



Switzerland (Headquarters)

VAT Vakuumentile AG
CH-9469 Haag

Representatives in many other countries



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	16	012	Mini vacuum gate valve	low cost gate valve in small diameters
	20	08	Insertable gate valve	thin valve, direct integration between DIN flanges
	24	09	HV gate valve	for very contaminating processes
	30	10	UHV gate valve	the standard for UHV applications, free of lubricants
	38	12	Vacuum gate valve	the standard for vacuum applications
	44	14	HV gate valve	the standard for HV applications
	52	15	Low particle gate valve	for vacuum systems requiring extremely low particle count
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	68	19	Large gate valves	from DN 400 mm / 16" diameter
	74	20	Vatterfly valve	compact alternative to gate valves
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B	Page	Series	Control valves	
	88	612	Butterfly valve control system	for pressure control, integrated controller
	94	615	Butterfly valve control system	for pressure control & isolation, integrated controller
	100	64	Gate valve control system	for pressure control & isolation, stainless steel
	110	650	Pendulum valve control system	for pressure control & isolation, integrated controller
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	124	95	Combo control valve	control and isolation valve in one body

C	Page	Series	Transfer valves and doors for SEMI	
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D	Page	Series	Transfer valves and doors for FPD and PV	
	140	024	Large transfer valve MONOVAT	for FPD and PV production systems
	142	060	Transfer valve XL-VAT	for FPD production systems
	144	066	Transfer valve / insert / door SolVAT	for PV production systems
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E	Page	Series	Angle valves, diaphragm valves	
	148	22	Diaphragm valve	for venting and as a rough metering valve
	150	24	Vacuum angle valve	with shaft feedthrough
	152	26	HV angle valve	with bellows feedthrough
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	166	29	Angle valve with soft-pump function	for less turbulences, particles and condensation
	172	54	All-metal angle valve	«Easy Close», maintenance-free
174	57	All-metal angle valve	very long cycle life	

F	Page	Series	Special valves for accelerators / synchrotrons	
	180	47	RF all-metal gate valve	sector valve with RF bridge or waveguide valve
	186	75	Fast closing valve	seals vacuum tight in milliseconds
	190	77	Fast closing shutter	reducing full conductance to a small leak, all-metal design
	194	77	Controller	for fast closing system
	196	79	Beam stopper	for integration into beam lines, all-metal design

G	Page	Series	Special valves for gases	
	198	010	Gate valves for gas analysis	with by-pass for pressure reduction in mass spectrometry
	200	27/66	Angle valves for chemistry	for aggressive and corrosive gases

H	Page	Series	Flange connection components	
	202	31	ISO-KF	small flange components, soft-start throttle valve
	206	32	ISO-K, ISO-F	clamp flange components
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	214	35	VATSEAL	metal seal for any shape of flange openings

I	Page	Heaters		to reduce deposition and pump-down times
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Valve series according to vacuum levels



	Gate valves (free opening)							Angle/Vatter-fly/Diaphragm valves		Control valves				
Vacuum														
VAT Series	012	024	060 066	08	12	150	190	22	24					
seal type / feedthrough														
FKM (VITON)														
> 1 · 10 ⁻⁷ mbar														
¹⁾ Actuator:	H/P	P	P	H/P	H/P	P	P	H	H/P					
HV (high vacuum)														
VAT Series	022/032	041 066	060 192	09	140 168	151	162	17	203 204	26 29	612 615	64	650	652
seal type / feedthrough														
FKM (VITON)														
bellows														
> 1 · 10 ⁻⁸ mbar														
¹⁾ Actuator:	P	P	P	H/P	H/P (14) P (168)	P	P	H/P	P	H/P/ EM (26) P (29)	M	M/P	M	M
UHV (ultra high vacuum)														
VAT Series	010	10	152			200 202	28							
seal type / feedthrough														
FKM (VITON)														
metal														
bellows														
> 1 · 10 ⁻¹⁰ mbar														
¹⁾ Actuator:	H/P	H/P	P			H	H/P							
XHV (extreme UHV)														
VAT Series	47	48			54	57								
seal type / feedthrough														
metal														
VATRING														
bellows														
< 10 ⁻¹⁰ mbar														
¹⁾ Actuator:	P	H/P			H	H/P								

¹⁾ H = manual actuator P = pneumatic actuator M = motor EM = electromagnetic actuator

Valve series according to nominal diameters



Nominal diameter		Gate valves (free, circular passage)		Angle valves	Vatterfly valves	Control valves
mm	inch	Flap valves			Diaphragm valves	
		linear	pendulum			
Valve series						
10	3/8			24, 26		
16	5/8	012, 48		24, 26, 28, 54, 57	22	66
25	1	010, 012		24, 26, 27, 29	22	66
40	1 1/2	010, 012, 17, 48, 75, 77		24, 26, 27, 28, 29, 54, 57	22	612, 615, 66
50	2	010, 012, 08, 09		24, 26, 27, 29		612, 615, 66
63	2 1/2	08, 09, 10, 12, 14, 15, 17, 47, 48, 75, 77, 79	162	24, 26, 27, 28, 29, 54, 57	200, 202, 203, 204	612, 615, 66
80	3	08, 09, 10, 12, 14		24, 26, 29	203, 204	612, 615, 66
100	4	08, 09, 10, 12, 14, 15, 17, 47, 48, 75, 77, 79	162	24, 26, 27, 29, 57	200, 202, 203, 204	612, 615, 64, 650, 66
160	6	09, 10, 12, 14, 15, 17, 47, 48, 75, 77, 79	162	24, 26, 27, 29, 57	200, 202, 203, 204	612, 64, 650
200	8	10, 12, 14, 15, 17, 47, 48, 75	162	24, 26	203, 204	612, 64, 650, 652
250	10	10, 12, 14, 15, 17, 48	162	24, 26		64, 650, 652
320	12	10, 12, 14, 17, 48	162	24		64, 650
350	14	14	162	24		64, 650
400	16	14, 19	162, 168	24		64, 650
500	20	19	168	24		
630	25	19		24		
800	32	19		24		
900	36	19		24		
1000	40	19		24		
1250	50	19		24		

Sizes for valves with rectangular openings see

Section C: Series 022, 032, 041, 051, 075 pages 126 to 139

Section D: Series 024, 060, 066, 075, 078 pages 140 to 147

Other sizes on request

INNOVATION



Worldwide leader in vacuum valve technology

More than 700 employees deal with nothing but vacuum valves. Development, a major part of the manufacturing and the assembly are based at the headquarter in Switzerland.

The patented innovations include

- VATLOCK mechanism for gate valves
- VATRING sealing element for all-metal valves
- MONOVAT configuration for particle-free valves

ENGINEERING



7 specialized product groups

with designers and product managers for

- designing customer specified special valves
- continuous improvement of standard valves

are assisted by our valve and electronics labs for fundamental research.



PARTS MANUFACTURING



Industrial manufacturing according to ISO 9001

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

The VAT production facilities include

- 6 specialized production cells
- 16000m² production area
- FCKW-free cleaning
- 3D control



**VALVE
ASSEMBLY
INSPECTION**



All valves are

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

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

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

**GLOBAL
SUPPORT**

Worldwide customer support

- VAT Service Centers in America, Asia, Europe
- VAT Subsidiaries in Benelux, England, France, Germany, China, Japan, Korea, Singapore, Taiwan, USA
- Representatives in many other countries

Ordering

Valve selection

1. To ascertain the most suitable valve series:
see **Table of contents** pages 2 and 3 as well as **Valve series according to vacuum levels** page 4
2. Check specification of the selected series: number of cycles, closing time, temperature range etc.
3. Determine ordering number by flange type, actuator, and position indicator
4. In case of electric actuation: Specify voltage by adding it to the ordering number
5. In case of options: Add «X» to the ordering number and describe required option (see «Ordering examples»)

Ordering examples

- a) Standard valve: Ordering text e. g. **10840-CE44, 24VDC**
- b) Valve with option: Requirement UHV gate valve, DN 200, stainless steel, pneumatic actuator, position indicator (80°C), solenoid 200V/60Hz, special flange, gate seal made of Chemraz
Ordering text e. g. **10846-XE44-X, 200V/60Hz**
X = Special flange according to enclosed drawing, gate seal made of Chemraz
- c) Seal kit: See operating manual or price list
- d) Accessories: See operating manual or price list
- e) Spare parts / service: When placing inquiries/orders please always specify the serial number of the product:
see «Serial number»

Ordering number to explain the ordering numbers used in the catalog

standard
option / speciality

1 0 8 4 8 - C E 4 4 - X plus description

VAT Series

Version

Actuator & position indicator
(see product data)

Body material
A aluminum
H aluminum, hard anodized
E stainless steel

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

Flange / Product type			
A	ASA	N	ISO-F (double number of holes)
B	ISO-KF «quick»	P	ISO-F
C	CF-F (fixed flange)	Q	ISO-K
D	DIN	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 specific
K	ISO-KF	Z	rectangular flange

Series 022/032/041/051/075 (SEMI) see pages 126 - 139

Series 024/060/066/075/078 (FPD/PV) on request

Serial number

is fixed on the valve directly or by means of an identification plate, for example in one of the following ways or similar:

[] [] [] [] [] - [] [] [] [] []
 F [] [] - [] [] [] [] [] [] [] [] [] []

Quality certification

ISO 9001:2000, ISO 14001:2004

VAT maintains a Quality Management system according to ISO 9001:2000 and an Environmental Management system according to ISO 14001:2004. Both systems are regularly audited and certified by the SQS (Swiss Commission for Quality and Management Systems).

Certificate of conformity CE

VAT products basically conform to the CE guidelines and are provided with the CE mark. A multi-lingual certificate of conformity is supplied with the relevant product on customer request.

Inspection certificates

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

Special quality documents

Declarations of compliance according to EN10204 2.1 or customer specified quality documents, e. g. concerning 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

Dimensional drawings

3D format: STEP AP 203

2D format: PDF

Further formats are available on request.

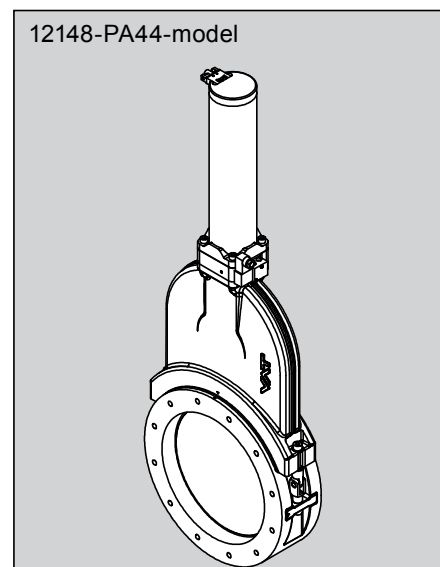
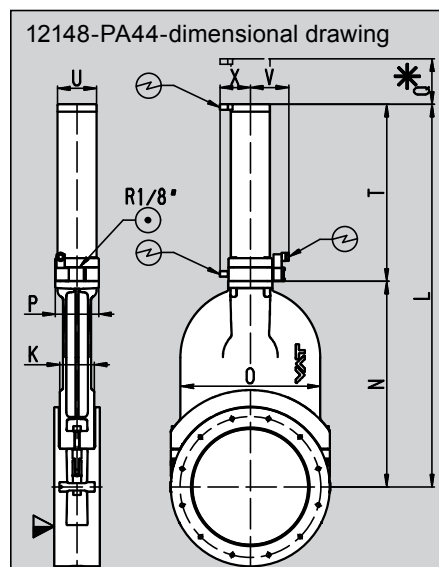
Important!

In order to ensure an optimum data exchange, we need your current CAD system information with your inquiry for dimensional drawings or models.

Inquiry

Ordering number of product-dimensional drawing or model
(e. g. 12148-PA44-dimensional dwg)

Example: Series 121, DN 250
with pneumatic actuator



Series 010

Universal applications

Modular actuator



Body material

stainless steel

Manual actuator

handwheel

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

with handwheel, with position indicator: 010 . . . E08

Pneumatic actuator

double acting
without position indicator
without solenoid

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

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

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

single acting with closing spring (NC)
without position indicator
without solenoid

25	1	01028-KE11		
40	1½	01032-KE11	01032-CE11	01032-UE11
50	2	01034-KE11		

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

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

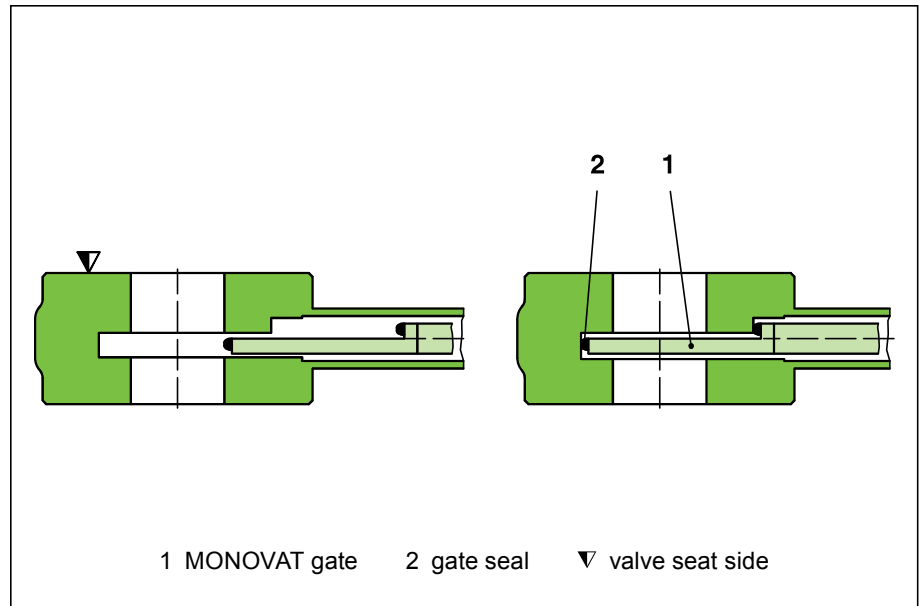
Sealing materials

Gate: FKM (VITON)

Bonnet: metal

Feedthrough

Bellows



Features

MONOVAT configuration (see glossary)

Bellows-sealed

Mechanism free of lubricants

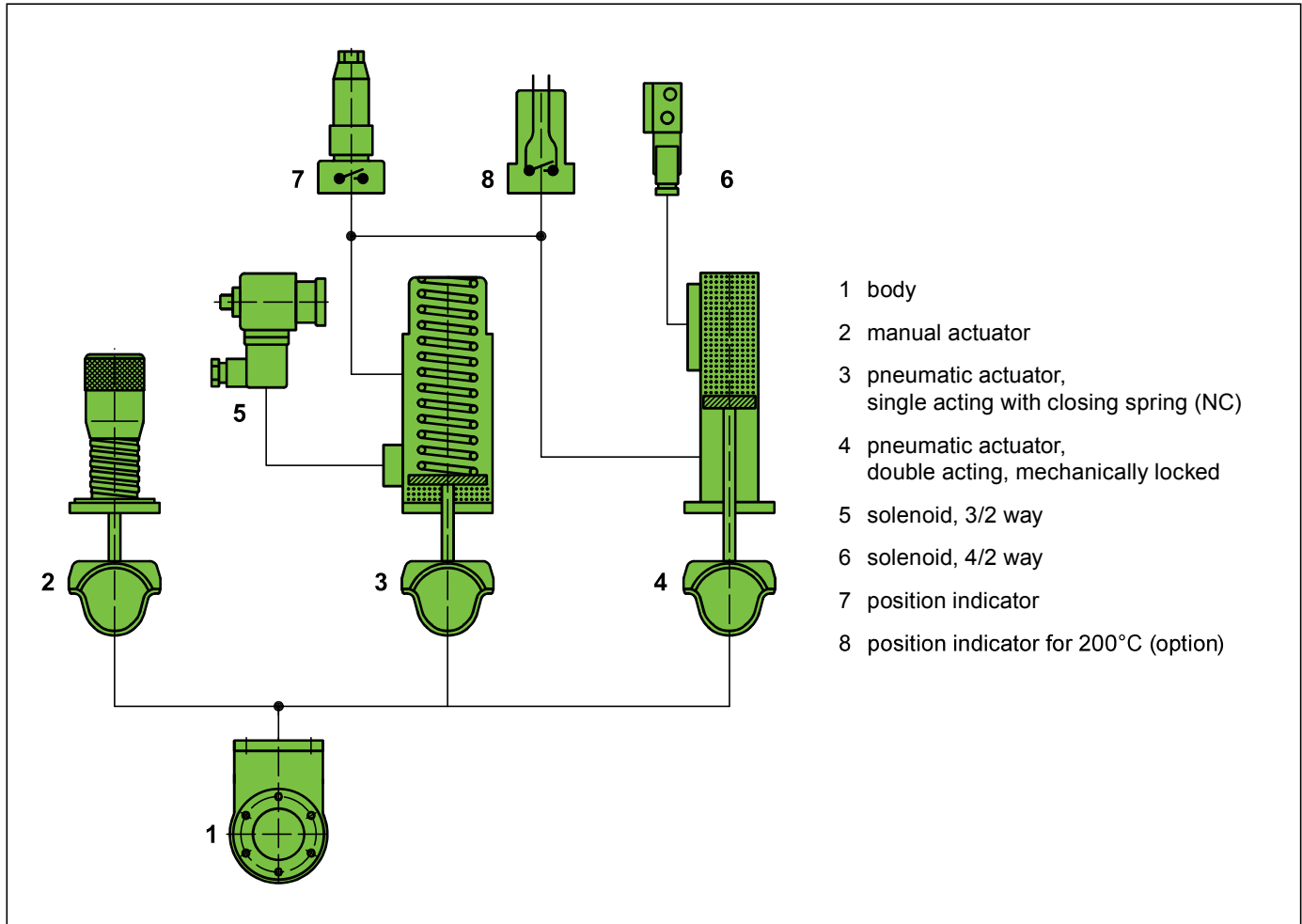
Technical data

Continued next page

Leak rate: body / valve seat	$< 5 \cdot 10^{-10} / < 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-10}$ mbar to 2 bar (abs)
Differential pressure on the gate	≤ 2 bar in either direction
Differential pressure at opening	≤ 30 mbar
Cycles until first service	50 000
Temperature ¹⁾	
- Valve body	$\leq 250^\circ\text{C}$ open, $\leq 200^\circ\text{C}$ closed
- Manual actuator	$\leq 250^\circ\text{C}$
- Pneumatic actuator	$\leq 200^\circ\text{C}$
- Position indicator	$\leq 80^\circ\text{C}$
- Solenoid	$\leq 50^\circ\text{C}$
Heating and cooling rate	$\leq 50^\circ\text{C h}^{-1}$
Material	
- Valve body, flanges	AISI 304 (1.4301) / AISI 316L (1.4435)
- Gate	AISI 304 (1.4301)
- Bellows	AISI 316L (1.4435)
Seal: bonnet / gate	metal / FKM (VITON)
Mounting position	any
Solenoid	
- Double acting actuator	24 VDC, 5.4 W
- Spring opening/closing actuator	24 VDC, 9 W (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 250 VAC ≤ 50 VDC
- Current	≤ 5 A ≤ 3 A
Valve position	visual (mechanical)

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

Actuators



Technical data

DN (nominal I. D.)		standard flanges		molecular flow conductance		manual			pneumatic						
						turns per stroke	weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch	ISO-KF	CF-F O.D.	ISO-KF ls ⁻¹	CF-F ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
25	1	25		38		5	1.5	3.3	5 - 7	72.5 - 100	0.06	0.002	0.7	1.8	4
40	1½	40	2¾	160	220	5	1.5	3.3	5 - 7	72.5 - 100	0.06	0.002	0.7	1.8	4
50	2	50		160		5	1.5	3.3	5 - 7	72.5 - 100	0.06	0.002	0.7	1.8	4

Options

Actuator:

- Solenoid for impulse actuation:
actual valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V / 50 Hz
24, 100, 115, 200, 230 V / 60 Hz
- Manual emergency operation on solenoid lockable
- Manual actuator with position indicator
- Position indicator for 200°C with connecting cable 0.3 m
contact rating: ≤ 50VAC / DC, ≤ 1 A
- Pneumatic actuator, single acting with opening spring (NO)
- Version for 1 000 000 cycles (special bellows)


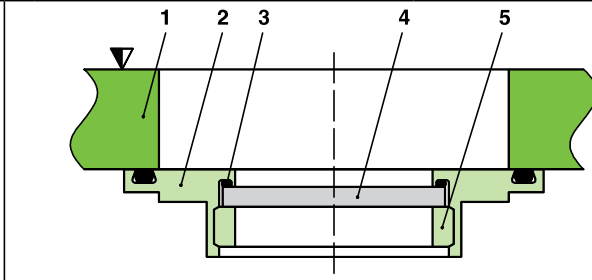
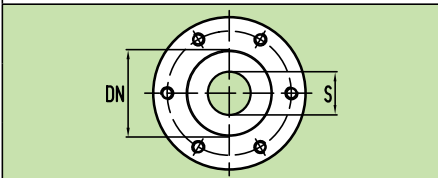
Valve:

- Customer specified flanges
- Insert version for integration into the vacuum system (without body)
- Other sealing materials (Chemraz, EPDM etc.)
- Window in valve gate: see specification below
- Special valve gate, suitable to install various foils or orifices
- Gate valve for gas analysis (see page 198)
- With by-pass valves for gas analysis at high pressures (see page 198)
- Gate valve with protective ring (see series 17)

Ordering information for options:

Ordering No. of valve-X (e. g. 01032-CE44-X, X = version for 1 000 000 cycles)

Gate valve with window

	 <p>1 valve body 2 valve gate 3 elastomer seal for window 4 window 5 screwed window retainer ▽ valve seat side</p>																
	<p>Exchangeable window Material: borosilicate Seal: elastomer Window mechanism retrofitable Window exchangeable by user</p>	<table border="1"> <tr> <td>DN valve</td> <td>mm inch</td> <td>25 %</td> <td>40 1 ½</td> <td>50 2</td> </tr> <tr> <td>optically free diameter «S»</td> <td>mm inch</td> <td>21 0.82</td> <td>21 0.82</td> <td>21 0.82</td> </tr> <tr> <td>thickness of glass</td> <td>mm inch</td> <td>1.5 0.06</td> <td>1.5 0.06</td> <td>1.5 0.06</td> </tr> </table>	DN valve	mm inch	25 %	40 1 ½	50 2	optically free diameter «S»	mm inch	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
DN valve	mm inch	25 %	40 1 ½	50 2													
optically free diameter «S»	mm inch	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													

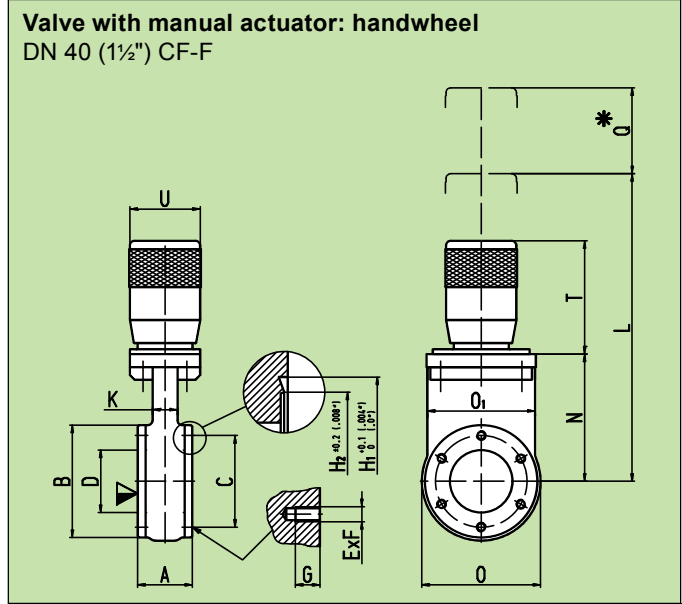
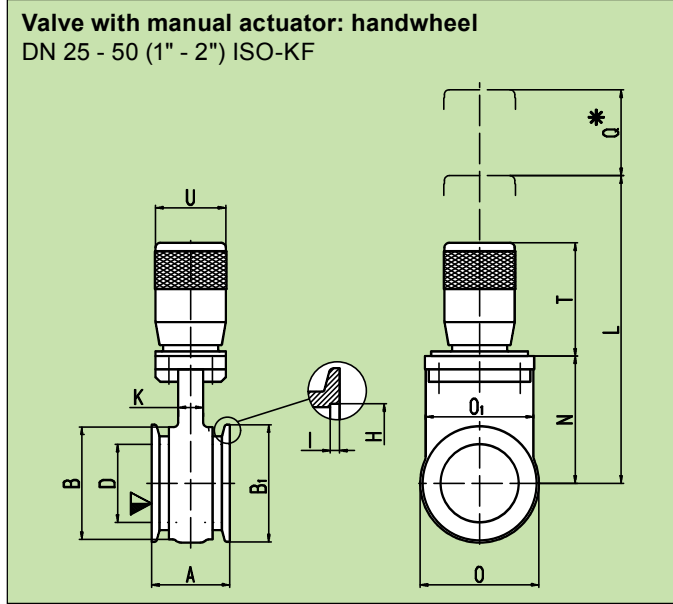
Accessories

Fittings for installation of the valve: series 31 and 33

Seal kit

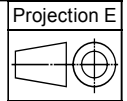
Consisting of gate with vulcanized seal and bonnet seal
Ordering No.: see operating manual or price list

Dimensions



▼ valve seat side

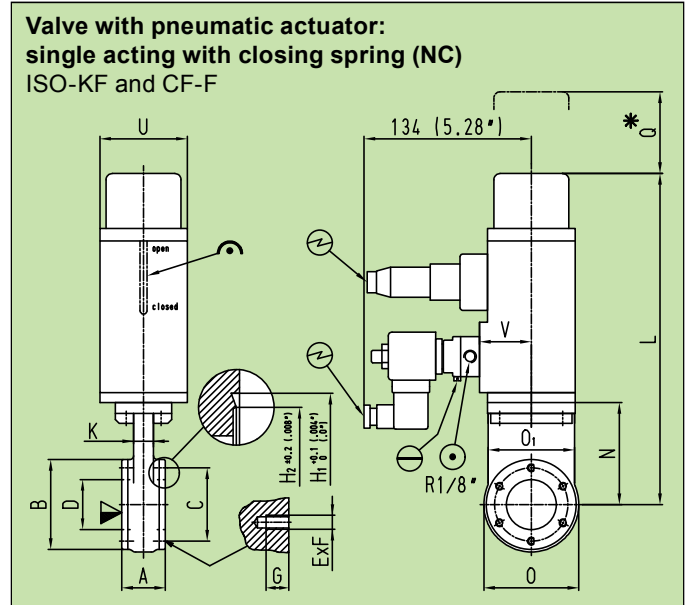
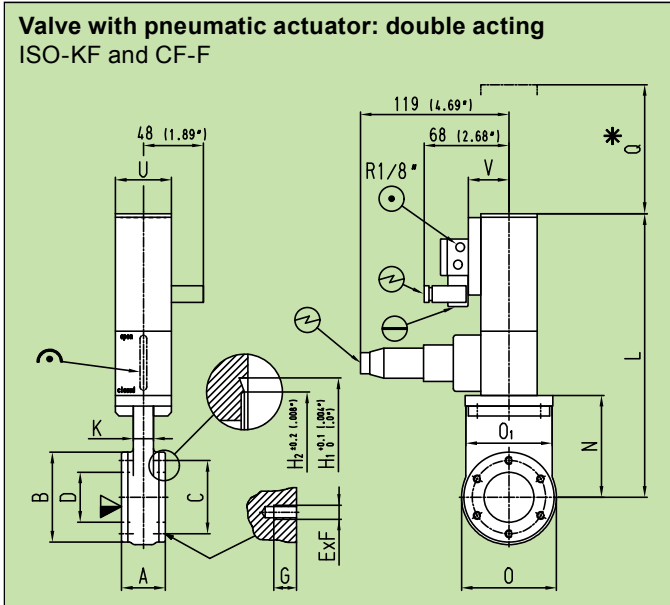
* required for dismantling



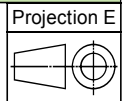
		ISO-KF		
DN	mm inch	25 1	40 1½	50 (ID 40) 2 (ID 1.57)
A	mm inch	50 1.97	50 1.97	50 1.97
B	mm inch	72 2.83	72 2.83	72 2.83
B1	mm inch	40 1.57	55 2.16	75 2.95
D	mm inch	25 0.98	40 1.57	40 1.57
H	mm inch	26.2 1.03	41.2 1.62	52.2 2.05
I	mm inch	3 0.12	3 0.12	3 0.12
K	mm inch	16 0.63	16 0.63	16 0.63
L	mm inch	198 7.8	198 7.8	198 7.8
N	mm inch	82 3.23	82 3.23	82 3.23
O	mm inch	76 2.99	76 2.99	76 2.99
O1	mm inch	70 2.76	70 2.76	70 2.76
Q	mm inch	55 2.16	55 2.16	55 2.16
T	mm inch	73 2.87	73 2.87	73 2.87
U	mm inch	45 1.77	45 1.77	45 1.77

		CF-F		
DN	mm inch	40 1½		
A	mm inch	35 1.38		
B	mm inch	72 2.83		
C	mm inch	58.7 2.31		
D	mm inch	40 1.57		
E x F		6 x M6 6 x ¼"-28 UNF		
G	mm inch	7 0.28		
H1	mm inch	48.3 1.9		
H2	mm inch	42 1.65		
K	mm inch	16 0.63		
L	mm inch	198 7.8		
N	mm inch	82 3.23		
O	mm inch	76 2.99		
O1	mm inch	70 2.75		
Q	mm inch	55 2.16		
T	mm inch	73 2.87		
U	mm inch	45 1.77		

Dimensions



- ▼ valve seat side
- ⊙ compressed air connection
- ⊕ mechanical position indication
- * required for dismantling
- ⊗ electrical connection
- ⊖ emergency operation



		CF-F	ISO-KF, A - I: see page 14
DN	mm inch	40 1½	
A	mm inch	35 1.38	
B	mm inch	72 2.83	
C	mm inch	58.7 2.31	
D	mm inch	40 1.57	
E x F		6 x M6 6 x ¼"-28 UNF	
G	mm inch	7 0.28	
H1	mm inch	48.3 1.9	
H2	mm inch	42 1.65	
K	mm inch	16 0.63	
L	mm inch	230 9.06	
N	mm inch	82 3.23	
O	mm inch	76 2.99	
O1	mm inch	70 2.75	
Q	mm inch	55 2.16	
U	mm inch	45 1.77	
V	mm inch	32.5 1.28	

		CF-F	ISO-KF, A - I: see page 14
DN	mm inch	40 1½	
A	mm inch	35 1.38	
B	mm inch	72 2.83	
C	mm inch	58.7 2.31	
D	mm inch	40 1.57	
E x F		6 x M6 6 x ¼"-28 UNF	
G	mm inch	7 0.28	
H1	mm inch	48.3 1.9	
H2	mm inch	42 1.65	
K	mm inch	16 0.63	
L	mm inch	266 10.47	
N	mm inch	82 3.23	
O	mm inch	76 2.99	
O1	mm inch	70 2.75	
Q	mm inch	55 2.16	
U	mm inch	70 2.75	
V	mm inch	42 1.65	

Series 012

Small and light-weight

Low cost



Body material

aluminum

Manual actuator

toggle lever

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

Pneumatic actuator

double acting
without position indicator
without solenoid

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

with position indicator, without solenoid: 012 . . -KA~~2~~4

with position indicator, with solenoid: 012 . . -KA~~4~~4 (specify control voltage)

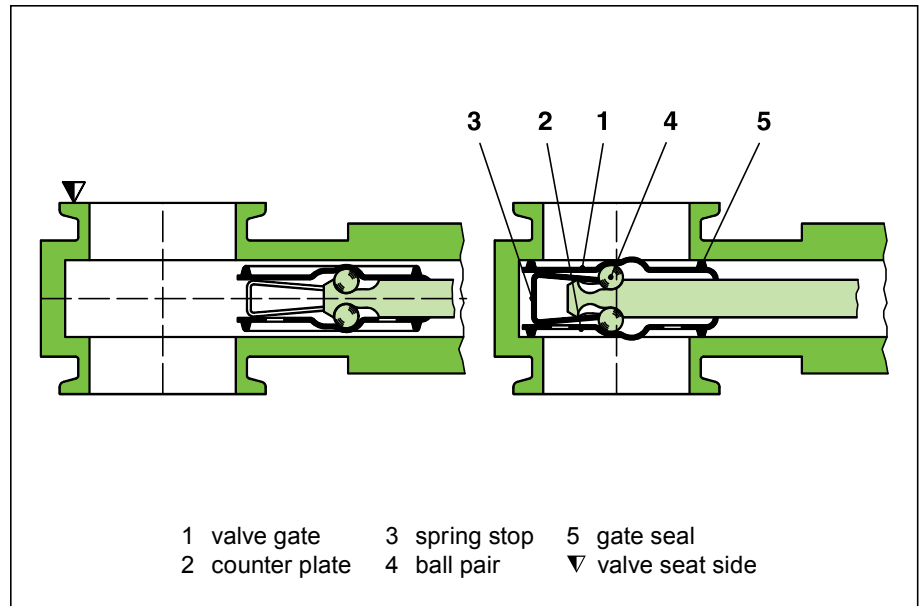
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

O-ring shaft seal



Features

VATLOCK configuration (see glossary)

O-ring shaft seal

Vulcanized gate seal

Technical data

Continued next page

Leak rate: body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-7}$ mbar to 1 bar (abs)
Differential pressure on the gate	≤ 1 bar in either direction
Differential pressure at opening	≤ 30 mbar
Cycles until first service	50 000
Temperature ¹⁾	
- Valve body	$\leq 100^\circ\text{C}$
- Manual and pneumatic actuator	$\leq 80^\circ\text{C}$
- Position indicator	$\leq 80^\circ\text{C}$
- Solenoid	$\leq 50^\circ\text{C}$
Heating and cooling rate	$\leq 50^\circ\text{C h}^{-1}$
Material	
- Valve body	EN AW-6082 (3.2315)
- Gate	AISI 301 (1.4310)
Seal	
- Bonnet	FKM (VITON)
- Gate	FKM (VITON, vulcanized)
Mounting position	any
Solenoid	24 VDC, 5.4 W (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 50 VAC / DC
- Current	≤ 0.5 A
- Power	max. 10 W
Valve position	visual (mechanical)

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

Options

Actuator:

- Solenoid for impulse actuation:
actual valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50/60 Hz
- Manual emergency operation on solenoid lockable

Valve:

- ISO-KF «quick» for fast mounting,
with centering rings and clamp integrated into the valve body



Ordering information for options:

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

Accessories

Fittings for installation of the valve: Series 31

Seal kit

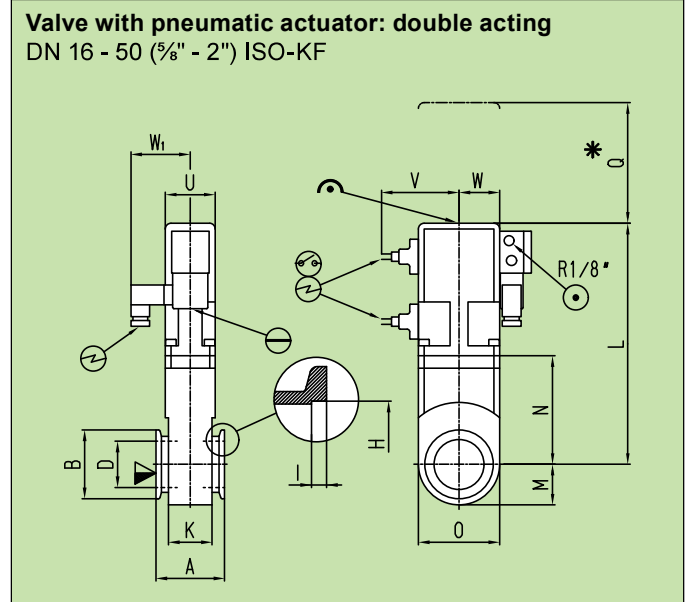
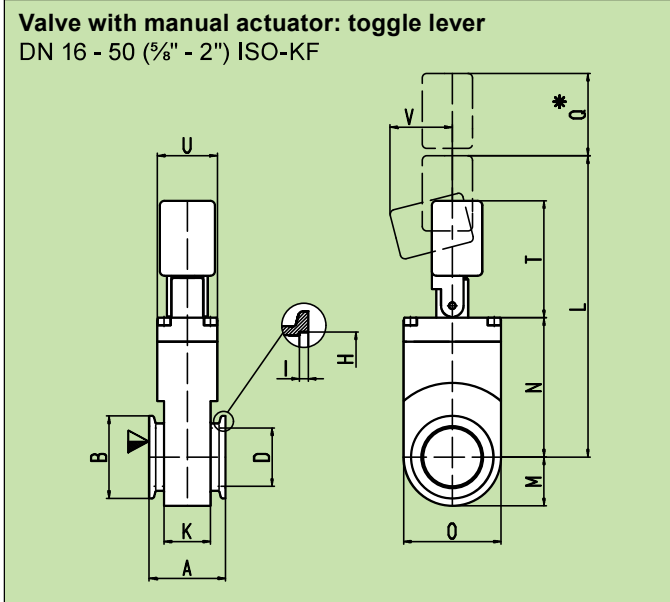
Consisting of gate with vulcanized seal, bonnet seal, and one set of lubricated locking balls

Ordering No.: see operating manual or price list

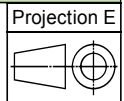
Technical data

DN (nominal I. D.)		standard flanges ISO-F	molecular flow conductance	manual		pneumatic						
				weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch		ls ⁻¹	kg	lbs	bar	psi	l	ft ³		s	kg
16	5/8	15	10	0.4	0.9	4.5 - 7	65 - 100	0.01	0.0004	0.8	0.8	1.8
25	1	25	34	0.4	0.9	4.5 - 7	65 - 100	0.03	0.001	1.1	0.8	1.8
40	1½	40	140	0.7	1.5	4.5 - 7	65 - 100	0.07	0.002	1.2	1.2	2.7
50	2	50	260	0.7	1.5	4.5 - 7	65 - 100	0.07	0.002	1.3	1.2	2.7

Dimensions



- ▼ valve seat side
- * required for dismantling
- ⊖ emergency operation
- ⊕ compressed air connection
- ⊕ electrical connection
- ⊕ position indicator
- ⊕ mechanical position indication



DN	mm inch	16 3/8"	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	17.2 0.68	26.2 1.03	41.2 1.62	52.2 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 1.3
L	mm inch	100 3.94	139 5.47	208 8.19	240 9.45
M	mm inch	15 0.59	22 0.87	32.5 1.28	37.5 1.48
N	mm inch	39 1.55	59 2.32	93 3.66	108 4.25
O	mm inch	30 1.18	44 1.73	65 2.56	75 2.95
Q	mm inch	25 0.98	35 1.38	55 2.17	65 2.56
T	mm inch	37 1.46	50 1.97	85 3.35	93 3.67
U	mm inch	25 0.98	32 1.26	40 1.57	40 1.57
V	mm inch	30 1.18	30 1.18	50 1.97	55 2.17

DN	mm inch	16 3/8"	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	17.2 0.68	26.2 1.03	41.2 1.62	52.2 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 1.3
L	mm inch	105 4.13	136 5.35	196 7.72	220 8.66
M	mm inch	15 0.59	22 0.87	32.5 1.28	37.5 1.48
N	mm inch	39 1.55	56 2.2	88 3.46	103 4.06
O	mm inch	30 1.18	44 1.73	65 2.56	75 2.95
Q	mm inch	25 0.98	35 1.38	55 2.17	65 2.56
U	mm inch	25 0.98	32 1.26	40 1.57	40 1.57
V	mm inch	56 2.2	61 2.4	65 2.56	65 2.56
W	mm inch	55 2.17	60 2.36	61 2.4	66 2.6
W1	mm inch	50 1.97	50 1.97	50 1.97	50 1.97

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



Body material

aluminum

Manual actuator

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

DN		Ordering numbers
mm	inch	
50	2	08234-FA06
63	2 ½	08136-FA03
80	3	08138-FA03
100	4	08140-FA03

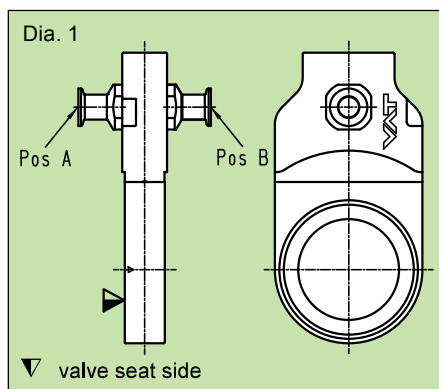
Pneumatic actuator

double acting
 with position indicator
 with solenoid

50	2	08234-FA44
63	2 ½	08136-FA44
80	3	08138-FA44
100	4	08140-FA44

without position indicator, without solenoid: 08 . . . -FA14
 with position indicator, without solenoid: 08 . . . -FA24

Options



Actuator:

- Solenoid for impulse actuation:
actual valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
 24, 48, 100, 115, 200, 230 V 50 Hz
 24, 100, 115, 200, 230 V 60 Hz

Valve:

- DN (nominal I. D.) 16, 25, 40
- Port with seal made of FKM (VITON) [diagram 1] for DN 63 - 100 for roughing (by-pass), venting or for gauges (recommended port: ISO-KF16 for DN 63, ISO-KF25 for DN 80 and 100)

Ordering information for options:

Ordering No. of valve-X (e. g. 08140-FA44-X, X = port ISO-KF25 in position A)

Seal kit

Consisting of seals for flanges, gate and lower part of body
Ordering No.: see operating manual or price list

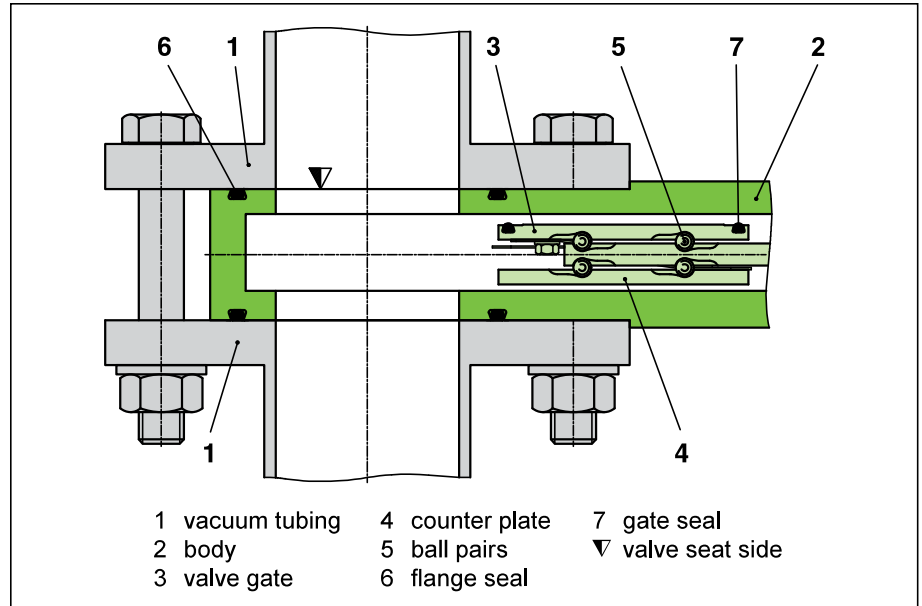
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

FKM (VITON) / shaft feedthrough



Features

Flanges with DIN centering insert

VATLOCK configuration (see glossary)

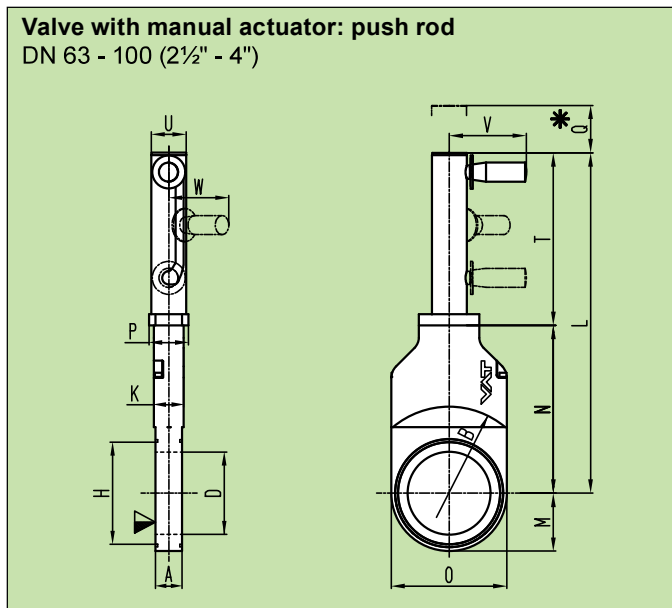
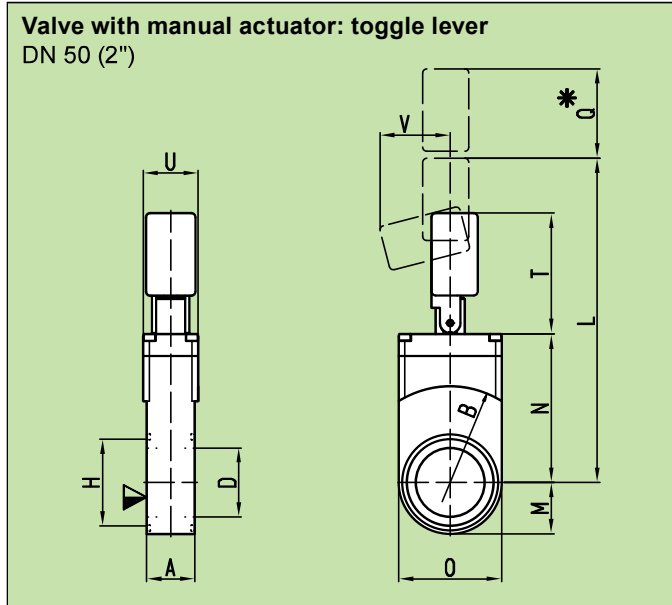
Technical data

Continued next page

Leak rate: 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 / 63 - 100	≤ 1 / ≤ 1.6 bar in either direction
Differential pressure at opening	≤ 30 mbar
Cycles until first service - DN 50 / 63 - 100	50 000 / 200 000
Temperature ¹⁾	
- Valve body DN 50 / 63 - 100	$\leq 100^\circ\text{C}$ / $\leq 120^\circ\text{C}$
- Manual / pneumatic actuator	$\leq 80^\circ\text{C}$
- Position indicator	$\leq 80^\circ\text{C}$
- Solenoid	$\leq 50^\circ\text{C}$
Material	
- Valve body DN 50	EN AW-6060 (3.3206)
DN 63 - 100	EN AW-5083 (3.3547)
- Mechanism	AISI 304 (1.4301), AISI 301 (1.4310), AISI 420 (1.4034)
Seal	
- Bonnet	FKM (VITON)
- Gate DN 50 / 63 - 100	FKM (VITON, vulcanized) / FKM (VITON)
Mounting position	any
Solenoid	24 VDC, 5.4 W (others see «Options»)
Position indicator: contact rating	<u>DN 50</u> <u>DN 63 - 100</u>
- Voltage	≤ 50 VAC/DC ≤ 250 VAC ≤ 50 VDC
- Current	≤ 2 A ≤ 1.2 A
- Power	max. 10 W
Valve position	visual (mechanical)

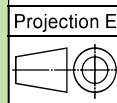
¹⁾ Maximum values: depending on operating conditions and sealing materials

Dimensions



DN	mm inch	50 2	63 2½	80 3	100 4
A	mm inch	35 1.38	32 1.26	32 1.26	32 1.26
B	mm inch	140 5.51	160 6.3	190 7.48	210 8.27
D	mm inch	50 1.97	65 2.56	80 3.15	100 3.94
H	mm inch	63 2.48	88 3.46	104 4.09	124 4.88
I.D. x d ¹⁾		63.09x3.53 2.48x0.139	88.49x3.53 3.49x0.139	104.37x3.53 4.11x0.139	123.42x3.53 4.86x0.139
K	mm inch	-	36 1.42	36 1.42	36 1.42
L	mm inch	240 9.45	329.5 12.97	363 14.29	413 16.26
M	mm inch	37.5 1.48	50 1.97	59 2.32	70 2.76
N	mm inch	108 4.25	155.5 6.12	173.5 6.83	203.5 8.01
O	mm inch	75 2.95	100 3.94	118 4.65	140 5.51
P	mm inch	-	48 1.89	48 1.89	48 1.89
Q	mm inch	65 2.56	25 0.98	25 0.98	25 0.98
T	mm inch	93 3.67	174 6.85	189.5 7.46	209.5 8.25
U	mm inch	40 1.57	43 1.69	43 1.69	43 1.69
V	mm inch	55 2.17	94 3.7	94 3.7	94 3.7
W	mm inch	-	75 2.95	75 2.95	75 2.95

¹⁾ dimensions of flange O-ring



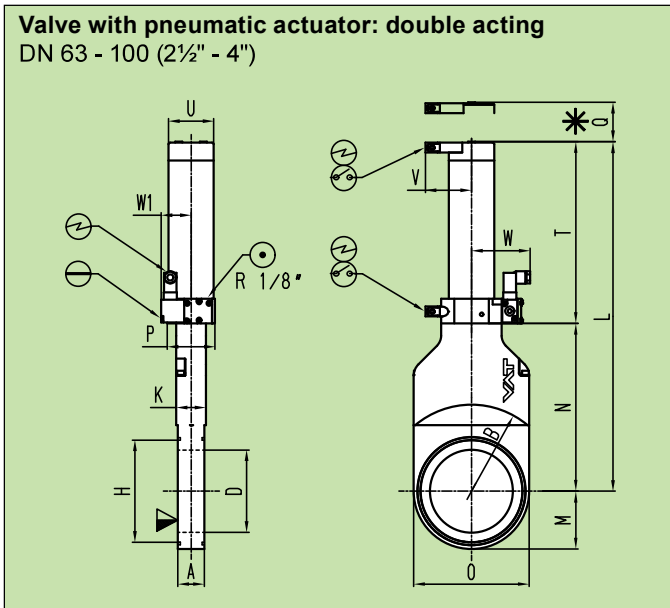
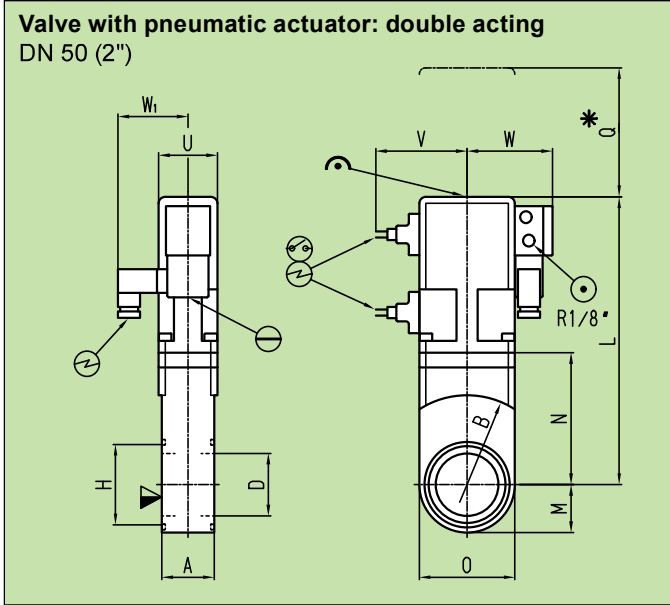
▽ valve seat side

* required for dismantling

Technical data

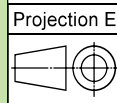
DN (nominal I. D.)		molecular flow conductance	manual		pneumatic						
			weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch	ls ⁻¹	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
50	2	410	0.7	1.5	4.5 - 7	65 - 100	0.07	0.002	1.2	1.2	2.7
63	2½	1000	1.5	3.3	4 - 7	55 - 100	0.16	0.0056	1.5	1.5	3.3
80	3	2000	2.3	5.1	4 - 7	55 - 100	0.2	0.0071	1.7	2.3	5.1
100	4	3800	3	6.6	4 - 7	55 - 100	0.22	0.0078	2	3	6.6

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	6.3	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 ¹⁾		63.09x3.53 2.48x0.139	88.49x3.53 3.49x0.139	104.37x3.53 4.11x0.139	123.42x3.53 4.86x0.139
K	mm	–	36	36	36
	inch	–	1.42	1.42	1.42
L	mm	220	341.5	375	425
	inch	8.66	13.44	14.76	16.73
M	mm	37.5	50	59	70
	inch	1.48	1.97	2.32	2.76
N	mm	103	155.5	173.5	203.5
	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	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	mm	–	186	201.5	221.5
	inch	–	7.32	7.93	8.72
U	mm	40	55	55	55
	inch	1.57	2.17	2.17	2.17
V	mm	65	56	56	56
	inch	2.56	2.2	2.2	2.2
W	mm	66	72	72	72
	inch	2.6	2.83	2.83	2.83
W1	mm	50	36.5	36.5	36.5
	inch	1.97	1.44	1.44	1.44

¹⁾ dimensions of flange O-ring



- ▽ valve seat side
- * required for dismantling
- ⊖ emergency operation
- ⊕ compressed air connection
- ⊕ electrical connection
- ⊕ position indicator
- ⊕ mechanical position indication

Stainless steel valve with bellows for harsh process conditions

Suitable for 1 bar differential pressure opening

Very easy maintenance thanks to simple wedge design



Body material

stainless steel

Manual actuator

handwheel

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

with position indicator: 091 . . . E08

Pneumatic actuator

double acting
without position indicator
without solenoid

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-KF ¹⁾ ISO-F ²⁾	JIS	ASA-LP	CF-F metric threads	CF-F UNF threads
50	2	09134-KE14 ¹⁾				
63	2½	09136-PE14 ²⁾	09136-JE14	09136-TE14	09136-CE14	09136-UE14
80	3	09138-PE14 ²⁾	09138-JE14	09138-TE14	09138-CE14	09138-UE14
100	4	09140-PE14 ²⁾	09140-JE14	09140-TE14	09140-CE14	09140-UE14
160	6	09144-PE14 ²⁾	09144-JE14	09144-TE14	09144-CE14	09144-UE14

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

with position indicator, with solenoid: 091 . . . E44

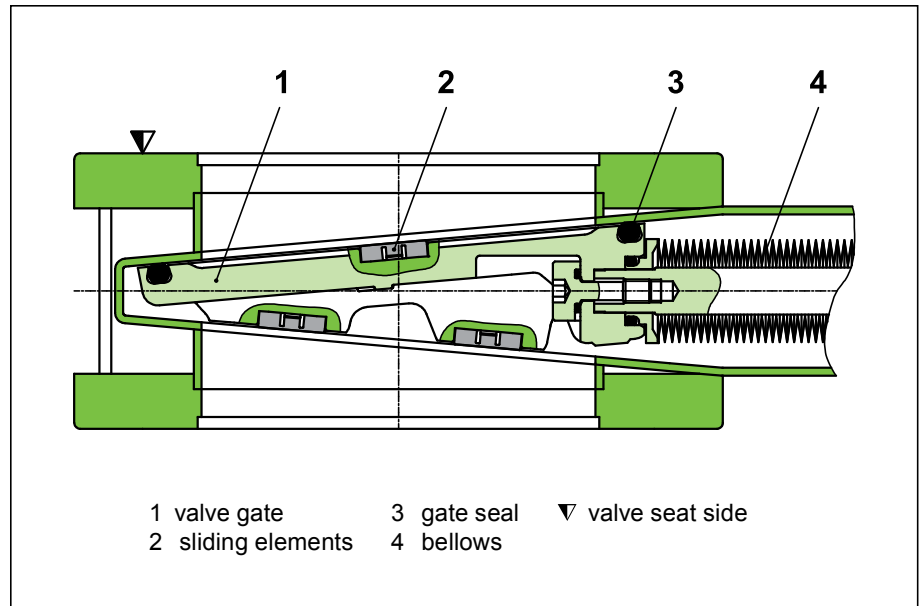
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Bellows



Features

Very robust design with wedge sealing system

No grease and no moving parts in the vacuum

Technical data

Continued next page

Leak rate:	
- Body	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
- Valve seat	$< 1 \cdot 10^{-7}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-9}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	≤ 1.2 bar in either direction
Differential pressure at opening	≤ 1.0 bar
Bellows feedthrough	100000 cycles
Cycles until first service	5000 ¹⁾
Temperature ²⁾	
- Valve body	$\leq 120^{\circ}\text{C}$ (150 [°] C on request)
- Manual and pneumatic actuator	$\leq 100^{\circ}\text{C}$
- Position indicator	$\leq 60^{\circ}\text{C}$
- Solenoid	$\leq 50^{\circ}\text{C}$
Material	
- Valve body	AISI 304 (1.4301)
- Valve gate	AISI 304 (1.4301, 1.4308)
- Bellows	AISI 633 (AM 350)
- Small parts (contacting the media)	A2 Ni Teflon-coated, PEEK
Seal: bonnet, gate	FKM (VITON)
Mounting position	any
Solenoid	24 VDC, 5.4 W (others see «Options»)
Position indicator: contact rating	
- Voltage	10 - 30 VDC
- Current	≥ 0.5 A
- Power	max. 10 W

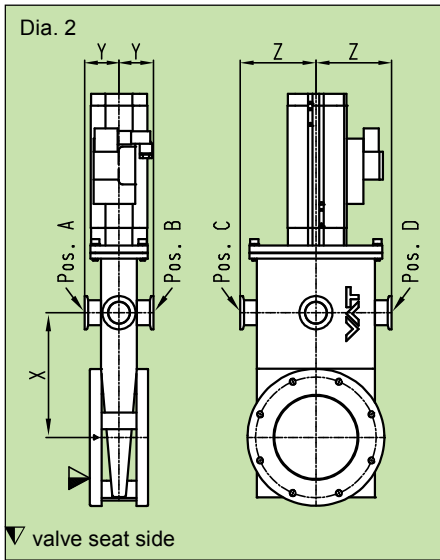
¹⁾ Depending on the process conditions shorter service intervals may be required

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

Options



- Solenoid for impulse actuation
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V / 50 Hz
24, 100, 115, 200, 230 V / 60 Hz
- Bake-out jacket (picture 1)
- Shaft feedthrough with PTFE bellows (instead of metal bellows feedthrough)
- Ports (diagram 2) for roughing (by-pass), venting or for gauges



DN valve	mm inch	50 2	63 2 ½	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	41.5 1.63	41.5 1.63	41.5 1.63	41.5 1.63	52 2.05
Z	mm inch	65 2.56	72.5 2.85	91 3.58	91 3.58	116 4.57

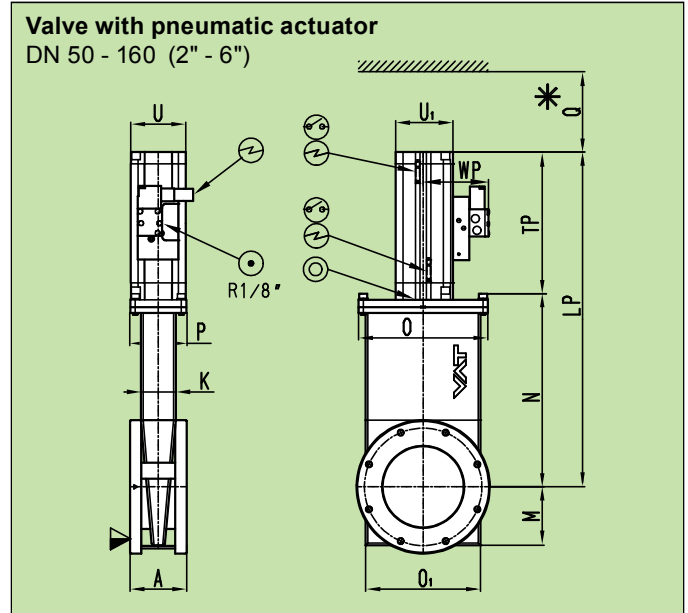
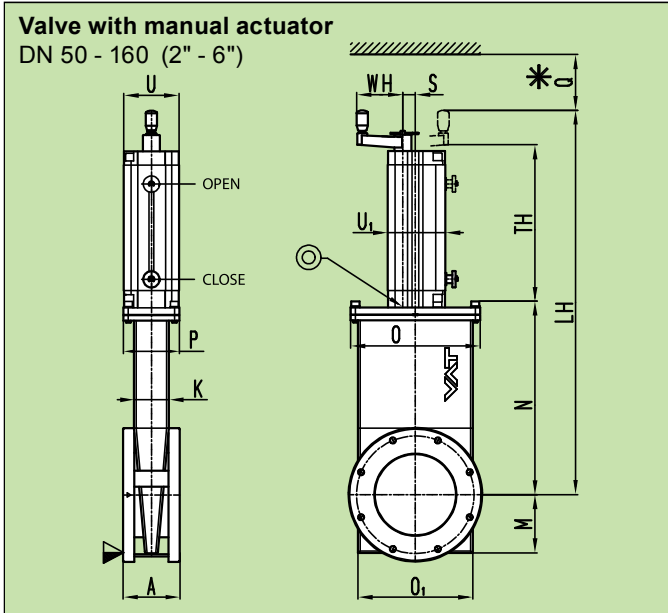
Ordering information for options:

Ordering No. of valve-X (e. g. 09140-PE44-X, X = port ISO-KF25 in position B)

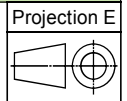
Technical data

DN (nominal I. D.)		molecular flow conductance	manual			pneumatic						
			turns per stroke	weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch	ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
50	2	400	22	3.4	6.8	4 - 7	60 - 100	0.08	0.003	<1.5	3.4	6.8
63	2 ½	600	27	5.6	12.4	4 - 7	60 - 100	0.16	0.005	<2	5.6	12.4
80	3	800	33	7	14	4 - 7	60 - 100	0.21	0.007	<2	7	14
100	4	1700	39	8.1	17.9	4 - 7	60 - 100	0.25	0.008	<2	7.8	17.2
160	6	5000	41	15.1	33.3	4 - 7	60 - 100	0.53	0.017	<3	15.1	33.3

Main dimensions



- ▼ valve seat side
- * required for dismantling
- ⊕ electrical connection
- ⊙ compressed air connection
- ⊖ position indicator
- ⊙ leak detection hole

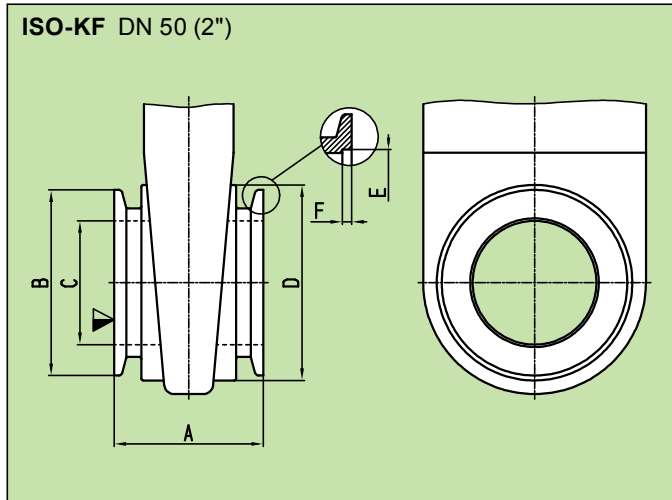


Flange dimensions see pages 28 + 29

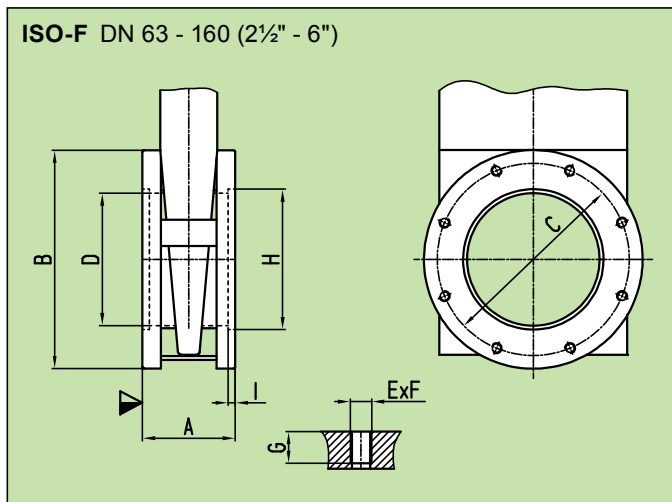
DN	mm	50	63	80	100	160
inch		2	2½	3	4	6
A	mm	60	70	70	70	90
inch		2.36	2.75	2.75	2.75	3.54
K	mm	36	43	43	43	52.5
inch		1.42	1.69	1.69	1.69	2.06
LH	mm	320	375	424	474	651
inch		12.6	14.76	16.69	18.66	25.62
M	mm	45	53.5	72.5	72	97
inch		1.77	2.1	2.85	2.83	3.83
N	mm	149	176	209	239	337
inch		5.87	6.92	8.29	9.4	13.27
O	mm	109.5	123	142	160	210
inch		4.31	4.84	5.59	6.3	8.26
O1	mm	90	105	124	142	192
inch		3.54	4.13	4.88	5.59	7.55
P	mm	63	69	69	69	87
inch		2.48	2.71	2.71	2.71	3.42
Q	mm	120	160	200	200	260
inch		4.72	6.3	7.87	7.87	10.23
S	mm	13	15.5	15.5	15.5	20.5
inch		0.51	0.61	0.61	0.61	0.8
TH	mm	131	149	165	185	264
inch		5.16	5.86	6.5	7.28	10.39
U	mm	60	68	68	68	87
inch		2.36	2.67	2.67	2.67	3.42
U1	mm	62.5	71	71	71	91
inch		2.46	2.79	2.79	2.79	3.58
WH	mm	21	57	57	57	73
inch		0.83	2.24	2.24	2.24	2.87

DN	mm	50	63	80	100	160
inch		2	2½	3	4	6
A	mm	60	70	70	70	90
inch		2.36	2.75	2.75	2.75	3.54
K	mm	36	43	43	43	52.5
inch		1.42	1.69	1.69	1.69	2.06
LP	mm	268	314	384	413.5	578
inch		10.55	12.36	15.12	16.27	22.75
M	mm	45	53.5	72.5	72	97
inch		1.77	2.1	2.85	2.83	3.83
N	mm	149	176	209	239	337
inch		5.87	6.92	8.29	9.4	13.27
O	mm	109.5	123	142	160	210
inch		4.31	4.84	5.59	6.3	8.26
O1	mm	90	105	124	142	192
inch		3.54	4.13	4.88	5.59	7.55
P	mm	63	69	69	69	87
inch		2.48	2.71	2.71	2.71	3.42
Q	mm	120	160	200	200	260
inch		4.72	6.3	7.87	7.87	10.23
TP	mm	119	138	175	174.5	241
inch		4.69	5.43	6.89	6.87	9.48
U	mm	60	68	68	68	87
inch		2.36	2.67	2.67	2.67	3.42
U1	mm	62.5	71	71	71	91
inch		2.46	2.79	2.79	2.79	3.58
WP	mm	77	82	82	82	92
inch		3.03	3.22	3.22	3.22	3.62

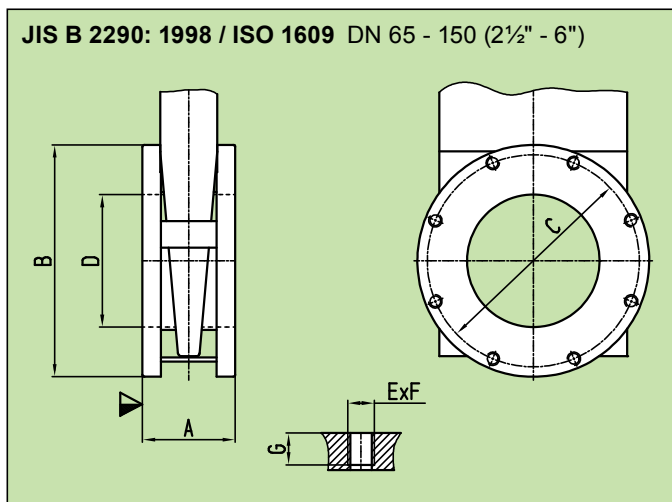
Flange dimensions



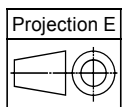
DN	mm inch	50 2			
A	mm inch	60 2.36			
B	mm inch	75 2.95			
C	mm inch	50 1.97			
D	mm inch	79 3.11			
E	mm inch	52.2 2.06			
F	mm inch	3 0.19			



DN	mm inch	63 2½	80 3	100 4	160 6
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	136 5.35	145 5.7	165 6.5	225 8.86
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87
D	mm inch	63 2.48	80 3.15	100 3.94	150 5.91
E x F		4 x M8	8 x M8	8 x M8	8 x M8
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 0.2

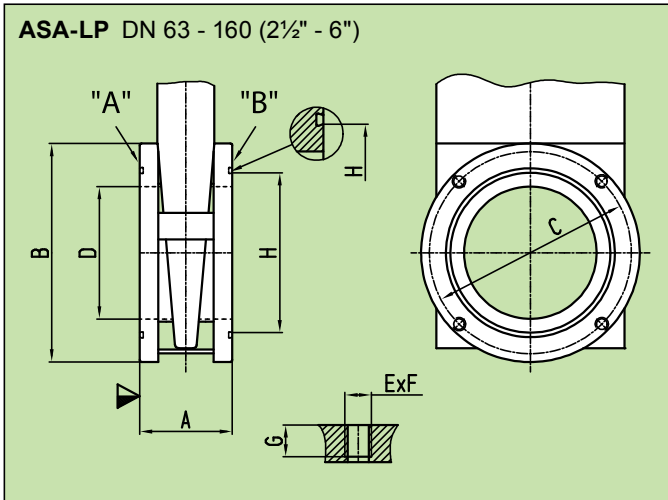


DN	mm inch	65 2½	80 3	100 4	150 6
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	136 5.35	165 6.5	175 6.89	225 8.86
C	mm inch	120 4.72	135 5.31	160 6.31	210 8.27
D	mm inch	63 2.48	80 3.15	100 3.94	150 5.91
E x F		4 x M10	8 x M10	8 x M10	8 x M10
G	mm inch	12 0.47	12 0.47	12 0.47	15 0.59

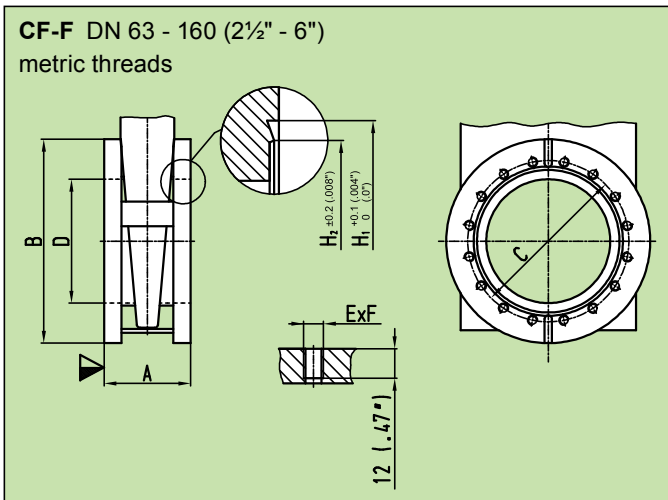


▼ valve seat side

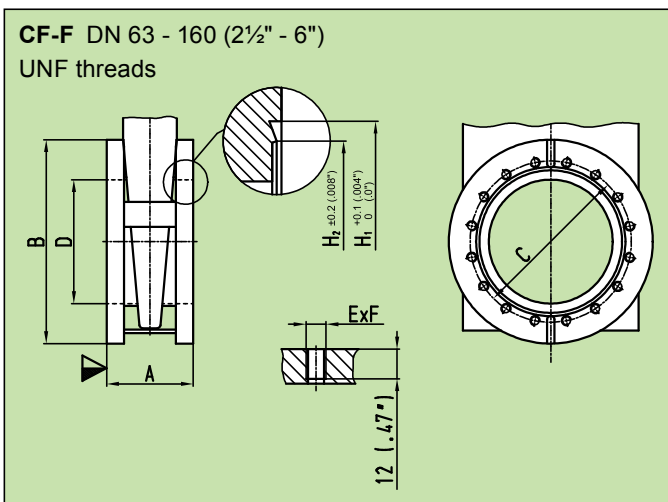
Flange dimensions



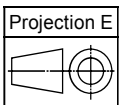
DN	mm inch	63 2½	80 3	100 4	160 6
ASA-LP		2		3	4
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	152.4 6	177.8 7	190.5 7.5	225 8.86
C	mm inch	120.7 4.75	139.7 5.5	152.4 6	190.5 7.5
D	mm inch	70 2.76	76 3	100 3.94	150 5.91
E x F		4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	8 x ⅜" 16 UNC
G	mm inch	15 0.59	15 0.59	15 0.59	15 0.59
H	mm inch	88.9 3.5	88.9 3.5	120.65 4.75	158.75 6.25
O-Ring I.D. x d		88.49 x 3.53 3.48 x 0.139	88.49 x 3.54 3.48 x 0.140	120.24 x 3.53 4.73 x 0.139	158.34 x 3.53 6.23 x 0.139



DN	mm inch	63 2½	80 3	100 4	160 6
O.D. inch		4½	4⅝	6	8
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	135.8 5.35	145 5.71	164.8 6.49	224.8 8.85
C	mm inch	92.1 3.63	102.4 4.08	130.3 5.13	181 7.13
D	mm inch	63 2.48	80 3.15	100 3.94	150 5.91
E x F		8 x M8	10 x M8	16 x M8	20 x M8
H1	mm inch	82.5 3.25	91.5 3.6	120.65 4.75	171.45 6.75
H2	mm inch	77.4 3.05	86.3 3.4	115.5 4.55	166 6.54



DN	mm inch	63 2½	80 3	100 4	160 6
O.D. inch		4½	4⅝	6	8
A	mm inch	70 2.76	70 2.76	70 2.76	90 3.54
B	mm inch	135.8 5.35	145 5.71	164.8 6.49	224.8 8.85
C	mm inch	92.1 3.63	102.4 4.08	130.3 5.13	181 7.13
D	mm inch	63 2.48	80 3.15	100 3.94	150 5.91
E x F		8 x ⅝" 24 UNF	10 x ⅝" 24 UNF	16 x ⅝" 24 UNF	20 x ⅝" 24 UNF
H1	mm inch	82.5 3.25	91.5 3.6	120.65 4.75	171.45 6.75
H2	mm inch	77.4 3.05	86.3 3.4	115.5 4.55	166 6.54



▼ valve seat side

The standard for UHV applications

Free of lubricants



Body material

stainless steel

Manual actuator

handwheel

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

with position indicator: 108 . . - . E08

Pneumatic actuator

double acting
with position indicator
with solenoid

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

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

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

Large sizes

DN 400 - 1250 (16" - 50"): see series 19, page 68

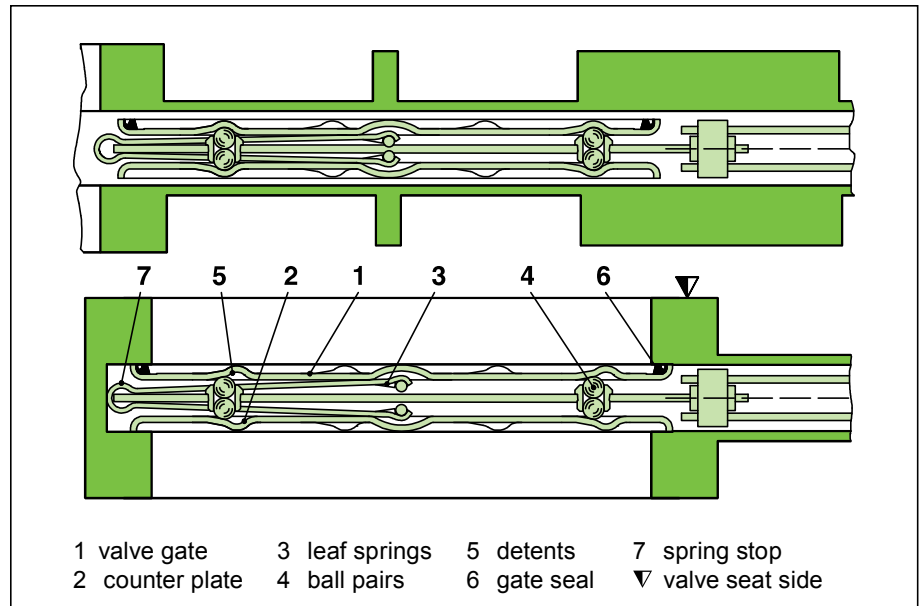
Sealing materials

Gate: FKM (VITON)

Bonnet: metal

Feedthrough

Bellows



Features

Bellows sealed mechanism without any lubricants

Minimal closing shock and minimal wear due to VATLOCK configuration

Free of trapped volumes thanks to vulcanized gate seal (DN 63 - 200); see next page

Technical data

Continued next page

Leak rate	
- Body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
- Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	
- DN 63 - 200	$1 \cdot 10^{-10}$ mbar to 1.6 bar (abs)
- DN 250 - 320	$1 \cdot 10^{-10}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	
- DN 63 - 200	≤ 1.6 bar in either direction
- DN 250 - 320	≤ 1.2 bar in either direction
Differential pressure at opening	≤ 30 mbar
Cycles until first service	50 000
Temperature ¹⁾	
- Valve body	$\leq 250^\circ\text{C}$ open, $\leq 200^\circ\text{C}$ closed
- Manual actuator	$\leq 250^\circ\text{C}$
- Pneumatic actuator	$\leq 200^\circ\text{C}$
- Position indicator	$\leq 80^\circ\text{C}$
- Solenoid	$\leq 50^\circ\text{C}$
Heating and cooling rate	$\leq 50^\circ\text{C h}^{-1}$
Seal	
- Bonnet	metal
- Gate DN 63, 100 - 200	FKM (VITON, vulcanized)
DN 80, 250 - 320	FKM (VITON O-ring)
Mounting position	any
Material	
- Valve body	AISI 304 (1.4301)
- Mechanism	AISI 304 (1.4301), AISI 316L (1.4404), AISI 301 (1.4310), AISI 420 (1.4034)
- Bellows	AISI 316L (1.4435)

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

Technical data

Solenoid 24 VDC, 5.4 W (others see «Options»)

Position indicator: contact rating

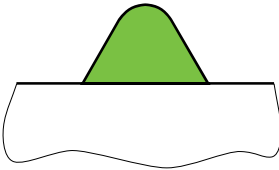
- Voltage ≤ 250 VAC ≤ 50 VDC
- Current ≤ 2 A ≤ 1.2 A

Valve position visual (mechanical)

DN (nominal I. D.)		standard flanges			molecular flow conductance	manual				pneumatic					
		CF-F	ISO-F	ASA-LP		turns per stroke	weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch	O.D.			ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	1 ½	4 ½	63	2	600	10	9	20	4 - 7	55 - 100	0.08	0.0028	1	9	20
80	3	4 ⅝	80		800	10	9	20	4 - 7	55 - 100	0.08	0.0028	1	9	20
100	4	6	100	3	1700	13	12	26	4 - 7	55 - 100	0.11	0.0038	1.2	12	26
160	6	8	160	4	6000	17	18	40	4 - 7	55 - 100	0.14	0.0049	1.5	18	40
200	8	10	200	6	12000	17	25	55	4 - 7	55 - 100	0.25	0.0087	2	24	53
250	10	12	250	8	26000	40	52	114	5 - 7	70 - 100	0.35	0.0122	4	42	92
320	12		320	10	35000	45	86	190	5 - 7	70 - 100	0.48	0.0167	5	95	210

Sealing systems

FKM (VITON,
vulcanized)
DN 63
DN 100 - 200



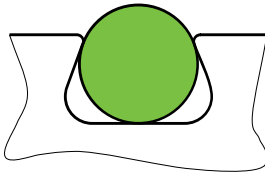
The vulcanized seal has the following advantages compared to an O-ring seal:

Increased reliability
of operation

Easy maintenance

- Seal cannot be pulled out of the groove due to sticking or differential pressure
- No seal groove
- Seal remains on gate
- Flat surfaces in the sealing area ensure easy cleaning

FKM
(VITON O-ring)
DN 80
DN 250 - 320



Improved vacuum
properties

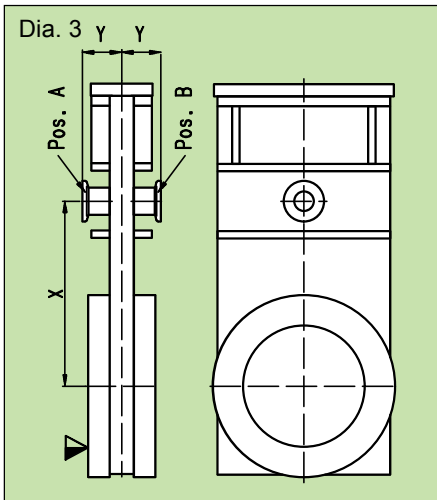
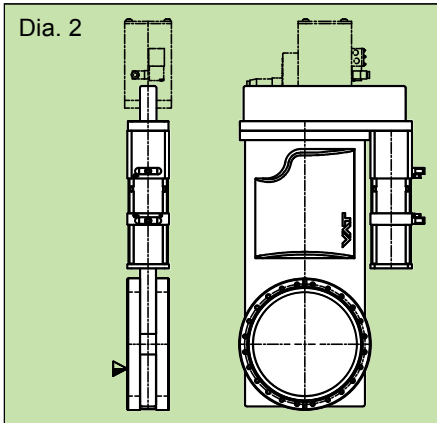
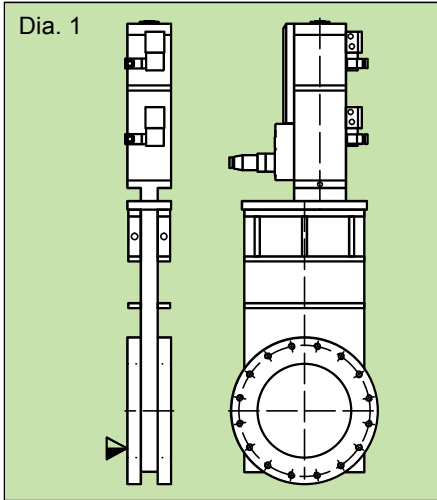
- Only one sealing line
- No voids that cause outgassing
- No hidden impurities

Vulcanized seals can be made of fluoroelastomers and perfluoroelastomers. Outgassing rate, permeation and bakeability are equal to selected high quality O-rings.

Option: gate valve with window

		<p>1 valve body</p> <p>2 valve gate</p> <p>3 elastomer seal</p> <p>4 window</p> <p>5 screwed window retainer</p> <p>▽ valve seat side</p>																																			
	<p>Exchangeable window</p> <p>Material: borosilicate</p> <p>Seal: elastomer</p> <p>Window exchangeable by user</p>	<table border="1"> <thead> <tr> <th>DN valve</th> <th>mm</th> <th>63</th> <th>100</th> <th>160</th> <th>200</th> </tr> </thead> <tbody> <tr> <td></td> <td>inch</td> <td>2 ½</td> <td>4</td> <td>6</td> <td>8</td> </tr> <tr> <td>optically free diameter «S»</td> <td>mm</td> <td>40</td> <td>43</td> <td>68</td> <td>90</td> </tr> <tr> <td></td> <td>inch</td> <td>1.57</td> <td>1.69</td> <td>2.67</td> <td>3.54</td> </tr> <tr> <td rowspan="2">thickness of glass</td> <td>mm</td> <td>4</td> <td>4</td> <td>6</td> <td>6</td> </tr> <tr> <td>inch</td> <td>0.15</td> <td>0.15</td> <td>0.23</td> <td>0.23</td> </tr> </tbody> </table>	DN valve	mm	63	100	160	200		inch	2 ½	4	6	8	optically free diameter «S»	mm	40	43	68	90		inch	1.57	1.69	2.67	3.54	thickness of glass	mm	4	4	6	6	inch	0.15	0.15	0.23	0.23
DN valve	mm	63	100	160	200																																
	inch	2 ½	4	6	8																																
optically free diameter «S»	mm	40	43	68	90																																
	inch	1.57	1.69	2.67	3.54																																
thickness of glass	mm	4	4	6	6																																
	inch	0.15	0.15	0.23	0.23																																

Options



▽ valve seat side

Actuator:

- Solenoid for impulse actuation: actual valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V / 50 Hz
24, 100, 115, 200, 230 V / 60 Hz
- Manual emergency operation on solenoid lockable
- Double position indicator (2 switches each for the positions «open» and «closed»)
- Bakeable position indicator
 - for manual actuator DN 63 - 320: max. 250°C
 - for pneumatic actuator DN 63 - 320: max. 200°C
- Position indicator with change-over contact
- 3-position pneumatic actuator, adjustable for throttling DN 63 - 320 (diagram 1)

Valve:

- Customer specified flanges
- Space saving compact version (diagram 2); DN 200 only
- Other sealing materials
- Version for > 1 bar internal pressure on request
- Window in valve gate, DN 63 - 200: see specification on page 32
- Special valve gate for the installation of various foils
- Ports (diagram 3) for roughing (by-pass), venting, purging or for gauges; other positions on request

DN valve	mm inch	63 2 ½	80 3	100 4	160 6	200 8	250 10	320 12
recommen- ded port	CF-F ISO-KF	40 25	40 25	40 25	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	CF-F	64 2.52	64 2.52	64 2.52	64 2.52	68 2.68	62 2.44	72 2.84
	ISO-KF	44 1.73	44 1.73	44 1.73	44 1.73	48 1.89	62 2.44	72 2.84

Ordering information for options:

Ordering No. of valve-X (e. g. 10844-CE44-X, X = port ISO-KF40 in position B)

Accessories

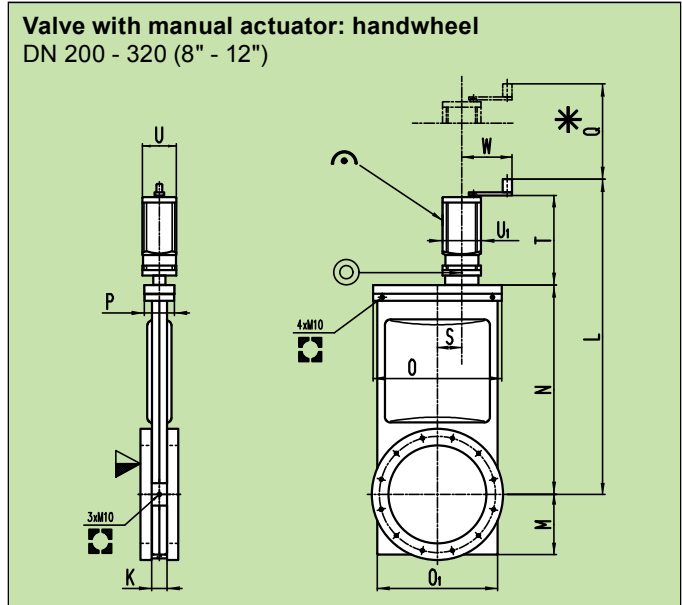
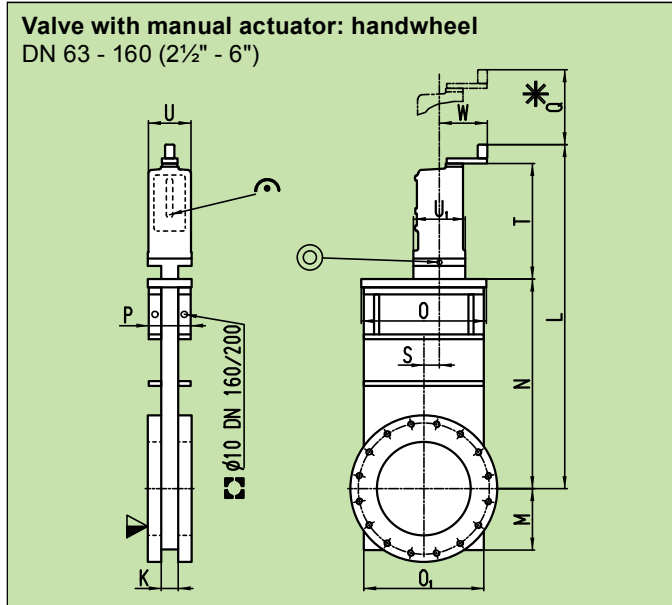
- Fittings for installation of the valve: series 32 and 33
- Flexible bake-out jacket

Seal kit

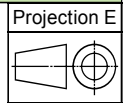
Consisting of seals for bonnet and gate or gate with vulcanized seal for DN 63 - 200

Ordering No.: see operating manual or price list

Main dimensions



- ▼ valve seat side
- * required for dismantling
- ⌚ mechanical position indication
- ⊙ leak detection hole
- for attachment

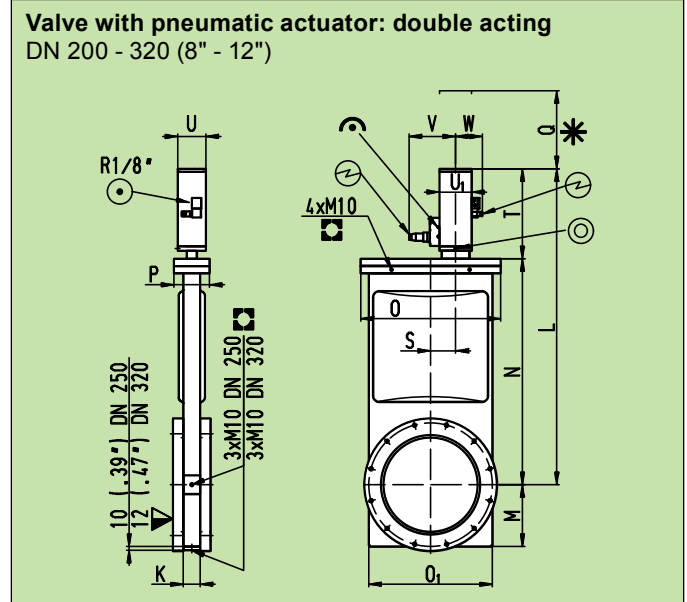
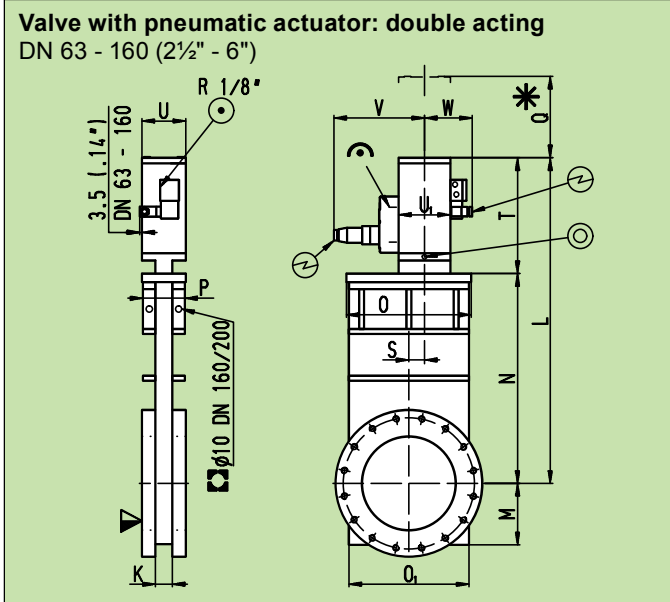


Flange dimensions see pages 36 + 37

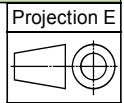
DN	mm	63	80	100	160
	inch	2½	3	4	6
K	mm	27	27	27	27
	inch	1.06	1.06	1.06	1.06
L	mm	408	421	462	552
	inch	16.06	16.57	18.19	21.73
M	mm	57	57	73	99
	inch	2.24	2.24	2.87	3.9
N	mm	192	205	247	336
	inch	7.56	8.07	9.72	13.23
O	mm	115	115	145	200
	inch	4.53	4.53	5.71	7.87
O1	mm	112	112	142	192
	inch	4.41	4.41	5.59	7.56
P	mm	70	70	70	70
	inch	2.76	2.76	2.76	2.76
Q	mm	180	180	220	290
	inch	7.09	7.09	8.66	11.42
S	mm	11	11	9	25
	inch	0.43	0.43	0.35	0.98
T	mm	184	184	184	184
	inch	7.24	7.24	7.24	7.24
U	mm	70	70	70	70
	inch	2.76	2.76	2.76	2.76
U1	mm	83	83	83	83
	inch	3.27	3.27	3.27	3.27
W	mm	77	77	77	77
	inch	3.03	3.03	3.03	3.03

DN	mm	200	250	320	
	inch	8	10	12	
K	mm	31	41	54	
	inch	1.22	1.61	2.13	
L	mm	660	841	1038	
	inch	25.98	33.11	40.87	
M	mm	120	161	198	
	inch	4.73	6.34	7.8	
N	mm	430	559	724	
	inch	16.93	22	28.5	
O	mm	250	344	448	
	inch	9.84	13.5	17.64	
O1	mm	232	321	396	
	inch	9.13	12.6	15.59	
P	mm	80	80	114	
	inch	3.15	3.15	4.49	
Q	mm	350	450	560	
	inch	13.78	17.72	22.05	
S	mm	38.5	65	80	
	inch	1.52	2.56	3.15	
T	mm	200	240	272	
	inch	7.87	9.45	10.71	
U	mm	90	90	90	
	inch	3.54	3.54	3.54	
U1	mm	103	103	103	
	inch	4.06	4.06	4.06	
W	mm	94	134	134	
	inch	3.7	5.28	5.28	

Main dimensions



- ▽ valve seat side
- * required for dismantling
- Ⓛ leak detection hole
- ⓐ compressed air connection
- ⓔ electrical connection
- Ⓜ mechanical position indication
- for attachment

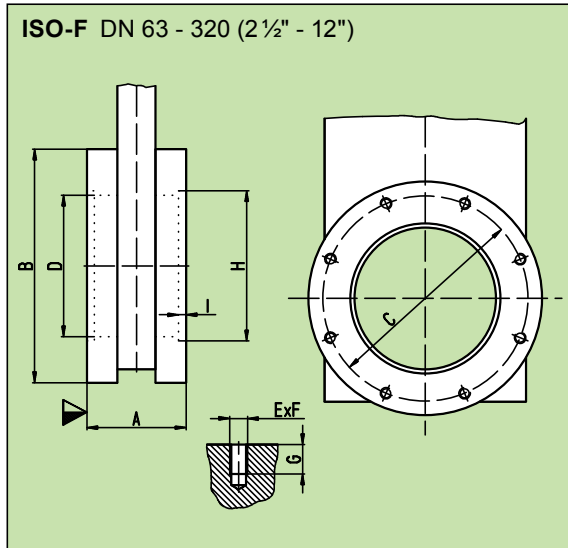


Flange dimensions see pages 36 + 37

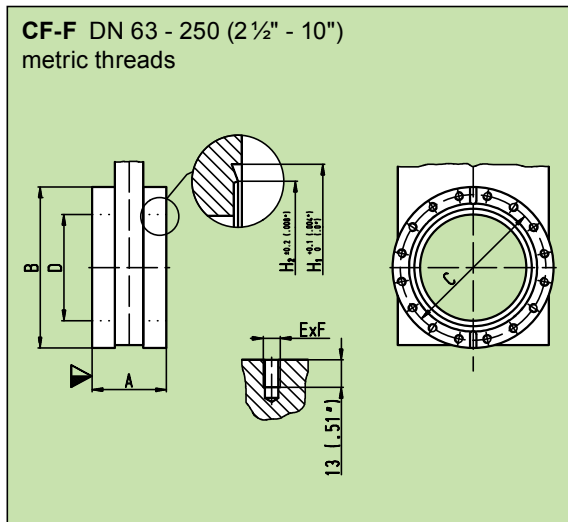
DN	mm	63	80	100	160
	inch	2½	3	4	6
K	mm	27	27	27	27
	inch	1.06	1.06	1.06	1.06
L	mm	346	358	418	523
	inch	13.62	14.07	16.46	20.59
M	mm	57	57	73	99
	inch	2.24	2.24	2.87	3.9
N	mm	192	205	247	336
	inch	7.56	8.07	9.72	13.23
O	mm	115	115	145	200
	inch	4.53	4.53	5.71	7.87
O1	mm	112	112	142	192
	inch	4.41	4.41	5.59	7.56
P	mm	70	70	70	70
	inch	2.76	2.76	2.76	2.76
Q	mm	180	180	220	290
	inch	7.09	7.09	8.66	11.42
S	mm	11	11	9	25
	inch	0.43	0.43	0.35	0.98
T	mm	154	154	171	187
	inch	6.06	6.06	6.73	7.36
U	mm	70	70	70	70
	inch	2.76	2.76	2.76	2.76
U1	mm	83	83	83	83
	inch	3.27	3.27	3.27	3.27
V	mm	145	145	145	145
	inch	5.71	5.71	5.71	5.71
W	mm	77	77	77	77
	inch	3.03	3.03	3.03	3.03

DN	mm	200	250	320	
	inch	8	10	12	
K	mm	31	41	54	
	inch	1.22	1.61	2.13	
L	mm	630	800	1013	
	inch	24.8	31.5	39.88	
M	mm	120	161	198	
	inch	4.73	6.34	7.8	
N	mm	430	559	724	
	inch	16.93	22.0	28.5	
O	mm	250	344	448	
	inch	9.84	13.5	17.64	
O1	mm	232	321	396	
	inch	9.13	12.6	15.59	
P	mm	80	80	114	
	inch	3.15	3.15	4.49	
Q	mm	350	450	560	
	inch	13.78	17.72	22.05	
S	mm	38.5	65	80	
	inch	1.52	2.56	3.15	
T	mm	200	240	289	
	inch	7.87	9.45	11.38	
U	mm	90	90	90	
	inch	3.54	3.54	3.54	
U1	mm	103	103	103	
	inch	4.06	4.06	4.06	
V	mm	155	155	155	
	inch	6.1	6.1	6.1	
W	mm	87	87	87	
	inch	3.42	3.42	3.42	

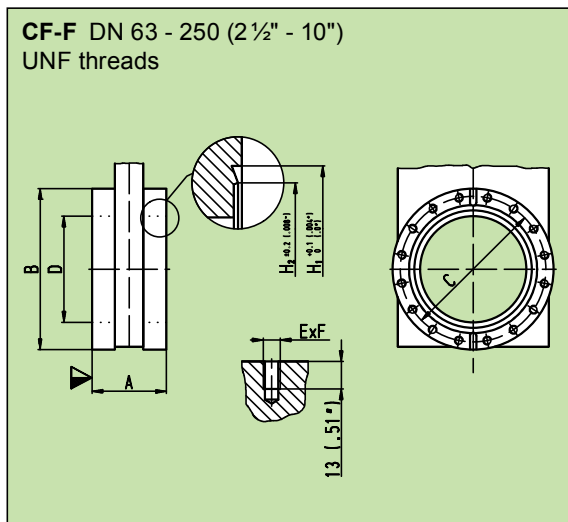
Flange dimensions



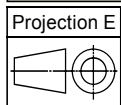
DN	mm inch	63 2 1/2	80 3	100 4	160 6	200 8	250 10	320 12
A	mm inch	70 2.76	70 2.76	70 2.76	70 2.76	80 3.15	100 3.94	120 4.72
B	mm inch	130 5.12	145 5.71	165 6.5	225 8.86	285 11.22	350 13.78	425 16.73
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24	310 12.2	395 15.55
D	mm inch	70 2.76	76 3	100 3.94	150 5.91	200 7.87	261 10.27	306 12.05
E x F		4 x M8	8 x M8	8 x M8	8 x M10	12 x M10	12 x M10	12 x M12
G	mm inch	13 0.51	13 0.51	13 0.51	15 0.59	15 0.59	15 0.59	18 0.71
H	mm inch	-	83 3.27	102 4.02	153 6.02	213 8.39	-	318 12.52
I	mm inch	-	4.5 0.18	3 0.12	5 0.2	5 0.2	-	5 0.2



DN	mm inch	63 2 1/2	80 3	100 4	160 6	200 8	250 10	
O.D. inch		4 1/2	4 5/8	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	113.5 4.47	117.5 4.63	151.6 5.97	202.4 7.97	253.2 9.97	350 13.78	
C	mm inch	92.1 3.63	102.4 4.08	130.2 5.13	181 7.13	231.8 9.13	284 11.18	
D	mm inch	70 2.76	76 3	100 3.94	150 5.91	200 7.87	254 10	
E x F		8 x M8	10 x M8	16 x M8	20 x M8	24 x M8	32 x M8	
H1	mm inch	82.5 3.25	91.5 3.6	120.65 4.75	171.45 6.75	222.3 8.75	273.15 10.75	
H2	mm inch	77.4 3.05	86.3 3.4	115.5 4.55	166 6.54	217 8.54	267 10.51	



DN	mm inch	63 2 1/2	80 3	100 4	160 6	200 8	250 *) 10	250 *) 10
O.D. inch		4 1/2	4 5/8	6	8	10	12	13 1/4
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	113.5 4.47	117.5 4.63	151.6 5.97	202.4 7.97	253.2 9.97	350 13.78	350 13.78
C	mm inch	92.1 3.63	102.4 4.08	130.2 5.13	181 7.13	231.8 9.13	284 11.18	306.3 12.06
D	mm inch	70 2.76	76 3	100 3.94	150 5.91	200 7.87	254 10	254 10
E x F		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 inch	82.5 3.25	91.5 3.6	120.65 4.75	171.45 6.75	222.3 8.75	273.15 10.75	294.64 11.6
H2	mm inch	77.4 3.05	86.3 3.4	115.5 4.55	166 6.54	217 8.54	267 10.51	288.3 11.35



▼ valve seat side

*) O.D. 12" standard VAT, O.D. 13 1/4" option

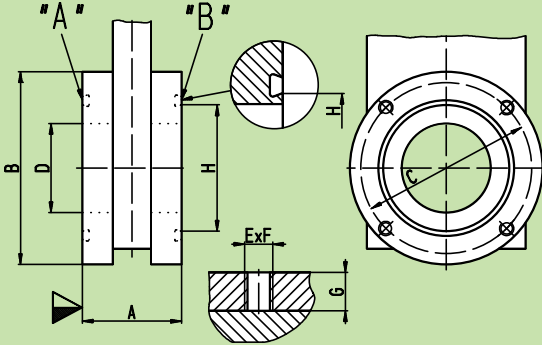
Ordering information for option: O.D. 13 1/4"

Ordering No. of valve-X (e. g. 10848-UE44-X, X = O.D. 13 1/4")

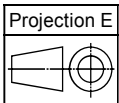
Flange dimensions

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	152.4 6	177.8 7	190.5 7.5	225 8.86	279.4 11	350 13.78	425 16.73
C	mm inch	120.7 4.75	139.7 5.5	152.4 6	190.5 7.5	241.3 9.5	298.5 11.75	362 14.25
D	mm inch	70 2.76	76 3	100 3.94	150 5.91	200 7.87	254 10	300 11.81
E x F		4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	4 x ⅜" 16 UNC	8 x ⅜" 16 UNC	8 x ¼" 10 UNC	8 x ¼" 10 UNC	12 x ¼" 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	88.9 3.5	88.9 3.5	120.65 4.75	158.75 6.25	206.4 8.13	266.7 10.5	317.5 12.5
O-ring I.D. x d		88.49 x 3.53 3.48 x 0.139	88.49 x 3.53 3.48 x 0.139	120.24 x 3.53 4.73 x 0.139	158.34 x 3.53 6.23 x 0.139	202.79 x 3.53 7.98 x 0.139	266.29 x 3.53 10.48 x 0.139	316.87 x 7.0 12.47 x 0.275



▼ valve seat side

Low cost gate valve
«Split body» for easy cleaning



Body material

aluminum

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

Pneumatic actuator

double acting
with position indicator
with solenoid

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

without position indicator, without solenoid: 121 . . . A14
with position indicator, without solenoid: 121 . . . A24

Larger sizes

DN 400 (16"): see series 14, page 44
DN 400 - 500 (16" - 20"): see series 168, page 60
DN 400 - 1250 (16" - 50"): see series 19, page 68

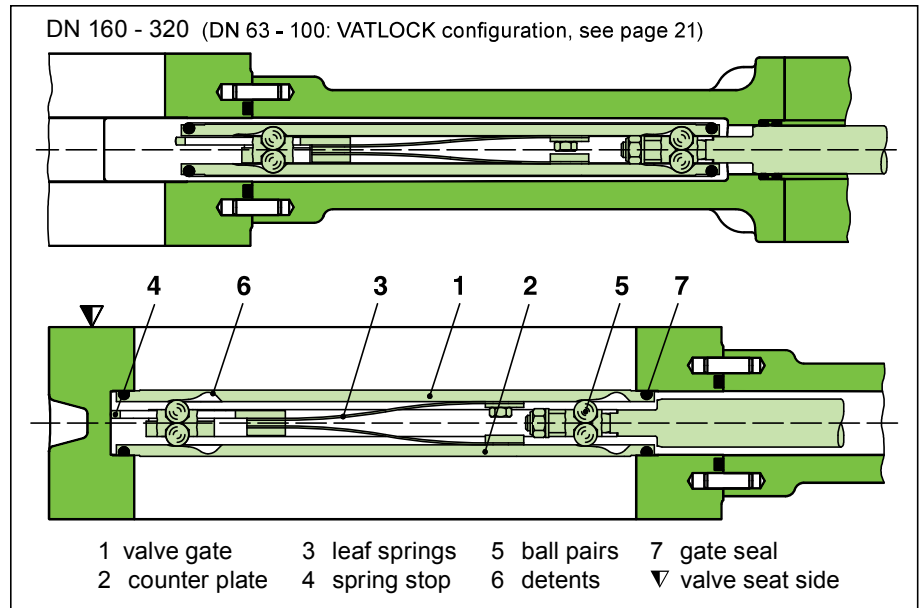
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

FKM (VITON) / shaft feedthrough



Features

High quality shaft feedthrough

VATLOCK configuration (see glossary)

Low shock during operation

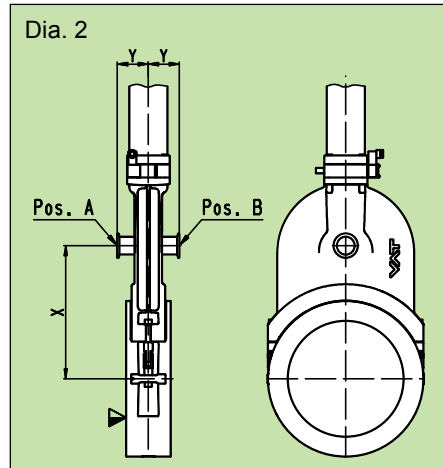
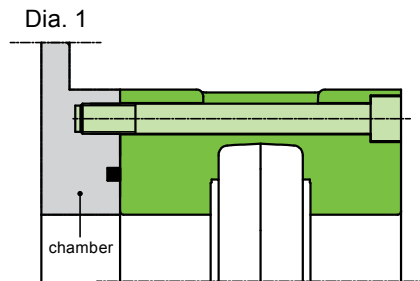
Technical data

Continued next page

Leak rate: 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 / 250 - 320	$\leq 1.6 / \leq 1.2$ bar in either direction	
Differential pressure at opening	≤ 30 mbar	
Cycles until first service		
- DN 63 - 100 / 160 - 320	200 000 / 100 000	
Temperature ¹⁾		
- Valve body	$\leq 120^{\circ}\text{C}$	
- Actuator (manual + pneum.), pos. indicator	$\leq 80^{\circ}\text{C}$	
- Solenoid	$\leq 50^{\circ}\text{C}$	
Material	DN 63 - 100	DN 160 - 320
- Valve body	EN AW-5083 (3.3547)	EN AC-42100 (3.2371)
- Valve gate	AISI 304 (1.4301)	EN AW-6060 (3.3206)
- Mechanism	AISI 301 (1.4310)	AISI 301 (1.4310)
	AISI 304 (1.4301)	AISI 304 (1.4301)
	AISI 420 (1.4034)	AISI 420 (1.4034)
Seal: bonnet, gate	FKM (VITON)	
Mounting position	any	
Solenoid	24 VDC, 5.4 W (others see «Options»)	
Position indicator: contact rating		
- Voltage	≤ 250 VAC	≤ 50 VDC
- Current	≤ 2 A	≤ 1.2 A
Valve position	visual (mechanical)	

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

Options



▽ valve seat side

Actuator:

- Solenoid for impulse actuation:
last valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V / 50 Hz
24, 100, 115, 200, 230 V / 60 Hz

Valve:

- Through holes in valve body for mounting valve to flat chamber wall (diagram 1)
- Customer specified flanges
- Stainless steel gate for DN 160 - 320 on request
- ASA-LP flanges for DN 100 - 320 on request
- Other sealing materials
- Heater and insulating jacket
- Ports (diagram 2) with seal made of FKM (VITON) for roughing (by-pass), venting or for gauges

DN valve	mm inch	63 2 ½	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

Ordering information for options:

Ordering No. of valve-X (e. g. 12148-PA44-X, X = port ISO-KF40 in position B)

Accessories

Fittings for installation of the valve: series 32

Seal kit

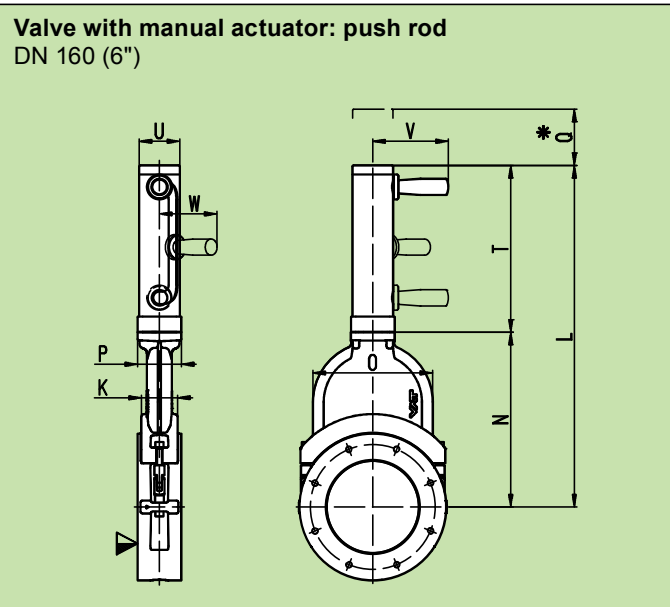
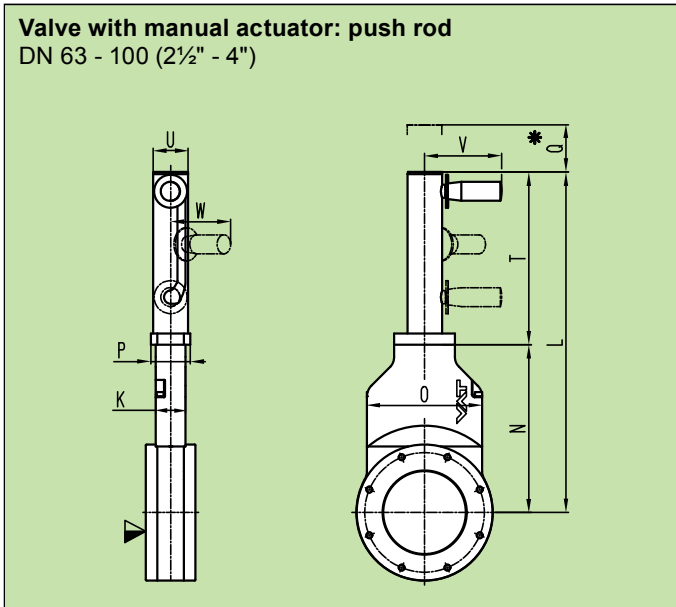
Consisting of seals for bonnet, gate and feedthrough

Ordering No.: see operating manual or price list

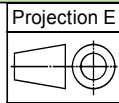
Technical data

DN (nominal I. D.)		standard flanges		molecular flow conductance	manual		pneumatic						
		ISO-F	JIS		weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch			ls ⁻¹	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	63	63	550	3	7	4 - 7	55 - 100	0.16	0.006	1.5	3	7
80	3	80	80	1000	3.8	9	4 - 7	55 - 100	0.2	0.007	1.7	3.8	9
100	4	100	100	2000	4.5	10	4 - 7	55 - 100	0.22	0.008	2	4.5	10
160	6	160	150	6000	9	20	4 - 7	55 - 100	0.5	0.018	2	9	20
200	8	200	200	12000	-	-	4 - 7	55 - 100	0.9	0.032	3	18	38
250	10	250	250	22000	-	-	4 - 7	55 - 100	1.5	0.053	5	25	55
320	12	320	300	33000	-	-	4 - 7	55 - 100	2.8	0.099	7	40	88

Main dimensions



- ▽ valve seat side
- * required for dismantling



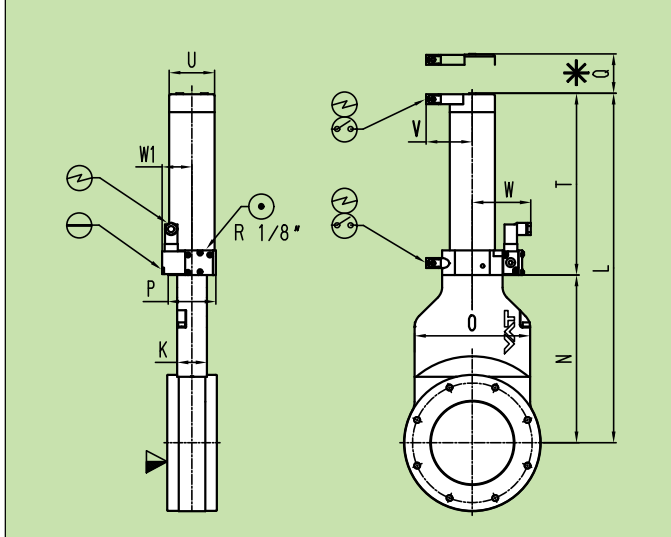
Flange dimensions see page 43

DN	mm	63	80	100
	inch	2½	3	4
K	mm	36	36	36
	inch	1.42	1.42	1.42
L	mm	329.5	363	413
	inch	12.97	14.29	16.26
N	mm	155.5	173.5	203.5
	inch	6.12	6.83	8.01
O	mm	100	118	140
	inch	3.94	4.65	5.51
P	mm	48	48	48
	inch	1.89	1.89	1.89
Q	mm	25	25	25
	inch	0.98	0.98	0.98
T	mm	174	189.5	209.5
	inch	6.85	7.46	8.25
U	mm	43	43	43
	inch	1.69	1.69	1.69
V	mm	94	94	94
	inch	3.7	3.7	3.7
W	mm	75	75	75
	inch	2.95	2.95	2.95

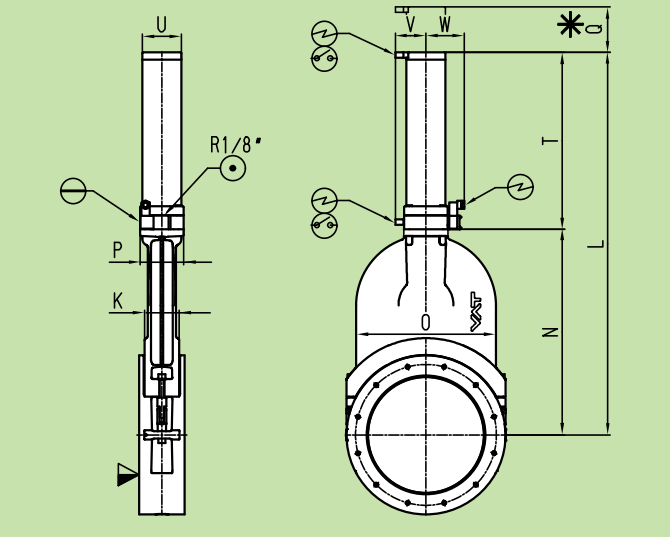
DN	mm	160		
	inch	6		
K	mm	58		
	inch	2.28		
L	mm	547		
	inch	21.54		
N	mm	280		
	inch	11.02		
O	mm	192		
	inch	7.56		
P	mm	70		
	inch	2.76		
Q	mm	60		
	inch	2.36		
T	mm	267		
	inch	10.51		
U	mm	65		
	inch	2.56		
V	mm	122		
	inch	4.8		
W	mm	95		
	inch	3.74		

Main dimensions

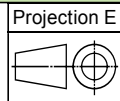
Valve with pneumatic actuator: double acting
DN 63 - 100 (2½" - 4")



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



- ▼ valve seat side
- * required for dismantling
- ⊕ electrical connection
- ⊙ compressed air connection
- ⊖ emergency operation
- ⊙ position indicator

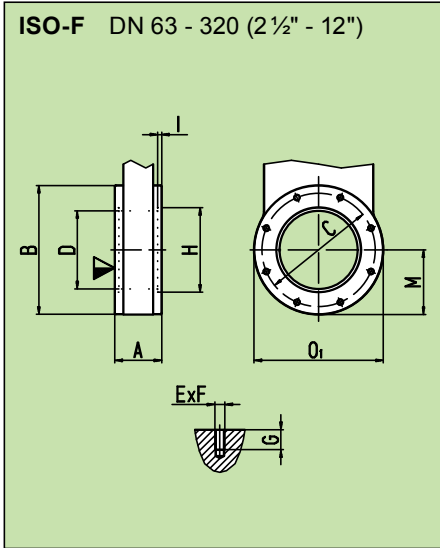


Flange dimensions see page 43

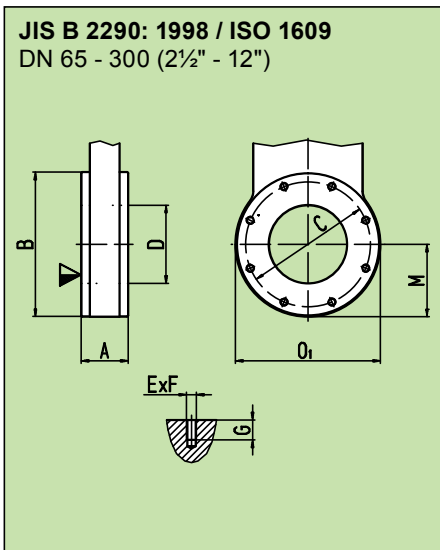
DN	mm	63	80	100	
inch		2½	3	4	
K	mm	36	36	36	
inch		1.42	1.42	1.42	
L	mm	341.5	375	425	
inch		13.45	14.76	16.69	
N	mm	155.5	173.5	203.5	
inch		6.12	6.83	8.01	
O	mm	100	118	140	
inch		3.94	4.65	5.51	
P	mm	58	58	58	
inch		2.28	2.28	2.28	
Q	mm	25	25	25	
inch		0.98	0.98	0.98	
T	mm	186	201.5	221.5	
inch		7.32	7.93	8.72	
U	mm	55	55	55	
inch		2.17	2.17	2.17	
V	mm	56	56	56	
inch		2.2	2.2	2.2	
W	mm	72	72	72	
inch		2.83	2.83	2.83	
W1	mm	36.5	36.5	36.5	
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	2.6	2.99	3.78
L	mm	547	688	843	1029
inch		21.54	27.09	33.19	40.51
N	mm	280	363.5	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	324.5	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	71.5	76.5	84.5	93.5
inch		2.82	3.01	3.33	3.68

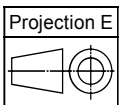
Flange dimensions



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 6.5	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 12.2	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 x F		4 x M8	8 x M8	8 x M8	8 x M10	12 x M10	12 x M10	12 x 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 0.2	5 0.2	–	–
M	mm inch	65.5 2.58	73 2.87	83 3.27	117.5 4.63	144 5.67	175 6.89	212.5 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 6.3	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 6.3	210 8.27	270 10.63	320 12.6	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 x F		4 x M10	4 x M10	8 x M10	8 x M10	8 x M12	12 x M12	12 x M12
G	mm inch	12 0.47	12 0.47	12 0.47	16 0.63	16 0.63	16 0.63	20 0.79
M	mm inch	73 2.87	81 3.19	93 3.66	117.5 4.63	144 5.67	175 6.89	212.5 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

General purpose stainless steel valve

Compact and variable actuator



Body material

stainless steel

Manual actuator

DN 63 - 350: lever

DN 400: 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-PE06	14036-CE06	14036-UE06	14036-TE06	14036-JE06
80	3	14038-PE06	14038-CE06	14038-UE06	on request	on request
100	4	14040-PE06	14040-CE06	14040-UE06	14040-TE06	14040-JE06
160	6	14044-PE06	14044-CE06	14044-UE06	14044-TE06	14044-JE06
200	8	14046-PE06	14046-CE06	14046-UE06	14046-TE06	14046-JE06
250	10	14048-PE06	14048-CE06	14048-UE06	14048-TE06	14048-JE06
320	12	14050-PE06	on request	on request	14050-TE06	14050-JE06
350	14	on request	on request	on request	on request	on request
400	16	14052-PE01	on request	on request	14052-AE01	14052-JE01

with handwheel: 140 . . . E01 (DN 63 - 350)

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

Pneumatic actuator

double acting

with position indicator

with solenoid

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	on request
400	16	14052-PE44	on request	on request	14052-AE44	14052-JE44

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

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

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

3-position pneumatic actuator

See series 64: 3-position pneumatic actuator with intermediate throttling position

Stepper motor

See series 64: for conductance and pressure control

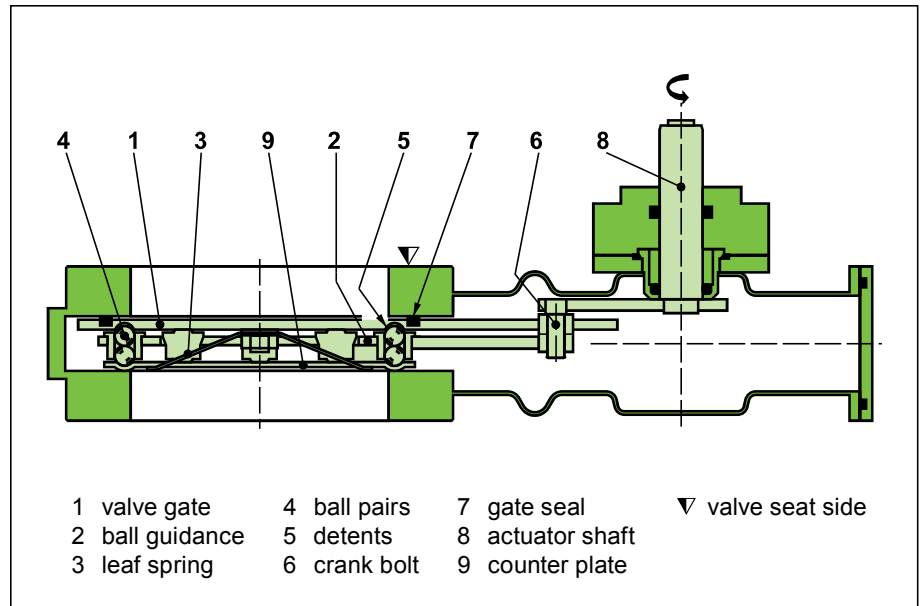
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

FKM (VITON) / rotary feedthrough



Features

Six actuator possibilities (three positions on either side)

Rotary feedthrough for high cycle life, low particle count

Optimized VATLOCK configuration (see glossary)

Technical data

Continued next page

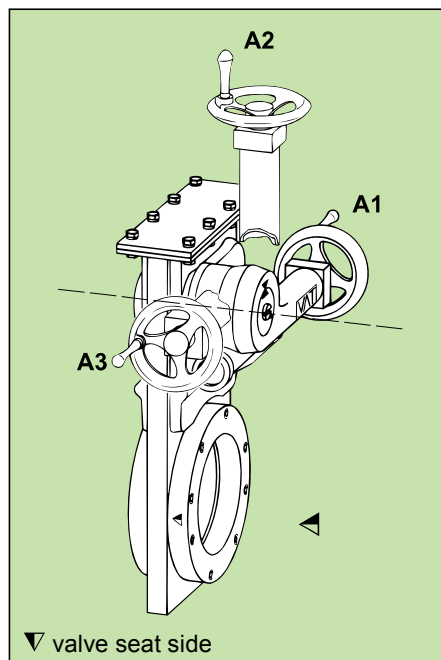
Leak rate: body, valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹
Pressure range	
- DN 63 - 200	1 · 10 ⁻⁸ mbar to 2 bar (abs)
- DN 250 - 400	1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
Differential pressure on the gate	
- DN 63 - 200 / 250 - 400	≤ 2 / ≤ 1.2 bar in either direction
Differential pressure at opening	
- in closing and opening direction	≤ 30 mbar
Cycles until first service	
- DN 63 - 400	200 000
- DN 400 vertical mounting pos.: (standing/suspended)	reduced cycle life
Temperature ¹⁾	
- Valve body	≤ 150°C
- Manual actuator, position indicator	≤ 80°C
- Pneumatic actuator, motor, solenoid	≤ 50°C
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	FKM (VITON)
Mounting position: DN 63 - 350 / DN 400	any / horizontal
Solenoid	24 VDC, 2.5W (others see «options»)
Position indicator: contact rating	
- Voltage	≤ 250VAC ≤ 50VDC
- Current	≤ 5A ≤ 3A
Valve position	visual (mechanical)

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

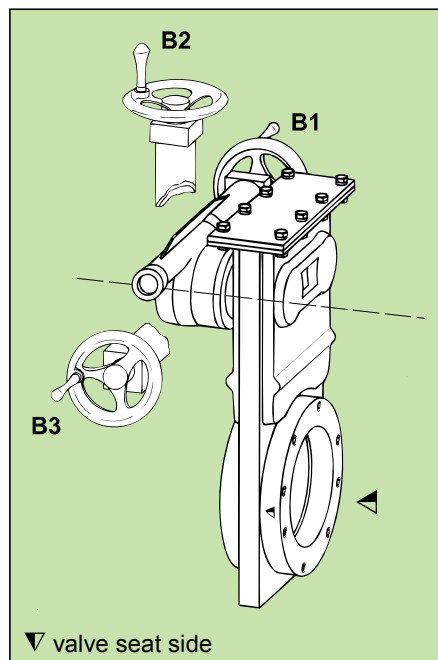
Actuator positions

For optimum system design the actuator can be mounted:

- on the A-side (valve seat side): standard
- on the B-side: option (please indicate in your order)
- in position 1 (standard for A- and B-side)
- in position 2 (can be mounted by customer: for DN 63 restricted)
- in position 3 (can be mounted by customer: for DN 63 restricted)



standard: A1
options: A2, A3

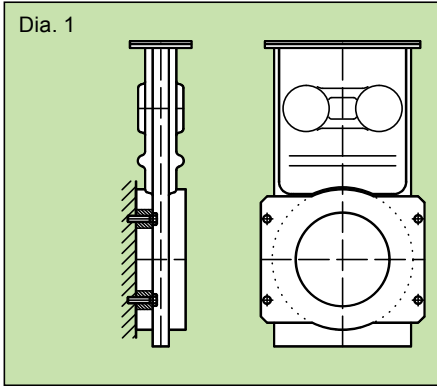


options: B1, B2, B3

Technical data

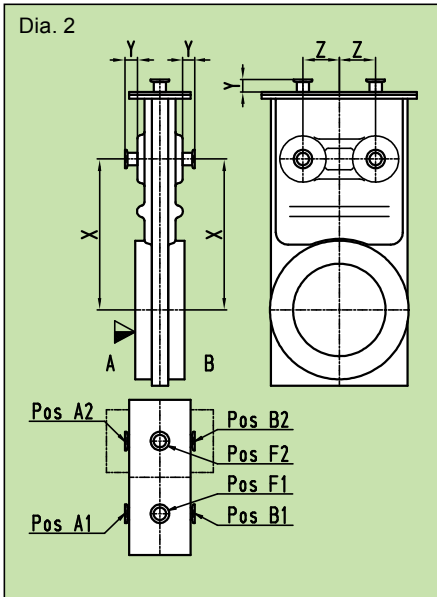
DN (nominal I.D.)		standard flanges				molecular flow conductance	angle of rotation per stroke	manual				pneumatic							
								lever		handwheel		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time		weight	
mm	inch	OD			ls ⁻¹	o	kg	lbs	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	
63	2½	4½	63	2	65	440	130	8	17	41	10	22	4 - 7	55 - 100	0.13	.005	1.5	10	22
80	3	4¾	80	-	-	800	130	9	20	41	10	22	4 - 7	55 - 100	0.13	.005	1.5	10	22
100	4	6	100	3	100	1700	130	13	28	41	15	33	4 - 7	55 - 100	0.13	.005	1.5	15	34
160	6	8	160	4	150	5000	130	24	52	37	26	57	4 - 7	55 - 100	0.28	.01	2.5	27	58
200	8	10	200	6	200	12000	130	30	66	37	32	70	4 - 7	55 - 100	0.28	.01	2.5	33	72
250	10	12	250	8	250	22000	130	58	127	48	60	132	4 - 7	55 - 100	0.75	.025	4.5	62	137
320	12		320	10	300	30000	130	108	237	48	110	242	4 - 7	55 - 100	0.75	.025	4.5	112	246
350	14		on request			43000	130	108	237	48	110	242	4 - 7	55 - 100	0.75	.025	4.5	112	246
400	16		400	14	400	50000	-	-	-	48	153	336	4 - 7	55 - 100	0.75	.025	5.5	155	340

Options



Actuator:

- Solenoid for impulse actuation:
last valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50/60 Hz
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Actuator in position 2 or 3 (position 1 is standard)
- Actuator on B-side (A-side is standard)



▽ valve seat side

Valve:

- Customer specified flanges
- For direct mounting to flat chamber (diagram 1):
Special flange for mounting to chamber wall, standard flange on opposite side
- Other sealing materials
- Watercooled or waterheated flanges
- Rotary feedthrough with intermediate pump port
- Ports (diagram 2)
for roughing (by-pass), venting, purging or for gauges
- Special ports on request resp. according to customer's specification

DN valve	mm	63	80	100	160	200	250	320	350	400
	inch	2 ½	3	4	6	8	10	12	14	16
*)	mm	16	16	40	40	40	40	40	40	40
	inch	5/8	5/8	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½
X	mm	146	146	185	245	304.4	387.3	482	482	415
	inch	5.75	5.75	7.28	9.65	11.98	15.25	18.98	18.98	16.34
Y	mm	20	20	20	20	20	20	20	20	20
	inch	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Z	mm	30	30	47.5	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

*) recommended port: CF-F or ISO-KF

Ordering information for options:

Ordering No. of valve-X (e. g. 14046-CE01-X,

X = actuator A2, port ISO-KF40 in position F2)

Heater

Temperature control with thermostat: individually adjustable

Supply voltage: 100 - 120V / 200 - 240VAC

Accessories

Fittings for installation of the valve: series 32 and 33

Seal kit

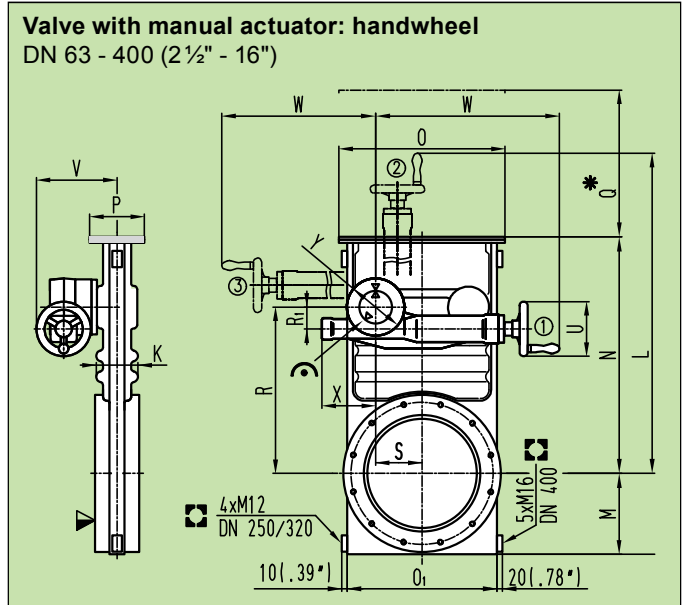
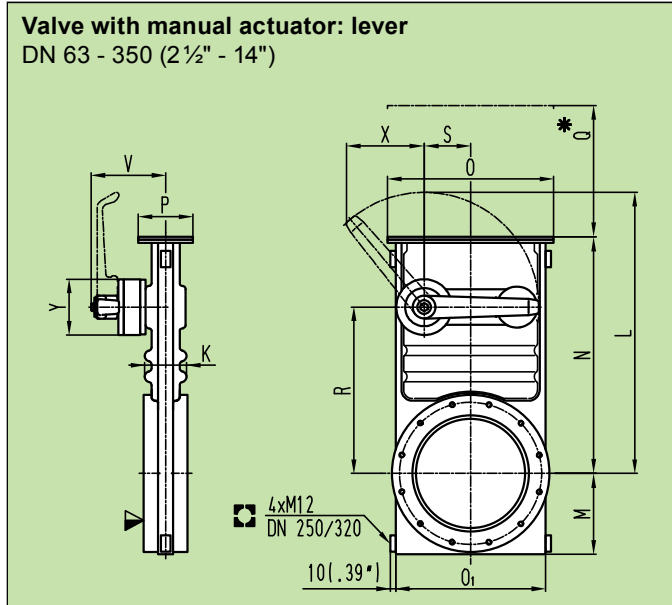
Consisting of seals for gate, bonnet and rotary feedthrough

Ordering No.: see operating manual or price list

Standard: FKM (VITON). Special sealing materials on request.

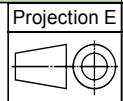
Specify fabrication number of valve: e. g. 14044-PE24-AGV1/0014

Main dimensions



- ▽ valve seat side
- ⊕ mechanical position indication
- * required for dismantling
- for attachment

- ① standard actuator position (A1)
- ②③ optional actuator positions

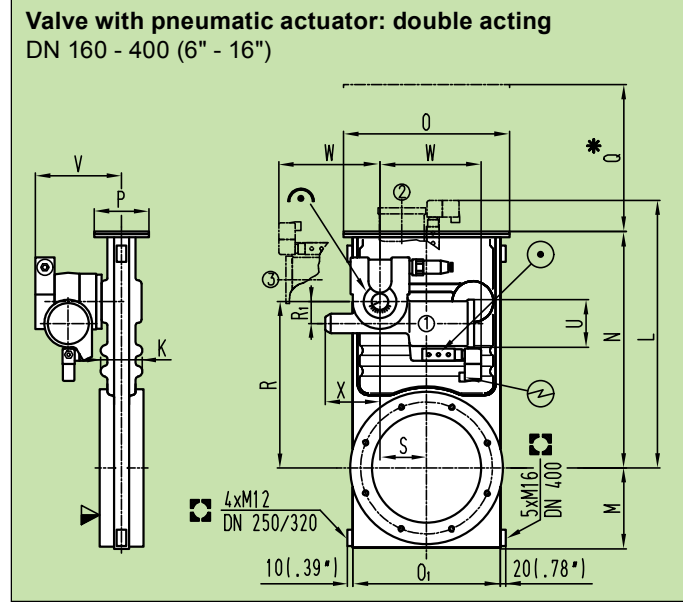
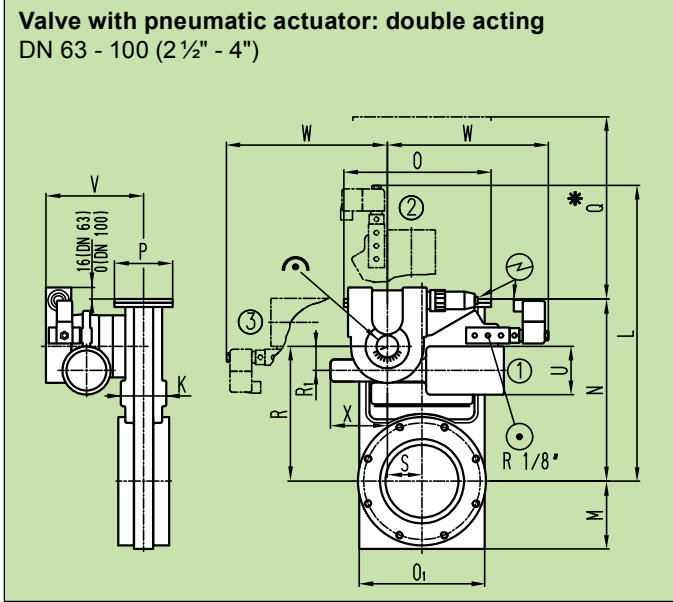


Flange dimensions see pages 50 and 51

DN	mm	63 / 80	100	160	200	250	320/350
	inch	2½ / 3	4	6	8	10	12/14
K	mm	51	63	75	77	117	120
	inch	2.01	2.48	2.95	3.03	4.6	4.72
L	mm	276	315	455	515	817	1012
	inch	10.87	12.4	17.91	20.27	32.17	39.84
M	mm	73	93	123	148	177	214
	inch	2.87	3.66	4.84	5.83	6.97	8.43
N	mm	211	270	362	441	570	691
	inch	8.31	10.63	14.25	17.36	22.44	27.2
O	mm	152	190	252	304	400	475
	inch	5.98	7.48	9.92	11.97	15.75	18.7
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	47.5	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	288	353
	inch	3.78	3.78	5.63	5.63	11.34	13.9
Y	mm	85	85	102	102	130	130
	inch	3.35	3.35	4.02	4.02	5.12	5.12

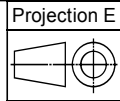
DN	mm	63 / 80	100	160	200	250	320/350	400
	inch	2½ / 3	4	6	8	10	12/14	16
K	mm	51	63	75	77	117	120	133
	inch	2.01	2.48	2.95	3.03	4.6	4.72	5.23
L	mm	458	497	595	655	771	849	935
	inch	18.03	19.57	23.43	25.79	30.35	33.42	36.81
M	mm	73	93	123	148	177	214	232
	inch	2.87	3.66	4.84	5.83	6.97	8.43	9.13
N	mm	211	270	362	441	570	689	789
	inch	8.31	10.63	14.25	17.36	22.44	27.13	31.06
O	mm	152	190	252	304	400	475	520
	inch	5.98	7.48	9.92	11.97	15.75	18.7	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	1.3	1.3	1.57	1.57	1.97	1.97	1.97
S	mm	30	47.5	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	160.5	160.5	196.5	198	202
	inch	5.08	5.08	6.32	6.32	7.74	7.8	7.95
W	mm	312	312	350	350	384	367	367
	inch	12.28	12.28	13.78	13.78	15.12	14.45	14.45
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

Main dimensions



- ▼ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- Ⓜ mechanical position indication
- Ⓚ for attachment
- Ⓛ electrical connection

- ① standard actuator position (A1)
- ② ③ optional actuator positions

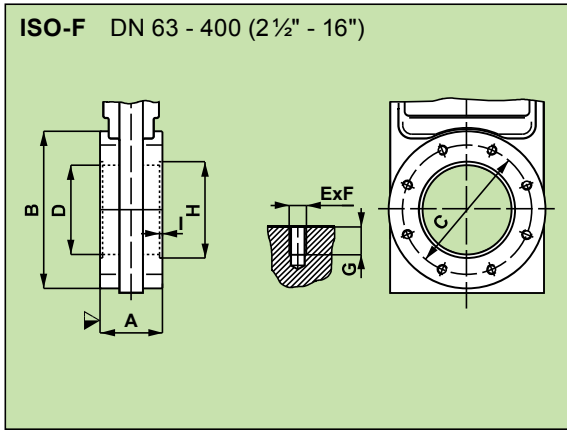


Flange dimensions see pages 50 and 51

DN	mm	63 / 80	100			
	inch	2 1/2 / 3	4			
K	mm	51	63			
	inch	2.01	2.48			
L	mm	367	406			
	inch	14.45	15.98			
M	mm	73	93			
	inch	2.87	3.66			
N	mm	211	270			
	inch	8.31	10.63			
O	mm	152	190			
	inch	5.98	7.48			
O1	mm	134	172			
	inch	5.28	6.77			
P	mm	80	80			
	inch	3.15	3.15			
Q	mm	180	220			
	inch	7.09	8.66			
R	mm	146	185			
	inch	5.75	7.28			
R1	mm	33	33			
	inch	1.3	1.3			
S	mm	30	47.5			
	inch	1.18	1.87			
U	mm	66	66			
	inch	2.6	2.6			
V	mm	135	135			
	inch	5.32	5.32			
W	mm	221	221			
	inch	8.7	8.7			
X	mm	78	78			
	inch	3.07	3.07			

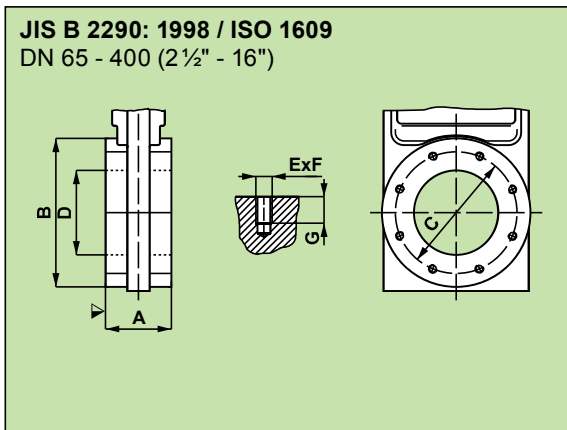
DN	mm	160	200	250	320	350	400
	inch	6	8	10	12	14	16
K	mm	75	77	117	120	120	130
	inch	2.95	3.03	4.6	4.72	4.72	5.12
L	mm	435	495	654	750	750	836
	inch	17.13	19.49	25.75	29.59	29.59	32.91
M	mm	123	148	177	214	214	232
	inch	4.84	5.83	6.97	8.43	8.43	9.13
N	mm	362	441	570	689	689	789
	inch	14.25	17.36	22.44	27.13	27.13	31.06
O	mm	252	304	400	475	475	520
	inch	9.92	11.97	15.75	18.7	18.7	20.47
O1	mm	222	274	356	421	421	474
	inch	8.74	10.79	14.02	16.57	16.57	18.66
P	mm	100	100	138	138	138	138
	inch	3.94	3.94	5.43	5.43	5.43	5.43
Q	mm	300	350	450	550	550	600
	inch	11.81	13.78	17.72	21.65	21.65	23.62
R	mm	245	305	387	482	482	568
	inch	9.65	12.01	15.24	18.98	18.98	22.36
R1	mm	40	40	50	50	50	50
	inch	1.57	1.57	1.97	1.97	1.97	1.97
S	mm	59	85	100	135	135	140
	inch	2.32	3.35	3.94	5.31	5.31	5.51
U	mm	87	87	122.5	122.5	122.5	122.5
	inch	3.43	3.43	4.82	4.82	4.82	4.82
V	mm	158	158	202	202	202	206
	inch	6.22	6.22	7.95	7.95	7.95	8.11
W	mm	190	190	268	268	268	268
	inch	7.48	7.48	10.55	10.55	10.55	10.55
X	mm	100	100	131	131	131	131
	inch	3.94	3.94	5.16	5.16	5.16	5.16

Flange dimensions



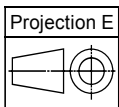
DN	mm inch	63 2½	80 3	100 4	160 6	200 8
A	mm inch	70 2.76	70 2.76	70 2.76	80 3.15	80 3.15
B	mm inch	136 5.35	136 5.35	176 6.93	225 8.86	288 11.34
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24
D	mm inch	63 2.48	80 3.15	100 3.94	150 5.91	200 7.87
E x F		4 x M8	8 x M8	8 x M8	8 x M10	12 x M10
G	mm inch	13 0.51	13 0.51	13 0.51	14 0.55	16 0.63
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 0.2	5 0.2

DN	mm inch	250 10	320 12	350 14	400 16	
A	mm inch	100 3.94	120 4.72	on request	150 5.9	
B	mm inch	350 13.78	425 16.73		510 20.08	
C	mm inch	310 12.2	395 15.55		480 18.9	
D	mm inch	261 10.28	318 12.52		400 15.75	
E x F		12 x M10	12 x M12		16 x M12	
G	mm inch	16 0.63	16 0.63		20 0.79	
H	mm inch	-	-		-	
I	mm inch	-	-		-	



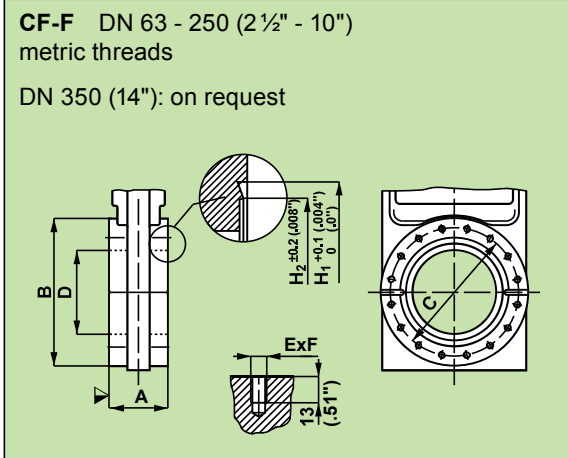
DN	mm inch	65 2½	100 4	150 6	200 8	250 10	300 12	400 16
A	mm inch	70 2.76	70 2.76	80 3.15	80 3.15	100 3.94	120 4.72	150 5.9
B	mm inch	136 5.35	176 6.93	225 8.86	288 11.34	350 13.78	425 16.73	510 20.08
C	mm inch	120 4.72	160 6.3	210 8.27	270 10.63	320 12.6	370 14.57	480 18.9
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87	261 10.28	318 12.52	400 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 M16
G	mm inch	12 0.47	12 0.47	14 0.55	16 0.63	16 0.63	16 0.63	25 0.98

DN 80 (3") and DN 350 (14") on request

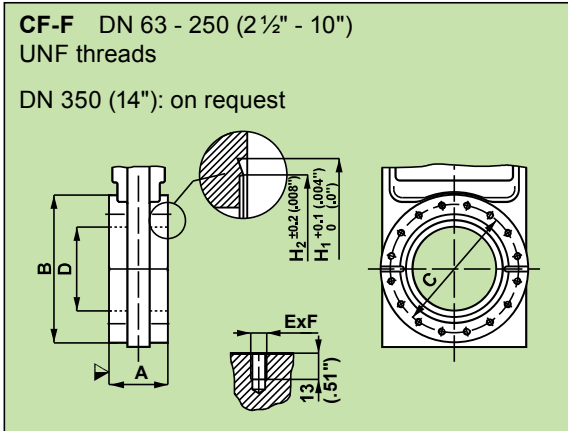


▼ valve seat side

Flange dimensions



DN	mm	63	80	100	160	200	250	
	inch	2 1/2	3	4	6	8	10	
O.D.	inch	4 1/2	4 5/8	6	8	10	12	
A	mm	70	70	70	80	80	100	
	inch	2.76	2.76	2.76	3.15	3.15	3.94	
B	mm	136	136	176	225	288	350	
	inch	5.35	5.35	6.93	8.86	11.34	13.78	
C	mm	92.1	102.4	130.3	181	231.8	284	
	inch	3.63	4.03	5.13	7.13	9.13	11.18	
D	mm	63	80	100	150	200	254	
	inch	2.48	3.15	3.94	5.91	7.87	10	
E x F		8 x M8	10 x M8	16 x M8	20 x M8	24 x M8	32 x M8	
H1	mm	82.5	91.55	120.65	171.45	222.3	273.15	
	inch	3.25	3.6	4.75	6.75	8.75	10.75	
H2	mm	77.4	86.3	115.5	166	217	267	
	inch	3.05	3.4	4.55	6.54	8.54	10.51	



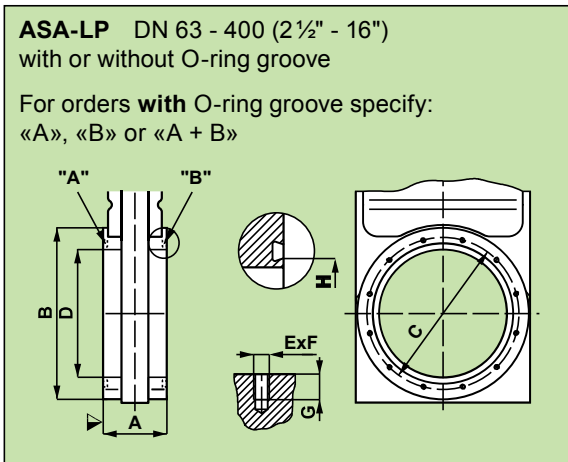
DN	mm	63	80	100	160	200	250 *)	250 *)
	inch	2 1/2	3	4	6	8	10	10
O.D.	inch	4 1/2	4 5/8	6	8	10	12	13 1/4
A	mm	70	70	70	80	80	100	100
	inch	2.76	2.76	2.76	3.15	3.15	3.94	3.94
B	mm	136	136	176	225	288	350	350
	inch	5.35	5.35	6.93	8.86	11.34	13.78	13.78
C	mm	92.1	102.4	130.3	181	231.8	284	306.3
	inch	3.63	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		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	82.5	91.55	120.65	171.45	222.3	273.15	294.64
	inch	3.25	3.6	4.75	6.75	8.75	10.75	11.6
H2	mm	77.4	86.3	115.5	166	217	267	288.3
	inch	3.05	3.4	4.55	6.54	8.54	10.51	11.35

*) O.D. 12" VAT standard, O.D. 13 1/4" option

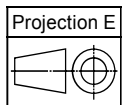
Ordering information for option: O.D. 13 1/4"

Ordering No. of valve-X

(e. g. 14048-UE44-X, X = O.D. 13 1/4")



DN	mm	63	100	160	200	250	320	400
	inch	2 1/2	4	6	8	10	12	16
ASA-LP		2	3	4	6	8	10	16 *)
A	mm	70	70	80	80	100	120	150
	inch	2.76	2.76	3.15	3.15	3.94	4.72	5.9
B	mm	136	176	225	288	350	425	596.9
	inch	5.35	6.93	8.86	11.34	13.78	16.73	23.5
C	mm	120.7	152.4	190.5	241.3	298.5	362	539.8
	inch	4.75	6	7.5	9.5	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	11.81	15.75
E x F		4 x 3/8"	4 x 3/8"	8 x 3/8"	8 x 3/4"	8 x 3/4"	12 x 3/4"	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	25.4
	inch	0.59	0.59	0.59	0.79	0.79	1.1	1
H	mm	88.9	120.65	158.75	206.4	266.7	317.5	419.1
	inch	3.5	4.75	6.25	8.13	10.5	12.5	16.5
O-Ring		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		3.48 x .139	4.73 x .139	6.23 x .139	7.96 x .139	10.48 x .139	12.47 x .275	16.46 x .275



▽ valve seat side

DN 80 (3") and DN 350 (14") on request

*) ASA

For vacuum systems requiring extremely low particle count and low shock

High cycle life

Design variations:
depending on specification of system –
vacuum, HV, UHV



Body material

aluminum or stainless steel

Nominal diameters

DN 63 - 160 (2½" - 6") aluminum

DN 63 - 250 (2½" - 10") stainless steel

Actuator

Double acting pneumatic cylinder

Flanges

ISO-F, JIS, ASA-LP (aluminum body)

CF-F, ISO-F (stainless steel body)

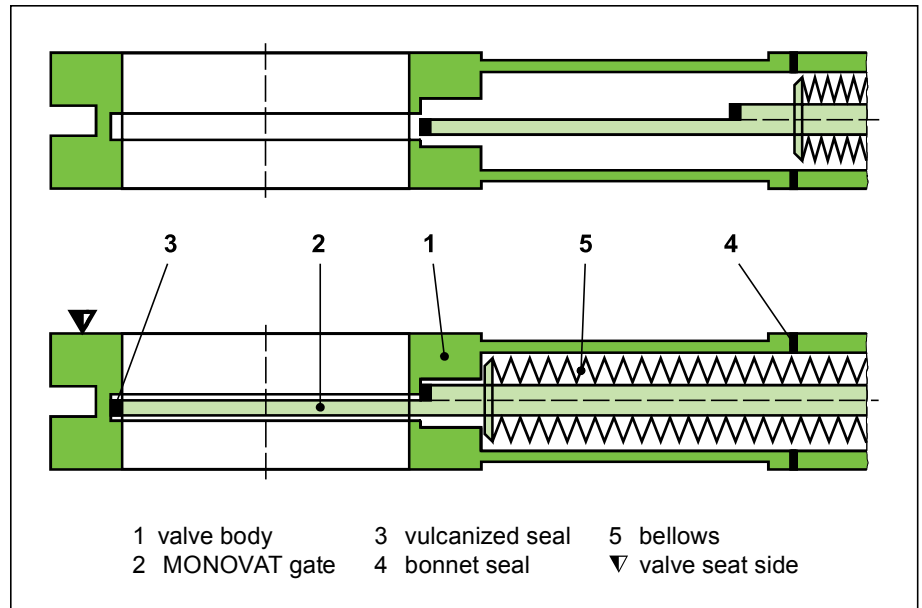
Options

Actuator:

- Solenoid
- Position indicator

Valve:

- Aluminum: hard anodized
- Sealing material: Chemraz, EPDM, FPM
- Flange: customer specified
- Customer specified solutions



Features

- Guidance of the gate outside the vacuum
- Vulcanized seal on valve gate (see glossary)
- Small flange-to-flange dimension

Technical data

Vacuum level	Vacuum	HV	UHV
Series	15.0	15.1	15.2
Seal type / feedthrough			
Body material	aluminum	aluminum	stainless steel
Gate seal	FKM (VITON)	FKM (VITON)	FKM (VITON)
Bonnet seal	FKM (VITON)	FKM (VITON)	metal
Feedthrough	shaft feedthrough	bellows	bellows
Temperature ¹⁾			
- Valve open	≤ 150°C	≤ 150°C	≤ 250°C
- Valve closed	≤ 150°C	≤ 150°C	≤ 200°C
Cycle life	500 000	500 000	500 000
Leak rate	mbar ls ⁻¹	mbar ls ⁻¹	mbar ls ⁻¹
- Body	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁹	< 5 · 10 ⁻¹⁰
- Valve seat	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁹
Pressure range	1 · 10 ⁻⁷ mbar to 1 bar (abs)	1 · 10 ⁻⁸ mbar to 1 bar (abs)	1 · 10 ⁻¹⁰ mbar to 1 bar (abs)
Differential pressure at opening	≤ 30 mbar ²⁾	≤ 30 mbar ²⁾	≤ 30 mbar ²⁾

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

²⁾ at 1 bar increased particle generation and reduced cycle life

Series 162

For corrosive processes

Compact design

Low vibration level and low particle count during operation



Body material

aluminum

Pneumatic actuator

single acting cylinder
with closing spring (NC)
with position indicator
without solenoid

DN		Ordering numbers		
mm	inch	ISO-F	JIS	ASA-LP
63	2 ½	16236-PA21	16236-JA21	16236-TA21
100	4	16240-PA21	16240-JA21	16240-TA21
160	6	16244-PA21	16244-JA21	16244-TA21
200	8	16246-PA21	16246-JA21	16246-TA21
250	10	16248-PA21	16248-JA21	16248-TA21
320	12	16250-PA21	16250-JA21	16250-TA21
350	14	not available	16251-JA21	16251-TA21
400	16	16252-PA21	16252-JA21	16252-TA21

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

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

3-position pneumatic actuator

with position indicator
without solenoid

DN		Ordering numbers		
mm	inch	ISO-F	JIS	ASA-LP
63	2 ½	16236-PA28	16236-JA28	16236-TA28
100	4	16240-PA28	16240-JA28	16240-TA28
160	6	16244-PA28	16244-JA28	16244-TA28
200	8	16246-PA28	16246-JA28	16246-TA28
250	10	16248-PA28	16248-JA28	16248-TA28
320	12	16250-PA28	16250-JA28	16250-TA28
350	14	not available	16251-JA28	16251-TA28
400	16	16252-PA28	16252-JA28	16252-TA28

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

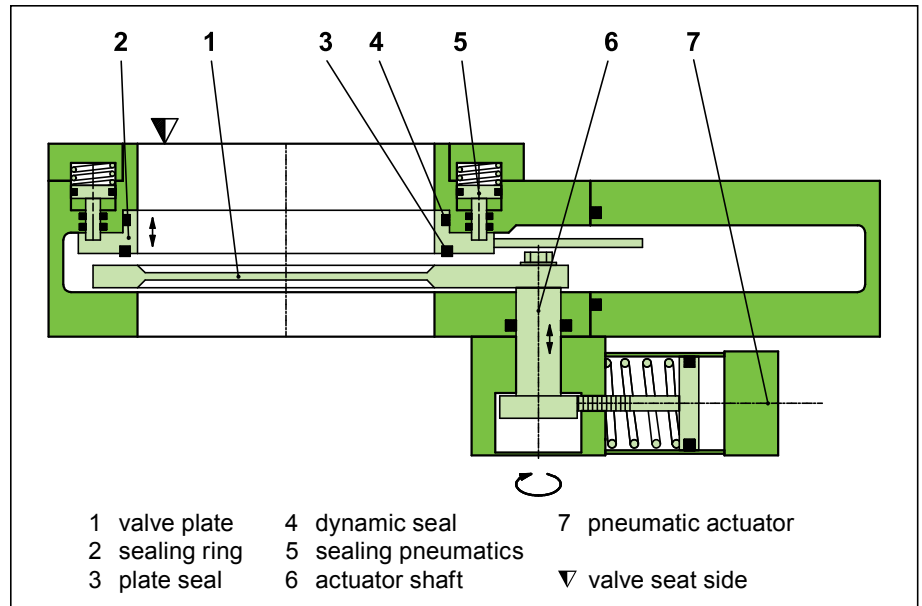
Sealing materials

Plate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Rotary feedthrough



Features

No mechanism in the plate

Easy and fast maintenance due to the split body design

No readjustments after the cleaning process

Technical data

Continued next page

Leak rate: 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 in either direction
Cycles until first service	200 000
Temperature ¹⁾	
- Valve body	$\leq 120^{\circ}\text{C}$
- Actuator, position indicator	$\leq 80^{\circ}\text{C}$
- Solenoid	$\leq 50^{\circ}\text{C}$
Heating and cooling rate	$\leq 30^{\circ}\text{C h}^{-1}$
Material	
- Valve body	ENAW-5083(3.3547)/ENAW-6060(3.3206)
- Plate	ENAW-5083(3.3547)/ENAW-6060(3.3206)
- Sealing ring	ENAW-5083(3.3547)/ENAW-6060(3.3206)
- Feedthrough (parts in contact with media)	AISI 300 and 400 series
Seal	
- Bonnet, plate, dynamic, feedthrough	FKM (VITON)
- Actuator	FKM (VITON), Buna-N
Mounting position	any
Solenoid	24 VDC, 5.4 W (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 250 VAC ≤ 50 VDC
- Current	≤ 2 A ≤ 1.2 A
Valve position	visual (mechanical)

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

Technical data

DN (nom. I.D.)		standard flanges			molecular flow conductance	min. adjustable conductance with 3-position pneumatic actuator	max. differential pressure in closed position	max. differential pressure at opening	compressed air pressure min. - max. overpressure		volume of air cylinder		opening and closing time *)	weight	
mm	inch	ISO-F	JIS	ASA	ls ⁻¹	ls ⁻¹	mbar	mbar	bar	psi	l	ft ³	s	kg	lbs
63	2 ½	63	65	2	440	6.5	1200	30	5-7	75-100	0.2	0.007	3	12	26.5
100	4	100	100	3	1700	7.5	1200	30	5-7	75-100	0.2	0.007	3	12	26.5
160	6	160	150	4	4700	12.5	1200	10	5-7	75-100	0.25	0.009	3	16	35.3
200	8	200	200	6	11000	15	1200	10	5-7	75-100	0.3	0.01	4	21	46.1
250	10	250	250	8	21700	22	1200	5	5-7	75-100	0.35	0.012	4	25	55.1
320	12	320	300	10	32600	54	1200	5	5-7	75-100	0.55	0.02	5	48	106
350	14	**)	350	12	41500	62	1200	5	5-7	75-100	0.6	0.021	5	57	125.7
400	16	400	400	14	61000	69	1200	5	5-7	75-100	0.65	0.023	5.5	60	132.3

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

***) not available

Easy and fast maintenance

Split body design

Removable pendulum plate and sealing ring

No readjustments after the cleaning process



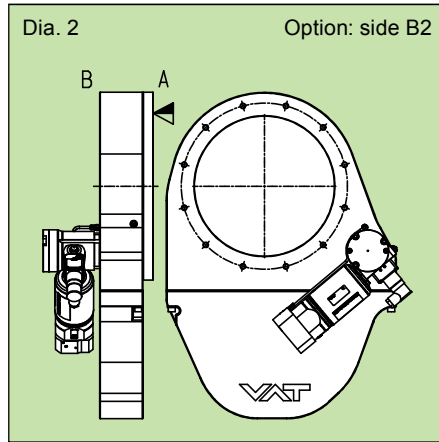
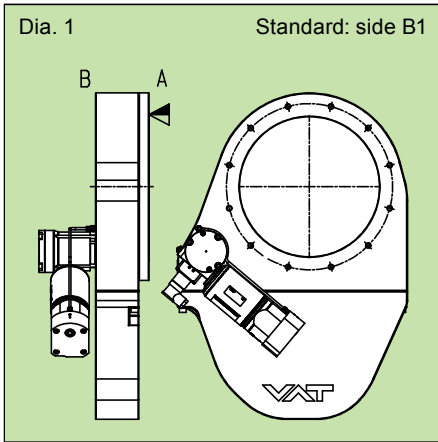
Seal kit

Consisting of plate seal, dynamic seal and 4 g VAT vacuum grease
Ordering No.: see operating manual or price list

Accessories

Fittings for installation of the valve: series 32

Options



Actuator:

- Solenoid for 12, 48 VDC
- 24, 48, 100, 115, 200, 230 V 50/60 Hz
- Actuator on side B2: see diagram 2

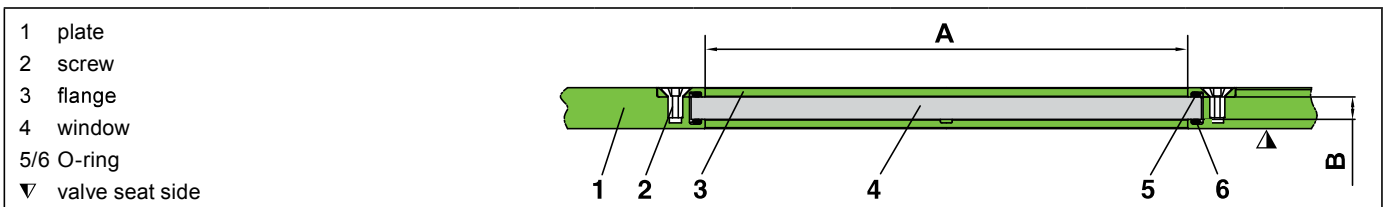
Valve:

- Customer specified flanges
- Heater with insulation and overtemperature switch: see picture 3
- Other sealing materials
- Body hardanodized or nickel-plated
- Helicoils for valve flanges
- Ports in body
- Window in valve plate: see picture 4 and specification below



Ordering information for options: Ordering No. of valve-X (e. g. 16246-PA21-X, X = KF40 port in body)

Valve with window



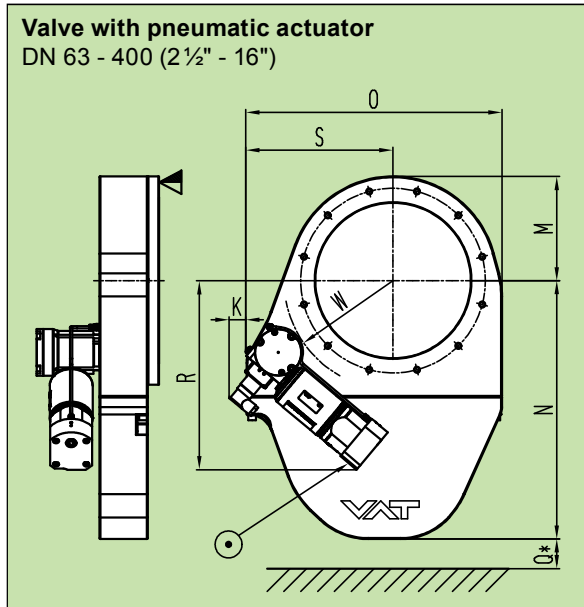
Window material: borosilicate or sapphire
 Seals: FKM (VITON)
 Exchange of window by user possible

The window is put between two elastomer O-rings (5 & 6) and clamped into the valve plate (1) by means of a flange (3)

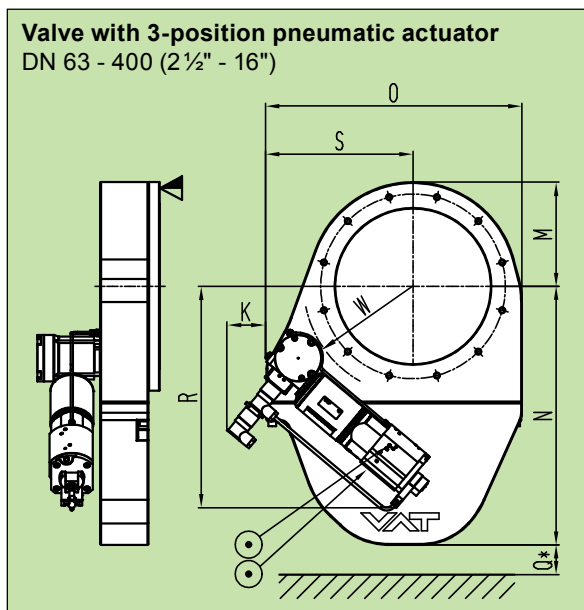
	DN valve	mm	63	100	160	200	250	320	350	400
		inch	2½	4	6	8	10	12	14	16
Window made of borosilicate	optically free diameter «A»	mm	63	80	90	130	130	150	150	150
		inch	2.48	3.15	3.54	5.12	5.12	5.91	5.91	5.91
Window made of sapphire	thickness of glass «B»	mm	5	5	6	6	6	8	8	8
		inch	0.20	0.20	0.24	0.24	0.24	0.31	0.31	0.31
Window made of sapphire	optically free diameter «A»	mm	63	80	112	170	200	250	250	250
		inch	2.48	3.15	4.41	6.69	7.87	9.84	9.84	9.84
Window made of sapphire	thickness of glass «B»	mm	4	4	4	5	6	8	8	8
		inch	0.16	0.16	0.16	0.20	0.24	0.31	0.31	0.31

Above specification includes the largest possible windows. Smaller windows on request.
 Due to the weight of the window, it is not possible to mount any valve in any position.

Main dimensions



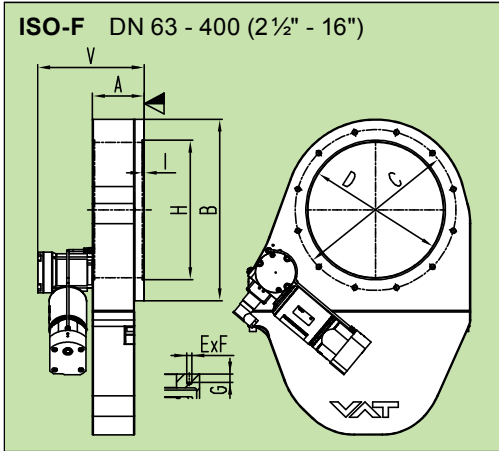
DN	mm	63	100	160	200	250	320	350	400
mm	inch	2½	4	6	8	10	12	14	16
K	mm	10	10	10	10	29	7	-	6
inch		0.39	0.39	0.39	0.39	1.14	0.28	-	0.24
M	mm	95	95	121.5	150	175	214	235	260
inch		3.74	3.74	4.78	5.91	6.89	8.43	9.25	10.24
N	mm	200	200	300	360	434	538	590	655
inch		7.87	7.87	11.81	14.17	17.09	21.18	23.23	25.79
O	mm	266	266	321	370	429	533	579	630
inch		10.47	10.47	12.64	14.57	16.89	20.98	22.8	24.8
Q	mm	50	50	50	50	50	50	50	50
inch		1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97
R	mm	235	235	251	265	312	392	405	428
inch		9.25	9.25	9.88	10.43	12.28	15.43	15.94	16.85
S	mm	166	166	188	214	246	276	300	320
inch		6.54	6.54	7.4	8.43	9.69	10.87	11.81	12.6
W	mm	95	95	122	152.5	185	233	253	285
inch		3.74	3.74	4.8	6	7.28	9.17	9.96	11.22



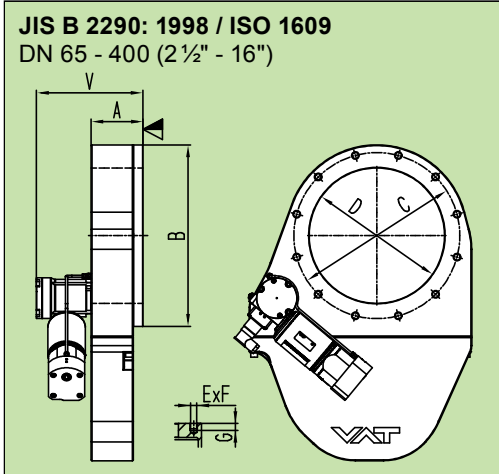
DN	mm	63	100	160	200	250	320	350	400
mm	inch	2½	4	6	8	10	12	14	16
K	mm	34	34	34	34	65	32	24	19
inch		1.34	1.34	1.34	1.34	2.56	1.26	0.94	0.75
M	mm	95	95	121.5	150	175	214	235	260
inch		3.74	3.74	4.78	5.91	6.89	8.43	9.25	10.24
N	mm	200	200	300	360	434	538	590	655
inch		7.87	7.87	11.81	14.17	17.09	21.18	23.23	25.79
O	mm	266	266	321	370	429	533	579	630
inch		10.47	10.47	12.64	14.57	16.89	20.98	22.8	24.8
Q	mm	50	50	50	50	50	50	50	50
inch		1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97
R	mm	282	282	304	318	363	424	438	460
inch		11.1	11.1	11.97	12.52	14.29	16.69	17.24	18.11
S	mm	166	166	188	213.5	246	276	300	320
inch		6.54	6.54	7.4	8.41	9.69	10.87	11.81	12.6
W	mm	95	95	122	152.5	185	233	253	285
inch		3.74	3.74	4.8	6	7.28	9.17	9.96	11.22

- ▽ valve seat side
- ⊙ compressed air connection
- * required for dismantling

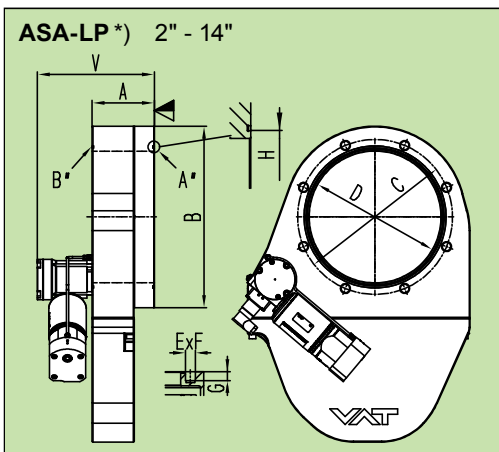
Flange dimensions



DN	mm	63	100	160	200	250	320	350	400
	inch	2½	4	6	8	10	12	14	16
A	mm	70	70	88	88	100	120	not available	128
	inch	2.76	2.76	3.46	3.46	3.94	4.72		5.04
B	mm	190	190	242	300	350	428		520
	inch	7.48	7.48	9.53	11.81	13.78	16.85		20.47
C	mm	110	145	200	260	310	395		480
	inch	4.33	5.71	7.87	10.24	12.2	15.55		18.9
D	mm	63	100	150	200	261	318		400
	inch	2.48	3.94	5.91	7.87	10.28	12.52		15.75
E x F		4 x M8	8 x M8	8 x M10	12 x M10	12 x M10	12 x M12		16 x M12
G	mm	12	12	14	15	16	18		20
	inch	0.47	0.47	0.55	0.59	0.63	0.71	1.57	
H	mm	70	102	153	213	-	-	-	
	inch	2.76	4.02	6.02	8.39	-	-	-	
I	mm	3	3	5	5	-	-	-	
	inch	0.12	0.12	0.2	0.2	-	-	-	
V	mm	185	185	200	200	205	241	250	
	inch	7.28	7.28	7.87	7.87	8.07	9.49	9.84	



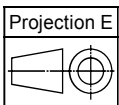
DN	mm	65	100	150	200	250	300	350	400
	inch	2½	4	6	8	10	12	14	16
A	mm	70	70	88	88	100	120	126	128
	inch	2.76	2.76	3.46	3.46	3.94	4.72	4.96	5.04
B	mm	190	190	242	300	350	428	470	520
	inch	7.48	7.48	9.53	11.81	13.78	16.85	18.5	20.47
C	mm	120	160	210	270	320	370	420	480
	inch	4.72	6.3	8.27	10.63	12.6	14.57	16.54	18.9
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	15	16	18	16	25
	inch	0.47	0.47	0.55	0.59	0.63	0.71	0.63	0.98
V	mm	185	185	200	200	205	241	247	250
	inch	7.28	7.28	7.87	7.87	8.07	9.49	9.72	9.84



		2"	3"	4"	6"	8"	10"	12"	14"
		ASA-LP	ASA-LP	ASA-LP	ASA-LP	ASA-LP	ASA-LP	ASA-LP	ASA-LP
		2.0	3.0	4.0	6.0	8.0	10.0	12.0	14.0
		ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
A	mm	70	70	88	88	120	120	126	128
	inch	2.76	2.76	3.46	3.46	4.72	4.72	4.96	5.04
B	mm	190	190	242	300	350	428	470	520
	inch	7.48	7.48	9.53	11.81	13.78	16.85	18.5	20.47
C	mm	120.7	152.4	190.5	241.3	298.5	362	432	476
	inch	4.75	6	7.5	9.5	11.75	14.25	17	18.74
D	mm	63	100	150	200	254	300	350	400
	inch	2.48	3.94	5.91	7.87	10	11.81	13.78	15.75
E x F		4 x ¾"	4 x ¾"	8 x ¾"	8 x ¾"	8 x ¾"	12 x ¾"	12 x ¾"	12 x ¾"
		16 UNC	16 UNC	16 UNC	10 UNC	10 UNC	10 UNC	10 UNC	10 UNC
G	mm	12	12	14	15	16	18	16	20
	inch	0.47	0.47	0.55	0.59	0.63	0.71	0.63	0.79
H	mm	88.9	120.65	158.75	206.4	266.7	317.5	368.5	419.1
	inch	3.5	4.75	6.25	8.13	10.5	12.5	14.5	16.5
V	mm	185	185	200	200	225	241	247	250
	inch	7.28	7.28	7.87	7.87	8.86	9.49	9.72	9.84
O-Ring		88.49	120.24	158.34	202.79	266.29	304.17	354.97	405.26
I.D. x d		x 3.53	x 3.53	x 3.53	x 3.53	x 3.53	x 5.33	x 5.33	x 5.33

*) with or without O-ring groove

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



▼ valve seat side

Series 168

Compact gate valve for large coating systems and FPD production systems



Body material

aluminum

Pneumatic actuator

double acting
with position indicator
without solenoid

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

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

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

3-position pneumatic actuator

with position indicator
without solenoid

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

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

Accessories

Fittings for installation of the valve: series 32

Seal kit

Consisting of plate seal, bonnet seal and rotary feedthrough seal

Ordering No.: see operating manual or price list

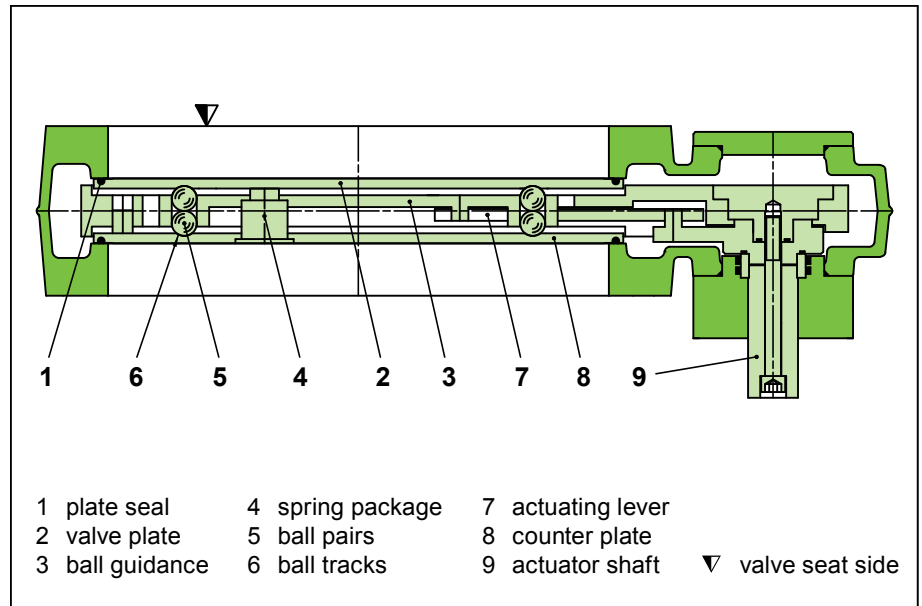
Sealing materials

Plate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Rotary feedthrough



Features

- Compact
- Low vibration operation
- Easy and fast maintenance

Technical data

Continued next page

Leak rate: body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-7}$ mbar to 1.2 bar (abs)
Differential pressure on the plate	≤ 1.2 bar in either direction
Differential pressure at opening	≤ 30 mbar
Cycles until first service	100 000
Temperature ¹⁾	
- Valve body	$\leq 120^{\circ}\text{C}$
- Actuator, position indicator	$\leq 80^{\circ}\text{C}$
- Solenoid	$\leq 50^{\circ}\text{C}$
Heating and cooling rate	$\leq 30^{\circ}\text{C h}^{-1}$
Material	
- Valve body	EN AC-42100 (3.2371)
- Plate	EN AW-6060 (3.3206)
- Mechanism (parts in contact with media)	AISI 420 (1.4034), AISI 304 (1.4301), AISI 301 (1.4310), AISI 303 (1.4305)
Seal	
- Bonnet, plate, feedthrough	FKM (VITON)
- Actuator	FKM (VITON), Buna-N
Mounting position	any
Solenoid	24 VDC, 5.4 W (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 250 VAC ≤ 50 VDC
- Current	≤ 5 A ≤ 3 A
Valve position	visual (mechanical)

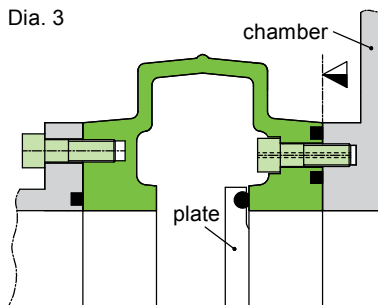
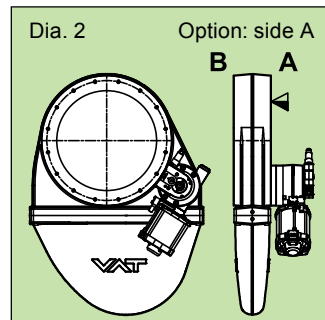
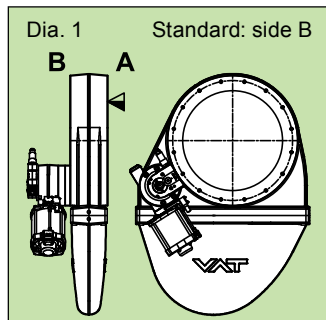
¹⁾ Maximum values: depending on operating conditions and sealing materials

Technical data

DN (nom. I.D.)		standard flanges			molecular flow conductance	min. adjustable conductance with 3-position pneum. actuator	max. differential pressure in closed position	compressed air pressure min. - max. overpressure			volume of air cylinder		opening and closing time *)	weight	
mm	inch	ISO-F	JIS	ASA	ls ⁻¹	ls ⁻¹	mbar	bar	psi	l	ft ³	s	kg	lbs	
400	16	400	400	14	50 000	150	1200	5-7	75-100	2	0.071	12	85	187	
457	16	-	-	16	68 000	200	1200	5-7	75-100	3.3	0.116	14	125	358	
500	20	500	500	16	90 000	200	1200	5-7	75-100	3.3	0.116	14	115	330	

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

Options



▼ valve seat side

Actuator:

- Solenoid for 12, 24, 48 VDC
24, 48, 100, 115, 200, 230 V 50/60 Hz
- Actuator on side A (valve seat side); see diagram 2

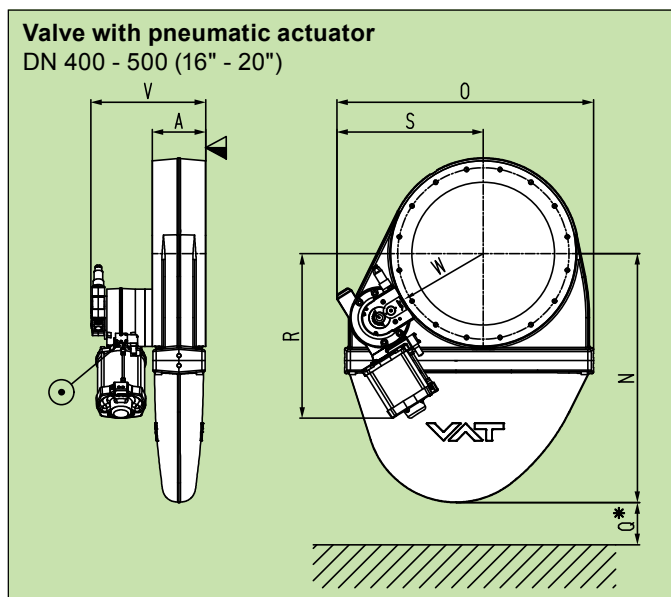
Valve:

- Customer specified flanges
- Splinter shield grid for turbo pump
- Window in plate
- Ports in body
- For direct mounting to chamber (diagram 3)

Ordering information for options:

Ordering No. of valve-X (e. g. 16854-PA24-X, X = KF40 port in body)

Main dimensions



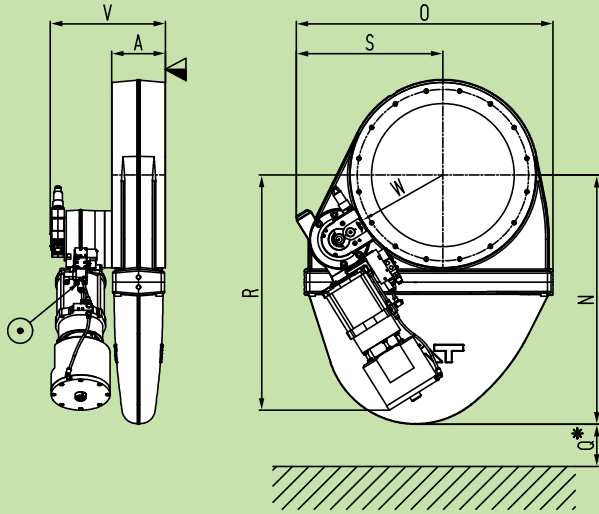
DN	mm	inch	400	500
A	mm	inch	150	170
N	mm	inch	700	855
O	mm	inch	725	855
Q	mm	inch	200	230
R	mm	inch	465	615
S	mm	inch	415	470
V	mm	inch	330	350
W	mm	inch	260	320

▼ valve seat side

⊙ compressed air connection

* required for dismantling

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

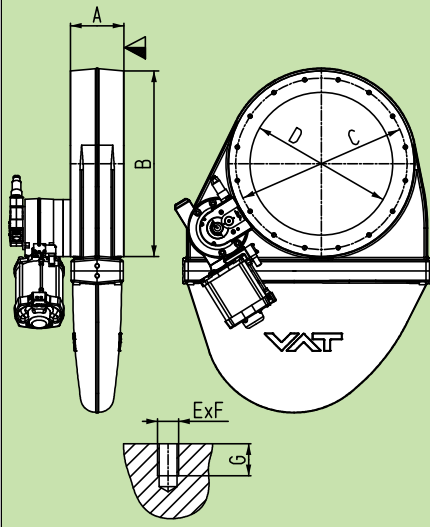


DN	mm inch	400 16	500 20
A	mm inch	150 5.91	170 6.69
N	mm inch	700 27.56	855 33.66
O	mm inch	725 28.54	855 33.66
Q	mm inch	200 7.87	230 9.06
R	mm inch	665 26.18	810 31.89
S	mm inch	415 16.34	470 18.5
V	mm inch	330 12.99	350 13.78
W	mm inch	260 10.24	320 12.6

▼ valve seat side ⊙ compressed air connection
* required for dismantling

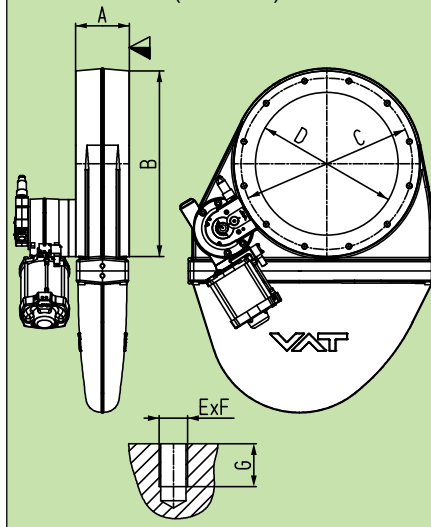
Flange dimensions

ISO-F DN 400 - 500 (16" - 20")



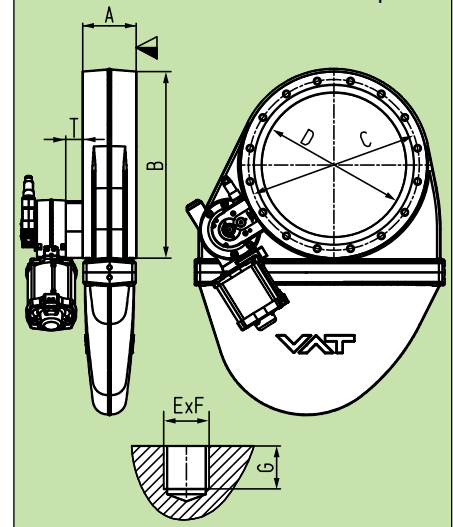
DN	mm inch	400 16	500 20
A	mm inch	150 5.91	170 6.69
B	mm inch	520 20.47	625 24.61
C	mm inch	480 18.9	580 22.83
D	mm inch	400 15.75	501.2 19.73
E x F		16 x M12	16 x M12
G	mm inch	18 0.71	18 0.71

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

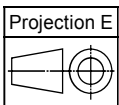


DN	mm inch	400 16	500 20
A	mm inch	150 5.91	170 6.69
B	mm inch	520 20.47	625 24.61
C	mm inch	480 18.9	585 23.03
D	mm inch	400 15.75	500.2 19.69
E x F		12 x M16	16 x M16
G	mm inch	18 0.71	24 0.94

ASA 16" - 20" / 14" and 18" on request



		16" ASA	20" ASA
		16.0 ANSI	20.0 ANSI
A	mm inch	170 6.69	170 6.69
B	mm inch	625 24.61	700 27.56
C	mm inch	540 21.25	635 25
D	mm inch	457 17.99	500.2 19.69
E x F		16 x 1" 8 UNC	20 x 1" 8 UNC
G	mm inch	20 0.79	24 0.94
T	mm inch	-	42 1.65



▼ valve seat side

For contaminating processes
 High cycle life even under
 contaminating conditions
 Easy to service, quick exchange
 of gate seal



Body material

stainless steel

Manual actuator

handwheel

DN		Ordering numbers				
mm	inch	CF-F metric threads	CF-F UNF threads	ISO-KF ¹⁾ ISO-F ²⁾	ASA-LP	JIS
40	1 ½	17432-CE01	17432-UE01	17432-KE01 ¹⁾		
63	2 ½	17236-CE01	17236-UE01	17236-PE01 ²⁾	17236-TE01	17236-JE01
100	4	17240-CE01	17240-UE01	17240-PE01 ²⁾	17240-TE01	17240-JE01
160	6	17244-CE01	17244-UE01	17244-PE01 ²⁾	17244-TE01	17244-JE01
200	8	17246-CE01	17246-UE01	17246-PE01 ²⁾	17246-TE01	17246-JE01
250	10	17248-CE01	17248-UE01	17248-PE01 ²⁾	17248-TE01	17248-JE01
320	12	on request	on request	17250-PE01 ²⁾	17250-TE01	17250-JE01

with hand lever (DN 63 - 320 only): 172 E06

with position indicator: 17 E08

Pneumatic actuator

double acting
 with position indicator
 with solenoid

DN		Ordering numbers (specify control voltage)				
mm	inch	CF-F metric threads	CF-F UNF threads	ISO-KF ¹⁾ ISO-F ²⁾	ASA-LP	JIS
40	1 ½	17432-CE44	17432-UE44	17432-KE44 ¹⁾		
63	2 ½	17236-CE44	17236-UE44	17236-PE44 ²⁾	17236-TE44	17236-JE44
100	4	17240-CE44	17240-UE44	17240-PE44 ²⁾	17240-TE44	17240-JE44
160	6	17244-CE44	17244-UE44	17244-PE44 ²⁾	17244-TE44	17244-JE44
200	8	17246-CE44	17246-UE44	17246-PE44 ²⁾	17246-TE44	17246-JE44
250	10	17248-CE44	17248-UE44	17248-PE44 ²⁾	17248-TE44	17248-JE44
320	12	on request	on request	17250-PE44 ²⁾	17250-TE44	17250-JE44

without position indicator, without solenoid: 17 E14

with position indicator, without solenoid: 17 E24

without position indicator, with solenoid: 17 E34 (specify control voltage)

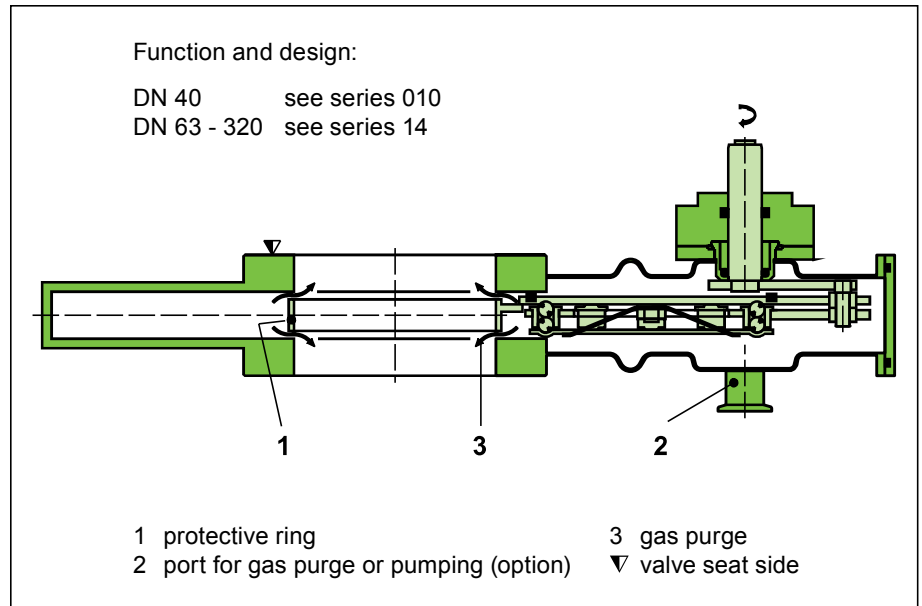
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON) (DN 40: metal)

Feedthrough

FKM (VITON) / rotary feedthrough with pump port



Features

Protective ring (option: port for gas purge)

Spreadable protective ring (on request)

VATLOCK configuration (see glossary)

Technical data

Continued next page

Leak rate: body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹	
Pressure range:	DN 40 - 200	$1 \cdot 10^{-8}$ mbar to 2 bar (abs)
	DN 250 - 320	$1 \cdot 10^{-8}$ mbar to 1.2 bar (abs)
Differential pressure on the gate:		
	DN 40 - 200	≤ 2 bar in either direction
	DN 250 - 320	≤ 1.2 bar in either direction
Differential pressure at opening		
- in closing and opening direction		≤ 30 mbar
Cycles until first service:		
	DN 40	20 000 (standard)
	DN 63 - 320	100 000
Temperature ¹⁾		
- Valve body DN 40 / 63 - 320		$\leq 200^{\circ}\text{C}$ / $\leq 150^{\circ}\text{C}$
- Manual actuator, position indicator		$\leq 80^{\circ}\text{C}$
- Pneumatic actuator, motor, solenoid		$\leq 50^{\circ}\text{C}$
Material		
- Valve body, valve gate		AISI 440C (1.4125) / 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:	DN 40	metal / FKM (VITON)
	DN 63 - 320	FKM (VITON) / FKM (VITON)
Mounting position		any
Solenoid		24 VDC, 2.5 W (others see «Options»)
Position indicator: contact rating		
- Voltage		≤ 250 VAC ≤ 50 VDC
- Current		≤ 2 A ≤ 3 A
Valve position		visual (mechanical)

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

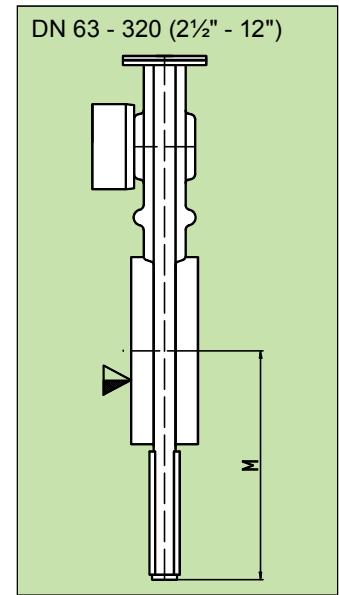
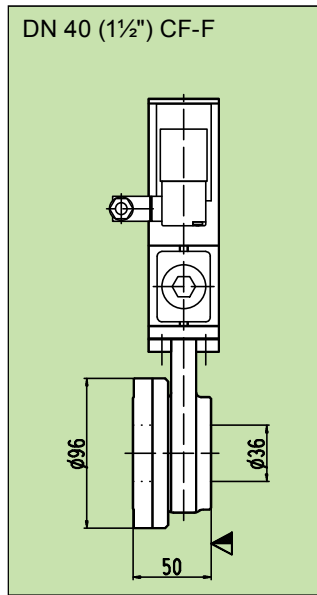
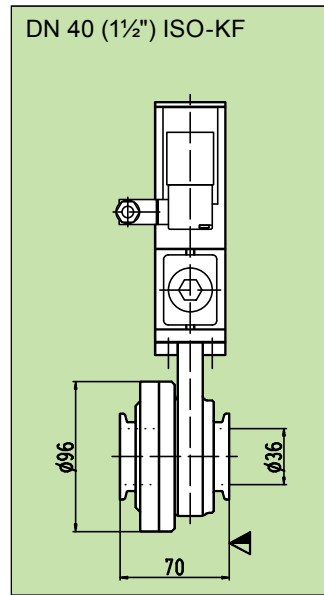
Dimensions

DN 40: see series 010

DN 63 - 320: see series 14

Exceptions:
 - flange-to-flange distance
 - diameter of body

Exceptions:
 - length «M»



▽ valve seat side

DN		M	
mm	inch	mm	inch
63	2 1/2	151	5.94
100	4	200	7.87
160	6	279	10.98
200	8	354	13.94
250	10	455	17.91
320	12	565	22.24

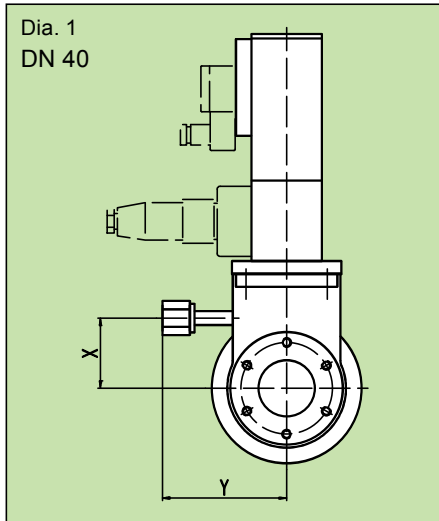
Actuator positions

See series 14, page 46

Technical data

DN (nominal I. D.)		standard flanges				molecular flow conductance	angle of rotation per stroke	manual				pneumatic						motor							
								hand lever		handwheel		compressed air pressure min. - max. overpressure	volume of air cylinder		closing or opening time	weight	power required	closing or opening time	weight						
mm	inch	CF-F	ISO-F	ASA-LP	JIS	ls ⁻¹	o	kg	lbs	n	kg		lbs	bar						psi	l	ft ³	s	kg	lbs
40	1 1/2	2 3/4	40	-	-	220/160	-	-	-	5	2.5	5.5	4.5 - 7	65 - 100	0.06	.002	0.7	2.8	6.2						
63	2 1/2	4 1/2	63	2	65	440	130	9	20	41	11	24	4 - 7	55 - 100	0.13	.005	1.5	11	25	21	4	13	29		
100	4	6	100	3	100	1700	130	15	33	41	17	38	4 - 7	55 - 100	0.13	.005	1.5	17	39	21	4	19	42		
160	6	8	160	4	150	5000	130	28	62	37	30	67	4 - 7	55 - 100	0.28	.01	2.5	31	68	85	5	33	73		
200	8	10	200	6	200	12000	130	37	81	37	39	86	4 - 7	55 - 100	0.28	.01	2.5	39	87	85	5	42	92		
250	10	12	250	8	250	22000	130	76	167	48	78	172	4 - 7	55 - 100	0.75	.025	4	80	177	160	6	86	189		
320	12		320	10	300	30000	130	132	291	48	134	296	4 - 7	55 - 100	0.75	.025	4	136	300	160	6	142	313		

Options

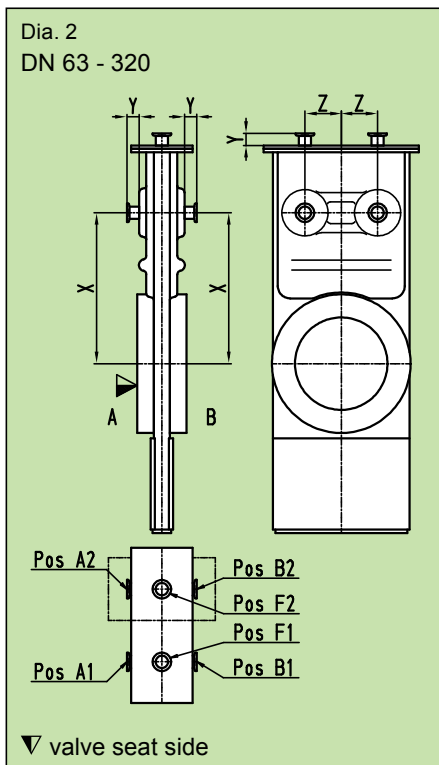


Actuator:

- Solenoid for impulse actuation:
last valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50 Hz
24, 100, 115, 200, 230 V 60 Hz
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Actuator in position 2 or 3 (position 1 is standard)
- Actuator on side B (side A is standard)

Valve:

- Customer specified flanges
- For direct mounting to flat chamber:
Special flange for mounting to chamber wall, standard flange on opposite side
- Watercooled or waterheated flanges
- Heat-resistant mechanism and protective ring on request
- Ports (diagram 1: DN 40 / diagram 2: DN 63 - 320)
for roughing (by-pass), venting or for gauges
- Special ports on request



DN valve	mm inch	40 1 ½	63 2 ½	100 4	160 6	200 8	250 10	320 12
*)	mm inch	VCR ¼	16 ⅝	40 1 ½	40 1 ½	40 1 ½	40 1 ½	40 1 ½
X	mm inch	45 1.77	146 5.75	185 7.28	245 9.65	304.4 11.98	387.3 15.25	482 18.98
Y	mm inch	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
Z	mm inch	–	30 1.18	47.5 1.87	59 2.32	85 3.35	100 3.94	135 5.31

*) recommended port: CF-F or ISO-KF

Ordering information for options:

Ordering No. of valve-X (e. g. 17246-PE44-X, X = port ISO-KF40 in position F2)

Flange dimensions

See series 14, pages 50 and 51

Accessories

Fittings for installation of the valve: series 31, 32 and 33

Seal kit

Consisting of seals for gate, bonnet and rotary feedthrough
Ordering No.: see operating manual or price list

Low shock, damped opening and closing
 Differential pressure possible on either side
 Proven design, used in large research and industrial systems as well as in space simulation



Series 190 HV gate valve



Series 192 UHV gate valve

Body material

stainless steel

Pneumatic actuator

double acting
 with position indicator
 with solenoid

DN		Ordering numbers (specify control voltage)	
mm	inch	Series 190 HV gate valve ISO-F	Series 192 UHV gate valve ISO-F
400	16	19052-PE44	19252-PE44
500	20	19054-PE44	19254-PE44
630	25	19056-PE44	19256-PE44
800	32	19058-PE44	19258-PE44
900	36	19059-PE44	19259-PE44
1000	40	19060-PE44	19260-PE44
1250	50	19062-PE44	19262-PE44

without position indicator, without solenoid: 19 . . . - . E14
 with position indicator, without solenoid: 19 . . . - . E24

Other sizes

on request

Projects for special versions

Our product groups are experienced in developing special requirements concerning material, stability, heaters, etc. On customer request, we can perform special test programs, bakeout 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.

Sealing materials

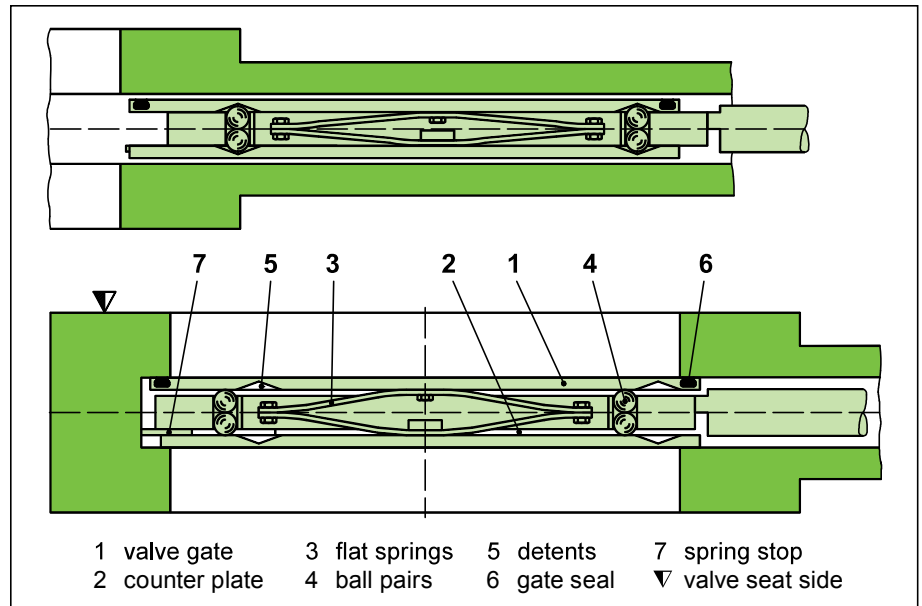
Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

HV gate valve: shaft feedthrough

UHV gate valve: bellows

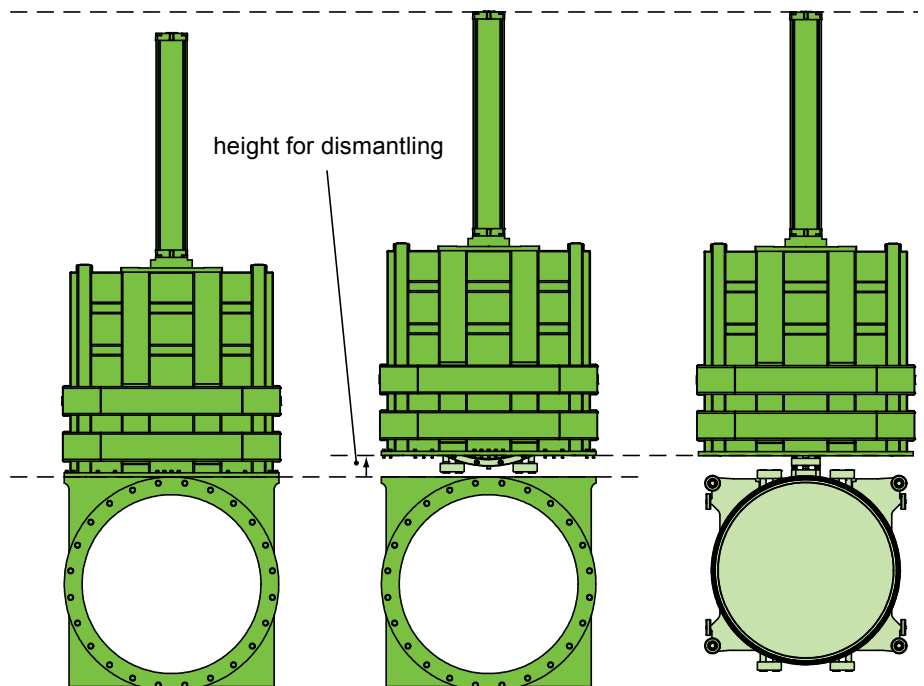


Features

Proved VATLOCK configuration (see glossary)

Assembly in cleanroom according to UHV quality standards

DN 900 - 1250 HV with split body: hence extremely short height for dismantling and convenient maintenance (see illustration below)



- Move valve gate to the position «open»

- Unscrew actuator part of body and lift it off from flange part (flange part remains in the system)

- Move valve gate to the position «closed» and carry out maintenance work

Technical data

Leak rate: body, valve seat	< $1 \cdot 10^{-9}$ mbar $l s^{-1}$
Pressure range	
- HV gate valve	$1 \cdot 10^{-7}$ mbar to 1 bar (abs)
- UHV gate valve	$1 \cdot 10^{-9}$ mbar to 1 bar (abs)
Differential pressure on the gate	≤ 1 bar in either direction
Differential pressure at opening	
- DN 400 - 500	≤ 20 mbar
- DN 630 - 1250	≤ 10 mbar
Cycles until first service	
- DN 400 - 500 HV	100 000
- DN 630 HV / 400 - 630 UHV	20 000
- DN 800 - 1250 HV + UHV	10 000
Temperature ¹⁾	
- Valve body	$\leq 150^{\circ}C$
- Pneumatic actuator	$\leq 50^{\circ}C$
- Solenoid	$\leq 50^{\circ}C$
- Position indicator	$\leq 80^{\circ}C$
Heating and cooling rate	
- 400 - 630	$\leq 30^{\circ}C h^{-1}$
- 800 - 1250	$\leq 5^{\circ}C h^{-1}$
Material	
- Valve body	AISI 304 (1.4301)
- Bellows (UHV gate valve only)	AISI 316L (1.4435) or AISI 304L (1.4306)
- Valve gate, counter-plate	EN AW-6060 (3.3206), AISI 304 (1.4301)
- Mechanism	EN AW-6060 (3.3206), AISI 304 (1.4301), Nimonic, AISI 420 (1.4034), AISI 301 (1.4310)
Seal: bonnet, gate	FKM (VITON)
Mounting position	actuator horizontal or vertical («actuator down» on request)
Solenoid	24 VDC, 8 W (others see «Options»)
Position indicator: contact rating	
- Voltage	<u>HV</u> ≥ 240 VAC ≥ 170 VDC
- Current	≥ 0.18 A
- Power	max. 10 W
	<u>UHV</u> 250 VAC 10 A (3A) AC -

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

DN (nominal I. D.)		molecular flow conductance	compressed air pressure min. - max. overpressure				volume of air cylinder				closing or opening time		weight			
			HV		UHV		HV		UHV		HV	UHV	HV		UHV	
mm	inch		bar	psi	bar	psi	l	ft ³	l	ft ³	s	s	kg	lbs	kg	lbs
400	16	50 000	5 - 7	70 - 100	5 - 9	70 - 130	5.9	0.208	1.8	0.63	10	12	140	309	160	353
500	20	90 000	5 - 7	70 - 100	5 - 9	70 - 130	6.8	0.240	3	0.11	12	12	200	441	235	518
630	25	190 000	5 - 7	70 - 100	6 - 9	85 - 130	8.6	0.304	4.7	0.16	15	18	320	706	405	893
800	32	320 000	5 - 7	70 - 100	6 - 9	85 - 130	17.9	0.632	11	0.28	20	80	580	1279	710	1565
900	36	405 000	5 - 7	70 - 100	6 - 9	85 - 130	20.8	0.735	15	0.33	23	100	1000	2200	1400	3086
1000	40	550 000	5 - 7	70 - 100	6 - 9	85 - 130	21.9	0.773	18	0.38	25	110	1200	2645	1700	3748
1250	50	900 000	5 - 7	70 - 100	6 - 9	85 - 130	43	1.519	25.5	0.95	30	120	1900	4189	2500	5512

Options

Actuator:

- Solenoid for impulse actuation:
 - Power failure: last valve position is maintained
 - Compressed air failure: valve closed - valve remains closed
valve open - valve position is undefined
- Solenoid for impulse actuation and non-return valve:
 - valve position is undefined at power failure and compressed air failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 VDC
 - 24, 48, 100, 115, 200, 220 V / 50 Hz
 - 24, 100, 115, 200, 220 V / 60 Hz
- Mechanical position indicator (Series 190)
- Lockable actuator

Valve:

- All standard flanges available (ISO, ASA, ASA-LP, JIS)
- Customer specified flanges
- Water-cooled flanges
- Metal static seals
- Ports for roughing (by-pass), venting or for gauges
- Bake-out equipment
- 3-position actuator
- Protective ring
- Heat protection shield
- Other sizes

Ordering information for options:

Ordering No. of valve-X (e. g. 19254-PE44-X,
X = port as per enclosed dimensional drawing)

Accessories

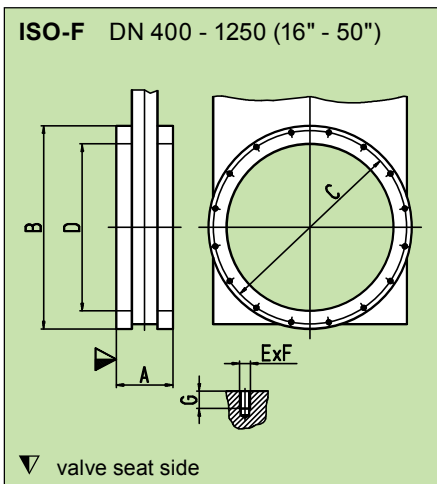
Blank flanges for testing and bake-out

Seal kit

Consisting of seals for bonnet, gate and actuator

Ordering No.: see operating manual

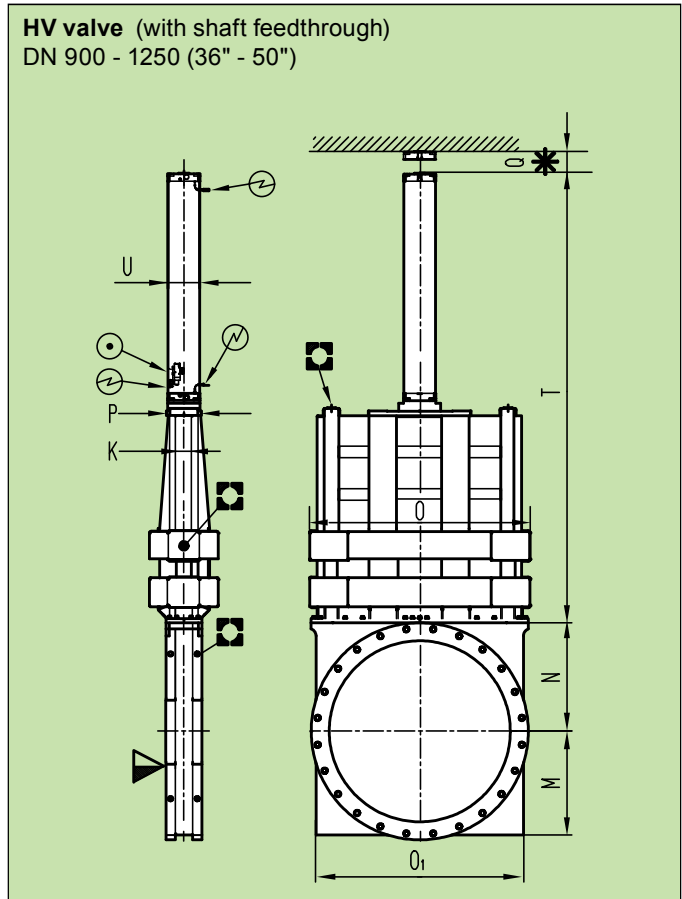
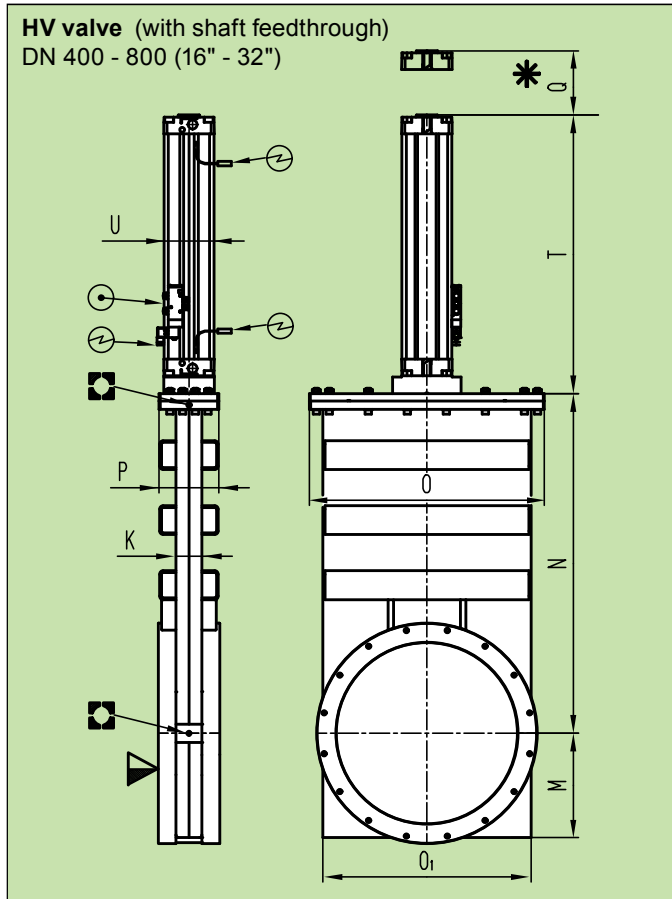
Flange dimensions



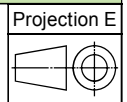
		HV and UHV valve						
DN	mm inch	400 16	500 20	630 25	800 32	900 36	1000 40	1250 50
A	mm inch	150 5.9	170 6.69	180 7.09	220 8.66	220 8.66	240 9.45	260 10.24
B	mm inch	510 20.08	610 24.02	780 30.71	960 37.8	– –	1168 46	1500 59.05
C	mm inch	480 18.9	580 22.83	720 28.35	890 35.04	– –	1090 42.91	1370 53.94
D	mm inch	400 15.75	501 19.72	651 25.63	800 31.5	900 35.4	1000 39.37	1250 49.21
E x F		16 x M12	16 x M12	20 x M12	24 x M12	–	32 x M12	32 x M16
G	mm inch	20 0.79	20 0.79	20 0.79	20 0.79	– –	20 0.79	25 0.98

Dimensions for ASA and JIS flanges on request

Main dimensions



- ▽ valve seat side
- ◻ for attachment
- * required for dismantling
- ⊙ leak detection hole
- ⊙ compressed air connection
- ⊕ electrical connection

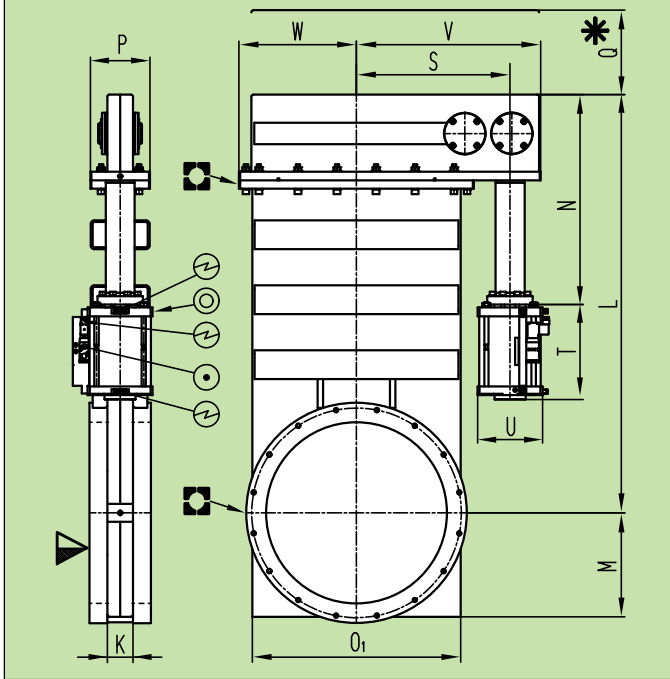


DN	mm	400	500	630	800
	inch	16	20	25	32
K	mm	67	77	80	98
	inch	2.64	3.03	3.15	3.85
M	mm	233	291	366	446
	inch	9.17	11.46	14.41	17.56
N	mm	794	940	1195	1440
	inch	31.26	37	47.05	56.69
O	mm	525	650	806	990
	inch	20.67	25.6	31.73	38.98
O ₁	mm	467	582	738	920
	inch	18.39	22.91	29.05	36.22
P	mm	148	165	240	340
	inch	5.83	6.5	9.45	13.39
Q	mm	600	700	850	1050
	inch	23.62	27.56	33.46	41.34
T	mm	670	773	930	1108
	inch	26.34	30.44	36.61	43.62
U	mm	115	115	115	150
	inch	4.53	4.53	4.53	5.9

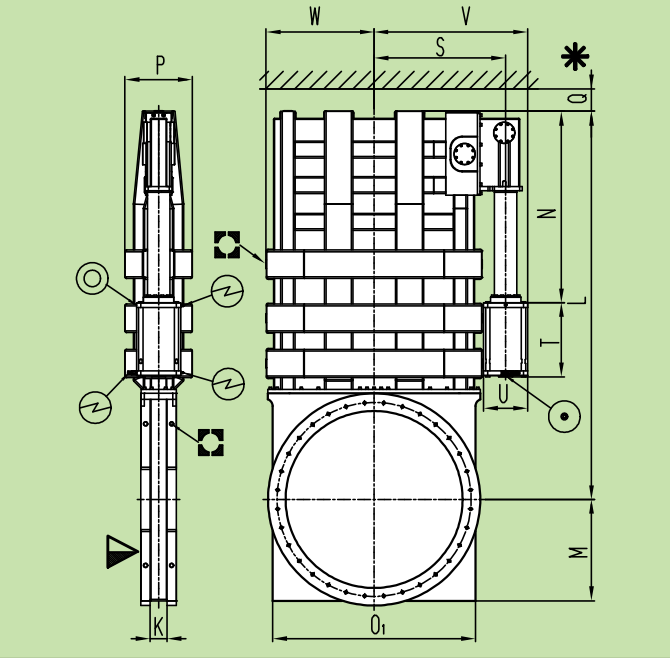
DN	mm	900	1000	1250	
	inch	36	40	50	
K	mm	87	116	116	
	inch	3.43	4.57	4.57	
M	mm	512	562	716	
	inch	20.16	22.13	28.19	
N	mm	530	584	750	
	inch	20.87	22.99	29.50	
O	mm	1120	1209	1529	
	inch	44.09	47.60	60.20	
O ₁	mm	1024	1124	1433	
	inch	40.31	44.25	56.42	
P	mm	210	240	240	
	inch	8.27	9.45	9.45	
Q	mm	100	150	150	
	inch	3.94	5.91	5.91	
T	mm	2376	2497	3114	
	inch	93.54	98.31	122.60	
U	mm	184	218	218	
	inch	7.24	8.58	8.58	

Main dimensions

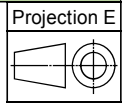
UHV valve (with bellows feedthrough)
DN 400 - 800 (16" - 32")



UHV valve (with bellows feedthrough)
DN 1000 - 1250 (40" - 50")



- ▽ valve seat side
- for attachment
- * required for dismantling
- ⊙ leak detection hole
- ⊕ compressed air connection
- ⊖ electrical connection



DN	mm	400	500	630	800
inch		16	20	25	32
K	mm	70	77	80	96
inch		2.76	3.03	3.15	3.78
L	mm	958	1160	1433	1750
inch		37.72	45.67	56.41	68.89
M	mm	235	291	366	460
inch		9.25	11.46	14.41	18.11
N	mm	490	591	682	1050
inch		19.29	23.26	26.53	41.34
O1	mm	470	582	738	920
inch		18.5	22.91	29.06	36.22
P	mm	150	165	240	340
inch		5.91	6.5	9.45	13.39
Q	mm	600	1400	1600	1050
inch		23.62	55.12	62.99	41.34
S	mm	340	425	503	626
inch		13.39	16.73	19.8	24.64
T	mm	225	255	272	373
inch		8.86	10.03	10.7	14.68
U	mm	180	180	220	262
inch		7.09	7.09	8.66	10.31
V	mm	470	524	630	757
inch		18.5	20.63	24.8	29.8
W	mm	263	325	417	505
inch		10.35	12.79	16.41	19.88

DN	mm	1000	1250		
inch		40	50		
K	mm	106	122		
inch		4.17	4.8		
L	mm	2182	2712		
inch		85.9	106.77		
M	mm	560	712		
inch		22.05	28.03		
N	mm	1100	1322		
inch		43.3	52.04		
O1	mm	1120	1424		
inch		44.09	56.06		
P	mm	420	482		
inch		16.53	18.97		
Q	mm	1250	1600		
inch		49.21	62.99		
S	mm	800	932		
inch		31.49	36.69		
T	mm	425	525		
inch		16.73	20.66		
U	mm	324	312		
inch		12.75	12.28		
V	mm	1021	1088		
inch		40.19	42.83		
W	mm	610	760		
inch		24.02	29.92		

Series 200 / 202

Manual actuator,
with bellows feedthrough

Compact alternative to gate valves

Only for applications in clean vacuum systems because of exposed valve mechanism



Body material

aluminum or stainless steel

Manual actuator

easy 1/2 turn operation

DN		Ordering numbers			
mm	inch	Series 200 with standard body		Series 202 with extended body	
		aluminum ISO-F	stainless steel CF-F metric	aluminum ISO-F	stainless steel CF-F metric
63	2 1/2	20036-PA04	20036-CE04	20236-PA04	20236-CE04
100	4	20040-PA04	20040-CE04	20240-PA04	20240-CE04
160	6	20044-PA04	20044-CE04	20244-PA04	20244-CE04

Pneumatic actuator

See series 203 / 204, pages 76 - 79

Technical data

further technical data on request

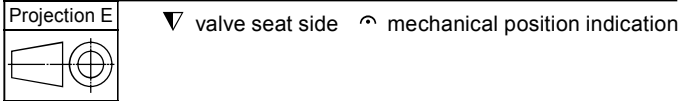
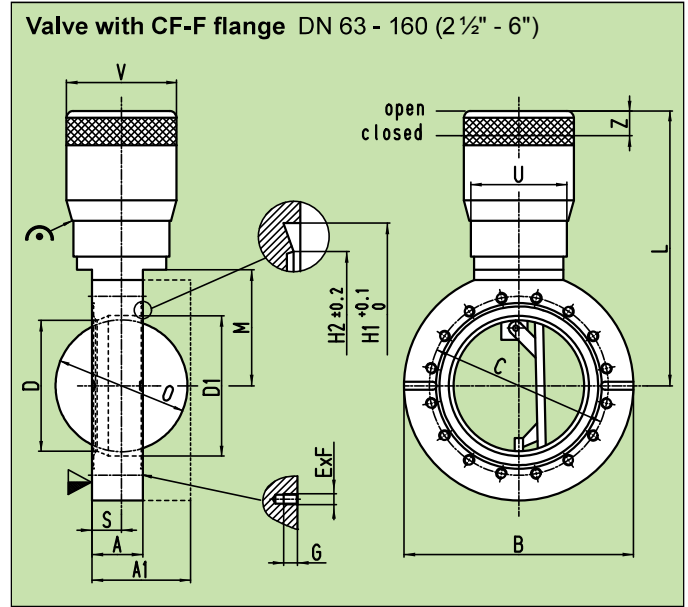
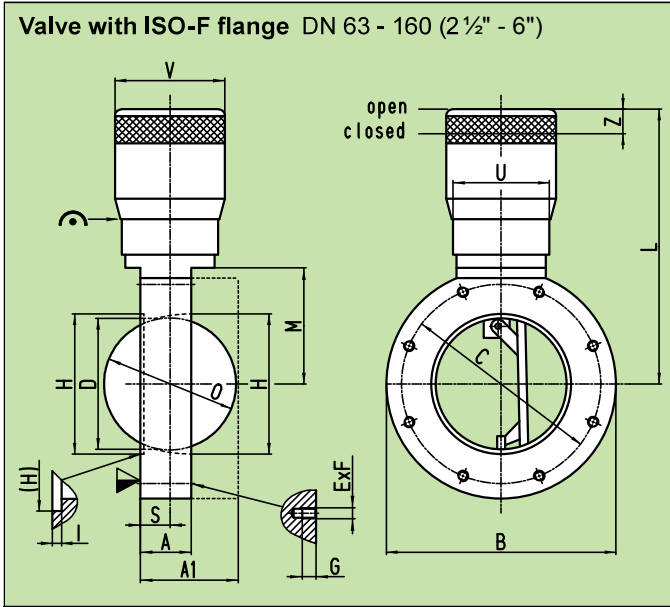
Leak rate: body / valve seat	$< 5 \cdot 10^{-10} / < 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-9} \text{ mbar}$ to 1.2 bar (abs)
Differential pressure on the plate	$\leq 1.2 \text{ bar}$ in either direction
Differential pressure at opening	$\leq 30 \text{ mbar}$
Cycles until first service	10000 (under clean conditions)
Temperature ¹⁾ : body, actuator	$\leq 150^\circ\text{C}$
Material	
- Aluminum body ISO-F	ENAW-6060 (3.3206), ENAW-6061 (3.3211), ENAW-6063 (3.3206), ENAW-6082 (3.2315)
- Stainless steel body CF-F	AISI 304 (1.4301)
- Mechanism, valve plate	AISI 304 (1.4301), AISI 304L (1.4306), AISI 420 (1.4034)
- Bellows	AISI 316L (1.4404)
Seal	
- Bonnet	metal
- Plate	FKM (VITON)
Mounting position	any

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

Options & Accessories

On request

Dimensions



A: standard body series 200
A1: extended body series 202

DN	mm inch	63 2 1/2	100 4	160 6
A	mm inch	32 1.26	38 1.5	60 2.36
A1	mm inch	50 1.97	70 2.76	110 4.33
B	mm inch	131 5.16	167 6.57	226 8.9
C	mm inch	110 4.33	145 5.71	200 7.87
D	mm inch	65 2.56	95 3.74	142 5.59
E x F		4 x M8	8 x M8	8 x M10
G	mm inch	10 0.39	16 0.63	15 0.59
H	mm inch	70 2.76	102 4.02	153 6.02
I	mm inch	2.5 0.1	2.5 0.1	4.5 0.18
L	mm inch	145 5.71	190 7.48	245 9.65
M	mm inch	66.5 2.62	84 3.31	113.5 4.47
O	mm inch	67 2.64	96 3.78	144 5.67
S	mm inch	16 0.63	22 0.87	34 1.34
U	mm inch	62 2.44	70 2.76	78 3.07
V	mm inch	70 2.76	80 3.15	90 3.54
Z	mm inch	12 0.47	18 0.71	28 1.1

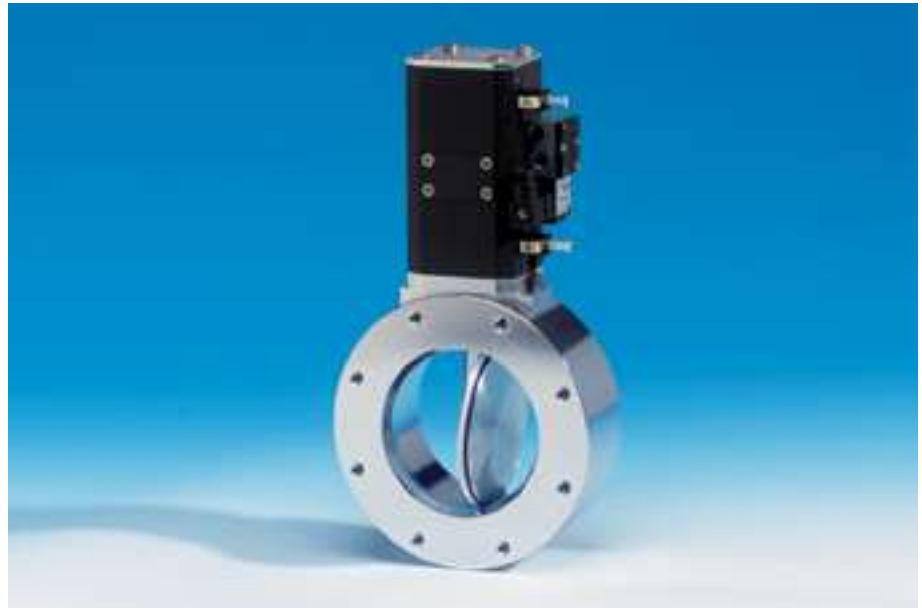
DN	mm inch	63 2 1/2	100 4	160 6
A	mm inch	32 1.26	38 1.5	60 2.36
A1	mm inch	50 1.97	70 2.76	110 4.33
B	mm inch	131 5.16	167 6.57	226 8.9
C	mm inch	92.1 3.63	130.2 5.13	181 7.13
D	mm inch	65 2.56	95 3.74	142 5.59
D1	mm inch	70 2.76	102 4.02	153 6.02
E x F		8 x M8	16 x M8	20 x M8
G	mm inch	12 0.47	10 0.39	12 0.47
H1	mm inch	82.5 3.25	120.65 4.75	171.45 6.75
H2	mm inch	77.4 3.05	115.5 4.55	166 6.54
L	mm inch	145 5.71	190 7.48	245 9.65
M	mm inch	66.5 2.62	84 3.31	113.5 4.47
O	mm inch	67 2.64	96 3.78	144 5.67
S	mm inch	16 0.63	22 0.87	34 1.34
U	mm inch	62 2.44	70 2.76	78 3.07
V	mm inch	70 2.76	80 3.15	90 3.54
Z	mm inch	12 0.47	18 0.71	28 1.1

Series 203 / 204

Pneumatic actuator,
with rotary feedthrough

For contaminating and aggressive
applications, mechanism in the actuator

Compact alternative to gate valves



Body material

aluminum or stainless steel

Pneumatic actuator

double acting
without position indicator
without solenoid

DN		Ordering numbers		
mm	inch	Series 203 with standard body		
		aluminum	stainless steel	
		ISO-F	ISO-F	CF-F
63	2½	20336-PA14	20336-PE14	20336-CE14
80	3	20338-PA14	20338-PE14	
100	4	20340-PA14	20340-PE14	20340-CE14
160	6	20344-PA14	20344-PE14	20344-CE14
200	8	20346-PA14	20346-PE14	20346-CE14

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

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

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

DN		Ordering numbers		
mm	inch	Series 204 with extended body		
		aluminum	stainless steel	
		ISO-F	ISO-F	CF-F
63	2½	20436-PA14	20436-PE14	20436-CE14
80	3	20438-PA14	20438-PE14	
100	4	20440-PA14	20440-PE14	20440-CE14
160	6	20444-PA14	20444-PE14	20444-CE14
200	8	20446-PA14	20446-PE14	20446-CE14

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

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

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

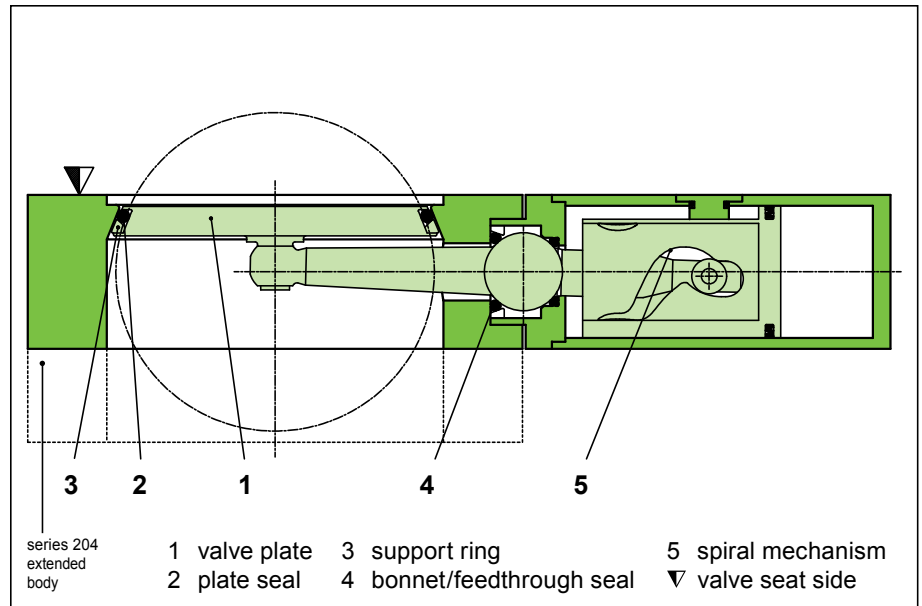
Manual actuator

See series 200 / 202, pages 74 - 75

Sealing materials

Plate: FKM (VITON)

Combined bonnet and feedthrough seal: FKM (VITON)



Features

Rotary feedthrough for high cycle life

No friction of the plate seal: first swing, then tilt

Low particle count

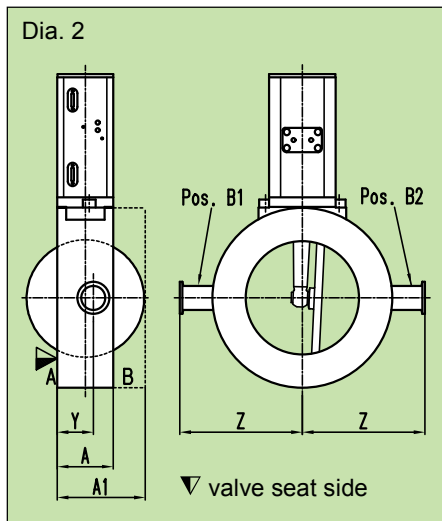
Technical data

Continued next page

Leak rate: 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	≤ 1.2 bar in opening direction ≤ 1.6 bar in closing direction
Differential pressure at opening	≤ 500 mbar
Cycles until first service	100 000 at T _{max} 80°C
Temperature ¹⁾	
- Valve	$\leq 120^\circ\text{C}$ (150°C optional)
- Position indicator	$\leq 80^\circ\text{C}$
- Solenoid	$\leq 50^\circ\text{C}$
Material	
- Plate, body aluminum version	ENAW-6060 (3.3206), ENAW-6061 (3.3211), ENAW-6063 (3.3206), ENAW-6082 (3.2315)
- Plate, body stainless steel version	AISI 304 (1.4301)
- Mechanism	AISI 316L (1.4435), AISI 304 (1.4301)
- Support ring	POM
Seal: bonnet, feedthrough, plate	FKM (VITON)
Mounting position	any
Solenoid	24 VDC, 7.6 W (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 50 VAC / DC
- Current	≤ 0.5 A
- Power	max. 10 W

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

Options



Actuator:

- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50/60 Hz

Valve:

- CF-F flanges with UNF threads
- Body with customer specified flanges
- With soft-pump function (picture 1)
- Port (diagram 2)
 - screwed (aluminum body)
 - welded (stainless steel body)

DN valve	mm inch	63 2 1/2	80 3	100 4	160 6	200 8
recommended port	ISO-KF	16 5/8	25 1	25 1	25 1	40 1 1/2
	¹⁾ CF-F	16 5/8	16 5/8	16 5/8	40 1 1/2	40 1 1/2
Y	mm inch	30 1.18	35 1.38	35 1.38	35 1.38	45 1.77
Z ISO-KF	mm inch	92 3.62	112 4.41	122 4.8	152 5.98	185 7.28
Z CF-F	mm inch	90 3.54	100 3.94	110 4.33	145 5.71	180 7.09

¹⁾ stainless steel body

Ordering information for options:

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

Seal kit

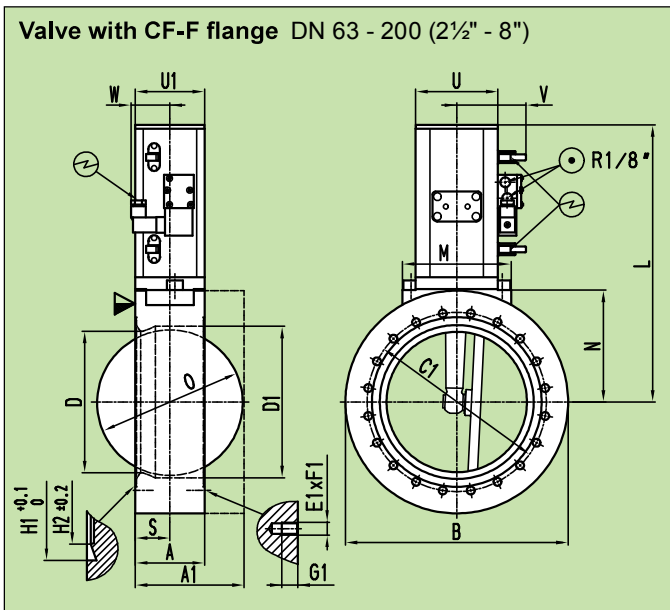
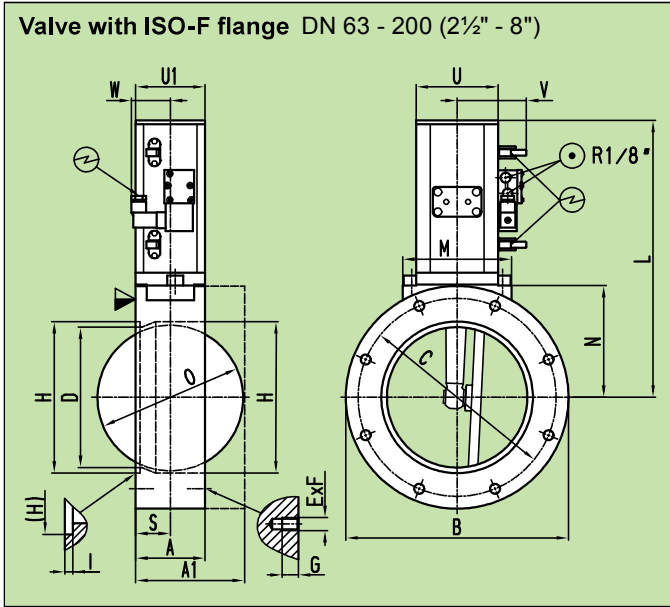
Consisting of seals for plate and feedthrough
Ordering No.: see operating manual or price list

Technical data

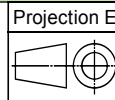
¹⁾ depending on pneumatic installation

	DN (nominal I.D.)		molecular flow conductance	compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time ¹⁾	weight			
	mm	inch		bar	psi	l	ft ³		aluminum body		stainless steel body	
			ls ⁻¹					s	kg	lbs	kg	lbs
Series 203 with standard body	63	2 1/2	550	4 - 7	60 - 100	0.04	0.0014	0.4	2.3	5.1	4.6	10.1
	80	3	700	4 - 7	60 - 100	0.08	0.003	0.8	3.8	8.4	7.5	16.5
	100	4	1400	4 - 7	60 - 100	0.08	0.003	0.8	4	8.8	8	17.6
	160	6	4000	4 - 7	60 - 100	0.13	0.0045	1.4	7.4	16.3	15.6	34.4
	200	8	7500	4 - 7	60 - 100	0.3	0.01	1.8	16.1	35.5	34.2	75.4
Series 204 with extended body	63	2 1/2	450	4 - 7	60 - 100	0.04	0.0014	0.4	2.5	5.5	5.3	11.7
	80	3	600	4 - 7	60 - 100	0.08	0.003	0.8	4.2	9.3	8.5	18.7
	100	4	1050	4 - 7	60 - 100	0.08	0.003	0.8	4.7	10.4	10.1	22.3
	160	6	2550	4 - 7	60 - 100	0.13	0.0045	1.4	9.7	21.4	22.3	49.2
	200	8	4700	4 - 7	60 - 100	0.3	0.01	1.8	21.3	47	20.8	45.9

Dimensions



- ▼ valve seat side
- ⊙ compressed air connection
- ⊕ electrical connection



DN	mm inch	63 2 1/2	80 3	100 4	160 6	200 8
A	mm inch	50 1.97	60 2.36	60 2.36	70 2.76	90 3.54
A1	mm inch	60 2.36	70 2.76	80 3.15	110 4.33	145 5.71
B	mm inch	130 5.12	145 5.71	165 6.5	225 8.86	300 11.81
C	mm inch	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24
C1	mm inch	92.1 3.63	— —	130.2 5.13	181 7.13	231.8 9.13
D	mm inch	63 2.48	76 2.99	95 3.74	142 5.59	192 7.56
D1	mm inch	70 2.76	— —	102 4.02	153 6.02	208 8.19
E x F		4 x M8	8 x M8	8 x M8	8 x M10	12 x M10
E1 x F1		8 x M8	—	16 x M8	20 x M8	24 x M8
G	mm inch	12 0.47	12 0.47	12 0.47	15 0.59	15 0.59
G1	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	213 8.39
H1	mm inch	82.5 3.25	— —	120.65 4.75	171.45 6.75	222.3 8.75
H2	mm inch	77.4 3.05	— —	115.5 4.55	166 6.54	217 8.54
I	mm inch	2.5 0.1	2.5 0.1	2.5 0.1	4.5 0.18	4.5 0.18
L	mm inch	181 7.13	228 8.98	228 8.98	285 11.22	371 14.61
M	mm inch	76 2.99	86 3.39	86 3.39	110 4.33	140 5.51
N	mm inch	65 2.56	82.5 3.25	82.5 3.25	113 4.45	147.5 5.81
O	mm inch	66 2.6	80 3.15	100 3.94	147 5.79	200 7.87
S	mm inch	25 0.98	30 1.18	30 1.18	35 1.38	45 1.77
U	mm inch	60 2.36	70 2.76	70 2.76	83 3.27	103 4.06
U1	mm inch	50 1.97	60 2.36	60 2.36	70 2.76	90 3.54
V	mm inch	60 2.36	65 2.56	65 2.56	70 2.76	80 3.15
W	mm inch	44 1.73	40 1.57	40 1.57	40 1.57	30 1.18

A: standard body series 203
A1: extended body series 204

For extreme UHV and/or aggressive media

Bakeable to 300°C in open and closed position

Radiation resistant

Maintenance-free up to 20000 cycles

Opening possible up to 1 bar differential pressure



Body material

stainless steel

Manual actuator

handwheel

DN		Ordering numbers
mm	inch	CF-F
16	5/8	48124-CE01
40	1 1/2	48132-CE01
63	2 1/2	48236-CE01
100	4	48240-CE01
160	6	48244-CE01
200	8	48146-CE01

with position indicator 80°C: 48 . . . - . E08

with position indicator 200°C: 48 . . . - . E05

Pneumatic actuator

double acting

with position indicator 80°C

with solenoid

DN		Ordering numbers (specify control voltage)		
mm	inch	compact actuator valve 200°C CF-F	extended actuator valve 300°C CF-F	actuator modules see page 82
16	5/8		48124-CE44	
40	1 1/2		48132-CE44	
63	2 1/2	48236-CE74	48236-CE44	
100	4	48240-CE74	48240-CE44	
160	6	48244-CE74	48244-CE44	
200	8	48146-CE74	48146-CE44	
250	10	48148-CE74	48148-CE44	
320	12	48150-XE74	48150-XE44	X = customer specific

with position indicator 80°C, without solenoid: 48 . . . - . E72 (compact actuator)

48 . . . - . E24 (extended actuator)

further versions: see pages 82 and 83

Bake-out jacket

For bake-out we recommend commercial controllers with settable heating rate and temperature limiting device.

The bake-out jacket is without thermocouples and thermostats.

Details see page 216. Ordering number on request.

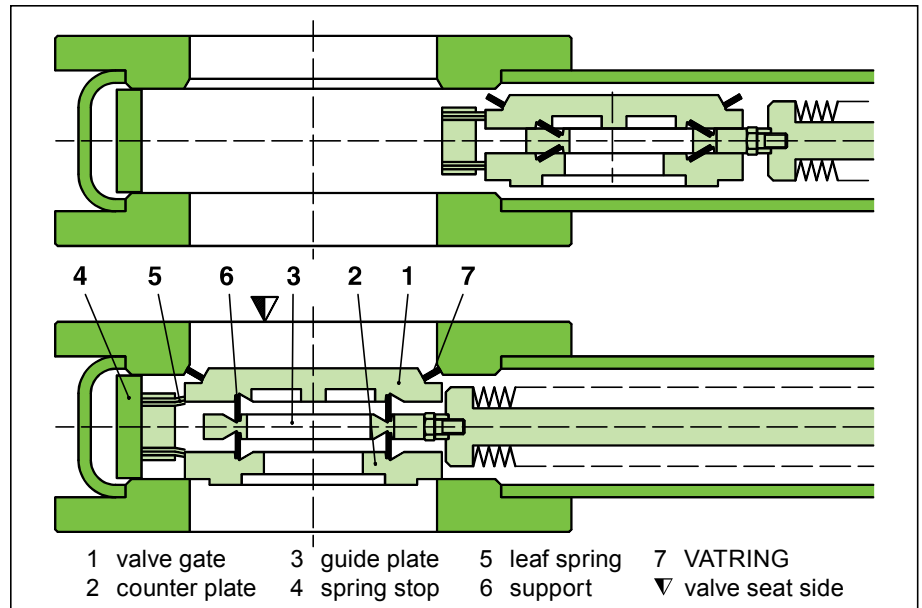
Sealing materials

Gate: metal

Bonnet: metal

Feedthrough

Bellows



Features

VATRING configuration (see glossary)

Sealing surfaces are only elastically deformed

Locked in closed position

Technical data

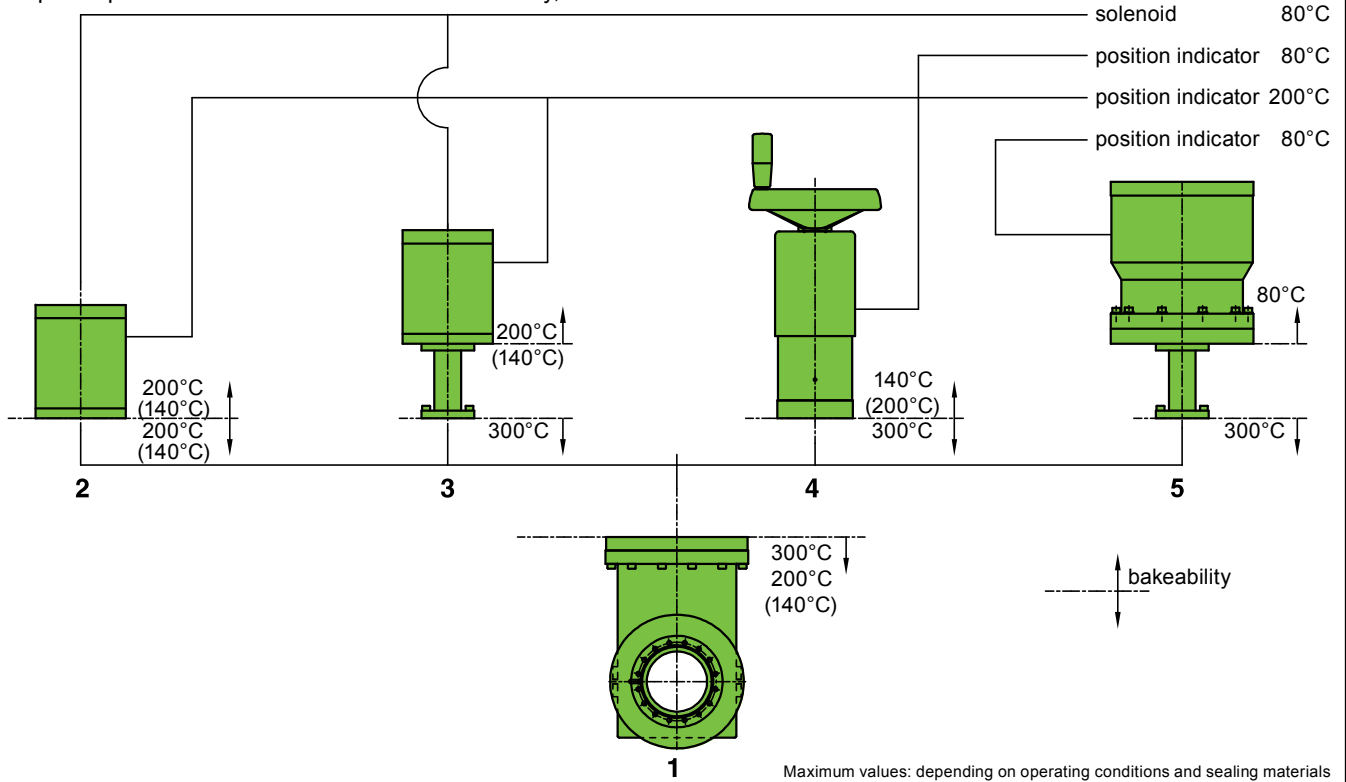
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Leak rate: body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	UHV to 2 bar (abs)
Differential pressure on the gate	2 bar in either direction
Differential pressure at opening	
- DN 16 - 40	≤ 1 bar
- DN 63 - 250	≤ 500 mbar (1 bar with reduced cycle life)
- DN 320	≤ 500 mbar with reduced cycle life
Cycles until first service	
- DN 16 - 200 / 250 - 320	20000 / 5000
Temperature ¹⁾	
- Valve body	≤ 300°C
- Manual actuator	≤ 140°C (option: 200°C)
- Pneumatic actuator	≤ 200°C
- Position indicator	≤ 80°C (option: 200°C)
- Solenoid	≤ 80°C
- Flexible bake-out jacket	≤ 300°C (valve), 115, 230 V, 50/60 Hz
Heating and cooling rate	
- DN 16 / 40 - 160 / 200 - 320	≤ 80°C h ⁻¹ / ≤ 50°C h ⁻¹ / ≤ 25°C h ⁻¹
Material	
- Valve body, mechanism	AISI 316L (1.4435, 1.4404)
- Bellows	AISI 316L (1.4435)
Seal: bonnet, gate	metal
Mounting position: DN 16 - 250	any
Solenoid	24 VDC, 2.5 W (others see «Options»)
Position indicator: contact rating	<u>80°C</u> <u>200°C</u>
- Voltage	≤ 50VAC / DC ≤ 50VAC / DC
- Current	≤ 1.2A ≤ 1A
Valve position	visual (mechanical)

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

Actuators – modular selection

- | | | | |
|---|---|---|---|
| 1 | Body, valve 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 | option: 10 ⁵ Gy, bakeable to 200°C |
| 5 | Special pneumatic actuator for hot zone | : 10 ⁸ Gy, bakeable to 80°C | |



Accessories

- Fittings for installation of the valve: series 33
- Flexible bake-out jacket: see page 216

Seal kit

Consisting of seals for gate (VATRING) and bonnet
Ordering No.: see operating manual or price list

Technical data

DN (nominal I.D.)		CF-F flange	molecular flow conduc- tance	turns per stroke	manual		pneumatic						
					weight	weight	compressed air pressure min. - max. overpressure	volume of air cylinder	closing or opening time	weight	weight		
mm	inch	O.D.	ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³	s	kg	lbs
16	5/8	1 1/8	10	19	2.5	6	4 - 8	55 - 115	0.1	0.003	1	3.8	8.4
40	1 1/2	2 3/4	100	21	5.5	12	4 - 8	55 - 115	0.27	0.01	1	7.2	16
63	2 1/2	4 1/2	400	32	16	35	4 - 8	55 - 115	0.5	0.018	2	17.3	38
100	4	6	1400	46	23.5	52	4 - 8	55 - 115	1.4	0.049	3	27	60
160	6	8	4200	66	38	84	4 - 8	55 - 115	4.3	0.152	8	38	84
200	8	10	6900	63	74.5	164	4 - 8	55 - 115	8.3	0.293	14	88	194
250	10	12	12700	-	-	-	4 - 8	55 - 115	10.7	0.378	24	156	344
320	12	X	23500	-	-	-	4 - 8	55 - 115	12.9	0.455	19	223	492

Options

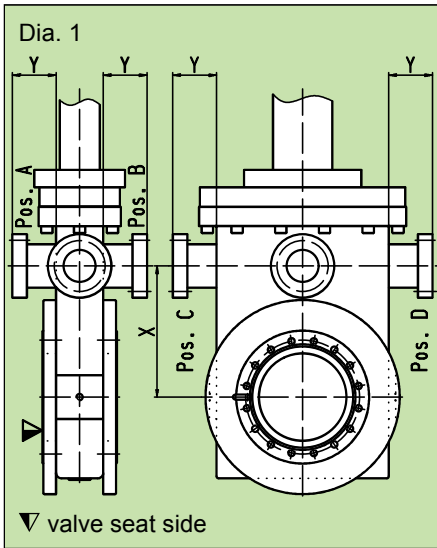
¹⁾ Maximum values: depending on operating conditions and sealing materials

Actuator:

- Accessory for pneumatic actuator for faster closing
- Pneumatic actuator compact or extended 10⁶ Gy, bakeable to 140°C ¹⁾
- Pneumatic actuator for hot zone: radiation resistant to 10⁸ Gy, bakeable to 80°C
- Manual actuator bakeable to 200°C ¹⁾
- Solenoid for impulse actuation:
actual valve position is maintained at power failure
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50 Hz
24, 100, 115, 200, 230 V 60 Hz
- Solenoid radiation resistant to 10⁶ Gy (standard 10⁴ Gy)
- Position indicator for pneumatic actuator bakeable to 200°C
- Position indicator for manual actuator bakeable to 80°C or 200°C
- Double position indicator (2 switches each for the positions «open» and «closed»)

Valve:

- Customer specified flanges
- Larger diameters on request
- Antimagnetic version with defined permeability: see page 220
- Window in valve gate: see specification below
- Ports (diagram 1) for roughing (by-pass), venting or for gauges

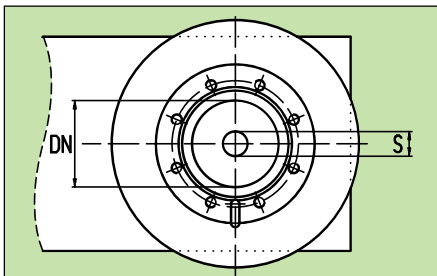


DN valve	mm	16	40	63	100	160	200	250	320
	inch	$\frac{5}{8}$	1½	2½	4	6	8	10	12
recommended port CF-F	mm	16	16	16	40	40	40	40	40
	inch	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	1½	1½	1½	1½	1½
X	mm	40	70	115	135	220	280	365	440
	inch	1.57	2.76	4.53	5.31	8.66	11.02	14.37	17.32
Y	mm	18	18	20	50	50	50	50	50
	inch	0.71	0.71	0.79	1.97	1.97	1.97	1.97	1.97

Ordering information for options:

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

Gate valve with window

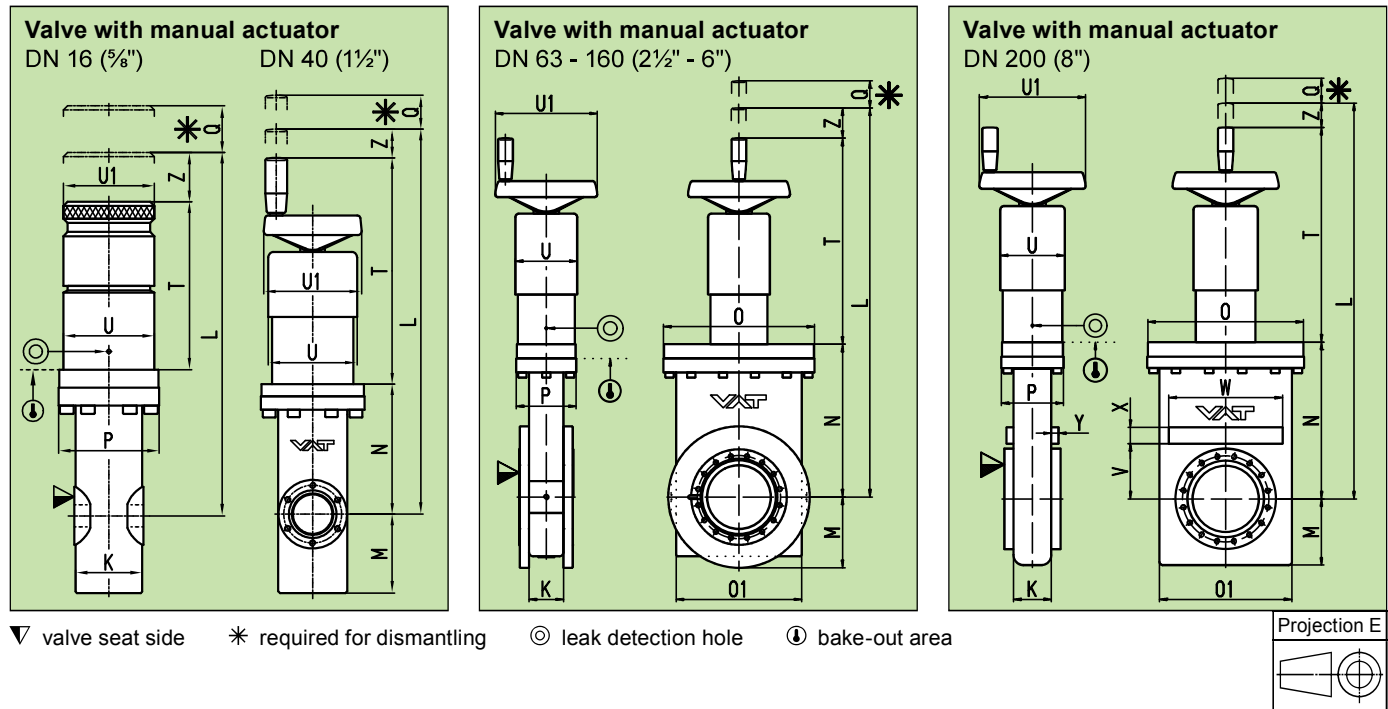


window welded into valve gate
window retrofitable at VAT
window material: sapphire

Options: - special glass qualities
- other materials (e. g. berillium)
- other window sizes

DN valve	mm	40	63	100	160	200
	inch	1½	2½	4	6	8
optically free diameter «S»	mm	8	18	34	34	34
	inch	0.32	0.71	1.34	1.34	1.34
thickness of glass	mm	2	2	2	2	2
	inch	0.08	0.08	0.08	0.08	0.08

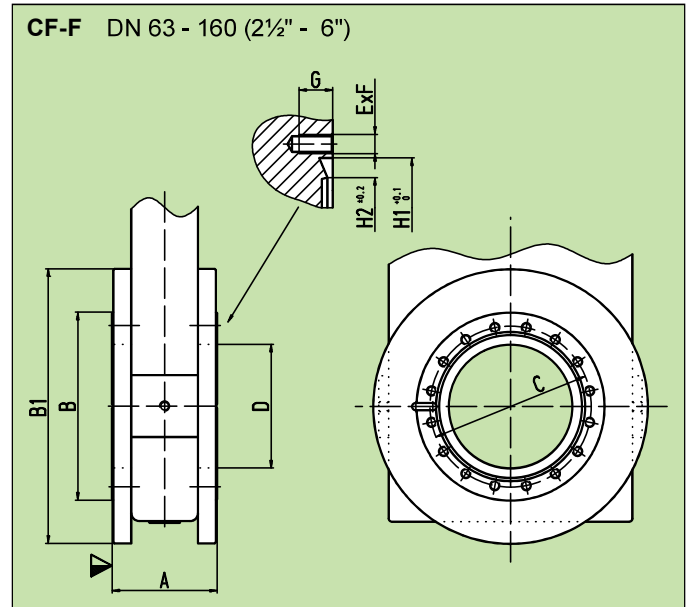
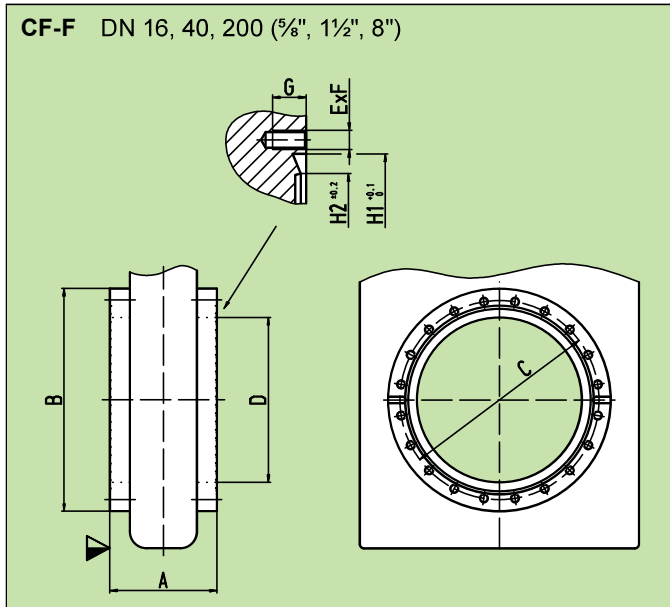
Main dimensions



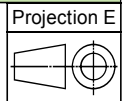
Flange dimensions see page 85

DN	mm inch	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6	200 8
K	mm inch	48.5 1.91	70 2.76	46 1.81	54 2.13	58 2.28	78 3.07
L	mm inch	261 10.28	414 16.3	554 17.13	678 26.69	873 34.37	1101 43.33
M	mm inch	56 2.2	80 3.15	90 3.54	111 4.37	144 5.67	161 6.34
N	mm inch	106 4.17	132 5.2	209 8.23	240 9.45	329 12.95	410 16.14
O	mm inch	-	-	189 7.44	237 9.33	287 11.3	352 13.86
O1	mm inch	-	-	156 6.14	197 7.76	253 9.96	316 12.44
P	mm inch	73 2.87	105 4.13	77 3.03	94 3.7	93 3.66	114 4.49
Q	mm inch	150 5.9	200 7.87	280 11.02	320 12.6	450 17.72	570 22.44
T	mm inch	122 4.8	230 9.06	266 8.9	324 12.76	378 14.88	473 18.62
U	mm inch	66 2.6	90 3.54	97 3.81	97 3.81	97 3.81	97 3.81
U1	mm inch	66 2.6	100 3.7	100 3.94	160 6.3	160 6.3	200 7.87
V	mm inch	-	-	-	-	-	155 6.1
W	mm inch	-	-	-	-	-	277 10.91
X	mm inch	-	-	-	-	-	40 1.57
Y	mm inch	-	-	-	-	-	30 1.18
Z	mm inch	33 1.3	52 2.05	79 3.11	114 4.49	166 6.54	218 8.58

Flange dimensions

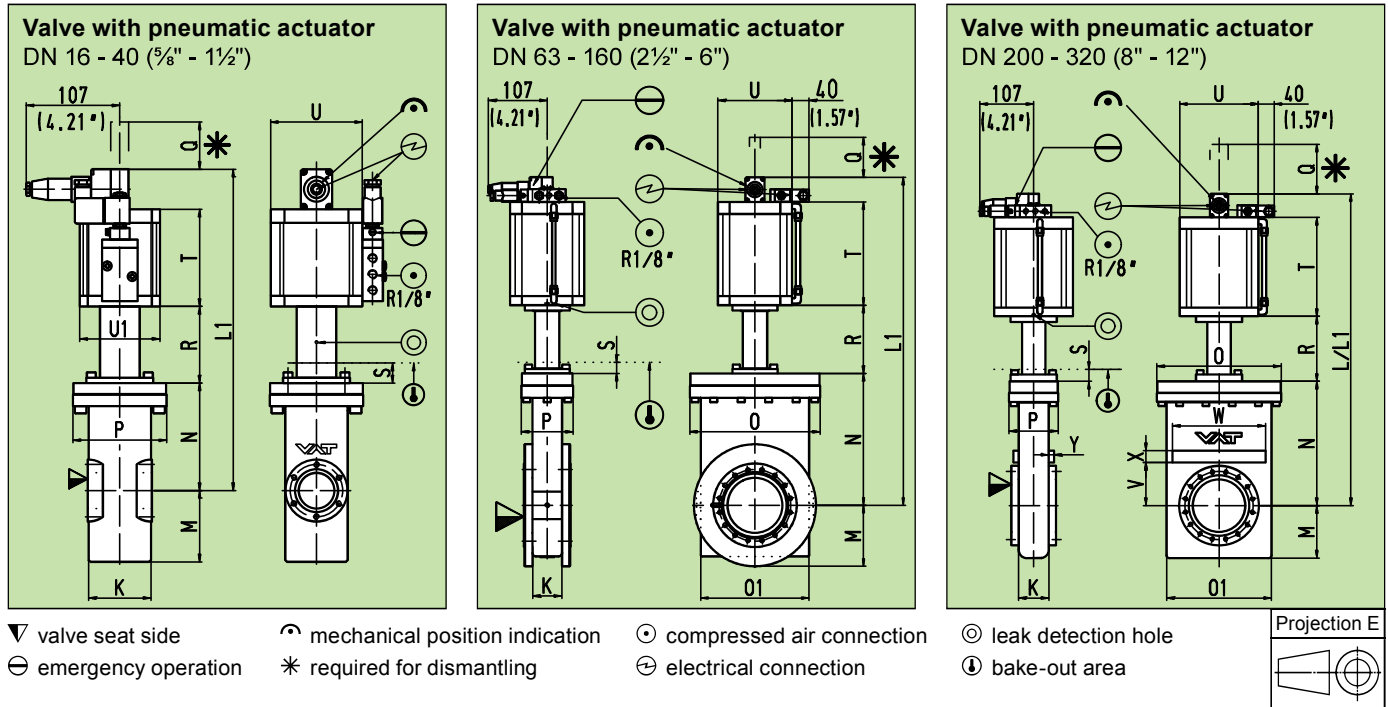


▽ valve seat side



DN	mm inch	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6	200 8
O.D.	mm inch	1 1/2	2 3/4	4 1/2	6	8	10
A	mm inch	50 1.97	72 2.83	75 2.95	85 3.35	97.5 3.84	140 5.51
B	mm inch	42 1.65	69.5 2.73	113.5 4.47	152 5.98	202.5 7.97	277 10.9
B1	mm inch	-	-	180 7.08	222 8.73	288 11.33	-
C	mm inch	27 1.06	58.7 2.31	92.1 3.63	130.3 5.13	181 7.13	231.8 9.12
D	mm inch	16 0.63	40 1.57	63 2.48	100 3.94	150 5.9	200 7.87
E x F	mm inch	6 x M4	6 x M6	8 x M8	16 x M8	20 x M8	24 x M8
G	mm inch	8 0.31	10 0.39	12 0.47	14 0.55	16 0.63	17 0.67
H1	mm inch	21.4 0.84	48.3 1.9	82.5 3.25	120.65 4.75	171.45 6.75	222.3 8.75
H2	mm inch	18.5 0.72	42 1.65	77.4 3.05	115.5 4.55	166 6.53	217 8.54

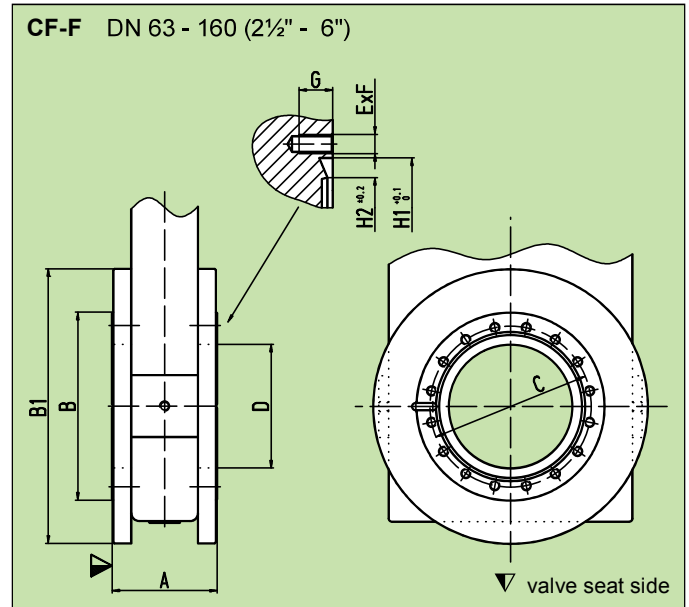
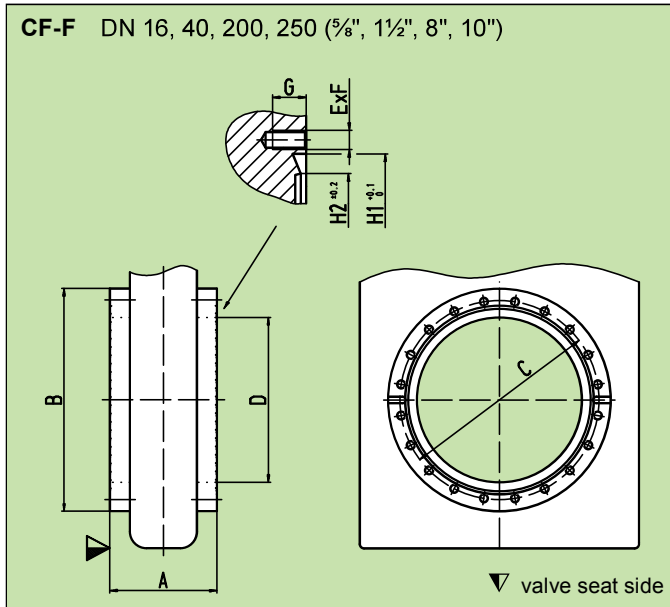
Main dimensions



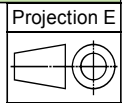
L1 and R for extended actuator / flange dimensions see page 87

DN	mm inch	16 5/8	40 1 1/2	63 2 1/2	100 4	160 6	200 8	250 10	320 12
K	mm inch	48.5 1.91	70 2.76	46 1.81	54 2.13	58 2.28	78 3.07	90 3.54	105 4.13
L	mm inch	-	-	403 15.87	473 18.62	616 24.25	770 30.31	947 37.28	1114 43.86
L1	mm inch	312 12.28	372 14.65	527 20.75	597 23.5	740 29.13	894 35.2	1071 42.17	1238 48.74
M	mm inch	56 2.2	80 3.15	90 3.54	111 4.37	144 5.67	161 6.34	205 8.07	240 9.45
N	mm inch	106 4.17	132 5.2	209 8.23	240 9.45	329 12.95	410 16.14	525 20.67	632 24.88
O	mm inch	-	-	189 7.44	237 9.33	287 11.3	352 13.86	446 17.56	516 20.32
O1	mm inch	-	-	156 6.14	197 7.76	253 9.96	316 12.44	410 16.14	480 18.89
P	mm inch	73 2.87	105 4.13	77 3.03	94 3.7	93 3.66	114 4.49	126 4.96	141 5.55
Q	mm inch	150 5.9	200 7.87	280 11.02	320 12.6	450 17.72	535 21.06	675 26.57	800 31.50
R	mm inch	64 2.52	86 3.39	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88	124 4.88
S	mm inch	15 0.59	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
T	mm inch	90 3.54	109 4.29	149 5.87	188 7.4	242 9.53	315 12.4	377 14.84	438 17.24
U	mm inch	83 3.27	103 4.06	98 3.86	135 5.31	190 5.91	230 9.06	230 9.06	230 9.06
U1	mm inch	70 2.76	90 3.54	-	-	-	-	-	-
V	mm inch	-	-	-	-	-	155 6.1	210 8.27	245 9.65
W	mm inch	-	-	-	-	-	277 10.91	441 17.36	511 20.12
X x Y	mm inch	-	-	-	-	-	40 x 30 1.57 x 1.18	50 x 50 1.97 x 1.97	60 x 60 2.36 x 2.36

Flange dimensions



DN 320 customer specific



DN	mm inch	16 ¾"	40 1½"	63 2½"	100 4"	160 6"	200 8"	250 10"	320 12"
O.D.	mm inch	1½"	2¾"	4½"	6"	8"	10"	12"	-
A	mm inch	50 1.97	72 2.83	75 2.95	85 3.35	97.5 3.84	140 5.51	150 5.91	170 6.69
B	mm inch	42 1.65	69.5 2.73	113.5 4.47	152 5.98	202.5 7.97	277 10.9	380 14.96	444 17.48
B1	mm inch	-	-	180 7.08	222 8.73	288 11.33	-	-	-
C	mm inch	27 1.06	58.7 2.31	92.1 3.63	130.3 5.13	181 7.13	231.8 9.12	284 11.18	-
D	mm inch	16 0.63	40 1.57	63 2.48	100 3.94	150 5.9	200 7.87	250 9.84	320 12.6
E x F	mm inch	6 x M4	6 x M6	8 x M8	16 x M8	20 x M8	24 x M8	32 x M8	-
G	mm inch	8 0.31	10 0.39	12 0.47	14 0.55	16 0.63	17 0.67	17 0.67	-
H1	mm inch	21.4 0.84	48.3 1.9	82.5 3.25	120.65 4.75	171.45 6.75	222.3 8.75	273.15 10.75	-
H2	mm inch	18.5 0.72	42 1.65	77.4 3.05	115.5 4.55	166 6.53	217 8.54	267 10.51	-

Series 612

- Downstream pressure control valve
- Compact design
- Very fast operation
- High-performance, integrated controller



Body material

aluminum or stainless steel

Valve with integrated controller

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

optional controller configurations

- SPS = ±15VDC Sensor Power Supply
- PFO = Power Failure Option (valve closes or opens automatically at power failure)

x
y

G = basic version	1)	2)	1)	2)
A = with SPS	G = RS232	1	J = RS485	1
H = with PFO	H = RS232	2	K = RS485	2
C = with SPS and PFO	C = Logic	1	Y = Ethernet	1
	E = Logic	2	Z = Ethernet	2
	P = DeviceNet®	1	L = CC-Link	1
	Q = DeviceNet®	2	N = CC-Link	2
	D = Profibus	1	I = EtherCAT	1
	F = Profibus	2	X = EtherCAT	2

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

1) = interface
 2) = quantity of sensors

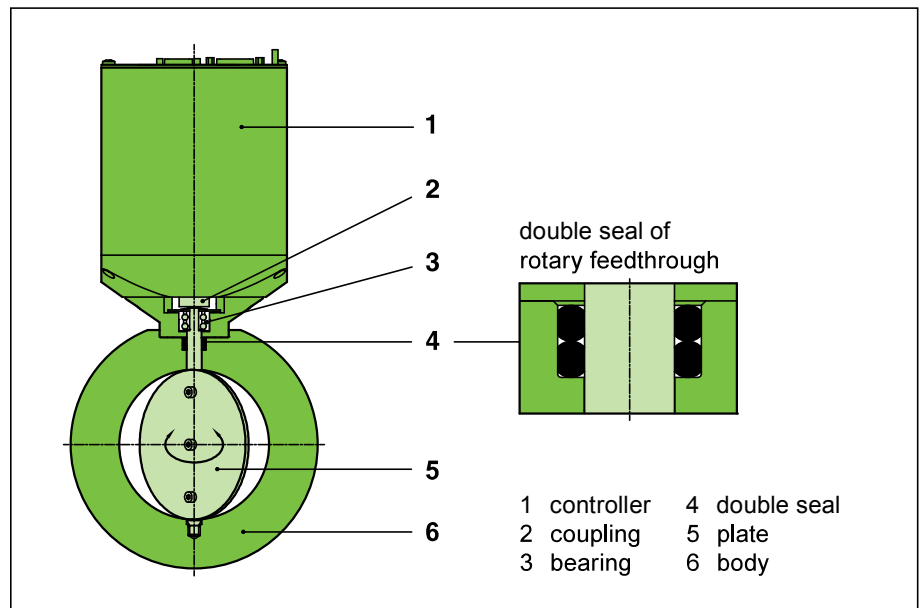
Accessories

Designation	Ordering No.
CV software including service cable ³⁾	600SV-99LB
CPA software including service cable ³⁾	600SP-99LB
Service box 2 (standard version with 1.5 m cable) ³⁾	601BS-29NN
Control panel for installation into 19" rack, including 5 m cable ³⁾	602BS-29LE
Connector kit for valves with RS232, RS422, RS485 or Logic interface consisting of counter plugs for INTERFACE, SENSOR and POWER connections	242411
Connector kit for valves with fieldbus consisting of counter plugs for SENSOR and POWER connections	242410
AC power supply unit (input: 100 - 240 VAC, output: 24 VDC / 4A)	249775

³⁾ Details see chapter «Pressure controller»

Feedthrough

Rotary feedthrough FKM (VITON)
(double seal)



B

Features

- Very fast operation
- Extremely short control response times
- Integrated controller
- Automatic service signal (contamination)
- Position indication
- Actuator unit easy to remove/mount
- Service port (computer or service box 2 connection)
- Excellent resistance to contaminating processes

Function

The valve plate acts as a throttling element and varies the conductance of the valve opening. The integrated controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 225. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures very fast and accurate process pressure control even in demanding contaminating processes.

Control range

VAT provides the «CONTROL VALVE EVALUATION TOOL» to help you select the product most suitable for your process. The tool is available on our website www.vatvalve.com → Country → Control Valve Evaluation Tool for free use.

Technical data

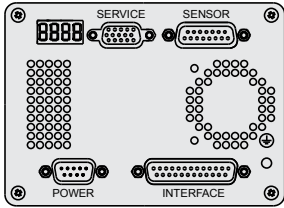
Actuator unit with controller	Power consumption	+ 24 VDC (±10%) @ 0.5 V pk-pk max. 38 W max. (controller + motor) 10 W max. for Power Failure Option 36 W max. for Sensor Power Supply
	Sensor supply	24 VDC or ±15 VDC
	Sensor input	
	- Signal voltage	0 - 10 VDC linear with pressure
	- Input resistance	Ri = 100kΩ
	- Resolution	0.23 mV
	- Sampling rate	10 ms
	Control accuracy	0.1% of maximum sensor range
	Position resolution	20 000 (steps = 0 - 90° rotation)
	Ambient temperature	50°C max. (<35°C recommended)
Valve unit	Pressure range	1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
	Leak rate to the outside	1 · 10 ⁻⁹ mbar ls ⁻¹
	Cycles until first service ¹⁾	2 million
	Temperature ²⁾	
	- Valve body	≤ 150°C
	- Actuator	≤ 50°C
	- Ambient	≤ 50°C
	Mounting position	any
	Material in vacuum	
	- Valve body, plate	EN AW-6082 (3.2315) or AISI 316L (1.4404)
- Shaft	AISI 316L (1.4404)	
- Other parts	iglidur [®] X, AISI 316L (1.4404)	
- Feedthrough seals	FKM (VITON)	

¹⁾ Unheated and under clean conditions

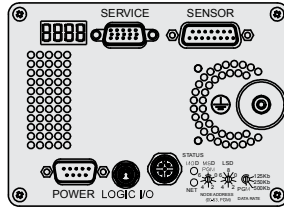
²⁾ Maximum values: depending on operating conditions and sealing materials

DN (nominal I. D.)		conductance in open position (molecular flow)	minimum controllable conductance (molecular flow)	max. differential pressure	typical closing / opening time	weight (approx.)			
						aluminum		stainless steel	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	s	kg	lbs	kg	lbs
40	1½	80	0.25	1000	0.3	2.1	4.6	2.6	5.7
50	2	150	0.3	1000	0.3	2.4	5.3	3	6.6
63	2½	360	0.45	1000	0.3	2.6	5.7	4.1	9
80	3	850	0.65	1000	0.3	2.8	6.2	4.7	10.4
100	4	1400	0.85	800	0.3	3	6.6	5	11.
160	6	3800	1.7	300	0.3	4.2	9.3	7.2	15.9
200	8	7800	2.8	150	0.3	4.7	10.4	8.1	17.9

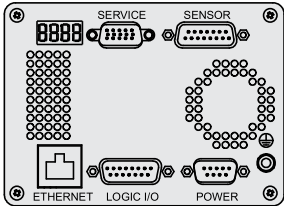
Pressure controller



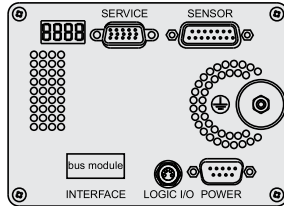
RS232, Logic, RS422, RS485



DeviceNet®



Ethernet



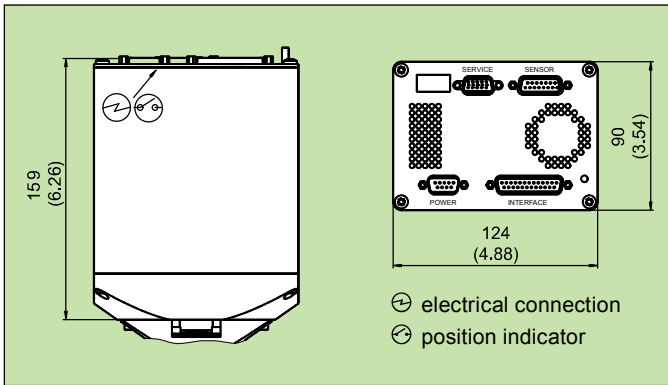
Profibus, CC-Link, EtherCAT

Features

- Very fast and accurate pressure control
- Automatic learning of system parameters
- Hold function for plasma ignition
- Valve position control
- Remote control
- Information display
- Inputs for 1 or 2 linear pressure sensors (capacitance manometers)
- Service interface for local operation
- Closing or opening of the valve at power failure (option)

B

Dimensions



Electrical connections

	connection	type
POWER	power input	DB-9 male
SENSOR	sensor input sensor power supply	DB-15 female
INTERFACE	RS232, Logic, RS422, RS485	DB-25 female
	DeviceNet®	micro-style male
	Ethernet	RJ 45
Bus modules	Profibus	DB-9 female
	CC-Link	5-pole terminal screw
	EtherCAT	2 x RJ 45

Pressure control

The controller ensures very fast and accurate pressure control. 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.

Valve position control

In position control mode the valve plate can be moved to any position.

Display

Status and position are displayed by means of 4 bright digits.

Remote control

The valve can be controlled by a host computer via RS232, RS422, RS485, Logic, 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 «closed» (status of valve).

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

Service port

The valve has a service port (RS232) for connecting a computer or a service box. VAT can provide two software versions which, independent of the hoster computer, allow a variety of functions.

For connecting the computer to the valve, a special cable designed by VAT is required.



Basic version VAT Control View (CV software)

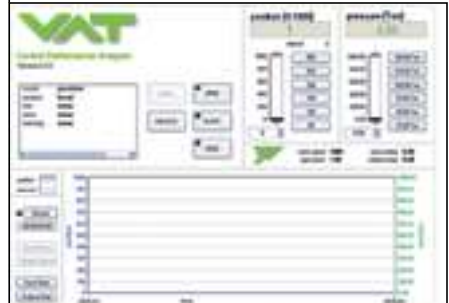


- Setup
- Operation
- Monitoring
- Diagnostics

The basic software (CV) and the drawing for the connecting cable may be downloaded for free from our Website www.vatvalve.com → Country → Services → Downloads.

The software and the cable may also be ordered from VAT. For details see price list.

Extended version VAT Control Performance Analyzer (CPA software)



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

The extended software (CPA) and the connecting cable may be ordered from VAT. For details see price list.

Service box 2 / Control panel

For local operation of valves with integrated controller as an alternative to the computer.



standard service box 2 with cable



control panel with cable for integration into a 19" rack

Power Failure Option (PFO)

This function is optionally available. It closes (to the minimum conductance) or opens the valve automatically at power failure.

Sensor Power Supply (SPS)

Optionally, the valve can be provided with a ± 15 VDC power supply unit for the sensor/s.

Options

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

Actuator / controller

- Ultra fast actuator (100 ms)
- Output for control of isolation valve
- Controller with configurable PI parameters
- RS232 interface with 2 analog outputs

Valve

- Sizes DN 25 and DN 250
- Other flanges (JIS, ASA-LP, CF-F)
- Customer specified flanges
- Aluminum hard anodized or nickel-plated
- Other sealing materials
- Heater with insulation (picture) for valve temperatures up to 150°C (for temperatures up to 200°C on request)
- «Combo» body to combine a series 612 control valve with an isolation valve: see series 95, pages 124 - 125

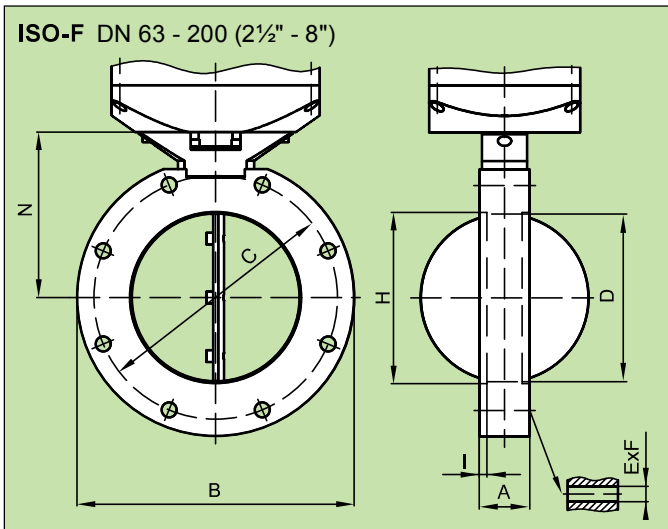
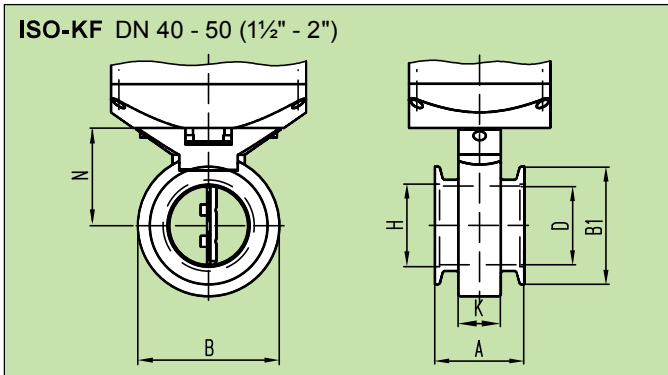


Ordering information for options:

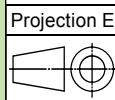
Ordering No. of valve-X (e. g. 61236-PEGG-X, X = valve with heater for 80°C)

B

Dimensions



DN	mm inch	40 1½	50 2	63 2½	80 3	100 4	160 6	200 8
A	mm inch	57 2.25	57 2.25	30 1.18	30 1.18	30 1.18	30 1.18	30 1.18
B	mm inch	80 3.15	90 3.54	130 5.12	145 5.71	165 6.5	225 8.86	285 11.22
B1	mm inch	54.9 2.16	74.9 2.95	-	-	-	-	-
C	mm inch	-	-	110 4.33	125 4.92	145 5.71	200 7.87	260 10.24
D	mm inch	40 1.57	50 1.97	63 2.48	80 3.15	100 3.94	150 5.91	200 7.87
ExF	mm inch	-	-	4x9 4x0.35	8x9 8x0.35	8x9 8x0.35	8x11 8x0.43	12x11 12x0.43
H	mm inch	41.3 1.63	52.3 2.06	70 2.76	83 3.27	102 4.02	153 6.02	213 8.39
I	mm inch	-	-	4.5 0.18	4.5 0.18	4.5 0.18	4.5 0.18	4.5 0.18
K	mm inch	27 1.06	27 1.06	-	-	-	-	-
N	mm inch	57 2.24	62 2.44	77.5 3.05	90.5 3.56	98.5 3.88	123.5 4.86	157 6.18



Series 615

with **extended** control range

Downstream pressure control and isolation valve

Compact design

Fast operation

High-performance, integrated controller

Low minimum controllable conductance



Body material

aluminum hard anodized or stainless steel

Valve with integrated controller

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

optional controller configurations

SPS = ±15VDC Sensor Power Supply

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

x		y					
G = basic version				1)	2)	1)	2)
A = with SPS				G = RS232	1	J = RS485	1
H = with PFO				H = RS232	2	K = RS485	2
C = with SPS and PFO				C = Logic	1	Y = Ethernet	1
				E = Logic	2	Z = Ethernet	2
				P = DeviceNet®	1	L = CC-Link	1
				Q = DeviceNet®	2	N = CC-Link	2
				D = Profibus	1	I = EtherCAT	1
				F = Profibus	2	X = EtherCAT	2

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

1) = interface
2) = quantity of sensors

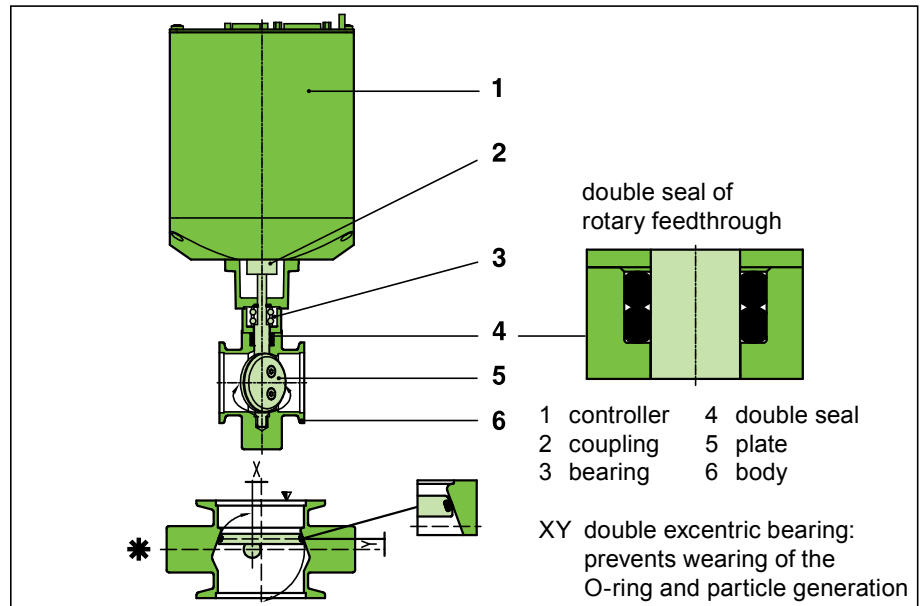
Accessories

Designation	Ordering No.
CV software including service cable ³⁾	600SV-99LB
CPA software including service cable ³⁾	600SP-99LB
Service box 2 (standard version with 1.5 m cable) ³⁾	601BS-29NN
Control panel for installation into 19" rack, including 5 m cable ³⁾	602BS-29LE
Connector kit for valves with RS232, RS422, RS485 or Logic interface consisting of counter plugs for INTERFACE, SENSOR and POWER connections	242411
Connector kit for valves with fieldbus consisting of counter plugs for SENSOR and POWER connections	242410
AC power supply unit (input: 100 - 240 VAC, output: 24 VDC / 4A)	249775

³⁾ Details see chapter «Pressure controller»

Feedthrough

Rotary feedthrough FKM (VITON)
(double seal)



Features

- Low minimum controllable conductance, extended control range
- Fast operation
- Extremely short control response times
- Integrated controller
- Automatic service signal (contamination)
- Position indication
- Actuator unit easy to remove/mount
- Service port (computer or service box 2 connection)
- Excellent resistance to contaminating processes

Function

The valve plate acts as a throttling element and varies the conductance of the valve opening. The integrated controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 225. Actuation is performed by a stepper motor. An encoder monitors the position. This principle ensures fast and accurate process pressure control even in demanding contaminating processes.

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

Control range

VAT provides the «CONTROL VALVE EVALUATION TOOL» to help you select the product most suitable for your process. The tool is available on our website www.vatvalve.com → Country → Control Valve Evaluation Tool for free use.

Technical data

Actuator unit with controller	Power consumption	+ 24 VDC (±10%) 38 W max. (controller + motor) 10 W max. for Power Failure Option 36 W max. for Sensor Power Supply
	Sensor supply	24 VDC or ±15 VDC
	Sensor input	
	- Signal voltage	0 - 10 VDC linear with pressure
	- Input resistance	Ri = 100kΩ
	- Resolution	0.23 mV
	- Sampling rate	10 ms
Control accuracy	0.1% of maximum sensor range	
Position resolution	>28000	
Ambient temperature	50°C max. (<35°C recommended)	

Valve unit	Pressure range ¹⁾	
	- Aluminum valve, hard anodized	1 · 10 ⁻⁶ mbar to 1.2 bar (abs)
	- Stainless steel valve	1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
	Leak rate to the outside ¹⁾	
	- Aluminum valve, hard anodized	1 · 10 ⁻⁵ mbar ls ⁻¹
	- Stainless steel valve	1 · 10 ⁻⁹ mbar ls ⁻¹
	Leak rate at the seat ¹⁾	
	- Aluminum valve, hard anodized	1 · 10 ⁻⁴ mbar ls ⁻¹
	- Stainless steel valve	1 · 10 ⁻⁹ mbar ls ⁻¹
	Cycles until first service ²⁾	
	- Control cycles	2 million
	- Closing cycles	DN 40 - 50: 250 000 DN 63 - 100: 100 000
Temperature ³⁾		
- Valve body	≤ 120°C	
- Actuator	≤ 50°C	
- Ambient	≤ 50°C	
Mounting position	any	
Material in vacuum		
- Valve body, plate	EN AW-6082 (3.2315) hard anodized or AISI 316L (1.4404)	
- Shaft	AISI 316L (1.4404)	
- Other parts	iglidur [®] X, AISI 316L (1.4404)	
- Feedthrough seals	FKM (VITON)	

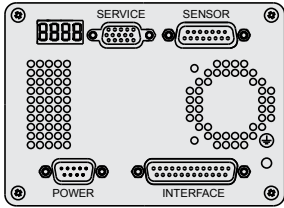
¹⁾ Unheated on delivery

²⁾ Unheated and under clean conditions

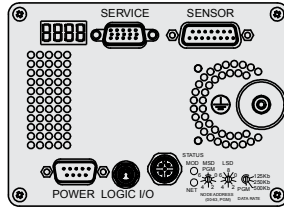
³⁾ Maximum values: depending on operating conditions and sealing materials

DN (nominal I. D.)		conductance in open position (molecular flow)	minimum controllable conductance (molecular flow)	max. differential pressure	typical closing/ opening time		weight (approx.)			
					throttling only	throttling and closing	aluminium, hard anodized		stainless steel	
mm	inch	ls ⁻¹	ls ⁻¹	mbar	s	s	kg	lbs	kg	lbs
40	1½	60	0.05	1000	0.5	0.6	2.5	5.5	3.3	7.3
50	2	120	0.1	1000	0.5	0.6	2.7	6.0	3.6	7.9
63	2½	220	0.15	1000	0.5	0.6	3.8	8.4	5.9	13.0
80	3	360	0.2	1000	0.5	0.6	4.8	10.6	8.8	19.4
100	4	600	0.25	1000	0.5	0.6	5.2	11.5	9.7	21.4

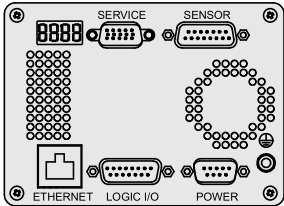
Pressure controller



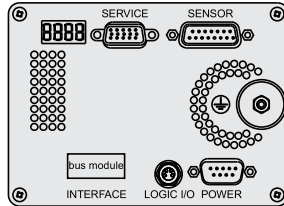
RS232, Logic, RS422, RS485



DeviceNet®



Ethernet



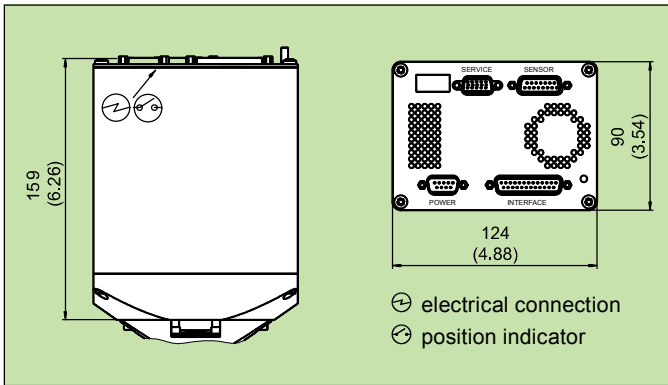
Profibus, CC-Link, EtherCAT

Features

- Fast and accurate pressure control
- Automatic learning of system parameters
- Hold function for plasma ignition
- Valve position control
- Remote control
- Information display
- Inputs for 1 or 2 linear pressure sensors (capacitance manometers)
- Service interface for local operation
- Closing or opening of the valve at power failure (option)

B

Dimensions



Electrical connections

	connection	type
POWER	power input	DB-9 male
SENSOR	sensor input sensor power supply	DB-15 female
INTERFACE	RS232, Logic, RS422, RS485	DB-25 female
	DeviceNet®	micro-style male
	Ethernet	RJ 45
Bus modules	Profibus	DB-9 female
	CC-Link	5-pole terminal screw
	EtherCAT	2 x RJ 45

Pressure control

The controller ensures fast and accurate pressure control. 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.

Valve position control

In position control mode the valve plate can be moved to any position.

Display

Status and position are displayed by means of 4 bright digits.

Remote control

The valve can be controlled by a host computer via RS232, RS422, RS485, Logic, 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 «closed» (status of valve).

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

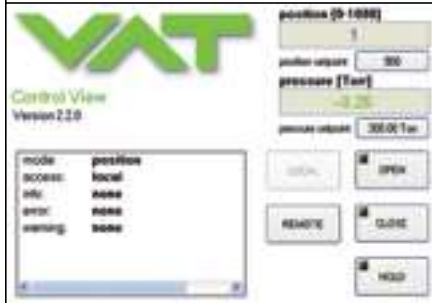
Service port

The valve has a service port (RS232) for connecting a computer or a service box. VAT can provide two software versions which, independent of the hoster computer, allow a variety of functions.

For connecting the computer to the valve, a special cable designed by VAT is required.



Basic version VAT Control View (CV software)

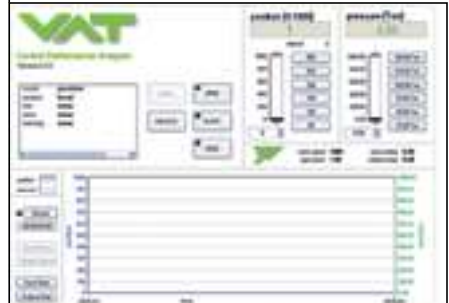


- Setup
- Operation
- Monitoring
- Diagnostics

The basic software (CV) and the drawing for the connecting cable may be downloaded for free from our Website www.vatvalve.com → Country → Services → Downloads.

The software and the cable may also be ordered from VAT. For details see price list.

Extended version VAT Control Performance Analyzer (CPA software)



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

The extended software (CPA) and the connecting cable may be ordered from VAT. For details see price list.

Service box 2 / Control panel

For local operation of valves with integrated controller as an alternative to the computer.



standard service box 2 with cable



control panel with cable for integration into a 19" rack

Power Failure Option (PFO)

This function is optionally available. It closes or opens the valve automatically at power failure.

Sensor Power Supply (SPS)

Optionally, the valve can be provided with a ± 15 VDC power supply unit for the sensor/s.

Options

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



Actuator / controller

- Ultra fast actuator (100 ms)
- Controller with configurable PI parameters
- RS232 interface with 2 analog outputs

Valve

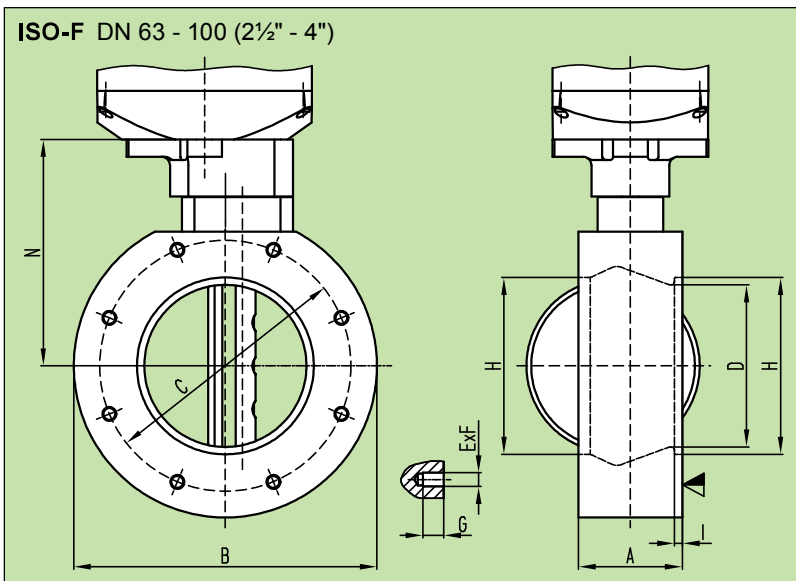
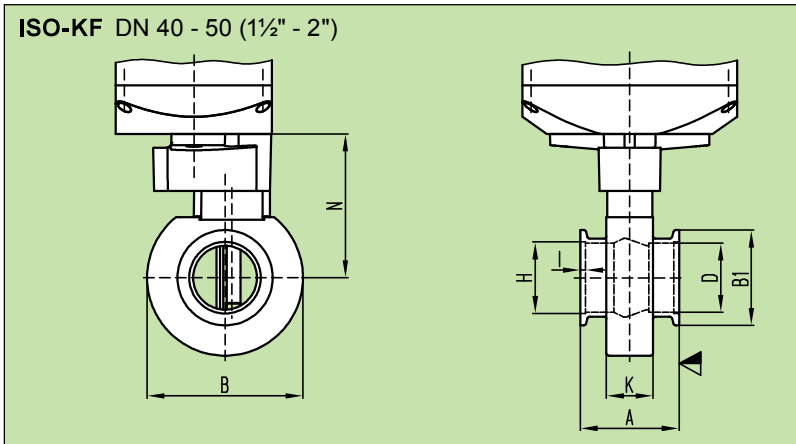
- Heater with insulation (picture) for valve temperatures up to 120°C: for DN 40 and DN 50 only

Ordering information for options:

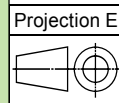
Ordering No. of valve-X (e. g. 61534-KHGG-X, X = valve with heater for 80°C)

B

Dimensions



DN	mm	40	50	63	80	100
inch		1½	2	2½	3	4
A	mm	57	57	40	50	60
inch		2.25	2.25	1.57	1.97	2.36
B	mm	90	110	135	165	175
inch		3.54	4.33	5.31	6.5	6.89
B1	mm	54.9	74.9	—	—	—
inch		2.16	2.95	—	—	—
C	mm	—	—	110	125	145
inch		—	—	4.33	4.92	5.71
D	mm	40	50	60.5	75.5	94
inch		1.57	1.97	2.39	2.97	3.7
ExF	mm	—	—	4 x M8	8 x M8	8 x M8
inch		—	—	—	—	—
G	mm	—	—	12	12	12
inch		—	—	0.47	0.47	0.47
H	mm	41.3	52.3	70	83	102
inch		1.63	2.06	2.76	3.27	4.02
I	mm	3	3	4.5	4.5	4.5
inch		0.12	0.12	0.18	0.18	0.18
K	mm	27	27	—	—	—
inch		1.06	1.06	—	—	—
N	mm	83	88	108	126	131
inch		3.27	3.46	4.25	4.96	5.16



Control and isolation valve

General purpose stainless steel valve

Adaptive pressure control with stepper motor or throttling by adjustable 3-position pneumatic actuator



Body material

stainless steel

Throttling gate valve with 3-position pneumatic actuator

double acting
with position indicator
with solenoids

DN		Ordering numbers (specify control voltage)				
mm	inch	ISO-F	CF-F metric threads	CF-F UNF threads	ASA-LP (T) ASA (A)	JIS
100	4	64040-PE48	64040-CE48	64040-UE48	64040-TE48	64040-JE48
160	6	64044-PE48	64044-CE48	64044-UE48	64044-TE48	64044-JE48
200	8	64046-PE48	64046-CE48	64046-UE48	64046-TE48	64046-JE48
250	10	64048-PE48	64048-CE48	64048-UE48	64048-TE48	64048-JE48
320	12	64050-PE48	on request	on request	64050-TE48	64050-JE48
350	14	–	–	–	–	64051-JE48
400	16	64052-PE48	on request	on request	64052-AE48	64052-JE48

with position indicator, without solenoids: 640 E28

Control gate valve with stepper motor

100	4	64040-PE52	64040-CE52	64040-UE52	64040-TE52	64040-JE52
160	6	64244-PE52	64244-CE52	64244-UE52	64244-TE52	64244-JE52
200	8	64246-PE52	64246-CE52	64246-UE52	64246-TE52	64246-JE52
250	10	64248-PE52	64248-CE52	64248-UE52	64248-TE52	64248-JE52
320	12	64250-PE52	on request	on request	64250-TE52	64250-JE52
350	14	–	–	–	–	64251-JE52
400	16	64252-PE52	on request	on request	64252-AE52	64252-JE52

Pressure controller

Type		Ordering numbers	Interface	Sensor(s)
PM-5	local and remote control	641PM-16xy	A = without	1
PM-4	remote control with service box interface	641PM-26xy	B = without	2
			C = logic	1
			E = logic	2
			G = RS232	1
			H = RS232	2
			J = RS485	1
			K = RS485	2

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

A = without PFO
B = NIMH PFO

Connection cable

Control gate valve — pressure controller	Ordering numbers
length 3 m (10 ft)	640CV-99LC
length 10 m (33 ft)	640CV-99LJ
other lengths to max. 50 m (170 ft)	640CV-99LX *)

*) specify length X in m/ft

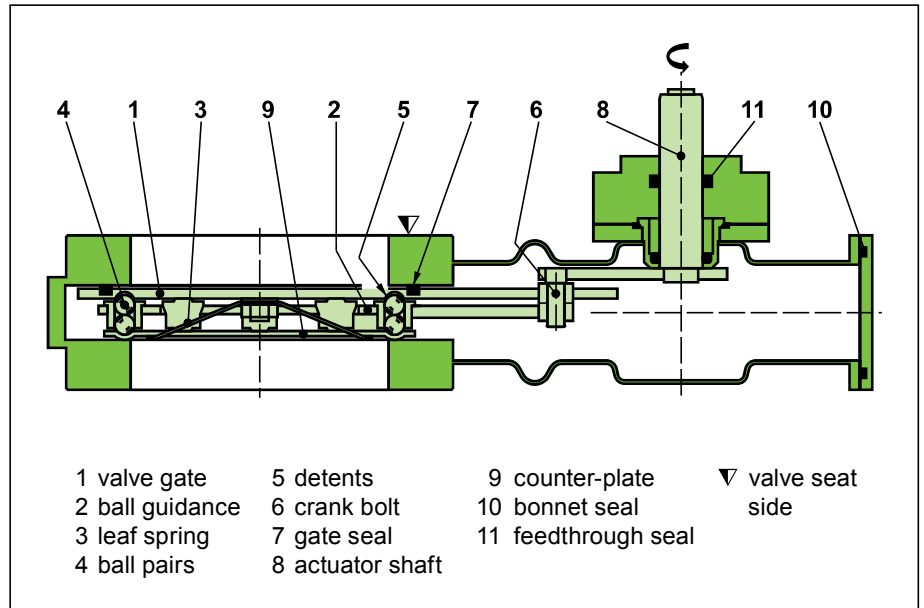
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Rotary feedthrough / FKM (VITON)



B

Features

VATLOCK configuration

3-position pneumatic actuator or stepper motor

Function

The valve gate acts as a throttling element and varies the conductance of the valve opening. Actuation is performed either with a 3-position pneumatic actuator or with a stepper motor and controller. With the 3-position pneumatic actuator, it is not only possible to move the valve gate to the open and closed position, but also to any preset intermediate position. The stepper motor/controller version ensures accurate pressure control due to exact gate positioning. For leaktight closing the VATLOCK principle is applied. For details see page 227.

Control range

VAT provides the «CONTROL VALVE EVALUATION TOOL» to help you select the product most suitable for your process. The tool is available on our website www.vatvalve.com → Country → Control Valve Evaluation Tool for free use.

Valve types

Control gate valve with stepper motor
DN 100

Control gate valve with stepper motor
DN 160 - 400

Throttling gate valve with adjustable 3-position pneumatic actuator
DN 100 - 400



Technical data

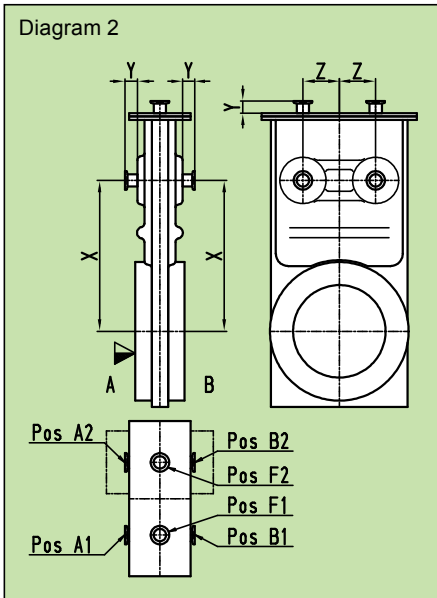
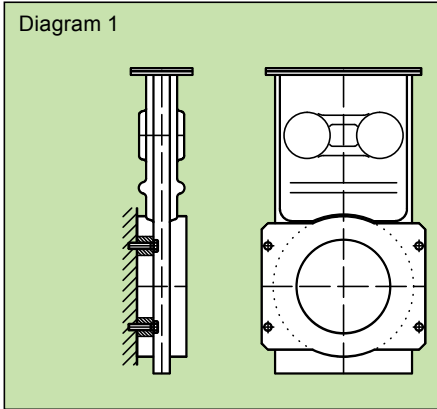
Leak rate: body, valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹
Pressure range	
- DN 100 - 200	1 · 10 ⁻⁸ mbar to 2 bar (abs)
- DN 250 - 400	1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
Differential pressure	
- Valve closed	DN 100 - 200 ≤ 2 bar in either direction DN 250 - 400 ≤ 1.2 bar in either direction
- During opening / closing	≤ 30 mbar
Cycles until first service	200000
Operating temperature ¹⁾	
- Valve body	≤ 150°C
Ambient temperature ¹⁾	
- Pneumatic actuator, motor	≤ 50°C
- Position indicator	≤ 80°C
- Solenoid	≤ 50°C
Material	
- Valve body, 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)
Mounting position	
- DN 100 - 350	any
- DN 400	horizontal only (vertical mounting position: see «Options»)
Valve position	visual (mechanical and on controller)
Connections actuator	
- 3-position pneumatic actuator	compressed air (see table below)
- Solenoids	24 V DC, 2 x 2.5 W (others see «Options»)
- Position indicator: contact rating	
- Voltage	≤ 30 VAC / DC
- Current	≤ 0.3 A
- Power	≤ 9 W
- Stepper motor	connection to the VAT Pressure Controller

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

DN (nominal I. D.)		standard flanges				molecular flow conductance	stepper motor				3-position pneumatic actuator					
		CF-F	ISO-F	ASA-LP	JIS		minimum controllable conductance	minimum closing or opening time	weight		minimum adjustable conductance	compressed air pressure min. - max. overpressure	closing or opening time	weight		
mm	inch	O.D.				ls ⁻¹	ls ⁻¹	s	kg	lbs	ls ⁻¹	bar	psi	s	kg	lbs
100	4	6	100	3	100	1700	1	3	17	37	5	4 - 7	55 - 100	2.5	17	37
160	6	8	160	4	150	5000	1.6	6	28	62	7.5	4 - 7	55 - 100	3.5	30	66
200	8	10	200	6	200	12000	2	6	34	75	10	4 - 7	55 - 100	3.5	36	79
250	10	12	250	8	250	22000	2.5	10	62	136	12.5	4 - 7	55 - 100	6	69	151
320	12		320	10	300	30000	3.2	10	112	246	16	4 - 7	55 - 100	6	119	261
350	14	-	-	-	350	40000	3.5	10	120	264	16	4 - 7	55 - 100	6	127	279
400	16		400	14	400	50000	4	10	155	340	20	4 - 7	55 - 100	10	164	360

Options

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



▽ valve seat side

Actuator:

- Actuator rotated by 90° / 180° to position 2 or 3 (position 1 is standard): see dimensional drawings on pages 104 and 105 for optimum adaptation
- Actuator on side B (side A is standard)
- Stepper motor for vertical mounting position DN 400 (closing time 15 s, cycles until first service 50000)
- Solenoids for impulse actuation: actual valve position is maintained at power failure
- Solenoid separate, for external mounting
- Solenoid for 12, 48 V DC
24, 48, 100, 115, 200, 220 V / 50 Hz
24, 100, 115, 200, 220 V / 60 Hz

Valve:

- Sizes DN 63 and 80 on request
- Customer specified flanges
- For direct mounting to flat chamber (diagram 1) Special flange for mounting to chamber wall, standard flange on opposite side
- Other sealing materials
- Watercooled or waterheated flanges (ISO-F)
- Rotary feedthrough with pump port
- Ports (diagram 2) for roughing (by-pass), venting or for gauges

DN valve	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
*)	mm inch	40 1½	40 1½	40 1½	40 1½	40 1½	40 1½	40 1½
X	mm inch	185 7.28	245 9.65	304.4 11.98	387.3 15.25	482 18.98	482 18.98	415 16.34
Y	mm inch	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79	20 0.79
Z	mm inch	47.5 1.87	59 2.32	85 3.35	100 3.94	135 5.31	135 5.31	140 5.51

*) recommended port: CF-F or ISO-KF

Ordering information for options:

Ordering No. of valve-X

(e. g. 64244-CE52-X, X = actuator A2, port KF40 in position B2)

Heater

Thermostat temperature control 80°C, 100°C, 120°C
or temperature sensor for external control (PT100 or thermocouple)
Supply voltage: 100 - 120 V resp. 200 - 240 VAC
Insulation box for touch protection

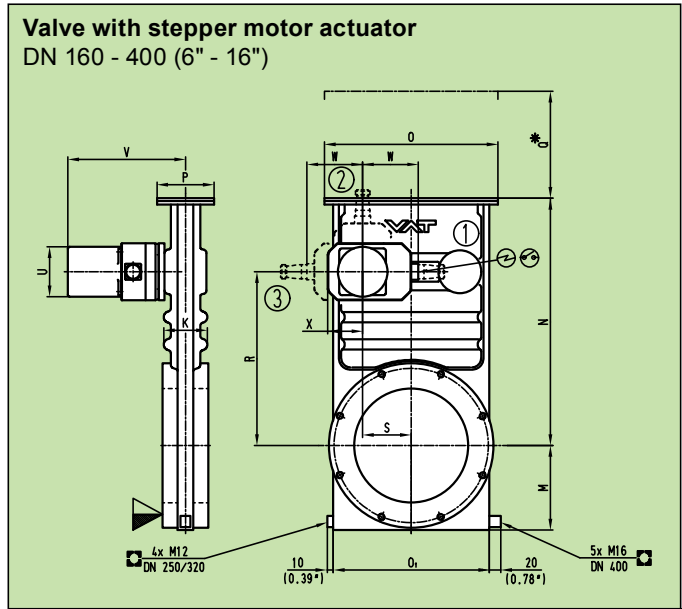
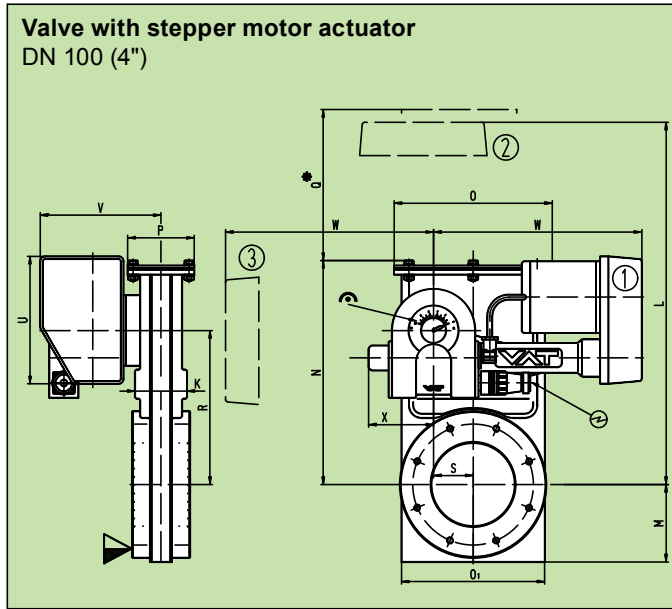
Accessories

Fittings for installation of the valve: series 32 and 33

Seal kit

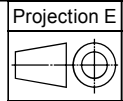
Consisting of seals for gate, bonnet and rotary feedthrough
Ordering No.: see operating manual or price list

Main dimensions



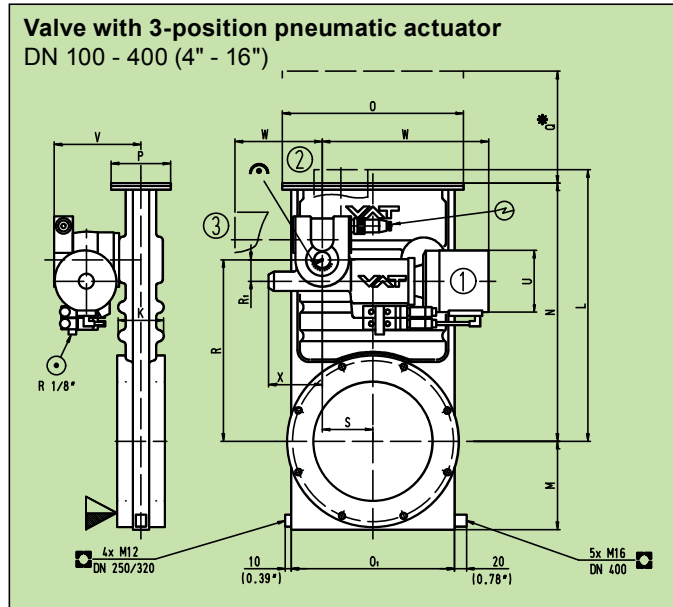
- ▽ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- ⤴ mechanical position indication
- for attachment
- ⊖ electrical connection

- ① standard actuator position (A1)
- ②③ optional actuator positions



DN	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
K	mm inch	63 2.48	75 2.95	77 3.03	116 4.57	120 4.72	120 4.72	130 5.12
L	mm inch	435 17.12						
M	mm inch	93 3.66	123 4.84	148 5.83	177 6.97	214 8.43	214 8.43	232 9.13
N	mm inch	270 10.63	362 14.25	442 17.4	570 22.44	689 27.13	689 27.13	790 31.1
O	mm inch	190 7.48	252 9.92	304 11.97	400 15.75	475 18.7	475 18.7	520 20.47
O1	mm inch	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	100 3.94	100 3.94	138 5.43	138 5.43	138 5.43	138 5.43
Q	mm inch	220 8.66	300 11.81	350 13.78	450 17.72	550 21.65	550 21.65	600 23.62
R	mm inch	185 7.28	245 9.65	304.4 11.98	387.3 15.25	482 18.98	482 18.98	568 22.36
S	mm inch	47.5 1.87	59 2.32	85 3.35	100 3.94	135 5.31	135 5.31	140 5.51
U	mm inch	153 6.02	87 3.43	87 3.43	87 3.43	87 3.43	87 3.43	87 3.43
V	mm inch	142 5.59	207 8.1	207 8.1	248 9.76	248 9.76	248 9.76	253 9.96
W	mm inch	250 9.84	98.5 3.88	98.5 3.88	118.5 4.67	118.5 4.67	118.5 4.67	118.5 4.67
X	mm inch	78 3.07	61 2.4	61 2.4	74 2.91	74 2.91	74 2.91	74 2.91

Main dimensions

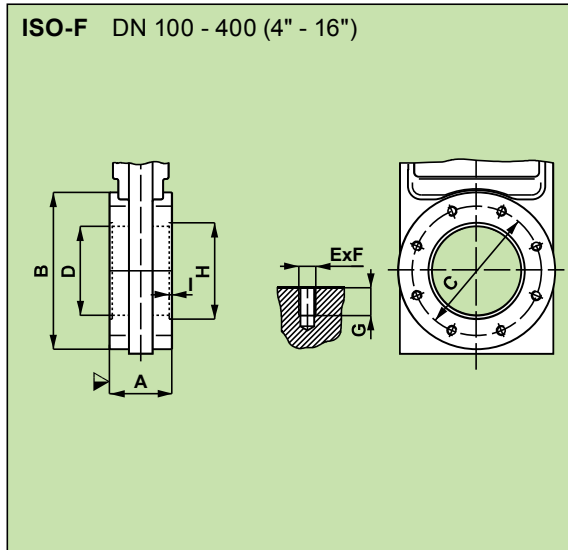


- ▼ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- ⌢ mechanical position indication
- ⊠ for attachment
- ⊖ electrical connection
- ① standard actuator position (A1)
- ②③ optional actuator positions

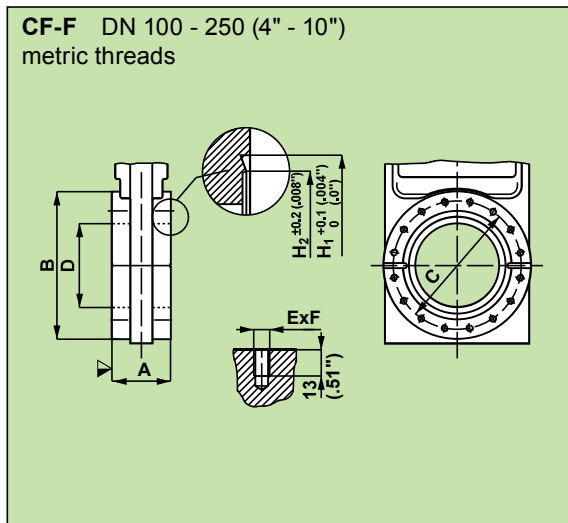
¹⁾ L + W, DN 100: without pneumatic connection 6 mm shorter

DN	mm	100	160	200	250	320	350	400
inch		4	6	8	10	12	14	16
K	mm	63	75	77	116	120	120	130
inch		2.48	2.95	3.03	4.57	4.72	4.72	5.12
L	mm	503 ¹⁾	569	628	843	938	938	1024
inch		19.8	22.4	24.72	33.19	36.93	36.93	40.31
M	mm	93	123	148	177	214	214	232
inch		3.66	4.84	5.83	6.97	8.43	8.43	9.13
N	mm	270	362	442	570	689	689	790
inch		10.63	14.25	17.4	22.44	27.13	27.13	31.1
O	mm	190	252	304	400	475	475	520
inch		7.48	9.92	11.97	15.75	18.7	18.7	20.47
O1	mm	172	222	274	356	421	421	474
inch		6.77	8.74	10.79	14.02	16.57	16.57	18.66
P	mm	80	100	100	138	138	138	138
inch		3.15	3.94	3.94	5.43	5.43	5.43	5.43
Q	mm	220	300	350	450	550	550	600
inch		8.66	11.81	13.78	17.72	21.65	21.65	23.62
R	mm	185	245	304.4	387.3	482	482	568
inch		7.28	9.65	11.98	15.25	18.98	18.98	22.36
R1	mm	33	40	40	50	50	50	50
inch		1.3	1.57	1.57	1.97	1.97	1.97	1.97
S	mm	47.5	59	85	100	135	135	140
inch		1.87	2.32	3.35	3.94	5.31	5.31	5.51
U	mm	96	115	115	165	165	165	165
inch		3.78	4.53	4.53	6.5	6.5	6.5	6.5
V	mm	158	159	159	216.5	216.5	216.5	221.5
inch		6.22	6.26	6.26	8.52	8.52	8.52	8.72
W	mm	318 ¹⁾	324	324	456	456	456	456
inch		12.52	12.76	12.76	17.95	17.95	17.95	17.95
X	mm	78	101	101	131	131	131	131
inch		3.07	3.98	3.98	5.16	5.16	5.16	5.16

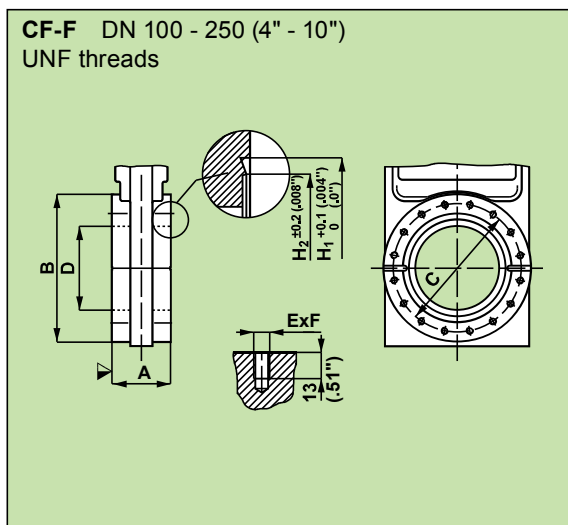
Flange dimensions



DN	mm	100	160	200	250	320	400
	inch	4	6	8	10	12	16
A	mm	70	80	80	100	120	150
	inch	2.76	3.15	3.15	3.94	4.72	5.9
B	mm	176	225	288	350	425	510
	inch	6.93	8.86	11.34	13.78	16.73	20.08
C	mm	145	200	260	310	395	480
	inch	5.71	7.87	10.24	12.2	15.55	18.9
D	mm	100	150	200	261	318	400
	inch	3.94	5.91	7.87	10.28	12.52	15.75
E x F		8 x M8	8 x M10	12 x M10	12 x M10	12 x M12	16 x M12
G	mm	13	14	16	16	16	20
	inch	0.51	0.55	0.63	0.63	0.63	0.79
H	mm	102	153	213	-	-	-
	inch	4.02	6.02	8.39	-	-	-
I	mm	3	5	5	-	-	-
	inch	0.12	0.2	0.2	-	-	-



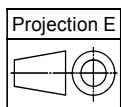
DN	mm	100	160	200	250		
	inch	4	6	8	10		
O.D.	inch	6	8	10	12		
A	mm	70	80	80	100		
	inch	2.76	3.15	3.15	3.94		
B	mm	176	225	288	350		
	inch	6.93	8.86	11.34	13.78		
C	mm	130.2	181	231.8	284		
	inch	5.13	7.13	9.13	11.18		
D	mm	100	150	200	254		
	inch	3.94	5.91	7.87	10		
E x F		16 x M8	20 x M8	24 x M8	32 x M8		
H1	mm	120.65	171.45	222.3	273.15		
	inch	4.75	6.75	8.75	10.75		
H2	mm	115.5	166	217	267		
	inch	4.55	6.54	8.54	10.51		



DN	mm	100	160	200	250 ¹⁾	250 ¹⁾	
	inch	4	6	8	10	10	
O.D.	inch	6	8	10	12	13 1/4	
A	mm	70	80	80	100	100	
	inch	2.76	3.15	3.15	3.94	3.94	
B	mm	176	225	288	350	350	
	inch	6.93	8.86	11.34	13.78	13.78	
C	mm	130.2	181	231.8	284	306.3	
	inch	5.13	7.13	9.13	11.18	12.06	
D	mm	100	150	200	254	254	
	inch	3.94	5.91	7.87	10	10	
E x F		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	
H1	mm	120.65	171.45	222.3	273.15	294.64	
	inch	4.75	6.75	8.75	10.75	11.6	
H2	mm	115.5	166	217	267	288.3	
	inch	4.55	6.54	8.54	10.51	11.35	

¹⁾ O.D. 12" VAT standard, O.D. 13 1/4" option

Ordering information for option: O.D. 13 1/4"
Ordering No. of valve-X (e. g. 64048-UE48-X, X = O.D. 13 1/4")

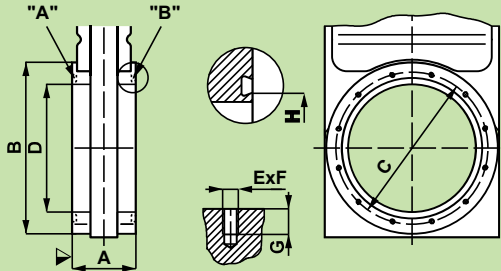


▼ valve seat side

Flange dimensions

ASA-LP DN 100 - 400 (4" - 16")
with or without O-ring groove

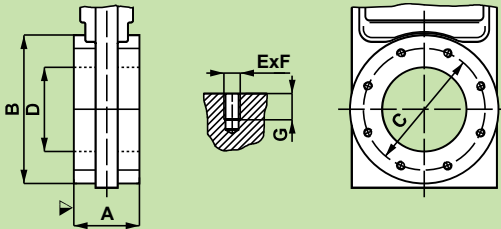
For orders **with** O-ring groove specify:
«A», «B» or «A + B»



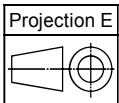
DN	mm inch	100 4	160 6	200 8	250 10	320 12	400 16
ASA-LP		3	4	6	8	10	16 ¹⁾
A	mm inch	70 2.76	80 3.15	80 3.15	100 3.94	120 4.72	150 5.9
B	mm inch	176 6.93	225 8.86	288 11.34	350 13.78	425 16.73	596.9 23.5
C	mm inch	152.4 6	190.5 7.5	241.3 9.5	298.5 11.75	362 14.25	539.8 21.25
D	mm inch	100 3.94	150 5.91	200 7.87	254 10	300 11.81	400 15.75
E x F		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 inch	15 0.59	15 0.59	20 0.79	20 0.79	28 1.1	25.4 1
H	mm inch	120.65 4.75	158.75 6.25	206.4 8.13	266.7 10.5	317.5 12.5	419.1 16.5
O-Ring I.D. x d		120.24 x 3.53 4.73 x .139	158.34 x 3.53 6.23 x .139	202.79 x 3.53 7.98 x .139	266.29 x 3.53 10.48 x .139	316.87 x 7.00 12.47 x .275	417.96 x 7.00 16.46 x .275

¹⁾ ASA

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



DN	mm inch	100 4	150 6	200 8	250 10	300 12	350 14	400 16
A	mm inch	70 2.76	80 3.15	80 3.15	100 3.94	120 4.72	120 4.72	150 5.9
B	mm inch	176 6.93	225 8.86	288 11.34	350 13.78	425 16.73	450 17.72	510 20.08
C	mm inch	160 6.3	210 8.27	270 10.63	320 12.6	370 14.57	420 16.54	480 18.9
D	mm inch	100 3.94	150 5.91	200 7.87	261 10.28	318 12.52	350 13.78	400 15.75
E x F		8 x M10	8 x M10	8 x M12	12 x M12	12 x M12	12 x M12	12 x M16
G	mm inch	12 0.47	14 0.55	16 0.63	16 0.63	16 0.63	16 0.63	25 0.98



▼ valve seat side

B

Pressure controller



PM-5



PM-4

PM-5: Version for local and remote control
 PM-4: Version for remote control

Features	PM-4	PM-5
Fast and accurate adaptive pressure control	X	X
Automatic learning of system parameters	X	X
Hold function for plasma ignition	X	X
Position control	X	X
Local operation		X
Interface for service box	X	
Operation with remote control interface	X	option
Large information display		X
LED function indicators	X	
Interface for linear pressure sensors (capacitance manometers)	X	X
Zero adjust of sensor	X	X
Closing of valve at power failure	option	option

Pressure control

The PM-4 / PM-5 controllers ensure fast and accurate pressure control. The LEARN function, being performed only once during system set-up, automatically determines all relevant system parameters.

During pressure control the pressure controller continuously adapts to the process conditions (gas type, gas flow). No parameter inputs are necessary.

Position control

The PM-4 / PM-5 controllers are provided with a position control mode that allows to control any valve position between 'open – closed' with selectable speed.

Local operation

The PM-5 controller can be operated locally via keyboard and display on the front panel. In combination with a service box the PM-4 controller can also be operated locally.

Display

The PM-5 controller has a large display for pressure, position and status information. The pressure can be displayed in various ranges (0-1, 2.5, 5, 10, 20 1000) and units (mbar, μ bar, kPa, Pa, Torr, mTorr).

Remote operation

By means of a remote control interface the controllers PM-4 / PM-5 can be controlled by a host system (see selectable interface options below).

Logic interface

Digital inputs	<ul style="list-style-type: none"> - opening and closing of valve - control mode and setpoint selection - LEARN, zero adjust, and hold - keyboard interlock
Digital outputs	<ul style="list-style-type: none"> - valve position open and closed - remote control status - setpoint deviation
Analog inputs	<ul style="list-style-type: none"> - pressure and position setpoints
Analog outputs	<ul style="list-style-type: none"> - current pressure and valve position

RS232 interface	Serial RS232 interface	- operation of all functions, selectable baudrate (110 - 19200)
	Digital inputs	- opening and closing of valve
	Digital outputs	- valve position open and closed
Power Failure Option	This function is available as an option. It automatically closes the valve at power failure.	
Technical data	Mains voltage	100 - 240 V (± 10 %), 50/60 Hz
	Power required	max. 150W
	Ambient temperature	0 - 50°C
	Pressure control accuracy	0.1 % of the sensor full scale range
	Position control	1000 positions
	Pressure sensor	
	- Sensor input voltage	0 - 1V, 2V, 5V, 10V (selectable)
	- Sensor input	differential, R _i > 100 kOhm
	- Sensor power supply	+ 15 V (± 5 %), max. 1400 mA *) - 15 V (± 5 %), max. 1400 mA *)
		*) total for both sensors with 2-sensor version
	Power Failure Option (PFO)	
	- Accumulator type	NiMH
	- Minimum charge time	10 h
	- Life time (35°C)	20 months
	Inputs (interface option)	
	- Digital	control with relay contacts or optocouplers
	- Analog	0 - 10V, R _i >100 kOhm
	Outputs (interface option)	
	- Digital	potential-free relay contacts max. 70 V, 500 mA, 10W
	- Analog	0 - 10V, max. 1 mA
	Dimensions (w x h x d)	241 x 88 x 264 mm (9.5" x 3.5" x 10.5") ½ of 19" rack insert, 2 height units
	Weight: without PFO / with PFO	2.6 kg (5.7 lbs) / 3.4 kg (7.5 lbs)
Options	<ul style="list-style-type: none"> - Service box for PM-4: 601BS-29NN (picture 1) - Connection of 2 sensors - RS485 interface - Customer specific software on request - Blank panel for installation into 19" rack: 64263-R1 (picture 2) - Installation kit for connecting 2 controllers in a 19" rack: 64263-R2 	



picture 1



picture 2



Series 650

- Downstream pressure control and isolation valve
- Compact design
- Fast, virtually particle-free and shock-free operation
- High-performance, integrated controller



Body material

aluminum or aluminum hard anodized

Valve with integrated controller

optional controller configurations

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

Ordering example: 65040-PAGG
 = aluminum valve with ISO-F DN 100 flanges, RS232 interface, for 1 sensor

DN		Ordering numbers											
		aluminum				aluminum hard anodized							
mm	inch	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

x		y		1)	2)	1)	2)
G = basic version		G = RS232	1	J = RS485	1		
A = with SPS		H = RS232	2	K = RS485	2		
H = with PFO		C = Logic	1	Y = Ethernet	1		
C = with SPS and PFO		E = Logic	2	Z = Ethernet	2		
T = basic version with VC		P = DeviceNet®	1	L = CC-Link	1		
V = with SPS and VC		Q = DeviceNet®	2	N = CC-Link	2		
U = with PFO and VC		D = Profibus	1	I = EtherCAT	1		
W = with SPS, PFO and VC		F = Profibus	2	X = EtherCAT	2		
				S = w/o (VC only)			
				1) interface	2) qty. of sensors		

Accessories

Designation	Ordering No.
CV software including service cable ³⁾	600SV-99LB
CPA software including service cable ³⁾	600SP-99LB
Service box 2 (standard version with 1.5 m cable) ³⁾	601BS-29NN
Control panel for installation into 19" rack, including 5 m cable ³⁾	602BS-29LE
Connector kit for valves with RS232, RS422, RS485 or Logic interface consisting of counter plugs for INTERFACE, SENSOR and POWER connections	242411
Connector kit for valves with fieldbus consisting of counter plugs for SENSOR and POWER connections	242410
AC power supply unit (input: 100 - 240 VAC, output: 24 VDC / 4A)	249775
Separation unit for controller including 2 m cable	255544

³⁾ Details see chapter «Pressure controller»

Sealing materials

Plate: FKM (VITON)

Body: FKM (VITON)

Bonnet: FKM (VITON)

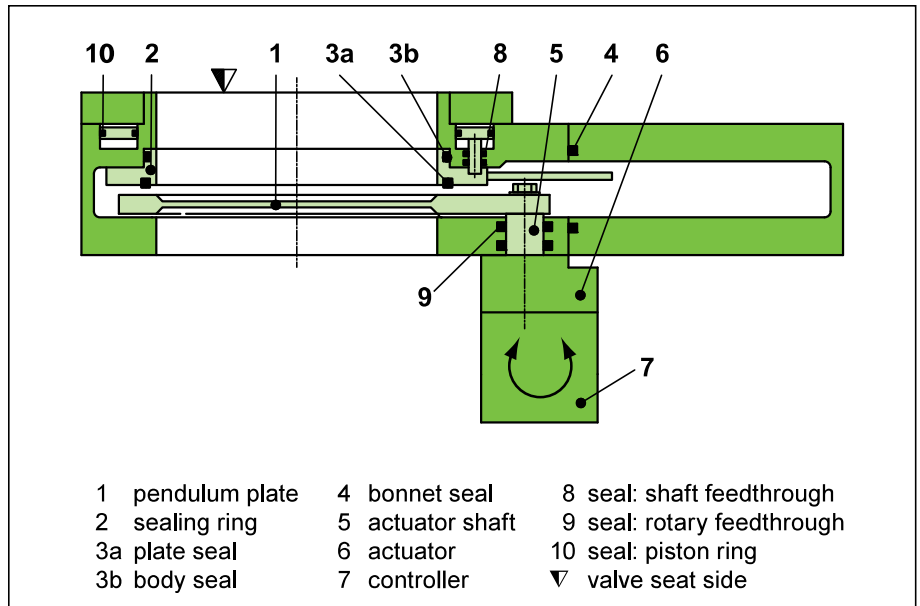
Feedthrough

Rotary feedthrough (actuator)

FKM (VITON)

Shaft feedthrough (sealing ring)

FKM (VITON)



B

Features

Fast operation

Position indication

Easy maintenance

Extremely short control response times

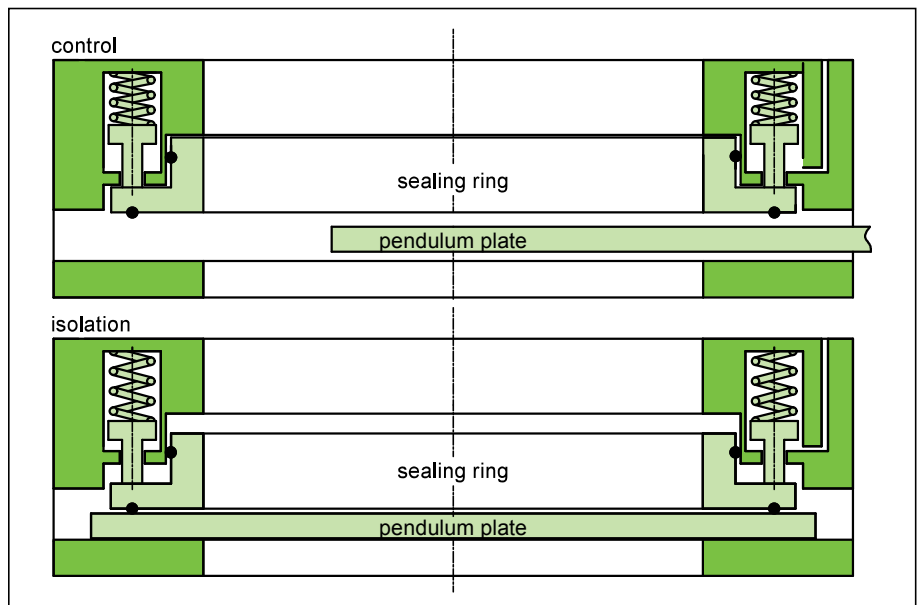
Integrated controller (easy to remove)

Service port (computer or service box 2 connection)

Function

The valve plate acts, due to its pendulum motion, as a throttling element and varies the conductance of the valve opening. The integrated controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 225. 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 moves downwards. It is closed by a spring. For opening the sealing ring is lifted pneumatically.



Control range

VAT provides the «CONTROL VALVE EVALUATION TOOL» to help you select the product most suitable for your process. The tool is available on our website www.vatvalve.com → Country → Control Valve Evaluation Tool for free use.

Technical data

Actuator unit with controller

Power consumption	+ 24 VDC (±10%) @ 0.5 V pk-pk max. 50 W max. (controller + motor) 10 W max. for Power Failure Option 36 W max. for Sensor Power Supply
Sensor supply	24 VDC or ±15 VDC
Sensor input	
- Signal voltage	0 - 10 VDC linear with pressure
- Input resistance	Ri = 100kΩ
- Resolution	0.23 mV
- Sampling rate	10 ms
Control accuracy	0.1% of maximum sensor range
Position resolution	≥ 9155 (depending on nominal diameter)
Ambient temperature	50°C max. (<35°C recommended)

Valve unit

Pressure range ¹⁾	
- blank / hard anodized	1 · 10 ⁻⁸ / 1 · 10 ⁻⁶ mbar to 1.2 bar (abs)
Leak rate to the outside ¹⁾	
- blank / hard anodized	1 · 10 ⁻⁹ / 1 · 10 ⁻⁵ mbar ls ⁻¹
Leak rate at the seat ¹⁾	
- blank / hard anodized	1 · 10 ⁻⁹ / 1 · 10 ⁻⁴ mbar ls ⁻¹
Cycles until first service ²⁾	
- Throttling cycles	1 million (open - max. throttling - open)
- Closing cycles	200 000 (open - closed - open)
Operating temperature ³⁾	10°C - 120°C
Mounting position	
- DN 100 - 250	any ⁴⁾
- DN 320 - 400	horizontal only ⁴⁾
Material in vacuum	
- Valve body	EN AW-6082 (3.2315)
- Pendulum plate	EN AW-6082 (3.2315)
- Sealing ring	EN AW-6082 (3.2315), AISI 305 (1.4303), AISI 420C (1.3541), AISI 631 (1.4568)
- Other parts	AISI 316L (1.4404, 1.4435), AISI 440 (1.4122), AISI 301 (1.4310), AISI 316 Ti (1.4571), AISI 304 (1.4301)
- Seals	FKM (VITON)

¹⁾ Unheated on delivery

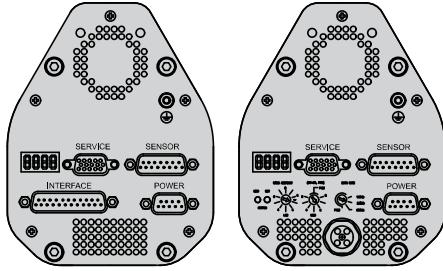
²⁾ Unheated and under clean conditions / FKM (VITON)

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

⁴⁾ Valve seat on chamber side recommended

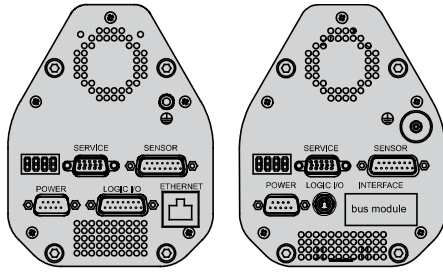
DN (nominal I. D.)		conductance in open position (molecular flow)	minimum controllable conductance (molecular flow)	max. differential pressure in closed position	max. differential pressure during operation	compressed air pressure min. - max. (overpressure)		typical closing / opening time		weight (approx.)	
mm	inch					bar	psi	throttling only	throttling and closing	kg	lbs
100	4	1700	3	1200	30	4 - 7	55 - 100	0.7	3 / 4	12	26.5
160	6	5000	5	1200	10	4 - 7	55 - 100	0.8	3 / 4	18	40
200	8	12000	10	1200	5	4 - 7	55 - 100	0.9	3 / 4	22	48.5
250	10	22000	15	1200	5	4 - 7	55 - 100	0.9	3 / 4	29	64
320	12	30000	22	1200	5	4 - 7	55 - 100	1.1	5 / 6	48	106
350	14	43000	25	1200	5	4 - 7	55 - 100	1.3	5 / 6	59	130
400	16	61000	30	1200	5	4 - 7	55 - 100	1.5	5 / 6	68	150

Pressure controller



RS232, Logic,
RS422, RS485

DeviceNet®



Ethernet

Profibus, CC-Link,
EtherCAT

Features

- Fast and accurate pressure control
- Automatic learning of system parameters
- Hold function for plasma ignition
- Valve position control
- Remote control
- Information display
- Inputs for 1 or 2 linear pressure sensors (capacitance manometers)
- Service interface for local operation
- Closing or opening of the valve at power failure (option)

Electrical connections

	power input	type
POWER	power input	DB-9 male
SENSOR	sensor input sensor power supply	DB-15 female
INTERFACE	RS232, Logic, RS422, RS485	DB-25 female
	DeviceNet®	micro-style male
	Ethernet	RJ 45
Bus modules	Profibus	DB-9 female
	CC-Link	5-pole terminal screw
	EtherCAT	2 x RJ 45

Pressure control

The controller ensures fast and accurate pressure control. 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.

Valve position control

In position control mode the valve plate can be moved to any position.

Display

Status and position are displayed by means of 4 bright digits.

Remote control

The valve can be controlled by a host computer via RS232, RS422, RS485, Logic, 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 «closed» (status of valve).

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

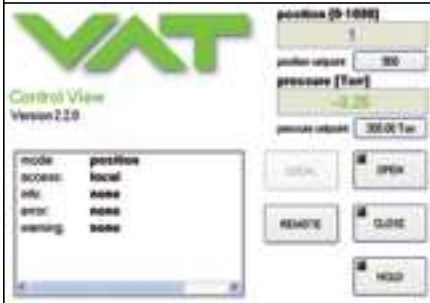
Service port

The valve has a service port (RS232) for connecting a computer or a service box. VAT can provide two software versions which, independent of the hoster computer, allow a variety of functions.

For connecting the computer to the valve, a special cable designed by VAT is required.



Basic version VAT Control View (CV software)

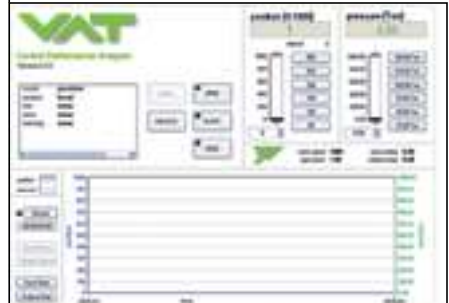


- Setup
- Operation
- Monitoring
- Diagnostics

The basic software (CV) and the drawing for the connecting cable may be downloaded for free from our Website www.vatvalve.com → Country → Services → Downloads.

The software and the cable may also be ordered from VAT. For details see price list.

Extended version VAT Control Performance Analyzer (CPA software)



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

The extended software (CPA) and the connecting cable may be ordered from VAT. For details see price list.

Service box 2 / Control panel

For local operation of valves with integrated controller as an alternative to the computer.



standard service box 2 with cable



control panel with cable for integration into a 19" rack

Sensor Power Supply (SPS)

Optionally, the valve can be provided with a ± 15 VDC power supply unit for the sensor/s.

Power Failure Option (PFO)

This function is optionally available. It closes or opens the valve automatically at power failure.

Valve Cluster Option (VC)

This function is optionally available. It makes possible to control several valves synchronously.

Easy maintenance



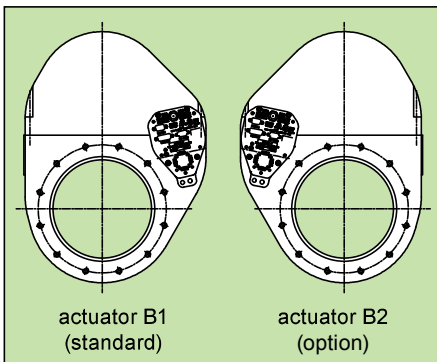
- Valve need not be removed from the system for maintenance
- Fast removal and reinstallation of pendulum plate and sealing ring for cleaning
- Only 2 standard tools are necessary for maintenance

B

Options

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

Picture 1



Actuator / controller:

- Actuator B2 (picture 1)
- Controller with configurable PI parameters
- RS232 interface with 2 analog outputs

Valve:

- Other sizes (e. g. DN 80)
- Other flange types (e. g. ASA-LP)
- Customer specified flanges (e. g. rectangular flange for direct mounting to chamber)
- Other sealing materials
- Other surface processings (e. g. nickel-plating)
- KF ports on the body
- Heater (picture 2) with insulation for valve temperatures up to 120°C
- Valve with detached controller (picture 3)
- Control valve only (no leaktight closing)
- Wedge-shaped pendulum plate for smaller controllable conductances

Picture 2



DN	320	350	400
standard	22 l/s	25 l/s	30 l/s
wedge-shaped	16 l/s	19 l/s	22 l/s

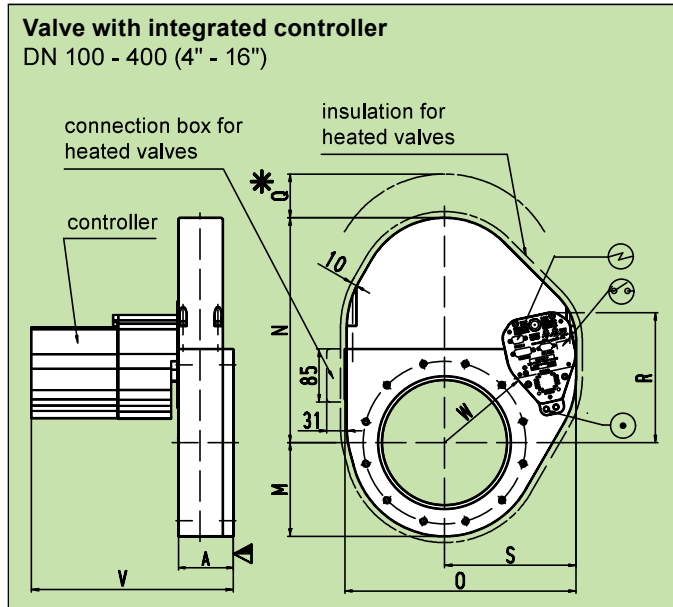
Picture 3



Ordering information for options:

Ordering No. of valve-X (e. g. 65046-PAGH-X, X = valve with heater for 80°C)

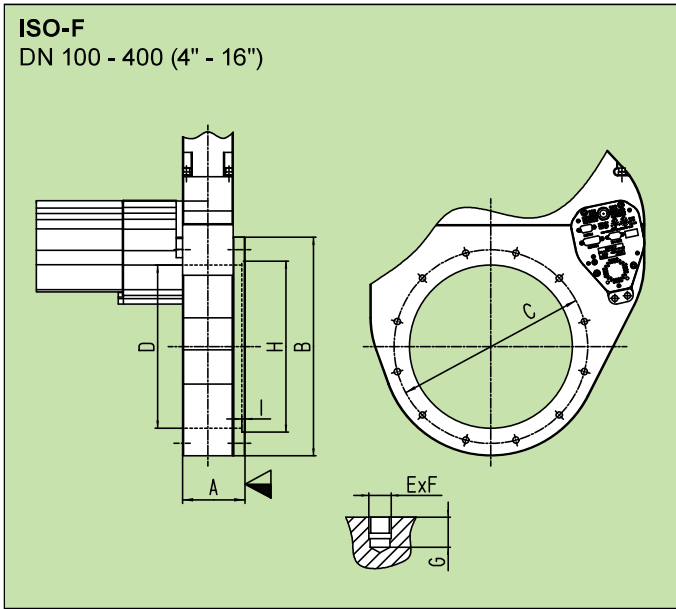
Main dimensions



- * required for dismantling
- ⊙ electrical connection
- ⊗ compressed air connection
- ⊕ position indicator
- ▽ valve seat side

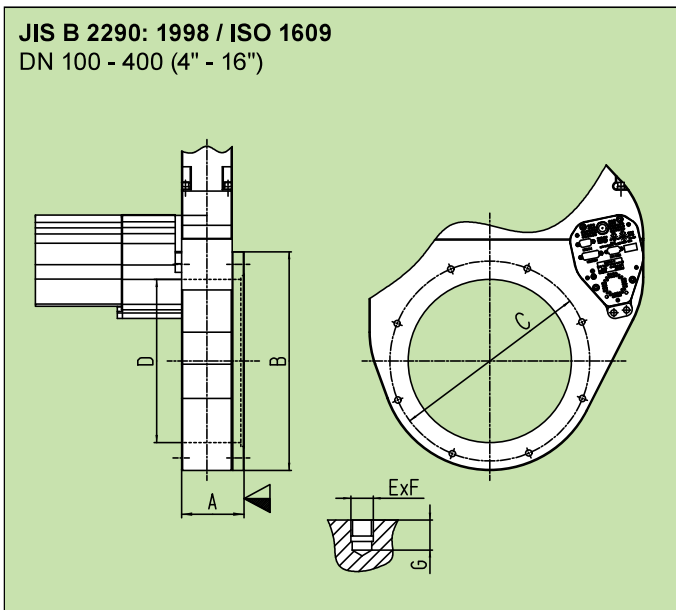
DN	mm inch	100 4	160 6	200 8	250 10	320 12	350 14	400 16
A	mm inch	70 2.76	88 3.46	88 3.46	100 3.94	120 4.72	126 4.96	128 5.04
M	mm inch	95 3.74	121.5 4.78	150 5.91	175 6.89	214 8.43	235 9.25	260 10.24
N	mm inch	200 7.87	302 11.88	360 14.17	438 17.24	538 21.18	590 23.23	655 25.79
O	mm inch	260.9 10.27	321 12.64	370.15 14.57	442.7 17.43	536.4 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	208.5 8.21	233.5 9.19	277 10.91	290 11.42	313 12.32
S	mm inch	162.9 6.41	184.7 7.27	210.8 8.3	246.4 9.7	274.5 10.81	300 11.81	320 12.6
V	mm inch	308 12.13	326 12.83	326 12.83	331 13.03	351 13.82	358 14.09	360 14.17
W	mm inch	94 3.7	121 4.76	151 5.94	194 7.64	236 9.29	257 10.12	292 11.5

Flange dimensions

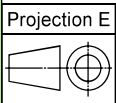


DN	mm	100	160	200	250	320	-	400
	inch	4	6	8	10	12	-	16
A	mm	70	88	88	100	120	-	128
	inch	2.76	3.46	3.46	3.94	4.72	-	5.04
B	mm	190	243	300	350	425	-	520
	inch	7.48	9.57	11.81	13.78	16.73	-	20.47
C	mm	145	200	260	310	395	-	480
	inch	5.71	7.87	10.24	12.2	15.55	-	18.9
D	mm	100	150	200	261	318	-	400
	inch	3.94	5.91	7.87	10.28	12.52	-	15.75
E x F		8 x M8	8 x M10	12 x M10	12 x M10	12 x M12	-	16 x 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	213.2	-	-	-	-
	inch	-	6.02	8.39	-	-	-	-
I	mm	-	5	5	-	-	-	-
	inch	-	0.2	0.2	-	-	-	-

B



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	18.5	20.47
C	mm	160	210	270	320	370	420	480
	inch	6.3	8.27	10.63	12.6	14.57	16.54	18.9
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 x F		8 x M10	8 x M10	8 x M12	12 x M12	12 x M12	12 x M12	12 x 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



Series 652

with **extended** control range

Downstream pressure control and isolation valve

Compact design

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

High-performance, integrated controller



Body material

aluminum or aluminum hard anodized

Valve with integrated controller

DN		Ordering numbers											
		aluminum				aluminum hard anodized							
mm	inch	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

optional controller configurations

SPS = ±15VDC Sensor Power Supply

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

VC = Valve Cluster Option
(controller for operating several valves synchronously)

x	y								
G = basic version				1)	2)			1)	2)
A = with SPS				G = RS232	1			J = RS485	1
H = with PFO				H = RS232	2			K = RS485	2
C = with SPS and PFO				C = Logic	1			Y = Ethernet	1
T = basic version with VC				E = Logic	2			Z = Ethernet	2
V = with SPS and VC				P = DeviceNet®	1			L = CC-Link	1
U = with PFO and VC				Q = DeviceNet®	2			N = CC-Link	2
W = with SPS, PFO and VC				D = Profibus	1			I = EtherCAT	1
				F = Profibus	2			X = EtherCAT	2
								S = no	0
									(VC only)

Ordering example: 65246-PAGG
= aluminum valve with ISO-F DN 200 flanges, RS232 interface, for 1 sensor

1) = interface
2) = quantity of sensors

Accessories

Designation	Ordering No.
CV software including service cable ³⁾	600SV-99LB
CPA software including service cable ³⁾	600SP-99LB
Service box 2 (standard version with 1.5 m cable) ³⁾	601BS-29NN
Control panel for installation into 19" rack, including 5 m cable ³⁾	602BS-29LE
Connector kit for valves with RS232, RS422, RS485 or Logic interface consisting of counter plugs for INTERFACE, SENSOR and POWER connections	242411
Connector kit for valves with fieldbus consisting of counter plugs for SENSOR and POWER connections	242410
AC power supply unit (input: 100 - 240 VAC, output: 24 VDC / 6.25A)	369877

³⁾ Details see chapter «Pressure controller»

Sealing materials

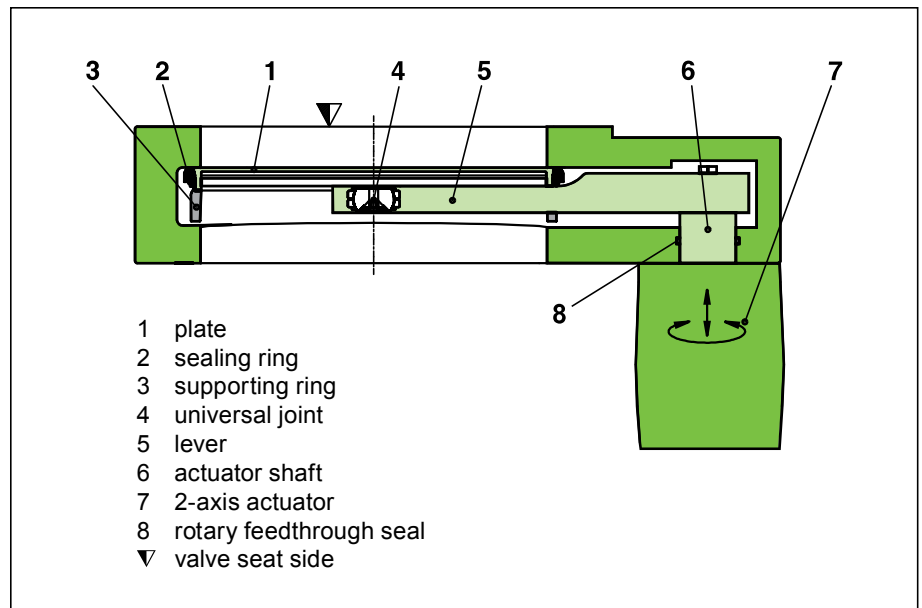
Plate: FKM (VITON, vulcanized)

Bonnet: FKM (VITON O-ring)

Feedthrough

Rotary feedthrough (actuator)

FKM (VITON O-ring)



- 1 plate
- 2 sealing ring
- 3 supporting ring
- 4 universal joint
- 5 lever
- 6 actuator shaft
- 7 2-axis actuator
- 8 rotary feedthrough seal
- ▼ valve seat side

B

Features

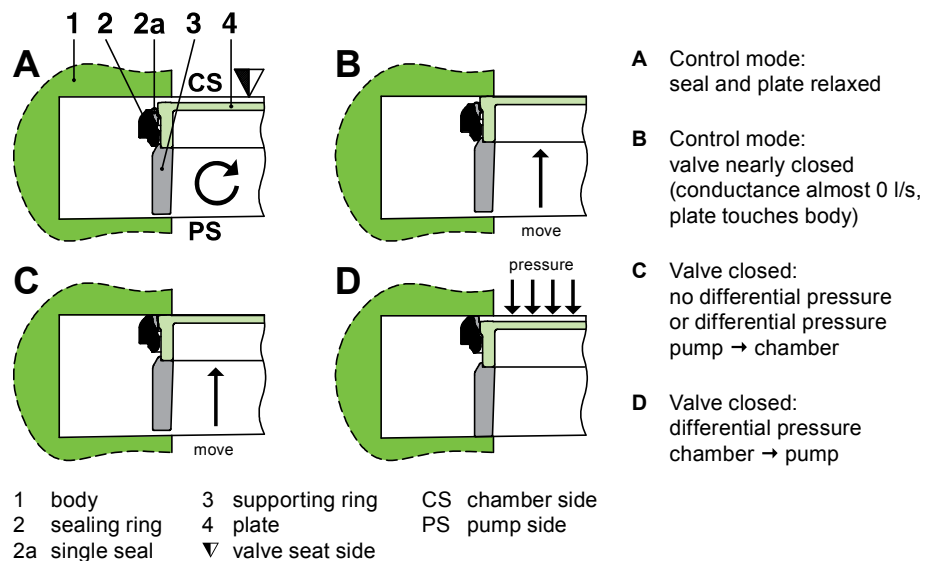
Very fast operation
Position indication
Easy maintenance

Conductance control to almost 0 l/s
Integrated controller (easy to remove)
Service port (computer and service box 2 connection)

Function

The valve plate acts, due to its pendulum and stroke motion, as a throttling element and varies the conductance of the valve opening. The integrated controller calculates the required plate position to achieve the setpoint pressure. See also principle drawing on page 225. 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 of the sealing ring are performed by the second actuator axis.



- A** Control mode: seal and plate relaxed
- B** Control mode: valve nearly closed (conductance almost 0 l/s, plate touches body)
- C** Valve closed: no differential pressure or differential pressure pump → chamber
- D** Valve closed: differential pressure chamber → pump

- 1 body
- 2 sealing ring
- 2a single seal
- 3 supporting ring
- 4 plate
- ▼ valve seat side
- CS chamber side
- PS pump side

Control range

VAT provides the «CONTROL VALVE EVALUATION TOOL» to help you select the product most suitable for your process. The tool is available on our website www.vatvalve.com → Country → Control Valve Evaluation Tool for free use.

Technical data

Actuator unit with controller	Power consumption	+ 24 VDC (±10%) @ 0.5 V pk-pk max. 100 W max. (controller + motor) 10 W max. for Power Failure Option 36 W max. for Sensor Power Supply
	Sensor supply	24 VDC or ±15 VDC
	Sensor input	
	- Signal voltage	0 - 10 VDC linear with pressure
	- Input resistance	Ri = 100kΩ
	- Resolution	0.23 mV
	- Sampling rate	10 ms
	Control accuracy	0.1% of maximum sensor range
	Ambient temperature	50°C max. (<35°C recommended)

Valve unit

Pressure range ¹⁾	
- blank	1 · 10 ⁻⁸ mbar to 1.2 bar (abs)
- hard anodized	1 · 10 ⁻⁶ mbar to 1.2 bar (abs)
Leak rate to the outside ¹⁾	
- blank	1 · 10 ⁻⁹ mbar ls ⁻¹
- hard anodized	1 · 10 ⁻⁵ mbar ls ⁻¹
Leak rate at the seat ¹⁾	
- blank	1 · 10 ⁻⁹ mbar ls ⁻¹
- hard anodized	1 · 10 ⁻⁴ mbar ls ⁻¹
Cycles until first service ²⁾	
- Throttling cycles	2.5 million (open - max. throttling - open)
- Closing cycles	20 000 (open - closed - open)
Operating temperature ³⁾	
- Valve	120°C
- Ambient	50°C
Mounting position	any ⁴⁾
Material in vacuum	
- Valve body	EN AW-6082 (3.2315)
- Lever, actuator shaft	EN AW-6082 (3.2315), EN AW-5083 (3.3547) Fibral, EN AW-6082 (3.2315) PTFE coated AISI 301 (1.4310), 303 (1.4305), 304 (1.4301), 305 (1.4303), 304 (1.4301) / 305 (1.4303) hard-chrome plated, 316L (1.4404, 1.4435), A2-70 Ni-PTFE coated, A2 (304, 433)
- Plate	EN AW-6082 (3.2315), partly PTFE coated EN AC-42100 (3.2371.62) AISI 301 (1.4310), 303 (1.4305), 440 (1.4122), A2 (125A), A2-70 Ni-PTFE coated FKM (VITON)
- Seals	FKM (VITON)

¹⁾ Unheated on delivery

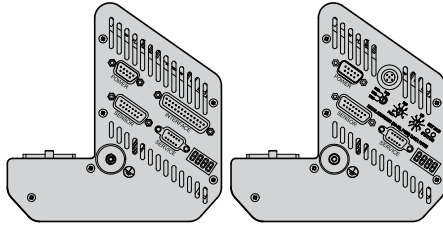
²⁾ Unheated and under clean conditions / FKM (VITON)

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

⁴⁾ Valve seat on chamber side recommended

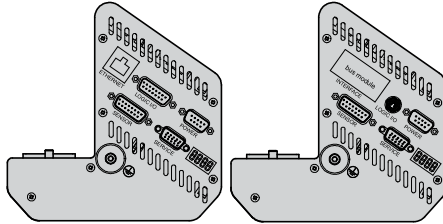
DN (nominal I. D.)		conductance in open position (molecular flow)	minimum controllable conductance (molecular flow)	max. differential pressure in closed position	max. differential pressure during operation	typical closing/ opening time		weight (approx.)	
						throttling only	throttling and closing		
mm	inch	ls ⁻¹	ls ⁻¹	mbar	mbar	s	s	kg	lbs
200	8	12 000	0.2	1 200	10	0.9	2 / 2.8	27	59.5
250	10	22 000	0.25	1 200	10	0.9	2 / 2.8	34	75

Pressure controller



RS232, Logic,
RS422, RS485

DeviceNet®



Ethernet

Profibus, CC-Link,
EtherCAT

Features

- Very fast and accurate pressure control
- Automatic learning of system parameters
- Hold function for plasma ignition
- Valve position control
- Remote control
- Information display
- Inputs for 1 or 2 linear pressure sensors (capacitance manometers)
- Service interface for local operation
- Closing or opening of the valve at power failure (option)

Electrical connections

	power input	type
POWER	power input	DB-9 male
SENSOR	sensor input sensor power supply	DB-15 female
INTERFACE	RS232, Logic, RS422, RS485	DB-25 female
	DeviceNet®	micro-style male
	Ethernet	RJ 45
Bus modules	Profibus	DB-9 female
	CC-Link	5-pole terminal screw
	EtherCAT	2 x RJ 45

Pressure control

The controller ensures very fast and accurate pressure control. 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.

Valve position control

In position control mode the valve plate can be moved to any position.

Display

Status and position are displayed by means of 4 bright digits.

Remote control

The valve can be controlled by a host computer via RS232, RS422, RS485, Logic, 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 «closed» (status of valve).

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

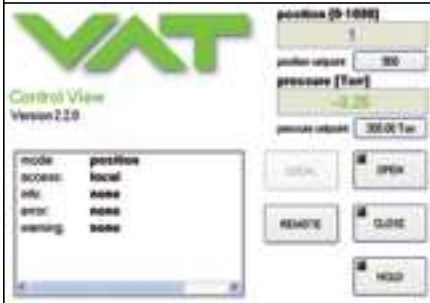
Service port

The valve has a service port (RS232) for connecting a computer or a service box. VAT can provide two software versions which, independent of the hoster computer, allow a variety of functions.

For connecting the computer to the valve, a special cable designed by VAT is required.



Basic version VAT Control View (CV software)

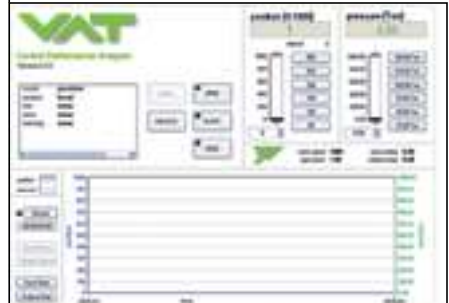


- Setup
- Operation
- Monitoring
- Diagnostics

The basic software (CV) and the drawing for the connecting cable may be downloaded for free from our Website www.vatvalve.com → Country → Services → Downloads.

The software and the cable may also be ordered from VAT. For details see price list.

Extended version VAT Control Performance Analyzer (CPA software)



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

The extended software (CPA) and the connecting cable may be ordered from VAT. For details see price list.

Service box 2 / Control panel

For local operation of valves with integrated controller as an alternative to the computer.



standard service box 2 with cable



control panel with cable for integration into a 19" rack

Sensor Power Supply (SPS)

Optionally, the valve can be provided with a ± 15 VDC power supply unit for the sensor/s.

Power Failure Option (PFO)

This function is optionally available. It closes or opens the valve automatically at power failure.

Valve Cluster Option (VC)

This function is optionally available. It makes possible to control several valves synchronously.

Options

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



Actuator / controller:

- RS232 interface with analog output

Valve:

- Other sizes (e. g. DN 160, 320, 350)
- Heater (picture) with insulation for valve temperatures up to 120°C

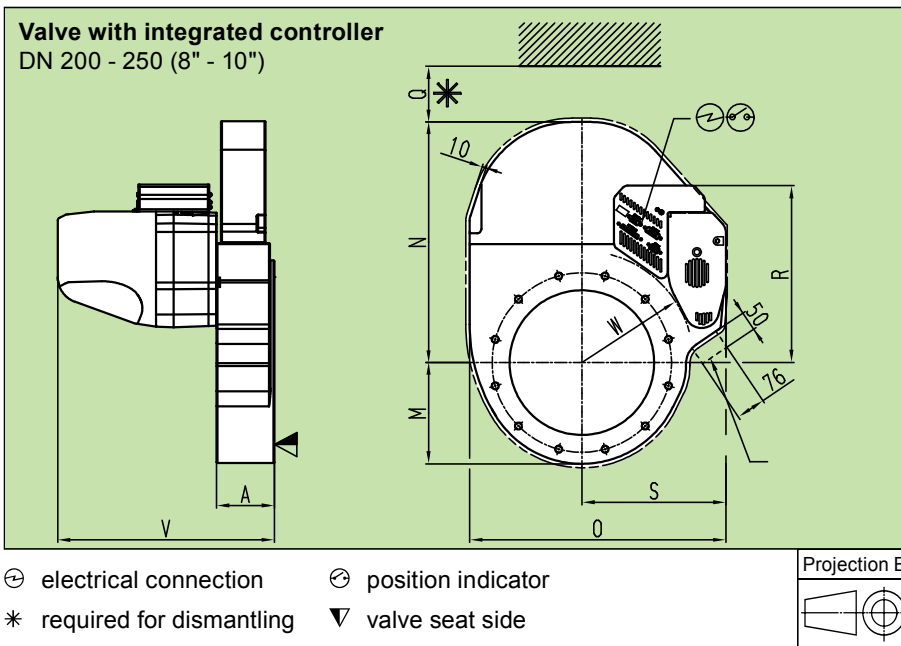
Ordering information for options:

Ordering No. of valve-X (e. g. 65248-PAGH-X, X = valve with heater for 80°C)

B

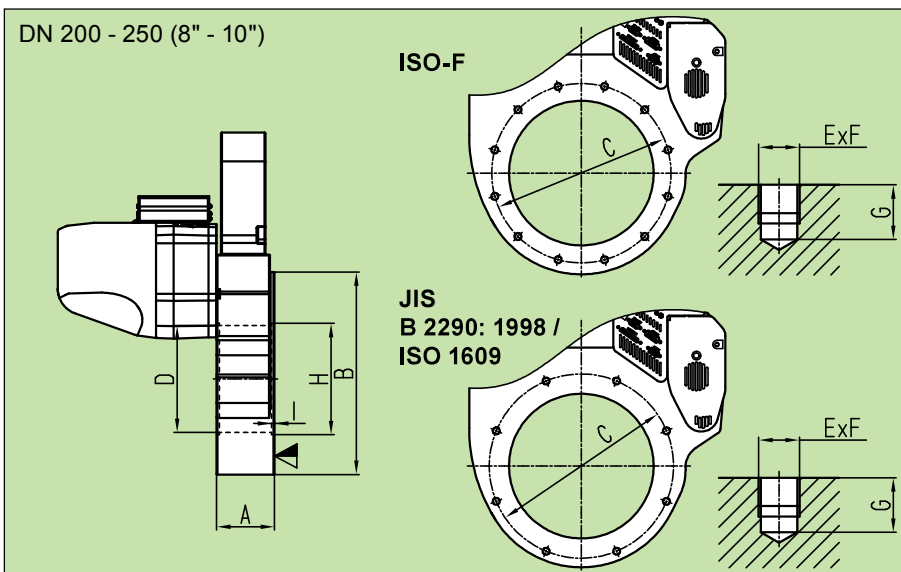
Main dimensions

Valve with integrated controller
DN 200 - 250 (8" - 10")



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	384.5	443
	inch	15.14	17.44
Q	mm	20	20
	inch	0.79	0.79
R	mm	240	306
	inch	9.45	12.05
S	mm	223	249
	inch	8.78	9.80
V	mm	361	375
	inch	14.21	14.76
W	mm	165	195
	inch	6.50	7.68

Flange dimensions



	ISO-F		JIS		
DN	mm	200	250	200	250
	inch	8	10	8	10
A	mm	86	100	86	100
	inch	3.39	3.94	3.39	3.94
B	mm	300	350	300	350
	inch	11.81	13.78	11.81	13.78
C	mm	260	310	270	320
	inch	10.24	12.20	10.63	12.60
D	mm	200	254	200	254
	inch	8	10	8	10
ExF	mm	12 x	12 x	8 x	12 x
	inch	M10	M10	M12	M12
G	mm	15	16	15	16
	inch	0.59	0.63	0.59	0.63
H	mm	213.2	261	-	-
	inch	8.39	10.28	-	-
I	mm	5	5	-	-
	inch	0.20	0.20	-	-

Control valve combined with an isolation valve for pressure control and isolation

Series 951: control valve + angle valve

- with bellows feedthrough
- opening at 1 bar differential pressure possible
- compact

Series 952: control valve + gate valve

- with O-ring shaft seal

Body material

Series 951: aluminum or stainless steel
Series 952: aluminum



Series 951: DN 40 - 50



Series 952: DN 63 - 250

Valve with integrated controller

	DN		Ordering numbers					
	mm	inch	aluminum		stainless steel			
Series 951 ISO-KF	40	1 ½	95132-KA	x	y	95132-KE	x	y
	50	2	95134-KA	x	y	95134-KE	x	y
Series 952 ISO-F	63	2 ½	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			

optional controller configurations

SPS = ±15VDC Sensor Power Supply

PFO = Power Failure Option

(valve closes or opens automatically at power failure)

G = basic version

A = with SPS

H = with PFO

C = with SPS and PFO

Ordering example: 95134-KAAG
= valve DN 50, controller with SPS, RS232 interface, for 1 sensor

1) G = RS232

H = RS232

C = Logic

E = Logic

P = DeviceNet®

Q = DeviceNet®

D = Profibus

F = Profibus

1) J = RS485

K = RS485

Y = Ethernet

Z = Ethernet

L = CC-Link

N = CC-Link

I = EtherCAT

X = EtherCAT

1) = interface

2) = quantity of sensors

Options

- Service port for connecting a computer
- VAT Control View (CV) software and VAT Control Performance Analyzer (CPA) software for setup, operation, monitoring, diagnostics etc. (for details see Series 612)
- Service box or control panel for integration into a 19" rack as an alternative to a computer



service box



control panel

Technical data

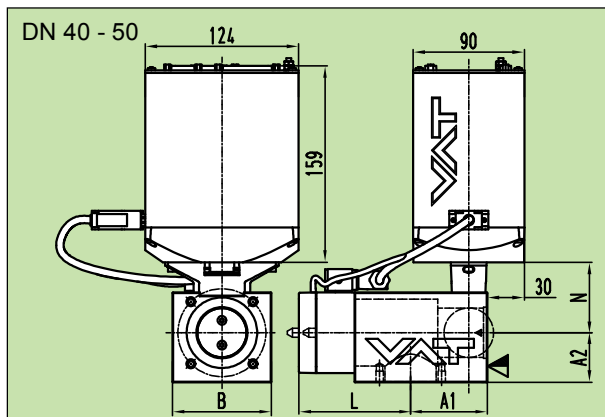
Actuator unit with controller	Power consumption	+ 24 VDC (±10%) @ 0.5 V pk-pk max. 38 W max. (controller + motor)
	Sensor supply	24 VDC or ±15 VDC
Valve unit	Pressure range	- Series 951 - Series 952 DN 63 - 200 / 250
		1 · 10 ⁻⁸ mbar to 1.2 bar (abs) 1 · 10 ⁻⁷ mbar to 1.6 / 1.2 bar (abs)
	Leak rate to the outside	1 · 10 ⁻⁹ mbar ls ⁻¹
	Cycles until first service ¹⁾	2 million
	- Throttling - Closing DN 40 - 50 / 63 - 100 / 160 - 250	2 million / 200 000 / 100 000
	Temperature ²⁾ - Valve body - Ambient	≤ 120°C (Option: 150°C) ≤ 50°C
	Mounting position	any

¹⁾ Unheated and under clean conditions

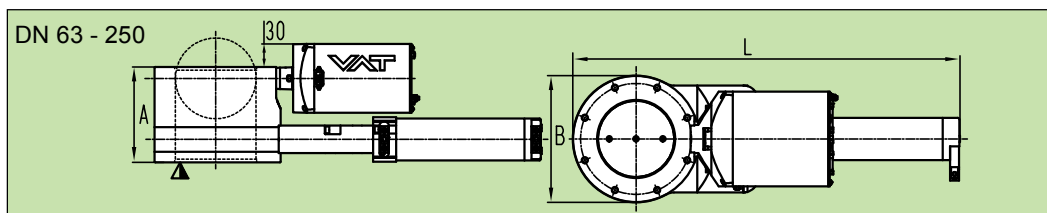
²⁾ Maximum values: depending on operating conditions and sealing materials

	DN (nominal I. D.)		conductance in open position (molecular flow)	minimum controllable conductance (molecular flow)	compressed air pressure min. - max. overpressure		max. differential pressure			typical opening / closing time	
							closing	opening	throttling	closing	throttling
	mm	inch	ls ⁻¹	ls ⁻¹	bar	psi	bar	mbar	bar	s	s
Series 951	40	1½	45	0.25	4 - 8	55 - 115	4.0	1000	1	0.6	0.3
	50	2	80	0.3	4 - 8	55 - 115	4.0	1000	1	0.6	0.3
Series 952	63	2½	180	0.45	4 - 7	55 - 100	1.6	30	1	1.5	0.3
	80	3	370	0.65	4 - 7	55 - 100	1.6	30	1	1.7	0.3
	100	4	730	0.85	4 - 7	55 - 100	1.6	30	0.8	2	0.3
	160	6	2000	1.7	4 - 7	55 - 100	1.6	30	0.3	2	0.3
	200	8	4000	2.8	4 - 7	55 - 100	1.6	30	0.15	3	0.3
	250	10	15000	14	4 - 7	55 - 100	1.6	30	0.1	3	0.3

Dimensions



DN	mm	40	50	63	80	100	160	200	250
	inch	1½	2	2½	3	4	6	8	10
A	mm	-	-	125	125	125	140	175	-
	inch	-	-	4.92	4.92	4.92	5.51	6.89	-
A1	mm	62	69	-	-	-	-	-	-
	inch	2.44	2.72	-	-	-	-	-	-
A2	mm	40	43	-	-	-	-	-	-
	inch	1.57	1.69	-	-	-	-	-	-
B	mm	80	86	131	146	166	237	290	-
	inch	3.15	3.39	5.16	5.75	6.54	9.33	11.42	-
L	mm	90	99	407	448	508	665	832	-
	inch	3.54	3.9	16.02	17.64	20	26.18	32.76	-
N	mm	57	62	-	-	-	-	-	-
	inch	2.24	2.44	-	-	-	-	-	-



▽ valve seat side

B

For SEMI applications handling
200, 300 and 450 mm wafers
For load lock / process module isolation
Virtually particle and vibration-free
>5 million cycles between maintenance
Very easy maintenance
thanks to self-adjusting plate



Body material

aluminum or stainless steel

Valve Series 022

double acting
pneumatic actuator
with position indicator

SEMI E21-94
SEMI E21-94
SEMI E21.1-1296

DN (D1 x D)		Ordering numbers			
mm	inch	type B opening: rear side > seat side with bonnet flange		type A opening: rear side = seat side with bonnet flange	
		aluminum	stainless steel	aluminum	stainless steel
32 x 222	1.26 x 8.74	02209-BA24	02209-BE24	02209-AA24	02209-AE24
46 x 236	1.81 x 9.29	02210-BA24	02210-BE24	02210-AA24	02210-AE24
50 x 336	1.97 x 13.23	02212-BA24	02212-BE24	02212-AA24	02212-AE24
56 x 496	2.20 x 19.53	02213-BA24	02213-BE24	02213-AA24	02213-AE24

with solenoid for impulse actuation: 022 **44** (specify control voltage)

Other opening sizes: see «Options»

Insert Series 032

double acting
pneumatic actuator
with position indicator

SEMI E21-94
SEMI E21-94
SEMI E21.1-1296

DN (D1 x D)		Ordering numbers	
mm	inch	type C	
		aluminum	stainless steel
32 x 222	1.26 x 8.74	03209-CA24	03209-CE24
46 x 236	1.81 x 9.29	03210-CA24	03210-CE24
50 x 336	1.97 x 13.23	03212-CA24	03212-CE24
56 x 496	2.20 x 19.53	03213-CA24	03213-CE24

with solenoid for impulse actuation: 032 **44** (specify control voltage)

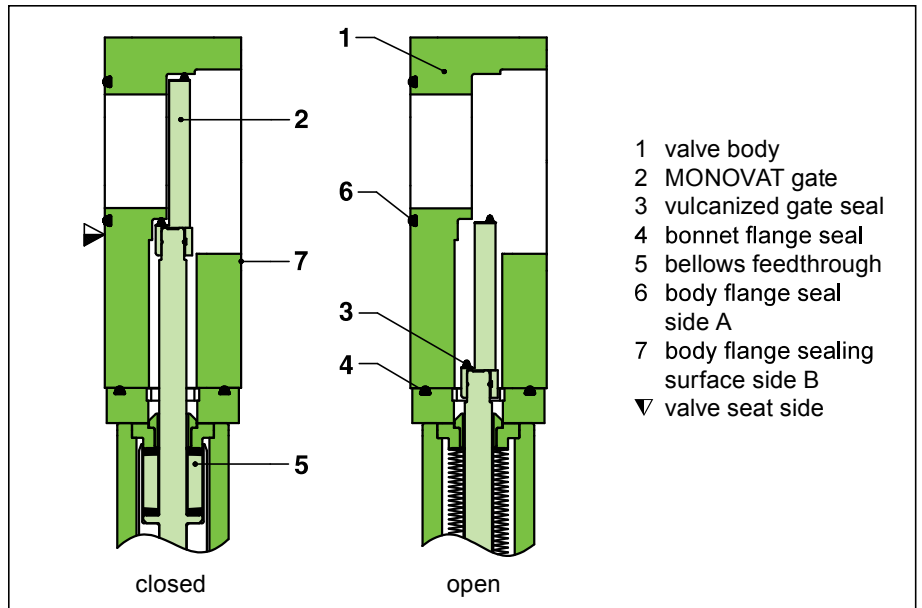
Other opening sizes and insert types: see «Options»

Sealing materials

- Gate: FKM (VITON, vulcanized)
- Bonnet flange: FKM (VITON, O-ring)
- Body flange (seat side): FKM (VITON, O-ring)

Feedthrough

Bellows feedthrough (welded bellows) inside, protected

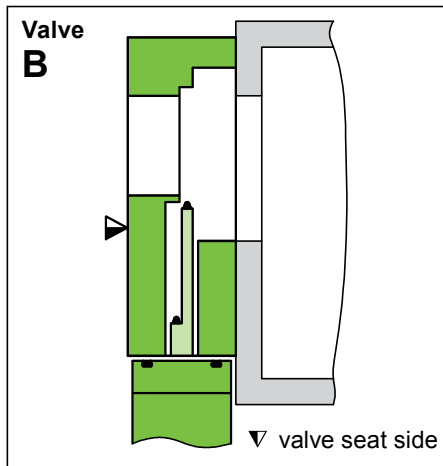


- 1 valve body
- 2 MONOVAT gate
- 3 vulcanized gate seal
- 4 bonnet flange seal
- 5 bellows feedthrough
- 6 body flange seal side A
- 7 body flange sealing surface side B
- ▽ valve seat side

Features

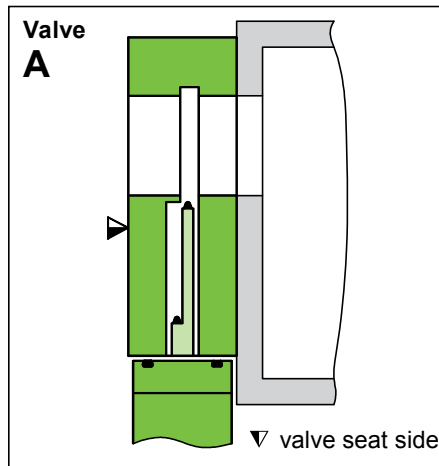
- Compact design
- Modular system, same actuator for different valve sizes
- Maintenance-free actuator, self-adjusting gate without detached mounting parts

Types



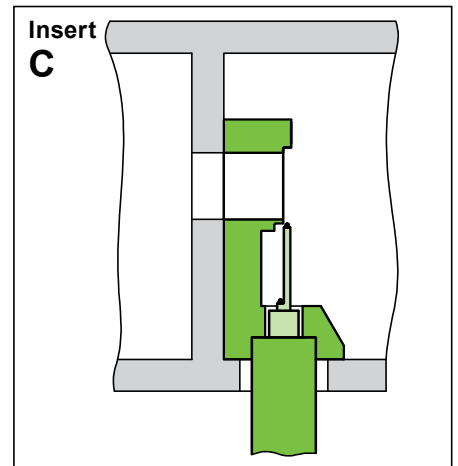
Opening on rear side larger than on seat side

With bonnet flange
Gate service through bonnet flange



Same size of opening on seat side and rear side

With bonnet flange
Gate service through bonnet flange

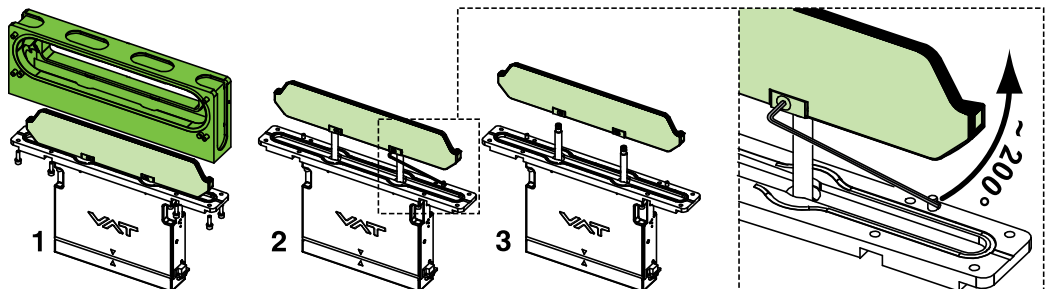


MONOVAT seat mounted inside of chamber

Insert installation from the top
Gate service through chamber

Easy gate exchange

- 1 Dismount actuator/gate
- 2, 3 Remove gate screws: To do this, apply an Allen wrench and turn it about 200°



C

Technical data

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

sealing surface	FKM seal		FFKM seal		metal seal
	body	seat	body	seat	body
metal blank (milled / ball polished)	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁸	< 1 · 10 ⁻⁷	< 5 · 10 ⁻¹⁰ (stainless steel only)
aluminum: hard anodized	< 1 · 10 ⁻⁵	< 1 · 10 ⁻⁴	< 1 · 10 ⁻⁵	< 1 · 10 ⁻⁴	
aluminum: nickel-plated	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁹	< 1 · 10 ⁻⁸	< 1 · 10 ⁻⁷	
Measuring conditions: Body: 30s, He conc. ≥ 20% Seat: 15s, He conc. ≥ 30%			Automatic leak rate supervision dp = 1 bar		

Pressure range

- Metal blank or nickel-plated 1 · 10⁻⁹ mbar to 1.2 bar (abs)
- Aluminum, hard anodized 1 · 10⁻⁶ mbar to 1.2 bar (abs)
- Metal seal 5 · 10⁻¹⁰ mbar to 1.2 bar (abs)

Differential pressure on the gate

1.2 bar in either direction

Differential pressure at opening

≤ 30 mbar in either direction

Cycles until first service

≥ 5 million

Temperature ²⁾

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

Pneumatic box (solenoid, non-return valve, pressure controller): < 60°C

Material

- Valve body and gate: aluminum EN AW-6082 (3.2315)
- Valve body and gate: stainless steel AISI 316L (1.4404, 1.4435)
- Differential pressure tabs, stoppers PEEK (Polyetheretherketon)
- Bellows end pieces, rod AISI 316L (1.4404, 1.4435)
- Bellows AISI 633 (AM 350)
- Clamping piece AISI 301 (1.4310)

Seal: gate, bonnet

FKM (VITON)

Air connection

internal threads 1/8" (ISO / NPT)

Recommended operating pressure ³⁾

2 - 6 bar / 30 - 90 psi

Position indicator: contact rating

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

Mounting position

any

¹⁾ At room temperature (25°C) and under clean environmental conditions.

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

³⁾ In order to maximize the life time of the gate, the operating pressure should be kept as low as possible, however high enough to ensure the required leak rate in the closed valve position. Depending on the length of the sealing line (size of gate), tolerances of the sealing lip, accuracy of the measurement and required leak rate, the operating pressure settings may be slightly beyond the specified pressure range.

DN (D1 x D) D1 slit height D slit length		molecular flow conductance	compressed air pressure min. - max. overpressure ³⁾		volume of air cylinder		closing or opening time		weight			
mm	inch		bar	psi	l	ft3	with standard pneumatics (400SLPM)	with high speed actuation kit	aluminum body (type A)		stainless steel body (type A)	
		ls-1				s	s	kg	lbs	kg	lbs	
32 x 222	1.26 x 8.74	1590	3 - 6	45 - 90	0.09	0.003	≤ 1	≤ 0.5	8	18	16	35
46 x 236	1.81 x 9.29	3340	2 - 4	30 - 60	0.12	0.004	≤ 1	≤ 0.5	10	22	20	44
50 x 336	1.97 x 13.23	5000	2 - 4	30 - 60	0.12	0.004	≤ 1	≤ 0.5	12	26	25	55

Options

Valve body:

- Opening sizes:
 - 25 x 160 / 210 / 265 / 420 mm (designation 01 / 02 / 03 / 04)
 - 51 x 160 / 210 / 265 / 420 mm (designation 05 / 06 / 07 / 08)
 - Other opening sizes on request, max. 56 x 700 mm
- Body flange:
 - Sealing surface or groove with O-ring
 - Sealing materials (O-ring): FKM, FFKM
 - Metal seal (for stainless steel)
 - Other sealing materials on request
 - Bolt pattern outside or inside of the sealing line
 - Alignment pins, alignment holes
- Surface treatment:
 - Aluminum: hard anodized or nickel-plated
 - Aluminum / stainless steel: ball-polished
- UHV version:
 - Sealing surfaces for metal flange seal
 - Metal seal on bonnet flange
 - Bellows assembly welded to bonnet flange
- Temperature management:
 - Valve body prepared for: liquid cooling (stainless steel) / nitrogen purge / heating cartridges
 - Heating cartridges with or without thermocouple
 - PTC heating cartridges
 - Temperature sensors with/without overtemp. protection
- High speed closing for the connection valve body/bonnet flange (dismounting/mounting of actuator/gate unit)
- Port KF16 for bypass, venting or gauges
- Valve body prepared for customer-specific sensor systems (pressure, temperature, wafer detection)

Actuator, pneumatics:

- Pneumatic locking in closed and open position
- High speed venting valve for fast closing and opening times
- Pressure control for the closed valve position
- Bakeable to 150°C
- Manual mechanical locking
- Solenoid for impulse actuation
12 / 24 VDC, 115 / 230 V 50/60 Hz

Feedthrough:

- Bellows feedthrough with optimized particle protection
- Bellows feedthrough with detachable convolutions and optimized particle protection

Accessories

- VATSEAL metal seal for flanges
- Claw (M8) for valves with clamp edges: Ord. No. 32009-QAPR

Insert:

- Types L, M, N:
(Special requirements concerning stiffness and manufacturing tolerances of the chamber design must be considered. VAT recommends using the one-piece C-type.)
 - L: Seat mounted to chamber wall, with bonnet flange, gate service through bonnet flange
 - M: Seat mounted to chamber wall, without bonnet flange, gate service through chamber
 - N: Seat mounted through chamber wall, without bonnet flange, gate service through chamber
- Opening sizes:
 - 25 x 160 / 210 / 265 / 420 mm (designation 01 / 02 / 03 / 04)
 - 51 x 160 / 210 / 265 / 420 mm (designation 05 / 06 / 07 / 08)
 - Other opening sizes on request, max. 56 x 700 mm
- Sealing materials (O-ring):
 - FKM, FFKM
 - Other sealing materials on request
- Surface treatment: see paragraph «Valve body»
- Temperature management: see paragraph «Valve body»

Gate:

- Sealing materials for vulcanized seals:
 - FKM, FFKM
 - Other sealing materials on request
- Gate with groove
- Sealing material for gate O-ring:
 - FKM, FFKM
 - Other sealing materials on request
- Surface treatment:
 - Aluminum: hard anodized or nickel-plated
 - Aluminum / stainless steel: bead-blasted or ball-polished
 - Stainless steel: electro polished
- Protective shields against heat radiation / coating / plasma and process gases
- Temperature management:
 - Liquid cooling (stainless steel)
 - Gate with heating conductor

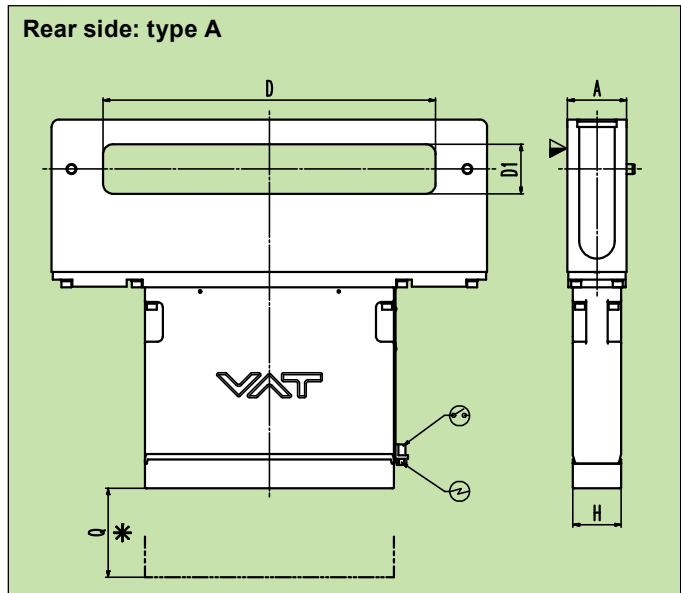
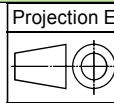
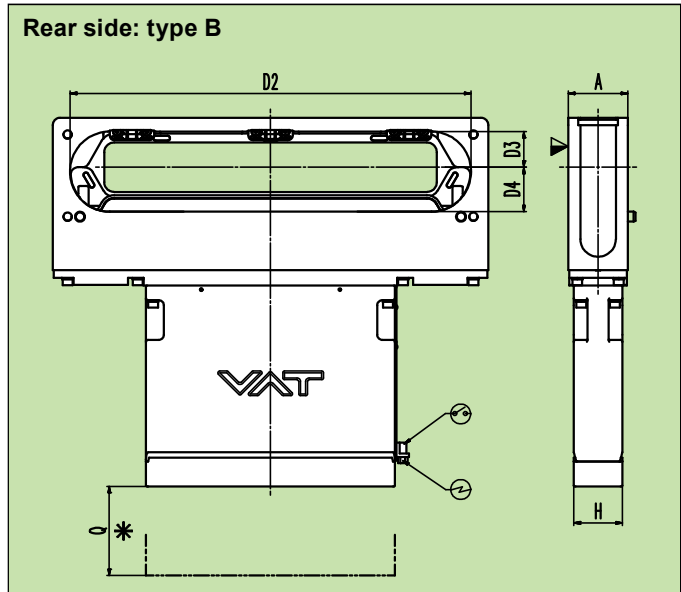
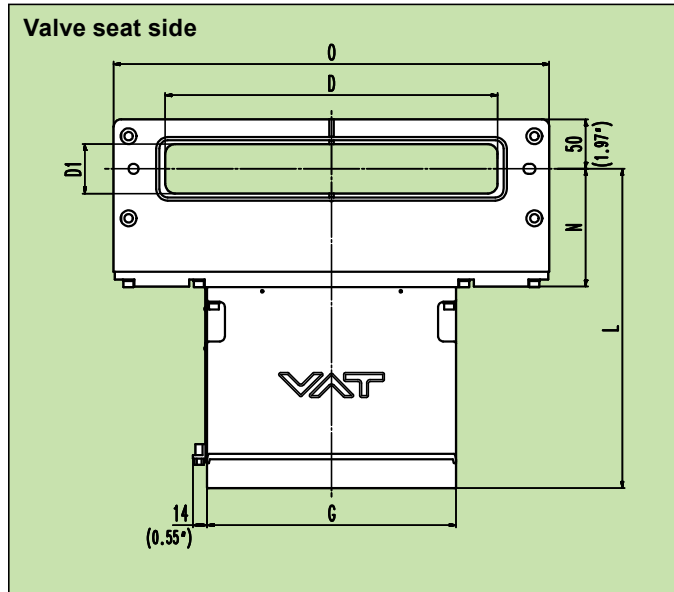
Position indicator:

- Bakeable to 150°C
- Double position indicators in both end positions
- Mechanical and electronic magnetic field sensors with LED
- Cycle counter

Service kit

- Seal kit, consisting of valve gate and bonnet flange seal. Ordering number on request.

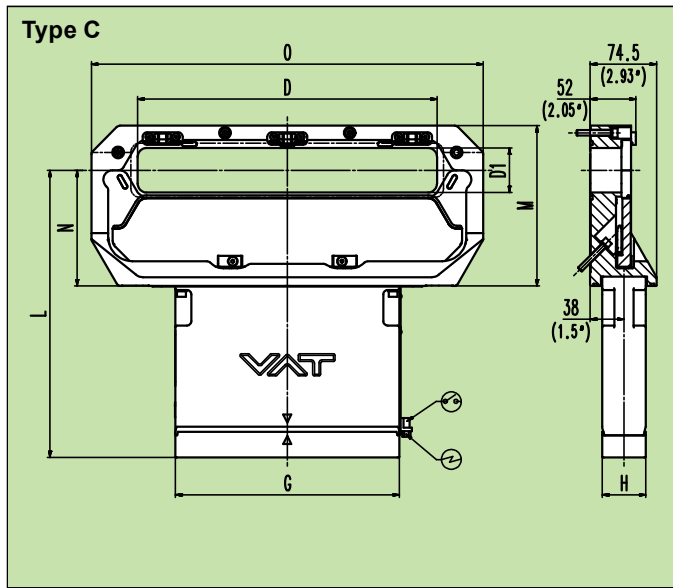
Dimensions: Valve Series 022



D1 x D	mm inch	32 x 222 1.26 x 8.74	46 x 236 1.81 x 9.29	50 x 336 1.97 x 13.23
A	mm inch	50 1.97	50 1.97	60 2.36
D	mm inch	222 8.74	236 9.29	336 13.23
D1	mm inch	32 1.26	46 1.81	50 1.97
D2	mm inch	275 10.83	305 12.01	405 15.94
D3	mm inch	29 1.14	36 1.42	36 1.42
D4	mm inch	35 1.38	44 1.73	45 1.77
G	mm inch	203.5 8.01	251.5 9.9	251.5 9.9
H	mm inch	43 1.69	49 1.93	49 1.93
L	mm inch	251.5 9.9	322.5 12.7	322.5 12.7
N	mm inch	112 4.41	119 4.69	119 4.69
O	mm inch	340 13.39	340 13.39	440 17.32
Q	mm inch	75 3.13	90 3.54	90 3.54

- ▽ valve seat side
- * required for dismantling
- ⊕ electrical connection
- ⊙ position indicator

Dimensions: Insert Series 032



- ⊕ electrical connection
- ⊙ position indicator

D1 x D	mm inch	32 x 222 1.26 x 8.74	46 x 236 1.81 x 9.29	50 x 336 1.97 x 13.23
D	mm inch	222 8.74	236 9.29	336 13.23
D1	mm inch	32 1.26	46 1.81	50 1.97
G	mm inch	203.5 8.01	251.5 9.9	251.5 9.9
H	mm inch	43 1.69	49 1.93	49 1.93
L	mm inch	251.5 9.9	322.5 12.7	322.5 12.7
M	mm inch	135 5.31	175 6.89	180 7.09
N	mm inch	100 3.94	130 5.12	130 5.12
O	mm inch	290 11.42	320 12.6	440 17.32

C

L-motion valve / insert
for corrosive semiconductor processes
such as Etch or CVD

Very easy maintenance
thanks to simple gate exchange

O-ring gate seal optional



Body material

aluminum

Valve Series 041

double acting
pneumatic actuator
with position indicator

SEMI E21-94
SEMI E21.1-1296

DN (D1 x D)		Ordering numbers
mm	inch	type B opening: rear side > seat side with hard anodized service cover
46 x 236	1.8 x 9.3	04110-BA24
50 x 336	1.9 x 13.2	04112-BA24

with solenoid for impulse actuation: 041 **44** (specify control voltage)

Insert Series 051

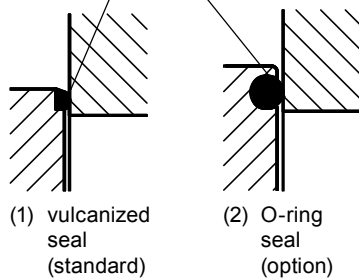
double acting
pneumatic actuator
with position indicator

SEMI E21-94
SEMI E21.1-1296

DN (D1 x D)		Ordering numbers
mm	inch	type L
46 x 236	1.8 x 9.3	05110-LA24
50 x 336	1.9 x 13.2	05112-LA24

with solenoid for impulse actuation: 051 **44** (specify control voltage)

Options



Actuator:

- Solenoid for impulse actuation 24 VDC, 12 VDC, 115V 50/60Hz, 230 V 50/60Hz

Valve:

- Different opening sizes on request
- Different sealing materials Fluoroelastomers (FKM)
Perfluoroelastomers (FFKM)
- Surface treatment aluminum hard anodized
- Special versions on request
- Gate with O-ring seal (2) instead of
with vulcanized seal (1)

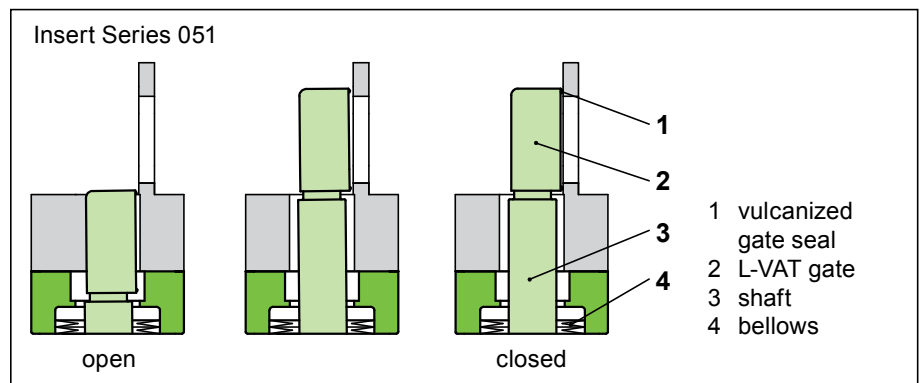
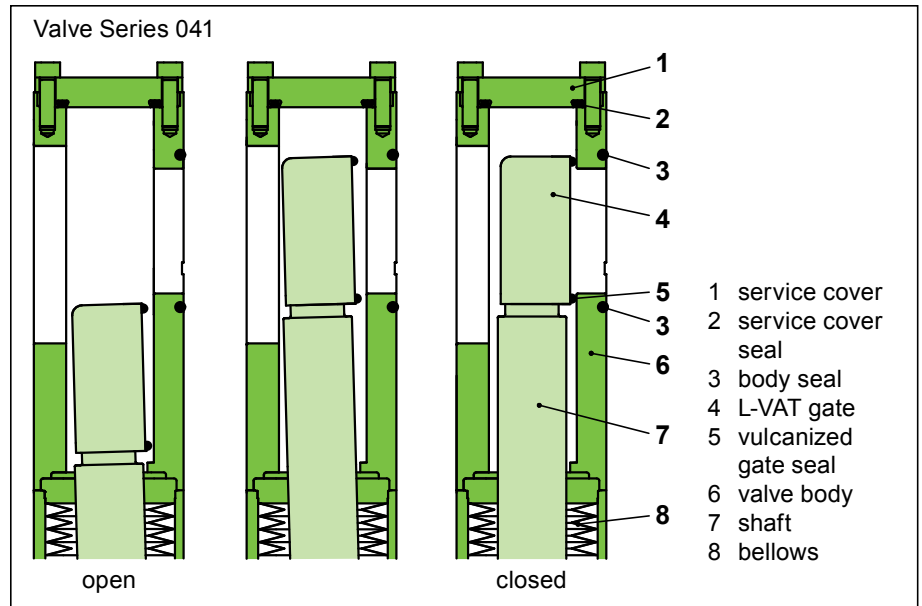
Sealing materials

Gate: FKM (VITON)

Service cover: FKM (VITON)

Feedthrough

Welded bellows



Features

Reliable single-shaft actuator with bellows-sealed feedthrough

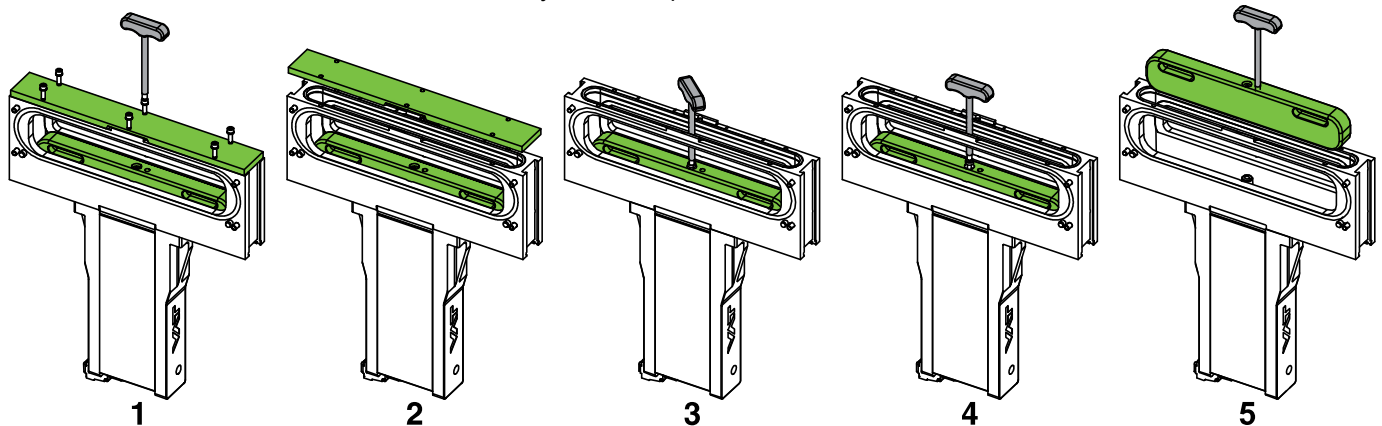
Mechanically secured L-motion, generated by excentric cam shaft and pneumatic sequence control

Mechanically locked in closed position, even without compressed air supply

Simple gate exchange

due to easy access via service cover (or alternatively via transfer chamber)

No adjustment required after service



Accessories

Convenience tool for gate exchange
Ordering No. 239582



Technical data

Leak rate: body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-9}$ mbar to 1.2 bar (abs)
Differential pressure on the gate	≤ 1.2 bar in either direction
Differential pressure at opening - in opening and closing direction	≤ 30 mbar
Cycles until first service	≥ 2 million under clean operating conditions

Temperature ¹⁾

operating temperature of valve	configurations			
	valve		actuator	
	body	gate	position indicator	solenoid
$\leq 50^\circ\text{C}$	aluminum	aluminum	standard	standard
$\leq 80^\circ\text{C}$	aluminum	aluminum	standard	without
$\leq 120^\circ\text{C}$	aluminum	aluminum	bakeable	without

Temperature difference seat/gate	$\leq 40^\circ\text{C}$
Heating and cooling rate	$\leq 40^\circ\text{C h}^{-1}$

Material

- Service cover	EN AW-6082 (3.2315)
- Valve body	EN AW-6082 (3.2315)
- Valve gate	EN AW-6082 (3.2315)
- Shaft	AISI 316L (1.4435)
- Bellows end pieces	AISI 316L (1.4435)
- Bellows	AISI 633 (AM 350)

Seal

- Service cover	FKM (VITON)
- Gate	FKM (VITON)

Compressed air connection without solenoid	internal threads $\frac{1}{8}$ " ISO-NPT connections «open» and «closed»
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Position indicator: contact rating

- Voltage	≤ 50 V AC / DC
- Current	≤ 0.5 A
- Power	max. 10 W
- Connection	9-pin subminiature D

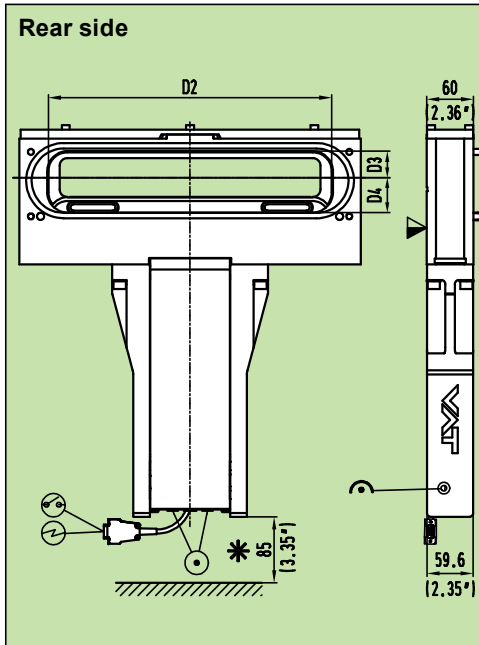
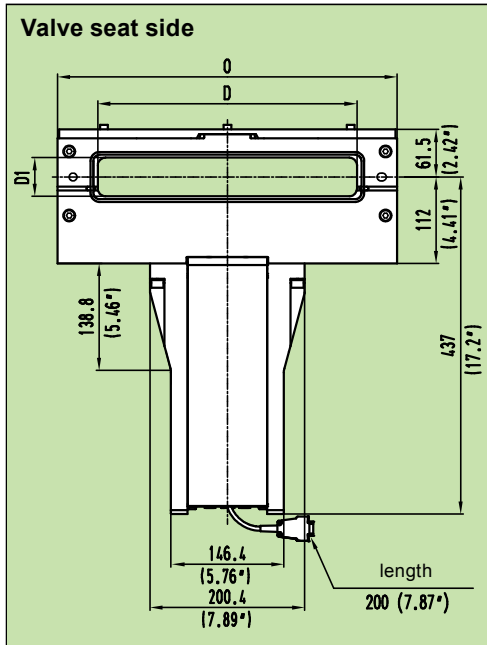
¹⁾ Maximum values: depending on operating conditions and sealing materials

Mounting position

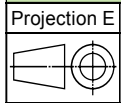
actuator downward, vertical stroke

DN (D1 x D) D1 slit height D slit length		compressed air pressure min. - max. overpressure		volume of air cylinder		closing / opening time	weight	
mm	inch	bar	psi	l	ft ³		kg	lbs
46 x 236	1.8 x 9.3	4 - 7	55 - 100	0.12	0.004	< 1	15	33
50 x 336	1.9 x 13.2	4 - 7	55 - 100	0.12	0.004	< 1	15.6	34.4

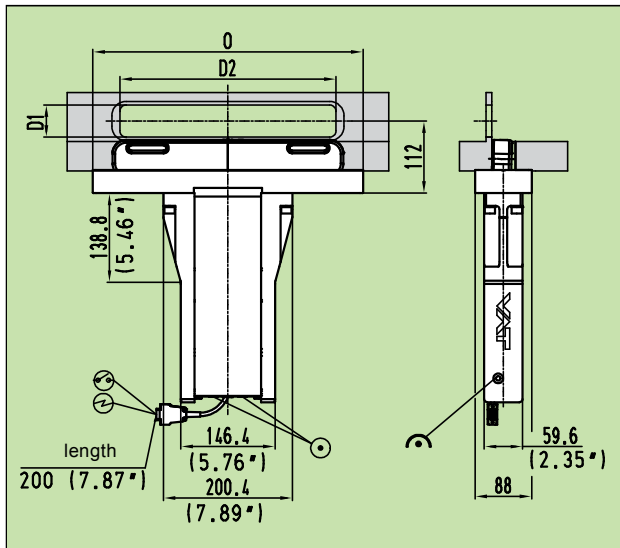
Dimensions: Valve Series 041



D1xD	mm inch	46 x 236 1.8 x 9.3	50 x 336 1.9 x 13.2
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
O	mm inch	340 13.39	440 17.32



Dimensions: Insert Series 051



D1xD	mm inch	46 x 236 1.8 x 9.3	50 x 336 1.9 x 13.2
D	mm inch	236 9.29	336 13.23
D1	mm inch	46 1.81	50 1.97
O	mm inch	320 12.6	420 16.54

- ▽ valve seat side
- * required for dismantling
- ⌚ mechanical position indication
- ⊙ compressed air connection
- ⊖ electrical connection
- ⊕ position indicator

C

Series 075

Transfer door-valve for SEMI applications

For operation in atmospheric pressure,
e. g. load lock chambers

No vacuum seals on actuator

Virtually particle and vibration free
L-motion



Gate material

aluminum or stainless steel

Aluminum

double acting
pneumatic actuator SEMI E21-94
with position indicator SEMI E21.1-1296

DN (D1 x D)		Ordering numbers	
mm	inch	type U	type V
46 x 236	1.8 x 9.3	07510-UA24	07510-VA24
50 x 336	1.9 x 13.2	07512-UA24	07512-VA24

with solenoid for impulse actuation: 075 **A44** (specify control voltage)

Additional opening sizes: see «Options»

Stainless steel

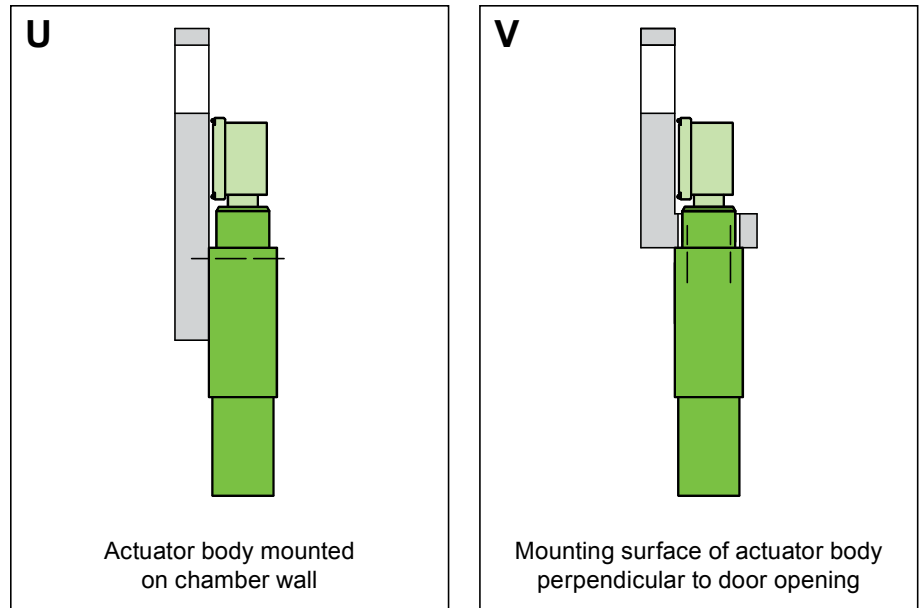
double acting
pneumatic actuator SEMI E21-94
with position indicator SEMI E21.1-1296

DN (D1 x D)		Ordering numbers	
mm	inch	type U	type V
46 x 236	1.8 x 9.3	07510-UE24	07510-VE24
50 x 336	1.9 x 13.2	07512-UE24	07512-VE24

with solenoid for impulse actuation: 075 **E44** (specify control voltage)

Additional opening sizes: see «Options»

Door types



C

Features

- L-VAT configuration (see glossary)
- Vulcanized gate seal (see glossary)
- Pneumatically locked in closed position, even without compressed air supply

Sealing material

Gate: FKM (VITON)

Options

Actuator:

- Solenoid for impulse actuation 24VDC
- Position indicator with electro-magnetic sensors and LED display
- Actuator cover kit to cover the pistons and cylinders of the actuator

Gate:

- Gate seal O-ring
- Different opening sizes:
 - 37 x 336 / 435 / 510 mm (gate seal vulcanized)
 - 51 x 160 / 210 / 265 / 420 mm (gate seal vulcanized)
 - ≤ 80 x 160 . . . 420 mm (gate seal O-ring)
 - Other sizes on request
- Different sealing materials:
 - Fluoroelastomers (FKM)
 - Perfluoroelastomers (FFKM)
 - Silicone (VMQ)
 - Fluorosilicone (FVMQ)
- Gate shield:
 - Protection from coating
 - Protection from heating through radiation
- Distance between actuator fixation screws center line and opening center line
115 mm or 185 mm (standard 132 mm: see dimensional drawing on page 139),
type U only

Technical data

Leak rate: gate	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-9}$ mbar to 1.1 bar (abs)
Differential pressure on the gate	
- in closing direction	1 bar
- in opening direction	≤ 0.1 bar
Differential pressure at opening	≤ 0.1 bar in either direction
Cycles until first service	≥ 3 million

Temperature ¹⁾

operating temperature of valve	configurations		
	valve	actuator	
	gate	position indicator	solenoid
$\leq 50^{\circ}\text{C}$	aluminum	standard	with
$\leq 80^{\circ}\text{C}$	aluminum	standard	without
$\leq 150^{\circ}\text{C}$	aluminum	without	without
$\leq 200^{\circ}\text{C}$	stainless steel	without	without

Material

- Gate: aluminum	EN AW-6082 (3.2315)
- Gate: stainless steel	AISI 316L (1.4404, 1.4435)

Seal: gate

FKM (VITON)

Air connection

- with solenoid	quick connect fittings for pneumatics for tubing O.D. 4 mm
- without solenoid	R 1/8" internal thread

Position indicator: contact rating

- Voltage	≤ 50 VAC / DC
- Current	≤ 0.5 A
- Power	max. 10 W
- Connection	9 pin subminiature D

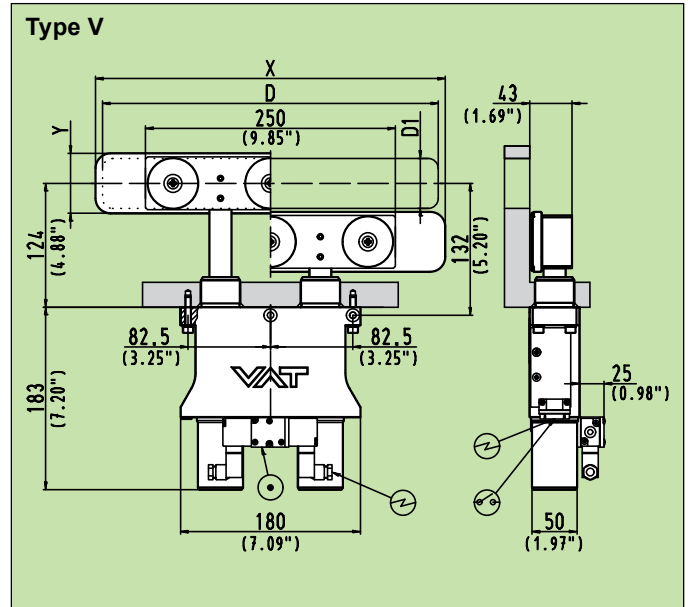
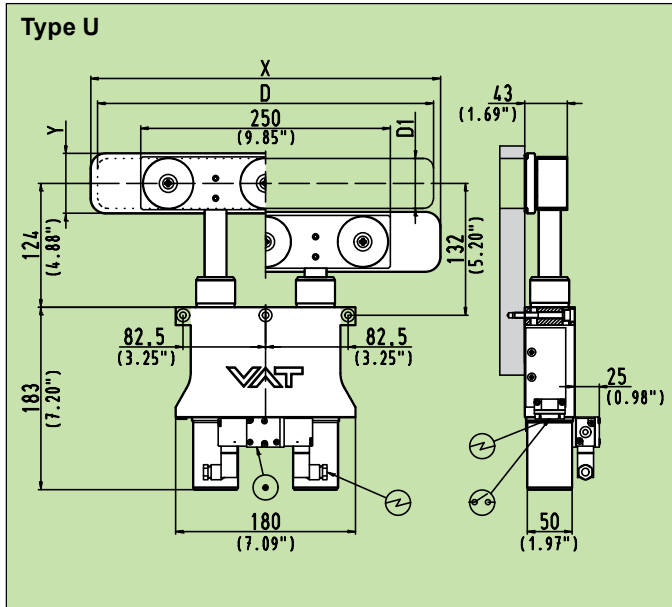
¹⁾ Maximum values: depending on operating conditions and sealing materials

Mounting position

any

DN (D1 x D) D1 slit height D slit length		compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	door weight			
							aluminum		stainless steel	
mm	inch	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
46 x 236	1.8 x 9.3	4 - 7	55 - 100	0.25	0.007	≤ 1	5	11	6	13.2
50 x 336	1.9 x 13.2	4 - 7	55 - 100	0.25	0.007	≤ 1	5.2	11.4	6.4	14.1

Dimensions



C

D1 x D	mm inch	46 x 236 1.8 x 9.3	50 x 336 1.9 x 13.2
D	mm inch	236 9.29	336 13.23
D1	mm inch	46 1.81	50 1.97
X	mm inch	255 10.04	355 13.98
Y	mm inch	65 2.56	65 2.56

Series 024

For FPD and PV production systems

Opening sizes:

50 mm (2") x 500 mm (20") to
150 mm (6") x 1750 mm (70")



Body material

aluminum

Actuator

Double acting pneumatics

Opening sizes

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

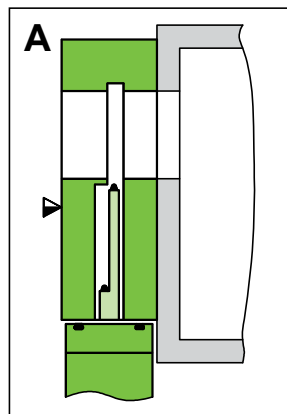
X = standard sizes

O = special sizes,
available on request

Intermediate sizes on request

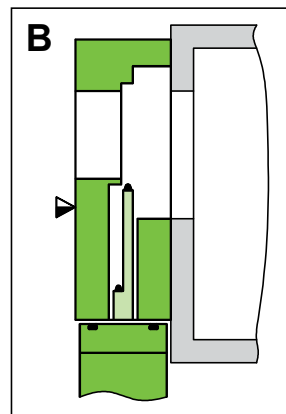
Ordering numbers on request (example: 0240X-BA44- . . . 1)

Valve types



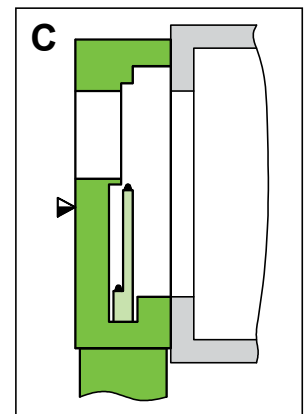
Same size of opening on seat side and rear side

With bonnet flange, gate service through bonnet flange



Opening on rear side larger than on seat side

With bonnet flange, gate service through bonnet flange



Opening on rear side larger than on seat side

Without bonnet flange, gate service through opening on rear side

▽ valve seat side

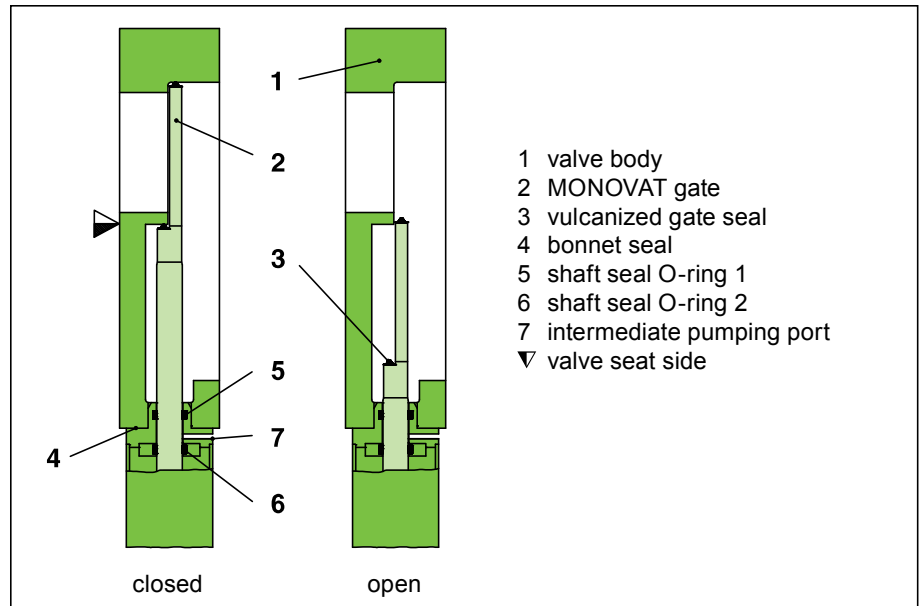
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Shaft sealed



Technical data

Further technical data on request

Leak rate: body, valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Differential pressure on the gate	≤ 1 bar in either direction
Differential pressure at opening	≤ 5 mbar
Cycles until first service	1 million ¹⁾
Opening / closing time	≤ 1.5 s (at 100 mm opening height)
Temperature ²⁾	
- Valve body, flanges	$\leq 120^{\circ}\text{C}$
- Pneumatic actuator	$\leq 80^{\circ}\text{C}$
- Solenoid	$\leq 50^{\circ}\text{C}$
Temperature difference body/gate	$\leq 25^{\circ}\text{C}$
Material	
- Valve body, flanges, gate	EN AW-6082 (3.2315)
- Actuator shafts	AISI 303 (1.4305)
- Bellows	AISI 633 (AM 350)
- Differential pressure tabs	AISI 304 (1.4301)
Seal: bonnet, gate, feedthrough	FKM (VITON)
Mounting position	actuator up, down or lateral ³⁾
Position indicator: contact rating	
- Voltage	10 - 30 VDC PNP (NPN optional)
- Current	≤ 0.15 A
- Power	max. 4.5 W

¹⁾ Unheated and under clean conditions

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

³⁾ In the mounting position «actuator lateral» the lifetime until first service reduces to 0.5 million cycles

Options

Actuator:

- Solenoid for impulse actuation 24 VDC, 12 VDC, 115 V 50/60 Hz, 230 V 50/60 Hz
- Bellows feedthrough

Valve:

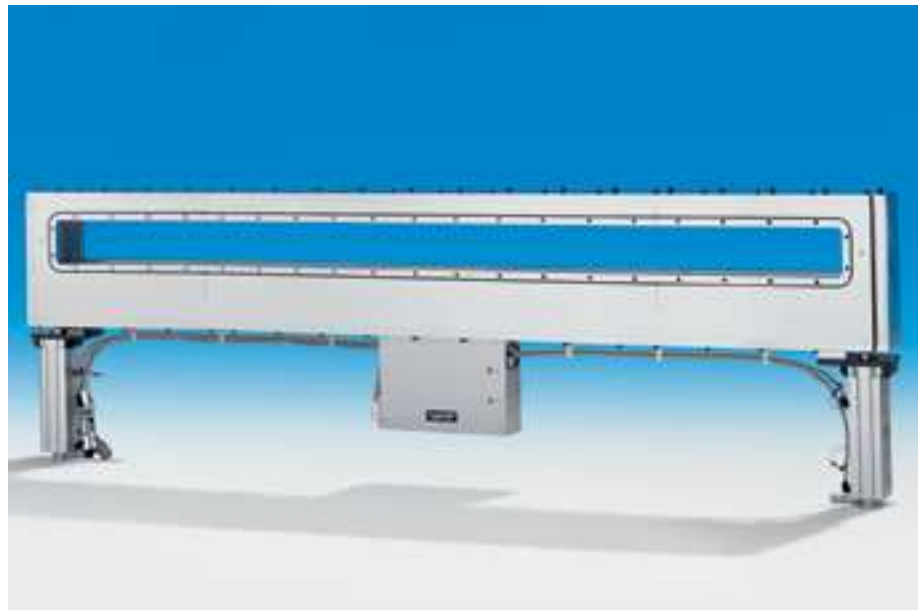
- Customer specified flanges: groove with O-rings
- Surface: aluminum hard anodized
- Gate shield for heat radiation protection
- Variety of gate sealing materials
- Watercooling in body to cool the flange seals

Series 060

For FPD production systems

Opening sizes:

100 mm (4") x 1350 mm (54") to
300 mm (12") x 3000 mm (120")



Body material

aluminum

Actuator

Double acting pneumatics with control unit

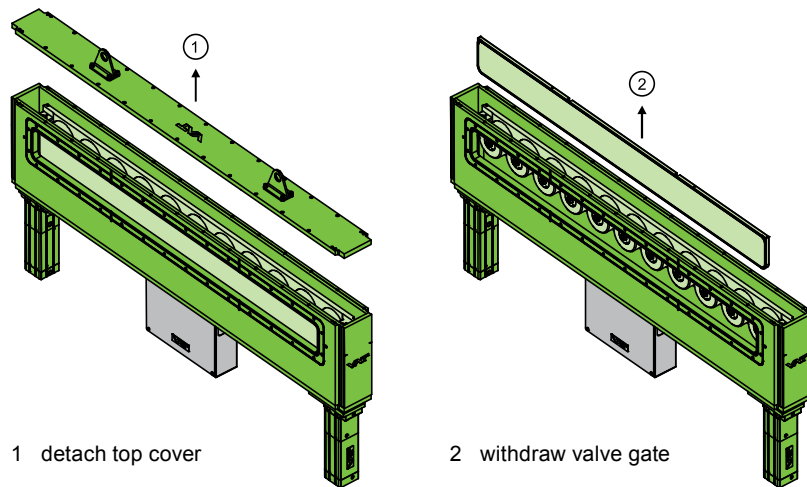
Flanges

Customer-specific

Interface

Logic or RS232

Easy maintenance of valve gate



1 detach top cover

2 withdraw valve gate

Options

- Body and gate hard anodized
- Gate electrical grounding
- Bellows feedthrough
- Various sealing compounds
- Vertical mounting orientation
- Designed for 1.2 bar differential pressure on the gate in either direction

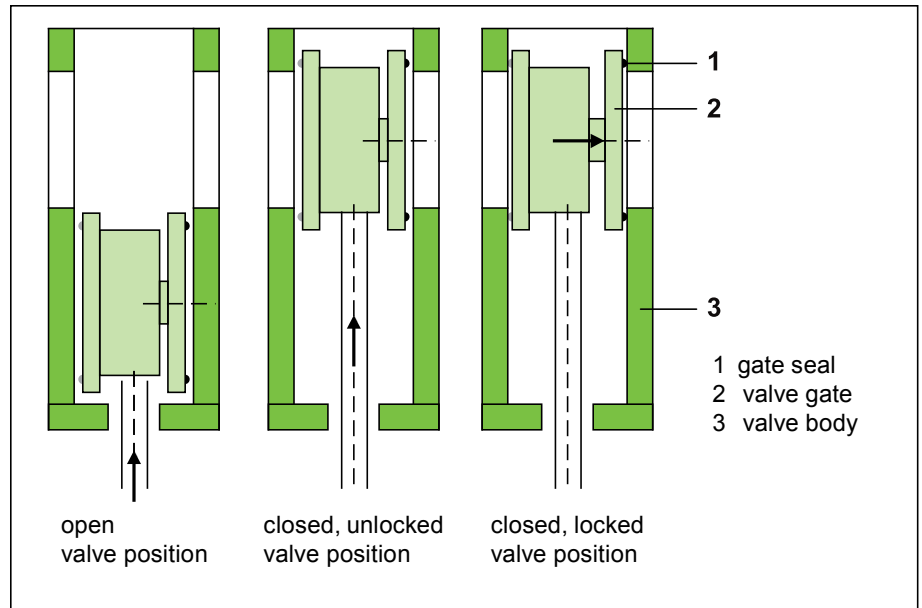
Sealing materials

Gate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Shaft sealed



Features

Modular design

Same flange-to-flange dimension for all opening sizes

Pneumatically locked

Technical data

Further technical data on request

Leak rate: body, valve seat	$< 1 \cdot 10^{-7}$ mbar ls ⁻¹
Differential pressure on the gate	≤ 1 bar in either direction
Differential pressure at opening	≤ 5 mbar
Cycles until first service	1 million ¹⁾
Opening / closing time (DN 120 x 2000)	≤ 4 s
Temperature ²⁾	
- Valve body	$\leq 120^\circ\text{C}$
- Pneumatic actuator	$\leq 80^\circ\text{C}$
- Control unit	$\leq 50^\circ\text{C}$
Heating and cooling rate	$\leq 40^\circ\text{C h}^{-1}$
Material	
- Valve body, flanges	EN AW-5083 (3.3547)
- Valve gate	EN AW-5083 (3.3547)
- Actuators	AISI 316 (1.4401)
Seal: bonnet, gate	FKM (VITON)
Mounting position	actuator up / down

¹⁾ Unheated and under clean conditions

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

Series 066

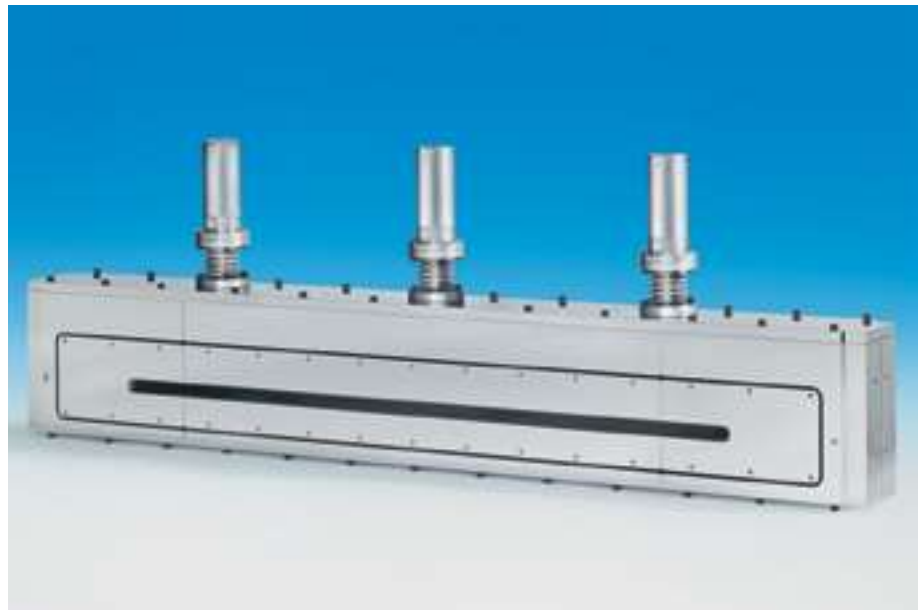
For PV production systems

Opening sizes:

50 mm (2") x 1000 mm (40") to
150 mm (6") x 3000 mm (120")

Body and gate material

aluminum or stainless steel



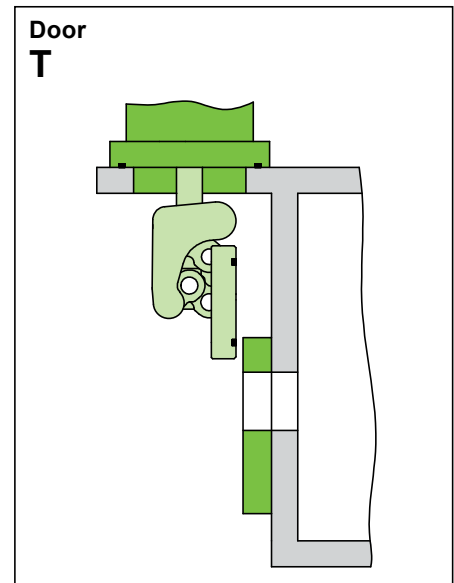
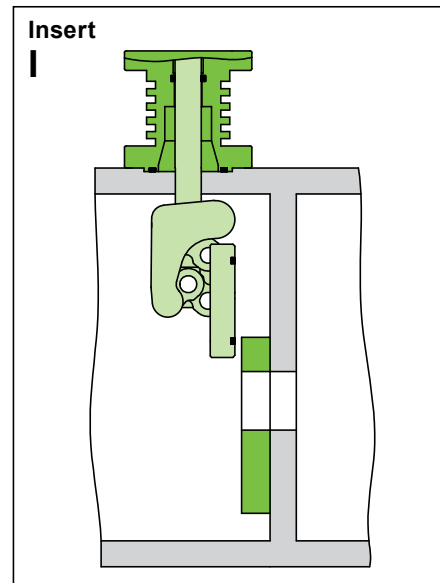
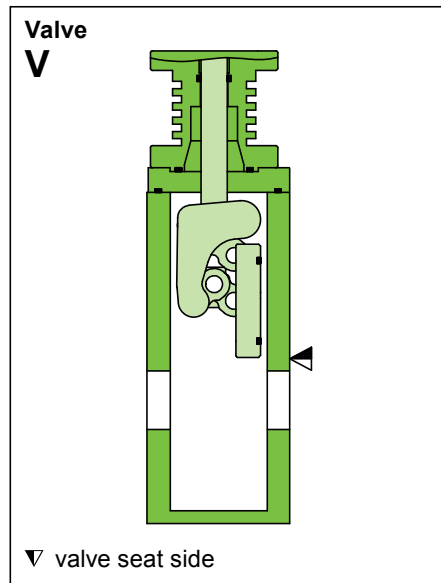
Actuator

Double acting pneumatics with position indicator

Flanges

Customer-specific

Types



Options

- Bellows feedthrough
- Various sealing compounds
- Vertical mounting position

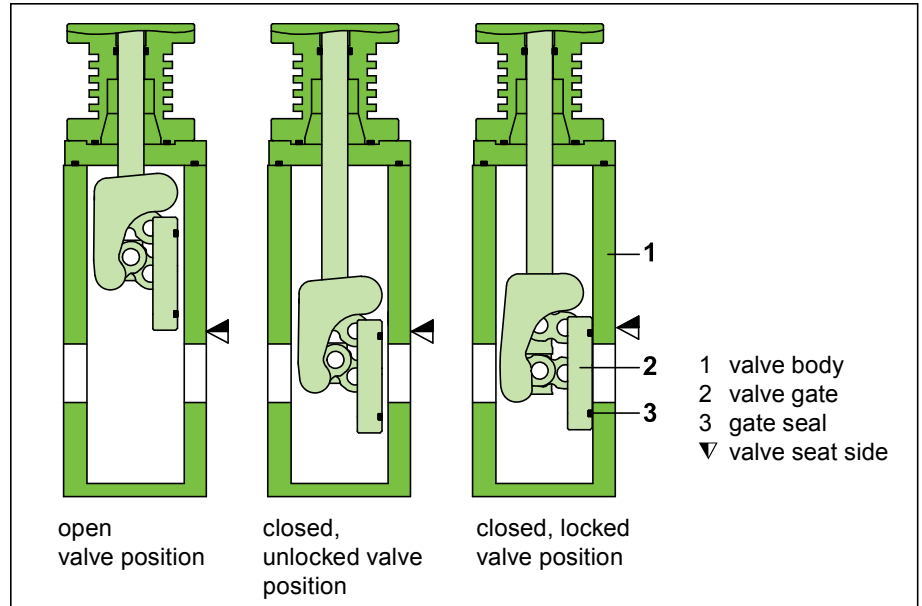
Sealing materials

Gate: FKM (VITON)

Actuator flange: FKM (VITON)

Feedthrough

Shaft feedthrough



Features

- Modular design
- Pneumatically locked

Technical data

Further technical data on request

Leak rate:		
- Body		$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$
- Valve seat		$< 1 \cdot 10^{-5} \text{ mbar ls}^{-1}$
Differential pressure on the gate		$\leq 1 \text{ bar}$ in either direction
Differential pressure at opening		$\leq 5 \text{ mbar}$
Cycles until first service		1 million ¹⁾
Opening / closing time (DN 50 x 1500)		$\leq 1.5 \text{ s}$
Temperature ²⁾		<u>aluminum</u> <u>stainless steel</u>
- Valve body, gate		$\leq 120^\circ\text{C}$ $\leq 200^\circ\text{C}$
- Pneumatic actuator		$\leq 80^\circ\text{C}$ $\leq 80^\circ\text{C}$
Heating and cooling rate		$\leq 40^\circ\text{C h}^{-1}$
Material		
- Valve body, gate, flanges		EN AW-5083 (3.3547), EN AW-6082 (3.2315) or AISI 304 (1.4301)
- Actuator shafts		AISI 304 (1.4301)
- Bellows		AISI 633 (AM350)
Seal: flange, gate		FKM (VITON)
Mounting position		actuator up / down
Solenoid		24 VDC
Position indicator: contact rating		
- Voltage		10 - 30 VDC PNP (NPN optional)
- Current		$\leq 0.15 \text{ A}$
- Power		max. 4.5 W

¹⁾ Unheated and under clean conditions

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

Series 075

For FPD and PV production systems with opening heights up to 80 mm

Opening sizes:
50 mm (2") x 600 mm (24") to
80 mm (3") x 3500 mm (140")

Virtually particle and vibration free L-motion



Gate material

aluminum or stainless steel

Features

- L-VAT configuration (see glossary)
- Low cost of ownership
- Various O-ring compounds available

Actuator

Double acting pneumatics with position indicator

Technical data

Further technical data on request

Leak rate: seat / gate (dynamic) ^{1) 2)}	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
Differential pressure (Δp) on the gate	
- in closing direction	$\leq 1 \text{ bar}$
- in opening direction	$\leq 5 \text{ mbar}$
Differential pressure at opening	$\leq 5 \text{ mbar}$
Cycles until first service ¹⁾	$\geq 1 \text{ million}$
Opening / closing time ²⁾	$\leq 3 \text{ s}$
Temperature ³⁾	
- Aluminum gate	$\leq 120^\circ\text{C}$
- Stainless steel gate	$\leq 150^\circ\text{C}$
- Actuator	$\leq 80^\circ\text{C}$
- Position indicator	$\leq 50^\circ\text{C}$
Heating and cooling rate	$\leq 40^\circ\text{C h}^{-1}$
Material	
- Aluminum gate	EN AW-6082 (3.2315), EN AW-5083 (3.3547)
- Stainless steel gate	AISI 304 (1.4301)
- Connecting parts	EN AW-6082 (3.2315)
- Shafts	AISI 304 (1.4301)
Seal	
- Gate	FKM (VITON)
- Actuator	FKM (VITON)
Mounting position	actuator up, down or lateral

¹⁾ Unheated and under clean conditions

²⁾ Depending on opening size

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

Series 078

For FPD and PV production systems with opening heights from 80 mm

Opening sizes:

80 mm (3") x 800 mm (32") to 250 mm (10") x 3000 mm (120")

Virtually particle and vibration free L-motion



Gate material

aluminum or stainless steel

Features

- L-VAT configuration (see glossary)
- Low cost of ownership
- Various O-ring compounds available

Actuator

Double acting pneumatics with position indicator

Technical data

Further technical data on request

Leak rate: seat / gate (dynamic) ^{1) 2)}	< 1 · 10 ⁻⁷ mbar ls ⁻¹
Differential pressure (Δp) on the gate	
- in closing direction	≤ 1 bar
- in opening direction	≤ 5 mbar
Differential pressure at opening	≤ 5 mbar
Cycles until first service ¹⁾	≥ 1 million
Opening / closing time ²⁾	≤ 4 s
Temperature ³⁾	
- Aluminum gate	≤ 120°C
- Stainless steel gate	≤ 150°C
- Actuator	≤ 80°C
- Position indicator	≤ 50°C
Heating and cooling rate	≤ 40°C h ⁻¹
Material	
- Aluminum gate	EN AW-6082 (3.2315), EN AW-5083 (3.3547)
- Stainless steel gate	AISI 304 (1.4301)
- Connecting parts	EN AW-6082 (3.2315)
- Shafts	AISI 304 (1.4301)
Seal	
- Gate	FKM (VITON)
- Actuator	FKM (VITON)
Mounting position	actuator up or down

¹⁾ Unheated and under clean conditions

²⁾ Depending on opening size

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

Robust vacuum valve for venting and rough metering

For gases and liquids



Body material

aluminum or stainless steel

Manual actuator

DN		Ordering numbers	
mm	inch	aluminum	stainless steel
16	5/8	22024-KA01	22024-KE01
25	1	22028-KA01	22028-KE01
40	1 1/2	22032-KA01	22032-KE01

Technical data

Leak rate: 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	100 000
Temperature ¹⁾	
- Valve body	≤ 100°C
- Handwheel	≤ 50°C
Material	
- Valve body: aluminum	ENAW-6060 (3.3206), ENAW-6061 (3.3211), ENAW-6063 (3.3206), ENAW-6082 (3.2315)
- Valve body: stainless steel	AISI 316 L (1.4404 or 1.4435)
- Actuator body and handwheel	plastic (POM)
- Seal	diaphragm made of FKM (VITON)
Mounting position	any
Molecular flow conductance	
- DN 16 / 25 / 40	2 / 5 / 17 ls ⁻¹
Spindle turns per stroke	
- DN 16 / 25 / 40	3.5 / 5 / 6.5
Weight (aluminum body)	
- DN 16	0.16 kg / 0.35 lbs
- DN 25	0.5 kg / 1.1 lbs
- DN 40	1.2 kg / 2.6 lbs
Valve position	visual (mechanical)

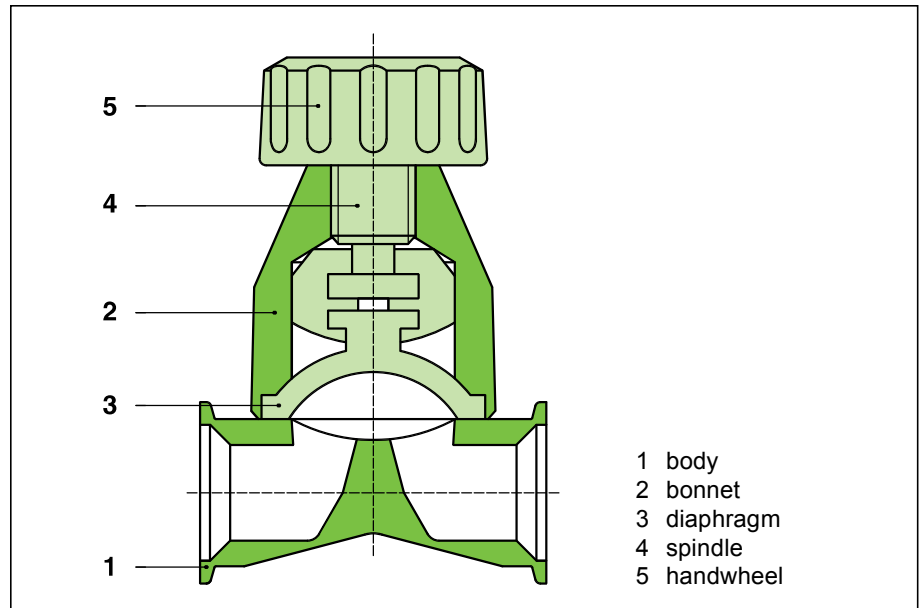
¹⁾ Maximum values: depending on operating conditions and sealing materials

Spare diaphragm

See operating manual or price list

Sealing material

Diaphragm made of FKM (VITON)

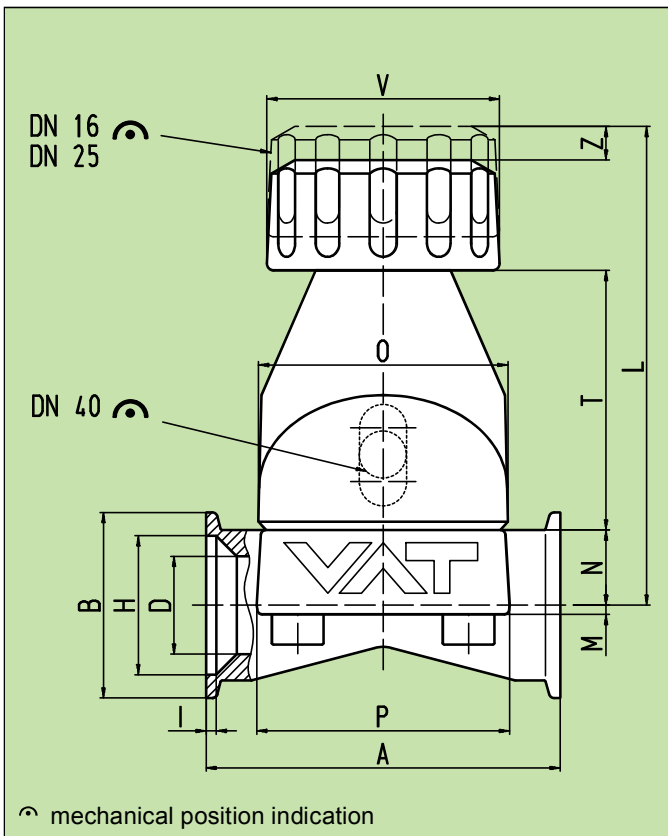


- 1 body
- 2 bonnet
- 3 diaphragm
- 4 spindle
- 5 handwheel

Features

Diaphragm made of FKM (VITON)
Easy replacement of the diaphragm

E



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	17.2 0.68	26.2 1.03	41.2 1.62
I	mm inch	3 0.12	3 0.12	3 0.12
L	mm inch	66.5 2.62	111 4.37	132 5.2
M	mm inch	10 0.39	2 0.08	2.7 0.11
N	mm inch	10 0.39	14 0.55	22.3 0.88
O	mm inch	□ 32 x 32 □ 1.26 x 1.26	□ 54 x 54 □ 2.13 x 2.13	□ 74 x 79 □ 2.91 x 3.11
P	mm inch	□ 32 x 32 □ 1.26 x 1.26	□ 54 x 54 □ 2.13 x 2.13	□ 75 x 80 □ 2.95 x 3.15
T	mm inch	27.5 1.08	56 2.2	77 3.03
V	mm inch	30 1.18	47.5 1.87	69 2.72
Z	mm inch	5.5 0.22	10 0.39	- -

Angle valve with shaft feedthrough for large gas flows



Body material

aluminum or stainless steel

Manual actuator

removable handwheel

Pneumatic actuator

single acting with closing spring (NC)
without position indicator
without solenoid

double acting
without position indicator
without solenoid

	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	24438-QE01	24538-QA01	24538-QE01
	100	4	24340-QA01	24340-QE01		24540-QE01
	160	6	24344-QA01	24344-QE01		
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	24438-QE11	24538-QA11	24538-QE11
	100	4	24340-QA11	24340-QE11		24540-QE11
	160	6	24344-QA11	24344-QE11		
ISO-K	200	8		24446-QE14		
	250	10	24448-QA14	24448-QE14		
ISO-K ¹⁾	320	12		24450-QE14		
	500	20		24454-QE14		
	630	25		24456-QE14		
ISO-F	1000	40		24460-PE14		

¹⁾ ISO-F optional

with position indicator, without solenoid: 24 . . . - . . **2** .

with solenoid, without position indicator: 24 . . . - . . **3** . (specify control voltage)

with position indicator, with solenoid: 24 . . . - . . **4** . (specify control voltage)

Electromagnetic actuator

see page 160

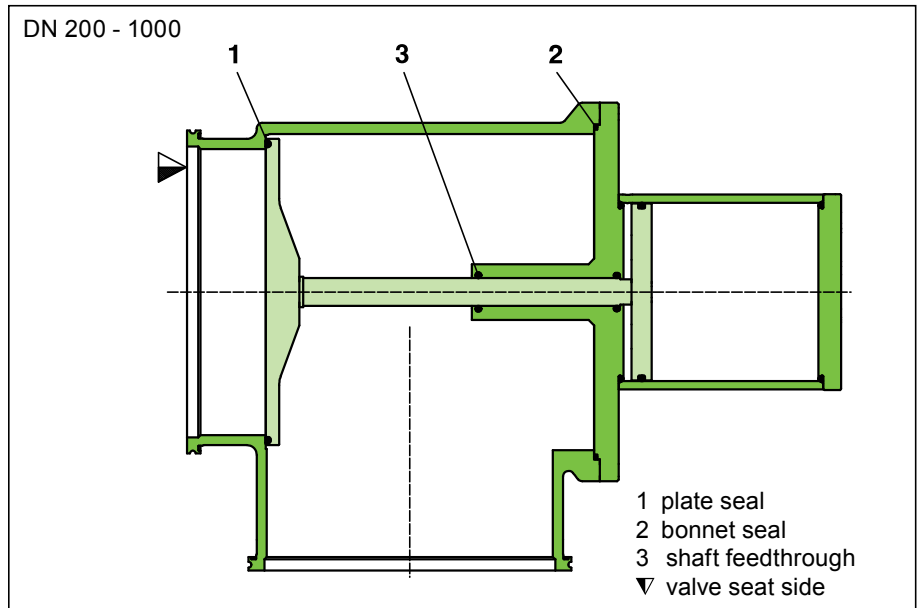
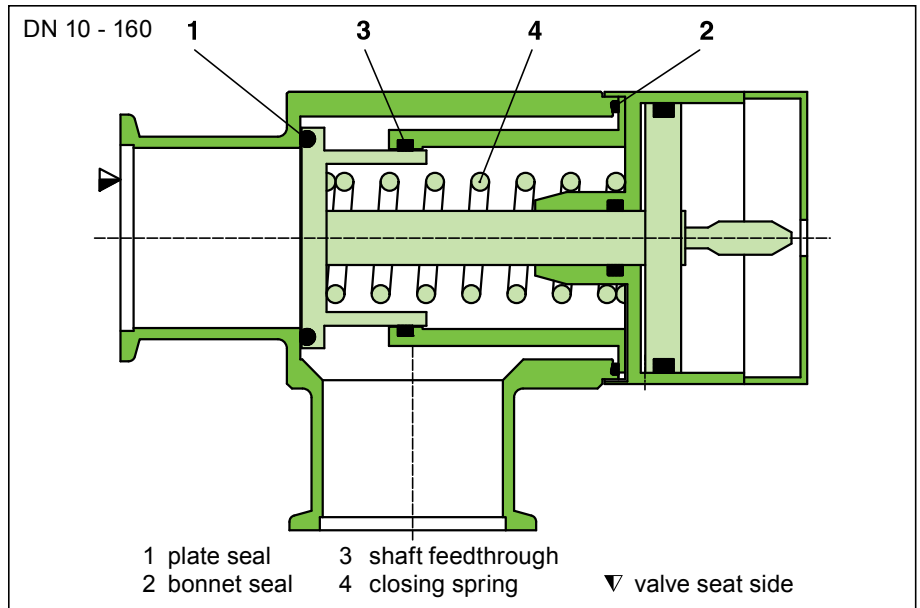
Sealing materials

Plate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

FKM (VITON) / shaft feedthrough



E

Features

- Modular design
- Robust, compact
- Easy cleaning

Technical data

Further technical data see series 26, pages 153 - 159

Pressure range:	DN 10 - 50	1 · 10 ⁻⁷ mbar to 5 bar (abs)
	DN 63 - 1000	1 · 10 ⁻⁷ mbar to 4 bar (abs)
Material		
- Aluminum body	DN 16 - 50	ENAW-6060 (3.3206), ENAW-6061 (3.3211), ENAW-6063 (3.3206), ENAW-6082 (3.2315)
	DN 63 - 1000	ENAC-42000
- Stainless steel body		AISI 304 (1.4301, 1.4305)
- Plate		AISI 316L (1.4404, 1.4435)

Standard angle valve
with bellows feedthrough

For large gas flows we recommend
Series 24



Body material

aluminum or stainless steel

Manual actuator

removable handwheel

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	$\frac{3}{8}$		26420-KE01		
	16	$\frac{5}{8}$	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	26438-QE01	26538-QA01	26538-QE01
	100	4	26340-QA01	26340-QE01		26540-QE01
	160	6	26344-QA01	26344-QE01		

Pneumatic actuator

single acting with closing spring (NC)
without position indicator
without solenoid

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	$\frac{3}{8}$		26420-KE11		
	16	$\frac{5}{8}$	26424-KA11	26424-KE11	26524-KA11	26524-KE11
	25	1	26428-KA11	26428-KE11	26528-KA11	26528-KE11
	40	1½	26432-KA11	26432-KE11	26532-KA11	26532-KE11
	50	2	26434-KA11	26434-KE11	26534-KA11	26534-KE11
ISO-K	63	2½	26436-QA11	26436-QE11		
	80	3	26438-QA11	26438-QE11	26538-QA11	26538-QE11
	100	4	26340-QA11	26340-QE11		26540-QE11
	160	6	26344-QA11	26344-QE11		

with position indicator, without solenoid: 26 **21**

with solenoid, without position indicator: 26 **31** (specify control voltage)

with position indicator, with solenoid: 26 **41** (specify control voltage)

double acting

without position indicator
without solenoid

ISO-K	200	8		26446-QE14		
		250	10	26448-QA14	26448-QE14	

with position indicator, without solenoid: 264 . . -Q . **24**

with solenoid, without position indicator: 264 . . -Q . **34** (specify control voltage)

with position indicator, with solenoid: 264 . . -Q . **44** (specify control voltage)

Electromagnetic actuator

see page 160

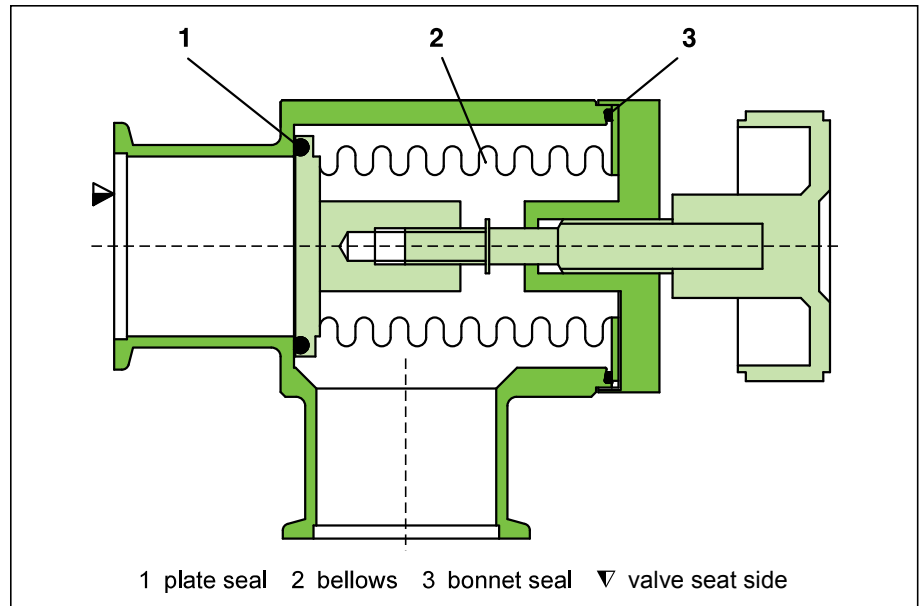
Sealing materials

Plate: FKM (VITON)

Bonnet: FKM (VITON)

Feedthrough

Bellows



1 plate seal 2 bellows 3 bonnet seal ▽ valve seat side

Features

- Modular design
- Robust, compact
- Easy cleaning

Technical data

Series 24: DN 10 - 1000

Series 26: DN 10 - 250

Continued next page

series 26	Pressure range: DN 10 - 50 / 63 - 250	1 · 10 ⁻⁸ mbar to 5 bar / 4 bar (abs)	
	Material	DN 16 - 50	ENAW-6060 (3.3206), ENAW-6061 (3.3211), ENAW-6063 (3.3206), ENAW-6082 (3.2315)
series 24 / 26		DN 63 - 160, 250	ENAC-42000
	- Stainless steel body		AISI 304 (1.4301, 1.4305)
	- Plate		AISI 316L (1.4404, 1.4435)
	- Bellows		AISI 316L (1.4404, 1.4435), 316 Ti (1.4571)
	Leak rate: body, valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹	
	Differential pressure on the plate in opening / closing direction	<u>DN 10 - 63</u> ≤ 2 bar / ≤ 5 bar	<u>DN 80 - 250</u> ≤ 1.2 bar / ≤ 4 bar
	Differential pressure at opening	≤ 1 bar in either direction	
	Cycles until first service at T _{max} 80°C	<u>DN 10 - 80</u> 3 million	<u>DN 100 - 250</u> 1 million
	Temperature ¹⁾		
	- Body	≤ 150°C	
	- Manual and pneumatic actuator	≤ 120°C	
	- Position indicator / solenoid	≤ 80°C (option: 120°C) / ≤ 80°C	
	Seal: bonnet, plate	FKM (VITON) [others optional]	
	Mounting position	any	
	Solenoid: DN 10 - 50 / 63 - 1000	24 VDC, 2.5 W / 24 VDC, 9.0 W (others see «Options»)	
	Position indicator: contact rating	<u>DN 10 - 80, 200 - 250</u> ≤ 50 VAC / DC	<u>DN 100 - 160</u> ≤ 50 VAC / DC
	- Voltage		
	- Current	≤ 0.1 A	
	- Power	max. 1 W	
	Valve position	visual (mechanical)	

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



Technical data

Series 24 + 26

Angle valves

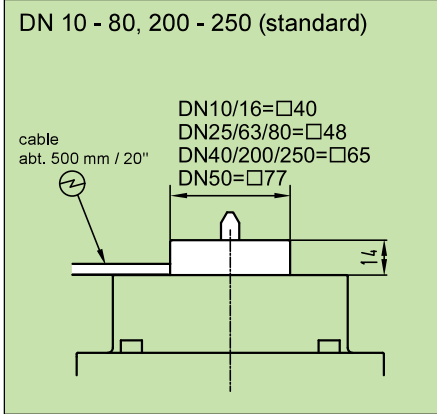
DN (nominal I. D.)		molecular flow conductance	turns per stroke	manual				pneumatic, single acting with closing spring (NC)								
				weight		compressed air pressure min. - max. overpressure	volume of air cylinder	closing time	weight							
mm	inch	ls ⁻¹	n	aluminum body	stainless steel body				bar	psi	l	ft ³	s	aluminum body	stainless steel body	
				kg	lbs	kg	lbs					kg	lbs	kg	lbs	
10	3/8	3	3.6	–	–	0.26	0.57	4-8	60-115	0.004	0.0001	0.1	–	–	0.34	0.75
16	5/8	5	3.6	0.2	0.44	0.26	0.57	4-8	60-115	0.004	0.0001	0.1	0.28	0.62	0.34	0.75
25	1	14	3.8	0.27	0.6	0.34	0.75	4-8	60-115	0.011	0.0004	0.2	0.41	0.9	0.51	1.12
40	1 1/2	45	4.5	0.6	1.32	0.75	1.65	4-8	60-115	0.035	0.0012	0.55	0.97	2.14	1.13	2.49
50	2	80	4.8	0.94	2.07	1.1	2.43	4-8	60-115	0.047	0.0017	0.65	1.45	3.2	1.61	3.55
63	2 1/2	160	6.6	2.9	6.39	1.7	3.75	4-8	60-115	0.112	0.004	0.7	2.9	6.39	1.7	3.75
80	3	200	6.6	3.1	6.83	3.39	7.47	4-8	60-115	0.112	0.004	0.7	3.1	6.84	3.46	7.62
100	4	440	11	5.79	12.76	4.85	10.69	4-8	60-115	0.330	0.0117	1	8	17.64	7.38	16.27
160	6	1000	11	8.83	19.47	7.35	16.2	4-8	60-115	1.050	0.0371	2	14.7	30.42	12.54	27.65

DN (nominal I. D.)		molecular flow conductance	pneumatic, double acting								
			compressed air pressure min. - max. overpressure	volume of air cylinder	closing time	weight					
mm	inch	ls ⁻¹	bar	psi	l	ft ³	s	aluminum body	stainless steel body		
								kg	lbs	kg	lbs
200	8	2000	5-7	70-105	3.1	0.1	3	–	–	21	46
250	10	3100	5-7	70-105	3.1	0.1	4	32	70	24	53
320	12		Series 24: data on request								
500	20										
630	25										
1000	40										

Inline valves

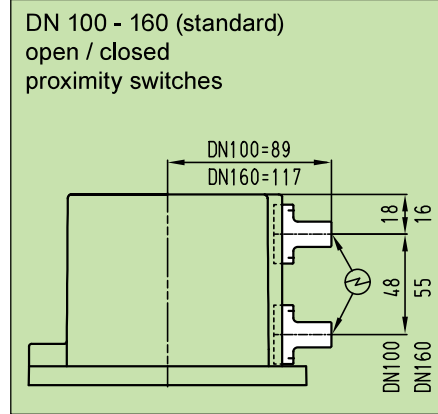
DN (nominal I. D.)		molecular flow conductance	turns per stroke	manual				pneumatic, single acting with closing spring (NC)								
				weight		compressed air pressure min. - max. overpressure	volume of air cylinder	closing time	weight							
mm	inch	ls ⁻¹	n	aluminum body	stainless steel body				bar	psi	l	ft ³	s	aluminum body	stainless steel body	
				kg	lbs	kg	lbs					kg	lbs	kg	lbs	
16	5/8	5	3.6	0.28	0.62	0.26	0.57	4-8	60-115	0.004	0.0001	0.1	0.36	0.79	0.25	0.54
25	1	14	3.8	0.42	0.93	1.04	2.29	4-8	60-115	0.011	0.0004	0.2	0.56	1.23	0.29	0.64
40	1 1/2	45	4.5	1	2.2	2.45	5.4	4-8	60-115	0.035	0.0012	0.55	1.37	3.02	0.66	1.46
50	2	80	4.8	1.61	3.55	4.71	10.38	4-8	60-115	0.047	0.0017	0.65	1.61	3.55	1.13	2.48
80	3	200	6.6	3	6.61	3.3	7.28	4-8	60-115	0.112	0.004	0.7	3.07	6.76	3.4	7.5

Position indicator



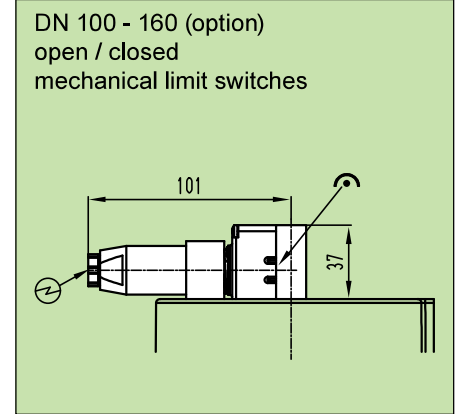
One closing contact each for the open and closed valve positions

Ordering No. 244 **21** and **41** resp.
Ordering No. 264 **21** and **41**



One closing contact each for the open and closed valve positions

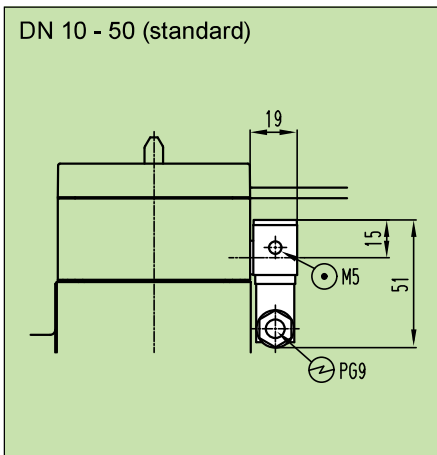
Ordering No. 243 **A21** and **41** resp.
Ordering No. 263 **A21** and **41**



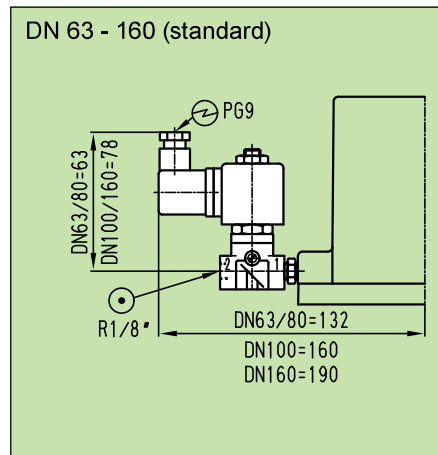
One closing contact each for the open and closed valve positions

Ordering No. 243 **A21** and **41** resp.
Ordering No. 263 **A21** and **41**

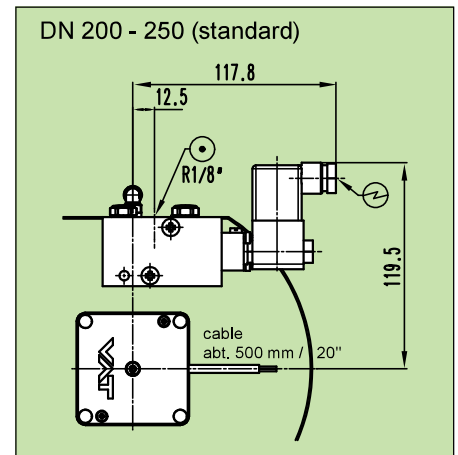
Solenoid



Ordering No. 244 . . -K . **31** and **41** resp.
Ordering No. 264 . . -K . **31** and **41**



Ordering No. 24 . . . -Q . **31** and **41** resp.
Ordering No. 26 . . . -Q . **31** and **41**



Ordering No. 244 . . -Q . **31** and **41** resp.
Ordering No. 264 . . -Q . **31** and **41**

Coil and solenoid rotatable
Specify control voltage!

- ⊙ compressed air connection
- ⊕ electrical connection
- ⊖ mechanical position indication

E

Options

Actuator:

- Solenoid for DN 10 - 50
12, 24, 48, 110 VDC
24, 48, 115, 220 - 230 V 50 Hz
24, 48, 115, 220 - 230 V 60 Hz
- DN 63 - 80, 200 - 250
12, 24, 48, 110 VDC
24, 48, 110 - 115, 220 - 230 V 50 Hz
24, 110 - 115, 220 - 230 V 60 Hz
100 V 50/60 Hz
200 V 50/60 Hz
- DN 100 - 160
12, 24, 48, 110 VDC
24, 48, 110, 220 - 230 V 50 Hz
24, 115, 220 - 230 V 60 Hz
100 V 50/60 Hz
200 V 50/60 Hz
- Common 7-pole plug for position indicator and solenoid (to 48 V only)
- Solenoid with manual emergency operation
- Position indicator for 120°C
- Mechanical position indicator (DN 100 - 160)
- Pneumatic actuator with opening spring (NO) for DN 10 - 50
- Customer specified actuators

Valve:

- Other sealing materials
- Surface treatments (e. g. hard anodized, nickel-plated)
- CF flanges
- Customer specified bodies
- Valve with heating jacket (picture)

Ordering information for options:

Ordering No. of valve-X (e. g. 26432-KA41-X, X = position indicator for 120°C)



Accessories

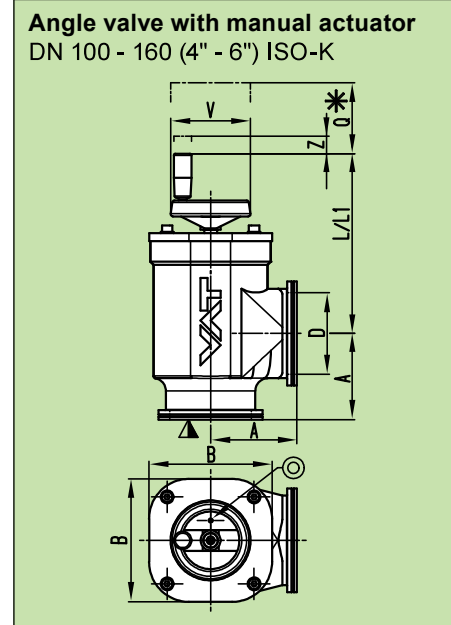
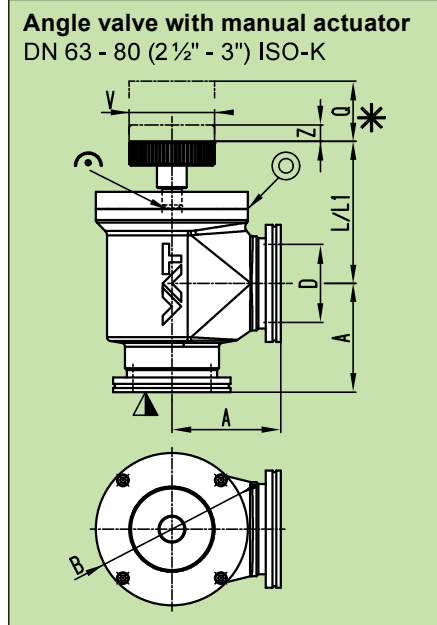
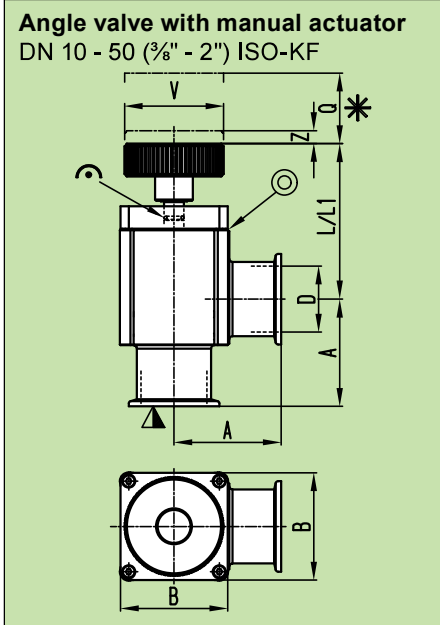
Fittings for installation of the valve: series 31

Seal kit

Consisting of seals for plate and bonnet

Ordering No.

Dimensions

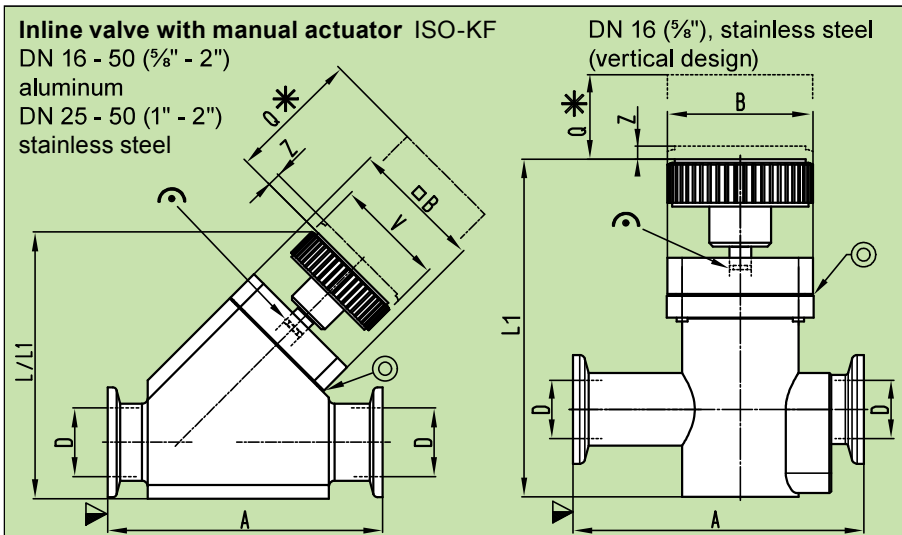


DN	10	16	25	40	50	63	80	100	160
mm	10	16	25	40	50	63	80	100	160
inch	3/8	5/8	1	1 1/2	2	2 1/2	3	4	6
A	30	40	50	65	70	88	90	108	138
mm	30	40	50	65	70	88	90	108	138
inch	1.18	1.57	1.97	2.56	2.76	3.46	3.54	4.25	5.43
B	40	40	48	65	77	123	123	154	215
mm	40	40	48	65	77	123	123	154	215
inch	1.57	1.57	1.89	2.56	3.03	4.84	4.84	6.06	8.46
D	12	16	25	40	50	63	80	100	153
mm	12	16	25	40	50	63	80	100	153
inch	0.47	0.63	0.98	1.57	1.97	2.5	3.14	3.93	6.02
L	-	64.9	60.9	94.3	101.1	112	111.7	225.1	240.5
mm	-	64.9	60.9	94.3	101.1	112	111.7	225.1	240.5
inch	-	2.56	2.4	3.71	3.98	4.41	4.4	8.86	9.46
L1	67.4	67.4	64.3	97.3	104.1	111.7	114.8	215.6	244.7
mm	67.4	67.4	64.3	97.3	104.1	111.7	114.8	215.6	244.7
inch	2.65	2.65	2.53	3.83	4.1	4.4	4.52	8.48	9.63
Q	46	46	44	73.5	85.5	105	105	170	195
mm	46	46	44	73.5	85.5	105	105	170	195
inch	1.81	1.81	1.73	2.89	3.35	4.13	4.13	6.69	7.67
V	40	40	40	60	60	60	60	100	160
mm	40	40	40	60	60	60	60	100	160
inch	1.57	1.57	1.57	2.36	2.36	2.36	2.36	3.93	6.29
Z ¹⁾	3.6	3.6	4.7	7.9	9.3	13.3	13.3	22	27.2
mm	3.6	3.6	4.7	7.9	9.3	13.3	13.3	22	27.2
inch	0.14	0.14	0.19	0.31	0.37	0.52	0.52	0.86	1.07

- ▽ valve seat side
- * required for dismantling
- ⊙ leak detection hole
- ↻ mechanical position indication

L = aluminum
L1 = stainless steel

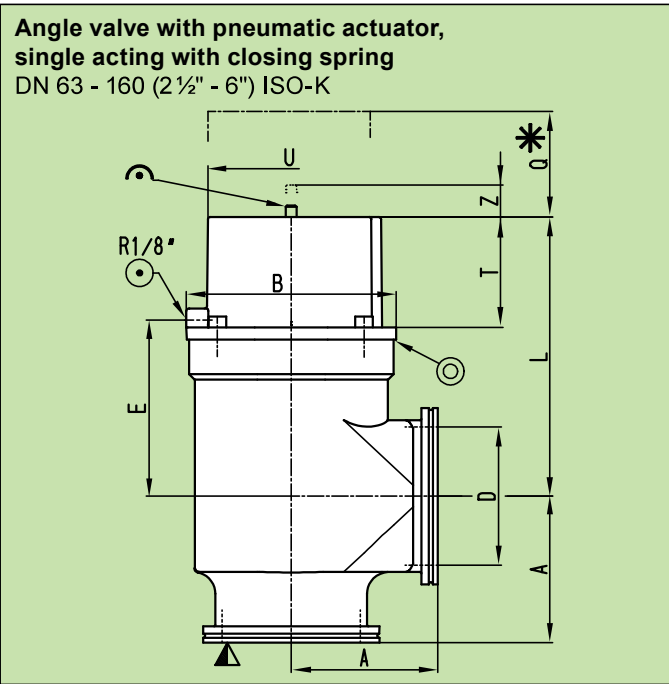
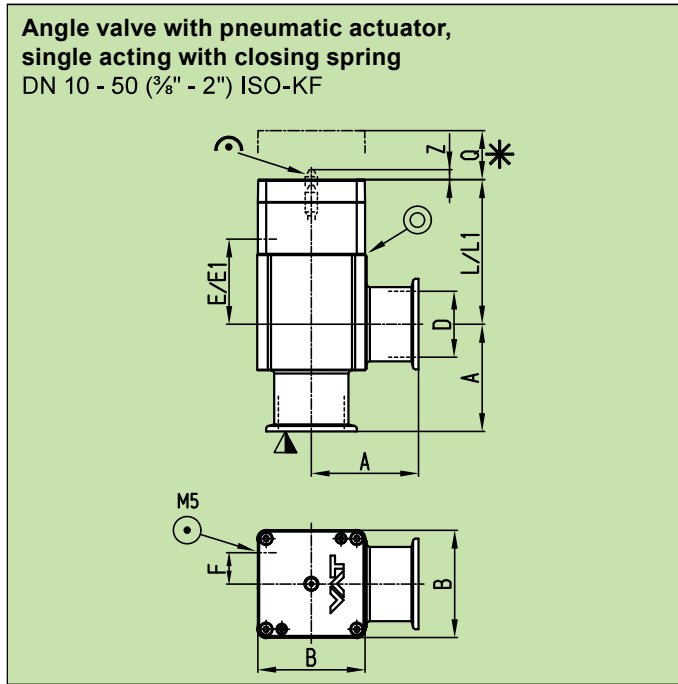
¹⁾ gate stroke is longer due to transmission



DN	16	25	40	50
mm	16	25	40	50
inch	5/8	1	1 1/2	2
A	80	100	130	178
mm	80	100	130	178
inch	3.15	3.94	5.12	7.01
B	40	48	65	77
mm	40	48	65	77
inch	1.57	1.89	2.56	3.03
D	16	25	40	50
mm	16	25	40	50
inch	0.63	0.98	1.57	1.97
L	90.6	97	143.5	167.2
mm	90.6	97	143.5	167.2
inch	3.57	3.82	5.65	6.58
L1	92.8	105.8	152.5	172.1
mm	92.8	105.8	152.5	172.1
inch	3.65	4.16	6	6.77
Q	46	44	73.5	85.5
mm	46	44	73.5	85.5
inch	1.81	1.73	2.89	3.37
V	40	40	60	60
mm	40	40	60	60
inch	1.57	1.57	2.36	2.36
Z	3.6	4.7	7.9	9.3
mm	3.6	4.7	7.9	9.3
inch	0.14	0.19	0.31	0.37

E

Dimensions



▽ valve seat side * required for dismantling ☉ mechanical position indication ⊙ leak detection hole ⊕ compressed air connection

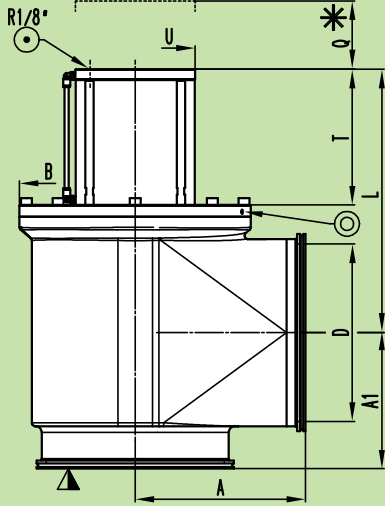
E = aluminum
E1 = stainless steel
L = aluminum
L1 = stainless steel

DN	mm inch	10 3/8	16 1/2	25 1	40 1 1/2	50 2
A	mm inch	30 1.18	40 1.57	50 1.97	65 2.56	70 2.76
B	mm inch	40 1.57	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
E	mm inch	— —	35.6 1.4	30.6 1.2	51.6 2.03	58.4 2.3
E1	mm inch	38.1 1.5	38.1 1.5	34 1.34	54.6 2.15	61.4 2.42
F	mm inch	9 0.35	9 0.35	13 0.51	18.9 0.74	20 0.79
L	mm inch	— —	65.2 2.57	60.6 2.38	87.7 3.45	96 3.78
L1	mm inch	67.7 2.67	67.7 2.67	64 2.52	90.7 3.57	99 3.9
Q	mm inch	46 1.81	46 1.81	44 1.73	73.5 2.89	85.5 3.35
Z	mm inch	2 0.08	2 0.08	4 0.16	9.5 0.37	10.5 0.41

DN	mm inch	63 2 1/2	80 3	100 4	160 6
A	mm inch	88 3.46	90 3.54	108 4.25	138 5.43
B	mm inch	123 4.84	123 4.84	155 6.1	216 8.5
D	mm inch	63 2.48	80 3.15	102 4.02	153 6.02
E	mm inch	71.4 2.81	71.4 2.81	131 5.16	117 4.61
E1	mm inch	71.4 2.81	71.4 2.81	121.6 4.78	122 4.8
L	mm inch	109 4.29	109 4.29	206.5 8.13	202 7.95
L1	mm inch	109 4.29	109 4.29	197.2 7.76	207 8.15
Q	mm inch	115.6 4.55	115.6 4.55	170 6.69	195 7.68
T	mm inch	31.1 1.22	31.1 1.22	81 3.19	86.5 3.41
U	mm inch	94 3.7	94 3.7	123 4.84	180 7.09
Z	mm inch	32.6 1.28	32.6 1.28	6 0.24	6 0.24

Dimensions

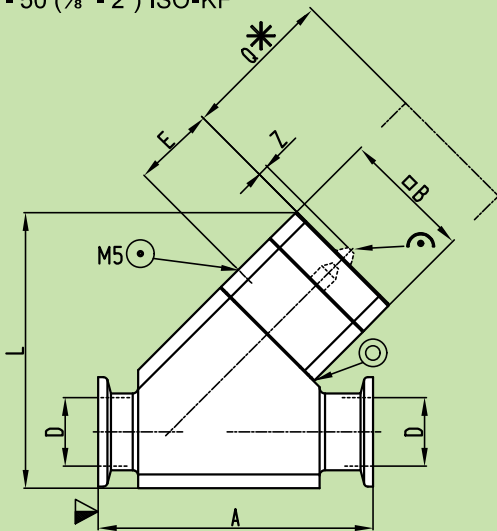
Angle valve with pneumatic actuator, double acting
 DN 200 - 630 (8" - 25") ISO-K, DN 1000 (40") ISO-F



		series 24 + 26		series 24 only			
DN	mm	200	250	320	500	630	1000
	inch	8	10	12	20	25	40
A	mm	178	250	250	400	450	650
	inch	7	9.84	9.84	15.75	17.72	25.59
A1	mm	178	200	250	400	450	650
	inch	7	7.87	9.84	15.75	17.72	25.59
D	mm	213	261	318	501	651	1000
	inch	8.39	10.28	12.52	19.72	25.63	39.37
B	mm	290	340	on request (customer-specific)			
	inch	11.42	13.39				
L	mm	324.8	387.4	on request (customer-specific)			
	inch	12.79	15.25				
Q	mm	260	305	on request (customer-specific)			
	inch	10.24	12.01				
T	mm	169.7	199.8	on request (customer-specific)			
	inch	6.68	7.87				
U	mm	208	208	on request (customer-specific)			
	inch	8.19	8.19				

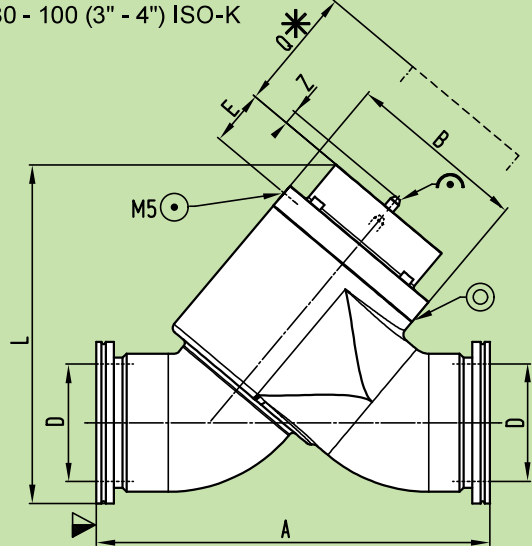
▽ valve seat side * required for dismantling Ⓞ mechanical position indication ⊙ leak detection hole ⊕ compressed air connection

Inline valve with pneumatic actuator, single acting with closing spring
 DN 16 - 50 (5/8" - 2") ISO-KF



DN	mm	16	25	40	50
	inch	5/8	1	1 1/2	2
A	mm	80	100	130	178
	inch	3.15	3.94	5.12	7.01
B	mm	40	48	65	77
	inch	1.57	1.89	2.56	3.03
D	mm	16	25	40	50
	inch	0.63	0.98	1.57	1.97
E	mm	29.6	30	36.1	37.6
	inch	1.16	1.18	1.42	1.48
L	mm	91.5	100.3	140.9	170.1
	inch	3.6	3.95	5.54	6.7
Q	mm	46	44	73.5	85.5
	inch	1.81	1.73	2.89	3.37
Z	mm	2	4	9.5	10.5
	inch	0.08	0.16	0.37	0.41

Inline valve with pneumatic actuator, single acting with closing spring
 DN 80 - 100 (3" - 4") ISO-K



DN	mm	80	100		
	inch	3	4		
A	mm	268	345		
	inch	10.55	13.58		
B	mm	123	154		
	inch	4.84	6.06		
D	mm	80	102		
	inch	3.15	4.02		
E	mm	37.6	75.5		
	inch	1.48	2.97		
L	mm	230.5	335.3		
	inch	9.07	13.2		
Q	mm	150	170		
	inch	4.13	6.69		
Z	mm	31.4	6		
	inch	1.23	0.24		

E

Electromagnetic actuator

Large conductance
Differential pressure resistant



Actuator
single acting with closing spring (NC)
with position indicator
with control electronics
Voltage: 100 - 120 V / 50 - 60 Hz
200 - 240 V / 50 - 60 Hz

	DN		Ordering numbers			
	mm	inch	angle valve		inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	–	26420-KE61	–	–
	16	5/8	26424-KA61	26424-KE61	26524-KA61	26524-KE61
	25	1	26428-KA61	26428-KE61	26528-KA61	26528-KE61
	40	1 1/2	26432-KA61	26432-KE61	26532-KA61	26532-KE61

Technical data

Leak rate: body, valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹
Pressure range	10 ⁻⁸ mbar to 2 bar
Differential pressure on the plate	2 bar in either direction (even at opening)
Operating temperature	0 - 50°C
Cycles until first service	200 000
Material: valve body	ENAW-6060 (3.3206), ENAW-6061 (3.3211), ENAW-6063 (3.3206), ENAW-6082 (3.2315)
Seal: bonnet, plate	FKM (VITON)
Mains voltage	100 - 120 V / 200 - 240 V / 50 - 60 Hz
Starting power / holding power	700 W / 8 W
Closing and opening time	0.1 s
Operating frequency	max. 15 min ⁻¹ at 20°C
Weight	DN 10: 1.1 kg / 2.4 lbs DN 16: 1.2 kg / 2.6 lbs DN 25: 1.4 kg / 3.1 lbs DN 40: 1.8 kg / 4.0 lbs

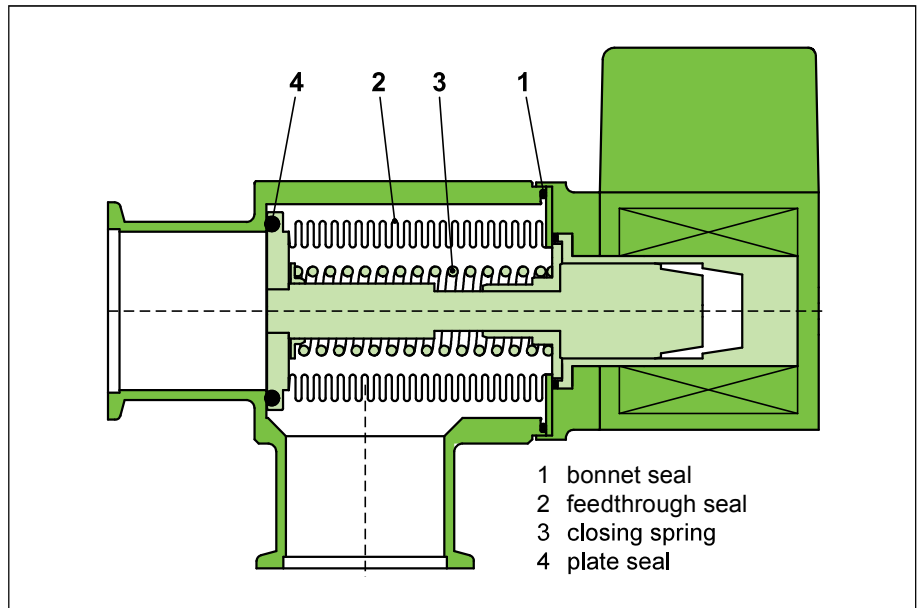
Sealing material

Plate: FKM (VITON)

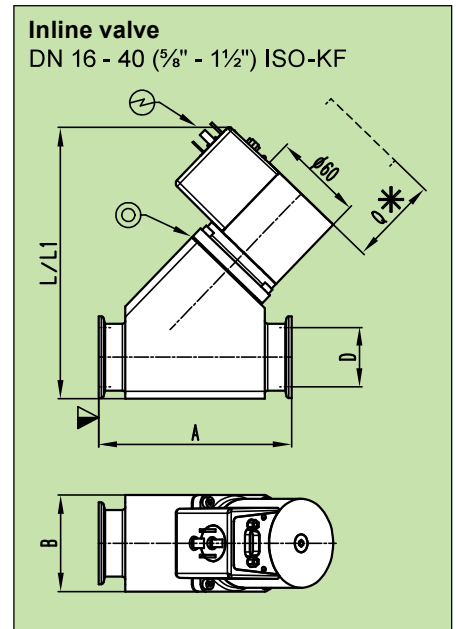
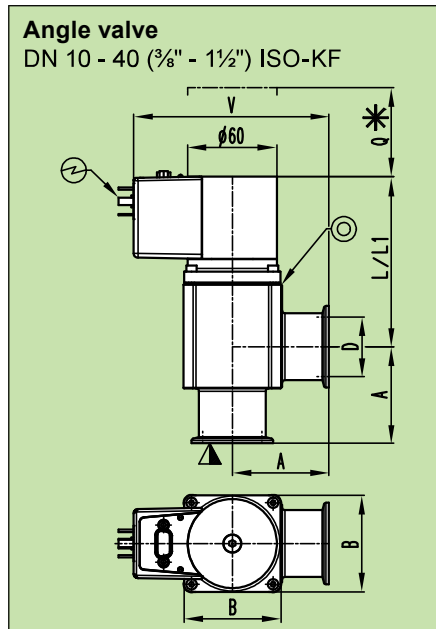
Bonnet: FKM (VITON)

Feedthrough

Bellows



Dimensions



- ⊙ leak detection hole
- * required for dismantling
- ⊕ electronics connection
- ▼ valve seat side

DN	mm	10	16	25	40
inch		3/8	5/8	1	1 1/2
A	mm	30	40	50	65
	inch	1.18	1.57	1.97	2.56
B	mm	40	40	48	65
	inch	1.57	1.57	1.89	2.56
D	mm	10	16	25	40
	inch	0.39	0.63	0.98	1.57
L	mm	-	100	93	114
	inch	-	3.94	3.66	4.49
L1	mm	102.5	102.5	103.4	117
	inch	4.04	4.04	4.07	4.61
Q	mm	46	46	44	73.5
	inch	1.81	1.81	1.73	2.89
V	mm	96.5	106.5	116.5	131.5
	inch	3.8	4.2	4.59	5.18

DN	mm	16	25	40
inch		5/8	1	1 1/2
A	mm	80	100	130
	inch	3.15	3.94	5.12
B	mm	40	48	65
	inch	1.57	1.89	2.56
D	mm	16	25	40
	inch	0.63	0.98	1.57
L	mm	148	153	183
	inch	5.83	6.02	7.2
L1	mm	149.5	161	192
	inch	5.89	6.34	7.56
Q	mm	46	44	73.5
	inch	1.81	1.73	2.89

L = aluminum
L1 = stainless steel

E

Extremely low outgassing rate
 Suited for most corrosive gases



Body material

stainless steel

Manual actuator

handwheel (removable)

DN		Ordering numbers
mm	inch	CF-R
16	5/8	28424-GE01
40	1 1/2	28432-GE01
63	2 1/2	28436-GE01

Pneumatic actuator

single acting with closing spring (NC)
 without position indicator
 without solenoid

DN		Ordering numbers
mm	inch	CF-R
16	5/8	28424-GE11
40	1 1/2	28432-GE11
63	2 1/2	28436-GE11

with position indicator, without solenoid: 284 . . -GE21
 with solenoid, without position indicator: 284 . . -GE31 (specify control voltage)
 with position indicator, with solenoid: 284 . . -GE41 (specify control voltage)

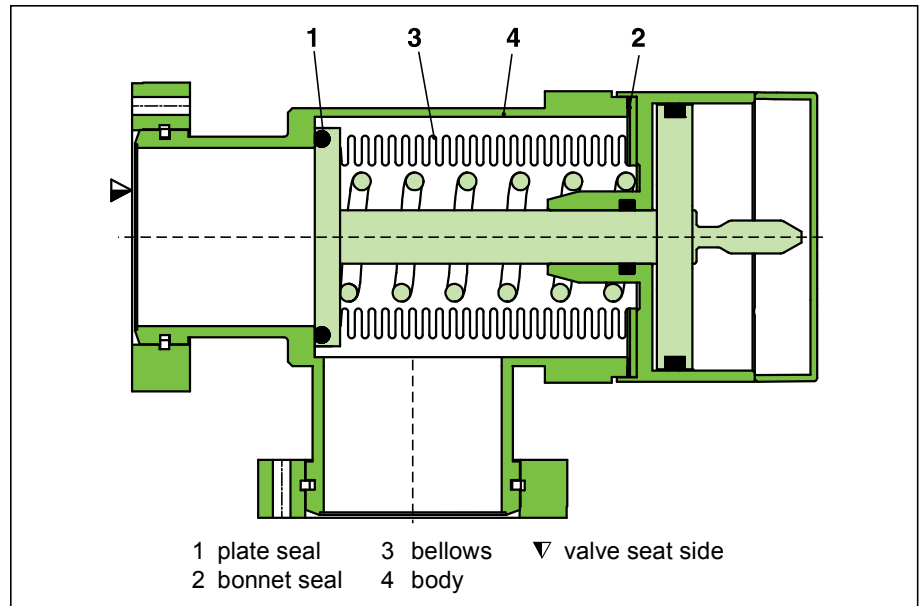
Sealing materials

Plate: FKM (VITON)

Bonnet: metal

Feedthrough

Bellows



Features

Standard with metal bonnet seal

Technical data

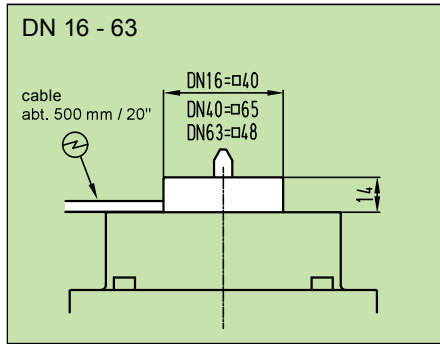
Continued next page

Leak rate	
- Body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
- Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	$1 \cdot 10^{-10}$ mbar to 5 bar (abs)
Differential pressure on the plate	
- in opening direction	≤ 2 bar
- in closing direction	≤ 5 bar
Differential pressure at opening	≤ 1 bar in either direction
Cycles until first service at T _{max} 80°C	3 million
Temperature ¹⁾	
- Valve body	$\leq 200^\circ\text{C}$ open / $\leq 150^\circ\text{C}$ closed
- Manual actuator	$\leq 120^\circ\text{C}$ (without handwheel 200°C)
- Pneumatic actuator	$\leq 120^\circ\text{C}$ (option: 150°C)
- Position indicator	$\leq 80^\circ\text{C}$ (option: 120°C , 200°C)
- Solenoid	$\leq 80^\circ\text{C}$
Material	
- Valve body	AISI 304 (1.4301)
- Plate	AISI 316L (1.4404, 1.4435)
- Bellows	AISI 316L (1.4404, 1.4435)
Seal: bonnet / plate	metal / FKM (VITON)
Mounting position	any
Solenoid	24 VDC (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 50 VAC / DC
- Current	≤ 0.1 A
- Power	max. 1 W
Valve position	visual (mechanical)

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

E

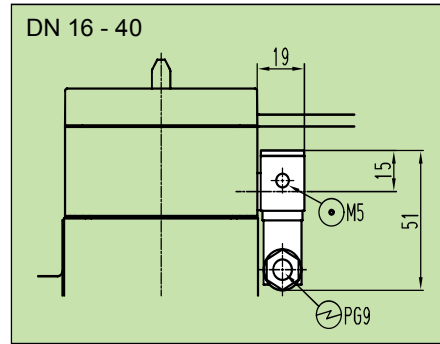
Position indicator



Ordering No. 284 . . -GE21 and 41

One closing contact each for the open and closed valve positions

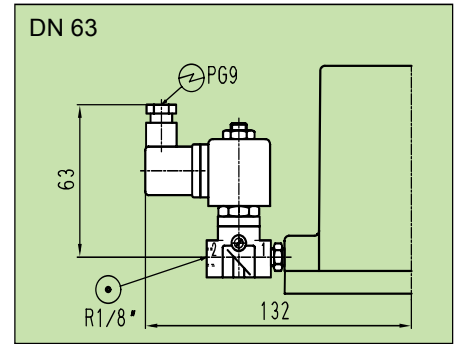
Solenoid



Ordering No. 284 . . -GE31 and 41

Coil and solenoid rotatable. Specify control voltage!

⊙ compressed air connection ⊕ electrical connection



Ordering No. 284 . . -GE31 and 41

Options

Actuator:

- Solenoid for

<u>DN 16 - 40</u>	<u>DN 63</u>
12, 24, 48, 110 VDC	12, 24, 48, 110 VDC
24, 48, 100, 110-115, 220-230V 50Hz	24, 48, 110-115, 220-230V 50Hz
24, 48, 100, 110-115, 220-230V 60Hz	24, 110-115, 220-230V 60Hz
	100 V 50/60 Hz, 200 V 50/60 Hz

- Position indicator for 120°C
- Position indicator for 200°C (picture)

Valve:

- ISO-KF, ISO-K flanges
- Customer specified flanges
- Valve with manual actuator bakeable to 200°C
- Other sealing materials
- Customer specified bodies

Ordering information for options:

Ordering No. of valve-X (e. g. 28432-GE41-X, X = position indicator for 120°C)



Seal kit

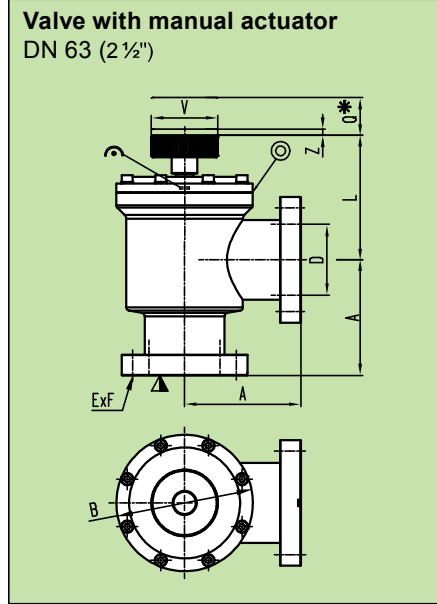
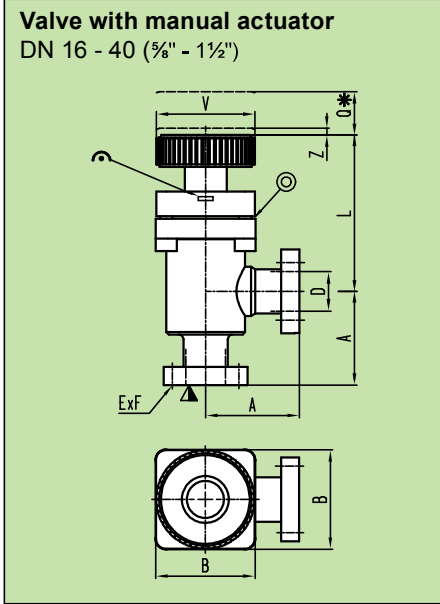
Consisting of seals for plate and bonnet

Ordering No.

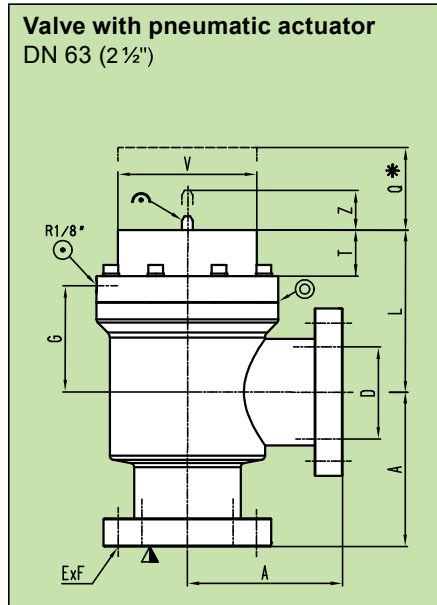
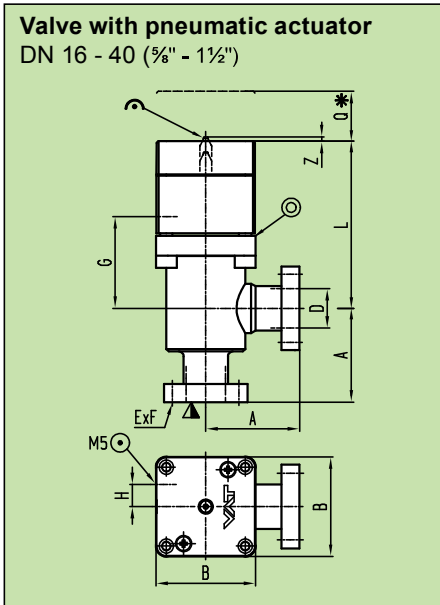
Technical data

DN (nominal I. D.)		CF-R flange	molecular flow conductance	turns per stroke	manual		pneumatic						
					weight		compressed air pressure min. - max. overpressure		volume of air cylinder		closing time	weight	
mm	inch		ls ⁻¹	n	kg	lbs	bar	psi	l	ft ³		s	kg
16	5/8	1 1/3	5	3.6	0.3	0.7	4-8	60-115	0.004	0.0001	0.10	0.4	0.9
40	1 1/2	2 3/4	45	4.5	1.5	3.3	4-8	60-115	0.035	0.0012	0.55	1.6	3.5
63	2 1/2	4 1/2	160	6.6	5.3	11.7	4-8	60-115	0.112	0.0040	0.70	6.0	13.2

Dimensions



DN	mm	16	40	63
	inch	5/8	1 1/2	2 1/2
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 x F		6 x 4.30 6 x 0.17	6 x 6.60 6 x 0.26	8 x 8.40 8 x 0.33
L	mm	67.3	97.4	112.3
	inch	2.65	3.83	4.42
Q	mm	45	73.5	105
	inch	1.77	2.89	4.13
V	mm	40	60	60
	inch	1.57	2.36	2.36
Z	mm	3.6	7.9	13.4
	inch	0.14	0.31	0.53



DN	mm	16	40	63
	inch	5/8	1 1/2	2 1/2
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 x F		6 x 4.30 6 x 0.17	6 x 6.60 6 x 0.26	8 x 8.40 8 x 0.33
G	mm	38.2	54.7	72
	inch	1.50	2.15	2.83
H	mm	9	19	
	inch	0.35	0.75	
L	mm	67.8	90.8	109.6
	inch	2.67	3.57	4.31
Q	mm	45	71	119
	inch	1.77	2.80	4.68
T	mm	-	-	31.1
	inch	-	-	1.22
V	mm	-	-	94
	inch	-	-	3.70
Z	mm	2	9.5	31.4
	inch	0.08	0.37	1.24

- ▼ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- ⊙ leak detection hole
- ⊙ mechanical position indication

E

For pump-down and venting
with reduced turbulences, particle and
substrate agitation and condensation



Body material

aluminum or stainless steel

Pneumatic actuator

single acting with closing spring (NC)
without position indicator
without solenoid

	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	29038-QE11		
	100	4	29040-QA11	29040-QE11		
	160	6	29044-QA11	29044-QE11		

with position indicator, without solenoid: 29 . . . - . . **21**

with solenoid, without position indicator: 29 . . . - . . **31** (specify control voltage)

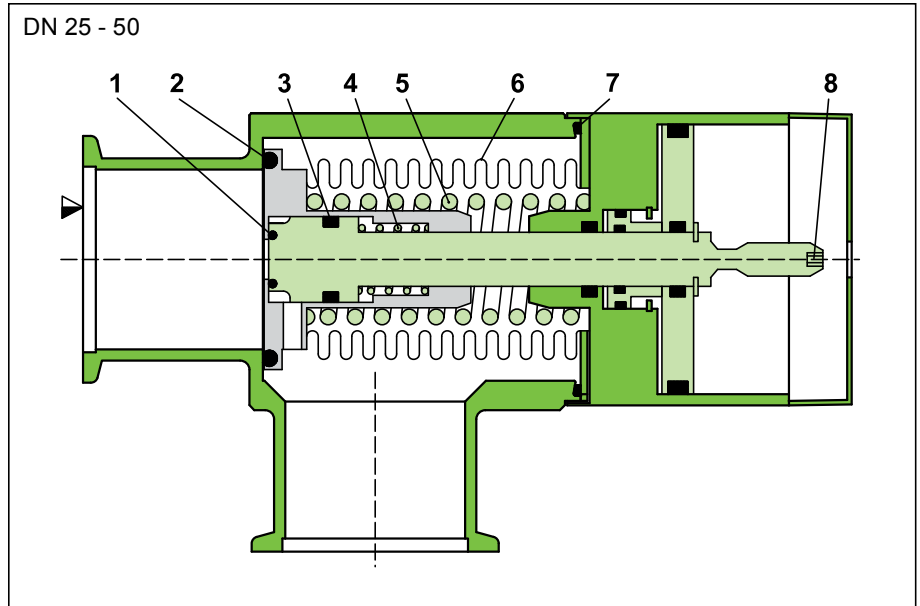
with position indicator, with solenoid: 29 . . . - . . **41** (specify control voltage)

Sealing materials

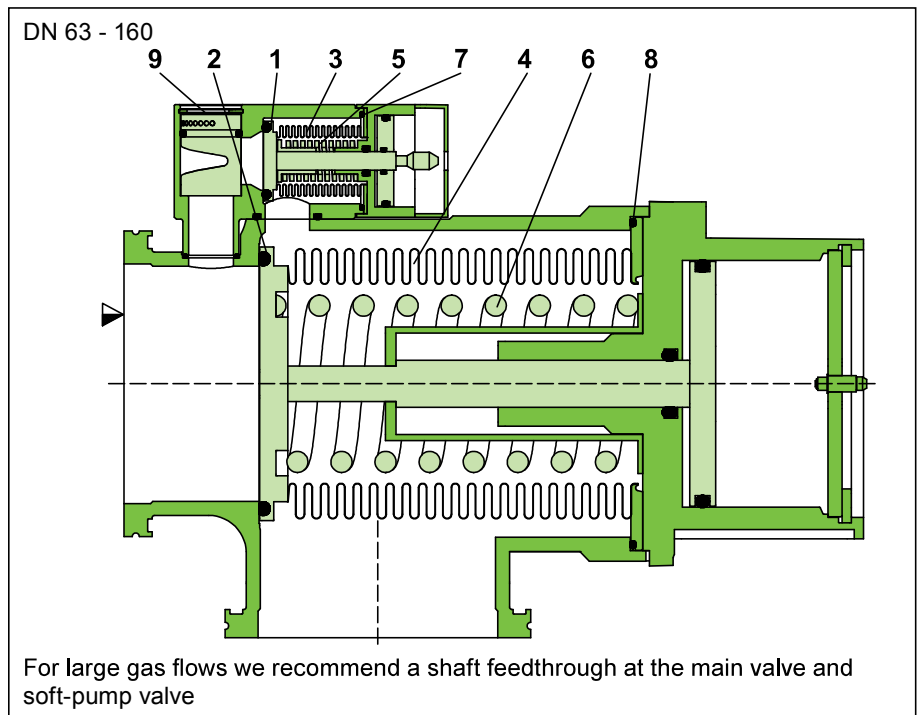
Plate: FKM (VITON)

Bonnet: FKM (VITON)

- 1 plate seal (soft-pump unit)
 - 2 plate seal (main valve)
 - 3 shaft feedthrough (soft-pump unit)
 - 4 closing spring (soft-pump unit)
 - 5 closing spring (main valve)
 - 6 bellows feedthrough (soft-pump unit)
 - 7 bonnet seal
 - 8 setting of the orifice opening
- ▼ valve seat side



- 1 plate seal (soft-pump unit)
 - 2 plate seal (main valve)
 - 3 bellows feedthrough (soft-pump unit)
 - 4 bellows feedthrough (main valve)
 - 5 closing spring (soft-pump unit)
 - 6 closing spring (main valve)
 - 7 bonnet seal (soft-pump unit)
 - 8 bonnet seal (main valve)
 - 9 setting of the orifice opening
- ▼ valve seat side



E

Features

Adjustable soft-pump opening to reduce the turbulences during pump-down and venting

Orifice opening

DN valve	mm inch	25 1	40 1½	50 2	63 2½	80 3	100 4	160 6
opening range of orifice of the soft-pump unit		0.2 - 20 mm ²	0.3 - 40 mm ²	0.4 - 50 mm ²	5 - 250 mm ²	5 - 250 mm ²	5 - 250 mm ²	5 - 250 mm ²

Technical data

Leak rate: body, valve seat	< 1 · 10 ⁻⁹ mbar ls ⁻¹
Pressure range	DN 25- 50: 1 · 10 ⁻⁸ mbar to 1.2 bar (abs) DN 63-160: 1 · 10 ⁻⁸ mbar to 4 bar (abs)
Differential pressure on the plate in opening / closing direction	DN 25- 50: ≤ 1.2 bar / ≤ 1.2 bar DN 63-160: ≤ 1.2 bar / ≤ 4 bar
Differential pressure at opening	DN 25- 50: ≤ 1.2 bar DN 63-160: ≤ 1 bar
Cycles until first service at T _{max} 80°C	DN 25- 80: 3 million DN 100-160: 1 million
Temperature ¹⁾	
- Body	DN 25-50: ≤ 150°C / DN 63-160: ≤ 120°C
- Pneumatic actuator	DN 25-50: ≤ 120°C / DN 63-160: ≤ 80°C
- Position indicator / solenoid	≤ 80°C (option: 120°C) / ≤ 80°C
Material	
- Aluminum body	
DN 25- 50:	ENAW-6060(3.3206), ENAW-6061(3.3211), ENAW-6063(3.3206), ENAW-6082(3.2315)
DN 63-160: soft-pump unit	ENAW-6060(3.3206), ENAW-6061(3.3211), ENAW-6063(3.3206), ENAW-6082(3.2315)
main valve	ENAC-42000
- Stainless steel body	AISI 304 (1.4301, 1.4305)
- Plate	AISI 316L (1.4404, 1.4435) or AISI 304L (1.4306)
- Bellows	AISI 316L(1.4404, 1.4435), AISI 316 Ti(1.4571)
Seal: bonnet, plate	FKM (VITON) [others as option]
Mounting position	any
Solenoid	DN 25- 50: 24 VDC, 2.5 W DN 63-160: 24 VDC, 9.0 W (others see «Options»)
Position indicator: contact rating	
- Voltage	≤ 50 VAC / DC
- Current	≤ 0.1 A
- Power	max. 1 W
Valve position, valve adjustment	visual (mechanical)

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

²⁾ without position indicator/solenoid
- with position indicator: + 0.02 kg / 0.044 lbs
- with solenoid: + 0.07 kg / 0.154 lbs

	DN (nominal I. D.)		standard flanges ISO-KF	molecular flow conductance	compressed air pressure min. - max. overpressure		volume of air cylinder		closing time	weight ²⁾			
	mm	inch			bar	psi	l	ft ³		aluminum body		stainless steel body	
				ls ⁻¹					s	kg	lbs	kg	lbs
angle valve	25	1	25	14	4.5-7	65-100	0.011	0.0004	0.20	0.60	1.323	0.70	1.543
	40	1½	40	45	4-8	60-115	0.035	0.0012	0.55	1.20	2.646	1.40	3.086
	50	2	50	80	4-8	60-115	0.047	0.0017	0.65	1.90	4.189	2.10	4.630
	63	2½	63	160	4-8	60-115	0.112	0.0040	0.70	3.70	8.157	2.60	5.732
	80	3	80	200	4-8	60-115	0.112	0.0040	0.70	3.90	8.598	4.36	9.612
	100	4	100	440	4-8	60-115	0.330	0.0116	1.00	9.50	20.944	10.22	22.531
inline valve	160	6	160	1000	4-8	60-115	1.050	0.0371	2.50	15.10	33.290	13.04	28.748
	25	1	25	14	4.5-7	65-100	0.011	0.0004	0.20	0.76	1.676	0.45	0.992
	40	1½	40	45	4-8	60-115	0.035	0.0012	0.55	1.60	3.527	1.45	3.197
	50	2	50	80	4-8	60-115	0.047	0.0017	0.65	2.78	6.129	2.30	5.071

Options

Actuator:

- Solenoid for 12, 24, 48, 110 VDC
24, 48, 115, 220 - 230 V 50 Hz
24, 48, 115, 220 - 230 V 60 Hz
- Position indicator for 120°C

Valve:

- Other sealing materials
- Surface coated bodies (e. g. hard anodized, nickel-plated)
- CF flanges
- Customer specified bodies

Ordering information for options:

Ordering No. of valve-X (e. g. 29028-KA41-X, X = 24 V 60 Hz)

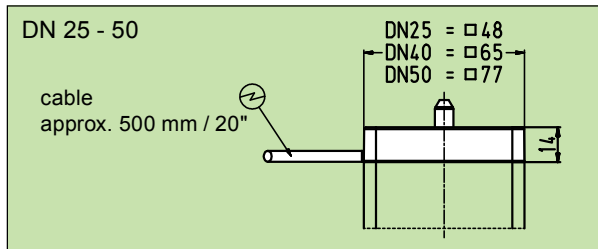
Accessories

Fittings for installation of the valve: series 31

Seal kit

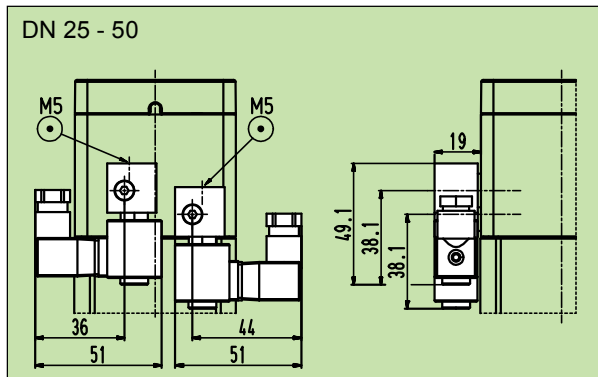
Consisting of seals for plate and bonnet
Ordering No.

Position indicator



One closing contact each for the open and closed valve positions: Ordering No. 29 **21** and **41**

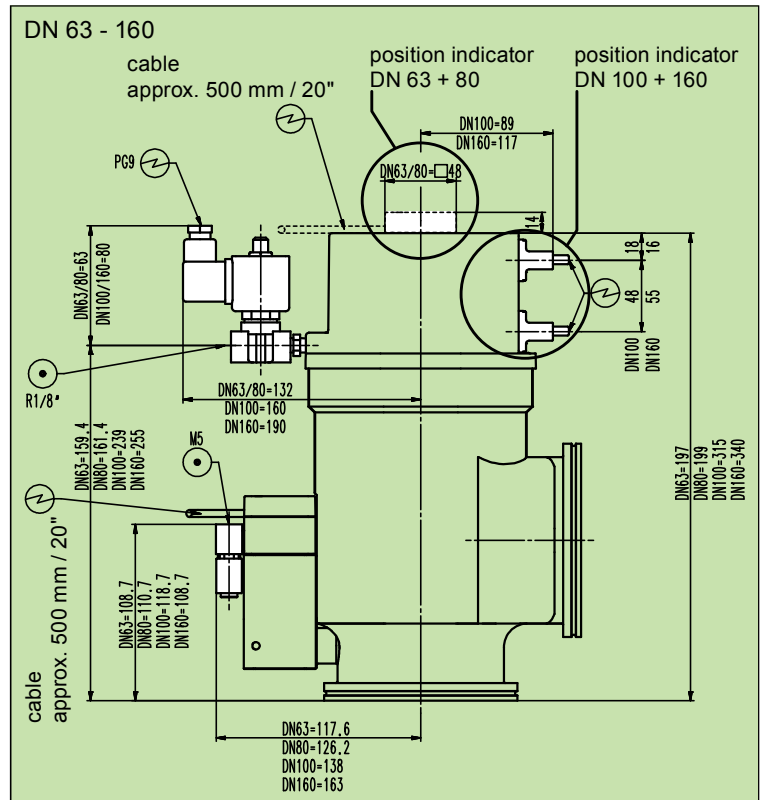
Solenoid



Coil and solenoid rotatable. Specify control voltage!
Ordering No. 29 **31** and **41**

⊙ compressed air connection ⊕ electrical connection

Position indicator + solenoid

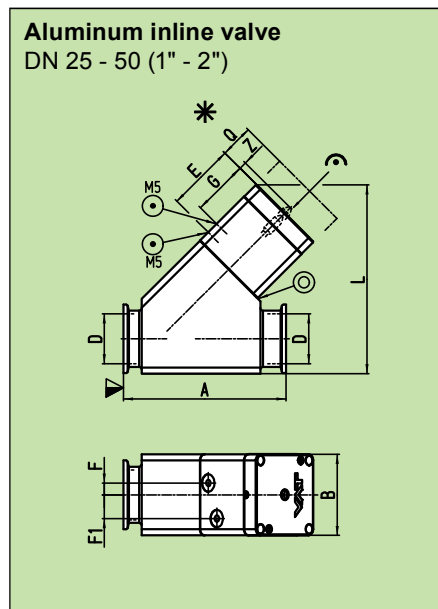
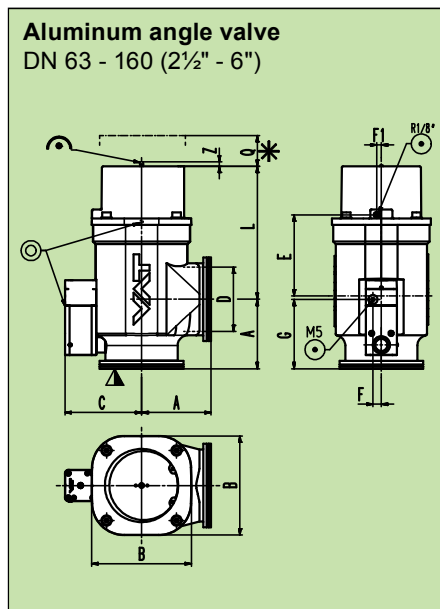
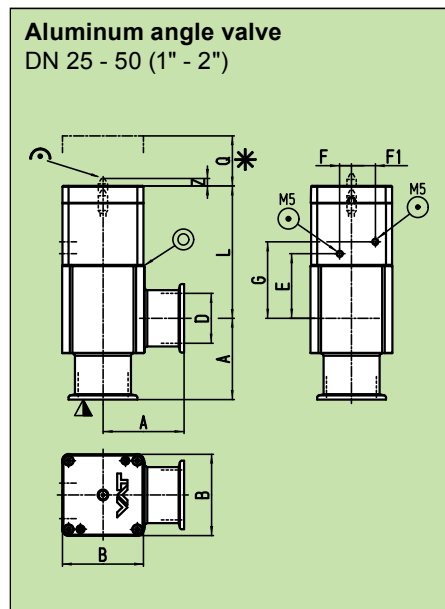


One closing contact each for the open and closed valve positions: Ordering No. 290 **21** and **41**

Coil and solenoid rotatable. Specify control voltage!
Ordering No. 290 **31** and **41**

E

Dimensions



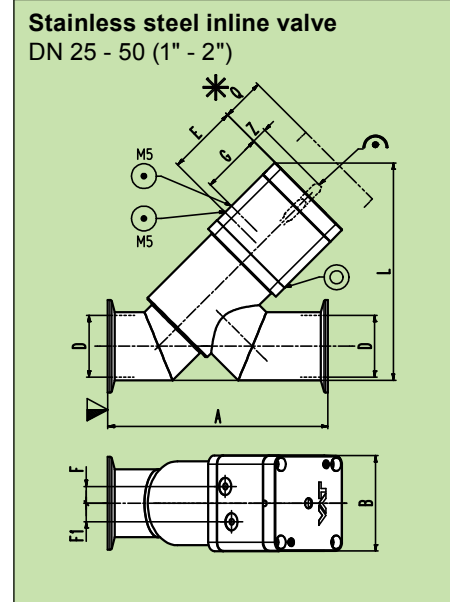
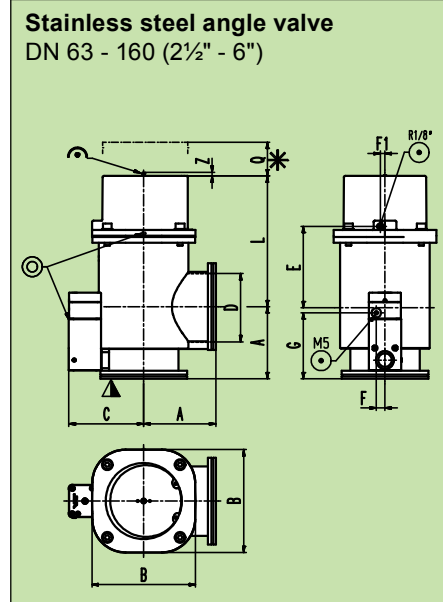
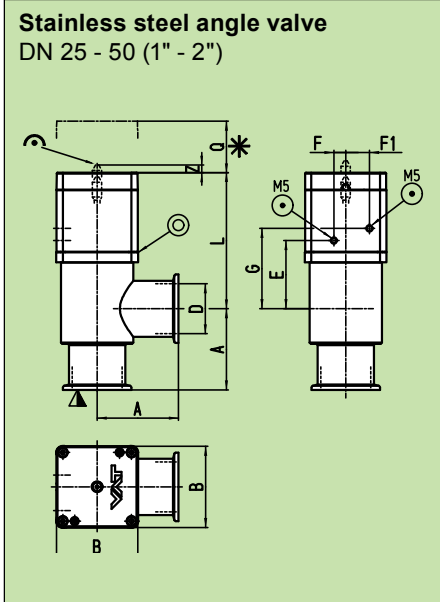
- ▽ valve seat side
- * required for dismantling
- ⊙ leak detection hole
- ⊗ compressed air connection
- ⊙ mechanical position indication

DN	mm	25	40	50
	inch	1	1½	2
A	mm	50	65	70
	inch	1.97	2.56	2.76
B	mm	48	65	77
	inch	1.89	2.56	3.03
D	mm	25	40	50
	inch	0.98	1.57	1.97
E	mm	40	51	59
	inch	1.57	2	2.32
F	mm	9.5	12.5	13.6
	inch	0.37	0.49	0.53
F1	mm	13	15	15
	inch	0.51	0.59	0.59
G	mm	49	59	66
	inch	1.92	2.32	2.59
L	mm	89.5	106	115.7
	inch	3.52	4.17	4.55
Q	mm	46	77	85
	inch	1.81	3.03	3.35
Z	mm	5.6	11	12.5
	inch	0.22	0.43	0.49

DN	mm	63	80	100	160
	inch	2½	3	4	6
A	mm	88	90	108	138
	inch	3.46	3.54	4.25	5.43
B	mm	123	126.6	154	216
	inch	4.84	4.98	6.06	8.5
C	mm	98.8	107.3	119	144
	inch	3.89	4.22	4.68	5.67
D	mm	63	80	102	153
	inch	2.48	3.15	4.01	6.02
E	mm	71	71	131	117
	inch	2.79	2.79	5.15	4.6
F	mm	13	13	13	13
	inch	0.51	0.51	0.51	0.51
F1	mm	—	—	7	—
	inch	—	—	0.27	—
G	mm	98	100	107.7	97.7
	inch	3.86	3.94	4.24	3.84
L	mm	109	109	206.5	202
	inch	4.29	4.29	8.13	7.95
Q	mm	115	115	170	195
	inch	4.52	4.52	6.69	7.67
Z	mm	31.4	31.4	6	5
	inch	1.23	1.23	0.23	0.19

DN	mm	25	40	50
	inch	1	1½	2
A	mm	100	130	178
	inch	3.94	5.12	7.01
B	mm	48	65	77
	inch	1.89	2.56	3.03
D	mm	25	40	50
	inch	0.98	1.57	1.97
E	mm	49.5	55	57
	inch	1.95	2.16	2.24
F	mm	9.5	14	13.6
	inch	0.37	0.55	0.53
F1	mm	13	15	15
	inch	0.51	0.59	0.59
G	mm	40.5	47	50
	inch	1.59	1.85	1.97
L	mm	121	154	184
	inch	4.76	6.06	7.24
Q	mm	46	77	85
	inch	1.81	3.03	3.35
Z	mm	5.6	11	12.5
	inch	0.22	0.43	0.49

Dimensions



- ▽ valve seat side
- * required for dismantling
- ⊙ leak detection hole
- ⊗ compressed air connection
- ⊙ mechanical position indication

E

DN	mm	25	40	50
inch		1	1½	2
A	mm	50	65	70
inch		1.97	2.56	2.76
B	mm	48	65	77
inch		1.89	2.56	3.03
D	mm	25	40	50
inch		0.98	1.57	1.97
E	mm	43	54	62
inch		1.69	2.12	2.44
F	mm	9.5	12.5	13.6
inch		0.37	0.49	0.53
F1	mm	13	15	15
inch		0.51	0.59	0.59
G	mm	52	62	69
inch		2.05	2.44	2.72
L	mm	92.8	109	118.7
inch		3.65	4.29	4.67
Q	mm	46	77	85
inch		1.81	3.03	3.35
Z	mm	5.6	11	12.5
inch		0.22	0.43	0.49

DN	mm	63	80	100	160
inch		2½	3	4	6
A	mm	88	90	108	138
inch		3.46	3.54	4.25	5.43
B	mm	123	126.6	154	216
inch		4.84	4.98	6.06	8.5
C	mm	98.3	107.3	116	138
inch		3.87	4.22	4.56	5.43
D	mm	63	80	102	153
inch		2.48	3.15	4.01	6.02
E	mm	71	71	122	121
inch		2.79	2.79	4.8	4.76
F	mm	13	13	13	13
inch		0.51	0.51	0.51	0.51
F1	mm	-	-	7	-
inch		-	-	0.27	-
G	mm	98	100	104	106
inch		3.86	3.94	4.09	4.17
L	mm	109	109	197	207
inch		4.29	4.29	7.75	8.15
Q	mm	115	115	170	195
inch		4.52	4.52	6.69	7.67
Z	mm	31.4	31.4	6	6
inch		1.23	1.23	0.23	0.23

DN	mm	25	40	50
inch		1	1½	2
A	mm	100	130	178
inch		3.94	5.12	7.01
B	mm	48	65	77
inch		1.89	2.56	3.03
D	mm	25	40	50
inch		0.98	1.57	1.97
E	mm	49.5	55	57
inch		1.95	2.16	2.24
F	mm	9.5	14	13.6
inch		0.37	0.55	0.53
F1	mm	13	15	15
inch		0.51	0.59	0.59
G	mm	40.5	47	50
inch		1.59	1.85	1.97
L	mm	131	163	176
inch		5.15	6.41	6.92
Q	mm	46	77	85
inch		1.81	3.03	3.35
Z	mm	5.6	11	12.5
inch		0.22	0.43	0.49

For extreme UHV

Bakeable to 300°C in open and closed position

Maintenance-free

High conductance

Radiation resistant to 10⁸ Gy



Body material

stainless steel

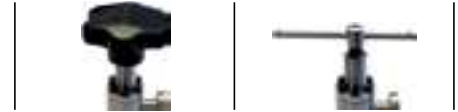
Manual actuator

hexagon head

DN		Ordering numbers		
mm	inch	valve CF-R with hexagon head	handwheel	T-bar tool
16	5/8	54024-GE02	240039	312699
40	1 1/2	54032-GE02	240039	not available
63	2 1/2	54036-GE02	not available	312731

Accessories

Handwheel or T-bar tool to put on hexagon head



Technical data

Leak rate: body, valve seat	< 1 · 10 ⁻¹⁰ mbar ls ⁻¹
Pressure range	UHV to 2 bar (abs)
Differential pressure on the plate	2 bar in either direction
Differential pressure at opening	1 bar (>1 bar with reduced cycle life)
Molecular flow conductance - DN 16 / 40 / 63	5 / 50 / 105 ls ⁻¹
Lifetime	1000 cycles
Closing force	closing to stop
Turns per stroke	DN 16: 6 / DN 40: 15 / DN 63: 9
Temperature: valve ¹⁾	≤ 300°C
Heating and cooling rate	≤ 60°C h ⁻¹
Material - Valve body, mechanism - Bellows	AISI 304L (1.4306), AISI 316L (1.4435) AISI 316L (1.4404)
Seal: bonnet, plate	metal
Mounting position	any
Valve position	visual (mechanical)
Weight: DN 16 / 40 / 63	0.4 / 2.2 / 6.2 kg (0.9 / 4.9 / 13.7 lbs)

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

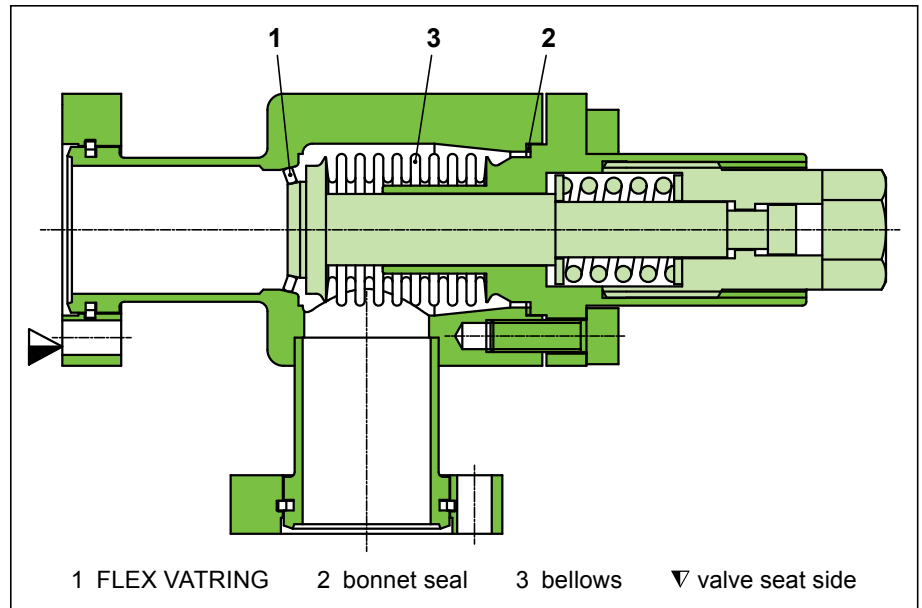
Sealing materials

Plate: metal

Bonnet: metal

Feedthrough

Bellows



1 FLEX VATRING 2 bonnet seal 3 bellows ▽ valve seat side

Features

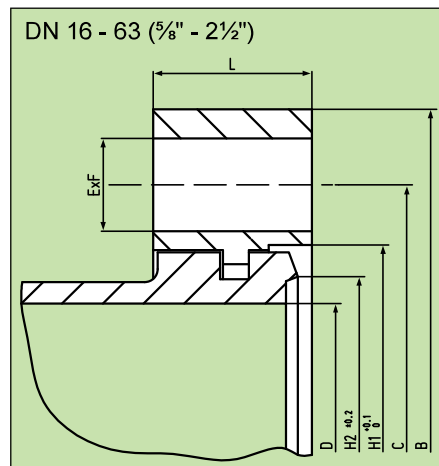
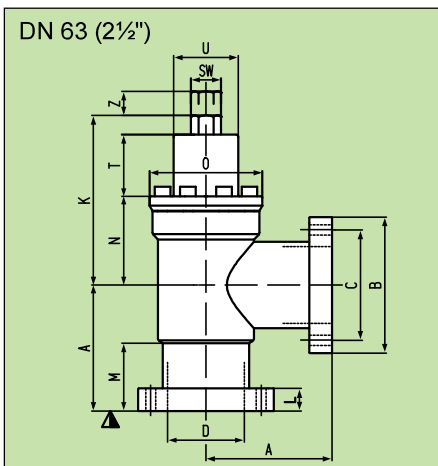
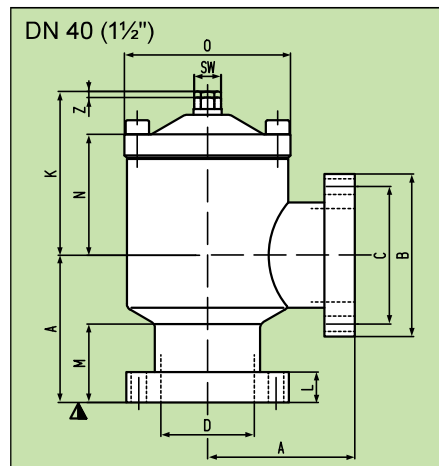
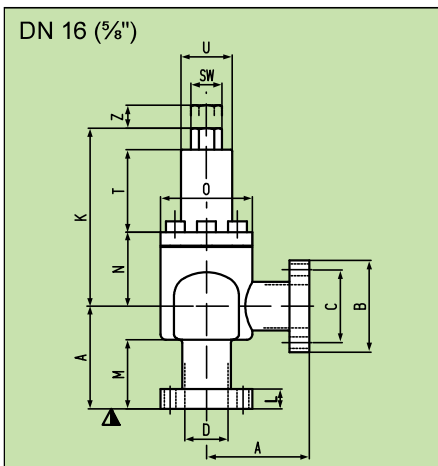
«FLEX VATRING» system: sealing elements are only elastically deformed

Closing to mechanical stop – eliminates torque wrench requirement

Fixed rotatable flanges

Dimensions

▽ valve seat side



DN	mm	inch	16	40	63
			5/8	1 1/2	2 1/2
A	mm	inch	38	63	105
			1.5	2.48	4.13
B	mm	inch	34	69.5	113.5
			1.34	2.74	4.47
C	mm	inch	27	58.7	92.1
			1.06	2.31	3.63
D	mm	inch	16	40	64
			0.63	1.57	2.52
E x F			6 x 4.3	6 x 6.6	8 x 8.4
H1	mm	inch	21.4	48.3	82.5
			0.84	1.9	3.25
H2	mm	inch	18.5	42	77.4
			0.73	1.65	3.05
K	mm	inch	66	70	141.5
			2.6	2.76	5.57
L	mm	inch	7.3	13	19
			0.29	0.51	0.75
M	mm	inch	25.6	33.6	56.6
			1	1.32	2.23
N	mm	inch	27.5	51.7	74
			1.08	2.04	2.91
O	mm	inch	34	71	94
			1.34	2.8	3.7
SW	mm	inch	10	10	22
			0.39	0.39	0.87
T	mm	inch	30.5	-	51.5
			1.2	-	2.03
U	mm	inch	19	-	54
			0.75	-	2.13
Z	mm	inch	8.5	2.5	20
			0.33	0.1	0.79

E

For extreme UHV and/or aggressive media

Bakeable to 450°C in open position, to 350°C in closed position

Maintenance-free for 10000 cycles

High conductance

Radiation resistant to 10⁸ Gy



Body material

stainless steel

Manual actuator

hexagon head

DN		Ordering numbers
mm	inch	CF-R
16	5/8	57124-GE02
40	1 1/2	57132-GE02
63	2 1/2	57036-GE02
100	4	57040-GE02
160	6	57044-GE02

with position indicator 80°C: 57 E08

Pneumatic actuator

with position indicator 80°C
with solenoid

DN		Ordering numbers (specify control voltage)		
mm	inch	pneumatics (NC) with closing spring CF-R	pneumatics double acting CF-R	actuator modules see page 176
16	5/8	57124-GE41	57124-GE44	
40	1 1/2	57132-GE41	57132-GE44	
63	2 1/2	57036-GE41	57036-GE44	
100	4	57040-GE41	57040-GE44	
160	6	57044-GE41	57044-GE44	

without position indicator, without solenoid: 57 E11 (with closing spring) (double acting)
with position indicator 80°C, without solenoid: 57 E21 57 E14
with position indicator 80°C, with solenoid: 57 E24 57 E24

DN 10, with closing spring
valve bakeable to 250°C

without position indicator, without solenoid: 57120-XE11
with position indicator 80°C, without solenoid: 57120-XE21
with position indicator 80°C, with solenoid: 57120-XE41

Flanges: standard CF-R 16 (others on request)

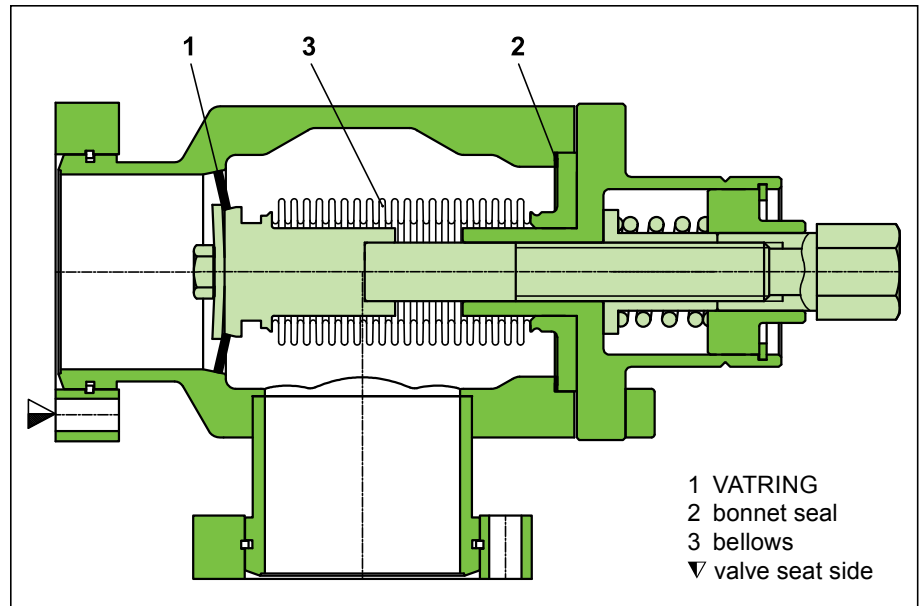
Sealing materials

Plate: metal

Bonnet: metal

Feedthrough

Bellows



Features

VATRING configuration: sealing surfaces are only elastically deformed

Largest possible conductance for the nominal diameter

Closing to mechanical stop — without requirement of torque wrench (Series 571)

Technical data

Continued next page

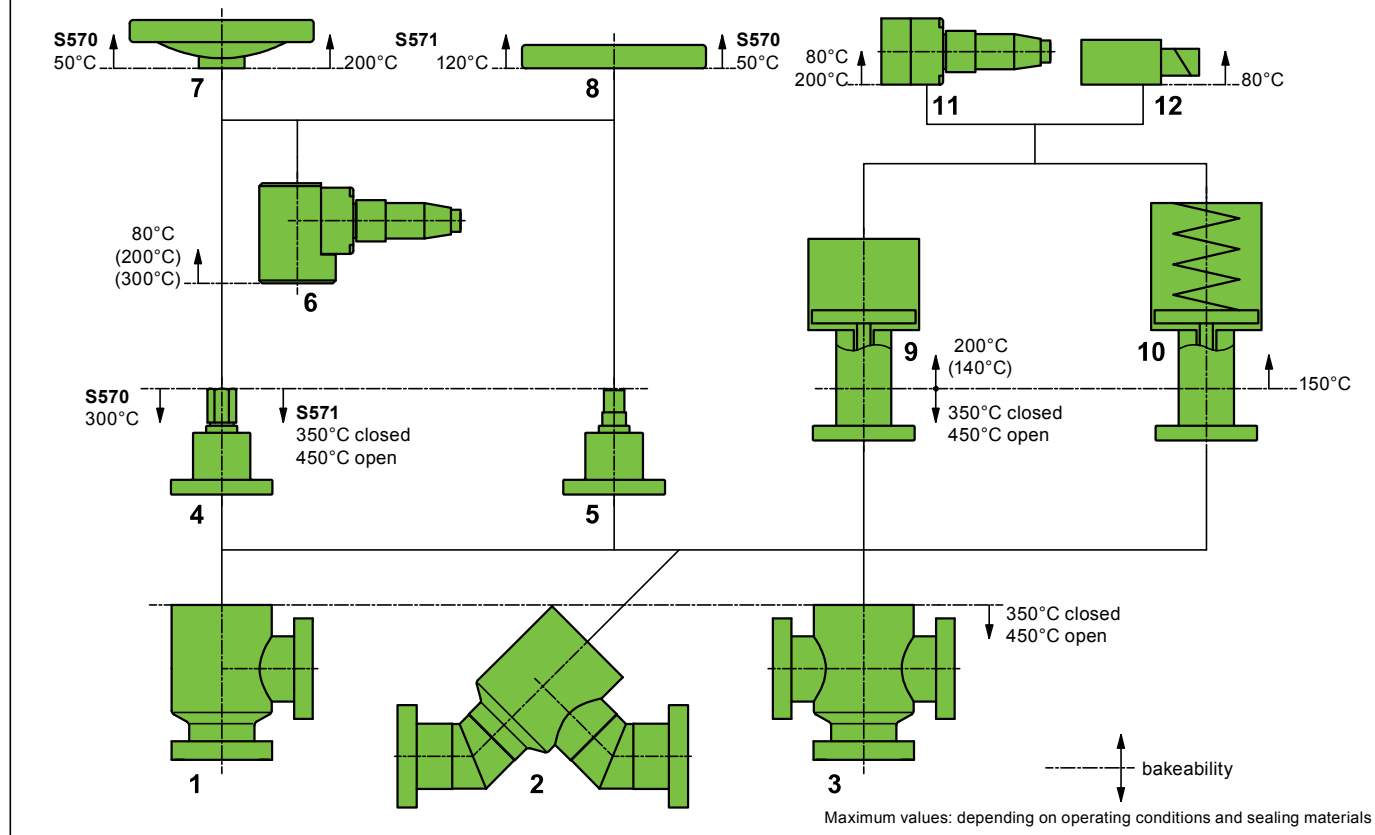
Leak rate: body, valve seat	<math> < 1 \cdot 10^{-10} \text{ mbar ls}^{-1}</math>
Pressure range	UHV to 5 bar (abs)
Differential pressure on the plate	5 bar in either direction
Differential pressure at opening	1 bar (> 1 bar with reduced cycle life)
Cycles until first service	10000
Temperature ¹⁾	
- Valve body	≤ 450°C open / ≤ 350°C closed
- Manual actuator (hex-head) DN 16 - 40	≤ 450°C (10 ⁸ Gy)
DN 63 - 160	≤ 300°C (10 ⁷ Gy)
- Handwheel (removable) R570 / R571	≤ 50°C (option: ≤ 200°C)
- Pneumatic actuator	≤ 200°C (options see page 176 + 177)
- Position indicator	≤ 80°C (options see page 176 + 177)
- Solenoid	≤ 80°C
- Flexible bake-out jacket	≤ 300°C (valve), 115, 230 V, 50/60 Hz
Heating and cooling rate	≤ 60°C h ⁻¹
Material	
- Valve body, mechanism	AISI 304L (1.4306), AISI 316L (1.4435)
- Bellows	AISI 316L (1.4404)
Seal: bonnet, plate	metal
Mounting position	any
Solenoid	24 VDC, 2.5 W (others see «Options»)
Position indicator: contact rating	<u>80°C</u> <u>200°C</u>
- Voltage	≤ 50VAC / DC ≤ 50VAC / DC
- Current	≤ 1.2A ≤ 1A
Valve position	visual (mechanical)

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



Bodies and actuators – modular selection

- | | |
|--|--|
| 1 valve body (angle), plate, bellows | 10 ⁸ Gy, bakeable to 350°C closed / 450°C open; DN 10: 250°C |
| 2 valve body (inline), plate, bellows | 10 ⁸ Gy, bakeable to 350°C closed / 450°C open; DN 10: 250°C |
| 3 valve body (T), plate, bellows | 10 ⁸ Gy, bakeable to 350°C closed / 450°C open; DN 10: 250°C |
| 4 manual actuator with hexagon head | 10 ⁸ Gy, bakeable to 350°C closed / 450°C open; (DN 16 - 40) |
| 5 manual actuator with cylindrical head | 10 ⁸ Gy, bakeable to 350°C closed / 450°C open; (DN 16 - 40) |
| 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 | 10 ⁸ Gy, bakeable to 200°C (DN 16 - 40); 10 ⁴ Gy / 50°C (DN 63 - 100) |
| 8 handwheel with free wheel for cylindrical head | 10 ⁵ Gy, bakeable to 120°C (DN 16 - 40); 10 ⁴ Gy / 50°C (DN 63 - 100) |
| 9 pneumatic actuator, double acting | 10 ⁵ Gy, bakeable to 200°C (options: 10 ⁶ Gy / 140°C) |
| 10 pneumatic actuator, with closing spring | 10 ⁵ Gy, bakeable to 150°C (options: 10 ⁶ Gy / 140°C) |
| 11 position indicator | 10 ⁵ Gy, bakeable to 80°C (option: 10 ⁶ Gy / 200°C) |
| 12 solenoid | 10 ⁴ Gy, bakeable to 80°C |



Technical data

DN (nominal I. D.)		CF-R flange	molecular flow conductance	manual					pneumatic single acting					pneumatic double acting								
				torque		turns per stroke	weight		compressed air pressure min. - max. overpressure		closing or opening time	volume of air cylinder		weight		compressed air pressure min. - max. overpressure		closing or opening time	volume of air cylinder		weight	
mm	inch	O.D.	ls ⁻¹	Nm	ftlb	n	kg	lbs	bar	psi	s	l	ft ³	kg	lbs	bar	psi	s	l	ft ³	kg	lbs
16	¾	1 ½	5	4	3	6	0.8	1.8	6-9	85-130	1	0.12	.004	4.6	10.1	4-5	55-70	1	0.08	.003	2.9	6.4
40	1 ½	2 ¾	50	10	7.5	8	2.3	5	6-9	85-130	2	0.35	.01	16.5	36.5	4-5	55-70	2	0.32	.011	6	13
63	2 ½	4 ½	125	45	33	4.5	8	17.8	6-9	85-130	4	0.8	.028	26	57.3	4-5	55-70	2	0.55	.02	17.2	37.3
100	4	6	380	90	66	6.4	16	35.2	6-9	85-130	4	2.4	.085	58	128	4-5	55-70	4	1.5	.053	29	62
160	6	8	940	125	92	8	36	79.2	6-9	85-130	6	4.8	.17	136	299	4-5	55-70	6	3.3	.116	65	143

Options

Actuator:

- Manual actuator with cylindrical head
- Pneumatic actuator 10⁶ Gy, bakeable to 140°C ¹⁾
- Solenoid for impulse actuation:
actual valve position is maintained at power failure
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50 Hz
24, 100, 115, 200, 230 V 60 Hz
- Position indicator for manual and pneumatic actuator bakeable to 200°C ¹⁾
- Double position indicator
(2 switches each for the positions «open» and «closed»)

Valve:

- Customer specified flanges
- CF-F (fixed flange), ISO-KF, weld neck
- Valve with different flanges (e. g. CF/KF, CF/Cajon VCR)
- Antimagnetic version with defined permeability: see page 220
- Valve without bonnet flange, welded (as roughing valve, for tritium systems)
- Inline valve
- T-valve

Ordering information for options:

Ordering No. of valve-X (e. g. 57132-GE02-X, X = T-valve)

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



Accessories

- Handwheel for hexagon head (DN 16 - 40)
Ordering No.: see price list
- Handwheel with sliding clutch for hexagon head (DN 63 - 100)
Ordering No.: see price list
- Handwheel with free wheel for cylindrical head (DN 16 - 40)
Ordering No.: see price list
- Handwheel with sliding clutch and free wheel for cylindrical head (DN 63 - 100)
Ordering No.: see price list
- Fittings for installation of the valve: series 33
- Flexible bake-out jacket for DN 40 - 160
Ordering No.: on request

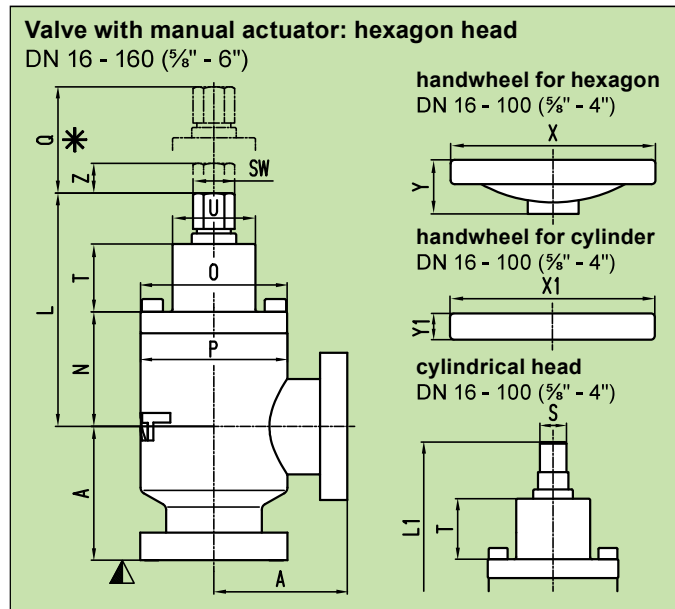
For bake-out we recommend commercial controllers with settable heating rate and temperature limiting device.

The bake-out jacket is without thermocouples and thermostats.

Seal kit

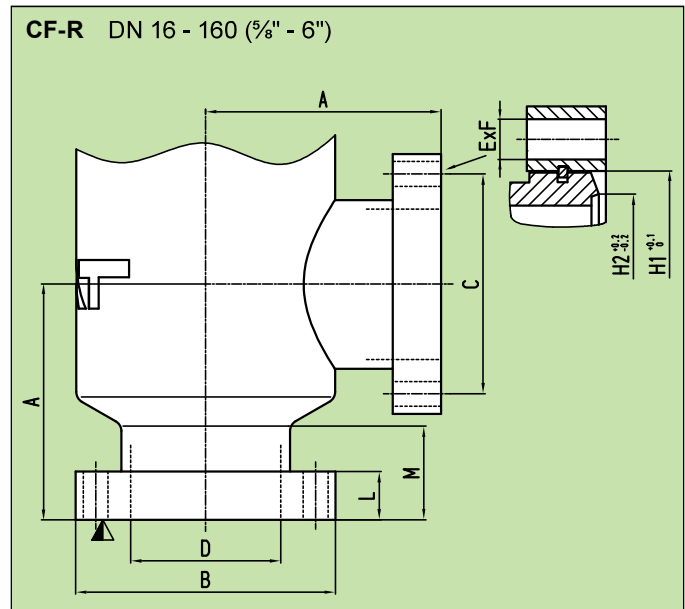
Consisting of seals for plate (VATRING) and bonnet
Ordering No.

Main dimensions



▽ valve seat side
* required for dismantling

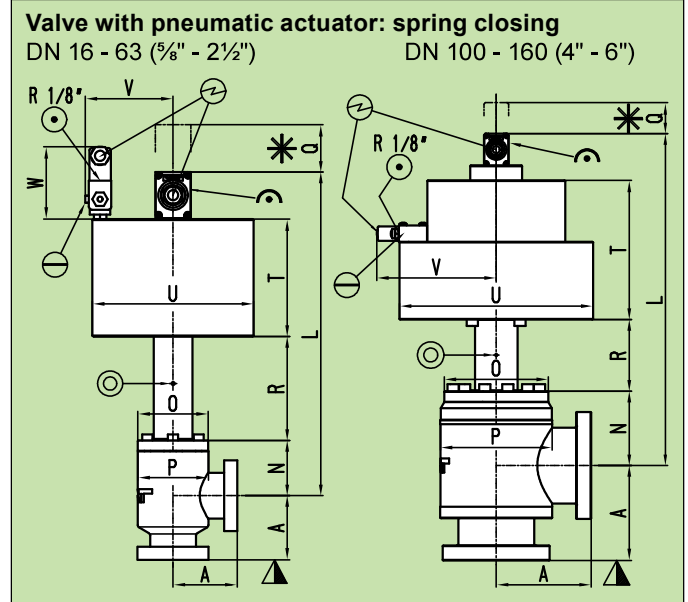
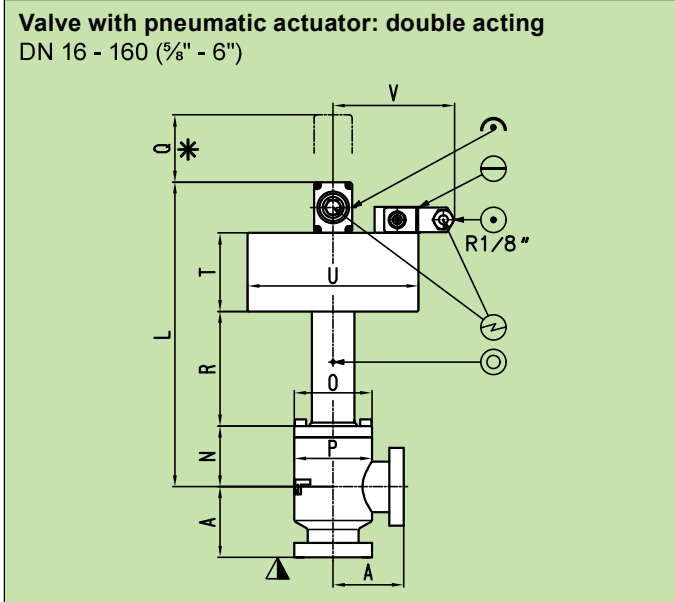
Flange dimensions



DN	mm inch	16 %	40 1 1/2	63 2 1/2	100 4	160 6
A	mm inch	38 1.5	63 2.48	105 4.13	135 5.31	167 6.57
L	mm inch	100.2 3.94	126 4.96	185.5 7.3	258.5 10.18	285.1 11.22
L1	mm inch	115.7 4.55	133.5 5.26	185.5 7.3	258.5 10.18	— —
N	mm inch	52.6 2.07	54 2.13	88 3.46	106 4.17	134.6 5.3
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	60.8 2.39	78 3.07	134.5 5.29	163.5 6.44	264.9 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	68.5 2.7	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 1.3	72 2.83	80 3.25	— —
Y1	mm inch	12 0.47	16 0.63	75 2.95	95 3.74	— —
Z	mm inch	7.5 0.3	14 0.55	20 0.79	32 1.26	44 1.73

DN	mm inch	16 %	40 1 1/2	63 2 1/2	100 4	160 6
A	mm inch	38 1.5	63 2.48	105 4.13	135 5.31	167 6.57
B	mm inch	34 1.34	69.5 2.74	113.5 4.47	152 5.98	202.5 7.97
C	mm inch	27 1.06	58.7 2.31	92.1 3.62	130.3 5.13	181 7.12
D	mm inch	16 0.63	40 1.57	64 2.52	102 4.01	150 5.9
E x F	mm inch	6 x 4.3 6 x 0.17	6 x 6.6 6 x 0.26	8 x 8.4 8 x 0.33	16 x 8.4 16 x 0.33	20 x 8.4 20 x 0.33
H1	mm inch	21.4 0.84	48.3 1.9	82.5 3.25	120.65 4.75	171.45 6.75
H2	mm inch	18.5 0.73	42 1.62	77.4 3.05	115.5 4.55	166 6.53
L	mm inch	7.4 0.29	12 0.47	19 0.75	21.5 0.85	22 0.87
M	mm inch	22.6 0.89	25.6 1.01	46.6 1.83	60 2.36	62 2.44

Main dimensions



- ▽ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- ⊕ electrical connection
- ⌒ mechanical position indication
- ⊙ leak detection hole
- ⊖ emergency operation

E

Flange dimensions see page 178

DN	mm	16	40	63	100	160
	inch	5/8	1 1/2	2 1/2	4	6
A	mm	38	63	105	135	167
	inch	1.5	2.48	4.13	5.31	6.57
L	mm	232.3	272	317	382.7	460
	inch	9.15	10.71	12.48	15.07	18.11
N	mm	52.6	54	88	105.7	135
	inch	2.07	2.13	3.46	4.16	5.31
O	mm	54	69	102	148	202
	inch	2.13	2.72	4.02	5.83	7.95
P	mm	36	69	102	159	220
	inch	1.42	2.72	4.02	6.26	8.66
Q	mm	60.7	68	113	142.3	185
	inch	2.39	2.68	4.45	5.6	7.28
R	mm	79.7	102	93	102	130
	inch	3.14	4.02	3.66	4.02	5.12
T	mm	54	70	90	130	150
	inch	2.13	2.76	3.54	5.12	5.91
U	mm	98	152	194	238	278
	inch	3.86	5.98	7.64	9.37	10.94
V	mm	94	108	130	151	171.5
	inch	3.7	4.25	5.12	5.94	6.75

DN	mm	16	40	63	100	160
	inch	5/8	1 1/2	2 1/2	4	6
A	mm	38	63	105	135	167
	inch	1.5	2.48	4.13	5.31	6.57
L	mm	250.3	317	375	471.3	592
	inch	9.85	12.48	14.76	18.56	23.31
N	mm	52.6	54	88	105.7	135
	inch	2.07	2.13	3.46	4.16	5.31
O	mm	54	69	102	148	202
	inch	2.13	2.72	4.02	5.83	7.95
P	mm	36	69	102	159	206
	inch	1.42	2.72	4.02	6.26	8.11
Q	mm	83.7	93	115	138.7	183
	inch	3.3	3.66	4.53	5.46	7.2
R	mm	79.7	102	93	102	130
	inch	3.14	4.02	3.66	4.02	5.12
T	mm	72	115	148	198	250
	inch	2.83	4.53	5.83	7.8	9.84
U	mm	108	158	198	275	328
	inch	4.25	6.22	7.8	10.83	12.91
V	mm	61	86	131.5	170	196.5
	inch	2.4	3.39	5.18	6.69	7.74
W	mm	71	71	27	27	27
	inch	2.8	2.8	1.06	1.06	1.06

- For accelerators and storage rings
- Low RF resistance
- Customer specified RF aperture
- Bakeable to 300°C in open and closed position
- Radiation resistant
- Opening also possible up to 1 bar differential pressure



Body material

stainless steel

Pneumatic actuator

- double acting
- with position indicator 80°C
- with solenoid

DN		Ordering numbers (specify control voltage)		
mm	inch	compact actuator valve 200°C CF-F	extended actuator valve 300°C CF-F	actuator modules see page 182
63	2 ½	47236-CE74	47236-CE44	
100	4	47240-CE74	47240-CE44	
160	6	47244-CE74	47244-CE44	
200	8	47146-CE74	47146-CE44	

with position indicator 80°C, without solenoid: 47 . . . -CE72 (compact actuator)
47 . . . -CE24 (extended actuator)

further versions: see pages 182 and 183

Bake-out jacket

For bake-out we recommend commercial controllers with settable heating rate and temperature limiting device.

The bake-out jacket is without thermocouples and thermostats.

Details see page 216. Ordering number on request.

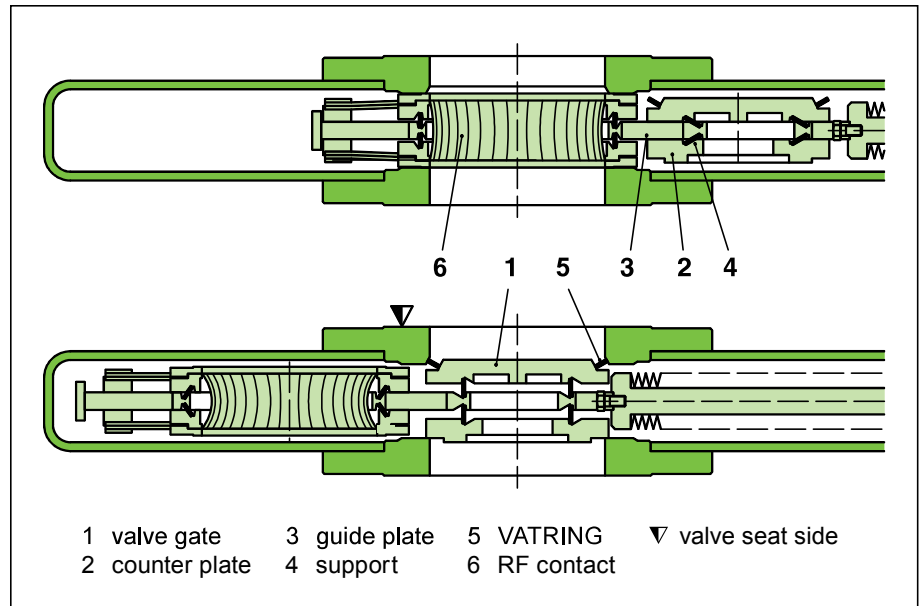
Sealing materials

Gate: metal

Bonnet: metal

Feedthrough

Bellows



Features

Reproducible RF contact due to mechanically loaded springs

VATRING configuration (see glossary)

Locks in open and closed position

Technical data

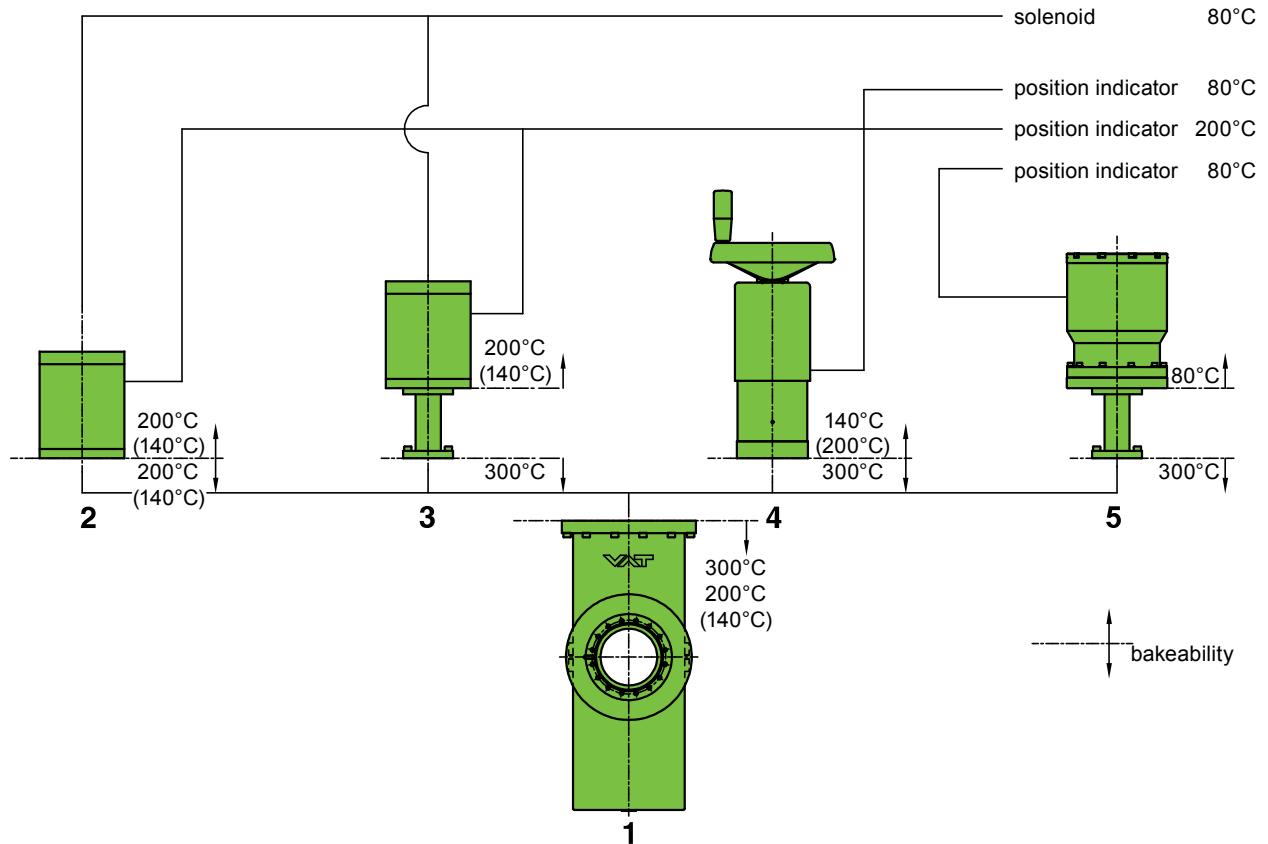
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Leak rate: body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	UHV to 2 bar (abs)
Differential pressure on the gate	1 bar in either direction
Differential pressure at opening	≤ 500 mbar (1 bar with reduced cycle life)
Cycles until first service	10 000 (option: 20 000)
- DN 63 - 160	5 000 (option: 20 000)
- DN 200	
Temperature ¹⁾	
- Valve body	$\leq 300^\circ\text{C}$
- Pneumatic actuator	$\leq 200^\circ\text{C}$
- Position indicator	$\leq 80^\circ\text{C}$ (option: 200°C)
- Solenoid	$\leq 80^\circ\text{C}$
- Flexible bake-out jacket	$\leq 300^\circ\text{C}$ (valve), 115, 230 V, 50/60 Hz
Heating and cooling rate	
- DN 63 - 160	$\leq 50^\circ\text{C h}^{-1}$
- DN 200	$\leq 25^\circ\text{C h}^{-1}$
Material	
- Valve body, mechanism	AISI 316L (1.4435, 1.4404)
- Bellows	AISI 316L (1.4435)
- RF contact	AISI 301 (1.4310) (option: CuBe) thermorestant silver-coated
Seal: bonnet, gate	metal
Mounting position	beam line horizontal, otherwise any
Solenoid	24 VDC, 2.5 W (others see «Options»)
Position indicator: contact rating	<u>80°C</u> <u>200°C</u>
- Voltage	≤ 50 VAC / DC ≤ 50 VAC / DC
- Current	≤ 1.2 A ≤ 1 A
Valve position	visual (mechanical)

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

Actuators – modular selection

- 1 Body, valve mechanism, bellows : 10⁸ Gy, bakeable to 300°C
- 2 Pneumatic actuator compact : 10⁵ Gy, bakeable to 200°C option: 10⁶ Gy, bakeable to 140°C
- 3 Pneumatic actuator extended : 10⁵ Gy, bakeable to 200°C option: 10⁶ Gy, bakeable to 140°C
- 4 Manual actuator (option) : 10⁵ Gy, bakeable to 140°C or 200°C
- 5 Special pneumatic actuator for hot zone: 10⁸ Gy, bakeable to 80°C



Maximum values: depending on operating conditions and sealing materials

Technical data

DN (nominal I. D.)		CF-F flange	molecular flow conductance	compressed air pressure min. - max. overpressure		volume of air cylinder		closing or opening time	weight	
mm	inch	O.D.	ls ⁻¹	bar	psi	l	ft ³	s	kg	lbs
63	2½	4½	400	4 - 8	55 - 115	0.7	0.024	2	21	46
100	4	6	1400	4 - 8	55 - 115	1.7	0.06	4	36	80
160	6	8	4200	4 - 8	55 - 115	5	0.18	9	59	130
200	8	12	6900	4 - 8	55 - 115	9.7	0.34	18	148	326

Options

Actuator:

- Accessory for pneumatic actuator for faster closing
- Pneumatic actuator compact 10⁶ Gy, bakeable to 140°C ¹⁾
- Pneumatic actuator extended 10⁶ Gy, bakeable to 140°C ¹⁾
- Pneumatic actuator for hot zone:
radiation resistant to 10⁸ Gy, bakeable to 80°C
- Solenoid for impulse actuation:
actual valve position is maintained at power failure
- Solenoid for 12, 48 VDC
24, 48, 100, 115, 200, 230 V 50 Hz
24, 100, 115, 200, 230 V 60 Hz
- Solenoid radiation resistant to 10⁶ Gy (standard 10⁴ Gy)
- Position indicator for pneumatic actuator bakeable to 200°C
- Double position indicator
(2 switches each for the positions «open» and «closed»)
- Manual actuator bakeable to 140°C or 200°C
- Position indicator for manual actuator bakeable to 80°C or 200°C

Valve:

- Customer specified flanges
- Antimagnetic version with defined permeability: see page 220
- Customer specified RF aperture
- Cu Be material for RF contacts «finger type»
- RF contact «comb type»
- Waveguide
- Ports for roughing (by-pass), venting or for gauges

Ordering information for options:

Ordering No. of valve-X (e. g. 47240-CE44-X, X = impulse actuation 220 V / 50 Hz)

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

Special version

with gate seal made of FKM (VITON): see page 184

Accessories

- Fittings for installation of the valve: series 33
- Flexible bake-out jacket: see page 216

Seal kit

Consisting of seals for gate (VATRING) and bonnet
Ordering No.

Special version

RF UHV gate valve
with gate seal made of FKM (VITON)

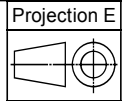
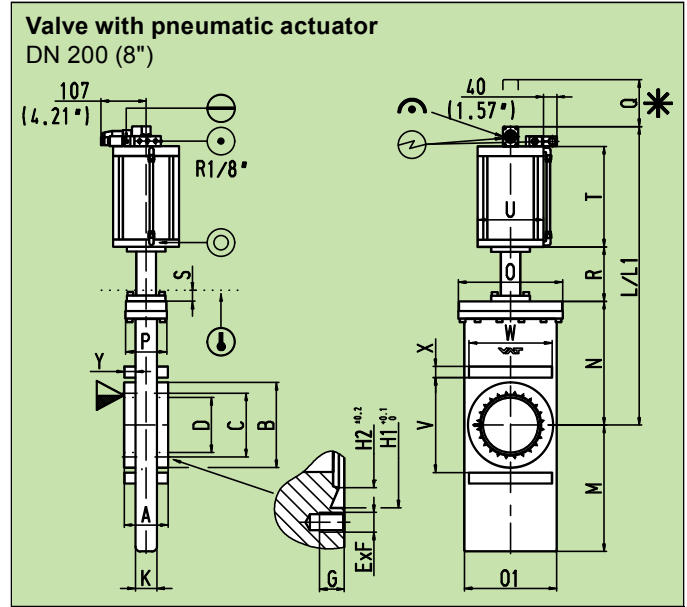
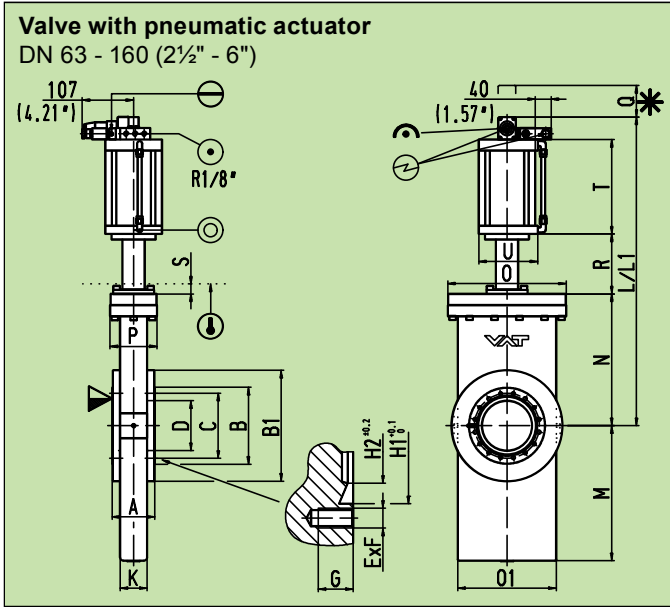


Technical data

Leak rate	
- Body	$< 5 \cdot 10^{-10}$ mbar ls ⁻¹
- Valve seat	$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range	UHV to 1 bar (abs)
Differential pressure on the gate	1 bar in either direction
Cycles until first service	10000
Temperature ¹⁾	
- Valve body	$\leq 200^{\circ}\text{C}$
- Actuator	$\leq 200^{\circ}\text{C}$
- Position indicator	$\leq 80^{\circ}\text{C}$ (option: 200°C)
- Solenoid	$\leq 80^{\circ}\text{C}$
Seal	
- Bonnet	metal
- Gate	FKM (VITON)
Further details	on request

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

Main dimensions



L1, R for extended actuator

DN	mm inch	63 2½	100 4	160 6	200 8
K	mm inch	46 1.81	54 2.13	70 2.76	78 3.07
L	mm inch	459 18.07	537 21.14	702 27.64	851 33.5
L1	mm inch	583 22.95	661 26.02	826 32.52	975 38.39
M	mm inch	215 8.46	272 10.7	356 14.02	460 18.11
N	mm inch	231 9.09	264 10.39	370 14.57	443 17.44
O	mm inch	189 7.44	237 9.33	287 11.3	372 14.65
O1	mm inch	156 6.14	197 7.76	253 9.96	336 13.23
P	mm inch	77 3.03	94 3.7	93 3.66	114 4.49
Q	mm inch	420 16.54	520 20.47	700 27.56	880 34.65
R	mm inch	124 4.88	124 4.88	124 4.88	124 4.88
S	mm inch	20 0.79	20 0.79	20 0.79	20 0.79
T	mm inch	183 7.2	228 8.98	287 11.3	363 14.29
U	mm inch	104 4.09	135 5.31	190 7.48	230 9.06
V	mm inch				346 10.24
W	mm inch				302 14.89
X	mm inch				40 1.57
Y	mm inch				40 1.57

- ▽ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- ⊕ electrical connection
- ⊖ emergency operation
- ⊙ leak detection port
- ⊙ bake-out area
- ↻ mechanical position indication

Flange dimensions CF-F

DN	mm inch	63 2½	100 4	160 6	200 8
O.D.	mm inch	4½	6	8	10
A	mm inch	75 2.95	85 3.35	110 4.33	160 6.3
B	mm inch	113.5 4.47	152 5.98	202.5 7.97	310 12.2
B1	mm inch	180 7.08	222 8.74	288 11.34	
C	mm inch	92.1 3.63	130.3 5.13	181 7.13	231.8 9.13
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87
E x F		8 x M8	16 x M8	20 x M8	24 x M8
G	mm inch	12 0.47	14 0.55	17 0.67	17 0.67
H1	mm inch	82.5 3.25	120.65 4.75	171.45 6.75	222.3 8.75
H2	mm inch	77.4 3.05	115.5 4.55	166 6.54	217 8.54

F

Vacuum safety system for protection of storage rings or accelerators

Detection of pressure rise in milliseconds

Leak tight closure in milliseconds



Body material

stainless steel

Gate valve with pneumatic actuator

double acting

DN		Ordering numbers
mm	inch	
40	1½	75232-CE44

Flap valve with pneumatic actuator

double acting

DN		Ordering numbers
mm	inch	
63	2½	75036-CE44
100	4	75040-CE44
160	6	75044-CE44
200	8	75046-CE44

Controller including accessories

See «Controller for fast closing system Series 77», page 194

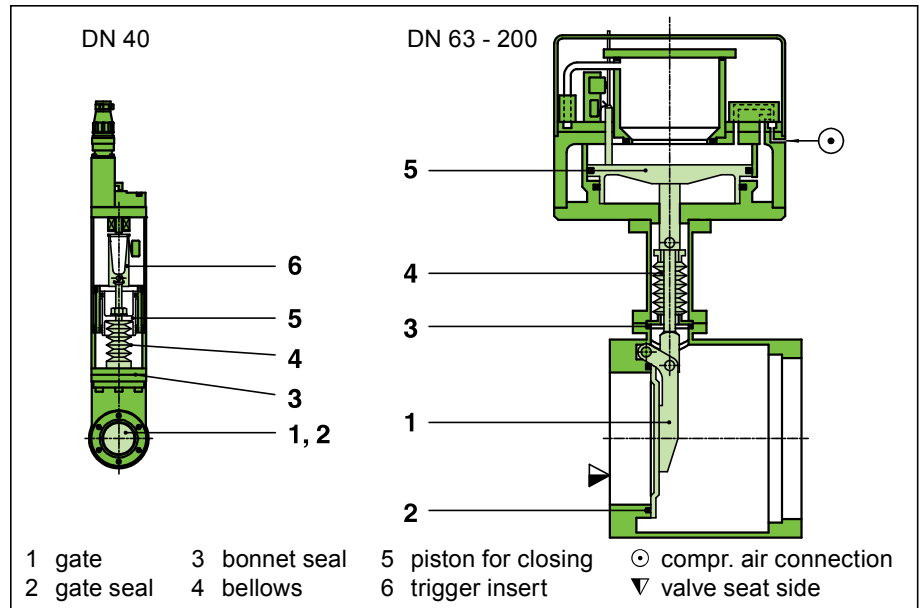
Sealing material

Gate: FKM (VITON)

Bonnet: metal

Feedthrough

Bellows



Features

Closing by releasing a latch (DN 40) or fast venting/evacuation of the pneumatic cylinder (DN 63 - 200)

Pneumatic dampening during closing

Opening by compressed air

Technical data

Continued next page

Leak rate		
- Body		$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
- Valve seat		$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		$1 \cdot 10^{-10}$ mbar to 2 bar (abs)
Differential pressure		see table on next page
Cycles until first service		2000
Temperature ¹⁾		
- Valve body		$\leq 200^{\circ}\text{C}$ (DN 40: trigger insert removed)
- Actuator		$\leq 50^{\circ}\text{C}$
Radiation resistance		
- Valve body		10^5 Gy
- Actuator		10^4 Gy
Material		
- Valve body	DN 40	AISI 304 (1.4301)
	DN 63 - 200	AISI 316L (1.4435)
- Mechanism	DN 40	AISI 304 (1.4301)
	DN 63 - 200	AISI 316L (1.4435)
- Bellows	DN 40	AISI 633 (AM 350)
	DN 63 - 200	AISI 316L (1.4404)
Seal		
- Bonnet		metal
- Gate		FKM (VITON)

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

Mounting position seat side marked ∇ in opposite direction of air inrush

Option

- Customer specified flanges

Ordering information for option:

Ordering No. of valve-X (e. g. 75040-CE44-X, X = ISO-F flanges)

Seal kit

Consisting of

- Gate with seal and bonnet seal (DN40)

- Gate O-ring and bonnet seal (DN 63 - 200)

Ordering No.

Technical data

Series 752: DN 40 gate valve

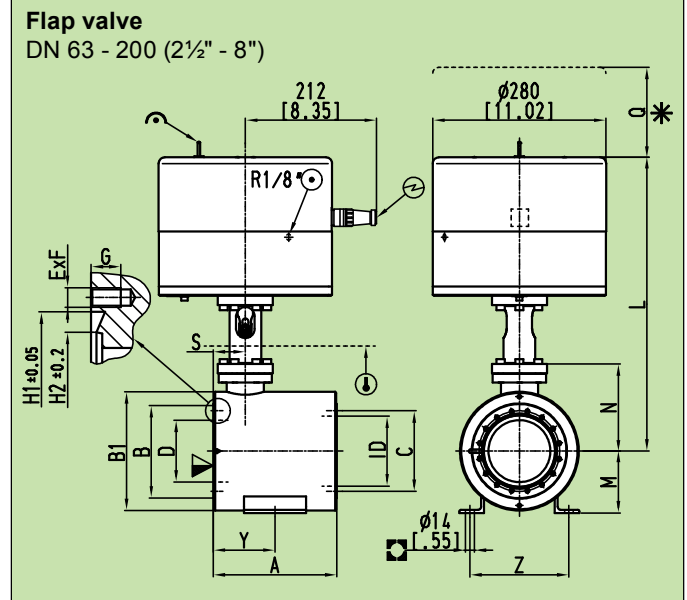
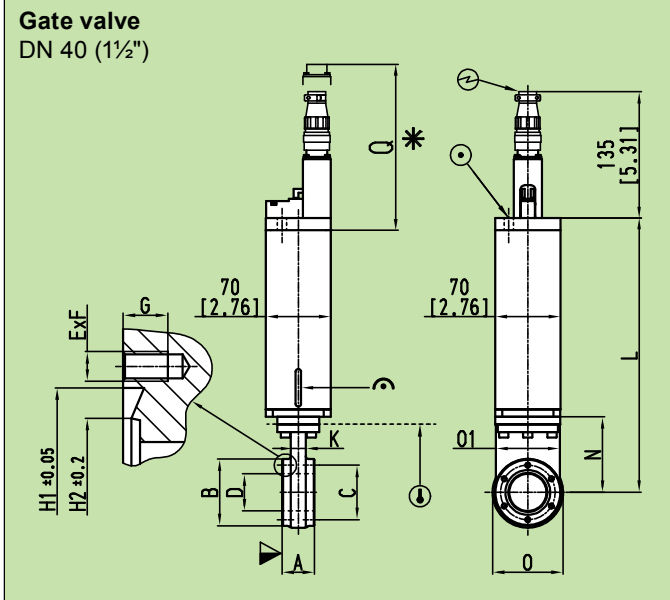
*) from sensor signal to leak tight valve

DN (nominal I. D.)		standard flanges CF-F	molecular flow conductance	differential pressure: valve closed		differential pressure at opening		compressed air pressure min. - max. overpressure		volume of air cylinder		total closing time *)	opening time	weight	
				in closing direction	in opening direction	in closing direction	in opening direction	bar	psi	l	ft ³			kg	lbs
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	mbar	bar	psi	l	ft ³	ms	s	kg	lbs
40	1½	2¾	160	≤1,2	≤1,2	≤30	≤30	4 - 5	55 - 70	0.032	0.001	<10	9	2	4.5

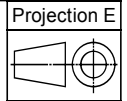
Series 750: DN 63 - 200 flap valve

DN (nominal I. D.)		standard flanges CF-F	molecular flow conductance	differential pressure: valve closed		differential pressure at opening		compressed air pressure min. - max. overpressure		volume of air cylinder		total closing time *)	opening time	weight	
				in closing direction	in opening direction	in closing direction	in opening direction	bar	psi	l	ft ³			kg	lbs
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	bar	bar	psi	l	ft ³	ms	s	kg	lbs
63	2½	4½	200	≤2	≤1,2	≤600	≤1	5 - 8	70 - 110	1.77	0.06	13	7	25	55
100	4	6	700	≤2	≤1,2	≤180	≤1	5 - 8	70 - 110	1.77	0.06	15	7	29	64
160	6	8	1700	≤2	≤0,5	≤ 50	≤1	5 - 8	70 - 110	1.77	0.06	23	7	36	80
200	8	10	2500	≤2	≤0,07	≤ 25	≤1	5 - 8	70 - 110	1.77	0.06	40	7	42	93

Dimensions



- ▼ valve seat side
- * required for dismantling
- ⊙ compressed air connection
- ⊕ electrical connection
- ⤴ mechanical position indication
- Ⓧ for attachment
- Ⓜ bake-out area



DN	mm inch	40 1 1/2			
A	mm inch	35 1.38			
B	mm inch	72 2.83			
C	mm inch	58.7 2.31			
D	mm inch	40 1.57			
E x F		6 x M6			
G	mm inch	7 0.28			
H1	mm inch	48.35 1.9			
H2	mm inch	42 1.65			
K	mm inch	16 0.63			
L	mm inch	295.5 11.63			
N	mm inch	81.5 3.21			
O	mm inch	76 2.99			
O1	mm inch	69 2.72			
Q	mm inch	195 7.68			

DN	mm inch	63 2 1/2	100 4	160 6	200 8
A	mm inch	150 5.91	200 7.87	250 9.84	300 11.81
B	mm inch	113.5 4.47	152 5.98	202.5 7.97	253 9.96
B1	mm inch	154 6.06	192 7.56	242 9.53	306 12.05
C	mm inch	92.1 3.63	130.3 5.13	181 7.13	231.8 9.13
D	mm inch	63 2.48	100 3.94	150 5.91	200 7.87
E x F		8 x M8	16 x M8	20 x M8	24 x M8
G	mm inch	12 0.47	12 0.47	12 0.47	12 0.47
H1	mm inch	82.55 3.25	120.65 4.75	171.5 6.75	222.35 8.75
H2	mm inch	77.4 3.05	115.5 4.55	166 6.54	217 8.54
ID	mm inch	76 2.99	113 4.45	164 6.47	214 8.43
L	mm inch	456 17.95	475 18.7	500 19.69	526 20.71
M	mm inch	80 3.15	100 3.94	125 4.92	160 6.3
N	mm inch	122 4.8	141 5.55	166 6.54	192 7.56
Q	mm inch	83 3.27	83 3.27	85 3.35	84 3.31
S	mm inch	52 2.05	52 2.05	52 2.05	52 2.05
Y	mm inch	75 2.95	100 3.94	125 4.92	
Z	mm inch	120 4.72	160 6.3	160 6.3	200 7.87

Vacuum safety system for protection of storage rings or accelerators

Detection of pressure rise in milliseconds

Closure to a small leak in milliseconds



Body material

stainless steel

Slot shutter with pneumatic actuator

double acting

DN		○ circular opening		Ordering numbers
mm	inch	mm	inch	
40	1½	Ø 40	Ø 1½	77332-CE44

DN		▬ slot opening	D x D1 (height x width)	Ordering numbers
mm	inch	mm	inch	
63	2½	35 x 50	1.38 x 1.97	77336-CE44
100	4	35 x 80	1.38 x 3.15	77340-CE44
160	6	35 x 130	1.38 x 5.12	77344-CE44

Flap shutter with pneumatic actuator

double acting

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

Controller including accessories

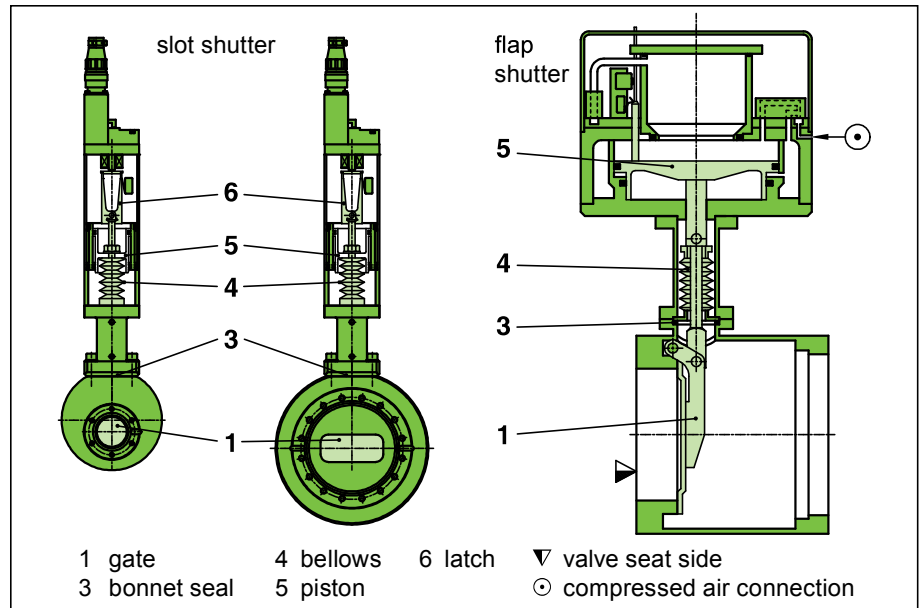
See «Controller for fast closing system Series 77», page 194

Sealing material

Bonnet: metal

Feedthrough

Bellows



Features

Closing by releasing a latch (slot shutter) or fast venting/evacuation of the pneumatic cylinder (flap shutter)

Pneumatic dampening during closing

Opening by compressed air

Technical data

Continued next page

Leak rate		
- Body		$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
- Valve seat Series 773		< 1 mbar ls ⁻¹
- Valve seat Series 771		< 30 mbar ls ⁻¹
Pressure range		UHV to 1.2 bar (abs)
Differential pressure		see table on next page
Cycles until first service		
- Slot shutter		5000 at 5 bar compressed air pressure
- Flap shutter		2000 at 5 bar compressed air pressure
Temperature ¹⁾		
- Shutter body		$\leq 300^\circ\text{C}$
- Actuator		$\leq 50^\circ\text{C}$
Radiation resistance		
- Shutter body		10^8 Gy
- Actuator		10^4 Gy
Material		
- Shutter body	DN 40	AISI 304 (1.4301)
	DN 63 - 160	AISI 316L (1.4435, 1.4404)
- Mechanism	DN 40	AISI 304 (1.4301)
	DN 63 - 160	AISI 316L (1.4435, 1.4404)
- Bellows		AISI 304L (1.4306)
- Gate		Titanium
Seal		
- Bonnet		metal
Mounting position		shutter side marked ▽ in opposite direction of air inrush

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

Options

- Customer specified flanges
- Special slot dimensions

Ordering information for options:

Ordering No. of valve-X (e. g. 77340-CE44-X, X = ISO-F flanges)

Seal kit

Bonnet seal
Ordering No.

Technical data

Slot shutter

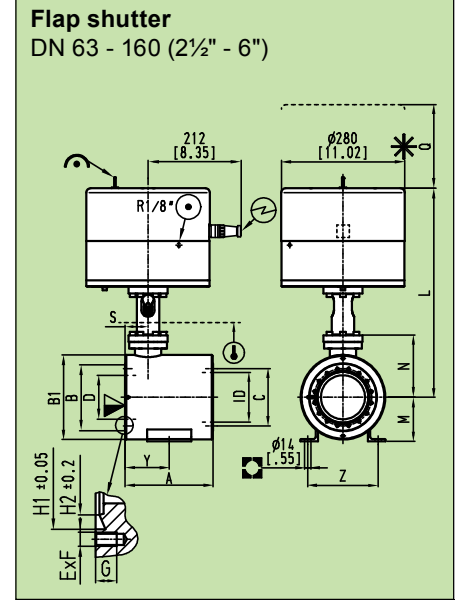
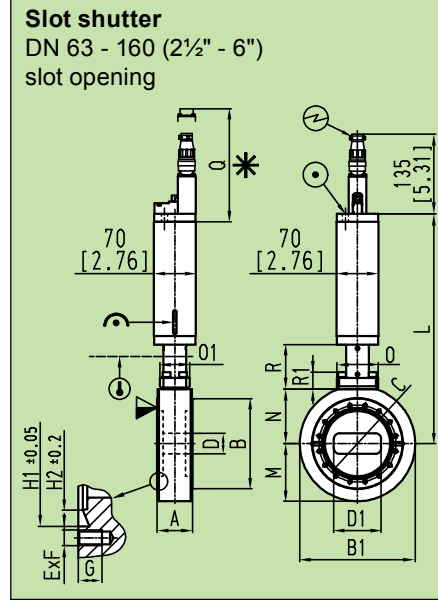
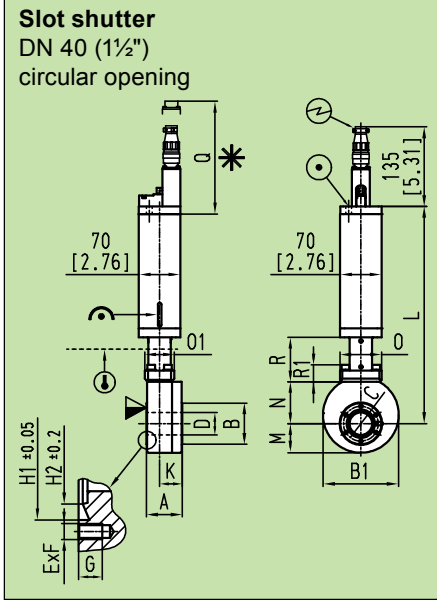
*) from sensor signal to closed shutter

DN (nominal I. D.)		standard flanges CF-F	molecular flow conductance	differential pressure: shutter closed		differential pressure at opening		compressed air pressure min. - max. overpressure		volume of air cylinder		total closing time *)	opening time	weight	
				in closing direction	in opening direction	in closing direction	in opening direction	bar	psi	l	ft ³			kg	lbs
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	mbar	bar	psi	l	ft ³	ms	s	kg	lbs
40	1 ½	2 ¾	110	≤1.2	≤1.2	≤300	≤300	4 - 6	55 - 85	0.032	0.001	< 10	9	8.1	18
63	2 ½	4 ½	240	≤1.2	≤1.2	≤200	≤200	4 - 6	55 - 85	0.1	0.0033	< 10	9	11	24
100	4	6	450	≤1.2	≤1.2	≤150	≤150	4 - 6	55 - 85	0.24	0.008	< 10	9	14	30
160	6	8	830	≤1.2	≤1.2	≤100	≤100	4 - 6	55 - 85	0.72	0.025	< 10	9	20	44

Flap shutter

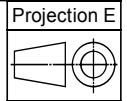
DN (nominal I. D.)		standard flanges CF-F	molecular flow conductance	differential pressure: shutter closed		differential pressure at opening		compressed air pressure min. - max. overpressure		volume of air cylinder		total closing time *)	opening time	weight	
				in closing direction	in opening direction	in closing direction	in opening direction	bar	psi	l	ft ³			kg	lbs
mm	inch	O.D.	ls ⁻¹	bar	bar	mbar	bar	bar	psi	l	ft ³	ms	s	kg	lbs
63	2 ½	4 ½	200	≤2	≤1.2	≤600	≤1	5 - 8	70 - 110	1.77	0.06	13	7	25	55
100	4	6	700	≤2	≤1.2	≤180	≤1	5 - 8	70 - 110	1.77	0.06	15	7	29	64
160	6	8	1700	≤2	≤0.5	≤ 50	≤1	5 - 8	70 - 110	1.77	0.06	23	7	36	80

Dimensions



- ▼ valve seat side ⊕ electrical connection
- * required for dismantling
- ⊙ compressed air connection

- ⤴ mechanical position indication
- ⊙ bake-out area



DN	mm	40		
	inch	1½		
A	mm	60		
	inch	2.36		
B	mm	69.5		
	inch	2.74		
B1	mm	128		
	inch	5.04		
C	mm	58.7		
	inch	2.31		
D	mm	38		
	inch	1.5		
E x F		6 x M6		
G	mm	12		
	inch	0.47		
H1	mm	48.35		
	inch	1.9		
H2	mm	42		
	inch	1.65		
L	mm	367		
	inch	14.45		
M	mm	49		
	inch	1.93		
N	mm	71		
	inch	2.8		
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	113.5	152	202.5
	inch	4.47	5.98	7.97
B1	mm	158	195	245
	inch	6.22	7.67	9.65
C	mm	92.1	130.3	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 x F		8 x M8	16 x M8	20 x M8
G	mm	12	12	12
	inch	0.47	0.47	0.47
H1	mm	82.55	120.7	171.5
	inch	3.25	4.75	6.75
H2	mm	77.4	115.5	166
	inch	3.05	4.55	6.54
L	mm	369	388	414
	inch	14.52	15.28	16.3
M	mm	79	97.5	122.5
	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	113.5	152	202.5
	inch	4.47	5.98	7.97
B1	mm	154	192	242
	inch	6.06	7.56	9.53
C	mm	92.1	130.3	181
	inch	3.63	5.13	7.13
D	mm	63	100	150
	inch	2.48	3.94	5.91
E x F		8 x M8	16 x M8	20 x M8
G	mm	12	12	12
	inch	0.47	0.47	0.47
H1	mm	82.55	120.65	171.5
	inch	3.25	4.75	6.75
H2	mm	77.4	115.5	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	18.7	19.69
M	mm	80	100	125
	inch	3.15	3.94	4.92
N	mm	122	141	166
	inch	4.8	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	6.3	6.3

Controller for operating

- fast closing valves, Series 75
- fast closing shutters, Series 77

Processing of the sensor signals and triggering the closing or opening movement of the fast closing valve or shutter



Construction

Basic device VF-2 fitted with various modules

Basic device VF-2

Ordering number see price list

- 19" rack insert with Power Supply
- Storage spaces for max. 10 modules
- Mains voltage: 100 - 240 V $\pm 10\%$, 50/60 Hz, max. 150 VA
- Key switch for «LOCAL», «LOCKED», «REMOTE»
- Ambient temperature 0 - 50°C
- Dimensions (w x h x d):
 - 19" rack insert, 3 height units
 - 445 x 132.5 x 300 mm (17.5" x 5.2" x 11.8")
 - Depth with plugs 410 mm (16.1")
- Weight: 11 kg (24 lbs)

Modules for basic device VF-2

Ordering number see price list

CONTROL module

- Storage space for 1 module required
- System control module for max. 6 sensors and 4 fast closing valves / shutters
- External trigger
- 8-pole plug for «REMOTE» control
- LED display «READY», «EXTERNAL TRIGGER»
- Push button «RESET»

FV-SENSOR module

- Storage space for 1 module required
- Connection of a fine vacuum sensor by a Triax connector (LEMO)
- Sensor voltage 3.5 kV
- LED display «READY», «INRUSH», «EXT. SIGNAL», «INTERLOCK»
- 8-pole plug for «REMOTE» control

HV-SENSOR module

- Storage space for 2 modules required
- Connection of a high vacuum sensor by a Triax connector (LEMO)
- Sensor voltage 3.5 kV
- LED display for pressure
- Trigger pressure adjustable between $2 \cdot 10^{-8}$ and $8 \cdot 10^{-4}$ mbar
- Trigger time adjustable between 1 and 7 msec
- 8-pole plug for «REMOTE» control

- VALVE module**
 - Storage space for 1 module required
 - Connection of a fast closing valve or shutter
 - LED display «READY», «TRIGGERED», «READY TO OPEN», «INTERLOCK»
 - Push buttons «OPEN», «CLOSE», «INTERLOCK»
 - 19-pole plug for connecting the valve / shutter
 - 12-pole plug for «REMOTE» control
- 1-GATE module**
 - Storage space for 1 module required
 - Connection of an isolation valve
 - LED display «READY»
 - Push buttons «OPEN», «CLOSE»
 - 12-pole plug for connecting the isolation valve
 - 19-pole plug for «REMOTE» control
- 2-GATE module**
 - Storage space for 1 module required
 - Connection of two isolation valves
 - LED display «READY» for each isolation valve
 - Push buttons «OPEN», «CLOSE» for each isolation valve
 - 2 x 12-pole plug for connecting the isolation valves
 - 19-pole plug for «REMOTE» control
- LINK module**
 - Storage space for 1 module per rack required
 - To link two basic devices if the 9 storage spaces of one basic device are insufficient

Cable

Ordering number see price list

Sensor – SENSOR module	max. 300 m, Triax cable 3.5 mm ²
Valve/shutter – VALVE module	max. 150 m, 12-pole cable 0.75 mm ²
Isolation valve – GATE module	max. 200 m, 7-pole cable 0.75 mm ²

Vacuum sensor

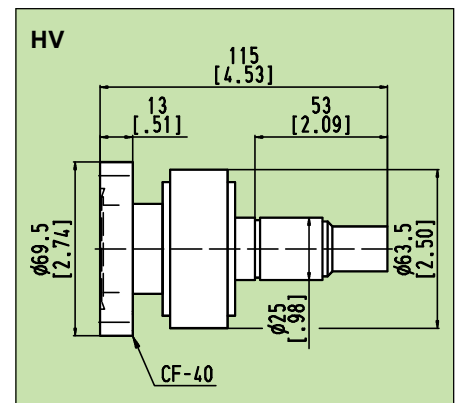
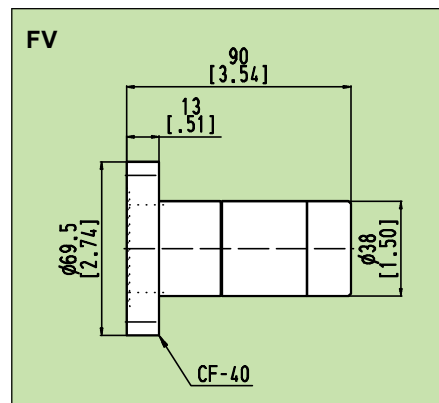
Ordering number see price list

Trigger pressure:	FV	approx. $1 \cdot 10^{-2}$ mbar
	HV	10^{-8} to 10^{-3} mbar adjustable
Response time:	FV	approx. 1 ms
	HV	2 ms (air inrush 1 bar)
Radiation resistance:	FV	10^8 Gy (10^{10} rad)
	HV	10^7 Gy (10^9 rad)
Flange		CF-F 40
Weight		approx. 1 kg (2 lbs)

Fine vacuum sensor (FV)
glow discharge



High vacuum sensor (HV)
cold cathode



F

Up to 6 kW beam load
due to watercooled copper plate

No welding or brazing joint between
water containment and vacuum

UHV compatible



Body material

stainless steel

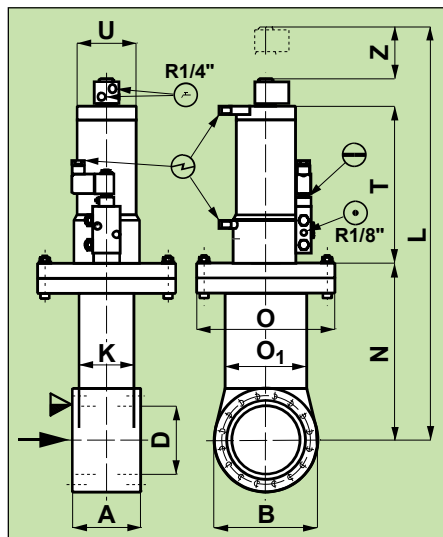
Pneumatic actuator

double acting
with position indicator 80°C
without solenoid

DN		Ordering numbers
mm	inch	CF-F
63	2 ½	79036-CE24
100	4	79040-CE24
160	6	79044-CE24

with position indicator 80°C, with solenoid: 790 . . -CE44 (specify control voltage)

Dimensions



DN	mm	63	100	160
	inch	2 ½	4	6
A	mm	100	100	100
	inch	3.94	3.94	3.94
B	mm	113.5	152	202.5
	inch	4.47	5.98	7.97
D	mm	65	100	150
	inch	2.56	3.94	6.91
K	mm	88.9	80	80
	inch	3.5	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	202.5	253
	inch	5.98	7.97	9.96
O1	mm	88.9	120	180
	inch	3.5	4.72	7.09

DN	mm	63	100	160
	inch	2 ½	4	6
T	mm	195.5	230.5	280.5
	inch	7.7	9.07	11.04
U	mm	87	87	87
	inch	3.43	3.43	3.43
Z	mm	71	106	156
	inch	2.8	4.17	6.14

- beam direction
- ▼ valve seat side
- ⊙ compressed air connection
- ⊕ electrical connection
- ⊖ emergency operation
- ⊗ cooling water connection

Accessories

- Fittings for installation of the beam stopper: series 33
- Flexible bake-out jacket: see page 216

For bake-out we recommend commercial controllers with settable heating rate and temperature limiting device.

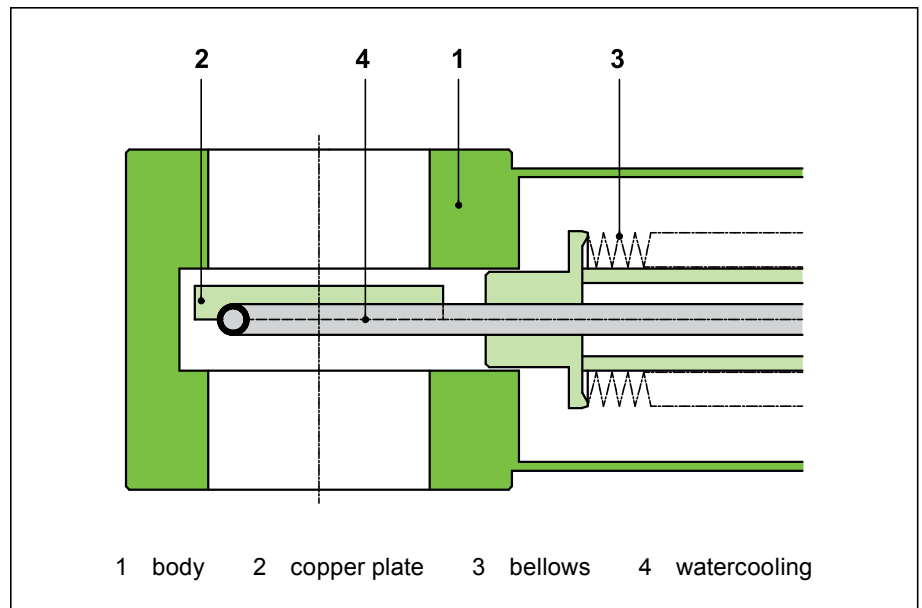
The bake-out jacket is without thermocouples and thermostats.

Sealing material

Bonnet: metal

Feedthrough

Bellows



Technical data

Leak rate: body	$5 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	UHV to 1 bar (abs)
Max. load	beam Ø <60 mm: 5 kW beam Ø >60 mm: 6 kW
Max. specific load	25 W / mm ²
Min. cooling water quantity	15 l / min.
Max. cooling water temperature	15 °C
Cycles until first service	5000
Temperature ¹⁾	
- Beam stopper body	≤ 250 °C
- Pneumatic actuator	≤ 80 °C (option: 200 °C)
Heating rate	80 °C h ⁻¹
Material	
- Beam stopper body, mechanism	AISI 304L (1.4301)
- Watercooled plate	copper
- Bellows	AISI 304L (1.4306)
Seal: bonnet	metal
Mounting position	any
Compressed air pressure	4 - 7 bar / 55 - 100 psi
Closing time: DN 63 / 100 / 160	1.0 / 2.0 / 3.0 s

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

Options



- Customer specified flanges
- Ports at the body for roughing, venting or for gauges
- Actuator and position indicator for 200 °C ¹⁾
- Beam stopper without body for direct integration into vacuum system (see picture)
Ordering No. 793 E . . . (number for nominal diameter refers to connection [bonnet] flange)

Ordering information for options:

Ordering No. of valve-X (e. g. 79 E . . . -X, X = actuator and position indicator for 200 °C)

F

Gate valve for gas analysis



With bypass valves

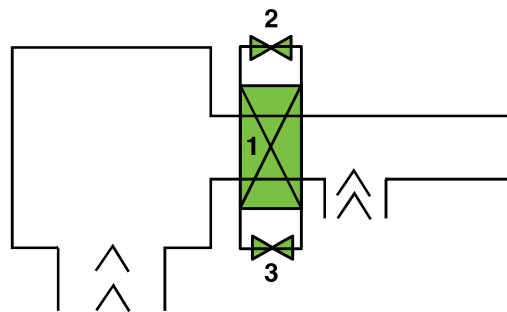
Pressure reduction of the process gas by means of two bypass valves with orifice

Analysis of the residual gases at base pressure with the gate valve open

Very compact



Function



- 1: Vacuum tight gate valve with manual or pneumatic actuator
- 2, 3: Bypass valves with manual or pneumatic actuator and application specific, easily exchangeable orifice

Technical data

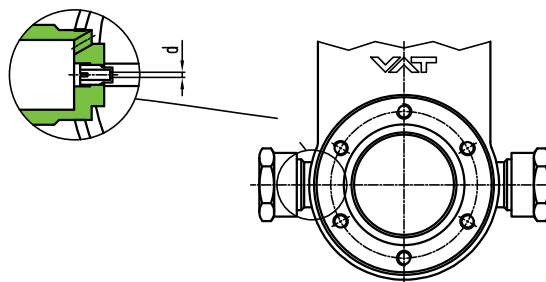
Gate valve: See section A, Mini UHV gate valve, Series 010

Bypass 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

Available orifices

Size (d): 0.03 / 0.05 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.9 / 1 / 1.5 mm



Ordering information:

Ordering No. of valve-X (e. g. 01032-CE44-X,

X = with manually actuated Nupro valves, diaphragm A 0.2 mm, diaphragm B 0.4 mm)

With exchangeable orifice

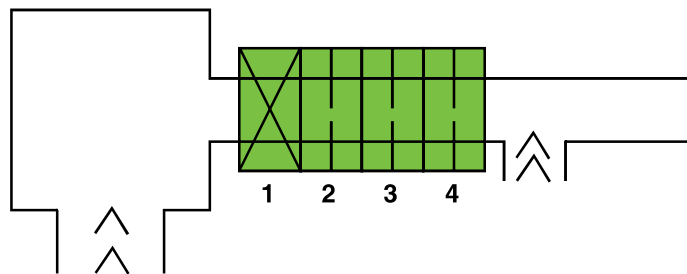
Pressure reduction of the process gas by means of maximum three gate valves with orifice

Analysis of the residual gases at base pressure with the gate valves open

Line of sight between analyzer and process chamber



Function



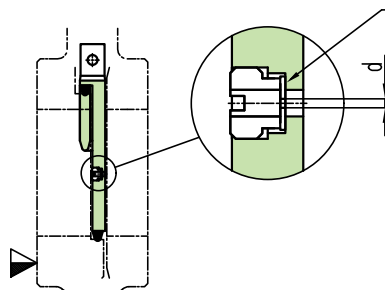
- 1: Vacuum tight gate valve with manual or pneumatic actuator
- 2, 3, 4: One to three gate valves, each rotated by 90°, with manual or pneumatic actuator and application specific, easily exchangeable orifice

Technical data

See section A, Mini UHV gate valve, Series 010

Available orifices

Size (d): 0.005 / 0.01 / 0.02 / 0.03 / 0.05 / 0.1 mm



Ordering information:

Ordering No. of valve-X (e. g. 01032-CE44-X,
X = 2 valves welded together, 1 valve rotated by 90°, diaphragm 0.1 mm)

For aggressive or corrosive gases

DN 16 - 160

These products are subject to the Non Proliferation Treaty (NPT)



Body material

aluminum or stainless steel

Manual or pneumatic actuator

Sealing materials

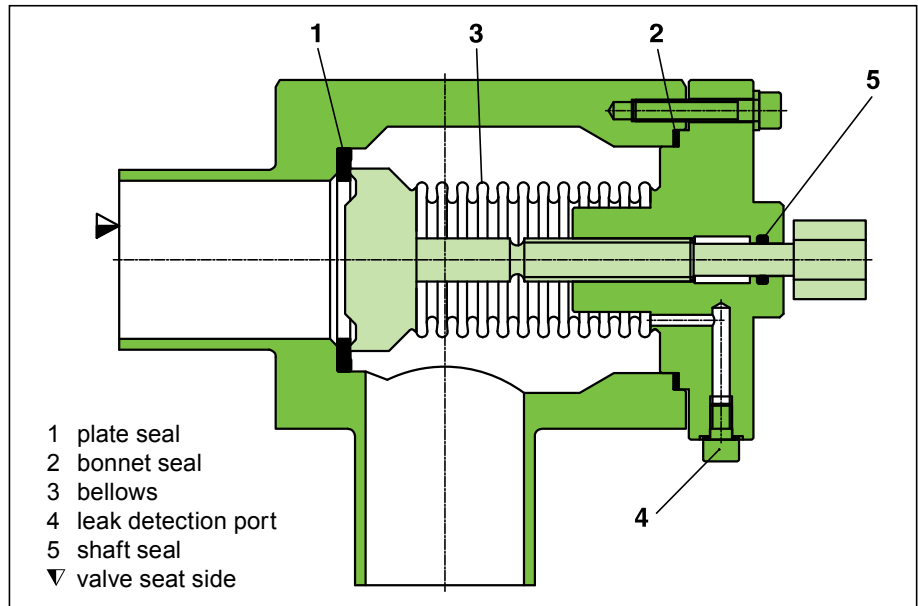
Plate: Tenic

Bonnet: PFA

copper with DN 25 - 40
if valve body is made of
stainless steel

Feedthrough

Bellows with shaft seal



Technical data

Leak rate	
- Body	$< 1 \cdot 10^{-9}$ mbar Is ⁻¹
- Valve seat	$< 1 \cdot 10^{-7}$ mbar Is ⁻¹
Pressure range	$1 \cdot 10^{-7}$ mbar to 4 bar
Differential pressure on the plate	≤ 4 bar
Cycles	5000
Temperature ¹⁾	
- Valve body, manual actuator	$\leq 120^{\circ}\text{C}$ (copper bonnet seal)
	$\leq 100^{\circ}\text{C}$ (PFA bonnet seal)
- Pneumatic actuator	$\leq 100^{\circ}\text{C}$ (option: 120°C)
Material	
- Valve body	AISI 316L (1.4435) ²⁾ or EN AW-5049 (3.3527)
- Bellows	AISI 316L (1.4404)

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

²⁾ AISI 304L (1.4306) optional

For aggressive and corrosive gases

DN 16 - 100

These products are subject to the Non Proliferation Treaty (NPT)



Body material

stainless steel

Features

Control and leaktight closing

Selection of flow range by replaceable needle/nozzle unit

Increased safety by evacuation of bellows interior

Technical data

Actuator	stepper motor with positioning control manual (option)
Flow range	0.01 to 10 m ³ /h
Control range	to 1 decade for $k_{vmin} = 0.01$ to $0.1 \text{ m}^3\text{h}^{-1}$ to 2 decades for $k_{vmin} > 0.1 \text{ m}^3\text{h}^{-1}$
Leak rate	
- Body	$< 1 \cdot 10^{-9} \text{ mbar ls}^{-1}$
- Valve seat (stepper motor actuator)	$< 1 \cdot 10^{-6} \text{ mbar ls}^{-1}$
- Valve seat (manual actuator)	$< 1 \cdot 10^{-7} \text{ mbar ls}^{-1}$
Pressure range	$1 \cdot 10^{-7} \text{ mbar}$ to 5 bar
Differential pressure on the plate	$\leq 1 \text{ bar}$
Cycles until first service	10000
Ambient temperature	$\leq 120^\circ\text{C}$
Material	
- Valve body	AISI 316L (1.4435)
- Bellows	AISI 316L (1.4404)
- Seat seal	Tenic
- Bonnet seal	metal (2.0040.26)
- Shaft feedthrough	FKM (VITON)
Control	
- Size	$\frac{1}{2}$ of 19" rack insert, 2 height units
- Positioning voltage	0 - 10 V



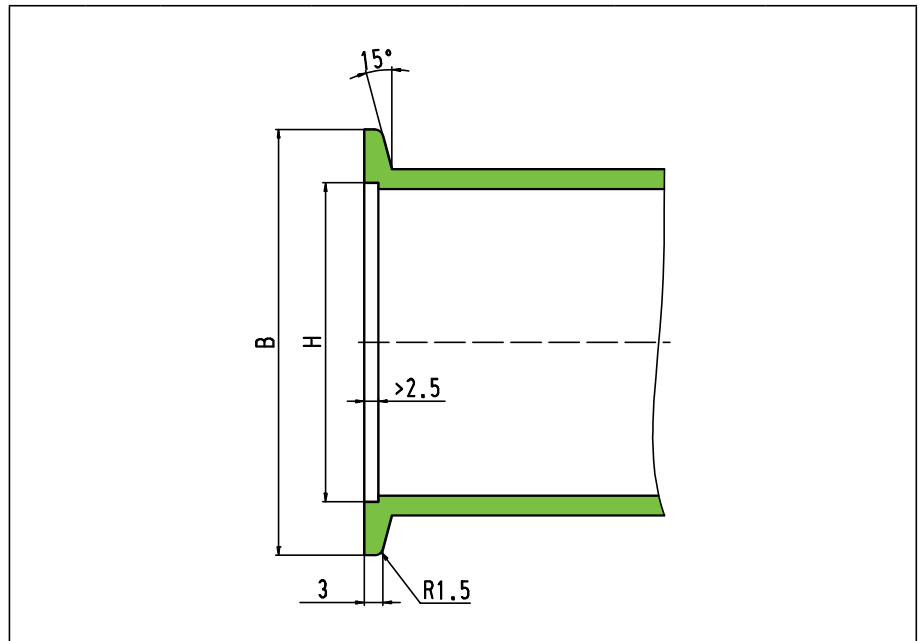
- Clamp
- Claw
- Centering ring
- Blank-off flange
- Weld neck flange
- Metal seal (indium, max. 60°C)
- Soft-start throttle



Seal	FKM (VITON)	Indium
Suitable flange material	A, E	A, E
Temperature ¹⁾	≤ 200°C	≤ 60°C
Leak rate for helium (mbar ls ⁻¹)	< 1 · 10 ⁻⁹	< 1 · 10 ⁻¹⁰
Sealing force (N per cm sealing line)	10 - 50	50 - 500
Multiple use of seal	yes	yes

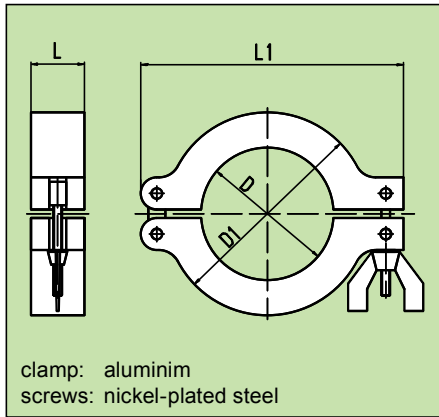
A: aluminum
E: stainless steel

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



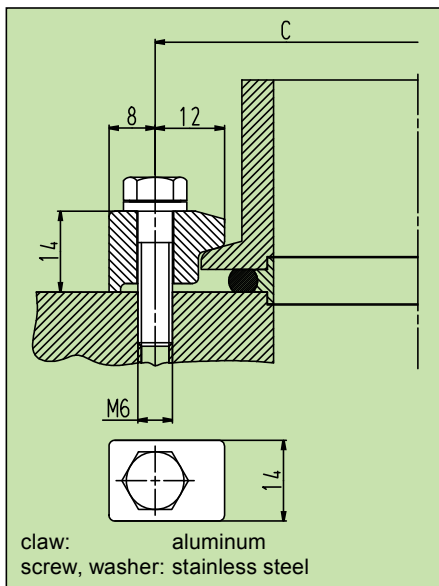
DN	mm inch	10 3/8	16 5/8	25 1	40 1 1/2	50 2
B	mm inch	30 1.18	30 1.18	40 1.57	55 2.17	75 2.95
H	mm inch	12.2 0.48	17.2 0.68	26.2 1.03	41.2 1.62	52.2 2.06

Clamp for seal made of FKM (VITON) and indium



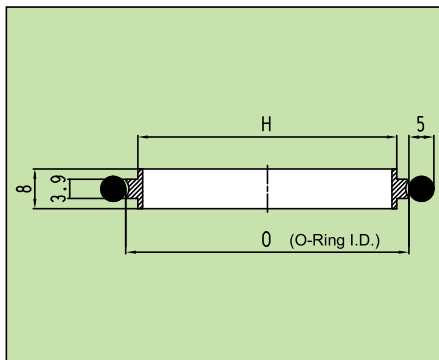
	DN	D	D1	L	L1		Ordering numbers
mm inch	10 / 16 3/8 / 5/8	22 0.87	45 1.77	16 0.63	61 2.4		31024-KASR
mm inch	25 1	32 1.26	55 2.17	16 0.63	72 2.83		31028-KASR
mm inch	40 1 1/2	47 1.85	70 2.76	18 0.71	90 3.54		31032-KASR
mm inch	50 2	62 2.44	95 3.74	25 0.98	123 4.84		31034-KASR

Claw with screw and washer



	DN	C	hex-head screw	quantity per flange	Ordering numbers	
					1 piece	1 kit (4 pieces)
mm inch	10 / 16 3/8 / 5/8	45 1.77	M6 x 20	4	31024-KAPR	31024-KAPR-AY1
mm inch	25 1	55 2.17	M6 x 20	4		
mm inch	40 1 1/2	71 2.8	M6 x 20	4		
mm inch	50 2	91 3.58	M6 x 20	4		

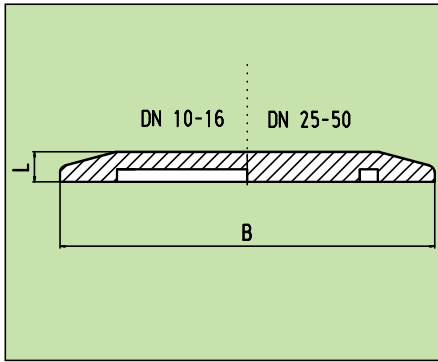
Centering ring with O-ring made of FKM (VITON)



	DN	H	O	Ordering numbers aluminum	Ordering numbers stainless steel
mm inch	10 3/8	12 0.47	15.2 0.6	31020-KAZV	31020-KEZV
mm inch	16 5/8	17 0.67	18.4 0.72	31024-KAZV	31024-KEZV
mm inch	25 1	26 1.02	27.9 1.1	31028-KAZV	31028-KEZV
mm inch	40 1 1/2	41 1.61	40.6 1.6	31032-KAZV	31032-KEZV
mm inch	50 2	52 2.05	53.3 2.1	31034-KAZV	31034-KEZV

H

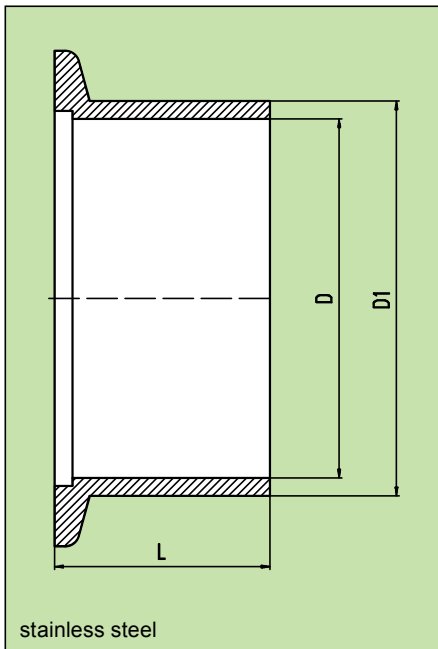
Blank-off flange



	DN	B	L *)			Ordering No. aluminum	Ordering No. stainless steel
mm	10	30	5			31020-KAFB	31020-KEFB
inch	$\frac{3}{8}$	1.18	0.2				
mm	16	30	5			31024-KAFB	31024-KEFB
inch	$\frac{5}{8}$	1.18	0.2				
mm	25	40	5			31028-KAFB	31028-KEFB
inch	1	1.57	0.2				
mm	40	55	5			31032-KAFB	31032-KEFB
inch	1½	2.17	0.2				
mm	50	75	6			31034-KAFB	31034-KEFB
inch	2	2.95	0.24				

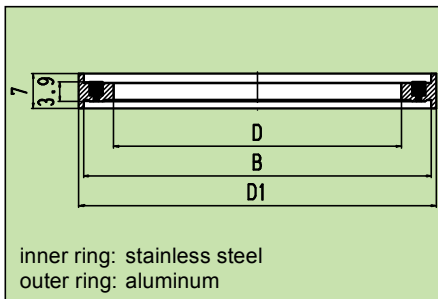
*) minimum dimension

Weld-neck flange short or long



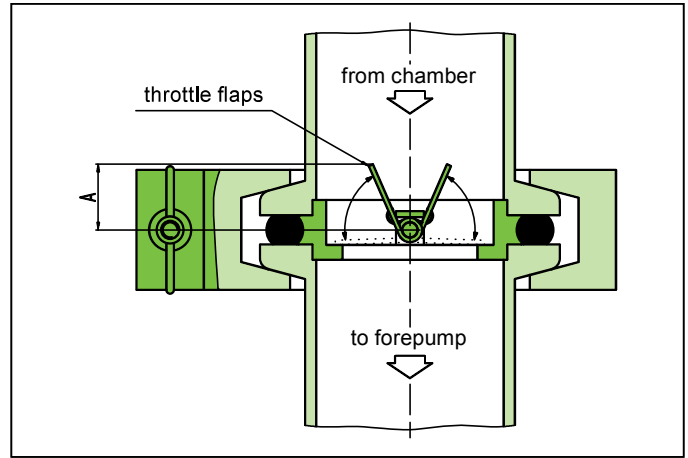
	DN	D	D1	L short	L long	Ordering No. short	Ordering No. long
mm	10	12	16	20	70	31120-KESK	31120-KESL
inch	$\frac{3}{8}$	0.47	0.63	0.79	2.76		
mm	16	16	20	20	70	31124-KESK	31024-KESL
inch	$\frac{5}{8}$	0.63	0.79	0.79	2.76		
mm	25	26	30	20	70	31128-KESK	31128-KESL
inch	1	1.02	1.18	0.79	2.76		
mm	40	41	45	20	70	31132-KESK	31132-KESL
inch	1½	1.61	1.77	0.79	2.76		
mm	50	50	55	20	70	31134-KESK	31034-KESL
inch	2	1.97	2.17	0.79	2.76		

Metal seal indium



	DN	B	D	D1	Ordering numbers
mm	10 / 16	30	18.1	32	31024-KETR
inch	$\frac{3}{8}$ / $\frac{5}{8}$	1.18	0.71	1.26	
mm	25	40	28.1	42	31028-KETR
inch	1	1.57	1.1	1.65	
mm	40	55	43.1	57	31032-KETR
inch	1½	2.17	1.7	2.24	
mm	50	75	63.1	77	31034-KETR
inch	2	2.95	2.48	3.03	

Max. temperature 60°C, multiple use with VAT clamps



For reduction of turbulence in pump forelines during pump-down

Protection device against

- turbulence in piping and chambers
- particulate contamination in vacuum installations
- movement of substrates caused by turbulence

Soft-start throttle valves consist of two halves of throttle flaps supported on a common axis and maintained in the open position by a spring. The axis is held in an ISO-KF centering ring that is formed as a body with valve seat.

When mounting them between two ISO-KF flanges (instead of a centering ring), the open flaps must be orientated against the air flow in the vacuum line. When the roughing system goes into operation, a strong air flow occurs in the forevacuum line, which immediately closes the valve and reduces the pipe section by about 99%. When reaching a differential pressure of approx. 15 mbar, the valve opens abruptly and leaves the pipe section nearly unobstructed for further pumping.

Technical data

DN		dimensions		open area		
		A		open		closed
mm	16	6.2	mm ²	90	4	
inch	5/8	0.24	inch ²	0.14	0.006	
mm	25	9	mm ²	200	5.5	
inch	1	0.35	inch ²	0.31	0.0085	
mm	40	14.3	mm ²	570	8	
inch	1 1/2	0.56	inch ²	0.88	0.012	
mm	50	19.9	mm ²	1190	10.5	
inch	2	0.78	inch ²	1.84	0.016	

Ordering numbers

	DN	Ordering numbers
mm	16	31124-KASO
inch	5/8	
mm	25	31128-KASO
inch	1	
mm	40	31132-KASO
inch	1 1/2	
mm	50	31134-KASO
inch	2	

Behavior

- fast closing
 - opening
- when roughing is started at Δp approx. 15 mbar ¹⁾

Bake-out temperature ²⁾ 150°C

Mounting position any

Cycle life 100000 (at T_{max} 80°C, Δp max. 1 bar)

Material

- centering ring EN AW-6082 (3.2315)
- inner parts AISI 301 (1.4310), AISI 303 (1.4305)

Seal FKM (VITON)

¹⁾ Depending on system configuration

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

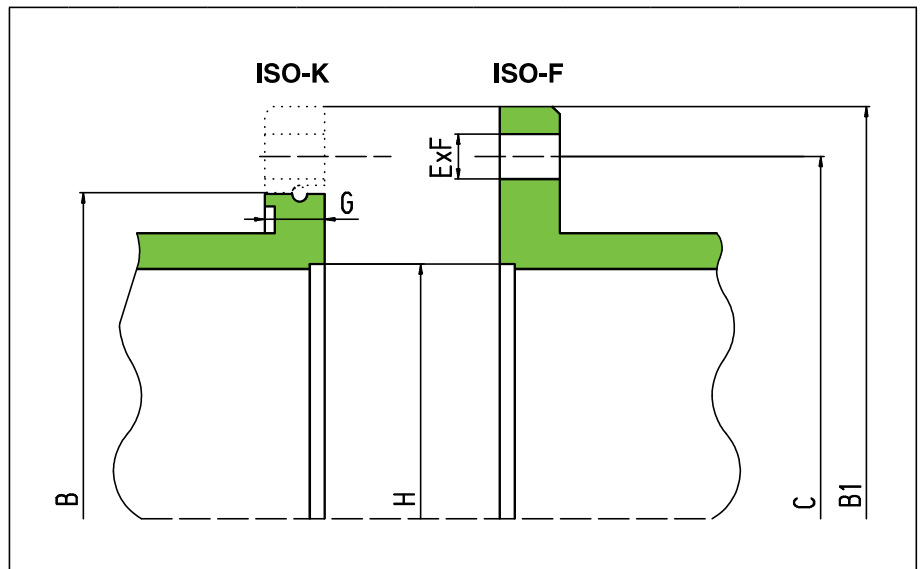
- Clamp
- Claw
- Bolt
- Centering ring
- Rotatable flange
- Blank-off flange
- Weld neck flange



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

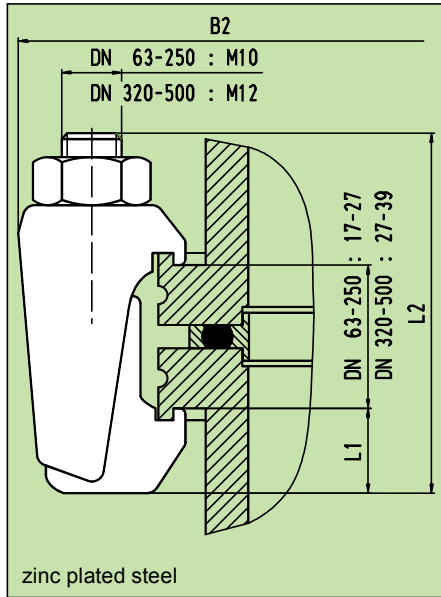
A: aluminum
E: stainless steel

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



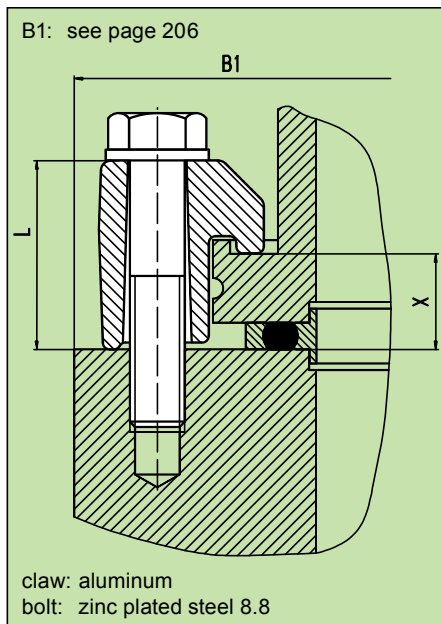
DN	mm	63	80	100	160	200	250	320	400	500
	inch	2 1/2	3	4	6	8	10	12	16	20
B	mm	95	110	130	180	240	290	370	450	550
	inch	3.74	4.33	5.12	7.09	9.45	11.42	14.57	17.72	21.65
B1	mm	130	145	165	225	285	335	425	510	610
	inch	5.12	5.71	6.5	8.86	11.22	13.19	16.73	20.08	24.02
C	mm	110	125	145	200	260	310	395	480	580
	inch	4.33	4.92	5.71	7.87	10.24	12.2	15.55	18.9	22.83
EXF	mm	4x9	8x9	8x9	8x11	12x11	12x11	12x14	16x14	16x14
	inch	4x .35	8x .35	8x .35	8x .43	12x .43	12x .43	12x .55	16x .55	16x .55
G	mm	12	12	12	12	12	12	17	17	17
	inch	0.47	0.47	0.47	0.47	0.47	0.47	0.67	0.67	0.67
H	mm	70	83	102	153	213	261	318	400	501
	inch	2.76	3.27	4.02	6.02	8.39	10.28	12.52	15.75	19.72

Clamp



	DN	B2	L1	L2	qty. per flange	Ordering numbers 1 piece	
mm	63	138	12	60	4	32036-QNKS	
inch	2½	5.43	0.47	2.36	4		
mm	80	153	12	60	4		
inch	3	6.02	0.47	2.36	4		
mm	100	173	12	60	4		
inch	4	6.81	0.47	2.36	4		
mm	160	223	12	60	4	32050-QNKS	
inch	6	8.78	0.47	2.36	4		
mm	200	283	12	60	6		
inch	8	11.14	0.47	2.36	6		
mm	250	333	12	60	6		
inch	10	13.11	0.47	2.36	6		
mm	320	417	14	78	8	32050-QNKS	
inch	12	16.42	0.55	3.07	8		
mm	400	497	14	78	8		
inch	16	19.57	0.55	3.07	8		
mm	500	597	14	78	12		
inch	20	23.5	0.55	3.07	12		

Claw with bolt and washer

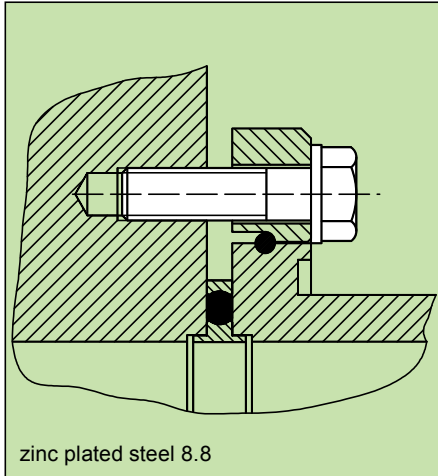


	DN	L	X	hex-head bolt	quantity per flange	Ordering numbers 1 piece 1 kit (4 pieces)	
mm	63	27.5	13.9	M 8x40	4	32040-QAPR	32040-QAPR-AYY1
inch	2½	1.08	0.55	M 8x40	4		
mm	80	27.5	13.9	M 8x40	8		
inch	3	1.08	0.55	M 8x40	8	32044-QAPR	32044-QAPR-AYY1
mm	100	27.5	13.9	M 8x40	8		
inch	4	1.08	0.55	M 8x40	8		
mm	160	28.5	13.9	M10x45	8	32050-QAPR	32050-QAPR-AYY1
inch	6	1.12	0.55	M10x45	8		
mm	200	28.5	13.9	M10x45	12		
inch	8	1.12	0.55	M10x45	12	32050-QAPR	32050-QAPR-AYY1
mm	250	28.5	13.9	M10x45	12		
inch	10	1.12	0.55	M10x45	12		
mm	320	36.5	20.6	M12x55	12	32050-QAPR	32050-QAPR-AYY1
inch	12	1.44	0.81	M12x55	12		
mm	400	36.5	20.6	M12x55	16		
inch	16	1.44	0.81	M12x55	16	32050-QAPR	32050-QAPR-AYY1
mm	500	36.5	20.6	M12x55	16		
inch	20	1.44	0.81	M12x55	16		

Claw for SEMI interface (groove in flange):

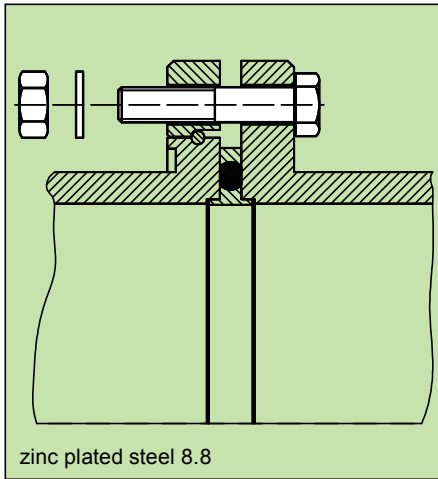
	DN	L	X	hex-head bolt	Ordering numbers 1 piece 1 kit (4 pieces)	
mm	63 - 80	23.5	10	M 8x40	32009-QAPR	320XX-QAPR-AYY1
inch	2½ - 3	0.93	0.39	M 8x40		

Bolt with washer



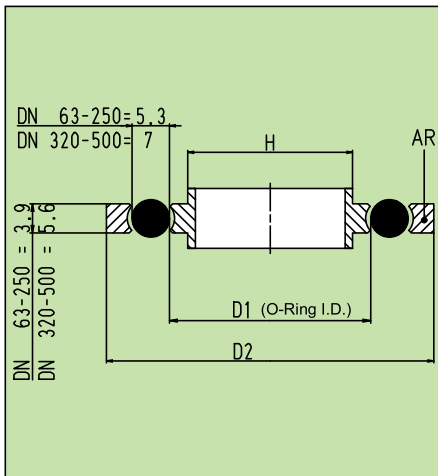
	DN	hex-head bolt	quantity per flange	Ordering numbers 1 piece
mm inch	63 2½	M 8 x 30	4	32036-QNSU
mm inch	80 3	M 8 x 30	8	
mm inch	100 4	M 8 x 30	8	
mm inch	160 6	M 10 x 35	8	32044-QNSU
mm inch	200 8	M 10 x 35	12	
mm inch	250 10	M 10 x 35	12	
mm inch	320 12	M 12 x 45	12	32050-QNSU

Bolt with washer and nut



	DN	hex-head bolt	quantity per flange	Ordering numbers 1 piece
mm inch	63 2½	M 8 x 40	4	32036-QNSS
mm inch	80 3	M 8 x 40	8	
mm inch	100 4	M 8 x 40	8	
mm inch	160 6	M 10 x 50	8	32044-QNSS
mm inch	200 8	M 10 x 50	12	
mm inch	250 10	M 10 x 50	12	
mm inch	320 12	M 12 x 60	12	32050-QNSS

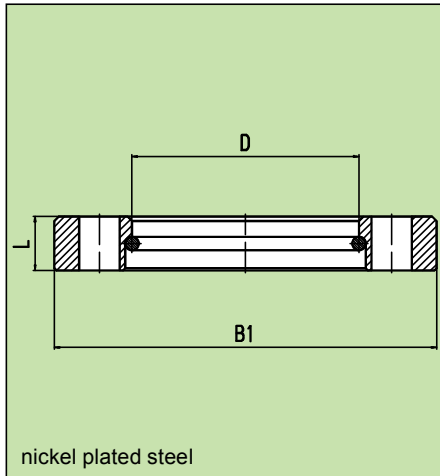
Centering ring with O-ring made of FKM (VITON)



	DN	H	D1	D2 max.	Ordering numbers aluminum	Ordering numbers stainless steel
mm inch	63 2½	70 2.76	75.6 2.98	96 3.78	32036-QAZV	32036-QEZV
mm inch	80 3	83 3.27	88.3 3.48	109 4.29	32038-QAZV	32038-QEZV
mm inch	100 4	102 4.02	107.3 4.22	128 5.04	32040-QAZV	32040-QEZV
mm inch	160 6	153 6.02	158.1 6.22	179 7.05	32044-QAZV	32044-QEZV
mm inch	200 8	213 8.39	208.9 8.22	239 9.41	32046-QAZV	32046-QEZV
mm inch	250 10	261 10.28	253.4 9.98	287 11.3	32048-QAZV	32048-QEZV
mm inch	320 12	318 12.52	329.6 12.98	358 14.1	32050-QAZV	-
mm inch	400 16	400 15.75	405.3 15.96	440 17.32	32052-QAZV	-
mm inch	500 20	501 19.72	506.9 19.96	541 21.3	32054-QAZV	-

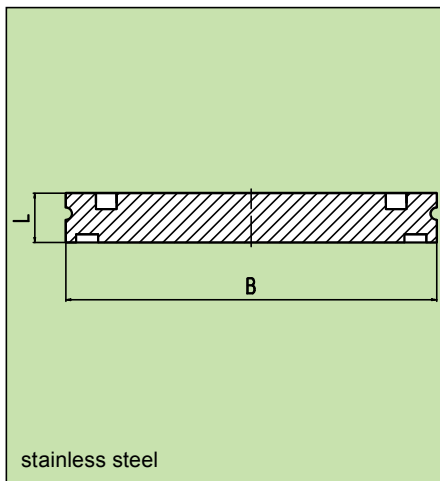
stainless steel version: outer ring (AR) made of aluminum

Rotatable flange with retaining ring ISO-K



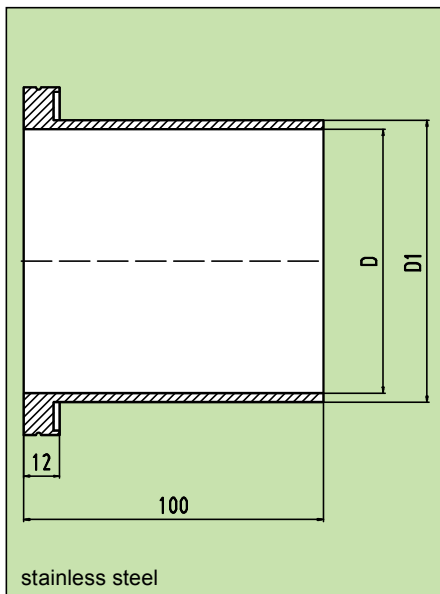
	DN	B1	D	L1	Ordering numbers
mm inch	63 2 1/2	130 5.12	95.6 3.76	12 0.47	32036-QNUF
mm inch	100 4	165 6.5	130.5 5.14	12 0.47	32040-QNUF
mm inch	160 6	225 8.86	180.8 7.12	16 0.63	32044-QNUF
mm inch	200 8	285 11.22	240.8 9.48	16 0.63	32046-QNUF
mm inch	250 10	335 13.19	290.8 11.45	16 0.63	32048-QNUF
mm inch	320 12	425 16.73	371 14.6	20 0.79	32050-QNUF

Blank-off flange



	DN	B	L		Ordering numbers
mm inch	63 2 1/2	95 3.74	12 0.47		32036-QEFB
mm inch	80 3	110 4.33	12 0.47		32038-QEFB
mm inch	100 4	130 5.12	12 0.47		32040-QEFB
mm inch	160 6	180 7.09	12 0.47		32044-QEFB
mm inch	200 8	240 9.45	12 0.47		32046-QEFB
mm inch	250 10	290 11.42	12 0.47		32048-QEFB
mm inch	320 12	370 14.57	17 0.67		32050-QEFB

Weld neck flange



	DN	D	D1		Ordering numbers
mm inch	63 2 1/2	71.5 2.81	76.1 3		32136-QESK
mm inch	100 4	104 4.09	108 4.25		32140-QESK
mm inch	160 6	155 6.1	159 6.26		32144-QESK
mm inch	200 8	212.7 8.37	219.1 8.63		32046-QESK

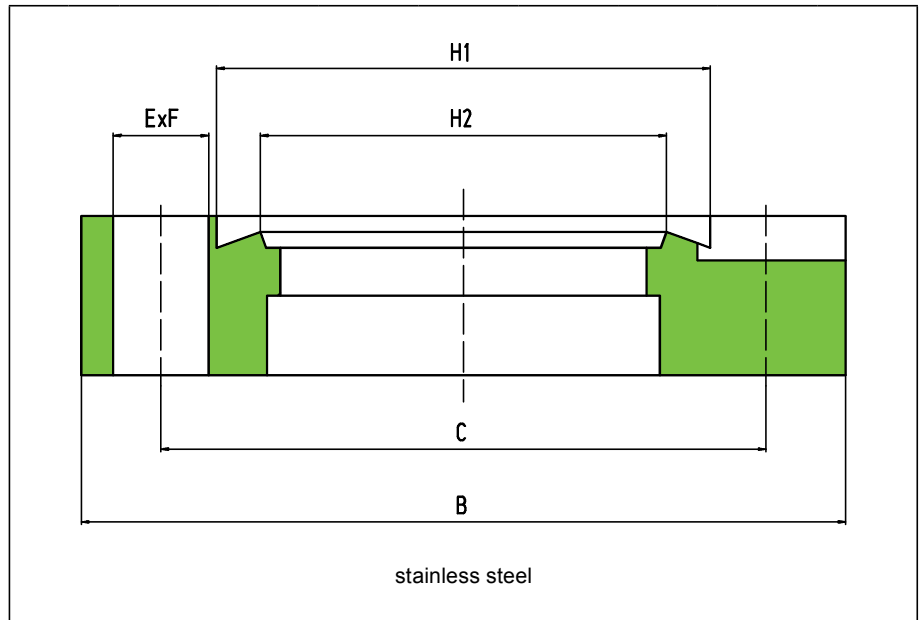
H

- Bolt
- Stud bolt
- Copper seal
- Blank-off flange
- Weld flange
- Weld neck flange fixed
- Weld neck flange rotatable



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

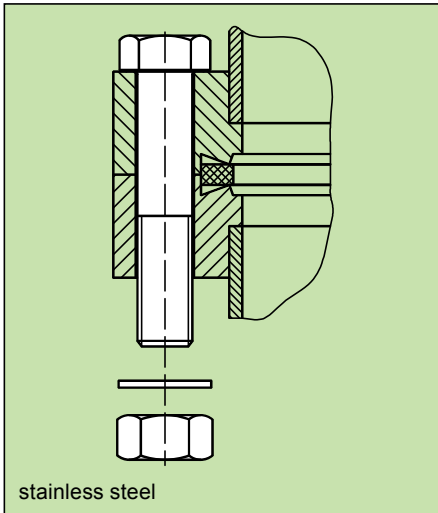
¹⁾ Maximum value: depending on operating conditions and sealing materials



DN	mm	16	25	40	63	100	160	200	250
inch		5/8	1	1 1/2	2 1/2	4	6	8	10
O.D.	inch	1 1/2	2 1/8	2 3/4	4 1/2	6	8	10	12
B	mm	34	54	69.5	113.5	152	202.5	253	305
inch		1.34	2.13	2.74	4.47	5.98	7.97	9.96	12.01
C	mm	27	41.3	58.7	92.2	130.3	181	231.8	284
inch		1.06	1.63	2.31	3.63	5.13	7.13	9.13	11.18
ExF	mm	6x4.3	4x6.6	6x6.6	8x8.4	16x8.4	20x8.4	24x8.4	32x8.4
inch		6x .17	4x .26	6x .26	8x .33	16x .33	20x .33	24x .33	32x .33
H1	mm	21.4	32.9	48.3	82.5	120.6	171.4	222.2	273.1
inch		0.84	1.3	1.9	3.25	4.75	6.75	8.75	10.75
H2	mm	18.5	27.6	42	77	115	166	217	267
inch		0.73	1.09	1.65	3.03	4.53	6.54	8.54	10.51

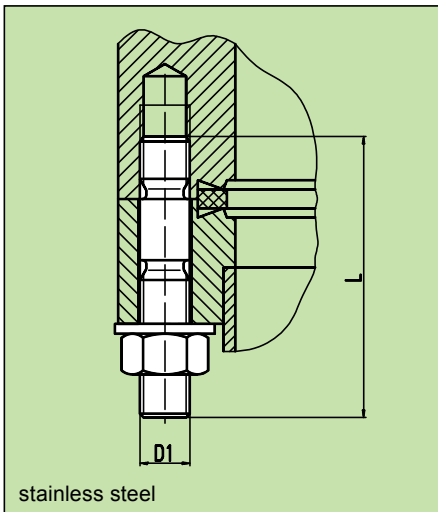
DN 16, 25, 40 without venting groove

Bolt with washer and nut



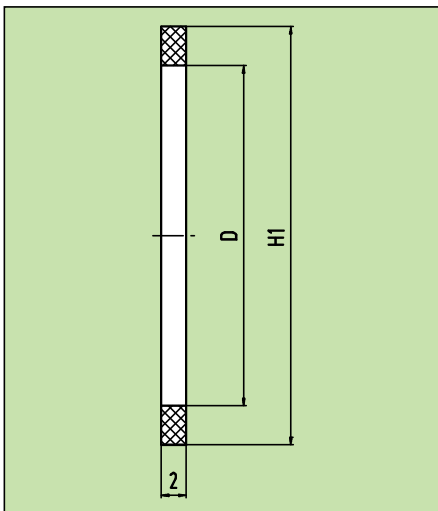
	DN	hex-head bolt	quantity per flange	Ordering numbers 1 piece
mm inch	16 5/8	M4 x 20	6	33024-CESS
mm inch	25 1	M6 x 35	4	33028-CESS
mm inch	40 1 1/2	M6 x 35	6	
mm inch	63 2 1/2	M8 x 50	8	33036-CESS
mm inch	100 4	M8 x 55	16	33040-CESS
mm inch	160 6	M8 x 55	20	
mm inch	200 8	M8 x 60	24	33046-CESS
mm inch	250 10	M8 x 60	32	

Stud bolt with washer and nut



	DN	D1	L	quantity per flange	Ordering numbers 1 piece
mm inch	16 5/8	M4	20 0.79	6	33024-CEST
mm inch	25 1	M6	32.5 1.28	4	33028-CEST
mm inch	40 1 1/2	M6	32.5 1.28	6	
mm inch	63 2 1/2	M8	40 1.57	8	33036-CEST
mm inch	100 4	M8	45 1.77	16	33040-CEST
mm inch	160 6	M8	50 1.97	20	33044-CEST
mm inch	200 8	M8	50 1.97	24	
mm inch	250 10	M8	50 1.97	32	

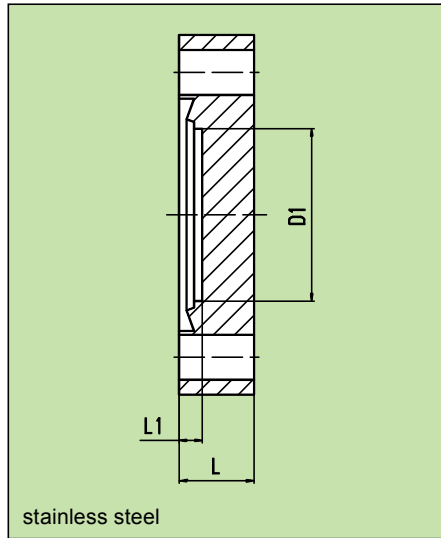
Copper seal



	DN	D	H1	Ordering numbers Cu silver-plated	Ordering numbers Cu
mm inch	16 5/8	16.2 0.64	21.3 0.84	33024-CSDF	33024-CKDF
mm inch	25 1	25.4 1	32.8 1.29	33028-CSDF	33028-CKDF
mm inch	40 1 1/2	36.8 1.45	48.1 1.89	33032-CSDF	33032-CKDF
mm inch	63 2 1/2	63.6 2.5	82.4 3.24	33036-CSDF	33036-CKDF
mm inch	100 4	101.7 4	120.5 4.74	33040-CSDF	33040-CKDF
mm inch	160 6	152.6 6	171.3 6.74	33044-CSDF	33044-CKDF
mm inch	200 8	203.3 8	222.1 8.74	33046-CSDF	33046-CKDF
mm inch	250 10	254 10	272.7 10.74	33048-CSDF	33048-CKDF

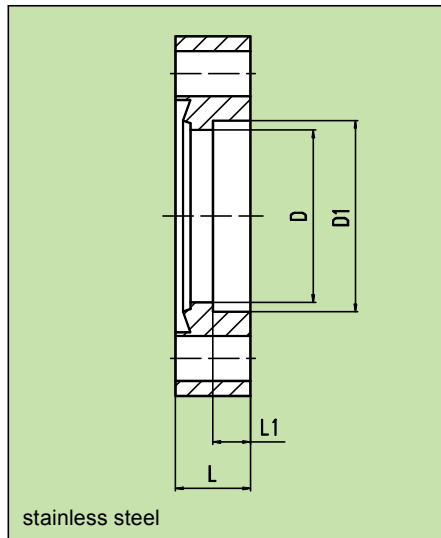
silver-plated version recommended for bakeout temperatures ≥ 200°C

Blank-off flange



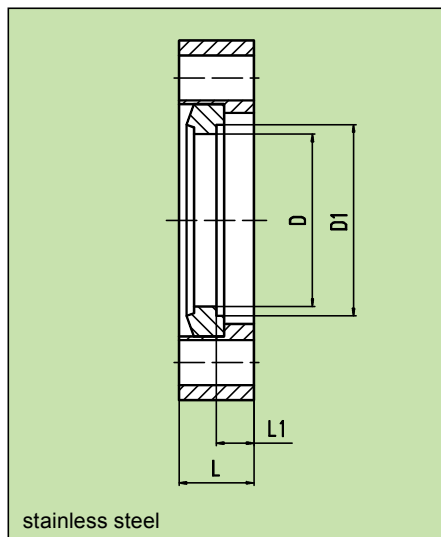
	DN	D1	L	L1	Ordering numbers
mm inch	16 ¾	14 0.55	7.5 0.3	1.4 0.06	33024-CEFB
mm inch	25 1	– –	13 0.51	1.4 0.06	33028-CEFB
mm inch	40 1½	38 1.5	13 0.51	1.4 0.06	33032-CEFB
mm inch	63 2½	66 2.6	17.5 0.69	1.4 0.06	33036-CEFB
mm inch	100 4	104 4.09	20 0.79	1.4 0.06	33040-CEFB
mm inch	160 6	155 6.1	22 0.87	1.4 0.06	33044-CEFB
mm inch	200 8	205 8.07	24.5 0.96	1.4 0.06	33046-CEFB
mm inch	250 10	256 10.08	24.5 0.96	1.4 0.06	33048-CEFB

Weld flange fixed



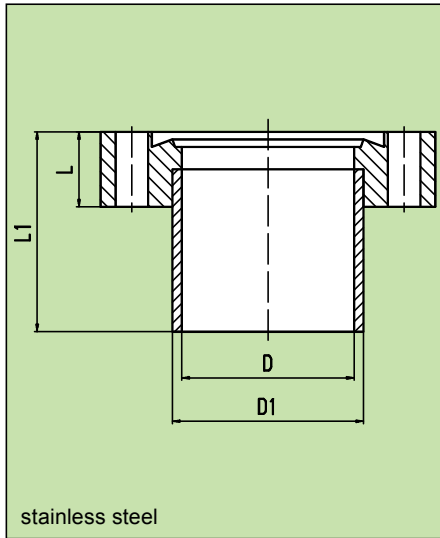
	DN	D	D1	L	L1	Ordering numbers
mm inch	25 1	25 0.98	27.5 1.08	13 0.51	7.5 0.3	33028-CEFF
mm inch	40 1½	36.8 1.45	40.3 1.59	13 0.51	7.5 0.3	33032-CEFF
mm inch	63 2½	66 2.6	70.3 2.77	17.5 0.69	8 0.31	33036-CEFF
mm inch	100 4	104 4.09	108.5 4.27	20 0.79	9 0.35	33040-CEFF
mm inch	160 6	155 6.1	159.5 6.28	22 0.87	10 0.39	33044-CEFF
mm inch	200 8	200 7.87	205.5 8.09	24.5 0.96	12 0.47	33046-CEFF
mm inch	250 10	250 9.84	256.5 10.1	24.5 0.96	12 0.47	33048-CEFF

Weld flange rotatable



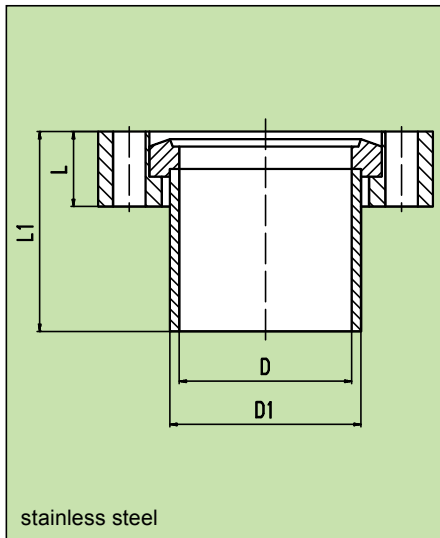
	DN	D	D1	L	L1	Ordering numbers
mm inch	25 1	25 0.98	28.1 1.1	13 0.51	7.5 0.3	33028-GEFD
mm inch	40 1½	36.8 1.45	40.3 1.59	13 0.51	7.5 0.3	33032-GEFD
mm inch	63 2½	66 2.6	70.3 2.77	17.5 0.69	8 0.31	33036-GEFD
mm inch	100 4	104 4.09	108.5 4.27	20 0.79	9 0.35	33040-GEFD
mm inch	160 6	155 6.1	159.5 6.28	22 0.87	10 0.39	33044-GEFD
mm inch	200 8	200 7.87	205.5 8.09	24.5 0.96	12 0.47	33046-GEFD
mm inch	250 10	250 9.84	256.5 10.1	24.5 0.96	12 0.47	33048-GEFD

Weld neck flange fixed



	DN	D	D1	L	L1	Ordering numbers
mm inch	16 5/8	16 0.63	18 0.71	7.5 0.3	38 1.5	33124-CESK
mm inch	25 1	25 0.98	28 1.1	12.7 0.5	50 1.97	33028-CESK
mm inch	40 1 1/2	36.8 1.45	40 1.57	13 0.51	63 2.48	33032-CESK
mm inch	63 2 1/2	66 2.6	70 2.76	17.5 0.69	105 4.13	33136-CESK

Weld neck flange rotatable



	DN	D	D1	L	L1	Ordering numbers
mm inch	16 5/8	16 0.63	18 0.71	7.5 0.3	38 1.5	33124-GESD

The metal seal for vacuum, cryogenics and high temperature applications



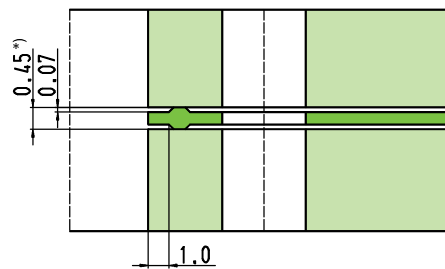
Material

silver-plated copper

Metal seals are used instead of elastomer seals if

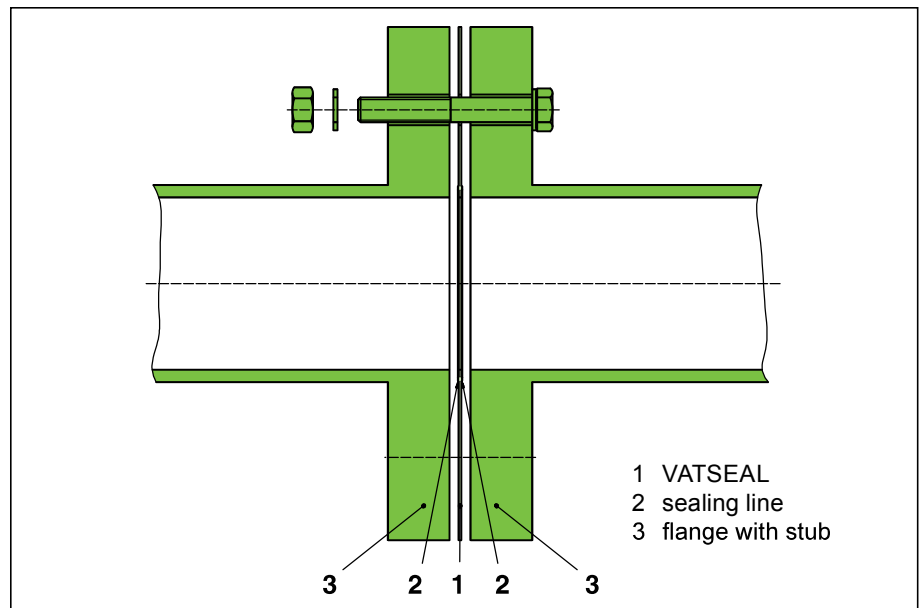
- permeation through an elastomer seal is not acceptable
- outgassing must be very low
- the temperature exceeds 150°C
- process gases are not compatible with elastomer seals
- high radiation resistance is required

Installation



*) 0.6 uncompressed

VATSEAL metal seals make a leak-tight seal and at the same time a reliable, low resistance RF contact



Features

- Sealing line any shape
- Flanges require only flat sealing surfaces
- Simple and reliable

Technical data

VATSEAL

Seals: - Material	silver-plated copper
- Hardness	70 - 90 HV
	Options: copper, gold-plated copper, silver-plated stainless steel
Sealing force required	min. 2000 N per cm sealing line
Leak rate	$< 1 \cdot 10^{-10}$ mbar ls ⁻¹
Pressure range	10 ⁻¹³ mbar to 10 bar (flanges permitting)
Temperature ¹⁾	-271°C (2K) to +300°C
Heating and cooling rate	≤ 50°C h ⁻¹
Sealing line	
- Shape	any
- Distance to edge of flange	> 1 mm
Thickness of VATSEAL	
- before mounting	0.60 mm
- compressed	0.45 mm
VATSEAL sizes possible	10 mm Ø to 500 x 600 mm

¹⁾ Maximum values: depending on operating conditions

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 length	max. 0.2 mm
- Flatness over 50 mm	max. 0.02 mm
- Surface finish	N4 (Ra = 0.2 µm)
Thickness	10 - 22 mm, depending on size
Distance between holes	max. 50 mm

**To prevent process contamination/
gases from condensing**

**To minimize cleaning intervals,
resulting in less maintenance work**

The valves shown in this picture are for

CVD systems

Plasma etching systems



**To reduce the pumping time
by conditioning valves**

**Increased process safety due to
lower residual gas pressure**

The valves shown in this picture are for

UHV systems

Sputtering systems

Research systems



Engineering with VAT

Our engineers are experienced in solutions concerning

- integration into system concepts
- application in cleanrooms
- regular temperature distribution
- valves with integrated heating controller
- protection against accidental contact
- simple mounting

Please contact VAT to determine the best heating solution for your specific application.

Minimum contamination due to corrosion resistant surface treatment

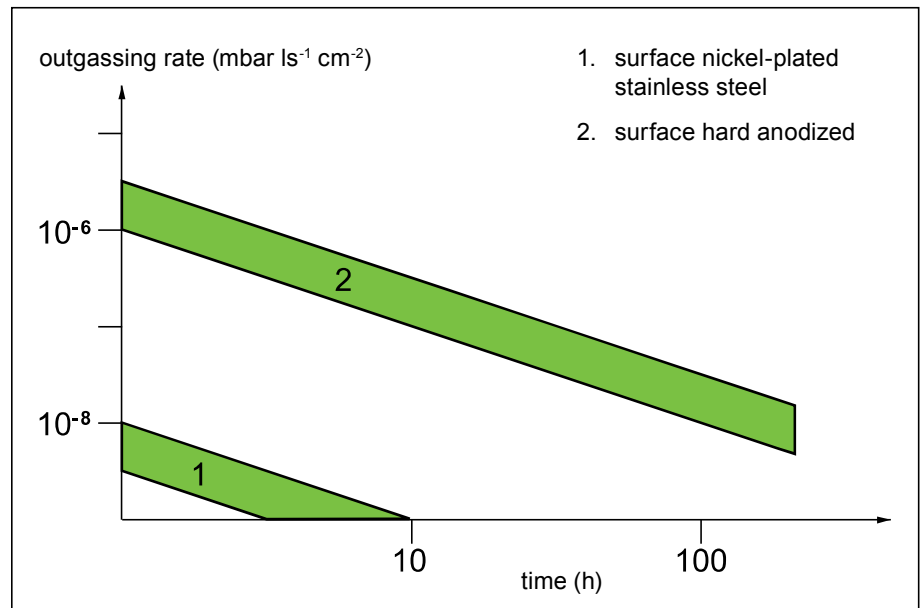
Low cost of ownership due to higher cycle life

The valves shown in this picture are for Plasma etching systems



The surface coating is selected according to the application. The increased outgassing rate has to be considered when defining the pumps.

Minimum contamination can be obtained by surface treatment and/or using a valve heater.



Engineering with VAT

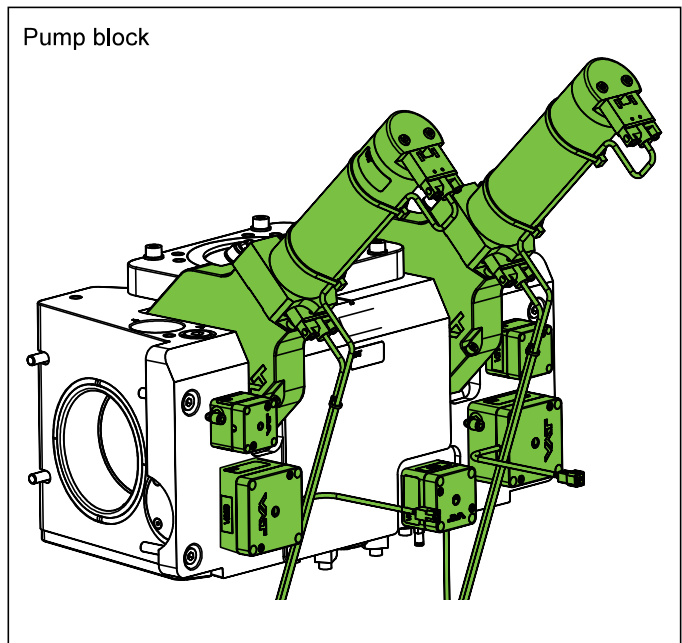
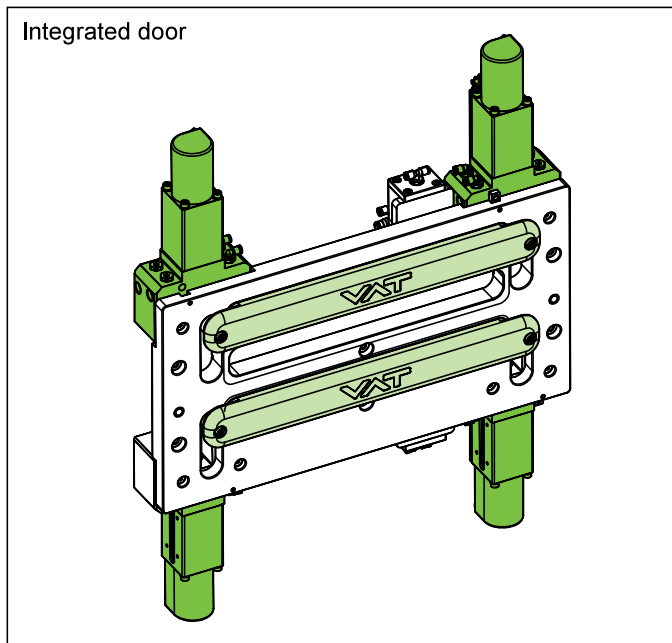
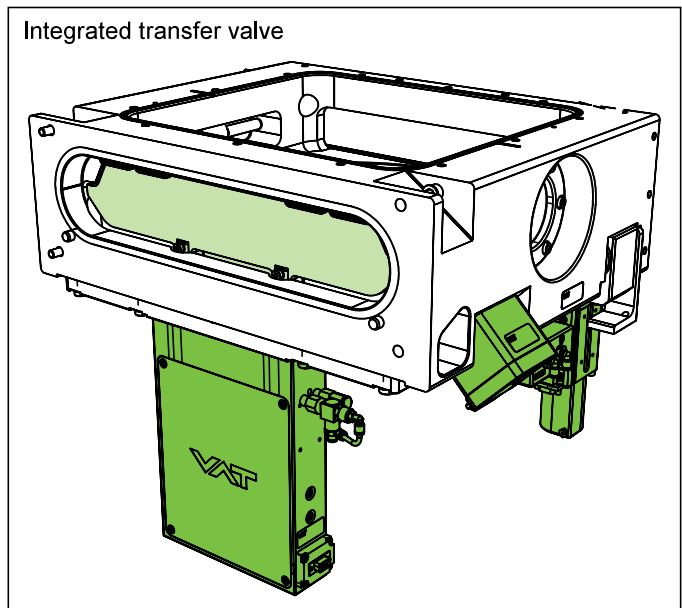
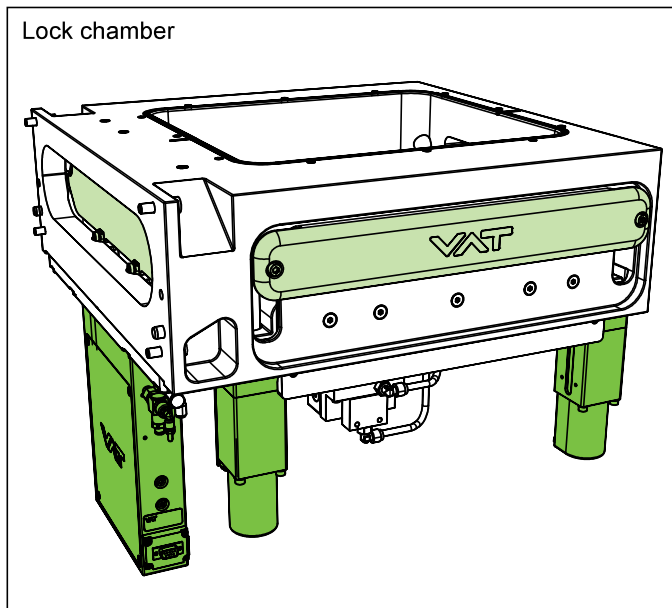
Our engineers are experienced concerning

- sealing technology with surface treated valves
- selection and treatment of corrosion resistant sealing materials
- reduction of maintenance costs by means of modular spare parts concept

We supply complete customer-specific modules with integrated valves for direct installation into the customer system. Function and leak tests are performed by VAT so that the modules are ready for use when delivered.

- Advantages are:
- space-saving (reduced footprint)
 - minimized sealing lengths
 - higher throughput
 - cost savings: fewer parts
fewer assembly work
fewer logistics (package delivery)
 - reduced pump volumes

Integration of transfer valves, doors, angle valves and gate valves





Lock chamber for an analysis system

Integrated are:

- Gate valve, Series 121
- Door mechanism
- Angle valves for evacuation and venting
- Sensors
- Docking device for transport and positioning module



Pumpstack

Integrated are:

- Butterfly control valve DN 100
- 2 Angle valves DN 100
- 4 Angle valves DN 25/40
- Various ports
- Pressure control valves
- Bore holes for liquid heating



Pump and vent valves module

Integrated are:

- 4 Angle valves DN 80 for evacuation
- 3 Angle valves DN 16 for venting
- Filters for venting
- Complex, customer-specific pipe system in narrow space
- Pump ports
- Connections for vacuum chambers
- Position indicators

Introduction

The glossary explains some technical terms and trade names used in this catalogue. These terms are explained in a way consistent with vacuum valve technology.

Adaptive controller

A controller adapting itself to changes in pressure, gas flow, and pumping speed without any manual adjustments. This allows for a completely automatic operation of the system.

All-metal valve

The static seals and the seat seal are made of metal.

Because these valves are free of lubricants and do not contain any elastomers or plastomers, their outgassing rate is very small and they can be baked at higher temperatures. They are therefore used for extreme UHV applications. With a special actuator they are radiation resistant to higher levels (10^8 Gy) than elastomer sealed valves.

Antimagnetic

Short form for «not ferromagnetic».

The relative magnetic permeability μ_r is measured with a Förster probe indicating the average value of μ_r in a volume of about 1 cm^3 in front of the probe.

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 stem. 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

CHEMRAZ®

Trade name for a perfluoro elastomer.

Closing direction

The closing direction is defined as the direction in which the gate approaches the seat during closing.

Closing / opening time

Time between the switching of solenoid voltage and the arriving of the gate in the fully closed, vacuum tight resp. open position.

The data in the catalog shows typical values. They are dependent on the compressed air pressure, the mounting position of the valve, the cross sections and lengths of the compressed air lines as well as on the measuring method and measuring system.

For fast closing systems the expression «total closing time» is used. This is the time between the triggering of the sensor (without sensor response time) and the arrival of the plate in the fully closed position.

Compressed air pressure

The specified compressed air pressures are always overpressures in bar.

Compression set

Lasting deformation of an elastomer seal after relief. The compression set is depending on the kind of material and has to be considered when defining dynamic seals.

$$CS = 100 \cdot (h_0 - h_2) / (h_0 - h_1)$$

CS ... compression set (%)

h_0 ... original height of seal

h_1 ... height of seal in compressed condition

h_2 ... height of seal in relieved condition

Conductance

The gas flow through a component (valve, tube, diaphragm) depends on the differential pressure to the component. The proportional factor is the conductance.

$$q = L \cdot \Delta p \text{ (mbar ls}^{-1}\text{)}$$

$$q \dots \text{ gas flow (mbar ls}^{-1}\text{)}$$

$$L \dots \text{ conductance (ls}^{-1}\text{)}$$

$$\Delta p \dots \text{ pressure difference (mbar)}$$

There is molecular flow in high vacuum. In this case, the conductance is only dependent on the size of the component.

The inner diameter of an open VAT valve is at each position equal to or larger than the corresponding tube diameter. The conductance of a VAT valve is hence roughly equal to a tube of the same configuration, diameter, and length.

The molecular flow conductance specified in the catalogue is calculated with the long tube formula. This is valid for valves mounted in a tube of the same diameter.

Formula for gate valves:

$$L_v = 12.2 \cdot D^3 / l$$

Formula for angle valves:

$$L_v = 12.2 \cdot D^3 / (2 \cdot e + 0.7 \cdot D)$$

Approximate formula for rectangular valves:

$$L_v = 40 \cdot a^2 \cdot b^2 / ((a + b) \cdot l)$$

$$a = \text{length of the slit (cm)}$$

$$b = \text{width of the slit (cm)}$$

$$D = \text{inner diameter of the valve (cm)}$$

$$e = \text{corner – flange distance (cm)} \\ \text{(dimension A in dimensional drawing)} \\ \text{(0.7 D is the correction factor for 90° bend)}$$

$$l = \text{flange-to-flange dimension of valve (cm)}$$

$$L_v = \text{molecular flow conductance (ls}^{-1}\text{)}$$

Conductance calculation in the vacuum system

The conductance L of a tube is composed of the conductance of the opening (orifice) L_B and the conductances of the tube elements L_{Ri} .

$$1 / L = 1 / L_B + \sum_i 1 / L_{Ri}$$

$$L_B = 9.2 \cdot D^2$$

$$L_R = 12.2 \cdot D^3 / l \text{ (long tube formula)}$$

$$D = \text{inner diameter (cm)}$$

$$l = \text{length of a tube element (cm)}$$

$$L, L_B, L_R = \text{conductance (ls}^{-1}\text{)}$$

The short tube formula contains the conductances of the orifice and of the tube. It is normally not applicable to valves.

Formula for the effective pumping speed of a pump:

$$1 / S_{\text{eff}} = 1 / S_o + \sum_i 1 / L_{Rij}$$

$$S_o = \text{nominal pumping speed (ls}^{-1}\text{)}$$

$$L_{Ri} = \text{conductances of tubes and valves (ls}^{-1}\text{)}$$

S_o accounts for the orifice. All conductances of tubes and valves have to be calculated with the long tube formula.

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 can reduce the time between maintenance.

Desorption

The desorption of physically or chemically bound gases from the interior surfaces of a vacuum container is the last step of the processes «diffusion» and «permeation».

In valve manufacturing, a small desorption rate is achieved by:

- Selection of material
- Surface treatment
- Cleaning
- Vacuum bake of valves and delivery with blank-off flanges on special request

DeviceNet®

DeviceNet® is a digital network serving as a communication network between industrial controllers and I/O devices. It is based on the CAN standard (Controller Area Network). Originally developed by Allen Bradley, it is now supervised by the non-profit organization DeviceNet Vendors Association (ODVA).

Differential pressure

The differential pressure is the pressure difference at the closed valve gate.

- With the higher pressure on seat side, the differential pressure acts in the opening direction
- With the higher pressure on the reverse side, the differential pressure acts in the closing direction

(See also 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. nitrile, silicone, FKM (VITON®), CHEMRAZ®, Kalrez®).

FFKM

See «Perfluoro elastomer»

FKM

See «Fluoro elastomer»

Fluoro elastomer

Fluoro (FKM or FPM) is an elastomer with high chemical resistance. Fluoro elastomers from different manufacturers have slightly different properties regarding chemical resistance, temperature resistance, mechanical properties and cleanliness.

FPD

Short term for Flat Panel Display. Designates flat screens that are, for instance, used in TV sets or computers.

Free of lubricants (dry)

The lubricant used in the vacuum is a fluoro based vacuum grease. Solid lubricants and metal films are normally not mentioned as lubricants.

Free of lubricants or dry means that friction problems in the vacuum are solved in a way not to emit any hydrocarbon or silicone vapours into the vacuum.

Gas purge

Additional gas flow directly into the valve. A low overpressure reduces the gas penetration into the valve interior to a large extent, and valve mechanism and seal are protected against contamination.

Gas purge is only useful in combination with protective rings. The protective ring minimizes the additional gas penetration and the influence on the process. The kind of gas and volume of gas flow depend on the process. Usually, the gas purge is about 5 % of the process gas flow.

Series 17 valves are available with a port for gas purging.

Gray (Gy)

Unit for the energy dose in the SI system (international measuring system). The energy dose is the radiation energy absorbed by the material per unit of mass.

1 Gy = 1 J/kg = 100 rad

Hot zone

Area with (locally) increased radiation level and increased temperature. The radiation level is higher than normally used materials can withstand during the expected time of use.

Valves are typically radiation resistant between 10³ and 10⁶ Gy depending on the sealing materials used. Actuators are typically suited for 10¹ to 10⁵ 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 >50ms. Between actuations the solenoid is currentless (but can also stay under voltage). This ensures no change of valve position at power failure.

Intermediate pumping

To reduce the leak rate static seals, rotary and shaft feed-throughs can be double sealed in order to evacuate the space between the two seals. This intermediate space is typically pumped to a pressure of 0.1 to 10 mbar. The lower differential pressure reduces the permeation through the seal and the gas carrying during actuation.

Kalrez®

Trade name for a perfluoro elastomer.

Leak rate

Helium gas flow in mbar ls^{-1} leaking through a sealing arrangement or a body. During the measurement the difference of the helium partial pressure is in the order of 1000 mbar. The rise of the helium gas flow during the test time (typically 1 minute) is the leak rate. The test time depends on the permeation rate of helium through the gasket and the vacuum time constant of the system.

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-motion transfer valve comes with vulcanized gates or O-ring gates 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 developed and patented by VAT. It features shock-free and virtually particle-free actuation and very long cycle life.



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.

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

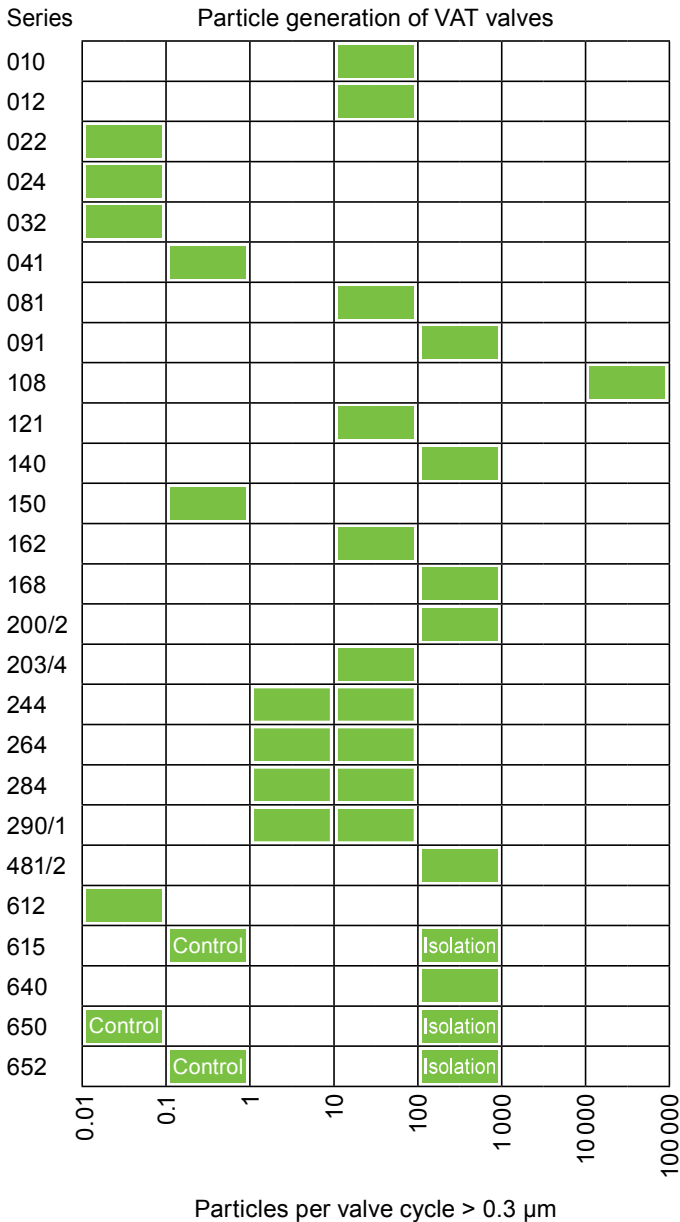
The outgassing rate of very well degassed surfaces (baked) in VAT valves is at room temperature:

- Stainless steel: $2 \cdot 10^{-13} \text{ mbar ls}^{-1} \text{ cm}^{-2}$
- FKM (VITON®) (without permeation): $2 \cdot 10^{-11} \text{ mbar ls}^{-1} \text{ cm}^{-2}$

Particle

Valves with friction in the vacuum may generate substantial numbers of particles during operation. Valves with low particle count have as little as possible friction in the vacuum.

VAT regularly carries out particle measurements on valves under atmospheric pressure. This allows us to use highly sensitive laser particle counters as applied for cleanroom supervision. Compared with measurement under vacuum our method is very sensitive because a large percentage of the generated particles are conveyed to the particle counter due to the laminar flow.



Perfluoro elastomer

Perfluoro (FFKM or FFPM) is fully fluorinated hydrogen-free FKM. Its chemical resistance is even higher than that of FKM. Perfluoro elastomers are, for instance, offered under the trade names Chemraz®, Kalrez® or Perlast®.

Perlast®

Trade name for a perfluoro elastomer.

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®, Vespel®).

Pneumatic actuator

VAT valves are available with various types of compressed air cylinders and various solenoid valves.

Even for non mechanically locked valves the valve position can be maintained for a certain period of time at compressed air failure by installing a check valve at the compressed air inlet.

POM

Short form for Polyoxymethylene, a thermoplastic material.

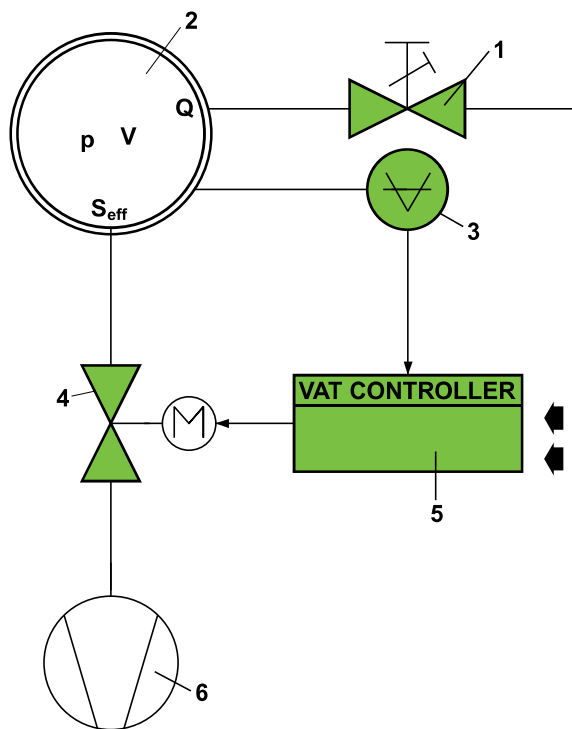
Pressure

Vacuum pressures are always absolute pressures unless explicitly specified as pressure differences.

Compressed air pressures are always pressure differences to the atmospheric pressure, i.e. overpressures.

Pressure closed-loop control

Elements:



- | | |
|-------------------|-----------------------|
| 1 gas flow meter | 4 control valve |
| 2 process chamber | 5 pressure controller |
| 3 pressure sensor | 6 vacuum pump |

In stationary condition the following formula is applicable:

$$S_{\text{eff}} \dots Q / p$$

S_{eff} ... effective pumping speed (ls^{-1})

Q ... gas flow (mbar ls^{-1})

p ... pressure (mbar)

or units used in USA

$$S_{\text{eff}} = 12.7 \cdot Q / p$$

S_{eff} ... effective pumping speed (ls^{-1})

Q ... gas flow (scm)

p ... pressure (mTorr)

Way 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

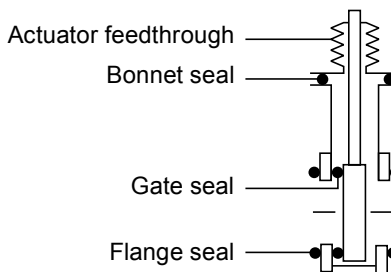
This guarantees a small RF resistance through the open valve. In the open valve position a metal ring, having the geometric shape of the beam tube, is spread between the two connecting flanges and ensures a direct electrically conducting connection between the two flanges.

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).

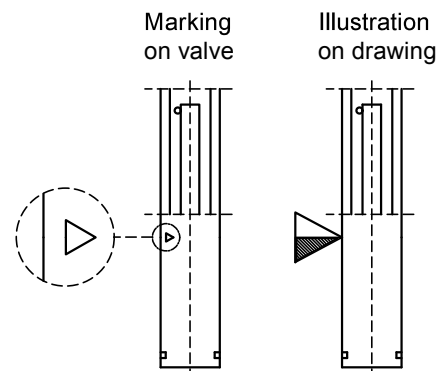
Seals of valves



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.

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).



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.

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.

SoIVAT

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 SoIVAT valve is based on a modular design. Scaling for the required substrate size is hence easy. The valve is very robust against aggressive media and high temperatures and may be supplied in a variety of materials and material combinations.

Stepper motor

The stepper motor is well suited for exact positioning. It is hence often used as actuator for control valves.

Tenic®

Teflon® (PTFE) filled with nickel powder. Sealing material for the chemical industry.

Vacuum brazing

Joining technique for void-free joints.

In addition vacuum brazing is an ideal way of cleaning and degassing the brazed parts.

Vacuum grease

For valves with lubricants VAT uses a fluoro based vacuum grease with very low vapour pressure ($<5 \cdot 10^{-13}$ mbar at 20 °C).

Vacuum levels

See page 230.

VATLOCK

Gate valve mechanism (e.g. used in series 10, 12 and 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

All-metal sealing configuration developed by VAT.

The conically arranged seal ring allows for large sealing forces with relatively small closing or axial forces.

The sealing partners are stainless steels which are only elastically deformed despite the large sealing forces.

Under clean operating conditions the VATRING configuration has a very long cycle life of 100,000 cycles. It is bakeable to 450°C in the open and closed position.



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 200/202 feature a bellows feedthrough, those of the Series 203/204 a rotary feedthrough.



Vespel®

Trade name for a polyimide used as seat seal in special valves.

VITON®

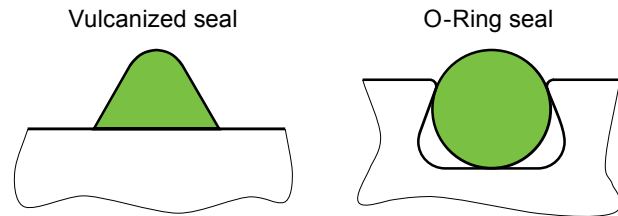
Trade name for a fluoroelastomer (FKM). VITON® has a small desorption rate.

The maximum temperature for valves in open position is 200°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 200°C and the lifetime of the seal is reduced.

Vulcanized seal

Is used as a dynamic seal for UHV valves and MONOVAT systems (series 01, 02, 03, 04, 05, 10.8, 15, 20).



The vulcanized seal has the following advantages compared to an O-ring seal:

- Increased reliability of operation:
Seal cannot be pulled out of the groove due to sticking or differential pressure
- Easy maintenance:
No seal groove, seal remains on gate, flat surfaces in the sealing area ensure easy cleaning
- Improved vacuum properties:
Only one sealing line, no voids that cause outgassing, no hidden impurities

Vulcanized seals can be made of fluoroelastomer, perfluoroelastomers, silicones or EPDM. Outgassing rate, permeation and bakeability are equal to selected high quality O-rings.

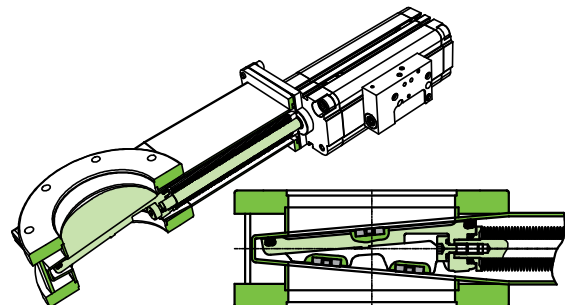
Waveguide

In the open position a tube is placed between the flanges. Only a small gap remains between the ends of the tube and the flanges. The RF resistance of the open valve is hence greatly reduced.

Wedge sealing system

Sealing system developed by VAT for the Series 09 gate valves.

This extremely robust system is provided with a wedge-shaped gate which is pressed on an appropriate seat in the body. O-ring compression is limited by PEEK sliding elements. This enables a combination of a good leak rate with a corresponding cycle life, even if exposed to multiple differential pressure openings of up to 1 bar. Furthermore, the sliding elements prevent dynamic metal-to-metal contact and consequently reduce particle generation. This may be crucial for sensitive applications.



Weld neck (weld stub)

A valve can be equipped with a weld neck instead of a flange. Such a valve can be welded directly into a tubing or a specific flange can be attached by the customer. Care has to be taken not to warp or contaminate the valve.

XL-VAT

L-motion transfer valve with an O-ring gate seal, primarily developed for the flat screen production. The XL-VAT valve is based on a modular design. Scaling for the required substrate size is hence easy. The required locking pressure may be controlled via the control unit. Overstraining of the gate O-ring may therefore be prevented. Furthermore, the XL-VAT valve is designed for very easy maintenance.

Different applications require different technical designs of the valves. VAT valves can roughly be divided into 4 vacuum levels. This table shows the major features.

Vacuum level	Pressure range (mbar)	Maximum temperature (°C)	Seals		Feedthrough
			Gate	Bonnet	
Vacuum	to $1 \cdot 10^{-7}$	150	FKM (VITON)	FKM (VITON)	O-ring shaft seal, sealed with O-Ring made of FKM (VITON)
HV (high vacuum)	to $1 \cdot 10^{-8}$	150	FKM (VITON)	FKM (VITON)	rotary feedthrough, sealed with O-Ring made of FKM (VITON) or bellows feedthrough
UHV (ultra high vacuum)	to $1 \cdot 10^{-10}$	200 / 250	FKM (VITON)	metal	bellows feedthrough
XHV (extreme UHV)	better than 10^{-10}	300 / 450	metal	metal	bellows feedthrough

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	X10CrNi18-8	0.05 - 0.15	16.0 - 19.0	6.0 - 9.5	≤0.8
303	1.4305	X8CrNiS18-9	≤0.10	17.0 - 19.0	8.0 - 10.0	–
304	1.4301	X5CrNi18-10	≤0.07	17.5 - 19.5	8.0 - 10.5	–
304L	1.4306	X2CrNi19-11	≤0.030	18.0 - 20.0	10.0 - 12.0	–
305	1.4303	X4CrNi18-12	≤0.06	17.0 - 19.0	11.0 - 13.0	–
–	1.4308	Gx5CrNi19-10				
316	1.4401	X5CrNiMo17-12-2	≤0.070	16.5 - 18.5	10.0 - 13.0	2.00 - 2.50
316L	1.4404	X2CrNiMo17-12-2	≤0.030	16.5 - 18.5	10.0 - 13.0	2.00 - 2.50
316L	1.4435	X2CrNiMo18-14-3	≤0.030	17.0 - 19.0	12.5 - 15.0	2.50 - 3.00
316LN	1.4429	X2CrNiMo17-13-3	≤0.030	16.5 - 18.5	11.0 - 14.0	2.50 - 3.00
316Ti	1.4571	X6CrNiMoTi17-12-2	≤0.08	16.5 - 18.5	10.5 - 13.5	2.00 - 2.50
420	1.4034	X46Cr13	0.43 - 0.50	12.5 - 14.5	–	–
420C	1.3541	X47Cr14	0.43 - 0.50	12.5 - 14.5	–	–
420D	1.4037	X65Cr14	0.60 - 0.70	12.5 - 14.5	–	≤0.75
430	1.4016	X6Cr17	≤0.08	16.0 - 18.0	–	–
440	1.4122	X39CrMo17-1	0.33 - 0.45	15.5 - 17.5	≤1.00	0.80 - 1.30
440C	1.4125	X105CrMo17	0.95 - 1.20	16.0 - 18.0	–	0.40 - 0.80
631	1.4568	X7CrNiAl17-7	≤0.09	16.0 - 18.0	–	6.50 - 7.80

Aluminum alloys						
Material No.		Abbreviated designation	Composition (%)			
EN	EN	EN	Mg	Si	Mn	
EN AC-42000	–	EN AC-AISi7Mg	0.2 - 0.65	6.5 - 7.5	≤0.35	
EN AC-42100	3.2371	EN AC-AISi7Mg0.3	0.2 - 0.4	6.5 - 7.5	≤0.05	
EN AW-5083	3.3547	EN AW-AlMg4.5Mn0.7	4.0 - 4.9	0.4	0.4 - 1.0	
EN AW-5049	3.3527	EN AW-AlMg2Mn0.8	1.6 - 0.5	0.4	0.5 - 1.1	
EN AW-5754	3.3535	EN AW-AlMg3	2.6 - 3.6	0.4	0.5	
EN AW-6014	–	EN AW-AlMg0.6Si0.6V	0.4 - 0.8	0.3 - 0.6	0.05 - 0.2	
EN AW-6060	3.3206	EN AW-AlMgSi	0.45 - 0.6	0.5 - 0.6	≤0.1	
EN AW-6061	3.3211	EN AW-AlMg1SiCu	0.80 - 1.2	0.4 - 0.8	≤0.15	
EN AW-6063	3.3206	EN AW-AlMg0.7Si	0.45 - 0.9	0.2 - 0.6	≤0.1	
EN AW-6082	3.2315	EN AW-AISi1MgMn	0.6 - 1.2	0.7 - 1.3	0.4 - 1.0	

Other materials	
Material No.	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
Hastelloy C22	Nickel with 22 % Cr, 13 % Mo, 3 % W, 3 % Fe, ≤2.5 % Co
Inconel 625	Nickel with 20 - 23 % Cr, 8 - 10 % Mo, 5 % Fe, 3.2 - 4.2 % Nb und Ta, 1 % C
Nimonic 90	Nickel with 15 - 21 % Co, 18 - 21 % Cr, 2 - 3 % Ti, 1 - 2 % Al
Titanium 3.7035	99.3 % Ti

Pressure

	Pa (N m ⁻²)	bar	mbar	µbar (dyn cm ⁻²)	Torr (mm Hg)	micron (µ, mTorr)	atm	psi (lbf inch ⁻²)	psf (lbf ft ⁻²)
1 Pa (N m ⁻²) =	1	1 · 10 ⁻⁵	1 · 10 ⁻²	10	7.5 · 10 ⁻³	7.5	9.87 · 10 ⁻⁶	1.45 · 10 ⁻⁴	2.09 · 10 ⁻²
1 bar =	1 · 10 ⁵	1	1000	1 · 10 ⁶	750	7.5 · 10 ⁵	0.987	14.5	2.09 · 10 ³
1 mbar =	100	1 · 10 ⁻³	1	1000	0.75	750	9.87 · 10 ⁻⁴	1.45 · 10 ⁻²	2.09
1 µbar (dyn cm ⁻²) =	0.1	1 · 10 ⁻⁶	1 · 10 ⁻³	1	7.5 · 10 ⁻⁴	0.75	9.87 · 10 ⁻⁷	1.45 · 10 ⁻⁵	2.09 · 10 ⁻³
1 Torr (mm Hg) =	133.3	1.333 · 10 ⁻³	1.333	1333	1	1000	1.32 · 10 ⁻³	1.93 · 10 ⁻²	2.78
1 micron (µ, mTorr) =	0.1333	1.333 · 10 ⁻⁶	1.333 · 10 ⁻³	1.333	1 · 10 ⁻³	1	1.32 · 10 ⁻⁶	1.93 · 10 ⁻⁵	2.78 · 10 ⁻³
1 atm =	1.01 · 10 ⁵	1.013	1013	1.01 · 10 ⁶	760	7.6 · 10 ⁵	1	14.7	2.12 · 10 ³
1 psi (lbf inch ⁻²) =	6.89 · 10 ³	6.89 · 10 ⁻²	68.9	6.89 · 10 ⁴	51.71	5.17 · 10 ⁴	6.8 · 10 ⁻²	1	144
1 psf (lbf ft ⁻²) =	47.8	4.78 · 10 ⁻⁴	0.478	478	0.359	359	4.72 · 10 ⁻⁴	6.94 · 10 ⁻³	1

Gas flow and leak rate

	Pa m ³ s ⁻¹	mbar ls ⁻¹	Torr ls ⁻¹	atm cm ³ s ⁻¹	lusec	sccm	slm	Mol s ⁻¹
1 Pa m ³ s ⁻¹ =	1	10	7.5	9.87	7.5 · 10 ³	592	0.592	4.41 · 10 ⁻⁴
1 mbar ls ⁻¹ =	0.1	1	0.75	0.987	750	59.2	5.92 · 10 ⁻²	4.41 · 10 ⁻⁵
1 Torr ls ⁻¹ =	0.1333	1.333	1	1.32	1000	78.9	7.89 · 10 ⁻²	5.85 · 10 ⁻⁵
1 atm cm ³ s ⁻¹ =	0.101	1.01	0.76	1	760	60	6 · 10 ⁻²	4.45 · 10 ⁻⁵
1 lusec =	1.333 · 10 ⁻⁴	1.333 · 10 ⁻³	10 ⁻³	1.32 · 10 ⁻³	1	7.89 · 10 ⁻²	7.89 · 10 ⁻⁵	5.86 · 10 ⁻⁸
1 sccm =	1.69 · 10 ⁻³	1.69 · 10 ⁻²	1.27 · 10 ⁻²	1.67 · 10 ⁻²	12.7	1	10 ⁻³	7.45 · 10 ⁻⁷
1 slm =	1.69	16.9	12.7	16.7	1.27 · 10 ⁴	1000	1	7.45 · 10 ⁻⁴
1 Mol s ⁻¹ =	2.27 · 10 ³	2.27 · 10 ⁴	1.7 · 10 ⁴	2.24 · 10 ⁴	1.7 · 10 ⁷	1.34 · 10 ⁶	1.34 · 10 ³	1

Temperature

	K	°C	°F
1 K =	1	K-273.15	5/9 x K-459.67)
1 °C =	°C+273.15	1	5/9 x °C+32)
1 °F =	5/9 x (°F+459.67)	5/9 x (°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 [µ inch]	1	2	4	8	16	32	63	125	250	500	1000	2000

Example: Surface finish class N3 → Ra less than 0.1 µm

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