105 4.13	135 5.31	167 6.57
L	mm inch	192.60 7.58	250.30 9.85	317 12.48	375 14.76	471.30 18.56	592 23.31
N	mm inch	35.90 1.41	52.60 2.07	54 2.13	88 3.46	105.70 4.16	135 5.31
O	mm inch	47 1.85	54 2.13	69 2.72	102 4.02	148 5.83	202 7.95
P	mm inch	28 1.10	36 1.42	69 2.72	102 4.02	159 6.26	206 8.11
Q	mm inch	41 1.61	83.70 3.30	93 3.66	115 4.53	138.70 5.46	183 7.20
R	mm inch	15.70 0.62	79.70 3.14	102 4.02	93 3.66	102 4.02	130 5.12
T	mm inch	57 2.24	72 2.83	115 4.53	148 5.83	198 7.80	250 9.84
U	mm inch	98 3.86	108 4.25	158 6.22	198 7.80	275 10.83	328 12.91
V	mm inch	84 3.31	61 2.40	86 3.39	131.5 5.18	170 6.69	196.5 7.74
W	mm inch	–	71 2.80	71 2.80	27 1.06	27 1.06	27 1.06

Main dimensions

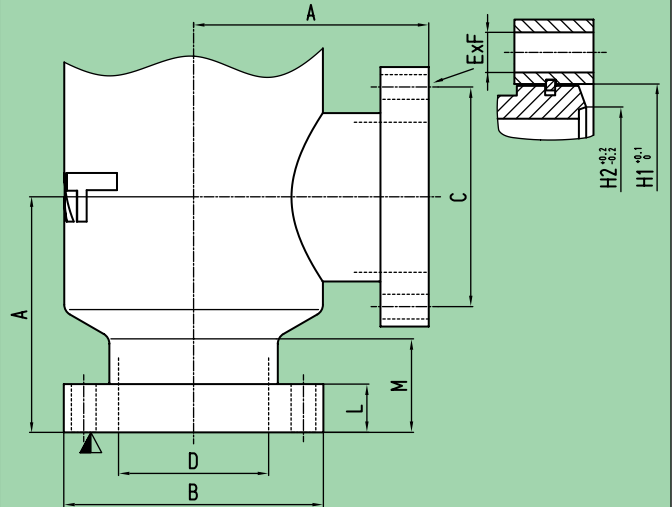
Valve with pneumatic actuator: double acting
DN 63–160 (2½"–6")



- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Mechanical position indication
- ⊖ Emergency operation
- ⊙ Leak detection hole

Flange dimensions

CF-R
DN 16–160 (½"–6")



DN	mm inch	16 ¾	40 1½	63 2½	100 4	160 6
A	mm inch	38 1.50	63 2.48	105 4.13	135 5.31	167 6.57
L	mm inch	232.30 9.15	272 10.71	317 12.48	382.70 15.07	460 18.11
N	mm inch	52.60 2.07	54 2.13	88 3.46	105.70 4.16	135 5.31
O	mm inch	54 2.13	69 2.72	102 4.02	148 5.83	202 7.95
P	mm inch	36 1.42	69 2.72	102 4.02	159 6.26	220 8.66
Q	mm inch	60.70 2.39	68 2.68	113 4.45	142.30 5.60	185 7.28
R	mm inch	79.70 3.14	102 4.02	93 3.66	102 4.02	130 5.12
T	mm inch	54 2.13	70 2.76	90 3.54	130 5.12	150 5.91
U	mm inch	98 3.86	152 5.98	194 7.64	238 9.37	278 10.94
V	mm inch	94 3.70	108 4.25	130 5.12	151 5.94	171.5 6.75

DN	mm inch	10/16 ¾/¾	40 1½	63 2½	100 4	160 6
O.D.	inch	1½/1½	2¾	4½	6	8
A	mm inch	38 1.50	63 2.48	105 4.13	135 5.31	167 6.57
B	mm inch	34 1.34	69.50 2.74	113.50 4.47	152 5.98	202.50 7.97
C	mm inch	27 1.06	58.70 2.31	92.10 3.62	130.30 5.13	181 7.12
D	mm inch	16 0.63	40 1.57	64 2.52	102 4.01	150 5.9
E×F	mm inch	6×4.30 6×0.17	6×6.60 6×0.26	8×8.40 8×0.33	16×8.40 16×0.33	20×8.40 20×0.33
H1	mm inch	21.40 0.84	48.30 1.90	82.50 3.25	120.65 4.75	171.45 6.75
H2	mm inch	18.50 0.73	42 1.62	77.40 3.05	115.50 4.55	166 6.53
L	mm inch	7.40 0.29	12 0.47	19 0.75	21.50 0.85	22 0.87
M	mm inch	22.60 0.89	25.60 1.01	46.60 1.83	60 2.36	62 2.44

Main applications

Gas inlet valve for smallest gas flows
to control the process pressure



Ordering information

Valve with manual actuator
(handwheel)
or stepper motor with integrated
controller

DN		Ordering numbers			
mm	inch	CF-R			
		Valve with manual actuator	Valve with stepper motor and integrated controller		
			RS232/1 sensor	Logic/1 sensor	RS485/1 sensor
16	5/8	59024-GE01	59024-GEGG	59024-GEGC	59024-GEGJ

Technical data

Valve

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	UHV to 10 bar (abs)
Differential pressure at opening	≤ 10 bar
Dead volume	
– Seat side	2.7 cm ³
– Side port	1.1 cm ³
Cycles	20 000
Bake-out temperature ¹⁾	
– Valve body	≤ 300 °C
– Manual actuator	≤ 300 °C
– Stepper motor	≤ 50 °C
Heating and cooling rate	≤ 60 °C h ⁻¹
Material	
– Valve body	AISI 660 (1.4943), AISI 316L (1.4404)
– Diaphragm	AISI 301 (1.4310), gold-plated
Mounting position	any
Valve position indication	visual (scale)
Conductance (molecular flow)	0.05 ls ⁻¹
Adjustable gas flow	$1 \cdot 10^{-10}$ mbar ls ⁻¹ to 100 mbar ls ⁻¹

¹⁾ Maximum values: depending on operating conditions
and sealing materials

Stepper motor with integrated controller

Position resolution	100 000 (steps = 0–90° rotation)
Closing time	3.5 s
Further technical data	see pages 146–149

Features

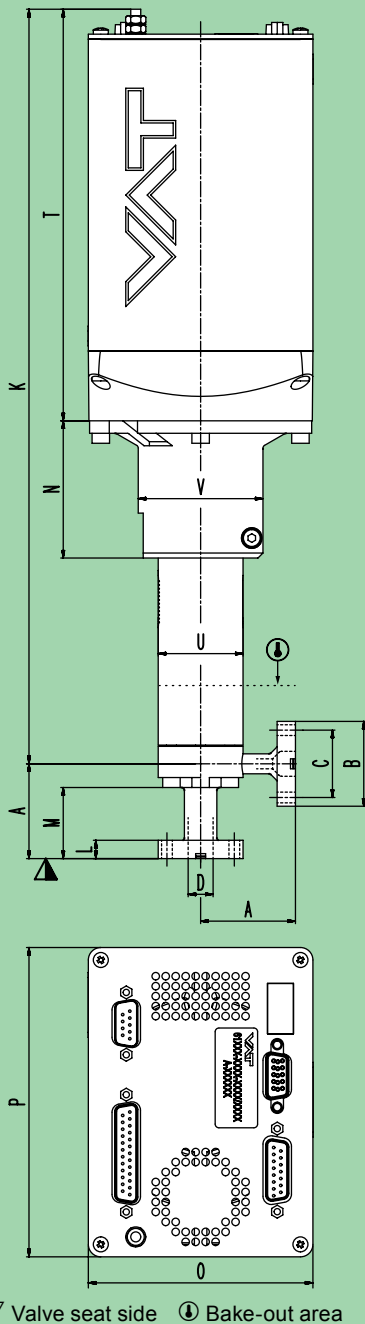
Body material: stainless steel

Resistant to corrosive and aggressive gases

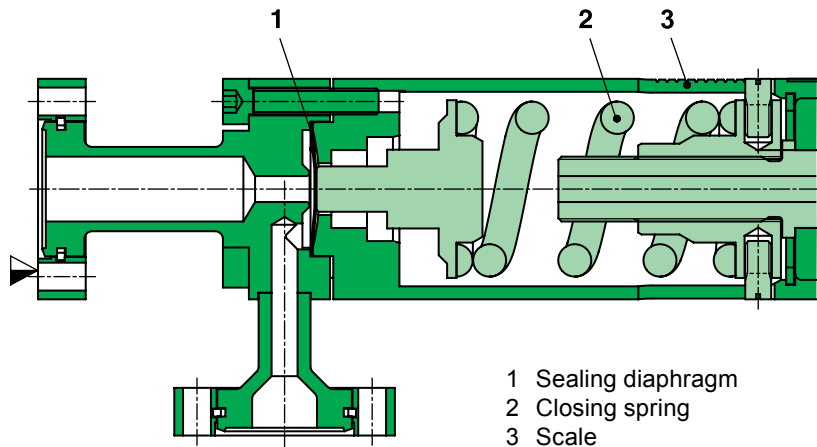
Precise, reproducible adjustment of the gas flow

Dimensions

Valve with stepper motor and controller DN 16 (5/8")

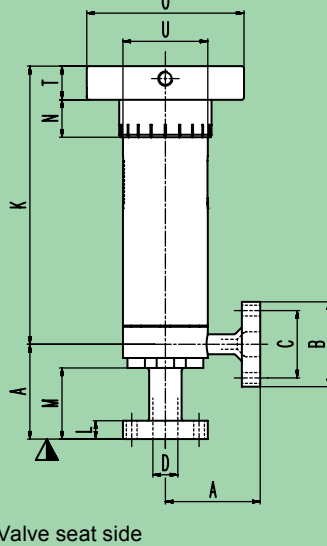


Functional principle



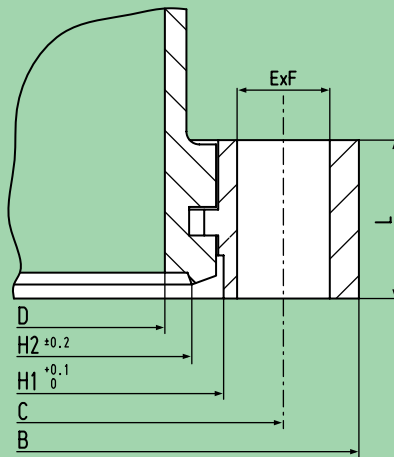
- 1 Sealing diaphragm
- 2 Closing spring
- 3 Scale
- ▼ Valve seat side

Valve with manual actuator: handwheel DN 16 (5/8")



		Manual actuator	Motor
DN	mm inch	16 5/8	16 5/8
A	mm inch	38 1.50	38 1.50
K	mm inch	111.50 4.39	302.50 11.91
M	mm inch	28.50 1.12	28.50 1.12
N	mm inch	15 0.59	55 2.17
O	mm inch	63 2.48	90 3.54
P	mm inch	—	124 4.88
T	mm inch	13.50 0.53	165 6.50
U	mm inch	34 1.34	34 1.34
V	mm inch	—	50 1.69

Flange DN 16 (5/8")



		DN 16	
DN	mm inch	16 5/8	CF-F DN 40 flange and inline version on request
B	mm inch	34 1.34	
C	mm inch	27 1.06	
D	mm inch	10 0.39	
E x F	mm inch	6 x 4.30 6 x 0.17	
H1	mm inch	21.40 0.84	
H2	mm inch	18.50 0.73	
L	mm inch	7.35 0.29	

Main applications

Sector valve for storage rings in accelerators and synchrotrons

Isolation valve in microwave transmission lines



Ordering information

Valve with pneumatic actuator
double acting
with solenoid valve
with position indicator 80 °C

DN		Ordering numbers (specify control voltage)	
mm	inch	CF-F	
		compact actuator: valve bakeable to 200 °C	extended actuator: valve bakeable to 300 °C
63	2 ½	47236-CE74	47236-CE44
100	4	47240-CE74	47240-CE44
160	6	47244-CE74	47244-CE44
200	8	47146-CE74	47146-CE44

without solenoid valve, with position indicator 80 °C: compact actuator 47 . . . -CE72
extended actuator 47 . . . -CE24

Other versions: see pages 218 + 219

Bake-out jacket

See page 270: ordering information and technical data on request

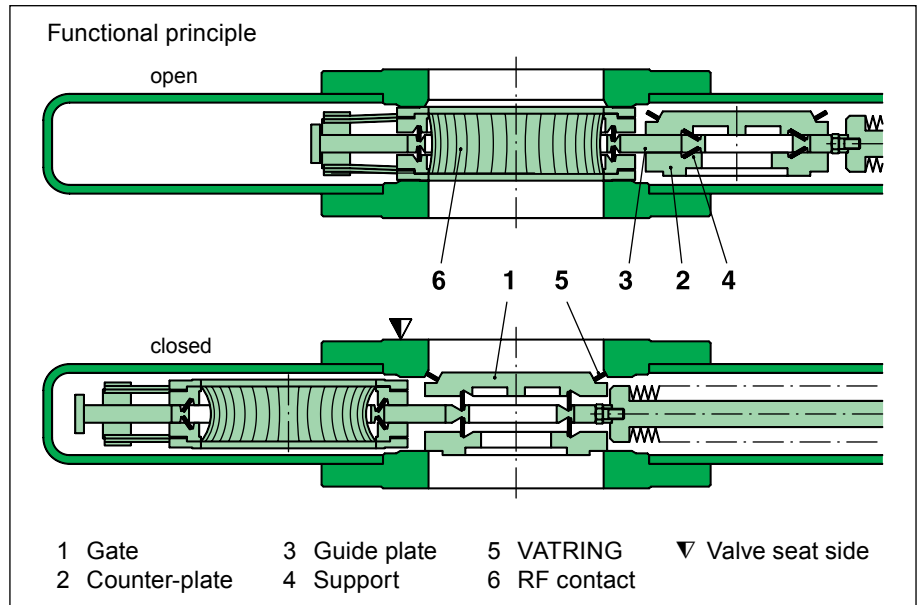
To control the heating process we recommend using commercial controllers with settable heating rate and temperature limiting device. Our bake-out jackets are supplied without thermocouples and thermostats.

Special version

Valve with gate seal made of FKM (Viton®) instead of metal: see page 221

Features

Body material: stainless steel
 VATRING configuration: see glossary
 Mechanically locked in open and closed position
 Radiation resistant
 Low RF resistance
 Customer specific RF aperture
 Reproducible RF contact due to mechanically loaded springs
 Bakeable to 300 °C in open and closed position



Technical data

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-10} \text{ mbar ls}^{-1}$
Pressure range	XHV to 2 bar (abs)
Differential pressure on the gate	$\leq 1 \text{ bar}$
Differential pressure at opening	$\leq 500 \text{ mbar}^{1)}$
Cycles until first service	
– DN 63–160	10 000
– DN 200	5 000
Bake-out temperature ²⁾	
– Valve body	$\leq 300 \text{ °C}$
– Pneumatic actuator	$\leq 200 \text{ °C}$
– Solenoid valve	$\leq 80 \text{ °C}$
– Position indicator	$\leq 80 \text{ °C}$ (option: 200 °C)
Heating and cooling rate	
– DN 63–160	$\leq 50 \text{ °C h}^{-1}$
– DN 200	$\leq 25 \text{ °C h}^{-1}$
Material	
– Valve body, mechanism	AISI 316L (1.4435, 1.4404)
– Bellows	AISI 316L (1.4435)
– RF contact	AISI 301 (1.4310), thermo-resistant silver-coated
Seal: bonnet, gate	metal
Feedthrough	bellows
Mounting position	beam line horizontal, otherwise any
Solenoid valve	24 VDC, 2.5 W (others on request)
Position indicator: contact rating	
– Voltage	$\leq 50 \text{ VAC/DC}$
– Current	80 °C: $\leq 1.2 \text{ A}$ 200 °C: $\leq 1 \text{ A}$
Valve position indication	visual (mechanical)

¹⁾ 1 bar with reduced number of cycles

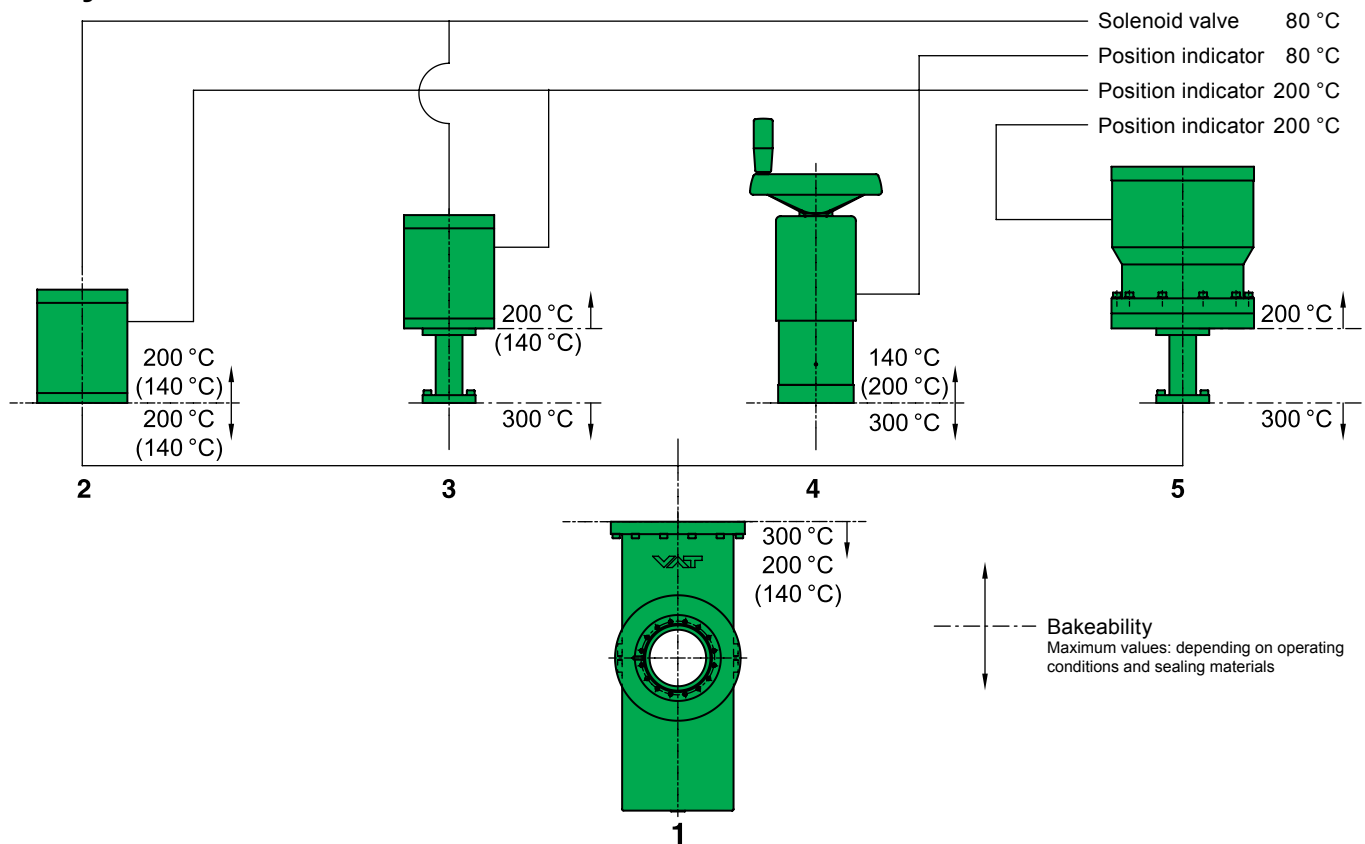
²⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

DN (nominal I.D.)		CF-F flange	Conductance (molecular flow)	Compressed air min. – max. overpressure		Volume of pneu- matic actuator		Closing or opening time	Weight	
mm	inch	O.D.	ls ⁻¹	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	4 ½	400	4–8	58–116	0.7	0.024	2	21	46
100	4	6	1400	4–8	58–116	1.7	0.060	4	36	80
160	6	8	3700	4–8	58–116	5.0	0.180	9	59	130
200	8	10	6100	4–8	58–116	9.7	0.340	18	148	326

Body and actuators: modular selection



- 1 Valve body, mechanism, bellows : 10⁸ Gy, bakeable to 300 °C
- 2 Pneumatic actuator: compact : 10⁵ Gy, bakeable to 200 °C
- 3 Pneumatic actuator: extended : 10⁵ Gy, bakeable to 200 °C
- 4 Manual actuator (option) : 10⁵ Gy, bakeable to 140 °C or 200 °C
- 5 Special pneumatic actuator for hot zone : 10⁸ Gy, bakeable to 200 °C

Option: 10⁶ Gy, bakeable to 140 °C
Option: 10⁶ Gy, bakeable to 140 °C

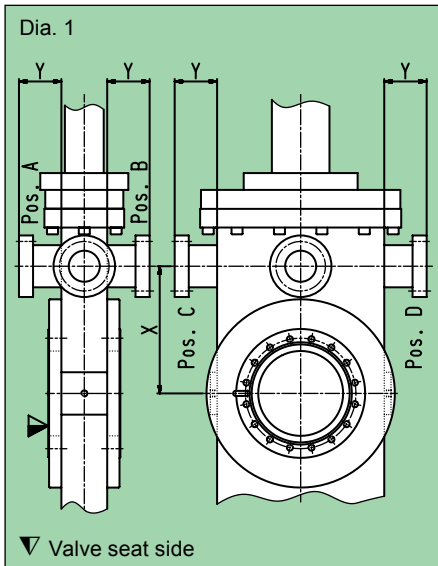
Options

Actuator

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Other solenoid valve voltage (standard: 24 VDC)
- Solenoid valve radiation resistant to 10^6 Gy (standard: 10^4 Gy)
- Position indicator for pneumatic actuator bakeable to 200 °C¹⁾ (standard: 80 °C)
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Accessory for pneumatic actuator for faster closing
- Pneumatic actuator (compact or extended):
radiation resistant to 10^6 Gy, bakeable to 140 °C¹⁾
- Pneumatic actuator for hot zone:
radiation resistant to 10^8 Gy, bakeable to 200 °C¹⁾
- Manual actuator bakeable to 140 °C or 200 °C¹⁾
- Position indicator for manual actuator bakeable to 80 °C or 200 °C¹⁾

Valve

- Customer specified flanges
- Antimagnetic version with defined permeability:
see glossary
- Ports for roughing (by-pass), venting or for gauges (Dia. 1),
possible in positions A, B, C and D



DN valve	mm inch	63 2 ½	100 4	160 6	200 8
Recommended port CF-F	mm inch	16 ¾	40 1 ½	40 1 ½	40 1 ½
X	mm inch	115 4.53	135 5.31	220 8.66	280 11.02
Y	mm inch	20 0.79	50 1.97	50 1.97	50 1.97
Other ports on request					

- Customer specific RF aperture
- RF contact «finger type» made of CuBe
- RF contact «comb type» made of OFHC copper
- Waveguide

Ordering information for options:

Ordering No. of valve-X (e. g. 47240-CE44-X,
X = solenoid valve for impulse actuation 220 V 50 Hz)

Spare parts

- **Seals**
on request (specify fabrication number of valve)

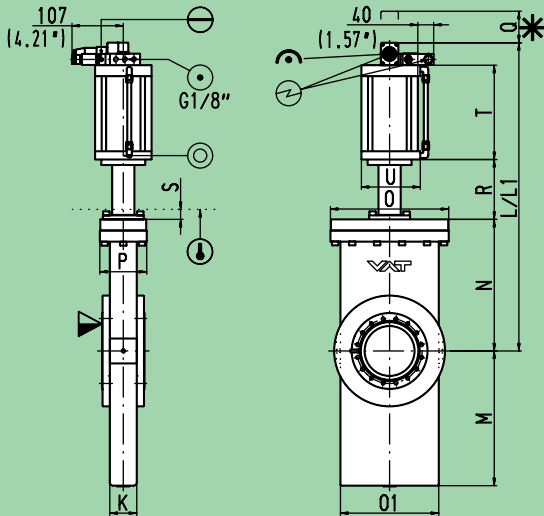
Accessories

- **Flexible bake-out jacket:** see page 270
- **Flange connections**
for installation of the valve: see series 33

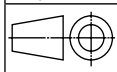
¹⁾ Maximum values: depending on operating conditions
and sealing materials

Main dimensions

Valve with pneumatic actuator: double acting
DN 63–160 (2½"–6")

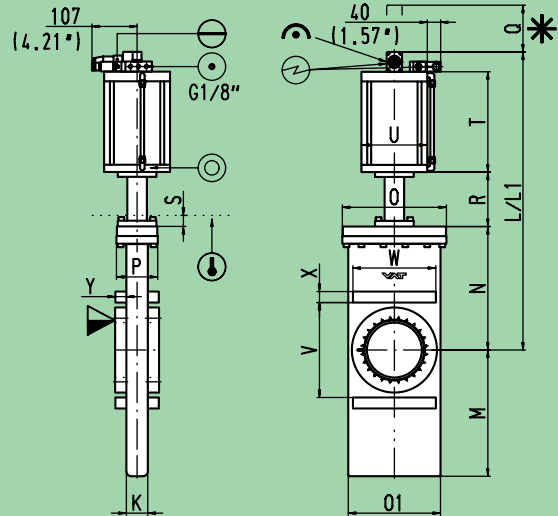


Projection E



- ▼ Valve seat side
- * Required for dismantling
- ⊙ Leak detection hole
- ⊖ Emergency operation
- ⊕ Compressed air connection
- ⊕ Electrical connection
- ⊕ Mechanical position indication
- ⊕ Bake-out area

Valve with pneumatic actuator: double acting
DN 200 (8")



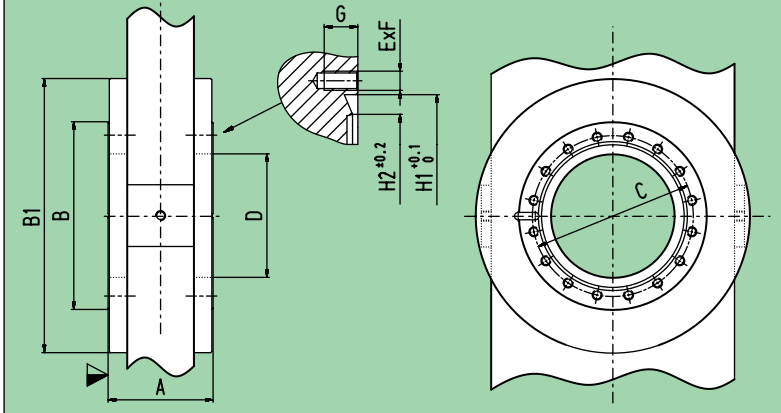
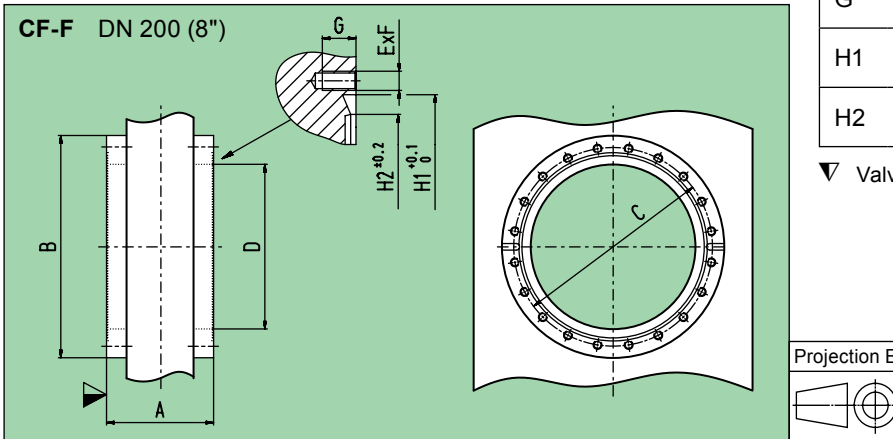
L1 and R for extended actuator
Flange dimensions: see page 221

L1 and R for extended actuator
Flange dimensions: see page 221

DN	mm inch	63 2½	100 4	160 6
K	mm inch	46 1.81	54 2.13	70 2.76
L	mm inch	459 18.07	537 21.14	702 27.64
L1	mm inch	583 22.95	661 26.02	826 32.52
M	mm inch	215 8.46	272 10.70	356 14.02
N	mm inch	231 9.09	264 10.39	370 14.57
O	mm inch	189 7.44	237 9.33	287 11.30
O1	mm inch	156 6.14	197 7.76	253 9.96
P	mm inch	77 3.03	94 3.70	93 3.66
Q	mm inch	420 16.54	520 20.47	700 27.56
R	mm inch	124 4.88	124 4.88	124 4.88
S	mm inch	20 0.79	20 0.79	20 0.79
T	mm inch	183 7.20	228 8.98	287 11.30
U	mm inch	104 4.09	135 5.31	190 7.48

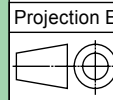
DN	mm inch	200 8		
K	mm inch	78 3.07		
L	mm inch	851 33.50		
L1	mm inch	975 38.39		
M	mm inch	460 18.11		
N	mm inch	443 17.44		
O	mm inch	372 14.65		
O1	mm inch	336 13.23		
P	mm inch	114 4.49		
Q	mm inch	880 34.65		
R	mm inch	124 4.88		
S	mm inch	20 0.79		
T	mm inch	363 14.29		
U	mm inch	230 9.06		
V	mm inch	346 10.24		
W	mm inch	302 14.89		
X	mm inch	40 1.57		
Y	mm inch	40 1.57		

Flange dimensions

CF-F DN 63–160 (2½"–6")

CF-F DN 200 (8")


DN	mm inch	63 2½	100 4	160 6	200 8
O.D.	inch	4½	6	8	10
A	mm inch	75 2.95	85 3.35	110 4.33	160 6.30
B	mm inch	113.50 4.47	152 5.98	202.50 7.97	310 12.20
B1	mm inch	180 7.08	222 8.74	288 11.34	–
C	mm inch	92.10 3.63	130.30 5.13	181 7.13	231.80 9.13
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87
E × F	mm inch	8 × M8	16 × M8	20 × M8	24 × M8
G	mm inch	12 0.47	14 0.55	17 0.67	17 0.67
H1	mm inch	82.50 3.25	120.65 4.75	171.45 6.75	222.30 8.75
H2	mm inch	77.40 3.05	115.50 4.55	166 6.54	217 8.54

▼ Valve seat side



Special version



HF-UHV gate valve with gate seal made of FKM (Viton®)

Technical data:

Leak rate

- Valve body $< 5 \cdot 10^{-10}$ mbar ls⁻¹
- Valve seat $< 1 \cdot 10^{-9}$ mbar ls⁻¹

Pressure range

UHV to 1 bar (abs)

Differential pressure on the gate

≤ 1 bar

Cycles until first service

10 000

Bake-out temperature ¹⁾

- Valve body ≤ 200 °C
- Pneumatic actuator ≤ 200 °C
- Solenoid valve ≤ 80 °C
- Position indicator ≤ 80 °C (option: 200 °C)

Seal

- Bonnet metal
- Gate FKM (Viton®)

Further details

on request

¹⁾ Maximum values: depending on operating conditions and sealing materials

Main applications

To preserve the vacuum in accelerators and storage rings in case of an air inrush



Ordering information

Series 75.2
Gate valve with pneumatic actuator
 double acting
 without controller

DN		Ordering numbers
mm	inch	CF-F
40	1 ½	75232-CE44

Series 75.0
Flap valve with pneumatic actuator
 double acting
 without controller

DN		Ordering numbers
mm	inch	CF-F
63	2 ½	75036-CE44
100	4	75040-CE44
160	6	75044-CE44
200	8	75046-CE44

Controller including accessories

See page 230

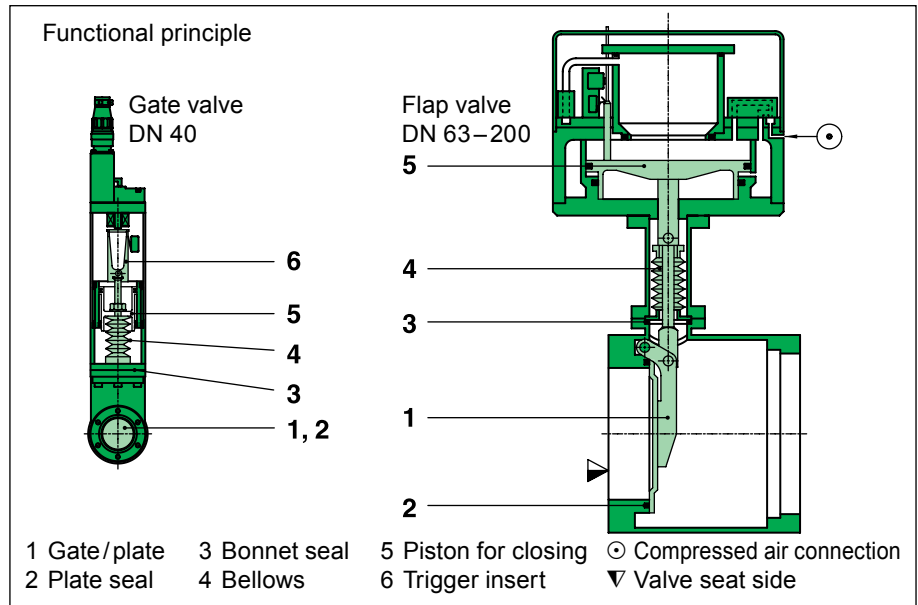
Features

Body material: stainless steel

Closes vacuum-tight in a few milliseconds

Pneumatic dampening during closing

Closing by releasing a mechanical latch (DN 40) or fast venting/evacuation of the pneumatic cylinder (DN 63–200)



Technical data

Leak rate	
– Valve body	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
– Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-10}$ to 2 bar (abs)
Differential pressure	see table on next page
Cycles until first service	2000
Bake-out temperature ¹⁾	
– Valve body	≤ 200 °C (DN 40: trigger insert removed)
– Pneumatic actuator	≤ 50 °C
Radiation resistance	
– Valve body	10^5 Gy
– Pneumatic actuator	10^4 Gy
Material	
– Valve body	
– DN 40	AISI 304 (1.4301)
– DN 63–200	AISI 316L (1.4435)
– Mechanism	
– DN 40	AISI 304 (1.4301)
– DN 63–200	AISI 316L (1.4435)
– Bellows	AISI 316L (1.4404, 1.4435)
Seal	
– Bonnet	metal
– Gate/plate	FKM (Viton®)
Feedthrough	bellows
Mounting position	seat side marked ▼ in opposite direction of the air inrush

¹⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

DN (nominal I.D.)		CF-F flange	Conductance (molecular flow)	Differential pressure: valve closed		Differential pressure at opening		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Total closing time *)	Opening time	Weight	
				In closing direction	In opening direction	In closing direction	In opening direction								
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	bar	bar	psi	l	ft ³	ms	s	kg	lbs
Gate valve Series 75.2															
40	1½	2¾	220	≤1.2	≤1.2	≤ 30	≤30	4–5	58–73	0.36	0.01	<10	9	2	4.5
Flap valve Series 75.0															
63	2½	4½	200	≤2	≤1.2	≤600	≤1	5–8	73–116	3	0.11	13	7	25	55
100	4	6	700	≤2	≤1.2	≤180	≤1	5–8	73–116	3	0.11	15	7	29	64
160	6	8	1700	≤2	≤0.5	≤ 50	≤1	5–8	73–116	3	0.11	23	7	36	80
200	8	10	2500	≤2	≤0.07	≤ 25	≤1	5–8	73–116	3	0.11	40	7	42	93

*) from sensor signal to leak tight valve

Option

– Customer specified flanges

Ordering information for option:

Ordering No. of valve-X (e. g. 75040-CE44-X, X = special flanges)

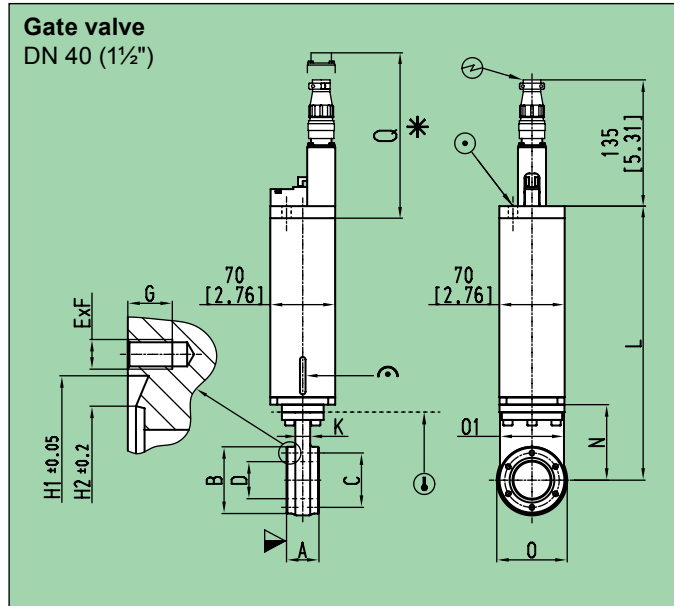
Spare parts

– **Seals**
on request (specify fabrication number of valve)

Accessories

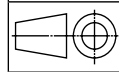
– **Controller:** see page 230
– **Flange connections**
for installation of the valve: see series 33

Dimensions

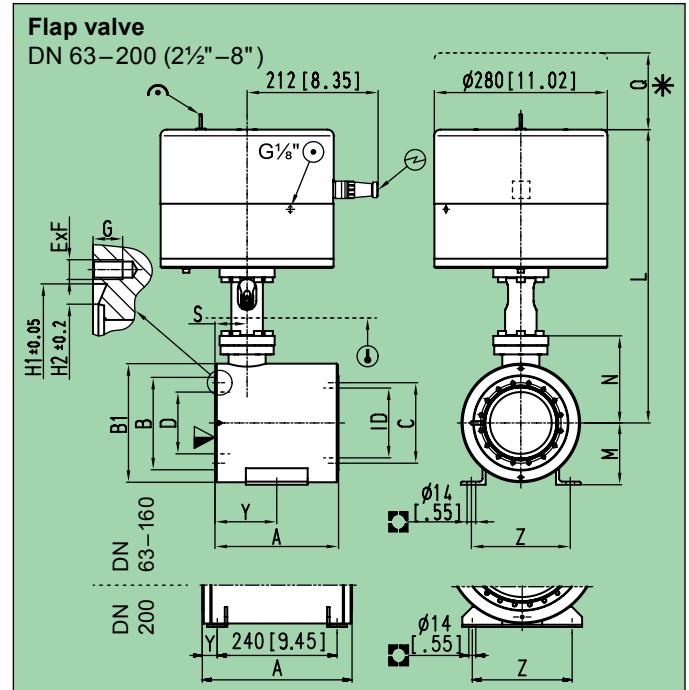


- ▽ Valve seat side
* Required for dismantling
⊙ Compressed air connection
⊕ Electrical connection
↻ Mechanical position indication
Ⓢ Bake-out area
■ For attachment

Projection E



DN	mm	40			
	inch	1½			
A	mm	35			
	inch	1.38			
B	mm	72			
	inch	2.83			
C	mm	58.70			
	inch	2.31			
D	mm	40			
	inch	1.57			
E × F		6 × M6			
G	mm	7			
	inch	0.28			
H1	mm	48.35			
	inch	1.90			
H2	mm	42			
	inch	1.65			
K	mm	16			
	inch	0.63			
L	mm	295.50			
	inch	11.63			
N	mm	81.50			
	inch	3.21			
O	mm	76			
	inch	2.99			
O1	mm	69			
	inch	2.72			
Q	mm	195			
	inch	7.68			



DN	mm	63	100	160	200
	inch	2½	4	6	8
A	mm	150	200	250	300
	inch	5.91	7.87	9.84	11.81
B	mm	113.50	152	202.50	253
	inch	4.47	5.98	7.97	9.96
B1	mm	154	192	242	306
	inch	6.06	7.56	9.53	12.05
C	mm	92.10	130.30	181	231.80
	inch	3.63	5.13	7.13	9.13
D	mm	63	100	150	200
	inch	2.48	3.94	5.91	7.87
E × F		8 × M8	16 × M8	20 × M8	24 × M8
G	mm	12	12	12	12
	inch	0.47	0.47	0.47	0.47
H1	mm	82.55	120.65	171.50	222.35
	inch	3.25	4.75	6.75	8.75
H2	mm	77.40	115.50	166	217
	inch	3.05	4.55	6.54	8.54
ID	mm	76	113	164	214
	inch	2.99	4.45	6.47	8.43
L	mm	456	475	500	526
	inch	17.95	18.70	19.69	20.71
M	mm	80	100	125	160
	inch	3.15	3.94	4.92	6.30
N	mm	122	141	166	192
	inch	4.80	5.55	6.54	7.56
Q	mm	83	83	85	84
	inch	3.27	3.27	3.35	3.31
S	mm	52	52	52	52
	inch	2.05	2.05	2.05	2.05
Y	mm	75	100	125	30
	inch	2.95	3.94	4.92	1.18
Z	mm	120	160	160	200
	inch	4.72	6.30	6.30	7.87

Main applications

To preserve the vacuum in accelerators and storage rings in case of an air inrush



Ordering information

Series 77.3
Slot shutter with pneumatic actuator
double acting
without controller

DN		Circular opening		Ordering numbers
mm	inch	mm	inch	
40	1½	Ø 40	Ø 1½	CF-F 77332-CE44

DN		Slot opening	D × D1 (height × width)	Ordering numbers
mm	inch	mm	inch	
63	2½	35 × 50	1.38 × 1.97	CF-F 77336-CE44
100	4	35 × 80	1.38 × 3.15	77340-CE44
160	6	35 × 130	1.38 × 5.12	77344-CE44

Series 77.1
Flap shutter with pneumatic actuator
double acting
without controller

DN		Circular opening		Ordering numbers
mm	inch	mm	inch	
63	2½	Ø 63	Ø 2½	CF-F 77136-CE44
100	4	Ø 100	Ø 4	77140-CE44
160	6	Ø 160	Ø 6	77144-CE44

Controller including accessories

See page 230

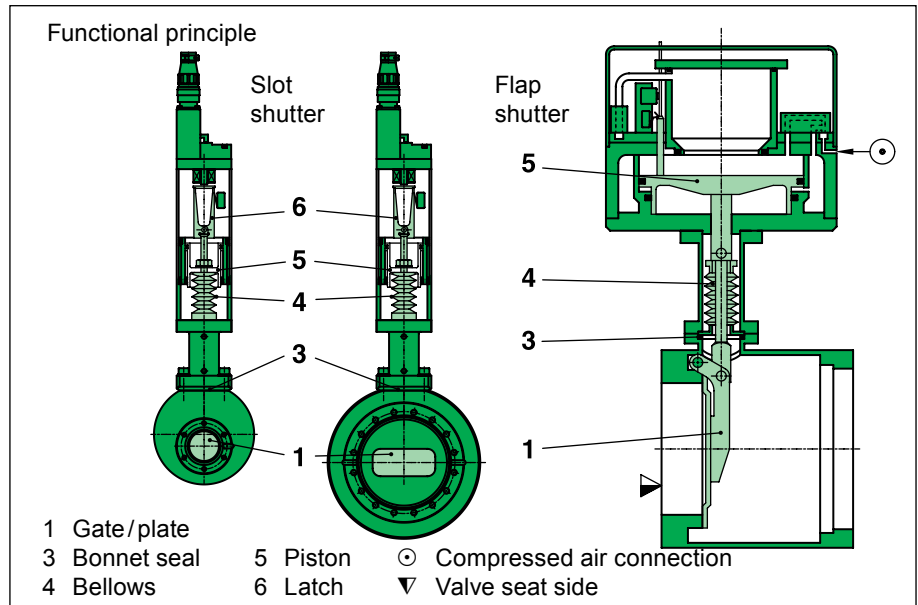
Features

Body material: stainless steel

Closes to a small leak in a few milli-seconds

Pneumatic dampening during closing

Closing by releasing a mechanical latch (Series 77.3) or fast venting/evacuation of the pneumatic cylinder (Series 77.1)



Technical data

Leak rate	
– Valve body	$< 1 \cdot 10^{-10} \text{ mbar ls}^{-1}$
– Valve seat	
– Series 77.3	$< 1 \text{ mbar ls}^{-1}$
– Series 77.1	$< 30 \text{ mbar ls}^{-1}$
Pressure range	UHV to 1.2 bar (abs)
Differential pressure	see table on next page
Cycles until first service	
– Slot shutter	5000 ¹⁾
– Flap shutter	2000 ¹⁾
Bake-out temperature ²⁾	
– Valve body	$\leq 300 \text{ }^{\circ}\text{C}$
– Pneumatic actuator	$\leq 50 \text{ }^{\circ}\text{C}$
Radiation resistance	
– Valve body	10^8 Gy
– Pneumatic actuator	10^4 Gy
Material	
– Valve body	AISI 316L (1.4435, 1.4404)
– Mechanism	
– DN 40	AISI 304 (1.4301)
– DN 63– 160	AISI 316L (1.4435)
– Bellows	
– Slot shutter	AISI 633 (AM 350)
– Flap shutter	AISI 316L (1.4404)
– Gate/plate	
– Slot shutter	AISI 316L (1.4404), silver-plated
– Flap shutter	Titanium
Seal: bonnet	metal
Feedthrough	bellows
Mounting position	seat side marked ▼ in opposite direction of the air inrush

¹⁾ At 5 bar compressed air

²⁾ Maximum values: depending on operating conditions and sealing materials

Further technical data on next page →

Continued Technical data

DN (nominal I.D.)	CF-F flange	Conductance (molecular flow)	Differential pressure: valve closed		Differential pressure at opening		Compressed air min. –max. overpressure	Volume of pneumatic actuator	Total closing time *)	Opening time	Weight				
			In closing direction	In opening direction	In closing direction	In opening direction									
Slot shutter Series 77.3															
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	mbar	bar	psi	l	ft³	ms	s	kg	lbs
40	1½	2¾	110	≤1.2	≤1.2	≤300	≤300	4–6	58–87	0.36	0.01	<10	9	8.1	18
63	2½	4½	240	≤1.2	≤1.2	≤200	≤200	4–6	58–87	0.36	0.01	<10	9	11	24
100	4	6	450	≤1.2	≤1.2	≤150	≤150	4–6	58–87	0.36	0.01	<10	9	14	30
160	6	8	830	≤1.2	≤1.2	≤100	≤100	4–6	58–87	0.36	0.01	<10	9	20	44
Flap shutter Series 77.1															
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	bar	bar	psi	l	ft³	ms	s	kg	lbs
63	2½	4½	200	≤2	≤1.2	≤600	≤1	5–8	73–116	3	0.11	13	7	25	55
100	4	6	700	≤2	≤1.2	≤180	≤1	5–8	73–116	3	0.11	15	7	29	64
160	6	8	1700	≤2	≤0.5	≤50	≤1	5–8	73–116	3	0.11	23	7	36	80

*) from sensor signal to closed shutter

Options

- Customer specified flanges
- Special slot dimensions (slot shutter)

Ordering information for options:

Ordering No. of shutter-X (e. g. 77340-CE44-X, X = special flanges)

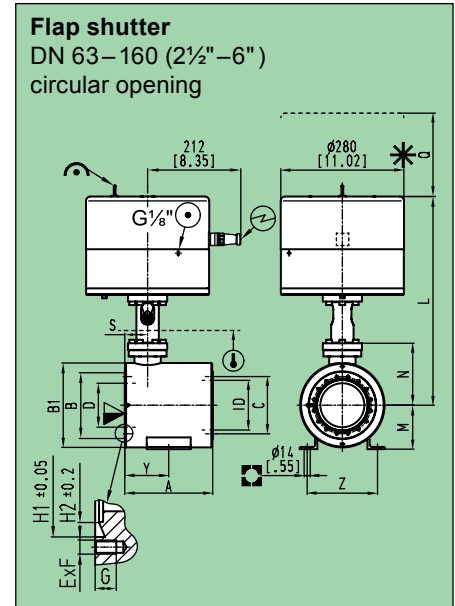
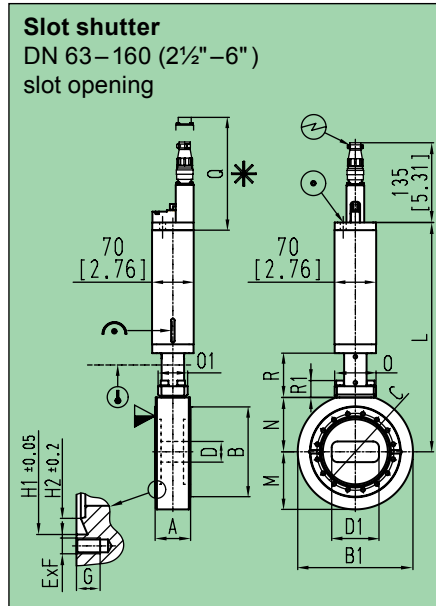
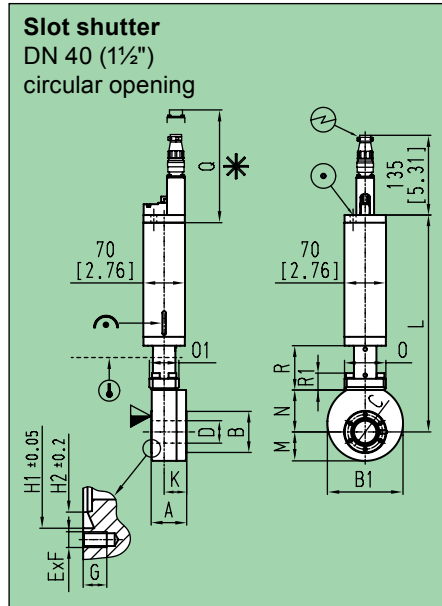
Spare parts

- **Seals**
on request (specify fabrication number of valve)

Accessories

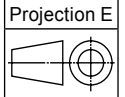
- **Controller:** see page 230
- **Flange connections**
for installation of the valve: see series 33

Dimensions



▽ Valve seat side ⊕ Electrical connection
* Required for dismantling
⊙ Compressed air connection

⦿ Mech. position indication Ⓢ Bake-out area ◼ For attachment



DN	mm inch	40 1½		
A	mm inch	60 2.36		
B	mm inch	69.50 2.74		
B1	mm inch	128 5.04		
C	mm inch	58.70 2.31		
D	mm inch	38 1.50		
E × F		6 × M6		
G	mm inch	12 0.47		
H1	mm inch	48.35 1.90		
H2	mm inch	42 1.65		
L	mm inch	367 14.45		
M	mm inch	49 1.93		
N	mm inch	71 2.80		
O	mm inch	70 2.76		
O1	mm inch	50 1.97		
Q	mm inch	195 7.68		
R	mm inch	75 2.95		
R1	mm inch	29 1.14		

DN	mm inch	63 2½	100 4	160 6
A	mm inch	60 2.36	60 2.36	60 2.36
B	mm inch	113.50 4.47	152 5.98	202.50 7.97
B1	mm inch	158 6.22	195 7.67	245 9.65
C	mm inch	92.10 3.63	130.30 5.13	181 7.13
D	mm inch	35 1.38	35 1.38	35 1.38
D1	mm inch	50 1.97	80 3.15	130 5.12
E × F		8 × M8	16 × M8	20 × M8
G	mm inch	12 0.47	12 0.47	12 0.47
H1	mm inch	82.55 3.25	120.70 4.75	171.50 6.75
H2	mm inch	77.40 3.05	115.50 4.55	166 6.54
L	mm inch	369 14.52	388 15.28	414 16.30
M	mm inch	79 3.11	97.50 3.84	122.50 4.82
N	mm inch	73 2.87	92 3.62	118 4.65
O	mm inch	70 2.76	70 2.76	70 2.76
O1	mm inch	50 1.97	50 1.97	50 1.97
Q	mm inch	195 7.68	195 7.68	195 7.68
R	mm inch	75 2.95	75 2.95	75 2.95
R1	mm inch	29 1.14	29 1.14	29 1.14

DN	mm inch	63 2½	100 4	160 6
A	mm inch	150 5.91	200 7.87	250 9.84
B	mm inch	113.50 4.47	152 5.98	202.50 7.97
B1	mm inch	154 6.06	192 7.56	242 9.53
C	mm inch	92.10 3.63	130.30 5.13	181 7.13
D	mm inch	63 2.48	100 3.94	150 5.91
E × F		8 × M8	16 × M8	20 × M8
G	mm inch	12 0.47	12 0.47	12 0.47
H1	mm inch	82.55 3.25	120.65 4.75	171.5 6.75
H2	mm inch	77.40 3.05	115.50 4.55	166 6.54
ID	mm inch	76 2.99	113 4.45	164 6.47
L	mm inch	456 17.95	475 18.70	500 19.69
M	mm inch	80 3.15	100 3.94	125 4.92
N	mm inch	122 4.80	141 5.55	166 6.54
Q	mm inch	83 3.27	83 3.27	83 3.27
S	mm inch	52 2.05	52 2.05	52 2.05
Y	mm inch	75 2.95	100 3.94	125 4.92
Z	mm inch	120 4.72	160 6.30	160 6.30

Main applications

Controller for fast closing and controlled opening of the

- valves series 75
- shutters series 77

For fast processing of the sensor signal

To control further isolation valves



Ordering information

Controller VF-2 combined with various modules
Ordering numbers on request

Technical data

Controller VF-2 (basic device)

- 19" rack insert with power supply
- Storage spaces for max. 10 modules
- Mains voltage: 100–240 V $\pm 10\%$, 50/60 Hz, max. 150 VA
- Key switch for «LOCAL», «LOCKED», «REMOTE»
- Ambient temperature: 0–50 °C
- Dimensions:
 - 19" rack insert, 3 height units
 - 445 × 132.5 × 300 mm / 17.5" × 5.2" × 11.8" (W × H × D)
 - Depth with plugs: 410 mm (16.1")
- Weight: 11 kg (24 lbs)

Modules for controller VF-2

CONTROL

- Storage: space for 1 module required
- System control module for max. 6 sensors and 4 fast closing valves/shutters
- External trigger
- 8-pole plug for «REMOTE» control
- LED display «READY», «EXTERNAL TRIGGER»
- Push button «RESET»

FV SENSOR

- Storage: space for 1 module required
- Connection of a fine vacuum sensor by a triaxial connector (LEMO)
- Sensor voltage: 3.5 kV
- LED display «READY», «INRUSH», «EXTERNAL SIGNAL», «INTERLOCK»
- 8-pole plug for «REMOTE» control

HV SENSOR

- Storage: space for 2 modules required
- Connection of a high vacuum sensor by a triaxial connector (LEMO)
- Sensor voltage: 3.5 kV
- LED display for pressure
- Trigger pressure adjustable between $2 \cdot 10^{-8}$ and $8 \cdot 10^{-4}$ mbar
- Trigger time adjustable between 1 and 7 msec
- 8-pole plug for «REMOTE» control
- Analog pressure signal (optional)

- | | |
|---------------|--|
| VALVE | <ul style="list-style-type: none"> – Storage: space for 1 module required – Connection of a fast closing valve or shutter – LED display «READY», «TRIGGERED», «READY TO OPEN», «INTERLOCK» – Push buttons «OPEN», «CLOSE», «INTERLOCK» – 19-pole plug for connecting the valve/shutter – 12-pole plug for «REMOTE» control |
| 1-GATE | <ul style="list-style-type: none"> – Storage: space for 1 module required – Connection of 1 isolation valve – LED display «READY» – Push buttons «OPEN», «CLOSE» – 12-pole plug for connecting the isolation valve – 12-pole plug for «REMOTE» control |
| 2-GATE | <ul style="list-style-type: none"> – Storage: space for 1 module required – Connection of 2 isolation valves – LED display «READY» for each isolation valve – Push buttons «OPEN», «CLOSE» for each isolation valve – 12-pole plug (2 ×) for connecting the isolation valves – 12-pole plug for «REMOTE» control |
| LINK | <ul style="list-style-type: none"> – Storage: space for 1 module per rack required – To link two controllers VF-2 if the 10 storage spaces of one controller are insufficient |

Accessories

– Cable

- Sensor–SENSOR module: max. 300 m, triaxial cable
- Valve/shutter–VALVE module: max. 150 m, 12-pole cable 0.75 mm²
- Isolation valve–GATE module: max. 200 m, 7-pole cable 0.75 mm²

– Vacuum sensor

Fine vacuum sensor (FV)
glow discharge



High vacuum sensor (HV)
cold cathode



Technical data

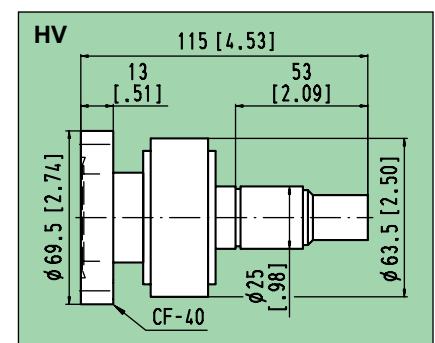
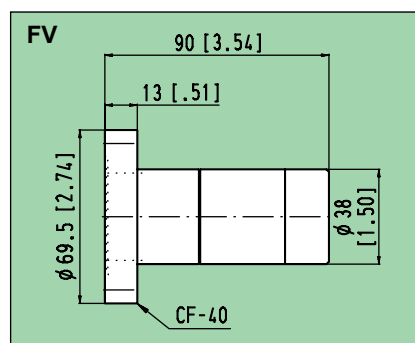
Trigger pressure: approx. 10⁻² mbar
 Response time: approx. 1 ms
 Radiation resistance: 10⁸ Gy (10¹⁰ rad)
 Flange: CF-F 40
 Weight: approx. 1 kg (2 lbs)

FV

approx. 10⁻² mbar
 approx. 1 ms
 10⁸ Gy (10¹⁰ rad)
 CF-F 40
 approx. 1 kg (2 lbs)

HV

adjustable from 10⁻⁸ to 10⁻³ mbar
 2 ms (air inrush 1 bar)
 10⁷ Gy (10⁹ rad)
 CF-F 40
 approx. 1 kg (2 lbs)



Main applications

Beam stopper for use in multiple applications, e. g. photon stopper

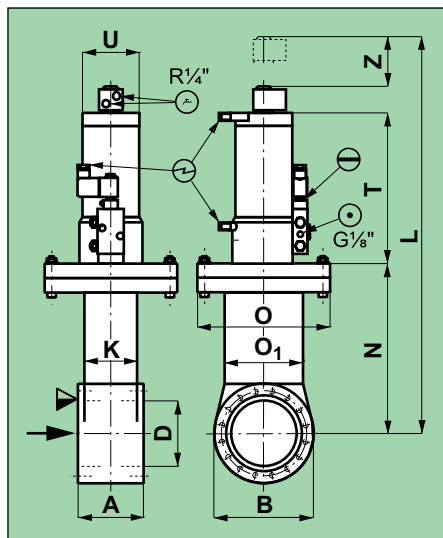


Ordering information

Beam stopper
with pneumatic actuator
double acting

DN		Ordering numbers	
mm	inch	CF-F	
		without solenoid valve with position indicator 80 °C	with solenoid valve with position indicator 80 °C
63	2 ½	79036-CE24	79036-CE44
100	4	79040-CE24	79040-CE44
160	6	79044-CE24	79044-CE44

Dimensions



DN	mm inch	63 2 ½	100 4	160 6
A	mm inch	100 3.94	100 3.94	100 3.94
B	mm inch	113.50 4.47	152 5.98	202.50 7.97
D	mm inch	65 2.56	100 3.94	150 6.91
K	mm inch	88.90 3.50	80 3.15	80 3.15
L	mm inch	502 19.76	639 25.16	841 33.11
N	mm inch	195 7.68	262 10.31	364 14.33
O	mm inch	152 5.98	202.50 7.97	253 9.96
O1	mm inch	88.90 3.50	120 4.72	180 7.09

DN	mm inch	63 2 ½	100 4	160 6
T	mm inch	195.50 7.70	230.50 9.07	280.50 11.04
U	mm inch	87 3.43	87 3.43	87 3.43
Z	mm inch	71 2.80	106 4.17	156 6.14

- Beam direction
- ▼ Valve seat side
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ⊖ Emergency operation
- ⊖ Cooling water connection

Accessories

- Flexible bake-out jacket: see page 270
- Flange connections
for installation of the beam stopper: see series 33

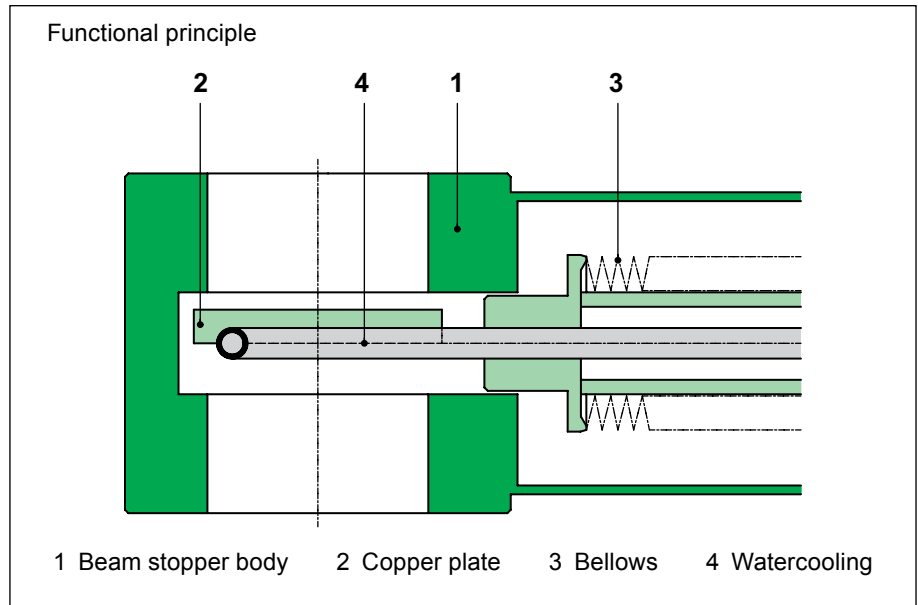
Features

Body material: stainless steel

Up to 6 kW beam load due to water-cooled copper plate

No welding or brazing joint between water containment and vacuum

UHV compatible



Technical data

Leak rate: beam stopper body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	UHV to 1 bar (abs)
Cycles until first service	5000 (option: 50 000)
Bake-out temperature ¹⁾	
– Beam stopper body	≤ 250 °C
– Pneumatic actuator	≤ 80 °C (option: 200 °C)
– Cooling water	≤ 15 °C
Heating and cooling rate	≤ 80 °C h ⁻¹
Material	
– Beam stopper body, mechanism	AISI 304 (1.4301)
– Bellows	AISI 316L (1.4404)
– Watercooled plate	copper
Seal: bonnet	metal
Feedthrough	bellows
Mounting position	any
Compressed air, min.–max. overpressure	4–7 bar / 58–102 psi
Closing time	DN63: 1 s / DN 100: 2 s / DN 160: 3 s
Load	
– Beam $\varnothing < 60$ mm / > 60 mm	max. 5 kW / 6 kW
Specific load	max. 25 W / mm ²
Cooling water quantity	min. 15 l / min.

¹⁾ Maximum values: depending on operating conditions and sealing materials

Options



- Without watercooling
 - Pneumatic actuator and position indicator bakeable to 200 °C ¹⁾
 - Customer specified flanges
 - Ports in beam stopper body for roughing (by-pass), venting or for gauges
 - Beam stopper without body, for direct integration into the vacuum system (Picture)
- Ordering number 793 E . . . (number for nominal diameter refers to connection [bonnet] flange)

Ordering information for options: Ordering No. of valve-X
(e. g. 79 E . . . -X, X = actuator and position indicator for 200 °C)

Main applications

For pressure reduction of the process gas by means of two by-pass valves with orifice

Analysis of the residual gases at base pressure with the open valve

Features

By-pass valves and orifices exchangeable

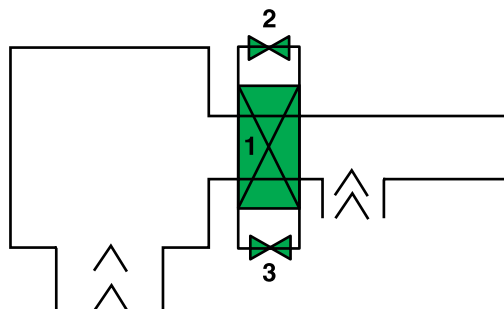
Very compact design



Ordering information

Available sizes	DN 25–50 (1"–2"): see series 01.0, page 14
Ordering number	Ordering number of valve series 01.0-X Example: 01032-CE44-X X = with manually actuated Nupro valves, orifice A 0.2 mm, orifice B 0.4 mm

Function



- 1: Vacuum tight gate valve with manual or pneumatic actuator
- 2, 3: By-pass valves with manual or pneumatic actuator and application specific, easily exchangeable orifice

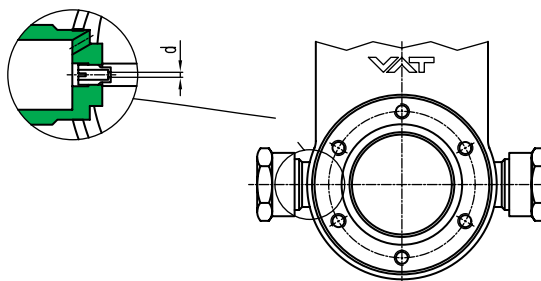
Technical data

Valve: see series 01.0, page 14

By-pass valve: exchangeable

- type Nupro with seat made of Kel-F (bakeable to 90 °C)
- with manual actuator, Typ SS-4BKT
- with pneumatic actuator, single acting with closing spring (NC), type SS-4BK-1C

Available orifices



Size (d) in mm:	0.03
	0.05
	0.1
	0.2
	0.3
	0.4
	0.5
	0.9
	1
	1.5

Main applications

For pressure reduction of the process gas by means of maximum three gate valves with orifice

Analysis of the residual gases at base pressure with the open valves

Features

Orifices exchangeable

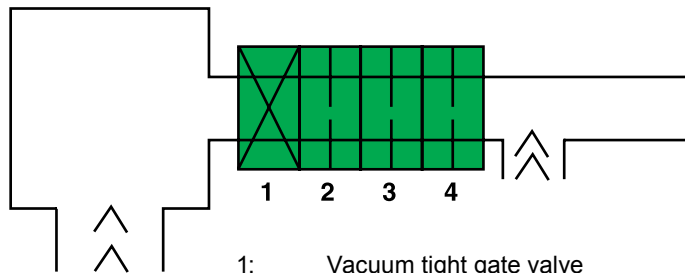
Line of sight between analyzer and process chamber



Ordering information

Available sizes	DN 25–50 (1"–2"): see series 01.0, page 14
Ordering number	Ordering number of valve series 01.0-X Example: 01032-CE44-X X = 2 valves welded together, 1 valve rotated by 90°, orifice 0.1 mm

Function

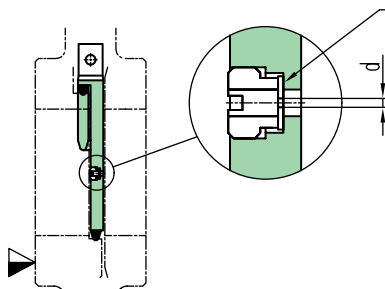


- 1: Vacuum tight gate valve with manual or pneumatic actuator
- 2, 3, 4: One to three gate valves, each rotated by 90°, with manual or pneumatic actuator and application specific, easily exchangeable orifice

Technical data

Valve: see series 01.0, page 14

Available orifices



Size (d) in mm: 0.005
0.01
0.02
0.03
0.05
0.1

These products are subject to the Non Proliferation Treaty (NPT)

Main applications

For processes with aggressive and corrosive gases



Ordering information

Valve with manual actuator
hexagon head

DN		Ordering numbers			
mm	inch	with weld neck		with ISO-KF flange ¹⁾ ISO-K flange ²⁾	
		aluminum	stainless steel	aluminum	stainless steel
16	5/8	27124-RA02	27124-RE02	27124-KA02 ¹⁾	27124-KE02 ¹⁾
25	1	27128-RA02	27128-RE02	27128-KA02 ¹⁾	27128-KE02 ¹⁾
40	1 1/2	27132-RA02	27132-RE02	27132-KA02 ¹⁾	27132-KE02 ¹⁾
63	2 1/2	27136-RA02	27136-RE02	27136-QA02 ²⁾	27136-QE02 ²⁾
100	4	27140-RA02	27140-RE02	27140-QA02 ²⁾	27140-QE02 ²⁾
160	6	27144-RA02	27144-RE02	27144-QA02 ²⁾	27144-QE02 ²⁾

Valve with pneumatic actuator
single acting with closing spring (NC)
with solenoid valve
with position indicator

DN		Ordering numbers (specify control voltage)			
mm	inch	with weld neck		with ISO-KF flange ¹⁾ ISO-K flange ²⁾	
		aluminum	stainless steel	aluminum	stainless steel
16	5/8	27124-RA41	27124-RE41	27124-KA41 ¹⁾	27124-KE41 ¹⁾
25	1	27128-RA41	27128-RE41	27128-KA41 ¹⁾	27128-KE41 ¹⁾
40	1 1/2	27132-RA41	27132-RE41	27132-KA41 ¹⁾	27132-KE41 ¹⁾
63	2 1/2	27136-RA41	27136-RE41	27136-QA41 ²⁾	27136-QE41 ²⁾
100	4	27140-RA41	27140-RE41	27140-QA41 ²⁾	27140-QE41 ²⁾
160	6	27144-RA41	27144-RE41	27144-QA41 ²⁾	27144-QE41 ²⁾

Options

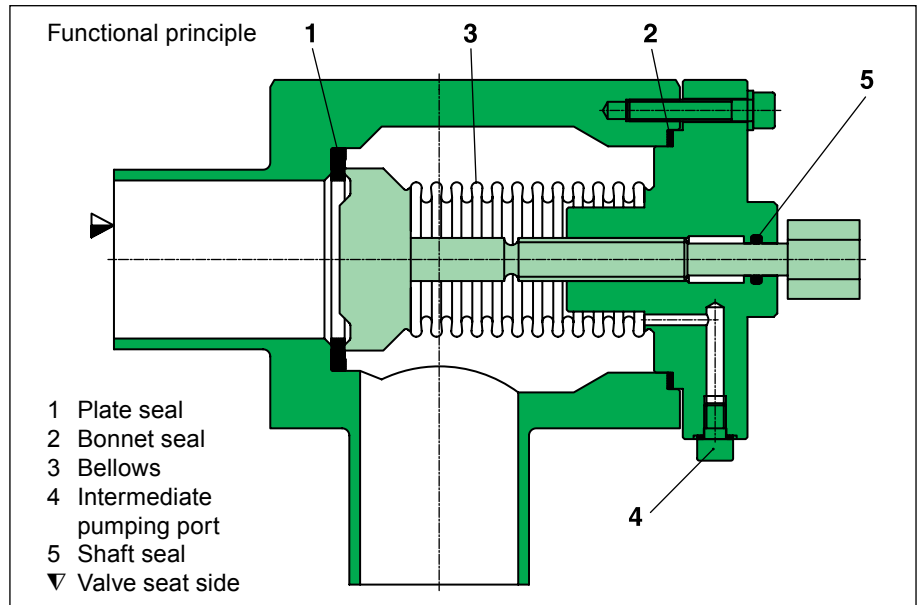
- Manual actuator with torque handwheel
- Manual actuator with electrical position indicator
- Pneumatic actuator, single acting with opening spring (NO)
- Customer specified flanges
- Inline version
- Other options on request

Features

Body material:

aluminum or stainless steel

Bellows with intermediate pumping port



Technical data

Leak rate	
– Valve body	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
– Valve seat	$< 1 \cdot 10^{-7}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-7}$ mbar to 4 bar (abs)
Differential pressure on the plate	≤ 4 bar
Differential pressure at opening	≤ 1 bar
Cycles until first service	5000
Temperature ¹⁾	
– Valve body	
– with copper bonnet seal	≤ 120 °C
– with PFA bonnet seal	≤ 100 °C
– Manual and pneumatic actuator	≤ 100 °C
Material	
– Valve body	
– aluminum	EN AW-5049 (3.3527), -6082 (3.2315)
– stainless steel	AISI 316L (1.4404, 1.4435)
– Bellows	AISI 316L (1.4404), AISI 316Ti (1.4571)
Seal	
– Bonnet (aluminum body)	PFA
– Bonnet (stainless steel body)	
– DN 16– 40	copper
– DN 63– 160	PFA
– Plate	Tenic
Feedthrough	bellows with intermediate pumping port
Mounting position	any
Solenoid valve	24 VDC (others on request)
Position indicator: contact rating	
– Voltage	5–50 VAC/DC
– Current	5–100 mA
Valve position indication	visual (mechanical)

¹⁾ Maximum values: depending on operating conditions and sealing materials

Main applications

Pressure control and isolation valve for processes with high temperatures and high pressures (e. G. SEMI, MOCVD)

Features

Body material:
aluminum or stainless steel

Pressure control and isolation

External pressure controller



Ordering information

Valve with stepper motor
(external pressure controller)

Nominal I. D.	100 mm (4"), others on request
Ordering number	on request

Technical data

Leak rate ¹⁾ : valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the plate	1000 mbar
Cycles until first service ²⁾	
– Pressure control	2 million
– Closing/opening	100 000
Temperature ²⁾	
– Valve body, plate, bellows	≤ 200 °C
– Ambient	≤ 50 °C ³⁾
Material	
– Valve body, plate	AISI 316L (1.4404 or 1.4435)
– Bellows	AISI 316Ti (1.4571)
Seal: bonnet, plate	FKM (Viton®)
Feedthrough	bellows
Mounting position	any ⁴⁾
Conductance (molecular flow)	440 ls ⁻¹
Minimum controllable conductance (molecular flow)	0.05 ls ⁻¹
Full stroke	40 mm
Typical closing or opening time	4 s

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

³⁾ < 35 °C recommended

⁴⁾ Valve seat towards chamber recommended

Pressure controller: see pages 146–149

Series 66.0

These products are subject to the Non Proliferation Treaty (NPT)

Main applications

Pressure control and isolation valve for processes with aggressive and corrosive gases

Features

Body material: stainless steel

Pressure control and isolation

Evacuation of bellows interior possible

External pressure controller



Ordering information

Valve with stepper motor
(external pressure controller
or with manual actuator)

Nominal I.D.	16–50 mm ($\frac{5}{8}$ "–2")
Ordering numbers	on request

Technical data

Leak rate ¹⁾	
– Valve body	$< 1 \cdot 10^{-9}$ mbar Is ⁻¹
– Valve seat	$< 1 \cdot 10^{-6}$ mbar Is ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 5 bar (abs)
Differential pressure on the plate	≤ 1 bar
Cycles until first service ²⁾	20 000
Temperature ²⁾	
– Valve body, ambient	≤ 120 °C
Material	
– Valve body, plate	AISI 316L (1.4404 or 1.4435)
– Bellows	AISI 316L (1.4404)
Seal	
– Bonnet (valve with stepper motor)	metal (2.0040.26)
– Bonnet (valve with manual actuator)	PFA
– Plate	Tenic
Feedthrough	bellows
Mounting position	any
Flow range	
– $K_{v_{min}}$	≥ 0.01 m ³ /h
– $K_{v_{max}}$	≤ 8 m ³ /h
Control range	
– for 1 decade at $K_{v_{min}}$	0.01–0.1 m ³ /h
– for 2 decades at $K_{v_{min}}$	> 0.1 m ³ /h
Typical closing or opening time	< 4 s

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

Pressure controller: data on request

Series 66.3

These products are subject to the Non Proliferation Treaty (NPT)

Main applications

Pressure control valve for processes with aggressive and corrosive gases

Features

Body material:

aluminum or stainless steel

Pressure control

Evacuation of bellows interior possible

External pressure controller



Ordering information

Valve with stepper motor
(external pressure controller)

Nominal I.D.	40–100 mm (1½"–4")
Ordering numbers	on request

Technical data

Leak rate ¹⁾ : valve body	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-8}$ mbar to 1 bar (abs)
Differential pressure on the plate	
– DN 40–65	1000 mbar
– DN 100	250 mbar
Cycles until first service ²⁾	125 000
Temperature ²⁾ : valve body, ambient	≤ 70 °C
Material	
– Valve body aluminum	EN AW-5083 (3.3547)
– Valve body stainless steel	AISI 304 (1.4301) or AISI 316L (1.4404 or 1.4435)
– Plate	AISI 316L (1.4404 or 1.4435)
– Bellows	AISI 316L (1.4404)
Seal: bonnet	PFA
Feedthrough	bellows
Mounting position	any
Flow range	
– Kv_{min}	≥ 0.05 m³/h
– Kv_{max}	≤ 80 m³/h
Control range	
– To 1 decade at Kv_{min}	0.05–0.1 m³/h
– To 2 decades at Kv_{min}	> 0.1 m³/h
Typical closing or opening time	
– DN 40–65	< 8 s
– DN 100	< 10 s

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

Pressure controller: data on request

Main applications

Downstream pressure control and isolation valve for SEMI and FPD processes if symmetrical gas flows are required

Optimal for demanding processes (e. g. uniformity)

Features

Body material:

aluminum or
aluminum, hard anodized

External pressure controller



Ordering information

Valve with stepper motor
(external pressure controller)

Nominal I.D.	320–450 mm (12"–18")
Ordering numbers	on request

Technical data

Leak rate ¹⁾ : valve body	
– Aluminum	$1 \cdot 10^{-9}$ mbar ls ⁻¹
– Aluminum, hard anodized	$1 \cdot 10^{-5}$ mbar ls ⁻¹
Leak rate ¹⁾ : valve seat	
– Aluminum	$1 \cdot 10^{-9}$ mbar ls ⁻¹
– Aluminum, hard anodized	$1 \cdot 10^{-4}$ mbar ls ⁻¹
Pressure range ¹⁾	
– Aluminum	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
– Aluminum, hard anodized	$1 \cdot 10^{-6}$ mbar to 1.2 bar (abs)
Differential pressure on the plate	
– Chamber side → plate	1200 mbar (valve closed) 10 mbar (during operation)
– Pump side → plate	10 mbar
Cycles until first service ²⁾	
– Pressure control	2 million
– Closing/opening	200 000
Temperature ²⁾	
– Valve body	≤ 120 °C
– Ambient	≤ 50 °C
Material	
– Flange, plate	EN AW-6082 (3.2315)
– Actuator shaft	AISI 316L (1.4404 or 1.4435)
– Bellows	AISI 633 (AM 350)
Seal: flange, plate	FKM (Viton®)
Feedthrough	bellows
Mounting position	actuator down

¹⁾ Unheated on delivery

²⁾ Maximum values: depending on operating conditions and sealing materials

Pressure controller: see pages 146–149

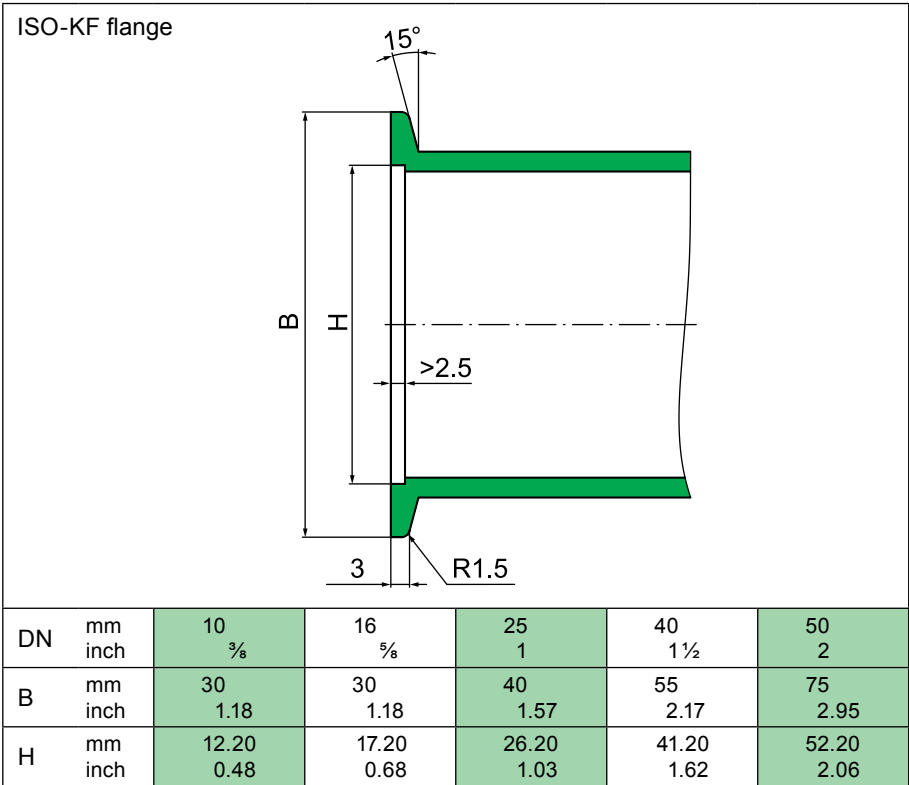
- Clamping rings, clamping chains
- Claws
- Centering rings
- Seals
- Blank-off flanges
- Weld neck flanges
- Elbows
- T-Pieces
- Intermediate pieces
- Bellows
- Adapters
- Soft-start throttles



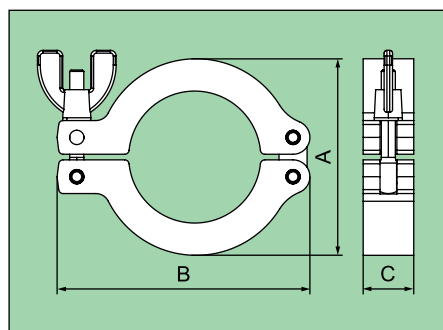
Seal	FKM (Viton®)	Indium
Suitable flange material	A, E	A, E
Temperature ¹⁾	≤200 °C	≤80 °C
Leak rate for Helium (mbar ls ⁻¹)	< 1 · 10 ⁻⁹	< 1 · 10 ⁻¹⁰
Sealing force (N per cm sealing line)	10–50	50–500
Multiple use of seal	yes	yes

A: aluminim
E: stainless steel

¹⁾ Maximum values: depending on operating conditions
and sealing materials



Technical data and ordering information

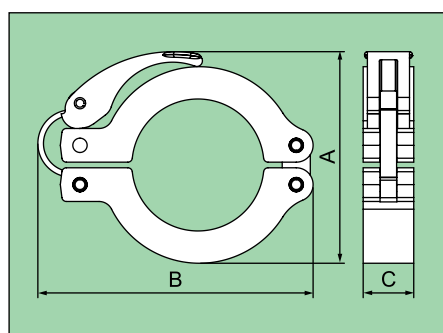

Clamping ring complete

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 5/8	45	1.77	61	2.40	16	0.63	31024-KASR-0001
25	1	55	2.17	72	2.83	16	0.63	31028-KASR-0001
40	1 1/2	70	2.76	90	3.54	18	0.71	31032-KASR-0001
50	2	95	3.74	123	4.84	25	0.98	31034-KASR-0001

Clamping ring: aluminum EN AC-46200 (3.2162)

Screw: steel, nickel-plated

Nut: zinc, nickel-plated

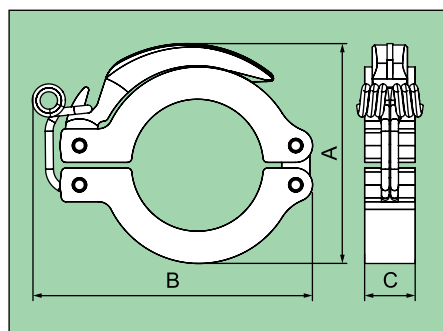

Rapid clamping ring

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 5/8	52	2.05	70	2.76	16	0.63	31024-KASP-0001
25	1	61	2.40	81	3.19	16	0.63	31028-KASP-0001
40	1 1/2	75	2.95	98	3.86	18	0.71	31032-KASP-0001

Clamping ring: aluminum EN AC-46200 (3.2162)

Spring: steel

Lever: polyamide

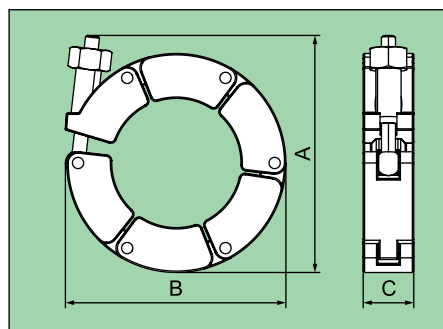

Rapid clamping ring, metal

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 5/8	53	2.09	72	2.83	16	0.63	31024-KASM-0001
25	1	61	2.40	83	3.27	16	0.63	31028-KASM-0001
40	1 1/2	78	3.07	99	3.90	18	0.71	31032-KASM-0001

Clamping ring: aluminum EN AC-46200 (3.2162)

Spring: stainless steel

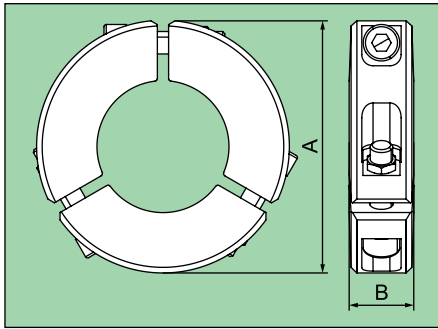
Lever: aluminum EN AC-47100 (3.2982)


Clamping chain

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 5/8	71	2.80	52.5	2.07	18	0.71	31024-KASA-0001
25	1	74	2.91	64	2.52	18	0.71	31028-KASA-0001
40	1 1/2	98	3.86	79	3.11	18	0.71	31032-KASA-0001
50	2	99	3.90	97.5	3.84	20	0.79	31034-KASA-0001

Chain: aluminium EN AW-6081 (3.2215)

Screw, nut: stainless steel



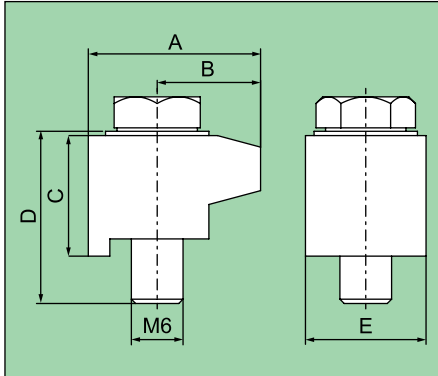
Clamping device

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
10/16	3/8 / 5/8	52	2.05	18	0.71		31024-KASE-0001
25	1	75	2.95	20	0.79		31028-KASE-0001
40	1 1/2	90	3.54	23	0.91		31032-KASE-0001
50	2	115	4.53	28	1.10		31034-KASE-0001

Chain: aluminum EN AC-46200 (3.2162)

Screw: stainless steel

Nut: zinc, nickel-plated

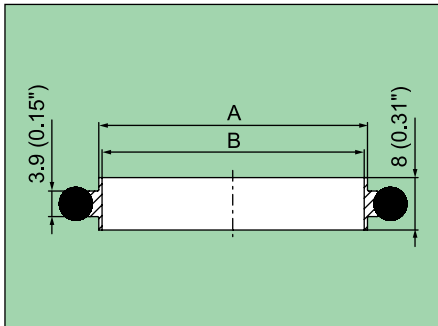


Claw

DN		A		B		C		D		E		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10-50	3/8-2	20	0.79	12	0.47	14	0.55	20	0.79	14	0.55	310XX-KAPR-0001

Claw: aluminum EN AW-6082 (3.2315)

Screw, washer: stainless steel



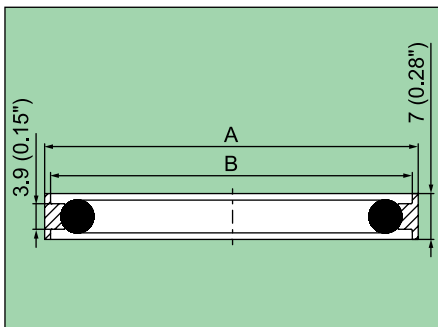
Centering ring

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
10	3/8	12	0.47	10	0.39		31020-KAZV-0001 ¹⁾
16	5/8	17	0.67	16	0.63		31024-KAZV-0001 ¹⁾
25	1	26	1.02	25	0.98		31028-KAZV-0001 ¹⁾
40	1 1/2	41	1.61	40	1.57		31032-KAZV-0001 ¹⁾
50	2	52	2.05	50	1.97		31034-KAZV-0001 ¹⁾
10	3/8	12	0.47	10	0.39		31020-KEZV-0001 ²⁾
16	5/8	17	0.67	16	0.63		31024-KEZV-0001 ²⁾
25	1	26	1.02	25	0.98		31028-KEZV-0001 ²⁾
40	1 1/2	41	1.61	40	1.57		31032-KEZV-0001 ²⁾
50	2	52	2.05	50	1.97		31034-KEZV-0001 ²⁾

Seal: elastomer FKM (Viton®)

Ring: ¹⁾ aluminum EN AW-6082 (3.2315)

²⁾ stainless steel AISI 303 (1.4305)

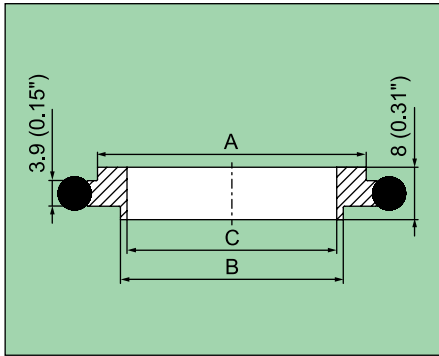


Outer centering ring

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
16	5/8	32	1.26	30.2	1.19		31024-KAUR-0001
25	1	42	1.65	40.2	1.58		31028-KAUR-0001
40	1 1/2	57	2.24	55.2	2.17		31032-KAUR-0001
50	2	77	3.03	75.2	2.96		31034-KAUR-0001

Seal: elastomer FKM (Viton®)

Ring: aluminum EN AW-6082 (3.2315)



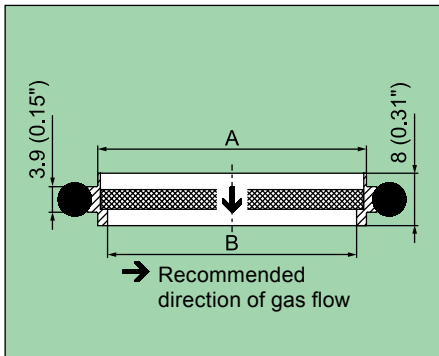
Reducing centering ring

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16/10	5/8 / 3/8	17	0.67	12	0.47	10	0.39	31024-KAZR-0001 ¹⁾
25/20	1 / 3/4	26	1.02	22	0.87	20	0.79	31028-KAZR-0001 ¹⁾
40/32	1 1/8	41	1.61	34	1.34	32	1.26	31032-KAZR-0001 ¹⁾
16/10	5/8 / 3/8	17	0.67	12	0.47	10	0.39	31024-KEZR-0001 ²⁾
25/20	1 / 3/4	26	1.02	22	0.87	20	0.79	31028-KEZR-0001 ²⁾
40/32	1 1/8	41	1.61	34	1.34	32	1.26	31032-KEZR-0001 ²⁾

Seal: elastomer FKM (Viton®)

Ring: ¹⁾ aluminum EN AW-6082 (3.2315)

²⁾ stainless steel AISI 303 (1.4305)



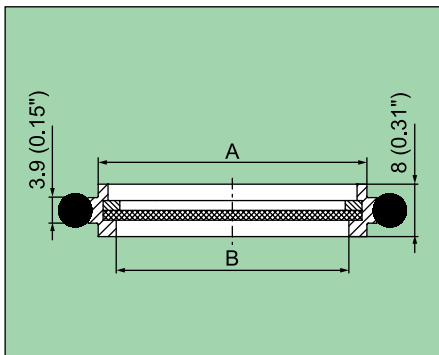
Centering ring with filter

DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10	3/8	12	0.47	8	0.31	31020-KEZF-0001
16	5/8	17	0.67	14	0.55	31024-KEZF-0001
25	1	26	1.02	23	0.91	31028-KEZF-0001
40	1 1/2	41	1.61	38	1.50	31032-KEZF-0001
50	2	52	2.05	48	1.89	31034-KEZF-0001

Seal: elastomer FKM (Viton®)

Ring: stainless steel AISI 303 (1.4305)

Filter: stainless steel AISI 316L (1.4435), pore size: 0.02 mm



Centering ring with fine filter

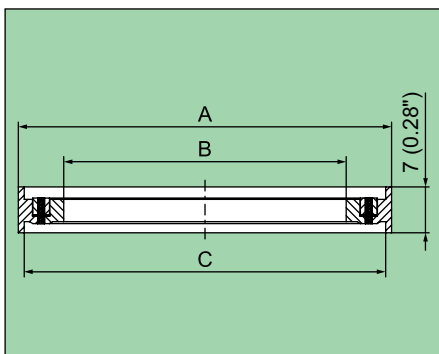
DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10	3/8	12	0.47	9	0.35	31020-KEZG-0001
16	5/8	17	0.67	13	0.51	31024-KEZG-0001
25	1	26	1.02	22	0.87	31028-KEZG-0001
40	1 1/2	41	1.61	35.5	1.40	31032-KEZG-0001
50	2	52	2.05	45.7	1.80	31034-KEZG-0001

Seal: elastomer FKM (Viton®)

Inner ring: stainless steel AISI 303 (1.4305)

Snap ring: stainless steel AISI 304 (1.4301)

Filter: stainless steel AISI 316L (1.4435), pore size: 0.004 mm



Indium seal with outer centering

(with inner centering on request)

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 1/4	32	1.26	18.1	0.71	30.2	1.19	31024-KETR-0001
25	1	42	1.65	28.1	1.11	40.2	1.58	31028-KETR-0001
40	1 1/2	57	2.24	43.1	1.70	55.2	2.17	31032-KETR-0001
50	2	77	3.03	63.1	2.48	75.2	2.96	31034-KETR-0001

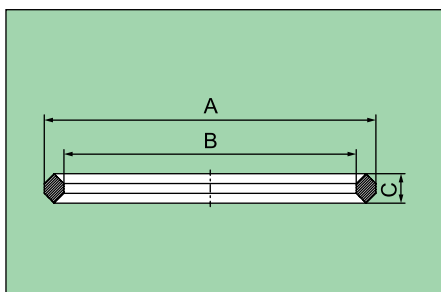
Seal: indium

Inner ring: stainless steel AISI 304 (1.4301)

Outer ring: aluminum EN AW-6082 (3.2315)

Temperature: max. 80 °C

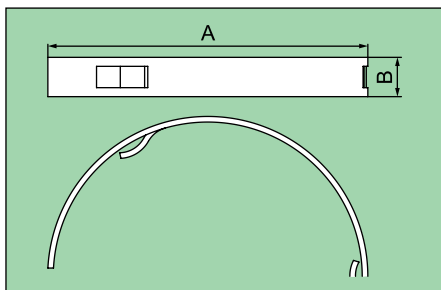
Multiple use



Aluminum seal

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8/5/8	25.6	1.01	19.6	0.77	4.5	0.18	31024-KADK-0001
25	1	35.6	1.40	29.6	1.17	4.5	0.18	31028-KADK-0001
40	1 1/2	50.6	1.99	44.6	1.76	4.5	0.18	31032-KADK-0001
50	2	65.6	2.58	59.6	2.35	4.5	0.18	31034-KADK-0001

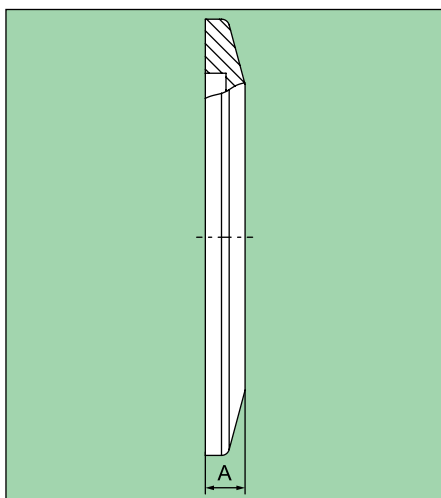
Aluminum EN AW-6082 (3.2315), annealed



Bracket for aluminum seal

DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10/16	3/8/5/8	32	1.30	7	0.28	31024-KEDH-0001
25	1	42	1.65	7	0.28	31028-KEDH-0001
40	1 1/2	57	2.24	7	0.28	31032-KEDH-0001
50	2	77	3.03	7	0.28	31034-KEDH-0001

Stainless steel AISI 301 (1.4310), reusable

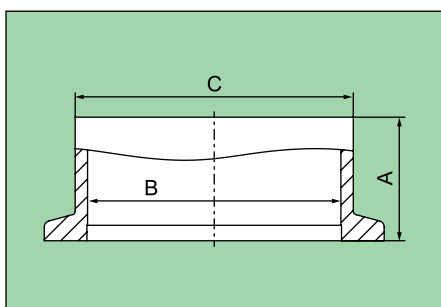


Blank-off flange

DN		A		Ordering numbers
mm	inch	mm	inch	
10	3/8	5	0.20	31020-KAFB-0001 ¹⁾
16	5/8	5	0.20	31024-KAFB-0001 ¹⁾
25	1	5	0.20	31028-KAFB-0001 ¹⁾
40	1 1/2	5	0.20	31032-KAFB-0001 ¹⁾
50	2	6	0.24	31034-KAFB-0001 ¹⁾
10	3/8	5	0.20	31020-KEFB-0001 ²⁾
16	5/8	5	0.20	31024-KEFB-0001 ²⁾
25	1	5	0.20	31028-KEFB-0001 ²⁾
40	1 1/2	5	0.20	31032-KEFB-0001 ²⁾
50	2	6	0.24	31034-KEFB-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

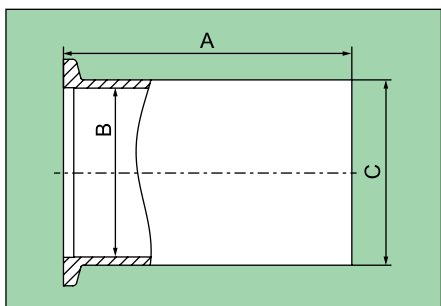
²⁾ Stainless steel AISI 304 (1.4301)



Weld neck flange, short

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	20	0.79	12	0.47	16	0.63	31020-KESK-0001
16	5/8	20	0.79	16	0.63	20	0.79	31024-KESK-0001
25	1	20	0.79	26	1.02	30	1.18	31028-KESK-0001
40	1 1/2	20	0.79	41	1.61	45	1.77	31032-KESK-0001
50	2	20	0.79	50	1.97	54	2.13	31034-KESK-0001

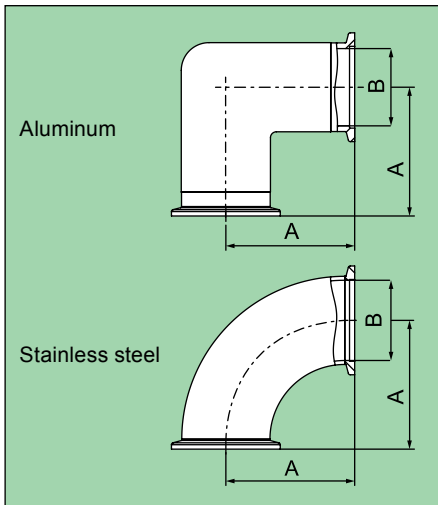
Stainless steel AISI 304 (1.4301)



Weld neck flange, long

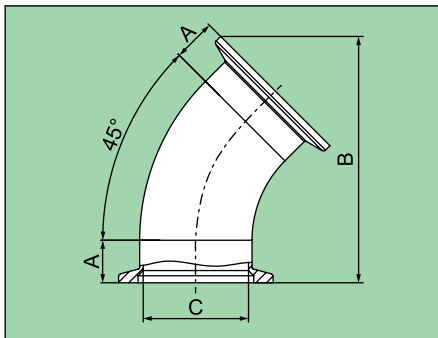
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	70	2.76	12	0.47	16	0.63	31020-KESL-0001
16	5/8	70	2.76	16	0.63	20	0.79	31024-KESL-0001
25	1	70	2.76	26	1.02	30	1.18	31028-KESL-0001
40	1 1/2	70	2.76	41	1.61	45	1.77	31032-KESL-0001
50	2	70	2.76	50	1.97	54	2.13	31034-KESL-0001

Stainless steel AISI 304 (1.4301)


Elbow 90°

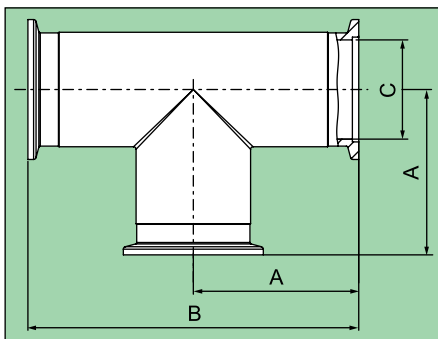
DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
10	3/8	30	1.18	12	0.47		31020-KAKR-0001 ¹⁾
16	5/8	40	1.57	16	0.63		31024-KAKR-0001 ¹⁾
25	1	50	1.97	25	0.98		31028-KAKR-0001 ¹⁾
40	1 1/2	65	2.56	39	1.54		31032-KAKR-0001 ¹⁾
10	3/8	30	1.18	9	0.35		31020-KEKR-0001 ²⁾
16	5/8	40	1.57	15	0.59		31024-KEKR-0001 ²⁾
25	1	50	1.97	25	0.98		31028-KEKR-0001 ²⁾
40	1 1/2	65	2.56	40.5	1.59		31032-KEKR-0001 ²⁾
50	2	70	2.76	49	1.93		31034-KEKR-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)

Elbow 45°

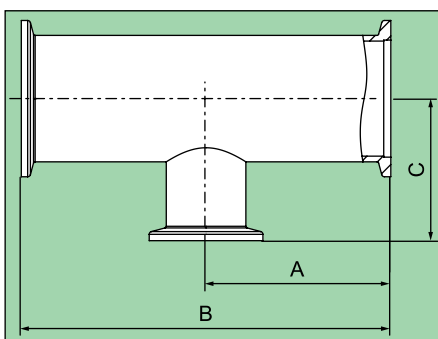
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	26	1.02	55	2.17	15	0.59	31024-KEKH-0001
25	1	32	1.26	68.8	2.71	25	0.98	31028-KEKH-0001
40	1 1/2	40	1.57	87.7	3.45	37	1.46	31032-KEKH-0001

Stainless steel AISI 304 (1.4301)


T-Piece

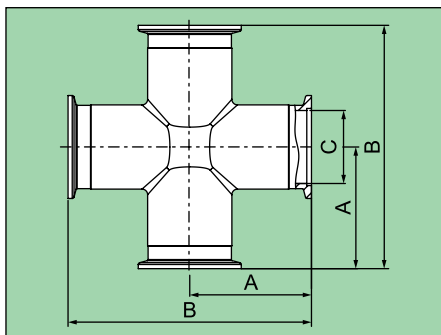
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	30	1.18	60	2.36	12	0.47	31020-KATS-0001 ¹⁾
16	5/8	40	1.57	80	3.15	16	0.63	31024-KATS-0001 ¹⁾
25	1	50	1.97	100	3.94	25	0.98	31028-KATS-0001 ¹⁾
40	1 1/2	65	2.56	130	5.12	39	1.54	31032-KATS-0001 ¹⁾
10	3/8	30	1.18	60	2.36	12	0.47	31020-KETS-0001 ²⁾
16	5/8	40	1.57	80	3.15	16	0.63	31024-KETS-0001 ²⁾
25	1	50	1.97	100	3.94	25	0.98	31028-KETS-0001 ²⁾
40	1 1/2	65	2.56	130	5.12	40.5	1.59	31032-KETS-0001 ²⁾
50	2	70	2.76	140	5.51	53	2.09	31034-KETS-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)

Reducing T-piece

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
25/16	1 1/8	50	1.97	100	3.94	32	1.26	31028-KETV-ACK1
40/16	1 1/2	65	2.56	130	5.12	40	1.57	31032-KETV-ACK1
40/25	1 1/2	65	2.56	130	5.12	50	1.97	31032-KETV-ABW1
50/16	2 1/8	70	2.76	140	5.51	50	1.97	31034-KETV-ACK1
50/25	2 1/4	70	2.76	140	5.51	65	2.56	31034-KETV-ABW1
50/40	2 1/2	70	2.76	140	5.51	65	2.56	31034-KETV-ABJ1

Stainless steel AISI 304 (1.4301)

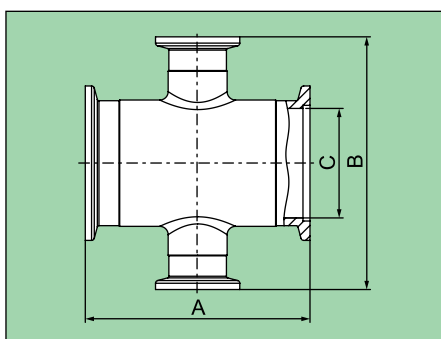


Cross

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	30	1.18	60	2.36	12	0.47	31020-KAKX-0001 ¹⁾
16	5/8	40	1.57	80	3.15	16	0.63	31024-KAKX-0001 ¹⁾
25	1	50	1.97	100	3.94	25	0.98	31028-KAKX-0001 ¹⁾
40	1 1/2	65	2.56	130	5.12	39	1.54	31032-KAKX-0001 ¹⁾
10	3/8	30	1.18	60	2.36	12	0.47	31020-KEKX-0001 ²⁾
16	5/8	40	1.57	80	3.15	16	0.63	31024-KEKX-0001 ²⁾
25	1	50	1.97	100	3.94	25	0.98	31028-KEKX-0001 ²⁾
40	1 1/2	65	2.56	130	5.12	40.5	1.59	31032-KEKX-0001 ²⁾
50	2	70	2.76	140	5.51	53	2.09	31034-KEKX-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)

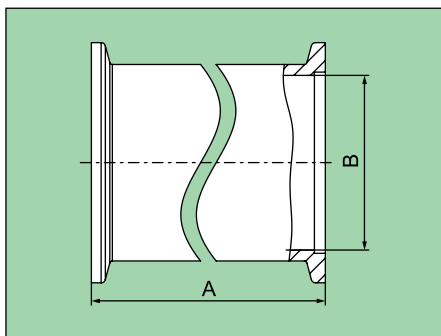


Reducing cross

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
25/16	1 1/8	70	2.76	70	2.76	25	0.98	31028-KAKZ-0001 ¹⁾
40/16	1 1/2 5/8	80	3.15	90	3.54	39	1.54	31032-KAKZ-0001 ¹⁾
25/16	1 1/8	70	2.76	70	2.76	25	0.98	31028-KEKZ-0001 ²⁾
40/16	1 1/2 5/8	80	3.15	90	3.54	40.5	1.59	31032-KEKZ-0001 ²⁾
50/16	2 5/8	100	3.94	100	3.94	53	2.09	31034-KEKX-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)

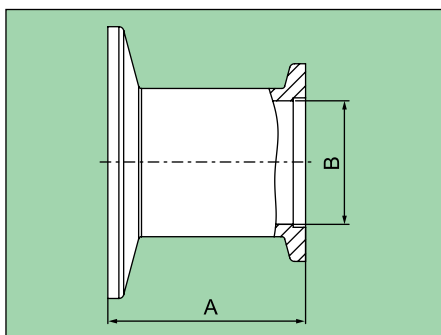


Intermediate piece

DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
16	5/8	80	3.15	16	0.63	31024-KAZS-0001 ¹⁾
25	1	100	3.94	25	0.98	31028-KAZS-0001 ¹⁾
40	1 1/2	130	5.12	40	1.57	31032-KAZS-0001 ¹⁾
16	5/8	80	3.15	16	0.63	31024-KEZS-0001 ²⁾
25	1	100	3.94	25	0.98	31028-KEZS-0001 ²⁾
40	1 1/2	130	5.12	40.5	1.59	31032-KEZS-0001 ²⁾
50	2	140	5.51	53	2.09	31034-KEZS-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)

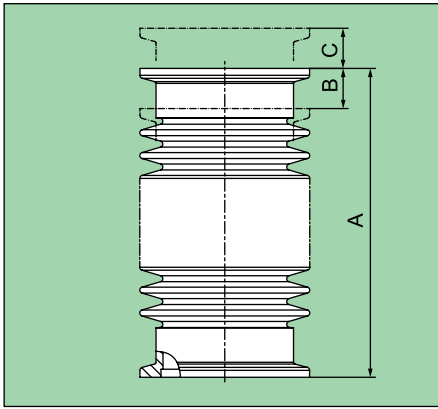


Reducing piece

DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
25/16	1 1/8	40	1.57	16	0.63	31028-KAUP-ACK1 ¹⁾
40/16	1 1/2 5/8	40	1.57	16	0.63	31032-KAUP-ACK1 ¹⁾
40/25	1 1/2 1	40	1.57	25	0.98	31032-KAUP-ABW1 ¹⁾
50/40	2 1/2	40	1.57	40	1.57	31034-KAUP-ABJ1 ¹⁾
25/16	1 1/8	40	1.57	16	0.63	31028-KEUP-ACK1 ²⁾
40/16	1 1/2 5/8	40	1.57	16	0.63	31032-KEUP-ACK1 ²⁾
40/25	1 1/2 1	40	1.57	26	1.02	31032-KEUP-ABW1 ²⁾
50/16	2 5/8	40	1.57	16	0.63	31034-KEUP-ACK1 ²⁾
50/25	2 1	40	1.57	26	1.02	31034-KEUP-ABW1 ²⁾
50/40	2 1/2	40	1.57	40	1.57	31034-KEUP-ABJ1 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

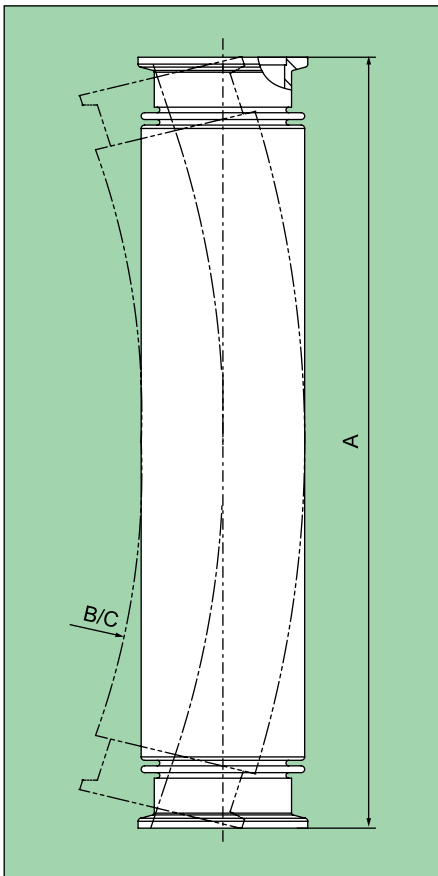
²⁾ Stainless steel AISI 303 (1.4305)


Spring bellows, short

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	70	2.76	3.5	0.14	3	0.12	31020-KEFK-0001
16	5/8	70	2.76	6.4	0.25	4.1	0.16	31024-KEFK-0001
25	1	80	3.15	8	0.31	5	0.20	31028-KEFK-0001
40	1 1/2	100	3.94	11	0.43	7	0.28	31032-KEFK-0001
50	2	100	3.94	10	0.39	6	0.24	31034-KEFK-0001

A = Uncompressed length

Flange: stainless steel AISI 304 (1.4301)
 Bellows: stainless steel AISI 316Ti (1.4571)
 Internal pressure: max. 4 bar

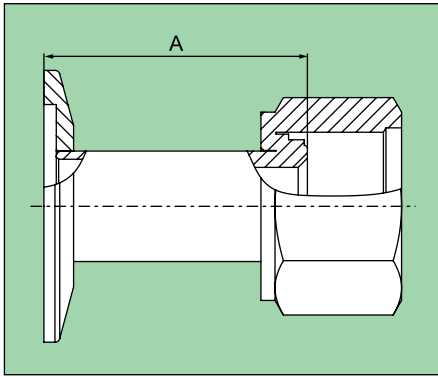

Spring bellows, long

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	250	9.84	70	2.76	32	1.26	31020-KEFK-ABR1
10	3/8	500	19.69	70	2.76	32	1.26	31020-KEFK-ABS1
10	3/8	750	29.53	70	2.76	32	1.26	31020-KEFK-ABT1
10	3/8	1000	39.37	70	2.76	32	1.26	31020-KEFK-ABP1
16	5/8	250	9.84	70	2.76	50	1.97	31024-KEFK-ABR1
16	5/8	500	19.69	70	2.76	50	1.97	31024-KEFK-ABS1
16	5/8	750	29.53	70	2.76	50	1.97	31024-KEFK-ABT1
16	5/8	1000	39.37	70	2.76	50	1.97	31024-KEFK-ABP1
16	5/8	1500	59.06	70	2.76	50	1.97	31024-KEFK-ACH1
16	5/8	2000	78.74	70	2.76	50	1.97	31024-KEFK-ACI1
25	1	250	9.84	100	3.94	60	2.36	31028-KEFK-ABR1
25	1	500	19.69	100	3.94	60	2.36	31028-KEFK-ABS1
25	1	750	29.53	100	3.94	60	2.36	31028-KEFK-ABT1
25	1	1000	39.37	100	3.94	60	2.36	31028-KEFK-ABP1
25	1	1500	59.06	100	3.94	103	4.06	31028-KEFK-ACH1
25	1	2000	78.74	100	3.94	103	4.06	31028-KEFK-ACI1
40	1 1/2	250	9.84	130	5.12	100	3.94	31032-KEFK-ABR1
40	1 1/2	500	19.69	130	5.12	100	3.94	31032-KEFK-ABS1
40	1 1/2	750	29.53	130	5.12	100	3.94	31032-KEFK-ABT1
40	1 1/2	1000	39.37	130	5.12	100	3.94	31032-KEFK-ABP1
40	1 1/2	1500	59.06	130	5.12	129	5.08	31032-KEFK-ACH1
40	1 1/2	2000	78.74	130	5.12	129	5.08	31032-KEFK-ACI1
50	2	250	9.84	200	7.87	130	5.12	31034-KEFK-ABR1
50	2	500	19.69	200	7.87	130	5.12	31034-KEFK-ABS1
50	2	750	29.53	200	7.87	130	5.12	31034-KEFK-ABT1
50	2	1000	39.37	200	7.87	130	5.12	31034-KEFK-ABP1

B = Radius for several bendings

C = Radius for one bending

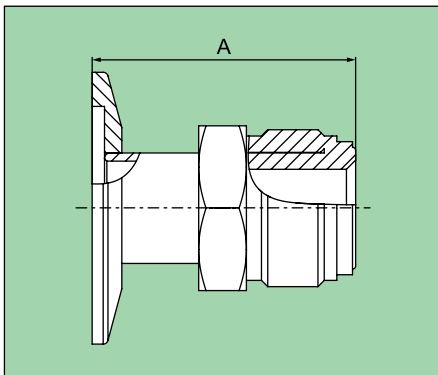
Flange: stainless steel AISI 304 (1.4301)
 Bellows: stainless steel AISI 316Ti (1.4571)
 Internal pressure: max. 4 bar



Adapter flange VCR with internal thread

ISO-KF		DN		VCR		A		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	6.35	1/4	35.8	1.41			31024-KEAW-ACP1
25	1	6.35	1/4	35.8	1.41			31028-KEAW-ACP1
25	1	12.70	1/2	40.6	1.60			31028-KEAW-ACQ1
40	1 1/2	19.05	3/4	53.3	2.10			31032-KEAW-ACR1

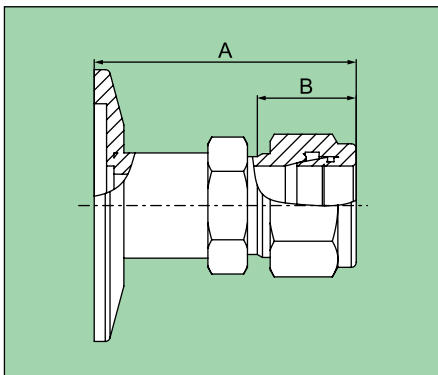
Flange: stainless steel AISI 304 (1.4301)
 Nut: stainless steel AISI 316L (1.4435)
 Wrench size: inch



Adapter flange VCR with external thread

ISO-KF		DN		VCR		A		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	6.35	1/4	35.8	1.41			31024-KEAM-ACP1
25	1	6.35	1/4	35.8	1.41			31028-KEAM-ACP1
25	1	12.70	1/2	40.6	1.60			31028-KEAM-ACQ1
40	1 1/2	19.05	3/4	53.3	2.10			31032-KEAM-ACR1

Flange: stainless steel AISI 304 (1.4301)
 Wrench size: inch



Adapter flange Swagelok

ISO-KF		DN		Swagelok		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	6	0.24	37	1.46	15.3	0.60			31024-KEAS-ACL1 ¹⁾
25	1	10	0.39	45	1.77	17.2	0.68			31028-KEAS-ACM1 ¹⁾
40	1 1/2	16	0.63	53	2.09	24.4	0.96			31032-KEAS-ACN1 ¹⁾
16	5/8	3.18	1/8	34.5	1.36	12.7	0.50			31024-KEAS-ACO1 ²⁾
25	1	6.35	1/4	37	1.46	15.3	0.60			31028-KEAS-ACP1 ²⁾
40	1 1/2	6.35	1/4	37	1.46	15.3	0.60			31032-KEAS-ACP1 ²⁾
40	1 1/2	12.70	1/2	47.5	1.87	22.8	0.90			31032-KEAS-ACQ1 ²⁾

Flange: stainless steel AISI 304 (1.4301)
 Nut: stainless steel AISI 316L (1.4435)
 Wrench size: ¹⁾ metric
²⁾ inch

Soft-start throttle

to reduce the gas flow in pump forelines

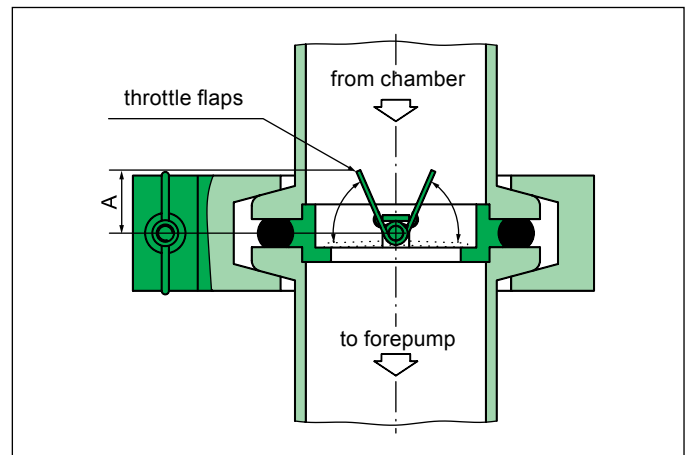
Protection device against

- turbulence in piping and chambers
- particle contamination in vacuum systems
- movement of substrates caused by turbulence



Soft-start throttle valves consist of two halves of throttle flaps supported on a common axis and maintained in the open position by a spring. The axis is held in an ISO-KF centering ring that is formed as a body with valve seat.

When mounting them between two ISO-KF flanges (instead of a centering ring), the open flaps must be orientated against the air flow in the vacuum line. When the roughing system goes into operation, a strong air flow occurs in the forevacuum line, which immediately closes the valve and reduces the pipe section by about 99%. When reaching a differential pressure of approx. 15 mbar, the valve opens abruptly and leaves the pipe section nearly unobstructed for further pumping.



Technical data & ordering information

DN		Dimensions		Open section				Ordering numbers
		A		Throttle open		Throttle closed		
mm	inch	mm	inch	mm ²	inch ²	mm ²	inch ²	
16	⅝	6.2	0.24	90	0.14	4	0.006	31124-KASO
25	1	9.0	0.35	200	0.31	5.5	0.0085	31128-KASO
40	1½	14.3	0.56	570	0.88	8	0.012	31132-KASO
50	2	19.9	0.78	1190	1.84	10.5	0.016	31134-KASO

Behavior

- Fast closing
- Opening

when pumping is started
at Δp approx. 15 mbar ¹⁾

Temperature ²⁾

150 °C

Mounting position

any

Lifetime

100 000 cycles

Material

- Centering ring
- Inner parts

EN AW-6082 (3.2315)
AISI 301 (1.4310), AISI 303 (1.4305)

Seal

FKM (Viton®)

¹⁾ Depending on system configuration

²⁾ Maximum value: depending on operating conditions and sealing materials

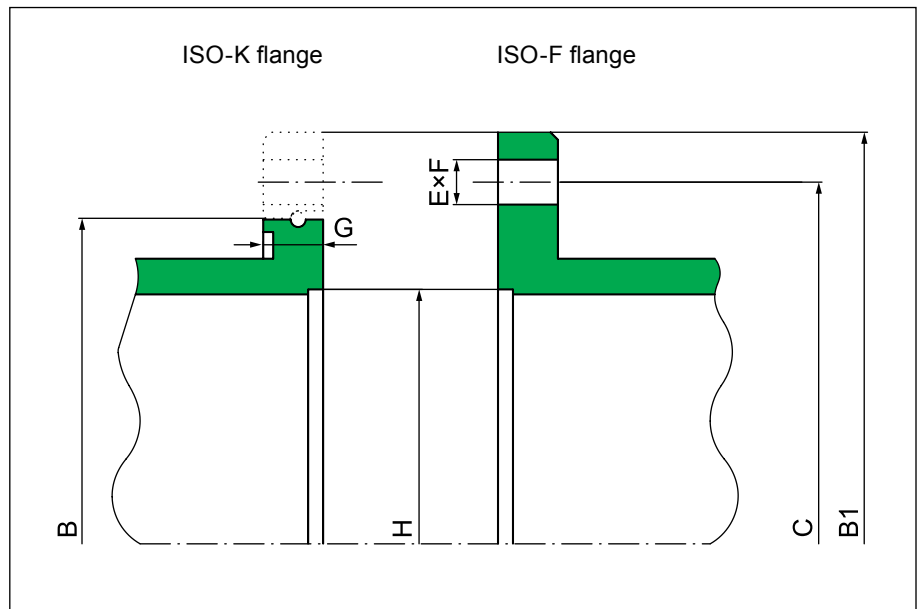
Clamps
Claws
Screws
Centering rings
Seals
Flanges
Ports
Elbows
T-Pieces
Reducing pieces
Cross pieces
Bellows



Seal	FKM (Viton®)
Suitable flange material	A, E
Temperature ¹⁾	≤200 °C
Leak rate for Helium (mbar ls ⁻¹)	<1 · 10 ⁻⁹
Sealing force (N per cm sealing line)	10–50
Multiple use of seal	yes

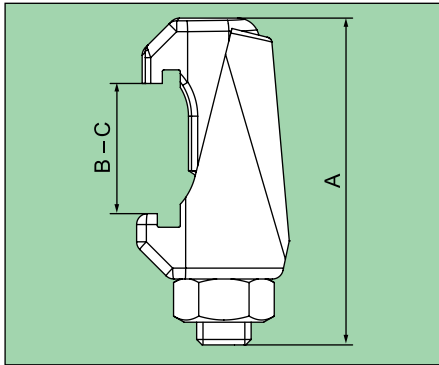
A: aluminum
E: stainless steel

¹⁾ Maximum values: depending on operating conditions and sealing materials



DN	mm inch	63 2 ½	80 3	100 4	160 6	200 8	250 10	320 12	400 16	500 20	630 25	800 32	1000 60
B	mm inch	95 3.74	110 4.33	130 5.12	180 7.09	240 9.45	290 11.42	370 14.57	450 17.72	550 21.65	690 27.17	—	—
B1	mm inch	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	335 13.19	425 16.73	510 20.08	610 24.02	750 29.53	920 36.22	1120 44.09
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55	480 18.90	580 22.83	720 28.35	890 35.04	1090 42.91
E x F	mm inch	4 x 9 4 x 0.35	8 x 9 8 x 0.35	8 x 9 8 x 0.35	8 x 11 8 x 0.43	12 x 11 12 x 0.43	12 x 11 12 x 0.43	12 x 14 12 x 0.55	16 x 14 16 x 0.55	16 x 14 16 x 0.55	20 x 14 20 x 0.55	24 x 14 24 x 0.55	32 x 14 32 x 0.55
G	mm inch	12 0.47	12 0.47	12 0.47	12 0.47	12 0.47	12 0.47	17 0.67	17 0.67	17 0.67	22 0.87	—	—
H	mm inch	70 2.76	83 3.27	102 4.02	153 6.02	213 8.39	261 10.28	318 12.52	400 15.75	501 19.72	651 25.63	800 31.50	1000 39.37

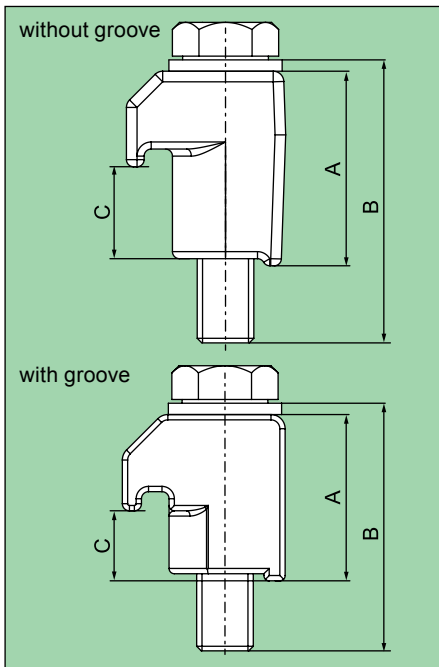
Technical data and ordering information


Clamp, ISO-K

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63-250	2½-10	60	2.36	17	0.67	27	1.06	32036-QNKS-0001 ¹⁾
320-500	12-20	78	3.07	27	1.06	39	1.54	32050-QNKS-0001 ¹⁾
630	25	88	3.66	31	1.22	49	1.93	32056-QNKS-0001 ¹⁾
63-250	2½-10	61	2.40	18	0.71	28	1.10	32036-QEKS-0001 ²⁾
320-630	12-25	82	3.23	29	1.14	47	1.85	32050-QEKS-0001 ²⁾

¹⁾ Steel, zinc-plated 1045

²⁾ Stainless steel AISI 316 (1.4401)


Claw with screw and washer, ISO-K

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63-100	2½-4	27.5	1.08	40	1.57	14	0.55	32040-QAPR-0001 ¹⁾
160-250	6-10	28.5	1.12	45	1.77	14	0.55	32044-QAPR-0001 ¹⁾
320-500	12-20	36.5	1.44	55	2.17	20.3	0.80	32050-QAPR-0001 ¹⁾
63-100	2½-4	23.5	0.93	35	1.38	10	0.39	320XX-QAPR-0001 ²⁾

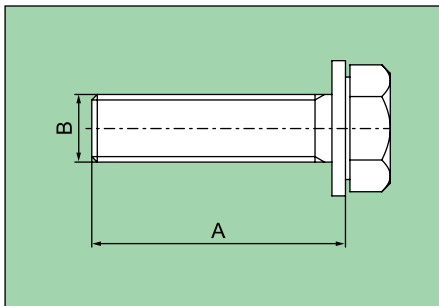
¹⁾ Clamp flange, base plate without groove

²⁾ Clamp flange, base plate with groove

Claw: aluminum

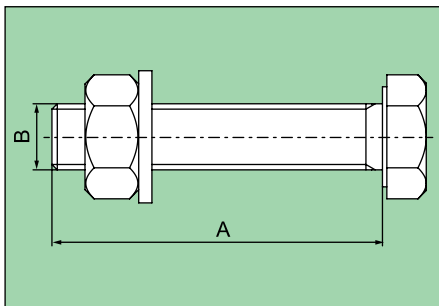
Screw: steel 8.8, zinc-plated

mm	inch	screw	pieces per flange
63	2½	M8 × 40	4
80-100	3-4	M8 × 40	8
160	6	M10 × 45	8
200-250	8-10	M10 × 45	12
320	12	M12 × 55	12
400-500	16-20	M12 × 55	16


Screw with washer, ISO-F

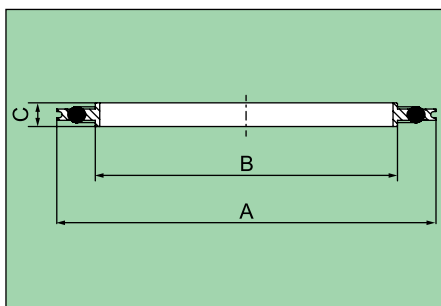
DN		A		B	pieces per flange	Ordering numbers
mm	inch	mm	inch	thread		
63	2½	30	1.18	M8	4	32036-QNSU-0001
80-100	3-4	30	1.18	M8	8	32036-QNSU-0001
160	6	35	1.38	M10	8	32044-QNSU-0001
200-250	8-10	35	1.38	M10	12	32044-QNSU-0001
320	12	45	1.77	M12	12	32050-QNSU-0001

Steel, zinc-plated


Screw with washer and nut, ISO-F

DN		A		B	pieces per flange	Ordering numbers
mm	inch	mm	inch	thread		
63	2½	40	1.57	M8	4	32036-QNSS-0001
80-100	3-4	40	1.57	M8	8	32036-QNSS-0001
160	6	50	1.97	M10	8	32044-QNSS-0001
200-250	8-10	50	1.97	M10	12	32044-QNSS-0001
320	12	60	2.36	M12	12	32050-QNSS-0001

Steel, zinc-plated

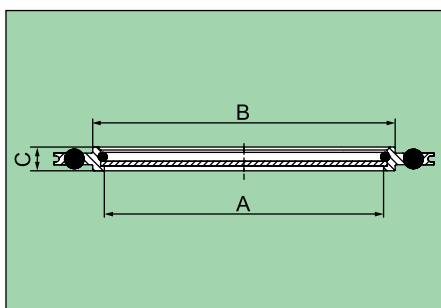


Centering ring, ISO-K / ISO-F

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 1/2	96	3.78	70	2.76	8	0.31	32036-QAZV-0001 ¹⁾
80	3	109	4.29	83	3.27	8	0.31	32038-QAZV-0001 ¹⁾
100	4	128	5.04	102	4.02	8	0.31	32040-QAZV-0001 ¹⁾
160	6	179	7.05	153	6.02	8	0.31	32044-QAZV-0001 ¹⁾
200	8	239	9.41	213	8.39	8	0.31	32046-QAZV-0001 ¹⁾
250	10	287	11.30	261	10.28	8	0.31	32048-QAZV-0001 ¹⁾
320	12	358	14.09	318	12.52	14	0.55	32050-QAZV-0001 ¹⁾
400	16	440	17.32	400	15.75	14	0.55	32052-QAZV-0001 ¹⁾
500	20	541	21.30	501	19.72	14	0.55	32054-QAZV-0001 ¹⁾
630	25	691	27.20	651	25.63	14	0.55	32056-QAZV-0001 ¹⁾
800	32	840	33.07	800	31.50	14	0.55	32058-QAZV-0001 ¹⁾
1000	60	1040	40.94	1000	39.37	14	0.55	32060-QAZV-0001 ¹⁾
63	2 1/2	96	3.78	70	2.76	8	0.31	32036-QEZV-0001 ²⁾
80	3	109	4.29	83	3.27	8	0.31	32038-QEZV-0001 ²⁾
100	4	128	5.04	102	4.02	8	0.31	32040-QEZV-0001 ²⁾
160	6	179	7.05	153	6.02	8	0.31	32044-QEZV-0001 ²⁾
200	8	239	9.41	213	8.39	8	0.31	32046-QEZV-0001 ²⁾
250	10	287	11.30	261	10.28	8	0.31	32048-QEZV-0001 ²⁾

¹⁾ Inner and outer ring: aluminum EN AW-6082 (3.2315)
Seal: elastomer FKM (Viton®)

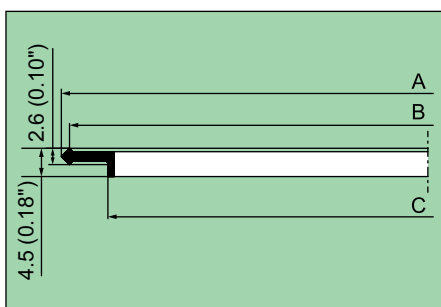
²⁾ Inner ring: stainless steel AISI 304 (1.4301)
Outer ring: aluminum EN AW-6082 (3.2315)
Seal: elastomer FKM (Viton®)



Centering ring with fine filter, ISO-K / ISO-F

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 1/2	62	2.44	69.8	2.75	8	0.31	32036-QEZG-0001
100	4	94	3.70	101.8	4.01	8	0.31	32040-QEZG-0001

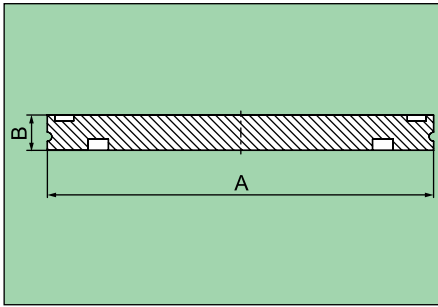
Inner ring: stainless steel AISI 304 (1.4301)
Spring ring: stainless steel AISI 304 (1.4301)
Seal: elastomer FKM (Viton®)
Filter: stainless steel AISI 316L (1.4435), pore size: 0.004 mm
Degree of separation: 0.001 mm to 98%



Aluminum seal, ISO-K / ISO-F

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 1/2	85.6	3.37	83	3.27	69.8	2.75	32036-QADK-0001
100	4	116.6	4.59	114	4.49	101.8	4.01	32040-QADK-0001
160	6	166.6	6.56	164	6.46	152.8	6.02	32044-QADK-0001
250	10	276.6	10.89	274	10.79	260.8	10.27	32048-QADK-0001

Aluminum EN AW-6082 (3.2315), annealed

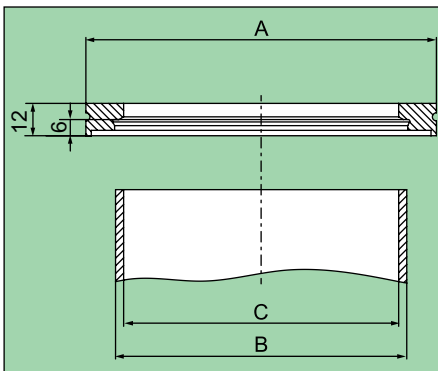

Blank-off flange, ISO-K

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
63	2 ½	95	3.74	12	0.47		32036-QAFB-0001 ¹⁾
100	4	130	5.12	12	0.47		32040-QAFB-0001 ¹⁾
160	6	180	7.09	12	0.47		32044-QAFB-0001 ¹⁾
200	8	240	9.45	12	0.47		32046-QAFB-0001 ¹⁾
250	10	290	11.42	12	0.47		32048-QAFB-0001 ¹⁾
320	12	370	14.57	17	0.67		32050-QAFB-0001 ¹⁾
63	2 ½	95	3.74	12	0.47		32036-QNFB-0001 ²⁾
100	4	130	5.12	12	0.47		32040-QNFB-0001 ²⁾
160	6	180	7.09	12	0.47		32044-QNFB-0001 ²⁾
250	10	290	11.42	12	0.47		32048-QNFB-0001 ²⁾
63	2 ½	95	3.74	12	0.47		32036-QEFB-0001 ³⁾
80	3	110	4.33	12	0.47		32038-QEFB-0001 ³⁾
100	4	130	5.12	12	0.47		32040-QEFB-0001 ³⁾
160	6	180	7.09	12	0.47		32044-QEFB-0001 ³⁾
200	8	240	9.45	12	0.47		32046-QEFB-0001 ³⁾
250	10	290	11.42	12	0.47		32048-QEFB-0001 ³⁾
320	12	370	14.57	17	0.67		32050-QEFB-0001 ³⁾
400	16	450	17.72	17	0.67		32052-QEFB-0001 ³⁾
500	20	550	21.65	17	0.67		32054-QEFB-0001 ³⁾
630	25	690	27.17	22	0.87		32056-QEFB-0001 ³⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

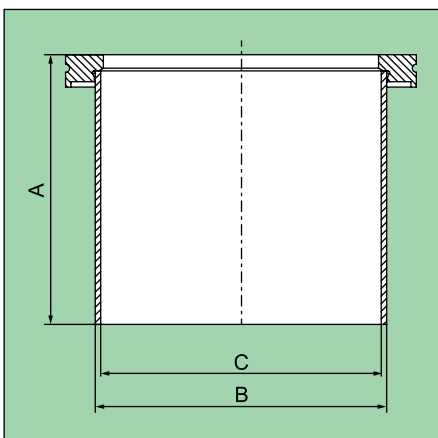
²⁾ Steel, nickel-plated A570

³⁾ Stainless steel AISI 304 (1.4301)


Weld neck flange, ISO-K

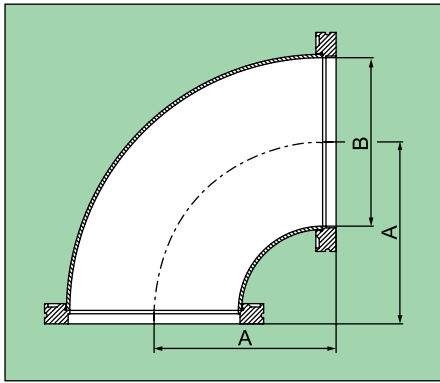
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 ½	95	3.74	76.1	3.00	71.5	2.81	32036-QEFF-0001
80	3	110	4.33	88.9	3.50	84.9	3.34	32038-QEFF-0001
100	4	130	5.12	108	4.25	102	4.02	32040-QEFF-0001
160	6	180	7.09	159	6.26	155	6.10	32044-QEFF-0001
200	8	240	9.45	219.1	8.63	213.1	8.39	32046-QEFF-0001
250	10	290	11.42	267	10.51	261	10.28	32048-QEFF-0001
320	12	370	14.57	324	12.76	318	12.52	32050-QEFF-0001

Stainless steel AISI 304 (1.4301)


Weld neck flange, ISO-K

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 ½	100	3.94	76.1	3.00	71.5	2.81	32036-QESK-0001
100	4	100	3.94	108	4.25	104	4.09	32040-QESK-0001
160	6	100	3.94	159	6.26	155	6.10	32044-QESK-0001
200	8	100	3.94	219.1	8.63	213.7	8.41	32046-QESK-0001
250	10	100	3.94	267	10.51	261	10.28	32048-QESK-0001
320	12	100	3.94	324	12.76	318	12.52	32050-QESK-0001
400	16	100	3.94	406	15.98	400	15.75	32052-QESK-0001
500	20	100	3.94	508	20.00	500	19.69	32054-QESK-0001
630	25	100	3.94	660	25.98	650	25.59	32056-QESK-0001

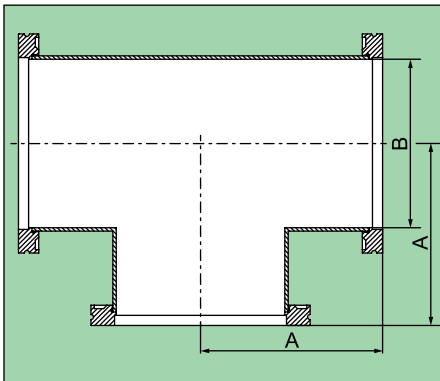
Stainless steel AISI 304 (1.4301)



Elbow 90°, ISO-K

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
63	2 ½	88	3.46	66	2.60		32036-QEKR-0001
100	4	108	4.25	100	3.94		32040-QEKR-0001
160	6	138	5.43	150	5.91		32044-QEKR-0001
200	8	178	7.01	213	8.39		32046-QEKR-0001
250	10	208	8.19	250	9.84		32048-QEKR-0001
320	12	250	9.84	318	12.52		32050-QEKR-0001

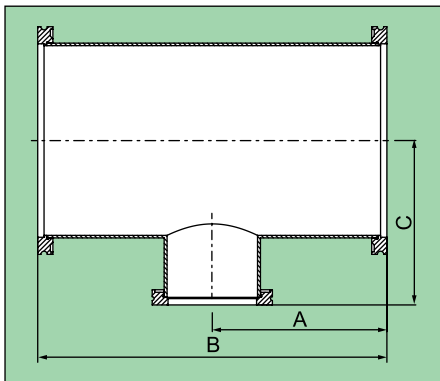
Stainless steel AISI 304 (1.4301)



T-Piece, ISO-K

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
63	2 ½	88	3.46	66	2.60		32036-QETS-0001
100	4	108	4.25	100	3.94		32040-QETS-0001
160	6	138	5.43	150	5.91		32044-QETS-0001
200	8	178	7.01	213	8.39		32046-QETS-0001
250	10	208	8.19	250	9.84		32048-QETS-0001
320	12	250	9.84	318	12.52		32050-QETS-0001

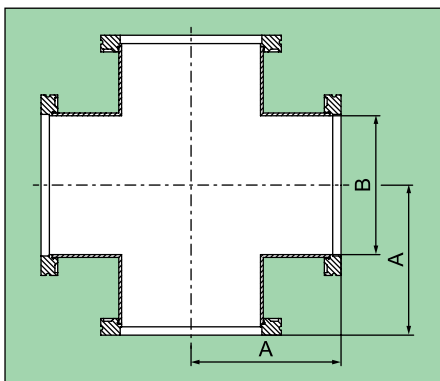
Stainless steel AISI 304 (1.4301)



Reducing T-piece, ISO-K

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
160/ 63	6/2 ½	138	5.43	276	10.87	130	5.12	32044-QETV-ABU1
160/100	6/4	138	5.43	276	10.87	131	5.16	32044-QETV-ACS1
250/200	10/8	190	7.48	380	14.96	208	8.19	32048-QETV-ACT1

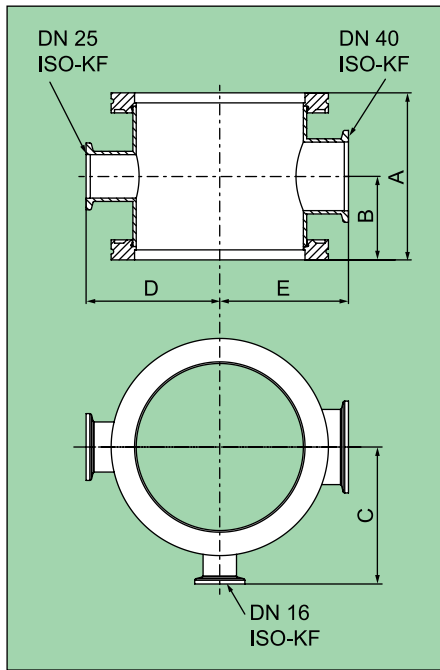
Stainless steel AISI 304 (1.4301)



Cross, ISO-K

DN		A		B			Ordering numbers
mm	inch	mm	inch	mm	inch		
63	2 ½	88	3.46	66	2.60		32036-QEKX-0001
100	4	108	4.25	100	3.94		32040-QEKX-0001
160	6	138	5.43	150	5.91		32044-QEKX-0001
200	8	178	7.01	213	8.39		32046-QEKX-0001
250	10	208	8.19	250	9.84		32048-QEKX-0001

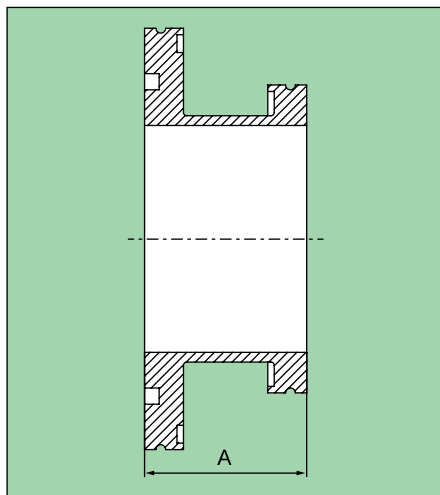
Stainless steel AISI 304 (1.4301)


Reducing cross, ISO-K

DN		A		B		C		D		E		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
63	2 1/2	88	3.46	44	1.73	66	2.60	64	2.52	59	2.32	32036-QEKZ-0001
100	4	100	3.94	50	1.97	82	3.23	80	3.15	77	3.03	32040-QEKZ-0001
160	6	100	3.94	50	1.97	107	4.21	107	4.21	105	4.13	32044-QEKZ-0001

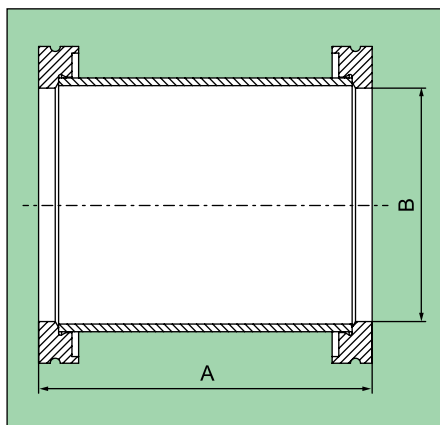
Stainless steel AISI 304 (1.4301)

1 × DN 16 ISO-KF
1 × DN 25 ISO-KF
1 × DN 40 ISO-KF


Reducing piece, ISO-K

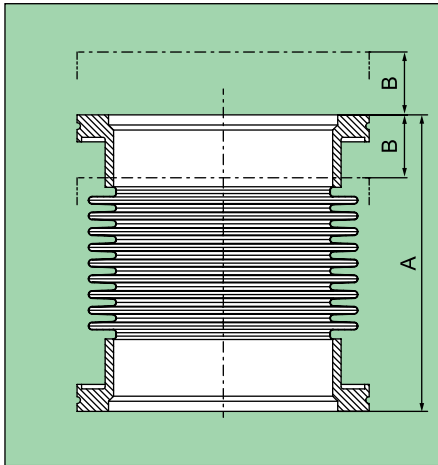
DN		A			Ordering numbers
mm	inch	mm	inch		
80/ 63	3/2 1/2	50	1.97		32038-QEUP-ABU1
100/ 63	4/2 1/2	50	1.97		32040-QEUP-ABU1
160/100	6/4	50	1.97		32044-QEUP-ACS1
200/160	8/6	50	1.97		32046-QEUP-ACU1
250/160	10/6	50	1.97		32048-QEUP-ACU1
250/200	10/8	50	1.97		32048-QEUP-ACT1

Stainless steel AISI 303 (1.4305)


Intermediate piece, ISO-K

DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
63	2 1/2	100	3.94	70	2.76	32036-QEVS-0001

Stainless steel AISI 304 (1.4301)



Spring bellows, short, ISO-K

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch			
63	2 ½	132	5.20	20	0.79	30°		32036-QEFK-0001
100	4	132	5.20	28	1.10	30°		32040-QEFK-0001
160	6	150	5.91	22	0.87	14°		32044-QEFK-0001
200	8	150	5.91	20	0.79	12°		32046-QEFK-0001
250	10	200	7.87	30	1.18	13°		32048-QEFK-0001
320	12	250	9.84	50	1.97	12°		32050-QEFK-0001

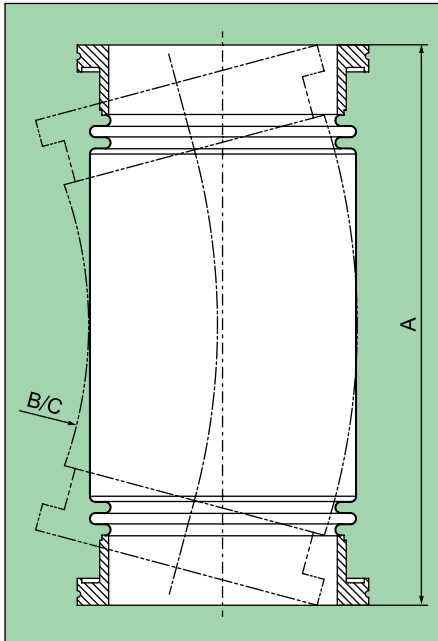
A = Uncompressed length

C = Max. deviation from axis

Flange: stainless steel AISI 304 (1.4301)

Bellows: stainless steel AISI 316Ti (1.4571)

Internal pressure: max. 1.5 bar



Spring bellows, long, ISO-K

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch			
63	2 ½	250	9.84	250	9.84	160	6.30	32036-QEFK-ABR1
63	2 ½	500	19.69	250	9.84	160	6.30	32036-QEFK-ABS1
63	2 ½	750	29.53	250	9.84	160	6.30	32036-QEFK-ABT1
63	2 ½	1000	39.37	250	9.84	160	6.30	32036-QEFK-ABP1
100	4	250	9.84	370	14.57	240	9.45	32040-QEFK-ABR1
100	4	500	19.69	370	14.57	240	9.45	32040-QEFK-ABS1
100	4	750	29.53	370	14.57	240	9.45	32040-QEFK-ABT1
100	4	1000	39.37	370	14.57	240	9.45	32040-QEFK-ABP1

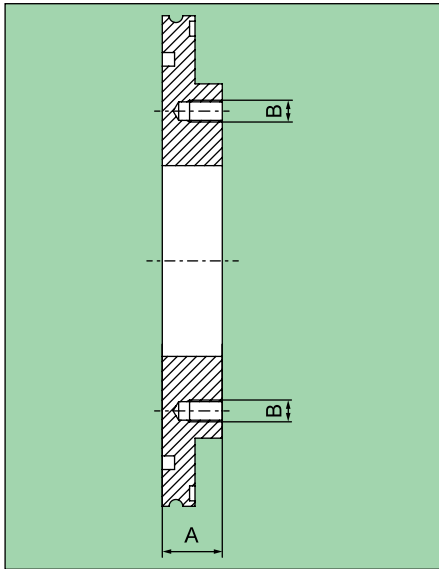
B = Radius for several bendings

C = Radius for one bending

Flange: stainless steel AISI 304 (1.4301)

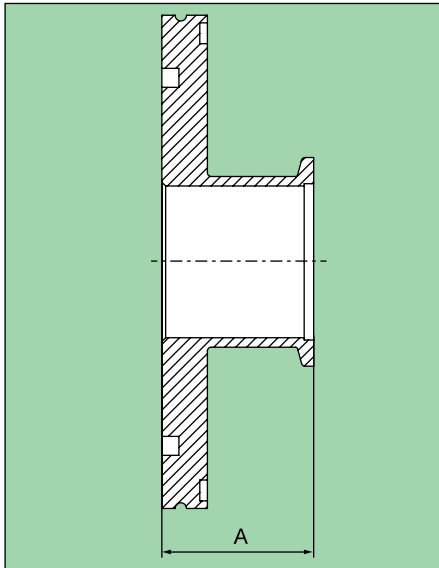
Bellows: stainless steel AISI 316Ti (1.4571)

Internal pressure: max. 1.5 bar


Adapter flange, ISO-K / ISO-F

DN				A		B	Ordering numbers
ISO-K		ISO-F		mm	inch	Gewinde	
mm	inch	mm	inch	mm	inch		
160	6	63	2 ½	22	0.87	M8	32044-QEAO-ACA1
160	6	100	4	25	0.98	M8	32044-QEAO-ACB1
200	8	100	4	20	0.79	M8	32046-QEAO-ACB1
200	8	160	6	25	0.98	M8	32046-QEAO-ACC1
250	10	160	6	22	0.87	M10	32048-QEAO-ACC1

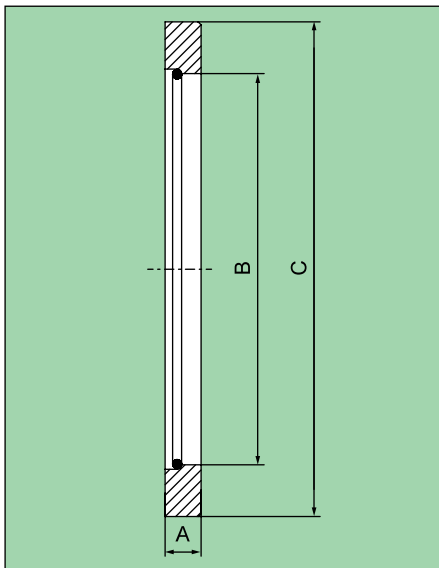
Stainless steel AISI 304 (1.4301)


Adapter flange, ISO-K / ISO-F

DN				A		Ordering numbers
ISO-K		ISO-KF		mm	inch	
mm	inch	mm	inch	mm	inch	
63	2 ½	40	1 ½	40	1.57	32036-QAAK-ABJ1 ¹⁾
63	2 ½	50	2	45	1.77	32036-QAAK-ABX1 ¹⁾
63	2 ½	25	1	50	1.97	32036-QEAK-ABW1 ²⁾
63	2 ½	40	1 ½	40	1.57	32036-QEAK-ABJ1 ²⁾
63	2 ½	50	2	45	1.77	32036-QEAK-ABX1 ²⁾
100	4	40	1 ½	40	1.57	32040-QEAK-ABJ1 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)


Rotatable flange, ISO-F

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 ½	12	0.47	95.5	3.76	130	5.12	32036-QNUF-0001 ¹⁾
80	3	12	0.47	110.5	4.35	145	5.71	32038-QNUF-0001 ¹⁾
100	4	12	0.47	130.5	5.14	165	6.50	32040-QNUF-0001 ¹⁾
160	6	16	0.63	180.7	7.11	225	8.86	32044-QNUF-0001 ¹⁾
200	8	16	0.63	240.7	9.48	285	11.22	32046-QNUF-0001 ²⁾
250	10	16	0.63	290.7	11.44	335	13.19	32048-QNUF-0001 ²⁾
320	12	20	0.79	370.8	14.60	425	16.73	32050-QNUF-0001 ²⁾
400	16	20	0.79	450.8	17.75	510	20.08	32052-QNUF-0001 ²⁾
500	20	20	0.79	550.8	21.69	610	24.02	32054-QNUF-0001 ²⁾
630	25	24	0.94	691.0	27.20	750	29.53	32056-QNUF-0001 ²⁾

¹⁾ Flange: steel 1.0831, nickel-plated

²⁾ Flange: steel 1.0037, nickel-plated

Retaining ring: steel, nickel-plated

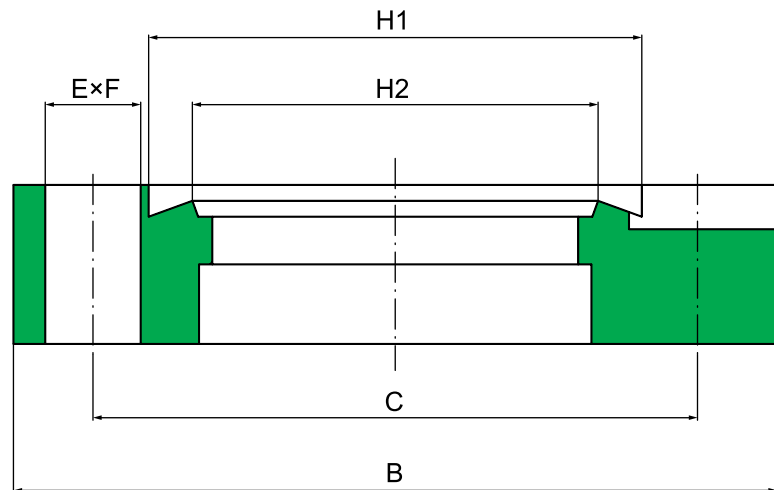
Screws, bolts
Copper seals
Flanges
Reducing pieces
Intermediate pieces
Elbows
T-Pieces
Cross pieces
Bellows
Adapters



Seal	Cu (copper)
Suitable flange material	stainless steel
Temperature ¹⁾	≤400 °C
Leak rate for Helium (mbar ls ⁻¹)	< 1 · 10 ⁻¹⁰
Sealing force (N per cm sealing line)	3000–5000
Multiple use of seal	no

¹⁾ Maximum values: depending on operating conditions and sealing materials

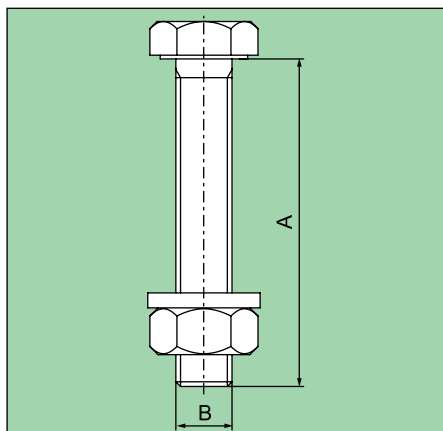
CF flange



DN	mm inch	16 %	25 1	40 1½	63 2½	100 4	160 6	200 8	250 10
O. D.	inch	1½	2½	2¾	4½	6	8	10	12
B	mm inch	34 1.34	54 2.13	69.50 2.74	113.50 4.47	152 5.98	202.50 7.97	253 9.96	305 12.01
C	mm inch	27 1.06	41.30 1.63	58.70 2.31	92.20 3.63	130.30 5.13	181 7.13	231.80 9.13	284 11.18
E x F	mm inch	6 x 4.30 6 x 0.17	4 x 6.60 4 x 0.26	6 x 6.60 6 x 0.26	8 x 8.40 8 x 0.33	16 x 8.40 16 x 0.33	20 x 8.40 20 x 0.33	24 x 8.40 24 x 0.33	32 x 8.40 32 x 0.33
H1	mm inch	21.40 0.84	32.90 1.3	48.30 1.9	82.50 3.25	120.60 4.75	171.40 6.75	222.20 8.75	273.10 10.75
H2	mm inch	18.50 0.73	27.60 1.09	42 1.65	77 3.03	115 4.53	166 6.54	217 8.54	267 10.51

DN 16, 25, 40 without venting groove

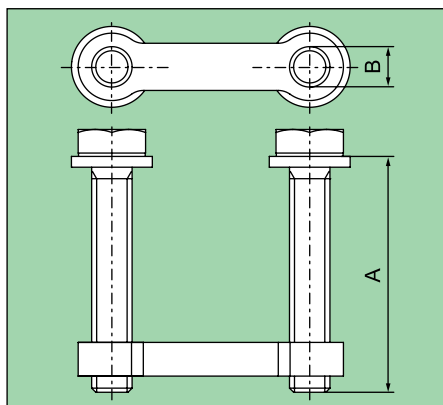
Technical data and ordering information



Screw with washer and nut

DN		A		B	thread	Ordering numbers
mm	inch	mm	inch			
16	$\frac{5}{8}$	20	0.79	M4		33024-CESS-0001
25	1	35	1.38	M6		33028-CESS-0001
40	$1\frac{1}{2}$	35	1.38	M6		33032-CESS-0001
63	$2\frac{1}{2}$	50	1.97	M8		33036-CESS-0001
100	4	55	2.17	M8		33040-CESS-0001
160	6	55	2.17	M8		33044-CESS-0001
200	8	60	2.36	M8		33046-CESS-0001
250	10	60	2.36	M8		33048-CESS-0001

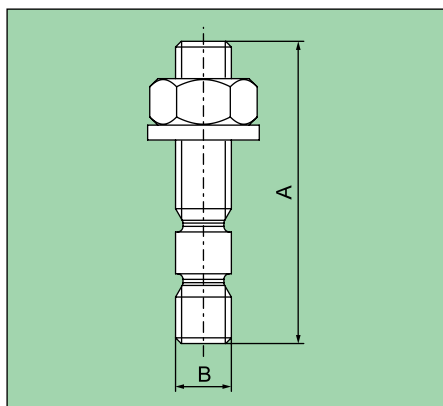
Stainless steel



Screw with double nut

DN		A		B	thread	Ordering numbers
mm	inch	mm	inch			
16	$\frac{5}{8}$	20	0.79	M4		33024-CESX-0001
40	$1\frac{1}{2}$	35	1.38	M6		33032-CESX-0001
63	$2\frac{1}{2}$	45	1.77	M8		33036-CESX-0001
100	4	50	1.97	M8		33040-CESX-0001
160	6	55	2.17	M8		33044-CESX-0001

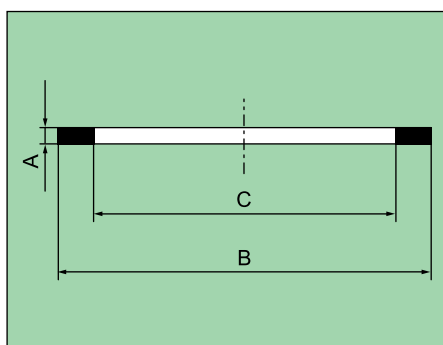
Stainless steel



Stud bolt with washer and nut

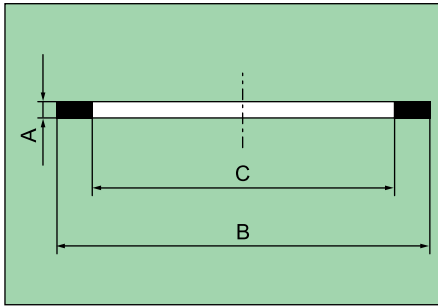
DN		A		B	thread	Ordering numbers
mm	inch	mm	inch			
16	$\frac{5}{8}$	20	0.79	M4		33024-CEST-0001
25	1	32.5	1.28	M6		33028-CEST-0001
40	$1\frac{1}{2}$	32.5	1.28	M6		33032-CEST-0001
63	$2\frac{1}{2}$	40	1.57	M8		33036-CEST-0001
100	4	45	1.77	M8		33040-CEST-0001
160	6	50	1.97	M8		33044-CEST-0001
200	8	50	1.97	M8		33046-CEST-0001
250	10	50	1.97	M8		33048-CEST-0001

Stainless steel



Copper seal

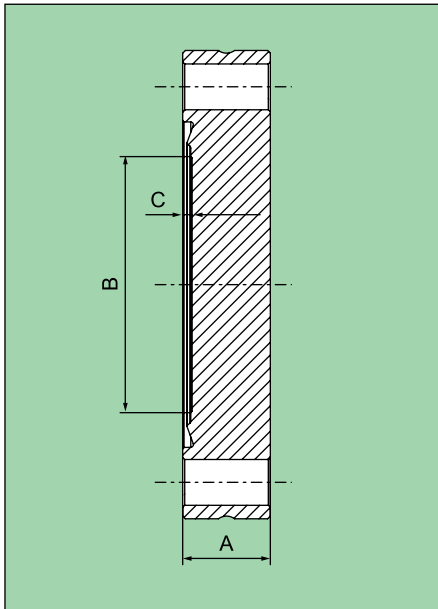
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	$\frac{5}{8}$	2	0.08	21.3	0.84	16.2	0.64	33024-CKDF-0001
40	$1\frac{1}{2}$	2	0.08	48.1	1.89	39	1.54	33032-CKDF-0001
63	$2\frac{1}{2}$	2	0.08	82.4	3.24	63.6	2.50	33036-CKDF-0001
100	4	2	0.08	120.5	4.74	101.8	4.01	33040-CKDF-0001
160	6	2	0.08	171.3	6.74	152.6	6.01	33044-CKDF-0001
200	8	2	0.08	222.1	8.74	203.4	8.01	33046-CKDF-0001
250	10	2	0.08	272.9	10.74	254.2	10.01	33048-CKDF-0001



Copper seal

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	2	0.08	21.3	0.84	16.2	0.64	33024-CSDF-0001
40	1 1/2	2	0.08	48.1	1.89	39	1.54	33032-CSDF-0001
63	2 1/2	2	0.08	82.4	3.24	63.6	2.50	33036-CSDF-0001
100	4	2	0.08	120.5	4.74	101.8	4.01	33040-CSDF-0001
160	6	2	0.08	171.3	6.74	152.6	6.01	33044-CSDF-0001
200	8	2	0.08	222.1	8.74	203.4	8.01	33046-CSDF-0001
250	10	2	0.08	272.9	10.74	254.2	10.01	33048-CSDF-0001

Silver-plated

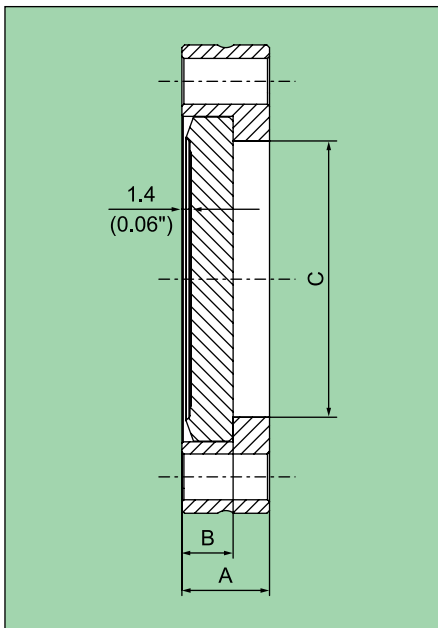


Blank-off flange

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.5	0.30	14	0.55	1.4	0.06	33024-CEFB-0001 ¹⁾
40	1 1/2	13	0.51	38	1.50	1.4	0.06	33032-CEFB-0001 ¹⁾
63	2 1/2	17.5	0.69	66	2.60	1.4	0.06	33036-CEFB-0001 ¹⁾
100	4	20	0.79	104	4.09	1.4	0.06	33040-CEFB-0001 ¹⁾
160	6	22	0.87	155	6.10	1.4	0.06	33044-CEFB-0001 ¹⁾
200	8	24.5	0.96	205	8.07	1.4	0.06	33046-CEFB-0001 ¹⁾
250	10	24.5	0.96	256	10.08	1.4	0.06	33048-CEFB-0001 ¹⁾
16	5/8	7.5	0.30	14	0.55	1.4	0.06	33024-CEFB-AAH1 ²⁾
40	1 1/2	13	0.51	38	1.50	1.4	0.06	33032-CEFB-AAH1 ²⁾
63	2 1/2	17.5	0.69	66	2.60	1.4	0.06	33036-CEFB-AAH1 ²⁾
100	4	20	0.79	104	4.09	1.4	0.06	33040-CEFB-AAH1 ²⁾
160	6	22	0.87	155	6.10	1.4	0.06	33044-CEFB-AAH1 ²⁾
200	8	24.5	0.96	205	8.07	1.4	0.06	33046-CEFB-AAH1 ²⁾
250	10	24.5	0.96	256	10.08	1.4	0.06	33048-CEFB-AAH1 ²⁾

¹⁾ Stainless steel AISI 304 (1.4301)

²⁾ Stainless steel AISI 316LN (1.4429)

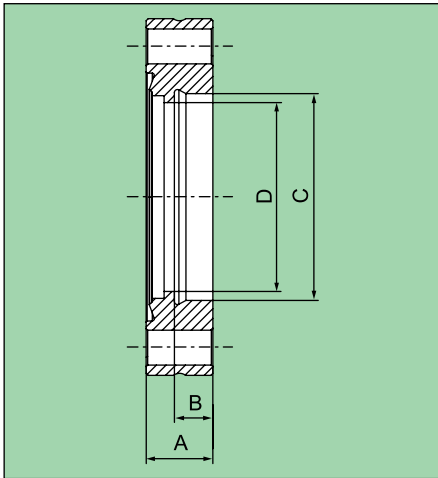


Blank-off flange, rotatable

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.5	0.30	5.8	0.23	18.6	0.73	33024-GEBD-0001 ¹⁾
40	1 1/2	13	0.51	7.6	0.30	41	1.61	33032-GEBD-0001 ¹⁾
63	2 1/2	17.5	0.69	12.6	0.50	71	2.80	33036-GEBD-0001 ¹⁾
100	4	20	0.79	14.3	0.56	109	4.29	33040-GEBD-0001 ¹⁾
160	6	22	0.87	15.8	0.62	160	6.30	33044-GEBD-0001 ¹⁾
200	8	24.5	0.96	17.1	0.67	206	8.11	33046-GEBD-0001 ¹⁾
250	10	24.5	0.96	18	0.71	257	10.12	33048-GEBD-0001 ¹⁾
16	5/8	7.5	0.30	5.8	0.23	18.6	0.73	33024-GEBD-AAH1 ²⁾
40	1 1/2	13	0.51	7.6	0.30	41	1.61	33032-GEBD-AAH1 ²⁾
63	2 1/2	17.5	0.69	12.6	0.50	71	2.80	33036-GEBD-AAH1 ²⁾
100	4	20	0.79	14.3	0.56	109	4.29	33040-GEBD-AAH1 ²⁾
160	6	22	0.87	15.8	0.62	160	6.30	33044-GEBD-AAH1 ²⁾
200	8	24.5	0.96	17.1	0.67	206	8.11	33046-GEBD-AAH1 ²⁾
250	10	24.5	0.96	18	0.71	257	10.12	33048-GEBD-AAH1 ²⁾

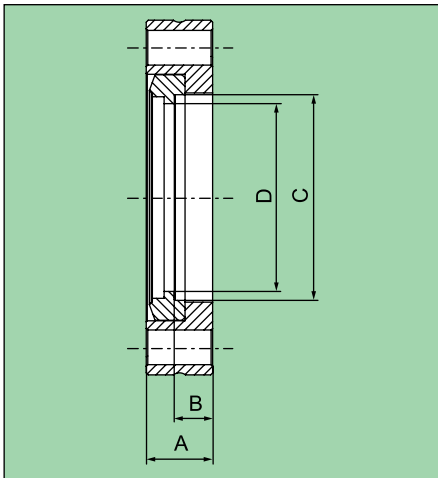
¹⁾ Stainless steel AISI 304 (1.4301)

²⁾ Stainless steel AISI 316LN (1.4429)


Weld flange

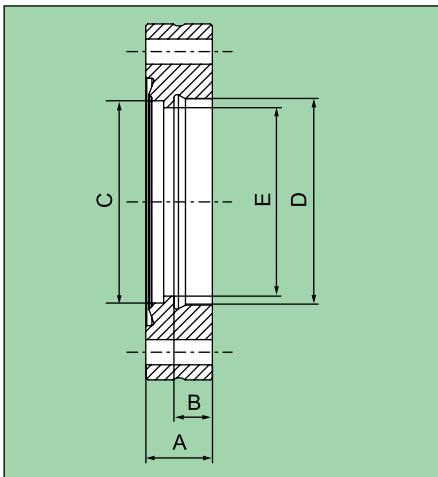
DN		A		B		C		D		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.5	0.30	3.3	0.13	18.3	0.72	16	0.63	33024-CEFF-0001 ¹⁾
40	1 1/2	13	0.51	7.5	0.30	40.3	1.59	36.8	1.45	33032-CEFF-0001 ¹⁾
63	2 1/2	17.5	0.69	8	0.31	70.3	2.77	66	2.60	33036-CEFF-0001 ¹⁾
100	4	20	0.79	9	0.35	108.5	4.27	104	4.09	33040-CEFF-0001 ¹⁾
160	6	22	0.87	10	0.39	159.5	6.28	155	6.10	33044-CEFF-0001 ¹⁾
200	8	24.5	0.96	12	0.47	205.5	8.09	200	7.87	33046-CEFF-0001 ¹⁾
250	10	24.5	0.96	12	0.47	256.5	10.19	250	9.84	33048-CEFF-0001 ¹⁾
16	5/8	7.5	0.30	3.3	0.13	18.3	0.72	16	0.63	33024-CEFF-AAH1 ²⁾
40	1 1/2	13	0.51	7.5	0.30	40.3	1.59	36.8	1.45	33032-CEFF-AAH1 ²⁾
63	2 1/2	17.5	0.69	8	0.31	70.3	2.77	66	2.60	33036-CEFF-AAH1 ²⁾
100	4	20	0.79	9	0.35	108.5	4.27	104	4.09	33040-CEFF-AAH1 ²⁾
160	6	22	0.87	10	0.39	159.5	6.28	155	6.10	33044-CEFF-AAH1 ²⁾
200	8	24.5	0.96	12	0.47	205.5	8.09	200	7.87	33046-CEFF-AAH1 ²⁾
250	10	24.5	0.96	12	0.47	256.5	10.19	250	9.84	33048-CEFF-AAH1 ²⁾

¹⁾ Stainless steel AISI 304 (1.4301)

²⁾ Stainless steel AISI 316LN (1.4429)

Weld flange, rotatable

DN		A		B		C		D		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.5	0.30	3.3	0.13	18.3	0.72	16	0.63	33024-GEFD-0001 ¹⁾
40	1 1/2	13	0.51	7.5	0.30	40.3	1.59	36.8	1.45	33032-GEFD-0001 ¹⁾
63	2 1/2	17.5	0.69	8	0.31	70.3	2.77	66	2.60	33036-GEFD-0001 ¹⁾
100	4	20	0.79	9	0.35	108.5	4.27	104	4.09	33040-GEFD-0001 ¹⁾
160	6	22	0.87	10	0.39	159.5	6.28	155	6.10	33044-GEFD-0001 ¹⁾
200	8	24.5	0.96	12	0.47	205.5	8.09	200	7.87	33046-GEFD-0001 ¹⁾
250	10	24.5	0.96	12	0.47	256.5	10.19	250	9.84	33048-GEFD-0001 ¹⁾
16	5/8	7.5	0.30	3.3	0.13	18.3	0.72	16	0.63	33024-GEFD-AAH1 ²⁾
40	1 1/2	13	0.51	7.5	0.30	40.3	1.59	36.8	1.45	33032-GEFD-AAH1 ²⁾
63	2 1/2	17.5	0.69	8	0.31	70.3	2.77	66	2.60	33036-GEFD-AAH1 ²⁾
100	4	20	0.79	9	0.35	108.5	4.27	104	4.09	33040-GEFD-AAH1 ²⁾
160	6	22	0.87	10	0.39	159.5	6.28	155	6.10	33044-GEFD-AAH1 ²⁾
200	8	24.5	0.96	12	0.47	205.5	8.09	200	7.87	33046-GEFD-AAH1 ²⁾
250	10	24.5	0.96	12	0.47	256.5	10.19	250	9.84	33048-GEFD-AAH1 ²⁾

¹⁾ Stainless steel AISI 304 (1.4301)

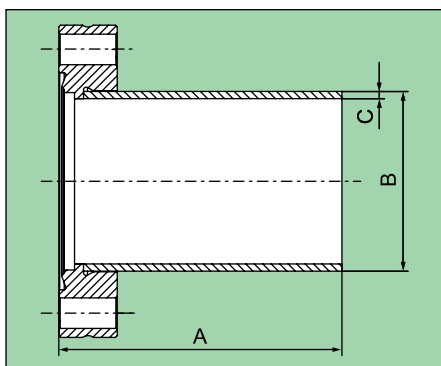
²⁾ Stainless steel AISI 316LN (1.4429)

Weld flange with thread

DN		A		B		C		D		E		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.5	0.30	3.3	0.13	17.2	0.68	18.3	0.72	16	0.63	33024-CEFF-ABN1
40	1 1/2	13	0.51	7.5	0.30	39.5	1.56	40.3	1.59	36.8	1.45	33032-CEFF-ABN1
63	2 1/2	17.5	0.69	8	0.31	66	2.60	70.3	2.77	66	2.60	33036-CEFF-ABN1
100	4	20	0.79	9	0.35	104	4.09	108.5	4.27	104	4.09	33040-CEFF-ABN1

DN 16 = 6 × M4 DN 63 = 8 × M8

DN 40 = 6 × M6 DN 100 = 16 × M8

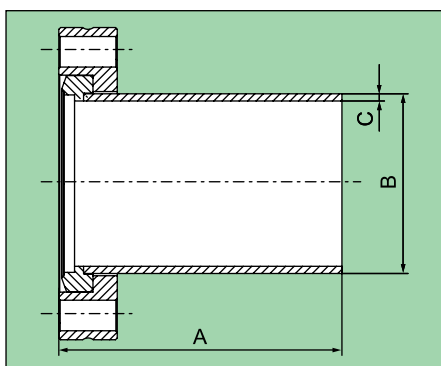
Stainless steel AISI 304 (1.4301)



Weld neck flange

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	38	1.50	18	0.71	1	0.04	33024-CESK-0001
40	1 1/2	63	2.48	40	1.57	1.6	0.06	33032-CESK-0001
63	2 1/2	105	4.13	70	2.76	2	0.08	33036-CESK-0001
100	4	135	5.31	108	4.25	2	0.08	33040-CESK-0001
160	6	167	6.61	159	6.26	2	0.08	33044-CESK-0001

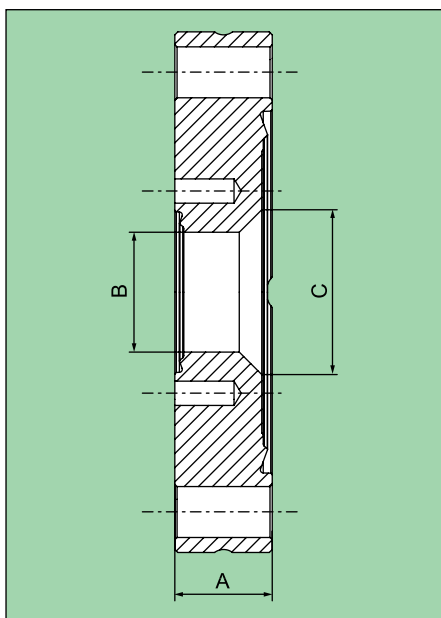
Stainless steel AISI 304 (1.4301)



Weld neck flange, rotatable

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	38	1.50	18	0.71	1	0.04	33024-GESD-0001
40	1 1/2	63	2.48	40	1.57	1.6	0.06	33032-GESD-0001
63	2 1/2	105	4.13	70	2.76	2	0.08	33036-GESD-0001
100	4	135	5.31	108	4.25	2	0.08	33040-GESD-0001
160	6	167	6.61	159	6.26	2	0.08	33044-GESD-0001

Stainless steel AISI 304 (1.4301)



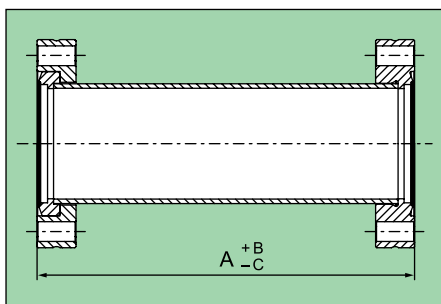
Reducing flange

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
40/ 16	1 1/2/ 5/8	13	0.51	16	0.63	22	0.87	33032-CEUC-ACZ1 ¹⁾
63/ 40	2 1/2/ 1 1/2	17.5	0.69	39	1.54	50	1.97	33036-CEUC-ABQ1 ¹⁾
100/ 40	4/ 1 1/2	20	0.79	39	1.54	55	2.17	33040-CEUC-ABQ1 ¹⁾
100/ 63	4/ 2 1/2	20	0.79	66	2.60	85	3.35	33040-CEUC-ADA1 ¹⁾
160/ 40	6/ 1 1/2	22	0.87	39	1.54	60	2.36	33044-CEUC-ABQ1 ¹⁾
160/100	6/ 4	22	0.87	104	4.09	120	4.72	33044-CEUC-ADB1 ¹⁾
40/ 16	1 1/2/ 5/8	13	0.51	16	0.63	22	0.87	33032-CEUC-ADC1 ²⁾
63/ 40	2 1/2/ 1 1/2	17.5	0.69	39	1.54	50	1.97	33036-CEUC-ADD1 ²⁾
100/ 40	4/ 1 1/2	20	0.79	39	1.54	55	2.17	33040-CEUC-ADD1 ²⁾
100/ 63	4/ 2 1/2	20	0.79	66	2.60	85	3.35	33040-CEUC-ADE1 ²⁾
160/ 40	6/ 1 1/2	22	0.87	39	1.54	60	2.36	33044-CEUC-ADD1 ²⁾
160/100	6/ 4	22	0.87	104	4.09	120	4.72	33044-CEUC-ADF1 ²⁾

DN 40/16 = 6 × M4 DN 100/40 = 6 × M6 DN 160/ 40 = 6 × M6
 DN 63/40 = 6 × M6 DN 100/63 = 8 × M8 DN 160/100 = 16 × M8

¹⁾ Stainless steel AISI 304 (1.4301)

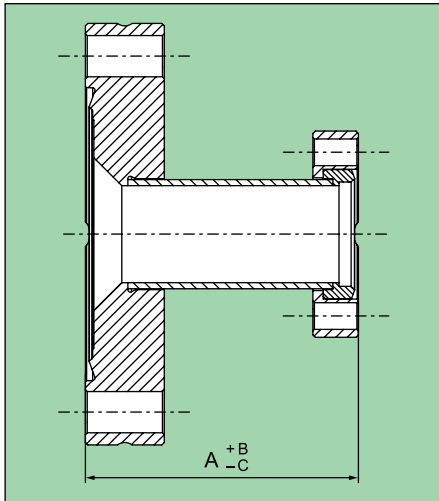
²⁾ Stainless steel AISI 316LN (1.4429)



Intermediate piece

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	76	2.99	0.5	0.02	0.5	0.02	33024-GEZS-0001
40	1 1/2	126	4.96	1	0.04	1	0.04	33032-GEZS-0001
63	2 1/2	210	8.27	1	0.04	1	0.04	33036-GEZS-0001
100	4	270	10.63	1	0.04	1	0.04	33040-GEZS-0001
160	6	334	13.15	1.5	0.06	1.5	0.06	33044-GEZS-0001

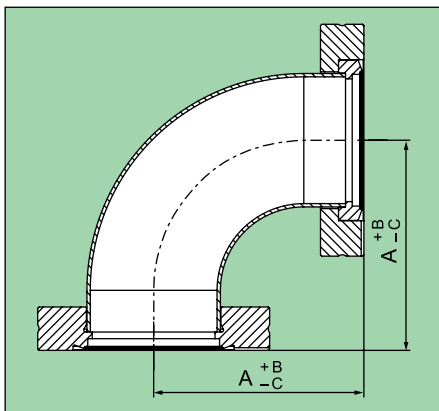
Stainless steel AISI 304 (1.4301)



Reducing piece

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
40/ 16	1½/⅝	45	1.77	1	0.04	1	0.04	33032-CEUP-ACW1
63/ 40	2½/1½	75	2.95	1	0.04	1	0.04	33036-CEUP-ACV1
100/ 40	4/1½	75	2.95	1	0.04	1	0.04	33040-CEUP-ACV1
100/ 63	4/2½	95	3.74	1	0.04	1	0.04	33040-CEUP-ACX1
160/100	6/4	105	4.13	1.5	0.06	1.5	0.06	33044-CEUP-ACY1

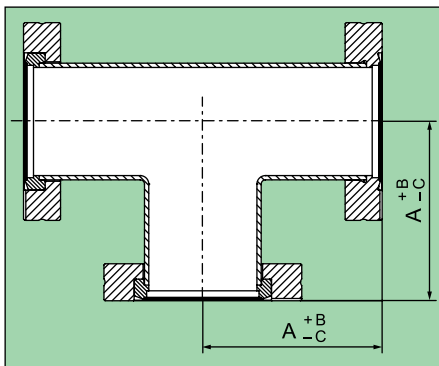
Stainless steel AISI 304 (1.4301)



Elbow 90°

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	⅝	38	1.50	0.5	0.02	0.5	0.02	33024-GEKR-0001
40	1½	63	2.48	0.5	0.02	0.5	0.02	33032-GEKR-0001
63	2½	105	4.13	1	0.04	1	0.04	33036-GEKR-0001
100	4	135	5.31	1	0.04	1	0.04	33040-GEKR-0001
160	6	167	6.57	1.5	0.06	1.5	0.06	33044-GEKR-0001

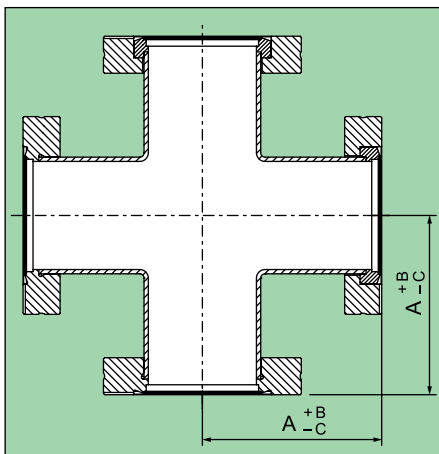
Stainless steel AISI 304 (1.4301)



T-Piece

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	⅝	38	1.50	0.5	0.02	0.5	0.02	33024-GETS-0001
40	1½	63	2.48	0.5	0.02	0.5	0.02	33032-GETS-0001
63	2½	105	4.13	1	0.04	1	0.04	33036-GETS-0001
100	4	135	5.31	1	0.04	1	0.04	33040-GETS-0001
160	6	167	6.57	1.5	0.06	1.5	0.06	33044-GETS-0001

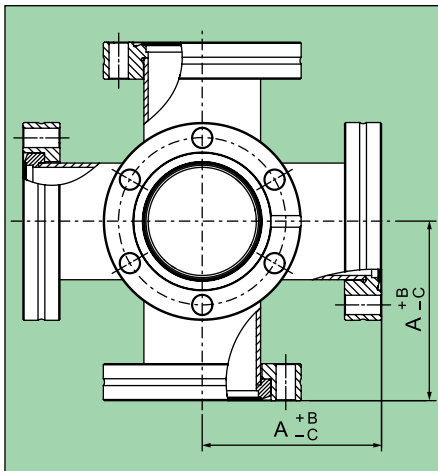
Stainless steel AISI 304 (1.4301)



Cross

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	⅝	38	1.50	0.5	0.02	0.5	0.02	33024-GEKX-0001
40	1½	63	2.48	0.5	0.02	0.5	0.02	33032-GEKX-0001
63	2½	105	4.13	1	0.04	1	0.04	33036-GEKX-0001
100	4	135	5.31	1	0.04	1	0.04	33040-GEKX-0001
160	6	167	6.57	1.5	0.06	1.5	0.06	33044-GEKX-0001

Stainless steel AISI 304 (1.4301)

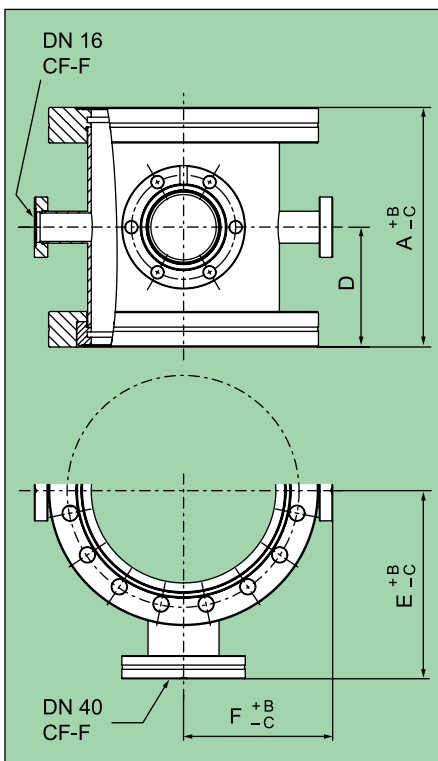


Double cross

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
40	1½	63	2.48	0.5	0.02	0.5	0.02	33032-GEKY-0001
63	2½	105	4.13	1	0.04	1	0.04	33036-GEKY-0001
100	4	135	5.31	1	0.04	1	0.04	33040-GEKY-0001
160	6	167	6.57	1.5	0.06	1.5	0.06	33044-GEKY-0001

Stainless steel AISI 304 (1.4301)

3 × rotatable flange, 3 × fixed flange



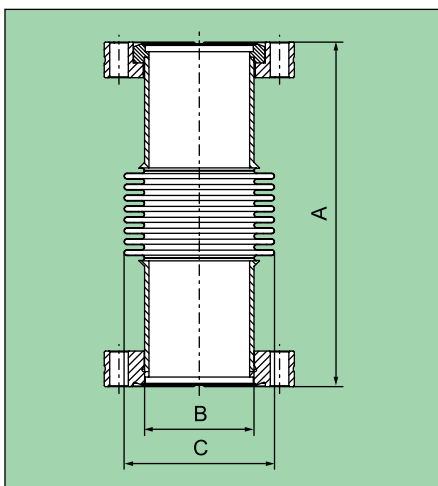
Reducing cross

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
100	4	135	5.31	1	0.04	1	0.04	33040-GEKZ-0001
		D		E		F		
		mm	inch	mm	inch	mm	inch	
		67.5	2.66	106	4.17	84	3.31	

Stainless steel AISI 304 (1.4301)

2 × DN 16 CF-F

2 × DN 40 CF-F

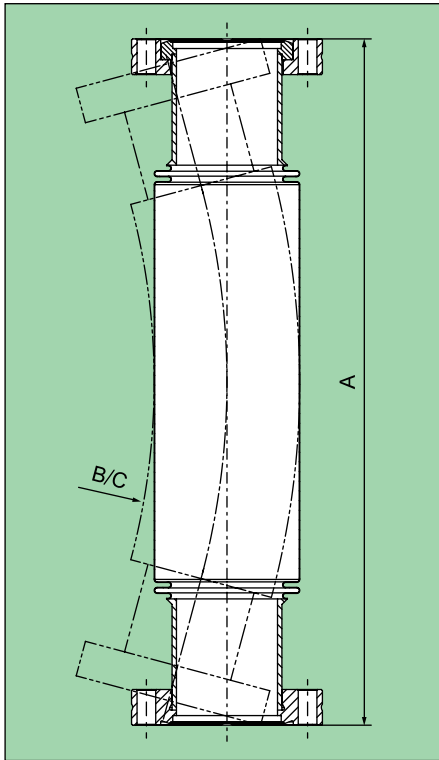


Spring bellows, short

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	⅝	76	2.99	15	0.59	22	0.87	33024-GEFK-0001
40	1½	126	4.96	40	1.57	55	2.17	33032-GEFK-0001
63	2½	139	5.47	62	2.44	80	3.15	33036-GEFK-0001
100	4	142	5.59	92	3.62	116	4.57	33040-GEFK-0001
160	6	250	9.84	154	6.06	187	7.36	33044-GEFK-0001

A = Uncompressed length

Flange: stainless steel AISI 304 (1.4301)
 Bellows: stainless steel AISI 316Ti (1.4571)
 Internal pressure: DN 16– 40: max. 4.0 bar
 DN 63– 160: max. 1.5 bar



Spring bellows, long

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	$\frac{5}{8}$	250	9.84	70	2.76	50	1.97	33024-GEFK-ABR1
16	$\frac{5}{8}$	500	19.69	70	2.76	50	1.97	33024-GEFK-ABS1
16	$\frac{5}{8}$	750	29.53	70	2.76	50	1.97	33024-GEFK-ABT1
16	$\frac{5}{8}$	1000	39.37	70	2.76	50	1.97	33024-GEFK-ABP1
40	$1\frac{1}{2}$	250	9.84	130	5.12	100	3.94	33032-GEFK-ABR1
40	$1\frac{1}{2}$	500	19.69	130	5.12	100	3.94	33032-GEFK-ABS1
40	$1\frac{1}{2}$	1000	39.37	130	5.12	100	3.94	33032-GEFK-ABT1

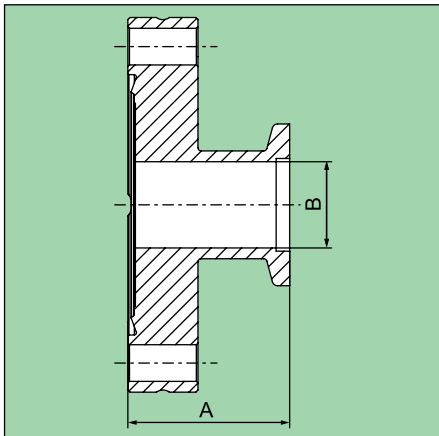
B = Radius for several bendings

C = Radius for one bending

Flange: stainless steel AISI 304 (1.4301)

Bellows: stainless steel AISI 316Ti (1.4571)

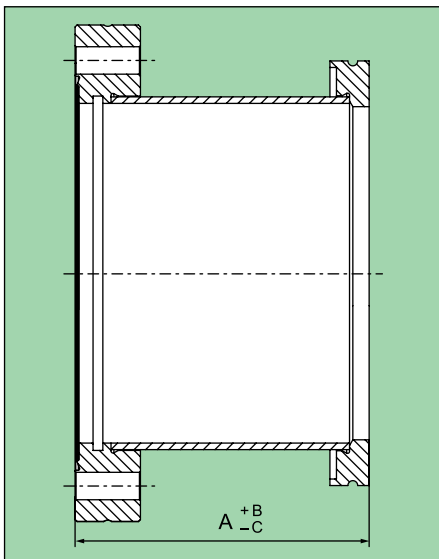
Internal pressure: max. 5 bar



Adapter flange ISO-KF

DN				A		B		Ordering numbers
CF-F		ISO-KF		mm	inch	mm	inch	
16	$\frac{5}{8}$	16	$\frac{5}{8}$	35	1.38	16	0.63	33024-CEAK-ACK1
16	$\frac{5}{8}$	25	1	35	1.38	16	0.63	33024-CEAK-ABW1
40	$1\frac{1}{2}$	16	$\frac{5}{8}$	30	1.18	16	0.63	33032-CEAK-ACK1
40	$1\frac{1}{2}$	25	1	30	1.18	26	1.02	33032-CEAK-ABW1
40	$1\frac{1}{2}$	40	$1\frac{1}{2}$	50	1.97	37	1.46	33032-CEAK-ABJ1
63	$2\frac{1}{2}$	40	$1\frac{1}{2}$	35	1.38	41	1.61	33036-CEAK-ABJ1
100	4	40	$1\frac{1}{2}$	50	1.97	41	1.61	33040-CEAK-ABJ1

Stainless steel AISI 304 (1.4301)



Adapter flange ISO-K

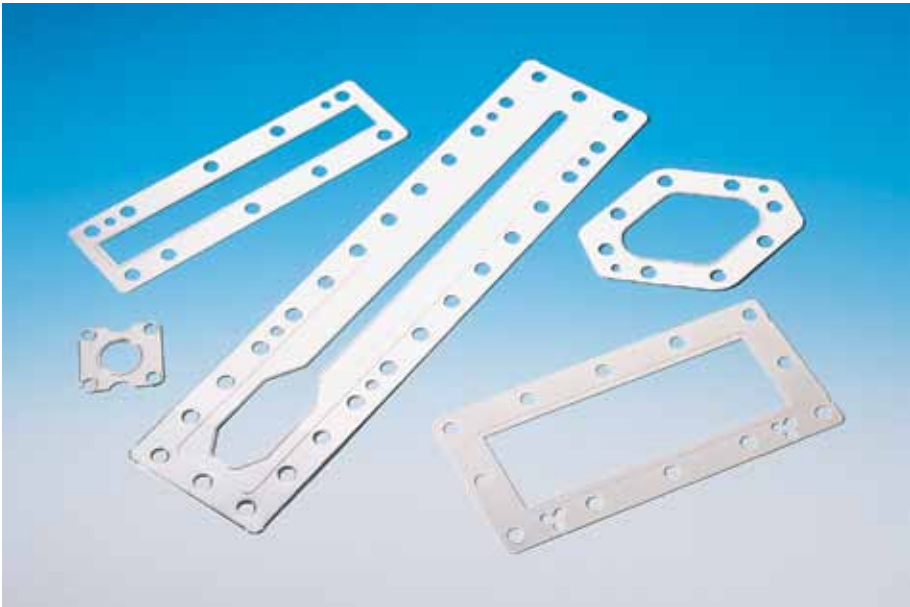
DN				A		B, C		Ordering numbers
CF-F		ISO-K		mm	inch	mm	inch	
63	$2\frac{1}{2}$	63	$2\frac{1}{2}$	90	3.54	1	0.04	33036-CEAF-ABJ1
100	4	100	4	90	3.54	1	0.04	33040-CEAF-ACS1
160	6	160	6	90	3.54	1.5	0.06	33044-CEAF-ACU1

Stainless steel AISI 304 (1.4301)

Main applications

Metal seals suited for demanding applications requiring specific geometries

Especially suited to RF applications, cryogenics and high temperatures



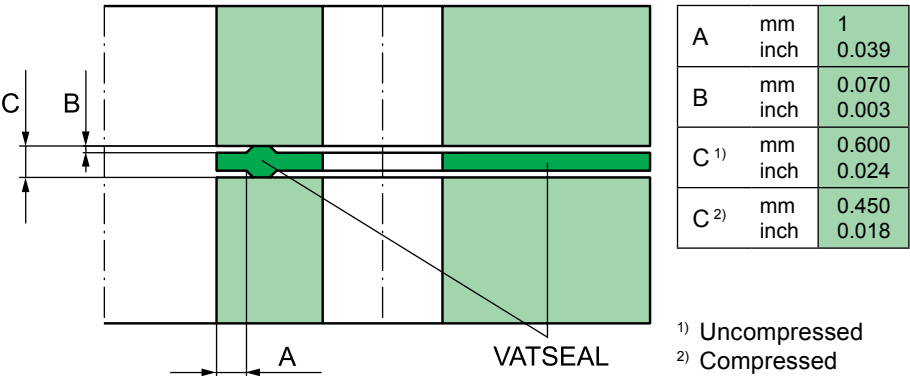
Ordering information

Metal seal

Possible sizes	max. 500 × 700 mm (19.69" × 27.56")
Ordering numbers	on request

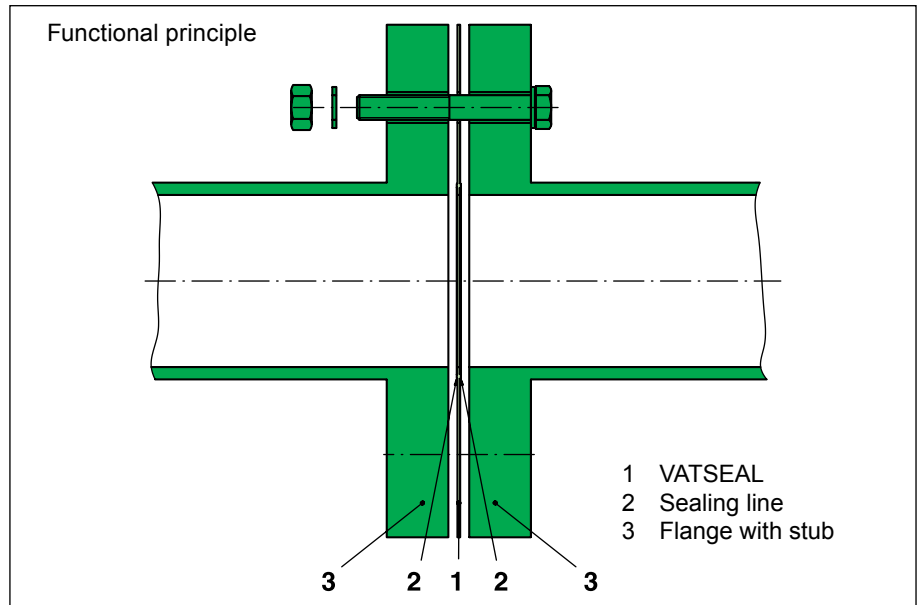
- Metal seals are used instead of elastomer seals if
- permeation through an elastomer seal is not acceptable
 - outgassing must be very low
 - the temperature exceeds 150 °C
 - process gases are not compatible with elastomer seals
 - high radiation resistance is required

Installation



Features

Excellent vacuum tightness
 Reliable, low resistance RF contact
 Sealing line any shape
 Flanges require only flat sealing surfaces



Technical data

VATSEAL

Leak rate	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	10 ⁻¹³ mbar to 10 bar (depending on flange)
Temperature ¹⁾	-271 °C (2K) to +300 °C
Heating and cooling rate	≤ 50 °C h ⁻¹
Material ²⁾	silver-plated copper, hardness 70–90 HV
Thickness	
– Uncompressed	0.60 mm
– Compressed	0.45 mm
Sealing force	min. 2000 N per cm sealing line
Sealing line	
– Shape	any
– Distance to edge of flange	> 1 mm

¹⁾ Maximum values: depending on operating conditions

²⁾ Other materials on request
 e. g. – Copper
 – Gold-plated copper
 – Silver-plated stainless steel

Flanges for VATSEAL

Material	stainless steel
	e. g. AISI 304 (1.4301) AISI 304L (1.4306) AISI 316L (1.4435)
Sealing surface requirements	
– Flatness over largest length	max. 0.2 mm
– Flatness over 50 mm	max. 0.02 mm
– Surface finish	N4 (Ra = 0.2 µm)
– Thickness	10–22 mm, depending on size
– Distance between holes	max. 50 mm

To prevent process contamination and gases from condensing

To minimize cleaning intervals, resulting in less maintenance work

The valves shown in this picture are for

- CVD systems
- plasma etching systems



To reduce the pumping time by conditioning the valves

Increased process safety due to lower residual gas pressure

The valves shown in this picture are for

- UHV systems
- sputtering systems
- research systems



Engineering with VAT

Our engineers are experienced in solutions concerning

- integration into system concepts
- application in cleanrooms
- regular temperature distribution
- valves with integrated heating controller
- protection against accidental contact
- simple mounting

Please contact VAT to determine the best heating solution for your specific application.

Minimum contamination due to corrosion resistant surface treatment

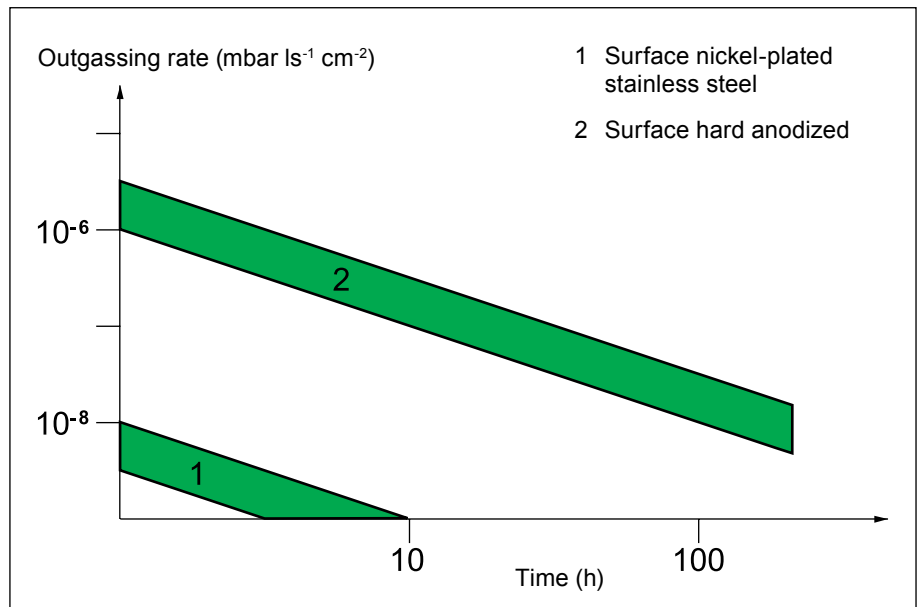
Low cost of ownership due to longer lifetime

The valves shown in this picture are for plasma etching systems



The surface coating is selected according to the application. The increased outgassing rate has to be considered when defining the pumps.

Minimum contamination can be obtained by surface treatment and/or using a valve heater.



Engineering with VAT

Our engineers are experienced in solutions concerning

- sealing technology with surface treated valves
- selection and treatment of corrosion resistant sealing materials
- reduction of maintenance costs by means of modular spare parts concept

Multi-valve modules are customer-specific bodies with various integrated valves. The modules are installed directly into the customer system.

The benefits are

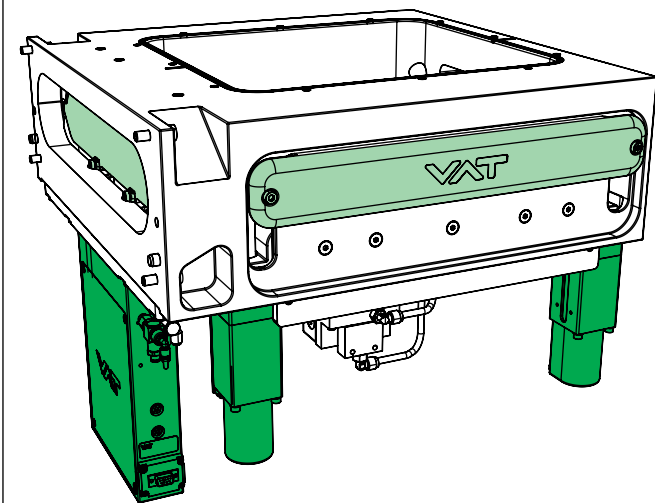
- improved system performance, e. g. higher throughput due to smaller chamber volume
- reduced system footprint
- simplified procurement (only one part with one ordering number)
- lower cost

VAT offers

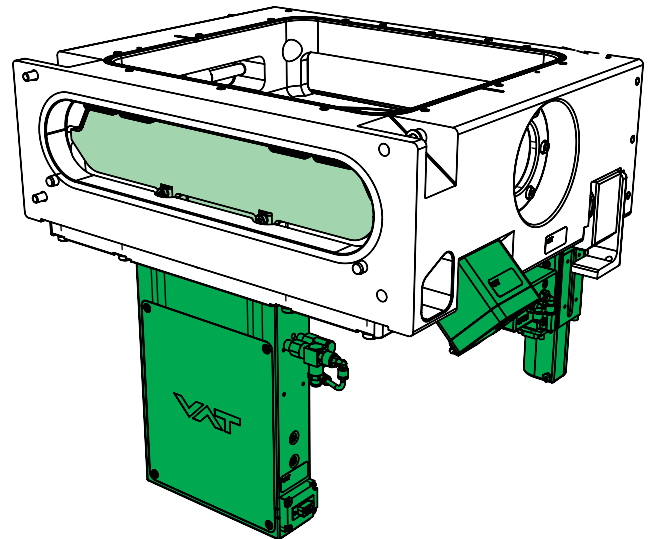
- development of the module according to the customer's specification
- manufacturing of the individual components
- assembling and testing of the module

Integration of transfer valves, doors, angle valves and gate valves

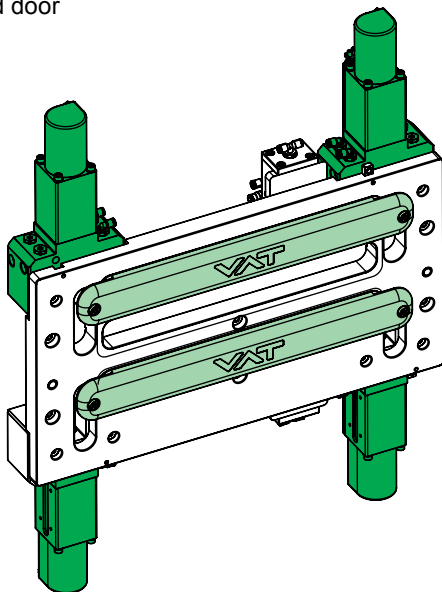
Loading module



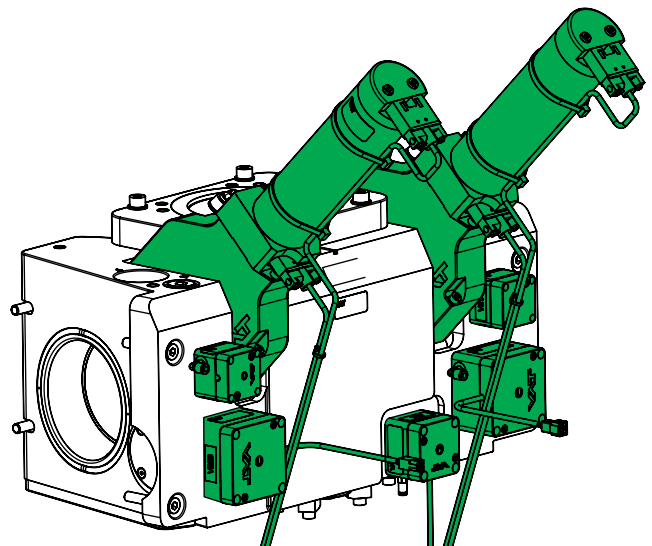
Integrated transfer valve



Integrated door



Pump block



Examples of customer-specific multi-valve modules



Loading module for analysis system

Integrated are

- gate valve, series 12.1
- door mechanism
- angle valves for evacuation and venting
- sensors
- docking device for transport and positioning module



Pump manifold

Integrated are

- butterfly control valve DN 100
- 2 angle valves DN 100
- 4 angle valves DN 25/40
- various ports
- pressure control valves
- bore holes for liquid heating



Loading module for semiconductor systems

Integrated are

- 2 atmospheric doors 30 × 336 mm
- 2 vacuum transfer valves 30 × 336 mm
- 2 softpump valves DN 40
- 2 venting diffusers
- various ports

Introduction

The glossary explains some technical terms and trade names used in this catalogue. These terms are explained in a way consistent with vacuum valve technology.

Adaptive controller

A controller adapting itself to changes in pressure, gas flow, and pumping speed without any manual adjustments. This allows for a completely automatic operation of the system.

All-metal valve

The static seals and the seat seal are made of metal.

Because these valves are free of lubricants and do not contain any elastomers or plastomers, their outgassing rate is very small and they can be baked at higher temperatures. They are therefore used for extreme UHV applications. With a special actuator they are radiation resistant to higher levels (10^8 Gy) than elastomer sealed valves.

Antimagnetic

Short form for «not ferromagnetic».

The relative magnetic permeability μ_r is measured with a permeameter.

Most VAT valves can optionally be supplied in an antimagnetic version. We distinguish between two classes of antimagnetic valves:

Class 1: parts $\mu_r < 1.05$
welds $\mu_r < 1.08$

Class 2: parts $\mu_r < 1.3$
welds $\mu_r < 1.3$

Special materials are used to reach these low values. For stainless steel the manufacturing process is carefully supervised. Small parts with little mass may have μ_r values above 2.

ASA/ASA-LP flange

ASA flanges were originally developed for high pressure applications. Later on, they have been used in vacuum technology. ASA flanges have a larger distance between the mounting holes and the nominal diameter (DN) than other vacuum flanges.

ASA-LP (ASA Large Port) flanges are ASA flanges with an increased nominal diameter. The outer diameter (O.D.) and the mounting holes are identical to those of the ASA flange. ASA-LP flanges are available for the nominal diameters 2½" to 12".

Example: ASA 6" has a nominal diameter of 6"
ASA-LP 6" has a nominal diameter of 8"

Bellows

Bellows are used to seal the actuating shaft. Only formed and welded metal bellows are used in VAT valves. This sealing technology offers the following advantages:

- Small leak rate during actuation
- Free of lubricants
- Bakeable

Closing direction

The closing direction is defined as the direction in which the gate approaches the seat during closing.

Closing/opening time

Time between the switching of solenoid voltage and the arriving of the gate in the fully closed, vacuum tight resp. open position.

The data in the catalog shows typical values. They are dependent on the compressed air pressure, the mounting position of the valve, the cross sections and lengths of the compressed air lines as well as on the measuring method and measuring system.

For fast closing systems the expression «total closing time» is used. This is the time between the triggering of the sensor (without sensor response time) and the arrival of the plate in the fully closed position.

Compressed air pressure

The specified compressed air pressures are always overpressures in bar.

Compression set

Lasting deformation of an elastomer seal after relief. The compression set is depending on the kind of material and has to be considered when defining dynamic seals.

$$CS = 100 \cdot (h_0 - h_2) / (h_0 - h_1)$$

CS ... Compression set (%)

h_0 ... Original height of seal

h_1 ... Height of seal in compressed condition

h_2 ... Height of seal in relieved condition

Conductance

The gas flow through a component (valve, tube, diaphragm) depends on the differential pressure to the component. The proportional factor is the conductance.

$$q = L \cdot \Delta p \text{ (mbar ls}^{-1}\text{)}$$

$$q \dots \text{ Gas flow (mbar ls}^{-1}\text{)}$$

$$L \dots \text{ Conductance (ls}^{-1}\text{)}$$

$$\Delta p \dots \text{ Pressure difference (mbar)}$$

There is molecular flow in high vacuum. In this case, the conductance is only dependent on the size of the component.

The inner diameter of an open VAT valve is at each position equal to or larger than the corresponding tube diameter. The conductance of a VAT valve is hence roughly equal to a tube of the same configuration, diameter, and length.

The molecular flow conductance specified in the catalogue is calculated with the long tube formula. This is valid for valves mounted in a tube of the same diameter.

Formula for gate valves:

$$L_v = 12.2 \cdot D^3 / l$$

Formula for angle valves:

$$L_v = 12.2 \cdot D^3 / (2 \cdot e + 0.7 \cdot D)$$

Approximate formula for rectangular valves:

$$L_v = 40 \cdot a^2 \cdot b^2 / ((a + b) \cdot l)$$

$$a = \text{Length of the slit (cm)}$$

$$b = \text{Width of the slit (cm)}$$

$$D = \text{Inner diameter of the valve (cm)}$$

$$e = \text{Corner – flange distance (cm)} \\ \text{(dimension A in dimensional drawing)} \\ \text{(0.7 D is the correction factor for 90° bend)}$$

$$l = \text{Flange-to-flange dimension of valve (cm)}$$

$$L_v = \text{Molecular flow conductance (ls}^{-1}\text{)}$$

Conductance calculation in the vacuum system

The conductance L of a tube is composed of the conductance of the opening (orifice) L_B and the conductances of the tube elements L_{Ri} .

$$1 / L = 1 / L_B + \sum_i 1 / L_{Ri}$$

$$L_B = 9.2 \cdot D^2$$

$$L_R = 12.2 \cdot D^3 / l \text{ (long tube formula)}$$

$$D = \text{Inner diameter (cm)}$$

$$l = \text{Length of a tube element (cm)}$$

$$L, L_B, L_R = \text{Conductance (ls}^{-1}\text{)}$$

The short tube formula contains the conductances of the orifice and of the tube. It is normally not applicable to valves.

Formula for the effective pumping speed of a pump:

$$1 / S_{\text{eff}} = 1 / S_o + \sum_i 1 / L_{Ri}$$

$$S_o = \text{Nominal pumping speed (ls}^{-1}\text{)}$$

$$L_{Ri} = \text{Conductances of tubes and valves (ls}^{-1}\text{)}$$

S_o accounts for the orifice. All conductances of tubes and valves have to be calculated with the long tube formula.

Cycle

An open–close–open movement of the valve.

Cycles until first service

Numbers of cycles (open–close–open) for which a valve can be safely operated under clean conditions without any maintenance. After the required maintenance the valve can again be operated for the specified numbers of cycles. Process induced contamination and increased temperatures can reduce the time between maintenance.

Desorption

The desorption of physically or chemically bound gases from the interior surfaces of a vacuum container is the last step of the processes «diffusion» and «permeation».

In valve manufacturing, a small desorption rate is achieved by:

- Selection of material
- Surface treatment
- Cleaning
- Vacuum bake of valves and delivery with blank-off flanges on special request

DeviceNet®

DeviceNet® is a digital network serving as a communication network between industrial controllers and I/O devices. It is based on the CAN standard (Controller Area Network). Originally developed by Allen Bradley, it is now supervised by the non-profit organization DeviceNet Vendors Association (ODVA).

Differential pressure

The differential pressure is the pressure difference at the closed valve gate.

- With the higher pressure on seat side, the differential pressure acts in the opening direction
- With the higher pressure on the reverse side, the differential pressure acts in the closing direction

(See also Valve seat side, Opening direction, Closing direction).

Diffusion

Diffusion is the transport of one material through another material. Hydrogen is dissolved in stainless steel. It diffuses to the interior surface and limits the vacuum when desorbing.

By vacuum annealing (H₂ firing) a zone depleted of hydrogen can be created in special cases during the valve manufacturing. This reduces the diffusion of hydrogen to the interior surface and hence the desorption into the vacuum is diminished.

DN

See «Nominal I. D.».

Elastomer

Elastomers are materials with properties similar to rubber. They are very well suited for gaskets [e. g. FKM (Viton®)].

FFKM

See «Perfluoro elastomer».

FKM

See «Fluoro elastomer».

FlapVAT

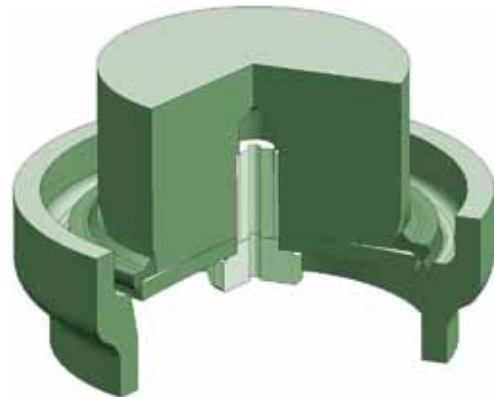
The FlapVAT transfer valve is offered for opening heights up to 100 mm as a low-cost supplement to the SolVAT transfer valve. The applied valve technology is referred to as a flapper. Compared to other flapper valves the FlapVAT transfer valve has a long seal lifetime and is mechanically locked in the closed position. Optionally, it is also available in the version «differential pressure resistant in either direction».

Function:

A shaft to which a mechanism is mounted is rotated by a pneumatic actuator. Depending on the rotation direction of the shaft, the mechanism with the valve gate is either moved to the open or to the closed valve position.

FLEX VATRING

This dynamic, all-metal sealing system is characterized by consistent sealing and closing forces. It enables to reach high sealing forces with comparably low axial forces. The sealing partners are in stainless steel and deformed elastically only. The FLEX VATRING system is suitable for extreme UHV. It may be baked to 300 °C in open and closed position and reaches a lifetime of > 1000 cycles if operated under clean conditions.



Fluoro elastomer

Fluoro (FKM or FPM) is an elastomer with high chemical resistance. Fluoro elastomers from different manufacturers have slightly different properties regarding chemical resistance, temperature resistance, mechanical properties and cleanliness.

FPD

Short term for Flat Panel Display. Designates flat screens that are, for instance, used in TV sets or computers.

Free of lubricants (dry)

The lubricant used in the vacuum is a fluoro based vacuum grease. Solid lubricants and metal films are normally not mentioned as lubricants.

Free of lubricants or dry means that friction problems in the vacuum are solved in a way not to emit any hydrocarbon or silicone vapours into the vacuum.

Gas purge

Additional gas flow directly into the valve. A low overpressure reduces the gas penetration into the valve interior to a large extent, and valve mechanism and seal are protected against contamination.

Gas purge is only useful in combination with protective rings. The protective ring minimizes the additional gas penetration and the influence on the process. The kind of gas and volume of gas flow depend on the process. Usually, the gas purge is about 5 % of the process gas flow.

Series 17 valves are available with a port for gas purging.

Gray (Gy)

Unit for the energy dose in the SI system (international measuring system). The energy dose is the radiation energy absorbed by the material per unit of mass.

1 Gy = 1 J/kg = 100 rad

Hot zone

Area with (locally) increased radiation level and increased temperature. The radiation level is higher than normally used materials can withstand during the expected time of use.

Valves are typically radiation resistant between 10^3 and 10^6 Gy depending on the sealing materials used. Actuators are typically suited for 10^1 to 10^5 Gy.

Only all-metal valves with a special actuator are suited for higher radiation levels.

Impulse actuation

Most pneumatically actuated VAT valves can optionally be equipped with an impulse solenoid. For actuation the valve needs only a short electric pulse of > 50 ms. Between actuations the solenoid is currentless (but can also stay under voltage). This ensures no change of valve position at power failure.

Intermediate pumping

To reduce the leak rate static seals, rotary and shaft feed-throughs can be double sealed in order to evacuate the space between the two seals. This intermediate space is typically pumped to a pressure of 0.1 to 10 mbar. The lower differential pressure reduces the permeation through the seal and the gas carrying during actuation.

Leak rate

Helium gas flow in mbar ls^{-1} leaking through a sealing arrangement or a body. During the measurement the difference of the helium partial pressure is in the order of 1000 mbar. The rise of the helium gas flow during the test time (typically 1 minute) is the leak rate. The test time depends on the permeation rate of helium through the gasket and the vacuum time constant of the system.

Lifetime

Numbers of cycles (open–close–open) for which a valve can be safely operated under clean conditions and normal temperatures without any maintenance.

L-MOTION

L-MOTION stands for a mechanically triggered real L-actuation of the gate in combination with a patented gate / shaft connection which enables a uniform seal compression.

Locking

A valve mechanism is mechanically locked if the sealing force remains intact at the failure of the closing force. This is normally accomplished by a joint going over center.

L-VAT

Especially designed for aggressive semiconductor applications. This L-movement transfer valve comes with vulcanized or O-ring gate seals and its L-motion is mechanically ensured. L-VAT features a very reliable single-shaft actuator, a bellows-sealed feedthrough and enables quick and simple maintenance.

MONOVAT

Sealing configuration for elastomer sealed gate valves and transfer valves developed and patented by VAT. It features shock-free and virtually particle-free actuation and a very long lifetime.



Nitrile

Short form for nitrile-butadiene rubber (NBR). It is an elastomer material for gaskets.

Nominal I. D. (DN)

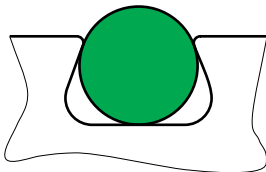
Size denomination of a flange. The nominal I.D. (DN) does not always correspond to the smallest diameter of a flange or tube.

Opening direction

The opening direction is defined as the direction in which the gate is retracted from the seat during opening.

O-ring seal

O-ring seals are made of materials with properties similar to rubber. They are put into grooves. Due to the compression the O-ring is pressed into the groove. Small voids remain between the seal groove and the O-ring.



Also see «Vulcanized seal».

Outgassing rate

The outgassing rate (in mbar ls⁻¹) is the sum of all gas loads caused by:

- Desorption
- Diffusion
- Permeation
- Outgassing of voids and crevices
- Disintegration of surface layers

A small outgassing rate is essential for efficient pump down and low base pressure. In valve manufacturing, a small outgassing rate is achieved by:

- Use of materials with as small desorption, diffusion, and permeation rates as possible
- Preventing crevices and unvented voids
- Vacuum compatible cleaning

Particle

Particles in valves are mainly generated by friction of the valve components. VAT develops and uses a variety of inspection devices to detect particles. The inspections take place in VAT's own laboratory. This makes it possible to get profound knowledge about the particle emission of our valves and to improve the quality of the valve components accordingly.

Depending on the field of application of the valves, particle emissions are either detected by means of optical measuring devices (particles > 300 nm) or by using a differential mobility analyzer (particles > 10 nm).



VAT particle test stand for particles > 10 nm

The following table gives you a survey about the magnitude of the particle emission of our valves. For detailed information please contact your VAT representative.

Series	Particle generation of VAT valves						
01.0							
01.2							
02.2							
02.4							
03.2							
04.3							
05.3							
08							
09							
10							
11							
12							
14.0							
14.1							
15							
16.2							
16.8							
17							
19							
20.0/2							
20.3/4							
24							
25							
26							
28							
29							
47							
48							
61.2							
61.5							
64.2							
65.0							
65.2							

Particles per valve cycle > 300 nm,
measured by an optical particle counter

PEEK

Short form for polyetheretherketone, a high temperature resistant thermoplast.

Perfluoro elastomer

Perfluoro (FFKM or FFPM) is fully fluorinated hydrogen-free FKM. Its chemical resistance is even higher than that of FKM.

Permeation (gas permeability)

Permeation is a multi-stage process. Gas adsorbed at the outer wall is dissolved in the material, diffuses through the material and desorbs from the inner wall. For stainless steel gas flows due to permeation can be neglected for the temperature used in vacuum technology. These gas flows have however to be taken into account for elastomer and plastomer gaskets.

For FKM (Viton®) the permeation rates «P» have approx. the following values after a long time at room temperature:

- He $P = 10 \cdot 10^{-8} \text{ cm}^2 \text{ s}^{-1}$
- O₂ $P = 1 \cdot 10^{-8} \text{ cm}^2 \text{ s}^{-1}$
- N₂ $P = 0.6 \cdot 10^{-8} \text{ cm}^2 \text{ s}^{-1}$

For a body with the area «A» (cm²) and the average diffusion length «l» (cm) the gas flow «Q» due to permeation at a pressure difference «Δp» (mbar) is around:

$$Q = P \cdot A / l \cdot \Delta p \text{ (mbar ls}^{-1}\text{)}$$

For air at atmospheric pressure the partial pressures «p» of the relevant gases are:

- He $p = 5.0 \cdot 10^{-3} \text{ mbar}$
- O₂ $p = 2.1 \cdot 10^2 \text{ mbar}$
- N₂ $p = 7.8 \cdot 10^2 \text{ mbar}$

For well degassed O-rings the permeation of nitrogen and oxygen of the air through the FKM (Viton®) is the major contributor to outgassing.

The helium gas flow due to permeation can simulate large leaks during leak testing after a test time depending on the gasket.

PFA

There are three types of Teflon®: PTFE, FEP and PFA. In this catalogue the word Teflon® is only used for Teflon PTFE.

High chemical resistance (similar to PTFE), but higher mechanical stability and hardness. PFA is used for chemically very resistant gaskets.

Plastomer

Name for materials which are used for predominantly plastically deformable gaskets (e.g. PFA, Tenic®).

Pneumatic actuator

VAT valves are available with various types of compressed air cylinders and various solenoid valves.

Even for non mechanically locked valves the valve position can be maintained for a certain period of time at compressed air failure by installing a check valve at the compressed air inlet.

POM

Short form for Polyoxymethylene, a thermoplastic material.

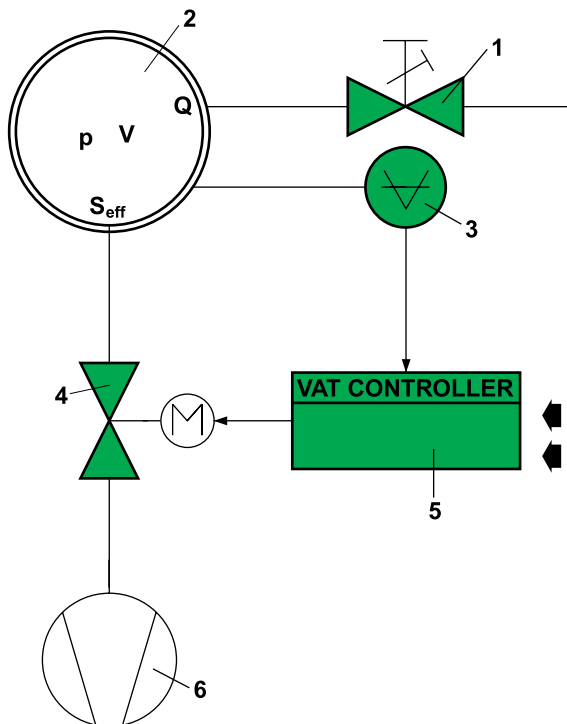
Pressure

Vacuum pressures are always absolute pressures unless explicitly specified as pressure differences.

Compressed air pressures are always pressure differences to the atmospheric pressure, i.e. overpressures.

Pressure closed-loop control

Elements:



- | | |
|-------------------|-----------------------|
| 1 Gas flow meter | 4 Control valve |
| 2 Process chamber | 5 Pressure controller |
| 3 Pressure sensor | 6 Vacuum pump |

In stationary condition the following formula is applicable:

S_{eff}	...	Q / p
S_{eff}	...	Effective pumping speed (ls^{-1})
Q	...	Gas flow (mbar ls^{-1})
p	...	Pressure (mbar)

or units used in USA

S_{eff}	=	$12.7 \cdot Q / p$
S_{eff}	...	Effective pumping speed (ls^{-1})
Q	...	Gas flow (sccm)
p	...	Pressure (mTorr)

Principle of operation:

The controller compares the actual pressure in the process chamber given by the pressure sensor with the preset pressure. The controller uses the difference between actual and set pressure to calculate the correct position of the control valve. The controller drives the control valve into the correct position and the actual pressure again equals the set pressure.

This control operation is performed continuously. Pressure changes in the process chamber due to leaks, desorption, gas flow, reaction products, variations in pumping speed etc. are always corrected at once.

Pressure control

In a vacuum system which is pumped and into which gas is admitted at the same time, the pressure can be controlled in two ways:

1. Downstream control

The pressure is controlled by changing the conductance of a control valve between pump and process chamber. This changes the effective pumping speed at the process chamber. Pressure and gas flow can be independently controlled over a wide range.

2. Upstream control

The pressure is controlled by changing the gas flow into the process chamber, while the pumping speed remains constant.

Protective ring

In an open gate valve the protective ring bridges the opening between the flanges. To the gas flow the open valve looks like a tube i.e. has no changes in inner diameter.

The protective ring improves the gas flow, reduces the contamination of the valve interior and protects the gate seal from heat radiation (e.g. if the gate valve is used as a lock for hot items). An additional gas purge helps to protect the valve interior completely.

PV

Short term for photovoltaics. Designates the technology for transforming sunlight into electrical energy.

Quality assurance

The high quality level of VAT valves is planned according to the TQM (Total Quality Management) system and constantly monitored during manufacturing and assembly. Monitoring is performed with SPC (Statistical Process Control) in combination with modern measuring machines such as 3D coordinate measuring instruments and automated valve testing machines with automatic data recording.

The following tests are performed on each VAT valve:

Parts/subassemblies:

- Visual examination
- Verification of dimensions
- Functional test
- Helium leak test

Complete valve:

- Visual examination
- Functional test
- Helium leak test

Additional tests can be performed and certificates of conformity, acceptance test certificates, inspection certificates and material certificates can be supplied on customer request.

Radiation resistance

Use of special materials increases the service life under ionizing radiation over that of normal valves. The radiation resistance in Gray is the dose up to which the valve functions safely (1 Gray = 100 Rad).

RF contact

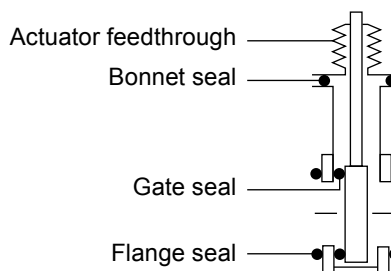
This guarantees a small RF resistance through the open valve. In the open valve position a metal ring, having the geometric shape of the beam tube, is spread between the two connecting flanges and ensures a direct electrically conducting connection between the two flanges.

Rotary feedthrough

A rotary feedthrough is an element to transmit a rotation or pivoting motion into the valve interior. VAT's rotary feedthroughs are elastomer sealed and lubricated with a fluoro based vacuum grease. The gas carry-over into the valve interior is much smaller than for a shaft feedthrough of the same diameter.

The operating costs are substantially lower than for a bellows feedthrough due to the long cycle life and the low costs for spare parts (no bellows).

Seals of valves



Some valves also have a seal between the bonnet flange and the actuator assembly. This seal is made of the same material as the bonnet seal.

Shaft feedthrough

A shaft feedthrough consists of an O-ring and a stem and transmits a linear motion into the valve interior. The elastomer gasket is lubricated with a fluoro based high vacuum grease.

During closing a short-term pressure rise may occur.

Shutter

A shutter reduces the full conductance in a very short time to a small leak (not vacuum tight). This prevents the shock wave of an air inrush from spreading. Shutters are compatible with all-metal systems.

Silicone

In connection with gaskets a short form for silicone rubber.

SolVAT

A valve primarily developed for the solar module production featuring a special, VAT-invented locking system. Leaktight closing is performed by a plate provided with an O-ring seal. The SolVAT valve is based on a modular design. Scaling for the required substrate size is hence easy. The valve is very robust against aggressive media and high temperatures and may be supplied in a variety of materials and material combinations.

Stepper motor

The stepper motor is well suited for exact positioning. It is hence often used as actuator for control valves.

Tenic®

Teflon® (PTFE) filled with nickel powder. Sealing material for the chemical industry.

Vacuum brazing

Joining technique for void-free joints.

In addition vacuum brazing is an ideal way of cleaning and degassing the brazed parts.

Vacuum grease

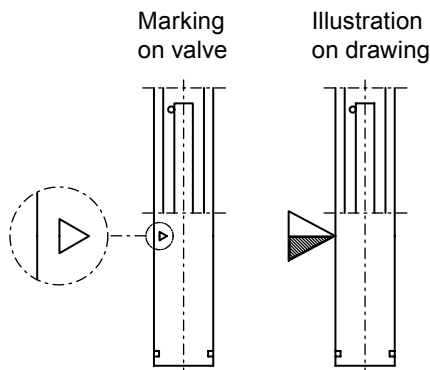
For valves with lubricants VAT uses a fluoro based vacuum grease with very low vapour pressure ($< 5 \cdot 10^{-13}$ mbar at 20 °C).

Vacuum levels

See page 285.

Valve seat side (A side)

Side of the gate seal indicated with the sign ∇ in the dimensional drawings. Each VAT valve has a triangle ∇ stamped into the flange on the seat side. The tip of the triangle points towards the seat. This information is important in connection with differential pressure (see Differential pressure).



VATLOCK

Gate valve mechanism (e.g. used in series 10, 11, 12, 14) developed by VAT.

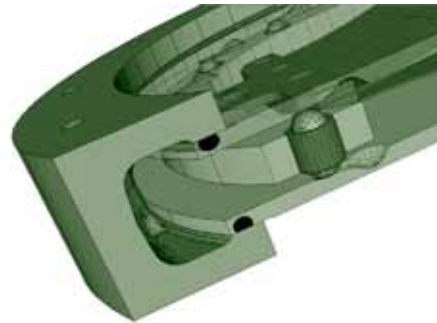
Gate valves with VATLOCK system are mechanically locked in the closed position.

In the open position the mechanism is not locked. Leaf springs hold gate and counter plate against the carriage with the ball retainers. The ball pairs are in the detents.

For closing, the mechanism is moved forward into the closing position.

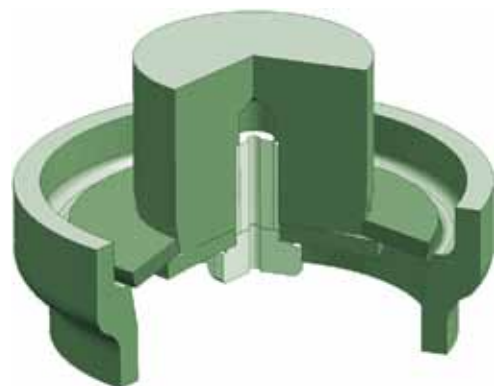
The locking starts after the leaf spring stop touches the body. The ball retainers move the ball pairs out of the detents. Gate and counter plate are spread apart. The gate seal is pressed against the sealing surface without scuffing. The arrangement of ball pairs ensures an increase of the sealing force with vacuum on either side of the gate.

During opening the movements proceed in the reverse order.



VATRING

This dynamic, all-metal sealing system is characterized by consistent sealing and closing forces. It enables to reach high sealing forces with comparably low closing resp. axial forces. The sealing partners are in stainless steel and deformed elastically only. The VATRING system is suitable for extreme UHV. It may be baked to 450 °C in open and 350 °C in closed position and reaches a lifetime of > 100 000 cycles if operated under clean conditions.



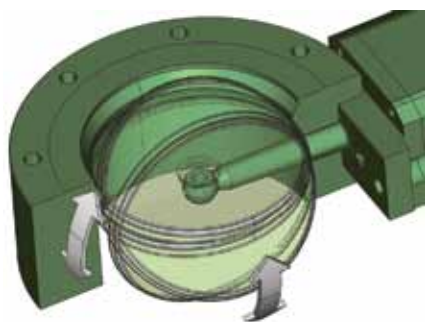
VATSEAL

This metal flange seal developed and patented by VAT requires only parallel flanges with carefully prepared flat sealing surfaces.

VATTERFLY

VATTERFLY valves can – at first look – be easily mistaken for butterfly valves. They are pivoting plate valves that in many cases are a compact economical alternative to a gate valve. In VATTERFLY valves the gate first swings to the closing position without any friction of the gate seal. For vacuum tight closing and locking the plate pivots. The sealing procedure is similar to that of a gate valve.

VATTERFLY valves of the Series 20.0/20.2 feature a bellows feedthrough, those of the Series 20.3/20.4 a rotary feedthrough.



Viton®

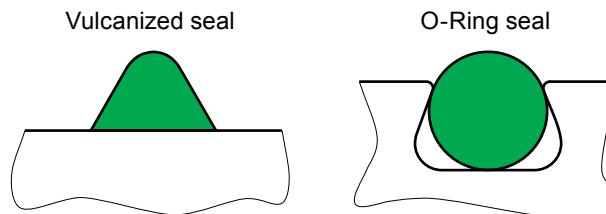
Trade name for a fluoroelastomer (FKM). Viton® has a small desorption rate.

The maximum temperature for valves in open position is 220 °C (250 °C for a short while), for valves in closed position 150 °C due to the strong sticking properties and compression set.

Viton® decomposes at temperatures exceeding 220 °C and the lifetime of the seal is reduced.

Vulcanized seal

Is used as a dynamic seal for UHV valves and MONOVAT systems (e. g. series 01, 02, 03, 04, 05, 10.8, 15, 20).



The vulcanized seal has the following advantages compared to an O-ring seal:

- Increased reliability of operation:
Seal cannot be pulled out of the groove due to sticking or differential pressure
- Easy maintenance:
No seal groove, seal remains on gate, flat surfaces in the sealing area ensure easy cleaning
- Improved vacuum properties:
Only one sealing line, no voids that cause outgassing, no hidden impurities

Vulcanized seals can be made of fluoroelastomer, perfluoroelastomers, silicones or EPDM. Outgassing rate, permeation and bakeability are equal to selected high quality O-rings.

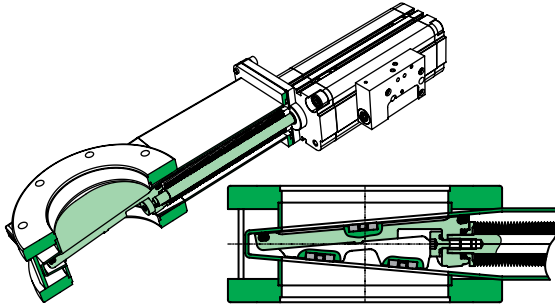
Waveguide

In the open position a tube is placed between the flanges. Only a small gap remains between the ends of the tube and the flanges. The RF resistance of the open valve is hence greatly reduced.

Wedge sealing system

Sealing system developed by VAT for the Series 09 gate valves.

This extremely robust system is provided with a wedge-shaped gate which is pressed on an appropriate seat in the body. O-ring compression is limited by PEEK sliding elements. This enables a combination of a good leak rate with a corresponding cycle life, even if exposed to multiple differential pressure openings of up to 1 bar. Furthermore, the sliding elements prevent dynamic metal-to-metal contact and consequently reduce particle generation. This may be crucial for sensitive applications.



Weld neck (weld stub)

A valve can be equipped with a weld neck instead of a flange. Such a valve can be welded directly into a tubing or a specific flange can be attached by the customer. Care has to be taken not to warp or contaminate the valve.

XL-VAT

L-movement transfer valve with an O-ring gate seal, primarily developed for the flat screen production. The XL-VAT valve is based on a modular design. Scaling for the required substrate size is hence easy. The required locking pressure may be controlled via the control unit. Overstraining of the gate O-ring may therefore be prevented. Furthermore, the XL-VAT valve is designed for very easy maintenance.

Different applications require different technical designs of the valves. VAT valves can roughly be divided into 4 vacuum levels. This table shows the major features.

Vacuum level	Pressure range (mbar)	Maximum temperature (°C)	Seals		Feedthrough
			Gate	Bonnet	
Vacuum	to $1 \cdot 10^{-7}$	150	FKM (Viton®)	FKM (Viton®)	Shaft feedthrough, sealed with O-ring made of FKM (Viton®)
HV (high vacuum)	to $1 \cdot 10^{-8}$	150	FKM (Viton®)	FKM (Viton®)	Rotary feedthrough, sealed with O-ring made of FKM (Viton®) or bellows
UHV (ultra high vacuum)	to $1 \cdot 10^{-10}$	200/250	FKM (Viton®)	metal	Bellows
XHV (extreme UHV)	better than 10^{-10}	300/450	metal	metal	Bellows

The following tables present the official denomination and the composition of materials used in VAT valves.

Stainless steel						
Material No.		Abbreviated designation	Composition (%)			
AISI	EN	DIN	C	Cr	Ni	Mo
301	1.4310	X 10 CrNi 18 8	0.05–0.15	16.0–19.0	6.0– 9.5	≤0.8
303	1.4305	X 8 CrNiS 18 9	≤0.10	17.0–19.0	8.0–10.0	–
304	1.4301	X 5 CrNi 18 10	≤0.07	17.5–19.5	8.0–10.5	–
304L	1.4306	X 2 CrNi 19 11	≤0.03	18.0–20.0	10.0–12.0	–
305	1.4303	X 4 CrNi 18 12	≤0.06	17.0–19.0	11.0–13.0	–
–	1.4308	G X 6 CrNi 19 10	≤0.07	18.0–20.0	8.0–12.0	–
316	1.4401	X 5 CrNiMo 17 12 2	≤0.07	16.5–18.5	10.0–13.0	2.0–2.5
316L	1.4404	X 2 CrNiMo 17 12 2	≤0.03	16.5–18.5	10.0–13.0	2.0–2.5
316L	1.4435	X 2 CrNiMo 18 14 3	≤0.03	17.0–19.0	12.5–15.0	2.5–3.0
316LN	1.4429	X 2 CrNiMo 17 13 3	≤0.03	16.5–18.5	11.0–14.0	2.5–3.0
316Ti	1.4571	X 6 CrNiMoTi 17 12 2	≤0.08	16.5–18.5	10.5–13.5	2.0–2.5
420	1.4034	X 46 Cr 13	0.43–0.50	12.5–14.5	–	–
420C	1.3541	X 47 Cr 14	0.43–0.50	12.5–14.5	–	–
420D	1.4037	X 65 Cr 14	0.60–0.70	12.5–14.5	–	≤0.75
430	1.4016	X 6 Cr 17	≤0.08	16.0–18.0	–	–
440	1.4122	X 39 CrMo 17 1	0.33–0.45	15.5–17.5	≤1.0	0.8–1.3
440C	1.4125	X 105 CrMo 17	0.95–1.20	16.0–18.0	–	0.4–0.8
631	1.4568	X 7 CrNiAl 17 7	≤0.09	16.0–18.0	–	6.5–7.8
660	1.4943	X 4 NiCrTi 25 15	≤0.08	13.0–16.0	24.0–27.0	1.0–1.5

Aluminum alloys						
Material No.		Abbreviated designation	Composition (%)			
EN	DIN	EN	Mg	Si	Mn	
EN AC-42000	–	EN AC-AISi7Mg	0.20–0.65	6.5– 7.5	≤0.35	≤0.05
EN AC-42100	3.2371	EN AC-AISi7Mg0.3	0.20–0.40	6.5– 7.5	≤0.05	≤0.05
EN AC-46200	3.2162	EN AC-AISi8Cu3	0.05–0.55	7.5– 9.5	0.15–0.65	2.0–3.5
EN AC-47100	3.2982	EN AC-AISi12Cu1 (Fe)	≤0.35	10.5–13.5	0.55	0.7–1.2
EN AW-5083	3.3547	EN AW-AlMg4.5Mn0.7	4.00–4.90	≤0.4	0.40–1.00	≤0.10
EN AW-5049	3.3527	EN AW-AlMg2Mn0.8	1.60–0.50	≤0.4	0.50–1.10	≤0.10
EN AW-5754	3.3535	EN AW-AlMg3	2.60–3.60	≤0.4	≤0.50	≤0.10
EN AW-6014	–	EN AW-AlMg0.6Si0.6V	0.40–0.80	0.3– 0.6	0.05–0.20	≤0.25
EN AW-6060	3.3206	EN AW-AlMgSi	0.45–0.60	0.5– 0.6	≤0.10	≤0.10
EN AW-6061	3.3211	EN AW-AlMg1SiCu	0.80–1.20	0.4– 0.8	≤0.15	0.15–0.40
EN AW-6063	3.3206	EN AW-AlMg0.7Si	0.45–0.90	0.2– 0.6	≤0.10	≤0.10
EN AW-6081	3.2215	EN AW-AISi0.9MgMn	0.60–1.00	0.7– 1.1	0.10–0.45	≤0.10
EN AW-6082	3.2315	EN AW-AISi1MgMn	0.60–1.20	0.7– 1.3	0.40–1.00	≤0.10

Other materials	
Material	Composition
AISI 633 (AM 350)	Iron with 16–17% Cr, 4–5% Ni, 2.5–3.3% Mo, 0.5–1.4% Mn, 0.08–0.17% C
Nimonic 90	Nickel with 15–21% Co, 18–21% Cr, 2–3% Ti, 1–2% Al
Titan 3.7035	>99.2% Ti (grade 2)

Pressure

		Pa (N m ⁻²)	bar	mbar	μbar (dyn cm ⁻²)	Torr (mm Hg)	micron (μ, mTorr)	atm	psi (lbf inch ⁻²)	psf (lbf ft ⁻²)
1 Pa (N m ⁻²)	=	1	1 · 10 ⁻⁵	1 · 10 ⁻²	10	7.5 · 10 ⁻³	7.5	9.87 · 10 ⁻⁶	1.45 · 10 ⁻⁴	2.09 · 10 ⁻²
1 bar	=	1 · 10 ⁵	1	1000	1 · 10 ⁶	750	7.5 · 10 ⁵	0.987	14.5	2.09 · 10 ³
1 mbar	=	100	1 · 10 ⁻³	1	1000	0.75	750	9.87 · 10 ⁻⁴	1.45 · 10 ⁻²	2.09
1 μbar (dyn cm ⁻²)	=	0.1	1 · 10 ⁻⁶	1 · 10 ⁻³	1	7.5 · 10 ⁻⁴	0.75	9.87 · 10 ⁻⁷	1.45 · 10 ⁻⁵	2.09 · 10 ⁻³
1 Torr (mm Hg)	=	133.3	1.333 · 10 ⁻³	1.333	1333	1	1000	1.32 · 10 ⁻³	1.93 · 10 ⁻²	2.78
1 micron (μ, mTorr)	=	0.1333	1.333 · 10 ⁻⁶	1.333 · 10 ⁻³	1.333	1 · 10 ⁻³	1	1.32 · 10 ⁻⁶	1.93 · 10 ⁻⁵	2.78 · 10 ⁻³
1 atm	=	1.01 · 10 ⁵	1.013	1013	1.01 · 10 ⁶	760	7.6 · 10 ⁵	1	14.7	2.12 · 10 ³
1 psi (lbf inch ⁻²)	=	6.89 · 10 ³	6.89 · 10 ⁻²	68.9	6.89 · 10 ⁴	51.71	5.17 · 10 ⁴	6.8 · 10 ⁻²	1	144
1 psf (lbf ft ⁻²)	=	47.8	4.78 · 10 ⁻⁴	0.478	478	0.359	359	4.72 · 10 ⁻⁴	6.94 · 10 ⁻³	1

Gas flow and leak rate

		Pa m ³ s ⁻¹	mbar ls ⁻¹	Torr ls ⁻¹	atm cm ³ s ⁻¹	lusec	sccm	slm	Mol s ⁻¹
1 Pa m ³ s ⁻¹	=	1	10	7.5	9.87	7.5 · 10 ³	592	0.592	4.41 · 10 ⁻⁴
1 mbar ls ⁻¹	=	0.1	1	0.75	0.987	750	59.2	5.92 · 10 ⁻²	4.41 · 10 ⁻⁵
1 Torr ls ⁻¹	=	0.1333	1.333	1	1.32	1000	78.9	7.89 · 10 ⁻²	5.85 · 10 ⁻⁵
1 atm cm ³ s ⁻¹	=	0.101	1.01	0.76	1	760	60	6 · 10 ⁻²	4.45 · 10 ⁻⁵
1 lusec	=	1.333 · 10 ⁻⁴	1.333 · 10 ⁻³	10 ⁻³	1.32 · 10 ⁻³	1	7.89 · 10 ⁻²	7.89 · 10 ⁻⁵	5.86 · 10 ⁻⁸
1 sccm	=	1.69 · 10 ⁻³	1.69 · 10 ⁻²	1.27 · 10 ⁻²	1.67 · 10 ⁻²	12.7	1	10 ⁻³	7.45 · 10 ⁻⁷
1 slm	=	1.69	16.9	12.7	16.7	1.27 · 10 ⁴	1000	1	7.45 · 10 ⁻⁴
1 Mol s ⁻¹	=	2.27 · 10 ³	2.27 · 10 ⁴	1.7 · 10 ⁴	2.24 · 10 ⁴	1.7 · 10 ⁷	1.34 · 10 ⁶	1.34 · 10 ³	1

Temperature

	K	°C	°F
1 K =	1	K-273.15	5/9 × K-459.67)
1 °C =	°C+273.15	1	5/9 × °C+32)
1 °F =	5/9 × (°F+459.67)	5/9 × (°F-32)	1

°C	-50	0	50	100	150	200	250
°F	-58	32	122	212	302	392	482

Torque

	Nm	ft lbs	kp m	kgf cm
1 Nm	=	1	0.738	0.102
1 ft lbs	=	1.36	1	0.138
1 kp m	=	9.81	7.23	1
1 kgf cm	=	0.098	0.072	0.01

Surface finish

Surface finish	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
Max. Ra, CLA, AA [μm]	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
Max. Ra, CLA, AA [μ inch]	1	2	4	8	16	32	63	125	250	500	1000	2000

Example: Surface finish class N3 → Ra less than 0.1 μm

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