






VACUUM VALVES



2018

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MORE THAN 50 YEARS OF INNOVATION

We have come a long way. Founded in 1965 as a small family company, VAT is today the world market leader in high-end vacuum valves.

CLOSE PARTNERSHIP ENSURES SUCCESS

Based in the Rhine valley in Switzerland, we focus on the vacuum technology as our key competence. From the beginning, our approach was to work very closely with our customers. We have a deep knowledge of their industries, needs, and expectations and develop new products accordingly. This and our passion for technology innovation put us in the leading position we are in today.

VAT has 1,600 highly-skilled employees worldwide. About 20 percent are directly involved in the innovation process. The company's success story is based on their valuable contribution and dedication. Since 2016, VAT is listed on the SIX Swiss Exchange in Zurich.

WIDE PRODUCT PORTFOLIO FOR ALL VACUUM LEVELS

VAT products enable innovation and facilitate digitalization. Our products are at the heart of today's most sophisticated manufacturing processes – a mission-critical component that is positioned close to the beginning of the manufacturing value chain of many digital devices, high-tech industrial as well as experimental applications. Our strength is the wide range of our product portfolio which comprises approximately 140 valves series with more than 8,000 customized and 2,500 standard products. We have solutions for all vacuum levels from sub-atmospheric to extremely high vacuum (XHV).

GLOBAL FOOTPRINT SUPPORTS CUSTOMERS IN ALL MARKETS

To bring us close to our customers, we opened a new engineering facility in the Silicon Valley, USA, in 2016. Also, VAT operates sales and service centers in Switzerland, Germany, UK, France, in the US, China, South Korea, Japan, Taiwan, and Singapore. This does not only bring us nearer to our customer but also enables us to profit from local expertise to adapt to regional needs.

Local training courses for operation and maintenance together with the delivery of spare parts ensure short reaction times and keep our customers "going". VAT has manufacturing facilities in Switzerland, Romania, and Malaysia. Our state-of-the-art R&D lab is located in our headquarters in Haag, Switzerland. It is here that we collaborate to find the best solutions for our customers.



GLOBAL SERVICE

The VAT Global Service team is highly experienced and utilizes well-established, proven processes. Your goals are our #1 priority. VAT Global Service assures continuous performance improvement, minimized downtimes and ensures your vacuum equipment is running at its best performance and optimal efficiencies.

CONSUMABLES SPARES GATES

All consumables, spares and gates perform to VAT's valve engineering excellence for optimal operation. Spares and gates are genuine VAT parts. Ask the VAT Global Service experts about VAT genuine parts and optimize valve performance and cost of ownership.



GENUINE VAT PARTS

- Maximized lifetime
- Authentic fit
- Easy-to-use maintenance kits
- Improved valve performance
- Local stock
- Budgetary pricing
- Full VAT warranty



HIGH-QUALITY GENUINE VAT GATES

- Proven reliability
- Authentic fit
- Availability for older tools
- Up-to-date engineering
- State-of-the-art elastomers
- Application-specific gates on request
- Improved functionality

UPGRADES RETROFITS



Upgrades and retrofits offer solutions on existing tools preparing them for the latest technologies or new requirements.

- Increased tool uptime
- Higher throughput
- Improved particle performance
- Improved lifetime of gate
- Shorter process times with up-to-date valve technology
- Higher yield
- Lower cost of ownership

REFURBISHMENT
MAINTENANCE
SERVICE AGREEMENTS
TRAININGS



- Professional evaluation and analysis
- Repairs in the VAT service center or on-site
- Warranty on parts and labor
- Service agreements ranging from repair & maintenance to individuals
- Training for operation, service and maintenance

GLOBAL SUPPORT

VAT Service Centers provide local services to our customers and offer experienced, professional staff, state-of-the-art tools and fast response times. Service centers across the globe provide additional service capacity where needed to keep your systems up and running.



San Jose, CA, USA

Haag, Switzerland

Shanghai, China
Himeji, Japan
Pyongtaek-City, Korea
Penang, Malaysia
Singapore
Hsin-Chu City, Taiwan

GATE VALVES, PENDULUM VALVES

Series	Vacuum level	Main applications	Page
01.0	UHV	General purpose valve for isolation in UHV or other demanding applications.	22
01.2	Vacuum	General purpose valve for isolation in vacuum applications.	30
08.1/08.2	Vacuum	General purpose valve for isolation in vacuum applications where space or design constraints prevent the use of standard vacuum flanges.	34
09.1	HV	For demanding pump isolation applications. Especially suited to applications with high levels of process byproduct in the gas stream.	38
10.8	UHV	The standard valve for UHV isolation applications in research and industry.	44
11.0	HV	General purpose valve for isolation in high vacuum systems. Especially suited to pump isolation.	52
12.1	Vacuum	The standard valve for vacuum isolation applications in research and industry.	60
14.0	HV	General purpose valve for isolation in high or rough vacuum applications. Especially suited to industrial processes.	66
15.0/15.1/ 15.2	Vacuum, HV, UHV	Isolation valve for extremely particle and shock sensitive vacuum systems.	74
16.2	HV	For applications requiring a compact design. Especially suited to demanding corrosive processes.	82
16.8	HV	For applications requiring a compact design in large DN sizes. Especially suited to large coating and FPD production systems.	88
17.2	HV	Isolation valve for contaminating processes.	92
19.0/19.1/ 19.2	Vacuum, HV, UHV	Isolation valve for research and industrial applications requiring large DN sizes. Especially suited to space simulation systems.	100
20.3/20.4	HV	Compact isolation valve for contaminating and aggressive processes.	106
21.0	HV	Compact isolation valve for vacuum. Alternative to gate valves.	110
48.1/48.2	XHV	Isolation valve for vacuum applications in extreme UHV, high temperature or aggressive media.	114
92.0	HV, UHV	Chamber or pump isolation valve for surface and semiconductor applications.	122

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.	126
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.	132
62.0	HV	Downstream pressure control and isolation valve for processes with high temperatures and high pressures like LPCVD, ALD etc.	138
64.2	HV	Control and isolation valve for SEMI, FPD and industrial processes. Optimal for sputtering and etching processes.	142
64.8	UHV	Control and isolation valve for SEMI, FPD and industrial processes. Optimal for sputtering and etching processes.	150
65.0/65.1/ 65.2/65.5	HV	Downstream pressure control and isolation valve for SEMI and FPD processes. Optimal for corrosive etching and cleaning processes.	156
67.0	HV	Downstream pressure control and isolation valve for SEMI and FPD processes. Ideal for demanding etching processes.	176

TRANSFER VALVES & DOORS FOR SEMICONDUCTORS

Series	Vacuum level	Main applications	Page
02.1/03.1	HV, UHV	For load lock and process chamber isolation in semiconductor production systems for 200 and 300 mm wafers.	192
02.2/03.2	HV	For load lock and process chamber isolation in semiconductor production systems for 200, 300 and 450 mm wafers.	198
04.1/05.1	HV	For load lock and process chamber isolation in semiconductor production systems. Especially suited for corrosive processes such as etch or CVD.	204
04.2/05.2	HV	For load lock and process chamber isolation in semiconductor production systems. Especially suited for corrosive processes such as etch or CVD.	210
04.3/05.3	HV	For load lock and process chamber isolation in semiconductor production systems. Especially suited for corrosive processes such as etch or CVD.	216
07.5	HV	For load lock and process chamber isolation on the atmospheric side of semiconductor production systems.	222
94.0/94.5	HV	For transfer and process chamber isolation in semiconductor production systems for 200 and 300 mm wafers.	226

TRANSFER VALVES & DOORS FOR DISPLAY & SOLAR

Series	Vacuum level	Main applications	Page
02.4	Vacuum	For FPD production systems up to generation 6. Suitable for use in high vacuum environment, e. g. in vapor deposition systems for organic materials.	230
02.7	Vacuum	For web / foil coating systems.	232
06.0 / 06.2	Vacuum	For FPD production systems.	234
06.1	Vacuum	For FPD production systems.	236
06.6	Vacuum	For PV and large coating systems.	238
06.8	Vacuum	For PV and large coating systems.	240
07.5 / 07.8		For FPD and PV production systems.	242

ANGLE VALVES, DIAPHRAGM VALVES

Series	Vacuum level	Main applications	Page
21.1	Vacuum	For introducing a controlled, reproducible flow of gas into a vacuum chamber.	250
21.2	HV	System and operator protection for system overpressure.	252
21.3	HV	For controlled venting or closing of vacuum systems.	254
22.0	Vacuum	For roughing / backing line isolation and rough metering of gases and liquids.	258
23.0	HV	For infrequently pumped vacuum vessels or gas isolation.	260
24.4 / 24.5	Vacuum	For pumping and venting of vacuum systems with large gas flows.	262
26.4 / 26.5	HV	For pumping and venting of HV systems.	272
28.4	UHV	For pumping and venting of UHV systems when an extremely low outgassing rate is important.	282
29.0 / 29.2	Vacuum, HV	For pumping and venting of HV systems when few turbulences, particles, substrate movements and condensation are important.	286
25.0 / 25.1 / 25.2	HV	For pumping and venting of HV systems when maximum conductance is important.	292
54.1	XHV	For vacuum processes with extreme UHV requirements.	296
57.0 / 57.1	XHV	For vacuum processes with extreme UHV requirements and/or low/high temperature applications.	300
59.0	XHV	Gas inlet valve for smallest gas flows to control the process pressure.	308

SPECIAL VALVES FOR ACCELERATORS & SYNCHROTRONS

Series	Vacuum level	Main applications	Page
47.1 / 47.2	XHV	Sector valve for storage rings in accelerators and synchrotrons. Isolation valve in microwave transmission lines.	314
75.0 / 75.2	HV	Valve to preserve the vacuum in accelerators and storage rings in case of an air inrush.	320
77.1 / 77.3	HV	Shutter to preserve the vacuum in accelerators and storage rings in case of an air inrush.	324
79.0 / 79.3	HV	For use in multiple applications, e. g. photon stopper.	330

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.	336
27.1	HV	For processes with aggressive and corrosive gases.	338
62.7	HV	Fine gas dosing valve for demanding upstream processes.	340
66.0 / 66.3	HV	For processes with aggressive and corrosive gases.	342

VACUUM LEVELS
Gate valves, transfer valves
 (free opening)

Vacuum

Valve series:	01.2	02.4 02.7	06.0 06.2	06.1	06.6	06.8	08.1 08.2	12.1	15.0	19.0
Seal, feedthrough:										
1000 – 10 ⁻³ mbar										
Actuator:	H/P	P	P	P	P	P	H/P	H/P	P	P

HV (high vacuum)

Valve series:	02.1 03.1	02.2 03.2	04.1/05.1 04.2/05.2 04.3/05.3 94.0/94.5	09.1	11.0 92.0¹⁾	14.0 16.8²⁾	15.1	16.2	17.2	19.1
Seal, feedthrough:										
10 ⁻⁴ – 10 ⁻⁸ mbar										
Actuator:	P	P	P	H/P	H/P	H/P	P	P	H/P	P

UHV (ultra high vacuum)

Valve series:	01.0	10.8	15.2	19.2	92.0
Seal, feedthrough:					
10 ⁻⁹ – 10 ⁻¹² mbar					
Actuator:	H/P	H/P	P	P	P

XHV (extreme UHV)

Valve series:	47.1 47.2	48.1 48.2
Seal, feedthrough:		
10 ⁻¹³ mbar and below		
Actuator:	P	H/P

Angle valves, inline valves, diaphragm valves, Vatterfly valves, butterfly valves	Control valves
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21.1	22	24.4 24.5	29.2³⁾	62.7
H	H	H/P		M

20.3⁴⁾ 20.4⁴⁾ 21.0	21.2 21.3 23.0⁵⁾	21.3	23.0⁶⁾	25.0 25.1 25.2	26.4 26.5 29.0⁷⁾ 29.1⁷⁾	61.2 61.5	62.0	64.2	65.0 65.1	65.2 65.5	67.0
H/P	H	EM	H	P	H/P/EM	M	M	M	M	M	M

28.4	64.8
H/P	M

54.1	57.0 57.1	59.0
H	H/P	H/M

- ¹⁾ 92.0 pneumatic only
- ²⁾ 16.8 pneumatic only
- ³⁾ 29.2 DN 100 – 160
- ⁴⁾ 20.3/20.4 pneumatic only
- ⁵⁾ 23.0 pump-out port
- ⁶⁾ 23.0 valve mechanism
- ⁷⁾ 29.0/29.1 DN 25 – 80, pneumatic only

- H Manual actuator
- P Pneumatic actuator
- M Motor
- EM Electromagnetic actuator

Nominal diameter		Gate valves (free, circular passage) Flap valves		Angle valves	Butterfly valves Vatterfly valves Diaphragm valves	Control valves
mm	inch	linear	pendulum			
Valve series						
10	¾	92.0		21.1, 21.3, 24.4, 26.4, 57.1		
16	⅝	01.0, 01.2, 48.1		21.1, 21.2, 23.0, 24.4/5, 25.0/1/2, 26.4/5, 27.1, 28.4, 54.1, 57.1, 59.0, 62.7	22.0	66.0
25	1	01.0, 01.2		23.0, 24.4/5, 25.0/1/2, 26.4/5, 27.1, 29.0/1	22.0	61.2, 66.0
40	1½	01.0, 01.2, 47.2, 48.1, 75.2, 77.3, 92.0		23.0, 24.4/5, 25.0/1/2, 26.4/5, 27.1, 28.4, 29.0/1, 54.1, 57.1	22.0	61.2, 61.5, 66.0, 66.3
50	2	01.0, 01.2, 08.2, 09.1		24.4/5, 26.4/5, 29.0/1		61.2, 61.5, 62.0, 66.0, 66.3
63	2½	08.1, 09.1, 10.8, 11.0, 12.1, 14.0, 15.0, 15.1, 15.2, 17.2, 47.2, 48.2, 75.0, 77.1/3, 79.0, 92.0		24.4, 26.4, 27.1, 28.4, 29.0, 54.1, 57.1	20.3, 20.4, 21.0	61.2, 61.5, 64.2, 66.3
80	3	08.1, 09.1, 10.8, 11.0, 12.1, 14.0		24.4/5, 26.4/5, 29.0		61.2, 61.5, 64.2
100	4	08.1, 09.1, 10.8, 11.0, 12.1, 14.0, 15.0, 15.1, 15.2, 17.2, 47.2, 48.2, 75.0, 77.1/3, 79.0/3, 92.0		24.4, 26.4, 27.1, 29.2, 57.0	20.3, 20.4, 21.0	61.2, 61.5, 62.0, 64.2, 65.0, 66.3
160	6	09.1, 10.8, 11.0, 12.1, 14.0, 15.0, 15.1, 15.2, 17.2, 47.2, 48.2, 75.0, 77.1/3, 79.0/3		24.4, 26.4, 27.1, 29.2, 57.0	20.3, 20.4, 21.0	61.2, 64.2, 64.8, 65.0, 65.1
200	8	10.8, 11.0, 12.1, 14.0, 15.2, 17.2, 47.1, 48.1, 75.0, 79.3	16.2	24.4	20.3, 20.4	61.2, 64.2, 64.8, 65.0, 65.1, 65.2
250	10	10.8, 11.0, 12.1, 14.0, 15.2, 17.2, 48.1	16.2	24.4	21.0	61.2, 64.2, 64.8, 65.0, 65.1, 65.2, 65.5, 67.0
320	12	10.8, 11.0, 12.1, 14.0, 17.2, 48.1	16.2			61.2, 64.2, 65.0, 65.1, 67.0
350	14	14.0	16.2			64.2, 65.0, 65.1, 67.0
400	16	14.0, 19.0, 19.1, 19.2, 64.0	16.2, 16.8			64.2, 65.0, 65.1, 67.0
450	18					67.0
500	20	19.0, 19.1, 19.2	16.2, 16.8			
630	25	19.0, 19.1, 19.2				
800	32	19.0, 19.1, 19.2				
900	36	19.0, 19.1, 19.2				
1000	40	19.0, 19.1, 19.2				
1250	50	19.0, 19.1, 19.2				
1600	63	19.0, 19.1, 19.2				
2000	78	19.0, 19.1, 19.2				

Sizes for valves with rectangular openings see

– Section C: series 02.1/03.1, 02.2/03.2, 04.1/05.1, 04.2/05.2, 04.3/05.3, 07.5, 94.0/94.5 (SEMI), pages 192–227

– Section D: series 02.4, 02.7, 06.0/06.2, 06.1, 06.6, 06.8, 07.5, 07.8 (DS), pages 230–247

Other sizes on request

QUALITY CERTIFICATION

ISO 9001, ISO 14001

VAT, as a global leader in high quality vacuum valves, maintains a quality management system according to ISO 9001 and environmental management system according to ISO 14001. The current certificates may be downloaded from our website.

Compliance with EU directives

VAT products are in conformity with the relevant EU directives and their listed harmonized standards.

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 in the following formats:

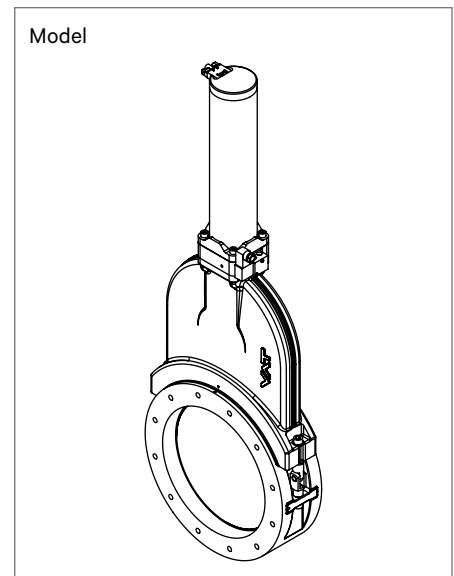
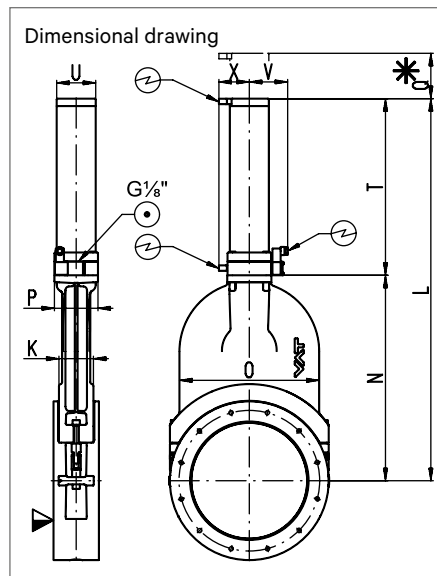
- 3D: STEP AP 203
- 2D: PDF

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



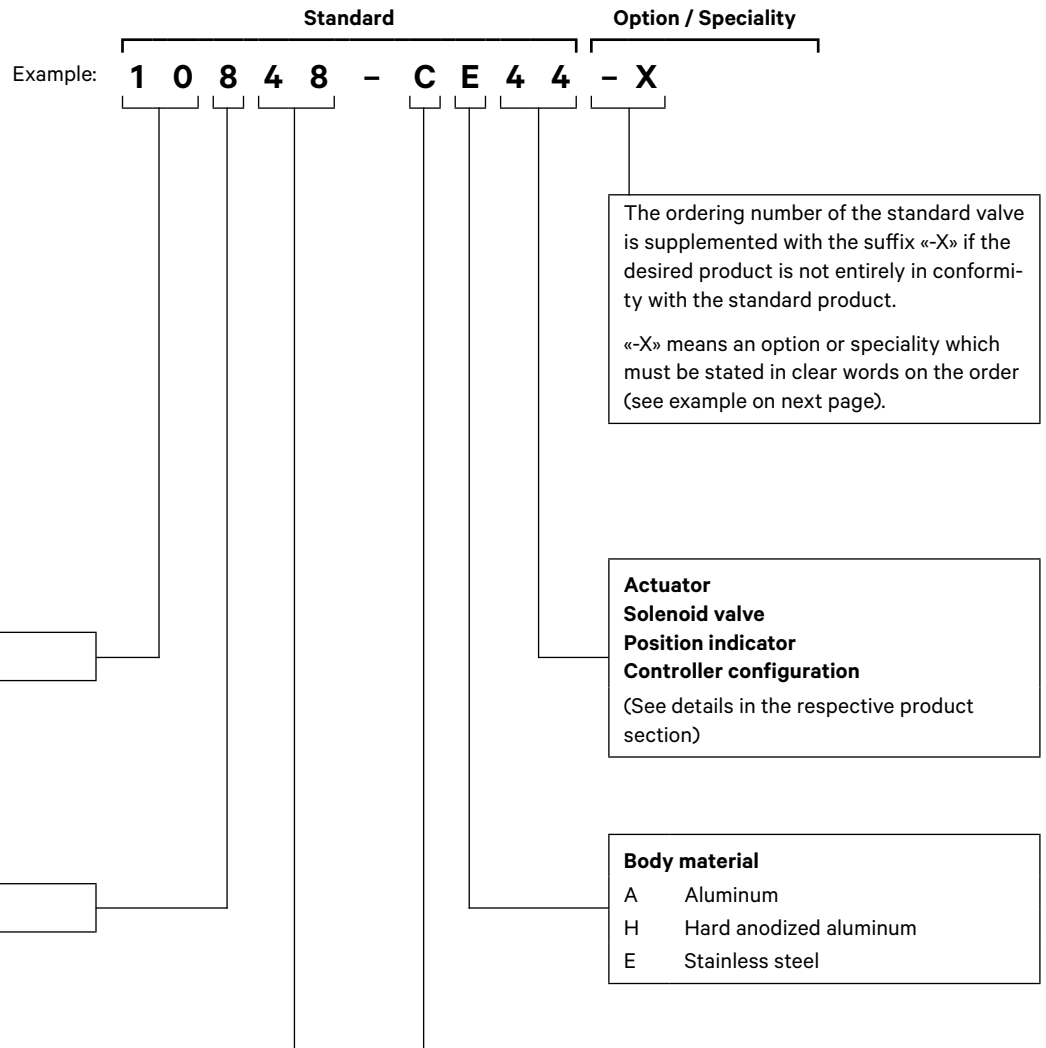
Ordering number:
Product-dimensional drawing / model

e. g. 12148-PA44-dimensional drawing

e. g. 12148-PA44-model

ORDERING NUMBER

The ordering number of VAT products is composed as follows:



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

Series 02.1/03.1, 02.2/03.2, 04.1/05.1, 04.2/05.2, 04.3/05.3, 07.5, 94.0/94.5 (SEMI): see pages 192–227

Series 02.4, 02.7, 06.0/06.2, 06.1, 06.6, 06.8, 07.5, 07.8 (DS): 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 02.1/03.1, 02.2/03.2, 04.1/05.1, 04.2/05.2, 04.3/05.3, 07.5, 94.0/94.5 (SEMI): see pages 192–227

Series 02.4, 02.7, 06.0/06.2, 06.1, 06.6, 06.8, 07.5, 07.8 (DS): code on request



GATE VALVES, PENDULUM VALVES

SERIES	TYPE	PAGE
01.0	MINI UHV GATE VALVE	22
01.2	MINI VACUUM GATE VALVE	30
08.1 / 08.2	INSERTABLE GATE VALVE	34
09.1	HV GATE VALVE	38
10.8	UHV GATE VALVE	44
11.0	HV GATE VALVE	52
12.1	VACUUM GATE VALVE	60
14.0	HV GATE VALVE	66
15.0 / 15.1 / 15.2	LOW PARTICLE GATE VALVE	74
16.2	PENDULUM VALVE	82
16.8	LARGE PENDULUM VALVE	88
17.2	HV GATE VALVE WITH PROTECTIVE RING	92
19.0 / 19.1 / 19.2	LARGE GATE VALVES	100
20.3 / 20.4	VATTERFLY VALVE	106
21.0	BUTTERFLY VALVE	110
48.1 / 48.2	ALL-METAL GATE VALVE	114
92.0	L-GATE VALVE /INSERT	122

MINI UHV GATE VALVE, SERIES 01.0

General purpose valve for isolation in UHV or other demanding applications.



Free of lubricants

Low particle generation

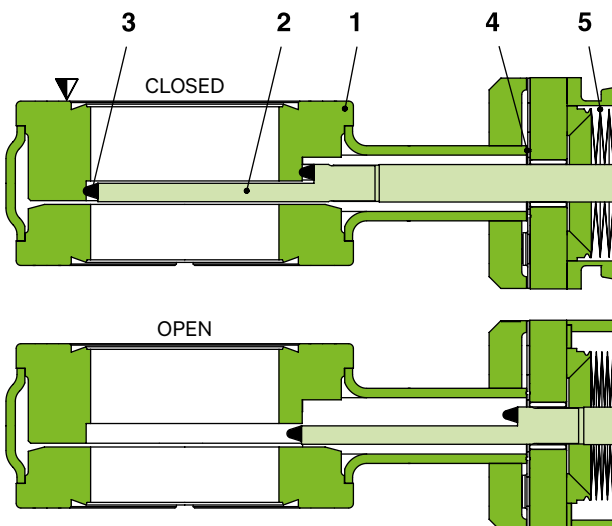
Low shock

Vulcanized gate seal (see glossary)

MAIN FEATURES

Sizes	DN 16 – 50 mm ($\frac{5}{8}$ " – 2")
Actuators	manual with turning handle pneumatic: single acting with closing spring (NC) or opening spring (NO), or double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	ISO-KF, CF-F
Sealing technology	MONOVAT (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Valve body
- 2 Gate
- 3 Gate seal
- 4 Bonnet seal
- 5 Bellows
- ▼ Valve seat side

TECHNICAL DATA

Leak rate	Valve body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
	Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		1 · 10 ⁻¹⁰ mbar to 2 bar (abs)
Differential pressure on the gate		≤ 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
Heating and cooling rate		≤ 50 °C h ⁻¹
Material	Valve body	AISI 304 (1.4301), AISI 316L (1.4435)
	Mechanism	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 or opening spring	24 V DC, 9.0 W (others on request)
	Actuator double acting	24 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage	≤ 250 V AC ≤ 50 V DC
	Current	≤ 5 A ≤ 3 A
Valve position indication		visual (mechanical)

				Valve with manual actuator			Valve with pneumatic actuator								
				Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight			
DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)			kg	lbs	bar	psi	l	ft ³		kg	lbs	kg	lbs
mm	inch	ls ⁻¹	ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
16	5/8	9	–	5	1.50	3.30	5–7	73–102	0.10	0.004	0.70	4.20	9.26	2.20	4.85
25	1	38	–	5	1.50	3.30	5–7	73–102	0.10	0.004	0.70	4.20	9.26	2.20	4.85
40	1½	160	220	5	1.50	3.30	5–7	73–102	0.10	0.004	0.70	4.20	9.26	2.20	4.85
50	2	160	–	5	1.50	3.30	5–7	73–102	0.10	0.004	0.70	4.20	9.26	2.20	4.85

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

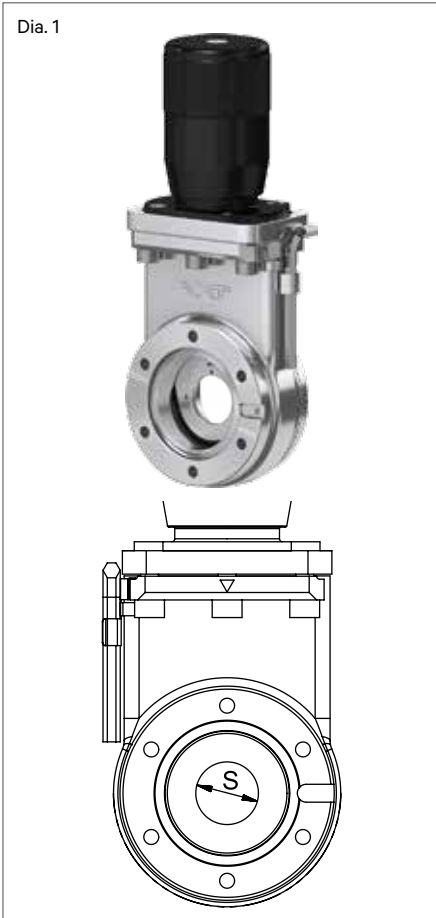
OPTIONS, CUSTOMIZED SOLUTIONS

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 24VDC)
- 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 ≤ 50 V AC/DC, ≤ 1 A

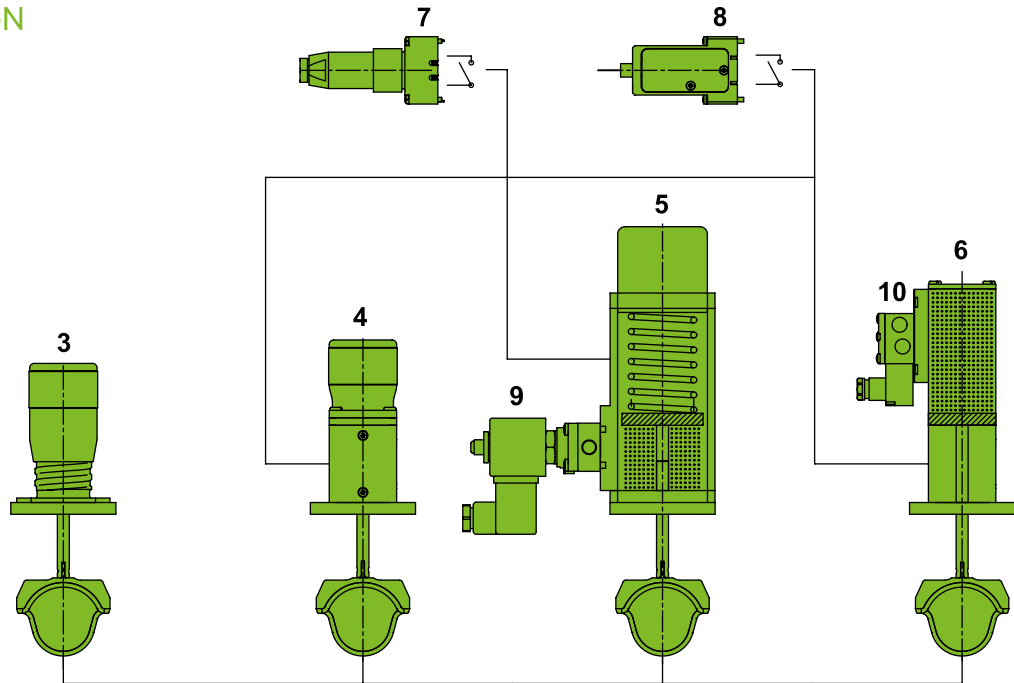
VALVE

- 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)

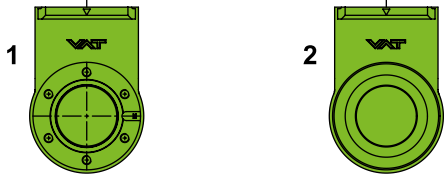


		Window screwed into gate. Window material: e. g. borosilicate Seals: elastomer			
		1 Valve body 2 Gate 3 Elastomer seal 4 Window 5 Screwed window retainer ▼ Valve seat side			
DN valve	mm inch	16 5/8	25 1	40 1½	50 2
Optically free diameter «S»	mm inch	21 0.82	21 0.82	21 0.82	21 0.82
Thickness of glass	mm inch	1.5 0.06	1.5 0.06	1.5 0.06	1.5 0.06

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) or single acting with opening spring (NO)
- 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



SPECIAL VERSIONS FOR GAS ANALYSIS

Pressure reduction of the process gas by means of two by-pass valves with orifice.



Vacuum-tight valve with manual or pneumatic actuator.

Bypass valves with manual or pneumatic actuator and application specific, easily exchangeable orifice.

Pressure reduction of the process gas by means of maximum 3 gate valves with orifice.



Vacuum-tight valve with manual or pneumatic actuator.

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

For details see pages 336 + 337.

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

**Valve with manual actuator
turning handle**

DN		Ordering numbers		
mm	inch	ISO-KF	CF-F metric threads	CF-F UNF threads
16	¾	01024-KE01	-	-
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
16	¾	01024-KE11	-	-
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
single acting with opening spring (NO)
without solenoid valve
without position indicator**

DN		Ordering numbers		
mm	inch	ISO-KF	CF-F metric threads	CF-F UNF threads
16	¾	01024-KE12	-	-
25	1	01028-KE12	-	-
40	1½	01032-KE12	01032-CE12	01032-UE12
50	2	01034-KE12	-	-

without solenoid valve, with position indicator: 010 . . . E22

with solenoid valve, with position indicator: 010 . . . E42 (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
16	¾	01024-KE14	-	-
25	1	01028-KE14	-	-
40	1½	01032-KE14	01032-CE14	01032-UE14
50	2	01034-KE14	-	-

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

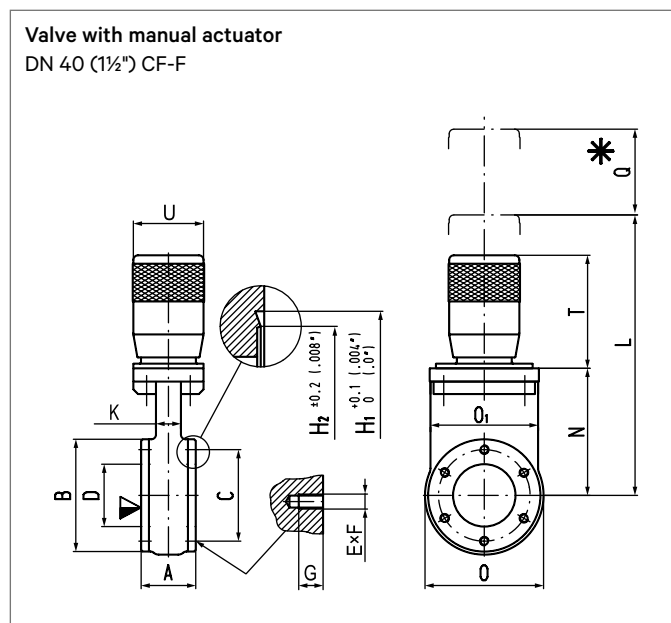
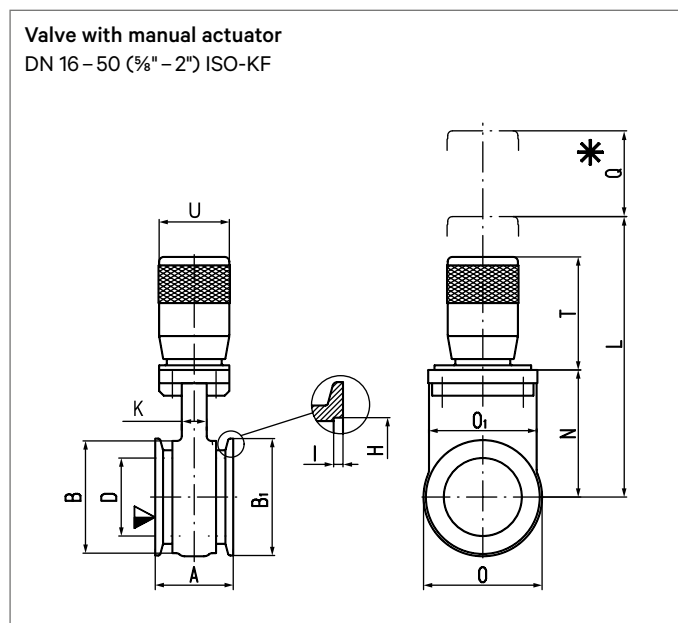
with solenoid valve, with position indicator: 010 . . . E44 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

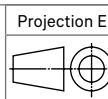
Basic ordering number plus «-X»: -X to be specified

Example: 01032-CE44-X, X = special bellows for 1 million cycles

DIMENSIONS



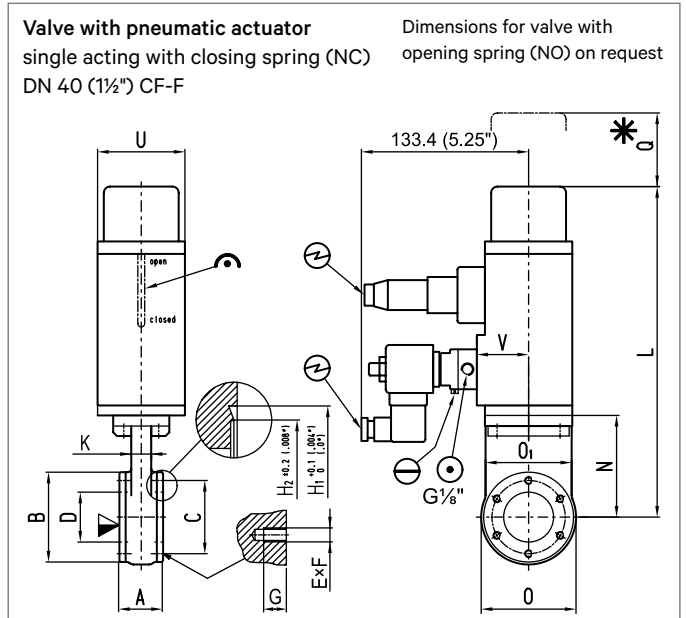
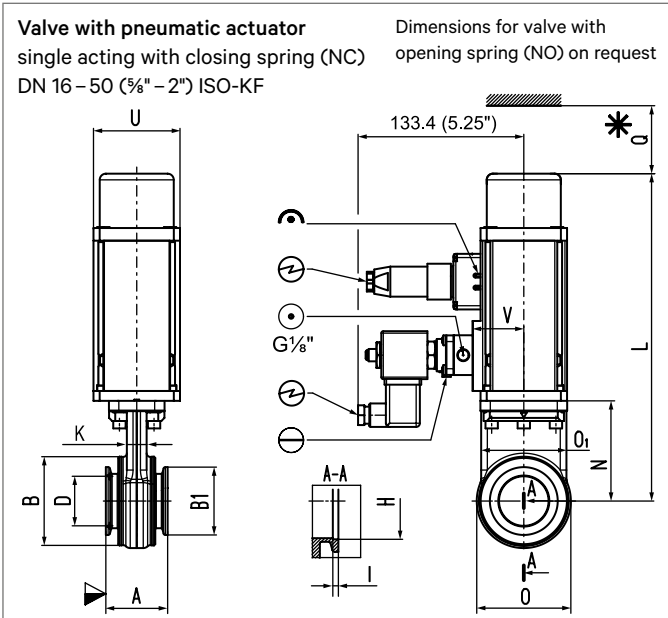
- ▼ Valve seat side
- * Required for dismantling



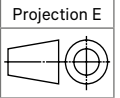
DN	mm inch	16 ¾	25 1	40 1½	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97	50 1.97
B	mm inch	71.80 2.83	71.80 2.83	71.80 2.83	71.80 2.83
B1	mm inch	29.90 1.18	39.90 1.57	54.90 2.16	74.90 2.95
D	mm inch	16.10 0.63	25.10 0.99	40.10 1.58	40.10 1.58
H	mm inch	17.30 0.68	26.30 1.04	41.30 1.63	52.30 2.06
I	mm inch	3 0.12	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63	16 0.63
L	mm inch	197.80 7.79	197.80 7.79	197.80 7.79	197.80 7.79
N	mm inch	81.30 3.20	81.30 3.20	81.30 3.20	81.30 3.20
O	mm inch	76.20 3	76.20 3	76.20 3	76.20 3
O1	mm inch	70.20 2.76	70.20 2.76	70.20 2.76	70.20 2.76
Q	mm inch	55 2.17	55 2.17	55 2.17	55 2.17
T	mm inch	73.50 2.89	73.50 2.89	73.50 2.89	73.50 2.89
U	mm inch	45.80 1.80	45.80 1.80	45.80 1.80	45.80 1.80

DN	mm inch	40 1½			
A	mm inch	35 1.38			
B	mm inch	71.80 2.83			
C	mm inch	58.70 2.31			
D	mm inch	40.10 1.58			
E x F		6 x M6 6 x ¼"-28 UNF			
G	mm inch	7 0.28			
H1	mm inch	48.35 1.90			
H2	mm inch	42 1.65			
K	mm inch	16 0.63			
L	mm inch	197.80 7.79			
N	mm inch	81.30 3.20			
O	mm inch	76.20 3			
O1	mm inch	70.20 2.76			
Q	mm inch	55 2.17			
T	mm inch	73.50 2.89			
U	mm inch	45.80 1.80			

DIMENSIONS



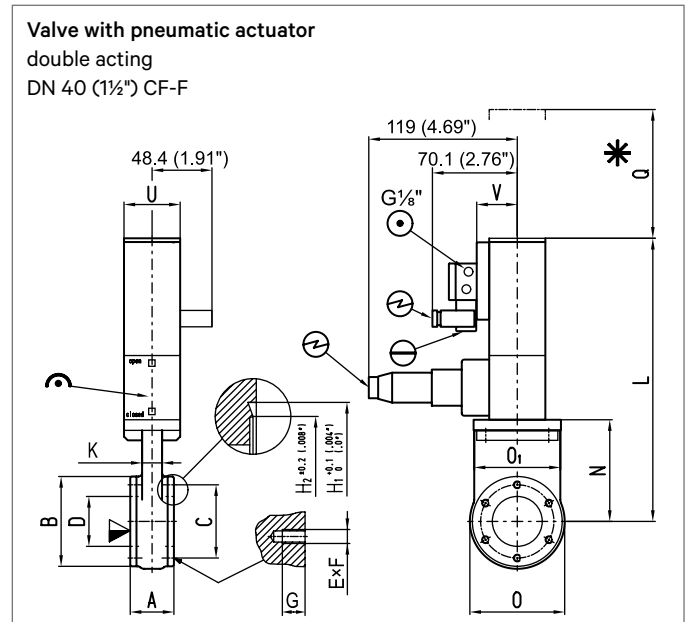
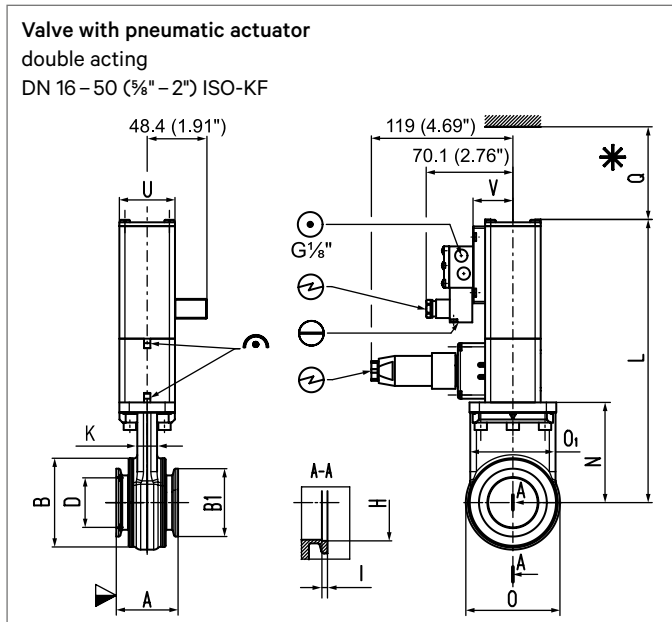
- ▼ Valve seat side
 * Required for dismantling
 ⊕ Compressed air connection
 ⊖ Electrical connection
 ⤴ Mechanical position indication
 ⊖ Emergency operation



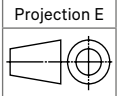
DN	mm inch	16 ¾	25 1	40 1½	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97	50 1.97
B	mm inch	71.80 2.83	71.80 2.83	71.80 2.83	71.80 2.83
B1	mm inch	29.90 1.18	39.90 1.57	54.90 2.16	74.90 2.95
D	mm inch	16.10 0.63	25.10 0.99	40.10 1.58	40.10 1.58
H	mm inch	17.30 0.68	26.30 1.04	41.30 1.63	52.30 2.06
I	mm inch	3 0.12	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63	16 0.63
L	mm inch	265.50 10.45	265.50 10.45	265.50 10.45	265.50 10.45
N	mm inch	81.30 3.20	81.30 3.20	81.30 3.20	81.30 3.20
O	mm inch	76.20 3	76.20 3	76.20 3	76.20 3
O1	mm inch	70.20 2.76	70.20 2.76	70.20 2.76	70.20 2.76
Q	mm inch	55 2.17	55 2.17	55 2.17	55 2.17
U	mm inch	70 2.75	70 2.75	70 2.75	70 2.75
V	mm inch	41.50 1.63	41.50 1.63	41.50 1.63	41.50 1.63

DN	mm inch	40 1½			
A	mm inch	35 1.38			
B	mm inch	71.80 2.83			
C	mm inch	58.70 2.31			
D	mm inch	40.10 1.58			
E x F		6 x M6 6 x ¼"-28 UNF			
G	mm inch	7 0.28			
H1	mm inch	48.35 1.90			
H2	mm inch	42 1.65			
K	mm inch	16 0.63			
L	mm inch	265.50 10.45			
N	mm inch	81.30 3.20			
O	mm inch	76.20 3			
O1	mm inch	70.20 2.76			
Q	mm inch	55 2.17			
U	mm inch	70 2.75			
V	mm inch	41.50 1.63			

DIMENSIONS



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



DN	mm inch	16 ¾"	25 1"	40 1½"	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97	50 1.97
B	mm inch	71.80 2.83	71.80 2.83	71.80 2.83	71.80 2.83
B1	mm inch	29.90 1.18	39.90 1.57	54.90 2.16	74.90 2.95
D	mm inch	16.10 0.63	25.10 0.99	40.10 1.58	40.10 1.58
H	mm inch	17.30 0.68	26.30 1.04	41.30 1.63	52.30 2.06
I	mm inch	3 0.12	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63	16 0.63
L	mm inch	229.10 9.02	229.10 9.02	229.10 9.02	229.10 9.02
N	mm inch	81.30 3.20	81.30 3.20	81.30 3.20	81.30 3.20
O	mm inch	76.20 3	76.20 3	76.20 3	76.20 3
O1	mm inch	70.20 2.76	70.20 2.76	70.20 2.76	70.20 2.76
Q	mm inch	55 2.17	55 2.17	55 2.17	55 2.17
U	mm inch	45 1.77	45 1.77	45 1.77	45 1.77
V	mm inch	32.30 1.27	32.30 1.27	32.30 1.27	32.30 1.27

DN	mm inch	40 1½"			
A	mm inch	35 1.38			
B	mm inch	71.80 2.83			
C	mm inch	58.70 2.31			
D	mm inch	40.10 1.58			
E x F		6 x M6 6 x ¼"-28 UNF			
G	mm inch	7 0.28			
H1	mm inch	48.35 1.90			
H2	mm inch	42 1.65			
K	mm inch	16 0.63			
L	mm inch	229.10 9.02			
N	mm inch	81.30 3.20			
O	mm inch	76.20 3			
O1	mm inch	70.20 2.76			
Q	mm inch	55 2.16			
U	mm inch	45 1.77			
V	mm inch	32.30 1.27			

MINI VACUUM GATE VALVE, SERIES 01.2

General purpose valve for isolation in vacuum applications.



Low cost

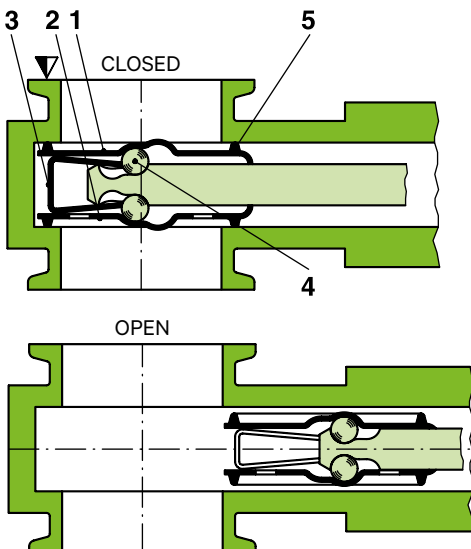
Compact and simple design

Mechanically locked in closed position

MAIN FEATURES

Sizes	DN 16 – 50 mm ($\frac{3}{8}$ " – 2")
Actuators	manual with toggle lever pneumatic: double acting
Body material	aluminum
Feedthrough	shaft feedthrough
Standard flanges	ISO-KF
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



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

TECHNICAL DATA

Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		1 · 10 ⁻⁷ mbar to 1 bar (abs)
Differential pressure on the gate		≤ 1 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service ¹⁾		50 000
Temperature ¹⁾	Valve body	≤ 100 °C
	Manual and pneumatic actuator	≤ 80 °C
	Solenoid valve	≤ 50 °C
	Position indicator	≤ 80 °C
Heating and cooling rate		≤ 30 °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 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage	≤ 50 V AC/DC
	Current	≤ 0.1 A
	Power	max. 10 W
Valve position indication		visual (mechanical)

DN (nominal I.D.)		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 pneumatic actuator		Closing or opening time	Weight	
mm	inch	ls ⁻¹	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
16	5/8	10	0.40	0.90	4.5–7	65–102	0.01	0.0004	0.80	0.80	1.80
25	1	34	0.40	0.90	4.5–7	65–102	0.03	0.001	1.10	0.80	1.80
40	1½	140	0.70	1.50	4.5–7	65–102	0.07	0.002	1.20	1.20	2.70
50	2	260	0.70	1.50	4.5–7	65–102	0.07	0.002	1.30	1.20	2.70

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

OPTIONS, CUSTOMIZED SOLUTIONS

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 24V DC)
- Manual emergency operation on solenoid valve lockable

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 31

ORDERING INFORMATION FOR STANDARD VALVES

Valve with manual actuator
toggle lever

DN		Ordering numbers ISO-KF
mm	inch	
16	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 ISO-KF
mm	inch	
16	5/8	01224-KA14
25	1	01228-KA14
40	1½	01232-KA14
50	2	01234-KA14

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

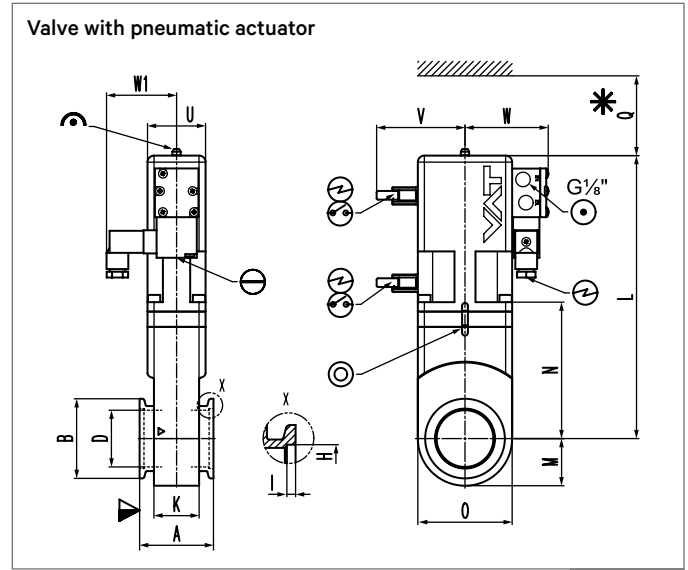
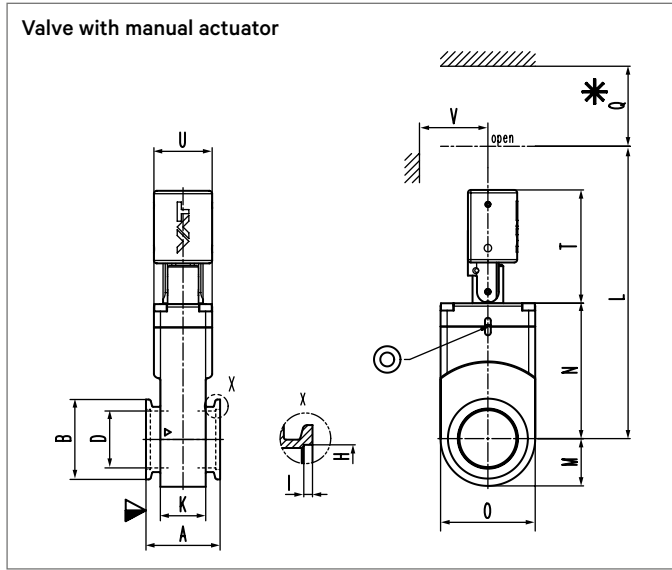
with solenoid valve, with position indicator: 012 .. -KA44 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

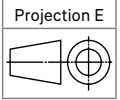
Basic ordering number plus «-X»: -X to be specified

Example: 01232-KA44-X, X = solenoid valve for impulse actuation

DIMENSIONS



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

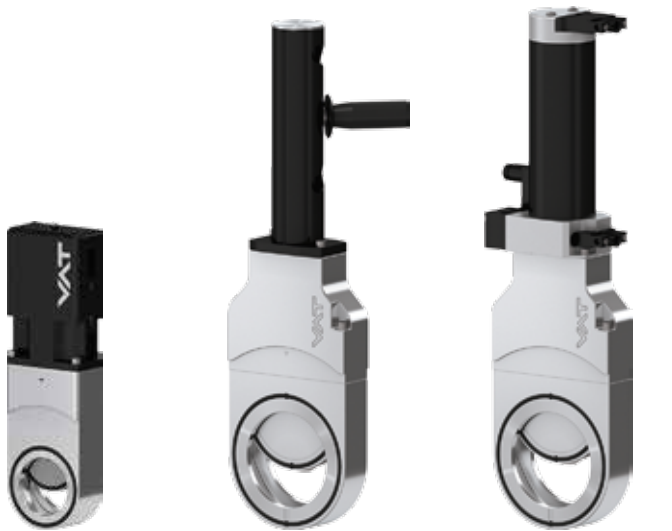


DN	mm inch	16 5/8	25 1	40 1 1/2	50 2
A	mm inch	40 1.57	50 1.97	51 2.01	55 2.17
B	mm inch	30 1.18	40 1.57	55 2.17	75 2.95
D	mm inch	15 0.59	24 0.94	39 1.54	49 1.93
H	mm inch	17.20 0.68	26.20 1.03	41.20 1.62	52.20 2.06
I	mm inch	3 0.12	3 0.12	3 0.12	3 0.12
K	mm inch	25 0.98	32 1.26	31 1.22	33 1.30
L	mm inch	97.30 3.83	139 5.47	200.80 7.91	235.80 9.28
M	mm inch	15 0.59	22 0.87	32.50 1.28	37.50 1.48
N	mm inch	39 1.55	58.50 2.30	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	33.30 1.31	47.50 1.87	77.80 3.06	87.80 3.46
U	mm inch	25 0.98	32 1.26	40 1.57	40 1.57
V	mm inch	20 0.79	30 1.18	47 1.85	52 2.05

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	135.90 5.35	195.10 7.68	220.1 8.66
M	mm inch	15 0.59	22 0.87	32.50 1.28	37.50 1.48
N	mm inch	45.30 1.78	62.30 2.45	94 3.70	109 4.29
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	52.80 2.08	57.40 2.26	60.90 2.40	64.70 2.55
W	mm inch	49.80 1.96	56.80 2.34	57.40 2.26	62.40 2.46
W1		48.40 1.91	48.40 1.91	48.30 1.90	48.30 1.90

INSERTABLE GATE VALVE, SERIES 08.1/08.2

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



DN 50: pneumatic

DN 63-100: manual

DN 63-100: pneumatic

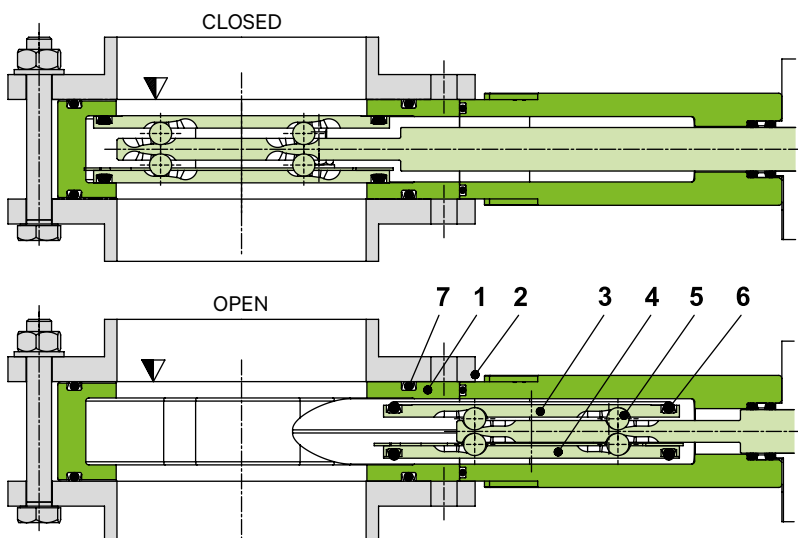
Space-saving due to direct mounting between DIN flanges or sealing surfaces

Body with DIN centering insert

MAIN FEATURES

Sizes	DN 50 – 100 mm (2" – 4")
Actuators	DN 50: manual with toggle lever, DN 63-100: manual with push rod pneumatic: double acting
Body material	aluminum
Feedthrough	shaft feedthrough
Installation	DIN centering ring
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Valve body
- 2 Vacuum tubing
- 3 Gate
- 4 Counter-plate
- 5 Ball pairs
- 6 Gate seal
- 7 Flange seal
- ▼ Valve seat side

TECHNICAL DATA

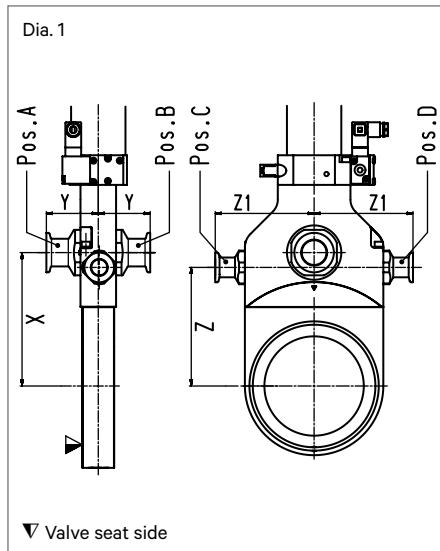
Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-7}$ mbar to 1.6 bar (abs)
Differential pressure on the gate	DN 50 DN 63–100	≤ 1.0 bar ≤ 1.6 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service ¹⁾	DN 50 DN 63–100	50 000 200 000
Temperature ²⁾	Valve body DN 50 DN 63–100 Manual and pneumatic actuator Solenoid valve Position indicator	≤ 100 °C ≤ 120 °C ≤ 80 °C ≤ 50 °C ≤ 80 °C
Heating and cooling rate		≤ 30 °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), EN AW-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 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage DN 50 DN 63–100 Current DN 50 DN 63–100	≤ 50 V AC/DC ≤ 250 V AC ≤ 50 V DC ≤ 0.1 A ≤ 2 A ≤ 1.2 A
Valve position indication		visual (mechanical)

			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 pneumatic actuator		Closing or opening time	Weight	
mm	inch		kg	lbs	bar	psi	l	ft ³		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

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



OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Other solenoid valve voltage (standard 24V DC)

VALVE

- Other sealing materials
- Nominal diameters DN 16, 25, 40
- Ports for roughing (by-pass), venting or for gauges (Dia. 1): possible positions A, B, C and D

DN valve	mm inch	50 2	63 2½	80 3	100 4
Recommended port	ISO-KF	-	16	16	25
X	mm inch	-	105 4.13	110 4.33	135 5.31
Y	mm inch	-	48 1.89	48 1.89	63 2.48
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					

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ORDERING INFORMATION FOR STANDARD VALVES

Valve with manual actuator
DN 50 with toggle lever
DN 63-100 with push rod

DN		Ordering numbers	
mm	inch	with toggle lever	with push rod
50	2	08234-FA06	-
63	2½	-	08136-FA03
80	3	-	08138-FA03
100	4	-	08140-FA03

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

DN		Ordering numbers (specify control voltage)
mm	inch	
50	2	08234-FA14
63	2½	08136-FA14
80	3	08138-FA14
100	4	08140-FA14

without solenoid valve, with position indicator: 08...-FA24

with solenoid valve, without position indicator: 08...-FA34 (specify control voltage)

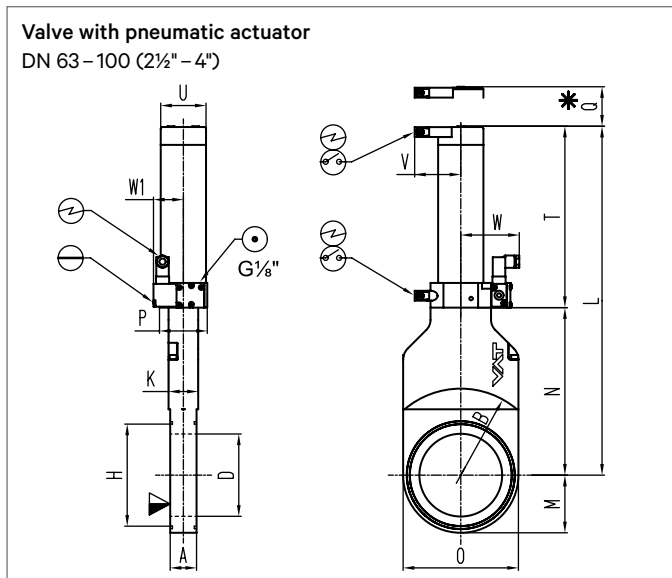
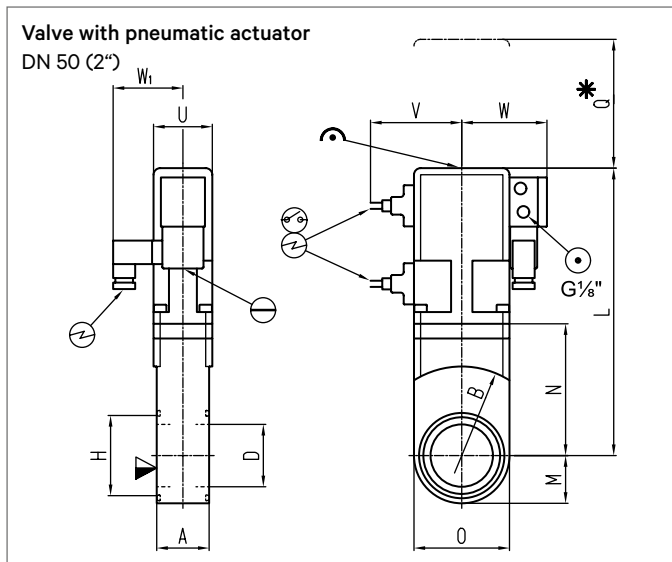
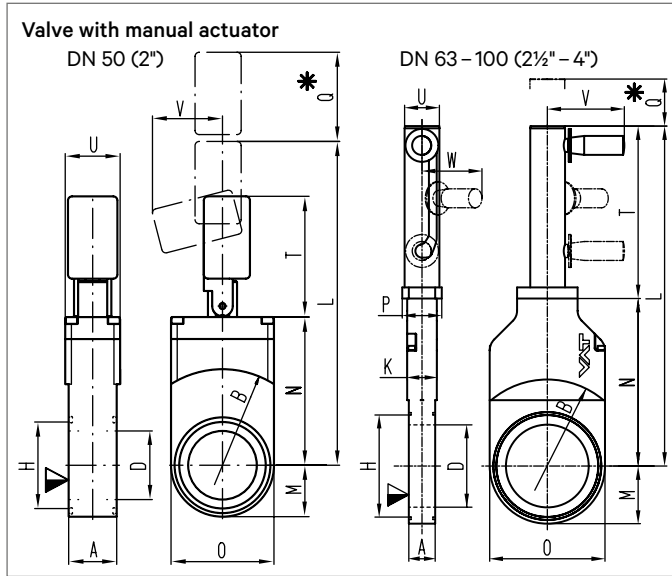
with solenoid valve, with position indicator: 08...-FA44 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

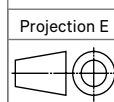
Example: 08140-FA44-X, X = port ISO-KF 25 in position A

DIMENSIONS



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. x d ³⁾		63.09 x 3.53 2.48 x 0.139	88.49 x 3.53 3.49 x 0.139	104.37 x 3.53 4.11 x 0.139	123.42 x 3.53 4.86 x 0.139
K	mm	-	36	36	36
	inch	-	1.42	1.42	1.42
L ¹⁾	mm	240	329.50	363	413
	inch	9.45	12.97	14.29	16.26
L ²⁾	mm	220	341.50	375	425
	inch	8.66	13.44	14.76	16.73
M	mm	37.50	50	59	70
	inch	1.48	1.97	2.32	2.76
N ¹⁾	mm	108	155.50	173.50	203.50
	inch	4.25	6.12	6.83	8.01
N ²⁾	mm	103	155.50	173.50	203.50
	inch	4.06	6.12	6.83	8.01
O	mm	75	100	118	140
	inch	2.95	3.94	4.65	5.51
P ¹⁾	mm	-	48	48	48
	inch	-	1.89	1.89	1.89
P ²⁾	mm	-	58	58	58
	inch	-	2.28	2.28	2.28
Q	mm	65	25	25	25
	inch	2.56	0.98	0.98	0.98
T ¹⁾	mm	93	174	189.50	209.50
	inch	3.67	6.85	7.46	8.25
T ²⁾	mm	-	186	201.50	221.50
	inch	-	7.32	7.93	8.72
U ¹⁾	mm	40	43	43	43
	inch	1.57	1.69	1.69	1.69
U ²⁾	mm	40	55	55	55
	inch	1.57	2.17	2.17	2.17
V ¹⁾	mm	55	94	94	94
	inch	2.17	3.70	3.70	3.70
V ²⁾	mm	65	56	56	56
	inch	2.56	2.20	2.20	2.20
W ¹⁾	mm	-	75	75	75
	inch	-	2.95	2.95	2.95
W ²⁾	mm	66	72	72	72
	inch	2.60	2.83	2.83	2.83
W1	mm	50	36.50	36.50	36.50
	inch	1.97	1.44	1.44	1.44

¹⁾ Valve with manual actuator
²⁾ Valve with pneumatic actuator
³⁾ Dimensions of flange seal



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

HV GATE VALVE, SERIES 09.1

For demanding pump isolation applications.
Especially suited to applications with high levels of process byproduct in the gas stream.



Manual

Pneumatic

Reliable sealing in harsh processes

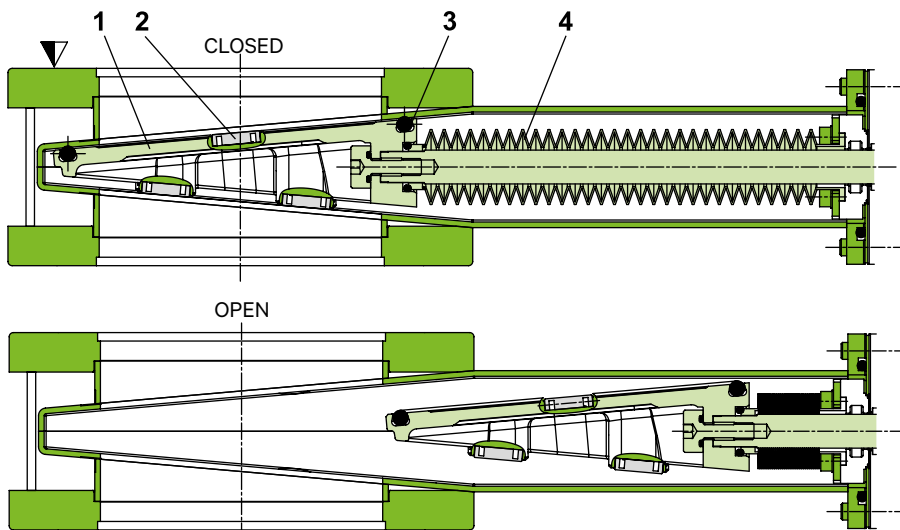
Robust and easy maintenance thanks to simple wedge design

Opening at 1 bar differential pressure possible

MAIN FEATURES

Sizes	DN 50 – 160 mm (2" – 6")
Actuators	manual with crank handle pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	ISO-KF, ISO-F, CF-F, ASA-LP, JIS
Sealing technology	WEDGE (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Gate
- 2 Sliding element
- 3 Gate seal
- 4 Bellows
- ▽ Valve seat side

TECHNICAL DATA

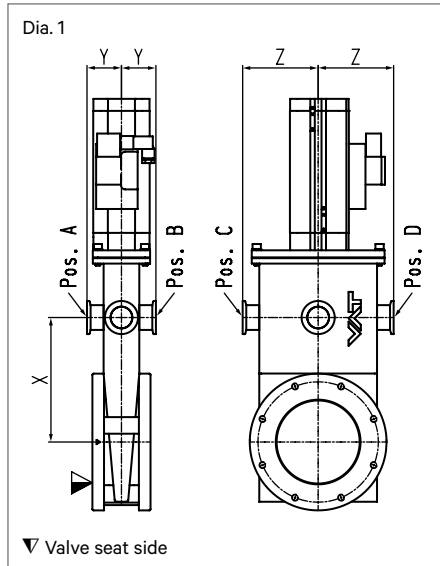
Leak rate	Valve body Valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹ $<1 \cdot 10^{-7}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate		≤ 1.2 bar
Differential pressure at opening		≤ 1 bar
Cycles until first service ¹⁾		5 000
Bellows cycles ¹⁾		100 000
Temperature ²⁾	Valve body Manual and pneumatic actuator Solenoid valve Position indicator	≤ 150 °C ≤ 100 °C ≤ 50 °C ≤ 60 °C
Material	Valve body Gate Bellows	AISI 304 (1.4301) AISI 304 (1.4301) AISI 633 (AM350)
Seal	Bonnet, gate	FKM (Viton®)
Feedthrough		bellows
Mounting position		any
Solenoid valve		24 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage Current Power	10–30 V DC ≤ 0.5 A max. 10 W

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator				Valve with pneumatic actuator ²⁾					
			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		ft ³	s
50	2	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

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

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

OPTIONS, CUSTOMIZED SOLUTIONS



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 24V DC)

VALVE

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

DN valve	mm inch	50 2	63 2½	80 3	100 4	160 6
Recommended port	ISO-KF	25	25	25	25	25
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						

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.
Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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	09134-TE01	09134-JE01
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

with position indicator: 091 . . . E08

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

DN		Ordering numbers (specify control voltage)				
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	09134-TE14	09134-JE14
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

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

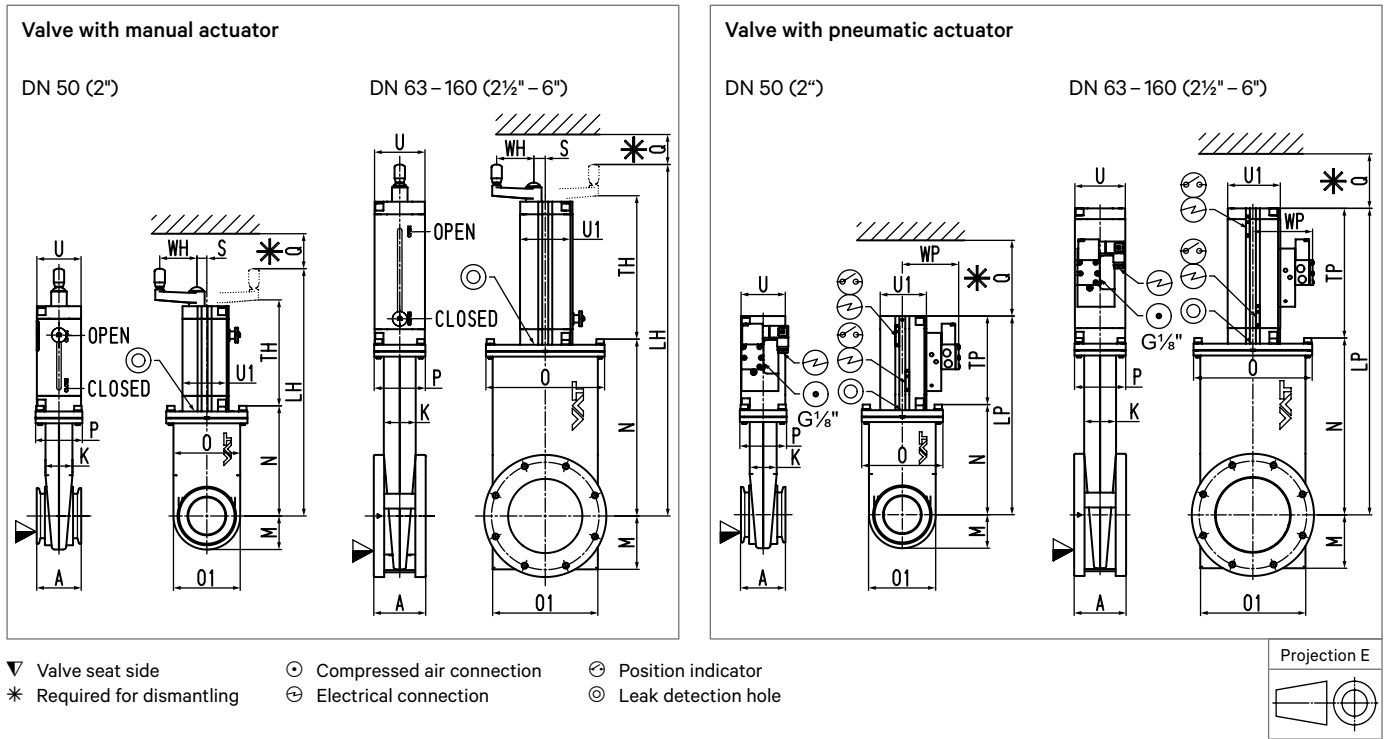
with solenoid valve, with position indicator: 091 . . . E44 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 09140-PE14-X, X = port ISO-KF 25 in position A

MAIN DIMENSIONS

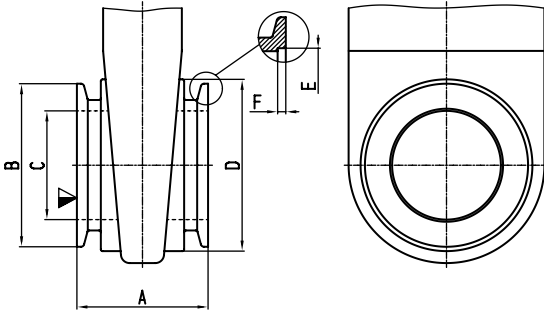
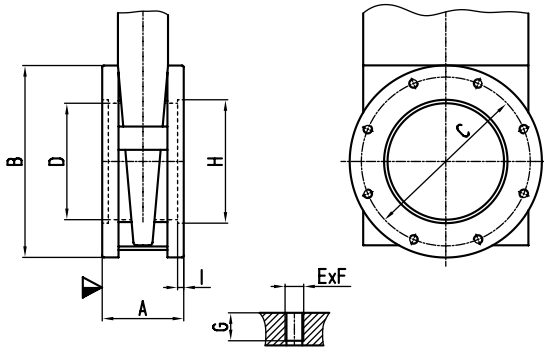
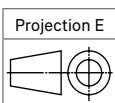
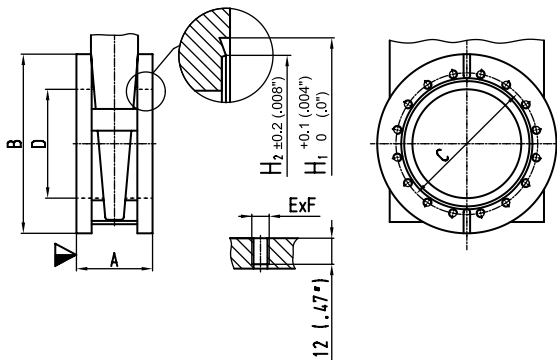


DN	mm inch	50 2	63 2½	80 3	100 4	160 6
A	mm inch	60 2.36	70 2.75	70 2.75	70 2.75	90 3.54
K	mm inch	36 1.42	43 1.69	43 1.69	43 1.69	52.50 2.06
LH	mm inch	320 12.60	375 14.76	424 16.69	474 18.66	651 25.62
M	mm inch	45 1.77	53.50 2.10	72.50 2.85	72 2.83	97 3.83
N	mm inch	149 5.87	176 6.92	209 8.29	239 9.40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

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

Flange dimensions: see pages 42 – 43

FLANGE DIMENSIONS

ISO-KF
 DN 50 (2")

ISO-F
 DN 63 - 160 (2½" - 6")

CF-F
 DN 50 - 160 (2" - 6")


▽ Valve seat side

	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	mm inch	50 2	63 2½	80 3	100 4	160 6
O.D.	mm inch	3	4½	4%	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	102.40 4.03	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

¹⁾ Metric threads

²⁾ UNF threads

FLANGE DIMENSIONS

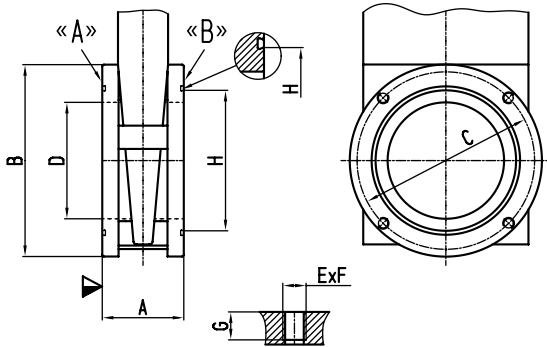
ASA-LP

DN 63 – 160 (2½" – 6")

with or without O-ring groove

For orders with O-ring groove specify:

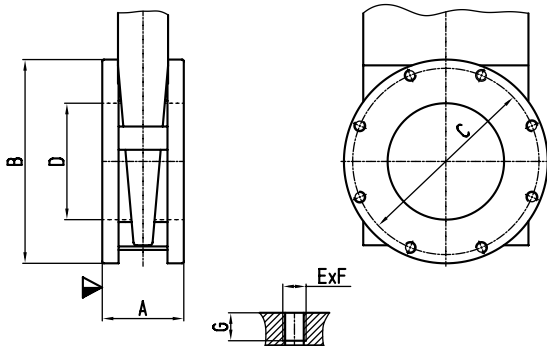
«A», «B» or «A + B»



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 6.00	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 2.99	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	mm inch	88.49 × 3.53 3.48 × 0.139	88.49 × 3.53 3.48 × 0.139	120.24 × 3.53 4.73 × 0.139	158.34 × 3.53 6.23 × 0.139

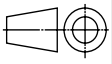
JIS B 2290: 1998 / ISO 1609

DN 65 – 150 (2½" – 6")



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 6.30	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

Projection E



▼ Valve seat side

UHV GATE VALVE, SERIES 10.8

The standard valve for UHV isolation applications in research and industry.



Free of lubricants

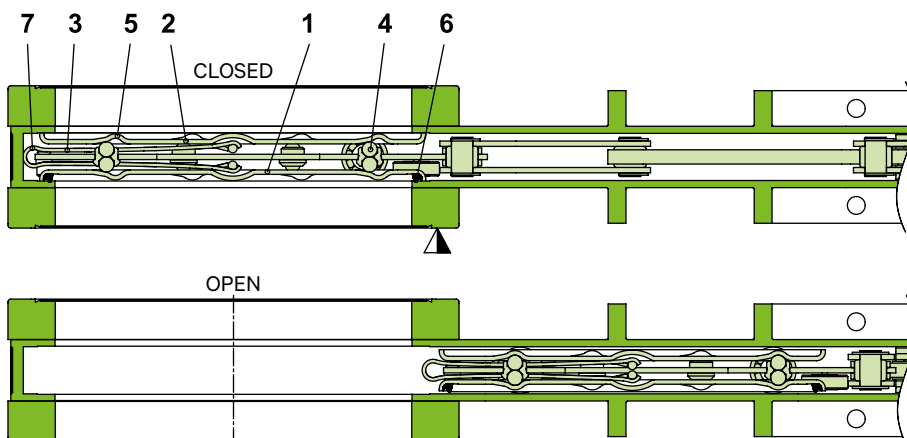
DN 63 – 200 with vulcanized gate seal
(see glossary)

Easy maintenance

MAIN FEATURES

Sizes	DN 63 – 320 mm (2½" – 12")
Actuators	manual with crank handle pneumatic: double acting 3-position pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	ISO-F, CF-F, ASA-LP, JIS
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



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

TECHNICAL DATA

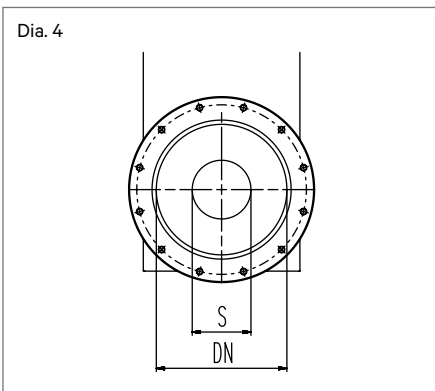
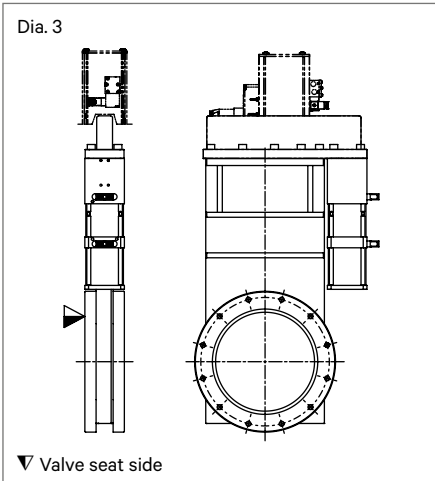
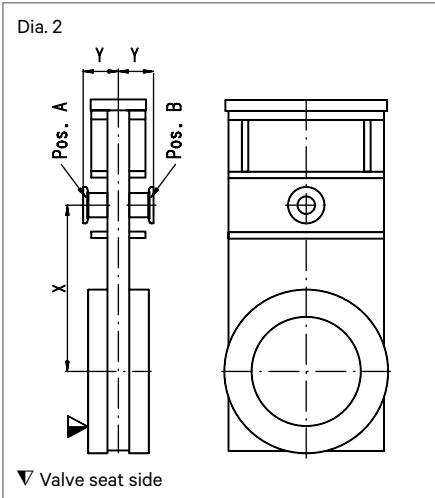
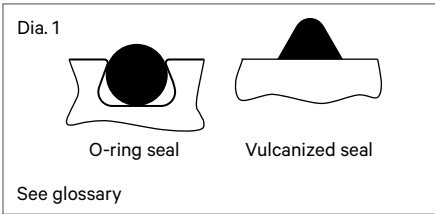
Leak rate	Valve body Valve seat	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹ $< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	DN 63 – 200 DN 250 – 320	1 · 10 ⁻¹⁰ mbar to 1.6 bar (abs) 1 · 10 ⁻¹⁰ mbar to 1.2 bar (abs)
Differential pressure on the gate	DN 63 – 200 DN 250 – 320	≤ 1.6 bar ≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service		50 000
Temperature ¹⁾	Valve body Manual actuator Pneumatic actuator Solenoid valve Position indicator	≤ 250 °C open / ≤ 200 °C closed ≤ 250 °C ≤ 200 °C ≤ 50 °C ≤ 80 °C
Heating and cooling rate		≤ 50 °C h ⁻¹
Material	Valve body Mechanism DN 63 – 200 DN 250 – 320 Bellows	AISI 304 (1.4301) AISI 316L (1.4404) AISI 304 (1.4301) AISI 316L (1.4404, 1.4435)
Seal	Bonnet Gate	metal FKM (Viton®)
Feedthrough		bellows
Mounting position		any
Solenoid valve		24 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage Current	≤ 50 V AC/DC ≤ 1.2 A
Valve position indication		visual (mechanical)

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator			Valve with pneumatic actuator ²⁾						
mm	inch		Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
		ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2½	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	11	24	4 – 7	58 – 102	0.11	0.0038	1.20	12	26
160	6	5880	17	16	35	4 – 7	58 – 102	0.14	0.0049	1.50	17	37
200	8	12200	17	29	64	4 – 7	58 – 102	0.25	0.0087	2	29	64
250	10	21690	40	51	112	5 – 7	73 – 102	0.35	0.0122	4	52	115
320	12	29130	45	89	196	5 – 7	73 – 102	0.48	0.0167	5	91	200

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

²⁾ Technical data for valve with 3-position pneumatic actuator on request.

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

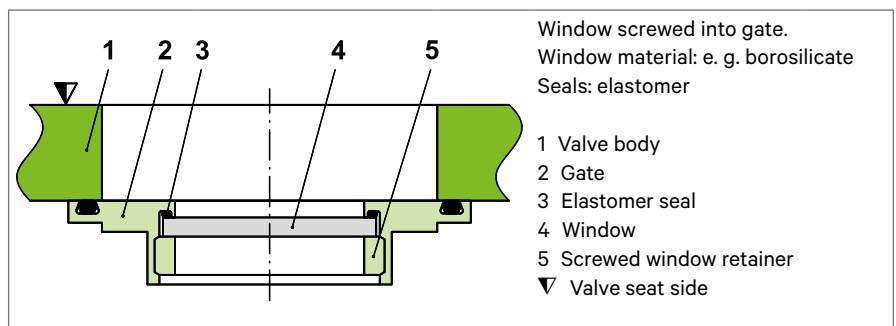
- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard 24VDC)
- Manual emergency operation on solenoid valve lockable
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Bakeable position indicator:
manual actuator bakeable to max. 250 °C, pneumatic actuator to max. 200 °C

VALVE

- Customer specified flanges with/without watercooling
- Other sealing materials
- O-ring seal in gate (Dia. 1) with DN 63, 100, 160, 200 instead of the vulcanized seal
- Ports for roughing (by-pass), venting or for gauges (Dia. 2): possible positions A and B

DN valve	mm inch	63 2½	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	64 2.52	64 2.52	64 2.52	68 2.68	62 2.44	72 2.83
Other ports on request								

- Space saving compact version: DN 200 + 250 only (Dia. 3)
- Special gate for the installation of various foils
- Window in gate (Dia. 4) with DN 63, 100, 160, 200



DN valve	mm inch	63 2½	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			

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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)

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

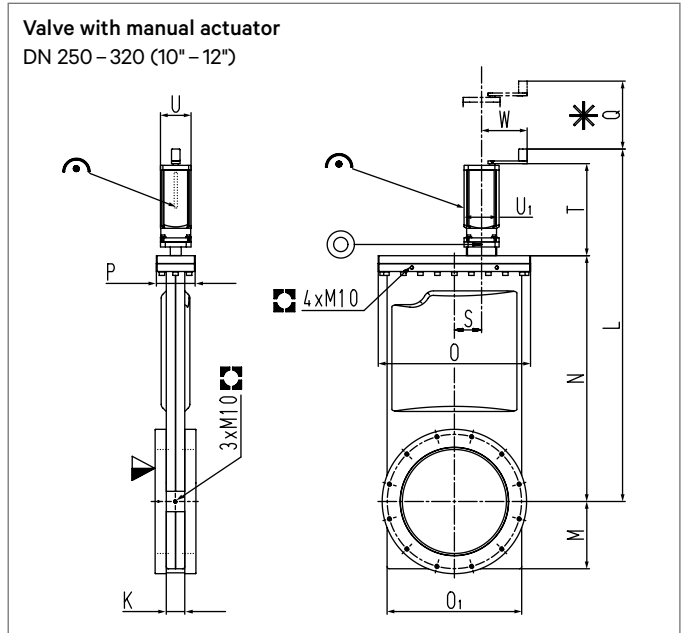
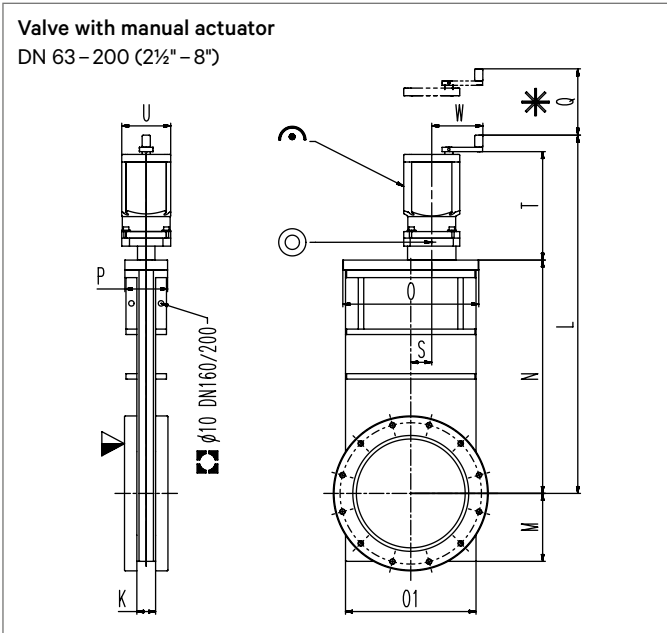
without solenoid valve, with position indicator: 108 . . . E28

ORDERING INFORMATION FOR VALVES WITH OPTIONS

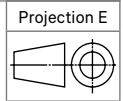
Basic ordering number plus «-X»: -X to be specified

Example: 10846-CE44-X, X = port CF-F 40 in position A

MAIN DIMENSIONS



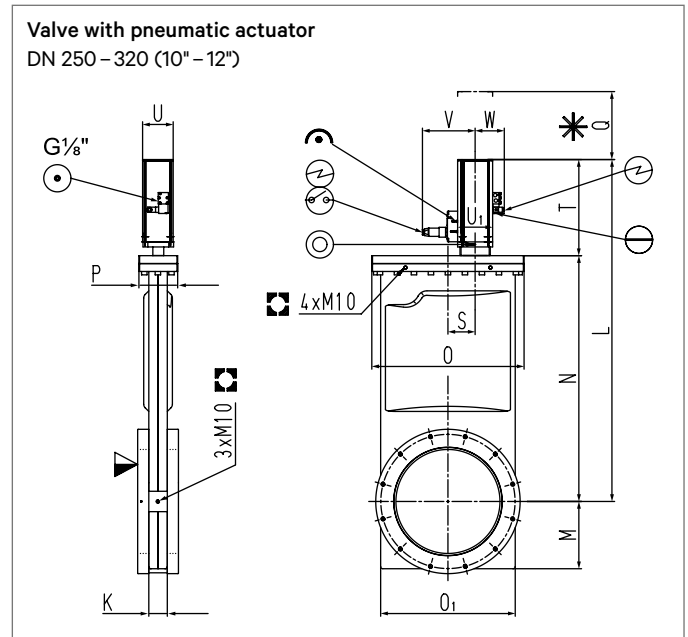
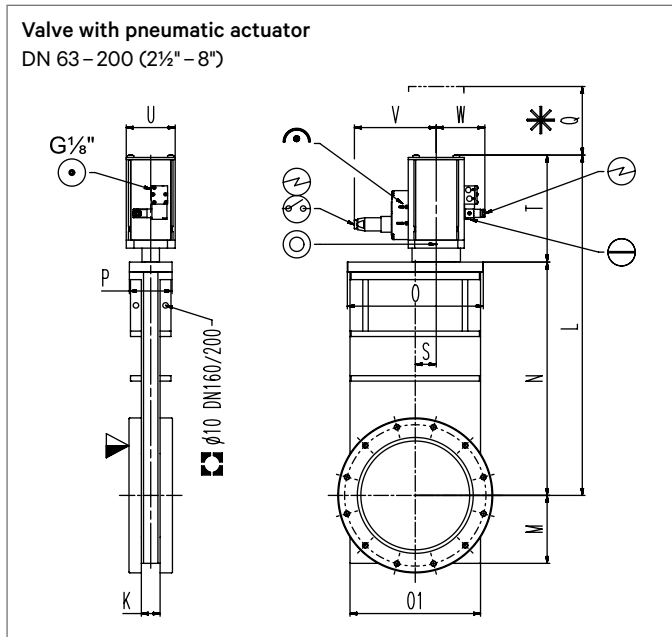
- ▼ Valve seat side
- * Required for dismantling
- ⤴ Mechanical position indication
- ⊙ Leak detection hole
- ◻ For attachment



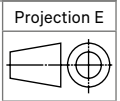
DN	mm	63	80	100	160	200	250	320
	inch	2½	3	4	6	8	10	12
K	mm	27	27	27	27	34.50	41	54
	inch	1.06	1.06	1.06	1.06	1.36	1.61	2.13
L	mm	406	421	461	551	660	841	1038
	inch	15.98	16.57	18.15	21.69	25.98	33.11	40.87
M	mm	57	57	73	99	125	160	198
	inch	2.24	2.24	2.87	3.90	4.92	6.30	7.80
N	mm	191	205	246	336	430	559	724
	inch	7.52	8.07	9.68	13.23	16.93	22.01	28.50
O	mm	115	115	145	200	250	344	448
	inch	4.53	4.53	5.71	7.87	9.84	13.54	17.64
O1	mm	112	112	143	192	240	321	396
	inch	4.41	4.41	5.63	7.56	9.45	12.64	15.59
P	mm	70	70	70	70	80	80	114
	inch	2.76	2.76	2.76	2.76	3.15	3.15	4.49
Q	mm	180	180	220	290	350	450	560
	inch	7.09	7.09	8.66	11.42	13.78	17.72	22.05
S	mm	11	11	9	25	38.50	65	80
	inch	0.43	0.43	0.35	0.98	1.52	2.56	3.15
T	mm	185	185	185	185	195	239	271
	inch	7.28	7.28	7.28	7.28	7.68	9.41	10.67
U	mm	70	70	70	70	90	90	90
	inch	2.76	2.76	2.76	2.76	3.54	3.54	3.54
U1	mm	83	83	83	83	103	103	103
	inch	3.27	3.27	3.27	3.27	4.06	4.06	4.06
W	mm	76	76	76	76	94	134	134
	inch	2.99	2.99	2.99	2.99	3.70	5.28	5.28

Flange dimensions: see pages 50 – 51

MAIN DIMENSIONS



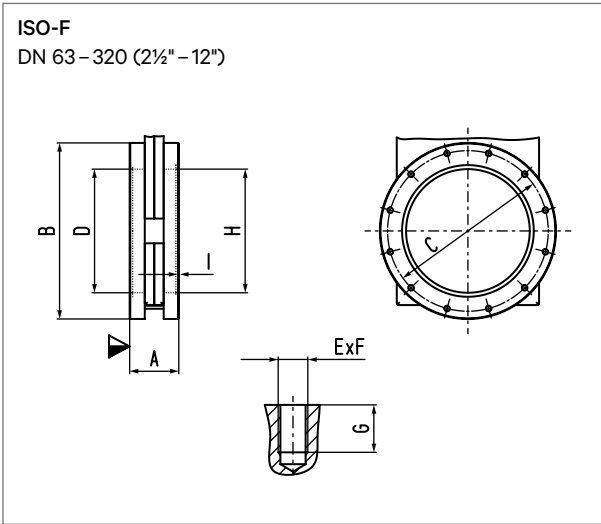
- ▼ Valve seat side
- * Required for dismantling
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ↻ Mechanical position indication
- ⊙ Position indicator
- ⊗ Leak detection hole
- ⊖ Emergency operation
- ⊠ For attachment



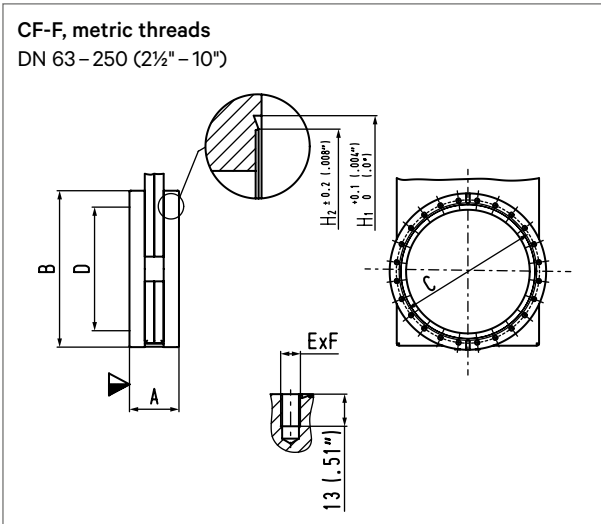
DN	mm	63	80	100	160	200	250	320
	inch	2½	3	4	6	8	10	12
K	mm	27	27	27	27	34.50	41	54
	inch	1.06	1.06	1.06	1.06	1.36	1.61	2.13
L	mm	342	358	414	521	626	796	1010
	inch	13.46	14.07	16.30	20.51	24.65	31.34	39.76
M	mm	57	57	73	99	120	161	198
	inch	2.24	2.24	2.87	3.90	4.73	6.34	7.80
N	mm	191	205	246	336	429	558	723
	inch	7.52	8.07	9.68	13.23	16.89	21.97	28.46
O	mm	115	115	145	200	250	344	448
	inch	4.53	4.53	5.71	7.87	9.84	13.54	17.64
O1	mm	112	112	143	192	230	321	396
	inch	4.41	4.41	5.63	7.56	9.06	12.64	15.59
P	mm	70	70	70	70	80	80	114
	inch	2.76	2.76	2.76	2.76	3.15	3.15	4.49
Q	mm	180	180	220	290	350	450	560
	inch	7.09	7.09	8.66	11.42	13.78	17.72	22.05
S	mm	11	11	9	25	38.50	65	80
	inch	0.43	0.43	0.35	0.98	1.52	2.44	3.15
T	mm	151	151	168	185	197	238	287
	inch	5.94	5.94	6.61	7.28	7.76	9.37	11.30
U	mm	70	70	70	70	90	90	90
	inch	2.76	2.76	2.76	2.76	3.54	3.54	3.54
U1	mm	83	83	83	83	103	103	103
	inch	3.27	3.27	3.27	3.27	4.06	4.06	4.06
V	mm	145	145	145	145	150	150	150
	inch	5.71	5.71	5.71	5.71	5.91	5.91	5.91
W	mm	80	80	80	80	89	89	89
	inch	3.15	3.15	3.15	3.15	3.50	3.50	3.50

Flange dimensions: see pages 50 – 51

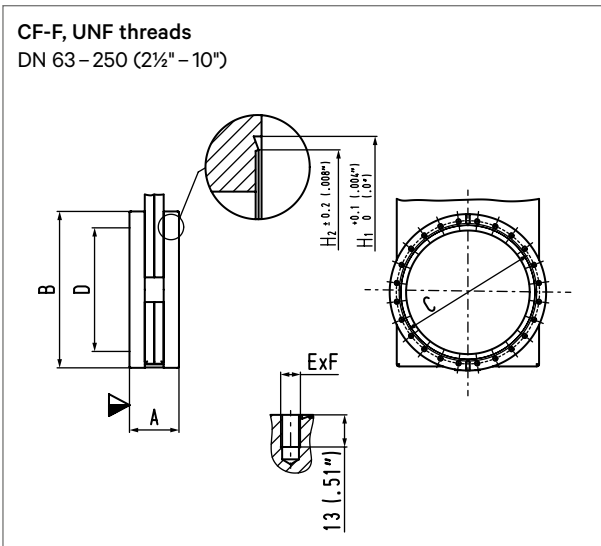
FLANGE DIMENSIONS



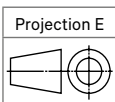
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	350 13.78	425 16.73
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55
D	mm inch	70 2.76	76 2.99	100 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



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	
O.D.	inch	4½	4¾	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	



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 ¹⁾ 10	250 ²⁾ 10
O.D.	mm inch	4½	4¾	6	8	10	12 ¹⁾	13¼ ²⁾
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



▽ Valve seat side

¹⁾ VAT standard O.D. 12"

²⁾ Option O.D. 13¼": Ordering No. 10848-UE44-X, X = O.D. 13¼

FLANGE DIMENSIONS

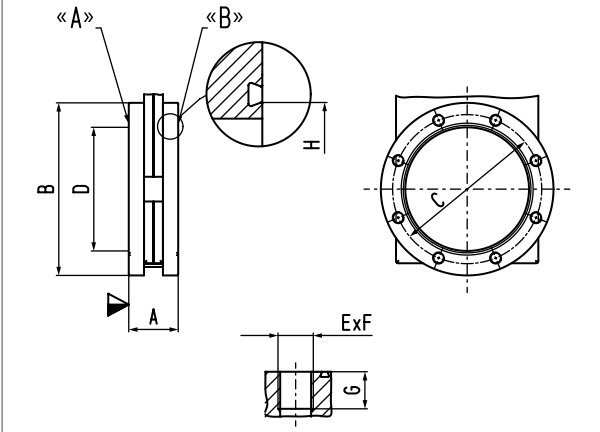
ASA-LP

DN 63 – 320 (2½" – 12")

with or without O-ring groove

For orders with O-ring groove specify:

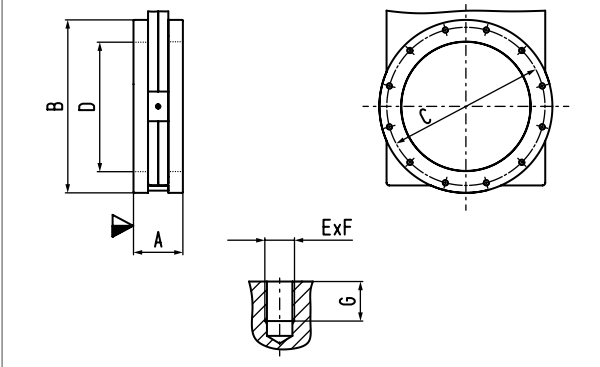
«A», «B» or «A + B»



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 × F		4 × ⅜" 16 UNC	4 × ⅜" 16 UNC	8 × ⅜" 16 UNC	8 × ⅜" 16 UNC	8 × ¾" 10 UNC	8 × ¾" 10 UNC	12 × 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. × D	mm inch	88.49 × 3.53 3.48 × .139	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	266.29 × 3.53 10.48 × .139	316.87 × 7.00 12.47 × .275

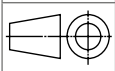
JIS B 2290: 1998 / ISO 1609

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 × F		4 × M10	8 × M10	8 × M10	8 × M10	8 × M12	12 × M12	12 × 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

HV GATE VALVE, SERIES 11.0

General purpose valve for isolation in high vacuum systems. Especially suited to pump isolation.



Good value bellows sealed valve

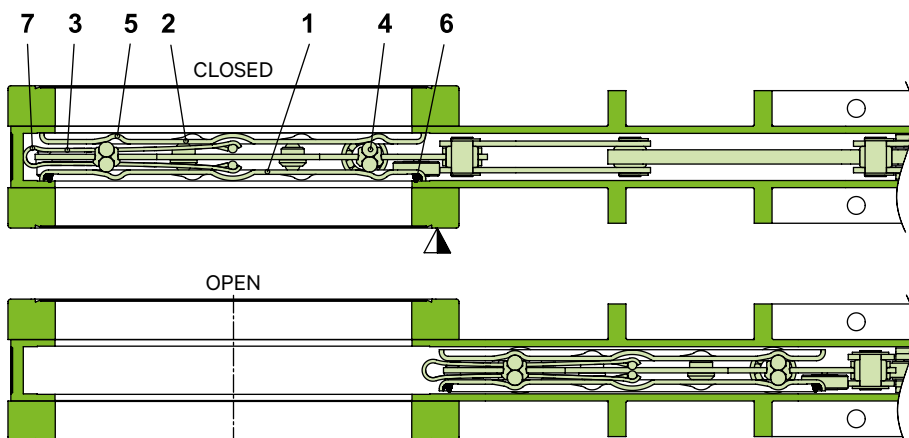
DN 63 – 200 with vulcanized gate seal
(see glossary)

High life cycle

MAIN FEATURES

Sizes	DN 63 – 320 mm (2½" – 12")
Actuators	manual with crank handle pneumatic: double acting 3-position pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	ISO-F, CF-F, ASA-LP, JIS
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



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

TECHNICAL DATA

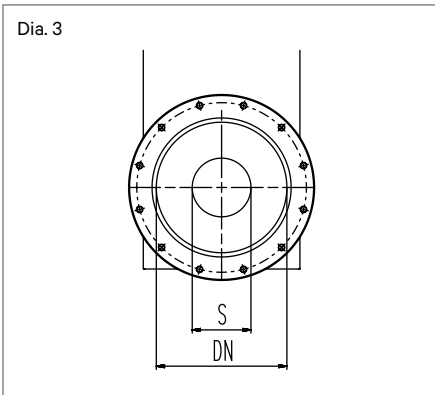
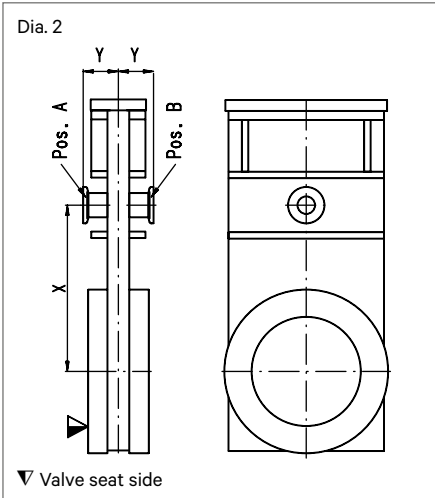
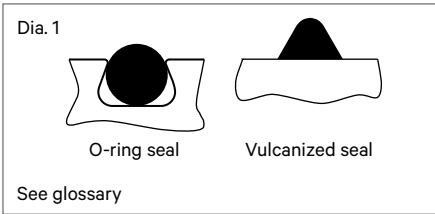
Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	DN 63–200	$1 \cdot 10^{-8}$ mbar to 1.6 bar (abs)
	DN 250–320	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	DN 63–200	≤ 1.6 bar
	DN 250–320	≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service		200 000
Temperature ¹⁾	Valve body	≤ 150 °C
	Manual and pneumatic actuator	≤ 80 °C
	Solenoid valve	≤ 50 °C
	Position indicator	≤ 50 °C
Heating and cooling rate		≤ 50 °C h ⁻¹
Material	Valve body	AISI 304 (1.4301)
	Mechanism DN 63–200 DN 250–320	AISI 316L (1.4404)
		AISI 304 (1.4301)
	Bellows	AISI 633 (AM350)
Seal	Bonnet, gate	FKM (Viton®)
Feedthrough		bellows
Mounting position		any
Solenoid valve		24 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage	≤ 50 V AC/DC
	Current	≤ 1.2 A
Valve position indication		visual (mechanical)

DN (nominal I. D.)			Valve with manual actuator			Valve with pneumatic actuator ²⁾						
						Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator	
mm	inch	ls ⁻¹	n	kg	lbs		bar	psi	l	ft ³	s	kg
63	2½	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	11	24	4–7	58–102	0.11	0.0038	1.20	12	26
160	6	5880	17	16	35	4–7	58–102	0.14	0.0049	1.50	17	37
200	8	12200	17	29	64	4–7	58–102	0.25	0.0087	2	29	64
250	10	21690	40	51	112	5–7	73–102	0.35	0.0122	4	52	115
320	12	29130	45	89	196	5–7	73–102	0.48	0.0167	5	91	200

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

²⁾ Technical data for valve with 3-position pneumatic actuator on request.

OPTIONS, CUSTOMIZED SOLUTIONS



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 24VDC)
- Manual emergency operation on solenoid valve lockable
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Position indicator with change-over contact

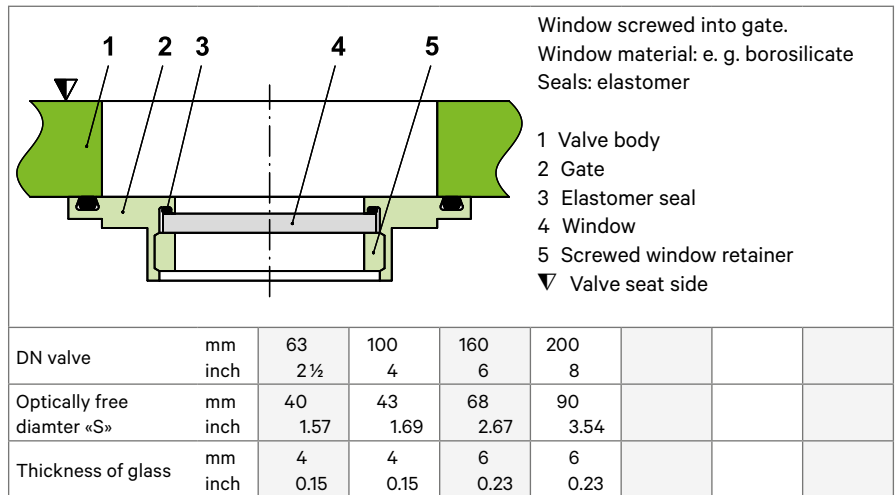
VALVE

- Customer specified flanges with/without watercooling
- Other sealing materials
- O-ring seal in gate (Dia. 1) with DN 63, 100, 160, 200 instead of the vulcanized seal
- Ports for roughing (by-pass), venting or for gauges (Dia. 2): possible positions A and B

DN valve	mm inch	63 2½	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	120 4.72	205 8.07	260 10.24	335 13.19	415 16.34
Y	mm inch	44 1.73	64 2.52	64 2.52	64 2.52	68 2.68	62 2.44	72 2.83

Other ports on request

- Special gate for the installation of various foils
- Window in gate (Dia. 3) with DN 63, 100, 160, 200



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION

FOR STANDARD VALVES

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)

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

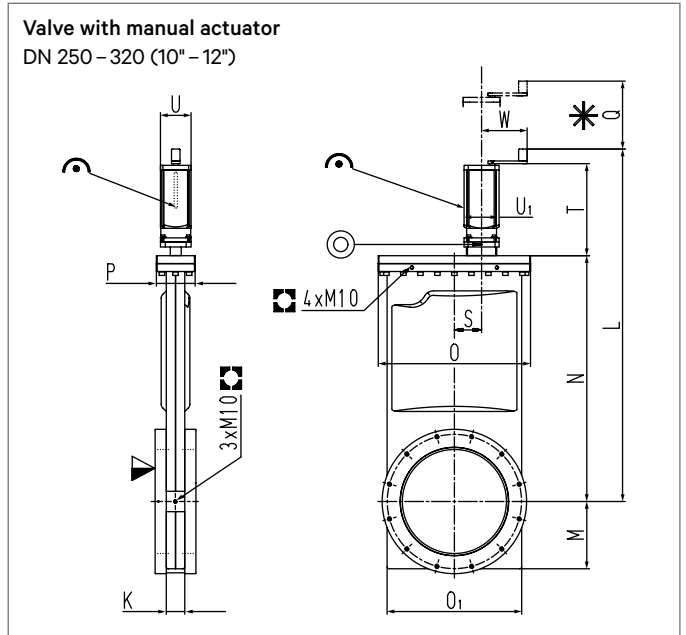
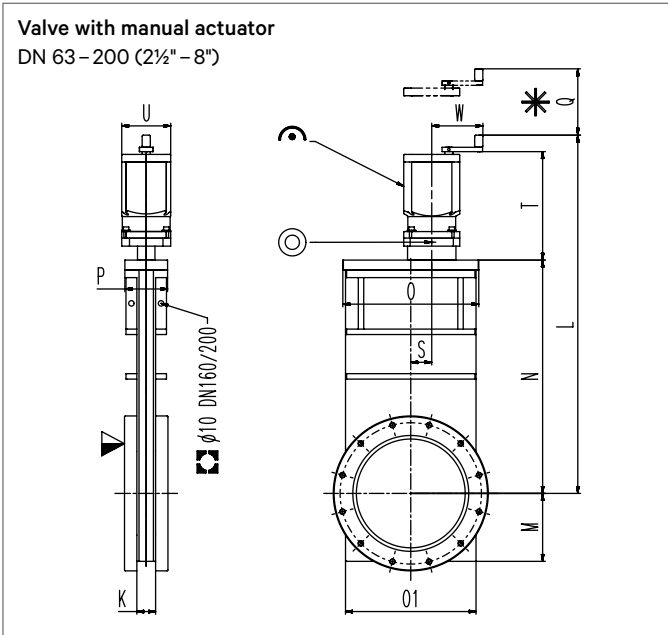
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

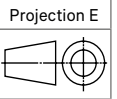
Basic ordering number plus «-X»: -X to be specified

Example: 11040-CE44-X, X = port ISO-KF 40 in position A

MAIN DIMENSIONS



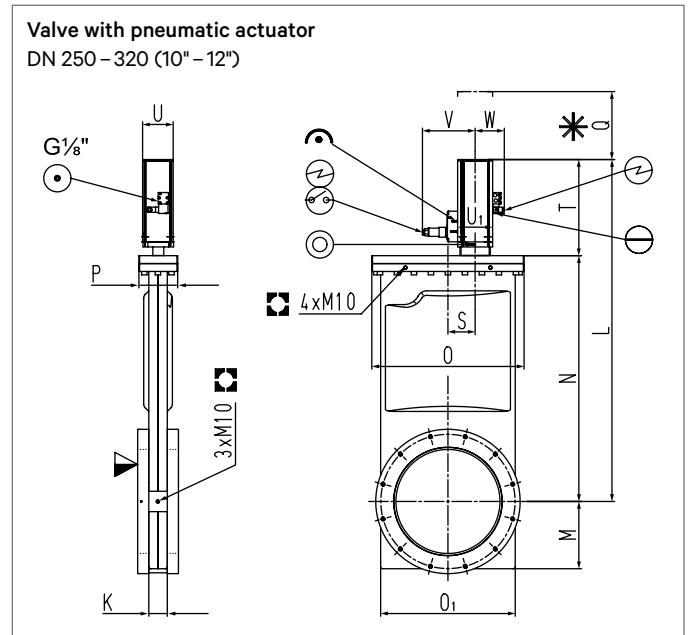
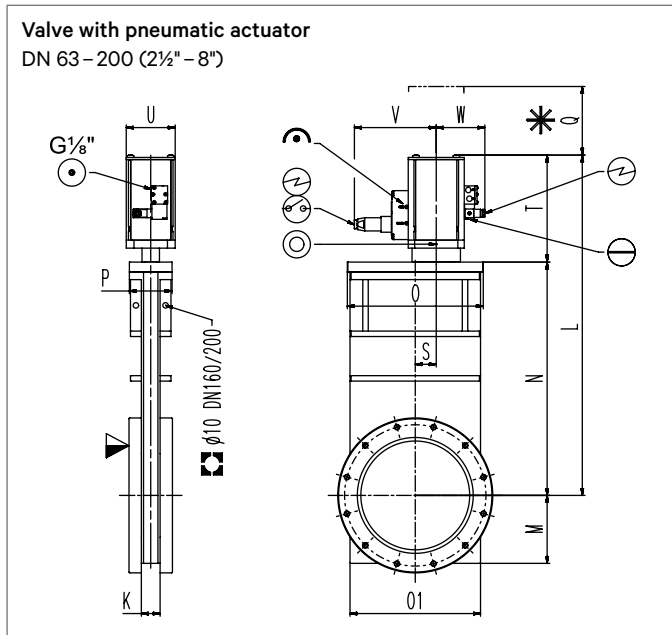
- ▼ Valve seat side
- * Required for dismantling
- ⤴ Mechanical position indication
- ⊙ Leak detection hole
- ▣ For attachment



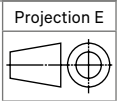
DN	mm	63	80	100	160	200	250	320
	inch	2½	3	4	6	8	10	12
K	mm	27	27	27	27	34.50	41	54
	inch	1.06	1.06	1.06	1.06	1.36	1.61	2.13
L	mm	406	421	461	551	660	841	1038
	inch	15.98	16.57	18.15	21.69	25.98	33.11	40.87
M	mm	57	57	73	99	125	160	198
	inch	2.24	2.24	2.87	3.90	4.92	6.30	7.80
N	mm	191	205	246	336	430	559	724
	inch	7.52	8.07	9.68	13.23	16.93	22.01	28.50
O	mm	115	115	145	200	250	344	448
	inch	4.53	4.53	5.71	7.87	9.84	13.54	17.64
O1	mm	112	112	143	192	240	321	396
	inch	4.41	4.41	5.63	7.56	9.45	12.64	15.59
P	mm	70	70	70	70	80	80	114
	inch	2.76	2.76	2.76	2.76	3.15	3.15	4.49
Q	mm	180	180	220	290	350	450	560
	inch	7.09	7.09	8.66	11.42	13.78	17.72	22.05
S	mm	11	11	9	25	38.50	65	80
	inch	0.43	0.43	0.35	0.98	1.52	2.56	3.15
T	mm	185	185	185	185	195	239	271
	inch	7.28	7.28	7.28	7.28	7.68	9.41	10.67
U	mm	70	70	70	70	90	90	90
	inch	2.76	2.76	2.76	2.76	3.54	3.54	3.54
U1	mm	83	83	83	83	103	103	103
	inch	3.27	3.27	3.27	3.27	4.06	4.06	4.06
W	mm	76	76	76	76	94	134	134
	inch	2.99	2.99	2.99	2.99	3.70	5.28	5.28

Flange dimensions: see pages 58 – 59

MAIN DIMENSIONS



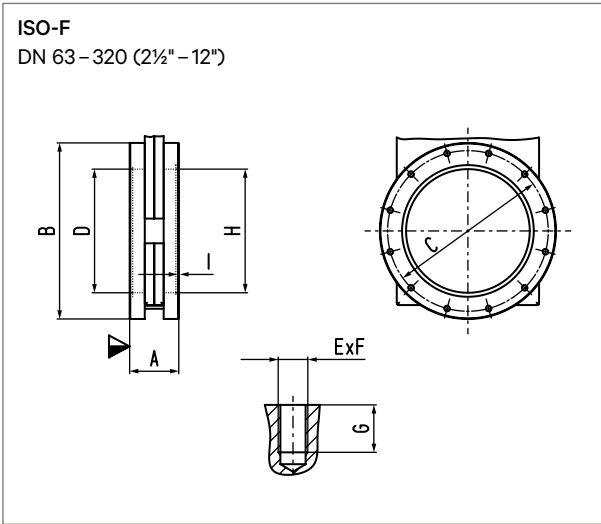
- ▼ Valve seat side
- * Required for dismantling
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ↻ Mechanical position indication
- ⊙ Position indicator
- ⊗ Leak detection hole
- ⊖ Emergency operation
- ⊠ For attachment



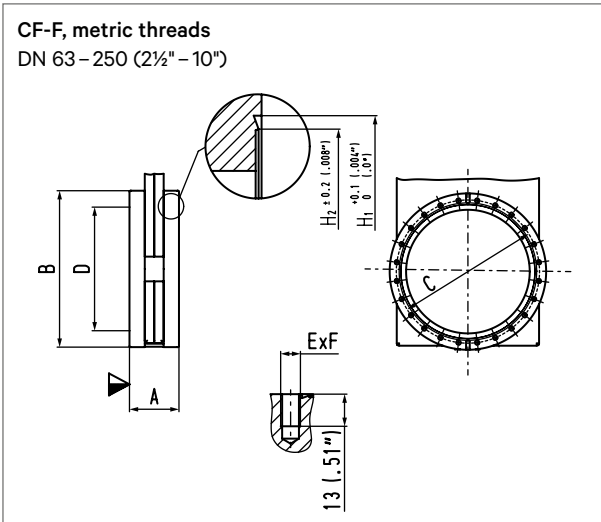
DN	mm	63	80	100	160	200	250	320
	inch	2½	3	4	6	8	10	12
K	mm	27	27	27	27	34.50	41	54
	inch	1.06	1.06	1.06	1.06	1.36	1.61	2.13
L	mm	342	358	414	521	626	796	1010
	inch	13.46	14.07	16.30	20.51	24.65	31.34	39.76
M	mm	57	57	73	99	120	161	198
	inch	2.24	2.24	2.87	3.90	4.73	6.34	7.80
N	mm	191	205	246	336	429	558	723
	inch	7.52	8.07	9.68	13.23	16.89	21.97	28.46
O	mm	115	115	145	200	250	344	448
	inch	4.53	4.53	5.71	7.87	9.84	13.54	17.64
O1	mm	112	112	143	192	230	321	396
	inch	4.41	4.41	5.63	7.56	9.06	12.64	15.59
P	mm	70	70	70	70	80	80	114
	inch	2.76	2.76	2.76	2.76	3.15	3.15	4.49
Q	mm	180	180	220	290	350	450	560
	inch	7.09	7.09	8.66	11.42	13.78	17.72	22.05
S	mm	11	11	9	25	38.50	65	80
	inch	0.43	0.43	0.35	0.98	1.52	2.44	3.15
T	mm	151	151	168	185	197	238	287
	inch	5.94	5.94	6.61	7.28	7.76	9.37	11.30
U	mm	70	70	70	70	90	90	90
	inch	2.76	2.76	2.76	2.76	3.54	3.54	3.54
U1	mm	83	83	83	83	103	103	103
	inch	3.27	3.27	3.27	3.27	4.06	4.06	4.06
V	mm	145	145	145	145	150	150	150
	inch	5.71	5.71	5.71	5.71	5.91	5.91	5.91
W	mm	80	80	80	80	89	89	89
	inch	3.15	3.15	3.15	3.15	3.50	3.50	3.50

Flange dimensions: see pages 58 – 59

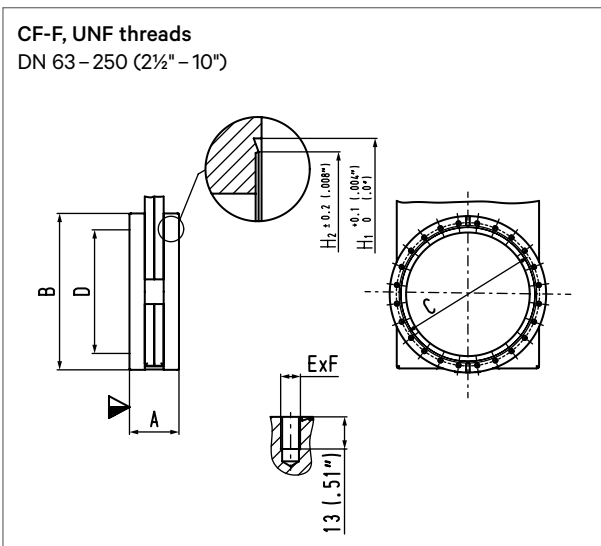
FLANGE DIMENSIONS



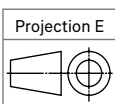
DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	350 13.78	425 16.73
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55
D	mm inch	70 2.76	76 2.99	100 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



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	
O.D.	inch	4½	4¾	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	



DN	mm inch	63 2½	80 3	100 4	160 6	200 8	250 ¹⁾ 10	250 ²⁾ 10
O.D.	mm inch	4½	4¾	6	8	10	12 ¹⁾	13¼ ²⁾
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



▽ Valve seat side

¹⁾ VAT standard O.D. 12"

²⁾ Option O.D. 13¼": Ordering No. 11048-UE44-X, X = O.D. 13¼"

FLANGE DIMENSIONS

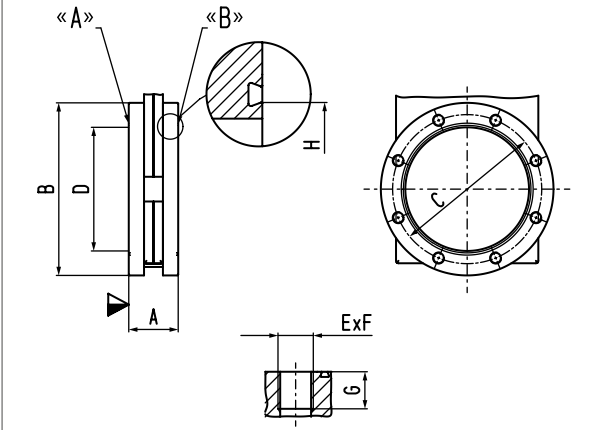
ASA-LP

DN 63 – 320 (2½" – 12")

with or without O-ring groove

For orders with O-ring groove specify:

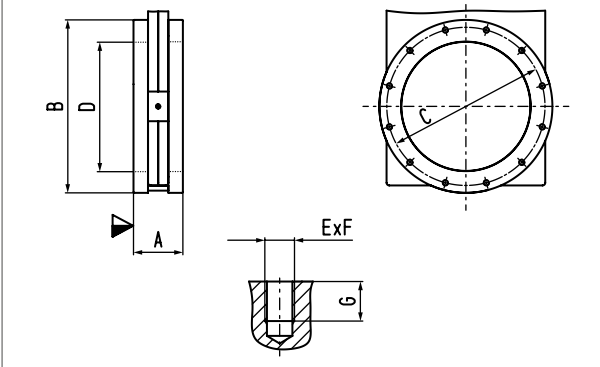
«A», «B» or «A + B»



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 × F		4 × ¾" 16 UNC	4 × ¾" 16 UNC	8 × ¾" 16 UNC	8 × ¾" 16 UNC	8 × ¾" 10 UNC	8 × ¾" 10 UNC	12 × 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. × D	mm inch	88.49 × 3.53 3.48 × .139	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	266.29 × 3.53 10.48 × .139	316.87 × 7.00 12.47 × .275

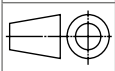
JIS B 2290: 1998 / ISO 1609

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 × F		4 × M10	8 × M10	8 × M10	8 × M10	8 × M12	12 × M12	12 × 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

VACUUM GATE VALVE, SERIES 12.1

The standard valve for VACUUM isolation applications in research and industry.



Low cost of ownership

Through holes for direct mounting (option)

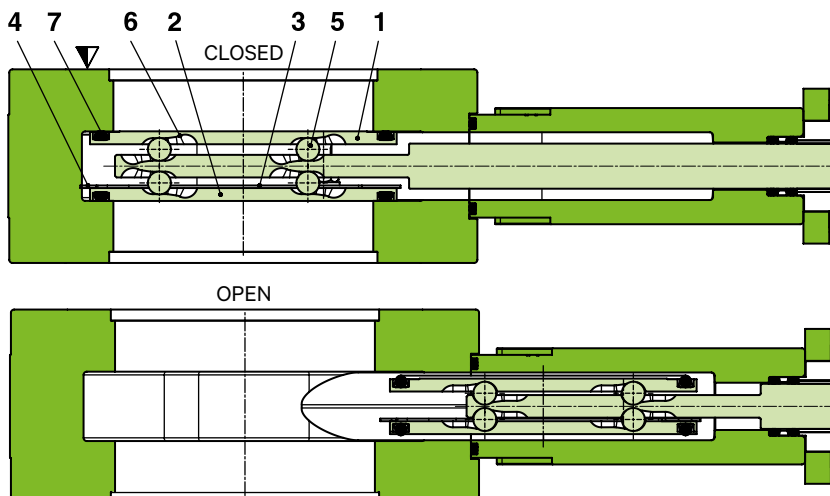
Split body for easy cleaning

Mechanically locked in closed position

MAIN FEATURES

Sizes	DN 63 – 320 mm (2½" – 12")
Actuators	manual with push rod pneumatic: double acting
Body material	aluminum
Feedthrough	shaft feedthrough
Standard flanges	ISO-F, JIS
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



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

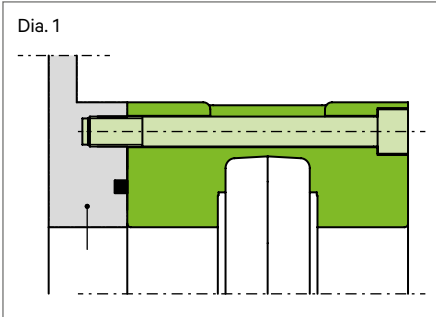
TECHNICAL DATA

Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	DN 63 – 200	$1 \cdot 10^{-7}$ mbar to 1.6 bar (abs)
	DN 250 – 320	$1 \cdot 10^{-7}$ 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	DN 63 – 100	200 000
	DN 160 – 320	100 000
Temperature ¹⁾	Valve body	≤ 120 °C
	Manual and pneumatic actuator	≤ 80 °C
	Solenoid valve	≤ 50 °C
	Position indicator	≤ 80 °C
Heating and cooling rate		≤ 30 °C h ⁻¹
Material	Valve body DN 63 – 100	EN AW-5083 (3.3547), EN AW-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 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage	≤ 250 V AC ≤ 50 V DC
	Current	≤ 2 A ≤ 1.2 A
Valve position indication		visual (mechanical)

DN (nominal I. D.)		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 pneumatic actuator		Closing or opening time	Weight	
mm	inch	ls ⁻¹	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2½	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

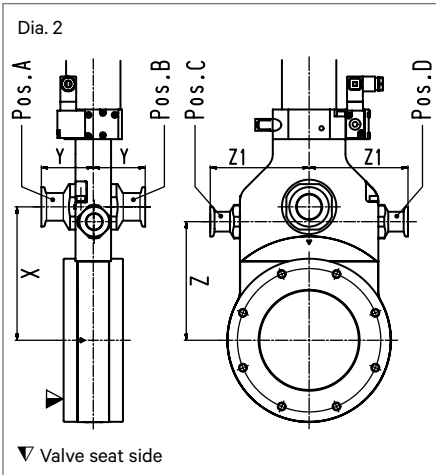
¹⁾ Maximum values: depending on operating conditions and sealing materials.

OPTIONS, CUSTOMIZED SOLUTIONS



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 24VDC)
- 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 roughing (by-pass), venting or for gauges (Dia. 2):
DN 63 – 100 possible positions C and C
DN 63 – 320 possible positions A, B, C and D

DN valve	mm inch	63 2½	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								

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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, 16.8, 19

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

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

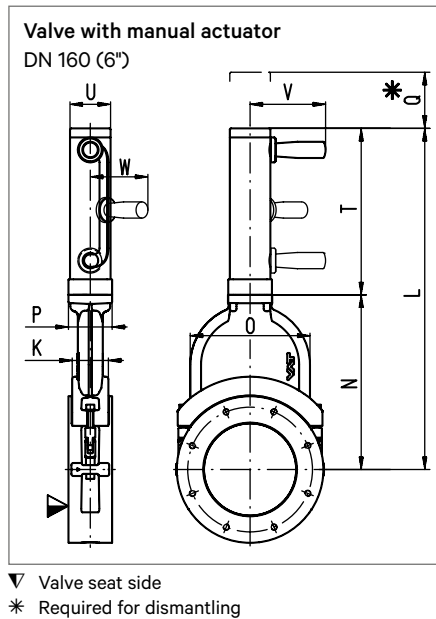
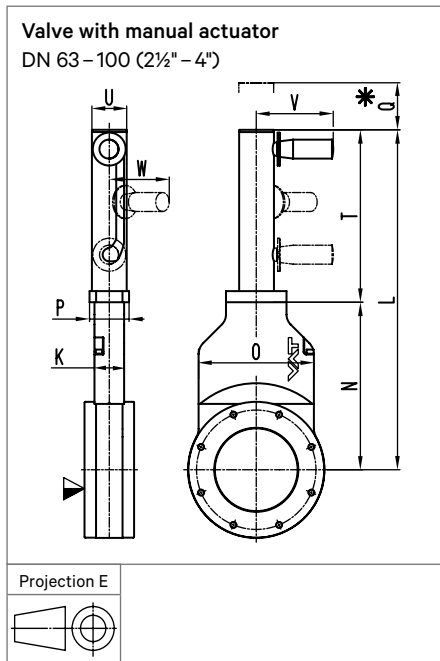
with solenoid valve, without position indicator: 121... - A34 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 12148-PA44-X, X = port ISO-KF 40 in position A

MAIN DIMENSIONS

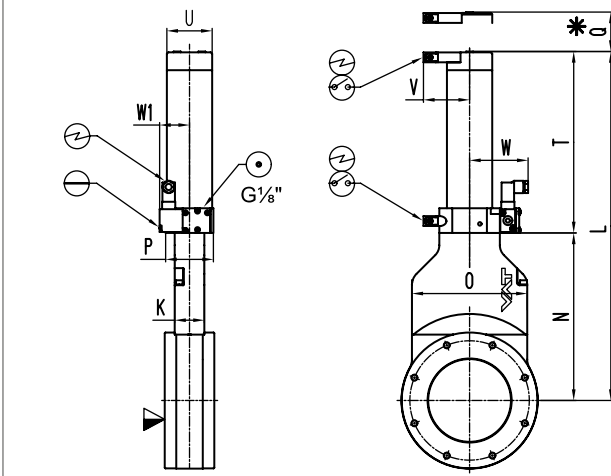


DN	mm	63	80	100	160
	inch	2½	3	4	6
K	mm	36	36	36	58
	inch	1.42	1.42	1.42	2.28
L	mm	329.50	363	413	547
	inch	12.97	14.29	16.26	21.54
N	mm	155.50	173.50	203.50	280
	inch	6.12	6.83	8.01	11.02
O	mm	100	118	140	192
	inch	3.94	4.65	5.51	7.56
P	mm	48	48	48	70
	inch	1.89	1.89	1.89	2.76
Q	mm	25	25	25	60
	inch	0.98	0.98	0.98	2.36
T	mm	174	189.50	209.50	267
	inch	6.85	7.46	8.25	10.51
U	mm	43	43	43	65
	inch	1.69	1.69	1.69	2.56
V	mm	94	94	94	122
	inch	3.70	3.70	3.70	4.80
W	mm	75	75	75	95
	inch	2.95	2.95	2.95	3.74

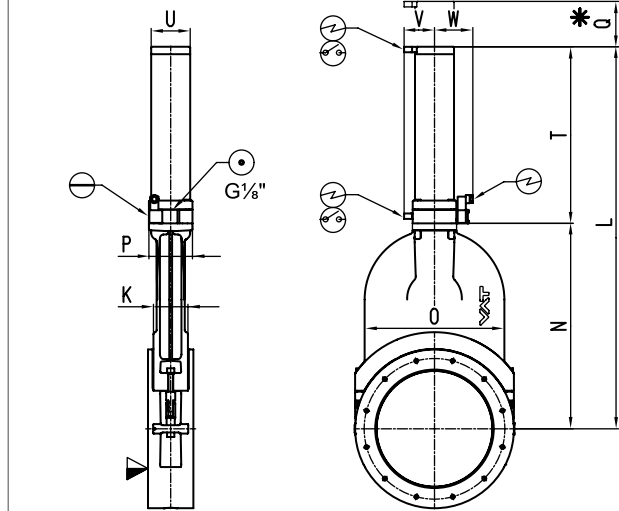
Flange dimensions: see page 65

MAIN DIMENSIONS

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

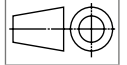


Valve with pneumatic actuator
DN 160 – 320 (6" – 12")



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

Projection E



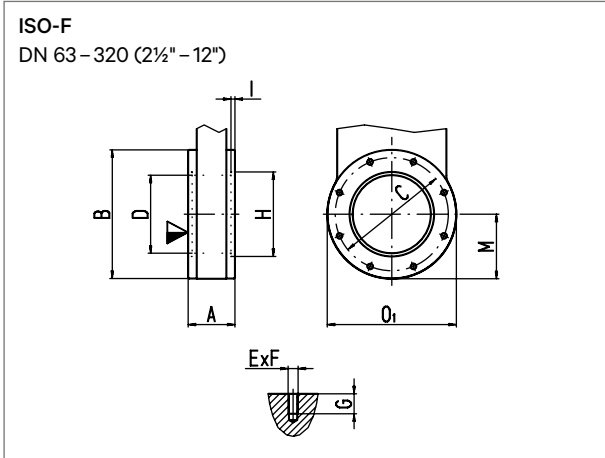
DN	mm	63	80	100
	inch	2½	3	4
K	mm	36	36	36
	inch	1.42	1.42	1.42
L	mm	341.50	375	425
	inch	13.45	14.76	16.69
N	mm	155.50	173.50	203.50
	inch	6.12	6.83	8.01
O	mm	100	118	140
	inch	3.94	4.65	5.51
P	mm	58	58	58
	inch	2.28	2.28	2.28
Q	mm	25	25	25
	inch	0.98	0.98	0.98
T	mm	186	201.50	221.50
	inch	7.32	7.93	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

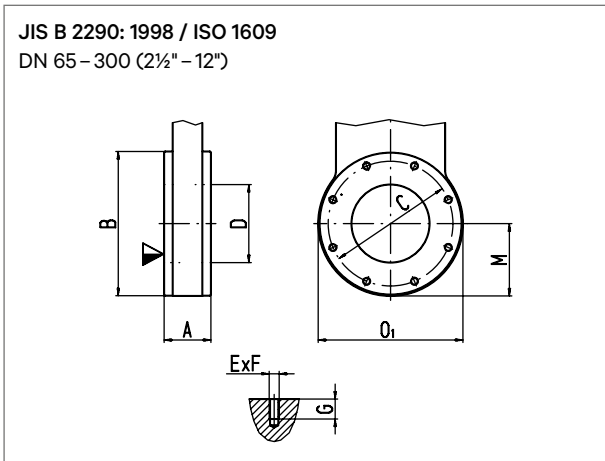
Flange dimensions: see page 65

FLANGE DIMENSIONS

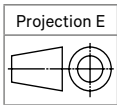
A



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



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



▽ Valve seat side

HV GATE VALVE, SERIES 14.0

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

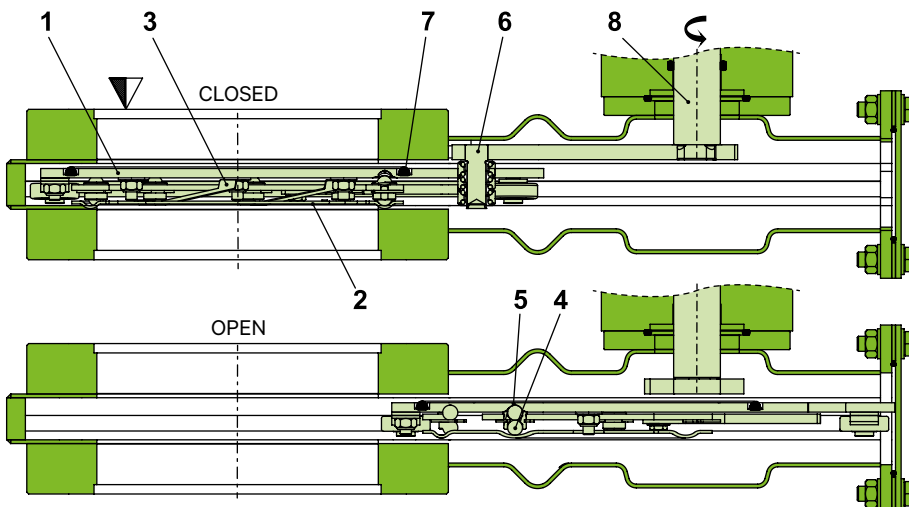


Compact design
Variable actuator positions
Rotary feed-through for a high number of cycles

MAIN FEATURES

Sizes	DN 63 – 400 mm (2½" – 16")
Actuators	manual with lever or handwheel pneumatic: double acting 3-position pneumatic: double acting
Body material	stainless steel
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, CF-F, ASA-LP/ASA, JIS
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Gate
 - 2 Counter-plate
 - 3 Leaf springs
 - 4 Ball pairs
 - 5 Ball detents
 - 6 Crank bolt
 - 7 Gate seal
 - 8 Actuator shaft
- ▼ Valve seat side

TECHNICAL DATA

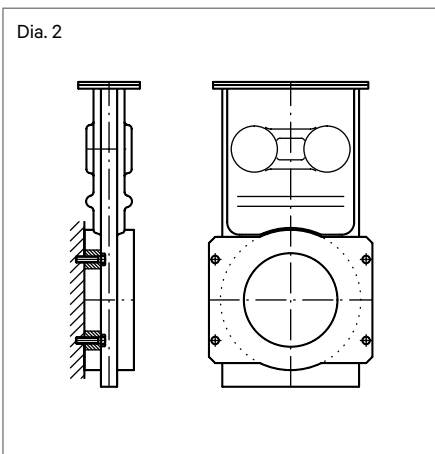
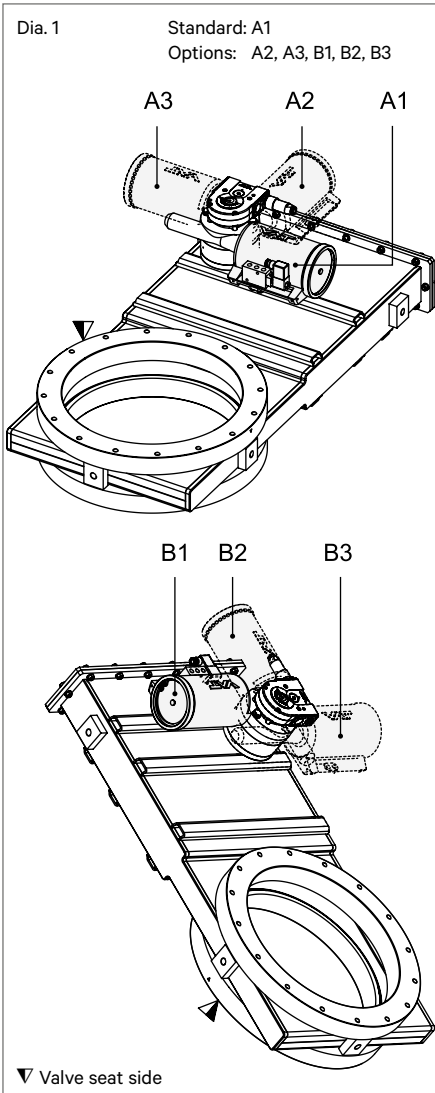
Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	DN 63–200	$1 \cdot 10^{-8}$ mbar to 2 bar (abs)
	DN 250–400	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	DN 63–200	≤ 2 bar
	DN 250–400	≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service		200 000 ¹⁾
Temperature ²⁾	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, valve gate	AISI 304 (1.4301)
	Mechanism (main components)	AISI 301 (1.4310), AISI 304 (1.4301), AISI 316L (1.4404), AISI 420 (1.4034),
Seal	Bonnet, gate	FKM (Viton®)
Feedthrough		rotary feedthrough
Mounting position	DN 63–350	any
	DN 400	horizontal ¹⁾
Solenoid valve		24 V DC, 2.5 W (others on request)
Position indicator: contact rating	Voltage	≤ 250 V AC ≤ 50 V DC
	Current	≤ 5 A ≤ 3 A
Valve position indication		visual (mechanical)

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator						Valve with pneumatic actuator												
			lever		handwheel		Compressed air min. – max. overpressure	standard				3-position									
mm	inch	ls ⁻¹	Angle of rotation per stroke °	Weight kg	Weight lbs	Turns per stroke n		Weight kg	Weight lbs	bar	psi	Volume of pneumatic actuator l	Volume of pneumatic actuator ft ³	Closing or opening time s	Weight kg	Weight lbs	Minimum controllable conductance ls ⁻¹	Volume of pneumatic actuator l	Volume of pneumatic actuator ft ³	Closing or opening time s	Weight kg
63	2½	440	130	10	22	41	10	22	4–7	58–102	0.15	0.005	1.5	10	22	3	0.53	0.019	2.5	14	31
80	3	890	130	10	22	41	10	22	4–7	58–102	0.15	0.005	1.5	10	22	–	–	–	–	–	–
100	4	1740	130	13	28	41	15	33	4–7	58–102	0.15	0.005	1.5	15	34	5	0.53	0.019	2.5	17	37
160	6	5150	130	24	52	37	26	57	4–7	58–102	0.32	0.011	2.5	27	58	7.5	0.96	0.034	3.5	30	66
200	8	12200	130	30	66	37	32	70	4–7	58–102	0.32	0.011	2.5	33	72	10	0.96	0.034	3.5	36	79
250	10	21690	130	58	127	48	60	132	4–7	58–102	0.84	0.030	4.5	62	137	12.5	2.62	0.093	6	69	151
320	12	32690	130	108	237	48	110	242	4–7	58–102	0.84	0.030	4.5	112	246	16	2.62	0.093	6	119	261
350	14	43580	130	108	237	48	110	242	4–7	58–102	0.84	0.030	4.5	112	246	16	2.62	0.093	6	127	279
400	16	52050	–	–	–	48	153	336	4–7	58–102	0.84	0.030	5.5	155	340	20	2.62	0.093	10	164	360

¹⁾ DN 400 in horizontal mounting position only. Mounting the valve in any other position may reduce the cycle lifetime.

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

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

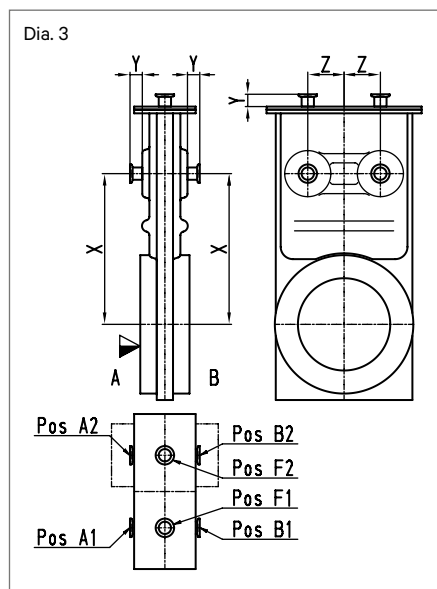
- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard 24VDC)
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Actuator mountable in 6 positions (Dia. 1):
A1, A2, A3 (valve seat side) or B1, B2, B3 (rear side) – desired position to be specified with order.
Without specification, the actuator is mounted in the standard position A1.

VALVE

- Customer specified flanges with/without watercooling
- Other sealing materials
- Intermediate pumping of the rotary feedthrough
- For direct mounting to flat chamber (Dia. 2):
special flange for mounting to chamber wall, standard flange on opposite side
- Ports for roughing (by-pass), venting or for gauges (Dia. 3):
possible positions A1, A2, B1, B2, F1, F2

DN valve	mm	63	80	100	160	200	250	320	350	400
	inch	2½	3	4	6	8	10	12	14	16
Recommended port	mm	16	16	40	40	40	40	40	40	40
CF-F or ISO-KF	inch	¾	¾	1½	1½	1½	1½	1½	1½	1½
X	mm	146	146	185	245	304.40	387.30	482	482	415
	inch	5.75	5.75	7.28	9.65	11.98	15.25	18.98	18.98	16.34
Y	mm	30	30	30	30	30	30	30	30	30
	inch	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
Z	mm	30	30	47.50	59	85	100	135	135	140
	inch	1.18	1.18	1.87	2.32	3.35	3.94	5.31	5.31	5.51

Other ports on request



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

Valve with manual actuator handwheel

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP (T) ASA (A)	JIS
63	2 ½	14036-PE01	14036-CE01	14036-UE01	14036-TE01	14036-JE01
80	3	14038-PE01	14038-CE01	14038-UE01	on request	on request
100	4	14040-PE01	14040-CE01	14040-UE01	14040-TE01	14040-JE01
160	6	14044-PE01	14044-CE01	14044-UE01	14044-TE01	14044-JE01
200	8	14046-PE01	14046-CE01	14046-UE01	14046-TE01	14046-JE01
250	10	14048-PE01	14048-CE01	14048-UE01	14048-TE01	14048-JE01
320	12	14050-PE01	on request	on request	14050-TE01	14050-JE01
350	14	on request	on request	on request	on request	14051-JE01
400	16	14052-PE01	on request	on request	on request	14052-JE01

with handwheel, with position indicator: 140 . . . E08

with lever (instead of handwheel, DN 63 – 350 only): 140 . . . 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 (T) ASA (A)	JIS
63	2 ½	14036-PE44	14036-CE44	14036-UE44	14036-TE44	14036-JE44
80	3	14038-PE44	14038-CE44	14038-UE44	on request	on request
100	4	14040-PE44	14040-CE44	14040-UE44	14040-TE44	14040-JE44
160	6	14044-PE44	14044-CE44	14044-UE44	14044-TE44	14044-JE44
200	8	14046-PE44	14046-CE44	14046-UE44	14046-TE44	14046-JE44
250	10	14048-PE44	14048-CE44	14048-UE44	14048-TE44	14048-JE44
320	12	14050-PE44	on request	on request	14050-TE44	14050-JE44
350	14	on request	on request	on request	on request	14051-JE44
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)

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 (T) ASA (A)	JIS
63	2 ½	14036-PE48	14036-CE48	14036-UE48	14036-TE48	14036-JE48
100	4	14040-PE48	14040-CE48	14040-UE48	14040-TE48	14040-JE48
160	6	14044-PE48	14044-CE48	14044-UE48	14044-TE48	14044-JE48
200	8	14046-PE48	14046-CE48	14046-UE48	14046-TE48	14046-JE48
250	10	14048-PE48	14048-CE48	14048-UE48	14048-TE48	14048-JE48
320	12	14050-PE48	on request	on request	14050-TE48	14050-JE48
350	14	on request	on request	on request	on request	14051-JE48
400	16	14052-PE48	on request	on request	14052-AE48	14052-JE48

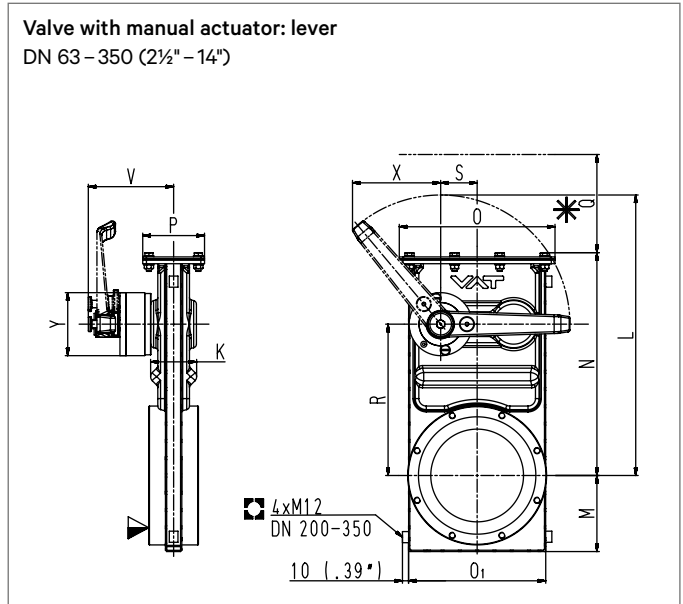
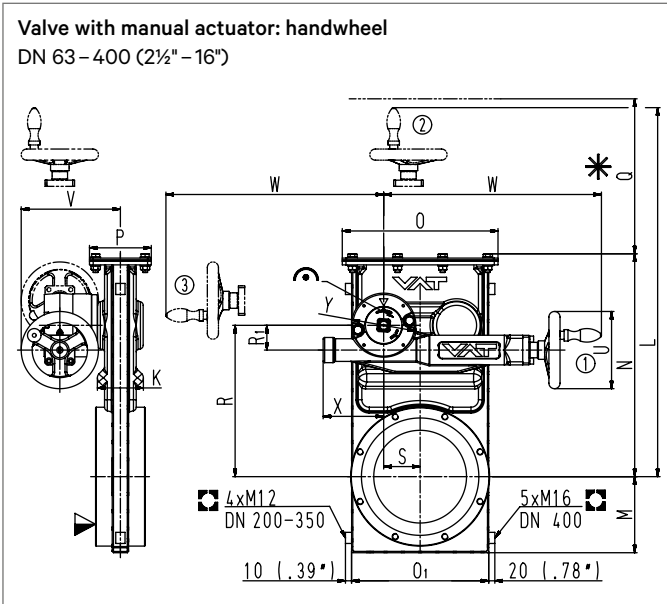
without solenoid valve, with position indicator: 140 . . . E28

ORDERING INFORMATION FOR VALVES WITH OPTIONS

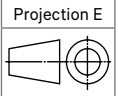
Basic ordering number plus «-X»: -X to be specified

Example: 14046-CE44-X, X = port CF-F 40 in position A1

MAIN DIMENSIONS



- ▼ Valve seat side
- * Required for dismantling
- ↻ Mechanical position indication
- For attachment
- ① Standard actuator position (A1)
- ②③ Optional actuator positions

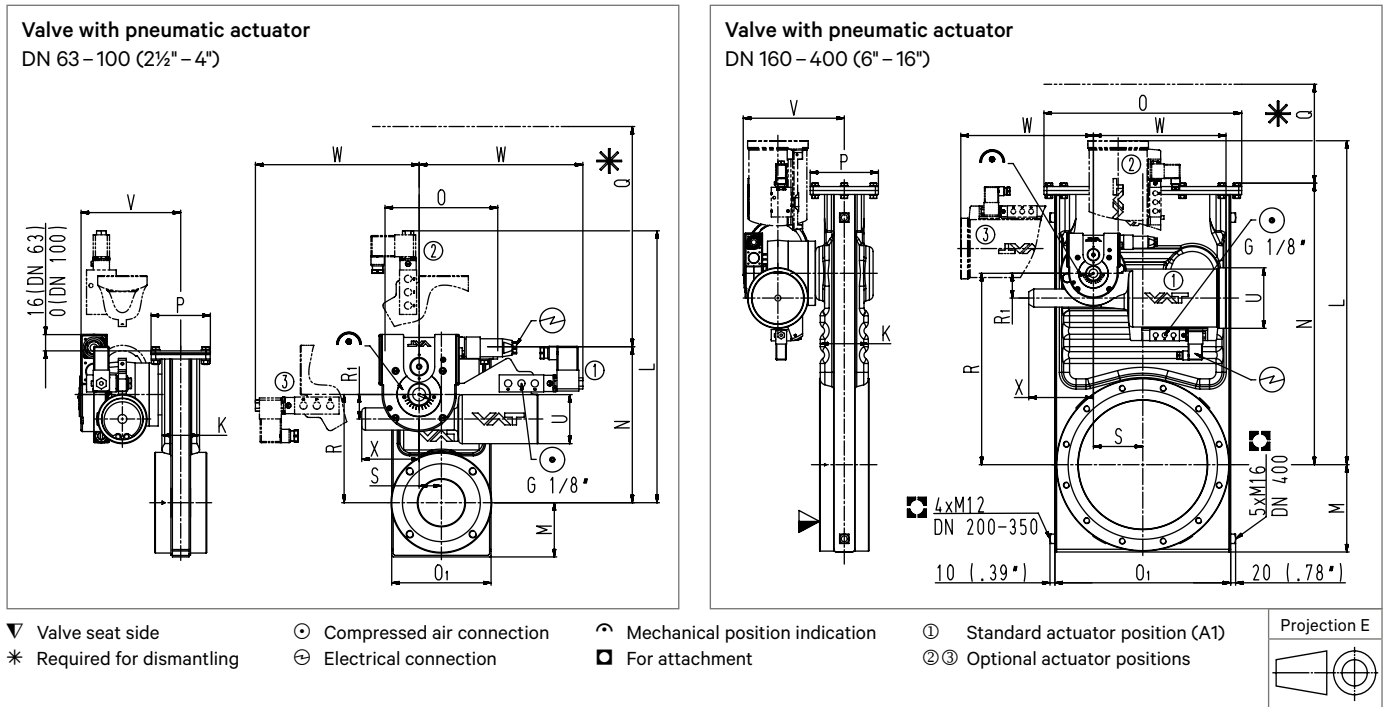


DN	mm	63 / 80	100	160	200	250	320/350	400
inch		2½ / 3	4	6	8	10	12/14	16
K	mm	51	63	75	77	117	120	130
inch		2.01	2.48	2.95	3.03	4.60	4.72	5.12
L	mm	458	497	595	655	771	849	935
inch		18.03	19.57	23.43	25.79	30.35	33.42	36.81
M	mm	73	93	123	148	177	214	232
inch		2.87	3.66	4.84	5.83	6.97	8.43	9.13
N	mm	211	270	362	441	570	689	787
inch		8.31	10.63	14.25	17.36	22.44	27.13	31
O	mm	152	190	252	304	400	475	520
inch		5.98	7.48	9.92	11.97	15.75	18.70	20.47
O1	mm	134	172	222	274	356	421	474
inch		5.28	6.77	8.74	10.79	14.02	16.57	18.66
P	mm	80	80	100	100	138	138	138
inch		3.15	3.15	3.94	3.94	5.43	5.43	5.43
Q	mm	180	220	300	350	450	550	600
inch		7.09	8.66	11.81	13.78	17.72	21.65	23.62
R	mm	146	185	245	305	387	482	568
inch		5.75	7.28	9.65	12.01	15.24	18.98	22.36
R1	mm	33	33	40	40	50	50	50
inch		1.30	1.30	1.57	1.57	1.97	1.97	1.97
S	mm	30	47.50	59	85	100	135	140
inch		1.18	1.87	2.32	3.35	3.94	5.31	5.51
U	mm	100	100	125	125	125	125	125
inch		3.94	3.94	4.92	4.92	4.92	4.92	4.92
V	mm	129	129	160.50	160.50	196.50	198	202
inch		5.08	5.08	6.32	6.32	7.74	7.80	7.95
W	mm	312	312	350	350	385	385	385
inch		12.28	12.28	13.78	13.78	15.16	15.16	15.16
X	mm	78	78	98	98	130	130	130
inch		3.07	3.07	3.86	3.86	5.12	5.12	5.12
Y	mm	85	85	104	104	130	130	130
inch		3.35	3.35	4.09	4.09	5.12	5.12	5.12

DN	mm	63 / 80	100	160	200	250	320/350
inch		2½ / 3	4	6	8	10	12/14
K	mm	51	63	75	75	117	120
inch		2.01	2.48	2.95	2.95	4.60	4.72
L	mm	276	315	455	515	817	1012
inch		10.87	12.40	17.91	20.27	32.17	39.84
M	mm	73	93	123	148	182	214
inch		2.87	3.66	4.84	5.83	7.17	8.43
N	mm	211	270	362	441	570	688
inch		8.31	10.63	14.25	17.36	22.44	27.09
O	mm	152	190	252	304	400	475
inch		5.98	7.48	9.92	11.97	15.75	18.70
O1	mm	134	172	222	274	356	421
inch		5.28	6.77	8.74	10.79	14.02	16.57
P	mm	80	80	100	100	138	138
inch		3.15	3.15	3.94	3.94	5.43	5.43
Q	mm	180	220	300	350	450	550
inch		7.09	8.66	11.81	13.78	17.72	21.65
R	mm	146	185	245	305	387	482
inch		5.75	7.28	9.65	12.01	15.24	18.98
S	mm	30	47.50	59	85	100	135
inch		1.18	1.87	2.32	3.35	3.94	5.31
V	mm	120	120	138	138	189	189
inch		4.72	4.72	5.43	5.43	7.44	7.44
X	mm	96	96	143	143	293	353
inch		3.78	3.78	5.63	5.63	11.54	13.90
Y	mm	85	85	102	102	130	130
inch		3.35	3.35	4.02	4.02	5.12	5.12

Flange dimensions: see pages 72 – 73

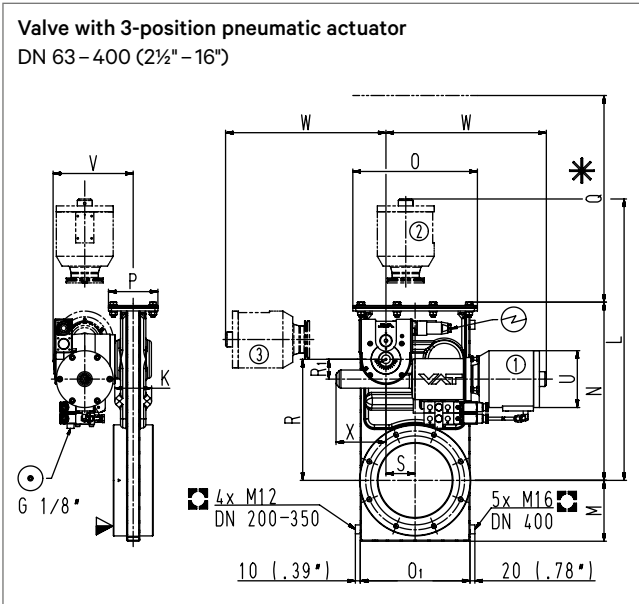
MAIN DIMENSIONS



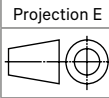
DN	mm inch	63 / 80 2½ / 3	100 4	160 6	200 8	250 10	320 12	350 14	400 16
K	mm inch	51 2.01	63 2.48	75 2.95	75 2.95	117 4.60	120 4.72	120 4.72	130 5.12
L	mm inch	367 14.45	406 15.98	435 17.13	495 19.49	654 25.75	750 29.59	750 29.59	836 32.91
M	mm inch	73 2.87	93 3.66	123 4.84	148 5.83	177 6.97	214 8.43	214 8.43	232 9.13
N	mm inch	211 8.31	270 10.63	362 14.25	441 17.36	570 22.44	689 27.13	689 27.13	787 31
O	mm inch	152 5.98	190 7.48	252 9.92	304 11.97	400 15.75	475 18.70	475 18.70	520 20.47
O1	mm inch	134 5.28	172 6.77	222 8.74	274 10.79	356 14.02	421 16.57	421 16.57	474 18.66
P	mm inch	80 3.15	80 3.15	100 3.94	100 3.94	138 5.43	138 5.43	138 5.43	138 5.43
Q	mm inch	180 7.09	220 8.66	300 11.81	350 13.78	450 17.72	550 21.65	550 21.65	600 23.62
R	mm inch	146 5.75	185 7.28	245 9.65	305 12.01	387 15.24	482 18.98	482 18.98	568 22.36
R1	mm inch	33 1.30	33 1.30	40 1.57	40 1.57	50 1.97	50 1.97	50 1.97	50 1.97
S	mm inch	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
U	mm inch	66 2.60	66 2.60	87 3.43	87 3.43	122.50 4.82	122.50 4.82	122.50 4.82	122.50 4.82
V	mm inch	136 5.35	135 5.32	158 6.22	158 6.22	202 7.95	202 7.95	202 7.95	206 8.11
W	mm inch	221 8.70	221 8.70	190 7.48	190 7.48	268 10.55	268 10.55	268 10.55	268 10.55
X	mm inch	78 3.07	78 3.07	101 3.98	101 3.98	131 5.16	131 5.16	131 5.16	131 5.16

Flange dimensions: see pages 72 – 73

MAIN DIMENSIONS



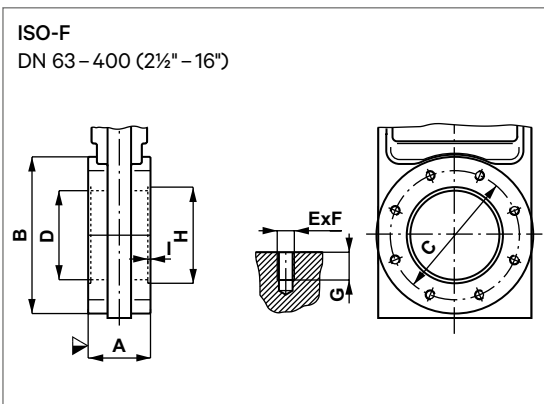
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- For attachment
- ① Standard actuator position (A1)
- ②③ Optional actuator positions



DN	mm	63	100	160	200	250	320	350	400
inch		2½	4	6	8	10	12	14	16
K	mm	51	63	75	75	116	120	120	130
inch		2.01	2.48	2.95	2.95	4.57	4.72	4.72	5.12
L	mm	474 ¹⁾	503 ¹⁾	569	628	843	938	938	1024
inch		18.66	19.80	22.40	24.72	33.19	36.93	36.93	40.31
M	mm	73	93	123	148	177	214	214	232
inch		2.87	3.66	4.84	5.83	6.97	8.43	8.43	9.13
N	mm	211	270	362	442	570	689	689	790
inch		8.31	10.63	14.25	17.40	22.44	27.13	27.13	31.10
O	mm	152	190	252	304	400	475	475	520
inch		5.98	7.48	9.92	11.97	15.75	18.70	18.70	20.47
O1	mm	134	172	222	274	356	421	421	474
inch		5.28	6.77	8.74	10.79	14.02	16.57	16.57	18.66
P	mm	80	80	100	100	138	138	138	138
inch		3.15	3.15	3.94	3.94	5.43	5.43	5.43	5.43
Q	mm	180	220	300	350	450	550	550	600
inch		7.09	8.66	11.81	13.78	17.72	21.65	21.65	23.62
R	mm	146	185	245	304.4	387.3	482	482	568
inch		5.75	7.28	9.65	11.98	15.25	18.98	18.98	22.36
R1	mm	33	33	40	40	50	50	50	50
inch		1.30	1.30	1.57	1.57	1.97	1.97	1.97	1.97
S	mm	30	47.5	59	85	100	135	135	140
inch		1.18	1.87	2.32	3.35	3.94	5.31	5.31	5.51
U	mm	96	96	115	115	165	165	165	165
inch		3.78	3.78	4.53	4.53	6.50	6.50	6.50	6.50
V	mm	158	158	162	162	217	217	217	221.50
inch		6.22	6.22	6.38	6.38	8.54	8.54	8.54	8.72
W	mm	328 ¹⁾	318 ¹⁾	324	324	456	456	456	456
inch		12.91	12.52	12.76	12.76	17.95	17.95	17.95	17.95
X	mm	78	78	101	101	131	131	131	131
inch		3.07	3.07	3.98	3.98	5.16	5.16	5.16	5.16

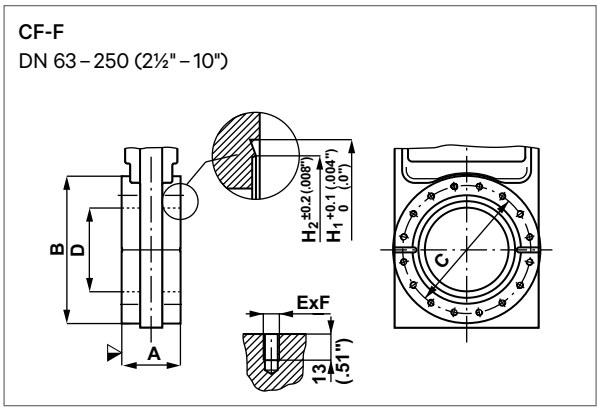
¹⁾ L + W DN 63 + 100: without pneumatic connection 6 mm shorter

FLANGE DIMENSIONS



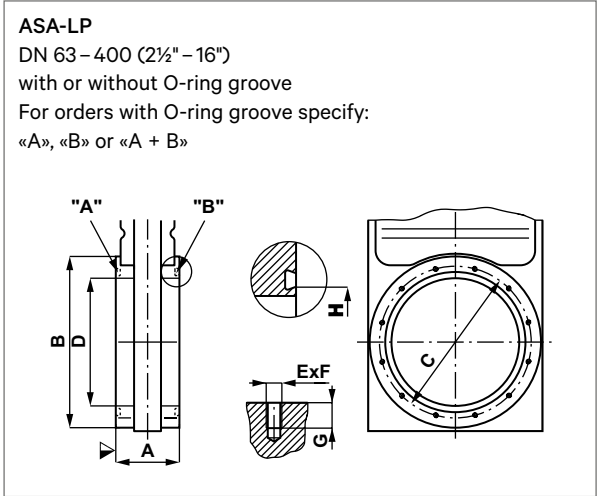
DN	mm	63	80	100	160	200	250	320	400
inch		2½	3	4	6	8	10	12	16
A	mm	70	70	70	80	80	100	120	150
inch		2.76	2.76	2.76	3.15	3.15	3.94	4.72	5.90
B	mm	136	136	176	225	288	350	425	510
inch		5.35	5.35	6.93	8.86	11.34	13.78	16.73	20.08
C	mm	110	125	145	200	260	310	395	480
inch		4.33	4.92	5.71	7.87	10.24	12.20	15.55	18.90
D	mm	63	80	100	150	200	261	318	400
inch		2.48	3.15	3.94	5.91	7.87	10.28	12.52	15.75
E × F		4 × M8	8 × M8	8 × M8	8 × M10	12 × M10	12 × M10	12 × M12	16 × M12
G	mm	13	13	13	14	16	16	16	20
inch		0.51	0.51	0.51	0.55	0.63	0.63	0.63	0.79
H	mm	70	83	102	153	213	-	-	-
inch		2.76	3.27	4.02	6.02	8.39	-	-	-
I	mm	3	3	3	5	5	-	-	-
inch		0.12	0.12	0.12	0.20	0.20	-	-	-

Dimensions for DN 350 (14") on request.

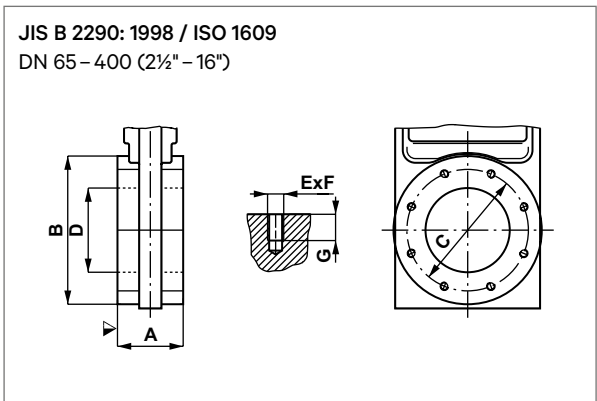


¹⁾ Option UNF DN 250 (10"), O. D. 13¼"
Ordering No. 14048-UE44-X, X = O. D. 13¼"

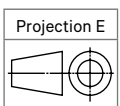
DN	mm	63	80	100	160	200	250	250 ¹⁾
	inch	2½	3	4	6	8	10	10
O. D.	inch	4½	4¾	6	8	10	12	13¼
A	mm	70	70	70	80	80	100	100
	inch	2.76	2.76	2.76	3.15	3.15	3.94	3.94
B	mm	136	136	176	225	288	350	350
	inch	5.35	5.35	6.93	8.86	11.34	13.78	13.78
C	mm	92.10	102.40	130.30	181	231.80	284	306.30
	inch	3.63	4.03	5.13	7.13	9.13	11.18	12.06
D	mm	63	80	100	150	200	254	254
	inch	2.48	3.15	3.94	5.91	7.87	10	10
E x F	metric threads	8 x M8	10 x M8	16 x M8	20 x M8	24 x M8	32 x M8	-
	UNF threads	8 x 5/16" 24 UNF	10 x 5/16" 24 UNF	16 x 5/16" 24 UNF	20 x 5/16" 24 UNF	24 x 5/16" 24 UNF	32 x 5/16" 24 UNF	30 x 3/8" 24 UNF
H1	mm	82.50	91.55	120.65	171.45	222.40	273.15	294.64
	inch	3.25	3.60	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



DN	mm	63	100	160	200	250	320	400
	inch	2½	4	6	8	10	12	16
ASA-LP		2	3	4	6	8	10	-
ASA		-	-	-	-	-	-	16
A	mm	70	70	80	80	100	120	150
	inch	2.76	2.76	3.15	3.15	3.94	4.72	5.90
B	mm	136	176	225	288	350	425	596.90
	inch	5.35	6.93	8.86	11.34	13.78	16.73	23.50
C	mm	120.70	152.40	190.50	241.30	298.50	362	539.80
	inch	4.75	6.00	7.50	9.50	11.75	14.25	21.25
D	mm	63	100	150	200	254	300	400
	inch	2.48	3.94	5.91	7.87	10.00	11.81	15.75
E x F		4 x 3/8" 16 UNC	4 x 3/8" 16 UNC	8 x 3/8" 16 UNC	8 x 3/4" 10 UNC	8 x 3/4" 10 UNC	12 x 3/4" 10 UNC	16 x 1" 8 UNC
G	mm	15	15	15	20	20	28	25.40
	inch	0.59	0.59	0.59	0.79	0.79	1.10	1
H	mm	88.90	120.65	158.75	206.40	266.70	317.50	419.10
	inch	3.50	4.75	6.25	8.13	10.50	12.50	16.50
O-ring	mm	88.49 x 3.53	120.24 x 3.53	158.34 x 3.53	202.79 x 3.53	266.29 x 3.53	316.87 x 7.00	417.96 x 7.00
I. D. x D	inch	3.48 x .139	4.73 x .139	6.23 x .139	7.98 x .139	10.48 x .139	12.47 x .275	16.46 x .275



DN	mm	65	100	150	200	250	300	350	400
	inch	2½	4	6	8	10	12	14	16
A	mm	70	70	80	80	100	120	120	150
	inch	2.76	2.76	3.15	3.15	3.94	4.72	4.72	5.90
B	mm	136	176	225	288	350	425	450	510
	inch	5.35	6.93	8.86	11.34	13.78	16.73	17.72	20.08
C	mm	120	160	210	270	320	370	420	480
	inch	4.72	6.30	8.27	10.63	12.60	14.57	16.54	18.90
D	mm	63	100	150	200	261	318	350	400
	inch	2.48	3.94	5.91	7.87	10.28	12.52	13.78	15.75
E x F		4 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12	12 x M12	12 x M16
G	mm	12	12	14	16	16	16	16	25
	inch	0.47	0.47	0.55	0.63	0.63	0.63	0.63	0.98



▼ Valve seat side

LOW PARTICLE GATE VALVE, SERIES 15.0 / 15.1 / 15.2

15.0 vacuum / 15.1 HV / 15.2 UHV isolation valve for extremely particle and shock sensitive vacuum systems.



Very low shock

Low particle count

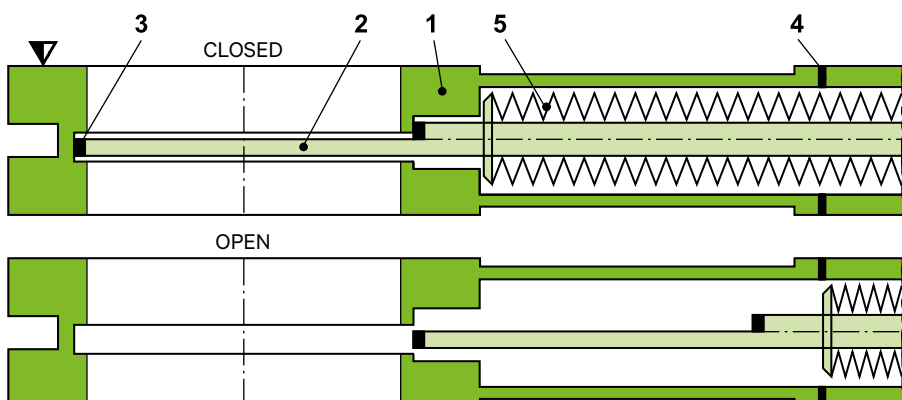
No mechanism in vacuum

Vulcanized gate seal (see glossary)

MAIN FEATURES

Sizes	DN 63 – 250 mm (2½" – 10")
Actuators	pneumatic: double acting
Body material	15.0 / 15.1: aluminum 15.2: stainless steel
Feedthrough	15.0: shaft feedthrough 15.1/15.2: bellows
Standard flanges	15.0 / 15.1: ISO-F, ASA-LP, JIS 15.2: ISO-F, CF-F, ASA-LP, JIS
Sealing technology	MONOVAT (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Valve body
- 2 Gate
- 3 Gate seal
- 4 Bonnet seal
- 5 Bellows
- ▼ Valve seat side

TECHNICAL DATA

Leak rate	Valve body	15.0 / 15.1	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
		15.2	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	Valve seat		$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
		15.0	$1 \cdot 10^{-7}$ mbar to 1 bar (abs)
		15.1	$1 \cdot 10^{-8}$ mbar to 1 bar (abs)
		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	15.0 / 15.1	≤ 120 °C ³⁾
		15.2: DN 63 – 200	≤ 250 °C open / ≤ 200 °C closed
		15.2: DN 250	≤ 120 °C ³⁾
	Actuator	15.0 / 15.1	≤ 100 °C
		15.2: DN 63 – 160	≤ 200 °C
		15.2: DN 200 – 250	≤ 100 °C ³⁾
	Solenoid valve		≤ 50 °C
	Position indicator		≤ 80 °C
Heating and cooling rate	15.0 / 15.1		≤ 30 °C h ⁻¹
	15.2		≤ 50 °C h ⁻¹
Material	Valve body	15.0 / 15.1	EN AW-6082 (3.2315)
		15.2	AISI 304 (1.4301)
	Gate	15.0 / 15.1	EN AW-6082 (3.2315)
		15.2: DN 63 – 200	AISI 304 (1.4301)
		15.2: DN 250	EN AW-6082 (3.2315)
	Bellows		AISI 633 (AM350)
Seal	Bonnet	15.0 / 15.1	FKM (Viton®)
		15.2	metal
	Gate		FKM (Viton®)
Feedthrough	Bonnet	15.0	shaft feedthrough
		15.1/15.2	bellows
Mounting position			any
Solenoid valve			24 V DC, 5.4 W (others on request)
Position indicator: contact rating	Voltage		≤ 250 V AC ≤ 50 V DC
	Current		≤ 2 A ≤ 1.2 A
Valve position indication			visual (mechanical)

DN (nominal I.D.)	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	l	ft ³	15.0/15.1	15.2	15.0	15.1	15.2	kg	lbs	kg	lbs	
mm	inch	ls ⁻¹	ls ⁻¹	bar	psi	l	ft ³	s	s	kg	lbs	kg	lbs	kg	lbs
63	2 ½	480	480	4 – 7	58 – 102	0.22	0.008	1.50	1.50	7	15.50	8	17.70	11.50	25.40
100	4	1700	1700	4 – 7	58 – 102	0.32	0.011	2.80	2.80	9	19.90	10	22.10	15.50	34.20
160	6	6000	6000	4 – 7	58 – 102	0.46	0.016	3.10	3.10	12	26.50	13.50	29.80	22	48.50
200	8	–	12000	4 – 7	58 – 102	1.08	0.038	–	6	–	–	–	–	36	79.40
250	10	–	19400	5 – 7	73 – 102	2.10	0.074	–	7	–	–	–	–	55	121.30

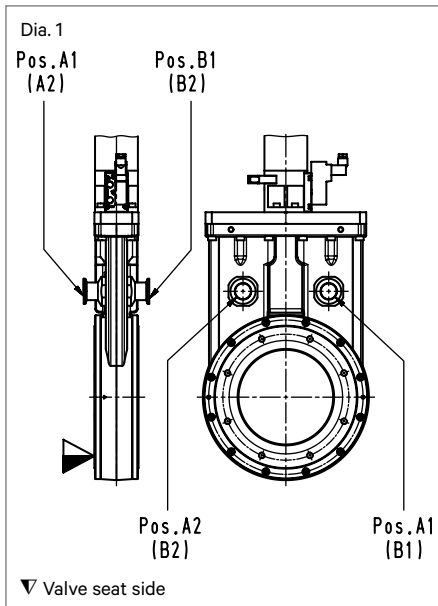
¹⁾ Higher number of cycles on request.

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

³⁾ Higher temperatures on request.



OPTIONS, CUSTOMIZED SOLUTIONS



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 24VDC)
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Bakeable position indicator: pneumatic actuator bakeable to max. 140 °C

VALVE

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

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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	2½	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)

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	2½	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)

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		ASA-LP	JIS
			metric threads	UNF threads		
63	2½	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

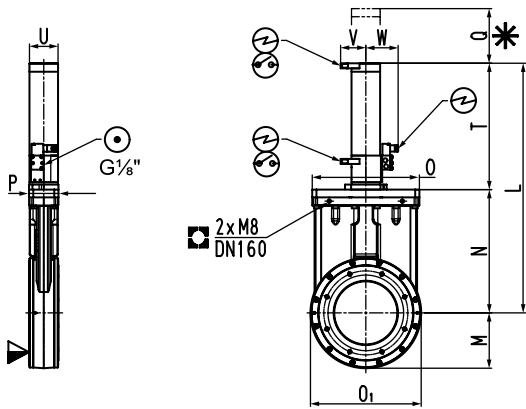
without solenoid valve, without position indicator: 152 . . . **E14**
 without solenoid valve, with position indicator: 152 . . . **E24**
 with solenoid valve, without position indicator: 152 . . . **E34** (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

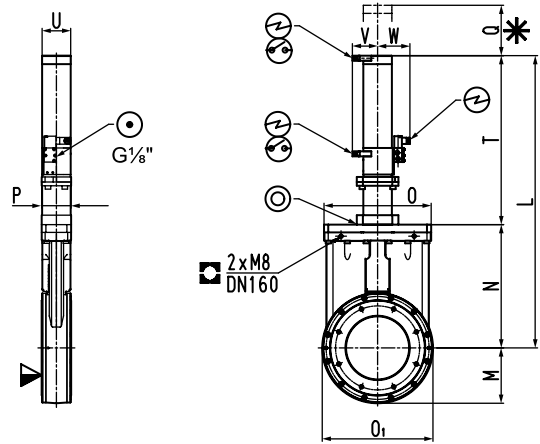
Basic ordering number plus «-X»: -X to be specified
 Example: 15246-CE44-X, X = port CF-F 40 in position A1

MAIN DIMENSIONS

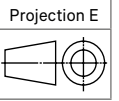
15.0
 Vacuum valve with pneumatic actuator
 DN 63 – 160 (2½" – 6")



15.1
 HV valve with pneumatic actuator
 DN 63 – 160 (2½" – 6")



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



DN	mm	63	100	160
	inch	2½	4	6
L	mm	384.50	472	594.50
	inch	15.14	18.58	23.41
M	mm	87	107	132
	inch	3.43	4.21	5.20
N	mm	168.50	221	293.50
	inch	6.63	8.70	11.56
O	mm	155	195	255
	inch	6.10	7.68	10.04
O1	mm	174	214	264
	inch	6.85	8.43	10.39
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	216	251	301
	inch	8.50	9.88	11.85
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	77	77	77
	inch	3.03	3.03	3.03

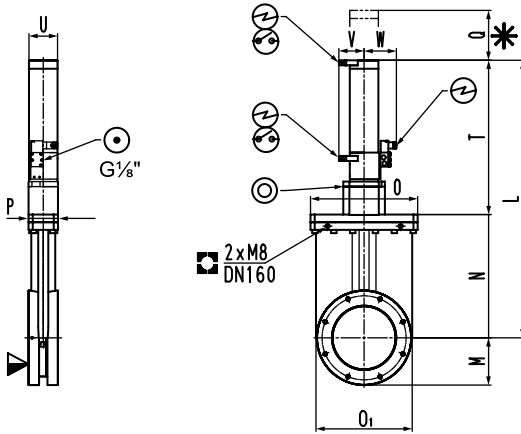
DN	mm	63	100	160
	inch	2½	4	6
L	mm	443	552.50	696
	inch	17.44	21.75	27.40
M	mm	87	107	132
	inch	3.43	4.21	5.20
N	mm	168.50	221	293.50
	inch	6.63	8.70	11.56
O	mm	155	195	255
	inch	6.10	7.68	10.04
O1	mm	174	214	264
	inch	6.85	8.43	10.39
P	mm	70	70	70
	inch	2.76	2.76	2.76
Q	mm	110	145	195
	inch	4.33	5.71	7.68
T	mm	274	331.50	402.50
	inch	10.79	13.05	15.85
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	77	77	77
	inch	3.03	3.03	3.03

Flange dimensions: see pages 80 – 81

MAIN DIMENSIONS

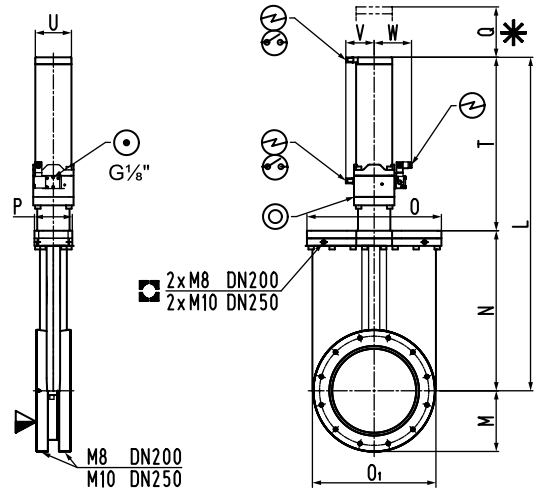
15.2

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



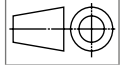
15.2

UHV valve with pneumatic actuator
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

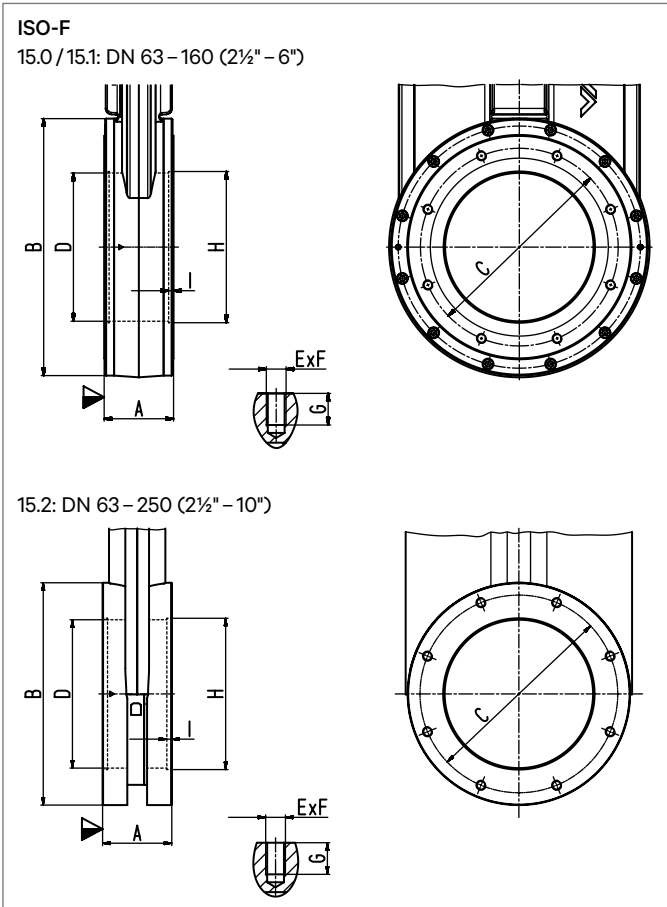


DN	mm	63	100	160
	inch	2½	4	6
L	mm	415	517.50	661
	inch	16.34	20.37	26.02
M	mm	67.50	87.50	112.50
	inch	2.66	3.44	4.43
N	mm	168.50	221	293.50
	inch	6.63	8.70	11.56
O	mm	155	195	255
	inch	6.10	7.68	10.04
O1	mm	139	179	229
	inch	5.47	7.05	9.02
P	mm	70	70	70
	inch	2.76	2.76	2.76
Q	mm	110	145	195
	inch	4.33	5.71	7.68
T	mm	246.50	296.50	367.50
	inch	9.70	11.67	14.47
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	77	77	77
	inch	3.03	3.03	3.03

DN	mm	200	250
	inch	8	10
L	mm	794.50	942.80
	inch	31.28	37.12
M	mm	144.50	176.50
	inch	5.69	6.95
N	mm	381.50	481.30
	inch	15.02	18.95
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	225	275
	inch	8.86	10.83
T	mm	413	470.50
	inch	16.26	18.52
U	mm	86	106
	inch	3.39	4.17
V	mm	67	75
	inch	2.64	2.95
W	mm	89	126.40
	inch	3.50	4.98

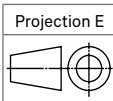
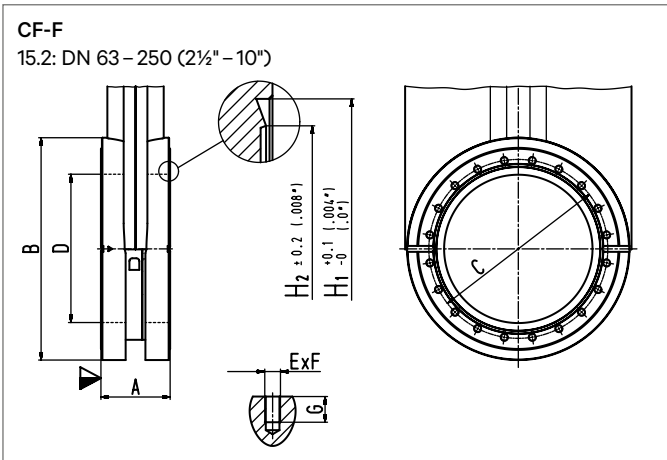
Flange dimensions: see pages 80 – 81

FLANGE DIMENSIONS



DN	mm inch	63 2½	100 4	160 6	200 8	250 10
A	mm inch	70.20 2.76	70.20 2.76	70.20 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	65.10 2.56	100.10 3.94	150.10 5.91	200.10 7.87	250.10 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	16 0.63
H	mm inch	70.10 2.76	102.10 4.02	153.10 6.02	213.10 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


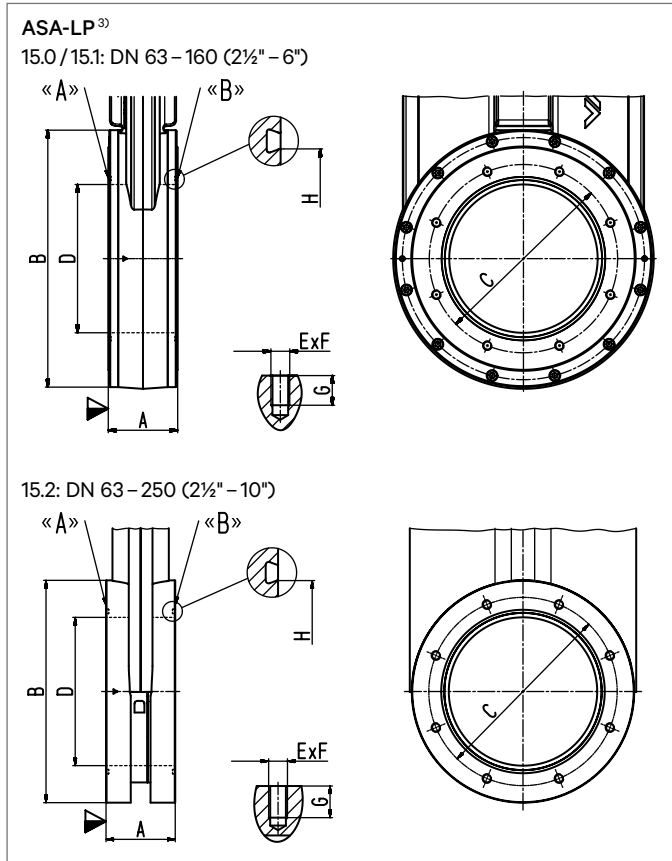
▽ Valve seat side

DN	mm inch	63 2½	100 4	160 6	200 8	250 10
O.D.	inch	4½	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	289.50 11.40	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	65.10 2.56	100.10 3.94	150.10 5.91	200.10 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

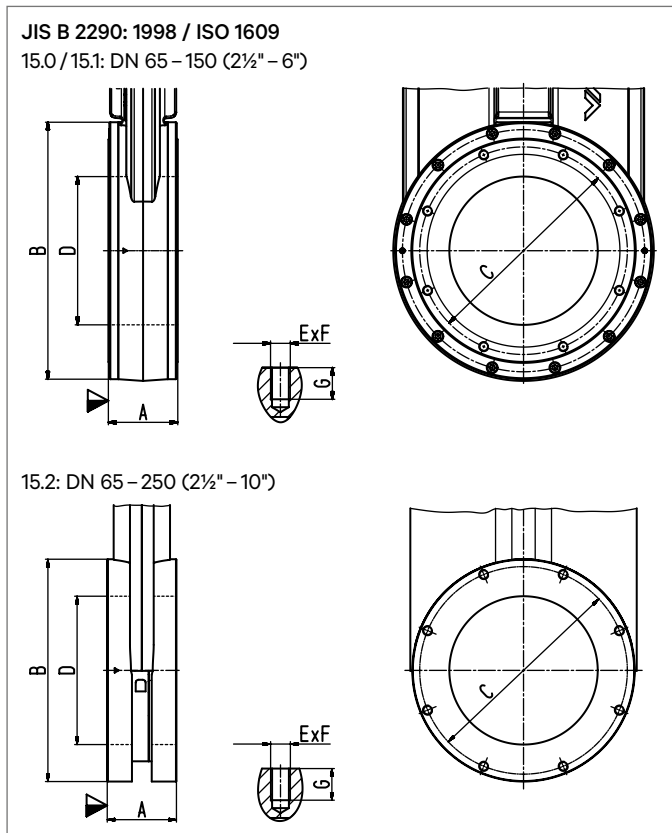
FLANGE DIMENSIONS



³⁾ ASA-LP
 with or without O-ring groove
 For orders with O-ring groove specify:
 «A», «B» or «A + B»

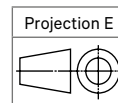
DN	mm	63	100	160	200	250
	inch	2½	4	6	8	10
ASA-LP		2	3	4	6	8
A	mm	70	70	70	80	100
	inch	2.76	2.76	2.76	3.15	3.94
B ¹⁾	mm	170	210	260	-	-
	inch	6.69	8.27	10.24		
B ²⁾	mm	135	175	225	290	354
	inch	5.31	6.89	8.86	11.41	13.94
C	mm	120.70	152.40	190.50	241.30	298.50
	inch	4.75	6.00	7.50	9.50	11.75
D	mm	65	100	150	200	250
	inch	2.56	3.94	5.91	7.87	9.84
E × F		4 × ¾" 16 UNC	4 × ¾" 16 UNC	8 × ¾" 16 UNC	8 × ¾" 10 UNC	8 × ¾" 10 UNC
G	mm	15	15	15	19	19
	inch	0.59	0.59	0.59	0.75	0.75
H	mm	88.90	120.65	158.75	206.40	266.70
	inch	3.50	4.75	6.25	8.13	10.50
O-ring I.D. × D	mm	88.49 × 3.53	120.24 × 3.53	158.34 × 3.53	202.79 × 3.53	266.29 × 3.53
	inch	3.48 × 0.139	4.73 × 0.139	6.23 × 0.139	7.98 × .139	10.48 × .139

¹⁾ 15.0/15.1
²⁾ 15.2



DN	mm	65	100	150	200	250
	inch	2½	4	6	8	10
A	mm	70	70	70	80	100
	inch	2.76	2.76	2.76	3.15	3.94
B ¹⁾	mm	170	210	260	-	-
	inch	6.69	8.27	10.24		
B ²⁾	mm	135	175	225	290	354
	inch	5.31	6.89	8.86	11.42	13.94
C	mm	120	160	210	270	320
	inch	4.72	6.30	8.27	10.63	12.60
D	mm	65	100	150	200	250
	inch	2.56	3.94	5.91	7.87	9.84
E × F		4 × M10	8 × M10	8 × M10	8 × M12	12 × M12
G ¹⁾	mm	12	12	15	-	-
	inch	0.47	0.47	0.59		
G ²⁾	mm	15	15	15	16	16
	inch	0.59	0.59	0.59	0.63	0.63

¹⁾ 15.0/15.1
²⁾ 15.2



▼ Valve seat side

PENDULUM VALVE, SERIES 16.2

For applications requiring a compact design.
Especially suited to demanding corrosive processes.



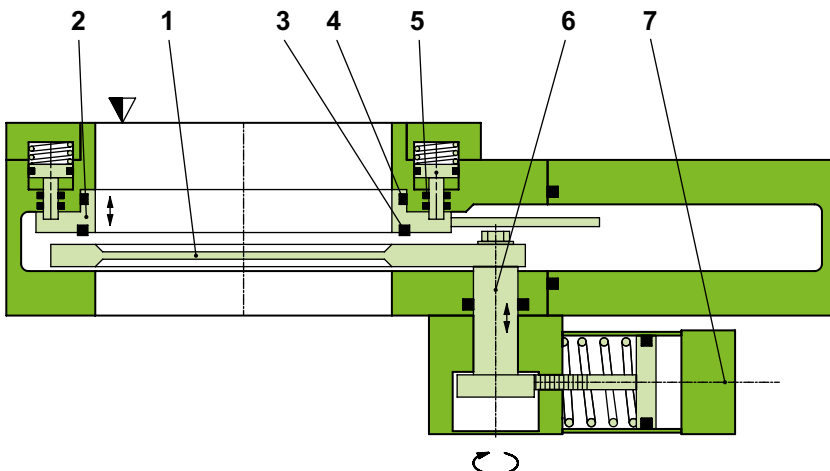
Low vibration level and
low particle count during
operation

Split body design for fast
and easy maintenance

MAIN FEATURES

Sizes	DN 200 – 550 mm (8" – 22")
Actuators	pneumatic: single acting with closing spring (NC) 3-position pneumatic: single acting with closing spring (NC)
Body material	aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, ASA-LP, JIS

FUNCTIONAL PRINCIPLE



- 1 Plate
- 2 Sealing ring
- 3 Plate seal
- 4 Dynamic seal
- 5 Pneumatics seal
- 6 Actuator shaft
- 7 Pneumatic actuator
- ▼ Valve seat side

TECHNICAL DATA

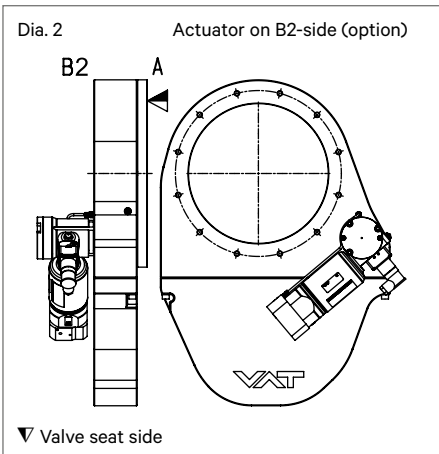
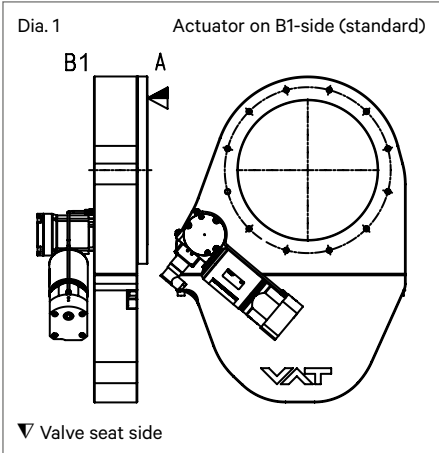
Leak rate	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
Differential pressure on the plate		≤ 1.2 bar
Differential pressure at opening	DN 200 DN 250 – 500	≤ 10 mbar ≤ 5 mbar
Cycles until first service		200 000
Temperature ¹⁾	Valve body Actuator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

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Minimum adjustable conductance with 3-position pneumatic actuator	Max. differential pressure in closed position	Compressed air			Volume of pneumatic actuator		Closing or opening time ²⁾	Weight	
mm	inch				bar	psi	l	ft ³	kg		lbs	
200	8	11000	15	1200	5–7	73–102	0.30	0.010	4	23	50.70	
250	10	21700	22	1200	5–7	73–102	0.35	0.012	4	30	66.10	
320	12	32600	54	1200	5–7	73–102	0.55	0.020	5	56	123.50	
350	14	41500	62	1200	5–7	73–102	0.60	0.021	5	65	143.30	
400	16	61000	69	1200	5–7	73–102	0.65	0.023	5.5	76	167.60	
500	20	101500	100	1200	5–7	73–102	1.40	0.047	10	120	264.60	

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

²⁾ Extended closing/opening time with 3-position pneumatic actuator.

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

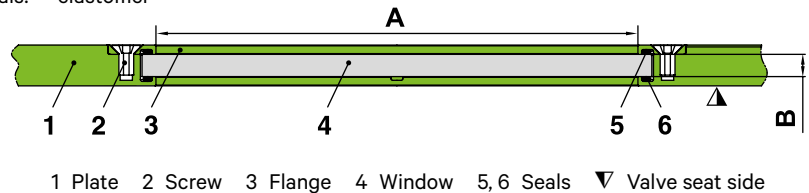
- Other solenoid valve voltage (standard 24VDC)
- Actuator on B2-side (Dia. 2). B1-side (Dia. 1) is standard.

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 for roughing (by-pass), venting or for gauges
- Window in plate (Pic. 4)

Window specification

Material: borosilicate or sapphire
Seals: elastomer



The window is put between two seals (5, 6) and clamped into the plate (1) by means of a flange (3).

	DN valve	mm	200	250	320	350	400	500	
		inch	8	10	12	14	16	20	
Borosilicate	Optically free diameter «A»	mm	130	130	150	150	150		on request
		inch	5.12	5.12	5.91	5.91	5.91		
	Thickness of glass «B»	mm	6	6	8	8	8		
		inch	0.24	0.24	0.31	0.31	0.31		
Sapphire	Optically free diameter «A»	mm	170	200	250	250	250		on request
		inch	6.69	7.87	9.84	9.84	9.84		
	Thickness of glass «B»	mm	5	6	6	6	6		
		inch	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 the valve in any position.

Pic. 3



Pic. 4



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION FOR STANDARD VALVES

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
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

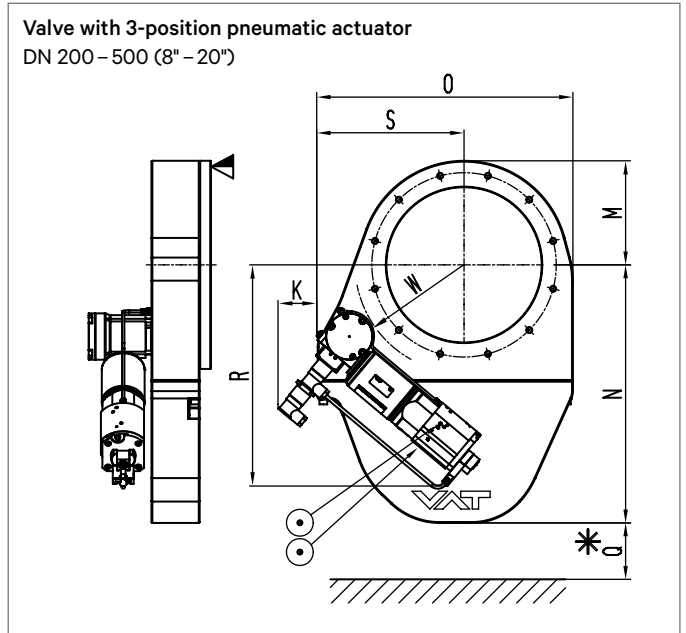
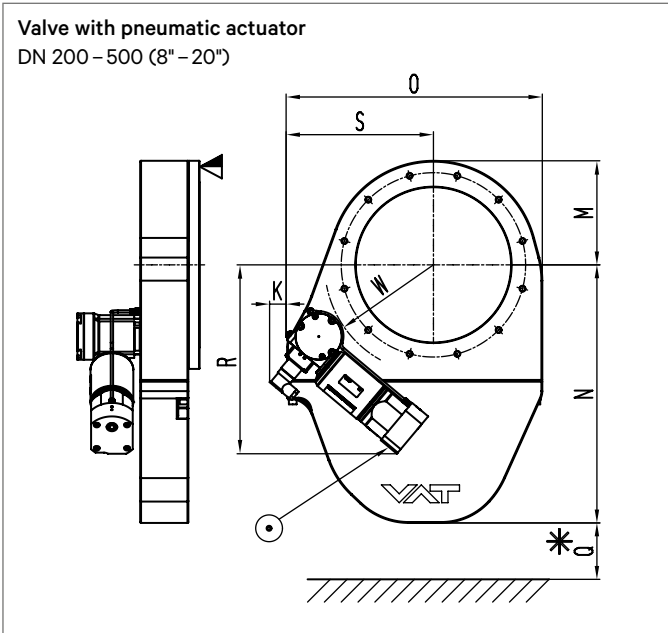
DN		Ordering numbers		
mm	inch	ISO-F	ASA-LP	JIS
200	8	16246-PA28	16246-TA28	16246-JA28
250	10	16248-PA28	16248-TA28	16248-JA28
320	12	16250-PA28	16250-TA28	16250-JA28
350	14	-	16251-TA28	16251-JA28
400	16	16252-PA28	16252-TA28	16252-JA28
500	20	16254-PA28	16254-TA28	16254-JA28
550	22	on request	on request	on request

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

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
 Example: 16246-PA21-X, X = port CF-F 40 in position A

MAIN DIMENSIONS



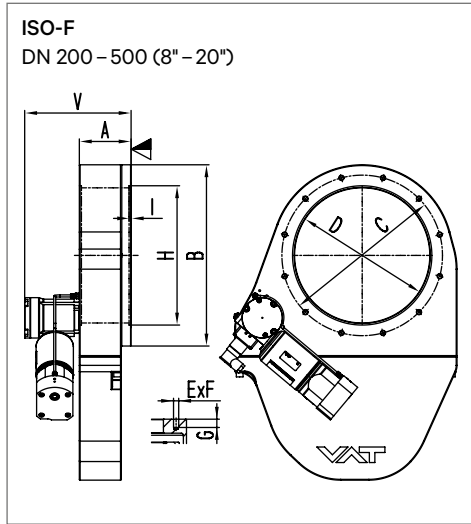
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection

DN	mm inch	200 8	250 10	320 12	350 14	400 16	500 20
K	mm ¹⁾ inch ¹⁾	10 0.39	29 1.14	7 0.28	- -	6 0.24	60 2.36
	mm ²⁾ inch ²⁾	34 1.34	65 2.56	32 1.26	24 0.94	31 1.22	³⁾
M	mm inch	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24	325 12.80
	N	mm inch	360 14.17	434 17.09	538 21.18	590 23.23	655 25.79
O		mm inch	367 14.45	429 16.89	533 20.98	579 22.80	630 24.80
	Q	mm inch	50 1.97	50 1.97	50 1.97	50 1.97	50 1.97
P		mm ¹⁾ inch ¹⁾	265 10.43	312 12.28	392 15.43	405 15.94	428 16.85
	mm ²⁾ inch ²⁾	318 12.52	363 14.29	424 16.69	438 17.24	460 18.11	³⁾
S	mm inch	210.50 8.29	246 9.69	276 10.87	300 11.81	320 12.60	401 15.79
	W	mm inch	152.50 6	185 7.28	233 9.17	253 9.96	285 11.22

- ¹⁾ Pneumatic actuator
- ²⁾ 3-position pneumatic actuator
- ³⁾ On request

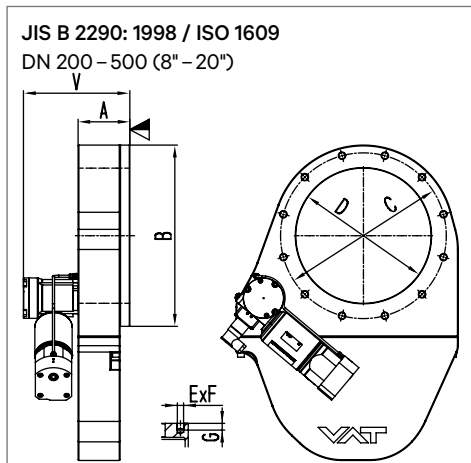
Flange dimensions: see page 87

FLANGE DIMENSIONS

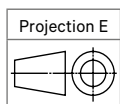
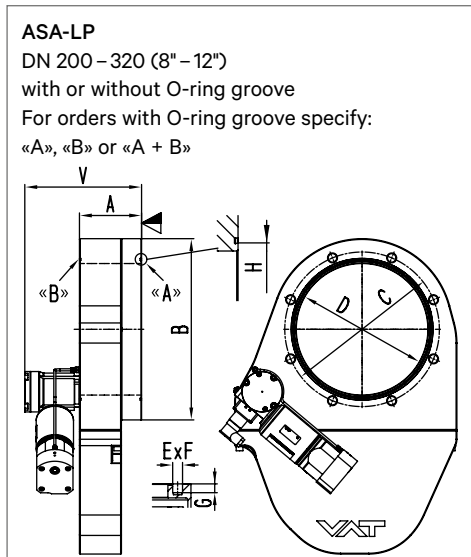


[Ⓝ] Not available

DN	mm inch	200 8	250 10	320 12	350 14	400 16	500 20
A	mm inch	88 3.46	100 3.94	120 4.72	Ⓝ	128 5.04	150 5.91
B	mm inch	300 11.81	350 13.78	428 16.85		520 20.47	635 25
C	mm inch	260 10.24	310 12.20	395 15.55		480 18.90	580 22.83
D	mm inch	200 7.87	261 10.28	318 12.52		400 15.75	500 19.69
E × F		12 × M10	12 × M10	12 × M12		16 × M12	16 × M12
G	mm inch	15 0.59	16 0.63	18 0.71		20 0.79	20 0.79
H	mm inch	213 8.39	-	-		-	-
I	mm inch	5 0.20	-	-		-	-
V	mm inch	200 7.87	205 8.07	241 9.49	250 9.84	343 13.50	



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



▽ Valve seat side

DN	mm inch	200 8	250 10	320 12			
ASA-LP		6	8	10			
ANSI		6	8	10			
A	mm inch	88 3.46	120 4.72	120 4.72			
B	mm inch	300 11.81	350 13.78	428 16.85			
C	mm inch	241.30 9.50	298.50 11.75	362 14.25			
D	mm inch	200 7.87	254 10	300 11.81			
E × F		8 × ¾" 10 UNC	8 × ¾" 10 UNC	12 × ¾" 10 UNC			
G	mm inch	15 0.59	16 0.63	18 0.71			
H	mm inch	206.40 8.13	266.70 10.50	317.50 12.50			
V	mm inch	200 7.87	225 8.86	241 9.49			
O-ring I.D. × D	mm inch	202.79 × 3.53 7.98 × 0.139	266.29 × 3.53 10.48 × 0.139	304.17 × 5.33 11.98 × 0.210			

LARGE PENDULUM VALVE, SERIES 16.8

For applications requiring a compact design in large DN sizes. Especially suited to large coating and FPD production systems.



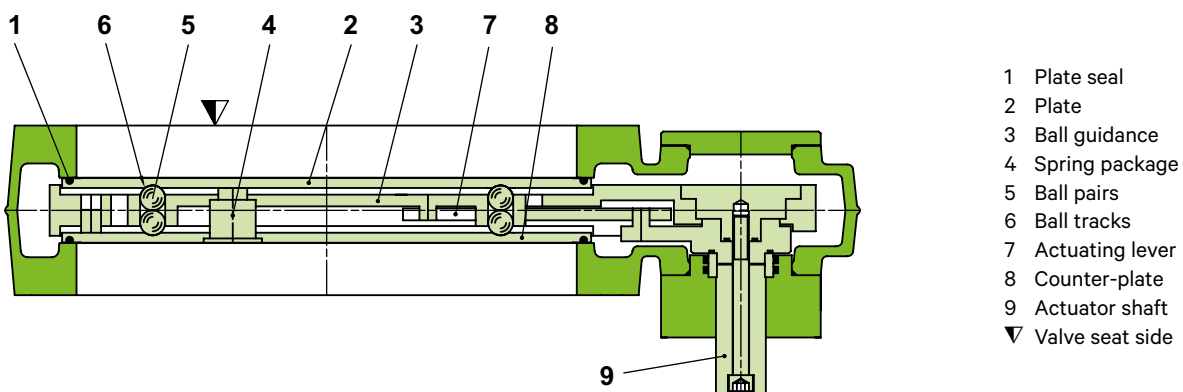
Low vibration level during operation

Split body design for fast and easy maintenance

MAIN FEATURES

Sizes	DN 400 – 500 mm (16" – 20")
Actuators	pneumatic: double acting 3-position pneumatic: double acting
Body material	aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, ASA, JIS

FUNCTIONAL PRINCIPLE



- 1 Plate seal
- 2 Plate
- 3 Ball guidance
- 4 Spring package
- 5 Ball pairs
- 6 Ball tracks
- 7 Actuating lever
- 8 Counter-plate
- 9 Actuator shaft
- ▼ Valve seat side

TECHNICAL DATA

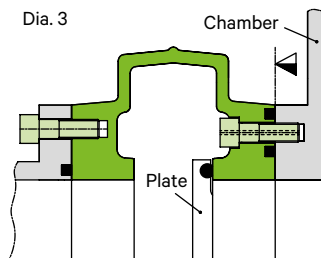
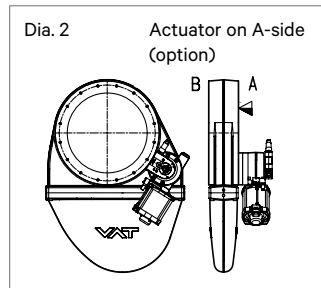
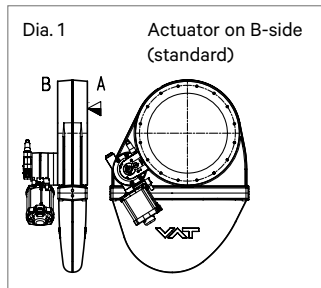
Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the plate		≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service		100 000
Temperature ¹⁾	Valve body	≤ 120 °C
	Actuator	≤ 80 °C
	Solenoid valve	≤ 50 °C
	Position indicator	≤ 80 °C
Heating and cooling rate		≤ 30 °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	≤ 50 V AC/DC
	Current	≤ 3 A
Valve position indication		visual (mechanical)

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Minimum adjustable conductance with 3-position pneumatic actuator	Max. differential pressure in closed position	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time ²⁾	Weight	
mm	inch				ls ⁻¹	mbar	bar	psi		l	ft ³
400	16	50 000	150	1200	5–7	73–102	2.0	0.071	12	85	187
457	16	68 000	200	1200	5–7	73–102	3.3	0.116	14	125	276
500	20	90 000	200	1200	5–7	73–102	3.3	0.116	14	115	254

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

²⁾ Extended closing/opening time with 3-position pneumatic actuator.

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Other solenoid valve voltage (standard 24VDC)
- Actuator on A-side (Dia. 2). B-side (Dia. 1) is standard.

VALVE

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

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION FOR STANDARD VALVES

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

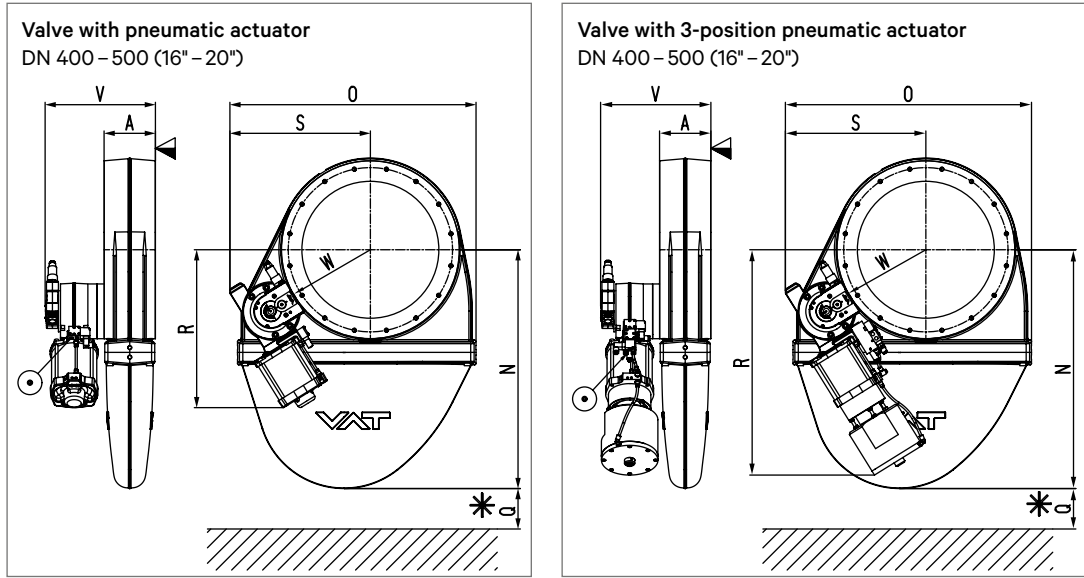
with solenoid valve, with position indicator: 168 . . - . A48 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus -X: -X to be specified

Example: 16852-PA24-X, X = window in plate

MAIN DIMENSIONS

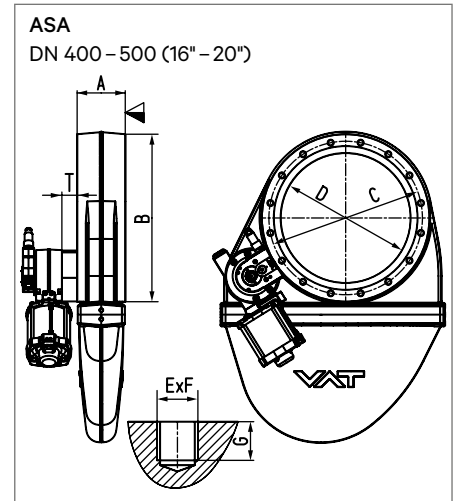
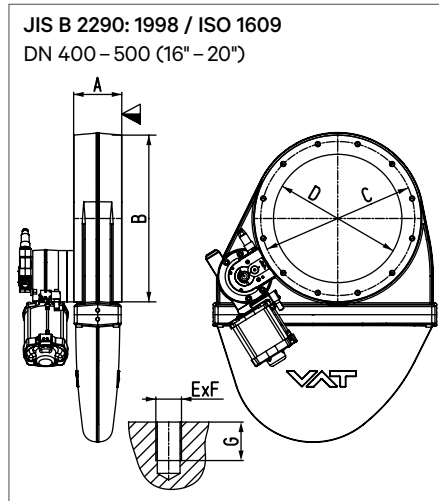
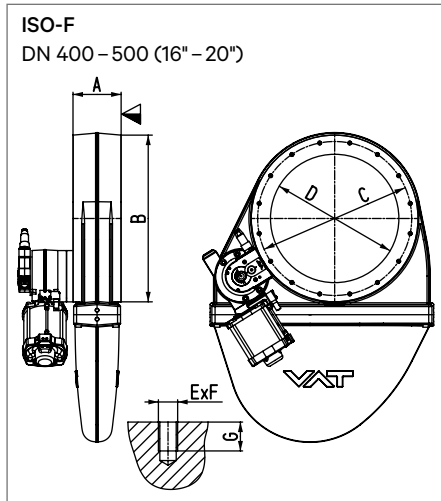


DN	mm	400	500
mm	inch	16	20
A	mm	150	170
	inch	5.91	6.69
N	mm	698	850
	inch	27.48	33.46
O	mm	716	854
	inch	28.19	33.62
Q	mm	200	230
	inch	7.87	9.06
R	mm ¹⁾	461	612
	inch ¹⁾	18.15	24.09
R	mm ²⁾	659	805
	inch ²⁾	25.94	31.69
S	mm	410	466
	inch	16.14	18.35
V	mm	322	337
	inch	12.68	13.27
W	mm	260	320
	inch	10.24	12.60

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

¹⁾ Pneumatic actuator
²⁾ 3-position pneumatic actuator

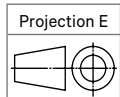
FLANGE DIMENSIONS



DN	mm	400	500
mm	inch	16	20
A	mm	128	150
	inch	5.04	5.91
B	mm	520	635
	inch	20.47	25
C	mm	480	580
	inch	18.90	22.83
D	mm	400	500
	inch	15.75	19.69
E x F		16 x M12	16 x M12
G	mm	20	20
	inch	0.79	0.79

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

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



▼ Valve seat side

HV GATE VALVE WITH PROTECTIVE RING, SERIES 17.2

Isolation valve for contaminating processes.



Protected valve mechanism

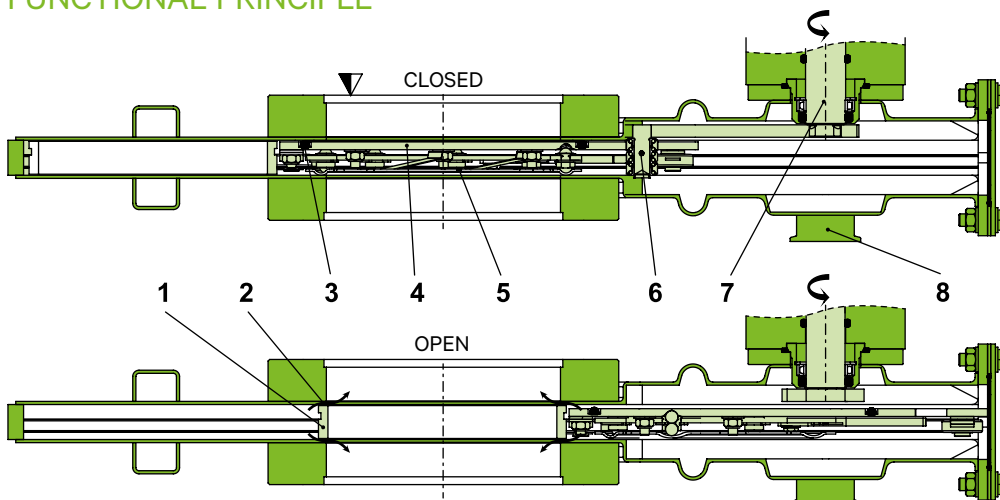
Long lifetime even under contaminating conditions

Easy maintenance

MAIN FEATURES

Sizes	DN 63 – 320 mm (2½" – 12")
Actuators	manual with handwheel or lever pneumatic: double acting
Body material	stainless steel
Feedthrough	rotary feedthrough with intermediate pumping
Standard flanges	ISO-F, CF-F, ASA-LP, JIS
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Protective ring
 - 2 Gas purge
 - 3 Gate seal
 - 4 Gate
 - 5 Counter-plate
 - 6 Crank bolt
 - 7 Actuator shaft
 - 8 Port for gas purge or pumping (option)
- ▽ Valve seat side

TECHNICAL DATA

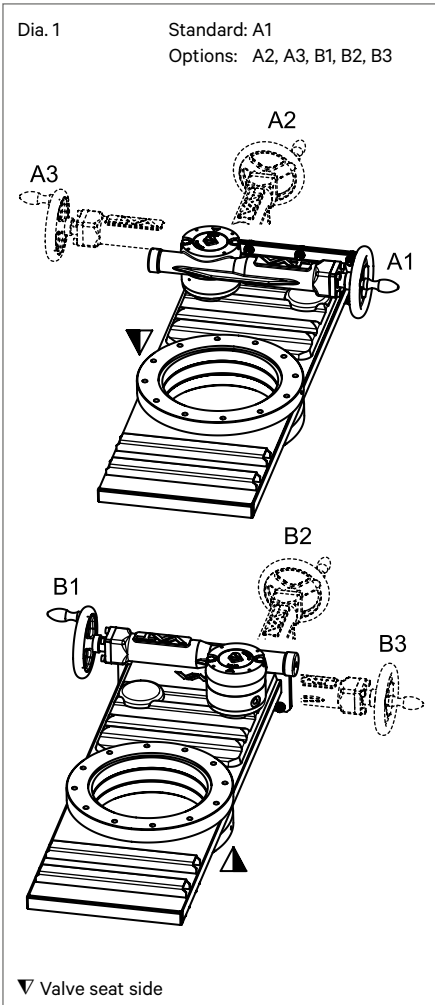
Leak rate	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-8}$ mbar to 2 bar (abs)
Differential pressure on the gate		≤ 2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service		100 000
Temperature ¹⁾	Valve body	≤ 150 °C
	Manual actuator	≤ 80 °C
	Pneumatic actuator	≤ 50 °C
	Solenoid valve	≤ 50 °C
	Position indicator	≤ 80 °C
Heating and cooling rate		≤ 50 °C h ⁻¹
Material	Valve body, flange	AISI 304 (1.4301)
	Mechanism (main components)	AISI 301 (1.4310), AISI 304 (1.4301), AISI 316L (1.4404), AISI 420 (1.4034)
Seal	Bonnet, gate	FKM (Viton®)
Feedthrough	Bonnet	rotary feedthrough with intermediate pumping
Mounting position		any
Solenoid valve		24 V DC, 2.5 W (others on request)
Position indicator: contact rating	Voltage	≤ 250 V AC ≤ 50 V DC
	Current	≤ 5 A ≤ 3 A
Valve position indication		visual (mechanical)

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Valve with manual actuator				Valve with pneumatic actuator						
			Weight: valve with handwheel		Weight: valve 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
63	2½	440	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	5 150	30	66	28	62	4 – 7	58 – 102	0.28	0.010	2.5	31	68
200	8	12 200	39	86	37	82	4 – 7	58 – 102	0.28	0.010	2.5	39	86

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



OPTIONS, CUSTOMIZED SOLUTIONS



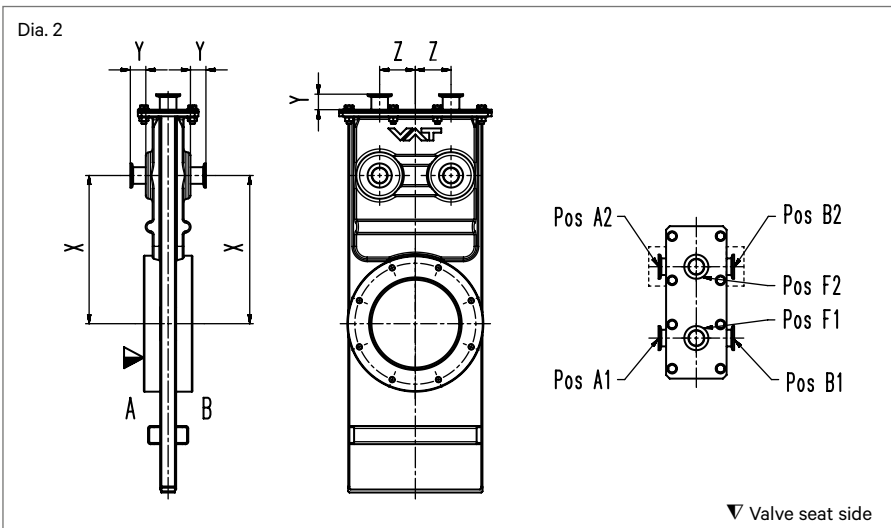
ACTUATOR

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve separate, for external mounting
- Other solenoid valve voltage (standard 24VDC)
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Actuator mountable in 6 positions (Dia. 1):
A1, A2, A3 (valve seat side) or B1, B2, B3 (rear side) – desired position to be specified with order.
Without specification, the actuator is mounted in the standard position A1.

VALVE

- Customer specified flanges with/without watercooling
- Other sealing materials
- Intermediate pumping of the rotary feedthrough
- 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):
possible positions A1, A2, B1, B2, F1 and F2

DN valve	mm inch	63 2½	100 4	160 6	200 8
Recommended port ISO-KF or CF-F		16 ¾	40 1½	40 1½	40 1½
X	mm inch	146 5.75	185 7.28	245 9.65	304.40 11.98
Y	mm inch	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					



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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

Valve with manual actuator lever

DN		Ordering numbers				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP	JIS
63	2 ½	17236-PE06	17236-CE06	17236-UE06	17236-TE06	17236-JE06
100	4	17240-PE06	17240-CE06	17240-UE06	17240-TE06	17240-JE06
160	6	17244-PE06	17244-CE06	17244-UE06	17244-TE06	17244-JE06
200	8	17246-PE06	17246-CE06	17246-UE06	17246-TE06	17246-JE06
250	10	on request	on request	on request	on request	on request
320	12	on request	on request	on request	on request	on request

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

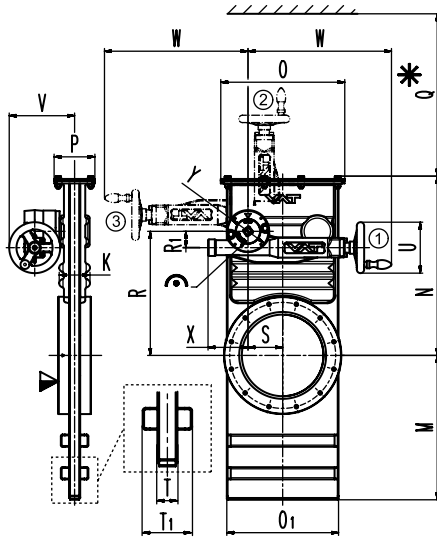
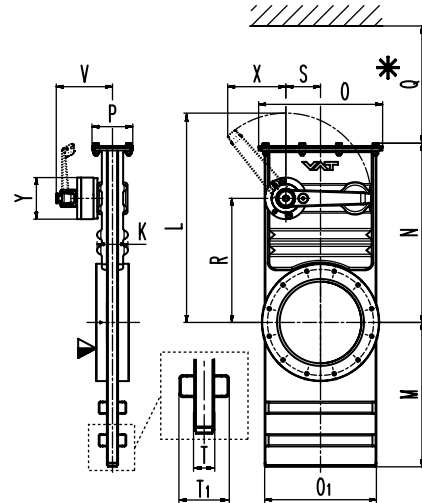
with solenoid valve, without position indicator: 172... - . E34 (specify control voltage)

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

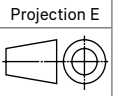
Example: 17246-PE44-X, X = port ISO-KF 40 in position F2

MAIN DIMENSIONS

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

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


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

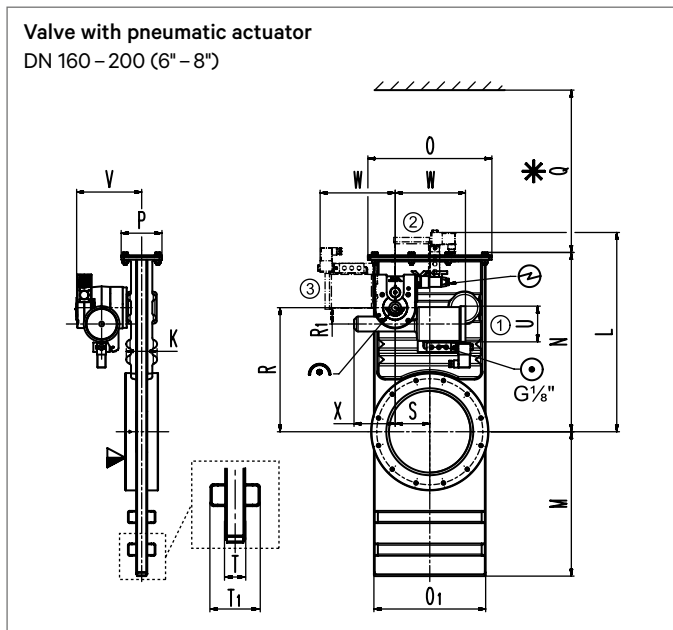
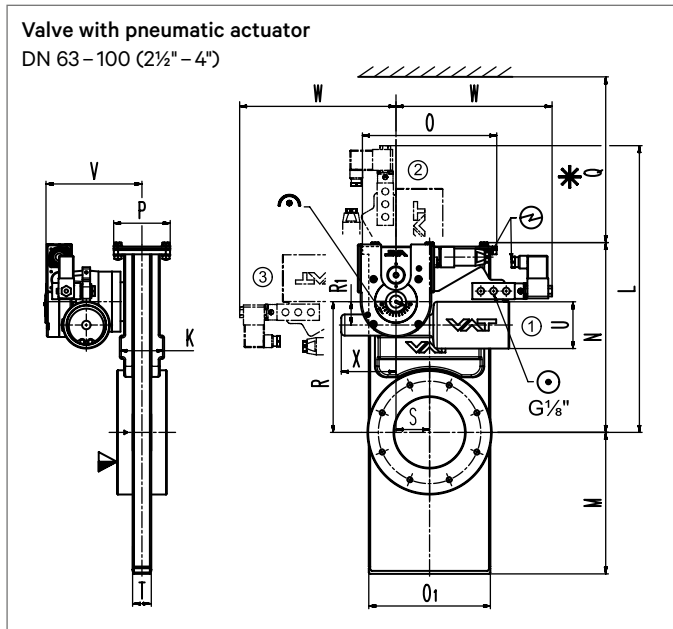
- ▽ Valve seat side
- * Required for dismantling
- ⌒ Mechanical position indication
- ① Standard actuator position
- ②③ Optional actuator positions



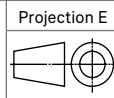
Flange dimensions: see pages 98 – 99

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



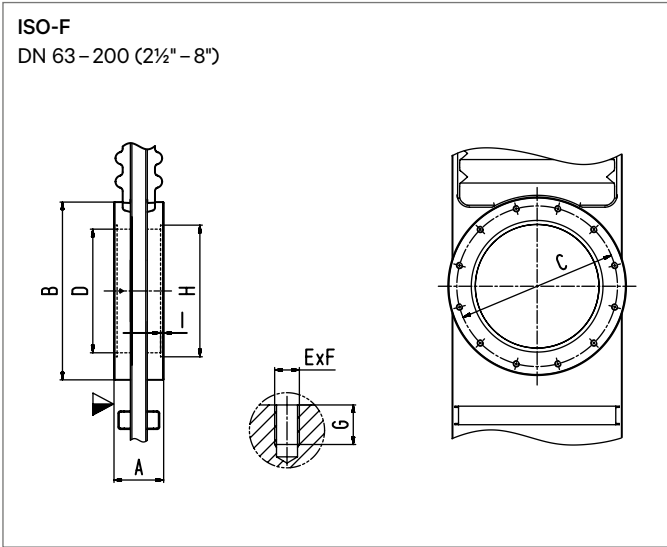
- ▼ Valve seat side
- * Required for dismantling
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ⌚ Mechanical position indication
- ⊖ Emergency operation
- ① Standard actuator position
- ②③ Optional actuator positions



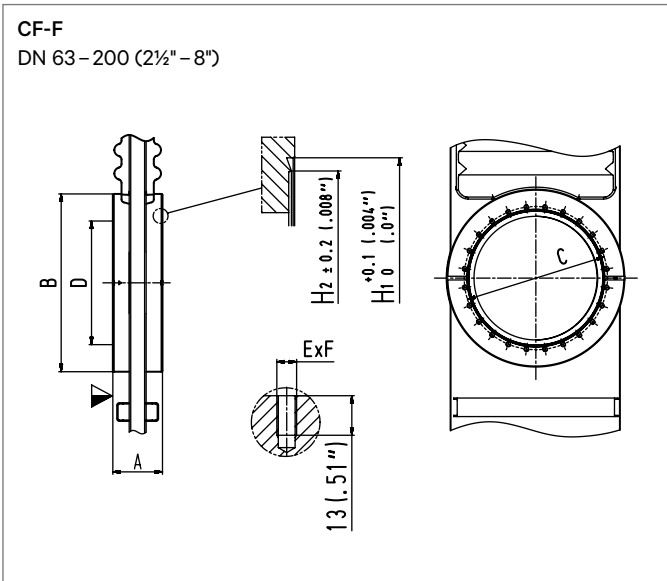
DN	mm	63	100	160	200
inch		2 ½	4	6	8
K	mm	51	63	74	77
inch		2.01	2.48	2.91	3.03
L	mm	367	406	435	495
inch		14.45	15.98	17.13	19.49
M	mm	151	200	279	354
inch		5.94	7.87	10.98	13.94
N	mm	211	270	361	441
inch		8.31	10.63	14.21	17.36
O	mm	152	190	252	304
inch		5.98	7.48	9.92	11.97
O1	mm	134	172	222	274
inch		5.28	6.77	8.74	10.79
P	mm	80	80	100	100
inch		3.15	3.15	3.94	3.94
Q	mm	180	220	300	350
inch		7.09	8.66	11.81	13.78
R	mm	146	185	245	305
inch		5.75	7.28	9.65	12.01
R1	mm	33	33	40	40
inch		1.30	1.30	1.57	1.57
S	mm	30	47.50	59	85
inch		1.18	1.87	2.32	3.35
T	mm	26.50	26.50	26.50	26.50
inch		1.04	1.04	1.04	1.04
T1	mm	-	-	66	67.50
inch		-	-	2.60	2.66
U	mm	66	66	88	87
inch		2.60	2.60	3.46	3.43
V	mm	135	135.20	159	159
inch		5.31	5.32	6.26	6.26
W	mm	221	221	190	190
inch		8.70	8.70	7.48	7.48
X	mm	78	78	100	100
inch		3.07	3.07	3.94	3.94

Flange dimensions: see pages 98 – 99

FLANGE DIMENSIONS



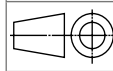
DN	mm inch	63 2½	100 4	160 6	200 8
A	mm inch	70 2.76	70 2.76	80 3.15	80 3.15
B	mm inch	136 5.35	176 6.93	225 8.86	288 11.34
C	mm inch	110 4.33	145 5.71	200 7.87	260 10.24
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87
E × F		4 × M8	8 × M8	8 × M10	12 × M10
G	mm inch	13 0.51	13 0.51	14 0.55	16 0.63
H	mm 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



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	136 5.35	176 6.93	225 8.86	288 11.34
C	mm inch	92.10 3.63	130.20 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 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

▼ Valve seat side

Projection E


¹⁾ Metric threads

²⁾ UNF threads

FLANGE DIMENSIONS

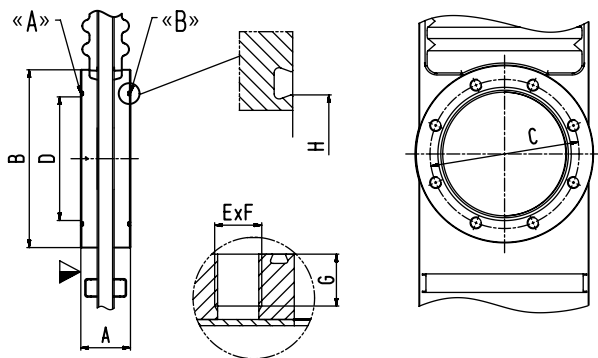
A

ASA-LP

DN 63 – 200 (2½" – 8")

with or without O-ring groove

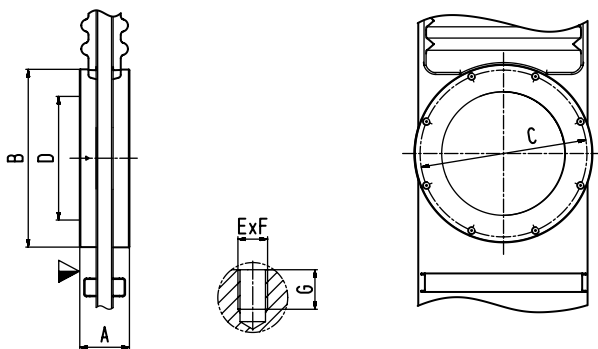
For orders with O-ring groove specify: «A», «B» or «A + B».



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	80 3.15	80 3.15
B	mm inch	136 5.35	176 6.93	225 8.86	288 11.34
C	mm inch	120.70 4.75	152.40 6	190.50 7.50	241.30 9.50
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87
E × F		4 × ⅜" 16 UNC	4 × ⅜" 16 UNC	8 × ⅜" 16 UNC	8 × ⅜" 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

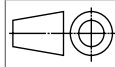
DN 65 – 200 (2½" – 8")



DN	mm inch	65 2½	100 4	150 6	200 8
A	mm inch	70 2.76	70 2.76	80 3.15	80 3.15
B	mm inch	136 5.35	176 6.93	225 8.86	300 11.81
C	mm inch	120 4.72	160 6.30	210 8.27	270 10.63
D	mm inch	63 2.48	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

▼ Valve seat side

Projection E



LARGE GATE VALVES, SERIES 19.0 / 19.1 / 19.2

19.0 vacuum / 19.1 HV / 19.2 UHV isolation valve for research and industrial applications requiring large DN sizes. Especially suited to space simulation systems.



19.0: Vacuum

19.1: HV / 19.2: UHV

Damped opening and closing

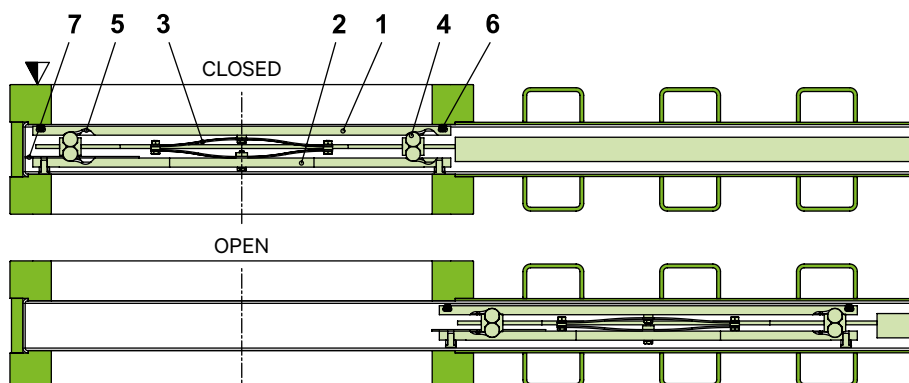
Differential pressure possible on either side

From DN 900 with split body for convenient maintenance

MAIN FEATURES

Sizes	DN 400 – 2000 mm (16" – 78")
Actuator	pneumatic: double acting
Body material	stainless steel
Feedthrough	19.0: shaft feedthrough 19.1/19.2: bellows
Standard flanges	ISO-F
Sealing technology	VATLOCK (see glossary)

FUNCTIONAL PRINCIPLE



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

TECHNICAL DATA

Leak rate	Valve body 19.0 / 19.1	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
	19.2	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	Valve seat 19.0 / 19.1 / 19.2	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
	19.0	$1 \cdot 10^{-7}$ mbar to 1 bar (abs)
Differential pressure on the gate	19.1	$1 \cdot 10^{-8}$ mbar to 1 bar (abs)
	19.2	$1 \cdot 10^{-10}$ mbar to 1 bar (abs)
Differential pressure at opening	DN 400 – 500	≤ 20 mbar
Cycles until first service	DN 630 – 2000	≤ 10 mbar
	19.0 DN 400 – 500	100 000
	19.0 DN 630	20 000
	19.1 / 19.2 DN 400 – 630	20 000
Temperature ¹⁾	19.0 / 19.1 / 19.2 DN 800 – 2000	10 000
	Valve body	≤ 150 °C
	Actuator, position indicator	≤ 80 °C
Heating and cooling rate	Solenoid valve	≤ 50 °C
	DN 400 – 630	≤ 30 °C h ⁻¹
Material	DN 800 – 1250	≤ 5 °C h ⁻¹
	Valve body	AISI 304 (1.4301)
Seal	Mechanism (main components)	EN AW-6082 (3.2315), AISI 304 (1.4301), AISI 316L (1.4435) or AISI 304L (1.4306)
	Bellows (19.1, 19.2 only)	
Feedthrough	Bonnet 19.0 / 19.1	FKM (Viton®)
	19.2	metal
Mounting position	Gate 19.0 / 19.1 / 19.2	FKM (Viton®)
	19.0	shaft feedthrough
Solenoid valve	19.1 / 19.2	bellows
	DN 400 – 800	any
Position indicator: contact rating	DN 900 – 2000	to be specified with request for offer
	24 V DC, 2 W (others on request)	
Valve position indication	19.0	LED
	19.1 / 19.2	visual (mechanical)

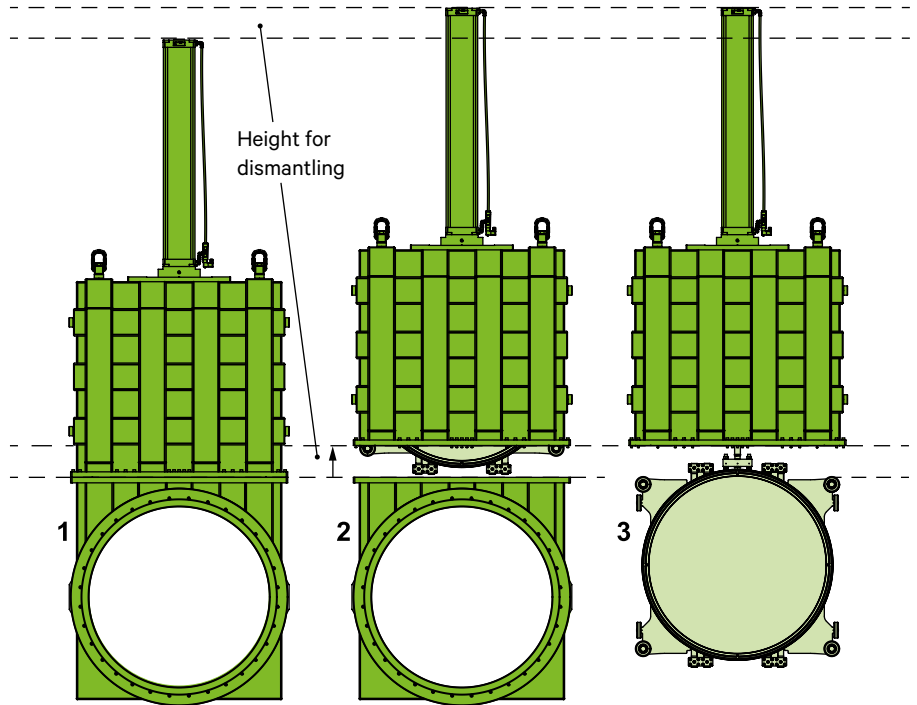
DN (nominal I.D.)		Conductance (molecular flow)	Compressed air min. – max. overpressure				Volume of pneu- matic actuator				Closing or opening time		Weight			
			19.0		19.1 / 19.2		19.0		19.1 / 19.2		19.0	19.1 / 19.2	19.0		19.1 / 19.2	
mm	inch	ls ⁻¹	bar	psi	bar	psi	l	ft ³	l	ft ³	s	s	kg	lbs	kg	lbs
400	16	52 000	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	187 000	5–7	73–102	6–9	87–131	8.8	0.311	4.8	0.170	10	14	350	772	385	849
800	32	283 000	5–7	73–102	6–9	87–131	17.9	0.632	11	0.388	21	35	580	1279	730	1609
900	36	435 000	5–7	73–102	6–9	87–131	20.8	0.735	”	”	23	”	760	1676	”	”
1000	40	509 000	5–7	73–102	6–9	87–131	22.6	0.798	18.8	0.664	25	50	1000	2205	1300	2866
1250	50	953 000	5–7	73–102	6–9	87–131	43.6	1.540	25.9	0.915	30	70	1700	3748	2100	4630
1600	63	1666 000	5–7	73–102	”	”	111.1	3.923	”	”	35	”	2800	6173	”	”
2000	78	2793 000	5–7	73–102	”	”	217.4	7.677	”	”	55	”	5050	11133	”	”

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

” on request

EASY MAINTENANCE

DN 900 – 2000 with split body



- 1 Put valve to the open position
- 2 Unscrew actuator part and lift it off (flange part remains in the system)
- 3 Move gate assembly out of body and carry out maintenance work

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Solenoid valve 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 24VDC)
- 3-position pneumatic actuator
- Mechanical position indicator for 19.0
- Lockable actuator

VALVE

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

PROJECTS FOR SPECIAL VERSIONS

Our business units 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.

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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

DN		Ordering numbers (specify control voltage)		
mm	inch	19.0: Vacuum ISO-F	19.1: HV ISO-F	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 ^{*)}	36	19059-PE44	19159-PE44	19259-PE44
1000	40	19060-PE44	19160-PE44	19260-PE44
1250 ^{*)}	50	19062-PE44	19162-PE44	19262-PE44
1600 ^{*)}	63	19064-PE44	19164-PE44	19264-PE44
2000 ^{*)}	78	19066-PE44	19166-PE44	19266-PE44
Other sizes on request				

without solenoid valve, without position indicator: 19 ... -PE14

without solenoid valve, with position indicator: 19 ... -PE24

with solenoid valve, without position indicator: 19 ... -PE34 (specify control voltage)

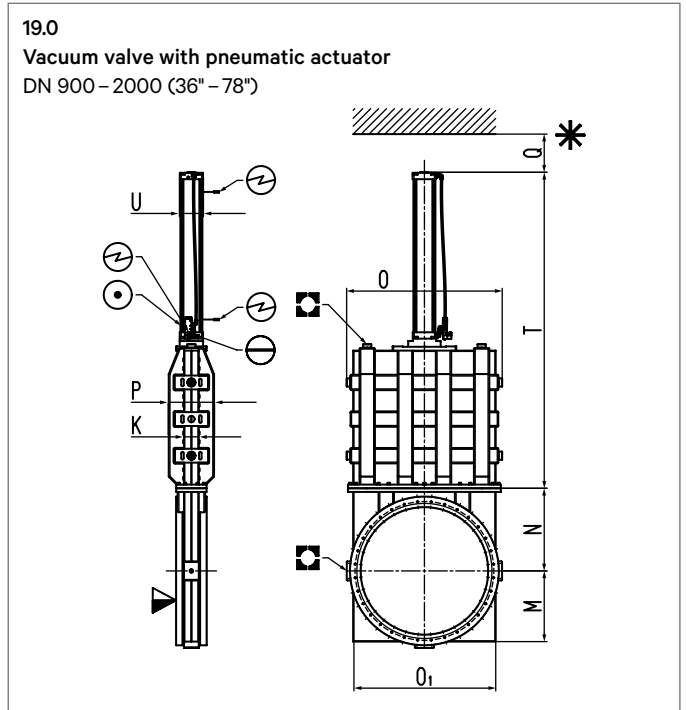
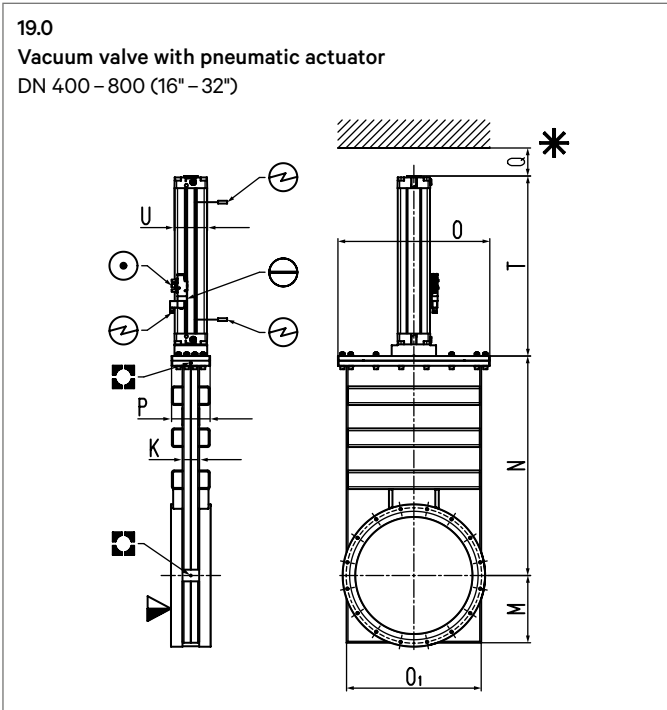
^{*)} customer-specific

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

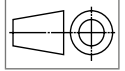
Example: 19254-PE44-X, X = port as per enclosed dimensional drawing

MAIN DIMENSIONS



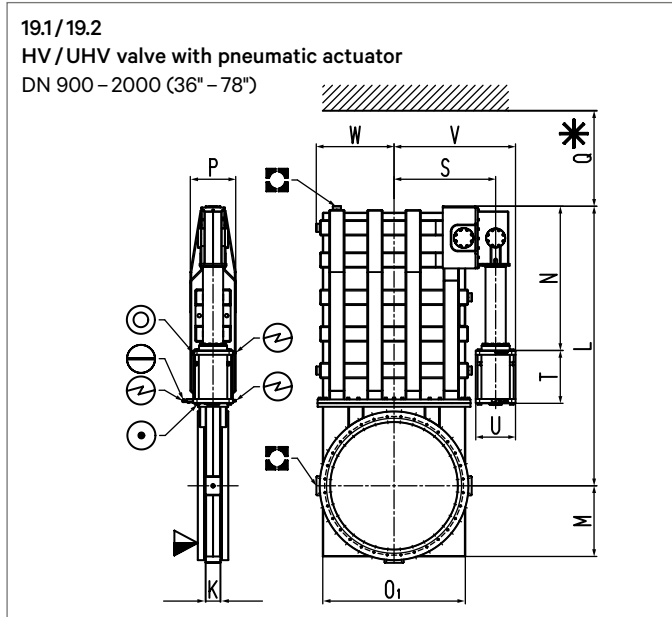
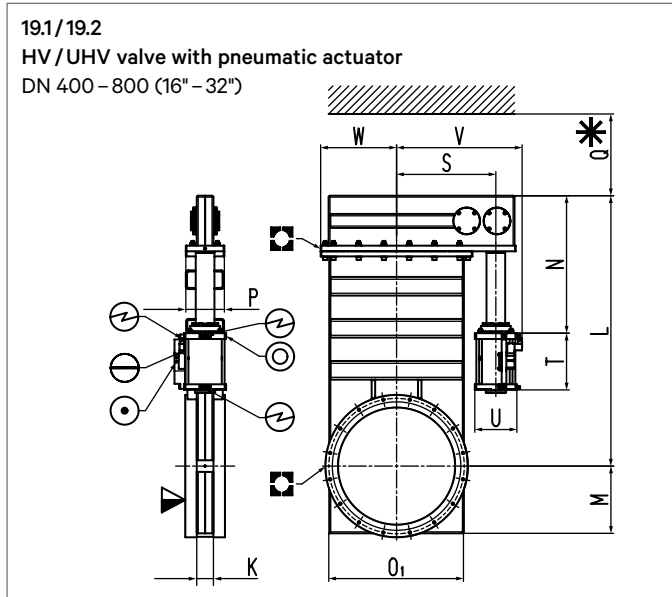
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Emergency operation
- For attachment

Projection E



DN	mm	400	500	630	800	900 ³⁾	1000	1250 ³⁾	1600 ³⁾	2000 ³⁾
	inch	16	20	25	32	36	40	50	63	78
K	mm	67	72	75	87	87	116	116.80	125	145
	inch	2.64	2.83	2.95	3.43	3.43	4.57	4.60	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	241	336	212	356	356	365	553
	inch	5.79	6.50	9.49	13.23	8.35	14.02	14.02	14.37	21.77
Q	mm	617	699	844	1032	133	176	210	252	200
	inch	24.29	27.52	33.23	40.63	5.24	6.93	8.27	9.92	7.87
T	mm	690	771	926	1170	2338	2515	3058	3832	4751
	inch	27.17	30.35	36.46	46.06	92.05	99.02	120.39	150.87	187.05
U	mm	140	136	136	186	186	186	224	224	280
	inch	5.51	5.35	5.35	7.32	7.32	7.32	8.82	8.82	11.02

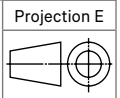
MAIN DIMENSIONS



DN	mm	400	500	630	800	1000	1250 ³
mm	inch	16	20	25	32	40	50
K	mm	67	72	75	87	116	116.80
mm	inch	2.64	2.83	2.95	3.43	4.57	4.60
L	mm	957	1158	1434	1748	2196	2744
mm	inch	37.68	45.59	56.46	68.82	86.46	108.03
M	mm	233	288	363	455	555	709
mm	inch	9.17	11.34	14.29	17.91	21.85	27.91
N	mm	486	589	683	1047	1123	1353
mm	inch	19.13	23.19	26.89	41.22	44.21	53.27
O1	mm	467	577	732	911	1119	1419
mm	inch	18.39	22.72	28.82	35.87	44.06	55.87
P	mm	147	165	240	336	356	356
mm	inch	5.79	6.50	9.45	13.23	14.02	14.02
Q	mm	603	700	896	1052	140	182
mm	inch	23.74	27.56	35.28	41.42	5.51	7.17
S	mm	340	425	503	626	798	929
mm	inch	13.39	16.73	19.80	24.65	31.42	36.57
T	mm	225	255	260	373	436	536
mm	inch	8.86	10.04	10.24	14.69	17.17	21.10
U	mm	180	180	220	262	312	312
mm	inch	7.09	7.09	8.66	10.31	12.28	12.28
V	mm	448	533	630	733	954	1085
mm	inch	17.64	20.98	24.80	28.86	37.56	42.72
W	mm	263	325	403	505	611	760
mm	inch	10.35	12.80	15.87	19.88	24.06	29.92

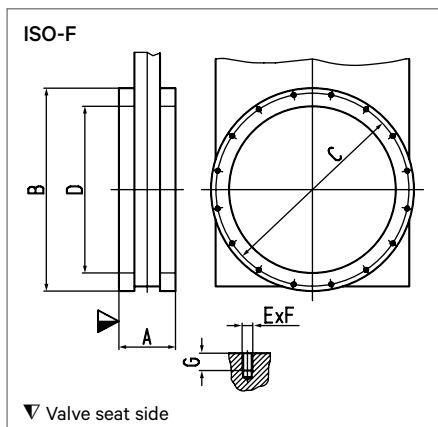
³ customer-specific

Dimensions for DN 900, 1600, 2000 on request



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

FLANGE DIMENSIONS



DN	mm	400	500	630	800	900 ³	1000	1250 ³	1600 ³	2000 ³
mm	inch	16	20	25	32	36	40	50	63	78
A	mm	150	170	180	220.50	204	240	250	300	340
mm	inch	5.90	6.69	7.09	8.66	8.03	9.45	9.84	11.81	13.40
B	mm	510	610	780	960	1060	1168	1500	1850	2232
mm	inch	20.08	24.02	30.71	37.80	41.70	46	59.05	72.83	87.80
C	mm	480	580	720	890	990	1090	1370	1760	2121
mm	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
mm	inch	15.75	19.72	25.63	31.50	35.40	39.37	49.21	63	78
E x F		16 x M12	16 x M12	20 x M12	24 x M12	28 x M12	32 x M12	32 x M16	40 x M24	36 x 3/4"
G	mm	20	20	20	20	20	20	25	36	34
mm	inch	0.79	0.79	0.79	0.79	0.79	0.79	0.98	1.42	1.33

Dimensions for other flanges on request

³ customer-specific

VATTERFLY VALVE, SERIES 20.3/20.4

Compact isolation valve for contaminating and aggressive processes.



Low particle butterfly valve

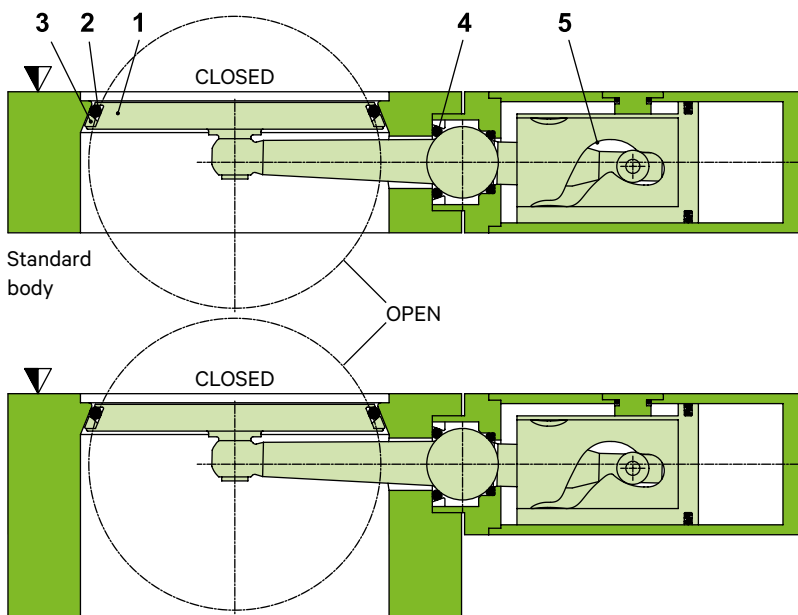
No moving parts in vacuum

Mechanically locked in open and closed position

MAIN FEATURES

Sizes	DN 63 – 200 mm (2½" – 8")
Actuator	pneumatic: double acting
Body material	aluminum or stainless steel
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, CF-F

FUNCTIONAL PRINCIPLE



- 1 Plate
- 2 Plate seal
- 3 Support ring
- 4 Bonnet seal / feedthrough seal
- 5 Spiral mechanism
- ▼ Valve seat side

Extended body: plate remains inside body

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 In closing direction	≤ 1.2 bar ≤ 1.6 bar
Differential pressure at opening		≤ 500 mbar
Cycles until first service		100 000
Temperature ¹⁾	Valve body Actuator Solenoid valve Position indicator	≤ 120 °C (150 °C optional) ≤ 120 °C ≤ 50 °C ≤ 80 °C
Material	Aluminum valve body / plate Stainless steel valve body / plate Mechanism Support ring: standard Support ring: 150 °C option	EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315) AISI 304 (1.4301) AISI 316L (1.4435), AISI 304 (1.4301) POM PEEK
Seal	Bonnet, plate, feedthrough	FKM (Viton®)
Feedthrough		rotary feedthrough
Mounting position		any
Solenoid valve		24 V DC, 7.6 W (others on request)
Position indicator: contact rating	Voltage Current Power	≤ 50 V AC / DC ≤ 0.5 A max. 10 W

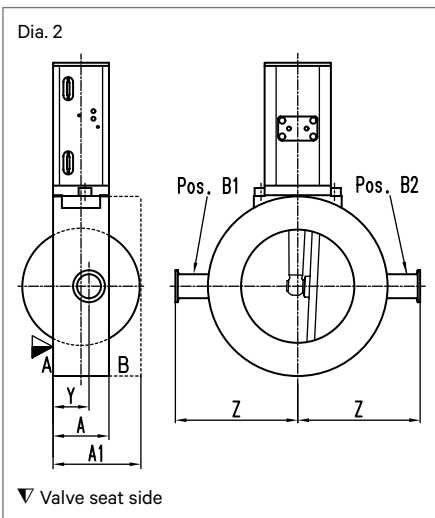
	DN (nominal I.D.)		Conductance (molecular flow)	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time ²⁾	Weight: valve with aluminum body		Weight: valve with stainless steel body	
	mm	inch		bar	psi	l	ft ³		kg	lbs	kg	lbs
20.3 standard body	63	2½	550	4–7	58–102	0.04	0.0014	0.40	2.30	5.10	4.60	10.10
	100	4	1400	4–7	58–102	0.08	0.0028	0.80	4.00	8.80	8.00	17.60
	160	6	4 000	4–7	58–102	0.13	0.0046	1.40	7.40	16.30	15.60	34.40
	200	8	7500	4–7	58–102	0.30	0.0106	1.80	16.10	35.50	34.20	75.40
20.4 extended body	63	2½	450	4–7	58–102	0.04	0.0014	0.40	2.50	5.50	5.30	11.70
	100	4	1050	4–7	58–102	0.08	0.0030	0.80	4.70	10.40	10.10	22.30
	160	6	2550	4–7	58–102	0.13	0.0046	1.40	9.70	21.40	22.30	49.20
	200	8	4 700	4–7	58–102	0.30	0.0106	1.80	21.30	47.00	20.80	45.90

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

²⁾ Depending on pneumatic installation.

OPTIONS, CUSTOMIZED SOLUTIONS

Pic. 1



ACTUATOR

- Other solenoid valve voltage (standard 24VDC)

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 positions B1 and B2
 - aluminum valve body: screwed port
 - stainless steel valve body: welded port

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

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

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

	DN		Ordering numbers		
	mm	inch	ISO-F aluminum	ISO-F stainless steel	CF-F, metric threads stainless steel
20.3 standard body	63	2 ½	20336-PA14	20336-PE14	20336-CE14
	100	4	20340-PA14	20340-PE14	20340-CE14
	160	6	20344-PA14	20344-PE14	20344-CE14
	200	8	20346-PA14	20346-PE14	20346-CE14
20.4 extended body	63	2 ½	20436-PA14	20436-PE14	20436-CE14
	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: 20 ... - . . 24

with solenoid valve, without position indicator: 20 ... - . . 34 (specify control voltage)

with solenoid valve, with position indicator: 20 ... - . . 44 (specify control voltage)

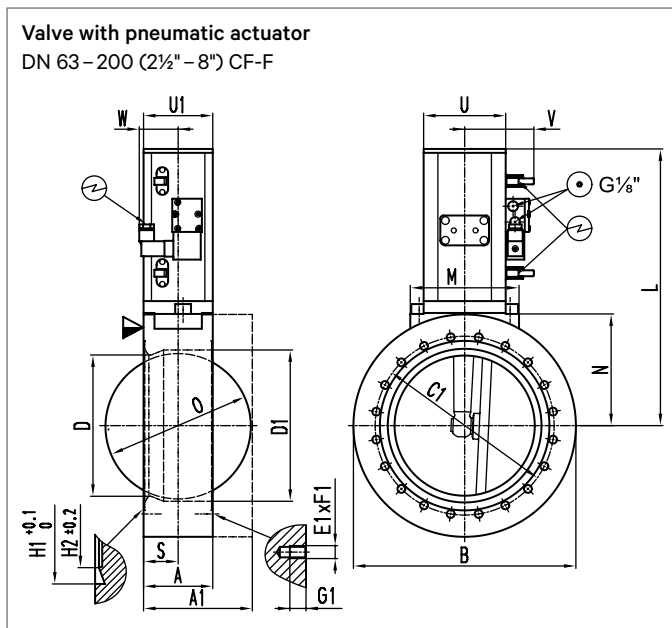
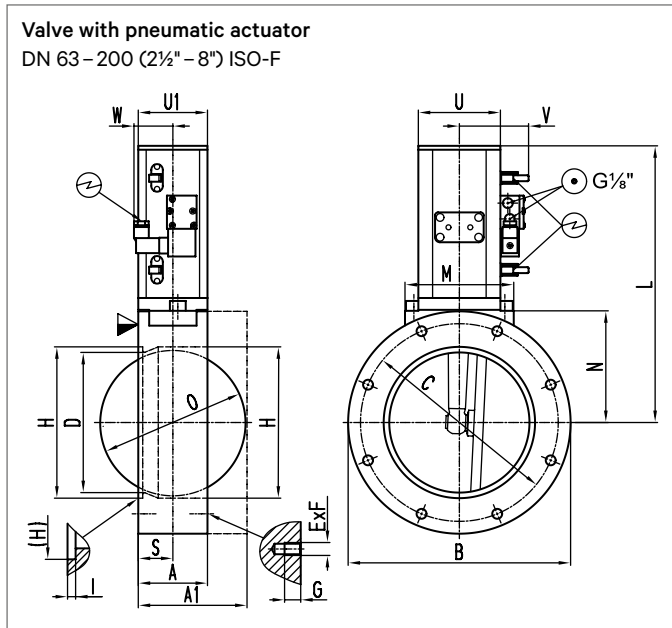
ORDERING INFORMATION
FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 20340-PA44-X, X = port ISO-KF 25 in position B1

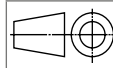
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DIMENSIONS



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

Projection E



DN	mm inch	63 2½	100 4	160 6	200 8
A ¹⁾	mm inch	50 1.97	60 2.36	70 2.76	90 3.54
A1 ²⁾	mm inch	60 2.36	80 3.15	110 4.33	145 5.71
B	mm inch	130 5.12	165 6.50	225 8.86	300 11.81
C	mm inch	110 4.33	145 5.71	200 7.87	260 10.24
C1	mm inch	92.10 3.63	130.20 5.13	181 7.13	231.80 9.13
D	mm inch	63 2.48	95 3.74	142 5.59	192 7.56
D1	mm inch	70 2.76	102 4.02	153 6.02	210 8.27
E × F		4 × M8	8 × M8	8 × M10	12 × M10
E1 × F1		8 × M8	16 × M8	20 × M8	24 × M8
G	mm inch	12 0.47	12 0.47	15 0.59	15 0.59
G1	mm inch	12 0.47	12 0.47	12 0.47	12 0.47
H	mm inch	70 2.76	102 4.02	153 6.02	213 8.39
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
I	mm inch	2.50 0.10	2.50 0.10	4.50 0.18	4.50 0.18
L	mm inch	181 7.13	228 8.98	285 11.22	371 14.61
M	mm inch	76 2.99	86 3.39	110 4.33	140 5.51
N	mm inch	65 2.56	82.50 3.25	113 4.45	147.50 5.81
O	mm inch	66 2.60	100 3.94	147 5.79	200 7.87
S	mm inch	25 0.98	30 1.18	35 1.38	45 1.77
U	mm inch	60 2.36	70 2.76	83 3.27	103 4.06
U1	mm inch	50 1.97	60 2.36	70 2.76	90 3.54
V	mm inch	60 2.36	65 2.56	70 2.76	80 3.15
W	mm inch	44 1.73	40 1.57	40 1.57	30 1.18

¹⁾ Standard body, series 20.3

²⁾ Extended body, series 20.4

BUTTERFLY VALVE, SERIES 21.0

Compact isolation valve for vacuum. Alternative to gate valves.



Manual

Pneumatic

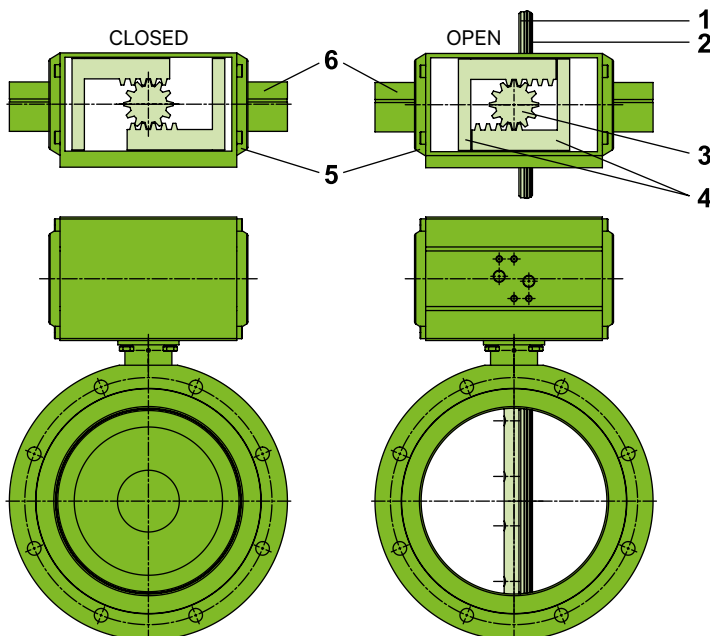
Robust and compact pump isolation valve

Operation under differential pressure possible

MAIN FEATURES

Sizes	DN 63 – 250 mm (2½" – 10")
Actuators	manual with turning lever pneumatic: double acting
Body material	stainless steel
Feedthrough	rotary feedthrough
Standard flanges	DN 63 – 160: ISO-F, DN 250: ISO-F, ISO-K

FUNCTIONAL PRINCIPLE



- 1 Plate
- 2 Plate seal
- 3 Shaft with pinion gear
- 4 Piston with rack gear
- 5 Actuator
- 6 Valve body

TECHNICAL DATA

Leak rate	Valve body Valve seat: valve with manual actuator valve with pneumatic actuator		$< 1 \cdot 10^{-9}$ mbar ls ⁻¹ $< 5 \cdot 10^{-9}$ mbar ls ⁻¹ $< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	Valve with manual actuator	DN 63 – 100 DN 160	1 · 10 ⁻⁸ mbar to 4 bar (abs) 1 · 10 ⁻⁸ mbar to 1.3 bar (abs)
	Valve with pneumatic actuator	DN 63 – 250	1 · 10 ⁻⁸ mbar to 1.3 bar (abs)
Differential pressure on the plate	Valve with manual actuator	DN 63 – 100 DN 160	≤ 4 bar ≤ 1.3 bar
	Valve with pneumatic actuator	DN 63 – 250	≤ 1.3 bar
Differential pressure at opening ¹⁾			≤ 1.3 bar
Cycles until first service ²⁾	Valve with manual actuator	DN 63 – 160	100 000
	Valve with pneumatic actuator	DN 63, 250	1 million
		DN 100, 160	1.5 million
Temperature ³⁾	Valve body		≤ 150 °C
	Actuator		≤ 80 °C
	Solenoid valve		≤ 50 °C
	Position indicator		≤ 80 °C
Material	Valve body, plate, shaft		AISI 304 (1.4301)
Seal	Bonnet, plate		FKM (Viton®)
Feedthrough			rotary feedthrough
Mounting position			any
Solenoid valve			24 VDC, 5.7 W, normally closed (NC) (others on request)
Position indicator: contact rating	Voltage		≤ 50 V AC / 5 – 30 V DC
	Current		0.1 A

		Valve with manual actuator			Valve with pneumatic actuator								
DN (nominal I.D.)		Conductance (molecular flow) ls ⁻¹	Weight		Conductance (molecular flow) ls ⁻¹	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time ⁴⁾ s	Opening time ⁴⁾ s	Weight	
mm	inch		kg	lbs		bar	psi	l	ft ³			kg	lbs
63	2½	350	3.20	7.10	400	4 – 6	58 – 87	0.25	0.009	≤ 0.15	≤ 0.20	3.80	8.40
100	4	1000	5.20	11.50	1400	4 – 6	58 – 87	0.60	0.021	≤ 0.32	≤ 0.52	6.50	14.30
160	6	3400	9.3	20.50	4000	4 – 6	58 – 87	0.60	0.021	≤ 0.32	≤ 0.55	10	22
250	10	–	–	–	8200	4 – 6	58 – 87	0.70	0.025	≤ 2	≤ 5	15.70	34.60

¹⁾ Maximum value; may reduce the specified cycle lifetime.

²⁾ Tested at room temperature and under clean and static conditions. Expandable parts are excluded.

³⁾ Maximum values; depending on operating conditions and sealing materials.

⁴⁾ Depending on pneumatic installation.

OPTIONS, CUSTOMIZED SOLUTIONS

Ports for roughing (by-pass), venting or for gauges: specification on request.

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with manual actuator
turning handle: ¼ turn

DN		Ordering numbers
mm	inch	
63	2 ½	ISO-F 21036-PE06
100	4	21040-PE06
160	6	21044-PE06

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

		ISO-F	ISO-K
63	2 ½	21036-PE14	-
100	4	21040-PE14	-
160	6	21044-PE14	-
250	10	21048-PE14	21048-QE14

without solenoid valve, with position indicator: 210 .. - E24

with solenoid valve, with position indicator: 210 .. - E44 (specify control voltage)

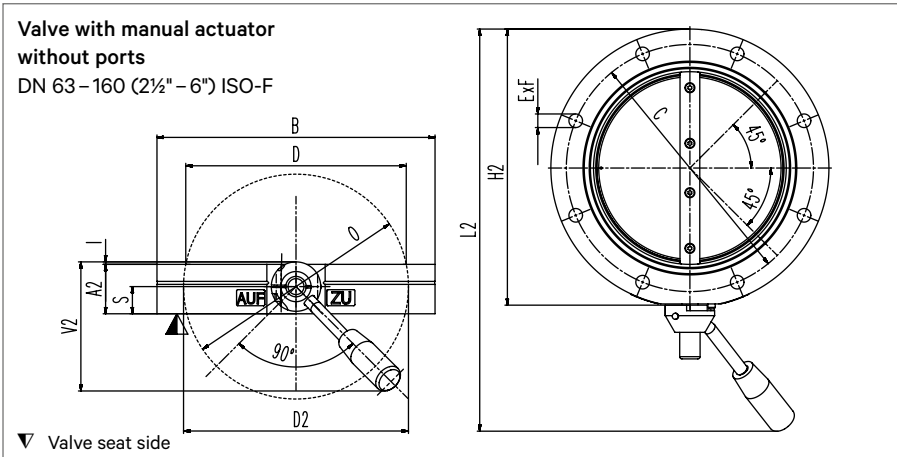
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

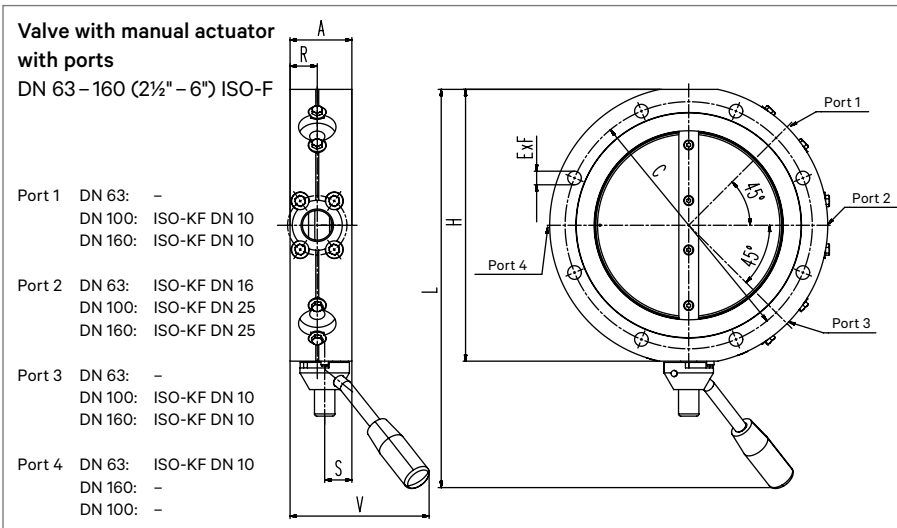
Basic ordering number plus «-X»: -X to be specified

Example: 21044-PE44-X, X = customer-specific valve body

DIMENSIONS



DN	mm	63	100	160
	inch	2 ½	4	6
A	mm	40	50	50
	inch	1.57	1.97	1.97
A2	mm	35	35	40
	inch	1.38	1.38	1.57
B	mm	130	165	225
	inch	5.12	6.50	8.86
C	mm	110	145	200
	inch	4.33	5.71	7.87
D ¹⁾	mm	97	132	182
	inch	3.82	5.20	7.17
D2 ²⁾	mm	91	124	182
	inch	3.58	4.88	7.17
E × F		4 × Ø9	8 × Ø9	8 × Ø11
H	mm	124	158	220
	inch	4.88	6.22	8.66
H2	mm	127	161.50	222.50
	inch	5	6.36	8.76
I	mm	5	6	2
	inch	0.20	0.24	0.08
L	mm	200	234	324
	inch	7.87	9.21	12.76
L2	mm	202	237	326
	inch	7.95	9.33	12.83
O	mm	70	101	150.60
	inch	2.76	3.98	5.93
R	mm	23	28	28
	inch	0.91	1.10	1.10
S	mm	20	21	22
	inch	0.79	0.83	0.87
V	mm	83.20	92.10	112.50
	inch	3.28	3.63	4.43
V2	mm	83.10	77.10	104.50
	inch	3.27	3.04	4.11

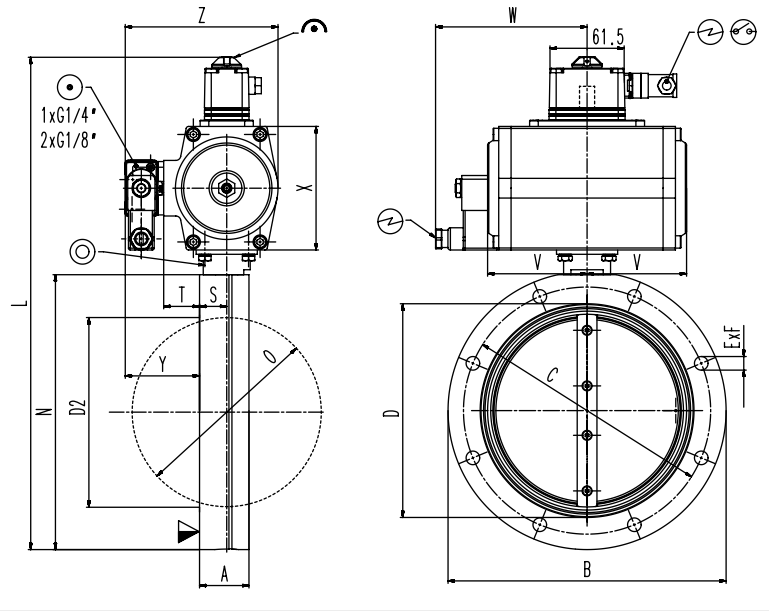


¹⁾ Sealing surface ²⁾ O-ring groove

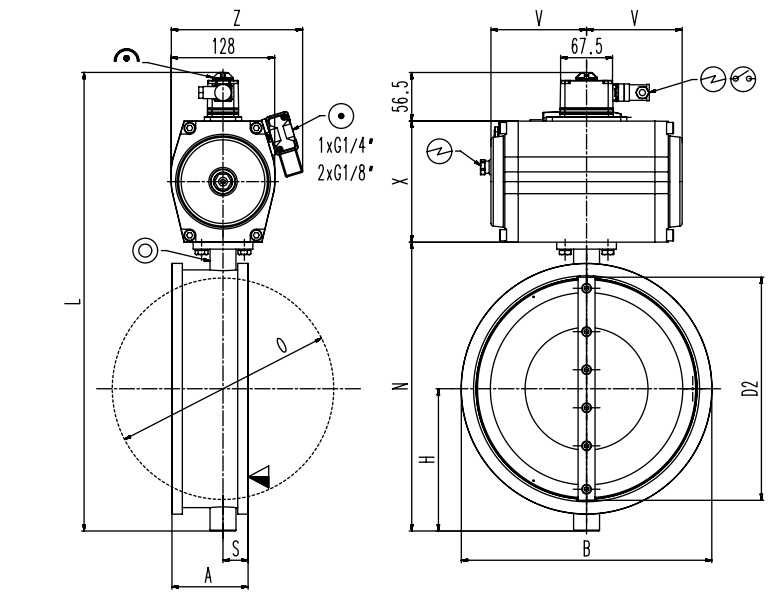
DIMENSIONS

A

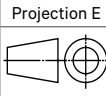
Valve with pneumatic actuator without ports
DN 63 – 160 (2½" – 6") ISO-F



Valve with pneumatic actuator without ports
DN 250 (10") ISO-K



- ▼ Valve seat side
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Mechanical position indication
- ⊗ Position indicator
- ⊘ Leak detection hole



DN	mm	63	100	160	250
	inch	2 ½	4	6	10
A	mm	35	35	40	88
	inch	1.38	1.38	1.57	3.46
B	mm	130	165	225	290
	inch	5.12	6.50	8.86	11.42
C	mm	110	145	200	-
	inch	4.33	5.71	7.87	-
D	mm	97	132	166	-
	inch	3.82	5.20	6.54	-
D2	mm	91	124	153	261
	inch	3.58	4.88	6.02	10.28
E x F		4 x Ø9	8 x Ø9	8 x Ø11	-
H	mm	65	82.50	112.50	164.50
	inch	2.56	3.25	4.43	6.48
L	mm	183	337.80	398.80	530.20
	inch	7.20	13.30	15.70	20.87
N	mm	127	161.50	222.50	334
	inch	5	6.36	8.76	13.15
O	mm	72	102	153	256
	inch	2.83	4.02	6.02	10.08
S	mm	20	21	22	29
	inch	0.79	0.83	0.87	1.14
T	mm	19	30	29	31
	inch	0.75	1.18	1.14	1.22
V	mm	66	80.50	80.50	110.50
	inch	2.60	3.17	3.17	4.35
W	mm	122.60	122.60	122.60	-
	inch	4.83	4.83	4.83	-
X	mm	94	120	120	140
	inch	3.70	4.72	4.72	5.51
Y	mm	50.70	61.60	60.60	-
	inch	2	2.43	2.39	-
Z	mm	100.20	124.10	124.10	152
	inch	3.94	4.89	4.89	5.98

Dimensions for valves with ports on request

ALL-METAL GATE VALVE, SERIES 48.1/48.2

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

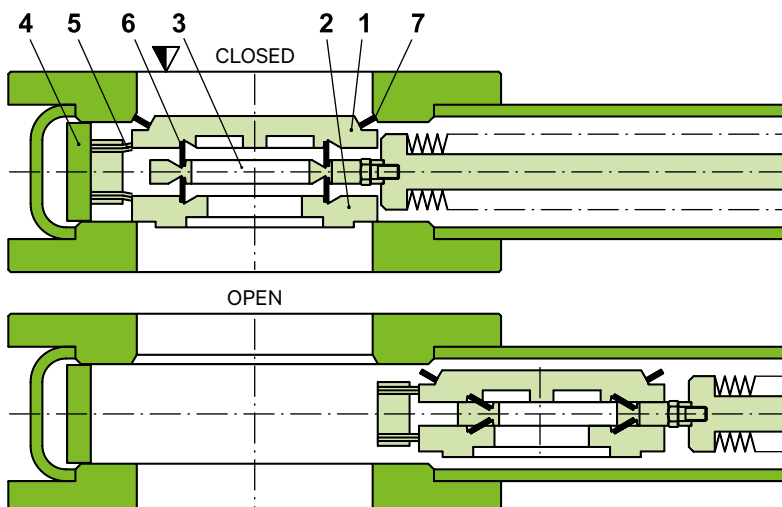


«Hard on hard» sealing
 The reliable standard
 Field-proven technology

MAIN FEATURES

Sizes	DN 16 – 320 mm (5/8" – 12")
Actuators	manual pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-F
Sealing technology	VATRING (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Gate
- 2 Counter-plate
- 3 Guide plate
- 4 Spring stop
- 5 Leaf spring
- 6 Support
- 7 VATRING
- ▼ Valve seat side

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 DN 63 – 250 DN 320	≤ 1 bar ≤ 500 mbar ¹⁾ ≤ 500 mbar ²⁾
Cycles until first service	DN 16 – 200 DN 250 – 320	20 000 5 000
Bake-out temperature ³⁾	Valve body Manual actuator Pneumatic actuator Solenoid valve Position indicator	≤ 300 °C ≤ 140 °C (Option: 200 °C) ≤ 200 °C ≤ 80 °C ≤ 80 °C (Option: 200 °C)
Heating and cooling rate	DN 16 DN 40 – 160 DN 200 – 320	≤ 80 °C h ⁻¹ ≤ 50 °C h ⁻¹ ≤ 25 °C h ⁻¹
Material	Valve body, mechanism Bellows	AISI 316L (1.4404, 1.4435) AISI 316L (1.4435)
Seal	Bonnet, gate	metal
Feedthrough		bellows
Mounting position	DN 16 – 250 DN 320	any on request
Solenoid valve		24 V DC, 2.5 W (others on request)
Position indicator: contact rating	Voltage Current	≤ 50 V AC/DC 80 °C: ≤ 1.2 A / 200 °C: ≤ 1 A
Valve position indication		visual (mechanical)

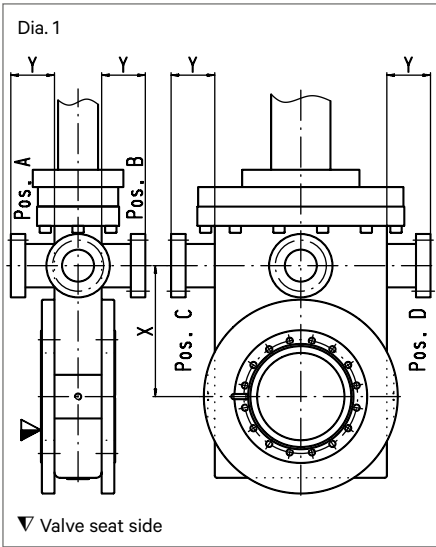
DN (nominal I.D.)		Conductance (molecular flow)	Valve with manual actuator				Valve with pneumatic actuator					
			Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch	ls ⁻¹		n	kg	lbs	bar	psi	l		ft ³	s
16	5/8	10	19	3.0	6.6	4 – 8	58 – 116	0.1	0.004	1	3.8	8.4
40	1½	100	21	5.5	12	4 – 8	58 – 116	0.27	0.010	1.5	7.2	16
63	2½	400	32	16	35	4 – 8	58 – 116	0.5	0.018	2	17.3	38
100	4	1400	46	23.5	52	4 – 8	58 – 116	1.4	0.049	4	27	60
160	6	4 200	66	39	85	4 – 8	58 – 116	4.3	0.152	9	45	100
200	8	6 900	63	74.5	164	4 – 8	58 – 116	8.3	0.293	15	88	194
250	10	12 700	–	–	–	4 – 8	58 – 116	10.7	0.378	20	156	344
320	12	23 500	–	–	–	5 – 8	63 – 116	12.9	0.456	20	230	507

¹⁾ 1 bar with reduced number of cycles.

²⁾ Reduced number of cycles.

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

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Other solenoid valve voltage (standard 24VDC)
- Bakeable position indicator:
manual and pneumatic actuator bakeable to max. 200 °C¹⁾ (standard: 80 °C)
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Pneumatic actuator (compact or extended): radiation resistant to 10⁶ Gy, bakeable to 140 °C¹⁾
- Pneumatic actuator for hot zone: radiation resistant to 10⁸ Gy, bakeable to 200 °C¹⁾
- Manual actuator bakeable to 200 °C¹⁾

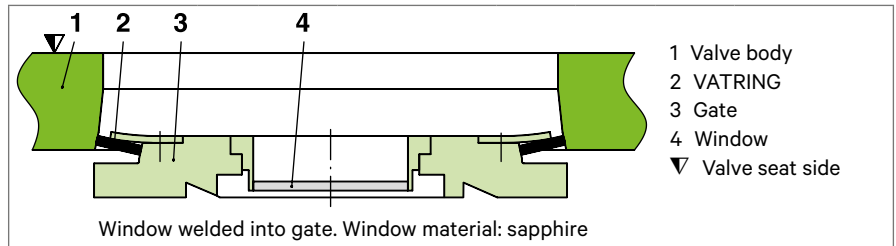
VALVE

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

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



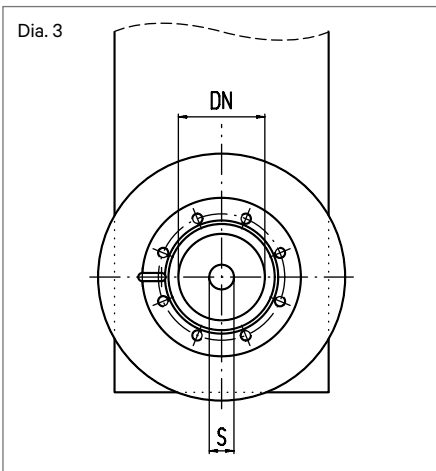
- Window in gate with DN 40, 63, 100, 160, 200 only (Pic. 2, Dia. 3)



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

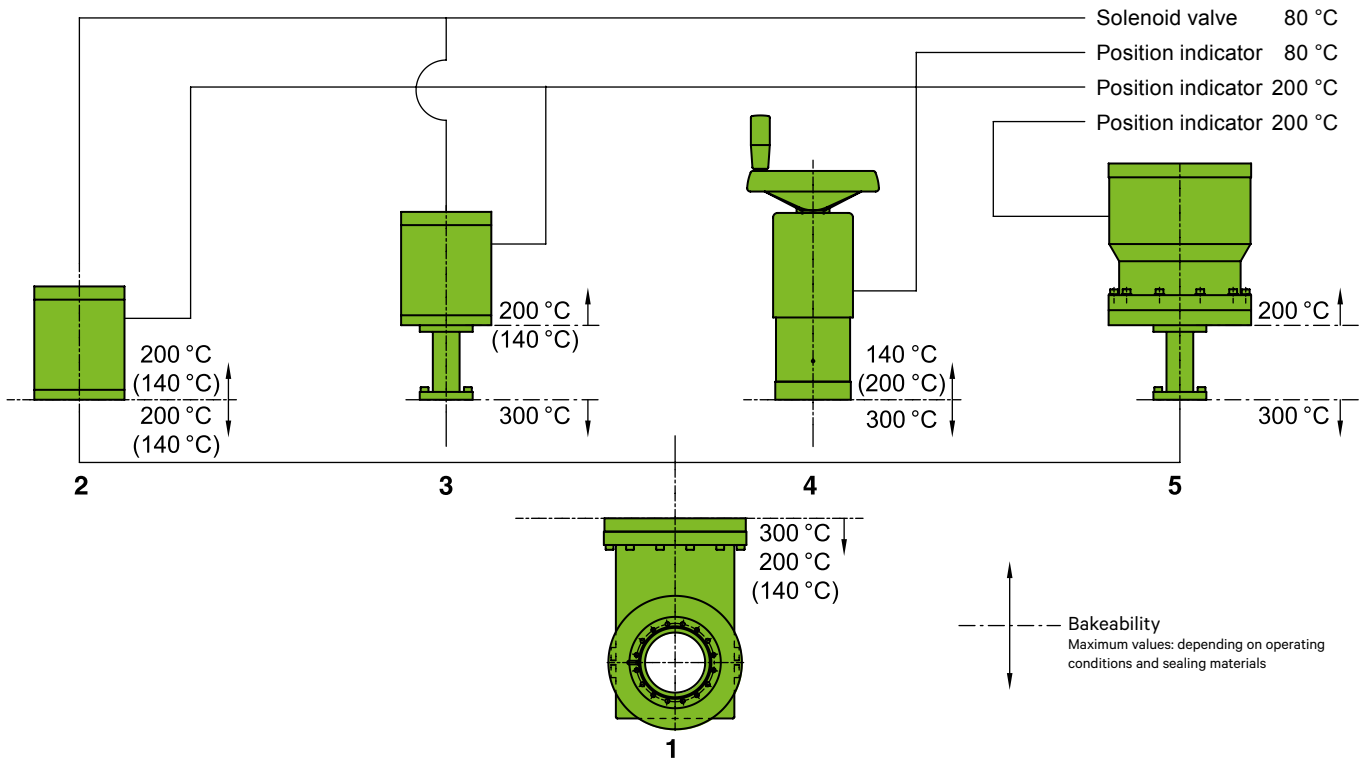
- Options:
- Special glass qualities
 - Other materials (e. g. berillium)
 - Other window sizes

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



BODY AND ACTUATORS

MODULAR SELECTION



- | | | |
|---|--|--|
| 1 Valve body, mechanism, bellows | : 10 ⁸ Gy, bakeable to 300 °C | |
| 2 Pneumatic actuator: compact | : 10 ⁵ Gy, bakeable to 200 °C | Option: 10 ⁶ Gy, bakeable to 140 °C |
| 3 Pneumatic actuator: extended | : 10 ⁵ Gy, bakeable to 200 °C | Option: 10 ⁶ Gy, bakeable to 140 °C |
| 4 Manual actuator | : 10 ⁵ Gy, bakeable to 140 °C or 200 °C | |
| 5 Special pneumatic actuator for hot zone | : 10 ⁸ Gy, bakeable to 200 °C | |

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 33
- Bake-out jackets

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. Technical details and ordering information on request.

ORDERING INFORMATION FOR STANDARD VALVES

Valve with manual actuator handwheel

DN		Ordering numbers		
mm	inch	CF-F without position indicator	CF-F with position indicator 80 °C	CF-F with position indicator 200 °C
16	¾	48124-CE01	48124-CE08	48124-CE05
40	1½	48132-CE01	48132-CE08	48132-CE05
63	2½	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

DN		Ordering numbers (specify control voltage)	
mm	inch	CF-F with compact actuator, valve bakeable to 200 °C	
		without solenoid valve with position indicator 80 °C	with solenoid valve with position indicator 80 °C
63	2½	48236-CE72	48236-CE74 ¹⁾
100	4	48240-CE72	48240-CE74 ¹⁾
160	6	48244-CE72	48244-CE74 ¹⁾
200	8	48146-CE72	48146-CE74 ¹⁾
250	10	48148-CE72	48148-CE74 ¹⁾
320	12	48150-XE72 X = customer specific	48150-XE74 ¹⁾ X = customer specific

¹⁾ specify control voltage

DN		Ordering numbers (specify control voltage)	
mm	inch	CF-F with extended actuator, valve bakeable to 300 °C	
		without solenoid valve with position indicator 80 °C	with solenoid valve with position indicator 80 °C
16	¾	48124-CE24	48124-CE44 ¹⁾
40	1½	48132-CE24	48132-CE44 ¹⁾
63	2½	48236-CE24	48236-CE44 ¹⁾
100	4	48240-CE24	48240-CE44 ¹⁾
160	6	48244-CE24	48244-CE44 ¹⁾
200	8	48146-CE24	48146-CE44 ¹⁾
250	10	48148-CE24	48148-CE44 ¹⁾
320	12	48150-XE24 X = customer specific	48150-XE44 ¹⁾ X = customer specific

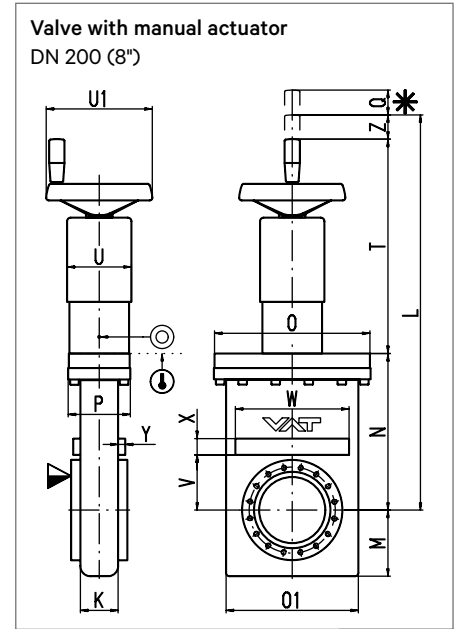
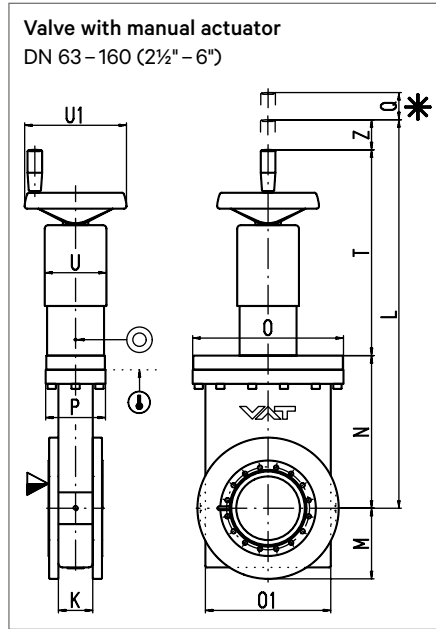
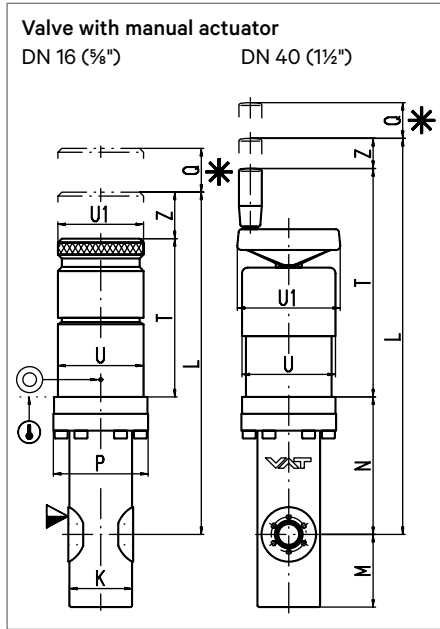
¹⁾ specify control voltage

ORDERING INFORMATION FOR VALVES WITH OPTIONS

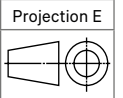
Basic ordering number plus «-X»: -X to be specified

Example: 48240-CE44-X, X = port CF-F 40 in position A

MAIN DIMENSIONS



▼ Valve seat side * Required for dismantling © Leak detection hole ① Bake-out area



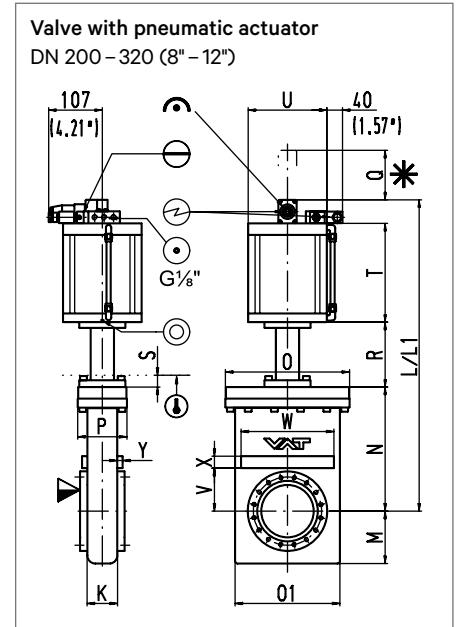
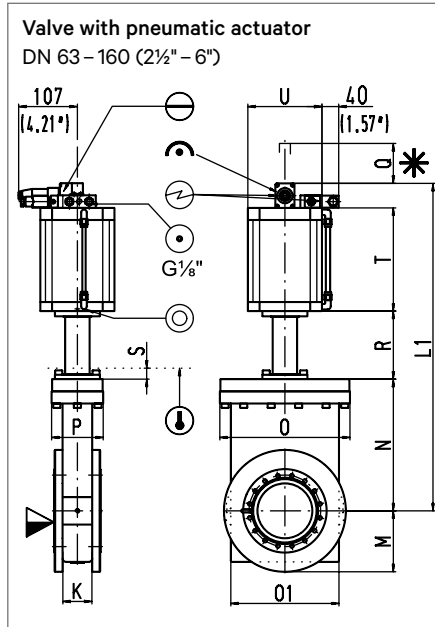
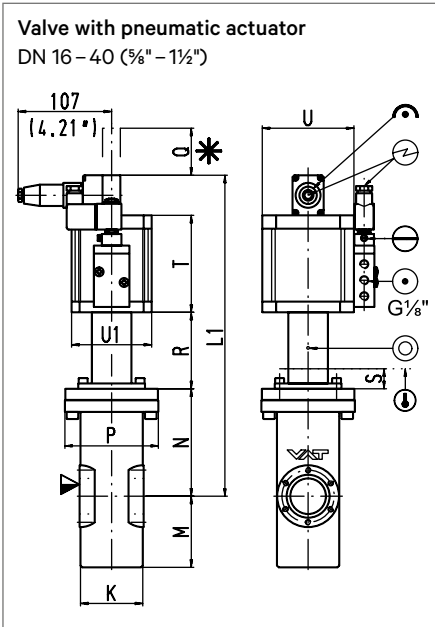
DN	mm inch	16 5/8"	40 1½"
K	mm inch	48.50 1.91	70 2.76
L	mm inch	261 10.28	414 16.30
M	mm inch	56 2.20	80 3.15
N	mm inch	106 4.17	132 5.20
P	mm inch	73 2.87	105 4.13
Q	mm inch	150 5.90	200 7.87
T	mm inch	122 4.80	230 9.06
U	mm inch	66 2.60	90 3.54
U1	mm inch	66 2.60	100 3.70
Z	mm inch	33 1.30	52 2.05

DN	mm inch	63 2½"	100 4"	160 6"
K	mm inch	46 1.81	54 2.13	58 2.28
L	mm inch	554 17.13	678 26.69	873 34.37
M	mm inch	90 3.54	111 4.37	144 5.67
N	mm inch	209 8.23	240 9.45	329 12.95
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	280 11.02	320 12.60	450 17.72
T	mm inch	266 8.90	324 12.76	378 14.88
U	mm inch	97 3.81	97 3.81	97 3.81
U1	mm inch	100 3.94	160 6.30	160 6.30
Z	mm inch	79 3.11	114 4.49	166 6.54

DN	mm inch	200 8"
K	mm inch	78 3.07
L	mm inch	1101 43.33
M	mm inch	161 6.34
N	mm inch	410 16.14
O	mm inch	352 13.86
O1	mm inch	316 12.44
P	mm inch	114 4.49
Q	mm inch	570 22.44
T	mm inch	473 18.62
U	mm inch	97 3.81
U1	mm inch	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	218 8.58

Flange dimensions: see page 121

MAIN DIMENSIONS



▽ Valve seat side

* Required for dismantling

⊕ Compressed air connection

⊖ Electrical connection

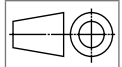
⊖ Emergency operation

⊕ Leak detection hole

⊕ Bake-out area

⊖ Mechanical position indication

Projection E



DN	mm	16	40
	inch	¾	1½
K	mm	48.50	70
	inch	1.91	2.76
L1 ¹⁾	mm	312	372
	inch	12.28	14.65
M	mm	56	80
	inch	2.20	3.15
N	mm	106	132
	inch	4.17	5.20
P	mm	73	105
	inch	2.87	4.13
Q	mm	150	200
	inch	5.90	7.87
R ¹⁾	mm	64	86
	inch	2.52	3.39
S	mm	15	20
	inch	0.59	0.79
T	mm	90	109
	inch	3.54	4.29
U	mm	83	103
	inch	3.27	4.06
U1	mm	70	90
	inch	2.76	3.54

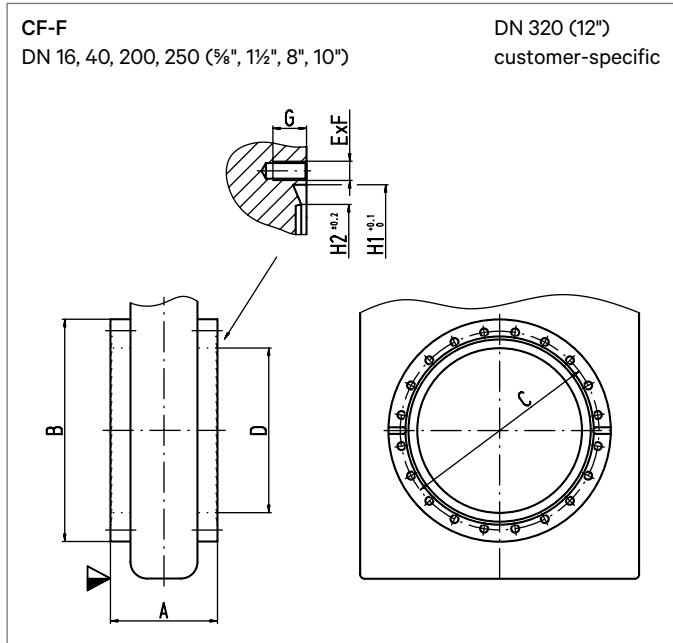
¹⁾ Extended actuator

DN	mm	63	100	160
	inch	2½	4	6
K	mm	46	54	58
	inch	1.81	2.13	2.28
L	mm	403	473	616
	inch	15.87	18.62	24.25
L1 ¹⁾	mm	527	597	740
	inch	20.75	23.50	29.13
M	mm	90	111	144
	inch	3.54	4.37	5.67
N	mm	209	240	329
	inch	8.23	9.45	12.95
O	mm	189	237	287
	inch	7.44	9.33	11.30
O1	mm	156	197	253
	inch	6.14	7.76	9.96
P	mm	77	94	93
	inch	3.03	3.70	3.66
Q	mm	280	320	450
	inch	11.02	12.60	17.72
R ¹⁾	mm	124	124	124
	inch	4.88	4.88	4.88
S	mm	20	20	20
	inch	0.79	0.79	0.79
T	mm	149	188	242
	inch	5.87	7.40	9.53
U	mm	98	135	190
	inch	3.86	5.31	5.91

DN	mm	200	250	320
	inch	8	10	12
K	mm	78	90	105
	inch	3.07	3.54	4.13
L	mm	770	947	1114
	inch	30.31	37.28	43.86
L1 ¹⁾	mm	894	1071	1238
	inch	35.20	42.17	48.74
M	mm	161	205	240
	inch	6.34	8.07	9.45
N	mm	410	525	632
	inch	16.14	20.67	24.88
O	mm	352	446	516
	inch	13.86	17.56	20.32
O1	mm	316	410	480
	inch	12.44	16.14	18.89
P	mm	114	126	141
	inch	4.49	4.96	5.55
Q	mm	535	675	800
	inch	21.06	26.57	31.50
R ¹⁾	mm	124	124	124
	inch	4.88	4.88	4.88
S	mm	20	20	20
	inch	0.79	0.79	0.79
T	mm	315	377	438
	inch	12.40	14.84	17.24
U	mm	230	230	230
	inch	9.06	9.06	9.06
V	mm	155	210	245
	inch	6.10	8.27	9.65
W	mm	277	441	511
	inch	10.91	17.36	20.12
X × Y	mm	40 × 30	50 × 50	60 × 60
	inch	1.57 × 1.18	1.97 × 1.97	2.36 × 2.36

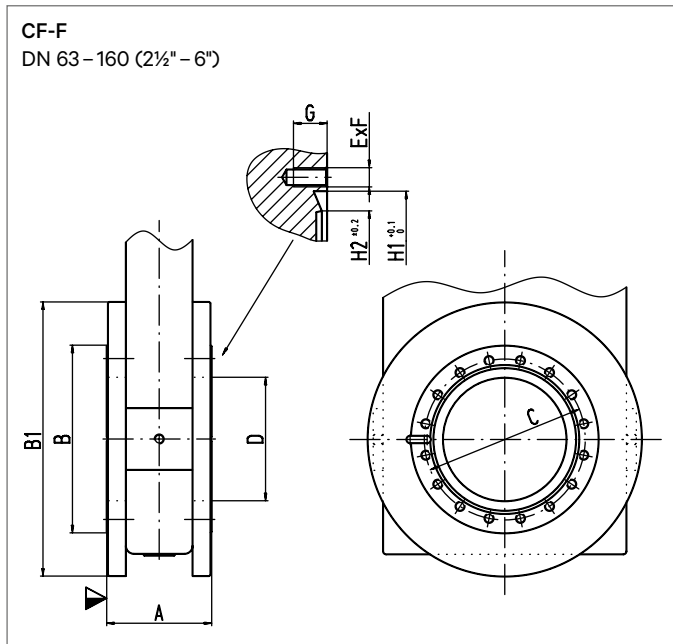
Flange dimensions: see page 121

FLANGE DIMENSIONS



DN	mm inch	16 5/8	40 1 1/2	200 8	250 10	320 ¹⁾ 12
O.D.	inch	1 1/8	2 3/8	10	12	-
A	mm inch	50 1.97	72 2.83	140 5.51	150 5.91	170 6.69
B	mm inch	42 1.65	69.50 2.73	277 10.90	380 14.96	444 17.48
C	mm inch	27 1.06	58.70 2.31	231.80 9.13	284 11.18	-
D	mm inch	16 0.63	40 1.57	200 7.87	250 9.84	320 12.60
E x F		6 x M4	6 x M6	24 x M8	32 x M8	-
G	mm inch	8 0.31	10 0.39	17 0.67	17 0.67	-
H1	mm inch	21.40 0.84	48.30 1.90	222.30 8.75	273.15 10.75	-
H2	mm inch	18.50 0.72	42 1.65	217 8.54	267 10.51	-

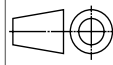
¹⁾ Customer-specific



DN	mm inch	63 2 1/2	100 4	160 6
O.D.	inch	4 1/2	6	8
A	mm inch	75 2.95	85 3.35	97.50 3.84
B	mm inch	113.50 4.47	152 5.98	202.50 7.97
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
D	mm inch	63 2.48	100 3.94	150 5.91
E x F		8 x M8	16 x M8	20 x M8
G	mm inch	12 0.47	14 0.55	16 0.63
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

▼ Valve seat side

Projection E



L-GATE VALVE / INSERT, SERIES 92.0

Chamber or pump isolation valve for surface analysis and semiconductor applications.



Valve



Insert

Low particle count

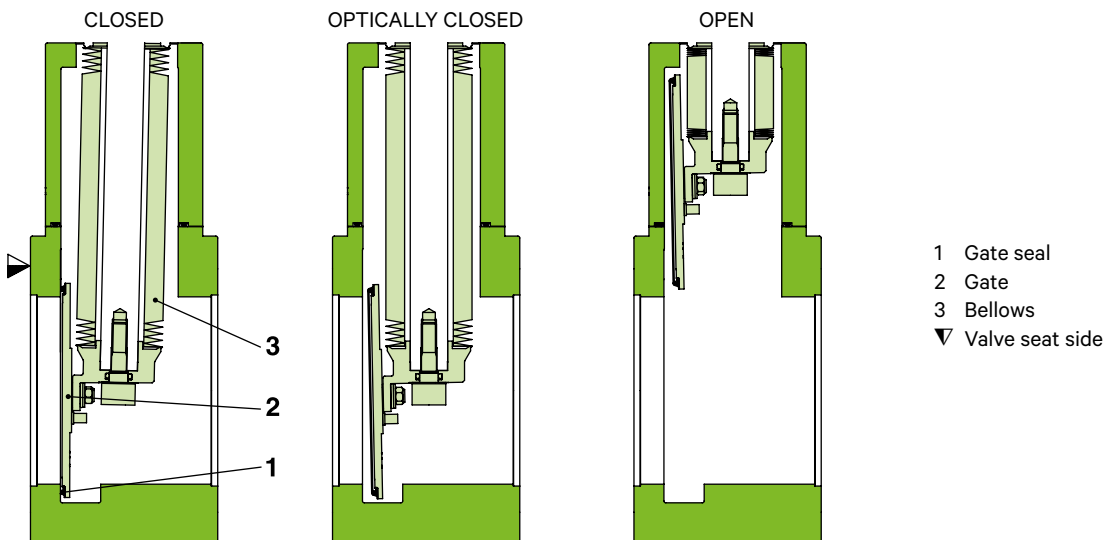
Low cost of ownership

Easy maintenance

MAIN FEATURES

Sizes	DN 10 – 100 mm (3/8" – 4")
Actuators	pneumatic: single acting with closing spring or double acting
Body material	aluminum or stainless steel
Feedthrough	bellows
Standard flanges	ISO-KF, ISO-F, CF-F
Vacuum level	HV, UHV

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-9}$ mbar to 1 bar (abs)
Differential pressure on the gate		≤ 1 bar
Differential pressure at opening		≤ 30 mbar ¹⁾
Cycles until first service		on request: depending on valve size
Temperature ²⁾	Valve body	≤ 120 °C
	Actuator	≤ 50 °C
	Solenoid valve	≤ 50 °C
	Position indicator	≤ 50 °C
Heating and cooling rate		≤ 30 °C h ⁻¹
Material	Aluminum valve body	EN AW-5083 (3.3547)
	Stainless steel valve body	AISI 304 (1.4301)
	Gate	AISI 304 (1.4301)
	Bellows	AISI 316L (1.4435), AISI 633 (AM 350)
Seal	Bonnet (aluminum body)	FKM (Viton®)
	Bonnet (stainless steel body)	metal
	Gate	FKM (Viton®)
Feedthrough		bellows
Mounting position		any
Solenoid valve		24 V DC, 2.5 W (others on request)
Position indicator: contact rating		on request: depending on valve size
Valve position indication		visual (mechanical)

¹⁾ ≤ 1 bar: reduces number of cycles until first service.

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

AVAILABLE SIZES

DN 10 mm (3/8")
 DN 40 mm (1 1/2")
 DN 63 mm (2 1/2")
 DN 100 mm (4")

ORDERING INFORMATION

On request, depending on specification

OPTIONS, CUSTOMIZED SOLUTIONS

- Customer specified flanges
- Insert version (without body, for integration into the vacuum system)
- Other sealing materials
- Other options on request

DIMENSIONS

On request



CONTROL VALVES

SERIES	TYPE	PAGE
61.2	BUTTERFLY CONTROL VALVE	126
61.5	BUTTERFLY CONTROL VALVE WITH ISOLATION FUNCTION	132
62.0	ANGLE CONTROL VALVE	138
64.2	HV GATE CONTROL VALVE	142
64.8	UHV GATE CONTROL VALVE	150
65.0	PENDULUM CONTROL VALVE	156
65.1	PENDULUM CONTROL VALVE	162
65.2	PENDULUM CONTROL VALVE	168
65.5	PENDULUM CONTROL VALVE	172
67.0	SYMMETRICAL CONTROL VALVE	176
95.1 / 95.2	BUTTERFLY AND ISOLATION VALVE	180
	PRESSURE CONTROLLERS FOR VALVES	184

BUTTERFLY CONTROL VALVE, SERIES 61.2

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 – 320

Reliable operation in dirty processes

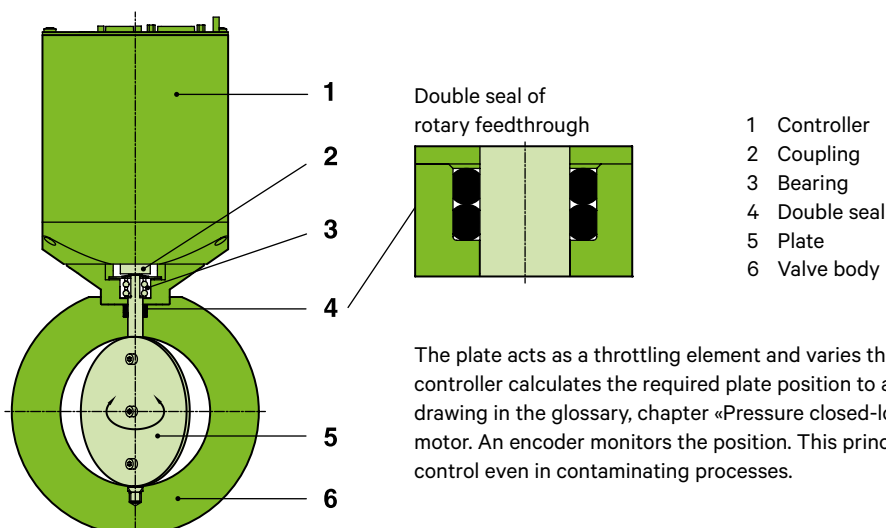
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

Sizes	DN 25 – 320 mm (1" – 12")
Actuator	integrated pressure controller with stepper motor
Body material	aluminum or stainless steel
Feedthrough	rotary feedthrough
Standard flanges	ISO-KF, ISO-F

FUNCTIONAL PRINCIPLE



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 in the glossary, chapter «Pressure closed-loop control». Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control even in contaminating processes.

TECHNICAL DATA

Leak rate ¹⁾	Valve body	<1·10 ⁻⁹ mbar ls ⁻¹
Pressure range ¹⁾		1·10 ⁻⁸ mbar to 1.2 bar (abs)
Cycles until first service ²⁾		2 million
Temperature ²⁾	Valve body Actuator: ambient	≤ 150 °C max. 50 °C (≤ 35 °C recommended)
Material	Aluminum valve body / plate Stainless steel valve body / plate 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	Feedthrough	FKM (e.g. Viton®)
Feedthrough		rotary feedthrough
Mounting position		any (shaft on pump side recommended)

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Typical closing or opening time		Typical closing or opening time "position only"		Weight: aluminum valve		Weight: stainless steel valve	
					aluminum	stainless steel	aluminum	stainless steel	kg	lbs	kg	lbs
mm	inch	ls ⁻¹	ls ⁻¹	mbar	s	s	s		kg	lbs	kg	lbs
25	1	22	0.15	1000	0.3	0.3	0.09	0.09	2	4.40	2.50	5.50
40	1½	80	0.25	1000	0.3	0.3	0.09	0.09	2.10	4.60	2.60	5.70
50	2	150	0.30	1000	0.3	0.3	0.09	0.09	2.40	5.30	3	6.60
63	2½	360	0.45	1000	0.3	0.3	0.09	0.09	2.60	5.70	4.10	9
80	3	850	0.65	1000	0.3	0.3	0.09	0.09	2.80	6.20	4.70	10.40
100	4	1400	0.85	800	0.3	0.3	0.09	0.1	3	6.60	5	11
160	6	3800	1.70	300	0.3	0.3	0.1	0.13	4.20	9.30	7.20	15.90
200	8	7800	2.80	150	0.3	0.3	0.13	0.17	4.70	10.40	10	22
250	10	15000	5	100	0.3	0.6	0.17	0.27	5.70	12.50	12.30	27.10
320	12	27000	6	75	0.6	n. a.	0.27	n. a.	10.40	23	n. a.	n. a.

¹⁾ Unheated on delivery.

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

Technical data for pressure controller: see pages 184 - 189

OPTIONS, CUSTOMIZED SOLUTIONS

Pic. 1



Pic. 2



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) up to DN 100
- Output for control of isolation valve
- Special control algorithms (fix PID, upstream, soft-pump)
- «Position only» control version with resolution of 4000 steps (Pic. 1):
Ordering number 613 . . . M1

VALVE

- Special sizes, e. g. DN 10
- 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
- Integrated heater with insulation (Pic. 2)
- 200 °C version with or without heater
- Industrial version up to DN 160 for harsh conditions,
e. g. differential pressure up to 1 bar, heavy contamination
- «Butterfly and isolation valve»: see series 95.1 and 95.2

SPARE PARTS

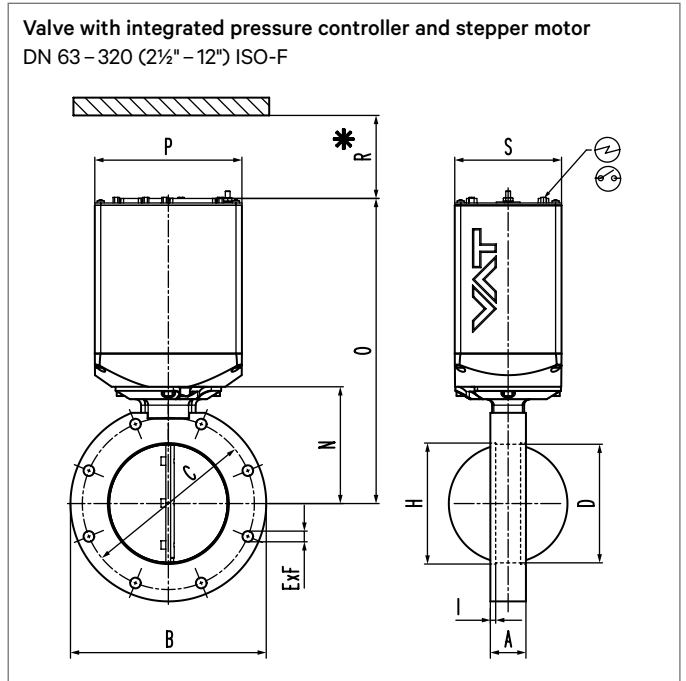
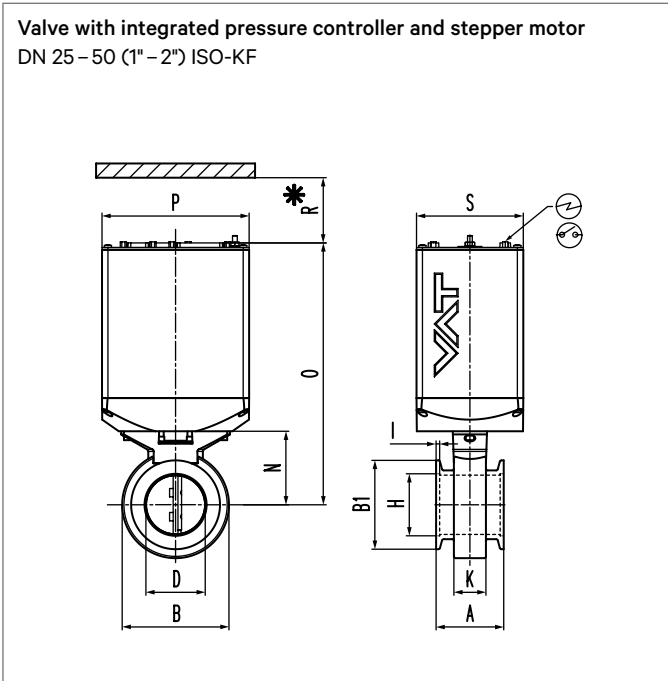
We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

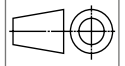
Flange connections for installation of the valve: see series 31 and 32

DIMENSIONS



- * Required for dismantling
- ⊕ Electrical connection
- ⊙ Position indicator

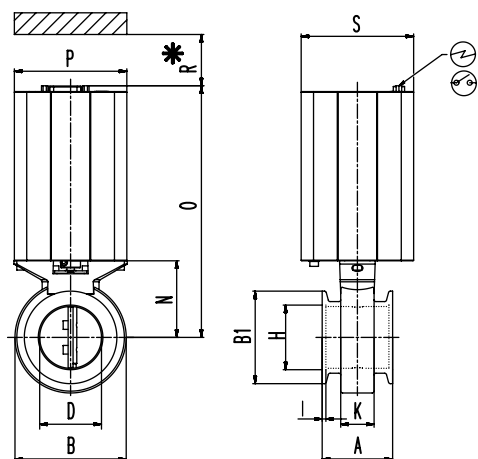
Projection E



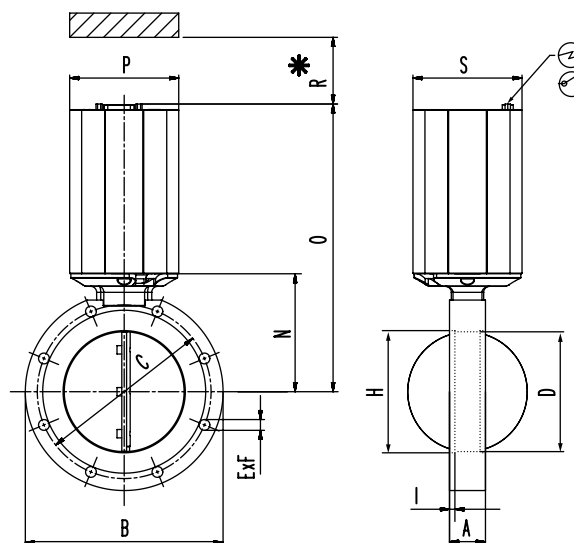
DN	mm inch	25 1	40 1½	50 2	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	50 1.97	57 2.24	57 2.24	30 1.18	30 1.18	30 1.18	30 1.18	30 1.18	30 1.18	35 1.38
B	mm inch	65 2.56	80 3.15	90 3.54	130 5.12	145 5.71	165 6.50	225 8.86	285 11.22	335 13.19	425 16.73
B1	mm inch	39.90 1.57	54.90 2.16	74.90 2.95	-	-	-	-	-	-	-
C	mm inch	-	-	-	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.20	395 15.55
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	312 12.28
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	12 × 13 12 × 0.51
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	318 12.52
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	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	62 2.44	77.50 3.05	90 3.54	98.50 3.88	123.50 4.86	157 6.18	182 7.17	233 9.17
O	mm inch	208 8.19	216 8.50	221 8.70	236 9.29	249 9.80	257 10.12	282 11.10	316 12.44	341 13.43	391 15.39
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	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	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	90 3.54

DIMENSIONS

Valve with integrated controller and stepper motor:
«position only» version, ordering number 613 . . . M1
DN 25 – 50 (1" – 2") ISO-KF

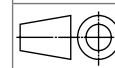


Valve with integrated controller and stepper motor:
«position only» version, ordering number 613 . . . M1
DN 63 – 320 (2½" – 12") ISO-F



- * Required for dismantling
- ⊕ Electrical connection
- ⊙ Position indicator

Projection E



DN	mm inch	25 1	40 1½	50 2	63 2½	80 3	100 4	160 6	200 8	250 10	320 12
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	35 1.38
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	425 16.73
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	395 15.55
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	312 12.28
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	12 × 13 12 × 0.51
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	318 12.52
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	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	62 2.44	77.50 3.05	90 3.54	98.50 3.88	123.50 4.86	157 6.18	182 7.17	233 9.17
O	mm inch	191 7.52	198 7.80	204 8.03	219 8.62	232 9.13	240 9.45	265 10.43	299 11.77	323 12.72	373 14.69
P	mm inch	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58
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	70 2.76
S	mm inch	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58	91 3.58

BUTTERFLY CONTROL VALVE WITH ISOLATION FUNCTION, SERIES 61.5

Downstream pressure control and isolation valve for SEMI, FPD, PV, SOLAR and industrial processes. Optimal for fast and demanding processes, e. g. CVD.



High pressure / low flow control capability

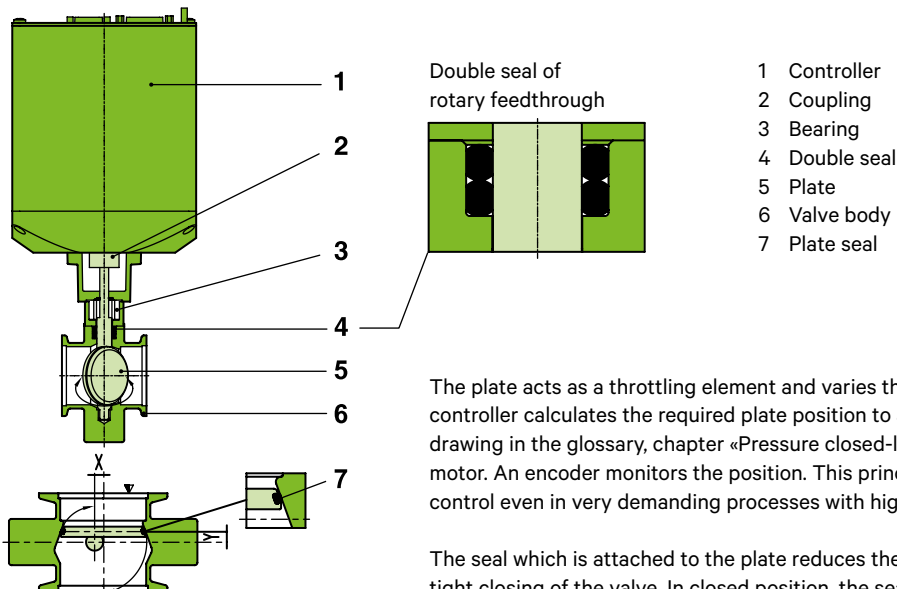
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

Sizes	DN 40 – 100 mm (1½" – 4")
Actuator	integrated pressure controller with stepper motor
Body material	hard anodized aluminum or stainless steel
Feedthrough	rotary feedthrough
Standard flanges	ISO-KF, ISO-F

FUNCTIONAL PRINCIPLE



Double seal of rotary feedthrough

- 1 Controller
- 2 Coupling
- 3 Bearing
- 4 Double seal
- 5 Plate
- 6 Valve body
- 7 Plate seal

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 in the glossary, chapter «Pressure closed-loop control». 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 drawing.

TECHNICAL DATA

Leak rate ¹⁾	Valve body: hard anodized aluminum stainless steel	<1·10 ⁻⁵ mbar ls ⁻¹ <1·10 ⁻⁹ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: hard anodized aluminum stainless steel	<1·10 ⁻⁴ mbar ls ⁻¹ <1·10 ⁻⁹ mbar ls ⁻¹
Pressure range ¹⁾	Hard anodized aluminum Stainless steel	<1·10 ⁻⁶ mbar to 1.2 bar (abs) <1·10 ⁻⁸ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	Pressure control Isolation DN 40 – 50 DN 63 – 100	2 million 250 000 100 000
Temperature ²⁾	Valve body Actuator: ambient	≤ 120 °C max. 50 °C (≤ 35 °C recommended)
Material	Aluminum valve body / plate Stainless steel valve body / plate 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 (e. g. 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	Typical closing or opening time «position only» version	Weight: aluminum valve		Weight: stainless steel valve	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	s	s	s	kg	lbs	kg	lbs
40	1½	60	0.05	1000	0.5	0.6	0.39	2.50	5.50	3.30	7.30
50	2	120	0.10	1000	0.5	0.6	0.39	2.70	6	3.60	7.90
63	2½	220	0.15	1000	0.5	0.6	0.39	3.80	8.40	5.90	13
80	3	360	0.20	1000	0.5	0.6	0.39	4.80	10.60	8.80	19.40
100	4	600	0.25	1000	0.5	0.6	0.39	5.20	11.50	9.70	21.40

¹⁾ Unheated on delivery.

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

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS



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

ACTUATOR

- Fast actuator (0.18 / 0.2 s) for DN 40 and DN 50
- Special control algorithms (fix PID, upstream, soft-pump) for DN 40 and DN 50
- «Position only» control version with resolution of 4000 steps (Pic. 1):
Ordering number 616 . . . M1

VALVE

- Other flanges, e. g. JIS, ASA-LP, CF-F
- Customer specified flanges
- Other sealing materials
- Vulcanized plate
- Heater (Pic. 2) for DN 40/50 with insulation
- Heater for DN 63–100 without insulation

SPARE PARTS

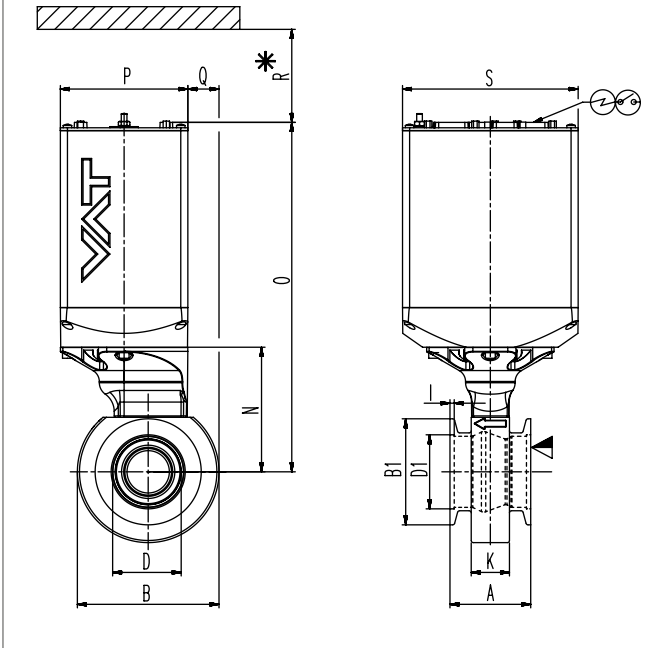
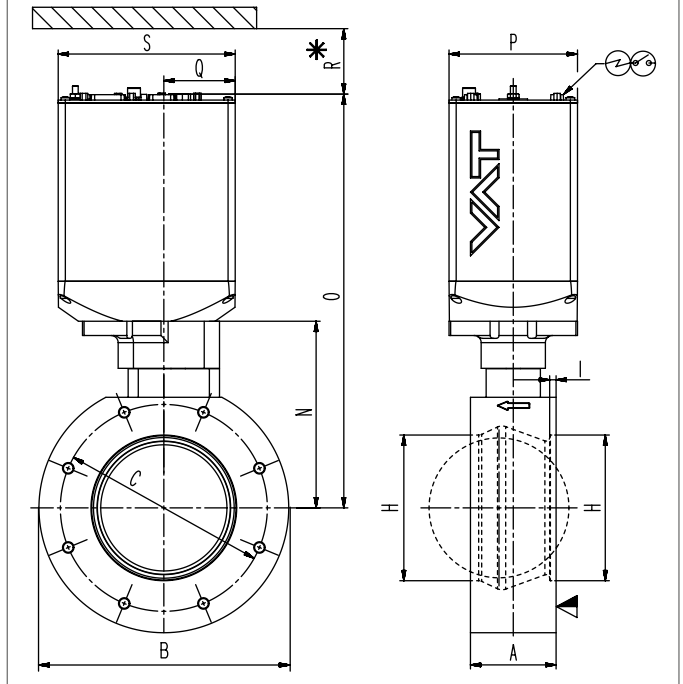
We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

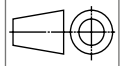
ACCESSORIES

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

DIMENSIONS

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

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


Projection E



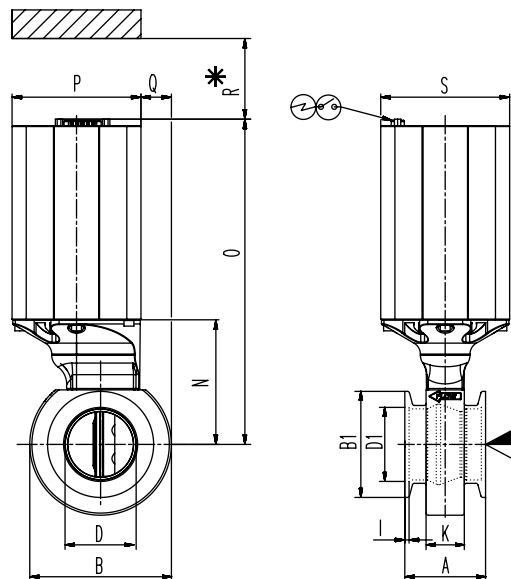
- ▼ Valve seat side
- * Required for dismantling
- ⊕ Electrical connection
- ⊙ Position indicator

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

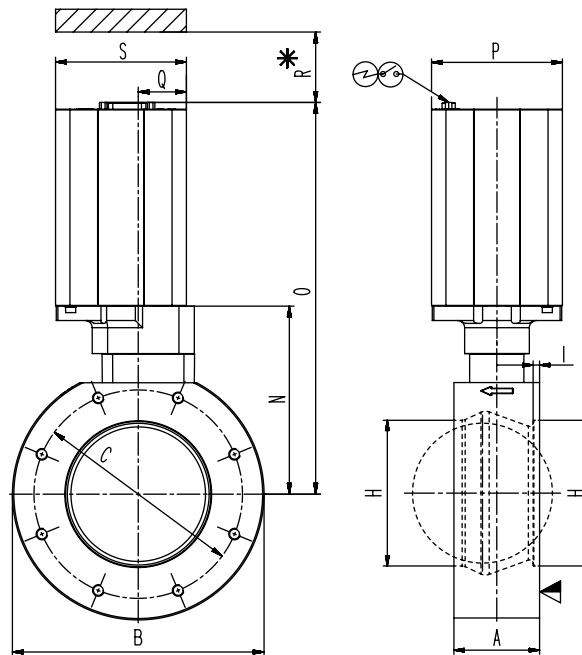
DN	mm	63	80	100
	inch	2½	3	4
A	mm	40	50	60
	inch	1.57	1.97	2.36
B	mm	130	165	175
	inch	5.12	6.50	6.89
C	mm	110	125	145
	inch	4.33	4.92	5.71
H	mm	70	83	102.10
	inch	2.76	3.27	4.02
I	mm	4.50	4.50	4.50
	inch	0.18	0.18	0.18
N	mm	108	126	131
	inch	4.25	4.96	5.16
O	mm	267	285	290
	inch	10.51	11.22	11.42
P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

DIMENSIONS

Valve with integrated controller and stepper motor:
«position only» version, ordering number 616 . . . M1
DN 40 – 50 (1½" – 2") ISO-KF

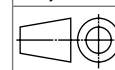


Valve with integrated controller and stepper motor:
«position only» version, ordering number 616 . . . M1
DN 63 – 100 (2½" – 4") ISO-F



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

Projection E



DN	mm	40	50
	inch	1½	2
A	mm	57	57
	inch	2.24	2.24
B	mm	90	100
	inch	3.54	3.94
B1	mm	54.90	74.90
	inch	2.16	2.95
D	mm	40	50
	inch	1.57	1.97
D1	mm	41.30	52.30
	inch	1.63	2.06
I	mm	3	3
	inch	0.12	0.12
K	mm	27	27
	inch	1.06	1.06
N	mm	83	88
	inch	3.27	3.46
O	mm	225	230
	inch	8.86	9.06
P	mm	91	91
	inch	3.58	3.58
Q	mm	17.50	21.50
	inch	0.69	0.85
R	mm	70	70
	inch	2.76	2.76
S	mm	91	91
	inch	3.58	3.58

DN	mm	63	80	100
	inch	2½	3	4
A	mm	40	50	60
	inch	1.57	1.97	2.36
B	mm	130	165	175
	inch	5.12	6.50	6.89
C	mm	110	125	145
	inch	4.33	4.92	5.71
H	mm	70	83	102.10
	inch	2.76	3.27	4.02
I	mm	4.50	4.50	4.50
	inch	0.18	0.18	0.18
N	mm	108	126	131
	inch	4.25	4.96	5.16
O	mm	249	267	272
	inch	9.80	10.51	10.71
P	mm	91	91	91
	inch	3.58	3.58	3.58
Q	mm	29.50	31.50	33.50
	inch	1.16	1.24	1.32
R	mm	70	70	70
	inch	2.76	2.76	2.76
S	mm	91	91	91
	inch	3.58	3.58	3.58

ANGLE CONTROL VALVE, SERIES 62.0

Downstream pressure control and isolation valve for processes with high temperatures and high pressures like LPCVD, ALD etc..



DN 50

DN 100

Integrated soft-start

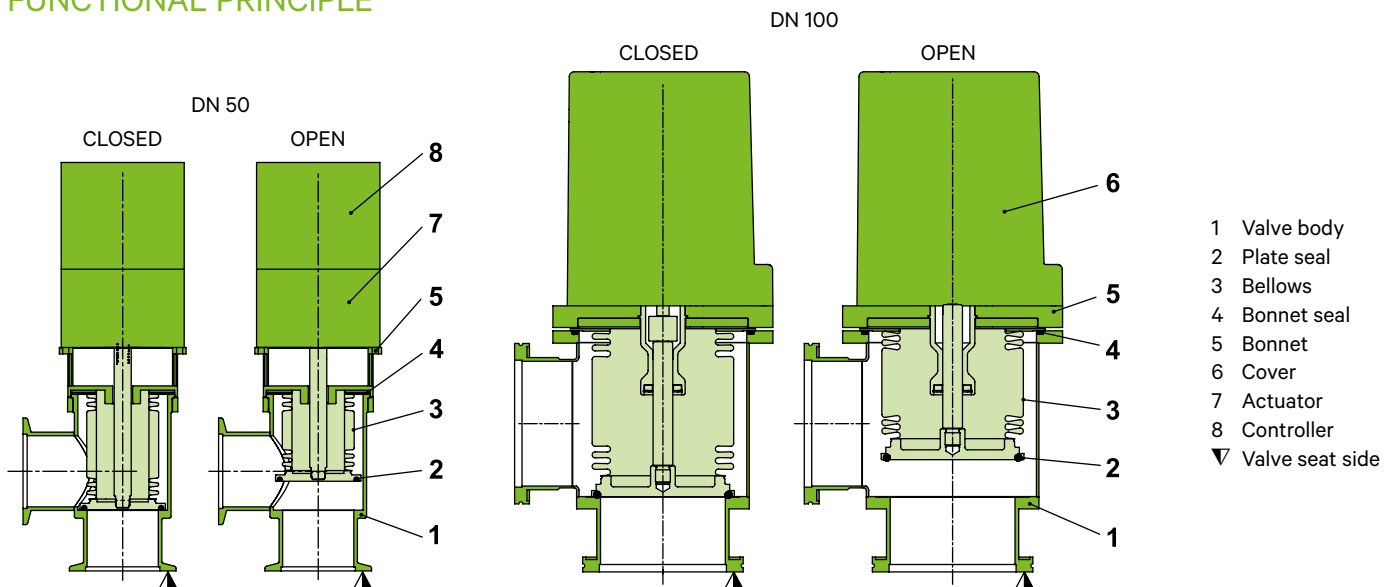
Excellent pressure control performance

Service port to connect a computer via USB and on-board Control Performance Analyzer (CPA) software

MAIN FEATURES

Sizes	DN 50, 100 mm (2", 4")
Actuator	linear drive with closed loop controlled stepper motor
Body material	stainless steel
Feedthrough	bellows
Standard flanges	DN 50: ISO-KF, DN 100: ISO-K

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate ¹⁾	Valve body	<1·10 ⁻⁹ mbar ls ⁻¹
Pressure range ¹⁾		<1·10 ⁻⁸ mbar to 1.2 bar (abs)
Differential pressure on the plate		≤1.1 bar
Cycles until first service ²⁾	Throttling DN 50	2 million
	DN 100	1 million
	Isolation DN 50	1 million
	DN 100	200 000
Temperature ²⁾	Valve body, plate, bellows	≤ 150 °C
	Ambient	max. 50 °C (≤ 35 °C recommended)
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

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	
mm	inch						kg	lbs
50	2	80	0.10	1.00	1.20	1.80	3.50	7.70
100	4	400	0.20	1.10	1.00	2.50	14.50	32.00

¹⁾ Unheated on delivery.

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

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

- Version for a temperature of 200 °C (DN 100 only)
- DN 40 and DN 80
- Valve body nickel-coated

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with external pressure controller and stepper motor

DN		Ordering numbers					
mm	inch	ISO-KF			ISO-K		
50	2	62034-KE	x	y	-		
100	4	-			62040-QE	x	y

Controller configurations:		Interface		Number of sensors
G	= basic version	H	= RS232	2
A	= with SPS	E	= Logic (analog/digital)	2
H	= with PFO	Q	= DeviceNet®	2
C	= with SPS and PFO	F	= Profibus	2
T	= basic version with VC master	K	= RS485	2
V	= with SPS and VC master	X	= EtherCAT	2
U	= with PFO and VC master	S	= VC slave (without interface)	
W	= with SPS, PFO and VC master			

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

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

VC = Valve Cluster
(for operating several valves synchronously)

Example: 62040-QEGE
= DN 100 valve, Logic interface, for 2 sensors

Pressure controller: see pages 184 – 189

ORDERING INFORMATION

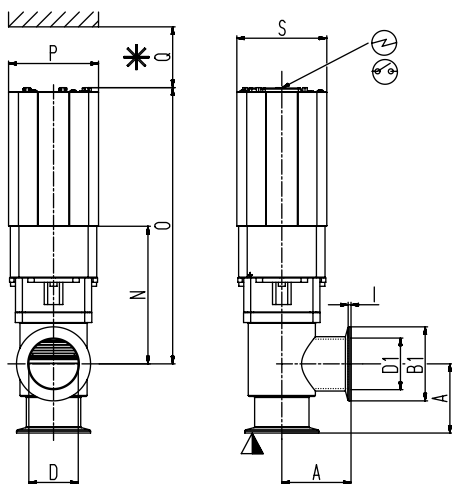
FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

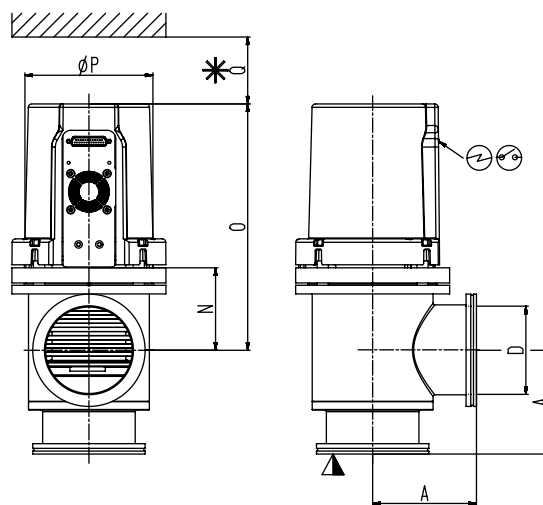
Example: 62040-QEKG-X, X = valve for 200 °C

DIMENSIONS

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



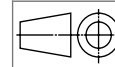
Valve with integrated pressure controller and stepper motor
DN 100 (4") ISO-F



DN	mm inch	50 2	100 4
A	mm inch	70 2.76	120 4.72
B1	mm inch	74.90 2.95	-
D	mm inch	50 2	102 4.02
D1	mm inch	52.20 2.06	-
I	mm inch	2.90 0.12	-
N	mm inch	39 5.47	95 3.74
O	mm inch	280 11	285 11.22
P	mm inch	91 3.58	148 5.83
Q	mm inch	70 2.76	110 4.33
S	mm inch	91 3.58	-

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

Projection E



HV GATE CONTROL VALVE, SERIES 64.2

Control and isolation valve for SEMI, FPD and industrial processes.
Optimal for sputtering and etching processes.



Robust

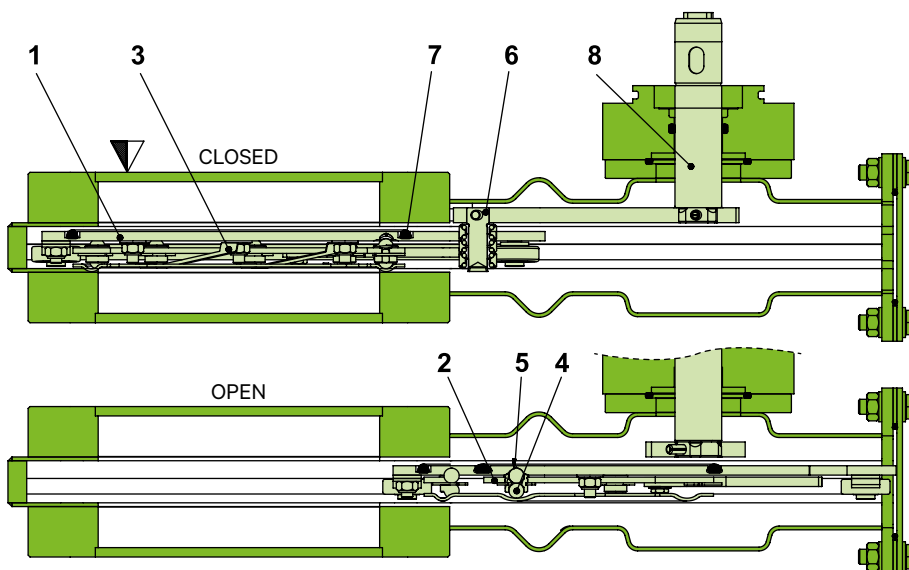
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

Sizes	DN 63–400 mm (2½"–16")
Actuator	integrated pressure controller with stepper motor
Body material	stainless steel
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, CF-F, ASA-LP/ASA, JIS

FUNCTIONAL PRINCIPLE



- | | |
|-----------------|-------------------|
| 1 Gate | 6 Crank bolt |
| 2 Counter-plate | 7 Gate seal |
| 3 Leaf springs | 8 Actuator |
| 4 Ball pairs | ▼ Valve seat side |
| 5 Ball detents | |

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 set-point pressure. See also principle drawing in the glossary, chapter «Pressure closed-loop control». 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 glossary.

TECHNICAL DATA

Leak rate ¹⁾	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range ¹⁾	DN 63–200	$1 \cdot 10^{-8}$ mbar to 2 bar (abs)
	DN 250–400	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	Valve closed: DN 63–200	≤ 2 bar
	DN 250–400	≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service ²⁾	Pressure control	1 million
	Closing / opening	200 000
Temperature ²⁾	Valve body	≤ 150 °C
	Controller	max. 50 °C (≤ 35 °C recommended)
Material	Valve body, valve gate	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 ⁴⁾
Valve position indication		visual (mechanical and on controller)

DN (nominal I. D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Minimum controllable conductance (molecular flow)	Operating time for throttling	Typical closing or opening time	Weight	
mm	inch					kg	lbs
63	2½	440	0.65	4	5	14	31
80	3	800	0.80	4	5	14	31
100	4	1700	1	4	5	17	37
160	6	5000	1.60	4	5	28	62
200	8	12000	2	4	5	34	75
250	10	22000	2.50	7	8	62	136
320	12	30000	3.20	9	10	112	246
350	14	43000	3.50	9	10	120	264
400	16	50000	4	15	16	155	340

¹⁾ Unheated on delivery.

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

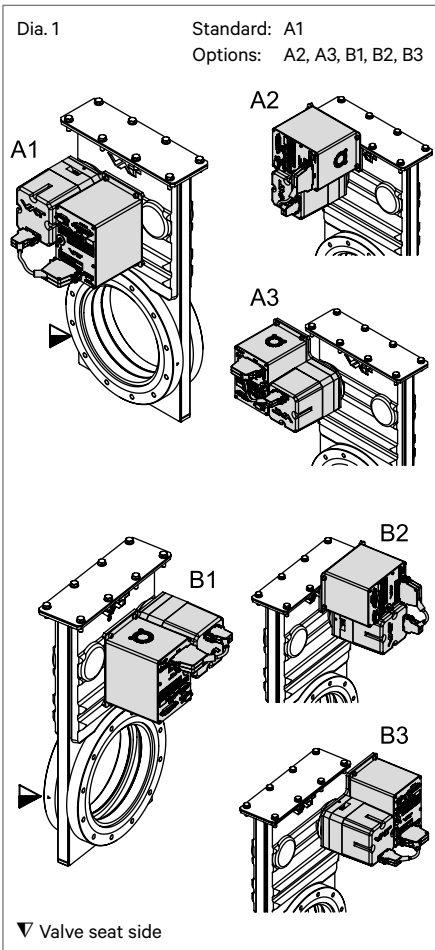
³⁾ Seat side towards chamber.

⁴⁾ Vertical mounting position: see «Options».

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

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



ACTUATOR

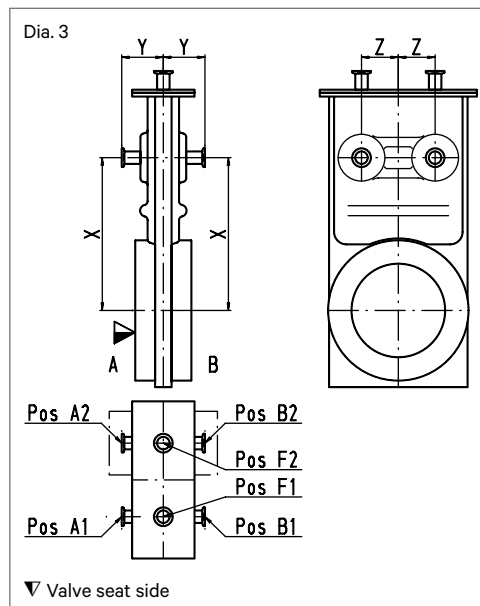
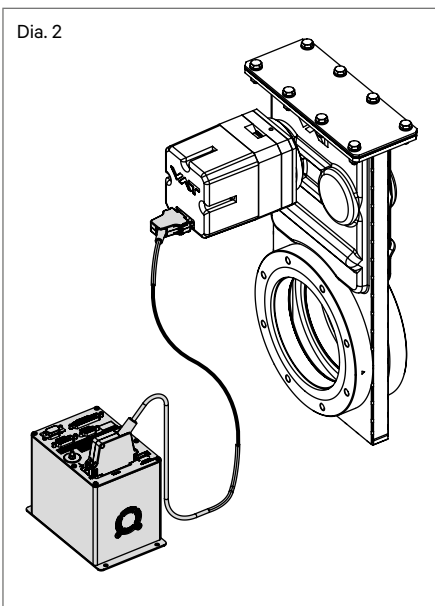
- Stepper motor with integrated controller mountable in 6 positions (Dia. 1): A1, A2, A3 (valve seat side) or B1, B2, B3 (rear side) – desired position to be specified with order. Without specification, the stepper motor is mounted in the standard position A1.
- Valve with external pressure controller (Dia. 2): ordering No. 642 . . - **E52**. Controller and cable must be ordered in addition.
- Actuator for mounting the valve DN 400 in vertical position (extended closing time, fewer cycles)
- Special control algorithms (fix PID, upstream, soft-pump)

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 positions A1, A2, B1, B2, F1, F2

DN valve	mm inch	63 2½	80 3	100 4	160 6	200 8	250 10	320 12	350 14	400 16
Recommended port CF-F or ISO-KF	mm inch	16 %	16 %	40 1½	40 1½	40 1½	40 1½	40 1½	40 1½	40 1½
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



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers					
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP (T) ASA (A)	JIS	
63	2½	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:

<p>x</p> <p>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</p> <p>SPS = Sensor Power Supply (±15 V DC power supply for sensor)</p> <p>PFO = Power Failure Option (valve closes / opens automatically at power failure)</p> <p>VC = Valve Cluster (for operating several valves synchronously)</p>	<p>y</p> <p>Interface</p> <p>G = RS232 H = RS232 V = RS232 + analog output W = RS232 + analog output C = Logic (analog / digital) E = Logic (analog / digital) 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)</p>	<p>Number of sensors</p> <p>1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2</p>
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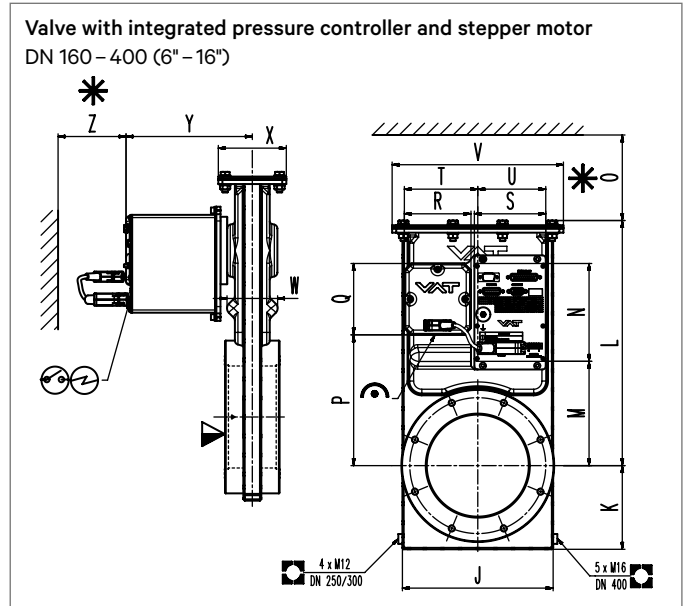
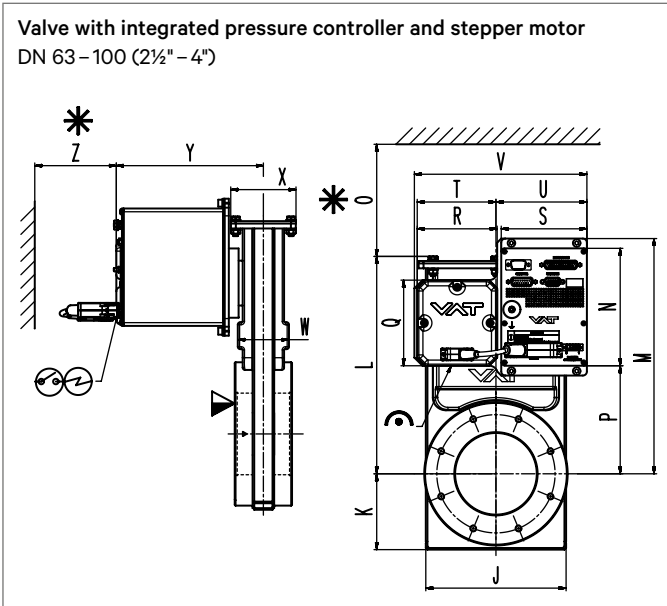
Example: 64240-PEGG
 = valve with ISO-F DN 100 flanges, RS232 interface, for 1 sensor

Pressure controller: see pages 184 – 189

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
 Example: 64244-PEGH-X, X = port ISO-KF 40 in position F2

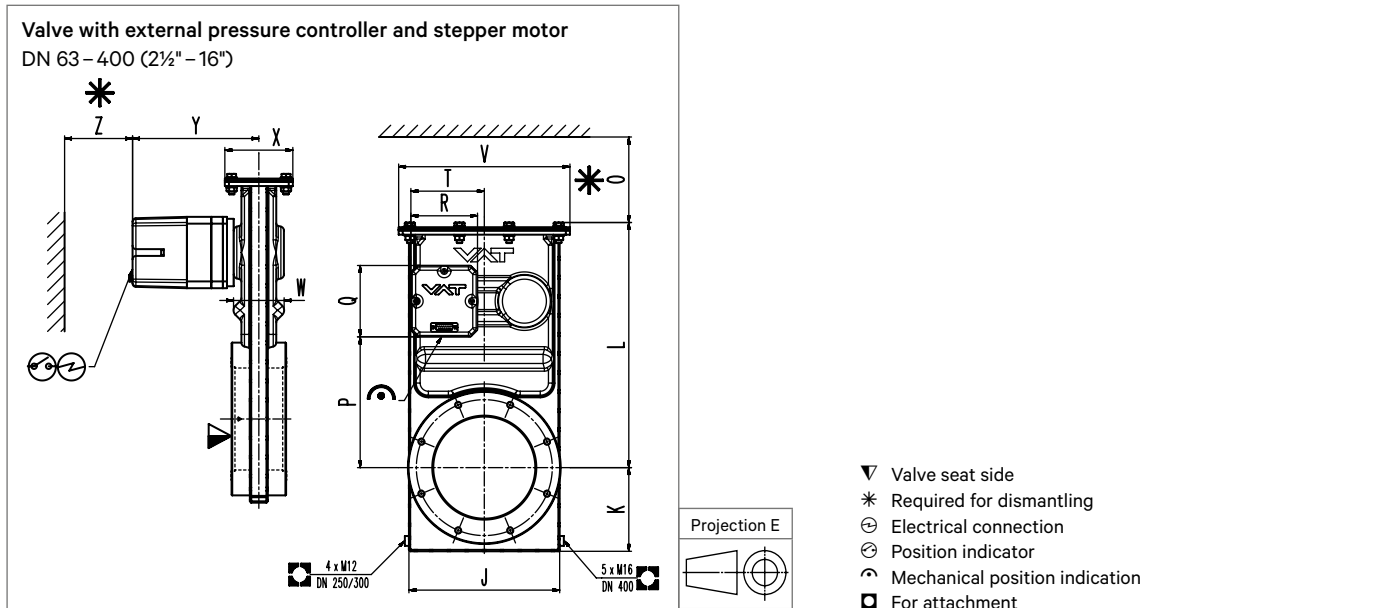
MAIN DIMENSIONS



Flange dimensions: see pages 148 – 149

DN	mm	63	80	100	160	200	250	320	350	400
	inch	2½	3	4	6	8	10	12	14	16
J	mm	134	134	172	222	274	356	420	420	474
	inch	5.28	5.28	6.77	8.74	10.79	14.02	16.54	16.54	18.66
K	mm	73	73	93	123	148	177	214	214	232
	inch	2.87	2.87	3.66	4.84	5.83	6.97	8.43	8.43	9.13
L	mm	208	208	267	361	438	570	688	688	787
	inch	8.19	8.19	10.51	14.21	17.24	22.44	27.09	27.09	30.98
M	mm	250	250	228	154	213	298	393	393	479
	inch	9.84	9.84	8.98	6.06	8.39	11.73	15.47	15.47	18.86
N	mm	144	144	144	144	144	144	144	144	144
	inch	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67
O	mm	180	180	220	300	350	450	550	550	600
	inch	7.09	7.09	8.66	11.81	13.78	17.72	21.65	21.65	23.62
P	mm	94	94	132	192	252	320	415	415	501
	inch	3.70	3.70	5.20	7.56	9.92	12.60	16.34	16.34	19.72
Q	mm	105	105	105	105	105	134	134	134	134
	inch	4.13	4.13	4.13	4.13	4.13	5.28	5.28	5.28	5.28
R	mm	98	98	98	98	98	134	134	134	134
	inch	3.86	3.86	3.86	3.86	3.86	5.28	5.28	5.28	5.28
S	mm	105	105	105	105	105	105	105	105	105
	inch	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13
T	mm	79	79	96	108	134	167	202	202	207
	inch	3.11	3.11	3.78	4.25	5.28	6.57	7.95	7.95	8.15
U	mm	129	129	112	100	74	77	42	42	36
	inch	5.08	5.08	4.41	3.94	2.91	3.03	1.65	1.65	1.42
V	mm	212	212	212	252	304	400	475	475	520
	inch	8.35	8.35	8.35	9.92	11.97	15.75	18.70	18.70	20.47
W	mm	51	51	63	75	75	97	120	120	130
	inch	2.01	2.01	2.48	2.95	2.95	3.82	4.72	4.72	5.12
X	mm	80	80	80	100	100	138	138	138	138
	inch	3.15	3.15	3.15	3.94	3.94	5.43	5.43	5.43	5.43
Y	mm	180	180	180	186	186	231	231	231	236
	inch	7.09	7.09	7.09	7.32	7.32	9.09	9.09	9.09	9.29
Z	mm	100	100	100	100	100	100	100	100	100
	inch	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94

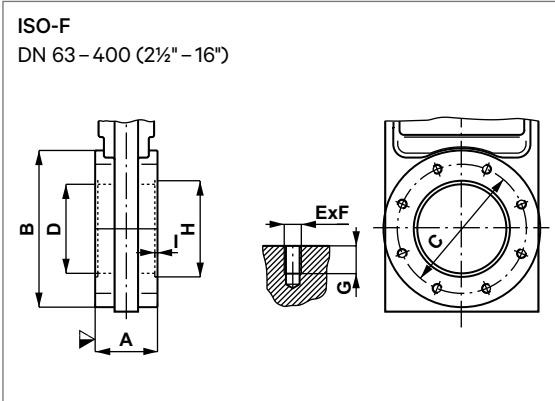
MAIN DIMENSIONS



Flange dimensions: see pages 148 – 149

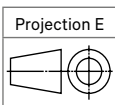
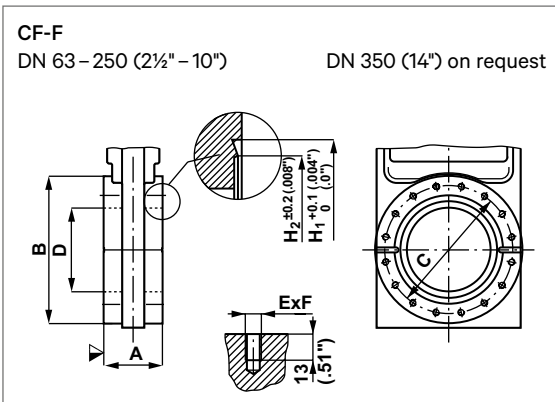
DN	mm	63	80	100	160	200	250	320	350	400
	inch	2½	3	4	6	8	10	12	14	16
J	mm	134	134	172	222	274	356	420	420	474
	inch	5.28	5.28	6.77	8.74	10.79	14.02	16.54	16.54	18.66
K	mm	73	73	93	123	148	177	214	214	232
	inch	2.87	2.87	3.66	4.84	5.83	6.97	8.43	8.43	9.13
L	mm	208	208	267	361	438	570	688	688	787
	inch	8.19	8.19	10.51	14.21	17.24	22.44	27.09	27.09	30.98
O	mm	180	180	220	300	350	450	550	550	600
	inch	7.09	7.09	8.66	11.81	13.78	17.72	21.65	21.65	23.62
P	mm	94	94	132	192	252	320	415	415	501
	inch	3.70	3.70	5.20	7.56	9.92	12.60	16.34	16.34	19.72
Q	mm	105	105	105	105	105	134	134	134	134
	inch	4.13	4.13	4.13	4.13	4.13	5.28	5.28	5.28	5.28
R	mm	98	98	98	98	98	134	134	134	134
	inch	3.86	3.86	3.86	3.86	3.86	5.28	5.28	5.28	5.28
T	mm	79	79	96	108	134	167	202	202	207
	inch	3.11	3.11	3.78	4.25	5.28	6.57	7.95	7.95	8.15
V	mm	212	212	212	252	304	400	475	475	520
	inch	8.35	8.35	8.35	9.92	11.97	15.75	18.70	18.70	20.47
W	mm	51	51	63	75	75	97	120	120	130
	inch	2.01	2.01	2.48	2.95	2.95	3.82	4.72	4.72	5.12
X	mm	80	80	80	100	100	138	138	138	138
	inch	3.15	3.15	3.15	3.94	3.94	5.43	5.43	5.43	5.43
Y	mm	180	180	180	186	186	231	231	231	236
	inch	7.09	7.09	7.09	7.32	7.32	9.09	9.09	9.09	9.29
Z	mm	100	100	100	100	100	100	100	100	100
	inch	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94

FLANGE DIMENSIONS



DN	mm	63	80	100	160	200	250	320	400
	inch	2½	3	4	6	8	10	12	16
A	mm	70	70	70	80	80	100	120	150
	inch	2.76	2.76	2.76	3.15	3.15	3.94	4.72	5.90
B	mm	136	136	176	225	288	350	425	510
	inch	5.35	5.35	6.93	8.86	11.34	13.78	16.73	20.08
C	mm	110	125	145	200	260	310	395	480
	inch	4.33	4.92	5.71	7.87	10.24	12.20	15.55	18.90
D	mm	63	80	100	150	200	261	318	400
	inch	2.48	3.15	3.94	5.91	7.87	10.28	12.52	15.75
E x F		4 x M8	8 x M8	8 x M8	8 x M10	12 x M10	12 x M10	12 x M12	16 x M12
G	mm	13	13	13	14	16	16	16	20
	inch	0.51	0.51	0.51	0.55	0.63	0.63	0.63	0.79
H	mm	70	83	102	153	213	-	-	-
	inch	2.76	3.27	4.02	6.02	8.39	-	-	-
I	mm	3	3	3	5	5	-	-	-
	inch	0.12	0.12	0.12	0.20	0.20	-	-	-

Dimensions for DN 350 (14") on request.

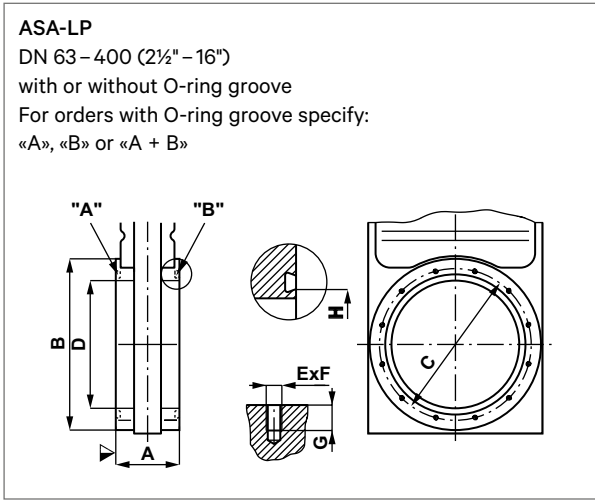


▽ Valve seat side

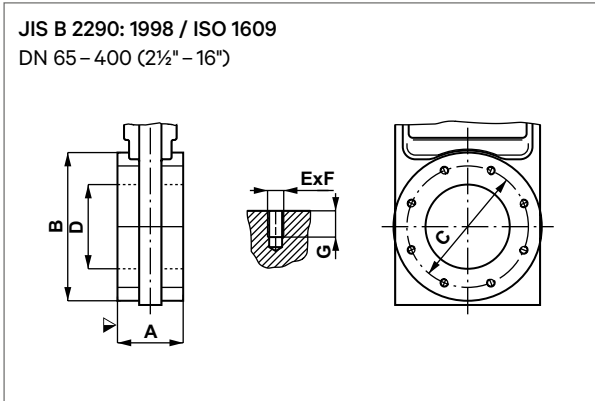
DN	mm	63	80	100	160	200	250	250 ¹⁾
	inch	2½	3	4	6	8	10	10
O. D.	inch	4½	4¾	6	8	10	12	13¼
A	mm	70	70	70	80	80	100	100
	inch	2.76	2.76	2.76	3.15	3.15	3.94	3.94
B	mm	136	136	176	225	288	350	350
	inch	5.35	5.35	6.93	8.86	11.34	13.78	13.78
C	mm	92.10	102.40	130.30	181	231.80	284	306.30
	inch	3.63	4.03	5.13	7.13	9.13	11.18	12.06
D	mm	63	80	100	150	200	254	254
	inch	2.48	3.15	3.94	5.91	7.87	10	10
E x F	metric threads	8 x M8	10 x M8	16 x M8	20 x M8	24 x M8	32 x M8	-
	UNF threads	8 x 5/16"	10 x 5/16"	16 x 5/16"	20 x 5/16"	24 x 5/16"	32 x 5/16"	30 x 3/8"
		24 UNF	24 UNF	24 UNF	24 UNF	24 UNF	24 UNF	24 UNF
H1	mm	82.50	91.55	120.65	171.45	222.30	273.15	294.64
	inch	3.25	3.60	4.75	6.75	8.75	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

¹⁾ Option UNF DN 250 (10"), O. D. 13¼":
Ordering No. 64248-UE . . -X, X = O. D. 13¼"

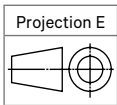
FLANGE DIMENSIONS



DN	mm	63	100	160	200	250	320	400
	inch	2½	4	6	8	10	12	16
ASA-LP		2	3	4	6	8	10	-
ASA		-	-	-	-	-	-	16
A	mm	70	70	80	80	100	120	150
	inch	2.76	2.76	3.15	3.15	3.94	4.72	5.90
B	mm	136	176	225	288	350	425	596.90
	inch	5.35	6.93	8.86	11.34	13.78	16.73	23.50
C	mm	120.70	152.40	190.50	241.30	298.50	362	539.80
	inch	4.75	6.00	7.50	9.50	11.75	14.25	21.25
D	mm	63	100	150	200	254	300	400
	inch	2.48	3.94	5.91	7.87	10.00	11.81	15.75
E x F		4 x ¾"	4 x ¾"	8 x ¾"	8 x ¾"	8 x ¾"	12 x ¾"	16 x 1"
		16 UNC	16 UNC	16 UNC	10 UNC	10 UNC	10 UNC	8 UNC
G	mm	15	15	15	20	20	28	25.40
	inch	0.59	0.59	0.59	0.79	0.79	1.10	1
H	mm	88.90	120.65	158.75	206.40	266.70	317.50	419.10
	inch	3.50	4.75	6.25	8.13	10.50	12.50	16.50
O-ring	mm	88.49 x 3.53	120.24 x 3.53	158.34 x 3.53	202.79 x 3.53	266.29 x 3.53	316.87 x 7.00	417.96 x 7.00
i.D. x D	inch	3.48 x .139	4.73 x .139	6.23 x .139	7.98 x .139	10.48 x .139	12.47 x .275	16.46 x .275



DN	mm	65	100	150	200	250	300	350	400
	inch	2½	4	6	8	10	12	14	16
A	mm	70	70	80	80	100	120	120	150
	inch	2.76	2.76	3.15	3.15	3.94	4.72	4.72	5.90
B	mm	136	176	225	288	350	425	450	510
	inch	5.35	6.93	8.86	11.34	13.78	16.73	17.72	20.08
C	mm	120	160	210	270	320	370	420	480
	inch	4.72	6.30	8.27	10.63	12.60	14.57	16.54	18.90
D	mm	63	100	150	200	261	318	350	400
	inch	2.48	3.94	5.91	7.87	10.28	12.52	13.78	15.75
E x F		4 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12	12 x M12	12 x M16
G	mm	12	12	14	16	16	16	16	25
	inch	0.47	0.47	0.55	0.63	0.63	0.63	0.63	0.98



▽ Valve seat side

UHV GATE CONTROL VALVE, SERIES 64.8

Control and isolation valve for SEMI, FPD and industrial processes.
Optimal for sputtering and etching processes.



Bellows-sealed and grease-free

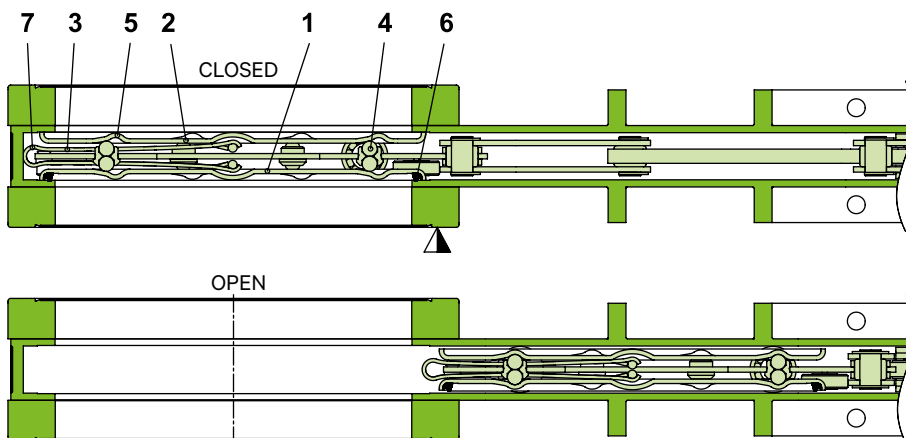
Excellent pressure control performance

Service port to connect a computer via USB and on-board
Control Performance Analyzer (CPA) software

MAIN FEATURES

Sizes	DN 160 – 250 mm (6" – 10")
Actuator	integrated pressure controller with closed loop-controlled stepper motor
Body material	stainless steel
Feedthrough	bellows feedthrough
Standard flanges	ISO-F, CF-F, ASA-LP/ASA, JIS

FUNCTIONAL PRINCIPLE



- | | |
|-----------------|-------------------|
| 1 Gate | 5 Ball detents |
| 2 Counter-plate | 6 Gate seal |
| 3 Leaf springs | 7 Spring stop |
| 4 Ball pairs | ▼ 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 set-point pressure. See also principle drawing in the glossary, chapter «Pressure closed-loop control». 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 glossary.

TECHNICAL DATA

Leak rate ¹⁾	Valve body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
	Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range ¹⁾	DN 160 – 200	1 · 10 ⁻¹⁰ mbar to 1.6 bar (abs)
	DN 250	1 · 10 ⁻¹⁰ mbar to 1.2 bar (abs)
Differential pressure on the gate	DN 160 – 200	≤ 1.6 bar
	DN 250	≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service ²⁾³⁾	Throttling (open – max. open)	100 000
	Isolation (open – close – open)	30 000
Temperature ²⁾	Valve body	≤ 80 °C
	Controller	max. 50 °C (≤ 35 °C recommended)
Material	Valve body	AISI 304 (1.4301)
	Mechanism DN 160 – 200	AISI 316L (1.4404)
	DN 250	AISI 304 (1.4301)
	Bellows	AISI 316L (1.4404, 1.4435)
Seal	Bonnet	metal
	Gate	FKM (Viton®)
Feedthrough		bellows
Mounting position		any
Valve position indication		visual (mechanical and on controller)

DN (nominal I.D.)		Conductance (molecular flow) (depending on A-dimension and flange type)	Minimum controllable conductance (molecular flow)	Operating time for throttling	Typical closing or opening time	Weight	
mm	inch					kg	lbs
160	6					data on request	
200	8	12 000	4	5	7	34	75
250	10	22 000	6	9	10	62	136

¹⁾ Unheated on delivery.

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

³⁾ Unheated and under clean conditions.

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

Pic. 1



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

ACTUATOR

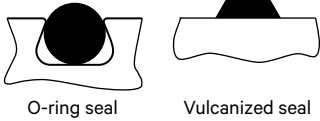
- Valve with external pressure controller (Pic. 1): ordering No. 648 . . - . **E52**. Controller and cable must be ordered in addition.
- Special control algorithms (fix PID, upstream, soft-pump)

VALVE

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

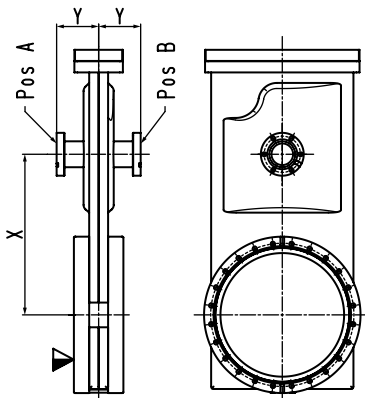
DN valve	mm inch	160 6	200 8	250 10
Recommended port CF-F	mm inch	40 1½	40 1½	40 1½
X	mm inch	205 8.07	260 10.24	335 13.19
Y	mm inch	44 1.73	48 1.89	62 2.44
Other ports on request				

Dia. 2



See glossary

Dia. 3



▼ Valve seat side

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers					
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP (T) ASA (A)	JIS	
160	6	64844-PE x y	64844-CE x y	64844-UE x y	64844-TE x y	64844-JE x y	
200	8	64846-PE x y	64846-CE x y	64846-UE x y	64846-TE x y	64846-JE x y	
250	10	64848-PE x y	64848-CE x y	64848-UE x y	64848-TE x y	64848-JE x y	

Controller configurations:	x		y		Interface	Number of sensors
	G = basic version					
	A = with SPS				E = Logic (analog / digital)	2
	H = with PFO				Q = DeviceNet®	2
	C = with SPS and PFO				F = Profibus	2
	T = basic version with VC master				K = RS485	2
	V = with SPS and VC master				X = EtherCAT	2
	U = with PFO and VC master				S = VC slave (without interface)	
	W = with SPS, PFO and VC master					

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

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

VC = Valve Cluster
(for operating several valves synchronously)

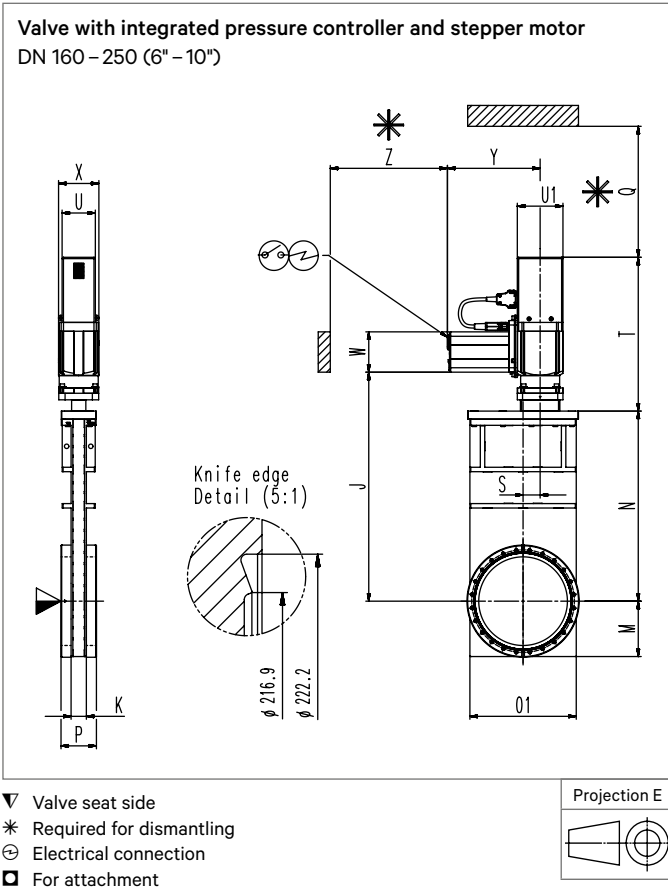
Example: 64846-PEGH
= valve with ISO-F DN 200 flanges, RS232 interface, for 2 sensors

Pressure controller: see pages 184 – 189

ORDERING INFORMATION FOR VALVES WITH OPTIONS

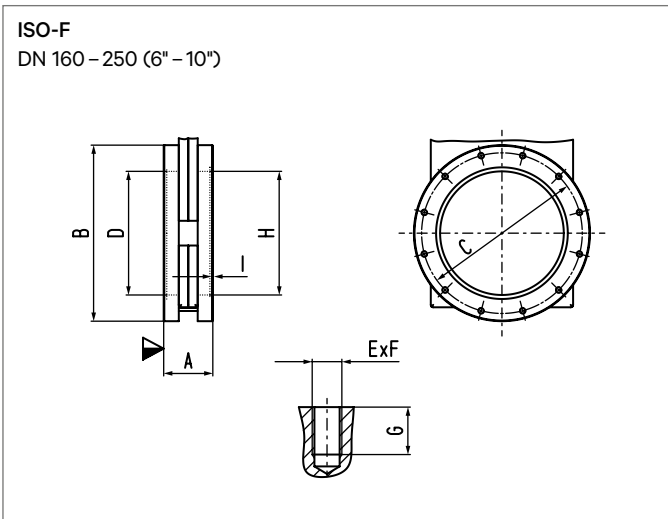
Basic ordering number plus «-X»: -X to be specified
Example: 64846-PEGH-X, X = port ISO-KF 40 in position A

MAIN DIMENSIONS

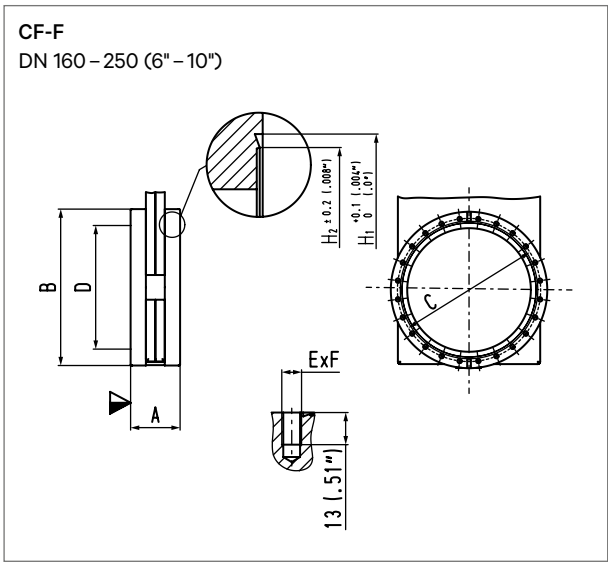


DN	mm inch	160 6	200 8	250 10
J	mm inch	dimensions on request	517 20.35	646 25.43
K	mm inch		34.50 1.36	42 1.65
L	mm inch		770 30.31	939 36.97
M	mm inch		125 4.92	170 6.69
N	mm inch		430 16.93	558 21.97
O	mm inch		250 9.84	344 13.54
O1	mm inch		240 9.45	321 12.64
P	mm inch		78.50 3.09	80 3.15
Q	mm inch		350 13.78	450 17.72
S	mm inch		38.60 1.52	65 2.56
T	mm inch		410 16.14	451 17.76
U	mm inch		90 3.54	90 3.54
U1	mm inch		103 4.06	103 4.06
W	mm inch		91 3.58	91 3.58
X	mm inch		91 3.58	91 3.58
Y	mm inch		207.20 8.16	207.20 8.16
Z	mm inch		100 3.94	100 3.94

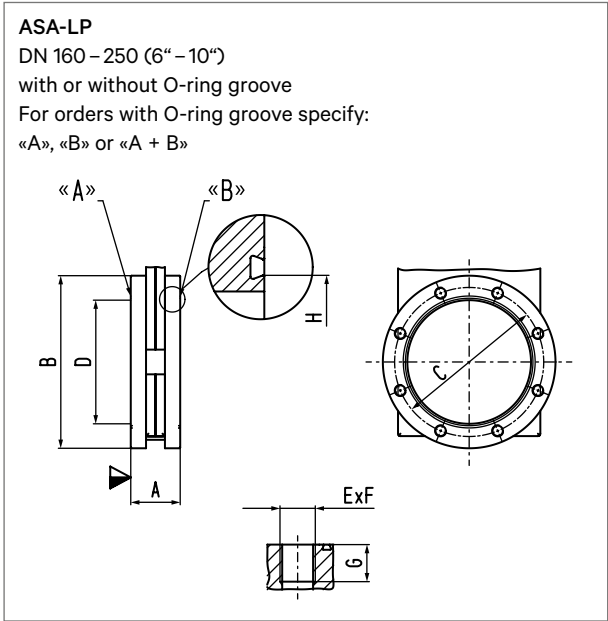
FLANGE DIMENSIONS



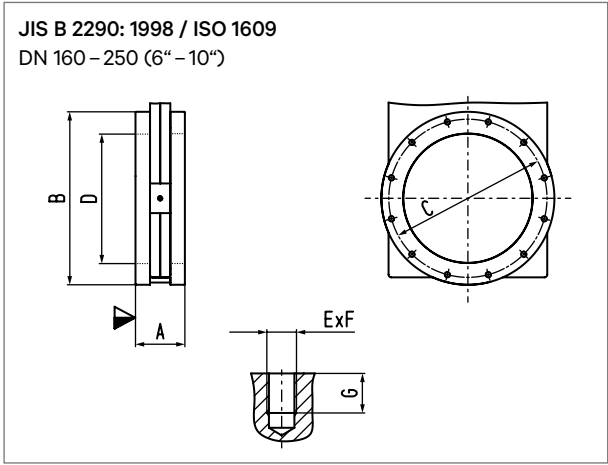
DN	mm inch	160 6	200 8	250 10
A	mm inch	70 2.76	80 3.15	100 3.94
B	mm inch	225 8.86	285 11.22	350 13.78
C	mm inch	200 7.87	260 10.24	310 12.20
D	mm inch	150 5.91	200 7.87	261 10.28
E × F		8 × M10	12 × M10	12 × M10
G	mm inch	13 0.51	15 0.59	15 0.59
H	mm inch	153 6.02	213 8.39	-
I	mm inch	5 0.20	5 0.20	-



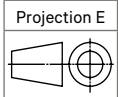
		Metric threads			UNF threads		
DN	mm inch	160 6	200 8	250 10	160 6	200 8	250 10
O.D.	inch	8	10	12	8	10	12
A	mm inch	70 2.76	80 3.15	100 3.94	70 2.76	80 3.15	100 3.94
B	mm inch	202.40 7.97	253.20 9.97	350 13.78	202.40 7.97	253.20 9.97	350 13.78
C	mm inch	181 7.13	231.80 9.13	284 11.18	181 7.13	231.80 9.13	284 11.18
D	mm inch	150 5.91	200 7.87	254 10.00	150 5.91	200 7.87	254 10.00
E × F		20 × M8	24 × M8	32 × M8	20 × 5/16" 24 UNF	24 × 5/16" 24 UNF	32 × 5/16" 24 UNF
H1	mm inch	171.45 6.75	222.40 8.76	273.15 10.75	171.45 6.75	222.40 8.76	273.15 10.75
H2	mm inch	166 6.54	217 8.54	267 10.51	166 6.54	217 8.54	267 10.51



DN	mm inch	160 6	200 8	250 10
ASA-LP		4	6	8
A	mm inch	70 2.76	80 3.15	100 3.94
B	mm inch	225 8.86	279.40 11.00	350 13.78
C	mm inch	190.50 7.50	241.30 9.50	298.50 11.75
D	mm inch	150 5.91	200 7.87	254 10.00
E × F		8 × 3/8" 16 UNC	8 × 3/4" 10 UNC	8 × 3/4" 10 UNC
G	mm inch	15 0.59	19 0.75	19 0.75
H	mm inch	158.75 6.25	206.40 8.13	266.70 10.50
O-ring I.D. × D	mm inch	158.34 × 3.53 6.23 × .139	202.79 × 3.53 7.98 × .139	266.29 × 3.53 10.48 × .139



DN	mm inch	150 6	200 8	250 10
A	mm inch	70 2.76	80 3.15	100 3.94
B	mm inch	235 9.25	300 11.81	350 13.78
C	mm inch	210 8.27	270 10.63	320 12.60
D	mm inch	150 5.91	200 7.87	261 10.28
E × F		8 × M10	8 × M12	12 × M12
G	mm inch	13 0.51	15 0.59	15 0.59



▼ Valve seat side

PENDULUM CONTROL VALVE, SERIES 65.0

Downstream pressure control and isolation valve for SEMI and FPD processes.
Optimal for corrosive etching and cleaning processes.



Blank aluminum

Hard anodized aluminum

Virtually particle-free and shock-free operation

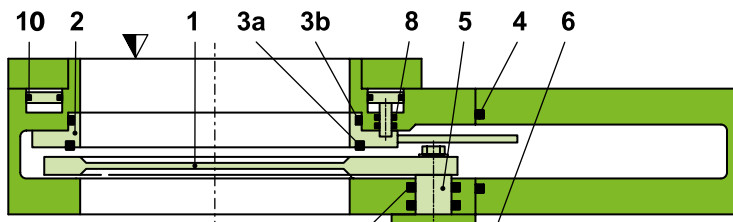
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

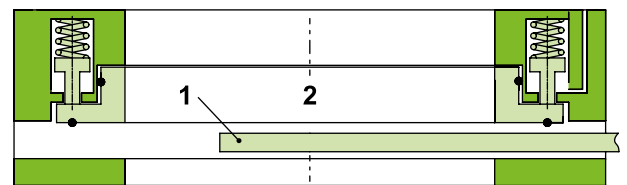
Sizes	DN 100 – 400 mm (4" – 16")
Actuator	integrated pressure controller with stepper motor
Body material	blank or hard anodized aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, JIS

FUNCTIONAL PRINCIPLE

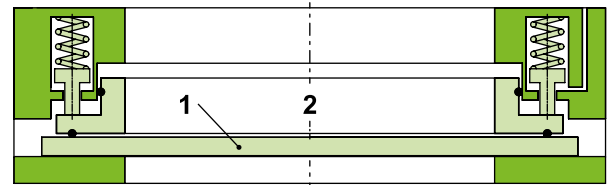


- 1 Plate
- 2 Sealing ring
- 3a Plate seal
- 3b Body seal
- 4 Bonnet seal
- 5 Actuator shaft
- 6 Actuator
- 7 Controller
- 8 Shaft feedthrough seal
- 9 Rotary feedthrough seal
- 10 Piston ring seal
- ▽ Valve seat side

Pressure control



Isolation



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 in the glossary, chapter «Pressure closed-loop control». 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.

COMPARISON SERIES 65.0 / 65.1

FEATURES	SERIES 65.0	SERIES 65.1
Control range	standard	extended
Minimum controllable conductance	standard	minimized
Pressure rise time (up to setpoint)	standard	reduced
Vibration	very low	very low

TECHNICAL DATA

Leak rate ¹⁾	Valve body: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾	Blank aluminum Hard anodized aluminum	1·10 ⁻⁸ mbar to 1.2 bar (abs) 1·10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	Pressure control Closing / opening	1 million 200 000
Temperature ²⁾	Valve body Controller	≤ 120 °C max. 50 °C (≤ 35 °C recommended)
Material	Valve body, plate Sealing ring Other parts	EN AW-6082 (3.2315) EN AW-6082 (3.2315), AISI 305 (1.4303) AISI 420C (1.3541), AISI 631 (1.4568) 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 Sealing ring	rotary feedthrough shaft feedthrough
Mounting position	DN 100 – 250 DN 320 – 400	any ³⁾ horizontal only ³⁾

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 open → closed	Typical closing / opening time closed → open	Weight	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	mbar	bar	psi	s	s	s	kg	lbs
100	4	1700	3	1200	30	4 – 7	58 – 102	0.70	3	4	12	27
160	6	5 000	5	1200	10	4 – 7	58 – 102	0.80	3	4	18	40
200	8	12 000	10	1200	5	4 – 7	58 – 102	0.90	3	4	22	49
250	10	22 000	15	1200	5	4 – 7	58 – 102	0.90	3	4	29	64
320	12	30 000	22	1200	5	4 – 7	58 – 102	1.10	5	6	48	106
350	14	43 000	25	1200	5	4 – 7	58 – 102	1.30	5	6	59	130
400	16	61 000	30	1200	5	4 – 7	58 – 102	1.50	5	6	68	150

¹⁾ Unheated on delivery.

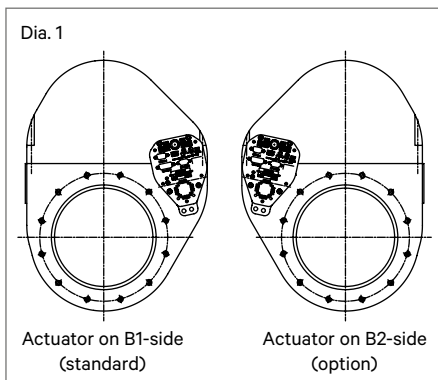
²⁾ Maximum values: depending on operating conditions and sealing materials.

³⁾ Valve seat on chamber side recommended.

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

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)
- Special control algorithms (adaptive, fix PID, upstream, soft-pump)

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
- Valve with external 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)

Pic. 2



Pic. 3



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION
FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers											
mm	inch	blank aluminum				hard anodized aluminum							
		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:

<p>x</p> <p>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</p> <p>SPS = Sensor Power Supply (±15 V DC power supply for sensor)</p> <p>PFO = Power Failure Option (valve closes / opens automatically at power failure)</p> <p>VC = Valve Cluster (for operating several valves synchronously)</p>	<p>y</p> <p>Interface</p> <p>G = RS232 H = RS232 V = RS232 + analog output W = RS232 + analog output C = Logic (analog / digital) E = Logic (analog / digital) 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)</p>	<p>Number of sensors</p> <p>1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2</p>
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Example: 65040-PAGG
 = aluminum valve with ISO-F DN 100 flanges, RS232 interface, for 1 sensor

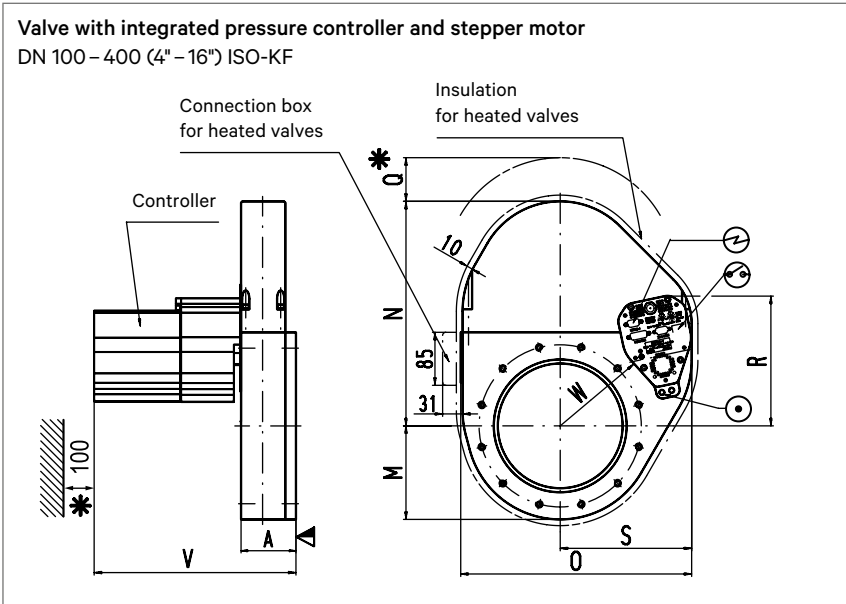
Pressure controller: see pages 184 – 189

ORDERING INFORMATION
FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
 Example: 65046-PAGH-X, X = valve with heater for 120 °C

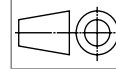


MAIN DIMENSIONS



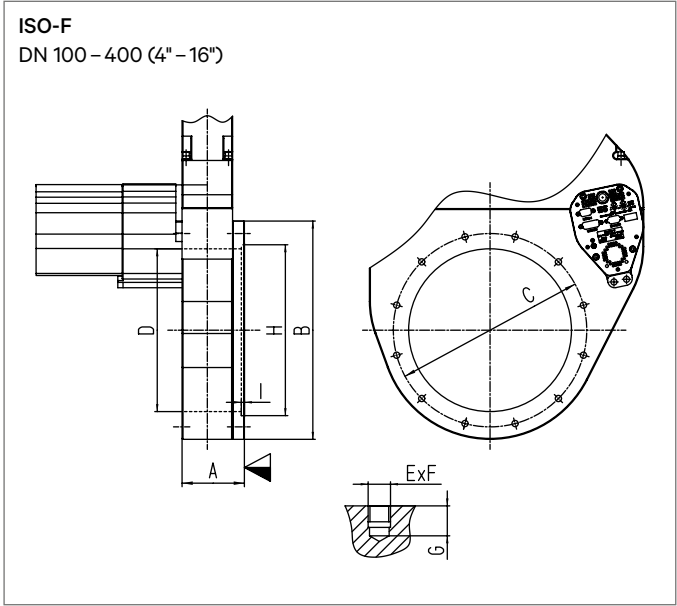
- ▼ Valve seat side
- * Required for dismantling
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ⊙ Position indicator

Projection E

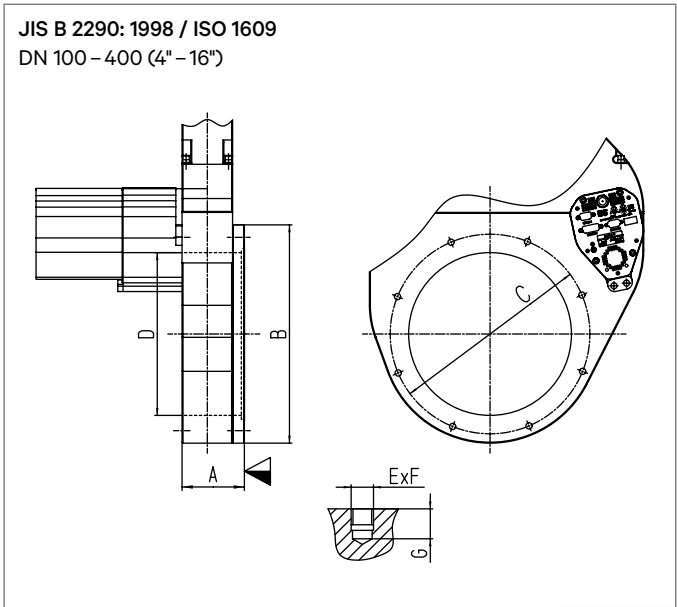


DN	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
M	mm inch	95 3.74	121.50 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24
N	mm inch	200 7.87	302 11.88	360 14.17	438 17.24	538 21.18	590 23.23	655 25.79
O	mm inch	260.90 10.27	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	276 10.86	300 11.81	320 12.60
V	mm inch	309 12.17	326 12.83	326 12.83	331 13.03	357 14.06	363 14.29	360 14.17
W	mm inch	94 3.70	122 4.80	152 5.98	195 7.68	236 9.29	258 10.16	292 11.50

FLANGE DIMENSIONS



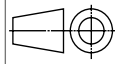
DN	mm	100	160	200	250	320	400
	inch	4	6	8	10	12	16
A	mm	70	88	88	100	120	128
	inch	2.76	3.46	3.46	3.94	4.72	5.04
B	mm	190	243	300	350	425	520
	inch	7.48	9.57	11.81	13.78	16.73	20.47
C	mm	145	200	260	310	395	480
	inch	5.71	7.87	10.24	12.20	15.55	18.90
D	mm	100	150	200	261	318	400
	inch	3.94	5.91	7.87	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	-	-	-



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

Projection E



PENDULUM CONTROL VALVE, SERIES 65.1

Downstream pressure control and isolation valve for SEMI and FPD processes.
Optimal for corrosive etching and cleaning processes.



Blank aluminum

Hard anodized aluminum

Low minimum controllable conductance

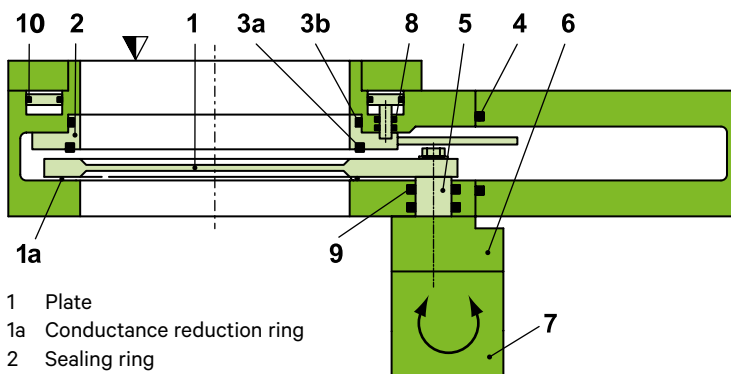
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

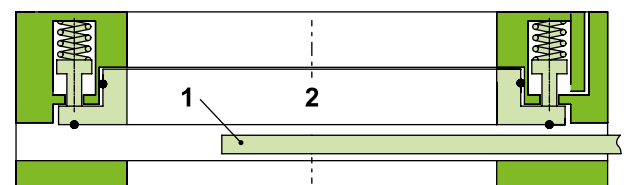
Sizes	DN 160 – 400 mm (6" – 16")
Actuator	integrated pressure controller with stepper motor
Body material	blank or hard anodized aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, JIS

FUNCTIONAL PRINCIPLE

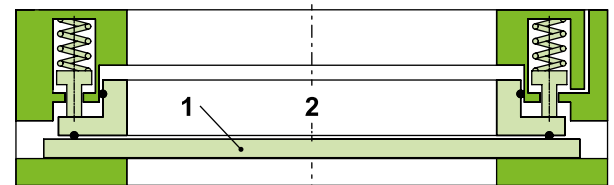


- 1 Plate
- 1a Conductance reduction ring
- 2 Sealing ring
- 3a Plate seal
- 3b Body seal
- 4 Bonnet seal
- 5 Actuator shaft
- 6 Actuator
- 7 Controller
- 8 Shaft feedthrough seal
- 9 Rotary feedthrough seal
- 10 Piston ring seal
- ▽ Valve seat side

Pressure control



Isolation



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 in the glossary, chapter «Pressure closed-loop control». 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.

COMPARISON SERIES 65.0 / 65.1

FEATURES	SERIES 65.0	SERIES 65.1
Control range	standard	extended
Minimum controllable conductance	standard	minimized
Pressure rise time (up to setpoint)	standard	reduced
Vibration	very low	very low

TECHNICAL DATA

Leak rate ¹⁾	Valve body: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾	Blank aluminum Hard anodized aluminum	1·10 ⁻⁸ mbar to 1.2 bar (abs) 1·10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	Pressure control Closing / opening	1 million 200 000
Temperature ²⁾	Valve body Controller	≤ 120 °C max. 50 °C (≤ 35 °C recommended)
Material	Valve body Plate Sealing ring Other parts	EN AW-6082 (3.2315) EN AW-6082 / PTFE EN AW-6082 (3.2315), AISI 305 (1.4303) AISI 420C (1.3541), AISI 631 (1.4568) 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 Sealing ring	rotary feedthrough shaft feedthrough
Mounting position	DN 160 – 250 DN 320 – 400	any ³⁾ horizontal only ³⁾

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 open → closed	Typical closing / opening time closed → open	Weight	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	mbar	bar	psi	s	s	s	kg	lbs
160	6	5 000	1.6	1200	10	4 – 7	58 – 102	0.80	3	4	18	40
200	8	12 000	2	1200	5	4 – 7	58 – 102	0.90	3	4	22	49
250	10	22 000	2.5	1200	5	4 – 7	58 – 102	0.90	3	4	29	64
320	12	30 000	3.2	1200	5	4 – 7	58 – 102	1.10	5	6	48	106
350	14	43 000	3.5	1200	5	4 – 7	58 – 102	1.30	5	6	59	130
400	16	61 000	4	1200	5	4 – 7	58 – 102	1.50	5	6	68	150

¹⁾ Unheated on delivery.

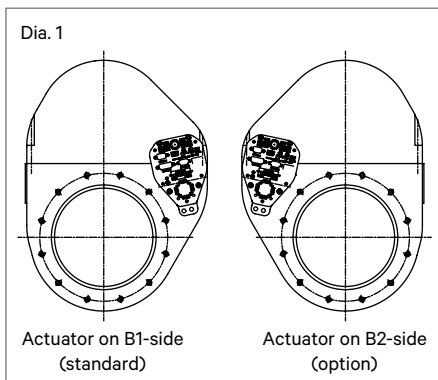
²⁾ Maximum values: depending on operating conditions and sealing materials.

³⁾ Valve seat on chamber side recommended.

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

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)
- Special control algorithms (adaptive, fix PID, upstream, soft-pump)

VALVE

- 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
- Valve with external pressure controller (Pic. 3)

Pic. 2



Pic. 3



SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers											
mm	inch	blank aluminum				hard anodized aluminum							
		ISO-F		JIS		ISO-F		JIS					
160	6	65144-PA	x	y	65144-JA	x	y	65144-PH	x	y	65144-JH	x	y
200	8	65146-PA	x	y	65146-JA	x	y	65146-PH	x	y	65146-JH	x	y
250	10	65148-PA	x	y	65148-JA	x	y	65148-PH	x	y	65148-JH	x	y
320	12	65150-PA	x	y	65150-JA	x	y	65150-PH	x	y	65150-JH	x	y
350	14	-			65151-JA	x	y	-			65151-JH	x	y
400	16	65152-PA	x	y	65152-JA	x	y	65152-PH	x	y	65152-JH	x	y

Controller configurations:	x		y		Interface	Number of sensors	
	G	A	H	C			T
	G = basic version				G = RS232	1	
	A = with SPS				H = RS232	2	
	H = with PFO				V = RS232 + analog output	1	
	C = with SPS and PFO				W = RS232 + analog output	2	
	T = basic version with VC master				C = Logic (analog / digital)	1	
	V = with SPS and VC master				E = Logic (analog / digital)	2	
	U = with PFO and VC master				P = DeviceNet®	1	
	W = with SPS, PFO and VC master				Q = DeviceNet®	2	
					D = Profibus	1	
	SPS = Sensor Power Supply (±15 V DC power supply for sensor)				F = Profibus	2	
	PFO = Power Failure Option (valve closes / opens automatically at power failure)				J = RS485	1	
	VC = Valve Cluster (for operating several valves synchronously)				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: 65144-PAGG
= aluminum valve with ISO-F DN 160 flanges, RS232 interface, for 1 sensor

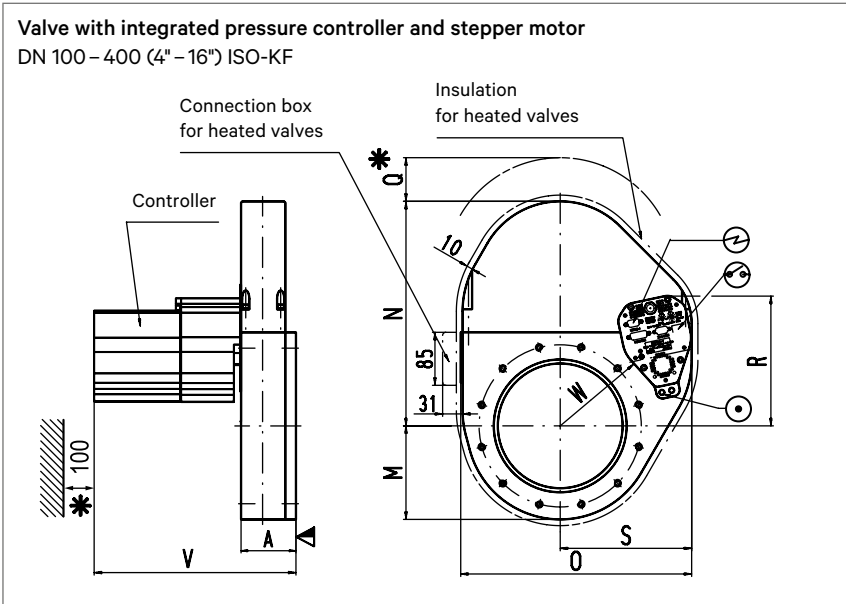
Pressure controller: see pages 184 – 189

ORDERING INFORMATION FOR VALVES WITH OPTIONS

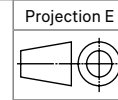
Basic ordering number plus «-X»: -X to be specified

Example: 65146-PAGH-X, X = valve with heater for 120 °C

MAIN DIMENSIONS

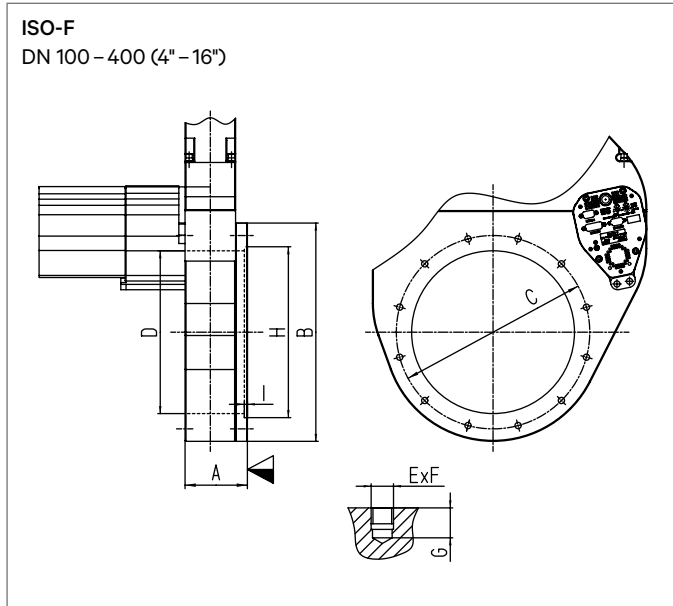


- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊗ Position indicator

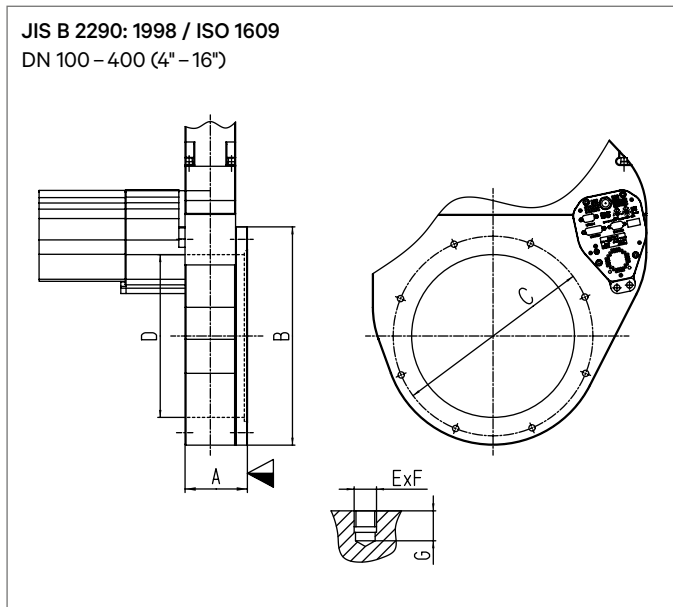


DN	mm inch	160 6	200 8	250 10	320 12	350 14	400 16
A	mm inch	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
M	mm inch	121.50 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24
N	mm inch	302 11.88	360 14.17	438 17.24	538 21.18	590 23.23	655 25.79
O	mm inch	321 12.64	370.15 14.57	442.70 17.43	536.40 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
R	mm inch	192 7.56	208.50 8.21	233.50 9.19	277 10.91	290 11.42	313 12.32
S	mm inch	184.70 7.27	210.80 8.30	246.40 9.70	276 10.86	300 11.81	320 12.60
V	mm inch	326 12.83	326 12.83	331 13.03	357 14.06	363 14.29	360 14.17
W	mm inch	122 4.80	152 5.98	195 7.68	236 9.29	258 10.16	292 11.50

FLANGE DIMENSIONS



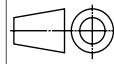
DN	mm	160	200	250	320	400
	inch	6	8	10	12	16
A	mm	88	88	100	120	128
	inch	3.46	3.46	3.94	4.72	5.04
B	mm	243	300	350	425	520
	inch	9.57	11.81	13.78	16.73	20.47
C	mm	200	260	310	395	480
	inch	7.87	10.24	12.20	15.55	18.90
D	mm	150	200	261	318	400
	inch	5.91	7.87	10.28	12.52	15.75
E × F		8 × M10	12 × M10	12 × M10	12 × M12	16 × M12
G	mm	14	15	16	18	20
	inch	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	-	-	-



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

▼ Valve seat side

Projection E



PENDULUM CONTROL VALVE, SERIES 65.2

Downstream pressure control and isolation valve for SEMI and FPD processes.
Optimal for corrosive etching and cleaning processes.



Blank aluminum

Hard anodized aluminum

Conductance control to almost 0 ls^{-1}

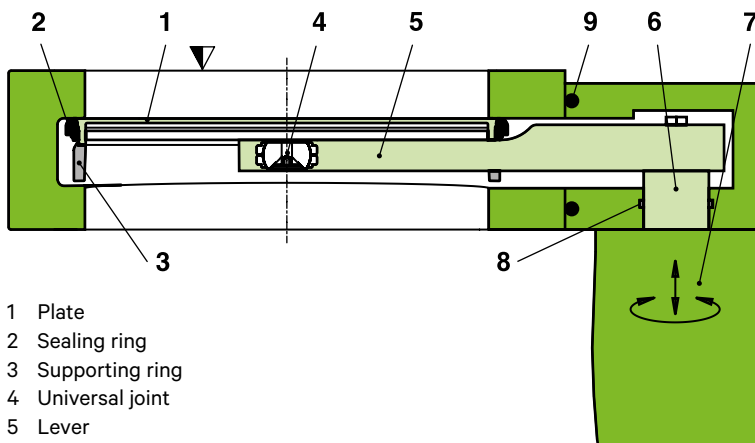
Excellent pressure control performance

Service port to connect a computer or a service box

MAIN FEATURES

Sizes	DN 200 – 250 mm (8" – 10")
Actuator	integrated pressure controller with stepper motor
Body material	blank or hard anodized aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, JIS

FUNCTIONAL PRINCIPLE

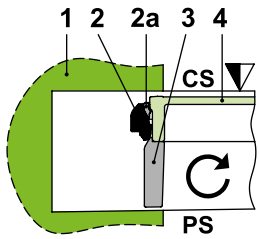


- 1 Plate
 - 2 Sealing ring
 - 3 Supporting ring
 - 4 Universal joint
 - 5 Lever
 - 6 Actuator shaft
 - 7 Two-axis actuator
 - 8 Rotary feedthrough seal
 - 9 Bonnet seal
- ▼ Valve seat side

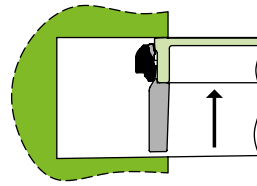
The plate acts, due to its pendulum and stroke movement, as a throttling element and varies the conductance of the valve opening. The pressure controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing in the glossary, chapter «Pressure closed-loop control». 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.

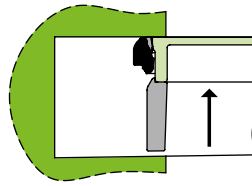
Pressure control:
sealing ring and plate relaxed



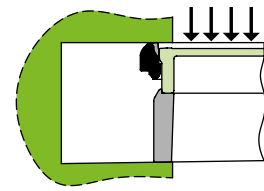
Pressure control:
valve almost closed
(conductance almost 0 ls⁻¹,
plate touches body)



Valve closed:
no differential pressure
or differential pressure
pump → chamber



Valve closed:
differential pressure
chamber → pump



- 1 Valve body
- 2 Sealing ring
- 2a Seal
- 3 Supporting ring
- 4 Plate
- ▼ Valve seat side
- CS Chamber side
- PS Pump side

TECHNICAL DATA

Leak rate ¹⁾	Valve body: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾	Blank aluminum Hard anodized aluminum	1·10 ⁻⁸ mbar to 1.2 bar (abs) 1·10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	Pressure control Closing / opening	2.5 million 20 000
Temperature ²⁾	Valve body Controller	≤ 120 °C max. 50 °C (≤ 35 °C recommended)
Material	Valve body Plate Lever Actuator shaft	EN AW-6082 (3.2315) EN AW-6082 (3.2315), partly PTFE coated, EN AC-42100 (3.2371.62) EN AW-6082 (3.2315), AISI 304 (1.4301) hard-chrome plated AISI 304 (1.4301)
Seal	Bonnet, plate, feedthrough	FKM (Viton®)
Feedthrough		rotary feedthrough
Mounting position		any ³⁾

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	1200	10	0.80	1.20	1.90	2.60	27	60
250	10	22 000	0.25	1200	10	0.90	1.30	2.20	3.10	34	75

¹⁾ Unheated on delivery.
²⁾ Maximum values: depending on operating conditions and sealing materials.
³⁾ Valve seat on chamber side recommended.

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

Pic. 1



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

ACTUATOR

- Special control algorithms (adaptive, fix PID, upstream, soft-pump)

VALVE

- O-ring seal in plate (standard: vulcanized seal)
- Valve with external pressure controller
- Heater with insulation (Pic. 1) for valve temperatures up to 120 °C

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers											
mm	inch	blank aluminum				hard anodized aluminum							
		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:

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
(±15 V 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

G = RS232

H = RS232

V = RS232 + analog output

W = RS232 + analog output

C = Logic (analog / digital)

E = Logic (analog / digital)

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

1

2

Example: 65246-PAGG

= aluminum valve with ISO-F DN 200 flanges, RS232 interface, for 1 sensor

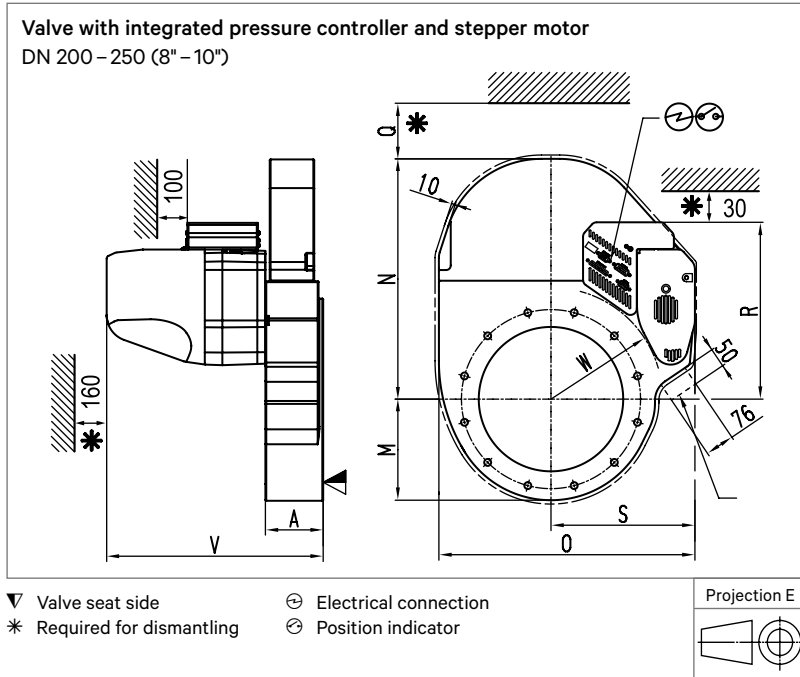
Pressure controller: see pages 184 – 189

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

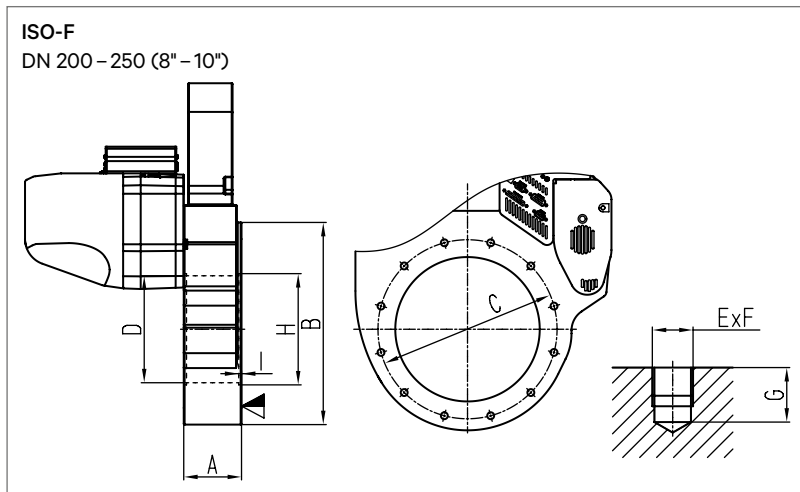
Example: 65248-PAGH-X, X = valve with heater for 120 °C

MAIN DIMENSIONS

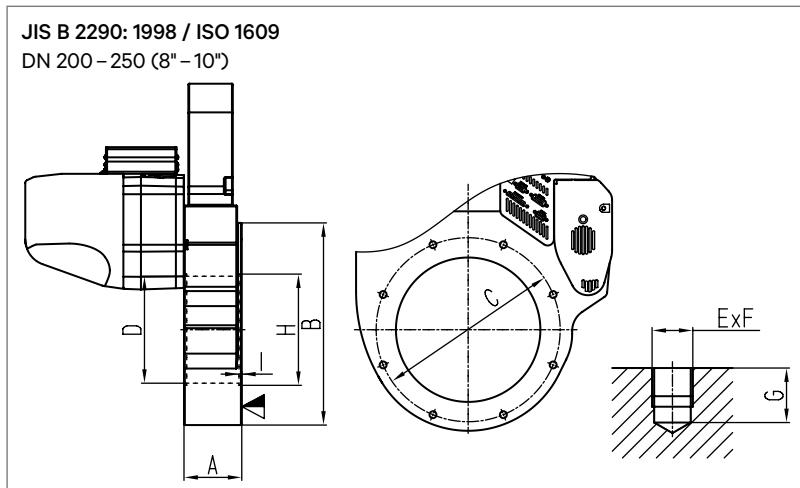


DN	mm	200	250
	inch	8	10
A	mm	86	100
	inch	3.39	3.94
M	mm	150	175
	inch	5.91	6.89
N	mm	330	416
	inch	12.99	16.38
O	mm	384.50	443
	inch	15.14	17.44
Q	mm	20	20
	inch	0.79	0.79
R	mm	294	306
	inch	11.57	12.05
S	mm	223	249
	inch	8.78	9.80
V	mm	361	375
	inch	14.21	14.76
W	mm	165	195
	inch	6.50	7.68

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	7.87	10	7.87	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		



PENDULUM CONTROL VALVE, SERIES 65.5

Downstream pressure control and isolation valve for SEMI and FPD processes.
Optimal for corrosive etching and cleaning processes.



Blank aluminum

Hard anodized aluminum

Fast, virtually particle-free operation

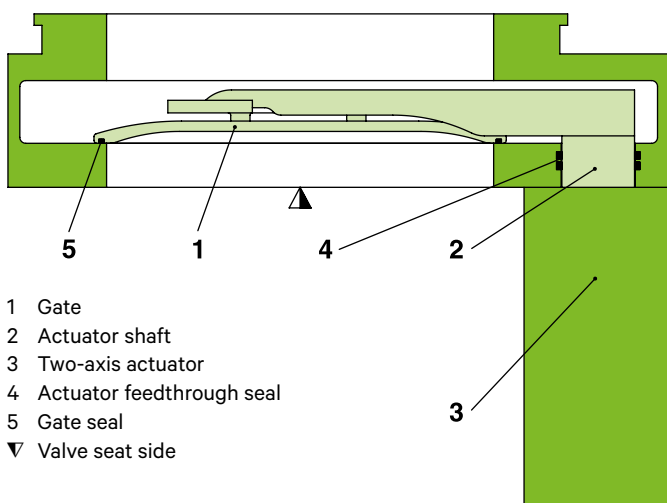
Excellent pressure control performance

Service port to connect a computer via USB and on-board Control Performance Analyzer (CPA) software

MAIN FEATURES

Sizes	DN 250 mm (10")
Actuator	integrated pressure controller with servo drive
Body material	blank or hard anodized aluminum
Feedthrough	rotary feedthrough
Standard flanges	ISO-F, JIS

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 in the glossary, chapter «Pressure closed-loop control». Actuation is performed by a servo drive. This principle ensures very fast and accurate process pressure control.

For leaktight closing the plate moves downwards. Opening and closing are performed by the second actuator axis.

TECHNICAL DATA

Leak rate ¹⁾	Valve body: blank aluminum	<1·10 ⁻⁹ mbar ls ⁻¹
	hard anodized aluminum	<1·10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: blank aluminum	<1·10 ⁻⁹ mbar ls ⁻¹
	hard anodized aluminum	<1·10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾	Blank aluminum	1·10 ⁻⁸ mbar to 1.2 bar (abs)
	Hard anodized aluminum	1·10 ⁻⁶ mbar to 1.2 bar (abs)
Cycles until first service ²⁾	Pressure control	2 million
	Closing / opening	50 000
Temperature ²⁾	Valve body	≤ 120 °C
	Controller	max. 50 °C (≤ 35 °C recommended)
Material	Valve body, plate	EN AW-6061 (3.2311) T651
	Other parts	AISI 316L (1.4404, 1.4435)
	Connection screw at plate	SST A4-80, Ni-PTFE, coated
Seal	Bonnet, plate, body, feedthrough	FKM (Viton®)
Feedthrough	Actuator	rotary feedthrough
Mounting position	any ³⁾	

DN (nominal I.D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Max. differential pressure on the plate	Max. differential pressure during operation	Operating time for throttling	Typical closing / opening time open → closed	Typical closing / opening time closed → open	Weight	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	mbar	s	s	s	kg	lbs
250	10	22 000	2	1200	5	0.5	2	0.7	36	79

¹⁾ Unheated on delivery.

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

³⁾ Valve seat on chamber side recommended.

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

Pic. 1



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

ACTUATOR

- Special control algorithms (fix PID, upstream, soft-pump)

VALVE

- Customer specified flanges, e. g. rectangular flange for direct mounting to chamber
- Other sealing materials
- KF ports in body
- Heater with insulation (Pic. 1) for valve temperatures up to 120 °C

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 32

ORDERING INFORMATION FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers											
mm	inch	blank aluminum				hard anodized aluminum							
		ISO-F		JIS		ISO-F		JIS					
250	10	65548-PA	x	y	65548-JA	x	y	65548-PH	x	y	65548-JH	x	y

Controller configurations:

x		y		Interface		Number of sensors
G	= basic version			H	= RS232	2
A	= with SPS			E	= Logic (analog / digital)	2
H	= with PFO			Q	= DeviceNet®	2
C	= with SPS and PFO			F	= Profibus	2
T	= basic version with VC master			K	= RS485	2
V	= with SPS and VC master			X	= EtherCAT	2
U	= with PFO and VC master			S	= VC slave (without interface)	
W	= with SPS, PFO and VC master					

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

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

VC = Valve Cluster
(for operating several valves synchronously)

Example: 65548-PAGG

= aluminum valve with ISO-F DN 250 flanges, RS232 interface, for 1 sensor

Pressure controller: see pages 184 – 189

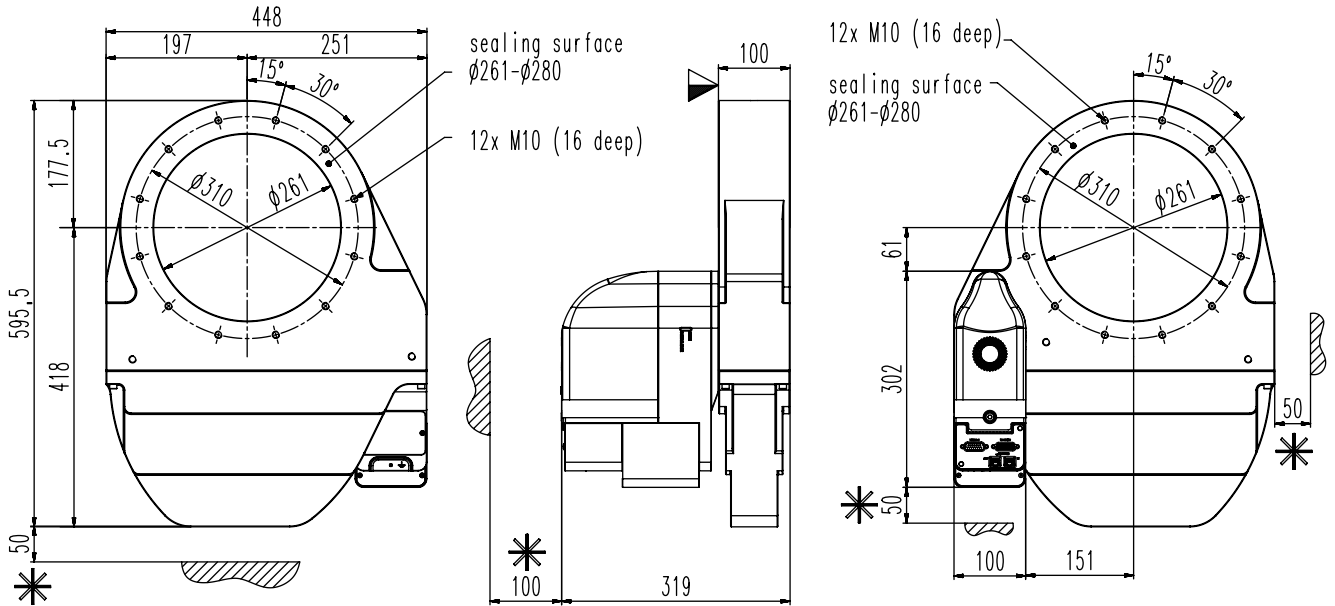
ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

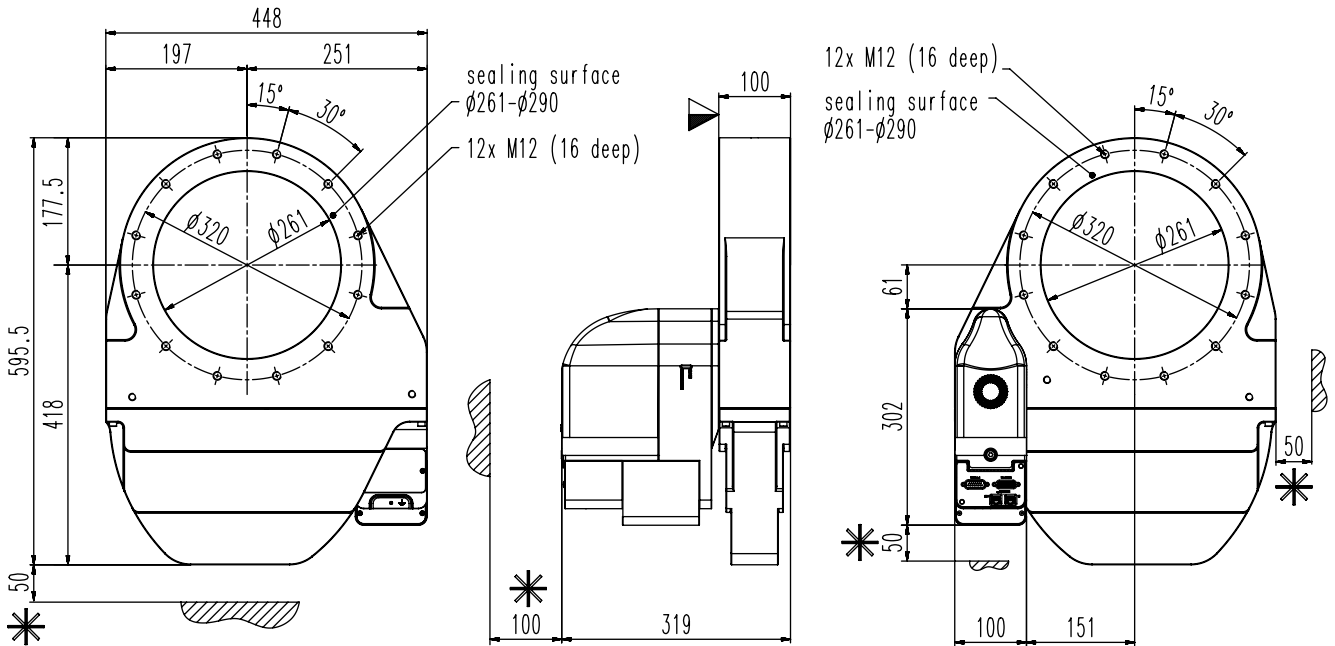
Example: 65548-PAGH-X, X = valve with heater for 120 °C

DIMENSIONS

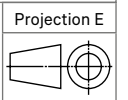
Valve with integrated pressure controller and stepper motor
 DN 250 (10") with ISO-F flanges



Valve with integrated pressure controller and stepper motor
 DN 250 (10") with JIS flanges



- ▼ Valve seat side
- * Required for dismantling



SYMMETRICAL CONTROL VALVE, SERIES 67.0

Downstream pressure control and isolation valve for SEMI and FPD processes.
Ideal for demanding etching processes.



Blank aluminum

Hard anodized aluminum

Enables symmetrical flow at virtually particle-free operation

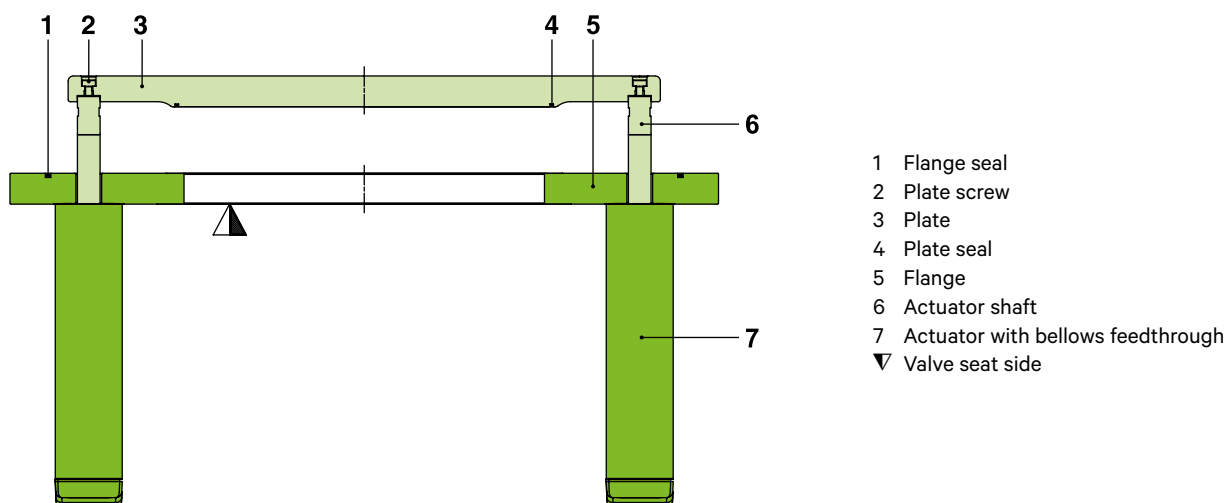
Excellent pressure control performance

Service port to connect a computer via USB and on-board Control Performance Analyzer (CPA) software

MAIN FEATURES

Sizes	DN 250 – 450 mm (10" – 18")
Actuator	two synchronized linear drives with closed loop controlled stepper motors
Body material	blank or hard anodized aluminum
Feedthrough	bellows
Flanges	pump side: ISO-F, JIS, chamber side: proprietary

FUNCTIONAL PRINCIPLE



- 1 Flange seal
- 2 Plate screw
- 3 Plate
- 4 Plate seal
- 5 Flange
- 6 Actuator shaft
- 7 Actuator with bellows feedthrough
- ▼ 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 in the glossary, chapter «Pressure closed-loop control». Actuation is performed by two synchronously driven stepper motors. An encoder monitors the position. This principle ensures fast and accurate process pressure control with a wide control range and symmetrical flow.

TECHNICAL DATA

Leak rate ¹⁾	Valve body: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹
Leak rate ¹⁾	Valve seat: blank aluminum hard anodized aluminum	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁴ mbar ls ⁻¹
Pressure range ¹⁾	Blank aluminum Hard anodized aluminum	1·10 ⁻⁸ mbar to 1.2 bar (abs) 1·10 ⁻⁶ mbar to 1.2 bar (abs)
Differential pressure on the plate	Chamber side → plate Pump side → plate	1200 mbar (valve closed) 10 mbar
Cycles until first service ²⁾	Pressure control Isolation	2 million 200000
Temperature ²⁾	Valve body Actuator: ambient	≤ 120 °C max. 50 °C (≤ 35 °C recommended)
Material	Flange, plate Actuator shafts Bellows	EN AW-6082 (3.2315) or AW-6061 (3.3211) AISI 316L (1.4404) AISI 633 (AM 350)
Seal	Flange, plate, actuators	FKM (e.g. Viton®)
Feedthrough		bellows
Mounting position		actuators down

DN (nominal I.D.)		Minimum controllable conductance (molecular flow)	Max. differential pressure during operation	Max. stroke	Operating time for throttling per 100 mm	Isolation (max. throttling → isolation)	De-isolation (isolation → max. throttling)	Weight	
mm	inch							kg	lbs
250	10	0.25	30	130	1	1	1	28	61.73
320	12	0.32	30	130	1	1	1	32	70.55
350	14	0.35	30	130	1	1	1	34	74.96
400	16	0.4	30	130	1	1	1	38	83.78
450	18	on request							

¹⁾ Unheated on delivery.

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

Technical data for pressure controller: see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

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

VALVE

- Other nominal diameters
- Customer specified body
- Customer specified flanges
- Surface treatment, e. g. aluminum hard anodized or nickel-plated
- Other sealing materials
- Heater for flange and/or plate

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with two stepper motors

DN		Ordering numbers			
mm	inch	blank aluminum		hard anodized aluminum	
		ISO-F	JIS	ISO-F	JIS
250	10	67048-PA52	67048-JA52	67048-PH52	67048-JH52
320	12	67050-PA52	67050-JA52	67050-PH52	67050-JH52
350	14	67051-PA52	67051-JA52	67051-PH52	67051-JH52
400	16	67052-PA52	67052-JA52	67052-PH52	67052-JH52
450	18	on request	on request	on request	on request

Connecting cable: valve – pressure controller

Length 2 m:	670CV-99LB
Length 3 m:	670CV-99LC
Length 4 m:	670CV-99LD
Length 5 m:	670CV-99LE

Pressure controller

670EC-24 . . . (Example: 670EC-24GH = controller with RS232 interface)
--

Controller configurations:		Interface	Number of sensors
G = basic version		H = RS232	2
A = with SPS		E = Logic (analog / digital)	2
H = with PFO		Q = DeviceNet®	2
C = with SPS and PFO		F = Profibus	2
T = basic version with VC master		K = RS485	2
V = with SPS and VC master		X = EtherCAT	2
U = with PFO and VC master		S = VC slave (without interface)	
W = with SPS, PFO and VC master			

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

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

VC = Valve Cluster
(for operating several valves synchronously)

Pressure controller: see pages 184 – 189

ORDERING INFORMATION

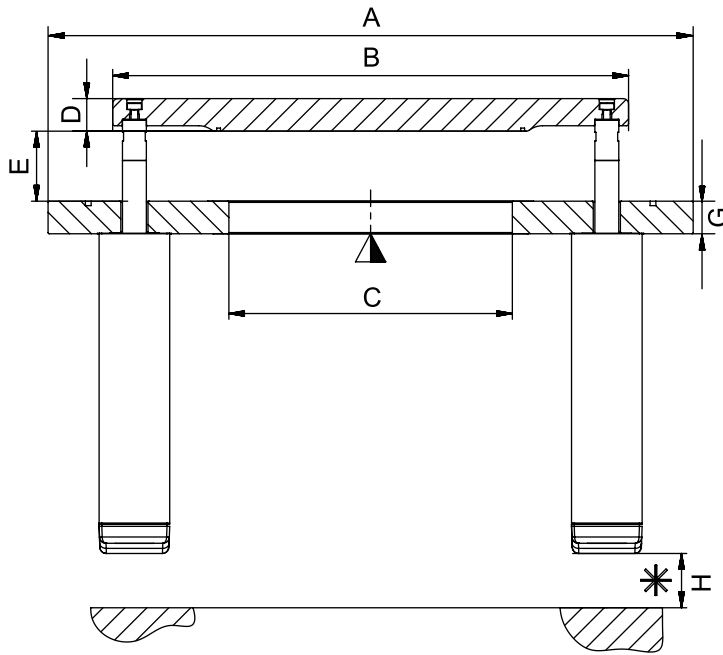
FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 67048-PA52-X, X = valve with heater for 120 °C

DIMENSIONS

Valve with two stepper motors
DN 250 – 450 (10" – 18")



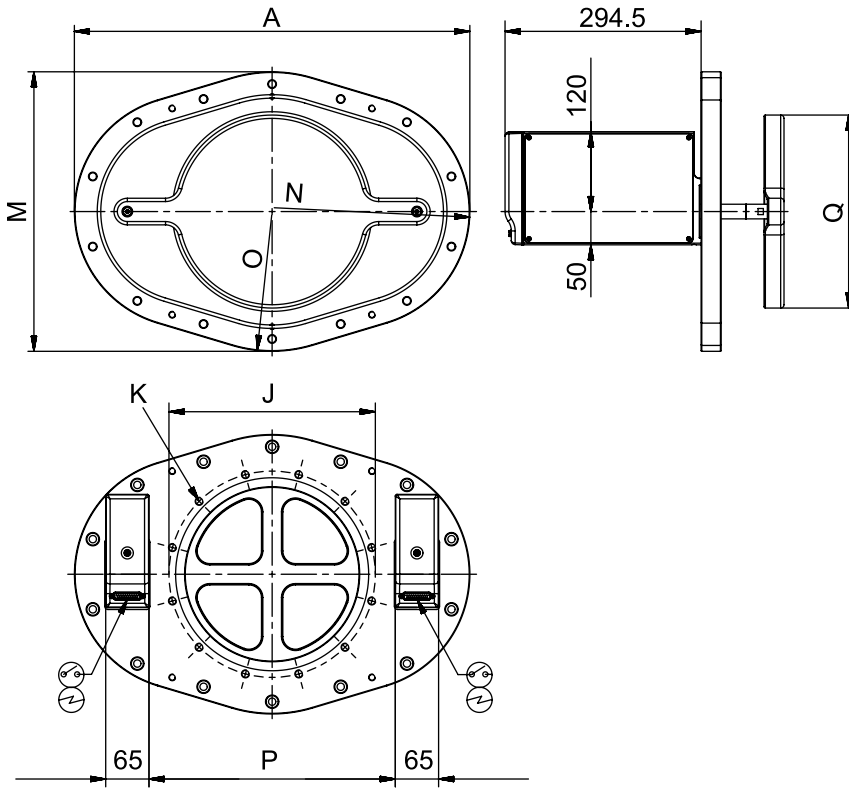
DN	mm	250	320	350	400
	inch	10	12	14	16
A	mm	594	656	688	740
	inch	23.39	25.83	27.09	29.13
B	mm	475	550	575	645
	inch	18.70	21.65	22.64	25.39
C	mm	261	318	350	400
	inch	10.28	12.52	13.78	15.75
D	mm	30	30	30	30
	inch	1.18	1.18	1.18	1.18
E ¹⁾	mm	130	130	130	130
	inch	5.12	5.12	5.12	5.12
G	mm	30	30	30	30
	inch	1.18	1.18	1.18	1.18
H	mm	70	70	70	70
	inch	2.76	2.76	2.76	2.76

¹⁾ Maximum stroke:
effective stroke depends on
controller configuration

DN 450 on request

* Required for dismantling
▼ Valve seat side

DN 250 – 450 (10" – 18")



	DN	mm	250	320	350	400
		inch	10	12	14	16
	A	mm	594	656	688	740
		inch	23.39	25.83	27.09	29.13
ISO-F	J	mm	310	395	-	480
		inch	12.20	15.55	-	18.90
	K		12 × M10	12 × M12	-	16 × M12
JIS	J	mm	310	370	420	480
		inch	12.20	14.57	16.54	18.90
	K		12 × M12	12 × M12	12 × M12	12 × M16
	M	mm	420	500	530	600
		inch	16.54	19.69	20.87	23.62
	N	mm	175	200	188	220
		inch	6.89	7.87	7.40	8.66
	O	mm	210	250	265	300
		inch	8.27	9.84	10.43	11.81
	P	mm	370	445	470	540
		inch	14.57	17.52	18.50	21.26
	Q	mm	290	340	374	430
		inch	11.42	13.39	14.72	16.93

J = Bolt circle
K = Thread diameter

DN 450 on request

⊙ Position indicator
⊕ Electrical connection

BUTTERFLY AND ISOLATION VALVE, SERIES 95.1/95.2

Control and isolation valve combined as a compact unit.



Series 95.1
DN 25 – 50

Series 95.2
DN 63 – 250

Series 95.1: Series 61.2 Butterfly control valve and Series 26.4 HV angle valve

Opening at 1 bar differential pressure possible

Series 95.2: Series 61.2 Butterfly control valve and Series 12.1 vacuum gate valve

MAIN FEATURES

Sizes	DN 25 – 250 mm (1" – 10")
Actuator	integrated pressure controller with stepper motor
Body material	aluminum or stainless steel
Standard flanges	ISO-KF, ISO-F

TECHNICAL DATA

Leak rate ¹⁾	Valve body, valve seat	<1·10 ⁻⁹ mbar ls ⁻¹	
Pressure range ¹⁾	95.1	1·10 ⁻⁸ mbar to 1.2 bar (abs)	
	95.2	1·10 ⁻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	max. 50 °C (≤ 35 °C recommended)	
Mounting position		any	

DN (nominal I. D.)		Conductance (molecular flow)	Minimum controllable conductance (molecular flow)	Compressed air min. – max. overpressure		Max. differential pressure during closing	Max. differential pressure during opening	Max. differential pressure during pressure control	Operating time for throttling	Typical closing or opening time	Weight: aluminum valve		Weight: stainless steel valve	
mm	inch	ls ⁻¹	ls ⁻¹	mbar					s		kg	lbs	kg	lbs
25	1	8.50	0.15	4 – 8	58 – 116	1.20	1000	1	0.30	0.60	2.70	6	3.60	8
40	1½	29	0.25	4 – 8	58 – 116	1.20	1000	1	0.30	0.60	3.60	7.90	5.70	12.50
50	2	52	0.30	4 – 8	58 – 116	1.20	1000	1	0.30	0.70	4.20	9.30	6.80	15
63	2½	210	0.45	4 – 7	58 – 102	1.20	30	1	0.30	1.50	7.10	15.60	–	–
80	3	450	0.65	4 – 7	58 – 102	1.20	30	1	0.30	1.70	7.90	17.40	–	–
100	4	800	0.85	4 – 7	58 – 102	1.20	30	0.80	0.30	2	9.10	20	–	–
160	6	2300	1.70	4 – 7	58 – 102	1.20	30	0.30	0.30	2	15.80	34.80	–	–
200	8	4700	2.80	4 – 7	58 – 102	1.20	30	0.15	0.30	3	25.70	56.60	–	–
250	10	8900	5	4 – 7	58 – 102	1.20	30	0.10	0.30	5	41.50	91.50	–	–

¹⁾ Unheated on delivery.

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

Technical data for pressure controller: see pages 184 – 189

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with integrated pressure controller and stepper motor

DN		Ordering numbers							
mm	inch	Series 95.1				Series 95.2			
		aluminum ISO-KF		stainless steel ISO-KF		aluminum ISO-F		stainless steel ISO-F	
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 = 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	H = RS232	2
					V = RS232 + analog output	1
					W = RS232 + analog output	2
					C = Logic (analog / digital)	1
					E = Logic (analog / digital)	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)	

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

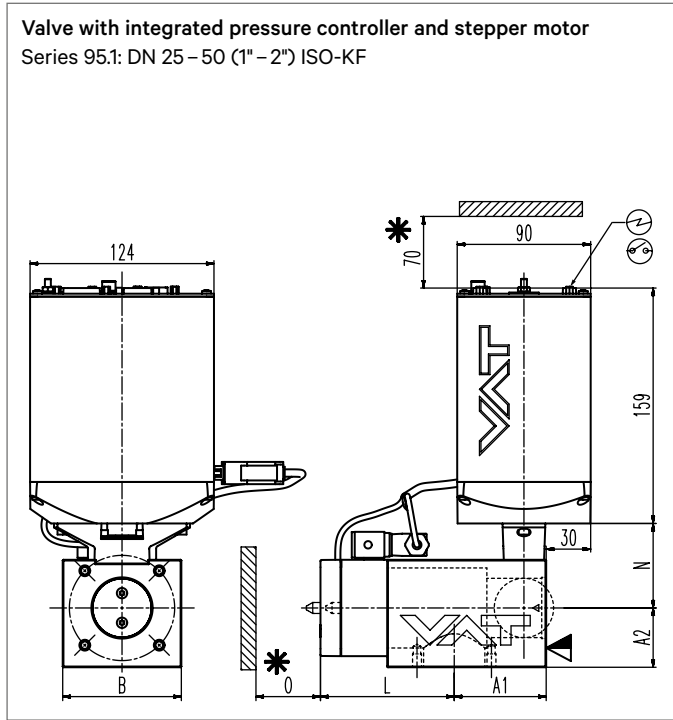
Example: 95240-PAGG

= aluminum valve with ISO-F DN 100 flanges, RS232 interface, for 1 sensor

Pressure controller: see pages 184 – 189

DIMENSIONS

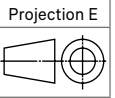
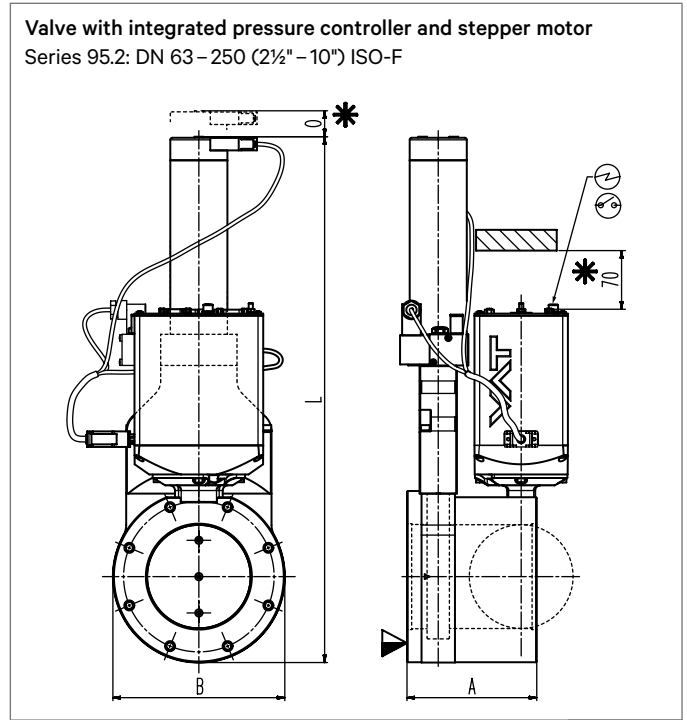
Valve with integrated pressure controller and stepper motor
Series 95.1: DN 25 – 50 (1" – 2") ISO-KF



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

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

Valve with integrated pressure controller and stepper motor
Series 95.2: DN 63 – 250 (2½" – 10") ISO-F



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

PRESSURE CONTROLLERS FOR VALVES

Integrated or external pressure controller,
depending on valve type

Automatic learning of system parameters

Extremely short control response times

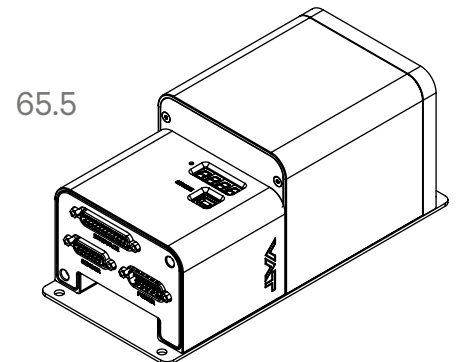
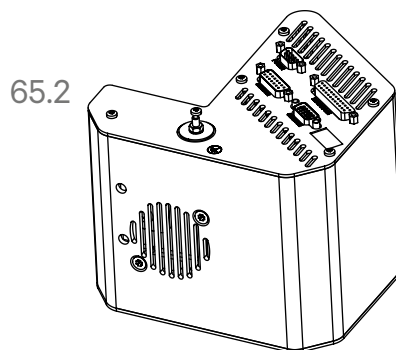
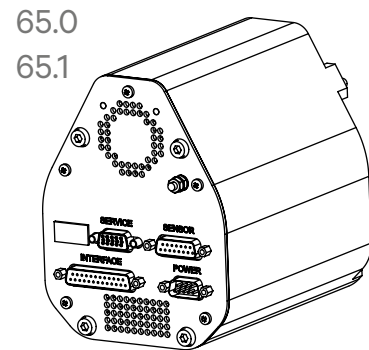
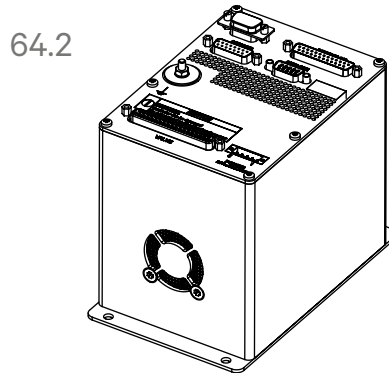
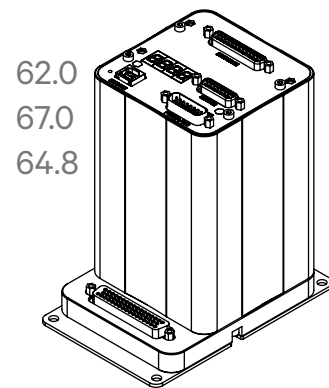
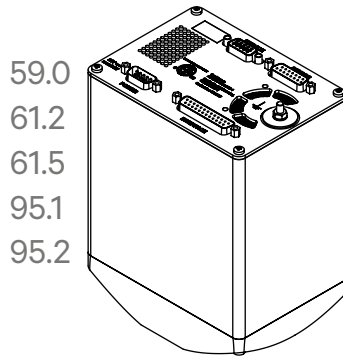
Fast and accurate pressure control

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.

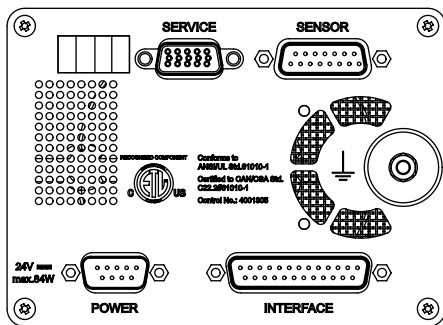
B

TECHNICAL DATA

Integrated controller
for Series 59.0, 61.2, 61.5, 95.1, 95.2

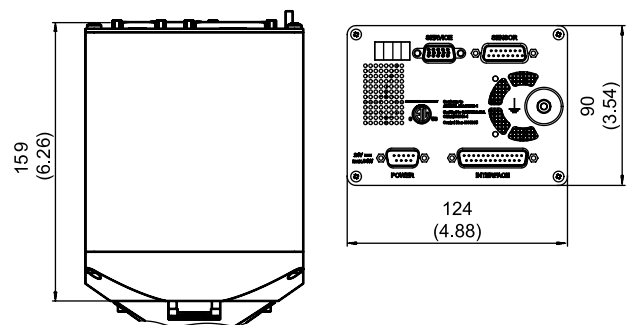
Power consumption	24 V DC (±10%) @ 0.5 V pk-pk
– Controller + motor	max. 40 W
– Power failure option (PFO)	max. 10 W
– Sensor power supply (SPS)	max. 36 W
Sensor supply	24 V DC or ±15 V DC
Sensor input	
– Signal voltage	0–10 V DC linear with pressure
– Input resistance	Ri = 100 kΩ
– Resolution	0.23 mV
– Sampling rate	10 ms
Control accuracy	5 mV or 0.1% of setpoint (the higher value applies)
Position resolution	depending on valve type
Protective system	IP 30

Example: RS232



Available interfaces:

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

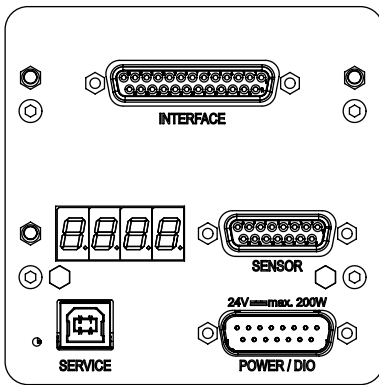


TECHNICAL DATA

External controller
for Series 62.0, 67.0, 64.8

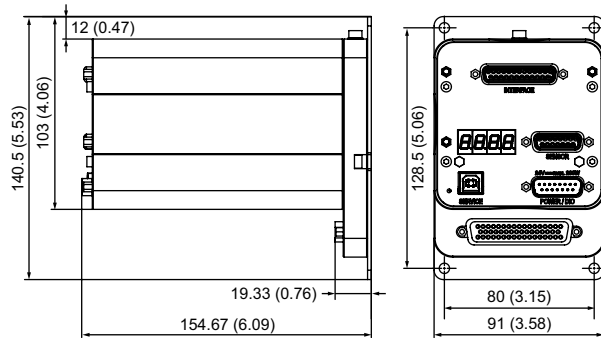
Power consumption	24 V DC ($\pm 10\%$) @ 0.5 V pk-pk
- Controller + motor	max. 150 W
- Power failure option (PFO)	max. 10 W
- Sensor power supply (SPS)	max. 40 W
Sensor supply	24 V DC or ± 15 V DC
Sensor input	
- Signal voltage	0 – 10 V DC linear with pressure
- Input resistance	$R_i = 100 \text{ k}\Omega$
- Resolution	0.23 mV
- Sampling rate	2 ms
Control accuracy	5 mV or 0.1% of setpoint (the higher value applies)
Position resolution	depending on valve type
Protective system	IP 40

Example: RS232



Available interfaces:

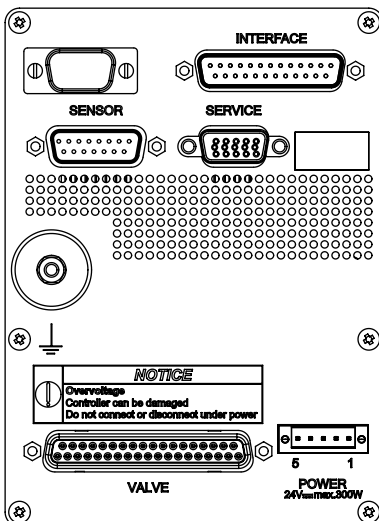
- Logic
- RS232
- RS485
- DeviceNet®
- Profibus
- EtherCAT



Integrated controller
for Series 64.2
(external controller available as an option)

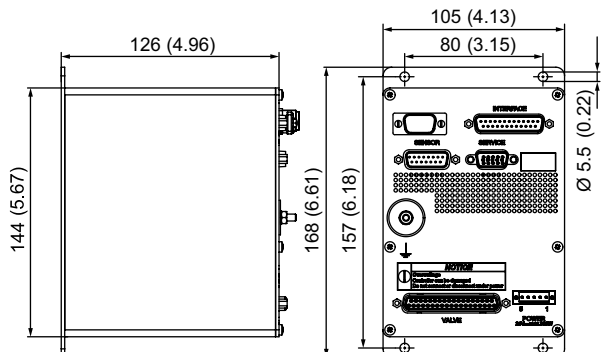
Power consumption	24 V DC ($\pm 10\%$) @ 0.5 V pk-pk
- Controller + motor	max. 54 W
- Power failure option (PFO)	max. 10 W
- Sensor power supply (SPS)	max. 36 W
Sensor supply	24 V DC or ± 15 V DC
Sensor input	
- Signal voltage	0 – 10 V DC linear with pressure
- Input resistance	$R_i = 100 \text{ k}\Omega$
- Resolution	0.23 mV
- Sampling rate	10 ms
Control accuracy	5 mV or 0.1% of setpoint (the higher value applies)
Position resolution	depending on valve type
Protective system	IP 20

Example: RS232

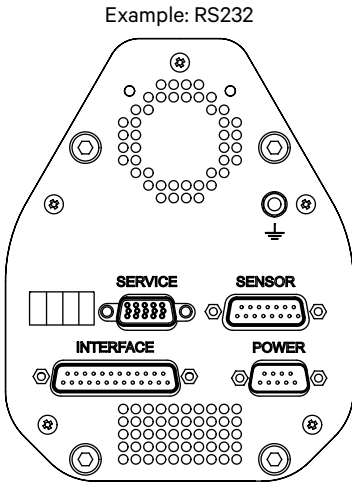


Available interfaces:

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



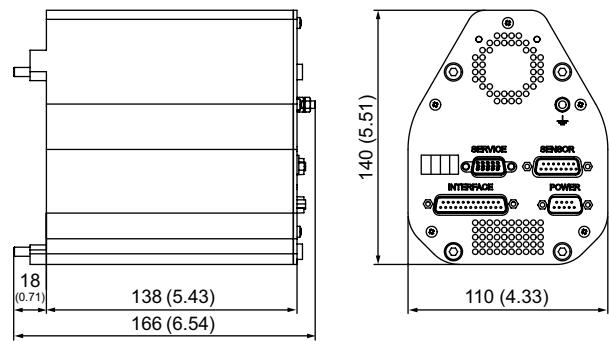
Integrated controller for Series 65.0, 65.1
(external controller available as an option)



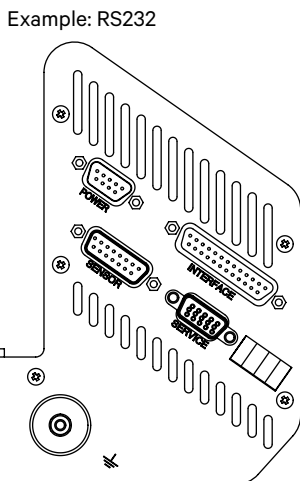
Power consumption	24 V DC (±10%) @ 0.5 V pk-pk
- Controller + motor	max. 50 W
- Power failure option (PFO)	max. 10 W
- Sensor power supply (SPS)	max. 36 W
Sensor supply	24 V DC or ±15 V DC
Sensor input	
- Signal voltage	0 – 10 V DC linear with pressure
- Input resistance	Ri = 100 kΩ
- Resolution	0.23 mV
- Sampling rate	10 ms
Control accuracy	5 mV or 0.1% of setpoint (the higher value applies)
Position resolution	depending on nominal diameter
Protective system	IP 20

Available interfaces:

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



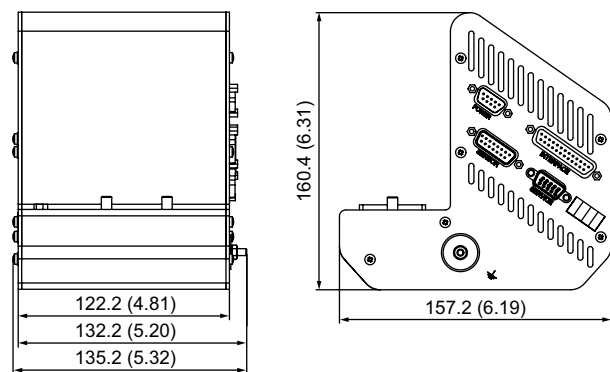
Integrated controller for Series 65.2
(external controller available as an option)



Power consumption	24 V DC (±10%) @ 0.5 V pk-pk
- Controller + motor	max. 86 W
- Power failure option (PFO)	max. 10 W
- Sensor power supply (SPS)	max. 36 W
Sensor supply	24 V DC or ±15 V DC
Sensor input	
- Signal voltage	0 – 10 V DC linear with pressure
- Input resistance	Ri = 100 kΩ
- Resolution	0.23 mV
- Sampling rate	10 ms
Control accuracy	5 mV or 0.1% of setpoint (the higher value applies)
Position resolution	depending on nominal diameter
Protective system	IP 20

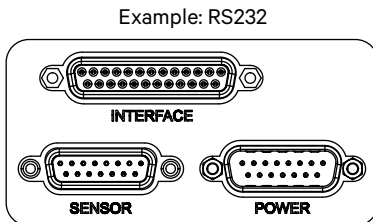
Available interfaces:

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



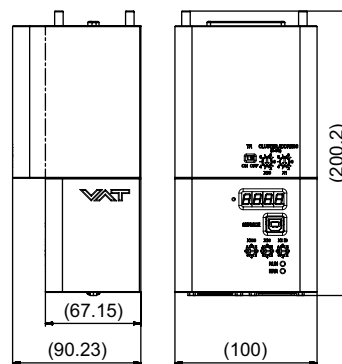
**Integrated controller
for Series 65.5**
(external controller available as an option)

Power consumption	24 V DC ($\pm 10\%$) @ 0.5 V pk-pk
- Controller + motor	max. 110 W
- Power failure option (PFO)	max. 10 W
- Sensor power supply (SPS)	max. 40 W
Sensor supply	24 V DC or ± 15 V DC
Sensor input	
- Signal voltage	0 – 10 V DC linear with pressure
- Input resistance	$R_i = 100 \text{ k}\Omega$
- Resolution	0.23 mV
- Sampling rate	2 ms
Control accuracy	5 mV or 0.1% of setpoint (the higher value applies)
Position resolution	depending on nominal diameter
Protective system	IP 40



Available interfaces:

- Logic
- RS232
- RS485
- DeviceNet®
- Profibus
- EtherCAT



ELECTRICAL CONNECTIONS

	CONNECTION	TYPE
POWER	Power input: all except below	DB-9 male
	64.2, 64.8	Weidmüller SL 3.50 male
	62.0, 65.5, 67.0	DB-15 male
SENSOR	Sensor input	DB-15 female
	Sensor power supply	
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 screw terminal
	EtherCAT (with Logic I/O)	2 × RJ 45
	Logic I/O	Binder M8 female
SERVICE	Connector: all except below	DB-15 HD female
	62.0, 67.0, 65.5	USB type B

OPTIONS, CUSTOMIZED SOLUTIONS

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

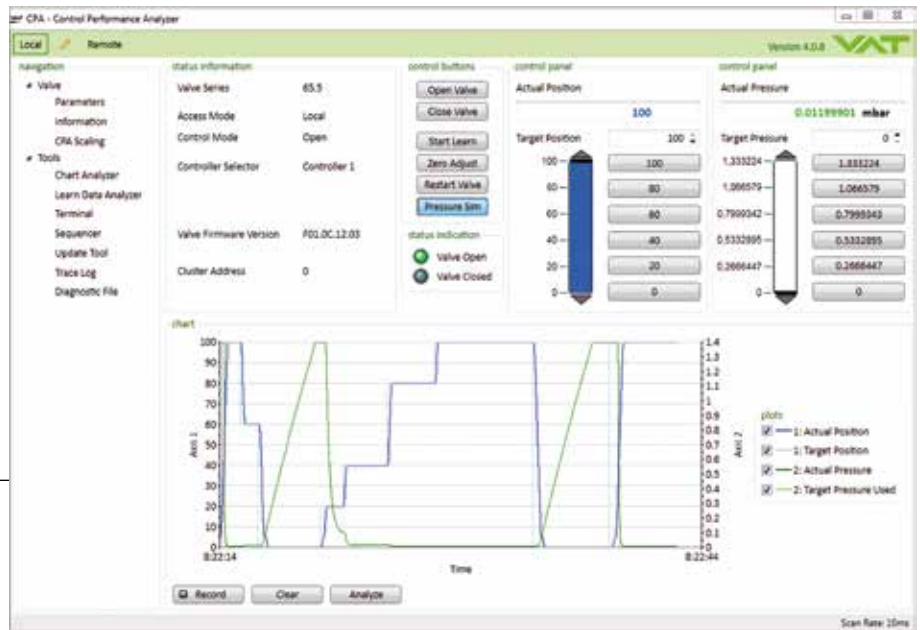
ACCESSORIES

- CPA software: see «OPERATION»
- Service box: see «OPERATION»
- Control panel: see «OPERATION»
- Connector kits for the various interfaces
- AC power supply unit
(input: 100 – 240 V AC, output: 24 V DC / 4 A)

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)
 - is on-board for the controllers 62.0, 65.5, 67.0
 - can be downloaded from the VAT website for all other controllers.

The required cable can 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



TRANSFER VALVES & DOORS FOR SEMICONDUCTORS

SERIES	TYPE	PAGE
02.1 / 03.1	TRANSFER VALVE / INSERT MONOVAT	192
02.2 / 03.2	TRANSFER VALVE / INSERT MONOVAT	198
04.1 / 05.1	TRANSFER VALVE / INSERT L-VAT	204
04.2 / 05.2	TRANSFER VALVE / INSERT L-VAT	210
04.3 / 05.3	TRANSFER VALVE / INSERT L-MOTION	216
07.5	TRANSFER DOOR L-VAT	222
94.0	SPECIAL TRANSFER VALVE L-MOTION / L-VAT	226
94.5	SPECIAL DOOR L-VAT	227

TRANSFER VALVE / INSERT MONOVAT, SERIES 02.1 / 03.1

For load lock and process chamber isolation in semiconductor production systems for 200 and 300 mm wafers.



Valve 02.1

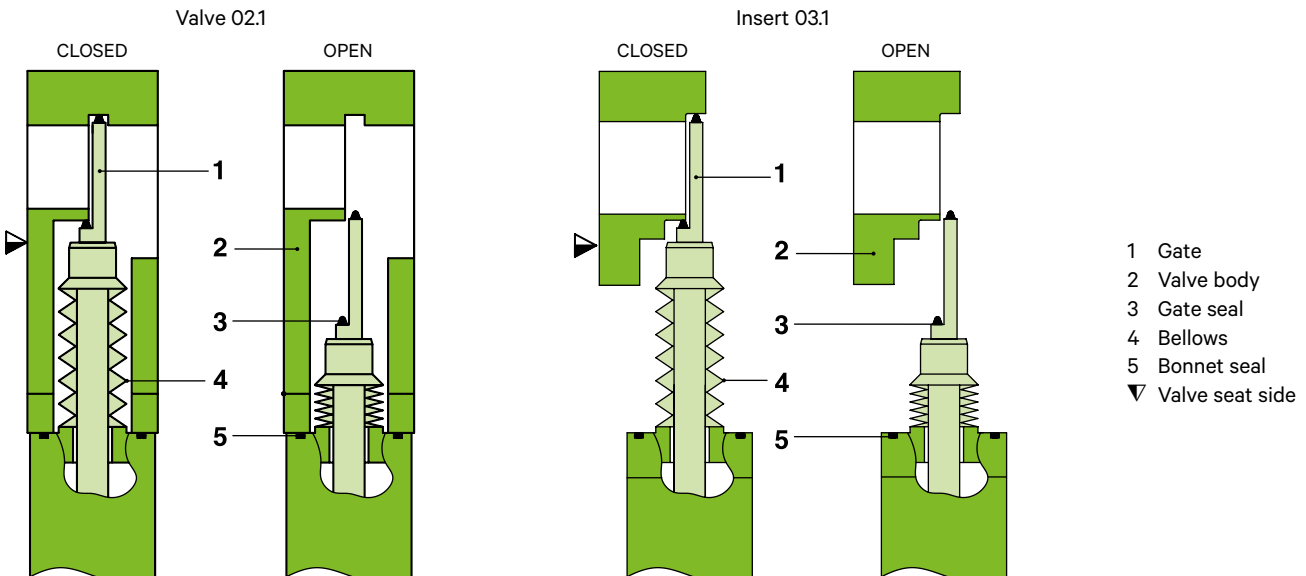
Insert 03.1

- Mechanically locked in closed position
- Low shock
- Liquid cooling of body and gate (option)
- UHV version (option)
- Differential pressure tabs (option)

MAIN FEATURES

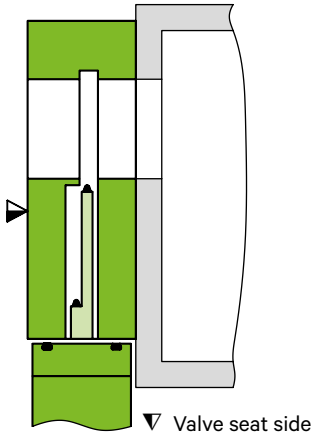
Opening sizes	32 × 222 mm to 51 × 420 mm (1.26" × 8.74" to 2.01" × 16.54")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum or stainless steel
Feedthrough	bellows
Sealing technology	MONOVAT: see glossary

FUNCTIONAL PRINCIPLE



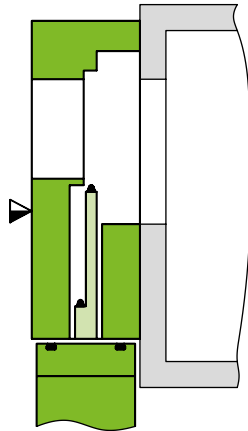
TYPES

Valve type A



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

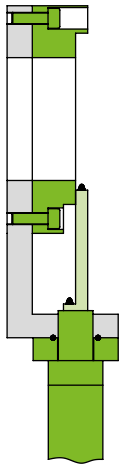
Valve type B



Opening: rear side > seat side
 With bonnet flange
 Gate service through bonnet flange

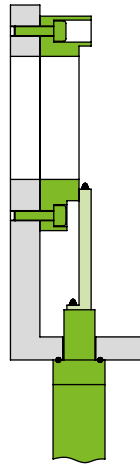
For the types L, M, N the chamber must meet specific requirements regarding stiffness and manufacturing tolerances.

Insert type L



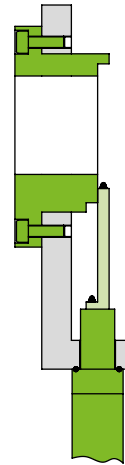
Seat mounted to chamber wall
 With bonnet flange
 Gate service through chamber

Insert type M



Seat mounted to chamber wall
 Without bonnet flange
 Gate service through chamber

Insert type N



Seat mounted through chamber wall
 Without bonnet flange
 Gate service through chamber

VAT
 Customer part

TECHNICAL DATA

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

Sealing surface	Seal				
	FKM (Viton®)		FFKM (FKM Zalak 5100)		Metal
	Body	Seat	Body	Seat	Body
Blank metal (milled / ball polished)	<1·10 ⁻⁹	<1·10 ⁻⁹	<1·10 ⁻⁸	<1·10 ⁻⁷	<5·10 ⁻¹⁰
Hard anodized aluminum	<1·10 ⁻⁵	<1·10 ⁻⁴	<1·10 ⁻⁵	<1·10 ⁻⁴	stainless steel only
Nickel-plated aluminum	<1·10 ⁻⁹	<1·10 ⁻⁹	<1·10 ⁻⁸	<1·10 ⁻⁷	stainless steel only

Pressure range	Blank or nickel-plated metal	1·10 ⁻⁹ mbar to 1.2 bar (abs)
	Hard anodized aluminum	1·10 ⁻⁶ mbar to 1.2 bar (abs)
	Metal seal	5·10 ⁻¹⁰ mbar to 1.1 bar (abs)

Differential pressure on the gate ³⁾	1.2 bar
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Differential pressure at opening	≤ 30 mbar
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Cycles until first service ¹⁾³⁾	≥ 2 million
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Temperature ³⁾

Operating temperature of the valve	Configurations			
	Valve		Actuator	
	Valve 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
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Temperature difference seat / gate	< 40 °C
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Material	Aluminum valve body / gate	EN AW-6061 (3.3211), EN AW-6082 (3.2315)
	Stainless steel valve body / gate	AISI 316L (1.4404, 1.4435)
	Differential pressure tabs	AISI 316L (1.4404, 1.4435)
	Bellows end pieces, shaft	AISI 316L (1.4404, 1.4435)
	Bellows	AISI 633 (AM 350)

Seal	Bonnet, gate	FKM (Viton®)
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Feedthrough	bellows
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Mounting position	actuator up or down
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Impulse solenoid valve	24 V DC, 2.5 W (others on request)
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Position indicator: contact rating	Voltage	≤ 50 V AC/DC
	Current	≤ 3 A
	Power	≤ 30 W
	Connection	9 pin subminiature D

Compressed air connection	internal threads M5
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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

TECHNICAL DATA

DN (D1 × D) D1 opening height D opening length		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight			
							Aluminum valve type A		Stainless steel valve type A	
mm	inch	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
32 × 222	1.26 × 8.74	3 – 7	44 – 102	0.22	0.01	< 1	8	18	16	35
46 × 236	1.81 × 9.29	2 – 7	29 – 102	0.49	0.02	< 1	10	22	20	44
50 × 336	1.97 × 13.23	2 – 7	29 – 102	0.49	0.02	< 1	12	26	25	55
51 × 160	2.01 × 6.30	3 – 7	44 – 102	0.49	0.02	< 1	17	37	35	77
51 × 210	2.01 × 8.27	3 – 7	44 – 102	0.49	0.02	< 1	17	37	35	77
51 × 420	2.01 × 16.54	5 – 7	73 – 102	0.98	0.04	< 2	34	74	68	150

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Pneumatically locked in open position
- Other solenoid valve voltage (standard 24VDC)
- Bakeable to 200 °C
- Double position indicator for the positions OPEN and CLOSED

VALVE AND INSERT

- Surface
 - Hard anodised or nickel-plated aluminum
 - Aluminum, ball-polished stainless steel
 - Electro-polished stainless steel gate
- Temperature management
 - Body prepared for liquid cooling (stainless steel)
 - Gate prepared for liquid cooling
 - Body prepared for heating cartridges
 - PTC or resistance heating cartridges
- FFKM gate seal
- 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)
 - Screw holes outside or inside of the sealing line
 - Centering pins, centering holes
- Body
 - Tabs made of PEEK (B-side only)
- UHV version
 - Body flange sealing surfaces for metal seal (VATSEAL)
 - Metal seal on bonnet flange (VATSEAL)

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- VATSEAL metal seals for flanges
- Claw (M8) for valves with clamp edges: see Series 32
- Adapter for pneumatic connection R $\frac{1}{8}$ " / NPT $\frac{1}{8}$ "

ORDERING INFORMATION

FOR STANDARD VALVES

Valve type A, Series 02.1
with pneumatic actuator
double acting
with position indicator

	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
SEMI E21-94	32 × 222	1.26 × 8.74	02109-AA24	02109-AA44 *	02109-AE24	02109-AE44 *
SEMI E21-94	46 × 236	1.81 × 9.29	02110-AA24	02110-AA44 *	02110-AE24	02110-AE44 *
SEMI E21.1-1296	50 × 336	1.97 × 13.23	02112-AA24	02112-AA44 *	02112-AE24	02112-AE44 *
	51 × 160	2 × 6.30	02105-AA24	02105-AA44 *	02105-AE24	02105-AE44 *
	51 × 210	2 × 8.27	02106-AA24	02106-AA44 *	02106-AE24	02106-AE44 *
	51 × 420	2 × 16.54	02108-AA24	02108-AA44 *	02108-AE24	02108-AE44 *

Other sizes on request

Valve type B, Series 02.1
with pneumatic actuator
double acting
with position indicator

	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
SEMI E21-94	32 × 222	1.26 × 8.74	02109-BA24	02109-BA44 *	02109-BE24	02109-BE44 *
SEMI E21-94	46 × 236	1.81 × 9.29	02110-BA24	02110-BA44 *	02110-BE24	02110-BE44 *
SEMI E21.1-1296	50 × 336	1.97 × 13.23	02112-BA24	02112-BA44 *	02112-BE24	02112-BE44 *
	51 × 160	2 × 6.30	02105-BA24	02105-BA44 *	02105-BE24	02105-BE44 *
	51 × 210	2 × 8.27	02106-BA24	02106-BA44 *	02106-BE24	02106-BE44 *
	51 × 420	2 × 16.54	02108-BA24	02108-BA44 *	02108-BE24	02108-BE44 *

Other sizes on request

Insert types L / M / N, Series 03.1

Ordering numbers on request

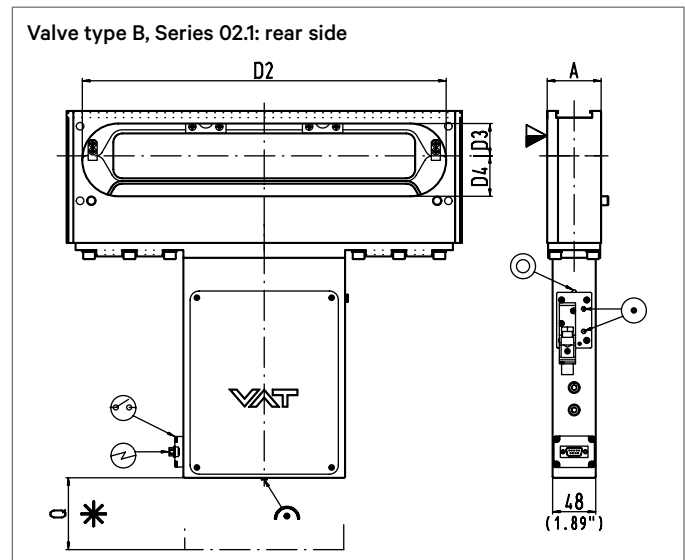
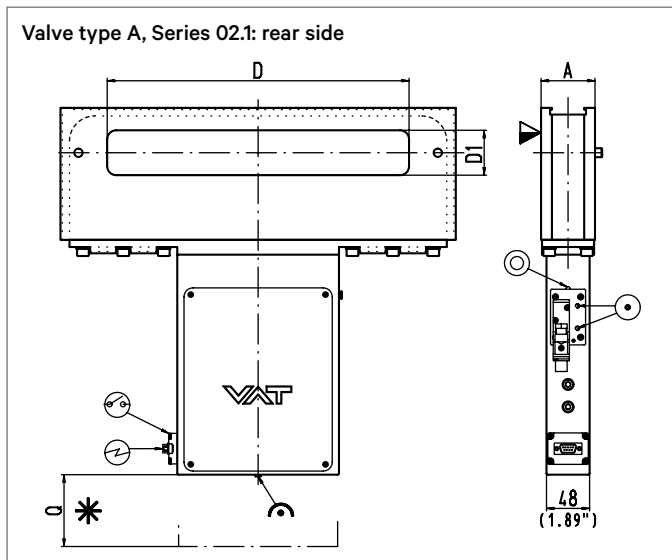
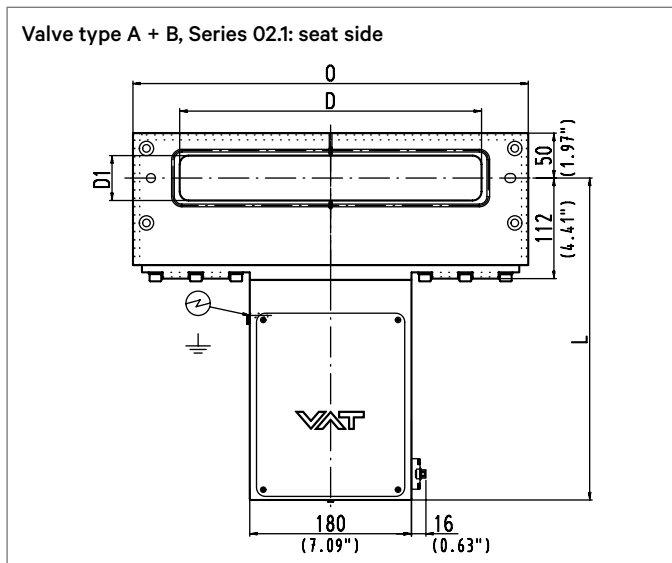
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 02112-AA24-X, X = bakeable to 200 °C

MAIN DIMENSIONS



D1 × D	mm	32 × 222	46 × 236	50 × 336	51 × 160	51 × 210	51 × 420
	inch	1.26 × 8.74	1.81 × 9.29	1.97 × 13.23	2 × 6.30	2 × 8.27	2 × 16.54
A	mm	50	50	60	50	50	50
	inch	1.97	1.97	2.36	1.97	1.97	1.97
D	mm	222	236	336	160	210	420
	inch	8.74	9.29	13.23	6.30	8.27	16.54
D1	mm	32	46	50	51	51	51
	inch	1.26	1.81	1.97	2.01	2.01	2.01
D2	mm	275	305	405	235	285	495
	inch	10.83	12.01	15.94	9.25	11.22	19.49
D3	mm	29	36	36	38.50	38.50	38.50
	inch	1.14	1.42	1.42	1.52	1.52	1.52
D4	mm	35	44	45	45	45	45
	inch	1.38	1.73	1.77	1.77	1.77	1.77
L	mm	279	357	358.50	359.50	359.50	359.50
	inch	10.98	14.06	14.11	14.15	14.15	14.15
O	mm	340	340	440	275	325	535
	inch	13.39	13.39	17.32	10.83	12.80	21.06
Q	mm	60	80	80	80	80	80
	inch	2.36	3.15	3.15	3.15	3.15	3.15

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

Dimensions for insert types L / M / N on request.

TRANSFER VALVE / INSERT MONOVAT, SERIES 02.2 / 03.2

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



Valve 02.2



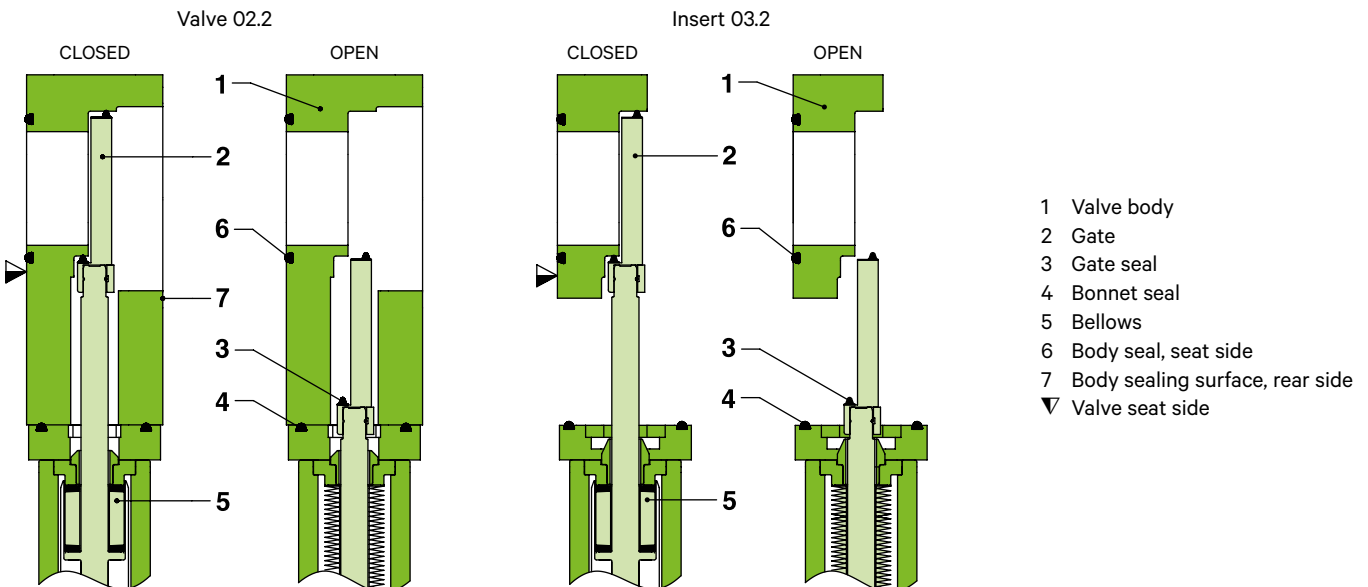
Insert 03.2

- Low shock
- Protected bellows
- Long lifetime
- Pneumatically locked (option)
- Easy gate exchange

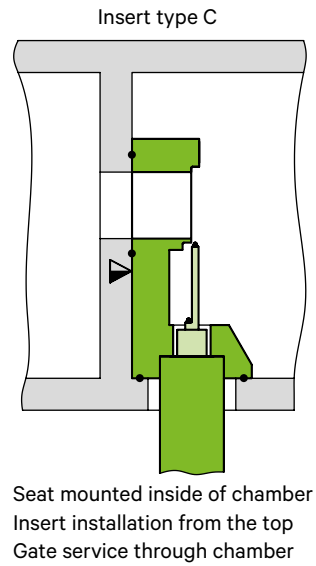
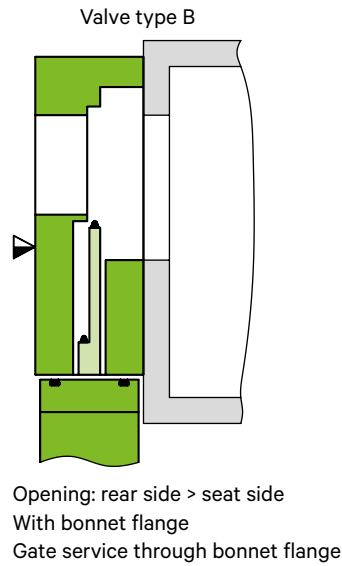
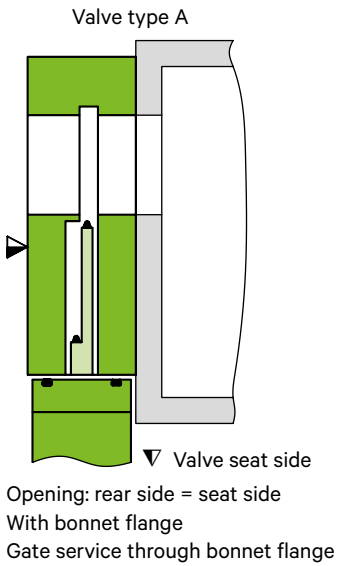
MAIN FEATURES

Opening sizes	32 × 222 mm to 100 × 500 mm (1.26" × 8.74" to 3.94" × 19.69")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum or stainless steel
Feedthrough	bellows
Sealing technology	MONOVAT: see glossary

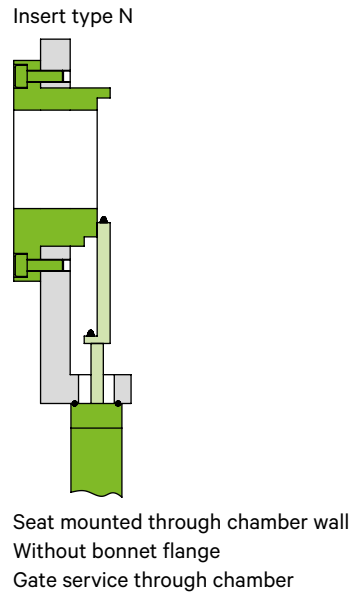
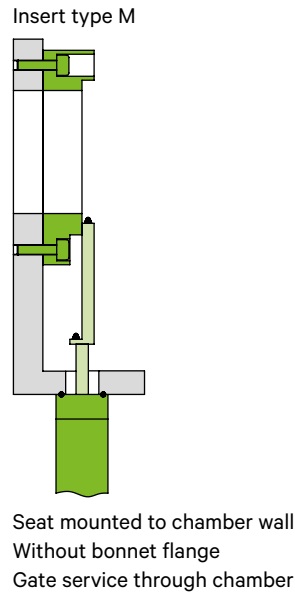
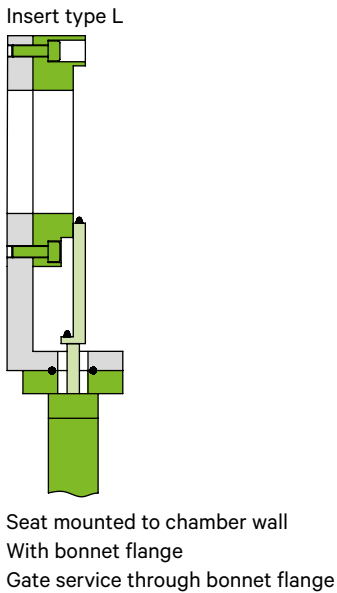
FUNCTIONAL PRINCIPLE



TYPES



For the types L, M, N the chamber must meet specific requirements regarding stiffness and manufacturing tolerances.



■ VAT
■ Customer part

TECHNICAL DATA

Leak rate¹⁾²⁾ at valve body and valve seat in mbar ls⁻¹

Sealing surface	Seal			
	FKM (Viton®)		FFKM (FKM Zalak 5100)	
	Body	Seat	Body	Seat
Blank metal (milled / ball polished)	< 1·10 ⁻⁹	< 1·10 ⁻⁹	< 1·10 ⁻⁸	< 1·10 ⁻⁷
Hard anodized aluminum	< 1·10 ⁻⁵	< 1·10 ⁻⁴	< 1·10 ⁻⁵	< 1·10 ⁻⁴
Nickel-plated aluminum	< 1·10 ⁻⁹	< 1·10 ⁻⁹	< 1·10 ⁻⁸	< 1·10 ⁻⁷

Pressure range	Blank or nickel-plated metal	1·10 ⁻⁹ mbar to 1.2 bar (abs)
	Hard anodized aluminum	1·10 ⁻⁶ mbar to 1.2 bar (abs)

Differential pressure on the gate ³⁾	1.2 bar
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Differential pressure at opening	≤ 30 mbar
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Cycles until first service ¹⁾³⁾⁴⁾	up to DN 56 × 496 mm	≥ 5 million
	> DN 56 × 496 mm to DN 100 × 500 mm	≥ 1 million

Temperature³⁾

Operating temperature of the valve	Configurations		
	Valve body	Gate	Position indicator
≤ 80 °C	aluminum	aluminum	standard
≤ 150 °C	aluminum	aluminum	bakeable
≤ 200 °C	stainless steel	stainless steel	without

Heating and cooling rate	≤ 40 °C h ⁻¹
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Temperature difference seat / gate	< 40 °C
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Material	Aluminum valve body / gate	EN AW-5083 (3.3547), EN AW-6061 (3.3211), EN AW-6082 (3.2315)
	Stainless steel valve body / gate	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	Bonnet, gate	FKM (Viton®)
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Feedthrough	bellows
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Mounting position	actuator up or down
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Impulse solenoid valve	24 V DC, 2.5 W (others on request)
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Position indicator: contact rating	Voltage	≤ 50 V AC/DC
	Current	≤ 0.1 A, ≤ 5 mA
	Connection	9 pin subminiature D

Compressed air connection	internal threads 1/8"
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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.

TECHNICAL DATA

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

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Pneumatically locked in closed and open position (check valve)
- Other solenoid valve voltage (standard 24VDC)
- Bakeable to 150 °C
- Double position indicator for the positions OPEN and CLOSED

VALVE AND INSERT

- Surface
 - Hard anodised or nickel-plated aluminum
 - Aluminum, ball-polished stainless steel
 - Electro-polished stainless steel gate
- Temperature management
 - Body prepared for heating cartridges
 - PTC or resistance heating cartridges
- 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)
 - Screw holes outside or inside of the sealing line
 - Centering pins, centering holes
- Body
 - Tabs made of stainless steel with vulcanized ZALAK 5100 (B-side only)

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Claw (M8) for valves with clamp edges: see Series 32
- Adapter for pneumatic connection R $\frac{1}{8}$ " / NPT $\frac{1}{8}$ "

ORDERING INFORMATION

FOR STANDARD VALVES

Valve type A, Series 02.2
with pneumatic actuator
double acting
with position indicator

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

Valve type B, Series 02.2
with pneumatic actuator
double acting
with position indicator

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

Insert type C, Series 03.2
with pneumatic actuator
double acting
with position indicator

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 *

Other sizes on request

Insert types L / M / N, Series 03.2

Ordering numbers on request

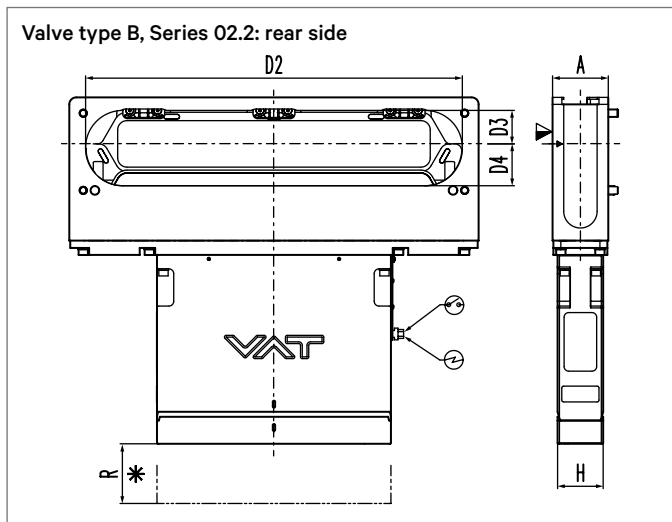
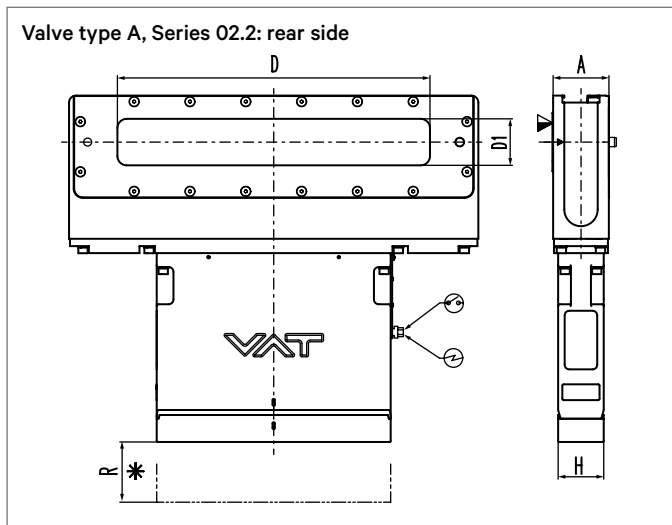
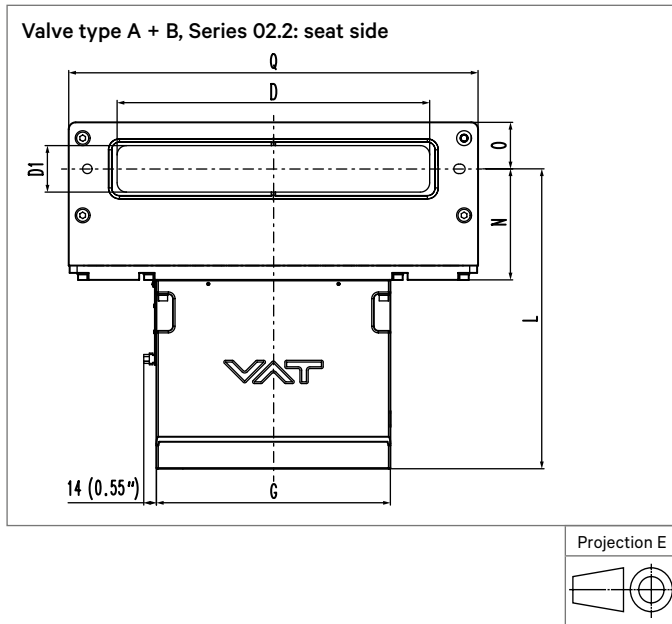
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 02212-AA24-X, X = tabs made of stainless steel with ZALAK 5100

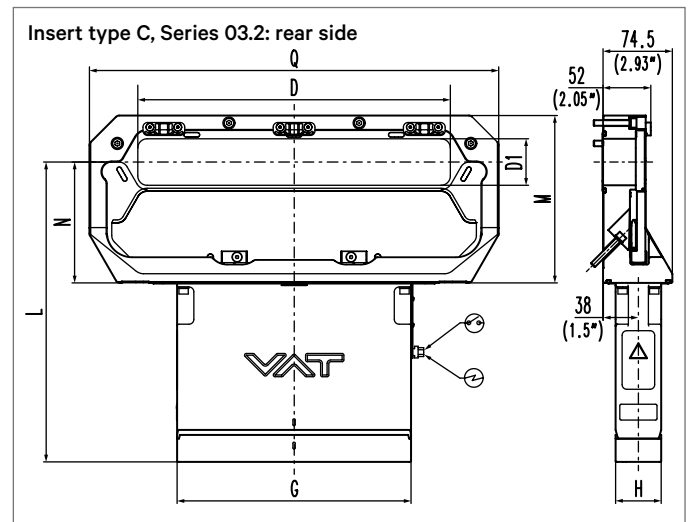
MAIN DIMENSIONS



D1 × D	mm	inch	32 × 222	46 × 236	50 × 336	56 × 496	100 × 500
			1.26 × 8.74	1.81 × 9.29	1.97 × 13.23	2.20 × 19.53	3.94 × 19.69
A	mm	inch	50	50	60	60	70
			1.97	1.97	2.36	2.36	2.76
D	mm	inch	222	236	336	496	500
			8.74	9.29	13.23	19.53	19.69
D1	mm	inch	32	46	50	56	100
			1.26	1.81	1.97	2.20	3.94
D2	mm	inch	275	305	405	570	606
			10.83	12.01	15.94	22.44	23.85
D3	mm	inch	29	36	36	39	72
			1.14	1.42	1.42	1.54	2.83
D4	mm	inch	35	44	45	45	67
			1.38	1.73	1.77	1.77	2.64
G	mm	inch	203.50	251.50	251.50	251.50	251.50
			8.01	9.90	9.90	9.90	9.90
H	mm	inch	43	49	49	49	59
			1.69	1.93	1.93	1.93	2.32
L	mm	inch	251.50	322.50	322.50	325.50	540.70
			9.90	12.70	12.70	12.81	21.29
M	mm	inch	135	175	180	185	1)
			5.31	6.89	7.09	7.28	
N ¹⁾	mm	inch	112	119	119	122	207.40
			4.41	4.69	4.69	4.80	8.16
N ²⁾	mm	inch	100	130	130	130	207.40
			3.94	5.12	5.12	5.12	8.16
O	mm	inch	50	50	50	60	3)
			1.97	1.97	1.97	2.36	
Q ¹⁾	mm	inch	340	340	440	645	640
			13.39	13.39	17.32	25.39	25.20
Q ²⁾	mm	inch	290	320	440	610	640
			11.42	12.60	17.32	24.02	25.20
R	mm	inch	75	90	90	95	115
			3.13	3.54	3.54	3.74	4.53

¹⁾ Valve, Series 02.2 ²⁾ Insert, Series 03.2 ³⁾ On request

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



Dimensions for insert types L / M / N on request.

TRANSFER VALVE / INSERT L-VAT, SERIES 04.1 / 05.1

For load lock and process chamber isolation in semiconductor production systems.
Especially suited for corrosive processes such as etch or CVD.



Protected bellows

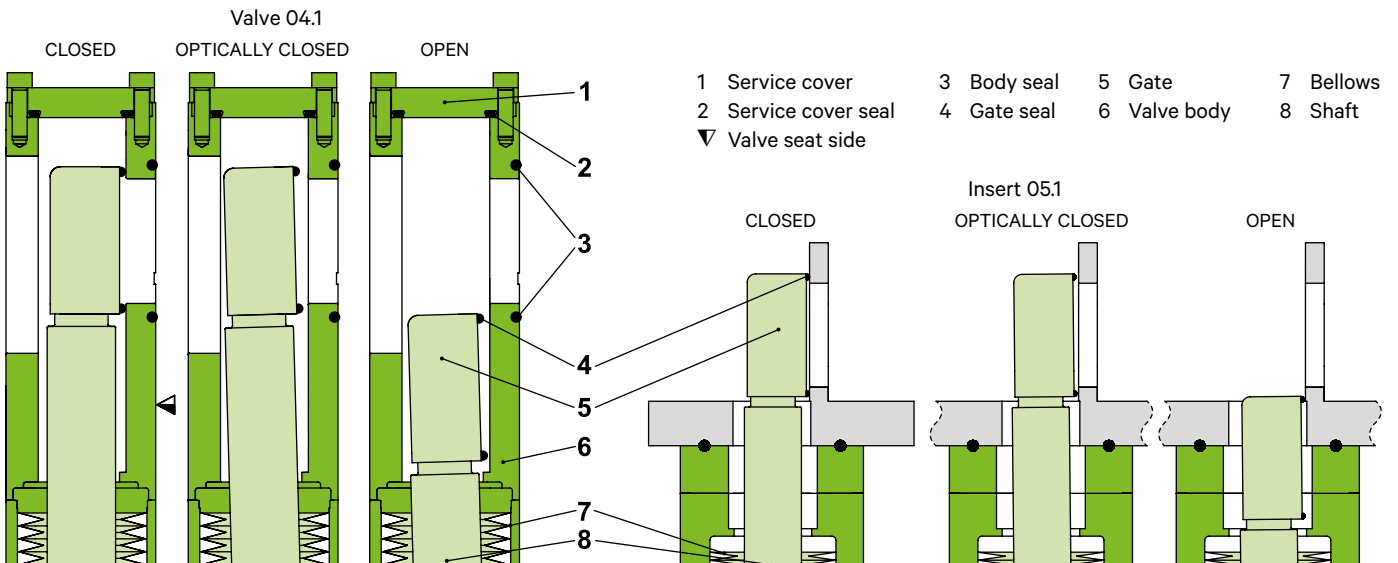
Mechanically locked in closed position

L-movement secured by mechanical guidance

MAIN FEATURES

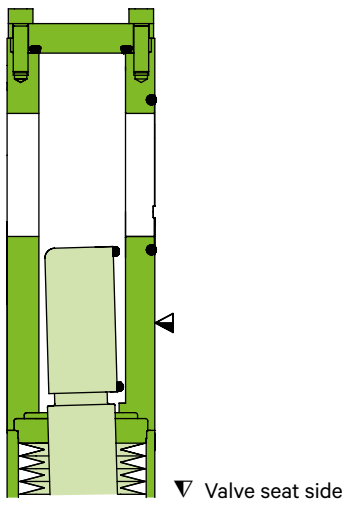
Opening sizes	46 × 236 mm to 50 × 336 mm (1.81" × 9.29" to 1.97" × 13.23")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum
Feedthrough	bellows
Sealing technology	L-VAT: see glossary

FUNCTIONAL PRINCIPLE



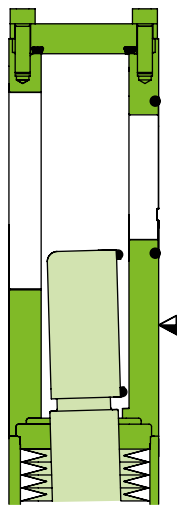
TYPES

Valve type A



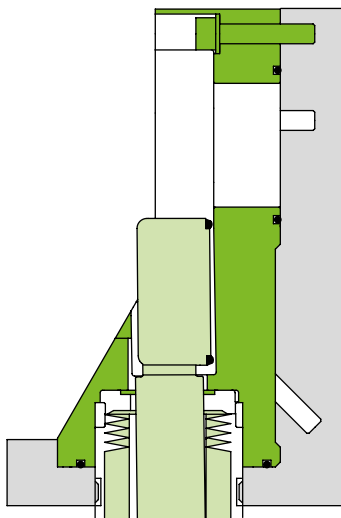
Opening: rear side = seat side
 With bonnet flange
 Gate service through bonnet flange

Valve type B



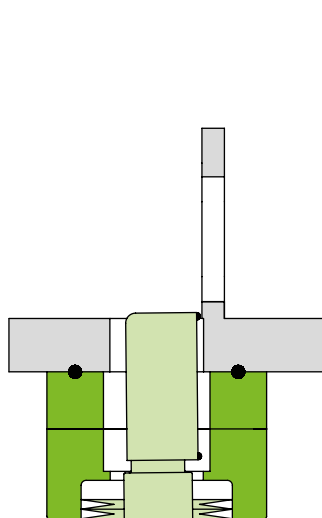
Opening: rear side > seat side
 With bonnet flange
 Gate service through bonnet flange

Insert type C



Seat mounted inside of chamber
 Without bonnet flange
 Gate service through chamber

Insert type L



Seat mounted to chamber
 With bonnet flange
 Gate service through chamber or bonnet flange

VAT
 Customer part

TECHNICAL DATA

Leak rate	Body, valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹			
Pressure range		1 · 10 ⁻⁹ mbar to 1.2 bar (abs)			
Differential pressure on the gate ³⁾		≤ 1.2 bar			
Differential pressure at opening		≤ 30 mbar			
Cycles until first service ^{1) 3)}		≥ 2 million			
Temperature ^{2) 3)}					
	Operating temperature of the valve	Configurations			
		Valve body	Gate	Position indicator	Solenoid valve
	≤ 50 °C	aluminum	aluminum	standard	standard
	≤ 80 °C	aluminum	aluminum	standard	without
	≤ 120 °C (150 °C optionally)	aluminum	aluminum	bakeable	without
Heating and cooling rate		≤ 40 °C h ⁻¹			
Temperature difference seat / gate		< 40 °C			
Material	Valve body, gate, service cover Shaft, bellows end pieces Bellows	EN AW-6082 (3.2315) AISI 316L (1.4435) AISI 633 (AM 350)			
Seal	Bonnet, gate	FKM (Viton®)			
Feedthrough		bellows			
Mounting position		actuator down			
Impulse solenoid valve		24 V DC, 2.5 W (others on request)			
Position indicator: contact rating	Voltage Current Power Connection	≤ 50 V DC ≤ 250 mA ≤ 10 W 9 pin subminiature D			
Compressed air connection	Without solenoid valve With solenoid valve	internal threads ½" ISO/NPT internal threads M5			

DN (D1 × D)		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight valve	
D1 opening height	D opening length	bar	psi	l	ft ³		kg	lbs
mm	inch					s		
46 × 236	1.81 × 9.29	5.5 – 7	80 – 102	0.12	0.004	< 1	15	33
50 × 336	1.97 × 13.23	5.5 – 7	80 – 102	0.12	0.004	< 1	15.60	34.40

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

²⁾ Measuring conditions:

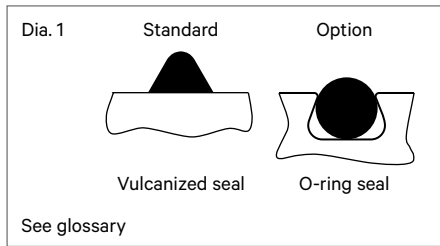
· body: 30 s, He concentration ≥ 20%

· seat: 15 s, He concentration ≥ 30%

Automatic leak rate supervision, dp = 1 bar

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

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Other solenoid valve voltage (standard 24VDC)

VALVE AND INSERT

- FFKM gate seal
- O-ring seal in gate (Dia. 1) instead of the vulcanized seal (standard)

VALVE

- Valve body stainless steel, hard anodized or nickel-plated aluminum

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- VATSEAL metal seals for flanges
- Claw (M8) for valves with clamp edges: see Series 32
- Adapter for pneumatic connection R $\frac{1}{8}$ " / NPT $\frac{1}{8}$ "

ORDERING INFORMATION FOR STANDARD VALVES

Valve type A or B, Series 04.1
with pneumatic actuator
double acting
with position indicator

SEMI E21-94
SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (*specify control voltage)			
mm	inch	Valve type A		Valve type B	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
46 × 236	1.81 × 9.29	04110-AA24	04110-AA44 *	04110-BA24	04110-BA44 *
50 × 336	1.97 × 13.23	04112-AA24	04112-AA44 *	04112-BA24	04112-BA44 *

Other sizes on request

Insert type C or L, Series 05.1
with pneumatic actuator
double acting
with position indicator

SEMI E21-94
SEMI E21.1-1296

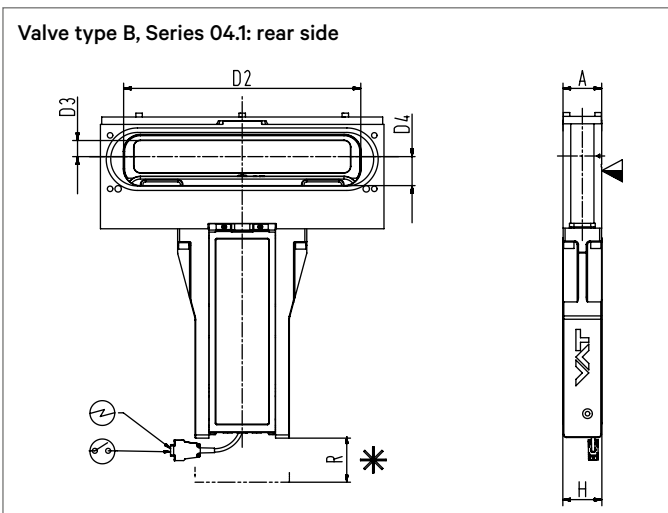
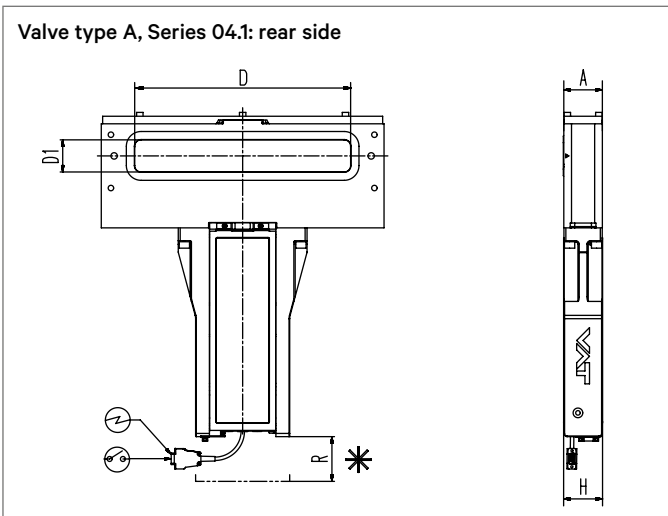
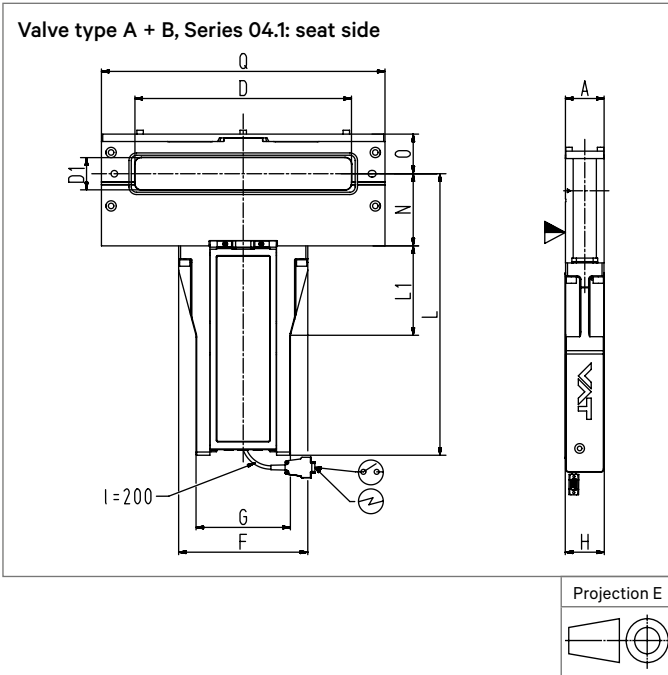
DN (D1 × D)		Ordering numbers (*specify control voltage)			
mm	inch	Insert type C		Insert type L	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
46 × 236	1.81 × 9.29	05110-CA24	05110-CA44 *	05110-LA24	05110-LA44 *
50 × 336	1.97 × 13.23	05112-CA24	05112-CA44 *	05112-LA24	05112-LA44 *

Other sizes on request

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
Example: 04112-AA24-X, X = valve body hard anodized

MAIN DIMENSIONS

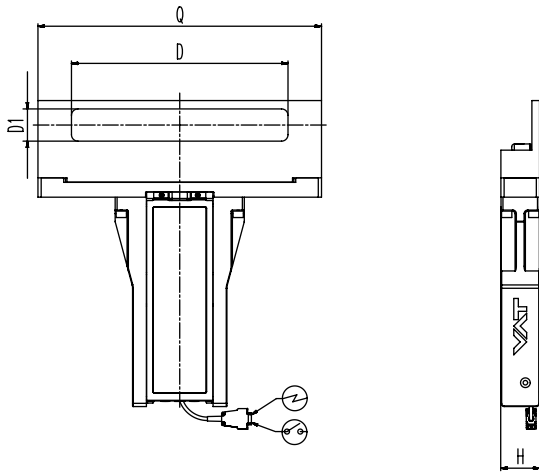


D1 × D	mm inch	46 × 236 1.81 × 9.29	50 × 336 1.97 × 13.23
A	mm inch	60 2.36	60 2.36
D	mm inch	236 9.29	336 13.23
D1	mm inch	46 1.81	50 1.97
D2	mm inch	265 10.43	365 14.37
D3	mm inch	32 1.26	34 1.39
D4	mm inch	43 1.69	45 1.77
F	mm inch	200.40 7.89	200.40 7.89
G	mm inch	146.40 5.76	146.40 5.76
H	mm inch	59.60 2.35	59.60 2.35
L	mm inch	437 17.20	437 17.20
L1	mm inch	138.80 5.46	138.80 5.46
N	mm inch	112 4.41	112 4.41
O	mm inch	61.50 2.42	61.50 2.42
Q	mm inch	340 13.39	440 17.32
R	mm inch	85 3.35	85 3.35

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

MAIN DIMENSIONS

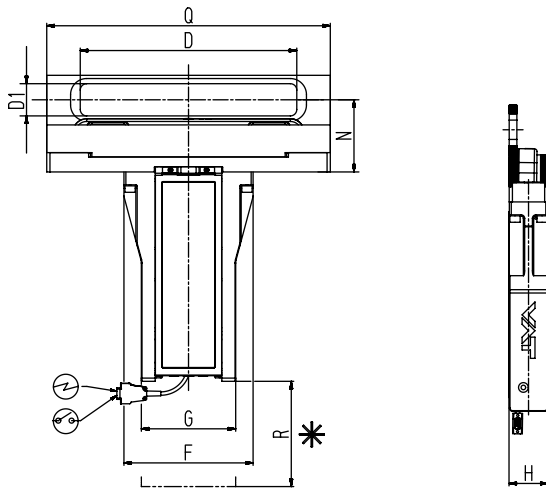
Insert type L, Series 05.1: seat side



D1 × D	mm inch	46 × 236 1.81 × 9.29	50 × 336 1.97 × 13.23
D	mm inch	236 9.29	336 13.23
D1	mm inch	46 1.81	50 1.97
F	mm inch	200.40 7.89	200.40 7.89
G	mm inch	146.40 5.76	146.40 5.76
H	mm inch	59.60 2.35	59.60 2.35
N	mm inch	112 4.41	112 4.41
Q	mm inch	340 13.39	440 17.32
R	mm inch	85 3.35	85 3.35

Dimensions for insert type C on request.

Insert type L, Series 05.1: rear side



- * Required for dismantling
- ⊖ Electrical connection
- ⊕ Position indicator

TRANSFER VALVE / INSERT L-VAT, SERIES 04.2 / 05.2

For load lock and process chamber isolation in semiconductor production systems.
Especially suited for corrosive processes such as etch or CVD.



Protected bellows

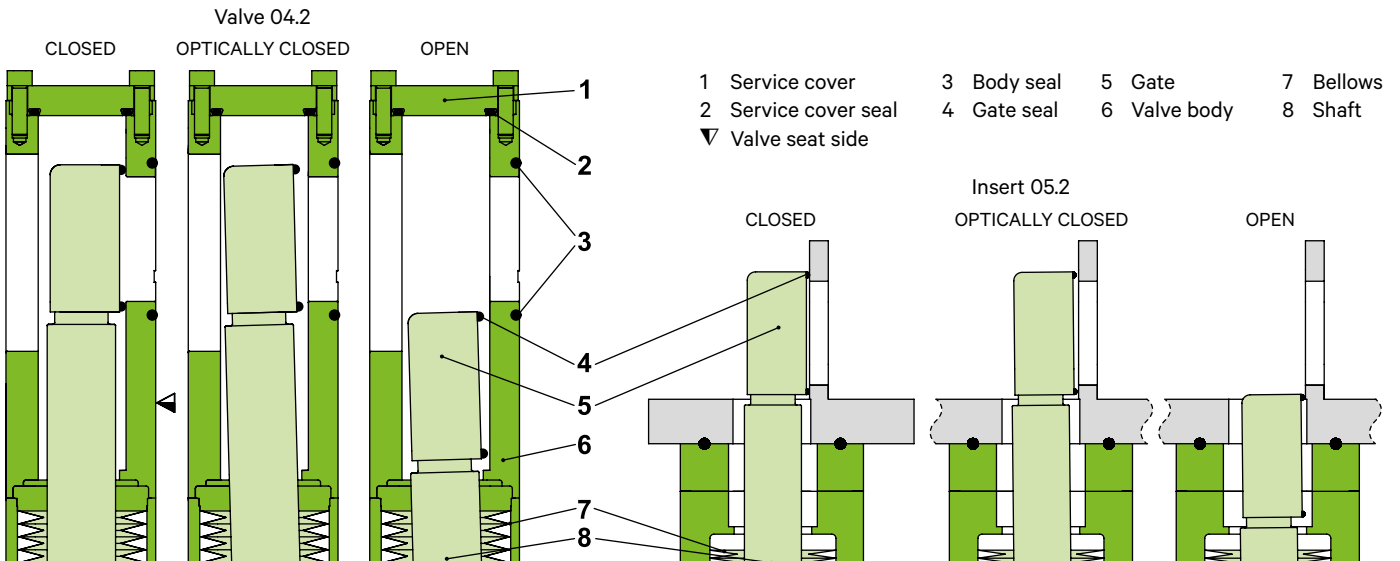
Low shock

Pneumatically locked possible

MAIN FEATURES

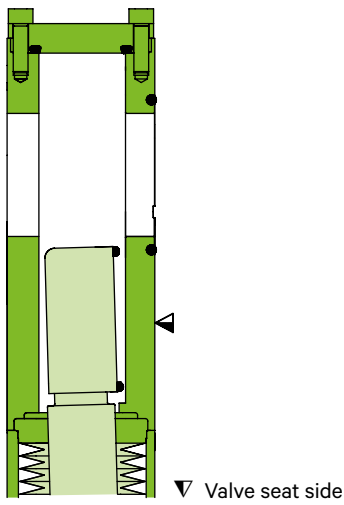
Opening sizes	46 × 236 mm to 50 × 336 mm (1.81" × 9.29" to 1.97" × 13.23")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum
Feedthrough	bellows
Sealing technology	L-VAT: see glossary

FUNCTIONAL PRINCIPLE



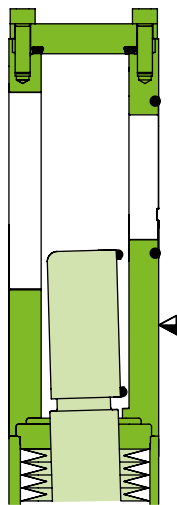
TYPES

Valve type A



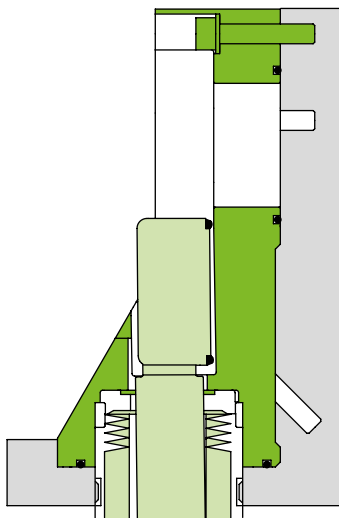
Opening: rear side = seat side
 With bonnet flange
 Gate service through bonnet flange

Valve type B



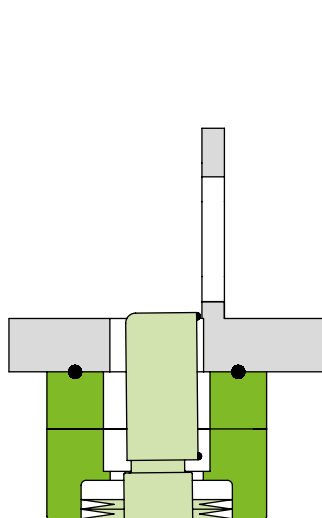
Opening: rear side > seat side
 With bonnet flange
 Gate service through bonnet flange

Insert type C



Seat mounted inside of chamber
 Without bonnet flange
 Gate service through chamber

Insert type L



Seat mounted to chamber
 With bonnet flange
 Gate service through chamber or bonnet flange

VAT
 Customer part

TECHNICAL DATA

Leak rate	Body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹																								
Pressure range		1 · 10 ⁻⁹ mbar to 1.2 bar (abs)																								
Differential pressure on the gate ³⁾		≤ 1.2 bar																								
Differential pressure at opening		≤ 30 mbar																								
Cycles until first service ^{1) 3)}		≥ 3 million																								
Temperature ^{2) 3)}	<table border="1"> <thead> <tr> <th rowspan="2">Operating temperature of the valve</th> <th colspan="4">Configurations</th> </tr> <tr> <th>Valve body</th> <th>Gate</th> <th>Position indicator</th> <th>Solenoid valve</th> </tr> </thead> <tbody> <tr> <td>≤ 50 °C</td> <td>aluminum</td> <td>aluminum</td> <td>standard</td> <td>standard</td> </tr> <tr> <td>≤ 80 °C</td> <td>aluminum</td> <td>aluminum</td> <td>standard</td> <td>without</td> </tr> <tr> <td>≤ 120 °C (150 °C optionally)</td> <td>aluminum</td> <td>aluminum</td> <td>bakeable</td> <td>without</td> </tr> </tbody> </table>		Operating temperature of the valve	Configurations				Valve body	Gate	Position indicator	Solenoid valve	≤ 50 °C	aluminum	aluminum	standard	standard	≤ 80 °C	aluminum	aluminum	standard	without	≤ 120 °C (150 °C optionally)	aluminum	aluminum	bakeable	without
Operating temperature of the valve	Configurations																									
	Valve body	Gate	Position indicator	Solenoid valve																						
≤ 50 °C	aluminum	aluminum	standard	standard																						
≤ 80 °C	aluminum	aluminum	standard	without																						
≤ 120 °C (150 °C optionally)	aluminum	aluminum	bakeable	without																						
Heating and cooling rate		≤ 40 °C h ⁻¹																								
Temperature difference seat / gate		< 40 °C																								
Material	Valve body, gate, service cover Shaft, bellows end pieces Bellows	EN AW-6082 (3.2315), EN AW-6061 (3.3211) AISI 316L (1.4435) AISI 633 (AM 350)																								
Seal	Bonnet, gate	FKM (Viton®)																								
Feedthrough		bellows																								
Mounting position		actuator down																								
Impulse solenoid valve		24 V DC, 2.5 W (others on request)																								
Position indicator: contact rating	Voltage Current Power Connection	≤ 50 V DC ≤ 250 mA ≤ 10 W 9 pin subminiature D																								
Compressed air connection	Without solenoid valve With solenoid valve	internal threads 1/8" ISO/NPT internal threads M5																								

DN (D1 × D)		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight valve	
D1 opening height	D opening length	bar	psi	l	ft ³		kg	lbs
46 × 236	1.81 × 9.29	5 – 7	72 – 102	0.12	0.004	< 1	17	37
50 × 336	1.97 × 13.23	5 – 7	72 – 102	0.12	0.004	< 1	18	40

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

²⁾ Measuring conditions:

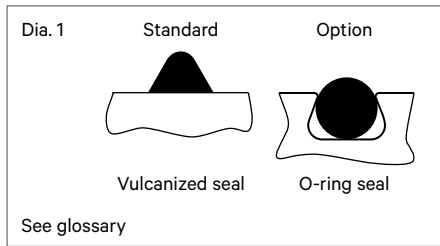
· body: 30 s, He concentration ≥ 20%

· seat: 15 s, He concentration ≥ 30%

Automatic leak rate supervision, dp = 1 bar

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

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Other solenoid valve voltage (standard 24VDC)

VALVE AND INSERT

- FFKM gate seal
- O-ring seal in gate (Dia. 1) instead of the vulcanized seal (standard)

VALVE

- Valve body stainless steel, hard anodized or nickel-plated aluminum

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- VATSEAL metal seals for flanges
- Claw (M8) for valves with clamp edges: see Series 32
- Adapter for pneumatic connection R $\frac{1}{8}$ " / NPT $\frac{1}{8}$ "

ORDERING INFORMATION FOR STANDARD VALVES

Valve type A or B, Series 04.2
with pneumatic actuator
double acting
with position indicator

SEMI E21-94
SEMI E21.1-1296

DN (D1 × D)		Ordering numbers (*specify control voltage)			
mm	inch	Valve type A		Valve type B	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
46 × 236	1.81 × 9.29	04210-AA24	04210-AA44 *	04210-BA24	04210-BA44 *
50 × 336	1.97 × 13.23	04212-AA24	04212-AA44 *	04212-BA24	04212-BA44 *

Other sizes on request

Insert type C or L, Series 05.2
with pneumatic actuator
double acting
with position indicator

SEMI E21-94
SEMI E21.1-1296

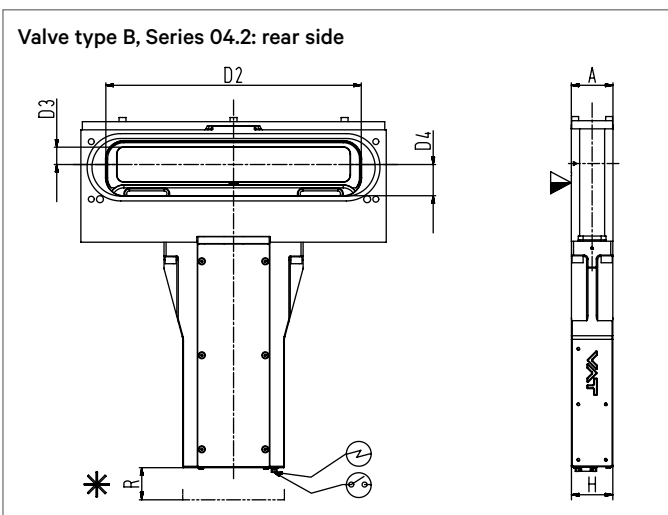
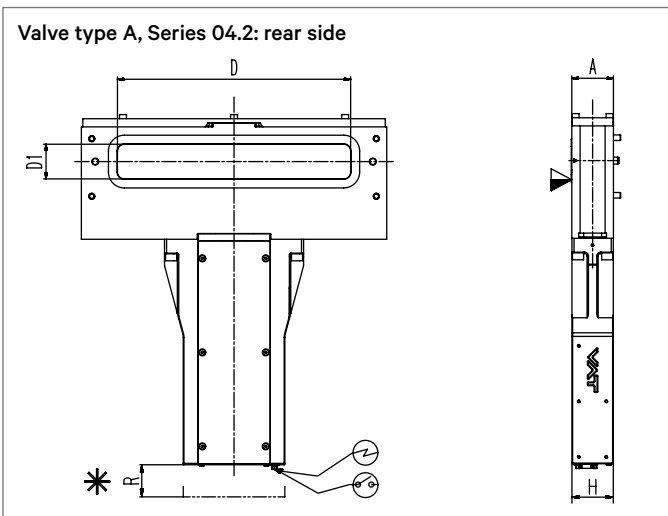
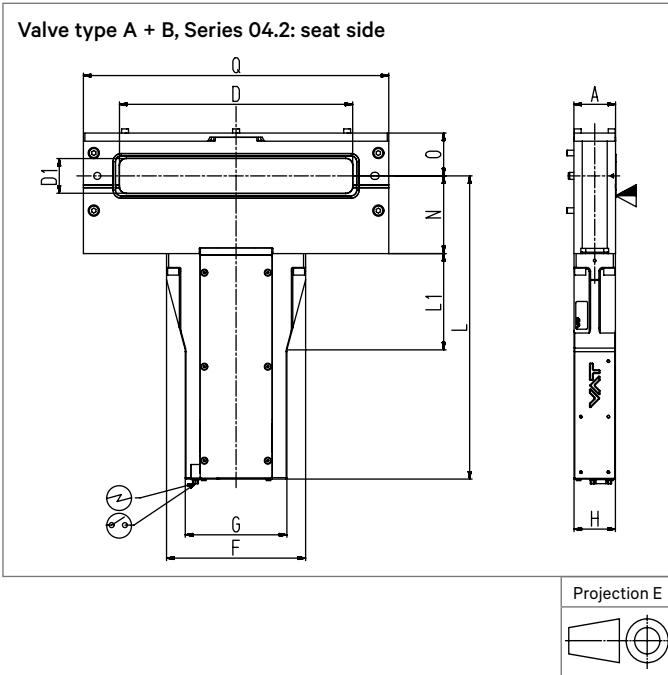
DN (D1 × D)		Ordering numbers (*specify control voltage)			
mm	inch	Insert type C		Insert type L	
		without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
46 × 236	1.81 × 9.29	05210-CA24	05210-CA44 *	05210-LA24	05210-LA44 *
50 × 336	1.97 × 13.23	05212-CA24	05212-CA44 *	05212-LA24	05212-LA44 *

Other sizes on request

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
Example: 04212-AA24-X, X = valve body hard anodized

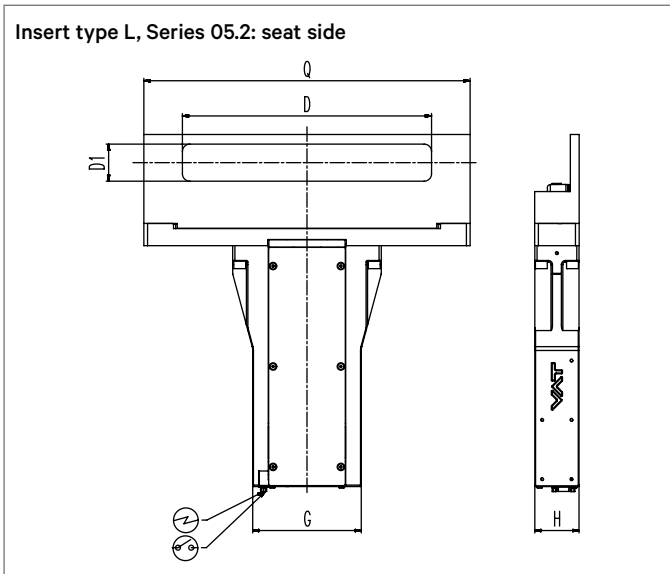
MAIN DIMENSIONS



D1 × D	mm inch	46 × 236 1.81 × 9.29	50 × 336 1.97 × 13.23
A	mm inch	60 2.36	60 2.36
D	mm inch	236 9.29	336 13.23
D1	mm inch	46 1.81	50 1.97
D2	mm inch	265 10.43	365 14.37
D3	mm inch	32 1.26	34 1.39
D4	mm inch	43 1.69	45 1.77
F	mm inch	200.40 7.89	200.40 7.89
G	mm inch	146.40 5.76	146.40 5.76
H	mm inch	59.60 2.35	59.60 2.35
L	mm inch	437 17.20	437 17.20
L1	mm inch	138.80 5.46	138.80 5.46
N	mm inch	112 4.41	112 4.41
O	mm inch	61.50 2.42	61.50 2.42
Q	mm inch	340 13.39	440 17.32
R	mm inch	85 3.35	85 3.35

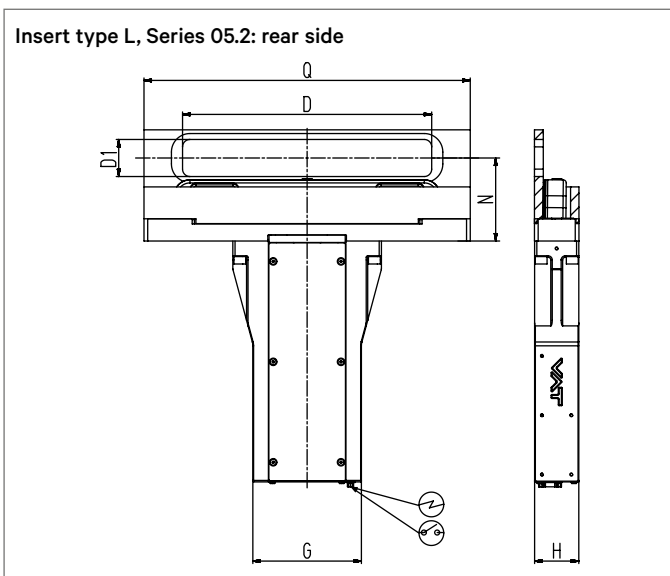
- ▽ Valve seat side
- * Required for dismantling
- ⊕ Electrical connection
- ⊙ Position indicator

MAIN DIMENSIONS



D1 × D	mm	46 × 236	50 × 336
	inch	1.81 × 9.29	1.97 × 13.23
D	mm	236	336
	inch	9.29	13.23
D1	mm	46	50
	inch	1.81	1.97
G	mm	146.40	146.40
	inch	5.76	5.76
H	mm	59.60	59.60
	inch	2.35	2.35
Q	mm	340	440
	inch	13.39	17.32

Dimensions for insert type C on request.



- ⊕ Electrical connection
- ⊗ Position indicator

TRANSFER VALVE / INSERT L-MOTION, SERIES 04.3 / 05.3

For load lock and process chamber isolation in semiconductor production systems. Especially suited for corrosive processes such as etch or CVD.



Valve 04.3



Insert 05.3

Protected bellows

Pneumatically and mechanically locked (option)

Uniform compression and long lifetime of the gate seal

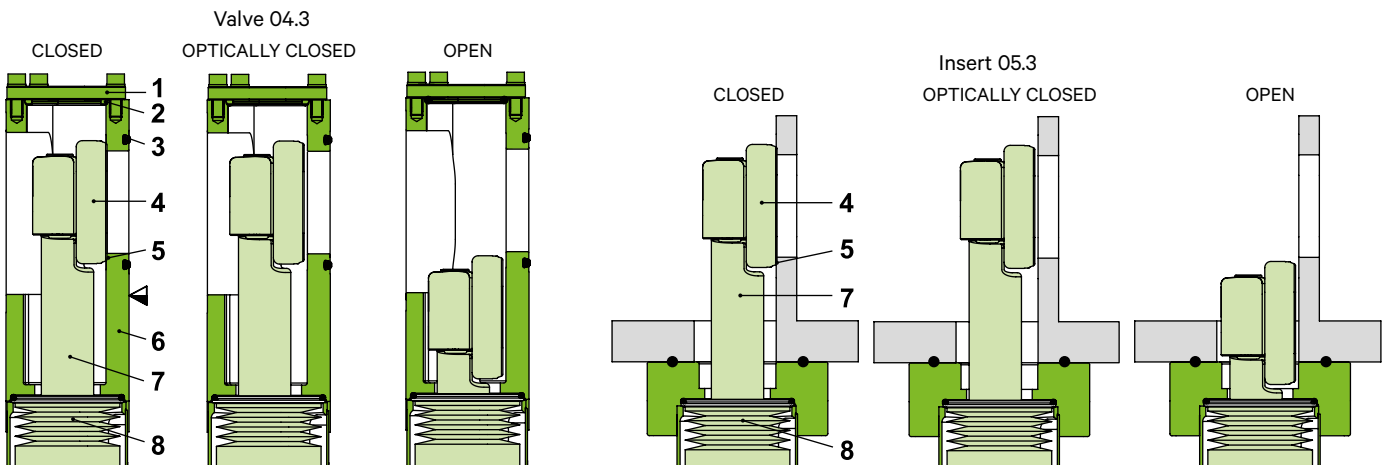
Virtually particle-free

Low shock

MAIN FEATURES

Opening sizes	50 × 336 mm to 80 × 500 mm (1.97" × 13.23" to 3.15" × 19.69")
Actuator	pneumatic: double acting with position indicator
Body material	blank or hard anodized aluminum
Feedthrough	bellows
Sealing technology	L-MOTION: see glossary

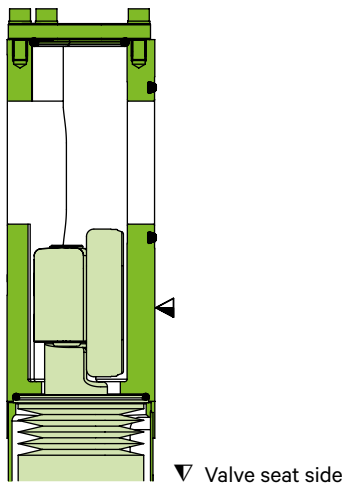
FUNCTIONAL PRINCIPLE



- 1 Service cover
 - 2 Service cover seal
 - 3 Body seal
 - 4 Gate
 - 5 Gate seal
 - 6 Valve body
 - 7 Shaft
 - 8 Bellows
- ▼ Valve seat side

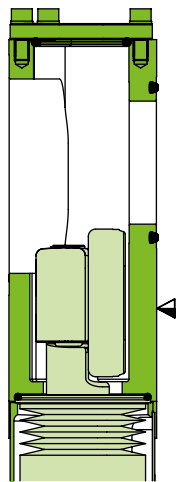
TYPES

Valve type A



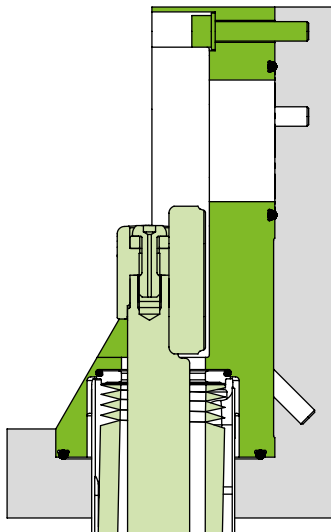
Opening: rear side = seat side
 With bonnet flange
 Gate service through bonnet flange

Valve type B



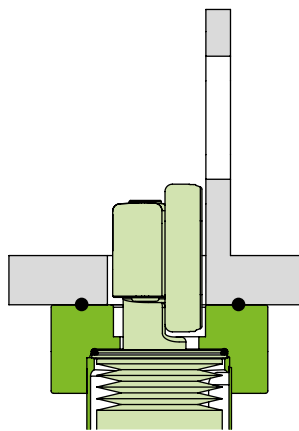
Opening: rear side > seat side
 With bonnet flange
 Gate service through bonnet flange

Insert type C



Seat mounted inside of chamber
 Without bonnet flange
 Gate service through chamber

Insert type L



Seat mounted to chamber
 With bonnet flange
 Gate service through chamber or bonnet flange

VAT
 Customer part

TECHNICAL DATA

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

Sealing surface	Seal			
	FKM (Viton®)		FFKM (FKM Zalak 5100)	
	Body	Seat	Body	Seat
Blank metal (milled / ball polished)	<1·10 ⁻⁹	<1·10 ⁻⁹	<1·10 ⁻⁸	<1·10 ⁻⁷
Hard anodized aluminum	<1·10 ⁻⁵	<1·10 ⁻⁴	<1·10 ⁻⁵	<1·10 ⁻⁴
Nickel-plated aluminum	<1·10 ⁻⁹	<1·10 ⁻⁹	<1·10 ⁻⁸	<1·10 ⁻⁷

Pressure range	Blank or nickel-plated aluminum Hard anodized aluminum	1·10 ⁻⁹ mbar to 1.1 bar (abs) 1·10 ⁻⁶ mbar to 1.1 bar (abs)
Differential pressure on the gate ³⁾		1.1 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service ¹⁾³⁾	up to DN 56 × 496 mm DN 80 × 500 mm	≥ 3 million ≥ 2 million
Temperature ³⁾	Valve body, gate Actuator	≤ 120 °C ≤ 80 °C
Heating and cooling rate		≤ 40 °C h ⁻¹
Material	Valve body, gate, service cover Bellows end pieces, shaft Bellows	EN AW-5083 (3.3547), EN AW-6061 (3.3211), EN AW-6082 (3.2315) AISI 316L (1.4404) AISI 633 (AM 350)
Seal	Gate, service cover	FKM (Viton®)
Feedthrough		bellows
Mounting position		actuator up or down
Impulse solenoid valve		24 VDC, 2.5 W (others on request)
Position indicator: contact rating	Voltage Current Connection	≤ 50 V AC/DC ≤ 0.1 A, ≤ 5 mA 9 pin subminiature D
Compressed air connection		quick connector O.D. 6 mm

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

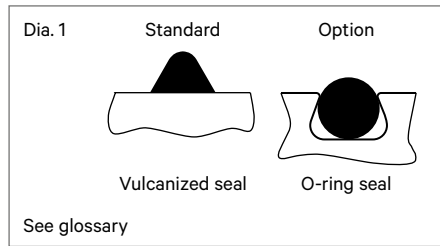
²⁾ Measuring conditions:

- 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

DN (D1 × D) D1 opening height D opening length		Compressed air min. - max. overpressure		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	20.50	45	13	29
80 × 500	3.15 × 19.69	5 - 7	73 - 102	0.36	0.012	< 2	52	115	35	77

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Other solenoid valve voltage (standard 24VDC)

VALVE AND INSERT

- Other sealing materials, e. g. FFKM, VMQ, FVMQ gate seal
- O-ring seal in gate (Dia. 1) instead of the vulcanized seal (standard)

VALVE

- Heating and cooling equipment
- Valve body stainless steel
- Double position indicator

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Service tool for easy gate exchange
- Particle jail option

ORDERING INFORMATION

FOR STANDARD VALVES

Valve type A, Series 04.3
with pneumatic actuator
double acting
with position indicator

SEMI E21.1-1296	DN (D1 × D)		Ordering numbers (*specify control voltage)			
	mm	inch	blank aluminum		hard anodized aluminum	
			without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
	50 × 336	1.97 × 13.23	04312-AA24	04312-AA44 *	04312-AH24	04312-AH44 *
	50 × 480	1.97 × 18.90	on request	on request	on request	on request
	80 × 500	3.15 × 19.69	04331-AA24	04331-AA44 *	04331-AH24	04331-AH44 *

Other sizes on request

Valve type B, Series 04.3
with pneumatic actuator
double acting
with position indicator

SEMI E21.1-1296	DN (D1 × D)		Ordering numbers (*specify control voltage)			
	mm	inch	blank aluminum		hard anodized aluminum	
			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
	80 × 500	3.15 × 19.69	04331-BA24	04331-BA44 *	04331-BH24	04331-BH44 *

Other sizes on request

Insert type C, Series 05.3
with pneumatic actuator
double acting
with position indicator

SEMI E21.1-1296	DN (D1 × D)		Ordering numbers (*specify control voltage)			
	mm	inch	blank aluminum		hard anodized aluminum	
			without solenoid valve	with impulse solenoid valve	without solenoid valve	with impulse solenoid valve
	50 × 336	1.97 × 13.23	05312-CA24	05312-CA44 *	05312-CH24	05312-CH44 *
	50 × 480	1.97 × 18.90	on request	on request	on request	on request
	80 × 500	3.15 × 19.69	05331-CA24	05331-CA44 *	05331-CH24	05331-CH44 *

Other sizes on request

Insert type L, Series 05.3
with pneumatic actuator
double acting
with position indicator

SEMI E21.1-1296	DN (D1 × D)		Ordering numbers (*specify control voltage)			
	mm	inch	blank aluminum		hard anodized aluminum	
			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
	80 × 500	3.15 × 19.69	05331-LA24	05331-LA44 *	05331-LH24	05331-LH44 *

Other sizes on request

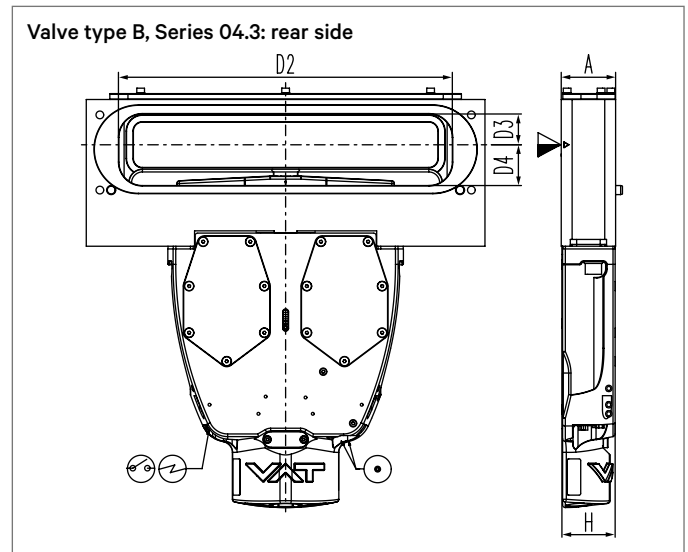
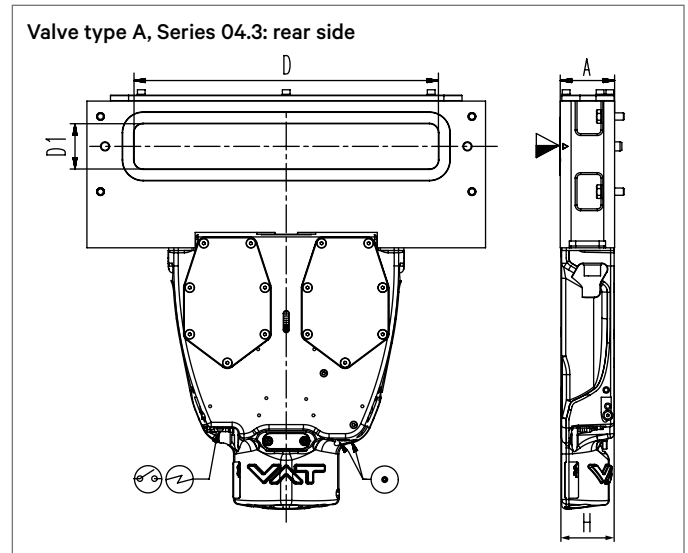
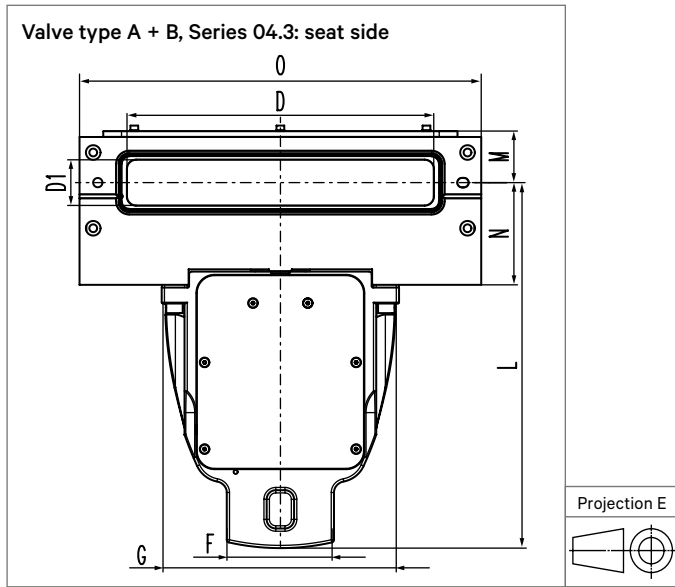
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 04312-AA24-X, X = O-ring seal in gate

MAIN DIMENSIONS



D1 × D	mm	50 × 336	50 × 480	80 × 500
	inch	1.97 × 13.23	1.97 × 18.90	3.15 × 19.69
A	mm	60	60	85
	inch	2.36	2.36	3.35
D	mm	336	480	500
	inch	13.23	18.90	19.69
D1	mm	50	50	80
	inch	1.97	1.97	3.15
D2	mm	368.50	532	565
	inch	14.50	20.94	22.24
D3	mm	34	39	60
	inch	1.39	1.54	2.36
D4	mm	45	45	120
	inch	1.77	1.77	4.72
F	mm	120	120	256
	inch	4.72	4.72	10.08
G	mm	260	260	310
	inch	10.24	10.24	12.20
H	mm	58.80	58.80	79
	inch	2.30	2.30	3.11
I	mm	88	88	1
	inch	3.46	3.46	
L	mm	400.50	400.50	586.70
	inch	15.77	15.77	23.10
M	mm	56.50	70	110
	inch	2.23	2.75	4.33
N	mm	112	112	183.70
	inch	4.41	4.41	7.23
O ²⁾	mm	440	600	650
	inch	17.32	23.62	25.60
O ³⁾	mm	420	540	-
	inch	16.54	21.26	

1) On request

2) Valve

3) Insert

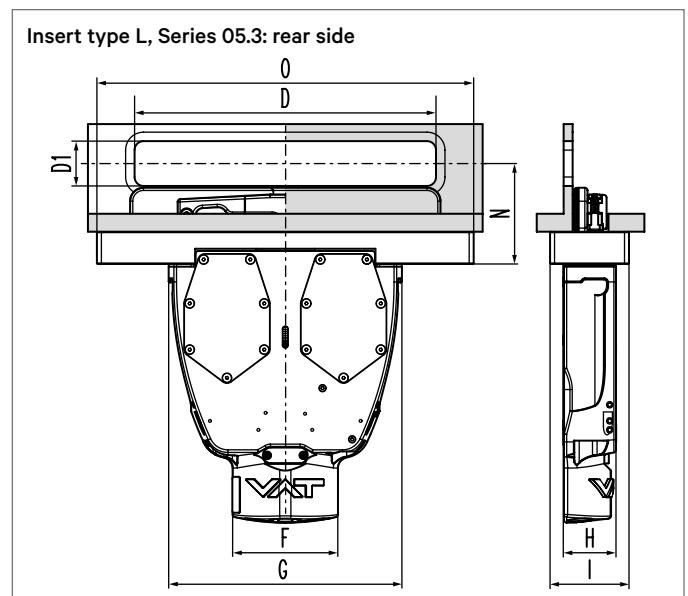
▽ Valve seat side

⊙ Compressed air connection

⊕ Electrical connection

⊗ Position indicator

Dimensions for insert type C on request.



TRANSFER DOOR L-VAT, SERIES 07.5

For load lock and process chamber isolation on the atmospheric side of semiconductor production systems.



Low cost of ownership

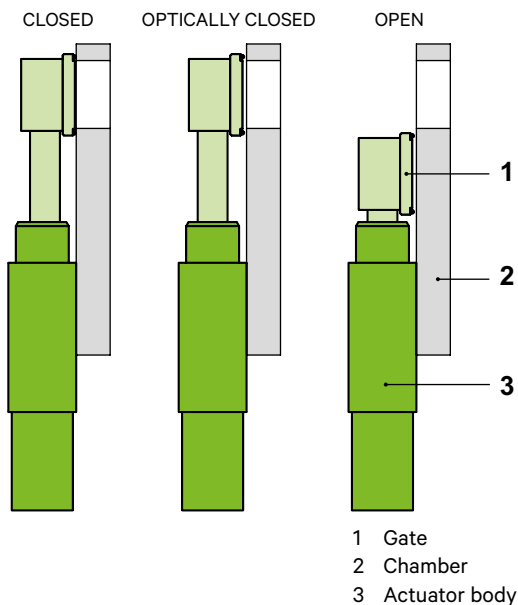
Easy installation

Protected pressure bar possible

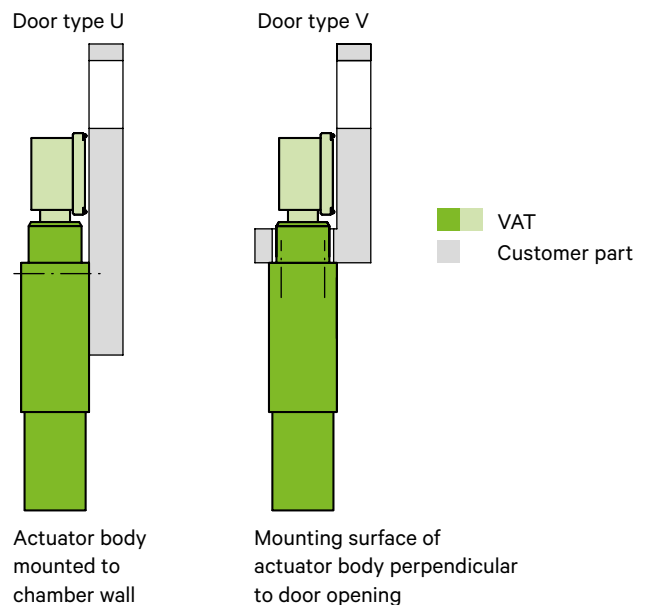
MAIN FEATURES

Opening sizes	46 × 236 mm to 50 × 336 mm (1.81" × 9.29" to 1.97" × 13.23")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum
Sealing technology	L-VAT: see glossary

FUNCTIONAL PRINCIPLE



TYPES



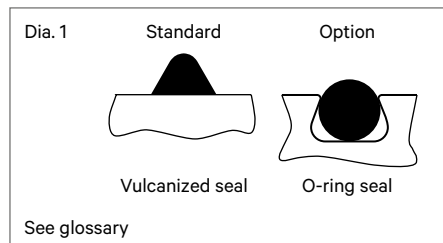
TECHNICAL DATA

Leak rate	Gate: blank or nickel-plated – with FKM seal – with FFKM seal – with VMQ seal Gate: hard anodized – with FKM or FFKM seal	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁷ mbar ls ⁻¹ <1·10 ⁻⁶ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹																			
Pressure range on vacuum side		1·10 ⁻⁹ mbar to 1.1 bar (abs)																			
Differential pressure on the gate	In closing direction In opening direction	1 bar ≤ 0.1 bar																			
Differential pressure at opening		≤ 0.1 bar																			
Cycles until first service		≥ 3 million																			
Temperature ¹⁾																					
	<table border="1"> <thead> <tr> <th rowspan="2">Operating temperature of the door</th> <th colspan="3">Configurations</th> </tr> <tr> <th>Door</th> <th colspan="2">Actuator</th> </tr> <tr> <td></td> <th>Gate</th> <th>Position indicator</th> <th>Solenoid valve</th> </tr> </thead> <tbody> <tr> <td>≤ 50 °C</td> <td>aluminum</td> <td>standard</td> <td>with</td> </tr> <tr> <td>≤ 80 °C</td> <td>aluminum</td> <td>standard</td> <td>without</td> </tr> </tbody> </table>	Operating temperature of the door	Configurations			Door	Actuator			Gate	Position indicator	Solenoid valve	≤ 50 °C	aluminum	standard	with	≤ 80 °C	aluminum	standard	without	
Operating temperature of the door	Configurations																				
	Door	Actuator																			
	Gate	Position indicator	Solenoid valve																		
≤ 50 °C	aluminum	standard	with																		
≤ 80 °C	aluminum	standard	without																		
Material	Aluminum gate Stainless steel gate	EN AW-5083 (3.3547), EN AW-6061 (3.3211), EN AW-6082 (3.2315) AISI 316L (1.4404, 1.4435)																			
Seal	Gate	FKM (Viton®)																			
Mounting position		actuator up or down																			
Impulse solenoid valve		24 V DC, 2.5 W (others on request)																			
Position indicator: contact rating	Voltage Current Power Connection	≤ 50 V AC / DC ≤ 0.5 A max. 10 W 9 pin subminiature D																			
Compressed air connection	With solenoid valve Without solenoid valve CDA flow rate	quick connector O.D. 4 mm, tube length ≥ 1 m R ¹ / ₈ " internal thread, tube length ≥ 1 m min. 600 SLPM																			

DN (D1 × D) D1 opening height D opening length		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight			
							Aluminum valve		Stainless steel valve	
mm	inch	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
46 × 236	1.81 × 9.29	4 – 7	58 – 102	0.25	0.007	< 1	5	11	6	13.20
50 × 336	1.97 × 13.23	4 – 7	58 – 102	0.25	0.007	< 1	5.20	4.30	6.4	14.10

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

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Actuator cover kit to cover the pistons and cylinders of the gate pressure bar

VALVE

- Other sealing materials, e. g. FFKM, VMQ, FVMQ gate seal
- O-ring seal in gate (Dia. 1) instead of the vulcanized seal (standard)
- Gate: hard anodized or nickel-plated

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ORDERING INFORMATION FOR STANDARD VALVES

Door type U
with pneumatic actuator
double acting
with position indicator

	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
SEMI E21-94	46 × 236	1.81 × 9.29	07510-UA24	07510-UA44 *	07510-UE24	07510-UE44 *
SEMI E21.1-1296	50 × 336	1.97 × 13.23	07512-UA24	07512-UA44 *	07512-UE24	07512-UE44 *

Other sizes on request

Door type V
with pneumatic actuator
double acting
with position indicator

	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
SEMI E21-94	46 × 236	1.81 × 9.29	07510-VA24	07510-VA44 *	07510-VE24	07510-VE44 *
SEMI E21.1-1296	50 × 336	1.97 × 13.23	07512-VA24	07512-VA44 *	07512-VE24	07512-VE44 *

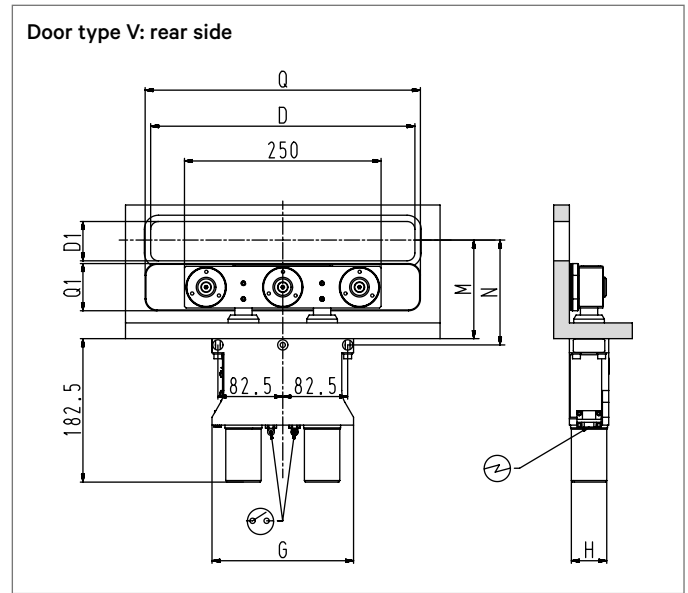
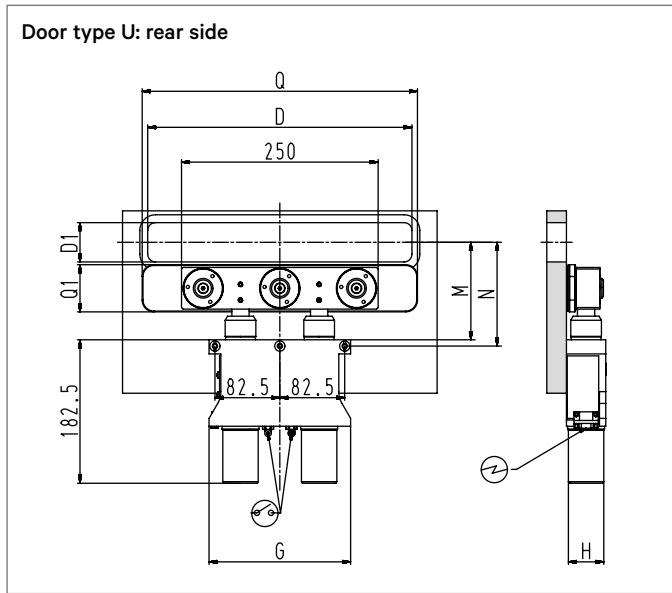
Other sizes on request

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 07512-UA24-X, X = hard anodized gate

DIMENSIONS



⊖ Electrical connection ⊕ Position indicator ■ Customer part

D1 × D	mm	46 × 236	50 × 336	56 × 496
	inch	1.81 × 9.29	1.97 × 13.23	2.20 × 19.53
D	mm	236	336	496
	inch	9.29	13.23	19.53
D1	mm	46	50	56
	inch	1.81	1.97	2.20
G	mm	180	180	180
	inch	7.09	7.09	7.09
H	mm	50	50	50
	inch	1.97	1.97	1.97
M	mm	124	124	124
	inch	4.88	4.88	4.88
N	mm	132	132	132
	inch	5.20	5.20	5.20
Q	mm	60	60	64
	inch	2.36	2.36	2.52
Q1	mm	250.30	350	510
	inch	9.85	13.78	20.08

SPECIAL TRANSFER VALVE L-MOTION / L-VAT, SERIES 94.0

For transfer and process chamber isolation in semiconductor production systems for 200 and 300 mm wafers.

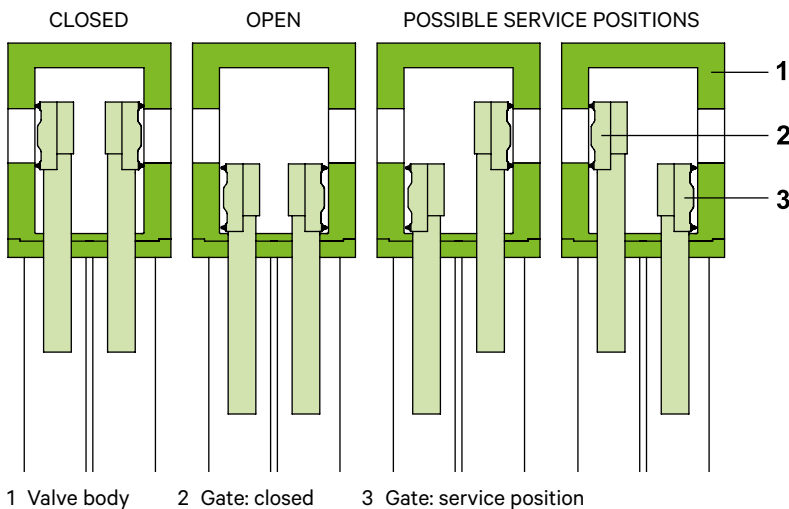


- Customer-specific
- High system performance
- Small footprint (only one valve body)
- Simple procurement (only one part number)
- Actuation with two independent pneumatic actuators
- Customized solutions on request

MAIN FEATURES

Sizes	customer-specific
Actuators	pneumatic: double acting
Body material	customer-specific
Sealing technology	depending on valve technology

FUNCTIONAL PRINCIPLE



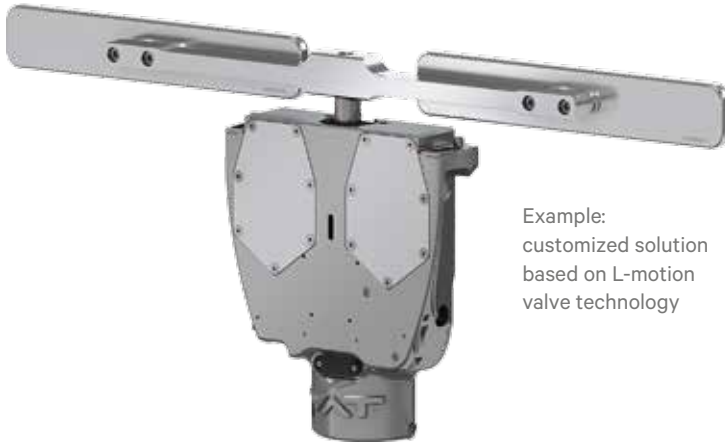
Customized solution based on L-VAT Series 04.2 valve technology. Service valve in closed position (LOTO position).

TECHNICAL DATA & ORDERING INFORMATION

On request

SPECIAL DOOR L-VAT, SERIES 94.5

For transfer and process chamber isolation in semiconductor production systems for 200 and 300 mm wafers.



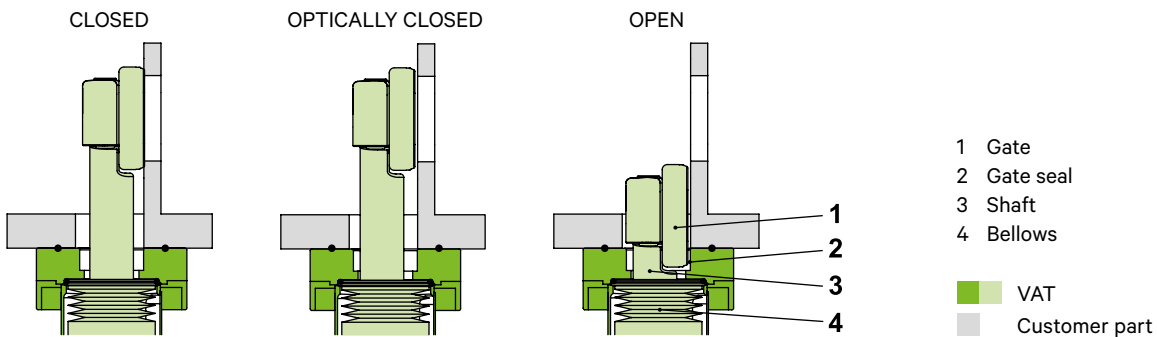
Example:
customized solution
based on L-motion
valve technology

- Customer-specific
- Protected bellows
- Fast and smooth operation
- Adjustable sealing force for different sealing materials
- Pneumatically locked in closed and open position
- Customized solutions on request

MAIN FEATURES

Sizes	customer-specific
Actuators	pneumatic: double acting
Body material	aluminum or hard anodized aluminum
Sealing technology	depending on valve technology

FUNCTIONAL PRINCIPLE



TECHNICAL DATA & ORDERING INFORMATION

On request



TRANSFER VALVES & DOORS FOR DISPLAY & SOLAR

SERIES	TYPE	PAGE
02.4	LARGE TRANSFER VALVE MONOVAT	230
02.7	ROLL-TO-ROLL TRANSFER VALVE MONOVAT	232
06.0 / 06.2	LARGE TRANSFER VALVE / INSERT XL-VAT	234
06.1	LARGE TRANSFER VALVE / INSERT TwinVAT	236
06.6	LARGE TRANSFER VALVE / INSERT / DOOR SoIVAT	238
06.8	LARGE TRANSFER VALVE / INSERT / DOOR FlapVAT	240
07.5	LARGE DOOR L-VAT	242
07.8 «small»	LARGE DOOR L-VAT	244
07.8	LARGE DOOR L-VAT	246

LARGE TRANSFER VALVE MONOVAT, SERIES 02.4

For FPD production systems up to generation 6. Suitable for use in high vacuum environment, e. g. in vapor deposition systems for organic materials.



Compact design and small mounting dimension

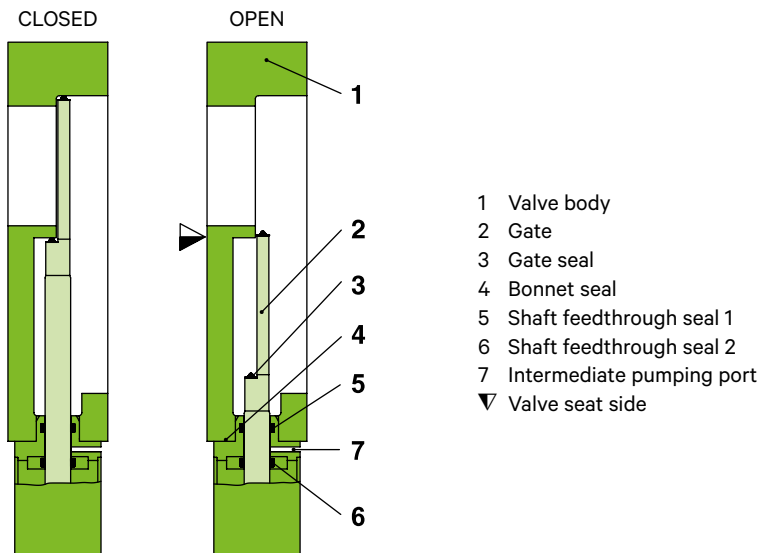
Excellent vacuum performance

Fast motion times

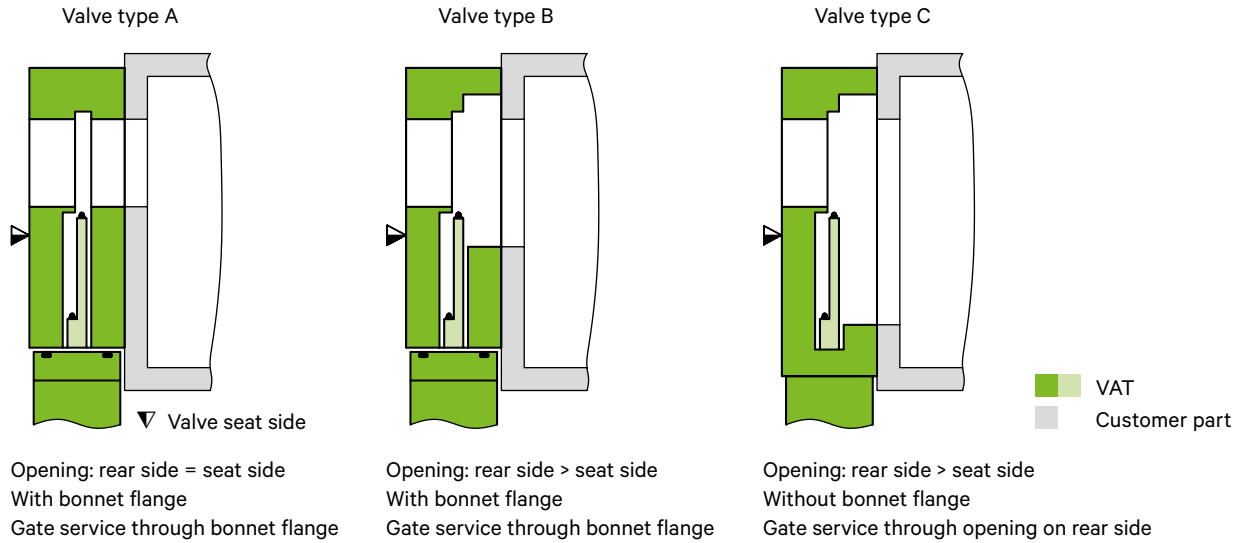
MAIN FEATURES

Opening sizes	Standard: 50 × 500 mm to 150 × 1600 mm (1.97" × 19.69" to 5.91" × 62.99") Special sizes on request
Actuator	pneumatic: double acting with position indicator
Body material	aluminum
Feedthrough	shaft feedthrough with intermediate pumping
Sealing technology	MONOVAT: see glossary

FUNCTIONAL PRINCIPLE



TYPES



TECHNICAL DATA

Leak rate ¹⁾	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Differential pressure on the gate	In closing / opening direction	≤ 1 bar
Differential pressure at opening		≤ 5 mbar
Cycles until first service ¹⁾²⁾		1 million
Closing or opening time		≤ 1.5 s (with 100 mm opening height)
Temperature ¹⁾	Valve body, gate	≤ 120 °C
	Actuator, position indicator	≤ 60 °C
Temperature difference body / gate ³⁾	Small sizes	≤ 40 °C
	Large sizes ³⁾	≤ 25 °C
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 V DC PNP (NPN optional)

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

²⁾ Mounting position «actuator lateral»: cycles until first service will be reduced to 0.5 million.

³⁾ Large size = valve opening > 150 mm in height or > 1250 mm in length. If any side of the valve opening exceeds this size, the temperature difference body/gate is limited to 25 °C.

OPTIONS, CUSTOMIZED SOLUTIONS

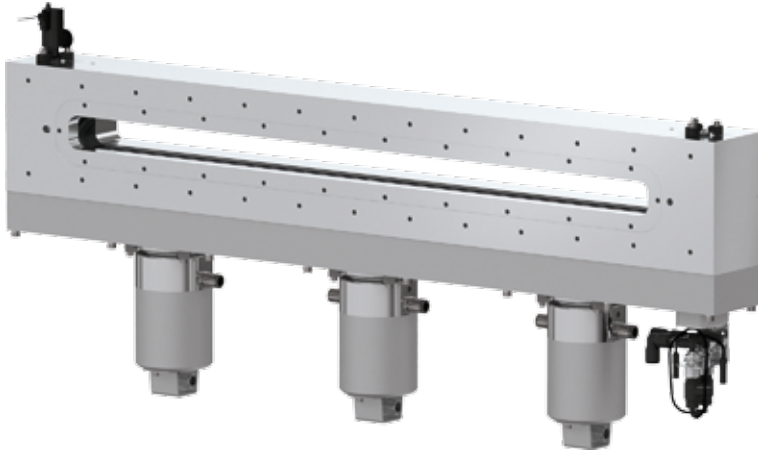
- Solenoid valve for impulse actuation 24 V DC (others on request)
- Surface treatment, e. g. hard anodized or nickel-plated aluminum
- Other sealing materials
- Bellows
- Grounding of gate

ORDERING INFORMATION

Ordering numbers on request (example: 02421-BA24- . . .)

ROLL-TO-ROLL TRANSFER VALVE MONOVAT, SERIES 02.7

For web/foil coating systems.



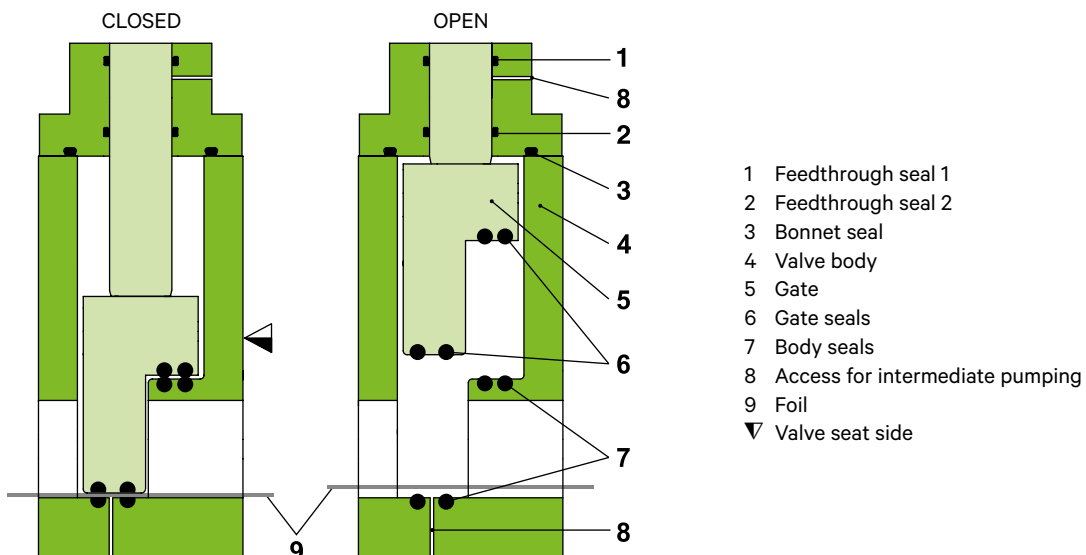
No damage of the foil due to the sophisticated sealing technology

Excellent sealing performance and high safety due to double sealing and intermediate pumping

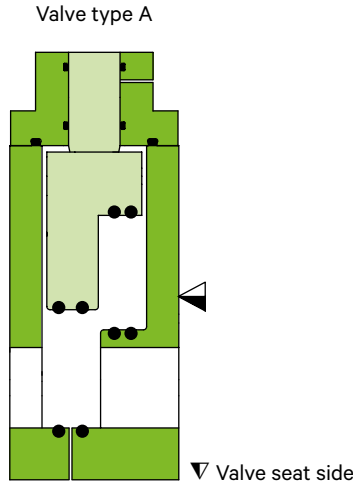
MAIN FEATURES

Opening sizes	50 × 300 mm to 50 × 1750 mm (1.97" × 11.81" to 1.97" × 68.90")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum or stainless steel
Feedthrough	shaft feedthrough with intermediate pumping
Sealing technology	MONOVAT: see glossary

FUNCTIONAL PRINCIPLE



TYPE



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

TECHNICAL DATA

Leak rate ¹⁾²⁾	Valve body, valve seat	< 1 · 10 ⁻⁵ mbar ls ⁻¹
Differential pressure on the gate	In closing / opening direction	≤ 1 bar
Differential pressure at opening		≤ 5 mbar
Cycles until first service ²⁾		10 000
Closing or opening time		≤ 1.5 s (with 50 mm opening height)
Temperature ²⁾	Aluminum valve body / gate Stainless steel valve body / gate Actuator, position indicator	≤ 120 °C ≤ 150 °C ≤ 80 °C
Temperature difference body / gate		≤ 25 °C
Material	Aluminum valve body / gate Stainless steel valve body / gate Actuator shafts	EN AW-5083 (3.3547) AISI 304 (1.4301) 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 V DC 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,
 CUSTOMIZED SOLUTIONS

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

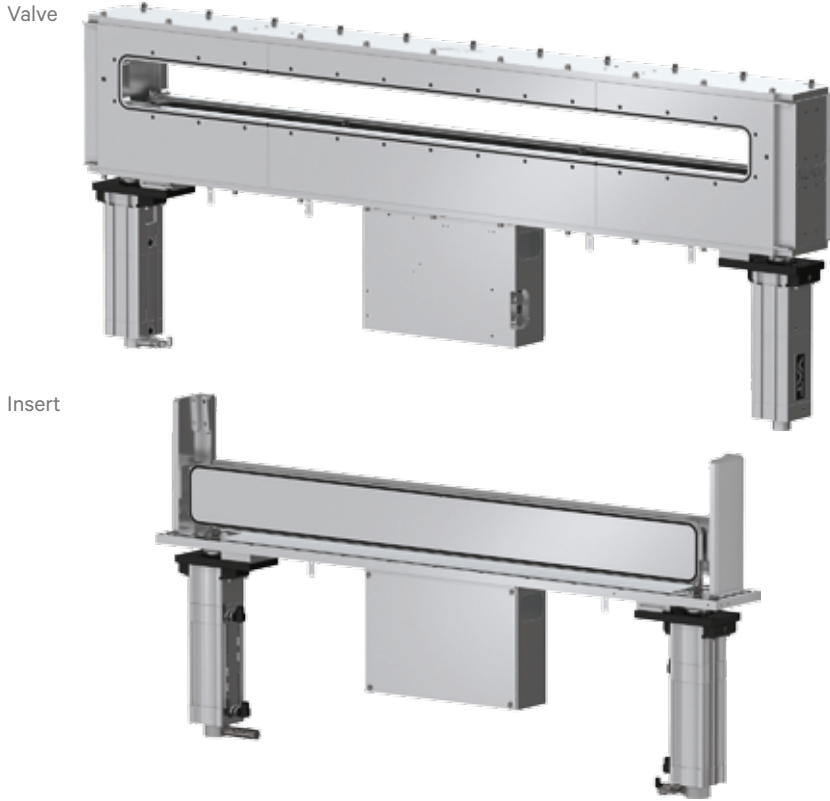
ORDERING INFORMATION

Ordering numbers on request (example: 0270X-AA24- . . .)



LARGE TRANSFER VALVE / INSERT XL-VAT, SERIES 06.0 / 06.2

For FPD production systems.



Adjustable sealing force
(high/low pressure)

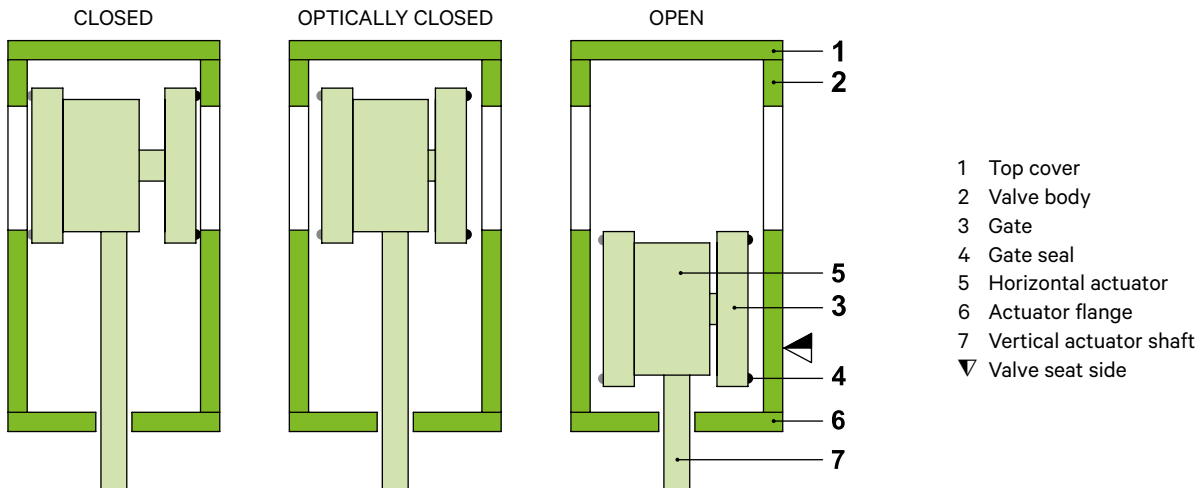
Same flange-to-flange dimension
for all opening sizes

Gate or gate seal maintenance
via top cover

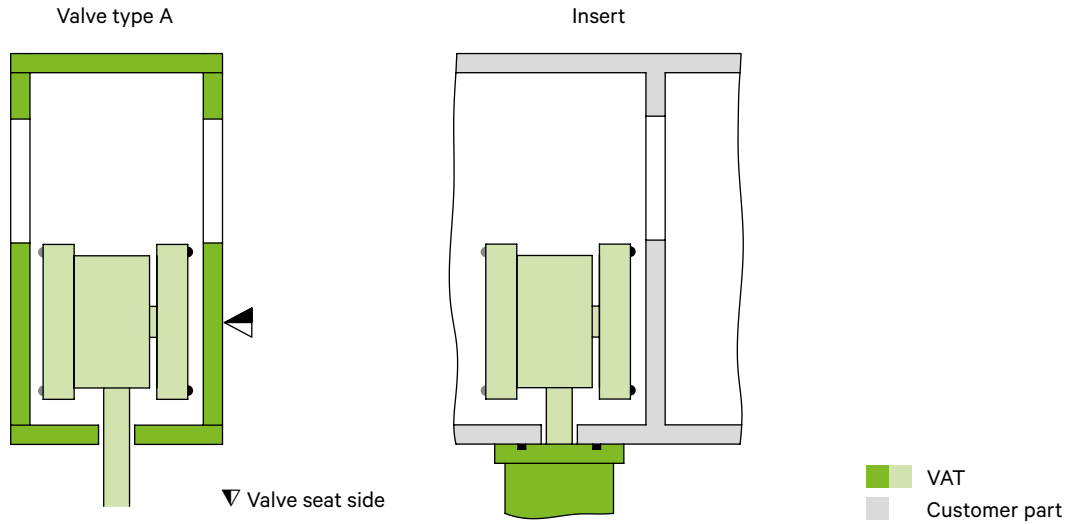
MAIN FEATURES

Opening sizes	100 × 1300 mm to 300 × 3000 mm (3.94" × 51.18" to 11.81" × 118.11")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum
Feedthrough	shaft feedthrough

FUNCTIONAL PRINCIPLE



TYPES



TECHNICAL DATA

Leak rate ¹⁾	Valve body, valve seat	$< 1 \cdot 10^{-7}$ mbar ls ⁻¹
Differential pressure on the gate	In closing direction	≤ 1 bar
	In opening direction	valve 1 bar, insert 10 mbar
Differential pressure at opening		≤ 5 mbar
Cycles until first service ¹⁾²⁾		1 million
Closing or opening time ¹⁾		≤ 4 s (with 120 mm opening height)
Temperature ¹⁾	Valve body, flanges	≤ 120 °C
	Actuator	≤ 80 °C
	Control unit	≤ 50 °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 or down
Position indicator	Voltage	24 V DC 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, CUSTOMIZED SOLUTIONS

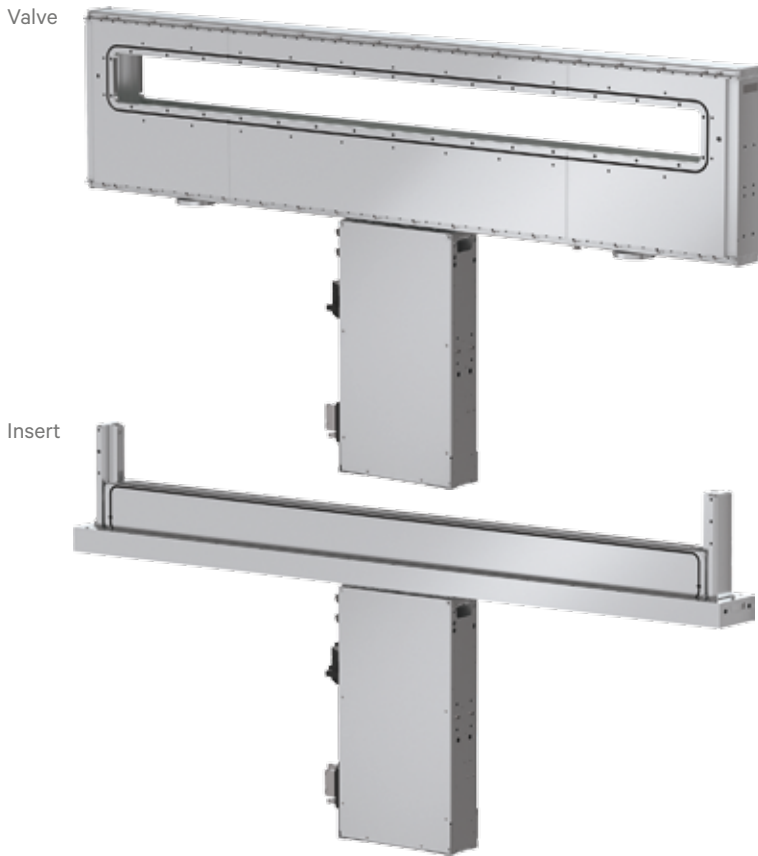
- Other sealing materials
- Bellows
- Shaft feedthrough with intermediate pumping
- Grounding of gate
- Surface treatment, e. g. hard anodized aluminum
- Mounting position: actuator lateral

ORDERING INFORMATION

Ordering numbers on request (example: 0600X-AA49- . . .)

LARGE TRANSFER VALVE / INSERT TwinVAT, SERIES 06.1

For FPD production systems.



Low shock at high operation speed

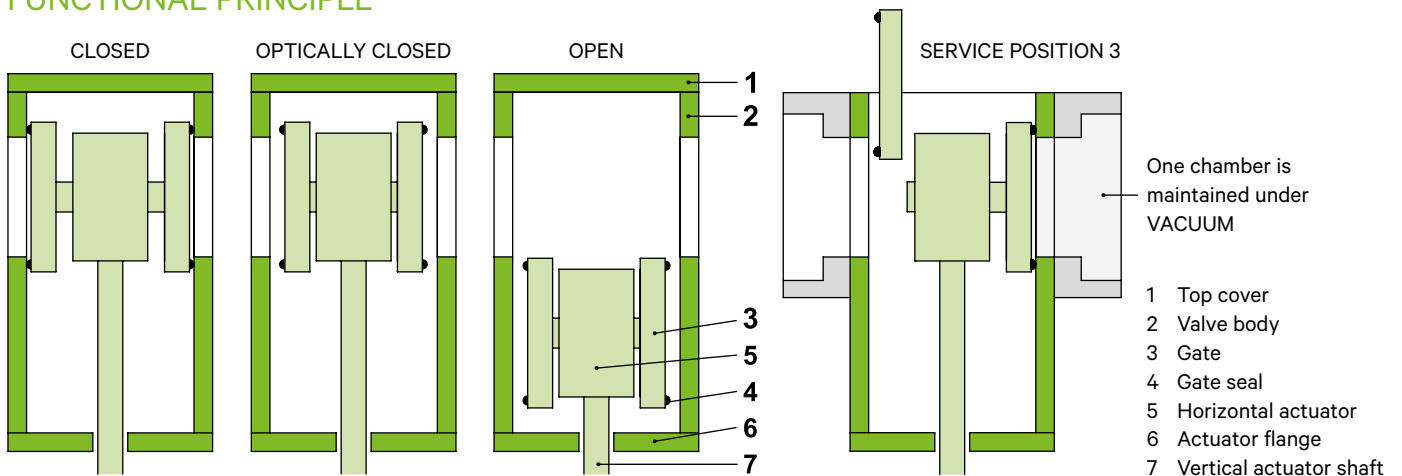
Low particle count

Three different service positions;
position 3 allows to keep one chamber under vacuum while maintenance work is carried out on the valve

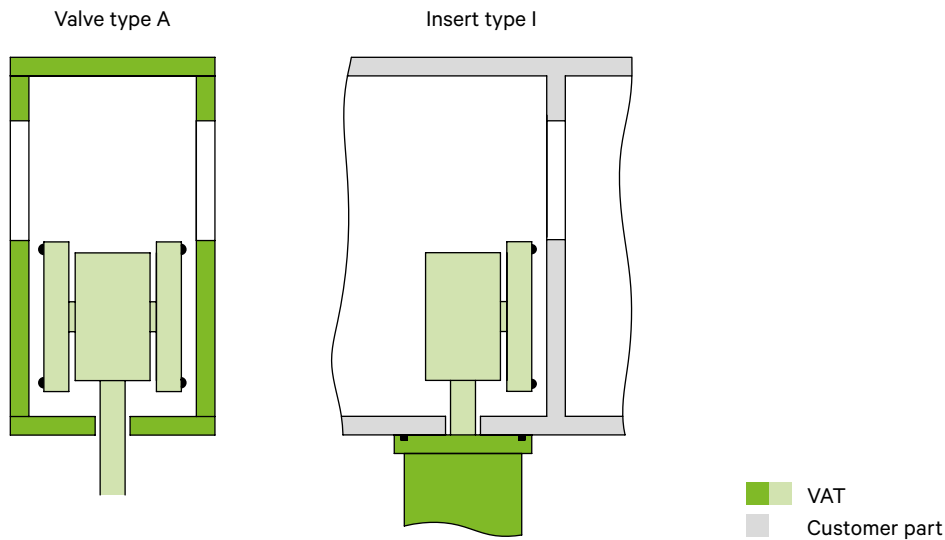
MAIN FEATURES

Opening sizes	100 × 1000 mm to 300 × 3800 mm (3.94" × 39.37" to 11.81" × 149.60")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum
Feedthrough	shaft feedthrough

FUNCTIONAL PRINCIPLE



TYPES



TECHNICAL DATA

Leak rate ¹⁾	Valve body, valve seat	$< 1 \cdot 10^{-7}$ mbar ls ⁻¹
Differential pressure on the gates ¹⁾	Valve: in closing direction only Insert: in opening direction	≤ 1 bar ≤ 30 mbar
Differential pressure at opening		≤ 5 mbar
Cycles until first service ¹⁾²⁾		1 million
Closing or opening time ¹⁾		< 2.5 s (with 150 mm opening height)
Temperature ¹⁾	Valve body, gate Actuator Solenoid valve	≤ 120 °C ≤ 60 °C ≤ 50 °C
Material	Valve body, gate Actuator shafts Bellows on pressure element	EN AW-6082 (3.2315) or EN AW-5083 (3.3547) AISI 316 (1.4401) AISI 633 (AM 350)
Seal	Gate, flanges, feedthrough, actuator	FKM (Viton®)
Feedthrough		shaft feedthrough
Pump/vent port		ISO-KF 40
Mounting position ²⁾		actuator up or down
Position indicator	Voltage	24 V DC 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, CUSTOMIZED SOLUTIONS

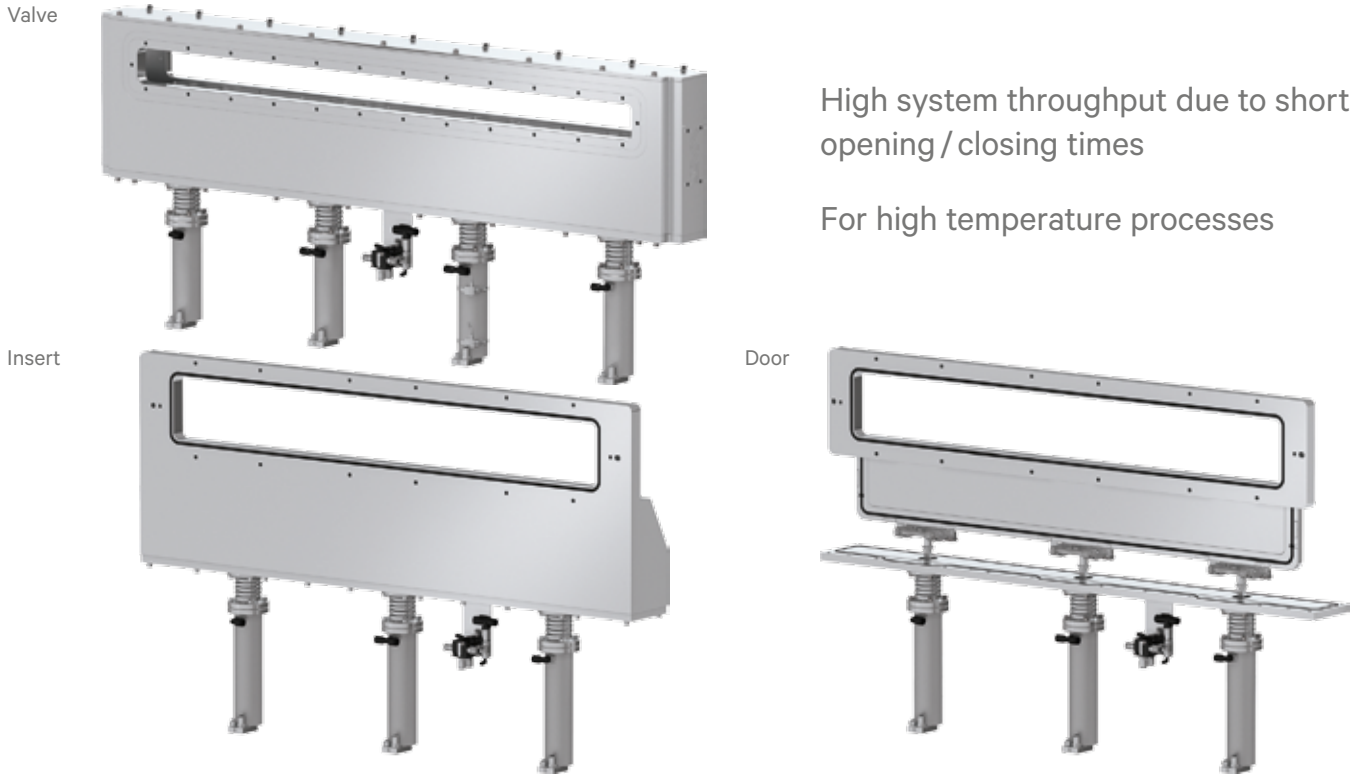
- Process control unit (PCU) and solenoid valves
- Surface treatment, e. g. hard anodized aluminum
- Other sealing materials
- Bellows
- Grounding of gate
- Vacuum gauge to detect the pressure inside the valve body
- Mounting position: actuator lateral

ORDERING INFORMATION

Ordering numbers on request (example: 0610X-AA49- . . .)

LARGE TRANSFER VALVE / INSERT / DOOR SoIVAT, SERIES 06.6

For PV and large coating systems.



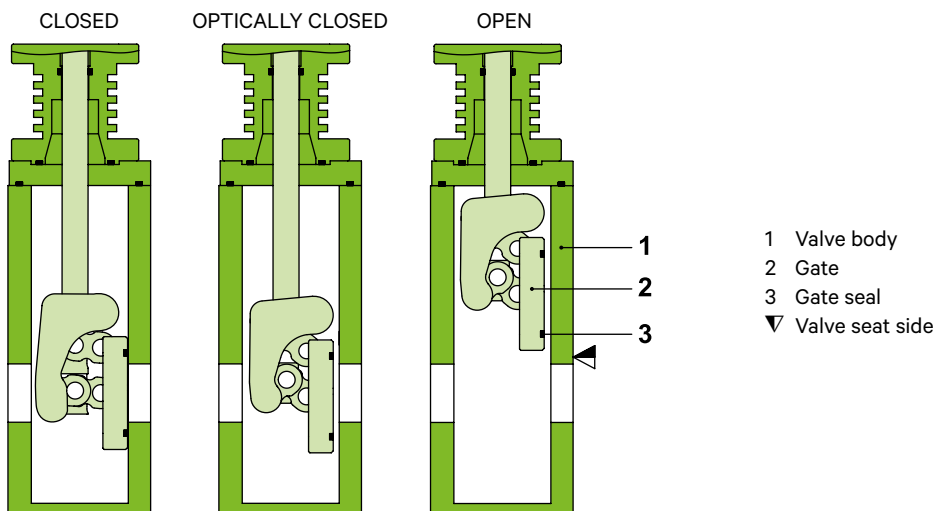
High system throughput due to short opening / closing times

For high temperature processes

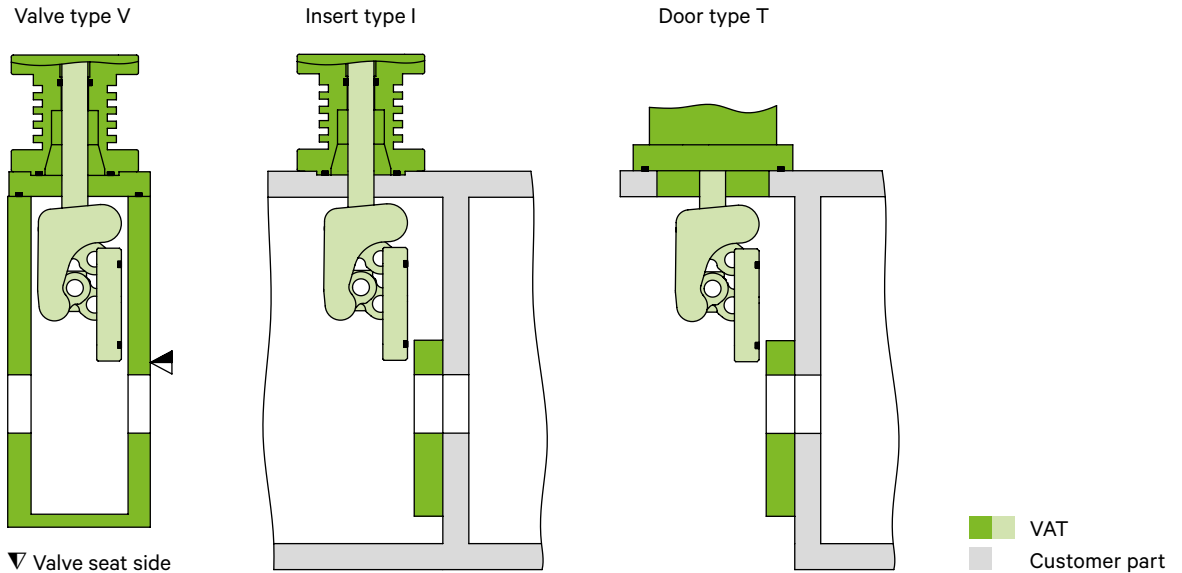
MAIN FEATURES

Opening sizes	50 × 500 mm to 300 × 3000 mm (1.97" × 19.69" to 11.81" × 118.11")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum or stainless steel
Feedthrough	shaft feedthrough

FUNCTIONAL PRINCIPLE



TYPES



TECHNICAL DATA

Leak rate ¹⁾	Valve body Valve seat	$< 1 \cdot 10^{-7}$ mbar ls ⁻¹ $< 1 \cdot 10^{-5}$ 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⁾		≤ 2 s (with 100 mm opening height)
Temperature ¹⁾	Aluminum valve body / flanges Stainless steel valve body / flanges Actuator, position indicator	≤ 120 °C ≤ 200 °C ≤ 80 °C
Material	Aluminum valve body / gate / flanges Stainless steel valve body / gate / flanges 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 V DC 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, CUSTOMIZED SOLUTIONS

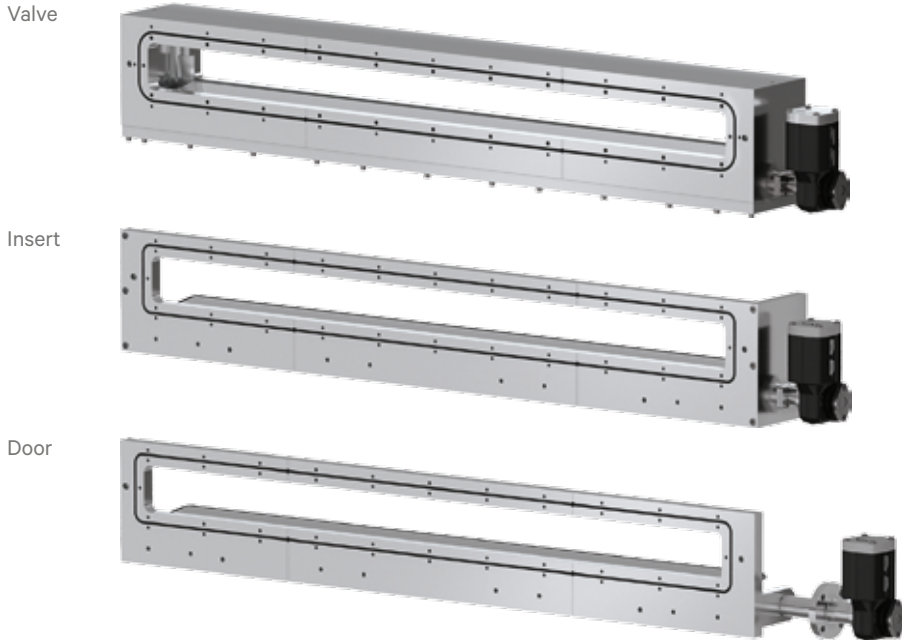
- Solenoid valve for impulse actuation 24 V DC (others on request)
- Bellows
- Water cooling in valve body and gate
- Pneumatic locking for open gate position

ORDERING INFORMATION

Ordering numbers on request (example: 0660X-VA24- . . .)

LARGE TRANSFER VALVE / INSERT / DOOR FlapVAT, SERIES 06.8

For PV and large coating systems.



Lowest Cost of Ownership

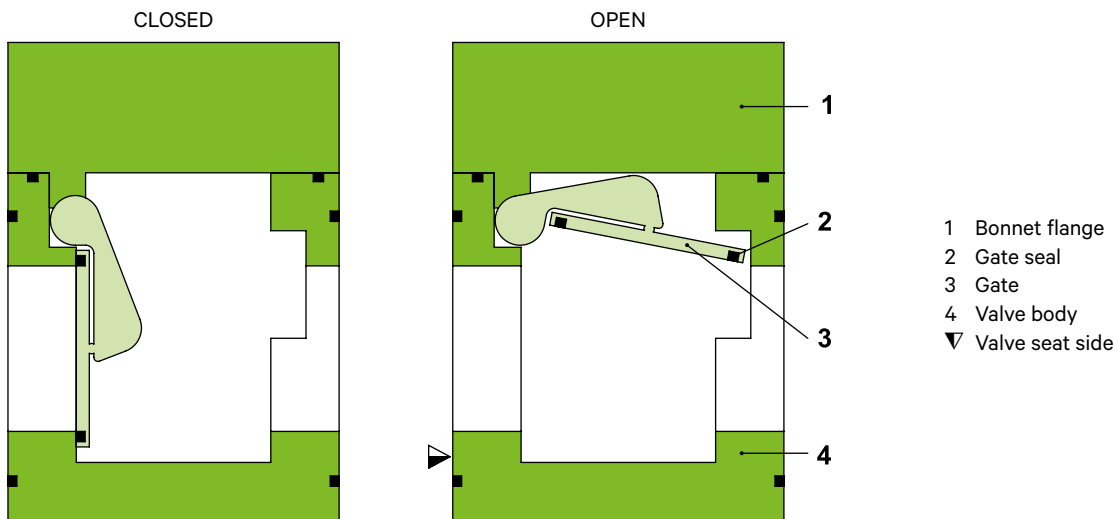
High system throughput due to short opening / closing times

Customer-specific designs

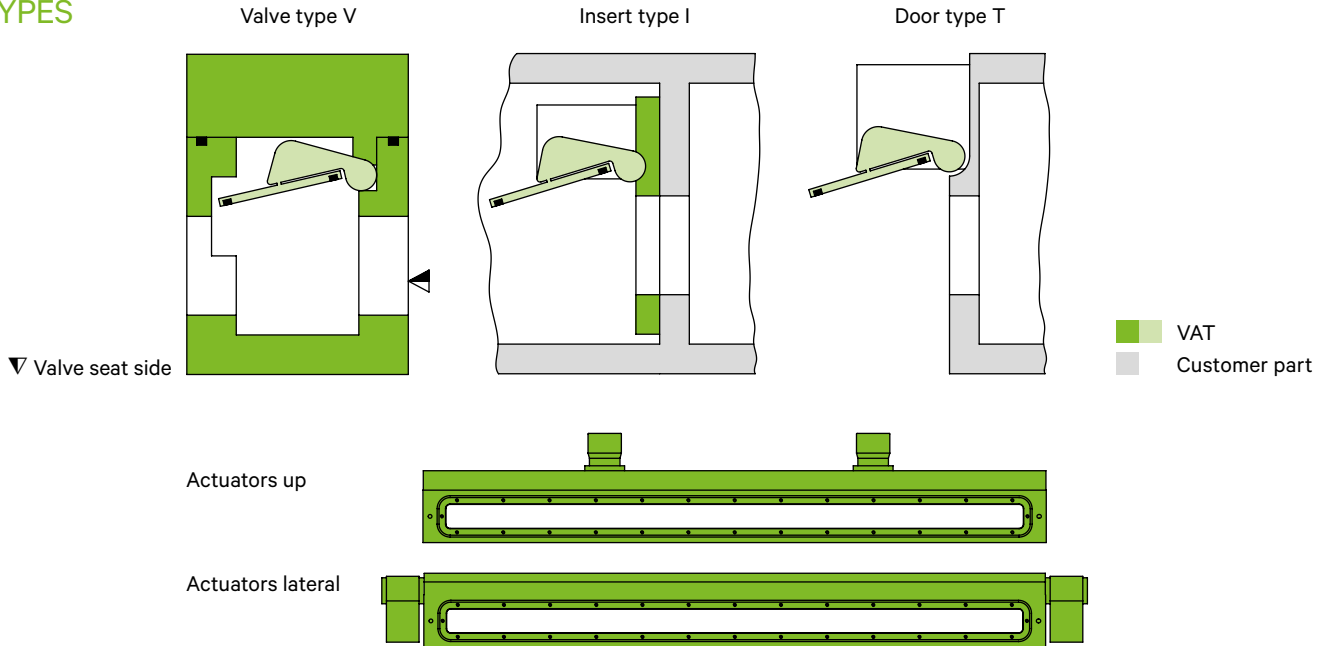
MAIN FEATURES

Opening sizes	50 × 500 mm to 100 × 3000 mm (1.97" × 19.69" to 3.94" × 118.11")
Actuator	pneumatic: double acting with position indicator
Body material	aluminum or stainless steel
Feedthrough	rotary feedthrough

FUNCTIONAL PRINCIPLE



TYPES



TECHNICAL DATA

Leak rate ¹⁾	Valve body Valve seat	<1·10 ⁻⁷ mbar ls ⁻¹ <1·10 ⁻⁵ mbar ls ⁻¹
Differential pressure on the gate	In closing direction In opening direction	≤1 bar ≤10 mbar (optional 1 bar)
Differential pressure at opening		≤5 mbar
Cycles until first service ¹⁾²⁾		1 million
Closing or opening time ¹⁾		≤1.2 s (with size 80 × 1500 mm)
Temperature ¹⁾	Aluminum valve body / gate Stainless steel valve body / gate Actuator	≤ 120 °C ≤ 200 °C ≤ 80 °C
Material	Aluminum valve body / gate / flanges Stainless steel valve body / gate / flanges 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 – 30 V DC 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, CUSTOMIZED SOLUTIONS

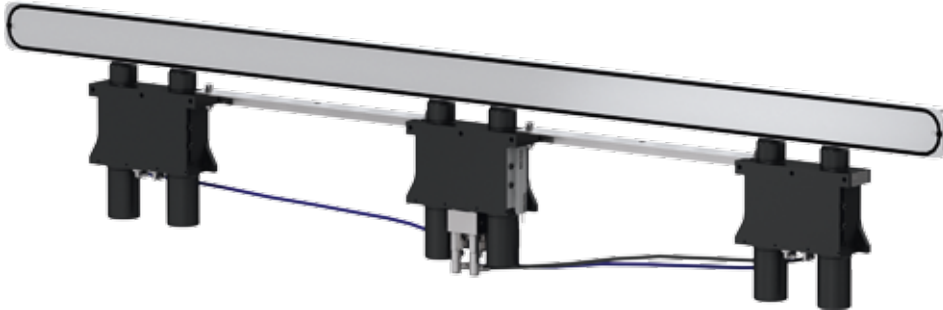
- Solenoid valve for impulse actuation 24 V DC (others on request)
- Other sealing materials
- Water cooling in valve body and gate
- Pneumatic locking for open gate position
- Resistant against 1 bar differential pressure in opening direction

ORDERING INFORMATION

Ordering numbers on request (example: 0680X-VA24- . . .)

LARGE DOOR L-VAT, SERIES 07.5

For FPD and PV production systems.



Shock-free L-movement

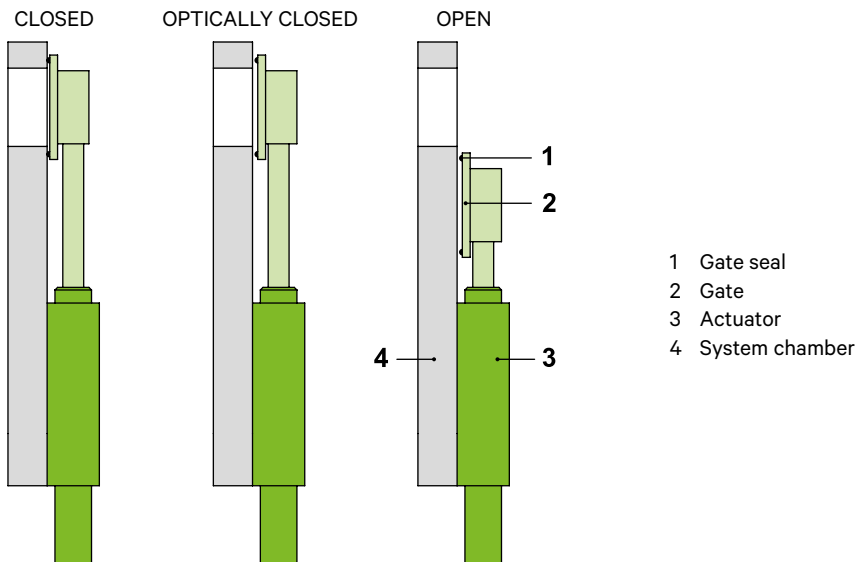
Particle-free

Low cost of ownership

MAIN FEATURES

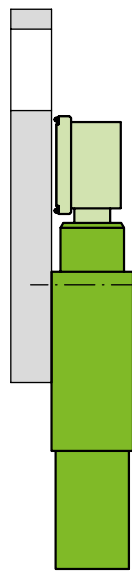
Opening sizes	25 × 560 mm to 80 × 3500 mm (0.98" × 22.05" to 3.15" × 137.80")
Actuator	pneumatic: double acting with position indicator
Gate material	aluminum or stainless steel
Sealing technology	L-VAT: see glossary

FUNCTIONAL PRINCIPLE

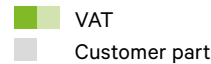


TYPE

Door type U



Actuator body mounted to chamber wall



TECHNICAL DATA

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⁾	Aluminum gate	≤ 120 °C
	Stainless steel gate	≤ 150 °C
	Actuator, position indicator	≤ 80 °C
Material	Aluminum gate	EN AW-5083 (3.3547)
	Stainless steel gate	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 V DC 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, CUSTOMIZED SOLUTIONS

- Solenoid valve for impulse actuation 24 V DC (others on request)
- Surface treatment, e. g. hard anodized or nickel-plated aluminum
- Other sealing materials

ORDERING INFORMATION

Ordering numbers on request (example: 0750X-UA24- . . .)

LARGE DOOR L-VAT, SERIES 07.8 «small»

For FPD and PV production systems.



Shock-free L-movement

Particle-free

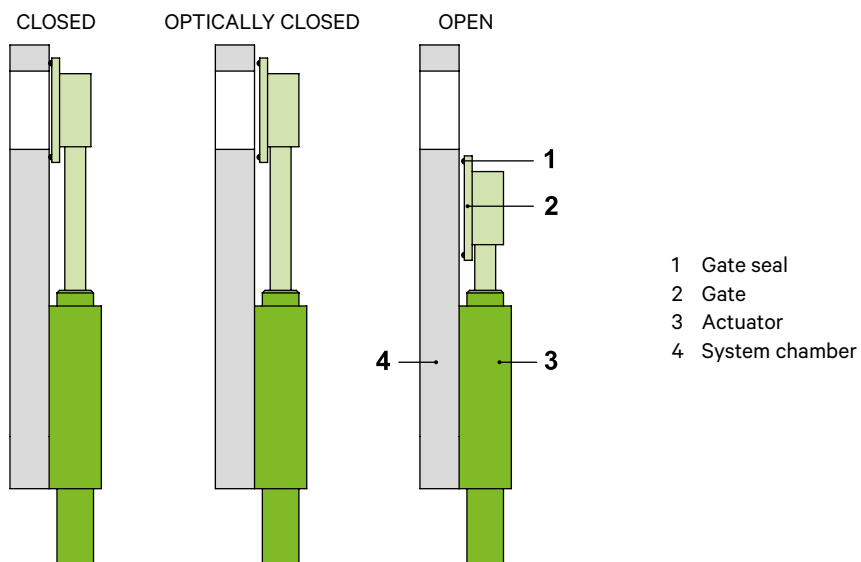
Low cost of ownership

Compact design

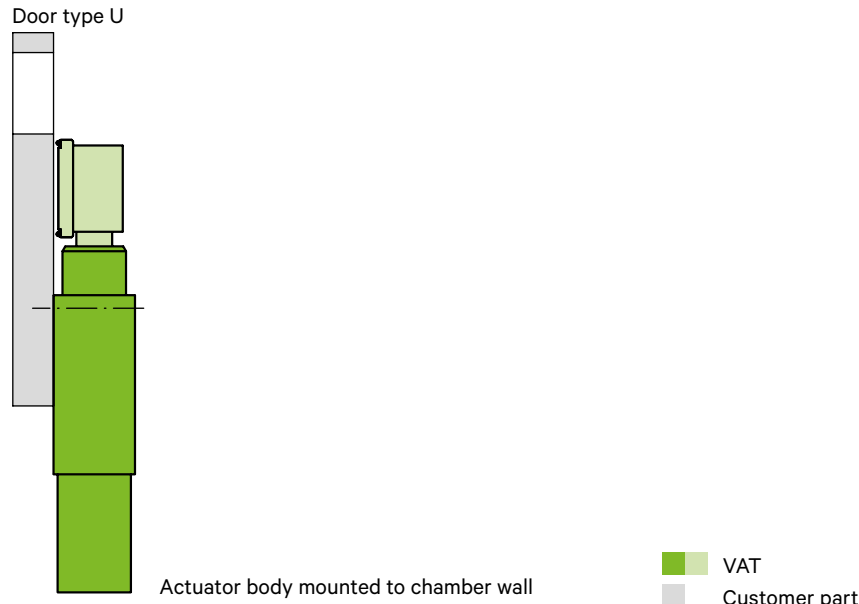
MAIN FEATURES

Opening sizes	81 × 400 mm to 200 × 1200 mm (3.19" × 15.75" to 7.87" × 47.24")
Actuator	pneumatic: double acting with position indicator
Gate material	aluminum
Sealing technology	L-VAT: see glossary

FUNCTIONAL PRINCIPLE



TYPE



TECHNICAL DATA

Leak rate ¹⁾	Gate in closing direction	$< 1 \cdot 10^{-7}$ 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⁾		≤ 2.5 s
Temperature ¹⁾	Gate	≤ 120 °C
	Actuator, position indicator	≤ 80 °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		actuator up, down or lateral
Position indicator	Voltage	10 – 30 V DC 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, CUSTOMIZED SOLUTIONS

- Solenoid valve for impulse actuation 24 V DC (others on request)
- Surface treatment, e. g. hard anodized or nickel-plated aluminum
- Other sealing materials

ORDERING INFORMATION

Ordering numbers on request (example: 0780X-UA24- . . .)

LARGE DOOR L-VAT, SERIES 07.8

For FPD and PV production systems.



Shock-free L-movement

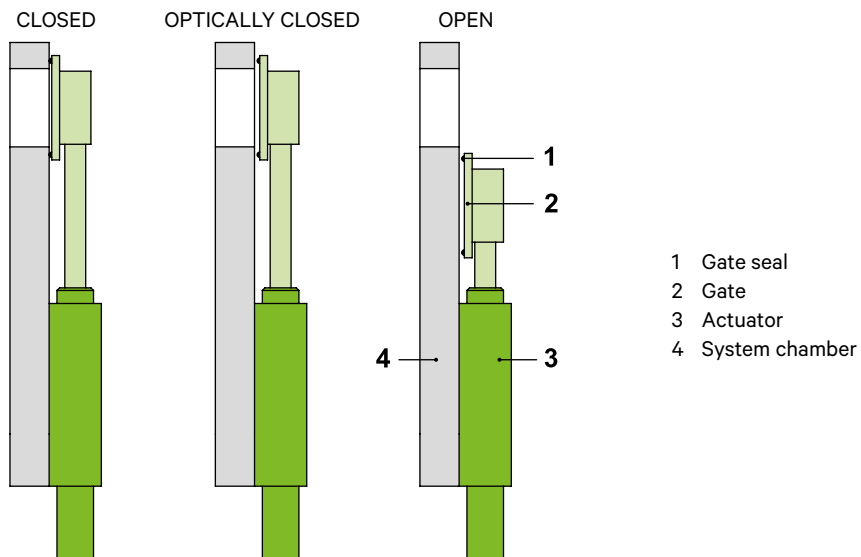
Particle-free

Low cost of ownership

MAIN FEATURES

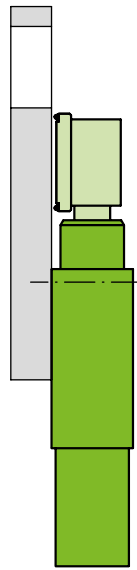
Opening sizes	81 × 800 mm to 250 × 2300 mm (3.19" × 31.50" to 9.84" × 90.55")
Actuator	pneumatic: double acting with position indicator
Gate material	aluminum
Sealing technology	L-VAT: see glossary

FUNCTIONAL PRINCIPLE



TYPE

Door type U



Actuator body mounted to chamber wall

VAT
 Customer part

TECHNICAL DATA

Leak rate ¹⁾	Gate in closing direction	< 1·10 ⁻⁷ 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⁾		≤ 2.5 s
Temperature ¹⁾	Gate	≤ 120 °C
	Actuator, position indicator	≤ 80 °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		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,
CUSTOMIZED SOLUTIONS**

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

ORDERING INFORMATION

Ordering numbers on request (example: 0780X-UA24- . . .)



ANGLE VALVES, DIAPHRAGM VALVES

SERIES	TYPE	PAGE
21.1	GAS DOSING VALVE	250
21.2	PRESSURE RELIEF VALVE	252
21.3	VENTING VALVE	254
22.0	DIAPHRAGM VALVE	258
23.0	VALVE MECHANISM AND PUMP-OUT PORT SYSTEM	260
24.4/24.5	VACUUM ANGLE / INLINE VALVE	262
26.4/26.5	HV ANGLE / INLINE VALVE	272
28.4	UHV ANGLE VALVE	282
29.0 / 29.2	ANGLE / INLINE VALVE WITH SOFT-PUMP FUNCTION	286
25.0 / 25.1 / 25.2	HV CYLINDER VALVE	292
54.1	«EASY CLOSE» ALL-METAL ANGLE VALVE	296
57.0 / 57.1	ALL-METAL ANGLE VALVE	300
59.0	ALL-METAL VARIABLE LEAK VALVE	308

GAS DOSING VALVES, SERIES 21.1

For introducing a controlled, reproducible flow of gas into a vacuum chamber.



Coarse gas dosing valve

Fine gas dosing valve

Controls wide range of flow

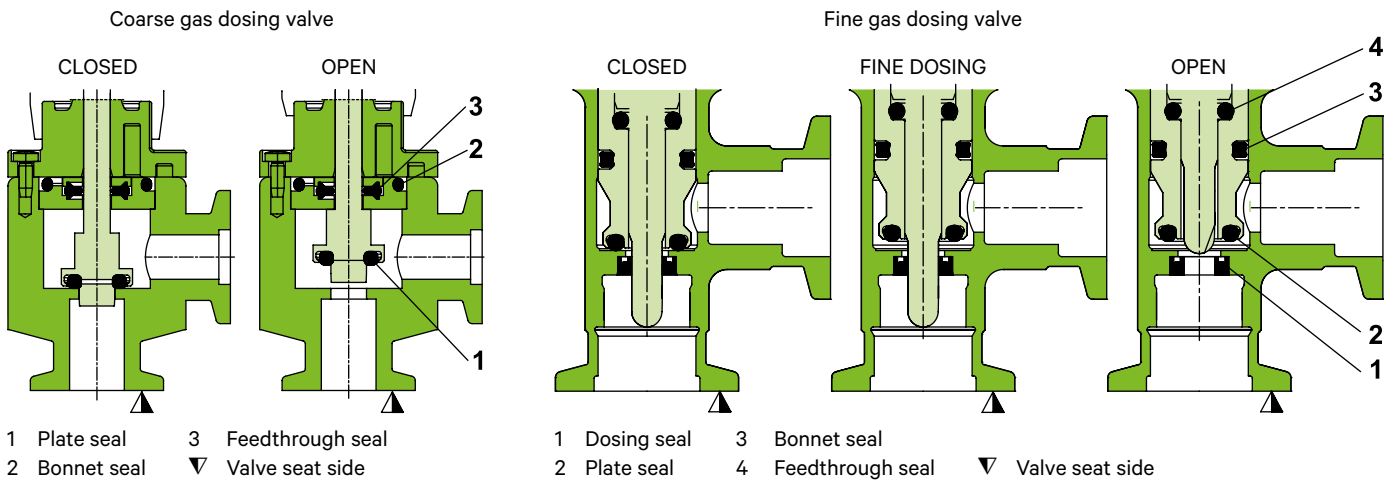
Integrated shut-off valve

Closing without losing flow setting

MAIN FEATURES

Size	coarse gas dosing valve: DN 10 mm (3/8") fine gas dosing valve: DN 16 mm (5/8")
Actuator	manual with handwheel
Body material	coarse gas dosing valve: aluminum fine gas dosing valve: stainless steel
Standard flanges	ISO-KF

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

		Coarse gas dosing valve	Fine gas dosing valve
Leak rate	Valve body, valve seat	$1 \cdot 10^{-8}$ mbar l/s ⁻¹	$< 1 \cdot 10^{-9}$ mbar l/s ⁻¹
Pressure range		$1 \cdot 10^{-7}$ mbar to 4 bar (abs)	$1 \cdot 10^{-8}$ mbar to 2.5 bar (abs)
Gas flow, controllable		min. 40 mbar l/s max. 1700 mbar l/s	min. $5 \cdot 10^{-6}$ mbar l/s max. 1000 mbar l/s
Dead volume		–	0.032 cm ³
Temperature		Bakeout ≤ 100 °C	Operating ≤ 80 °C Bakeout ≤ 100 °C
Material	Valve body Actuator Dosing sleeve	EN AW-6082 T6 Plastic (POM) –	AISI 304 (1.4301) Plastic (POM) fluoropolymer
Seal		FKM (Viton®)	FKM (Viton®)
Mounting position		any	any
Weight		0.2 kg / 0.44 lbs	0.4 kg / 0.88 lbs

ORDERING INFORMATION

Valve with manual actuator
handwheel

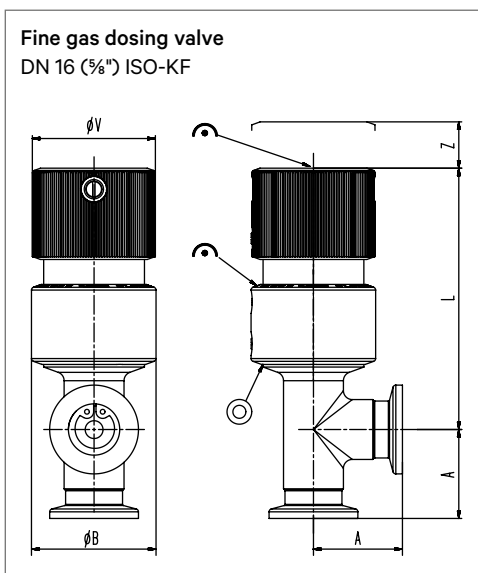
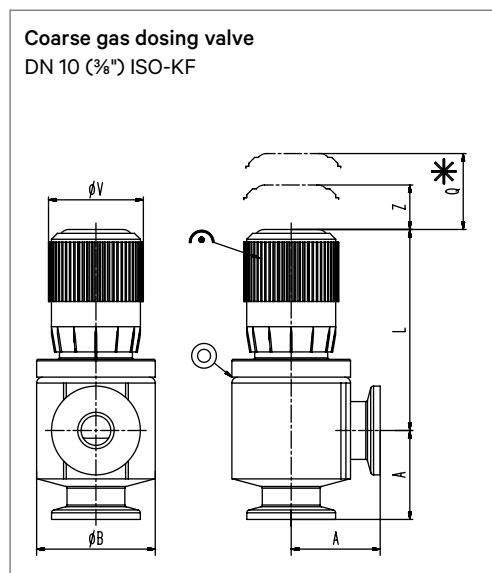
DN		Ordering numbers	
mm	inch	Coarse gas dosing valve	Fine gas dosing valve
10	$\frac{3}{8}$	21120-KA01	–
16	$\frac{5}{8}$	–	21124-KE0X

ACCESSORIES

Filter vacuum side for fine gas dosing valve:

- 590 mbar l/s, Ordering number 575928
- 1250 mbar l/s, Ordering number 576040

DIMENSIONS



		Coarse gas dosing valve	Fine gas dosing valve
DN	mm inch	10 $\frac{3}{8}$	16 $\frac{5}{8}$
A	mm inch	30 1.18	30 1.18
øB	mm inch	40 1.57	42 1.65
L	mm inch	66 2.60	87.50 3.44
Q	mm inch	34 1.34	–
øV	mm inch	32 1.26	42 1.65
Z	mm inch	5.50 0.20	12.50 0.49

- * Required for dismantling
- ⊙ Mechanical position indication
- ⊙ Leak detection hole

PRESSURE RELIEF VALVE, SERIES 21.2

System and operator protection for system overpressure.



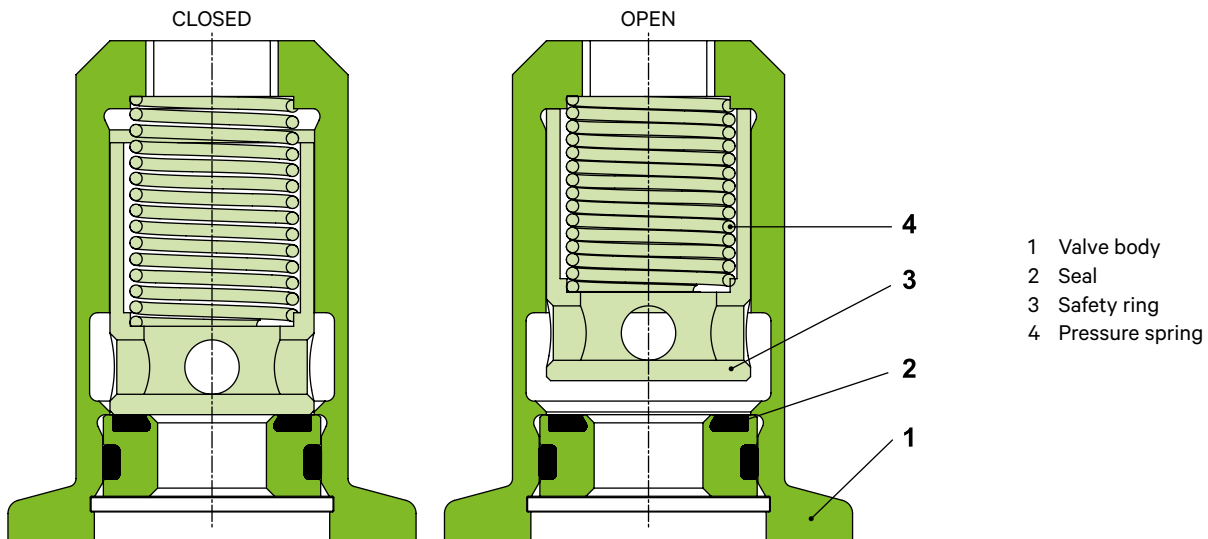
Protects vacuum systems from pressure > 1.5 bar

Relief trigger point 1.2 to 1.5 bar differential pressure

MAIN FEATURES

Size	DN 16 mm (5/8")
Body material	stainless steel
Standard flanges	ISO-KF

FUNCTIONAL PRINCIPLE



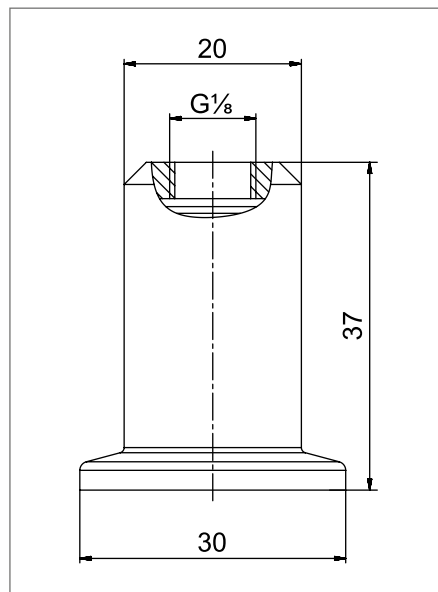
TECHNICAL DATA

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 at opening		1.2 to 1.5 bar
Temperature	Ambient Bakeout	0 – 50 °C ≤ 150 °C
Material	Valve body	AISI 304L (AISI 1.4306)
Seal		FKM (Viton®)
Gas flow		0 – 6 l/min
Weight		0.046 kg / 1 lbs

ORDERING INFORMATION

DN		Ordering numbers
mm	inch	ISO-KF
16	$\frac{5}{8}$	21224-KEXX

DIMENSIONS



VENTING VALVE, SERIES 21.3

For controlled venting or closing of vacuum systems.



Automatic venting or closing in case of a power failure (2, 3)

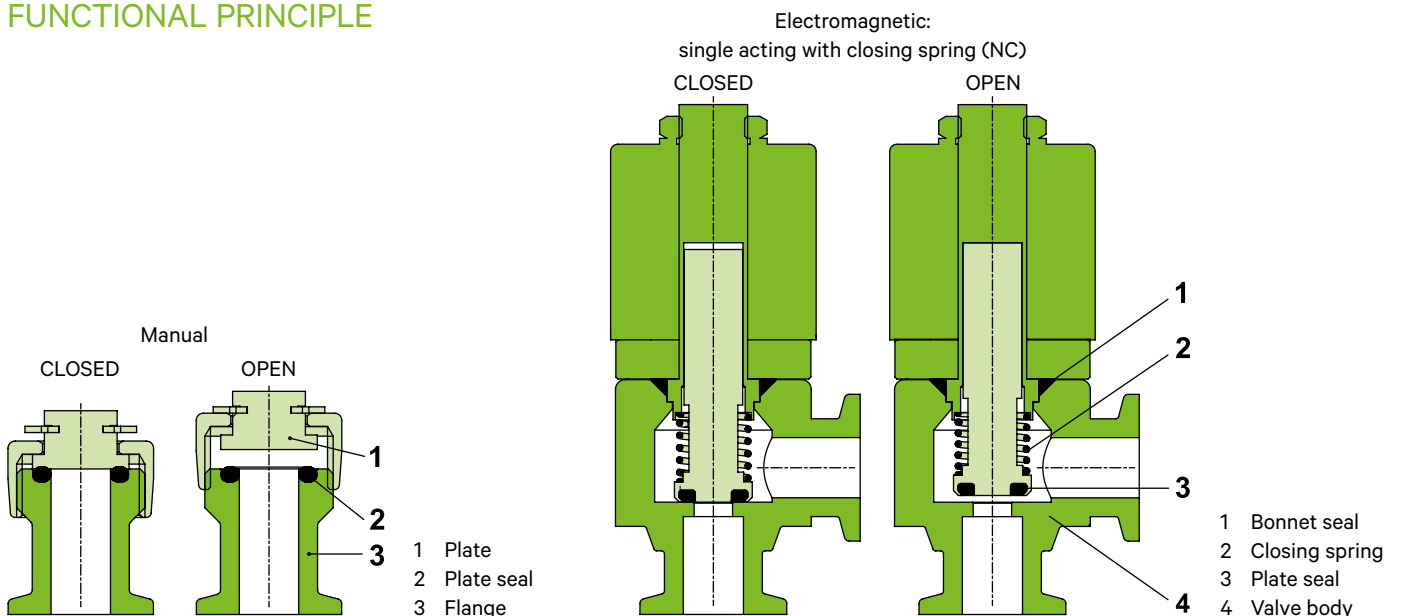
No vacuum feedthrough (3)

Long service life (1, 2, 3)

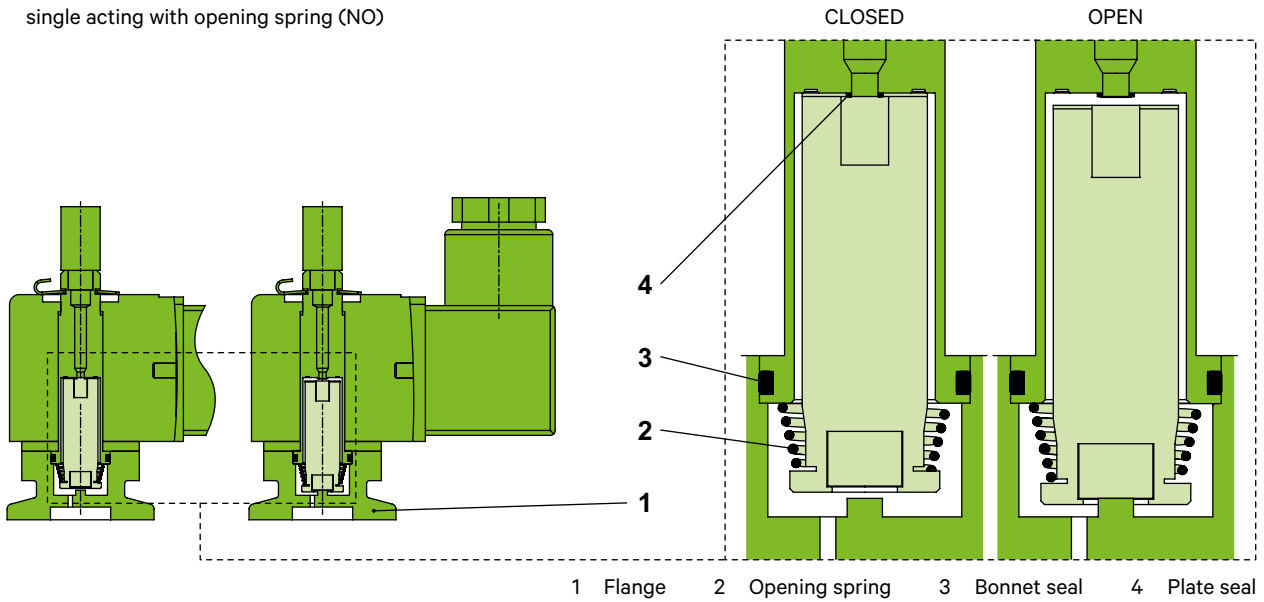
MAIN FEATURES

Size	DN 10 mm (3/8")
Actuators	manual electromagnetic: single acting with closing spring (NC) or opening spring (NO)
Body material	manual: aluminum and stainless steel electromagnetic: aluminum
Standard flanges	ISO-KF

FUNCTIONAL PRINCIPLE



Electromagnetic:
single acting with opening spring (NO)



TECHNICAL DATA

		MANUAL	ELECTROMAGNETIC with closing spring (NC)	ELECTROMAGNETIC with opening spring (NO)
Leak rate	Valve body, valve seat	$<1 \cdot 10^{-9}$ mbar ls ⁻¹	$<1 \cdot 10^{-9}$ mbar ls ⁻¹	$<1 \cdot 10^{-7}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-8}$ mbar to 1 bar (abs)	$1 \cdot 10^{-8}$ mbar to 1 bar (abs)	$1 \cdot 10^{-8}$ mbar to 10 bar (abs)
Differential pressure on the plate	In closing direction	–	10 mbar	–
	In opening direction	–	1 mbar	–
Differential pressure at opening	In closing direction	–	2 mbar ¹⁾	–
	In opening direction	–	1 mbar	–
Cycles until first service ²⁾		–	1.5 million	3 million
Temperature ³⁾	With aluminum body	0 – 80 °C	5 – 40 °C	5 – 50 °C
	With stainless steel body	0 – 120 °C	–	–
Material	Aluminum valve body	EN AW-6023 (3.0306)	EN AW-6082 (3.2315)	EN AW-6026
	Stainless steel valve body Plate: aluminum valve stainless steel valve	AISI 303 (1.4305) EN AW-6023 (3.0306) AISI 304 (1.4301)	–	–
Seal		FKM (Viton®)	FKM (Viton®)	FKM (Viton®)
Feedthrough		none	none	none
Mounting position		any	any	any
Power supply		–	200 – 240 V AC, 50/60 Hz 100 – 115 V AC, 50/60 Hz 24 V AC, 50/60 Hz 24 V DC	200 – 240 V AC, 50/60 Hz 100 – 115 V AC, 50/60 Hz 24 V DC
Venting time		50 l in 14 sec.	100 l in 30 sec.	50 l in 270 sec.
Weight	Aluminum valve	0.1 kg / 0.22 lbs	0.46 kg / 1.01 lbs	0.1 kg / 0.22 lbs
	Stainless steel valve	0.15 kg / 0.33 lbs	–	–

¹⁾ Opening above atmospheric pressure reduces the specified cycle life.
²⁾ Cycle life tested at room temperature.
³⁾ Maximum values: depending on operating conditions and sealing materials.

OPTIONS

- Various filters
- Various power supply voltages

SPARE PARTS

Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 31

ORDERING INFORMATION FOR STANDARD VALVES

Valve with manual actuator

DN		Ordering numbers	
mm	inch	aluminum	stainless steel
10	3/8	21320-KA01	21320-KE01

Valve with electromagnetic actuator single acting with closing spring (NC)

DN		Ordering numbers
mm	inch	ISO-KF aluminum
10	3/8	21320-KA64

Valve with electromagnetic actuator single acting with opening spring (NO)

DN		Ordering numbers
mm	inch	ISO-KF aluminum
10	3/8	21320-KA66

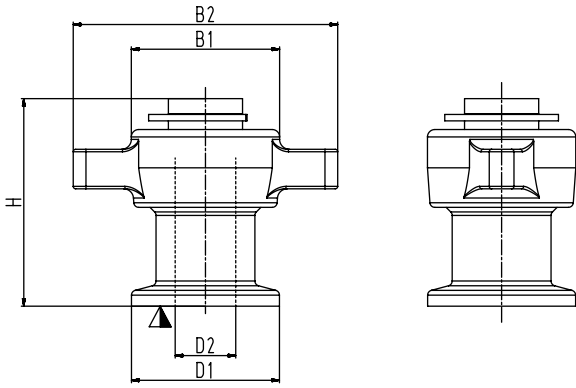
ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

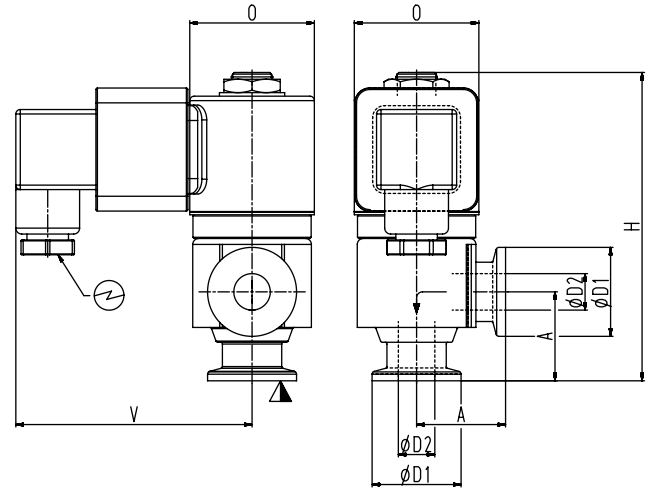
Example: 21320-KA64-X, X = power supply voltage ... V ... Hz

DIMENSIONS

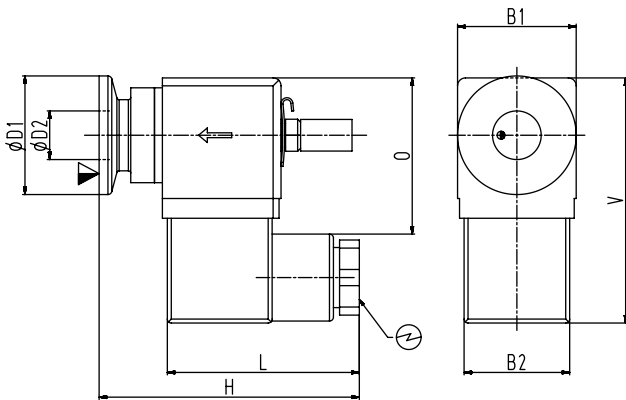
Valve with manual actuator
DN 10 (3/8") ISO-KF



Valve with electromagnetic actuator, single acting with closing spring (NC)
DN 10 (3/8") ISO-KF



Valve with electromagnetic actuator, single acting with opening spring (NO)
DN 10 (3/8") ISO-KF



		Manual	Electromagnetic	
			With closing spring (NC)	With opening spring (NO)
DN	mm inch	10 3/8	10 3/8	10 3/8
B1	mm inch	30 1.18	-	30 1.18
B2	mm inch	51 2	-	27 1.06
D1	mm inch	29.90 1.18	30 1.18	30 1.18
D2	mm inch	12.20 0.48	12.30 0.48	12.30 0.48
H	mm inch	42 1.77	105 4.13	27 1.06
L	mm inch	-	-	65.80 2.60
O	mm inch	-	42 1.89	39.50 1.56
V	mm inch	-	60 2.36	64 2.52

- ▼ Valve seat side
- ⊕ Electrical connection

DIAPHRAGM VALVE, SERIES 22.0

For roughing / backing line isolation and rough metering of gases and liquids.



Easy dosing

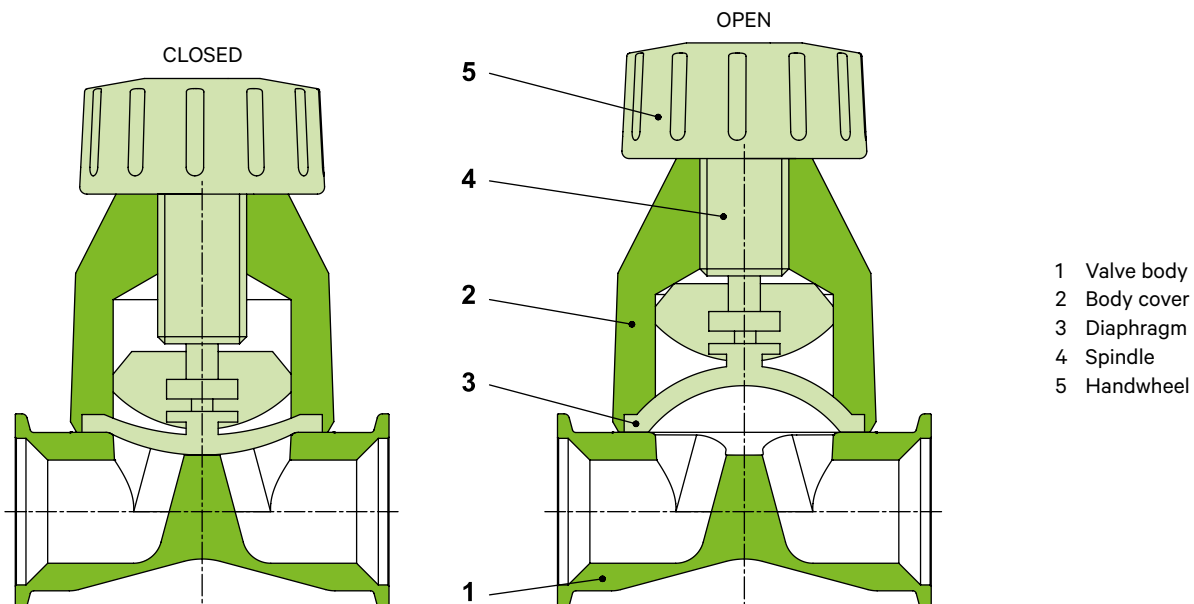
Easy maintenance: fast diaphragm seal replacement

Small footprint and easy system integration

MAIN FEATURES

Sizes	DN 16 – 40 mm (5/8" – 1½")
Actuator	manual with handwheel
Body material	aluminum
Standard flanges	ISO-KF

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

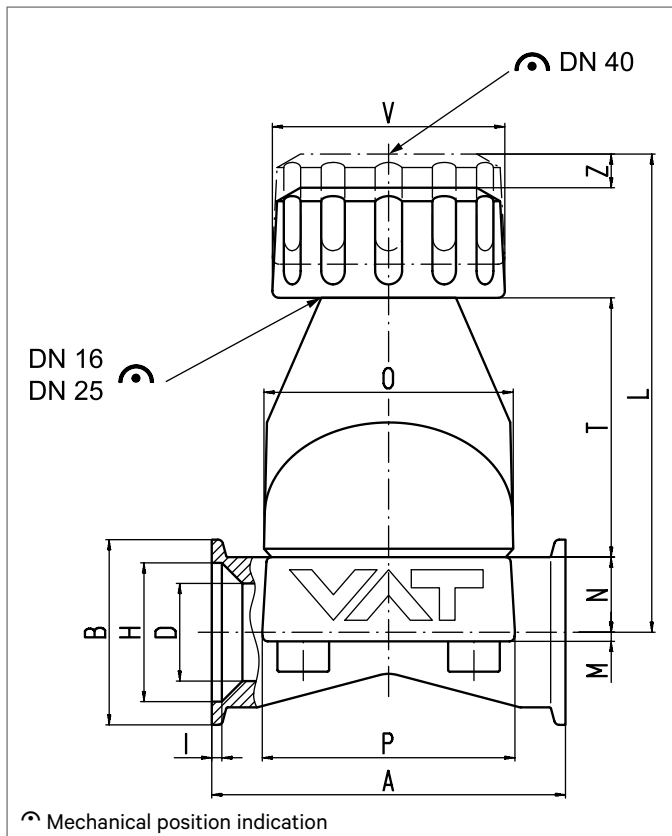
Leak rate	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-7}$ mbar to 5 bar (abs)
Cycles until first service		20 000
Temperature	Valve body Actuator	≤ 100 °C ≤ 50 °C
Material	Valve body Actuator	EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315) plastic (POM)
Seal	Diaphragm	FKM (Viton®)
Mounting position		any
Valve position indication		visual (mechanical)
Conductance (molecular flow)	DN 16 / DN 25 / DN 40	2 ls ⁻¹ / 5 ls ⁻¹ / 17 ls ⁻¹
Turns per stroke	DN 16 / DN 25 / DN 40	3.5 / 5 / 6.5
Weight	DN 16 DN 25 DN 40	0.16 kg / 0.35 lbs 0.50 kg / 1.10 lbs 1.20 kg / 2.60 lbs

ORDERING INFORMATION

Valve with manual actuator
handwheel

DN		Ordering numbers	
mm	inch	Valve ISO-F	Spare diaphragm
16	5/8	22024-KA01	100618-01
25	1	22028-KA01	100619-01
40	1 1/2	22032-KA01	100620-01

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 2.60	111 4.37	148.50 5.85
M	mm inch	10 0.39	14 0.55	22.30 0.88
N	mm inch	□ 32 × 32 □ 1.26 × 1.26	□ 54 × 54 □ 2.13 × 2.13	□ 74 × 79 □ 2.91 × 3.11
O	mm inch	32 × 32 1.26 × 1.26	54 × 54 2.13 × 2.13	75 × 80 2.95 × 3.15
P	mm inch	27.50 1.08	56 2.20	77 3.03
T	mm inch	30 1.18	47.50 1.87	69 2.72
V	mm inch	29.50 1.16	47 1.85	69.50 2.74
Z	mm inch	4 0.16	10 0.39	14 0.55

VALVE MECHANISM AND PUMP-OUT PORT SYSTEM, SERIES 23.0

For infrequently pumped vacuum vessels or gas isolation.



Valve mechanism



Pump-out port

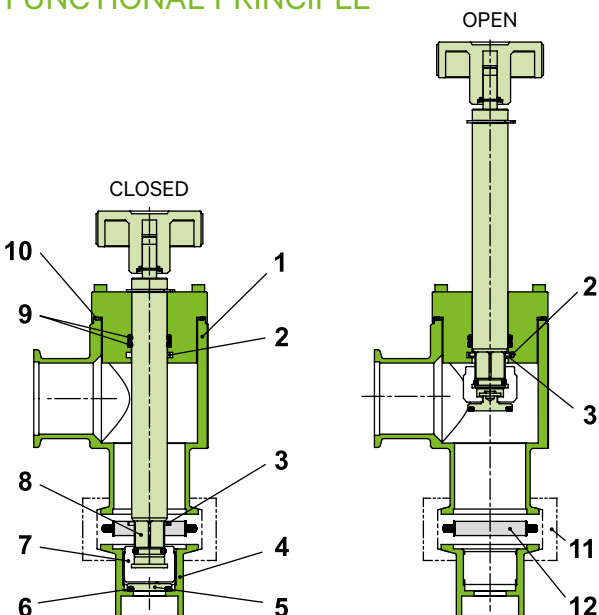
Protects against unintentional opening

One valve mechanism (lock) for multiple pump-out ports

MAIN FEATURES

Size	DN 16 – 40 mm (5/8" – 1½")
Actuator	valve mechanism with self-locking handwheel
Body material	valve mechanism: aluminum pump-out port: stainless steel
Feedthrough	shaft feedthrough
Standard flanges	ISO-KF

FUNCTIONAL PRINCIPLE



- 1 Valve mechanism
- 2 Retaining device
- 3 Retaining pin on shaft
- 4 Pump-out port
- 5 Plate
- 6 Plate seal
- 7 Isolating plug
- 8 Plug-in shaft head / hexagon
- 9 Feedthrough seal
- 10 Bonnet seal
- 11 Clamping ring
- 12 Centering ring with O-ring

The illustration shows a valve mechanism and pump-out port system with clamping ring (11) and centering ring (12). Clamping ring and centering ring are not part of the system.

TECHNICAL DATA

		Valve mechanism	Pump-out port
Leak rate		1·10 ⁻⁸ mbar ls ⁻¹	< 1·10 ⁻⁹ mbar ls ⁻¹
Pressure range		1·10 ⁻⁸ mbar to 1 bar (abs)	1·10 ⁻⁸ mbar to 1 bar (abs)
Temperature	Valve body	≤ 150 °C	-
	Handwheel	≤ 50 °C	-
Material	Body	EN AW-6060 (3.3206)	AISI 304 (1.4301)
	Shaft	AISI 304 (1.4301)	-
	Plate	-	AISI 304 (1.4301)
Seal	Bonnet, feedthrough, plate	FKM (Viton®)	FKM (Viton®)
Mounting position		any	any
Stroke	DN 16, 25	75 mm (2.95")	-
	DN 40	107 mm (4.21")	-
Unobstructed flow diameter	DN 16	-	2.5 mm (0.10")
	DN 25	-	8.0 mm (0.31")
	DN 40	-	18.0 mm (0.71")
Weight	DN 16	0.35 kg (0.77 lbs)	0.05 kg (0.11 lbs)
	DN 25	1 kg (2.2 lbs)	0.10 kg (0.22 lbs)
	DN 40	1.2 kg (2.65 lbs)	0.25 kg (0.55 lbs)

Further technical data on request.

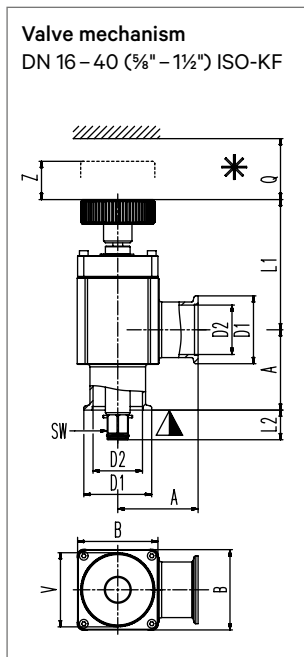
ACCESSORIES

Flange connections for installation of the valve: see series 31

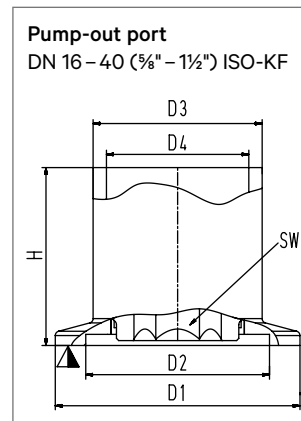
ORDERING INFORMATION

ISO-KF	DN		Ordering numbers	
	mm	inch	valve mechanism with self-locking handwheel	pump-out port
	16	5/8	23024-KA01	23024-KEPS
25	1	23028-KA01	23028-KEPS	
40	1 1/2	23032-KA01	23032-KEPS	

DIMENSIONS



DN	mm	16	25	40
	inch	5/8	1	1 1/2
A	mm	40	50	65
	inch	1.57	1.97	2.56
B	mm	40	48	65
	inch	1.57	1.89	2.56
D1	mm	29.90	39.90	54.90
	inch	1.17	1.57	2.16
D2	mm	16	25	40
	inch	0.63	0.98	1.57
L1	mm	63.80	83.10	105.40
	inch	2.51	3.27	4.15
L2	mm	19.50	21	24
	inch	0.77	0.83	0.94
Q	mm	130	130	130
	inch	5.12	5.12	5.12
SW	mm	5	8	17
	inch	0.20	0.31	0.67
V	mm	40	40	60
	inch	1.57	1.57	2.36
Z	mm	75	75	107
	inch	2.95	2.95	4.21

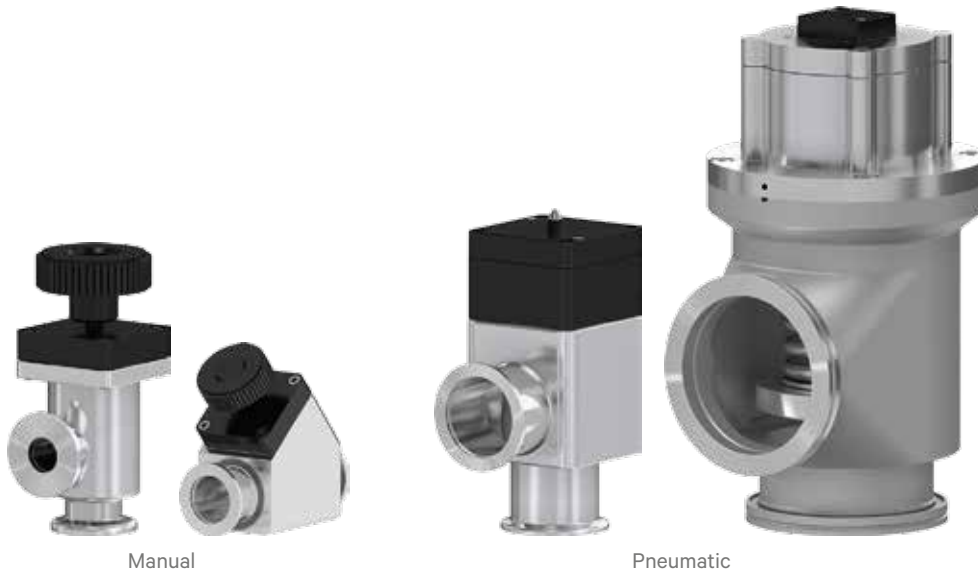


DN	mm	16	25	40
	inch	5/8	1	1 1/2
D1	mm	30	40	55
	inch	1.18	1.57	2.17
D2	mm	17.20	26.20	41.20
	inch	0.68	1.03	1.62
D3	mm	16	25	38
	inch	0.63	0.98	1.50
D4	mm	10	22	32
	inch	0.39	0.87	1.26
H	mm	25.50	31.20	40
	inch	1	1.23	1.57
SW	mm	5	8	17
	inch	0.20	0.31	0.67

▼ Valve seat side
* Required for dismantling

VACUUM ANGLE / INLINE VALVE, SERIES 24.4 / 24.5

For pumping and venting of vacuum systems with large gas flows.



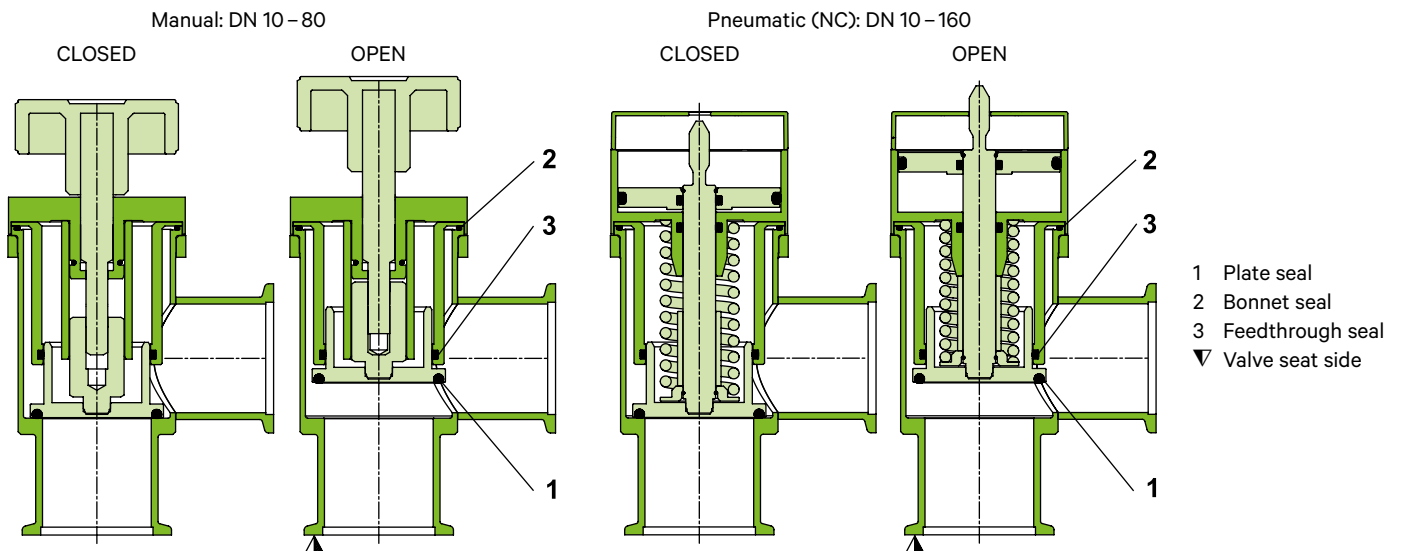
Resistant against high differential pressure

Long lifetime

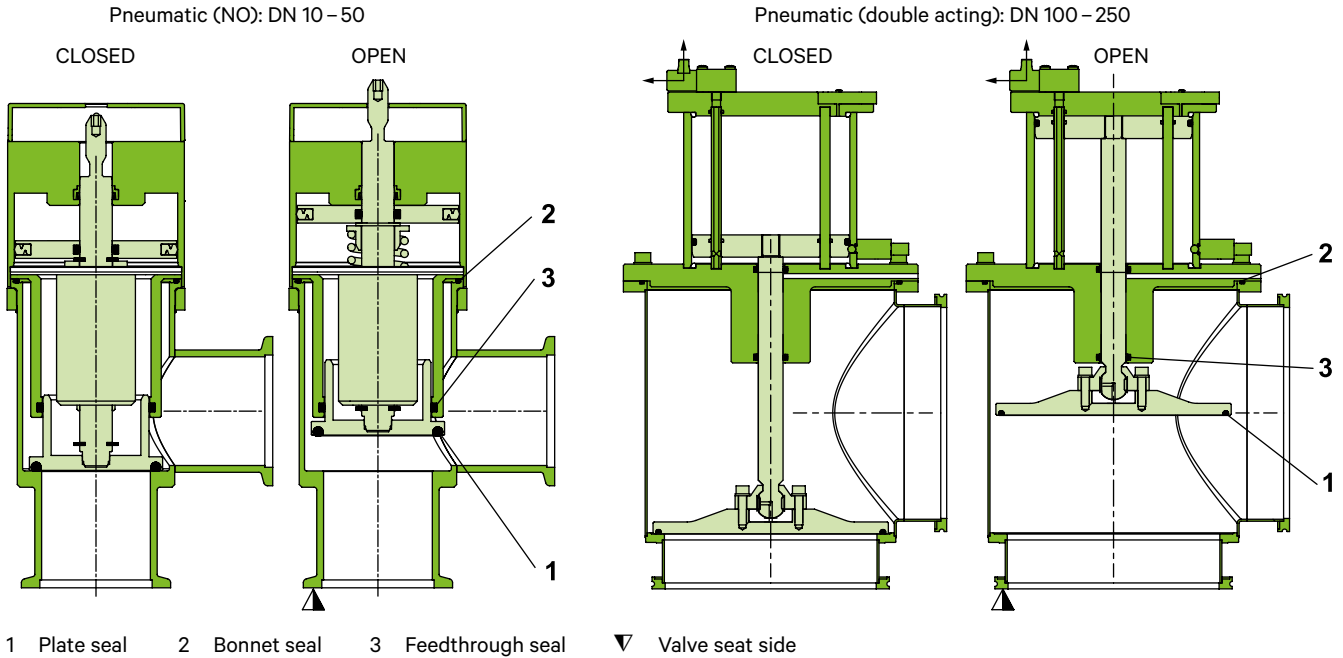
MAIN FEATURES

Sizes	DN 10 – 250 mm (3/8" – 10")
Actuators	manual: with removable handwheel pneumatic: single acting with closing spring (NC) or opening spring (NO), or double acting
Body material	aluminum or stainless steel
Feedthrough	shaft feedthrough
Standard flanges	ISO-KF, ISO-K

FUNCTIONAL PRINCIPLE



FUNCTIONAL PRINCIPLE



TECHNICAL DATA (ANGLE AND INLINE VALVES)

Leak rate	Valve body, valve seat		$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		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)
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
Cycles until first service ¹⁾	Valve with manual actuator	DN 10 – 80	10 000
	Valve with pneumatic actuator	DN 10 – 80	3 million (NC, NO)
		DN 100 – 160	1 million (NC, NO)
		DN 100 – 160	2 million (double acting)
		DN 200 – 250	1 million ²⁾ (double acting)
Temperature ³⁾	Valve body		≤ 150 °C
	Manual & pneumatic actuator		≤ 120 °C
	Solenoid valve & position indicator	DN 10 – 80	≤ 80 °C
		DN 100 – 250	≤ 50 °C
Material	Aluminum valve body	DN 16 – 63	EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315)
		DN 80 – 160	EN AC-42000
	Stainless steel valve body Plate	DN 10 – 250	AISI 316L (1.4404)
		DN 10 – 160	AISI 316L (1.4404, 1.4435)
		DN 200 – 250	AISI 304 (1.4301)

¹⁾ Tested at room temperature under clean and static conditions.

²⁾ Reduced lifetime with venting applications.

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

– continued next page –

TECHNICAL DATA (ANGLE AND INLINE VALVES)

Seal	Bonnet, plate	FKM (Viton®)
Feedthrough		shaft feedthrough
Mounting position		any
Solenoid valve		DN 10 – 80 24 V DC, 2.5 W (others on request) DN 100 – 250 24 V DC, 1.0 W (others on request)
Position indicator: contact rating	Voltage	DN 10 – 160 5 – 50 V AC / DC
		DN 200 – 250 ≤ 50 V AC / DC
	Current	DN 10 – 160 5 – 100 mA
		DN 200 – 250 ≤ 1.2 A
Valve position indication		visual (mechanical)

ANGLE VALVES

			with manual actuator					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					
mm	inch			kg	lbs	kg	lbs				bar	psi	l	ft ³	kg	lbs
10	3/8	3	3.6	–	–	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	–	–	0.34	0.75
16	5/8	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	–	–	4 – 8	58 – 116	0.112	0.0040	0.70	3.10	6.83	–	–
100	4	440	–	–	–	–	–	4.5 – 7	65 – 102	0.330	0.0117	1	10	22	–	–
160	6	1000	–	–	–	–	–	4.5 – 7	65 – 102	1.050	0.0371	2	14	31	–	–

			with pneumatic actuator, single acting with opening spring (NO)													
mm	inch	Conductance	Turns per stroke	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
10	3/8	3	3.6	–	–	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	–	–	0.40	0.88
16	5/8	5	3.6	0.20	0.44	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	0.40	0.88	0.40	0.88
25	1	14	3.8	0.27	0.60	0.34	0.75	4 – 8	58 – 116	0.011	0.0004	0.15	0.60	1.32	0.80	1.76
40	1½	45	4.5	0.60	1.32	0.75	1.65	4 – 8	58 – 116	0.035	0.0012	0.20	1.36	3	1.6	3.52
50	2	80	4.8	0.94	2.07	1.10	2.43	4 – 8	58 – 116	0.047	0.0017	0.25	2.10	4.63	2.10	4.63

			with pneumatic actuator, double acting													
mm	inch	Conductance	Turns per stroke	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
100	4	440	–	–	–	–	–	4.5 – 7	65 – 102	0.330	0.0117	1	7.38	16.27	8.80	19.40
160	6	1000	–	–	–	–	–	4.5 – 7	65 – 102	0.380	0.0134	2	12.54	27.65	12.20	26.80
200	8	2000	–	–	–	–	–	5 – 7	73 – 102	3.100	0.1095	2	–	–	32.25	71.09
250	10	3100	–	–	–	–	–	5 – 7	73 – 102	3.100	0.1095	2	–	–	46.95	103.51

INLINE VALVES

			with manual actuator					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			
mm	inch			kg	lbs	kg	lbs	bar	psi	l	ft ³		kg	lbs	kg	lbs
16	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	–	–

			with pneumatic actuator, single acting with opening spring (NO)												
mm	inch	Conductance (molecular flow)	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
16	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

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Other solenoid valve voltage (standard 24VDC)
- Solenoid valve with manual emergency operation
- Bakeable position indicator: actuator 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

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

ORDERING INFORMATION

FOR STANDARD VALVES

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

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
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

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
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)

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

	DN		Ordering numbers	
	mm	inch	Angle valve	
			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)

ORDERING INFORMATION

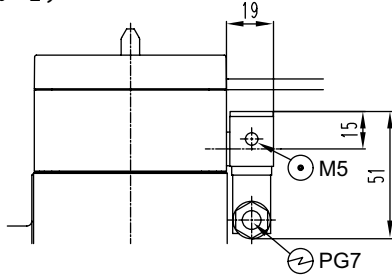
FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 24432-KA42-X, X = position indicator bakeable to 200 °C

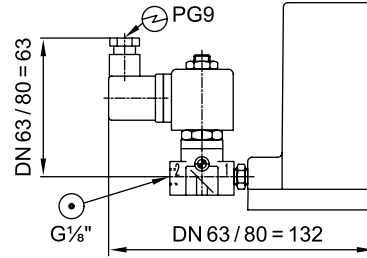
SOLENOID VALVES

Solenoid valve
DN 10 – 50 (3/8" – 2")



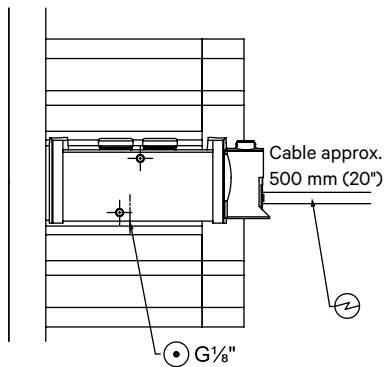
Ordering numbers: 24... -... **31/41**
24... -... **32/42**

Solenoid valve
DN 63 – 80 (2 1/2" – 3")



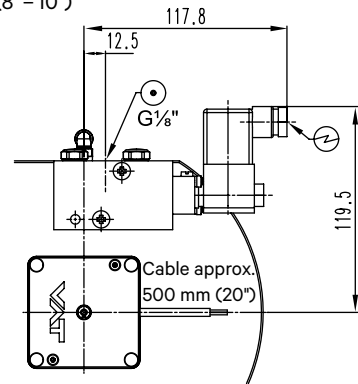
Ordering numbers: 24... -... **31/41**

Solenoid valve
DN 100 – 160 (4" – 6")



Ordering numbers: 24... -... **31/41**
24... -... **34/44**

Solenoid valve
DN 200 – 250 (8" – 10")

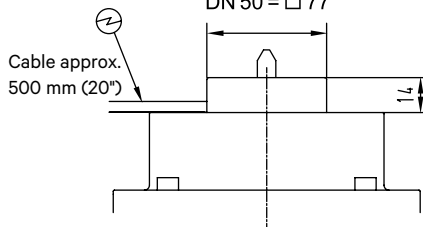


Ordering numbers: 24... -... **34/44**

POSITION INDICATOR

Position indicator
DN 10 – 250 (3/8" – 10")

DN 10 / 16 = □ 40
DN 25 / 63 / 80 / 100 / 160 = □ 48
DN 40 / 200 / 250 = □ 65
DN 50 = □ 77

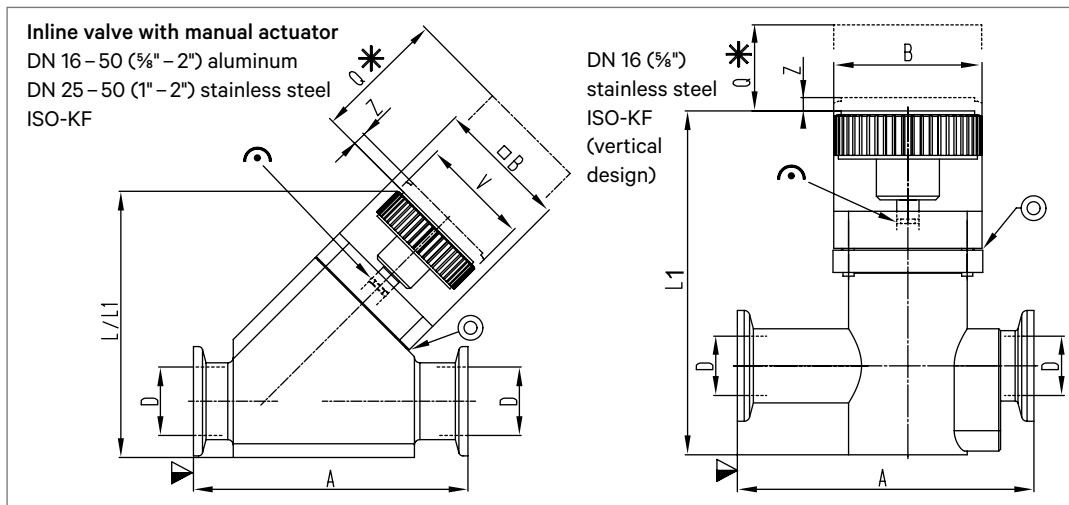
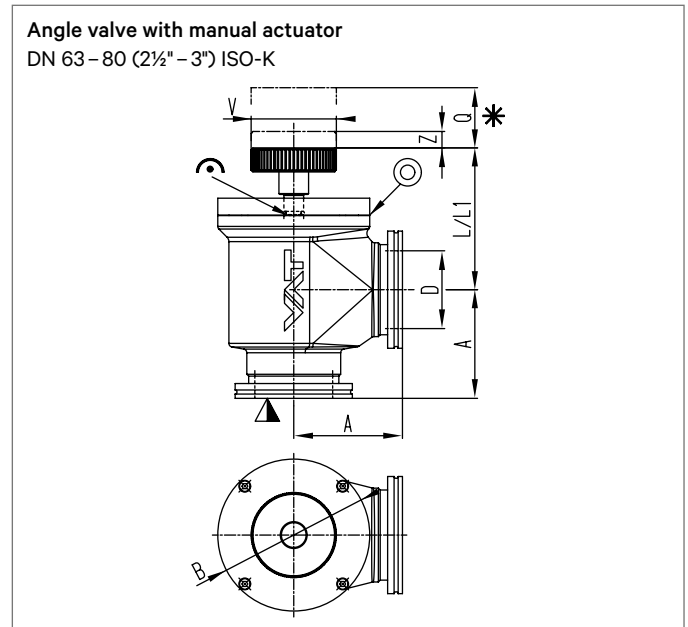
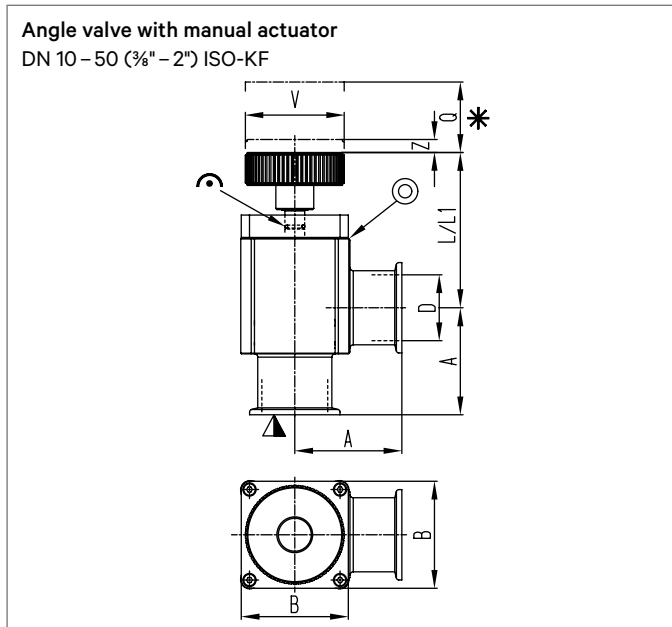


One closing contact each for the open and closed valve positions.

Ordering numbers: 24... -... **21/41**
24... -... **22/42**
24... -... **24/44**

- ⊕ Compressed air connection
- ⊖ Electrical connection

DIMENSIONS



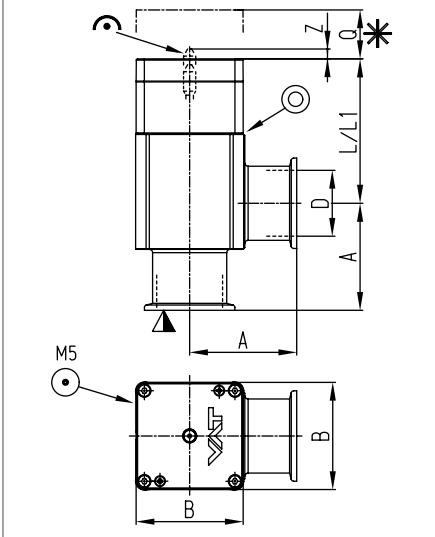
- ▽ Valve seat side
 - * Required for dismantling
 - ⊕ Mechanical position indication
 - ⊙ Leak detection hole
- L = aluminum
L1 = stainless steel

¹⁾ Gate stroke longer due to transmission

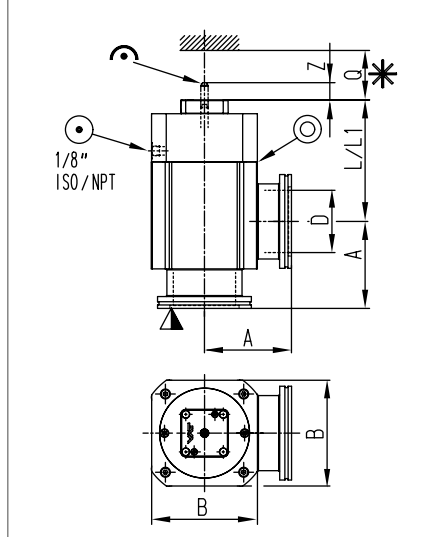
DN	Angle valves								Inline valves				
	mm inch	10 ¾"	16 1"	25 1"	40 1½"	50 2"	63 2½"	80 3"	16 ¾"	25 1"	40 1½"	50 2"	80 3"
A	mm inch	30 1.18	40 1.57	50 1.97	65 2.56	70 2.76	88 3.46	90 3.54	80 3.15	100 3.94	130 5.12	178 7.01	on request
B	mm inch	40 1.57	40 1.57	48 1.89	65 2.56	77 3.03	123 4.84	123 4.84	40 1.57	48 1.89	65 2.56	77 3.03	
D	mm inch	12 0.47	16 0.63	25 0.98	40 1.57	50 1.97	63 2.48	80 3.15	16 0.63	25 0.98	40 1.57	50 1.97	
L	mm inch	-	64.90 2.56	60.90 2.40	94.30 3.71	101.10 3.98	112 4.41	111.70 4.40	90.60 3.57	97 3.82	143.50 5.65	167.20 6.58	
L1	mm inch	67.40 2.65	67.40 2.65	64.30 2.53	97.30 3.83	104.10 4.10	111.70 4.40	-	92.80 3.65	105.80 4.17	152.50 6	175.10 6.89	
Q	mm inch	46 1.81	46 1.81	44 1.73	73.50 2.89	85.50 3.37	105 4.13	105 4.13	46 1.81	44 1.73	73.50 2.89	85.50 3.37	
V	mm inch	40 1.57	40 1.57	40 1.57	60 2.36	60 2.36	60 2.36	60 2.36	40 1.57	40 1.57	60 2.36	60 2.36	
Z ¹⁾	mm inch	3.60 0.14	3.60 0.14	4.70 0.19	7.90 0.31	9.30 0.37	13.30 0.52	13.30 0.52	3.60 0.14	4.70 0.19	7.90 0.31	9.30 0.37	

DIMENSIONS

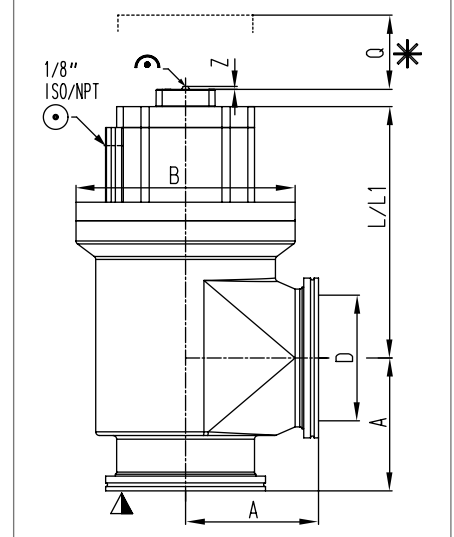
Angle valve with pneumatic actuator,
single acting with closing spring (NC)
or opening spring (NO)
DN 10 – 50 (3/8" – 2") ISO-KF



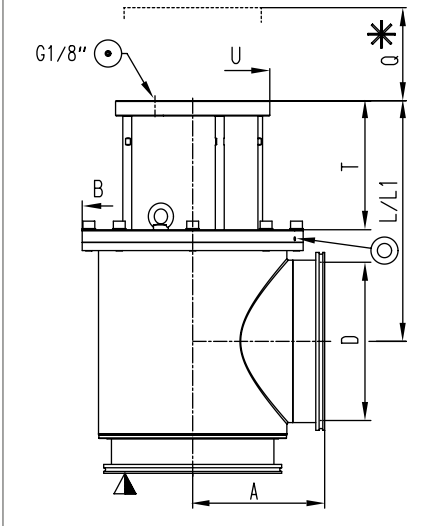
Angle valve with pneumatic actuator,
single acting with closing spring (NC)
DN 63 (2½") ISO-K



Angle valve with pneumatic actuator,
single acting with closing spring (NC)
double acting
DN 80 – 160 (3" – 6") ISO-K



Angle valve with pneumatic actuator,
double acting
DN 200 – 250 (8" – 10") ISO-K



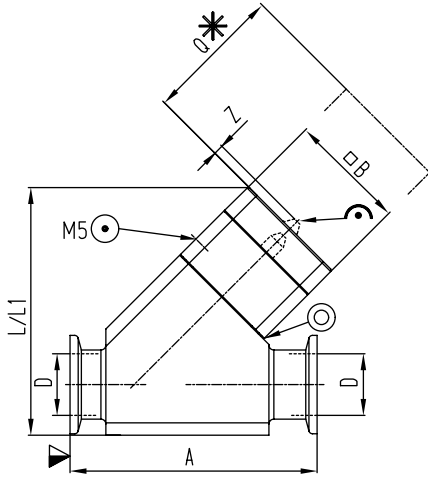
L = aluminum
L1 = stainless steel

	DN	mm	10	16	25	40	50	63	80	100	160	200	250
	inch	3/8	1/2	1	1 1/2	2	2 1/2	3	4	6	8	10	
	A	mm	30	40	50	65	70	88	90	108	138	178	208
	inch		1.18	1.57	1.97	2.56	2.76	3.46	3.54	4.25	5.43	7.01	8.19
	B	mm	40	40	48	65	77	107.60	123	178	220	298	339
	inch		1.57	1.57	1.89	2.56	3.03	4.24	4.84	7.01	8.66	11.73	13.35
	D	mm	12	16	25	40	50	63	80	102	153	213	261
	inch		0.47	0.63	0.98	1.57	1.97	2.48	3.15	4.02	6.02	8.39	10.28
with closing spring	L	mm	-	65.20	60.60	87.70	96	123	109	218.30	221.50	-	-
	inch			2.57	2.39	3.45	3.78	4.84	4.29	8.59	8.72		
with opening spring	L	mm	-	78.90	79.10	110.20	96	-	-	-	-	-	-
	inch			3.11	3.11	4.34	3.78						
double acting	L	mm	-	-	-	-	-	-	-	218.10	218.50	-	-
	inch									8.59	8.60		
double acting	L1	mm	-	-	-	-	-	-	-	215.50	225	324.70	349.20
	inch									8.48	8.86	12.78	13.75
	Q	mm	46	46	44	73.50	85.50	105	115.60	170	200	258	305
	inch		1.81	1.81	1.73	2.89	3.37	4.13	4.55	6.69	7.87	10.16	12.01
	T	mm	-	-	-	-	-	-	-	77.50	84.50	174.10	204
	inch									3.03	3.30	6.80	7.97
	U	mm	-	-	-	-	-	-	-	136	136	208	208
	inch									5.35	5.35	8.19	8.19
	Z	mm	2	2	4	9.50	10.50	31.40	31.40	2.40	2.40	-	-
	inch		0.08	0.08	0.16	0.37	0.41	1.24	1.24	0.09	0.09		

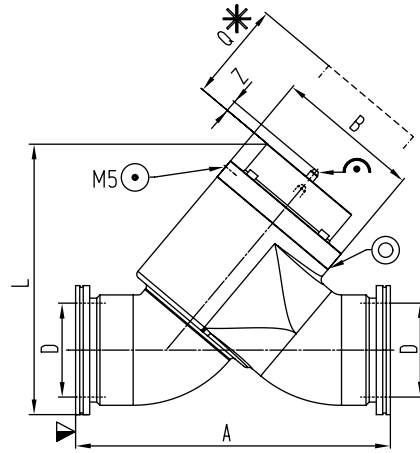
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Mechanical position indication
- ⊙ Leak detection hole

DIMENSIONS

**Inline valve with pneumatic actuator,
single acting with closing spring (NC) or opening spring (NO)
DN 16 – 50 (½" – 2") ISO-KF**



**Inline valve with pneumatic actuator,
single acting with closing spring (NC)
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	16	25	40	50	80
	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch
	mm inch	16 ¾	25 1	40 1½	50 2	80 3
	A	80 3.15	100 3.94	130 5.12	178 7.01	268 10.55
	B	40 1.57	48 1.89	65 2.56	77 3.03	123 4.84
	D	16 0.63	25 0.98	40 1.57	50 1.97	80 3.15
with closing spring	L	91.50 3.60	100.30 3.95	140.90 5.55	170.10 6.70	230.50 9.07
	L1	93 3.66	108.90 4.29	149.90 5.90	171.80 6.76	-
with opening spring	L	102.10 4.02	118 4.65	157.20 6.19	187.80 7.39	-
	L1	106.70 4.20	123.20 4.85	166 6.54	189.70 7.47	-
	Q	46 1.81	44 1.73	73.50 2.89	85.50 3.37	150 5.91
	Z	2 0.08	4 0.16	9.50 0.37	10.50 0.41	31.40 1.24

HV ANGLE / INLINE VALVE, SERIES 26.4 / 26.5

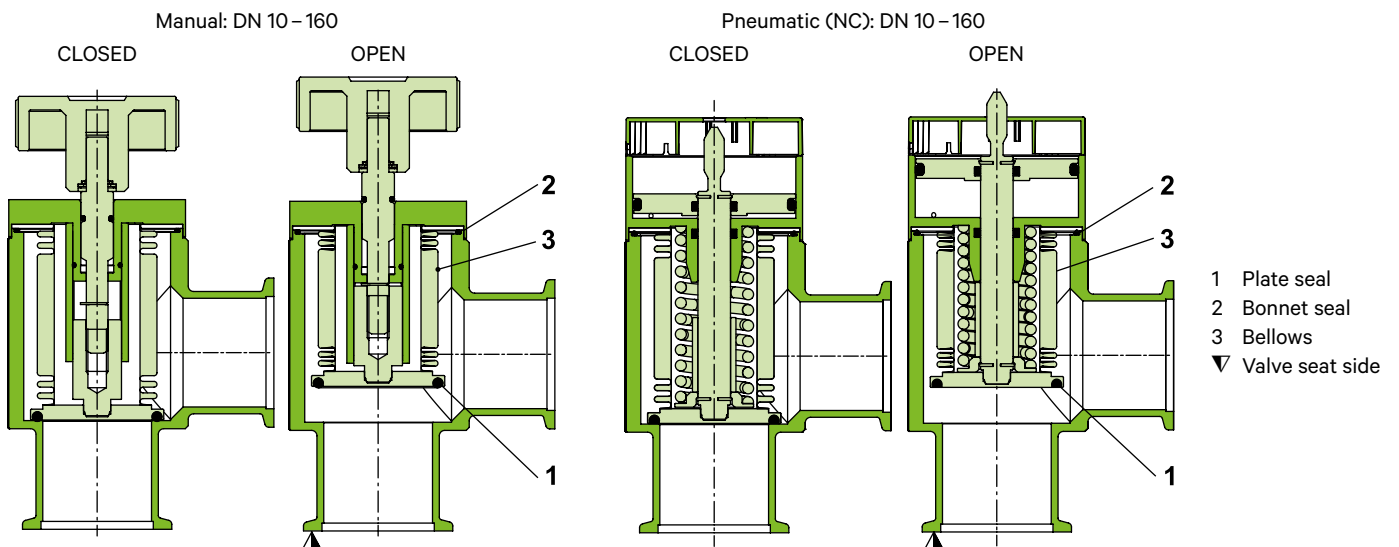
For pumping and venting of HV systems.



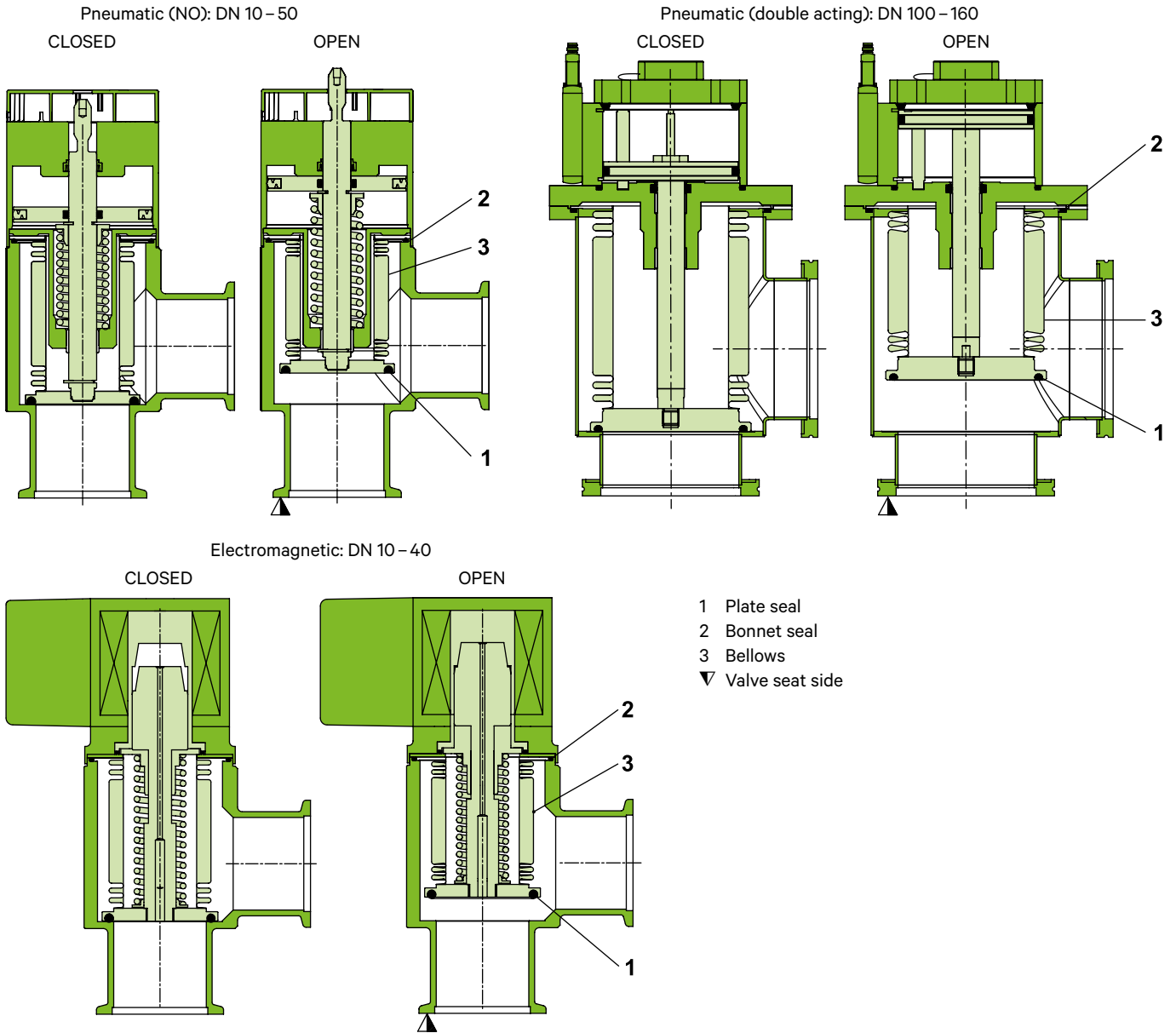
MAIN FEATURES

Sizes	DN 10 – 160 mm (3/8" – 6")
Actuators	manual: with removable handwheel pneumatic: single acting with closing spring (NC) or opening spring (NO), or double acting electromagnetic: single acting with closing spring (NC)
Body material	aluminum or stainless steel
Feedthrough	bellows
Standard flanges	ISO-KF, ISO-K

FUNCTIONAL PRINCIPLE



FUNCTIONAL PRINCIPLE



TECHNICAL DATA (ANGLE AND INLINE VALVES)

Leak rate	Valve body, valve seat		$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$	
Pressure range	Valve with manual/pneumatic actuator	DN 10 – 50	$1 \cdot 10^{-8} \text{ mbar to 5 bar (abs)}$	
		DN 63 – 80	$1 \cdot 10^{-8} \text{ mbar to 4 bar (abs)}$	
		DN 100 – 160	$1 \cdot 10^{-8} \text{ mbar to 2 bar (abs)}$	
	Valve with electromagnetic actuator	DN 10 – 40	$1 \cdot 10^{-8} \text{ mbar to 2 bar (abs)}$	
Differential pressure on the plate	Valve with manual/pneumatic actuator	In opening direction	DN 10 – 50	$\leq 2.0 \text{ bar}$
			DN 63 – 160	$\leq 1.2 \text{ bar}$
		In closing direction	DN 10 – 50	$\leq 5.0 \text{ bar}$
			DN 63 – 80	$\leq 4.0 \text{ bar}$
		Valve with electromagnetic actuator	DN 100 – 160	$\leq 2.0 \text{ bar}$
			DN 10 – 40	$\leq 2.0 \text{ bar}$
Differential pressure at opening			$\leq 1 \text{ bar}$	

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Cycles until first service ¹⁾	Valve with manual actuator	DN 10 – 160	10 000
	Valve with pneumatic actuator	DN 10 – 80	3 million (NC, NO)
		DN 100 – 160	1 million (NC, double acting)
	Valve with electromagnetic actuator	DN 10 – 40	200 000
Temperature ²⁾	Valve body: valve with manual/pneumatic actuator		≤ 150 °C
	valve with electromagnetic actuator		≤ 50 °C
	Actuator: manual/pneumatic		≤ 120 °C
	electromagnetic		≤ 50 °C
Solenoid valve & position indicator	DN 10 – 80	≤ 80 °C	
	DN 100 – 160	≤ 50 °C	
Material	Aluminum valve body	DN 16 – 63	EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315)
		DN 80 – 160	EN AC-42000
	Stainless steel valve body	DN 10 – 50	AISI 304 (1.4301)
		DN 63 – 160	AISI 316L (1.4404)
			AISI 316L (1.4404, 1.4435)
Plate		AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571)	
Bellows		AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571)	
Seal	Bonnet, plate		FKM (Viton®)
Feedthrough			bellows
Mounting position			any
Solenoid valve	DN 10 – 80		24 V DC, 2.5 W (others on request)
	DN 100 – 160		24 V DC, 1.0 W (others on request)
Position indicator: contact rating	Voltage: valve with manual/pneumatic actuator		5 – 50 V AC / DC
	valve with electromagnetic actuator		max. 48 V AC / DC
Current: valve with manual/pneumatic actuator			5 – 100 mA
valve with electromagnetic actuator			max. 500 mA
Mains voltage: valve with electromagnetic actuator			100 – 120 V / 200 – 240 V / 50 – 60 Hz
Operating frequency: valve with electromagnetic actuator			max. 15 min ⁻¹ at 20 °C
Valve position indication			visual (mechanical)

¹⁾ Tested at room temperature under clean and static conditions.

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

ANGLE VALVES

DN (nominal I. D.)		Conductance (molecular flow)		Turns per stroke		with manual actuator				with pneumatic actuator, single acting with closing spring (NC)									
						Weight				Weight									
						Aluminum valve		Stainless steel valve		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time		Aluminum valve		Stainless steel valve	
mm	inch	ls ⁻¹	n	kg	lbs	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	-	-	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	1.050	0.0371	2	14	31	14	31			

ANGLE VALVES

			with pneumatic actuator, single acting with opening spring (NO)								
DN (nominal I.D.)		Conductance (molecular flow)						Weight			
mm	inch		ls ⁻¹	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time s	Aluminum valve		Stainless steel valve
			bar	psi	l	ft ³			kg	lbs	kg
10	3/8	3	4 – 8	58 – 116	0.004	0.0001	0.10	–	–	0.45	0.99
16	5/8	5	4 – 8	58 – 116	0.004	0.0001	0.10	0.45	0.99	0.50	1.10
25	1	14	4 – 8	58 – 116	0.011	0.0004	0.15	0.60	1.32	0.70	1.54
40	1½	45	4 – 8	58 – 116	0.035	0.0012	0.20	1.28	2.82	1.40	3.09
50	2	80	4 – 8	58 – 116	0.047	0.0017	0.25	2	4.41	2.10	4.63
			with pneumatic actuator, double acting								
100	4	440	4.5 – 7	65 – 102	0.330	0.0117	1	7.38	16.27	7.9	17.42
160	6	1000	4.5 – 7	65 – 102	0.380	0.0134	2	12.54	27.65	10.7	23.59

INLINE VALVES

			with manual actuator				with pneumatic actuator, single acting with closing spring (NC)									
DN (nominal I.D.)		Conductance (molecular flow)	Turns per stroke	Weight									Weight			
mm	inch			ls ⁻¹	Aluminum valve		Stainless steel valve		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time s	Aluminum valve		Stainless steel valve
			kg	lbs	kg	lbs	bar	psi	l	ft ³		kg		lbs	kg	lbs
16	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	–	–
			with pneumatic actuator, single acting with opening spring (NO)													
16	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					

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ANGLE & INLINE VALVES

with electromagnetic actuator													
DN (nominal I. D.)		Conductance (molecular flow)	Starting power	Holding power	Closing / opening time	Weight							
						Angle valve				Inline valve			
mm	inch	ls ⁻¹	W	W	s	aluminum		stainless steel		aluminum		stainless steel	
						kg	lbs	kg	lbs	kg	lbs	kg	lbs
10	¾	3	700	10	0.2	–	–	1.30	2.90	–	–	–	–
16	¾	5	700	10	0.2	1.30	2.90	1.30	2.90	1.30	2.90	1.40	3.10
25	1	14	700	10	0.2	1.40	3.10	1.40	3.09	1.50	3.30	1.50	3.30
40	1½	45	700	10	0.2	1.80	4	2	4.40	2.20	4.85	1.65	3.64

 OPTIONS,
CUSTOMIZED SOLUTIONS

ACTUATOR (manual & pneumatic)

- Other solenoid valve voltage (standard 24VDC)
- Solenoid valve with manual emergency operation
- Bakeable position indicator: actuator bakeable to 120 °C or 200 °C
- Common connector for solenoid valve and position indicator (up to 48V only)
- Customer specified actuators

VALVE

- CF flanges
- Other sealing materials
- Customer specified bodies

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

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

 ORDERING INFORMATION
FOR STANDARD VALVES

Valve with manual actuator
removable handwheel

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	¾	–	26420-KE01	–	–
	16	¾	26424-KA01	26424-KE01	26524-KA01	26524-KE01
	25	1	26428-KA01	26428-KE01	26528-KA01	26528-KE01
	40	1½	26432-KA01	26432-KE01	26532-KA01	26532-KE01
	50	2	26434-KA01	26434-KE01	26534-KA01	26534-KE01
ISO-K	63	2½	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

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
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

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
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)

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

	DN		Ordering numbers	
	mm	inch	Angle valve	
			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
 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

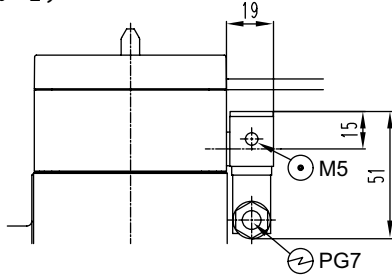
ORDERING INFORMATION
 FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
 Example: 26432-KA42-X, X = position indicator bakeable to 200 °C

E

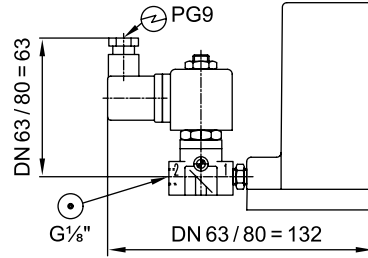
SOLENOID VALVES

Solenoid valve
DN 10 – 50 (3/8" – 2")



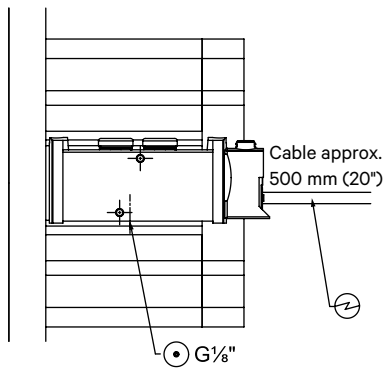
Ordering numbers: 26 **31/41**
26 **32/42**

Solenoid valve
DN 63 – 80 (2 1/2" – 3")



Ordering numbers: 26 **31/41**

Solenoid valve
DN 100 – 160 (4" – 6")

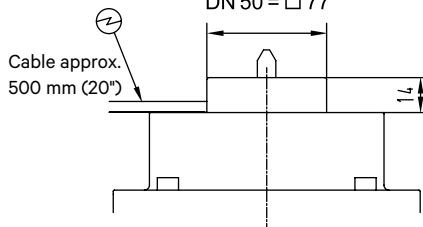


Ordering numbers: 26 **31/41**
26 **34/44**

POSITION INDICATOR

Position indicator
DN 10 – 160 (3/8" – 6")

DN 10 / 16 = □ 40
DN 25 / 63 / 80 / 100 / 160 = □ 48
DN 40 / 200 / 250 = □ 65
DN 50 = □ 77

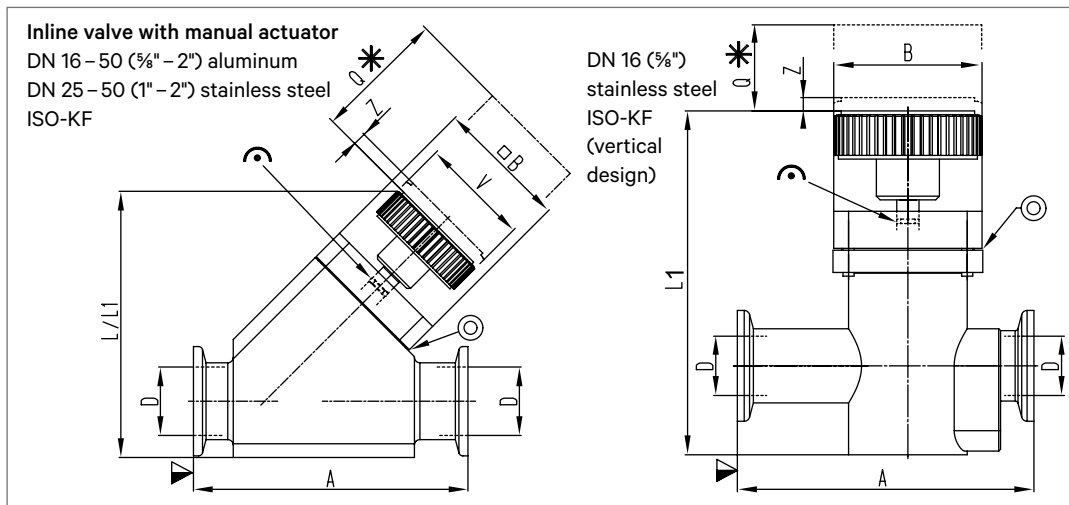
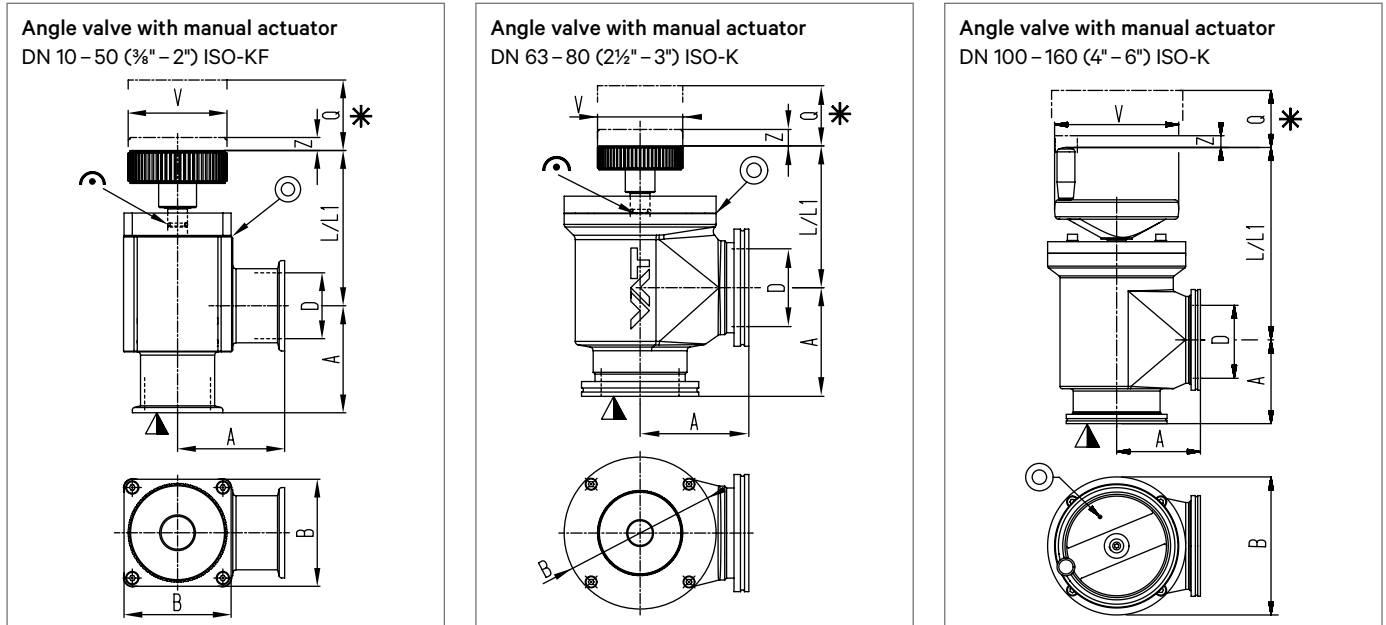


One closing contact each for the open and closed valve positions.

Ordering numbers: 26 **21/41**
26 **22/42**
26 **24/44**

- ⊕ Compressed air connection
- ⊖ Electrical connection

DIMENSIONS



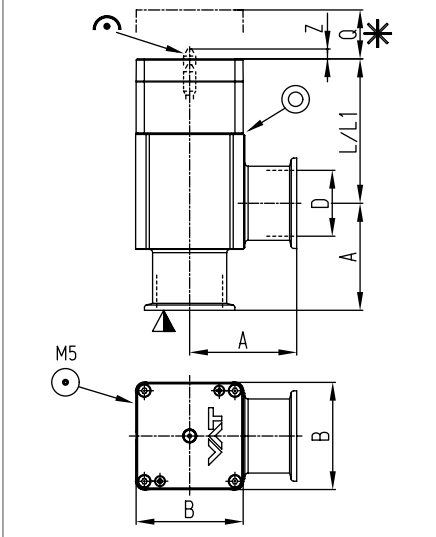
- ▼ Valve seat side
 - * Required for dismantling
 - ☉ Mechanical position indication
 - ⊗ Leak detection hole
- L = aluminum
L1 = stainless steel

¹⁾ Gate stroke longer due to transmission

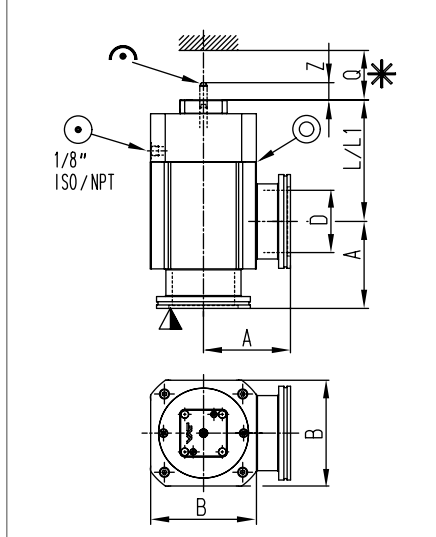
DN	Angle valves										Inline valves				
	mm inch	10 3/8	16 1/2	25 1	40 1 1/2	50 2	63 2 1/2	80 3	100 4	160 6	16 3/8	25 1	40 1 1/2	50 2	80 3
A	mm inch	30 1.18	40 1.57	50 1.97	65 2.56	70 2.76	88 3.46	90 3.54	108 4.25	138 5.43	80 3.15	100 3.94	130 5.12	178 7.01	on request
B	mm inch	40 1.57	40 1.57	48 1.89	65 2.56	77 3.03	123 4.84	123 4.84	154 6.06	215 8.46	40 1.57	48 1.89	65 2.56	77 3.03	
D	mm inch	12 0.47	16 0.63	25 0.98	40 1.57	50 1.97	63 2.48	80 3.15	100 3.94	153 6.02	16 0.63	25 0.98	40 1.57	50 1.97	
L	mm inch	-	64.90 2.56	60.90 2.40	94.30 3.71	101.10 3.98	112 4.41	111.70 4.40	225.10 8.86	240.50 9.47	90.60 3.57	97 3.82	143.50 5.65	167.20 6.58	
L1	mm inch	67.40 2.65	67.40 2.65	64.30 2.53	97.30 3.83	104.10 4.10	111.70 4.40	-	215.60 8.49	244.70 9.63	92.80 3.65	105.80 4.17	152.50 6	175.10 6.89	
Q	mm inch	46 1.81	46 1.81	44 1.73	73.50 2.89	85.50 3.37	105 4.13	105 4.13	170 6.69	195 7.68	46 1.81	44 1.73	73.50 2.89	85.50 3.37	
V	mm inch	40 1.57	40 1.57	40 1.57	60 2.36	60 2.36	60 2.36	60 2.36	100 3.94	160 6.30	40 1.57	40 1.57	60 2.36	60 2.36	
Z ¹⁾	mm inch	360 0.14	360 0.14	470 0.19	790 0.31	930 0.37	1330 0.52	1330 0.52	22 0.87	2720 1.07	360 0.14	470 0.19	790 0.31	930 0.37	

DIMENSIONS

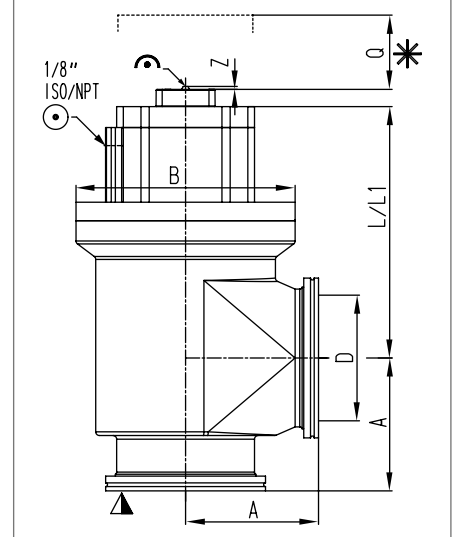
Angle valve with pneumatic actuator,
single acting with closing spring (NC)
or opening spring (NO)
DN 10 – 50 (3/8" – 2") ISO-KF



Angle valve with pneumatic actuator,
single acting with closing spring (NC)
DN 63 (2 1/2") ISO-K



Angle valve with pneumatic actuator,
single acting with closing spring (NC)
double acting
DN 80 – 160 (3" – 6") ISO-K



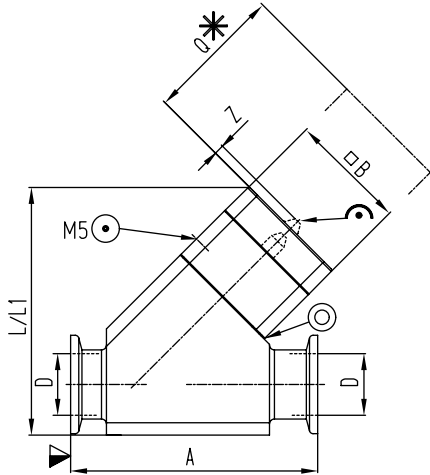
L = aluminum
L1 = stainless steel

	DN	10	16	25	40	50	63	80	100	160
	mm inch	mm 3/8"	mm 5/8"	mm 1"	mm 1 1/2"	mm 2"	mm 2 1/2"	mm 3"	mm 4"	mm 6"
	A	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	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	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	-	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
with closing spring	L1	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	-	78.90 3.11	79.10 3.11	110.20 4.34	96 3.78	-	-	-	-
with opening spring	L1	67.70 2.67	81.30 3.20	82.50 3.25	113.20 4.46	124 4.88	-	-	-	-
	L	-	-	-	-	-	-	-	218.10 8.59	218.50 8.60
double acting	L1	-	-	-	-	-	-	-	211.50 8.33	225 8.86
	Q	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	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

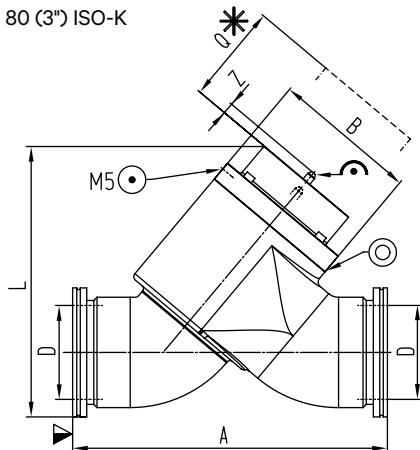
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ↻ Mechanical position indication
- ⊙ Leak detection hole

DIMENSIONS

Inline valve with pneumatic actuator, single acting with closing spring (NC) or opening spring (NO)
 DN 16 – 50 (3/8" – 2") ISO-KF



DN 80 (3") ISO-K



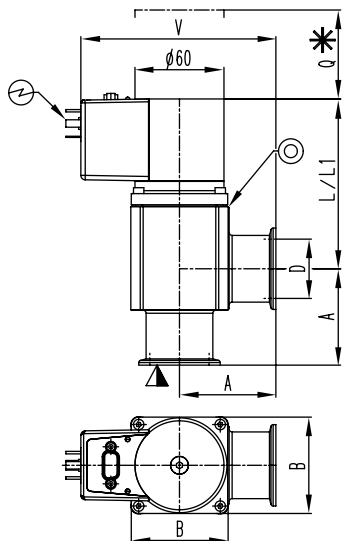
L = aluminum
 L1 = stainless steel

	DN	16		25		40		50		80	
		mm	inch	3/8	1	1 1/2	2	3			
with closing spring	A	80	3.15	100	3.94	130	5.12	178	7.01	268	10.55
	B	40	1.57	48	1.89	65	2.56	77	3.03	123	4.84
	D	16	0.63	25	0.98	40	1.57	50	1.97	80	3.15
with opening spring	L	91.50	3.60	100.30	3.95	140.90	5.55	170.10	6.70	230.50	9.07
	L1	93	3.66	108.90	4.29	149.90	5.90	171.80	6.76	-	-
with opening spring	L	102.10	4.02	118	4.65	157.20	6.19	187.80	7.39	-	-
	L1	106.70	4.20	123.20	4.85	166	6.54	189.70	7.47	-	-
Q	mm	46	1.81	44	1.73	73.50	2.89	85.50	3.37	150	5.91
	inch	1.81	0.08	1.73	0.16	2.89	0.37	3.37	0.41	5.91	1.24

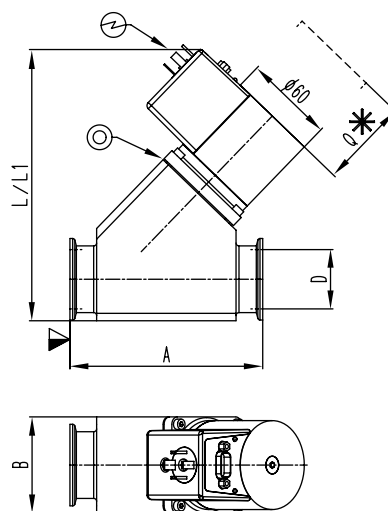
- ▽ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Mechanical position indication
- ⊕ Control electronics connection
- ⊙ Leak detection hole

L = aluminum
 L1 = stainless steel

Angle valve with electromagnetic actuator, single acting with closing spring (NC)
 DN 10 – 40 (3/8" – 1 1/2") ISO-KF



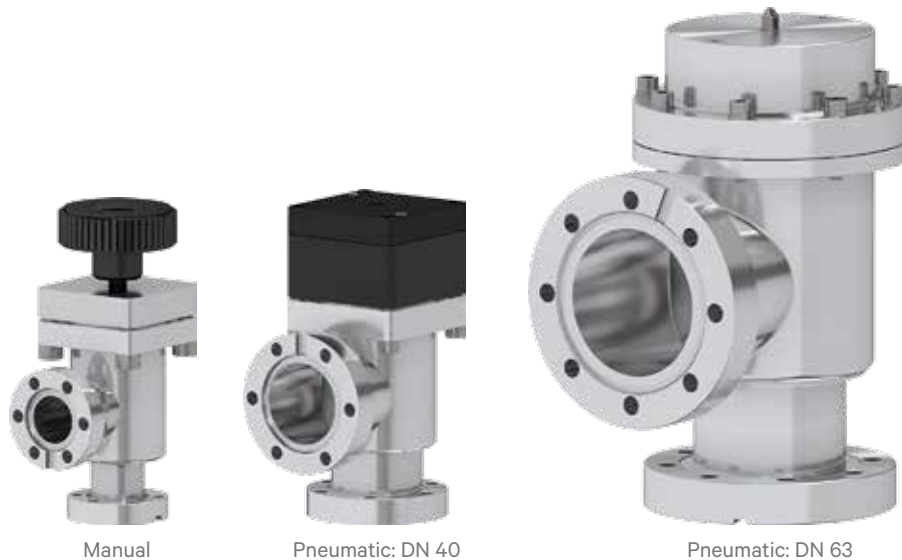
Inline valve with electromagnetic actuator, single acting with closing spring (NC)
 DN 16 – 40 (3/8" – 1 1/2") ISO-KF



	DN	10		16		25		40	
		mm	inch	3/8	5/8	1	1 1/2		
Angle valve	A	30	1.18	40	1.57	50	1.97	65	2.56
Inline valve	A	-	-	80	3.15	100	3.94	130	5.12
	B	40	1.57	40	1.57	48	1.89	65	2.56
Angle valve	D	10	0.39	16	0.63	25	0.98	40	1.57
	L	-	-	100	3.94	93	3.66	114	4.49
Inline valve	L	-	-	148	5.83	153	6.03	183	7.20
	L1	-	-	149.50	5.89	161	6.34	192	7.56
Q	mm	46	1.81	46	1.81	44	1.73	73.50	2.89
	inch	1.81	0.08	1.81	0.16	1.73	0.41	2.89	0.41
V	mm	96.50	3.80	106.50	4.20	116.50	4.59	131.50	5.18
	inch	3.80	0.42	4.20	0.45	4.59	0.51	5.18	0.51

UHV ANGLE VALVE, SERIES 28.4

For pumping and venting of UHV systems when an extremely low outgassing rate is important.



Extremely low outgassing rate

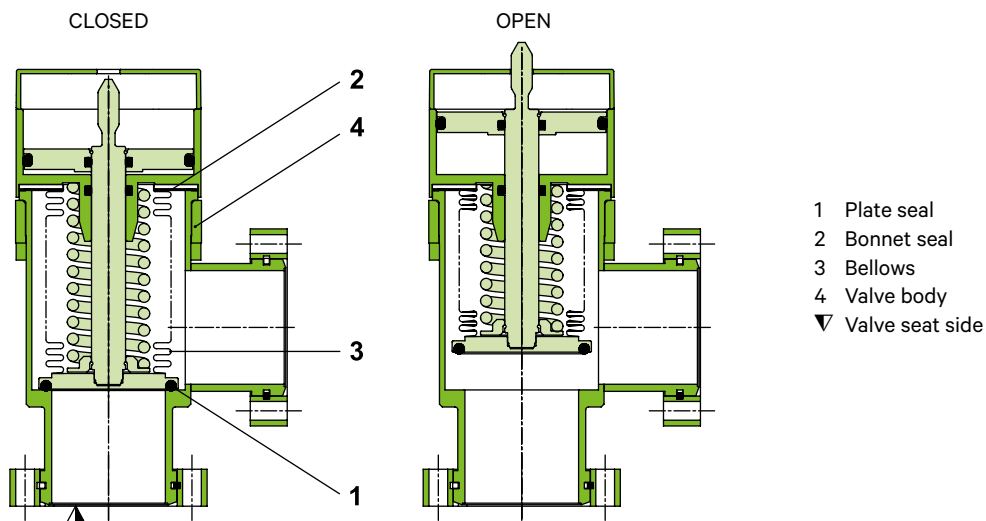
Resistant against high differential pressure

Stationary rotatable CF flange

MAIN FEATURES

Sizes	DN 16 – 63 mm ($\frac{5}{8}$ " – 2½")
Actuators	manual: with removable handwheel pneumatic: single acting with closing spring (NC)
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-R

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Valve body Valve seat	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹ $< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$5 \cdot 10^{-10}$ mbar to 5 bar (abs)
Differential pressure on the plate	In opening direction In closing direction	≤ 2 bar ≤ 5 bar
Differential pressure at opening		≤ 1 bar
Cycles until first service		3 million
Temperature ¹⁾	Valve body Manual actuator Pneumatic actuator Solenoid valve & position indicator	≤ 150 °C ≤ 120 °C ≤ 150 °C ≤ 80 °C
Material	Valve body DN 16, 40 DN 63 Plate Bellows	AISI 304 (1.4301) AISI 316L (1.4404, 1.4435) AISI 316L (1.4404, 1.4435) AISI 316L (1.4404, 1.4435)
Seal	Bonnet Plate	metal FKM (Viton®)
Feedthrough		bellows
Mounting position		any
Solenoid valve		24 V DC (others on request)
Position indicator: contact rating	Voltage Current	5 – 50 V AC / DC 5 – 100 mA
Valve position indication		visual (mechanical)

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

				with manual actuator			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	5/8	1 1/3	5	3.6	0.30	0.70	4 – 8	58 – 116	0.004	0.0001	0.10	0.40	0.90
40	1 1/2	2 3/4	45	4.5	1.50	3.30	4 – 8	58 – 116	0.035	0.0012	0.55	1.60	3.50
63	2 1/2	4 1/2	160	6.6	5.30	11.70	4 – 8	58 – 116	0.112	0.0040	0.70	6.00	13.20

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Other solenoid valve voltage (standard 24VDC)
- Manual actuator bakeable to 200 °C
- Pneumatic actuator bakeable to 150 °C
- Bakeable position indicator: actuator bakeable to 120 °C or 150 °C

VALVE

- Customer specified flanges
- ISO-KF, ISO-K flanges
- Other sealing materials
- Customer specified bodies

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 33

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with manual actuator
removable handwheel

DN		Ordering numbers
mm	inch	
16	¾"	CF-R 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	
16	¾"	CF-R 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)

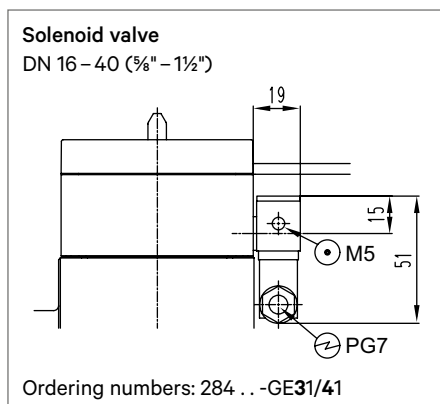
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

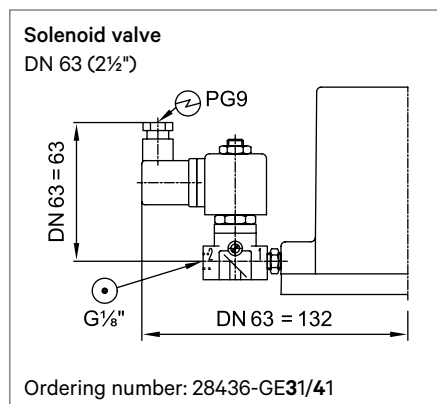
Basic ordering number plus «-X»: -X to be specified

Example: 28432-GE41-X, X = position indicator bakeable to 200 °C

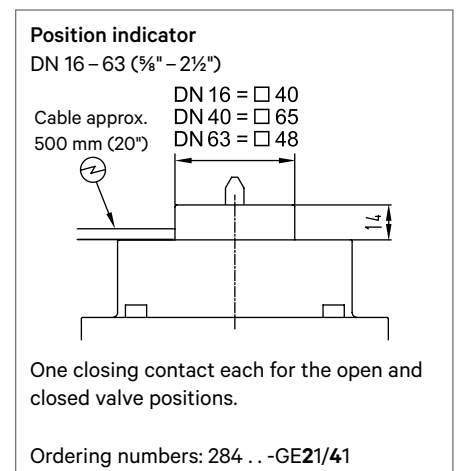
SOLENOID VALVES



- ⊙ Compressed air connection
- ⊕ Electrical connection

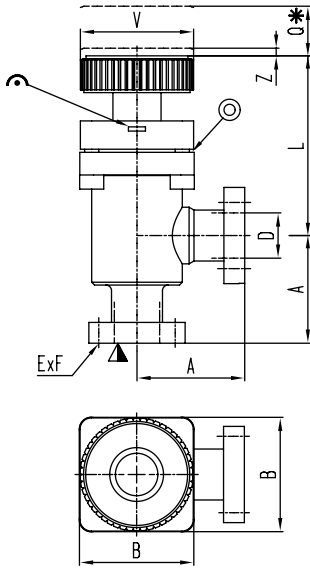


POSITION INDICATOR

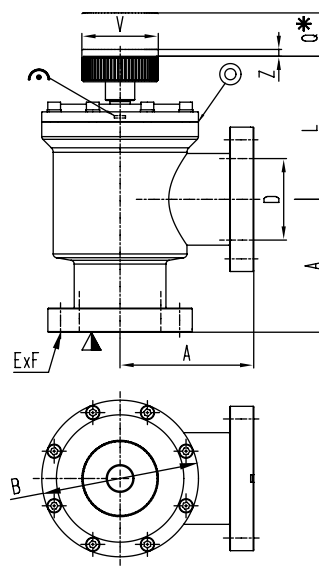


DIMENSIONS

Valve with manual actuator
DN 16 – 40 (5/8" – 1½") CF-R

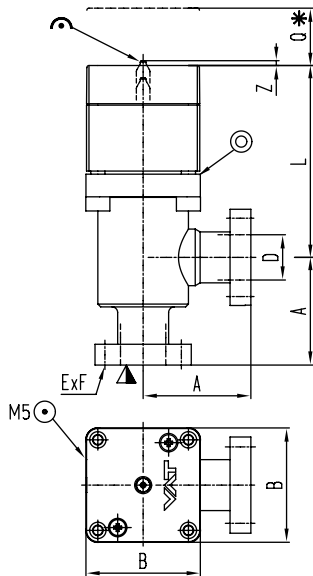


Valve with manual actuator
DN 63 (2½") CF-R

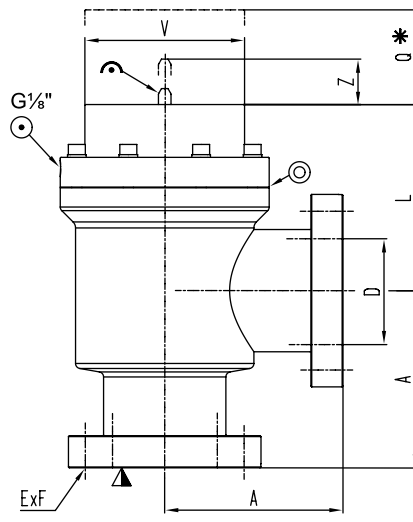


DN	mm	16	40	63
inch		5/8	1½	2½
A	mm	38	63	105
inch		1.50	2.48	4.13
B	mm	40	65	123
inch		1.57	2.56	4.84
D	mm	16	40	64
inch		0.63	1.57	2.52
E × F	mm	6 × 4.30	6 × 6.60	8 × 8.40
inch		6 × 0.17	6 × 0.26	8 × 0.33
L	mm	67.30	97.40	111.70
inch		2.65	3.83	4.40
Q	mm	45	73.50	105
inch		1.77	2.89	4.13
V	mm	40	60	60
inch		1.57	2.36	2.36
Z	mm	3.60	7.90	13.40
inch		0.14	0.31	0.53

Valve with pneumatic actuator, single acting with closing spring (NC)
DN 16 – 40 (5/8" – 1½") CF-R



Valve with pneumatic actuator, single acting with closing spring (NC)
DN 63 (2½") CF-R



DN	mm	16	40	63
inch		5/8	1½	2½
A	mm	38	63	105
inch		1.50	2.48	4.13
B	mm	40	65	-
inch		1.57	2.56	-
D	mm	16	40	64
inch		0.63	1.57	2.52
E × F	mm	6 × 4.30	6 × 6.60	8 × 8.40
inch		6 × 0.17	6 × 0.26	8 × 0.33
L	mm	67.80	90.80	109.60
inch		2.67	3.57	4.31
Q	mm	45	71	105
inch		1.77	2.80	4.13
V	mm	-	-	94
inch		-	-	3.70
Z	mm	2	9.50	31.40
inch		0.08	0.37	1.24

- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⌒ Mechanical position indication
- ⊙ Leak detection hole

ANGLE/INLINE VALVE WITH SOFT-PUMP FUNCTION, SERIES 29.0/29.2

For pumping and venting of HV systems when few turbulences, particles, substrate movements and condensation are important.



DN 25 – 50

DN 63 – 160

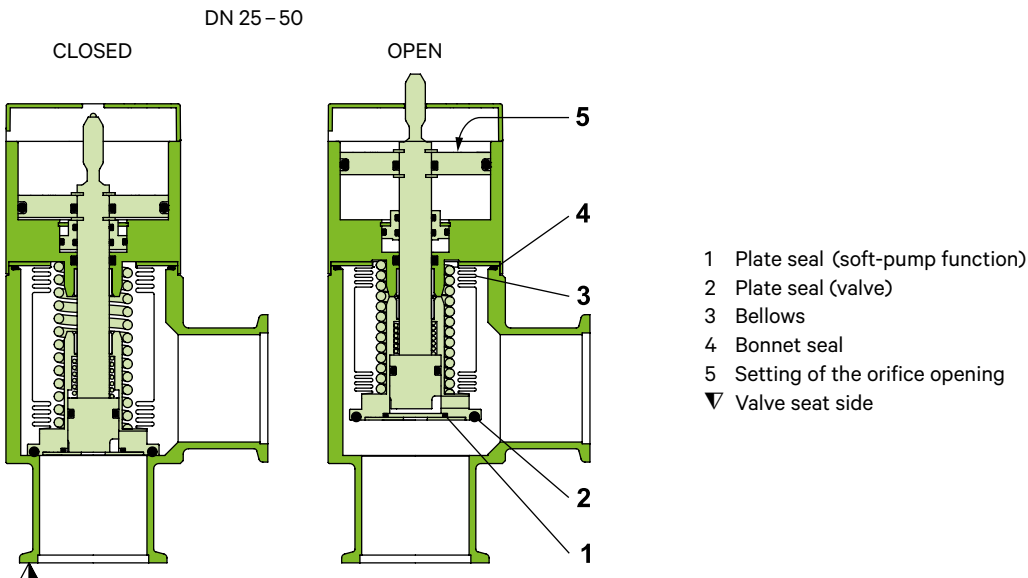
Resistant against differential pressure

Setting of the orifice opening by means of a scale

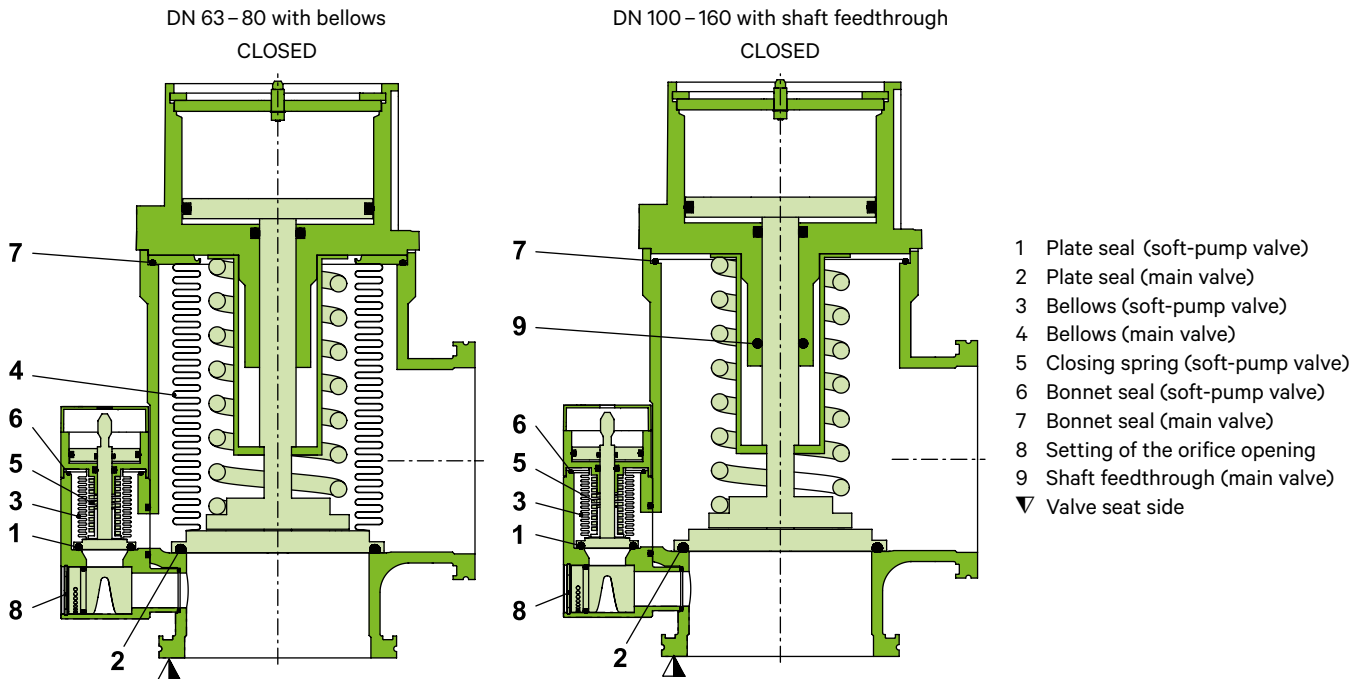
MAIN FEATURES

Sizes	DN 25 – 160 mm (1" – 6")
Actuators	pneumatic DN 25 – 160: single acting with closing spring (NC) pneumatic DN 100 – 160: main valve double acting, soft-pump valve single acting with closing spring (NC)
Body material	aluminum or stainless steel
Feedthrough main valve	DN 25 – 80 bellows DN 100 – 160 shaft feedthrough
Standard flanges	ISO-KF, ISO-K

FUNCTIONAL PRINCIPLE



FUNCTIONAL PRINCIPLE



TECHNICAL DATA (ANGLE AND INLINE VALVES)

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	Main valve body: aluminum	DN 25 – 63	EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315)
		DN 80 – 160	EN AC-42000
	Main valve body: stainless steel	DN 25 – 160	AISI 304 (1.4301), AISI 316L (1.4404)
	Soft-pump valve body		EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315)
	Plate		AISI 316L (1.4404, 1.4435) or AISI 304L (1.4306)
	Bellows		AISI 316L (1.4404, 1.4435), AISI 316Ti (1.4571)
Seal	Bonnet, plate		FKM (Viton®)

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

Feedthrough (main valve)	DN 25 – 80 DN 100 – 160	bellows shaft feedthrough
Mounting position		any
Solenoid valve	DN 25 – 80 DN 63 – 160	24 V DC, 2.5 W (others on request) 24 V DC, 9.0 W (others on request)
Position indicator: contact rating	Voltage Current	5 – 50 V AC / DC 5 – 100 mA
Valve position indication		visual (mechanical)

ANGLE VALVES

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			bar	psi	l	ft ³		With aluminum body		With stainless steel body	
		ls ⁻¹	mm ²					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	9.5	21	12	26
160	6	1000	9 – 270	4.5 – 7	65 – 102	1.050	0.0371	1.5	16.50	36	15.80	34.80

with pneumatic actuator, double acting												
mm	inch	ls ⁻¹	mm ²	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
100	4	440	9 – 270	4.5 – 7	65 – 102	0.330	0.0117	1	9	20	12	26
160	6	1000	9 – 270	4.5 – 7	65 – 102	1.050	0.0371	1.5	13	29	16	35

INLINE VALVES

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			bar	psi	l	ft ³		With aluminum body		With stainless steel body	
		ls ⁻¹	mm ²					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, CUSTOMIZED SOLUTIONS

ACTUATOR (manual & pneumatic)

- Other solenoid valve voltage (standard 24VDC)
- Bakeable position indicator: actuator bakeable to 120 °C

VALVE

- CF flanges
- Other sealing materials
- Customer specified bodies

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the valve: see series 31

ORDERING INFORMATION FOR STANDARD VALVES

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)

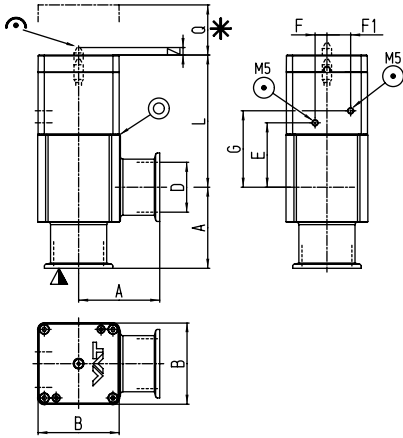
ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

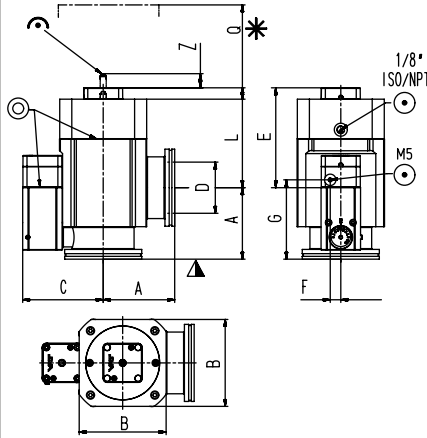
Example: 29028-KA41-X, X = position indicator bakeable to 120 °C

DIMENSIONS

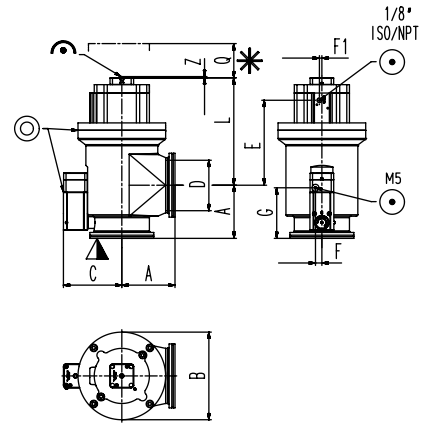
**Aluminum angle valve
with pneumatic actuator,
single acting with closing spring (NC)**
DN 25 – 50 (1" – 2") ISO-KF



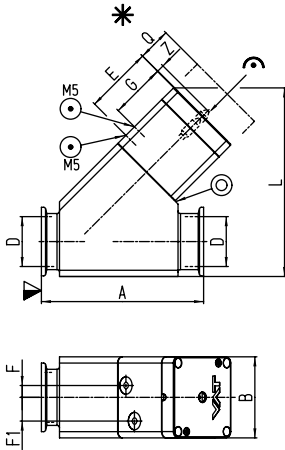
**Aluminum angle valve
with pneumatic actuator,
single acting with closing spring (NC)**
DN 63 (2½") ISO-K



**Aluminum angle valve
with pneumatic actuator,
single acting with closing spring (NC)
double acting**
DN 80 – 160 (3" – 6") ISO-K
DN 100 – 160 (4" – 6") ISO-K



**Aluminum inline valve
with pneumatic actuator,
single acting with closing spring (NC)**
DN 25 – 50 (1" – 2") ISO-KF



DN	Angle valve									Inline valve			
	single acting with closing spring (NC)						double acting			25	40	50	
mm	25	40	50	63	80	100	160	100	160	25	40	50	
inch	1	1½	2	2½	3	4	6	4	6	1	1½	2	
A	50	65	70	88	90	108	138	108	138	100	130	178	
inch	1.97	2.56	2.76	3.46	3.54	4.25	5.43	4.25	5.43	3.94	5.12	7.01	
B	48	65	77	107	126.60	178	220	178	220	48	65	77	
inch	1.89	2.56	3.03	4.21	4.98	5.43	8.66	5.43	8.66	1.89	2.56	3.03	
C	mm	-	-	98.80	107.30	118.30	143.30	118.30	143.30	-	-	-	
inch	inch	-	-	3.89	4.22	4.66	5.64	4.66	5.64	-	-	-	
D	mm	25	40	50	63	80	102	153	102	153	25	40	50
inch	inch	0.98	1.57	1.97	2.48	3.15	4.02	6.02	4.02	6.02	0.98	1.57	1.97
E	mm	40	51	59	71.40	71.40	172.60	166	172.60	166	49.50	55	57
inch	inch	1.57	2	2.32	2.81	2.81	6.80	6.54	6.80	6.54	1.95	2.17	2.24
F	mm	9.50	12.50	13.60	13	13	13	13	13	13	9.50	14	13.60
inch	inch	0.37	0.49	0.54	0.51	0.51	0.51	0.51	0.51	0.51	0.37	0.55	0.54
F1	mm	13	15	15	-	-	5	5	5	5	13	15	15
inch	inch	0.51	0.59	0.59	-	-	0.20	0.20	0.20	0.20	0.51	0.59	0.59
G	mm	49	59	66	97.70	100	102.80	98.70	102.80	98.70	40.50	47	50
inch	inch	1.93	2.32	2.60	3.85	3.94	4.05	3.89	4.05	3.89	1.59	1.85	1.97
L	mm	89.50	106	115.70	109	109	218.30	221.50	218.30	221.50	121	154	184
inch	inch	3.52	4.17	4.56	4.29	4.29	8.59	8.72	8.59	8.72	4.76	6.06	7.24
Q	mm	46	77	85	105	115	170	200	170	200	46	77	85
inch	inch	1.81	3.03	3.35	4.13	4.53	6.69	7.87	6.69	7.87	1.81	3.03	3.35
Z	mm	5.60	11	12.50	31.40	31.40	2.40	2.40	2.40	2.40	5.60	11	12.50
inch	inch	0.22	0.43	0.49	1.24	1.24	0.09	0.09	0.09	0.09	0.22	0.43	0.49

▽ Valve seat side

* Required for dismantling

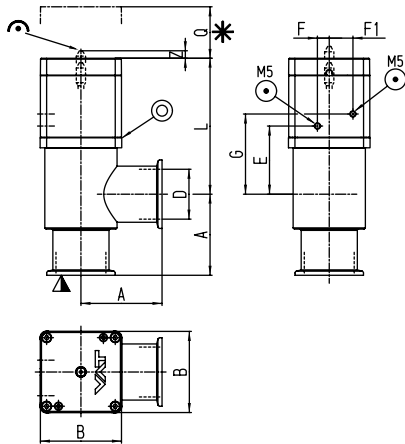
⊙ Compressed air connection

⊕ Mechanical position indication

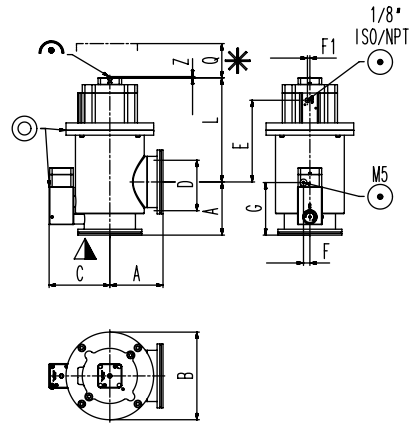
⊙ Leak detection hole

DIMENSIONS

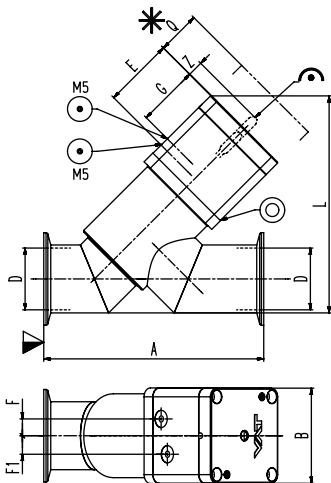
**Stainless steel angle valve
with pneumatic actuator,
single acting with closing spring (NC)
DN 25 – 50 (1" – 2") ISO-KF**



**Stainless steel angle valve
with pneumatic actuator,
single acting with closing spring (NC)
DN 63 – 160 (2½" – 6") ISO-K
double acting
DN 100 – 160 (4" – 6") ISO-K**



**Aluminum inline valve
with pneumatic actuator,
single acting with closing spring (NC)
DN 25 – 50 (1" – 2") ISO-KF**



- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ↻ Mechanical position indication
- ⊙ Leak detection hole

DN	Angle valve								Inline valve		
	single acting with closing spring (NC)				double acting				25	40	50
mm	25	40	50	63	100	160	100	160	25	40	50
inch	1	1½	2	2½	4	6	4	6	1	1½	2
A	50	65	70	88	108	138	108	138	100	130	178
inch	1.97	2.56	2.76	3.46	4.25	5.43	4.25	5.43	3.94	5.12	7.01
B	48	65	77	123	178	220	178	220	48	65	77
inch	1.89	2.56	3.03	4.84	5.43	8.66	5.43	8.66	1.89	2.56	3.03
C	-	-	-	98.30	123.30	143	123.30	143	-	-	-
inch	-	-	-	3.87	4.85	5.63	4.85	5.63	-	-	-
D	25	40	50	63	102	153	102	153	25	40	50
inch	0.98	1.57	1.97	2.48	4.02	6.02	4.02	6.02	0.98	1.57	1.97
E	43	54	52	71	166	172.50	166	172.50	49.50	55	57
inch	1.69	2.13	2.05	2.80	6.54	6.80	6.54	6.80	1.95	2.17	2.24
F	9.50	12.50	13.60	13	13	13	13	13	9.50	14	13.60
inch	0.37	0.49	0.54	0.51	0.51	0.51	0.51	0.51	0.37	0.55	0.54
F1	13	15	15	-	5	5	5	5	13	15	15
inch	0.51	0.59	0.59	-	0.20	0.20	0.20	0.20	0.51	0.59	0.59
G	52	62	69	98	106.80	114.30	106.80	114.30	40.50	47	50
inch	2.05	2.44	2.72	3.86	4.20	4.50	4.20	4.50	1.59	1.85	1.97
L	92.80	109	118.70	109	211.50	228	211.50	228	131	163	176
inch	3.65	4.29	4.67	4.29	8.33	8.98	8.33	8.98	5.16	6.42	6.93
Q	46	77	85	115	170	200	170	200	46	77	85
inch	1.81	3.03	3.35	4.53	6.69	7.87	6.69	7.87	1.81	3.03	3.35
Z	5.60	11	12.50	31.40	2.40	2.40	2.40	2.40	5.60	11	12.50
inch	0.22	0.43	0.49	1.24	0.09	0.09	0.09	0.09	0.22	0.43	0.49

HV CYLINDER VALVE, SERIES 25.0 / 25.1 / 25.2

For pumping and venting of HV systems when maximum conductance is important.



For harsh process environments

Protected gate seal

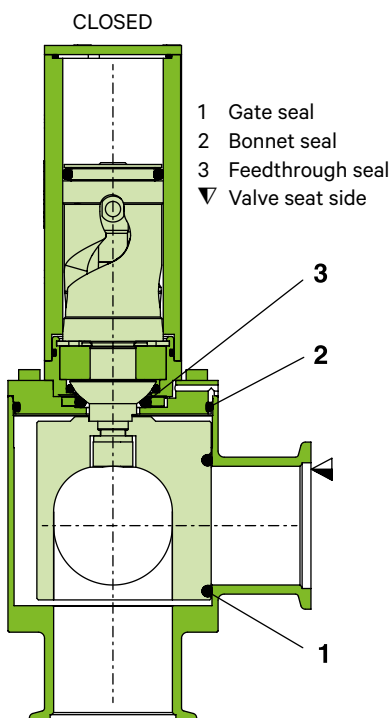
Resistant against differential pressure

Mechanically locked in open and closed position

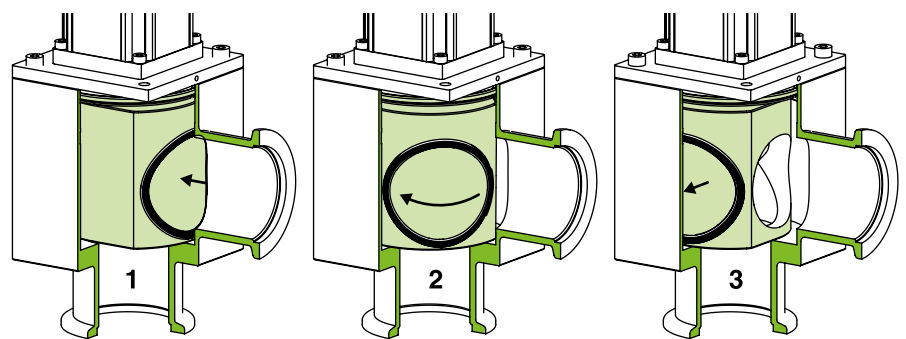
MAIN FEATURES

Sizes	DN 16 – 40 mm (5/8" – 1½")
Actuator	pneumatic: double acting
Body material	aluminum
Standard flanges	ISO-KF, ISO-KF «claw»

FUNCTIONAL PRINCIPLE



The cylinder-shaped gate performs a TILT-TURN-TILT movement. This prevents the gate seal from sliding on the valve seat.



3 steps from CLOSED to OPEN:

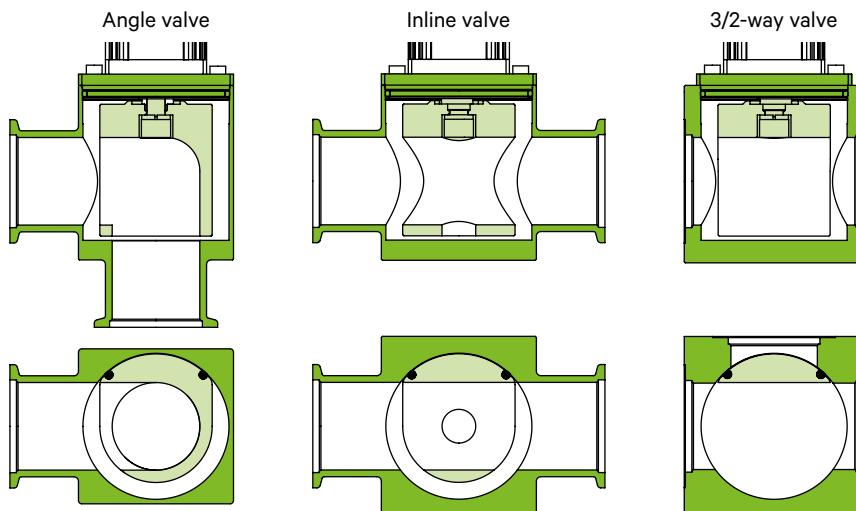
- 1 TILT movement of gate. Gate seal lifts off from valve seat.
- 2 90° TURN of gate towards the open position.
- 3 TILT movement of gate towards the valve body. Gate seal is protected.

MAXIMUM CONDUCTANCE

The conductance is comparable to a 90° elbow (angle valve) or a straight tube (inline valve). The gas flow is not inhibited by the gate.

PROTECTED GATE SEAL

The gate seal is pressed against the valve body in closed and open position. The contact with process gas is minimized.



TECHNICAL DATA

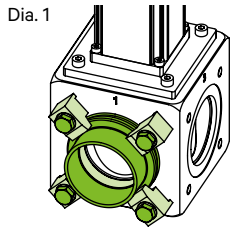
Leak rate	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-8}$ mbar to 3 bar (abs)
Differential pressure on the gate	In opening direction	≤ 1.2 bar
	In closing direction	≤ 3.0 bar
Differential pressure at opening		≤ 1.2 bar
Cycles until first service		100 000
Temperature ¹⁾	Valve body	≤ 120 °C
	Actuator	≤ 120 °C
	Position indicator	≤ 80 °C
Material	Valve body	EN AW-6060 (3.3206), EN AW-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 V DC
	Current	5 – 100 mA
Valve position indication		LED ²⁾

DN (nominal I.D.)		Conductance (molecular flow)				Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
		25.0	25.1	25.2		bar	psi	l	ft ³			
mm	inch	ls ⁻¹	ls ⁻¹	A → B ls ⁻¹	A → C ls ⁻¹							
16	5/8	5	6	8	7	4 – 8	58 – 116	0.032	0.0011	0.6	1.40	3
25	1	16	19	31	24	4 – 8	58 – 116	0.032	0.0011	0.6	1.40	3
40	1½	46	55	90	67	4 – 8	58 – 116	0.032	0.0011	0.6	1.70	3.70

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

²⁾ Valves with position indicator.

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- One-touch fitting for pneumatic tube

VALVE

- Other sealing materials, e. g. FFKM
- Valve DN 40 with flange ISO-KF DN 50 «claw» (Dia. 1)
- Stainless steel version
- Heating cartridge for DN 40

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 31
- Solenoid valve for external mounting

ORDERING INFORMATION

25.0
Angle valve with pneumatic actuator
double acting

DN		Ordering numbers	
mm	inch	ISO-KF	
		without position indicator	with position indicator
16	5/8	25024-KA14	25024-KA24
25	1	25028-KA14	25028-KA24
40	1½	25032-KA14	25032-KA24

25.1
Inline valve with pneumatic actuator
double acting

DN		Ordering numbers	
mm	inch	ISO-KF	
		without position indicator	with position indicator
16	5/8	25124-KA14	25124-KA24
25	1	25128-KA14	25128-KA24
40	1½	25132-KA14	25132-KA24

25.2
3/2-way valve with pneumatic actuator
double acting

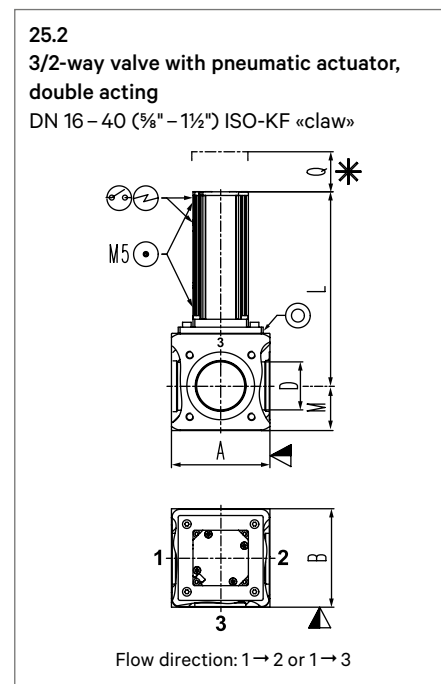
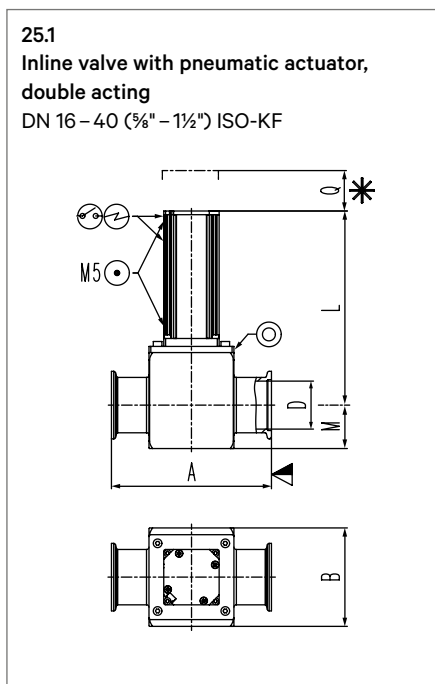
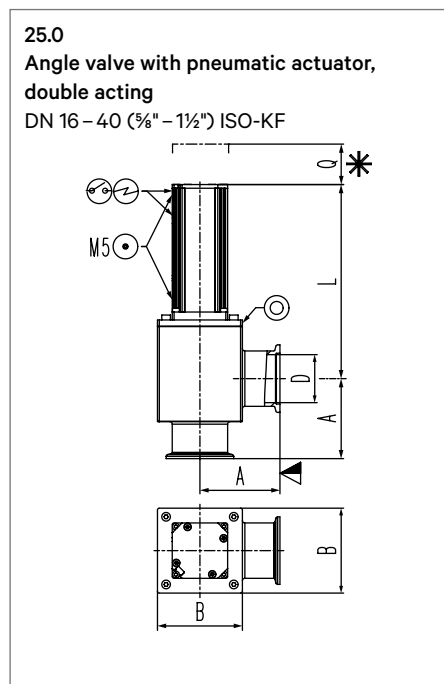
DN		Ordering numbers	
mm	inch	ISO-KF «claw»	
		without position indicator	with position indicator
16	5/8	25224-EA14	25224-EA24
25	1	25228-EA14	25228-EA24
40	1½	25232-EA14	25232-EA24

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 25032-KA14-X, X = one-touch fitting for 4 mm pneumatic tube

DIMENSIONS



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

DN	mm inch	16 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
Q	mm inch	55 2.17	55 2.17	68 2.68

DN	mm inch	16 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 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

«EASY CLOSE» ALL-METAL ANGLE VALVE, SERIES 54.1

For vacuum processes with extreme UHV requirements.



Sealing surfaces are only elastically deformed

Convenient operation with a standard hexagon wrench – no torque wrench required

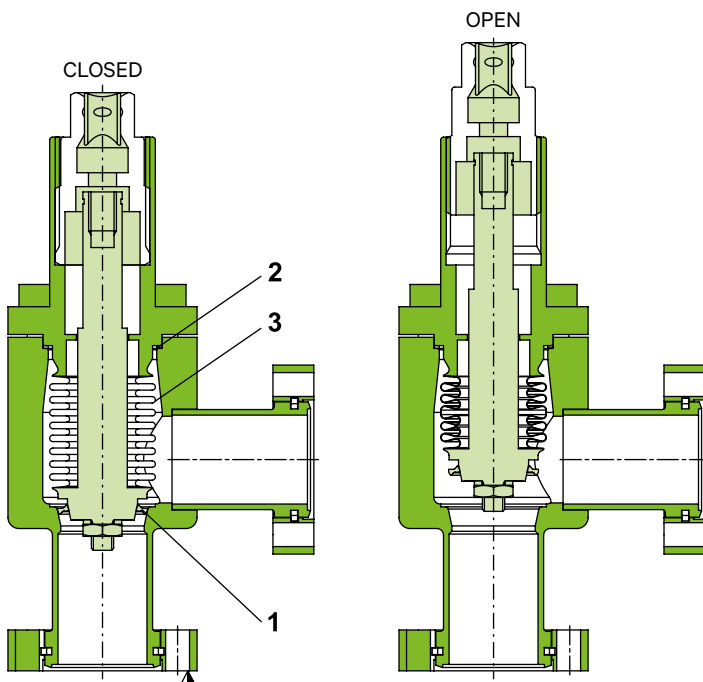
High conductance

FLEX VATRING exchangeable twice

MAIN FEATURES

Sizes	DN 16 – 63 mm (5/8" – 2½")
Actuator	manual: hexagon head
Body material	stainless steel
Standard flanges	CF-R
Sealing technology	FLEX VATRING (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Plate seal (FLEX VATRING)
- 2 Bonnet seal
- 3 Bellows
- ▼ Valve seat side

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 plate		≤ 2 bar
Differential pressure at opening		≤ 1 bar ¹⁾
Lifetime		≥ 1000 cycles
Bake-out temperature ²⁾	In open and closed position	≤ 300 °C
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)	DN 16	5 ls ⁻¹
	DN 40	50 ls ⁻¹
	DN 63	105 ls ⁻¹
Closing force		closes at a mechanical stop
Weight	DN 16	0.4 kg / 0.9 lbs
	DN 40	1.9 kg / 4.2 lbs
	DN 63	5.9 kg / 13 lbs

¹⁾ > 1 bar with reduced number of cycles.

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

SPARE PARTS

Service kit: see next page

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 33
- Handwheel: see ordering information on next page
- T-bar tool: see ordering information on next page
- Service kits: see ordering information on next page

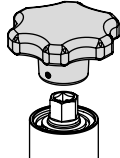
ORDERING INFORMATION

Valve with manual actuator
hexagon head

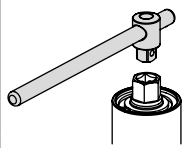
DN		Ordering numbers
mm	inch	
16	5/8	54124-GE02
40	1 1/2	54132-GE02
63	2 1/2	54136-GE02

Accessories

Handwheel

DN		Ordering numbers	 To put on the hexagon head for convenient operation of the valve.
mm	inch		
16	5/8	240039	
40	1 1/2	531966	
63	2 1/2	not available	

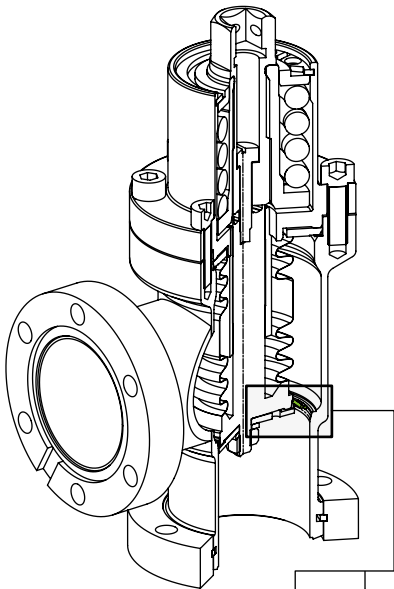
T-bar tool

DN		Ordering numbers	 To put on the hexagon head for convenient operation of the valve.
mm	inch		
16	5/8	312699	
40	1 1/2	530026	
63	2 1/2	312731	

Service kits

DN		Ordering numbers	
mm	inch	Service kit 1	Service kit 2
16	5/8	529581	529582
40	1 1/2	530022	530023
63	2 1/2	530024	530025

The service kits allow 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.

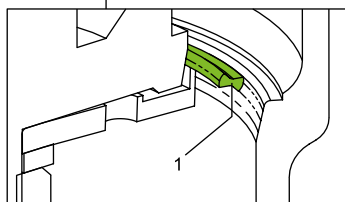


Easy replacement of FLEX VATRING

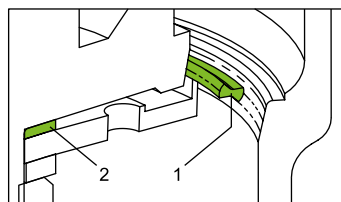
In case of a seat seal leak caused by environmental influences, the FLEX VATRING seal can be replaced twice without the need for re-machining the valve seat.

Three seal rings of different diameters enable leak tight sealing on three different levels of pre-prepared sealing surface provided in the valve body. If there is damage on one level, the replacement seal ring, of a different diameter, will seal at the next level.

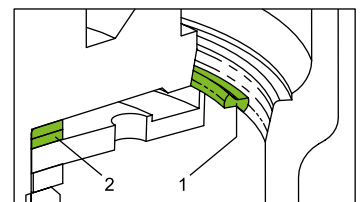
VAT offers a range of service kits, and the seal exchange can easily be carried out by the user.



Initial sealing system
(maximum diameter of FLEX
VATRING seal)

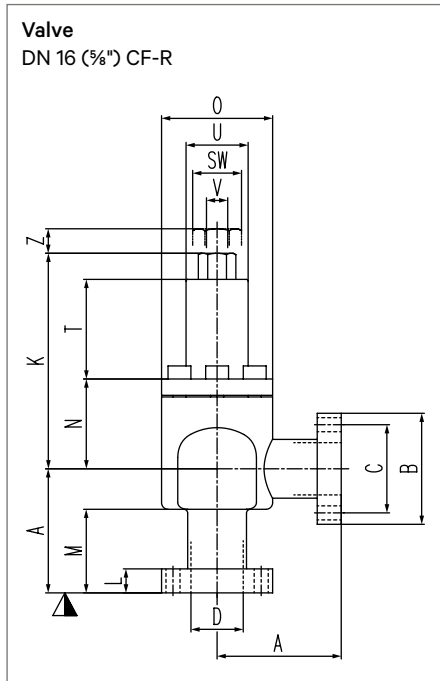


Sealing system after installation of
the first service kit
(medium diameter of FLEX VATRING
seal)

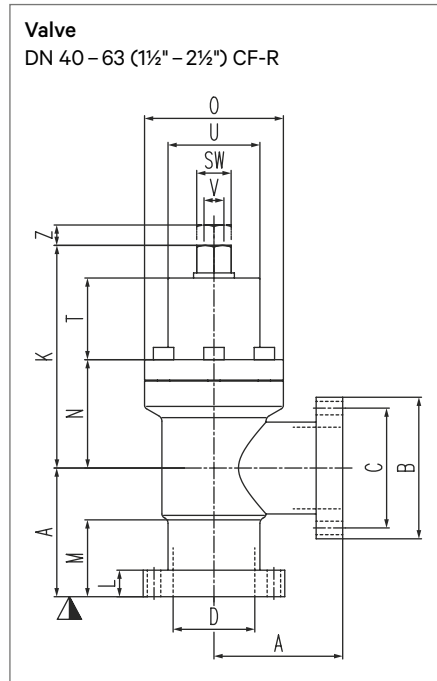


Sealing system after installation of
the second service kit
(minimum diameter of FLEX
VATRING seal)

MAIN DIMENSIONS

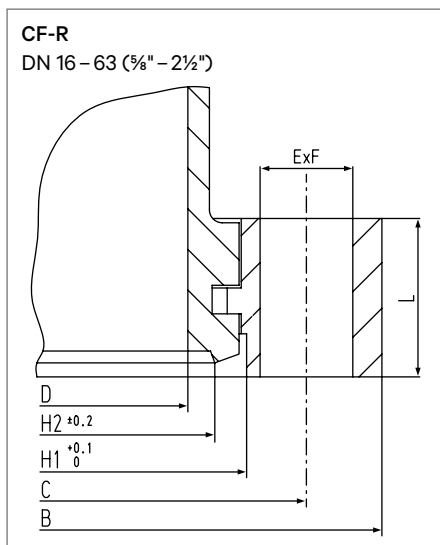


▼ Valve seat side



DN	mm	16	40	63
	inch	5/8	1½	2½
A	mm	38	63	105
	inch	1.50	2.48	4.13
B	mm	34	69.35	113.35
	inch	1.34	2.73	4.46
C	mm	27	58.70	92.10
	inch	1.06	2.31	3.63
D	mm	16	40	64
	inch	0.63	1.57	2.52
K	mm	66	109.10	141.50
	inch	2.60	4.30	5.57
L	mm	7.35	13	18.90
	inch	0.29	0.51	0.74
M	mm	25.60	37.60	56.60
	inch	1.01	1.48	2.23
N	mm	27.50	53.10	74
	inch	1.08	2.09	2.91
O	mm	34	68	94
	inch	1.34	2.68	3.70
SW	mm	10	17	22
	inch	0.39	0.67	0.87
T	mm	30.50	40	51.50
	inch	1.20	1.57	2.03
U	mm	19	45	54
	inch	0.75	1.77	2.13
V	mm	6.35	9.53	12.70
	inch	0.25	0.38	0.50
Z	mm	8.50	20	20
	inch	0.33	0.79	0.79

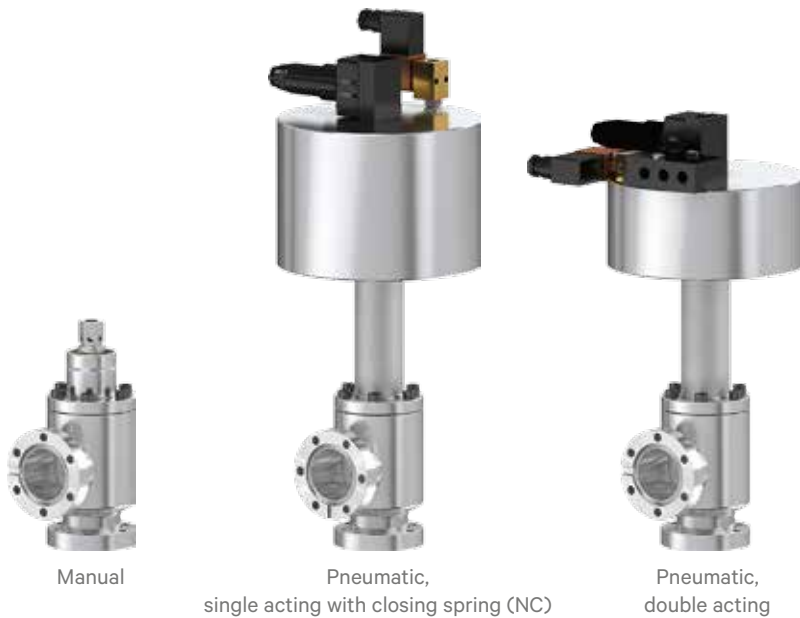
FLANGE DIMENSIONS



DN	mm	16	40	63
	inch	5/8	1½	2½
B	mm	34	69.35	113.35
	inch	1.34	2.73	4.46
C	mm	27	58.70	92.10
	inch	1.06	2.31	3.63
D	mm	16	40	64
	inch	0.63	1.57	2.52
E x F	mm	6 x 4.30	6 x 6.60	8 x 8.40
	inch	6 x 0.17	6 x 0.26	8 x 0.33
H1	mm	21.40	48.30	82.50
	inch	0.84	1.90	3.25
H2	mm	18.50	42	77.40
	inch	0.73	1.65	3.05
L	mm	7.35	13	18.90
	inch	0.29	0.51	0.74

ALL-METAL ANGLE VALVE, SERIES 57.0 / 57.1

For vacuum processes with extreme UHV requirements and/or low/high temperature applications.



Sealing surfaces are only elastically deformed

Largest possible conductance for the nominal diameter

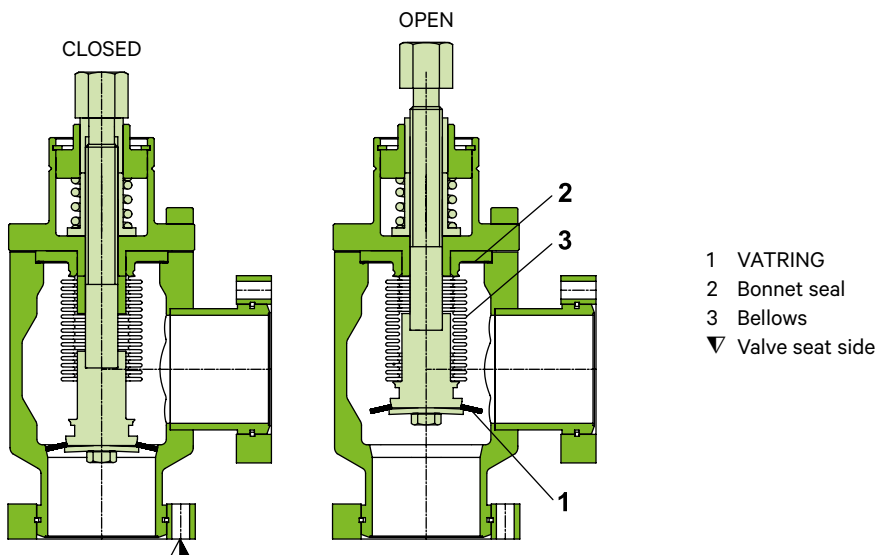
Radiation resistant to 10^8 Gy

DN 16 – 40 closes at a mechanical stop – no torque wrench required

MAIN FEATURES

Sizes	DN 10 – 160 mm (3/8" – 6")
Actuators	manual: hexagon head pneumatic: single acting with closing spring (NC) or double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-R
Sealing technology	VATRING (see glossary)

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Valve body, valve seat	<1·10 ⁻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 Manual actuator ³⁾ Pneumatic actuator ³⁾ Solenoid valve ³⁾ Position indicator ³⁾	≤ 450 °C open / ≤ 350 °C closed DN 16 – 40 ≤ 450 °C open / ≤ 350 °C closed DN 63 – 160 ≤ 300 °C open and closed ≤ 150 °C (single acting with closing spring) ≤ 200 °C (double acting) ≤ 80 °C ≤ 80 °C (Option: 200 °C)
Heating and cooling rate		≤ 60 °C h ⁻¹
Material	Valve body, mechanism Bellows	AISI 316L (1.4404, 1.4435) AISI 316L (1.4435)
Seal	Bonnet, gate	metal
Feedthrough		bellows
Mounting position		any
Solenoid valve		24 V DC, 2.5 W (others on request)
Position indicator: contact rating	Voltage Current	≤ 50 V AC/DC 80 °C: ≤ 1.2 A / 200 °C: ≤ 1.0 A
Valve position indication		visual (mechanical)

DN		Valve with manual actuator					Valve with pneumatic actuator															
							single acting with closing spring (NC)							double acting								
Conductance (molecular flow)		Torque	Turns per stroke	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight		Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight				
mm	inch			kg	lbs	bar	psi	l	ft ³		kg	lbs	bar	psi	l	ft ³		s	kg	lbs		
10	¾	2	–	–	–	–	–	6–9	87–131	0.07	0.002	0.5	1.75	3.9	–	–	–	–	–	–	–	–
16	5/8	5	4	3	6	0.8	1.8	6–9	87–131	0.12	0.004	1	4.60	10.1	4–5	58–73	0.08	0.003	1	2.9	6.4	
40	1½	50	10	7.5	8	2.3	5	6–9	87–131	0.35	0.010	2	9	19.8	4–5	58–73	0.32	0.011	2	6	13	
63	2½	125	45	33	4.5	8	17.8	6–9	87–131	0.80	0.028	4	26		4–5	58–73	0.55	0.02	2	17.2	37.3	
100	4	380	90	66	6.4	16	35.2	6–9	87–131	2.40	0.085	4	35	77.2	4–5	58–73	1.5	0.053	4	26	57.3	
160	6	940	125	92	8	36	79.2	6–9	87–131	4.80	0.170	7	136	299	4–5	58–73	3.3	0.116	7	65	143	

¹⁾ >1 bar with reduced number of cycles.

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

³⁾ Further details and options: see next page.

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Compact pneumatic actuator
- Solenoid valve for impulse actuation:
last valve position is maintained at power failure
- Other solenoid valve voltage (standard 24VDC)
- Bakeable position indicator:
manual and pneumatic actuator bakeable to max. 200 °C¹⁾ (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 °C¹⁾
- 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.

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

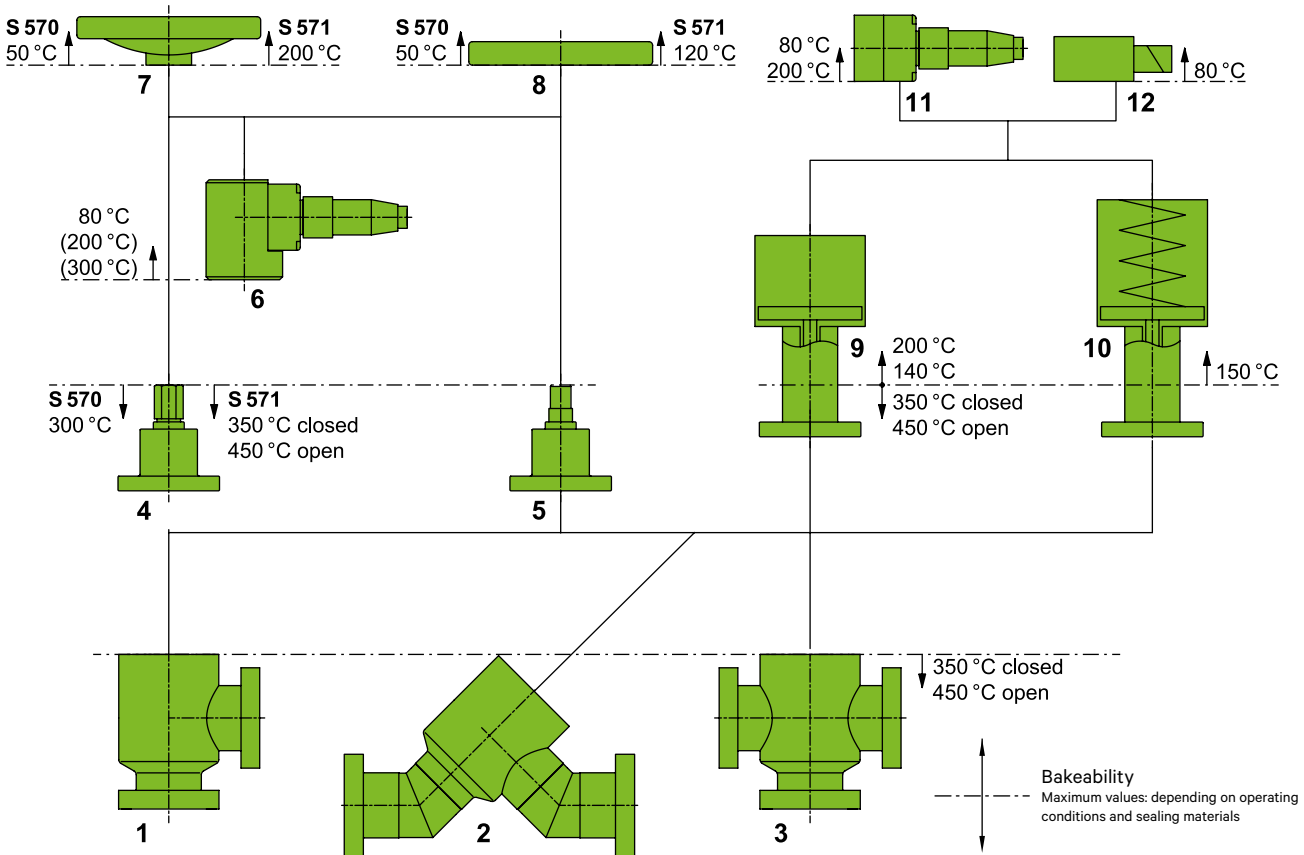
Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 33
- Bake-out jackets
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. Technical details and ordering information on request.
- 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)

BODY AND ACTUATORS

MODULAR SELECTION



1-3	Valve body (angle, inline, T valve), plate, bellows		10^8 Gy, bakeable to 450 °C open / 350 °C closed
4	Manual actuator with hexagon head	DN 16-40 DN 63-160	10^8 Gy, bakeable to 450 °C open / 350 °C closed 10^7 Gy, bakeable to 300 °C open and closed
5	Manual actuator with cylindrical head	DN 16-40 DN 63-160	10^8 Gy, bakeable to 450 °C open / 350 °C closed 10^7 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 (option: 10^6 Gy / 140 °C)
10	Pneumatic actuator: single acting with closing spring		10^5 Gy, bakeable to 150 °C (option: 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

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with manual actuator hexagon head

DN		Ordering numbers		
mm	inch	CF-R without position indicator	CF-R with position indicator 80 °C	CF-R with position indicator 200 °C
16	¾	57124-GE02	57124-GE08	57124-GE05
40	1½	57132-GE02	57132-GE08	57132-GE05
63	2½	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	CF-R without solenoid valve with position indicator 80 °C	CF-R with solenoid valve ¹⁾ with position indicator 80 °C
10	¾	57120-XE11 ²⁾	57120-XE21 ²⁾	57120-XE41 ²⁾
16	¾	57124-GE11	57124-GE21	57124-GE41
40	1½	57132-GE11	57132-GE21	57132-GE41
63	2½	57036-GE11	57036-GE21	57036-GE41
100	4	57040-GE11	57040-GE21	57040-GE41
160	6	57044-GE11	57044-GE21	57044-GE41

¹⁾ specify control voltage

²⁾ CF-R 16 flanges (others on request)

Valve with pneumatic actuator double acting

DN		Ordering numbers		
mm	inch	CF-R without solenoid valve without position indicator	CF-R without solenoid valve with position indicator 80 °C	CF-R with solenoid valve ¹⁾ with position indicator 80 °C
16	¾	57124-GE14	57124-GE24	57124-GE44
40	1½	57132-GE14	57132-GE24	57132-GE44
63	2½	57036-GE14	57036-GE24	57036-GE44
100	4	57040-GE14	57040-GE24	57040-GE44
160	6	57044-GE14	57044-GE24	57044-GE44

¹⁾ specify control voltage

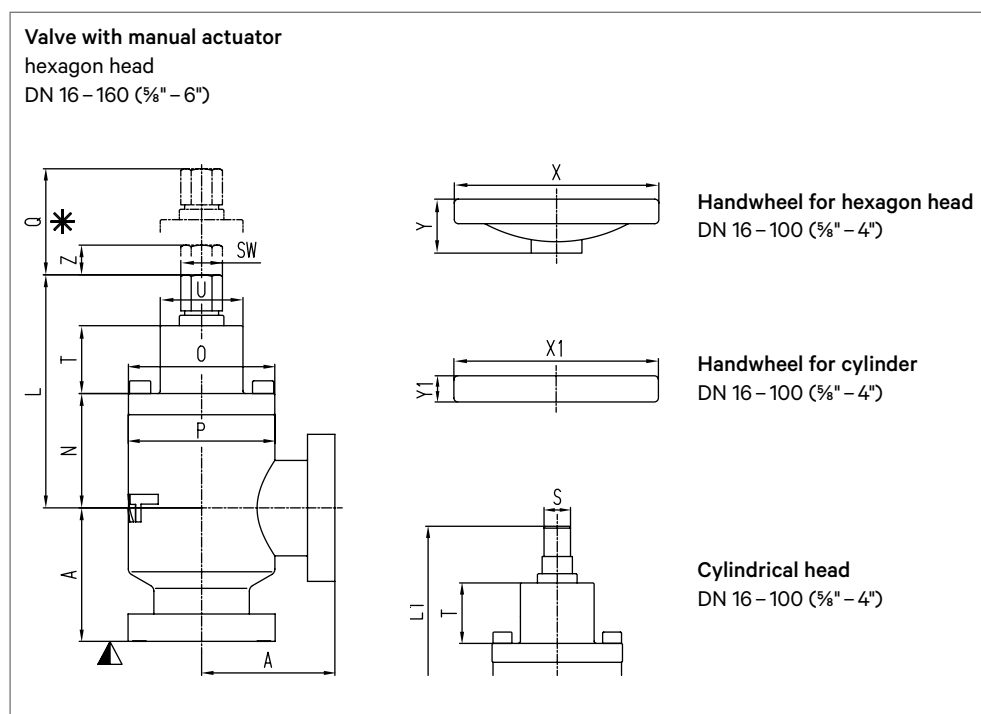
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

Basic ordering number plus «X»: -X to be specified

Example: 57132-GE02-X, X = T valve

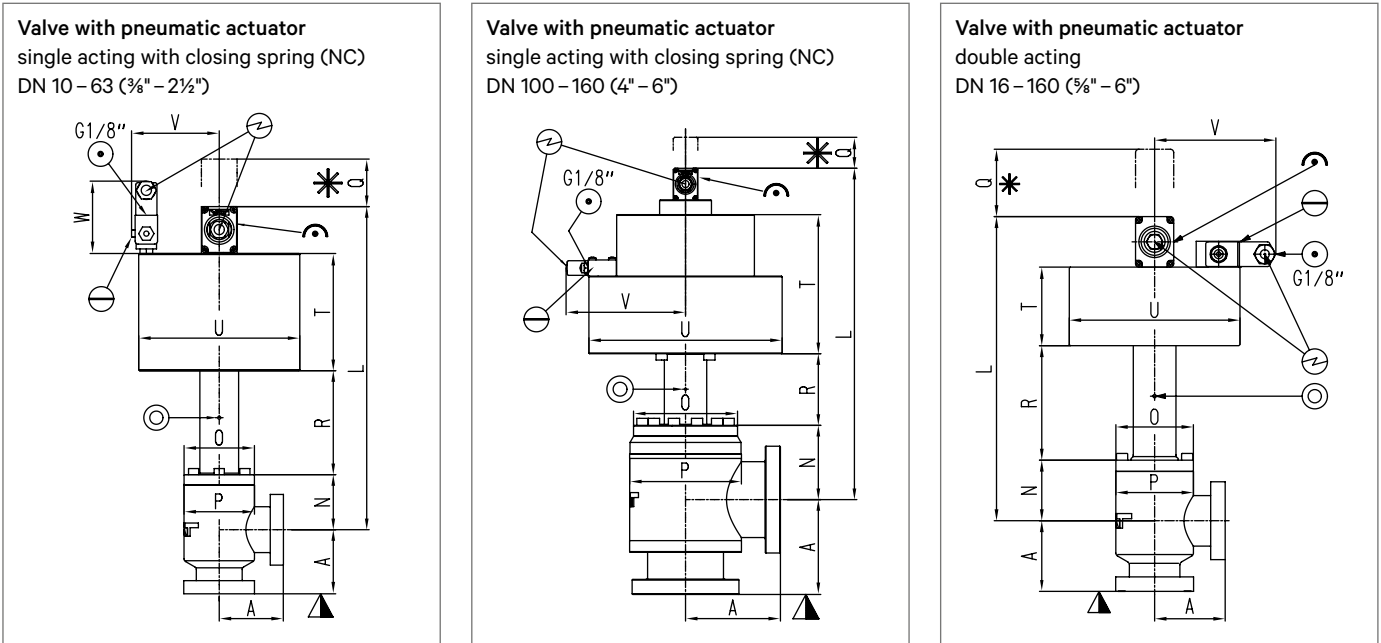
MAIN DIMENSIONS



DN	mm inch	16 ½"	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	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

Flange dimensions: see page 307

MAIN DIMENSIONS

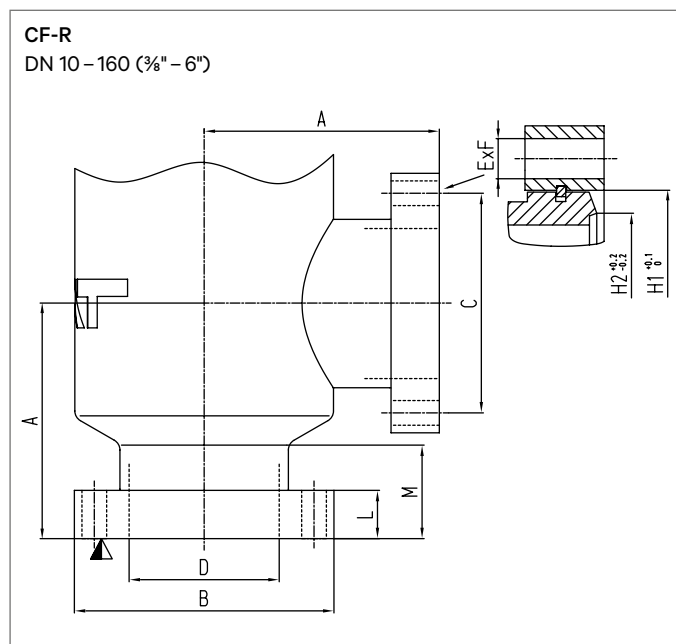


- ▼ Valve seat side
- * Required for dismantling
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ⊕ Mechanical position indication
- ⊖ Emergency operation
- ⊙ Leak detection hole

DN	mm inch	single acting with closing spring (NC)						double acting					
		10 3/8	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6	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	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	232.30 9.15	272 10.71	317 12.48	382.70 15.07	460 18.11	
N	mm inch	35.90 1.41	52.60 2.07	54 2.13	88 3.46	105.70 4.16	135 5.31	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	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	36 1.42	69 2.72	102 4.02	159 6.26	220 8.66	
Q	mm inch	41 1.61	83.70 3.30	93 3.66	115 4.53	138.70 5.46	183 7.20	60.70 2.39	68 2.68	113 4.45	142.30 5.60	185 7.28	
R	mm inch	15.70 0.62	79.70 3.14	102 4.02	93 3.66	102 4.02	130 5.12	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	54 2.13	70 2.76	90 3.54	130 5.12	150 5.91	
U	mm inch	98 3.86	108 4.25	158 6.22	198 7.80	275 10.83	328 12.91	98 3.86	152 5.98	194 7.64	238 9.37	278 10.94	
V	mm inch	84 3.31	61 2.40	86 3.39	131.5 5.18	170 6.69	196.5 7.74	94 3.70	108 4.25	130 5.12	151 5.94	171.50 6.75	
W	mm inch	-	71 2.80	71 2.80	27 1.06	27 1.06	27 1.06	-	-	-	-	-	

Flange dimensions: see page 307

FLANGE DIMENSIONS



▼ Valve seat side

DN	mm inch	10 3/8	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6
O.D.	inch	1 1/8	1 1/8	2 3/8	4 1/8	6	8
A	mm inch	38 1.50	38 1.50	63 2.48	105 4.13	135 5.31	167 6.57
B	mm inch	34 1.34	34 1.34	69.50 2.74	113.50 4.47	152 5.98	202.50 7.97
C	mm inch	27 1.06	27 1.06	58.70 2.31	92.10 3.62	130.30 5.13	181 7.12
D	mm inch	16 0.63	16 0.63	40 1.57	64 2.52	102 4.01	150 5.9
E x F		6 x 4.30 6 x 0.17	6 x 4.30 6 x 0.17	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
H1	mm inch	21.40 0.84	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	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	7.40 0.29	12 0.47	19 0.75	21.50 0.85	22 0.87
M	mm inch	22.60 0.89	22.60 0.89	25.60 1.01	46.60 1.83	60 2.36	62 2.44

ALL-METAL VARIABLE LEAK VALVE, SERIES 59.0

Gas inlet valve for smallest gas flows to control the process pressure.



Resistant to corrosive and aggressive gases

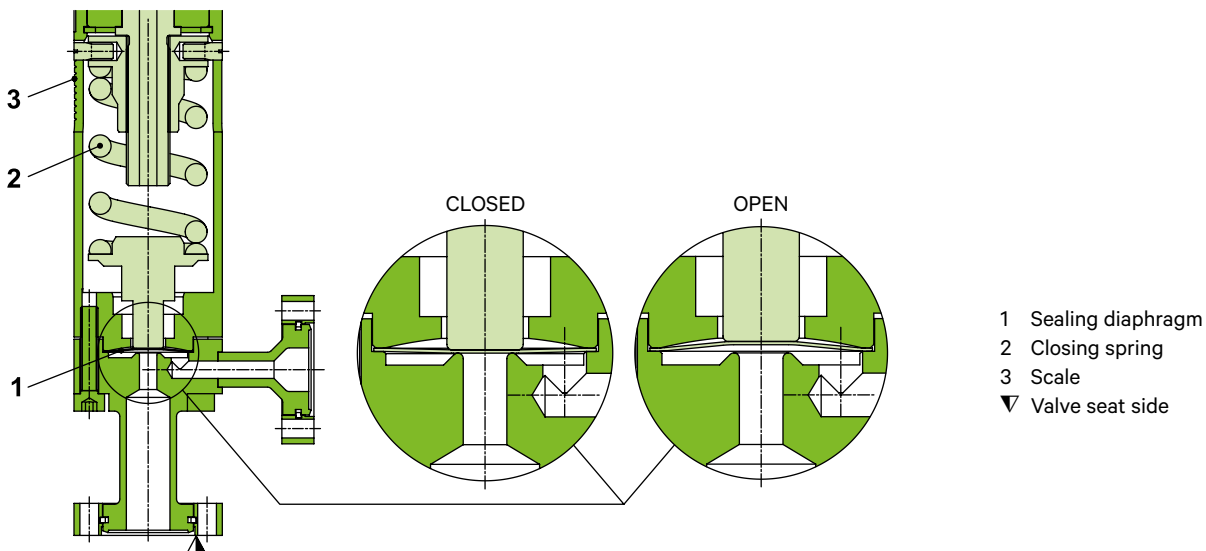
Precise, reproducible adjustment of the gas flow

Repeatable and reliable leaktight closing

MAIN FEATURES

Sizes	DN 16 mm (½")
Actuators	manual: handwheel integrated or detachable pressure controller with stepper motor
Body material	stainless steel
Standard flanges	CF-R
Sealing technology	diaphragm

FUNCTIONAL PRINCIPLE



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	Angle valve: Seat side	2.7 cm ³
	Side port	1.1 cm ³
	Inline valve: Seat side	0.98 cm ³
	Side port	1.01 cm ³
Cycles until first service		20 000
Bake-out temperature ¹⁾	Valve body	≤ 300 °C
	Manual actuator	≤ 300 °C
	Controller with 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 500 mbar ls ⁻¹
Weight	With manual actuator	0.94 kg / 2.07 lbs
	With controlled stepper motor	2.5 kg / 5.5 lbs

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

CONTROLLER

Position resolution	100 000 steps
Closing time	3.5 s
Further data	see pages 184 – 189

OPTIONS, CUSTOMIZED SOLUTIONS

CF-F DN 40 seat side / VCR on seat or gas inlet side

SPARE PARTS

Under clean operating conditions, it is unlikely that the sealing diaphragm would need to be exchanged during the specified lifetime.

Nevertheless, should you have any questions for spare parts, we ask you to specify the fabrication number of the valve indicated on the identification tag.

ACCESSORIES

Flange connections for installation of the valve: see series 33

ORDERING INFORMATION

Valve with manual actuator
handwheel

DN		Ordering numbers	
mm	inch	Angle valve CF-R	Inline valve ¼" VCR male
16	¾"	59024-GE01	59024-XE01

Valve with pressure controller
and stepper motor

DN		Ordering numbers	
mm	inch	Valve with integrated controller CF-R	Valve with detachable controller CF-R
16	¾"	59024-GE x y	on request

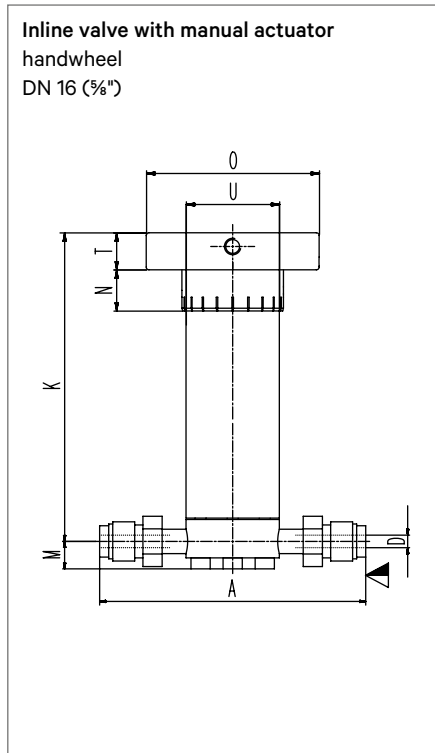
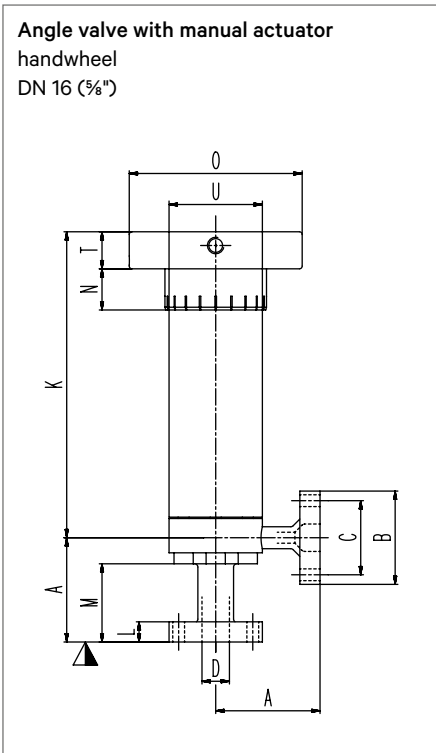
Controller configurations:

G = basic version
A = with SPS
(Sensor Power Supply,
±15 VDC power supply for sensor)

Interface	Number of sensors
G = RS232	1
C = Logic (analog / digital)	1
P = DeviceNet®	1
D = Profibus	1
J = RS485	1
Y = Ethernet	1
L = CC-Link	1
I = EtherCAT	1

Example: 59024-GEGG
= Controller with RS232 interface, 1 sensor

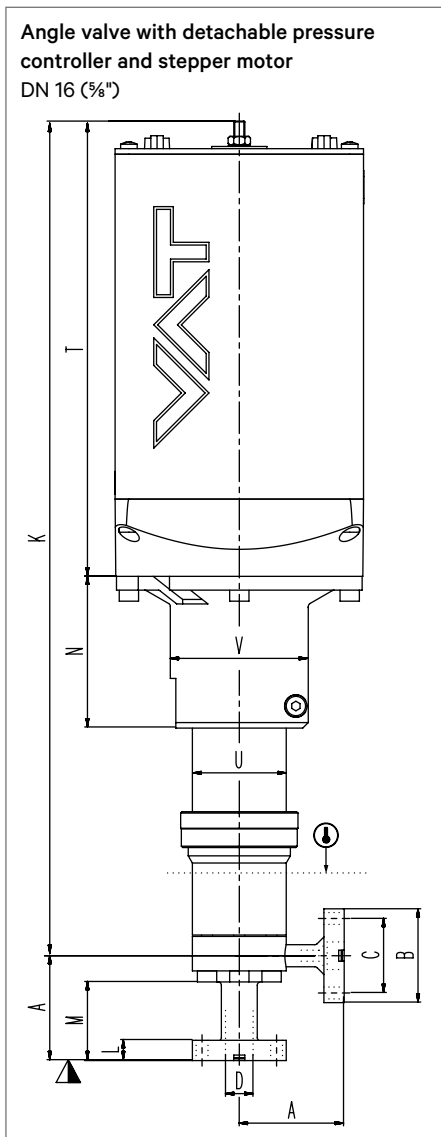
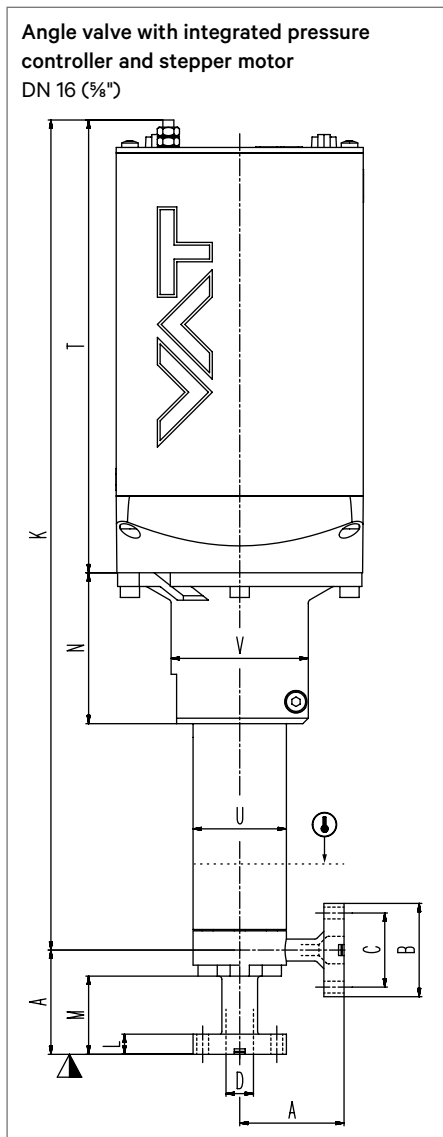
MAIN DIMENSIONS



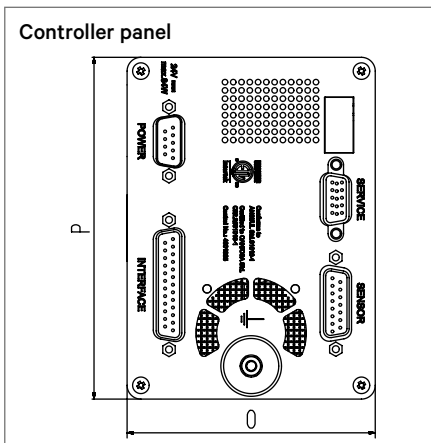
	Angle valve	Inline valve
DN	mm	16
	inch	¾"
A	mm	38
	inch	1.50
B	mm	34
	inch	1.34
C	mm	27
	inch	1.06
D	mm	10
	inch	0.39
K	mm	111.50
	inch	4.39
L	mm	7.35
	inch	0.29
M	mm	28.50
	inch	1.12
N	mm	15
	inch	0.59
O	mm	63
	inch	2.48
T	mm	13.50
	inch	0.53
U	mm	34
	inch	1.34

▽ Valve seat side

MAIN DIMENSIONS

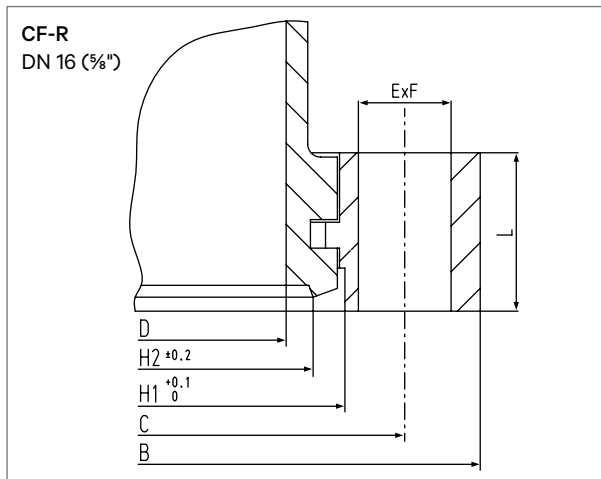


▼ Valve seat side ① Bake-out area



	Angle valve with integrated controller	Angle valve with detachable controller
DN	16 5/8"	16 5/8"
A	38 1.50	38 1.50
B	34 1.34	34 1.34
C	27 1.06	27 1.06
D	10 0.39	10 0.39
K	302.50 11.91	302.50 11.91
L	7.35 0.29	7.35 0.29
M	28.50 1.12	28.50 1.12
N	55 2.17	55 2.17
O	90 3.54	90 3.54
P	124 4.88	124 4.88
T	165 6.50	165 6.50
U	34 1.34	34 1.34
V	50 1.69	50 1.69

FLANGE DIMENSIONS



DN	mm inch	16 5/8"
B	mm inch	34 1.34
C	mm inch	27 1.06
D	mm inch	10 0.39
E × F	mm inch	6 × 4.30 6 × 0.17
H1	mm inch	21.40 0.84
H2	mm inch	18.50 0.73
L	mm inch	7.35 0.29

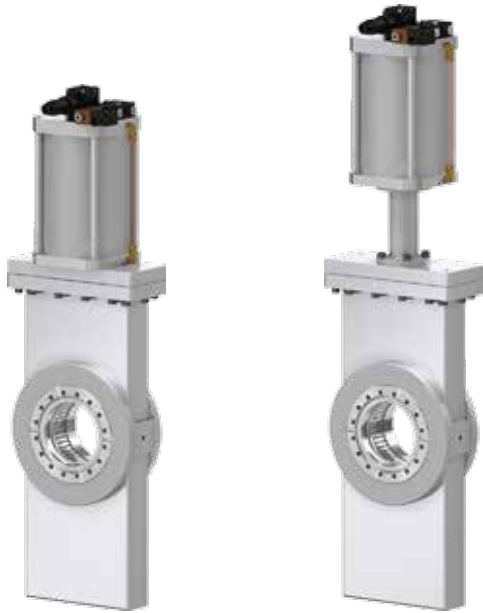


SPECIAL VALVES FOR ACCELERATORS & SYNCHROTRONS

SERIES	TYPE	PAGE
47.1 / 47.2	RF ALL-METAL GATE VALVE	314
75.0 / 75.2	FAST CLOSING VALVE	320
77.1 / 77.3	FAST CLOSING SHUTTER	324
	CONTROLLER FOR FAST CLOSING SYSTEMS SERIES 75/77	328
79.0 / 79.3	BEAM STOPPER/BEAM STOPPER INSERT	330

RF ALL-METAL GATE VALVE, SERIES 47.1/47.2

Sector valve for storage rings in accelerators and synchrotrons.
Isolation valve in microwave transmission lines.



Pneumatic
with compact actuator

Pneumatic
with extended actuator

«Hard on hard» sealing

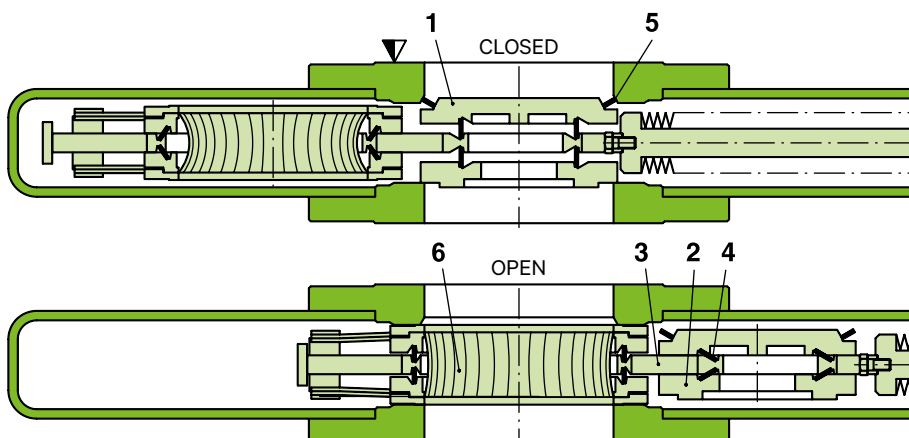
The reliable standard

Field-proven technology

MAIN FEATURES

Sizes	DN 40 – 200 mm (1" – 8")
Actuators	pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-F
Sealing technology	VATRING (see glossary)

FUNCTIONAL PRINCIPLE



- 1 Gate
- 2 Counter-plate
- 3 Guide plate
- 4 Support
- 5 VATRING
- 6 RF contact
- ▼ Valve seat side

TECHNICAL DATA

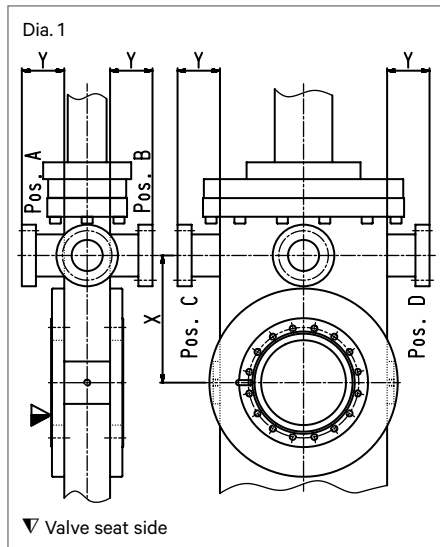
Leak rate	Valve body, valve seat	$<1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range		XHV to 2 bar (abs)
Differential pressure on the gate		≤ 1 bar
Differential pressure at opening		≤ 500 mbar ¹⁾
Cycles until first service	DN 40 – 160	10 000
	DN 200	5 000
Bake-out temperature ²⁾	Valve body	≤ 300 °C
	Pneumatic actuator	≤ 200 °C
	Solenoid valve	≤ 80 °C
	Position indicator	≤ 80 °C (Option: 200 °C)
Heating and cooling rate	DN 40 – 160	≤ 50 °C h ⁻¹
	DN 200	≤ 25 °C h ⁻¹
Material	Valve body, mechanism	AISI 316L (1.4404, 1.4435)
	Bellows	AISI 316L (1.4435)
	RF contact	AISI 301 (1.4310), thermoresistant silver-coated
Seal	Bonnet, gate	metal
Feedthrough		bellows
Mounting position		beam line horizontal, otherwise any
Solenoid valve		24 V DC, 2.5 W (others on request)
Position indicator: contact rating	Voltage	≤ 50 V AC/DC
	Current	80 °C: ≤ 1.2 A / 200 °C: ≤ 1 A
Valve position indication		visual (mechanical)

DN (nominal I.D.)		Conductance (molecular flow)	Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing or opening time	Weight	
mm	inch		bar	psi	l	ft ³		kg	lbs
40	1½	100	4 – 8	58 – 116	0.3	0.011	2	15	33
63	2½	400	4 – 8	58 – 116	0.7	0.024	2	21	46
100	4	1400	4 – 8	58 – 116	1.7	0.060	4	36	80
160	6	3700	4 – 8	58 – 116	5	0.180	9	59	130
200	8	6100	4 – 8	58 – 116	9.7	0.340	18	148	326

¹⁾ 1 bar with reduced number of cycles.

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

OPTIONS, CUSTOMIZED SOLUTIONS



ACTUATOR

- Removable actuator
- Solenoid valve for impulse actuation: last valve position is maintained at power failure
- Other solenoid valve voltage (standard 24VDC)
- Bakeable position indicator:
pneumatic actuator bakeable to max. 200 °C¹⁾ (standard: 80 °C)
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Pneumatic actuator (compact or extended): radiation resistant to 10⁶ Gy, bakeable to 140 °C¹⁾
- Pneumatic actuator for hot zone: radiation resistant to 10⁸ Gy, bakeable to 200 °C¹⁾
- Non-greased spindle drive actuator for little number of actuations
- 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 positions A, B, C and D

DN valve	mm inch	40 1½	63 2½	100 4	160 6	200 8
Recommended port CF-F		16 %	16 %	40 1½	40 1½	40 1½
X	mm inch	95 3.74	115 4.53	135 5.31	220 8.66	280 11.02
Y	mm inch	20 0.79	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

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

SPECIAL VERSION



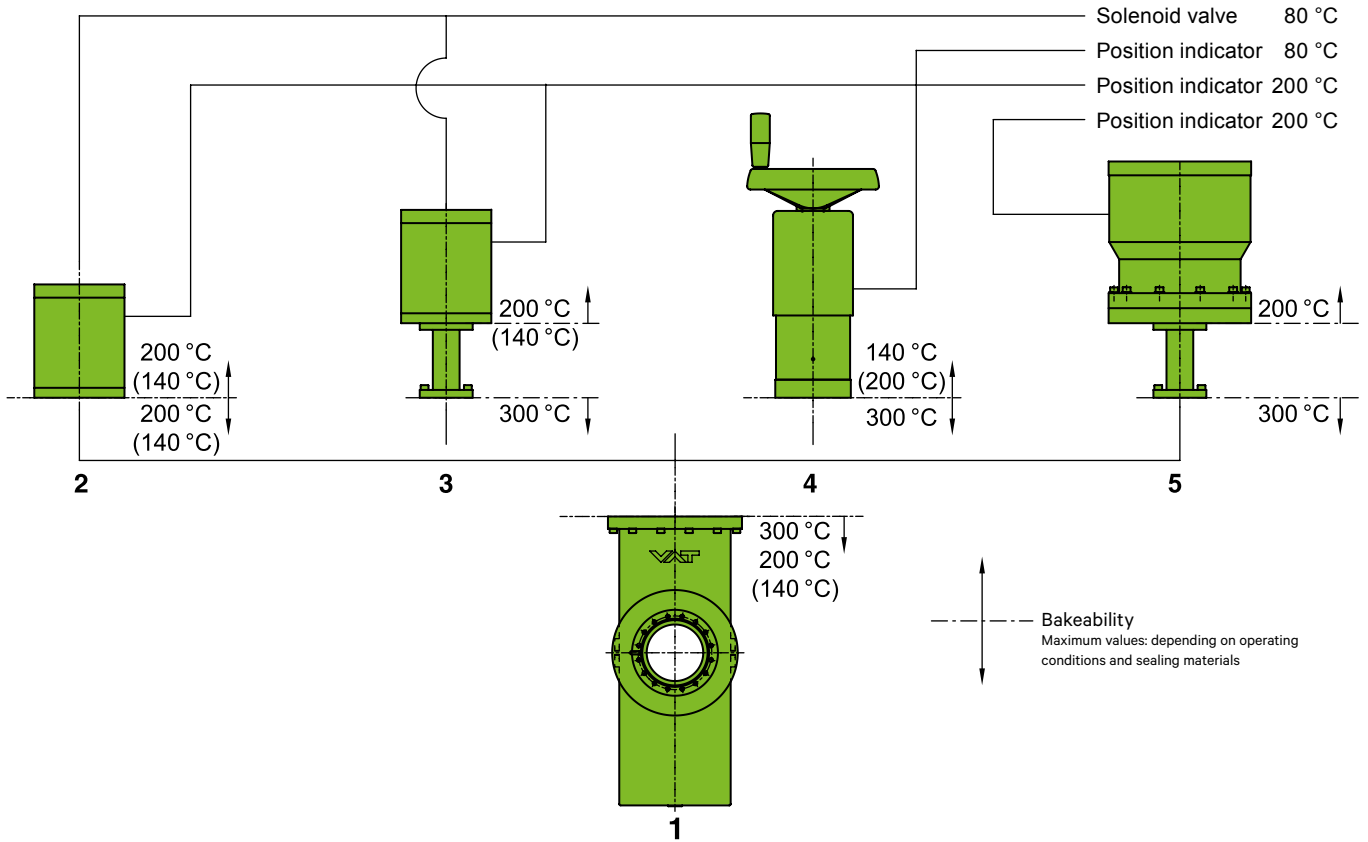
RF-UHV GATE VALVE WITH GATE SEAL MADE OF FKM (Viton®)

Leak rate	Valve body Valve seat	< 5 · 10 ⁻¹⁰ mbar ls ⁻¹ < 1 · 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 Pneumatic actuator Solenoid valve Position indicator	≤ 200 °C ≤ 200 °C ≤ 80 °C ≤ 80 °C (Option: 200 °C)
Seal	Bonnet Gate	metal FKM (Viton®)
Further details		on request

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

BODY AND ACTUATORS

MODULAR SELECTION



- | | | | |
|---|---|--|--|
| 1 | Valve body, mechanism, bellows | : 10 ⁸ Gy, bakeable to 300 °C | |
| 2 | Pneumatic actuator: compact | : 10 ⁵ Gy, bakeable to 200 °C | Option: 10 ⁶ Gy, bakeable to 140 °C |
| 3 | Pneumatic actuator: extended | : 10 ⁵ Gy, bakeable to 200 °C | Option: 10 ⁶ Gy, bakeable to 140 °C |
| 4 | Manual actuator (option) | : 10 ⁵ Gy, bakeable to 140 °C or 200 °C | |
| 5 | Special pneumatic actuator for hot zone | : 10 ⁸ Gy, bakeable to 200 °C | |

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

– Flange connections for installation of the valve: see series 33

– Bake-out jackets

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. Technical details and ordering information on request.

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with pneumatic actuator
double acting

DN		Ordering numbers	
		CF-F	
		with compact actuator, valve bakeable to 200 °C	
mm	inch	without solenoid valve with position indicator 80 °C	with solenoid valve with position indicator 80 °C
40	1½	47232-CE72	47232-CE74 [‡]
63	2½	47236-CE72	47236-CE74 [‡]
100	4	47240-CE72	47240-CE74 [‡]
160	6	47244-CE72	47244-CE74 [‡]
200	8	47146-CE72	47146-CE74 [‡]

[‡] specify control voltage

DN		Ordering numbers	
		CF-F	
		with extended actuator, valve bakeable to 300 °C	
mm	inch	without solenoid valve with position indicator 80 °C	with solenoid valve with position indicator 80 °C
40	1½	47232-CE24	47232-CE44 [‡]
63	2½	47236-CE24	47236-CE44 [‡]
100	4	47240-CE24	47240-CE44 [‡]
160	6	47244-CE24	47244-CE44 [‡]
200	8	47146-CE24	47146-CE44 [‡]

[‡] specify control voltage

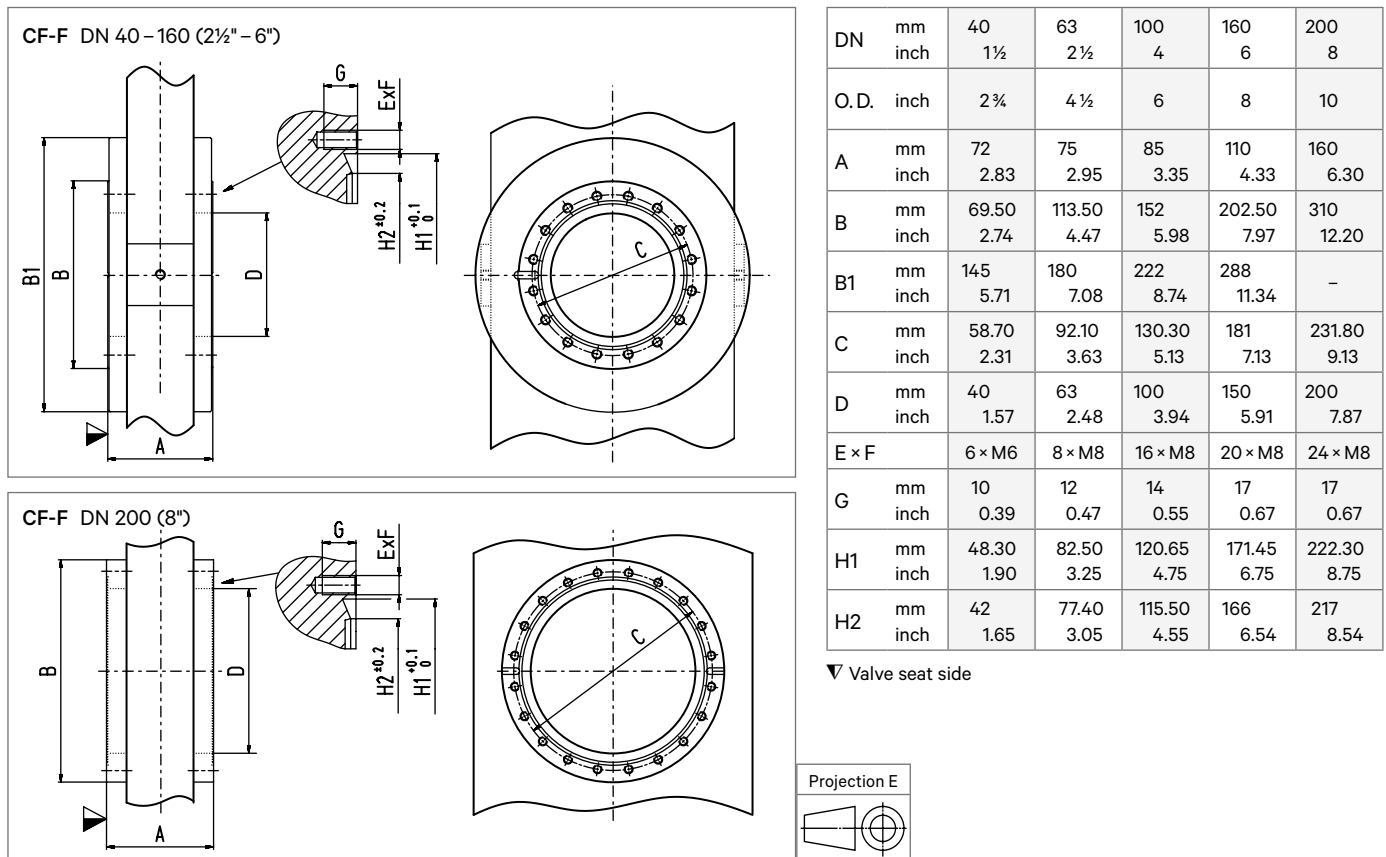
ORDERING INFORMATION

FOR VALVES WITH OPTIONS

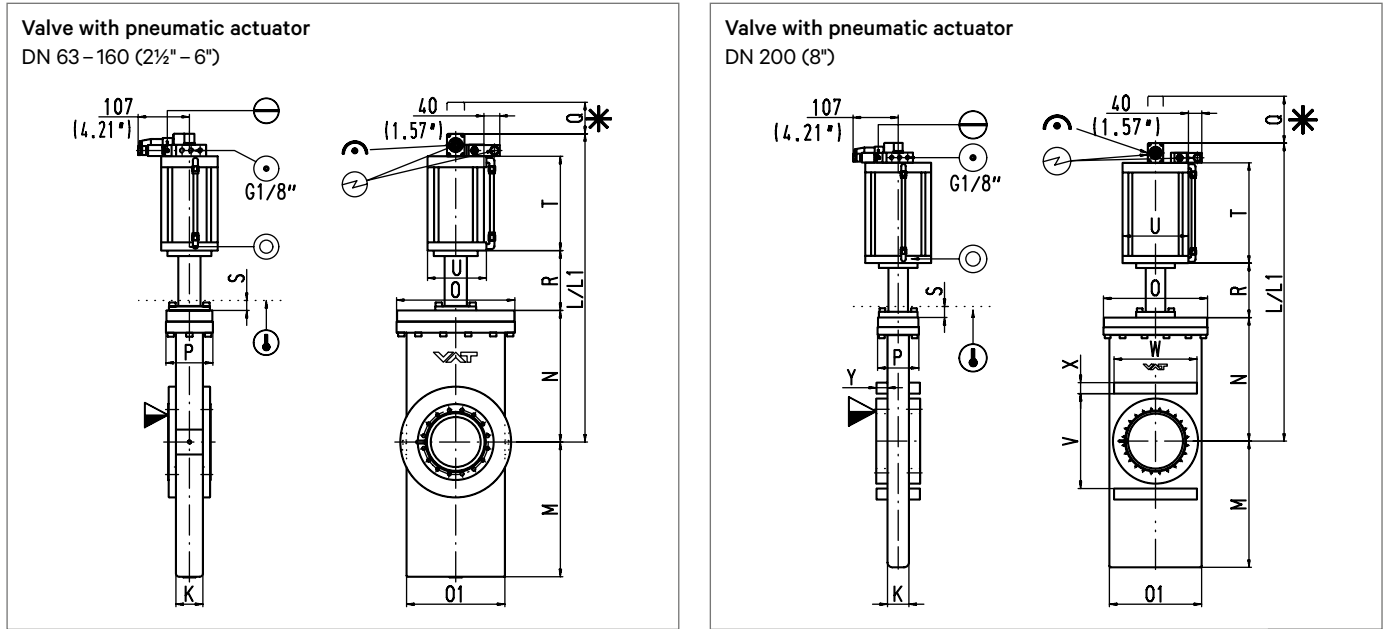
Basic ordering number plus «-X»: -X to be specified

Example: 47240-CE44-X, X = solenoid valve for impulse actuation 220 V 50 Hz

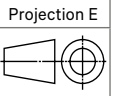
FLANGE DIMENSIONS



MAIN DIMENSIONS



- ▼ Valve seat side
- * Required for dismantling
- ⊕ Compressed air connection
- ⊖ Electrical connection
- ⊖ Emergency operation
- ⊖ Leak detection hole
- Ⓛ Bake-out area
- Ⓜ Mechanical position indication



¹⁾ Extended actuator

DN	mm	40	63	100	160	200
	inch	1½	2½	4	6	8
K	mm	48	46	54	70	78
	inch	1.89	1.81	2.13	2.76	3.07
L	mm	353	459	537	702	851
	inch	13.89	18.07	21.14	27.64	33.50
L1 ¹⁾	mm	439	583	661	826	975
	inch	17.28	22.95	26.02	32.52	38.39
M	mm	165	215	272	356	460
	inch	6.50	8.45	10.70	14.02	18.11
N	mm	177	231	264	370	443
	inch	6.97	9.09	10.39	14.57	17.44
O	mm	158	189	237	287	372
	inch	6.22	7.44	9.33	11.30	14.65
O1	mm	125	156	197	253	336
	inch	4.92	6.14	7.76	9.96	13.23
P	mm	82	77	94	93	114
	inch	3.23	3.03	3.70	3.66	4.49
Q	mm	340	420	520	700	880
	inch	13.39	16.54	20.47	27.56	34.65
R ¹⁾	mm	86	124	124	124	124
	inch	3.39	4.88	4.88	4.88	4.88
S	mm	20	20	20	20	20
	inch	0.79	0.79	0.79	0.79	0.79
T	mm	131	183	228	287	363
	inch	5.16	7.20	8.98	11.30	14.29
U	mm	90	104	135	190	230
	inch	3.54	4.09	5.31	7.48	9.06
V	mm	-	-	-	-	346
	inch	-	-	-	-	10.24
W	mm	-	-	-	-	302
	inch	-	-	-	-	14.89
X, Y	mm	-	-	-	-	40
	inch	-	-	-	-	1.57

FAST CLOSING VALVE, SERIES 75.0 / 75.2

75.0 flap valve / 75.2 gate valve to preserve the vacuum in accelerators and storage rings in case of an air inrush.



Gate valve DN 40



Flap valve DN 63 – 200

Highly reliable

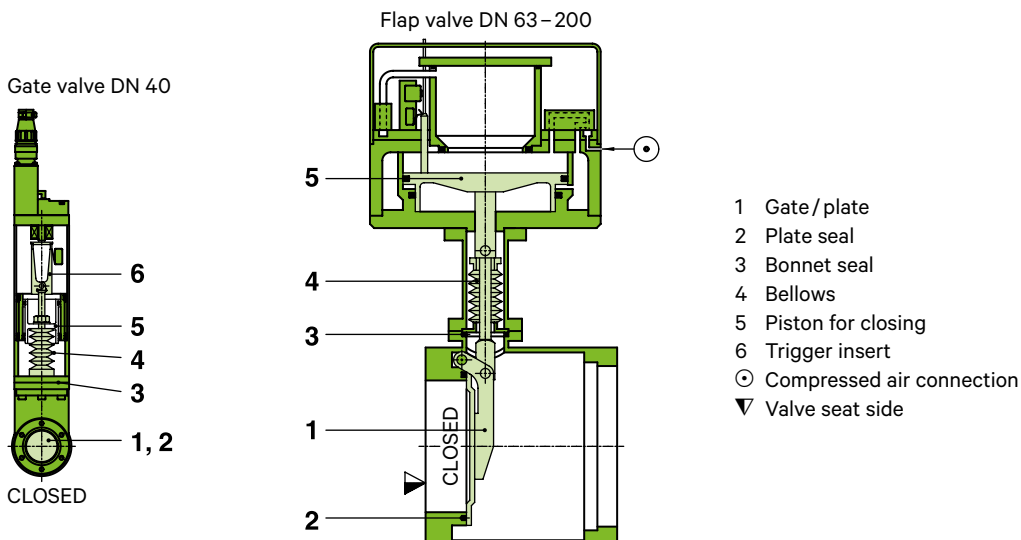
Maintenance-free

Part of a field-proven system

MAIN FEATURES

Sizes	DN 40 – 200 mm (1½" – 8")
Actuators	pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-F

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Valve body Valve seat	<1·10 ⁻¹⁰ mbar ls ⁻¹ <1·10 ⁻⁹ mbar ls ⁻¹
Pressure range		1·10 ⁻¹⁰ mbar to 2 bar (abs)
Differential pressure		see table below
Cycles until first service		2000
Bake-out temperature ¹⁾	Valve body Actuator	≤ 200 °C ¹⁾ (DN 40: trigger insert removed) ≤ 50 °C
Radiation resistance	Valve body Plate seal Pneumatic actuator	10 ⁸ Gy <10 ⁵ Gy (option: 10 ⁶ Gy) 10 ⁴ Gy
Material	Valve body DN 40 DN 63 – 200 Mechanism DN 40 DN 63 – 200 Gate / plate 75.0 flap valve 75.2 gate valve Bellows	AISI 304 (1.4301) AISI 316L (1.4435) AISI 304 (1.4301) AISI 316L (1.4435) Titanium AISI 304 (1.4301) AISI 316L (1.4404, 1.4435)
Seal	Bonnet Gate / plate	metal FKM (Viton®)
Feedthrough		bellows
Mounting position		seat side (marked ▼) in opposite direction of the air inrush

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		Closing time ²⁾	Opening time	Weight	
mm	inch	O. D.		In closing direction	In opening direction	In closing direction	In opening direction	bar	psi	l	ft ³			kg	lbs
Gate valve 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 75.0															
63	2½	4½	200	≤2	≤1.2	≤600	≤1000	5–8	73–116	3	0.11	13	7	25	55
100	4	6	700	≤2	≤1.2	≤180	≤1000	5–8	73–116	3	0.11	15	7	29	64
160	6	8	1700	≤2	≤0.5	≤50	≤1000	5–8	73–116	3	0.11	23	7	36	80
200	8	10	2500	≤2	≤0.07	≤25	≤1000	5–8	73–116	3	0.11	40	7	42	93

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

²⁾ From closing signal to leaktight valve.

OPTIONS, CUSTOMIZED SOLUTIONS

Customer-specified flanges

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 33
- Controller: see pages 328 – 329

ORDERING INFORMATION FOR STANDARD VALVES

75.2
Gate valve with pneumatic actuator
double acting
without controller

DN		Ordering numbers
mm	inch	CF-F
40	1½	75232-CE44

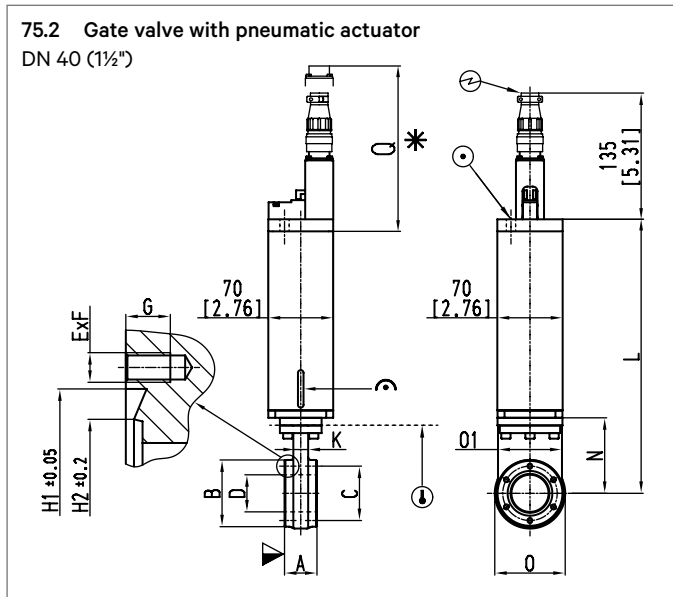
75.0
Flap valve with pneumatic actuator
double acting
without controller

DN		Ordering numbers
mm	inch	CF-F
63	2½	75036-CE44
100	4	75040-CE44
160	6	75044-CE44
200	8	75046-CE44

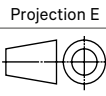
ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
Example: 75040-CE44-X, X = special flanges

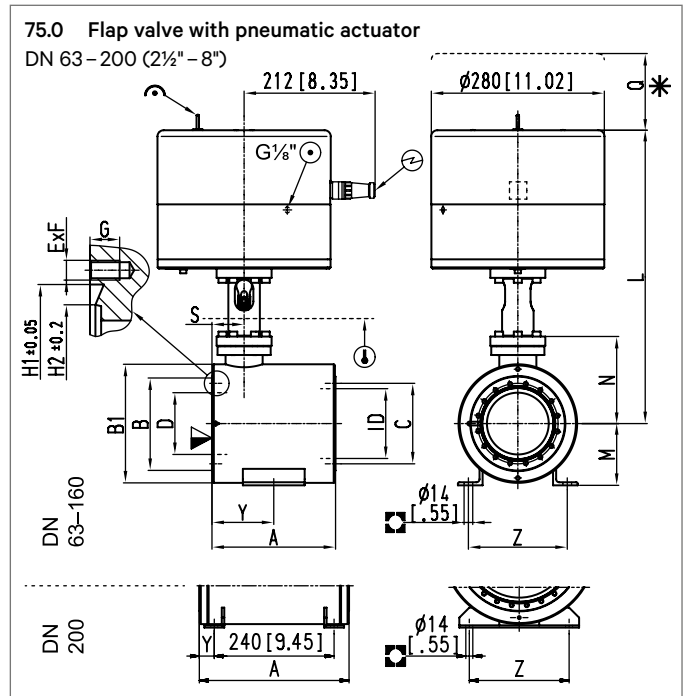
MAIN DIMENSIONS



- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⤴ Mechanical position indication
- Ⓜ Bake-out area
- ▣ For attachment



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 x F		6 x 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 x F		8 x M8	16 x M8	20 x M8	24 x 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

FAST CLOSING SHUTTER, SERIES 77.1/77.3

77.1 flap shutter / 77.3 slot shutter to preserve the vacuum in accelerators and storage rings in case of an air inrush.

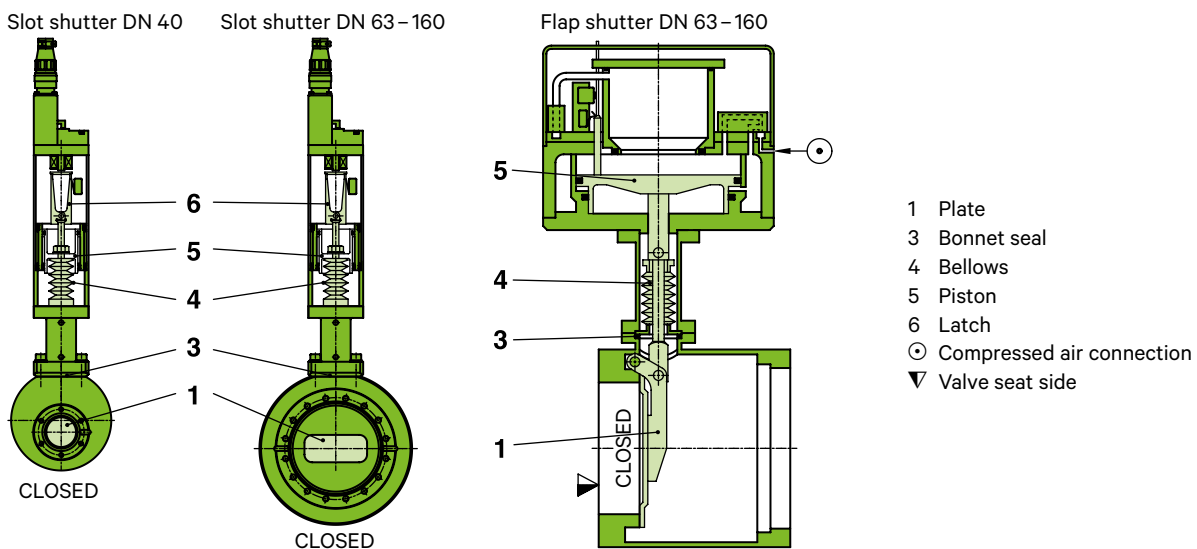


- Highly reliable
- Maintenance-free
- Part of a proven system

MAIN FEATURES

Sizes	DN 40 – 160 mm (1½" – 6")
Actuators	pneumatic, double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-F

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Valve body Valve seat 77.3 77.1	<1·10 ⁻¹⁰ mbar ls ⁻¹ < 1 mbar ls ⁻¹ <30 mbar ls ⁻¹
Pressure range		UHV to 1.2 bar (abs)
Differential pressure		see table below
Cycles until first service	Slot shutter Flap shutter	5000 ¹⁾ 2000 ¹⁾
Bake-out temperature ²⁾	Valve body Actuator	≤ 300 °C ≤ 50 °C
Radiation resistance	Valve body Pneumatic actuator	10 ⁸ Gy 10 ⁴ Gy
Material	Valve body Mechanism DN 40 DN 63 – 160 Bellows Slot shutter Flap shutter Gate / plate Slot shutter Flap shutter	AISI 316L (1.4435, 1.4404) AISI 304 (1.4301) AISI 316L (1.4435) AISI 633 (AM 350) AISI 316L (1.4404) AISI 316L (1.4404), silver-plated Titanium
Seal	Bonnet	metal
Feedthrough		bellows
Mounting position		seat side (marked ▼) in opposite direction of the air inrush

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 ³⁾	Opening time	Weight	
mm	inch	O. D.		In closing direction	In opening direction	In closing direction	In opening direction	bar	psi	l	ft ³			kg	lbs
Slot shutter 77.3															
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 77.1															
63	2½	4½	200	≤2	≤1.2	≤600	≤1000	5–8	73–116	3	0.11	13	7	25	55
100	4	6	700	≤2	≤1.2	≤180	≤1000	5–8	73–116	3	0.11	15	7	29	64
160	6	8	1700	≤2	≤0.5	≤50	≤1000	5–8	73–116	3	0.11	23	7	36	80

¹⁾ At 5 bar compressed air.

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

³⁾ From closing signal to closed shutter.

OPTIONS, CUSTOMIZED SOLUTIONS

- Customer-specified flanges
- Special slot dimensions (slot shutter)

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 33
- Controller: see pages 328 – 329

ORDERING INFORMATION FOR STANDARD VALVES

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	77332-CE44

DN		▭ Slot opening D × D1 (height × width)		Ordering numbers
mm	inch	mm	inch	
63	2½	35 × 50	1.38 × 1.97	77336-CE44
100	4	35 × 80	1.38 × 3.15	77340-CE44
160	6	35 × 130	1.38 × 5.12	77344-CE44

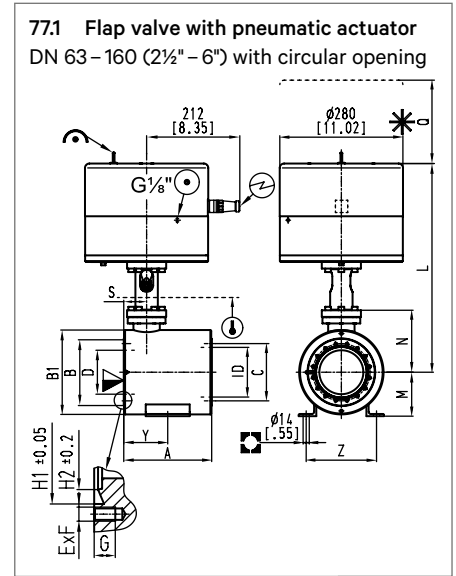
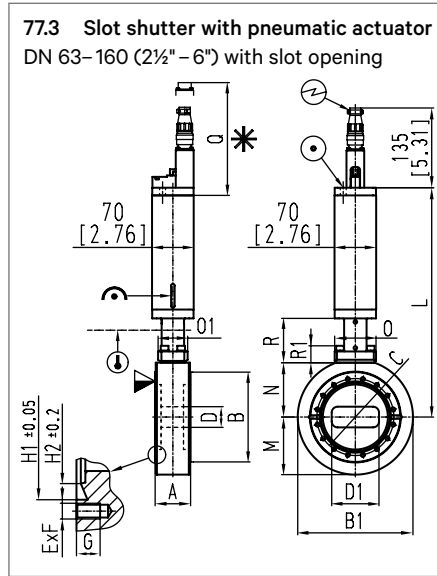
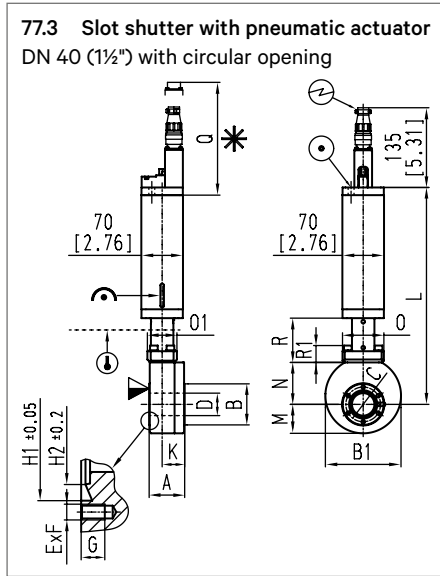
77.1
Flap shutter with pneumatic actuator
double acting
without controller

DN		○ Circular opening		Ordering numbers
mm	inch	mm	inch	
63	2½	Ø 63	Ø 2½	77136-CE44
100	4	Ø 100	Ø 4	77140-CE44
160	6	Ø 160	Ø 6	77144-CE44

ORDERING INFORMATION FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified
Example: 77340-CE44-X, X = special flanges

MAIN DIMENSIONS

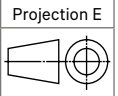


▼ Valve seat side
* Required for dismantling

⊙ Compressed air connection
⊕ Electrical connection

↻ Mechanical position indication
Ⓞ Bake-out area

▣ For attachment



DN	mm	40		
	inch	1½		
A	mm	60		
	inch	2.36		
B	mm	69.50		
	inch	2.74		
B1	mm	128		
	inch	5.04		
C	mm	58.70		
	inch	2.31		
D	mm	38		
	inch	1.50		
E × F		6 × M6		
G	mm	12		
	inch	0.47		
H1	mm	48.35		
	inch	1.90		
H2	mm	42		
	inch	1.65		
L	mm	367		
	inch	14.45		
M	mm	49		
	inch	1.93		
N	mm	71		
	inch	2.80		
O	mm	70		
	inch	2.76		
O1	mm	50		
	inch	1.97		
Q	mm	195		
	inch	7.68		
R	mm	75		
	inch	2.95		
R1	mm	29		
	inch	1.14		

DN	mm	63	100	160
	inch	2½	4	6
A	mm	60	60	60
	inch	2.36	2.36	2.36
B	mm	113.50	152	202.50
	inch	4.47	5.98	7.97
B1	mm	158	195	245
	inch	6.22	7.67	9.65
C	mm	92.10	130.30	181
	inch	3.63	5.13	7.13
D	mm	35	35	35
	inch	1.38	1.38	1.38
D1	mm	50	80	130
	inch	1.97	3.15	5.12
E × F		8 × M8	16 × M8	20 × M8
G	mm	12	12	12
	inch	0.47	0.47	0.47
H1	mm	82.55	120.70	171.50
	inch	3.25	4.75	6.75
H2	mm	77.40	115.50	166
	inch	3.05	4.55	6.54
L	mm	369	388	414
	inch	14.52	15.28	16.30
M	mm	79	97.50	122.50
	inch	3.11	3.84	4.82
N	mm	73	92	118
	inch	2.87	3.62	4.65
O	mm	70	70	70
	inch	2.76	2.76	2.76
O1	mm	50	50	50
	inch	1.97	1.97	1.97
Q	mm	195	195	195
	inch	7.68	7.68	7.68
R	mm	75	75	75
	inch	2.95	2.95	2.95
R1	mm	29	29	29
	inch	1.14	1.14	1.14

DN	mm	63	100	160
	inch	2½	4	6
A	mm	150	200	250
	inch	5.91	7.87	9.84
B	mm	113.50	152	202.50
	inch	4.47	5.98	7.97
B1	mm	154	192	242
	inch	6.06	7.56	9.53
C	mm	92.10	130.30	181
	inch	3.63	5.13	7.13
D	mm	63	100	150
	inch	2.48	3.94	5.91
E × F		8 × M8	16 × M8	20 × M8
G	mm	12	12	12
	inch	0.47	0.47	0.47
H1	mm	82.55	120.65	171.50
	inch	3.25	4.75	6.75
H2	mm	77.40	115.50	166
	inch	3.05	4.55	6.54
ID	mm	76	113	164
	inch	2.99	4.45	6.47
L	mm	456	475	500
	inch	17.95	18.70	19.69
M	mm	80	100	125
	inch	3.15	3.94	4.92
N	mm	122	141	166
	inch	4.80	5.55	6.54
Q	mm	83	83	83
	inch	3.27	3.27	3.27
S	mm	52	52	52
	inch	2.05	2.05	2.05
Y	mm	75	100	125
	inch	2.95	3.94	4.92
Z	mm	120	160	160
	inch	4.72	6.30	6.30

CONTROLLER FOR FAST CLOSING SYSTEMS, SERIES 75 / 77

For fast closing and controlled opening of the valves and shutters Series 75 / 77, for fast processing of the sensor signal and for the control of further isolation valves.



TECHNICAL DATA

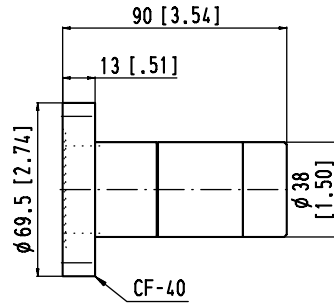
Controller VF-2 (basic device)	<ul style="list-style-type: none"> - 19" rack insert with power supply - Storage spaces for max. 10 modules - Mains voltage: 100 – 240 V ±10%, 50/60 Hz, max. 150 VA - Key switch for LOCAL, LOCKED, REMOTE - Ambient temperature: 0– 50 °C - Dimensions: <ul style="list-style-type: none"> · 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	<table border="0" style="width: 100%;"> <tr> <td style="width: 20%; vertical-align: top;">CONTROL</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - Storage: space for 1 module required - System control module for max. 6 sensors and 4 fast closing valves / shutters - External trigger - 8-pole male connector for REMOTE control - LED display READY, EXTERNAL TRIGGER - Push button RESET </td> </tr> </table>	CONTROL	<ul style="list-style-type: none"> - Storage: space for 1 module required - System control module for max. 6 sensors and 4 fast closing valves / shutters - External trigger - 8-pole male connector for REMOTE control - LED display READY, EXTERNAL TRIGGER - Push button RESET
CONTROL	<ul style="list-style-type: none"> - Storage: space for 1 module required - System control module for max. 6 sensors and 4 fast closing valves / shutters - External trigger - 8-pole male connector for REMOTE control - LED display READY, EXTERNAL TRIGGER - Push button RESET 		
	<table border="0" style="width: 100%;"> <tr> <td style="width: 20%; vertical-align: top;">FV SENSOR</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - 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 male connector for REMOTE control </td> </tr> </table>	FV SENSOR	<ul style="list-style-type: none"> - 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 male connector for REMOTE control
FV SENSOR	<ul style="list-style-type: none"> - 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 male connector for REMOTE control 		
	<table border="0" style="width: 100%;"> <tr> <td style="width: 20%; vertical-align: top;">HV SENSOR</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - 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 male connector for REMOTE control - 4-pole female connector - Analog pressure signal </td> </tr> </table>	HV SENSOR	<ul style="list-style-type: none"> - 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 male connector for REMOTE control - 4-pole female connector - Analog pressure signal
HV SENSOR	<ul style="list-style-type: none"> - 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 male connector for REMOTE control - 4-pole female connector - Analog pressure signal 		
	<table border="0" style="width: 100%;"> <tr> <td style="width: 20%; vertical-align: top;">VALVE</td> <td style="vertical-align: top;"> <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 female connector for connecting the valve / shutter - 12-pole male connector for REMOTE control </td> </tr> </table>	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 female connector for connecting the valve / shutter - 12-pole male connector for REMOTE control
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 female connector for connecting the valve / shutter - 12-pole male connector 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 - 19-pole female connector for connecting the isolation valve - 12-pole male connector 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 female connector (2 x) for connecting the isolation valves - 12-pole male connector 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

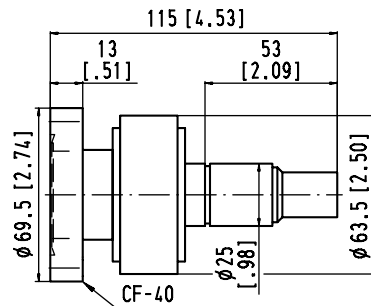
- Cable
 - Sensor – SENSOR module: max. 300 m, triaxial cable, 3.5 mm²
 - Valve / shutter – VALVE module: max. 150 m, 12-pole cable, 0.75 mm²
 - Isolation valve – GATE module: max. 200 m, 7-pole cable, 0.75 mm²
- Ordering No.
770CS-99LX
770CV-79LX
770CV-89LX
X = Length: to be specified

- Fine vacuum sensor (FV)
Ordering No. 770SF-99NN
glow discharge



- Trigger pressure: approx. 10⁻² mbar
- Response time: approx. 1 ms
- Radiation resistance: 10⁸ Gy (10¹⁰ rad)
- Flange: CF-F 40
- Weight: approx. 0.6 kg (1.32 lbs)

- High vacuum sensor (HV)
Ordering No. 770SH-99NN
cold cathode



- Trigger pressure: adjustable from 10⁻⁸ to 10⁻³ mbar
- Response time: 2 ms (air inrush 1 bar)
- Radiation resistance: 10⁷ Gy (10⁹ rad)
- Flange: CF-F 40
- Weight: approx. 1.1 kg (2.43 lbs)

ORDERING INFORMATION

Controller VF-2 combined with various modules
Ordering numbers on request

BEAM STOPPER / BEAM STOPPER INSERT, SERIES 79.0 / 79.3

For use in multiple applications, e. g. photon stopper.



Beam stopper
Series 79.0



Beam stopper insert
Series 79.3

One-piece water guide

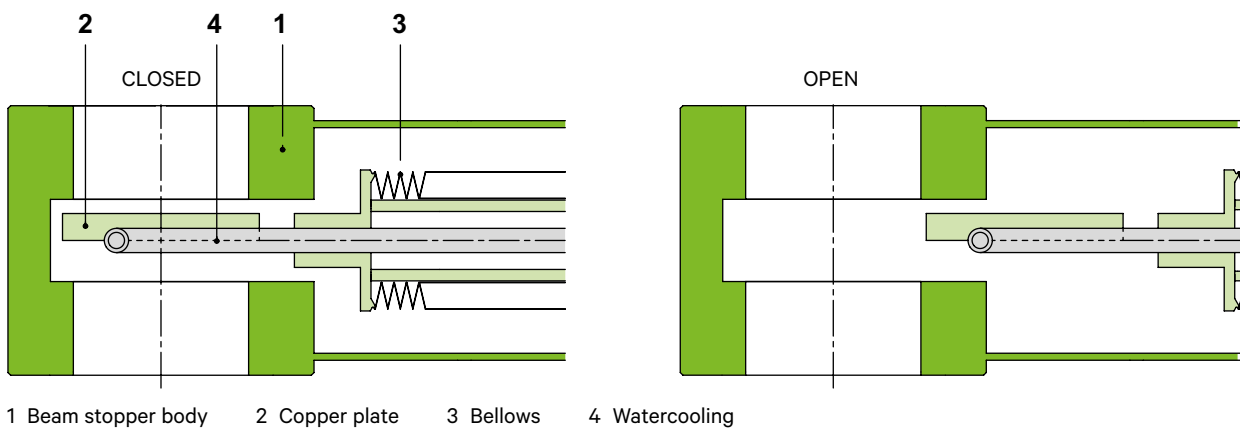
Industrially manufactured

UHV compatible

MAIN FEATURES

Sizes	DN 63 – 160 mm (2½" – 6")
Actuators	pneumatic: double acting
Body material	stainless steel
Feedthrough	bellows
Standard flanges	CF-F

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Beam stopper body	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range		UHV to 1 bar (abs)
Cycles until first service		5 000 (option: 50 000)
Bake-out temperature ¹⁾	Beam stopper body Pneumatic actuator	≤ 250 °C ≤ 80 °C (Option: 200 °C)
Heating and cooling rate		≤ 80 °C h ⁻¹
Material	Beam stopper body, mechanism Bellows Watercooled plate	AISI 304 (1.4301) AISI 316L (1.4404) copper
Seal	Bonnet	metal
Feedthrough		bellows
Mounting position		any
Compressed air (min. – max. overpressure)		4 – 7 bar / 58 – 102 psi
Closing time	DN 63 DN 100 DN 160	1 s 2 s 3 s
Load	Beam $\varnothing < 60$ mm Beam $\varnothing > 60$ mm	max. 5 kW max. 6 kW
Specific load		max. 25 W / mm ²
Cooling water	Quantity Temperature	min. 15 l / min < 15 °C

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

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Bakeable position indicator:
pneumatic actuator bakeable to max. 200 °C¹⁾ (standard: 80 °C)

BEAM STOPPER

- Without watercooling
- Customer specified flanges
- Ports for roughing (by-pass), venting or for gauges

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

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

Flange connections for installation of the beam stopper: see series 33

ORDERING INFORMATION

FOR STANDARD BEAM STOPPERS

79.0

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	2½	79036-CE24	79036-CE44 ¹⁾
100	4	79040-CE24	79040-CE44 ¹⁾
160	6	79044-CE24	79044-CE44 ¹⁾

¹⁾ specify control voltage

79.3

Beam stopper insert with pneumatic actuator
double acting

DN		Ordering numbers (based on bonnet dimension)	
mm	inch	CF-F	
		without solenoid valve with position indicator 80 °C	with solenoid valve with position indicator 80 °C
100	4	79340-CE24	79340-CE44 ¹⁾
160	6	79344-CE24	79344-CE44 ¹⁾
200	8	79346-CE24	79346-CE44 ¹⁾

¹⁾ specify control voltage

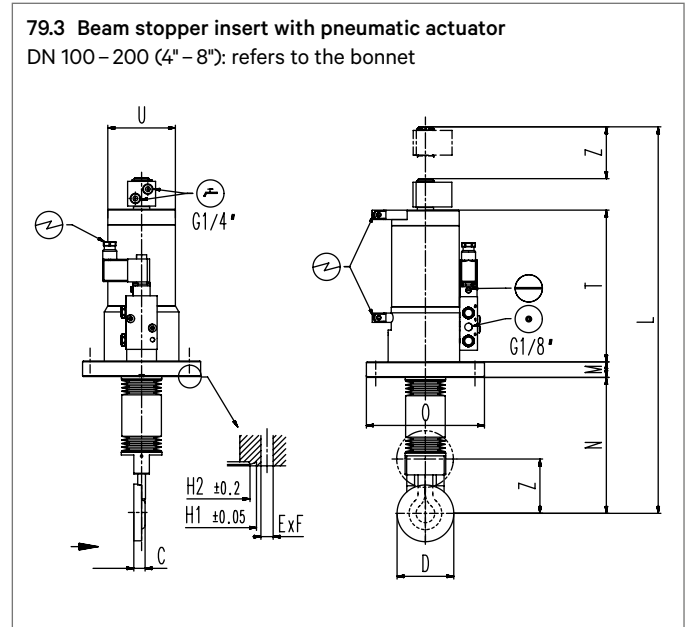
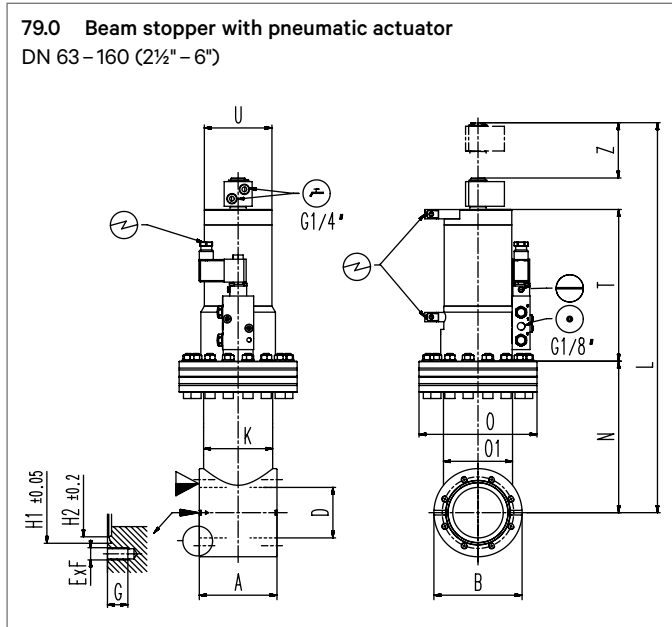
ORDERING INFORMATION

FOR BEAM STOPPERS WITH OPTIONS

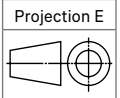
Basic ordering number plus «-X»: -X to be specified

Example: 79040-CE44-X, X = pneumatic actuator bakeable to 200 °C

MAIN DIMENSIONS



- ▼ Valve seat side
- Beam direction
- ⊙ Compressed air connection
- ⊗ Electrical connection
- ⊖ Emergency operation
- ⊕ Cooling water connection



DN	mm	63	100	160
	inch	2½	4	6
A	mm	100	100	100
	inch	3.94	3.94	3.94
B	mm	113.50	152	202.50
	inch	4.47	5.98	7.97
D	mm	65	100	150
	inch	2.56	3.94	6.91
E × F		8 × M8	16 × M8	20 × M8
G	mm	13	13	13
	inch	0.51	0.51	0.51
H1	mm	82.55	120.70	171.50
	inch	3.25	4.75	6.75
H2	mm	77.40	115.50	166
	inch	3.05	4.55	6.54
K	mm	88.90	80	80
	inch	3.50	3.15	3.15
L	mm	502	639	841
	inch	19.76	25.16	33.11
N	mm	195	262	364
	inch	7.68	10.31	14.33
O	mm	152	202.50	253
	inch	5.98	7.97	9.96
O1	mm	88.90	120	180
	inch	3.50	4.72	7.09
T	mm	195.50	230.50	280.50
	inch	7.70	9.07	11.04
U	mm	87	87	87
	inch	3.43	3.43	3.43
Z	mm	71	106	156
	inch	2.80	4.17	6.14

DN	mm	100	160	200
	inch	4	6	8
C	mm	14.50	14.50	14.50
	inch	0.57	0.57	0.57
D	mm	73	107.50	158
	inch	2.87	4.23	6.22
E × F	mm	16 × Ø8.40	20 × Ø8.40	24 × Ø8.40
	inch	16 × Ø0.33	20 × Ø0.33	24 × Ø0.33
H1	mm	120.65	171.50	222.35
	inch	4.75	6.75	8.75
H2	mm	115.50	166	217
	inch	4.55	6.54	8.54
L	mm	502	639	1018
	inch	19.76	25.16	40.01
M	mm	20	22	24.50
	inch	0.79	0.87	0.96
N	mm	175	240	416.50
	inch	6.89	9.45	16.40
O	mm	152	202.50	253
	inch	5.98	7.97	9.96
T	mm	195.50	230.50	330.50
	inch	7.70	9.07	13.01
U	mm	87	87	87
	inch	3.43	3.43	3.43
Z	mm	71	106	206
	inch	2.80	4.17	8.11



SPECIAL VALVES FOR GASES

SERIES	TYPE	PAGE
01.0	GATE VALVES FOR GAS ANALYSIS	336
27.1	ANGLE VALVE FOR CHEMISTRY	338
62.7	GAS DOSING VALVE	340
66.0 / 66.3	CONTROL ANGLE VALVE FOR CHEMISTRY	342

GATE VALVE FOR GAS ANALYSIS, SERIES 01.0

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.



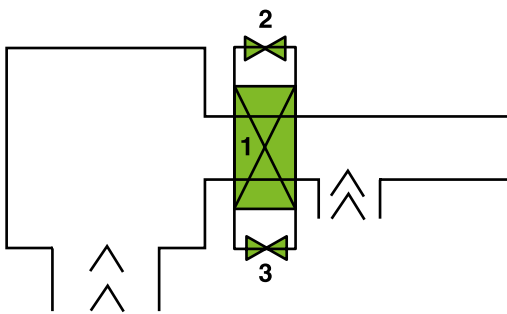
By-pass valves and orifices exchangeable

Very compact design

MAIN FEATURES

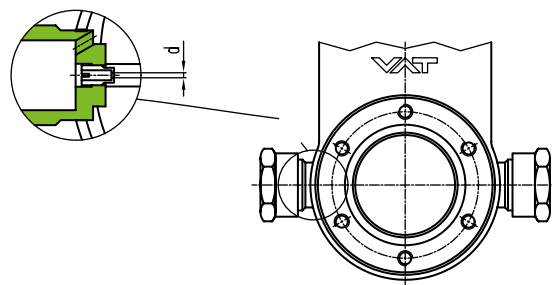
Sizes	DN 16 – 50 mm (5/8" – 2")
Technical data of gate valve	see series 01.0, pages 22 – 29
By-pass valve	exchangeable – type Nupro with seat made of Kel-F (bakeable to 90 °C) – with manual actuator, type SS-4BKT – with pneumatic actuator, single acting with closing spring (NC), type SS-4BK-1C

FUNCTIONAL PRINCIPLE



- 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.

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

ORDERING INFORMATION

Basic ordering number of series 01.0 plus «-X»: -X to be specified

Example:

01032-CE44-X, X = with manually actuated Nupro valves, orifice A 0.2 mm, orifice B 0.4 mm

GATE VALVE FOR GAS ANALYSIS, SERIES 01.0

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.



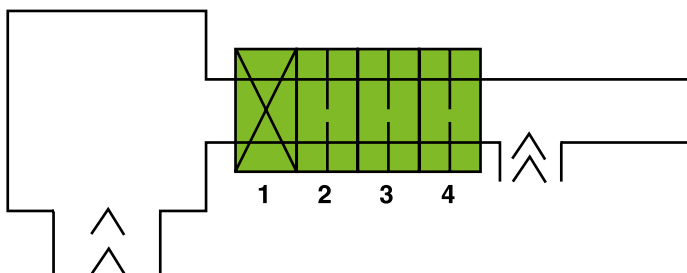
Orifices exchangeable

Line of sight between analyzer and process chamber

MAIN FEATURES

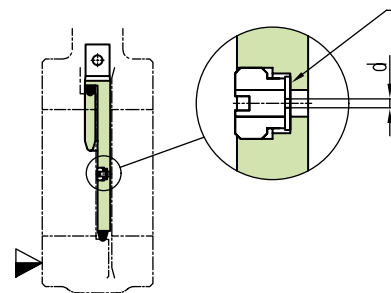
Sizes	DN 16 – 50 mm (5/8" – 2")
Technical data of gate valve	see series 01.0, pages 22 – 29

FUNCTIONAL PRINCIPLE



- 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.

AVAILABLE ORIFICES



Size (d) in mm: 0.005, 0.01, 0.02, 0.03, 0.05, 0.1

▼ = valve seat side

ORDERING INFORMATION

Basic ordering number of series 01.0 plus «-X»: -X to be specified

Example:

01032-CE44-X, X = 2 valves welded together, 1 valve rotated by 90°, orifice 0.1 mm

ANGLE VALVE FOR CHEMISTRY, SERIES 27.1

The isolation angle valve for processes with aggressive and corrosive gases. These products are subject to the Non Proliferation Treaty (NPT).



Robust design

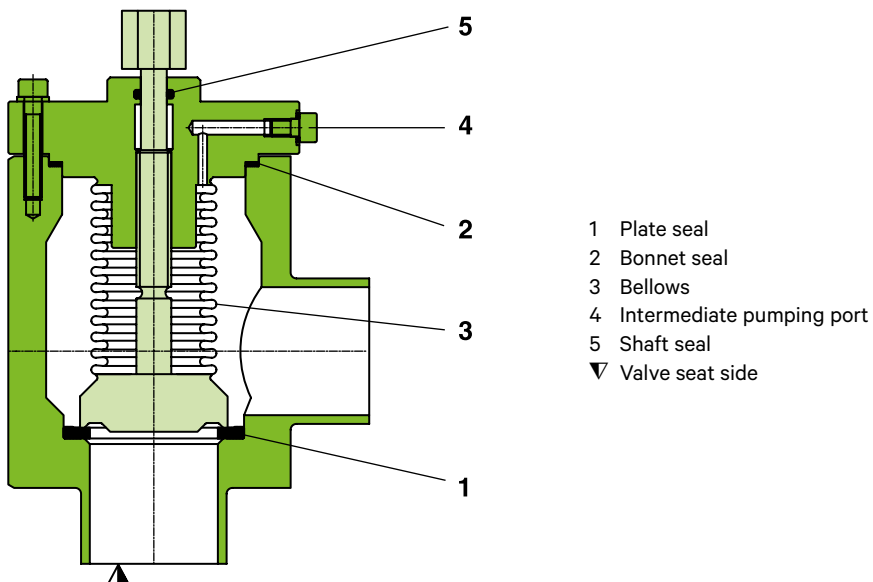
Reliable, for long term use

Maintenance-free

MAIN FEATURES

Sizes	DN 16 – 160 mm (½" – 6")
Actuators	manual with hexagon head pneumatic: single acting with closing spring (NC)
Body material	aluminum or stainless steel
Feedthrough	bellows with intermediate pumping port
Standard flanges	weld neck, ISO-KF/ISO-K, or customized

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

Leak rate	Valve body Valve seat	<1·10 ⁻⁹ mbar ls ⁻¹ <1·10 ⁻⁷ mbar ls ⁻¹
Pressure range		1·10 ⁻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 Valve body with PFA bonnet seal Manual and pneumatic actuator	≤ 120 °C ≤ 100 °C ≤ 100 °C
Material	Aluminum valve body Stainless steel valve body Bellows	EN AW-5049 (3.3527), EN AW-6082 (3.2315) AISI 316L (1.4404, 1.4435) AISI 316L (1.4404), AISI 316Ti (1.4571)
Seal	Bonnet (aluminum body) Bonnet (stainless steel body) DN 16 – 40 DN 63 – 160 Plate	PFA copper PFA Tenic
Feedthrough		bellows with intermediarte pumping port
Mounting position		any
Solenoid valve		24 V DC (others on request)
Position indicator: contact rating	Voltage Current	5 – 50 V AC/DC 5 – 100 mA
Valve position indication		visual (mechanical)

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

ORDERING INFORMATION FOR STANDARD VALVES

Valve with manual actuator
hexagon head

DN		Ordering numbers					
mm	inch	weld neck		ISO-KF		ISO-K	
		aluminum	stainless steel	aluminum	stainless steel	aluminum	stainless steel
16	5/8	27124-RA02	27124-RE02	27124-KA02	27124-KE02	-	-
25	1	27128-RA02	27128-RE02	27128-KA02	27128-KE02	-	-
40	1½	27132-RA02	27132-RE02	27132-KA02	27132-KE02	-	-
63	2½	27136-RA02	27136-RE02	-	-	27136-QA02	27136-QE02
100	4	27140-RA02	27140-RE02	-	-	27140-QA02	27140-QE02
160	6	27144-RA02	27144-RE02	-	-	27144-QA02	27144-QE02

Valve with pneumatic actuator
single acting with closing spring (NC)
with solenoid valve
with position indicator

16	5/8	27124-RA41	27124-RE41	27124-KA41	27124-KE41	-	-
25	1	27128-RA41	27128-RE41	27128-KA41	27128-KE41	-	-
40	1½	27132-RA41	27132-RE41	27132-KA41	27132-KE41	-	-
63	2½	27136-RA41	27136-RE41	-	-	27136-QA41	27136-QE41
100	4	27140-RA41	27140-RE41	-	-	27140-QA41	27140-QE41
160	6	27144-RA41	27144-RE41	-	-	27144-QA41	27144-QE41

Specify control voltage

OPTIONS, CUSTOMIZED SOLUTIONS

- 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

DIMENSIONS

On request

GAS DOSING VALVE, SERIES 62.7

Fine gas dosing valve for demanding upstream processes.



DN 5

DN 16

Applicable through a large pressure regime

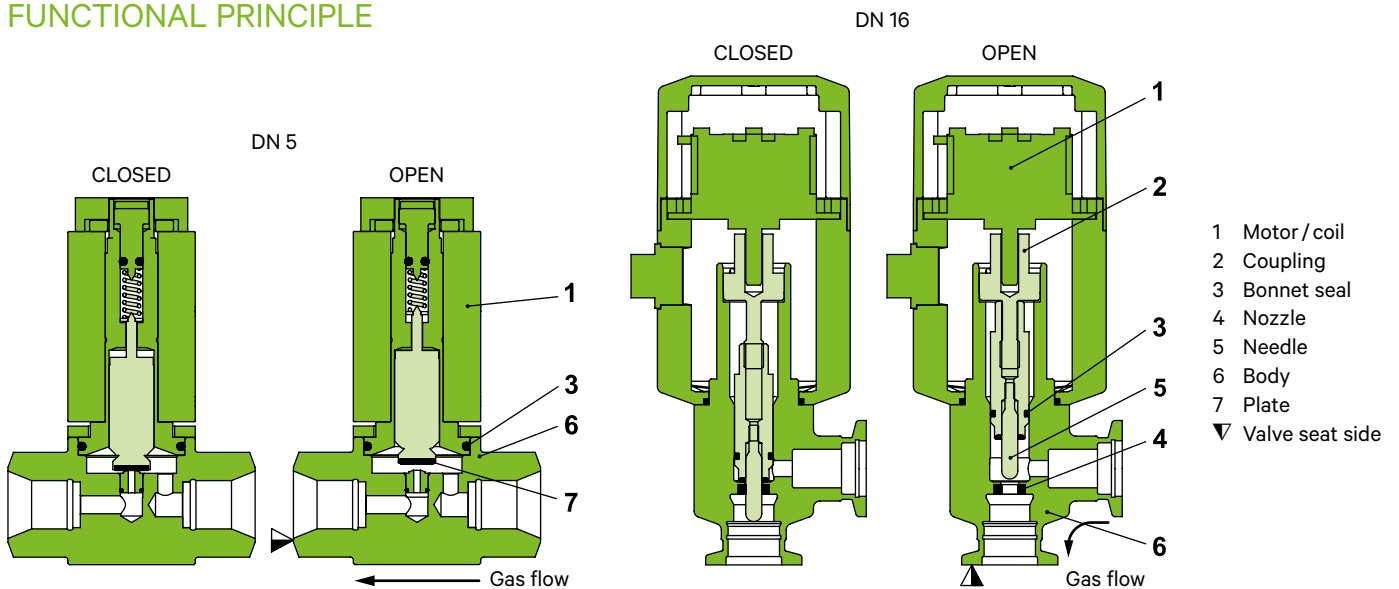
Accurate and closed loop pressure control

Excellent reproducibility

MAIN FEATURES

Sizes	DN 5 mm ($\frac{3}{16}$ ") / DN 16 mm ($\frac{5}{8}$ ")
Actuator	DN 5: electromagnetic DN 16: stepper motor
Body material	stainless steel
Feedthrough	shaft feedthrough
Standard flanges	DN 5: specific / DN 16: ISO-KF

FUNCTIONAL PRINCIPLE



TECHNICAL DATA

		DN 5	DN 16
Leak rate ¹⁾	Valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range ¹⁾		$< 1 \cdot 10^{-8}$ mbar ls ⁻¹ to 2 bar (abs)	$< 1 \cdot 10^{-8}$ mbar ls ⁻¹ to 2.5 bar (abs)
Differential pressure on the plate		≤ 1.0 bar	≤ 1.1 bar
Temperature ²⁾	Valve body, plate Ambient	– 5 °C – 50 °C	≤ 150 °C 5 °C – 40 °C
Material	Valve body Plate	AISI 316L (1.4404 or 1.4435) AISI 430IL (1.4105IL)	AISI 316L (1.4404 or 1.4435) AISI 316L (1.4404 or 1.4435)
Seal	Plate Dosing sleeve	FPM –	FPM fluoropolymer
Feedthrough		shaft feedthrough	shaft feedthrough
Mounting position		any	any
Controllable conductance	Minimum / maximum	10 / 5000 sccm	$5 \cdot 10^{-6}$ / 1250 mbar ls ⁻¹
Operating time	Closing / opening	< 30 ms / < 30 ms	3 s / 4 s
Power supply		24 V DC / 12 VA	24 V DC / 12 VA
Control		digital with controller analog 0 ... 10 V DC	digital with controller analog 0 ... 10 V DC
Weight		0.096 kg / 0.2 lbs	0.8 kg / 1.8 lbs

¹⁾ Unheated on delivery. ²⁾ Maximum values: depending on operating conditions and sealing materials.

ACCESSORIES

- Flange adapters for DN 5 gas dosing valve
- Controller PM-C to close the valve automatically in case of a power failure:
Ordering number 627PM-16GV-0002
- Interface module 582225 to connect RS232C interface with digital interface of valve
- Cable to connect controller with valve:

Length	Ordering number	Length	Ordering number	Length	Ordering number
3 m	627CV- .9LC-0002	15 m	627CV- .9LK-0002	25 m	627CV- .9LX-AIK2
5 m	627CV- .9LE-0002	20 m	627CV- .9LL-0002	40 m	627CV- .9LX-AIL2
10 m	627CV- .9LJ-0002				

— 8 for DN 5 Example: 627CV-89LC-0002
 — 9 for DN 16 Example: 627CV-99LC-0002

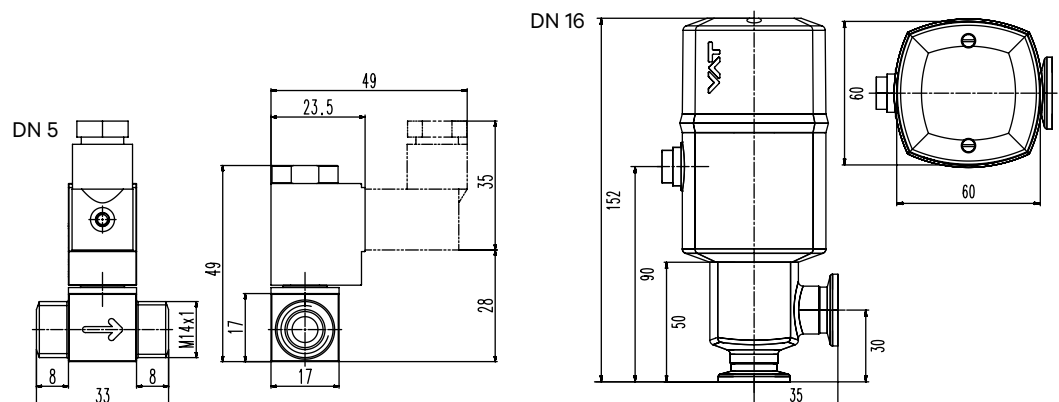
- Flange connections for installation of the valve: see series 31

ORDERING NUMBERS

	DN 5 (3/16")						DN 16 (5/8")
	10 sccm	50 sccm	100 sccm	500 sccm	1000 sccm	5000 sccm	
62714-XE64	-ABE .	-ABF .	-ABG .	-ABH .	-ABI .	-ABJ .	62724-KE52

Example: 62714-XE64-ABE .

DIMENSIONS



CONTROL ANGLE VALVE FOR CHEMISTRY, SERIES 66.0

The control and isolation angle valve for processes with aggressive and corrosive gases. These products are subject to the Non Proliferation Treaty (NPT).



Manual

Stepper motor with external pressure controller

Isolation and control in one
 Accurate flow or position control
 Maintenance-free

MAIN FEATURES

Sizes	DN 16 – 50 mm (½" – 2")
Actuators	manual with hexagon head or stepper motor with external pressure controller
Body material	stainless steel
Feedthrough	bellows
Standard flanges	weld neck, ISO-KF/ISO-K, or customized

TECHNICAL DATA

Leak rate ¹⁾	Valve body Valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹ < 1 · 10 ⁻⁶ mbar ls ⁻¹
Pressure range		1 · 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 Bellows	AISI 316L (1.4404, 1.4435) AISI 316L (1.4404)
Seal	Bonnet (valve with manual actuator) Bonnet (valve with stepper motor) Plate	PFA metal (2.0040.26) Tenic
Feedthrough		bellows
Mounting position		any
Flow range	Kv _{min} Kv _{max}	≥ 0.01 m ³ /h ≤ 8 m ³ /h
Control range	for 1 decade at Kv _{min} for 2 decades at Kv _{min}	0.01 – 0.1 m ³ /h > 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.

FURTHER INFORMATION

On request

CONTROL ANGLE VALVE FOR CHEMISTRY, SERIES 66.3

The control angle valve for processes with aggressive and corrosive gases. These products are subject to the Non Proliferation Treaty (NPT).



Stepper motor with external pressure controller

- Outstanding control range
- Accurate flow or position control
- Memory function for power failure
- Maintenance-Free

MAIN FEATURES

Sizes	DN 40 – 100 mm (1½" – 4")
Actuators	stepper motor with external pressure controller
Body material	aluminum or stainless steel
Feedthrough	bellows
Standard flanges	weld neck, ISO-KF / ISO-K, or customized

TECHNICAL DATA

Leak rate ¹⁾	Valve body	< 1·10 ⁻⁹ mbar ls ⁻¹
Pressure range		1·10 ⁻⁸ mbar to 1 bar (abs)
Differential pressure on the plate	DN 40 – 65 DN 100	1000 mbar 250 mbar
Cycles until first service ²⁾		125 000
Temperature ²⁾	Valve body, ambient	≤ 70 °C
Material	Aluminum valve body Stainless steel valve body Plate Bellows	EN AW-5083 (3.3547) AISI 304 (1.4301) or AISI 316L (1.4404 or 1.4435) AISI 316L (1.4404 or 1.4435) AISI 316L (1.4404)
Seal	Bonnet	PFA
Feedthrough		bellows
Mounting position		any
Flow range	Kv _{min} Kv _{max}	≥ 0.05 m ³ /h ≤ 80 m ³ /h
Control range	for 1 decade at Kv _{min} for 2 decades at Kv _{min}	0.05 – 0.1 m ³ /h > 0.1 m ³ /h
Typical closing or opening time	DN 40 – 65 DN 100	< 8 s < 10 s

¹⁾ Unheated on delivery. ²⁾ Maximum values: depending on operating conditions and sealing materials.

FURTHER INFORMATION

On request



FLANGE CONNECTIONS

SERIES	TYPE	PAGE
31.0	FLANGE CONNECTIONS ISO-KF	346
31.1	SOFT-START THROTTLE	357
32.0	FLANGE CONNECTIONS ISO-K, ISO-F	358
33.0	FLANGE CONNECTIONS CF	368
35.0	METAL SEAL «VATSEAL»	378

FLANGE CONNECTIONS ISO-KF, SERIES 31.0 / 31.1

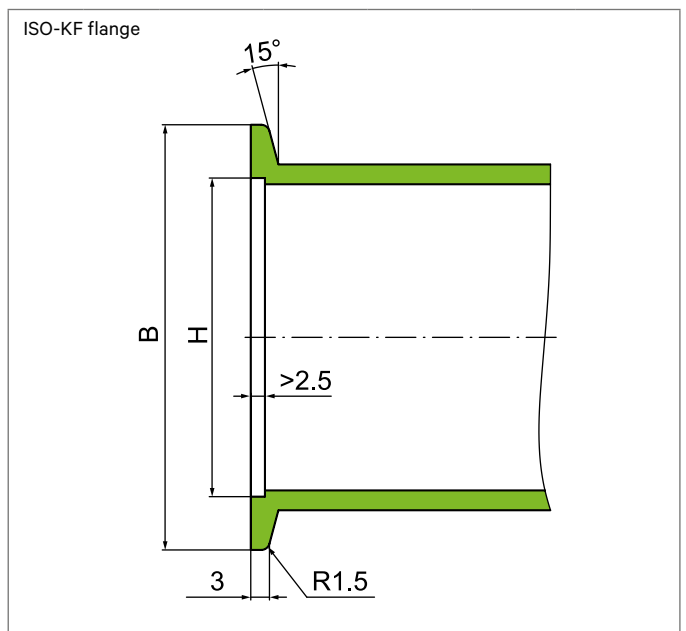
Clamping rings	Blank-off flanges	Bellows
Clamping chains	Weld neck flanges	Adapters
Claws	Elbows	Soft-start throttles
Centering rings	T-Pieces	
Seals	Intermediate pieces	

TECHNICAL DATA & ORDERING INFORMATION

Seal	FKM (Viton®)	Indium	Aluminum
Suitable flange material	A, E	A, E	E
Temperature ¹⁾	≤ 200 °C	≤ 80 °C	≤ 200 °C
Leak rate for Helium (mbar ls ⁻¹)	< 1·10 ⁻⁹	< 1·10 ⁻¹⁰	< 1·10 ⁻⁹
Sealing force (N per cm sealing line)	10 – 50	50 – 500	see clamping chain & clamping device
Multiple use of seal	yes	yes	no

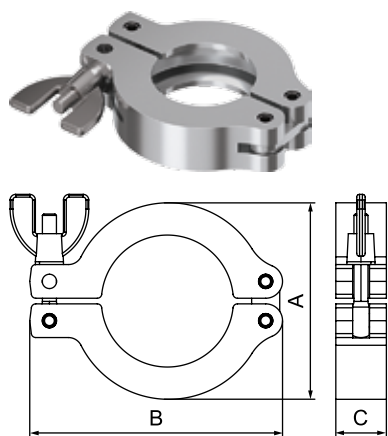
A: aluminum
E: stainless steel

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



DN	mm inch	10 %	16 %	25 1	40 1½	50 2
B	mm inch	30 1.18	30 1.18	40 1.57	55 2.17	75 2.95
H	mm inch	12.20 0.48	17.20 0.68	26.20 1.03	41.20 1.62	52.20 2.06

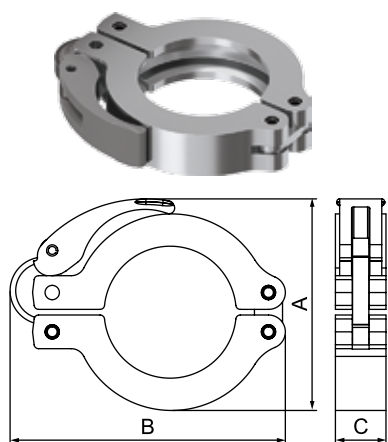
CLAMPING RING



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

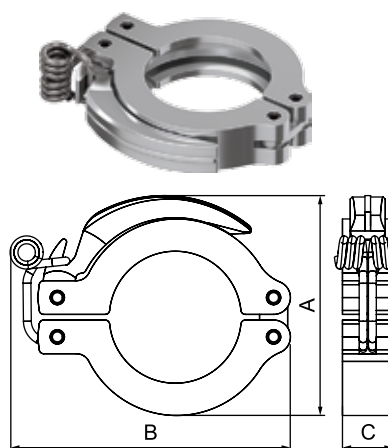
RAPID CLAMPING RING



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

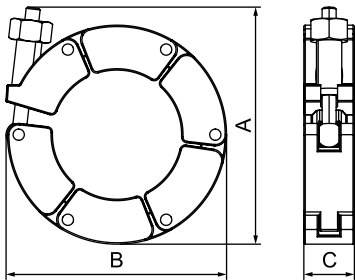
Clamping ring: aluminum EN AC-46200 (3.2162)
 Spring: steel
 Lever: polyamide
 Temperature: max. 80 °C

RAPID CLAMPING RING: METAL



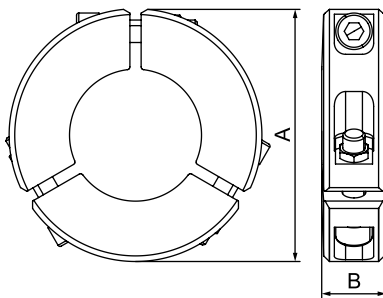
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 5/8	53	2.09	72	2.83	16	0.63	31024-KASM-0001
25	1	61	2.40	83	3.27	16	0.63	31028-KASM-0001
40	1 1/2	78	3.07	99	3.90	18	0.71	31032-KASM-0001

Clamping ring: aluminum EN AC-46200 (3.2162)
 Spring: stainless steel
 Lever: aluminum EN AC-47100 (3.2982)
 Temperature: max. 150 °C

CLAMPING CHAIN


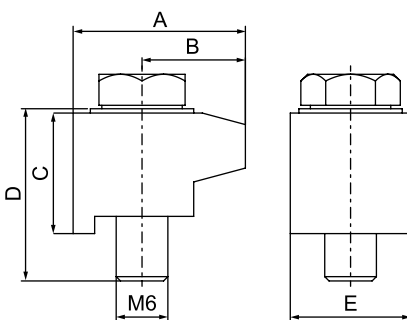
DN		A		B		C		Recommended tightening torque Nm	Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch		
10/16	3/8 / 5/16	72	2.83	52	2.05	18	0.71	2.50	31024-KASA-0001
25	1	82.50	3.25	62	2.44	18	0.71	3.50	31028-KASA-0001
40	1½	85	3.35	77	3.03	18	0.71	5	31032-KASA-0001
50	2	119	4.69	95	3.74	20	0.79	6	31034-KASA-0001

Chain: aluminum EN AW-6081 (3.2215)
 Screw, nut: 1.6582 (nitro gas carburized)
 Suitable for aluminum seal

CLAMPING DEVICE


DN		A		B		Recommended tightening torque Nm	Ordering numbers
mm	inch	mm	inch	mm	inch		
10/16	3/8 / 5/16	52	2.05	18	0.71	3	31024-KASE-0001
25	1	75	2.95	20	0.79	8	31028-KASE-0001
40	1½	90	3.54	23	0.91	12	31032-KASE-0001
50	2	115	4.53	28	1.10	12	31034-KASE-0001

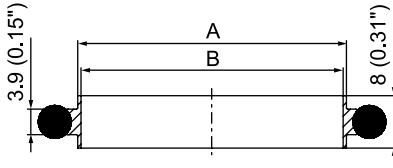
Chain: aluminum EN AC-46200 (3.2162)
 Screw: stainless steel
 Nut: zinc, nickel-plated
 Suitable for aluminum seal

CLAW


DN		A		B		C		D		E		Ordering number
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

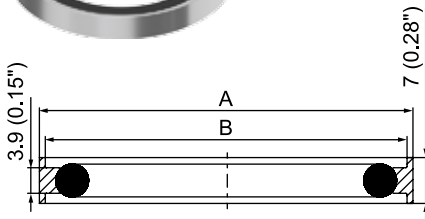
CENTERING RING



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)

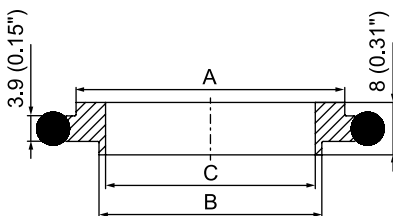
OUTER CENTERING RING



DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10/16	3/8 / 5/8	32	1.26	30.20	1.19	31024-KAUR-0001
25	1	42	1.65	40.20	1.58	31028-KAUR-0001
40	1 1/2	57	2.24	55.20	2.17	31032-KAUR-0001
50	2	77	3.03	75.20	2.96	31034-KAUR-0001

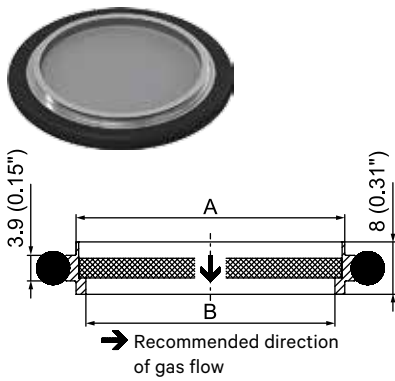
Seal: elastomer FKM (Viton®)
 Ring: aluminum EN AW-6082 (3.2315)

REDUCING CENTERING RING



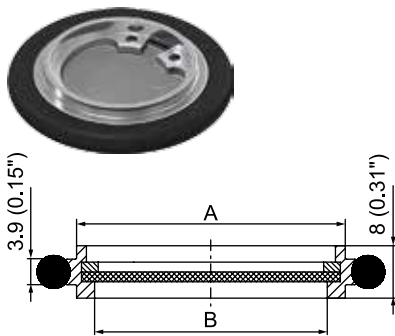
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16/10	5/8 / 3/8	17	0.67	12	0.47	10	0.39	31024-KAZR-0001 ¹⁾
25/20	1 / 3/4	26	1.02	22	0.87	20	0.79	31028-KAZR-0001 ¹⁾
40/32	1 1/2 / 1 1/8	41	1.61	34	1.34	32	1.26	31032-KAZR-0001 ¹⁾
16/10	5/8 / 3/8	17	0.67	12	0.47	10	0.39	31024-KEZR-0001 ²⁾
25/20	1 / 3/4	26	1.02	22	0.87	20	0.79	31028-KEZR-0001 ²⁾
40/32	1 1/2 / 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


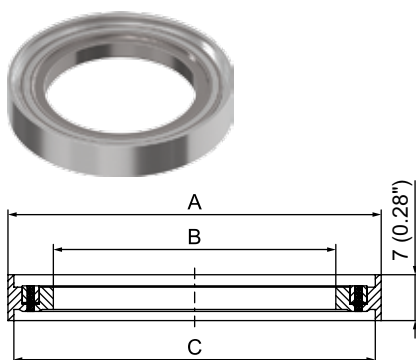
DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10	3/8	12	0.47	8	0.31	31020-KEZF-0001
16	5/8	17	0.67	14	0.55	31024-KEZF-0001
25	1	26	1.02	23	0.91	31028-KEZF-0001
40	1 1/2	41	1.61	38	1.50	31032-KEZF-0001
50	2	52	2.05	48	1.89	31034-KEZF-0001

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	35.50	1.40	31032-KEZG-0001
50	2	52	2.05	45.70	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


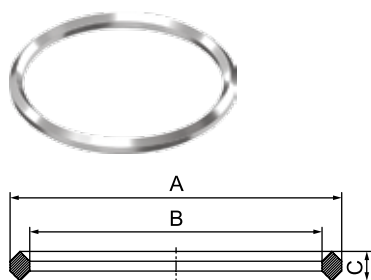
With inner centering ring on request

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10/16	3/8 / 3/8	32	1.26	18.10	0.71	30.20	1.19	31024-KETR-0001
25	1	42	1.65	28.10	1.11	40.20	1.58	31028-KETR-0001
40	1 1/2	57	2.24	43.10	1.70	55.20	2.17	31032-KETR-0001
50	2	77	3.03	63.10	2.48	75.20	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
 Recommended clamping devices: clamping chain 310xx-KASA, clamping device 310xx-KASE
 Suitable for use with stainless steel flanges

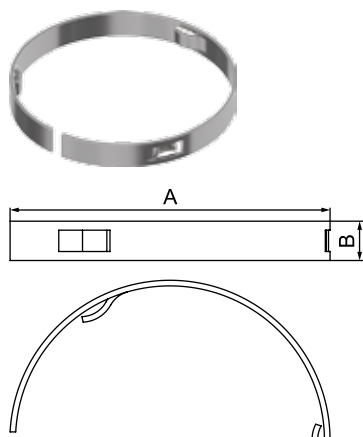
ALUMINUM SEAL



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10 / 16	3/8 / 5/8	25.60	1.01	19.60	0.77	4.50	0.18	31024-KADK-0001
25	1	35.60	1.40	29.60	1.17	4.50	0.18	31028-KADK-0001
40	1½	50.60	1.99	44.60	1.76	4.50	0.18	31032-KADK-0001
50	2	65.60	2.58	59.60	2.35	4.50	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	1½	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)

Multiple use

Recommended clamping devices: clamping chain 310xx-KASA, clamping device 310xx-KASE

Suitable for use with stainless steel flanges

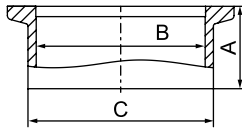
BLANK-OFF FLANGE



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	1½	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	1½	5	0.20	31032-KEFB-0001 ²⁾
50	2	6	0.24	31034-KEFB-0001 ²⁾

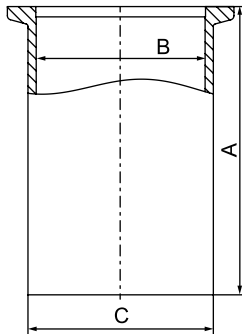
¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 304 (1.4301)

WELD NECK FLANGE: SHORT


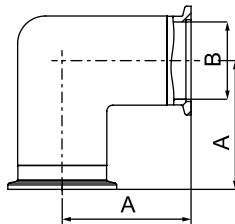
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	20	0.79	12	0.47	16	0.63	31020-KESK-0001
16	5/8	20	0.79	16	0.63	20	0.79	31024-KESK-0001
25	1	20	0.79	26	1.02	30	1.18	31028-KESK-0001
40	1 1/2	20	0.79	41	1.61	45	1.77	31032-KESK-0001
50	2	20	0.79	50	1.97	54	2.13	31034-KESK-0001

Stainless steel AISI 304 (1.4301)

WELD NECK FLANGE: LONG


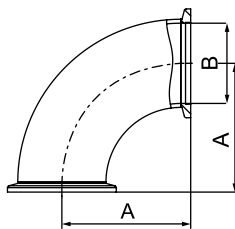
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	70	2.76	12	0.47	16	0.63	31020-KESL-0001
16	5/8	70	2.76	16	0.63	20	0.79	31024-KESL-0001
25	1	70	2.76	26	1.02	30	1.18	31028-KESL-0001
40	1 1/2	70	2.76	41	1.61	45	1.77	31032-KESL-0001
50	2	70	2.76	50	1.97	54	2.13	31034-KESL-0001

Stainless steel AISI 304 (1.4301)

ELBOW 90°: ALUMINUM


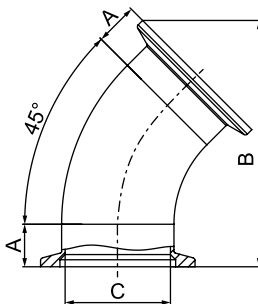
DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10	3/8	30	1.18	12	0.47	31020-KAKR-0001
16	5/8	40	1.57	16	0.63	31024-KAKR-0001
25	1	50	1.97	25	0.98	31028-KAKR-0001
40	1 1/2	65	2.56	39	1.54	31032-KAKR-0001

Aluminum EN AW-6082 (3.2315)

ELBOW 90°: STAINLESS STEEL


DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
10	3/8	30	1.18	9	0.35	31020-KEKR-0001
16	5/8	40	1.57	15	0.59	31024-KEKR-0001
25	1	50	1.97	25	0.98	31028-KEKR-0001
40	1 1/2	65	2.56	40.50	1.59	31032-KEKR-0001
50	2	70	2.76	49	1.93	31034-KEKR-0001

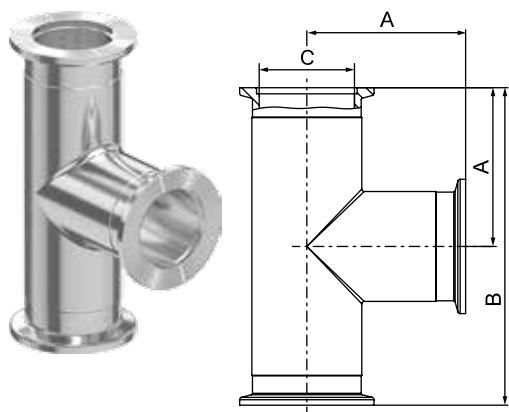
Stainless steel AISI 304 (1.4301)

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	68.80	2.71	25	0.98	31028-KEKH-0001
40	1 1/2	40	1.57	87.70	3.45	37	1.46	31032-KEKH-0001

Stainless steel AISI 304 (1.4301)

T-PIECE

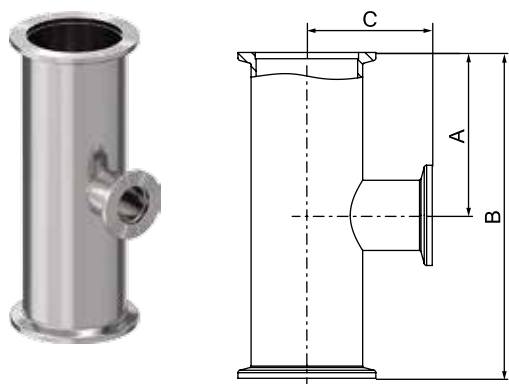


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	30	1.18	60	2.36	12	0.47	31020-KATS-0001 ¹⁾
16	5/8	40	1.57	80	3.15	16	0.63	31024-KATS-0001 ¹⁾
25	1	50	1.97	100	3.94	25	0.98	31028-KATS-0001 ¹⁾
40	1½	65	2.56	130	5.12	39	1.54	31032-KATS-0001 ¹⁾
10	3/8	30	1.18	60	2.36	12	0.47	31020-KETS-0001 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	1½	65	2.56	130	5.12	40.50	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)

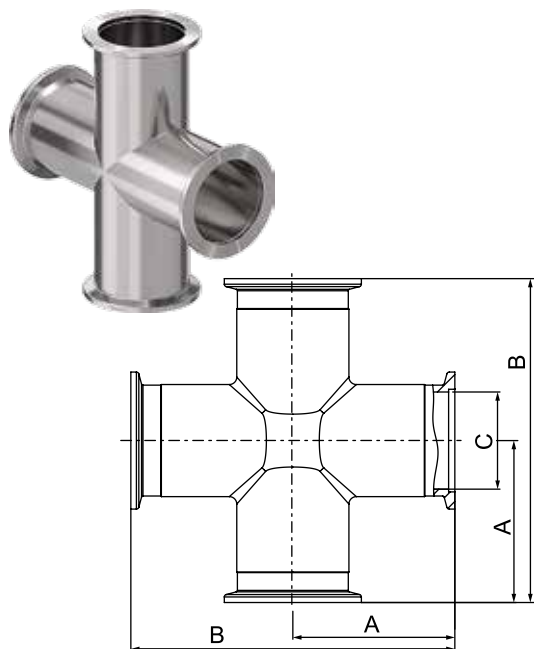
REDUCING T-PIECE



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
25/16	1/5/8	50	1.97	100	3.94	32	1.26	31028-KETV-ACK1
40/16	1½/5/8	65	2.56	130	5.12	40	1.57	31032-KETV-ACK1
40/25	1½/1	65	2.56	130	5.12	50	1.97	31032-KETV-ABW1
50/16	2/5/8	70	2.76	140	5.51	50	1.97	31034-KETV-ACK1
50/25	2/1	70	2.76	140	5.51	65	2.56	31034-KETV-ABW1
50/40	2/1½	70	2.76	140	5.51	65	2.56	31034-KETV-ABJ1

Stainless steel AISI 304 (1.4301)

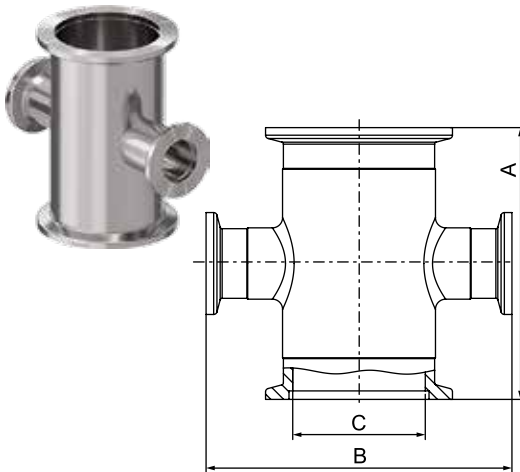
CROSS



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	1½	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	1½	65	2.56	130	5.12	40.50	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)

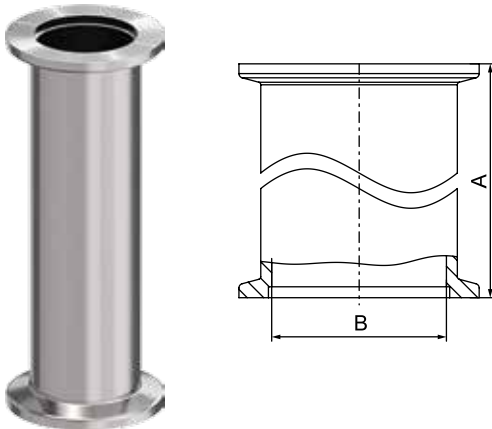
²⁾ Stainless steel AISI 304 (1.4301)

REDUCING CROSS


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
25/16	1/8"	70	2.76	70	2.76	25	0.98	31028-KAKZ-0001 ¹⁾
40/16	1 1/2 / 8"	80	3.15	90	3.54	39	1.54	31032-KAKZ-0001 ¹⁾
25/16	1/8"	70	2.76	70	2.76	25	0.98	31028-KEKZ-0001 ²⁾
40/16	1 1/2 / 8"	80	3.15	90	3.54	40.50	1.59	31032-KEKZ-0001 ²⁾
50/16	2 / 8"	100	3.94	100	3.94	53	2.09	31034-KEKZ-0001 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

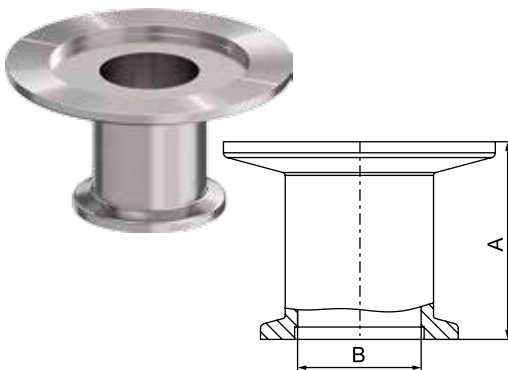
²⁾ Stainless steel AISI 304 (1.4301)

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	40.50	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)

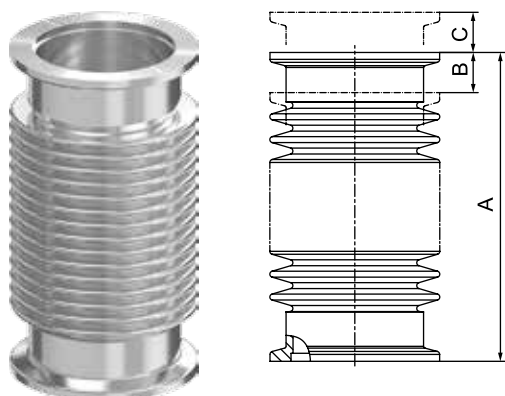
REDUCING PIECE


DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
25/16	1/8"	40	1.57	16	0.63	31028-KAUP-ACK1 ¹⁾
40/16	1 1/2 / 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 1/2"	40	1.57	40	1.57	31034-KAUP-ABJ1 ¹⁾
25/16	1/8"	40	1.57	16	0.63	31028-KEUP-ACK1 ²⁾
40/16	1 1/2 / 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 / 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 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

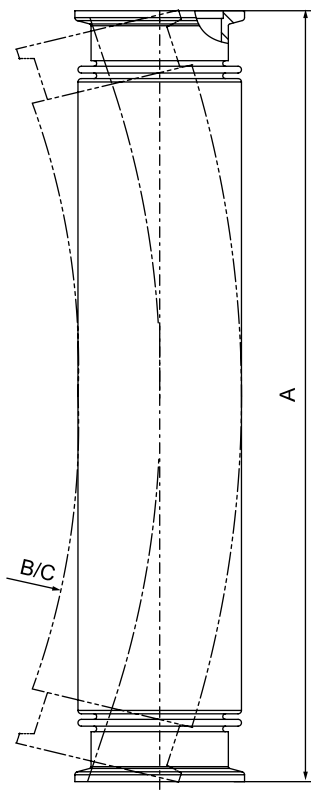


Short

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
10	3/8	70	2.76	3.50	0.14	3	0.12	31020-KEFK-0001
16	5/8	70	2.76	6.40	0.25	4.10	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

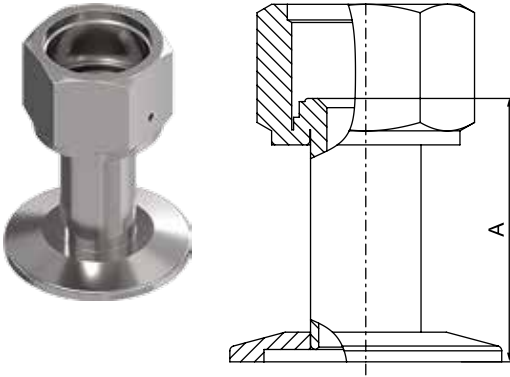
Maximum deviation from axis: DN 10 23°
 DN 16 21°
 DN 25 17°
 DN 40 15°
 DN 50 15°



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

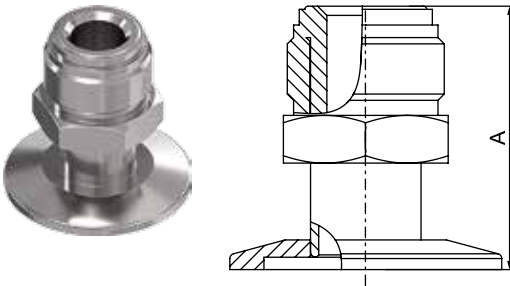
ADAPTER FLANGE VCR WITH INTERNAL THREAD


DN				A		Ordering numbers
ISO-KF		VCR		mm	inch	
mm	inch	mm	inch			
10/16	3/8 / 3/8	6.35	1/4	35.80	1.41	31024-KEAW-ACP1
25	1	6.35	1/4	35.80	1.41	31028-KEAW-ACP1
25	1	12.70	1/2	40.60	1.60	31028-KEAW-ACQ1
40	1 1/2	19.05	3/4	53.30	2.10	31032-KEAW-ACR1

Flange: stainless steel AISI 304 (1.4301)

Nut: stainless steel AISI 316L (1.4435)

Wrench size: inch

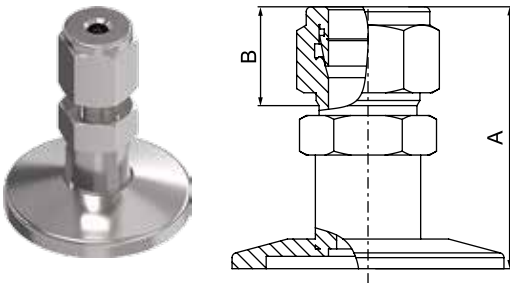
ADAPTER FLANGE VCR WITH EXTERNAL THREAD


DN				A		Ordering numbers
ISO-KF		VCR		mm	inch	
mm	inch	mm	inch			
10/16	3/8 / 3/8	6.35	1/4	35.80	1.41	31024-KEAM-ACP1
25	1	6.35	1/4	35.80	1.41	31028-KEAM-ACP1
25	1	12.70	1/2	40.60	1.60	31028-KEAM-ACQ1
40	1 1/2	19.05	3/4	53.30	2.10	31032-KEAM-ACR1

Flange: stainless steel AISI 304 (1.4301)

Nut: stainless steel AISI 316L (1.4435)

Wrench size: inch

ADAPTER FLANGE SWAGELOK


DN				A		B		Ordering numbers
ISO-KF		Swagelok		mm	inch	mm	inch	
mm	inch	mm	inch					
16	5/8	6	0.24	37	1.46	15.30	0.60	31024-KEAS-ACL1 ¹⁾
25	1	10	0.39	45	1.77	17.20	0.68	31028-KEAS-ACM1 ¹⁾
40	1 1/2	16	0.63	53	2.09	24.40	0.96	31032-KEAS-ACN1 ¹⁾
16	5/8	3.18	1/8	34.50	1.36	12.70	0.50	31024-KEAS-ACO1 ²⁾
25	1	6.35	1/4	37	1.46	15.30	0.60	31028-KEAS-ACP1 ²⁾
40	1 1/2	6.35	1/4	37	1.46	15.30	0.60	31032-KEAS-ACP1 ²⁾
40	1 1/2	12.70	1/2	47.50	1.87	22.80	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, SERIES 31.1

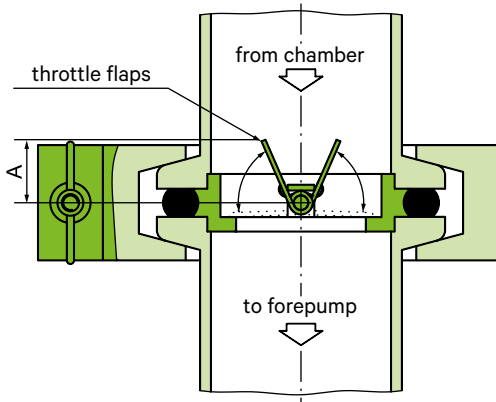
to reduce the gas flow in pump forelines.



Protection device against

- turbulence in piping and chambers
- particle contamination in vacuum systems
- movement of substrates caused by turbulence

FUNCTIONAL PRINCIPLE



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

DN (nominal I.D.)		Dimensions		Open section			
		A		throttle open		throttle closed	
mm	inch	mm	inch	mm	inch	mm	inch
16	5/8	6.20	0.24	90	0.14	4	0.006
25	1	9	0.35	200	0.31	5.50	0.0085
40	1½	14.30	0.56	570	0.88	8	0.012
50	2	19.90	0.78	1190	1.84	10.50	0.016

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 304 (1.4301), AISI 303 (1.4305)
Seal		FKM (Viton®)

¹⁾ Depending on system configuration.

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

ORDERING INFORMATION

DN (nominal I.D.)		Ordering numbers
mm	inch	
16	5/8	31124-KASO-0001
25	1	31128-KASO-0001
40	1½	31132-KASO-0001
50	2	31134-KASO-0001

FLANGE CONNECTIONS ISO-K/ISO-F, SERIES 32.0

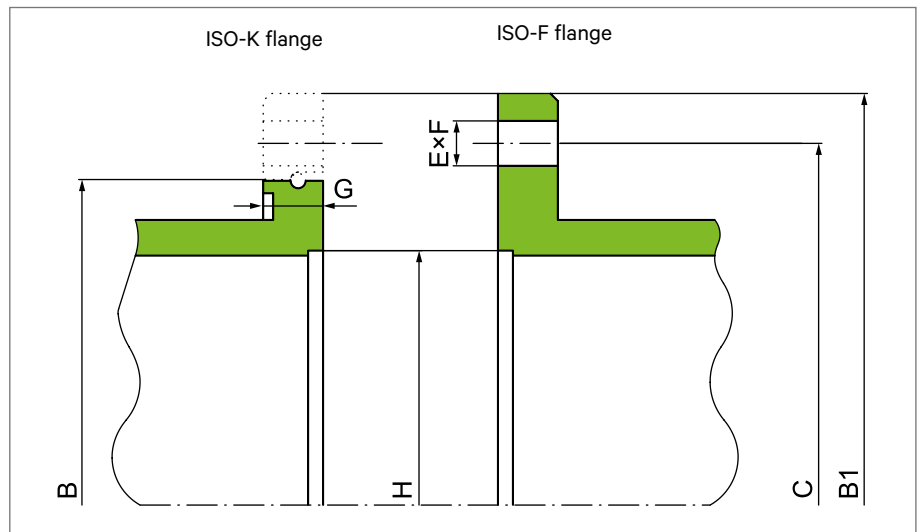
Clamps	Seals	T-Pieces
Claws	Flanges	Reducing pieces
Screws	Ports	Cross pieces
Centering rings	Elbows	Bellows

TECHNICAL DATA & ORDERING INFORMATION

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

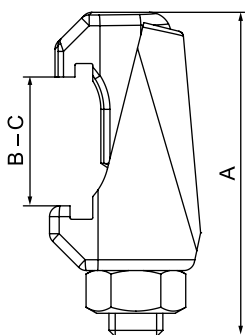
A: aluminum
E: stainless steel

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



DN	mm	63	80	100	160	200	250	320	400	500	630	800	1000
	inch	2½	3	4	6	8	10	12	16	20	25	32	60
B	mm	95	110	130	180	240	290	370	450	550	690	-	-
	inch	3.74	4.33	5.12	7.09	9.45	11.42	14.57	17.72	21.65	27.17	-	-
B1	mm	130	145	165	225	285	335	425	510	610	750	920	1120
	inch	5.12	5.71	6.50	8.86	11.22	13.19	16.73	20.08	24.02	29.53	36.22	44.09
C	mm	110	125	145	200	260	310	395	480	580	720	890	1090
	inch	4.33	4.92	5.71	7.87	10.24	12.20	15.55	18.90	22.83	28.35	35.04	42.91
E × F	mm	4 × 9	8 × 9	8 × 9	8 × 11	12 × 11	12 × 11	12 × 14	16 × 14	16 × 14	20 × 14	24 × 14	32 × 14
	inch	4 × 0.35	8 × 0.35	8 × 0.35	8 × 0.43	12 × 0.43	12 × 0.43	12 × 0.55	16 × 0.55	16 × 0.55	20 × 0.55	24 × 0.55	32 × 0.55
G	mm	12	12	12	12	12	12	17	17	17	22	-	-
	inch	0.47	0.47	0.47	0.47	0.47	0.47	0.67	0.67	0.67	0.87	-	-
H	mm	70	83	102	153	213	261	318	400	501	651	800	1000
	inch	2.76	3.27	4.02	6.02	8.39	10.28	12.52	15.75	19.72	25.63	31.50	39.37

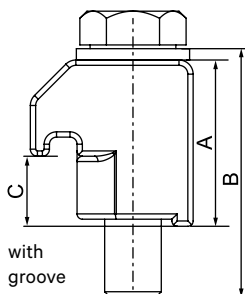
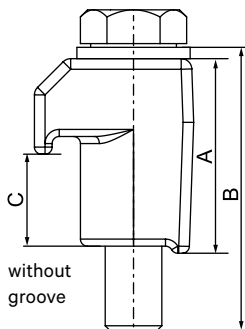
CLAMP: ISO-K



DN		A		B		C		¹⁾	Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	Nm	
63-250	2½-10	60	2.36	17	0.67	27	1.06	30	32036-QNKS-0001 ²⁾
320-500	12-20	78	3.07	27	1.06	39	1.54	45	32050-QNKS-0001 ²⁾
630	25	88	3.66	31	1.22	49	1.93	45	32056-QNKS-0001 ²⁾
63-250	2½-10	61	2.40	18	0.71	28	1.10	30	32036-QEKS-0001 ³⁾
320-630	12-25	82	3.23	29	1.14	47	1.85	45	32050-QEKS-0001 ³⁾

¹⁾ Recommended tightening torque
²⁾ Steel, zinc-plated 1045
³⁾ Stainless steel AISI 316 (1.4401)

CLAW WITH SCREW AND WASHER: ISO-K

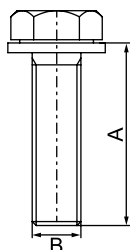


DN		A		B		C		¹⁾	Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	Nm	
63-100	2½-4	27.50	1.08	40	1.57	14	0.55	10	32040-QAPR-0001 ²⁾
160-250	6-10	28.50	1.12	45	1.77	14	0.55	15	32044-QAPR-0001 ²⁾
320-500	12-20	36.50	1.44	55	2.17	20.30	0.80	20	32050-QAPR-0001 ²⁾
63-100	2½-4	23.50	0.93	35	1.38	10	0.39	10	320XX-QAPR-0001 ³⁾

¹⁾ Recommended tightening torque
²⁾ Clamp flange: base plate without groove
³⁾ Clamp flange: base plate with groove
 Claw: aluminum
 Screw: steel 8.8, zinc-plated

DN		screw	number per flange
mm	inch		
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

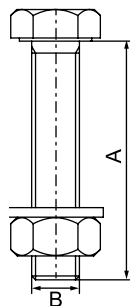
SCREW WITH WASHER: ISO-F



DN		A		B		Ordering numbers
mm	inch	mm	inch	thread	number per flange	
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

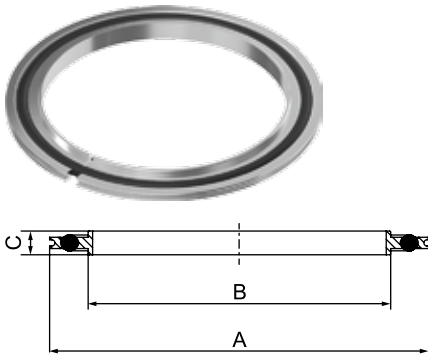
Steel, zinc-plated

SCREW WITH WASHER AND NUT: ISO-F



DN		A		B		Ordering numbers
mm	inch	mm	inch	thread	number per flange	
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

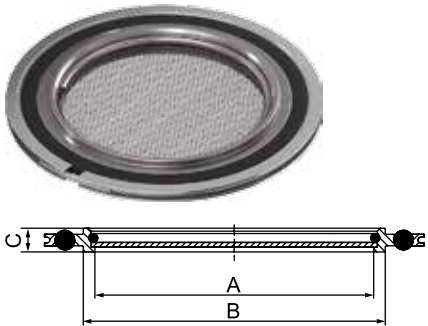
Steel, zinc-plated

CENTERING RING: ISO-K/ISO-F


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2½	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	2½	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⁾

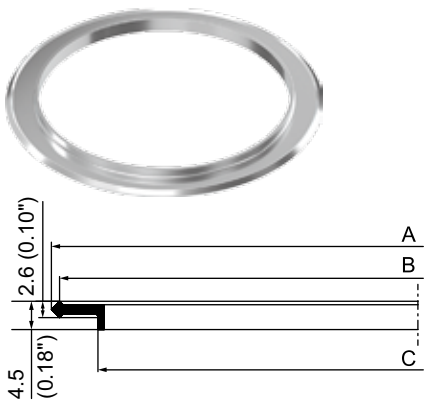
¹⁾ Inner and outer ring: aluminum EN AW-6082 (3.2315)
Seal: elastomer FKM (Viton®)

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	2½	62	2.44	69.80	2.75	8	0.31	32036-QEZG-0001
100	4	94	3.70	101.80	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%

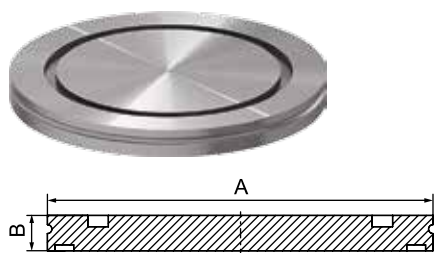
ALUMINUM SEAL: ISO-K/ISO-F


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2½	85.60	3.37	83	3.27	69.80	2.75	32036-QADK-0001
100	4	116.60	4.59	114	4.49	101.80	4.01	32040-QADK-0001
160	6	166.60	6.56	164	6.46	152.80	6.02	32044-QADK-0001
250	10	276.60	10.89	274	10.79	260.80	10.27	32048-QADK-0001

Aluminum EN AW-6082 (3.2315), annealed

Suitable for use with stainless steel flanges

BLANK-OFF FLANGE: ISO-K



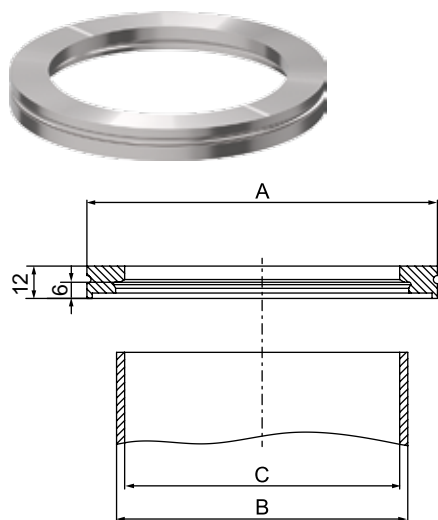
DN		A		B				Ordering numbers
mm	inch	mm	inch	mm	inch			
63	2 ½	95	3.74	12	0.47			32036-QAFB-0001 ¹⁾
100	4	130	5.12	12	0.47			32040-QAFB-0001 ¹⁾
160	6	180	7.09	12	0.47			32044-QAFB-0001 ¹⁾
200	8	240	9.45	12	0.47			32046-QAFB-0001 ¹⁾
250	10	290	11.42	12	0.47			32048-QAFB-0001 ¹⁾
320	12	370	14.57	17	0.67			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

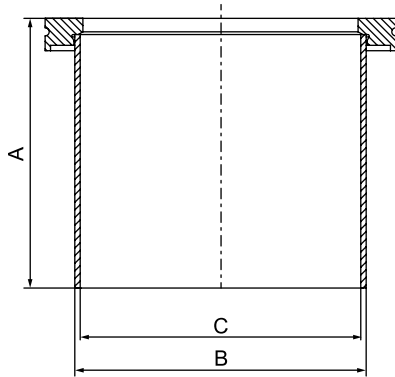
³⁾ Stainless steel AISI 304 (1.4301)

WELD FLANGE: ISO-K



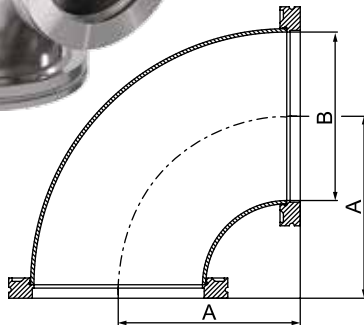
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2 ½	95	3.74	76.10	3.00	71.50	2.81	32036-QEFF-0001
80	3	110	4.33	88.90	3.50	84.90	3.34	32038-QEFF-0001
100	4	130	5.12	108	4.25	102	4.02	32040-QEFF-0001
160	6	180	7.09	159	6.26	155	6.10	32044-QEFF-0001
200	8	240	9.45	219.10	8.63	213.10	8.39	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 FLANGE: ISO-K


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2½	100	3.94	76.10	3.00	71.50	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	219.10	8.63	213.70	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

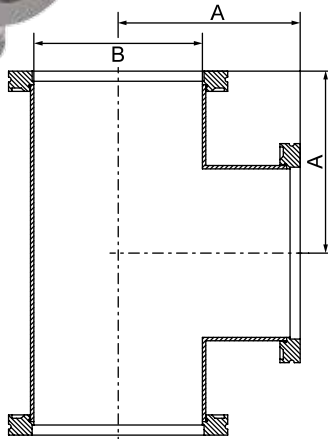
Stainless steel AISI 304 (1.4301)

ELBOW 90°: ISO-K


DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
63	2½	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)

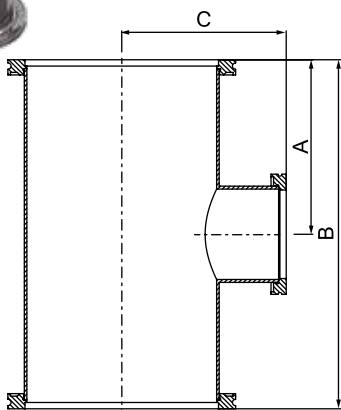
T-PIECE: ISO-K



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

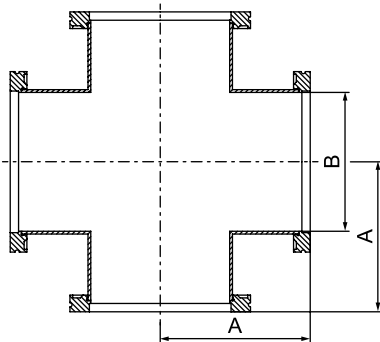
Stainless steel AISI 304 (1.4301)

REDUCING T-PIECE: ISO-K



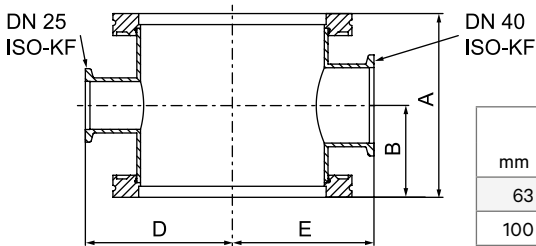
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
160/ 63	6/2 ½	138	5.43	276	10.87	130	5.12	32044-QETV-ABU1
160/100	6/4	138	5.43	276	10.87	131	5.16	32044-QETV-ACS1
250/200	10/8	190	7.48	380	14.96	208	8.19	32048-QETV-ACT1

Stainless steel AISI 304 (1.4301)

CROSS: ISO-K


DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
63	2½	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

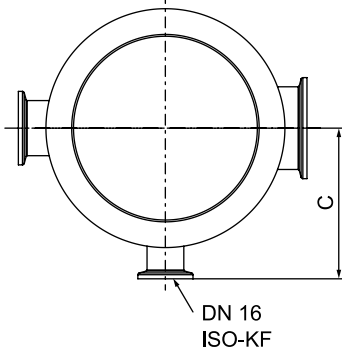
Stainless steel AISI 304 (1.4301)

REDUCING CROSS: ISO-K


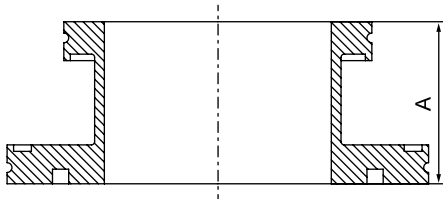
DN		A		B		C		D		E		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
63	2½	88	3.46	44	1.73	66	2.60	64	2.52	59	2.32	32036-QEKZ-0001
100	4	100	3.94	50	1.97	82	3.23	80	3.15	77	3.03	32040-QEKZ-0001
160	6	100	3.94	50	1.97	107	4.21	107	4.21	105	4.13	32044-QEKZ-0001

Stainless steel AISI 304 (1.4301)

- 1 × DN 16 ISO-KF
- 1 × DN 25 ISO-KF
- 1 × DN 40 ISO-KF



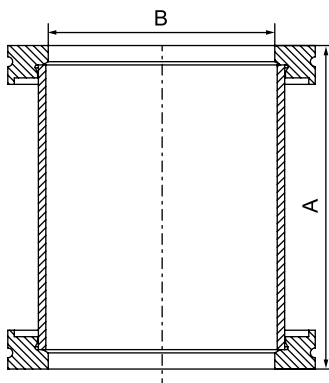
REDUCING PIECE: ISO-KF



DN		A		Ordering numbers
mm	inch	mm	inch	
80 / 63	3 / 2½	50	1.97	32038-QEUP-ABU1
100 / 63	4 / 2½	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)

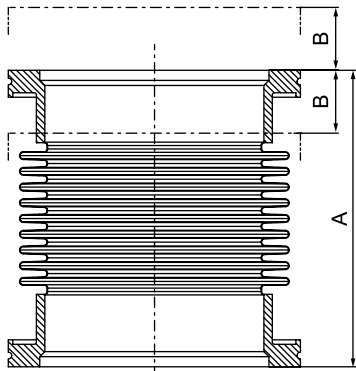
INTERMEDIATE PIECE: ISO-K



DN		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	
63	2½	100	3.94	70	2.76	32036-QEVS-0001

Stainless steel AISI 304 (1.4301)

SPRING BELLOWS: ISO-K

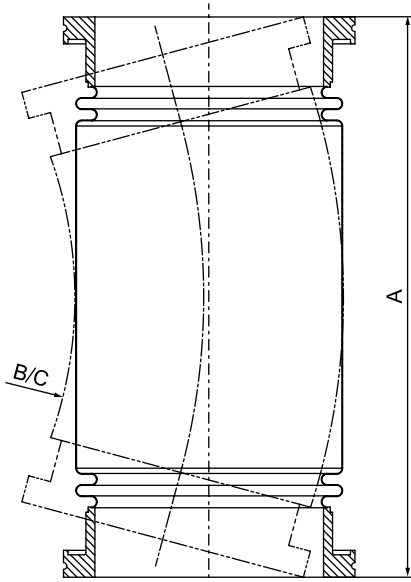


Short

DN		A		B		Max. deviation from axis	Ordering numbers
mm	inch	mm	inch	mm	inch		
63	2½	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



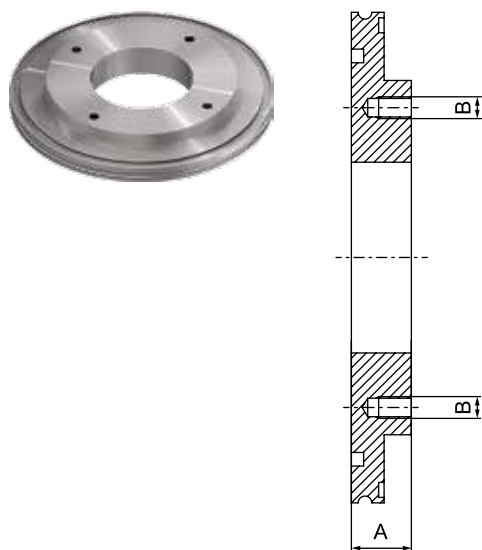
Long

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2½	250	9.84	250	9.84	160	6.30	32036-QEFK-ABR1
63	2½	500	19.69	250	9.84	160	6.30	32036-QEFK-ABS1
63	2½	750	29.53	250	9.84	160	6.30	32036-QEFK-ABT1
63	2½	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

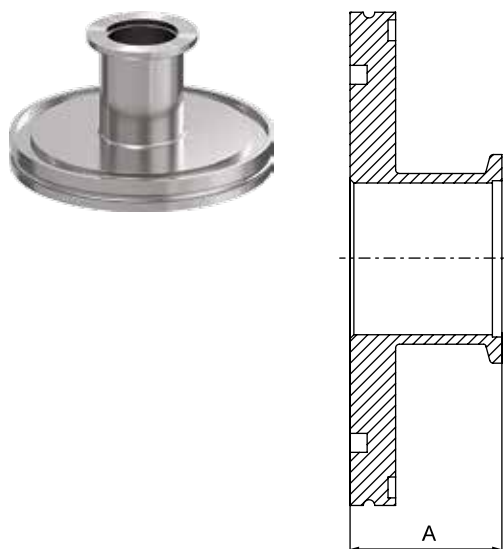
ADAPTER FLANGE: ISO-K/ISO-F



DN				A		B	Ordering numbers
ISO-K		ISO-F		mm	inch	Thread	
mm	inch	mm	inch	mm	inch		
160	6	63	2½	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-KF

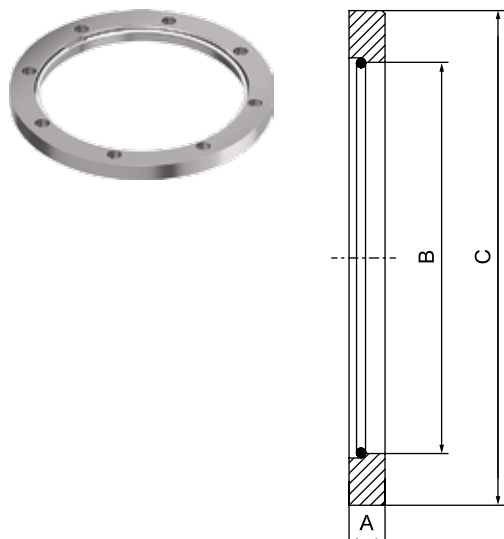


DN				A		Ordering numbers
ISO-K		ISO-KF		mm	inch	
mm	inch	mm	inch	mm	inch	
63	2½	40	1½	40	1.57	32036-QAAK-ABJ1 ¹⁾
63	2½	50	2	45	1.77	32036-QAAK-ABX1 ¹⁾
63	2½	25	1	50	1.97	32036-QEAK-ABW1 ²⁾
63	2½	40	1½	40	1.57	32036-QEAK-ABJ1 ²⁾
63	2½	50	2	45	1.77	32036-QEAK-ABX1 ²⁾
100	4	40	1½	40	1.57	32040-QEAK-ABJ1 ²⁾

¹⁾ Aluminum EN AW-6082 (3.2315)

²⁾ Stainless steel AISI 303 (1.4305)

ROTATABLE FLANGE: ISO-F



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
63	2½	12	0.47	95.50	3.76	130	5.12	32036-QNUF-0001 ¹⁾
80	3	12	0.47	110.50	4.35	145	5.71	32038-QNUF-0001 ¹⁾
100	4	12	0.47	130.50	5.14	165	6.50	32040-QNUF-0001 ¹⁾
160	6	16	0.63	180.70	7.11	225	8.86	32044-QNUF-0001 ¹⁾
200	8	16	0.63	240.70	9.48	285	11.22	32046-QNUF-0001 ²⁾
250	10	16	0.63	290.70	11.44	335	13.19	32048-QNUF-0001 ²⁾
320	12	20	0.79	370.80	14.60	425	16.73	32050-QNUF-0001 ²⁾
400	16	20	0.79	450.80	17.75	510	20.08	32052-QNUF-0001 ²⁾
500	20	20	0.79	550.80	21.69	610	24.02	32054-QNUF-0001 ²⁾
630	25	24	0.94	691	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

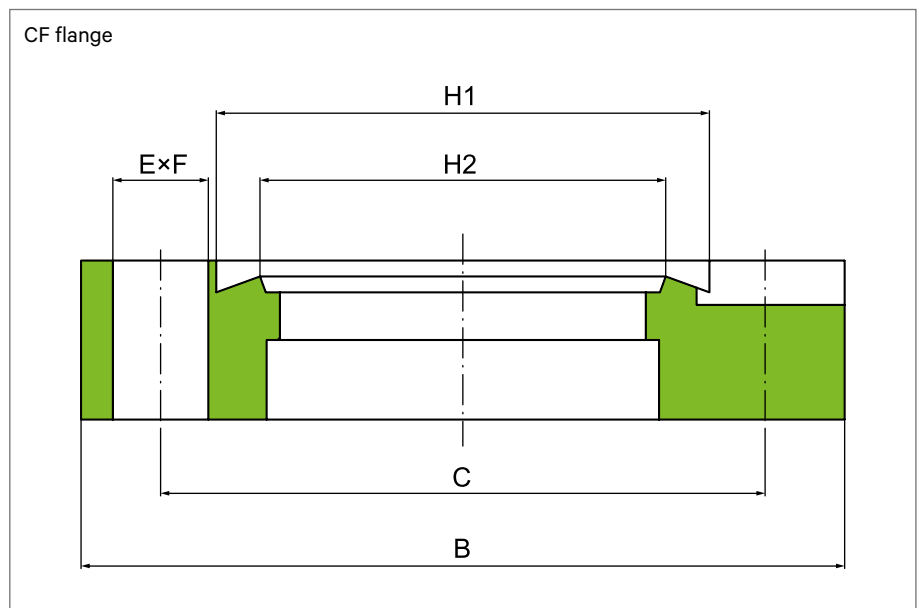
FLANGE CONNECTIONS CF, SERIES 33.0

Screws	Reducing pieces	Cross pieces
Bolts	Intermediate pieces	Bellows
Copper seals	Elbows	Adapters
Flanges	T-Pieces	

TECHNICAL DATA & ORDERING INFORMATION

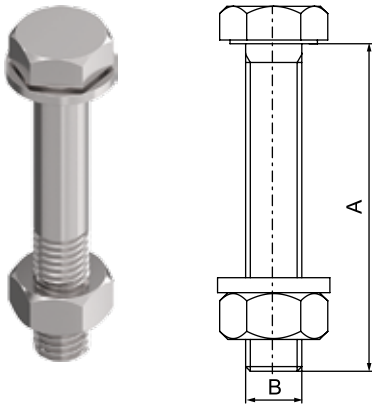
Seal	Cu (copper)
Suitable flange material	stainless steel
Temperature ¹⁾	≤ 400 °C
Leak rate for Helium (mbar ls ⁻¹)	< 1·10 ⁻¹⁰
Sealing force (N per cm sealing line)	3000 – 5000
Multiple use of seal	no

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



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 1.30	48.30 1.90	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

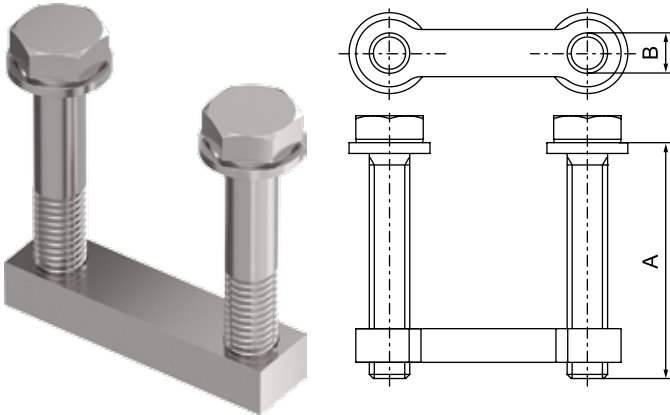
SCREW WITH WASHER AND NUT



DN		A		B	thread	Ordering numbers
mm	inch	mm	inch			
16	5/8	20	0.79		M4	33024-CESX-0001
25	1	35	1.38		M6	33028-CESX-0001
40	1 1/2	35	1.38		M6	33032-CESX-0001
63	2 1/2	50	1.97		M8	33036-CESX-0001
100	4	55	2.17		M8	33040-CESX-0001
160	6	55	2.17		M8	33044-CESX-0001
200	8	60	2.36		M8	33046-CESX-0001
250	10	60	2.36		M8	33048-CESX-0001

Stainless steel

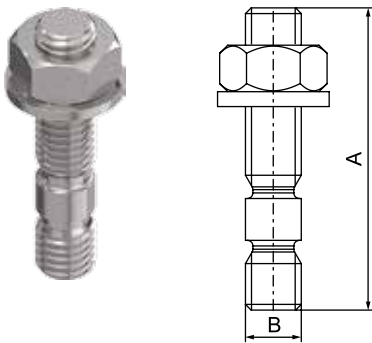
SCREW WITH DOUBLE NUT



DN		A		B	thread	Ordering numbers
mm	inch	mm	inch			
16	5/8	20	0.79		M4	33024-CESX-0001
40	1 1/2	35	1.38		M6	33032-CESX-0001
63	2 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

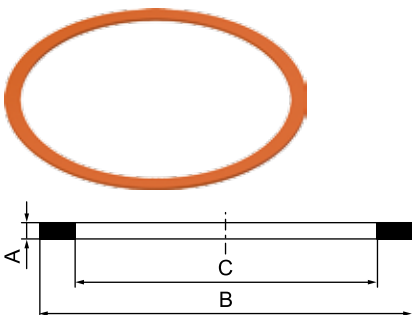
STUD BOLT WITH WASHER AND NUT



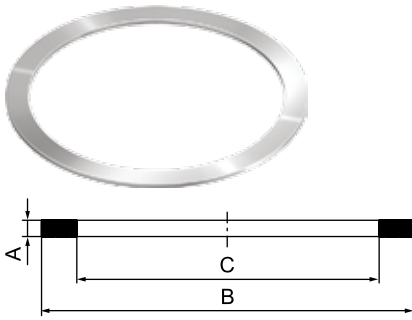
DN		A		B	thread	Ordering numbers
mm	inch	mm	inch			
16	5/8	20	0.79		M4	33024-CEST-0001
25	1	32.50	1.28		M6	33028-CEST-0001
40	1 1/2	32.50	1.28		M6	33032-CEST-0001
63	2 1/2	40	1.57		M8	33036-CEST-0001
100	4	45	1.77		M8	33040-CEST-0001
160	6	50	1.97		M8	33044-CEST-0001
200	8	50	1.97		M8	33046-CEST-0001
250	10	50	1.97		M8	33048-CEST-0001

Stainless steel

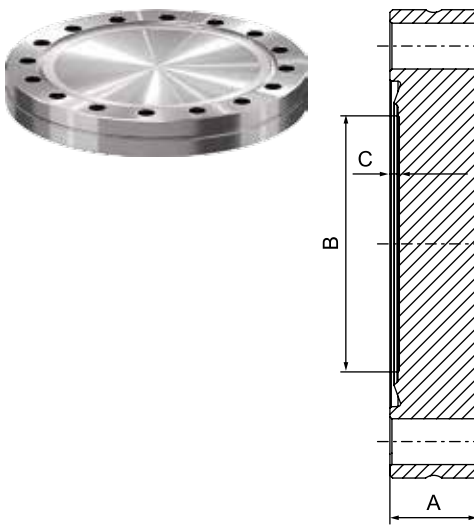
COPPER SEAL



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	2	0.08	21.30	0.84	16.20	0.64	33024-CKDF-0001
40	1 1/2	2	0.08	48.10	1.89	39	1.54	33032-CKDF-0001
63	2 1/2	2	0.08	82.40	3.24	63.60	2.50	33036-CKDF-0001
100	4	2	0.08	120.50	4.74	101.80	4.01	33040-CKDF-0001
160	6	2	0.08	171.30	6.74	152.60	6.01	33044-CKDF-0001
200	8	2	0.08	222.10	8.74	203.40	8.01	33046-CKDF-0001
250	10	2	0.08	272.90	10.74	254.20	10.01	33048-CKDF-0001

COPPER SEAL: SILVER-PLATED


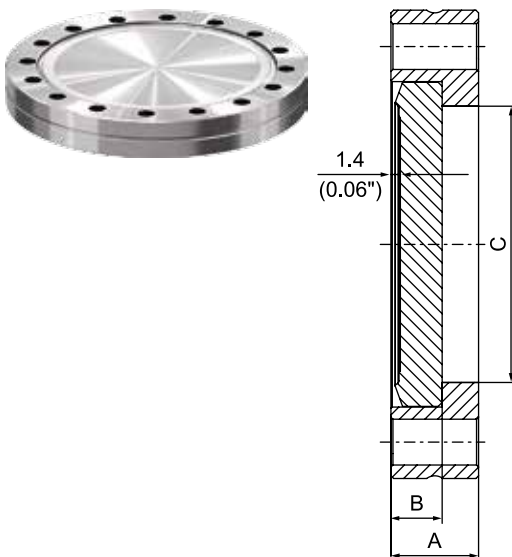
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	2	0.08	21.30	0.84	16.20	0.64	33024-CSDF-0001
40	1 1/2	2	0.08	48.10	1.89	39	1.54	33032-CSDF-0001
63	2 1/2	2	0.08	82.40	3.24	63.60	2.50	33036-CSDF-0001
100	4	2	0.08	120.50	4.74	101.80	4.01	33040-CSDF-0001
160	6	2	0.08	171.30	6.74	152.60	6.01	33044-CSDF-0001
200	8	2	0.08	222.10	8.74	203.40	8.01	33046-CSDF-0001
250	10	2	0.08	272.90	10.74	254.20	10.01	33048-CSDF-0001

BLANK-OFF FLANGE


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.50	0.30	14	0.55	1.40	0.06	33024-CEFB-0001 ¹⁾
40	1 1/2	13	0.51	38	1.50	1.40	0.06	33032-CEFB-0001 ¹⁾
63	2 1/2	17.50	0.69	66	2.60	1.40	0.06	33036-CEFB-0001 ¹⁾
100	4	20	0.79	104	4.09	1.40	0.06	33040-CEFB-0001 ¹⁾
160	6	22	0.87	155	6.10	1.40	0.06	33044-CEFB-0001 ¹⁾
200	8	24.50	0.96	205	8.07	1.40	0.06	33046-CEFB-0001 ¹⁾
250	10	24.50	0.96	256	10.08	1.40	0.06	33048-CEFB-0001 ¹⁾
16	5/8	7.50	0.30	14	0.55	1.40	0.06	33024-CEFB-AAH1 ²⁾
40	1 1/2	13	0.51	38	1.50	1.40	0.06	33032-CEFB-AAH1 ²⁾
63	2 1/2	17.50	0.69	66	2.60	1.40	0.06	33036-CEFB-AAH1 ²⁾
100	4	20	0.79	104	4.09	1.40	0.06	33040-CEFB-AAH1 ²⁾
160	6	22	0.87	155	6.10	1.40	0.06	33044-CEFB-AAH1 ²⁾
200	8	24.50	0.96	205	8.07	1.40	0.06	33046-CEFB-AAH1 ²⁾
250	10	24.50	0.96	256	10.08	1.40	0.06	33048-CEFB-AAH1 ²⁾

¹⁾ Stainless steel AISI 304 (1.4301)

²⁾ Stainless steel AISI 316LN (1.4429)

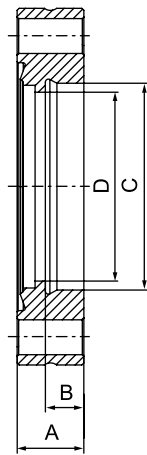
BLANK-OFF FLANGE: ROTATABLE


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.50	0.30	5.80	0.23	18.60	0.73	33024-GEBD-0001 ¹⁾
40	1 1/2	13	0.51	7.60	0.30	41	1.61	33032-GEBD-0001 ¹⁾
63	2 1/2	17.50	0.69	12.60	0.50	71	2.80	33036-GEBD-0001 ¹⁾
100	4	20	0.79	14.30	0.56	109	4.29	33040-GEBD-0001 ¹⁾
160	6	22	0.87	15.80	0.62	160	6.30	33044-GEBD-0001 ¹⁾
200	8	24.50	0.96	17.10	0.67	206	8.11	33046-GEBD-0001 ¹⁾
250	10	24.50	0.96	18	0.71	257	10.12	33048-GEBD-0001 ¹⁾
16	5/8	7.50	0.30	5.80	0.23	18.60	0.73	33024-GEBD-AAH1 ²⁾
40	1 1/2	13	0.51	7.60	0.30	41	1.61	33032-GEBD-AAH1 ²⁾
63	2 1/2	17.50	0.69	12.60	0.50	71	2.80	33036-GEBD-AAH1 ²⁾
100	4	20	0.79	14.30	0.56	109	4.29	33040-GEBD-AAH1 ²⁾
160	6	22	0.87	15.80	0.62	160	6.30	33044-GEBD-AAH1 ²⁾
200	8	24.50	0.96	17.10	0.67	206	8.11	33046-GEBD-AAH1 ²⁾
250	10	24.50	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

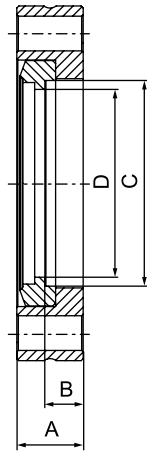


DN		A		B		C		D		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.50	0.30	3.30	0.13	18.30	0.72	16	0.63	33024-CEFF-0001 ¹⁾
40	1 1/2	13	0.51	7.50	0.30	40.30	1.59	36.80	1.45	33032-CEFF-0001 ¹⁾
63	2 1/2	17.50	0.69	8	0.31	70.30	2.77	66	2.60	33036-CEFF-0001 ¹⁾
100	4	20	0.79	9	0.35	108.50	4.27	104	4.09	33040-CEFF-0001 ¹⁾
160	6	22	0.87	10	0.39	159.50	6.28	155	6.10	33044-CEFF-0001 ¹⁾
200	8	24.50	0.96	12	0.47	205.50	8.09	200	7.87	33046-CEFF-0001 ¹⁾
250	10	24.50	0.96	12	0.47	256.50	10.19	250	9.84	33048-CEFF-0001 ¹⁾
16	5/8	7.50	0.30	3.30	0.13	18.30	0.72	16	0.63	33024-CEFF-AAH1 ²⁾
40	1 1/2	13	0.51	7.50	0.30	40.30	1.59	36.80	1.45	33032-CEFF-AAH1 ²⁾
63	2 1/2	17.50	0.69	8	0.31	70.30	2.77	66	2.60	33036-CEFF-AAH1 ²⁾
100	4	20	0.79	9	0.35	108.50	4.27	104	4.09	33040-CEFF-AAH1 ²⁾
160	6	22	0.87	10	0.39	159.50	6.28	155	6.10	33044-CEFF-AAH1 ²⁾
200	8	24.50	0.96	12	0.47	205.50	8.09	200	7.87	33046-CEFF-AAH1 ²⁾
250	10	24.50	0.96	12	0.47	256.50	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

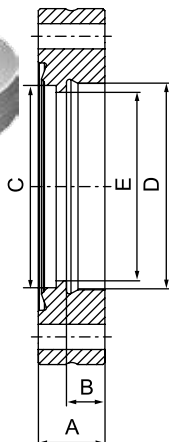


DN		A		B		C		D		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	7.50	0.30	3.30	0.13	18.30	0.72	16	0.63	33024-GEFD-0001 ¹⁾
40	1 1/2	13	0.51	7.50	0.30	40.30	1.59	36.80	1.45	33032-GEFD-0001 ¹⁾
63	2 1/2	17.50	0.69	8	0.31	70.30	2.77	66	2.60	33036-GEFD-0001 ¹⁾
100	4	20	0.79	9	0.35	108.50	4.27	104	4.09	33040-GEFD-0001 ¹⁾
160	6	22	0.87	10	0.39	159.50	6.28	155	6.10	33044-GEFD-0001 ¹⁾
200	8	24.50	0.96	12	0.47	205.50	8.09	200	7.87	33046-GEFD-0001 ¹⁾
250	10	24.50	0.96	12	0.47	256.50	10.19	250	9.84	33048-GEFD-0001 ¹⁾
16	5/8	7.50	0.30	3.30	0.13	18.30	0.72	16	0.63	33024-GEFD-AAH1 ²⁾
40	1 1/2	13	0.51	7.50	0.30	40.30	1.59	36.80	1.45	33032-GEFD-AAH1 ²⁾
63	2 1/2	17.50	0.69	8	0.31	70.30	2.77	66	2.60	33036-GEFD-AAH1 ²⁾
100	4	20	0.79	9	0.35	108.50	4.27	104	4.09	33040-GEFD-AAH1 ²⁾
160	6	22	0.87	10	0.39	159.50	6.28	155	6.10	33044-GEFD-AAH1 ²⁾
200	8	24.50	0.96	12	0.47	205.50	8.09	200	7.87	33046-GEFD-AAH1 ²⁾
250	10	24.50	0.96	12	0.47	256.50	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	7.50	0.30	3.30	0.13	17.20	0.68	18.30	0.72	16	0.63	33024-CEFF-ABN1
40	1 1/2	13	0.51	7.50	0.30	39.50	1.56	40.30	1.59	36.80	1.45	33032-CEFF-ABN1
63	2 1/2	17.50	0.69	8	0.31	66	2.60	70.30	2.77	66	2.60	33036-CEFF-ABN1
100	4	20	0.79	9	0.35	104	4.09	108.50	4.27	104	4.09	33040-CEFF-ABN1

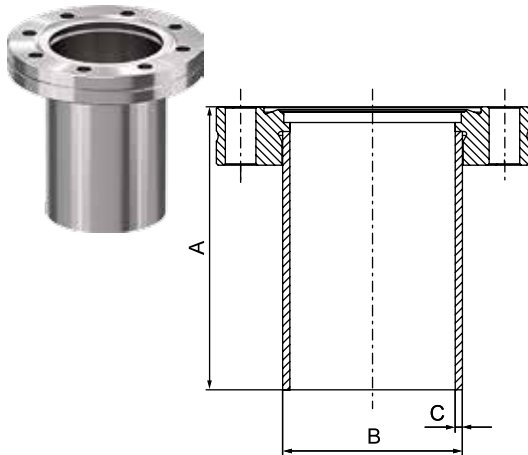
DN 16 = 6 × M4

DN 40 = 6 × M6

DN 63 = 8 × M8

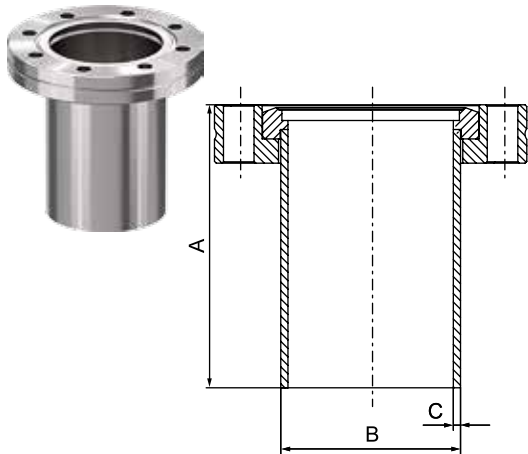
DN 100 = 16 × M8

Stainless steel AISI 304 (1.4301)

WELD NECK FLANGE


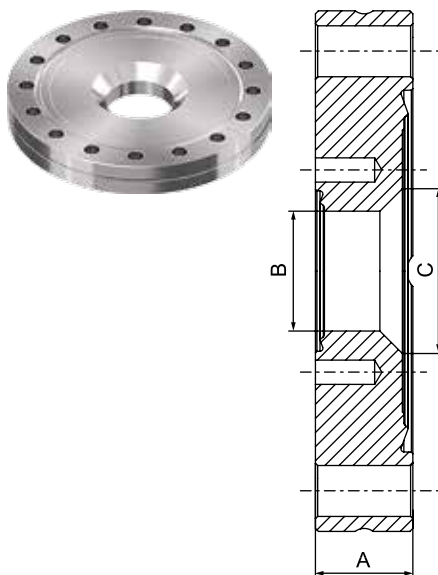
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	38	1.50	18	0.71	1	0.04	33024-CESK-0001
40	1 1/2	63	2.48	40	1.57	1.6	0.06	33032-CESK-0001
63	2 1/2	105	4.13	70	2.76	2	0.08	33036-CESK-0001
100	4	135	5.31	108	4.25	2	0.08	33040-CESK-0001
160	6	167	6.61	159	6.26	2	0.08	33044-CESK-0001

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	17.50	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	17.50	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

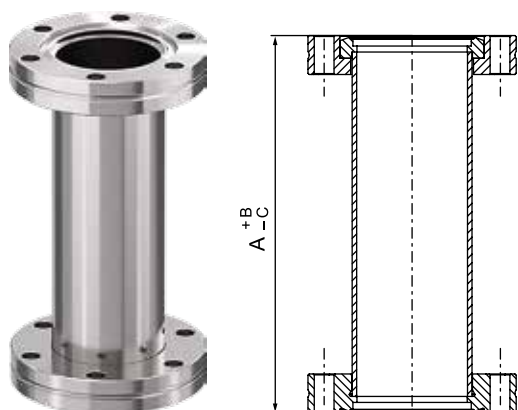
DN 100/63 = 8 × M8

DN 160/100 = 16 × M8

¹⁾ Stainless steel AISI 304 (1.4301)

²⁾ Stainless steel AISI 316LN (1.4429)

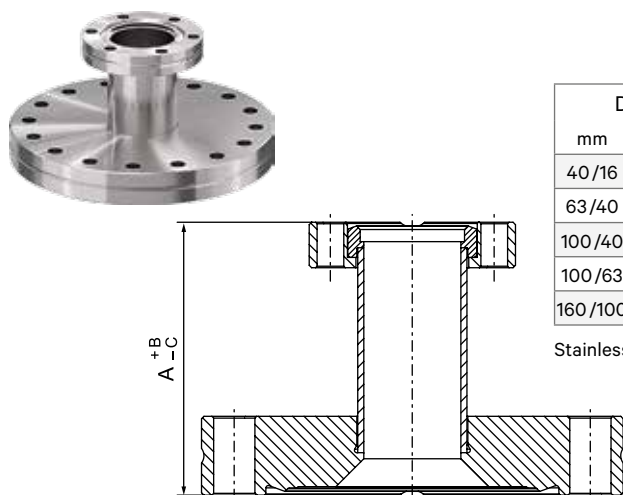
INTERMEDIATE PIECE



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	76	2.99	0.50	0.02	0.50	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	1.50	0.06	1.50	0.06	33044-GEZS-0001

Stainless steel AISI 304 (1.4301)

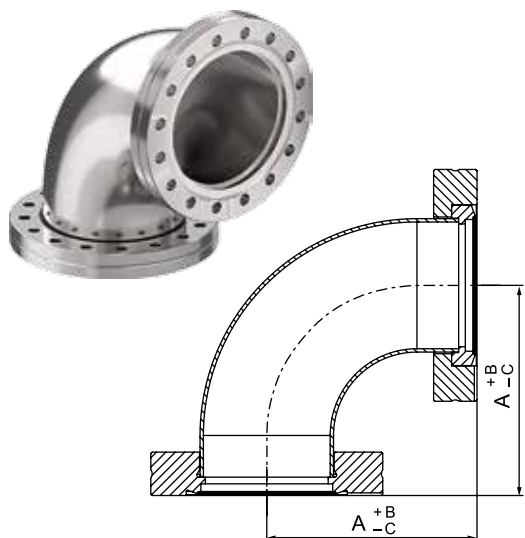
REDUCING PIECE



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
40/16	1 1/2 / 5/8	45	1.77	1	0.04	1	0.04	33032-CEUP-ACW1
63/40	2 1/2 / 1 1/2	75	2.95	1	0.04	1	0.04	33036-CEUP-ACV1
100/40	4 / 1 1/2	75	2.95	1	0.04	1	0.04	33040-CEUP-ACV1
100/63	4 / 2 1/2	95	3.74	1	0.04	1	0.04	33040-CEUP-ACX1
160/100	6 / 4	105	4.13	1.50	0.06	1.50	0.06	33044-CEUP-ACY1

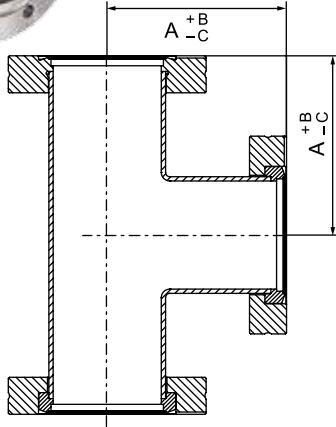
Stainless steel AISI 304 (1.4301)

ELBOW 90°



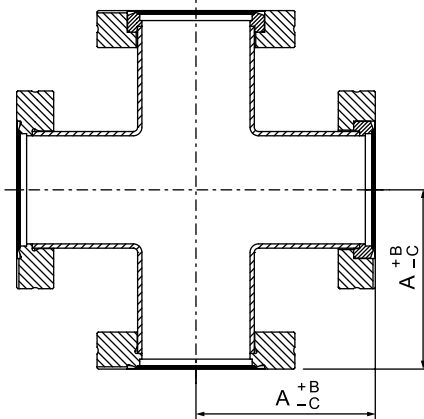
DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	38	1.50	0.50	0.02	0.50	0.02	33024-GEKR-0001
40	1 1/2	63	2.48	0.50	0.02	0.50	0.02	33032-GEKR-0001
63	2 1/2	105	4.13	1	0.04	1	0.04	33036-GEKR-0001
100	4	135	5.31	1	0.04	1	0.04	33040-GEKR-0001
160	6	167	6.57	1.50	0.06	1.50	0.06	33044-GEKR-0001

Stainless steel AISI 304 (1.4301)

T-PIECE


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	38	1.50	0.50	0.02	0.50	0.02	33024-GETS-0001
40	1½	63	2.48	0.50	0.02	0.50	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	1.50	0.06	1.50	0.06	33044-GETS-0001

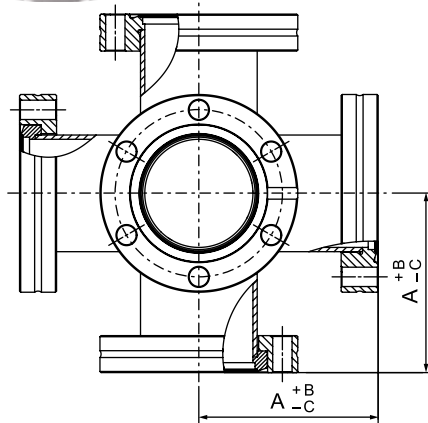
Stainless steel AISI 304 (1.4301)

CROSS


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	38	1.50	0.50	0.02	0.50	0.02	33024-GEKX-0001
40	1½	63	2.48	0.50	0.02	0.50	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	1.50	0.06	1.50	0.06	33044-GEKX-0001

Stainless steel AISI 304 (1.4301)

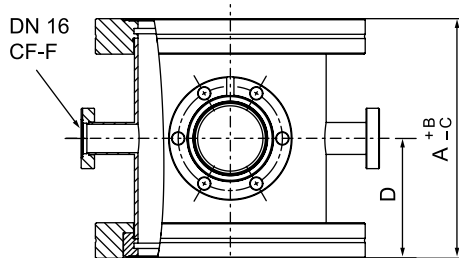
DOUBLE CROSS



DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
40	1½	63	2.48	0.50	0.02	0.50	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	1.50	0.06	1.50	0.06	33044-GEKY-0001

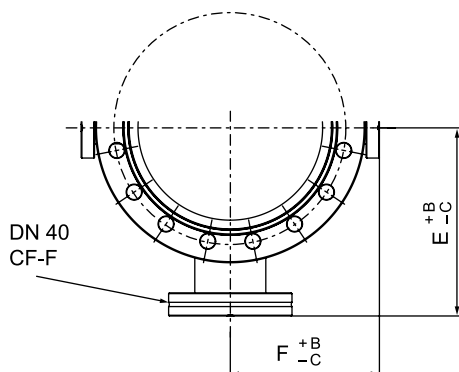
Stainless steel AISI 304 (1.4301)
 3 × rotatable flange
 3 × fixed flange

REDUCING CROSS

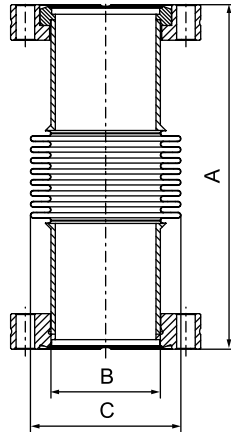


DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
100	4	135	5.31	1	0.04	1	0.04	33040-GEKZ-0001
		D		E		F		
		mm	inch	mm	inch	mm	inch	
		67.50	2.66	106	4.17	84	3.31	

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	5/8	76	2.99	15	0.59	22	0.87	33024-GEFK-0001
40	1 1/2	126	4.96	40	1.57	55	2.17	33032-GEFK-0001
63	2 1/2	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 bar

DN 63 – 160: max. 1.5 bar

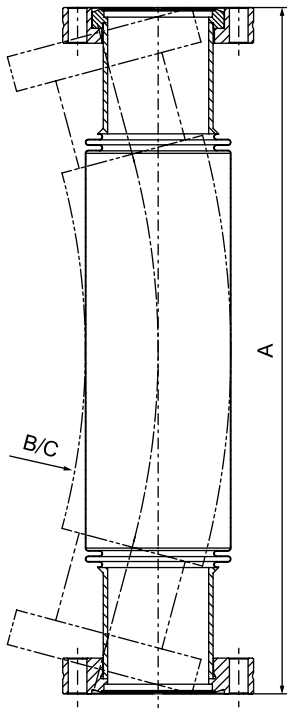
Maximum deviation from axis: DN 16 21.0°

DN 40 7.5°

DN 63 37.0°

DN 100 28.0°

DN 160 16.0°



Long

DN		A		B		C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	250	9.84	70	2.76	50	1.97	33024-GEFK-ABR1
16	5/8	500	19.69	70	2.76	50	1.97	33024-GEFK-ABS1
16	5/8	750	29.53	70	2.76	50	1.97	33024-GEFK-ABT1
16	5/8	1000	39.37	70	2.76	50	1.97	33024-GEFK-ABP1
40	1 1/2	250	9.84	130	5.12	100	3.94	33032-GEFK-ABR1
40	1 1/2	500	19.69	130	5.12	100	3.94	33032-GEFK-ABS1
40	1 1/2	1000	39.37	130	5.12	100	3.94	33032-GEFK-ABP1

B = Radius for several bendings

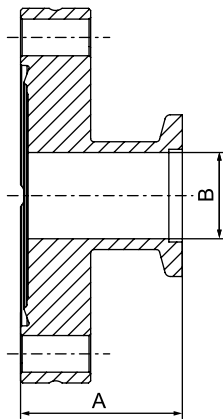
C = Radius for one bending

Flange: stainless steel AISI 304 (1.4301)

Bellows: stainless steel AISI 316Ti (1.4571)

Internal pressure: max. 5 bar

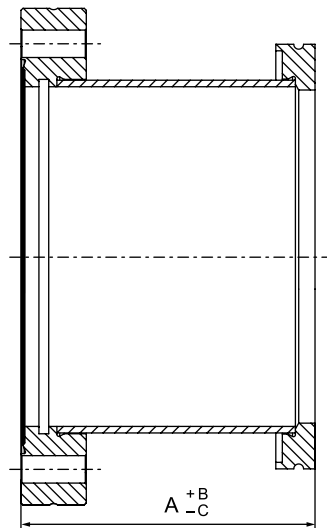
ADAPTER FLANGE: ISO-KF



CF-F		DN		ISO-KF		A		B		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16	5/8	16	5/8	35	1.38	16	0.63			33024-CEAK-ACK1
16	5/8	25	1	35	1.38	16	0.63			33024-CEAK-ABW1
40	1 1/2	16	5/8	30	1.18	16	0.63			33032-CEAK-ACK1
40	1 1/2	25	1	30	1.18	26	1.02			33032-CEAK-ABW1
40	1 1/2	40	1 1/2	50	1.97	37	1.46			33032-CEAK-ABJ1
63	2 1/2	40	1 1/2	35	1.38	41	1.61			33036-CEAK-ABJ1
100	4	40	1 1/2	50	1.97	41	1.61			33040-CEAK-ABJ1

Stainless steel AISI 304 (1.4301)

ADAPTER FLANGE: ISO-K

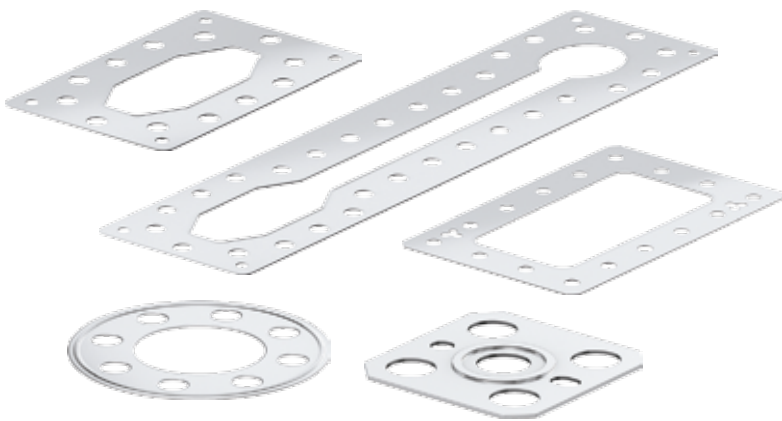


CF-F		DN		ISO-K		A		B, C		Ordering numbers
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
63	2 1/2	63	2 1/2	90	3.54	1	0.04			33036-CEAF-ABU1
100	4	100	4	90	3.54	1	0.04			33040-CEAF-ACS1
160	6	160	6	90	3.54	1.50	0.06			33044-CEAF-ACU1

Stainless steel AISI 304 (1.4301)

METAL SEAL «VATSEAL», SERIES 35.0

Metal seals are suited for demanding applications requiring specific geometries, e. g. for RF applications, cryogenics, high temperature applications.



Excellent vacuum tightness

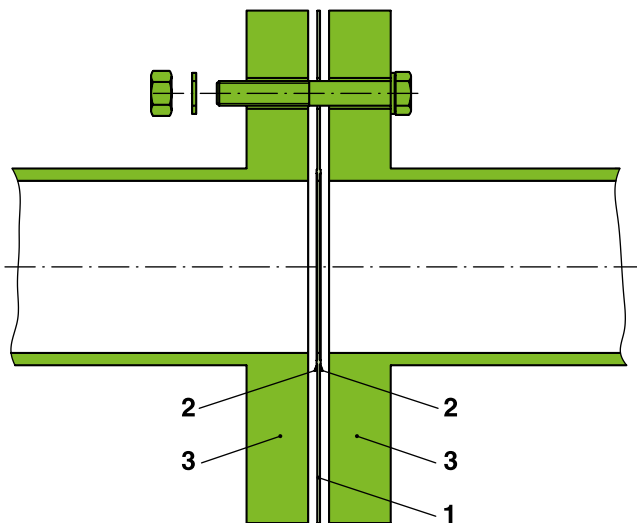
Reliable, low resistance RF contact

Flanges require only flat sealing surfaces

MAIN FEATURES

Sizes	max. 500 × 700 mm (19.69" × 27.56")
Material	silver-plated copper (other materials on request)
Sealing line	any shape

FUNCTIONAL PRINCIPLE



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

- 1 VATSEAL
- 2 Sealing line
- 3 Flange with stub

TECHNICAL DATA

VATSEAL

Leak rate		$1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range		10 ⁻¹³ mbar to 10 bar (depending on flange)
Differential pressure at opening		≤ 10 bar
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 Compressed	0.60 mm 0.45 mm
Sealing force		min. 2000 N per cm sealing line
Sealing line	Shape Distance to edge of flange	any >1 mm

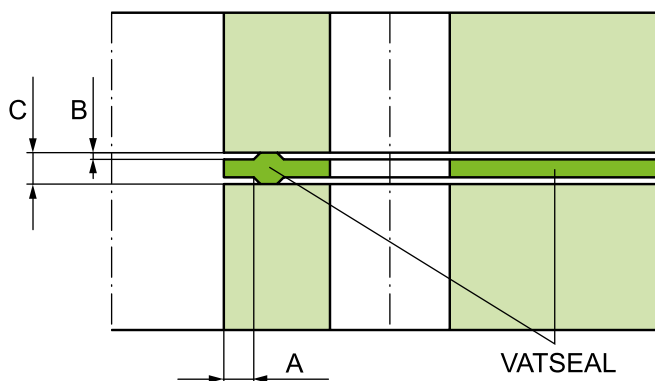
¹⁾ Maximum values: depending on operating conditions and sealing materials.

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 Flatness over 50 mm Surface finish Thickness Distance between holes	max. 0.2 mm max. 0.02 mm N4 (Ra = 0.2 μm) 10 – 22 mm, depending on size max. 50 mm

INSTALLATION DIMENSIONS



A	mm inch	1 0.039
B	mm inch	0.070 0.003
C uncompressed	mm inch	0.600 0.024
C compressed	mm inch	0.450 0.018

ORDERING INFORMATION

On request



WELDED BELLOWS

SECTION	PAGE
FUNCTIONAL PRINCIPLE	382
STROKES	383
ANGULAR ROTATION POINTS	383
TECHNICAL DATA & ORDERING INFORMATION	384
PREMACHINING OF END PIECES	388
STANDARD END-PIECES	388
STANDARD FLANGES	389

WELDED BELLOWS

Welded bellows are used in various vacuum applications in the semiconductor industry, in medical technology, in research and in the automotive industry.



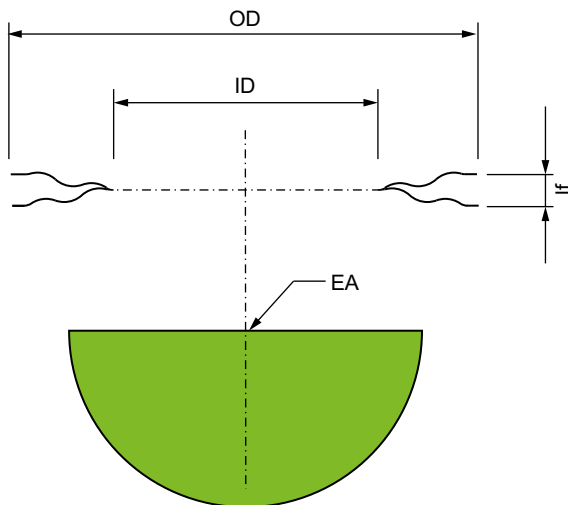
Impervious

Clean

No particles

Customer-specific solutions

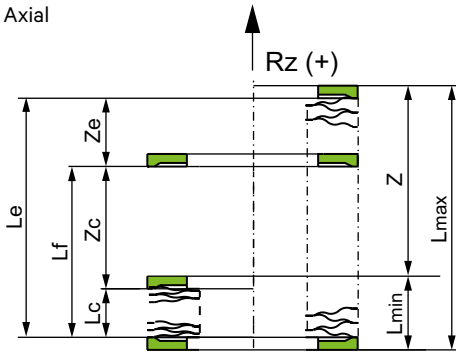
FUNCTIONAL PRINCIPLE



- OD Outside diameter
- ID Inside diameter
- lf Free length per convolution
- EA Effective area

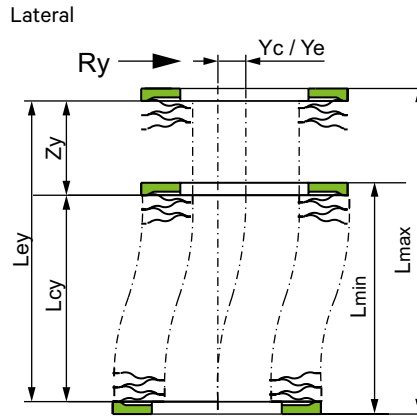
STROKES

Axial



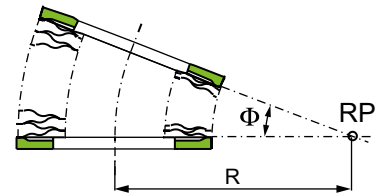
- Lc Compressed bellows length
- Le Extended bellows length
- Lf Free bellows length: manufactured length
- Lmax Maximum installed length from flange to flange
- Lmin Minimum installed length from flange to flange
- Rz Resulting axial force
- Z Axial stroke of edge welded bellows
- Zc Compression stroke of edge welded bellows
- Ze Extension stroke of edge welded bellows

Lateral



- Lcy Minimum installed length for a given lateral stroke
- Ley Maximum installed length for a given lateral stroke
- Lmax Maximum installed length from flange to flange
- Lmin Minimum installed length from flange to flange
- Ry Resulting lateral force
- Yc Lateral stroke of edge welded bellows at Lcy
- Ye Lateral stroke of edge welded bellows at Ley
- Zy Axial stroke of edge welded bellows for lateral offset

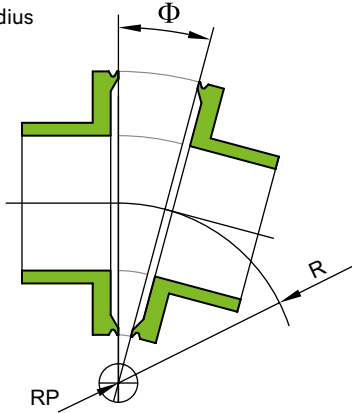
Angular



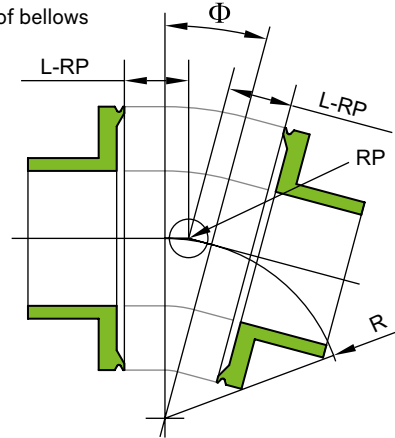
- R Resulting axial force
- RP Minimum installed length from flange to flange
- ϕ Bending angle

ANGULAR ROTATION POINTS

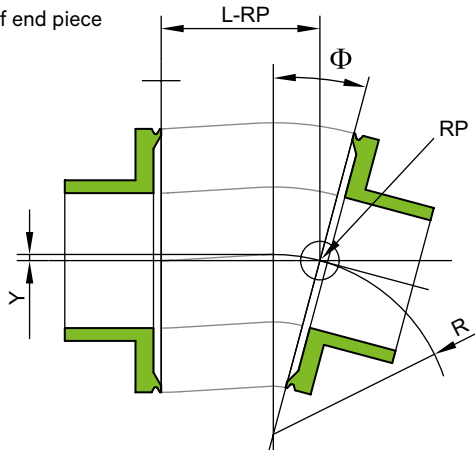
In bellows radius (standard)



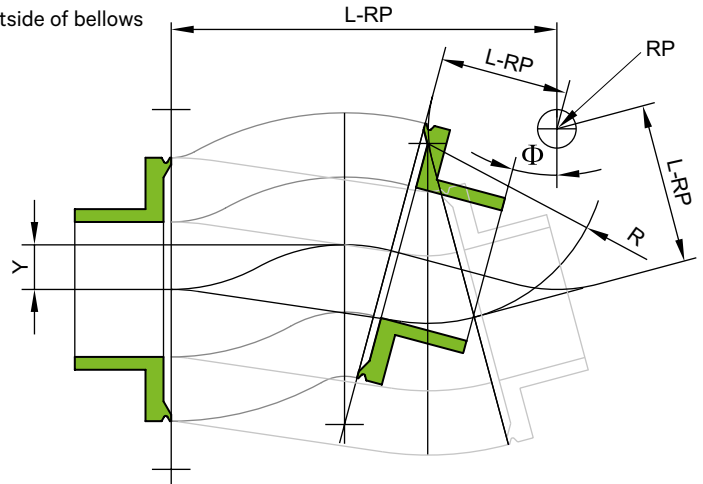
Middle of bellows



Middle of end piece



Outside of bellows



- R Radius
- Y Lateral movement
- RP Rotation point
- ϕ Bending angle
- L-RP Displacement from end piece to rotation point

TECHNICAL DATA & ORDERING INFORMATION

FOR STANDARD BELLOWS

Material: Stainless steel 316L
Features: For operating temperatures up to 450 °C
 Up to 500 000 load alternations
 Not magnetic
 Extremely corrosion-resistant

All values stated in the following tables refer to the following operating conditions:
 differential pressure: $P_i = 0$, $P_a = 1$ bar / operating temperature: room temperature / bake-out temperature: 80 °C / number of cycles: 10 000

Please contact us in case of other operating conditions or if a specific solution is required.

Analysis	Metal	Fe	C	Si	Mn	P	S	Cr	Mo	Ni
	%	Rest	≤0.03	≤1.0	≤2.0	≤0.045	≤0.03	16.0–18.0	2.0–3.0	10.0–14.0

Characteristics	Rp 0.2	Rm	E-Module	Density	Temperature	Permeability
	300 N/mm ²	600 N/mm ²	200 000 N/mm ²	8.0 kg/dm ³	-250/+350 °C	1.003–1.005 μr

DN	Inside diameter		Outside diameter		Compressed bellows length	Free bellows length	Axial stroke	Wall thickness of membranes	Effective area	Spring constant: axial direction
	mm	inch	mm	inch						
10	4.80	0.189	12.70	0.500	0.27	0.53	0.36	0.08	0.70	80
	6	0.236	13	0.512	0.27	0.50	0.32	0.08	0.80	105
	8	0.315	16	0.630	0.27	0.65	0.48	0.08	1.30	60
	8.60	0.339	16.20	0.638	0.20	0.55	0.55	0.05	1.30	25
	9	0.354	20	0.787	0.35	0.80	0.60	0.08	1.90	55
	9	0.354	31.50	1.240	0.36	1.35	1.18	0.10	4.30	55
	10	0.394	20	0.787	0.33	0.60	0.50	0.10	2	45
16	13	0.512	26	1.024	0.32	0.90	0.80	0.08	3.40	55
	16	0.630	31.50	1.240	0.45	1.20	1.15	0.13	5	95
	16	0.630	35	1.378	0.43	1.15	1.35	0.13	5.90	49
25	18.50	0.728	31.50	1.240	0.37	0.90	0.85	0.10	5.30	95
	19	0.748	37	1.457	0.40	1.60	1.55	0.13	6.90	70
	21	0.827	39	1.535	0.43	1.10	1.40	0.13	7.80	49
	21	0.827	41	1.614	0.50	1.85	1.90	0.13	8.40	75
	21	0.827	49	1.929	0.55	2.30	2.10	0.15	11.30	65
	21.10	0.831	34.90	1.374	0.35	1.05	1.10	0.10	6.60	75
	22	0.866	40.70	1.602	0.43	1.25	1.40	0.13	8.50	50
	24	0.945	35	1.378	0.33	0.70	0.70	0.10	7.20	82
	26	1.024	41	1.614	0.44	1.25	1.40	0.13	9.40	135
	26	1.024	46	1.811	0.45	1.80	1.90	0.13	11.10	75
40	31	1.220	49	1.929	0.43	1.10	1.40	0.13	13.40	48
	31	1.220	51	2.008	0.50	1.80	1.90	0.13	14.20	65
	35	1.378	48	1.890	0.33	0.90	0.80	0.10	14	90
	35	1.378	49	1.929	0.33	0.90	0.90	0.10	14.40	90
	35.60	1.402	56	2.205	0.43	1.20	1.45	0.13	17.50	60
	36	1.417	56	2.205	0.50	1.80	2	0.13	17.60	65
	36	1.417	72	2.835	0.75	2.50	3.43	0.20	25.80	90
	38	1.496	51	2.008	0.35	1.10	1.05	0.10	16.10	85
	39	1.535	59	2.323	0.50	2	2	0.13	19.90	65

DN	Inside diameter		Outside diameter		Compressed bellows length	Free bellows length	Axial stroke	Wall thickness of membranes	Effective area	Spring constant: axial direction
	mm	inch	mm	inch						
50	46	1.811	62.50	2.461	0.50	1.45	1.50	0.13	24	130
	46	1.811	71	2.795	0.50	2.30	2.40	0.13	28.50	60
	46	1.811	72	2.835	0.43	1.50	1.75	0.13	29.10	49
	46	1.811	88	3.465	0.70	3.30	3	0.20	39.20	96
	51	2.008	76	2.992	0.50	2.40	2.60	0.15	33.30	85
63	52	2.047	62	2.441	0.33	0.85	0.60	0.10	26.10	120
	52	2.047	95	3.740	0.75	3.60	3.40	0.20	46.70	75
	60	2.362	88	3.465	0.55	2.70	2.80	0.15	45.10	80
	65	2.559	90	3.543	0.50	2.40	2.80	0.15	49	95
	65	2.559	108	4.252	0.80	2.65	2.75	0.20	63.20	35
100	70	2.756	94	3.701	0.55	2.35	2.65	0.15	54.70	95
	75	2.953	100	3.937	0.60	2.40	2.90	0.15	62.20	95
	77.50	3.051	120	4.724	0.75	3.50	3.60	0.20	81.20	85
	80	3.150	108	4.252	0.55	2.25	2.50	0.15	71.90	80
	82	3.228	125	4.921	0.75	3.70	3.80	0.20	88.90	80
	90	3.543	110	4.331	0.50	1.45	1.40	0.15	80.40	145
	90	3.543	120	4.724	0.60	2.80	2.80	0.15	89.50	70
	90.50	3.563	135	5.315	0.70	4.20	4.20	0.20	105.10	80
	92	3.622	149	5.866	0.85	4.75	4.60	0.25	122	95
	100	3.937	150	5.906	0.66	2.20	2.50	0.20	129.30	66
	102	4.016	128	5.039	0.50	1.50	1.90	0.15	106.60	145
	102	4.016	132	5.197	0.60	2.60	3.10	0.15	110.70	75
	102.50	4.035	150	5.906	0.90	4.40	4.60	0.25	131.40	135
160	110	4.331	140	5.512	0.50	1.50	2	0.15	126.20	115
	110	4.331	160	6.299	0.80	4.25	3	0.20	150	40
	115	4.528	145	5.709	0.55	2.60	3.10	0.15	136.30	75
	120	4.724	140	5.512	0.50	1.25	1.70	0.15	135.30	125
	127	5	157	6.181	0.70	2.60	3.20	0.20	162.30	100
	135	5.315	165	6.496	0.66	1.90	2	0.20	180.90	140
	150	5.906	180	7.087	0.66	1.75	2	0.20	218.50	175
	150	5.906	185	7.283	0.75	2.60	3.40	0.20	225.70	140
	156	6.142	186	7.323	0.75	2.60	3.30	0.20	234.50	200
200	170	6.693	210	8.268	0.66	2	2.25	0.20	290.50	120
	173	6.811	203	7.992	0.65	2.50	3.20	0.15	283.10	100
	180	7.087	209	8.228	0.65	2.15	3.10	0.15	302.80	95
	180	7.087	215	8.465	0.75	2.80	3.40	0.20	312.90	148
	200	7.874	235	9.252	0.75	3	3.50	0.20	379	160
250	230	9.055	265	10.433	0.70	2.80	3.50	0.20	490	160
	250	9.843	280	11.024	0.66	2	2	0.20	560.70	333
	250	9.843	285	11.220	0.80	3.20	3.20	0.20	572	200
300	280	11.024	330	12.992	0.90	3.30	3.50	0.20	745.40	150
	300	11.811	340	13.386	0.80	3.20	3.60	0.20	818.20	200
400	360	14.173	440	17.323	2	7.50	6	0.30	1286.20	150
	400	15.748	480	18.898	1.45	5	4.50	0.40	1553.60	350

TECHNICAL DATA & ORDERING INFORMATION

FOR STANDARD BELLOWS

Material: Stainless steel AM350
Features: Smallest installation dimension
 For operating temperatures up to 250 °C
 Up to 10 million load alternations
 Slightly magnetic
 Corrosion-resistant

All values stated in the following tables refer to the following operating conditions:
 differential pressure: $P_i = 0$, $P_a = 1$ bar / operating temperature: room temperature / bake-out temperature: 80 °C / number of cycles: 10 000

Please contact us in case of other operating conditions or if a specific solution is required.

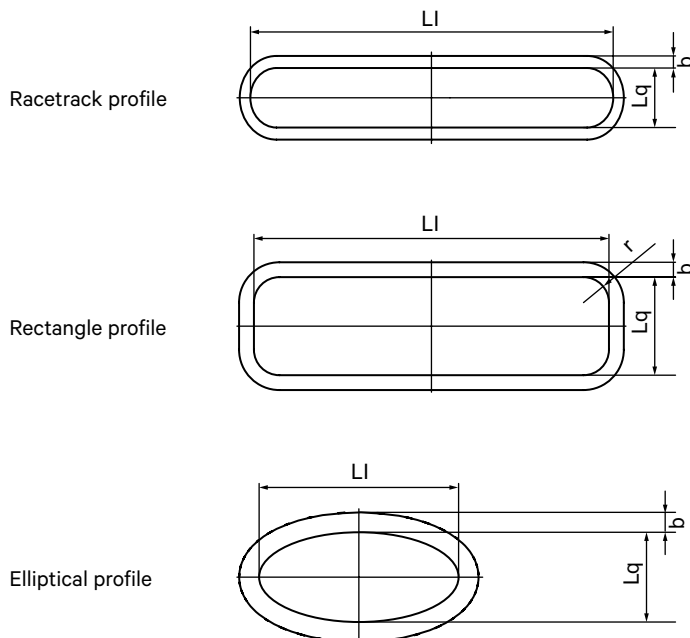
Analysis	Metal	Fe	C	Si	Mn	P	S	Cr	Mo	Ni	N
	%	Rest	0.07–0.11	≤0.5	0.5–1.25	≤0.04	≤0.03	16.0–17.0	2.5–3.25	4.0–5.0	0.07–0.13

Characteristics	Rp 0.2	Rm	E-Module	Density	Temperature	Permeability
	500 N/mm ²	1150 N/mm ²	200 000 N/mm ²	8.0 kg/dm ³	+20/+200 °C	10–15 µ

DN	Inside diameter		Outside diameter		Compressed bellows length	Free bellows length	Axial stroke	Wall thickness of membranes	Effective area	Spring constant: axial direction
	mm	inch	mm	inch						
10	6	0.236	13	0.512	0.30	0.65	0.50	0.06	0.80	75
	8	0.315	20	0.787	0.30	1.20	1.10	0.08	1.80	49
	8.60	0.339	16.20	0.638	0.27	0.75	0.65	0.06	1.30	34
	9	0.354	19.05	0.750	0.27	1.05	1	0.06	1.80	37
	9	0.354	20	0.787	0.32	1.10	1.15	0.08	1.90	65
	9	0.354	31.50	1.240	0.40	1.75	1.80	0.10	4.30	60
	9.40	0.370	23	0.906	0.27	1.35	1.40	0.06	2.50	25
16	13	0.512	26	1.024	0.32	1.35	1.60	0.08	3.40	52
	16	0.630	31.50	1.240	0.45	1.65	1.70	0.10	5	60
25	18.50	0.728	31.50	1.240	0.32	1.30	1.60	0.08	5.30	55
	19	0.748	37	1.457	0.45	1.90	2.15	0.10	6.90	52
	21	0.827	41	1.614	0.50	2.40	2.60	0.10	8.40	52
	21	0.827	49	1.929	0.50	3.10	3.50	0.13	11.30	52
	23	0.906	43	1.693	0.45	2.40	2.65	0.10	9.50	47
	26	1.024	41	1.614	0.40	1.70	1.90	0.10	9.40	90
	26	1.024	46	1.811	0.45	2.15	2.60	0.10	11.10	65
40	31	1.220	51	2.008	0.50	2.40	2.80	0.10	14.20	45
	36	1.417	56	2.205	0.50	2.50	3	0.10	17.60	40
	38	1.496	51	2.008	0.40	1.50	1.85	0.10	16.10	100
	39	1.535	59	2.323	0.50	2.50	3	0.10	19.90	40
50	46	1.811	62.50	2.461	0.40	1.75	2.25	0.10	24	90
	46	1.811	71	2.795	0.50	2.85	3.60	0.13	28.50	60
	46	1.811	88	3.465	0.65	4	4	0.15	39.20	65
	51	2.008	76	2.992	0.50	2.95	3.80	0.13	33.30	65
63	60	2.362	88	3.465	0.50	3.20	4.20	0.13	45.10	60
	63.50	2.500	77	3.031	0.35	1.40	2	0.10	39.60	120
	65	2.559	90	3.543	0.54	2.80	3.80	0.13	49	65

DN	Inside diameter		Outside diameter		Compressed bellows length	Free bellows length	Axial stroke	Wall thickness of membranes	Effective area	Spring constant: axial direction
	mm	inch	mm	inch						
100	70	2.756	94	3.701	0.50	2.70	3.50	0.13	54.70	70
	71.40	2.811	84.10	3.311	0.37	1.25	1.75	0.10	48.40	155
	75	2.953	100	3.937	0.54	2.80	3.80	0.13	62.20	65
	80	3.150	108	4.252	0.60	2.70	3.60	0.15	71.90	77
	89.60	3.528	133.40	5.252	0.85	4.50	5	0.20	102.80	85
	90	3.543	120	4.724	0.60	3	4.20	0.13	89.50	55
	90.50	3.563	135	5.315	0.85	4.90	5.20	0.20	105.10	80
	101.60	4	139.70	5.500	0.55	3.25	4.30	0.15	118.70	43
	102	4.016	132	5.197	0.70	3	4.40	0.15	110.70	80
160	102.50	4.035	150	5.906	0.85	5.10	6	0.20	131.40	90
	115	4.528	145	5.709	0.70	2.85	3.50	0.15	136.30	80
	127	5	157	6.181	0.75	2.95	4.20	0.15	162.30	85
	150	5.906	185	7.283	0.90	3.20	4	0.20	225.70	166
	160	6.299	185	7.283	0.65	2.65	3.80	0.13	238.10	87
200	160	6.299	210	8.268	1.10	5.15	5.80	0.25	277.40	120
	180	7.087	215	8.465	0.70	2.75	4.10	0.15	312.90	80
250	200	7.874	235	9.252	0.70	3.20	4.30	0.15	379	74
	250	9.843	285	11.220	0.70	3.20	4.20	0.15	572	74
320	270	10.630	310	12.205	0.80	3.30	4	0.20	672.60	140
	300	11.811	340	13.386	0.80	3.50	4.60	0.20	818.20	90
400	430	16.929	480	18.898	1.10	4.50	5.60	0.25	1652.70	280

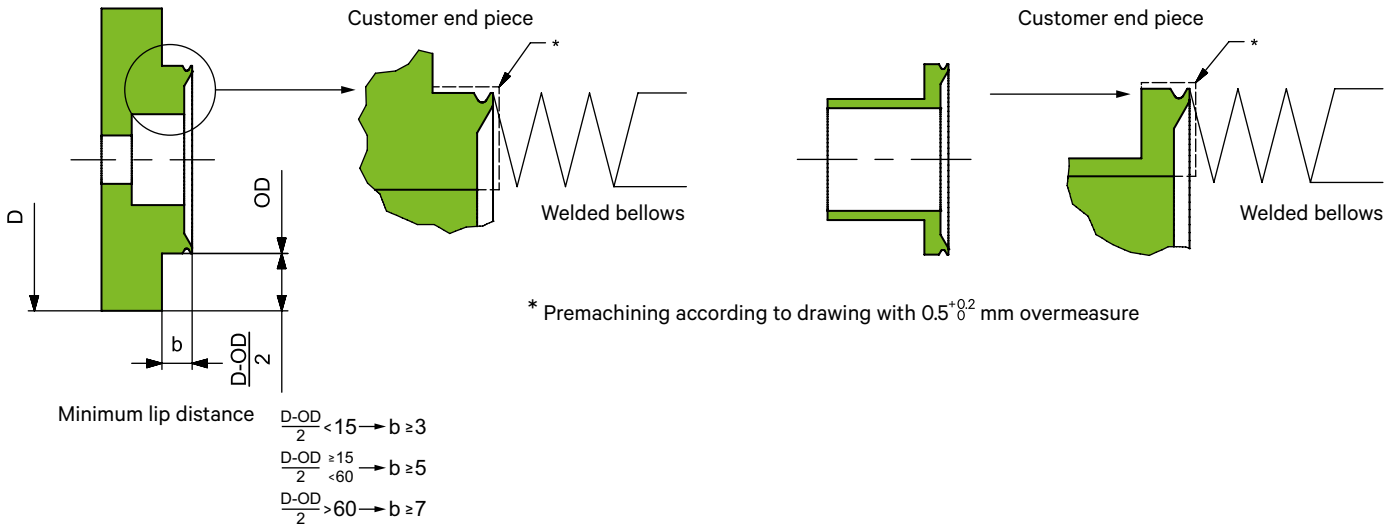
TECHNICAL DATA & ORDERING INFORMATION FOR SPECIAL BELLOWS



	Technical specification					Ordering No.
	Length (lengthwise)	Length (crossways)	Profile width	Corner radius	Material	
Racetrack	LI mm	Lq mm	b mm	r mm		
	150	80	9	-	316L	150-80-RS
	210	30	15	-	316L	210-30-RS
	240	120	15	-	316L	240-120-RS
	292	38	12.5	-	AM350	292-38-RS
Rectangle	300	190	19.5	20	316L	300-190
	836	231	35	60	316L	836-231
Elliptical	127	57.16	12.7	-	316L	127-57.2

Other shapes and sizes are available on request.

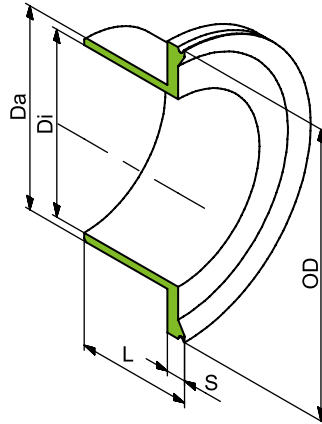
PREMACHINING OF END PIECES



STANDARD END-PIECES

ONE-PART END PIECE
Material: stainless steel 316L

Other materials on request

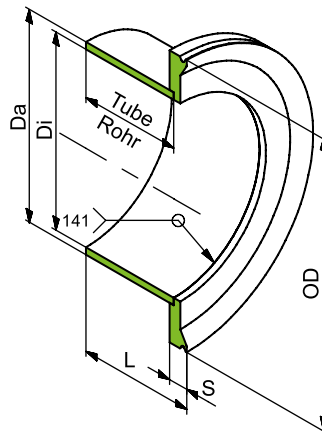


DN	ID		OD		Di	Da	S
	mm	inch	mm	inch			
10	8	0.315	16	0.630	8	10	4
16	16	0.630	31.50	1.240	16	18	4
25	26	1.024	46	1.811	24	28	4
40	39	1.535	59	2.323	38	41.30	4
50	51	2.008	76	2.992	53	57	4

Other sizes on request
L selectable

TWO-PART END PIECE
Material:
stainless steel 316L (bellows connection)
stainless steel 304 (pipe)

Other materials on request
Also available with one-part end piece



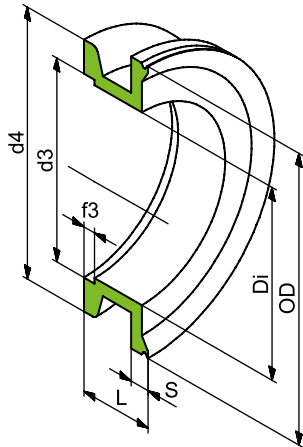
DN	ID		OD		Di	Da	S
	mm	inch	mm	inch			
63	65	2.559	90	3.543	66	70	5
75	75	2.953	100	3.937	72.10	76.10	5
100	102	4.016	132	5.197	104	108	5
130	127	5	157	6.181	123	129	5
160	150	5.906	185	7.283	150	156	5
200	200	7.874	235	9.252	200	206	6
250	250	9.843	285	11.220	250	256	6
300	300	11.811	340	13.386	300	306	6
350	360	14.173	440	17.323	350	356	10
400	400	15.748	480	18.898	400	406	10
500	520	20.472	640	25.197	500	506	15
630	690	27.165	810	31.890	650	662	16

Other sizes on request
L selectable, minimum 20 mm

STANDARD FLANGES

ISO-KF (DIN 28403)
Material: stainless steel 316L

Other materials on request



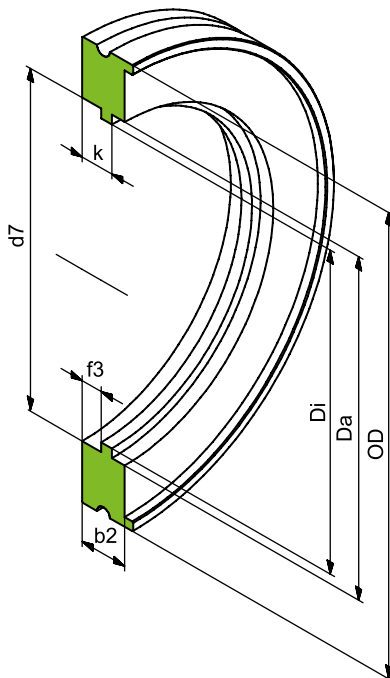
DN	OD		Di	d3	d4	f3 +0.2/0	L	S
	mm	inch						
10	20	0.787	10	12.20	30	2.50	14	4
16	31.50	1.240	16	17.20	30	2.50	14	4
20	41	1.614	20	22.20	40	2.50	14	4
25	46	1.811	25	26.20	40	2.50	14	4
32	51	2.008	31	34.20	55	2.50	15	4
40	59	2.323	39	41.20	55	2.50	15	4
50	76	2.992	50	52.40	75	2.50	18.50	4

Other lengths «L» on request

ISO-K (DIN 28404)
Material: stainless steel 316L

Other materials on request

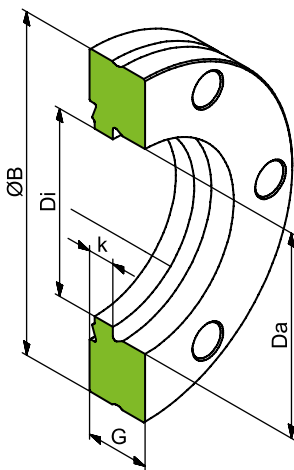
Membrane bellows mounting with one-part or two-part end piece



DN	OD		Di	Da	d7	f3	b2	k
	mm	inch						
40	65	2.559	38	41.30	41.20	2.50	10	5.50
50	75	2.953	53	57	52.20	2.50	10	5.50
63	95	3.740	66	70	70	4.50	10	7
80	110	4.331	72.10	76.10	83	4.50	10	7
100	130	5.118	104	108	102	4.50	10	7
125	155	6.102	123	129	127	4.50	10	7
160	180	7.087	150	156	153	4.50	10	7
200	240	9.449	200	206	213	4.50	10	7
250	290	11.417	250	256	261	4.50	10	7
320	370	14.567	300	306	318	4.50	15	10
400	450	17.717	400	406	400	4.50	15	10
500	550	21.654	500	506	501	4.50	15	10
630	690	27.165	600	608	651	4.50	20	12

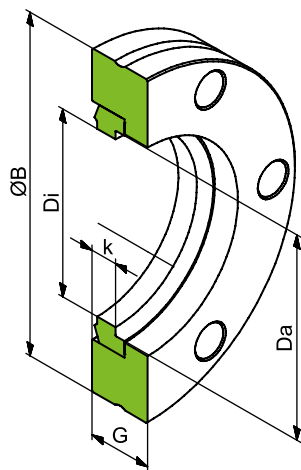
CF fixed
Material: stainless steel 316L

Other materials on request



CF rotatable
Material: stainless steel 316L

Other materials on request



DN	ØB		Di	Da	G	k
	mm	inch				
10 ¹⁾	25.40	1	9	18	6	3
16	34	1 1/8	16	27	7.50	4.20
25	54	2 1/8	24	41.30	12	4.80
40	69.50	2 3/4	38	58.70	13	5.50
50	85.60	3 3/8	47.60	72.40	15.70	5.70
63	113.50	4 1/2	66	92.20	17.50	9.50
75	117.50	4 5/8	72.10	76.40	17.50	9.50
100	152	6	104	130.30	20	11
130	171.40	6 3/4	123	129	21	11.50
160	202.50	8	150	181	22	12
200	253	10	200	231.80	24.50	12.50
250	305	12	250	284	24.50	12.50
300	355.60	14 1/2	300	325.40	28.50	12.70
350	419.10	16 1/2	350	388.90	28.50	12.70
400	457	18	400	431.80	28.50	16

¹⁾ Flange DN 10 only available as fixed flange



MODULES – FROM SKETCH TO PRODUCT

The origin is an idea, a vision, or an existing project.

VAT defines a module as an assembly of vacuum valves and other vacuum components in a customer-specific housing. Each module creates a value proposition for the customer, the end user, the suppliers, and VAT.

FOCUSING ON CORE COMPETENCES

VAT's engineering and manufacturing competence in vacuum enables your team to focus more on your core competences in process and system design. For quick-turn product development, VAT's global engineering staff performs multi-shift runs in close cooperation with your global locations.

EFFICIENT & COST OPTIMIZED

Simplify your logistics and streamline your assembly processes. Reduce the complexity of your supply chain by consolidating several BOMs to one part number. VAT's efficient and cost effective procurement processes enable ship-to-line concepts, allow warehouse optimization, and reduce working capital.

Individual parts



Module: only one part number



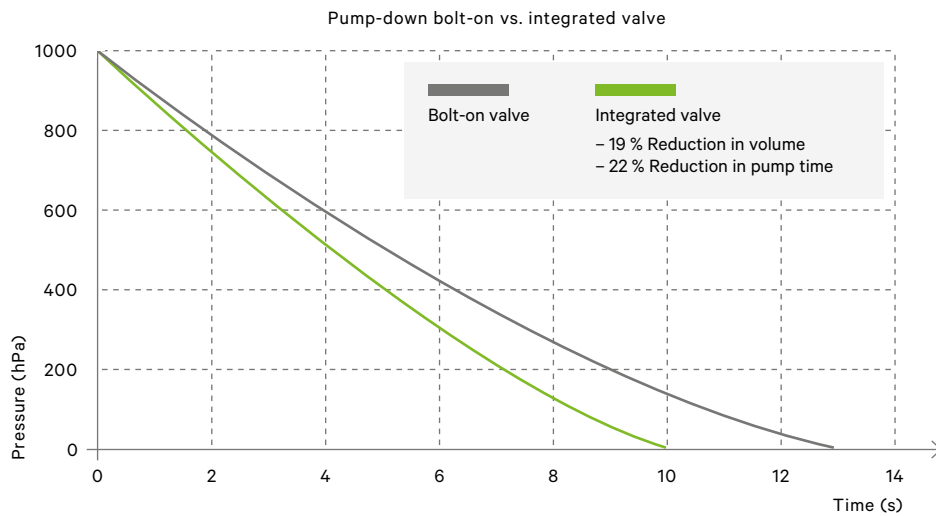
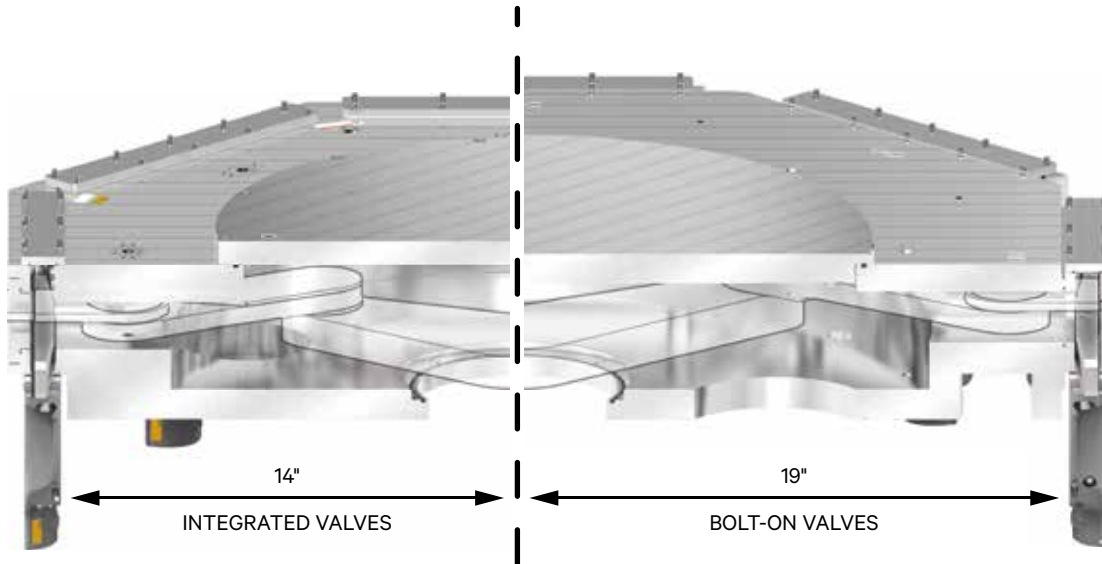
HIGH PURITY PROGRAM

Utilizing best-practices from machining to packaging, VAT is able to manufacture, assemble, test, and package in ISO Class 6. Workflows and cleaning processes are documented and strictly monitored. VAT is able to utilize in-situ monitoring of particles, while parts are cleaned to specification.



MINIMIZED FOOTPRINT

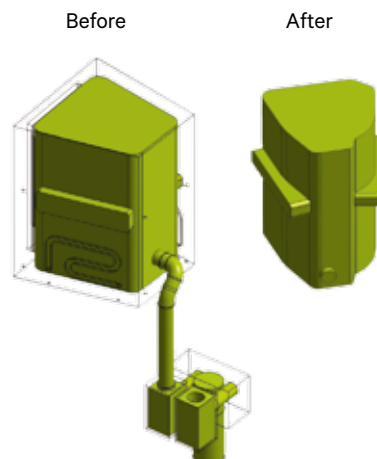
Integration of our valve housings into a common monolithic design reduces weight, size, number of o-rings, vacuum surface area, and volume. This can lead to a significant footprint reduction. A minimized footprint enables cost savings beyond the integration of the valves. As an example, a reduction of the robot reach may allow use of a smaller handler, which saves significant costs in robotics.



IMPROVED THROUGHPUT

Reduction in footprint allows for optimized internal volume and wetted surface area. Unnecessary interfaces are eliminated and the total length of seals is shortened, which reduces permeation. These measures result in a lower overall gas load.

Reduced gas load results in a shorter time for pumping and venting. This can lead to higher throughput, lower base pressure, or cost savings due to selection of a smaller pump.



MODULES PRODUCT PORTFOLIO

VAT Modules competences are in design, development, and optimization of vacuum chamber assemblies. Each customized module is exclusively designed for and sold to one single customer.

Your benefits:

Experience collected on an installed base of more than 10,000 modules ensures that you get the best design solution for your project.

SINGLE / DUAL-SLOT AND BATCH LOAD LOCK

Load lock chambers are designed to meet your performance requirements. Slot sizes range from reticles to wafers to display substrates.



WAFER TRANSFER CHAMBERS

Transfer chambers are designed to interface with your vacuum handler and process modules. Transfer and isolation valves as well as other vacuum components are integrated into one assembly.



PUMP MANIFOLDS

Manifolds for pumping, gas supply, and leak check are designed to minimize space requirements, number of seals, and internal volume. Control valves, isolation valves, angle valves, and further vacuum components are integrated.



CUSTOMIZED CHAMBERS

Designed to meet your specific purpose. Features may include integrated valves, other vacuum components, integrated fluid lines for heating and cooling, specific surface coatings, and other features as specified by you.



GLOSSARY

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

Communication interfaces

Device Net®: 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).

CC-Link: CC-Link (Control and Communications Link) is a union of open industrial networks used to transmit control data as well as information. The standard is widely spread in Asia. It was originally developed by the Mitsubishi Electric Corporation as their corporate internal network. Due to a rising demand it was finally released as an open network.

- EtherCAT:** EtherCAT (Ethernet for Control Automation Technology) is an Ethernet-based fieldbus, invented by Beckhoff Automation. The main goal of the EtherCAT development was to achieve low cycle times and a low jitter rate (run-time deviation) which makes this interface applicable for automation applications requiring short data update times.
- Ethernet:** Ethernet is a family of computer networking technologies commonly used to connect local area networks (LAN) but also larger networks like wide area networks (WAN). This technology is used to exchange data between devices connected to the network using predefined data-frames.
- Logic:** Logic is a simple communication interface allowing the user to communicate with a device using simple digital and analog signals. The Logic-interface used in VAT controllers supports several digital and analog inputs to control the connected device. Additional digital and analog outputs can be used for status inquiries. Each in- and output has its own designated function.
- Profibus:** Profibus (Process Field Bus) is an international fieldbus standard used to communicate in the field of automation technology. It was developed by 21 companies and got promoted by BMBF (German department of education and research). Profibus is suitable for time critical applications as well as for complex communication tasks.
- RS232:** RS232 is a wide spread standard for serial data communication. It was developed in the early 1960s by the EIA (Electronic Industries Association). RS232 interfaces are still commonly used in industrial facilities because they are easy to implement and perfectly adequate for simple tasks.
- RS485:** The RS485 interface, also known as EIA-485, is an industrial standard used in serial communication systems. By using differential balanced lines for the data transmission, any influences of interferences can be decreased thus allowing higher clock-rate and larger transmission distances. The RS485 interface is still commonly used in the industrial automation field.

Conductance

The gas flow through a component (valve, tube, diaphragm) depends on the differential pressure to the component. The proportional factor is the conductance.

- $q = L \cdot \Delta p$ (mbar ls⁻¹)
- q ... Gas flow (mbar ls⁻¹)
- L ... Conductance (ls⁻¹)
- Δp ... 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 = Length of the slit (cm)
- b = Width of the slit (cm)
- D = Inner diameter of the valve (cm)
- e = Corner – flange distance (cm) (dimension A in dimensional drawing) (0.7 D is the correction factor for 90° bend)
- l = Flange-to-flange dimension of valve (cm)
- L_v = Molecular flow conductance (ls⁻¹)

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:

$$1/S_{eff} = 1/S_o + \sum_i 1/L_{Ri}$$

$$S_o = \text{Nominal pumping speed (ls}^{-1}\text{)}$$

$$L_{Ri} = \text{Conductances of tubes and valves (ls}^{-1}\text{)}$$

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

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

High purity

High purity is a collective term for cleanliness specifications which meet highest customer requirements regarding particles, organic and inorganic substances. High purity processes cover the entire manufacturing process from the production and cleaning of individual parts to the assembly and packaging of products.

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 feedthroughs 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 $l s^{-1}$ 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)

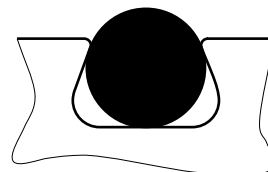
Size denomination of a flange. The nominal I.D. (DN) does not always correspond to the smallest diameter of a flange or tube.

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

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 nonreturn valve at the compressed air inlet.

POM

Short form for Polyoxymethylene, a thermoplastic material.

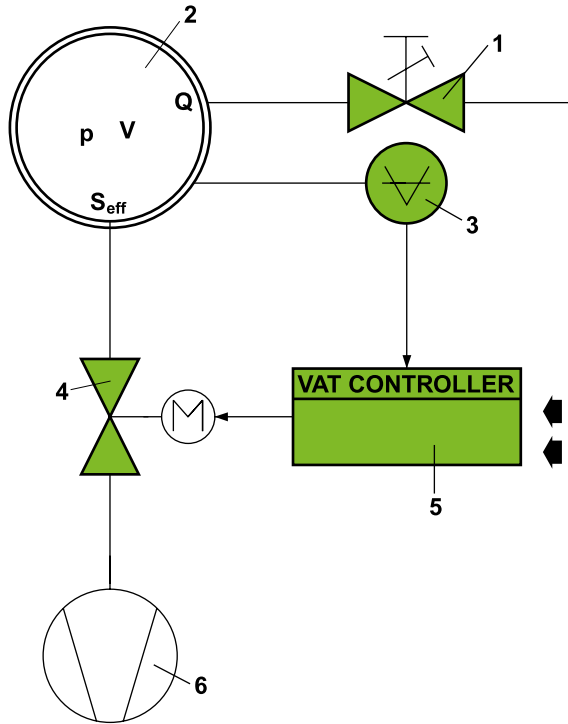
Pressure

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:

- $S_{eff} \dots Q / p$
- $S_{eff} \dots$ Effective pumping speed (l/s^{-1})
- $Q \dots$ Gas flow ($mbar \cdot l/s^{-1}$)
- $p \dots$ Pressure ($mbar$)

or units used in USA

- $S_{eff} = 12.7 \cdot Q / p$
- $S_{eff} \dots$ Effective pumping speed (l/s^{-1})
- $Q \dots$ Gas flow ($sccm$)
- $p \dots$ 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

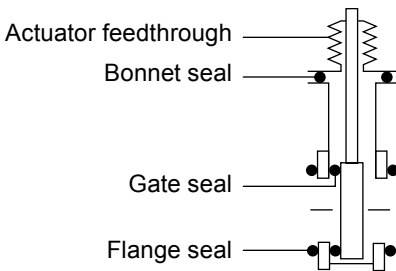
This guarantees a small RF resistance through the open valve. In the open valve position a metal ring, having the geometric shape of the beam tube, is spread between the two connecting flanges and ensures a direct electrically conducting connection between the two flanges.

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.

SFV

Short form for Symmetrical Flow Valve. Valve concept at which the process gas flow is symmetrical around the gate during pressure control.

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 ranges

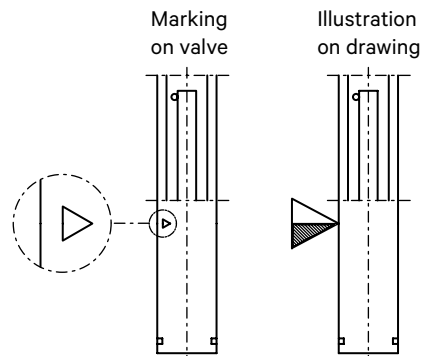
See page 403.

Valve cluster

Valve network consisting of a master and one or more slave valves. The master valve is controlled by the host system while the slave valves will follow the master.

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.

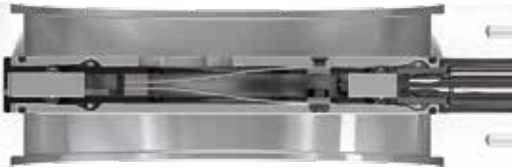
Gate valves with VATLOCK system are mechanically locked in the closed position.

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 20.3/20.4 feature a rotary feed-through.



Viton®

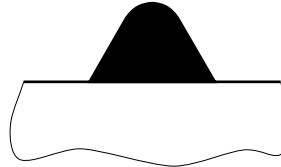
Trade name for a fluoroelastomer (FKM). Viton® has a small desorption rate.

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, perfluoro-elastomers, silicones or EPDM. Outgassing rate, permeation and bakeability are equal to selected high quality O-rings.

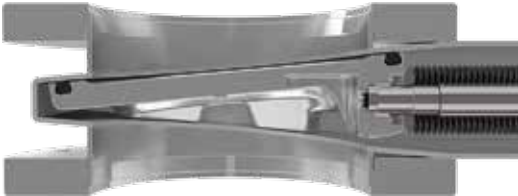
Waveguide

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.

VACUUM RANGES

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 range	Pressure range		Maximum temperature (°C)	Seals		Feedthrough
	(mbar)	(Torr)		Gate	Bonnet	
Low or rough vacuum	1000 – 10 ⁻³	760 – 10 ⁻³	150	FKM (Viton®)	FKM (Viton®)	Shaft feedthrough, sealed with O-ring made of FKM (Viton®)
High vacuum (HV)	10 ⁻⁴ – 10 ⁻⁸	10 ⁻⁴ – 10 ⁻⁸	150	FKM (Viton®)	FKM (Viton®)	Rotary feedthrough, sealed with O-ring made of FKM (Viton®) or bellows
Ultrahigh vacuum (UHV)	10 ⁻⁹ – 10 ⁻¹²	10 ⁻⁹ – 10 ⁻¹²	200 / 250	FKM (Viton®)	metal	Bellows
Extreme high vacuum (XHV)	10 ⁻¹³ and below	10 ⁻¹³ and below	300 / 450	metal	metal	Bellows

MATERIALS

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-AISI2Cu1 (Fe)	≤ 0.35	10.5 – 13.5	0.55	0.7 – 1.2
EN AW-5083	3.3547	EN AW-AIMg4.5Mn0.7	4.00 – 4.90	≤ 0.4	0.40 – 1.00	≤ 0.10
EN AW-5049	3.3527	EN AW-AIMg2Mn0.8	1.60 – 0.50	≤ 0.4	0.50 – 1.10	≤ 0.10
EN AW-5754	3.3535	EN AW-AIMg3	2.60 – 3.60	≤ 0.4	≤ 0.50	≤ 0.10
EN AW-6014	–	EN AW-AIMg0.6Si0.6V	0.40 – 0.80	0.3 – 0.6	0.05 – 0.20	≤ 0.25
EN AW-6060	3.3206	EN AW-AIMgSi	0.45 – 0.60	0.5 – 0.6	≤ 0.10	≤ 0.10
EN AW-6061	3.3211	EN AW-AIMg1SiCu	0.80 – 1.20	0.4 – 0.8	≤ 0.15	0.15 – 0.40
EN AW-6063	3.3206	EN AW-AIMg0.7Si	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)

CONVERSION TABLES

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
1K	=	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	10.2
1 ft lbs	=	1.36	1	0.138	13.8
1 kp m	=	9.81	7.23	1	100
1 kgf cm	=	0.098	0.072	0.01	1

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 [µinch]	1	2	4	8	16	32	63	125	250	500	1000	2000

Example: Surface finish class N3 → Ra less than 0.1 µm

TRADE MARKS

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